QuickStart Quide
RDK-LBC-219-1F

WinSystem's ROM-DOS Development Kits (RDK) are designed to minimize the leaning curve for our Single Board Computer products. These kits provide first time users with a familiar operating environment and all of the components necessary to get an embedded system up and running quickly. Several kits are available with slight variation for different CPU boards.

SDK and RDOS development kits are also available and may be more suitable for certain applications. Please contact the WinSystems Applications Engineering Group for more information on development kit options.

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1 ROM-DOS 6.22 Distribution Diskette (3.5" 720KB)
1 ROM-DOS 6.22 Users Manual
1 512K X 8 EPROM (Bootable ROM-DISK A:) @ U19
2 512K X 8 PEROMs (FLASH Disk C:) @ U20 and U21
1 CBL-123-1 Serial I/O cable
1 CBL-122-1 Printer Cable
1 CBL-180-6 DB9 Female to Female Null Modem cable
1 CBL-204-1 Multi-Function Cable
1 PS-50W-1 Power Supply with Harness
1 PCM-POST Diagnostic Card

NOTE : This development kit is compatible with the LBC-486SX/DX/DX2/DX4 single board computers (Sold separately).

BOARD CONFIGURATION

If the single board computer and the development kit are ordered together, the memory devices will be installed and tested prior to shipment. The jumper configuration will be preset to the following :

J2 = 1-2	J9 = 3-4
J10 = OPEN	
J11 = 7-8,13-14,15-16,19-20,21-22	
J17 = OPEN	J19 = OPEN
J21 = OPEN	J22 = OPEN
J23 = 4-6,7-9,8-10	J24 = 2-3
J25 = 3-4,5-6,7-9,8-10	J26 = 2-3
J27 = 3-4,5-6,7-9,8-10	J28 = 2-3
J29 = 3-4,5-6,7-9,8-10	J30 = 2-3
J32 = OPEN	J35 = 1-2
J36 = 1-2	J39 = 1-2,3-4

NOTE : The preset jumper configuration allows the LBC board to boot from the ROM-DISK and operate as directed in this guide. The configuration may need to be altered for your specific application. Please see the LBC-486SX/DX Operations Manual for details.

GETTING STARTED

This section will help you boot the CPU and transfer your application to the RAM Disk onboard the CPU. This guide assumes that you are using a desktop PC for development of your embedded application (Referred to as the PC in the remainder of this document).

1. Connect the multi-function cable (CBL-204-1) to the J41 connector on the LBC-486 board.

2. Connect an AT compatible keyboard to the keyboard connector of the Multi-function cable.

3. To use the serial console connect the CBL-123-1 to the COMM1 connector J8 on the LBC-486 board. Then attach one end of the Null Modem Cable (CBL-180-6) to the DB9 connector of the serial cable just attached. Connect the other end of the Null modem cable to COMM1 of your PC.

4. Connect the power cable from the PS-50W-1 to the LBC-486 power connector at J3.

5. If using a video display board, install it onto the PC/104 connector J15. Be sure that all pins are properly inserted before applying power.

SCON1 - SERIAL CONSOLE UTILITY

In order to use the serial console and file transfer utility, you will need to start the Serial Console utility (SCON1 or SCON2) located on the LBC-486's A: drive. If you have a VGA display card you can boot the system normally and add an AUTOEXEC.BAT file to the LBC-486's C: drive. The new AUTOEXEC file can initiate one of the console programs. This new AUTOEXEC file might look something like this :

```
@echo off
cls
a:\scon1
```

You can use the DOS copy command to create the file as follows :

```
copy con c:\autoexec.bat
```

This command will open a file on C: named AUTOEXEC.BAT and copy your keyboard entries into it. Each time you press ENTER, a line will be added to the file. To make the serial console active when the system is booted, add the following line to the file :

```
a:\scon1
```

This will make COMM1 on the LBC-486 the serial console port. To end the copy command press the F6 key and then ENTER. When the system is next booted the serial console will be enabled and files can be transferred to the LBC-486 by following the instructions below. If you make a mistake while copying to the AUTOEXEC.BAT file, simply end the copy and do it over.

If you do not have a video card and do not need to change the BIOS settings, you can still initiate the serial console. Simply boot the system without any monitor adapter. Do not press any keys while the system is booting! When the system beeps once to indicate a successful POST (Power on Self Test), key in SCON1 and press ENTER. You are keying command 'blind' so be sure to press the right keys. Next follow the instructions below to connect to the LBC-486 via the serial console port.

SERIAL CONSOLE

1. Load the ROM-DOS software onto your PC by copying all of the files on the ROM-DOS diskette to an appropriate directory. For example :

```
md rom-dos
copy a:\*.* \romdos
```

2. Go to the ROM-DOS directory you just created and execute the COMM.EXE console program with the following command.

```
comm /b38400
```

The screen will be cleared and the bottom line will appear as :

```
COMM v2.0 Press F1 for Help   Com1: 38400 N81 Echo Off CR
```

Pressing the F1 key will display the Help Screen. The COMM Console utility options are detailed later in this quickstart guide.

3. Turn on the power to the LBC-486SX/DX. The single board computer will boot and present the following message on your PC's console screen :

```
WinSystems Remote Console Version 1.01
(C) Copyright 1994, All Rights Reserved
A:\
```

The ROM-DISK is configured to search drive C: for additional CONFIG.SYS and AUTOEXEC.BAT files. This feature allows configuration changes to be made without burning a new EPROM.

Datalight's ROM-DOS operating system is small, efficient and perfect for embedded applications. Unlike MS-DOS, Datalight's ROM-DOS is very affordable for large scale OEM projects and does not require a complex OEM contract. ROM-DOS is fully MS-DOS 6.22 compatible and supports 100% of the DOS INT 21H calls and works well in combination with the industry standard Award BIOS present on the LBC-486 board.

The A: drive is the ROM-DISK which contains the necessary ROM-DOS system files for booting the single board computer. To list the files contained on the ROM-DISK, enter the following command :

```
dir
```

To view the contents of the AUTOEXEC.BAT file enter the command :

```
type autoexec.bat
```

The LBC-486 will display :

```
prompt $p$g
if not exist c:autoexec.bat goto done
c:
autoexec
:done
```

the 'if' statement checks drive C: for an additional AUTOEXEC.BAT file and executes it if present. This allows you to run an application program on system power-up.

FILE TRANSFERS

Files can be uploaded/downloaded to the LBC-486 by running the TRANSFER utility program from the Serial Console. The path and filename specified when using the Transfer utility correspond to file storage on the LBC-486. The path and filename for the PC file are specified separately.

A fictitious filename, SAMPLE.XXX will be used in the following examples to illustrate the command format and system responses. Substitute the path and name of your application file for this example.

To transfer a file to the SAT system, you must start the transfer program and specify the name of the destination file that will be created on the target system. For example :

```
transfer c:\sample.xxx
```

In this example, SAMPLE.XXX will be created on the C: drive of the target LBC-486 when the transfer is complete.

The Transfer program will respond with :

```
Receiving sample.xxx
```

Press the PgUp key on your PC keyboard. The COMM console utility will display this prompt :

```
Upload which file :
```

Type in the path and filename on your PC for the file you wish to upload to the LBC-486. For example :

```
c:\urdir\sample.xxx
```

The system will then prompt you for a transfer protocol :

```
Upload C:\URDIR\SAMPLE.XXX ASCII or Xmodem (A or X)
```

Type the letter 'X' to indicate Xmodem. The utility will display an estimated transfer time. The letter 'T' will be replicated across the screen indicating the transfer is in progress. The word 'DONE' will appear when the transfer has been successfully complete. Once the transfer is complete the system will beep and you will be returned to the ROM-DOS prompt.

At the A:\ prompt type :

```
dir c:\
```

The file that was transferred should now be present on the LBC- 486's RAM Disk.

These examples should provide you with a general understanding of the serial console and Transfer utilities. If you need further assistance contact the WinSystems Application Engineering Group.

COMM CONSOLE UTILITY

The COMM communications program allows a PC to act as a console for the remote ROM-DOS system. It also allows for XMODEM protocol uploading and downloading of files to a ROM-DOS system when used in conjunction with the Transfer utility.

The COMM program is invoked from the MS-DOS command line as :

```
COMM options
```

the options can be any combination of the following separated by spaces.

/B#nnnn Where nnnn is one of the supported baud rates of 300, 1200, 2400, 4800, 9600, 19200, or 38400.

/COMn Where n is the communications port number. Allowed values are either 1 or 2.

/8N1 Communications parameters for 8-bit character with no parity checking and 1 stop bit (Default)

/7E1 Communications parameters for 7-bit character with even parity and 1 stop bit. (Not usable for XMODEM file transfer)

In addition to the command line switches shown above the COMM utility will also use an environment variable for startup parameters. For example the line :

```
SET COMM = /COMM2 /B2400 /7E1
```

would cause the COMM utility to alter it's default setting upon next invocation to those specified by the COMM environment variable. Options given on the command line however, always override the environment variable's settings.

Once COMM has loaded there are a series of commands available to control it's operation as well as to allow the uploading and downloading of binary and ASCII files to ROM-DOS and/or computer bulletin boards. All but two of the command utilize a 2-key combination using the ALT key in conjunction with the command key. A summary of the command key sequences is given here :

ALT-B toggles through the available baud rates. Repeated pressing of this combination will cycle through all supported baud rates.

ALT-C Clears the console screen.

ALT-D When used with a modem with an AT command set allows the entry of a phone number for autodialing. Pressing Enter will redial the previous number. Pressing ESCAPE aborts the command.

ALT-E Toggles the duplex function between full with no echo, to half with echo.

ALT-H when used with a modem with an AT command set, instructs the modem to hang up the line.

ALT-P Gives the option of setting the communications port number and/or the communications parameters. ESCAPE will abort the command.

ALT-T Toggles the CR/LF option. When enabled the ENTER key will generate a 2-character Carriage Return/Line Feed combination. When disabled only a CR (Carriage Return) will be sent when the ENTER key is pressed.

ALT-X Exits the COMM utility and returns to MS-DOS.

PG-UP Is the upload file command . After pressing this command key, the user is prompted for the file name and transfer protocol (XMODEM or ASCII). ESCAPE will abort the command at any time, even during the transfer.

PG-DN Is the download file command. The user will again be prompted for the filename and transfer protocol. The ESCAPE key may be used to abort the command at any time.