

LABANGRAPH: A COMPUTER EDITOR FOR THE LABAN SYSTEM OF NOTATION

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The first version of LabanGraph was introduced to ICKL at the 2011 conference in Hungary (Fügedi 2012). At that time, its control system was based on key combinations of a special device shown in figure 1 that proved to be too complicated for most users. The new version provides visual representations of symbols and certain functions to edit a score.

LabanGraph was not conceived as a stand-alone program but as an application of the well-known computer aided design software, AutoCAD. The reasons for not developing a stand-alone editor are various. The most important ones are that the host software:

- a) manages rapid changes in operating systems;
- b) solves basic functions of graphics such as drawing lines, arcs, circles, shading, handling the symbol database, functions of different zooms, moving around in the drawing, and so forth; and
- c) provides a programming interface to identify complex graphical elements and makes customization possible.

As a matter of fact, commercial software may have several disadvantages. Their use usually requires fees, and their development and trade may be prohibited. At the time of this paper, Autodesk, the producer of AutoCAD, follows a policy to make it available free for students, educators, and educational institutions. Its file



Fig. 1

format is so widespread that a great number of software can interpret it, therefore, in the improbable event of Autodesk terminating its trade, at least scores currently created can be saved graphically.

In the following, only certain main functions of LabanGraph will be discussed to give an impression of its architecture and possibilities; a complete description of LabanGraph's operation is available on its home page (db.zti.hu/neptanc_tudastar/labangraph_en.asp).

LabanGraph's Basic Tools

The opening screen, when LabanGraph is installed, is shown in figure 2. Two tools are available. One is a tool palette, which can be dragged to a convenient location on the screen; its size can be adjusted according to needs. The other is a ribbon under the LabanGraph tab at the top of the screen. Its panels are best kept there, but can also be moved from the Ribbon onto the editing screen and back if needed.

Fig. 2

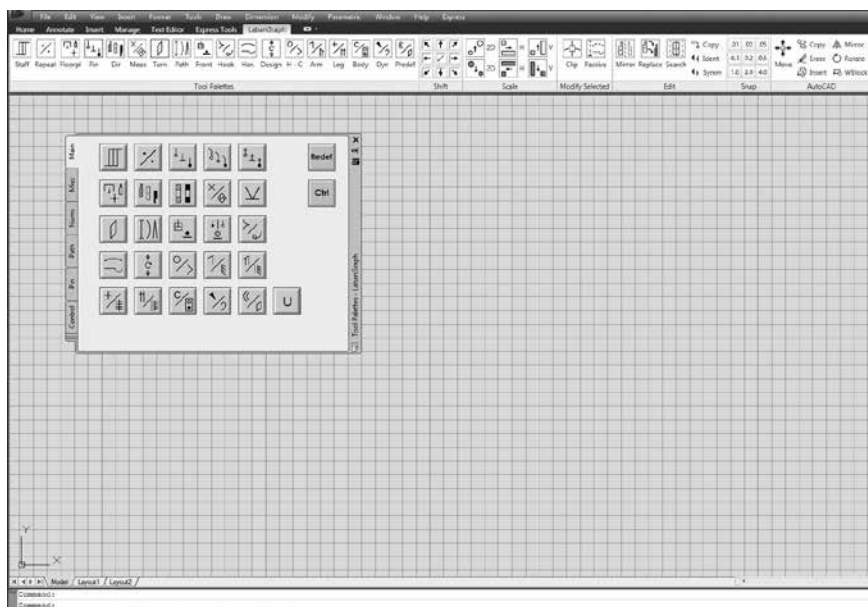


Figure 3 presents the MAIN tool palette that appears at program start (or by typing “tp” in AutoCAD’s command line). A click on the buttons in MAIN calls up subpalettes; the icons represent the subpalettes’ approximate content. The first button in the upper left corner of MAIN helps in creating staves; the second in the first row presents a set for inserting repetition signs, the third a set of pins, and so forth.

Editing scores usually starts with the staff. The Staff button calls up a subpalette shown in figure 4. Its first row offers different measure structures. Selecting one, for example 2/4, initiates another subpalette as shown in figure 5, from which the number

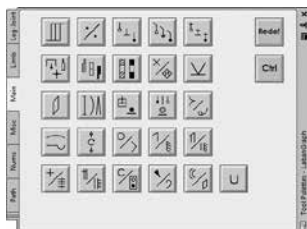


Fig. 3

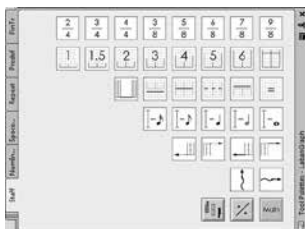


Fig. 4

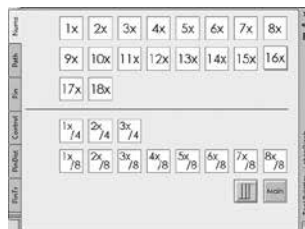


Fig. 5

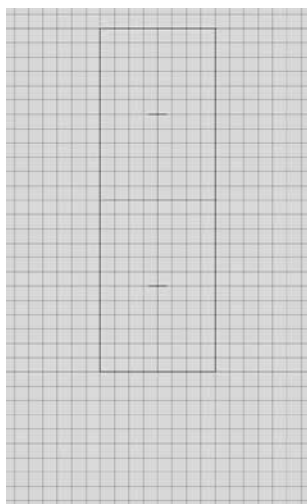


Fig. 6

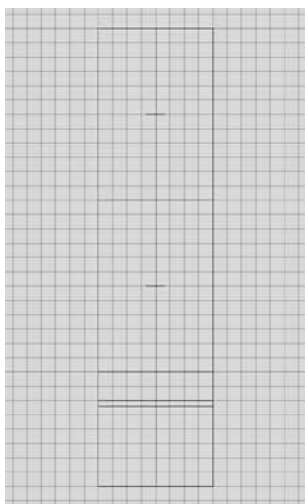


Fig. 7

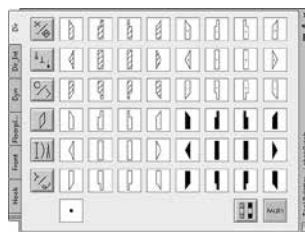


Fig. 8

of measures can be defined. If 2x is clicked, the outline of a staff of two measures of 2/4 appears and moves together with the cursor; it can be inserted at the desired place in the drawing. When inserted as shown in figure 6, the palette changes back to the subpalette as shown in figure 4. The predefined staves of LabanGraph possess four columns and a beat corresponds to six squares.¹ The size of the background grid is set to the width of one column.

The second row of the STAFF palette helps in creating the upbeat and the starting position. The numbers in the icons of upbeats represent their length in squares. For example, when editing upbeat #2 is selected and subsequently the starting position at the end of this row is selected, the result, shown in figure 7, is produced.

Clicking the Main button in the STAFF palette (figure 4) returns the user to the MAIN palette (figure 3), where another subpalette can be selected. For faster and frequently selected changes, the Direction button also can be selected from the STAFF palette, which takes the user directly to the DIRECTION palette—see figure 8. Icons for main direction symbols are grouped by level; buttons for the most frequently used palettes form a column on the left side of the palette. Clicking an icon for a

¹ Parametric definition of staves is not an option at present.

direction sign produces a small, one-square-sized direction symbol on the crosshair of the cursor—see figure 9. After the insertion point of the symbol is selected, the icon is replaced by an extendable rectangle that helps in producing the length of the sign as shown in figure 10. Only the length of direction symbols needs to be established, the program does not alter the width of signs (such as direction symbols) designed to be one column wide. After extending the symbol to the required length, a click produces the direction sign, a place low in this case, as shown in figure 11, which is the start of the short sequence to be presented here. Measure 1 in figure 12 was edited repeating the selection–insertion–length definition process for each of the direction signs. The turn sign in the upbeat was selected from the TURN palette (see figure 13); its length set in the same way as direction symbols. The place direction symbol in the second eight count phrase is modified with a black pin, selected from the PIN palette (see figure 14); the narrow sign for the right arm was selected from the SPACE MEASUREMENT palette (figure 15); and the pre-sign for the left lower arm from the ARM JOINTS palette (figure 16).

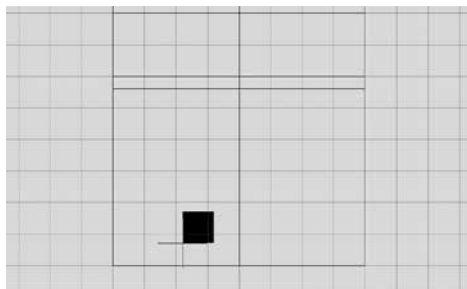


Fig. 9

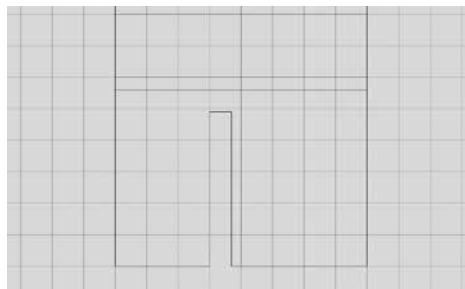


Fig. 10

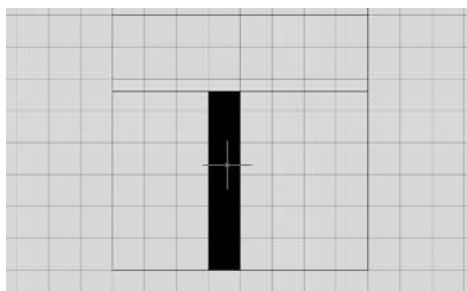


Fig. 11



Fig. 13

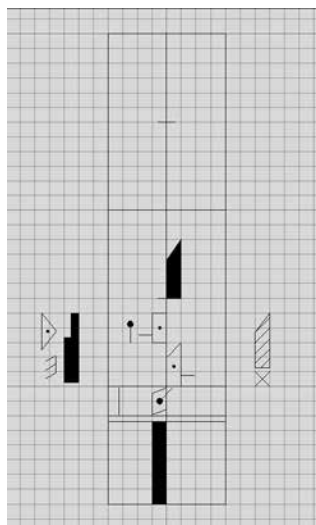


Fig. 12

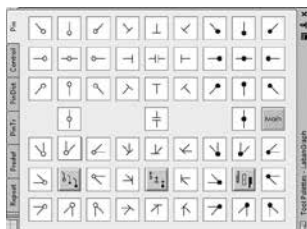


Fig. 14

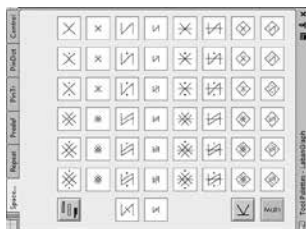


Fig. 15



Fig. 16



Fig. 17



Fig. 18

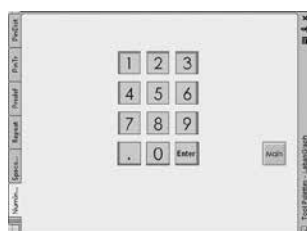


Fig. 19

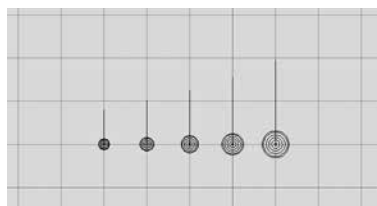


Fig. 20

As noted above, palettes can be changed by returning to the MAIN palette and selecting the required set or, more directly, by selecting an icon from the *Tool Palettes* panel in the Ribbon menu, shown in figure 17. LabanGraph's Ribbon menu serves further functions. An arrow selected from the *Shift* panel (figure 18) shifts a symbol in the corresponding direction. The distance of the shift can be set by clicking in the center of the icon, which calls up the NUMINPUT palette (figure 19). The value of a column width is 2; all measurements are related to this value. The default value of shift distance is 0.25; it can be overwritten by selecting a new value in the NUMINPUT palette.

The *Scale* panel changes the size of a selected symbol. The scale may be completed two-dimensionally, as shown in figure 20, where the size of a black pin—the original size in the middle—is decreased or increased. Such a 2D scale of signs that have set sizes (pins, space measurement, K-signs, and so forth) may be needed if there is little space available on the staff when several signs need to be written side by side. Figure 20 shows that the black disc of the pin is substituted with concentric circles. The reason for this substitution is transportability. When an AutoCAD drawing is imported into another graphical program, the translators cannot always properly interpret the solids in circular patterns, which may result in the misprinting of a full disc. However, simple concentric circles with the appropriate line weight result in a filled image of a disc.

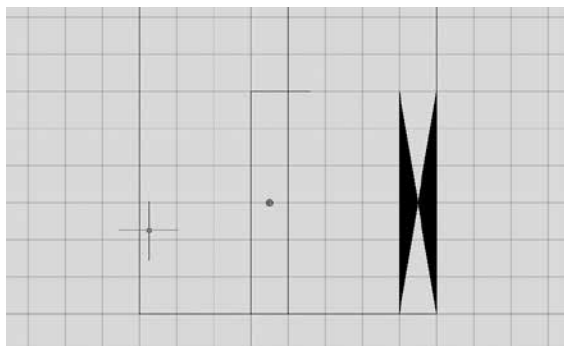


Fig. 21



Fig. 22



Fig. 23

The *Scale* panel offers possibilities to modify only a symbol's length or width, without changing the other dimension. Figure 21 presents a posture where the directions of the right thigh and lower leg are notated with half-width symbols, the width of the signs were decreased with the appropriate function of *Scale*.

The left icon in the *Modify Selected* panel can be used to split a symbol, usually a path sign or a vertical or horizontal bow to insert another sign into it. The right icon transforms a selected sign, such as an action stroke, a path sign, an addressing sign, or a bow into a passive one. If a sign is selected for which transformation into a dotted version makes no sense, the function is not available.

The *Snap* panel in figure 22 changes the *Snap* mode applied while editing notation. *Snap* is a vital tool to attach symbols precisely. Without *Snap* the symbols are misplaced, which results in poor quality printing. Editing a score always requires selection of *Snap* mode, no matter how small the measure of *Snap*. For general uses, *Snap* 0.5 serves most needs. The *AutoCAD* panel in figure 22 is a collection of icons that call up the most frequently needed AutoCAD commands for creating scores.

Advanced Functions

LabanGraph includes some special functions that may be needed in editing or revising a score. A click on the small icons for "Identical" or "Symmetrical" functions (abbreviated as Ident and Symm) in the *Edit* panel shown in figure 23 repeats a selected sign identically or symmetrically (if symmetrical is applicable). The difference between the "Copy" functions in the *Edit* and *AutoCAD* panels is that, in the *Edit* panel the Copy command must be clicked each time it is needed; in the *AutoCAD* panel the Copy command remains in effect until cancelled.

Movement sequences in dance are frequently mirrored, referred to as having symmetrical repeats in kinetography theory, echoing the bilateral symmetry of the human body. To speed up editing, a "Mirror" function allows users to insert a symmetrical set of selected symbols. Instead of notating measure 1 of figure 12 again, sign by sign, to achieve a symmetrical sequence, first the content of measure 1 is copied into

measure 2—see figure 24, where, after clicking the “Mirror” button as the function requested, the signs are selected (dotted and grayed) and the CONTROL tool palette becomes visible as well. The selection can be concluded by clicking the Enter button in the CONTROL tool palette. The function then asks, in the command line, for the axis of mirroring. Definition of a single point is sufficient as the mirroring will be performed across a vertical graphical axis. The function next requires the user to answer whether the original signs are deleted or not. For present purposes, the user should select the Yes button. The result of mirroring can be seen in figure 25. The “Mirror” function is not just a simple graphical mirroring, but a logical one: all symbols are replaced by their symmetrical counterpart at the level of symbol identification in the database of AutoCAD’s entities.

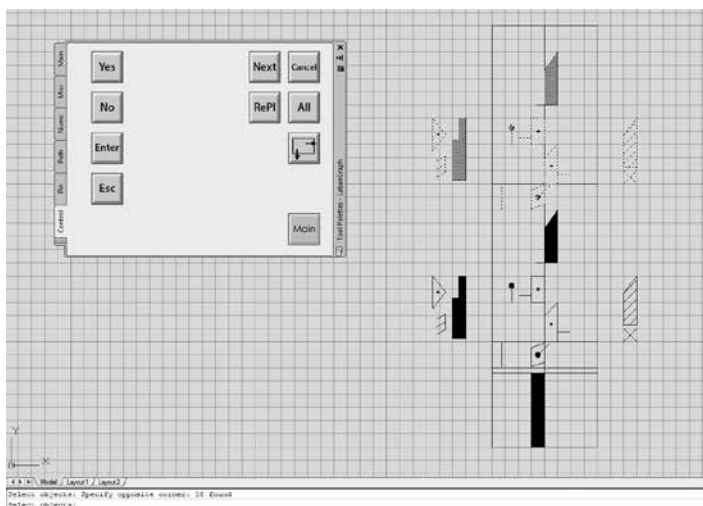


Fig. 24

Another special function of the *Edit* panel is “Replace”, which searches for single symbols and offers the possibility to replace them with another designated one. Figure 26 shows a section of 64 measures from a dance in Mezőség called *sűrű* (a fast men’s dance), phrased into eight measures that correspond to the phrases of the tune accompanying the dance.² In this notation the use of black pins follow Mária Szentpál’s usage of notation in that the black pins show the physical relationship in positions of the feet, deviating from the standard rules representing the relation of the center points of feet.³ The intention is to replace the black pins with white

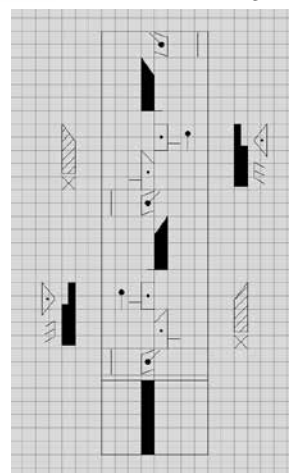


Fig. 25

² The dance was performed by János Lőrincz in Szépkényerűszentmárton (Comuna Sânmărtin, Romania), recorded by László Füleki and Gábor Misi in August 18, 1997, notated and edited with LabanGraph by Gábor Misi in 2003 and revised in 2015, archive ID MTA BTK ZTI Tit. 1403.

³ See a detailed discussion on this usage by Gábor Misi in the 2013 Proceedings of ICKL, 50-42.

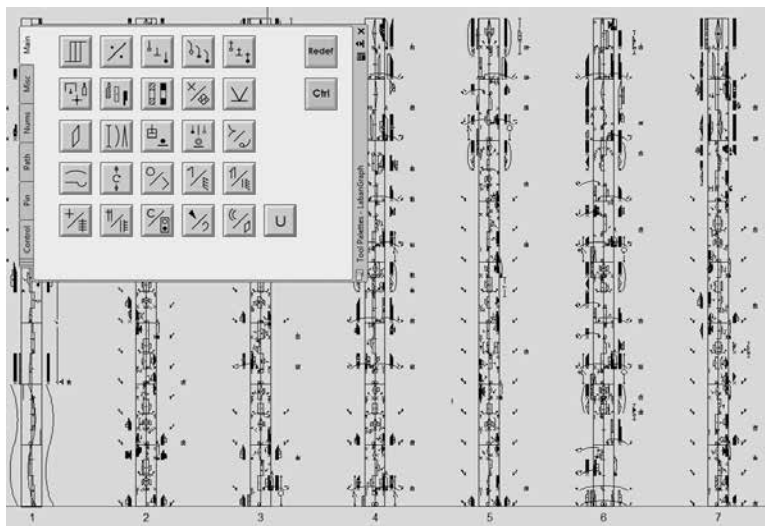


Fig. 26

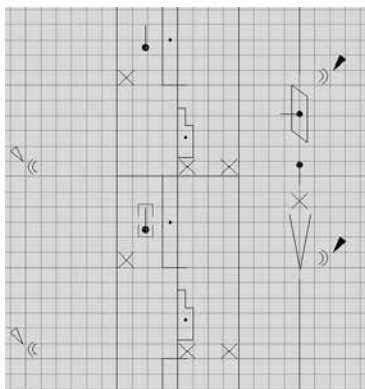


Fig. 27

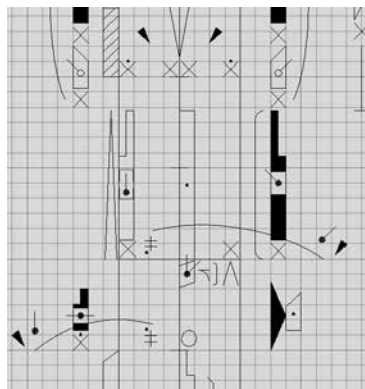


Fig. 28

pins as proposed by Ann Hutchinson at the 1979 ICKL conference (“Technical Report,” 58). The user clicks the Replace button in the *Edit* panel changing the tool palette to the CONTROL palette and the program sends the message “Select a sign to replace!” The black pin next to a place direction sign in the support column is selected in figure 27 and the user clicks the Enter button in the CONTROL palette. The pin is enclosed by a dotted rectangle and the next message appears: “Select another sign to replace with!” After the user selects a white pin from another section of the score (the “sign to replace” can be selected in any context, it can even be added temporarily to the drawing), the next message asks whether to keep the frame around the signs to replace. Because even symbols with fixed sizes can be resized after inserting them, the question refers to keeping the actual size or changing to the program’s pre-defined size. Select the Yes button, as it suits most needs. The last question is: “Replace all? (y/n).” Select the No button, because black pins are applied in different contexts, not only to define relationships of feet. The function searches for instances of the forward black pin, encloses those found by dotted rectangles as shown in figure 28, and asks the question “Replace?” Select the No button, the intention is not to modify

intermediate directions. Figure 29 presents a hit where the black pin needs replacing. If the Yes button is selected, the function replaces the black pin with the white one as shown in figure 30 and waits for a command. It can be Next, which searches for the next instance of a black forward pin, or Cancel, which ends the “Replace” function.

The “Search” function provides a possibility to search a single symbol or a group of symbols. If the user clicks the Search button in the *Edit* panel, the CONTROL palette appears and the function asks the user to select symbols. In figure 31, five signs are selected – two place middle directions, two dynamic signs, and a horizontal bow; together, they represent a heel click. When the selection is finished by clicking the Enter button in the CONTROL palette or on the keyboard, the selected signs are enclosed by a rectangle, then the prompt asks: “Do you want to modify search rectangle? (y/n).” The function searches the selected signs within the rectangle surrounding the selection, but not beyond. Therefore, if a similar constellation is larger (longer) than the selection, it will not result in a hit. In the example, the selection is shorter than a beat. For the sake of this search it is modified to include a whole beat, so the question is answered “Yes.” An enlarged rectangle is set as shown in figure 32. The next question asks for confirmation: “Rectangle OK?” If the answer is No, the rectangle can be modified again, if Yes, the search is started. Different search results, enclosed

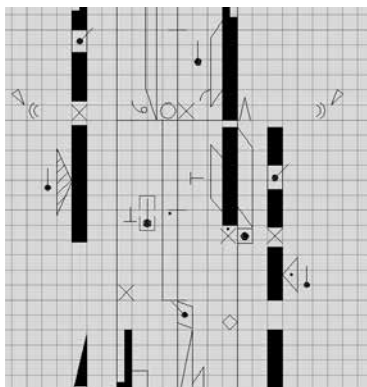


Fig. 29

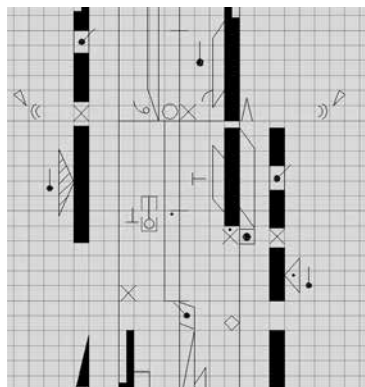


Fig. 30

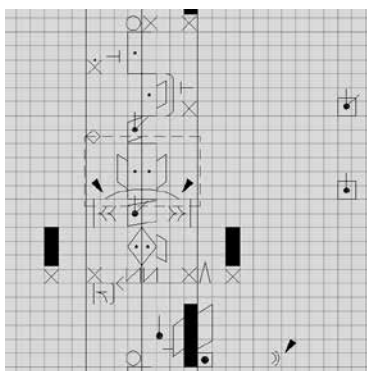


Fig. 31

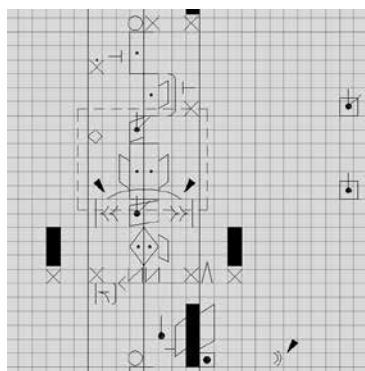


Fig. 32

by the set search rectangle, can be seen in figures 33-35. Each includes the originally selected set of signs, which may be different in shape and applied in different context.

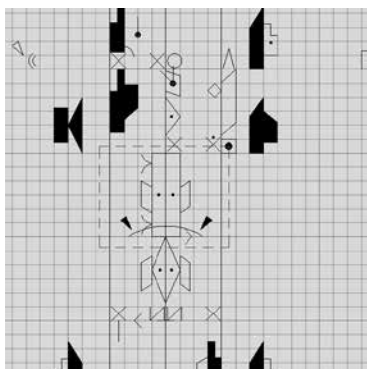


Fig. 33

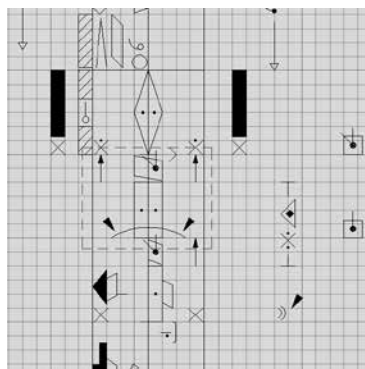


Fig. 34

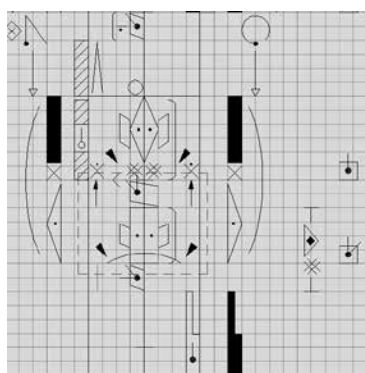


Fig. 35

Publishing Notation

The primary goal of developing LabanGraph was to create a tool to professionally edit and publish scores. AutoCAD produces high resolution, highly detailed vector graphics, where the actual size of the drawing can be defined independently from line weight (dissimilar to the pixel graphics such as in jpg or tif formats, where the change of picture size changes the width of lines). Although scores may be published directly from AutoCAD, to accommodate required text and musical information, publishing is better with software developed for this purpose such as Adobe's InDesign. As InDesign does not accept the AutoCAD dwg file format I import the dwg file first into Adobe's Illustrator, set the appropriate size and line weight prior to sending the graphics to the publishing software..

Future Possibilities

The created structure of LabanGraph serves a possibility to develop it into different directions. One can be the inclusion of the symbol set and drawing requirements of Motif Writing or Effort analysis. The other can be the widening of graphical

possibilities to speed up editing or serve special needs of different dance genres. Gábor Misi has already begun a promising initiative in his experiment “Search and Analysis in Kinetography Laban/Labanotation” to support structural analysis of traditional dance.

Availability

LabanGraph is free for all those interested. Its beta version with documentation can be downloaded from its home page. As mentioned above, AutoCAD version 2011 or later is required. AutoCAD runs on Windows, Mac OS, and iOS, however, for the time being, the Tool Palette extension, on which LabanGraph’s latest version is based, can be achieved only for versions running on the Windows operating system.

ACKNOWLEDGEMENT

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REFERENCES CITED

- FÜGEDI, János. 2012. “LabanGraph 4P – An(other) Computer Editor for Labanotation.” *Proceedings of the Twenty-seventh Biennial ICKL Conference*, edited by Marion Bastien, János Fügedi, and Richard Allan Ploch, International Council of Kinetography Laban, pp. 327-331.
- . 2016. *Knowledge Base of Traditional Dances*. Institute for Musicology, Research Centre for the Humanities, Hungarian Academy of Sciences. dx.doi.org/10.23714/nzntk.ntt.ind.en.
- “Technical Report.” *Proceedings of the Eleventh Biennial ICKL Conference*, International Council of Kinetography Laban, pp. 58-61.
- MISI, Gábor. 2014. “Indications of the Placement of the Feet with Pins.” *Proceedings of the Twenty-eighth Biennial ICKL Conference*, edited by Marion Bastien and János Fügedi, International Council of Kinetography Laban, pp. 45-89.
- . “Search and Analysis in Kinetography Laban/Labanotation.” www.labanatory.com/eng/theory.html.