An Extended Menu Navigation Interface Using Multiple Pressure Sensitive Strips

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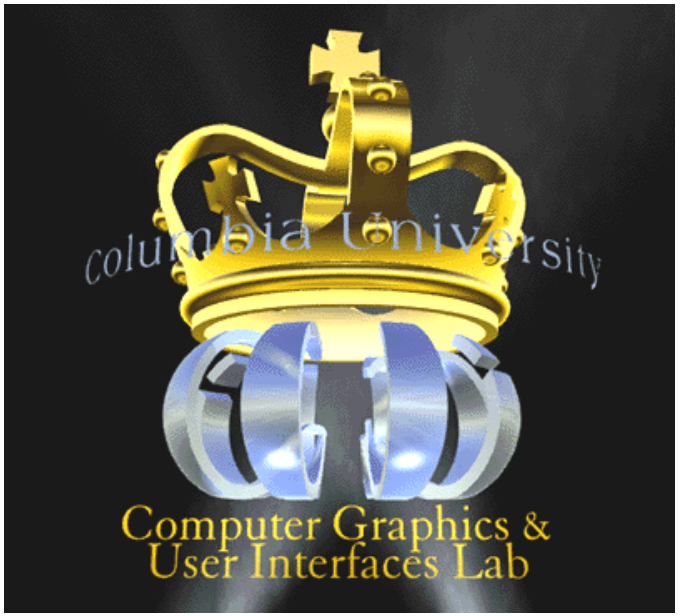

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Project Goals

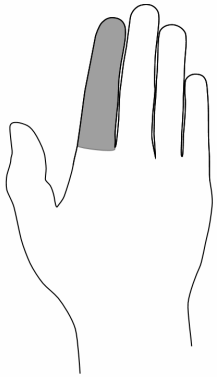
Input Device

- Versatile input
- Direct access to a large breadth of functions
- Eyes-free use → tactile guidance
- Instantaneous availability

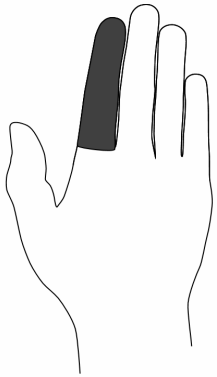
Graphical User Interface

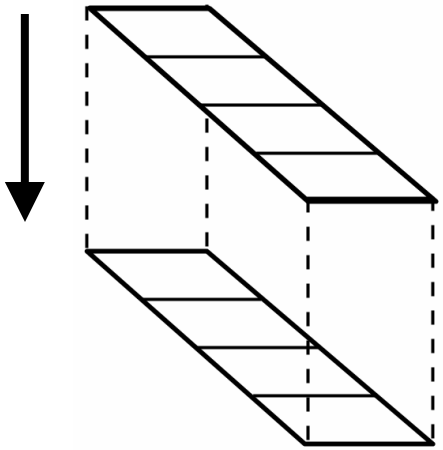
- Cursorless menu navigation
- Decreased need for visual feedback
- Easy legibility in eyeglass based head-worn displays

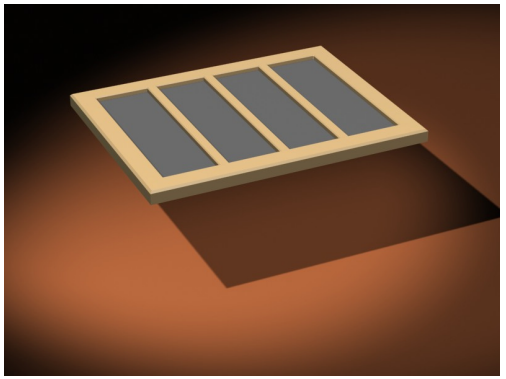
Pressure-Based Extensions



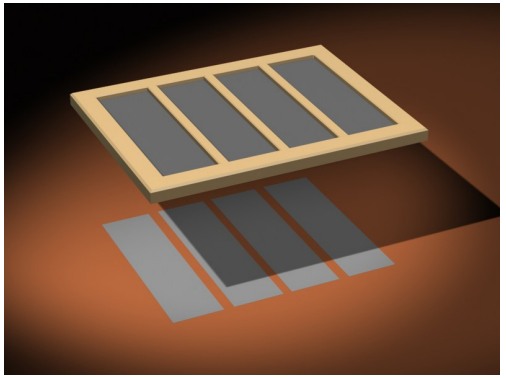
Applied extra pressure “pops-through”





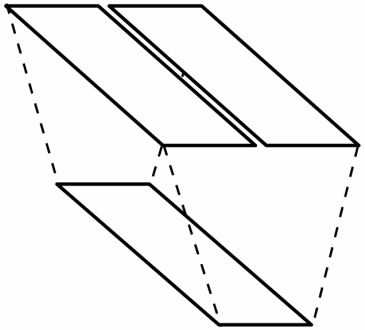


With 4 Secondary Strips device accommodates 8 menu strips

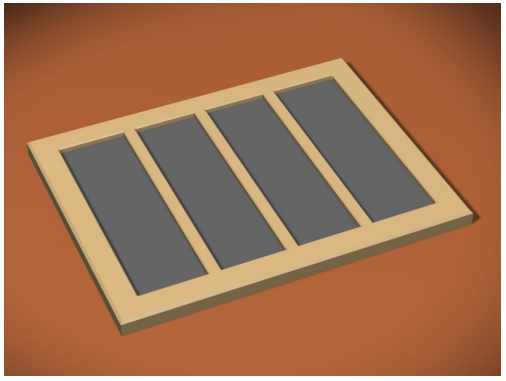


Dual-Finger Extensions

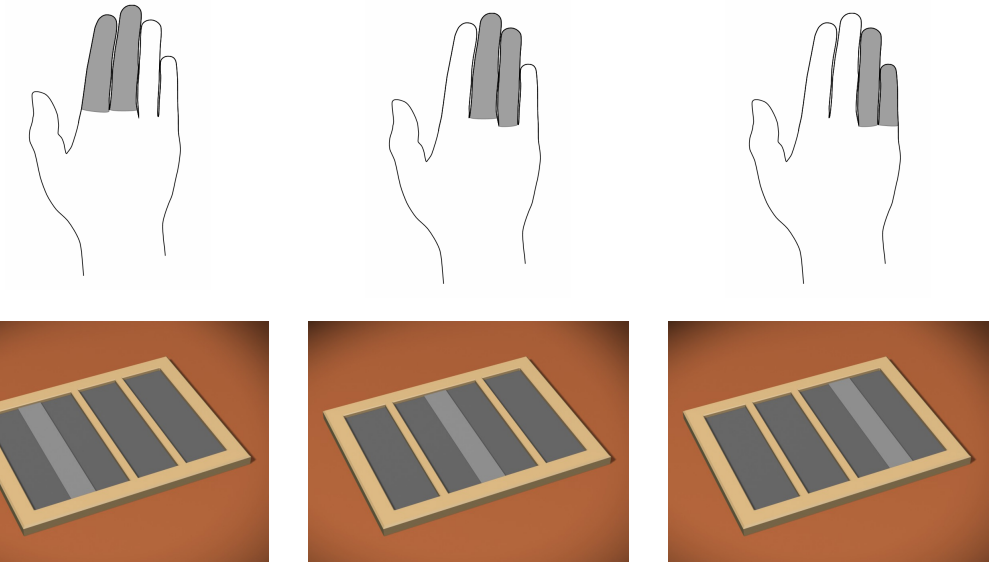
Neighboring Primary Strips

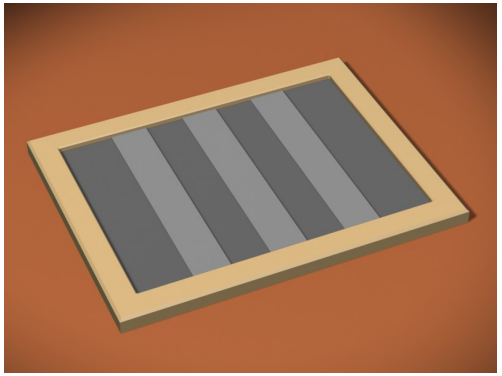


Equivalent Dual-Motion Strip



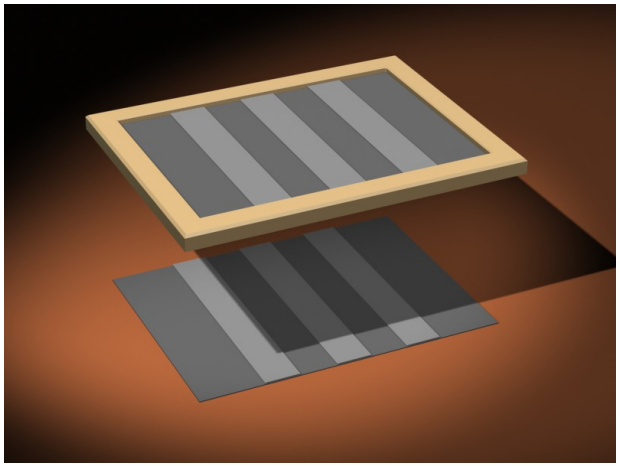
With 3 Dual Strips
device accommodates
7 menu strips

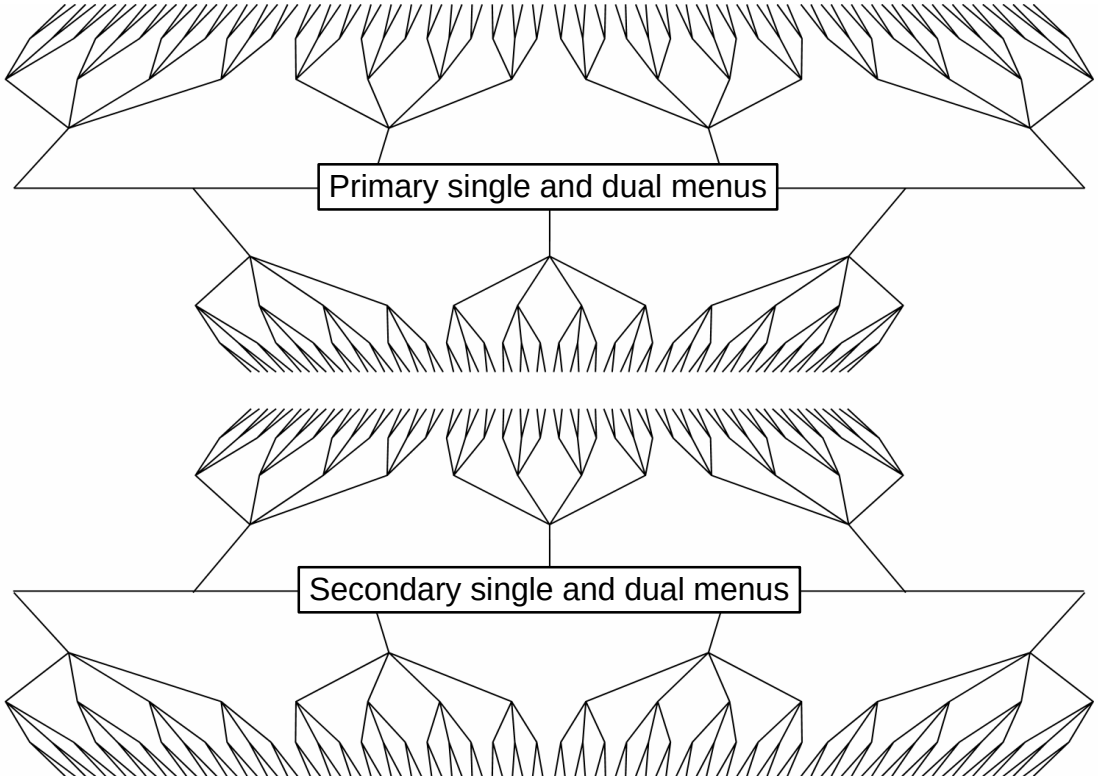


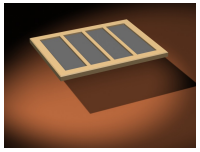


Pressure & Dual-Finger Extensions

Introduced Extensions to [1] allow direct access to up to 14 independent menu trees





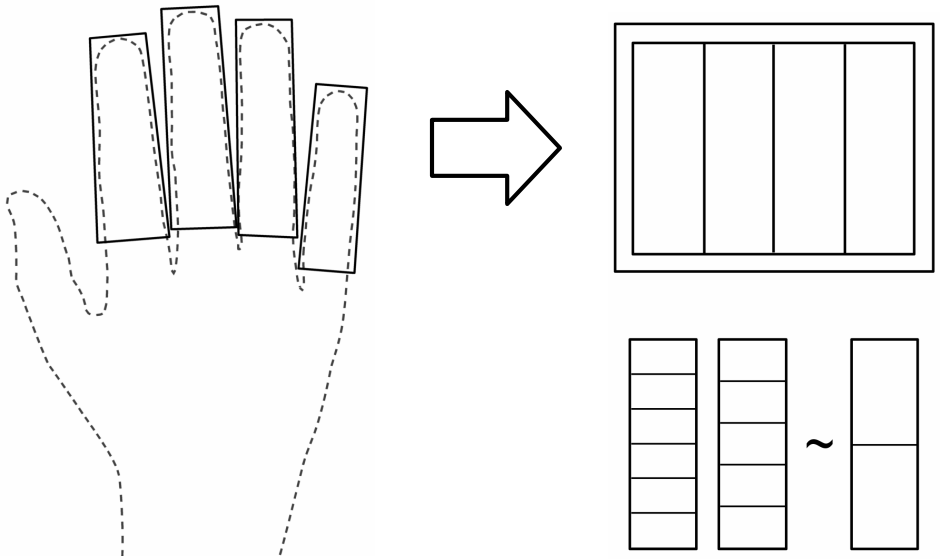


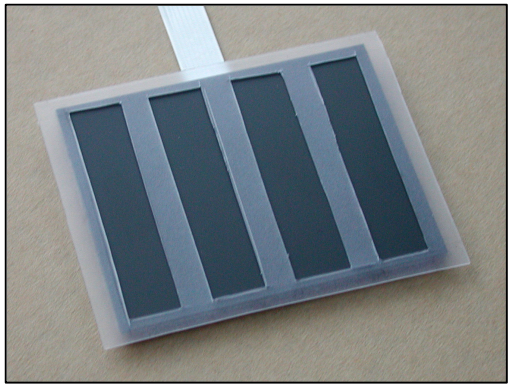
[1] Gábor Blaskó, Steven Feiner, **A Menu Interface for Wearable Computing**, 6th International Symposium on Wearable Computers (ISWC 2002), Seattle, WA, USA 7-10 October, 2002. p.164-165

Prototype Implementation

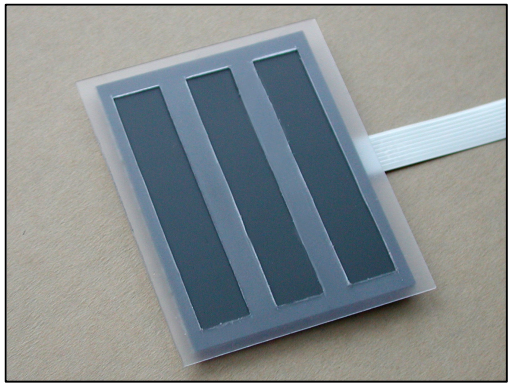
Synaptics TouchPad™
capacitive touch sensor

Reports absolute coordinates of contact and applied pressure



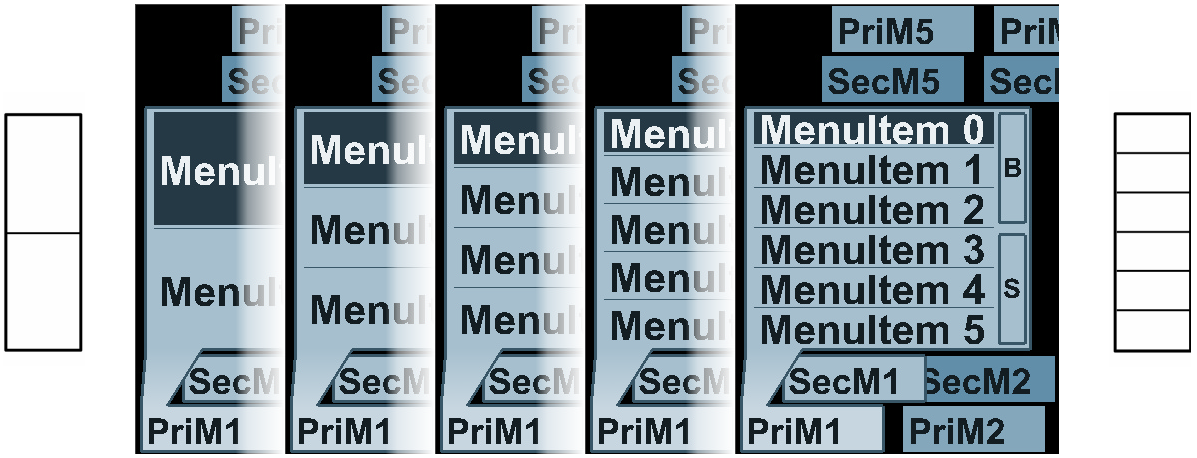


Horizontal orientation
4 strips → 14 menu strips



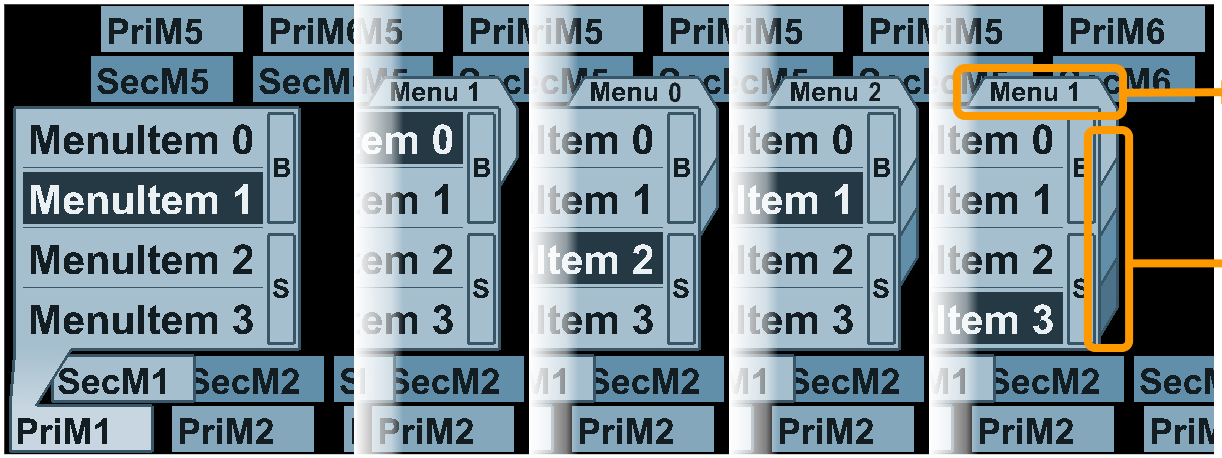
Vertical orientation
3 strips → 10 menu strips

Graphical Interface Elements



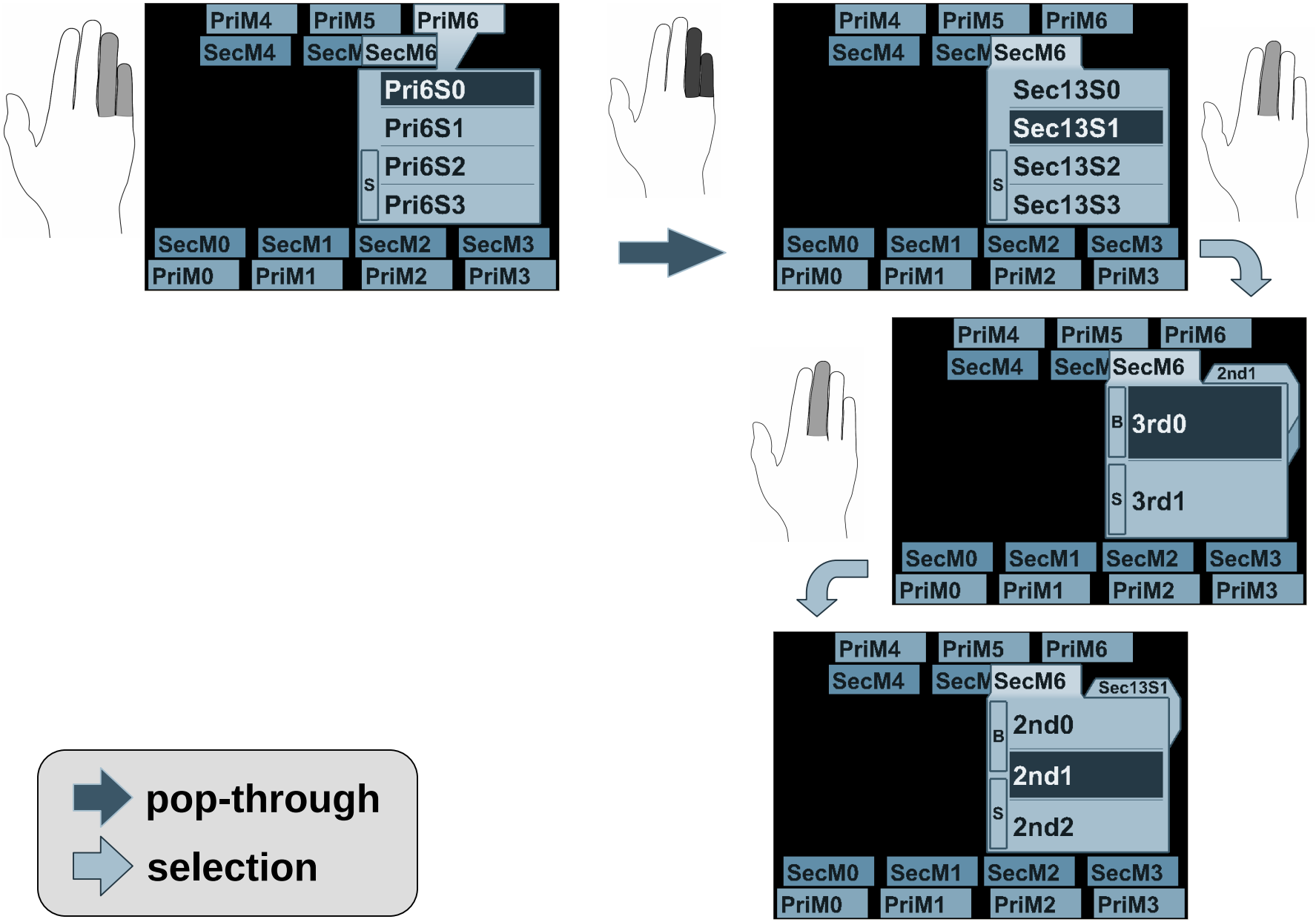
Strips are dynamically repartitioned

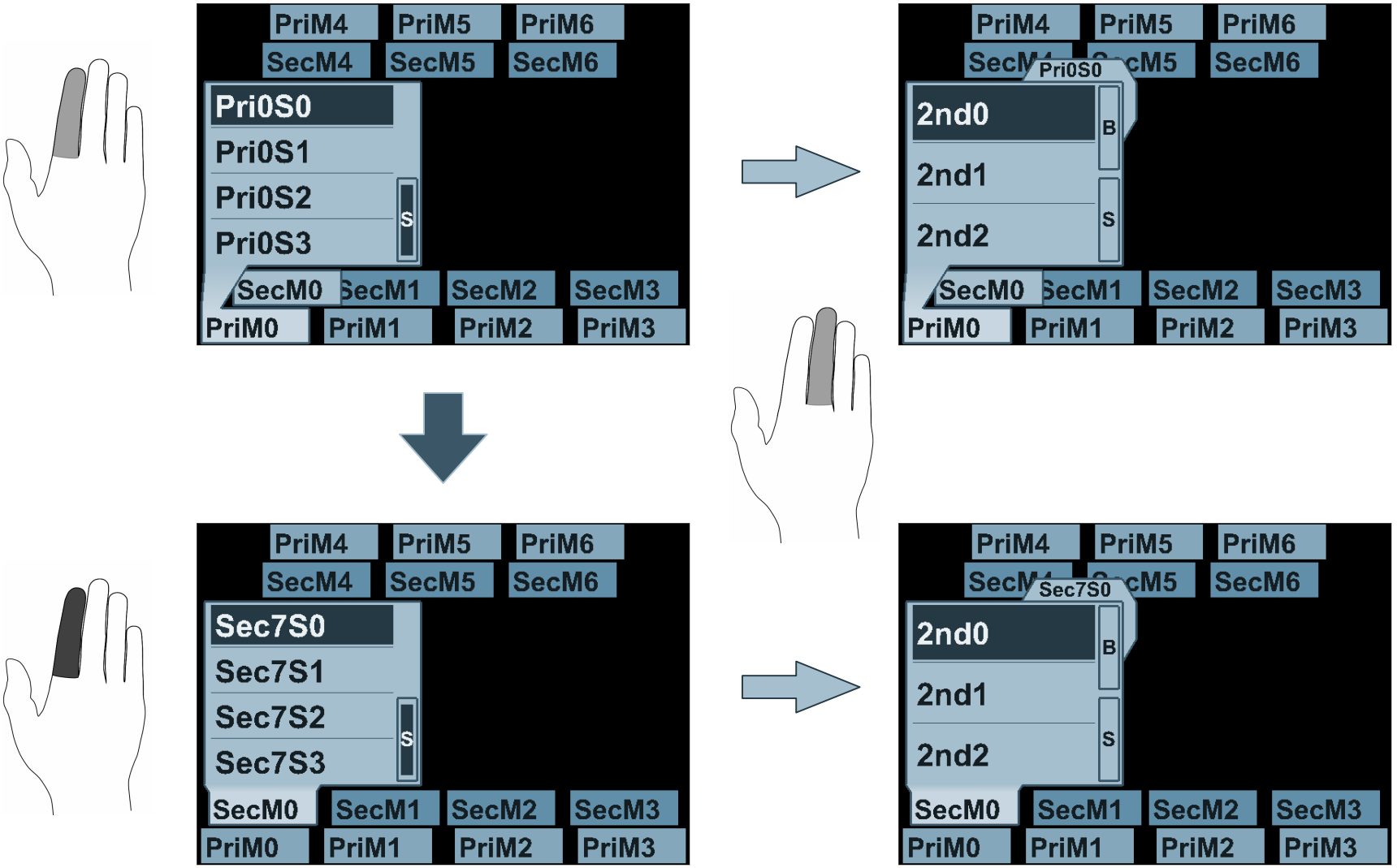
One sensor subsection per menu item

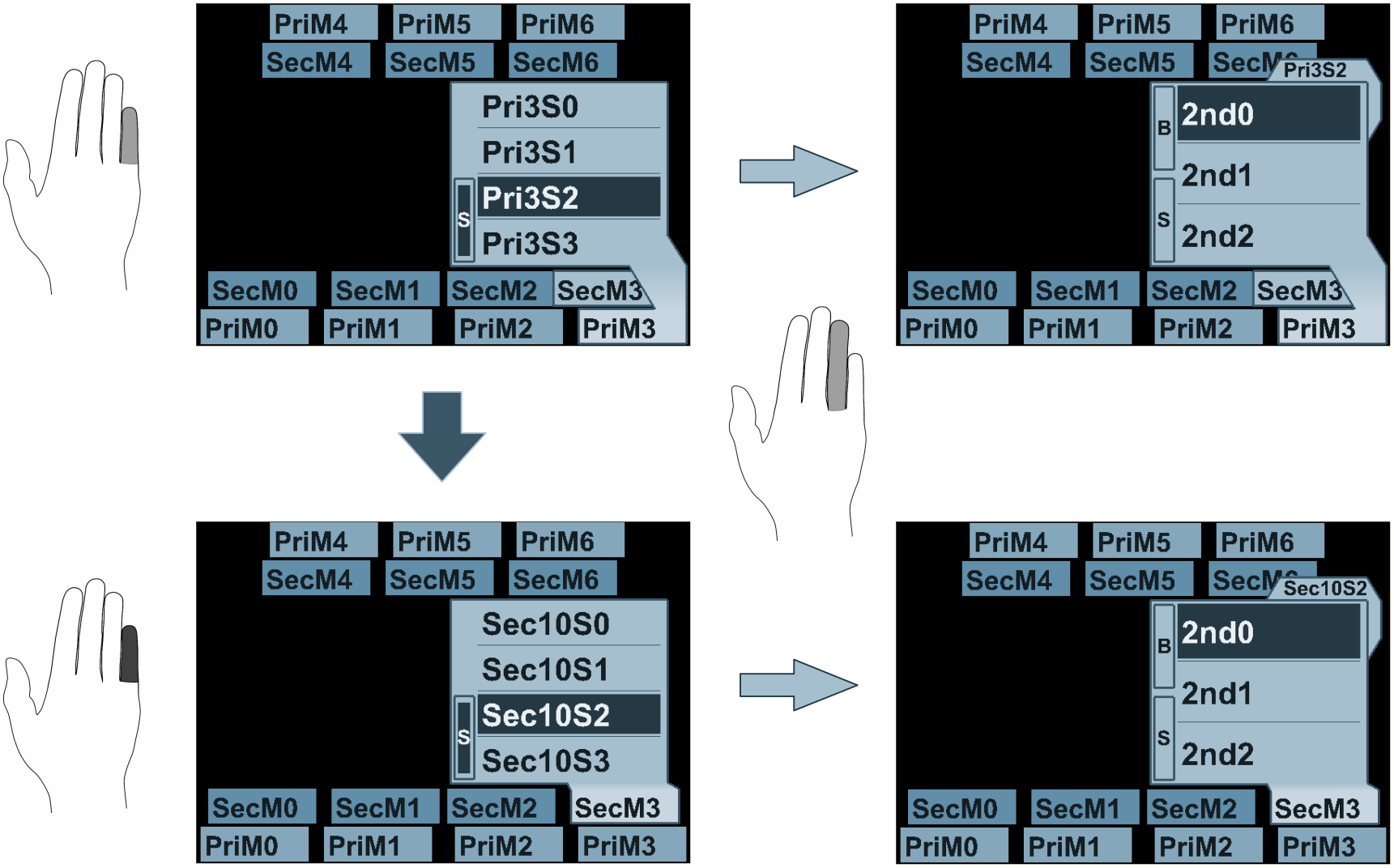


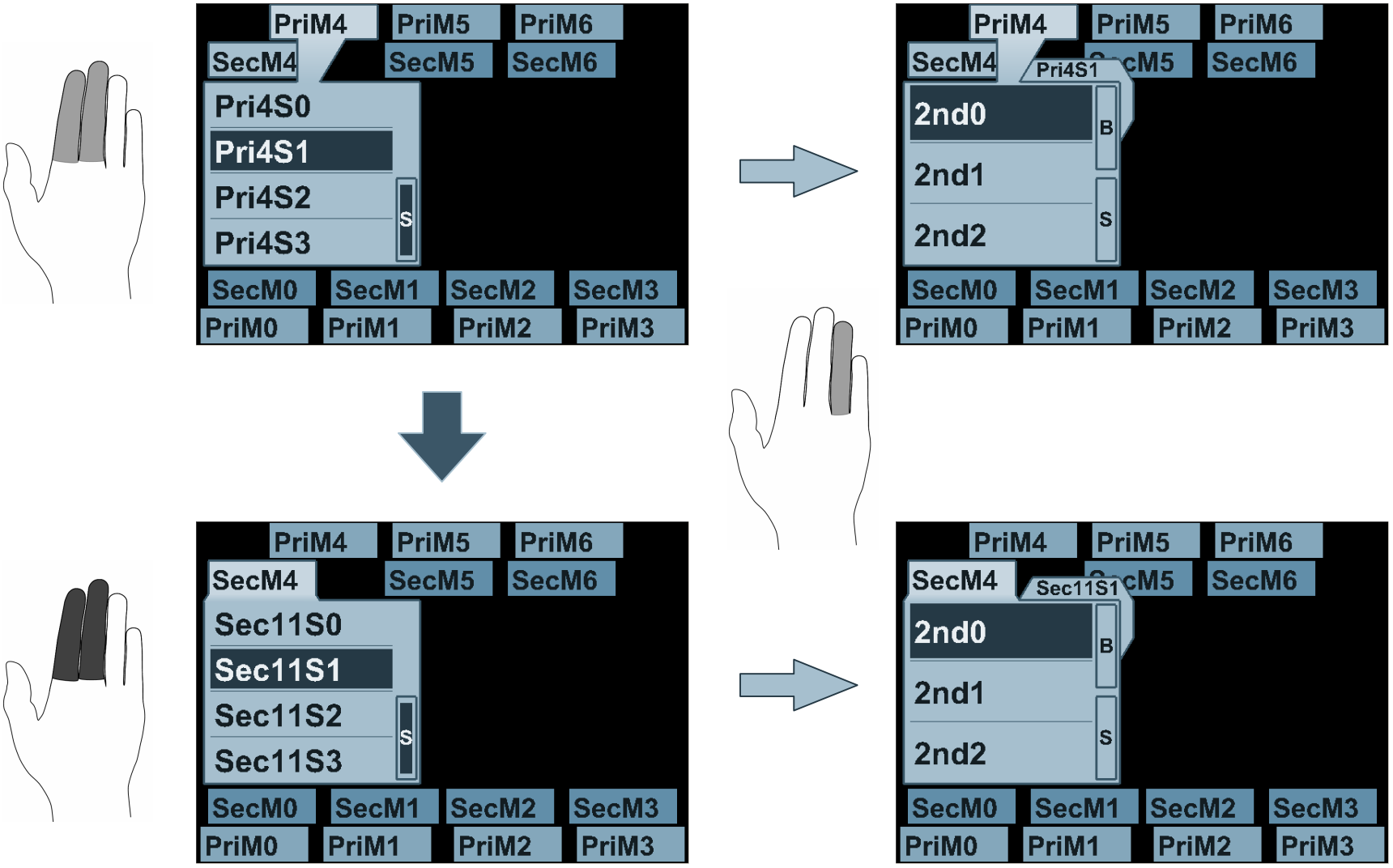
Title of the current menu

Visual depth cue


PriM4
PriM5
PriM6
SecM4
SecM
SecM6
Pri6S0
Pri6S1
S
Pri6S2
Pri6S3
SecM0
SecM1
SecM2
SecM3
PriM0
PriM1
PriM2
PriM3
Sec13S0
Sec13S1
Sec13S2
Sec13S3
2nd1
B
3rd0
3rd1
Sec13S1
2nd0
2nd1
2nd2
pop-through
selection


PriM4
PriM5
PriM6
SecM4
SecM5
SecM6
Pri0S0
Pri0S1
Pri0S2
Pri0S3
S
SecM0
SecM1
SecM2
SecM3
PriM0
PriM1
PriM2
PriM3
Pri0S0
2nd0
2nd1
2nd2
B
S
Sec7S0
Sec7S1
Sec7S2
Sec7S3


PriM4
PriM5
PriM6
SecM4
SecM5
SecM6
Pri3S0
Pri3S1
S
Pri3S2
Pri3S3
SecM0
SecM1
SecM2
SecM3
PriM0
PriM1
PriM2
PriM3
B
2nd0
2nd1
S
2nd2
Sec10S0
Sec10S1
Sec10S2
Sec10S3


PriM4
PriM5
PriM6
SecM4
SecM5
SecM6
Pri4S0
Pri4S1
Pri4S2
Pri4S3
S
SecM0
SecM1
SecM2
SecM3
PriM0
PriM1
PriM2
PriM3
Pri4S1
2nd0
2nd1
2nd2
B
S
Sec11S0
Sec11S1
Sec11S2
Sec11S3
Sec11S1