

To build the Turnkey project:

1. Select the **Project** drop-down menu and select **Make**, or use the F7 key as a shortcut to build the project.

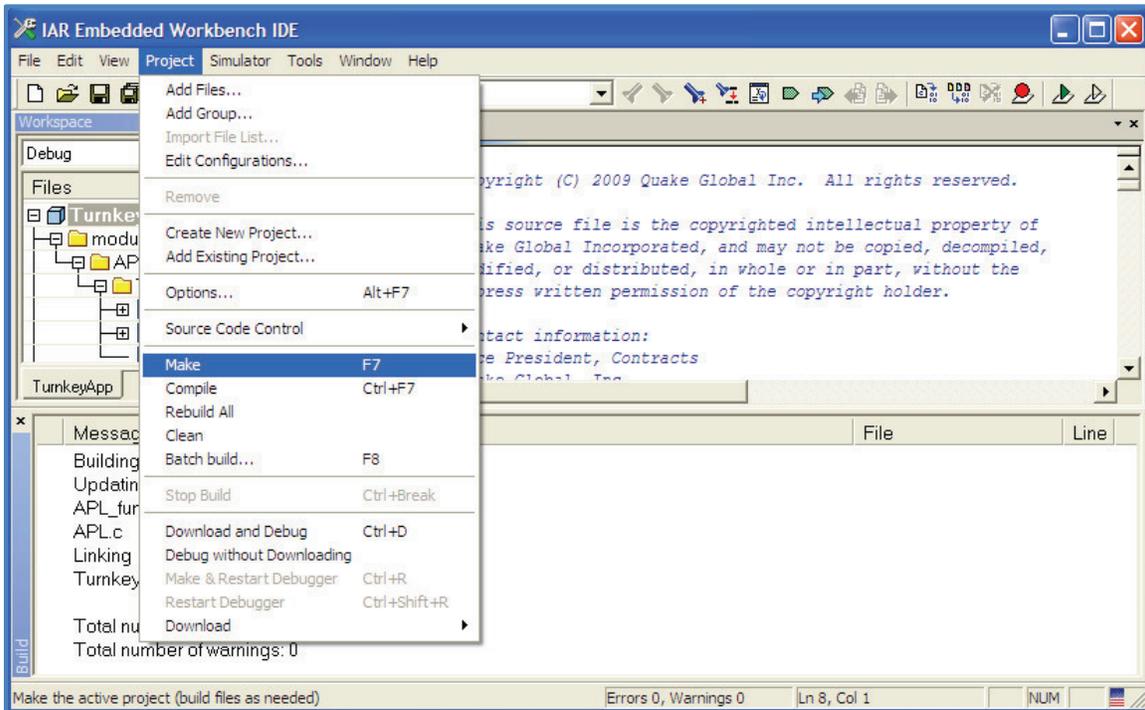


Figure 12-4: Project menu

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2. After a successful build, the bottom window should appear as shown below:

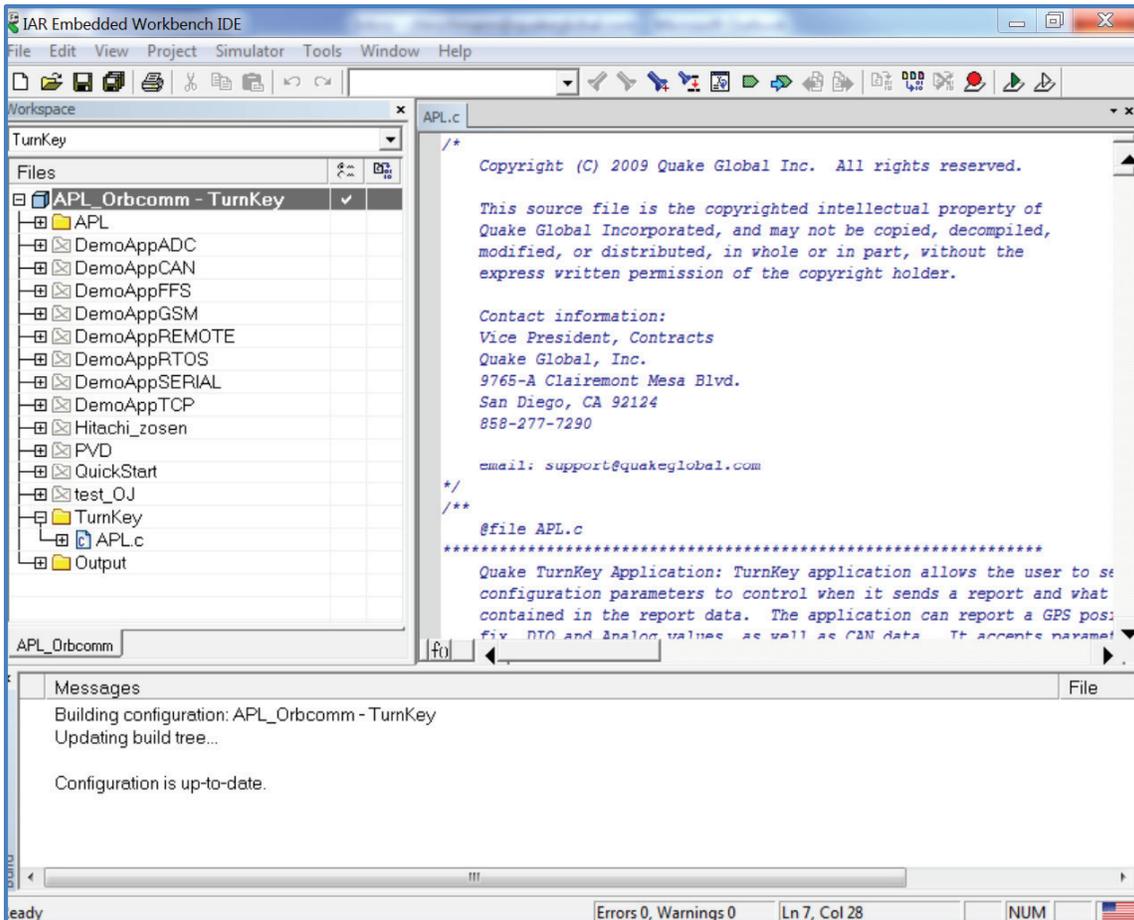


Figure 12-5: A successful build of Turnkey

Ensure that there are no errors and no warnings. To verify the files were built correctly, go to ...\Orbcomm_API_and_Files_1_3\APL_Orbcomm\Turnkey\Exe. There should be a TurnKey.out and a Q4Ka-xGT-x.x.x.x-TurnKey.bin file with current timestamps, as shown below:

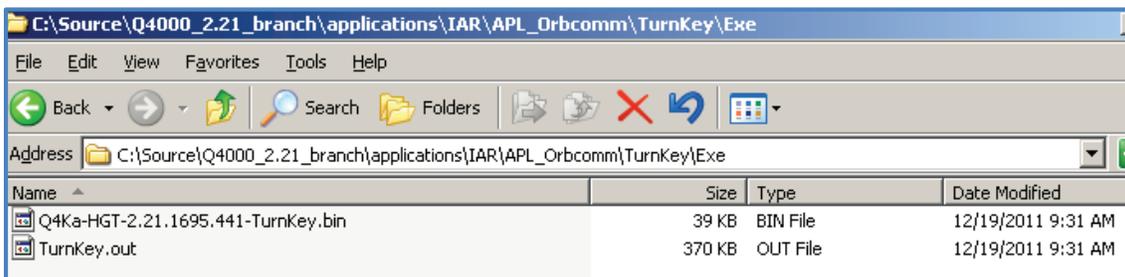


Figure 12-6: Turnkey executable files

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**Note:**

See [Appendix E - Software file naming convention](#) for the key to the file names.

The application's binary file is an independent executable. QUAKE'S foundation code does not have to be compiled and linked to the application file during the build process. Pointers allow the application to access required foundation functions and global variables. Changes to the application **do not** require the modem's foundation code to be downloaded again. Only the application binary file must be downloaded to the modem after being changed. This greatly reduces download times and simplifies the application build process.

12.2.2 Loading Turnkey with the QUAKE Configuration Tool (QCT)

Binary files are loaded into the modem using the QUAKE Configuration Tool (QCT). QCT is a utility with a Graphical User Interface (GUI) that allows custom application files to be downloaded into QUAKE modems. QCT can be downloaded from the Downloads page of the QUAKE website, or obtained by contacting QUAKE customer support. See [Section 2.4.1](#) for more information on QCT.

For debugging QUAKE modem applications, a host computer with two serial ports should be used. One port is connected to the modem's Logger serial port, and the other to the modem's Main Transport Socket (MTS) serial port. A single computer should be used for both development and loading files to speed development time. Two serial cables are required.

1. To access the output data on the Logger port, open a terminal emulation program (such as HyperTerminal) on the host computer and configure the COM port to the following settings:

Baud rate: 115200 bps
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None

The Logger port displays output from the modem's foundation code. It can also display printf statements from your custom code.

2. Connect a serial cable from a COM port of the host computer to the MTS port of the QUAKE modem. Start QCT.

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3. Select the correct COM port, with Baud Rate of 4800, and then click 

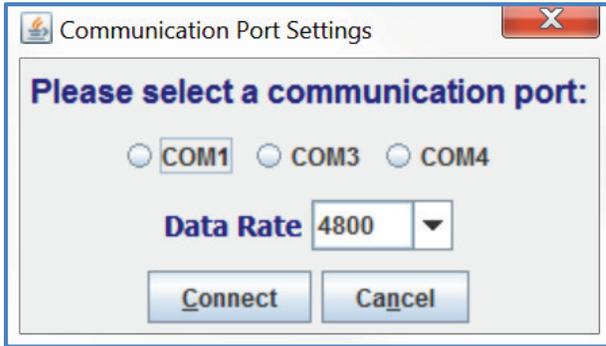


Figure 12-7: QCT - Communication port settings

4. QCT will then display your connection status:

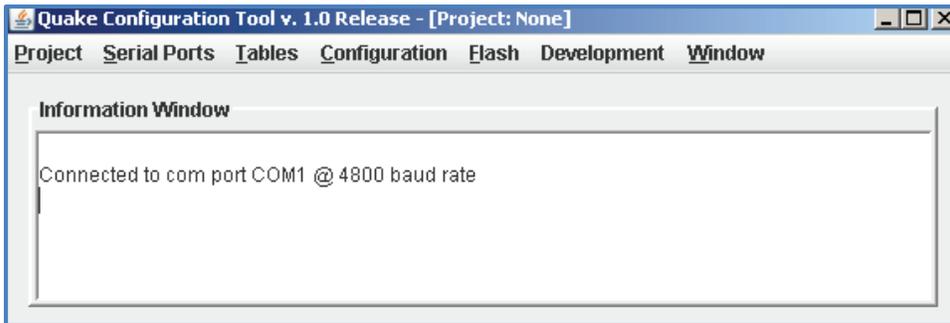
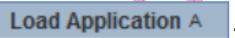


Figure 12-8: QCT - Connection status

5. Select , then .

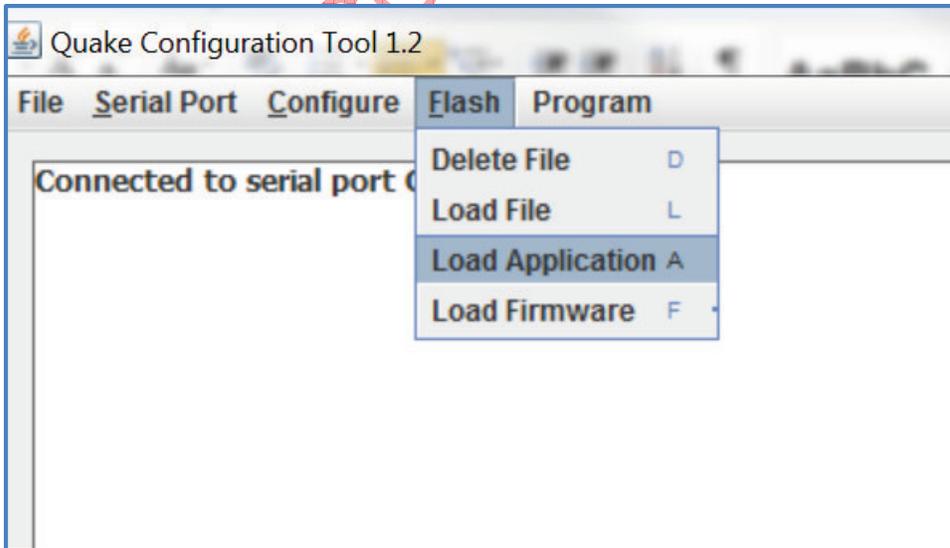


Figure 12-9: QCT - Flash menu

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- A dialog box appears, allowing you to browse to TurnKey.bin. Browse to the directory containing the xxx-TurnKey.bin and double-click to select it.

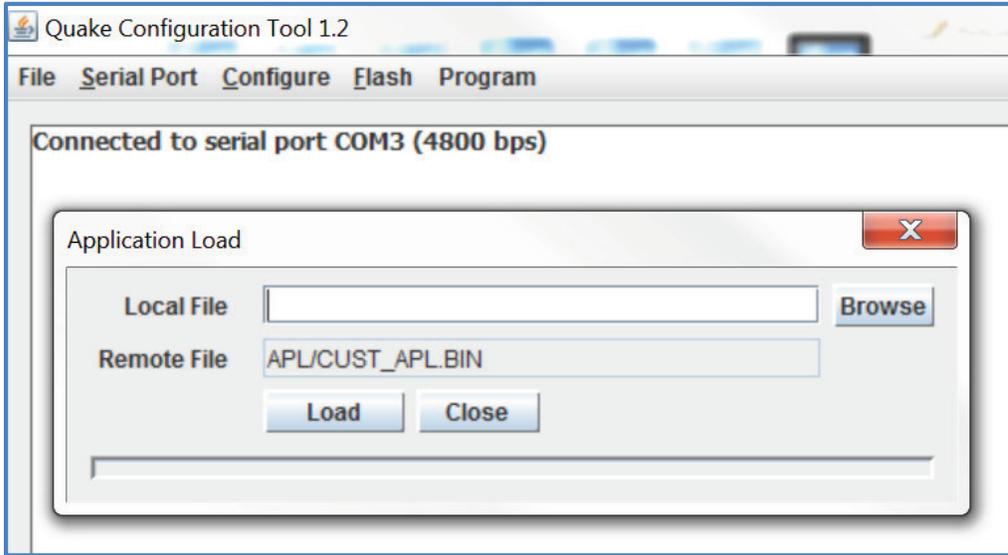


Figure 12-10: QCT - Application Load (browse)

- Click to begin the download process.

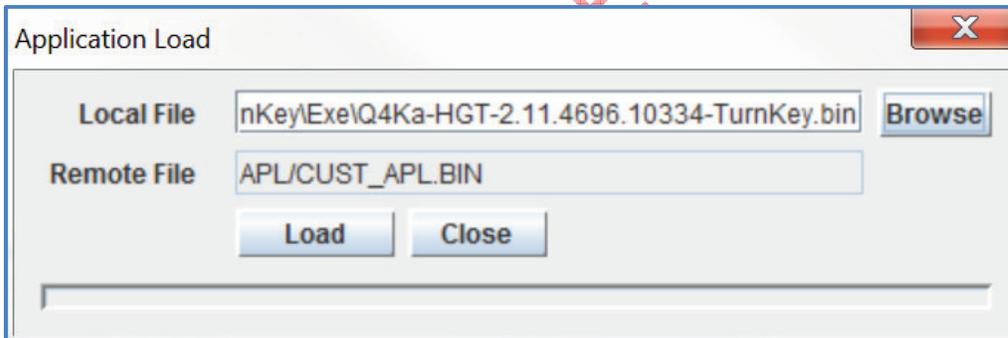


Figure 12-11: QCT - Application Load (load)

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- The download information is displayed in QCT's information window. When the download is complete, QCT reports that the "File update was successful".

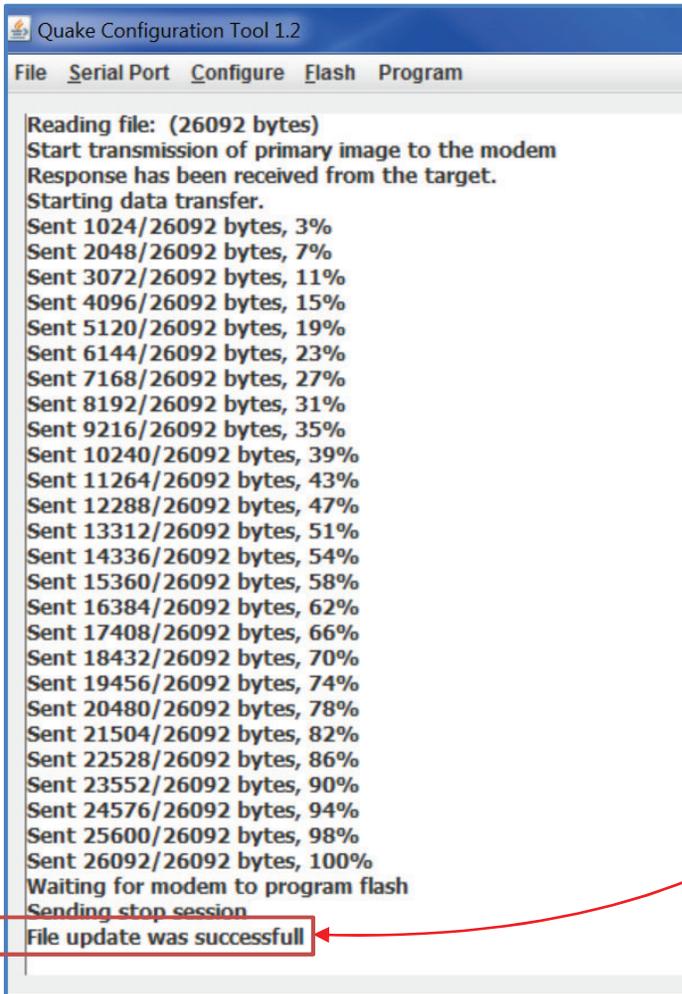


Figure 12-12: QCT - Successful file download



Note:

The application is always stored in the modem's non-volatile memory (NVM) in `APL/CUST_APL.BIN`. If you have problems with the download, please consult the QCT Manual.

12.2.3 Running Turnkey

If the requirements of your application are similar to Turnkey or one of the DemoApps, make a copy of the application and use it as a starting point for your application. If none of the examples are sufficient, use the empty event-driven template of QuickStart as a basis for your application, adding functionality through your custom 'C' code and through calls to the QUAKE APIs.

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Once you have the Logger port connected and configured, and the Turnkey binary file has been downloaded, cycle power on the modem. You should see the following output on the Logger port:



```

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of Quake Global Incorporated, and may not be copied, decompiled, modified,
or distributed, in whole or in part, without the express written permission
of the copyright holder. The copyright notice above does not evidence any
actual or intended publication of such source code.

Boot Loader Version 2.1
Built at 15:01:55 on Jun 9 2010
Verifying the image...
Loading Version 1.2 of the Quake Foundation
Noted: 2198.569
Product: 1, Feature: a
Starting the image

CP Code version Dec 1 2010 09:36:25
Configuring RTC...
SYS_setTime: Updated system time status (Src RTC Sync 0)
Current Time:

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desired_gwy_id: 1
Quake GTobaT SC #QWAKETEST027
TL Code version 1.12.1
No ETS_CHANNEL_MODES; default to elapsed times inactive.
No SMH_WRITE_INTERVAL; default to 720 seconds.

Starting customer application
Quake Turnkey APL Version Nov 30 2010, 09:54:30

---accessPointName = ORBCOMM.T-MOBILE.COM
---serverName = mail.gmx.com
---serverPort = 25
---smtpUser = quaketest11@gmx.com
---smtpPass = Quaketest11
---smtpToAddress = jlitvak@quakeglobal.com
---smtpDefaultSubject = Testing...
Turnkey parameters may be set using the CfgMgr Utils (type U C M to access)
Parameter names and current settings are:
TK_POWER_DOWN_AFTER_MSG 0
TK_XMIT_INTERVAL 600
TK_RX_INTERVAL 120
TK_PARAM_MASK 0xffffffff
TK_POWER_DOWN_GSM_AFTER_MSG 0
TK_ENABLE 1
TK_PGNO_NUMBER 65263
Reading 1 MSN LL elements from NVM
MSN LL[0] Gwy 1 SCT: Msg 0 967554511 Gg 0 971471311 SC0: Msg 1 Gg 1 Rpt 2
Turning on TERR modem
Sent GPS stop cmd
GPS: Power off
    
```

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Figure 12-13: Logger output of Turnkey application startup

The information above is generated by the modem foundation code and provides information on code versions, various low-level processes and initialization routines. The information related to the downloaded application follows immediately after the statement:

Starting customer application.

APL_init(void) is the first application function called by the QUAKE firmware, and is the starting point for custom code development. The statement: **Quake Turnkey APL Version Nov 30 2010, 09:54:30** indicates that the application is running properly and your development environment is ready to begin developing custom applications.

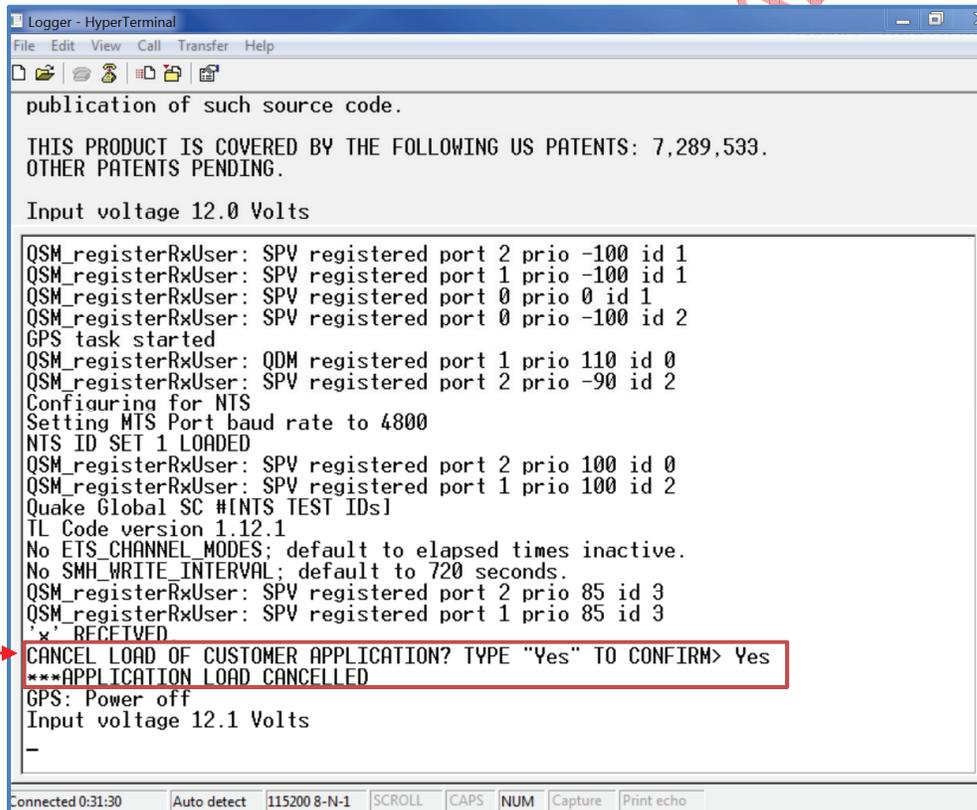
12.2.4 Stopping and removing Turnkey from the modem

If an incorrect version of the application is downloaded and causes the modem to crash or reboot, there is a command sequence to allow you to stop the modem and remove the application.

To stop the application:

1. Type 'd' 'R' on the Logger port to initiate a reboot.
2. Immediately press the 'x' key on the Logger Port during boot up until you get a prompt asking: **CANCEL LOAD OF CUSTOMER APPLICATION?** It may be necessary to press the 'x' key numerous times until you receive the prompt.
3. After the prompt, type 'Yes' (it is case-sensitive). After that, the application is halted so that the file may be removed and a new application can be downloaded into the modem

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```

publication of such source code.

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Input voltage 12.0 Volts

QSM_registerRxUser: SPV registered port 2 prio -100 id 1
QSM_registerRxUser: SPV registered port 1 prio -100 id 1
QSM_registerRxUser: SPV registered port 0 prio 0 id 1
QSM_registerRxUser: SPV registered port 0 prio -100 id 2
GPS task started
QSM_registerRxUser: QDM registered port 1 prio 110 id 0
QSM_registerRxUser: SPV registered port 2 prio -90 id 2
Configuring for NTS
Setting MTS Port baud rate to 4800
NTS ID SET 1 LOADED
QSM_registerRxUser: SPV registered port 2 prio 100 id 0
QSM_registerRxUser: SPV registered port 1 prio 100 id 2
Quake Global SC #[NTS TEST IDs]
TL Code version 1.12.1
No ETS_CHANNEL_MODES; default to elapsed times inactive.
No SMH_WRITE_INTERVAL; default to 720 seconds.
QSM_registerRxUser: SPV registered port 2 prio 85 id 3
QSM_registerRxUser: SPV registered port 1 prio 85 id 3
'x' RECEIVED
CANCEL LOAD OF CUSTOMER APPLICATION? TYPE "Yes" TO CONFIRM> Yes
***APPLICATION LOAD CANCELLED
GPS: Power off
Input voltage 12.1 Volts
-
    
```

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- To remove the binary application file from NVM, type 'd' 'f' on the Logger port. You should see the following debug menu screen.

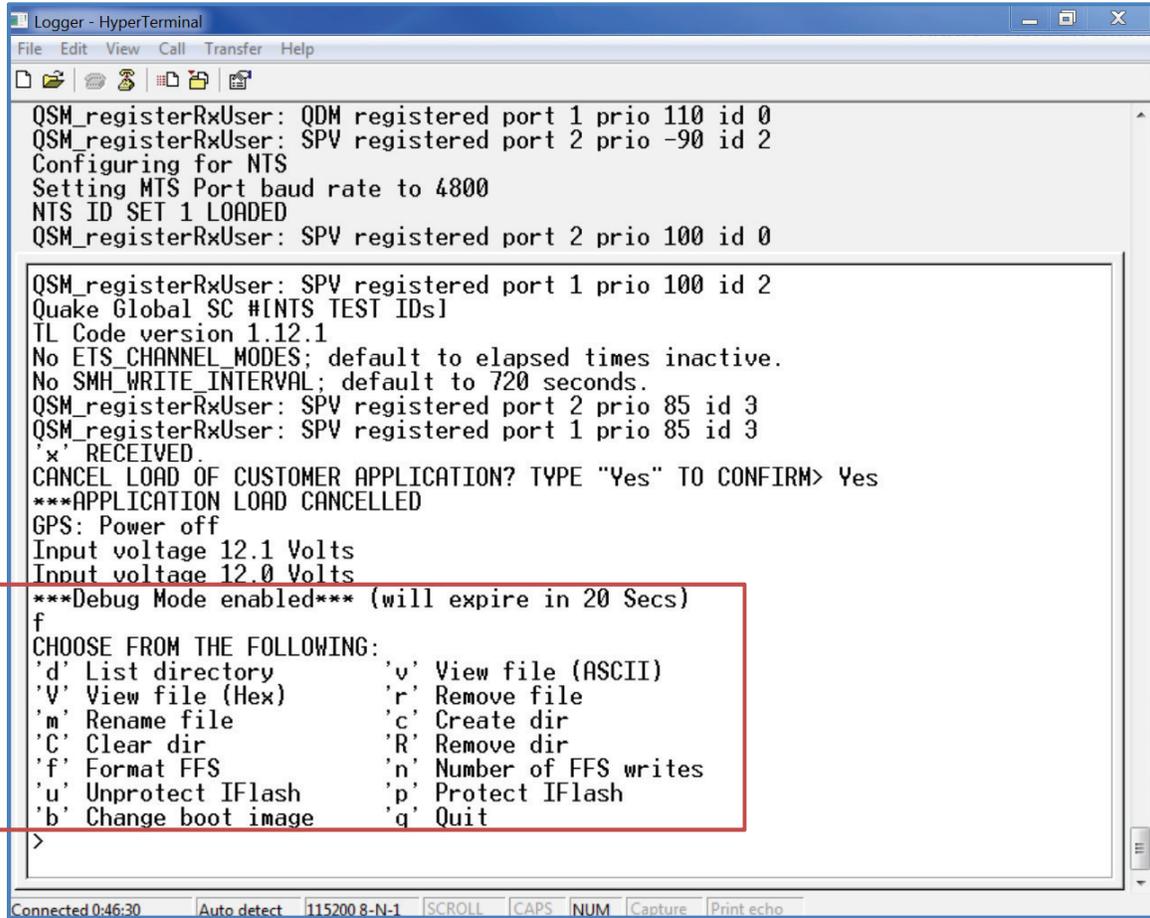


Figure 12-14: Entering the Debug Flash menu

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- To remove the bad application file completely, type: 'r', and then 'APL/CUST_APL.BIN' when prompted for the file name.



Note:

The application is always stored in this directory under this name. This removes the file from NVM.

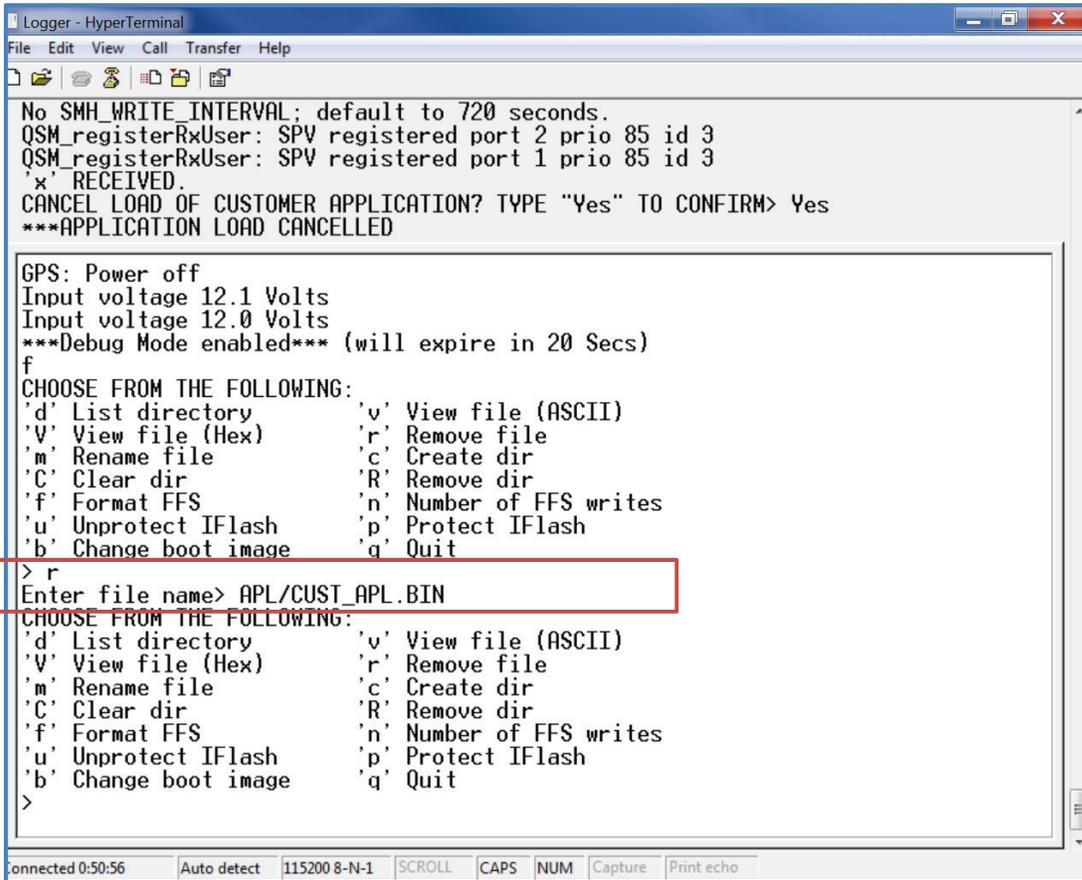


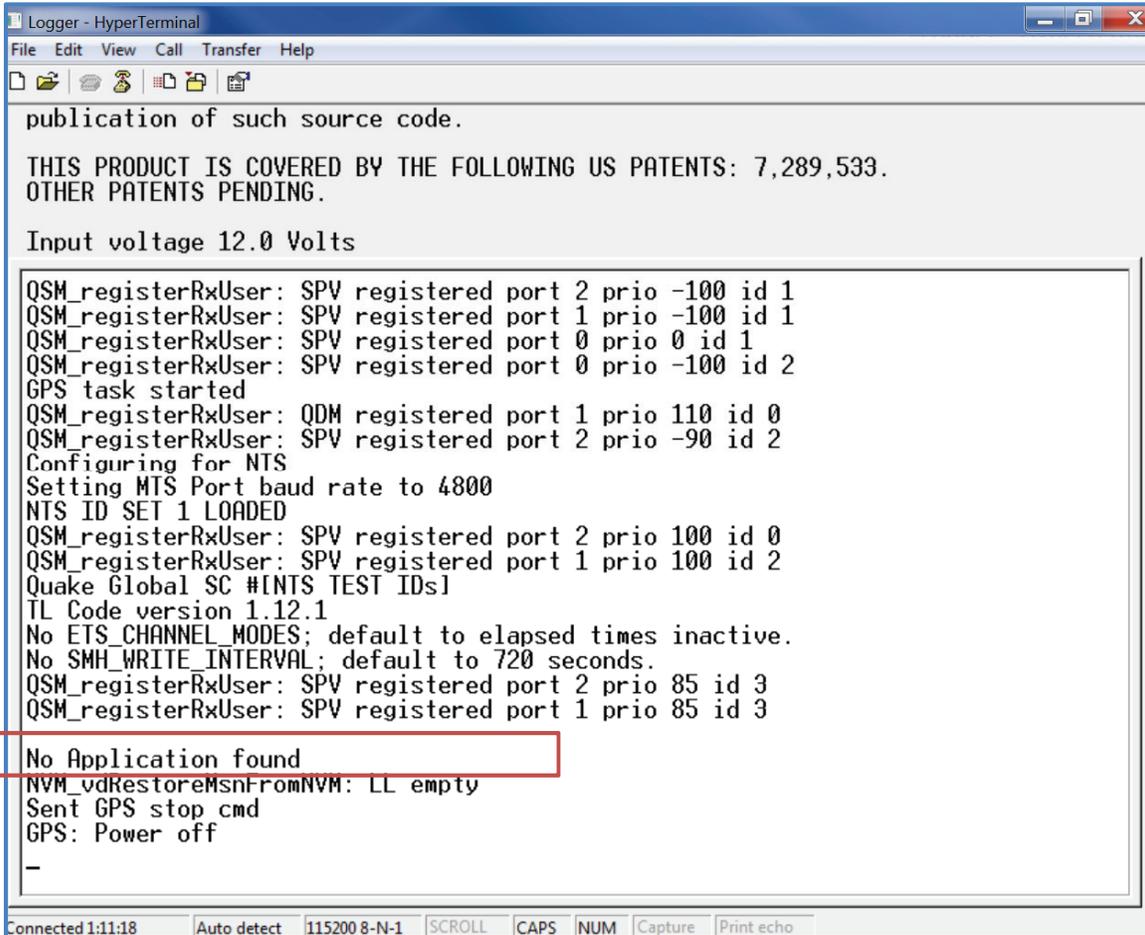
Figure 12-15: Stopping and removing the application

- Type 'q' to quit the debug mode.

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- After rebooting the modem, you will see the statement: 'No Application found' if the application has been deleted correctly.



```

Logger - HyperTerminal
File Edit View Call Transfer Help
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OTHER PATENTS PENDING.
Input voltage 12.0 Volts
QSM_registerRxUser: SPV registered port 2 prio -100 id 1
QSM_registerRxUser: SPV registered port 1 prio -100 id 1
QSM_registerRxUser: SPV registered port 0 prio 0 id 1
QSM_registerRxUser: SPV registered port 0 prio -100 id 2
GPS task started
QSM_registerRxUser: QDM registered port 1 prio 110 id 0
QSM_registerRxUser: SPV registered port 2 prio -90 id 2
Configuring for NTS
Setting MTS Port baud rate to 4800
NTS ID SET 1 LOADED
QSM_registerRxUser: SPV registered port 2 prio 100 id 0
QSM_registerRxUser: SPV registered port 1 prio 100 id 2
Quake Global SC #[NTS TEST IDs]
TL Code version 1.12.1
No ETS_CHANNEL_MODES; default to elapsed times inactive.
No SMH_WRITE_INTERVAL; default to 720 seconds.
QSM_registerRxUser: SPV registered port 2 prio 85 id 3
QSM_registerRxUser: SPV registered port 1 prio 85 id 3
No Application found
NVM_vdRestoreMsnFromNVM: LL empty
Sent GPS stop cmd
GPS: Power off
-
Connected 1:11:18 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo
    
```

Figure 12-16: The application was successfully removed



Note:

In most cases it is not necessary to remove an application from the modem if you simply want to replace it with a new application. When you load the new application with QCT, it will over-write the existing application file.

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