*16-bit variables and arrays must start with #*

***$****0000 =* ***%****00000000 =* ***“ “*** *=* ***0***

|  |  |
| --- | --- |
| **REM** *This is a comment*  ***‘*** *This is a comment too*    **CONST** name = value  **SIGNED** var\_or\_array  **UNSIGNED** var\_or\_array  **VARPTR** var\_or\_array  **DIM** array(size)  label**: PROCEDURE** *‘ One line*  … **END**    **GOTO** label  **GOSUB** procedure  **RETURN** | **FOR** i **=** value **TO** value [**STEP** value]  **NEXT** [i]  **WHILE** expr … **WEND**  **DO WHILE** expr … **LOOP**  **DO UNTIL** expr … **LOOP**  **DO** … **LOOP WHILE** expr  **DO** … **LOOP UNTIL** expr  **EXIT** (**FOR**/**WHILE**/**DO**)  **IF** expr **GOTO** label  **IF** expr [**ELSEIF** expr **THEN** …]  [**ELSE** label] **END IF** |

**ON** expr **GOTO** label[, label…] *‘ IntyBASIC’s switch statement*

**ON** expr **GOSUB** label[,, label…] *‘ Can omit labels to skip for certain values*

**ON FRAME GOSUB** label *‘ Can only appear once*

**STACK\_CHECK** *‘ Checks for stack overflows in VBLANK routine*

**WAIT** *‘ For VBLANK - 60hz NTSC, 50hz PAL*

|  |  |
| --- | --- |
| **POKE** address, value  **RESTORE** label *‘ Sets read point*  **READ** var[, var…]  var = labelname(index) *‘ Equivalent*  **DATA** const[, const…]  **DATA** string | **INCLUDE** “filename.bas”  **ASM INCLUDE** “filename.asm”  **ASM** assembler\_instruction  **CALL** asm\_function([argument, …])  var = **USR** asm\_function([argument, …])  **DEF FN** function([var, …]) = expr |

**DEFINE** [**ALTERNATE**] card\_num, total, label

**DEFINE** [**ALTERNATE**] card\_num, total, **VARPTR** label(expr)

*‘Secondary PSG (requires ECS) identical except SOUND 5 through 9*

**SOUND 0**, sound\_12bit, vol\_4bit *‘ Channel A*

**SOUND 1**, sound\_12bit, vol\_4bit *‘ Channel B*

**SOUND 2**, sound\_12bit, vol\_4bit *‘ Channel C*

**SOUND 3**, sound\_16bit, type\_4bit *‘ Volume envelope (frequency/shape)*

**SOUND 4**, noise\_5bit, mix\_reg *‘ Noise and mix register ($38 value by default)*

**SOUND (0…2)**, sound\_12bit, **48** ‘ Magic volume number, means use envelope on 3

**SPRITE** index, x\_coord, y\_coord, cardinfo ‘ Index = card number

|  |  |  |
| --- | --- | --- |
| x\_coord bits:  7-0: position  8: interaction  9: visibility  10: double width | y\_coord bits:  6-0: position  7: 16 line sprite  9-8: Scale: 00,01,10,11  (0.5x, 1x, 2x, 4x)  10: flip X  11: flip Y | cardinfo bits:  2-0: lower bits/color  11-3: card number  12: upper bit/color  13: next color stack |

**CLS** ‘ Clears screen, sets cursor to upper left

**PRINT** [**AT** expr] [**COLOR** expr][**,**] string[, string…] *‘ XOR with color present*

|  |  |
| --- | --- |
| Foreground/Background **COLOR** bits:  2-0: Foreground color (0-7)  8-9: Background bits 0-1  12: Background bit 3 (not 2!)  13: Background bit 2 | Color Stack **COLOR** bits:  2-0: Low 3 bits of FG color  12: High bit of FG color  (Must be 0 for GROM cards)  13: Change color stack |

**SCROLL** offset\_x, offset\_y, move\_screen

*‘ move\_screen will move screen if offset\_x or offset\_y exceed 7*

*‘ 0 = no move, 1 = move left, 2 = move right, 3 = move up, 4 = move down*

**BORDER** color, mask *‘ color = 0 through 15*

*‘ mask: 0 = mask none, 1 = mask left column, 2 = mask top row, 3 = mask both*

**SCREEN** label[, source\_offset, target\_offset, cols, rows[, source\_width]]

*‘ Label can also be #array() for dynamically-drawn elements*

*‘ source\_offset = distance from label, target\_offset = distance/screen pos. 0*

**BITMAP** “\_\_\_XX\_\_\_” *‘ Anything not “0”, “\_”, “.”, or space = 1.*

*‘ Should be paired. Stored as 16-bit DECLEs (high bits = row 2, low = row 1)*

**PLAY SIMPLE** [**NO DRUMS**] *‘ Simple means sound channel 2 is available*

**PLAY FULL** [**NO DRUMS**] *‘ NO DRUMS means sound channel 4 is available*

**PLAY VOLUME** expr *‘ 0 = silent, 15 = max*

**PLAY NONE**

*‘ Turn off sound with SOUND 4,0,$38 after using NO DRUMS*

*‘ Turn off sound with SOUND (1…3),1,0 and SOUND 4,0,$38 after NONE*

**PLAY** label

*‘ Label can also be #array() for dynamically generated music*

label: **DATA** tempo *‘ Ticks per note, 50 ticks per second NTSC/PAL both*

**MUSIC** note1, note2, note3[, note4]

|  |  |
| --- | --- |
| Mandatory parts of note: (1-3 only)  Note + Octave (C2 through C8)  Sharp notes: D4#  Drums: (note4 only)  M1 = strong, M2 = tap, M3 = roll | Can also add instrument after note:  W = piano, X = clarinet,  Y = flute, Z = bass (C4#W, etc.)  - means silence (no note for beat)  S means sustain previous note |

**VOICE INIT** *‘ Must come before any voice commands*

**VOICE PLAY** label *‘ Play sound information at label (or #array())*

**VOICE WAIT** *‘ Halt execution until voice queue is clear*

**VOICE PLAY WAIT** label *‘ Play voice and halt execution until sound is done*

**VOICE NUMBER** expr *‘ Say number out loud (“twenty seven thousand”)*

label: **VOICE** phoneme\_or\_phrase[, phoneme\_or\_phrase…], 0

|  |  |
| --- | --- |
| Phrases:  MATTEL, ZERO, ONE, TWO, THREE,  FOUR, FIVE, SIX, SEVEN, EIGHT,  NINE, TEN, ELEVEN, TWELVE,  THIRTEEN, FOURTEEN, FIFTEEN,  SIXTEEN, SEVENTEEN, EIGHTEEN,  NINETEEN, TWENTY, THIRTY, FO**U**RTY,  FIFTY, SIXTY, SEVENTY, EIGHTY,  NINETY, HUNDRED, THOUSAND, TEEN,  TY, PRESS, ENTER, OR, AND | Phonemes:  PA5, PA4, PA3, PA2, PA1 (pauses),  AA, AE1, AO, AR, AW, AX, AY, BB1,  BB2, CH, DD1, DD2, DH1, DH2, EH,  EL, ER1, ER2, EY, FF, GG1, GG2,  GG3, HH1, HH2, IH, IY, JH, KK1,  KK2, KK3, LL, MM, NG1, NN1, NN2,  OR2, OW, OY, PP, RR1, RR2, SH, SS,  TH, TT1, TT2, UH, UW1, UW2, VV,  WH, WW, XR2, YR, YY1, YY2, ZH, ZZ |

**FLASH INIT** *‘ Put at start of program, compile --jlp*

**FLASH ERASE** row *‘ row goes from FLASH.FIRST to FLASH.LAST*

**FLASH READ** row, **VARPTR** #array() *‘ #array() must hold exactly 96 elements*

**FLASH WRITE** row, **VARPTR** #array() *‘ Flash ops stop execution for a moment*

Number of 8-bits variables allowed: 228

*Subtract 3 if you use SCROLL Subtract 3 if you use VOICE*

*Subtract 6 if you use the keypad Subtract 26 if you use PLAY*

Number of 16-bits variables allowed: 47

*7962 if using --jlp or --cc3 switch)*

*Subtract 20 if you use SCROLL Subtract 30 if you use VOICE*

Controller variables (CONT is all controllers, CONT1 and CONT2 are specific):

|  |  |  |  |
| --- | --- | --- | --- |
| **CONT** | **CONT1** | **CONT2** |  |
| *Contains bitmask from $01ff (left/1), $01fe (right/2), or both together* | | | |
| **CONT.UP** | **CONT1.UP** | **CONT2.UP** | *Non-zero if UP pressed* |
| **CONT.DOWN** | **CONT1.DOWN** | **CONT2.DOWN** | *Non-zero if DOWN pressed* |
| **CONT.LEFT** | **CONT1.LEFT** | **CONT2.LEFT** | *Non-zero if LEFT pressed* |
| **CONT.RIGHT** | **CONT1.RIGHT** | **CONT2.RIGHT** | *Non-zero if RIGHT pressed* |
| **CONT.BUTTON** | **CONT1.BUTTON** | **CONT2.BUTTON** | *Non-zero if any button pressed* |
| **CONT.B0** | **CONT1.B0** | **CONT2.B0** | *Non-zero if top buttons pressed* |
| **CONT.B1** | **CONT1.B1** | **CONT2.B1** | *Non-zero if left button pressed* |
| **CONT.B2** | **CONT1.B2** | **CONT2.B2** | *Non-zero if right button pressed* |
| **CONT.KEY** | **CONT1.KEY** | **CONT2.KEY** |  |
| *Current pressed key (0-9, 10=clear, 11=enter, 12=not pressed)*  *Because movements can be read as keys, wait for 12 before waiting for key* | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **COL0** | **COL1** | **COL2** | **COL3** | **COL4** | **COL5** | **COL6** | **COL7** |
| *Collision between sprites for frame. Bit 0-7 = collision with that sprite*  *Bit 8 = collision against background pixel, Bit 9 = against borders* | | | | | | | |

**RAND** *‘ Pseudo-random value between 0 and 255, updated each frame*

**RAND(**max) *‘ Same as RAND but for 0 to max. Powers of 2 are optimized.*

**RANDOM**(max) *‘ Same as RAND(max) but doesn’t need frame wait. Slower.*

**LEN**(string) *‘ Gives length of string. Useful in macros.*

**POS**(expr) *‘ Gives current cursor position. Expression evaluated, not used*

**FRAME** *‘ Current frame number (0-65535, cycles over itself)*

**NTSC** *‘ 1 if Intellivision is NTSC, 0 otherwise*

**#MOBSHADOW()** *‘ Alias for locations 0-23 of STIC (the MOB buffer)*

**#BACKTAB()** *‘ Alias for screen buffer ($0200-$02EF)*

**FLASH.FIRST**, **FLASH.LAST** *‘ First and last rows of JLP flash memory*

**MUSIC.PLAYING** *‘ 1 if music is playing, 0 otherwise*