Mediatune 3.0
COM3000
Integrator’s Manual
“Just Drag and Drop”
1. Mediatune Overview

Mediatune command and control software controls the COM51 card in a COM3000 system.

- The software routes programming from one or more tuners on the COM51 to televisions located in a Bar or Restaurant.
- The system intuitively routes programming from one tuner to all televisions requesting that programming. This creates a matrix type system that best utilizes the Tuner : TV ratio.

Example:
- TVs 1, 5, 9, 11 and 36 are all requesting ESPN.
- One COM51 tuner will provide ESPN programming all 5 TVs leaving other tuners free to provide programming to other televisions.

It is important to understand the number of TVs at an installation drives the QAM count not the number of tuners needed.

- Normally each QAM can supply signal to two TVs (TV count / 2 = QAM count)

Each COM51 card can route HD video to up to 40-50 TVs at which point a second card is required. If 4K programming is desired, then each COM51 can route 4K video to about 20-25 TVs, so additional COM51s would be required to accommodate the number of simultaneous 4K streams needed.

One QAM20 fully licensed for 48 QAMs can provide HD signal to 96 televisions.
Note: 4K channels will require one QAM per TV, thus for 4K support in QAM mode, the ratio is 1:1 for TVs to QAM carriers.

Two COM51 cards will provide up to 46 tuners to be “shared” on the 96 televisions.

Mediatune is designed to work with the CHROME browser on the PC and the Safari browser on the iPad. While you may be able to get other browsers to work, you will have the best experiences using the devices which Technicolor recommends.

COMMERCIAL USE This product is designed to go into areas that are not accessible to the public at large and are not for home use. Technicolor COM3000 Products provide Head-End systems for distribution solutions for the AT&T / DIRECTV Commercial and Lodging and Institutions (L&I) markets
Note to System Installer – This reminder is provided to call the systems installer’s attention to Section 820-93 of the National Electric Code which provide guidelines for proper grounding and, in particular, specify that the Coaxial cable shield shall be connected to the grounding system of the building, as close to the point of cable entry as practical.
Mediatune 3.0 New Features

Technicolor has added many new features to the Mediatune platform. The following new features for 2019 will be covered in this manual.

- **TV Zones** – Televisions can now be grouped into zones and control can be defined by each zone.
  - Zones can be accessed once defined in the SETUP.
  - Each zone can be set up with its own home channel selection.
  - All Mediatune features are specified for each zone.

- **View All** – Changes the screen layout to view all TVs
  - An expanded view of the TVs section allows larger screens to display all TVs, eliminating the need to scroll through extended TV lists.

- **MMS** – Support for IP Multicast with LG Pro:Centric televisions
  - Technicolor has added control for LG Pro:Centric televisions. This allows Mediatune to function over IP multicast systems. Mediatune will send commands to LG televisions to tune to a specific multicast broadcast address associated with a given channel.
  - TV Power On/Off. This is specific to LG Pro:Centric televisions and allows centralized ON/OFF commands to be issued from Mediatune.
2 Introduction
This document will guide you through a typical installation process for Mediatune 3.0.

Mediatune can be used with COM3000 system to direct content from any source tuner to any output QAM channel and allow for a simple tuning interface for both IP and RF installations.

The system is based on a web server within the COM51 card. Any browser-based device can interact and become a control point, allowing for maximum flexibility for the users. You can have several PCs, iPads, and other tablet devices which all will synchronize with the interface running on the COM3000.

Note: Control devices need to support drag and drop function either via a touch pad or mouse.

Note: Throughout this document, the default IP address for Card 1 in Chassis 1 is referenced. If you are using a different card in a different chassis or have changed the IP configuration, the 192.168.3.18 default address will be different.

It is assumed that technicians installing Mediatune are well versed in all aspects of COM3000, DIRECTV MFH2, and industry standard RF and/or IP distribution technology.
3 Installing Mediatune on COM51

3.1 COM51 Licensing

Mediatune can only be installed on COM51 cards which have been enabled with the “MT” feature. Features are added to the COM51 cards by uploading a license file obtained from your authorized Technicolor distributor.

- Mediatune license is needed only for the “master” COM51 card in the system that is running the Mediatune software. Additional COM51 cards will run as “slave” cards controlled by the Mediatune software and do not require the Mediatune license.

3.2 License Installation

In most cases the system will be delivered from the Distributor with all license and Software preinstalled. However, it is important to know how to install the Mediatune license and software.

From the COM51 Pairing Info tab, select CHOOSE FILE and browse your PC for the license file (.dat) you received from your distributor.

Once selected, press UPLOAD to transfer this file to the COM51 card’s internal TFTP server. You will see that the Software Upgrade settings for the card have changed and the file will be listed under ‘Filename:’. Make sure to check the Upgrade box for the intended card, select 4=License, and press SUBMIT.
You will see the following screen.

Once the license file has been transferred, you can confirm the feature from the SysInfo page.

Click on Discover to update the information, then navigate to SysInfo.
Listed under the Features column, you will see “MT”.

3.3 MMS Mode

To work in IP mode and control IP endpoints such as an LG Pro:Centric TV, Mediatune requires MMS licenses in addition to the MT license provided above. By default, the MT license contains 10 MMS licenses so that 10 unique IP endpoints can be used when installed. If more MMS licenses are required, please contact your distributor to purchase. To determine how many MMS licenses are active, you can use the Misc Get/Set feature in Advanced Edit.

Type ‘mms’ in the Name field, then hit submit
3.4 Install Mediatune Software

Mediatune Software consists of a .tar software file which is transferred to the licensed COM51 card within a COM3000 system. Transferring the Mediatune file is like the software upgrade process, and utilizes the TFTP mechanism.

From the Pairing Info page on the COM3000 interface, select CHOOSE FILE and browse to the MT.TAR file on your PC.

Press UPLOAD to transfer this file to the COM51’s internal TFTP server.

Check the upgrade check box on the card to receive this file.

Select Usage: 1 = MT from the drop-down list

Mode: 0 = TFPT

Press SUBMIT
MT.tar is a big file with lots of zipped images. Please allow 20 seconds for a COM51 or 3-5 minutes for a COM46 after you have made this transfer before moving to the next step.

3.5 Remove Password Requirement from COM51

Each COM51 must have the password set to an empty string to disable password protection. Otherwise Mediatune running on an external device such as a tablet will not have the needed permissions to talk to the COM51 cards.

NOTE: If you overlook this step Mediatune will function normally for the 8-hour duration of the default password session, then become inaccessible.

Enter the default password (com3k) into the COM51 card, then navigate to the Lock tab. Leave the Password field blank. Click submit.
DIRECTV COM3000

Commands: Overview, Discover, PairingInfo, TuneAll, Help Display, SysInfo, HealthInfo, EPG, Syslog, Lock, ATSC, NTSC, 401, QAM

Lock

Create a password.

Password: 
Submit

This will lock write access to all of the cards. Start the password with "Read" to always permit readonly access.
3.6 Access the Mediatune Webserver

Use the Chrome browser on the PC to browse to the following IP address.

**192.168.3.18/mt/mediatune.html**

This assumes 192.168.3.18 is the IP address of the card running Mediatune.

You will see the Mediatune interface with blank TV information as shown below
4 Configuring Mediatune

Configuration of the Mediatune software is done using SETUP menu from the Mediatune interface and the Mediatune XML web server interface.

4.1 Mediatune Editor

Mediatune editor allows editing the XML scripts that control the functions of the Mediatune interface.

Many features can be set up using the Mediatune setup menu user interface which will be covered in a later section of this manual.

You can access the editor at the following IP address, assuming 192.168.3.18 is the IP address of the COM51 card running Mediatune.

http://192.168.3.18/mt/MTeditor.html

MediaTune XML Editor

Select a file to edit.

atsochannels.xml ▼

Load Save
4.1.1 Tuner Filter

Tuner filters must be set up in the Mediatune editor. The filter list is an XML script that lists all tuners available to Mediatune. Filters are necessary to prevent Mediatune from attempting to use unlicensed tuner on the COM51. They also facilitate the use of a shared COM400 chassis with COM51 cards not controlled by Mediatune.

Example:
A hotel could have 4 COM51 cards streaming free to guest channels to guestrooms and 2 COM51 cards providing Mediatune to a sports bar in the lobby from one COM400 chassis.

In the line below, we can see that the filter sets the following:
- Chassis number
- Slot number
- Tuner index

The text below sets chassis one, slot1 and tuner 1 to be accessed by Mediatune

```
<filterList>
  <filter><chassis>1</chassis><slot>1</slot><index>1</index></filter>
</filterList>
```

By default, a COM51 is only licensed for 8 tuners. A license file can increase the licensed tuner count to 23. Don’t include more tuners in the Tuner Filter list XML file than are enabled on a COM51.

The filter list below will set 16 tuners on a COM51 for use with Mediatune.

```
<filterList>
  <filter><chassis>1</chassis><slot>1</slot><index>1</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>2</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>3</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>4</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>5</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>6</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>7</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>8</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>9</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>10</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>11</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>12</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>13</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>14</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>15</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>16</index></filter>
</filterList>
```
This filter list enables a COM51 card with 23 tuners

```
<filterList>
  <filter><chassis>1</chassis><slot>1</slot><index>1</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>2</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>3</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>4</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>5</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>6</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>7</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>8</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>9</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>10</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>11</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>12</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>13</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>14</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>15</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>16</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>17</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>18</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>19</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>20</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>21</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>22</index></filter>
  <filter><chassis>1</chassis><slot>1</slot><index>23</index></filter>
</filterList>
```

It is recommended best practice to edit the filter list in notepad. Then copy and paste the file into the editor as shown below. Remember to include the closing statement `<filterList>` at the end of each file.

To apply the filter list, use the drop-down box in the Mediatune XML editor to select `tunerFilter.xml`

Selecting **Load** will cause the existing file to appear in the screen.

To load an edited file copy and paste the data into the field and select **Save**.
To verify an existing filter, select Load and the current filter will be displayed.
4.1.2 TV Configuration

Configuration of TVs can be set up in both the Mediatune setup menu and the XML editor. In the section below we will discuss editing the tvs.xml file in the Mediatune editor.

Mediatune comes configured for a basic 24 TV system. If you look at the TV.XML section of the Mediatune editor, you will see the following page:

Each line represents a TV as shown below:

```
<tv> <tvid>1</tvid> <tvdesc>TV1</tvdesc> <ip>192.168.6.2</ip> <port>17</port></tv>
```

Editable fields

TV names and IP destinations can be edited from the XML page. Do not use symbols such as &, #, @, <, >, in TV names as these are recognized as XML script.

Do not use spaces in TV names. Use underscore if spaces are needed as shown below.

<table>
<thead>
<tr>
<th>TV Name</th>
<th>Destination IP and Port Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;tv&gt; &lt;tvid&gt;1&lt;/tvid&gt; &lt;tvdesc&gt;TV1&lt;/tvdesc&gt;</code></td>
<td><code>&lt;ip&gt;192.168.6.2&lt;/ip&gt; &lt;port&gt;17&lt;/port&gt;</code></td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td><code>&lt;tv&gt; &lt;tvid&gt;1&lt;/tvid&gt; &lt;tvdesc&gt;BAR_Bigscreen1&lt;/tvdesc&gt;</code></td>
<td><code>&lt;ip&gt;172.100.6.2&lt;/ip&gt; &lt;port&gt;50&lt;/port&gt;</code></td>
</tr>
</tbody>
</table>
Additional TVs can be added to the TV.xml list as shown below:

<table>
<thead>
<tr>
<th>TV Name</th>
<th>Destination IP and Port Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV1</td>
<td>&lt;ip&gt;192.168.6.2&lt;/ip&gt; &lt;port&gt;17&lt;/port&gt;</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>TV25</td>
<td>&lt;ip&gt;172.100.6.2&lt;/ip&gt; &lt;port&gt;50&lt;/port&gt;</td>
</tr>
</tbody>
</table>

Each TV can be assigned to a group in the Mediatune interface.

In the example below we have edited the tvs.xml to reflect the following:

TV1 is named **BAR1**, it plays on QAM port **17** and is attached to the group **BAR**:

```xml
<tv> <tvid>1</tvid> <tvdesc>BAR1</tvdesc> <ip>192.168.6.2</ip> <port>17</port> <group>BAR</group> </tv>
```

TV30 is named **REST30**, it plays on QAM port **242** and is attached to the group **REST**:

```xml
<tv> <tvid>30</tvid> <tvdesc>REST30</tvdesc> <ip>192.168.6.2</ip> <port>242</port> <group>REST</group> </tv>
```

TV44 is named **Patio44**, it plays on QAM port **354** and is attached to the group **Patio**:

```xml
<tv> <tvid>44</tvid> <tvdesc>Patio44</tvdesc> <ip>192.168.6.2</ip> <port>354</port> <group>Patio</group> </tv>
```
4.2 Mediatune Settings

The Mediatune software has a settings section that can facilitate some setup parameters using a graphical use interface that may be more accessible to installers who are not comfortable with editing the XML script.

In the top right side of the Mediatune interface you will see the SETUP link.

Clicking on the link will bring you to a login screen. The default password is 1234.

Once you have successfully entered the password you will access the SETUP menu shown below.
4.2.1 TV Setup Mediatune Interface

From the setup menu select EDIT TVs.

By default, Mediatune is preconfigured for 24 TVs, a partial example of which is shown below:

<table>
<thead>
<tr>
<th>TV ID</th>
<th>TV Description</th>
<th>IP</th>
<th>Port</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TV1</td>
<td>192.168.6.2</td>
<td>17</td>
<td>red</td>
</tr>
<tr>
<td>2</td>
<td>TV2</td>
<td>192.168.6.2</td>
<td>18</td>
<td>red</td>
</tr>
<tr>
<td>3</td>
<td>TV3</td>
<td>192.168.6.2</td>
<td>33</td>
<td>red</td>
</tr>
<tr>
<td>4</td>
<td>TV4</td>
<td>192.168.6.2</td>
<td>34</td>
<td>red</td>
</tr>
<tr>
<td>5</td>
<td>TV5</td>
<td>192.168.6.2</td>
<td>49</td>
<td>red</td>
</tr>
<tr>
<td>6</td>
<td>TV6</td>
<td>192.168.6.2</td>
<td>50</td>
<td>red</td>
</tr>
<tr>
<td>7</td>
<td>TV7</td>
<td>192.168.6.2</td>
<td>65</td>
<td>red</td>
</tr>
<tr>
<td>8</td>
<td>TV8</td>
<td>192.168.6.2</td>
<td>66</td>
<td>red</td>
</tr>
</tbody>
</table>

**QAM MODE**

The TV configuration defines the TV name, where to send selected content, and assigns the TV location to a group.

In the example above the first TV is called “TV1”. The destination IP and UDP Port are 192.168.6.2 port 17 which is the destination IP of the first QAM20 modulator in the chassis, and the UDP port routes the video to the first QAM carrier.

If the QAM20 was set to output channel 23 on the first QAM carrier then TV 1 will receive programming on channel 23-1.
TV2 = QAM 1 port 18 or channel 23-2
The UDP port number is the QAM carrier index * 16 + the program number.
MMS MODE (IP)

In MMS mode, the destination becomes the IP address of the TV, rather than the IP address of the QAM.

As an example, if first TV is called “TV1”, the destination IP would be IP address of the TV (192.168.2.101). Since you set up the TVs separately (Section 9), you can program Mediatune first, or come back to the TV setup once you’ve set IP addresses for all the TVs. The UDP Port field in the setup MUST be a negative number. It is suggested that you use the negative of the last octet of the IP address for the UDP Port number in this field.
4.2.2 Add /Edit TV settings

To add or change TV settings, select the Icon.

From this field you can change:
- The TV description
- QAM IP address
- Port Number
- Group

Once changes are made select Save
To add a TV to the list, scroll to the bottom of the TV list and select **Add New TV.** Enter the information as you would in the edit TV field and select **Save**

![Add New TV](image)

**Delete TV**

To delete a TV from the list, select the trashcan icon
4.2.3 Channel Edit

Mediatune configures the channel list from the APG guide data obtained by the COM51 card. The guide data displays all available channels in the continental United States. Consequently, the channel listings in the Mediatune guide display many channels not available or not desirable to the customer.

To make the guide more user friendly, channels can be eliminated or designated as News, Sports, Favorites in the Mediatune guide.

To edit guide settings, access the Mediatune setup menu and navigate to Edit Channels.

Use the checkboxes to determine channels to eliminate from the lineup, or designate as a special category, News, Sports, Favorites.
Use the Jump to Major field to access a specific channel. Channel Range can hide or show a large range of channels from the guide as shown below:

![Channel Guide](image)

When you have completed your selections exit the setup menu and click on the Technicolor logo to refresh the screen.

The channel guide will now reflect your edits and make it much easier for your customer to navigate channels.
Use the icons across the top of the channel guide to display channels designated as Sports, News, and Favorites:

<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>206 ESPNHD</td>
<td>SportsCenter, Vanderbilt vs Tennessee</td>
</tr>
<tr>
<td>207 ESPNHD</td>
<td>NBA: The Jump, High Noon</td>
</tr>
<tr>
<td>208 ESPNUHD</td>
<td>College Basketball, Wake Forest vs Notre Dame</td>
</tr>
<tr>
<td>209 ESPNHD</td>
<td>Pardon the Interruption, Purdue vs Indiana</td>
</tr>
<tr>
<td>212 NFLHD</td>
<td>Top 10, NFL Total Access</td>
</tr>
<tr>
<td>213 MLBHD</td>
<td>FOX, MLB Tonight, Intentional Talk</td>
</tr>
<tr>
<td>214 MLBHD</td>
<td>Lucas Oil Midwest Short Course League, Lucas Oil Off Road Racing Series</td>
</tr>
<tr>
<td>215 NHLHD</td>
<td>NHL Tonight, NHL Tonight</td>
</tr>
<tr>
<td>216 NBAHD</td>
<td>Players Only: Dwyane Wade vs Kevin Garnett, Open Court</td>
</tr>
<tr>
<td>202 CNN HD</td>
<td>The Situation Room With Wolf Blitzer, Erin Burnett OutFront</td>
</tr>
<tr>
<td>204 HLN HD</td>
<td>Forensic Files, Forensic Files</td>
</tr>
<tr>
<td>207 ESPNHD</td>
<td>NBA: The Jump, High Noon</td>
</tr>
<tr>
<td>353 BTNHD</td>
<td>Bloomberg Daybreak: Asia</td>
</tr>
<tr>
<td>355 CNBC HD</td>
<td>Mad Money, Shark Tank</td>
</tr>
<tr>
<td>356 MSNBC HD</td>
<td>The Beat With Ari Melber, Hardball With Chris Matthews</td>
</tr>
<tr>
<td>367 CNNW UHD</td>
<td>Asia.Squawk Box</td>
</tr>
<tr>
<td>360 ESPNHD</td>
<td>The Evening Edit, Lou Dobbs Tonight</td>
</tr>
<tr>
<td>360 ESPNHD</td>
<td>Special Report With Bret Baier, The Story With Martha Stewart</td>
</tr>
<tr>
<td>4 WTTV-HD</td>
<td>CBS Evening News With Jeff Glor, The Big Bang Theory</td>
</tr>
<tr>
<td>5 WTTV-HD</td>
<td>ABC World News Tonight With David Muir, WRTV News: The News at 7,30</td>
</tr>
<tr>
<td>6 WISH HD</td>
<td>News 8 at 6PM, Inside Edition</td>
</tr>
<tr>
<td>15 WTHR-HD</td>
<td>NBC Nightly News With Lester Holt, Wheel of Fortune</td>
</tr>
<tr>
<td>20 WNYF-HD</td>
<td>PBS NewsHour, Nightly Business Report</td>
</tr>
<tr>
<td>59 WION-HD</td>
<td>FOX59 News at Six, FOX59 News at Seven</td>
</tr>
</tbody>
</table>
The guide page offers options to Hide Standard Def Duplicates and Show All Channels.

The Search function will query guide data for keywords and display relevant programming.
5 External Content

One of the most versatile features of Mediatune is the ability to accept an external input and route it through to any of the TVs, just as the interface handles the DIRECTV channels.

External sources are any device that can stream an MPEG2 transport stream (.TS) file to a specific IP and UDP port number.

The COM51 card running Mediatune has set port numbers tied to the input of these sources shown below:
The IP address input is to be the IP address of the COM51 card running Mediatune
Incoming streams will be accepted on one of two port schemes, 9XX or 30XX as shown below.

By default, there are 4 external source identifiers pre-configured in the interface,

EXT 1 <COM51 card IP>Port 999 - 192.168.3.18:999 (or :3000)
EXT 2 <COM51 card IP>Port 998 - 192.168.3.18:998 (or :3001)
EXT 3 <COM51 card IP>Port 997 - 192.168.3.18:997 (or :3002)
EXT 2 <COM51 card IP>Port 996 - 192.168.3.18:996 (or :3003)
5.1  Edit External Source Descriptions

You can edit the names of these in the SETUP screens.

Or in the XML Editor
<table>
<thead>
<tr>
<th>Channel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ext1</td>
<td>Mediaplayer 1</td>
</tr>
<tr>
<td>2 Ext2</td>
<td>Encoder 2</td>
</tr>
<tr>
<td>3 Ext3</td>
<td>External Source 3</td>
</tr>
<tr>
<td>4 Ext4</td>
<td>Source 4</td>
</tr>
<tr>
<td>5 Ext5</td>
<td>Source 5</td>
</tr>
</tbody>
</table>
6 ATSC Off-air Tuner

An additional external source you can bring into the Mediatune management system is from off air antenna utilizing an 8VSB to IP device such as the HDHomeRun tuner from Silicon Dust.

This ATSC tuner allows the property to view and manage content which potentially is not available from DIRECTV or can serve as a backup source in the event of rain-fade or service interruptions.

For additional information about the Silicon Dust device contact your distributor, or visit the Silicon Dust website at the link below:
https://www.silicondust.com/hd homerun/commercial/

There are multiple resources available for assistance with antenna selection and available channels. Links to two examples are below:
https://www.fcc.gov/media/engineering/dtvmaps
https://antennaweb.org/

Before proceeding with a Silicon Dust integration off-air signal integrity should be verified.

Mediatune controls Silicon Dust tuners. The tuner count only affects the number of simultaneous off-air programs available to all TV locations.

When an off-air channel is selected via Mediatune the software will:
1. Look for that channel on an existing tuner and route that stream appropriately.
2. If the requested channel is not currently tuned Mediatune will look for an available tuner and tune the requested channel.
3. If all tuners are currently being used for other channels Mediatune will return an out of tuners message.
6.1 ATSC Configuration

All desired local channels must be configured in the Mediatune software. This must be done in
the Mediatune editor.

For Mediatune to control an ATSC tuner, the device must first be Discovered using the COM51
interface.

Using the ATSC tab on the COM51, click DISCOVER

To discover ATSC boards and set their IP address:
Base IP address: 192.168.4.1

Discover Set Load

If the ATSC unit is configured correctly, it will respond to this query, if not, please see the
COM3000 Integrator’s Manual for configuration settings.

AtscDiscover
Found 10.0.0.43
Found 10.0.0.38
Found 169.254.32.157
Found 169.254.52.91
In this example, 2 HDHomeRun devices were discovered. Mediatune can become aware of these devices, by returning to the ATSC page and setting a tune command. In the example below, an “empty” tune command is satisfactory since all that is desired is to “set” the tuners as available resources. The zeros shown are OK.

**ATSC**

See [http://www.antennasdirect.com/hdtv-station-list.html](http://www.antennasdirect.com/hdtv-station-list.html)
See [http://dtv.gov/stationlist.htm](http://dtv.gov/stationlist.htm)

Newer ATSC-C units cannot tune via virtual channel number.
Usage: HomeRun_IP Tuner_Index RF_Index ProgramIndex.0 Dest_IP Dest_Port
192.168.2.1 0 21 1.0 192.168.6.9 17
Click Query to see the ProgramIndexes available on the tuned frequencies.

Older ATSC-C units can tune via virtual channel number.
Old Usage: HomeRun_IP Tuner_Index RF_Index Major.Minor Dest_IP Dest_Port
192.168.2.1 0 21 20.1 192.168.6.9 17
To acquire all of the subchannels, set Major.Minor to '0.0' and add 256 to the QAM24 port. When acquiring all subchannels, no other channels can be sent to the same QAM channel.
Set RF_Index to -1 to close the tuner.

```
10.0.0.43 0 0 0.0 192.168.0.0 1234
10.0.0.43 1 0 0.0 192.168.0.0 1234
10.0.0.43 0 0 0.0 192.168.0.0 1234
10.0.0.43 1 0 0.0 192.168.0.0 1234
```

Click Save then Click Run.
Browse to <Mediatune com51 IP address>/mt/MTeditor.html and select “atscchannels.xml”. For this example, we will use the default 192.168.3.18 address.

**MediaTune XML Editor**

Select a file to edit.

atscchannels.xml

Load | Save
To configure an entry the following information will be needed

1. **The Frequency Index or RF carrier of the channel.** This can be found on the suggested websites listed above, or from individual station websites.

   The example below is from the FCC website for Indianapolis ABC affiliate WRTV. It shows ABC channel 6 is broadcast on Frequency Index 25 (UHF). It also provides direction to and distance from the broadcast tower.

   ![FCC Website Screenshot]

<table>
<thead>
<tr>
<th>WRTV</th>
<th>ABC</th>
<th>6</th>
<th>UHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRTV Facility ID: 40877</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WRTV (Licensing) (Public File)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of License: INDIANAPOLIS, IN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF Channel: 25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RX Strength: 111 dbuV/m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tower Distance: 11 mi; Direction: 247°</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. **The program number** (available from the silicone dust HDHomeRun Tech software).

   Below is an example of the HDHomeRun software tuning WRTV on RF broadcast ch 25, Program number 3. Other programs may be available on the same RF carrier and will be listed in the Program drop down box. Also displayed is the channel status.

   ![HDHomeRun Software Screenshot]
3. **DIRECTV major-minor channel or channel object ID.** If the channel tuned is available on DIRECTV, guide data can be imported from the APG guide data available on the COM51. To accomplish this the channel major-minor number must be entered. The major number is the DIRECTV channel and the minor number is normally always 65535.

- Another option is to use the Channel Object ID. All information above is displayed on the COM51 Channel Tune screen of the COM51 advanced edit section.

Tune a COM51 tuner to the local channel desired.

```
3 239.100.0.19 5001 6_WRTV 15 -27
```

Navigate to Advanced edit > Channel Tune.

Note the Channel_Object_ID

In this case DIRECTV Major #6 ABC (WRTV) is tuned and the Channel_Object_ID is 3105940

**Channel Tune**

```
Dest_IP_Address: 239.100.0.19
Dest_Port_Number: 5001
Protocol_Type: 0 = UDP
Channel_Object_ID: 3105940
Major_Number: 6
Minor_Number: 65535
Stream_ID: 111
Security_Mode: 0 = None
Persistent: 1 = TRUE
Submit  Channel_Close
```
The following information has been gathered for WRTV, ABC:

1. Frequency Index  25
2. Program Number  3
3. Major-minor channel  6-65535

Repeat these steps to gather information for all local off-air channels.

For the example below we will use WFYI, PBS for a second channel entry:

1. Frequency Index  21
2. Program Number  3
3. Channel Object ID  4390123

Using this information, we will create the XML data required for Mediatune.

6.2 XML Channel Syntax

The text below must be carefully edited and entered in the Mediatune editor ATSC page.
XML pages must always include “open” and “close” phrases with text information between these statements
The first line must always be:
<atscchannels>
The final line must always be:
</atscchannels>
Below is an example of an entry for channels 6 WRTV (ABC) and 8 WISH (CW) and the necessary edits:

```xml
<atscchannels>
  <atscchandesc>
    <major>1</major>
    <minor>0</minor>
    <freqIndex>25</freqIndex>
    <desc>6.1 ABC</desc>
    <dtvch>6-65535</dtvch>
  </atscchandesc>
  <atscchandesc>
    <major>1</major>
    <minor>0</minor>
    <freqIndex>9</freqIndex>
    <desc>8.1 CW</desc>
    <dtvch>3900956</dtvch>
  </atscchandesc>
</atscchannels>
```

<table>
<thead>
<tr>
<th>Program Number</th>
<th>0 is to designate tuning by Program Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Index of desired channel</td>
<td></td>
</tr>
<tr>
<td>Channel Name – You choose, free</td>
<td></td>
</tr>
<tr>
<td>DTV channel to correspond with program data. Leave as 0 if no corresponding DTV channel. Set as channel Object ID if desired channel isn’t listed by channel number.</td>
<td></td>
</tr>
</tbody>
</table>

![Channel Tune](image-url)
Enter the data above in the Mediatune XML Editor atscchannels.xml field as shown below:

```
<atscchannels>
<atscchandesc>
<major>3</major>
<major>3</major>
<minor>0</minor>
<freqIndex>29</freqIndex>
<desc>ABC</desc>
<dtuch>31156950</dtuch>
</atscchandesc>
<atscchandesc>
<major>3</major>
<major>3</major>
<minor>0</minor>
<freqIndex>21</freqIndex>
<desc>28_JHFSX</desc>
<dtuch>64390123</dtuch>
</atscchandesc>
</atscchannels>
```

The Mediatune interface will display the following in the ATSC
Again, the RF frequency index 25 will allow Mediatune to tune program 3.0 which corresponds to virtual channel 6.1. In the Indianapolis market, this corresponds to WRTV 6 ABC.

You are free to put whatever name or title you’d like in the <desc> field. By putting the DIRECTV local channel number, the Mediatune interface will associate the DIRECTV data from channel 6 with this entry.

All channels are displayed in the order they are presented in this list, so if you’d like them in numerical order, start with the lowest numbers, then add channels below increasing in value. When completed with this file, click SAVE, then exit into Mediatune to view your results. You may have to hit the Technicolor logo to refresh the interface.
7 TV Setup for Mediatune

Mediatune outputs encrypted content requiring TVs capable of decrypting Pro:Idiom signals, or the use of a Pro:Idiom enabled set-back box will be required. There are multiple Pro:Idiom enabled set-back boxes available. For this manual a Technicolor DCI401MCS will be used.

Mediatune is designed such that a TV is set to a specific QAM channel and does not change. Once set to the correct channel, there is no reason to change the channel on the TV or the DCI401MCS.

Each TV or set-top box should be assigned a unique RF channel and if possible be locked on that channel to prevent channel changes. Most commercial televisions allow setting a “start channel”, if so, each TV should be set to start on its assigned operational channel.

It is recommended best practice to keep documentation of TV locations, designated RF channel and DCI401 Unit Identifier number (if used) and any other relevant information.

It can also be useful to label the TVs with their assigned TV number

Example:

<table>
<thead>
<tr>
<th>TV Location</th>
<th>TV Number / Name</th>
<th>RF Channel</th>
<th>DCI401 ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAR Left</td>
<td>Bar Left - 1</td>
<td>23-1</td>
<td>0413843855</td>
</tr>
<tr>
<td>BAR Center</td>
<td>Bar Center -2</td>
<td>23-2</td>
<td>0413843548</td>
</tr>
<tr>
<td>Above table 12</td>
<td>Table12 - 3</td>
<td>24-1</td>
<td>0413845684</td>
</tr>
</tbody>
</table>

Section 12 details programing for LG STB boxes and is informational only. Technicolor recommends you contact the vendor of any set back box for guidance before proceeding.

Set back boxes generally connect to the TV via HDMI.

Be sure all TVs are HDCP compliant
8 Using Mediatune

Mediatune was designed to be a simple drag and drop user interface. Click on a desired channel to watch. Drag and drop it on the TV you would like to watch it on. Mediatune will do the rest to assign a tuner, tune the content, and route the content to the desired output. Note: Control device must support drag and drop feature or use an appropriate pointing device (mouse).

Controls are via 7 icons on the Mediatune interface. In this section we will cover setup and use of each control icon.
Home Button

The Home channel function stores TV channel settings and will automatically tune all TVs to a preset channel.

To configure home screens:

- Tune all TVs to a desired channel
- Enter SETUP and click “Save Home Setup”. Multiple Home configurations can be set up and labeled as shown below:

Once configured Mediatune will revert to this known desired channel configuration when a home screen is selected.

- When the home button is clicked the system will offer home screen options. Select which home screen is desired and click Tune to Home.
Clear All

Clear All will clear tuning from all COM51 tuners. You will be prompted to confirm. If you are accessing a single zone then only the tuners feeding that zone will be closed. If Mediatune exhibits any odd functionality this is a good first step in troubleshooting.

Tune All

If you’d like all the TVs or zones to play the same channel, drag the desired channel to the Tune All button. You will be prompted to confirm, then all TVs will tune to the desired channel. If you are logged into a zone only the TVs in that zone will tune.
If you’d like to clear a specific TV, you can drag that TV to the trash can icon. You will be prompted to confirm. Like the Clear all this can be used in troubleshooting.

Clicking on the Mediatune logo will change from the 4-column view to a wider view if allowed by device screen size.

Clicking on the Technicolor logo will refresh the page and revert the display back to the 4-column display.
Clicking on the TVS button will scroll through all TV Zones. If you assigned different zones in the TV.xml file they will appear as shown below:
8.1 Logging into Specific Group Access

Access to Mediatune can be restricted to only specific TV groups.

A user can be limited to seeing only specific TV groups by using a specific URL for that group, add “?group=(groupname)” to the Mediatune URL and only the TVs in that group will display. The user will not be able to access other groups of TVs.

Example:

http://192.168.3.18/mt/mediatune.html?group=patio

This URL will only allow access to Patio TVs, the user cannot access BAR or REST TV groups.

This feature is extremely valuable in large properties such as casinos where you would like to prevent someone in the bar from accidentally changing a TV in the Sports Book or Poker area.

The URLs are not password protected unless the tuning device has a protection on it. This is a convenience feature, not a hardened security feature.
9 Mediatune using LG Pro:Centric Televisions

Technicolor has partnered with LG Electronics to bring the next evolution of Mediatune to market.

The Mediatune MMS (Multi-Cast Matrix Switch) uses IP Multicast technology to stream DIRECTV channels to a TV.

Unlike the RF QAM version of Mediatune the MMS version does not use QAM. Instead it assigns a multicast IP address to each tuner. Mediatune then controls the TV via the LG Pro:Centric Technology and changes the TV channel to tune to the stream requested.

This is a more efficient method of signal distribution, especially considering the new DIRECTV 4K programming that will require much more bandwidth on the RF network. With the advent of 4K, RF systems will require a dedicated QAM carrier per TV, effectively doubling the QAM cost when delivering 4K.

Software Requirements
COM51 Software Version 04.01.37 or newer
Mediatune version 3.0.20 or newer

9.1 TV Programming
Turn on LG IP TV.
Press the MENU button.
If icons appear on the right, select “…”
If icons appear on the left, highlight “General”.
Press the 1 button 15-30 times until the Host Diagnostics screen appears.
   If unsuccessful repeat the process on the Safety Icon

Press ‘0’ to complete IN-STOP (reset to factory default)
Select “YES”
TV will reset and turn off
Enter Pro:Centric Settings
Turn TV on.
Select NEXT
Select Manual PRO:CENTRIC
Set Pro:Centric Mode to “HTML”
Set Media Type to “IP”
Set Server Address to “IP Address”
Set IP Address to COM51 IP address (192.168.3.18)
Set IP port to “80”
Select SEARCH

TV will search for Pro:Centric server on the COM51 card and report Server Found
Select NEXT
Select TURN OFF
Turn TV on
It is recommended to set each TV with a fixed IP address. This address will need to be included in the TV.XML config file in Mediatune. If a DHCP server is used the TVs and the COM system must be in the same subnet. Reserve IP address in the DHCP Mac address table. If the TV’s IP address and the IP address in the TV.XML file to not match the TV will cease to function with Mediatune

**Set fixed IP on TV.**

Enter LG Installer Menu
- Hit “Menu” or “Settings” over and over until TV does not respond
- Press “9-8-7-6-Enter”

Navigate to option 119 Data Channel 253”
Press “2-5-3-Menu” or “2-5-3-Settings” to enter the Network settings menu
Select edit in the network menu and De-select the automatic IP settings.
Enter correct IP information
This setting will be saved after the exit.
Change the tvs.xml file to have the new IP address.

TVs IP address can be verified by pressing the PORTAL button. The TV’s IP address will be displayed.
In tvs.xml set the TV’s IP address.
Power cycle TV
Press PORTAL
Use Mediatune to change channels.
10 External Tuners

There are several set back boxes available that will allow Pro:Idiom content to be displayed on a residential model TV. Each should be set up per the manufacturer’s specifications and tested carefully in a lab environment before deployment.

10.1 DCI401MCS for Mediatune

If Pro:Idiom TVs are not used the DCI401MCS set-back box is recommended to receive the Pro:Idiom encrypted content from the COM3000.

Before proceeding, tune channels to all TVs in the Mediatune interface so all RF channels will be present when scanning for channels.

Connect DCI401MCS boxes to each TV and the RF distribution system. Industry standards for RF distribution and signal quality must be adhered to.

Channel Scan DCI401 MCS Using DCI401 Remote

“Pair” remotes to each DCI401MCS per the DCI401MCS manual.

Access the menu and perform a channel scan.

Tune the DCI401MCS to the designated channel for each TV.

The DCI401 will operate with an IR remote that does not require pairing. A Xfinity remote from Comcast has been verified to work.
Channel Scan COM51 401 Interface

The COM51 interface includes a tab that will send commands to DCI401MCS boxes connected to the unit via RF.

**DIRECTV COM3000**

**Commands:** Overview, Discover, PairingInfo, TuneAll, Help

*Display, SysInfo, HealthInfo, EPG, Syslog, Lock, ATSC, NTSC, 4L, OAM*

**DCI401MCS**

<table>
<thead>
<tr>
<th>Submit</th>
<th>Channel_Close</th>
</tr>
</thead>
</table>

**MessageType:** 0 = Download Now

**Receiver_ID:** 0xffffffff

**RF_Channel:** 0

**Bank:** 0

**Filename:**

**TFTP_IP:** 192.168.1.254

This interface sends software updates to the DCI401MCS and can be used to send command to channel scan, tune and lock tuners.

To send commands to individual boxes the DCI401MCS Unit identifier must be entered the Receiver ID field. This allows a tune command to be sent to one individual DCI401MCS.

The default hex 0xffffffff ID will send commands to all connected boxes and is useful for sending software updates, channel scan, and feature lock commands

Using the default Receiver id hex use the drop-down box to select 6=Channel scan. This will cause all DCI401s to scan for all available channels. The TVs will display a screen, “Channel scan in progress”.
Tune DCI401MCS Channel

This may be done manually with the remote control or from the COM51 interface. Using the 401 interfaces will require the Unit Identifier be entered in the Receiver field and the channel to be tuned entered.

Lock DCI401MCS Functions

Once all the DCI401MCS boxes have been tuned to the correct channel and verified the Channel Change and Power keys on the remote control should be disabled.

This is done via the 401 tab on the COM51 interface.
From the dropdown menu select 3=Feature enable

In the entry mode field select checkboxes.

De-select
(1) Power Key (6) Allow Channel Change

Click Submit
Attempts to change channels with a remote will result in a key defeat message on the TV.
11 General Tip, Tricks and Best Practices

➢ Mediatune is always accessed via the web page XXX.XXX.XXX.XXX/mt/mediatune.html where XXX.XXX.XXX.XXX is the IP address of the card containing the Mediatune files.

➢ If you are using a wireless network to connect an iPad or other tablet device, you must make sure you have a very good wireless signal in all areas where the wireless devices are used.

➢ It is good practice to always have a connected PC running Chrome wired directly into the network to insure a good connection to the interface.

➢ Like all COM systems, support requires a method to remotely access the system. Technicolor, Distributors, Dealers cannot support a site that is not remotely accessible.

➢ On the iPad, you can save the Mediatune web interface to the home screen by selecting “Add to Home Screen”. This will provide an icon you can click on the home screen which takes you directly to Mediatune.

➢ If you are using an iPad, it is helpful to permanently mount the device with a connected power supply. If connected to a power supply, you can prevent the interface from timing out by setting the Auto-Lock to Never. You can turn on and off the device from the Sleep/Wake button on the top corner.

Let’s Double Check

➢ You must set the password to a blank string on a COM51 cards.

➢ Please use a PC and CHROME to configure Mediatune as some of the items do not display well on an iPad running Safari.

➢ Remember, 2 streams only per QAM carrier!

➢ There is no reason to change the channel on the TV or on the DCI401MCS. Throw the remotes AWAY!

Mediatune was designed to work with the CHROME browser on the PC and the Safari browser on the iPad. While you may be able to get other browsers to work, you will have the best experiences using the devices which Technicolor actively supports.
12 QAM Log Check

If the system is incorrectly configured it is possible that multiple video sources may be sent to the same QAM UDP port. This can cause system wide video issues. To determine if the QAM is in a good state, access the QAM tab from a COM51 web page. The QAM’s IP address is 192.168.6.1+chassisId so the first QAM is normally at 192.168.6.2.

Click on the qamLog button to see the QAM’s syslog. Notice that every time you click the qamLog button that the letters “CCC” are added to the end of the log.

To verify that the QAM is stable, click the qamLog button three times with a few seconds between presses. Verify that the QAM syslog contains a long sequence of “CCCCCCCCC”.

If the QAM syslog contains “P## P## P##” or “T## T## T##” there is probably a system configuration problem. The first number refers to the QAM index (zero based). The second number refers to the program index (zero based). Therefore, the message “P21” means that the third QAM carrier, second program might be receiving packets from two difference channels at the same time. Frequent overflow messages also indicate a problem.

To resolve an issue, remove channels until the QAM syslog is clean. Add back channels until the problem occurs again in order to understand which channels are conflicting.

13 Transport Stream Router (troute) [Advanced Debugging]

Mediatune works by sending UDP packets from the tuners to the troute application. The troute application then duplicates to the UDP packets to each of the TVs. The status of troute can be determined by accessing the URL http://192.168.3.18:8082/troute?aaa. Right click on the resulting screen and select “View page source”:

<dupList>
<dup><in>1000</in> <ip>192.168.6.2</ip> <port>17</port></dup>
<dup><in>1000</in> <ip>192.168.6.2</ip> <port>18</port></dup>
<dup><in>1001</in> <ip>192.168.6.2</ip> <port>33</port></dup>
</dupList>

This example indicates that every UDP packet received on UDP port 1000 is forwarded to 192.168.6.2:17 and 192.168.6.2:18. To add or remove stream duplication:

http://X.X.X.X:8082/troute?portIn=<portIn>&ipOut=<IPin>&portOut=<portOut>&stop =<stop>

For example, to stop the first duplication:

http://X.X.X.X:8082/troute?portIn=1000&ipOut=192.168.6.2&portOut=17&stop=1

To stop all duplications on a card set stop to 2.