Laser-Scan Ltd.

LITES2

KERN DSR and LEICA SD Workstation Guide

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1 *Introduction*

This document describes the extra facilities available under licence in the versions of LITES2 for DEC VAXstation displays (images LITES2UIS.EXE and LITES2MOTIF.EXE), when used in conjunction with a KERN DSR or LEICA SD photogrammetric plotter. It is to be read as a supplement to the LITES2 Reference Manual, the LITES2 VAXstation (UIS) Workstation Guide, the LITES2 X-Windows (MOTIF) Workstation Guide, and the LITES2 User's Guide.

2 *Use of photogrammetric plotter*

In order to use a KERN DSR or a LEICA SD with LITES2, the logical name LSL$LITES2_KERN_ROUTINES must be set up to point to an appropriate shareable image (supplied by Laser-Scan). The name of this image will depend on which instrument is to be used, and whether it is fitted with the optional image superimposition system.

Before use of LITES2, the instrument must be switched on and loaded with the model intended for use. The DSR also required its plate processor program (e.g. KPH$DSR1B:PROC2.SAV) to be loaded. It is expected that this will be done using KERN or LEICA software. The default directory must be set to that containing the orientation files for the model - those files relevant to LITES2 being ABSOR.DAT, ABSOR.MEA, INNER.MEA, and RELATI.MEA. For a KERN DSR, certain other files must also be present in their appropriate directories - these are KPH$WS:KERNIO.DAT, and (if a KRISS is being used) KPH$WS:KRISS.DEF and KPH$MAPS200:KRISS.LO.

The IFF file(s) being used should have a coordinate range appropriate for the model loaded into the instrument. The instrument works in absolute coordinates, so the origin offset in the IFF file(s) should be set appropriately.

The instrument is activated using the command ENABLE SD. GRAPHICS must also be enabled. This command will cause the instrument to be initialised and the floating mark driven to the current LITES2 cursor position. If given in INITIAL state, then the instrument will be initialised when the map(s) are read in. The instrument may be enabled/disabled at any time. A VAXstation display window may optionally be used (ENABLE PRIMARY).

While the instrument is enabled, the floating mark will be continuously driven to the LITES2 cursor position. If the LITES2 cursor does not have a known Z coordinate, then the floating mark will be driven to the X and Y position, retaining its existing Z coordinate. The instrument will not move if the LITES2 cursor position is outside its range of movement. It is advisable to disable the instrument if performing a sequence of non-interactive edits, so as not to waste time driving the instrument to the LITES2 cursor position. The floating mark is not automatically constrained if a LITES2 cursor constraint is in operation - a button which transmits a position must be pressed for the constraint to be applied.

3 *Keys, Buttons, and Pedals*

On the KERN DSR, pressing the pedals, the outer two buttons on the tracing stand, or the buttons on the keypad will transmit the coordinate of the floating

mark to LITES2, though the PRIORITY POSITION command may be used to modify this behaviour. The buttons may be programmed as a PUCK on device 6 with 20 buttons - the first 16 on the keypad, and the other 4 for press and release of left and right pedals/tracing stand buttons.

The layout of the buttons is as follows:

```
       Keypad
 -------------------
|  8 |  9 | 10 | 11 |
|-------------------|          left pedal/button   press 17
|  5 |  6 |  7 | 12 |                             release 18
|-------------------|
|  2 |  3 |  4 | 13 |         right pedal/button   press 19
|-------------------|                             release 20
|  1 | 16 | 15 | 14 |
 -------------------
```

On the LEICA SD, pressing the pedals, the outer top two and lower right buttons on the tracing stand, the outer buttons on the trackerball, or some of the keys on the PC keyboard will transmit the coordinate of the floating mark to LITES2, though the PRIORITY POSITION command may be used to modify this behaviour. The buttons and keys may be programmed as a PUCK on device 6 with 256 buttons - the first 6 for press and release of the three pedals/tracing stand buttons, and the rest for the keys on the PC keyboard (possibly modified by holding down the SHIFT, ALT, or CTRL keys while pressing the key).

The layout of the buttons is as follows:

```
                    top left pedal/button   press  4
                                           release  3

                   top right pedal/button   press  2
                                           release  1

                 lower right pedal/button   press  6
                                           release  5
```

To use PC keys for LITES2 macros, either the P1 + P2, or P2 only option must be selected in the LEICA menu on the PC screen. Some of the keys are always used to operate the LEICA menu on the PC screen and cannot be used for LITES2 macros. The correspondence of PC keys with macro numbers is best determined by experiment (do ENABLE ECHO, press them, and observe which macro number is echoed). For keys which have an associated ASCII code, the macro number is just the ASCII code (e.g. 'A' is 65, 'a' is 97, 'CTRL/D' is 4 the same as pressing the top left button). The other keys, and the ALT/key combinations usually use numbers 128 and above.

4 *Use of superimposition*

The superimposition display is activated using the command ENABLE SI. GRAPHICS and SD must also be enabled. This command will cause the superimposition display to be initialised. If given in INITIAL state, then the display will be

initialised when the map(s) are read in, and the map(s) will be drawn onto it. The picture will only appear after the read in is complete. Once the superimposition display has been initialised, then any subsequent ENABLE/DISABLE/TOGGLE SI commands will just switch the display on and off. Note that any editing performed while the display is disabled will not be reflected in the picture until a redraw is performed. The KRISS is a monochrome device. The COLORISS has 7 colours plus black. For any operations which use a colour, the colour displayed will be the remainder after dividing the colour number by 8, except that 0 is black, and anything else divisible by 8 uses 7. It may be possible to change the actual colours of colour numbers 1-7 using directives in the DAT_SI.CFG file on the PC.

4.1 *Manual registration*

On the KERN DSR with KRISS superimposition, if it is necessary for any reason to manually bring the KRISS image into registration with the plates, then the ENABLE KRISS REGISTRATION command may be used. The user is prompted to move the plates until registration is acheived, and then press the right button to accept, or the left button to leave the registration unchanged. Once set, the registration will be maintained for the duration of the LITES2 session. If it is required to remove the effect of any manual registration, the command ENABLE KRISS REGISTRATION 0 may be used.

This command does nothing on the LEICA SD with COLORISS - a similar alignment of the picture is performed instead using the PC menu and keyboard.

4.2 *Redrawing*

Any commands causing the LITES2 picture a be redrawn (DRAW,WINDOW,ZOOM) will clear the superimposition display and reload the picture into it. Since it is loaded with the entire picture initially, this is not in general useful, unless selections have changed, or it is desired to just load part of the picture. The superimposition display may be disabled during a redraw if it is desired just to redraw the picture on the VAXstation screen.

4.3 *Highlighting*

Found features, new constructions etc. are highlighted on the superimposition by flashing them. The display is limited to flashing up to 40 data points, so it is advisable to use a command such as REFRESH VERTICES 5 (for example) to limit the number of points that LITES2 will attempt to highlight. Rubber band lines are not drawn on the display because they would be distracting to the operator viewing the floating mark.

4.4 *Screen menu*

A screen menu may be displayed on the superimposition display. In the case of the KRISS, it must be fitted with an additional overlay plane, and for the COLORISS, the 'menu' directive must appear in the DAT_SI.CFG file on the PC.

The menu is created exactly as on the VAXstation. For the purposes of the arguments to DESCRIBE SCREENMENU specifying the size of the menu, the display is assumed to have 30 pixels to the cm (the entire screen is 1024 pixels). If a VAXstation is also in use, the same menu will be drawn on its screen. It is possible to get a different size or shape of menu on the two screens by giving a new DESCRIBE SCREENMENU command, then DISABLE SI, redrawing the menu using DISABLE/ENABLE SCREENMENU, and finally ENABLE SI again.

The superimposition menu is activated by giving an additional ENABLE SCREENMENU command when the menu is already visible. This will cause a full screen cursor to appear on the KRISS, or an arror pointer on the COLORISS, which may be moved using the tracing stand, hand wheels, or mouse/trackerball on the instrument. After moving to the desired menu box, pressing any button will trigger the menu command and remove the cursor. If one of the pedals or tracing stand buttons is programmed to give the ENABLE SCREENMENU command, then the pedal or button may be held down while the cursor is moved, and the release be used to trigger the selection. If the cursor is outside the screen menu, or a command is given from another device, then the cursor will disappear and no menu command will be obeyed.

4.5 *Status line and dialogue area*

A status line similar to that on the terminal may be displayed on the superimposition display. It contains the current state, and the construction map, layer, feature code, and text feature code. The command ENABLE SI STATUS is used to display the status line. This command has optional arguments to specify the position and size of the status area (see the LITES2 help and reference manual).

In addition, a single line dialogue area is provided into which other messages may be written using the ENABLE SI MESSAGE command. The position and size of the dialogue area is set using the ENABLE SI DIALOG command.

The text written into the screen menu, status line, and dialogue area uses the TRI font specified by the ANNOTATION FONT command (default 1). The height of the text is equal to the height of the area (or 0.8 of the height of a menu box for the menu). The status line and dialogue area are cleared before new text is written into them. An additional half of the height below the area is also cleared, in order to erase any descenders from the letters, so care should be taken when positioning the menu and the areas so that they do not interfere with each other.

By default, the superimposition overlay plane (including screen menu, status line, and dialogue area) is displayed in the left eyepiece. With stereo superimposition, the ENABLE SI SIDE command may be used to switch to the right eyepiece (or both). This command may also be used to temporarily switch off the overlay plane, without losing its contents.

4.6 *General*

The image visible in the instrument may be zoomed locally using its own controls. Because of this, LITES2 does not know the size of the picture being viewed, so some experimentation with TOLERANCE FIND and ANNOTATION SIZE may be

required to find appropriate values. The screen menu, status line, and dialogue area may not be visible as a result of zooming, so it is recommended that macros be written to change their size and position appropriately for different zoom factors.