

Chapter 8

Software for generating the data of the pulse programmer and the pulse shaping unit

Since the computer can control the pulse programmer and the pulse shaping unit, so it is necessary to have software for the computer to control these instruments. To make it easy for the non-programmer user, this software should be designed in packages such that user does not know how source program work. The software has 3 main sections, they are the pulse programmer editor (Editor for PPM), the pulse shaping editor (PSP Editor) and Send_data for PPM and PSP. The first two sections allow user to generate the data for PPM and PSP respectively, by mouse device and/or keyboard. The last section will retrieve the generated data and send to the pulse programmer or the pulse shaping unit. All sections are written in units of Turbo Pascal, so the another programmer can use them in their program.

The pulse programmer editor (Editor for pulse programmer)

This unit is written in 40 column CGA text mode. Most of the programs use the mouse device, except 4 options on the upper-right corner are sometimes used keyboard. These 4 options are L(oad), S(ave), D(irectory) and Q(uit). The first column is used to program clock and the 8 next columns are used to program channels. From Fig.8-1, it illustrates example for programming pulse sequence on PPM.

The pulse shaping editor (Editor for Pulse Shaping unit)

This unit is written in EGA graphic mode and used mouse device and sometimes keyboard for user interface. From Fig.8-2, it shows file menu that consists of New, Load, Save, Directory and Quit. This menu is easy to use.

Fig.8-3 shows the draw menu which consists of Freehand, Line and Math. User can draw any shapes by freehand mode or line mode. It normally defaults freehand mode. Math option is used for drawing the mathematical shapes, $Y(T)=f(T)$.

Fig.8-4 shows Editor menu which consists of Grid, Insert, Delete, Replicate, Multistep, Mirror, Move, Amplifier and Copy. Grid option is used for changing a mouse speed, its value normally defaults 10. Insert option is used for inserting space on any shapes. Delete option is opposed to the insert option for deleting any shapes. Replicate option is used to copying one shape to many identical shapes. Multistep option is used to copying one shape to many shapes, but changing size of each shape from positive value to negative value with constant step. This multistep option is used for NMR imaging. Mirror option is used to reversing any shapes from left position to right position and right position to left position. Move option is used to moving any shapes to place another shapes. Amplifier option is used to changing the size of shape with multiplying by scale factor. If result shape is larger than window ($-128 < Y < 128$), it will be clipped. Copy option is used to split one shape to two shapes.

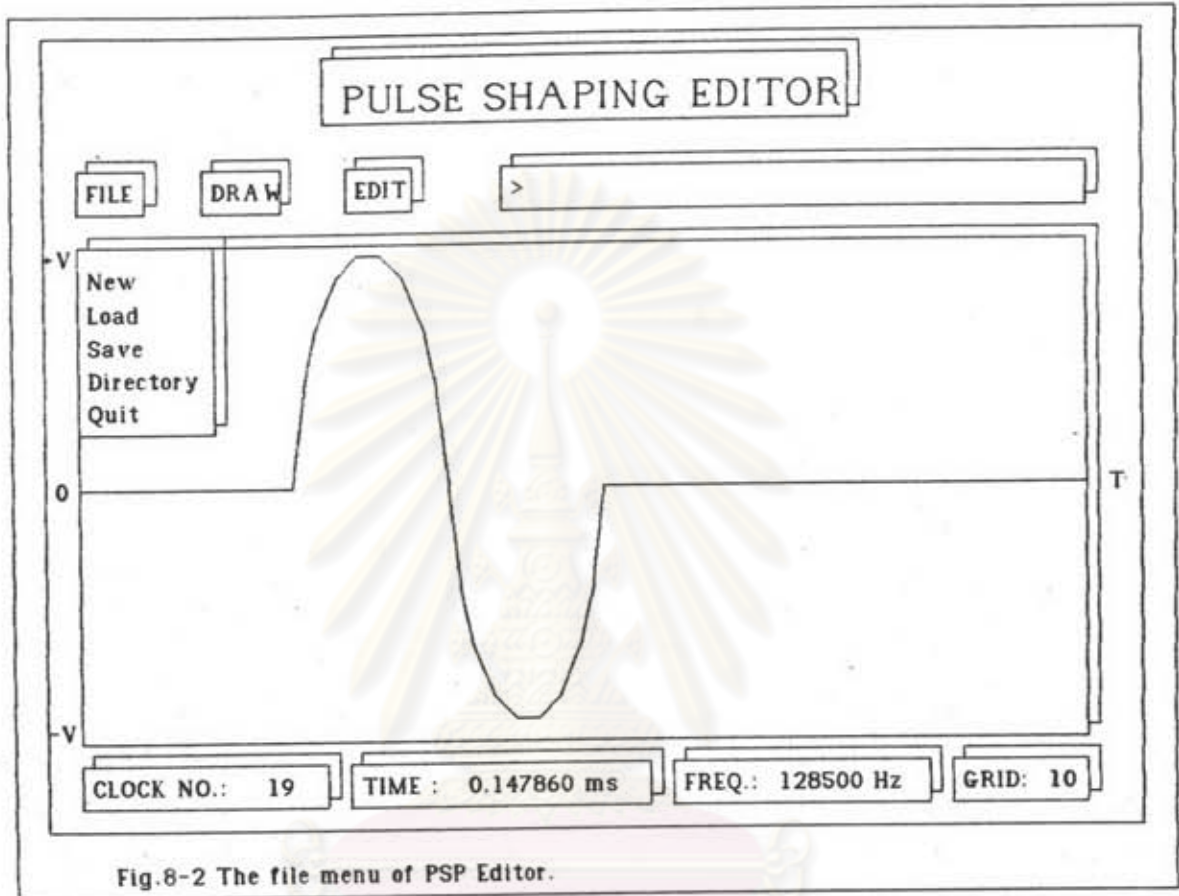


Fig.8-2 The file menu of PSP Editor.

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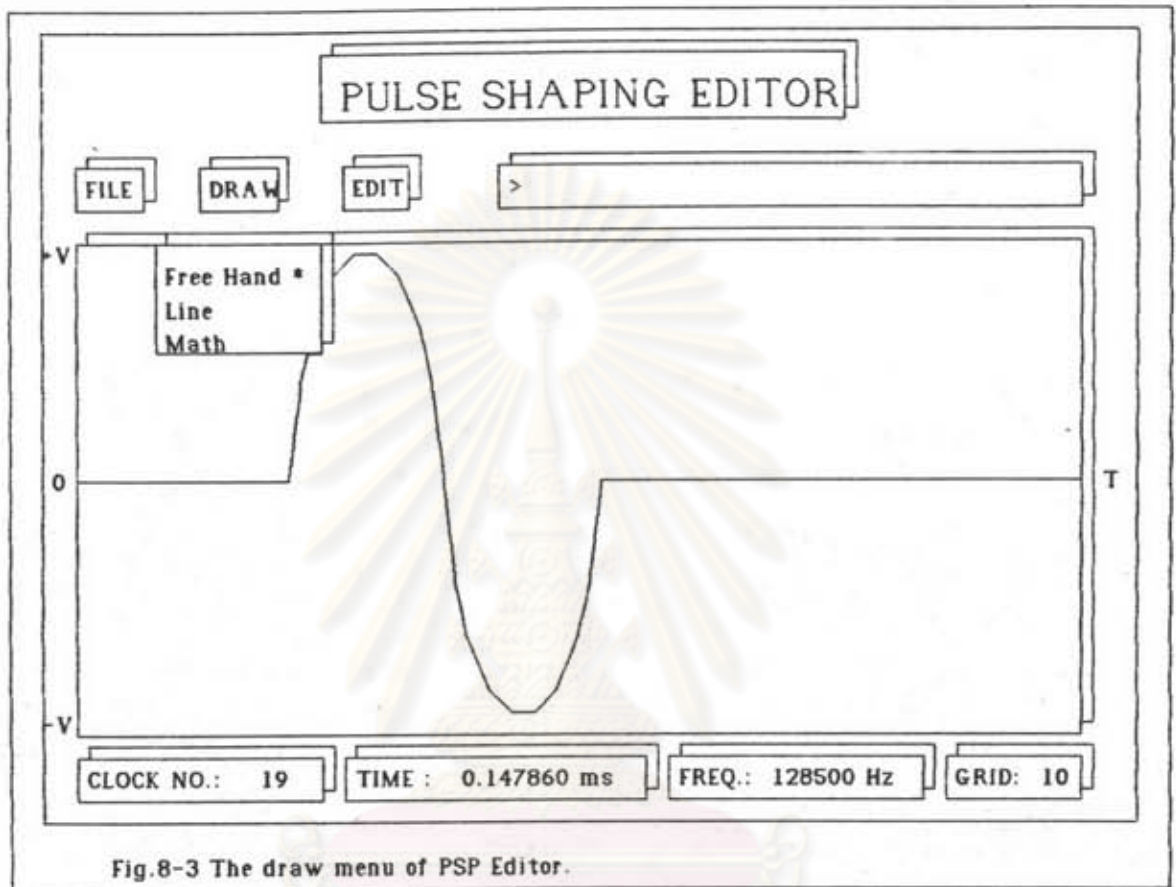


Fig.8-3 The draw menu of PSP Editor.

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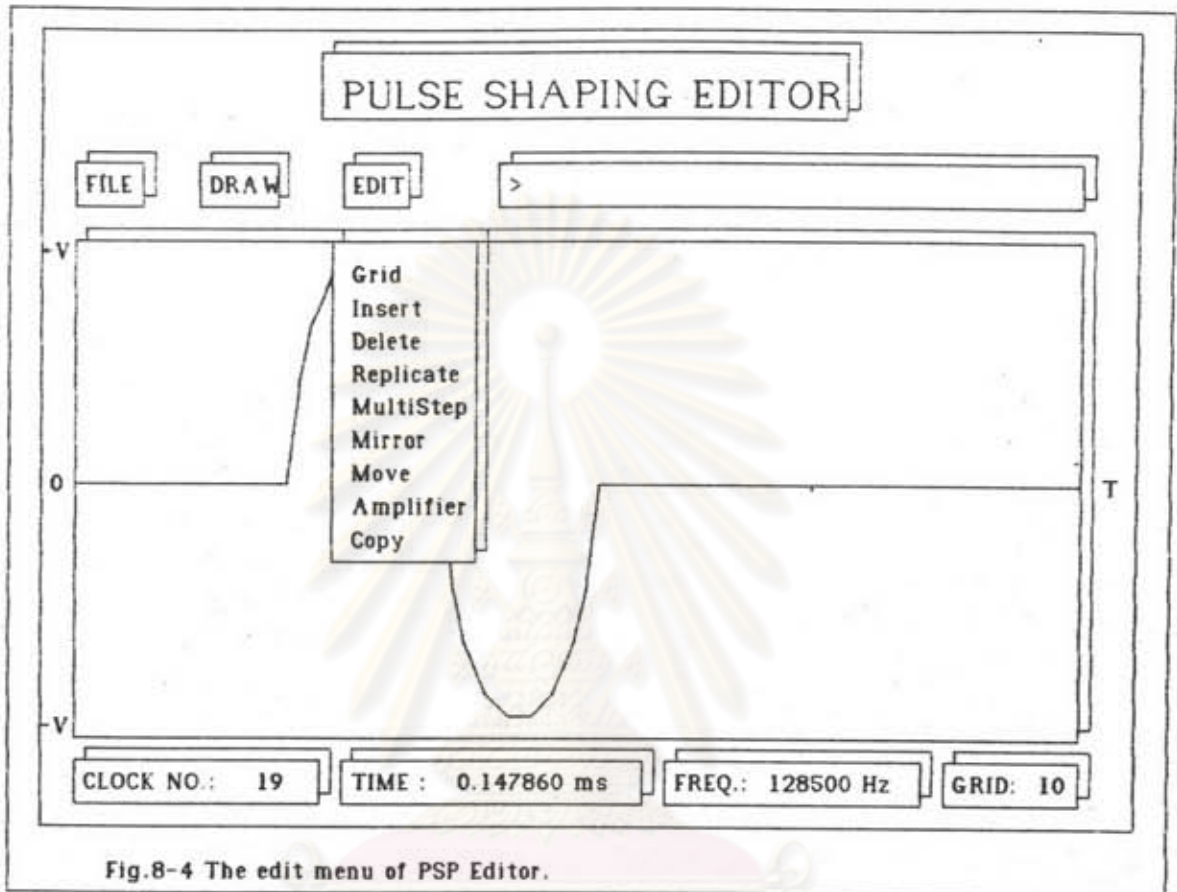


Fig.8-4 The edit menu of PSP Editor.

This editor can scroll left or right by left mouse button. It can change the frequency by mouse or sometimes keyboard. From Fig.8-4, clock no. and time values are clock and time at mouse position, respectively. Appendix G is shown the source program of PSP editor and appendix H is shown the source program of parser2, that is used by PSP editor.

Send data for the pulse programmer and the pulse shaping unit

This unit is written in unit of Turbo Pascal, it is interfaced with Wiwat's thesis program (Wiwat Sidhisoradej 1989). This unit will load the data files that are generated by PPM editor or PSP editor, and send them to the specified PPM or PSP. All devices have the different address. the source program of send_data unit for PPM and PSP is shown in appendix I. User controls the start times of PPM or PSP with triggering to PSP or PPM by the following command :

```
Gptrg(<specific device address>,successful);
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This command is in gpib unit, so user must be included (used) this unit before using this command.



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