Program 8

Title: Polyfit
Author: S(a) Section
PERME
Westcott, Aylesbury, Bucks, U.K.
Memory Requirement: 4050A
Peripherals: Character Enhancement ROM
464X Printer
Files: 1 ASCII Program
Statements: 416

Polyfit provides the coefficients to solve a polynomial equation of the form:

$$y = a_0 + a_1x + a_2x^2 + a_3x^3 \ldots$$

It uses the "Weighted Least Squares Polynomial Approximation."

The program is menu driven and allows data to be input, edited, increased, graphed, and listed on screen or printer.

Program 9

Title: Header
Author: Larry Parkhurst and
Mike Anderson
Dieterich Standard Corporation
Boulder, CO
Memory Requirement: 4054 w/Opt. 30
Peripherals: Optional - 4662 Plotter
Files: 2 Binary Programs (1 example)
1 Binary Data
Requires dedicated tape
Statements: 245

This program maintains a user defined menu of the contents of the tape on which it is contained. The menu describes the tape location, program description, program author, amount of memory used to store the program, the file type (ASCII or binary), and the amount of tape left for further storage. The tape will load and start a selected program. The menu can be output to the 4662 plotter for permanent file or may be used on the screen only.

Program 10

Title: 7D20/4050A Utility
Author: Craig Bulmer
Tektronix, Inc.
Chicago, IL
Memory Requirement: 4050A w/64K
Extended Memory or 4907 File Manager
7D20 Programmable Digitizer for 7K mainframes
4052R07 SPS ROM #1
4052R08 SPS ROM #2
4052R14A1 GPIB Enhancement ROM for 4050A
Files: 1 ASCII Program
16 Binary Programs
(Transfer all files to separate tape)
Statements: 2278

This software acquires waveforms from the Tektronix 7D20, based on 7D20 acquisition mode, and applies user selected signal processing routines to the acquired waveforms. The software can also save to or retrieve from the extended memory (or file manager) waveforms and instrument settings. A general purpose talk/listen routine and a menu-driven 7D20 front panel set-up routine are also included.

Program 11

Title: 7912AD/4050A Utility/Demo
Author: John McHugh
Tektronix, Inc.
St. Paul, MN
Memory Requirement: 4050A w/64K
Peripherals: 7912AD Programmable Digitizer with
7A16P Programmable Vertical Plug-in
and 7B90 Programmable Horizontal Plug-In
4050A Extended Memory or 4907 File Manager
4052R07 SPS ROM #1
4052R08 SPS ROM #2
Optional - 4052R14A1 GPIB Enhancement ROM
Files: 1 ASCII Program
18 Binary Programs
5 Binary Data (Examples)
(Transfer all files to separate tape)
Statements: 1561

This software acquires waveforms from the Tektronix 7912AD (either referenced to ground, not referenced to ground, or averaged) and applies a variety of user-selectable signal processing routines to the acquired waveform. Waveforms may be stored and recalled from Extended Memory/4907 file or tape. A talk/listen function permits the operator to communicate with any instrument on the bus. The operator may define a sequence of User-Defined Key (UDK) keystrokes and let the 7912AD/4052A run unattended. Functions include:

Acquire Waveform/Graph it on 4052A (the entire 7912AD may be set to a previously defined setup), Min-Max Pulse Parameter measurements, Analysis of waveform when pulse analysis is not applicable, Differentiation (2-point or 3-point), FFT (may be cosine tapered), Average, Correlation, Convolution, Integrate. The software is well documented for those wishing to use only portions of it or to change it.

TEKniques Vol. 7 No. 4 T2 Part #062-7456-01

TEKniques Vol. 7 No. 4 T2 consists of 11 programs: one Education/Research, three Graphing, three Interfacing, two Mapping, and two Programming Aids. These programs will run on any of the 4050 Series systems.

One of the programs must be transferred to a 4907 File Manager, and four of the programs must be transferred to their own dedicated tapes. The individual abstracts describe the programs.

Program 1

Title: Multivariate Bargraph with Enhancements
Author: Lysander Ng
NMFS-Charleston
Charleston, SC
Memory Requirement: 16K
Peripherals: Optional - 4662/3 Plotter
Files: 1 ASCII Program
Statements: 290

Multivariate data consisting of one continuous variable in addition to up to four discrete variables may be represented in one output using this program. The discrete variables are denoted as treatment, group, block, and story.

If data only consist of one continuous variable and three discrete variables, then output may be produced with one level of story. Or you may use just one block level, and so forth. You have complete latitude in assigning discrete variables according to the adopted terminology, depending on desired output format, arrangement of meaningful data patterns, and priority of comparisons among various levels of discrete variables.

Each variable and the graph may be labeled. On plotter output, character sizes for the labels may be specified, and the Y-axis label (the continuous variable) may be rotated 90 degrees. Seven shade enhancements distinguish bars of each treatment level.

Optionally, standard deviation of each bar may be represented.

Output is to the screen or plotter. No provision for data storage.

Program 2

Title: Log Axis
Author: Dr. Jay R. Herman
Goddard Space Flight Center
Greenbelt, MD
Memory Requirement: 8K
Files: 1 ASCII Program
Statements: 88

Two short subprograms and two sample drivers produce logarithmic tic marks on the vertical or horizontal axis of a plot using externally defined WINDOW and VIEWPORT statement, and axis statements. The size of the tic marks are adjustable. A reverse logarithmic grid can be produced. The two subprograms are intended to be appended to the user's driver program.

Program 3

Title: INTERP
Author: Dr. Jay R. Herman
Goddard Space Flight Center
Greenbelt, MD
Memory Requirement: 8K
Files: 1 ASCII Program
Statements: 64

INTERP performs linear interpolation on data stored in vector form. Given a numerically defined function y(x) where the data is stored in the vectors Y and X, and a list of new independent variable values are stored in the vector D, the linear interpolation

$$C(I) = (Y(J+1) - Y(J))/(X(J+1) - X(J))*(B(I) - X(J)) + Y(J)$$

is solved for all C(I) corresponding to the B(I). The program insures that B(I) falls in the interval between some pair [X(J),X(J+1)], if not, then a default value is inserted into C(I). The vectors X and B must be monotonic.

Program 4

Title: LORAN-C Distance and Time Difference Readings
Author: Mike Lombardi
National Bureau of Standards
Boulder, CO
Memory Requirement: 16K
Files: 1 ASCII Program
Statements: 409

This program computes distances and time difference readings from any given receiver site to any of the fourteen LORAN-C navigation chains in operation worldwide. The user is only required to select a LORAN-C chain, and to enter the coordinates of the receiving site (these coordinates may be permanently entered into the program and used as a default value).

The program is useful in determining which LORAN-C chain is best for navigation purposes from your location, which stations your receiver has acquired, and whether or not your receiver is tracking these stations on the right cycle. The program can be used by those who use LORAN-C to navigate as well as by those who use LORAN navigation receivers for purposes of frequency calibration.

Program 5

Title: GPIB General Device Exerciser
Author: John Burgess
Tektronix, Inc.
Beaverton, OR
Memory Requirement: 32K
Peripherals: IEEE-488 Device Under Test
Files: 1 ASCII Program
Statements: 721

This program provides the facilities to send commands to a device under test (DUT) connected to the IEEE-488 port, and to receive responses from it. Some features are: 1) The Carriage Return character (0D hex) may be sent within the command string by including the characters "<CR>"; 2) If a "?" is found in the command string, the program will automatically try to get a response from the DUT; 3) Several options are available concerning communication protocol - use "ITRM" or UDK #18; 4) All program control commands are three characters or less, preceded by "CTRL-I" - the TAB character.

The specific commands for these and the other features are provided by a "directions" section within the program. All program control commands prompt the user for input, tell what the default is, and the allowable range of responses, where appropriate.

There are three commands to control the display mode when receiving information from the DUT: 1) Print the ASCII representation of the character with control characters sent unmodified - for example, CTRL-L would page the 405X screen; 2) Same as #1, except the mnemonics of control characters are printed in < > - for example, CTRL-L would be printed as <FF>; 3) The decimal value of each character will be printed. In any display mode, if a character whose ASCII value is greater than 127 (DI08 asserted) is received, its decimal value will be printed. If EOI is asserted with a byte, the characters < >&EOI will surround the character. For example, <FF&EOI>.

The program can handle up to 9 instruments on the bus at once.

Program 6

Title: 4050/1980 Interface
Author: William C. Bean, PAE
Tektronix, Inc.
Beaverton, OR
Memory Requirement: 8K
Peripherals: Opt. 1 Data Comm. I/F
Tektronix 1980 Automatic
Video Measurement Set
Files: 1 ASCII Program
(Requires pre-marked data files)
Statements: 56

The Tektronix 1980 Automatic Video Measurement Set provides the television facility widely variable measurement capabilities under software control. Nonvolatile storage of program data, however, is limited to the space provided in the 1980's internal nonvolatile memory (8K words) and limits the possibility of transporting data external to the 1980.

This program uses the tape cartridge in the 4050 to store and transport data. You can save your own programs, transport 1980 program patches from one site to another and archive routines. In addition the 4050 is used as the controlling terminal for normal 1980 operations.

The files must be pre-marked. Because 1980 code is written in "ANSWER BASIC," the data will not be readily processable by the 4050.

Areas of application are T.V. studios, production facilities and manufacturing lines.

Program 7

Title: BASIC Linker
Author: James B. Bains, Jr.
AMF Tuboscope, Inc.
Houston, TX
Memory Requirement: 4050
Peripherals: 4907 File Manager
Files: 5 ASCII Program
(Must be transferred to disk)
Statements: 350

The Linker is a set of BASIC programs assigned to link together any number of files to form one BASIC program. A syntax (using REMARK statements) has been defined to allow symbolic labels for BASIC line numbers to be defined and referenced. The Linker is invoked, the operator responds to prompts to direct the Linker. The user's files are concatonated and the symbolic references are resolved. The sections of the Linker program are automatically paged in and out to allow the maximum size of user program to be concatonated. The label definitions and references may be left in the linked program or not, as desired. Error messages are given for a variety of error conditions.

Program 8

Title: Modified Data Graphing, Pie Chart and Slidemaker
Author: Lynn Cueto
Tektronix, Inc.
Memory Requirement: 16K
Peripherals: Optional - 4662 Plotter
Files: 7 ASCII Program
(Transfer to separate tape)
Data files must be pre-marked
Statements: 1279

The popular Data Graphing program authored by Chuck Eng has been separated into several overlays so it may run in a 4051 with 16K memory. Computer expertise is not required since you are prompted for the minimal inputs.

Program 9

Title: Stereonet Plot (Equal Area)
Author: Steve Wilson
University of California
Dept. of Earth Sciences
Riverside, CA
Memory Requirement: 32K
Peripherals: Optional - 4662 Plotter
464X Printer
Files: 4 ASCII Program
(Transfer to dedicated tape)
Statements: 764

Stereonet Plot is a general graphics program for plotting and manipulating geologic data or any other 3-D orientation data expressed as direction and amount of dip, for example, fault planes, joints pebble orientation, paleocurrents, petrofabrics, paleomagnetic poles, on an Equal Area Projection.

Features include:
1) data storage/recall
2) data rotation
3) vector mean calculation
4) least squares best fit great circle
5) data editing (add, delete, change, list)
6) plotting on a 10cm radius net with:
   - 3 symbols for pole to plane data
   - 2 symbols for lineation data
   - 1 symbol for vector mean
   - 1 symbol for best fit pole including cylographic trace

Program 10

Title: TM5000 Instrument Checkout
Author: Jim Ormond and
Bill Vesser
Tektronix, Inc.
Beaverton, OR
Memory Requirement: 32K
Peripherals: Optional - 464X Printer
TM5000 Series Instrument
Files: 16 ASCII Program
(Transfer to dedicated tape)
Statements: 4071

A collection of BASIC programs checks out the TM5000 Series of programmable instruments for all GPIB functions. It checks for compliance to the reference library of commands and Tek Codes and Formats for GPIB instruments.

This verification software provides a go/no-go testing of the firmware command set used during normal operation of the TM5000 instruments. It also verifies that the proper error codes are returned for specific conditions created by the software.

Operator interaction is minimal. Once a test or test sequence has been selected, no additional settings or display screen pagings are required. The exception is testing the error code generation. In this mode, the operator is required to interact periodically by pressing the front panel ID button on an instrument, connecting a signal to the instrument, etc.

Program 11

Title: 4051 Assembler
Author: Carl Hovey and
Steve Tuttle
Tektronix, Inc.
Wilsonville, OR
Memory Requirement: 4051 16K
Files: 1 ASCII Program
1 ASCII Data
3 ASCII Text
(Transfer to a separate tape)
Statements: N/A (In Call Execute Format)

This program is an interactive assembly and debugging tool for the 4051. It provides the 4051 programmer with a versatile system for creating and debugging programs in 6800 machine code. The one pass assembler allows the user to examine memory locations and registers.

To create source files the Editor ROM or any other text processing program for the 4051 can be used. Also source can be entered directly into the program.

4100 Series 4115

VAX/UNIX (Berkeley) Driver For 4115 DMA (Option 3A)

Part #062-7327-01

Author: Pat Franz
Tektronix, Inc.
Wilsonville, OR
Equipment: 4115B w/Opt. 3A
VAX, UNIX (Berkeley)
Media: 9-track tape

This driver supports the 4115* color display terminal with Option 3A DMA Interface in a VAX/UNIX environment. Written for UNIX version 4.1bsd, this driver can serve as a reference for writing 4115 DMA drivers for other UNIX versions.

All included files are recorded in "TAR" format on the tape.

Documentation files and examples of application programs written in C are also included on tape.

Contents of tape are:

hsg.c	Driver
hsg.h	Defines for use with driver
hsgmanual.p	Driver manual text
pixeldma.c	Program that DMA's pixel image to 4115
term.c	Subroutine that converts two integers to 4115 escape code format
termint.c	Subroutine that converts an integer to 4115 escape code format
testdma.c	Tests the DMA link to the 4115

*Driver developed specifically for 4115B.

VAX/ VMS Driver For 4115* DMA (Option 3A)

Part #062-7305-01

Author: Kevin Nolan
QTC
Equipment: 4115B w/Opt. 3A
VAX, VMS
Media: 9-track tape

This driver supports the 4115* color display terminal with Option 3A DMA Interface in a VAX/VMS environment. Written for VMS version 3.3, the driver can serve as a reference for writing 4115 DMA drivers for other VMS versions.

All included files are recorded in "Files 11" format on the tape.

Documentation files and examples of application programs written in RATFOR (and their FORTRAN outputs) that call drivers are also included on tape.

*Driver developed specifically for 4115B.