

RPN

REVERSE POLISH NOTATION

- A METHOD FOR ENTERING COMMANDS

JANUARI 1989 AVAB ELEKTRONIK AB v-1.0

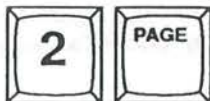
Basic philosophy

RPN is a method for entering commands into calculators and computers. We at AVAB have chosen to use this principle in all our products.

The main principle is that you enter numbers first and then a command key. We can say that the numbers are similar to words in a normal sentence and the command is the full stop. As in a sentence you must have words and a full stop. Then everyone understands that you have finished your sentence or idea.

An example

Let us assume that you want to open Monitor page 2. When using RPN you start with the number and then you choose the command you want to be executed.



First the number and then the functions key.

Why AVAB use RPN!

Your command is always finished: As soon as you press the command key you have executed the command and updated the monitor. With other methods you begin by entering the command and then the number. With this method the computer is not able to know when the command is finished.

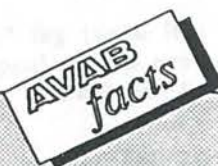
To fix this problem the maker of the equipment has two choices:

1. To use an extra key to finish the command (usually a star key).
2. To decide that all numbers must be, for example, 3 digits. Then the computer can count the keys and after counting 3 it understands that the command is finished.

These two methods require extra keystrokes,

also it will lead to different methods for different functions.

If we analyze this we find that these other methods are illogical and require unnecessary keystrokes.



The Postfix Notation is a way to describe mathematical expressions where the operator is placed after the operand. An expression like $A+B$ will in Postfix Notation be $AB+$.

The Postfix Notation has been developed by Jan Lukaszewicz, a Polish mathematician. That is why the Postfix Notation also is called Reversed Polish Notation.

The Postfix Notation is developed from the Prefix Notation. In mathematics both the Prefix Notation and the Postfix Notation is used to eliminate parenthesis.

The expression $(2+3)/(5-2)$ in Prefix Notation will be $2 3 + 5 2 - /$ in Postfix Notation (RPN). Note that no parenthesis are needed to define evaluation order.

Reversed Polish Notation is used in several programming languages and compilers because there is no need for parenthesis or other interpunctuation.

The famous scientific calculators from Hewlett Packard work in this way

And, of course, AVAB has since the microcomputer lightboard boom started in the mid-seventies known about the superiority of RPN as a command language for lightboards.

AVAB info



The power of RPN

In the RPN method you have great power and control over your commands. In the entering of a command you can always cancel the command before it is finally entered. This is because no action is taken until the command key is entered.

With other methods you begin with the command key and then enter a number.

Then the number is predestinated to that command. If you want to change your mind you have to back out the command you entered to enter a new one.

In RPN you will never get "stuck" in a command, you can change function as you change your mind. Very flexible.

Quick response

In RPN every command is finished as soon as you press the function key.

The monitor can be updated immediately with the correct information. The information on the monitor will always be up-to-date.

With another method (in this case the At method) you will always be one step behind in the update of the channel group on the monitor. If you build a group of channels 1 + 120 then the indication

for the second channel of the group (channel 120) will not be visible until you press a new command (15 minutes later, or so). Then the computer understands that the previous command was finished.

This means that you will never have an updated image on the monitor. The monitor is always one step behind.

Logical

All commands have the same structure. You don't have to invent new methods of keystrokes for different types of commands. We can always have Number, Command. This makes the equipment easy to use and understand because all commands work the same way.

Scientific

Hewlett Packard use the RPN method for their calculators. The advantage in the calculation business (and of course in the lighting business too) is that you can always see the subresults of a complex calculation. You don't need the parenthesis and equal sign keys (the execute key) because of the logical RPN method. You can solve any calculation with a minimum of key strokes.

CONCLUSION

- few keystrokes and no execute key
- quick response in action and on the monitor
- always logical and consequent
- always free to change your mind