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NOSPLOT - A COMPUTER PROGRAM FOR PLOTTING SCORS OUTPUT ON A TEKTRONIX TERMINAL

by N. K. Ruiz



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NOSPLOT - A COMPUTER PROGRAM FOR OTTING SCORS OUTPUT ON A TEXTRONIX TERMINAL*

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Nancy Ruiz, 5166

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ABSTRACT

NOSPLOT will read the SC-4020 plot tapes output by the SCORS plotting package and plot selected frames on a Tektronix terminal under the CDC 6600's NOS 1 operating system. This enables SCORS users on the CDC 6600/7600 to examine their plots immediately rather than waiting until the next day.

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1. INTRODUCTION

Most of the larger programs at SLA employ the SCORS^[1] system of plotting software. It is an old but very powerful system into which a great deal of development effort has been channelled over the years. Some of the plot programs which utilize the SCORS system are very complex and took many years to develop. Output from the SCORS system is in SC-4020 language on magnetic tape. Such tapes are input to the Stromberg Carlson 4020 plotter, which produces high quality paper plots.

NOSPLOT will read SC-4020 tapes and plot selected frames on the screen of a Tektronix terminal under the CDC 6600's NOS 1 operating system. This has made it possible to enable all users of the SCORS system to examine their plotted output immediately upon termination of the computer job that generated the plots, without modification of existing plot programs. Typically the user must wait 24 hours or longer for the SC-4020 paper plots to be returned. In some cases it will be possible to obtain report quality plots from NOSPLOT if the terminal used is attached to a hardcopy device. The tape also may be sent with a peripheral request card to either the SC-4020 or DX-4460 for making hardcopy plots, slides, microfiche or movies.

There are two main parts of this report, a user manual and the program documentation. Section 2 is a user manual and is intended to contain all the information needed by the casual user of the program. Section 3 is the program documentation and hopefully contains surficient additional information to enable a programmer to modify the program, restore it from backup, and perform routine tasks associated with program maintenance.

2. USER INSTRUCTIONS

After the user has logged onto the NOS system, the SC-4020 tape to be plotted should be mounted on logical tape unit 40. If it is not a very long tape, it would be more efficient to mount the tape on some other unit, copy it to tape 40, and release the physical tape. To request the plot tape the user types

REQUEST(TAPE40, F=S, D=HI, PO=R, LB=KU, VSN=xxxxx)

where xxxxx is the visual serial number of the user's plot tape.

To invoke NOSPLOT the user types

GET, U4020/UN=UCODES

after the plot tape has been mounted. Some explanatory comments will be printed on the screen, and the user will be asked to enter some information about the terminal he is working on. The transmission rate must be given in baud, and the screen size must be identified as either large (4014/15) or small (4006, 4010/11). If the screen is small, the user may clout to distort the frame shape from square to rectangular. This option is useful when the small 4020 typewriter characters have been used to scale and label the plots because it "stretches" the numbers and labels, thus increasing their legibility. The user will next be asked to enter the frame number he wishes to plot (sequence on the file - frame one is the thunderbird logo), followed by a carriage return. If the frame is found, it will be plotted. A prompt character (question mark) will appear in the upper left corner of the screen to signal completion of the plot. To proceed, the user depresses the carriage return key and

will be asked for the next frame number to plot. If the frame number is not found, the user will be informed as to how many plot frames are on the tape and may elect to rewind the tape and search again. This is hard on tapes, so the tapes should be scanned sequentially if possible. Input of a frame number of zero causes termination of the program.

SC-4020 plot files are normally sent to the plotter without any user action, upon completion of the computer run in which they are generated. This is the case when the plot program calls the subroutine HDCOPY. To obtain a plot file on a personal tape, the user must modify the plot program to call ENTFLM instead of HDCOPY, and must request a personal tape. On the CDC 6600 this is done via the REQUEST control card.

REQUEST, FILENAM, HI, S. VSN=xxxxx

This replaces the following card:

REQUEST, FILENAM, *PF.

On the CDC 7600 FILE and STAGE control cards are required:

FILE(FILENAM, RT=U, MBL=1260, BT=K)
STAGE(FILENAM, POST, ST=MFA, HI, VSN=xxxxx)

FILENAM is the logical file name, and VSN is the visual serial number of the tape. This tape may be sent to the SC-4020 or DX-4460, along with a peripheral request card for making paper plots, slides, microfiche or movies.

NOSPLOT uses, in addition to logical tape unit 40, logical tape units 66 and 77. Any of the user's local files duplicating these file names should be renamed before invoking NOSPLOT in order to avoid overwriting the local files.

3. PROGRAM DOCUMENTATION

This portion of the report is based on Sandia Laboratories' guidelines for scientific software documentation. [2][3]

3.1 FULL NARRATIVE DESCRIPTION OF THE PROGRAM

NOSPLOT will read the SC-4020 tapes output by the SCORS plotting package and plot selected frames on a Tektronix terminal. The input tape containing SC-4020 instructions is read and unpacked. The user enters the ordinal number of a frame to be plotted and the program scans the SC-4020 instructions one by one, counting the frame advances. If and when the frame is found, all the SC-4020 instructions up to the next frame advance will be processed, also one by one. A subroutine PLOTC2 analyzes the SC-4020 instructions and calls a subroutine which performs the appropriate function, such as plotting a character or drawing a line. If the frame is not found, a count of the frames on the tape is printed and the user may elect to rewind the tape and look again. A zero frame number causes termination of the program.

3.2 HARDWARE CONFIGURATION REQUIRED

NOSPLOT was written to be executed from a Tektronix terminal 4006, 4010, 4012/13 or 4014/15 on the CDC 6600.

3.3 LANGUAGES USED

The main program is written in FTECS (Fortran Language with Extended Control Structures) [4] which is both an extension to the Fortran language and a preprocessor for the implementation of that extension. The FLECS program was then translated into Fortran and compiled with the FTN compiler. Several subroutines were written

in Fortran. Since FLECS produces ANSI standard Fortran, the program is portable.

3.4 OPERATING SYSTEM

NOSPLOT was written to be executed on the CDC 6600 NOS 1 time sharing system.

3.5 SPECIAL SOFTWARE USED

NOSPLOT uses the Tektronix Terminal Control System software package^[5] which is stored in the library file TKLIB at SLA.

3.6 INPUT

Data to be plotted are in SC-4020 language on magnetic tape or disk. The SC-4020 instructions are 36 bits long and are packed into 60 bit words. This is the format output by the SCORS^[1] plotting system. The tape is a SCOPE stranger tape (S format) and should be high density (556 BPI). The logical file name is TAPE40. Whenever possible, the tape should be copied to disk and the physical tape released, thus freeing the tape drive for other users.

User input is entered at the terminal keyboard. The user will be asked to enter the transmission rate, type of terminal (large or small screen) and frame numbers to be plotted. The carriage return key must be depressed after each data entry.

3.7 OUTPUT

NOSPLOT produces SCORS plots on the screen of a Tektronix terminal. The plots will be very similar, but not identical, to SC-4020 paper plots. If reproduced on a Tektronix 4631 hardcopy unit, the plots produced on the terminal are about 1 inch smaller in both dimensions than the SC-4020 plots. The small typewriter

characters are much larger on the Tektronix than on the SC-4020, and better quality plots will be obtained by employing vector-drawn alphanumeric characters in plot programs. Some examples of NOSPLOT output are reproduced in Section 8 of this report.

3.8 FILES

The SC-4020 instructions must be on TAPE40, which may be either tape or, preferably, disk. The Tektronix plot package uses TAPE66, which is the terminal input file, and TAPE77, which is disk.

3.9 BACKUP CAPABILITY AND PROGRAM LISTING

The backup files for restoring NOSPLOT are on personal library tape 19947. File 1 is the object code, file 2 is the FLECS source code, and file 3 is the FLECS translator in object form. The following run stream is used to obtain these files:

REQUEST(BACKUP, VSN=19947, D=HI, F=SI, PO=R, LB=KU)

REWIND(BACKUP)

COPYBF, BACKUP, TEK4020.

COPYCF, BACKUP, NOSPLOT.

COPYBE, BACKUP, FLXLGO.

REWIND, BACKUP, TEK4020, NOSPLOT, FLXLGO.

To run the program a user procedure U4020, stored under the user number UCODES, is invoked. A listing of U4020 follows:

ASSIGN, TT, TAPE77.

LIBRARY (TKLIB)

GET, TEK4020/UN=UCODES.

TK4020 (TAPE40)

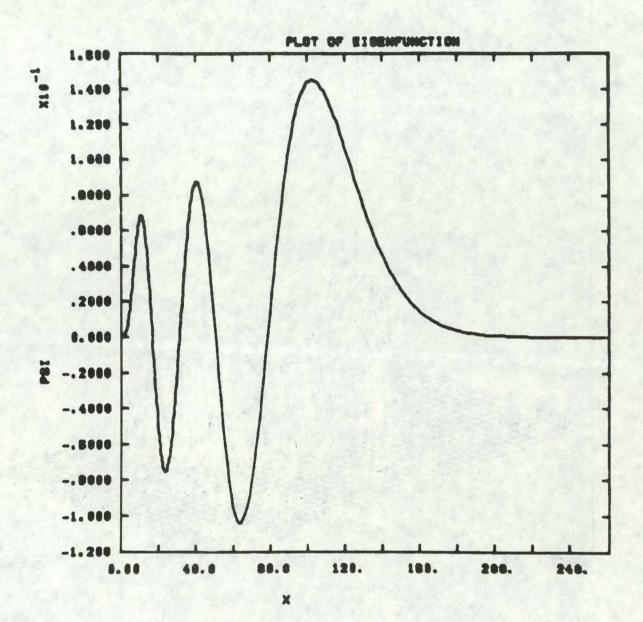
The following run stream will produce a program listing, Fortran source code and object code:

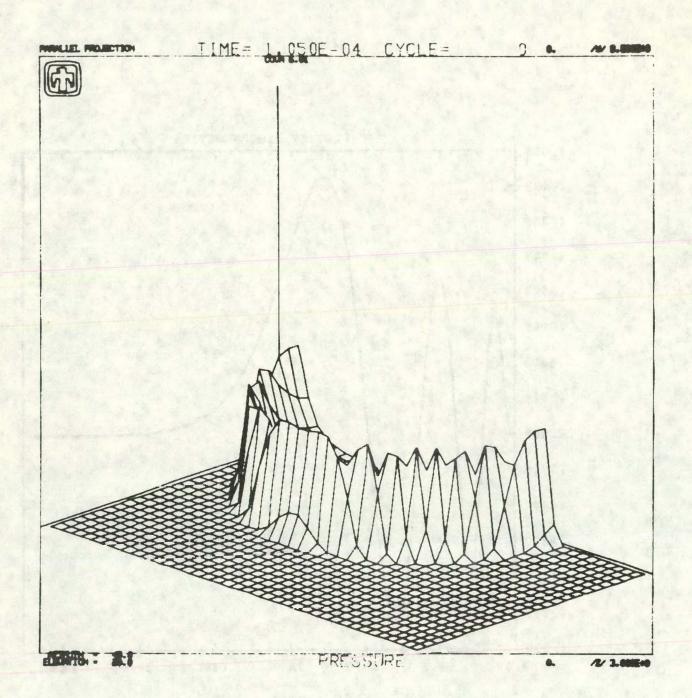
FLXLGO (IN=NOSPLOT)

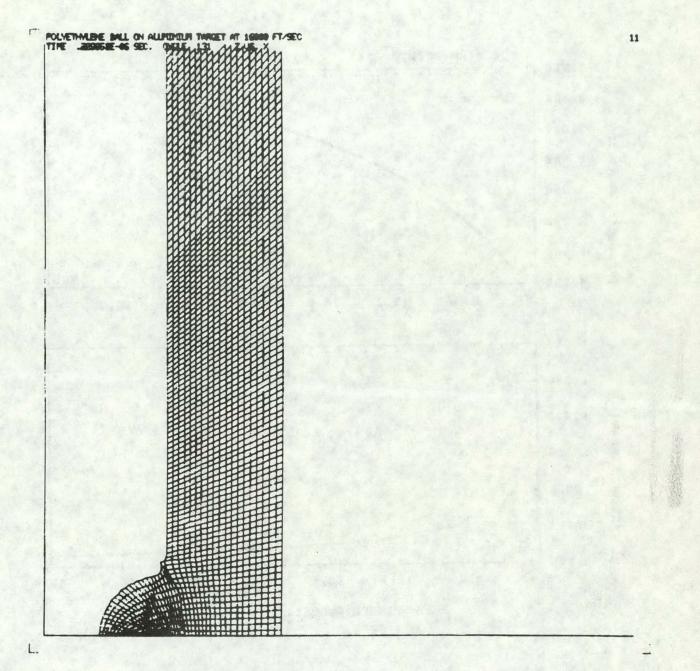
REWIND, LOUT, FOUT.

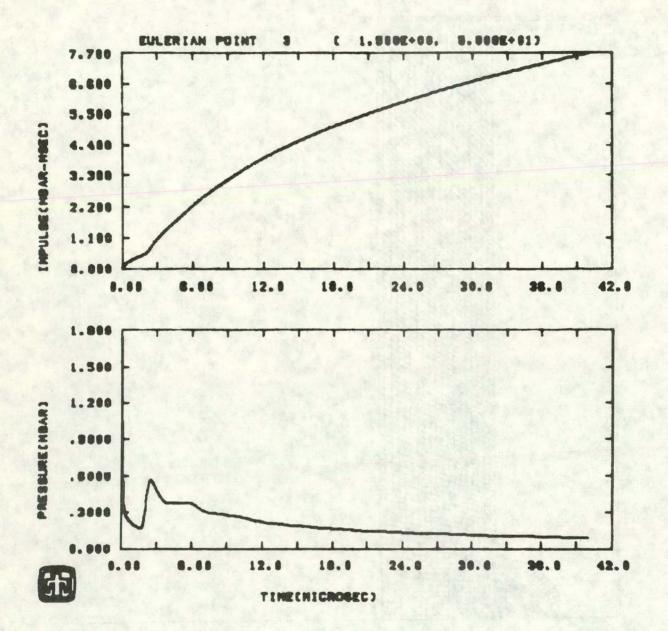
FTN, I=FOUT, L=LISTING, B=TEK4020.

EXAMPLES OF NOSPLOT OUTPUT









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