Observer RPM

Admin Guide

Software Release 7.0

Document 04/09/13

1. INTRODUCTION

1.1. PRODUCT OVERVIEW

Volicon's Observer Remote Program Monitor (RPM) system is a powerful toolset for automated media monitoring and quality assurance in broadcast and cable networks, including features such as:

- Automated monitoring and diagnosis of multichannel broadcasts
- VOD and interactive service monitoring
- Media recording of scanned channels
- Manual viewing/diagnostics and remote system tuning

A Central Server (CS) web-based application is used for setup and user management, which means that a standard TCP/IP connection is all that is needed to have remote access to the RPM's administrative features.

1.2. ABOUT THIS GUIDE

The "Observer RPM Admin Guide" is intended for system and network administrators in charge of systems configuration and in need of additional information not found in the "Observer RPM User Manual"; the latter covers the common Observer RPM monitoring operations.

Please note that RPMs may be used with a standalone CS and one or more probe servers. If you need to install and configure the CS and Probe hardware, please refer to the "Observer Admin Guide" for details. For instructions on how to physically install the RPM probe in an equipment rack, please refer to the "Observer Site Prep Guide".

This guide explains how to build the RPM database in configuring a list of services that the RPM will monitor; how to setup alert thresholds for the services and to configure scripts for the more complex service monitoring functions.

1.2.1. *Definition of Key Terms*

Element/term name	Description
Central server/ Web server	In addition to web services, it provides centralized database, probe configuration and user administration. It is installed on a separate server unless there are very few probes in the system to manage.
Probe server/ Encoder server	Hardware chassis capable of accepting one, toup to eight encoder modules. Includes embedded software to manage chassis functions.
Encoder/scanner	Module installed in probe chassis, used to analyze video and media data. Dials/scans multiple channels to monitor them for media faults. May be purchased with optional software modules that enable other features.
Media fault	Detected when media content falls outside of the operational limits for audio, video and closed captioning
Operational limits	Parameters defined in scripts, e.g., thresholds and timeouts
Broadcast service/ Service	Content of network service perceived by the end user. Typically a cable or broadcast channel or a specialty/interactive service.
RPM service/Service	Automated function that refers to and interacts with a broadcast service. RPM service is also referred to as a service
Lineup	Administrator defined sequence of services for a scanner to monitor
Scan cycle	Monitoring all the services in a lineup to detect media faults and then getting ready to repeat the cycle through the complete lineup of services
Reviewer	An encoder used to validates the results of a scanner
Alert	Email and/or SNMP notification event in response to detecting media or system faults, if enabled to send an alert
SNMP trap	An alert sent to an external system through an SNMP protocol(used in general to manage devices on IP networks)
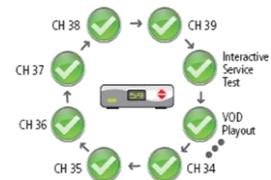
1.3. SYSTEM OVERVIEW

The Observer RPM system consists of a central server and one or more probe servers, these are often deployed in various strategic locations in the service provider's operations, such as in the network management center, the operations center or in unmanned remote distribution hubs.

Probes are the building blocks of the system providing the physical housing for the encoder modules and related software. When broadcast and cable TV networks cover broad geographic areas requiring many encoder modules, the RPM system administrator often organizes the probes into related groups.

The CS interfaces the system to the web client machines (client PCs). Usually the administrator configures the web and probe server addresses and other parameters related to various functions of the system.

The following figure illustrates a simplified RPM deployment showing an example of the various components.
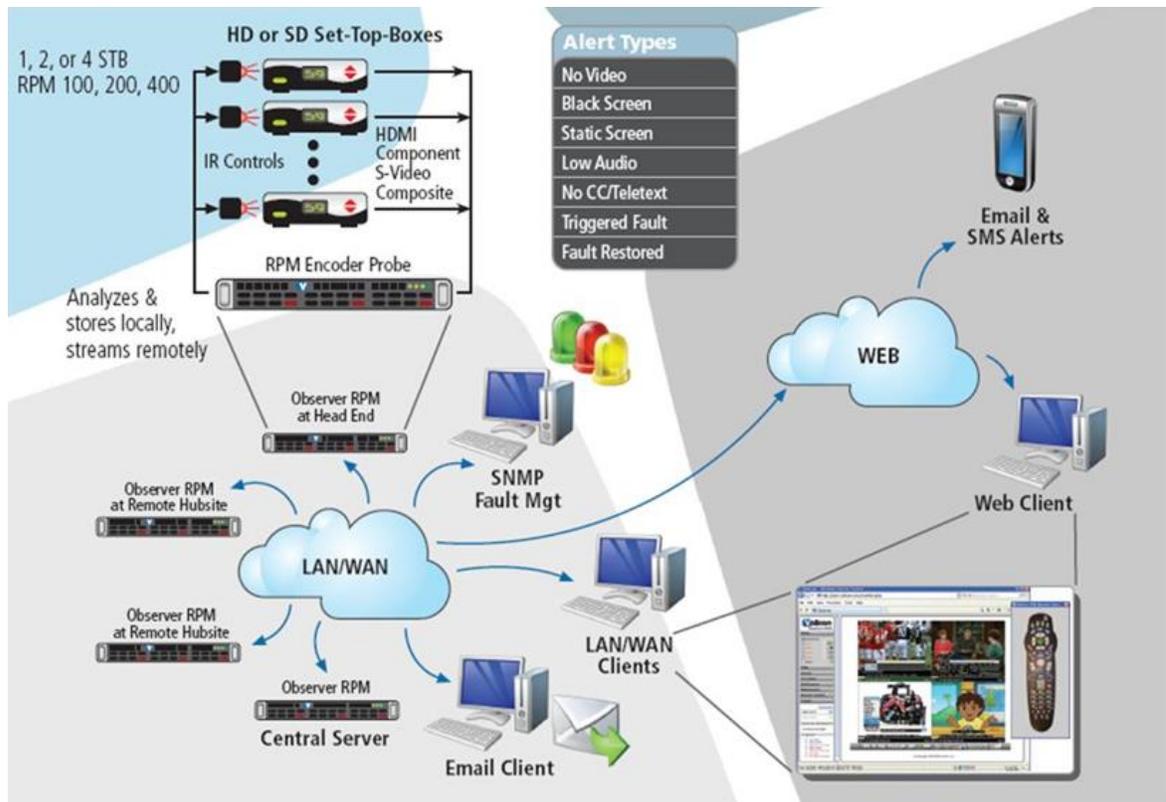

Figure: RPM system components in a typical network

Once configured, the RPM constantly records video inputs through its Probe/Encoder servers and monitors channels for various failures. It is done by scanning, issuing channel change commands to each Set Top Box (STB), thereby allowing the RPM to monitor all of the available channels on a rotating basis. When faults are found the system alerts the user through email messages and SNMP traps. Accessing the RPM is possible via a standard internet TCP/IP and is entirely web-based.

1.3.1. *Observer RPM Interface to Broadcasting*

The RPM systems interface with the broadcast network/streams through the encoder modules. The physical interface needs to be setup properly with the same parameters as the broadcast network to match it. The Observer can only monitor one broadcast program/service per stream. This section of the manual is referred to as "Stream level configuration".

The RPM has additional functions to monitor various broadcast programs per stream by scanning the related services. This section of the manual is referred to as "Organizing services for scanning".

2. ORGANIZING SERVICES FOR SCANNING

The scanning configuration comprises of the following elements:
- RPM Services
- Scripts
- Lineups
- Bouquets

This chapter includes procedures for creating services and assembling them to build lineups and bouquets. A service is associated with test methods (script and schedules). A lineup contains service sequences assembled to scan channels. During operation, bouquet translates services to channel numbers for a specific area STB. The chapter also describes how to import/export bouquets and lineups to and from text files and spreadsheets.

In the RPM system, a lineup is a collection of services/programs to monitor (radio and video channels, etc.) and their associated test methods (scripts) and schedules. A lineup includes the order in which to dial services, what to test, when and how often to test the service in the monitoring cycle (schedule and recurrence). The RPM system offers scripting capability empowering you to create advanced monitoring plans in your operations.

In a bouquet the association of a service and a dial number is often only valid for a specific city or neighborhood. That means that in another area, the same service could be accessed with a different dial number. In order to manage the service and dial number associations for the RPM Observer, you can create several different bouquets that cover the areas your operation is monitoring.

Once defined, you can assign a specific lineup and bouquet to each encoder in the RPM probes. This enables the encoder to dial any service that is offered in its area in a way that mimics the channel mapping that a customer would use on his set-top box.
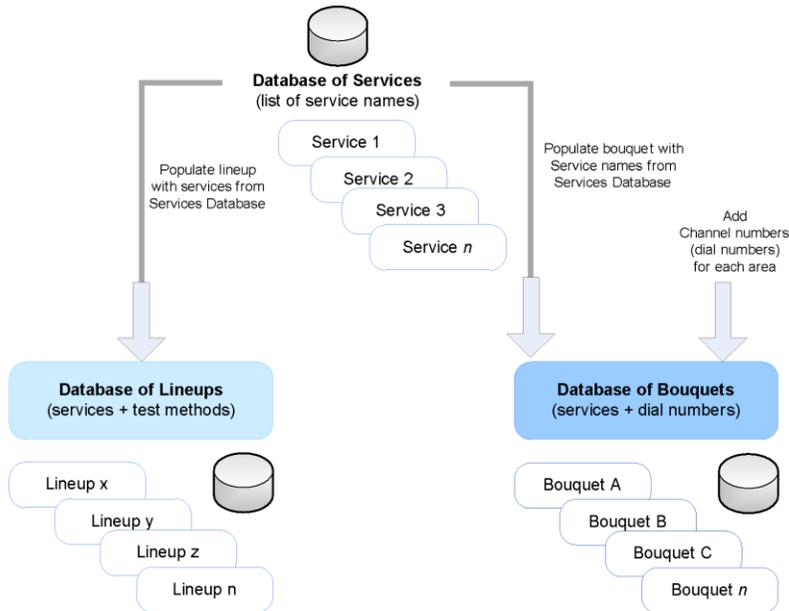
2.1. MANAGING SERVICES

The global services database table contains the list of system services and their associated parameters. These parameters act as default values when creating or imp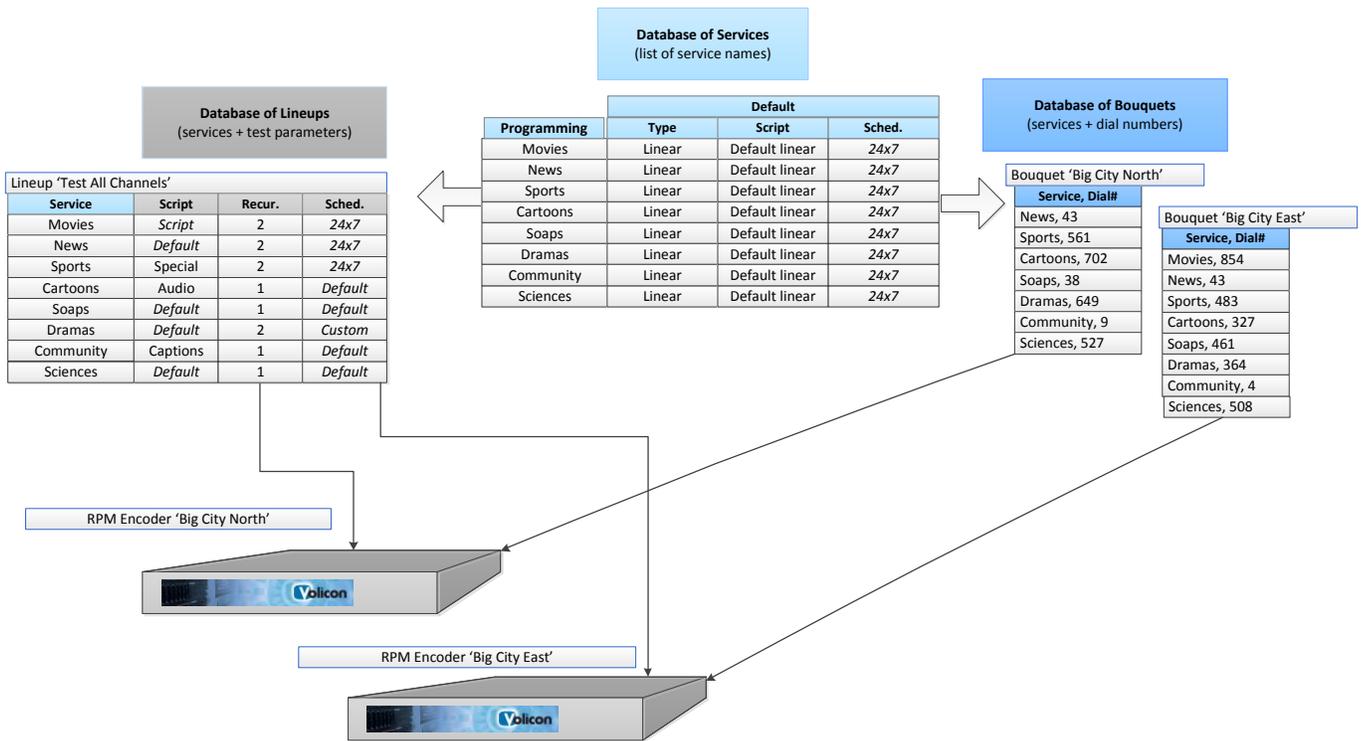orting lineups. Since the imported files contain only the list of service names, the remaining lineup parameters are added from the global services table.

The global services table, lineup and bouquet tables provide additional information allowing each RPM encoder to respond appropriately when a service is invoked during scanning. The lineup table relates services with test parameters and methods. The bouquet table associates services with dial numbers. During scanning the lineup table points to service tests to perform, while the bouquet translates the services to channel numbers to dial for the particular areas.

Database of Services
(list of service names)

Database of Lineups
(services + test parameters)

Database of Bouquets
(services + dial numbers)

Lineup 'Test All Channels'

Service	Script	Recur.	Sched.
Movies	*Script*	2	*24x7*
News	*Default*	2	*24x7*
Sports	Special	2	*24x7*
Cartoons	Audio	1	*Default*
Soaps	*Default*	1	*Default*
Dramas	*Default*	2	*Custom*
Community	Captions	1	*Default*
Sciences	*Default*	1	*Default*

| Programming | Default | | |
	Type	Script	Sched.
Movies	Linear	Default linear	*24x7*
News	Linear	Default linear	*24x7*
Sports	Linear	Default linear	*24x7*
Cartoons	Linear	Default linear	*24x7*
Soaps	Linear	Default linear	*24x7*
Dramas	Linear	Default linear	*24x7*
Community	Linear	Default linear	*24x7*
Sciences	Linear	Default linear	*24x7*

Bouquet 'Big City North'

Service, Dial#
News, 43
Sports, 561
Cartoons, 702
Soaps, 38
Dramas, 649
Community, 9
Sciences, 527

Bouquet 'Big City East'

Service, Dial#
Movies, 854
News, 43
Sports, 483
Cartoons, 327
Soaps, 461
Dramas, 364
Community, 4
Sciences, 508

RPM Encoder 'Big City North'

RPM Encoder 'Big City East'

There are **three** ways to create a service:
- Manually adding a service using the **Services** menu
- As a result of importing a lineup
- As a result of importing a bouquet

2.1.1. *Creating service manually*

To create a new service manually:

1. From the Home page, select **Central Config → Services** to open the Global Services List in which one can add, remove and edit services
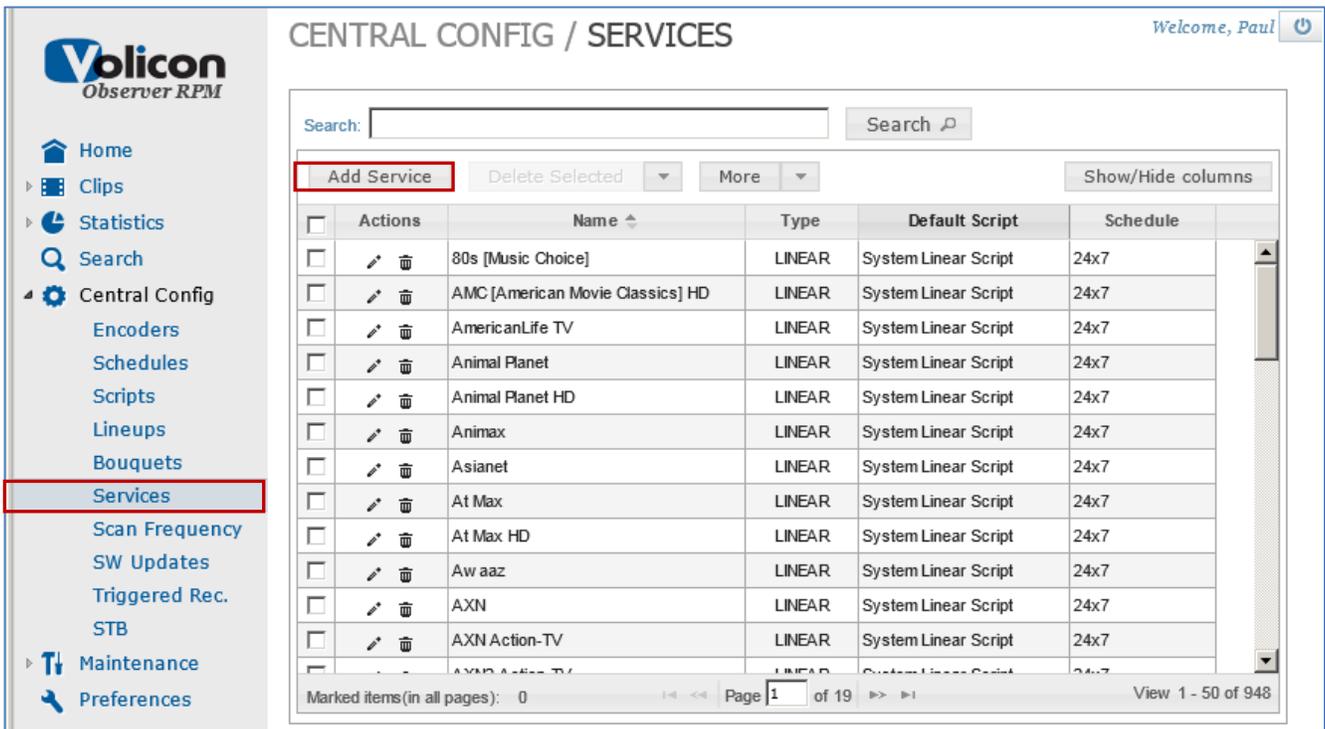

Figure: Services List

2. Click the **<Add Service>** button. A window appears, allowing you to define this new service:
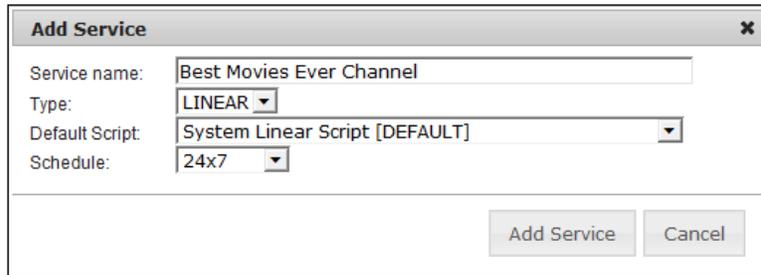
Figure: Add Service

3. In the **Service name** field, type in a descriptive name allowing you to easily identify this service. For example, use the content provider's name, the station call letters, or a well-known abbreviation.

4. In the **Type** field, select **Linear** or **Script** to determine how the RPM encoder accesses the service when it is included in a Lineup.

   - If choosing **Linear**, the RPM dials digits to access the channel. Linear services need to be placed in bouquets so that the RPM encoder can dial the correct number.

   - If choosing **Script**, the RPM will be able to access special services such as menu navigation, VOD asset acquisition or STB diagnostics that are called up in a script, and may also dial digits to access channels.

5. Select the "**System Linear Script (DEFAULT)**" from the drop down list. In a new system, only the default system linear script appears. If you have created your own scripts, you can select one of these instead. For more information see the "Managing Scripts" section **@0** and "Add lineup services" section **@0.**

6. Choose a **Schedule** for these tests. By default, the service is tested continuously (24x7). However, you can choose to test this service at a particular time of day and day(s) of the week.

7. Click **<Add Service>** to add the new service to the RPM services database

   Note: A service can also be defined during **Central Config → Lineups** menu

Default Script   (Dropdown-box)

   o For a **"Linear"** service-type **select** the "**Default Linear Script**"
   o Script selected here (**service level**) is the new default for the **service level**
   o Default selected here is **overridden at lineup level** to allow services be used with different scripts

2.1.2. *Configuring Custom Schedule*

When you add services schedule is defaulted to **24x7** see "Figure: Add Service" above in this section. Selecting **CUSTOM** schedule expands the schedule dialog box

- **Start Time/Duration -** Weekly schedule for repetitive tasks
- **Days of the week** – Select any or all weekdays
- **Start Date**
- **End Date**
  - o **Never** (continue indefinitely)
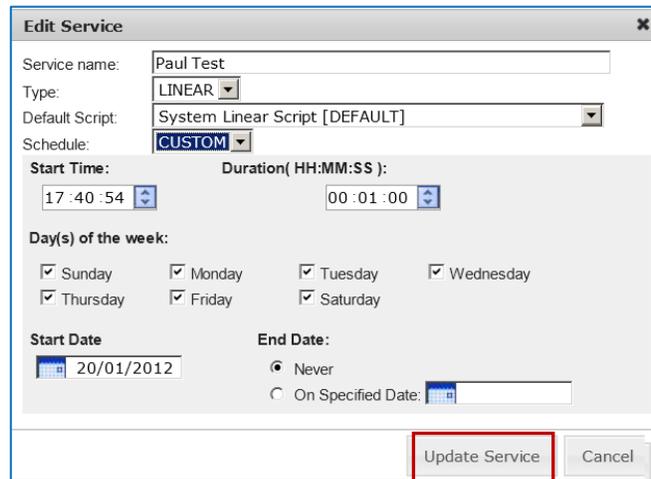 - o (stop) **On Specified Date**

Figure: Edit Service Schedule

2.1.3. *Deleting a service*

This procedure explains how to remove a service from the Observer RPM system's database. Deleting a service using this procedure also removes the service from any bouquets and lineups it is linked to. To delete a service:

1. From the Home page, select **Central Config → Services** on the left, see "Figure: Services List" earlier in this section*.*

2. Browse through the list of services, or type in all or part of the name and click SEARCH to display only services whose names match your search criteria.

3. When you find the service, click the delete icon (red x). This opens a confirmation window. Click **<OK>** to delete the service and return to the list of services.

4. Repeat the previous step for each service you want to delete from the bouquet.
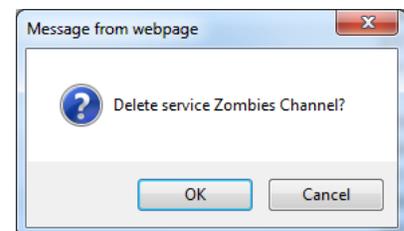
2.1.4. *Exporting services*

This procedure explains how to export the entire list of services to a CSV (comma separated values) file. Exported services contain a list of service names, one name per line shown when later imported into a. Services are exported for backup, or as a starting point for creating a lineup or a bouquet:
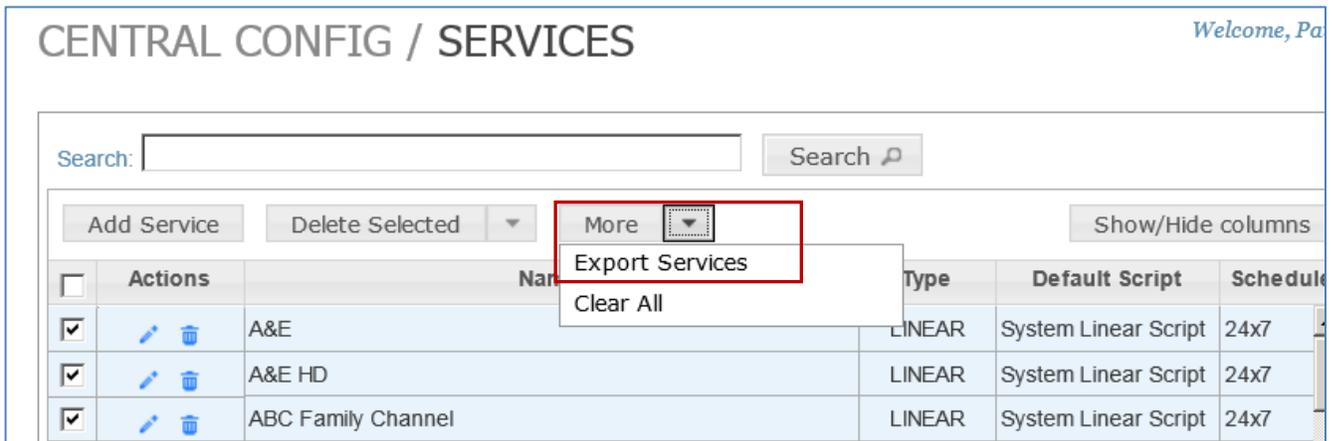

Figure: Services export

To export services:

1. From the Home page, select **Central Config → Services** see Figure: Services List above
2. Select services of interest to be exported
3. From the **<More>** dropdown button select the **Export Services** selection
4. Save the file

An RPM service refers to couple of meaning including an automated function which interacts with a broadcast channel. The following are different types of services:

- Linear
- On-demand
- Interactive TV service (E.g. On demand movies, VOD play out)

2.2. *MANAGING LINEUPS*

This section provides instructions to create and manage monitoring lineups. A lineup is composed of a sequence of services assembled to scan, monitor and test channels. The RPM encoder takes its monitoring instructions from the services listed in its lineup. A service includes script, schedule and recurrence. *Script* details what to check, which thresholds to use; and *schedule* when to run, the times of day and days of the week. Finally, the *recurrence* can be used to emphasize the importance of certain services by increasing the number of times the will be monitored in a scan cycle in comparison to other services set with the default value of "1". Before scanning of specific channels is possible, bouquets need to be defined to translate services to specific channel (dial) numbers.

As all encoders of each probe needs a lineup, you will need to create several lineups and assign them for the different encodes. Each RPM encoder can be assigned a primary and a secondary lineup. The RPM concatenates the two lineups before scanning.

While the RPM system provides a considerable range of flexibility through its advanced scripting features, at the same time to help the user it includes practical default scripts and schedules so that you can get your monitoring system up and running quickly and easily.

2.2.1. *Adding a new lineup*

There are two ways to create a lineup: by importing a CSV file "Import Lineup" section **@0**, and by creating a blank lineup and then manually adding and configuring its services as follows:

Access lineups from the left menu**: Central Config → Lineups**
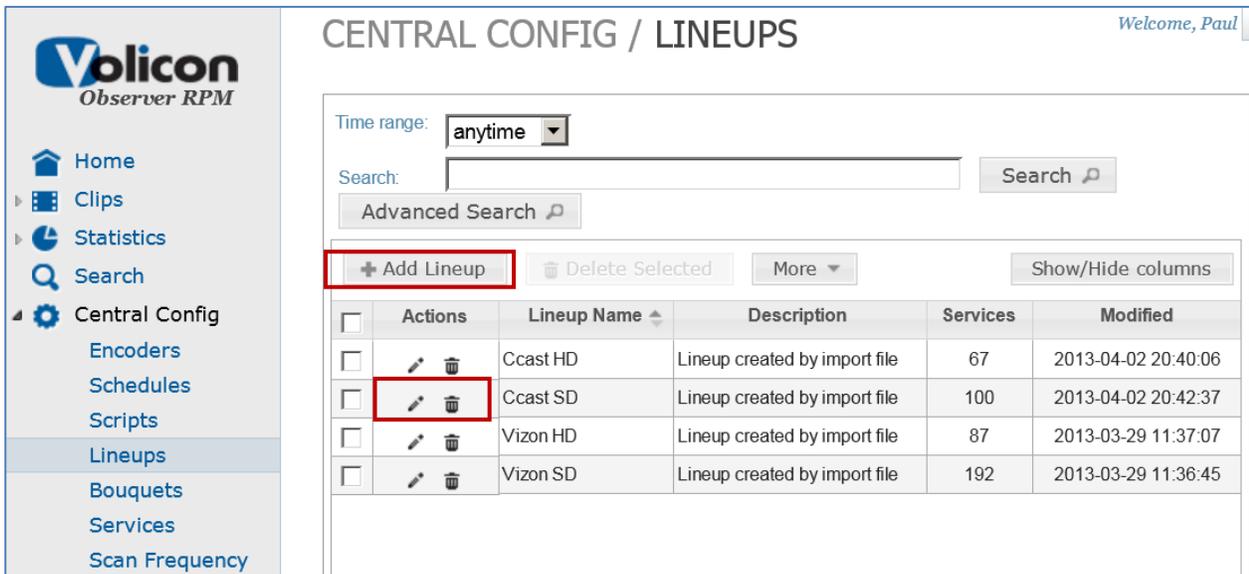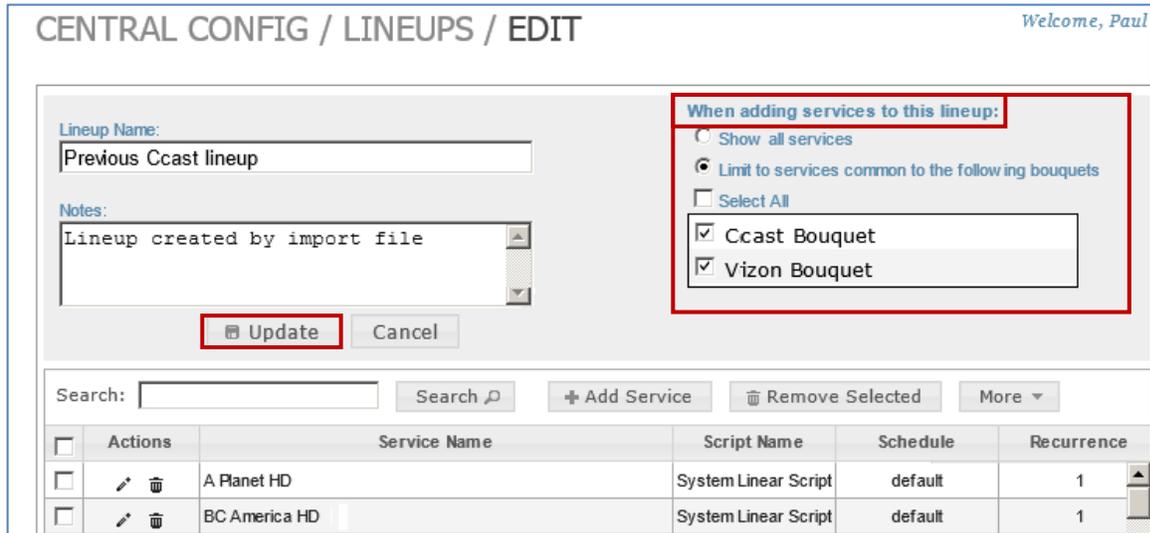Open the "**Lineups**" list to add, edit, remove and import lineups.

Figure: Lineups list

The **<Add Lineup>** button is used to assemble a lineup, see details in the following section.

2.2.2. *Lineup service parameters*

A lineup is selected from all available services or from filtered services:

Figure: Lineup service list

After editing the following fields:

- **Lineup Name**   Descriptive name of the lineup
- **Notes**   Description of the lineup
- **When addition services to the lineup**
  - **Show all services**
  - **Limit services common to the following bouquets** Filter services that are common to bouquets selected just below the "**Select All**" line. See the following section for more details
  - **Select all services** List without filtering (insure bouquets' services will execute properly on the targeted encoder/STB and geographic locations)

Press the **<Update>** to save the configuration to an existing lineup or **<Add Lineup>** button for a new lineup. The same button changes names depending if we are adding a new lineup or editing an existing lineup.

2.2.3. *When adding services to a lineup*

This is a services filtering capability when adding services to a lineup depending on the bouquets selected, to determine which services are offered to be added to the new lineup.

- **Scripted Service** Contains a script to access special services such as menu navigation, VOD asset acquisition or STB diagnostics and (may) dial digits to access channels
    - o Scripted (not linear) services are listed (for selection) without filtering (e.g. dialing numbers directly from within the script….)
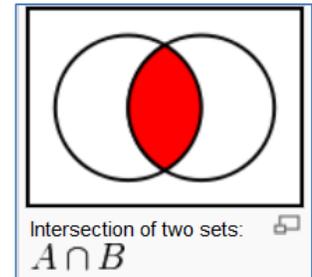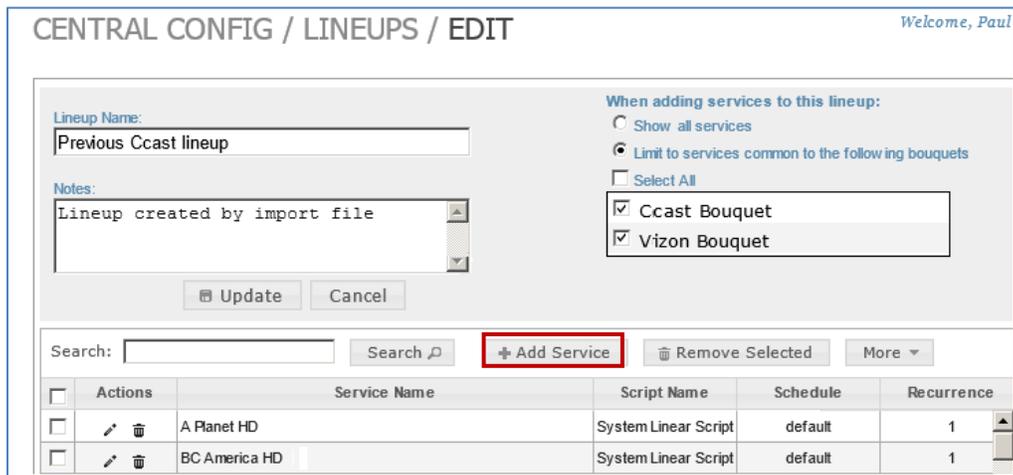

Figure: Intersection of services between bouquets

Example: In figure "Lineup Service List" section above, only services in common to **"Ccast Bouquet"** and "**Vizon Bouquet"** are listed for selection to ensure that translated dial number will work correctly at the corresponding STBs/geographic location.

Add services to a lineup with the **<Add Service>** button in figure above and in figure "Services list", section @0.
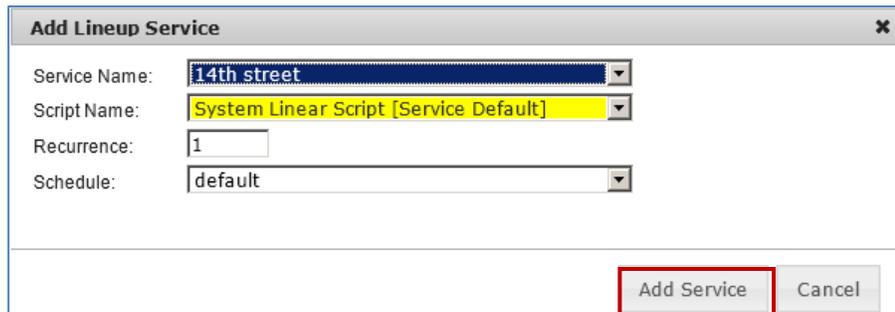

Figure: Add Lineup Service Dialog-box

Service Name   To be included in lineup

Script Name   Select from the dropdown to change the default script. Change here prevents automatic modification later at the Services level from reaching the lineup (see "Lineup and Bouquet Import Rules" section)

Recurrence   Provides more weight to certain services in lineup as compared to others such as with recurrence of "3" the service will be scanned three times per scan cycle more often than others with a recurrence of "1"

Schedule   For configuration see schedule in "Managing services"

2.2.4. *Import lineup*

Importing allows the creation of a **new** lineup or the merging of additional Services to an existing lineup. The process of importing bouquet and lineup is similar, the same *.csv file format is used. See "Import Bouquet" section. You can import Bouquet to a lineup as a starting point of it then modify the lineup.
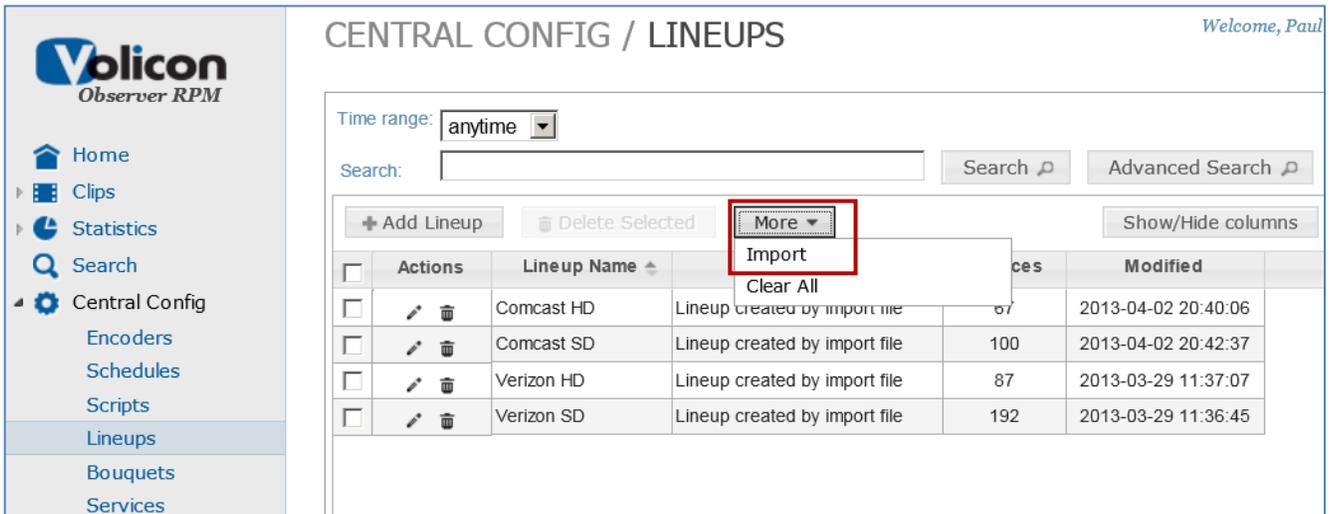

Figure: Import Lineup

From the **Lineups** page (above) select the **Import** item from the **<More>** dropdown button to get the import form below:
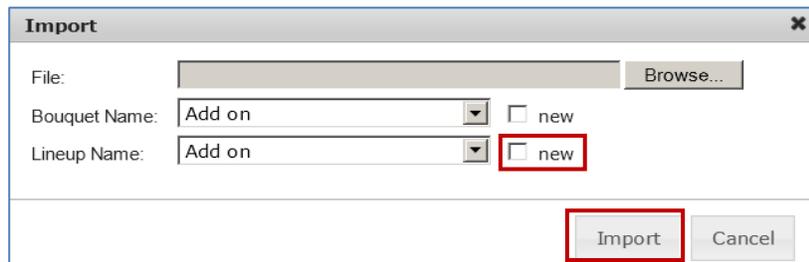

Figure: Lineup Import Dialog-box

2.2.5. *Lineup Import Rules*

Importing allows the creation of a new lineup or the merging of additional services to an existing lineup:

- Use "**new**" checkboxes to import comma delimited (*.csv) file format to create a new *lineup*
- **Uncheck** new checkbox: Select *lineup* from the dropdown box
    - o This will update the selected lineup with new services imported
    - o Services not present in the system will be added to the "global services list"
- The same rules as above apply to bouquets as well

2.2.6. *General Import and Export Notes*

Since bouquets can be exported but not lineups, exported bouquet can also be imported at the lineup level then used as a starting point to build a new lineup (of services) while the RPM system fills in scripts and schedules with the default values (at the service level).

2.3. EDIT LINEUP SERVICES

A lineup can be modified with parameters similar to when adding a lineup, see "Figure: Modify Lineup Dialog-Box". Click the "Edit" icon to "Edit Lineup Service Dialog-box". This is called **modifying script at the lineup level**.
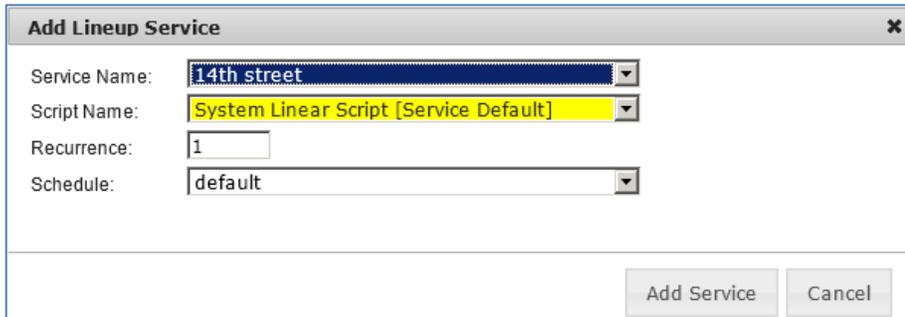

Figure: Edit Lineup Service Dialog-box

2.3.1. *Script modification rule - Service and lineup levels*

Script of a service modified at the lineup level (just above) will make it immune from script changes made at the service level , i.e., "Creating a service manually" section **@0**. But when a script of a service is not modified at the lineup level, a change at the service level will carry over to the lineup level.

2.3.2. *Script modification example - Service and lineup levels*

Services level: Service 1 and 2 configured with the following **default scripts at the service level**:
  Service 1 <= Script A   Initialize Service 1 with script A
  Service 2 <= Script B   Initialize Service 2 with script B

Lineup level: **Lineup** services and scripts modified, "**Edit Lineup Services"** section **@2.3**:
  Service 1 (default)   **Services level** default not modified
  Service 2 <= Script C   **Services level** default modified with Script C

New Services level modifications: **Service 1 and 2** modified with Script D

Service 1 <= Script D	**Service level** change
Service 2<= *Script D*	**Service level** change

Service 1 <= Script D	**Lineup level:** Modified by the **Service level** change because it was not previously modified at the Lineup level
Service 2 = *Script C*	**Lineup level: Service's script** not modified by the **Service level** change because the script was already modified at the **lineup level** (made it immune from service level change)

2.3.3. *Service Schedule Modification Rule*

Service Schedule modified at the lineup level will make it immune from being modified at the service level – analogous to "Script Modification Rule" above.

2.4. MANAGING SCRIPTS

Scripts are sequence of instructions for the RPM system used to monitor broadcast media content and detect when it falls outside of defined parameters.

Click **Central Configuration → Scripts** to open the Scripts list to "**Add Script**", **Delete** and **Edit** existing scripts. See figure below:

FIGURE: SCRIPTS LIST

ADD SCRIPT   A Script is added with the <Add Script> button.

EDIT SCRIPT   It is edited with the **"Edit"** icon

DELETE SCRIPT

You can delete a script if it is no longer needed. However, if the script is used in any lineups, a warning message will appear. If you choose to delete the script anyway, the system updates the lineup so that any services that used the deleted script will now use the default script. However, this change is not applied at the service level for any services that were using the script as the default value. Note that if you edit one of the services through **Central Config → Services**, the service's script field will be blank.

2.5. EDIT SCRIPT

"Edit Script" screen is entered with the **"Edit"** icon:

Figure: Edit Script

Script Name	Name assigned to a script
Description	Script description
Image Batch	Images defined for the script to use for image detection. Need to define the image batch when a script contains image detectors. Used with WOIS tool (optional module) for more complex scripts.
Alert Profile	Alert parameters see table below
Scripting Help	Place mouse over any **Alert Profile** parameter to display context-sensitive help in the right textbox
Script Textbox	Configure script parameters and simple script commands (see Interactive Script Commands dictionary). Use WOIS tool (optional module) for more complex scripts

Table: Edit Script Areas

2.5.1. *Alert Region*

Observer detects Video alerts by the examining pixels from the whole screen or from only a specific region. The region detection when enabled with "Region Enable", its rectangular position is specified by L, T, and its size by W and H – these are further defined in "Table: Alert Profile" below.

2.5.2. *Alert Profile*

Alert profile defines the media-fault-detection script parameters. Use the Script Textbox to define the script and the **<Update>** button to update the system with the new parameters.

Region Enable	Enables detection in partial screen area. When not checked - full screen detection is done.
L **T**	Origin Measured from the left edge (horizontally) and from the top edge (vertically) as a percentage of the screen size (numbers range from 0 to 100)
W **H**	Size width and height measured as a percentage of the screen (from 0 to 100)
Check STB	(Enable/Duration) STB health is checked through graphical banner matching/ Duration of the detection to give the system more time
Channel Verification	(Enable/Duration/Mask) Channel Change Verification Dialed digits are verified. Mask reduces the size of area where banner is being detected.
Banner Wait	(Enable/Duration) delay inserted after digits dialing/before starting the banner detect to give the STB time to go to the dialed channel
BS Black Screen	(Enable/Duration/Threshold/Region) If the percentage of black screen exceeds level and duration thresholds, then the corresponding media fault is detected
SS Static Screen	(Enable/Duration/Threshold/Region) If the percentage of static screen exceeds level and duration thresholds, then the corresponding media fault is detected
Motion Detect	(Checkbox) - When enabled, either Static Screen or Moving Screen are enabled but not at the same time.
Moving Screen	(Enable/Duration/Threshold/Region) If the percentage of moving screen exceeds level and duration thresholds, the corresponding media fault is detected. Moving screen is the complement of static screen.
Low Audio	(Enable/Duration/Threshold in dB) If the audio level (dB) is below threshold and persisting over the duration threshold, then the corresponding media fault is detected
High Audio	(Enable/Duration/Threshold in dB) if the audio level (dB) is above threshold and persisting over the duration, the corresponding media fault is detected

Table: Alert Profile

2.6. MANAGING BOUQUETS

Bouquets are similar to lineups with the list of services, with the addition of channel numbers corresponding to each service listed in a bouquet. Bouquets are created to associate lineup services with dial numbers for given geographical area. Bouquets are used by the encoders to dial the correct channel number when a user calls up a particular service. Since the same service may have a different dial number in another area, you will likely need to create several bouquets to help organize the various channel mappings.

When new services are added or when they are moved to different dial numbers, you will have to update one or more of the bouquets.

Within a specific bouquet, you can add and remove services, change the dial number, add notes and rename the bouquet. You can also make three global changes to all bouquets. These are: adding a service, changing a dial number for a service, and removing a service without deleting it from the list of available services in the system. The service is only removed from the bouquet, and not the system, since the service may still be used in a lineup.

Once you save your modifications, the system automatically propagates the changes to the database and to any RPM encoder that uses the bouquet.

2.6.1. *Creating a bouquet manually*

A bouquet is composed of a set of services translated to channel (dial) numbers. Since the same lineup of services which might apply across different geographic areas but only vary with different dial numbers, the same lineup of services is used only with different bouquets to accommodate for the dial number variation.

There are two ways to create a bouquet: by importing a CSV file and by creating a blank bouquet and manually adding services to it. For instructions on creating a bouquet by importing a file, please see section "Defining Bouquet" procedure.

To create a new bouquet:
1. From the Home page, select **Central Config → Bouquets** on the left.
2. Click the **<Add Bouquet>** button. This brings you to the page for defining your new bouquet

Figure: Bouquets List

![Volicon logo]

2.6.2. *Adding a new bouquet*

A new bouquet is added in the "**Bouquet**" screen with the **<Add Bouquet>** button shown in figure above.
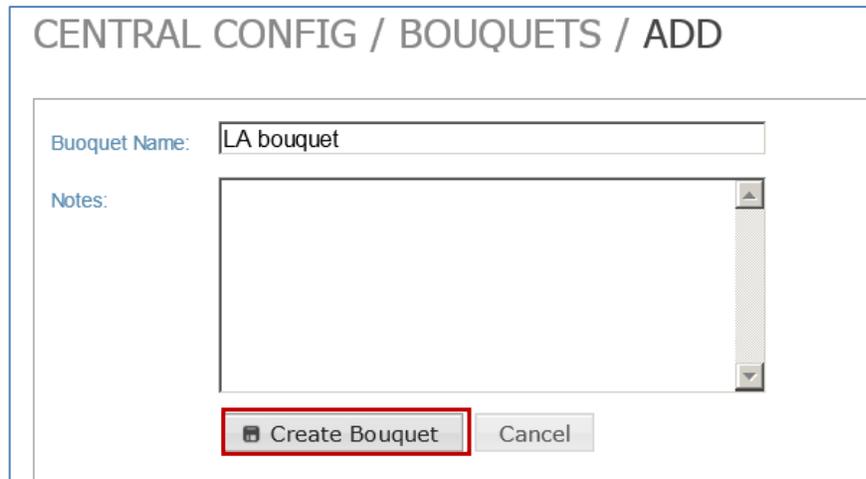
Figure: Bouquet properties

Type its **name, Notes** (optional) description, then press the **<Add Bouquet>** button. Then the services and their associated **Dial Numbers** need to be added:
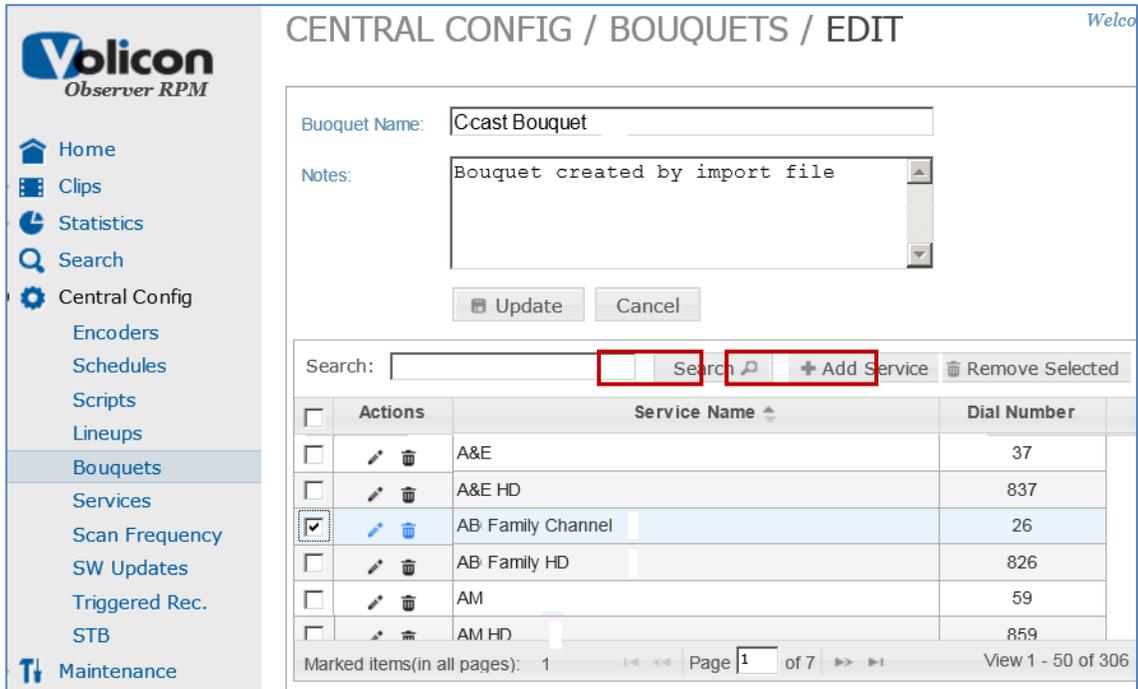
Figure: Bouquet Services List

Once the Service Name is defined, the **<Add Service>** button becomes active for you to select services with the help of a **Search** "**Service Name or Dial Number**" textbox and a **<Search>** button.

Press the **<Add Service>** button to get the "Add Service" form to associate a **Service Name** with a **Dial** (channel) **Number:**

Figure: Bouquet's Add Service Form

2.6.3. *Importing a bouquet and its services*

Figure: Bouquet list

Press the **"Import Bouquet"** selection from \the **<More>** button dropdown – the following dialog-box will appear:
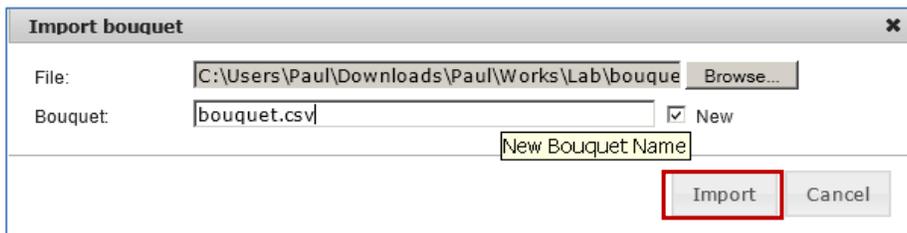
Figure: Bouquet services import form

2.6.4. *Bouquet Import Rules*

Importing allows the creation of a new bouquet or the merging of additional services to an existing bouquet:

- Use "**new**" checkboxes to import comma delimited (*.csv) file format to create a new *bouquet*
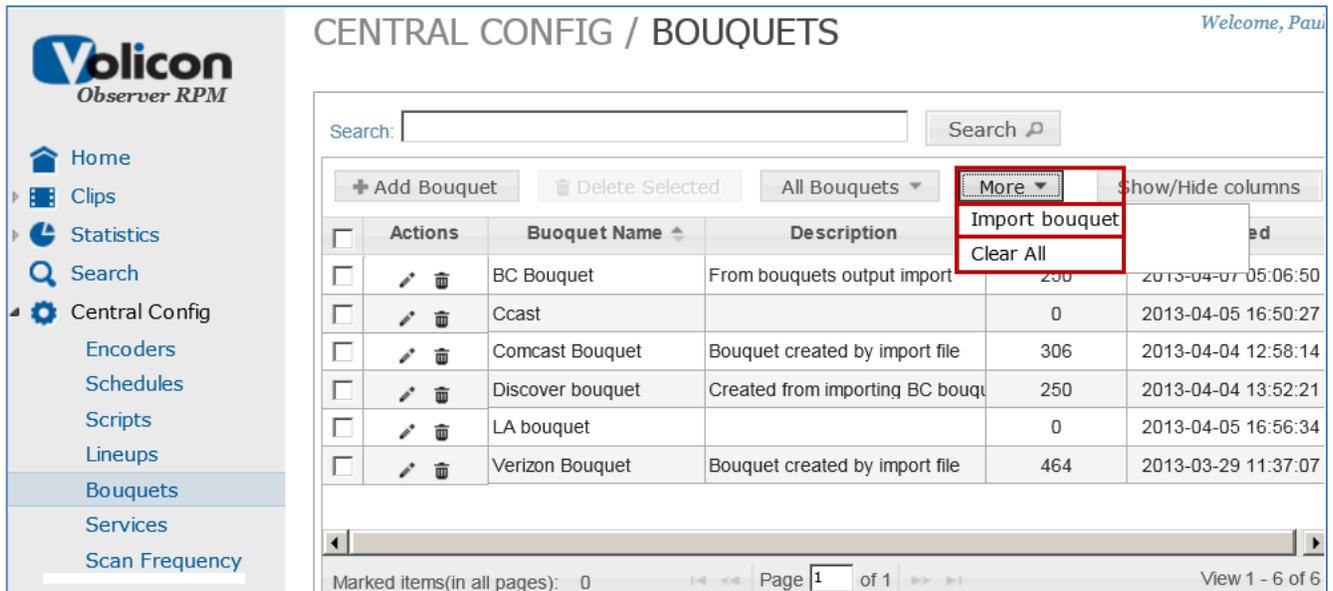- An attempt to create a new bouquet with the same name as one that exists will be rejected with a warning shown to the right:
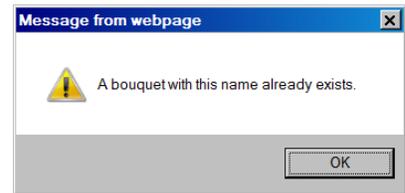
- Select *bouquet* (but not the new checkbox)
  - o Update the select bouquet with new services imported
  - o Service not present in the "global services list" will be added to it
- Service present in the imported file and selected bouquet but mapped to a different channel number will get updated in the *bouquet* (from the imported number).
- Imported channel number already used in the selected bouquet by a different service will not update the bouquet but will update the "global services list". The RPM will report the bouquet as a partially successful import.

The different possible modes for the **"Import bouquet"** dialog-box are shown in the table below:

Bouquet Import Operation	
Press the **<Browse>** button to look for a *.csv file to import	
Modes of operation depending on the state of the "New" checkbox:	
New (Checkbox)	**Bouquet (Name-field)**
Checked	Import file as a new bouquet and type its name
Not checked	Select bouquet (from a dropdown list)
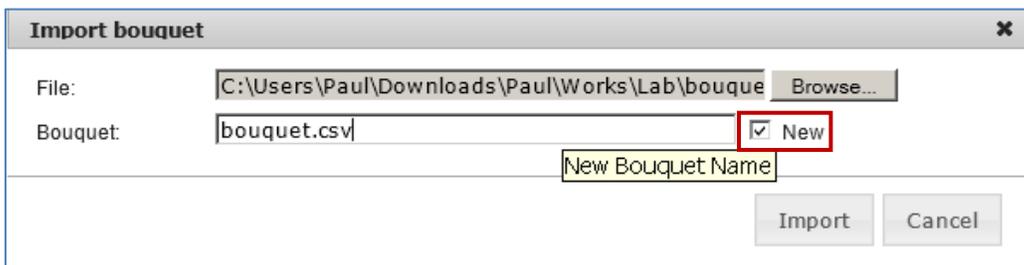
Import bouquet when "New" box is checked

1. If an imported **bouquet** exists , then services from both sources will be merged
   - **Services** not existing in a **bouquet** will be added to it
   - Existing **services** dial numbers will be updated
   - **Services** missing in the imported file but defined in the **Bouquet** will remain in the **bouquet**

2. If an imported bouquet does not exist, then it will get created in the Observer

EXAMPLE OF BOUQUET IMPORT FILE

Service	Dial Number	CSV File Format
A! Entertainment	34	A! Entertainment,34
HATV	32	HATV,32
EXPN	49	EXPN,49
Family Channel	26	Family Channel,26

2.6.5. *Bouquet edit*

1. Select **Central Config → Bouquet** (on the left)
2. Edit a bouquet with the "**Edit**" icon (on the left)

This is similar to "Adding a new bouquet" section **@2.6.2** above.

2.6.6. *Example - Lineup Modifications with Export and Import*

1. Export bouquet - modify the lineup of services see "Export Bouquet" section **@2.6.5**.

2. Select **Central Config → Lineups** (on the left)

3. Press the **<Import>** button to import the modified csv file

4. Select the "**new**" option to the right of the "**Lineup Name"** and type the new name in the name field if creating a new lineup from the imported file. Otherwise select an existing lineup from a list for services from the file to be added to the existing lineup.

5. Select Import:

6. Browse and select the file for the lineup
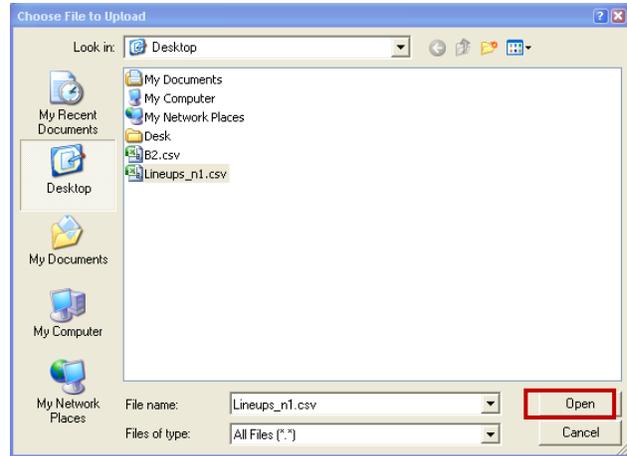
7. The new lineup is now in the lineups list:

8. Go to **Central Config** → **Encoders** and click on the Encoder to drill down to the encoder where you would like to use the new Lineup:
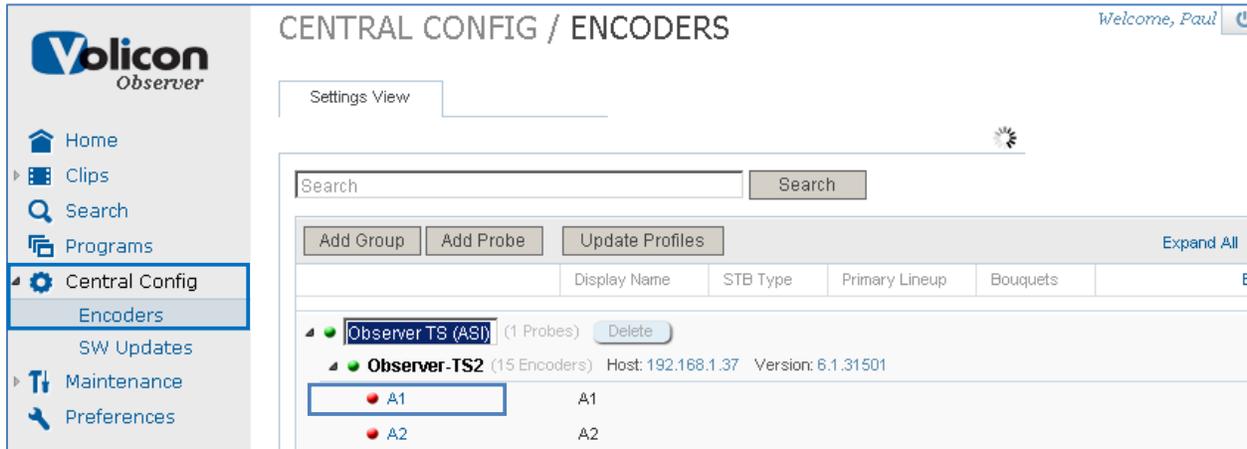
9. Click on encoder **A1** to edit it (figure above) and select the **Bouquets** and **Primary Lineup** you just imported (figure below).

A **Secondary Lineup** is used to add services to the **Primary Lineup;** this way for example the **Primary Lineup** could be shared as the base lineup among a group of encoders.

10. Bouquet should contain all the services/channels that can be selected on the encoder's (STB) for the system to dial channel numbers, therefore it is necessary to populate the bouquet field.

3. CENTRAL CONFIGURATION - STREAM CONTROL

Probe servers house the encoder-streams. The probes are organized in groups - the hierarchy is controlled by the Central Server:

- A probe group contains multiple probes that usually have some commonality, i.e., geographical location
- A probe server contains one or more encoder-streams or channels

See the Observer Admin Guide section "Central Configuration – Stream Control" for additional description and configuration details.

4. OBSERVER RPM ALERTING

Media Faults such as "Black Screen" or "Low audio" detected in Encoder-stream input usually exceed certain characteristic media parameter and persist over certain duration.

See the Observer Admin Guide section "Observer/RPM Alerting" for additional description and configuration details.

5. SNMP NOTIFICATION

Upon detecting alerts, the Observer signals SNMP notification to external systems (e.g. NMS). See the Observer Admin Guide 6.1 section "SNMP Notification" for configuration details.

6. STREAM LEVEL CONFIGURATION

The section covers additional configuration of encoder/stream properties through the back-end. See the Observer Admin Guide 6.1 section "Stream Level Configuration" for details.

7. NATIONAL REVIEWER

7.1. ALERT AGGREGATION LOGIC

7.1.1. *How it works*

The following is a brief description of the alert aggregation method. Examples are in the slides ahead:

- Count of faults is maintained for each element in the system (probe, group, system). The counters are for each combination of service and fault type (BS on CNN might be one, while SS on Fox is a different counter)
- On fault detection on any encoder:
  - We increment ref-count of probe (for that service and fault type)
  - Calculate group/system count by counting their non-zero descendants
- Sending 'set alert' when count goes up to:
  - System or group: 2
  - Probe: 1
- Sending 'clear alert' when count goes down to
  - System/Group: 0
  - Probe: 0
  - We keep track of each SNMP SET for all the sent data. The CLEAR will contain almost the same data: ALL attributes of the SNMP will be the same except for the ALERT_TYPE which will be 1 in case of a SET and a 0 in case of a CLEAR.

7.1.2. *Observer system hierarchy levels example*

System Level

Group (of probes) level

Probe level

Encoders with Services
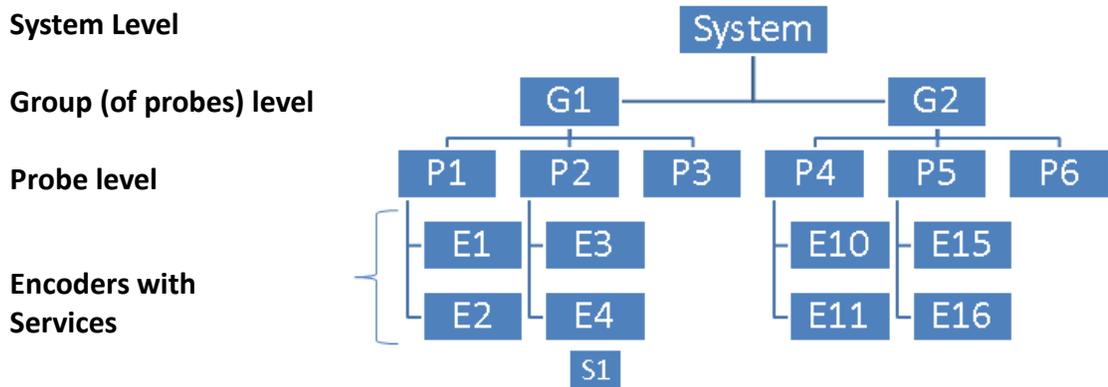
7.1.3. *Probe Fault*

A specific fault type on a specific service is detected by the system. First one to spot it is Encoder E4:
Alert (SNMP+email) is sent as 'Probe' level alert, identified as P2 (1).
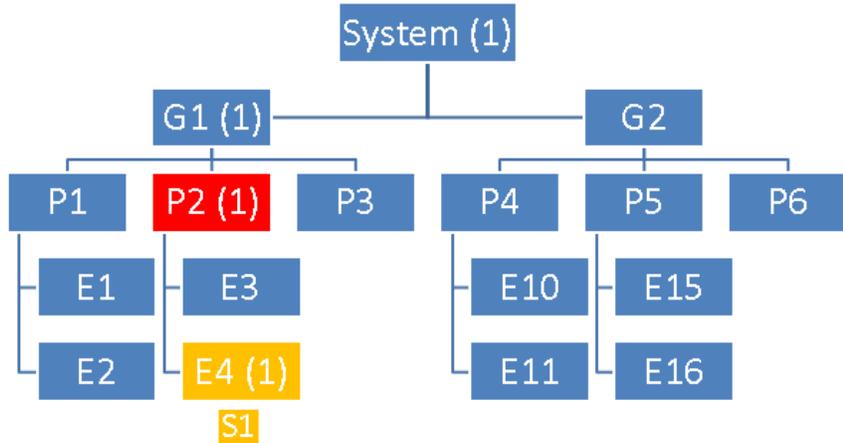
7.1.4. *Group Fault*

E2 spots the same problem on the same service, it's count increases, E4 (1):
Alert is sent for 'Group' level on behalf of G1 (1) and it's count increases because it has now two non-zero descendants, P1 (1) and P2 (1)
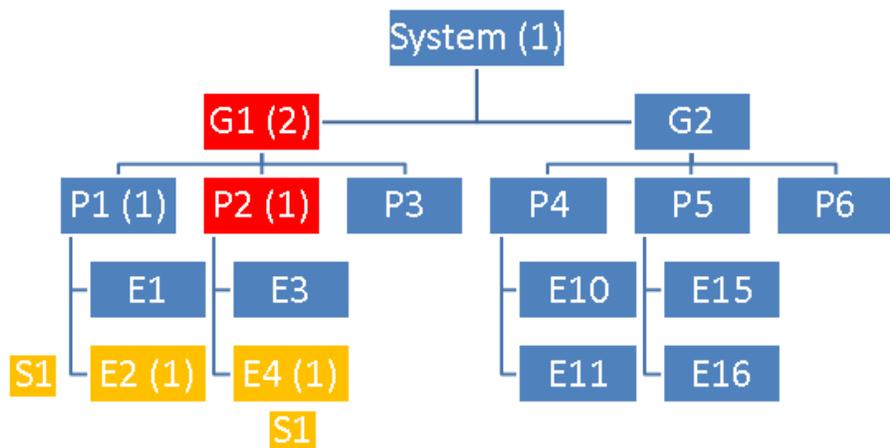
7.1.5. *System Fault*

E10 detects the same alert sent on the system level because probe and group alerts were already sent for the fault/service combination.

No more alerts will be sent from now, no matter who else detects the fault on the same service.

However, web front-end will still show ALL alerts detected, with fault clips etc.
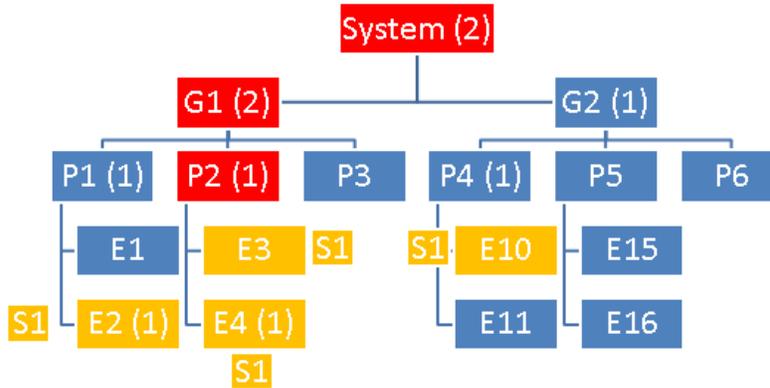
Scanning continues and faults begin to resolve:

7.1.6. *Resolve Service Faults not affecting Probe, Group or System Alerts*

E10 is for P4 is resolved, its count going to P4 (0) and the System count decreases to (1), but it's still in system-wide alert, and therefore alert clear is not sent yet.
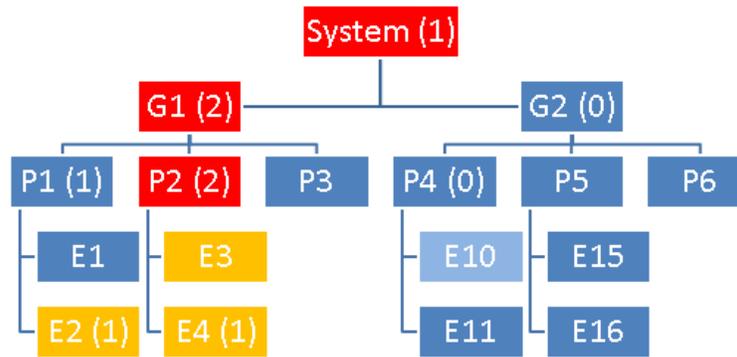
E4 is resolved to E4 (0), P2 (2) goes to P (1): Still no alert clear is sent as group and system have descendants.
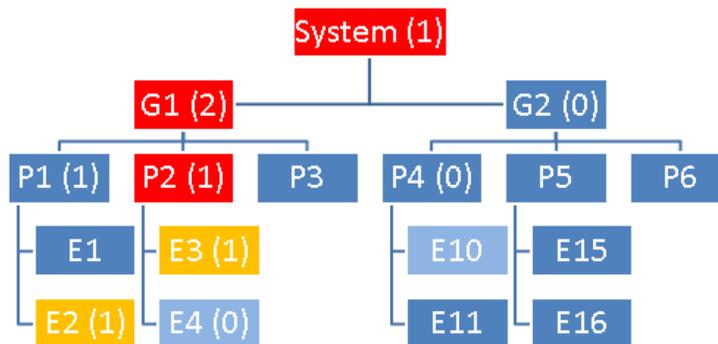
7.1.7. *Clear Probe Fault*

E3 is resolved: P2 (0), 'Clear' sent to Probe level on P2

SNMP CLEAR will contain 'E4' in the encoder field because it was the one generating the alert.
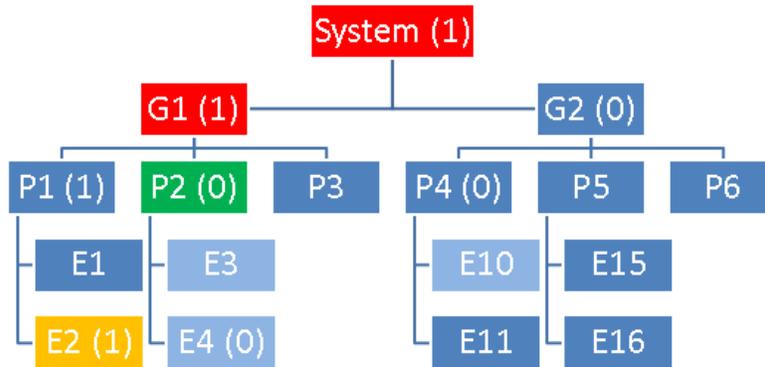
7.1.8. *Clear Group and System Faults*

E2 is resolved: 'Clear' is sent at the Group level for G1 (0) and to System level, System (0). SNMP CLEAR details for 'System' will impersonate E10, the probe which originally reported the 'System' alert

SNMP CLEAR for 'G1' will contain E2 which happened to be the one sending the group alert.
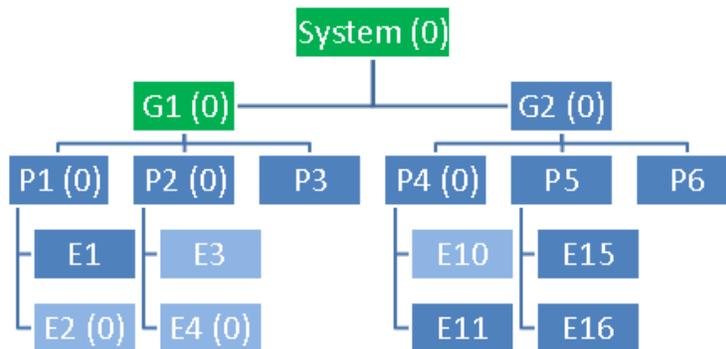
8. INTERACTIVE SCRIPT COMMANDS DICTIONARY

The table list and describes all currently supported interactive service script commands which can be used in script that run on the RPM on version 5.5 and above.

8.1. SUPPORTED COMMANDS

Name	Command Syntax	Description
Remote Control (R/C)	Any R/C command, e.g., dial-number, EXIT, MENU, INFO	R/C commands as broadcast from the interactive menu or the virtual R/C. Used to dial channels and navigate through menus (RIGHT, UP, EXIT…) Concatenate **R/C** (level) commands with commas **(,)** unless pauses are needed in between Separate from **script** (level) commands with **semi-colon (;)** Example: EXIT, MENU, RIGHT, UP; P(7); DOWN, UP;
Pause	P(<duration>)	Insert a pause in the script execution. Used when waiting for a banner or menu to appear/disappear. Should be separated from all other commands using a semi-colons (;) **Parameters**: Duration: number of seconds to pause
Detect	D(BS(..), SS(…))	Monitor one or more detectors for A/V quality to detect alerts. Multiple detectors inside the D() command are separated by commas. Separate from all other script level commands with semi-colons (;)
Black Screen Detector	BS([<left>], [<top>], [<width>], [<height>],<duration>, <threshold>)	Run the black screen detector. Alert will be registered for BS if measured values exceed the threshold (configured) parameter for longer period than the duration (configured) parameter **Parameters**: Threshold: measured in black pixels percentage of screen Duration: (seconds) minimum time necessary for the measured values to exceed threshold continuously. The first 4 parameters (optional) provide a way to monitor only the "Alert Region" of the screen **@2.5.1** though when specifying the region all 4 parameters should appear together. Note: all detectors are built such that they will complete right away if the measured values are within the thresholds for A/V (are OK); i.e., the D command might complete executing in under a second if all detectors return OK
Static Screen Detector	SS[<left>], [<top>], [<width>], [<height>],(<duration>, <threshold>)	Similar to a BS but detects (measures) the static screen between two consecutive frames. The "Alert Region" **@2.5.1** parameters are the same as above.

Motion Screen Detector	MS[<left>], [<top>], [<width>], [<height>],(<duration>, <threshold>)	Complement of SS detecting motion and alerting for percent of screen movement which is greater than the set threshold. The "Alert Region" @**2.5.1** parameters are the same as in BS above.
Low Audio Detector	LA(<duration>, <threshold>)	Alert if audio level drops below the specified threshold (dB) for the configured duration (in seconds)
High Audio Detector	HA(<duration>, <threshold>)	Alert if audio level goes above below the specified threshold (dB) for the configured duration (in seconds)
Find	F(<imagePath>, <timeout>)	Match a pre-captured image (with image at the specified location on the screen) to verify its existence within the live video being logged. This command is only available for customer who purchased the interactive services module, and can only be created using the IS Wizard application. **Parameters:** ImagePath: contains the path and the name of the image to be matched. This is created automatically by the IS wizard. Duration: (in seconds) to try get a match before timeout
Negative Find	N(<ImagePath>, <timeout>)	Same as F() above, only that this command returns TRUE if the image does NOT exist within the captured video. (Included in the interactive services module) Parameters: same as for F() command
Step	S(<ImagePath>, <timeout>, <R/C command>, <# of repeats>)	Step through an interactive menu until a certain image is detected. This command will try to find a match multiple times, each time iterating through the menu according to the parameters set for it. (Included in the interactive services module) **Parameters:** ImagePath: same as above Timeout: (seconds) time used to find a match. This timeout will start and be exhausted on every iteration through the menu R/C command - sent between matches to iterate menu commands # of repeats: - of R/C commands to try find a match

Program Not Available	NA(F(…)[,N(…)][,D(…)])	Encapsulating commands such as F(), N() and D() (for image recognition of splash screens) indicating the availability of underlying services and if unavailable stops the execution of the enclosed detector scripts (D(BS, SS…)) without reporting any faults.
		The main use case is on services that have only limited availability. When not available a splash screen appears with "Service unavailable" that the NA() command recognizes to prevent detection of invalid faults (e. g., static screen)
		Parameters: One or more F() or N() commands looking for specific images on the screen and D((BS, SS…))detector enclosed commands to detect of A/V faults
		Usage example: EXIT, %DIALNUMBER%;NA(myscript/ProgNotAvail, 7);P(3);D(BS(30,95),SS(30,95)); => Detect black-screen and static-screen if ProgNotAvail image does not show up on the screen. If it does, continue scanning without reporting anything
Banner	B(<ImagePath>, <timeout>)	The banner command is basically the F() command but whose results are different. It is designed to match a part of the STB banner. If the command fails (no banner is detected), the system will initiate a power cycle on the STB. At first the R/C power command is used but if not effective, it is followed by a cold power reset through the IP power switch (if such is setup on the system). Parameters: same as F() command

8.1.1. *Supported Variables*

The following variables used in scripts get replaced by the system during runtime.

Name	Syntax	Description
Dial Number	%DIALNUMBER%	Generic variable replaced at runtime to reflect channel specific dial numbers (see example above)
STB	%STB%	Generic variable replaced at runtime to reflect the STB specific image locations
		For example in a script command %STB% variable: F(%STB%/imageMatch1, 7) Gets translated to: F(UnitedCableSTB/imageMatch1, 7) or (HorizonNetSTB/imageMatch1,7) Depending on the STB used, the right scanner image location gets selected

Example: A generic script can be created with the %DIALNUMBER% variable to run on all the channels of a lineup without channel specific hard-coding. Then at runtime just before dialing, the variable gets translated to the actual channel numbers through the (bouquet) table lookup.

8.2. SCRIPT EDITING

The web front end provides a simple script editor whose context sensitive "Scripting Help"**@2.5** (in Help sidebar) should be read before any editing. Please note that the editor does not check the syntax of scripts edited manually, though it will usually create a fault clip of type SCRIPT-ERROR and point to the offending command such as **Command: (P7)** in example below:

For example:
SCRIPT ERROR Command: (P7). Channel: 123 MTV. R-Encoder: ENC7@MyProbe1. Script: INFO,123;(P7);D(BS(30,95));. ScriptName: MyFaultyScript. Scanner: ENC7. Ref: RPM-120440

8.2.1. *Commas vs. semi-colons*

The "B" is an R/C command while the P(<number>) is a script command and those should be separated from each other by semi-colons. Commas are used only to separate consecutive R/C commands.

The script editor distinguishes between the B as it expected a banner command such as B(path/image, 7)

Example: EXIT,801;P(5);B;P(10);0000;P(5);D(BS(15,95),SS(15,95),LA(15,-40),HA(15,-1));

8.2.2. *Other Examples*

DEFAULT SCRIPT WITH STATIC SCREEN ENABLED

EXIT,%DIALNUMBER%;NA(F;P(5);**D(**BS(30,96),**SS(30,95**),LA(30,-40),HA(30,-1)**));**

DEFAULT SCRIPT WITH MOVING SCREEN ENABLED

EXIT,%DIALNUMBER%;NA(F;P(5);**D(**BS(30,96),**MS(30,95)**,LA(30,-40),HA(30,-1)**));**

Here the moving screen is defined instead of the static screen

9. IR TRAINER

Figure: IR Trainer Tab

Infra-Red (IR) Trainer adapts the RPM system to the STBs used for dial number and script dialing. This is done through the IR codes files. If one is not available for a given Set Top Box (STB), it can be created by training the RPM with the STB's Remote Control (R/C). You will need to have a set top box and a means of viewing its video for verification. If a monitor is not available, use "Preview" (described in the Observer Admin Guide).

Training requires that the IR transceivers be attached to the Observer pointing at the STB. **As the Encoder service and the IR Trainer share the IR devices, to avoid IO conflict, before running the IR Trainer stop the scanning process by placing the scanners in manual mode.** Another way is to stop and disable the Observer encoder service. It is disabled on the probe server in Device manager → Services.
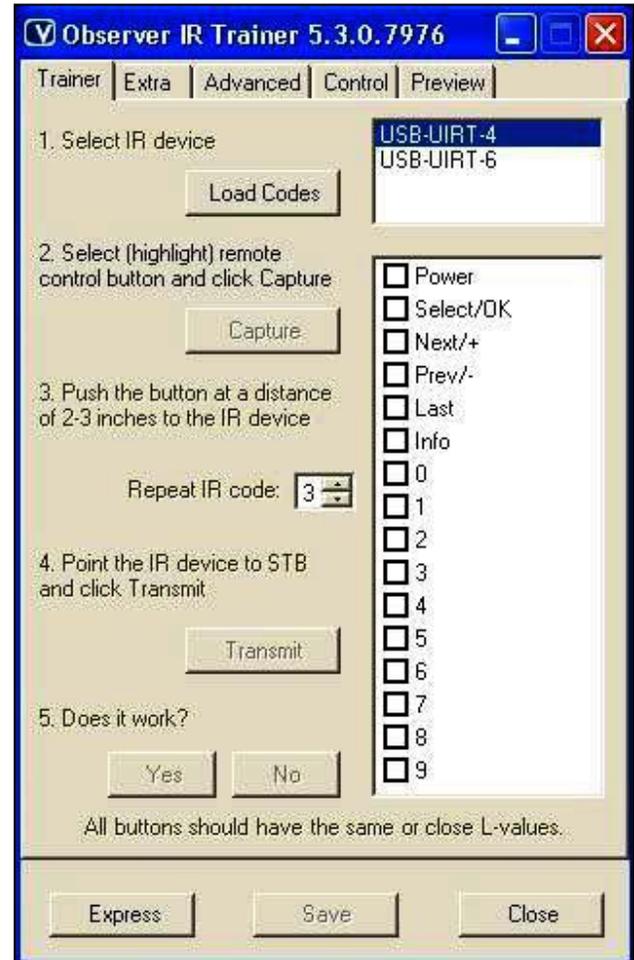
REPEAT IR CODE

Setup related to repeating IR code transmission (the default is 3).

9.1. TRAINER TAB

After running the IR trainer application, you will be presented with the IR Trainer interface. Then select the matching IR device from a list shown on top-right. On a 4-channel RPM system there will be four IR devices available. The list of checkbox commands applies to the IR device selected.

9.1.1. Express Mode

This mode saves time when programming the entire R/C key set. Start by directing a Remote Control to the IR blaster selected above and press the **<Express>** button. You will be prompted to press the first R/C key **<Power>**, press it for about 4 sec until the IR blaster LED turns off or until a confirmation code displays next to the digit being programmed. The received codes the same for the digits programmed (figure on right) help us to verify that the IR codes were programmed correctly.
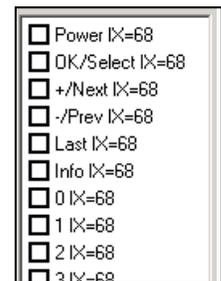
If any of the keys are not successfully programmed, record the key type to revisit it later but proceed to the next key to program it using the Express Mode until all keys in the basic set are programmed.

Then to confirm that digits are working with the STB used - checkmark a digit; direct the IR blaster to the STB and press the **<Transmit>** button, then verify that the key affected the SRB in the expected fashion.

9.1.2. *Regular Key Programing*

To start programming the IR codes file, select the first command in the list **"Power"** and place remote control in front of the IR transceiver about 2-3 inches, then press the **<Capture>** button on IR Trainer and firmly press the **<Power>** button on the R/C - the UIRT LED will come on. Keep pressing the button until the UIRT LED goes off.

After releasing the button, wait 4-5 seconds. If receipt of the signal was successful, the cursor will change into an hourglass shape, and shortly afterwards, the power command will display an IX value on the IR trainer GUI.

Repeat the training process for all the entries in the list, each time pushing the appropriate buttons on the remote control.

Note that the IX values must be identical for all of the commands. If there is a different IX value for a given command, then the capture for that command was not successful. To redo the command, select it in the list, then click the **<Transmit>** button on the left of the IR trainer GUI. After 2-3 seconds, the Yes/No buttons below **<Transmit>** will activate. Click <No> and the entry in the command list will become blank. Reselect the blank entry in the command list and repeat the training process for this entry.

9.1.3. *Training Verification*

Once you have completed filling in all of the commands, you must verify that they all work with the set-top box. To do this, select the first command in the list "Power", point the IR transceiver at a set-top box, and click the Transmit button. The transceiver will broadcast the selected command to the set-top box. After about 2-3 seconds, the **<Yes>/<No>** buttons below **<Transmit>** will activate. If the transmitted command worked, click **<Yes>,** otherwise click **<No>**. If you click <No>, the entry will be erased, allowing you to re-input the command.

Every command sent and verified will be marked with a checkmark. Repeat the process for each entry in the command list, making sure that the sent commands perform the expected function just as if you had issued them from the remote control.

9.2. EXTRA CONFIGURATION

Button names such as "Menu" and its dialing characteristics configure the channel number and other characteristics of the channel. The first field in the Lineup is the channel number used by the RPM to dial a sequence of numbers for this channel during scanning.

9.2.1. Script Macro

By populating the script field defines a line as a script macro line. In contrast from a regular channel, the first field in scrip line is a label distinguishing it from other macros and regular channels in the Lineup.

Since the Channel Number field is used for a macro label, dial the actual channel numbers to a STB using the macro script.

The Extra configuration is used to define additional remote control IR buttons used in the script macro command or in the Remote Control window.

For example, Extra buttons that can be used are UP, Down and Menu. Basic commands are Power, OK, Info, Last, Next, Prev and all the digits as defined in the IR Code Training above
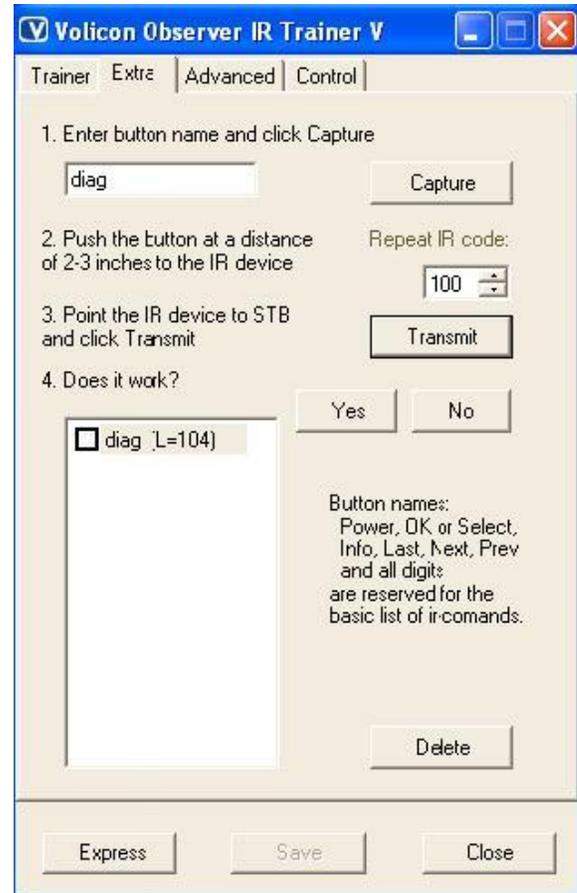
9.2.2. Extra tab

1. First name a button and click <Enter> see figure.
 Set the Repeat IR code, 3- 5 works well for most buttons. For special cases such as entering a diagnostic mode where a button needs to be pressed for 10 sec for example, enter Repeat IR code of an approximate setting of 100.

2. & 3.   Transmit the button from remote control to the Transceiver
4. Test the new IR command to insure it works

9.2.3. Extra tab Editing

As it is common to change the names of the extra programmed IR keys, editing is used to streamline this effort. To edit a key, first highlight its name by clicking on it, and then rename the key

9.3. ADVANCED CONFIGURATION

For the following configurations select the "Advanced" tab at the top.

9.3.1. *Dial 2 [or 3] digits, e.g. 07 [007] for channel 7*

Some STBs have problem receiving <OK/Select>. Then instead, the RPM pads the channel number with leading zeros.

Select the number of total digits you want the system to send. For example when selecting 3, channel number 7 will be sent as 007 and 35 as 035

9.3.2. *Interval between digits (ms)*

Select the amount of time for the RPM to delay between sending consecutive channels number digits as some STBs do not properly receive the numbers if sent too close to one another.

However, keep the delay at minimum possible value as to conserve the total cycle time though all the channels.

9.3.3. *Send OK/Select IR-command after dialing*

Some STBs have problem receiving <OK/Select> IR command to indicate that all digits dialed were dialed for that channel. Then unselect this checkbox. See Dial 2[or 3] digits section above.

Use the Info command if there is a need for more information about the channel being switched from. In some cases this command helps reset guide information which spontaneously appears on the screen

9.3.4. *Send INFO IR-command before dialing the number*

INFO key sent before dialing the number helps if banner is not displayed by an STB. Or another code programmed instead of the INFO key to prime an STB receive digits before changing a channel
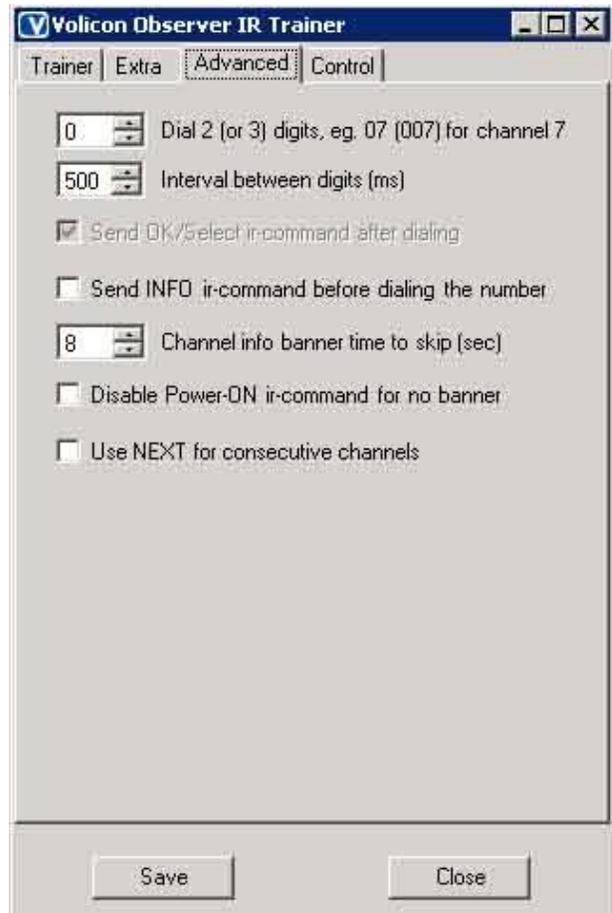
9.3.5. *Channel Info Banner Time to Skip (sec)*

On most set-top boxes, a graphical banner is overlaid upon channel change. Customers use it to determine the channel dialed by a STB and tested by the RPM. RPM uses it to determine when STB needs power cycling.

If the banner duration is configurable on a STB, then set it to as low as 2 seconds. Then configure the Banner Time to Skip in Advanced tab just a bit larger than STB banner duration to help RPM avoid including banner in the channel video analysis

9.3.6. *Disable Power ON IR-command for No Banner*

If scanner detects no banner, it will initiate a power-off/power-on cycle for the STB. It is possible to disable this option if it doesn't work reliably on some STB types. However those STBs need to work reliably without periodic power cycling

9.3.7. *Use Next for consecutive channels*

For this feature to work (and for RPM in general) insure that valid channels are provisioned in the STB and also configured correspondingly in the RPM channel Lineup.

Otherwise missing channels from the STB will cause it to display the following: "???".

The Next command is not referred to in the RPM channels Lineup, only "Use Next for consecutive channels" checkbox needs to be selected in the Infrared codes file; therefore a different IR codes file needs to be configured with IR Trainer as follows:

- o Before using the IR Trainer, disable and stop Observer Encoder service

- o Select the Next checkbox "Use Next for consecutive channels" in the "Advanced" tab of IR Trainer, see Fig. above

- o After finishing to program the IR codes, enable Observer Encoder service, setting it to automatic and start the service

- o After changing the IR codes in the IR Trainer, select the new Infrared Codes file in the Control Center Encoder see section "8. RPM Settings" above, the field "Infrared codes"

- o To be safe restart the Encoder used and the Encoder service
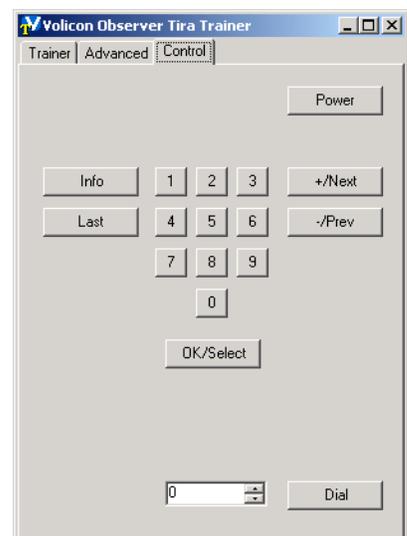
o Watch how digits are dialed in the STB - note the difference between RPM dialing digits to Next command advancing the STB to next channel

9.4. CONTROL SIMULATION

The third and final tab, "Control", is designed to facilitate issuing commands from the IR transceiver after you've configured and verified each button.

Buttons will be grayed out until after they have been configured and verified on the "Trainer" tab. Once completed, you can use the buttons in order to issue the corresponding commands. This capability is useful for checking a given IR transceiver position in front of a corresponding STB. It is also useful to check for commands that leak and affect other STBs.

*In addition, there is a numeric field with a <Dial> button capability. You may use this field to issue tuning requests in the same way that the RPM issue them, such as for example, to tune to channel 45, enter "45" in the numeric field and click the Dial button. The IR transceiver will issue the appropriate sequence of commands needed to dial channel 45, including settings from the "Advanced" tab such as inter-command delay and "leading-zeros"…

9.5. SAVING AND LOADING IR PROFILES

When you are satisfied with the configuration and the operation of a given IR profile, save it by clicking the "Save" button. Give the profile a meaningful name such as the model of the STB which it is designed to control. Then select the Infrared codes profile in the Control Center section "8. RPM Settings" for the RPM to use this profile for its Encoder-Stream, see figure below.

9.5.1. IR Training in Convenient Location

During preparatory visit to potential clients, schedule some time for IR training. Borrow a STB and its Remote Control the company uses. Then find a quiet room and free from IR interference, plan to use your Windows XP PC / laptop and use the IR Trainer software to program all the Remote Control keys, and then verify the STB IR codes file through the IR blaster to the STB.

In addition, contact Volicon support with the STB manufacturer and model number information as they will help you with this effort, see the Site Prep Guide.

To use the IR Trainer on your laptop, first copy the following files from the RPM server:
c:\Program files\observer:
IRTrainer.exe
DirectShowLib-2005.dll
UsbUirtManagedWrapper.dll

To a designated directory on your PC

Plug in a USB-UIRT IR blaster into your Laptop then install IR blaster's driver; first downloading it from http://www.usbuirt.com/getstart.htm v1.4 location to a directory on your laptop. The v1.4 driver is for XP and Windows server type OS.

To rename the IR Blaster device run uurename.exe file, run it inside a DOS window on your Laptop; the uurename.exe file is located on demo RPM server at the following directory:

c:\Program files\observe\tools

For additional instructions see "UIRT Module Driver Install and Setup Instructions" section below.

10. UIRT MODULE DRIVER INSTALL AND SETUP INSTRUCTIONS

10.1. DRIVER INSTALLATION PROCEDURE

The following steps configure an IR device to certain USB port and install the USB driver

- o Run a self-extracting zip file [UIRT.exe] this will create a folder [UIRT] in the root of C:\
- o Plug UIRT device into available USB port to start new Hardware Wizard
- o Select the [No, not this time] Option. Then click [Next].
- o On the next screen, select [Install from a list or specific location] option then click [Next]
- o On the following screen select [Don't search, I will choose the driver to install] option. Then click [Next]

- Insure [Show compatible hardware] is selected

- Click on [Have disk]

- n the next screen press [Browse] and select the [C:\UIRT] folder which was created in a previous step and contains drivers and utilities needed for installation

- On the next screen click [next]

- The click [Finish]
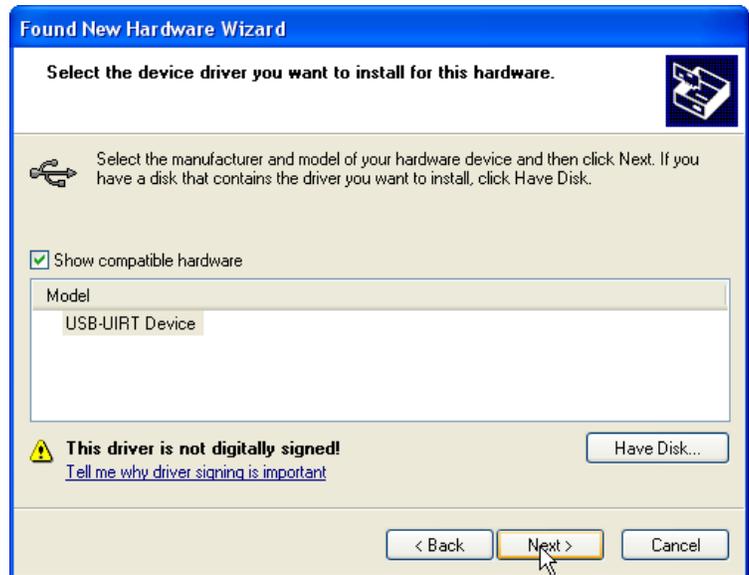
10.2. *Configuring UIRT devices 4 channel and 8 Channel RPM*

1. Open a command prompt using [Start]; [Run].
2. Change directory "c:\uirt\firmware" such as

Then press [Enter].

3. At the new command prompt type"uuremane.exe"
   c:\uirt\firmware\uurename.exe
   Then press [Enter]

Type "Y" to rename the device

Then choose a number to change to; use the next available number, 3 in this case.
By default all UIRT devices have the number 1 so for an 8 channel RPM you only need to rename 7 devices. 2, 3, 4, 5, 6, 7, and 8

After selecting a new number you must unplug and re pug in the device for the change to take effect. It is also suggested that you label the device at this time in order to avoid confusion in the future. Repeat steps 3-5 for as many devices as needed

11. APPENDIX

11.1. REFERENCES TO OBSERVER ADMIN GUIDE

As the RPM is based on the Observer system, the following subjects are covered in the Observer Admin Guide:

- Power on, shutdown
- Network configuration
- Maintenance
- Mounting, power, basic connections
- Capture Cards and Breakout Cables
- Central Configuration – Stream Control
- Observer/RPM Alerting
- SNMP Notification
- Stream Level Configuration
- Audio Profile Setup in Control Center
- Closed Captions and Subtitles
- Database Automatic Cleanup
- Email Notification
- Active Directory (AD) Integration
- hMailServer Configuration on Web Server
- What NOT to do on the server side
- Troubleshooting and maintenance
- RAID Alert Notification
- Raid Maintenance
- Antivirus Excluded Storage Areas / Services to Scan

11.2. REVISION CHANGE HISTORY

012112 Major update to RPM 6.0
032712 Services, scripts, lineups. Format front page and revisions
032912 Minor correction
051612 C Center Alerting Tab
052112 Still Include STB error, Encoder error
070512 Update introduction, encode section, probe groups, probes, lineup level, service level
        section, Alerting and SNMP, and Alert aggregation
080712 Edit probe table update; overall review and formatting
090512 Scripts dictionary
091812 National Reviewer and IR Trainer edits
100312 Update to 6.1; Configure encoder for lineup/bouquet; Refer to Observer admin guide for
        stream configuration, alerting and SNMP
121412 Import bouquet to lineup
021713 Check encoder Config STB; formatting
040913 Update to rel. 7.0 QB2