

A program for plotting data on the storage scope

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Introduction

The storage scope is a very useful device for displaying information of various kinds. It is particularly useful for displaying quantities that might change as a function of another variable. For example, in tuning a beam transport system, one could plot the current measured at a current monitor as a function of a quadrupole strength or a steering magnet strength.

This note describes a computer program that allows the user to plot from one to five quantities as a function of another parameter.

The computer program

The program, written in FORTRAN, is accessed from the system touch panel at either MAXI console. Starting with the "Home Page," one touches "Beam Quality," "LEBT Appl Progs," and "PLOT PARAMETER" in that order. The program is brought into memory, and it writes the page, shown in Fig.1, on the user touch screen. A binary data file, DK2:[210, 210] PLDAT.DAT, is read to obtain the initial information for the program. This file contains the latest information used by the program. When the user changes any quantity, this information is immediately recorded on this file.

The user interacts with the program via the users touch panel and via the terminal (maxi console). Commands are issued via the touch panel; information is entered via the terminal.

Touch-panel options

A description of each command, issued by a touch panel button, is given below.

Button 1. SPECIFY DEVICES

Using this button, one can specify the names of the devices from which the data is to be acquired and plotted. On the keyboard

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scope will appear the message "NAME OF DEVICE TO BE PLOTTED AS ABSCISSA," followed by the name of the previously defined device. If the user wishes to change the device, he enters the new name, followed by a "\$", via the keyboard and presses the "return" key. The previous device will be retained if the user simply presses "return."

After the abscissa is specified, the user is asked to specify the number of quantities to be plotted as ordinates (from 1 to 5), and is then asked to specify the name for each of the devices.

For any device that is a current monitor, as can be recognized from the device name, additional information is required from the user. The data from a current monitor consists of 16 words. The first word contains a calibration reading, and the second word contains the zero-offset for the device. The remaining 14 words contain data from the current monitor sampled at times specified by the system. The user tells the program how to treat this data by entering two integers, N1 and N2. If N1 = 1, then the calibration word will be plotted; if N1 = 2, then the zero-offset will be plotted. For N1 > 2, the data in words N1 through N2 will be averaged and modified by the zero-offset and calibration word before being plotted.

Button 4. DROP

This button causes the storage scope to be erased and the program to be dropped.

Button 5. SPECIFY GRAPH LIMITS

This button allows the user to modify the various parameters concerned with the construction of the graph background. He will first be asked to specify the location of the graph on the storage scope, by specifying the storage scope coordinates of the left, right, bottom, and top boundaries of the graph. He will then be asked to specify the data values to be associated with the graph boundaries. Next, he will be asked for information concerning the construction and labeling of the grid. This is specified by 3 integers, N, M, and K for each of the two axes. The integer N specifies the number of intervals at which to draw grid lines, M is the number of intervals at which to write a numerical scale,

and K specifies the number of places to the right of the decimal point in the numerical scale.

Button 6. DRAW GRAPH

This button causes the storage scope to be erased and the graph background, including the date and time, to be written on the storage scope.

Button 7. SPECIFY PLOT SYMBOLS

This button allows the user to specify a plotting symbol for each of the devices that has been specified as ordinates.

Button 8. WRITE COMMENT ON S.S.

This button allows the user to write any comment, up to 60 characters, on the storage scope. The starting position (storage scope coordinates) for the first character is also specified by the user.

Button 13. START

Pressing this button starts the measuring and plotting process, which will continue until the "STOP" button is pressed. All other buttons are ignored until STOP has been pressed.

Button 14. STOP

This button causes the measuring and plotting to be stopped.

LEVEL 2

PREVIOUS PAGE 0
SIDEWAYS LINK 0

SPECIFY
DEVICES

DROP

SPECIFY
GRAPH
LIMITS

DRAW
GRAPH

SPECIFY
PLOT
SYMBOLS

WRITE
COMMENT
ON S.S.

START

STOP

- LINK OF BUTTON 1=
- LINK OF BUTTON 2=
- LINK OF BUTTON 3=
- LINK OF BUTTON 4=
- LINK OF BUTTON 5=
- LINK OF BUTTON 6=
- LINK OF BUTTON 7=
- LINK OF BUTTON 8=
- LINK OF BUTTON 9=
- LINK OF BUTTON 10=
- LINK OF BUTTON 11=
- LINK OF BUTTON 12=
- LINK OF BUTTON 13=
- LINK OF BUTTON 14=
- LINK OF BUTTON 15=
- LINK OF BUTTON 16=

Figure 1 : "User page" of PLOT PARAMETER program.