OPERATOR INTERFACE PRODUCTS APPLICATION NOTE

Subject: Using ProComm to Backup and Restore Programs AN# 1082A
Date: 02/17/00
Name: Irvin Hayes Jr.

Description: Using ProComm to Backup and Restore Programs in a 20XX or 48XX

Xycom 4800/2000 OIL (Operator Interface Language)- Series Terminals: Backup and Restore with ProComm

Introduction

The Xycom 4800/2000 OIL-series terminals offer you the ability to backup and restore program and blocks and register values. In the past this was done with bulky recorders and tapes. Today's technology lets a PC/AT computer, running a communications package such as ProComm, backup and restore program blocks and/or register values from a Xycom 4800/2000 OIL-series terminal.

ProComm is a shareware package available on many bulletin boards. You can also obtain a copy by calling our Applications Engineering Department at (734) 429-4971. The latest release of ProComm is version 2.4.3. The steps outlined here also apply to ProComm Plus, available from Datastorm Technologies Inc.

How Backup and Restore Works:

When selecting from the Backup/Restore Menu on a 4800/2000 OIL-series terminal, the user is given several options. These are to backup only the <P>rograms, only the <R>egister Values, or <ALL> (both Register Values and Program Blocks in the same file).

When backing up Programs, the information in each Program Block is downloaded in order from block 1 to 255. The actual data of each block will be preceded by the sequence <-[14;xxxp, were xxx is the program block number (e.g., the data of Program Block 001 would be preceded by <-[14;001p).

When backing up Registers, the register values are downloaded as one block and are preceded by the sequence <-[14;000p. When selecting to backup All, the Register Values are first downloaded into the file, followed by the Program Blocks. (Before backing up Register Values, please review the section entitled "Backing Up Registers – Special Considerations:, located at the end of this document).

The sequence of characters (<-[14;xxxp) that precedes the Register Values or each individual Program Block is used as a pointer to indicate where data was stored prior to the backup. Thus, if the terminal encounters the sequence <-[14;120p, then it will restore the next block of data into Program Block 120.

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Setting up ProComm for Backup/Restore:

Once in ProComm, you will have to define parameters in three places: the Terminal Setup Menu, the ASCII Transfer Menu, and the Line Options Configuration Menu. The Terminal and ASCII Transfer Setup Menus are subsets of the Main Setup Menu, accessed by pressing <ALT><S>. the Terminal Setup (option #2) and the ASCII Transfer Setup (option #6) must be configured as follows:

```
============================ Terminal Setup ============================

     1) Terminal emulation…..ANSI-BBS          10) Break Length (ms)…….350
     2) Duplex……..FULL                        11) Enquiry (CTRL-E)…….OFF
     3) Flow control…….XON/XOFF
     4) CR translation (in)……CR
     5) CR translation (out)…..CR
     6) BS translation……DEST
     7) BS key definition……..BS
     8) Line wrap……..ON
     9) Scroll…….ON

OPTION ==                                                  ESC = EXIT
```

Terminal Setup Menu

Press <ESC> to return to the Main Setup Menu after the appropriate changes have been made.

```
======================   ASCII TRANSFER SETUP ======================

                ASCII UPLOAD

        1) Echo locally……..NO
        2) Expanded blank lines...FULL

        3) Pace character…….0(ASCII)
        4) Character pacing…….0(1/1000 sec)
        5) Line pacing…….0(1/10 sec)

        6) CR translation……..NONE
        7) LF translation……...NONE

                ASCII DOWNLOAD

        8) CR translation……..NONE
        9) LF translation……...NONE

OPTION ==                                                ESC = EXIT
```

ASCII Transfer Setup Menu

Press <ESC> to return to the Main Setup Menu after the appropriate changes have been made.

Options #1 (Modem Setup), #3 (Kermit Setup), #4 (General Setup), and #5 (Host Mode Setup) will not affect the Backup/Restore procedure. Save the changes by selecting option S (Save Setup to Disk) and then exit the Setup Menu by pressing <ESC>.

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To set the Line Options (baud rate, parity, etc.), press <ALT><P> for the Line Options Configuration Menu. These parameters must match those to be set in the Serial Port Configuration Menu of the 4800/2000 OIL-series terminal. For example, to set the communications at 9600 baud, no parity, 8 data bits, and 1 stop bit, you would select option #11 from the ProComm Line Settings Menu shown below.

LINE SETTINGS

CURRENT SETTINGS: 9600, N, 8, 1, COM1

1)	300,E,7,1	7)	300,N,8,1
2)	1200,E,7,1	8)	1200,N,8,1
3)	2400,E,7,1	9)	2400,N,8,1
4)	4800,E,7,1	10)	4800,N,8,1
5)	9600,E,7,1	11)	9600,N,8,1
6)	19200,E,7,1	12)	19200,N,8,1

Parity	Data Bits	Stop Bits
13) ODD	16) 7 bits	18) 1 bit
14) Mark	17) 8 bits	19) 2 bit
15) SPACE		

20) COM1 21) COM2 22) COM3 24) COM4

24) Save Changes YOUR CHOICE:

Press ESC to return

Line Options Configuration Menu

Press <ESC> to return to the program after the appropriate changes have been made and/or saved. The ProComm features should all now be set to operational parameters. Next the user must set up the Xycom terminal. Be sure to remember your settings in ProComm, because the settings in the terminal will have to match.

Setting up a 4800/2000 OIL-Series Terminal for Backup/Restore:

The Serial Port Configuration Menu is accessed by selecting option #1 (Configuration) from the Main Menu of the 4800/2000 OIL-series terminal. Be sure that the parameters match those set in ProComm. For example, to set the parameters to match set in ProComm in the previous section, you should have the following:

```
======================  Serial Port Configuration Menu  ====================

        6  Baud – 1=300 2=600 3=1200 4=2400 5=4800 6=9600 7=19.2K
        0  Parity – 0=zero 1=one 2=even 3=odd
        0  1=Parity Enabled    .    .    .    0=Disabled
        1  1=8 Data Bits       .    .    .    0=7 Data Bits
        1  1=Full Duplex       .    .    .    0=Half Duplex
        1  1=Handshaking Enabled    .    .    0=Disabled
        0  1=RTS/CTS Handshaking    .    .    0=XON/XOFF
        0  1=Echo Input        .    .    .    0=Don't Echo Input



 Use <UP-ARROW>,<DOWN-ARROW>,<LEFT-ARROW>,<RIGHT-ARROW>
 Use values 0 through 9
 "C" for next configuration menu, <RET> or <ENTER> to quit.
```

Terminal Configuration Menu

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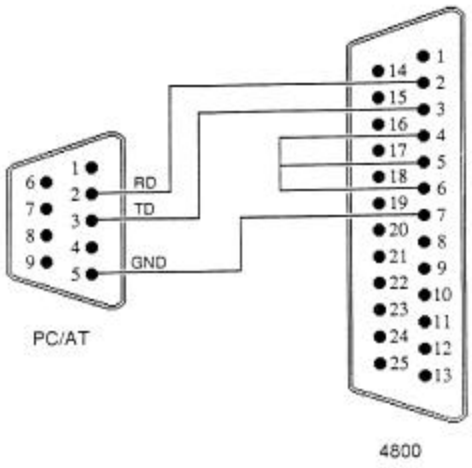
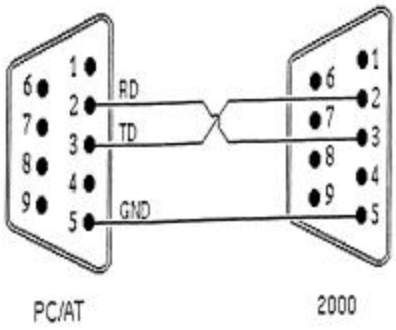
Download Cable:

Before any program block or register values can be transferred, the serial port on the 4800/2000 OIL-series terminal and the COM port of the IBM PC/AT or PC/XT need to be connected via a cable. The cable pinouts are shown below:

On the 9-pin IBM PC/AT COM port:

The cabling should be constructed as per the diagrams on the right. The Transmit Data, Receive Data, and Logic Ground are the only signals used.





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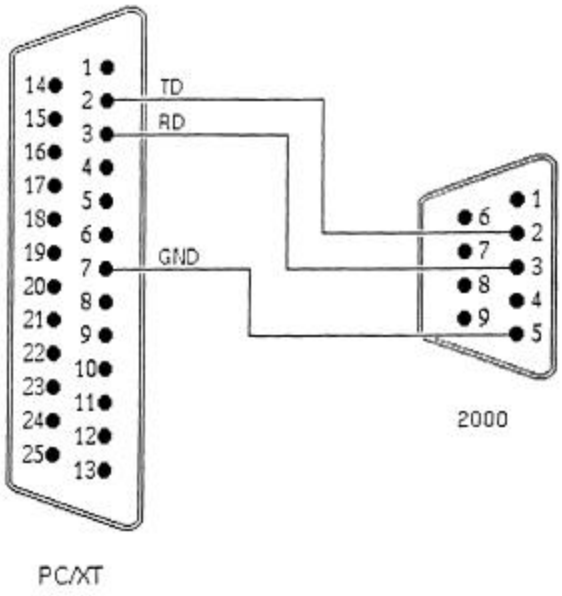
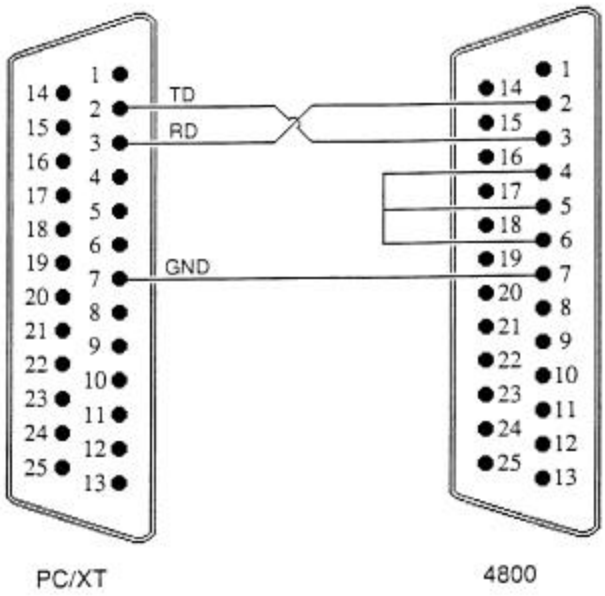
On the 25-pin IBM PC/XT
COM port:

The cabling should be
constructed as per the
diagrams shown here.





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Backup/Restore/Verify

Backup:

In ProComm press the PGDN key. The Download Menu will appear. You should select option #7 (ASCII) as the protocol. You will then be prompted for a filename. Your filename should have an extension of .PRG. This allows you to use this ASCII file with our documentation program "QBXYC", available on request "free" from our Applications department. If your file has another extension, rename it prior to using "QBXYC". After entering a filename and pressing C/R, ProComm will wait to begin receiving data.

On the 4800/2000 OIL-series terminal select Backup from the Backup/Restore menu. Select to Backup <P>rograms, <R>egisters, or <A>ll. The terminal will begin sending data.

Restore:

On the 4800/2000 OIL-series terminal, select Restore from the Backup/Restore menu. The terminal will wait until it begins receiving data. As the file is restored, the bottom right hand corner indicates that either registers or a particular program block is being restored.

In ProComm press the PGUP key. The Upload Menu will appear. You should select option #7 (ASCII) as the protocol. You will then be prompted for a filename. After entering a filename and pressing C/R, ProComm will begin sending the data.

Verify:

The Backup/Restore Menu on the 4800/2000 OIL-series terminal also has an option to Verify. This will allow you to check that the backed up or restored file is accurate.

Verify is similar to Restore in that it waits to receive data. The difference is that instead of writing the data to registers or program blocks, it simply compares the incoming data to what is already resident in the terminal.

To Verify, select that option from the Backup/Restore menu. The terminal will wait until it begins receiving data.

In ProComm press the PGUP key. The Upload Menu will appear. You should select option #7 (ASCII) as the protocol. You will then be prompted for a filename. After entering a filename and pressing C/R, ProComm will begin sending the data. As the data is being sent from ProComm, it is verified against the data in the terminal. If all the data (program blocks and/or registers) match, the terminal displays the message "Verification Passed". If the incoming data does not match the data currently residing in the terminal, the message "Verification Failed" is displayed.

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Backing up Registers – Special Considerations:

As mentioned earlier, when a 4800/2000 OIL-series terminal sends register values, it simply sends out the header (<[14;000p) followed by 490 bytes of data. If some of the registers contain null values, problems will occur when trying to restore a register file that was backed up using ProComm. The problem occurs because ProComm strips out null values as it receives them.

Thus, it is unreliable to back up registers containing null values with a communications package such as ProComm (one that strips those null values). If unsure of register values, it is best only to back up and restore the data from the program blocks.

Example #1:

When you select to backup registers, and the first 100 contain null values, ProComm will strip those nulls as it receives them. This means that the first value that ProComm has in the backed up file is the value from register 112. (Registers 1 – 10 are reserved and therefore not backed up. The null values from registers 11 – 111 have been stripped). If this file were now restored, the value from register 112 would be put in register 11. The Xycom terminal has no way of knowing that ProComm has stripped out the first 100 values.

Example #2:

When you select to back up both programs and registers in the same file, the register values are sent across, followed by the data from the program blocks. Any null register values are stripped from the file. When this file is restored, the terminal restores the first 490 bytes of the file as register values. Because nulls were stripped from the file, some of the bytes restored as register values may actually be data from program blocks. This would leave the first several program blocks empty.

Technical Support:

If you have any questions or comments, please call the Xycom Application Engineering Department at (734) 429-4971. We will be more than happy to answer any question or note any comment that you might have.