PET BASIC

SIMPLE VARIABLES

Type	Name	Range
Real	XY	+/- 1.70141183E+38
		+/- 2.93873588E-39
Integer	XY%	+/- 32767
String	XY$	0 to 255 characters

X is a letter (A-Z), Y is a letter or number (0-9). Variable names can be more than 2 characters, but only the first two are recognized. Strings are postfixed with a dollar sign, '$'. Integers are postfixed with a percent sign, '%'. So A, A$ and A% are three unique variables that are of type real, string and integer, respectively.

ARRAY VARIABLES

Type	Name
Single Dimension	XY(5)
Two-Dimension	XY(5,5)
Three-Dimension	XY(5,5,5)

One-dimensional arrays of up to eleven elements (subscripts 0-10) can be used where needed. Arrays with more than eleven elements need to be DIMensioned first. You can use the same naming conventions used with simple variables.

SYSTEM VARIABLES

Time	TI	Display the system clock in jiffy ticks
	TI$	Display/Set the system time in 24 hour clock format i.e. TI$="030012" ("HHMMSS")
I/O Status	ST	Tape/File access status number.
π	(Pi symbol) Value of Pi. Programmers keyboard only.	
4.0 BASIC Disc Status	DS	Reads Current Disc Error Condition from dev 8
	DS$	Reads Complete Error Condition to string "##, ERR TXT, Track, Sect"

ALGEBRAIC OPERATORS

= Assigns value to variable (numbers and strings)
- Negation
^ Exponentiation
* Multiplication
/ Division
+ Addition (numbers and strings)
- Subtraction

RELATIONAL OPERATORS (numbers and strings)

= Equal
<> Not Equal To
< Less Than
> Greater Than
<= Less Than or Equal To
>= Greater Than or Equal To

LOGICAL OPERATORS (integers only)

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NOT Bitwise Logical "Not" (single integer argument)
AND Bitwise Logical "And"
OR  Bitwise Logical "Or"
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SYSTEM COMMANDS AND FUNCTIONS

RUN	Executes a program
RUN xxx	Executes program starting at line xxx
STOP	Halts execution (see CONT)
END	Ends execution
CONT	Continues program execution from line where program was halted (see STOP)
NEW	Erase all program lines from memory
FRE(0)	Invokes garbage collection. Usage is A=FRE(0). Returns number of bytes free.

MEMORY ACCESS COMMANDS

PEEK(X)	Returns contents of memory location X
POKE X,Y	Changes contents of location X to value Y
WAIT X,Y,Z	Program waits until contents of memory location X, when XORed with Z and ANDed with Y, is nonzero. WAIT 6502,0 is an Easter egg on the 3032.

MACHINE LANGUAGE EXECUTION COMMANDS

SYS xxxxx	Jumps to execute a machine language program, starting at xxxxx
USR(X)	Passes value of X to a machine language subroutine can also return value from machine language subroutine (is used like a function (*e.g.*, Y = USR(X)))

DISC FILE COMMANDS

LOAD "NAME"	Loads a program from tape
SAVE "NAME"	Saves a program on tape
LOAD "NAME",8	Loads a program from disc
SAVE "NAME",8	Saves a program to disc
VERIFY "NAME"	Verifies that program was SAVEd without errors

EDITING AND FORMATTING COMMANDS

LIST	Lists entire program
LIST A-B	Lists from line A to line B
REM Message	Comment message can be listed but is ignored during program execution
TAB(X)	Used in PRINT statement. Spaces X positions on screen
SPC(X)	Used in PRINT statement. PRINTs X spaces on line
POS(0)	Returns current cursor column position (argument is ignored).

EDITING AND FORMATTING KEYS

CLR/HOME	Positions cursor to left corner of screen
SHIFT+CLR/HOME	Clears screen and places cursor in "Home" position
SHIFT+INST/DEL	Inserts space at current cursor position
INST/DEL	Deletes character at current cursor position
CTRL	When used with numeric color key, selects text color. May be used in PRINT statement.
CRSR keys	Moves cursor up, down, left, right on screen
SHIFT	Access Graphics characters in upper case/graphics mode and upper case characters in upper/lower case mode.

ARRAYS

DIM A(X,Y,Z,…)	Sets maximum subscripts for A; reserves space for (X+1)*(Y+1)*(Z+1)*… elements starting at A(0,0,0,…. Index counts from zero to the dimension value.

STRINGS

LEN(X$)	Returns number of characters in X$
STR$(X)	Returns numeric value of X, converted to a string
VAL(X$)	Returns numeric value of X$, up to first non-numeric character
CHR$(X)	Returns ASCII character whose code is X
ASC(X$)	Returns ASCII code for first character of X$
LEFT$(A$,X)	Returns leftmost X characters of A$
RIGHT$(A$,X)	Returns rightmost X characters of A$
MID$(A$,X,Y)	Returns Y characters of A$ starting at character X

INPUT/OUTPUT COMMANDS

You may also use A$, A or A% for the input variable but if a number is not entered for the last two then an error is generated.

INPUT A$	PRINTs "?" on screen and waits for user to enter a string or value followed by a RETURN.
INPUT "ABC";A$	PRINTs the message in quotes, waits for user to enter value.
GET A$	Gets the next character from the keyboard buffer. If no character is present then A$ is an empty string. This command does not wait for the user.
DATA A,"B",C	A set of values that can be used by READ statements
READ A$	Assigns next DATA value to A$
RESTORE	Resets data pointer to start READing the DATA list again
CLR	Same as RESTORE but it also clears all variables
PRINT"A= ";A	PRINTs string "A=" and value of A ";" suppresses spaces - "," tabs data to next field

PROGRAM FLOW

:	The colon can be used to put multiple executable statements on a single line. Example: **PRINT "HELLO":GOTO 100**
GOTO X	Branches to line X
IF A=1 THEN ...	IF assertion is true THEN execute following part of statement. IF false, execute next line number
FOR A=1 TO 10 STEP 2	Executes all statements between FOR and corresponding NEXT, with A going from 1 to 10 by 2. The index variable must be a REAL type. The index can be a positive, negative and/or fractional. Default step size is 1 (i.e., STEP is optional if step size is 1).
NEXT A	Defines end of loop. A is optional
GOSUB 2000	Branches to subroutine starting at line 2000
RETURN	Marks end of subroutine. Returns to statement following most recent GOSUB
ON X GOTO 10,20,30,…	Branches to Xth line number on list. If X=1 branches to 10, etc. Drops to next line if x<1 or x>N.
ON X GOSUB 10,20,30,…	Branches to subroutine at Xth line number in list

MATH FUNCTIONS

SIN(X)	Sine function. Argument is in radians.
COS(X)	Cosine function. Argument is in radians.
TAN(X)	Tangent function. Argument is in radians.
ATN(X)	Inverse tangent function. Return value is in radians.
EXP(X)	Inverse natural log (e^x).
LOG(X)	Natural log.
SQR(X)	Square root.
ABS(X)	Absolute value.
SGN(X)	Sign function. Returns -1 if X<0, 0 if X=0 and +1 if X >0.
INT(X)	Floor of X. INT(-6.5) -> -7, INT(6.5) -> 6.
RND(X)	Random number between 0 and 1. X is the seed value.
FLOOR(X)	UDOCUMENTED FUNCTION! DO NOT USE!