DEMO PACKAGE

FOR

PICTURE SYSTEM 2

April 20, 1977

Starting Up the System:

1. Turn on the PDP-11 computer.

2. Place the disk pack described herein in the RK05 disk drive unit. Turn it to RUN.

3. Turn on the PICTURE SYSTEM (may come on automatically).

4. Set the ENABLE/HALT switch to HALT.

5. Enter the appropriate bootstrap number in the console switches.

6. Press LOAD ADDR.

7. Set the ENABLE/HALT switch to ENABLE.

8. Press START.

9. The console terminal (which, if it did not come on automatically when the system was powered up, should have been manually turned on) will type a line similar to:
   RT-11 S/J V02B

10. Now type the line,
    SET USR NOSWAP

11. A demonstration may now be run by typing an "R", a space, the name of the demonstration program, and a carriage return.

12. To terminate a program, hold the CTRL key down and type "C". (Some programs require that this be done twice.)

Program Name: HORSIE, HORSES, HORSE5, HORSE7, HORS11, HORS15

Peripherals Used: None

Description:

Displays moving hobby horses in various combinations, depending on the particular program used. All the above programs use Linear Display Mode (Truck Mode) except HORSIE; therefore HORSIE runs slower than the others.

Each horse drawn contains 1,039 data points and requires 27 matrix transformations to produce the horse.

Program Name: COIN

Peripherals Used: None

Description:

Shows a coin spinning on a platform. Five discrete transformations are involved in the motion of the coin, including four rotations and a translation. See if you can point them out.

Due to a bug in the DEC Random Number Generator, the first seven spins o f the coin always produces a head.

Program Name: ALAMOS

Peripherals Used: Data Tablet, Console Terminal (TTY)

Description:

This program displays a grid of small squares, each bounded by short line segments. Thus, for example, a grid 80 x 100 squares in area would require the drawing of approximately 8,000 horizontal and 8,000 vertical short lines, or a total of approximately 16,000 lines altogether.

Operation:

When the program first appears, the pen is to be touched down on the Data Tablet approximately one inch from the lower left corner. The Console Terminal will then type

HORIZONTAL SEGMENTS =

The user then types some number from 1 to 200, after which he gets:

VERTICAL SEGMENTS =

Here he responds with a similar number. A cursor will then appear on the screen. Using the Data Tablet, he may specify the respective sizes of the grid he is defining, the window against which it is to be clipped, and the viewport through which it appears on the screen. As he points to each of these menu items, a diagonal line appears on the screen. By touching somewhere on the Tablet, he specifies an x- and y-size for the object under consideration, as measured from the lower left corner of the Tablet. If he touches on the line, the object is square; off the line produces a rectangular object.

Finally, he selects the menu box called DISPLY, and the grid is displayed.

Program Name: ARCH2

Peripherals Used: Data Tablet

Description:

This program displays an empty platform, and a menu to be used to place objects on the platform, such as buildings, roads, sidewalks, etc.; and to manipulate either the platform and its contents, or the individual objects thereon.

The upper three rows of menu commands refer to the individual objects, and permit placing them on the platform, deleting them, moving, rotating, raising and lowering them, and changing their size and shape. The lower two command rows permit motion of the entire platform, when used with the accelerator control directly below. (Simply select the function to be performed, and then touch the appropriate position on the acceleration control.)

Operations involving single objects require selecting the operation, optionally touching some point on the acceleration control, positioning the pen so the cursor is directly beneath the desired object, and touching the pen down on the Data Tablet.

Program Name: TANK

Peripherals Used: Data Tablet, Function Switches 0-3

Description:

This program displays an obstacle course populated by two military tanks. The first tank may be steered, driven, and its cannon fired, by means of switches 3 thru 0 of the Function Switch Unit. The other tank is controlled by moving the pen left and right on the Data Tablet, and touching down when the vertical bar on the screen is over the proper menu control item.

Program Name: PSKNBB

Peripherals Used: Control Dials

Description:

This program displays a digital haystack consisting of several hundred random lines, which may be manipulated as an object by the Control Dials. The Dials are numbered 0 thru 3 along the front row, and 4 thru 7 along the back row.

Dials 0 thru 2 control rotation

Dials 4 and 5 control translation in x and y

Dial 6 controls translation in z (shown in perspective)

Dials 3 and 7 control the relative positions of the hither and yon clipping planes

Program Name: PONG1

Peripherals Used: Data Tablet

Description:

This program is an improvement over the standard PONG game as played on the home television set.

First a level of skill is selected by means of the Data Tablet and cursor, by touching the pen down when the cursor is in the appropriate screen area. Then, when the game area is displayed, the paddle (a rectangular one) is moved in response to the pen x-y position. Service is accomplished by momentarily touching the pen down on the Tablet.

Program Name: BDEMO

Peripherals Used: Data Tablet, Function Switch 0

Description:

This program shows simulated wind tunnel data, graphically plotted on an x-y graph. Three different graphs are available as explained below.

Operation:

First (this step is optional) select one of the three available graphs for display, before running the program. This is done by typing the following sequence of commands (the underlined portions refer to those automatically typed by the computer):

```
.R PIP
*FTN4.DAT=xxx.DAT/I/X
*↑C
```

where xxx refers to one of the three names BOE1, BOE2 or BOE4. Then type R BDEMO.

The program is run by touching the Tablet pen down when the cursor is over one of the control points on one of the curves. When the pen is lifted up, the entire curve will begin to blink. The point may be moved to a new position by moving the pen to a new spot on the Tablet and touching it down. By this means the curve is redefined.

The screen may be loaded with data by turning on Function Switch 0. This causes two additional copies of the picture to be displayed, each one rotating with respect to the screen.

Program Name: WEDGE

Peripherals Used: Function Switch 0

Description:

This program displays a checkerboard of 64 individual intensities on the screen, being displayed with the brightest square at the upper lefthand corner, and proceeding down the screen.

The entire display may be blanked by turning on Function Switch 0.

Program Name: WSYMBL

Peripherals Used: Function Switches 0 and 1

Description:

At 500 randomly selected points on the screen, characters are displayed as defined in the Random Access Character Font Table of the Character Generater. These characters are defined in the eight sizes supplied by the Graphics Software Package, and a new size is selected each time Function Switch 0 changes state.

Two characters are defined, one a subset of the other. These represent standard station symbols on a weather map, and the more complex of the two (produced if Function Switch 1 is on whenever Switch 0 changes state) contains 25 setpoints and 75 strokes.

Program Name: PERIPH

Peripherals Used: Control Dials, Data Tablet, Two Function Switch Units

Description:

Program displays information necessary to determine the working status of all peripheral devices described above. The Control Dials are shown both in absolute and limiting (i.e. with floor and ceiling function) modes.

Program Name: CH7000

Peripherals Used: Console Terminal (TTY)

Description:

This program displays (before clipping) 7,000 characters on the screen, in one of the eight Graphics Software Package-defined sizes. When the program starts, the user is requested to enter the appropriate font size.

Program Name: RAMP

Peripherals Used: None

Description:

This program is used to adjust the CRT to the proper intensi for running the STAR program. It serves no other purpose.

Operation:

1. Adjust room lights so that room is nearly (but not quit dark.

2. Rotate the CRT Contrast knob (second-from-bottom on the right side of the scope) to the second position from fully counter-clockwise.

3. Adjust the video gain control (top righthand scope cont until the last (ninth) dot just disappears.

4. Adjust the focus control (below the video-gain) until the best focus is obtained on the diagonal line and the dots.

5. Terminate the program and run STAR.

Program Name: STAR

Peripherals Used: Control Dials, Function Switch 0, Data Tablet

Description:

This program displays the stars as seen from any spot on Earth, provided that the program RAMP has been run first to calibrate the scope. The stars shown are the 3,500 stars whose brightness exceed Magnitude 5.75 on the visual scale.

Also shown is a spherical grid to aid in locating the desired portion to be viewed. After the program first appears, it requires about five seconds for residual gimmick effects to die out.

Operation:

The Control Dials (front row = 0-3, back row = 4-7) provide the main control panel for this "planetarium". Dials 1 and 2 provide respectively for changes in Right Ascension and Declination, allowing one to view any part of the heavens. The dial should be turned a small amount, and the picture should be allowed to come to rest before turning further. Dial 3 controls intensity of the grid. Dial 7 allows for adjustment of the relative star intensity. Proper setting of this dial is several turns counterclockwise, followed by exactly 1/2 turn clockwise.

Dial 4 provides a "telescope" zoom function of approximately 50-to-1. The position of this dial may be overridden by turning on Function Switch 0, which sets the magnification to 1.

By rotating Dial 0 clockwise 1/4 turn every few seconds, eventually a meteor shower will appear, the center of which may be controlled by the careful manipulation of Dials 5 and 6.

The Data Tablet may be used to point at various stars.

Program Name: SPINE

Peripherals Used: Control Dials

Description:

Program displays a model of a human vertebra. The model may be maneuvered on the screen in a manner similar to that described in program PSKNBB (page 8) by use of the Control Dials.

OPERATION -- "MOVIE" (CUBIC DEMO)

1. THE VARIOUS AIRCRAFT AVAILABLE ARE IDENTIFIED UNDER THE FOLLOWING FILE NAMES:

PLANE1.DAT	SUBSONIC AIRCRAFT (JET)
PLANE2.DAT	SUPERSONIC AIRCRAFT (JET)
EPLANE.DAT	EI-PLANE (ROTATING PROP)
EPLAN2.DAT	EI-PLANE (NO PROP VISIBLE)
COPTER.DAT	HELICOPTER (ROTATING ROTOR)

2. LOADING INSTRUCTIONS:

   A. LOADING "MOVIE.LDA" (SPECIALIZED TERRAIN -- MOUNTAINS)

      1. LOG IN (TYPE "LO 200,200")

      2. ASSIGN ONE OF THE AIRCRAFT (I.E. TYPE "AS XXXXXX.DAT,1" WHERE "XXXXXX.DAT" IS ONE OF THE ABOVE AIRCRAFT FILES).

      3. ASSIGN THE MAP (TYPE "AS RMAP.DAT,2")

      4. TURN OFF ALL CONSOLE DATA SWITCHES.

      5. TYPE "RU MOVIE"

      6. WHEN PICTURE APPEARS, RAISE DATA SWITCH 7, AND THEN RAISE AND LOWER SWITCH 0. MOTION WILL FREEZE FOR SEVERAL SECONDS, AND THEN RESUME. LOWER SWITCH 7.

   B. LOADING "MOVIE2.LDA" (STYLIZED TERRAIN -- CHECKERBOARD)

      1. PERFORM SUBSTEPS 1, 2 AND 4 ABOVE.

      2. TYPE "RU MOVIE2"

3. THE PROGRAM IS NOW IN EXECUTION AND THE DISPLAY WHICH APPEARS MAY BE THOUGHT OF AS A VIEW OF THE FORMATION FROM A HOVERING AIRCRAFT. THE TABLET IS USED TO CONTROL THE AZIMUTH AND ELEVATION OF THE CHASER AIRCRAFT WITH RESPECT TO THE FORMATION, AND DATA SWITCHES 1 AND 2, TOGETHER WITH SPEED CONTROL SWITCHES 13, 14 AND 15, SPECIFY DISTANCE OF THE CHASER FROM

THE FORMATION. AZIMUTH MAY BE FROZEN BY RAISING SWITCH 3, AND ELEVATION BY SWITCH 4. SWITCH 1 MOVES THE CHASER IN CLOSER, AND SWITCH 2 CAUSES IT TO BACK OFF. THE SPEED OF THIS MOTION IS CONTROLED BY A 3-BIT LOGARITHMIC NUMBER IN SWITCHES 15-13. THE VALUE 100 (SW. 15 ONLY) IS A GOOD VALUE FOR THIS FIELD.

4. DATA SWITCH 5 CAUSES ANOTHER PLANE TO BE SUPERIMPOSED OVER AIRCRAFT NO. 4 FOR RANDOM MOTION COMPARISON. (THE FOUR ACTUAL AIRCRAFT ARE IN CONSTANT RANDOM MOTION DUE TO WIND DRIFT, TURBULENCE, AND PILOT ERROR.)

5. DATA SWITCH 7 CAUSES A SPLIT-SCREEN VIEW TO APPEAR. THE VIEW ON THE RIGHT IS ELEVATED 90 DEGREES FROM THE LEFT VIEW.

6. IF DATA SWITCH 8 IS UP WHEN THE PROGRAM IS RESTARTED (VIA DATA SWITCH 0) A DASHED CORRIDOR WILL APPEAR ABOVE THE TERRAIN.

7. IF SWITCH 9 IS RAISED, AIRCRAFT NO. 4 WILL "PEEL OFF" AND LEAVE THE FORMATION. LOWERING SWITCH 9 CAUSES IT TO EVENTUALLY RETURN AND RESUME ITS POSITION.

10. SUMMARY OF DATA SWITCH USAGE:

0. CAUSES PROGRAM TO RESET. SWITCHES 7 AND 8 UP DURING RESET CAUSES TEXT SIZE AND CORRIDOR TO BE AFFECTED.

1. BRINGS CAMERA (CHASER) PLANE IN CLOSE.

2. BACKS CHASE PLANE OUT.

3. FREEZE AZIMUTH ANGLE.

4. FREEZE ELEVATION ANGLE.

5. SUPERIMPOSES STATIONARY "GHOST" OVER AIRCRAFT NO. 4

6. NOT USED.

7. PRODUCES SPLIT SCREEN. IF UP DURING RESTART, PRODUCES SMALLER TEXT.

8. IF UP DURING RESTART, A FLIGHT CORRIDOR IS DISPLAYED.

9. CAUSES PLANE NØ. 4 TO "PEEL OFF".

10-12. NOT USED.

13-15. EXPONENTIAL SPEED CONTROL FOR SWS. 1 & 2.

TABLET. HORIZONTAL MOTION CONTROLS CAMERA AZIMUTH; VERTICAL MOTION CONTROLS ELEVATION ANGLE.