32. The multi-touch surface apparatus of claim 25, wherein the apparatus is ergonomically arched.

33. The multi-touch surface apparatus of claim 25, wherein the apparatus includes hand configuration visual indicators.

34. The multi-touch surface apparatus of claim 25, wherein the apparatus includes hand configuration audio indicators.

35. The multi-touch surface apparatus of claim 25 being one of fabricated on or integrated with a display device.

36. The multi-touch surface apparatus of claim 35, wherein the display device comprises one of a liquid crystal display (LCD) or a light-emitting polymer display (LPD).

37. A method for tracking and identifying hand contacts in a sequence of proximity images in order to support interpretation of hand configurations and activities related to typing, multiple degree-of-freedom manipulation via chords, and handwriting, the method comprising the steps of:

segmenting each proximity image into groups of electrodes which indicate significant proximity, each group representing proximity of a distinguishable hand part or other touch device;

extracting total proximity, position, shape, size, and orientation parameters from each group of electrodes;

tracking group paths through successive proximity images including detection of path endpoints at contact touchdown and liftoff;

computing velocity and filtered position vectors along each path;

assigning a hand and finger identity to each contact path by incorporating relative path positions and velocities, individual contact features, and previous estimates of hand and finger positions; and

maintaining estimates of hand and finger positions from trajectories of paths currently assigned to the fingers, wherein the estimates provide high level feedback to bias segmentations and identifications in future images.

38. A method for filtering and segmenting hand contacts in a sequence of proximity images in order to support interpretation of various contact sizes, shapes, orientations, and spacings, the method comprising the steps of:

creating a smoothed copy of the most recent proximity image;

searching for pixels with locally maximum proximity in the smoothed proximity image;

searching outward from each local maximum pixel for contact boundary pixels using boundary tests of pixel and neighboring pixel proximities which depend on properties of hand contacts expected in a segmentation region of the pixel;

forming groups from those pixels surrounding each local maximum pixel up to and including the boundary pixels;

combining groups of pixels which partially overlap;

extracting group positions and features by fitting an ellipse to each group of pixels; and

updating positions of the segmentation regions of the pixels in response to further analysis of the position and features extracted from each group of pixels.

39. The method of claim 38, wherein sloppy segmentation regions of the pixels include rectangular areas under expected palm locations where only proximity valleys between the palm heels or pixels near a background signal level act as boundaries, and wherein a remaining image portion is a strict segmentation region that establishes group boundaries at a directional proximity minima encountered in a direction of search outward from a given local maximum pixel.

40. The method of claim 38, wherein segmentation region rules of a hand touching the surface override segmentation region rules of a hand not contacting the surface.

41. The method of claim 38, wherein verified properties of each group of pixels in previous images are fed back as estimated hand offsets to adjust alignment of the segmentation regions for the current image.

42. A method for associating into paths those surface contacts from successive proximity images caused by the same hand part and detecting liftoff from and touchdown onto the surface by each hand part, the method comprising the steps of:

predicting the current positions of hand parts from their velocity along existing paths;

finding for each of a group of pixels in current proximity image the existing path with a closest predicted path position;

finding for each existing path the pixel group whose centroid is closest to the predicted path position and whose centroid is within a path-dependent tracking radius;

pairing each pixel group with its closest path if the pixel group is also the closest pixel group to the path;

starting new paths for remaining unpaired pixel groups;

deactivating paths which have no pairable pixel groups within the path-dependent tracking radius; and

updating path parameters from the measured parameters of the pixel group paired with each path.

43. A method of computing hand and finger position offsets from the measured positions of individual hand contacts on a multi-touch surface for the purpose of biasing future hand contact identifications or morphing the key layout in an integrated manual input device, the method comprising the steps of:

establishing fingertip, thumb, or palm identities for each contact;

establishing an offset weighting for each contact;

computing a hand position offset, wherein the offset is a weighted average of the difference between a measured position of each contact and a predetermined default position of the hand part which corresponds to an established identity of the contact; and

computing a finger position offset by subtracting a predetermined default position of an associated hand part of the contact and the hand position offset from a measured position of the contact.