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Moving-Map Composer Personal Computer (MMCPC) Version 2.0 Software User's Manual

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MOVING-MAP COMPOSER–PERSONAL COMPUTER (MMCPC) VERSION 2.0 SOFTWARE USER’S MANUAL

1. INTRODUCTION

This report documents a substantial revision of the Moving-Map Composer-Personal Computer (MMCPC) system designed and developed by scientists at the Naval Research Laboratory, Marine Geosciences Division. MMCPC v2.0 has been reconfigured and modified to support the map development planning needs for the C-130J Map File Data Cartridge (MFDC) system versus the MMCPC v1.0 original intent of supporting the Tactical Aircraft Moving Map Capability (TAMMAC) system. MMCPC is specifically designed and configured to support Kuwait Air Force KC-130J mission planners and pilots in the field for map data planning and cartridge loading for the MFDC.

MMCPC v2.0 is a software-only application intended for target installation on a Windows 10 computer configured with a PCMCIA drive for creating, writing, and reading MFDC theater map data loads. MMCPC v2.0 enables users to perform the following major functions:

- Ingest Compressed ARC Digitized Raster Graphics¹ (CADRG) into MMCPC via data logging;
- Create and save map coverages (map compositions) based on available logged data sources at multiple scales for map theater data loads as a series of bitmap representations;
- Build map theaters from valid map compositions with map data from logged CADRG data sources that fit within the constraints defined by the MFDC and PCMCIA card size;
- Write map theaters to a specified drive that should be pre-configured for PCMCIA cards.

Note that MMC v2.0 specifically does **not** support the following functions previously implemented in MMCPC v1.0 due to reduced scope for this effort:

- Process source GEOTIFF files into a CADRG-compatible format;
- Process Digital Terrain Elevation Data (DTED) into TAMMAC-compatible RegridDED DTED (RDTED);
- Support the ability to ingest or utilize RDTED, CIB, or static data frames for map coverage definition or build;
- Generate TAMMAC-compatible map theater or mission data loads.

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2. QUICK START GUIDE

A. Start MMCPD

1. Unzip the MMCPD installation to a folder on your Windows 10 computer.
2. Click on *MMCPD.EXE* to start the application.
3. Click Yes if a message appears titled "Directory(s) Does not Exist" to create directory paths needed for MMCPD.

B. Verify Viewing options

1. Click *View* on the main menu and verify the following settings are on:
 - ✓ World Map
 - ✓ Lat/Lon Grid
 - ✓ Available coverage

C. Log Data

1. Click *Log* on the main menu, then *Log Source*. "Logging Mode" appears at lower-right (below lat/lon display).
2. In the Log dialog box, select *Browse* to navigate to a valid CADR dataset to log into MMCPD.
 - 2.1. Select the directory name located one-directory level above the RPF directory.
 - 2.2. The name must be unique; otherwise, MMCPD will prompt to overwrite or cancel in a later step.
3. Verify *Found Valid Source Data* is checked. If not checked, data source is invalid, click *Cancel*, repeat step 1.
4. Notice the name of the selected directory now appears in the *Processed Data Name* field. Click *Log*.
5. If the name is not unique, MMCPD will prompt to overwrite the current logged source.
6. Wait until the progress indicator is dismissed and the Log Source completion dialog appears. Click *Ok*.
7. Locate the logged source data.
 - 7.1. Select the chart scale of the logged source from the pulldown scale menu.
 - 7.2. The logged coverage will be displayed as a group of green boxes.
 - 7.3. Right-mouse click on the base map and select *Zoom by Stretch Box*.
 - 7.4. Hold down the left-mouse button and draw a box over the area of interest to zoom in.
 - 7.5. Large-scale data (e.g. 1:12.5K) may require zoom to be visible on the world base map.
8. Repeat steps (1) – (6) to log all valid CADR datasets needed.

D. Compose Coverage (create a map composition)

1. Click *New* to start composing mode and to activate drawing tools. "Composing Mode" appears at lower-right.
2. Toggle any of the drawing tools to include coverage at any scale(s) where logged data exists (green).
3. Selected coverage is red with a green checkmark set for scale(s) where map coverage has been added.
4. Once completed adding coverage, click *Compose*, then *Verify Composition* to make sure your map composition fits within the size constraints pre-defined in your configuration. Adjust your composition size accordingly. Click *Ok*.

E. Map Theater Build

1. Click *Build* on the main menu, then *Build Map*.
2. In the Save Composition dialog, enter a name for the Composition, then click *Ok*.
3. In the next dialog, the full composition name is shown. Click *Ok*.
4. The Data Sources Needed dialog lists the map data IDs needed (you can modify order of preference). Click *Ok*.
5. Wait until the progress indicator is dismissed and the Map Build completion dialog appears. Click *Ok*.

F. Write a Map Theater to a device [PCMCIA card(s)]

1. Click *Build* on the main menu, then *Write Theater Map*.
2. "Building Mode" is now displayed in the lower-right portion of the screen.
3. In the Select Map Build dialog, select the name of the map theater built above in step E.
4. The selected composition appears in the Map Build Name field. Click *OK*.
5. The PC Card drive dialog appears. Enter a disk into the pre-configured designated drive and click *OK*.
6. Wait until the progress indicator is dismissed and the Map Build completion dialog appears. Click *Ok*.

3. SYSTEM CONFIGURATION

Figure 1 illustrates the MMCPD operational components, data flow between each of these components, and the principal MMCPD software operations:

- Log data sources;
- Create a geographic map coverage (map composition) based on logged sources;
- Build a map theater from a map composition;
- Writing the map theater to a pre-configured disk drive assumed to be installed as the PCMCIA card drive.

Map compositions are user-defined regions of interest based on logged sources for CADRQ map data. Figure 2 outlines how to create a new map composition.

The main body of this manual provides detailed information on the MMCPD v2.0 software. Section 4 describes the graphical user interface (GUI), including the world-map workspace, tool bars, and associated utilities. Section 5 provides step-by-step instructions on how to perform the most common operations. Acronyms and terms are defined in Appendix A. Appendix B lists the modified ASCII symbol set, and Appendix C contains the Mission Planning System (MPS) import file format.

NOTE: While some figures within this document have been updated to reflect specific MMCPD v2.0 features and capabilities, others are older images from MMCPD v1.0 where the significant functionality discussed has not been changed. In those other images, there may be ancillary menu items displayed that are not included as part of MMCPD v2.0.



Figure 1 MMCPD operational components

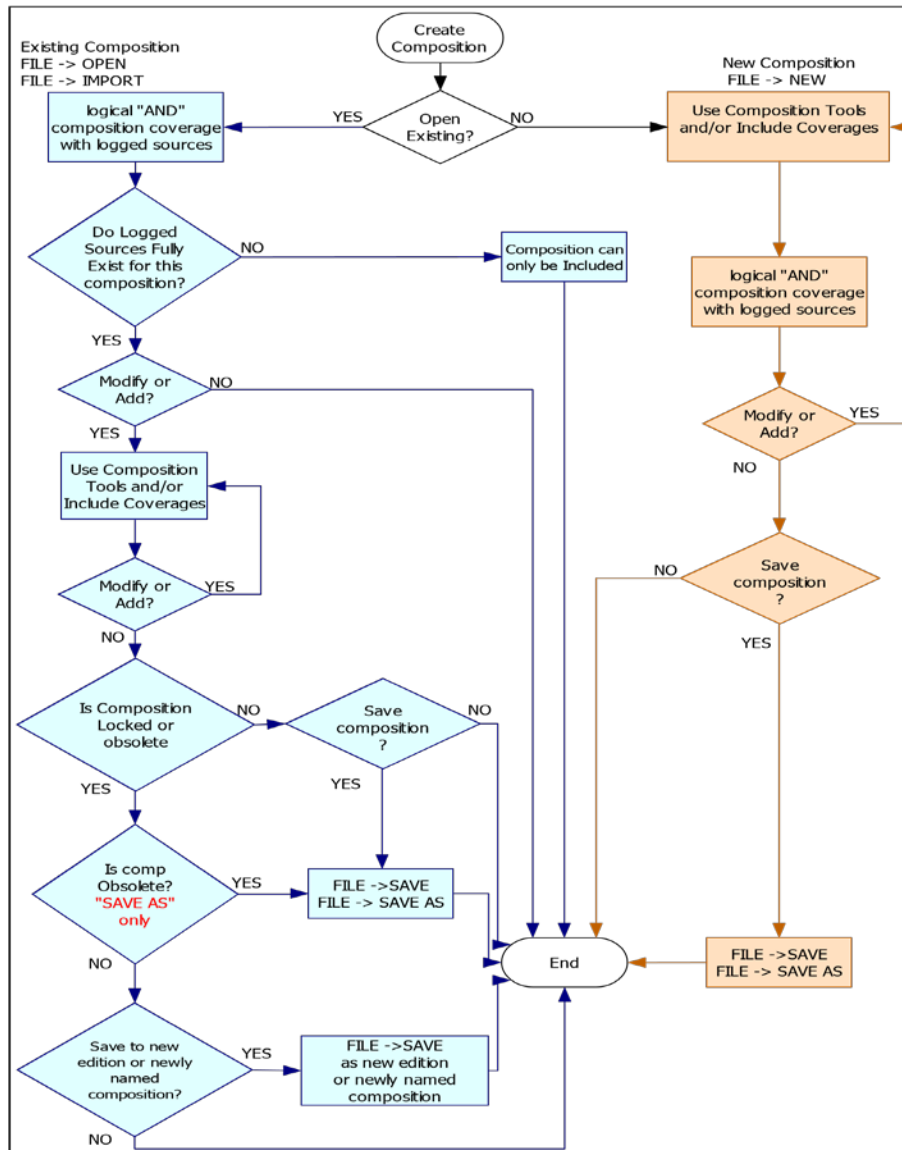


Figure 2 Create a map composition (Note: new edition functionality disabled in MMCP v2.0)

4. GRAPHICAL USER INTERFACE

Some screen captures have been updated to reflect specific v2.0 functionality changes.

4.1. Starting MMCP

MMCP is invoked by clicking on the file named MMCP.EXE that has been previously stored in a folder on your PC, which brings up the main MMCP window (figure 3).

Section 4.2 provides detailed descriptions and illustrations of the workspace, menus, tools, and title bar. Section 4.3 provides detailed descriptions of operations accessed from the main menu.

4.2. Toolbars and Workspace Definitions

4.2.1. World-map Workspace

Figure 3 depicts the main MMCPD window, primarily consisting of a world base map, in Mercator projection, on which to design map compositions.

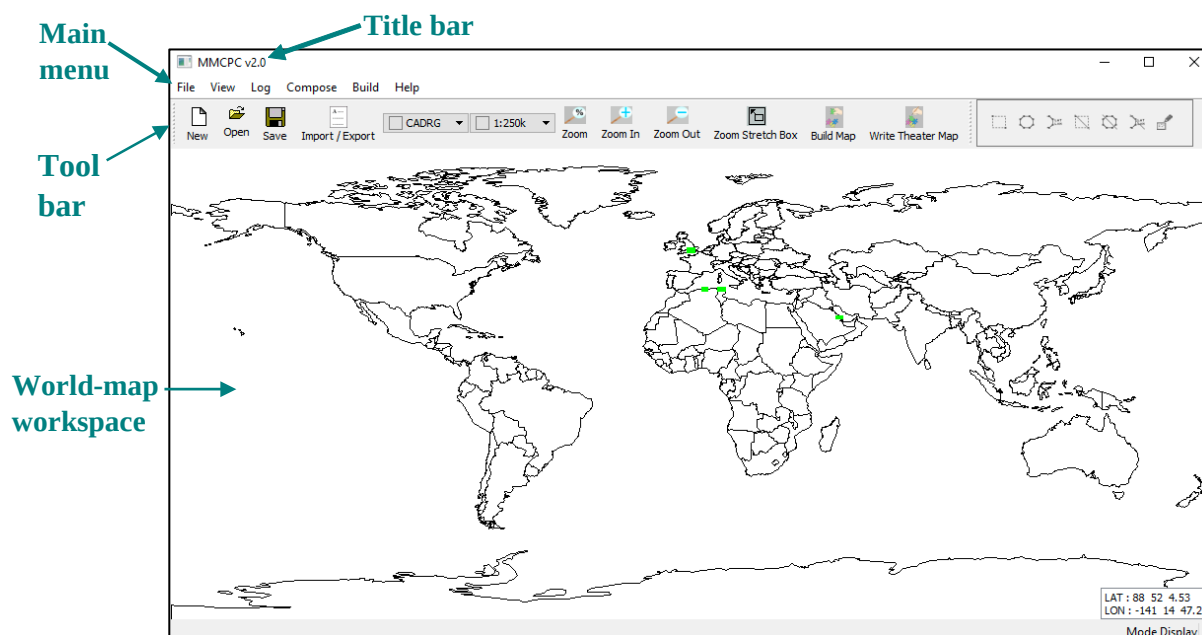


Figure 3 Main MMCPD window

The cursor latitude/longitude position box (located in the lower right corner of the workspace) shows the current geographic position of the cursor over the MMCPD base map. Position can be shown in degrees, minutes and seconds [default] or in decimal degrees of latitude and longitude. The preference can be changed in the View menu, under Properties.

Shortcuts for common base map operations are available by clicking the right mouse button over the map to invoke the shortcut selection window (figure 4):

Full View to restore the world base map to full view (e.g., following a zoom operation).

Zoom by Stretch Box to zoom into a region of interest using the “stretch-box” tool (Section 4.2.2.3).

View RPF Data to display geographic areas of coverage for Raster Product Format (RPF) data. This option is only active when clicking on a selected map coverage for a composition (i.e., red map tiles).

Hide Lat/Lon Display to toggle on/off the cursor latitude/longitude position box.

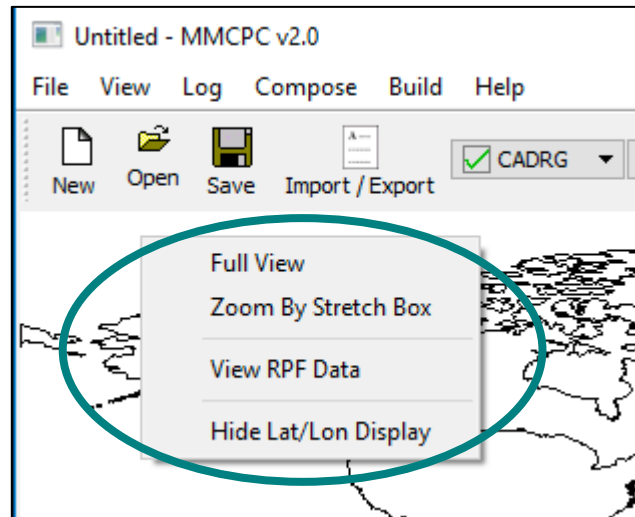


Figure 4 Base map shortcuts (access by clicking right mouse button anywhere on map)

4.2.2. Tool Bar

MMCP provides tools to quickly access common operations, also available through main menu options. This section describes the functionality of each tool group. The descriptions that follow are keyed to the tool bar illustrated in figure 5:

1. File buttons (Section 4.2.2.1)
2. Data type and scale boxes (Section 4.2.2.2)
3. Zoom buttons (Section 4.2.2.3)
4. Build and Write buttons (Section 4.2.2.4)
5. Coverage definition buttons (Section 4.2.2.5)

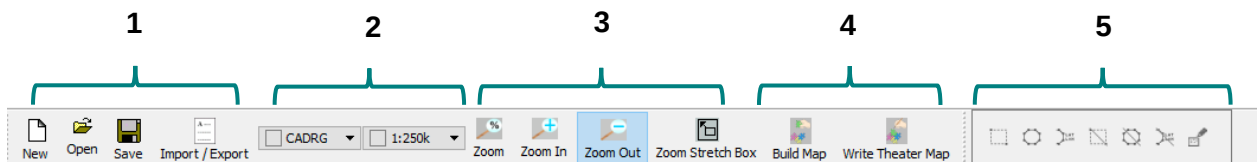


Figure 5 MMCP tool bar with all selectable options

MMCP displays the name of a toolbar button in a screen tip when the mouse pointer rests on the button. Tool bar fields may be selectively included or removed from view in the main window. Place the mouse cursor within any of the toolbars and click the right mouse button to invoke the tool bar view selection window (figure 6). Select a viewing preference by placing a check mark next to the desired tool bars.

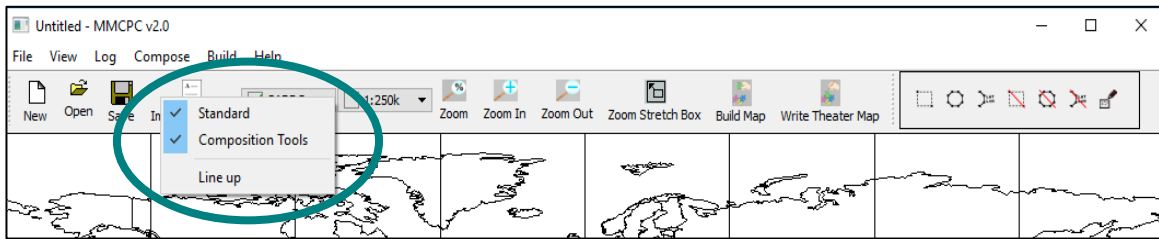


Figure 6 MMCP tool bar view selection

4.2.2.1. File Buttons

The File buttons (figure 7) are shortcuts for common operations also available via the *File* menu (Section 4.3.1), including opening new or existing files and performing save operations. File buttons may be selectively included or removed from the tool bar by clicking the mouse right-button and toggling the Standard tool button on/off (adding or removing the check mark; see figure 6).

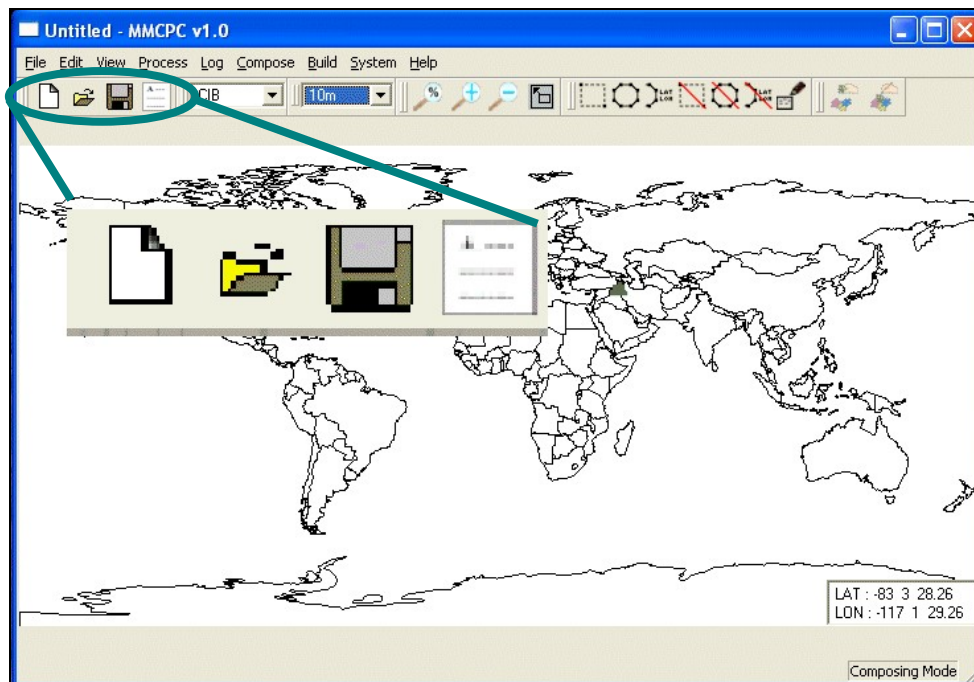


Figure 7 File buttons: Create composition, Open file, Save file, Import/Export



The Create a New Composition button enables map composition drawing tools in preparation for building a new map composition (Section 4.3.1.1).



The Opens an existing composition button opens an existing composition file (Section 4.3.1.2).



The Save File button saves an open composition file (Section 4.3.1.4).



The Import/Export button imports map compositions in ASCII file format (Section 4.3.1.6). The Mission Planning System (MPS) format required for import is defined in Appendix C.

4.2.2.2. Data Type and Scale Boxes

Select the *map data type* and *map scale* from these drop-down lists (figure 8). **MMCP C V2.0 only supports CADR G data**. Users can define coverages in one map scale and switch to another map scale without losing what they defined in the first.

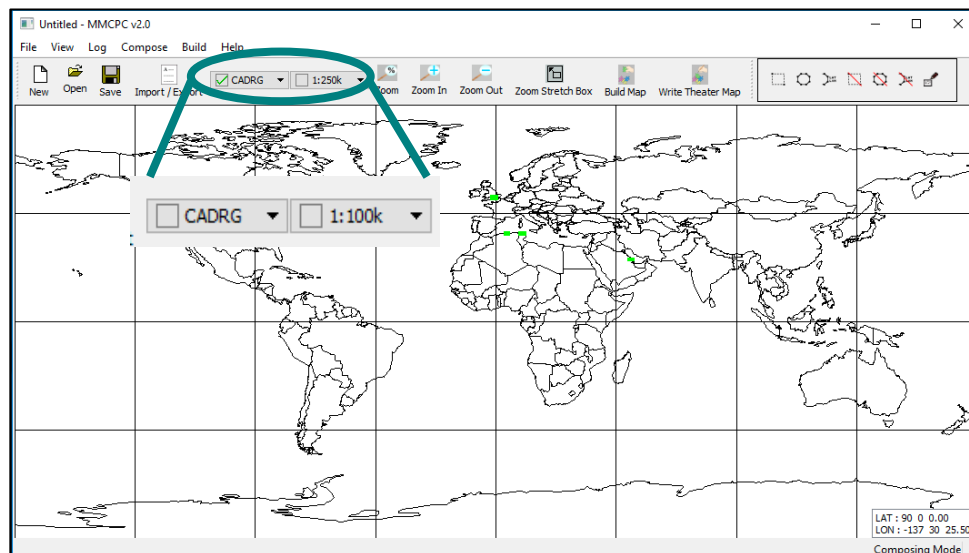
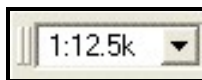


Figure 8 Map data type and scale boxes



This option is not selectable in MMCPC v2.0. Only CADRG is supported.



Choose the map *Data Scale* from this drop-down list: select one of the following scales: 1:5M, 1:2M, 1:1M, 1:500k, 1:250k, 1:100k, 1:50k, and 1:12.5k.

4.2.2.3. Zoom Buttons

To optimize performance, the user is advised to zoom-in to a region of interest before designing a composition. The Zoom buttons (figure 9) allow the user to zoom into (or out of) an area of interest on the MMCPC base map. Zooming can be accomplished via stretch-box or by selecting a zoom factor and then mouse click on the base map. Note when using the zoom factor (percentage) icon: By default 100% is world view; to zoom in select a percentage less than 100%; to zoom out choose a percentage greater than 100%. Choosing a zoom percentage greater than 100% at world view will result no action.

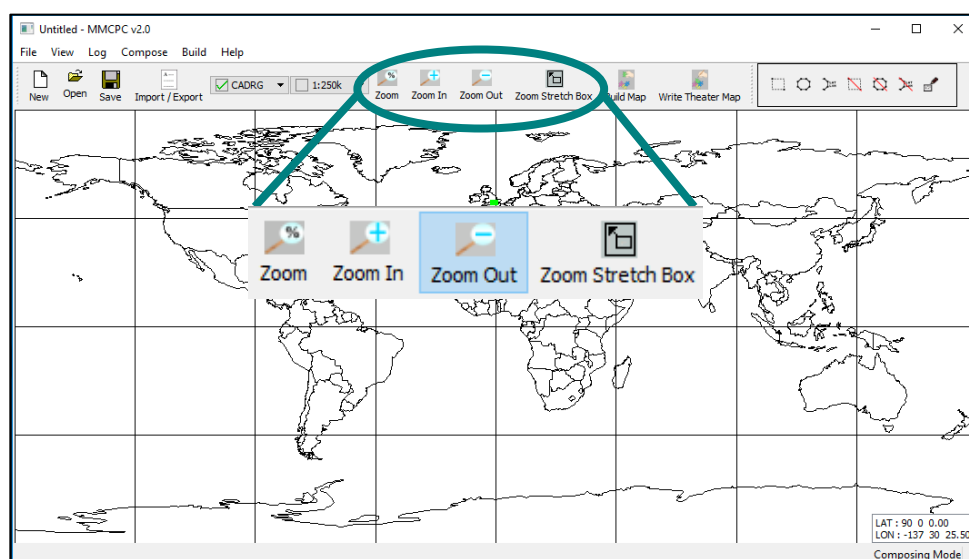


Figure 9 Zoom buttons



The Zoom-in to ROI via factor box button adjusts the zoom factor with the pop-up magnification selection box (figure 10). The default magnification (100%) displays the entire world base map. Factor values of 75% or less will zoom-in centered to the point selected. Choosing a zoom percentage greater than 100% at world view will result no action.

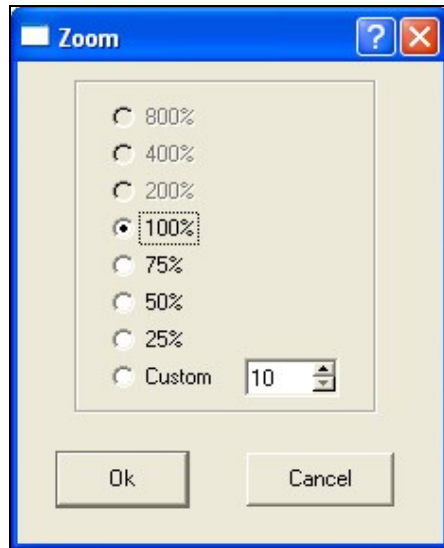


Figure 10 Zoom factor selection box



The *Zoom-in on a Point* button zooms in to the MMCPD base map. Click on this button, adjust the zoom factor, and then click on the map to zoom-in (the map will center on the selected point).



The *Zoom-out from a Point* button zooms out from the MMCPD base map. Click on this button, and then click on the map to zoom-out (the map will center on the selected point).



The *Zoom-in on a Stretch-Box* button zooms in to an area of interest with a stretch-box. Click on this button, then click on the upper left corner of the area of interest with the left mouse button, holding the mouse button down and dragging the resulting stretch-box to the lower right corner of the area of interest. As long as the mouse button is pressed, the stretch-box may be adjusted. The box maintains a constant aspect ratio identical to the display screen. As soon as the box is satisfactory, release the mouse button (figure 11).

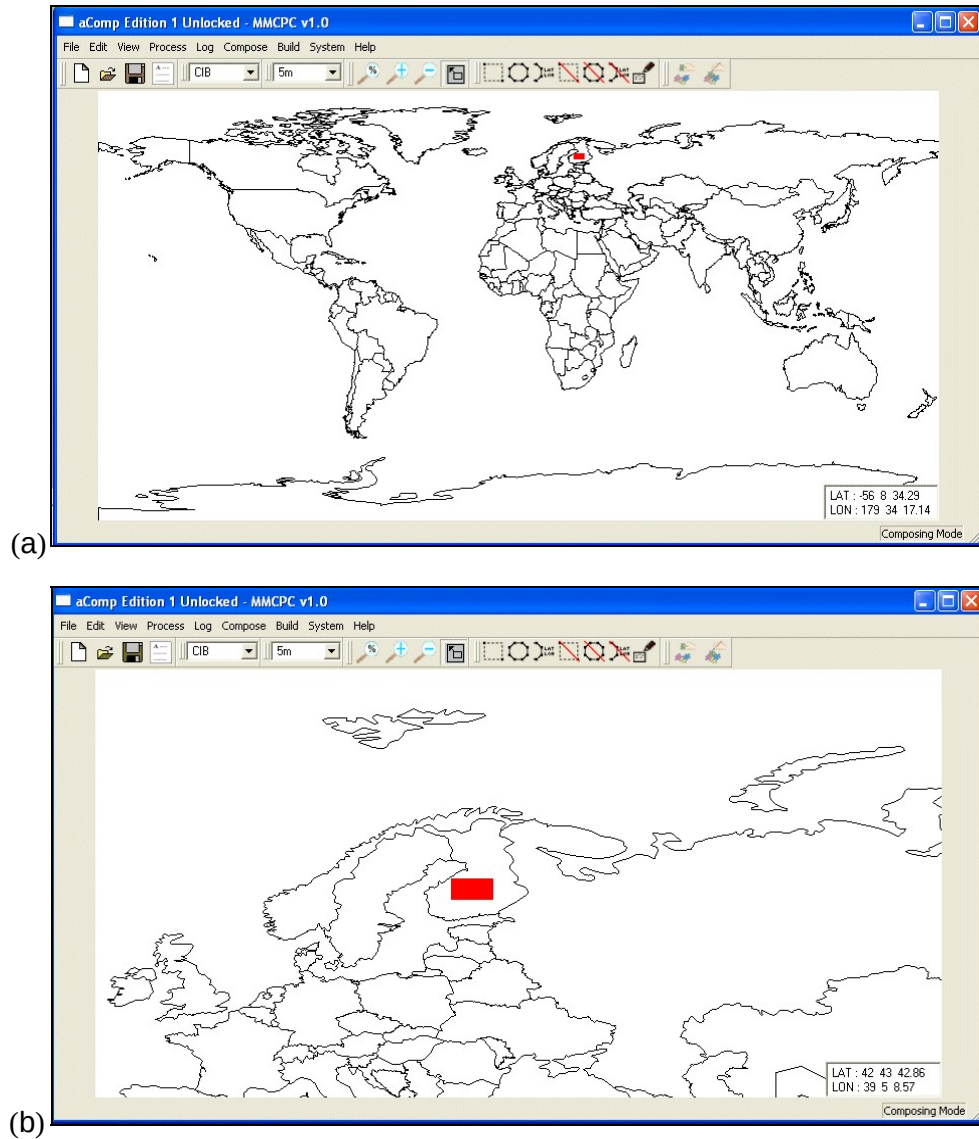


Figure 11 Zooming in to an area of interest: (a) before zoom, (b) after zoom

4.2.2.4. Build/Write Map Buttons

The Build/Write Map buttons (figure 12) are shortcuts for common operations also available via the *Build* menu (Section 4.3.5), including building map loads and writing them to PC card(s).

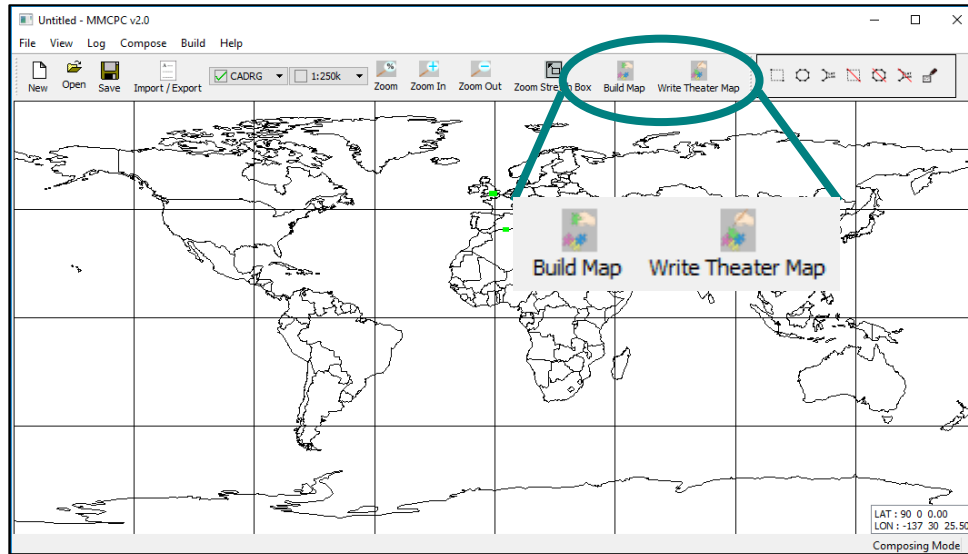


Figure 12 Build/Write Map buttons



Build Map button builds a map theater (see Section 4.3.5.1).



The **Write Theater Map** button writes a map theater to PC card(s) (see Section 4.3.5.2).

4.2.2.5. Coverage Definition Buttons

The **Coverage Definition** buttons (figure 13) allow a user to define or modify map coverage. The coverage definition buttons are activated once MMCP is in compose mode (via File -> New or File->Open). Once activated, the user simply clicks on one of the buttons thereby highlighting that particular button to turn on that function. This section describes the button functionalities that serve this purpose.

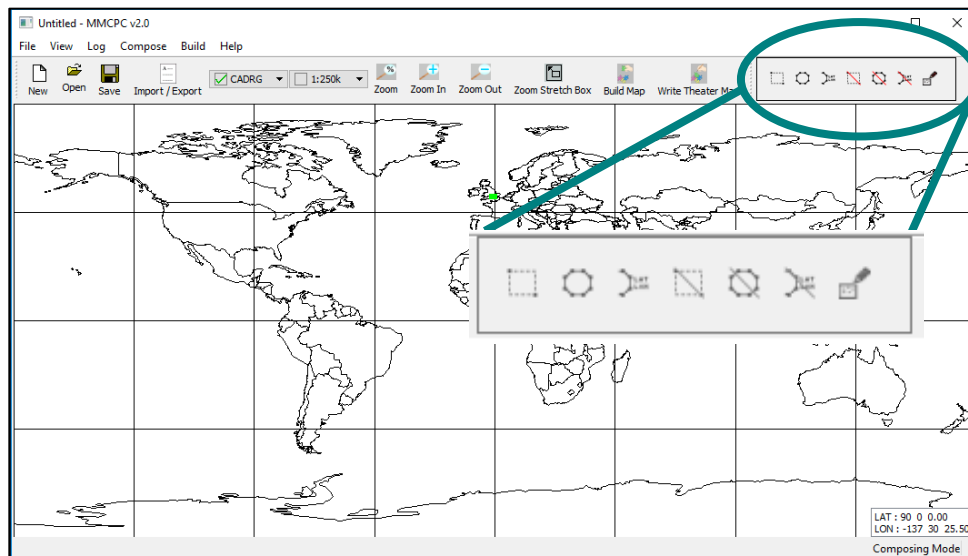
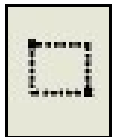
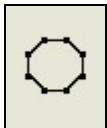


Figure 13 Coverage Definition buttons

Define Area of Coverage: Use any combination of these four buttons to define an area or areas of map coverage for inclusion in a theater or mission composition.



The Define Coverage by a Stretch-Box button defines a rectangular area of coverage using a stretch-box. Click this button, then click on the upper left corner of the area to be defined with the left mouse button. Hold the mouse button down and drag the resulting stretch-box to define the desired area. As long as the mouse button is depressed, the stretch-box is adjustable. Release the mouse button when the box is satisfactory.



The Define Coverage by Clicking Polygon Vertices button defines an irregularly shaped area. Click this button, and then click a series of points (with the left mouse button) on the world map to define the vertices of a polygon, which in turn defines the coverage area. To close the polygon and fill the defined area with segments, double click with the left mouse button.



The Define Coverage by Latitude/Longitude Coordinates button defines an area bounded by specific latitude and longitude points. When a user clicks this button, a Latitude/Longitude Entry window (figure 14) pops up. Enter each geographic coordinate pair in decimal degrees (latitude, longitude), then click Add LAT/LON. As each pair is added, MMCP will list it in the Latitude/Longitude Entry window. The user can edit the entries as follows before accepting the coverage area:

- To edit a record, select the entry in the list (the Add LAT/LON button will automatically rename to Change LAT/LON), edit the latitude and/or longitude value(s) and click Change LAT/LON.
- To delete a record, select the entry in the list and click Remove LAT/LON.
- When all coordinates are listed correctly, click OK. The main MMCPD window will return, and the defined composition will appear on the world map.
- To exit from the Latitude/Longitude Entry window and not save the points as a composition, click Cancel. The main MMCPD window will return.

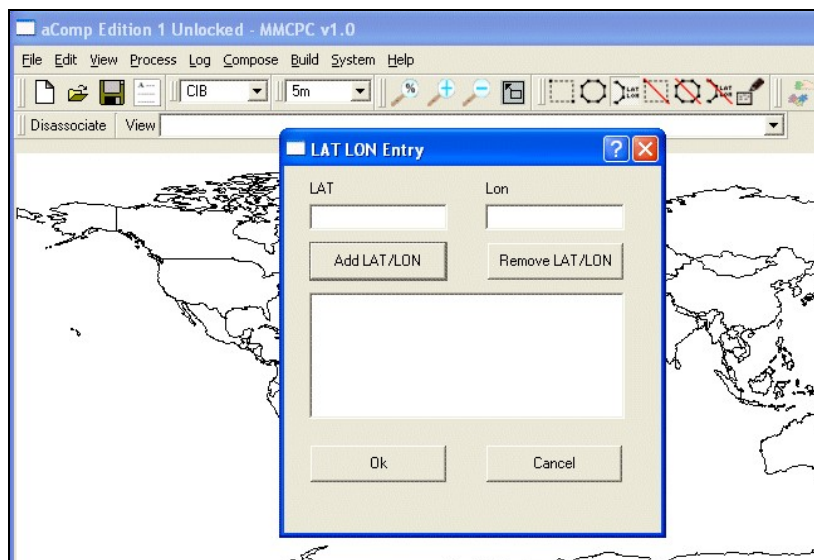
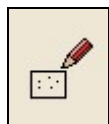
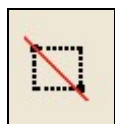


Figure 14 Latitude/Longitude entry window

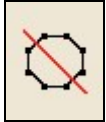


The Set/Clear button individually selects segments to be added to—or deleted from—a composition. In other words, this button acts as a toggle to select and deselect individual segments.

Erase an Area of Coverage: These three buttons are deactivated until the user has defined at least one area of coverage with one or more of the Define Coverage buttons. Use any combination of the following buttons to erase areas of map coverage (i.e., remove coverage from a map theater composition).



The Erase Coverage by a Stretch-Box button erases a rectangular area of coverage in the same way that the Define Coverage by a Stretch-Box button works.



The Erase Coverage by Clicking Polygon Vertices button erases an irregularly shaped area in the same way that the Define Coverage equivalent works.



The Erase Coverage By Latitude/Longitude Coordinates button erases an area bounded by specific latitude and longitude points in the same way that the Define Coverage equivalent works, using the Latitude/Longitude Entry window.

4.3. Main Menu

The top menu bar (main menu) provides drop-down menus for the main operations of MMCPD.

4.3.1. File

The File menu (figure 15) lets a user create, open, close and save a composition, import a map composition, review a map theater build, and exit from MMCPD. The export function is not supported in MMCPD v2.0.

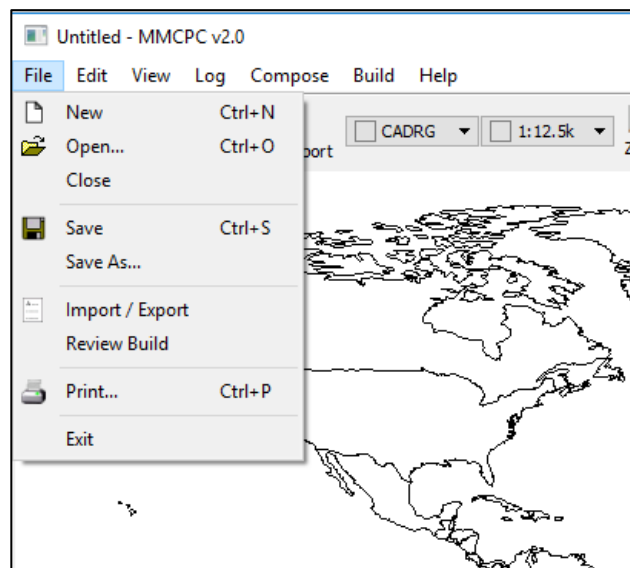


Figure 15 File menu

4.3.1.1. New (Ctrl-N or Alt-FN)

This option, also available via the Create a New Composition button on the tool bar (Section 4.2.2.1), enables map composition drawing tools in preparation for building a map composition. See the Open option (below) for alternatives to New. If a user designs a composition and does not save it before selecting New, MMCPD will issue a warning to save the work prior to starting a new file.

4.3.1.2. Open (Ctrl-O or Alt-FO)

This option, also available via the Opens an existing composition button on the tool bar (Section 4.2.2.1) opens, a file containing a map composition. When the user selects Open, MMCPD displays a list of compositions from which to choose (figure 16), after which MMCPD returns to the base map and displays the selected composition (figure 17). At this point, the user can view the map data defined by the composition (via the View RPF Data selection from the right mouse button menu) or modify the composition.

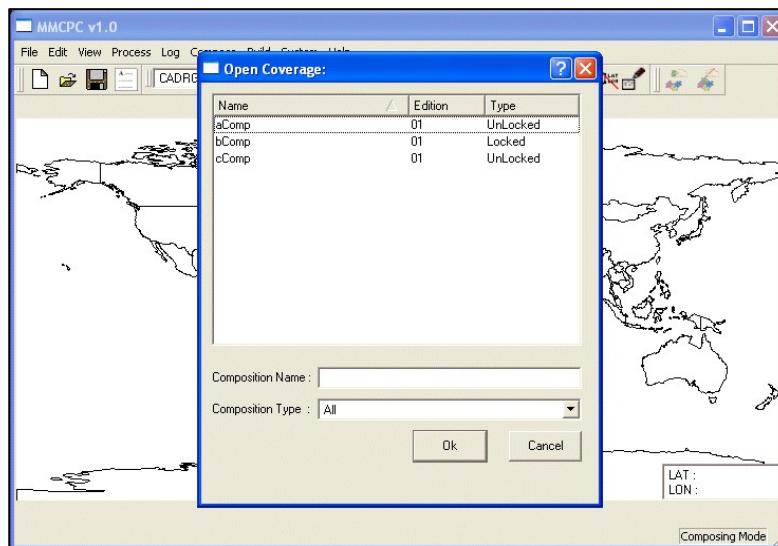


Figure 16 Sample list of compositions

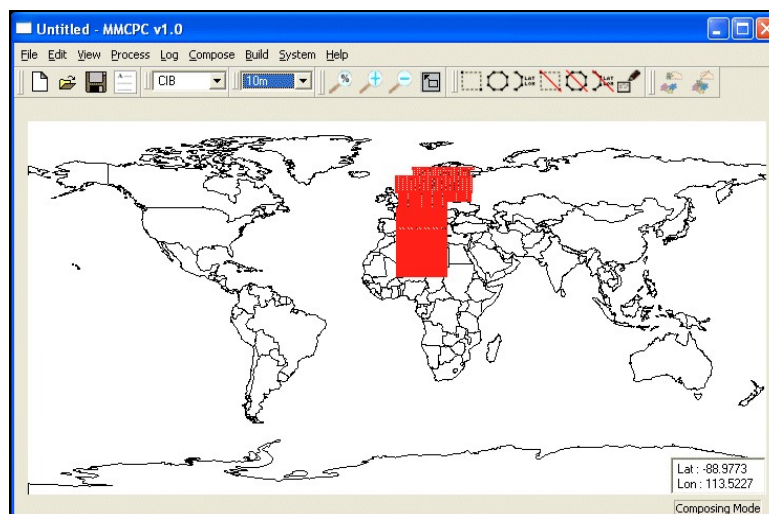


Figure 17 Sample composition displayed on the MMCPD base map

4.3.1.3. Close

This option closes the current composition and refreshes the main MMCPD window. If the user has made unsaved changes, MMCPD will issue a warning and provide an opportunity to save the work prior to closing.

4.3.1.4. Save (Ctrl-S or Alt-FS)

This option, also available via the Save File button (Section 4.2.2.1), saves the current composition as a working file, with no associated map theater specifics. MMCPD does not place any size restrictions on these files, so the user may save a large “master” composition as a working file, and then break it into smaller compositions for final files.

MMCPD prompts the user for the final filename, which must be 10 characters or less with only Modified ASCII (MASCII) alphanumeric characters (i.e., A–Z, 0–9). The full MASCII symbol set is provided in Appendix B. Note that if the status of the file is *locked*, it cannot be overwritten and must be given a different name. A new composition is always saved in an *unlocked* state, which indicates the composition has not been used to create a map theater. Once a composition has been successfully used to create a map theater, MMCPD automatically changes the state of the composition to *locked*, after which no changes can be made to that composition. This process enables the MMCPD user to track a map theater based on its corresponding locked composition. When map sources are removed from MMCPD, any *locked* compositions referencing those sources will automatically be marked *obsolete*, indicating a map theater may no longer be exactly replicated because one or more originally referenced map sources are no longer available. If the user tries to save a composition with an unlocked composition filename that already exists, MMCPD will ask if the user wants to overwrite the preexisting file.

4.3.1.5. Save As (Alt-FA)

This option saves the current composition with a new filename in an unlocked state. MMCPD does not place any size restrictions on these compositions, so the user may save a large “master” composition and later break it into smaller compositions for map theater builds. Filename restrictions are described above in Section 4.3.1.4.

4.3.1.6. Import/Export (Alt-FI)

This option, also available via the Import/Export button (Section 4.2.2.1), imports map compositions in ASCII format. The Mission Planning System (MPS) format required for import is defined in Appendix C. The export portion of this function is not supported in MMCPD.

4.3.1.7. Review Build

This option provides the ability to review a map theater build that resides on the hard drive or on a PCMCIA card via a pop-up dialog window. If the hard drive is selected, MMCPD displays a list of available map theaters (named by composition) that exist on the hard drive for MMCPD. Once a map theater is selected, geographic coverage of the data contained for that map theater is displayed in light blue tiles by scale. If a PCMCIA card is selected, the coverage shown represents only what resides on the specific card loaded for the PC drive. In the case where a map theater spans two cards, total coverage is only partially represented on each card.

4.3.1.8. Print (Ctrl-P or Alt-FP)

This option print the contents of the screen.

4.3.1.9. Exit (Alt-FX)

This option closes the current composition and exits from MMCPD. If the user has made unsaved changes, MMCPD will issue a warning and provide an opportunity to save the work prior to closing.

4.3.2. View

The View menu (figure 18) includes options to refresh the display and overlay shorelines, latitude and longitude grid, available data coverages, and zoom. Some options are selected with a toggle button that shows a check mark when chosen. These options can also be invoked via hot keys.

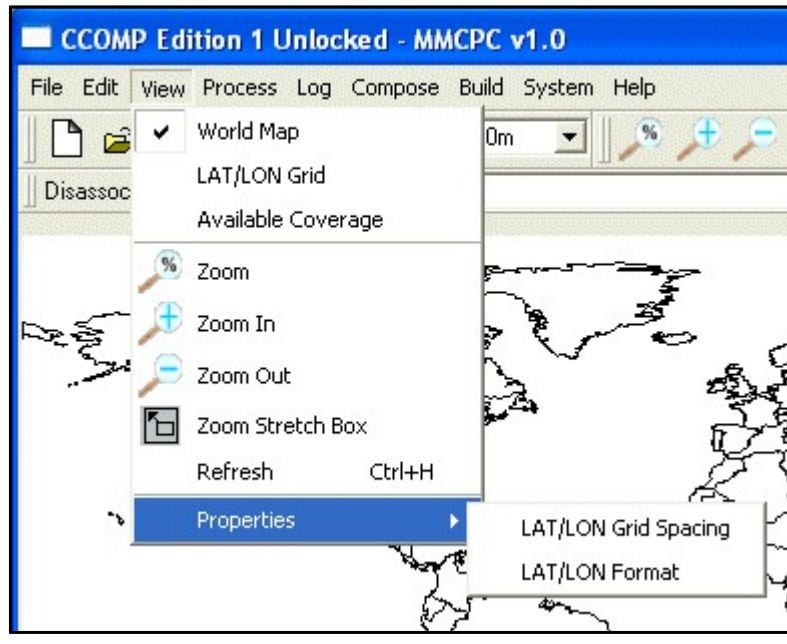


Figure 18 View menu

4.3.2.1. World Map (Alt-VW)

World Map is the base map for MMCP and a standard product from the National Geospatial-Intelligence Agency (NGA). This overlay draws the shorelines of the world and is ON by default (figure 19). When this option is toggled off, MMCP will not draw the World Map.



Figure 19 MMCP base world map

4.3.2.2. LAT/LON Grid (Alt-VG)

This option displays a user-defined grid of latitude and longitude lines. When the user turns this overlay ON, MMCPC will overlay the grid on the World Map. Default grid spacing is 45° (latitude and longitude), but the user can change this (Section 4.3.2.6). Figure 20 shows the LAT/LON Grid ON with a 20° grid.

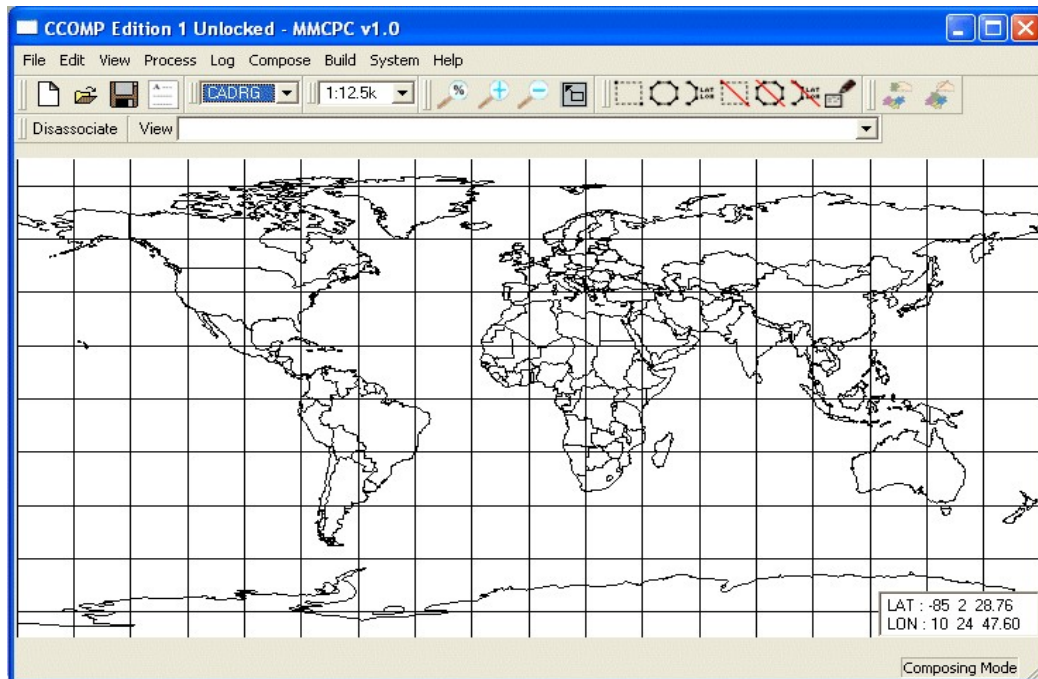


Figure 20 MMCPC base map with latitude/longitude grid overlay ON

4.3.2.3. Available Coverage (Alt-VC)

This option displays all logged data coverage for the current map type and scale. All available coverage is shown in green (figure 21). The user may click through the map scale drop-down box (figure 8) to see the available coverage at each map scale.

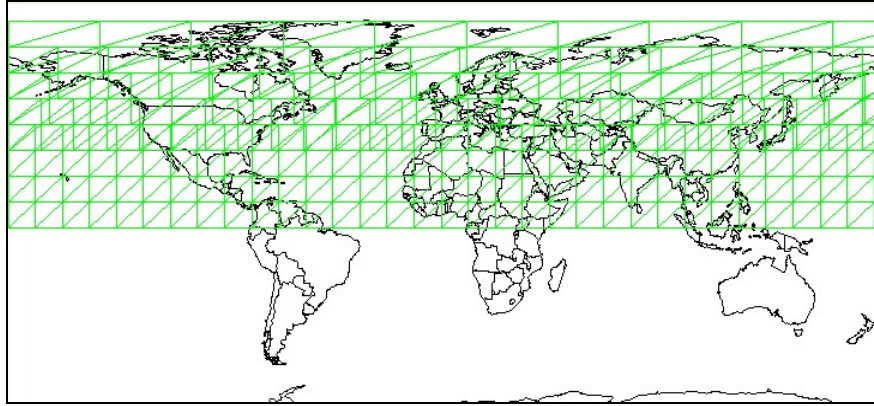


Figure 21 Available coverage of data sources overlay

4.3.2.4. Zoom Options (Alt-VZ)

These options allow a user to zoom into (or out from) an area of interest on the world base map with zoom tool buttons (figure 9). Zooming can also be performed by clicking on one of the zoom icons on the tool bar (see Section 4.2.2.3).

4.3.2.5. Refresh (Ctrl-H or Alt-VR)

This option redraws the current map information in the MMCPD window.

4.3.2.6. Properties

The Properties option allows adjustment of geospatial coordinate grid spacing and display format.

LAT/LON Grid Spacing: This window (figure 22) allows the user to adjust the grid spacing of geospatial coordinates (the default is 45° in latitude and longitude).

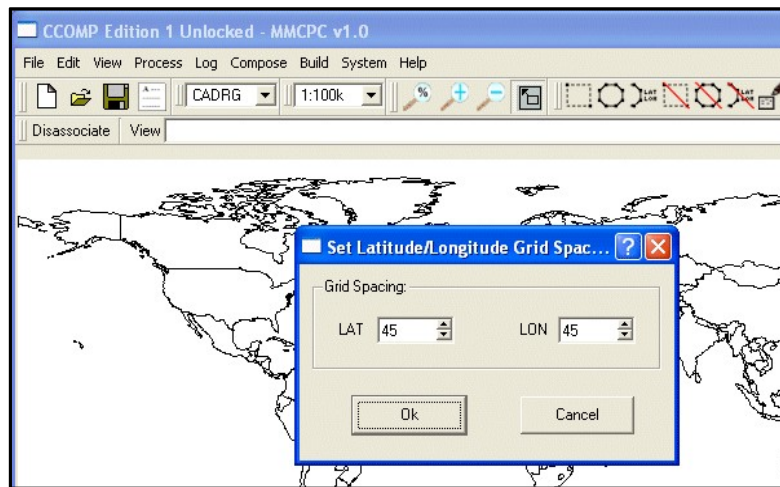


Figure 22 Space adjustment of latitude and longitude grid lines

LAT/LON Format: This window (figure 23) allows the user to change the default latitude and longitude format from degrees, minutes, and seconds to decimal degrees for display of the cursor's geospatial position on the MMCPC base map.

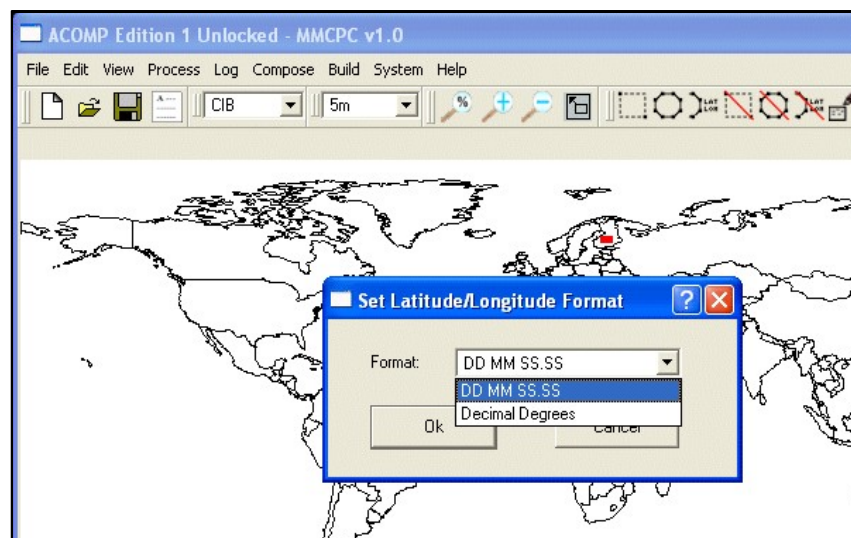


Figure 23 Adjustment of latitude and longitude coordinate format

4.3.3. Log

The Log menu (figure 24) provides utilities to catalog data in the MMCPD source database. These options can also be invoked via shortcuts or hot keys.

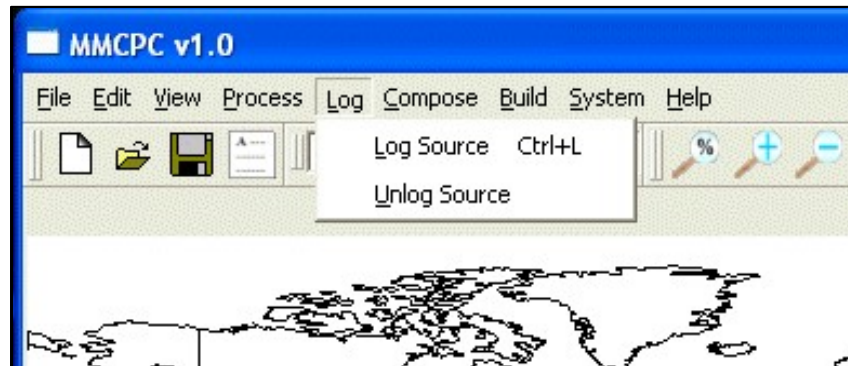


Figure 24 Log menu

4.3.3.1. Log Source (Ctrl-L or Alt-LL)

This option logs new sources in the MMCPD source database. A browser allows data to be logged from CD-ROM, the hard disk, or networked sources (figure 25) and all data must be logged with this function.

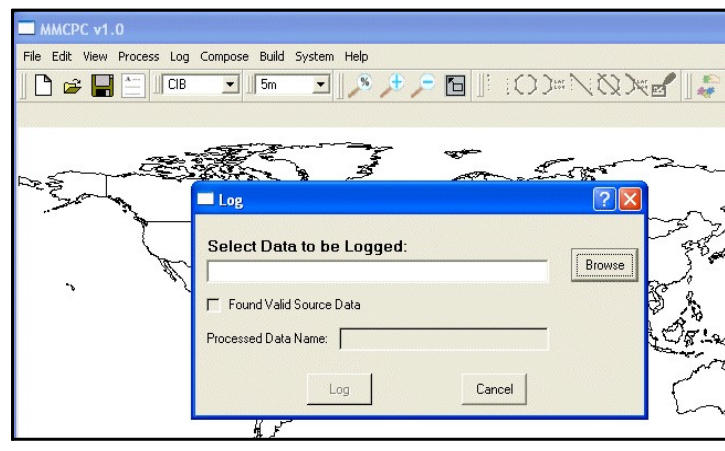


Figure 25 Log source data window

4.3.3.2. Unlog Source (Alt-LU)

This option removes references to source data from the MMCPD log file (figure 26). For example, when a previously logged source is found to be bad (e.g., an unreadable CD-ROM) or when older map data becomes obsolete. Un-logging map data will render obsolete any compositions that included that data. The unlog function should be used primarily to manage the obsolescence of

map data. In turn, this will allow MMCPD to automatically manage the state of MMCPD compositions.

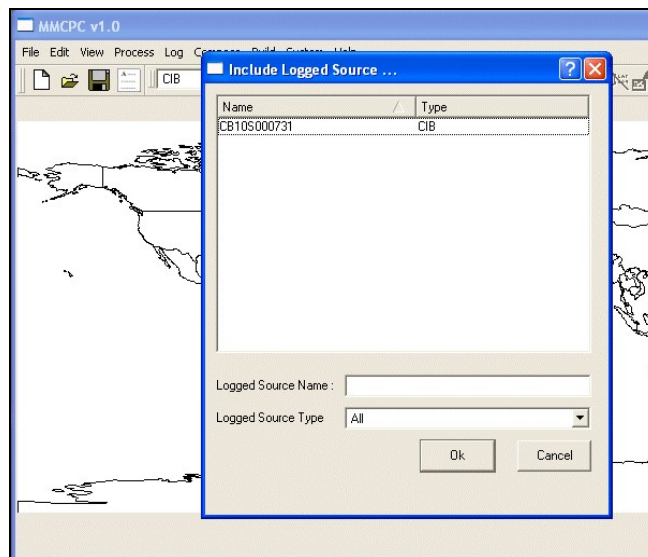


Figure 26 Unlog source data window

4.3.4. Compose

The Compose menu (figure 27) provides additional utilities to create and modify compositions or to verify the size of a current composition. Note: To begin creating a composition, click on the New icon (Section 4.2.2.1) to activate all composition tools (Section 4.2.2.5).

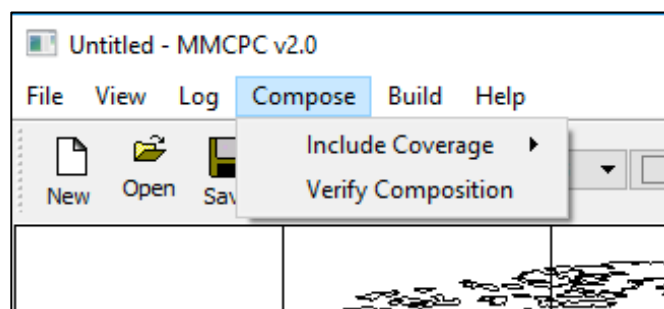


Figure 27 Compose menu

4.3.4.1. Include Coverage (Alt-CC)

This option allows the user to include logged sources or other compositions in the construction of a new composition (figure 28).

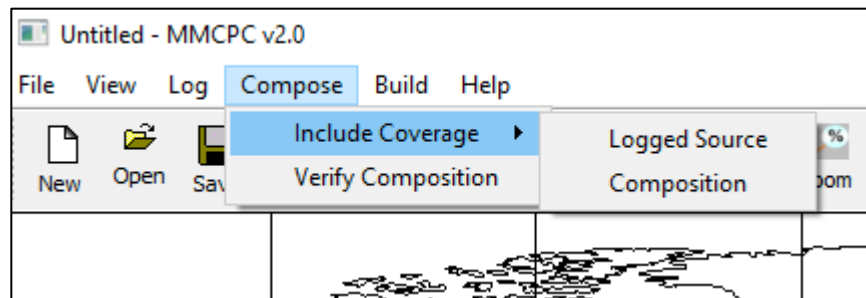


Figure 28 Compose menu, Include Coverage option

Logged Source

This option provides the capability to include logged sources in the construction of a composition. Valid source coverages include CADRG data that have been previously logged into MMCP. MMCP will present a list of logged sources available for selection. To select multiple logged sources at once, click one logged source, then depress the CTRL or SHIFT key while clicking on others.

Composition

This option provides the capability to include other compositions in the creation of a new composition. MMCP will present a list of available compositions for user selection. Valid composition file types are locked, unlocked, and obsolete; users may select any of these files. To select multiple compositions at once, click one composition, then depress the CTRL or SHIFT key while clicking on others.

4.3.4.2. Verify Composition (Alt-CV)

This option verifies that the active composition is within the proper size constraints for a map theater (figure 29). MFDC map theaters are configurable by the size of their PCMCIA cards and typically have a maximum of two cards. A configuration file exists that can be modified, but the default value is 2GB PCMCIA card size with a maximum of two cards (4GB total map theater size). If the composition is within the maximum size constraints, the user can continue and use it for a map theater. If the composition exceeds the required limits, the user must make modifications (e.g., delete data) until it is within size constraints prior to building the map theater. Note: MMCP performs a final verification of the selected composition as part of the map theater build. Therefore, this size verification procedure is not required, but is provided as an informational tool for use in constructing a composition.

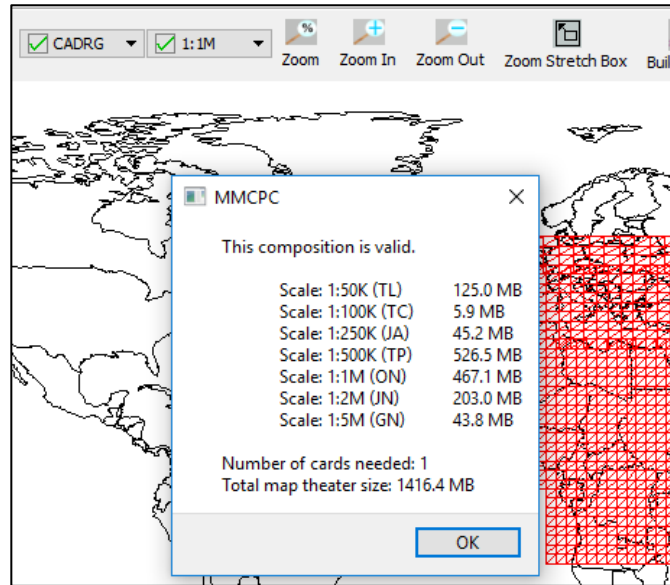


Figure 29 Verify Composition message

4.3.5. Build

The **Build** menu (figure 30) provides utilities to create map theater loads. Some of these options can also be invoked via shortcuts or hot keys.

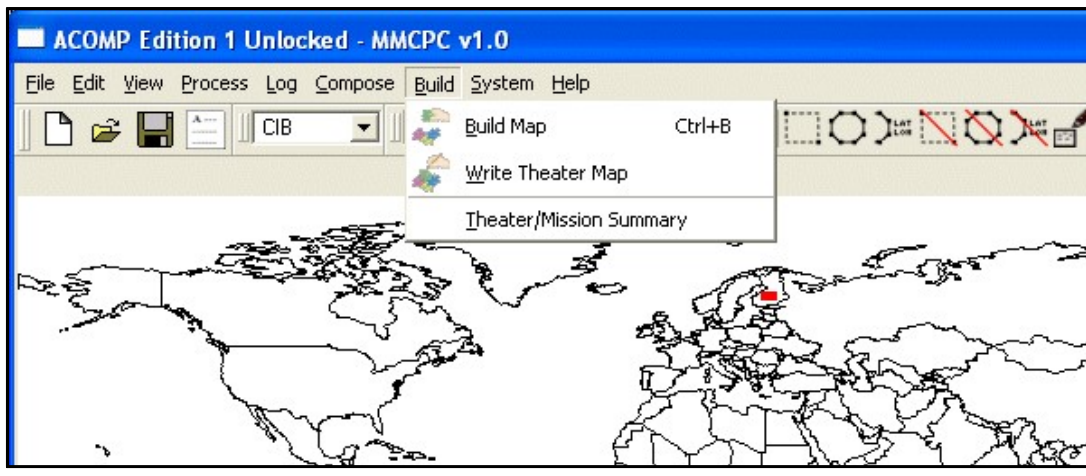


Figure 30 Build menu

4.3.5.1. Build Map (Ctrl-B or Alt-BB)

This function, also available via the Build a Map button (Section 4.2.2.4), acquires the necessary map data represented by the selected composition and writes that data in the MFDC format. If the current composition has not been saved, a prompt will appear to save and name the composition before proceeding. Only unlocked compositions may be selected to create a map theater via the browse button. Further, if an unlocked composition has not yet been verified for size constraints, MMCPD will verify its size before proceeding and notify the user if the composition is too large. See Section 5.4 for additional information on building and writing map data.

4.3.5.2. Write Theater Map (Alt-BW)

This function, also available via the Write a Theater Map button (Section 4.2.2.4), is used to transfer any map theater from the MMCPD-reserved directory for map theaters to PCMCIA cards. Once a map theater resides in the MMCPD-reserved directory, it may be written to PCMCIA cards as many times as needed. See Section 5.4 for additional information on building and writing map data.

4.3.5.3. Theater/Mission Summary (Alt-BT)

This option provides an information window that summarizes all map theaters currently residing on hard disk. Mission data loads are not supported in this version of MMCPD.

4.3.6. Help

The Help menu (figure 31 provides information about errors, warnings, and other messages issued by MMCPD, and general information about MMCPD.

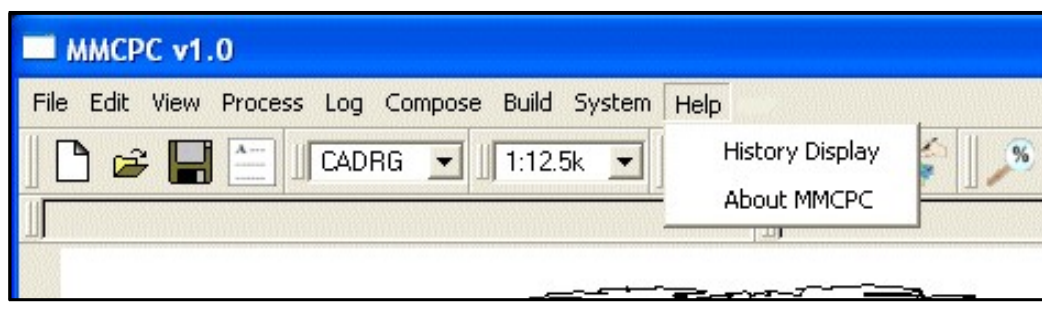


Figure 31 Help menu

4.3.6.1. History Display

This option displays the MMCPD history log file (figure 32), which includes all errors, warnings, and other messages issued by MMCPD. To print this file (while it is displayed in the History Log window), go to the File menu and click on Print (Section 4.3.1.7), or type *Ctrl-P* or *Alt-FP*.

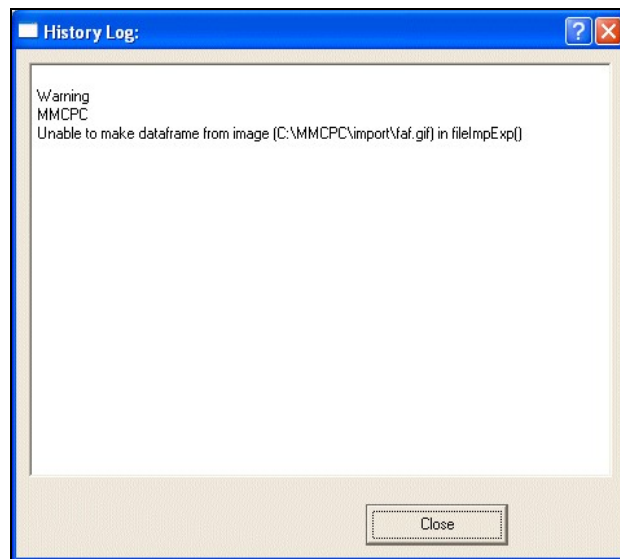


Figure 32 MMCPD history processing log file

4.3.6.2. About MMCPD

This option displays technical point of contact information and the MMCPD release statement.

5. COMMON OPERATIONS

5.1. Common Operations Overview

Most MMCPD users will be concerned primarily with using the composition functions to develop a map theater to write to PCMCIA cards based on a particular region of interest at certain CADRG map scales. The following sections step through frequently used key operations. Note: this is not a comprehensive list of all functions supported by MMCPD.

5.2. Logging Map Data

This section lists steps for logging map data. See Section 4.3.3 for additional information on Log menu options. All map data sources must be logged before any map compositions can be built. Map data sources are logged via the *Log* menu.

MMCPD can log valid map data from any location accessible via the standard Windows browse function.

Perform the following steps to log data into MMCPD:

1. From the main menu, click Log, then Log Source, or type *Ctrl-L* or *Alt-L* (Section 4.3.3). MMCPD will display a browser for defining the directory path to the data (figure 33). For CDRG data, the user should browse to one-directory level above the RPF directory. **Note: The use of commas “,” in any directory path of a logged data source is prohibited. Commas are treated as delimiters in MMCPD path names and will result in incorrect logging results.**
2. Verify that a checkmark appears next to the Found Valid Source Data box and that the correct label name appears. The label name should be the same name as the directory immediately above the RPF directory.
3. Click the Log button to log the data.

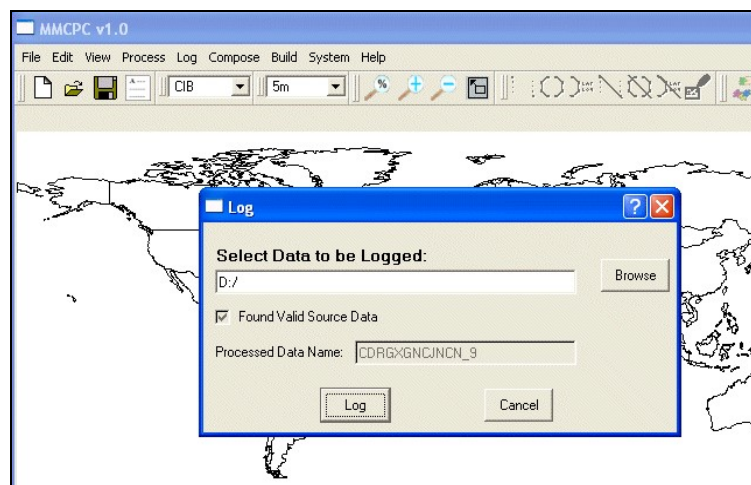


Figure 33 Log data browser

5.3. Map Composition

This section describes methods to design and create map compositions. A map composition defines all geo-referenced map data selected to exist on its corresponding map theater. Each map composition is a set of user-defined regions of interest that may span multiple map scales. The methods described below may also be used in combination to create a composition.

5.3.1. Define a Composition Using Logged Sources

1. From the MMCPD main menu, click Compose, then Include Coverage, then Logged Source (figure 34). “Composing Mode” is now displayed in the lower-right portion of the screen.

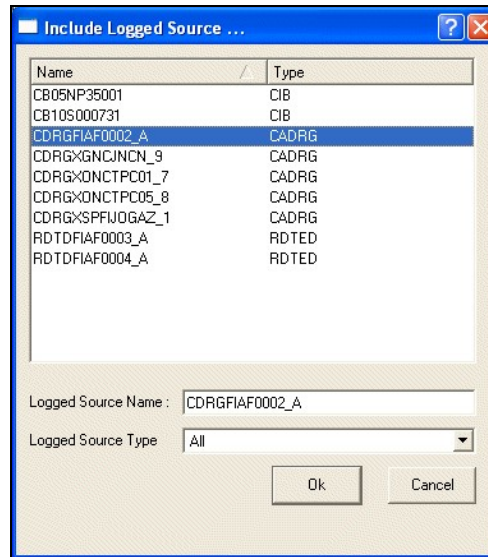


Figure 34 Listing of logged source data

2. Verify the map coverage:

- Double click on a source and verify that map coverage over the appropriate geographic area is displayed (figures 35a and 35b). A logged source may contain multiple map scales.
- Repeat for each scale. The user may need to adjust settings in the MMCP Scale box (Section 4.2.2.2).

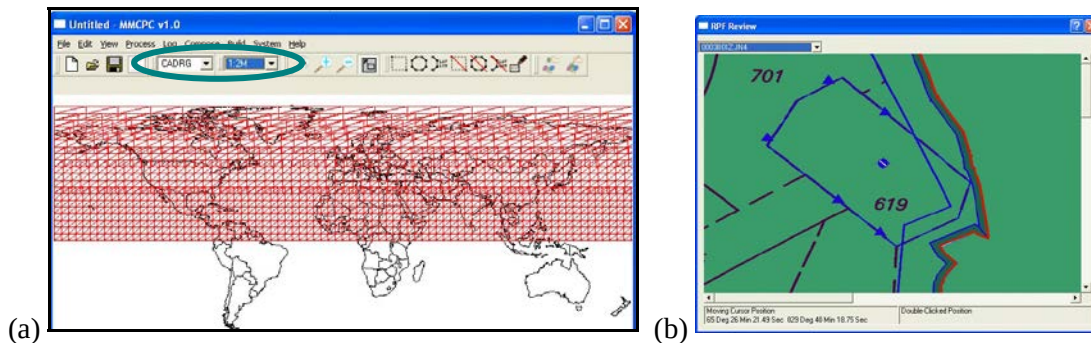


Figure 35 Data coverage verification

- (a) Showing coverage for CDRG data at the 1:2M scale; (b) Viewing CDRG data for this scale

- From the MMCP main window, click File, then Save. Enter a composition name. The composition will be saved as an unlocked composition. Click OK.
- From the main window, click File, then Close.

5. From the main window, click File, then Open. Double-click on the newly saved composition and verify that all map data (of all types and scales) included in the composition were properly saved.
6. From the main window, click Compose, then Verify Composition (Section 4.3.4) Review the popup dialog (figure 36) to make sure your map composition fits within the size constraints pre-defined in your configuration, then Click Ok. If needed, adjust your composition size accordingly.

NOTE: The calculation used to determine maximum map theater size and theater card size, are defined in a configuration file that may be modified. The current maximum capacity setting for theater map cards is 2.0 GB. Once verified, click File, then Close.

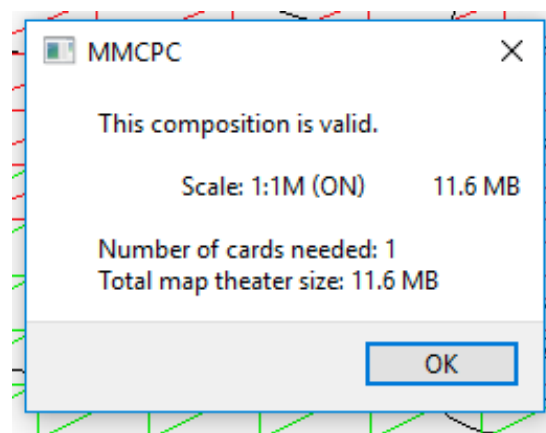


Figure 36 Verification of current composition

5.3.2. Define a Composition Using Another Composition

1. From the MMCPC main window, click Compose, then Include Coverage, and then Composition. Double-click a composition name. This name will appear in the Composition Name field. Click Ok.
2. From the MMCPC main window, click File, then Save. Enter a composition name. The new composition will be saved as an unlocked composition. Click OK.
3. From the main window, click File, then Close. Verify the composition has been closed.
4. From the main window, click File, then Open. Double click on the newly saved composition. Verify that all of the map data included in the composition was properly saved. This new composition should contain exactly the same map coverage as the composition that was included.
5. From the main window, click Compose, then Verify Composition (Section 4.3.4) Review the popup dialog (figure 35) to make sure your map composition fits within the size constraints pre-defined in your configuration, then Click Ok. If the composition is too large, the user may remove coverage via the Erase an Area of Coverage function (Section 4.2.2.5).

6. Once verified, click File, then Close.

5.3.3. Define a Composition Using the MMCPD Composition Toolbar

1. From the MMCPD main window, click File, then New.
2. Show all available map coverage by clicking View from the main menu. A checkmark should be displayed next to Available Coverage showing that it has been toggled on (Section 4.3.2). If it is not displayed, click Available Coverage. Using Scale drop-down menus (Section 4.2.2.2), click through each map scale selection. Note that the color of the map coverages shown is green (figure 37). This indicates that the coverage shown is available but not part of the current composition (map segments are displayed in red for compositions).

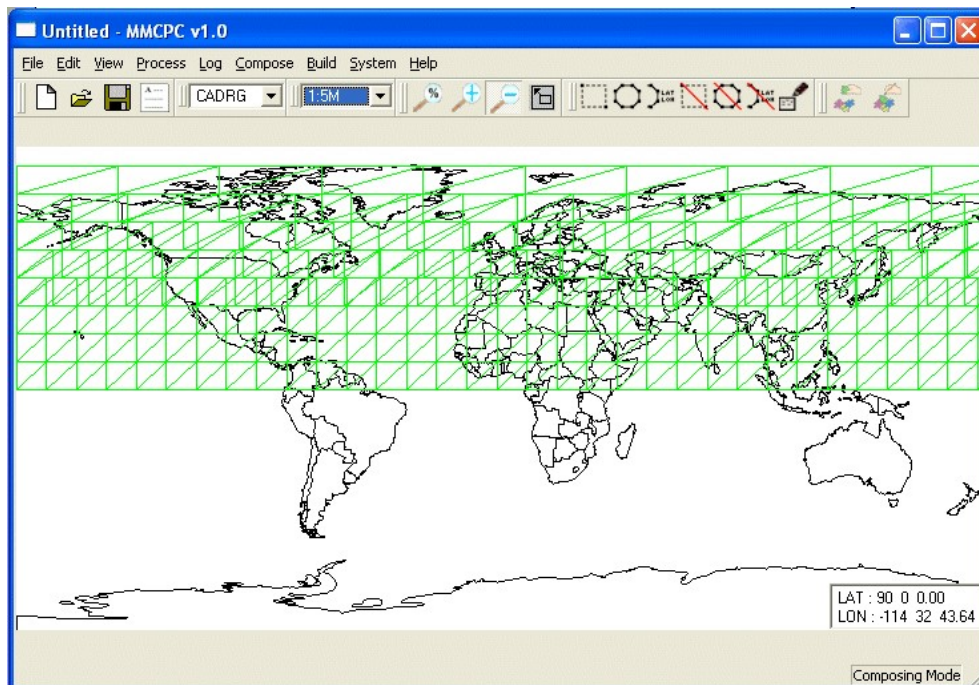


Figure 37 Area of available coverage for a new composition. The green-colored grid indicates coverage is available but not yet part of the current composition

3. Use the Zoom-in on a Stretch-Box tool (Section 4.2.2.3) to zoom into a region of interest. Depress the left mouse button at the upper left corner of the region of interest and drag to the lower right corner of the area to create the desired zoom box.
4. Click the Zoom-in on a Stretch-Box tool again to return the cursor to an arrow.
5. Select a Scale (e.g., CADRG data at 1:5M scale). Green map segments should be displayed for the entire areas of existing available coverage.

6. Use the Define Coverage by a Stretch-Box tool (Section 4.2.2.5) to select an area. Depress the button to activate the function, hold down the left mouse button at the upper left corner of the region of interest and drag to the lower right corner of the desired coverage. A purple box will be displayed showing the extents of the stretch-box, and the color of the map segments within the intersecting box should now be red (indicating that these map segments are part of the current composition, figure. 38a).
7. The map scale can be changed to include additional data at other scales by repeating step (2) for each scale.
8. Use the Erase Coverage by a Stretch-Box tool to remove unwanted coverage (Section 4.2.2.5). Depress the button to activate the function, hold down the left mouse button in the upper left corner of the region of interest and drag to the lower right corner of the desired coverage. A purple box should be displayed showing the extents of the stretch-box, and the map segments within the box will now be removed (figure. 38b).

Note regarding different scales: Actions taken at one scale are not automatically applied to the others. Verify that any changes on one scale do not adversely affect the coverages of another.

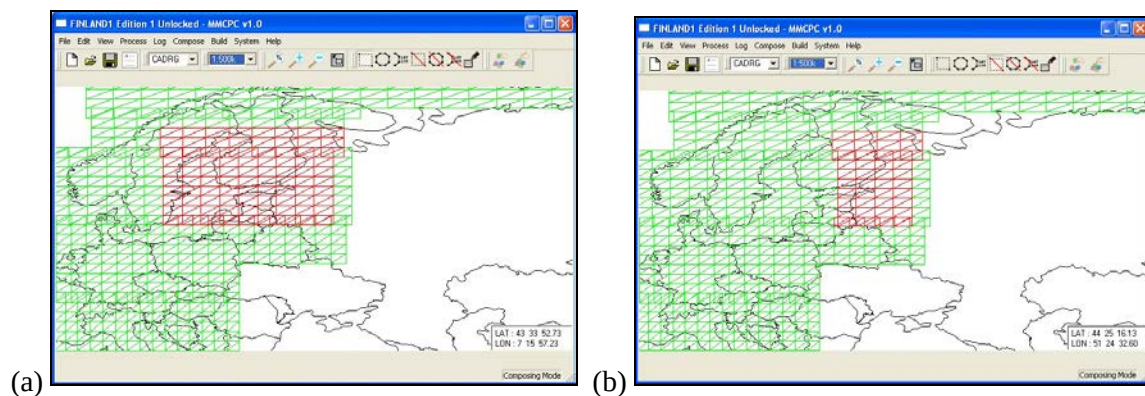


Figure 38 Defining a composition area of coverage.

- (a) Defined coverage area is red, available data is green; (b) a portion of coverage is erased to redefine the composition area.

5.4. Map Theater Build

This section includes methods to build and write an MFDC map theater (Section 4.3.5). Each MFDC map theater includes the following configurable parameter and symbol set files: DMU.INI, MFDC130, OVERLAY.PAL, and SYMBOL.DAT. These files are permanently stored in the /system/mfdc subdirectory under the main MMCP executable directory.

In MMCP, all map theaters are first written to hard disk. Map theaters may then be written to MFDC PCMCIA cards.

The PCMCIA card size is significant because a map theater may span two cards. When this is the case, the MFDC data structure containing map files for a map theater must be sized to fit each card without any one CADRG scale spanning across both cards. MMCPD reads a configuration file that specifies the card size. This, in turn, affects the map composition verification process to ensure that the resulting map theater will fit within the PCMCIA card constraints. Should the PCMCIA card size change in the future, this parameter file will require modification.

Note: MMCPD assumes the PCMCIA card size is the same for both cards. Should lower capacity cards (e.g. 1.0GB) be used than what has been configured (2.0GB by default), the map composition verification process will not be able to adequately verify whether a resultant map theater can actually be written to those lower capacity PCMCIA cards and may fail during write.

5.4.1. Build Map Theater

1. From the MMCPD main menu, click Build, then Build Map. A Build Map window is displayed (figure 39). If a composition is open, the user will be prompted to save it before the Build Map window is displayed. The open composition will be the default composition shown in the Build Map window.

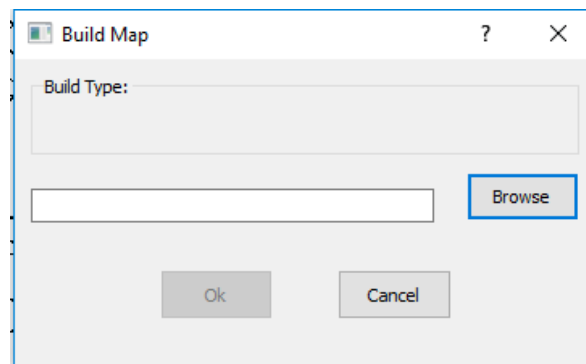


Figure 39 Build Map window

The user may also click Browse and choose any other unlocked composition that exists within MMCPD (figure 40). The dialog is updated to show the selected composition name. Click *Ok*. Note there is a 4 GB size limit for builds by default configuration. Once the build is complete, the composition will be locked.

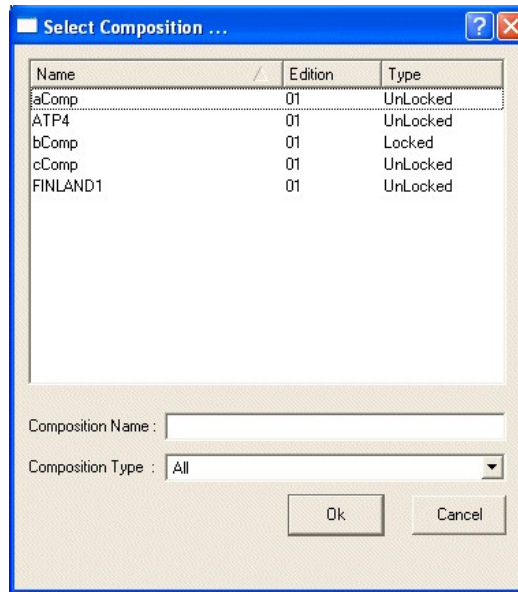


Figure 40 Build map composition browser (Note: Locked composition types may not be selected)

2. The Build Map window then closes and the Data Sources window is displayed (figure 41). This window shows all possible map sources for the selected composition. Click OK to accept the default order of sources.

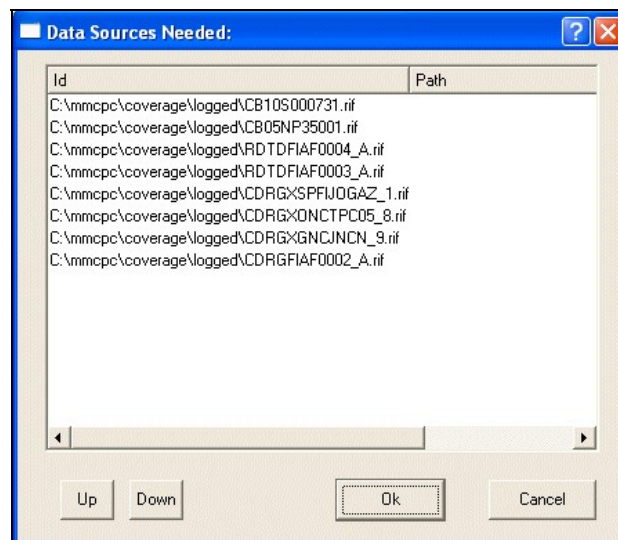


Figure 41 Build map data sources window

NOTE: Map data sources may have overlapping coverage. The Data Sources window allows the user to set the order of precedence of the data sources that will be used to construct the map build (top is highest priority). Order of precedence may be important when newer map data overlaps older data or when prioritizing the source provider. The user may change the order of precedence by clicking (i.e., selecting) a particular source and using the Up and Down buttons to set the order.

3. The build process will begin. For sources on CD-ROM, MMCPC requests the user to insert the CDROM or to locate an alternate location (figure 42) and click OK to continue. When the window appears indicating the build is complete, click OK (figure 43). MMCPC will write the map theater as discussed in the following section.

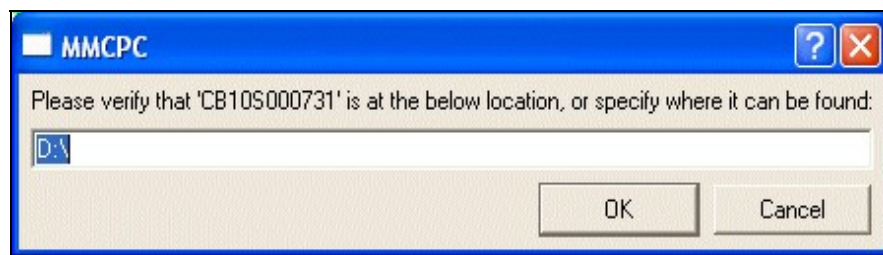


Figure 42 Build map data source locator

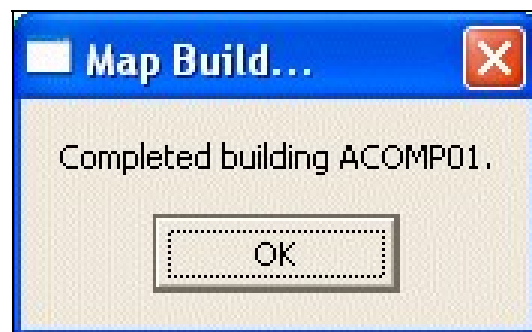


Figure 43 Build map completion message

5.4.2. Write Map Theater to PC Card(s)

1. From the MMCPC main window, click Build, then Write Theater Map. Double click on the name of map theater to be written (figure 44). Note that the map theater name is the same as its corresponding composition, including its two-digit edition number. "Building Mode" is now displayed in the lower-right portion of the screen.

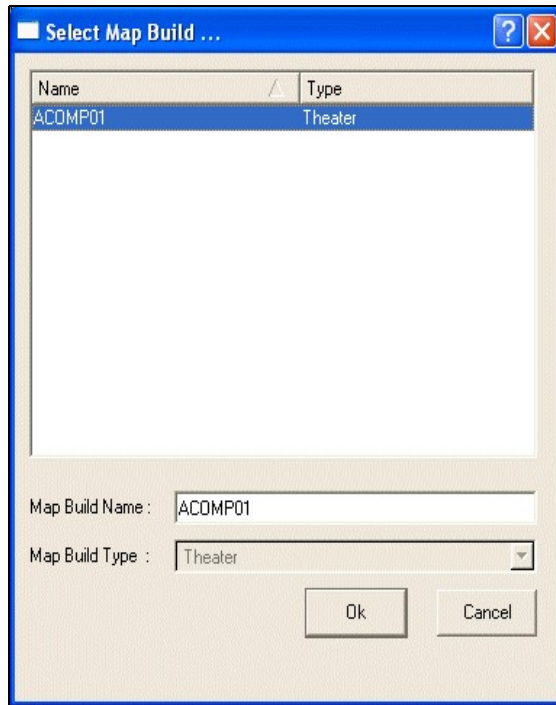


Figure 44 Write theater map browser

2. The PCMCIA card drive dialog appears (figure 45). Enter a disk into the pre-configured designated drive and click **OK**.

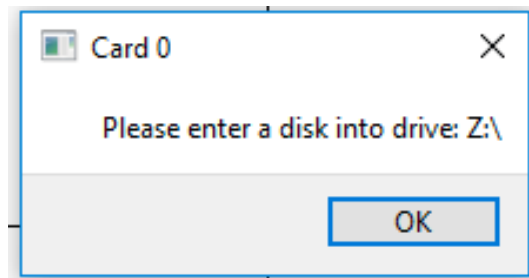


Figure 45 PC card window

3. When the write operation requires a single card load, click **OK** after the write has completed. Eject the card from the PC card drive and label this card with a descriptive title.
4. When the write operation spans two cards, the user will be prompted to insert the next card if needed. Eject the first card and label it with a descriptive title, and insert it into the PC card drive.

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7. REFERENCES

1. MIL-C-89038, Military Specification for Compressed ARC Digitized Raster Graphics (CADRG), National Imagery and Mapping Agency, 6 October 1994.

Appendix A ACRONYMS AND TERMS

ASCII	American Standard Code for Information Interchange
CADRG	Compressed Arc Digitized Raster Graphics
GB	Gigabytes
GEOTIFF	Geo-referenced Tagged Image File Format
MASCII	Modified American Standard Code for Information Interchange
MFDC	Map File Data Cartridge
MMCPD	Moving-Map Composer–Personal Computer
MPS	Mission Planning System
NAVAIR	Naval Air Systems Command
NGA	National Geospatial-Intelligence Agency
NRL	Naval Research Laboratory
PCMCIA	Personal Computer Memory Card International Association
RPF	Raster Product Format

Appendix B MODIFIED ASCII SYMBOL SET

<i>Code (Decimal)</i>	<i>Character</i>	<i>Code (Decimal)</i>	<i>Character</i>	<i>Code (Decimal)</i>	<i>Character</i>
0	Space	43	%	87	reserved
1	A	44	,	88	reserved
2	B	45	°	89	reserved
3	C	46	.	90	reserved
4	D	47	/	91	reserved
5	E	48	0	92	reserved
6	F	49	1	93	reserved
7	G	50	2	94	reserved
8	H	51	3	95	reserved
9	I	52	4	96	reserved
10	J	53	5	97	reserved
11	K	54	6	98	reserved
12	L	55	7	99	reserved
13	M	56	8	100	reserved
14	N	57	9	101	reserved
15	O	58	=	102	reserved
16	P	59	reserved	103	reserved
17	Q	60	reserved	104	reserved
18	R	61	reserved	105	reserved
19	S	62	reserved	106	reserved
20	T	63	reserved	107	reserved
21	U	64	reserved	108	reserved
22	V	65	reserved	109	reserved
23	W	66	reserved	110	reserved
24	X	67	reserved	111	reserved
25	Y	68	reserved	112	reserved
26	Z	69	reserved	113	reserved
27	\	70	reserved	114	reserved
28	reserved	71	reserved	115	reserved
29	reserved	72	reserved	116	reserved
30	reserved	73	reserved	117	reserved
31	reserved	74	reserved	118	reserved
32	reserved	75	reserved	119	reserved
33	“	76	reserved	120	reserved
34	?	78	reserved	121	reserved

35	:	79	reserved	122	reserved
36	#	80	reserved	123	reserved
37	-	81	reserved	124	reserved
38	+	82	reserved	125	reserved
39	'	83	reserved	126	reserved
40	(	84	reserved	127	reserved
41	)	85	reserved	N/A	N/A
42	*	86	reserved	N/A	N/A

Appendix C MPS IMPORT FILE FORMAT

The MPS import is an ASCII file that serves as an interface between a mission planning system and MMCPD. The mission planning system import can be used to create a composition and process data frames in MMCPD based on the contents of the MPS-ASCII file. All import files must end with an extension of "MPS".

MMCPD reads the MPS import file (defined below) and creates an MMCPD composition from the file's contents. The user may import an MPS file into MMCPD from any available directory or hard drive. Further, source files for data frames listed in an MPS file may exist in any available directory or hard drive available to MMCPD.

A file folder will exist with the name given in the file. The MPS import file format is shown in figure 46 and is comprised of three sections: header, data, and location. Figure 47 presents an example of an import file.

The **header** section contains the unique mission name that will be assigned as the MMCPD composition name. The maximum name length is 10 characters and it cannot include spaces or special characters. This is accompanied by an integer that indicates the number of data sections to follow. An exclamation point (!) in the first column indicates that the line is a comment field and the entire line is ignored during import.

The **data** section consists of information to identify the map data type, map scale, and source/destination directories for data frames. Valid map data types include CDRG only. Valid map scales for these data types are listed in Table 1.

The **location** subsection is applicable to CDRG. The first entry in this section lists the number of coordinates that will follow for that particular *data* section (e.g., CDRG @ 1:2M). This is accompanied by a series of latitude and longitude coordinates that are specified in +/- decimal degrees and delimited by commas.

```
{Header section}
<Unique Identifier> (e.g. MPS0001)
{Data section}
  <Data Type> (CDRG,)
  <Scale>
  <Number of lat / lon points>
  {Location subsection} (CDRG with max. of 256 defined points)  <Lat, Lon>
  (Decimal degrees [dd.ddd,ddd.ddd])
  }
}
```

! Indicates comment field

Figure 46 MPS Import file format

Table 1 Valid data types and map scales

Data Type	Map Scale
CADRG	1:12.5k
	1:50k
	1:100k
	1:250k
	1:500k
	1:1M
	1:2M
	1:5M

```

ATP4
! Composition title
2
! Number of sections to follow
! CADRG has 8 scales [1:12.5k,1:50k,1:100k,1:250k,1:500k,1:1M,1:2M,1:5M]
CADRG
1:250k
4
61.5,024.5
62.5,024.5
62.5,025.5
61.5,025.5
CADRG
1:2M
4
61.5,024.5
62.5,024.5
62.5,025.5
61.5,025.5

```

Figure 47 MPS import file example (MPSIMPORT.MPS)