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ASTi Secure DACS User Guide

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Product Name: DACS

ASTi Secure DACS User Guide

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1.0. Introduction

In an ever-changing world where the threats are both internal and external security has come to the forefront of all Hardware platforms and Software applications; especially when those platforms reach out to a Wide Area Network (WAN). Driven by Department of Defense Directive (DODD) 8500.1 trainers and equipment are now required to follow a strict sets of rules handed down from DISA, NSA and alike. As such ASTi has taken the initiative to ensure that its suite of products (legacy, current generation and next generation) will adhere to current security requirements forced upon today's trainers.

The DACS has been upgraded to a fully embedded product that has no operating system and no shell/console present. The user only has access to the Model Builder user interface (read only) and cannot gain access to the computer. This allows customers to securely configure the DACS offline and provides ease of use while meeting security requirements.

The system does not require the use of a Hard Drive, floppy drive, keyboard or mouse. The system operates through a compact flash drive and bay. The bootable compact flash contains everything needed to run the entire application. A keyboard can optionally be connected to view the Model Builder application and make temporary changes.



Standard DACS	Secure DACS
Model Builder (MB) Software	Secure Model Builder (SMB) Software
Read/Write Hard Drive	Read Only Compact Flash Drive
DOS OS and Shell	No OS. Single Boot Process (SMB)
Model Save Enabled	Model Save Disabled
RMS Read/Write Capability	RMS Read Only Capability

Model and File Management is now performed offline on a secure Windows XP® Platform. This is achieved by removing the Compact Flash and inserting it into a Windows XP® platform where a user can now:

- Run Model Builder in Development Only Mode
- Perform minor edits to the Model (.mdl file) via a Terminal Window
- Edit the configuration files necessary for operation (i.e. Default.cfg & Default.ini)
- Add and delete models, soundfiles, etc. as required

2.0. Secure DACS Operation

2.1. Operation Introduction

The Secure DACS platform from an operational point of view is fundamentally the same as the standard DACS platform with a few minor footnotes. Users should refer to the existing DACS System Documentation for a complete system overview. This Secure DACS Users Guide is designed to be a supplement to the existing DACS documentation and describes the differences between the standard DACS and Secure DACS platforms. Please refer to the ASTi web site for complete DACS System Documentation:

http://www.asti-usa.com/support/document/dacs_mb.html

A Secure DACS platform is a standard 2U or 4U DACS chassis that does not include a hard drive or floppy drive. Secure Model Builder (SMB) runs on a compact flash card via the compact flash drive bay. The bootable compact flash contains everything needed to run the entire application. There is not a save capability and users do not have access to go to the command prompt. An optional keyboard can be connected to view the Model Builder application and make temporary changes.



The Secure DACS offers the following capabilities:

- Read Only Compact Flash Drive Bay
- Compact Flash containing SMB, Model(s), config and soundfiles in use
- No OS, Single Boot Process (SMB)
- Model Save Disabled
- RMS Read Only Capability

2.2. Operational Overview

The Secure DACS platform requires the user to make all model, configuration file, soundfile, etc. changes offline. This involves moving the ASTi provided compact flash back and forth between a Windows® XP platform and Secure DACS platform. Basic operation shown in image below:

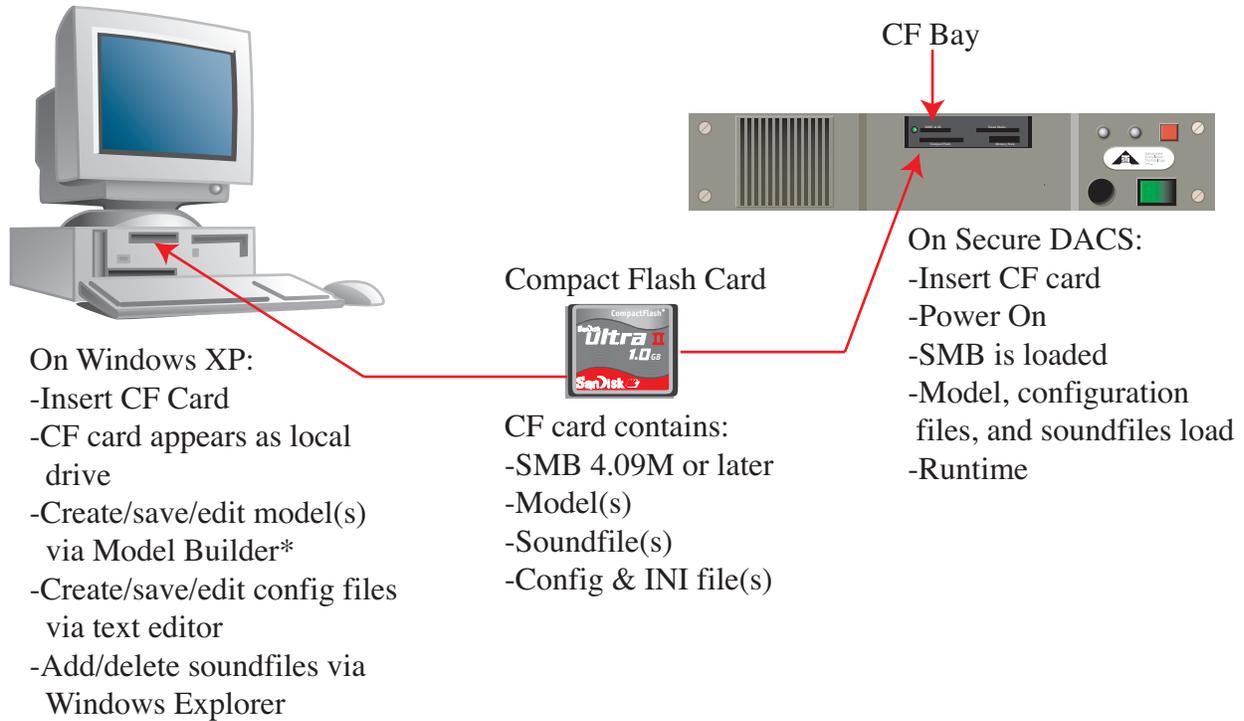


Figure 1: Secure DACS Theory of Operation

***While a user is able to create new models and edit existing models in Windows, this tool should be considered a model editing tool and not a full development platform.**

ASTi will provide the SMB Compact Flash Cards. These cards will be shipped without any customer specific models, configuration files or sound files, just as the standard DACS platforms are shipped. The end user must add these files for runtime. The compact flash shipped by ASTi contains the directories listed below.

Directory	Description
\	Root directory. Contains directories shown below and a single MBEdit.bat file. This file is used to run SMB on Windows XP
\bin	Hidden Directory that contains the required Secure MB files. <i>DO NOT EDIT</i>
\options	Contains the Options file for the platform. (.ops file)
\models	Contains the model (.mdl) and configuration files (i.e. default.cfg)
\sounds8	Contains all 8kHz Sound Files
\sounds16	Contains all 16kHz Sound Files

Table 1: Directory Structure

3.0. Model and File Management via Windows XP

The Secure DACS does not allow users to save model changes on the system. Additionally, the Compact Flash drive in the Secure DACS is a read-only drive which means that no development changes can be saved on a secure DACS platform.

Users will no longer have development capabilities unless they have a separate standard development DACS platform with a writable hard-drive. However, since many customer sites do not have the luxury of multiple DACS platforms we have designed a method for running Model Builder on a Windows XP platform.

Model Builder operation on a Windows XP platform is only for minor model editing and development. This will allow a user to create new Model Builder .mdl files, open and edit existing .mdl files as well as save off any changes. Users will also be able to manage the configuration files and sound files. The user can set the basic model configuration as well as edit the Controls, Signals, Feeders, Functions and Soundfiles lists inside of MB.

Limitations

The model editing and development capabilities under Windows XP do not provide a full development platform and are only meant to assist customers that do not have a separate standard DACS platform available. The purpose of the tool is to make minor model modifications such as radio mode changes, new host controls, and control modifications, etc. The tool is not designed to build models from scratch. If the user requires a full development platform the user should purchase a separate offline standard DACS.

3.1. File Management

Required SMB files are copied onto the compact flash card via Windows Explorer. This can include the options file, model(s), configuration file, soundfiles, etc.

1. Attach the Compact Flash Reader to Windows XP platform. This reader can be purchased from ASTi or provided by the customer.
2. Insert SMB Compact Flash into Compact Flash Reader. Windows should recognize the compact flash as an external drive (E:\, F:\, etc....)
3. Edit the `\models\ default .cfg` file so that it will work with the DACS DSP type.
 - a. In order to get MB to run without a DSP, a special command must be used in the `default .cfg` file. The required command will vary based on the DSP in the DACS platform, for your specific command see the table below.

Table of Commands	
DSP = 8CH or 8CH_OLD	For the Thru-hole early 8 channel card
DSP = TDM or TDM OLD	For the Thru-hole early TDM
DSP = TDMP or TDM_PC104	For the PC-104 TDM card
DSP = 8CHN or 8CH_NEW	For the Surface Mount 8 channel card
DSP = TDMN or TDM_NEW	For the Surface Mount TDM card

4. Use Windows Explorer to add, edit and delete required configuration and soundfiles. Note the directory structure below for reference:

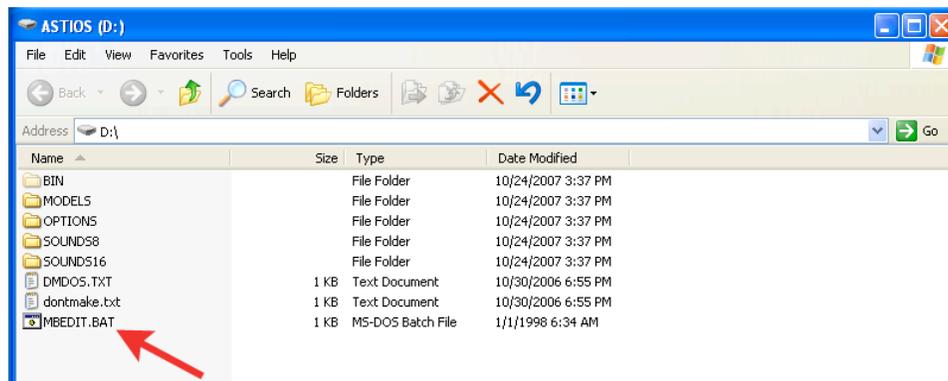
Directory	Description
\	Root directory. Contains directories shown below and a single MBEdit.bat file. This file is used to run MB on Windows XP
\bin	Hidden Directory that contains the required Secure MB files. DO NOT EDIT
\options	Contains the Options file for the platform. (.ops file)
\models	Contains the model (.mdl) and configuration files (i.e. default.cfg)
\sounds8	Contains all 8kHz Sound Files
\sounds16	Contains all 16kHz Sound Files

5. Remove Compact Flash Card from reader when done with changes.

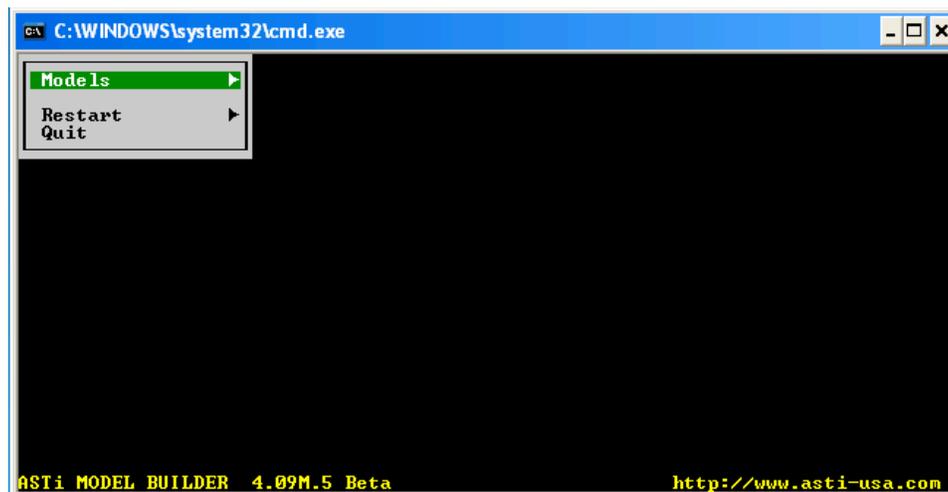
Note: The options file format for a SMB DACS platform is “.ops”. The current “.opt” file will not work. Contact ASTi if you do not have this file.

3.2. Model Management

1. Attach Compact Flash Reader to Windows XP Platform. This reader can be purchased from ASTi or provided by the customer.
2. Insert SMB Compact Flash into Compact Flash Reader. Windows should recognize the compact flash as an external drive (E:\, F:\, etc....).
3. Double-click on “**mbedit.bat**” to launch SMB.



4. Edit or create a model as required for your application. For specific details on Model Builder refer to the Model Builder Reference Manual.



5. After editing save the model and quit Model Builder.
6. Remove Compact Flash Card from the reader.

Notes

- Sound file links should not be explicit. They should appear as path
`../sounds16/"filename.au"` or `"sounds8"`

```

C:\WINDOWS\system32\cmd.exe
SoundFile List
Crash      ../SOUNDS16/Crash1.asd
Flyby     ../SOUNDS16/Flyby_7.au
Gunner    ../SOUNDS16/Gunnr_4.au
Hail      ../SOUNDS16/Hail.asd
Jettison  ../SOUNDS16/Jttsn_2.au
Hellfirelaunch ../SOUNDS16/Hf_lrch.au
Gundry    ../SOUNDS16/Gundry.au
Explosion  ../SOUNDS16/Explsn.au
Contact   ../SOUNDS16/Cntct_1.au
Hf_hung   ../SOUNDS16/Hf_hung.au
Gunturret ../SOUNDS16/Guntur_6.au
GunStrike ../SOUNDS16/Gunstr_4.au
Gbfail_9  ../SOUNDS16/Gbfail_9.au
Englight  ../SOUNDS16/Englight.au
ClutchFail ../SOUNDS16/CLUTCHFL.au

Esc-exit F2-menu F4-mark shiftF4-move ctrlF4-copy Line: 1
ASTi MODEL BUILDER 4.09M.5 Beta http://www.asti-usa.com

```

- Model names should contain no more than 8 characters i.e. “asticomm.mdl.”
- If the model is from Telestra 3 series contact ASTi for additional model information.

Limitations

- User cannot switch back and forth between full screen and Windows screen by using ALT <Enter>.
- No audio input/output
 - No DSPs
 - No RIU connectivity
- All DSP and Ethernet screens not available (they are not required for model development)
- User configuration files are not loaded.
- This tool is not considered a full development platform. Minor modifications are allowed; however, there are inherent limitations that prevent a user from creating a fully functional model from scratch.
- The user cannot link one signal to another without a DSP present. i.e. The user cannot connect a radio to a comm panel or a sine wave to a mixer, if this is attempted the system will display an error message.

4.0. Running SMB

Prior to booting up the Secure DACS platform and running SMB, the necessary customer specific files must exist on the compact flash card. The steps for this process are shown in section 3.0.

1. Ensure that the DACS platform is powered off.
2. Insert the Compact Flash Card into the DACS Compact Flash drive.



3. Power on DACS platform.
4. Secure Model Builder will automatically load specified model, config and soundfiles.
5. RUNTIME

Notes

- No DOS Shell
- No Save Capability
- RMS read only
- Unable to copy objects within SMB
- Quit will reboot the platform

Appendix A: Converting a Standard 2U DACS to a Secure DACS

The purpose of this appendix is to assist DACS users with converting a Standard 2U DACS with a hard drive and floppy drive to a Secure DACS. The floppy drive is replaced with a Compact Flash drive and the hard drive is removed.

Hardware Requirements for Conversion

- 2U DACS
- ASTi Compact Flash Drive
- Phillips head Screw driver
- Wire cutters
- Hard Drive Cover plate

Summary of Steps

Step 1: Removing the Cover

Step 2: Removing the Floppy Drive

Step 3: Removing the Hard Drive

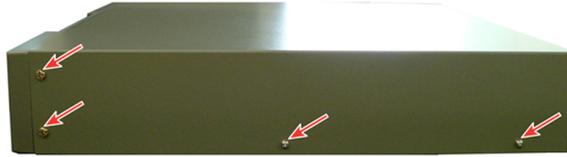
Step 4: Inserting the Compact Flash Drive

Step 5: Replacing the Cover

Step 6: Setting the BIOS

Step 1: Removing the Cover

1. Remove the four screws on both sides of the DACS as shown below.



2. Remove the two screws on the back side of the DACS as shown below.



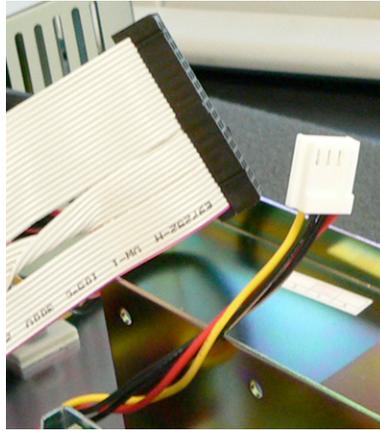
3. Remove the DACS cover.



Caution: All work for the remainder of the steps is to be done in and on an ESD safe environment. Damage will occur to the components if ESD Safe steps are not taken.

Step 2: Removing the Floppy Drive

1. Remove the ribbon cable by pulling it out of the back of the floppy drive. Be sure to handle it carefully by grabbing the black plastic part securely and pulling.
2. Remove the power cable by pulling it out of the back of the floppy drive.



3. Next remove the front plastic panel on the DACS. To do this, loosen the four screws on the front panel.

Note: These screws do not come out all of the way. Be careful not strip the screws.



4. After loosening the screws, snap the front cover off the DACS.
5. Remove the two small screws on either side of the floppy drive and pull it out.
6. Transfer the mounting brackets on either side of the floppy drive to either side of the compact flash drive.

Note: Take care to align the brackets properly, they must fit horizontally and vertically with the slot in the DACS. Remember to allow enough space to snap the front cover panel back in place.



Step 3: Removing the Hard Drive

1. Remove the ribbon cable by pulling it out of the back of the hard drive. Be sure to handle it carefully by grabbing the black plastic part securely and pulling. Note this ribbon cable connector will be reconnected to the compact flash drive during step 4.
2. Remove the power cable by pulling it out of the back of the hard drive.
3. Remove the two small screws on either side of the hard drive and pull it out.



Step 4: Installing the Compact Flash Drive

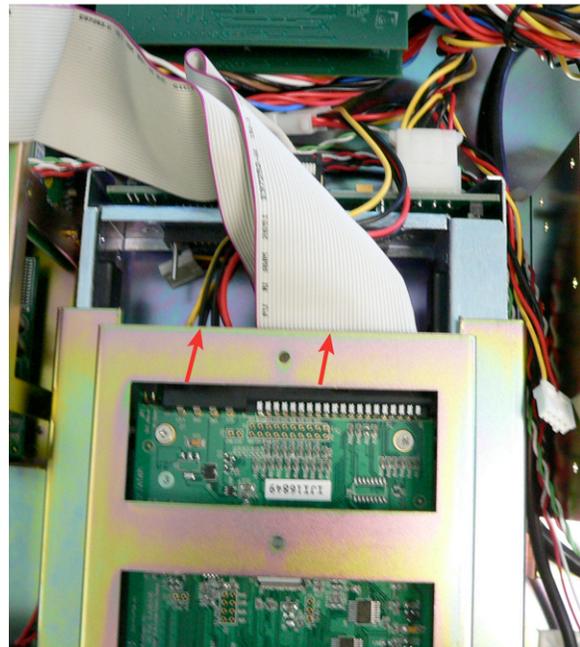
1. Align the mounting brackets and insert the new compact flash drive. Insert screws on either side of the drive.
2. Cut the plastic wrap around the power supply bundle and pull the larger power cable from the bundle. Insert this cable into the back of the compact flash drive.
3. Insert the ribbon cable that was removed from the hard drive into the back of the compact flash drive. Be sure to line the pins up with the holes when inserting cable.



Back of Compact Flash Drive



Ribbon and Power Cable



Ribbon and Power Cable inserted into CF

Step 5: Replacing the Cover

1. Snap the plastic panel over the empty hard drive space.
2. Replace the front onto the DACS and insert screws.
3. The Secure DACS should look as shown below.



Step 6: Setting the BIOS

The Bios settings are set the same as a standard DACS platform. For Bios settings details refer to the DACS Operation and Maintenance Manual on the ASTi web site:

http://www.asti-usa.com/support/document/dacs_mb.html

Appendix B: Converting a Standard 4U DACS to a Secure DACS

The purpose of this appendix is to assist DACS users with converting a Standard 4U DACS with a hard drive and floppy drive to a Secure DACS. The floppy drive is replaced with a Compact Flash drive and the hard drive is removed.

Hardware Requirements for Conversion

- 4U DACS
- ASTi Compact Flash Drive
- Phillips head Screw driver
- Wire cutters
- Hard Drive Cover plate

Summary of Steps

Step 1: Removing the Cover

Step 2: Removing the Drive Carrier Bay

Step 3: Removing the Floppy Drive

Step 4: Removing the Hard Drive Bay

Step 5: Inserting the Compact Flash Drive

Step 6: Replacing the Drive Carrier Bay

Step 7: Setting the BIOS

Step 1: Removing the Cover

1. Remove the screws from the top of the 4U DACS.
2. Remove the DACS cover.



Caution: All work for the remainder of the steps is to be done in and on an ESD safe environment. Damage will occur to the components if ESD safe steps are not taken.

Step 2: Removing the Drive Carrier Bay

To remove the floppy drive and insert the compact flash drive, the drive carrier bay must first be removed.

1. Remove the two screws on either side of the drive carrier bay and the two screws on top, as shown below.



2. Remove the ribbon (IDE) cables by pulling them out of the back of the floppy drive and removable hard drive. Be sure to handle it carefully by grabbing the black plastic part securely and pulling.
3. Remove the power cables by pulling them out of the back of the floppy drive and the removable hard drive.
4. Lift the drive carrier bay out of the DACS.

Step 3: Removing the Floppy Drive

1. Remove the screws from the drive carrier bay that connect the floppy drive.



2. Remove the floppy drive from the drive carrier bay.



Step 4: Removing the Hard Drive Bay

1. Remove the screws from the drive carrier bay that connect the hard drive bay.
2. Remove the hard drive bay and place the black metal cover onto the drive carrier bay.
3. Insert screws on either side of the black metal cover to secure it to the drive carrier bay.



Step 5: Inserting the Compact Flash Drive

1. Insert the new compact flash drive into the drive carrier bay and insert screws.



2. Insert screws on either side of the compact flash drive.



Step 6: Replacing the Drive Carrier Bay

1. Place the drive carrier bay into the DACS.
2. Insert the two screws on either side and the two screws on top of the drive carrier bay to mount it back into the DACS.
3. Insert the power cable and ribbon cable that were removed from the hard drive into the compact flash drive.
4. Replace the DACS cover and insert screws. The Secure DACS should look as shown below.



Step 7: Setting the BIOS

The Bios settings are set the same as a standard DACS platform. For Bios settings details refer to the DACS Operation and Maintenance Manual on the ASTi web site:

http://www.asti-usa.com/support/document/dacs_mb.html

Appendix C: Setting the BIOS

The Bios settings are set the same as a standard DACS platform. For Bios settings details refer to the DACS Operation and Maintenance Manual on the ASTi web site:

http://www.asti-usa.com/support/document/dacs_mb.html