K2/K3 Software Operational Manual

CCTV PIPELINE INSPECTION SYSTEM
P/N MK901, REVISION 03.01.00, 11.12.26



CUES® equipment is designed to be easy to use during day to day operation. However, it is powered electrically and thus must be operated with care and safety. PLEASE READ THE INFORMATION ON SAFETY AND MAINTENANCE EVEN IF THE SYSTEM IS SET UP BY SOMEONE ELSE.

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SAFETY PRECAUTIONS

Precautions must always be taken when operating electronic equipment. Exposed wires, damaged equipment, or improper operation can lead to a dangerous situation.

Please take a few minutes and read this entire manual prior to operating the equipment. Follow all safety procedures and thoroughly inspect equipment prior to use each day. This will help the equipment retain it's full value and will reduce the risk of injury, property, and/or equipment damage.

CAUTION

- Read the entire manual before attempting to connect or operate any equipment.
- Connect and disconnect cables only when the electric power is turned OFF.
- Never remove protection covers from the equipment or power generator. Internal repairs should only be done by an authorized CUES technician.
- If using a portable generator, always place it in an open area away from other equipment, manholes or obstructions prior to start-up; do not use a portable generator in an enclosed area.
- Upon receipt of the equipment, check for visible damage. If there is any evidence of rough handling, if damage is found, or if any equipment is missing, please contact the CUES Customer Service at 1-800-327-7791.

PERSONAL SAFETY EQUIPMENT & TRAINING

CUES stresses the use of appropriate safety equipment while working in and around manholes and during system operation. Safety should constantly remain the utmost priority. NOTE: The user of CUES products is responsible for all training and operation under federal, state and local guidelines and regulations for both confined space entry and traffic control. Recommended safety equipment includes but is not limited to the following:

- Safety goggles
- Work gloves
- Steel-toed boots
- Reflective vests
- Hard hats
- Filter masks (full respirators may be necessary)
- Flashlights
- Safety lines
- Traffic warning signs
- Traffic cones
- Gas detectors
- Ventilation fans

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01. STARTING UP AND OPERATING THE SYSTEM

1. As soon as the system is powered up, the message "Loading Cues Firmware" will scroll on the video display. Depending on the processor and type of compact flash on the single board computer in the CCU, and the type of startup of the Operating System, it may take between 35-60 seconds before the video is cleared and the message "Titler Initialized" appears in the lower left hand corner of the video display. A series of other messages will also appear there, giving updates on the progress of loading/initialization of system components.

2. The firmware system is organized as a series of screens containing fields. Three of these screens: Equipment Configuration, Set Up Display and the Run Time screen are used by almost all operators. Many of the other screens are only necessary either to get 'help' on an operation or to use a specific feature. Some screens display fields made up of menus and do not allow the video to be viewed. Other screens primarily display video, with possibly some text superimposed over the video by the titler.

3. Non video screens are organized into 16 rows of 40 columns of text. In the first row, in the 2nd to last column, the character displayed will alternate between '|' and '-' every one second to indicate that the system is healthy.

In the first row, in the last column will appear either an 'O' (default) or an 'I' indicating whether the system is in 'overwrite' or 'insert' mode for text fields. When in overwrite mode, typing characters will overwrite what is already in that field. The first character typed will clear out the field before inputting that character. When in insert mode, characters are inserted after the flashing cursor. The flashing cursor is whatever character is currently highlighted, or in the case of a 'space', it is displayed as a 'checkerboard'. The operator can toggle between overwrite and insert mode by pressing the <INS> key.

In the first row, in the 3rd to last column, the characters may alternate between the letters 'G', 'R', 'A','N', 'I', 'T', and 'E' as a reminder that the operator has temporarily exited from running GraniteXP or GraniteNet (see section Connecting to GXP or GraniteNet in Chapter 5). When these characters are displayed, the operator can return to running GXP or GraniteNet by selecting 'Return to Granite' from the Main Menu screen.

4. There are three basic types of fields: a) stored, b) text and c) digit.

Stored fields have a preset default value as well as possibly several other selections available. To choose between the other selections, the operator presses the <Uparrow> or <Downarrow> keys on the keyboard. The operator may alternately type in the first character of a selection, e.g. 'Y' for 'YES' or 'N' for 'No' for fields whose selections have unique starting characters. Finally, if the field only has two selections, pressing <SPACEBAR> will toggle back and forth between the selections.

Text fields have a preset default value (which may be all spaces) and can be filled in by the operator by any alphanumeric characters from the keyboard.

01. STARTING UP AND OPERATING THE SYSTEM

Digit fields have a preset default value and are restricted to the characters '0' through '9', a decimal point, and '-' (minus sign). When inputting a digit field, the range of acceptable values will be displayed in a status message if the operator attempts to exit that field with an illegal value.

5. Some fields are designated as 'Action' fields. An action field has a selection that ends in a '?' character. In order to select an 'Action' field, the operator must press the <ENTER> key for its action to be executed. An example would be a field whose selection moves the operator to a different screen.

6. Some fields are displayed as 'dimmed', which are shown in gray text rather than white on the screen shots in this manual. Dimmed fields cannot be reached or edited by the operator. Fields can be dimmed for three reasons: a) the setting for that field is unavailable due to it not having any additional selections (certain permutations of fields force other field's values), b), the field is a copy of a field from another screen that was deemed necessary to appear in more than one place, or c) the field is only available for edit if the operator is an Administrator. An Administrator has certain privileges that a normal operator does not, specifically being able to change certain fields on certain screens. This manual does not discuss the requirements/procedures for becoming an Administrator. Contact Cues Technical Support for more information.

7. Moving within a field can be accomplished by using the <Leftarrow>, <Rightarrow>, <Home> and <End> keys.

Deleting within a field can be accomplished by using the <Backspace> (delete previous character) or <Delete> (delete current character) keys.

Moving around the display from field to field is accomplished by pressing <TAB> (to go forward one field) or <SHIFT><TAB> (to go backward one field). On the Write Free Format screen, <TAB> will insert preset tab stops at 8, 16, 24, and 32 character positions.

Pressing <ENTER> is equivalent to pressing <TAB> in fields that are not 'Action' fields in that it will move the cursor to the next field on that screen.

8. Messages indicating that an operation was/was not successful, requesting operator input, and other status messages appear on the bottom row of the display. Messages sometimes will stay displayed until another message needs to be displayed. In the event of an unsuccessful operation, the message will be displayed for at least two seconds. The minimum amount of time that successful/unsuccessful messages remain on the display for may be set on the Customizable Parameters screen. Messages displayed are also logged to a file, the last 500 of which may be reviewed through the View Log File screen, selected from the Utilities screen, selected from the Main Menu screen.

A message that is too long to fit on the bottom row of the display will be scrolled.

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9. Any screen in the system other than the Main Menu screen can be exited to the next higher level screen by pressing <ESC>. The highest level screen is the Main Menu screen from which all other screens may be reached.

10. Pressing <F1> on any screen will bring up context sensitive help about that particular screen.

11. Pressing <CTRL><F1> in any user modifiable field will display a field specific help screen containing information directly applicable to that field. This is intended to help the operator when selecting or filling in a field in which he is unsure of the field's usage.

Returning from the field specific help screen back to the field being modified/viewed may be accomplished by pressing either <CTRL><F1>, <F1> by itself, or <ESC>.

12. There are many 'hot keys' (key combinations that require holding down two or more keys on the keyboard at the same time) that act as short cuts to quickly move from one screen to another screen without having to first go back up to the Main Menu screen. See Appendix A: K2/K3 Keycodes.

13. After briefly displaying a Copyright screen (that can be later viewed by way of a selection from the Main Menu screen), the Equipment Configuration screen is displayed which allows the operator to set up critical system parameters such as the cable type, transporter used, camera installed, lighting choices, etc. A second configuration screen, the Set Up Reels screen is reachable from the Main Menu screen and may also be needed to initially set up the reel parameters of the system.

The Equipment Configuration screen cannot be exited other than to the Configure Reels Screen until the operator has set the 'CONFIGURATION CORRECT?' field to 'YES', indicating that the information on this screen is correct. Information from this screen is then used to electrically power up the equipment selected and if not set properly, could damage the equipment.

Typically, information on the Equipment Configuration and Set Up Reels screens only needs to be set up once, and may even be done at Cues, prior to system delivery. However, if the operator changes any equipment these screens will need to be revisited. A field on the Customizable Parameters screen allows the system to skip over the Equipment Configuration screen and go directly to the Run Time screen for customers that know that the Equipment Configuration screen is set up properly and wish to immediately view video.

Exiting the Equipment Configuration screen by pressing <ENTER> while on the 'CONFIGURATION CORRECT?' field will move directly to the Run Time screen. However, initially the operator might wish to press <ESC> to return to the Main Menu screen in order to do further system setup.

01. STARTING UP AND OPERATING THE SYSTEM

14. The first selection from the Main Menu screen 'BEGIN?' will move the operator to the Run Time screen. If the operator leaves his cursor on the 'BEGIN?' selection, after 15 seconds the system will automatically move to the Run Time screen. The Run Time screen displays video received from the camera(s) generally with some information overlayed such as the distance position, date and time. However, prior to moving to the Run Time screen, the operator might wish to move to some other of the selections from the Main Menu screen. A few common selections are:

An operator can select 'SET UP RUN TIME DISPLAY?' which will allow for setting up those fields that will appear on the Run Time screen such as the time, date, main and lateral distance, etc., and the position where they will appear on the screen.

An operator can select 'SET UP INSPECTION?' which will allow for setting up information and data collection that can be written out to a text file for later transfer to a personal computer. If using Granite XP, or relying on VCR/DVD recording for documentation purposes, this may be skipped over.

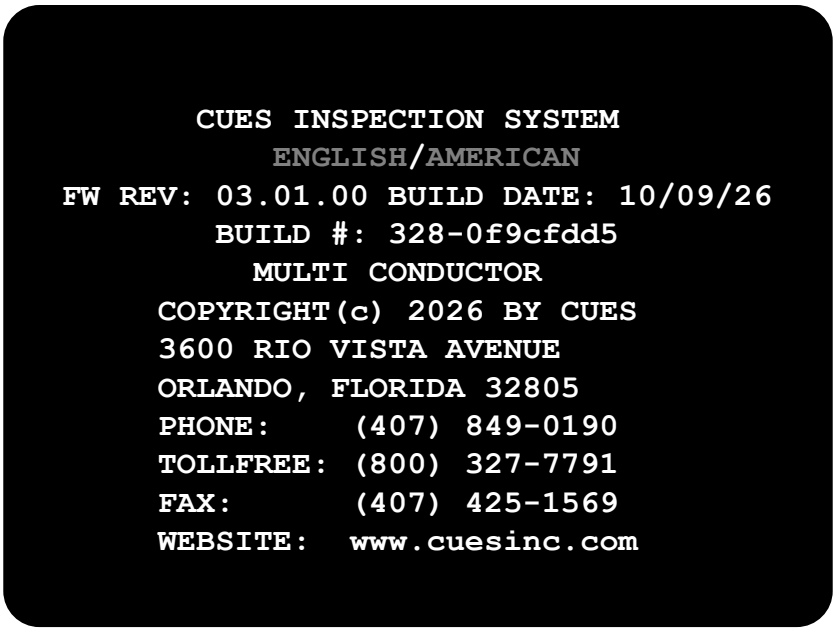
An operator can select 'DEFINE COMMENTS?' for setting up comments and codes that can be overlayed on the Run Time screen by using short cut keys.

If there is some particular text that the operator wishes to appear on all recordings made, he can select the 'WRITE FREE FORMAT SCREEN?', and then afterwards, use the FREE-FORMAT WITH RUN-TIME?' selection rather than the going to the Run Time screen.

An operator can select 'RUN DIAGNOSTICS' to test system electrical parameters, cable continuity, gamepad/handheld controller functionality, exercise the transporter, camera and lights, and display information regarding the K3.

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02. SCREEN OPERATIONS - *COPYRIGHT* SCREEN



The BUILD DATE is the date that the revision was made.

1. Turn on the system and VCR, if applicable. Verify that the system has power (power LED should be illuminated).

2. Verify that the Copyright Screen is displayed for few seconds when the system initially boots and then the Equipment Configuration Screen will be displayed.

02. SCREEN OPERATIONS - *EQUIPMENT CONFIGURATION*



To ensure proper equipment operation and to prevent equipment damage (over-voltage), please read all of the information that's provided in this manual.

3. The Equipment Configuration Screen is shown above. Please refer to the explanation on the following pages regarding how fields work, the types of fields, etc.

REV: 03.01.00 - Label field that shows the current version of K2/K3 firmware. This is also displayed on the Copyright Screen.

Configuration Correct? NO?
Is both an action and a stored field. This screen can not be exited unless the field is filled in with Yes.

Action: If the field is filled in with 'YES', move to the Run Time screen.
Selections – YES?, NO?
Default – NO?
Status Line – ARROW UP/DOWN to view correctness list

Label: SYSTEM TYPE
Type - stored field
Selections – K2-TV, K3-TV, K2-CATVS, K2-SOLID_FX
Default – K2-TV
Status Line - ARROW UP/DOWN to view system type list.
Note: System type selection is based on the type of PCU/CCU that affects which reels and other equipment may be paired, as well as whether Combined Analog Sonar and TV (CATVS) is being used. Selecting K2-CATVS will cause the video source to be set to Auxiliary, disable video equalization and the cable resistance will be halved if the cable length is > 2000 ft (609 m). The operator has to be an administrator in order to change the system type.

Label: MAIN REEL
Type: stored field
Selections: None, K2 Portable, K2 Truck, IGGY, Legacy Truck, IMX, MARK3, K2 Truck 10X
Default: K2 Truck 10X
Status Line: ARROW UP/DOWN to view main reel list
Note: Changing the reel type will automatically change the scaling counts field on the Set Up Reels screen. The operator has to be an administrator in order to change the reel type.

LABEL: CABLE TYPE
Type – stored field, dependent on reel field (from Configure Reels screen)
Selections: None, Coiler, Custom. WM305(Platinum), TM607(Gold), 0305490 (Gold), MD605(Orange), SM354(Gold), SD337(Platinum), LT379, HD321(Gold), LT379(Gold), MS391(Gold), MS393(Gold), MS355, IMX Gray, Yellow, HD321+HD350 Adapter
Default: WM305 (Platinum)
Status Line - ARROW UP/DOWN to view cable type list.
Note: The operator has to be an administrator in order to change the cable type.

LABEL: CABLE LENGTH
Type - digit field
Length - 4
Range – 1 - 9999
Type – Integer
Default - 10
Status Line – Input cable's length.

02. SCREEN OPERATIONS - *EQUIPMENT CONFIGURATION*

LABEL: EBOX
Type – stored field, dependent on SYSTEM_TYPE being K2-SOLID_FX. If not set to K2-SOLID_FX, this field will be hidden.
Selections – NONE, HD390, SF379 and SF387
Default – HD390
Status Line – ARROW UP/DOWN to view EBOX list.
Note: Selection an EBOX affects dependencies of TRANSPORTERS, FRONT CAMERAS, LIGHTS and ELECTRIC LIFT.

LABEL: TRANSPORTER
Type - stored field, dependent on TYPE
Selections – None, Shorty, Ultra-Shorty, Steerable Pipe Ranger, Pipe Ranger, Steerable MudMaster, Mud Master, Koala, Comp.PipeRngr WM350 HI-V, Comp.Pipe Rngr WM360 60V, Ultra-Shorty-21, Ultra-Shorty-III, WTR, LAMPI,LAMP II Small Wheel, LAMP II Large Wheel, Badger_NS, Logiball_6, Logiball_8, Cues LCS, NPR Tractor, Logiball 6 inch LCL, Logiball 8-18 inch LCL, Currahee Std. Cutter, Currahee F.F. Cutter
Default - None
Status Line - ARROW UP/DOWN to view transporter list.
Note: Changing the transporter to LAMPI or LAMPII will automatically change the scaling counts on the Configure Reels screen.

Select the Currahee Std. Cutter when using the Currahee Cutter with the Standard Camera Assembly (for reinstatement work). This front section contains two cameras – one adjustable, aimed backward toward the cutting head, and one fixed, aimed forward down the pipe. For Currahee Std. Cutter, there is one available front camera selection: CK314.

Select the Currahee F.F. Cutter (CFFC) when using the Currahee Cutter with an optional forward-facing cutting head and two side-mounted cameras (for line prep work). The left and right side-mounted cameras are both aimed forward from behind the cutting head. For Currahee F.F. Cutter, there are two available front camera selections: Straight Bit and Angled Bit. Select Straight Bit when using the cutting head that is aimed straight forward, horizontally, and Angled Bit when using the 45° cutting head.

Changes were made to the rotate (CCW/CW) controls in order to make the cutting head's movement direction, as viewed in the video image, consistent across all cameras in the system. In other words, pushing the joystick LEFT will always result in the onscreen cutting head moving to the left, and pushing the joystick RIGHT will always result in the onscreen cutting head moving to the right. The firmware selects which rotate command to send based on the active camera's current perspective. What follows is a further explanation of this.

Standard Configuration, Driving Camera: This camera is mounted all the way on the front of the cutter and looks straight forward down the pipe. Joystick LEFT rotates counter-clockwise (CCW), and joystick RIGHT rotates clockwise (CW).

Standard Configuration, Cutting Camera: This camera is mounted in front of the cutting head, aimed backwards at it, so the directions are reversed. Joystick LEFT rotates CW, and joystick RIGHT rotates CCW.

CFFC Configuration, Angled Bit, both Left and Right Cameras: These cameras are mounted behind and below the cutting head, aimed above horizontal. Joystick LEFT rotates CCW, and joystick RIGHT rotates CW.

CFFC Configuration, Straight Bit, both Left and Right Cameras: These cameras are also mounted behind the cutting head, but above it, aimed below horizontal, so the directions are reversed. Joystick LEFT rotates CW, and joystick RIGHT rotates CCW.

Note that all of the above is the behavior when the Cutting CCW/CW setting on the Customizable Parameters screen is set to NORMAL (NML). Selecting REVERSED (REV), reverses everything.

The default camera when exiting the Equipment Configuration screen with FRONT CAMERA set to CK314 is the Cutting camera.

The default camera when exiting the Equipment Configuration screen with FRONT CAMERA set to either Straight Bit or Angled Bit is the right camera.

Pressing the VIEW button on the gamepad when using the CFFC will toggle the camera view between the left and right cameras.

When displaying the cutter speed on the Run Time screen a '+' or '-" symbol is used to display the polarity of the CCW-CW movement. The Power Supply Status screen shows the motor polarity based on the output voltage polarity of the supply. It thus, can differ from the CCW-CW polarity shown on the Run Time screen.

More on the Currahee Cutter may be found in the CUES document CK902 Currahee Cutter User Manual, which may be found on the CUES website.

02. SCREEN OPERATIONS - *EQUIPMENT CONFIGURATION*

LABEL: FRONT CAMERA
Type - stored field, dependent on TRANSPORTER
Selections – None, OZ-II, OZ-II EC3051,Nite Lite,Pan & Tilt, Panther, Night Owl, PS2, PS3, OZ-III, OZ-III EC3044, SR3, Nite Lite III, OZ4-HD, Quick Zoom, Lite Stick, Aux Video, LAMP-II, LAMP-II EC3044, Illuminator, Industry Standard, DUC, PS3 - LAMP Control, Seeker System, IMX, Mainline MPT, DUC w/External, Analog Sonar, CK314, Straight Bit, Angled Bit, HD380-HD370, HD300-3, HD370, HD390, HD300-3, HD370, CZ340
Default – None
Status Line - ARROW UP/DOWN to view camera list.

LABEL: REAR CAMERA
Type - stored field, dependent on FRONT CAMERA
Selections – NONE, DIGITAL, ANALOG
Default – NONE
Status Line - ARROW UP/DOWN to view rear camera list.
If FRONT VIEWING CAMERA = None, filled with NONE

LABEL: LATERAL CAMERA
Type- stored field, dependent on the front camera
Selections- NONE, STANDARD, MINI P&T, MICRO P&T
Default - NONE
Status Line – ARROW UP/DOWN to view lateral list
Note: This field is only valid if the Front Viewing camera is set to LAMP-II or LAMP-II EC3044

LABEL: ELECTRIC LIFT
Type - stored field, dependent on TRANSPORTER
Selections – NO, YES
Default – NO
Status Line – ARROW UP/DOWN to view electric lift list

LABEL: LIGHTS
Type - stored field, dependent on CAMERA
Selections: Lights None, TriLight, HPL-10, HPL-8, HPL-6 (Parallel), HPL-6 (Serial), HPL-5.5, Shorty External, PS2 External, PS2 Internal Only, PS3 Internal Only, SR3 Internal Only, Internal LEDS, Internal Incandescent, CPR External Incandescent, Aries LEDs,DUC Internal LEDs, LAMP II Internal, Internal LEDs (P),Internal Incandescent (P),PS3 Internal + Translator,SR3 Internal + Translator,LEDs - LAMPI Control,Seeker, IMX Internal,CATVS, Not Applicable, CPR External LEDs, Currahee Lights, LM403_Test, HD390_lights, SF379_lights, SF387_lights, Solid_FX_Jeep
Default – None
Status Line - ARROW UP/DOWN to view lights list.

LABEL: TITLING SOURCE
Type - stored field
Selections - SOFTWARE, SUMMIT/K2/K3
Default – SOFTWARE
Status Line - ARROW UP/DOWN to view Titling Source.
Setting this value to SOFTWARE will allow Granite XP or another program to retrieve information from the K2/K3 as well as to control its titler. Setting this value to SUMMIT/K2/K3 will allow GraniteNet to retrieve information from the K2/K3, but not control its titler.

LABEL: AUDIO SOURCE
Type - stored field
Selections - Microphone, Auxiliary
Default – Microphone
Status Line - ARROW UP/DOWN to view audio list.
Note: This field is set up upon entry to the screen and also updated immediately upon any change to this field.

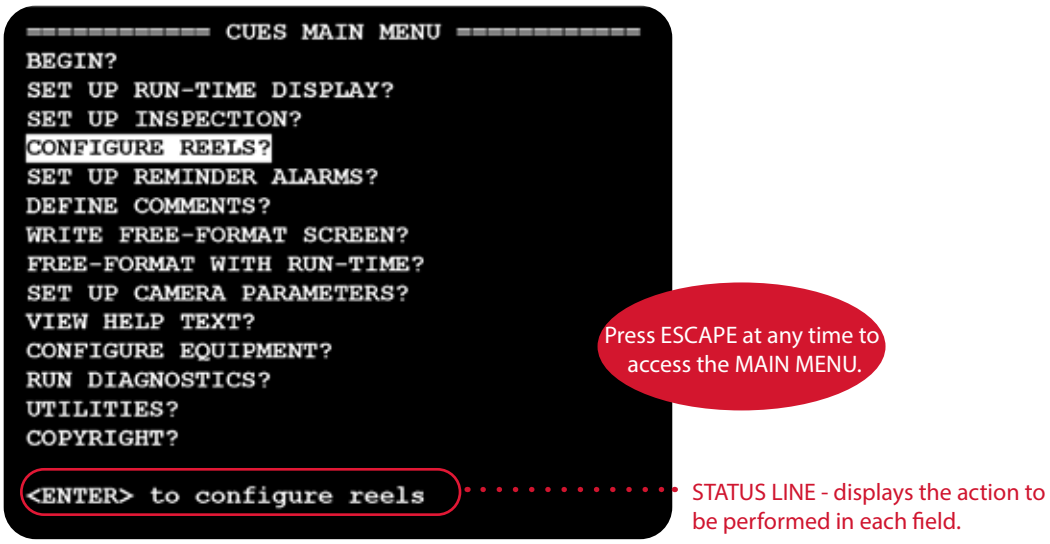
LABEL: SPEAKER VOLUME
Type - digit field
Length 3
Range – 0 - 255
Type – Integer
Default – 0
Status Line - Input speaker volume(0-255).
Note: another way to change the speaker volume is by pressing <CTRL>+<ALT>+<UPARROW> or <CTRL>+<ALT>+<DOWNARROW>. This works from any screen and will cause the status line to display:
SPEAKER: XXXXXXXXXXXXXXX
Each 'X' represents gain of 16. For example, the speaker volume of 35 would have 2 'X', whereas the speaker volume of 96 would have 6 'X'. The maximum number of 'X' is 15.

02. SCREEN OPERATIONS - *EQUIPMENT CONFIGURATION*

LABEL: SPEAKER ON/OFF
Type - stored field
Selections: Speaker ON, Speaker OFF
Default: Speaker OFF
Status Line - ARROW UP/DOWN to view speaker list.
Note: This field is set up upon entry to the screen and also updated immediately upon any change to this field.

NOTE: There are dependent fields throughout the system that default to FT. (short for feet). These are dependent on a stored field on the Customizable Parameters screen that allows the operator to set the desired distance units (you can chose feet or meters and several different abbreviations of those two). When changing between feet and meters and vice-versa, any fields dependent on this will be recomputed and displayed accordingly. However, numbers will be rounded-off when converting from feet to meters. Be sure to enter the applicable values in whatever units are being displayed.

02. SCREEN OPERATIONS - *MAIN MENU*



MAIN MENU SCREEN DESCRIPTIONS:

BEGIN?
Action Field – moves to the Run Time Screen
Status Line: <ENTER> to begin inspection
Note: if the cursor is left on this field for 15 seconds without any keys being pressed, it will automatically move to the Run Time Screen.

SET UP RUN-TIME DISPLAY?
Action Field – moves to the Display Set Up Screen
Status Line: <ENTER> to run-time display

SET UP INSPECTION?
Action Field – moves to the Inspection Set Up Screen
Status Line: <ENTER> to set up inspection

CONFIGURE REELS?
Action Field – moves to the Set Up Reels Screen
Status Line: <ENTER> to configure reels

SET UP REMINDER ALARMS?
Action Field – moves to the Set Up Reminders Screen
Status Line: <ENTER> to set up reminder alarms

02. SCREEN OPERATIONS - *MAIN MENU*

DEFINE COMMENTS?
Action Field – move to the Define Comments Screen
Status Line: <ENTER> to define comments

WRITE FREE FORMAT SCREEN?
Action Field – moves to the Free Format Screen
Status Line: <ENTER> to write free format screen

FREE-FORMAT With RUN-TIME?
Action Field: Moves to the Free Format With Run-Time screen
Status Line: <ENTER> to Free Format with Run Time

SET UP CAMERA PARAMETERS?
Action Field – moves to the Camera Parameters Screen
Status Line: <ENTER> to set up camera parameters

VIEW HELP TEXT?
Action Field – moves to the View Help Text Screen
Status Line: <ENTER> to view help text

CONFIGURE EQUIPMENT?
Action Field – moves to the Equipment Configuration Screen
Status Line: <ENTER> to configure equipment

RUN DIAGNOSTICS?
Action Field – moves to the Diagnostics Screen
Status Line: <ENTER> to run diagnostics

UTILITIES?
Action - Move to the UTILITIES screen
Status Line: <ENTER> to Utilities screen

COPYRIGHT?
Action – Move to the Copyright Screen
Status Line: <ENTER> to Copyright Information

RETURN TO GRANITE?
Action – Move the operator back to GXP or GraniteNet if he previously had been in either of them and exited to change configuration parameters.
Status Line: <ENTER> to return to Granite connection

02. SCREEN OPERATIONS - *DISPLAY SETUP*

```
========== CUES DISPLAY SET UP =========
FONTS: SMALL_OUT   SCREEN TIMEOUT:None
MAIN DISTANCE: On  RT FONT EBW      1, 1
LATERAL DISTANCE: ON     HUMID:OFF  2, 1
TIME: On     hh:mm AM   04:47 PM    3, 1
DATE: On     MM/DD/YY    11/07/16   4, 1
PRESSURE:Off PSI              ZERO?  5, 1
INCLINE:Off  DEG.    5-DEGREE ZERO?  6, 1
TRANS SPEED:Off   CUTTER SPD: OFF    7, 1
TTL:  Off                            8, 1
MH-1: Off                            9, 1
MH-2:                               10,1
DIR:  Off                           11,1
LEN:  Off                           12,1
CMT1: Off                           13,1
CMT2:                               14,1
ARROW UP/DOWN to view font size list
```

DISPLAY SETUP Menu Screen Descriptions:
Many options are available in the Display Setup Screen and can be defined per the user's preferences.

Label - FONTS:
Type - stored field
Selections- SMALL_OUT,LARGE_OUT, SMALLNO_OUT, LARGENO_OUT
Default- SMALL_OUT
Status Line - ARROW UP/DOWN to view font size list.
This field is used for the font sizes used on the Run Time Display. SMALL characters fit 40 per line, 17 lines per screen. LARGE characters fit 20 per line, 8 lines per screen.

The font selections refer to whether the font is small or large, and whether it has an outline color or not. Fonts with an outline color are beneficial for making the characters stand out regardless of the background video. Fonts without an outline color may be useful to avoid chroma crawl on some screens, depending on the video image being displayed.

For example, the font rendering EWB has an external background (meaning that video passes through), white outline color and black characters, when displayed with a font size selection that includes outlining. However, if the font size selection is set to SMALLNO_OUT or LARGENO_OUT, the white outline will not be drawn. This may be beneficial if the video has a lot of white.

02. SCREEN OPERATIONS - *RUNTIME DISPLAY SETUP*

Label – SCREEN TIMEOUT
Type – stored field
Selections – None, 5 Minutes, 30 Minutes, 1 Hour
Default – None
Status Line – ARROW UP/DOWN to view screentimeout list

This field controls whether a screen saver is used, and if so, how long before it is initiated. Screen saver can prevent burn in on a CRT monitor, but is unnecessary for an LCD monitor. If the screen saver is set to anything other than 'None', the screen will be blanked after the specified amount of time of passes without any activity. Pressing any key on the keyboard or controller, or the distance changing will cause the screen saver to be exited.

Label - MAIN DISTANCE:
Type - stored field
Selections – On, Off
Default – On
Status Line - ARROW UP/DOWN to view display distance list
This field controls whether the Distance is displayed on the Run Time screen.

Label – RT FONT
Type – stored field
Selections – EBW, HBW, WWB, BBW, EWB
Default – EBW
Status Line – ARROW UP/DOWN to view rendering list
This field controls the rendering used on the Run Time, Free Format with Run Time, Free Format, and GXP screens. The three letters are abbreviations for the background color, outline color and character color used for the text that is overlaid on the video display. E refers to external, meaning that the video is passed through (transparent). W refers to white, B refers to black and H refers to half-tone. These values are also changeable using the hotkey combination <CTRL><f> when on the video screens.

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There are sixteen pairs of row/column fields used for positioning the following fields on the Run Time Screen:
Main Distance
Lateral Distance
Humidity
Time
Date
Pressure
Incline
Transporter Speed
Cutter Speed
Title
Manhole-1
Manhole-2
Direction
Length
Comment-1
Comment-2

Label: LATERAL DISTANCE:
Type: stored field
Selections: OFF, ON, ON FOR LAT VIEW, ON EVEN ON GXP
Default: OFF
Status Line: ARROW UP/DOWN to view display distance list
This field controls whether the Lateral Distance is displayed on the Run time or GXP screens. If set to ON FOR LAT VIEW, it is only displayed if the lateral is being view on the main video display. If set to 'ON EVEN ON GXP', the lateral distance is displayed on both the Run Time screen AND the GXP screen.

Label – HUMID
Type – stored field
Selections – OFF, ON
Default – OFF
Status Line – ARROW UP/DOWN to view humidity list
Humidity is only available if using a Micro Pan & Tilt camera. Note that humidity will be displayed where the LENGTH field is shown and LENGTH should be set to 'Off' so as to not overwrite this field.

Humidity is only displayed if using Micro Pan and Tilt camera. If so, it will be displayed in the location given by the LENGTH field. In the above display, this would be row 12, column 1. If displaying humidity, the operator should make sure that the LENGTH field is set to 'Off', so they don't overwrite each other.

02. SCREEN OPERATIONS - *RUNTIME DISPLAY SETUP*

Label - TIME:
Type - stored field
Selections – Off, On
Default – On
Status Line - ARROW UP/DOWN to view display time list
This field controls whether the Time is displayed on the Run Time screen.

Unlabeled field
Type – stored field
Selections - hh:mm AM, hh:mm, hhmm
Default: hh:mm AM
ARROW UP/DOWN to view list of formats.
The operator selects the format for the time to be displayed on the Run Time Screen.

Unlabeled field
Type – text
Length - 8
Default – the current time in the existing time format
Status Line – Input time in existing format
Times with single digit hours may be entered without the '0' prefix, e.g. 6:35 AM rather than 06:35 AM

Label - DATE:
Type - stored field
Selections – Off, On
Default – On
Status Line - ARROW UP/DOWN to view display date list
This field controls whether the Date is displayed on the Run Time screen.

Unlabeled field
Type – stored field
Selections – 96 different selections for how to format the month, day and year
Default: MM/DD/YY
ARROW UP/DOWN to view list of formats.
The operator selects the format for the time to be displayed on the Run Time Screen.

Unlabeled field
Type – text
Length - 10
Default – the current date in the existing date format
Status Line – Input date in existing date format.
Label - PRESSURE:
Type - stored field

Selections – Off, On
Default – Off
Status Line – ARROW UP/DOWN to view display pressure list
This field controls whether the Pressure is displayed on the Run Time screen. The absolute pressure measured less 14.7 PSI is displayed.

Unlabeled field
Type – stored field
Selections – PSI, BARS, MILLIBARS, MBARS, psi, Bars, Millibars, millibars, bars, B., b., B, b, mbars, MB., mb., MB, mb
Default = PSI
Status Line - ARROW UP/DOWN for pressure units list
The units of pressure appears on the Run Time Screen.

Label: ZERO?
Type: Action field
Status line is initially '<ENTER> to zero pressure now?'
Pressing <ENTER> causes the pressure to be zeroed, the field to change to 'DONE' and the status line to change to 'Pressure has been zeroed.'. The next time the operator tabs into this field, it will change to 'ZERO?' and the status line to '<ENTER> to zero pressure now?'

Label - INCLINE:
Type - stored field
Selections – OFF, ON, ONGXP
Default – Off
Status Line - ARROW UP/DOWN to view display incline list
This field controls whether the Incline is displayed on the Run Time screen or GXP screen. If set to ONGXP, it will get displayed if GXP has taken control of the display.
Unlabeled field
Type – stored field
Selections: DEGREES ,GRADIENT,Degrees,Gradient,degrees, gradient, DEG., GRAD.,Deg.,Grad. ,deg.,grad., DEG, GRAD, Deg, Grad, deg, grad, d, g, %
Default – DEG.
Status line – ARROW UP/DOWN to view incline display
The units of incline appear on the Run Time screen. When the operator sets this field to GRADIENT, Gradient, gradient, GRAD., Grad., grad, Grad, grad, g, or %, the percent of incline is displayed.

Unlabeled field
Type – stored field
Selections - 5-DEGREE, 11-DEGREE
Default – 5-DEGREE
Status Line - ARROW UP/DOWN to view range hardware

02. SCREEN OPERATIONS - *RUNTIME DISPLAY SETUP*

Label - ZERO?
Type – action field
Status line is initially 'Perform inclinometer zeroing procedure'.
Pressing <ENTER> causes the next step to occur:
Field changes to 'FWD?' and Status Line changes to 'Note physical orientation, press <ENTER>!'
Pressing <ENTER> causes the next step to occur:
Field changes to 'REV?' and Status Line changes to 'Reverse Orientation, press <ENTER>!'
Pressing <ENTER> causes the next step to occur:
Incline zeroed, Field changes to 'DONE' and Status Line changes to 'Inclinometer has been zeroed.' The next time the operator tabs into this field, it will change to 'ZERO?' and the Status line will change to "Perform inclinometer zeroing procedure".

Label - TRANS SPEED:
Type - stored field
Selections – Off, On, ON EVEN ON GXP
Default – Off
Status Line -ARROW UP/DOWN to view display speed list
This field controls whether the Transporter Speed is displayed on the Run Time screen or GXP screen. If set to ON EVEN ON GXP, it will get displayed if GXP has taken control of the display.Note: See the Customizable parameters for fields for modifying the transporters speed sampling quantity and sampling method.

At the end of each row of this screen for fields that may be displayed on the Run Time Screen, are two values, separated by a comma. The length of these values is 2. The default for these values is '1'. The first value is the row to display it on the Run Time Screen. This has a range of 1-16 (1-8 for Large fonts). The second value is the column to display it on. This has a range of 1-40 (1-20 for Large fonts). The status line will read either 'Input display line' or 'Input display column'. If the operator attempts to position two fields such that they would overlap each other (independent of whether the operator has indicated that that field should be displayed on the Run Time Screen), the software will display a status message indicating a conflict.

The operator can either then choose to allow that conflict or return and change the positions so that they don't overlap. If a conflict is allowed, the software will display both fields on the Run ime Screen with the latter one overwriting the former one.

Label – CUTTER SPD
Type – stored field
Selections – OFF, ON
Default – OFF
Status Line – ARROW UP/DOWN to view cutter speed list
Cutter speeds may only be displayed if using the Currahee cutter. Note that cutter speeds will be displayed where the Transporter speed field is shown and Transporter speed should be set to 'Off' so as to not overwrite this field.
Cutter speed percentages are only displayed if the Transporter type is Currahee cutter. They will be displayed on the same location as the Transporter Speed field is set to. In the above display, this is row 7, column 1. If displaying cutter speed percentages, the operator should make sure that the Transporter speed is set to 'Off', so they don't overwrite each other.

Cutter speed may also be toggle on/off with the <F11> key on the Run Time screens.

If the operator attempts to position a field at a column that will not allow enough room for the field to be displayed on that line of the screen, the operator will receive a message 'Won't fit in 40 columns' or 'Won't fit in 20 columns' if using Large fonts. If this occurs, the operator needs to input a lesser value that will fit. Here is a table of how many characters each field requires:

Distance: 9 + the length of the units. For example, if units = 'FT.', it will take 12 characters.
Transporter Speed: 4 + the length of the units/min. For example, if units = 'FT.', the units/min that will be displayed is FT/Min, so it will take 10 characters.
Pressure: 4 + the length of the units. For example, if units = PSI, it will take 7 characters.
Incline: 5 + the length of the units. For example, if incline is DEG., it will take 9 characters.
Time: 8 characters
Date: 11 characters
Title: The length of the title string (as input on the Set Up Inspection Screen)
Manhole 1: The length of the manhole 1 string (as input on the Set Up Inspection Screen)
Manhole 2: The length of the manhole 2 string (as input on the Set Up Inspection Screen)
Direction: The length of the direction string (as input on the Set Up Inspection Screen)
Length: The length of the length string (as input on the Set Up Inspection Screen)
Comment 1: The length of the comment 1 string (as input on the Set Up Inspection Screen)
Comment 2: The length of the comment 2 string (as input on the Set Up Inspection Screen)

Label - ZERO?
Type – Action field
Status line is initially '<ENTER> to zero pressure now?'
Pressing <ENTER> causes the pressure to be zeroed, the field to change to 'DONE' and the status line to change to 'Pressure has been zeroed.'. The next time the operator tabs into this field, it will change to 'ZERO?' and the status line to '<ENTER> to zero pressure now?'

02. SCREEN OPERATIONS - *RUNTIME DISPLAY SETUP*

Label - TITL:
Type - stored field
Selections – Off, On
Default – Off
Status Line - ARROW UP/DOWN to view display title list
This field controls whether the Title is displayed on the Run Time screen.

Unlabeled field
Type – Text (read-only)
Length 25
Default – blank
This field contains the Title set on the Set Up Inspection Screen.

Label - MH-1:
Type - stored field
Selections – Off, On
Default – Off
Status Line - ARROW UP/DOWN to view display manh. list
This field controls whether the Manholes are displayed on the Run Time screen.

Unlabeled field
Type – Text (read-only)
Length 25
Default – blank
This field contains the Manhole -1 set on the Set Up Inspection Screen.

Unlabeled field
Type – Text (read-only)
Length 25
Default – blank
This field contains the Manhole -2 set on the Set Up Inspection Screen.

Label - DIR:
Type - stored field
Selections – Off, On
Default – Off
Status Line - ARROW UP/DOWN to view display dir. list
This field controls whether the Direction is displayed on the Run Time screen.

Unlabeled field
Type – Text (read-only)
Length 25
Default – blank
This field contains the Direction set on the Set Up Inspection Screen.

Label - LEN:
Type - stored field
Selections – Off, On
Default – Off
Status Line - ARROW UP/DOWN to view display len. list
This field controls whether the Length is displayed on the Run Time screen.

Unlabeled field
Type – Text (read-only)
Length 25
Default – blank
This field contains the Length set on the Set Up Inspection Screen.

Label – CMT1:
Type - stored field
Selections – Off, On
Default – Off
Status Line - ARROW UP/DOWN to view display comm. list
This field controls whether the Comments are displayed on the Run Time screen.

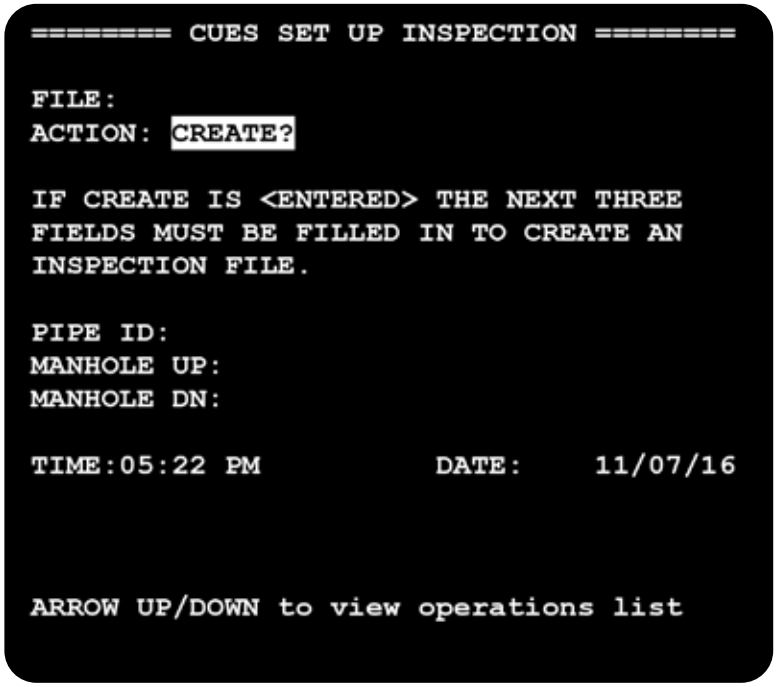
Unlabeled field
Type – Text (read-only)
Length 25
Default – blank
This field contains the Comment-1 set on the Set Up Inspection Screen.

Unlabeled field
Type – Text (read-only)
Length 25
Default – blank
This field contains the Comment-2 set on the Set Up Inspection Screen.

02. SCREEN OPERATIONS - *SETUP INSPECTION MENU*

Setting up an inspection fills two roles – allowing the operator to set up some information that he would like to be displayed on the Run Time screen and also providing a mechanism for storing to a disk file critical observations and data for a Pipe Segment.

There are two screens involved in the process. The first screen is called the SET UP INSPECTION screen. It looks as follows:



The fields on this screen are as follows:
Label – FILE:
Type – Stored Field
Selections – Either all spaces if no selections or one or more filenames
Default – all spaces initially until the first filename is created
Status Line - ARROW UP/DOWN to view list of files
This field contains the list of inspection file names, if any.

Label – ACTION:
Type – stored and action fields
Selections: CREATE?, VIEW/EDIT?, DELETE?, EXIT? CLOSE?
Default – CLOSE?
Status Line - ARROW UP/DOWN to view list of operations
This field contains the actions available that operate on inspection files. The PIPE ID, MANHOLE UP and MANHOLE DN fields are dimmed (unavailable) unless this field is set to CREATE? and <ENTER> is pressed.

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Label – PIPE ID:
Type – text field
Length - 25
Default – None
Status Line - Input Pipe ID
This field contains the Pipe ID. Only available for edit during the ACTION: CREATE?

Label – MANHOLE UP:
Type – text field
Length - 25
Default – None
Status Line - Input Manhole Up
This field contains the Manhole Up. It also is copied to the Display Set Up Screen on the Manhole-1 line. Only available for edit during the ACTION: CREATE?

Label – MANHOLE DN:
Type – text field
Length - 25
Default – None
Status Line - Input Manhole Down
This field contains the Manhole Down. It also is copied to the Display Set Up Screen on the Manhole-2 line. Only available for edit during the ACTION: CREATE?

Label - TIME:
Type – text field (Read-only)
Length - 8
Default- 12:00 AM
The system fills this field in with the current time. The time gets updated once per minute.

Label - DATE:
Type – text field (Read-only)
Length - 11
Default- 31 DEC 2006
The system fills this field in with the current date. The date gets updated once per minute.

The first time that this screen is entered the FILE: field is set to all spaces and the ACTION: field is set to CLOSE? with the cursor in the ACTION field. However, in cases where the FILE: file is not all spaces, it will be set to the latest (newest) file chronologically. Pressing <UPARROW> and <DOWNARROW> in this field will scroll through all the inspection files that may be operated on by the ACTION field which follows. As each successive filename is displayed, all of the information from that filename is also displayed so that it's easier to locate the desired PIPE ID: or MANHOLE UP: or MANHOLE DN:.

02. SCREEN OPERATIONS - *SETUP INSPECTION MENU*

If there are no files in the FILE: field, the ACTION: field will be set to CLOSE? and the operator will not be able to get to any of the other selections for this fields.

If the ACTION: field is set to CREATE?, if the operator presses <ENTER>, the cursor moves to the PIPE ID field. The operator needs to input something in each of the three fields in order for a inspection file to be created. Prior to all three fields having anything but spaces in them, as each field is exited the status line displays the message:

Please fill in the PIPEID and two Manholes.

If the MANHOLE UP:, MANHOLE DN: and PIPE ID: fields are filled in, there will be enough information to create a file. Upon exiting the last of these fields with something other than all spaces, the system checks to see if what has been entered meets certain criteria:

1. If the PIPE ID matches an earlier saved PIPE ID, but the MANHOLE UP differs, the status line will display the message:
   Unable to save. Invalid MANHOLE-UP.
   and no inspection file will be created.

2. If the PIPE ID and MANHOLE UP match an earlier saved PIPE ID and MANHOLE UP, but the MANHOLE DN differs, the status line will display the message:
   Unable to save. Invalid MANHOLE-DN
   and no inspection file will be created.

3. If the MANHOLE UP and MANHOLE DN match an earlier saved MANHOLE UP and MANHOLE DN, but the PIPE ID differs, the status line will display the message:
   Unable to save. Invalid PIPEID field
   and no inspection file will be created.

4. If the PIPE ID, MANHOLE UP and MANHOLE DN are identical to an earlier saved PIPE ID, MANHOLE UP and MANHOLE DN, the status line will display the message:
   Inspection of this asset already exists
   followed shortly thereafter by the message:
   Inspection of this asset saved

The inspection file created earlier with these three settings will be deleted and a new inspection file created.

When a file is created, it initially just has some basic information stored in it - the time, date, PIPE ID, MANHOLE UP and MANHOLE DN as well as the units that are being used (F or M for Feet or Meters, D or G for Degrees or Gradients, and P, M or B for PSI, Millibars or Bars- which are taken from the Display Set Up Screen. However, further information may be added to this file by visiting the More Set Up Inspection screen and/or selection observations while on the Run Time screen. Any observations that are noted will be appended to this file with the following information:

MM/DD/YY | HH:MM AM | Distance | Pressure | Incline | Observation.

See section Adding an Observation for information on selecting observations on the Run Time screen.

The very first time an inspection file is created, another file, ID.txt gets created to keep track of all of the inspection files. It contains the PIPE ID, MANHOLE UP, MANHOLE DN and filename for each inspection file that is saved. Inspection files, as well as the ID.txt summary file may be copied to a removable drive for later retrieval and printing by using the Removable Drive utilities – see section on 'Copying Inspection Files to a removable drive' and Copying ID Database to a removable drive for information on how to access the inspection files in order to print them on another computer.

The inspection file created is displayed in the FILE: field, filled in with YYMMDDhhmm (Year, Month, Day, hour,minute). Immediately after a file is created, the ACTION: field will change to VIEW/EDIT? and will receive the cursor.

Once the operator has input a PIPE ID, MANHOLE UP, and MANHOLE DN, and moved away from the last of the three fields while the ACTION: field was set to CREATE?, the system not only saves this information but also dims those three fields so that the operator cannot modify them.

Pressing <ENTER> when the ACTION: field has VIEW/EDIT? as its selection will cause the operator to move to the More Set Up Inspection screen, describe later in this section. It allows for viewing/editing the fields of the file displayed in the FILE field. If the operator wishes to view/edit a file different from the one currently displayed in the FILE field, he should <TAB> to that field and then use the <UPARROW> and <DOWNARROW> keys to move the desired file.

Pressing <ENTER> when the ACTION: field has DELETE? as its selection will cause the file in the FILE: field to be removed and its information deleted from the ID.txt summary file. If the operator wishes to delete a file different from the one currently displayed in the FILE field, he should <TAB> to that field and then use the <UPARROW> and <DOWNARROW> keys to move the desired file.

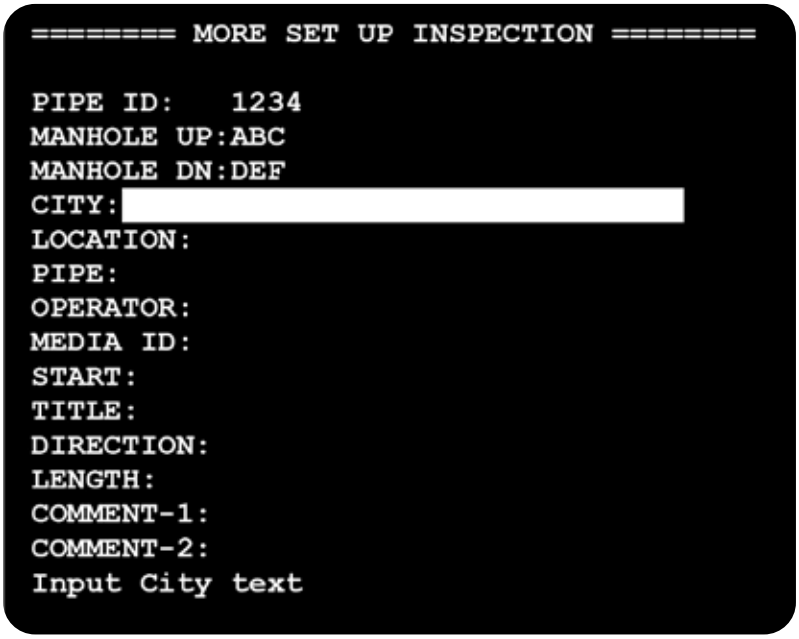
Pressing <ENTER> when the ACTION: field has EXIT? as its selection will move the operator to the MAIN MENU screen. This is equivalent to pressing <ESC> which always moves the operator back one level.

02. SCREEN OPERATIONS - *SETUP INSPECTION MENU*

Pressing <ENTER> when the ACTION: field has CLOSE? As its selection will move the operator to the Main Menu screen. This is equivalent to <ESC> which always moves the operator back one level.

Whatever the FILE: field is set to when the operator exits the Set Up Inspection screen is the filename that will be used to store any observations to when observations are selected in the Run Time screen. Therefore, if you do not wish to store observations, the ACTION: field should be set to CLOSE? which will set the FILE: field to all spaces, prior to exiting this screen.

The operator may move back and forth between the Run Time screen and the Set Up Inspection screen by pressing <F5> when on either of the two screens. The second screen is called the MORE SET UP INSPECTION screen and looks like:



The fields on this screen are as follows:
Label – PIPE ID:
Type – text field, readonly
Length - 25
Default – A copy of what was input for PIPE ID on the Set Up Inspection screen.

Label – MANHOLE UP:
Type – text field
Length - 25
Default – copy of what was input for MANHOLE UP on the Set Up Inspection screen.

Label – MANHOLE DN:
Type – text field
Length - 25
Default – – copy of what was input for MANHOLE UP on the Set Up Inspection screen.

Label – CITY:
Type – text field
Length - 25
Default – None
Status Line – Input City Text
This field contains the City.

Label – LOCATION:
Type – text field
Length - 25
Default – None
Status Line – Input Location Text
This field contains the Location.

Label – PIPE:
Type – text field
Length - 25
Default – None
Status Line – Input Pipe Text
This field contains the Pipe.

Label – OPERATOR:
Type – text field
Length - 25
Default – None
Status Line – Input Operator Text
This field contains the Operator.

Label – MEDIA ID:
Type – text field
Length - 25
Default – None
Status Line – Input Media ID Text
This field contains the Media ID.

02. SCREEN OPERATIONS - *SETUP INSPECTION MENU*

Label – START:
Type – text field
Length - 25
Default – None
Status Line – Input Start Text
This field contains the Start position.

Label – TITLE:
Type – text field
Length - 25
Default – None
Status Line - Input Title Text
This field contains the Title. It also is displayed on the Display Set Up Screen on the TITL line.
Label – DIRECTION:
Type – text field
Length - 25
Default – None
Status Line – Input Direction Text
This field contains the Direction. It also is displayed on the Display Set Up Screen on the DIRC line.

Label – LENGTH:
Type – text field
Length - 25
Default – None
Status Line – Input Length Text
This field contains the Length. It also is displayed on the Display Set Up Screen on the LENG line.

Label – COMMENT-1:
Type – text field
Length - 25
Default – None
Status Line - Input Comment-1 Text
This field contains the Comment-1. It also is displayed on the Display Set Up Screen on the CMT-1 line.

Label – COMMENT-2:
Type – text field
Length - 25
Default – None
Status Line - Input Comment-2 Text
This field contains the Comment-2. It also is displayed on the Display Set Up Screen on the CMT-2 line.

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Fields that are edited on this screen will be written to the inspection file upon exit from the screen. The screen is exited by pressing <ESC> which returns the operator to the Set Up Inspection screen.

The inspection report currently looks something like:

File: 12010414.10.TXT

Time and Date
Inspection Date (MM/DD/YY): 01/04/12
Inspection Time: 2:10 PM

Pipe Info
Pipe ID: 1565-ABC
M.H. Start: HDRD-05-N02
M.H. Stop: HDRD-04-N01
Direction: Away-U
Length: 2

Location Data
City: Springfield
Street: Harding Rd.
Operator: Tom Smith

Comments
Comment1 – 25 characters
Comment2 – 25 characters

Observation Data

ID	Date/Time	Dist (Feet)	Code/Defect	Pressure (PSI)	Incline (Degrees)
1	01/04/12 02:12 PM	0.0	Begin – MH upstream	14.7	0.1
2	01/04/12 02:14 PM	37.4	Pipe broken	14.7	0.0
3	01/04/12 02:15 PM	38.2	Connection Mfg north	14.7	0.0
4	01/04/12 02:18 PM	92.4	scnm connection	14.7	0.2
5	01/04/12 02:20 PM	98.3	Connection Mfg south	14.6	0.1
6	01/04/12 02:25 PM	135.0	Pipe broken	14.7	0.0
7	01/04/12 02:28 PM	185.1	Crack Longitudinal	14.7	0.3

02. SCREEN OPERATIONS - *CONFIGURE REELS*

```
========= CUES CONFIGURE REELS =========
  DEFAULT SCALING VALUES : FEET METERS
             K2 PORTABLE : 19875  65207
            K2 TRUCK 10X : 10000  32808
    K2 TRUCK/LEGACY/IGGY :  1000   3281
          LAMP I LATERAL : 15750  51673
         LAMP II LATERAL : 22100  72507
                IMX MAST : 40072 131469
                   MARK3 : 33956 111403
                MAIN          LATERAL
          REEL: K2 Truck 10x
  COUNTING DIR: UP            UP
 USE PLUS SIGN: NO            NO
SCALING COUNTS: 10000         15750
 PRESET:FT.           0.0           0.0

ARROW UP/DOWN to view count direction
```

CONFIGURE REELS SCREEN DESCRIPTIONS

The following fields appear under both MAIN and LATERAL headings.

Label: COUNTING DIR
Type: stored field
Selections: UP, DOWN
Default: UP
Status Line: ARROW UP/DOWN to view count direction
This field controls the counting direction of the encoder.

Label: USE PLUS SIGN
Type: stored field
Selections: NO, YES
Default: NO
Status Line: ARROW UP/DOWN to view plus sign list
This field controls whether a plus sign precedes positive distance values on the Run Time Screen.

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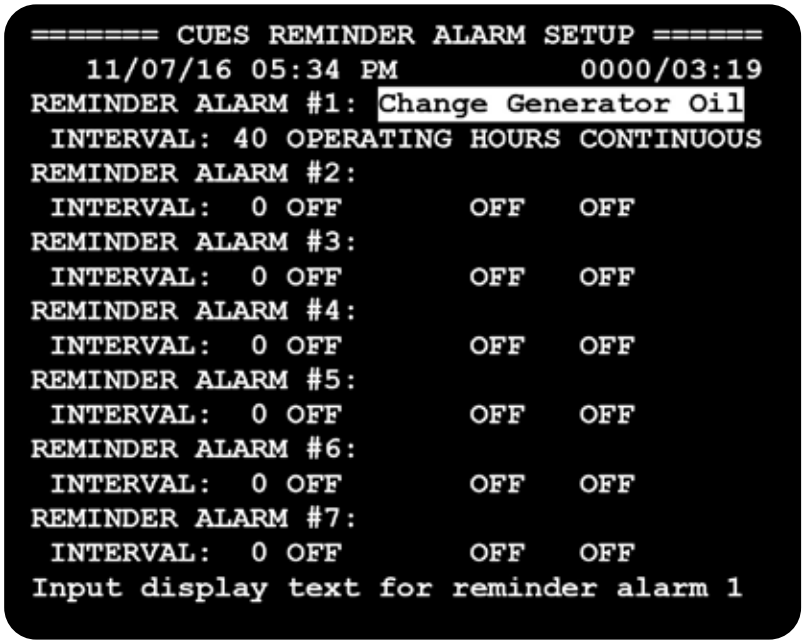
Label: SCALING COUNTS
Type: digit
Length: 6
Range: 0-99999
Type:Integer
Default: 1000 for main reel, 22100 for LAMPII reel
Status Line: Input scaling value (0-99999)
This field sets the distance scaling for the selected cable. It will fill automatically if the distance calibration is performed after the distance calibration is completed.

Label: PRESET
Type: digit
Length: 8
Range: -9999.99 – 9999.99
Type: Floating point
Default: 0
Status Line: Input preset distance (-9999.99-9999.99)
The distance display of the selected cable is preset to this value. Select <Control><d> while the Run Time screen is displayed to preset the main distance to this value. Select <ALT><d> while the Run Time screen is displayed to preset the lateral distance to this value.

02. SCREEN OPERATIONS - *REMINDER ALARM SETUP*

This screen is used to setup up to seven different alarms. When the alarm 'goes off', a message containing the alarm name will scroll across the status line area of the display. To STOP the scrolling, press <CTRL><F6>. In the case of a 'Continuous' timer, press <CTRL><F6> to reset the timer to run again.

Go to the Alarm Time Remaining Screen to check the remaining time (and all) timers.



Label - None
Type – Read-only Text
Contains the current date and time in the format set up on the Display Set Up Screen

Label – None
Type – Read-only Text
Contains the amount of time the systems has been running in the format DDDD/HH:MM where DDDD is the number of days

Label – REMINDER ALARM #n: (where n is a number 1-7)
Type – Text
Length – 20 characters
Default – All spaces
Status line – Input display text for reminder alarm n
Enter user-defined text to help as a reminder, e.g. 'Change Generator Oil'

Label – INTERVAL:
Type – Integer
Length – 3
Range 0-999
Default - 0
Status Line - Input quantity of time until alarm.
Set the number of hours or days before the alarm will go off

Label – None
Type – Stored
Selections – OFF, CALENDAR, OPERATING
Default – OFF
Status Line - ARROW UP/DOWN to view time period list.
Set whether the timer is based on CALENDAR time, OPERATING time or not at all. If this field is OFF, the timer is not set. OPERATING time refers to time where the system is running. For example, if the system runs for three consecutive days, eight hours each day, that would make up 1 DAY (or 24 hours) of OPERATING TIME

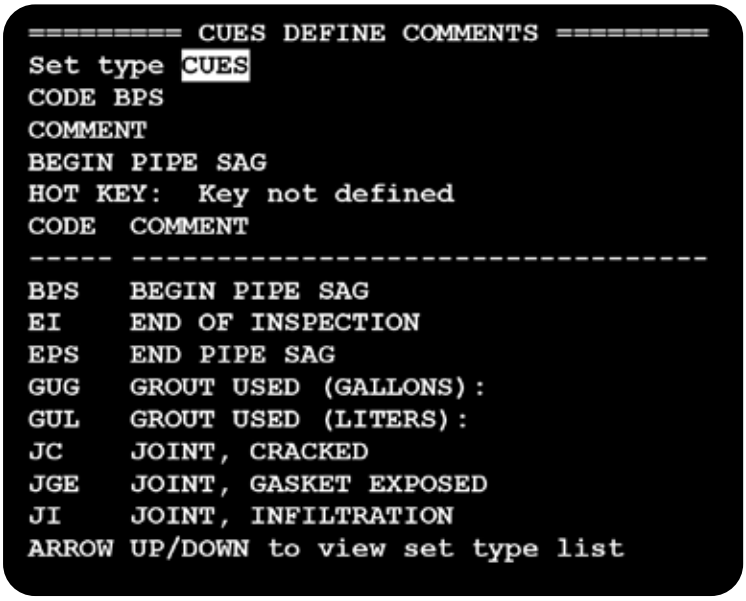
Label – None
Type - Stored
Selections – OFF, HOURS, DAYS
Default – OFF
Status Line - ARROW UP/DOWN to view time units list.
Set whether the units entered earlier are in HOURS, DAYS or not at all. If this field is OFF, the timer is not set.

Label – None
Type – Stored
Selections – OFF, CONTINUOUS, ONE-TIME
Default – OFF
Status Line - ARROW UP/DOWN to view trigger list.
Set whether the alarm goes off once only or resets itself each time it is acknowledged.

02. SCREEN OPERATIONS - *DEFINE COMMENTS*

This screen is used to switch between three different defined Comment Sets – CUES, Code Set 2 and Code Set 3,or a personally defined comment set. CUES, Code Set 2 and Code Set 3 define hundreds of codes and comments CUES, PACP and WRc define hundreds of codes and comments that may be used to mark observations in the Run Time Screen. Whichever set is selected in this screen will be the valid codes that may be entered on the Run Time Screen

To view all of the comments in the comment sets, scroll through the applicable list. New comments can also be added/saved to any of the sets. Hot Keys may be defined for any comment to facilitate input on the Run Time screen.



Lines 7-8 are a header and separation line for a list that appears in lines 9-16.

Lines 9-16, Columns 1-4 show the first three letters of the codes in the comment set.

Lines 9-16 Columns 6-40 show the first 35 characters of the comment associated with the code to its left.

Label – Set Type
Type – Stored field
Selections – CUES, CODE SET 2, CODE SET 3, PRIVATE
Default – CUES
Status Line - ARROW UP/DOWN to view set type list.
Use this field to switch between the three defined comment sets and the private set. Press <UPARROW> or <DOWNARROW> to cause the appropriate Code/Comment set to be loaded into the fields of this screen.

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K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CUES	
BPS BEGIN PIPE SAG	JS JOINT, SEPARATED
EI END OF INSPECTION	JSO JOINT, SEVERE OFFSET
EPS END PIPE SAG	MB MANHOLE, BURIED
GUG GROUT USED (GALLONS)	MBM MANHOLE, BRICKS MISSING
GUL GROUT USED (LITERS)	MC MANHOLE, COLLAPSING
JC JOINT, CRACKED	MCD MANHOLE, CHANNEL DAMAGE
JGE JOINT, GASKET EXPOSED	MEO MANHOLE, EXCESSIVE ODOR
JI JOINT, INFILTRATION	MIR MANHOLE, INFLOW AT RING
JMD JOINT, MINERAL DEPOSITS	MIW MANHOLE, INFILTRATION AT WALL
JMO JOINT, MODERATE OFFSET	MO MANHOLE, OTHER
JO JOINT, OTHER	MSD MANHOLE, STRUCTURAL DAMAGE

02. SCREEN OPERATIONS - *DEFINE COMMENTS*

K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CUES

MSM MANHOLE, STEPS MISSING	PGH PIPE, GREASE HEAVY
PB PIPE, BROKEN	PGL PIPE, GREASE LIGHT
PBM PIPE, BRICKS MISSING	PGM PIPE, GREASE MEDIUM
PC PIPE, COLLAPSED	PH PIPE, HOLE
PCC PIPE, CIRCULAR CRACK	PLC PIPE, LONGITUDINAL CRACK
PCH PIPE, CROWN HEAVY DAMAGE	PO PIPE, OTHER
PCL PIPE, CROWN LIGHT DAMAGE	POC PIPE, OPEN CRACK
PCM PIPE, CROWN MISSING	PS PIPE, SAG
PCR PIPE, CORROSION	RJH ROOTS IN JOINT - HEAVY
PD PIPE, DEPOSITS	RJL ROOTS IN JOINT - LIGHT
PDC PIPE, DROPPED CONNECTION	RJM ROOTS IN JOINT - MEDIUM
PE PIPE, EROSION	RO ROOTS, OTHER
PF PIPE, FLATTENED	RSH ROOTS IN SERVICE - HEAVY

K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CUES

RSL
ROOTS IN SERVICE - LIGHT

RSM
ROOTS IN SERVICE - MEDIUM

SA
SERVICE CONNECTION, ABANDONED

SB
SERVICE CONNECTION, BREAK-IN

SC
SERVICE CONNECTION

SCC
SERVICE CONNECTION, CROWN

SCF
SERVICE CONNECTION, 4-INCH

SCL
SERVICE CONNECTION, LEFT

SCR
SERVICE CONNECTION, RIGHT

SCS
SERVICE CONNECTION, 6-INCH

SD
SERVICE CONNECTION, DEFECTIVE

SDF
SERVICE CONN., DOMESTIC FLOW

SI
SERVICE CONN., INFILTRATION

SIF
SERVICE CONN., INDUSTRIAL FLOW

SO
SERVICE CONNECTION, OTHER

SPA
SERVICE CONN., PROTRUDING < 1

SPB
SERVICE CONN., PROTRUDING > 1

02. SCREEN OPERATIONS - *DEFINE COMMENTS*

K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CODE SET 2

ACB Catch Basin	CS Crack Spiral
ACOH Cleanout House	D Deformed
ACOM Cleanout Mainline	DAE Deposits Attached Encrustation
ACOP Cleanout Propertyline	DAGS Deposits Attached Grease
ADP Discharge Point	DAR Deposits Attached Ragging
AEP End of Pipe	DAZ Deposits Attached Other
AJB Junction Box	DB Displaced Brick
AM Meter	DH Deformed Horizontal Brick
AMH Manhole	DI Dropped Invert
AOC Special Chamber	DNF Deposits Ingressed Fine
ATC Tee Connection	DNGV Deposits Ingressed Gravel
AWA Wastewater Access Device	DNZ Deposits Ingressed Other
AWW Wet Well	DSC Deposits Settled Compacted
B Broken	DSF Deposits Settled Fine
BSV Broken Soil Visible	DSGV Deposits Settled Gravel
BVV Broken Void Visible	DSZ Deposits Settled Other
CC Crack Circumferential	DV Deformed Vertical Brick
CH2 Crack Longitudinal Hinge, 2	FC Fracture Circumferential
CH3 Crack Longitudinal Hinge, 3	FH2 Fracture Longitudinal Hinge, 2
CH4 Crack Longitudinal Hinge, 4	FH3 Fracture Longitudinal Hinge, 3
CL Crack Longitudinal	FH4 Fracture Longitudinal Hinge, 4
CM Crack Multiple	FL Fracture Longitudinal

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K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CODE SET 2	
FM Fracture Multiple	IW Infil Weeper
FS Fracture Spiral	JAL Joint Angular Large
GRT Grout done at Location	JAM Joint Angular Medium
GTFJ Grout Air Test Fail Joint	JOL Joint Offset Large
GTFL Grout Air Test Fail Lateral	JOM Joint Offset Medium
GTPJ Grout Air Test Pass Joint	JSL Joint Separated Large
GTPL Grout Air Test Past Lateral	JSM Joint Separated Medium
GTUJ Grout Air Test Unable Joint	KD Buckling Dimpling
GTUL Grout Air Test Unable Lateral	KI Inverse Curvature
H Hole	KW Buckling Wall
HSV Hole Soil Visible	LD Alignment Down
HVV Hole Void Visible	LFAC Lining Failure Abandoned Connection
ID Infil Dripper	LFAS Lining Failure Annular Space
IG Infil Gusher	LFB Lining Failure Blistered
IR Infil Runner	LFBK Lining Failure Buckled
IS Intruding Sealing Material	LFBU Lining Failure Bulges
ISGT Intruding Sealing Grout	LFCS Lining Failure Connection Cut Shifted
ISSR Intruding Sealing Ring	LFD Lining Failure Detached
ISSRB Intruding Sealing Ring Broken	LFDC Lining Failure Discoloration
ISSRH Intruding Sealing Ring Hanging	LFDE Lining Failure Defective End
ISSRL Intruding Sealing Ring Loose/Poorly Fitting	LFDL Lining Failure Delaminating
ISZ Intruding Sealing Other	LFOC Lining Failure Overcut Connection

02. SCREEN OPERATIONS - *DEFINE COMMENTS*

K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CODE SET 2

LFPH Lining Failure Pinhole	MSA Abandoned Survey
LFRS Lining Failure Resin Slug	MSC Shape or Size Change
LFUC Lining Failure Undercut Connection	MWL Water Level
LFW Lining Failure Wrinkled	MWLS Water Level Sag
LFZ Lining Failure Other	MWM Water Mark
LL Alignment Left	MYN Dye Test Not Visible
LLD Alignment Left Down	MYV Dye Test Visible
LLU Alignment Left Up	OBB Obstacle Brick
LR Alignment Right	OBC Obstacle Thru Connection
LRD Alignment Right Down	OBI Obstacle Intruding Thru Wall
LRU Alignment Right Up	OBJ Obstacle In Joint
LU Alignment Up	OBM Obstacle Pipe Material
MB Missing Brick	OBN Obstacle Construction Debris
MCU Camera Underwater	OBP Obstacle External Pipe or Cable
MGO General Observation	OBR Obstacle Rocks
MGP General Photo	OBS Obstacle Built Into Structure
MJL Joint Length Change	OBZ Obstacle Other
MLC Lining Change	RBB Roots Ball Barrel
MMC Material Change	RBC Roots Ball Connection
MML Mortar Missing Large	RBJ Roots Ball Joint
MMM Mortar Missing Medium	RBL Roots Ball Lateral
MMS Mortar Missing Small	RFB Roots Fine Barrel

K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CODE SET 2

Roots Fine Connection RFJ Roots Fine Joint RFL Roots Fine Lateral RMB Roots Medium Barrel RMC Roots Medium Connection RMJ Roots Medium Joint RML Roots Medium Lateral RPL Repair Localized Liner RPLD Repair Localized Liner Defective RPP Repair Patch RPPD Repair Patch Defective RPR Repair Point RPRD Repair Point Defective RPZ Repair Other RPZD Repair Other Defective RTB Roots Tap Barrel RTC Roots Tap Connection RTJ Roots Tap Joint RTL Roots Tap Lateral SAM Surface Aggregate Missing SAMC Surface Aggregate Missing Chemical SAMM Surface Aggregate Missing Mechanical SAMZ Surface Aggregate Missing Unknown	SAP Surface Aggregate Projecting SAPC Surface Aggregate Projecting Chemical SAPM Surface Aggregate Projecting Mechanical SAPZ Surface Aggregate Projecting Unknown SAV Surface Aggregate Visible SAVC Surface Aggregate Visible Chemical SAVM Surface Aggregate Visible Mechanical SAVZ Surface Aggregate Visible Unknown SCP Surface Corrosion Metal Pipe SMW Surface Missing Wall SMWC Surface Missing Wall Chemical SMWM Surface Missing Wall Mechanical SMWZ Surface Missing Wall Unknown SRC Surface Reinforcement Corroded SRCC Surface Reinforcement Corroded Chemical SRCM Surface Reinforcement Corroded Mechancl SRCZ Surface Reinforcement Corroded Unknown SRI Surface Roughness Increased SRIC Surface Roughness Increased Chemical SRIM Surface Roughness Increased Mechanical SRIZ Surface Roughness Increased Unknown SRP Surface Reinforcement Projecting

02. SCREEN OPERATIONS - *DEFINE COMMENTS*

K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CODE SET 2

SRPC Surface Reinforcement Projecting Chemcl	TFA Tap Factory Active
SRPM Surface Reinforcement Projecting Mchncl	TFB Tap Factory Abandoned
SRPZ Surface Reinforcement Projecting Unknwn	TFC Tap Factory Capped
SRV Surface Reinforcement Visible	TFD Tap Factory Defective
SRVC Surface Reinforcement Visible Chemical	TFI Tap Factory Intruding
SRVM Surface Reinforcement Visible Mechanicl	TR Tap Rehabilitated
SRVZ Surface Reinforcement Visible Unknown	TRD Tap Rehabilitated Defective
SSS Surface Spalling	TRI Tap Rehabilitated Intruding
SSSC Surface Spalling Chemical	TS Tap Saddle
SSSM Surface Spalling Mechanical	TSA Tap Saddle Active
SSSZ Surface Spalling Other	TSB Tap Saddle Abandoned
SZ Surface Other	TSC Tap Saddle Capped
SZC Surface Other Chemical	TSD Tap Saddle Defective
SZM Surface Other Mechanical	TSI Tap Saddle Intruding
SZZ Surface Other Unknown	VC Vermin Cockroach
TB Tap Break-in	VR Vermin Rat
TBA Tap Break-in Active	VZ Vermin Other
TBB Tap Break-in Abandoned	WFC Weld Failure Circumferential
TBC Tap Break-in Capped	WFL Weld Failure Longitudinal
TBD Tap Break-in Defective	WFM Weld Failure Multiple
TBI Tap Break-in Intruding	WFS Weld Failure Spiral
TF Tap Factory	WFZ

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K2/K3 Observation Codes There are three observation code sets: CUES, CODE SET 2 and CODE SET 3	
CODE SET 3	
B Broken BR Branch major CC Crack circumferential CID Continue inspection downstream CIU Continue inspection upstream CL Crack longitudinal CM Cracks multiple CN Connection CNI Connection intruding CU Camera under water CX Connection defective CXI Connection defective intruding D Deformed sewer DB Displaced bricks DC Dimension of sewers changes	DE Debris DEG Debris grease DES Debris silt DI Dropped invert EH Encrustation heavy EHJ Encrustation heavy at joint EL Encrustation light ELJ Encrustation light at joint EM Encrustation medium EMJ Encrustation medium at joint FC Fracture circumferential FH Finish survey FL Fracture longitudinal FM Fracture multiple GO General observation

02. SCREEN OPERATIONS - *DEFINE COMMENTS*

K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CODE SET 3

GP
General photograph

H
Hole

ID
Infiltration dripper

IDJ
Infiltration dripper at joint

IG
Infiltration gusher

IGJ
Infiltration gusher at joint

IR
Infiltration runner

IRJ
Infiltration runner at joint

IS
Infiltration seeper

ISJ
Infiltration seeper at joint

JDL
Joint displaced large

JDM
Joint displaced medium

JN
Junction

JTFL
Joint Failed but sealed to Lower pressure

JTFN
Joint Failed Not sealed

JTFS
Joint Failed Sealed

JTP
Joint Passed

JX
Junction Defective

LC
Lining change

LD
Line deviates down

LL
Line deviates left

LN
Lining defect

LR
Line deviates right

LU
Line deviates up

MB
Missing bricks

MC
Material change

MH
Manhole/node

Miscellaneous Features
Miscellaneous Features

MM
Mortar missing medium

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K2/K3 Observation Codes

There are three observation code sets: CUES, CODE SET 2 and CODE SET 3

CODE SET 3

MS
Mortar missing slight

MT
Mortar missing total

OB
Debris grease

OJL
Open joint large

OJM
Open joint medium

PC
Pipe length change

RF
Roots fine

RFJ
Roots fine at joint

RM
Roots mass

RMJ
Roots mass at joint

RT
Roots tap

RTJ
Roots tap at joint

SA
Survey abandoned

SC
Shape change

SSL
Spalling large

SSM
Spalling medium

SSS
Spalling slight

ST
Start of survey

SWL
Wear large

SWM
Wear medium

SWS
Wear slight

V
Vermin (rats and/or mice)

WL
Water level

X
Collapse

02. SCREEN OPERATIONS - *DEFINE COMMENTS*

Label – CODE
Type – Text
Length – 22
Default – Contains the first code of the current comment set.
Status Line - Input character code for comment.
This field shows the code for the code/comment pair shown at the top of the list displayed further down on this screen.

To create your own code, use the delete/backspace keys to clear out whatever code is in the field before inputting the new code.

Codes created by the user will appear in the list in lines 9-16 with an asterisk in column 5 after the first four letters of the code. This helps easily distinguish the codes that are user-created versus defined in the original code set.

Existing codes cannot be duplicated. If a duplicate code is entered, the COMMENT field will be filled with the comment associated with the already existing code.

Press <PageUp> or <PageDn> to scroll the list of Code/Comment pairs shown in the list further down on this screen. Movement will be eight lines at a time, or until the top or bottom of the list is reached.

Press <UPPARROW> or <DOWNARROW> to scroll through the list of Code/Comment pairs one line at a time.

Label – COMMENT
Type – Text
Length – 40
Default – contains the first code's comment of the current comment set.
Status Line - Input character comment text.
This field shows the comment for the code/comment pair shown at the top of the list displayed further down on this screen.

To change a comment for a currently existing code, use the delete/backspace keys to clear out whatever comment is in the field before inputting the new comment. However, if a new code has been entered (and the <TAB> key pressed), the comment field will be cleared out for input of the new comment.

Label – HOT KEY:
Type – Text
Length - 30
Default – contains the hot key combination of the current comment set
Status Line - Input hot key.

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Hold down a combination of the <SHIFT>, <CTRL>, <ALT> and other keyboard keys to create a hot key that may be used for inputting the code in the Run Time Screen.

There must always be at least one of the <SHIFT>, <CTRL> or <ALT> keys to make up the hot key combination.

There must always be at least one keyboard key other than the <SHIFT>, <CTRL> or <ALT> to make up the hot key combination.

When holding down the hot key combination, it will be displayed in this field. For example, hold the <CTRL> and <h> keys simultaneously to display <CTRL> and <H> key' in this field.

If a hot key combination is entered that is already in use, either for another code/comment pair or by the menu system (e.g. <CTRL><F6>), the message 'Duplicate Key, Try Another' will appear in this line. Please see Appendix A for a list of key combinations reserved by the K2/K3 system.

Additional Notes:
Initially, there are no codes or comments in the Private set.

Hot Key <CTRL><F10> will remove all created code/comment pairs (as well as their hot key combinations) from all comment sets.

02. SCREEN OPERATIONS - *FREE FORMAT*

The Free Format Screen is a 40 character wide by 16 line tall (20 character wide by 8 line tall if using Large fonts) region where text may be entered freely, subject to some basic rules. Any text on this screen will be drawn on the Free Format With Run Time Screen, prior to the Run Time 'data' being drawn over the top of it.

The rules governing the Free Format Screen are:

1. All input is done in 'insert' mode, so if the screen is full, insertion may not always be possible without first deleting something.

2. A cursor is not visible, but text will be entered immediately under/to the left of the blinking character. This is referred to as the 'insert position'.

3. Movement around the screen is accomplished using the arrow keys. However, at the end of entered text, the only way to get to the next line is by pressing <ENTER>, which moves the insert position to the first position of the next line.

   Moving the <UPARROW> and <DOWNARROW> will attempt to move the insert position to the same position on the above/below line. However, if that position is not occupied, the insert position will be moved to the end of that line.

4. Text entry is handled like a word processor in that words inserted cause those words to the right of the insert position to be moved further right, possibly onto the next line.

5. A word may not split between two lines unless it is greater than 40 characters (20 characters for large fonts) and will not fit on one line by itself.

6. When on an unoccupied space, the insert position appears as a flashing checkerboard. When over an occupied space, the character that is immediately to the right of the insert position blinks.

7. There are 'hard' tab stops at positions 8, 16, 24 and 32 (8 and 16 for Large fonts). Pressing <TAB> will move the insert position forward to the next hard tab stop.

8. Pressing <BACKSPACE> will delete the character to the left of the insert position.

9. Pressing <DEL> will delete the character to the right of the insert position.

10. Text may be marked, deleted or copied.

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11. To begin marking text press <CTRL><b>. Then move the insert position by using the arrow keys. As the marking continues, the characters being marked will be displayed in reverse video (black characters on white background). To stop marking text press <CTRL><c>. The text that had previously been displayed in reverse video will revert to normal display (white characters on a black background).

12. To delete text, first begin marking text (see #11). However, rather than stopping the marking of text, instead press <CTRL><x>. The text that had previously been display in reverse video will be deleted.

13. To copy text, first begin and stop marking text (see #11). Now move the insert position to the desired location for the copying of the text. Press <CTRL><v> and the text that had been marked will be copied to the insert position. It may be copied to more than one location if desired.

14. Whatever is on the screen when the screen is exited is saved so that the next time the operator enters the Free Format Screen, his earlier edits will appear.

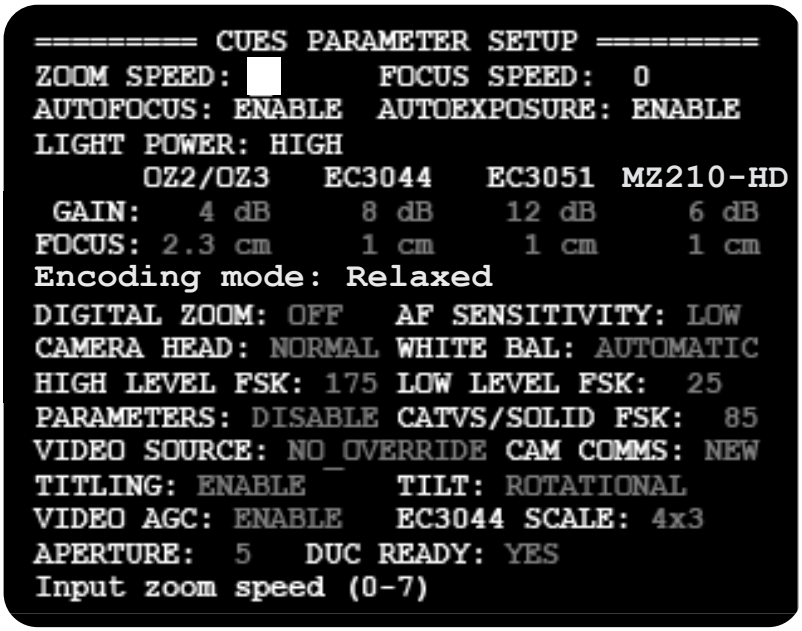
15. Each time the operator enters the Free Format Screen, the insert position in on the first character of the first row.

16. Pressing <CTRL><F4> will clear all the text on the Free Format Screen and move the insert position to the first character of the first row.

17. Pressing <HOME> will move the insert position to the start of the current row.

18. Pressing <END> will move the insert position to the end of the current row.

02. SCREEN OPERATIONS - *PARAMETER SETUP*



Label – ZOOM SPEED:
Type – digit field
Length – 1
Range – 0 - 7
Type – integer
Default – 4
Status Line – Input zoom speed.

Label – FOCUS SPEED:
Type – digit field
Length – 1
Range – 0-7
Type – integer
Default – 0
Status Line – Input focus speed

Label – AUTOFOCUS
Type – stored field
Selections – ENABLE, DISABLE
Default – Enable
Status Line – ARROW UP/DOWN to view autofocus list
Comments – The AutoFocus function automatically adjusts the focus position to maximize the high frequency content of the picture in a center measurement area, taking into consideration the high luminance and strong contrast components.

Label – AUTOEXPOSURE:
Type – stored field
Selections – ENABLE, DISABLE
Default – Enable
Status Line – ARROW UP/DOWN to view autoexposure list
Comments – Automatic exposure mode utilizes a fixed shutter speed of 1/60th second for NTSC or 1/50th second for PAL and automatically adjusts the iris and gain to output the optimum image for subjects from low light conditions to bright light conditions.

Label – LIGHT POWER:
Type – stored field
Selections – HIGH, LOW
Default – High
Status Line – ARROW UP/DOWN to view light power list.

Label – GAIN:
Type – stored field
Selections – Dependent on the camera type
Default – Dependent on the camera type
Status Line – ARROW UP/DOWN to view camera gain list.

Label – FOCUS:
Type – stored field
Selections – Dependent on the camera type
Default – Dependent on the camera type
Status Line – ARROW UP/DOWN to view minimum focus list.

Label - Encoding mode:
Type - stored field
Selections - Relaxed, Normal
Default - Relaxed
Status Line - Relax frame rate for full decode?
Comments - Only available for digital cameras

Label – DIGITAL ZOOM:
Type – stored field
Selections – OFF, ON
Default – Off
Status Line – ARROW UP/DOWN to view digital zoom list.

Label – AF SENSITIVITY
Type – stored field
Selections – LOW, HIGH
Default – Low
Status Line – ARROW UP/DOWN to view AF sensitivity list.
Comments – High autofocus sensitivity reaches the highest focus speed quickly to focus on fast-moving objects. Low autofocus sensitivity improves the stability of the focus. When the lighting level is low, the autofocus function does not take effect, even though the brightness varies, contributing to a stable image.

02. SCREEN OPERATIONS - *PARAMETER SETUP*

Label – CAMERA HEAD:
Type – stored field
Selections – NORMAL, LEFT, RIGHT
Default – Normal
Status Line – ARROW UP/DOWN to view camera head list.

Label – WHITE BAL:
Type – stored field
Selections – AUTOMATIC, INDOOR, and OUTDOOR
Default – AUTOMATIC
Status Line – ARROW UP/DOWN to view WB Mode list

Comments – The "White Bal" (short for White Balance) field is only modifiable if the operator has entered Administrator Mode. Each selection controls the camera's White Balance, which affects the overall color in the video, in the following ways: When set to AUTOMATIC, the camera automatically adjusts the color of the picture based on the current lighting conditions. This is the default mode, and is the best choice under most circumstances. When set to INDOOR, the camera uses a fixed White Balance setting that emphasizes the blues and greens while deemphasizing the reds and oranges. This mode works best with incandescent lights. When set to OUTDOOR, the camera uses a fixed White Balance setting that emphasizes the reds and oranges while deemphasizing the blues and greens. This mode works best with LED lights.

Label – HIGH LEVEL FSK
Type – digit field
Length – 3
Range – 0-255
Type – integer
Default – 175
Status Line – Input high level FSK gain.

Label – LOW LEVEL FSK
Type – digit field
Length – 3
Range – 0-255
Type – integer
Default – 25
Status Line – Input low level FSK gain.

Label – PARAMETERS:
Type – stored field
Selections – ENABLE, DISABLE
Default – Disable
Status Line – ARROW UP/DOWN to view parameters list.

Label – CATVS/SOLID FSK
Type – digit field
Length – 3
Range – 0-255
Type – integer
Default – 85
Status Line – Input CATVS/SOLID FSK gain (0-255)
This field is only used when CATVS is enabled on the Equipment Configuration screen, the cable length is > 2000 ft (609m) and the transporter is mudmaster or steerable mudmaster.

Label – VIDEO SOURCE:
Type – stored field
Selections – NO OVERRIDE, LIVE OVERRIDE, INTERNAL OVERRIDE
Default – No override
Status Line – ARROW UP/DOWN to view video source list.

Label – CAM COMMS:
Type – stored field
Selections – NEW, OLD
Default – New
Status Line – ARROW UP/DOWN to view camera comm list.

Label – TITLING:
Type – stored field
Selections – ENABLE, DISABLE
Default – Enable
Status Line – ARROW UP/DOWN to view titling list.

Label - TILT:
Type - stored field
Selections - ROTATIONAL, DIRECTIONAL
Default - Rotational
Status Line - ARROW UP/DOWN to view tilt list

Label – VIDEO AGC:
Type – stored field
Selections – ENABLE, DISABLE
Default – Enable
Status Line – ARROW UP/DOWN to view video AGC list

02. SCREEN OPERATIONS - *PARAMETER SETUP*

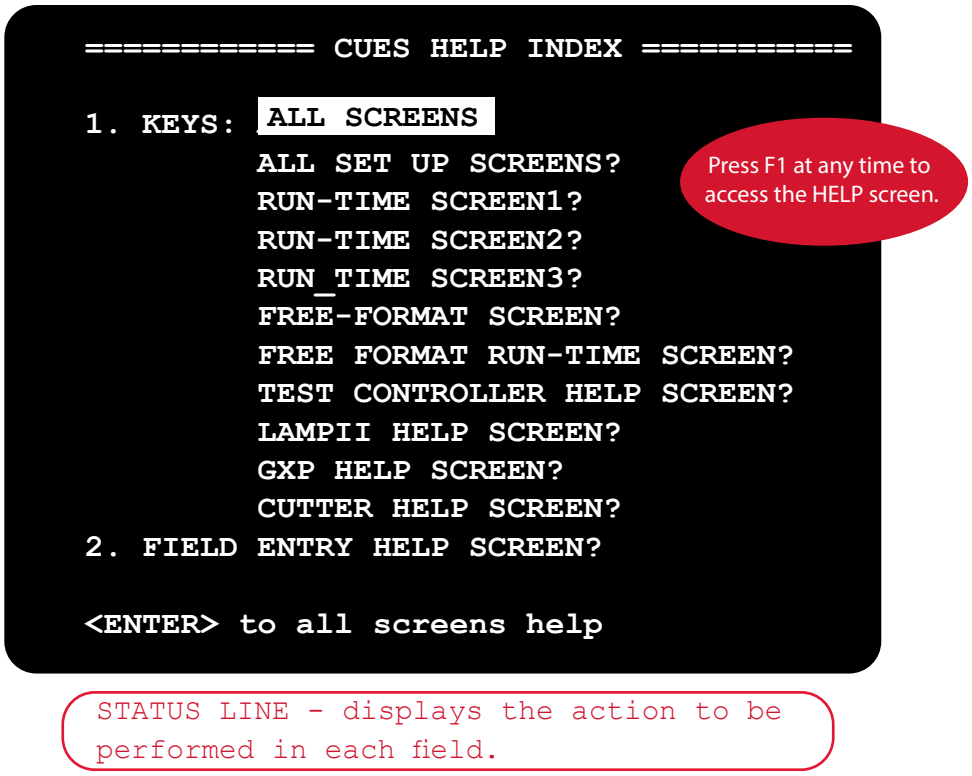
Label – EC3044 SCALE:
Type – stored field
Selections – 4x3 16x9
Default – 4x3
Status Line – ARROW UP/DOWN to view EC3044 scale list.
The EC3044 camera can display its image in either 4x3 or 16x9 scaling.

Label – APERTURE:
Type – digit field
Length – 2
Range – 0-15
Type – integer
Default – 5
Status Line – Input aperture gain.
Comments – Aperture control adjusts the enhancement of the edges of objects with a setting of zero being no edge enhancement.

Label – DUC READY:
Type – stored field
Selections – YES, NO
Default – YES
Status Line – ARROW UP/DOWN to view DUC readiness list.
For K3 systems that are built without the appropriate hardware in order to support the DUC camera, there is now a way to insure that DUC is never offered as one of the cameras on the Equipment Configuration screen. This is done by setting a field on the Camera Parameters screen labeled “DUC READY”. If set to NO, it will force the camera selection to NONE if it is already set to DUC. Otherwise it won’t let DUC get selected even if it is valid for that cable/transporter pair.

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02. SCREEN OPERATIONS - *VIEW HELP TEXT*



The View Help Text screen provides the ability to access individual screens that provide help information on a variety of screens and topics.

All of fields on this screen are action fields. Press <ENTER> to move to another screen.

KEYS: ALL SCREENS?
Moves to the All Screens Help Screen that provides information on keys that work on all screens.

ALL SET UP SCREENS?
Moves to the All Set Up Screens Help Screen that provides information on keys that work on all set up screens.

RUN-TIME SCREEN1?
Moves to the Run Time1 Help Screen that provides information on keys that work on the Run Time Screens.

RUN-TIME SCREEN2?
Moves to the Run Time2 Help Screen that provides information on additional keys that work on the Run Time Screens.

02. SCREEN OPERATIONS - *VIEW HELP TEXT*

RUN-TIME SCREEN3?
Moves to the Run Time3 Help Screen that provides information on additional keys that work on the Run Time Screens.

FREE FORMAT SCREEN?
Moves to the Free Format Help screen that provides information on additional keys that work on the Free Format screen.

FREE FORMAT RUN TIME SCREEN?
Moves to the Free Format with Run Time Help screen that provides additional information on additional keys that work on the Free Format with Run Time screen.

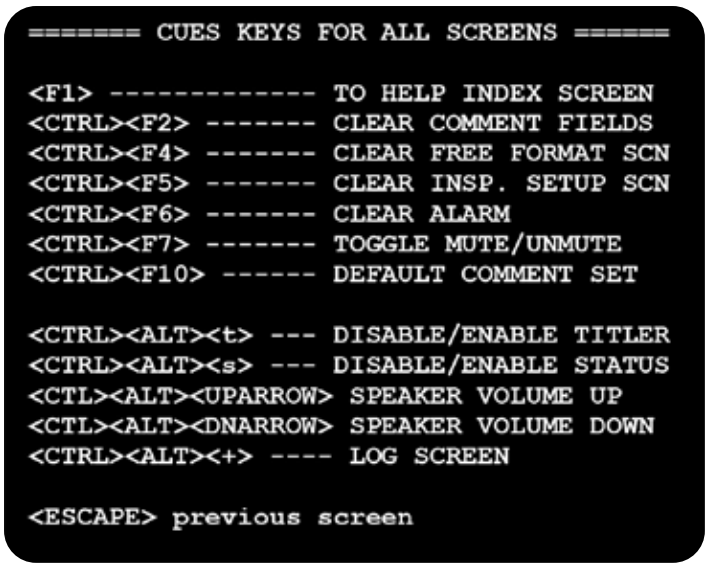
TEST CONTROLLER HELP SCREEN?
Moves to the Test Controller Help screen that provides information on additional keys that work on the Test Controller screen.

LAMPII HELP SCREEN?
Moves to the LAMPII HELP screen that provides information on additional keys that work only when using the LAMPII transporter/camera pair.

GXP HELP SCREEN?
Moves to the GXP HELP screen that provides information on additional keys that work only when on the GXP screen.

CUTTER HELP SCREEN?
Moves to the CUTTER HELP screen that provides information on additional keys that work only when operating the Currahee Cutter.

02. SCREEN OPERATIONS - *ALL SCREENS HELP*



The All Screens Help screen provides that ability to view the keystrokes that are available on all screens. There are no tab-able or editable fields on this screen screen.

Press <F1> to go to the highest level help screen.

Press <CTRL><F2> to clear the comment fields on the Set Up Inspection Screen.

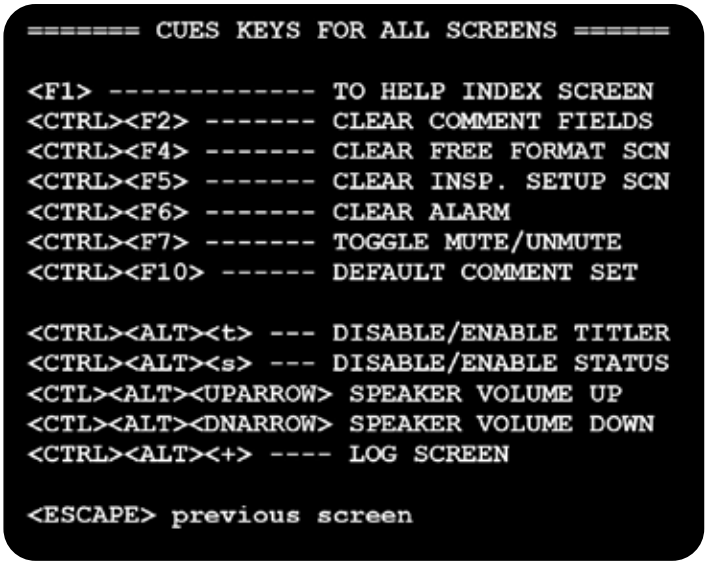
Press <CTRL><F4> to clear the free format screen.

Press <CTRL><F5> to clear all the fields on the Set Up Inspection Screen.

Press <CTRL><F6> to turn off/reset any alarm timer that has gone off that was set up on the Set Up Alarm Timers Screen.

Press <CTRL><F7> to toggle between muted and non-muted speaker.

02. SCREEN OPERATIONS - *ALL SCREENS HELP*



Press <CTRL><F10> to remove all user created comments from the currently enabled comment set.

Press <CTRL><ALT><UPARROW> to increase the speaker volume.

Press <CTRL><ALT><DOWNARROW> to decrease the speaker volume.

Press <CTRL><ALT><s> to toggle the status line off and on.

Press <CTRL><ALT><t> to toggle the Titler display off and on.

Press <CTRL><ALT><+> to write the value of the fields on the current screen to the log file.

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02. SCREEN OPERATIONS - *ALL SETUP SCREENS HELP*

```
=== CUES KEYS FOR ALL SET UP SCREENS ===

<ENTER> - SELECT ACTION/HILIGHT NEXT FLD
<UPARROW> ----- PREV SELECTION/FIELD
<DOWNARROW> --- NEXT SELECTION/FIELD
<LEFTARROW> --- MOVE CURSOR LEFT
<RIGHTARROW> -- MOVE CURSOR RIGHT
<DELETE> ------ DELETE AT CURSOR
<BACKSPACE> --- DELETE LEFT OF CURSOR
<CTRL><DELETE>  CLEAR ENTRY
<TAB> --------- HIGHLIGHT NEXT FIELD
<SHIFT><TAB> -- HIGHLIGHT PREVIOUS FIELD
<SPACEBAR> ---- TOGGLE TWO SELECTIONS
<CTL><ALT><INSERT> - RESTORE SCREEN
<INSERT> ------ TOGGLE OVERWRITE/INSERT

<ESCAPE> previous screen
```

The All Set Up Screens Help screen provides the ability to view the keystrokes that are available on all set up screens. There are no tab-able or editable fields on this screen.

Press <ENTER> to select an action in an action field or move to the next highlighted field.

Press <UPARROW> to change a stored field to its previous selection.

Press <DOWNARROW> to change a stored field to its next selection.

Press <LEFTARROW> to move the cursor to the left in a Text or Numeric field.

Press <RIGHTARROW> to move the cursor to the right in a Text or Numeric field.

Press <DELETE> to delete the character under the cursor in a Text or Numeric field.

Press <BACKSPACE> to delete the character to the left of the cursor in a Text or Numeric field.

02. SCREEN OPERATIONS - *ALL SETUP SCREENS HELP*

```
=== CUES KEYS FOR ALL SET UP SCREENS ===

<ENTER> - SELECT ACTION/HILIGHT NEXT FLD
<UPARROW> ----- PREV SELECTION/FIELD
<DOWNARROW> --- NEXT SELECTION/FIELD
<LEFTARROW> --- MOVE CURSOR LEFT
<RIGHTARROW> -- MOVE CURSOR RIGHT
<DELETE> ------ DELETE AT CURSOR
<BACKSPACE> --- DELETE LEFT OF CURSOR
<CTRL><DELETE>  CLEAR ENTRY
<TAB> --------- HIGHLIGHT NEXT FIELD
<SHIFT><TAB> -- HIGHLIGHT PREVIOUS FIELD
<SPACEBAR> ---- TOGGLE TWO SELECTIONS
<CTL><ALT><INSERT> - RESTORE SCREEN
<INSERT> ------ TOGGLE OVERWRITE/INSERT

<ESCAPE> previous screen
```

Press <CTRL><DELETE> to clear the entry in a Text or Numeric field.

Press <TAB> to move the cursor to the next highlighted field.

Press <SHIFT><TAB> to move the cursor to the previous highlighted field.

Press <CTRL><ALT><INSERT> to restore a screen to the values it had when the screen was entered.

Press <INSERT> to toggle the text and digit fields between overwrite and insert mode. The default for most fields initially is overwrite mode. In overwrite mode, as soon as the operator presses the first character or digit in the field, it will clear whatever the previous value had been and then add that character/digit. In insert mode, it will insert a character at the cursor position, assuming there is room in the field to do so. An indicator on the top line of the display (column 40) displays either an 'O' or an 'I' to indicate whether you are in overwrite or insert mode. This indicator is not shown on the Run Time Screen, Free Format With Run Time Screen, GXP Screen, Free Format Screen or Utility Screen.

02. SCREEN OPERATIONS - *RUN-TIME HELP SCREEN 1*

```
==== CUES KEYS FOR RUN-TIME SCREEN1 ====
<SHIFT><F1> ---- TOGGLE COMMENTS ON/OFF
<SHIFT><F2> ---- TOGGLE OBSERVATN ON/OFF
<SHIFT><F3> ---- TOGGLE INCLINE ON/OFF
<SHIFT><F4> ---- TOGGLE ARROW ON/OFF
<SHIFT><F5> ---- TOGGLE TITLE ON/OFF
<SHIFT><F6> ---- TOGGLE DATE ON/OFF
<SHIFT><F7> ---- TOGGLE TIME ON/OFF
<SHIFT><F8> ---- TOGGLE MANHOLES ON/OFF
<SHIFT><F9> ---- TOGGLE PRESSURE ON/OFF
<SHIFT><F10> --- TOGGLE DISTANCE ON/OFF
<F11> ---------- TOGGLE TRANS SPD ON/OFF
<CTRL><F11> ---- TOGGLE DIRECTION ON/OFF
<CTRL><F12> ---- TOGGLE LENGTH ON/OFF
ARROW-LF/RT ---- MOVE FIELDS/ARROW LF/RT
ARROW-UP/DN ---- MOVE FIELDS/ARROW UP/DN
<ESCAPE> previous menu
```

Press <SHIFT><F1> to toggle the display of the comments text on/off.

Press <SHIFT><F2> to toggle the display of observation mode on/off.

Press <SHIFT><F3> to toggle the display of the incline on/off.
This works on the Granite screens as well as the Run Time screens.

Press <SHIFT><F4> to toggle the display of the pointer arrow on/off.

Press <SHIFT><F5> to toggle the display of the title on/off.

Press <SHIFT><F6> to toggle the display of the date on/off.

Press <SHIFT><F7> to toggle the display of the time on/off.

Press <SHIFT><F8> to toggle the display of the manholes text on/off.

Press <SHIFT><F9> to toggle the display of the pressure on/off.

Press <SHIFT><F10> to toggle the display of the distance on/off.

Press <F11> to toggle the display of the transporter speed or the cutter speed on/off.
This works on the Granite screens as well as the Run Time screens.

Press <CTRL><F11> to toggle the display of the direction text on/off.

Press <CTRL><F12> to toggle the display of the length text on/off.

Press the <ARROW> keys to move all the fields on the screen left, right up and down.

02. SCREEN OPERATIONS - *RUN-TIME HELP SCREEN 2*

```
==== CUES KEYS FOR RUN-TIME SCREEN2 ====
<F1> --- TO/FROM HELP SCREENS
<F2> --- TO EQUIPMENT CONFIGURATION
<F3> --- TO/FROM FREE-FORMAT SCREEN
<F4> --- TO/FROM FREE-FORMAT W/RUN SCRN
<F5> --- TO/FROM INSPECTION SETUP SCREEN
<F6> --- To/FROM DISPLAY SETUP SCREEN
<F7> --- TO/FROM DIAGNOSTICS MENU SCREEN
<F8> --- TO/FROM REMINDER SETUP SCREEN
<F9> --- TO/FROM COMMENT DEFINITION SCRN
<F10> -- TO CONFIGURE REELS SCREEN
<CTRL><i> ----- ZERO INCLINATION
<CTRL><p> ----- ZERO PRESSURE
<CTRL>+<d>/<z>  PRESET/ZERO DISTANCE
<SHIFT><HOME> - HOME FIELDS
<SHIFT><INSERT> TOGGLE ALL FIELDS ON/OFF
<ESCAPE> previous menu
```

Press <F1> to move to/from the View Help Screen.

Press <F2> to move to/from the Equipment Configuration Screen.

Press <F3> to move to/from the Free Format Screen.

Press <F4> to move to/from the Free Format With Run Time Screen.

Press <F5> to move to/from the Set Up Inspection Screen.

Press <F6> to move to/from the Set Up Display Screen.

Press <F7> to move to/from the Run Diagnostics Screen.

Press <F8> to move to/from the Set Up Reminder Alarms Screen.

Press <F9> to move to/from the Define Comments Screen.

Press <F10> to move to the Configure Reels screen. Moving back from the Configure Reels screen to the Run Time screen isn't possible because all changes to the Configure Reels screen must first go through the Equipment Configuration screen.

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Press <CTRL><i> to enter the zeroing inclination mode.

Press <CTRL><p> to zero the pressure.

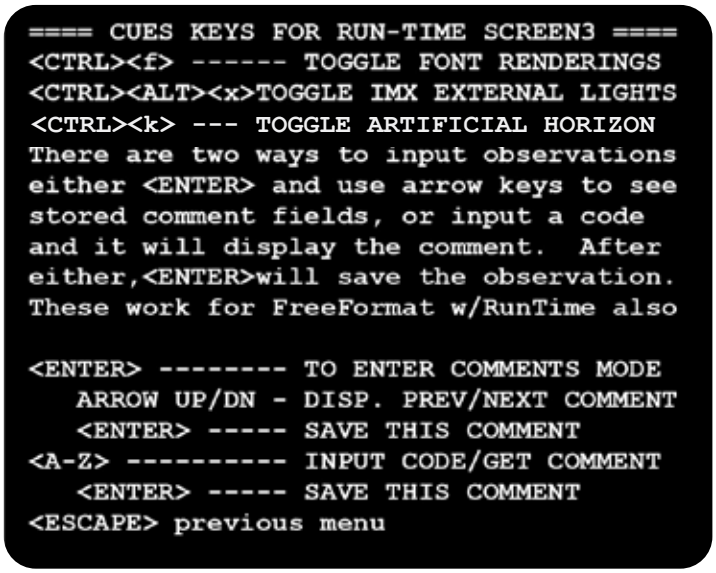
Press <CTRL><z> to set the distance to 0.0.

Press <CTRL><d> to set the distance to the Preset Distance on the Set Up Distance Screen

Press <SHIFT><HOME> to redisplay all fields in their initial position based on the Set Up Display Screen.

Press <SHIFT><INSERT> to toggle the display of all fields on/off.

02. SCREEN OPERATIONS - *RUN-TIME HELP SCREEN 3*



Press <CTRL><f> to cycle through the font renderings. There are four selections: EBW, HBW, WWB, BBW. The three letters are abbreviations for the background color, outline color and character color used for the text that is overlaid on the video display. E refers to external, meaning that the video is passed through (transparent). W refers to white, B refers to black and H refers to half-tone.

Press <CTRL><k> to toggle the display of the artificial horizon on/off.

There are two methods for selecting a comment. Both must be initiated by first pressing <SHIFT><F2> to enter the observation mode which causes an '*' to appear either on the top or bottom line of the display.

Pressing <ENTER> will cause a stored field to be displayed containing the first comment of the current code set as set up on the Define Comments Screen. Pressing <UPARROW> or <DOWNARROW> will scroll through this comments list. Once the desired comment is displayed, pressing <ENTER> will then cause that comment to be saved to the Inspection file if one has previously been set up on the Set Up Inspection Screen.

Or alternately, input a code (as define on the Define Comments Screen). As soon as enough characters are input to identify that code, the comment for that code will be displayed on the screen. Pressing <ENTER> will then cause that comment to be saved to the Inspection file if one has previously been set up on the Set Up Inspection Screen.

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02. SCREEN OPERATIONS - *KEYS FOR FREE FORMAT*

```
=== CUES KEYS FOR FREE-FORMAT SCREEN ===

<ENTER> ----- CARRIAGE RETURN/LINE FEED
<UPARROW> --- MOVE CURSOR UP
<DOWNARROW> - MOVE CURSOR DOWN
<LEFTARROW> - MOVE CURSOR LEFT
<RIGHTARROW>  MOVE CURSOR RIGHT

<DELETE> ---- DELETE SELECTION AT CURSOR
<BACKSPACE> - DELETE LEFT OF CURSOR
<TAB> ------- SPACE TO NEXT TAB STOP
<CTRL><b> --- BEGIN TEXT BLOCK SELECTION
<CTRL><c> --- COPY SELECTED TEXT BLOCK
<CTRL><x> --- CUT SELECTED TEXT BLOCK
<CTRL><v> --- PASTE SAVED TEXT BLOCK
<CTRL><f> --- TOGGLE FONT RENDERINGS
<ESCAPE> previous menu
```

Press <ENTER> to move to the next line.

Press <UPARROW> to move the cursor up one row.

Press <DOWNARROW> to move the cursor down one row.

Press <LEFTARROW> to move the cursor right one character.

Press <RIGHTARROW> to move the cursor right one character.

Press <DELETE> to delete the character at the cursor.

Press <BACKSPACE> to delete the character to the left of the cursor.

Press <TAB> to move to the next hard tab stop at columns 8, 6, 24, and 32.

Press <CTRL><b> to begin marking a selected block of text prior to copying, cutting or pasting.

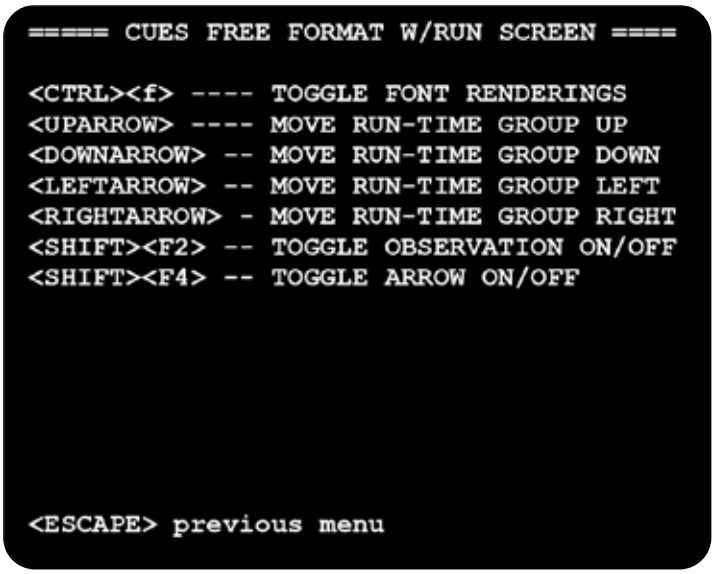
Press <CTRL><c> to copy the selected block of text prior to a paste.

Press <CTRL><x> to (cut) delete the selected block of text.

Press <CTRL><v> to paste a previously saved block of text.

Press <CTRL><f> to cycle through the font renderings. There are four selections: EBW, HBW, WWB, BBW. The three letters are abbreviations for the background color, outline color and character color used for the text that is overlaid on the video display. E refers to external, meaning that the video is passed through (transparent). W refers to white, B refers to black and H refers to half-tone.

02. SCREEN OPERATIONS - *FREE FORMAT RUN-TIME HELP*



Press <CTRL><f> to cycle through the font renderings. There are four selections: EBW, HBW, WWB, BBW. The three letters are abbreviations for the background color, outline color and character color used for the text that is overlaid on the video display. E refers to external, meaning that the video is passed through (transparent). W refers to white, B refers to black and H refers to half-tone.

Press <UPARROW> to move the group of run time fields up one row.

Press <DOWNARROW> to move the group of run time fields down one row.

Press <LEFTARROW> to move the group of run time fields left one character.

Press <RIGHTARROW> to move the group of run time fields right one character.

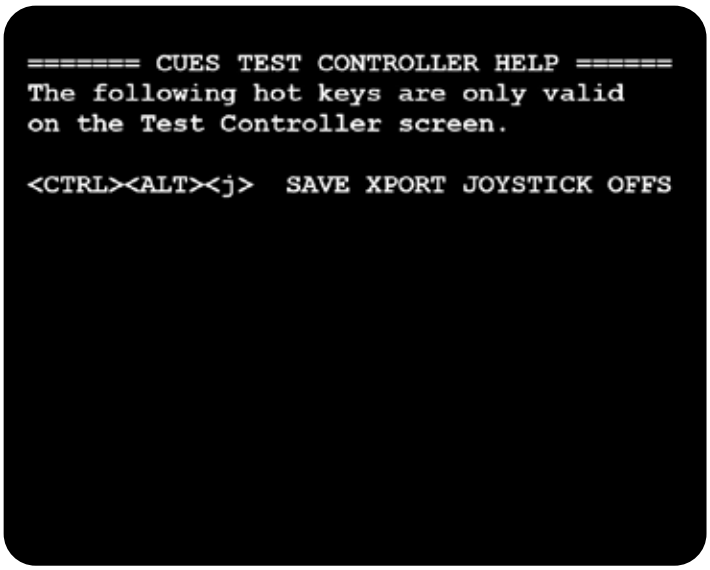
Press <SHIFT><F2> to toggle the display of observation mode on/off.

Press <SHIFT><F3> to toggle the display of the incline on/off.

Press <SHIFT><F4> to toggle the display of the pointer arrow on/off.

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02. SCREEN OPERATIONS - *TEST CONTROLLER HELP*



Press <CTRL><ALT><j> to save the values of the gamepad transporter analog sticks. The negatives of these values will then be added to all gamepad transporter analog stick values until the next power cycle of the system. This feature is to be used only if the gamepad's analog sticks are exhibiting 'creep', whereby when at rest, there values are not close enough to zero.

02. SCREEN OPERATIONS - *LAMP II HELP*

```
=========== CUES LAMPII HELP ===========
The following hot keys are only valid
when the LAMPII Transporter/Camera are
being used.

<ALT><F10> ----- TOGGLE LATERAL DISTANCE
<ALT><CTRL><v> - TOGGLE VIEW MAIN/LAMPII
<ALT><d> ------- PRESET LATERAL DISTANCE
<ALT><z> ------- ZERO LATERAL DISTANCE
The following only work with the Micro
Pan & Tilt
<SHUTTER>+<DPAD +/-> Raise/Lower floods
<IRIS>+<DPAD +/-> Raise/Lower spots
<ESCAPE> previous menu
```

Press <ALT><F10> to toggle the lateral distance display on the Run-Time screen on/off.

Press <ALT><CTRL><v> to toggle the view on the main video display between the main camera and the lateral camera. Note: Controller functionality is also changed; please refer to the LAMP II portion of the "How to Operate K2/K3's Controllers" section of this manual.

Press <ALT><d> to preset the lateral distance.

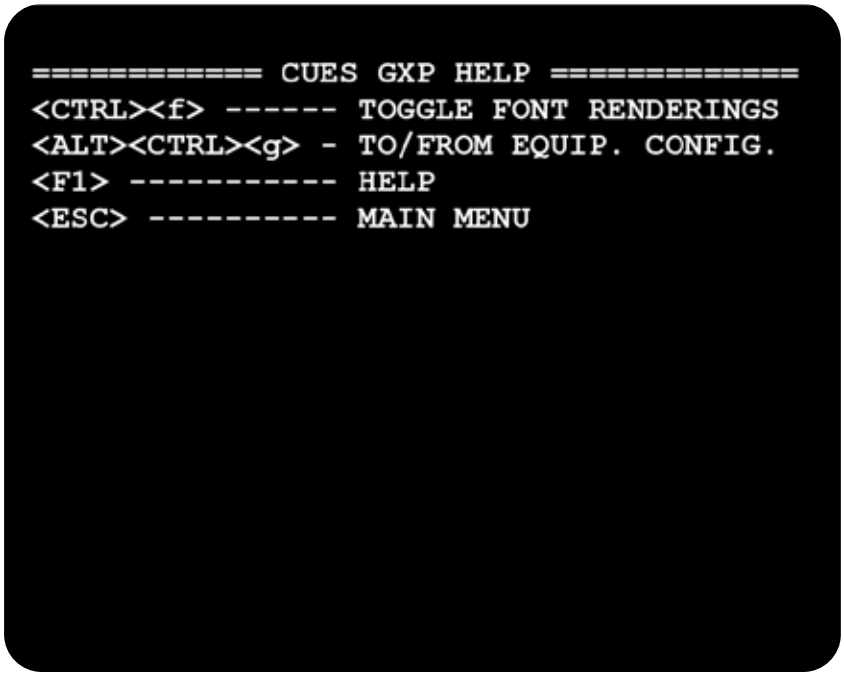
Press <ALT><z> to zero the lateral distance.

Press <SHUTTER><DPAD +/-> to raise or lower the flood lights.

Press <IRIS><DPAD +/-> to raise or lower the spot lights.

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02. SCREEN OPERATIONS - *GRANITE XP HELP*



Press <CTRL><f> to cycle through the font renderings. There are four selections: EBW, HBW, WWB, BBW. The three letters are abbreviations for the background color, outline color and character color used for the text that is overlaid on the video display. E refers to external, meaning that the video is passed through (transparent). W refers to white, B refers to black and H refers to half-tone.

Press <ALT><CTRL><g> to move to/from the Equipment Configuration screen.

Press <F1> to display the GXP Help screen.

Press <ESC> to move to the main menu.

02. SCREEN OPERATIONS - *CUTTER HELP*

```
========= CUES KEYS FOR CUTTER ========
Left joystick vert : UP/DN CUT
Right joystick horz : CCW/CW CUT
Right joystick vert:FWD/REV CUT DRV
IRIS+DPAD +/- : Raise/lower UP/DN CUT
SHUTTR+DPAD +/- : Raise/lower CCW CUT
FOCUS+DPAD +/- : Raise/lower FWD/REV CUT
LIGHTS+DPAD +/- :Raise/lower flood lgts
LIGHTS+DPAD 0/1 : Raise/lower spot lgts
DIAGNOSTICS+DPAD +/- : Pan up/down
ZOOM+DPAD +/- Focus near/far
Right joystick button : Pan home
VIEW : Toggle camera view
LIFT : Toggle btwen cut/drive on FWD/REV
F11 : Toggle display of cut speed %

<ESCAPE> previous menu
```

Moving the left joystick in the vertical direction will move the cutter in an up/down direction.

Moving the right joystick in the horizontal direction will move the cutter in a CounterClockwise/Clockwise direction.

Moving the right joystick in the vertical direction will move the cutter in a forward/reverse direction if in cut mode, or will drive it forward/reverse.

Pressing the IRIS button together with the DPAD '+' or '-' will raise or lower the up/down cutter speed percent by 2%.

Pressing the SHUTTER button together with the DPAD '+' or '-' will raise or lower the counterclockwise/clockwise cutter speed percent by 2%.

Pressing the FOCUS button together with the DPAD '+' or '-' will raise or lower the forward/reverse cutter speed percent by 2%.

Pressing the LIGHTS button together with the DPAD '+' or '-' will raise or lower the cutter flood lights.

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Pressing the LIGHTS button together with the DPAD ‘0’ or ‘1‘ will raise or lower the cutter spot lights.

Pressing the DIAGNOSTICS button together with the DPAD ‘+’ or ‘-‘ will pan the cutter camera up/down.

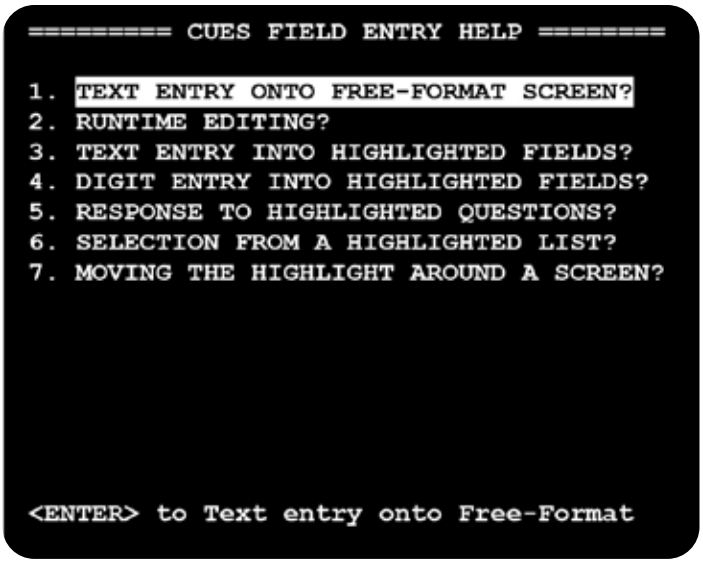
Pressing the ZOOM button together with the DPAD ‘+’ or ‘-‘ will adjust the cutter camera’s focus near/far.

Pressing the VIEW button will toggle the camera view.

Pressing the LIFT button will toggle between cutting and driving mode.

Pressing the <F11> key will toggle the display of the cut speed percentages on the Run Time screen.

02. SCREEN OPERATIONS - *FIELD ENTRY HELP*



FREE-FORMAT SCREEN TEXT ENTRY
This screen supports most common word processing operations. Permanent tab stops at columns 8, 16, 24, and 32 are supported as well as cut, copy, and paste operations.

RUNTIME EDITING
The cursor may be changed to an arrow for use in pointing at areas of interest. The parameter group can be overlaid and positioned as desired with the <ARROW> keys.

HIGHLIGHTED FIELD TEXT ENTRY
Text is entered at the blinking cursor. The left and right arrow keys can move the cursor left and right within the fixed size of the field. Use <BACKSPACE> to delete left of the cursor. Use <DELETE> to delete at the cursor. The <TAB> key may not be used for text entry in a highlighted field; rather, the <TAB> key will cause text entry to terminate and move the highlight to the next field on screen. The <ENTER> key may also be used to terminate text entry and move the highlight to the next field on the screen.

HIGHLIGHTED FIELD DIGIT ENTRY
Digit entry into a field is performed exactly like text entry except that only the digits 0 through 9 and the decimal point character are permitted. When the field is first highlighted, the existing value will appear showing the number of decimal places anticipated. The entry may or may not have the number of places shown; but upon leaving the field, the value is displayed in the previously suggested format. A limit on the range of acceptable values will be applied and will respond with an error message if the range is exceeded.

HIGHLIGHTED QUESTION RESPONSE

Use the <ENTER> key to respond “yes” to a highlighted question. In many cases, the yes response will cause a new screen to be displayed. Other times, the yes response will cause some action to commence, such as zeroing the inclinometer.

SELECTING FROM A HIGHLIGHTED LIST

A highlighted list field looks like a text or digit entry field; however, it will not accept input. Use the <ARROW-UP/DOWN> keys to view the several items in the list. When the desired item is displayed, press <ENTER> to select the item and move the highlight to the next field. You can also match the first letter or digit of the item desired by typing that letter or digit. The first item matching its first character with the input will be displayed. If only two items are in a list, you can toggle to the other item by inputting a space character.

MOVING THE HIGHLIGHT OR CURSOR

Screens that accept user input will display highlighted field(s). The highlight can be moved right/downwards with the <TAB> key or left/upwards with the <SHIFT><TAB> key combination. When the user presses <ENTER> to select from a list, or completes another form of field entry, the highlight will move right/downwards. Fields that accept alphanumeric input will display a highlighted cursor within the field, which moves with typed input or may be positioned with the left/right arrow keys.

02. SCREEN OPERATIONS - *INDICATORS*

INDICATORS

There are now three indicators that appear on the top line of the display in the 38th - 40th columns.

The indicators are not displayed on the following screens:

Run Time
Free Format
Free Format With Run Time
GXP
Titling Functions

While the operator is on any K2/K3 menu screen after having temporarily left GXP or GraniteNet, the letters 'G', 'R' , 'A', 'N', 'I', 'T', 'E', will be flashed on and off on the top line of the display in column 38.

The second of the three indicators shows that the system is alive. It is displayed in column 39. It will alternate between a '|' sign and a '-' sign, approximately once per second. If this indicator does not change, the system is hung up or has aborted in some way and will need to be restarted.

The third indicator shows whether the inputting of data in digit and text fields is in Insert mode 'I' or Overwrite mode 'O'. The Free Format Screen is always in Insert mode regardless of the setting of the indicator.

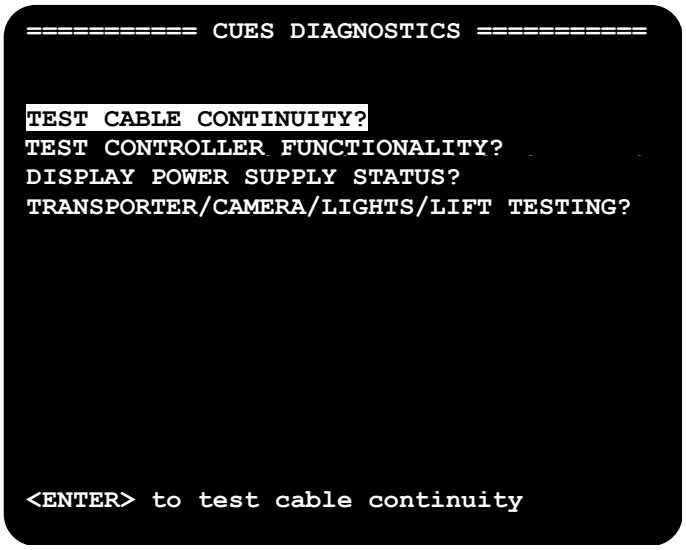
In Insert mode characters typed will be input at the cursor location and cause any characters to the right of the cursor location to be moved over, assuming that there is room in the field for them to be moved.

In Overwrite mode, the first character typed into a field will clear out all characters that currently are in that field and typing will commence in the first character position. Subsequent characters will be appended until the field is filled up.

When in Insert mode, the operator may have to use the <BACKSPACE> key or the <DEL> key in order to delete characters to the left or right of the cursor in order to make room for new characters to be input.

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02. SCREEN OPERATIONS - *DIAGNOSTICS*



Label – TEST CABLE CONTINUITY?
Type – Action
Status Line – <ENTER> to test cable continuity
Press <ENTER> to move the operator to the Cable Continuity Screen.

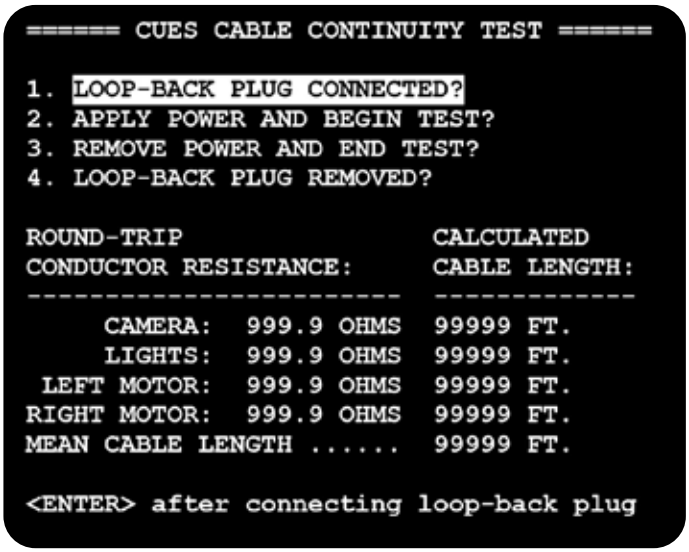
Label – TEST CONTROLLER FUNCTIONALITY?
Type – Action
Status Line – <ENTER> to test the controller
Press <ENTER> to move the operator to the Testing Controller Inputs Screen.

Label – DISPLAY POWER SUPPLY STATUS?
Type – Action
Status Line – <ENTER> to display power supply status
Press <ENTER> to move the operator to the Power Supply Status Screen.

Label - TRANSPORTER/CAMERA/LIGHTS/LIFT TESTING?
Type – Action
Status Line - <ENTER> to T/C/L/L Testing
Press <ENTER> to move the operator to the Transporter Camera Lights Lift Testing screen

Label – K3 INFORMATION?
Type – Action
Status Line - <ENTER> to K3 information
Press <ENTER> to move the operator to the K3 information screen
Note that this option is only available if the operator has selected K3 as the System Type on the Equipment Configuration screen.

02. SCREEN OPERATIONS - *CABLE CONTINUITY TEST*



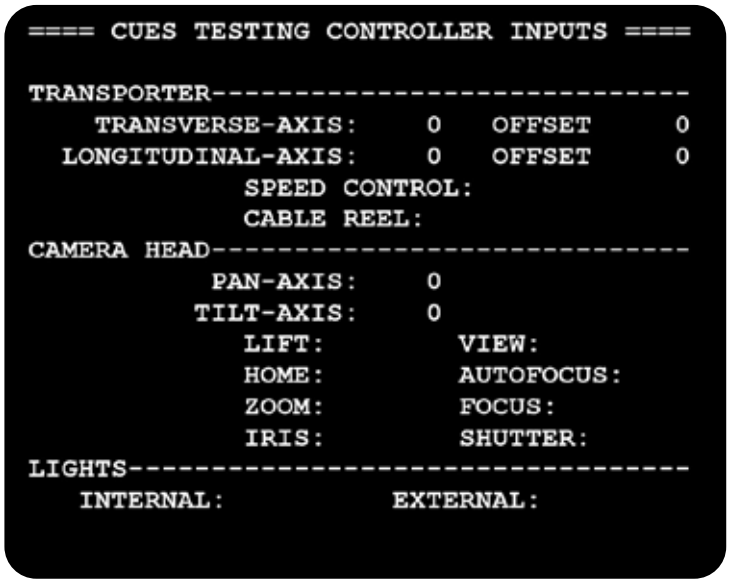
The Cable Continuity Test Screen provides a process for testing the continuity of the cable conductors. To run the Cable Continuity Test, a valid cable type selection is required on the Equipment Configuration Screen.

Upon entering the screen, the cable is assumed to be open circuited; that is, the loop-back plug is not yet installed. With the "1. LOOP-BACK PLUG CONNECTED?" line highlighted, the operator now connects the loop back plug and presses <ENTER>. The highlight moves to the "2. APPLY POWER AND BEGIN TEST?" line. Again, the operator presses <ENTER>. The highlight moves to the next line and the system begins to test the cable for open circuits.

The round-trip resistances are displayed for each of the four pairs. With the cable type known, the length of the conductor can then be calculated and displayed. The four calculated conductor lengths should be of similar length. If one of them is much shorter than the rest, this would indicate a short circuit at that indicated length. Because the test continues to run, the location of that short can be found rather accurately by flexing the cable near the location indicated and observing the change onscreen. For convenience, the mean of the four lengths is displayed as "MEAN CABLE LENGTH:" at the bottom of the screen.

With the "3. REMOVE POWER AND END TEST?" line highlighted, the operator presses <ENTER> which removes all power and ends the test. When the "4. LOOP-BACK PLUG REMOVED?" line is highlighted, the operator should do just that, remove the loop-back plug. The operator should then press <ENTER> which will return to the "CUES EQUIPMENT CONFIGURATION." menu screen.

02. SCREEN OPERATIONS - *TESTING CONTROLLER INPUTS*



The Testing Controller Inputs screen allows the operator to verify that the GamePad Controller is operational and able to control all aspects of the transporter, camera, and lights. With a controller connected and "found" by the K2/K3 software, this screen may be entered to obtain visual confirmation of controller operation.

All of the fields on this screen are updated in real-time to display the current positions of both joysticks, and the commands generated when the appropriate controller button or button combination is pressed.

NOTES:

- A value of zero displayed for a joystick axis indicates no movement from center. However, due to manufacturing variations, it is quite normal for the displayed values of a centered joystick to be non-zero, positive or negative.
- Many of the commands will, when triggered, only be displayed for an instant before disappearing. This is to be expected, as they are "one-shot" commands that are only sent once, as opposed to those that are sent continually.

continued...

02. SCREEN OPERATIONS - *TESTING CONTROLLER INPUTS*

Label – (unlabeled, row 2)
Type – Read-only Text Field
Value – (a) DISPLAY DIAGNOSTICS (b) LATERAL EXTEND (c) LATERAL RETRACT
> GamePad Controller: (a) Press the button labeled 'DIAGNOSTICS' (b) Press the button labeled 'LIGHTS' (c) Press the button labeled 'REEL'

Label – TRANSVERSE-AXIS:
Type – Read-only Digit Field
Value – Integer between –128 and +127
> This field displays the current X-axis position of the transporter joystick.

Label – OFFSET
Type – Read-only Digit Field
Value – Integer between –127 and +128
> This field displays the X-axis offset of the transporter joystick. It gets filled in by the operator pressing <CTRL><ALT><j> while on this screen. Once filled in, these values will be added to all X-axis transporter joystick values until the next power cycle of the system.

Label – LONGITUDINAL-AXIS:
Type – Read-only Digit Field
Value –Integer between –128 and +127
> This field displays the current Y-axis position of the transporter joystick.

Label – OFFSET
Type – Read-only Digit Field
Value – Integer between –127 and +128
> This field displays the Y-axis offset of the transporter joystick. It gets filled in by the operator pressing <CTRL><ALT><j> while on this screen. Once filled in, these values will be added to all Y-axis transporter joystick values until the next power cycle of the system.

Label – SPEED CONTROL:
Type – Read-only Text Field
Value – (a) CRUISE (b) STOP
> GamePad Controller: (a) Press the button labeled 'CRUISE' (b) Press the transporter joystick button (push down on the top)

Label – CABLE REEL:
Type – Read-only Text Fields. Note: two fields!
Values – (a) RETRIEVE (b) PAY OUT (c) FASTER (d) SLOWER
> GamePad Controller: (a) Hold down the button labeled 'REEL', and press the Right directional pad button ('1') (b) Hold down the button labeled 'REEL', and press the Left directional pad button ('0') (c) Hold down the button labeled 'REEL', and press the Up directional pad button ('+') (d) Hold down the button labeled 'REEL', and press the Down directional pad button ('–')

Label – PAN-AXIS:
Type – Read-only Digit Field and Read-only Text Field. Note: two fields!
Value – Integer between –128 and +127, (a) RIGHT (b) LEFT
> The Digit field displays the current X-axis position of the camera joystick. (a) Push the camera joystick to the extreme right (b) Push the camera joystick to the extreme left

Label – TILT-AXIS:
Type – Read-only Digit Field and Read-only Text Field. Note: two fields!
Value – Integer between –128 and +127, (a) CCW (b) CW
> The Digit field displays the current Y-axis position of the camera joystick. (a) Push the camera joystick to the extreme down (b) Push the camera joystick to the extreme up

Label – LIFT:
Type – Read-only Text Field
Value – (a) DOWN (b) UP
> GamePad Controller: (a) Hold down the button labeled 'LIFT', and press the Down directional pad button ('–') (b) Hold down the button labeled 'LIFT', and press the Up directional pad button ('+')

Label – VIEW:
Type – Read-only Text Field
Value – (a) MAIN (b) REAR/LAT
> GamePad Controller: (a) Press the button labeled 'VIEW' [Note: Available when viewing rear camera, or when in LAMP II Lateral Mode] (b) Press the button labeled 'VIEW' [Note: Available when viewing main camera, or when in LAMP II Mainline Mode]

02. SCREEN OPERATIONS - *TESTING CONTROLLER INPUTS*

Label – HOME:
Type – Read-only Text Field
Value – (a) P&T (b) TILT
> GamePad Controller: (a) Press the camera joystick button (push down on the top) (b) N/A

Label – AUTOFOCUS:
Type – Read-only Text Field
Value – (a) ON
> GamePad Controller: (a) Hold down the button labeled 'FOCUS', and press the Right directional pad button ('1')

Label – ZOOM:
Type – Read-only Text Field
Value – (a) OUT (b) IN
> GamePad Controller: (a) Hold down the button labeled 'ZOOM', and press the Down directional pad button ('–') (b) Hold down the button labeled 'ZOOM', and press the Up directional pad button ('+')

Label – FOCUS:
Type – Read-only Text Field
Value – (a) NEAR (b) FAR
> GamePad Controller: (a) Hold down the button labeled 'FOCUS', and press the Up directional pad button ('+') (b) Hold down the button labeled 'FOCUS', and press the Down directional pad button ('–')

Label – IRIS:
Type – Read-only Text Field
Value – (a) CLOSE (b) OPEN
> GamePad Controller: (a) Hold down the button labeled 'IRIS', and press the Down directional pad button ('–') (b) Hold down the button labeled 'IRIS', and press the Up directional pad button ('+')

Label – SHUTTER:
Type – Read-only Text Field
Value – (a) FAST (b) SLOW
> GamePad Controller: (a) Hold down the button labeled 'SHUTTER', and press the Down directional pad button ('–') (b) Hold down the button labeled 'SHUTTER', and press the Up directional pad button ('+')

Label – INTERNAL:
Type – Read-only Text Field
Value – (a) OFF (b) ON (c) TOGGLE
> GamePad Controller: (a) Hold down the button labeled 'LIGHTS', and press the Left directional pad button ('0') [Note: Displayed 2nd time button combo is used] (b) Hold down the button labeled 'LIGHTS', and press the Right directional pad button ('1') [Note: Displayed 2nd time button combo is used] (c) Hold down the button labeled 'LIGHTS', and press the Left directional pad button ('0') or the Right directional pad button ('1') [Note: Only displayed 1st time button combo is used]

Label – EXTERNAL:
Type – Read-only Text Field
Value – (a) BRIGHTER (b) DIMMER
> GamePad Controller: (a) Hold down the button labeled 'LIGHTS', and press the Up directional pad button ('+') (b) Hold down the button labeled 'LIGHTS', and press the Down directional pad button ('–')

02. SCREEN OPERATIONS - *POWER SUPPLY STATUS*

POWER SUPPLY STATUS FOR TRANSPORTER

```
======= CUES POWER SUPPLY STATUS =======

         -------------------------------
         SETPOINT  SOURCE SOURCE  LOAD*
         VOLTAGE   VOLTAGE CURRENT VOLTAGE
         -------- ------- ------- -------
CAMERA:    +40.0V   +0.0V +0.000A   +0.0V

LIGHTS:   +120.0V   +0.0V +0.000A   +0.0V

LT MOTOR:  +0.0V   +0.0V +0.000A   +0.0V

RT MOTOR:  +0.0V   +0.0V +0.000A   +0.0V
          -------------------------------
* Calculated load voltage
```

POWER SUPPLY STATUS FOR CURRAHEE CUTTER

```
======= CUES POWER SUPPLY STATUS =======

         -------------------------------
         SETPOINT  SOURCE SOURCE  LOAD*
         VOLTAGE   VOLTAGE CURRENT VOLTAGE
         -------- ------- ------- -------
CAMERA:    +40.0V   +0.0V +0.000A   +0.0V

FWD/REV: +120.0V   +0.0V +0.000A   +0.0V

UP/DOWN:   +0.0V   +0.0V +0.000A   +0.0V

CCW/CW   :  +0.0V   +0.0V +0.000A   +0.0V
           -------------------------------
* Calculated load voltage
```

The Power Supply Status screen provides the ability to verify the set point voltage, source voltage, source current and calculated load voltage to the camera, lights and two transporter motors.

This screen does not contain any tab-able or editable fields. Once the screen has been selected, values will be automatically updated on a continuous basis.

Voltages and amperages are displayed as floating point values with a maximum of three digits to the left of the decimal point and one digit after it. The value may be preceded by a '+' or '-'.

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02. SCREEN OPERATIONS - *TRANS/CAM/LIGHTS TESTING*

```
== CUES TRANS/CAM/LIGHTS/LIFT TESTING ==
TEST# TYPE                SECS VID CYCLES
  1:  None                 300  NO      0
  2:  None                 300  NO      0
  3:  Forward              300  NO      0
  4:  Reverse              300  NO      0
  5:  Rotate               300  NO      0
  6:  Pan                  300  NO      0
  7:  Home                 300  NO      0
  8:  Lights               300  NO      0
  9:  LIFT                 300  NO      0

BEGIN TEST?  PAUSE TEST?    REPEAT:  NO
CUR:                NEX:
TIME REMAINING:      Secs

ARROW UP/DOWN to view test type
```

Label: 1 (Also 2,3,4,5,6,7,8,9)
Type – stored field.
Selections: None,Extend,Retract,Forward,Reverse,Rot Main,Rot MPT/uPT CCW,Rot MPT/uPT CW,Rot MPT/uPT Both,Pan Main,Pan MPT/uPT Left,Pan MPT/uPT Right,Pan MPT/uPT Both,Home Main,Home MPT/uPT,Sonde MPT/uPT,Lights Main,Spots uPT,Floods uPT,Up/Down Cutter,CCW/CW Cutter,FWD/REV Cutter,All Cutter,Up Burn-in,Down Burn-in,CCW Burn-in,CW Burn-in,FWD Burn-in,REV Burn-in,Lift

Tests can be in any order, may be repeated multiple times, or not at all.
Default: The default values for the nine tests are initially: None, None, Forward, Reverse, Rotate, Pan, Home, Lights and Lift.

Status Line: ARROW UP/DOWN to view test type

Tests will be run in sequence, based on the order in the list.

'Extend', 'Retract', 'Forward' and 'Reverse' run their respective motors at 100% voltage for the duration of their tests.

'Extend' and 'Retract' refer to the lateral motors, whereas 'Forward' and 'Reverse' refer to the transporter motors.

'Pan Main' toggles back and forth between panning left and panning right for several seconds. When using a LAMPII transporter be sure to use the LAMPII immobilization block.

02. SCREEN OPERATIONS - *TRANS/CAM/LIGHTS TESTING*

'Rot Main' toggles back and forth between rotating forward and rotating backward for several seconds. When using a LAMP II transporter be sure to use the LAMP II immobilization block.

'Lights Main' toggles the lights on and off about once per second. When using a LAMP II transporter be sure to use the LAMP II immobilization block.

The 'Home' test uses the 4 combinations of Rotate and Pan (Rotate Forward-Pan Left, Rotate Forward-Pan Right, Rotate Backward-Pan Left, and Rotate Backward-Pan Right) to first 'offset' the camera head prior to homing.

The 'Lift' test raises and lower the lift for a fixed amount of time depending on the transporter type.

The 'Rot MPT/uPT CCW' and 'Rot uPT CW' tests rotate the Mini/Micro Pan & Tilt camera in either a counterclockwiseor clockwise direction for about one second.

The 'Rot MPT/uPT Both' test rotates the Mini/Micro Pan & Tilt camera in a counterclockwise and then a clockwise direction, each for about one second.

The Pan MPT/uPT Left and Pan MPT/uPT Right tests pan the Mini/Micro Pan & Tilt camera in either a left or right direction for about one second.

The 'Pan MPT/uPT Both' test pans the Mini/Micro Pan & Tilt camera in a left and then a right direction, each for about one second.

The 'Home MPT/uPT' test uses the 4 combinations of rotate and pan (rotate counterclockwise-pan left, rotate counterclockwise-pan right, rotate clockwise-pan left and rotate clockwise-pan right) to first 'offset' the Mini/Micro Pan & Tilt camera head prior to homing.

The 'Sonde uPT' test alternates between the sonde being off, sonde being on at low frequency, sonde being off and sonde being on at high frequency.

The 'Spots uPT' test cycles the Micro Pan & Tilt spot lights through their eight voltage settings from full off to full on.

The 'Floods uPT' test cycles the Micro Pan & Tilt flood lights through their eight voltage settings from full off to full on.

The 'UP/DN', 'CCW/CW', and 'FWD/REV' each move one of the cutter motors for a fixed amount of time in one direction, pause and then move in the other direction for that same fixed amount of time, and then pause again.

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The 'ALL CUTTER MOTORS' cycle through all three of the UP/DN, CCW/CW and FWD/REV cutter motors, moving one of the cutter motors for a fixed amount of time in one direction, pause and then move in the other direction for that same fixed amount of time, and then pause again.

The 'UP CUTTER BURNIN', 'DOWN CUTTER BURNIN', 'CCW_CUTTER BURNIN', 'CW CUTTER BURNIN', 'FWD CUTTER BURNIN', and 'REV CUTTER BURNING' run the chosen cutter motor for an extended amount of time in one direction and then pause for a fixed amount of time.

It is assumed that the transporter is either wheel-less or up on blocks.

Label: None
Type: digit
Length: 4
Range: 1 -9999
Type: Integer
Default:300
Status Line: input nbr of seconds for Textx (1-9999)
Where x is the number of the test between 1 and 8. At the end of the designated test time, the camera or lights are not guaranteed to be in the home or off position – they will be wherever they were when the time completed. The gamepad is still 'live' before, during, and after all tests are being conducted, so if necessary, the home button or lights button could be pressed to reset the camera or lights to their initial states.

Label: None
Type: stored field
Selections: NO/YES
Default: NO
Status Line: ARROW UP/DOWN to view video type
VIDEO controls whether the transporter camera video is displayed on the screen. Normally, video displayed with text overlaid makes the text hard to read, so the default is 'NO'. However, when running tests types 'Rotate', 'Pan' or 'Home', it may help to have the video on the display to verify that the tests are functioning properly. The VIDEO field may be changed at any time, so the operator could turn it on at any time to verify the video signal.

Label: CYCLES
Type: digit
Length: 4
Range: 1 -9999
Type: Integer
Default: 0

The cycles column keeps track of the number of cycles for rotate, pan or lift. A cycle is defined as the camera moving all the way to its extents in one direction or a lift moving up or down.

02. SCREEN OPERATIONS - *TRANS/CAM/LIGHTS TESTING*

Label: BEGIN TEST?
Type: Action field
Status Line: <ENTER> to begin testing
Or
<ENTER to end testing
Pressing <ENTER> with the cursor on 'BEGIN TEST?' causes the testing to begin, starting with the first non-'None' test in the list. The text of the field also immediately changes to 'END TEST?'. The 'CURRENT TEST' field will show the test type being conducted. The 'TIME REMAINING' field will show the time remaining for that particular test, in seconds. The 'NEXT TEST' field will show the next test scheduled. If no more non-'None' tests are scheduled and the 'REPEAT' field is set to 'NO', this line will say 'DONE'. If no more non-'None' tests are scheduled and the 'REPEAT' field is set to 'YES', this line will say 'REPEAT'.

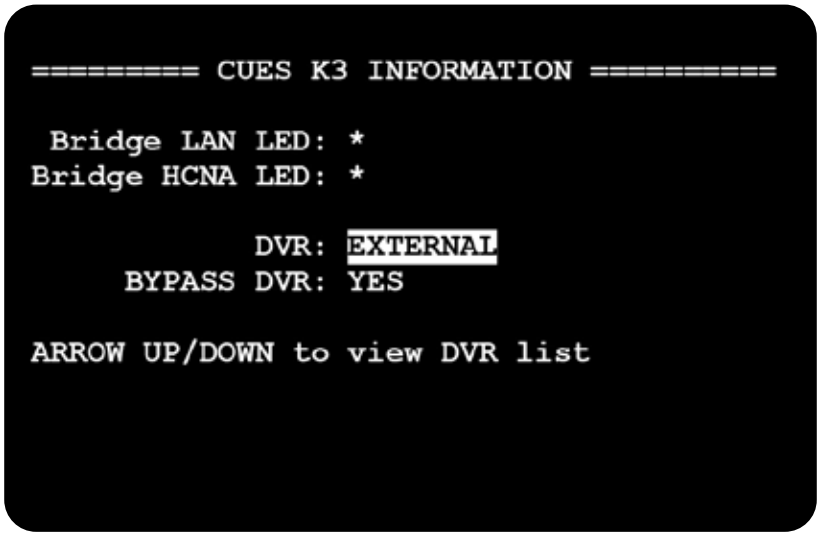
Time will continue to count down until 0 seconds are reached, upon which time the next test will begin, causing the 'CURRENT TEST', 'TIME REMAINING' and 'NEXT TEST' fields to be updated. If all tests are completed and the REPEAT field is set to 'NO', the 'CURRENT TEST' field will be set to 'NONE', the 'TIME REMAINING' field will be set to 0 Secs, and the 'NEXT TEST' field will be set to 'NONE'.

Pressing <ENTER> with the cursor on 'END TEST?' causes the testing to immediately stop and the field text changes back to 'BEGIN TEST?' The 'CURRENT TEST' field will be set to 'NONE'. The 'TIME REMAINING' field will be set to 0 Secs. The 'NEXT TEST' field will be set to 'NONE'. The text of the 'PAUSE TEST?' or 'RESUME TEST?' field will be set back to 'PAUSE TEST?'

Label: PAUSE TEST?
Type: Action field
Status Line: <ENTER> to pause testing
Or
<ENTER to resume testing
Pressing <ENTER> with the cursor on 'PAUSE TEST?' causes the testing to immediately pause. This selection only works if testing is underway. The text of the 'TIME REMAINING' field will stop counting down. The text of the field also immediately changes to 'RESUME TEST?'.
Pressing <ENTER> with the cursor on 'RESUME TEST?' causes the testing to continue, picking up where it left off. The text of the 'TIME REMAINING' field will resume counting down. The text of the field also immediately changes to 'PAUSE TEST?'.

Label: REPEAT
Type: stored field
Selections: NO/YES
Default: NO
REPEAT controls whether the tests are repeated indefinitely. If set to 'YES', after completing the nine tests, it will begin again at the top of the list. The REPEAT field may be changed at any time, so the operator could initially set it to 'YES' and then after a few hours, change it to 'NO' and it would then complete after the current list of nine tests completed.

02. SCREEN OPERATIONS - *K3 INFORMATION*



Label: Bridge LAN LED
Type: text field
Default: ‘ ‘
Note: The status field indicates whether the Bridge LAN is working and whether data is being transferred across it. If so, an asterisk ‘*’ will be displayed. Otherwise a space ‘ ‘ .

Label: Bridge HCNA LED
Type: text field
Default: ‘ ‘
Note: The status field indicates whether the Bridge HCNA is working and whether data is being transferred across it. If so, an asterisk ‘*’ will be displayed. Otherwise a space ‘ ‘ .

Label: DVR
Type: stored field
Selections: INTERNAL, EXTERNAL
Default: INTERNAL
Status Line: ARROW UP/DOWN to view DVR list
Note: This field controls whether the video and audio path pass through the internal or external DVR.

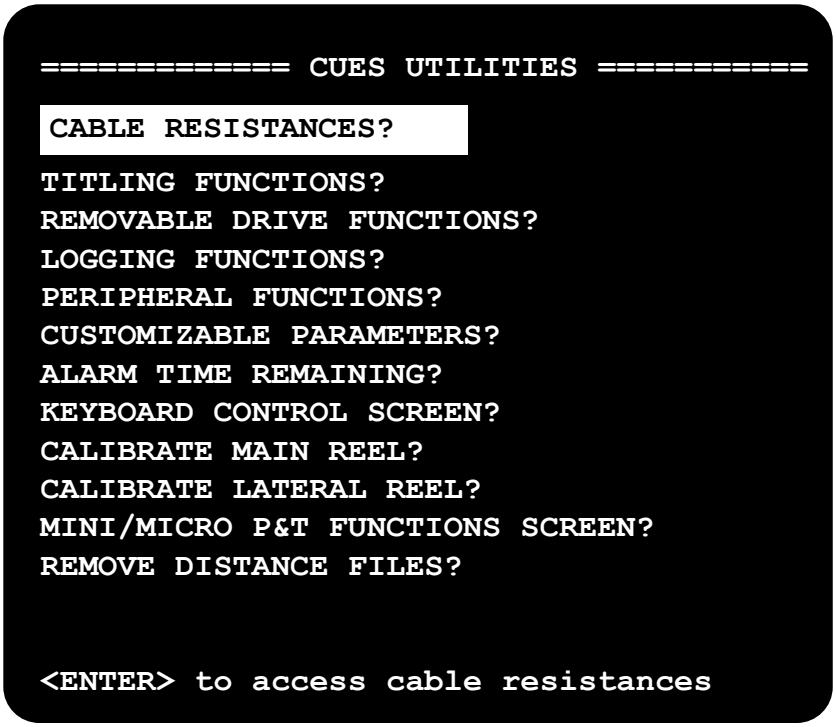
02. SCREEN OPERATIONS - *K3 INFORMATION*

Label: BYPASS DVR
Type: stored field
Selections: NO, YES
Default: NO
Status Line: ARROW UP/DOWN to view Bypass list
Note: This field controls whether the video and audio path bypass the selected DVR.

The SD-DVR is operated with 8 special keys on the MARK3 custom keyboard. However, they are mapped to keys found on a standard PC keyboard, even the K2 portable MiniKeyboard. In the event of a failure to the MARK3 custom keyboard, a standard keyboard could be plugged into the USB port on the K3's PCU. The keys are mapped as follows:

NUMPAD8 = DVRUpArrow
NUMPAD6 = DVRRightArrow
NUMPAD2 = DVRDownArrow
NUMPAD4 = DVRLeftArrow
NUMPAD5 + SHIFT = Toggle DVR-SD and DVR-Bypass
NUMPAD5 = DVRMenu
NUMPAD '+' = DVRPlay
NUMPAD '-' = DVRStop
NUMPAD '*' = DVRRecord

02. SCREEN OPERATIONS - *UTILITIES*



Label: CABLE RESISTANCES?
Type: Action
Status line: <ENTER> to cable resistances
Press <ENTER> to move to the Cable Resistances screen.

Label: TITLING FUNCTIONS?
Type: Action
Status line: <ENTER> for titling functions
Press <ENTER> to move to the Titling Functions screen.
Note: This selection is only available if the operator is an Administrator.

Label: REMOVABLE DRIVE FUNCTIONS?
Type: Action
Status line: <ENTER> for removable drive functions
Press <ENTER> to move to the Removable Drive Functions screen.

Label: LOGGING FUNCTIONS?
Type: Action
Status Line: <ENTER> for logging functions
Press <ENTER> to move to the Logging Functions screen.

02. SCREEN OPERATIONS - *UTILITIES*

Label: PERIPHERAL FUNCTIONS?
Type: Action
Status Line: <ENTER> for peripheral functions
Press <ENTER> to move to the Peripheral Functions screen.

Label: CUSTOMIZABLE PARAMETERS?
Type: Action
Status line: <ENTER> to customize parameters
Press <ENTER> to move to the Customizable Parameters screen.

Label – ALARM TIME REMAINING?
Type – Action
Status Line: <ENTER> to view alarm time remaining
Press <ENTER> to move the operator to the Alarm Time Remaining Screen.

Label: KEYBOARD CONTROL SCREEN?
Type: Action
Status Line: <ENTER> for Keyboard Control Screen
Press <ENTER> to move to the Keyboard Control screen.

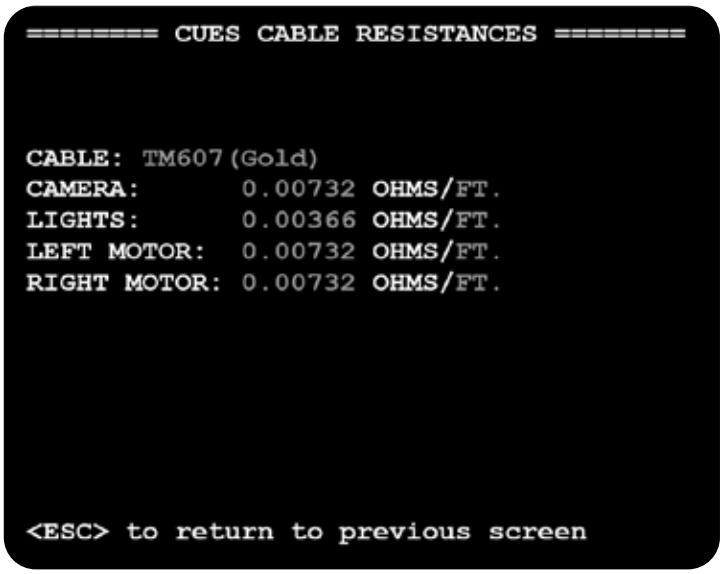
Label: CALIBRATE MAIN REEL?
Type: Action
Status line: <ENTER> to calibrate main reel
Press <ENTER> to move to the Calibrate Main Reel screen

Label: CALIBRATE LATERAL REEL?
Type: Action
Status line: <ENTER> to calibrate lateral reel
Press <ENTER> to move to the Calibrate Lateral Reel screen

Label: MINI/MICRO P&T FUNCTIONS SCREEN?
Type: Action
Status Line: <ENTER> to Mini/Micro P&T Funcs Screen
Press <ENTER> to move to the Mini/Micro Pan and Tilt Functions screen

Label: REMOVE DISTANCE FILES?
Type: Action
Status line: <ENTER> to remove distance files
Press <ENTER> to remove the distance files.

02. SCREEN OPERATIONS - *CABLE RESISTANCES*



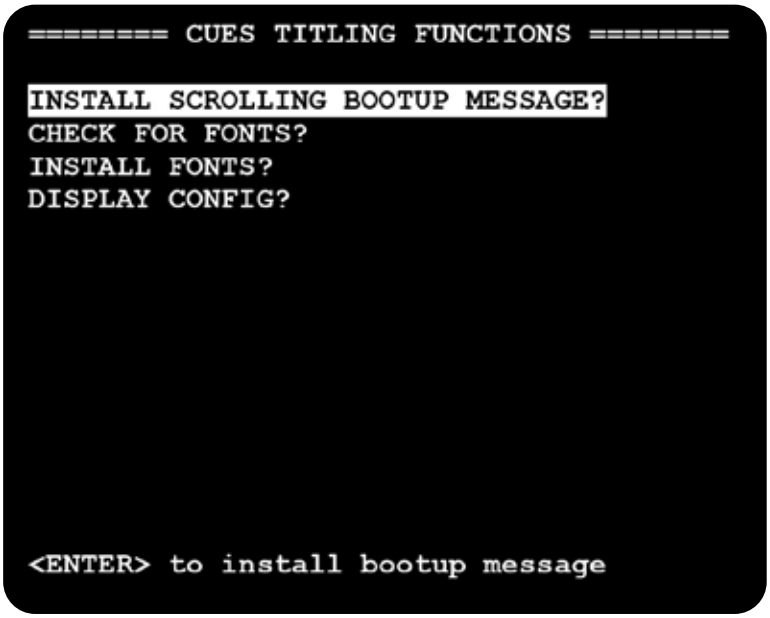
LABEL: CAMERA
Type - digit field, dependent on TYPE field
Length 7
Range – 0.00001- 1.00000
Type – Floating Point
Decimal places 5
Default – 0.00010
Status Line - Input resistance.

LABEL:LIGHTS
Type - digit field, dependent on TYPE field
Length 7
Range – 0.00000- 1.00000
Type – Floating Point
Decimal places 5
Default – 0.00350
Status Line - Input resistance.

LABEL:LEFT MOTOR
Type - digit field, dependent on TYPE field
Length 7
Range – 0.00000- 1.00000
Type – Floating Point
Decimal places 5
Default – 0.00700
Status Line - Input resistance.

LABEL: RIGHT MOTOR
Type - digit field, dependent on TYPE field
Length 7
Range – 0.00000- 1.00000
Type – Floating Point
Decimal places 5
Default – 0.00700
Status Line - Input resistance

02. SCREEN OPERATIONS - *TITLING FUNCTIONS*



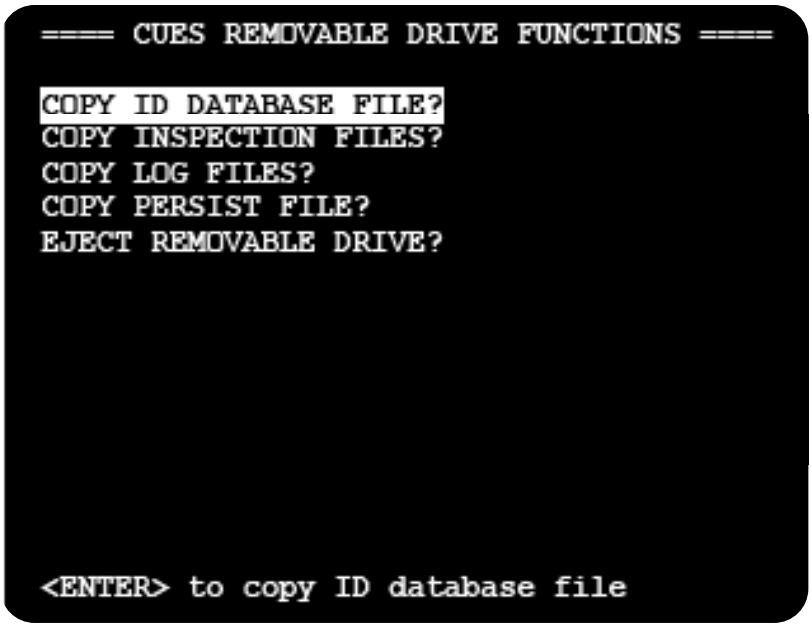
Label: INSTALL SCROLLING BOOTUP MESSAGE?
Type: Action
Status line: <ENTER> to install bootup message
Press <ENTER> to install the message that scrolls at bootup to the titler.

Label: CHECK FOR FONTS?
Type: Action
Status line: <ENTER> to check for fonts
Press <ENTER> to check if both large and small fonts are installed to the titler.

Label: INSTALL FONTS?
Type: Action
Status line: <ENTER> to install fonts
Press <ENTER> to install large and small font files to the titler.

Label: DISPLAY CONFIG?
Type: Action
Status line: <ENTER> to display config to VGA monitor
Press <ENTER> to display the titler configuration to a VGA monitor.

02. SCREEN OPERATIONS - *REMOVABLE DRIVE FUNCTIONS*



Label: COPY ID DATABASE FILE?
Type: Action
Status Line: <ENTER> to Copy ID database file
Press <ENTER> to copy the ID database file to a removable drive.

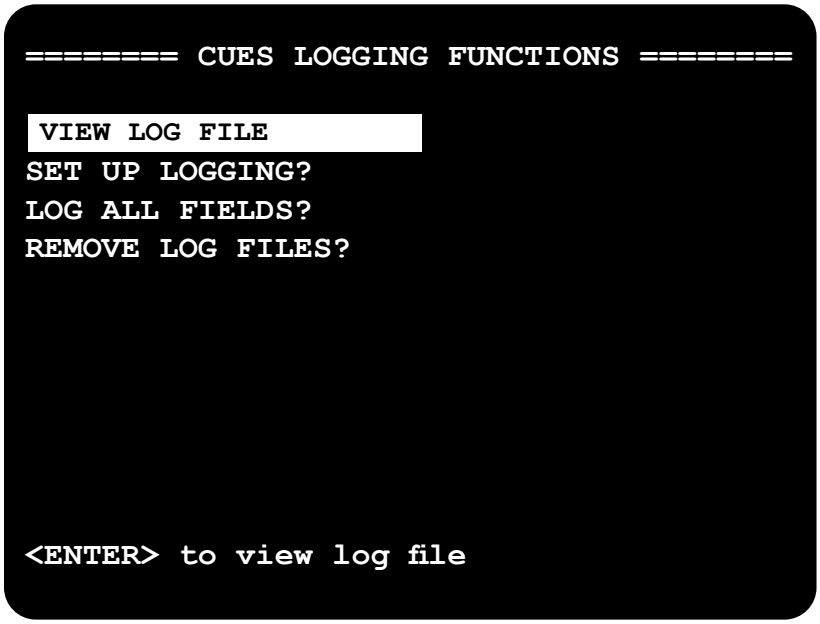
Label: COPY INSPECTION FILES?
Type: Action
Status Line: <ENTER> to Copy inspection files
Press <ENTER> to copy all inspection files to a removable drive.

Label: COPY LOG FILES?
Type: Action
Status Line: <ENTER> to copy log files
Press <ENTER> to copy all log files to a removable drive.

Label: COPY PERSIST FILE?
Type: Action
Status Line: <ENTER> to copy persist file
Press <ENTER> to copy the persist.txt file to a removable drive.

Label: EJECT REMOVABLE DRIVE?
Type: Action
Status Line: <ENTER> to eject removable drive
Press <ENTER> to flush all files to the removable drive, making it safe to remove.

02. SCREEN OPERATIONS - *LOGGING FUNCTIONS*



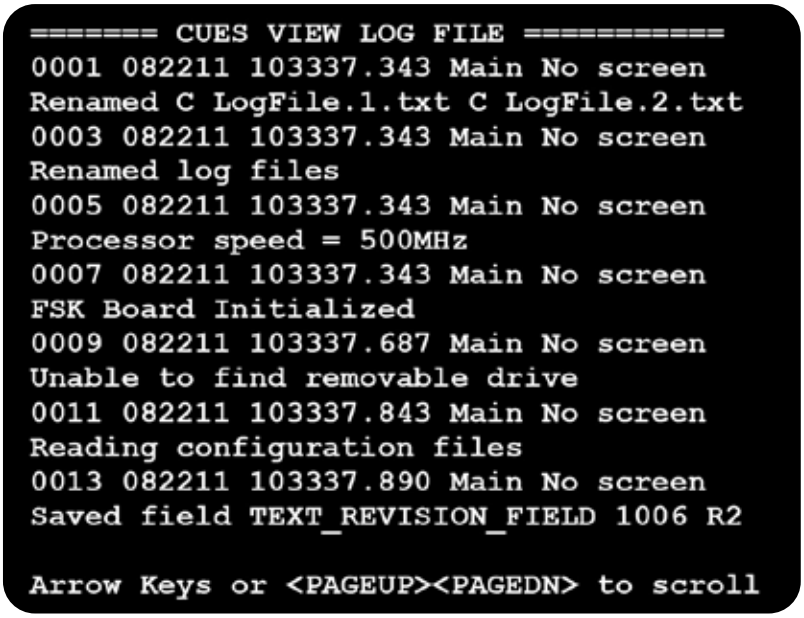
Label: VIEW LOG FILE?
Type: Action
Status line: <ENTER> to View log file
Press <ENTER> to view the log file.

Label: SET UP LOGGING?
Type: Action
Status line: <ENTER> to set up logging
Press <ENTER> to move to the Set Up Logging screen.

Label: LOG ALL FIELDS?
Type: Action
Status Line: <ENTER> to log all fields
Press <ENTER> to copy all fields to the log file.

Label: REMOVE LOG FILES?
Type: Action
Status line: <ENTER> to remove log files
Press <ENTER> to remove the log files.

02. SCREEN OPERATIONS - *VIEW LOG FILE*



The View Log File screen displays 7 lines at a time of the last 500 messages written to the log file (stored in D:\ConfigurationFiles\logfile.1.txt). Each line that is logged is preceded by a line with 5 pieces of information: a) the line number (beginning with 0001 and incrementing by 2), b) the date in the format MMDDYY, c) the time in the format HHMMSS.xxx where xxx is milliseconds, d) the 'thread' that generated this message (for customer service purposes), and e) the screen that generated this message (again, for customer service purposes).

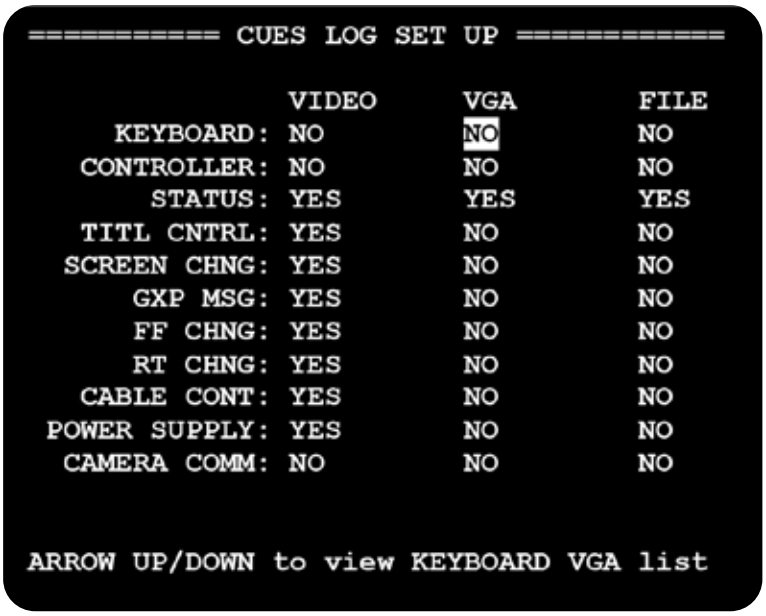
Messages that cannot be fit one line are broken into two or more pieces so that none of the information is lost.

Note that since this utility shows all messages that are being logged to the logfile.1.txt file, it may include many messages that are not displayed on the video screen. This is because the firmware logs many operations that Cues does not feel the operator needs to be bothered with knowing about/seeing on the video screen.

The <Uparrow> and <Downarrow> keys as well as <PageUp> and <PageDown> may be used to scroll through up the messages in this queue. The queue will wrap around and overwrite the earliest messages stored once 500 messages have been added. All the messages however, do go into the logfile.1.txt file described earlier.

This utility can be useful if a message flashes on the screen and the operator is not able to catch it prior to another message taking its place. It also may be useful in the event of an unexpected result in helping Cues customer service locate what actions immediately preceded the problem. The timestamp information can be very helpful in determining which operations took more time than expected or if a particular operation happened out of sequence from what would normally be expected.

02. SCREEN OPERATIONS - *LOG SET UP*



Label: KEYBOARD
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view KEYBOARD VGA list
or ARROW UP/DOWN to view KEYBOARD file list
Setting these fields to YES controls whether keyboard presses are logged to the VGA or disk file.

Label: CONTROLLER
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view CONTROLR VGA list
or ARROW UP/DOWN to view CONTROLR file list
Setting these fields to YES controls whether controller button presses and analog sticks maximums are logged to the VGA or disk file.

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Label: STATUS
Type: Stored field
Selections: NO, YES
Default: YES for VGA column, YES for FILE column
Status Line: ARROW UP/DOWN to view STATUS VGA list
or ARROW UP/DOWN to view STATUS file list
Setting these fields to YES controls whether status line messages are logged to the VGA or disk file.

Label: TITL CNTRL
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view TITL VGA list
or ARROW UP/DOWN to view TITL file list
Setting these fields to YES controls whether titler control messages are logged to the VGA or disk file.

Label: SCREEN CHNG
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view SCREEN VGA list
or ARROW UP/DOWN to view SCREEN file list
Setting these fields to YES controls whether screen messages are logged to the VGA or disk file.

Label: GXP MSG
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view GXP MSG VGA list
or ARROW UP/DOWN to view GXP MSG file list
Setting these fields to YES controls whether GXP messages are logged to the VGA or disk file.

Label: FF CHNG
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view FF VGA list
or ARROW UP/DOWN to view FF file list
Setting these fields to YES controls whether Free Format messages are logged to the VGA or disk file.

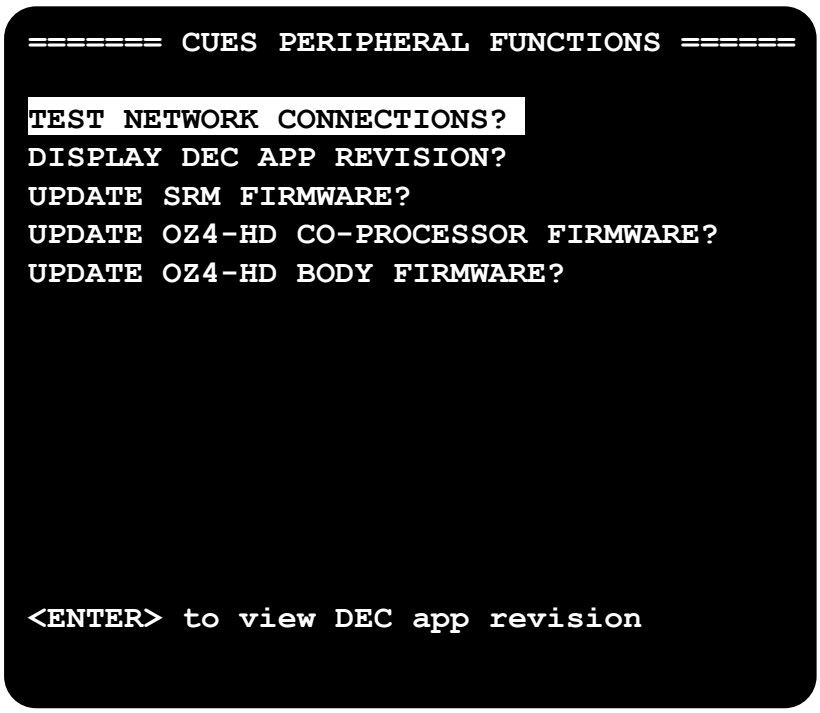
02. SCREEN OPERATIONS - *LOG SET UP*

Label: RT CHNG
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view RUNTIME VGA list
or ARROW UP/DOWN to view RUNTIME file list
Setting these fields to YES controls whether Run Time messages are logged to the VGA or disk file.
Label: CABLE CONT
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view CABLE VGA list
or ARROW UP/DOWN to view CABLE file list
Setting these fields to YES controls whether Cable Continuity messages are logged to the VGA or disk file.

Label: POWER SUPPLY
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view POWER VGA list
or ARROW UP/DOWN to view POWER file list
Setting these fields to YES controls whether Power Supply messages are logged to the VGA or disk file.

Label: CAMERA COMM
Type: Stored field
Selections: NO, YES
Default: NO for VGA column, NO for FILE column
Status Line: ARROW UP/DOWN to view CAMERA VGA list
or ARROW UP/DOWN to view CAMERA file list
Setting these fields to YES controls whether Camera Comm messages are logged to the VGA or disk file.

02. SCREEN OPERATIONS - *PERIPHERAL FUNCTIONS*



Label: TEST NETWORK CONNECTIONS?
Status Line: <ENTER> to test network connections
Press <ENTER> to move the operator to the Network Connections Screen.

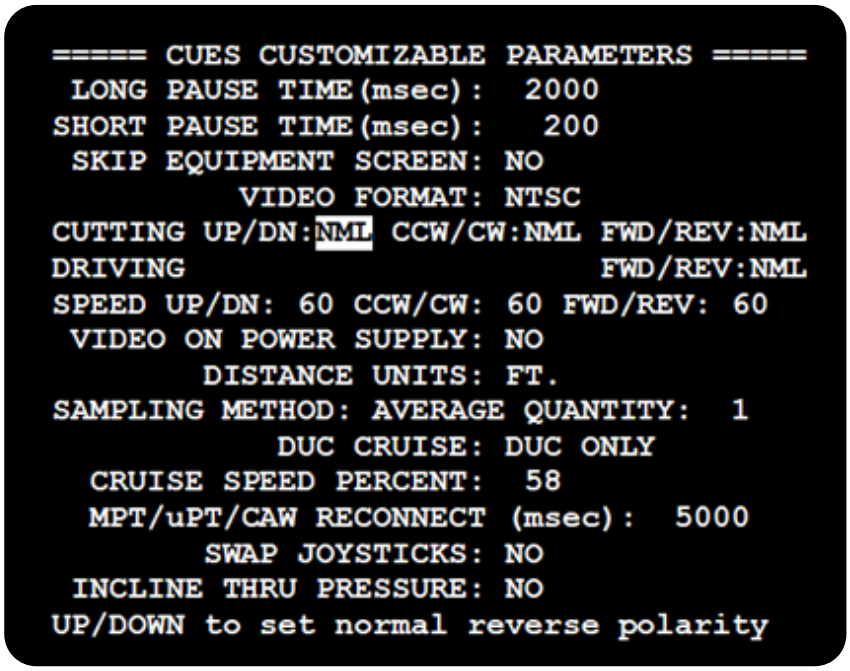
Label: DISPLAY DEC APP REVISION?
Type: Action
Status Line: <ENTER> to view DEC app revision
Press <ENTER> to display the revision of the DEC application that is currently running.

Label: UPDATE SRM FIRMWARE?
Type: Action
Status Line: <ENTER> to update SRM firmware
Press <ENTER> to initiate the process of updating the firmware in the Smart Relay Module (SRM).

Label: UPDATE OZ4-HD CO-PROCESSOR FIRMWARE?
Type: Action
Status Line: <ENTER> to update co-processor firmware
Press <ENTER> to initiate the process of updating the 'co-processor' firmware in the OZ4-HD camera.

Label: UPDATE OZ4-HD BODY FIRMWARE?
Type: Action
Status Line: <ENTER> to update camera body firmware
Press <ENTER> to initiate the process of updating the 'body' firmware in the OZ4-HD camera.

02. SCREEN OPERATIONS - *CUSTOMIZABLE PARAMETERS*



Label: LONG PAUSE TIME(msec):
Type: Digit
Length: 5
Range: 0 – 99999
Type: Integer
Default: 2000
Status Line: Input long pause msec (0 – 99999)
The value input in milliseconds is used to display error messages or messages for other unexpected conditions.

Label: SHORT PAUSE TIME(msec):
Type: Digit
Length: 5
Range: 0 – 99999
Type: Integer
Default: 200
Status Line: Input long pause msec (0 – 99999)
The value input in milliseconds is used to status messages or messages for other expected conditions.

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Label: SKIP EQUIPMENT SCREEN:
Type: stored
Selections: NO, YES
Default: NO
Status Line: ARROW UP/DOWN to view skip list

After exiting this screen, if set to 'YES', on subsequent reboots, the system will boot directly into the Run Time Screen. If set to 'NO', the system will boot to the Equipment Configuration Screen.

Label: VIDEO FORMAT:
Type: stored
Selections: NTSC, PAL
Default: NTSC
Status Line: ARROW UP/DOWN to view video formt list

After exiting this screen, if set to 'NTSC', the video format will change to NTSC and on subsequent reboots will use NTSC as the default. If set to 'PAL', the video format will change to PAL and on subsequent reboots will use PAL as the default.

NOTE: This will probably be done once at CUES prior to delivery to the customer.

Label: CUTTING UP/DN, CCW/CW, FWD/REV
Type: Stored
Selections: NML, REV (short for Normal or Reverse)
Default: NML
Status Line: UP/DOWN to set normal /reverse polarity
These three fields control whether the cutting polarity for the three Currahee cutter axis motors are normal or reverse. Normal polarity for the up/down axis is up=positive, down=negative.
Normal polarity for the ccw/cw axis is left = negative, right= positive.
Normal polarity for the fwd/rev axis is up= positive, down = negative.

Label 'DRIVING FWD/REV'
Type: Stored
Selections: NML, REV (short for Normal or Reverse)
Default: NML
Status Line: UP/DOWN to set normal/reverse polarity
Note: This field controls whether the polarity for the FWD/REV drive motor is normal or reverse. Normal polarity for the fwd/rev axis is up=positive, down = negative.

02. SCREEN OPERATIONS - *CUSTOMIZABLE PARAMETERS*

Label: SPEED UP/DN, CCW/CW, FWD/REV
Type: Digit
Length: 3
Range: 0-100
Type: Integer
Default: 60
Status line: Input UP/DN cutter speed (0-100)
These three fields control the speed in percentage of maximum for the three Currahee cutter axis motors. They can be changed, either on this screen, or by using button/DPad combinations on the gamepad.

Label: VIDEO ON POWER SUPPLY:
Type: stored
Selections: NO, YES
Default: NO
Status Line: ARROW UP/DOWN to view video list
After exiting this screen, if set to 'YES', video will be shown while on the Power Supply Status screen. This may be useful in debugging camera issues.

Label: DISTANCE UNITS field
Type: stored field
Selections: : FT., Ft., ft., FEET, Feet, feet, m, M., m., METERS, Meters, meters, METRES, Metres, metres
Default: FT.
Status Line: ARROW UP/DOWN to view distance units.

The units of distance appears on numerous screens. Basically there are only two types of units – Feet and Meters, just several abbreviations of those two. Depending on which type you set it to, the associated field may get converted from feet to meters or vice-versa.

Label: SAMPLING METHOD:
Type: Stored
Selections: AVERAGE, WEIGHTED

If the Sampling Method is set to 'Average', the transporter speed displayed is the simple average of the 'n' Sampling Quantity values.

If the Sampling Method is set to 'Weighted', the transporter speed displayed is the weighted average of the 'n' Sampling Quantity values, where the more recent samples are weighted more heavily than earlier samples.

Label: SAMPLING QUANTITY:
Type: Digit
Length: 2
Range: 1 - 20
Type: Integer
Default: 1
Status Line: Input sampling quantity in seconds (1-20)

The Sampling Quantity may be set to any value 1-20 in order to smooth the transporter speed displayed over a period of up to 20 samples rather than just one. Keep in mind that the higher the Sampling Quantity, the less "responsive" the speed display will be, but with higher accuracy, since it is a longer-term measurement.

Label: DUC CRUISE:
Type: Stored
Selections: DUC ONLY, ALWAYS
Default: DUC ONLY
Status Line: ARROW UP/DOWN to view cruise state list
Setting this value to DUC ONLY will make the DUC Cruise control setting only work when using the DUC camera. Setting the value to ALWAYS will make the DUC Cruise control setting work with all transporter types. See the section "Operating the DUC Cruise Function"

Label: CRUISE SPEED PERCENT:
Type: Digit
Length: 3
Range: 0-100
Default: 58
Status Line: Input cruise speed in Percent (0-100)
This value contains the cruise speed percent that will be used whenever the operator enters cruise control mode. See the section "Operating the DUC Cruise Function".

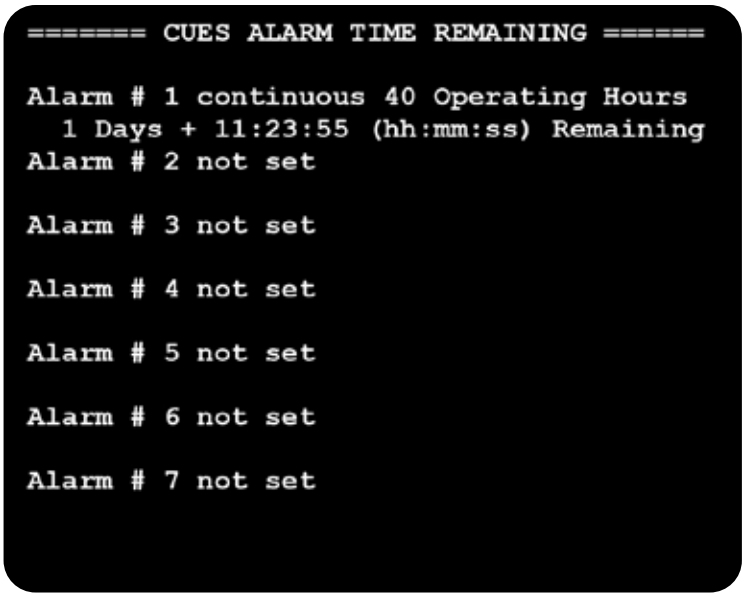
Label: SWAP JOYSTICKS
Type: Stored
Selections: NO, YES
Default: NO
Status Line: ARROW UP/DOWN to view joystick list
Setting this value to YES will cause the left analog stick to operate the camera and the right analog stick to operate the transporter on gamepads. If the mode button is pressed, the Dpad will control the camera.

02. SCREEN OPERATIONS - *CUSTOMIZABLE PARAMETERS*

Label: MPT/uPT/CAW RECONCT
Type: Digit
Length: 5
Range: 2000-99999
Default: 5000
Status Line: Input reconnect msec (0-99999)
Change the last line in this section to:
This value controls the delay in milliseconds between messages that the K2/K3 is attempting to reconnect to the Mini Pan and Tilt camera, Micro Pan & Tilt camera or Currahee Air & Water PCU. If set to 0, the Currahee Air & Water PCU will not display reconnect message.

Label: INCLINE THRU PRESSURE:
Type: Stored
Selections: NO, YES
Default: NO
Status Line: ARROW UP/DOWN for incline-pressure list
Legacy Prodata users that require inclination may now instead use a K2 CCU and bring their inclination data in through the pressure port on the back of the K2. Setting this value to 'YES', will cause the system to take an inclination value in through the pressure port on the back of the CCU.

02. SCREEN OPERATIONS - *ALARM TIME REMAINING*



Up to 7 timers are shown with their time remaining. Each timer occupies two lines of the display. On the first of the two lines is displayed whether the timer is continuous or one-time. A continuous timer, once reset, will begin again automatically. A one-time, once reset, will be cleared.

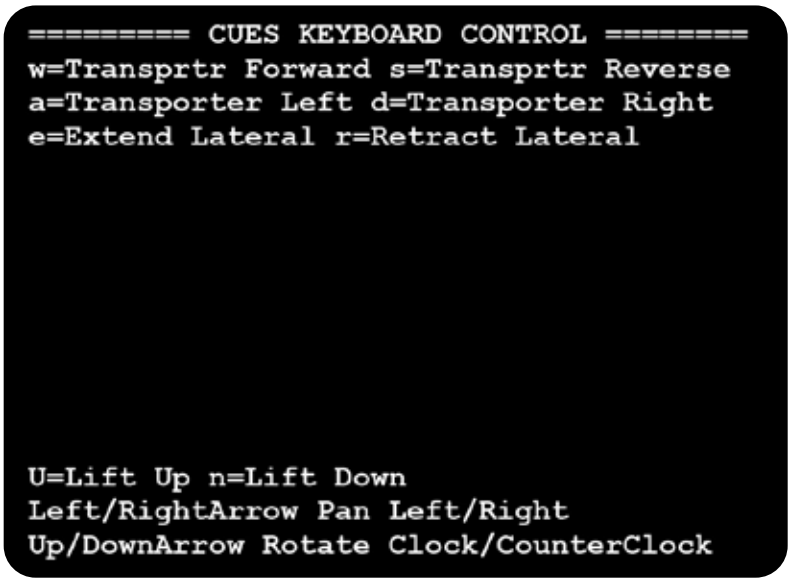
Next is displayed the number of units of time that the timer was originally set to, a number between 1 – 999.

After the number of units is whether the timer is based on Operating or Calendar time. Operating time only counts time that the system is running (power to the K2/K3). Calendar time counts time even when the system is powered down.

Finally is displayed the units, either Hours or Days.

The second line shows the amount of time remaining until the timer will go off. This is displayed in days + hours, minutes and seconds remaining.

02. SCREEN OPERATIONS - *KEYBOARD CONTROL*



The Keyboard Control screen is available for controlling a limited (subset) of transporter, camera, lift and LAMPII functions, without using a game controller. These keyboard controls could be used if the wireless gamepad stopped functioning (e.g. dead batteries) and there wasn't a wired gamepad available. In that situation, it would be desirable to retrieve the transporter which could be accomplished by first doing the following:
1. Lowering the lift, if one exists
2. Retracting the LAMPII if it is extended up a lateral
3. Moving the transporter in reverse enough to have the clutch disengage so that it could then be retrieved using only the reel (also known as free-wheel).

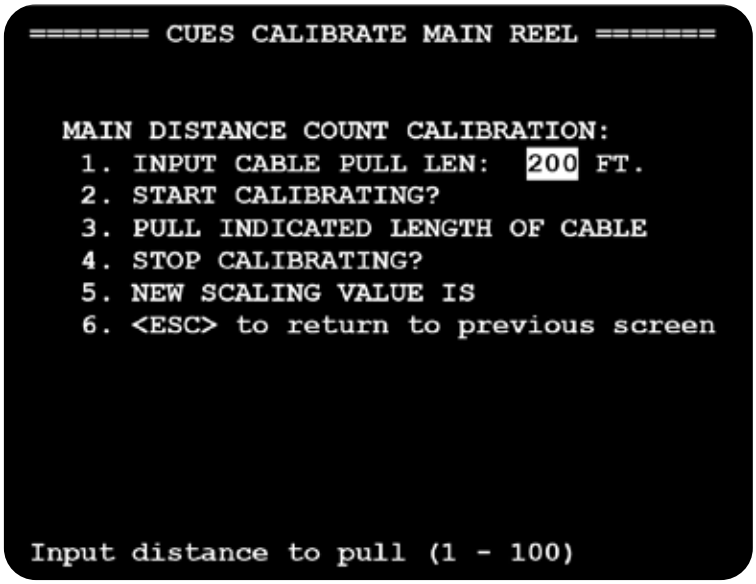
However, there are additional commands available that allow control of the transporter and camera that might also be useful for getting the transporter out of the pipe. Cues does not recommend keyboard control of the transporter for normal inspection of a pipe.

The screen will only display those functions available:
- options a and d will only work with steerable transporters
- options e and r will only work if a LAMPII is used for the transporter, and the view is set to the lateral
- options u and n will only work if the system has an electric lift

Commands require just a single keypress (no <SHIFT>, <ALT>, or <CTRL>). Commands are in effect as long as that particular key is held down. As soon as that key is released, the command is stopped. Multiple keys may be held at the same time. For example, a steerable transporter can be moved both forward and to the right by pressing the 'w' and 'a' keys simultaneously.
Movement of the transporter in all direction is done at 43% of the maximum voltage for that transporter (about 60V for a 140V transporter). So movements will not be very fast.

The Keyboard control screen is a video screen, so all actions may be viewed.
Some hot key combinations that are available on other video screens such as <ALT><CTRL><v> to change the view are available on the Keyboard Control screen.

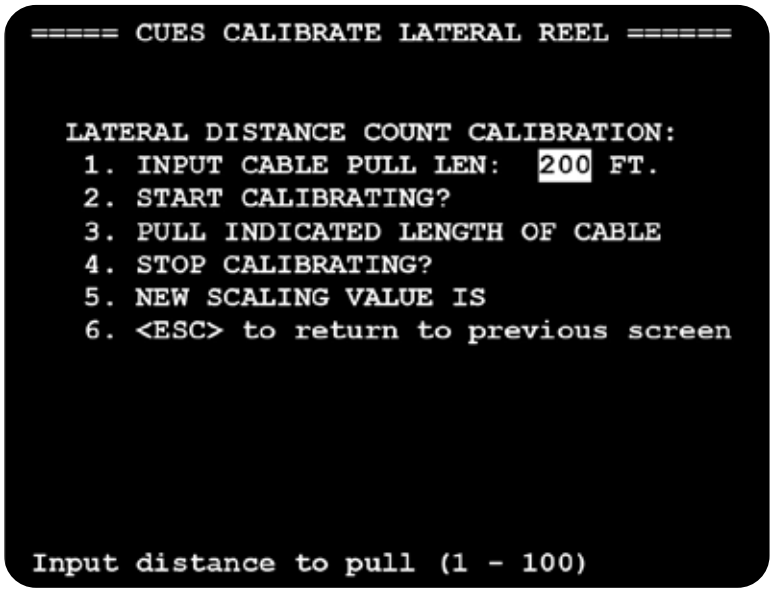
02. SCREEN OPERATIONS - *CALIBRATE MAIN REEL*



CALIBRATE MAIN REEL SCREEN DESCRIPTIONS

Label: 1. INPUT CABLE PULL LEN:
Type: digit
Length: 3
Range: 1 - 100
Type: Integer
Default: 100
Status Line: Input distance to pull (1 - 100)

02. SCREEN OPERATIONS - *CALIBRATE LATERAL REEL*



CALIBRATE MAIN REEL SCREEN DESCRIPTIONS

There is a CALIBRATE LATERAL REEL screen which is identical to the CALIBRATE MAIN REEL screen. It has all the same fields, but is used to calibrate the lateral reel. It is expected that this will rarely be necessary.

02. SCREEN OPERATIONS - *MINI/MICRO PAN & TILT FUNCTIONS*

```
= CUES MINI/MICRO PAN AND TILT FUNCTION==

          SONDE OUTPUT: ON
       SONDE FREQUENCY: 512 Hz
            MOTOR MODE: Unlimited
     FIRMWARE PROTOCOL: B
      FIRMWARE VERSION: R04
MINI PAN & TILT CAMERA DIAGNOSTICS?
CALIBRATE UPRIGHT POSITION?
PRESET ACTIVE 1
PRESETS SPOT FLOOD NAME
     1.   4     4
     2.   4     4
     3.   4     4
     4.   4     4
     5.   4     4
ARROW UP/DOWN to change sonde output
```

Label: SONDE OUTPUT
Type: Stored
Selections: OFF, ON , '---'
Default: ON
Status Line: ARROW UP/DOWN to change sonde output
The operator may use the <UPARROW> or <DOWNARROW> keys to change the setting to either OFF or ON. If the operation is unsuccessful due to a communication failure with the Mini or Micro Pan & Tilt camera, the field will display as '---'.

Label: SONDE FREQUENCY
Type: Stored
Selections: 512 Hz, 8 KHz, '----'
Default: 512 Hz
Status Line: ARROW UP/DOWN to change sonde frequency
The operator may use the <UPARROW> or <DOWNARROW> keys to change the setting to either 512 Hz or 8 KHz. If the operation is unsuccessful due to a communication failure with the Mini or Micro Pan & Tilt camera, the field will display as '----'.

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Label: MOTOR MODE
Type: Stored
Selections: Unlimited, Pan or Rotate, '----------'
Default: Unlimited
Status Line: ARROW/UP DOWN to change motor mode
The operator may use the <UPARROW> or <DOWNARROW> keys to change the setting to either Unlimited or Pan or Rotate. If the operation is unsuccessful due to a communication failure with the Mini or Micro Pan & Tilt camera, the field will display as '----------'.

Label: FIRMWARE PROTOCOL: B
Type: Read-only text field
Value Upon entry to this screen, the Mini or Micro Pan and Tilt's camera is queried and the value of the highest protocol that it supports is displayed. If the camera is unable to be read, this field is left blank.

Label: FIRMWARE REVISION
Type: Read-only text field
Value: Upon entry to this screen, the Mini Pan and Tilt's camera is read and the value of its firmware revision is written to this field. If the camera is unable to be read, this field is left blank.

Label: MINI/MICRO PAN & TILT CAMERA DIAGNOSTICS?
Type: Action
Status Line: <ENTER> to Mini/Micro Pan & Tilt Camera screen
Press <ENTER> to move to the Mini/Micro Pay & Tilt Camera screen.

Label: CALIBRATE UPRIGHT POSITION?
Type: Action
Status Line: <ENTER> to calibrate upright position
Press <ENTER> to set the current Mini/Micro Pan and Tilt Camera position as being calibrated.

Label: PRESET ACTIVE
Type: Digit
Length: 1
Range: 1-5
Type: Integer
Status Line: ARROW UP?DOWN to Select Lights Preset
This field selects which of the five preset lines that follow for setting the spot and flood lights for a Micro Pan & Tilt Camera. The Preset selected may be changed on this screen or through a keyboard hot key sequence, <CTRL><1>, <CTRL><2>,<CTRL><3>,<CTRL><4>, or <CTRL><5>

02. SCREEN OPERATIONS - *MINI/MICRO PAN & TILT FUNCTIONS*

Label: 1,2,3,4,5
Type: Stored
Selections: 0,1,2,3,4,5,6,7
Default: 4
Status Line: Arrow UP/DOWN to Set Spot 1 level
These 10 fields select the value for the spot or flood lights for the five different preset selections. Value 0 represents the light being off, whereas 7 represents the light at its brightest setting. The lights may be adjusted either by changing one of the preset lines on this screen or through a button/DPad combination on the gamepad. <SHUTTER><DPAD +/-> will raise/lower the floods and <IRIS><DPAD +/-> will raise/lower the spots.

When on the Run Time screen, the operator can change the Preset Active by inputting the key combination <CTRL><1>, <CTRL><2>, <CTRL><3>, <CTRL><4>, or <CTRL><5>. He may also increase or decrease the spot or flood lights by using the following gamepad key combinations:
<SHUTTER>+<DPAD +> Increase Floods
<SHUTTER>+<DPAD -> Decrease Floods
<IRIS>+<DPAD +> Increase Spots
<IRIS>+<DPAD -> Decrease Spots
The Flood and spot levels will be displayed showing 1-8 blinking cursor characters on the status line:
Flood Level:XXXXXXXX Spot Level:XXXXXXXX

02. SCREEN OPERATIONS - *MINI/MICRO PAN & TILT DIAGNOSTICS*

```
=== CUES MINI/MICRO P&T DIAGNOSTICS ===

      SONDE: ON       HUMIDITY:   25 %
 SONDE FREQ: 512 Hz       TEMP:  112  F
 SELF LEVEL: OFF       CURRENT:  150  mA
    PANNING: STOPPED PRESSURE: 0.0   PSI
   ROTATING: STOPPED  ACCEL X: 0.00  Gs
   FOCUSING: STOPPED  ACCEL Y: 0.00  Gs
        AJI: IDLE     ACCEL Z: 0.00  Gs
 PAN HOMING: IDLE     PAN TEMP: 70.0  F
OVER TILTED: NO    ROTATE TEMP: 70.0  F
 AT UPRIGHT: NO     PAN CURRENT:   50  mA
AT PAN HOME: NO   ROTATECURENT:   50  mA
 401 HEALTHY:YES SONDE CURENT:  550  mA
 BALLTMP: 86 F   FLOOD CURENT:   90  mA
                 SPOT CURRENT:   60  mA
```

Label: SONDE:
Type: Read-only Text Field
Value: ---, OFF, ON
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the status of the sonde. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to ---.

Label: HUMIDITY
Type: Read-only Text Field
Value : '---', 0-100%, 'INVLD '
The humidity in the Mini/Micro Pan and Tilt camera.
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to '---'. If the humidity returned is outside of the valid range, this field will be set to 'INVLD '. Note that humidity is not implemented in R040 but is there in preparation when new camera firmware is available.

Label: SONDE FREQ
Type: Read only Text Field
Value: ------, 512 Hz, 8 KHz
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the sonde frequency, regardless of whether sonde is turn on or not. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to ------.

02. SCREEN OPERATIONS - *MINI/MICRO PAN & TILT DIAGNOSTICS*

Label: TEMP
Type: Read-only Text Field
Value : '----', -99 to 99 C, 'INVLD '
The temperature in the Mini/Micro Pan and Tilt camera.
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to '----'. If the temperature returned is outside of the valid range, this field will be set to 'INVLD '. If the units system is set to an English dimension such as 'Feet' on the Customizable Parameters screen, temperature will be displayed in degree Farenheit. Note that temperature is not implemented in R040 but is there in preparation when new camera firmware is available.

Label: SELF LEVEL
Type: Read only Text Field
Value: ---, OFF, ON
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the self leveling feature of the camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to ---.

Label: CURRENT
Type: Read only Text Field
Value: '----', Integer number between 0 and 3000 indicating the number of milliamps that the camera is drawing. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

Label: PANNING:
Type: Read only Text Field
VALUE: -------, STOPPED, LEFT, RIGHT
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the panning feature of the camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to -------.

Label: PRESSURE
Type: Read-only Text Field
Value : ----, -99.99 to 99.99, 'INVLD '
The absolute pressure measured less 14.7 PSI is displayed after the value field to provided a reasonable estimate of how much pressure the Mini/Micro Pan and Tilt camera has. If desired, the operator may display the Mini Pan & Tilts absolute pressure on the Run Time screen by turning on the pressure display either on the Set Up Display screen, or using the <SHIFT><F9> hot key on the Run Time screen. Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This shows the status of the pressure of the camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to ----. If the pressure returned is outside of the valid range, this field will be set to 'INVLD'.

Label: ROTATING:
Type: Read Only Text Field
VALUE: -------, STOPPED, CW, CCW
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the rotating feature of the camera. CW is the abbreviation for clockwise and CCW is the abbreviation for counter-clockwise. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to -------.

Label: ACCEL X
Type: Read only Text Field
Value: '-----', Floating point number between -2.00 and 2.00 indicating the number of Gs (a measure of acceleration) that is measured in the X plane of the Mini/Micro Pan and Tilt camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this fields is set to '-----'.

Label: FOCUSING
Type: Read only Text Field
Value: -------, STOPPED,NEAR,FAR
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the focusing feature of the camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to -------.

Label: ACCEL Y
Type: Read only Text Field
Value: '-----', Floating point number between -2.00 and 2.00 indicating the number of Gs (a measure of acceleration) that is measured in the Y plane of the Mini/Micro Pan and Tilt camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this fields is set to '-----'.

Label: AJI
Type: Read only Text Field
Value: ------, IDLE, ACTIVE
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the automatic joint inspection feature of the camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to ------.

Label: ACCEL Z
Type: Read only Text Field
Value: '-----', Floating point number between -2.00 and 2.00 indicating the number of Gs (a measure of acceleration) that is measured in the Z plane of the Mini/Micro Pan and Tilt camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this fields is set to '-----'.

02. SCREEN OPERATIONS - *MINI/MICRO PAN & TILT DIAGNOSTICS*

Label: PAN HOMING
Type: Read only Text Field
Value: ------, IDLE, ACTIVE
Every 500 milliseconds, the Mini/Micro Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the homing feature of the camera. If the Mini/Micro Pan and Tilt camera is not able to be read, this field is set to ------.

Label: OVER TILTED
Type: Read only Text Field
Value: ---, NO, YES
Every 500 milliseconds, the Mini Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the over-tilted feature of the camera. If the Mini Pan and Tilt camera is not able to be read, this field is set to ---.

Label: AT UPRIGHT
Type: Read only Text Field
Value: ---, NO, YES
Every 500 milliseconds, the Mini Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the at upright feature of the camera. If the Mini Pan and Tilt camera is not able to be read, this field is set to ---.

Label: AT PAN HOME
Type: Read only Text Field
Value: ---, NO, YES
Every 500 milliseconds, the Mini Pan and Tilt camera is read and this field is updated based on the data returned. This field displays the state of the at home feature of the camera. If the Mini Pan and Tilt camera is not able to be read, this field is set to ---.

Label: 401 HEALTHY
Type: Read only Test Field
Value: ----, NO, YES
Every 500 milliseconds, the Micro Pan & Tilt camera is read and this field is updated based on the data returned. The field displays whether communications with the lights board is healthy.

Label: BALLTMP
Type: Read only Test Field
Value: '-----', Floating point number between 0.0 and 100.0 indicating the degrees Fahrenheit of the camera. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

Label: PAN TEMP
Type: Read only Test Field
Value: '-----', Floating point number between 0.0 and 100.0 indicating the degrees Fahrenheit of the pan motor that is measured in the Mini/Micro Pan & Tilt camera. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

Label: ROTATE TEMP
Type: Read only Test Field
Value: '-----', Floating point number between 0.0 and 100.0 indicating the degrees Fahrenheit of the rotate motor that is measured in the Mini/Micro Pan & Tilt camera. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

Label: PAN CURRENT
Type: Read only Test Field
Value: '----', Integer number between 0 and 3000 indicating the number of milliamps that the pan motor is drawing, measured in the Mini/Micro Pan & Tilt camera. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

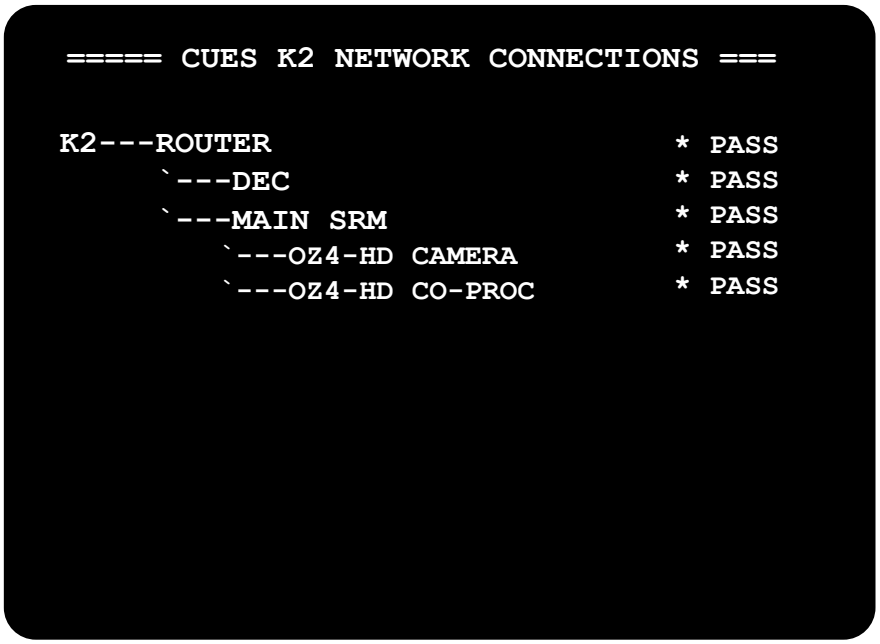
Label: ROTATECURENT
Type: Read only Test Field
Value: '----', Integer number between 0 and 3000 indicating the number of milliamps that the rotate motor is drawing in the Mini/Micro Pan & Tilt camera. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

Label: SONDE CURENT
Type: Read only Test Field
Value: '----', Integer number between 0 and 3000 indicating the number of milliamps that the sonde is drawing in the Mini/Micro Pan & Tilt camera. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

Label: FLOOD CURENT
Type: Read only Test Field
Value: '----', Integer number between 0 and 3000 indicating the number of milliamps that the flood lights are drawing in the Mini/Micro Pan & Tilt camera. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

Label: SPOT CURRENT
Type: Read only Test Field
Value: '----', Integer number between 0 and 3000 indicating the number of milliamps that the spot lights are drawing in the Mini/Micro Pan & Tilt camera. If the Mini/Micro Pan & Tilt camera is not able to be read, this field is set to '----'.

02. SCREEN OPERATIONS - *K2 NETWORK CONNECTIONS*



The K2 Network Connections screen provides the ability to test connectivity with other components in the system by pinging devices that support this diagnostic function.

This screen does not contain any tab-able or editable fields. Once the screen has been selected, values will be automatically updated on a continuous basis.

The K2 Network Connections screen tests all connections sequentially from upstream to downstream across three network levels, with all connections initially displaying unknown (blank) status. Testing follows a strict hierarchy: connections are only tested after their upstream parent achieves PASS status via successful ping tests, while failed connections cause all downstream paths to revert to unknown (blank) status.

A blank status indicates a connection has not yet been tested or cannot be tested because its upstream connection failed.

PASS means the ping test succeeded and the network connection is working.
FAIL means the ping test failed and the connection is not functioning.

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03. OPERATING THE SYSTEM

How to Operate the K2/K3 Controller: There are two basic controllers available for the K2/K3 system that can be used to operate the various transporters, cameras, lights, etc. for pipe inspection. They are the wired and wireless models of 'GamePad' controllers made by Logitech and/or Microsoft. Both of these controllers operate identically to each other to perform all of the same functions.

The following describes the functions that the attached equipment can perform, and how the controllers are operated to perform them. In the tables, items enclosed in square brackets, [], are the actual button names required to execute the various commands. If a button combination is required, both button names are shown with a plus sign, '+', between them to indicate they must be pressed simultaneously.

Driving the Transporter

Command	GamePad Controller
Drive Transporter	Move Left Joystick
Emergency Stop	Left Joystick Button (push down on the top)
Engage Cruise	[CRUISE]
Disengage Cruise	Move Left Joystick - or - Left Joystick Button (push down on the top)

Use the controller's left joystick to drive the transporter. For forward, push the joystick forward/up, and for reverse, pull the joystick backward/down. If driving a steerable transporter, move the joystick to the left to drive left, and move it to the right to drive right. The transporter joystick is an analog input, meaning the driving speed will vary based on how far the joystick is moved away from center.

To engage the standard cruise function, either: (a) use the joystick to get the transporter moving at the desired speed, and then press the 'Engage Cruise' button, or (b) hold down the 'Engage Cruise' button while adjusting the transporter speed with the joystick, and then release the 'Engage Cruise' button once the desired speed has been reached. The joystick may now be released, and the transporter will continue to drive at the set speed.

Disengaging the standard cruise function will cause the transporter to discontinue driving at the set speed. Pressing the 'Emergency Stop' button on the GamePad causes the transporter to stop immediately, while moving the left joystick out of the center position on either controller returns the transporter to a speed based on the joystick's position.

Operating the DUC Cruise Function:

Command	GamePad Controller
Turn DUC Cruise ON	[CRUISE] + [1]
Turn DUC Cruise OFF	[CRUISE] + [0] - or - Move Left Joystick - or - Left Joystick Button (push down on the top)
Start Transporter at Saved Speed (once DUC Cruise is on)	[CRUISE] + [+] OR [CRUISE] + [–]
Increase Transporter Speed	[CRUISE] + [+]
Decrease Transporter Speed	[CRUISE] + [–]
Save Transporter Speed	[LIFT] + [1]

An additional cruise control scheme is available, developed specifically for the Cues DUC Camera. The DUC Camera requires that the transporter be driven at a precise velocity for best picture quality, and the DUC Cruise function makes this much easier than the standard cruise function. Rather than using the left joystick to set the speed, a percentage of maximum speed can be sent to the transporter motors and varied incrementally up and down by a few percent using button combinations on the GamePad controller.

The Customizable Parameters screen includes two settings critical to the operation of the DUC Cruise function. These are:

DUC CRUISE: Set this to DUC ONLY, which is the default, to use the DUC Cruise function only when the front-viewing camera is set to “DUC”, and use the standard cruise function otherwise. Set this to ALWAYS to use the DUC Cruise function always, for all equipment configurations.

CRUISE SPEED PERCENT: The value in this field is the percent of the voltage that the transporter will be driven at initially. The value can be varied within the range of 0 to 100 percent, with a factory default of 58 percent.

03. OPERATING THE SYSTEM

Operating the DUC Cruise Function - continued:

Use the button combinations in the table on the previous page to control the DUC Cruise function. Please note that the transporter will not start moving just by turning the DUC Cruise function on. After the function is turned on, pressing either the 'Increase' or 'Decrease' speed button combination will start the transporter moving at the saved speed. Additional presses of the 'Increase' or 'Decrease' speed button combination will adjust the speed percent up or down, respectively, a few percent.

Turning off the DUC Cruise function will cause the transporter to discontinue driving at the set speed. Pressing the left joystick button or the 'OFF' button combination will cause the transporter to stop immediately, while moving the left joystick out of the center position returns the transporter to a speed based on the joystick's position.

Controlling the Reel

Command	GamePad Controller
Turn Automatic Payout ON/OFF	[REEL] + [0]
Turn Automatic Retrieve ON/OFF	[REEL] + [1]
Increase Payout or Retrieve Speed	[REEL] + [+]
Decrease Payout or Retrieve Speed	[REEL] + [–]

A complete description of reel functions and associated controller usage can be found in the "Operating the K2 Reel" section of this manual.

Moving the Camera

Command	GamePad Controller
Move Camera	Move Right Joystick ('CAMERA')
All Home	Right Joystick ('CAMERA') Button (push down on the top)

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Use the controller's right joystick, labeled 'CAMERA', to maneuver the camera. Pan & tilt cameras have two axes of movement: the linear pan axis, which may be side-to-side or up and down, depending on camera installation, and the rotational tilt axis, which is clockwise and counter-clockwise. In a "standard" camera installation, forward/up and backward/down movements (Y-axis) of the camera joystick cause the camera head to rotate clockwise and counter-clockwise, respectively, while left and right (X-axis) movements cause left and right panning. However, using a LAMP II camera or other "rotated" camera installation reverses the camera joystick's axes, so the X-axis controls tilting, while the Y-axis controls panning. Please refer to your specific camera's Operational Manual for further details.

"Homing" the camera is a term that means moving it automatically to the center of its range of motion. The homing feature available on the controller is the "All Home" function, which drives the camera head to its home region in both the pan and tilt axes, i.e. straight-ahead and level with the horizon for forward-facing cameras. At the same time, "All Home" also returns the Zoom, Shutter, and Iris camera parameters to their preset levels.

NOTE: The first homing operation after power-up may take longer than usual due to the camera head moving in the wrong direction initially. This is normal; the camera head will automatically reverse its direction after nine seconds without sensing the home region.

03. OPERATING THE SYSTEM

Controlling the Camera's Zoom

Command	GamePad Controller
Adjust Zoom IN	[ZOOM] + [+]
Adjust Zoom OUT	[ZOOM] + [–]

Press the "Adjust Zoom IN" button combination to zoom towards 'Telephoto', making more distant objects appear larger, and the "Adjust Zoom OUT" button combination to zoom towards 'Wide-Angle', reducing the size of foreground objects. If available on the camera being used, and turned on in the "Parameter Setup" screen, the digital zoom feature is controlled with the same controller buttons as the standard optical zoom. When the limit of the optical zoom is reached while zooming IN, the digital zoom activates, and continues zooming. Conversely, the limit of the digital zoom is reached first while zooming OUT, so it is then deactivated, and optical zooming continues.

Controlling the Camera's Focus

Command	GamePad Controller
Adjust Focus NEAR	[FOCUS] + [+]
Adjust Focus FAR	[FOCUS] + [–]
Activate Autofocus Feature	[FOCUS] + [1]

Upon power-up of the system, the camera will be in 'Autofocus' mode, if enabled in the "Parameter Setup" screen. Pressing either "Adjust Focus NEAR" or "Adjust Focus FAR" turns off the 'Autofocus' feature, allowing the focus to be adjusted manually. Use the "Adjust Focus NEAR" button combination to focus on an object closer to the camera, and the "Adjust Focus FAR" button combination to focus on an object farther away from the camera. After any manual adjustment, the 'Autofocus' feature will remain off, and the focus will remain constant until either the camera head is moved using the right joystick ('CAMERA'), or the "Activate Autofocus Feature" button combination is pressed.

Controlling the Camera's Iris

Command	GamePad Controller
OPEN Iris	[IRIS] + [+]
CLOSE Iris	[IRIS] + [–]

The camera's iris limits the amount of light that reaches the video image sensor, controlling how bright or dim the video image appears. Press the "OPEN Iris" button combination to open the iris, which will increase the aperture and make the image brighter. Press the "CLOSE Iris" button combination to close the iris, which will decrease the aperture and make the image dimmer. For example, opening the iris may be needed when looking down the center of the pipe, but closing it may be required when looking sideways at a pipe wall with the lights on.

Controlling the Camera's Shutter

Command	GamePad Controller
Increase Shutter Speed	[SHUTTER] + [–]
Decrease Shutter Speed	[SHUTTER] + [+]

The camera's shutter speed is a measure of how long the video image sensor "sees" the image for each frame of the video. Increasing the shutter speed shortens the exposure times, while decreasing the shutter speed lengthens the exposure times, of each frame. A short exposure time allows less light to be received, but captures sharper images of fast-moving objects, while a long exposure time allows more light to be received, but results in more motion blur. During a pipe inspection, often the subjects in the video are stationary, so the shutter speed can be used in combination with the iris to achieve optimal brightness/exposure of the video.

Controlling the Lights

Command	GamePad Controller
Turn Camera Lights ON	[LIGHTS] + [1]
Turn Camera Lights OFF	[LIGHTS] + [0]
Increase Brightness of Lights	[LIGHTS] + [+]
Decrease Brightness of Lights	[LIGHTS] + [–]

Using the GamePad controller, the system's lights can be turned ON and OFF as necessary during an inspection. Note that this feature is supported by most integrated camera lights, but not supported by most external lights. In addition, some light sets can also be brightened and dimmed. Please refer to the documentation that came with your specific camera/lights for further information.

For those lights with adjustable brightness, upon power-up, the lights voltage is set to its minimum level, i.e. minimum lights brightness. Pressing the "Increase Brightness" button ramps the voltage upward toward the maximum level, thus increasing the brightness. Pressing the "Decrease Brightness" button ramps the voltage downward toward the minimum level, thus decreasing the brightness.

03. OPERATING THE SYSTEM

Switching Camera Views

Command	GamePad Controller
Select Front-View Camera Video	[VIEW]
Select Rear-View/Lateral Camera Video	[VIEW]

The default video source shown on the K2/K3's primary display at power-up is the Front-View Camera. If you are using the LAMP II system or if a Rear-View Camera is installed on your transporter, the option to switch the view on the primary display to an alternate video source becomes available. Using the Gamepad controller, repeated presses of the 'VIEW' button will cycle through all of the cameras that are present in the system in the following order: 1. Front-View Camera, 2. Lateral Camera (LAMP II only), and 3. Rear-View Camera.

Displaying Diagnostic Messages

Command	GamePad Controller
Display Diagnostic Messages	[DIAGNOSTICS]

Most CUES Cameras have the capability of superimposing a series of diagnostic messages over the live video, so they can be viewed while on the Run-Time Screen. Displayed over the Main Camera video, the diagnostic messages contain various bits of information about the system from the perspective of the transporter and camera. Different cameras contain different sets of messages, so please consult your specific camera's Operation Manual for a list of messages it displays, along with detailed descriptions of them.

The means for controlling the display of the diagnostic messages, however, is the same for all cameras. Press the "Display Diagnostic Messages" button to initiate the series of diagnostic messages. With no further controller action, all of the messages will automatically be displayed, in succession, for approximately three seconds each. While the diagnostic messages are being displayed, the "Display Diagnostic Messages" button can be used to skip ahead to the next message in the series, bypassing the standard three-second display time.

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Operating the Electronic Lift

Command	GamePad Controller
Move Lift UP	[LIFT] + [+]
Move Lift DOWN	[LIFT] + [–]

The height of an electronic lift can be adjusted at any time using the controller, as opposed to a manual lift, which must be adjusted by hand before the transporter enters the pipe. Use the "Move Lift UP" and "Move Lift DOWN" button combinations to set the camera to the desired height.

Operating the LAMP II System

Note: The table below shows the controller commands that are unique for the LAMP II. The rest of the controller functions for the LAMP II system, including manipulating the camera and driving the transporter, are executed the same way as for all other transporter/camera combinations. LAMP II systems that use a Pan & Tilt lateral camera have some additional GamePad functionality, as described in the sections that follow.

Command	GamePad Controller
Extend Lateral Camera	[LIGHTS]
Retract Lateral Camera	[REEL]

LAMP II usage is separated into two operational modes: Mainline Mode, which is used for maneuvering the transporter through the mainline, and Lateral Mode, which is used for making lateral inspections. The system is in Mainline Mode whenever the primary monitor is displaying either the Front-View or Rear-View Camera video, since both of these provide views of the mainline. The system is in Lateral Mode when the primary monitor is displaying video from the Lateral Camera. The following highlights the operational differences between the two modes:

Mainline Mode

- Front-View or Rear-View Camera video on primary monitor
- Standard controller operation: "Extend Lateral Camera" and "Retract Lateral Camera" buttons operate their standard, non-LAMPII-specific functions, not the lateral camera
- Transporter joystick under normal operation

03. OPERATING THE SYSTEM

Lateral Mode

- Lateral Camera video on primary monitor
- Alternate controller operation: "Extend Lateral Camera" and "Retract Lateral Camera" buttons operate the lateral camera, and their standard, non-LAMPII-specific functions are temporarily disabled
- Transporter joystick scaled down for "braking" and gentle maneuvering

Extending/Retracting the Lateral Camera

There are two speeds available for extending and retracting the lateral camera: FAST, which is approximately 20 feet/second, and SLOW, which is approximately 10 feet/second. The first time either the "Extend Lateral Camera" or the "Retract Lateral Camera" button is pressed, the camera will move at FAST speed. It will continue moving in the desired direction as long as the button is held down, stopping when the button is released. Press the same button again to move the camera at SLOW speed. Subsequent presses of the same button will continue alternating the speed in this way, FAST, then SLOW, then FAST again, etc. However, when the direction of the Lateral Camera movement is changed, i.e. extend to retract or retract to extend, the initial speed will be FAST, regardless of the previous speed.

Maneuvering the Transporter in Lateral Mode

It is possible, due to friction between the Lateral Camera/Cable and the lateral's interior surface, for the transporter to begin to roll backwards while the Lateral Camera is being extended. To counteract this movement, a low voltage should be applied to the transporter wheels to act as a "brake", preventing them from turning. If you find that your LAMP II transporter is slightly out of position and the Lateral Camera misaligned with the lateral, a moderate voltage should be applied in order to gently drive the transporter to the proper spot. In its normal state, however, the transporter joystick easily applies enough voltage to drive the transporter at full-speed, which is not desirable while the Lateral Camera is extended into the lateral or if the transporter is out of place by only a small amount.

For these reasons, when the LAMP II unit is switched into Lateral Mode, the transporter joystick is scaled down to make it easier to apply low "braking" or moderate "repositioning" voltages. Moving the scaled joystick approximately half-way forward applies a low voltage to the transporter wheels that will neutralize any backward motion. Moving the scaled joystick to full extension applies a moderate voltage that will propel the transporter in either direction, but at a reduced, more controlled speed. Long-term "brake" application can be done either manually, by holding the transporter joystick in position, or automatically, by utilizing the cruise function (refer to the "Driving the Transporter" section of this manual for more information).

Note: If the transporter joystick is out of center when switching modes on the LAMP II, the joystick scaling/unscaling will not occur until the motor voltage is reduced to zero. This prevents the transporter from "lunging" due to an abrupt change in the transporter voltage.

Operating the LAMP II System with a Mini Pan & Tilt Camera

Note: The table below shows the controller commands that are unique for the LAMP II with a Mini Pan & Tilt camera. The operator must have already selected lateral mode by pressing the View button before any of these functions will work.

Command	GamePad Controller
Move Camera	Move Right Joystick ('CAMERA')
Adjust Focus NEAR	[FOCUS]+[+]
Adjust Focus FAR	[FOCUS]+[-]
Automatic Joint Inspection	[LIFT]
All Home	Right Joystick ('CAMERA') Button (push down on the top)
Move Mainline Camera	[CRUISE]+Right joystick ('CAMERA')

When operating the MPT camera pressing the CRUISE button while moving the camera joystick will allow the operator to move the mainline camera. Moving the mainline camera changes the angle at which the lateral launch camera is aimed at the lateral so switching back and forth between the two makes for a much easier lateral insertion.

03. OPERATING THE SYSTEM

Operating the LAMP II System with a Micro Pan & Tilt Camera:

In addition to all the controls that exist when operating a Mini Pan & Tilt Camera, the Micro Pan & Tilt Camera adds the following controls.

Command	GamePad Controller
Raise Flood Lights	[SHUTTER] +[+]
Lower Flood Lights	[SHUTTER] +[-]
Raise Spot Lights	[IRIS]+[+]
Lower Spot Lights	[IRIS]+[-]

Operating the Currahee Cutter

The following controls below are available when operating the Currahee cutter.

Command	Gamepad Controller
Toggle Air On/Off	[DIAGNOSTICS]+[IRIS]+[0]
Toggle Water On/Off	[DIAGNOSTICS][IRIS]+[1]
Toggle Camera View	[VIEW]
Toggle Driving/Cutting Mode	[LIFT]
Move Cutter Up/Down	Move Left Joystick 'TRANSPORTER' Vertically
Move Cutter Counterclockwise/Clockwise	Move Right Joystick 'CAMERA' Vertically
Drive/Move Cutter Forward/Reverse	Move Right Joystick 'CAMERA' Horizontally
Increase Up/Down Cutting Speed	[IRIS]+[+]
Decrease Up/Down Cutting Speed	[IRIS]+[-]
Increase Counterclockwise/Clockwise Cutting Speed	[SHUTTER]+[+]
Decrease Counterclockwise/Clockwise Cutting Speed	[SHUTTER]+[-]
Increase Forward/Reverse Cutting Speed	[FOCUS]+[+]
Decrease Forward/Reverse Cutting Speed	[FOCUS]+[-]
Focus Nearer	[ZOOM}+[+]
Focus Further	[ZOOM]+[-]
Pan Up	[DIAGNOSTICS]+[+]
Pan Down	[DIAGNOSTICS]+[-]
Pan Home	Right Joystick 'CAMERA' Button (push down on the top)

03. OPERATING THE SYSTEM

Operating the RV-HD

The RV-HD provides an artificial horizon display and a diagnostics pane. To use these features, an RV-HD camera must be installed, and the REAR CAMERA field on the Equipment Configuration screen must be set to DIGITAL.

Displaying the Artificial Horizon

Press <CTRL><k> on the keyboard to toggle the artificial horizon display on or off. The artificial horizon can be displayed while viewing either the front or rear camera.



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Viewing RV-HD Diagnostics

While viewing video from the RV-HD, press the DIAGNOSTICS button on the GamePad controller to open the RV-HD diagnostics pane.

The pane displays the following information:

- Firmware version
- Serial number
- Hours
- Humidity
- Temperature

Press the DIAGNOSTICS button again to close the pane. If the button is not pressed, the pane closes automatically after 15 seconds.



03. OPERATING THE SYSTEM

How to Create an Inspection Report

1. Power up the K2/K3 system.
2. Move to the Main Menu Screen (Pressing <ESC> from most screens will move to this screen.
3. From the Main Menu Screen select Set Up Inspection Screen.
4. On the field labeled 'ACTION:', use the <UPARROW> or <DOWNARROW> to set the field to 'CREATE?'
5. Press <ENTER> to begin the creation process. The cursor moves to the PIPE ID field.
6. The three fields labeled 'PIPE ID:', 'MANHOLE UP:' and 'MANHOLE DOWN:' need to be filled in to define a 'pipe segment'. The system will not let the same PIPE ID be used twice. (A MANHOLE UP or MANHOLE DOWN could be part of two different pipe segments).
7. Once the three fields are filled in, the field labeled 'FILE:' will be filled in with a name created containing the current date and time as YYMMDDHHmm.
8. Some additional fields may be filled in by setting the 'ACTION:' field to 'VIEW/EDIT?', pressing <ENTER> which will move to the More Set Up Inspection screen. None of these fields have to be filled in, but should be in order provide more information to be included in the report created. Press <ESC> to exit the More Set Up Inspection screen.
9. Move to the Run Time Screen. (If on the Set Up Inspection screen, this can be accomplished by pressing <F5>.)
10. Any observations input on the Run Time screen through the observation facility (see section Adding an Observation) will be written into the inspection file of the name that was shown in the FILE:field (with .txt appended to it). The file will be written to D:\InspectionFiles.

See the section 'Adding an observation' for information on how to add observations on the Run Time screen. See section on 'Copying Inspection Files to a removable drive' and Copying ID Database to a removable drive for information on how to access the inspection files in order to print them on another computer.

If the system is turned off and later turned on, in order to continue appending to this same file, the following must be done:

1. Move to the Set Up Inspection Screen,
2. Set the 'ACTION:' field to VIEW/EDIT.
3. Move to the 'FILE:' field. Use the <UPARROW> or <DOWNARROW> to set the field to the filename desired and press <ESC>.
4. Go to the Run Time screen and now any observations you enter will be appended.

Adding An Observation

There are two ways to add an observation on the Run Time Screen. One method requires that the operator know the observation code (often a two or three-letter abbreviation for the observation). The other only requires scrolling through a list using the <UPARROW> and <DOWNARROW> keys.
The steps for using an observation code are:

1. On the Run Time Screen, press <SHIFT><F2> to enter observation mode. An asterisk (*) will appear on either the top or bottom line of the display.

2. Type in an observation code. For example, if using the CUES inspection code set, type PCR for Pipe,Corrosion. As soon as enough characters have been typed to uniquely identify that code, the system will display the corresponding comment. If there is another similar code with more letters, you may need to type in a spacebar in order to distinguish between the two. For example, if there are codes ABC and AB, in order to reach code 'AB', type in 'a', 'b', '<SPACEBAR>'. To reach code 'ABC', type in 'a', 'b', 'c'.
3. At this point the comment will be displayed in place of the code typed in, but nothing has been saved to a data file. To save the observation, press <ENTER>.
4. Whether or not the obsevation is saved, the operator may continue typing in observation codes and receiving observation comments.
5. To exit from the observation mode press <SHIFT><F2>

The steps for using the <UPARROW> and <DOWNARROW> keys are:

1. On the Run Time Screen, press <SHIFT><F2> to enter observation mode. An asterisk (*) will appear on either the top or bottom line of the display.
2. Press <ENTER>. The first observation comment will be displayed.
3. Press <UPARROW> or <DOWNARROW> to move through the list of comments which are arranged alphabetically based on the observation codes.
4. To save an observation, press <ENTER>.
5. To exit from the observation mode press <SHIFT><F2>

Copying Inspection Files to a Removable Drive

The steps for copying inspection files to a removable drive which may then be moved to a computer attached to a printer are:

1. From the Main Menu Screen select Utilities.
2. From the Utilities Screen select Removable Drive Functions.
3. From the Removeable Drive Functions screen select Copy Inspection Files.
4. nsert a removable drive into the front of the K2/K3.
5. Select COPY INSPECTION FILES from this screen and it will write the inspection files to the removable drive.
6. After it finishes copying the inspection files press <TAB> to move to the EXIT field.
7. From the Exit Field, press <ENTER> to return to the Removable Drive Functions screen.

The removable drive may be then moved to a computer that has a printer attached.

The format of the files on the removable drive are as follows:
Name of file: YYMMDDHHmm.txt
Where:
YY = last two digits of year
MM = two digit month
DD = two digit day of month
HH = two digit hour
mm = two digit minute

03. OPERATING THE SYSTEM

Line 1 – Time and Date separated by a '|' character
Line 2 – Pipe ID
Line 3 – Manhole Up
Line 4 – Manhole Down
Line 5 –15, one field per line:
City
Location
Pipe
Operator
Tape ID
Start
Title
Direction
Length
Comment 1
Comment 2
Line 16 'F' or "M' (feet or meters) separated by a '|' character, followed by 'D' or 'G' (degrees or gradients) separated by a '|' character, followed by 'P' or 'B' or "M' (psi, bars or millibars)
Line 17 – n line containing the observation comment in the format:
Date, Time, Distance, Incline, Pressure, Observation Comment with each separated by a '|'character.

Copying Inspection Database to a Removable Drive

The steps for copying the inspection database to a removable drive which may then be moved to a computer attached to a printer are:

1. From the Main Menu Screen select Utilities.
2. From the Utilities Screen select Removable Drive Functions.
3. From the Removable Drive Functions screen select Copy ID Database File.
4. Insert a removable drive into the front of the K2/K3.
4. Select COPY ID DATABASE from this screen and it will write the ID Database to the removable drive.
5. After it finishes copying the ID Database press <TAB> to move to the EXIT field.
6. From the Exit Field, press <ENTER> to return to the Removable Drive Functions screen.

The removable drive may be then moved to a computer that has a printer attached. The format of the files on the removable drive are as follows:
Name of file: ID.txt
Lines 1-n
pipeid |manholeup |manholedn |Inspection Filename.TXT

Connection to Granite XP or GraniteNet - Legacy

Use this procedure for a legacy serial connection to Granite XP or GraniteNet. This method requires a computer with a serial communications port, or a USB port with a USB-to-serial cable and the associated software drivers.

1. Connect a NULL Modem serial communications cable between the COM2 port on the K2/SUMMIT/MARK3 system and the serial port of the computer that is to run the Granite XP or GraniteNet software.



2. Power up the Granite XP or GraniteNet computer.

3. Power up the K2/SUMMIT/MARK3 system..

4. On the K2/SUMMIT/MARK3 system, move to any screen EXCEPT the Equipment Configuration Screen or Configure Reels screen. Prior to connecting to Granite XP or GraniteNet, the K2/SUMMIT/MARK3 can be on any screen other than these two.

5. On the Granite XP or GraniteNet computer, execute the Granite XP or GraniteNet program.

6. If this is the first time this computer has been connected to the K2/SUMMIT/MARK3, the following setup will need to be done on the Granite XP or GraniteNet computer:
   - The titler type must be set to K2.
   - A communications port needs to be set up to be used and its baud rate set to 19200.
   - The type of measurement units for distance (mainline and/or lateral), inclination and pressure to be used need to be set.
   - Please consult your Granite XP or GraniteNet Operator's manual for information on how to configure these settings.

7. Once Granite XP or GraniteNet has been configured, its software will communicate with the K2/SUMMIT/MARK3 system. If running Granite XP, the K2/SUMMIT/MARK3 will immediately change to the Granite XP Screen (initially blank) and then will display those fields directed to by the Granite XP system (typically date, time, distance). If running GraniteNet, the K2/SUMMIT/MARK3 will immediately change to the Run Time screen, and does not display any data from GraniteNet. At this time, the K2/SUMMIT/MARK3 system has been taken over by Granite XP or GraniteNet software. Granite XP or GraniteNet will be in control unless the K2/SUMMIT/MARK3 takes control back – see the section "Temporarily Returning Control to the K2/SUMMIT/MARK3".

8. Consult the Granite XP documentation for how to modify the display on the K2/SUMMIT/MARK3.

03. OPERATING THE SYSTEM

Connecting to GraniteNet Using K2 Prime in Digital Platform System

Starting with K2 firmware version 03.01.00, use this procedure if your GraniteNet version supports the K2 Prime connection method. If your GraniteNet version does not support this method, use the legacy procedure on the previous page.

1. Power up the GraniteNet computer.

2. Power up the K2 system.

3. On the computer, start GraniteNet.

4. If this is the first time this computer has been connected using this method, configure the following settings in GraniteNet:

   - Set the titler device to K2 Prime.
   - Click Settings to open K2 Prime Settings.
   - Set Broker IP to 172.25.0.150.
   - Set Broker port to 1883.
   - Click OK to save the broker settings.
   - Set the measurement units for distance (mainline and/or lateral), inclination, and pressure.
   - Please consult your GraniteNet Operator's Manual for information on how to configure these settings.

5. Once GraniteNet has been configured, its software will communicate with the K2 system. The K2 will change to the Run Time screen and will not display any data from GraniteNet.

   GraniteNet will remain in control unless the K2 takes control back. See "Temporarily Returning Control to the K2."

6. Consult the GraniteNet documentation for instructions on modifying the display on the K2. K2"

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03. OPERATING THE SYSTEM

Temporarily Returning Control to the K2/K3

When running GraniteXP, the operator is able to temporarily exit from the GXP screen using <ESC> ,<F1>, or <CTRL><ALT><g>. The message 'Moving from GXP screen' is displayed at this time. Upon exiting, communications between the GXP and K2/K3 continue although the K2/K3 will ignore any GXP command that attempts to modify the K2/K3 display with the exception of the Auto Payout and Retrieving Transporter messages.

The operator is then free to make changes to parameters on the K2/K3 and return to the GXP screen when he desires.

While the operator is on any K2/K3 menu screen (after leaving the GXP screen while in GraniteXP or leaving the Run Time screen while in GraniteNet),, the letters 'G', 'R', 'A', 'N', 'I', 'T', 'E' will be flashed on and off the top line of the display in column 38 (to the left of the 'alive' indicator). A new Main Menu screen selection 'RETURN TO GRANITE' has been added so that the operator can return at any time to the GXP screen or Run Time screen, and in the case of GraniteXP, resume seeing GXP update the K2/K3 titler. However, upon return to the GXP screen, it will initially be cleared until GXP starts sending commands once again to update it.

Pressing <ESC> from the GXP screen or Run Time screen will move the operator to the Main Menu screen.

Pressing <F1> from the GXP screen will move the operator to the GXP Help screen.

Pressing <CTRL><ALT><g> from the GXP screen will move the operator to the Equipment Configuration screen. From the Equipment Configuration screen, the operator can move back to the GXP screen by again pressing <CTRL><ALT><g> assuming that the Configuration Correct field has been set to 'YES?'

Since GraniteNet does not display data on the K2/K3's titler, the operator may move to any K2/K3 screen other than the Equipment Configuration or Configure Reels screen and the K2/K3 will continue to respond to GraniteNet's request for distance, inclination or other information.

Upgrading Firmware Releases

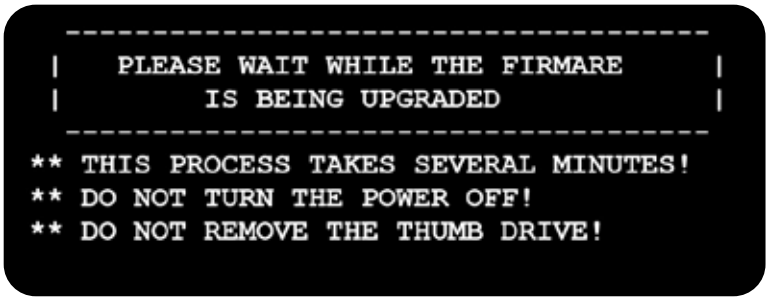
Note: Only Administrators can perform the firmware upgrade. Becoming an Administrator is not discussed here.

Insert a removable drive into one of the available USB ports on the K2/K3. This removable drive should contain the upgrade files in the root directory of this drive. The procedure for getting copies of the upgrade files is available by contacting CUES Customer Service.

Wait 15 seconds for the system to recognize that there is a new USB device installed.

Move to the Copyright screen, available from the Main Menu screen. Press the key combination <CTRL><ALT><u>

Almost immediately, the screen will change to:



The system will copy in the new firmware release from the thumb drive and then reboot.

At the conclusion of the reboot, the system will now be running the new firmware release. This can be verified by viewing the release number on either the Copyright screen or the Equipment Configuration screen. The entire time for copying/rebooting/loading the new firmware can take a couple of minutes.

Carefully check all of the settings before exiting the Equipment Configuration screen with the Configuration Correct field set to 'YES?'.

03. OPERATING THE SYSTEM

Using A Gamepad To Simulate The Keyboard

The gamepad may be used to initiate certain keyboard functions. This feature was implemented in order to allow operators to make selections on K2 menu screens while at the back of the truck away from the keyboard. However, since it essentially turns the gamepad into a pseudo keyboard, while in this mode the gamepad no longer can be used for its normal functions when on a video display.

To prevent the operator from accidentally either entering the simulation mode or performing a keyboard operation while in simulation mode, two or more gamepad buttons (including the DPad) must be held down simultaneously for anything to happen.

To enable/disable the keyboard simulation function, the operator must hold down simultaneously the three buttons 'LIFT', 'IRIS', and 'FOCUS' . A status message will be displayed: either "Gamepad can perform keyboard functions" or "Gamepad can't perform keyboard functions".

When enabled, the gamepad has the ability to generate the following keyboard equivalences:

Gamepad Combination	Keyboard Equivalent
DIAGNOSTICS + DPAD[+]	<SHIFT><TAB>
DIAGNOSTICS + DPAD[-]	<TAB>
DIAGNOSTICS + DPAD[0]	<UPARROW>
DIAGNOSTICS + DPAD[1]	<DOWNARROW>
DIAGNOSTICS + SHUTTER	<ESC>
DIAGNOSTICS + ZOOM	<ENTER>
DIAGNOSTICS + IRIS	set preset distance
DIAGNOSTICS + FOCUS	zero distance
ZOOM+FOCUS+SHUTTER+IRIS =	<CTRL><ALT><a>

Note that this last combination will allow the operator to become Administrator only if on the SPEAKER ON/OFF field of the Equipment Configuration screen.

Operating the K2 Reel

Cable Reel Operation – a cautionary statement

As with any piece of motorized industrial equipment, the cable reel poses risks to both equipment and personnel. While every effort has been made to ensure that this equipment is as safe as possible to operate, elevated caution is advised. Keep hands well clear of the rotating reel and the moving cable. Long hair, long beards, loose-fitting clothing, necklaces, neckties, and the like pose similar hazards to personal safety. Ensure that the cable's path is unhindered and keep personnel away from the cable when it is in motion. While payout of the cable is limited by transporter speed, retrieval is limited only by reel speed, which can approach or exceed 100 feet/minute. Without getting into the Newtonian physics of it, there are hundreds of pounds of equipment in motion, which "want" to remain in motion very, very much in spite of anything or anybody getting in its way.

A possible scenario would be the retrieval of a transporter in freewheel at maximum reel speed and, for whatever reason, the transporter becomes jammed in place in the pipe. This could easily occur by the transporter hanging up on a pipe offset. In an instant a portable reel could conceivably sweep from the ground and propel itself toward the manhole before becoming wedged therein. To preclude this occurrence, the anti-rollover braces should be secured to both the manhole's top-hole equipment and the reel itself. Should conditions ever prevent the use of the anti-rollover braces, ensure the reel's power cord will unplug if the reel begins to move towards the manhole entry. This can be done quite simply by tying off the supplying extension cord to a fixed object after minimizing any slack in the extension cord and reel power cord – when the reel moves, the cords will become more and more taut until they unplug and the electrical connection is broken.

Another result could be the fracture of the cable itself as would be more likely on a truck-mounted rather than a portable reel system where the sheer mass of the truck would prevent reel movement from its mounts, assuming the mounts are in place. Because the cable's pull strength is ordinarily quite large, such an occurrence has been observed to actually pull the rear of a full sized truck almost to the ground before stalling the reel motor. Setting the emergency brake in the truck is another good precaution, for the reel equipment is quite robust and certainly capable of moving a truck not otherwise restrained therefrom.

A large red mushroom-head pushbutton switch is provided on the reel controller panel labeled "Emergency stop." This function is independent of the mode in which the reel is being operated – it is hardwired and failsafe. Depressing this button at any time removes all power from the reel. While no further electrical energy will be feeding into the reel system, the rotating reel will still possess sizable kinetic energy; that is to say, the reel will "want" very, very much to continue rotating. The reel's energy will then dissipate rather quickly and the system will come to a stop. To reset the switch, turn the mushroom head clockwise and it will pop back out. Other methods of stopping the reel exist but are not failsafe because the circuits could possess a single undetectable failure, which would preclude performance of this emergency power cut off. Use the mushroom-head emergency stop button at any sign of trouble!

03. OPERATING THE SYSTEM

Operating the K2 Reel - continued

Manual Cable Reel Payout

The cable reel can be operated in a fully manual method, which might be appropriate during the initial set up at a site as the transporter is moved from truck to pavement and finally lowered into the manhole and inserted into the line. Other special circumstances may arise also where precise manual control of the reel seems beneficial. Too, it may merely be an operator preference.

1. Set the reel speed dial to minimum speed (i.e., zero speed).
2. Power on the cable reel controller.
3. The light within the "Press for local control" pushbutton will illuminate to indicate that the reel is in its local manual mode.
4. The "Caution, auto payout active" yellow indicator light will illuminate if the "Direction" switch is in the "Out" position. Otherwise the light will remain extinguished.
5. The reel speed dial must always be turned to minimum speed (i.e., zero speed) prior to reselecting reel direction manually.
6. Select "Out" direction.
7. The "Caution, auto payout active" yellow indicator light will illuminate. No onscreen indication is provided.
8. Dial up a moderate amount of reel speed.
9. The reel may begin to turn; however, a mechanical sensor bar riding upon the cable will quickly disable reel rotation when cable slack is detected to prevent cable backlash, sometimes referred to as cable nesting.
10. While driving the transporter forward at its desired speed, adjust the cable speed dial until the cable is paying out smoothly.
11. If the mechanical sensor bar is continually cycling the cable reel motor on and off, the reel is turning too fast and the cable speed should be dialed down to a slower speed.
12. If the cable is seen to be extremely taut and resisting transporter movement, the reel is turning too slowly and the cable speed should be dialed up to a higher speed.
13. Notice that when the transporter is slowed, it is normal for the reel's mechanical sensor bar to drop from time to time as cable slack is detected.
14. If it becomes necessary to back the transporter, first the speed must be dialed down to zero, then the direction changed to "In," and then the speed dialed up to synchronize with the transporter's reverse speed.
15. The initial settings should be adequate for some time; however as cable continues to pay out, the reel speed will have to be increased to compensate for the lesser length of cable per revolution paying out as the diameter of the outer wrap of cable decreases. The following formula details the optimal relationship between the linear speed (feet/minute) of the cable (and transporter) and the angular speed (revolutions per minute) of the reel:

$$\text{Linear Speed}_{\text{cable}} = \text{Angular Speed}_{\text{reel}} \times \pi \times \text{Diameter}$$

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Automatic Cable Reel Payout

The GamePad controller can be used to operate the cable reel in a semiautomatic method wherein the speed of the reel as it pays out cable can be synchronized to the speed of the transporter as it pulls off cable.

1. Set the reel speed dial to minimum speed (i.e., zero speed).
2. Power on the cable reel controller.
3. The light within the "Press for local control" pushbutton will illuminate to indicate that the reel is in its local manual mode.
4. The "Caution, auto payout active" yellow indicator light will illuminate if the "Direction" switch is in the "Out" position. Otherwise the light will remain extinguished.
5. On the GamePad controller, press the "Reel" button and the "O" button to engage (or disengage) auto payout.
6. Initial Auto Payout speed for the MARK3 reel is 40% of full speed. For all other reel types is it 80%. The light within the "Press for local control" pushbutton will extinguish to indicate that the reel is not in its local manual mode.
7. The "Caution, auto payout active" yellow indicator light will illuminate.
8. On the video screen, "Autopayout" will display at the bottom of the screen and then diminish until only the letters "A" and "P" alternate in the upper right corner of the display.
9. Drive the transporter at full speed.
10. Adjust the reel speed faster or slower on the GamePad by pressing the "Reel" button and the "+" or "-" until the cable is paying out smoothly.
11. The reel speed will be displayed on the bottom line of the screen in percent of maximum speed (0-100%).
12. If the mechanical sensor bar is continually cycling the cable reel motor on and off, the reel is turning too fast and the cable speed should be reduced to a slower speed.
13. If the cable is seen to be extremely taut and resisting transporter movement, the reel is turning too slowly and the cable speed should be increased to a higher speed.
14. Unlike manual payout mode, notice that when the transporter is slowed, the reel slows too such that the cable continues to payout smoothly.
15. Unlike manual payout mode, notice that when the transporter is backed, the reel pauses until the transporter mechanically engages its drive (indicated on the screen), and then the reel reverses (indicated on the screen). The length of the pause may be shortened by pressing any of the reel payout buttons. The speed of reel reversal may be adjusted in the same fashion as was shown for the forward direction.
16. Auto Payout currently only works with the K2 portable, K2 truck, and K2 truck 10x reels.

03. OPERATING THE SYSTEM

Manual Cable Reel Retrieve

The cable reel can be operated in a fully manual method, which might be appropriate during the final stages of retrieving the transporter as it is removed from the line, hoisted up through the manhole to the pavement, and onward toward the reel. Other special circumstances may arise also where precise manual control of the reel seems beneficial. Too, it may merely be an operator preference.

1. Set the reel speed dial to minimum speed (i.e., zero speed).
2. Power on the cable reel controller.
3. The light within the "Press for local control" pushbutton will illuminate to indicate that the reel is in its local manual mode.
4. The "Caution, auto payout active" yellow indicator light will illuminate if the "Direction" switch is in the "Out" position. Otherwise the light will remain extinguished.
5. The reel speed dial must always be turned to minimum speed (i.e., zero speed) prior to reselecting reel direction manually.
6. Select "In" direction.
7. The "Caution, auto payout active" yellow indicator light will extinguish.
8. Prior to dialing up the reel speed, the operator should power the transporter in reverse for two to three seconds to put the transporter drive into reverse freewheel.
9. Power down the transporter.
10. Slowly dial up to the desired reel speed.
11. If the cable is seen to be extremely taut as if the transporter is resisting movement, the transporter may not be in reverse free wheel. Power the transporter in reverse for another few seconds.
12. Pay close attention to the onscreen indication of distance and reduce reel speed to zero as the transporter approaches and arrives at its retrieval site (assumed to be at or near the preset distance entered at the beginning of the inspection).
13. During retrieval, it is prudent to be poised to hit the emergency stop mushroom pushbutton at the first sign of trouble, as might occur if the transporter gets lodged in the line.

Automatic Cable Reel Retrieve

The GamePad controller can be used to operate the cable reel in a semiautomatic method not so unlike the local manual method. The main differences between the two is that this mode offers remote control of the reel and additional indication of the mode in effect.

1. Set the reel speed dial to minimum speed (i.e., zero speed).
2. Power on the cable reel controller.
3. The light within the "Press for local control" pushbutton will illuminate to indicate that the reel is in its local manual mode.

4. The “Caution, auto payout active” yellow indicator light will illuminate if the “Direction” switch is in the “Out” position. Otherwise the light will remain extinguished.
5. Prior to engaging the auto retrieve mode, the operator should power the transporter in reverse for two to three seconds to put the transporter drive into reverse freewheel.
6. Power down the transporter.
7. On the GamePad controller, press the “Reel” button and the “|” button to engage (or disengage) auto retrieve.
8. On the GamePad controller, the “Reel” button must be depressed continually throughout auto retrieve operation.
9. The light within the “Press for local control” pushbutton will extinguish to indicate that the reel is not in its local manual mode.
10. The “Caution, auto payout active” yellow indicator light will extinguish.
11. On the video screen, “Retrieving Transporter” will display at the bottom of the screen and then diminish until only the letters “R” and “T” alternate.
12. The “Caution, auto payout active” yellow indicator light will extinguish.
13. The reel will begin to take up cable at a moderate speed.
14. If the cable is seen to be extremely taut as if the transporter is resisting movement, the transporter may not be in reverse free wheel. Power the transporter in reverse for another few seconds.
15. Adjust the reel speed faster or slower on the GamePad by pressing the “Reel” button and the “+” or “-“ until the cable is retrieving at the desired rate.
16. The reel speed will be displayed on the bottom line of the screen in percent of maximum speed (0-100%).
17. Pay close attention to the onscreen indication of distance and reduce reel speed to zero as the transporter approaches and arrives at its retrieval site (assumed to be at or near the preset distance entered at the beginning of the inspection).
18. During retrieval, it is prudent to be poised to hit the emergency stop mushroom pushbutton at the first sign of trouble, as might occur if the transporter gets lodged in the line. On the GamePad, the “Reel” button may be released at any time to stop retrieval.
19. Auto Retrieve currently only works with the K2 portable, K2 truck, K2 truck 10x, and MARK3 reels.

03. OPERATING THE SYSTEM

Reserved K2/K3 Keyboard Combinations

The K2/K3 reserves certain keyboard combinations for its internal use. These combinations involve a standard keyboard key, and possibly the Alt, and/or Ctrl and/or Shift modifier keys pressed simultaneously. (On the K2 mini-keyboard, the Fn modifier key is also needed to generate certain keys such as F11).

Some key combinations are only available when in the Administrator mode (used primarily for system maintenance by support personnel), or when on a specific screen, or even on a specific field.

Some key combinations have one meaning in one screen or field, but a different meaning when on a different screen or field. In the table below key combinations are only shown once, regardless of how many different purposes on different screens/fields they may have.

A handful of key combinations are reserved because they have meaning to the Operating System outside of the system's control program. Since the operator interfaces with the system through the titled video screen, these combinations are made unavailable, so as to not allow him to get away from or interfere with the control program.

When assigning shortcuts on the Define Comments screen, none of the reserved K2/K3 keyboard combinations may be used as a shortcut. Some of them will do the expected action of the keystroke for that type of field, e.g. pressing <Rightarrow> with no modifier keys will cause the cursor to move forward one character. Others will display the message “Duplicate key, try another” in the Hot Key field. Still others will not display anything, but will leave the Hot Key field with the “Key not defined” text that it is initialized to. If the key combination the operator typed in is not displayed in the Hot Key field, the system did not accept it.

The following table shows the keys (along with the setting of the Alt, Ctrl and Shift keys) that are reserved in the K2/K3 for various actions. An action (not all) is given that demonstrates the use of that key, as well as where - what screen(s), field(s) and when - only in Administrator mode) that key is valid.

03. K2/K3 KEYCODES

Key Name	Alt	Ctrl	Shift	Action	Where/When Valid
1		*		Select uPT Preset #1	Run Time screens
2		*		Select uPT Preset #2	Run Time screens
3		*		Select uPT Preset #3	Run Time screens
4		*		Select uPT Preset #4	Run Time screens
5		*		Select uPT Preset #5	Run Time screens
Backspace				Delete character	Observation Field
Break			*	Do nothing	All screens
Delete				Delete hot key	Hot Key Field
Delete		*		Clear field	Any digit or text field
Downarrow	*	*		Decrease speaker volume	All screens
Downarrow				Move data down	Run Time screens
End				Move to end of field	Free Format Field
Enter				Enter an observation	Run Time screens
Enter			*	Entering a field moving back One field	All screens
Enter	*			Do Nothing	All screens
Esc				Go back one screen	All screens
Esc		*		Do Nothing	All screens
Esc	*			Do Nothing	All screens
F1		*		Display/Return from Field Context Sensitive Help	All modifiable fields
F1			*	Toggle comments on/off	Run Time screens
F1				Display Help	All screens
F2			*	Toggle observation mode on/off	Run Time screens
F2		*		Clear inspection comments	Set Up Inspection screen
F2				Toggle between Configure Equipment and Run Time screen	Configure Equipment and Run Time screen
F3			*	Toggle Incline on/off	Run Time screens and Granite screens
F3				Toggle between Free Format and Run Time screen	Free Format and Run Time screen
F4			*	Toggle arrow cursor on/off	Run Time screens
F4		*		Clear field	Free Format screen
F4				Toggle between Free Format RunTime screen and Run Time screen	Free Format RunTime and Run Time screen

03. K2/K3 KEYCODES

F9			*	Toggle pressure on/off	Run Time screens
F9				Toggle between Define Comments and	Define Comments and Run
F5			*	Toggle title on/off	Run Time screens
F5		*		Clear inspection fields	Set Up Inspection screen
F5				Toggle between Set Up Inspection and Run Time screen	Set up Inspection and Run Time screen
F6			*	Toggle date on/off	Run Time screens
F6		*		Clear/Reset timer	All screens
F6				Toggle between Set Up Display and Run Time screen	Set Up Display and Run Time screen
F7			*	Toggle time on/off	Run Time screens
F7		*		Toggle speaker on/off	All screens
F7				Toggle between Diagnostics and Run Time screen	Diagnostics and Run Time screen
F8			*	Toggle manholes on/off	Run Time screens
F8				Toggle between Reminder Alarm and Run Time screen	Reminder Alarm and Run Time screen
F9			*	Toggle pressure on/off	Run Time screens
F9				Toggle between Define Comments and Run time screen	Define Comments and Run Time screen
F10			*	Toggle main distance on/off	Run Time screens
F10	*			Toggle auxiliary distance on/off	Run Time screens
F10		*		Remove user codes	All screens
F10				Toggle between Configure Reels and Run Time screen	Configure Reels and Run Time screen
F11		*		Toggle direction on/off	Run Time screens
F11				Toggle Transporter Speed or Cutter Speed	Run Time screens and Granite screens
F12		*		Toggle length on/off	Run Time screens
Home			*	Redisplay all fields	Run Time screens
Home				Move to home position	Free Format field
Insert	*	*		Restore screen to its earlier settings	All screens except for Define Comments screen
Insert				Toggle insert mode on/off	All screens
Leftarrow				Moves data or arrow cursor left	Run Time screen
PageDn				Move down a page	View Log File screen
PageUp				Move up a page	View Log File screen
Plus Sign	*	*		Log all screen fields	All screens

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Key Name	Alt	Ctrl	Shift	Action	Where/When Valid
Rightarrow				Moves data or arrow cursor right	Run Time screens
Spacebar	*			Do nothing	All screens
Tab				Tab to next field	All screens
Tab			*	Tab to previous field	All screens
Tab	*			Do nothing	All screens
Uparrow				Move data up	Run Time screens
Uparrow	*	*		Increase speaker volume	All screens
Window				Do nothing	All screens
A	*	*		Toggle administrator mode	Mute field
B	*	*		Exit program	All screens, admin mode
B		*		Mark buffer start	Free Format field
C	*	*	*	Fix EC3044 Purple Haze	Customer Service Only
C	*	*		Toggle GXP logging on/off	GXP screen, admin mode
C		*		Mark buffer end	Free Format field
D		*		Set main preset	Run Time screens
D	*			Set auxiliary preset	Run Time screens
D	*	*		Reset fields to the default settings	Camera Parameters screen
F	*			Flip EC3044/EC3051 image	Run Time screens
F		*		Scroll through rendering choices	Video screens
G	*	*		Toggle between Configure Equipment and GXP screen	Configure Equipment and GXP screen
H	*	*		Rehibernate system	Testing Controller Inputs screen
I		*		Zero incline	Run Time screens
J	*	*		Set gamepad offsets	Test Controller Screen
K		*		Toggle the display of the artificial horizon	Run Time screens
L	*	*		Toggle between Regular Light mode and Manhole Insertion Lighting mode	DUC camera only
O	*	*	*	Bring up Camera Menu	Customer Service Only
P		*		Zero pressure	Run Time screens
P	*	*		Toggle video source between main and auxiliary	All screens
P	*			Toggle between Run Time screen and Power Supply Status screen	Run Time screen/Power Supply Status screen
Q	*	*	*	Simulate hardware	Developer Only
R	*	*	*	Reset the EC3044 camera module to default settings	Video screens, Admin mode

03. K2/K3 KEYCODES

Key Name	Alt	Ctrl	Shift	Action	Where/When Valid
S	*	*		Toggle status line on/off	All screens
S		*		Toggle Sonde on/off	Run Time Screen
T	*	*	*	Debug MPT/upt communications	VGA screen. Developer only
T	*	*		Toggle titling on/off	All screens
U	*			Unflip EC3044/EC3051 Image	Run Time screens
U	*	*		Run batch file	Copyright Screen
W	*	*	*	Clear EC3044 Titling	Run Time screens
X		*		Delete marked buffer	Free Format field
X	*	*		Toggle IMX External Lights	Video screens + Power Supply Status screen
V	*	*		Toggle main and lateral viewing	All screens
V		*		Copy marked buffer	Free Format field
Z	*	*		Reboot system	Copyright screen, admin mode
Z	*			Zero auxiliary distance	All screens
Z		*		Zero main distance	All screens

03. K2/K3 MESSAGING & LOGGING

Messaging and Logging in the K2

Appendix A – Status Messages (Alphabetically)

Following is a listing of each status message displayed by the K2 system and an explanation of when it occurs. If the message can only appear on a certain screen, that screen's name will appear in parentheses after the explanation.
Some messages are only displayed to the VGA monitor or written to the log file on disk.

*** I2C Aborted - Address: - Address: XX Y
An error on the I2C bus has occurred. XX and Y are two numbers which indicate the location and type of error.

<Enter> to copy ID database
Prompt when copying ID database (Copy ID Database screen)

<Enter> to copy inspection files
Prompt when copying inspection files (Copy Inspection Files screen)

<Enter> to copy log files
Prompt when copying log files (Copy Log Files screen)

<Enter> to copy persist file
Prompt when copying a persist file (Copy Log Files screen)

<Enter> to eject removable drive
Prompt when ejecting a removable drive (Copy Log Files screen)

<Enter> to log all fields
Prompt when logging all fields (Copy Log Files screen)

<Enter> to zero pressure now
Prompt when zeroing pressure

A
Indicates that auto payout is running. Alternates about every half second with 'P'.

Air & Water reconnected
The Currahee Air and Water PCU has re-established communication.

03. K2/K3 MESSAGING & LOGGING

Alarm # X, labeled Y -has expired. Press <CTRL><F6> to acknowledge.
Alarm timer has gone off. X is the number of the alarm. Y is the name associated with the timer on the Set Up Alarm Timers screen. Message scrolls until acknowledged.

Alarm #X not set
There is not an alarm timer set for the number X alarm.

All superfields in use
Screen file has more superfields than allocated at top of page. Programmer debugging message. Customer should never receive this message.

All threads shut down successfully
The system has successfully shut down all threads during a reset or a shutdown.

Analog sonar camera needs CATVS on
When selecting the Analog Sonar camera, CATV must also be turned on.

Array indexed outside of range
An array has been indexed outside of its range. Fatal.

Attempt to save a non-save-able field X
Attempt to save a field that isn't a digit, text or stored field. X is the field number that is trying to be saved. Programmer debugging message. Customer should never receive this message.

Attempting Air & Water reconnection
The communication between the K2 CCU and Currahee Air & Water PCU is attempting to be re-established.

Attempting Mini/Micro P&T reconnection
The communication between the K2 CCU and MPT/uPT is attempting to be re-established.

Auto payout
Automatic reel payout is running.

Auto payout paused
Automatic reel payout is paused.

Board Stack initialized
The internal circuit boards have been initialized at startup.

Boot script loaded successfully
A boot script has been successfully loaded (Utilities screen).

Calibrated Upright Position
The Mini/Micro Pan & Tilt camera has had its upright position calibrated.

CapsLock now off
The operator toggled the CapsLock key off

CapsLock now on
The operator toggled the CapsLock key on

CATVS need CATVS or Not Applicable light
The operator is on the Equipment Configuration screen, has selected CATVS, and has a camera other than an OZ or NITE LIGHT.

CATVS needs OZ,NITE LITE,Sonar camera
The operator is on the Equipment Configuration screen, has selected CATVS, and has a lights type other than CATVS.

CAW Message failure
Communication with the Currahee Air & Water PCU has failed.

CCW/CW polarity reversed
The polarity of the joystick for operating the Counterclockwise/Clockwise Currahee cutter motor has been reversed.

CCW/CW polarity normal
The polarity of the joystick for operating the Counterclockwise/Clockwise Currahee cutter motors is now normal.

Clear inspection fields
The operator pressed <CTRL><F5> to clear all inspection fields.

Clearing inspection comments
The operator pressed <CTRL><F2> to clear all inspection comments.

Closed all files
All open configuration files have been closed.

03. K2/K3 MESSAGING & LOGGING

Closing log file
The log file on disk is to be temporarily closed during the upgrade process.

Computing mean of curr vs saved slope
Computing mean during zero of inclinometer.

Configuration successfully retrieved
Configuration is successfully retrieved from the Titler. (Utilities screen) The data retrieved is only logged to a VGA screen or a file since it contains several thousand characters of information.

Converting units. Please wait ...
When exiting the Customizable Parameters after changing units between English and metric, a slight delay occurs and this message is displayed.

Copied X Y
File copy succeeded. X is name of file successfully copied. Y is the name of the new file created.

Copied ID database
File ID.txt successfully copied to a removable drive (Copy ID Database screen).

Copied inspection files
Inspection files successfully copied to a removable drive (Copy Inspection Files screen).

Copied log files
Log files in ConfigurationFiles directory are successfully copied to the removable drive. (Copy Log files screen)

Copied persist file
File persist.txt file successfully copied. (Copy Log Files screen)

Corrupt AuxiliaryDistance.bak file
Corrupt AuxiliaryDistance.bin file
File AuxiliaryDistance.bak (or .bin) has been determined to be corrupted.

Corrupt line in file persist.txt X
Persist.txt file contains an odd numbered line that doesn't contain a field number. X is the previous field number that appeared on an odd field number as a means to help identify where the corruption occurred

Corrupt Logfile.5.txt
Corrupt Logfile1
Corrupt Logfile2
Either the logfile.5.txt that needs to be deleted or the logfile.1.txt that is opened for logging or the logfile.2.txt that is open for display has been determined to be corrupted.

Corrupt MainDistance.bin file
Corrupt MainDistance.bak file
File MainDistance.bak (or .bin) has been determined to be corrupted.

Created font loaded file
The system has created a file indicating that the fonts have been loaded

Created persist file from screens
File persist.txt file is created from the screen files.

CreateD X
Directory creation succeeded. X is the name of directory that was created.

Cruise control Off
The cruise control feature has been disabled.

Cruise control On
The cruise control feature has been enabled.

Currahee cutter needs 0305490 cable
The Currahee cutter transporter type only works on the 0305490 cable type.

Currahee cutter needs MZ436 buck swtchr
The Currahee cutter can not be selected as the transporter type because the PCU does not have MZ436 buck switchers installed.

Deleted X
File deletion succeeded. X is the name of the file that was deleted.

Disabling titler
The operator pressed <CTRL><ALT><t> to toggle display to the titler off.

03. K2/K3 MESSAGING & LOGGING

Done deleting distance files
The system is finished deleting distance files. (Utilities screen)

Done deleting log files
The system is finished deleting log files. (Utilities screen)

Downgrade - not moving legacy fields
The operator has chosen to move from a higher numbered release to a lowered number release. The persisted fields will not be copied to prevent a possible firmware incompatibility.

Download completed successfully
Font file downloaded successfully to Titler.

Downloading font file (approx 30 secs)
Displayed at startup automatically if it determines that fonts are not already loaded or if operator selects Download Fonts. (Utility screen)

DUC External Lights now
This message will have a percentage that follows telling how high the lights voltage is.

Duplicate key, try another
Operator has selected a hot key combination already in use (Define Comments screen)

Ejected Removable Drive
The removable drive has been safely ejected.

Enabling titler
The operator pressed <CTRL><ALT><t> to toggle display to the titler on.

ENTER to begin testing
The operator needs to press the <ENTER> key to start the testing.

ENTER to end testing
The operator needs to press the <ENTER> key to end the testing.

ENTER to pause testing
The operator needs to press the <ENTER> key to pause the testing. ENTER to resume testing
The operator needs to press the <ENTER> key to resume the testing.

Entering administrator mode
Operator pressed <CTRL><ALT><a> while on the stored mute field. (Equipment Configuration screen)

03. K2/K3 MESSAGING & LOGGING

Field contains all spaces
Operator attempted to exit a digit field containing all spaces.

Field contains decimal point
Operator has attempted to exit a digit field that is to contain an integer value that has a decimal point in it.

Field contains embedded spaces
Operator attempted to exit a digit field that contains spaces embedded inside the field.

Field contains minus sign after digit
Operator has attempted to exit from a digit field that contains a minus sign after an earlier digit.

Field contains too many decimal places
Operator has attempted to exit from a digit field that contains a decimal number with more digits after the decimal point than specified in the screen file.

Field contains too many decimal points
Operator has attempted to exit from a digit field that contains more than one decimal point.

Field contains too many minus signs
Operator has attempted to exit from a digit field that contains more than one minus sign.

Field contents will not fit in length X
An attempt is being made to store a value into a field that is greater than the length of the field. X contains the field number where this is occurring. Programmer error.

Field length larger than screenfile
A field in a screen file won't fit in its field size. Programmer debugging message. The customer should never receive this message.

Field requires at least one digit
Operator has attempted to exit from a digit field that does not contain at least one digit.

Field won't fit in 20 columns
Operator entered a position on the Set Up Display screen for a field to be displayed on the Run Time screen that won't fit in 20 columns given the size of the field and any units that must follow it. This is the case if the large font is being used.

Field won't fit in 40 columns
Operator entered a position on the Set Up Display screen for a field to be displayed on the Run Time screen that won't fit in 40 columns given the size of the field and any units that must follow it.

Field won't fit in 8 rows
Operator entered a position on the Set Up Display screen for a field to be displayed on the Run Time screen that won't fit in 8 rows. This is the case if the large font is being used.

First character must be alpha
Operator has typed a first character of an observation code that is not an alpha character. (Define Comments screen)

Fixing CVBS
The operator has pressed the hot key combination to fix the EC3044 Purple Haze issue

Flushing queue
All messages queued will be displayed and/or logged before the system continues.

Flushing screen fields
Operator has pressed <CTRL><ALT><+> to flush the fields on the current screen to the log file.

Font is now large
Loggable message that indicates that the current font being used is large.

Font is now small
Loggable message that indicates that the current font being used is small.

Font Rendering:
The font rendering has changed to whatever follows the colon. Current choices are EBW,HBW,WWB, BBW

Fonts loaded successfully
Fonts were successfully loaded.

Fonts previously installed
The system has determined that the fonts were previously installed.

03. K2/K3 MESSAGING & LOGGING

Fonts will be loaded
Attempt to read the configuration string of the Titler at startup was unsuccessful, causing the requirement to load fonts in the event that they aren't already loaded.

FWD/REV polarity reversed
The polarity of the joystick for operating the FORWARD/REVERSE Currahee cutter motor has been reversed.

FWD/REV polarity normal
The polarity of the joysticks for operating the FORWARD/REVERSE Currahee cutter motors is now normal.

FWD/REV now set to high speed
The FORWARD/REVERSE motor on the Currahee cutter is now set to driving mode.

FWD/REV now set to normal speed
The FORWARD/REVERSE motor on the Currahee cutter is now set to cutting mode.

Gamepad can perform keyboard functions
The gamepad is now set up to be used as a keyboard.

Gamepad can't perform keyboard functions
The gamepad can no longer be used as a keyboard.

Gamepad lost XXXX
The gamepad named XXXX that had previously been found (connected to the system) has now been lost (disconnected from the system).

Ignoring <CTRL><BREAK>
Operator has pressed <CTRL><BREAK> which is being ignored.

IMU not readable
The system was unable to read the Inertial measurement unit.

Inclinometer read timeout
Reading the inclinometer timed out during either <CTRL><i> or the Set Up Display screen.

Inclinometer zeroed
Inclinometer zeroing completed using <CTRL><i> or from the Set Up Display screen.

Initializing camera ...
Displayed when operator exits from the Equipment Configuration screen and logic is called to initialize whatever camera is specified on that screen.

Inspection of this asset already exists
An inspection of the same pipe ID, Manhole Up and Manhole Down already exists when trying to do a save. (Set Up Inspection screen)

Inspection of this asset saved
An inspection record was successfully saved. (Set Up Inspection screen)

Insufficient time between commands
The operator has attempted to send a command to the Currahee Air and Water PCU too soon after sending the previous command.

Invalid date format
Operator attempted to exit the date field when the date entered does not match the format of the date format field. (Set Up Display screen)

03. K2/K3 MESSAGING & LOGGING

Invalid time format
Operator attempted to exit the time field when the time entered does not match the format of the time format field (Set Up Display screen)

Joysticks swapped
The left analog stick will now operate the transporter and the right analog stick will operate the camera.

Key not valid
Operator pressed a key that isn't valid for this field or screen.

Lamp II video source now lateral
The operator has pressed <CTRL><ALT><v> to toggle the LAMP II video source to lateral.

Lamp II video source now main
The operator has pressed <CTRL><ALT><v> to toggle the LAMP II video source to main.

Large and small fonts already loaded
Both large and small fonts are already loaded as determined by reading the config string from the titler.

Leaving administrator mode
Operator pressed <CTRL><ALT><a> while on the stored mute field after previously entering administrator mode. (Equipment Configuration screen)

Loading Cues firmware
The Cues firmware is being loaded - part of the boot up message

Loading comment set ...
Operator changed comment sets on the Define Comments screen or pressed <CTRL><F10> to clear out operator created hot keys.

Loading screens
Displayed immediately after the copyright screen displayed.

Logged all fields
All fields were successfully logged to the log file on disk. (Utility screen)

Logging screen
The operator pressed <CTRL><ALT><+> to log the screen he is currently on to the log file on disk.

Low air pressure
The Currahee command was rejected because there is insufficient air pressure.

Manhole Insertion Lighting
The lighting mode for the DUC camera is flashlight (Manhole insertion lighting) mode, whereby the lights stay on all the time.

MARK3 Cable Maximum 1000 feet
If the operator attempts to exit the Equipment Configuration screen with a MARK3 cable and the cable length set > 1000 feet (304m).

Media can be safely removed
Removable drive can be safely removed.

Mini/Micro Pan & Tilt reconnected
The MPT/uPT has re-established communication.

Moving from GXP screen
The K2 is, possibly temporarily, moving away from the GXP screen.

Moving legacy fields
Field from the LegacyPersist.txt file are being copied into the persist.txt file.

Moving to GXP screen
GXP has taken control of the K2 and the display is changing to the GXP screen.

Moving to Run Time screen
Granite Net has taken control of the K2 and the display is changing to the Run Time screen.

MPT Message failure
Communication with the MPT camera has failed.

No ACK returned from erase
Communication with Titler problem during installation of fonts.

No ACK returned from flush
Communication with Titler problem during installation of fonts.

03. K2/K3 MESSAGING & LOGGING

Note physical orientation, press <Enter>
Operator has begun the zeroing of incline procedure.

NumLock now off
The operator toggled the NumLock key off.

NumLock now on
The operator toggled the NumLock key on.

Odd number of lines in persist.txt
Persist.txt file contains an odd number of lines. It should be an even number since the format for this file is a line containing a field number followed by a line containing a field value.

Okay to bring up camera menu
Hot key sequence that allows access to EC3044 or EC3051 camera menu has been executed.

Only small fonts loaded
Read of configuration string on the titler determines that only the small fonts have been previously loaded.

Operation only available on Titler
Operator is attempting to install fonts, check for fonts, install boot script or read the titler configuration without a Bob4 connected.

Operator needs to enable Air/Water
The operator can't send a command to the Currahee Air and Water PCU until he first turns on the Currahee Air & Water PCU.

Out of range X <= value <= Y
Operator has attempted to exit a digit field with a value that is out of range. X is the lower end of the range, whereas Y is the upper end.

P
Indicates that auto payout is running. Alternates with 'A'.

Perform inclinometer zeroing?
Prompt when operator is about to zero the inclinometer.

Persist file too big
File persist.txt is larger than 40K characters when it should normally be around 5K.

Please apply power first!
Power is not currently applied. (Cable Continuity screen)

Please connect loop-back plug first
Loop-back plug is not currently connected. (Cable Continuity screen)

Please fill in PIPEID, and two Manholes
Operator has attempted to save an inspection record without first filling in a pipe ID and two Manhole Ids. (Set Up Inspection screen)

Pressure has been zeroed
Pressure zeroed (Set Up Display screen)

Program ended. Power cycle to reboot
The program has ended normally.

Program ending
The program is ending normally.

PT Superuser privileges enabled
The operator has pressed the hot key combination that allows simulating hardware.

03. K2/K3 MESSAGING & LOGGING

R
Indicates that auto retrieve is running. Alternates about every half second with 'T'.

Ramping cruise speed to XXX%
The cruise speed percent is being ramped up or down to XXX%.

Read configuration string
Configuration string was successfully read from the Titler. (Utility screen)

Read messages file
The English language messages file has been successfully read.

Reading configuration files
Displayed immediate before the screen files are read in at startup.

Reading Inclinometer ...
Displayed when the inclinometer is being read during a <CTRL><i> or through the Set Up Display screen.

Rebooting system. Takes a few minutes
Displayed when the system is being automatically rebooted

Regular DUC Lighting
The lighting mode for the DUC camera is regular, which means flashing.

Removed Motor Limitation
The Mini/Micro Pan & Tilt camera can now both pan and tilt simultaneously.

Removing operator created comments ...
Operator has pressed <CTRL><F10> to remove operator comments.

Renamed log files
The system has renamed the log files on disk.

Renamed X Y
File renaming succeeded. X is the name of file successfully renamed to Y.

Requires HD cable type
The operator is on the Equipment Configuration screen, has selected CATVS, has cable length set > 2000 feet (609m) and has a cable type other than an HD cable (HD321 or Yellow)

Resetting system
Operator has pressed <ALT><CTRL><y> to reset the system.

Resetting KTC camera module
The operator has entered the hot key sequence to reset the EC3044 camera module to its default settings.

Restore screen's default values
The operator pressed <CTRL><ALT><INSERT> to restore the screen to the values it had upon his entry to the screen.

Restoring cruise speed to XXX%
The cruise speed percent of XXX%, stored in the persist file has been restored.

Retrieved legacy persist field
A field has been retrieved from the legacy persist file to be copied into the current persist file.

Retrieving
Automatic reel payout is retrieving.

Retrieving transporter! ...
Automatic reel retrieve is retrieving transporter.

Reverse orientation, press <CTRL><i>
Operator has done part of the zeroing inclinometer procedure and is instructed to do the remaining part.

Reverse orientation, press <Enter>!
Operator has done part of the zeroing inclinometer procedure and is instructor to do the remaining part. (Set Up Display screen)

03. K2/K3 MESSAGING & LOGGING

S
Saved field XXXX
The field with field number XXXX has been saved to the persist file.

Saving as zero slope
Saving slope during zero of inclinometer.

Saving cruise speed of of XXX%
The current cruise speed percentage of XXX% is being saved to the persist file.

Saving file ...
Displayed while saving the inspection file (Set Up Inspection screen)

Screen now set to X
Loggable status message logged when the screen has changed. X is the name of screen that has been changed to.

ScrollLock now off
The operator toggled the ScrollLock key off

ScrollLock now on
The operator toggled the ScrollLock key on

Setting direction display off
The operator pressed <CTRL><F11> and toggled the display of the direction off.

Setting direction display on
The operator pressed <CTRL><F11> and toggled the display of the direction on.

Setting lateral preset distance
The operator pressed <ALT><d> to set the lateral preset distance.

Setting length display off
The operator pressed <CTRL><F12> and toggled the display of the length off.

Setting length display on
The operator pressed <CTRL><F12> and toggled the display of the length on.

Setting main preset distance
The operator pressed <CTRL><d> to set the main preset distance.

Setting parameters to default values
The operator has pressed <CTRL><ALT><d> to restore the parameters to the values they had when he entered. (OZ II Functions screen)

Sonde frequency now high
The sonde's frequency in the Mini/Micro Pan and Tilt camera is set to 8 Khz.

Sonde frequency now low
The sonde's frequency in the Mini/Micro Pan and Tilt camera is set to 512 Hz.

Sonde now off
The sonde's frequency in the Mini/Micro Pan and Tilt camera is turned off.

Sonde now on
The sonde's frequency in the Mini/Micro Pan and Tilt camera is turned on.

Speaker: XXXXXXXXXXXXXXX
Operator pressed <CTRL><ALT><UPARROW> or <CTRL><ALT><DOWNARROW>. Displays the volume level of speaker. The number of Xs that follow approximate the range of the volume. Each keypress causes an X to appear or disappear, as there are 256 volume levels, but only 16 Xs. A block character is drawn in place of the X.

Speaker now off
The operator pressed <CTRL><F7> to toggle the speaker off.

Speaker now on
The operator pressed <CTRL><F7> to toggle the speaker on.

03. K2/K3 MESSAGING & LOGGING

Status line disabled
Operator pressed <CTRL><ALT><s> to disable status messages.

Status line enabled
Operator pressed <CTRL><ALT><s> to enable status messages after previously having turned them off.

Stopping transporter and reel
The transporter and reel are being stopped because the operator has either entered a menu screen or it has been determined that the controller has become disconnected.

Switching to External DVR
The operator has selected to use the external DVR.

Switching to External DVR Bypass
The operator has selected to bypass the external DVR.

Switching to Internal DVR
The operator has selected to use the internal DVR.

Switching to Internal DVR Bypass
The operator has selected to bypass the internal DVR.

T
Indicates that auto retrieve is running. Alternates about every half second with 'R'.

Timer cleared or reset.
Operator pressed <CTRL><F6> to clears or reset a timer.

Titler initialized
Displayed when Titler is initialized at startup.

Toggling Currahee air
The operator has pressed the gamepad combination to turn the Currahee air on or off.

Toggling Currahee water
The operator has pressed the gamepad combination to turn the Currahee water on or off.

Turned Off Motor Limitation
The Mini/Micro Pan and Tilt Limitation has been turned off.

Turned On Motor Limitation
The Mini/Micro Pan and Tilt Limitation has been turned on.

Turning off GXP logging
The operator has pressed <CTRL><ALT><c> to turn off GXP logging.

Turning on GXP logging
The operator has pressed <CTRL><ALT><c> to turn on GXP logging.

Two field position conflict-ignore?
Prompt to allow field position conflicts for where fields will appear on the Run Time Screens (Set Up Display screen)

Unable to append inspection file
The Inspection ID file could not be appended to.

Unable to close a volume handle
Volume close failed.

Unable to copy X Y
File copy failed. X is the name of the file that wasn't copied. Y is the name of the file not copied to.

03. K2/K3 MESSAGING & LOGGING

Unable to create big and small file
Displayed if unable to create file bigandsmall.txt after downloading fonts is successful.

Unable to create inspection file
Either the Inspection database or ID file could not be opened or created.

Unable to createD X
Directory creation failed. X is the name of directory that could not be created.

Unable to CreateEvent
Event creation failed. Used to create events that signal various threads that they may begin executing.

Unable to delete X
File deletion failed. X is the name of file that wasn't deleted.

Unable to device I/O
Windows API DeviceIOControl failed.

Unable to dismount
Volume dismount failed for thumb drive removal.

Unable to find any files
A file search did not find any files.

Unable to find file to delete X
File deletion failed. X is the name of file not found to delete.

Unable to find removable drive
A removable drive is not connected or working properly.

Unable to find screen file
The first screen file is not found when reading in the screen files.

Unable to GetExitCodeThread
Exit code retrieval failed when shutting down a thread.

Unable to load fonts
Loading fonts was unsuccessful

Unable to open Auxiliary Distance.bak file X
The lateral distance backup file could not be opened. X is the name of the file, AuxiliaryDistance.bak.

Unable to open AuxiliaryDistance.bin file X
The lateral distance binary file could not be opened. X is the name of the file, AuxiliaryDistance.bin.

Unable to open cameras file
File cameraparameters.txt is not able to be opened.

Unable to open comment file X
One of the commentcode files could not be opened. X is the name of file, either CommentCodeY.txt, where Y is 0,1,2,or 3.

Unable to open context help file
A context sensitive help file could not be opened.

Unable to open depend file X
The dependency file could not be opened. X is the name of the file, dependency.txt.

Unable to open enum file X
The enumeration file could not be opened. X is the name of the file, either enum100.txt or enum101.txt.

Unable to open font file X
The font file could not be opened. X is the name of the file, extended2b10x132.

Unable to open font loaded file
The file that tells the system that the font has already been loaded is not able to be opened.

Unable to open GXP log file X
The GXP log file could not be opened on drive e:. X is the name of the file, gxp_log.txt. drive e: is a removable drive needed to hold the GXP log file.

03. K2/K3 MESSAGING & LOGGING

Unable to open inspection file X
The inspection ID file could not be opened. X is the name of the file, ID.txt.

Unable to open legacy persist file
The file LegacyPersist.txt could not be opened.

Unable to open lights file
The lights.txt file could not be opened.

Unable to open log file X
The log file on disk could not be appended to. X is the name of the file, logfile.1.txt.

Unable to open MainDistance.bak file X
The main distance backup file could not be opened. X is the name of the file, MainDistance.bak.

Unable to open MainDistance.bin file X
The main distance binary file could not be opened. X is the name of the file, MainDistance.bin.

Unable to open mapping file X
The mapping file could not be opened. X is the name of the file, mapping.txt.

Unable to open or create persist file [X]
The persistence file could not be opened or created. Optionally X is the name of the file, persist.txt.

Unable to open priorities file
The priorities.txt file could not be opened.

Unable to open transporters file
The file transporterparameters.txt could not be opened.

Unable to open vectoring file
The file vectoring.txt could not be opened.

Unable to open voltages file
File vdacparameters.txt could not be opened.

Unable to open X
A generic file was unable to be opened. X is the name of the file.

Unable to read cameras file
The file cameraparameters.txt could not be opened

Unable to read comment strings
One of the comment code files is unable to be read.

Unable to read dependencies
File dependency.txt is unable to be read.

Unable to read lights file
File lights.txt is unable to be read

Unable to read mapping file
File mapping.txt is unable to be read.

Unable to read priorities file
File priorities.txt is unable to be read.

Unable to read screen files
One of screen files is unable to be read.

Unable to read transporters file
File transporterparameters.txt is unable to be read.

Unable to read vectoring file
File vectoring.txt is unable to be read.

Unable to read voltages file
File vdacparameters.txt is unable to be read.

Unable to rename corrupt aux bak file
Unable to rename corrupt aux bin file
Unable to rename corrupt main bak file
Unable to rename corrupt main bin file
One of the corrupted AuxiliaryDistance or MainDistance or (.bak or .bin) files was not able to be renamed.

Unable to rename corrupt logfile.5.txt
The corrupt file logfile.5.txt was not able to be renamed.

Unable to rename X Y
File renaming failed. X is the name of the file that could not be renamed to Y.

03. K2/K3 MESSAGING & LOGGING

Unable to ResetEvent
Event reset did not execute successfully.

Unable to save. Invalid MANHOLE-DN
Operator attempted to save an inspection while the pipe ID and manhole Up match an already existing inspection with a different manhole Down. (Set Up Inspection screen)

Unable to save. Invalid MANHOLE-UP
Operator attempted to save an inspection while the Pipe ID matches an already existing inspection with a different manhole Up. (Set Up Inspection screen)

Unable to save. Invalid PIPEID field
Operator attempted to save an inspection while the manhole Up ID and manhole Down ID match an already existing inspection with a different Pipe ID. (Set Up Inspection screen)

Unable to send85
Communication with Titler during installation of fonts was unsuccessful.

Unable to SetEvent
Event set did not execute successfully.

Unable to start thread
Thread creation did not execute successfully.

Unable to WaitForSingleObject
Object wait did not execute successfully.

UP/DOWN polarity reversed
The polarity of the joystick for operating the UP/DOWN Currahee cutter motor has been reversed.

UP/DOWN polarity normal
The polarity of the joystick for operating the UP/DOWN Currahee cutter motors is now normal.

uPT diagnostics messages enabled
The operator has pressed the hot key combination to allow MPT/uPT communications debugging on the VGA screen.

uPT diagnostics messages disabled
The operator has pressed the hot key combination to disallow MPT/uPT communications debugging on the VGA screen.

uPT lights preset n

The uPT lights preset has been changed to one of the five selections (n).

uPT spot lights raised to level n
The uPT spot lights were raised to level n (0-7)

uPT spot lights lowered to level n
The uPT spot lights were lowered to level n (0-7)

uPT flood lights raised to level n
The uPT flood lights were raised to level n (0-7)

uPT flood lights lowered to level n
The uPT flood lights were lowered to level n (0-7)

Using gamepad XXXX
The gamepad named by XXXX will be the one that is used. This message occurs when two or more gamepads are found.

03. K2/K3 MESSAGING & LOGGING

Video equalization = X
Indicate the amount of video equalization added by the equalization board. X is the amount.

Video source now auxiliary
The source of the video being displayed is from the auxiliary source.

Video source now main
The source of the video being displayed is from the main source.

Warning:Duplicate controller,ignoring...
Two or more of the same type of gamepad have been found. The second through n duplicate will be ignored (not used).

Warning:P/N 700800 Translator needed!
Operator has selected a PS3 or SR3 camera that requires a translator.

Working ...
Displayed during checking for fonts, reading titler configuration and installing a boot script to the titler.

Zeroing lateral distance
The operator pressed <ALT><z> to zero the lateral distance.

Zeroing main distance
The operator pressed <CTRL><z> to zero the main distance.

Zeroing pressure
The operator pressed <CTRL><p> to zero the pressure.

XXXX thread ID YYYY started up successfully
Threadname XXXX with ID YYYY has started up successfully.

XXXX thread ID YYYY shut down successfully
Threadname XXXX with ID YYYY has shut down successfully.

XXXX COM YYYY thread ID ZZZZ shut down successfully
Threadname XXXX on COM YYYY with ID ZZZZ has shut down successfully.

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CUES RECORD OF REVISIONS

This Record of Revision page is designed to allow the manual user to determine the engineering/manufacturing level to which the manual is written. As engineering changes to this hardware are made at CUES, necessary information in the manual will be revised to reflect those changes. The latest change level and the rationale for any change(s) will be explained in tabular format on this page to allow the manual user to be better equipped should the need arise to call CUES regarding technical information.

Original Manual	Revision	Change Description
K2 / K3 Firmware Manual	036	Initial release of the new, combined manual for the K2 and/or Mark 3 products 031516
	037	Updated manual to current version R037.
	038	Updated manual to current version R038.
	040	Updated manual to current version R040.
	043	08.06.20 - Updated entire manual to current version R043.
	044	09.21.21 - Updated entire manual to current version R044.
	02.02	11.01.24 - Updated entire manual to current version 02.02
	02.04	12.03.25 - Updated the manual to current version 02.04
	03.01.00	11.12.26 - Updated the manual to current 03.01.00

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In addition to inspection equipment, CUES also designs, manufactures, and sells a broad range of pipeline rehabilitation and profiling equipment. These include chemical grouting systems for sewer line pipe joints capable of using a wide variety of grouting products. CUES also manufactures lateral reinstatement cutting systems which enable the reinstating of laterals in mainline sewers after they have been relined with any of a wide variety of liner materials. Pipe profiling is accomplished via Laser for Sonar based systems.

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