

# HP38G Entry Reference

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Complete listing sorted by functionality  
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# 1 Introduction

This is a list of SystemRPL, User RPL and ML entries. The list groups the entries by task in many different chapters and sections. If you are looking for a particular entry go directly to the Index. There is also an address-sorted list, if you want to look up a particular address.

## 1.1 Disclaimer and Acknowledgments

The information provided in this document was compiled from a large variety of sources. The transformation of all the different formats to a single database was largely done with special purpose programs to reverse-engineer the different documents. This has worked very well in many cases, and less well in some other cases. If some of the information looks oddly formatted, the reason is probably the automatic extraction.

Many of the authors of the original documents will find literal bits and pieces of their text in this document. Thanks to all of them for their generosity in allowing me to use their documents and files freely.

Neither we nor the authors of the different sources assume any warranty. This document is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

If you find any errors, let us know so that the database can be updated and fixed. Sent bug reports and other comments to [Carsten Dominik](#). Reports about the ML chapter should be sent directly to [Thomas Rast](#), but with a CC to [Carsten Dominik](#).

Here is a list of sources which have been used.

*Programming in System RPL* by Eduardo Kalinowski

This book has been a major source for the database. The entire book has been reverse-engineered using pdftotext and then a variety of Emacs and Perl programs to extract and format the reference part of the book.

*CAS Documentation Draft* by Bernard Parisse

Bernard Parisse has kindly sent me a file with draft documentation about most CAS entries which is the basis of the CAS chapter. This covers both code derived from Erable (written by Bernard) and from ALG48 (by Mika Heiskanen and Claude-Nicolas Fiechter). The documentation is not complete, and not entirely up-to-date. However, the information given should be accurate.

*entries.srt* by Mika Heiskanen

Mika's really useful collection of entry description has been used to double-check the information derived from Eduardo's book.

*ML entry descriptions* by Peter Geelhoed

Peter Geelhoed created the initial version of the ML section for this document.

*HP48/49 entry cross-reference* by Joe Horn

This document has been used to make a list of entries for the HP49 in the first place, and to add and double-check addresses for both calculators.

Various posts on `comp.sys.hp48`

A number of post on `comp.sys.hp48` have documented a set of entry points, for example the Graphical Toolbox (Cyrille de Brebisson), the Editor related entries (myself) and other stuff.

Supported entry lists from HP

HP has published lists of supported entries for all calculators in the database. The lists generally only contain names and addresses, no further description.

Further contributions

Denis Martinez, Alberto Zamora Oyarce, Wolfgang Rautenberg, Michael de Coninck, Christoph Giesselink, Martin Lang, Piotr Kowalewski, Lilian Pigallio and in particular Jean-Yves Avenard have also contributed information about various entry points and/or have replied to my questions about different aspects related to entries.



## 1.2 Terminology

### 1.2.1 Abbreviations used in Stack Diagrams

Here is a list of the codes use to denote different objects in the stack diagrams.

ob	any object
1...n	n objects
#	binary integer (BINT)
HXS	hex string (User binary integer)
CHR	character
\$	character string
T	TRUE
F	FALSE
flag	TRUE or FALSE
%	real number
%%	extended real number
%C	complex number
%%C	extended complex number
z, Z ,ZINT	infinite precision integer
N	positive infinite precision integer
s, symb	symbolic
u, unit	unit object
{}	list
A, []	Array
V, []	Vector
M, [[]]	Matrix
P	Polynom, a list of Qs
Q	ZINT or P
meta, ob1..obn #n	meta object
grob	graphical object
menu	list or program returning a list

UserRPL stack diagrams use some additional abbreviations

x,y	real, list, generic UserRPL object
c, (,)	complex number
#	hex string (User binary integer)
greek theta	angle (a real number)
m,n	integer (ZINT or real)
date	DD.MMYYYY or MM.DDYyyy
name	global name
prog,prg	program
f,func	function
F	integral of f

### 1.2.2 Unsupported Entry Points

A large number of entries in this database are not officially supported (i.e. their address is not guaranteed by HP to be stable). However, many of these entries can still be used, provided that the entry address is (or has been) *stable* in all ROM versions.

On the HP49G, two address intervals have been pointed out by Jean-Yves Avenard to be stable, so entries found in these intervals will be added to this database.

On the HP48G, no new ROM versions are to be expected, and all entries can be considered *stable*.

The names of unsupported but stable entries will be *enclosed in single parenthesis*, like (CURSOR@).

### 1.2.3 More Information

This database has been used to create the entries reference in the second edition of *Programming in System RPL* by Eduardo M. Kalinowski and C. Dominik. In this book, the entry list is embedded into a lot more information about SystemRPL and the HP49G, so if you need additional information, check the book. The main reasons to make also the entry database available is that it is a more compact listing, contains information about ML entries as well and lists the addresses of the entry on many different calculators.

## 2 HP Objects

### 2.1 Binary Integers

#### 2.1.1 Built-in BINTS 0-127

0403F	BINT0	0d 0h aka: ZERO, any
04049	BINT1	1d 1h aka: ONE, real, MEMERR
04053	BINT2	2d 2h aka: TWO, cmp
0405D	BINT3	3d 3h aka: THREE, str
04067	BINT4	4d 4h aka: FOUR, arry
04071	BINT5	5d 5h aka: FIVE, list
0407B	BINT6	6d 6h aka: SIX, id, idnt
04085	BINT7	7d 7h aka: SEVEN, lam
0408F	BINT8	8d 8h aka: EIGHT, seco
04099	BINT9	9d 9h aka: NINE, symb
040A3	BINT10	10d Ah aka: TEN, sym
040AD	BINT11	11d Bh aka: ELEVEN, hxs
040B7	BINT12	12d Ch aka: TWELVE, grob
040C1	BINT13	13d Dh aka: TAGGED, THIRTEEN
040CB	BINT14	14d Eh aka: EXT, FOURTEEN, unitob
040D5	BINT15	15d Fh aka: FIFTEEN, rompointer

040DF	BINT16	16d 10h aka: REALOB, SIXTEEN
040E9	BINT17	17d 11h aka: SEVENTEEN, 2REAL, REALREAL
040F3	BINT18	18d 12h aka: EIGHTEEN
040FD	BINT19	19d 13h aka: NINETEEN
04107	BINT20	20d 14h aka: TWENTY
04111	BINT21	21d 15h aka: TWENTYONE
0411B	BINT22	22d 16h aka: TWENTYTWO
04125	BINT23	23d 17h aka: TWENTYTHREE
0412F	BINT24	24d 18h aka: TWENTYFOUR
04139	BINT25	25d 19h aka: TWENTYFIVE
04143	BINT26	26d 1Ah aka: REALSYM, TWENTYSIX
0414D	BINT27	27d 1Bh aka: TWENTYSEVEN
04157	BINT28	28d 1Ch aka: TWENTYEIGHT
04161	BINT29	29d 1Dh aka: TWENTYNINE
0416B	BINT30	30d 1Eh aka: REALEXT, THIRTY
04175	BINT31	31d 1Fh aka: THIRTYONE
0417F	BINT32	32d 20h aka: THIRTYTWO
04189	BINT33	33d 21h aka: THIRTYTHREE
04193	BINT34	34d 22h aka: THIRTYFOUR
0419D	BINT35	35d 23h aka: THIRTYFIVE

041B1	BINT37	37d 25h aka: THIRTYSEVEN
041BB	BINT38	38d 26h aka: THIRTYEIGHT
041C5	BINT39	39d 27h aka: THIRTYNINE
041CF	BINT40	40d 28h aka: FORTY, FOURTY
041D9	BINT41	41d 29h aka: FORTYONE
041E3	BINT42	42d 2Ah aka: FORTYTWO
041ED	BINT43	43d 2Bh aka: FORTYTHREE
80000	BINT44	44d 2Ch aka: FORTYFOUR
8000A	BINT45	45d 2Dh aka: FORTYFIVE
80014	BINT46	46d 2Eh aka: FORTYSIX
8001E	BINT47	47d 2Fh aka: FORTYSEVEN
80028	BINT48	48d 30h aka: FORTYEIGHT
80032	BINT49	49d 31h aka: FORTYNINE
8003C	BINT50	50d 32h aka: FIFTY
80046	BINT51	51d 33h aka: FIFTYONE
80050	BINT52	52d 34h aka: FIFTYTWO
8005A	BINT53	53d 35h aka: FIFTYTHREE, STRLIST, THREEFIVE
80064	BINT54	54d 36h aka: FIFTYFOUR
8006E	BINT55	55d 37h aka: FIFTYFIVE
8006E	#THREESEVEN	55d 37h

80078	BINT56	56d 38h aka: FIFTYSIX
80082	BINT57	57d 39h aka: FIFTYSEVEN
8008C	BINT58	58d 3Ah aka: FIFTYEIGHT
80096	BINT59	59d 3Bh aka: FIFTYNINE
800A0	BINT60	60d 3Ch aka: SIXTY
800AA	BINT61	61d 3Dh aka: SIXTYONE
800B4	BINT62	62d 3Eh aka: SIXTYTWO
800BE	BINT63	63d 3Fh aka: SIXTYTHREE
800BE	BINT3Fh	64d 3Fh
800C8	BINT64	64d 40h aka: BINT40h, SIXTYFOUR, YHI
800D2	BINT65	65d 41h aka: ARRYREAL
800D2	BINT_65d	65d 41h
800D2	SIXTYFIVE	65d 41h
800DC	BINT66	66d 42h aka: FORTTWO
800DC	SIXTYSIX	66d 42h
800E6	BINT67	67d 43h aka: FOURTHREE
800F0	BINT68	68d 44h aka: SIXTYEIGHT
800F0	2ARRY	68d 44h
800FA	BINT69	69d 45h aka: FOURFIVE
80104	BINT70	70d 46h aka: SEVENTY
80104	ARRYID	70d 46h
8010E	SEVENTYONE	71d 47h
80118	SEVENTYTWO	72h 48d
80122	SEVENTYTHREE	73d 49h

8012C	BINT74	74d 4Ah aka: SEVENTYFOUR
80136	SEVENTYFIVE	75d 4Bh
80140	SEVENTYSIX	76d 4Ch
8014A	SEVENTYSEVEN	77d 4Dh
80154	SEVENTYEIGHT	78d 4Eh
8015E	BINT79	79d 4Fh aka: SEVENTYNINE
80168	BINT80	80d 50h aka: EIGHTY
80168	LISTOB	80d 50h
80172	BINT81	81d 51h aka: EIGHTYONE, LISTREAL
8017C	BINT82	82d 52h aka: LISTCMP
80186	BINT83	83d 53h aka: FIVETHREE
80190	BINT84	84d 54h aka: FIVEFOUR
8019A	BINT85	85d 55h aka: 2LIST
801A4	BINT86	86d 56h aka: FIVESIX
801A4	LISTID	86d 56h
801AE	BINT87	87d 57h aka: LISTLAM
801B8	EIGHTYEIGHT	88d 58h
801C2	EIGHTYNINE	89d 59d
801CC	NINETY	90d 5Ah
801D6	BINT91	91d 5Bh aka: BINT_91d
801E0	NINETYTWO	92d 5Ch
801EA	NINETYTHREE	93d 5Dh
801F4	NINETYFOUR	94d 5Eh
801FE	NINETYFIVE	95d 5Fh
80208	BINT96	96d 60h aka: BINT_96d
80212	BINT97	97d 61h aka: IDREAL
8021C	IDCMP	98d 62h

8021C	NINETYEIGHT	98d 62h
80226	NINETYNINE	99d 63h
80230	BINT100	100d 64h aka: ONEHUNDRED
80230	IDARRY	100d 64h
8023A	IDLIST	101d 65h
8023A	SIXFIVE	101d 65h
80244	BINT111	111d 6Fh aka: char
80258	LAMREAL	113d 71h
80262	BINT_114	114d 72hd
8026C	BINT115	115d 73h aka: BINT_115d
80276	BINT116	116d 74h aka: BINT_116d
80280	LAMLIST	117d 75h
80280	BINT_117d	117d 75h
8028A	BINT122	122d 7Ah aka: BINT_122d

## 2.1.2 Built-in BINTS 127-255

80294	BINT128	128d 80h aka: BINT80h
80294	BINT_128d	128d 80h
8029E	BINT130	130d 82h aka: BINT130d, BINT_130d, XHI-1
802A8	BINT131	131d 83h aka: BINT_131d, BINT131d, XHI
802BC	SYMBREAL	145d 91h
802C6	SYMBCMP	146d 92h
802D0	SYMBSYM	154d 9Ah
802DA	SYMBUNIT	158d 9Eh
802E4	backup	159d 9Fh
802EE	SYMOB	160d A0h
802F8	SYMREAL	161d A1h
80302	SYMCMP	162d A2h
80316	SYMARRY	164d A4h
80320	SYMLIST	165d A5h
8032A	SYMID	166d A6h



80334	SYMLAM	167d A7h
8033E	SYMSYMB	169d A9h
80348	SYMSYM	170d AAh
80352	SYMEXT	174d AEh
8035C	HXSREAL	177d B1h
80366	2HXS	187d BBh
80370	BINTC0h	192d C0h
8037A	2GROB	204d CCh
80384	TAGGEDANY	208d DOh
8038E	EXTREAL	225d E1h
80398	EXTSYM	234d EAh
80398	UNITSYM	234d EAh
803A2	2EXT	238d EEh
803AC	ROMPANY	240d FOh
803B6	BINT253	253d FDh
803C0	BINT255d	255d FFh

### 2.1.3 Built-in BINTS 256-

803CA	REALOBOB	256d 100h
803D4	#_102	258d 102h
803D4	#_258_d	258d 102h
803DE	#SyntaxErr	262d 106h
803E8	BINT_263d	263d 107h
803F2	REALREALOB	272d 110h
803FC	3REAL	273d 111h
80406	Err#Kill	291d 123h
80406	#_291_d	291d 123h
80406	#_123	291d 123h
80410	#_124	292d 124h
80410	Err#NoLstStk	292d 124h
80410	#_292_d	292d 124h
8041A	#NoRoomForSt	305d 131h
8041A	BINT_305d	305d 131h
80424	BINT_306d	306d 132h
8042E	REALSTRSTR	307d 133h
8042E	BINT_307d	307d 133h
80492	Err#Cont	318d 13Eh

8049C	INTEGER337	337d 151h
804A6	CMPOBOB	512d 200h
804B0	Err#NoLstArg	517d 205h
804B0	#_205	517d 205h
804B0	#_517_d	517d 205h
804BA	STRREALREAL	785d 311h
804C4	ARRYREALREAL	1041d 411h
804CE	ARRYREALCMP	1042d 412h
804D8	3ARRY	1092d 444h
804E2	ARRYLSTREAL	1105d 451h
804EC	ARRYLSTCMP	1106d 452h
804F6	LISTREALOB	1296d 510h
80500	LISTREALREAL	1297d 511h
8050A	LISTLISTOB	1360d 550h
80514	IDREALOB	1552d 610h
8051E	IDLISTOB	1616d 650h
80528	FSTMACROROM#	1792d 700h
80528	LAMANYANY	1792d 700h
80532	PROGIDREAL	2145d 861h
8053C	PROGIDCMP	2146d 862h
80546	PROGIDLIST	2149d 865h
80550	PROGIDEXT	2158d 86Eh
8055A	ATTNERR	2563d A03h
80564	SYMREALREAL	2577d A11h
8056E	SYMREALCMP	2578d A12h
80578	SYMREALSYM	2586d A1Ah
80582	SYMCMPPREAL	2593d A21h
8058C	SYMCMPCMP	2594d A22h
80596	SYMCMPSYM	2602d A2Ah
805A0	SYMIDREAL	2657d A61h
805AA	SYMIDCMP	2658d A62h
805B4	SYMIDLIST	2661d A65h
805BE	SYMIDEXT	2670d A6Eh
805C8	SYMSYMREAL	2721d AA1h
805D2	SYMSYMCMP	2722d AA2h
805DC	3SYM	2730d AAAh
805E6	XFERFAIL	3078d C06h
805F0	PROTERR	3079d C07h

805FA	InvalServCmd	3080d C08h
80604	Connecting	3082d C0Ah
8060E	Retry	3083d C0Bh
80618	#CAlarmErr	3583d DFFh
80622	EXTOBOB	3584d E00h
03FDB	TYPEREAL	10547d 2933h
0402B	TYPEEREL	10581d 2955h
03FF9	TYPEIDNT	10568d 2948h
03FE5	TYPECMP	10615d 2977h
03FEF	TYPELIST	10868d 2A74h
04017	TYPERRP	10902d 2A96h
0400D	TYPESYMB	10936d 2AB8h
04035	TYPEEXT	10970d 2ADAh
04003	TYPECOL	11677d 2D9Dh
03FF9	TYPEIDNT	10568d 2948h
04021	TYPELAM	11885d 2E6Dh
8062C	#EXITERR	458752d 70000h
8065E	MINUSFIVE	1048571d FFFFBh
80654	MINUSFOUR	1048572d FFFFCh
8064A	MINUSTHREE	1048573d FFFFDh
80640	MINUSTWO	1048574d FFFFEh
80636	MINUSONE	1048575d FFFFFh

### 2.1.4 Pushing Several BINTs

815D1	ZEROZERO	( → #0 #0 )
844CF	ONEONE	( → #1 #1 ) aka: ONEDUP
8159A	DROPZERO	( ob → #0 )
8159F	2DROP00	( ob ob → #0 #0 )
8156D	DROPONE	( ob → #1 )
84493	DUPZERO	( ob → ob ob #0 )
844A7	DUPONE	( ob → ob ob #1 )
844E3	DUPTWO	( ob → ob ob #2 )
844BB	SWAPONE	( ob ob' → ob' ob #1 )
838A9	ZEROSWAP	( ob → #0 ob )
83AE8	ZEROOVER	( ob → ob #0 ob )
83F8E	ZEROFALSE	( → #0 F )

838D6	ONESWAP	( ob → #1 ob )
83FA2	ONEFALSE	( → #1 F )

### 2.1.5 Conversion

81CB1	COERCE	( % → # )
83750	COERCEDUP	( % → # # )
838EA	COERCESWAP	( ob % → # ob )
458CA	%ABSCOERCE	( % → # )
81C02	CHR>#	( chr → # )

### 2.1.6 Arithmetic Functions

817D4	#+	( # #' → ##' )
817E8	#1+	( # → #+1 )
817F7	#2+	( # → #+2 )
815A4	#3+	( # → #+3 )
815A9	#4+	( # → #+4 )
815AE	#5+	( # → #+5 )
DF0F3	#8+	( # → #+8 )
817D9	#-	( # #' → #-#' )
817ED	#1-	( # → #-1 )
817FC	#2-	( # → #-2 )
DF133	#3-	( # → #-3 )
817CF	##	( ##' → ##*' )
813B5	##OVF	( ##' → ##*' ) $0 \leq \text{result} \leq \text{FFFFF}$
817F2	##*	( # → ##*2 )
817DE	#/	( ##' → #r #q )
81801	#2/	( # → #/2 ) Rounded down.
81595	##-#2/	( ##' → (##-#)/2 )
8154F	##+DUP	( ##' → ##+' ##+' )
8386D	##+SWAP	( ob ##' → ##+' ob )
83AC0	##+OVER	( ob ##' → ob ##+' ob )
83881	##-SWAP	( ob ##' → ##-' ob )
83AD4	##-OVER	( ob ##' → ob ##-' ob )
83895	##1+SWAP	( ob # → ##+1 ob )
83A48	##1-ROT	( ob ob' # → ob' #-1 ob )

838BD	#1-1SWAP	( # → 1 #-1 ) Returns the bint ONE and the result.
81563	DUP#1+	( # → # #+1 )
8415A	2DUP#+	( # #' → # #' #+' ) aka: DUP3PICK#+
84236	DROP#1-	( # ob → #-1 )
81540	SWAP#-	( # #' → #' -# )
81568	SWAP#1+	( meta ob → meta&ob ) aka: SWP1+
82E95	'RSWP1+	( # → nob #+1 ) nob is the next object in the runstream.
84222	SWAP#1-	( # ob → ob #-1 )
841FA	SWAPOVER#-	( # #' → #' #-# )
84182	OVER#+	( # #' → # #' +# )
841D2	OVER#-	( # #' → # #' -# )
84A42	OVER#1-	( # #' → # #' #' )
8416E	ROT#+	( # ob #' → ob #' +# )
841BE	ROT#-	( # ob #' → ob #' -# )
8420E	ROT#1+	( # ob ob' → ob ob' #+1 )
81D2E	ROT#1+UNROT	( # ob ob' → #+1 ob ob' )
8383B	ROT#+SWAP	( # ob #' → #' +# ob ) aka: ROT+SWAP
84196	3PICK#+	( # ob #' → # ob #' +# )
841AA	4PICK#+	( # ob1 ob2 #' → # ob1 ob2 #' +# )
83854	4PICK#+SWAP	( # ob1 ob2 #' → # ob1 #' +# ob2 ) aka: 4PICK+SWAP
813A1	#MIN	( # #' → #' )
8139C	#MAX	( # #' → #' )
817E3	#AND	( # #' → #' ) Bitwise AND.

### 2.1.7 Tests

81806	#=	( # #' → flag )
8180B	#<>	( # #' → flag )
81810	#<	( # #' → flag )
81900	#<=	( # #' → flag )
81815	#>	( # #' → flag )
818FB	#>=	( # #' → flag )
8181F	#0<>	( # → flag )
8181A	#0=	( # → flag )

813BA	#1<>	( # → flag )
813BF	#1=	( # → flag )
8411E	#2<>	( # → flag )
813C4	#2=	( # → flag )
81581	#3=	( # → flag )
8410A	#5=	( # → flag )
840C9	#<3	( # → flag )
84146	#>1	( # → flag )
		aka: ONE#>
81572	2DUP#<	( # #' → # #' flag )
8155E	2DUP#>	( # #' → # #' flag )
83DF4	ONE_EQ	( # → flag )
		Uses EQ test.
8151D	OVER#=	( # #' → # flag )
81577	2DUP#=	( # #' → # #' flag )
840A1	OVER#0=	( # #' → # #' flag )
8157C	DUP#0=	( # → # flag )
840B5	OVER#<	( # #' → # flag )
81586	DUP#1=	( # → # flag )
84132	OVER#>	( # #' → # flag )
8158B	DUP#0<>	( # → # flag )
840DD	DUP#<7	( # → # flag )
		Returns TRUE if the argument is smaller than #7.
84083	2#0=0R	( # #' → flag )
		Returns TRUE if either argument is zero.

## 2.2 Real Numbers

### 2.2.1 Built-in Real Numbers

8083B	%-MAXREAL	-9.99E499
807E2	%-9	-9
807CD	%-8	-8
807B8	%-7	-7
807A3	%-6	-6
8078E	%-5	-5
80779	%-4	-4
80764	%-3	-3
8074F	%-2	-2

8073A	%-1	-1
80865	%-MINREAL	-1E-499
80668	%0	0
80850	%MINREAL	1E-499
80979	%.5	.5
8098E	%-.5	-.5
8067D	%1	1
80692	%2	2
80964	%e	e
806A7	%3	3
807F7	%PI	$\pi$
806BC	%4	4
806D1	%5	5
806E6	%6	6
806FB	%7	7
80710	%8	8
80725	%9	9
809A3	%10	10
48F1C	%15	15
48FB7	%25	25
809B8	%180	180
809CD	%200	200
809F7	%400	400
809E2	%360	360
80826	%MAXREAL	9.99E499

## 2.2.2 Built-in Extended Real Numbers

8087A	%%0	0
80916	%%.1	0.1
80930	%%.5	0.5
80894	%%1	1
808AE	%%2	2
808C8	%%3	3
8080C	%%PI	$\pi$
808E2	%%4	4
808FC	%%5	5
8094A	%%10	10

### 2.2.3 Conversion

81257	%>%	( % $\rightarrow$ %% )
838FE	%>%SWAP	( ob % $\rightarrow$ %% ob )
81252	%%>%	( %% $\rightarrow$ % )
81CB6	UNCOERCE	( # $\rightarrow$ % )
845A1	UNCOERCE%%	( # $\rightarrow$ %% )
81BFD	C%>%	( C% $\rightarrow$ %re %im )

### 2.2.4 Real Functions

8128E	%+	( % %' $\rightarrow$ %+' )
81293	%-	( % %' $\rightarrow$ %-' )
81289	%*	( % %' $\rightarrow$ %*' )
81298	%/	( % %' $\rightarrow$ %/' )
8129D	%^	( % %' $\rightarrow$ %'^ )
812A2	%ABS	( % $\rightarrow$ %' )
812D9	%CHS	( % $\rightarrow$ -% )
8133D	%SGN	( % $\rightarrow$ -1/0/1 )
8134C	%SQRT	( % $\rightarrow$ $\sqrt{a}$ % )
812ED	%EXP	( % $\rightarrow$ e^% )
812F2	%EXPM1	( % $\rightarrow$ e^%-1 )
8130B	%LN	( % $\rightarrow$ LN% )
81310	%LNP1	( % $\rightarrow$ LN(%+1) )
81315	%LOG	( % $\rightarrow$ LOG% )
812B1	%ALOG	( % $\rightarrow$ 10^% )
81342	%SIN	( % $\rightarrow$ SIN% )
812E3	%COS	( % $\rightarrow$ COS% )
81356	%TAN	( % $\rightarrow$ TAN% )
812BB	%ASIN	( % $\rightarrow$ ASIN% )
812A7	%ACOS	( % $\rightarrow$ ACOS% )
812C5	%ATAN	( % $\rightarrow$ ATAN% )
81347	%SINH	( % $\rightarrow$ SINH% )
812E8	%COSH	( % $\rightarrow$ COSH% )
8135B	%TANH	( % $\rightarrow$ TANH% )
812C0	%ASINH	( % $\rightarrow$ ASINH% )
812AC	%ACOSH	( % $\rightarrow$ ACOSH% )



812CA	%ATANH	( % → ATANH% )
8131A	%MANTISSA	( % → %mant )
812F7	%EXPONENT	( % → %expn )
81301	%FP	( % → %frac )
81306	%IP	( % → %int )
812FC	%FLOOR	( % → %maxint <=% )
812CF	%CEIL	( % → %minint >=% )
8131F	%MOD	( % %' → %rem )
812B6	%ANGLE	( %x %y → %ang )
82FDF	RNDXY	( % %places → %' )
82FF3	TRCXY	( % %places → %' )
812DE	%COMB	( % %' → COMB(%,%') )
81333	%PERM	( % %' → PERM(%,%') )
81324	%NFACT	( % → %! )
82F5D	%FACT	Calculates factorial of number. ( % → gamma(%+1) )
81329	%NROOT	Calculates gamma(x+1). ( % %n → %' )
		Calculates the %nth root of the real number. Equivalent to user function XROOT.
82F99	%MIN	( % %' → %lesser )
82F8F	%MAX	( % %' → %greater )
837F0	%MAXorder	( % %' → %max %min )
81338	%RAN	( → %random )
82FB7	%RANDOMIZE	Returns next random number. ( %seed → )
		System level RDZ: seeds the random number generator.
8132E	%OF	( % %' → %'/% * 100 )
81351	%T	( % %' → %pcttotal )
812D4	%CH	( % %' → %pcchange )
82F53	%D>R	( %deg → %rad )
82FAD	%R>D	( %rad → %deg )
82FC1	%REC>%POL	( %r %ang → %x %y )
82FA3	%POL>%REC	( %x %y → %r %ang )
82FCB	%SPH>%REC	( %r %ang %ph → %x %y %z )

## 2.2.5 Extended Real Functions

845C9	SWAP%#/	( % %' → %' %' )
-------	---------	------------------

8458D      %/>%                    ( % % ' → % )

## 2.2.6 Tests

8127F      %=                            ( % % ' → flag )

8127A      %<>                           ( % % ' → flag )

8126B      %<                             ( % % ' → flag )

81270      %<=                            ( % % ' → flag )

81284      %>                             ( % % ' → flag )

81275      %>=                            ( % % ' → flag )

81266      %0=                            ( % → flag )

845B5      DUP%0=                        ( % → flag )

82F3F      %0<>                            ( % → flag )

Can be used to change a user flag into a system flag.

81261      %0<                            ( % → flag )

8125C      %0>                            ( % → flag )

82F49      %0>=                            ( % → flag )

## 2.3 Complex Numbers

### 2.3.1 Conversion

81BF8      %>C%                         ( %re %im → C% )

83D18      SWAP%>C%                    ( %im %re → C% )

## 2.4 Character Strings

### 2.4.1 Built-in Characters

80C80      CHR\_00                        '\00', CHR 0d 00h

The NULL character.

80ED3      CHR\_Newline                 '\0a', CHR 10d 0Ah

80C87      CHR\_...                        '...', CHR 31d 1Fh

80EEF      CHR\_Space                     ' ', CHR 32d 20h

The space character.

80C95      CHR\_DblQuote                '"', CHR 34d 22h

80C9C      CHR\_#                         '#', CHR 35d 23h

80ECC	CHR_LeftPar	'(', CHR 40d 28h
80EE1	CHR_RightPar	)', CHR 41d 29h
80CA3	CHR_*	'*', CHR 42d 2Ah
80CAA	CHR_+	'+', CHR 43d 2Bh
80CB1	CHR_,	',', CHR 44d 2Ch
80CB8	CHR_-	'-', CHR 45d 2Dh
80CBF	CHR_.	'.', CHR 46d 2Eh
80CC6	CHR_/	'/', CHR 47d 2Fh
80CCD	CHR_0	'0', CHR 48d 30h
80CD4	CHR_1	'1', CHR 49d 31h
80CDB	CHR_2	'2', CHR 50d 32h
80CE2	CHR_3	'3', CHR 51d 33h
80CE9	CHR_4	'4', CHR 52d 34h
80CF0	CHR_5	'5', CHR 53d 35h
80CF7	CHR_6	'6', CHR 54d 36h
80CFE	CHR_7	'7', CHR 55d 37h
80D05	CHR_8	'8', CHR 56d 38h
80D0C	CHR_9	'9', CHR 57d 39h
80D13	CHR_:	':', CHR 58d 3Ah
80D1A	CHR_;	';', CHR 59d 3Bh
80D21	CHR_<	'<', CHR 60d 3Ch
80D28	CHR_=	'=', CHR 61d 3Dh
80D2F	CHR_>	'>', CHR 62d 3Eh
80D36	CHR_A	'A', CHR 65d 41h
80D3D	CHR_B	'B', CHR 66d 42h
80D44	CHR_C	'C', CHR 67d 43h
80D4B	CHR_D	'D', CHR 68d 44h
80D52	CHR_E	'E', CHR 69d 45h
80D59	CHR_F	'F', CHR 70d 46h
80D60	CHR_G	'G', CHR 71d 47h
80D67	CHR_H	'H', CHR 72d 48h
80D6E	CHR_I	'I', CHR 73d 49h
80D75	CHR_J	'J', CHR 74d 4Ah
80D7C	CHR_K	'K', CHR 75d 4Bh
80D83	CHR_L	'L', CHR 76d 4Ch
80D8A	CHR_M	'M', CHR 77d 4Dh
80D91	CHR_N	'N', CHR 78d 4Eh
80D98	CHR_O	'O', CHR 79d 4Fh

80D9F	CHR_P	'P', CHR 80d 50h
80DA6	CHR_Q	'Q', CHR 81d 51h
80DAD	CHR_R	'R', CHR 82d 52h
80DB4	CHR_S	'S', CHR 83d 53h
80DBB	CHR_T	'T', CHR 84d 54h
80DC2	CHR_U	'U', CHR 85d 55h
80DC9	CHR_V	'V', CHR 86d 56h
80DD0	CHR_W	'W', CHR 87d 57h
80DD7	CHR_X	'X', CHR 88d 58h
80DDE	CHR_Y	'Y', CHR 89d 59h
80DE5	CHR_Z	'Z', CHR 90d 5Ah
80EFD	CHR_['	'[' , CHR 91d 5Bh
80F04	CHR_]'	']' , CHR 93d 5Dh
80EF6	CHR_UndScore	'_' , CHR 95d 5Fh
80DEC	CHR_a	'a', CHR 97d 61h
80DF3	CHR_b	'b', CHR 98d 62h
80DFA	CHR_c	'c', CHR 99d 63h
80E01	CHR_d	'd', CHR 100d 64h
80E08	CHR_e	'e', CHR 101d 65h
80E0F	CHR_f	'f', CHR 102d 66h
80E16	CHR_g	'g', CHR 103d 67h
80E1D	CHR_h	'h', CHR 104d 68h
80E24	CHR_i	'i', CHR 105d 69h
80E2B	CHR_j	'j', CHR 106d 6Ah
80E32	CHR_k	'k', CHR 107d 6Bh
80E39	CHR_l	'l', CHR 108d 6Ch
80E40	CHR_m	'm', CHR 109d 5Dh
80E47	CHR_n	'n', CHR 110d 6Eh
80E4E	CHR_o	'o', CHR 111d 6Fh
80E55	CHR_p	'p', CHR 112d 70h
80E5C	CHR_q	'q', CHR 113d 71h
80E63	CHR_r	'r', CHR 114d 72h
80E6A	CHR_s	's', CHR 115d 73h
80E71	CHR_t	't', CHR 116d 74h
80E78	CHR_u	'u', CHR 117d 75h
80E7F	CHR_v	'v', CHR 118d 76h
80E86	CHR_w	'w', CHR 119d 77h
80E8D	CHR_x	'x', CHR 120d 78h

80E94	CHR_y	'y', CHR 121d 79h
80E9B	CHR_z	'z', CHR 122d 7Ah
80F0B	CHR_{	'{' , CHR 123d 7Bh
80F12	CHR_}	'}' , CHR 125d 7Dh
80EB7	CHR_Angle	'∠', CHR 128d 80h
80EC5	CHR_Integral	'∫', CHR 132d 84h
80EBE	CHR_Deriv	'∂', CHR 136d 88h
80EA2	CHR_→	'→', CHR 141d 8Dh
80EA9	CHR_<<	'<<', CHR 171d ABh
80EB0	CHR_>>	'>>', CHR 187d BBh
80EDA	CHR_Pi	'π', CHR 135d 87h
80EE8	CHR_Sigma	'Σ', CHR 133d 85h
80F19	CHR_<=	'≤', CHR 137d 89h
80F20	CHR_>=	'≥', CHR 138d 8Ah
80F27	CHR_<>	'≠', CHR 139d 8Bh
80C8E	CHR_'	

## 2.4.2 Built-in Strings

055BF	NULL\$	"" Empty string.
80B10	SPACE\$	" " aka: tok_
80ACE	14SPACES\$	" " String of 14 spaces.
80AF4	NEWLINE\$	"\0a" Newline.
0E909	CRLF\$	"\0d\0a" Carriage return and line feed.
80B70	toklparen	"("
80B7C	tokrparen	")"
80A26	tok[	"["
80A0C	tok]	"]"
80A32	tok{	"{"
80A3E	tok}	"}"
80A92	tok<<	"<<"
80A86	tok>>	">>"
80FF1	\$_LRParens	"()"
80FB9	\$_{ }	"{}"
80FAB	\$_<<>>	"<<>>"

80FD5	\$_''	''''	Two single quotes.
80FE3	\$_::	:::"	
80FFF	\$_2DQ	""""	Two double quotes.
80B4C	tok,	","	
80B40	tok'	''	One single quote.
80BB8	tok-	"_"	
80B58	tok.	"."	
80BC4	tok=	"="	
80C08	tok0	"0"	
80C14	tok1	"1"	
80C20	tok2	"2"	
80C2C	tok3	"3"	
80C38	tok4	"4"	
80C44	tok5	"5"	
80C50	tok6	"6"	
80C5C	tok7	"7"	
80B64	tok;	";"	
80C68	tok8	"8"	
80C74	tok9	"9"	
80A7A	tokESC	"\1B"	Escape character.
80A9E	tokexponent	"E"	
80B34	tokquote	""	One double quote.
80A4A	toksharp	"#"	
80A62	tok\$	"\$"	
80A6E	tok&	"&"	
80B94	tok*	"*"	
80BAC	tok+	"+"	
80BA0	tok/	"/"	
80AAA	tokanglesign	"∠"	
80BDC	tokDER	"∂"	
80B00	\$DER	"der"	
80AB6	tokSIGMA	"Σ"	
80BD0	tokSQRT	"√a"	
80A56	tokuscore	"_"	
80AC2	tokWHERE	" "	

80B88	tok^	"^"
4F7F8	tok:	":"
8104D	\$_RAD	"RAD"
8105D	\$_GRAD	"GRAD"
80F9B	\$_XYZ	"XYZ"
80F8B	\$_R<Z	"R/Z"
		"R<angle>Z"
80F7B	\$_R<<	"R/∠"
		"R<angle><angle>"
8101F	\$_EXIT	"EXIT"
8100D	\$_ECHO	"ECHO"
81031	\$_Undefined	"Undefined"
80BE8	tokCTGROB	"GROB"
80BFA	tokCTSTR	"C\$"
80B1C	tokUNKNOWN	"UNKNOWN"

### 2.4.3 Built-in Strings with Stack Manipulation

837C8	NULL\$SWAP	( ob → \$ ob ) NULL\$, then SWAP.
819FA	DROPNULL\$	( ob → NULL\$ ) DROP then NULL\$.
819FF	TWODROPNULL\$	( ob ob' → NULL\$ ) 2DROP then NULL\$.

### 2.4.4 Conversion

818C9	#>\$	( # → \$ ) Creates string from the bint (decimal).
81C07	ID>\$	( id/lam → \$ ) Converts identifier into string.

### 2.4.5 Management

81BE9	#>CHR	( # → chr ) Returns character with the specified ASCII code.
84ABA	CHR>\$	( chr → \$* Strings ) Converts a character into a string.
819DC	LEN\$	( \$ → #length ) Returns length in bytes.
8154A	DUPLLEN\$	( \$ → \$ # ) DUP then LEN\$.

83C00	NEWLINE\$\$	( \$ → "\$\0a" ) Appends newline character to string. aka: NEWLINE&\$
819D7	CAR\$	( \$ → chr ) ( \$ → " " ) Returns first character of string as a string, or NULL\$ for null string.
83179	CDR\$	( \$ → \$' ) Returns string without first character, or NULL\$ for null string.
81B3A	POS\$	( \$ \$find start# → #pos ) ( \$ \$find start# → #0 ) Search for \$find in \$search, starting at position #start. Returns position of \$find or 0 if not found. Same entry as POSCHR.
81B44	POSCHR	( \$search chr #start → #pos ) ( \$search chr #start → #0 ) Same entry as <REF>POS\$.
81B3F	POS\$REV	( \$ \$find #limit → #pos ) ( \$ \$find #limit → #0 ) Searches backwards from #limit to #1. Same entry as <REF>POSCHRREV.
81B49	POSCHRREV	( \$seach chr #start → #pos ) ( \$seach chr #start → #0 ) Same entry as <REF>POS\$REV.
819E6	SUB\$	( \$ #start #end → \$' ) Returns substring between specified positions.
83CB4	#1-SUB\$	( \$ #start #end+#1 → \$' ) Does #1- and then SUB\$.
83CC8	1_#1-SUB\$	( \$ #end → \$' ) Returns substring with the first #end characters. aka: 1_#1-SUB
83CDC	LAST\$	( \$ #start → \$' ) Returns substring from the specified start position to the end (inclusive).
83CF0	#1+LAST\$	( \$ #start-#1 → \$' ) Returns substring from the specified start position to the end (exclusive).
837DC	SUB\$SWAP	( ob \$ # #' → \$' ob ) SUB\$ then SWAP.
81A72	SUB\$1#	( \$ #pos → #' ) Returns bint with ASCII code of character at the specified position.
81491	EXPAND	( hxs #nibs → hxs' ) Appends #nibs zero nibbles to the hxs.



819C8	&\$	( \$ \$' → \$+\$' ) Concatenates two strings.
84975	&\$\$SWAP	( ob \$ \$' → \$+\$' ob ) &\$ then SWAP.
8316F	!append\$	( \$ \$' → \$+\$' ) Tries &\$, if not enough memory does !!append\$?.
8399E	!append\$\$SWAP	( ob \$ \$' → \$+\$' ob ) !append\$ then SWAP.
81590	!!append\$	( \$ \$' → \$+\$' ) Tries appending "in place".
819CD	>H\$	( \$ chr → \$' ) Prepends character to string
819D2	>T\$	( \$ chr → \$' ) Appends character to string.
8361F	APPEND_SPACE	( \$ → \$' ) Appends space to string.
831B5	SWAP&\$	( \$ \$' → \$'+\$' ) Concatenates two strings.

## 2.4.6 Parsing Strings

82E45	!*triand	( T T → ) ( F T → F T <SEMI> )
81C89	tok8cktrior	( \$1 \$1 → :: \$1 <Ob1> ; ) ( \$1 \$2 → :: \$1 <Ob2> <Rest> ; )
81C8E	tok8trior	( GNT data \$1 \$1 → :: GNT data GetNextToken ; ) ( GNT data \$1 \$2 → :: \$1 <Ob1> <Rest> ; )
81C93	nultrior	( NULL\$ → :: ; ) ( \$ → :: \$ <Ob1> <Rest> ; )
82E27	GetNextToken	( hxs-mask \$ #start → hxs-mask \$ #next \$token )

## 2.4.7 Decompilation

83197	EDITDECOMP\$	( ob → \$ ) Calls setStdEditWid and the decompiles for editing like <REF>editdecomp\$w.
83183	DECOMP\$	( ob → \$ ) Calls <REF>setStdWid and decompiles entire object (UserRPL components only). Breaks the string into lines using DcompWidth as width.
8318D	DO>STR	( \$ → \$ ) ( ob → \$ ) Internal version of →STR.

831BF	Decomp%Short	( % #width → \$ ) Decompiles a real number into a string of the given #width. It will drop less significant digits or add zeros as needed, but will also exceed #width when necessary. E.g. "-1.e-33" cannot be written with less than 7 characters, so even if #width is less, 7 chars will be used. %0 is always decompiled as "0".
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## 2.4.8 String Tests

819E1	NULL\$?	( ob → flag )
83C78	DUPNULL\$?	( ob → ob flag )

## 2.5 HEX Strings

### 2.5.1 Conversion

81BEE	#>HXS	( # → hxs ) Length will be five.
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### 2.5.2 General Functions

055B5	NULLHXS	HXS 0 Puts a null hxs in the stack.
81491	EXPAND	( hxs #nibs → hxs' ) Appends #nibs zero nibbles to the hxs.

## 2.6 Arrays

### 2.6.1 General Functions

81BD5	ARSIZE	( [] → # ) Returns number of elements as a bint.
81BDA	DIMLIMITS	( [] → {#n #m} ) Returns list of array dimensions.
81BDF	GETATELN	( # [] → ob T ) ( # [] → F ) Gets one element from array.
81E64	MATCON	( [%] % → [%] ' ) ( [C%] C% → [C%] ' ) Replace all elements of [F%] by F%.

81AA4	MDIMS	( [1D] → #m F ) ( [2D] → #m #n T ) If it is a vector, returns number of elements and FALSE. If it is an array (including arrays with only one line), returns dimensions and TRUE.
83A0C	MDIMSDROP	( [2D] → #m #n ) MDIMS followed by DROP.
83BB0	OVERARSIZE	( [] ob → [] ob #elts ) Does OVER then <REF>ARSIZE.
81AA9	PUTEL	( [%] % # → [%] ' ) ( [C%] C% # → [C%] ' ) Puts element at specified position. Converts to "short" before. Warning: no copy to tempob first.
81E6E	MATREDIM	( [F%] {#n #m} → [F%] ' )
81E78	MATTRN	( [F%] → [F%] ' ) Transposes matrix.

## 2.6.2 Conversion

81BE4	MAKEARRY	( {#n #m} ob → [] ) Makes array with all elements initialized to ob.
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## 2.7 Unit Objects

### 2.7.1 Creating Units

81F0E	EXTN	( ob1..obn #n → u ) Builds a unit object.
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## 2.8 Composites

### 2.8.1 General Operations

81F18	&COMP	( comp comp' → comp'' ) Concatenates two composites.
81E96	>TCOMP	( comp ob → comp+ob ) Adds ob to tail (end) of composite.
81E8C	>HCOMP	( comp ob → ob+comp ) Adds ob to head (beginning) of composite.
819A0	CARCOMP	( comp → ob_head ) ( comp_null → comp_null ) Returns first object of the composite, or a null composite if the argument is a null composite.

83BEC	?CARCOMP	( comp T → ob ) ( comp F → comp ) If the flag is TRUE, does CARCOMP.
81EA0	CDRCOMP	( comp → comp-ob_head ) ( comp_null → comp_null ) Returns the composite minus its first object, or a null composite if the argument is a null composite.
819AA	LENCOMP	( comp → #n ) Returns length of composite (number of objects).
83CA0	DUPLENCOMP	( comp → comp #n ) Does DUP then <REF>LENCOMP.
819B4	NULLCOMP?	( comp → flag ) If the composite is empty, returns TRUE.
83C8C	DUPNULLCOMP?	( comp → comp flag ) Does DUP then <REF>NULLCOMP?.
819AF	NTHELCOMP	( comp #i → ob T ) ( comp #i → F ) Returns specified element of composite and TRUE, or just FALSE if it could not be found.
8360B	NTHCOMPDROP	( comp #i → ob ) Does <REF>NTHELCOMP then DROP.
8378C	NTHCOMDDUP	( comp #i → ob ob ) Does <REF>NTHCOMPDROP then DUP.
81EDC	POSCOMP	( comp ob pred → #i ) ( comp ob pred → #0 ) (eg: pred = ' %< ) Evaluates pred for all elements of composite and ob, and returns index of first object for which the pred is TRUE. If no one returned TRUE, returns #0. For example, the program below returns #4: :: { %1 %2 %3 %-4 %-5 %6 %7 } %0 ' %< POSCOMP ;
84A6F	EQUALPOSCOMP	( comp ob → #pos ) ( comp ob → #0 ) POSCOMP with EQUAL as test.
81EBE	EQUALPOSCMP	( comp ob → #pos ) ( comp ob → #0 )
84A88	NTHOF	( ob comp → #i ) ( ob comp → #0 ) Does SWAP then <REF>EQUALPOSCOMP.
84A56	#=POSCOMP	( comp # → #i ) ( comp # → #0 ) POSCOMP with #= as test.
819B9	SUBCOMP	( comp #m #n → comp' ) Returns a sub-composite. Makes all index checks first.

81392	Embedded?	( ob1 ob2 → flag ) Returns TRUE if ob2 is embedded in, or is the same as, ob1. Otherwise returns FALSE.
81EC8	Lookup	( ob test comp → nextob T ) ( ob test comp → ob F ) Tests every odd element (1,3,...) in the composite. If a test returns TRUE, the object after the tested one is returned, along with TRUE. If no object tests TRUE, FALSE is returned. For example, the program below returns %6 and TRUE. :: %0 ' %< { %1 %2 %3 %-4 %-5 %6 } Lookup ;
81ED2	Lookup.1	( ob test → nextob T ) ( ob test → ob F ) Return Stack: ( comp → ) Lookup with the composite already pushed (with >R) onto the runstream. Called by Lookup.
84A9C	EQLookup	( ob comp → nextob T ) ( ob comp → ob F ) Lookup with EQ as test.
81B35	NEXTCOMPOB	( comp #ofs → comp #ofs' ob T ) ( comp #ofs → comp F ) Returns object at specified nibble offset from start. If the object is SEMI (i.e., the end of the composite has been reached) returns FALSE. To get the first element, use FIVE as offset value (to skip the prolog). ZERO works as well.

## 2.8.2 Building

81EFA	{ }N	( obn..ob1 #n → { obn..ob1 } )
81EF0	::N	( ob1..obn #n → :: ob1..obn ; )
81F04	SYMBN	( ob1..obn #n → sym )
8490C	top&Cr	( meta1 meta2 → symb ) Does top& then <REF>SYMBN: .
81F0E	EXTN	( ob1..obn #n → u ) Builds a unit object.
82E77	P::N	( ob1..obn #n → seco ) Build seco with possible garbage collection.

## 2.8.3 Exploding

819A5	INNERCOMP	( comp → obn..ob1 #n )
83C50	DUPINCOMP	( comp → comp obn..ob1 #n )
83C64	SWAPINCOMP	( comp obj → obj obn..ob1 #n )
835F7	INCOMPDROP	( comp → obn..ob1 )
836B0	INNERDUP	( comp → obn..ob1 #n #n )
840F6	INNER#1=	( comp → obn..ob1 flag )

## 2.8.4 Lists

055C9	NULL{}	( → {} ) Pushes a null list to the stack.
8447A	DUPNULL{ }?	( {} → {} flag )
83C28	TWO{ }N	( ob1 ob2 → { ob1 ob2 } )
83C3C	THREE{ }N	( ob1 ob2 ob3 → { ob1 ob2 ob3 } )
83C14	#1-{}N	( ob1..obn #n+1 → {} )
81EE6	PUTLIST	( ob #i {} → {}' ) Replaces object at specified position. Assumes valid #i.

## 2.8.5 Secondaries

055DD	NULL::	( → :: ; ) Returns null secondary.
849F2	Ob>Seco	( ob → :: ob ; ) Does ONE then <REF>::N.
849D9	?Ob>Seco	( ob → :: ob ; ) If the object is not a secondary, does Ob>Seco.
84A06	2Ob>Seco	( ob1 ob2 → :: ob1 ob2 ; ) Does TWO then <REF>::N.
83D40	::NEVAL	( ob1..obn #n → ? ) Does <REF>::N then <REF>EVAL.

## 2.9 Meta Objects

### 2.9.1 Stack Functions

81D5B	NDROP	( 1..n #n → )
849B1	DROPNDROP	( 1..n #n ob → )
839E4	#1+NDROP	( ob 1..n #n → ) aka: N+1DROP

81D01	psh	( meta1 meta2 → meta2 meta1 ) Should be called swap.
81D06	roll2ND	( meta1 meta2 meta3 → meta2 meta3 meta1 ) Should be called rot.
81D10	unroll2ND	( meta1 meta2 meta3 → meta3 meta1 meta2 ) Should be called unrot.
8431C	SWAPUnNDROP	( meta1 meta2 → meta2 ) Should be called swapdrop.
84308	SWAPUnDROP	( meta1 meta2 → meta2 ob1..obn ) Swaps two metas and drops the count. Should be called swapDROP.
84925	metaROTDUP	( meta1 meta2 meta3 → meta2 meta3 meta1 meta1 ) Should be called rotdup.

## 2.9.2 Combining Functions

81CF2	top&	( meta1 meta2 → meta1&meta2 )
8309D	pshtop&	( meta1 meta2 → meta2&meta1 )
84939	ROTUntop&	( meta1 meta2 meta3 → meta2 meta3&meta1 )
8494D	roll2top&	( meta1 meta2 meta3 → meta3 meta1&meta2 ) aka: rolltwotop&
83061	psh&	( meta1 meta2 meta3 → meta1&meta3 meta2 )

## 2.9.3 Meta and Object Operations

81568	SWAP#1+	( meta ob → meta&ob ) aka: SWP1+
815B8	get1	( ob meta → meta ob )
83075	psh1top&	( meta ob → ob&meta )
830B1	pull	( meta&ob → meta ob ) aka: #1-SWAP
830BB	pullrev	( ob&meta → meta ob )
81CF7	psh1&	( meta1 meta2 ob → ob&meta1 meta2 )
81CFC	psh1&rev	( meta1 meta2 ob → ob&meta1 meta2 )
830C5	pullpsh1&	( meta1 meta2&ob → ob&meta1 meta2 )
830A7	pshzer	( meta → #0 meta )

## 2.10 Symbolics

### 2.10.1 General Operations

81F04	SYMBN	( ob1..obn #n → sym )
055D3	NULLSYMB	( → sym ) Puts a null algebraic in the stack.
8320F	symcomp	( ob → ob' ) If ob is symbolic, does nothing, otherwise ONE SYMBN.
82E8B	SWAPcompSWAP	( ob ob' → ob'' ob' ) Does SWAP symcomp SWAP.

## 2.10.2 Derivatives

## 2.10.3 Meta Symbolics Functions

8499D	pZpargSWAPUn	( meta → M_rest M_last ) <REF>pshzerpsharg then <REF>psh .
84961	plDRPpZparg	( meta&ob → M_last M_rest ) Drops ob then calls <REF>pshzerpsharg .

## 2.11 Library and Backup Objects

### 2.11.1 Rompointers

81C0C	#>ROMPTR	( #lib #cmd → ROMPTR ) Creates rompointer.
81C66	ROMPTR>#	( ROMPTR → #lib #cmd ) Splits rompointer.
81C6B	ROMPTR@	( ROMPTR → ob T ) ( ROMPTR → F ) Recalls contents of rompointer.
83688	DUPROMPTR@	( ROMPTR → ROMPTR ob T ) ( ROMPTR → ROMPTR F ) Does DUP then ROMPTR@.
82FFD	?>ROMPTR	( ob → ob' ) If ROM-WORD? and TYPECOL? then RPL@.
83007	?ROMPTR>	( ob → ob' ) If <REF>TYPEROMP? and content exists <REF>INHARDROM? then return contents.
83011	RESOROMP	( → ob ) Recalls contents of next object in the runstream (which must be a rompointer).



81C20	COMPILEID	( id → id T ) ( id → ROMPTR T ) ( id → F ) Searches <code>id</code> in current path, if found returns <code>TRUE</code> . Else searches attached libraries. If nothing was found, return <code>FALSE</code> .
81496	ROM-WORD?	( ob → flag )

### 2.11.2 Libraries

81C84	TOSRRP	( # → ) Attaches <code>library</code> to HOME directory. -- <REF>TEXT:Libraries
81C43	OFFSRRP	( # → ) Detaches <code>library</code> from HOME directory. -- <REF>TEXT:Libraries
81C48	ONSRRP?	( # → flag ) Returns <code>TRUE</code> if <code>library</code> is attached to HOME di- rectory.
82D5F	XEQSETLIB	( % → ) Internal ATTACH.

### 2.11.3 Backup Objects

81720	BAKNAME	( bak → id T ) Returns backup's name
81716	BAK>OB	( bak → ob ) Gets backup object.

## 3 General SysRPL Entries

### 3.1 Stack Operations

81D3D	DUP	( ob → ob ob )
83728	DUPDUP	( ob → ob ob ob )
8304D	NDUPN	( ob #n → ob..ob #n ) ( ob #0 → #0 )
83A20	DUPROT	( 1 2 → 2 2 1 )
815C7	DUPUNROT	( 1 2 → 2 1 2 ) aka: SWAPOVER
83B60	DUPROLL	( 1..n #n → 1 3..n #n 2 )
83B4C	DUPPICK	( n..1 #n → n..1 #n n-1 )
81D42	2DUP	( 1 2 → 1 2 1 2 )
8464B	2DUP5ROLL	( 1 2 3 → 2 3 2 3 1 )
81D47	NDUP	( 1..n #n → 1..n 1..n )
81D51	DROP	( 1 → )
81545	DROPDUP	( 1 2 → 1 1 )
849B1	DROPNDROP	( 1..n #n ob → )
8152C	DROPSWAP	( 1 2 3 → 2 1 )
83A34	DROPROT	( 1 2 3 4 → 2 3 1 )
83A98	DROPOVER	( 1 2 3 → 1 2 1 )
81D56	2DROP	( 1 2 → )
8149B	3DROP	( 1 2 3 → )
814AA	4DROP	aka: XYZ> ( 1..4 → )
814BE	5DROP	aka: XYZW> ( 1..5 → )
814D2	6DROP	( 1..6 → )
81450	7DROP	( 1..7 → )
81D5B	NDROP	( 1..n #n → )
839E4	#1+NDROP	( ob 1..n #n → ) aka: N+1DROP
81D38	DEPTH	( 1..n → 1..n #n )
830CF	reversym	( 1..n #n → n..1 #n )
81D4C	SWAP	( 1 2 → 2 1 )
81536	SWAPDUP	( 1 2 → 2 1 1 )
8425E	SWAP2DUP	( 1 2 → 2 1 2 1 )
81455	SWAPDROP	( 1 2 → 2 ) aka: XY>Y

81554	SWAPDROPDUP	( 1 2 → 2 2 )
8144B	SWAPROT	( 1 2 3 → 3 2 1 ) aka: UNROTSWAP, XYZ>ZYX
84637	SWAP4ROLL	( 1 2 3 4 → 2 4 3 1 ) aka: XYZW>YWZX
8465F	SWAP3PICK	( 1 2 3 → 1 3 2 1 )
81374	2SWAP	( 1 2 3 4 → 3 4 1 2 )
81D60	ROT	( 1 2 3 → 2 3 1 )
8153B	ROTDUP	( 1 2 3 → 2 3 1 1 )
836EC	ROT2DUP	( 1 2 3 → 2 3 1 3 1 )
81446	ROTDROP	( 1 2 3 → 2 3 ) aka: XYZ>YZ
81531	ROT2DROP	( 1 2 3 → 2 ) aka: DROPSWAPDROP, XYZ>Y
81441	ROTDROPSWAP	( 1 2 3 → 3 2 ) aka: XYZ>ZY
8143C	ROTSWAP	( 1 2 3 → 2 1 3 ) aka: XYZ>YXZ
8145F	ROTROT2DROP	( 1 2 3 → 3 ) aka: UNROT2DROP, XYZ>Z
83714	ROTOVER	( 1 2 3 → 2 3 1 3 )
814B4	4ROLL	( 1 2 3 4 → 2 3 4 1 ) aka: FOURROLL, XYZW>YZWX
8393A	4ROLLSWAP	( 1 2 3 4 → 2 3 1 4 )
83A70	4ROLLROT	( 1 2 3 4 → 2 4 1 3 ) aka: FOURROLLROT
83B10	4ROLLOVER	( 1 2 3 4 → 2 3 4 1 4 )
814C8	5ROLL	( 1 2 3 4 5 → 2 3 4 5 1 ) aka: FIVEROLL
815BD	6ROLL	( 1..6 → 2..6 1 ) aka: SIXROLL
81379	7ROLL	( 1..7 → 2..7 1 ) aka: SEVENROLL
8137E	8ROLL	( 1..8 → 2..8 1 ) aka: EIGHTROLL
8145A	9ROLL	( 1..9 → 2..9 1 )
81D6F	ROLL	( 1..n #n → 2..n 1 )
839F8	ROLLDROP	( 1..n #n → 2..n )
837B4	ROLLSWAP	( 1..n #n → 2..n-1 1 n )
814FA	#1+ROLL	( ob 1..n #n → 1..n ob )
814FF	#2+ROLL	( a b 1..n #n → b 1..n a )
814F5	#+ROLL	( 1..n+m #n #m → 2..n+m 1 )
814F0	#-ROLL	( 1..n-m #n #m → 2..n-m 1 )

815CC	UNROT	( 1 2 3 → 3 1 2 ) aka: 3UNROLL, XYZ>ZXY
83764	UNROTDUP	( 1 2 3 → 3 1 2 1 )
81559	UNROTDROP	( 1 2 3 → 3 1 ) aka: SWAPDROPSWAP, XYZ>ZX
83AFC	UNROTOVER	( 1 2 3 → 3 1 2 1 )
814A5	3UNROLL	( 1 2 3 → 3 1 2 ) aka: UNROT, XYZ>ZXY
814B9	4UNROLL	( 1 2 3 4 → 4 1 2 3 ) aka: FOURUNROLL, XYZW>WXYZ
83778	4UNROLLDUP	( 1 2 3 4 → 4 1 2 3 3 )
81464	4UNROLL3DROP	( 1 2 3 4 → 4 ) aka: XYZW>W
83A84	4UNROLLROT	( 1 2 3 4 → 4 3 2 1 )
814CD	5UNROLL	( 1 2 3 4 5 → 5 1 2 3 4 ) aka: FIVEUNROLL
815C2	6UNROLL	( 1..6 → 6 1..5 ) aka: SIXUNROLL
83633	7UNROLL	( 1..7 → 7 1..6 )
83B88	8UNROLL	( 1..8 → 8 1..7 )
83B9C	10UNROLL	( 1..10 → 10 1..9 )
81D74	UNROLL	( 1..n #n → n 1..n-1 )
8150E	#1+UNROLL	( ob 1..n #n → n ob 1..n-1 )
81513	#2+UNROLL	( a b 1..n #n → n a b 1..n-1 )
81509	#+UNROLL	( 1..n+m #n #m → n+m 1..n+m-1 )
81504	#-UNROLL	( 1..n-m #n #m → n-m 1..n+m-1 )
81D65	OVER	( 1 2 → 1 2 1 )
8373C	OVERDUP	( 1 2 → 1 2 1 1 )
837A0	OVERSWAP	( 1 2 → 1 1 2 ) aka: OVERUNROT
837A0	OVERUNROT	( 1 2 → 1 1 2 ) aka: OVERSWAP
8469B	OVER5PICK	( 1 2 3 4 → 1 2 3 4 3 1 )
849C5	2OVER	( 1 2 3 4 → 1 2 3 4 1 2 )
814A0	3PICK	( 1 2 3 → 1 2 3 1 )
8394E	3PICKSWAP	( 1 2 3 → 1 2 1 3 )
83B24	3PICKOVER	( 1 2 3 → 1 2 3 1 3 )
84673	3PICK3PICK	( 1 2 3 → 1 2 3 1 2 )
DDCFE	4PICK	( 1 2 3 4 → 1 2 3 4 1 )
83962	4PICKSWAP	( 1 2 3 4 → 1 2 3 1 4 )
84687	SWAP4PICK	( 1 2 3 4 → 1 2 4 3 1 )
83B38	4PICKOVER	( 1 2 3 4 → 1 2 3 4 1 4 )

814C3	5PICK	( 1 2 3 4 5 → 1 2 3 4 5 1 )
814D7	6PICK	( 1..6 → 1..6 1 )
814DC	7PICK	( 1..7 → 1..7 1 )
814E1	8PICK	( 1..8 → 1..8 1 )
814E6	9PICK	( 1..9 → 1..9 1 )
814EB	10PICK	( 1..10 → 1..10 1 )
81D6A	PICK	( 1..n #n → 1..n 1 )
81478	#1+PICK	( 1..n #n-1 → 1..n 1 )
8147D	#2+PICK	( 1..n #n-2 → 1..n 1 )
81482	#3+PICK	( 1..n #n-3 → 1..n 1 )
81487	#4+PICK	( 1..n #n-4 → 1..n 1 )
81473	#+PICK	( 1..n+m #n #m → 1..n+m 1 )
8146E	#-PICK	( 1..n-m #n #m → 1..n-m 1 )

## 3.2 Temporary Environments

### 3.2.1 Built-in IDs and LAMs

82D4B	NULLID	( → id ) Null (empty) identifier.
84AD8	NULLLAM	( → lam ) Puts NULLLAM in the stack.

### 3.2.2 Conversion

81BF3	\$>ID	( \$ → ID )
83D04	DUP\$>ID	( \$ → \$ ID )

### 3.2.3 Temporary Environments Words

831C9	BIND	( obn..ob1 {lamn..lam1} → ) Binds n objects to n differently named lams.
817C0	DOBIND	( obn..ob1 lamn..lam1 #n → ) Binds n objects to n differently named lams.
83F3E	1LAMBIND	( ob → ) Binds one object to a null named lam.
83F39	DUP1LAMBIND	( ob → ob ) Does DUP then <REF>1LAMBIND.
84434	dvar1sBIND	( ob → ) Binds ob to LAM 'dvar.

817BB	ABND	( → ) Abandons topmost temporary environment.
816B2	CACHE	( obn . . ob1 #n lam → ) Binds all objects under the same name. 1LAM has the count.
81383	DUMP	( NULLLAM → ob1 . . obn #n ) Inverse of CACHE. Always does garbage collection.
81C16	@LAM	( lam → ob T ) ( lam → F ) Tries recalling object from lam. If successful, returns object and TRUE, otherwise returns just FALSE.
81C75	STOLAM	( ob lam → ) Tries storing object in lam. Generates "Undefined Local Name" error if lam is not found.
817C5	GETLAM	( #n → ob ) Gets contents of nth topmost lam.
815D6	1GETLAM	( → ob )
815E0	2GETLAM	( → ob )
815EA	3GETLAM	( → ob )
815F4	4GETLAM	( → ob )
815FE	5GETLAM	( → ob )
81608	6GETLAM	( → ob )
81612	7GETLAM	( → ob )
8161C	8GETLAM	( → ob )
81626	9GETLAM	( → ob )
81630	10GETLAM	( → ob )
8163A	11GETLAM	( → ob )
81644	12GETLAM	( → ob )
8164E	13GETLAM	( → ob )
81658	14GETLAM	( → ob )
81662	15GETLAM	( → ob )
8166C	16GETLAM	( → ob )
81676	17GETLAM	( → ob )
81680	18GETLAM	( → ob )
8168A	19GETLAM	( → ob )
81694	20GETLAM	( → ob )
8169E	21GETLAM	( → ob )
816A8	22GETLAM	( → ob )
817CA	PUTLAM	( ob #n → ) Stores new contents to nth topmost lam.
815DB	1PUTLAM	( ob → )

815E5	2PUTLAM	( ob → )
815EF	3PUTLAM	( ob → )
815F9	4PUTLAM	( ob → )
81603	5PUTLAM	( ob → )
8160D	6PUTLAM	( ob → )
81617	7PUTLAM	( ob → )
81621	8PUTLAM	( ob → )
8162B	9PUTLAM	( ob → )
81635	10PUTLAM	( ob → )
8163F	11PUTLAM	( ob → )
81649	12PUTLAM	( ob → )
81653	13PUTLAM	( ob → )
8165D	14PUTLAM	( ob → )
81667	15PUTLAM	( ob → )
81671	16PUTLAM	( ob → )
8167B	17PUTLAM	( ob → )
81685	18PUTLAM	( ob → )
8168F	19PUTLAM	( ob → )
81699	20PUTLAM	( ob → )
816A3	21PUTLAM	( ob → )
816AD	22PUTLAM	( ob → )
83F25	1GETABND	( → 1lamob ) Does <REF>1GETLAM then <REF>ABND .
83822	1ABNDSWAP	( ob → 1lamob ob ) Does <REF>1GETABND then SWAP.
83976	1GETSWAP	( ob → 1lamob ob ) Does <REF>1GETLAM then SWAP.
83D54	2GETEVAL	( → ? ) Does <REF>2GETLAM then <REF>EVAL .
81397	GETLAMP AIR	( #n → #n ob lam F ) ( #n → #n T ) Gets lam contents and name (10 = 1lam, 20 = 2lam, etc.)
84AD3	1NULLLAM{}	( → {} ) Puts a list with one NULLLAM in the stack.

### 3.3 Error Handling

#### 3.3.1 General Words

81B17	ERRBEEP	( → ) Beeps.
819EB	ERROR@	( → # ) Returns current error number.
819F0	ERRORSTO	( # → ) Stores new error number.
8424A	ERROROUT	( # → ) Stores new error number and calls ERRJMP.
819F5	ERRORCLR	( → ) Stores zero as new error number.
81A18	ERRJMP	( → ) Invokes error handling sub-system.
81A04	GETEXITMSG	( → \$ ) Gets EXITMSG (user defined error message).
81A09	EXITMSGSTO	( \$ → ) Stores \$ as EXITMSG.
8212F	DO#EXIT	( # → ) Stores new error number, does <REF>AtUserStack and then <REF>ERRJMP.
82139	DO\$EXIT	( \$ → ) Stores string as EXITMSG, #70000 as error number, does <REF>AtUserStack and then <REF>ERRJMP
81F9A	ABORT	. ( → ) Does <REF>ERRORCLR and <REF>ERRJMP .
81A0E	ERRSET	( → ) Sets new error trap.
81A13	ERRTRAP	( → ) Error trap marker. If no error happens, still removes all temporary environments created since ERRSET.
831E7	JstGetTHEMESG	( # → \$ ) Fetches message from message table. To get a mes- sage from a library, use the formula: libnum*#100+msgnum. -- <REF>TEXT:Libraries aka: JstGETTHEMESG
831DD	GETTHEMESG	( # → \$ ) If #70000 then does <REF>GETEXITMSG, else does <REF>JstGetTHEMESG . -- <REF>TEXT:Libraries
829EF	?GetMsg	( # → \$msg ) ( ob → ob ) If the argument is a bint, does JstGETTHEMESG to fetch a message. Other arguments are returned un- changed. -- <REF>TEXT:Libraries



### 3.3.2 Error Generating Words

81A22	SETMEMERR	Error 001h Generates "Insufficient Memory" error.
81A27	SETROMPERR	Error 004h Generates "Undefined XLIB Name" error.
81A1D	SETLBERR	Error 006h Generates "Power Lost" error.
81CA7	SETSTACKERR	Error 201h Generates "Too Few Arguments" error.
81CA2	SETTYPEERR	Error 202h Generates "Bad Argument Type" error.
81C9D	SETSIZEERR	Error 203h Generates "Bad Argument Value" error.
81C98	SETNONEXTERR	Error 204h Generates "Undefined Name" error.

## 3.4 Conditionals

### 3.4.1 Boolean Flags

82F3F	%0<>	( % → flag ) Can be used to change a user flag into a system flag.
03A81	TRUE	( → T )
0BDC1	TrueTrue	( → T T )
83F66	TrueFalse	( → T F ) aka: TRUEFALSE
03AC0	FALSE	( → F )
83F7A	FalseTrue	( → F T ) aka: FALSETRUE
81FDB	FalseFalse	( → F F )
82ED1	failed	( → F T )
81522	DROPTRUE	( ob → T )
81527	DROPFALSE	( ob → F )
835E3	2DROPFALSE	( ob1 ob2 → F )
83926	XYZ>ZTRUE	( ob1 ob2 ob3 → ob3 T )
8182E	NOT	( flag → flag' ) Returns FALSE if the input is TRUE, and vice-versa.
81824	AND	( flag1 flag2 → flag ) Returns TRUE if both flags are TRUE.
81833	OR	( flag1 flag2 → flag ) Returns TRUE if either flag is TRUE.

8183D	XOR	( flag1 flag2 → flag ) Returns TRUE if flags are different.
8401F	ORNOT	( flag1 flag2 → flag ) Returns FALSE if either flag is TRUE.
836C4	NOTAND	( flag1 flag2 → flag ) Returns TRUE if flag1 is TRUE and flag2 is FALSE.
83700	ROTAND	( flag1 ob flag2 → ob flag ) Returns TRUE if either flag is TRUE.

### 3.4.2 General Tests

81842	EQ	( ob1 ob2 → flag ) Returns TRUE if both objects are the same, i.e., they occupy the same physical space in memory. Only the addresses of the objects are tested.
84047	2DUPEQ	( ob1 ob2 → ob1 ob2 flag ) Does 2DUP then EQ.
8405B	EQOR	( flag ob1 ob2 → flag' ) Does EQ then OR.
83AAC	EQOVER	( ob3 ob1 ob2 → ob3 flag ob3 ) Does EQ then OVER.
81847	EQUAL	( ob1 ob2 → flag ) Returns TRUE if the objects are equal (but not necessarily the same), i.e., their prologs and contents are the same.
84033	EQUALNOT	( ob1 ob2 → flag ) Returns TRUE if the objects are different.
8406F	EQUALOR	( flag ob1 ob2 → flag' ) Does EQUAL then OR.

### 3.4.3 True/False Tests

813D3	?SEMI	( T → :: ; ) ( F → :: <ob1> <rest> ; )
81414	NOT?SEMI	( T → :: <ob1> <rest> ; ) ( F → :: ; )
842EF	?SEMIDROP	( ob T → :: ob ; ) ( ob F → :: <ob1> <rest> ; )
8398A	?SWAP	( ob1 ob2 T → :: ob2 ob1 <ob1> <rest> ; ) ( ob1 ob2 F → :: ob1 ob2 <ob1> <rest> ; )
8380E	?SKIPSWAP	( ob1 ob2 T → :: ob1 ob2 <ob1> <rest> ; ) ( ob1 ob2 F → :: ob2 ob1 <ob1> <rest> ; )
839CB	?SWAPDROP	( ob1 ob2 T → :: ob1 <ob1> <rest> ; ) ( ob1 ob2 F → :: ob2 <ob1> <rest> ; )

839B2	NOT?SWAPDROP	( ob1 ob2 T → :: ob2 <ob1> <rest> ; ) ( ob1 ob2 F → :: ob1 <ob1> <rest> ; )
817A2	RPIT	( T ob → :: ob <ob1> <rest> ; ) ( F ob → :: <ob1> <rest> ; ) ob is actually executed, and not pushed in the stack.
817A7	RPITE	( T ob1 ob2 → :: ob1 <ob1> <rest> ; ) ( F ob1 ob2 → ob2 <ob1> <rest> ; ) ob1 or ob2 is actually executed, and not pushed in the stack.
813FB	COLARPITE	( T ob1 ob2 → :: ob1 ; ) ( F ob1 ob2 → :: ob2 ; ) ob1 or ob2 is actually executed, and not pushed in the stack.
DE622	2'RCOLARPITE	Return to composite and ITE there.
81405	IT	( T → :: <ob1> <rest> ; ) ( F → :: <ob2> <rest> ; )
8173E	?SKIP	( T → :: <ob2> <rest> ; ) ( F → :: <ob1> <rest> ; ) aka: NOT_IT
8140A	ITE	( T → :: <ob1> <ob3> <rest> ; ) ( F → :: <ob2> <rest> ; )
8140F	ITE_DROP	( ob T → :: <ob2> <rest> ; ) ( ob F → :: ob <ob1> <rest> ; )
8486C	ANDITE	( f1 f2 → :: <ob1> <ob3> <rest> ; ) ( f1 f2 → :: <ob2> <rest> ; )
813D8	case	( T → :: <ob1> ; ) ( F → :: <ob2> <rest> ; )
81419	NOTcase	( T → :: <ob2> <rest> ; ) ( F → :: <ob1> ; )
846F5	ANDcase	( f1 f2 → :: <ob1> ; ) ( f1 f2 → :: <ob2> <rest> ; )
847EA	ANDNOTcase	( f1 f2 → :: <ob1> ; ) ( f1 f2 → :: <ob2> <rest> ; )
81FD1	ORcase	( f1 f2 → :: <ob1> ; ) ( f1 f2 → :: <ob2> <rest> ; )
813EC	casedrop	( ob T → :: <ob1> ; ) ( ob F → :: ob <ob2> <rest> ; )
8142D	NOTcasedrop	( ob T → :: ob <ob2> <rest> ; ) ( ob F → :: <ob1> ; )
813E2	case2drop	( ob1 ob2 T → :: <ob1> ; ) ( ob1 ob2 F → :: ob1 ob2 <ob2> <rest> ; )
81423	NOTcase2drop	( ob1 ob2 T → :: ob1 ob2 <ob2> <rest> ; ) ( ob1 ob2 F → :: <ob1> ; )
813E7	caseDROP	( ob T → :: ; ) ( ob F → :: ob <ob1> <rest> ; )

81428	NOTcaseDROP	( ob T → :: ob <ob1> <rest> ; ) ( ob F → :: ; )
842A4	casedrptru	( ob T → T ) ( ob F → :: ob <ob1> <rest> ; )
83FD9	casedrpf1s	Note: should be called caseDRPTRU. ( ob T → F ) ( ob F → :: ob <ob1> <rest> ; )
844F7	NOTcsdrpf1s	Note: should be called caseDRPF1S. ( ob T → :: ob <ob1> <rest> ; ) ( ob F → F )
813DD	case2DROP	Note: should be called NOTcaseDRPF1S. ( ob1 ob2 T → :: ; ) ( ob1 ob2 F → :: ob1 ob2 <ob1> <rest> ; )
8141E	NOTcase2DROP	( ob1 ob2 T → :: ob1 ob2 <ob1> <rest> ; ) ( ob1 ob2 F → :: ; )
83FF2	case2drpf1s	( ob1 ob2 T → F ) ( ob1 ob2 F → :: ob1 ob2 <ob1> <rest> ; )
83F52	caseTRUE	Note: should be called case2DRPF1S. ( T → T ) ( F → :: <ob1> <rest> ; )
842BD	NOTcaseTRUE	( T → :: <ob1> <rest> ; ) ( F → T )
8400B	caseFALSE	( T → F ) ( F → :: <ob1> <rest> ; )
842D6	NOTcaseFALSE	( T → :: <ob1> <rest> ; ) ( F → F )
81400	COLAcase	( T → :: <ob1> ; ) ( F → :: <ob2> <rest> ; ) Drops the rest of current stream and executes case in the stream above.

### 3.4.4 Binary Integer Tests

83DDB	#=?SKIP	( #m #n → :: <ob2> <rest> ; ) ( #m #n → :: <ob1> <rest> ; )
83E08	#>?SKIP	( #m #n → :: <ob1> <rest> ; ) ( #m #n → :: <ob2> <rest> ; )
8369C	#=ITE	( #m #n → :: <ob1> <ob3> <rest> ; ) ( #m #n → :: <ob2> <rest> ; )
848A8	#<ITE	( #m #n → :: <ob1> <ob3> <rest> ; ) ( #m #n → :: <ob2> <rest> ; )
848BC	#>ITE	( #m #n → :: <ob2> <rest> ; ) ( #m #n → :: <ob1> <ob3> <rest> ; )
8136A	#=case	( #m #n → :: <ob1> ; ) ( #m #n → :: <ob2> <rest> ; )
81365	OVER#=case	( #m #n → :: #m <ob1> ; ) ( #m #n → :: #m <ob2> <rest> ; )

8136F	#=casedrop	( #m #n → :: <ob1> ; ) ( #m #n → :: #m <ob2> <rest> ; ) Note: should be called OVER#=casedrop.
83FB6	#=casedrpfls	( #m #n → F ) ( #m #n → :: #m <ob1> <rest> ; ) Note: should be called OVER#=caseDRPFLS.
84745	#<>case	( #m #n → :: <ob2> <rest> ; ) ( #m #n → :: <ob1> ; )
8471D	#<case	( #m #n → :: <ob1> ; ) ( #m #n → :: <ob2> <rest> ; )
84772	#>case	( #m #n → :: <ob2> <rest> ; ) ( #m #n → :: <ob1> ; )
815B3	#0=?SEMI	( #0 → :: ; ) ( # → :: <ob1> <rest> ; )
83DA9	#0=?SKIP	( #0 → :: <ob2> <rest> ; ) ( # → :: <ob1> <rest> ; )
84894	#0=ITE	( #0 → :: <ob1> <ob3> <rest> ; ) ( # → :: <ob2> <rest> )
84853	DUP#0=IT	( #0 → :: #0 <ob1> <rest> ; ) ( # → :: # <ob2> <rest> ; )
848D0	DUP#0=ITE	( #0 → :: #0 <ob1> <ob3> <rest> ; ) ( # → :: # <ob2> <rest> ; )
81360	#0=case	( #0 → :: <ob1> ; ) ( # → :: <ob2> <rest> ; )
81FAE	DUP#0=case	( #0 → :: #0 <ob1> ; ) ( # → :: # <ob2> <rest> ; )
81388	DUP#0=csedrp	( #0 → :: <ob1> ; ) ( # → :: # <ob2> <rest> ; )
846C8	DUP#0=csDROP	( #0 → :: ; ) ( # → :: # <ob1> <rest> ; )
84731	#1=case	( #1 → :: <ob1> ; ) ( # → :: <ob2> <rest> ; )
83DC2	#1=?SKIP	( #1 → :: <ob2> <rest> ; ) ( # → :: <ob1> <rest> ; )
84759	#>2case	( #0/#1/#2 → :: <ob2> <rest> ; ) ( # → :: <ob1> ; )
82BCF	?CaseKeyDef	( # #' → :: ' ob1 T ; ) ( # #' → :: <ob2> <rest> ; ) Compares two bints. If equal, quotes the next object from the runsream and returns it along with TRUE.
82BED	?CaseRomptr@	( # #' → ob T ) ( # #' → F ) ( # #' → :: <ob2> <rest> ; ) Compares two bints. If equal, tries to resolve the rompointer which must be the next object in the run-stream. The ROMPTR@ pushes TRUE when successful, so this entry can be used directly for key handlers.

### 3.4.5 Real and Complex Number Tests

```
84786      j%0=case      ( %0 → :: <ob1> ; )
                        ( ob → :: <ob2> <rest> ; )
```

### 3.4.6 General Object Tests

```
8483A      EQIT          ( ob1 ob1 → :: <ob1> <rest> ; )
                        ( ob1 ob2 → :: <ob2> <rest> ; )
84880      EQITE        ( ob1 ob1 → :: <ob1> <ob3> <rest> ; )
                        ( ob1 ob2 → :: <ob2> <rest> ; )
846E1      jEQcase      ( ob1 ob1 → :: <ob1> ; )
                        ( ob1 ob2 → :: <ob2> <rest> ; )
DE46C      EQcase       ( ob1 ob1 → :: ob1 <ob1> ; )
                        ( ob1 ob2 → :: ob1 <ob2> <rest> ; )
                        Note: Should be called OVEREQcase.
8138D      EQcasedrop   ( ob1 ob1 → :: <ob1> ; )
                        ( ob1 ob2 → :: ob1 <ob2> <rest> ; )
                        Note: should be called OVEREQcasedrop.
84709      EQUALcase    ( ob1 ob1 → :: <ob1> ; )
                        ( ob1 ob2 → :: <ob2> <rest> ; )
847FE      EQUALNOTcase ( ob1 ob1 → :: <ob2> <rest> ; )
                        ( ob1 ob2 → :: <ob1> ; )
846AF      EQUALcasedrp ( ob ob1 ob2 → :: <ob1> ; )
                        ( ob ob1 ob2 → :: ob <ob2> <rest> ; )
84812      dIDNTNcase   ( id → :: id <ob2> <rest> ; )
                        ( ob → :: ob <ob1> ; )
8479A      REALcase     ( % → :: <ob1> ; )
                        ( ob → :: <ob2> <rest> ; )
84826      dREALNcase   ( % → :: % <ob2> <rest> ; )
                        ( ob → :: ob <ob1> ; )
847AE      dARRAYcase   ( [] → :: [] <ob1> ; )
                        ( ob → :: ob <ob2> <rest> ; )
847C2      dLISTcase    ( {} → :: {} ob1 ; )
                        ( ob → :: ob <ob2> <rest> ; )
```

### 3.4.7 Miscellaneous

```
848E4      UserITE      ( #set → :: <ob1> <ob3> <rest> ; )
                        ( #clr → :: <ob2> <rest> ; )
848F8      SysITE       ( #set → :: <ob1> <ob3> <rest> ; )
                        ( #clr → :: <ob2> <rest> ; )
```

845F6	caseDoBadKey	( T → :: DoBadKey ; ) ( F → :: <ob1> <rest> ; ) aka: caseDEADKEY
845DD	caseDrpBadKy	( ob T → :: DoBadKey ; ) ( ob F → :: ob <ob1> <rest> ; )
83BD8	caseERRJMP	( T → :: ERRJMP ; ) ( F → :: <ob> <rest> ; )
84510	caseSIZEERR	( T → :: SIZEERR ; ) ( F → :: <ob> <rest> ; )
84524	NcaseSIZEERR	( T → :: <ob> <rest> ; ) ( F → :: SIZEERR ; )
84551	NcaseTYPEERR	( T → :: <ob1> <rest> ; ) ( F → :: TYPEERR ; )
847D6	EditExstCase	( → :: <ob1> <rest> ; ) ( → :: <rest> ; ) Tests if there is an edit line active.

### 3.5 Runstream Control

81789	NOP	( → ) Does nothing.
8172A	'R	( → ob ) Pushes next object in return stack (i.e., the first object in the composite above this one) to the stack (skipping it). If top return stack is empty (contains SEMI), a null secondary is pushed and the pointer is not advanced.
8172F	'REVAL	( → ? ) Does <REF>'R then <REF>EVAL.
843E9	'R'R	( → ob1 ob2 ) Does <REF>'R twice.
8148C	ticR	( → ob T ) ( → F ) Pushes next object in return stack to stack and TRUE, of just FALSE if the top return stack body is empty. In this case, it is dropped.
84407	'RRDROP	( → ob ) Does <REF>'R , then <REF>RDROP.
81734	>R	( :: → ) Pushes :: to top of return stack (skips prolog, i.e., the composite will be executed automatically).
8178E	R>	( → :: ) Creates and pops a secondary from top return stack body to stack.

81793	R@	( → :: ) Like <REF>R>, but the return stack is not popped.
81757	EVAL	( ob → ) Evaluates object.
81CBB	COMPEVAL	( comp → ) EVAL just pushes a list back, this one executes it.
81B21	RDUP	( → ) Duplicates top return stack level.
81798	RDROP	( → ) Pops the return stack.
813CE	2RDROP	( → ) Pops two return stack levels.
81469	3RDROP	( → ) Pops three return stack levels.
83D68	DROPRDROP	( ob → ) Does DROP then <REF>RDROP .
81432	RDROPCOLA	( → ) Does <REF>RDROP then <REF>COLA .
81437	RSWAP	( → ) Swap in the return stack.
81B26	RROLL	( #n → ) Rolls nth return stack level to top of return stack.
84272	RSKIP	( → ) Skips first object in the return stack (i.e., the first object in the composite above this one).
0312B	SEMI	( → ) DROP the rest of the current stream.

### 3.5.1 Quoting Objects

81725	'	( → nob (nextob) ) Pushes next object in the stream to the stack (skipping it).
84330	DUP'	( ob → ob nob ) Does DUP then '.
84358	DROP'	( ob → nob ) Does DROP then '.
84344	SWAP'	( ob1 ob2 → ob2 ob1 nob ) Does SWAP then '.
8436C	OVER'	( ob1 ob2 → ob1 ob2 ob1 nob ) Does OVER then '.
84380	STO'	( ob id/lam → nob ) Does STO then '.
84394	TRUE'	( → T nob ) Pushes TRUE and the next object to the stack.



843C1	FALSE'	( → F nob ) Pushes FALSE and the next object to the stack.
843A8	ONEFALSE'	( → #1 F nob ) Pushes ONE, FALSE and the next object to the stack.
843D5	#1+'	( # → #+1 nob ) Does #1+ then '.
83D2C	'NOP	( → NOP ) Pushes NOP to the stack.
83BC4	'ERRJMP	( → ERRJMP ) Pushes ERRJMP to the stack.
81851	'DROPFALSE	( → DROPFALSE ) Pushes DROPFALSE to the stack.
82BBB	'DoBadKey	( → DoBadKey ) Pushes DoBadKey to the stack.
3C77E	'DoBadKeyT	( → DoBadKey T ) Pushes <REF>DoBadKey and TRUE to the stack.
84579	'xDER	( → xDER ) Pushes xDER (User word ∂) to the stack.
82E4F	'Rapndit	( meta ob1...ob4 → meta&ob ob1...ob4 ) Takes ob from runstream and appends it to the meta starting in level 5.
84461	'xDEREQ	( ob → flag ) Is ob eq to user command xDER?

### 3.5.2 Skipping Objects

8174D	COLA	Evals next obj and drops rest of this stream.
84420	ONECOLA	Does ONE, then COLA.
83D81	SWAPCOLA	Does SWAP, then COLA.
83D95	XYZ>ZCOLA	Does UNROT2DROP, then COLA.
813F6	COLA_EVAL	Returns and evals first obj in previous stream.
813F1	COLACOLA	Drops rest of current stream does COLA in the above one.
817AC	SKIP	Skips 1 obj in the runstream.
83E21	COLASKIP	Drops rest of current stream and skips one obj in above stream.

## 3.6 Loops

### 3.6.1 Indefinite Loops

81748	BEGIN	( → ) Pushes interpreter pointer into the return stack.
81743	AGAIN	( → ) Sets the interpreter pointer to the topmost value in the return stack, without popping it.
8179D	REPEAT	( → ) Sets the interpreter pointer to the topmost value in the return stack, without popping it.
817B1	UNTIL	( flag → ) If FALSE then <REF>AGAIN, otherwise <REF>RDROP .
83E35	NOT_UNTIL	( flag → ) NOT then <REF>UNTIL .
83647	#0=UNTIL	( # → # ) Actually, should be called DUP#0=UNTIL.
817B6	WHILE	( flag → ) If TRUE does nothing, otherwise <REF>RDROP then <REF>2SKIP .
83E4E	NOT_WHILE	( flag → ) NOT then <REF>WHILE .
83E67	DUP#0<>WHILE	( # → ) Try to guess what it does.

### 3.6.2 Definite Loops

81752	DO	( #stop #start → )
0744F	ZERO_DO	( #stop → )
83EEE	DUP#0_DO	( #stop → #stop )
0745A	ONE_DO	( #stop → )
07467	#1+_ONE_DO	( #stop → )
83F07	toLEN_DO	( {} → {} ) From ONE to #elements.
81784	LOOP	( → )
81739	+LOOP	( # → ) Increments index by specified number.
83ED5	DROPLoop	( ob → )
83EBC	SWAPLoop	( ob1 ob2 → ob2 ob1 )
8175C	INDEX@	( → # ) Recalls topmost loop counter value.
83E80	DUPINDEX@	( ob → ob # )
83E94	SWAPINDEX@	( ob1 ob2 → ob2 ob1 # )
83EA8	OVERINDEX@	( ob1 ob2 → ob1 ob2 ob1 # )
841E6	INDEX@#-	( # → #' )

81761	INDEXSTO	( # → ) Stores new topmost loop counter value.
81766	ISTOP@	( → # ) Recalls topmost loop stop value.
8176B	ISTOPSTO	( # → ) Stores new topmost loop stop value.
81770	JINDEX@	( → # ) Recalls second topmost loop counter value.
81775	JINDEXSTO	( # → ) Stores new second topmost loop counter value.
8177A	JSTOP@	( → # ) Recalls second topmost loop stop value.
8177F	JSTOPSTO	( # → ) Stores new second topmost loop stop value.
84A1A	ExitAtLOOP	( → ) Does not exit loop immediately. Just stores zero as the stop value, so all objects until the next LOOP will be evaluated. aka: ZEROISTOPSTO

## 3.7 Memory Operations

### 3.7.1 Recalling, Storing and Purging

81C11	@	( id/lam → ob T ) ( id/lam → F ) Basic recalling function.
83674	DUP@	( id/lam → id/lam ob T ) ( id/lam → id/lam F ) Does DUP then <REF>@.
81C70	STO	( ob id/lam → ) For ids this assumes ob is not pco. If replacing some object, that object is copied to TEMPOB and pointers are updated. For lams: Errors if lam is unbound.
81C61	REPLACE	( newob oldob → newob ) Replaces oldob (in memory) with newob.
81C4D	PURGE	( id → ) Purges variable. Does no type check first.
81C2F	CREATE	( ob id → ) Creates a variable in the current directory. Errors if id is or contains current directory. Assumes id is not a pco.
84448	'LAMLNAMESTO	( ob → ) STO to LAM LAMLNAME.

### 3.7.2 Directories

81C3E	MAKERRP	( #libnum → rrp ) Creates an empty directory.
82D2D	CREATEDIR	( id → ) Creates an empty directory. Calls <REF>?PURGE_HERE first to delete the original.
81C57	LASTRAM-WORD	( rrp → ob T ) ( rrp → F ) Recalls first object in directory.
81C5C	PREVRAM-WORD	( ob → ob' T ) ( ob → F ) Recalls next object in directory.
08452	RAM-WORDNAME	( ob → id ) Recalls name of object in current directory.
81C7F	SYSRRP?	( rrp → flag ) Is rrp HOME?
81C2A	CONTEXT@	( → rrp ) Recalls current directory.
81C25	CONTEXT!	( rrp → ) Sets new current directory.
81C7F	SYSRRP?	( rrp → flag ) Is rrp HOME?
81C34	HOMEDIR	( → ) Sets HOME as current directory. aka: SYSCONTEXT

### 3.7.3 Temporary Memory

81A4A	TOTEMPOB	( ob → ob' ) Copies object to TEMPOB and returns pointer to the new copy.
836D8	TOTEMPSWAP	( ob1 ob2 → ob2' ob1 ) Does TOTEMPOB then SWAP.
82D23	CKREF	( ob → ob' ) If object is in TEMPOB, is not embedded in a com- posite and not referenced, does nothing. Else copies it to TEMPOB and returns the copy.
84989	SWAPCKREF	( ob1 ob2 → ob2 ob1' ) Does SWAP then <REF>CKREF.
81A4F	INTEMNOTREF?	( ob → ob flag ) If the object is in TEMPOB area, is not embedded in a composite and is not referenced, returns the object and TRUE, otherwise returns the object and FALSE.

0220E8    ~INTEMOB?            ( ob → ob flag )

### 3.8 Time and Alarms

81A95      SLOW                    ( → )  
15 millisecond delay.

81A9A      VERYSLOW                ( → )  
300 millisecond delay.

81A9F      VERYVERYSLOW            ( → )  
3 second delay.

82C0B      dowait                    ( %secs → )  
Waits specified number of seconds.

82F85      %>HMS                    ( % → %hms )  
Converts from decimal to H.MMSS format.

82F7B      %HMS>                    ( %hms → % )  
Converts from H.MMSS format to decimal.

82F67      %HMS+                    ( %hms1 %hms2 → %hms )  
Adds time in hms format.

82F71      %HMS-                    ( %hms1 %hms2 → %hms )  
Subtracts time in hms format.

831D3      CLKTICKS                    ( → hxs )  
Returns tick count. aka: `SysTime`

### 3.9 System Functions

#### 3.9.1 User and System Flags

81A5E      SetSysFlag                    ( # → )  
Sets the system flag with number #.  
<REF>TEXT:Flags

81A54      ClrSysFlag                    ( # → )  
Clears the system flag with number #.  
<REF>TEXT:Flags

81A68      TestSysFlag                 ( # → flag )  
Returns TRUE if system flag is set.  
<REF>TEXT:Flags

81A63      SetUserFlag                 ( # → )  
Set the user flag with number #.  
<REF>TEXT:Flags

81A59      ClrUserFlag                 ( # → )  
Clear the user flag with number #.  
<REF>TEXT:Flags

81A6D      TestUserFlag                ( # → flag )  
Returns TRUE if user flag is set. <REF>TEXT:Flags

### 3.9.2 General Functions

81B1C	setbeep	( #ms #Hz → ) Also beeps.
82D05	TurnOff	( → ) Internal OFF.
81A40	GARBAGE	( → ) Forces garbage collection.
81A45	MEM	( → # ) Returns amount of free memory in nibbles. Does not do garbage collection. (The user word does.)
819C3	OSIZE	( ob → # ) Returns object size in nibbles. Forces garbage collection.
819BE	OCRC	( ob → #nib hxs ) Returns size in nibbles and checksum as hxs.
81BA8	INHARDROM?	( ob → ob flag ) Is object address < #80000h?
82D19	CHANGETYPE	( ob #prolog → ob' ) Changes prolog of object, does TOTEMPOB.

### 3.10 Kermit

82B57	DOFINISH	( → ) Internal FINISH.
10C72	CLOSEUART	( → ) Internal CLOSEIO.
82B9D	OpenIO	
82ADF	docr	
81D88	OpenUart?Clr	
82BB1	PRINT	
81A81	SetEcma94	
117CD	AllowPr1cdCl	
81D83	UARTBUFLEN	
82BA7	PUTSERIAL	
81D7E	GETSERIAL	

## 4 Input and Output

### 4.1 Checking for Arguments

#### 4.1.1 Number and Type of Arguments

45611	CK0	( → ) Saves current command to LASTCKCMD. Marks stack below level 1 to STACKMARK.
81CD9	CK&DISPATCH0	( → ) Dispatches on stack argument. Does not convert ZINTs to REAL. -- <REF>CK&DISPATCH1 <REF>CK&DISPATCH2 <REF>TEXT:Dispatch.Types
81CDE	CK&DISPATCH1	( → ) Dispatches on stack arguments, stripping tags and converting ZINTS to REALS (HP49 only) if necessary. -- <REF>CK&DISPATCH0 <REF>CK&DISPATCH2 <REF>TEXT:Dispatch.Types
81CE3	CK&DISPATCH2	( → ) Equivalent to <REF>CK&DISPATCH1. -- <REF>CK&DISPATCH0 <REF>TEXT:Dispatch.Types
45AC1	CK1&Dispatch	( → ) Combines <REF>CK1 with <REF>CK&DISPATCH1. -- <REF>TEXT:Dispatch.Types
45AD2	CK2&Dispatch	( → ) Combines <REF>CK2 with <REF>CK&DISPATCH1. -- <REF>TEXT:Dispatch.Types
45AE3	CK3&Dispatch	( → ) Combines <REF>CK3 with <REF>CK&DISPATCH1. -- <REF>TEXT:Dispatch.Types

45AF4	CK4&Dispatch	( → ) Combines <REF>CK4 <REF>CK&DISPATCH1. -- <REF>TEXT:Dispatch.Types	with
45B05	CK5&Dispatch	( → ) Combines <REF>CK5 <REF>CK&DISPATCH1. -- <REF>TEXT:Dispatch.Types	with
81B12	OLASTOWDOB!	( → ) Clears command save by last CK<n> command. <REF>CK0 aka: OLASTOWDOB!, OLastRomWrd!	

### 4.1.2 Type Checking

84538	CKREAL	( % → % ) ( Z → % ) Checks for real. If a ZINT, convert to real. Else SETTYPEERR.	
8184C	TYPE	( ob → #prolog ) Returns address of prolog of object.	
816FD	TYPEREAL?	( ob → flag )	
83593	DUPTYPEREAL?	( ob → ob flag ) aka: DTYPEREAL?	
816CB	TYPECMP?	( ob → flag )	
83539	DUPTYPECMP?	( ob → ob flag )	
816D5	TYPECSTR?	( ob → flag )	
8354D	DUPTYPECSTR?	( ob → ob flag ) aka: DTYPECSTR?	
8351B	DUPTYPEARRY?	( ob → ob flag ) aka: DTYPEARRY?	
816B7	TYPEARRY?	( ob → flag ??? )	
816F8	TYPERARRY?	( ob → flag )	
816C1	TYPECARRY?	( ob → flag )	
816F3	TYPELIST?	( ob → flag )	
83589	DUPTYPELIST?	( ob → ob flag ) aka: DTYPELIST?	
816E9	TYPEIDNT?	( ob → flag )	
83575	DUPTYPEIDNT?	( ob → ob flag )	
816EE	TYPELAM?	( ob → flag )	
8357F	DUPTYPELAM?	( ob → ob flag )	
8170C	TYPESYMB?	( ob → flag )	



835B1	DUPTYPESYMB?	( ob → ob flag )
816E4	TYPEHSTR?	( ob → flag )
8356B	DUPTYPEHSTR?	( ob → ob flag )
816DF	TYPEGROB?	( ob → flag )
83561	DUPTYPEGROB?	( ob → ob flag )
835BB	DUPTYPETAG?	( ob → ob flag )
816DA	TYPEEXT?	( ob → flag ) Is ob a unit object?
83557	DUPTYPEEXT?	( ob → ob flag ) Is ob a unit object?
81702	TYPEROMP?	( ob → flag )
8359D	DUPTYPEROMP?	( ob → ob flag )
816BC	TYPEBINT?	( ob → flag )
83525	DUPTYPEBINT?	( ob → ob flag )
81707	TYPERRP?	( ob → flag )
835A7	DUPTYPERRP?	( ob → ob flag )
816C6	TYPECHAR?	( ob → flag )
8352F	DUPTYPECHAR?	( ob → ob flag )
816D0	TYPECOL?	( ob → flag ) Is on a secondary?
83543	DUPTYPECOL?	( ob → ob flag ) Is ob a secondary? aka: DTYPECOL?

## 4.2 Keyboard Control

### 4.2.1 Converting Keycodes

82BD9	Ck&DecKeyLoc	( %rc.p → #kc #p ) Converts from user key representation format to system. Does handle shift-hold keys.
82BE3	CodePl>%rc.p	( #kc #p → %rc.p ) Converts from system key representation format to user. Does handle shift-hold keys.
82C6F	ModifierKey?	( #kc #pl → flag ) Is the key any of the three modifiers right-shift, left-shift, or alpha?

### 4.2.2 Waiting for Keys

81A86	FLUSHKEYS	( → ) Flushes the key buffer. aka: FLUSH
-------	-----------	---

81A31	CHECKKEY	( → #kc T ) ( → F ) Returns next key in the key buffer (if there is one), but does not pop it. Does handle shift-hold keys. -- <REF>TEXT:Keycodes
81A36	GETTOUCH	( → #kc T ) ( → F ) Pops next key from key buffer (if there is one). Does handle shift-hold keys. -- <REF>TEXT:Keycodes
82C3D	GETKEY	( → #kc flag ) Get a single keypress from the keybuffer, waits if necessary. The key is returned along with TRUE. If an exception happens, returns FALSE. The exception is not handled. Does handle shift-hold keys. -- <REF>TEXT:Keycodes
81A3B	REPKEY?	( #kc → flag ) Returns TRUE if the key is being pressed. -- <REF>TEXT:Keycodes
82CDD	REPEATER	( → ) Takes two objects from the runstream, a BINT and a program. The BINT must represent a keycode. The program is evaluated at least once, and then again and again as long as the specified key is being pressed. -- <REF>TEXT:Keycodes
82CE7	REPEATERCH	( → ) Same as REPEATER, but slower, so more appropriate for scrolling and cursor motions. -- <REF>TEXT:Keycodes
82C5B	KEYINBUFFER?	( → flag ) Returns TRUE if there is at least a key in the key buffer.
82D0F	WaitForKey	( → #kc #flag ) Returns next full key press. Does <i>not</i> handle shift-hold keys. -- <REF>TEXT:Keycodes

### 4.2.3 The ATTN Flag

81A90	ATTN?	( → flag ) Returns TRUE if <u>CANCEL</u> has been pressed.
82BC5	?ATTNQUIT	( → ) If <u>CANCEL</u> has been pressed, ABORTs program. aka: ?ATTN_QUIT
81A2C	ATTNFLAGCLR	( → ) Clears <u>CANCEL</u> key counter. Does not affect the key buffer.

### 4.2.4 Bad Keys

3C635	DoBadKey	( → ) Beeps.
-------	----------	-----------------

### 4.2.5 User Keys

82C65	Key>StdKeyOb	( #kc #pl → ob ) Recalls the standard assignment of the key. This is the assignment which is active when USER mode is of.
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## 4.3 The Menu

### 4.3.1 Menu Properties

82C79	NoExitAction	( → ) Sets NOP as ExitAction. Mostly used to avoid that the menu is saved as the previous menu when a new Menu gets installed.
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### 4.3.2 Building Menus

3CC36	TakeOver	( → ) Override the default menu key executer. If this is the first entry in a program, the program can be used in edit mode. When the first in a program in the label slot of a menu key, the program is evaluated to get the label object (most likely a grab).
-------	----------	---

82C47      `InitMenu`                    `( menu → )`  
 menu is {} or :: settings {} ; Settings override the default settings installed by `InitMenu`.

### 4.3.3 Menu Display

88527      `?DispMenu`                    `( → )`  
 Redisplay the menu now if no key is waiting in the buffer. Even better is this:  
 :: `DA30K?NOTIT ?DispMenu ;`

82C29      `DispMenu.1`                    `( → )`  
 Displays the menu immediately.

82C1F      `DispMenu`                         `( → )`  
 :: `DispMenu.1 SetDAsValid ;`

## 4.4 InputLine and Inputforms

### 4.4.1 Inputform

8273D      `DoInputForm`                    `( l1..ln f1..fm #n #m msg $ → ob1..obn T )`  
    `( l1..ln f1..fm #n #m msg $ → F )`

`l = $ #x #y`  
`f = msg #x #y #w #h #type legal`  
`dec $hlp ChDat ChDec res init`  
 Starts an input form using the old engine.

## 4.5 The Browser Engines

### 4.5.1 The HP48 Browser Engine

## 4.6 The Parametrized Outer Loop (POL)

82CD3      `ParOuterLoop`                    `( Disp Keys NonAppKeys? DoStdKeys? menu #row`  
    `suspendOK? ExitCond AppErr → )`

82C8D      `POLSaveUI`                         `( Disp Keys NonAppKeys? DoStdKeys? menu #row`  
    `suspendOK? ExitCond AppErr → )`  
 Saves current UI to `LAMSavedUI`.

82CB5      `POLSetUI`                            `<see>ParOuterLoop`  
 Sets new UI, same arguments as to `ParOuterLoop`.

82C97	POLKeyUI	( → ) Displays, reads and evaluates keys according to set UI.
82CAB	POLRestoreUI	( → ) Restores saved UI from LAMSavedUI.
82CA1	POLResUI&Err	( → ) Restores saved UI and executes ERRJMP.

## 4.7 The Display

### 4.7.1 Display Organization

81ACC	TOADISP	( → ) Sets the text display as the active.
81AD1	TOGDISP	( → ) Sets the graphic display as the active.
81860	ABUFF	( → <code>textgrob</code> ) Returns the text grob to the stack.
81892	GBUFF	( → <code>graphgrob</code> ) Returns the graphic grob to the stack. The HP49 extable address for ExitAction! is the same, but this must be a bug.
818A1	HARDBUFF	( → <code>dispgrob</code> ) Returns the current grob to the stack.
818A6	HARDBUFF2	( → <code>menugrob</code> ) Returns the menu grob to the stack.
33905	HARDHEIGHT	( → <code>#height</code> ) Returns the height of HARDBUFF.

### 4.7.2 Preparing the Display

8230F	RECLAIMDISP	( → ) Activates the text grob, clears it and sets the default size.
824B3	MENUOFF?	( → <code>flag</code> ) Returns TRUE if the menu grob is off.
8249F	TURNMENUOFF	( → ) Turns off menu display, enlarges ABUFF to fill screen.
824A9	TURNMENUON	( → ) Turns menu grob on.
81AC2	HEIGHTENGROB	( <code>grob #rows</code> → ) Heightens graph or text grob.

81AC7	KILLGDISP	( → ) Clears graph display by setting it to NULLGROB. See DOERASE.
821BB	DOERASE	( → ) Erases the graphics display grob without changing its size.

### 4.7.3 Controlling Display Refresh

8208F	ClrDA1OK	( → )
82099	ClrDA2aOK	( → )
820A3	ClrDA2bOK	( → )
820AD	ClrDA2OK	( → )
820B7	ClrDA3OK	( → )
81FEF	DA1OK?	( → flag )
81FF9	DA2aOK?	( → flag )
82003	DA2bOK?	( → flag )
8200D	DA2OK?	( → flag )
82017	DA3OK?	( → flag )
82021	DAsOK?	( → flag )
8202B	DA2aLess10K?	( → flag )
26B24	DA3OK?NOTIT	( → ) Does DA3OK?, NOT then IT.
82067	SetDA1Temp	( → )
82071	SetDA2aTemp	( → )
8207B	SetDA3Temp	( → )
82107	SetDA12Temp	( → )
82111	SetDAsTemp	( → )
82035	SetDA1Valid	( → )
8203F	SetDA2aValid	( → )
82049	SetDA2bValid	( → )
82053	SetDA2Valid	( → )
8205D	SetDA3Valid	( → )
81B9E	SetDA3ValidF	( → )
81B71	SetDA1Bad	( → )
81B4E	ClrDA1Bad	( → )
81B62	DA1Bad?	( → flag )
81B80	SetDA2aBad	( → )
81B53	ClrDA2aBad	( → )
81B67	DA2aBad?	( → flag )

81B8A	SetDA2bBad	( → )
81B58	ClrDA2bBad	( → )
81B94	SetDA3Bad	( → )
81B7B	SetDA1NoCh	( → )
81B85	SetDA2aNoCh	( → )
81B8F	SetDA2bNoCh	( → )
81B5D	ClrDA2bNoCh	( → )
81B6C	DA2bNoCh?	( → flag )
820C1	SetDA2NoCh	( → )
820CB	SetDA12NoCh	( → )
81B99	SetDA3NoCh	( → )
820DF	SetDA13NoCh	( → )
820D5	SetDA23NoCh	( → )
820E9	SetDA12a3NCh	( → )
		aka: SetDA12a3NoCh
820F3	SetDAsNoCh	( → )
82085	SetDA2aEcho	( → )
81B76	SetDA1IsStat	( → )
81BA3	SetNoRollDA2	( → )

#### 4.7.4 Clearing the Display

82157	BLANKIT	( #startrow #rows → ) Clears #rows from HARDBUFF, starting at #startrow.
81A8B	CLCD10	( → ) Clears status and stack areas.
821B1	DOCLLCD	( → ) Like user word <REF>CLLCD.

#### 4.7.5 Annunciator and Modes Control

82A03	LockAlpha	( → ) Sets alpha mode, annunciators, etc.
82A0D	UnLockAlpha	( → ) Clears alpha mode, annunciators, etc.

#### 4.7.6 Window Coordinates

81AD6	WINDOWCORNER	( → #y #x ) Gets coordinates of corner of window. Note the order of #x and #y.
81AEF	WINDOWXY	( #y #x → ) Sets corner coordinates. The name really should be WINDOWYX

### 4.7.7 Scrolling the Display

81AEA	WINDOWUP	( → ) Moves display one pixel up.
81ADB	WINDOWDOWN	( → ) Moves display one pixel down.
81AE0	WINDOWLEFT	( → ) Moves display one pixel left.
81AE5	WINDOWRIGHT	( → ) Moves display one pixel right.
82341	SCROLLUP	( → ) Moves display one pixel up, checks for corresponding key being pressed.
82323	SCROLLDOWN	( → ) Moves display one pixel down, checks for corresponding key being pressed.
8232D	SCROLLLEFT	( → ) Moves display one pixel left, checks for corresponding key being pressed.
82337	SCROLLRIGHT	( → ) Moves display one pixel right, checks for corresponding key being pressed.
82297	JUMPTOP	( → ) Jumps to top of display.
8228D	JUMPBOT	( → ) Jumps to bottom of display.
822A1	JUMPLEFT	( → ) Jumps to left of display.
822AB	JUMPRIGHT	( → ) Jumps to right of display.
824E5	WINDOWTOP?	( → flag ) Is window at the top?
824C7	WINDOWBOT?	( → flag ) Is window at the bottom?
824D1	WINDOWLEFT?	( → flag ) Is window at the left?
824DB	WINDOWRIGHT?	( → flag ) Is window at the right?



### 4.7.8 Displaying Text

821CF	DODISP	( ob %row → ) Displays any object in specified row.
8186A	DISPROW1	( \$ → ) aka: DISP@01, BIGDISPROW1
8186F	DISPROW2	( \$ → ) aka: DISP@09, BIGDISPROW2
81874	DISPROW3	( \$ → ) aka: DISP@17, BIGDISPROW3
81879	DISPROW4	( \$ → ) aka: DISP@25, BIGDISPROW4
8187E	DISPROW5	( \$ → )
81883	DISPROW6	( \$ → )
81888	DISPROW7	( \$ → )
8188D	DISPROW8	( \$ → ) May not be possible depending on the size of the font and whether the menu is on or off.
81865	DISPN	( \$ #row → ) aka: BIGDISPN

### 4.7.9 Messages and Boxes

## 4.8 Graphics

### 4.8.1 Built-in Grobs

### 4.8.2 Dimensions

81BAD	GROBDIM	( grob → #height #width )
8460F	GROBDIMw	( grob → #width )
8217F	CKGROBFITS	( g1 g2 #n #m → g1 g2' #n #m ) Shrinks g2 if it does not fit in g1.
69E2E	CHECKHEIGHT	( grob #height → ) Forces grob (ABUFF/GBUFF) to be at least 64 rows high.

### 4.8.3 Grob Handling

81897	GROB!	( grob1 grob2 #x #y → ) Stores grob1 into grob2. Bang type.
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82251	GROB+#	( flag grob1 grob2 #x #y → grob' ) Inserts grob2 into the specified position of grob1, using OR (if flag is TRUE) or XOR (if flag is FALSE). Does all necessary checks first.
8189C	GROB!ZERO	( grob #x1 #y1 #x2 #y2 → grob' ) Blanks a rectangular region of the grob. Bang type.
84290	GROB!ZERODRP	( grob #x1 #y1 #x2 #y2 → ) Blanks a rectangular region of the grob. Probably only useful if grob is the text or graphics grob (see section on display-organization). Bang type.
818B5	SUBGROB	( grob #x1 #y1 #x2 #y2 → grob' ) Returns specified portion of grob.
824EF	XYGROBDISP	( #x #y grob → ) Stores grob in HARDBUFF with upper left corner at (#x,#y). HARDBUFF is expanded if necessary.
82265	GROB>GDISP	( grob → ) Stores new graph grob.
818B0	MAKEGROB	( #height #width → grob ) Creates a blank grob.
818AB	INVGROB	( grob → grob' ) Inverts grob data bits. Bang type.
81AFE	PIXON	( #x #y → ) Sets pixel in text grob.
81AF4	PIXOFF	( #x #y → ) Clears pixel in text grob.
81B03	PIXON?	( #x #y → flag ) Is pixel in text grob on?
81B08	PIXON3	( #x #y → ) Sets pixel in graph grob.
81AF9	PIXOFF3	( #x #y → ) Clears pixel in graph grob.
81B0D	PIXON?3	( #x #y → flag ) Is pixel in graph grob on?
81BBC	LINEON	( #x1 #y1 #x2 #y2 → ) Draws a line in text grob.
81BB2	LINEOFF	( #x1 #y1 #x2 #y2 → ) Clears a line in text grob.
81BC6	TOGLINE	( #x1 #y1 #x2 #y2 → ) Toggles a line in text grob.
81BC1	LINEON3	( #x1 #y1 #x2 #y2 → ) Draws a line in graph grob.
81BB7	LINEOFF3	( #x1 #y1 #x2 #y2 → ) Clears a line in graph grob.

81BCB	TOGLINE3	( #x1 #y1 #x2 #y2 → ) Toggles a line in graph grob.
821D9	DOLCD>	( → grob ) Returns current display.

#### 4.8.4 Creating Menu Label Grobs

822D3	MakeStdLabel	( \$ → grob ) Makes standard menu label.
822B5	MakeBoxLabel	( \$ → grob ) Makes label with a box.
822BF	MakeDirLabel	( \$ → grob ) Makes directory label.
822C9	MakeInvLabel	( \$ → grob ) Makes inverse label.
82C15	Box/StdLabel	( \$ flag → grob ) If TRUE makes box label, otherwise makes standard label.
8235F	Std/BoxLabel	( \$ flag → grob ) If TRUE makes standard label, otherwise makes box label.

#### 4.8.5 Converting Strings to Grobs

818BA	\$>BIGGROB	( \$ → grob ) Makes grob of the string using the large font (5x9).
818BF	\$>GROB	( \$ → grob ) Makes grob of the string using the system font. Linefeed does <i>not</i> make new line.
818C4	\$>grob	( \$ → grob ) Makes grob of the string using the minifont. Linefeed does <i>not</i> make new line.

### 4.9 Plotting

82161	CHECKPICT	( → ) Checks size of GBUFF. If it is smaller than 131x64 sets GBUFF back to its default size (131x64).
82229	GETXMIN	( → % ) Recalls XMIN from the PPAR list if existent. If not, the default PPAR is created in the current directory. -- <REF>TEXT:Reserved PPAR

822E7	PUTXMIN	( % → ) Sets a new value for XMIN. PPAR is created if necessary. -- <REF>TEXT:Reserved PPAR
8223D	GETXMAX	( → % ) Recalls XMAX from the PPAR list if existent. If not, the default PPAR is created in the current directory. -- <REF>TEXT:Reserved PPAR
822FB	PUTXMAX	( % → ) Sets a new value for XMAX. PPAR is created if necessary. -- <REF>TEXT:Reserved PPAR
82233	GETYMIN	( → % ) Recalls YMIN from the PPAR list if existent. If not, the default PPAR is created in the current directory. -- <REF>TEXT:Reserved PPAR
822F1	PUTYMIN	( % → ) Sets a new value for YMIN. PPAR is created if necessary. -- <REF>TEXT:Reserved PPAR
82247	GETYMAX	( → % ) Recalls YMAX from the PPAR list if existent. If not, the default PPAR is created in the current directory. -- <REF>TEXT:Reserved PPAR
82305	PUTYMAX	( % → ) Sets a new value for YMAX. PPAR is created if necessary. -- <REF>TEXT:Reserved PPAR
69347	GETYPOS	
8221F	GDISPCENTER	( → ) Moves to center of graphics display

## 5 Entries specific to the HP38/39/40

### 5.1 Topic Variables and the Topic Outer Loop

These entries are used for the implementation of applets on the HP38G/39G/40G. On the HP49G, they are included for Hp38/39/40 compatibility, probably in order to allow applet development on the HP49G.

8325F	TopOuterLoop	
83269	TOLSaveUI	
83273	TOLSetTopicUI	
8327D	TOLSetViewUI	
83287	TOLKeyUI	
83291	TOLErrorTrap	
8329B	TOLResUI&Err	
832A5	TOLRestoreUI	
832AF	?ExitThisTop	
84AE4	CALCCXT!	( ob → )
84AF4	CALCCXT@	( → ob )
84B04	PGMCXT!	( ob → )
84B14	PGMCXT@	( → ob )
84B24	NOTESCXT!	( ob → )
84B34	NOTESCXT@	( → ob )
84B44	apletPTR!	( ob → )
84B54	apletPTR@	( → ob )
84B64	funcPTR!	( ob → )
84B74	funcPTR@	( → ob )
84B84	polarPTR!	( ob → )
84B94	polarPTR@	( → ob )
84BA4	paramPTR!	( ob → )
84BB4	paramPTR@	( → ob )
84BC4	seqPTR!	( ob → )
84BD4	seqPTR@	( → ob )
84BE4	statPTR!	( ob → )
84BF4	statPTR@	( → ob )
84C04	solvePTR!	( ob → )
84C14	solvePTR@	( → ob )
84C24	otherPTR!	( ob → )

84C34	otherPTR@	( → ob )
81996	TopicVarN!	
81991	TopicVarN@	
84C44	TopicVar1!	( ob → )
84C54	TopicVar1@	( → ob )
84C64	TopicVar2!	( ob → )
84C74	TopicVar2@	( → ob )
84C84	TopicVar3!	( ob → )
84C94	TopicVar3@	( → ob )
84CA4	TopicVar4!	( ob → )
84CB4	TopicVar4@	( → ob )
84CC4	TopicVar5!	( ob → )
84CD4	TopicVar5@	( → ob )
84CE4	TopicVar6!	( ob → )
84CF4	TopicVar6@	( → ob )
84D04	TopicVar7!	( ob → )
84D14	TopicVar7@	( → ob )
84D24	TopicVar8!	( ob → )
84D34	TopicVar8@	( → ob )
84D44	TopicVar9!	( ob → )
84D54	TopicVar9@	( → ob )
84D64	TopicVar10!	( ob → )
84D74	TopicVar10@	( → ob )
84D84	TopicVar11!	( ob → )
84D94	TopicVar11@	( → ob )
84DA4	TopicVar12!	( ob → )
84DB4	TopicVar12@	( → ob )
84DC4	TopicVar13!	( ob → )
84DD4	TopicVar13@	( → ob )
84DE4	TopicVar14!	( ob → )
84DF4	TopicVar14@	( → ob )
84E04	TopicVar15!	( ob → )
84E14	TopicVar15@	( → ob )
84E24	TopicVar16!	( ob → )
84E34	TopicVar16@	( → ob )
84E44	TopicVar17!	( ob → )
84E54	TopicVar17@	( → ob )
84E64	TopicVar18!	( ob → )

84E74	TopicVar18@	( → ob )
84E84	TopicVar19!	( ob → )
84E94	TopicVar19@	( → ob )
84EA4	TopicVar20!	( ob → )
84EB4	TopicVar20@	( → ob )
84EC4	TopicVar21!	( ob → )
84ED4	TopicVar21@	( → ob )
84EE4	TopicVar22!	( ob → )
84EF4	TopicVar22@	( → ob )
84F04	TopicVar23!	( ob → )
84F14	TopicVar23@	( → ob )
84F24	TopicVar24!	( ob → )
84F34	TopicVar24@	( → ob )
84F44	TopicVar25!	( ob → )
84F54	TopicVar25@	( → ob )
84F64	TopicVar26!	( ob → )
84F74	TopicVar26@	( → ob )
84F84	TopicVar27!	( ob → )
84F94	TopicVar27@	( → ob )
84FA4	TopicVar28!	( ob → )
84FB4	TopicVar28@	( → ob )
84FC4	TopicVar29!	( ob → )
84FD4	TopicVar29@	( → ob )
84FE4	TopicVar30!	( ob → )
84FF4	TopicVar30@	( → ob )
85004	TopicVar31!	( ob → )
85014	TopicVar31@	( → ob )
85024	TopicVar32!	( ob → )
85034	TopicVar32@	( → ob )
85044	TopicVar33!	( ob → )
85054	TopicVar33@	( → ob )
85064	TopicVar34!	( ob → )
85074	TopicVar34@	( → ob )
85084	TopicVar35!	( ob → )
85094	TopicVar35@	( → ob )
850A4	TopicVar36!	( ob → )
850B4	TopicVar36@	( → ob )
850C4	TopicVar37!	( ob → )

850D4	TopicVar37@	( → ob )
850E4	TopicVar38!	( ob → )
850F4	TopicVar38@	( → ob )
85104	TopicVar39!	( ob → )
85114	TopicVar39@	( → ob )
85124	TopicVar40!	( ob → )
85134	TopicVar40@	( → ob )
85144	TopicVar41!	( ob → )
85154	TopicVar41@	( → ob )
85164	TopicVar42!	( ob → )
85174	TopicVar42@	( → ob )
85184	TopicVar43!	( ob → )
85194	TopicVar43@	( → ob )
851A4	TopicVar44!	( ob → )
851B4	TopicVar44@	( → ob )
851C4	TopicVar45!	( ob → )
851D4	TopicVar45@	( → ob )
851E4	TopicVar46!	( ob → )
851F4	TopicVar46@	( → ob )
85204	TopicVar47!	( ob → )
85214	TopicVar47@	( → ob )
85224	TopicVar48!	( ob → )
85234	TopicVar48@	( → ob )
85244	TopicVar49!	( ob → )
85254	TopicVar49@	( → ob )
85264	TopicVar50!	( ob → )
85274	TopicVar50@	( → ob )
85284	TopicVar51!	( ob → )
85294	TopicVar51@	( → ob )
852A4	TopicVar52@	( ob → )
852B4	TopicVar52!	( → ob )
852C4	TopicVar53@	( ob → )
852E0	TopicVar53!	( → ob )
85307	TopicVar54@	( ob → )
85317	TopicVar54!	( → ob )
85327	TopicVar55@	( ob → )
85337	TopicVar55!	( → ob )
85347	TopicVar56@	( ob → )



85357	TopicVar56!	( → ob )
85367	TopicVar57@	( ob → )
85377	TopicVar57!	( → ob )
85387	TopicVar58@	( ob → )
85397	TopicVar58!	( → ob )
853A7	TopicVar59@	( ob → )
853B7	TopicVar59!	( → ob )
853C7	TopicVar60@	( ob → )
853D7	TopicVar60!	( → ob )
853E7	TopicVar61@	( ob → )
853F7	TopicVar61!	( → ob )
85407	TopicVar62@	( ob → )
85417	TopicVar62!	( → ob )
85427	TopicVar63@	( ob → )
85437	TopicVar63!	( → ob )
85447	TopicVar64@	( ob → )
85457	TopicVar64!	( → ob )
85467	TopicVar65@	( ob → )
85477	TopicVar65!	( → ob )
85487	TopicVar66@	( ob → )
85497	TopicVar66!	( → ob )
854A7	TopicVar67@	( ob → )
854B7	TopicVar67!	( → ob )
854C7	TopicVar68@	( ob → )
854D7	TopicVar68!	( → ob )
854E7	TopicVar69@	( ob → )
854F7	TopicVar69!	( → ob )
85507	TopicVar70@	( ob → )
85517	TopicVar70!	( → ob )
85527	TopicVar71@	( ob → )
85537	TopicVar71!	( → ob )
85547	TopicVar72@	( ob → )
85557	TopicVar72!	( → ob )
85567	TopicVar73@	( ob → )
85577	TopicVar73!	( → ob )
85587	TopicVar74@	( ob → )
85597	TopicVar74!	( → ob )
855A7	TopicVar75@	( ob → )

855B7	TopicVar75!	( → ob )
855C7	TopicVar76@	( ob → )
855D7	TopicVar76!	( → ob )
855E7	TopicVar77@	( ob → )
855F7	TopicVar77!	( → ob )
85607	TopicVar78@	( ob → )
85617	TopicVar78!	( → ob )
85627	TopicVar79@	( ob → )
85637	TopicVar79!	( → ob )
85647	TopicVar80@	( ob → )
85657	TopicVar80!	( → ob )
85667	TopicVar81@	( ob → )
85677	TopicVar81!	( → ob )
85687	TopicVar82@	( ob → )
85697	TopicVar82!	( → ob )
856A7	TopicVar83@	( ob → )
856B7	TopicVar83!	( → ob )
856C7	TopicVar84@	( ob → )
856D7	TopicVar84!	( → ob )
856E7	TopicVar85@	( ob → )
856F7	TopicVar85!	( → ob )
85707	TopicVar86@	( ob → )
85717	TopicVar86!	( → ob )
85727	TopicVar87@	( ob → )
85737	TopicVar87!	( → ob )
85747	TopicVar88@	( ob → )
85757	TopicVar88!	( → ob )
85767	TopicVar89@	( ob → )
85777	TopicVar89!	( → ob )
85787	TopicVar90@	( ob → )
85797	TopicVar90!	( → ob )
857A7	TopicVar91!	( ob → )
857B7	TopicVar91@	( → ob )
857C7	TOLVar1!	( ob → )
857D7	TOLVar1@	( → ob )
857E7	TOLVar2!	( ob → )
857F7	TOLVar2@	( → ob )
85807	TOLVar3!	( ob → )

85817	TOLVar3@	( → ob )
85827	TOLVar4!	( ob → )
85837	TOLVar4@	( → ob )
85847	TOLVar5!	( ob → )
85857	TOLVar5@	( → ob )
85867	TOLVar6!	( ob → )
85877	TOLVar6@	( → ob )
85887	TOLVar7!	( ob → )
85897	TOLVar7@	( → ob )
858A7	TOLVar8!	( ob → )
858B7	TOLVar8@	( → ob )
858C7	TOLVar9!	( ob → )
858D7	TOLVar9@	( → ob )
858E7	TOLVar10!	( ob → )
858F7	TOLVar10@	( → ob )
85907	TOLVar11!	( ob → )
85917	TOLVar11@	( → ob )
85927	TOLVar12!	( ob → )
85937	TOLVar12@	( → ob )
85947	TOLVar13!	( ob → )
85957	TOLVar13@	( → ob )
85967	TOLVar14!	( ob → )
85977	TOLVar14@	( → ob )
85987	TOLVar15!	( ob → )
85997	TOLVar15@	( → ob )
859A7	TOLVar16!	( ob → )
859B7	TOLVar16@	( → ob )
859C7	TOLVar17!	( ob → )
859D7	TOLVar17@	( → ob )
859E7	TOLVar18!	( ob → )
859F7	TOLVar18@	( → ob )
85A07	TOLVar19!	( ob → )
85A17	TOLVar19@	( → ob )
85A27	TOLVar20!	( ob → )
85A37	TOLVar20@	( → ob )
85A47	TOLVar21!	( ob → )
85A57	TOLVar21@	( → ob )
85A67	TOLVar22!	( ob → )

85A77	TOLVar22@	( → ob )
85A87	TOLVar23!	( ob → )
85A97	TOLVar23@	( → ob )
85AA7	TOLVar24!	( ob → )
85AB7	TOLVar24@	( → ob )
85AC7	TOLVar25!	( ob → )
85AD7	TOLVar25@	( → ob )
85AE9	TOLVar26!	( ob → )
85AFB	TOLVar26@	( → ob )
85B0D	TOLVar27!	( ob → )
85B1F	TOLVar27@	( → ob )
85B31	TOLVar28!	( ob → )
85B43	TOLVar28@	( → ob )
85B55	TOLVar29!	( ob → )
85B67	TOLVar29@	( → ob )
85B79	TOLVar30!	( ob → )
85B8B	TOLVar30@	( → ob )
85B9D	TOLVar31!	( ob → )
85BAF	TOLVar31@	( → ob )
85BC1	TOLVar32!	( ob → )
85BD3	TOLVar32@	( → ob )
85BE5	TOLVar33!	( ob → )
85BF7	TOLVar33@	( → ob )
85C09	TOLVar34!	( ob → )
85C1B	TOLVar34@	( → ob )
85C2D	TOLVar35!	( ob → )
85C3F	TOLVar35@	( → ob )
85C51	TOLVar36!	( ob → )
85C63	TOLVar36@	( → ob )
85C75	TOLVar37!	( ob → )
85C87	TOLVar37@	( → ob )
85C99	TOLVar38!	( ob → )
85CAB	TOLVar38@	( → ob )
85CBD	TOLVar39!	( ob → )
85CCF	TOLVar39@	( → ob )
85CE1	TOLVar40!	( ob → )
85CF3	TOLVar40@	( → ob )
85D05	TOLVar41!	( ob → )

85D17	TOLVar41@	( → ob )
85D29	TOLVar42!	( ob → )
85D3B	TOLVar42@	( → ob )
85D4D	TOLVar43!	( ob → )
85D5F	TOLVar43@	( → ob )
85D71	TOLVar44!	( ob → )
85D83	TOLVar44@	( → ob )
85D95	TOLVar45!	( ob → )
85DA7	TOLVar45@	( → ob )
85DB9	TOLVar46!	( ob → )
85DCB	TOLVar46@	( → ob )
85DDD	TOLVar47!	( ob → )
85DEF	TOLVar47@	( → ob )
85E01	TOLVar48!	( ob → )
85E13	TOLVar48@	( → ob )
85E25	TOLVar49!	( ob → )
85E37	TOLVar49@	( → ob )
85E49	TOLVar50!	( ob → )
85E5B	TOLVar50@	( → ob )
85E6D	TOLVar51!	( ob → )
85E7F	TOLVar51@	( → ob )
85E91	TOLVar52!	( ob → )
85EA3	TOLVar52@	( → ob )
85EB5	TOLVar53!	( ob → )
85EC7	TOLVar53@	( → ob )
85ED9	TOLVar54!	( ob → )
85EEB	TOLVar54@	( → ob )
85EFD	TOLVar55!	( ob → )
85F0F	TOLVar55@	( → ob )
85F21	TOLVar56!	( ob → )
85F33	TOLVar56@	( → ob )
85F45	TOLVar57!	( ob → )
85F57	TOLVar57@	( → ob )
85F69	TOLVar58!	( ob → )
85F7B	TOLVar58@	( → ob )
85F8D	TOLVar59!	( ob → )
85F9F	TOLVar59@	( → ob )
85FB1	TOLVar60!	( ob → )

85FC3	TOLVar60@	( → ob )
85FD5	TOLVar61!	( ob → )
85FE7	TOLVar61@	( → ob )
85FF9	TOLVar62!	( ob → )
8600B	TOLVar62@	( → ob )
8601D	TOLVar63!	( ob → )
8602F	TOLVar63@	( → ob )
86041	TOLVar64!	( ob → )
86053	TOLVar64@	( → ob )
86065	TOLVar65!	( ob → )
86077	TOLVar65@	( → ob )
86089	TOLVar66!	( ob → )
8609B	TOLVar66@	( → ob )
860AD	TOLVar67!	( ob → )
860BF	TOLVar67@	( → ob )
860D1	TOLVar68!	( ob → )
860E3	TOLVar68@	( → ob )
860F5	TOLVar69!	( ob → )
86107	TOLVar69@	( → ob )
86119	TOLVar70!	( ob → )
8612B	TOLVar70@	( → ob )
8613D	TOLVar71!	( ob → )
8614F	TOLVar71@	( → ob )
86161	TOLVar72!	( ob → )
86173	TOLVar72@	( → ob )
86185	TOLVar73!	( ob → )
86197	TOLVar73@	( → ob )
861A9	TOLVar74!	( ob → )
861BB	TOLVar74@	( → ob )
861CD	TOLVar75!	( ob → )
861DF	TOLVar75@	( → ob )
861F1	TOLVar76!	( ob → )
86203	TOLVar76@	( → ob )
86215	TOLVar77!	( ob → )
86227	TOLVar77@	( → ob )
86239	TOLVar78!	( ob → )
8624B	TOLVar78@	( → ob )
8625D	TOLVar79!	( ob → )

8626F	TOLVar79@	( → ob )
86281	TOLVar80!	( ob → )
86293	TOLVar80@	( → ob )
862A5	TOLVar81!	( ob → )
862B7	TOLVar81@	( → ob )
862C9	TOLVar82!	( ob → )
862DB	TOLVar82@	( → ob )
862ED	TOLVar83!	( ob → )
862FF	TOLVar83@	( → ob )
86311	TOLVar84!	( ob → )
86323	TOLVar84@	( → ob )
86335	TOLVar85!	( ob → )
86347	TOLVar85@	( → ob )
86359	TOLVar86!	( ob → )
8636B	TOLVar86@	( → ob )
8637D	TOLVar87!	( ob → )
8638F	TOLVar87@	( → ob )
863A1	TOLVar88!	( ob → )
863B3	TOLVar88@	( → ob )
863C5	TOLVar89!	( ob → )
863D7	TOLVar89@	( → ob )
863E9	TOLVar90!	( ob → )
863FB	TOLVar90@	( → ob )
8640D	TOLVar91!	( ob → )
8641F	TOLVar91@	( → ob )
86431	TOLVar92!	( ob → )
86443	TOLVar92@	( → ob )
86455	TOLVar93!	( ob → )
86467	TOLVar93@	( → ob )
86479	TOLVar94!	( ob → )
8648B	TOLVar94@	( → ob )
8649D	TOLVar95!	( ob → )
864AF	TOLVar95@	( → ob )
864C1	TOLVar96!	( ob → )
864D3	TOLVar96@	( → ob )
864E5	TOLVar97!	( ob → )
864F7	TOLVar97@	( → ob )
86509	TOLVar98!	( ob → )

8651B	TOLVar98@	( → ob )
8652D	TOLVar99!	( ob → )
8653F	TOLVar99@	( → ob )
86551	TOLVar100!	( ob → )
86563	TOLVar100@	( → ob )
86575	TOLVar101!	( ob → )
86587	TOLVar101@	( → ob )
86599	TOLVar102!	( ob → )
865AB	TOLVar102@	( → ob )
865BD	TOLVar103!	( ob → )
865CF	TOLVar103@	( → ob )
865E1	TOLVar104!	( ob → )
865F3	TOLVar104@	( → ob )
86605	TOLVar105!	( ob → )
86617	TOLVar105@	( → ob )
86629	TOLVar106!	( ob → )
8663B	TOLVar106@	( → ob )
8664D	TOLVar107!	( ob → )
8665F	TOLVar107@	( → ob )
86671	TOLVar108!	( ob → )
86683	TOLVar108@	( → ob )
86695	TOLVar109!	( ob → )
866A7	TOLVar109@	( → ob )
866B9	TOLVar110!	( ob → )
866CB	TOLVar110@	( → ob )
866DD	TOLVar111!	( ob → )
866EF	TOLVar111@	( → ob )
86701	TOLVar112!	( ob → )
86713	TOLVar112@	( → ob )
86725	TOLVar113!	( ob → )
86737	TOLVar113@	( → ob )
86749	TOLVar114!	( ob → )
8675B	TOLVar114@	( → ob )
8676D	TOLVar115!	( ob → )
8677F	TOLVar115@	( → ob )
86791	TOLVar116!	( ob → )
867A3	TOLVar116@	( → ob )
867B5	TOLVar117!	( ob → )



867C7	TOLVar117@	( → ob )
867D9	TOLVar118!	( ob → )
867EB	TOLVar118@	( → ob )
867FD	TOLVar119!	( ob → )
8680F	TOLVar119@	( → ob )
86821	TOLVar120!	( ob → )
86833	TOLVar120@	( → ob )
86845	TOLVar121!	( ob → )
86857	TOLVar121@	( → ob )
86869	TOLVar122!	( ob → )
8687B	TOLVar122@	( → ob )
8688D	TOLVar123!	( ob → )
8689F	TOLVar123@	( → ob )
868B1	TOLVar124!	( ob → )
868C3	TOLVar124@	( → ob )
868D5	TOLVar125!	( ob → )
868E7	TOLVar125@	( → ob )
868F9	TOLVar126!	( ob → )
8690B	TOLVar126@	( → ob )
8691D	TOLVar127!	( ob → )
8692F	TOLVar127@	( → ob )
86941	TOLVar128!	( ob → )
86953	TOLVar128@	( → ob )
86965	TOLVar129!	( ob → )
86977	TOLVar129@	( → ob )
86989	TOLVar130!	( ob → )
8699B	TOLVar130@	( → ob )
869AD	TOLVar131!	( ob → )
869BF	TOLVar131@	( → ob )
869D1	TOLVar132!	( ob → )
869E3	TOLVar132@	( → ob )
869F5	TOLVar133!	( ob → )
86A07	TOLVar133@	( → ob )
86A19	TOLVar134!	( ob → )
86A2B	TOLVar134@	( → ob )
86A3D	TOLVar135!	( ob → )
86A4F	TOLVar135@	( → ob )
86A61	TOLVar136!	( ob → )

86A73	TOLVar136@	( → ob )
86A85	TOLVar137!	( ob → )
86A97	TOLVar137@	( → ob )
86AA9	TOLVar138!	( ob → )
86ABB	TOLVar138@	( → ob )
86ACD	TOLVar139!	( ob → )
86ADF	TOLVar139@	( → ob )
86AF1	TOLVar140!	( ob → )
86B03	TOLVar140@	( → ob )
86B15	TOLVar141!	( ob → )
86B27	TOLVar141@	( → ob )
86B39	TOLVar142!	( ob → )
86B4B	TOLVar142@	( → ob )
86B5D	TOLVar143!	( ob → )
86B6F	TOLVar143@	( → ob )
86B81	TOLVar144!	( ob → )
86B93	TOLVar144@	( → ob )
86BA5	TOLVar145!	( ob → )
86BB7	TOLVar145@	( → ob )
86BC9	TOLVar146!	( ob → )
86BDB	TOLVar146@	( → ob )
86BED	TOLVar147!	( ob → )
86BFF	TOLVar147@	( → ob )
86C11	TOLVar148!	( ob → )
86C23	TOLVar148@	( → ob )
86C35	TOLVar149!	( ob → )
86C47	TOLVar149@	( → ob )
86C59	TOLVar150!	( ob → )
86C6B	TOLVar150@	( → ob )
86C7D	TOLVar151!	( ob → )
86C8F	TOLVar151@	( → ob )
86CA1	TOLVar152!	( ob → )
86CB3	TOLVar152@	( → ob )
86CC5	TOLVar153!	( ob → )
86CD7	TOLVar153@	( → ob )
86CE9	TOLVar154!	( ob → )
86CFB	TOLVar154@	( → ob )
86D0D	TOLVar155!	( ob → )

86D1F	TOLVar155@	( → ob )
86D31	TOLVar156!	( ob → )
86D43	TOLVar156@	( → ob )
86D55	TOLVar157!	( ob → )
86D67	TOLVar157@	( → ob )
86D79	TOLVar158!	( ob → )
86D8B	TOLVar158@	( → ob )
86D9D	TOLVar159!	( ob → )
86DAF	TOLVar159@	( → ob )
86DC1	TOLVar160!	( ob → )
86DD3	TOLVar160@	( → ob )
86DE5	TOLVar161!	( ob → )
86DF7	TOLVar161@	( → ob )
86E09	TOLVar162!	( ob → )
86E1B	TOLVar162@	( → ob )
86E2D	TOLVar163!	( ob → )
86E3F	TOLVar163@	( → ob )
86E51	TOLVar164!	( ob → )
86E63	TOLVar164@	( → ob )
86E75	TOLVar165!	( ob → )
86E87	TOLVar165@	( → ob )
86E99	TOLVar166!	( ob → )
86EAB	TOLVar166@	( → ob )
86EBD	TOLVar167!	( ob → )
86ECF	TOLVar167@	( → ob )
86EE1	TOLVar168!	( ob → )
86EF3	TOLVar168@	( → ob )
86F05	TOLVar169!	( ob → )
86F17	TOLVar169@	( → ob )
86F29	TOLVar170!	( ob → )
86F3B	TOLVar170@	( → ob )
86F4D	TOLVar171!	( ob → )
86F5F	TOLVar171@	( → ob )
86F71	TOLVar172!	( ob → )
86F83	TOLVar172@	( → ob )
86F95	TOLVar173!	( ob → )
86FA7	TOLVar173@	( → ob )
86FB9	TOLVar174!	( ob → )

86FCB	TOLVar174@	( → ob )
86FDD	TOLVar175!	( ob → )
86FEF	TOLVar175@	( → ob )
87001	TOLVar176!	( ob → )
87013	TOLVar176@	( → ob )
87025	TOLVar177!	( ob → )
87037	TOLVar177@	( → ob )
87049	TOLVar178!	( ob → )
8705B	TOLVar178@	( → ob )
8706D	TOLVar179!	( ob → )
8707F	TOLVar179@	( → ob )
87091	TOLVar180!	( ob → )
870A3	TOLVar180@	( → ob )
870B5	TOLVar181!	( ob → )
870C7	TOLVar181@	( → ob )
870D9	TOLVar182!	( ob → )
870EB	TOLVar182@	( → ob )
870FD	TOLVar183!	( ob → )
8710F	TOLVar183@	( → ob )
87121	TOLVar184!	( ob → )
87133	TOLVar184@	( → ob )
87145	TOLVar185!	( ob → )
87157	TOLVar185@	( → ob )
87169	TOLVar186!	( ob → )
8717B	TOLVar186@	( → ob )
8718D	TOLVar187!	( ob → )
8719F	TOLVar187@	( → ob )
871B1	TOLVar188!	( ob → )
871C3	TOLVar188@	( → ob )
871D5	TOLVar189!	( ob → )
871E7	TOLVar189@	( → ob )
871F9	TOLVar190!	( ob → )
8720B	TOLVar190@	( → ob )
8721D	TOLVar191!	( ob → )
8722F	TOLVar191@	( → ob )
87241	TOLVar192!	( ob → )
87253	TOLVar192@	( → ob )
87265	TOLVar193!	( ob → )

87277	TOLVar193@	( → ob )
87289	TOLVar194!	( ob → )
8729B	TOLVar194@	( → ob )
872AD	TOLVar195!	( ob → )
872BF	TOLVar195@	( → ob )
872D1	TOLVar196!	( ob → )
872E3	TOLVar196@	( → ob )
872F5	TOLVar197!	( ob → )
87307	TOLVar197@	( → ob )
87319	TOLVar198!	( ob → )
8732B	TOLVar198@	( → ob )
8733D	TOLVar199!	( ob → )
8734F	TOLVar199@	( → ob )
87361	TOLVar200!	( ob → )
87373	TOLVar200@	( → ob )
87385	TOLVar201!	( ob → )
87397	TOLVar201@	( → ob )
873A9	TOLVar202!	( ob → )
873BB	TOLVar202@	( → ob )
873CD	TOLVar203!	( ob → )
873DF	TOLVar203@	( → ob )
873F1	TOLVar204!	( ob → )
87403	TOLVar204@	( → ob )
87415	TOLVar205!	( ob → )
87427	TOLVar205@	( → ob )
87439	TOLVar206!	( ob → )
8744B	TOLVar206@	( → ob )
8745D	TOLVar207!	( ob → )
8746F	TOLVar207@	( → ob )
87481	TOLVar208!	( ob → )
87493	TOLVar208@	( → ob )
874A5	TOLVar209!	( ob → )
874B7	TOLVar209@	( → ob )
874C9	TOLVar210!	( ob → )
874DB	TOLVar210@	( → ob )
874ED	TOLVar211!	( ob → )
874FF	TOLVar211@	( → ob )
87511	TOLVar212!	( ob → )

87523	TOLVar212@	( → ob )
87535	TOLVar213!	( ob → )
87547	TOLVar213@	( → ob )
87559	TOLVar214!	( ob → )
8756B	TOLVar214@	( → ob )
8757D	TOLVar215!	( ob → )
8758F	TOLVar215@	( → ob )
875A1	TOLVar216!	( ob → )
875B3	TOLVar216@	( → ob )
875C5	TOLVarN!	( ob → )
875E8	TOLVarN@	( → ob )
8760B	ClrAllTVars	
87641	ClrAllTOLVs	
8765D	%0AllTopicVs	
87698	%0AllTOLVars	
876D3	TOLVarSet!	
877A0	%0TOLVarSet	
877F0	lgetcxt!	
87804	DoInCxt	
8785E	DoInCalcCxt	
87877	DoInAppCxt	
87890	DoInFuncCxt	
878A9	DoInPolarCxt	
878C2	DoInParamCxt	
878DB	DoInSeqCxt	
878F4	DoInStatCxt	
8790D	DoInSolveCxt	
87926	DoInOtherCxt	
879F3	otherNG?	
87A26	GET@tTYPER	

## 5.2 Special Variables

82D55	StoVar	( ob id → )
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Stores to variable. ID is one of the ids returned by any of the commands in the following subsections.

### 5.2.1 Real HOME variables

0000F2	~xa	( → id ) The id corresponding to the real variable A.
0010F2	~xb	( → id ) The id corresponding to the real variable B.
0020F2	~xc	( → id ) The id corresponding to the real variable C.
0030F2	~xd	( → id ) The id corresponding to the real variable D.
0050F2	~xf	( → id ) The id corresponding to the real variable F.
0060F2	~xg	( → id ) The id corresponding to the real variable G.
0070F2	~xh	( → id ) The id corresponding to the real variable H.
0090F2	~xj	( → id ) The id corresponding to the real variable J.
00A0F2	~xk	( → id ) The id corresponding to the real variable K.
00B0F2	~xl	( → id ) The id corresponding to the real variable L.
00C0F2	~xm	( → id ) The id corresponding to the real variable M.
00D0F2	~xn	( → id ) The id corresponding to the real variable N.
00E0F2	~xo	( → id ) The id corresponding to the real variable O.
00F0F2	~xp	( → id ) The id corresponding to the real variable P.
0100F2	~xq	( → id ) The id corresponding to the real variable Q.
0110F2	~xr	( → id ) The id corresponding to the real variable R.
0120F2	~xs	( → id ) The id corresponding to the real variable S.
0130F2	~xt	( → id ) The id corresponding to the real variable T.
0140F2	~xu	( → id ) The id corresponding to the real variable U.
0150F2	~xv	( → id ) The id corresponding to the real variable V.
0160F2	~xw	( → id ) The id corresponding to the real variable W.

0170F2	$\sim xx$	( $\rightarrow$ id ) The id corresponding to the real variable X.
0180F2	$\sim xy$	( $\rightarrow$ id ) The id corresponding to the real variable Y.
0190F2	$\sim xz$	( $\rightarrow$ id ) The id corresponding to the real variable Z.
01A0F2	$\sim xtheta$	( $\rightarrow$ id ) The id corresponding to the real variable $\theta$ .

### 5.2.2 Complex HOME variables

0310F2	$\sim xz0$	( $\rightarrow$ id ) The id corresponding to the complex variable Z0.
0320F2	$\sim xz1$	( $\rightarrow$ id ) The id corresponding to the complex variable Z1.
0330F2	$\sim xz2$	( $\rightarrow$ id ) The id corresponding to the complex variable Z2.
0340F2	$\sim xz3$	( $\rightarrow$ id ) The id corresponding to the complex variable Z3.
0350F2	$\sim xz4$	( $\rightarrow$ id ) The id corresponding to the complex variable Z4.
0360F2	$\sim xz5$	( $\rightarrow$ id ) The id corresponding to the complex variable Z5.
0370F2	$\sim xz6$	( $\rightarrow$ id ) The id corresponding to the complex variable Z6.
0380F2	$\sim xz7$	( $\rightarrow$ id ) The id corresponding to the complex variable Z7.
0390F2	$\sim xz8$	( $\rightarrow$ id ) The id corresponding to the complex variable Z8.
03A0F2	$\sim xz9$	( $\rightarrow$ id ) The id corresponding to the complex variable Z9.

### 5.2.3 Matrix HOME variables

03B0F2	$\sim xm0$	( $\rightarrow$ id ) The id corresponding to the matrix variable M0.
03C0F2	$\sim xm1$	( $\rightarrow$ id ) The id corresponding to the matrix variable M1.
03D0F2	$\sim xm2$	( $\rightarrow$ id ) The id corresponding to the matrix variable M2.
03E0F2	$\sim xm3$	( $\rightarrow$ id ) The id corresponding to the matrix variable M3.
03F0F2	$\sim xm4$	( $\rightarrow$ id ) The id corresponding to the matrix variable M4.



0400F2	~xm5	( → id ) The id corresponding to the matrix variable M5.
0410F2	~xm6	( → id ) The id corresponding to the matrix variable M6.
0420F2	~xm7	( → id ) The id corresponding to the matrix variable M7.
0430F2	~xm8	( → id ) The id corresponding to the matrix variable M8.
0440F2	~xm9	( → id ) The id corresponding to the matrix variable M9.

### 5.2.4 Graphical HOME variables

04F0F2	~xg0	( → id ) The id corresponding to the graphics variable G0.
0500F2	~xg1	( → id ) The id corresponding to the graphics variable G1.
0510F2	~xg2	( → id ) The id corresponding to the graphics variable G2.
0520F2	~xg3	( → id ) The id corresponding to the graphics variable G3.
0530F2	~xg4	( → id ) The id corresponding to the graphics variable G4.
0540F2	~xg5	( → id ) The id corresponding to the graphics variable G5.
0550F2	~xg6	( → id ) The id corresponding to the graphics variable G6.
0560F2	~xg7	( → id ) The id corresponding to the graphics variable G7.
0570F2	~xg8	( → id ) The id corresponding to the graphics variable G8.
0580F2	~xg9	( → id ) The id corresponding to the graphics variable G9.

### 5.2.5 List HOME variables

0450F2	~x10	( → id ) The id corresponding to the list variable L0.
0460F2	~x11	( → id ) The id corresponding to the list variable L1.
0470F2	~x12	( → id ) The id corresponding to the list variable L2.
0480F2	~x13	( → id ) The id corresponding to the list variable L3.

0490F2	~x14	( → id ) The id corresponding to the list variable L4.
04A0F2	~x15	( → id ) The id corresponding to the list variable L5.
04B0F2	~x16	( → id ) The id corresponding to the list variable L6.
04C0F2	~x17	( → id ) The id corresponding to the list variable L7.
04D0F2	~x18	( → id ) The id corresponding to the list variable L8.
04E0F2	~x19	( → id ) The id corresponding to the list variable L9.
81F86	ClearList0	( → ) Clears list 0.
81F2C	ClearList1	( → ) Clears list 1.
81F36	ClearList2	( → ) Clears list 2.
81F40	ClearList3	( → ) Clears list 3.
81F4A	ClearList4	( → ) Clears list 4.
81F54	ClearList5	( → ) Clears list 5.
81F5E	ClearList6	( → ) Clears list 6.
81F68	ClearList7	( → ) Clears list 7.
81F72	ClearList8	( → ) Clears list 8.
81F7C	ClearList9	( → ) Clears list 9.
28381	(ClearLists)	( → ) Clears all lists.
81F22	ClrListUtil	
81D92	ClrInAplet	

### 5.2.6 FUNCTION applet

0D20F2	~xF0	( → id ) The id corresponding to the FUNCTION applet variable F0.
0C00F2	~xF1	( → id ) The id corresponding to the FUNCTION applet variable F1.

0C20F2	~xF2	( → id ) The id corresponding to the FUNCTION applet variable F2.
0C40F2	~xF3	( → id ) The id corresponding to the FUNCTION applet variable F3.
0C60F2	~xF4	( → id ) The id corresponding to the FUNCTION applet variable F4.
0C80F2	~xF5	( → id ) The id corresponding to the FUNCTION applet variable F5.
0CA0F2	~xF6	( → id ) The id corresponding to the FUNCTION applet variable F6.
0CC0F2	~xF7	( → id ) The id corresponding to the FUNCTION applet variable F7.
0CE0F2	~xF8	( → id ) The id corresponding to the FUNCTION applet variable F8.
0D00F2	~xF9	( → id ) The id corresponding to the FUNCTION applet variable F9.
0D30F2	~idF0	( → id ) The id corresponding to the FUNCTION applet variable F0.
0C10F2	~idF1	( → id ) The id corresponding to the FUNCTION applet variable F1.
0C30F2	~idF2	( → id ) The id corresponding to the FUNCTION applet variable F2.
0C50F2	~idF3	( → id ) The id corresponding to the FUNCTION applet variable F3.
0C70F2	~idF4	( → id ) The id corresponding to the FUNCTION applet variable F4.
0C90F2	~idF5	( → id ) The id corresponding to the FUNCTION applet variable F5.
0CB0F2	~idF6	( → id ) The id corresponding to the FUNCTION applet variable F6.
0CD0F2	~idF7	( → id ) The id corresponding to the FUNCTION applet variable F7.

0CF0F2	~idF8	( → id ) The id corresponding to the FUNCTION applet variable F8.
0D10F2	~idF9	( → id ) The id corresponding to the FUNCTION applet variable F9.

### 5.2.7 PARAMETRIC applet

0F80F2	~xX0	( → id ) The id corresponding to the PARAMETRIC applet variable X0.
0D40F2	~xX1	( → id ) The id corresponding to the PARAMETRIC applet variable X1.
0D80F2	~xX2	( → id ) The id corresponding to the PARAMETRIC applet variable X2.
0DC0F2	~xX3	( → id ) The id corresponding to the PARAMETRIC applet variable X3.
0E00F2	~xX4	( → id ) The id corresponding to the PARAMETRIC applet variable X4.
0E40F2	~xX5	( → id ) The id corresponding to the PARAMETRIC applet variable X5.
0E80F2	~xX6	( → id ) The id corresponding to the PARAMETRIC applet variable X6.
0EC0F2	~xX7	( → id ) The id corresponding to the PARAMETRIC applet variable X7.
0F00F2	~xX8	( → id ) The id corresponding to the PARAMETRIC applet variable X8.
0F40F2	~xX9	( → id ) The id corresponding to the PARAMETRIC applet variable X9.
0FA0F2	~xY0	( → id ) The id corresponding to the PARAMETRIC applet variable Y0.
0D60F2	~xY1	( → id ) The id corresponding to the PARAMETRIC applet variable Y1.
0DA0F2	~xY2	( → id ) The id corresponding to the PARAMETRIC applet variable Y2.

0DE0F2	~xY3	( → id ) The id corresponding to the PARAMETRIC applet variable Y3.
0E20F2	~xY4	( → id ) The id corresponding to the PARAMETRIC applet variable Y4.
0E60F2	~xY5	( → id ) The id corresponding to the PARAMETRIC applet variable Y5.
0EA0F2	~xY6	( → id ) The id corresponding to the PARAMETRIC applet variable Y6.
0EE0F2	~xY7	( → id ) The id corresponding to the PARAMETRIC applet variable Y7.
0F20F2	~xY8	( → id ) The id corresponding to the PARAMETRIC applet variable Y8.
0F60F2	~xY9	( → id ) The id corresponding to the PARAMETRIC applet variable Y9.
0F90F2	~idX0	( → id ) The id corresponding to the PARAMETRIC applet variable X0.
0D50F2	~idX1	( → id ) The id corresponding to the PARAMETRIC applet variable X1.
0D90F2	~idX2	( → id ) The id corresponding to the PARAMETRIC applet variable X2.
0DD0F2	~idX3	( → id ) The id corresponding to the PARAMETRIC applet variable X3.
0E10F2	~idX4	( → id ) The id corresponding to the PARAMETRIC applet variable X4.
0E50F2	~idX5	( → id ) The id corresponding to the PARAMETRIC applet variable X5.
0E90F2	~idX6	( → id ) The id corresponding to the PARAMETRIC applet variable X6.
0ED0F2	~idX7	( → id ) The id corresponding to the PARAMETRIC applet variable X7.
0F10F2	~idX8	( → id ) The id corresponding to the PARAMETRIC applet variable X8.

0F50F2	~idX9	( → id ) The id corresponding to the PARAMETRIC applet variable X9.
0FB0F2	~idY0	( → id ) The id corresponding to the PARAMETRIC applet variable Y0.
0D70F2	~idY1	( → id ) The id corresponding to the PARAMETRIC applet variable Y1.
0DB0F2	~idY2	( → id ) The id corresponding to the PARAMETRIC applet variable Y2.
0DF0F2	~idY3	( → id ) The id corresponding to the PARAMETRIC applet variable Y3.
0E30F2	~idY4	( → id ) The id corresponding to the PARAMETRIC applet variable Y4.
0E70F2	~idY5	( → id ) The id corresponding to the PARAMETRIC applet variable Y5.
0EB0F2	~idY6	( → id ) The id corresponding to the PARAMETRIC applet variable Y6.
0EF0F2	~idY7	( → id ) The id corresponding to the PARAMETRIC applet variable Y7.
0F30F2	~idY8	( → id ) The id corresponding to the PARAMETRIC applet variable Y8.
0F70F2	~idY9	( → id ) The id corresponding to the PARAMETRIC applet variable Y9.

### 5.2.8 POLAR applet

10E0F2	~xR0	( → id ) The id corresponding to the POLAR applet variable R0.
0FC0F2	~xR1	( → id ) The id corresponding to the POLAR applet variable R1.
0FE0F2	~xR2	( → id ) The id corresponding to the POLAR applet variable R2.
1000F2	~xR3	( → id ) The id corresponding to the POLAR applet variable R3.

1020F2	~xR4	( → id ) The id corresponding to the POLAR applet variable R4.
1040F2	~xR5	( → id ) The id corresponding to the POLAR applet variable R5.
1060F2	~xR6	( → id ) The id corresponding to the POLAR applet variable R6.
1080F2	~xR7	( → id ) The id corresponding to the POLAR applet variable R7.
10A0F2	~xR8	( → id ) The id corresponding to the POLAR applet variable R8.
10C0F2	~xR9	( → id ) The id corresponding to the POLAR applet variable R9.
10F0F2	~idR0	( → id ) The id corresponding to the POLAR applet variable R0.
0FD0F2	~idR1	( → id ) The id corresponding to the POLAR applet variable R1.
0FF0F2	~idR2	( → id ) The id corresponding to the POLAR applet variable R2.
1010F2	~idR3	( → id ) The id corresponding to the POLAR applet variable R3.
1030F2	~idR4	( → id ) The id corresponding to the POLAR applet variable R4.
1050F2	~idR5	( → id ) The id corresponding to the POLAR applet variable R5.
1070F2	~idR6	( → id ) The id corresponding to the POLAR applet variable R6.
1090F2	~idR7	( → id ) The id corresponding to the POLAR applet variable R7.
10B0F2	~idR8	( → id ) The id corresponding to the POLAR applet variable R8.
10D0F2	~idR9	( → id ) The id corresponding to the POLAR applet variable R9.

### 5.2.9 SEQUENCE applet

0BE0F2	~xU0	( → id ) The id corresponding to the SEQUENCE applet variable U0.
0AC0F2	~xU1	( → id ) The id corresponding to the SEQUENCE applet variable U1.
0AE0F2	~xU2	( → id ) The id corresponding to the SEQUENCE applet variable U2.
0B00F2	~xU3	( → id ) The id corresponding to the SEQUENCE applet variable U3.
0B20F2	~xU4	( → id ) The id corresponding to the SEQUENCE applet variable U4.
0B40F2	~xU5	( → id ) The id corresponding to the SEQUENCE applet variable U5.
0B60F2	~xU6	( → id ) The id corresponding to the SEQUENCE applet variable U6.
0B80F2	~xU7	( → id ) The id corresponding to the SEQUENCE applet variable U7.
0BA0F2	~xU8	( → id ) The id corresponding to the SEQUENCE applet variable U8.
0BC0F2	~xU9	( → id ) The id corresponding to the SEQUENCE applet variable U9.
0BF0F2	~idU0	( → id ) The id corresponding to the SEQUENCE applet variable U0.
0AD0F2	~idU1	( → id ) The id corresponding to the SEQUENCE applet variable U1.
0AF0F2	~idU2	( → id ) The id corresponding to the SEQUENCE applet variable U2.
0B10F2	~idU3	( → id ) The id corresponding to the SEQUENCE applet variable U3.
0B30F2	~idU4	( → id ) The id corresponding to the SEQUENCE applet variable U4.



0B50F2	~idU5	( → id ) The id corresponding to the SEQUENCE applet variable U5.
0B70F2	~idU6	( → id ) The id corresponding to the SEQUENCE applet variable U6.
0B90F2	~idU7	( → id ) The id corresponding to the SEQUENCE applet variable U7.
0BB0F2	~idU8	( → id ) The id corresponding to the SEQUENCE applet variable U8.
0BD0F2	~idU9	( → id ) The id corresponding to the SEQUENCE applet variable U9.

### 5.2.10 SOLVE applet

08E0F2	~idE0	( → id ) The id corresponding to the SOLVE applet variable E0.
0850F2	~idE1	( → id ) The id corresponding to the SOLVE applet variable E1.
0860F2	~idE2	( → id ) The id corresponding to the SOLVE applet variable E2.
0870F2	~idE3	( → id ) The id corresponding to the SOLVE applet variable E3.
0880F2	~idE4	( → id ) The id corresponding to the SOLVE applet variable E4.
0890F2	~idE5	( → id ) The id corresponding to the SOLVE applet variable E5.
08A0F2	~idE6	( → id ) The id corresponding to the SOLVE applet variable E6.
08B0F2	~idE7	( → id ) The id corresponding to the SOLVE applet variable E7.
08C0F2	~idE8	( → id ) The id corresponding to the SOLVE applet variable E8.
08D0F2	~idE9	( → id ) The id corresponding to the SOLVE applet variable E9.

### 5.2.11 STATISTICS applet

5FFF4	xC1	( → id ) The id corresponding to the STATISTICS applet variable C1.
6001A	xC2	( → id ) The id corresponding to the STATISTICS applet variable C2.
60040	xC3	( → id ) The id corresponding to the STATISTICS applet variable C3.
60066	xC4	( → id ) The id corresponding to the STATISTICS applet variable C4.
6008C	xC5	( → id ) The id corresponding to the STATISTICS applet variable C5.

### 5.2.12 Unknown

1240F2	~xs1
1250F2	~xs2
1260F2	~xs3
1270F2	~xs4
1280F2	~xs5
1290F2	~xn1
12A0F2	~xn2
12B0F2	~xn3
12C0F2	~xn4
12D0F2	~xn5
1190F2	~xD0
1100F2	~xD1
1110F2	~xD2
1120F2	~xD3
1130F2	~xD4
1140F2	~xD5
1150F2	~xD6
1160F2	~xD7
1170F2	~xD8
1180F2	~xD9
0040F2	~xE

11A0F2	~xH1
11B0F2	~xH2
11C0F2	~xH3
11D0F2	~xH4
11E0F2	~xH5
0080F2	~xI
0250F2	~xQ1
0260F2	~xQ3
11F0F2	~xS1
0A70F2	~xS1fit
0A20F2	~xS1mark
1200F2	~xS2
0A80F2	~xS2fit
0A30F2	~xS2mark
1210F2	~xS3
0A90F2	~xS3fit
0A40F2	~xS3mark
1220F2	~xS4
0AA0F2	~xS4fit
0A50F2	~xS4mark
1230F2	~xS5
0AB0F2	~xS5fit
0A60F2	~xS5mark

### 5.3 m

0680F0	~m->DEFACOS
06E0F0	~m->DEFACOSH
0670F0	~m->DEFASIN
06D0F0	~m->DEFASINH
0690F0	~m->DEFATAN
06F0F0	~m->DEFATANH
0650F0	~m->DEFCOS
06B0F0	~m->DEFCOSH
0640F0	~m->DEFSIN
06A0F0	~m->DEFSINH
0660F0	~m->DEFTAN
06C0F0	~m->DEFTANH

0630F0	~m->TRG
05E0F0	~m-> [] <-*/
05D0F0	~m-> [] <-+-
03F0F0	~m- [] *
0410F0	~m- [] +
0420F0	~m- [] -
0400F0	~m- [] /
03E0F0	~m- [] L
03A0F0	~m1/ [] *
03B0F0	~m1/ [] /
03D0F0	~m1/ [] E
03C0F0	~m1/ [] ^
0210F0	~m<->*
01F0F0	~m<->+
0200F0	~m<->-
0220F0	~m<->/
0230F0	~m<-A-+
0240F0	~m<-A--
0250F0	~m<-A/*
0260F0	~m<-A//
0270F0	~m<-A^*
0500F0	~m<-M*E
04E0F0	~m<-M*^
0490F0	~m<-M+*
0520F0	~m<-M+L
04A0F0	~m<-M-*
0530F0	~m<-M-L
0510F0	~m<-M/E
04F0F0	~m<-M/^
0580F0	~m<-T*/
0570F0	~m<-T+-
01B0F0	~m<-T=
05A0F0	~m<- [*/
0590F0	~m<- [+-
0560F0	~m<T>*
0550F0	~m<T>+
02A0F0	~mA->*/
0280F0	~mA->+-

0290F0	~mA->--
02B0F0	~mA->//
02C0F0	~mA->^^
01C0F0	~mAF1q
01D0F0	~mAFqq
01E0F0	~mAFrq
05F0F0	~mCONJ []
0710F0	~mCOS+
0740F0	~mCOSH+
02D0F0	~mD->/+
02E0F0	~mD->/-
0310F0	~mD->E+
0320F0	~mD->E-
0330F0	~mD->L*
0340F0	~mD->L/
02F0F0	~mD->^+
0300F0	~mD->^-
0450F0	~mE [] ^
0430F0	~mE ^*
0440F0	~mE ^/
0610F0	~mIM []
0460F0	~mL* ^
0470F0	~mL []*
0480F0	~mL []/
0540F0	~mM->op
0600F0	~mRE []
0700F0	~mSIN+
0730F0	~mSINH+
01A0F0	~mT->=
0720F0	~mTAN+
0750F0	~mTANH+
0350F0	~m [] CHS*
0360F0	~m [] CHS/
0370F0	~m [] CHSL
0390F0	~m [] INVE
0380F0	~m [] INV ^
05C0F0	~m] ->*/
05B0F0	~m] ->+-

## 5.4 Keys

The following entries execute the command corresponding to the corresponding key.

00D0A1	~NSKey3.2	???	The unshifted key 3.2.
00E0A1	~NSKey3.3	???	The unshifted key 3.3.
0120A1	~NSKey4.1	???	The unshifted key 4.1.
0130A1	~NSKey4.2	???	The unshifted key 4.2.
0140A1	~NSKey4.3	???	The unshifted key 4.3.
0150A1	~NSKey4.4	???	The unshifted key 4.4.
0160A1	~NSKey4.5	???	The unshifted key 4.5.
0170A1	~NSKey4.6	???	The unshifted key 4.6.
0190A1	~NSKey5.2	???	The unshifted key 5.2.
01A0A1	~NSKey5.3	???	The unshifted key 5.3.
01B0A1	~NSKey5.4	???	The unshifted key 5.4.
01C0A1	~NSKey5.5	???	The unshifted key 5.5.
01D0A1	~NSKey6.1	???	The unshifted key 6.1.
01E0A1	~NSKey6.2	???	The unshifted key 6.2.
01F0A1	~NSKey6.3	???	The unshifted key 6.3.
0200A1	~NSKey6.4	???	The unshifted key 6.4.
0210A1	~NSKey6.5	???	The unshifted key 6.5.
0220A1	~NSKey7.1	???	The unshifted key 7.1.
0230A1	~NSKey7.2	???	The unshifted key 7.2.
0240A1	~NSKey7.3	???	The unshifted key 7.3.
0250A1	~NSKey7.4	???	The unshifted key 7.4.

0260A1	~NSKey7.5	???	The unshifted key 7.5.
0270A1	~NSKey8.1	???	The unshifted key 8.1.
0280A1	~NSKey8.2	???	The unshifted key 8.2.
0290A1	~NSKey8.3	???	The unshifted key 8.3.
02A0A1	~NSKey8.4	???	The unshifted key 8.4.
02B0A1	~NSKey8.5	???	The unshifted key 8.5.
02D0A1	~NSKey9.2	???	The unshifted key 9.2.
02E0A1	~NSKey9.3	???	The unshifted key 9.3.
02F0A1	~NSKey9.4	???	The unshifted key 9.4.
0300A1	~NSKey9.5	???	The unshifted key 9.5.
0000A2	~LSKey1.1	???	The shifted key 1.1.
0010A2	~LSKey1.2	???	The shifted key 1.2.
0020A2	~LSKey1.3	???	The shifted key 1.3.
0030A2	~LSKey1.4	???	The shifted key 1.4.
0040A2	~LSKey1.5	???	The shifted key 1.5.
0050A2	~LSKey1.6	???	The shifted key 1.6.
0060A2	~LSKey2.1	???	The shifted key 2.1.
0070A2	~LSKey2.2	???	The shifted key 2.2.
0080A2	~LSKey2.3	???	The shifted key 2.3.
00C0A2	~LSKey3.1	???	The shifted key 3.1.
00D0A2	~LSKey3.2	???	The shifted key 3.2.
00E0A2	~LSKey3.3	???	The shifted key 3.3.
0120A2	~LSKey4.1	???	The shifted key 4.1.

0130A2	~LSKey4.2	???	The shifted key 4.2.
0140A2	~LSKey4.3	???	The shifted key 4.3.
0150A2	~LSKey4.4	???	The shifted key 4.4.
0160A2	~LSKey4.5	???	The shifted key 4.5.
0170A2	~LSKey4.6	???	The shifted key 4.6.
0180A2	~LSKey5.1	???	The shifted key 5.1.
0190A2	~LSKey5.2	???	The shifted key 5.2.
01B0A2	~LSKey5.4	???	The shifted key 5.4.
01C0A2	~LSKey5.5	???	The shifted key 5.5.
01D0A2	~LSKey6.1	???	The shifted key 6.1.
01E0A2	~LSKey6.2	???	The shifted key 6.2.
01F0A2	~LSKey6.3	???	The shifted key 6.3.
0200A2	~LSKey6.4	???	The shifted key 6.4.
0210A2	~LSKey6.5	???	The shifted key 6.5.
0220A2	~LSKey7.1	???	The shifted key 7.1.
0230A2	~LSKey7.2	???	The shifted key 7.2.
0240A2	~LSKey7.3	???	The shifted key 7.3.
0250A2	~LSKey7.4	???	The shifted key 7.4.
0260A2	~LSKey7.5	???	The shifted key 7.5.
0270A2	~LSKey8.1	???	The shifted key 8.1.
0280A2	~LSKey8.2	???	The shifted key 8.2.
0290A2	~LSKey8.3	???	The shifted key 8.3.
02A0A2	~LSKey8.4	???	The shifted key 8.4.



02B0A2	~LSKey8.5	???	The shifted key 8.5.
02C0A2	~LSKey9.1	???	The shifted key 9.1.
02D0A2	~LSKey9.2	???	The shifted key 9.2.
02E0A2	~LSKey9.3	???	The shifted key 9.3.
02F0A2	~LSKey9.4	???	The shifted key 9.4.
0300A2	~LSKey9.5	???	The shifted key 9.5.
0000A4	~ANSKey1.1	???	The key 1.1 in alpha mode.
0010A4	~ANSKey1.2	???	The key 1.2 in alpha mode.
0020A4	~ANSKey1.3	???	The key 1.3 in alpha mode.
0030A4	~ANSKey1.4	???	The key 1.4 in alpha mode.
0040A4	~ANSKey1.5	???	The key 1.5 in alpha mode.
0050A4	~ANSKey1.6	???	The key 1.6 in alpha mode.
0060A4	~ANSKey2.1	???	The key 2.1 in alpha mode.
0070A4	~ANSKey2.2	???	The key 2.2 in alpha mode.
0080A4	~ANSKey2.3	???	The key 2.3 in alpha mode.
0090A4	~ANSKey2.4	???	The key 2.4 in alpha mode.
00A0A4	~ANSKey2.5	???	The key 2.5 in alpha mode.
00B0A4	~ANSKey2.6	???	The key 2.6 in alpha mode.
00C0A4	~ANSKey3.1	???	The key 3.1 in alpha mode.
00D0A4	~ANSKey3.2	???	The key 3.2 in alpha mode.
00E0A4	~ANSKey3.3	???	The key 3.3 in alpha mode.
00F0A4	~ANSKey3.4	???	The key 3.4 in alpha mode.
0100A4	~ANSKey3.5	???	The key 3.5 in alpha mode.

0110A4	~ANSKey3.6	???	The key 3.6 in alpha mode.
0120A4	~ANSKey4.1	???	The key 4.1 in alpha mode.
0130A4	~ANSKey4.2	???	The key 4.2 in alpha mode.
0140A4	~ANSKey4.3	???	The key 4.3 in alpha mode.
0150A4	~ANSKey4.4	???	The key 4.4 in alpha mode.
0160A4	~ANSKey4.5	???	The key 4.5 in alpha mode.
0170A4	~ANSKey4.6	???	The key 4.6 in alpha mode.
0180A4	~ANSKey5.1	???	The key 5.1 in alpha mode.
0190A4	~ANSKey5.2	???	The key 5.2 in alpha mode.
01A0A4	~ANSKey5.3	???	The key 5.3 in alpha mode.
01B0A4	~ANSKey5.4	???	The key 5.4 in alpha mode.
01C0A4	~ANSKey5.5	???	The key 5.5 in alpha mode.
01D0A4	~ANSKey6.1	???	The key 6.1 in alpha mode.
01E0A4	~ANSKey6.2	???	The key 6.2 in alpha mode.
01F0A4	~ANSKey6.3	???	The key 6.3 in alpha mode.
0200A4	~ANSKey6.4	???	The key 6.4 in alpha mode.
0210A4	~ANSKey6.5	???	The key 6.5 in alpha mode.
0220A4	~ANSKey7.1	???	The key 7.1 in alpha mode.
0230A4	~ANSKey7.2	???	The key 7.2 in alpha mode.
0240A4	~ANSKey7.3	???	The key 7.3 in alpha mode.
0250A4	~ANSKey7.4	???	The key 7.4 in alpha mode.
0260A4	~ANSKey7.5	???	The key 7.5 in alpha mode.
0270A4	~ANSKey8.1	???	The key 8.1 in alpha mode.

0280A4	~ANSKey8.2	???	The key 8.2 in alpha mode.
0290A4	~ANSKey8.3	???	The key 8.3 in alpha mode.
02A0A4	~ANSKey8.4	???	The key 8.4 in alpha mode.
02B0A4	~ANSKey8.5	???	The key 8.5 in alpha mode.
02C0A4	~ANSKey9.1	???	The key 9.1 in alpha mode.
02D0A4	~ANSKey9.2	???	The key 9.2 in alpha mode.
02E0A4	~ANSKey9.3	???	The key 9.3 in alpha mode.
02F0A4	~ANSKey9.4	???	The key 9.4 in alpha mode.
0300A4	~ANSKey9.5	???	The key 9.5 in alpha mode.
0000A5	~ALSKey1.1	???	The shifted 1.1 key in alpha mode.
0010A5	~ALSKey1.2	???	The shifted 1.2 key in alpha mode.
0020A5	~ALSKey1.3	???	The shifted 1.3 key in alpha mode.
0030A5	~ALSKey1.4	???	The shifted 1.4 key in alpha mode.
0040A5	~ALSKey1.5	???	The shifted 1.5 key in alpha mode.
0050A5	~ALSKey1.6	???	The shifted 1.6 key in alpha mode.
0060A5	~ALSKey2.1	???	The shifted 2.1 key in alpha mode.
0070A5	~ALSKey2.2	???	The shifted 2.2 key in alpha mode.
0080A5	~ALSKey2.3	???	The shifted 2.3 key in alpha mode.
0090A5	~ALSKey2.4	???	The shifted 2.4 key in alpha mode.
00A0A5	~ALSKey2.5	???	The shifted 2.5 key in alpha mode.
00B0A5	~ALSKey2.6	???	The shifted 2.6 key in alpha mode.
0170A5	~ALSKey4.6	???	The shifted 4.6 key in alpha mode.
00C0A5	~ALSKey3.1	???	The shifted 3.1 key in alpha mode.

00D0A5	~ALSKey3.2	???	The shifted 3.2 key in alpha mode.
00E0A5	~ALSKey3.3	???	The shifted 3.3 key in alpha mode.
00F0A5	~ALSKey3.4	???	The shifted 3.4 key in alpha mode.
0100A5	~ALSKey3.5	???	The shifted 3.5 key in alpha mode.
0110A5	~ALSKey3.6	???	The shifted 3.6 key in alpha mode.
0120A5	~ALSKey4.1	???	The shifted 4.1 key in alpha mode.
0130A5	~ALSKey4.2	???	The shifted 4.2 key in alpha mode.
0140A5	~ALSKey4.3	???	The shifted 4.3 key in alpha mode.
0150A5	~ALSKey4.4	???	The shifted 4.4 key in alpha mode.
0160A5	~ALSKey4.5	???	The shifted 4.5 key in alpha mode.
0180A5	~ALSKey5.1	???	The shifted 5.1 key in alpha mode.
0190A5	~ALSKey5.2	???	The shifted 5.2 key in alpha mode.
01A0A5	~ALSKey5.3	???	The shifted 5.3 key in alpha mode.
01B0A5	~ALSKey5.4	???	The shifted 5.4 key in alpha mode.
01C0A5	~ALSKey5.5	???	The shifted 5.5 key in alpha mode.
01D0A5	~ALSKey6.1	???	The shifted 6.1 key in alpha mode.
01E0A5	~ALSKey6.2	???	The shifted 6.2 key in alpha mode.
01F0A5	~ALSKey6.3	???	The shifted 6.3 key in alpha mode.
0200A5	~ALSKey6.4	???	The shifted 6.4 key in alpha mode.
0210A5	~ALSKey6.5	???	The shifted 6.5 key in alpha mode.
0220A5	~ALSKey7.1	???	The shifted 7.1 key in alpha mode.
0230A5	~ALSKey7.2	???	The shifted 7.2 key in alpha mode.
0240A5	~ALSKey7.3	???	The shifted 7.3 key in alpha mode.

0250A5	~ALSKey7.4	???
		The shifted 7.4 key in alpha mode.
0260A5	~ALSKey7.5	???
		The shifted 7.5 key in alpha mode.
0270A5	~ALSKey8.1	???
		The shifted 8.1 key in alpha mode.
0280A5	~ALSKey8.2	???
		The shifted 8.2 key in alpha mode.
0290A5	~ALSKey8.3	???
		The shifted 8.3 key in alpha mode.
02A0A5	~ALSKey8.4	???
		The shifted 8.4 key in alpha mode.
02B0A5	~ALSKey8.5	???
		The shifted 8.5 key in alpha mode.
02C0A5	~ALSKey9.1	???
		The shifted 9.1 key in alpha mode.
02D0A5	~ALSKey9.2	???
		The shifted 9.2 key in alpha mode.
02E0A5	~ALSKey9.3	???
		The shifted 9.3 key in alpha mode.
02F0A5	~ALSKey9.4	???
		The shifted 9.4 key in alpha mode.
0300A5	~ALSKey9.5	???
		The shifted 9.5 key in alpha mode.
0090A1	~MissingKey1	
00B0A1	~MissingKey2	
0090A2	~MissingKey3	
00B0A2	~MissingKey4	

## 5.5 Labels

81937	INT_00
8193C	INT_01
81941	INT_02
81946	INT_03
8194B	INT_04
81950	INT_05
81955	INT_06
8195A	INT_07
8195F	INT_08
81964	INT_09
81969	INT_0A

8196E	INT_OB
81973	INT_OC
81978	INT_OD
8197D	INT_OE
81982	INT_OF

## 5.6 LastBut

81DB0	LastBut0
81DB5	LastBut1
81DBA	LastBut2
81DBF	LastBut3
81DC4	LastBut4
81DC9	LastBut5
81DCE	LastBut6
81DD3	LastBut7
81DD8	LastBut8
81DDD	LastBut9
81DE2	LastBut10
81DE7	LastBut11
81DEC	LastBut12
81DF1	LastBut13
81DF6	LastBut14
81DFB	LastBut15
81E00	LastBut16
81E05	LastBut17
81E0A	LastBut18
81E0F	LastBut19
81E14	LastBut20
81E19	LastBut21
81E1E	LastBut22
81E23	LastBut23
81E28	LastBut24
81E2D	LastBut25
81E32	LastBut26
81E37	LastBut27
81E3C	LastBut28
81E41	LastBut29

81E46	LastBut30
81E4B	LastBut31
81E50	LastBut32

## 5.7 x

0620F2	~xAngle
0590F2	~xAns
0920F2	~xArea
0630F2	~xAxes
0650F2	~xConnect
06C0F2	~xCoord
0610F2	~xDate
0810F2	~xDigits
0910F2	~xExtremum
05A0F2	~xFIT
03A0AB	~xFmList
03B0AB	~xFmMat
0800F2	~xFormat
0640F2	~xGrid
05B0F2	~xHAngle
05D0F2	~xHDigits
05C0F2	~xHFormat
0740F2	~xHTick
0660F2	~xHighRes
09F0F2	~xHisWidth
0A10F2	~xHmax
0A00F2	~xHmin
0760F2	~xHzoom
05F0F2	~xIerr
0710F2	~xIndep
0690F2	~xInvCursor
0900F2	~xIsect
06A0F2	~xLabels
0230F2	~xMAXS
01B0F2	~xMEANS
0270F2	~xMEANX
02A0F2	~xMEANY

0240F2	~xMEDIAN
0220F2	~xMINS
0210F2	~xNS
09B0F2	~xNmax
09A0F2	~xNmin
0820F2	~xNoteText
07E0F2	~xNumCol
07F0F2	~xNumFont
07B0F2	~xNumIndep
07D0F2	~xNumRow
0780F2	~xNumStart
0790F2	~xNumStep
07A0F2	~xNumType
07C0F2	~xNumZoom
0830F2	~xPage
0840F2	~xPageNum
0300F2	~xRELERR
05E0F2	~xRadixMark
0680F2	~xRecenter
08F0F2	~xRoot
01F0F2	~xSSDEV
01D0F2	~xSVARS
0280F2	~xSX
0290F2	~xSX2
02D0F2	~xSXY
02B0F2	~xSY
02C0F2	~xSY2
09C0F2	~xSeqPlot
0670F2	~xSimult
0930F2	~xSlope
09D0F2	~xStatMode
09E0F2	~xStatPlot
01C0F2	~xTOTS
0960F2	~xTStep
0980F2	~xThetaMax
0970F2	~xThetaMin
0990F2	~xThetaStep
0600F2	~xTime



0950F2	~xTmax
0940F2	~xTmin
06B0F2	~xTracing
0750F2	~xVTick
0770F2	~xVzoom
0720F2	~xXcross
06E0F2	~xXmax
06D0F2	~xXmin
0730F2	~xYcross
0700F2	~xYmax
06F0F2	~xYmin
0150AB	~x>COL
0170AB	~x>DIAG
0B7002	~x>DISPLAY
0B9002	~x>PLOT
0130AB	~x>ROW
0570AB	~xACOT
0580AB	~xACSC
0590AB	~xASEC
0BA002	~xBLANKGROB
0470AB	~xBOWX
03B701	~xCHECK
0450AB	~xCOWEB
0160AB	~xCOL>
0370AB	~xCONCAT
0540AB	~xCOT
0560AB	~xCSC
01E0AB	~xCSWP
04D0AB	~xCUBICFIT
0280F1	~xDFLTNOTE
0290F1	~xDFLTPICT
0180AB	~xDIAG>
0B6002	~xDISPLAY>
0A6002	~xERASEA
0430AB	~xFRACTION
0210F1	~xFUNCSYMB
0080F1	~xFUNCTAB
0460AB	~xHIST

04E0AB	~xLOGISFIT
0530AB	~xMKMAT
0230F1	~xPARAMSYMB
00A0F1	~xPARAMTAB
0B8002	~xPLOT>
0220F1	~xPOLARSYMB
0090F1	~xPOLARTAB
05B0AB	~xPOLYFORM
04B0AB	~xPOWERFIT
05C0AB	~xPoly
04C0AB	~xQUADFIT
0320F1	~xREADNOTE
0330F1	~xREADPICT
05A0AB	~xRECURSE
0140AB	~xROW>
0550AB	~xSEC
0240F1	~xSEQSYMB
00B0F1	~xSEQTAB
0270F1	~xSOLVESYMB
00E0F1	~xSOLVETAB
0440AB	~xSTAIRSTEP
0260F1	~xSTAT2SYMB
00D0F1	~xSTAT2TAB
0250F1	~xSTATSYMB
00C0F1	~xSTATTAB
0500AB	~xStat1Var
0510AB	~xStat2Var
03C701	~xUNCHECK
04F0AB	~xUSERFIT
0340F1	~xUndefined
0330AB	~x\85LIST
02F0AB	~x\9BLIST
0350AB	~x\9CLIST
014701	~xx>DISPLAY
017701	~xx>GROB
016701	~xx>PLOT
018701	~xxARC
003701	~xxBEEP

00F701	~xxBOX
01D701	~xxBREAK
03F701	~xxCHOOSE
023701	~xxCOL+
022701	~xxCOL-
025701	~xxCSWP
03C0AB	~xxDEG
038701	~xxDEMO
002701	~xxDISP
013701	~xxDISPLAY>
031701	~xxDO1VSTATS
034701	~xxDO2VSTATS
009701	~xxERASE
00A701	~xxERASEPLOT
01F701	~xxFREEZE
040701	~xxGETKEY
010701	~xxGOR
03E0AB	~xxGRAD
012701	~xxGROBNOT
011701	~xxGXOR
041701	~xxHELP
01C701	~xxINPUT
0520AB	~xxITERATE
02D701	~xxLIBEVAL
00D701	~xxLINE
02A701	~xxMATEDIT
02B701	~xxMKGROB
03E701	~xxMSGBOX
00C701	~xxPIXOFF
00B701	~xxPIXON
015701	~xxPLOT>
086002	~xxPOS
01B701	~xxPRDISPLAY
019701	~xxPRSTC
01A701	~xxPRVAR
03D0AB	~xxRAD
036701	~xxRANM
026701	~xxRCI

027701	~xxRCIJ
008701	~xxRDM
005701	~xxRDZ
007701	~xxREPL
021701	~xxROW+
020701	~xxROW-
024701	~xxRSWP
039701	~xxRULES
029701	~xxRUNPGM
035701	~xxSELECT
033701	~xxSETDEPEND
030701	~xxSETFREQ
032701	~xxSETINDEP
02F701	~xxSETSAMPLE
03A701	~xxSETVIEWS
085002	~xxSIZE
01E701	~xxSTOP
006701	~xxSUB
02E701	~xxSYSEVAL
00E701	~xxTLINE
028701	~xxTO
001701	~xxTSTR
037701	~xxVERSION
004701	~xxWAIT
000701	~xxWSLOG
02C701	~xxZEROGROB

## 5.8 Rest

81CE8	!>ARRAY
BA700	#+#2-
829E5	#=Lookup
818F1	#DIV
8042E	#Error:
818F6	#MOD
818EC	#NEG
813A6	#NOT
81905	#ODD

813AB	#OR
803E8	#ObTypeBase
80424	#Warning:NL
813B0	#XOR
A4CEF	%-1
8307F	&&
84A2E	1GETLAM#0=
82E59	1GETapndcpl
8253F	2CDispList
825DF	2CKeyOK
82571	2Col?Case2Col
82535	2ColChoose
80046	2STR
826ED	?AdjFocusPos
82639	?DispMoreU/D
829BD	?FixFieldKeys
8289B	?GetFObTypes
82BF7	?NoTaskSwDef
81CAC	ABSCOERCE
800DC	ARRYCMP
800FA	ARRYLIST
8012C	ARRYSYM
82143	AddEq\$
8214D	AlDrawMenu
81A7C	AllowPRLCD
BD42C	Angle@
832C3	AngleField
832B9	AngleLabel
8211B	AnyDABad?
833BD	ApName\$>Id
833B3	ApNameId>\$
8339F	ApNameId>Id
81DA6	AppDir+Offs
BDF75	Area@
81EB4	AttnPOSCOMP
81711	BAK>HOME
81D79	BREAK
BD8BE	BTRow1@

3949A	BadIfEdit
8199B	BinLookup
8291D	BlankClient
82927	BlankHelp
81E5A	Bubble
81987	CAND
01C0F1	~CLRTOPICLAM
81C1B	COMPROMID
8198C	COR
81DA1	CalcDir+Offs
82DFE	CatNot
82DF5	CatPgm
82DEB	CatThisCxt
829C7	Choose&DoTask
833EF	ChooseVEntry
833F9	ChooseVExit
83403	ChooseViewUI
81DAB	Contxt+Offs
81B30	CopyRegCOb
8123D	DOINDIR
821E3	DOLCD>g0
82FD5	DOROOT
821ED	DOSHOWIT1
821F7	DOSHOWIT1C
82C01	DOWAIT
8287D	DecompNoNL
82869	DecompOb
82189	DefauPtXit
82193	DefauTrcInit
7B7D8	DefaultHint
E03A1	DemoFrames
BD940	Digits@
9165A	DispMsgBox
8219D	DispXFunc
821A7	DispYFunc
82909	DoAlert&Query
833C7	DoApletLib
8257B	DoAs2Col

83313	DoCapNoteV	
832F5	DoCapPlotSV	
832D7	DoCapPlotV	
8331D	DoCapSketchV	
83309	DoCapSymbSV	
832EB	DoCapSymbV	
832FF	DoCapTableSV	
832E1	DoCapTableV	
832CD	DoCurrAplet	
821C5	DoDemo	
825E9	DoDispBorder	
82783	DoDispField	
825FD	DoDispList	
825F3	DoDispPrompt	
8250D	DoEditLCancel	
82517	DoEditLOK	
824F9	DoEditLine	
82AFD	DoGetObFrSto	
82B2F	DoIOErrAlert	
82B25	DoIOStatusBox	
82E09	DoInApLbCxt	
82E1D	DoInNotCxt	
82E13	DoInPgmCxt	
827E7	DoKeyCheck	
827D3	DoKeyChoos/Ck	
827DD	DoKeyChoose	
828C3	DoMatEdit	
828FF	DoQueryBox	
82AE9	DoRecv/GetOb	( id → ) Receive an object. FIXME: Stack diagram not confirmed.
82AF3	DoRecvObFrEls	
82611	DoRestCovWin	
829F9	DoResultTab	
83039	DoRomPtrKey	
82607	DoSaveCovWin	
82AAD	DoSendOb	( ob → ) Send an object. FIXME: Stack diagram not confirmed.

82ACB	DoSendObToCDi
82AD5	DoSendObToDir
82AC1	DoSendObToSto
82913	DoSpecAlert
67B3E	Docrunchc
829DB	Done?CkNoNul:
25DF8	DropJunk
7D3ED	DummyMenuErr
82B39	ElsieGet
82B4D	ElsiePkt
82B43	ElsieSend
82689	EmptyList?
82585	EmptyRList?
7D46A	EnsureMenuOff
834FD	EnterGraphView
834F3	EnterTextView
2B7F5	EraseGraph
82201	EraseGrob
803D4	Err#Chr00
82959	EvalPart1
82963	EvalPart2
8296D	EvalPart3
BDFBB	Extremum@
82981	FAreaBad?
82E63	FOURpsh
803CA	FSTFLOATROM#
82AA3	FTypeCheck?
82A99	FTypeFixedL?
82A8F	FTypeList?
82A85	FTypeText?
82215	FUNCPLOTT
82837	FitLeftSmF
82841	FitRightSmF
BD8FF	Format@
8220B	FuncPLoop
83327	FuncPSetup1
83331	FuncSplitViewers
81ABD	GDISP?



8225B	GROBBUFF!
8226F	GROBVIEW
82DD7	GetBVars.1
828AF	GetChoiceFmt
828A5	GetChoiceList
82675	GetDASpecFlag
8302F	GetElNoRomp
83395	GetLastNotThis
82855	GetNextFId
82B1B	GetObType\$
82B11	GetObTypePr\$
8293B	GetPart1
82945	GetPart2
8294F	GetPart3
8285F	GetPrevFId
6E8C2	GraphTableUI
6E908	GraphZoomUI
82931	GtoField
82DC3	HOME>BAK
BD328	HTick@
BD3AA	HZoom@
C0383	HisWidth@
C040F	Hmax@
C03C9	Hmin@
827AB	IFCheck
827BF	IFChoosByChr
827B5	IFChooseNext
8275B	IFEDispClient
827A1	IFEDispHelp
8276F	IFEDispLabel
82765	IFEDispTitle
8278D	IFEUnShowSel
82751	IFEdLineMenu
82747	IFMenu
833A9	Id>ApNameId
83467	InAplet?
81D97	InApletF?
82567	Init2ColMets

82279	InitIndep
8255D	InitListMets
82283	Init_window
833DB	InpFormVEntry
833E5	InpFormVExit
833D1	InpFormViewUI
82797	InvertField
8282D	IsIFMenu?
82891	IsNullField?
82C51	IsTaskSwKey?
BDF2F	Isect@
82977	KeyFace
81E55	LASTBUTN
8269D	LEDispBorder
826CF	LESetIDecomp
826C5	LESetItem
826D9	LESetRowWidth
80AF4	LF\$
82625	LHighlight
80528	LSTBIMACROM#
8262F	LUnHighlight
BD530	LastEq@
BD4EF	LastIndep@
BD46D	LastX@
BD4AE	LastY@
83511	LeaveGraphView
83507	LeaveTextView
826E3	ListBar
81F90	ListNames
BE001	ListOfEqs@
8315B	M+prep
8338B	Make1stAplet
83449	MakeNoteVTt1
8342B	MakeNumSVTt1
83421	MakeNumVTt1
83417	MakePlotSVTt1
8340D	MakePlotVTt1
83453	MakeSketVTt1

8343F	MakeSymbSVTtl
83435	MakeSymbVTtl
829B3	MakeTitleBar
8345D	MakeViewTitle
82D37	MemStoAns
7D42E	MiniVar
8264D	MoreDown?
8261B	MoreU/D?
82643	MoreUp?
81D33	NULLargcase
81FC7	NUMEVAL1
83381	NextApOfType
828EB	NextTextLine
818DD	NotAndbitmap
82DCD	OB>BAK
81518	OVEREQcase
818D3	Orbitmap
82CBF	POLSetUIExt
8171B	PORTOADDR
421AF	PageDnNGrob
4216B	PageDnYGrob
42127	PageUpNGrob
420E3	PageUpYGrob
3D3F6	ParseExpr
822DD	PickedEqs@
829D1	PlaceFVals
BD5B2	Plot2Flg@
BD5F3	PlotCKSUM@
BD571	PlotFlag@
83237	PlotOvViewUI
83219	PlotViewUI
82D41	Port0Ids
8333B	PrepCurrAplet
82521	PrepEdLKeyOb
82B6B	PrintHist
82B89	PrintLcd
82B75	PrintVar
82B7F	PrintVarOb

83359	PurgeAplet
83363	PurgeApletOb
818E2	Put3x5
818E7	Put5x7
8267F	PutDASpecFlag
818CE	Putbitmap
8049C	REALLISTREAL
8044C	REALSTRID
81E82	REDIMPREP
81B2B	RPICK
83377	RclAplet
8336D	RclAplet?Err
82887	RclFieldVal
828B9	RclResetVal
C0527	ReCalcFlag@
831FB	Replace_List
BDEA3	Root@
82B61	SEFINISH
62D36	SETPLOTENV
99EF3	STArrayList
9C0B9	STBigKeyDef
9A7B8	STDoMedium
9A03D	STDoSmall
9BFA8	STEditKeyDef
97C29	STErrorGrob
99E30	STInitCols
9BFD8	STInsKeyDef
9B5E8	STJump
9B6BA	STJumpN
BD0B7	STO_tTYPE
9C4B2	STSortCol
9C1FA	STStatsKeyDef
9A024	STTableDisp
99FFC	STTableExit
9AE8B	STTableHKeys
99D95	STTableInit
80F74	STypeAnyChr
80F2E	STypeDirChr

80F5F	STypeLibChr
80F51	STypeLstChr
80F58	STypeMatChr
80F3C	STypeNteChr
80F43	STypePgmChr
80F66	STypeTgtChr
80F4A	STypeVarChr
80F6D	STypeVecChr
80F35	STypeZapChr
81D9C	SV_?defined
83471	SV_actual
8347B	SV_calledit
83485	SV_getbody
8348F	SV_keycancel
83499	SV_keycheck
834A3	SV_keyedit
834AD	SV_keyeval
834B7	SV_keyok
834C1	SV_keyshow
834CB	SV_setgrob19
834D5	SV_setitem0
C02F7	SVarType@
9C2CC	SWAPStatFlag
8030C	SYMSTR
81FE5	SafeCrunch%
831A1	SafeDecomp
82553	SaveListMets
82823	Sel&DispNextF
82805	SelNextField
8280F	SelPrevField
83345	SelectAplet
C6B6B	Seq_eval0
C6BC5	Seq_eval1
C6E45	Seq_eval2
C6FEE	Seq_evaln
820FD	SetDA2Temp
82125	SetDAsBad
82995	SetFAreaBad

8298B	SetFAreaOK
829A9	SetFAreasBad
8299F	SetFAreasOK
81D8D	SetInAplet
64184	SetRedrawFlag
8234B	Set_window
BDEE9	Slope@
BD634	Split1CKSUM@
BD675	Split2CKSUM@
BD87D	SplitRow@
82355	SplitTraceInit
C04E1	Stat2Flag@
C061C	StatFit@
C056D	StatFont@
C0455	StatMark@
C0586	StatMisc []@
C049B	StatModel@
C033D	StatPlot@
C0298	StatType!
C02B1	StatType@
0190F1	~StdApEntry
82873	StdDecompNoNL
82B07	StdIOProc
83223	StdTableViewUI
82369	StndXYCoord?
82D69	StoAns@
82D73	StoAns@Drp
8334F	StoAplet
831AB	StripTicks
82549	SwapL/RMets
8322D	SymbViewUI
82373	TBColL3x5
8237D	TBColL5x7
82387	TBColR3x5
82391	TBColR5x7
8239B	TBDrawF3x5
823A5	TBDrawF5x7
82503	TBEdSfKeys

823AF	TBErrorGrob
823B9	TBFormat
9216B	TBFuncDecomp
823C3	TBInv3x5C0
823CD	TBInv3x5C1
823D7	TBInv3x5C2
823E1	TBInv3x5C3
823EB	TBInv5x7C0
823F5	TBInv5x7C1
823FF	TBInv5x7C2
82409	TBRollD3x5
82413	TBRollD5x7
8241D	TBRollU3x5
82427	TBRollU5x7
83241	TBStdZooms
8324B	TBStdSplitInfo
BD83C	TCol1@
82431	TDDat3x5C1
8243B	TDDat3x5C2
82445	TDDat3x5C3
8244F	TDDat3x5C4
82459	TDDat3x5C5
82463	TDDatD3x5
8246D	TDDatL3x5
82477	TDDatR3x5
82481	TDDatU3x5
8248B	TDDataF3x5
BD779	TFlags@
041A7	THIRTYSIX
80050	THREEFOUR
BD6B6	TStart@
BD6F7	TStep@
BD738	TZoom@
83255	TablSetViewUI
BD7FB	Tcol@
82CFB	TempMenuBuff

Makes some new menus that surely comes from  
METAKERNEl FIXME: What is meant by this?

82495	TraceY
BD7BA	Trow@
824BD	UnpackGrob
5CAD5	Update_tTYPE
82D7D	UserSto
80474	VLMAlarmMsg
8046A	VLMUserKeys
80488	VLMcmdlmsg
80460	VLMhistmsg
8047E	VLMlastargs
80442	VLMmsg
80438	VLMpurgemsg
8044C	VLMstkmsg
80456	VLMundomsg
BD369	VTick@
BD3EB	VZoom@
8284B	WidthSmF
82DAF	XPURGEp
82DB9	XPURGEp0
82D9B	XRCLp
095A5	XRCLp0
82D87	XSTOp
82D91	XSTOp0
BD14D	Xmax!
BD265	Xmax2@
BD161	Xmax@
BD10C	Xmin!
BD224	Xmin2@
BD120	Xmin@
818D8	Xorbitmap
BD2E7	Ymax2@
BD1E3	Ymax@
BD2A6	Ymin2@
BD1A2	Ymin@
6E94E	ZoomAutoUI
831F1	alg=
82E9F	apndit
8310B	argswap



83101	argswap&&
83115	argswapnext
81FA4	blackbox
8216B	check_xrange
82175	check_yrange
82EA9	chooselst
82EB3	completed
8191E	d*
8190F	d<
81919	d<=
8190A	d>
81932	d>%
81914	d>=
81923	dDIV
81928	dMOD
0BCEE	dirstrucchk
8192D	dmuldiv
852EC	doptr!
852D0	doptr@
82EBD	dvbind
82EC7	elsiename
82EDB	filename
BE03D	funcCache@
82A17	grobCheck
82A21	grobCheckX
82A2B	grobInvChk
82A35	grobInvChkX
82A53	grobInvNoChk
82A49	grobInvUnChkX
82661	grobMoreDown
82657	grobMoreUp
8266B	grobNoMore
826F7	grobPOBox2
82701	grobPOBox3
8270B	grobPOBox4
82715	grobPOBox5
8271F	grobPOBoxP2
82729	grobPOBoxP3

82733	grobPOBoxP4
82A71	grobQueryIcon
82A7B	grobTitleBar
82A3F	grobUnCheckX
80208	idntany
80000	illnameerr
8024E	lamany
802B2	library
0BD53	loopdirck
83057	metaDUP
83129	metainsert
82EE5	newsymbPA
8311F	numargs
82EEF	oneexpr
82EF9	onestring
82F03	optfilename
82B93	prx1
8306B	psh1
83093	psharg
83089	pshmonop
80A0C	rbrac
82E31	realPA
83043	resolved
81D0B	roll3RD
81D1F	roll4TH
81D1A	rollNTH
8001E	rrp
82319	s1>
82E3B	solverTTT
83205	startSQFORM
830E3	syminner&
830F7	syminner&N
830ED	syminnertwo
83025	tTYPE@
82F0D	threeexprs
82F17	tok;triand
82F21	toktriand
834DF	topic_install

834E9	topic_uninstall
82F2B	twoexprs
82F35	twostrings
81D15	unroll3RD
81D24	unroll4TH
81D29	unrollNTH
830D9	unsyminner
83147	unsymone
83133	verysyminner
8313D	veryunsym
83151	vunsymfcn
835C5	{NoteText}
835CF	{NumVars}
835D9	{SketchSet}
0660AB	~{StatVars}
0060E8	~::args
0130E8	~?NULLSETDIM
02C0A1	~AttentionKe
0830F0	~CHECKEXISTS
08F0F0	~COLCTDER
0940F0	~COLCTFCNAP
0920F0	~COLCTIFTE
0900F0	~COLCTINTG
0930F0	~COLCTQUOTE
0910F0	~COLCTSUM
0DA002	~COMPLEXDUMM
0340AB	~ChkDaList
0100A1	~Darrow
0170F1	~DefauStat2T
0160F1	~DefauStatTy
01A0A2	~DoExponent
0000A1	~DoMenuKey1N
0010A1	~DoMenuKey2N
0020A1	~DoMenuKey3N
0030A1	~DoMenuKey4N
0040A1	~DoMenuKey5N
0050A1	~DoMenuKey6N
01F0E8	~DoNumeric:

0180A1	~Enter/Again
0100A2	~FarDArrow
00F0A2	~FarLArrow
0110A2	~FarRArrow
00A0A2	~FarUArrow
01D0F1	~GETPLTLABLS
0150F1	~GetTypeText
0010F0	~I:-InvSin
0090F0	~I:-InvSinh
0170F0	~I:Acosh
0160F0	~I:Asinh
0130F0	~I:Atan
0030F0	~I:LnTan
00A0F0	~I:LnTanh
00C0F0	~I:Tanh
0060F0	~INTGACOS
00F0F0	~INTGALOG
0050F0	~INTGASIN
0070F0	~INTGATAN
0020F0	~INTGCOS
00B0F0	~INTGCOSH
0190F0	~INTGDER
00E0F0	~INTGEXPM
0120F0	~INTGINV
0100F0	~INTGLN
0110F0	~INTGLOG
0180F0	~INTGSIGN
0000F0	~INTGSIN
0080F0	~INTGSINH
0140F0	~INTGSQ
0150F0	~INTGSQRT
0040F0	~INTGTAN
00D0F0	~INTGTANH
00F0A1	~LArrow
0300E8	~LIXRecv
0310E8	~LIXSend
0330C2	~MAKEEPIDN
0000B9	~MiscIFMsg

0210E8	~NotHidden
01E0F1	~POINTERR
01F0F1	~POINTEXTIT
0DB002	~POLARDUMMY
0000BE	~PlotIFMsg
0060A1	~PlotViewKey
0080C0	~PolyNSymbF
0070C0	~PolyNSymbP
0110A1	~RArrow
0620F0	~REIM[*]
01B0F1	~SETTOPICLAM
01A0F1	~SolveApEntr
0000BF	~SolveIFMsg
0000BB	~StatIFMsg
0070A1	~SymbViewKey
0080A1	~TableViewKe
00C0A1	~TopicLibKey
00A0A1	~UpArrow
0200E8	~UseHidden{}
0780F0	~WHEREDER
0770F0	~WHEREFCNAPP
0790F0	~WHEREIFTE
07C0F0	~WHEREINTG
07D0F0	~WHERESUM
07A0F0	~WHEREWHERE
0210AB	~XEQDIAG>L
0220AB	~XEQDIAG>R
0230AB	~XEQRANM
0020AB	~XEQSYMLIN
0810F0	~XEQXDPTCH
08A0F0	~XEVALp*
0890F0	~XEVALp?
08C0F0	~XPURGEp*
08B0F0	~XPURGEp?
0880F0	~XRCLp*
0850F0	~XRCLp?
08E0F0	~XRCLp?acc>
0870F0	~XRCLpL

0860F0	~XRCLpNL
07E0F0	~XSTOCHECK
07F0F0	~XSTOCHECK10
0820F0	~Xcont
04D0F0	~adjdiv
04B0F0	~adjdivsign
04C0F0	~adjsign
02E0E8	~arryspec
06B0AB	~bad^
08D0F0	~convertaddr
02D0E8	~copysub
0960F0	~covD/DCROSS
0970F0	~covD/DDOT
0B90F0	~covD/DINTG
0C90F0	~covINV*
0C60F0	~covINV+
0C70F0	~covINV-
0CA0F0	~covINV/
0C80F0	~covINV=
0D40F0	~covINVALOG
0CF0F0	~covINVCOS
0D20F0	~covINVCOSH
0CD0F0	~covINVEXP
0D50F0	~covINVEXPM1
0CE0F0	~covINVSIN
0D10F0	~covINVSINH
0D00F0	~covINVTAN
0D30F0	~covINVTANH
0CB0F0	~covINV^
0CC0F0	~covINV^X
0800F0	~covLBSTO
0C50F0	~covMANATG
0C10F0	~covMANCSIV
0BF0F0	~covMANEXP
0BD0F0	~covMANMENU*
0BC0F0	~covMANMENU+
0C30F0	~covMANMENUC
0C20F0	~covMANMENUE

0C00F0 ~covMANMENUL  
 0C40F0 ~covMANTRG  
 07B0F0 ~covWSPLIT  
 0760F0 ~covmanCOL  
 0840F0 ~covmetaLIBS  
 00D0E8 ~docmdlist  
 0040E8 ~doidseqn  
 00F0E8 ~dolatorre  
 0110E8 ~dolatorre+  
 0120E8 ~dolatorre2  
 0190E8 ~dolist+  
 0020E8 ~dontuple  
 0030E8 ~dontuple#  
 05F0AB ~dopcoeff  
 05E0AB ~dopolydiv  
 05D0AB ~dopolyz  
 00A0E8 ~doptrseqn  
 06D0AB ~dopval  
 0010E8 ~dosecntuple  
 0080E8 ~dosecseqn  
 0000E8 ~doseq  
 00B0E8 ~doseqn  
 00C0E8 ~doseqn#  
 01A0E8 ~dosort  
 0100E8 ~elsielists?  
 02F0E8 ~etorc  
 0250C2 ~lauserQR  
 0160E8 ~lolatorre  
 0150E8 ~lslatorre  
 0600AB ~metapolyz  
 0240E8 ~morerepl  
 0230E8 ~moresub  
 0260E8 ~mrepll  
 0270E8 ~mrepll+  
 0250E8 ~mrepln  
 02A0E8 ~msubll

## Internal DOSUBS

( comp ob # → { } )

Takes objects from comp in groups of # and evals ob on them. The results are returned as a list.

02B0E8	~msub11+
0280E8	~msub1n
0290E8	~msubn1
02C0E8	~msubnn
0070F1	~nBOXWHISKER
0000F1	~nFUNCTION
00F0F1	~nFUNCTOPIC
0050F1	~nHISTOGRAM
0030F1	~nPARAMETRIC
0110F1	~nPARAMTOPIC
0020F1	~nPOLAR
0100F1	~nPOLARTOPIC
0180F1	~nPTYPE>PINF
0040F1	~nSCATTER
0120F1	~nSEQTOPIC
0060F1	~nSEQUENCE
0010F1	~nSOLVE
0140F1	~nSOLVETOPIC
0130F1	~nSTATTOPIC
0680AB	~ns*spec
0170E8	~ollatorre
0180E8	~ollatorre+
0040C0	~pcoef
0050C0	~pcoefacc1
0060C0	~pcoefacc2
06E0AB	~pdiv
0030C0	~peval
0640AB	~poly*
0620AB	~poly+
0700AB	~poly/
06A0AB	~poly^
06C0AB	~poly^#
0630AB	~polyneg
0610AB	~polyprep
0010C0	~proot
0000C0	~proot_c
0020C0	~proot_r
0070E8	~ptrargs



0310C2	~rMAKEPCOPY
0320C2	~rPACKARRYD
06F0AB	~resymb
0D7002	~rpnAPPLY
0CE002	~rpnDER
0D1002	~rpnINTG
0D4002	~rpnWHERE
0200F1	~runalias?
0050E8	~seqid
00E0E8	~seqnargs
0140E8	~sllatorre
0670AB	~sn*spec
0690AB	~ss*spec
0310F1	~topic_CAPLE
02A0F1	~topic_NONE
0090E8	~udfargs
02C0F1	~view01_CAPL
02D0F1	~view23_CAPL
02E0F1	~view45_CAPL
02F0F1	~view6_CAPLE
0300F1	~view7_CAPLE
02B0F1	~view_NONE
01D0E8	~{\$}>{id}
01E0E8	~{\$}>{lam}
01B0E8	~{id}>{\$}
01C0E8	~{lam}>{\$}
83165	APPEND_SPC
81A77	AllowPrIcdCl
82AB7	DoSendObToE1
82DE1	GetApDirLst

## 6 UserRPL Commands

### 6.1 A-F

0270AB	~xCHOOSE	<pre>( title {elems} pos → ob 1 ) ( title {elems} pos → 0 ) User-Defined Choose Box Cmd -- Creates a user-defined choose box --</pre>
01C0AB	~xCOL+	<pre>Related: INFORM,NOVAL ( [[]] [[]] ' n → [[]]' ) ( [] x n → []' ) Insert Column Cmd -- Inserts an array (vector or matrix) into a matrix (one or more elements into a vector) at the position indi- cated by nindex, and returns the modified array. -- [[[mat]]1 [mat]2 nidx → [[mat]]3 [[[mat]]1 [vec]col nidx → [[mat]]2 [vec]1 nelement nidx → [vec]2 --</pre>
01B0AB	~xCOL-	<pre>Related: COL-,CSWP,ROW+,ROW- ( [] n → []' xn ) ( [[]] n → [[]]' [vn] ) Delete Column Cmd -- Deletes column n of a matrix (or element n of a vec- tor), and returns the modified matrix (or vector) and the deleted column (or element). --</pre>
0030AB	~xCOND	<pre>Related: COL+,CSWP,ROW+,ROW- ( [[n*n]] → x ) Conditional Number Cmd -- Returns the 1-norm (column norm) condition num- ber of a square matrix. --</pre>
01E0AB	~xCSWP	<pre>Related: SNRM,SRAD,TRACE</pre>

```

0360AB    ~xDOLIST      ( {1}...{n} n prog → {} )
              ( {1}...{n} prog → {} (n=1) )
              Do to List Cmd
              --
              Applies commands, programs, or user-defined func-
              tions to lists.
              --
              {lst}1 ...{lst}n n <<prog>> → {res}
              {lst}1 ...{lst}n n cmd   → {res}
              {lst}1 ...{lst}n n name  → {res}
              {lst}1 ...{lst}n <<prog>> → {res}
              {lst}1 ...{lst}n cmd    → {res}
              {lst}1 ...{lst}n name   → {res}
              --
              Related: DOSUBS,ENDSUB,NSUB,STREAM
02E0AB    ~xDOSUBS     ( {} n prog → {}' )
              ( {} prog → {}' (n=1) )
              Do to Sublist Cmd
              --
              Applies a program or command to groups of ele-
              ments in a list.
              --
              {list}1 n <<prog>> → {list}2
              {list}1 n command → {list}2
              {list}1 n name   → {list}2
              {list}1 <<prog>>  → {list}2
              {list}1 command → {list}2
              {list}1 name    → {list}2
              --
              Related: DOLIST,ENDSUB,NSUB,STREAM
0090AB    ~xEVG        ( [[]] → [[evect]]' [evals] )
              Eigenvalues and Eigenvectors Command
              --
              Computes the eigenvalues and right eigenvectors for
              a square matrix.
              --
              Related: EGVL
00A0AB    ~xEGVL       ( [[]] → [egval] )
              Eigenvalues Cmd
              --
              Computes the eigenvalues of a square matrix.
              --
              Related: EGV

```

0310AB	~xENDSUB	( $\rightarrow$ x ) Ending Sublist Cmd -- Provides a way to access the total number of sublists contained in the list used by DOSUBS. --
81FC2	xEVAL	Related: DOSUBS,NSUB ( ob $\rightarrow$ ? ) Evaluate Object Cmd -- Evaluates the object. -- obj $\rightarrow$ (see below) Obj. Type Effects of Evaluation Local Name Recalls the contents of the variable. Global Name Calls the contents of the variable: ; A name is evaluated. A program is evaluated. A directory becomes the current directory. Other objects are put on the stack. If no variable exists for a given name, evaluating the name returns the name to the stack. Program. Enters each object in the program: Names are evaluated (unless quoted). ed). Cmds are evaluated. Other objects are put on the stack. List Enters each object in the list: Names are evaluated. Cmds are evaluated. Programs are evaluated. Other objects are put on the stack. Tagged If the tag specifies a port, recalls and evaluates the specified object. Otherwise, puts the untagged object on the stack. Algebraic Enters each object in the algebraic expression: Names are evaluated. Cmds are evaluated. Other objects are put on the stack. Cmd, Func, XLIB Name Evaluates the specified object. Other Objects Puts the object on the stack. -- Related: $\rightarrow$ NUM,SYSEVAL

## 6.2 G-M

02B0AB	~xHEAD	( { } $\rightarrow$ ob ) ( \$ $\rightarrow$ \$' ) First Listed Element Cmd -- Returns the first element of a list or string. -- Related: TAIL
--------	--------	---

0010AB	~xLININ	( symb var $\rightarrow$ 0/1 ) Linear Test Func -- Tests whether an algebraic is structurally linear for a given variable.
00F0AB	~xLQ	( [[ ]] $\rightarrow$ [[L]] [[Q]] [[P]] ) LQ Factorization of a Matrix Cmd -- Returns the LQ factorization of an nm matrix. -- Related: LSQ,QR
0080AB	~xLSQ	( [B] [[A]] $\rightarrow$ [ ] ' ) ( [[B]] [[A]] $\rightarrow$ [[ ]] ' ) Least Squares Solution Cmd -- Returns the minimum norm least squares solution to any system of linear equations where $A X = B$ -- Related: LQ,RANK,QR, /
00D0AB	~xLU	( [[ ]] $\rightarrow$ [[L]] [[U]] [[P]] ) LU Dec of a Sq. Matrix Cmd -- Returns the LU decomposition of a square matrix. -- Related: DET,INV,LSQ, /
0280AB	~xMSGBOX	( \$ $\rightarrow$ ) Message Box Cmd -- Creates a user-defined message box. -- Related: CHOOSE,INFORM,PROMPT

### 6.3 N-S

0300AB	~xNSUB	( $\rightarrow$ npos ) Number of Sublist Cmd -- Provides a way to access the current sublist position during an iteration of a program or command applied using DOSUBS. -- Related: DOSUBS,ENDSUB
--------	--------	--

0250AB	~xPCOEF	( [roots] → [coefs] ) Monic Polynomial Coefficients Cmd -- Returns the coefficients of a monic polynomial (a polynomial with a leading coefficient of 1) having specific roots. --
0260AB	~xPEVAL	Related: PEVAL,PROOT ( [coefs] x → x' ) Polynomial Evaluation Cmd -- Evaluates an n-degree polynomial at x. --
03D701	~xPINIT	Related: PCOEFF,PROOT ( → ) Port Initialize Cmd -- Initializes all currently active ports. Does not affect data already stored in a port.
0240AB	~xPROOT	( [coefs] → [roots] ) Polynomial Roots Cmd -- Returns all roots of an n-degree polynomial having real or complex roots. --
0200F2	~xPSDEV	Related: PCOEFF,PEVAL ( → xpsdev ) ( → {x1...xn} ) Population Standard Deviation Cmd -- Calculates the population standard deviation of each of the m columns of coordinate values in the current statistics matrix (reserved variable ΣDAT). -- <REF>TEXT:Reserved ΣDAT --
00E0AB	~xQR	Related: MEAN,PCOV,PVAR,SDEV,TOT,VAR ( [[]] → [[Q]] [[R]] [[P]] ) QR Factorization of a Matrix Cmd -- Returns the QR factorization of an nm matrix. -- Related: LQ,LSQ

0070AB	~xRANK	( [ [] ] → n ) Matrix Rank Cmd -- Returns the rank of a rectangular matrix. --
0120AB	~xRANM	Related: LQ,LSQ,QR ( { m n } → [ [] ] ) ( [ [] ] → [ [] ]' ) Random Matrix Cmd -- Returns a matrix of specified dimensions that contains random integers in the range -9 through 9. -- { m n } → [[ rand mat ]]mn [[ mat ]]mn → [[ rand mat ]]mn --
01F0AB	~xRCI	Related: RAND,RDZ ( [ [] ] x nrow → [ [] ]' ) [ ] x n [ ]' Multiply Row by Constant Cmd -- Multiplies row n of a matrix (or element n of a vector) by a const x, and returns the modified matrix. --
0200AB	~xRCIJ	Related: RCIJ ( [ [] ] x n* n+ → [ [] ]' ) ( [ ] x n* n+ → [ ]' ) Add Multiplied Row Cmd -- Multiplies row n* of a matrix by a constant x, adds this product to row n+ of the matrix, and returns the modified matrix. Or, multiplies element n* of a vector by a constant x, adds this product to element n+ of the vector, and returns the modified vector. --
0380AB	~xREVLIST	Related: RCI ( { 1 . . . n } → { n . . . 1 }' ) Reverse List Cmd -- Reverses the order of the elements in a list. -- Related: SORT

0190AB	~xROW-	<p>( [ [] ] nrow → [ [] ] ' [ ] )  ( [ ] n → [ ] ' elt )  Delete Row Cmd  --  Deletes row n of a matrix (or element n of a vector), and returns the modified matrix (or vector) and the deleted row (or element).  --  Related: COL-,COL+,ROW-,RSWP</p>
01A0AB	~xROW+	<p>( [ [] ] [ [] ] ' n → [ [] ] ' ' )  ( [ [] ] [ ] n → [ [] ] ' )  ( [ ] n n' → [ ] )  Insert Row Cmd  --  Inserts an array into a matrix (or one or more numbers into a vector) at a position indicated by nindex, and returns the modified matrix (or vector).  --  Related: COL-,COL+,ROW-,RSWP</p>
0110AB	~xRREF	<p>( [ [] ] → [ [] ] ' )  Reduced Row Echelon Form Cmd  --  Converts a rectangular matrix to a reduced row echelon form.</p>
01D0AB	~xRSWP	<p>( [ ]/[ [] ] i j → [ ]/[ [] ] )  Row Swap Cmd  --  Swaps rows i and j of a matrix and returns the modified matrix, or swaps elements i and j of a vector and returns the modified vector.  --  Related: CSWP,ROW+,ROW-</p>
0100AB	~xSCHUR	<p>( [ [] ] → [ [Q] ] [ [T] ] )  Schur Decomp. of Squ. Matrix Cmd  --  Returns the Schur decomposition of a square matrix.  --</p>
02D0AB	~xSEQ	<p>Related: LQ,LU,QR,SVD,SVL,TRN  ( prog var start end incr → { } )  Sequential Calculation Cmd  --  Returns a list of results generated ated by repeatedly executing prog using index var over the range start to end, in increments of incr.  --  Related: DOSUBS,STREAM</p>



0060AB	$\sim$ xSNRM	( [ ] $\rightarrow$ x ) Spectral Norm Cmd -- Returns the spectral norm of an array. -- Related: ABS,CNRM,COND,RNRM,SRAD,TRACE
0390AB	$\sim$ xSORT	( { } $\rightarrow$ { }' ) Ascending Order Sort Cmd -- Sorts the elements in a list in ascending order. -- Related: REVLIST
0050AB	$\sim$ xSRAD	( [ [ ] ] $\rightarrow$ x ) Spectral Radius Cmd -- Returns the spectral radius of a square matrix. -- Related: COND,SNRM,TRACE
0320AB	$\sim$ xSTREAM	( { } prog $\rightarrow$ x ) Stream Execution Cmd -- Moves the first two elements from the list onto the stack, and executes prog. The moves the next element (if any) onto the stack, and executes obj again using the previous result and the new element. Repeats this until the list is exhausted, and returns the final result. --
00B0AB	$\sim$ xSVD	Related: DOSUBS ( [ [ ] ] $\rightarrow$ [ [U] ] [ [V] ] [S] ) Singular Value Decomposition Cmd -- Returns the singular value decomposition of an mn matrix. --
00C0AB	$\sim$ xSVL	Related: DIAG $\rightarrow$ ,MIN,SVL ( [ [ ] ] $\rightarrow$ [ ] ) Singular Values Cmd -- Returns the singular values of an mn matrix. -- Related: MIN,SVD

## 6.4 T-Z

02C0AB	~xTAIL	( { } → { }' ) ( \$ → \$' ) Last Listed Elements Cmd -- Returns all but the first element of a list or string. --
0040AB	~xTRACE	Related: HEAD ( [ [] ] → x ) Matrix Trace Cmd -- Returns the trace of a square matrix.
0000AB	~xVERSION	( → \$ \$ ) Software Version Cmd -- Displays the software version and copyright message.
02A0AB	~xXRECV	( name → ) XModem Receive Cmd -- Prepares the HP 48 to receive an object via XModem. The received object is stored in the given name. --
0290AB	~xXSEND	Related: BAUD,RECV,RECN,SEND,XSEND ( name → ) XModem Send Cmd -- Sends a copy of the named object via XModem. -- Related: BAUD,RECN,RECV,SEND,XRECV

## 6.5 Non A-Z

## 7 ML Entry Points

### 7.1 General Purpose

06816	SAVPTR	D0 to RPLTOP D1 to DSKTOP B to RETTOP D to FREETOP Clear carry
05123	GETPTRL00P	<see>GETPTR , Loop to RPL
01140	DisableIntr	Disable interrupts.

### 7.2 Errors

#### 7.2.1 Generating Errors

### 7.3 Hexadecimal Math

### 7.4 Memory Handling

#### 7.4.1 General Memory Handling Routines

03019	SKIPOB	Skip object in D0, clears ST1, clears carry, P=0 --> D0 = addr past object Uses: A.A C.A P ST1 RSTK2
81228	\$jSKIPBODY	

#### 7.4.2 Moving and Swapping Memory Areas

#### 7.4.3 Allocating Memory in TEMPOB

#### 7.4.4 Working with Memory

### 7.5 Display

## 7.6 Popping and Pushing

### 7.6.1 Pointers

03A86      PUSHA                      Push A, Loop

### 7.6.2 TRUE and FALSE

DEC0B	GPPushFLoop	<see>GETPTR , Push FALSE, Loop
DEBF2	GPPushTLoop	<see>GETPTR , Push TRUE, Loop
81117	\$jGPOvrWrFLp	
81125	\$jGPOvrWrTLp	
8118E	\$jOvrWrF/TLp	
81195	\$jOvrWrFLoop	
8119C	\$jOvrWrT/FLp	
811A3	\$jOvrWrTLoop	
811FE	\$jPshF/TLoop	
81205	\$jPshT/FLoop	

### 7.6.3 System Binary Integers (BINT)

066BC      POP#                              Pop # to A.A

### 7.6.4 Real and Complex Numbers

22706      PUSH%LOOP                      ( A -> %push ) Push A as %, <see>GETPTRLOOP

## 7.7 Keyboard Handling

## 7.8 Various ML Entries

## 7.9 Object Types

029E8	DOARRY	Array prologue 5 size 5 prologue of objects 5 # of dimensions 5n dimensions .. objects (content only)
02B62	DOBAK	Backup prologue 5 size 2 # of chars in name .. name .. object 5 DOBINT 5 CRC Apparently unused on the 49
02911	DOBINT	BINT prologue 5 number (hex)
029BF	DOCHAR	Character prologue 2 character
02977	DOCMP	Complex number prologue 3 real exponent 12 real mantissa 1 real sign 3 complex exponent 12 complex mantissa 1 complex sign
02DCC	DOCODE	Code prologue 5 length .. machine code
02D9D	DOCOL	Secondary prologue .. objects 5 SEMI
02A2C	DOCSTR	String prologue 5 length .. characters
0299D	DOECMP	Long complex prologue 5 real exponent 15 real mantissa 1 real sign 5 complex exponent 15 complex mantissa 1 complex sign
02955	DOEREL	Long real prologue 5 exponent 15 mantissa 1 sign

02ADA	DOEXT	Unit object prologue .. object (usually a real) .. unit
02B1E	DOGROB	5 SEMI GROB prologue 5 size 5 height 5 width
02A4E	DOHSTR	HXS prologue 5 length .. hex digits, reverse order aka: DOHXS
02E48	DOIDNT	Global name (ID) prologue 2 # of characters .. characters
02E6D	DOLAM	Local name (LAM) prologue see <see>DOIDNT
02A0A	DOLNKARRY	Linked array prologue Not used by the system.
02B40	DOLIB	Library prologue 5 size 2 # of characters .. name 2 # of characters (unless 0) 3 library ID 5 hash table offset 5 message table offset 5 link table offset 5 config object offset .. contents 4 CRC ; XLIBs: 1 or 3: kind 3 library ID 3 command ID .. object -- <REF>TEXT:Libraries
02A74	DOLIST	List prologue see <see>DOCOL
02933	DOREAL	Real number prologue 3 exponent 12 mantissa 1 sign
02E92	DOROMP	XLIB prologue 3 library ID 3 command #

02A96	DORRP	Directory prologue Home directory: 3 # of attached libs n* [ 3 library ID 5 address of hash table 5 address of message table ] 5 offset of last object * [ 5 offset to previous object 00000 for the first one 2 # of characters .. name of object 2 # of characters .. object ] ; Subdirectories: 3 # of attached library 7FF if none 5 offset of last object .. same as above
02AB8	DOSYMB	Symbolic prologue .. objects
02AFC	DOTAG	5 SEMI Tagged object prologue 2 # of chars in tag .. tag .. object
02B88	DOEXT0	
02BAA	DOEXT1	
		aka: DOACPTR
02BCC	DOEXT2	
02BEE	DOEXT3	
02C10	DOEXT4	

## 8 RAM entries

Note that pointers (->...) are always 5 nibbles wide.

### 8.1 UART buffering

F02B8      `uart_buffer`      UART buffer area (512)



## 9 Miscellaneous Entries

### 9.1 Various Matrix operations

00D0C3     $\sim$ 1a+COL  
 00E0C3     $\sim$ 1a+COLs  
 0110C3     $\sim$ 1a+ELEM  
 0100C3     $\sim$ 1a+ELEMc  
 00F0C3     $\sim$ 1a+ELEM<sub>r</sub>  
 00C0C3     $\sim$ 1a+RCsLP  
 00A0C3     $\sim$ 1a+ROW  
 00B0C3     $\sim$ 1a+ROWs  
 0090C3     $\sim$ 1a-COL  
 0070C3     $\sim$ 1a-ROW  
 0140C3     $\sim$ 1a>COL  
 0170C3     $\sim$ 1a>DIAG  
 0130C3     $\sim$ 1a>ELEM  
 0120C3     $\sim$ 1a>ROW  
 0200C2     $\sim$ 1aBPMUTE  
 0160C3     $\sim$ 1aCOL>  
 04D0C2     $\sim$ 1aCOND  
 04E0C2     $\sim$ 1aCONDdone  
 0040C3     $\sim$ 1aCSWP  
 0180C3     $\sim$ 1aDIAG>  
 0510C2     $\sim$ 1aDT  
 0070C2     $\sim$ 1aECQhQAQh  
 0040C2     $\sim$ 1aEGV  
 0020C2     $\sim$ 1aEGVL  
 0030C2     $\sim$ 1aEGVL%%  
 05E0C2     $\sim$ 1aEGetTiny  
 01B0C2     $\sim$ 1aEgCQRI  
 01C0C2     $\sim$ 1aEgCQRIk1  
 01A0C2     $\sim$ 1aEgCSchur  
 0060C2     $\sim$ 1aEgHF  
 00A0C2     $\sim$ 1aEgIsoVal  
 0110C2     $\sim$ 1aEgM\*G2  
 00F0C2     $\sim$ 1aEgM\*RG3

01E0C2 ~laEgPrep  
00C0C2 ~laEgQRik0  
0080C2 ~laEgQkHA  
00B0C2 ~laEgRQRI  
00D0C2 ~laEgRQRik1  
0090C2 ~laEgRSchur  
00E0C2 ~laEgRWilk3  
0130C2 ~laEgRotR  
0190C2 ~laEgSc1Cls  
0120C2 ~laEgValr  
0180C2 ~laEgVcPair  
0160C2 ~laEgVcSngl  
0170C2 ~laEgVcUrhs  
01D0C2 ~laEgVecC  
0150C2 ~laEgVecR  
0100C2 ~laEgWilk2  
01F0C2 ~laFPMUTE  
0210C2 ~laFSCALE  
0550C2 ~laIV  
0570C2 ~laIVF  
0560C2 ~laIVc  
0220C2 ~laLSQ  
0590C2 ~laLsdScale  
02B0C2 ~laQ2hX  
0260C2 ~laQRF  
02E0C2 ~laQRSVecUp  
0300C2 ~laQRmaxSV  
02F0C2 ~laQRminSV  
02D0C2 ~laQRrank  
0270C2 ~laQhA  
0280C2 ~laQhB  
0360C2 ~laRANK  
0000C3 ~laRANM  
0050C3 ~laRCI  
0060C3 ~laRCIJ  
0150C3 ~laROW>  
02A0C2 ~laRQF  
05B0C2 ~laRREF

02C0C2 ~1aRSVF  
0020C3 ~1aRSWP  
0030C3 ~1aRSWP2  
0010C3 ~1aRanInt  
05D0C2 ~1aRedHere?  
05C0C2 ~1aRedRow  
0520C2 ~1aRefinedT  
0050C2 ~1aSCHUR  
0290C2 ~1aSETDIAG  
0340C2 ~1aSNORM  
0350C2 ~1aSNORM%%  
0000C2 ~1aSRAD  
0530C2 ~1aSV  
0380C2 ~1aSVD  
0370C2 ~1aSVL  
0540C2 ~1aSVc  
05A0C2 ~1aScIntRnd  
0140C2 ~1aSchur2  
03C0C2 ~1aSvdAPPhV  
03D0C2 ~1aSvdAPk  
03F0C2 ~1aSvdBDQR  
0420C2 ~1aSvdBDirC  
0490C2 ~1aSvdCROTL  
0480C2 ~1aSvdCROTR  
0410C2 ~1aSvdFDirC  
03E0C2 ~1aSvdGPROT  
0430C2 ~1aSvdGShft  
03A0C2 ~1aSvdLtUBD  
04A0C2 ~1aSvdPSort  
04B0C2 ~1aSvdPrep  
0400C2 ~1aSvdQR2x2  
0470C2 ~1aSvdQRB  
0460C2 ~1aSvdQRF  
0450C2 ~1aSvdQRSB  
0440C2 ~1aSvdQRSF  
0390C2 ~1aSvdUBD  
03B0C2 ~1aSvdUqhQA  
04C0C2 ~1aTRACE

0580C2	~!aULHSVF
0240C2	~!aUserLQ
0500C2	~!aUserLU
0230C2	~!aUserQR
0010C2	~!aVMAX%%
04F0C2	~!aVMAXJRP
0080C3	~!aVec-

## 9.2 Undescribed Entry Points

81AB8	!MATTRNnc
81AAE	!REDIMTEMP
81AB3	!REDIMUSER
8185B	DropSysObs
81FB8	EVALCRUNCH
81C39	InitEnab
80A18	lbrac
81BD0	LINECHANGE
81856	NEWINDEP
82CC9	POLErrorTrap
028FC	PRLG
8301B	PTYPE>PINFO
82FE9	SYMBNUMSOLVE
82DA5	X@

## 10 Entries sorted by address

Here follows a list of entries sorted by address. Six-digit addresses are always sorted after five-digit addresses. The six-digit addresses for rompointers and flashpointers consist of the pointer number (first three digits) and the flashbank/library id (last three digits). Sorting of these addresses uses first the flashbank/library id and then the pointer number, so 000123 will be sorted after FFF122.

01140	DisableIntr	03019	SKIPOB	04071	BINT5
028FC	PRLG	0312B	SEMI	04071	list
02911	DOBINT	03A81	TRUE	0407B	id
02933	DOREAL	03A86	PUSHA	0407B	idnt
02955	DOEREL	03AC0	FALSE	0407B	BINT6
02977	DOCMP	03FDB	TYPEREAL	0407B	SIX
0299D	DOECMP	03FE5	TYPECMP	04085	lam
029BF	DOCHAR	03FEF	TYPELIST	04085	SEVEN
029E8	DOARRY	03FF9	TYPEIDNT	04085	BINT7
02A0A	DOLNKARRY	04003	TYPECOL	0408F	seco
02A2C	DOCSTR	0400D	TYPESYMB	0408F	EIGHT
02A4E	DOHSTR	04017	TYPERRP	0408F	BINT8
02A4E	DOHXS	04021	TYPELAM	04099	symb
02A74	DOLIST	0402B	TYPEEREL	04099	BINT9
02A96	DORRP	04035	TYPEEXT	04099	NINE
02AB8	DOSYMB	0403F	any	040A3	BINT10
02ADA	DOEXT	0403F	BINT0	040A3	sym
02AFC	DOTAG	0403F	ZERO	040A3	TEN
02B1E	DOGROB	04049	real	040AD	hxs
02B40	DOLIB	04049	BINT1	040AD	BINT11
02B62	DOBAK	04049	MEMERR	040AD	ELEVEN
02B88	DOEXT0	04049	ONE	040B7	BINT12
02BAA	DOEXT1	04053	BINT2	040B7	grob
02BAA	DOACPTR	04053	TWO	040B7	TWELVE
02BCC	DOEXT2	04053	cmp	040C1	THIRTEEN
02BEE	DOEXT3	0405D	BINT3	040C1	TAGGED
02C10	DOEXT4	0405D	str	040C1	BINT13
02D9D	DOCOL	0405D	THREE	040CB	FOURTEEN
02DCC	DOCODE	04067	FOUR	040CB	unitob
02E48	DOIDNT	04067	arry	040CB	EXT
02E6D	DOLAM	04067	BINT4	040CB	BINT14
02E92	DOROMP	04071	FIVE	040D5	rompointer

040D5	FIFTEEN	04175	BINT31	0BCEE	dirstrucchk
040D5	BINT15	0417F	BINT32	0BD53	loopdirck
040DF	REALOB	0417F	THIRTYTWO	0BDC1	TrueTrue
040DF	BINT16	04189	BINT33	0E909	CRLF\$
040DF	SIXTEEN	04189	THIRTYTHREE	10C72	CLOSEUART
040E9	BINT17	04193	BINT34	117CD	AllowPrIcdCl
040E9	SEVENTEEN	04193	THIRTYFOUR	22706	PUSH%LOOP
040E9	2REAL	0419D	BINT35	25DF8	DropJunk
040E9	REALREAL	0419D	THIRTYFIVE	26B24	DA3OK?NOTIT
040F3	EIGHTEEN	041A7	THIRTYSEX	28381	ClearLists
040F3	BINT18	041B1	THIRTYSEVEN	2B7F5	EraseGraph
040FD	NINETEEN	041B1	BINT37	33905	HARDHEIGHT
040FD	BINT19	041BB	BINT38	3949A	BadIfEdit
04107	BINT20	041BB	THIRTYEIGHT	3C635	DoBadKey
04107	TWENTY	041C5	BINT39	3C77E	'DoBadKeyT
04111	TWENTYONE	041C5	THIRTYNINE	3CC36	TakeOver
04111	BINT21	041CF	BINT40	3D3F6	ParseExpr
0411B	BINT22	041CF	FORTY	420E3	PageUpYGrob
0411B	TWENTYTWO	041CF	FOURTY	42127	PageUpNGrob
04125	BINT23	041D9	FORTYONE	4216B	PageDnYGrob
04125	TWENTYTHREE	041D9	BINT41	421AF	PageDnNGrob
0412F	TWENTYFOUR	041E3	BINT42	45611	CK0
0412F	BINT24	041E3	FORTYTWO	458CA	%ABSCOERCE
04139	BINT25	041ED	FORTYTHREE	45AC1	CK1&Dispatch
04139	TWENTYFIVE	041ED	BINT43	45AD2	CK2&Dispatch
04143	REALSYM	05123	GETPTRLOOP	45AE3	CK3&Dispatch
04143	BINT26	055B5	NULLHXS	45AF4	CK4&Dispatch
04143	TWENTYSIX	055BF	NULL\$	45B05	CK5&Dispatch
0414D	TWENTYSEVEN	055C9	NULL{}	48F1C	%15
0414D	BINT27	055D3	NULLSYMB	48FB7	%25
04157	TWENTYEIGHT	055DD	NULL::	4F7F8	tok:
04157	BINT28	066BC	POP#	5CAD5	Update_tTYPE
04161	BINT29	06816	SAVPTR	5FFF4	xC1
04161	TWENTYNINE	0744F	ZERO_DO	6001A	xC2
0416B	REALEXT	0745A	ONE_DO	60040	xC3
0416B	THIRTY	07467	#1+_ONE_DO	60066	xC4
0416B	BINT30	08452	RAM-WORDNAME	6008C	xC5
04175	THIRTYONE	095A5	XRCLp0	62D36	SETPLOTENV

64184	SetRedrawFlag	80064	BINT54	800FA	BINT69
67B3E	Docrunchc	8006E	FIFTYFIVE	800FA	FOURFIVE
69347	GETYPOS	8006E	BINT55	800FA	ARRAYLIST
69E2E	CHECKHEIGHT	8006E	#THREESEVEN	80104	SEVENTY
6E8C2	GraphTableUI	80078	FIFTYSIX	80104	ARRAYID
6E908	GraphZoomUI	80078	BINT56	80104	BINT70
6E94E	ZoomAutoUI	80082	FIFTYSEVEN	8010E	SEVENTYONE
7B7D8	DefaultHint	80082	BINT57	80118	SEVENTYTWO
7D3ED	DummyMenuErr	8008C	FIFTYEIGHT	80122	SEVENTYTHREE
7D42E	MiniVar	8008C	BINT58	8012C	ARRYSYM
7D46A	EnsureMenuOff	80096	BINT59	8012C	SEVENTYFOUR
80000	BINT44	80096	FIFTYNINE	8012C	BINT74
80000	illnameerr	800A0	SIXTY	80136	SEVENTYFIVE
80000	FORTYFOUR	800A0	BINT60	80140	SEVENTYSIX
8000A	FORTYFIVE	800AA	SIXTYONE	8014A	SEVENTYSEVEN
8000A	BINT45	800AA	BINT61	80154	SEVENTYEIGHT
80014	FORTYSIX	800B4	BINT62	8015E	SEVENTYNINE
80014	BINT46	800B4	SIXTYTWO	8015E	BINT79
8001E	rrp	800BE	SIXTYTHREE	80168	EIGHTY
8001E	BINT47	800BE	BINT63	80168	LIST0B
8001E	FORTYSEVEN	800BE	BINT3Fh	80168	BINT80
80028	BINT48	800C8	SIXTYFOUR	80172	BINT81
80028	FORTYEIGHT	800C8	BINT40h	80172	LISTREAL
80032	FORTYNINE	800C8	BINT64	80172	EIGHTYONE
80032	BINT49	800C8	YHI	8017C	BINT82
8003C	FIFTY	800D2	BINT_65d	8017C	LISTCMP
8003C	BINT50	800D2	BINT65	80186	BINT83
80046	2STR	800D2	ARRAYREAL	80186	FIVETHREE
80046	FIFTYONE	800D2	SIXTYFIVE	80190	BINT84
80046	BINT51	800DC	FOURTWO	80190	FIVEFOUR
80050	BINT52	800DC	ARRYCMP	8019A	BINT85
80050	THREEFOUR	800DC	SIXTYSIX	8019A	2LIST
80050	FIFTYTWO	800DC	BINT66	801A4	BINT86
8005A	BINT53	800E6	FOURTHREE	801A4	LISTID
8005A	THREEFIVE	800E6	BINT67	801A4	FIVESIX
8005A	STRLIST	800F0	2ARRAY	801AE	BINT87
8005A	FIFTYTHREE	800F0	SIXTYEIGHT	801AE	LISTLAM
80064	FIFTYFOUR	800F0	BINT68	801B8	EIGHTYEIGHT

801C2	EIGHTYNINE	8029E	BINT130d	803D4	#_258_d
801CC	NINETY	8029E	XHI-1	803D4	#_102
801D6	BINT_91d	8029E	BINT130	803D4	Err#Chr00
801D6	BINT91	802A8	XHI	803DE	#SyntaxErr
801E0	NINETYTWO	802A8	BINT_131d	803E8	BINT_263d
801EA	NINETYTHREE	802A8	BINT131	803E8	#ObTypeBase
801F4	NINETYFOUR	802A8	BINT131d	803F2	REALREALOB
801FE	NINETYFIVE	802B2	library	803FC	3REAL
80208	BINT96	802BC	SYMBREAL	80406	#_291_d
80208	idntany	802C6	SYMBCMP	80406	#_123
80208	BINT_96d	802D0	SYMSYM	80406	Err#Kill
80212	BINT97	802DA	SYMBUNIT	80410	#_124
80212	IDREAL	802E4	backup	80410	#_292_d
8021C	NINETYEIGHT	802EE	SYMOB	80410	Err#NoLstStk
8021C	IDCMP	802F8	SYMREAL	8041A	BINT_305d
80226	NINETYNINE	80302	SYMCMP	8041A	#NoRoomForSt
80230	IDARRY	8030C	SYMSTR	80424	BINT_306d
80230	ONEHUNDRED	80316	SYMARRY	80424	#Warning:NL
80230	BINT100	80320	SYMLIST	8042E	REALSTRSTR
8023A	IDLIST	8032A	SYMID	8042E	BINT_307d
8023A	SIXFIVE	80334	SYMLAM	8042E	#Error:
80244	char	8033E	SYMSYMB	80438	VLMPurgemsg
80244	BINT111	80348	SYMSYM	80442	VLMMsg
8024E	lamany	80352	SYMEXT	8044C	REALSTRID
80258	LAMREAL	8035C	HXSREAL	8044C	VLMstkmsg
80262	BINT_114	80366	2HXS	80456	VMundomsg
8026C	BINT_115d	80370	BINTCOh	80460	VMhistmsg
8026C	BINT115	8037A	2GROB	8046A	VMUserKeys
80276	BINT_116d	80384	TAGGEDANY	80474	VMAlarmMsg
80276	BINT116	8038E	EXTREAL	8047E	VMlastargs
80280	BINT_117d	80398	UNITSYM	80488	VMcmdlmsg
80280	LAMLIST	80398	EXTSYM	80492	Err#Cont
8028A	BINT_122d	803A2	2EXT	8049C	REALLISTREAL
8028A	BINT122	803AC	ROMPANY	8049C	INTEGER337
80294	BINT_128d	803B6	BINT253	804A6	CMPOBOB
80294	BINT128	803C0	BINT255d	804B0	Err#NoLstArg
80294	BINT80h	803CA	REALOBOB	804B0	#_205
8029E	BINT_130d	803CA	FSTFLOATROM#	804B0	#_517_d



804BA	STRREALREAL	80622	EXTOBOB	80916	%.1
804C4	ARRYREALREAL	8062C	#EXITERR	80930	%.5
804CE	ARRYREALCMP	80636	MINUSONE	8094A	%10
804D8	3ARRY	80640	MINUSTWO	80964	%e
804E2	ARRYLISTREAL	8064A	MINUSTHREE	80979	%.5
804EC	ARRYLISTCMP	80654	MINUSFOUR	8098E	%-.5
804F6	LISTREALOB	8065E	MINUSFIVE	809A3	%10
80500	LISTREALREAL	80668	%0	809B8	%180
8050A	LISTLISTOB	8067D	%1	809CD	%200
80514	IDREALOB	80692	%2	809E2	%360
8051E	IDLISTOB	806A7	%3	809F7	%400
80528	LSTBIMACROM#	806BC	%4	80A0C	tok]
80528	FSTMACROROM#	806D1	%5	80A0C	rbrac
80528	LAMANYANY	806E6	%6	80A18	lbrac
80532	PROGIDREAL	806FB	%7	80A26	tok[
8053C	PROGIDCMP	80710	%8	80A32	tok{
80546	PROGIDLIST	80725	%9	80A3E	tok}
80550	PROGIDEXT	8073A	%-1	80A4A	toksharp
8055A	ATTNERR	8074F	%-2	80A56	tokuscore
80564	SYMREALREAL	80764	%-3	80A62	tok\$
8056E	SYMREALCMP	80779	%-4	80A6E	tok&
80578	SYMREALSYM	8078E	%-5	80A7A	tokESC
80582	SYMCMPPREAL	807A3	%-6	80A86	tok>>
8058C	SYMCMPCMP	807B8	%-7	80A92	tok<<
80596	SYMCMPSYM	807CD	%-8	80A9E	tokexponent
805A0	SYMIDREAL	807E2	%-9	80AAA	tokanglesign
805AA	SYMIDCMP	807F7	%PI	80AB6	tokSIGMA
805B4	SYMIDLIST	8080C	%PI	80AC2	tokWHERE
805BE	SYMIDEXT	80826	%MAXREAL	80ACE	14SPACES\$
805C8	SYMSYMREAL	8083B	%-MAXREAL	80AF4	LF\$
805D2	SYMSYMCMP	80850	%MINREAL	80AF4	NEWLINE\$
805DC	3SYM	80865	%-MINREAL	80B00	\$DER
805E6	XFERFAIL	8087A	%0	80B10	SPACE\$
805F0	PROTERR	80894	%1	80B10	tok_
805FA	InvalServCmd	808AE	%2	80B1C	tokUNKNOWN
80604	Connecting	808C8	%3	80B34	tokquote
8060E	Retry	808E2	%4	80B40	tok'
80618	#CAlarmErr	808FC	%5	80B4C	tok,

80B58	tok.	80CE2	CHR_3	80DEC	CHR_a
80B64	tok;	80CE9	CHR_4	80DF3	CHR_b
80B70	toklparen	80CF0	CHR_5	80DFA	CHR_c
80B7C	tokrparen	80CF7	CHR_6	80E01	CHR_d
80B88	tok^	80CFE	CHR_7	80E08	CHR_e
80B94	tok*	80D05	CHR_8	80E0F	CHR_f
80BA0	tok/	80D0C	CHR_9	80E16	CHR_g
80BAC	tok+	80D13	CHR_:	80E1D	CHR_h
80BB8	tok-	80D1A	CHR_;	80E24	CHR_i
80BC4	tok=	80D21	CHR_<	80E2B	CHR_j
80BD0	tokSQRT	80D28	CHR_=	80E32	CHR_k
80BDC	tokDER	80D2F	CHR_>	80E39	CHR_l
80BE8	tokCTGROB	80D36	CHR_A	80E40	CHR_m
80BFA	tokCTSTR	80D3D	CHR_B	80E47	CHR_n
80C08	tok0	80D44	CHR_C	80E4E	CHR_o
80C14	tok1	80D4B	CHR_D	80E55	CHR_p
80C20	tok2	80D52	CHR_E	80E5C	CHR_q
80C2C	tok3	80D59	CHR_F	80E63	CHR_r
80C38	tok4	80D60	CHR_G	80E6A	CHR_s
80C44	tok5	80D67	CHR_H	80E71	CHR_t
80C50	tok6	80D6E	CHR_I	80E78	CHR_u
80C5C	tok7	80D75	CHR_J	80E7F	CHR_v
80C68	tok8	80D7C	CHR_K	80E86	CHR_w
80C74	tok9	80D83	CHR_L	80E8D	CHR_x
80C80	CHR_00	80D8A	CHR_M	80E94	CHR_y
80C87	CHR_...	80D91	CHR_N	80E9B	CHR_z
80C8E	CHR_'	80D98	CHR_O	80EA2	CHR_->
80C95	CHR_DblQuote	80D9F	CHR_P	80EA9	CHR_<<
80C9C	CHR_#	80DA6	CHR_Q	80EB0	CHR_>>
80CA3	CHR_*	80DAD	CHR_R	80EB7	CHR_Angle
80CAA	CHR_+	80DB4	CHR_S	80EBE	CHR_Deriv
80CB1	CHR_,	80DBB	CHR_T	80EC5	CHR_Integral
80CB8	CHR_-	80DC2	CHR_U	80ECC	CHR_LeftPar
80CBF	CHR_.	80DC9	CHR_V	80ED3	CHR_Newline
80CC6	CHR_/	80DD0	CHR_W	80EDA	CHR_Pi
80CCD	CHR_0	80DD7	CHR_X	80EE1	CHR_RightPar
80CD4	CHR_1	80DDE	CHR_Y	80EE8	CHR_Sigma
80CDB	CHR_2	80DE5	CHR_Z	80EEF	CHR_Space

80EF6	CHR_UndScore	811A3	\$jOvrWrTLoop	812F7	%EXPONENT
80EFD	CHR_[]	811FE	\$jPshF/TLoop	812FC	%FLOOR
80F04	CHR_] ]	81205	\$jPshT/FLoop	81301	%FP
80F0B	CHR_{ {	81228	\$jSKIPBODY	81306	%IP
80F12	CHR_} }	8123D	DOINDIR	8130B	%LN
80F19	CHR_<=	81252	%>%	81310	%LNP1
80F20	CHR_>=	81257	%>%	81315	%LOG
80F27	CHR_<>	8125C	%0>	8131A	%MANTISSA
80F2E	STypeDirChr	81261	%0<	8131F	%MOD
80F35	STypeZapChr	81266	%0=	81324	%NFACT
80F3C	STypeNteChr	8126B	%<	81329	%NROOT
80F43	STypePgmChr	81270	%<=	8132E	%OF
80F4A	STypeVarChr	81275	%>=	81333	%PERM
80F51	STypeLstChr	8127A	%<>	81338	%RAN
80F58	STypeMatChr	8127F	%=	8133D	%SGN
80F5F	STypeLibChr	81284	%>	81342	%SIN
80F66	STypeTgtChr	81289	%*	81347	%SINH
80F6D	STypeVecChr	8128E	%+	8134C	%SQRT
80F74	STypeAnyChr	81293	%-	81351	%T
80F7B	\$_R<<	81298	%/	81356	%TAN
80F8B	\$_R<Z	8129D	%^	8135B	%TANH
80F9B	\$_XYZ	812A2	%ABS	81360	#0=case
80FAB	\$_<<>>	812A7	%ACOS	81365	OVER#=case
80FB9	\$_{ }	812AC	%ACOSH	8136A	#=case
80FD5	\$_' '	812B1	%ALOG	8136F	#=casedrop
80FE3	\$_::	812B6	%ANGLE	81374	2SWAP
80FF1	\$_LRParens	812BB	%ASIN	81379	SEVENROLL
80FFF	\$_2DQ	812C0	%ASINH	81379	7ROLL
8100D	\$_ECHO	812C5	%ATAN	8137E	EIGHTROLL
8101F	\$_EXIT	812CA	%ATANH	8137E	8ROLL
81031	\$_Undefined	812CF	%CEIL	81383	DUMP
8104D	\$_RAD	812D4	%CH	81388	DUP#0=cshedrp
8105D	\$_GRAD	812D9	%CHS	8138D	EQcasedrop
81117	\$jGPOvrWrFLp	812DE	%COMB	81392	Embedded?
81125	\$jGPOvrWrTLp	812E3	%COS	81397	GETLAMP AIR
8118E	\$jOvrWrF/TLp	812E8	%COSH	8139C	#MAX
81195	\$jOvrWrFLoop	812ED	%EXP	813A1	#MIN
8119C	\$jOvrWrT/FLp	812F2	%EXPM1	813A6	#NOT

813AB	#OR	81455	SWAPDROP	814DC	7PICK
813B0	#XOR	81455	XY>Y	814E1	8PICK
813B5	#*OVF	8145A	9ROLL	814E6	9PICK
813BA	#1<>	8145F	XYZ>Z	814EB	10PICK
813BF	#1=	8145F	UNROT2DROP	814F0	#-ROLL
813C4	#2=	8145F	ROTROT2DROP	814F5	#+ROLL
813CE	2RDROP	81464	4UNROLL3DROP	814FA	#1+ROLL
813D3	?SEMI	81464	XYZW>W	814FF	#2+ROLL
813D8	case	81469	3RDROP	81504	#-UNROLL
813DD	case2DROP	8146E	#-PICK	81509	#+UNROLL
813E2	case2drop	81473	#+PICK	8150E	#1+UNROLL
813E7	caseDROP	81478	#1+PICK	81513	#2+UNROLL
813EC	casedrop	8147D	#2+PICK	81518	OVEREQcase
813F1	COLACOLA	81482	#3+PICK	8151D	OVER#=#
813F6	COLA_EVAL	81487	#4+PICK	81522	DROPTTRUE
813FB	COLARPITE	8148C	ticR	81527	DROPFALSE
81400	COLAcase	81491	EXPAND	8152C	DROPSWAP
81405	IT	81496	ROM-WORD?	81531	ROT2DROP
8140A	ITE	8149B	3DROP	81531	XYZ>Y
8140F	ITE_DROP	8149B	XYZ>	81531	DROPSWAPDROP
81414	NOT?SEMI	814A0	3PICK	81536	SWAPDUP
81419	NOTcase	814A5	3UNROLL	8153B	ROTDUP
8141E	NOTcase2DROP	814AA	4DROP	81540	SWAP#-
81423	NOTcase2drop	814AA	XYZW>	81545	DROPDUP
81428	NOTcaseDROP	814B4	XYZW>YZWX	8154A	DUPLEN\$
8142D	NOTcasedrop	814B4	4ROLL	8154F	#+DUP
81432	RDROPCOLA	814B4	FOURROLL	81554	SWAPDROPDUP
81437	RSWAP	814B9	FOURUNROLL	81559	UNROTDROP
8143C	XYZ>YXZ	814B9	XYZW>WXYZ	81559	SWAPDROPSWAP
8143C	ROTSWAP	814B9	4UNROLL	81559	XYZ>ZX
81441	ROTDROPSWAP	814BE	5DROP	8155E	2DUP#>
81441	XYZ>ZY	814C3	5PICK	81563	DUP#1+
81446	ROTDROP	814C8	5ROLL	81568	SWP1+
81446	XYZ>YZ	814C8	FIVEROLL	81568	SWAP#1+
8144B	SWAPROT	814CD	5UNROLL	8156D	DROPONE
8144B	XYZ>ZYX	814CD	FIVEUNROLL	81572	2DUP#<
8144B	UNROTSWAP	814D2	6DROP	81577	2DUP#=#
81450	7DROP	814D7	6PICK	8157C	DUP#0=#

81581	#3=	8162B	9PUTLAM	816E9	TYPEIDNT?
81586	DUP#1=	81630	10GETLAM	816EE	TYPELAM?
8158B	DUP#0<>	81635	10PUTLAM	816F3	TYPELIST?
81590	!!append\$	8163A	11GETLAM	816F8	TYPERRARY?
81595	#-#2/	8163F	11PUTLAM	816FD	TYPEREAL?
8159A	DROPZERO	81644	12GETLAM	81702	TYPEROMP?
8159F	2DROP00	81649	12PUTLAM	81707	TYPERRP?
815A4	#3+	8164E	13GETLAM	8170C	TYPESYMB?
815A9	#4+	81653	13PUTLAM	81711	BAK>HOME
815AE	#5+	81658	14GETLAM	81716	BAK>OB
815B3	#0=?SEMI	8165D	14PUTLAM	8171B	PORTOADDR
815B8	get1	81662	15GETLAM	81720	BAKNAME
815BD	6ROLL	81667	15PUTLAM	81725	'
815BD	SIXROLL	8166C	16GETLAM	8172A	'R
815C2	6UNROLL	81671	16PUTLAM	8172F	'REVAL
815C2	SIXUNROLL	81676	17GETLAM	81734	>R
815C7	DUPUNROT	8167B	17PUTLAM	81739	+LOOP
815C7	SWAPOVER	81680	18GETLAM	8173E	?SKIP
815CC	UNROT	81685	18PUTLAM	8173E	NOT_IT
815CC	XYZ>ZXY	8168A	19GETLAM	81743	AGAIN
815D1	ZEROZERO	8168F	19PUTLAM	81748	BEGIN
815D6	1GETLAM	81694	20GETLAM	8174D	COLA
815DB	1PUTLAM	81699	20PUTLAM	81752	DO
815E0	2GETLAM	8169E	21GETLAM	81757	EVAL
815E5	2PUTLAM	816A3	21PUTLAM	8175C	INDEX@
815EA	3GETLAM	816A8	22GETLAM	81761	INDEXSTO
815EF	3PUTLAM	816AD	22PUTLAM	81766	ISTOP@
815F4	4GETLAM	816B2	CACHE	8176B	ISTOPSTO
815F9	4PUTLAM	816B7	TYPEARRY?	81770	JINDEX@
815FE	5GETLAM	816BC	TYPEBINT?	81775	JINDEXSTO
81603	5PUTLAM	816C1	TYPECARRY?	8177A	JSTOP@
81608	6GETLAM	816C6	TYPECHAR?	8177F	JSTOPSTO
8160D	6PUTLAM	816CB	TYPECMP?	81784	LOOP
81612	7GETLAM	816D0	TYPECOL?	81789	NOP
81617	7PUTLAM	816D5	TYPECSTR?	8178E	R>
8161C	8GETLAM	816DA	TYPEEXT?	81793	R@
81621	8PUTLAM	816DF	TYPEGROB?	81798	RDROP
81626	9GETLAM	816E4	TYPEHSTR?	8179D	REPEAT

817A2	RPIT	81865	BIGDISPN	818FB	#>=
817A7	RPITE	8186A	DISPROW1	81900	#<=
817AC	SKIP	8186A	DISP@01	81905	#ODD
817B1	UNTIL	8186A	BIGDISPROW1	8190A	d>
817B6	WHILE	8186F	DISPROW2	8190F	d<
817BB	ABND	8186F	DISP@09	81914	d>=
817C0	DOBIND	8186F	BIGDISPROW2	81919	d<=
817C5	GETLAM	81874	DISPROW3	8191E	d*
817CA	PUTLAM	81874	BIGDISPROW3	81923	dDIV
817CF	#*	81874	DISP@17	81928	dMOD
817D4	#+	81879	BIGDISPROW4	8192D	dmuldiv
817D9	#-	81879	DISP@25	81932	d>%
817DE	#/	81879	DISPROW4	81937	INT_00
817E3	#AND	8187E	DISPROW5	8193C	INT_01
817E8	#1+	81883	DISPROW6	81941	INT_02
817ED	#1-	81888	DISPROW7	81946	INT_03
817F2	#2*	8188D	DISPROW8	8194B	INT_04
817F7	#2+	81892	GBUFF	81950	INT_05
817FC	#2-	81897	GROB!	81955	INT_06
81801	#2/	8189C	GROB!ZERO	8195A	INT_07
81806	#=	818A1	HARDBUFF	8195F	INT_08
8180B	#<>	818A6	HARDBUFF2	81964	INT_09
81810	#<	818AB	INVGROB	81969	INT_0A
81815	#>	818B0	MAKEGROB	8196E	INT_0B
8181A	#0=	818B5	SUBGROB	81973	INT_0C
8181F	#0<>	818BA	\$>BIGGROB	81978	INT_0D
81824	AND	818BF	\$>GROB	8197D	INT_0E
8182E	NOT	818C4	\$>grob	81982	INT_0F
81833	OR	818C9	#>\$	81987	CAND
8183D	XOR	818CE	Putbitmap	8198C	COR
81842	EQ	818D3	Orbitmap	81991	TopicVarN@
81847	EQUAL	818D8	Xorbitmap	81996	TopicVarN!
8184C	TYPE	818DD	NotAndbitmap	8199B	BinLookup
81851	'DROPFALSE	818E2	Put3x5	819A0	CARCOMP
81856	NEWINDEP	818E7	Put5x7	819A5	INNERCOMP
8185B	DropSysObs	818EC	#NEG	819AA	LENCOMP
81860	ABUFF	818F1	#DIV	819AF	NTHELCOMP
81865	DISPN	818F6	#MOD	819B4	NULLCOMP?

819B9	SUBCOMP	81A77	AlowPrLcdCl	81B2B	RPICK
819BE	OCRC	81A7C	AllowPRLCD	81B30	CopyRegCOB
819C3	OSIZE	81A81	SetEcma94	81B35	NEXTCOMPOB
819C8	&\$	81A86	FLUSHKEYS	81B3A	POS\$
819CD	>H\$	81A86	FLUSH	81B3F	POS\$REV
819D2	>T\$	81A8B	CLCD10	81B44	POSCHR
819D7	CAR\$	81A90	ATTN?	81B49	POSCHRREV
819DC	LEN\$	81A95	SLOW	81B4E	ClrDA1Bad
819E1	NULL\$?	81A9A	VERYSLOW	81B53	ClrDA2aBad
819E6	SUB\$	81A9F	VERYVERYSLOW	81B58	ClrDA2bBad
819EB	ERROR@	81AA4	MDIMS	81B5D	ClrDA2bNoCh
819F0	ERRORSTO	81AA9	PUTEL	81B62	DA1Bad?
819F5	ERRORCLR	81AAE	!REDIMTEMP	81B67	DA2aBad?
819FA	DROPNULL\$	81AB3	!REDIMUSER	81B6C	DA2bNoCh?
819FF	TWODROPNULL\$	81AB8	!MATTRNnc	81B71	SetDA1Bad
81A04	GETEXITMSG	81ABD	GDISP?	81B76	SetDA1IsStat
81A09	EXITMSGSTO	81AC2	HEIGHTENGROB	81B7B	SetDA1NoCh
81A0E	ERRSET	81AC7	KILLGDISP	81B80	SetDA2aBad
81A13	ERRTRAP	81ACC	TOADISP	81B85	SetDA2aNoCh
81A18	ERRJMP	81AD1	TOGDISP	81B8A	SetDA2bBad
81A1D	SETLBERR	81AD6	WINDOWCORNER	81B8F	SetDA2bNoCh
81A22	SETMEMERR	81ADB	WINDOWDOWN	81B94	SetDA3Bad
81A27	SETROMPERR	81AE0	WINDOWLEFT	81B99	SetDA3NoCh
81A2C	ATTNFLAGCLR	81AE5	WINDOWRIGHT	81B9E	SetDA3ValidF
81A31	CHECKKEY	81AEA	WINDOWUP	81BA3	SetNoRollDA2
81A36	GETTOUCH	81AEF	WINDOWXY	81BA8	INHARDROM?
81A3B	REPKEY?	81AF4	PIXOFF	81BAD	GROBDIM
81A40	GARBAGE	81AF9	PIXOFF3	81BB2	LINEOFF
81A45	MEM	81AFE	PIXON	81BB7	LINEOFF3
81A4A	TOTEMPOB	81B03	PIXON?	81BBC	LINEON
81A4F	INTEMNOTREF?	81B08	PIXON3	81BC1	LINEON3
81A54	ClrSysFlag	81B0D	PIXON?3	81BC6	TOGLINE
81A59	ClrUserFlag	81B12	OLASTOWDOB!	81BCB	TOGLINE3
81A5E	SetSysFlag	81B12	OLastRomWrd!	81BD0	LINECHANGE
81A63	SetUserFlag	81B17	ERRBEEP	81BD5	ARSIZE
81A68	TestSysFlag	81B1C	setbeep	81BDA	DIMLIMITS
81A6D	TestUserFlag	81B21	RDUP	81BDF	GETATELN
81A72	SUB\$1#	81B26	RROLL	81BE4	MAKEARRY

81BE9	#>CHR	81CAC	ABSCOERCE	81D88	OpenUart?Clr
81BEE	#>HXS	81CB1	COERCE	81D8D	SetInAplet
81BF3	\$>ID	81CB6	UNCOERCE	81D92	ClrInAplet
81BF8	%>C%	81CBB	COMPEVAL	81D97	InApletF?
81BFD	C%>%	81CD9	CK&DISPATCH0	81D9C	SV_?defined
81C02	CHR>#	81CDE	CK&DISPATCH1	81DA1	CalcDir+Offs
81C07	ID>\$	81CE3	CK&DISPATCH2	81DA6	AppDir+Offs
81C0C	#>ROMPTR	81CE8	!>ARRAY	81DAB	Contxt+Offs
81C11	@	81CF2	top&	81DB0	LastBut0
81C16	@LAM	81CF7	psh1&	81DB5	LastBut1
81C1B	COMPROMID	81CFC	psh1&rev	81DBA	LastBut2
81C20	COMPILEID	81D01	psh	81DBF	LastBut3
81C25	CONTEXT!	81D06	roll2ND	81DC4	LastBut4
81C2A	CONTEXT@	81D0B	roll3RD	81DC9	LastBut5
81C2F	CREATE	81D10	unroll2ND	81DCE	LastBut6
81C34	SYSCONTEXT	81D15	unroll3RD	81DD3	LastBut7
81C34	HOMEDIR	81D1A	rollNTH	81DD8	LastBut8
81C39	InitEnab	81D1F	roll4TH	81DDD	LastBut9
81C3E	MAKERRP	81D24	unroll4TH	81DE2	LastBut10
81C43	OFFSRRP	81D29	unrollNTH	81DE7	LastBut11
81C48	ONSRRP?	81D2E	ROT#1+UNROT	81DEC	LastBut12
81C4D	PURGE	81D33	NULLLargcase	81DF1	LastBut13
81C57	LASTRAM-WORD	81D38	DEPTH	81DF6	LastBut14
81C5C	PREVRAM-WORD	81D3D	DUP	81DFB	LastBut15
81C61	REPLACE	81D42	2DUP	81E00	LastBut16
81C66	ROMPTR>#	81D47	NDUP	81E05	LastBut17
81C6B	ROMPTR@	81D4C	SWAP	81E0A	LastBut18
81C70	STO	81D51	DROP	81E0F	LastBut19
81C75	STOLAM	81D56	2DROP	81E14	LastBut20
81C7F	SYSRRP?	81D5B	NDROP	81E19	LastBut21
81C84	TOSRRP	81D60	ROT	81E1E	LastBut22
81C89	tok8cktrior	81D65	OVER	81E23	LastBut23
81C8E	tok8trior	81D6A	PICK	81E28	LastBut24
81C93	nultrior	81D6F	ROLL	81E2D	LastBut25
81C98	SETNONEXTERR	81D74	UNROLL	81E32	LastBut26
81C9D	SETSIZEERR	81D79	BREAK	81E37	LastBut27
81CA2	SETTYPEERR	81D7E	GETSERIAL	81E3C	LastBut28
81CA7	SETSTACKERR	81D83	UARTBUFLEN	81E41	LastBut29



81E46	LastBut30	81FB8	EVALCRUNCH	82125	SetDAsBad
81E4B	LastBut31	81FC2	xEVAL	8212F	DO#EXIT
81E50	LastBut32	81FC7	NUMEVAL1	82139	DO\$EXIT
81E55	LASTBUTN	81FD1	ORcase	82143	AddEq\$
81E5A	Bubble	81FDB	FalseFalse	8214D	AlDrawMenu
81E64	MATCON	81FE5	SafeCrunch%	82157	BLANKIT
81E6E	MATREDIM	81FEF	DA10K?	82161	CHECKPICT
81E78	MATTRN	81FF9	DA2aOK?	8216B	check_xrange
81E82	REDIMPREP	82003	DA2bOK?	82175	check_yrange
81E8C	>HCOMP	8200D	DA2OK?	8217F	CKGROBFITS
81E96	>TCOMP	82017	DA3OK?	82189	DefauPtXit
81EA0	CDRCOMP	82021	DAsOK?	82193	DefauTrcInit
81EB4	AttnPOSCOMP	8202B	DA2aLess10K?	8219D	DispXFunc
81EBE	EQUALPOSCMP	82035	SetDA1Valid	821A7	DispYFunc
81EC8	Lookup	8203F	SetDA2aValid	821B1	DOCLLCD
81ED2	Lookup.1	82049	SetDA2bValid	821BB	DOERASE
81EDC	POSCOMP	82053	SetDA2Valid	821C5	DoDemo
81EE6	PUTLIST	8205D	SetDA3Valid	821CF	DODISP
81EF0	::N	82067	SetDA1Temp	821D9	DOLCD>
81EFA	{}N	82071	SetDA2aTemp	821E3	DOLCD>g0
81F04	SYMBN	8207B	SetDA3Temp	821ED	DOSHOWIT1
81F0E	EXTN	82085	SetDA2aEcho	821F7	DOSHOWIT1C
81F18	&COMP	8208F	ClrDA10K	82201	EraseGrob
81F22	ClrListUtil	82099	ClrDA2aOK	8220B	FuncPLoop
81F2C	ClearList1	820A3	ClrDA2bOK	82215	FUNCPLOT
81F36	ClearList2	820AD	ClrDA2OK	8221F	GDISPCENTER
81F40	ClearList3	820B7	ClrDA3OK	82229	GETXMIN
81F4A	ClearList4	820C1	SetDA2NoCh	82233	GETYMIN
81F54	ClearList5	820CB	SetDA12NoCh	8223D	GETXMAX
81F5E	ClearList6	820D5	SetDA23NoCh	82247	GETYMAX
81F68	ClearList7	820DF	SetDA13NoCh	82251	GROB+#
81F72	ClearList8	820E9	SetDA12a3NoCh	8225B	GROBBUFF!
81F7C	ClearList9	820E9	SetDA12a3NCh	82265	GROB>GDISP
81F86	ClearList0	820F3	SetDAsNoCh	8226F	GROBVIEW
81F90	ListNames	820FD	SetDA2Temp	82279	InitIndep
81F9A	ABORT	82107	SetDA12Temp	82283	Init_window
81FA4	blackbox	82111	SetDAsTemp	8228D	JUMPBOT
81FAE	DUP#0=case	8211B	AnyDABad?	82297	JUMPTOP

822A1	JUMPLEFT	8241D	TBRollU3x5	825F3	DoDispPrompt
822AB	JUMPRIGHT	82427	TBRollU5x7	825FD	DoDispList
822B5	MakeBoxLabel	82431	TDDat3x5C1	82607	DoSaveCovWin
822BF	MakeDirLabel	8243B	TDDat3x5C2	82611	DoRestCovWin
822C9	MakeInvLabel	82445	TDDat3x5C3	8261B	MoreU/D?
822D3	MakeStdLabel	8244F	TDDat3x5C4	82625	LHighlight
822DD	PickedEqs@	82459	TDDat3x5C5	8262F	LUnHighlight
822E7	PUTXMIN	82463	TDDatD3x5	82639	?DispMoreU/D
822F1	PUTYMIN	8246D	TDDatL3x5	82643	MoreUp?
822FB	PUTXMAX	82477	TDDatR3x5	8264D	MoreDown?
82305	PUTYMAX	82481	TDDatU3x5	82657	grobMoreUp
8230F	RECLAIMDISP	8248B	TDDatF3x5	82661	grobMoreDown
82319	s1>	82495	TraceY	8266B	grobNoMore
82323	SCROLLDOWN	8249F	TURNMENUOFF	82675	GetDASpecFlag
8232D	SCROLLLEFT	824A9	TURNMENUON	8267F	PutDASpecFlag
82337	SCROLLRIGHT	824B3	MENUOFF?	82689	EmptyList?
82341	SCROLLUP	824BD	UnpackGrob	8269D	LEDispBorder
8234B	Set_window	824C7	WINDOWBOT?	826C5	LESetItem
82355	SplitTraceInit	824D1	WINDOWLEFT?	826CF	LESetIDecomp
8235F	Std/BoxLabel	824DB	WINDOWRIGHT?	826D9	LESetRowWidth
82369	StndXYCoord?	824E5	WINDOWTOP?	826E3	ListBar
82373	TBColl3x5	824EF	XYGROBDISP	826ED	?AdjFocusPos
8237D	TBColl5x7	824F9	DoEditLine	826F7	grobPOBox2
82387	TBColR3x5	82503	TBEdSfKeys	82701	grobPOBox3
82391	TBColR5x7	8250D	DoEditLCancel	8270B	grobPOBox4
8239B	TBDrawF3x5	82517	DoEditLOK	82715	grobPOBox5
823A5	TBDrawF5x7	82521	PrepEdLKeyOb	8271F	grobPOBoxP2
823AF	TBErrorGrob	82535	2ColChoose	82729	grobPOBoxP3
823B9	TBFormat	8253F	2CDispList	82733	grobPOBoxP4
823C3	TBInv3x5C0	82549	SwapL/RMets	8273D	DoInputForm
823CD	TBInv3x5C1	82553	SaveListMets	82747	IFMenu
823D7	TBInv3x5C2	8255D	InitListMets	82751	IFEdLineMenu
823E1	TBInv3x5C3	82567	Init2ColMets	8275B	IFEDispClient
823EB	TBInv5x7C0	82571	2Col?Case2Col	82765	IFEDispTitle
823F5	TBInv5x7C1	8257B	DoAs2Col	8276F	IFEDispLabel
823FF	TBInv5x7C2	82585	EmptyRList?	82783	DoDispField
82409	TBRollD3x5	825DF	2CKeyOK	8278D	IFEUnShowSel
82413	TBRollD5x7	825E9	DoDispBorder	82797	InvertField

827A1	IFEDispHelp	8296D	EvalPart3	82AFD	DoGetObFrSto
827AB	IFEChech	82977	KeyFace	82B07	StdIOProc
827B5	IFECheoseNext	82981	FAreaBad?	82B11	GetObTypePr\$
827BF	IFECheosByChr	8298B	SetFAreaOK	82B1B	GetObType\$
827D3	DoKeyChoos/Ck	82995	SetFAreaBad	82B25	DoIOStatusBox
827DD	DoKeyChoose	8299F	SetFAreasOK	82B2F	DoIOErrAlert
827E7	DoKeyCheck	829A9	SetFAreasBad	82B39	ElsieGet
82805	SelNextField	829B3	MakeTitleBar	82B43	ElsieSend
8280F	SelPrevField	829BD	?FixFieldKeys	82B4D	ElsiePkt
82823	Sel&DispNextF	829C7	Choose&DoTask	82B57	DOFINISH
8282D	IsIFMenu?	829D1	PlaceFVals	82B61	SEFINISH
82837	FitLeftSmF	829DB	Done?CkNoNul:	82B6B	PrintHist
82841	FitRightSmF	829E5	#=Lookup	82B75	PrintVar
8284B	WidthSmF	829EF	?GetMsg	82B7F	PrintVarOb
82855	GetNextFId	829F9	DoResultTab	82B89	PrintLcd
8285F	GetPrevFId	82A03	LockAlpha	82B93	prx1
82869	DecompOb	82A0D	UnLockAlpha	82B9D	OpenIO
82873	StdDecompNoNL	82A17	grobCheck	82BA7	PUTSERIAL
8287D	DecompNoNL	82A21	grobCheckX	82BB1	PRINT
82887	RclFieldVal	82A2B	grobInvChk	82BBB	'DoBadKey
82891	IsNullField?	82A35	grobInvChkX	82BC5	?ATTN_QUIT
8289B	?GetFObTypes	82A3F	grobUnCheckX	82BC5	?ATTNQUIT
828A5	GetChoiceList	82A49	grobInvUnChkX	82BCF	?CaseKeyDef
828AF	GetChoiceFmt	82A53	grobInvNoChk	82BD9	Ck&DecKeyLoc
828B9	RclResetVal	82A71	grobQueryIcon	82BE3	CodePl>%rc.p
828C3	DoMatEdit	82A7B	grobTitleBar	82BED	?CaseRomptr@
828EB	NextTextLine	82A85	FTypeText?	82BF7	?NoTaskSwDef
828FF	DoQueryBox	82A8F	FTypeList?	82C01	DOWAIT
82909	DoAlert&Query	82A99	FTypeFixedL?	82C0B	dowait
82913	DoSpecAlert	82AA3	FTypeCheck?	82C15	Box/StdLabel
8291D	BlankClient	82AAD	DoSendOb	82C1F	DispMenu
82927	BlankHelp	82AB7	DoSendObToE1	82C29	DispMenu.1
82931	GtoField	82AC1	DoSendObToSto	82C3D	GETKEY
8293B	GetPart1	82ACB	DoSendObToCDi	82C47	InitMenu
82945	GetPart2	82AD5	DoSendObToDir	82C51	IsTaskSwKey?
8294F	GetPart3	82ADF	docr	82C5B	KEYINBUFFER?
82959	EvalPart1	82AE9	DoRecv/GetOb	82C65	Key>StdKeyOb
82963	EvalPart2	82AF3	DoRecvObFrEls	82C6F	ModifierKey?

82C79	NoExitAction	82E09	DoInApLbCxt	82F99	%MIN
82C8D	POLSaveUI	82E13	DoInPgmCxt	82FA3	%POL>%REC
82C97	POLKeyUI	82E1D	DoInNotCxt	82FAD	%R>D
82CA1	POLResUI&Err	82E27	GetNextToken	82FB7	%RANDOMIZE
82CAB	POLRestoreUI	82E31	realPA	82FC1	%REC>%POL
82CB5	POLSetUI	82E3B	solverTTT	82FCB	%SPH>%REC
82CBF	POLSetUIExt	82E45	!*triand	82FD5	DOROOT
82CC9	POLErrorTrap	82E4F	'Rapndit	82FDF	RNDXY
82CD3	ParOuterLoop	82E59	1GETapndcpl	82FE9	SYMBNUMSOLVE
82CDD	REPEATER	82E63	FOURpsh	82FF3	TRCXy
82CE7	REPEATERCH	82E77	P::N	82FFD	?>ROMPTR
82CFB	TempMenuBuff	82E8B	SWAPcompSWAP	83007	?ROMPTR>
82D05	TurnOff	82E95	'RWP1+	83011	RESOROMP
82D0F	WaitForKey	82E9F	apndit	8301B	PTYPE>PINFO
82D19	CHANGETYPE	82EA9	chooselst	83025	tTYPE@
82D23	CKREF	82EB3	completed	8302F	GetElNoRomp
82D2D	CREATEDIR	82EBD	dvbind	83039	DoRomPtrKey
82D37	MemStoAns	82EC7	elsiename	83043	resolved
82D41	Port0Ids	82ED1	failed	8304D	NDUPN
82D4B	NULLID	82EDB	filename	83057	metaDUP
82D55	StoVar	82EE5	newsymbPA	83061	psh&
82D5F	XEQSETLIB	82EEF	oneexpr	8306B	psh1
82D69	StoAns@	82EF9	onestring	83075	psh1top&
82D73	StoAns@Drp	82F03	optfilename	8307F	&&
82D7D	UserSto	82F0D	threeexprs	83089	pshmonop
82D87	XSTOp	82F17	tok;triand	83093	psharg
82D91	XSTOp0	82F21	toktriand	8309D	pshtop&
82D9B	XRCLp	82F2B	twoexprs	830A7	pshzer
82DA5	X@	82F35	twostrings	830B1	#1-SWAP
82DAF	XPURGEp	82F3F	%0<>	830B1	pull
82DB9	XPURGEp0	82F49	%0>=	830BB	pullrev
82DC3	HOME>BAK	82F53	%D>R	830C5	pullpsh1&
82DCD	OB>BAK	82F5D	%FACT	830CF	reversym
82DD7	GetBVars.1	82F67	%HMS+	830D9	unsyminner
82DE1	GetApDirLst	82F71	%HMS-	830E3	syminner&
82DEB	CatThisCxt	82F7B	%HMS>	830ED	syminnertwo
82DF5	CatPgm	82F85	%>HMS	830F7	syminner&N
82DFE	CatNot	82F8F	%MAX	83101	argswap&&

8310B	argswap	83273	TOLSetTopicUI	833EF	ChooseVEntry
83115	argswapnext	8327D	TOLSetViewUI	833F9	ChooseVExit
8311F	numargs	83287	TOLKeyUI	83403	ChooseViewUI
83129	metainsert	83291	TOLErrorTrap	8340D	MakePlotVTt1
83133	verysyminner	8329B	TOLResUI&Err	83417	MakePlotSVTt1
8313D	veryunsymin	832A5	TOLRestoreUI	83421	MakeNumVTt1
83147	unsymone	832AF	?ExitThisTop	8342B	MakeNumSVTt1
83151	vunsymfcn	832B9	AngleLabel	83435	MakeSymbVTt1
8315B	M+prep	832C3	AngleField	8343F	MakeSymbSVTt1
83165	APPEND_SPC	832CD	DoCurrAplet	83449	MakeNoteVTt1
8316F	!append\$	832D7	DoCapPlotV	83453	MakeSketVTt1
83179	CDR\$	832E1	DoCapTableV	8345D	MakeViewTitle
83183	DECOMP\$	832EB	DoCapSymbV	83467	InAplet?
8318D	DO>STR	832F5	DoCapPlotSV	83471	SV_actual
83197	EDITDECOMP\$	832FF	DoCapTableSV	8347B	SV_calledit
831A1	SafeDecomp	83309	DoCapSymbSV	83485	SV_getbody
831AB	StripTicks	83313	DoCapNoteV	8348F	SV_keycancel
831B5	SWAP&\$	8331D	DoCapSketchV	83499	SV_keycheck
831BF	Decomp%Short	83327	FuncPSetup1	834A3	SV_keyedit
831C9	BIND	83331	FuncSplitViewers	834AD	SV_keyeval
831D3	SysTime	8333B	PrepCurrAplet	834B7	SV_keyok
831D3	CLKTICKS	83345	SelectAplet	834C1	SV_keyshow
831DD	GETTHEMMSG	8334F	StoAplet	834CB	SV_setgrob19
831E7	JstGETTHEMMSG	83359	PurgeAplet	834D5	SV_setitem0
831E7	JstGetTHEMMSG	83363	PurgeAplet0b	834DF	topic_install
831F1	alg=	8336D	RclAplet?Err	834E9	topic_uninstall
831FB	Replace_List	83377	RclAplet	834F3	EnterTextView
83205	startSQFORM	83381	NextApOfType	834FD	EnterGraphView
8320F	symcomp	8338B	Make1stAplet	83507	LeaveTextView
83219	PlotViewUI	83395	GetLastNotThis	83511	LeaveGraphView
83223	StdTableViewUI	8339F	ApNameId>Id	8351B	DTYPEARRY?
8322D	SymbViewUI	833A9	Id>ApNameId	8351B	DUPTYPEARRY?
83237	PlotOvViewUI	833B3	ApNameId>\$	83525	DUPTYPEBINT?
83241	TBStdZooms	833BD	ApName\$>Id	8352F	DUPTYPECHAR?
8324B	TBStdSplitInfo	833C7	DoApletLib	83539	DUPTYPECMP?
83255	TablSetViewUI	833D1	InpFormViewUI	83543	DUPTYPECOL?
8325F	TopOuterLoop	833DB	InpFormVEntry	83543	DTYPECOL?
83269	TOLSaveUI	833E5	InpFormVExit	8354D	DUPTYPECSTR?

8354D	DTYPECSTR?	837A0	OVERSWAP	83A84	4UNROLLROT
83557	DUPTYPEEXT?	837A0	OVERUNROT	83A98	DROPOVER
83561	DUPTYPEGROB?	837B4	ROLLSWAP	83AAC	EQOVER
8356B	DUPTYPEHSTR?	837C8	NULL\$SWAP	83AC0	#+OVER
83575	DUPTYPEIDNT?	837DC	SUB\$SWAP	83AD4	#-OVER
8357F	DUPTYPELAM?	837F0	%MAXorder	83AE8	ZEROOVER
83589	DTYPELIST?	8380E	?SKIPSWAP	83AFC	UNROTOVER
83589	DUPTYPELIST?	83822	1ABNSWAP	83B10	4ROLLOVER
83593	DUPTYPEREAL?	8383B	ROT+SWAP	83B24	3PICKOVER
83593	DTYPEREAL?	8383B	ROT#+SWAP	83B38	4PICKOVER
8359D	DUPTYPEROMP?	83854	4PICK+SWAP	83B4C	DUPPICK
835A7	DUPTYPERRP?	83854	4PICK#+SWAP	83B60	DUPROLL
835B1	DUPTYPESYMB?	8386D	#+SWAP	83B88	8UNROLL
835BB	DUPTYPEPETH?	83881	#-SWAP	83B9C	10UNROLL
835C5	{NoteText}	83895	#1+SWAP	83BB0	OVERARSIZE
835CF	{NumVars}	838A9	ZEROSWAP	83BC4	'ERRJMP
835D9	{SketchSet}	838BD	#1-1SWAP	83BD8	caseERRJMP
835E3	2DROPFALSE	838D6	ONESWAP	83BEC	?CARCOMP
835F7	INCOMPDROP	838EA	COERCESWAP	83C00	NEWLINE\$\$
8360B	NTHCOMPDROP	838FE	%>%SWAP	83C00	NEWLINE&\$
8361F	APPEND_SPACE	83926	XYZ>ZTRUE	83C14	#1-{}N
83633	7UNROLL	8393A	4ROLLSWAP	83C28	TWO{}N
83647	#0=UNTIL	8394E	3PICKSWAP	83C3C	THREE{}N
83674	DUP@	83962	4PICKSWAP	83C50	DUPINCOMP
83688	DUPROMPTR@	83976	1GETSWAP	83C64	SWAPINCOMP
8369C	#=ITE	8398A	?SWAP	83C78	DUPNULL\$?
836B0	INNERDUP	8399E	!append\$SWAP	83C8C	DUPNULLCOMP?
836C4	NOTAND	839B2	NOT?SWAPDROP	83CA0	DUPLENCOMP
836D8	TOTEMPSWAP	839CB	?SWAPDROP	83CB4	#1-SUB\$
836EC	ROT2DUP	839E4	#1+NDROP	83CC8	1_#1-SUB
83700	ROTAND	839E4	N+1DROP	83CC8	1_#1-SUB\$
83714	ROTOVER	839F8	ROLLDROP	83CDC	LAST\$
83728	DUPDUP	83A0C	MDIMSDROP	83CF0	#1+LAST\$
8373C	OVERDUP	83A20	DUPROT	83D04	DUP\$>ID
83750	COERCEDUP	83A34	DROPROT	83D18	SWAP%>C%
83764	UNROTDUP	83A48	#1-ROT	83D2C	'NOP
83778	4UNROLLDUP	83A70	4ROLLROT	83D40	::NEVAL
8378C	NTHCOMDDUP	83A70	FOURROLLROT	83D54	2GETEVAL

83D68	DROPRDROP	84083	2#0=OR	84380	STO'
83D81	SWAPCOLA	840A1	OVER#0=	84394	TRUE'
83D95	XYZ>ZCOLA	840B5	OVER#<	843A8	ONEFALSE'
83DA9	#0=?SKIP	840C9	#<3	843C1	FALSE'
83DC2	#1=?SKIP	840DD	DUP#<7	843D5	#1+'
83DDB	#=?SKIP	840F6	INNER#1=	843E9	'R'R
83DF4	ONE_EQ	8410A	#5=	84407	'RRDROP
83E08	#>?SKIP	8411E	#2<>	84420	ONECOLA
83E21	COLASKIP	84132	OVER#>	84434	dvarlsBIND
83E35	NOT_UNTIL	84146	#>1	84448	'LAMLNAMESTO
83E4E	NOT_WHILE	84146	ONE#>	84461	'xDEREQ
83E67	DUP#0<>WHILE	8415A	2DUP#+	8447A	DUPNULL-{}?
83E80	DUPINDEX@	8415A	DUP3PICK#+	84493	DUPZERO
83E94	SWAPINDEX@	8416E	ROT#+	844A7	DUPONE
83EA8	OVERINDEX@	84182	OVER#+	844BB	SWAPONE
83EBC	SWAPLOOP	84196	3PICK#+	844CF	ONEDUP
83ED5	DROPLoop	841AA	4PICK#+	844CF	ONEONE
83EEE	DUP#0_DO	841BE	ROT#-	844E3	DUPTWO
83F07	toLEN_DO	841D2	OVER#-	844F7	NOTcsdrpfls
83F25	1GETABND	841E6	INDEX@#-	84510	caseSIZEERR
83F39	DUP1LAMBIND	841FA	SWAPOVER#-	84524	NcaseSIZEERR
83F3E	1LAMBIND	8420E	ROT#1+	84538	CKREAL
83F52	caseTRUE	84222	SWAP#1-	84551	NcaseTYPEERR
83F66	TRUEFALSE	84236	DROP#1-	84579	'xDER
83F66	TrueFalse	8424A	ERROROUT	8458D	%/>%
83F7A	FALSETRUE	8425E	SWAP2DUP	845A1	UNCOERCE%%
83F7A	FalseTrue	84272	RSKIP	845B5	DUP%0=
83F8E	ZEROFALSE	84290	GROB!ZERODRP	845C9	SWAP%%/
83FA2	ONEFALSE	842A4	casedrptru	845DD	caseDrpBadKy
83FB6	#=casedrpfls	842BD	NOTcaseTRUE	845F6	caseDEADKEY
83FD9	casedrpfls	842D6	NOTcaseFALSE	845F6	caseDoBadKey
83FF2	case2drpfls	842EF	?SEMIDROP	8460F	GROBDIMw
8400B	caseFALSE	84308	SWAPUnDROP	84637	XYZW>YWZX
8401F	ORNOT	8431C	SWAPUnNDROP	84637	SWAP4ROLL
84033	EQUALNOT	84330	DUP'	8464B	2DUP5ROLL
84047	2DUPEQ	84344	SWAP'	8465F	SWAP3PICK
8405B	EQOR	84358	DROP'	84673	3PICK3PICK
8406F	EQUALOR	8436C	OVER'	84687	SWAP4PICK



8469B	OVER5PICK	8499D	pZpargSWAPUn	84C34	otherPTR@
846AF	EQUALcasedrp	849B1	DROPNDROP	84C44	TopicVar1!
846C8	DUP#0=csDROP	849C5	2OVER	84C54	TopicVar1@
846E1	jEQcase	849D9	?0b>Seco	84C64	TopicVar2!
846F5	ANDcase	849F2	0b>Seco	84C74	TopicVar2@
84709	EQUALcase	84A06	20b>Seco	84C84	TopicVar3!
8471D	#<case	84A1A	ZEROISTOPSTO	84C94	TopicVar3@
84731	#1=case	84A1A	ExitAtLOOP	84CA4	TopicVar4!
84745	#<>case	84A2E	1GETLAM#0=	84CB4	TopicVar4@
84759	#>2case	84A42	OVER#1-	84CC4	TopicVar5!
84772	#>case	84A56	#=POSCOMP	84CD4	TopicVar5@
84786	j%0=case	84A6F	EQUALPOSCOMP	84CE4	TopicVar6!
8479A	REALcase	84A88	NTHOF	84CF4	TopicVar6@
847AE	dARRAYcase	84A9C	EQLookup	84D04	TopicVar7!
847C2	dLISTcase	84ABA	CHR>\$	84D14	TopicVar7@
847D6	EditExstCase	84AD3	1NULLLAM{}	84D24	TopicVar8!
847EA	ANDNOTcase	84AD8	NULLLAM	84D34	TopicVar8@
847FE	EQUALNOTcase	84AE4	CALCCXT!	84D44	TopicVar9!
84812	dIDNTNcase	84AF4	CALCCXT@	84D54	TopicVar9@
84826	dREALNcase	84B04	PGMCXT!	84D64	TopicVar10!
8483A	EQIT	84B14	PGMCXT@	84D74	TopicVar10@
84853	DUP#0=IT	84B24	NOTESCXT!	84D84	TopicVar11!
8486C	ANDITE	84B34	NOTESCXT@	84D94	TopicVar11@
84880	EQITE	84B44	apletPTR!	84DA4	TopicVar12!
84894	#0=ITE	84B54	apletPTR@	84DB4	TopicVar12@
848A8	#<ITE	84B64	funcPTR!	84DC4	TopicVar13!
848BC	#>ITE	84B74	funcPTR@	84DD4	TopicVar13@
848D0	DUP#0=ITE	84B84	polarPTR!	84DE4	TopicVar14!
848E4	UserITE	84B94	polarPTR@	84DF4	TopicVar14@
848F8	SysITE	84BA4	paramPTR!	84E04	TopicVar15!
8490C	top&Cr	84BB4	paramPTR@	84E14	TopicVar15@
84925	metaROTDUP	84BC4	seqPTR!	84E24	TopicVar16!
84939	ROTUntop&	84BD4	seqPTR@	84E34	TopicVar16@
8494D	rolltwotop&	84BE4	statPTR!	84E44	TopicVar17!
8494D	roll2top&	84BF4	statPTR@	84E54	TopicVar17@
84961	plDRPpZparg	84C04	solvePTR!	84E64	TopicVar18!
84975	&\$\$SWAP	84C14	solvePTR@	84E74	TopicVar18@
84989	SWAPCKREF	84C24	otherPTR!	84E84	TopicVar19!



84E94	TopicVar19@	850F4	TopicVar38@	85357	TopicVar56!
84EA4	TopicVar20!	85104	TopicVar39!	85367	TopicVar57@
84EB4	TopicVar20@	85114	TopicVar39@	85377	TopicVar57!
84EC4	TopicVar21!	85124	TopicVar40!	85387	TopicVar58@
84ED4	TopicVar21@	85134	TopicVar40@	85397	TopicVar58!
84EE4	TopicVar22!	85144	TopicVar41!	853A7	TopicVar59@
84EF4	TopicVar22@	85154	TopicVar41@	853B7	TopicVar59!
84F04	TopicVar23!	85164	TopicVar42!	853C7	TopicVar60@
84F14	TopicVar23@	85174	TopicVar42@	853D7	TopicVar60!
84F24	TopicVar24!	85184	TopicVar43!	853E7	TopicVar61@
84F34	TopicVar24@	85194	TopicVar43@	853F7	TopicVar61!
84F44	TopicVar25!	851A4	TopicVar44!	85407	TopicVar62@
84F54	TopicVar25@	851B4	TopicVar44@	85417	TopicVar62!
84F64	TopicVar26!	851C4	TopicVar45!	85427	TopicVar63@
84F74	TopicVar26@	851D4	TopicVar45@	85437	TopicVar63!
84F84	TopicVar27!	851E4	TopicVar46!	85447	TopicVar64@
84F94	TopicVar27@	851F4	TopicVar46@	85457	TopicVar64!
84FA4	TopicVar28!	85204	TopicVar47!	85467	TopicVar65@
84FB4	TopicVar28@	85214	TopicVar47@	85477	TopicVar65!
84FC4	TopicVar29!	85224	TopicVar48!	85487	TopicVar66@
84FD4	TopicVar29@	85234	TopicVar48@	85497	TopicVar66!
84FE4	TopicVar30!	85244	TopicVar49!	854A7	TopicVar67@
84FF4	TopicVar30@	85254	TopicVar49@	854B7	TopicVar67!
85004	TopicVar31!	85264	TopicVar50!	854C7	TopicVar68@
85014	TopicVar31@	85274	TopicVar50@	854D7	TopicVar68!
85024	TopicVar32!	85284	TopicVar51!	854E7	TopicVar69@
85034	TopicVar32@	85294	TopicVar51@	854F7	TopicVar69!
85044	TopicVar33!	852A4	TopicVar52@	85507	TopicVar70@
85054	TopicVar33@	852B4	TopicVar52!	85517	TopicVar70!
85064	TopicVar34!	852C4	TopicVar53@	85527	TopicVar71@
85074	TopicVar34@	852D0	doptr@	85537	TopicVar71!
85084	TopicVar35!	852E0	TopicVar53!	85547	TopicVar72@
85094	TopicVar35@	852EC	doptr!	85557	TopicVar72!
850A4	TopicVar36!	85307	TopicVar54@	85567	TopicVar73@
850B4	TopicVar36@	85317	TopicVar54!	85577	TopicVar73!
850C4	TopicVar37!	85327	TopicVar55@	85587	TopicVar74@
850D4	TopicVar37@	85337	TopicVar55!	85597	TopicVar74!
850E4	TopicVar38!	85347	TopicVar56@	855A7	TopicVar75@

855B7	TopicVar75!	85817	TOLVar3@	85A77	TOLVar22@
855C7	TopicVar76@	85827	TOLVar4!	85A87	TOLVar23!
855D7	TopicVar76!	85837	TOLVar4@	85A97	TOLVar23@
855E7	TopicVar77@	85847	TOLVar5!	85AA7	TOLVar24!
855F7	TopicVar77!	85857	TOLVar5@	85AB7	TOLVar24@
85607	TopicVar78@	85867	TOLVar6!	85AC7	TOLVar25!
85617	TopicVar78!	85877	TOLVar6@	85AD7	TOLVar25@
85627	TopicVar79@	85887	TOLVar7!	85AE9	TOLVar26!
85637	TopicVar79!	85897	TOLVar7@	85AFB	TOLVar26@
85647	TopicVar80@	858A7	TOLVar8!	85B0D	TOLVar27!
85657	TopicVar80!	858B7	TOLVar8@	85B1F	TOLVar27@
85667	TopicVar81@	858C7	TOLVar9!	85B31	TOLVar28!
85677	TopicVar81!	858D7	TOLVar9@	85B43	TOLVar28@
85687	TopicVar82@	858E7	TOLVar10!	85B55	TOLVar29!
85697	TopicVar82!	858F7	TOLVar10@	85B67	TOLVar29@
856A7	TopicVar83@	85907	TOLVar11!	85B79	TOLVar30!
856B7	TopicVar83!	85917	TOLVar11@	85B8B	TOLVar30@
856C7	TopicVar84@	85927	TOLVar12!	85B9D	TOLVar31!
856D7	TopicVar84!	85937	TOLVar12@	85BAF	TOLVar31@
856E7	TopicVar85@	85947	TOLVar13!	85BC1	TOLVar32!
856F7	TopicVar85!	85957	TOLVar13@	85BD3	TOLVar32@
85707	TopicVar86@	85967	TOLVar14!	85BE5	TOLVar33!
85717	TopicVar86!	85977	TOLVar14@	85BF7	TOLVar33@
85727	TopicVar87@	85987	TOLVar15!	85C09	TOLVar34!
85737	TopicVar87!	85997	TOLVar15@	85C1B	TOLVar34@
85747	TopicVar88@	859A7	TOLVar16!	85C2D	TOLVar35!
85757	TopicVar88!	859B7	TOLVar16@	85C3F	TOLVar35@
85767	TopicVar89@	859C7	TOLVar17!	85C51	TOLVar36!
85777	TopicVar89!	859D7	TOLVar17@	85C63	TOLVar36@
85787	TopicVar90@	859E7	TOLVar18!	85C75	TOLVar37!
85797	TopicVar90!	859F7	TOLVar18@	85C87	TOLVar37@
857A7	TopicVar91!	85A07	TOLVar19!	85C99	TOLVar38!
857B7	TopicVar91@	85A17	TOLVar19@	85CAB	TOLVar38@
857C7	TOLVar1!	85A27	TOLVar20!	85CBD	TOLVar39!
857D7	TOLVar1@	85A37	TOLVar20@	85CCF	TOLVar39@
857E7	TOLVar2!	85A47	TOLVar21!	85CE1	TOLVar40!
857F7	TOLVar2@	85A57	TOLVar21@	85CF3	TOLVar40@
85807	TOLVar3!	85A67	TOLVar22!	85D05	TOLVar41!

85D17	TOLVar41@	85FC3	TOLVar60@	8626F	TOLVar79@
85D29	TOLVar42!	85FD5	TOLVar61!	86281	TOLVar80!
85D3B	TOLVar42@	85FE7	TOLVar61@	86293	TOLVar80@
85D4D	TOLVar43!	85FF9	TOLVar62!	862A5	TOLVar81!
85D5F	TOLVar43@	8600B	TOLVar62@	862B7	TOLVar81@
85D71	TOLVar44!	8601D	TOLVar63!	862C9	TOLVar82!
85D83	TOLVar44@	8602F	TOLVar63@	862DB	TOLVar82@
85D95	TOLVar45!	86041	TOLVar64!	862ED	TOLVar83!
85DA7	TOLVar45@	86053	TOLVar64@	862FF	TOLVar83@
85DB9	TOLVar46!	86065	TOLVar65!	86311	TOLVar84!
85DCB	TOLVar46@	86077	TOLVar65@	86323	TOLVar84@
85DDD	TOLVar47!	86089	TOLVar66!	86335	TOLVar85!
85DEF	TOLVar47@	8609B	TOLVar66@	86347	TOLVar85@
85E01	TOLVar48!	860AD	TOLVar67!	86359	TOLVar86!
85E13	TOLVar48@	860BF	TOLVar67@	8636B	TOLVar86@
85E25	TOLVar49!	860D1	TOLVar68!	8637D	TOLVar87!
85E37	TOLVar49@	860E3	TOLVar68@	8638F	TOLVar87@
85E49	TOLVar50!	860F5	TOLVar69!	863A1	TOLVar88!
85E5B	TOLVar50@	86107	TOLVar69@	863B3	TOLVar88@
85E6D	TOLVar51!	86119	TOLVar70!	863C5	TOLVar89!
85E7F	TOLVar51@	8612B	TOLVar70@	863D7	TOLVar89@
85E91	TOLVar52!	8613D	TOLVar71!	863E9	TOLVar90!
85EA3	TOLVar52@	8614F	TOLVar71@	863FB	TOLVar90@
85EB5	TOLVar53!	86161	TOLVar72!	8640D	TOLVar91!
85EC7	TOLVar53@	86173	TOLVar72@	8641F	TOLVar91@
85ED9	TOLVar54!	86185	TOLVar73!	86431	TOLVar92!
85EEB	TOLVar54@	86197	TOLVar73@	86443	TOLVar92@
85EFD	TOLVar55!	861A9	TOLVar74!	86455	TOLVar93!
85F0F	TOLVar55@	861BB	TOLVar74@	86467	TOLVar93@
85F21	TOLVar56!	861CD	TOLVar75!	86479	TOLVar94!
85F33	TOLVar56@	861DF	TOLVar75@	8648B	TOLVar94@
85F45	TOLVar57!	861F1	TOLVar76!	8649D	TOLVar95!
85F57	TOLVar57@	86203	TOLVar76@	864AF	TOLVar95@
85F69	TOLVar58!	86215	TOLVar77!	864C1	TOLVar96!
85F7B	TOLVar58@	86227	TOLVar77@	864D3	TOLVar96@
85F8D	TOLVar59!	86239	TOLVar78!	864E5	TOLVar97!
85F9F	TOLVar59@	8624B	TOLVar78@	864F7	TOLVar97@
85FB1	TOLVar60!	8625D	TOLVar79!	86509	TOLVar98!

8651B	TOLVar98@	867C7	TOLVar117@	86A73	TOLVar136@
8652D	TOLVar99!	867D9	TOLVar118!	86A85	TOLVar137!
8653F	TOLVar99@	867EB	TOLVar118@	86A97	TOLVar137@
86551	TOLVar100!	867FD	TOLVar119!	86AA9	TOLVar138!
86563	TOLVar100@	8680F	TOLVar119@	86ABB	TOLVar138@
86575	TOLVar101!	86821	TOLVar120!	86ACD	TOLVar139!
86587	TOLVar101@	86833	TOLVar120@	86ADF	TOLVar139@
86599	TOLVar102!	86845	TOLVar121!	86AF1	TOLVar140!
865AB	TOLVar102@	86857	TOLVar121@	86B03	TOLVar140@
865BD	TOLVar103!	86869	TOLVar122!	86B15	TOLVar141!
865CF	TOLVar103@	8687B	TOLVar122@	86B27	TOLVar141@
865E1	TOLVar104!	8688D	TOLVar123!	86B39	TOLVar142!
865F3	TOLVar104@	8689F	TOLVar123@	86B4B	TOLVar142@
86605	TOLVar105!	868B1	TOLVar124!	86B5D	TOLVar143!
86617	TOLVar105@	868C3	TOLVar124@	86B6F	TOLVar143@
86629	TOLVar106!	868D5	TOLVar125!	86B81	TOLVar144!
8663B	TOLVar106@	868E7	TOLVar125@	86B93	TOLVar144@
8664D	TOLVar107!	868F9	TOLVar126!	86BA5	TOLVar145!
8665F	TOLVar107@	8690B	TOLVar126@	86BB7	TOLVar145@
86671	TOLVar108!	8691D	TOLVar127!	86BC9	TOLVar146!
86683	TOLVar108@	8692F	TOLVar127@	86BDB	TOLVar146@
86695	TOLVar109!	86941	TOLVar128!	86BED	TOLVar147!
866A7	TOLVar109@	86953	TOLVar128@	86BFF	TOLVar147@
866B9	TOLVar110!	86965	TOLVar129!	86C11	TOLVar148!
866CB	TOLVar110@	86977	TOLVar129@	86C23	TOLVar148@
866DD	TOLVar111!	86989	TOLVar130!	86C35	TOLVar149!
866EF	TOLVar111@	8699B	TOLVar130@	86C47	TOLVar149@
86701	TOLVar112!	869AD	TOLVar131!	86C59	TOLVar150!
86713	TOLVar112@	869BF	TOLVar131@	86C6B	TOLVar150@
86725	TOLVar113!	869D1	TOLVar132!	86C7D	TOLVar151!
86737	TOLVar113@	869E3	TOLVar132@	86C8F	TOLVar151@
86749	TOLVar114!	869F5	TOLVar133!	86CA1	TOLVar152!
8675B	TOLVar114@	86A07	TOLVar133@	86CB3	TOLVar152@
8676D	TOLVar115!	86A19	TOLVar134!	86CC5	TOLVar153!
8677F	TOLVar115@	86A2B	TOLVar134@	86CD7	TOLVar153@
86791	TOLVar116!	86A3D	TOLVar135!	86CE9	TOLVar154!
867A3	TOLVar116@	86A4F	TOLVar135@	86CFB	TOLVar154@
867B5	TOLVar117!	86A61	TOLVar136!	86D0D	TOLVar155!

86D1F	TOLVar155@	86FCB	TOLVar174@	87277	TOLVar193@
86D31	TOLVar156!	86FDD	TOLVar175!	87289	TOLVar194!
86D43	TOLVar156@	86FEF	TOLVar175@	8729B	TOLVar194@
86D55	TOLVar157!	87001	TOLVar176!	872AD	TOLVar195!
86D67	TOLVar157@	87013	TOLVar176@	872BF	TOLVar195@
86D79	TOLVar158!	87025	TOLVar177!	872D1	TOLVar196!
86D8B	TOLVar158@	87037	TOLVar177@	872E3	TOLVar196@
86D9D	TOLVar159!	87049	TOLVar178!	872F5	TOLVar197!
86DAF	TOLVar159@	8705B	TOLVar178@	87307	TOLVar197@
86DC1	TOLVar160!	8706D	TOLVar179!	87319	TOLVar198!
86DD3	TOLVar160@	8707F	TOLVar179@	8732B	TOLVar198@
86DE5	TOLVar161!	87091	TOLVar180!	8733D	TOLVar199!
86DF7	TOLVar161@	870A3	TOLVar180@	8734F	TOLVar199@
86E09	TOLVar162!	870B5	TOLVar181!	87361	TOLVar200!
86E1B	TOLVar162@	870C7	TOLVar181@	87373	TOLVar200@
86E2D	TOLVar163!	870D9	TOLVar182!	87385	TOLVar201!
86E3F	TOLVar163@	870EB	TOLVar182@	87397	TOLVar201@
86E51	TOLVar164!	870FD	TOLVar183!	873A9	TOLVar202!
86E63	TOLVar164@	8710F	TOLVar183@	873BB	TOLVar202@
86E75	TOLVar165!	87121	TOLVar184!	873CD	TOLVar203!
86E87	TOLVar165@	87133	TOLVar184@	873DF	TOLVar203@
86E99	TOLVar166!	87145	TOLVar185!	873F1	TOLVar204!
86EAB	TOLVar166@	87157	TOLVar185@	87403	TOLVar204@
86EBD	TOLVar167!	87169	TOLVar186!	87415	TOLVar205!
86ECF	TOLVar167@	8717B	TOLVar186@	87427	TOLVar205@
86EE1	TOLVar168!	8718D	TOLVar187!	87439	TOLVar206!
86EF3	TOLVar168@	8719F	TOLVar187@	8744B	TOLVar206@
86F05	TOLVar169!	871B1	TOLVar188!	8745D	TOLVar207!
86F17	TOLVar169@	871C3	TOLVar188@	8746F	TOLVar207@
86F29	TOLVar170!	871D5	TOLVar189!	87481	TOLVar208!
86F3B	TOLVar170@	871E7	TOLVar189@	87493	TOLVar208@
86F4D	TOLVar171!	871F9	TOLVar190!	874A5	TOLVar209!
86F5F	TOLVar171@	8720B	TOLVar190@	874B7	TOLVar209@
86F71	TOLVar172!	8721D	TOLVar191!	874C9	TOLVar210!
86F83	TOLVar172@	8722F	TOLVar191@	874DB	TOLVar210@
86F95	TOLVar173!	87241	TOLVar192!	874ED	TOLVar211!
86FA7	TOLVar173@	87253	TOLVar192@	874FF	TOLVar211@
86FB9	TOLVar174!	87265	TOLVar193!	87511	TOLVar212!

87523	TOLVar212@	9A024	STTableDisp	BD675	Split2CKSUM@
87535	TOLVar213!	9A03D	STDoSmall	BD6B6	TStart@
87547	TOLVar213@	9A7B8	STDoMedium	BD6F7	TStep@
87559	TOLVar214!	9AE8B	STTableHKeys	BD738	TZoom@
8756B	TOLVar214@	9B5E8	STJump	BD779	TFlags@
8757D	TOLVar215!	9B6BA	STJumpN	BD7BA	Trow@
8758F	TOLVar215@	9BFA8	SEditKeyDef	BD7FB	Tcol@
875A1	TOLVar216!	9BFD8	STInsKeyDef	BD83C	TColl@
875B3	TOLVar216@	9C0B9	STBigKeyDef	BD87D	SplitRow@
875C5	TOLVarN!	9C1FA	STStatsKeyDef	BD8BE	BTRow1@
875E8	TOLVarN@	9C2CC	SWAPStatFlag	BD8FF	Format@
8760B	ClrAllTVars	9C4B2	STSortCol	BD940	Digits@
87641	ClrAllTOLVs	A4CEF	%-1	BDEA3	Root@
8765D	%0AllTopicVs	BA700	#+#2-	BDEE9	Slope@
87698	%0AllTOLVars	BD0B7	STO_tTYPE	BDF2F	Isect@
876D3	TOLVarSet!	BD10C	Xmin!	BDF75	Area@
877A0	%0TOLVarSet	BD120	Xmin@	BDFBB	Extremum@
877F0	lgetcxt!	BD14D	Xmax!	BE001	ListOfEqs@
87804	DoInCxt	BD161	Xmax@	BE03D	funcCache@
8785E	DoInCalcCxt	BD1A2	Ymin@	C0298	StatType!
87877	DoInAppCxt	BD1E3	Ymax@	C02B1	StatType@
87890	DoInFuncCxt	BD224	Xmin2@	C02F7	SVarType@
878A9	DoInPolarCxt	BD265	Xmax2@	C033D	StatPlot@
878C2	DoInParamCxt	BD2A6	Ymin2@	C0383	HisWidth@
878DB	DoInSeqCxt	BD2E7	Ymax2@	C03C9	Hmin@
878F4	DoInStatCxt	BD328	HTick@	C040F	Hmax@
8790D	DoInSolveCxt	BD369	VTick@	C0455	StatMark@
87926	DoInOtherCxt	BD3AA	HZoom@	C049B	StatModel@
879F3	otherNG?	BD3EB	VZoom@	C04E1	Stat2Flag@
87A26	GET@tTYPER	BD42C	Angle@	C0527	ReCalcFlag@
88527	?DispMenu	BD46D	LastX@	C056D	StatFont@
9165A	DispMsgBox	BD4AE	LastY@	C0586	StatMisc[]@
9216B	TBFuncDecomp	BD4EF	LastIndep@	C061C	StatFit@
97C29	STErrorGrob	BD530	LastEq@	C6B6B	Seq_eval0
99D95	STTableInit	BD571	PlotFlag@	C6BC5	Seq_eval1
99E30	STInitCols	BD5B2	Plot2Flg@	C6E45	Seq_eval2
99EF3	STArryList	BD5F3	PlotCKSUM@	C6FEE	Seq_evaln
99FFC	STTableExit	BD634	Split1CKSUM@	DDCFE	4PICK

DE46C	EQcase	0100A1	~DArrow	0050A2	~LSKey1.6
DE622	2'RCOLARPITE	0110A1	~RArrow	0060A2	~LSKey2.1
DEBF2	GPPushTLoop	0120A1	~NSKey4.1	0070A2	~LSKey2.2
DEC0B	GPPushFLoop	0130A1	~NSKey4.2	0080A2	~LSKey2.3
DF0F3	#8+	0140A1	~NSKey4.3	0090A2	~MissingKey3
DF133	#3-	0150A1	~NSKey4.4	00A0A2	~FarUArrow
E03A1	DemoFrames	0160A1	~NSKey4.5	00B0A2	~MissingKey4
F02B8	uart_buffer	0170A1	~NSKey4.6	00C0A2	~LSKey3.1
085002	~xxSIZE	0180A1	~Enter/Again	00D0A2	~LSKey3.2
086002	~xxPOS	0190A1	~NSKey5.2	00E0A2	~LSKey3.3
0A6002	~xERASEA	01A0A1	~NSKey5.3	00F0A2	~FarLArrow
0B6002	~xDISPLAY>	01B0A1	~NSKey5.4	0100A2	~FarDArrow
0B7002	~x>DISPLAY	01C0A1	~NSKey5.5	0110A2	~FarRArrow
0B8002	~xPLOT>	01D0A1	~NSKey6.1	0120A2	~LSKey4.1
0B9002	~x>PLOT	01E0A1	~NSKey6.2	0130A2	~LSKey4.2
0BA002	~xBLANKGROB	01F0A1	~NSKey6.3	0140A2	~LSKey4.3
0CE002	~rpnDER	0200A1	~NSKey6.4	0150A2	~LSKey4.4
0D1002	~rpnINTG	0210A1	~NSKey6.5	0160A2	~LSKey4.5
0D4002	~rpnWHERE	0220A1	~NSKey7.1	0170A2	~LSKey4.6
0D7002	~rpnAPPLY	0230A1	~NSKey7.2	0180A2	~LSKey5.1
0DA002	~COMPLEXDUMM	0240A1	~NSKey7.3	0190A2	~LSKey5.2
0DB002	~POLARDUMMY	0250A1	~NSKey7.4	01A0A2	~DoExponent
0000A1	~DoMenuKey1N	0260A1	~NSKey7.5	01B0A2	~LSKey5.4
0010A1	~DoMenuKey2N	0270A1	~NSKey8.1	01C0A2	~LSKey5.5
0020A1	~DoMenuKey3N	0280A1	~NSKey8.2	01D0A2	~LSKey6.1
0030A1	~DoMenuKey4N	0290A1	~NSKey8.3	01E0A2	~LSKey6.2
0040A1	~DoMenuKey5N	02A0A1	~NSKey8.4	01F0A2	~LSKey6.3
0050A1	~DoMenuKey6N	02B0A1	~NSKey8.5	0200A2	~LSKey6.4
0060A1	~PlotViewKey	02C0A1	~AttentionKe	0210A2	~LSKey6.5
0070A1	~SymbViewKey	02D0A1	~NSKey9.2	0220A2	~LSKey7.1
0080A1	~TableViewKe	02E0A1	~NSKey9.3	0230A2	~LSKey7.2
0090A1	~MissingKey1	02F0A1	~NSKey9.4	0240A2	~LSKey7.3
00A0A1	~UpArrow	0300A1	~NSKey9.5	0250A2	~LSKey7.4
00B0A1	~MissingKey2	0000A2	~LSKey1.1	0260A2	~LSKey7.5
00C0A1	~TopicLibKey	0010A2	~LSKey1.2	0270A2	~LSKey8.1
00D0A1	~NSKey3.2	0020A2	~LSKey1.3	0280A2	~LSKey8.2
00E0A1	~NSKey3.3	0030A2	~LSKey1.4	0290A2	~LSKey8.3
00F0A1	~LArrow	0040A2	~LSKey1.5	02A0A2	~LSKey8.4



02B0A2	~LSKey8.5	0200A4	~ANSKey6.4	0150A5	~ALSKey4.4
02C0A2	~LSKey9.1	0210A4	~ANSKey6.5	0160A5	~ALSKey4.5
02D0A2	~LSKey9.2	0220A4	~ANSKey7.1	0170A5	~ALSKey4.6
02E0A2	~LSKey9.3	0230A4	~ANSKey7.2	0180A5	~ALSKey5.1
02F0A2	~LSKey9.4	0240A4	~ANSKey7.3	0190A5	~ALSKey5.2
0300A2	~LSKey9.5	0250A4	~ANSKey7.4	01A0A5	~ALSKey5.3
0000A4	~ANSKey1.1	0260A4	~ANSKey7.5	01B0A5	~ALSKey5.4
0010A4	~ANSKey1.2	0270A4	~ANSKey8.1	01C0A5	~ALSKey5.5
0020A4	~ANSKey1.3	0280A4	~ANSKey8.2	01D0A5	~ALSKey6.1
0030A4	~ANSKey1.4	0290A4	~ANSKey8.3	01E0A5	~ALSKey6.2
0040A4	~ANSKey1.5	02A0A4	~ANSKey8.4	01F0A5	~ALSKey6.3
0050A4	~ANSKey1.6	02B0A4	~ANSKey8.5	0200A5	~ALSKey6.4
0060A4	~ANSKey2.1	02C0A4	~ANSKey9.1	0210A5	~ALSKey6.5
0070A4	~ANSKey2.2	02D0A4	~ANSKey9.2	0220A5	~ALSKey7.1
0080A4	~ANSKey2.3	02E0A4	~ANSKey9.3	0230A5	~ALSKey7.2
0090A4	~ANSKey2.4	02F0A4	~ANSKey9.4	0240A5	~ALSKey7.3
00A0A4	~ANSKey2.5	0300A4	~ANSKey9.5	0250A5	~ALSKey7.4
00B0A4	~ANSKey2.6	0000A5	~ALSKey1.1	0260A5	~ALSKey7.5
00C0A4	~ANSKey3.1	0010A5	~ALSKey1.2	0270A5	~ALSKey8.1
00D0A4	~ANSKey3.2	0020A5	~ALSKey1.3	0280A5	~ALSKey8.2
00E0A4	~ANSKey3.3	0030A5	~ALSKey1.4	0290A5	~ALSKey8.3
00F0A4	~ANSKey3.4	0040A5	~ALSKey1.5	02A0A5	~ALSKey8.4
0100A4	~ANSKey3.5	0050A5	~ALSKey1.6	02B0A5	~ALSKey8.5
0110A4	~ANSKey3.6	0060A5	~ALSKey2.1	02C0A5	~ALSKey9.1
0120A4	~ANSKey4.1	0070A5	~ALSKey2.2	02D0A5	~ALSKey9.2
0130A4	~ANSKey4.2	0080A5	~ALSKey2.3	02E0A5	~ALSKey9.3
0140A4	~ANSKey4.3	0090A5	~ALSKey2.4	02F0A5	~ALSKey9.4
0150A4	~ANSKey4.4	00A0A5	~ALSKey2.5	0300A5	~ALSKey9.5
0160A4	~ANSKey4.5	00B0A5	~ALSKey2.6	0000AB	~xVERSION
0170A4	~ANSKey4.6	00C0A5	~ALSKey3.1	0010AB	~xLININ
0180A4	~ANSKey5.1	00D0A5	~ALSKey3.2	0020AB	~XEQSYMLIN
0190A4	~ANSKey5.2	00E0A5	~ALSKey3.3	0030AB	~xCOND
01A0A4	~ANSKey5.3	00F0A5	~ALSKey3.4	0040AB	~xTRACE
01B0A4	~ANSKey5.4	0100A5	~ALSKey3.5	0050AB	~xSRAD
01C0A4	~ANSKey5.5	0110A5	~ALSKey3.6	0060AB	~xSNRM
01D0A4	~ANSKey6.1	0120A5	~ALSKey4.1	0070AB	~xRANK
01E0A4	~ANSKey6.2	0130A5	~ALSKey4.2	0080AB	~xLSQ
01F0A4	~ANSKey6.3	0140A5	~ALSKey4.3	0090AB	~xEGV



00A0AB	~xEGLV	0300AB	~xNSUB	05D0AB	~dopolyz
00B0AB	~xSVD	0310AB	~xENDSUB	05E0AB	~dopolydiv
00C0AB	~xSVL	0320AB	~xSTREAM	05F0AB	~dopcoeff
00D0AB	~xLU	0330AB	~x\85LIST	0600AB	~metapolyz
00E0AB	~xQR	0340AB	~ChkDaList	0610AB	~polyprep
00F0AB	~xLQ	0350AB	~x\9CLIST	0620AB	~poly+
0100AB	~xSCHUR	0360AB	~xDOLIST	0630AB	~polyneg
0110AB	~xRREF	0370AB	~xCONCAT	0640AB	~poly*
0120AB	~xRANM	0380AB	~xREVLIST	0660AB	~{StatVars}
0130AB	~x>ROW	0390AB	~xSORT	0670AB	~sn*spec
0140AB	~xROW>	03A0AB	~xFmList	0680AB	~ns*spec
0150AB	~x>COL	03B0AB	~xFmMat	0690AB	~ss*spec
0160AB	~xCOL>	03C0AB	~xxDEG	06A0AB	~poly^
0170AB	~x>DIAG	03D0AB	~xxRAD	06B0AB	~bad^
0180AB	~xDIAG>	03E0AB	~xxGRAD	06C0AB	~poly^#
0190AB	~xROW-	0430AB	~xFRACTION	06D0AB	~dopval
01A0AB	~xROW+	0440AB	~xSTAIRSTEP	06E0AB	~pdiv
01B0AB	~xCOL-	0450AB	~xCOBWEB	06F0AB	~resymb
01C0AB	~xCOL+	0460AB	~xHIST	0700AB	~poly/
01D0AB	~xRSWP	0470AB	~xBOWW	0000B9	~MiscIFMsg
01E0AB	~xCSWP	04B0AB	~xPOWERFIT	0000BB	~StatIFMsg
01F0AB	~xRCI	04C0AB	~xQUADFIT	0000BE	~PlotIFMsg
0200AB	~xRCIJ	04D0AB	~xCUBICFIT	0000BF	~SolveIFMsg
0210AB	~XEQDIAG>L	04E0AB	~xLOGISFIT	0000C0	~proot_c
0220AB	~XEQDIAG>R	04F0AB	~xUSERFIT	0010C0	~proot
0230AB	~XEQRANM	0500AB	~xStat1Var	0020C0	~proot_r
0240AB	~xPROOT	0510AB	~xStat2Var	0030C0	~peval
0250AB	~xPCOEF	0520AB	~xxITERATE	0040C0	~pcoef
0260AB	~xPEVAL	0530AB	~xMKMAT	0050C0	~pcoefacc1
0270AB	~xCHOOSE	0540AB	~xCOT	0060C0	~pcoefacc2
0280AB	~xMSGBOX	0550AB	~xSEC	0070C0	~PolyNSymbP
0290AB	~xXSEND	0560AB	~xCSC	0080C0	~PolyNSymbF
02A0AB	~xXRECV	0570AB	~xACOT	0000C2	~laSRAD
02B0AB	~xHEAD	0580AB	~xACSC	0010C2	~laVMAX%%
02C0AB	~XTAIL	0590AB	~xASEC	0020C2	~laEGLV
02D0AB	~xSEQ	05A0AB	~xRECURSE	0030C2	~laEGLV%%
02E0AB	~xDOSUBS	05B0AB	~xPOLYFORM	0040C2	~laEGV
02F0AB	~x\9BLIST	05C0AB	~xPoly	0050C2	~laSCHUR

0060C2	~laEgHF	02C0C2	~laRSVF	0520C2	~laRefineDT
0070C2	~laECQhQAQh	02D0C2	~laQRrank	0530C2	~laSV
0080C2	~laEgQkHA	02E0C2	~laQRSVecUp	0540C2	~laSVc
0090C2	~laEgRSchur	02F0C2	~laQRminSV	0550C2	~laIV
00A0C2	~laEgIsoVal	0300C2	~laQRmaxSV	0560C2	~laIVc
00B0C2	~laEgRQRI	0310C2	~rMAKEPCOPY	0570C2	~laIVF
00C0C2	~laEgQRIk0	0320C2	~rPACKARRYD	0580C2	~laULHSVF
00D0C2	~laEgRQRIk1	0330C2	~MAKEPIDN	0590C2	~laLsdScale
00E0C2	~laEgRWilk3	0340C2	~laSNORM	05A0C2	~laScIntRnd
00F0C2	~laEgM*RG3	0350C2	~laSNORM%%	05B0C2	~laRREF
0100C2	~laEgWilk2	0360C2	~laRANK	05C0C2	~laRedRow
0110C2	~laEgM*G2	0370C2	~laSVL	05D0C2	~laRedHere?
0120C2	~laEgValr	0380C2	~laSVD	05E0C2	~laEGetTiny
0130C2	~laEgRotR	0390C2	~laSvdUBD	0000C3	~laRANM
0140C2	~laSchur2	03A0C2	~laSvdLtUBD	0010C3	~laRanInt
0150C2	~laEgVecR	03B0C2	~laSvdUqhQA	0020C3	~laRSWP
0160C2	~laEgVcSngl	03C0C2	~laSvdAPPhV	0030C3	~laRSWP2
0170C2	~laEgVcUrhs	03D0C2	~laSvdAPk	0040C3	~laCSWP
0180C2	~laEgVcPair	03E0C2	~laSvdGPROT	0050C3	~laRCI
0190C2	~laEgSc1Cls	03F0C2	~laSvdBDQR	0060C3	~laRCIJ
01A0C2	~laEgCSchur	0400C2	~laSvdQR2x2	0070C3	~la-ROW
01B0C2	~laEgCQRI	0410C2	~laSvdFDirC	0080C3	~laVec-
01C0C2	~laEgCQRIk1	0420C2	~laSvdBDirC	0090C3	~la-COL
01D0C2	~laEgVecC	0430C2	~laSvdGShft	00A0C3	~la+ROW
01E0C2	~laEgPrep	0440C2	~laSvdQRSF	00B0C3	~la+ROWs
01F0C2	~laFPMUTE	0450C2	~laSvdQRSB	00C0C3	~la+RCsLP
0200C2	~laBPMUTE	0460C2	~laSvdQRF	00D0C3	~la+COL
0210C2	~laFSCALE	0470C2	~laSvdQRB	00E0C3	~la+COLs
0220C2	~laLSQ	0480C2	~laSvdCROTR	00F0C3	~la+ELEMr
0230C2	~laUserQR	0490C2	~laSvdCROTL	0100C3	~la+ELEMc
0240C2	~laUserLQ	04A0C2	~laSvdPSort	0110C3	~la+ELEM
0250C2	~lauserQR	04B0C2	~laSvdPrep	0120C3	~la>ROW
0260C2	~laQRF	04C0C2	~laTRACE	0130C3	~la>ELEM
0270C2	~laQhA	04D0C2	~laCOND	0140C3	~la>COL
0280C2	~laQhB	04E0C2	~laCONDdone	0150C3	~laROW>
0290C2	~laSETDIAG	04F0C2	~laVMAXJRP	0160C3	~laCOL>
02A0C2	~laRQF	0500C2	~laUserLU	0170C3	~la>DIAG
02B0C2	~laQ2hX	0510C2	~laDT	0180C3	~laDIAG>

0000E8	~doseq	0260E8 ~mrepll	01A0F0 ~mT->=
0010E8	~dosecntuple	0270E8 ~mrepll+	01B0F0 ~m<-T=
0020E8	~dontuple	0280E8 ~msubln	01C0F0 ~mAF1q
0030E8	~dontuple#	0290E8 ~msubnl	01D0F0 ~mAFqq
0040E8	~doidseqn	02A0E8 ~msubll	01E0F0 ~mAFrq
0050E8	~seqid	02B0E8 ~msubll+	01F0F0 ~m<->+
0060E8	~::args	02C0E8 ~msubnn	0200F0 ~m<->-
0070E8	~ptrargs	02D0E8 ~copysub	0210F0 ~m<->*
0080E8	~dosecseqn	02E0E8 ~arryspec	0220F0 ~m<->/
0090E8	~udfargs	02F0E8 ~etorc	0230F0 ~m<-A-+
00A0E8	~doptrseqn	0300E8 ~LIXRecv	0240F0 ~m<-A--
00B0E8	~doseqn	0310E8 ~LIXSend	0250F0 ~m<-A/*
00C0E8	~doseqn#	0000F0 ~INTGSIN	0260F0 ~m<-A//
00D0E8	~docmdlist	0010F0 ~I:-InvSin	0270F0 ~m<-A^*
00E0E8	~seqnargs	0020F0 ~INTGCOS	0280F0 ~mA->+-
00F0E8	~dolatorre	0030F0 ~I:LnTan	0290F0 ~mA->--
0100E8	~elsielists?	0040F0 ~INTGTAN	02A0F0 ~mA->*/
0110E8	~dolatorre+	0050F0 ~INTGASIN	02B0F0 ~mA->>//
0120E8	~dolatorre2	0060F0 ~INTGACOS	02C0F0 ~mA->^^
0130E8	~?NULLSETDIM	0070F0 ~INTGATAN	02D0F0 ~mD->/+
0140E8	~sllatorre	0080F0 ~INTGSINH	02E0F0 ~mD->/-
0150E8	~lslatorre	0090F0 ~I:-InvSinh	02F0F0 ~mD->^+
0160E8	~lolatorre	00A0F0 ~I:LnTanh	0300F0 ~mD->^-
0170E8	~ollatorre	00B0F0 ~INTGCOSH	0310F0 ~mD->E+
0180E8	~ollatorre+	00C0F0 ~I:Tanh	0320F0 ~mD->E-
0190E8	~dolist+	00D0F0 ~INTGTANH	0330F0 ~mD->L*
01A0E8	~dosort	00E0F0 ~INTGEXPM	0340F0 ~mD->L/
01B0E8	~{id}>{ \$}	00F0F0 ~INTGALOG	0350F0 ~m [] CHS*
01C0E8	~{lam}>{ \$}	0100F0 ~INTGLN	0360F0 ~m [] CHS/
01D0E8	~{ \$}>{id}	0110F0 ~INTGLOG	0370F0 ~m [] CHSL
01E0E8	~{ \$}>{lam}	0120F0 ~INTGINV	0380F0 ~m [] INV^
01F0E8	~DoNumeric:	0130F0 ~I:Atan	0390F0 ~m [] INVE
0200E8	~UseHidden{ }	0140F0 ~INTGSQ	03A0F0 ~m1/ [] *
0210E8	~NotHidden	0150F0 ~INTGSQRT	03B0F0 ~m1/ [] /
0220E8	~INTEPOB?	0160F0 ~I:Asinh	03C0F0 ~m1/ [] ^
0230E8	~moresub	0170F0 ~I:Acosh	03D0F0 ~m1/ [] E
0240E8	~morerepl	0180F0 ~INTGSIGN	03E0F0 ~m- [] L
0250E8	~mrepln	0190F0 ~INTGDER	03F0F0 ~m- [] *

0400F0	~m- []/	0660F0	~m->DEFTAN	08C0F0	~XPURGEp*
0410F0	~m- []+	0670F0	~m->DEFASIN	08D0F0	~convertaddr
0420F0	~m- []-	0680F0	~m->DEFACOS	08E0F0	~XRCLp?acc>
0430F0	~mE^*	0690F0	~m->DEFATAN	08F0F0	~COLCTDER
0440F0	~mE^/	06A0F0	~m->DEFSINH	0900F0	~COLCTINTG
0450F0	~mE [] ^	06B0F0	~m->DEFACOSH	0910F0	~COLCTSUM
0460F0	~mL*^	06C0F0	~m->DEFTANH	0920F0	~COLCTIFTE
0470F0	~mL [] *	06D0F0	~m->DEFASINH	0930F0	~COLCTQUOTE
0480F0	~mL [] /	06E0F0	~m->DEFACOSH	0940F0	~COLCTFCNAP
0490F0	~m<-M+*	06F0F0	~m->DEFATANH	0960F0	~covD/DCROSS
04A0F0	~m<-M-*	0700F0	~mSIN+	0970F0	~covD/DDOT
04B0F0	~adjdivsign	0710F0	~mCOS+	0B90F0	~covD/DINTG
04C0F0	~adjsign	0720F0	~mTAN+	0BC0F0	~covMANMENU+
04D0F0	~adjdiv	0730F0	~mSINH+	0BD0F0	~covMANMENU*
04E0F0	~m<-M*^	0740F0	~mCOSH+	0BFOF0	~covMANEXP
04F0F0	~m<-M/^	0750F0	~mTANH+	0C00F0	~covMANMENUL
0500F0	~m<-M*E	0760F0	~covmanCOL	0C10F0	~covMANCSIV
0510F0	~m<-M/E	0770F0	~WHEREFCNAPP	0C20F0	~covMANMENUE
0520F0	~m<-M+L	0780F0	~WHEREDER	0C30F0	~covMANMENUC
0530F0	~m<-M-L	0790F0	~WHEREIFTE	0C40F0	~covMANTRG
0540F0	~mM->op	07A0F0	~WHEREWHERE	0C50F0	~covMANATG
0550F0	~m<T>+	07B0F0	~covWSPLIT	0C60F0	~covINV+
0560F0	~m<T>*	07C0F0	~WHEREINTG	0C70F0	~covINV-
0570F0	~m<-T+-	07D0F0	~WHERESUM	0C80F0	~covINV=
0580F0	~m<-T*/	07E0F0	~XSTOCHECK	0C90F0	~covINV*
0590F0	~m<- [+ -	07F0F0	~XSTOCHECK10	0CA0F0	~covINV/
05A0F0	~m<- [* /	0800F0	~covLBSTO	0CB0F0	~covINV^
05B0F0	~m] ->+-	0810F0	~XEQXDPTCH	0CC0F0	~covINV^X
05C0F0	~m] ->*/	0820F0	~Xcont	0CD0F0	~covINVEXP
05D0F0	~m-> [] <-+-	0830F0	~CHECKEXISTS	0CE0F0	~covINVSIN
05E0F0	~m-> [] <-*/	0840F0	~covmetaLIBS	0CF0F0	~covINVCOS
05F0F0	~mCONJ []	0850F0	~XRCLp?	0D00F0	~covINVTAN
0600F0	~mRE []	0860F0	~XRCLpNL	0D10F0	~covINVSINH
0610F0	~mIM []	0870F0	~XRCLpL	0D20F0	~covINVCOSH
0620F0	~REIM [] *	0880F0	~XRCLp*	0D30F0	~covINVTANH
0630F0	~m->TRG	0890F0	~XEVALp?	0D40F0	~covINVALOG
0640F0	~m->DEFSIN	08A0F0	~XEVALp*	0D50F0	~covINVEXPM1
0650F0	~m->DEFCOS	08B0F0	~XPURGEp?	0000F1	~nFUNCTION

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0020F1	~nPOLAR	0280F1 ~xDFLTNOTE	0190F2 ~xz
0030F1	~nPARAMETRIC	0290F1 ~xDFLTPICT	01A0F2 ~xtheta
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0060F1	~nSEQUENCE	02C0F1 ~view01_CAPL	01D0F2 ~xSVARS
0070F1	~nBOXWHISKER	02D0F1 ~view23_CAPL	01F0F2 ~xSSDEV
0080F1	~xFUNCTAB	02E0F1 ~view45_CAPL	0200F2 ~xPSDEV
0090F1	~xPOLARTAB	02F0F1 ~view6_CAPLE	0210F2 ~xNS
00A0F1	~xPARAMTAB	0300F1 ~view7_CAPLE	0220F2 ~xMINS
00B0F1	~xSEQTAB	0310F1 ~topic_CAPLE	0230F2 ~xMAXS
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0100F1	~nPOLARTOPIC	0010F2 ~xb	0280F2 ~xSX
0110F1	~nPARAMTOPIC	0020F2 ~xc	0290F2 ~xSX2
0120F1	~nSEQTOPIC	0030F2 ~xd	02A0F2 ~xMEANY
0130F1	~nSTATTOPIC	0040F2 ~xE	02B0F2 ~xSY
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01E0F1	~POINTERR	00F0F2 ~xp	0380F2 ~xz7
01F0F1	~POINTEXIT	0100F2 ~xq	0390F2 ~xz8
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0230F1	~xPARAMSYMB	0140F2 ~xu	03D0F2 ~xm2
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0460F2	~xl1	06C0F2	~xCoord	0920F2	~xArea
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0D70F2	~idY1	0FD0F2 ~idR1	1230F2 ~xS5
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