

APAS for DOS Video Digitizing

(Last revised: 14 November 2002)

Steps for digitizing with the Ariel Performance Analysis System (APAS):

(1) Turn on the APAS computer and both monitors (colour and monochrome).

Note, whenever a value is required by the program, be sure to press the “Enter” key after typing the number, otherwise the previous value will be used.

(2) Choose the #1 option: *****APAS-CBA***** system. Enter **1**, later press **Esc** when the Ariel logo appears. If your video data have already been “grabbed” skip to the Digitizing step otherwise turn on the Video Cassette Player (VCP) and its monitor and insert your video.

GRABBING

(3) From the Main APAS/CBA menu choose the **APAS** menu, and under this menu choose **Grab**. Enter the User Directory name where your files will be stored. Usually, this will be **D:\pasdata\apa4311**.

(4) The active screen for the Grab Module is the monochrome monitor; this is your input screen. Select **Filename**, then select **New**. Enter a **Root Filename** for the grabbed (.VID) file. For example, for subject DR’s first trial of normal walking, you could call it: WN01DR. The .VID files are stored on drive E:. If that gets filled press **F1** to change to C: or D:.

(5) To digitize from a video recording select the **VCR** menu. To adjust the contrast and brightness of the video display press **F1**. When complete press **F10** to return to the main menu.

(6) Choose the **Capture** menu and under this menu pick the **Params** option. Enter a **Descriptor** of the data (characteristics of the trial). Set **VCR** to **Auto** and for **Offset** enter **0**. The **#Images** should be set to the number of frames that it takes for the subject to get from the ipsilateral toe-off before landing on the force platform to the next ipsilateral toe-off from the force platform plus 10 additional frames. The **Skip_Factor** should be set to **0**. **StepDelay** to **200ms**. Press **F10** when complete.

(7) Go to the **Toggle_Confirm** option and make sure this option (Confirm Grab) is **no**.

(8) Advance the video to the image of the control points (e.g., grid board) and “grab” this image by selecting **Control** and pressing the “Enter” key.

(9) Advance the video to the trial you have selected to digitize. Select the **Data** item to have the system grab the number of frames that you specified in (6). You will notice the picture advance through your sequence storing (“frame grabbing”) each image as it goes. You can stop the process whenever enough frames are grabbed by pressing **Escape**.

(10) Exit the **Grab** menu by pressing the **F10** key twice and answering **Yes**.

DIGITIZING

(11) Choose the **Digitize** option from the **APAS** menu and choose the same directory as in step (3) above. For Desired Action select a **New** sequence. Enter the sequence filename (e.g., WN01DR) and an explanatory title. Enter the number of markers to be digitized (excluding the fixed point) for the **#Points**, usually **7**. Then enter the number of control points (excluding the fixed point, maximum is 31). Usually enter **16** for the **#ControlPoints**. The other parameters do not need to be changed. Press **F10** when complete.

(12) Select as your Point ID Source the option **File**. Then choose the filename **Default** which contains the usual seven points (body markers) to be digitized. The usual markers and their order is:

1. R. Shoulder = RS	2. R. Hip = RH	3. R. Knee = RK
4. R. Ankle = RA	5. R. Heel = RL	6. R. Ball = RB
7. R. Toes = RT		

If you want a different set of markers choose **Keyboard**. Select the **Points** menu and after this the **Point Ids (Identifiers)**. Then select the order and type of marker you want to digitize. The number of markers is based on step (11).

(13) Now select filename of the “grabbed” file defined above in step (4). Skip digitizing a sample frame by pressing **F10** twice.

(14) Now it is time to define the control points of the grid board. The **Control Point Location Source** is **File**. Then select the file, **Default**, or **Vertical**. The locations are on the actual grid board itself. These are the black markers on the control grid from left to right starting from the highest row. Finish with the triangular marker immediately above the force platform’s centre. Press **F10** to exit from this mode. The first set of numbers is for a horizontal board (default)--the second for a vertically oriented board. The **control point locations** are as follows:

-100	110	0	or	-50	215	0
-50	110	0		0	215	0
0	110	0		50	215	0
50	110	0		-50	165	0
100	110	0		0	165	0
-100	60	0		50	165	0
-50	60	0		-50	115	0
0	60	0		0	115	0
50	60	0		50	115	0
100	60	0		-50	65	0
-100	10	0		0	65	0
-50	10	0		50	65	0
0	10	0		-50	15	0
50	10	0		0	15	0
100	10	0		50	15	0
0	0	0		0	0	0

If you want use a different set of control points select **Keyboard**. Then enter the correct 3D locations of your control points. The number of control was specified in step (11).

(16) Next, choose **New_view** and enter the **FilmSpeed** of 60 (fps). For **Title** enter an appropriate title, such as, sagittal view, then press **F10**. The other parameters are unnecessary.

(17) Select **Video/PCX_File** and then select the filename of your grabbed file. To use automatic digitizing press **F1** (AutoDigitize) otherwise press another key to proceed. If you select AutoDigitize choose **Yes** to pause after each frame. This allows you a chance to make corrections if the computer digitizes incorrect markers.

(18) If your image is small or not very clear, choose the **Video (F8)** option to make the image larger (this will help in the identification of the body markers). For the laboratory setting, the **2X** option is usually sufficient, but adjust the zoom until you obtain the clearest picture for your trial. Press **F10** twice to return to the main menu.

(19) Deactivate the **Ftn_strip** (function strip). This strip can interfere with digitizing points on the left side of the screen. This is done through the **Display menu (F7)**.

(20) Start the digitizing process by digitizing the control points. Select **Options (F9)** then press **Control** and then **Digitize** to display the Control board. If no control points are included with the data file use the **Read** option and select a file that has them. Be sure it is a trial taken with exactly the same camera position. You must digitize the fixed point (ball marker on floor) and then the grid points (left to right from the top to the bottom, the last marker is the centre of the force plate). If you happen to make a mistake, use the **F3** key to back up and redigitize a point. Don't be concerned if the program cannot locate a point. It will not need to locate these points again. When finished press **F1** (Advance) and then **F10** to begin digitizing the body markers.

(21) Press the **F10** key to start digitizing the frames of your trial. Continue digitizing, advancing the images (with **F1**) until you are finished the entire sequence of frames.

(22) Record in the table below the frame numbers of significant events that occurred during the motion. For walking and running, the events are ipsilateral foot-strike (IFS); ipsilateral toe-off (ITO); contralateral foot-strike (CFS) and contralateral toe-off (CTO). The ipsilateral side is the side of the body that steps on the first force platform. Similar events are used for jumping but other events may be used for lifting, throwing, etc. Note, different motions require a different order of events. For walking the order is ITO, IFS, CTO, CFS, ITO, ...; for running the sequence is ITO, CFS, CTO, IFS, ITO, ... and for jumping ITO then IFS.

Event	Frame	Biomech†	Event	Frame	Biomech†
—			—		
ITO			—		
IFS			—		
CTO			—		
CFS			—		
ITO			—		
IFS			—		
† Biomech frame numbers are usually 6 less than the APAS numbers because they start at frame -5 whereas the APAS starts at frame 1.					

(23) Once finished digitizing, exit the **Digitize** menu and then **Exit** the program.

(24) Be safe, **make a copy** of your file on diskette and transfer it to another computer.