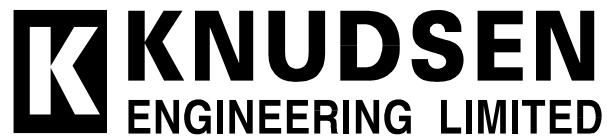


320 SERIES ECHOSOUNDER

SERIAL COMPUTER INTERFACING MANUAL

Supports Echosounder Firmware #: D40-02000 V4.00

D10 - 02390
Revision 1.0
November 4, 1999



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1 INTRODUCTION

1.1 About this manual

This manual provides detailed information about the 320 Series Echosounder serial interface port (COM3) protocols which can be used for data logging, echosounder control, and data loop-through. This information is intended for advanced users with specialized requirements. The following data is supplied for information only; it is not required knowledge for standard system operation.

1.2 Technical Support

For technical support or to report problems please contact your local representative or:

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Knudsen Engineering Limited
10 Industrial Road
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2 OVERVIEW

The 320 Echosounder was designed with a dedicated serial port (COM 3) for communications with the survey computer. This port is used for transmitting depth log strings to the survey computer or data logger, for re-transmitting ASCII strings received on other com ports if requested (loop-through), and for accepting and for acting upon command strings received from the survey computer or data logger. It is also used for system software upgrades.

The echosounder accepts command strings in two distinct formats. The first format is an ASCII string preceded by '\$PKEL'. This indicates that the string is a Knudsen Engineering proprietary NMEA string. These strings are assumed to be coming from some data processing program (such as the Serial Configuration Utility program, SerialUtility.exe) and are accepted by the echosounder without echoing the characters back to the external PC to avoid confusing the program.

The second format is an ASCII string preceded by the '/' character (user commands). These strings are assumed to be coming from user input at the keyboard and are accepted with character echoing enabled for the operator's convenience. Either format can be accessed by a user through any communications program.

Note: Different firmware compilations allow access to different combinations of the control strings listed in the following sections. If you have any questions regarding the firmware compilation for your system, please contact the factory or your local representative.

3 KEL PROPRIETARY CONTROL SENTENCES - INPUT

Table 3-1: PC To 320 Echosounder Control Sentences

KEL PROPRIETARY INPUT STRINGS	
Sentence ID	Description
0	Request data output string from MPM
1	Set units flag (meters/feet/fathoms)
2	Cause event marker with external annotation, only
3	Cause event marker with internal and external annotation.
4*	Set range
5*	Set auto phase mode, manual phase code
6*	Set HF Tx on/off, HF Tx power level
7*	Set HF AGC, HF manual Rx Gain
8*	Set HF pulse type
9*	Set LF Tx on/off , LF Tx power level
10*	Set LF AGC, LF manual Rx gain
11*	Set LF pulse type
12*	Set HF & LF Draft
13*	Set speed of sound
14*	Set tracking gate width
15*	Set HF & LF transmit blanking
16*	Set alarm trigger, alarm depth, and sound toggle
17	Set Com 1 device, baud, parity, data/stop bits, and loop-through configuration
18	Set Com 2 device, baud, parity, data/stop bits and loop-through configuration
19	Set Com 3 baud, parity, and data/stop bits
20	Set Com 4 device, baud, parity, data/stop bits and loop-through configuration
21	Load printer banner vanity string with the characters in Field 1.
22*	Set printer on/off, printer speed
23*	Set print contrast, manual contrast
24*	Set tracking overlay, heave overlay, corrected depth overlay toggles, tx blank overlay, tx blanking
25*	Select hardcopy format, grid format, and printer font size

KEL PROPRIETARY INPUT STRINGS	
Sentence ID	Description
26	Load data string into line 1 of the upper banner.
27	Load data string into line 2 of the upper banner.
28	Set time
29	Set date
30	Set depth log flag, set depth log format, load user-defined preamble
31	Set depth log rate code
32*	Set HF and LF multiplexer codes
33*	Set TVG flag
34*	Set event mark number, auto event mark toggle, auto event interval, event mark format
35*	Set Sync Mode
36*	Set Primary Channel
37*	Set Pinger Mode (available only with 3.5 and 12kHz)
38	Set current echosounder time to value expressed in milliseconds since midnight
39*	Initiate parameter data print out on the sounder's thermal printer.
40*	Set autophase search mode minimum depth and maximum depth
41*	Set HF & LF sensitivity
42*	Set HF & LF processing gain

* Only available on systems with full SERIAL CONTROL compilations.

Only available on 320M systems.

Only available on 320B systems.

3.1 \$PKEL00: Request Data Output String

Format: \$PKEL00,nn<CR><LF>

where: nn = Data Request code = 00 to 99
<CR> = carriage return
<LF> = line feed

This control string is used to request an information string to be returned to the PC by the sounder. The Data Request Code identifies the data response string for the echosounder to return; see Section 4 for details of the response strings.

3.2 \$PKEL01: Set Units Flag

Format: \$PKEL01,c<CR><LF>

where: c = units flag: 0 = meters, 1 = feet, 2 = fathoms

This control string is used to set the working units flag in the echosounder to the desired value.

3.3 \$PKEL02: Event Marker with External Annotation Only

Format: \$PKEL02,c--c<CR><LF>

where: c--c = External Annotation String (max. 68 valid ASCII chars)

This control string is used to trigger an event mark which uses only the external annotation string on the hardcopy record for 320Ms and in the SCSI data record (320Ms and 320Bs).

3.4 \$PKEL03: Event Marker with Internal and External Annotation

Format: \$PKEL03,c--c<CR><LF>

where: c--c = External Annotation String (max. 68 valid ASCII chars)

This control string is used to trigger an event mark which uses the internally generated and the external annotation string data on the hardcopy record for 320Ms and uses just the external annotation in the SCSI data record (320Ms and 320Bs).

3.5 \$PKEL04: Set Range

Format: \$PKEL04,c<CR><LF>

where: c = range code: 0=10, 1=20, 2=50, 3=100, 4=200, 5=500, 6=1000, 7=2000, 8=5000
(Units are dependent upon the working units setting: either m, ft or fm.)

This control string is used to set the range code parameter in the echosounder.

3.6 \$PKEL05: Set Phase

Format: \$PKEL05,a,bbb<CR><LF>

where: a = AutoPhase Mode Flag: 0 = off, 1 = on
bbb = Manual Phase Code: 1 to 7 for 320Ms and shallow water systems
1 to 239 for deep water systems

This control string is used to set the autophase flag and manual phase code parameters in the echosounder.

3.7 \$PKEL06: Set HF Tx On/Off, HF Tx Power Level

Format: \$PKEL06,a,b<CR><LF>

where: a = HF Tx On/Off: 0 = off, 1 = on
b = HF Tx Power: 1 to 4, or 1 to 8 for newer systems

This control string is used to set the HF channel transmit on/off state and transmit power level parameters in the echosounder.

3.8 \$PKEL07: Set HF AGC, HF Manual Rx Gain

Format: \$PKEL07,a,bbb<CR><LF>

where: a = HF Rx AGC Toggle: 0 = manual, 1 = auto
bbb = HF Manual Rx Gain: 0 to 255

This control string is used to set the HF channel Rx AGC Toggle, and manual Rx Gain parameters in the echosounder.

3.9 \$PKEL08: Set HF Pulse Type

Format: \$PKEL08,cc<CR><LF>

where: cc = HF Pulse Type Code: 0 to N where N is frequency code specific

This control string is used to set the HF channel PulseType Code parameter in the echosounder.

3.10 \$PKEL09: Set LF Tx On/Off, LF Tx Power Level

Format: \$PKEL09,a,b<CR><LF>

where: a = LF Tx On/Off: 0 = off, 1 = on
b = LF Tx Power: 1 to 4, or 1 to 8 for newer systems

This control string is used to set the LF channel transmit on/off state and transmit power level parameters in the echosounder.

3.11 \$PKEL10: Set LF AGC, Manual Rx Gain

Format: \$PKEL07,a,bbb<CR><LF>

where: a = LF Rx AGC Toggle: 0 = manual, 1 = auto
bbb = LF Manual Rx Gain: 0 to 255

This control string is used to set the LF channel Rx AGC Toggle, and manual Rx Gain parameters in the echosounder.

3.12 \$PKEL11: Set LF Pulse Type

Format: \$PKEL11,cc<CR><LF>

where: cc = LF Pulse Type Code: 0 to N where N is frequency code specific

This control string is used to set the LF channel Pulse Type Code parameter in the echosounder.

3.13 \$PKEL12: Set HF and LF Draft

Format: \$PKEL12,aaaaa,bbbbbb<CR><LF>

where: aaaaa = HF draft: 0 - 10000cm, 0 - 32808 ($\frac{1}{100}$ ths ft), or 0 - 5468($\frac{1}{100}$ ths fm)
bbbbbb = LF draft: 0 - 10000cm, 0 - 32808 ($\frac{1}{100}$ ths ft), or 0 - 5468($\frac{1}{100}$ ths fm)

This control string is used to set the draft for the HF and LF channels in the echosounder.

3.14 \$PKEL13: Set Speed of Sound

Format: \$PKEL13,cccc<CR><LF>

where: cccc = Speed of sound in water: 1300 - 1700m/s, 4265 - 5577ft/s,
or 710 - 929 fm/s.

This control string is used to set the speed of sound in the echosounder.

3.15 \$PKEL14: Set Tracking Gate Width

Format: \$PKEL14,www<CR><LF>

where: www = Tracking Gate Width: 2 to 200 (Units are dependent upon the working units setting: either m, ft or fm.)

This control string is used to set the tracking gate width used by the echosounder.

3.16 \$PKEL15: Set HF and LF Transmit Blanking

Format: \$PKEL15,aaaa,bbbb<CR><LF>

where: aaaa = HF Transmit Blanking: 0 - 3000dm, 0 - 9843(¹/₁₀ths ft), or 0 - 1640(¹/₁₀ths fm)
 bbbb = LF Transmit Blanking: 0 - 3000dm, 0 - 9843(¹/₁₀ths ft), or 0 - 1640(¹/₁₀ths fm)

This control string is used to set the transmit blanking value used in the echosounder.

3.17 \$PKEL16: Set Alarm Trigger, Alarm Depth and Alarm Sound Flag

Format: \$PKEL16,a,xxx,c<CR><LF>

where: a = Alarm Trigger Method: 0 = bottom lost, 1 = depth too shallow
 xxx = Alarm Depth: 0 to 100 in m, ft or fm dependent on working units
 c = Alarm Sound Flag: 0 = no sound, 1 = front panel, 2 = KEL remote display,
 3 = front panel and remote

This control string is used to select the alarm trigger mode used by the echosounder, to set the alarm trigger depth (if required) and the alarm sound option.

3.18 \$PKEL17: Set Com 1 Configuration

Format: \$PKEL17,aa,bbbb,c,d,e<CR><LF>

where: aa = Com 1 Device Code:	0 to 10 (13 for old GPS support compilations)
bbbb = Com 1 Baud Rate:	300, 600, 1200, 2400, 4800, 9600, 19200, (38400)
c = Com 1 Parity Code:	0 = none, 1 = odd, 2 = even
d = Com 1 Data & Stop Bits Code:	0 = 8 data, 1 stop; 1 = 7 data, 2 stop
e = Com 1 Loophru Flag:	0 = none, 1 = on

This control string sets the communication port settings for Com1 on the echosounder.

3.19 \$PKEL18: Set Com 2 Configuration

Format: \$PKEL18,a,b,c,d,e<CR><LF>

where: aa = Com 2 Device Code:	0 to 10 (13 for old GPS support compilations)
bbbb = Com 2 Baud Rate:	300, 600, 1200, 2400, 4800, 9600, 19200, (38400)
c = Com 2 Parity Code:	0 = none, 1 = odd, 2 = even
d = Com 2 Data & Stop Bits Code:	0 = 8 data, 1 stop; 1 = 7 data, 2 stop
e = Com 2 Loophru Flag:	0 = none, 1 = on

This control string sets the communication port settings for Com2 on the echosounder.

3.20 \$PKEL19: Set Com 3 Configuration

Format: \$PKEL19,b,c,d<CR><LF>

where: bbbbb = Com 3 Baud Rate:	300, 600, 1200, 2400, 4800, 9600, 19200, (38400)
c = Com 3 Parity Code:	0 = none, 1 = odd, 2 = even
d = Com 3 Data & Stop Bits Code:	0 = 8 data, 1 stop; 1 = 7 data, 2 stop

This control string sets the communication port settings for Com3 on the echosounder.

3.21 \$PKEL20: Set Com 4 Configuration

Format: \$PKEL20,a,b,c,d,e<CR><LF>

where: aa = Com 4 Device Code:	0 to 10 (13 for old GPS support compilations)
bbbb = Com 4 Baud Rate:	300, 600, 1200, 2400, 4800, 9600, 19200, (38400)
c = Com 4 Parity Code:	0 = none, 1 = odd, 2 = even
d = Com 4 Data & Stop Bits Code:	0 = 8 data, 1 stop; 1 = 7 data, 2 stop
e = Com 4 Loophru Flag:	0 = none, 1 = on

This control string sets the communication port settings for Com4 on the echosounder, if available.

3.22 \$PKEL21: Load Banner String

Format: \$PKEL21,c--c<CR><LF>

where: c--c = Banner Input String (max. 32 valid ASCII chars.)

This control string sets the Vanity Banner string on the echosounder's lower banner.

3.23 \$PKEL22: Set Paper Speed

Format: \$PKEL22,a,b<CR><LF>

where: a = Printer Paper On/Off Code: 0 = off, 1 = on

b = Printer Paper Speed: 0 = off, 1 = 1 line/ping, 2 = 10mm/min, 3 = 25mm/min,
4 = 50mm/min, 5 = 100mm/min, 6 = 197mm/min,
7 = 295mm/min

This control string toggles the printer on and off, and controls the paper speed when on.

3.24 \$PKEL23: Set Print Contrast

Format: \$PKEL23,c,xx<CR><LF>

where: c = Print Contrast Mode: 0 = auto:standard, 1 = auto:HF black, 3 = auto:w/depth,
4 = manual

xx = Manual Contrast Level: 1 to 16

This control string selects the printing contrast mode, and manual print contrast level if applicable.

3.25 \$PKEL24: Set Printer Overlay Toggles

Format: \$PKEL24,a,b,c,xxxxxx,d<CR><LF>

where: a = Tracking Gate Overlay Flag: 0 = off, 1 = on

b = Heave Trace Overlay Flag: 0 = off, 1 = on

c = Corrected Depth Overlay Flag: 0 = off, 1 = LF on, 2 = HF on

xxxxxx = Corrected Depth Overlay Offset -5000 to +5000 dm, $\frac{1}{10}$ ths ft or $\frac{1}{10}$ ths fm

d = Tx Blank Overlay Flag: 0 = off, 1 = on

d = Tx Blanking Flag: 0 = off, 1 = on

This control string selects the desired settings for various hardcopy overlays of applicable.

3.26 \$PKEL25: Set Hardcopy Format Options

Format: \$PKEL25,a,b,c<CR><LF>

where: a = Hardcopy Format: 0 = single graph, 1 = split dual graph
b = Hardcopy Grid Format: 0 = no grid, 1 = coarse grid, 2 = fine grid
c = Hardcopy Font Size: 0 = small, 1 = large

This control string sets the basic printer presentational formatting parameters.

3.27 \$PKEL26: Load Upper Banner Line 1

Format: \$PKEL26,c--c<CR><LF>

where: c--c = Upper Banner Line 1 (max 78 valid ASCII chars)

This control string sends the data for the first line in the upper margin banner of the echosounder hardcopy record.

3.28 \$PKEL27: Load Upper Banner Line 2

Format: \$PKEL27,c--c<CR><LF>

where: c--c = Upper Banner Line 2 (max 78 valid ASCII chars)

This control string sends the data for the second line in the upper margin banner of the echosounder hardcopy record.

3.29 \$PKEL28: Set Time

Format: \$PKEL28,hhmmss<CR><LF>

where: hh = hours: 00 to 23
mm = minutes: 00 to 59
ss = seconds: 00 to 59

This control string sets the time in the echosounder. (See also \$PKEL38.)

3.30 \$PKEL29: Set Date

Format: \$PKEL29,f,yyyy,mm,dd<CR><LF>

where: f = Date Format Code: 0 = day-month-year, 1 = Julian
 yyyy = Year: 1996 - 2096
 mm = Month: 01 to 12
 dd = Day: 01 - 31

This control string sets the date in the echosounder.

3.31 \$PKEL30: Set Depth Log Flag, Depth Log Format

Format: \$PKEL30,f,hhhh,xxxx,c--c<CR><LF>

where: f = Depth Log Flag: 0 = none, 1 = PKEL, 2 = ISAH:KEL, 3 = ISAH:Elac, 4 = Echotrac,
 5 = Digitrace[dm], 6 = Digitrace[cm], 7 = Simrad (6 byte),
 8 = Simrad (6 byte), 9 = Deso20, 10 = SDDBS(HF),
 11 = SDDBS(LF), [12 = *SERBCD(HF)*, 13 = *SERBCD(LF)*]
 hhhh = PKEL Depth Log Format, LSW: 0000 to FFFF hex
 xxxx = PKEL Depth Log Format, MSW: 0000 to FFFF hex
 c--c = User defined preamble (max. 16 valid ASCII chars)

This control string selects the echosounder's data logging mode, and configures the user-configurable format including the user-defined header string.

3.32 \$PKEL31: Set Depth Log Rate Code

Format: \$PKEL31,c<CR><LF>

where: c = Depth Log Rate Code 0 = at ping rate, 1 = 5 per second, 2 = 3 per second,
 3 = 2 per seconds, 4 = every second, 5 = every 2 seconds,
 6 = every 5 seconds, 7 = every 10 seconds

This control string set the depth logging throttling rate code. The sounder may have a faster ping rate, but will output the serial depth log string at the rate determined by the code.

3.33 \$PKEL32: Set Mux Codes

Format: \$PKEL32, hh, ll <CR><LF>

where: hh = HF Multiplexer Code: 00 to FF hex
ll = LF Multiplexer Code: 00 to FF hex

This control string sets the multiplexer codes for the HF and LF Channels. This is only applicable if a channel is connected to a KEL 1:8 Multiplexer Box and the multiplexer option is compiled in for the appropriate channel.

3.34 \$PKEL33: Set TVG Flag

Format: \$PKEL33, c <CR><LF>

where: c = TVG Flag: 0 = off, 1 = on

This control string is used to set the state of the TVG flag.

3.35 \$PKEL34: Set Event Number, Auto Event Flag and Interval, Event Format

Format: \$PKEL34, nnnnn, a, tttt, f <CR><LF>

where: nnnnn = Event Mark Number: 00001 to 65535
a = Auto Event Mark Flag: 0 = off, 1 = on
t = Auto Event Mark Interval: 6 to 3600 seconds
f = Event Mark Format: 0 = fix number only, 1 = full annotate

This control string sets the event mark number, timebase control option, timebase interval, and annotation parameters.

3.36 \$PKEL35: Set Sync Mode

Format: \$PKEL35, f <CR><LF>

where: f = Sync Mode Flag: 0 = internal, 1 = external; 2 = PC

This control string sets the echosounder's ping synchronization mode.

WARNING: setting the sounder to external sync mode causes the system to enter a state where it will not perform a transmit/acquisition cycle until it receives a strobe signal from an external source. This can appear as a "lock-up" of the sounder if this mode is improperly toggled on when no external signal is available.

3.37 \$PKEL36: Set Primary Channel

Format: \$PKEL36,f<CR><LF>

where: f = Primary Channel Flag: 0 = HF, 1 = LF

This control string sets the echosounder's primary channel flag.

3.38 \$PKEL37: Set Pinger Mode

Format: \$PKEL37,f<CR><LF>

where: f = Pinger Mode Flag: 0 = off, 1 = on

This control string controls the echosounder's pinger mode.

3.39 \$PKEL38: Set Time in milliseconds since midnight

Format: \$PKEL38,ttttttt<CR><LF>

where: ttttttt = Time in milliseconds since midnight

This control string tells the sounder to set the time to the value expressed in milliseconds since midnight. The sounder compensates this value for the time delay taken to send the data to the sounder based on the current baud rate. (See also \$PKEL28.)

3.40 \$PKEL39: Initiate Parameter Print on the Sounder's Thermal Printer

Format: \$PKEL39,<CR><LF>

This control string sends no data to the echosounder. Receipt of this command string automatically initiates the parameter print out on the echosounder's thermal printer.

3.41 \$PKEL40: Set Autophase Search Mode Minimum and Maximum Depths

Format: \$PKEL40,aaaaa,bbbbbb<CR><LF>

where: aaaaa = Minimum Depth: 0 - 12000

 bbbbbb = Maximum Depth: 20 - 12000

 (Units are dependent upon the working units setting: either m, ft or fm.)

This control string is used to set the autophase search mode's minimum and maximum depths used by the echosounder.

3.42 \$PKEL41: Set HF and LF Sensitivity

Format: \$PKEL41,aaa,bbb<CR><LF>

where: aaa = HF Sensitivity: 1 - 100, (1 = off)
 bbb = LF Sensitivity: 1 - 100, (1 = off)

This control string is used to set the channel sensitivity levels.

3.43 \$PKEL41: Set HF and LF Processing Gain

Format: \$PKEL41,a,b<CR><LF>

where: a = HF Processing Gain: 0 - 8
 b = LF Processing Gain: 0 - 8

This control string is used to set the channel processing gain values.

4 KEL PROPRIETARY CONTROL SENTENCES - OUTPUT

Table 4-1. 320 Echosounder to PC Response Sentences

KEL PROPRIETARY OUTPUT STRINGS	
Sentence ID	Description
0	System's software part and version numbers, and SPM frequency configurations
1	Returns current units flag.
4*	Returns current range selection
5*	Returns current phase mode, phase selection
6*	Returns current HF Tx on/off, HF Tx power setting
7*	Returns current HF Rx AGC and manual gain settings
8*	Returns current HF pulse type setting
9*	Returns current LF Tx on/off, LF Tx power setting
10*	Returns current LF Rx AGC and manual gain setting
11*	Returns current LF pulse type setting
12*	Returns current HF & LF Draft settings
13*	Returns current speed of sound setting
14*	Returns current tracking gate width
15*	Returns current HF & LF transmit blanking setting
16*	Returns current alarm trigger, alarm depth and sound toggle
17	Returns Com A's device, baud, parity, data/stop bits, and loop-thru configuration
18	Returns Com B's device, baud, parity, data/stop bits, and loop-thru configuration
19	Returns Com C's baud, parity and data/stop bits
20	Returns Com D's device, baud, parity, data/stop bits, and loop-thru configuration
21	Returns current contents of the printer banner vanity string.
22*	Returns current printer on/off, and paper speed
23*	Returns current print contrast, manual contrast
24*	Returns current tracking, heave, corrected depth, and tx blank overlay toggles
25*	Returns current hardcopy format, grid format, and printer font size
26	Returns current string contents of line 1 of the upper banner.
27	Returns current string contents of line 1 of the upper banner.
28	Returns MPM's current time of day

KEL PROPRIETARY OUTPUT STRINGS	
Sentence ID	Description
29	Returns MPM's current date
30	Returns current depth log flag, depth log format code, user-defined preamble
31	Returns current depth log rate code
32*	Returns current HF and LF multiplexer codes
33*	Returns current TVG flag
34*	Returns current fix number, auto event mark flag and interval, and fix format flag
35*	Returns current sync mode flag
36*	Returns current primary channel flag
37*	Returns current pinger mode flag
38	Returns current echosounder time expressed in milliseconds since midnight
39*	Reserved
40*	Returns current autophase search mode minimum and maximum depths
41*	Returns current HF & LF sensitivity settings
42*	Returns current HF & LF processing gain settings
97	Returns number of pulse types available for LF channel and a 10 character identification string for each pulse available
98	Returns number of pulse types available for HF channel and a 10 character identification string for each pulse available
99	Data Logger Output String

* Only available on systems with full SERIAL CONTROL compilations.

Only available on 320M systems.

Only available on 320B systems.

4.1 \$PKEL00 Response: Software ID and Version

Format: \$PKEL00,mmmmm,n.nn,ppppp,v.vv,hhhhh,lllll,xxxxxxx<CR><LF>

where: mmmm = MPM Software Part Number: 02000 - Marine Sounder
 n.nn = MPM Software Version Number: 0.00 to 9.99
 ppppp = Printer Software Part Number: 02319 - Basic Printer
 v.vv = Printer Software Version Number: 0.00 to 9.99
 hhhhh = HF Channel Frequency Configuration (6 chars)
 lllll = LF Channel Frequency Configuration (6 chars)
 xxxxxx = Setup Compilation Flags (hex)

4.2 \$PKEL01 to \$PKEL38

For format information see the appropriate sections describing the Input Control Strings.

4.3 \$PKEL97

Format: \$PKEL97,dd,cccccccc,cccccccc,.....<CR><LF>

where: dd = number of LF pulse types available
 cccccccc = pulse type identification string,
 one for each pulse available expressed in order of pulse codes

4.4 \$PKEL98

Format: \$PKEL98,dd,cccccccc,cccccccc,.....<CR><LF>

where: dd = number of LF pulse types available
 cccccccc = pulse type identification string,
 one for each pulse available expressed in order of pulse codes

4.5 PKEL Depth Log Output String

The PKEL depth log output string can be configured by the user to contain any combination of the fields listed in Table 4-2. Note that although this string is referred to in this documentation as the “PKEL” string (KEL’s proprietary NMEA label) it can begin with a user-defined preamble or no preamble. The fields appear in the output string in the same order listed below. If a field is selected but no data is available (ie. heave field selected but no heave device selected), the field position is filled with dashes. All the fields are fixed fields, meaning they do not vary in size regardless of the data. Fields, except Time and Milliseconds, are separated by commas.

Two methods are available for configuring the output string format:

- 1) A Windows serial utility program, SerialUtility.exe, is provided with the echosounder to allow the users to easily modify the depth log format to suit their individual needs. This program communicates with the echosounder's monitor port on COM3 via a null modem RS-232 serial cable.
- 2) It is possible to send the appropriate instruction directly to the echosounder monitor using any standard communications package with a simple null modem RS-232 serial cable.

The echosounder uses a 32-bit code to setup the configuration of the depth log string. This code is displayed in the secondary function interface menu as a hexadecimal value. The Windows utility program, SerialUtility.exe, automatically sets this code value and sends it to the echosounder. Users familiar with binary and hexadecimal conversions can easily compute the appropriate code value to send to the echosounder for a given configuration. The bit corresponding to a field in the code word is set to 1 to select the field for output, and is reset to 0 to deselect the field.

Table 4-2. PKEL Depth Log String Format

Field #	Field Description	Field Format	Code Word Bit #
0	User defined preamble string	Printable ASCII chars (max.16)	LSW:0
1	KEL Proprietary String Standard Header	\$PKEL99	LSW:1
2	Record Number	rrrrr	LSW:2
3	Fix Indicator	Fnnnn	LSW:3
4	Date	Standard: ddmmyyyy Julian: Jddyyyy	LSW:4
5	Time at start of ping, to second resolution from MPM Real-Time Clock	hhmmss	LSW:5
6	Milliseconds sync'd to Real-Time Clock (Time field must be selected)	.sss	LSW:6
7	Ping Start to Data Output Latency	ttttt	LSW:7
8	High Frequency Identification Header	HF	LSW:8
9	HF Depth, to transducer (uncorrected for any offsets)	xx.xx or xxx.x or xxxx. or xxxxx	LSW:9
10	HF Depth, corrected for draft	xx.xx or xxx.x or xxxx. or xxxxx	LSW:10
11	HF Depth, corrected for draft and heave	xx.xx or xxx.x or xxxx. or xxxxx	LSW:11
12	HF Depth, corrected for draft, heave, and tide	xx.xx or xxx.x or xxxx. or xxxxx	LSW:12
13	HF Depth validity flag	1 = okay, 0 = bad	LSW:13

Field #	Field Description	Field Format	Code Word Bit #
14	HF Multiplexer Channel	0 - 15	LSW:14
15	HF Draft offset	sxxx.xx	LSW:15
16	Low Frequency Identification Header	LF	MSW:0 (16)
17	LF Depth, to transducer (uncorrected for any offsets)	xx.xx or xxx.x or xxxx. or xxxxx	MSW:1 (17)
18	LF Depth, corrected for draft	xx.xx or xxx.x or xxxx. or xxxxx	MSW:2 (18)
19	LF Depth, corrected for draft and heave	xx.xx or xxx.x or xxxx. or xxxxx	MSW:3 (19)
20	LF Depth, corrected for draft, heave, and tide	xx.xx or xxx.x or xxxx. or xxxxx	MSW:4 (20)
21	LF Depth validity flag	1 = okay, 0 = bad	MSW:5 (21)
22	LF Multiplexer Channel	0 - 15	MSW:6 (22)
23	LF Draft offset	sxxx.xx	MSW:7 (23)
24	Tide (not in use yet)	sxx.xx	MSW:8 (24)
25	Tide latency (Tide field must be selected)	tttt	MSW:9 (25)
26	Speed of Sound	xxxx	MSW:10 (26)
27	Heave	shhhhq	MSW:11 (27)
28	Heave Latency (Heave field must be selected)	tttt	MSW:12 (28)
29	Position: Latitude, Longitude	ll ll.llllllN,ooo oo.oooooE	MSW:13 (29)
30	Position Latency (position field must be selected)	tttt	MSW:14 (30)
31	Checksum	hh	MSW:15 (31)

Example 1:

To setup the Hypack (knu320ms.dll) and Trimble HydroPro compatible string, select the following fields: HF depth corrected for draft, LF depth corrected for draft, and Heave. This is the factory-default configuration.

For the 32 bit code:

LSW = 0000 0100 0000 0000b = 0400h
MSW = 0000 1000 0000 0100b = 0804h

Thus the instruction to send to the echosounder would be: \$PKEL30,1,0400,0804,<CR><LF>

This would result in a depth log string as follows: xx.xx,xx,xx,shhhhq<CR><LF>

Example 2:

To setup the Hypack (k320s.dll) compatible string, select the following fields:
 User preamble = CHS320M, time, HF header, HF depth corrected for draft, HF validity flag, HF draft, LF header, LF depth corrected for draft, LF validity flag, LF draft, sound speed, and heave.

For the 32 bit code:

LSW = 1010 0101 0010 0001b = A521h
 MSW = 0000 1100 1010 0101b = 0CA5h

Thus the instruction to send to the echosounder would be: \$PKEL30,1,A521,0CA5,CHS320M<CR><LF>

This would result in a depth log string as follows:

CHS320M,hhmmss,HF,xx.xx,f,sxxx.xx,LF,xx.xx,f,sxxx.xx,xxxx,shhhhq<CR><LF>

Example 3:

For the following code selection:

LSW = 1010 1001 1111 1001b = A9F9h
 MSW = 1111 1100 1010 1001b = FCA9h

the resulting instruction would be: \$PKEL30,1,A9F9,FCA9,MyString<CR><LF>

and the expected depth log format would be:

MyString,Fnnnn,ddmmyyyy,hmms s.sss,tttt,HF,xx.xx,f,sxxx.xx,LF,xx.xx,f,sxxx.xx,xxx x,shhhq, ttt,ll.llllll,ooo oo.ooooo,ttt*hh <CR><LF>

5 USER CONTROL INTERFACE STRINGS

Table 5-1. User Control Input Strings

MONITOR MAINTENANCE INPUT COMMANDS	
Command	Description
/?	Show the basic list of the available command set
/GR	Switch program to run out of EPROM
/GT	Switch program to run out of SRAM
/R	Reset program to 'start'
/SBA dec	Set baud rate for COM 1 to 'dec'
/SBB dec	Set baud rate for COM 2 to 'dec'
/SBC dec	Set baud rate for COM 3 to 'dec'
/SBD dec	Set baud rate for COM 4 to 'dec'
/DT	Download TI tag file into SRAM
/VER	Show current software number, version and location where program is running
/ID	Print SCSI ID set by DIP switches
/CCLK	Check the validity bit on the real-time clock
/BAN	Load a string into the banner for the printer
/INVM	Load the non-volatile memory with the defaults values for parameters
/SNVM	Load the non-volatile memory with the current values for parameters
/PRGPS	Program the SRAM contents into EPROM
/PRGTX	Compute and program the pulse data into the TX EPROM