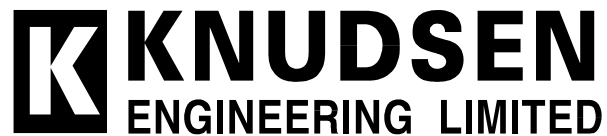


320B BLACK BOX ECHOSOUNDER

SOFTWARE INSTALLATION/UPGRADE MANUAL

Supports Software Package #: D42-02386 V2.00

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Knudsen Engineering Limited
10 Industrial Road
Perth, Ontario, Canada

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1 INTRODUCTION

1.1 About this manual

This manual provides installation and upgrade details for the software package provided with a 320B Series Black Box Echosounder. It provides descriptions of the Windows software applications, and the embedded firmware. It explains what needs to be installed for newly delivered system, and what needs to be done to upgrade an existing system.

1.2 Technical Support

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

Technical Support
Knudsen Engineering Limited
10 Industrial Road
Perth, Ontario
K7H 3P2

Voice: (613) 267-1165 8:30 am to 5:00 pm E.S.T. Core Hours
Fax: (613) 267-7085
E-Mail: support@knudsenengineering.com
WebSite: <http://knudsenengineering.com/>

2 SOFTWARE DEFINITIONS

2.1 Overview

Virtually every aspect of the 320B Series Echosounder's functionality is defined and controlled by software. This software includes the "firmware" which resides in non-volatile FLASH memories within the echosounder itself, and various Windows-compatible support applications which run on the host PC.

2.1.1 Firmware

The term firmware refers to the software which resides in FLASH eproms within the Echosounder. Upgrades and revisions are distributed periodically as ".tag" files which can be re-programmed into the echosounder in the field by the user.

The echosounder preserves its operating parameters in on-board non-volatile memory (NVM), and will restore the stored parameters on power-up. Unless new NVM parameters have been defined in a firmware upgrade, the system can preserve its customized configuration during a system upgrade. If new NVM parameters have been added in an MPM firmware upgrade, the system may have to restore the NVM to factory defaults.

2.1.2 Windows Support Applications

There are various Windows applications provided with the 320B Series Echosounders for different support purposes. All the programs are Windows compatible, and are installed with a standard Setup.exe process.

2.1.2.1 Echo Control (Echo Control.exe)

This program is an independent Windows application that interfaces to the echosounder via the SCSI interface. The SCSI interface must be connected and functioning for this application to be usable. It provides a scrolling echogram image display with echosounder operating controls, and controls for data logging and recording functions. This application is required for the user to be able to control the 320B.

2.1.2.2 Post-Survey (PostSurvey.exe)

This program is an independent Windows application that provides the user playback and printing capabilities for the echogram data recorded by the Echo Control application.

2.1.2.3 Hypack Device Driver (Knu320bs.dll)

This program is provided as a device driver to Coastal Oceanographics HYPACK for Windows hydrographic survey software, in the DLL (Dynamic Link Library) format required by HYPACK. This program is only useful to HYPACK for Windows users. It uses DDE data transfer protocol to interface with the stand-alone Echo Control application.

2.1.2.4 Serial Configuration Utility (Serial Utility.exe)

This program is a very simple Windows interface program. It communicates with the echosounder through the serial monitor port (COM3). It works with existing PC com port hardware (no special host adaptors are required), and provides basic configuration functions. It provides access to the serial port configuration controls required to set-up the echosounder to interface with external devices. Once the sounder's configuration parameters have been set, the program can be terminated and the sounder will retain the selected configuration.

2.1.2.5 Upgrade Utility (Upgrade Utility.exe)

This program is a very simple Windows interface program. It communicates with the echosounder through the serial monitor port (COM3). It works with existing PC com port hardware (no special host adaptors required), and provides strictly firmware upgrade capabilities.

3 INSTALLATION / UPGRADE GUIDELINES

3.1 Initial Installation

A newly delivered echosounder has the necessary firmware programmed into it. The user only needs to load the Windows support applications supplied on the CD-ROM. The CD-ROM contains a Setup.exe Windows installation program that creates the directory and copies all the files onto the user's hard disk. See Chapter 4 for a complete description of the installation process.

3.2 System Upgrades

Occasionally, a system that has already been operating out in the field will be provided an upgrade software package to provide additional operating features not available with the existing software. The upgrade package could impact any or all of the software and firmware files; sometimes just the Windows applications are affected and firmware does not need to be modified. An instruction pamphlet is provided with each upgrade package indicating what software needs to be modified. See Chapters 4 and 5 for detailed descriptions of the installation processes.

NOTE: When performing the upgrade, always perform the Windows upgrade first, as this will extract the necessary ".tag" file onto the hard disk required to proceed with the firmware upgrade (if needed).

4 PC SOFTWARE INSTALLATION

4.1 Installation CD-ROM

The CD-ROM provided with a new system or in an upgrade package contains a typical Windows installation program for the Echosounder software package, as well as some installations for useful support tools. The CD-ROM also includes all the important files in sub-directories so as to be accessible directly from the CD-ROM for more advanced users. There is a sub-directory with floppy disk images so users can create floppy disk installations to support machines without CD drives. There is also a directory with a minimal installation compressed in a ZIP file for e-mailing to remote sites via the Internet.

4.1.1 CD-ROM Contents

The CD-ROM contains the folders listed in Table 4-1. The main contents of these folders are as follows:

Table 4-1: CD-ROM Contents

Directory	Contents	Description
Root level	Setup.exe	The main installation program for the software package
Acrobat	ARSetup.exe	Acrobat Reader installation program
Aspi	Aspchk.exe and Win95-98 & WinNT sub-directories	Aspchk.exe is a utility for checking the status and version of the current ASPI layer installed in the host PC. Each subdirectory contains an installation program for loading/updating the ASPI Layer for the appropriate OS.
Disks	Sub-directories: Disk1 - Disk#	Each sub-directory contains the files to be loaded onto a single floppy disk for a floppy disk installation set.
Firmware	Tag files	The files required to upgrade or restore an Echosounder's firmware configuration.
Internet	D4202386.zip	A minimal installation compressed for sending via the Internet. NOTE: this installation does not contain any of the supporting documentation files.
Manual	.PDF files	Manual components in Portable Document Format (PDF) accessible via Acrobat Reader.
Promos	Company Overview.exe Product Overview.exe Show Data.exe	Promotional programs: 2 slideshows with overviews about the company and its products, and an application for viewing the sample data files included in the Samples sub-directory.
RunTime	Echo Control.exe PostSurvey.exe Serial Utility.exe Upgrade Utility.exe Knu320bs.dll	The main Windows applications for the Echosounder & their supporting files.
Samples	Sub-directories	Sample data files in various sub-directories.

4.2 Setup Procedure

The CD-ROM provided either with a new system or in an upgrade package contains a typical Windows Setup.exe installation program. For most Windows systems, this Setup.exe will automatically run (autorun) when the CD-ROM is loaded in the drive. If it does not start automatically simply run the file Setup.exe.

When this program is run, it displays a number of information and configuration prompts. The first dialogue box is simply the Welcome screen which describes the installation program and offers the user the option to proceed or to Cancel the installation. If the user chooses to proceed, the next dialogue box is an information box stating copyright and contact information. If the user decides to continue, the next box offers the user the option to change the destination folder name; the default is C:\Knudsen\320B. Once the user has selected and accepted the desired destination folder, the next dialogue box prompts for the "Setup type". There are three options available: Typical (all components), Compact(just main program and firmware files), and Custom (any or all components). The Typical and Compact types and the software components they install are defined in the following table. The Custom type allows the user to select any combination of components he desires. The Custom option is recommended for advanced users only.

Table 4-2: Installation Setup Types and Components

Component	Description	Type = Typical	Type = Custom
Program Files	This component includes all the Windows support applications.	X	X
Firmware Files	This component includes the firmware file(s) required to upgrade the echosounder system.	X	X
Manual Files	This component includes all the documentation files required for online support.	X	
Promo Files	This component includes company and product slideshows as well as a scrolling playback program for the sample data included on the CDROM.	X	

After the user has selected the Setup type required, and for Custom setups selected the necessary components, the Setup application offers the option to modify the Program Folder label that appears on the Start bar Programs menu; the default is Knudsen Echosounder\320B. After all these selections have been made by the user, the Setup application provides a summary dialogue box where the user can review his selections before deciding to go back to redo any selections or proceeding forward with the installation process. Once the user accepts the selections displayed in the summary box, the Setup application starts the actual file copying, formatting of the folders on the harddrive and formatting of the menu options on the Programs bar. A series of progress indicators are displayed during the process. After the copying process is complete, a dialogue box appears to indicating that the Setup is complete. Once the user exits the setup, he can proceed with the firmware upgrade if required.

4.3 Files Installed by Setup

For a Typical installation, the following files will have been loaded onto the disk drive and into the directory specified by the user. If the user has used the installation program's defaults, the path would be C:\Knudsen\320B.

Table 4-3: Files installed in a Typical Setup

File Name	Description	Programs Icon Name
Windows Applications:		
Echo Control.exe	SCSI Echo Control Application	Echo Control
PostSurvey.exe	Playback & Printing Application	Post Survey
Serial Utility.exe	Serial Configuration Utility	Serial Utility
Upgrade Utility.exe	Serial Upgrade Utility	Upgrade Utility
Knu320bs.dll	Hypack Device Driver	None
Kel.dat, Sample.cfg, .hlp and .cnt files	Support files	None
Firmware Files: <i>(these are provided with newly delivered systems for backup purposes only)</i>		
Knnnnnn.tag	Main Processing Module (MPM) firm ware file where nnnnnn = tag file serial number (<i>ie. K990034.tag</i>)	None
Documentation Files: <i>(These files are in PDF format; it may be necessary to install the Acrobat Reader application provided for accessing them.)</i>		
D1002219.pdf	Software Installation/Upgrade Manual	\Manual\Software Install
D1002096.pdf	Hardware Manual	\Manual\Hardware Manual
D1002139.pdf	Online SCSI Control Software Manual	\Manual\SCSI Echo Control
D1002193.pdf	Playback and Printing Software Manual	\Manual\Playback & Printing
D1002194.pdf	Serial Configuration Utility Software Manual	\Manual\Serial Utility
D1002278.pdf	Serial Upgrade Utility Software Manual	\Manual\Upgrade Utility
D1002390.pdf	Serial Computer Interfacing Manual	\Manual\Serial Interfacing
D1002251.pdf	Echosounder Concepts Technical Note	\Manual\Echosounder Concepts
D1002252.pdf	Customer Service Request Form	\Manual\Service Request Form
Accessory Files: <i>(these files are not required)</i>		
Company Overview.exe	Slideshow providing an overview about Knudsen Engineering Limited	Accessories\Company Overview
Product Overview.exe	Slideshow providing an overview about the 320 Series Product line	Accessories\Product Overview
Show Data.exe	A scrolling display program for viewing the sample files included on the CD-ROM in the Samples directory.	Accessories\Show Data

4.4 Acrobat Reader Installation

All the documentation files supporting this software package have been supplied in PDF format (Portable Document Format). If there is not an appropriate reader application on the host PC, it will be necessary to install Acrobat Reader to be able to access the documentation files. The Acrobat Reader installation program is available on the CD-ROM in the Acrobat directory. Simply run the ARSetup.exe file located in this directory and follow the on-screen prompts to proceed with the installation process. Once Acrobat Reader has been installed, it can be used to view, search, and print the documentation.

4.5 ASPI Layer Installation/Update

For the SCSI Echo Control application to function properly, the host PC must have installed a special interface layer called the Advanced SCSI Programming Interface (ASPI). Windows 95 and Windows 98 have a basic version of this loaded as part of the operating system installation but under certain conditions this layer needs to be updated to a more recent version. For Windows NT, the layer is not included in the operating system installation and must be loaded via a third-party application such as Adaptec's EZ-SCSI included with the standard host adapters provided by KEL.

If the ASPI layer is missing, or if it is too old a version, or has had its performance modified by some other SCSI device loaded on the PC, the Echo Control application will not be able to function properly. If the layer is missing altogether, the EchoControl application usually indicates that it has failed to load the desired DLL file for the ASPI interface and then states that it cannot find either the application or one of its components. If the version is too old or modified by another SCSI device, the Echo Control program often fails by exhibiting an apparent "lock-up" condition where it simply sits with an hourglass cursor (or equivalent "busy" cursor) and does not respond to any user inputs.

The CD-ROM provided with the Echosounder includes an ASPI layer installation program that will install or update the ASPI layer to a version normally suitable for the Echo Control application as well as most other SCSI peripherals. Windows 95 & Windows 98 can be updated using the installation program located in the \ASPI\Win95-98 directory on the CD-ROM. Windows NT needs a slightly different installation which can be found in the directory \ASPI\WinNT on the CD-ROM. These installation programs will install the ASPI layer with Version 4.57 files. NOTE: if your ASPI layer is of a later Version number than this, it should not be necessary to update the layer or the current files should be backed up before the installation is performed in case it compromises the performance of other SCSI devices. Use the Aspchk.exe file in the \ASPI directory to compare Version numbers only, not file dates since files loaded by the operating system often have the date the operating system was installed, not the date the ASPI layer files were originally created.

Table 4-4: ASPI File Locations

File Name	Typical Location
Windows 95 and Windows 98	
Winaspi.dll	c:\windows\system
Wnaspi32.dll	c:\windows\system
Aspienum.vxd	c:\windows\system
Apix.vxd	c:\windows\system\iosubsys
Windows NT	
Winaspi.dll	c:\winnt\system
Wowpost.exe	c:\winnt\system
Wnaspi32.dll	c:\winnt\system32
Aspi32.sys	c:\winnt\system32\drivers

4.6 Special Notes regarding Windows NT

If the SCSI application is used for the firmware installation, please note the following: the section describing the Program TX step states that the hour-glass icon stays active until the programming action is complete. Under Windows NT, this is not the case. The system will still be programming, and the Echo program will restore the arrow cursor but it will not respond accurately until the programming action is complete; this takes approximately two minutes. Once the programming is complete, the application cursor will respond smoothly again. If this method is used for the upgrade, wait a couple minutes after performing the Program Tx command to allow the system to complete the programming action.

5 FIRMWARE INSTALLATION

The firmware installation procedures are only required for system upgrades. Newly delivered systems do not need to have any firmware loaded. Upgrades are performed when new capabilities are added to the echosounder's functionality. Sometimes only the Windows support software is enhanced and firmware remains unaffected. Each upgrade release will include instructions indicating whether the firmware needs to be upgraded or not. If a firmware upgrade is required, always perform it after the PC software upgrade, since the Setup.exe installs the firmware file required for the upgrade.

The 320B Echosounder Main Processor Module (MPM) has FLASH memories for storing the firmware used to run the system. There is also a FLASH memory used to store the transmit pulse generation codes used for transmitting a ping. Upgrading the 320B involves downloading new firmware into the controller board, and the transmit memory.

5.1 Upgrading the MPM Firmware

There are four possible methods to use to upgrade the MPM firmware; one using the Online SCSI Control application, one using the Serial Configuration Utility, one using the Upgrade application, and one using any other PC communications package interfacing to the sounder's monitor port on COM3. The fastest and easiest method is the one using the Online SCSI Control application. The methods that use the serial link on COM 3 are slower due to the lower throughput rate of the serial link. The method used with the Serial Configuration Utility or the Upgrade Utility is virtually identical to that used with the SCSI once the communications link is established.

NOTE: None of the applications used to perform the firmware upgrade automatically reference the directory location for the firmware file(s). For the MPM, the firmware ".tag" can be located in the Firmware\MPM folder located in the destination folder specified during the Windows software installation. If the default location was used, the proper folder would be C:\Knudsen\320B\Firmware\MPM.

5.1.1 Using the SCSI Control Application: Echo Control.exe

(Note: This application is no longer compatible with echosounder firmware versions that pre-date D40-02000 V2.14. If your original firmware version pre-dates this one, please use an alternate method to perform the upgrade.)

Run the Echo application; if the firmware version on the echosounder is older than that fully supported by the Echo application, a message box will appear indicating this condition. After the user acknowledges the message, all controls in the program will be disabled except those required for the firmware upgrade. It is possible for extremely old firmware versions that the Echo application may not be able to recognize its configuration properly, and will disable all controls, even those required for the upgrade. In such a case, the user can use one of the other methods described here.

To load the new firmware into the sounder, select the menu option **Upgrades** and its submenu **Load Tag**. Select the appropriate Knnnnnn.tag file required for the upgrade and accept. The application will display an hourglass cursor until the firmware is completely loaded.

The **Load Tag** command simply loads the new firmware into the echosounder's SRAM memories. If the sounder were powered down at this point, the new firmware would be lost and the sounder would power up with its original firmware version. To program the new firmware permanently into the sounder EPROM memories, select the menu option **Upgrades** and the submenu **Program PS**. The application will display an hourglass cursor until the programming has completed.

At this point the sounder has the new firmware permanently loaded, but the Transmit EPROM data may not correspond properly with it. To load the Transmit EPROM with matching data, select the menu item **Upgrades** and its submenu **Program TX**. The new firmware itself loads the Transmit EPROM with the appropriate data. The Echo application will display an hourglass cursor until the transmit programming has completed; this can take significantly longer than the **Load Tag** and the **Program PS** operations.

5.1.2 Using Serial Configuration Utility: Serial Utility.exe

(NOTE: This application is not compatible with echosounder firmware versions that pre-date D40-02000 V1.01. If your original firmware version pre-dates this one, please use an alternate method to perform the upgrade.)

Before trying to use this application, please ensure that the echosounder is not sounding. If it is sounding, the data logging output string that is sent with every ping will confuse the Serial Configuration application, potentially causing error messages to occur during the upgrade attempt. Turn the transmit off for each frequency channel to avoid this problem.

Run the Serial Utility application; if the firmware version on the echosounder is older than that fully supported by the application, a message box will appear indicating this condition. After the user acknowledges the message, all controls in the program will be disabled except those required for the firmware upgrade. It is possible in the case of extremely old firmware versions that the Serial Utility application may not be able to recognize its configuration properly, and will have difficulty determine the correct communications settings to use for the link. If this occurs configure the PC port to match the echosounder manually using the Menu item **Com Ports**, sub menu **PC Port** command. Once the PC port has been properly configured, proceed with the firmware upgrade.

To load the new firmware into the sounder, select the menu option **Upgrades** and its submenu **Download Tag**. Select the appropriate Knnnnn.tag file required for the upgrade and accept. The application will display a status box indicating the progress of the download process; this can take couple of minutes dependent upon the serial data rate. After the download is complete, the Serial Utility application checks that the new firmware is responding properly, and reports its success or failure. If the tag file has downloaded successfully and the data setup could be successfully read, the user can proceed with the upgrade process.

The **Download Tag** command simply loads the new firmware into the echosounder's SRAM memories. If the sounder were powered down at this point, the new firmware would be lost and the sounder would power up with its original firmware version. To program the new firmware permanently into the sounder EPROM memories, select the menu option **Upgrades** and the submenu **Program PS**. The application will display messages received from the echosounder indicating the progress of the programming task.

At this point the sounder has the new firmware permanently loaded, but the Transmit EPROM data may not correspond properly with it. To load the Transmit EPROM with matching data, select the menu item **Upgrades** and its submenu **Program TX**. The new firmware itself loads the Transmit EPROM with the appropriate data. The application will display messages received from the echosounder indicating the progress of the programming task; this can take significantly longer than the **Program PS** operation.

5.1.3 Using Upgrade Utility: Upgrade Utility.exe

(NOTE: This application is not compatible with echosounder firmware versions that pre-date D40-02000 V1.01. If your original firmware version pre-dates this one, please use an alternate method to perform the upgrade.)

Before trying to use this application, please ensure that the echosounder is not sounding. If it is sounding, the data logging output string that is sent with every ping will confuse the Upgrade application, potentially causing error messages to occur during the upgrade attempt. Turn the transmit off for each frequency channel to avoid this problem.

Run the Upgrade Utility application and select the options for Main Processor Module, the Com port to use, and whether to use auto-detection for the com port settings. It is possible in the case of extremely old firmware versions that the Upgrade application may not be able to recognize its configuration properly, and will have difficulty determine the correct communications settings to use for the link. If this occurs configure the PC port to match the echosounder manually using the Menu item **Com Ports**, sub menu **PC Port** command. Once the PC port has been properly configured, proceed with the firmware upgrade.

To load the new firmware into the sounder, select the menu option **Upgrades** and its submenu **Download Tag**. Select the appropriate Knnnnnn.tag file required for the upgrade and accept. The application will display a status box indicating the progress of the download process; this can take couple of minutes dependent upon the serial data rate. After the download is complete, the Upgrade Utility application checks that the new firmware is responding properly, and reports its success or failure. If the tag file has downloaded successfully and the system configuration could be successfully read, the user can proceed with the upgrade process.

The **Download Tag** command simply loads the new firmware into the echosounder's SRAM memories. If the sounder were powered down at this point, the new firmware would be lost and the sounder would power up with its original firmware version. To program the new firmware permanently into the sounder EPROM memories, select the menu option **Upgrades** and the submenu **Program PS**. The application will display messages received from the echosounder indicating the progress of the programming task.

At this point the sounder has the new firmware permanently loaded, but the Transmit EPROM data may not correspond properly with it. To load the Transmit EPROM with matching data, select the menu item **Upgrades** and its submenu **Program TX**. The new firmware itself loads the Transmit EPROM with the appropriate data. The application will display messages received from the echosounder indicating the progress of the programming task; this can take significantly longer than the **Program PS** operation.

5.1.4 Using the Monitor Port and a Communications Program

Make sure a null modem serial communications cable is attached to the COM 3 connector on the 320M's connector panel and set up the baud, parity, and data format on COM 3 to match that used by the PC. The typical settings are:

Baud Rate: 19200
 Data bits: 8
 Parity: none

Step	Action	Keyboard Entry	Expected System Response
1	Start PC Communications Program	(Program Specific)	(Program Specific)
2	Power on 320M	none	SRAM Monitor sign-on message with prompt ">"
3	Switch to ROM	/GR[ENTER]	ROM Monitor sign-on message with prompt "*"
4	Start Download	/DT[ENTER]	"Waiting for TAG file."
5	Start ASCII transfer	(Program Specific)	(Program Specific)
6	Wait for transfer to complete	none	Download complete.
7*	Switch to SRAM	/GT[ENTER]	SRAM Monitor sign-on message with prompt ">"
8	Program permanently into EPROM	/PRGPS[ENTER]	Programming zeroes, erasing, programming, done.
9	Program Transmit EPROM to match new firmware	/PRGTX[ENTER]	Programming zeroes, erasing, programming LF, programming HF, done. (If only one frequency is installed, only the appropriate channel is programmed)

*Note: At this point the new software is in SRAM only. If a system power-down were to occur now, the new software would be lost. It MUST be programmed before the system can be powered down if the new code is to be preserved.

