

TEXT PROGRAMMING

0. XEQC47 "...." + X.XEQ [XEQC43 is also supported]

1. Only 4 sub-routine labels for a program, M1, M2, M3 & M4.

2. Nesting won't work.

3. CR & LF is disregarded therefore indents are possible and does not influence it.

4. Comment lines start with // and are until the next line break, i.e. the full line

5. GSB is used to execute the special subroutines M1 to M4 instead of XEQ since these are special labels M1 .. M4. RTN returns.

6. DSZ for looping. Other looping commands will not work.

7. Looping commands are special commands LBL, RTN, DSZ, GTO and normal labels cannot be called.

8. Only tested in ERP mode. ERP command enforces eRPN to ensure the program behaves.

9. Only register numbers are supported, not named variables and also not local variables, like "RCL 99" in which case double digits must be used.

10. FIX, etc., need to be written FIX 02 with the double digits.

11. Entry of numbers must be separated with ENTER or EXIT. EXIT makes it more robust against RPN mode.

Global type	Calculator item (cat)	XEQM text item	Extended description
Command	BATT?	"BATT?"	Battery voltage ± 1 mV
	BEEP	"BEEP"	Play beep sound (4 tones)
	CASE	"CASE" + parameter	Case statement, skips number of steps (CASE normally followed by number of GTO's)
	α Lock \downarrow	"CASEDN"	Move down alpha lock from N to A to a
	α Lock \uparrow	"CASEUP"	Move up alpha lock from a to A to N
	CF	"CF" + parameter	Clear flag
	CLGRF	"CLGRF"	Clear graph
	CLSTK	"CLSTK"	Clear all stack data
	CL Σ	"CLSUM"	Clear all statistics data (and delete STATS and HISTO matrices)
	CLX	"CLX"	Clear X-register
	CPXRES0	"CPXRES0"	Do not allow complex results for real input ; an error will occur for such events
	CPXRES1	"CPXRES1"	Allow complex results for real input ; an error will not occur for such events
	DEC (DECR)	"DECR" + parameter	Decrement by 1
	DROP \downarrow (DROP)	"DROP"	Drop one stack level
	E	"EEX"	Enter exponent
	ENTER (ENTER \uparrow)	"ENTER"	Enter input value to X (optionally also to Y) or push/duplicate value already in X to Y
	EXIT	"EXIT"	EXIT
	FILL	"FILL"	Fill stack with value in the X-register
	I-	"I-"	Decrement row index
	I+	"I+"	Increment row index
	INC	"INC" + parameter	Increment by 1
	\rightarrow	"IND \rightarrow "	Presented in TAM menus for commands accessing indirect input
	INDEX	"INDEX" + parameter	Index the matrix
	J-	"J-"	Decrement column index
	J+	"J+"	Increment column index
	LISTXY	"LISTXY"	List the actual STATS graph coordinates (7 digit floating point)
	NEW (M.NEW)	"M.NEW"	Create new matrix
	n ($n\Sigma$)	"NSUM"	Number of samples
	π	"PI"	Insert value of pi
	PLTRST	"PLTRST"	PLSTAT only: reset all plot options and redraw graph
	PROFF	"PROFF"	Set printer off
	PRON	"PRON"	Set printer on
	\boxtimes STK	"PRSTK"	Print stack registers - save contents as text to data file in FAT
	RAN#	"RAN#"	Random number (real)
	RCL	"RCL" + parameter	Recall value from register or variable can be followed by +, -, \times , \div for recall and add, recall and subtract, recall and multiply, recall and divide functions
	RCLEL	"RCLEL"	Recall current element
	Re \leftrightarrow Im	"RE \leftrightarrow IM"	Exchange real and imaginary part
	SEED	"SEED"	Set random seed (0..1] ; for values less than or equal to 0, the seed is derived from the internal clock
	set>TXT	"set>TXT"	Settings to text file
	SF	"SF" + parameter	Set flag
	SNAP	"SNAP"	Save screenshot as image to bitmap file in FAT ; if executed from the NORMAL keyboard (C47.81.13) saves contents of stack or alpha buffer as text to data file in FLASH memory ; plays clicking sound
	SPCRES0	"SPCRES0"	Do not allow special results of calculations (infinity, not-a-number) ; an error will occur for such events
	SPCRES1	"SPCRES1"	Allow special results of calculations (infinity, not-a-number) ; an error will not occur for such events
	σ	"STDDEV"	Population standard deviation
	STO	"STO" + parameter	Store value in register or variable ; can be followed by +, -, \times , \div for add into, subtract into, multiply into, divide into functions
	STOEL	"STOEL"	Store X into current element
	STOIJ	"STOIJ"	Set current index

Global type	Calculator item (cat)	XEQM text item	Extended description
	xsum	"SUM"	Return Σx and Σy in X and Y respectively
	$\Sigma+$	"SUM+"	Enter data into the statistics matrix (STATS)
	Σx	"SUMX"	Summation of x using statistics matrix (STATS)
	Σy	"SUMY"	Summation of y using statistics matrix (STATS)
	TICKS	"TICKS"	Number of ticks counted since calculator was turned on (1 tick = 0.1 s)
	STONE	"STONE" + parameter	Tone (0-9)
	VIEW	"VIEW" + parameter	View register or variable
	X	"X"	Presented in TAM menus for commands accessing stack level X
	x \leftrightarrow y	"X<>Y"	Swap register X and register Y
	Y	"Y"	Presented in TAM menus for commands accessing stack level Y
Constant	c	"c"	lightspeed $c = +2.99792458 \times 10^8$
	ϕ	"PHI"	r.golden $\phi = +1.618033988749894848204586834365638$
Function	-	"-"	Subtract X from Y
	$(-1)^x$	"(-1)^X"	Cosine of πx [+ i * sine of πx for complex parameter]
	x	"*"	Multiply Y by X
	\div	"/"	Divide Y by X
	+	"+"	Add X to Y ; concatenate X and Y
	\Rightarrow DEG	">>DEG"	If untagged, set tag to DEG ; if tagged, convert X to degrees ; does not change ADM
	\Rightarrow GRAD	">>GRAD"	If untagged, set tag to GRAD ; if tagged, convert X to GRAD ; does not change ADM
	\Rightarrow RAD	">>RAD"	If untagged, set tag to RAD ; if tagged, convert X to RAD ; does not change ADM
	\rightarrow POLAR	">POLAR"	Transform rectangular to polar coordinates (stack conventions according to flag HP.RP ; transform complex number to polar notation (monadic) and set POLAR tag
	\rightarrow REAL	">REAL"	Convert to real number
	\rightarrow RECT	">RECT"	Transform polar to rectangular coordinates (stack conventions according to flag HP.RP ; transform complex number to rectangular notation (monadic) and set RECT tag
		" "	Parallel impedance = $(X \times Y) / (X + Y)$
	$1/x$	"1/X"	Reciprocal ($1/x$)
	10^x	"10^X"	Raise 10 to the power in the X-register
	2^x	"2^X"	Raise 2 to the power in the X-register
	ABS	"ABS"	Magnitude (absolute value) of complex number
	ARCCOS (ACOS)	"ACOS"	Inverse cosine
	arcosh	"ARCOSH"	Inverse hyperbolic cosine
	arsinh	"ARSINH"	Inverse hyperbolic sine
	artanh	"ARTANH"	Inverse hyperbolic tangent
	ARCSIN (ASIN)	"ASIN"	Inverse sine
	ARCTAN (ATAN)	"ATAN"	Inverse tangent
	ceil	"CEIL"	Ceiling (type real)
	+/- (CHS)	"CHS"	Change sign
	cn(u,m)	"CN"	Elliptic cosine
	C_{yx} (COMB)	"COMB"	Combinations of X out of Y
	COMPLEX	"COMPLEX"	Convert to or from complex number
	COS	"COS"	Cosine
	cosh	"COSH"	Hyperbolic cosine
	$\sqrt[3]{x}$	"CUBRT"	Cube root of X
	$\Delta\%$	"DELTA%"	Delta percentage from Y to X, keeping Y on stack
	dn(u,m)	"DN"	Elliptic delta amplitudinis
	.d	"DOTD"	Convert to decimal (real) value ; clear fraction mode, base mode ; convert degrees / hours / date to real ; convert complex number with zero imaginary part to real number ; convert NIM input to date (according to date format set)
	e^{ix}	"e~iX"	Rotate complex unit vector by X radians : $e^{ix} = \cos(x) + i \sin(x)$
	e^x	"e^X"	Raise e to the power in the X-register
	e^{x-1}	"e^X-1"	More accurate calculation of e^{x-1} for $x \approx 0$
	EXPT	"EXPT"	Exponent of number in the X-register
	FIB	"FIB"	Fibonacci number n, where $n = X$
	floor	"FLOOR"	Floor (type real)
	FP	"FP"	Fractional part
	$\Gamma(x)$	"GAMMA"	Gamma function
	GCD	"GCD"	Greatest common divisor of X and Y
	g_d	"GD"	Gudermannian function
	g_d^{-1}	"GD^-1"	Inverse Gudermannian function
	HOURL	"HOURL"	Hours (of time)
	IDIV	"IDIV"	Integer divide
	IDIVR	"IDIVR"	Integer divide (X) and remainder (Y)
	Im	"IM"	Imaginary part of complex number
	IP	"IP"	Integer part (type real)
	LCM	"LCM"	Least common multiple of X and Y
	L_m	"LM"	Laguerre polynomials

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	LN	"LN"	Natural logarithm (base e)
	LN(1+x)	"LN(1+X)"	More accurate calculation of LN(1+x) for $x \approx 0$
	LN β	"LNBETA"	Natural logarithm of Euler's Beta function
	LN Γ	"LNGAMMA"	Natural logarithm of the Gamma function
	LOG	"LOG10"	Common logarithm (base 10)
	LB	"LOG2"	Binary logarithm (base 2)
	LOG _x y	"LOGXY"	Logarithm of Y for base X
	M \rightarrow zyx	"M>ZYX"	Decompose 3x1 matrix to ZYX
	x	"MAGN"	Magnitude (absolute value) of complex number
	max	"MAX"	Maximum of X and Y
	min	"MIN"	Minimum of X and Y
	MIN	"MINUTE"	Minutes (of time)
	MOD	"MOD"	Y modulo X
	NEXTP	"NEXTP"	Next prime number
	P _{yx} (PERM)	"PERM"	Permutations of X out of Y
	PRIME?	"PRIME?"	Test absolute value of integer part of X is prime
	RANI#	"RANI#"	Random integer : lower ENTER upper ; keeping input on stack (X: result, Y: upper, Z: lower)
	Re	"RE"	Real part of complex number
	RMD	"RMD"	Remainder of division of Y by X
	ROUND	"ROUND"	Rounds to current display format (type real)
	ROUNDI	"ROUNDI"	Rounds to next integer (max 1000 digits)
	SDL	"SDL" + parameter	Shift digits to the left
	SDR	"SDR" + parameter	Shift digits to the right
	SEC	"SEC"	Seconds (of time)
	sign	"SIGN"	Sign is -1 for negative numbers, 0 for zero, +1 for positive numbers
	SIN	"SIN"	Sine
	sinc	"SINC"	(Sine of X) / X
	sinc π	"SINCPI"	(Sine of $\pi * X$) / ($\pi * X$)
	sinh	"SINH"	Hyperbolic sine
	sn(u,m)	"SN"	Elliptic sine
	\sqrt{x}	"SQRT"	Square root
	$\sqrt{1+x^2}$	"SQRT1+XSQR"	$\sqrt{1+x^2}$
	TAN	"TAN"	Tangent
	tanh	"TANH"	Hyperbolic tangent
	x!	"X!"	For integers : x! ; for reals : $\Gamma(x+1)$
	x ²	"X^2"	Square of X
	x ³	"X^3"	Raise to power of 3
	$\sqrt[y]{x}$	"XRTY"	Xth root of Y
	y ^x	"Y^X"	Raise value in the Y-register to the power in the X-register
	zyx \rightarrow M	"ZYX>M"	Create 3x1 matrix from ZYX
Function from menu	α	"ALPHA"	Alpha menu is used to enter, edit and clear alpha input ; perform command to start graph, provided coordinates were entered in STATS using $\Sigma+$
	SCATR	"PLOT"	Scatter plot of measurements ; perform command to start graph, provided coordinates were entered in STATS using $\Sigma+$
	PLSTAT	"PLSTAT"	Plot statistics
Setting	ALL	"ALL" + parameter	Set numeric display mode to ALL digits notation ; display all digits as far as possible with max. nn decimal zeros
	CLK12	"CLK12"	12 hour time display
	CLK24	"CLK24"	24 hour time display
	CPX _i	"CPXI"	Set for the letter i representing the imaginary number
	CPX _j	"CPXJ"	Set for the letter j representing the imaginary number
	DEG	"DEG"	Set ADM to degrees mode
	DMY	"DMY"	Date display mode DD.MM.YYYY
	ENG	"ENG" + parameter	Set numeric display mode to ENGINEERING notation with nn+1 digits
	ENGOVR	"ENGOVR"	Change display to ENG for reals too large to display in full
	erPNon (erPN)	"ERPNI"	Set stack to entry RPN mode (no DUP)
	EXFRAC	"EXFRAC"	Exact fractions, helper mode to find (approximate) multiples or fractions of the constants e, π , ϕ , $\sqrt{2}$, $\sqrt{3}$ and $\sqrt{5}$
	F.1234	"F1234"	Longpress control: full Function key longpress cycle
	F.124	"F124"	Longpress control: skip g Function key longpress cycle
	F.14	"F14"	Longpress control: skip fg Function key longpress cycle
	COM, (FCOM)	"FCOM"	Set fractional part separator to comma
	DOT, (FDOT)	"FDOT"	Set fractional part separator to dot
	fg.FUL	"FGFUL"	Show full horizontal f- and g-lines indicating the state of the f- or g-shift in menu
	fg.LIM	"FGLIM"	Show limited horizontal f- and g-lines indicating the state of the f- or g-shift in menu
	fg.OFF	"FGOFF"	Do not show horizontal f- and g-lines indicating the state of the f- or g-shift in menu

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	FIX	"FIX" + parameter	Set numeric display mode to FIXED notation with nn+1 digits
	NONE (FNONE)	"FNONE"	No fractional part separator
	NSPC_ (FNNSPC)	"FNNSPC"	Set fractional part separator to narrow space
	PER. (FPER)	"FPER"	Set fractional part separator to period
	FPGRP	"FPGRP" + parameter	Set fractional part group size (2..9)
	SPC_ (FSPC)	"FSPC"	Set fractional part separator to space
	UNDR_ (FUNDR)	"FUNDR"	Set fractional part separator to underscore
	WSPC_ (FWSPC)	"FWSPC"	Set fractional part separator to double space
	WTICK' (FWTICK)	"FWTICK"	Set fractional part separator to tick
	g.2Tp	"G2TP"	Allow double tapping the FN-keys for a g-function
	HOME (_HOME)	"HOME"	HOME menu shown (when all menus are exited using EXIT)
	HOME.3	"HOMEX3"	HOME menu activated by triple shift
	COM, (ICOM)	"ICOM"	Set integer part separator to comma
	DOT· (IDOT)	"IDOT"	Set integer part separator to dot
	NONE (INONE)	"INONE"	No integer part separator
	NSPC_ (INNSPC)	"INNSPC"	Set integer part separator to narrow space
	PER. (IPER)	"IPER"	Set integer part separator to period
	IPGRP	"IPGRP" + parameter	Set integer part group size (2..9) ; not for SCI or ENG notation
	IPGRP1	"IPGRP1" + parameter	Set integer part first group size ; parameter 0 means follow IPGRP
	IPGRP1x	"IPGRP1X" + parameter	Extend first group to allow one additional digit up to maximum specified by parameter
	SPC_ (ISPC)	"ISPC"	Set integer part separator to space
	UNDR_ (IUNDR)	"IUNDR"	Set integer part separator to underscore
	WSPC_ (IWSPC)	"IWSPC"	Set integer part separator to double space
	WTICK' (IWTICK)	"IWTICK"	Set integer part separator to tick
	JG.1582	"JG1582"	Set Julian-Gregorian transition date to 1582-10-15
	JG.1752	"JG1752"	Set Julian-Gregorian transition date to 1752-09-14
	JG.1873	"JG1873"	Set Julian-Gregorian transition date to 1873-01-01
	JG.1949	"JG1949"	Set Julian-Gregorian transition date to 1949-10-01
	LRG_LI	"LARGELI"	Large longint display
	M.1234	"M1234"	Longpress control: full Math keys longpress cycle
	M.14	"M14"	Longpress control: skip fg Math keys longpress cycle
	MDY	"MDY"	Date display mode MM/DD/YYYY
	MULT π	"MULPI"	Set ADM to multiple of pi radians mode
	MULT \times	"MULTCR"	Multiplication symbol \times for exponential (and for complex numbers if CPXmul is set)
	MULT \cdot	"MULTDOT"	Multiplication symbol \cdot for exponential (and for complex numbers if CPXmul is set)
	MyM	"MYM"	Base (My) Menu shown (when all menus are exited using EXIT)
	$\Delta y/\Delta x$	"P_DIFF"	Add another curve, the graphical point-to-point differential of the main graph
	$\Sigma \bar{y} \Delta x$	"P_INT"	Add another curve, the graphical integral calculated from the point-to-point discrete integral
	RMS	"P_RMS"	Add another curve, the graphical root mean square, accumulated from left to right.
	\int AREA	"P_SHADE"	Shade the area underneath the graphical integral curve
	POLAR	"POLAR"	Polar representation of complex numbers (internal value is RECT)
	RAD	"RAD"	Set ADM to radians mode
	RECT	"RECT"	Rectangular display of complex numbers (internal value is RECT)
	eRPNoff (RPN)	"RPN"	Set stack to classic RPN mode
	SCI	"SCI" + parameter	Set numeric display mode to SCIENTIFIC notation with nn+1 digits
	SCIOVR	"SCIOVR"	Change display to SCI for reals too large to display in full
	SH.4s	"SH4S"	Set shift to time out after 4 seconds
	SIG	"SIG" + parameter	Set numeric display mode to SIGNIFICANT notation with nn+1 digits ; switching over to scientific or engineering notation when number of rounded trailing zeros exceeds group size (IPGRP)
	SSIZE4	"SSIZE4"	Set stack size to 4 registers
	SSIZE8	"SSIZE8"	Set stack size to 8 registers
	UNIT	"UNIT" + parameter	Set numeric display mode to UNIT nn+1 digits ; setting for showing all or limited set of prefixes: PFX.All (display using prefix also available from HOME for numeric entry: p - n - μ - m - k - M - G - T for pico, nano, micro, milli, kilo, Giga, Tera)
	YMD	"YMD"	Date display mode YYYY-MM-DD
	UNIT	"UNIT" + parameter	Set numeric display mode to UNIT nn+1 digits ; setting for showing all or limited set of prefixes: PFX.All (display using prefix also available from HOME for numeric entry: p - n - μ - m - k - M - G - T for pico, nano, micro, milli, kilo, Giga, Tera)
	YMD	"YMD"	Date display mode YYYY-MM-DD