



Advanced Simulation Technology inc.
500A Huntmar Park Drive
Herndon, Virginia 20170 U.S.A.
Tel. (703)471-2104 • Fax. (703)471-2108
www.asti-usa.com

ASTi SYNAPSE Workstation Operator Manual

Document: DOC-01-SYN4W-OM-1

Product Name: ASTi Synapse Workstation

Description: Network Voice Communications System

Part No.:

SYN-WS-

Number Comm Nets:

04: 4 Nets

08: 8 Nets

16: 16 Nets

ASTi Synapse Workstation Operator Manual

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ASTi

500-A Huntmar Park Drive

Herndon, VA 20170

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1.0. INTRODUCTION

1.1. Overview

The Synapse Workstation provides an elegant and economical solution to distributing voice communications over IP networks linking groups of operators with headsets and handheld communications terminals.

The Synapse Workstation operates as a stand-alone communications system, or with the Synapse Radio-IP Bridge to integrate live radios, or with the Synapse Operator Server to integrate computer client-based operators.

The Synapse Workstation is a digital communications system that is used to link operator voice traffic between distributed sites over local or wide area data networks. Each workstation provides the ability for up to 16 operators to select up to 16 nets for transmit/ receive capability.

Each Workstation operator interface includes a hand-held terminal (HHT) user control/ display device, and lightweight headset/ mic with adapter cable. Optional operator peripherals are available including: paging mic with PTT, powered speaker, industrial headsets, etc.

Here is a notional diagram of an application example for an ASTi Synapse Workstation. Two Synapse Bridges are integrated with Synapse Workstations and an ACE Studio master control station. Synapse Workstations can inter-communicate with existing ASTi DACS systems, as well as ASTi PC' ver.

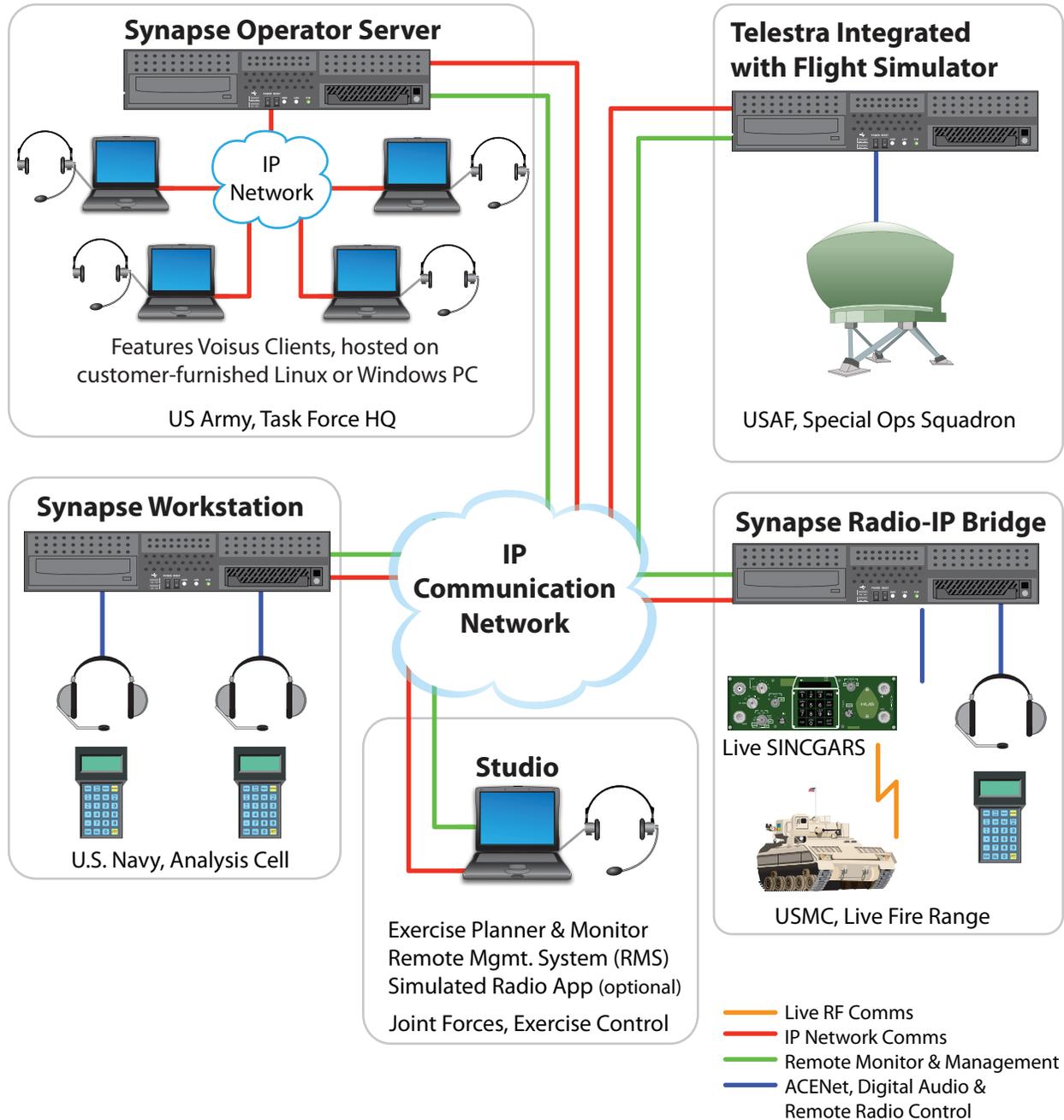


Figure 1: Synapse Application Example

This network-centric architecture is highly scalable, simply connect more Synapse Workstations to the IP network to add operator positions. Synapse Workstations on the network are connected by Category 5 cables eliminating wiring installation constraints. Operators can be located wherever there is access to the network.

Synapse Workstation features:

- **Flexible and Scalable Architecture:** Configure Workstation modules to meet custom requirements.
- **Interoperable:** Inter-operates with full fidelity radio simulations.
- **Deployable out-of-the-box:** Connect, configure, operate.
- **DIS/ HLA Compliant:** Synapse is inter-operable with a vast array of simulators, data analysis and data logging tools.
- **Simple to Install:** Modular/ click-together, all-Ethernet installation.
- **Simple to Run:** Even novice users can exploit the capabilities of ASTi's powerful and intuitive ACE software.
- **Robust and Reliable:** Industrial hardware, Intel Quad Core CPU, Realtime Linux OS.

2.0. GETTING STARTED

2.1. System Hardware

The standard Synapse Workstation includes the following components.

Description	SYN-WS-04	SYN-WS-08	SYN-WS-16	Standard Feature?
Telestra	1	1	1	Yes
ACE-RIU	2	4	8	Yes
Hand-Held Terminals (HHT)	4	8	16	Yes
Operator Audio and PTT ancillaries	4 sets	8 sets	16 sets	<i>Optional</i>

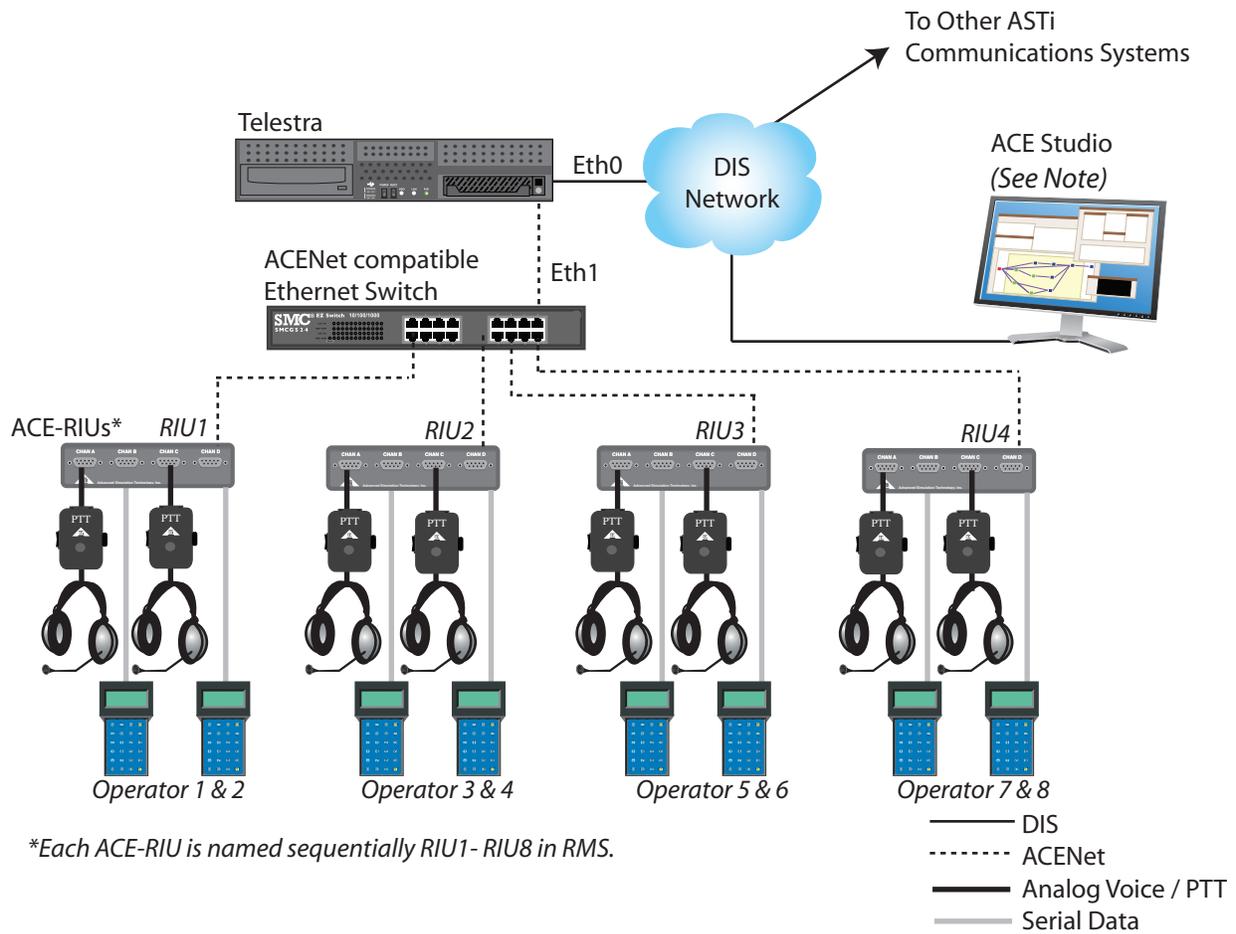


Figure 2: Hardware Installation

Note: ACE Studio provides centralized, network-based tools that are used to configure and manage Synapse systems. There are two Studio packages available:

- Studio VM (virtual machine) is provided with every Synapse system. Studio VM is a software-only product that installs on customer-furnished Windows[®] or Linux[™] computers.
- Studio integrated on a Telestra platform. This preconfigured, ready-to-use system is available separately.

2.2. ACENet Audio Distribution

The ACENet network provides a low latency, networked-based audio and I/O distribution architecture. ACE-RIUs connect to the ACENet network via an Ethernet port on the back panel of the device using a Category 5 cable. The Category 5 cable connects to an ACENet approved Ethernet switch. The maximum cable length is 100 meters (328 feet). The Ethernet switch connects to the Synapse Telestra via a Category 5 cable. The maximum cable length is 100 meters (328 feet).

Note: ACE-RIUs do not support daisy chaining to additional ACE-RIU devices.



Caution: Homemade cables are the number one reason for product performance problems. ASTi *highly recommends* using only manufactured, commercial, premium grade cable.

2.2.1. ACENet Requirements

In order to achieve a working ACENet infrastructure users must adhere to certain core requirements such as a closed network. No other traffic should be present on the ACENet network. Connect only Synapse Telestras, ACE-RIUs, and ACENet compatible equipment to the network.

All ACENet capable devices must adhere to the following cabling requirements:

- CAT 5e cable or better
- 100 meters (328 feet) maximum distance
- Wire according to 1000 BASE-T Specifications

Guidance for advanced ACENet configurations:

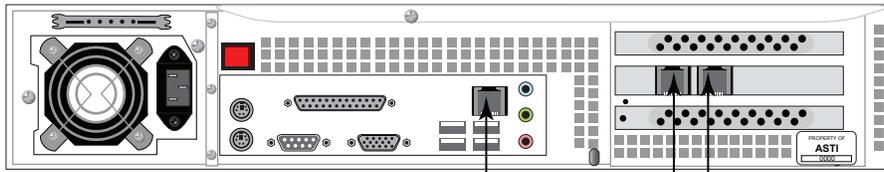
IMPORTANT: Synapse Workstation and Synapse Radio Bridge products require that each individual system (comprised of a single Telestra platform and a number of ACE-RIUs) be interconnected on its own ACENet. Conversely, you cannot connect multiple Telestras and ACE-RIUs on a common ACENet.

- An Ethernet switch is required for ACENet (no routers or hubs).
- Configure ACENet using multiple switches to realize flexible installations. Maximum of 6 hops (5 switches) are accommodated.
- 1Gb operation is required for ACENet
- Only port-based VLANs are acceptable.
- Each VLAN port must not see traffic from the other ports.
- If using VLANS: place each Telestra and its associated ACE-RIUs on a separate VLAN.
- VLAN tagging is not supported.
- Advanced protocols such as: 802.1p, port priority, spanning tree, etc. are not supported.
- Telestra platform can connect directly to an ACE-RIU using crossover CAT5e cable.

- See the ACENet User Guide (DOC-01-TEL4-AN-UG-1) for more information. See the ASTi website for the most recent versions of documentation. (www.asti-usa.com/support)

2.3. Ethernet Port Connections

Port	Connection
Eth0	DIS (network with ACE Studio)
Eth1	ACENet (network with ACENet devices)
Eth2	N/A



Network Ports

*See chassis labels for ethernet assignment
Ethernet labels will be **Eth0**, **Eth1**, and **Eth2***

Please read the Eth0, Eth1, and Eth2 labels on your system to verify the Ethernet locations.

2.4. System Hardware Installation

Refer to Figure 2 for top level system installation guidance.

2.4.1. ACE Studio Installation

In addition to the ACE Studio platform, you will need the following items:

- Monitor
- Keyboard
- Mouse
- Power Supply
- CAT5 or CAT6 cable
- Network connection

Follow these steps to install the ACE Studio platform:

1. Connect to a monitor, keyboard and mouse.
2. Connect ethernet port to an IP network (common with all of the Synapse Telestra systems that will be remotely managed by the ACE Studio).
3. Connect to power.

2.4.2. Telestra Installation

In addition to the Telestra chassis, you will need the following items:

- Monitor
- Keyboard
- Power cord
- CAT5 or CAT6 cable
- Network connection

Follow these steps to install the Telestra platform:

1. Connect Telestra platform to a monitor and keyboard. Note that a monitor and keyboard are only necessary for initial software configuration.
2. Connect Eth0 Ethernet port to an IP network (common with other Synapse Telestras systems and the ACE Studio that will remotely managing the Telestra).
3. Connect Eth1 Ethernet port to the Ethernet switch. This is the starting point for the ACENet network that connects the Telestra to the ACE-RIUs. See section 2.2 for detailed ACENet guidance.
4. Connect to power.

2.4.3. ACE-RIU Installation

Refer to Figure 2 for top level system installation guidance.

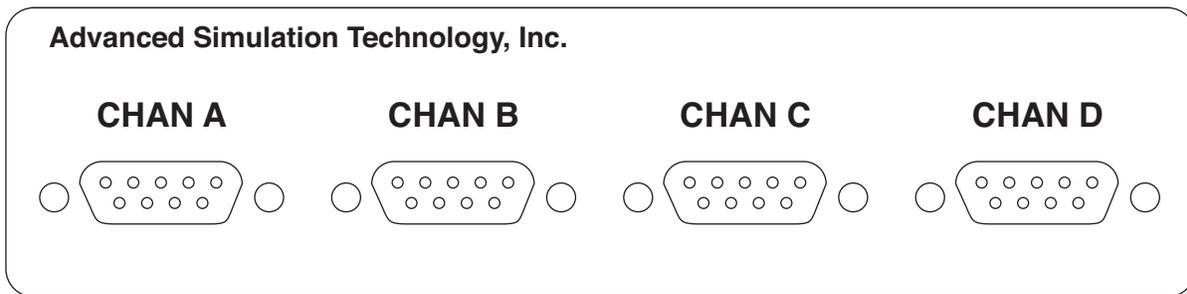


Figure 3: ACE-RIU Front Panel

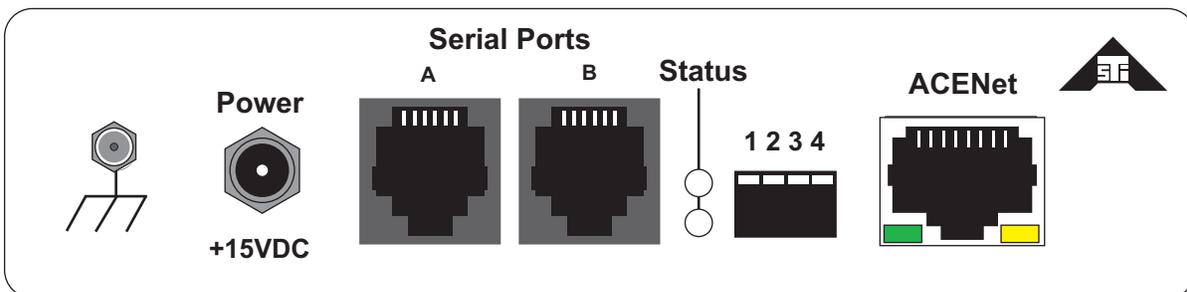


Figure 4: ACE-RIU Rear Panel

In addition to the ACE-RIUs, you will need the following items:

- ACE-RIU Power Supply
- CAT5 or CAT6 cable
- Ethernet switch

Follow these steps to install the ACE-RIUs:

1. Identify the ACE-RIU labeled “ACE-RIU”. Note: ACE-RIUs labeled “Radio ACE-RIUs” are configured for the Synapse Bridge and will not work properly with the Synapse Workstation.
2. Connect the ACE-RIU Ethernet port (ACENet) to the ACENet Ethernet switch.
3. Connect to a furnished 15 volt power supply. **IMPORTANT:** Use only the ASTi furnished power supplies for this purpose. Use of other power supplies may result in equipment damage not covered by the product warranty or degraded product performance.
4. Connect the HHT to Serial Port A using the furnished cable.
5. Connect the headset cable (CA-D9M-X4F) to Channel A.
6. Connect the headset to the headset cable.

ACE-RIU Connections

The operators connect to the ACE-RIUs sequentially with odd number operators for channels A and B and even number operators for channels C and D, see the table below for details. Refer to the Hardware Installation diagram in section **2.1 System Hardware** for further installation guidance.

ACE-RIU Address	ACE-RIU Channels	Operator	SYN-WS-04	SYN-WS-08	SYN-WS-16
1	A & B	1			
1	C & D	2			
2	A & B	3			
2	C & D	4			
3	A & B	5			
3	C & D	6			
4	A & B	7			
4	C & D	8			
5	A & B	9			
5	C & D	10			
6	A & B	11			
6	C & D	12			
7	A & B	13			
7	C & D	14			
8	A & B	15			
8	C & D	16			

Note: The gray boxes are the number of operators per system and highlight the corresponding ACE-RIU address and channels.

3.0. SYSTEM SETUP

3.1. ACE Studio Setup

ACE Studio provides centralized, network-based tools that are used to configure and manage Synapse systems. There are two Studio packages available:

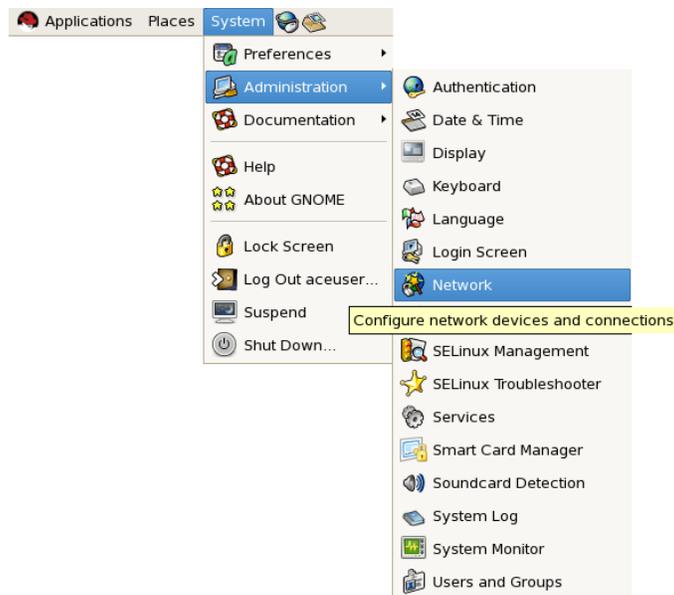
- Studio VM (virtual machine) is provided with every Synapse system. Studio VM is a software-only product that installs on customer-furnished Windows® or Linux™ computers.
- Studio integrated on a Telestra platform. This preconfigured, ready-to-use system is available separately.

The following instructions apply to both Studio VM and integrated Studio products.

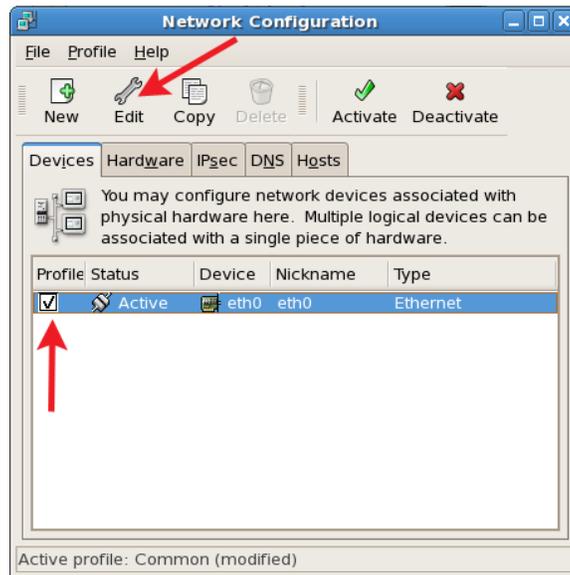
1. Power on the ACE Studio and allow it to boot.
2. Log into the ACE Studio:

Username: aceuser Password: aceuser

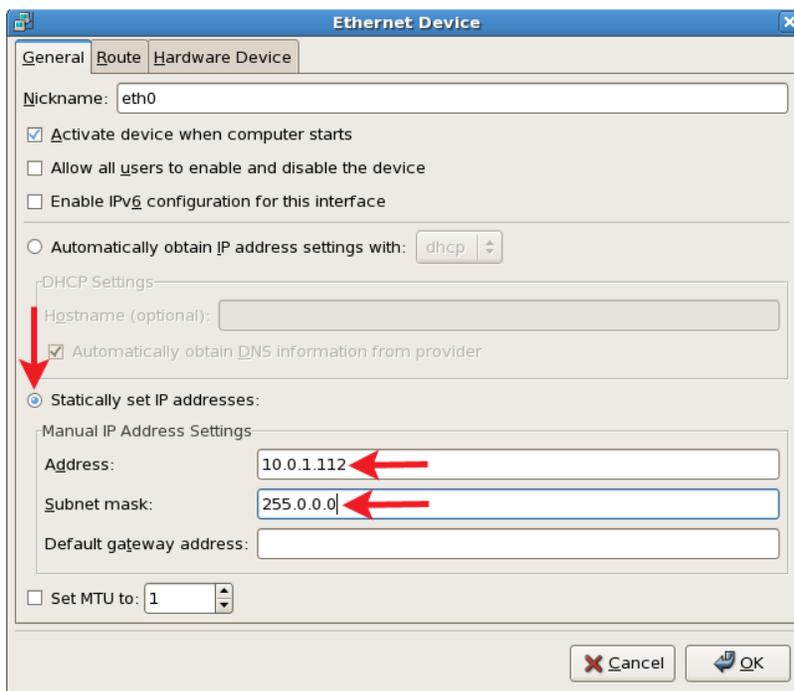
3. In the top left corner select **System > Administration > Network**.



4. Check the **'Profile'** box and then select **'Edit.'**



5. Select the **'Statically set IP addresses'** fill button.
6. Enter the IP address and Subnet mask.



Contact your network administrator for valid IP addresses and subnet masks for the network(s) where the Synapse Telestra and ACE Studio will be integrated.

3.2. Synapse Telestra Setup

1. Power on the Telestra and allow it to boot.
2. Login with

Username: **root** Password: **abcd1234**

3. At the prompt type:

```
ace-net-config -a xxx.xxx.xxx.xxx -n yyy.yyy.yyy.yyy
```

where “xxx.xxx.xxx.xxx” is the IP address and “yyy.yyy.yyy.yyy” is the netmask.

This sets the IP address and netmask for **Eth0** which is used to access the Remote Management System (RMS) via a browser to complete the network setup.

4. *Optional*: For more network setup options type:

```
ace-net-config -h
```

5. Reboot the Telestra to activate the changes.

Once you have configured the Telestra IP address, you can use ASTi’s web-browser based Remote Management System (RMS) interface to make subsequent changes to the Telestra network settings.

1. In RMS, navigate to the **Configuration > Network Devices** page and select the ‘**Edit Eth0 Config**’ link.

Current System: SYNAPSE

System

Status

Health

Logs

Reset / Power

Configuration

Networking

Network Devices ←

Option Files

Backup Restore

Description

SR & TTS

Update System

Voisus Downloads

Projects

Project Management

Network

Targets

ACENet

HLA

Audio

Upload Sound Files

Spectral Analysis

Archive Recordings

SYNAPSE Network Devices

Interface eth0

Mac Address: 00:07:B8:DC:66:B2

IP 4 Address: 10.2.129.1

IP 6 Address: fe80::207:b8ff:fedc:66b2/64

Subnet Mask: 255.255.0.0

Mode: fixed

[Edit eth0 Config.](#) ←

Interface eth3

Mac Address: 00:07:B8:DC:66:B8

Status: Off

[Edit eth3 Config.](#)

Interface eth1

Mac Address: 00:15:17:95:13:D0

IP 4 Address: 172.31.102.184

IP 6 Address: fe80::215:17ff:fe95:13d0/64

Subnet Mask: 255.255.0.0

Mode: fixed

[Edit eth1 Config.](#)

Interface eth2

Mac Address: 00:15:17:95:13:D1

IP 4 Address: 20.1.1.1

IP 6 Address: none

Subnet Mask: 255.0.0.0

Mode: fixed

[Edit eth2 Config.](#)

2. Login with

Default Username: **admin**

Password: **astirules**

Note: There are two modes to choose from either DHCP or Fixed. If you have a DHCP server and select DHCP, an IP address and subnet mask are automatically assigned. Continue with the following steps for fixed mode.

3. Enter the Telestra IP address that was previously entered in the Telestra’s command line.
4. Set the mode to ‘**fixed.**’
5. Enter the subnet mask.
6. Select the ‘**Make Changes**’ button to apply the IP address and subnet mask.

Current System: SYNAPSE

System

Status

Health

Logs

Reset / Power

Configuration

Networking

Network Devices

Option Files

Backup Restore

Description

SR & TTS

Update System

Voisus Downloads

Projects

Project Management

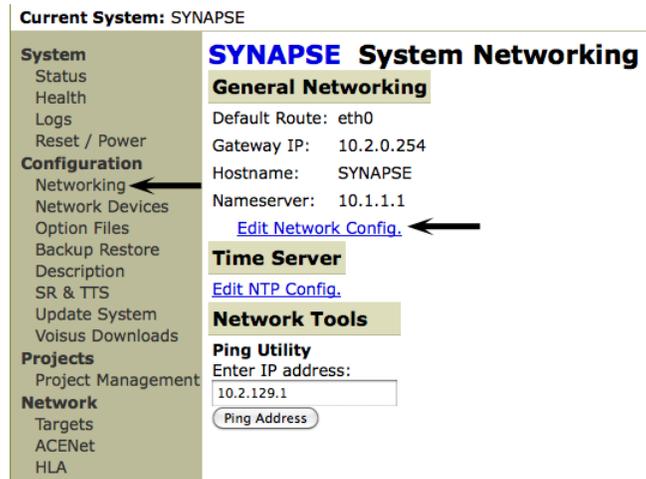
SYNAPSE Network Configuration: eth0 interface

Changing these settings may affect your ability to access this machine!

Current Settings		New Settings
Mode	→	Mode
fixed		fixed <input type="button" value="v"/>
IPv4 Address	→	IPv4 Address
10.2.129.1		<input type="text" value="10.2.129.1"/> (e.g. 192.168.10.10)
Subnet Mask	→	Subnet Mask
255.255.0.0		<input type="text" value="255.255.0.0"/> (e.g. 255.255.255.0)

7. Eth1 and Eth2 should remain at the factory default settings. Do not change Eth1 or Eth2.

- Optional: Change the network hostname of the Synapse. Navigate to the **Configuration > Networking** page, and select the ‘**Edit Network Config**’ link. Change the hostname and select ‘**Make Changes**.’



SYNAPSE Network Configuration

Changing these settings may affect your ability to access this machine!
It is recommended you save all changed data before performing this action.

Default Route
 Only applies if Gateway IP not specified

Domain

Gateway IP

Hostname

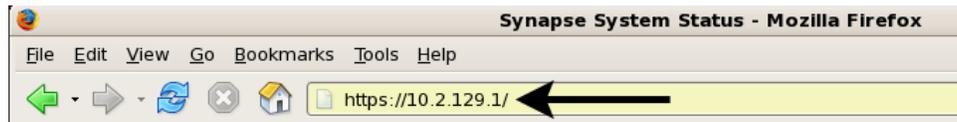
Nameserver

- Navigate to the ‘**System Actions**’ page (System > Reset/Power) and select ‘**System Reboot**.’ The reboot process will take approximately 2 minutes, select the ‘**Reboot Telestra System Now**’ button.



3.3. ACE-RIU Setup

1. Power on the ACE-RIU.
2. Using a Category 5 cable connect the Ethernet switch to **Eth1** on the Telestra.
3. On the ACE Studio, open RMS by opening the web browser and typing the Telestra IP address in the address bar.



4. In RMS, navigate to **Network > ACE-RIUs**.

All the connected ACE-RIUs are listed on this page and have green check marks under the 'Status' column, if there is a red 'X' under the 'Status' column there is a problem with the ACE-RIU.

Current System: SYNAPSE Logged in as admin · [Manage Users](#) · [Logout](#)

SYNAPSE Device List

Update Settings: [Name](#) [Number](#) [Latency](#)

Update Firmware: [ACE-RIU](#)

	Device Name	In Layout	F/W Version	Device Number	Latency Mode	Status	Message
4	RIU(s)						
	RIU1	■	2.2	7	Normal	✓	OK, MAC=00:1a:18:00:00:03
	RIU2	■	2.2	1366	Normal	✓	OK, MAC=00:1a:18:00:05:56
	RIU3	■	2.2	2052	Normal	✓	OK, MAC=00:1a:18:00:08:04
	RIU4	■	2.2	2003	Normal	✓	OK, MAC=00:1a:18:00:07:d3

5. Select each ACE-RIU name which displays the ACE-RIU channel information.

6. Select ‘Name.’ Rename each device RIU1, RIU2, RIU3, etc. as shown in the Hardware Installation diagram in section 2.1. **System Hardware.**

SYNAPSE Update Device Names

Important - save changes to the layout before pressing submit.

	Device Name	In Layout	F/W Version	Device Number	Latency Mode	Status	Message
4 RIU(s)	RIU1 ←	■ ■	2.2	7	Normal	✓	OK, MAC=00:1a:18:00:00:03
	RIU2	■ ■	2.2	1366	Normal	✓	OK, MAC=00:1a:18:00:05:56
	RIU3	■ ■	2.2	2052	Normal	✓ ■ ■	OK, MAC=00:1a:18:00:08:04
	RIU4	■ ■	2.2	2003	Normal	✓	OK, MAC=00:1a:18:00:07:d3

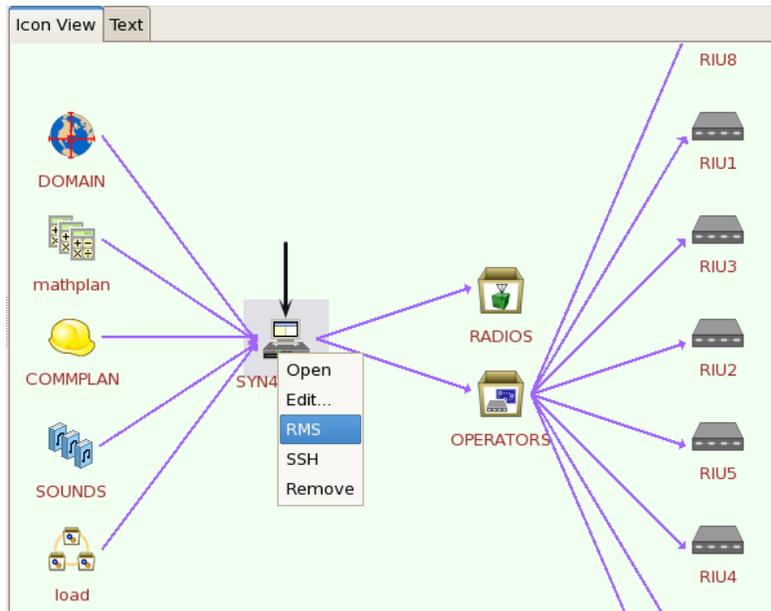
Apply Cancel

7. Return to the **System > Status** page and confirm the information for Eth0.

Optional: This page provides a system information section for user contact settings including description, contact email, installation facility, installation location, contact name, contact phone, and installation trainer. If desired, fill in the contact settings to identify your system.

8. Close the browser.

Hint: To open RMS from ACE Studio, right-click on the SYN4-WS-XX-X icon and select RMS.



4.0. SYSTEM SOFTWARE CONFIGURATION

The first step toward successful setup and integration of a Synapse system is coordination between all Synapse sites to ensure that critical communications parameters are defined. Follow the steps in this section to ensure proper configuration.

All software is pre-installed during factory system integration. Should you need to re-install the system software, please refer Appendix B Cold Start.

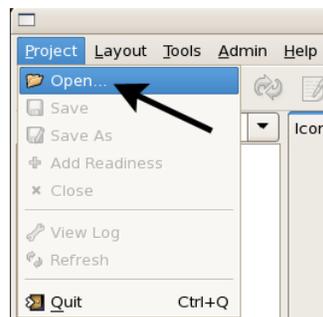
4.1. Creating a Layout in ACE Studio

Navigate to **Accessories > ASTi > ACE Studio** to open ACE Studio.

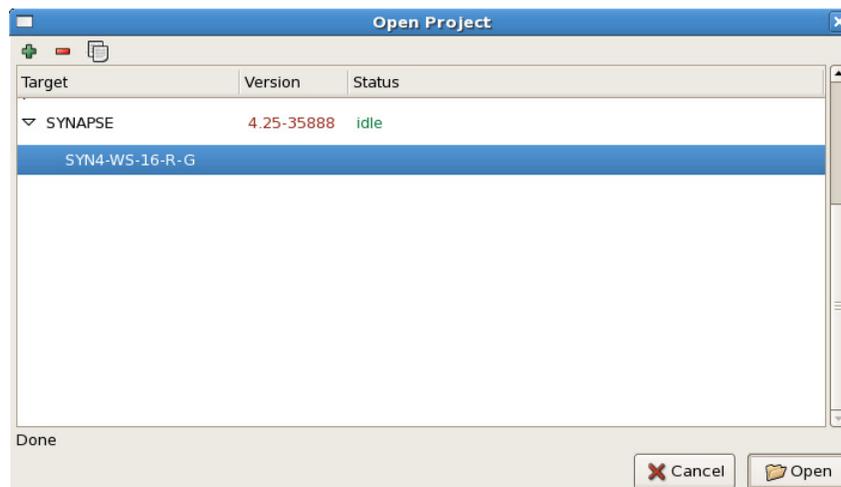


Step 1: Open Project

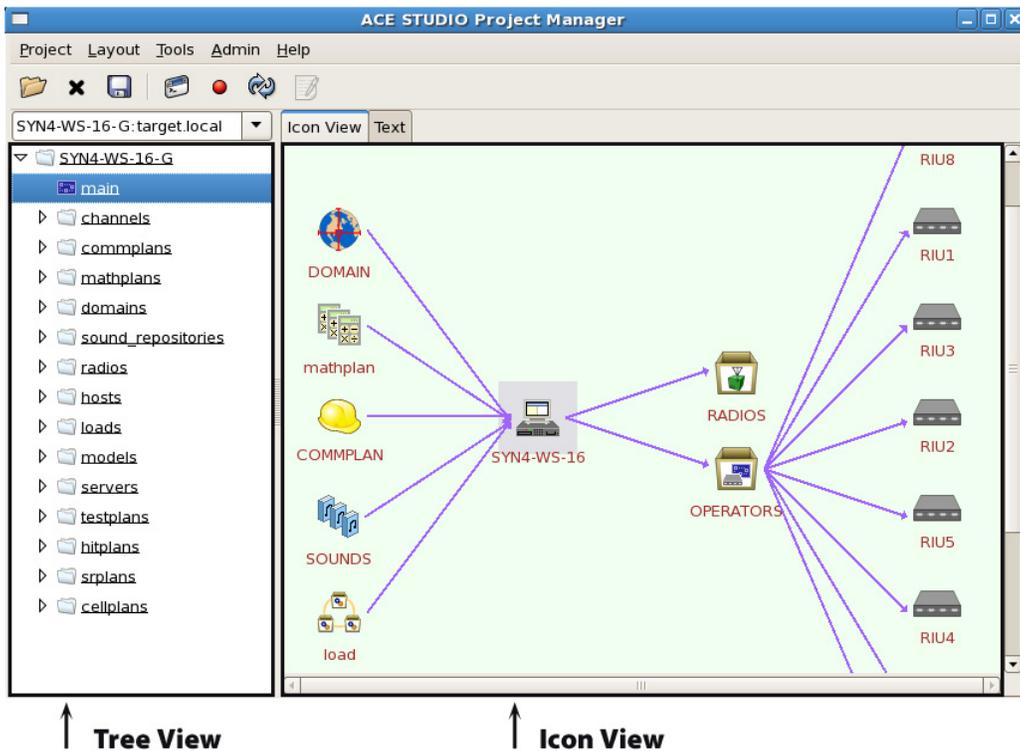
1. In the top left corner of the window, select **Project > Open**.



2. Expand the name of your system (`synapse.local`) by selecting the side arrow. This displays all the projects located on the system. Note: If you do not see your project listed you may need to restore your project from a backup.

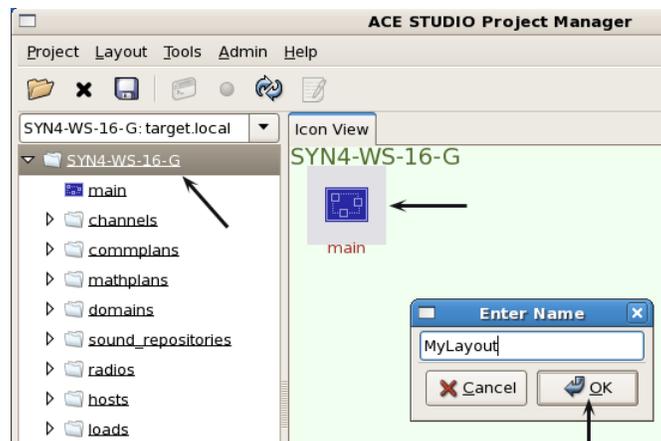


3. Select the project called SYN4 -WS-XX-X. This will open the Project.

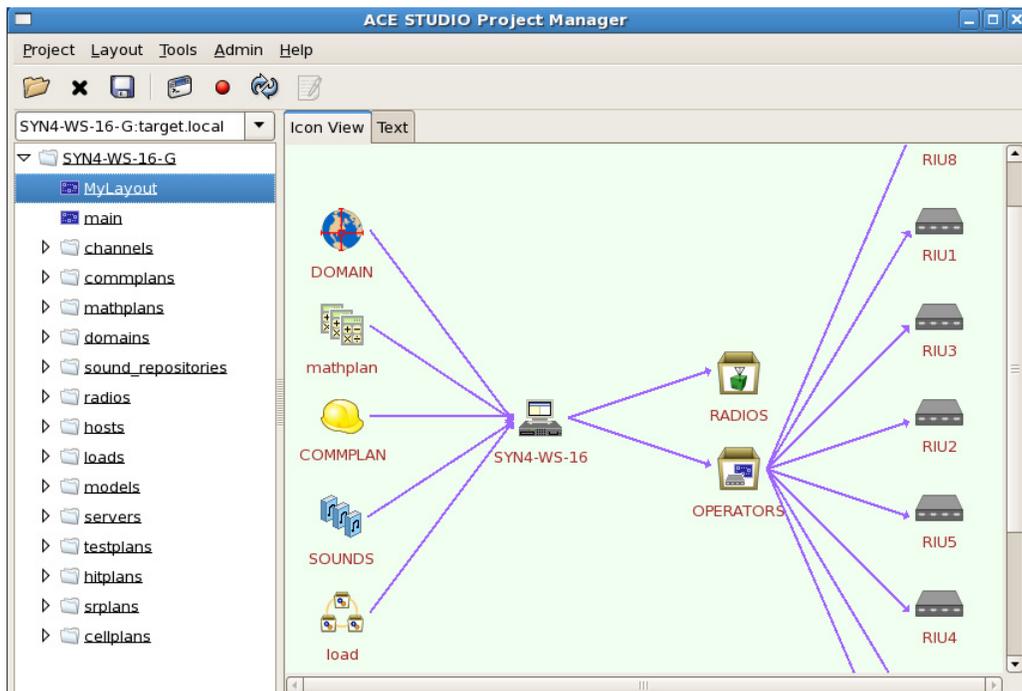
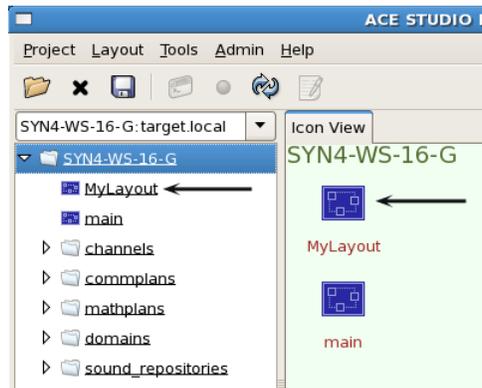


Note: In the remainder of this document the left column of folders is referred to as the ‘Tree View.’ The graphical layout view is referred to as the ‘Icon View.’

4. In the Tree view, click on the ‘SYN4-WS-XX-X’ folder. In the Icon view, right-click on ‘main’ layout and select ‘Clone’. Rename the project accordingly. This will keep your factory layout intact for future reference.



5. In the tree view, click on the new layout that was cloned from 'main'.

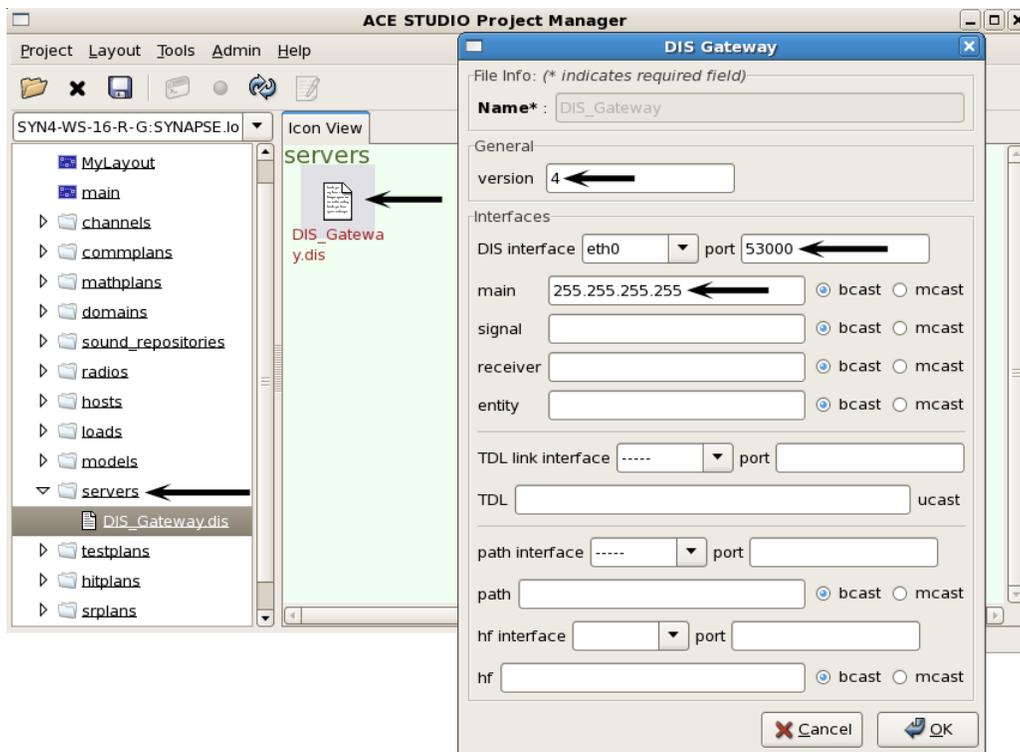


Step 2: Set DIS Gateway

1. In the Tree view, select the **Servers** folder.
2. In the Icon view, double-click the DIS Gateway. This opens the DIS Gateway window.
3. Fill in the DIS version number: 4, 5, or 6.
4. Select Eth0 for the interface and fill in a port number. The default port number is 53000.

Note: All of the Synapse systems on the DIS network must share a common DIS UDP Port number.

5. Next to '**main**' enter the multicast or broadcast address. This sets the outgoing destination address for packets on the DIS port.
6. Then select '**Ok**'.



Step 3: Set the Domain

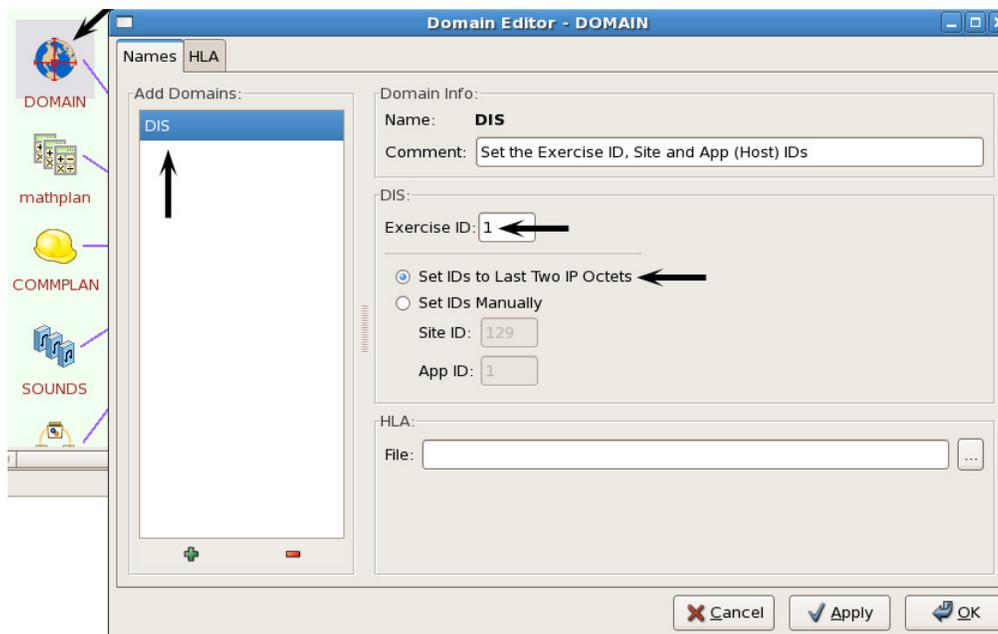
Important: Although the original ‘main’ layout was cloned and replaced, the Helper/Builder icons (Domain, CommPlan, Operators, Radios, etc.) in the new layout are still connected to the ‘main’ layout. If you make changes to any of the Helper/Builder icons in the new layout, the ‘main’ icons will also have these changes. In order to maintain the original layout, it is important to clone and replace the new layout Helper/Builder icons.

1. In the Icon View, right-click the Domain icon and select ‘**Clone and Replace**’ and rename it.
2. Double-click the **Domain** icon.
3. Under ‘**Add Domains**’ select ‘**DIS**’ Enter the DIS Exercise ID number.

Note that Synapse sites can only inter-communicate if they share the same DIS exercise ID.

4. Select to ‘**Set IDs to Last Two IP Octets**’ to automatically set the Site and App IDs.

Each Telestra on the network must have a unique set of DIS IDs.



Step 4: Set up the Comm Plan

Note: Comm plan will have pre-filled libraries for customer ease.

1. In the Icon View, right-click the Comm Plan icon and select ‘Clone and Replace’ and rename it.

1. Double-click the Comm Plan icon to open it.
2. Select the **Net** folder and then select the ‘net’ list.

Important: Do not change the Net names in the list.

3. Configure each Radio Net with a Frequency, Waveform, Crypto, Frequency Hop, and Satcom.

4. Select ‘Ok.’

The screenshot shows the 'Commplan Editor - COMMPLAN' window. At the top, there is a diagram with icons for 'COMMPLAN', 'SYN4-WS-16', 'RADIO', and 'RIU2'. Below the diagram is a tree view on the left with folders: 'Fill', 'Net', 'Waveform', 'Crypto', 'Frequhop', 'Receivergain', and 'Satcom'. The 'Net' folder is expanded, and a 'net' file is selected. The main area is a table with the following columns: Name, Frequency(Hz), TxFrequency(Hz), WAVEFORM, CRYPTO, FREQHOP, and SATCOM. The table contains 16 rows of radio configurations.

Name	Frequency(Hz)	TxFrequency(Hz)	WAVEFORM	CRYPTO	FREQHOP	SATCOM
RADIO01	101,000,000		waveform.FM-MULAW	crypto.CIPHER1	Off	Off
RADIO02	102,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO03	103,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO04	104,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO05	105,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO06	106,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO07	107,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO08	108,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO09	109,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO10	110,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO11	111,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO12	112,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO13	113,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO14	114,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO15	115,000,000		waveform.FM-MULAW	Off	Off	Off
RADIO16	116,000,000		waveform.FM-MULAW	Off	Off	Off

At the bottom of the window, there are buttons for 'Cancel', 'Apply', and 'OK'. The status bar at the bottom left says 'Opened Commplan 'COMMPLAN''.

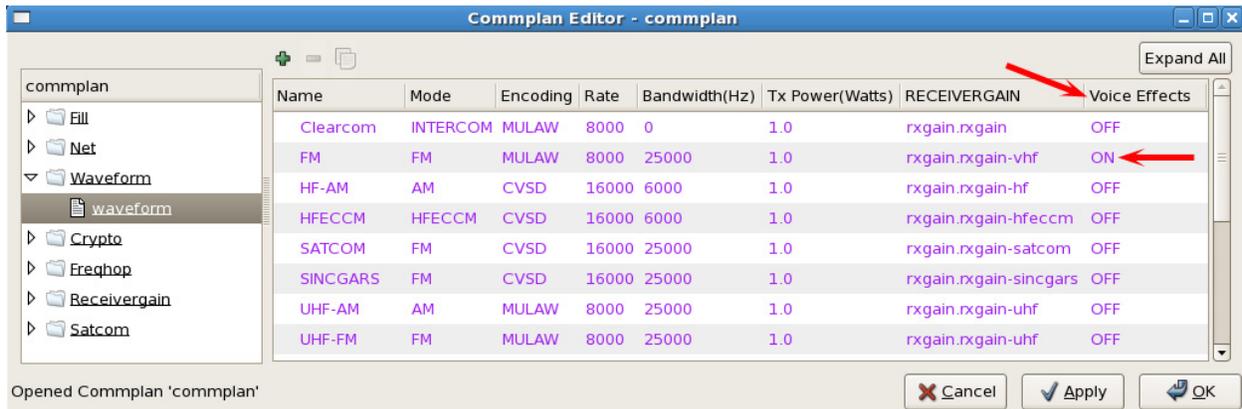
Optional: Set Voice Effects

Voice effects add filtering and distortion to the output audio path of a receiving radio to create a realistic radio sound. This is a receive-side effect and does not effect radio transmissions. The voice effects are enabled inside specific waveforms; waveforms are managed in the Studio Complan tool.

For example, if you enable voice effects in the FM waveform, all radios tuned to a net configured with the FM waveform will experience voice effects upon reception.

To apply voice effects:

1. In the Complan, go to the Waveform list and select a waveform.
2. Select 'ON' in the 'Voice Effects' column. Select 'Apply' and 'Ok.'
3. In the Complan, go to the Net list and select a net that you want to enable for voice effects. Select 'Apply' and 'Ok.'



Step 5: Set Up the Radios

1. In the Icon View, right-click the Radios icon and select “Clone and Replace” and rename it.
2. Double-click the Radios icon to open it.
3. Under ‘**Radio Name**’ select Radio: Radio1. Under Settings set the Domain by selecting the ‘...’ box, select the Domain from the drop down list.
4. Under Exercise ID select ‘**Set IDs from Domain.**’
5. Set the Entity ID and Radio ID.
6. Select the Fill, Crypto Library, and World Position.
7. Check the HHT box and enter an identifier for each radio.

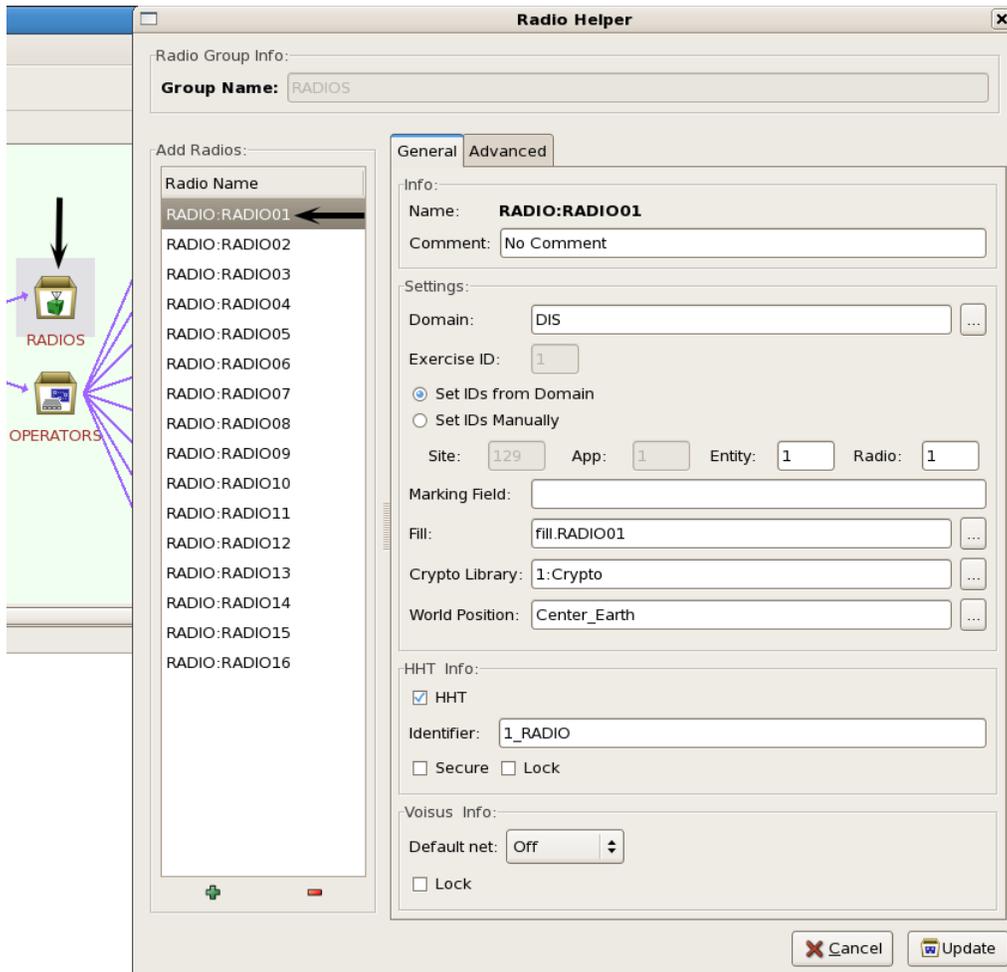
Each radio has a number as an identifier, do not change this number. The number is what the operator will view as the radio identifier on the HHT screen. So Radio2’s identifier is 2_Radio, Radio3 is 3_Radio, etc.

8. Do not change the Identifier.

Important: ASTi does not recommend changing the radio identifier unless absolutely necessary. Changing the identifier will affect the operation of your software. If your system requires an identifier change, please contact ASTi for support instructions.

9. *Optional:* Check the ‘**Secure**’ box to initialize the radio in a secure (crypto) state. Use this feature only if all three of these conditions are true:
 - The radio’s Fill contains a Net that is set to a radio-related waveform, such as AM or FM, but not an intercom.
 - The radio’s Fill contains a Net with crypto.
 - You want the radio to initialize in the secure state.

Check the ‘**Lock**’ box to disable the HHT operator’s ability to change the radio secure state.

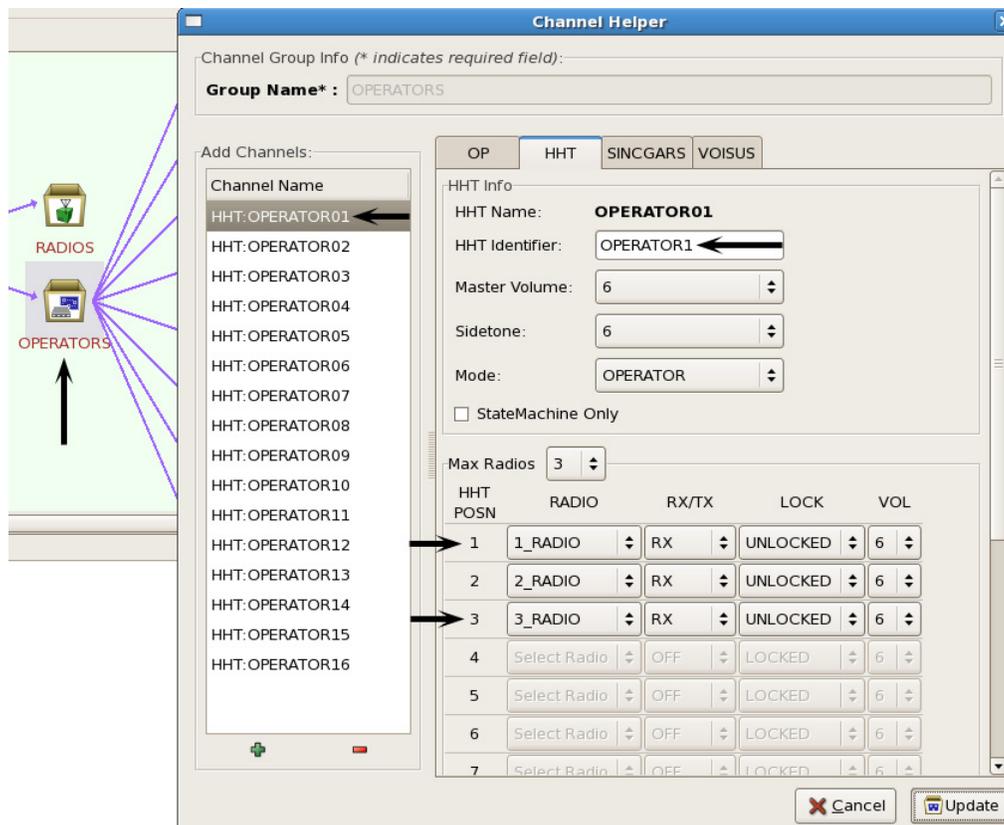


Step 6: Set up the Operators

1. In the Icon View, right-click the Operators icon and select '**Clone and Replace**' and rename it.
2. Double-click the Operators icon to open it.
3. Select an Operator under '**Channel Name.**' Note: Next to '**HHT Identifier**' the radio names will appear as changed previously in Step 6.
4. Master Volume and Sidetone default to 7. Master Volume sets the main level for all receptions, while Sidetone Volume sets the level for own-voice feedback during net transmissions.
5. Set the **Max Radios** number. This sets the maximum number of radios the operator will have access to.
6. Set the **Rx/Tx**. ASTi recommends setting most radios to Rx, multiple radios set to Rx/Tx may cause confusion.
7. Set the **Lock**. Lock prohibits the operators ability to change the Rx/Tx status.

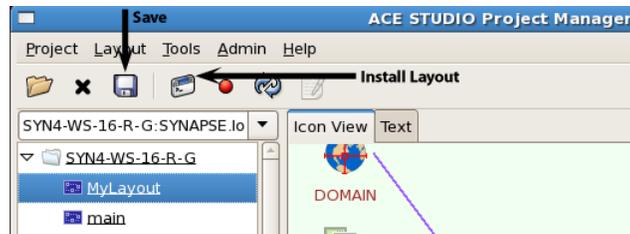
For example, Operator 1 has access to 3 radios. Two of those radios are Rx only and are locked. The operator cannot transmit on these two radios. The third radio is unlocked, therefore the operator can change the Rx/Tx settings, if desired.

8. Set the **Volume**. Sets the volume for each individual radio.

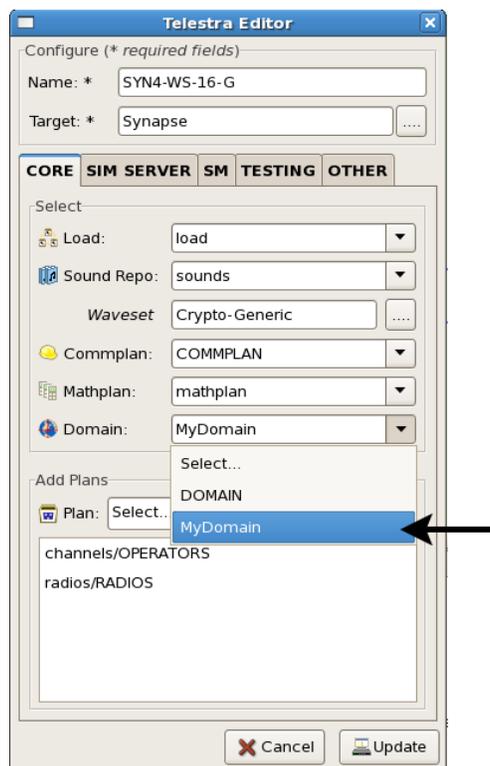


Step 7: Save and Install

1. Select the **Install** icon to save the layout and start using it immediately.
2. Select the **Save Project** icon to save it for later use.



Hint: If for some reason the Domain or Complan are not attached to your Synapse in the Layout, you can reassign them to the Synapse under the ‘Telestra Edit’ as shown below.



5.0. OPERATOR STATION CONCEPTS

5.1. Operator Station Overview

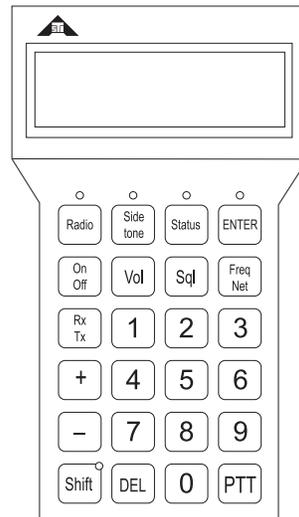


Figure 5: Operator Station HHT Device

The Operator Station features audio and control devices that provide a complete operator interface to the DIS network communications environment. The standard Synapse Workstation system includes sets of Operator Station ancillaries, including for each operator: a headset with mic and adapter cable and a Handheld Terminal (HHT) control device.

Operator stations may include optional headsets, mics, speakers and PTTs.

The HHT provides runtime communications control settings (volume, sidetone, receive and transmit access) for the specific operator position.

The Channel Helper - Operator settings provide pre-set values for the HHTs. At system startup, these values are automatically read into the software application running on the Telestra and to the HHT display. These settings include:

- **Master Volume:** overall reception volume
- **Sidetone Volume:** “own-voice” volume for transmissions
- **Radio Volumes:** individual reception volume settings for each radio
- **RX/TX:** Set Comms status for Receive Only, Transmit and Receive or Off, for each radio
- **Lock:** Grants comms status change privileges to the HHT operator. If locked, it disables the HHT operator's ability to change the comms status (receive, transmit or off) for each DIS radio. This means that the presets loaded from the software configuration cannot be changed by the operator.

Once the system is started, the HHT display shows the operator’s communications status, as loaded from the software configuration. This main display is called the Status Page. This page shows information relating to the DIS environment, from the operator’s vantage point.

The top line of the Status Page contains the identifier position, for example: “A_OPERATOR”.

The second line contains a line of letters representing each DIS radio. The letters are the identifiers for each radio.

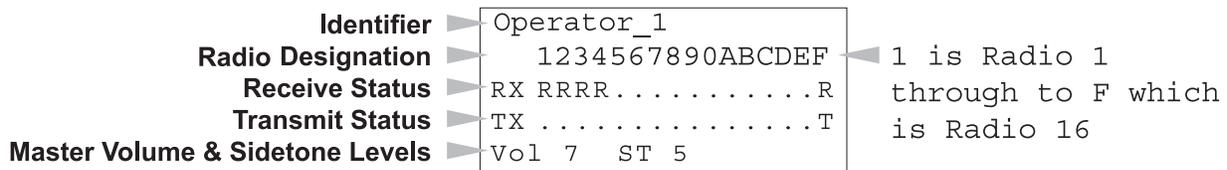
The third and fourth lines of the display are: receive (RX) and transmit (TX) lines. Access to each radio is represented by a symbol showing its current state.

- A radio selected for receive and transmit is represented by a R in the RX line and a T in the TX line.
- Receive only is shown as a R in the RX line and a period (.) in the TX line.
- If access to the radio is disabled (Off in the software configuration), the display shows a period in both the TX and RX lines for that radio.

Example: For a system with these presets:

- Status = Receive Only for radios 1 through 4.
- Status = Off for radios 5 through 15.
- Status = Receive and Transmit for radio 16.
- Master Volume = 7
- Sidetone Volume = 5

The HHT Status Page displays:



HHT Communications Activity Indication

When the operator is transmitting, the active radio Designator number(s) on the HHT changes to an asterisk (*) and the red LED located above the ENTER key blinks.

When the operator is receiving, the active radio designator number(s) on the HHT change to an asterisk(*) and the red LED located above the STATUS key illuminates.

5.2. Operator Station Operation

Operator Station communications parameters can be set using the HHT keys after the system is running. The user can modify the following parameters: Master Volume, Radio Volume (for each radio), Sidetone, Radio Access - Receive, Receive and Transmit or Off.

The user's ability to use the HHT to change the Receive and Transmit access to specific radios may be disabled through the lock in the Operator settings. HHT controls that may be effected by the lock are specified in the following sections.

HHT Keypad Operation

Master Volume

From the main Status screen, press  then either press the numeric key 0-9 for the desired volume, or ramp up or down using  and  followed by .

```
Operator 1
Volume: 5
```

Sidetone

From the main Status screen, press  then either press the numeric key 0-9 for the desired sidetone, or ramp up or down using  and  followed by .

```
Operator 1
Sidetone: 5
```

Transmit and Receive Access (Lock command disables)

The operator can also select a particular radio for transmission and any series of radios for passive monitoring. This can be accomplished most simply by use of the “hot keys” described later. An alternative method is to use ,  and  keys while in the Radio Status page.

Pressing  will bring up the Radio Status page. The radio displayed will default to the last radio selected by a hot key sequence or the first radio if no hot key sequence has been used.

```
1_Radio
  Status: OFF
  Volume: 5
```

Pressing  from this screen will toggle the mode of that radio (shown in the “Status” field) between OFF (silent) and RX.

Pressing  will toggle the mode of that radio between RX and RX_TX.

HHT Controls Overview

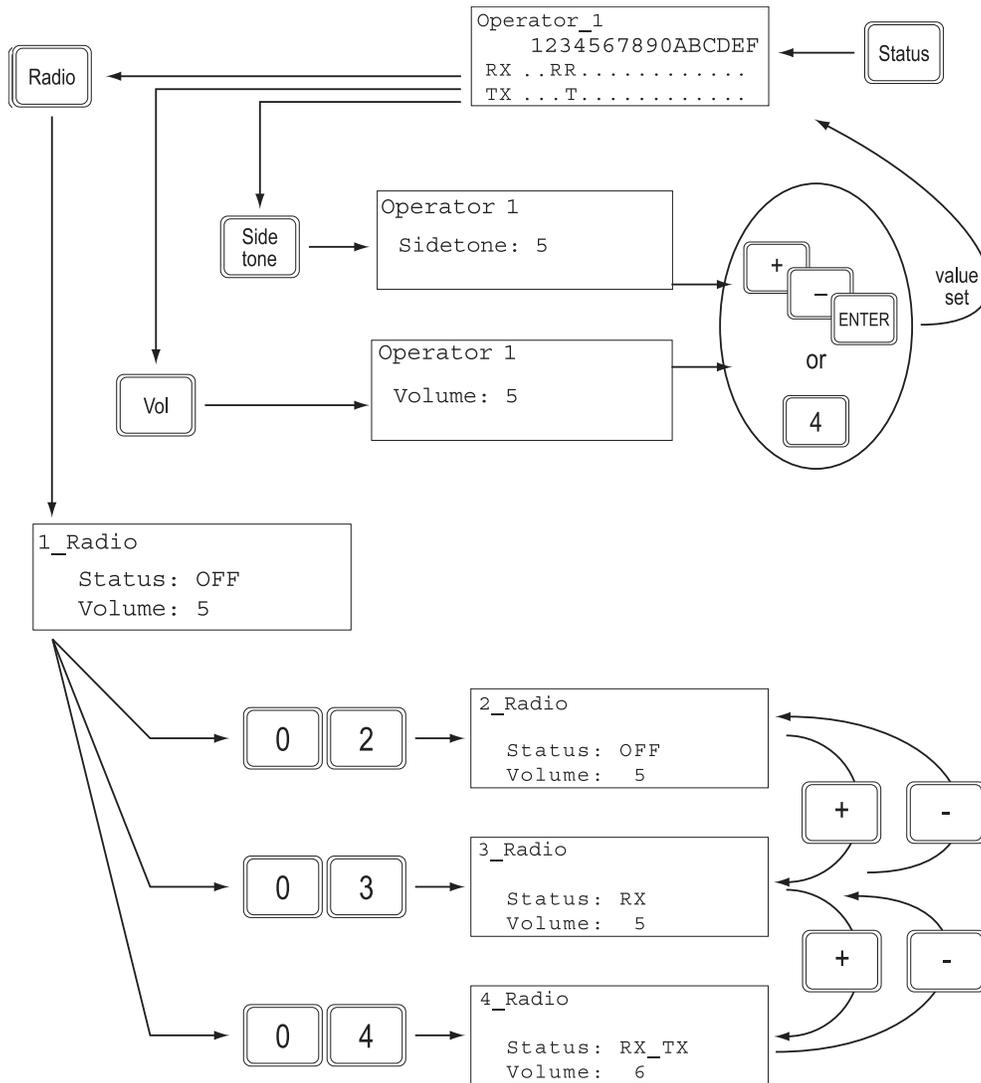
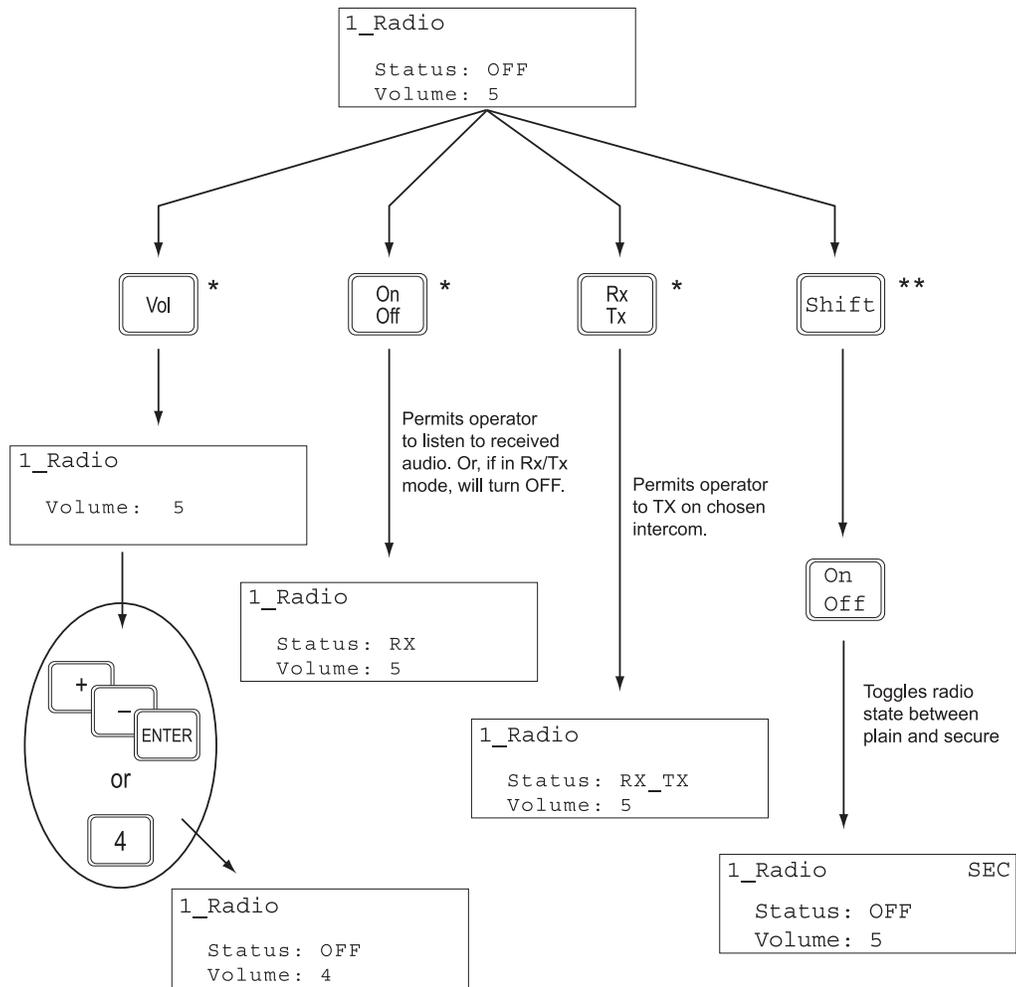


Figure 6: HHT Operation (Main Status Page)



* This control affects how individual operator audio is routed (and its level) to/from a simulated radio.

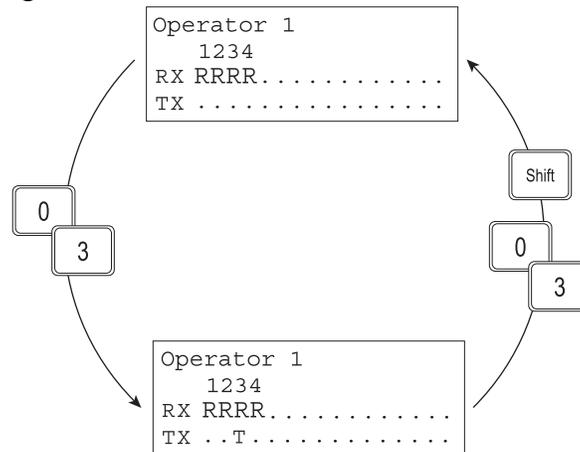
** This control affects operation of simulated radio. See Chapter 4.1, Step 6 for more information on the Secure Radio feature.

Figure 7: HHT Operation (Radio Status Page)

Hot Keys (Lock command disables)

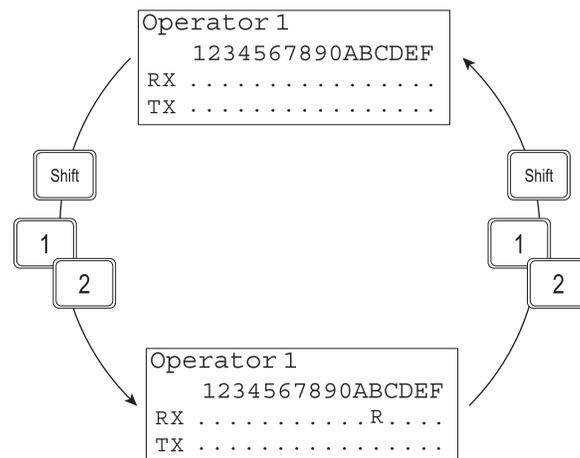
This Main Status Page mode employs a “hot key” concept to access the most frequently required functions:

To select a particular radio to Transmit and Receive, press the two-digit number (e.g., 01, 02, 15, etc.) of the radio from the Status Page. To turn off a Transmit/Receive radio, press **Shift** followed by the two-digit radio number.



Note: Use of the hot key method for selection of transmit status selects only a single radio for transmission at any one time. Using the method described in the previous section, an operator may select multiple radios for simultaneous transmission.

To select additional radios to be monitored in the Receive-Only mode, press **Shift** followed by the two-digit radio number. To turn off a Receive-Only radio, press **Shift** followed by the two-digit radio number again.



5.3. Push to Talk (PTT) Operation

Activating an operator's PTT switch (either from the HHT or a discrete hand or foot switch) connected to the ACE-RIU will key transmissions for all DIS radios selected for Transmit and Receive access (shown as T and R on the HHT display, respectively).

Specific PTTs control the activation of specific microphones:

OP #	ACE-RIU ADDR	PTT SOURCE:		MIC SOURCE	NOTES
		HHT –OR–	Discrete PTT Channel		
1	1	HHT, Serial Port A	Channel A or B	Channel A or B	SYN-WS-04, -08, and 16
2	1	HHT, Serial Port B	Channel C or D	Channel C or D	SYN-WS-04, -08, and 16
3	2	HHT, Serial Port A	Channel A or B	Channel A or B	SYN-WS-04, -08, and 16
4	2	HHT, Serial Port B	Channel C or D	Channel C or D	SYN-WS-04, -08, and 16
5	3	HHT, Serial Port A	Channel A or B	Channel A or B	SYN-WS-08 and -16
6	3	HHT, Serial Port B	Channel C or D	Channel C or D	SYN-WS-08 and -16
7	4	HHT, Serial Port A	Channel A or B	Channel A or B	SYN-WS-08 and -16
8	4	HHT, Serial Port B	Channel C or D	Channel C or D	SYN-WS-08 and -16
9	5	HHT, Serial Port A	Channel A or B	Channel A or B	SYN-WS-16 Only
10	5	HHT, Serial Port B	Channel C or D	Channel C or D	SYN-WS-16 Only
11	6	HHT, Serial Port A	Channel A or B	Channel A or B	SYN-WS-16 Only
12	6	HHT, Serial Port B	Channel C or D	Channel C or D	SYN-WS-16 Only
13	7	HHT, Serial Port A	Channel A or B	Channel A or B	SYN-WS-16 Only
14	7	HHT, Serial Port B	Channel C or D	Channel C or D	SYN-WS-16 Only
15	8	HHT, Serial Port A	Channel A or B	Channel A or B	SYN-WS-16 Only
16	8	HHT, Serial Port B	Channel C or D	Channel C or D	SYN-WS-16 Only

APPENDIX A: SYNAPSE ACE-RIU TECHNICAL SPECS

General Information

The ACE-RIU has a special configuration when used with the Synapse Workstation. The ACE-RIU is labeled as “ACE-RIU” on the bottom of the device.

Note that the ACE-RIUs for radio transceivers used with the Synapse Bridge are labeled as “Radio ACE-RIU” on the bottom of the device. These ACE-RIUs are configured differently and will not work properly with the Synapse Workstation.

A packaged ACE-RIU weighs 1.5 lbs. The power supply included with the ACE-RIU weighs 0.5 lbs. 19”, 1U high rackmount kits are available. Each kit will hold 3 ACE-RIUs.

Each ACE-RIU is pre-configured at the factory, prior to shipping. If you have any concerns that the internal settings of the ACE-RIUs have been changed from the factory settings, open the ACE-RIU case and check the settings before starting the system.

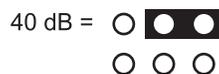
Configure the hardware settings for each ACE-RIU using the following guidelines.

The internal jumpers are accessed by removing the two faceplate screws on the ACE-RIU front face, removing the faceplate and bezel and sliding the top cover off. **IMPORTANT:** This operation must be performed at an approved ESD station to avoid damaging the equipment and voiding the manufacturer warranty.

ACE-RIU internal jumper settings:

DESCRIPTION	JUMPER SETTING	”Operator ACE-RIU”
Input Gain, Channel A	J1	40 dB
Input Gain, Channel B	J2	40 dB
Input Gain, Channel C	J3	40 dB
Input Gain, Channel D	J4	40 dB
Output Coupling, Channel A	J5	OPEN
Output Coupling, Channel B	J6	OPEN
Output Coupling, Channel C	J7	OPEN
Output Coupling, Channel D	J8	OPEN

Jumper guide for J1 through J4:



Connector Information

Power Supply: 2.1mm socket, center positive

Serial connections A & B: RJ-12 jacks

1 = TX+ 4 = RX-
 2 = TX- 5 = +5 VDC
 3 = RX+ 6 = Ground

RJ-45 Jacks

1 = RX+ 5 = SYN+
 2 = RX- 6 = TX-
 3 = TX+ 7 = SCK+
 4 = SYN- 8 = SCK-

Channels A, B, C, & D: 9-pin, female, subminiature 'D' connector

1 = Digital Out + 6 = Digital Out-
 2 = Audio Out, Hi 7 = Audio Out, Lo
 3 = Digital In + 8 = Digital In- (I/O GND)
 4 = Audio In, Hi 9 = Audio In, Lo
 5 = Chassis Ground

Power Supply

The ACE-RIU is powered by an individual power supply included with shipment.

Input to PSL-UM-001	100-240 VAC, 50-60Hz, 1.5Arms (120VAC), 0.75 Arms (240VAC)
Power Connector	Inside Diameter 0.100", Outside Diameter 0.218", locking, center positive
Power Consumption	15 VDC, 2 A

The power adapter inlet connector is an IEC320 type C14, requiring a matching cordset equipped with an IEC320 C13 connector (female line cord).

APPENDIX B: COLD START

Should you need to re-install the system software, please refer to the ASTi Synapse Cold Start and Installation Manual (DOC-01-SYN4-CSI-1).

Refer to the ASTi web site to download the ASTi Synapse Cold Start and Installation Manual and other Synapse documentation.

<http://www.asti-usa.com/support/document/synapse.html>

APPENDIX C: SAFETY and HANDLING

This section must be read completely and understood before using the Synapse Workstation. If you are unsure of any information presented please contact ASTi.

The following safety precautions must be observed when performing any operation and maintenance tasks associated with the ASTi Synapse Workstation. These safety precautions are necessary to prevent injury to personnel and damage to equipment.

Warning: Potentially fatal voltages are present in the Synapse Workstation. Before removing, or replacing any component, ensure that ALL electrical supplies have been turned off and electrical power cords disconnected from the platform.

The following disclaimer is provided regarding use of the Synapse Workstation. The disclaimer applies to all parties using the system in any situation or configuration. This disclaimer should be read and understood completely before using the system.

Disclaimer: The Synapse Workstation is a sound production device. The user, by the act of installing and using the Synapse Workstation and any associated equipment such as external amplifiers, headsets, speakers, etc., warrants and represents that he/she is aware that excessive audio levels can cause permanent hearing impairment and that he/she assumes full responsibility for configuring all equipment including hardware and software to achieve safe operating sound pressure levels under all conditions.

Equipment Handling: All platform circuit boards and modules are sensitive to electrostatic discharge (ESD). To avoid damage to system equipment, proper ESD procedures should be followed when handling all equipment. Ensure that all work is performed at a properly grounded ESD workstation. In addition, all personnel handling equipment should be properly grounded.

When transporting or shipping individual modules, equipment should be fully enclosed in an anti-static bag. *ASTi is not responsible for equipment damage due to improper handling.*

APPENDIX D: WARRANTY AND CUSTOMER SUPPORT

Warranty

ASTi provides a one year limited warranty on all ASTi equipment covering all parts and labor.

In the case of equipment upgrades, warranty applies to original date of shipment of individual components.

Other commercial equipment purchased or provided such as monitors, amplifiers, speakers, fiber optic links, etc. are also covered under the one year warranty unless otherwise stated.

The warranty does not cover improper equipment handling or improperly packaged returns.

Extended warranties are available. Contact ASTi for details (703) 471-2104.

Repairs and Returns

If it becomes necessary to return equipment to ASTi, please observe the following instructions:

Obtain an RMA number through ASTi's website: <http://www.asti-usa.com/support/>

When packaging the equipment in question, make sure it is well protected. The device should be properly enclosed in an antistatic bag to prevent possible ESD damage. Failure to properly package the equipment during shipping could void the warranty.

Do not include accessory pieces such as rackmount kids, power supplies or software. Only send items that do not work.

The shipping label must include the RMA number.

Include a description of the problem, point of contact, phone number, return address and unit serial number(s). Failure to include this information could extensively delay the return of the equipment.

Evaluation of equipment is performed free of charge. No work will be done without prior customer approval. Customer is responsible for shipping charges to ASTi for warranty and non-warranty repairs.

If an RMA number is not used within thirty (30) days of issuing date, the request data and number issued will be closed and designated as unused.

Any items received from customers without RMA numbers or appropriate contact information included with shipment will not be tested. After sixty (60) days, ASTi reserves the right to scrap all hardware received in this condition.

If the equipment is not under warranty a Purchase Order will be required to cover the cost of any repairs. ASTi will provide a quote for all non-warranty repair items.

Equipment will be shipped back using Federal Express, unless otherwise directed. If the repair is non-warranty then shipping charges will be billed.

International customers must include the correct product value on all shipping documents. Contact ASTi for proper harmonized tariff codes. The customer is responsible for all duties, taxes and fees incurred in shipment of the equipment.