UGSolutions

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General

How can I get the latest information on the NX plotting system?

The latest information on the NX plotting system is available at the UGS Tech Support page (http://support.ugs.com). Search the UGSolutions Database for the exact phrase "**NX Plotting System Information**."

Why does NX 3 provide a new plotting system?

A new NX plotting system was needed because legacy plotting functionality was outdated and inadequate. The legacy system was designed more than a decade ago, and it had not been updated to support newer printers or contemporary printing concepts or an easy-to-use graphical user interface. NX users had requested many enhancements that could not be effectively implemented in the context of the legacy plotting system.

It was essential to replace the legacy system with a new plotting system that provides modern printing features commonly available with other applications. The powerful features of the new system can significantly enhance the effectiveness and productivity of NX users.

Why does the new plotting system use commercial printing software provided by SDI?

The new plotting system is based on powerful commercial printing software developed by SDI (www.sdicgm.com), a UGS strategic partner. Basing the new system on commercial printing software provides NX users with capable, flexible, and up-to-date printing functionality.

SDI is in the business of and plotting, and also has extensive expertise in CGM (Computer Graphics Metafile), a graphics file format that NX produces for the new plotting system. Major NX customers already use SDI products, and SDI provides the printing/plotting capability in I-DEAS.

The UGS partnership with SDI means that NX customers can install other useful SDI products to obtain optional enhancements to printing and CGM functionality.

Can I still use the legacy plotting system?

No. The new plotting system replaces the legacy plotting system. Legacy NX plotting functionality is not supported by NX 3 or later NX releases. You cannot use legacy plot queues with these releases.

If you run NX 2 or an earlier NX release concurrently with NX 3 or a later NX release, then two different plotting systems are in use. The earlier release uses the legacy plotting system, and the

later release uses the new plotting system. The two plotting systems are independent and do not interact with one another.

Banner

How has banner functionality changed in the new plotting system?

In the new plotting system, plot banner functionality (appends an informative text block to plots) is enhanced to support additional content elements, including elements to display the full path of the part, the Team Center revision of the part, whether the drawing sheet is out of date, etc.

Plot banner functionality is also enhanced to permit the location of the banner text block to be defined relative to the bounds of the plot, so it is no longer necessary to specify the location in absolute plot coordinates. For example, the banner location might be specified relative to the lower-right corner of the plot.

In addition, for printers that use RTL printer models, you can set header and trailer options to display an alternate form of banner. If enabled, the header is printed on the leading edge of the output, and the trailer is printed on the trailing edge of the output. The content of the header and trailer are the same: date and time, user account name, CGM file name, SDI job number (a number referenced on the Queue page of the NX Print dialog), and an optional text message that you are prompted to enter when you click Print.

- You can enable headers or trailers for individual plot jobs on an RTL printer. Click Advanced Settings on the Print Setup tab of the NX Print dialog. When the Advanced Settings dialog is displayed turn on Headers or Trailers as desired.

- You can enable headers or trailers by default for all plot jobs printed on an RTL printer. Select the printer on the Printers tab of the Printer Administrator dialog, and click System Profile. When the System Profile dialog is displayed, click Advanced Settings on the Printer Setup tab. When the Advanced Settings dialog is displayed turn on Headers or Trailers as desired.

Colors and Widths

How are colors and widths used in the new plotting system?

The new plotting system supports easy specification of colors for plotting, including use of as-displayed (WYSIWYG) colors, part colors, custom color palettes, and black-on-white. All 216 object colors can be used. Custom color palettes are easy to create and edit, and can be readily stored and shared via color definition files (CDFs).

The new plotting system also supports easy specification of widths for plotting, including use of standard widths, an arbitrary single width, custom widths assigned according to object width index, and custom widths assigned according to object color index. Custom widths are easy to create and edit, and can be readily stored and shared via width definition files (WDFs).

Color customizations are independent of width customizations, and can be used in mix and match fashion. You can save custom color and width settings with an individual drawing sheet, so the same colors and widths can be used each time you plot the sheet.

Features of the NX Plotting System

What are key enhancements in the new plotting system introduced in NX 3?

- The new system uses standard plot file formats (CGM and TIFF) that are supported by a wide variety of commercial applications, so the new plotting system can be readily extended and integrated with other customer processes.

- All aspects of the new plotting system are controlled by intuitive, easy to use graphical user interfaces.

- It is much easier to control printer settings than in the legacy system. Many settings can be easily set by an NX user in the NX Print dialog instead of by a system administrator in a plot queue definition.

- It is much easier to define printer queues. An ordinary user can readily define printers and profiles for the plotter devices and plotting tasks that are most important to him. Easy printer definition means greater productivity for both end users and system administrators.

- The new system permits system administrators and ordinary users to define "profiles" to encapsulate commonly used printer option settings (scale, portrait/landscape, color/monochrome) for fast and easy preparation of plot jobs.

- CGM files produced for plotting support a generous variety of color and width settings. It is much easier to set color and width attributes than in the legacy system.

- The NX Print dialog displays a preview of the plot layout on paper, and also provides a CGM Viewer function that displays the contents of the CGM file to be printed. The CGM Viewer function can also be used to select a rectangular subregion of the plot for printing.

- The new system permits the user to save print-ready CGM files on disk that can be directed to any plotter at a later time without starting NX or loading a part.

- The new system permits the user to convert wireframe CGM output to raster images (e.g. JPEG) of arbitrary resolution.

- The new system provides an easy-to-use visual interface for arranging plots on a layout.

- The new system provides effective user interfaces for operating on multiple drawing sheets at once, both for plotting and CGM export.

- The new system provides powerful programmability, and the nxplot command-line program provides some programming options even to customers without GRIP and UFUN licenses.

- The new plotting system supports plotting of raster image annotations on drawing sheets.

NX Open

How can I convert legacy NX Open API programs for the new plotting system?

An extensive collection of NX Open API functions provides comprehensive access to NX plotting functionality introduced in NX 3.

For an example of how to plot all drawing sheets in the current part, refer to sample program ufd_plot_drawings.c in the NX Open kit.

For an example of how to create HP-GL/2 output files for all drawing sheets in the current part, perhaps for purposes of comparing plots in HP-GL/2 format, refer to sample program ufd_plot_drawings_hpgl.c and script move_hpgl.pl in the NX Open kit.

- Command-line program nxplot provides programmatic access to some plotting functionality without using an NX Open license. You can automate common plotting tasks by implementing scripts or programs that invoke nxplot.

How can I convert legacy NX Open GRIP programs for the new plotting system?

Beginning with NX 3, GRIP plotting statements are redefined to utilize the many features of the new plotting system. Plotting statements PLOT, PLTSAV, PLTSUB, and PLTDEL have new parameters and new behaviors. Also, statement PLTUPD and plotting-related parameters of statement DRAWV are now obsolete and have no effect.

If you have legacy GRIP plotting programs written for releases before NX 3, you can modify them to use the redefined statements with their new parameters. If you do not modify or recompile your legacy GRIP plotting programs, you can continue to use them with the new plotting system, provided you create a mapping file that maps legacy statement parameters to values that are meaningful in the new system.

- Only limited features of the new plotting system are available with this mapping technique. To fully exploit the capabilities of the new system, you must modify GRIP plotting programs to use the updated statement parameters.

You can find instructions for using the mapping technique in a sample mapping file provided with NX. The sample file is ${UGII_BASE_DIR}/nxplot/sample_plotter_mapping.txt.

Plot Layout

How can I combine multiple plots in one plot file?

The new plotting system provides Plot Layout functionality for arranging multiple plots in one plot file for printing or for saving to disk in CGM format. This functionality permits you to layout multiple plots for efficient printing on roll-feed paper, or to overlay plot jobs so they are printed on top of one another, or to collect plots in a single file for publishing.

Plot Layout functionality includes an intuitive, easy to use, graphical user interface that permits you to see the current arrangement of plots and to manipulate each new plot as it is added to the layout. Optionally, the functionality can compute a default, initial location for each new plot in a manner designed to conserve roll-feed media.

You can add any number of plots to the plot layout over the course of the session, but you can still plot individual jobs at any time without disturbing the contents of the layout.

To add a plot to the plot layout, click Add to Plot Layout in the File-->Plot dialog.

Saving Plots

How can I save plot output to disk in the new system?

The NX plotting system supports various strategies for saving plot files on disk. Choosing an approach depends on how you intend to use the files.

You can save plot files on disk in printer-independent CGM format by selecting Save CGM File in the File-->Plot dialog. You can later use the NX Print dialog to print the saved CGM files on any printer, or you can use various applications to import or otherwise process the files. For example, Microsoft Office applications support importing of CGM files. Note that you can view any CGM file with the CGM Viewer function of the NX Print dialog, but you can also install a CGM viewer application or browser plug-in so that you can easily view the CGM files you save on disk.

You also can save plot files on disk in the printer output format (e.g. RTL, PostScript, HP-GL/2). If you save a plot output file on disk only occasionally, then use the Output Options setting in the NX Print dialog.

1. In the File-->Plot dialog, click Plot to display the NX Print dialog.

2. Choose a printer and then set Output Options to Print to File or "Print to File and Printer".

3. When you click Print, the system prompts you to specify a path for the plot output file.

If you routinely save plot output files as part of some defined process, then you might prefer to invoke the process automatically whenever a plot output file is produced. To accomplish this, you can use the Printer Administrator dialog to set the Render File then Execute Program option for your printer.

1. Select File-->Utilities-->Printer Administration.

2. Specify the printer group for the printer of interest.

3. When you click OK, the Printer Administrator dialog displays. In the Printer Administrator dialog, select your printer.

4. Click Setup.

5. Turn on the Render File then Execute Program option.

6. Enter the full path of a command (including switches) to invoke your process. After SDI software generates each plot output file, it automatically invokes your command, specifying the plot file name as the last parameter. In a simple case, your command might simply copy the plot output file to a particular directory.

You can also generally retain plot output files so you can later access them on disk. In the Printer Administrator dialog, click the BPS Settings tab, and turn on the Save Input/Output Files option. The setting affects all plot jobs printed on all printers in the printer group.

You can find retained files under the "jobs" directory. (Search for UGII_SDI_BPS_JOBS_DIR in the ugii_env file.) By default, the jobs directory is ${UGII_TMP_DIR}/bps, and you can find all files for a particular plot job in one of the subdirectories of ${UGII_TMP_DIR}/bps/user_name/node_name, , where user_name represents the user account name, and node_name represents the system node name.

Retained input/output files can consume large amounts of disk space, so delete the files promptly when they are no longer needed.

Printer Queues and Printer Groups

Is there a way to automatically convert legacy plot queues for use with the new plotting system?

No. You must manually define new printers for the new plotting system, but defining a printer in the new system is generally easier than defining a queue in the legacy system. The process of defining a printer is similar to using the Add Printer function on Windows systems. It can be as simple as entering a name for the printer, and then using the mouse to choose the operating system print queue from one list and the printer model from another list.

You might define fewer printers for the new plotting system because the new system permits you to directly control more options than did the legacy system. For example, some options controlled by plot queue switches in the legacy system (switches /AS (auto-scale), /D (DPI), /SP (set palette), etc.) can be conveniently controlled by the NX user in the new system. Therefore, you might prefer not to define extra printers to handle the various option choices.

- Printer definitions are platform-specific, so if you use both Windows and UNIX workstations, you will create a printer group with printer definitions for Windows and a printer group with printer definitions for UNIX.

  Use File-->Utilities-->Printer Administration to define printers.

In the new plotting system, how can I obtain the behaviors produced by legacy plot queue switches?

In the legacy plotting system, you set plotting options by specifying switches (codes) in plot queue definitions. The new plotting system supports comparable features, but you enable the features in other ways. For some common legacy plot queue switches, the following table indicates how to produce comparable results in the new plotting system.

(HP-GL/2 switch)	When using the Printer Administrator dialog to create the printer, choose an HP-GL/2 printer model. (See also "How can I produce plot output in HP-GL/2 format?")
/AR (Auto-run switch)	You need not perform any steps to obtain this behavior. The new plotting system automatically processes all ready plot jobs.
/AS (Auto-scaling switch)	In the new plotting system, you can obtain auto-scaling behavior by enabling the Best Fit to Page option as follows. • You can enable Best Fit to Page for an individual plot job, or you can save the setting in a user profile. Set the Scaling option to Best Fit to Page on the Print Layout tab of the NX Print dialog. Click Save Profile As in the NX Print dialog to save the setting in a user profile. • You can enable Best Fit to Page as the default scaling setting for a printer. Select the printer on the Printers tab of the Printer Administrator dialog, and click System Profile. When the System Profile dialog is displayed, click the Print Layout tab, and turn on Best Fit to Page.

/DJ (DesignJet switch) /LJ (LaserJet switch)	When using the Printer Administrator dialog to create the printer, choose the appropriate DesignJet or LaserJet model from the list of printer models.
/D (DPI or dots-per-inch switch)	In the new plotting system, you can set the DPI or resolution as follows. • You can choose the resolution for an individual plot job, or you can save the resolution in a user profile. Set the Resolution option to the desired value on the Print Setup tab of the NX Print dialog. Click Save Profile As in the NX Print dialog to save the setting in a user profile. • You can set the default resolution for a printer. Select the printer on the Printers tab of the Printer Administrator dialog, and click System Profile. When the System Profile dialog is displayed, choose the default resolution on the Print Setup tab. • You can set the resolutions supported by a custom printer model. Select a custom printer model on the Models tab of the Printer Administrator dialog, and click Properties. When the Properties - Printer Model dialog is displayed, use the Resolutions option to customize resolutions supported by the printer model. Note that you cannot modify the properties of a predefined printer model. First use Save As to save a custom copy of a predefined printer model, and then modify the properties of the custom copy.
/MO (Monochrome switch)	In the new plotting system, you can enable monochrome output in the following ways. • You can enable monochrome output for individual plot jobs. In the File-->Plot dialog, set the Colors option to Black on White, or instead, set the Colors option to Monochrome on the Print Setup tab of the NX Print dialog. Click Save Profile As in the NX Print dialog to save the NX Print Monochrome setting in a user profile. • You can choose monochrome as the default color setting for a printer. Select the printer on the Printers tab of the Printer Administrator dialog, and click System Profile. When the System Profile dialog is displayed, set the Colors option to Monochrome on the Print Setup tab. • You can specify whether a printer model supports color or monochrome output. Select a custom printer model on the Models tab of the Printer Administrator dialog, and click Properties. When the Properties - Printer Model dialog is displayed, set the Colors option to Color, Monochrome, or Both. Note that you cannot modify the properties of a predefined printer model. First use Save As to save a custom copy of a predefined printer model, and then modify the properties of the custom copy.

/SP (Set palette switch)	In the new plotting system, you can set the Colors and Widths options in the File-->Plot dialog to reproduce the behavior of any of the many possible settings of the legacy /SP switch. You can set the Colors option to any of the following values.

As Displayed	The colors used to display the geometry on screen are also used in printing.
Part Colors	The colors of the part color table are used in printing.
Custom Palette	An alternate set of 216 colors is used for printed output.
Legacy Colors	Geometry is printed using 15 fixed colors supported by NX releases before NX 3, and each of the 216 colors in the part color table is mapped to the most similar of the 15 fixed colors.
Black on White	Geometry is printed in black.

You can set the Widths option to any of the following values.

Standard Widths	Three fixed line widths are used in printed output.
Single Width	A single line width is used. You can choose one of the standard widths, one of the custom 3 widths, or a user-defined width.
Custom 3 Widths	You specify three custom lines widths that are used in printed output.
Custom Palette	You specify custom line widths per color (for 216 colors).

| /11 /14 /17 /A3 /A4 (Tray selection | In the new plotting system, you can select a paper tray or size by using an initialization file containing tray selection or paper size commands that are inserted at the beginning of each output file dispatched to the printer.

When you define a printer, you can specify an initialization file to be used for all jobs printed on this printer.

1. On the Printers tab of the Printer Administration dialog, select the printer of interest.

2. Click Setup.

3. When the Printer Setup dialog displays, enter the path of an initialization file in the Initialization File entry field or click the Browse button to search for the file.

When you define a paper size for a custom printer model, you can specify an initialization file to be used for all jobs printed on |
|---|---|

switches) **/PG (Page size switch)**	paper of this size by all printers that share the custom printer model. Use this second approach if you wish to define a printer that supports printing to multiple paper trays.

1. On the Models tab of the Printer Administration dialog, select the custom model of interest.

2. Click Properties.

3. When the Properties - Printer Model Dialog displays, select the paper size of interest.

4. Click Edit Paper Size.

5. When the Paper Size Properties dialog displays, enter the path of an initialization file in the Initialization File entry field, or click the Browse button to search for the file.

Can all users at my site share the same printer definitions?

Yes. Printer definitions are stored in a directory called a printer group directory, and any NX user who can access the directory (i.e. who has "read permissions" for the directory) can use the printers in the printer group.

o Printer definitions are platform-specific, so if both Windows and UNIX workstations are used at the site, you must create a printer group with printer definitions for Windows and a printer group with printer definitions for UNIX.

Also, any printer devices or files specified by printer definitions must be visible to the operating system of each user workstation. When defining a printer for Windows, for example, the printer must have been added on each user workstation (via Add Printer), or you can use the LPR/Queue option to identify the printer in Uniform Naming Convention (UNC) format: \\server_name\share_name to permit access by all user nodes. On the Printers tab of the Printer Administration dialog, select the printer of interest, and click Setup. When the Printer Setup dialog is displayed, set the Printer option to LPR/Queue and enter the UNC name of the printer.

If all users at the site share only a single printer group per UNIX or Windows platform, then the system administrator sets environment variable UGII_SDI_SERVER_CFG_DIR in the ugii_env file to identify the printer group directory.

Users also can share multiple printer groups per platform. In this case, the system administrator enumerates the printer groups in a printer group list file, and he sets a customer default to identify this file.

What are some reasons for using multiple printer groups?

You can create multiple printer groups as a strategy for organizing printers, so that an individual printer group might represent just the printers at a particular location or just the printers belonging to a particular department or work group. This provides the following benefits:

- When you invoke the File-->Plot dialog to prepare a plot job, it is easy to choose the appropriate printer group by its descriptive name, and the NX Print dialog lists only the printers in this printer group. This approach can make it easier for you to select the printers you use most often, because printer lists are uncluttered by printers you rarely use.

- Use of multiple printer groups means that printer definition can be a distributed responsibility. The system administrator might create a printer group to represent printers that are shared by all users at the site. Others might create printer groups for printers used only by users in a particular workgroup at a particular location. An individual NX user might create a printer group to manage printers and printing options that he uses most often.

- Because it is easy to define printers in the NX plotting system, each individual NX user can readily define printers for his particular printing needs in his own printer group. (Defining a printer is similar to using Add Printer on Windows.)

To use multiple printer groups:

1. List the printer groups of interest in a printer group list file.

2. Set a customer default to identify the file. NX reads the printer group list file to display an option menu of printer groups in the File-->Plot dialog and other plotting dialogs.

3. Specify a special entry in a printer group list file to automatically include the contents of some other printer group list file, so an individual user can create a file that includes the contents of the printer group list file defined by a system administrator for the site or workgroup.

A template version of the printer group list file is provided with NX. The template file contains instructions and samples to explain file syntax. When creating a printer group list file, you can copy this template file and add your printer group information to the copied file. The template file is ${UGII_BASE_DIR}/nxplot/printer_group_list_file.txt.

How can I produce plot output in HP-GL/2 format?

To produce plot output in HP-GL/2 format, plot the job on a printer defined to use an HP-GL/2 printer model.

First you must define a printer that uses an HP-GL/2 printer model. By default, the SDI plotting software integrated with NX uses RTL (HP Raster Transfer Language, a subset of HP PCL) for many printer models. To produce HP-GL/2 output, you can choose an existing printer model that uses HP-GL/2, or you can create a new printer model that uses HP-GL/2. In either case, use the Printer Administrator dialog to define printers and printer models.

1. Select File-->Utilities-->Printer Administration.

2. Specify the printer group for the new printer.

3. When you click OK, the Printer Administrator dialog displays.

4. To use an existing printer model, add a new printer and choose printer model

"GEN:Generic HPGL/2". Or, if you have an actual printer device in mind (e.g. HP DesignJet), then you can create a HP-GL/2 model for this printer by copying an existing model. Follow these steps to create the model.

1. In the Printer Administrator dialog, click the Models tab and select the model of interest.

2. Click Save As, and specify a unique name for your new model, possibly including some reference to HP-GL/2.

3. Then click Properties, set the Class to "HPGL/2", and click OK.

4. Then return to the Printers tab and add a new printer using your new model.

5. After you add the new printer on the Printers tab, click System Profile and specify default options for the new printer.

6. Click Cancel or Close to dismiss the Printer Administrator program. You will be able use your new printer the next time you invoke File-->Plot.

If you wish to save HP-GL/2 plot output files on disk, see question "How can I save plot files on disk?"

Plot Quality

How can I eliminate the "jaggies" to make plotted lines appear smooth?

The problem of "jaggies", also known as aliasing, occurs when diagonal lines are rasterized for output on raster printers and plotters. In the rasterization process, a line is rendered using a pattern of dots. The print resolution or dots-per-inch (DPI) setting determines the number and size of dots in the pattern. If the resolution is low, the pattern contains fewer dots and larger dots, so jaggies can result, and the line does not appear smooth.

To address jaggies, you can increase the Resolution setting specified on the Print Setup tab of the NX Print dialog. You can specify resolution for RTL and PostScript printers you have defined, and you can save the preferred resolution in the system profile for the printer or in a user profile. You cannot specify resolution for HP-GL/2 printers, because the printer itself controls the resolution.

Note that increasing the resolution can increase printing time. Also, for RTL printers, it can significantly increase the size of plot files delivered to the printer.

Supported resolutions depend on the capabilities of the printer device, and also on the printer model definition managed by the Printer Administrator dialog. In some cases, different resolutions are supported for color and monochrome output.

On plotted output, why do solid curves appear broken and non-solid curves appear unevenly dashed or dotted?

If you set the Color option to Grayscale in the NX Print dialog, then patterns of black dots are used to represent the various shades of gray. For lighter shades, the pattern of dots is sparse, and curves and dashes can appear irregular or broken where no dots are printed.

You can use any of the following strategies to improve the appearance of curves on plotted output.

- Avoid using Grayscale. You can set the Colors option to Monochrome on the Print Setup tab of the NX Print dialog, or you can set the Colors option to Black on White in the File->Plot dialog.

- Use Grayscale, but increase the Resolution setting specified on the Print Setup tab of the NX Print dialog. (Note that you cannot specify the resolution for HP-GL/2 printers.)

- Use Grayscale, but set the Widths option to Custom 3 Widths in the File->Plot dialog, and increase each of the line width values in the Custom Widths dialog.

When you increase resolution or line widths for Grayscale output, the system uses more dots for each curve, giving the curve a more regular appearance.