



GenWatch3®
GW_GENsAC
Software Version 2.15
Module Book

GenWatch₃

600-2.15.0-Z.1
1/2/2018

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Refer to the GenWatch3 Manual Overview for your full license. All license information contained on pages 4-7 (Book 600-2.15.0-AA.1) are to be considered as contained herein.

Support

Customer satisfaction is our number one priority at Genesis. We are here to provide you with the best software possible, and we want to know when you have any questions, concerns or problems with GenWatch3 so that we can make it a better product for everyone.

Refer to the *Troubleshooting & Support* section of the GenWatch3 Manual Shell (Book 600-2.15.0-AA.1) for complete support and contact information.

Document History

Revision	Description	Author
2.0.2	Initial Release	JAW
2.0.3	Revision before release	JAW
2.0.4	Revised Hardware Setup	KIH
2.0.4	Release Revisions	KIH
2.0.4	Updated Figure 3.1	KIH
2.0.5	Release Revisions	TDW
2.0.5	Revised screenshots	KIH
2.0.6	Updated screenshots	CLB
2.0.6	Removed outdated link	CLB
2.0.6.6	Changes before release	WRK
2.2	Changes before release	CWF
2.3	Changes before release	CWF
2.4	Revisions Before Release	CWF
2.5	Revisions Before Release	CWF
2.6	Revisions Before Release	CWF
2.7	Revisions Before Release	JAW
2.8	Revisions Before Release	WRK
2.9	Revisions Before Release	ATG
2.10	Revisions Before Release	JPS
2.11	Converted to Docx format	CWF
2.11	Revisions Before Release	ATG
2.12	Revisions Before Release	JAW
2.13	Revisions Before Release	ATG
2.13	Removed info on obsolete connection type.	REB
2.14	Revisions Before Release	JAW
2.15	Revisions Before Release	REB

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Goals

This manual describes the role and function of the GW_GEnSAC module in the GenWatch3 solution.

Who Should Read This Manual?



This manual is written for the intended audience of novice to mid-level trunked radio system users and novice to mid-level PC users.

How This Manual Is Organized

This manual is organized as follows:

- **Overview:** Provides an overview of the role and function of the GW_GEnSAC module.
- **Hardware Setup:** Connecting input and output hardware to the PC.
- **Software Setup:** Configuring the GW_GEnSAC module.
- **GW_GEnSAC to Console Setup:** Wiring and programming your console for GW_GEnSAC.
- **GW_GEnSAC Troubleshooting:** GW_GEnSAC FAQ.

This manual contains the following images, used to indicate that a segment of text requires special attention:

-  **Additional Information:** Additional information is used to indicate shortcuts or tips.
-  **Warning:** Warnings are used to indicate possible problem areas, such as a risk of data loss, or incorrect/unexpected functionality.

This chapter gives an overview of the GW_GEnSAC (Genesis Enhanced Stand Alone CEB) module.

This chapter contains the following sections:

- **What is GW_GEnSAC?:** Defines the GW_GEnSAC module and GUI (Graphical User Interface).
- **Glossary:** Defines several acronyms used throughout this manual.
- **Feature List:** List of GW_GEnSAC features.
- **Specifications:** Hardware and system impact details.
- **Test Conducted:** Details about tests that GW_GEnSAC has passed.
- **Power and Heat:** Watt usage and BTU output information.
- **Warranty:** Details about software and hardware warranties.
- **Knowledge Requirements:** Outlines the basic knowledge required to effectively operate GW_GEnSAC.

What is GW_GEnSAC?

The GenWatch3 GW_GEnSAC module is a collaborative effort between Motorola field engineers and The Genesis Group. It is especially helpful if you have run out of resources in your Embassy Switch or AEB. It is also a wonderful enhancement to allow creating mobile communications centers. With GW_GEnSAC, your customers can display IDs and emergency calls on their Gold Elite or MCC 5500 operator positions, without connection to the Embassy Switch or AEB.

The GW_GEnSAC solution provides an alternate means of sending central controller packet data to Motorola consoles. The solution receives the packet data wirelessly via radio waves instead of using a landline T1 connection from the AEB. A PC running GW_GEnSAC receives the packet information through an input source, such as a Topaz-enabled EFJ mobile radio. It then separates those packets according to talkgroup, and forwards them via RS-232 serial cables to ACIM cards on the CEB (one talkgroup per card).

This will be explained in a later chapter in detail, but basically what happens is this: GW_GEnSAC comes loaded on a PC with a 16- or 32-COM Port Rocket® Board from Control Corp. Depending on the quantity of operating ports that you purchased, data for 4, 8, 16 or 32 Talkgroups is sent to 4, 8, 16 or 32 ACIM cards (one for each Talkgroup). You will connect one cable for each Talkgroup from the GW_GEnSAC PC COM Ports to each ACIM card in the CEB (Central Electronics Bank).

Glossary

ACIM	ASTRO® Console Interface Module
AEB	Ambassador Electronics Bank
AUX I/O	Auxiliary Input Output
BIM	Base Interface Module
CDM	Console Database Manager (Gold Elite)
CEB	Central Electronics Bank (Gold Elite)
CES	Console Electronics Shelf (MCC 5500)
COIM	Console Operator Interface Module (Gold Elite)
CSDM	Console System Database Manager (MCC 5500)
DAP	Digital Audio Processor (MCC 5500)
GW_GEnSAC	Genesis Enhanced Stand Alone CEB
TOPAZ	Protocol for TCP/IP interface with EFJ radios

Feature List

For Motorola SmartNet systems on 800 and 821 MHz frequencies, GW_GEnSAC will provide the following features:

- Routing of dispatch calls to ACIM cards.
- Routing of emergency PTTs to ACIM cards.
- Routing of patch calls to ACIM cards.
- Routing of multigroup calls to ACIM cards.
- Routing of coded calls to ACIM cards.
- Routing of emergency alarms to ACIM cards.

Specifications

See <http://genesisworld.com/GW3specs/>

Tests Conducted

Genesis has done extensive testing of GW_GEnSAC. While it is not yet certified by Motorola, the following tests were successfully conducted:

- Topaz setup
- ACIM setup
- Digital dispatch call – short duration
- Digital dispatch call – long duration
- Analog dispatch call
- Digital coded dispatch call
- Analog coded dispatch call
- Analog emergency PTT
- Digital emergency PTT
- Emergency alert
- Emergency alert acknowledgement

Power and Heat

PC: At present, we use a current-model Dell Dimension computer, and the numbers are from their website (subject to change based on current model).

- Wattage = 305W.
- Heat = 560 BTU fully loaded without monitor (which is the way we ship it).

RocketPort Card: The RocketPort Card will add:

- Wattage = zero since it is powered from the PC (5VCD bus~ 250mA, 12VCD bus~50mA).
- Heat = 5.87 BTU/hr.

Warranty

GENESIS: GW_GEnSAC software – 1 year after installation

DELL: PC – 5-year warranty including Next Business Day Parts and Labor.
On-Site Response.

COMTROL: RocketPort – The warranty information on this product was included with your GW_GEnSAC shipment. Be sure you fill out the warranty information and send it to Comtrol.
Hardware – 5 years from date of purchase.
Firmware and Software – 1 year from date of purchase.

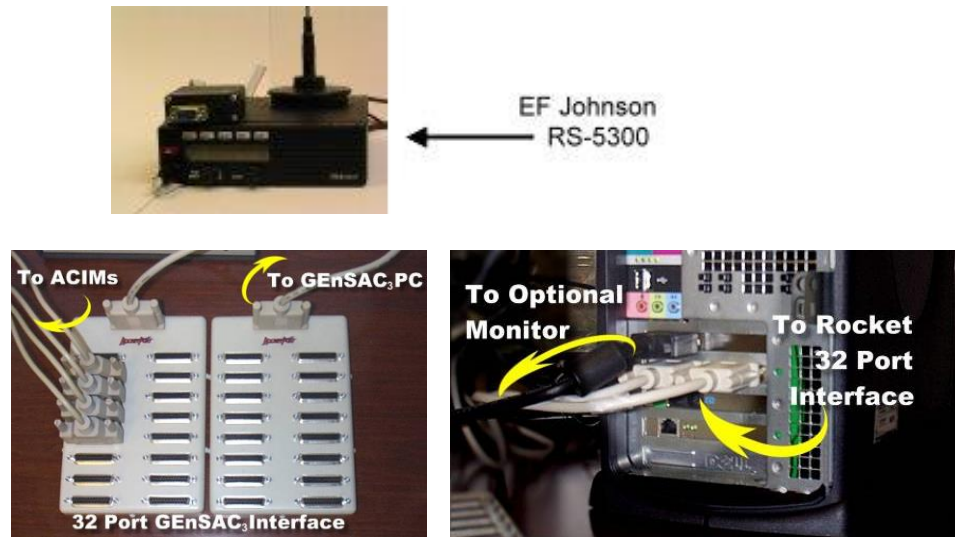
Knowledge Requirements

GW_GEnSAC and its manual will make a few assumptions about your knowledge level. For best success operating GW_GEnSAC, we recommend you have a good working knowledge of the following:

- Your version of Windows Operating System
- Gold Elite and/or MCC 5500 Console Setup and Configuration
- Creating RS-232 Cables

Welcome, and thank you for purchasing our GW_GEnSAC (Genesis Enhanced Stand Alone CEB) solution. We are proud to have you as a customer, and are confident that you will soon be benefiting from your new system.

Upon receiving your GW_GEnSAC hardware, you will want to set up and connect the various components before booting the machine. Below is the general setup of the system.



You may have purchased a 4-, 8-, 16- or 32-port GW_GEnSAC. To keep things simple, we are supplying a RocketPort Card that is capable of up to 32 ports. If you have purchased a GW_GEnSAC that is 16 or fewer ports, you will receive one port adapter “brick” (see below). If you order a GW_GEnSAC capable of 32 ports, you will receive two port adapter ‘bricks’ (see below). Depending on which version of the GW_GEnSAC port interface you purchased, you will have received one of the following:

32 Port GW_GEnSAC	2 RocketPort Adapters (as shown above)
16 or fewer Port GW_GEnSAC	1 RocketPort Adapter

To set up your GW_GEnSAC hardware, follow these steps:

1. **Power-** Hook up power to the GW_GEnSAC PC, your data source and your monitor.
2. **Data Source** – Connect your radio to the GW_GEnSAC PC. The following radios will work:
 - a. Motorola APX6500 or APX4500 mobile
 - b. EFJ 5300 or 53SL mobile
3. **RocketPort Cables** – Connect the RocketPort adapter cables to the back of the PC as shown in the picture. These cannot be extended as they are proprietary.
4. Connect your remaining COM Port cables to the RocketPort adapter and then to the ACIMs (Gold Elite) or DAP in the CES (MCC 5500).

This completes the hardware setup of GW_GEnSAC.

The GW_GENsAC GUI (Figure 3.1) contains one or more rows of properties. Each row is a GW_GENsAC group-to-serial-port connection. The number of available connections is determined by the *Connections* property under the GW_GENsAC module in your GenWatch3 license file.

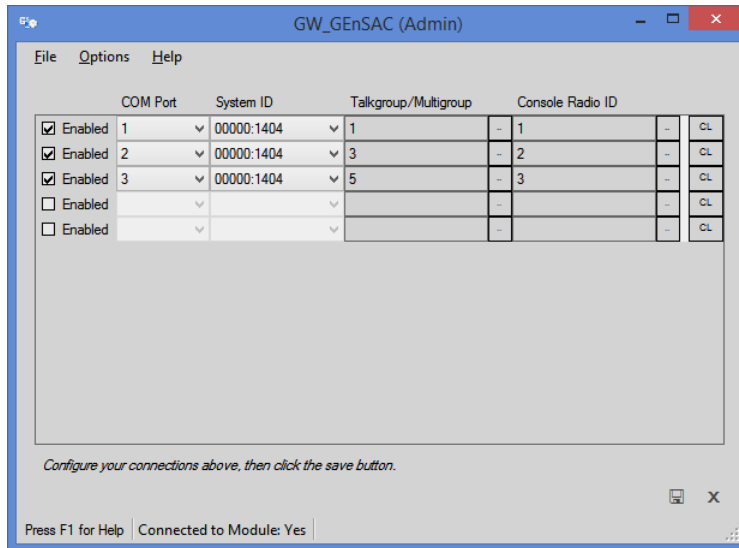


Figure 3.1 – GW_GENsAC GUI

Options

The GW_GENsAC module can output Radio IDs in one of two formats. By default, the output is the numeric radio ID. This can be changed to the ID plus 700,000 by selecting the **ID + 700,000** option.

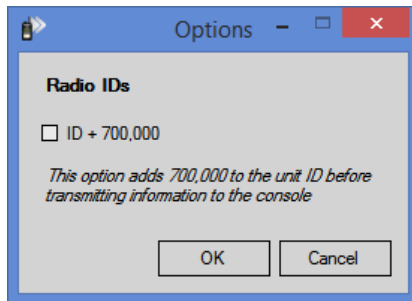


Figure 3.2 – GW_GENsAC Options Window

Connection Properties

Each GW_GEnSAC connection contains the following options:

- **Enabled:** Check this box to enable (start) a GW_GEnSAC connection. Enabled connections must have a valid COM Port, System ID, Talkgroup and Console Radio ID before they can be saved.
- **COM Port:** This is the Serial Port to which you want to send any Status, Emergency, or Call events that occur for this connection.
- **System ID:** This is the ID of the system you are connecting to.
- **Talkgroup:** This is the group you wish to filter activity on this connection by. For example: If you select 1, all Status, Emergency Alarm, and Call events that occur on talkgroup 1 from the selected System ID will be sent to the COM Port specified for the connection.
- **Console Radio ID:** This is the radio ID of the console that GW_GEnSAC is connected to. All Status, Emergency Alarm, and Call events originated from this radio ID will be ignored and NOT sent on this connection.

Cancel

Click this button to abandon any changes made to the connection settings and reload previous settings from the database.

Save

Click this button to save the current connection settings to the GenWatch3 database. GW_GEnSAC will start all enabled connections and stop all connections that are not enabled.



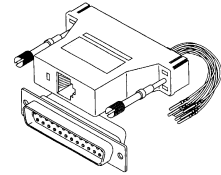
The number of connections available in the GW_GEnSAC screen is limited by your license. See the GenWatch3 Core Manual for more information on licensing.



If your licensed number of GW_GEnSAC connections is changed to a number lower than your previous license, connections are removed from the bottom of the connections list shown in GW_GEnSAC.


Cabling

This section may vary depending on the number of ports you purchased. Your objective is to get the data that is present on the RocketPort breakout box (brick) into the ACIM cards (Gold Elite) or DAP (MCC 5500). In the case of the 32-port Rocket DB25 breakout, your easiest method is likely to be purchasing a DB25 / RJ45 adapter. You will need one adapter for each talk-group. On the DB25 side, it needs to be male-to-male with the RocketPort ports. The next step will be to create the RJ45 to RJ45 cables for your installation (from the adapter to the ACIM card). Use good RS-232 cable practices, being concerned with length limits. Lower peripheral speeds of up to 9600 baud serial interfaces, like those used on the ACIM, can usually operate over cables up to 50 feet long. Use of special high quality cable may in some cases allow this limit to be extended to as much as 150 feet. The last step in the cabling process is to configure the adapter pin-outs, then plug everything together.



Gold Elite

The pin-out configuration may vary. For a DB9 and DB25 to RJ45 adapter, here is the configuration.

 Before beginning the work on the DB25-RJ45 adapter, compare the wire colors to the ones listed below. It has been found that different manufacturers use different color schemes.

The pin numbers are the accurate part of the chart below.

Color	RJ45 pin	DB9 pin	DB25 pin
Brown	1	NC	NC
Blue	2	NC	NC
Yellow	3	NC	NC
Green	4	2	3
Red	5	1	8
Black	6	3	2
Orange	7	4	20
Gray	8	5	7

NOTE: Jumper DB-9 pins 6, 7, 8 together

NOTE: Jumper DB-25 pins 4, 5, 6 together

The DB9 adapter is part number BKN6159A in CIE Maintenance Manual 68-81095E45.

The DB9 adapter should be female.

The DB25 adapter should be male.

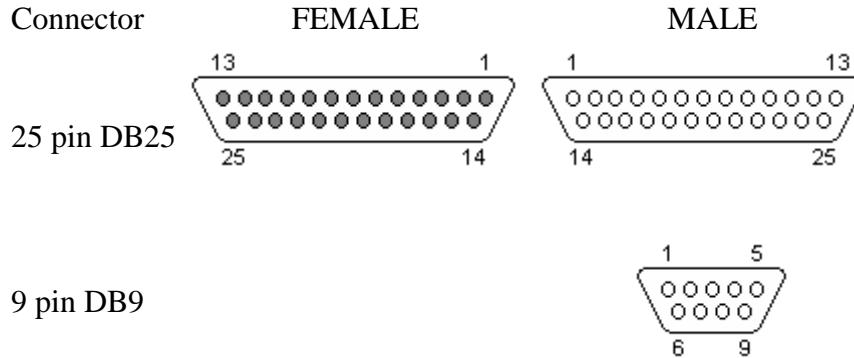
After creating the adapter, use straight through RJ45 to RJ45 cable to connect from the adapter to the ACIM card top port. Do not exceed 150 feet under normal circumstances.

MCC 5500

The best way is to utilize a DB25 / RJ45 adapter to allow ease of adjusting the pin-outs. Here is the configuration:

RJ45 pin	DB25 pin
1	7
2	2
3	NC
4	8
5	3

Where is Pin #1? This diagram may help:



GW_GEnSAC Gold Elite Workaround Connector

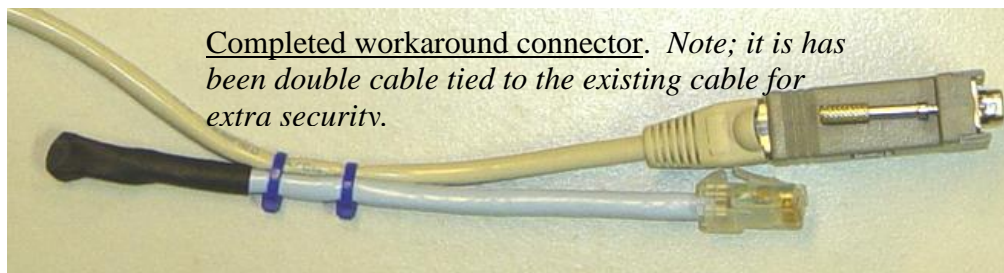
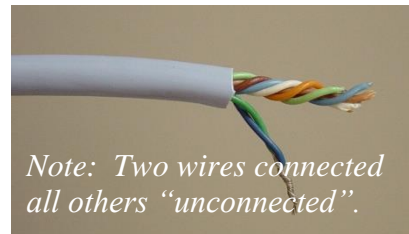
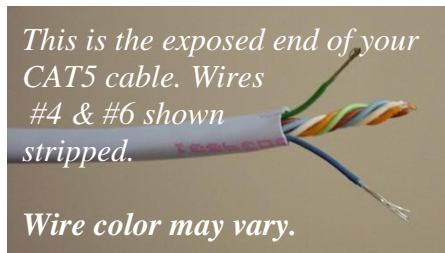
We have learned from field experience that the Gold Elite console will stop processing audio if the ACIM senses the lack of input. In a non-GW_GEnSAC world, this would be if the DIU (which feeds its data to the ACIM) goes bad, the audio processing stops for that channel or talkgroup. What this means to GW_GEnSAC users is that if you need to turn off the GW_GEnSAC machine for any reason, or if the unit fails, you could have a minor disaster on your hands. There is a workaround.

We suggest that you build a small “loop back” cable and tie wrap it to the main cable that goes from the RocketPort to the ACIM port. Tie this loop back to the ACIM end so that in an emergency, it can be quickly plugged into the ACIM in place of the GW_GEnSAC cable. You will need to make one loop back for each talkgroup that is connected from GW_GEnSAC to the ACIM.

We are not aware if this same issue exists in the MCC5500. Logically, it might be due to the “data” in port on the MCC5500 being the same specification as the ACIM port on the Gold Elite. To be safe, you should also create loop backs if you have an MCC5500 console.

How to build your emergency connector

1. Build a very short cable with an RJ45 on one end and nothing on the other end.
2. Connect the wires from Pin 4 & Pin 6 together (nothing else). Ensure you use a secure connection (soldering would be best).
3. Put heat shrink tubing over that.
4. Tie wrap that shorting plug to the end of the GW_GENsAC cable that plugs into the ACIM and mark it “Emergency Workaround Plug”.

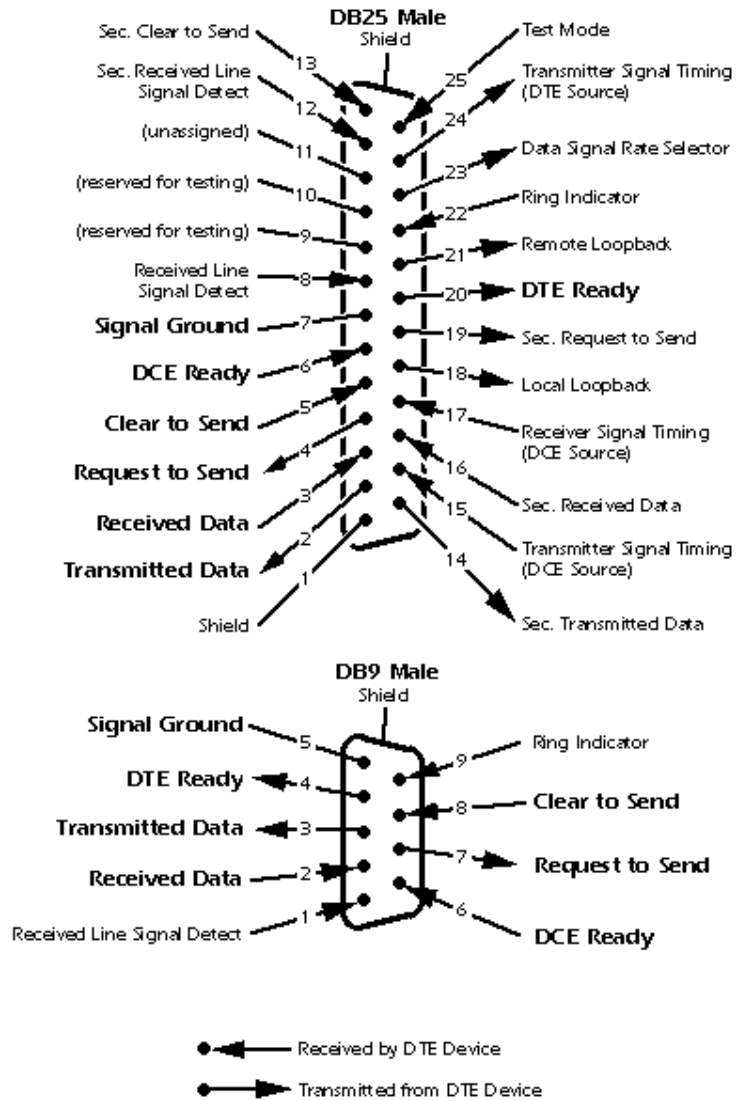


The RS-232 standard

DB-25	DCE	DB-9			
1			AA	x	Protective Ground
2	TXD	3	BA	I	Transmitted Data
3	RXD	2	BB	O	Received Data
4	RTS	7	CA	I	Request To Send
5	CTS	8	CB	O	Clear To Send
6	DSR	6	CC	O	Data Set Ready
7	GND	5	AB	x	Signal Ground
8	CD	1	CF	O	Received Line Signal Detector
9			--	x	Reserved for data set testing
10			--	x	Reserved for data set testing
11				x	Unassigned
12	SCF			O	Secndry Rcvd Line Signl Detctr
13	SCB			O	Secondary Clear to Send
14	SBA			I	Secondary Transmitted Data
15	DB			O	Transmissn Signl Elemnt Timng
16	SBB			O	Secondary Received Data
17	DD			O	Receiver Signal Element Timing
18				x	Unassigned
19	SCA			I	Secondary Request to Send
20	DTR	4	CD	I	Data Terminal Ready
21	CG			O	Signal Quality Detector
22		9	CE	O	Ring Indicator
23	CH/CI			I/O	Data Signal Rate Selector
24	DA			I	Transmit Signal Element Timing
25				x	Unassigned

STANDARD RS-232 PIN-OUT

Looking Into the DTE Device Connector



Hardware Setup



The information provided here about Centracom Gold Elite programming is for simple reference only. Please refer to your Motorola documentation for full details regarding the Centracom Gold Elite programming.

Centracom Gold Elite

The Console, at its heart, is a Motorola Centracom Gold Elite CEB with some programming and external wiring modifications. The basic parts list inside the card cage starts with 2 System Timers. Add one COIM for each operator position desired. Add one BIM, one AUX I/O, and one ACIM card for each talk group to be used by the console. Other cards for other applications may be added as needed (BIM for tone controlled conventional station, etc.). The BIMs should be configured for 4-wire audio at 600 ohms. The AUX I/O must be configured for local keying. P2, P3, and P4 should be routed to punch blocks as in a standard installation.

Consolettes

The control stations are specified to be ASTRO® Spectra consolettes. There must be one control station for every talk group to be used by the console. They should be jumpered for local keying, 4-wire audio, and 600-ohm terminations on the phone lines. Some non-standard wiring must be done to get 4-wire audio and local PTTs from the punch blocks to P3 on the back of the control station.

A supported mobile radio needs to be co-located with a PC provided by The Genesis Group. The Ethernet jack should be connected to the PC using standard network equipment. The Genesis PC is equipped with proprietary software and a multi-output serial card. There must be one output port available on the multi-serial card for every talk group to be used by the console (currently there is a 32-output limitation). These outputs are fed to the ACIM card (Gold Elite) or DAP (MCC 5500) that corresponds with the correct BIM (Gold Elite). This provides the PTT-ID data as well as the Emergency Alarm and Call indications. Again, some non-standard wiring must be done to adapt from the 25-pin serial COM Ports on the RocketPort output to RJ45 ACIM ports (Gold Elite) or to the CES punch block or patch panel (MCC 5500).

The rest of the Operator Position hardware is set up normally. Operator positions may be added to the limit of the card cages and power supplies in the CEB.

Programming



The information provided here about Gold Elite and MCC 5500 programming is for simple reference only. Please refer to your Motorola documentation for full details regarding the Gold Elite and MCC 5500 console programming.

Gold Elite

Special consideration must be paid to the way the console is programmed with the CDM. When the BIMs are added, they must be configured as ASTRO® Conventional signaling BIMs. This allows the AUX I/O card and the ACIM to be added accordingly. Also, in the ADM, aliases must be set up in the ASTRO® conventional book instead of trunking. In essence, the Genesis PC translates what would normally be SystemWatch data into ASTRO® conventional data, allowing it to pass through the ACIM, AUX I/O, and BIM in a standard Motorola format, minimizing modifications to the CEB. The serial ports are matched to talkgroups in the Genesis PC to allow data to be sent to the correct BIM. Data and audio take two different paths and have two different sources in this application. Using the BIMs in the ASTRO® conventional mode limits the console keying to local, as tone is not supported in the ASTRO® conventional setup.

MCC 5500

The primary settings that have been found to affect the operation of GEnSAC are in regard to the “Caller ID Type” that is to be displayed. To program the MCC 5500, in The MCC 5500 **CSDM** do the following:

1. Configuration
2. Radio Channel
3. Configuration
4. Pick a Radio Channel to Configure (such as TalkGroup 7)
5. Click on Edit at the bottom of the window
6. **IMPORTANT**—Be sure that the Caller ID format is set to ASTRO® 25 or Mixed Mode
7. Press NEXT
8. Choose ASTRO® Settings
9. Select- PTT ID
10. Select- Ignore Mobile to Mobile
11. Select all necessary buttons to back out to the CSDM desktop
12. Select File
13. Select Load

Consolettes

The ASTRO® Spectra consolettes are programmed as they normally would be for a trunked control station. If “Talk Permit” is enabled, the talk permit tone will be heard at the operator position, allowing the dispatcher positive indication of a channel grant. System tones, including denials and busies, will be heard at the operator position as well.

PC

The Genesis PC is set up per the instructions that are included with it. Be sure to turn off ALL power saving functions ensuring that the PC remains ready at all times. The control channels for the site to be monitored are set up in the GW_GEnSAC software. As noted earlier, specific talkgroups are routed to individual serial ports in the RocketPort that is installed in the PC. These must be configured on an individual basis. The PC acts as a filter, sending information recovered from the data source that is relevant to the selected talkgroup to the designated COM Port as DIU formatted data. That data is then sent, via a cable, to the ACIM (Gold Elite) or CES (MCC 5500).



This section of the manual is designed to help you answer some of the most frequently asked questions. It will also help to resolve some of the common errors.

Q: The red light in the tray never turns green, even after I double checked my settings.

A: The red light in the tray indicates that the Serial Port is NOT receiving data. Below is a list of items that you should check.

- The Ethernet cable is plugged into your PC and into the network.
- The data source radio is plugged in.
- The data source radio is connected to your PC.

Q: I get an SQL error when I try to start GW_GEnSAC, and it never starts.

A: Make sure that MSSQL server is running. You should see an icon in the windows tray that looks like this one . If you see this icon  instead, then double-click it and press the start button on the dialog that appears.

Q: I added a group to the GW_GEnSAC module setup but I don't ever see that group's activity.

A: Make sure you checked the Enabled checkbox for that group.

Q: What happens if the GW_GEnSAC computer ceases to operate for any reason?

A: The biggest thing that you need to be aware of is related to a design issue in the ACIM card. There is a "heartbeat" that goes from the ACIM to GW_GEnSAC and then back to the ACIM. If GW_GEnSAC stops operating for some reason, that heartbeat is lost. Then, the ACIM card stops the flow of audio through the console. Of course, this is not good. Since hardware is fallible, this is a possible problem if the GW_GEnSAC PC stops running. The current workaround is the following: Build a short RJ45 cable with the RJ45 connector only on one end. On the end with no connector, jumper pins 4&6 together. Seal the wires with heat shrink or something else to protect the cable end. Now, tie-wrap that short 'emergency' cable to your normal GW_GEnSAC cable so it is always ready for you. If the GW_GEnSAC fails for any reason, simply unplug the normal GW_GEnSAC to ACIM cable and plug in the 'emergency' cable. Now you have the luxury of time to bring the GW_GEnSAC PC back on line. Please refer to the GW_GEnSAC Gold Elite Workaround Connector section in Chapter 4 of this book.