

GenRef
v1.01

MDOS Reference guide.

KeyScan Library

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KeyScan - OVERVIEW

The KeyScan management routines in MDOS are provided to aid a programmer in writing applications requiring keyboard and joystic input. The Geneve supports keyboards utility up to 12 function keys and a separate keyboard.

CALLING KEYSKAN FUNCTIONS

The MDOS KeyScan Library must be called from within a machine code program running as a task under MDOS. You pass arguments to the KeyScan Library via the calling registers.

The MDOS KeyScan Library is invoked from a machine code program when software trap number zero (XOP 0) is called with a library number of 5. The calling program's R0 must contain the 16-bit subprogram at the time of the XOP.

```

SCAN  LI    R0,>0004    Scan Mode
      LI    R1,>FF00
      XOP   @FIVE,0      Access subprogram
      JNE   SCAN         Wait for keypress

      ANDI  R1,>FF00

      CI    R1,>FF00
      JEQ   SCAN

```

* Check Keypress

```

      ANDI  R1,>7F00      Codes (usually) never higher than >F

```

* Note – If you do NOT perform the ANDI, control codes may start at >80 - >9F

```

      MOVB  R1,@STR       Let's display the character – place in buffer

      LI    R0,>0027       Write Text Routine
      LI    R1,STR1        String to write
      CLR   R2             Null terminated string
      XOP   @SIX,0         Access subprogram

      BLWP  @0             Exit

FIVE  DATA >0005
SIX   DATA >0006
STR1  BYTE  >00
      BYTE  >0D,>0A,0      CR/LF/Null terminated
      EVEN

```

In the preceding example, three hidden assumptions were made. First it is assumed that STR1 is located on a page which is currently mapped into a memory page which has the same 16-bit address page number as its Virtual address page number (read the section on Memory Management.) The second assumption is that FIVE and SIX are actually at the virtual address FIVE and SIX, not in some overlay segment with a different virtual address.

When the key XOP is called, the keyboard is tested for any buffered keypresses prior to processing the respective keyboard mode (0-8). The returned key value and status are dependent upon the mode selected. Joystick processing is limited to modes 1 and 2.

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The raw "up" and "down" key values are stored in STRKBUF, the operating system's circular keyboard buffer, and are extracted "first-in, first-out" order. A key sequence is added to the buffer (1) during keyboard interrupt processing and (2) during the XOP call, as part of keyboard processing. The implication is that if interrupts are enabled within your program (i.e., LIM1 2), the OS will call the interrupt handler to consume the keypresses, which will then be tested during XOP processing. Allowing the OS to process key interrupts may improve perceived responsiveness in some use cases.

KeyScan Mode Library

KeyScan Mode

Function Returns key press from selected key mode.

Parameters R0x = Keyboard Mode

Results
 R0l = Returned mode (same as >8374 in TI-99/4A mode)
 R1h = Returned scan code (same as >8375 in TI-99/4A mode)
 R2l = Joystick X value (same as >8377 in TI-99/4A mode)
 R2h = Joystick Y Value (same as >8376 in TI-99/4A mode)

EQ bit in status register set if there's a new key in R0

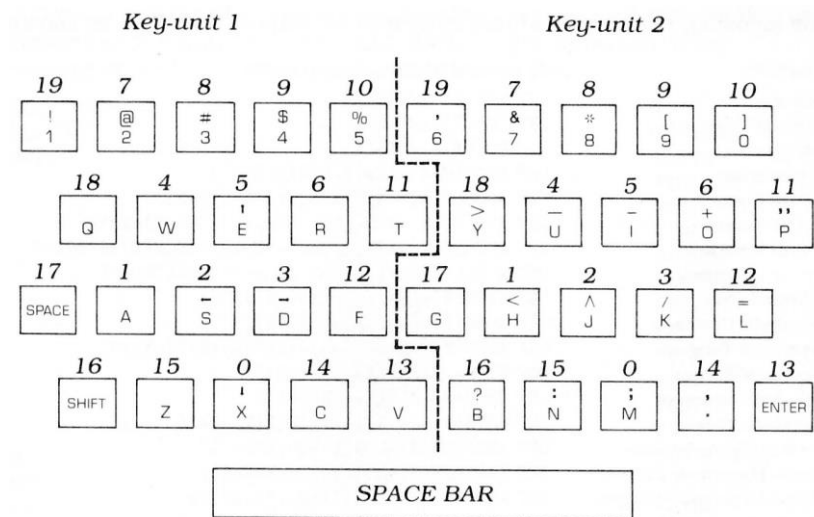
Mode 7	EQ = 1 if Break On
Mode 8	Raw scan code returned in R1h
	Raw code returned is >FF if no code in buffer

Parameter Description

Keyboard Mode

>0000	USE LAST KEYBOARD MODE (MUST BE GOOD!)
>0001	USE LEFT SIDE OF KEYBOARD
>0002	USE RIGHT SIDE OF KEYBOARD
>0003	STANDARD MODE
>0004	PASCAL MODE
>0005	BASIC MODE
>0006	Reserved for Abasic
>0007	BREAK KEY CHECK
>0008	RAW KEY CHECK

Left (>0001) and Right (>0002) side of Keyboard Modes



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KeyMode	0	Console keyboard, in mode previously specified by the calling subprogram.
	1	Only the left side of the keyboard is active.
	2	Only the right side of the keyboard is active.
	3	Places keyboard in standard TI-99/4A mode. (Most command module software used this mode.) Both upper and lower case alphabetical characters are returned as upper-case only, and the function keys (BACK, BEGIN, etc) return codes 1 through 15. No control characters are active. If code > 96 and Code < 123 then add ->20. If Code > 126, then Kill it. If Code < 32 and Code > 15 then Kill it.
	4	Remaps the keyboard in the PASCAL mode. Both upper and lower case alphabetical character codes are returned by the computer, and the function keys return codes from 129 through 143. The control character codes are 1 through 31.
	5	Places the keyboard in 99/4A BASIC mode. Both upper and lower case alphabetical character codes are returned by the computer. The function key codes are 1 through 15, and the control key codes are 128 through 159 (and 187).
	6	This mode does nothing at this time.
	7	ALT-4 and FCTN-4 test only. Sets or resets status flag via R15. Programmer can test with JEQ or JNE.
	8	Raw scan mode. Returns the raw make/break code sequence (2 bytes in succession calling the XOP twice stored in STRKBF.

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	<MODE>					
KEY	0	1	2	3	4	5
vvvvvvvKEYvvvvvv	0	1	2	3	4	5
--- ~ ---	96	-	-	96	96	96
SHIFT	126	-	-	126	126	126
--- 1 ---	49	19	-	49	49	49
CTRL	177	-	-	177	177	177
FCTN	3	-	-	3	131	3
SHIFT	33	-	-	33	33	33
--- 2 ---	50	7	-	50	50	50
CTRL	178	-	-	178	178	178
FCTN	4	-	-	4	132	4
SHIFT	64	-	-	64	64	64
--- 3 ---	51	8	-	51	51	51
CTRL	179	-	-	179	179	179
FCTN	7	-	-	7	135	7
SHIFT	35	-	-	35	35	35
--- 4 ---	52	9	-	52	52	52
CTRL	180	-	-	180	180	180
FCTN	2	-	-	2	130	2
SHIFT	36	-	-	36	36	36
--- 5 ---	53	10	-	53	53	53
CTRL	181	-	-	181	181	181
FCTN	14	-	-	14	142	14
SHIFT	37	-	-	37	37	37
--- 6 ---	54	-	19	54	54	54
CTRL	182	-	-	182	182	182
FCTN	12	-	-	12	140	12
SHIFT	94	-	-	94	94	94
--- 7 ---	55	-	7	55	55	55
CTRL	183	-	-	183	183	183
FCTN	1	-	-	1	129	1
SHIFT	38	-	-	38	38	38
--- 8 ---	56	-	8	56	56	56
CTRL	158	-	-	158	30	158
FCTN	6	-	-	6	134	6
SHIFT	42	-	-	42	42	42
--- 9 ---	57	-	9	57	57	57
CTRL	159	-	-	159	31	159
FCTN	15	-	-	15	143	15
SHIFT	40	-	-	40	40	40
--- 0 ---	48	-	10	48	48	48
CTRL	176	-	-	176	176	176
FCTN	188	-	-	188	188	188
SHIFT	41	-	-	41	41	41
--- - ---	45	-	-	45	45	45
SHIFT	95	-	-	95	95	95
--- = ---	61	-	-	61	61	61
CTRL	157	-	-	157	29	157
FCTN	5	-	-	5	133	5
SHIFT	43	-	-	43	43	43
--- [---	91	-	16	91	91	91
SHIFT	123	-	-	123	123	123
---] ---	93	-	-	93	93	93
SHIFT	125	-	-	125	125	125
--- \ ---	92	-	-	92	92	92
SHIFT	124	-	-	124	124	124
--- ; ---	59	-	17	59	59	59
CTRL	156	-	-	156	28	156
FCTN	189	-	-	189	189	189

	<MODE>					
KEY	0	1	2	3	4	5
vvvvvvvKEYvvvvvv	0	1	2	3	4	5
SHIFT	58	-	-	58	58	58
--- ' ---	39	-	-	39	39	39
SHIFT	34	-	-	34	34	34
--- , ---	44	-	14	44	44	44
CTRL	128	-	-	128	0	128
FCTN	184	-	-	184	184	184
SHIFT	60	-	-	60	60	60
--- . ---	46	-	13	46	46	46
CTRL	155	-	-	155	27	155
FCTN	185	-	-	185	185	185
SHIFT	62	-	-	62	62	62
--- / ---	47	-	16	47	47	47
CTRL	187	-	-	187	187	187
SHIFT	63	-	-	63	63	63
--- A ---	65	1	-	65	65	65
CTRL	129	-	-	129	1	129
FCTN	124	-	-	124	124	124
--- B ---	66	16	-	66	66	66
CTRL	130	-	-	130	2	130
FCTN	190	-	-	190	190	190
--- C ---	67	14	-	67	67	67
CTRL	131	-	-	131	3	131
FCTN	96	-	-	96	96	96
--- D ---	68	3	-	68	68	68
CTRL	132	-	-	132	4	132
FCTN	9	-	-	9	137	9
--- E ---	69	5	-	69	69	69
CTRL	133	-	-	133	5	133
FCTN	11	-	-	11	139	11
--- F ---	70	12	-	70	70	70
CTRL	134	-	-	134	6	134
FCTN	123	-	-	123	123	123
--- G ---	71	17	-	71	71	71
CTRL	135	-	-	135	7	135
FCTN	125	-	-	125	125	125
--- H ---	72	-	1	72	72	72
CTRL	136	-	-	136	8	136
FCTN	191	-	-	191	191	191
--- I ---	73	-	5	73	73	73
CTRL	137	-	-	137	9	137
FCTN	63	-	-	63	63	63
--- J ---	74	-	2	74	74	74
CTRL	138	-	-	138	10	138
FCTN	192	-	-	192	192	192
--- K ---	75	-	3	75	75	75
CTRL	139	-	-	139	11	139
FCTN	193	-	-	193	193	193
--- L ---	76	-	12	76	76	76
CTRL	140	-	-	140	12	140
FCTN	194	-	-	194	194	194
--- M ---	77	-	0	77	77	77
CTRL	141	-	-	141	13	141
FCTN	195	-	-	195	195	195
--- N ---	78	-	15	78	78	78
CTRL	142	-	-	142	14	142
FCTN	196	-	-	196	196	196
--- O ---	79	-	6	79	79	79

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KEY	<MODE>					
	0	1	2	3	4	5
CTRL	143	-	-	143	15	143
FCTN	39	-	-	39	39	39
--- P ---	80	-	11	80	80	80
CTRL	144	-	-	144	16	144
FCTN	34	-	-	34	34	34
--- Q ---	81	18	-	81	81	81
CTRL	145	-	-	145	17	145
FCTN	197	-	-	197	197	197
--- R ---	82	6	-	82	82	82
CTRL	146	-	-	146	18	146
FCTN	91	-	-	91	91	91
--- S ---	83	2	-	83	83	83
CTRL	147	-	-	147	19	147
FCTN	8	-	-	8	136	8
--- T ---	84	11	-	84	84	84
CTRL	148	-	-	148	20	148
FCTN	93	-	-	93	93	93
--- U ---	85	-	4	85	85	85
CTRL	149	-	-	149	21	149
FCTN	95	-	-	95	95	95
--- V ---	86	13	-	86	86	86
CTRL	150	-	-	150	22	150
FCTN	127	-	-	-	127	127
--- W ---	87	4	-	87	87	87
CTRL	151	-	-	151	23	151
FCTN	126	-	-	126	126	126
--- X ---	88	0	-	88	88	88
CTRL	152	-	-	152	24	152
FCTN	10	-	-	10	138	10
--- Y ---	89	-	18	89	89	89
CTRL	153	-	-	153	25	153
FCTN	198	-	-	198	198	198
--- Z ---	90	15	-	90	90	90
CTRL	154	-	-	154	26	154
FCTN	92	-	-	92	92	92
SPACE	32	-	-	32	32	32
ENTER	13	-	-	13	13	13
a	97			65	97	97
b	98			66	98	98
c	99			67	99	99
d	100			68	100	100
e	101			69	101	101
f	102			70	102	102
g	103			71	103	103
h	104	S	S	72	104	104
i	105	A	A	73	105	105
j	106	M	M	74	106	106
k	107	E	E	75	107	107
l	108	-	-	76	108	108

KEY	<MODE>					
	0	1	2	3	4	5
m	109	A	A	77	109	109
n	110	S	S	78	110	110
o	111	-	-	79	111	111
p	112	C	C	80	112	112
q	113	A	A	81	113	113
r	114	P	P	82	114	114
s	115	S	S	83	115	115
t	116			84	116	116
u	117			85	117	117
v	118			86	118	118
w	119			87	119	119
x	120			88	120	120
y	121			89	121	121
z	122			90	122	122
BACKSPACE	8	-	-	8	136	8
INSERT	4	-	-	4	132	4
HOME	-	18	-	-	-	-
PAGE UP	12	-	-	12	140	12
TAB	137	-	-	137	9	137
DELETE	3	-	-	3	131	3
PAGE DOWN	2	-	-	2	130	2
ESC	155	-	-	155	27	155
UP ARROW	11	5	-	11	139	11
DOWN ARROW	10	0	-	10	138	10
LEFT ARROW	8	2	-	8	136	8
RIGHT ARROW	9	3	-	9	137	9
F1 SL ON	226	-	-	226	226	226
F1 SL OFF	3	-	-	3	131	3
F2 SL ON	227	-	-	227	227	227
F2 SL OFF	4	-	-	4	132	4
F3 SL ON	228	-	-	228	228	228
F3 SL OFF	7	-	-	7	135	7
F4 SL ON	229	-	-	229	229	229
F4 SL OFF	2	-	-	2	130	2
F5 SL ON	230	-	-	230	230	230
F5 SL OFF	14	-	-	14	142	14
F6 SL ON	231	-	-	231	231	231
F6 SL OFF	12	-	-	12	140	12
F7 SL ON	232	-	-	232	232	232
F7 SL OFF	1	-	-	1	129	1
F8 SL ON	233	-	-	233	233	233
F8 SL OFF	6	-	-	6	134	6
F9 SL ON	234	-	-	234	234	234
F9 SL OFF	15	-	-	15	143	15
F10 SL ON	235	-	-	235	235	235
F10 SL OFF	188	-	-	188	188	188
F11	224	-	-	224	224	224
F12	225	-	-	225	225	225