

General Instructions on FLASHing Astro25 Mobile Radios XTL5000 and XTL2500

1. For best results it is suggested that the laptop/desktop computer that is going to be used to FLASH radios have a clock speed of at least 1GHz and 1Gbyte of memory. The reason behind this recommendation is to allow for the computer's operating system and the CPS program to run effectively. The additional space facilitates the handling of larger radio codeplugs. This is a suggestion and not a requirement, although there are minimum requirements that must be met for the CPS to run.
2. The most common method of FLASHing the mobile radios is through the control head, which first updates the control head firmware and then the transceiver firmware. The cable recommended for doing this is the HKN6183 Serial GCAI Connector cable. This cable will work on both mid-power radios as well as the high power mobile radio. As you will see further along in this document, there are other cables available for FLASHing the Astro25 mobile.
3. In the kit that is provided, there is a CD that contains documents with instructions on how to FLASH radios as well as the CVN files that actually contain the firmware. The first document is **FLASHport_User_Manual.pdf** and the second document is **Steps to Upgrade Your Radio.doc**. These documents need to be reviewed prior to attempting to FLASH radios. In addition to these documents, there are tutorials and help files in the CPS giving important information and instructions. These can be found by opening up the CPS and going to **Help → CPS Help Topics → Contents Tab → FLASHport Upgrade (4th item in the list)**. References will be made to the new control heads as well as the older control heads.
4. As mentioned in item 3 above, the CVN files that are needed to FLASH the radios are located on this CD. These CVN file names identify which radio they are for, such as **XTL5000_DVN1387G.cvn** which is for the XTL5000 mobile radio. The best location to put these files on the computer is:

**Mobile: C:\Program Files\Motorola\Astro25 Products\Astro25 Mobile
CPS\Upgrade Folder**

**Portable: C:\Program Files\Motorola\Astro25 Products\Astro25 Portable
CPS\Upgrade Folder**

You can put the CVN files in other locations on the hard drive, but to avoid problems during the FLASHing process, we strongly suggest that you put them in the Upgrade Folder.

5. Prior to flashing any radios, be sure to turn off the screen saver and set all of your power settings to “Never”. This applies to both desktop and laptop computers. This is done by right clicking on the computer Desktop and going to “Properties”. This will bring up your “Display Properties” screen. Go to the Screen Saver tab, and under this tab set your wait time to 200 minutes (arbitrary value); then go to the “Power” button in bottom right corner and select it. Set all of the power settings to “Never”. This is to make sure that nothing interrupts the FLASHing process. After you are done FLASHing, you can return these settings to their original values.
6. If you are FLASHing a mobile without removing it from the vehicle, do it with the engine running. Turn off air conditioning (sorry) to avoid sudden heavy loads on the vehicle’s electrical system. Also disconnect the antenna or put the radio on a quiet (unused) channel. Do not crank the vehicle or switch other equipment ON or OFF while the FLASH operation is in progress. If the vehicle has a marginal battery, replace it before FLASHing the radio.
7. In the CPS, go to the View/Options/Timers Options menu. If you are using USB for FLASHing, set the FLASHport USB Timer (sec) field to 30 (default is 15). If you are using RS232 for FLASHing, set the FLASHport RS232 Timer (sec) field to 25 (default is 15).
8. Do not use the computer for other tasks while FLASHing is in progress. Close Internet browsers, email clients, and any other application that may be continuously sending or receiving data.

FLASHing XTL5000 and XTL2500 Radios From R06.XX.XX & R07.XX.XX firmware to R09.XX.XX firmware or higher

1. Mobile radios with R06 or R07 firmware can only be FLASHed through the control head. However, once a radio has R08 firmware in it, it can be FLASHed through the transceiver if desired.

2. There are two ways to find out what firmware is in a radio; you can read the radio with CPS or put the radio in “Service Mode”. It should be noted that the firmware version of a radio is not saved in a codeplug archive file and can only be seen at the time a radio is read by the CPS.
 - a. After reading the radio with the CPS go to **Radio Information → Versioning Tab** and look at the Firmware field (2nd field down in left column) to verify what firmware version is in the radio.
 - b. To put the XTL5000 or XTL2500 radios into Service Mode, power the radio off and then power it back on. Allow it to complete its powerup sequence, and once the radio displays its current channel to talkgroup, then press the *Home Button* 5 times. “*Service Mode*” will come up on the display and right after that the *Host Version* will display (another name for firmware version) and this will show what firmware version is in the radio. *See the Basic Service Manual for more detail on how to put radio into Service Mode.*
3. Following the instructions found in the documents on the CD, the radios should take anywhere from 20 min. to 45 min. to FLASH depending on the size of the radio’s codeplug. Larger codeplugs will take more time. A “FLASH Successful” message will appear when the process has completed.
4. Radios will sometimes fail during FLASHing but the CPS will try to recover. You will receive an error message giving you instructions on what to do to try and restart the process. It is suggested that you retry at least 1 time and if that does not work, then select the cancel option and gracefully close out the FLASH.
5. Next, start the process over. At this point, the radio may display a 01/90 error and then go into Maintenance Mode, which is the normal indication of a failure. Once the FLASH has started, the CPS will display an error message that it has “Failed to Communicate with the Radio”. This is an expected error message, so select OK and in about 30 seconds to 1 minute a screen will appear asking the user to select the configuration of the radio that is being FLASHed. Once this is done, hit the return key or select Next. The 2nd screen will refer to where the programming cable is to be connected. Select Next or hit the return key. The 3rd screen will ask the user to power the radio off then on. Ignore this screen if the radio was in Maintenance Mode at the start of the FLASH. Select the Finish Button or hit the return key. Now the FLASH process will continue.
6. At this point, you will see the FLASH screen appear and more than likely the progress bar will hold at “1 of 20” or may go as far as “3 of 20” and stop.

This does not mean the FLASH is not working. At some point you will either get a “FLASH Successful” message or an error message will appear. If the FLASH gives an error message, retry once. If retries do not succeed then the radio will need to go to the Depot for recovery.

Illegal Flash Configurations or “Gotchas” when Flashing XTL5000 and XTL2500 Radios from R06.00.xx & R07.00.xx resulting in Flashing Failures

1. Flashing with the transceiver as the master, through the rear accessory port or the TIB, was not supported until 6.8 (R08.00.00). Therefore, attempting the flash upgrade through the transceiver will fail for R06.00.xx & R07.00.xx.
2. Flash upgrading the radio via USB, as it was not supported until R09.00.xx.
3. If the Radio Wide codeplug field ‘Control Head Required for Power Up’ is enabled, the flash will fail. This field must be disabled prior to flashing.
4. Attempting to flash a dash mount radio without a connector at the J2 rear accessory port to ground emergency. A connector is required on dash mounts to ground emergency. However, the connector cannot be a USB data cable, or the flash will also result in failure.

FLASHing XTL5000 and XTL2500 Radios With R08.XX.XX or Higher Firmware

1. Mobile radios with R08 or higher firmware can be FLASHed in one of three ways:
 - a. Through the Control Head
 - b. Through the GCAI connector on the TIB on remote mount radios
 - c. Through the 26 pin Accessory Connector on the back of Mid-Power Radios.
2. As mentioned, for Radios with R06/R07 firmware, these radios can be FLASHed through the control head with the HKN6183 Serial GCAI programming cable. **Note:** USB flashing was not officially supported and certified until R09 firmware. Do not attempt to flash the radio via USB if R06-R08 firmware exists in the radio.
3. Mid-Power Radios - Using the HKN6183 Serial GCAI Programming Cable **ONLY**, the radio can be FLASHed or programmed by connecting this cable to the GCAI connector on the Transceiver Interface Board (TIB). The TIB is on the front of the transceiver for remote mount radios. The GCAI Connector is to the left of the 25 pin connector. The radio is FLASHed or programmed the same way as you would FLASH or program through the control head. The difference between FLASHing the radio this way instead of going through the control head is that the transceiver is updated first and the control head last. This results in fewer failures and a faster FLASHing process. Once again, the radio must already have R08 firmware or above in order to use this method.
4. High Power Radios - In High Power Radios the HKN6183 Serial GCAI Programming Cable or the HKN6184 USB GCAI Programming Cable can be used to FLASH or program the radio via the GCAI connector on the TIB.
5. Mid-Power Radio FLASHing/Programming through Accessory Connector - Using the HKN6160 Serial Data Cable or the HKN6163 USB Data Cable, a Mid-Power radio can be FLASHed or programmed through the Accessory Connector on the back of the transceiver. The process for using this method is the same as going through the control head. **NOTE:** This method only applies to Mid-Power radios as High Power radios do not have an Accessory Connector.

Illegal Flash Configurations or “Gotchas” when Flashing XTL5000 and XTL2500 Radios from R08.00.xx firmware or higher resulting in Flashing Failures

- 1. Attempting to flash upgrade the radio through the control head with a USB data cable attached to the J2 rear accessory port or the TIB of the transceiver.**
- 2. Attempting to flash upgrade the radio through the J2 rear accessory port with a USB data cable attached to the TIB of the transceiver or control head.**
- 3. Attempting to flash upgrade the radio through the TIB of the transceiver with a USB data cable attached to J2 rear accessory port of the transceiver or the control head.**

FLASHing Multi Control Head Radios

1. Multi Control Radios FLASH the same way as a single control head except you have more than 1 control head that you can FLASH through. You can FLASH the radio through any of the control heads which will update the other control heads as well as the transceiver.
2. The Mid-Power Multi Control Head radio can be FLASHed through the GCAI Connector on the TIB or through the back of the transceiver using the same cables mentioned above.
3. The High Power Multi Control Head radio will FLASH through the GCAI Connector on the TIB using the serial or USB cable.

Recovery Methods if Control Head Errors are Displayed During/After the Flash

1. CH ID ERR – This is a fatal error. The CHs with the error must be fixed using FPP before any flash is attempted. Each CH must have a unique ID.
2. EXTRA CH error – This is a fatal error. Either disconnect the extra CHs from the system or fix the codeplug settings to allow the correct number of CHs before any flash is attempted.
3. CH MISMATCH error – This error occurs when an incorrect CH type is connected to the radio (ex. XTL5000 with a M5 control head). Connect correct CH type before any flash is attempted.

Quick Way to Determine What Firmware is In the Control Head and What Firmware in The Transceiver it will Work With.

1. By putting the control head into bootload mode you can determine if the control head will work with a transceiver. To put the control head in bootload mode:
 - a. Power off the control head
 - b. Hold down the orange button and the right most buttons underneath the control head display and then apply power.

- c. The display will turn green and on the right hand side of the display the Motorola symbol will be displayed.
- d. On the left hand side of the display the first lines will be read FLASHZap Bootloader Version RXX.XX.XX.

2. Here are the BootLoader Versions and the Control Head/Host firmware versions associated with each:

Bootloader version	Host version	Control Head Version
R04.00.00	R15.XX.XX	R11.00.00
R04.00.00	R14.XX.XX	R08.10.01
R04.00.00	R12.XX.XX	R06.00.03
R04.00.00	R11.XX.XX	R06.00.03
R04.00.00	R10.XX.XX	R05.00.00
R03.00.00	R09.XX.XX	R04.00.00
R02.00.10	R08.XX.XX	R03.00.00
R02.00.00	R07.XX.XX	R02.00.00