

#### **COM2000 Training Workshop**





# Welcome

Welcome to the Technicolor COM2000 training workshop

Your instructor is Mark Anderson

The Technicolor MCS Management Team is:

- Rob Rhodes Director of R&D
- Doug Strachota Product Manager
- Tony Watters Sales Manager



# **Contacting Technicolor MCS**

#### The Technicolor MCS website:

http://www.technicolor.com/en/solutions-services/connected-home/commercial-video-solutions

The Technicolor MCS toll free support number:

1-855-297-5820

The Technicolor MCS email address:

mcssales@technicolor.com



# **Classroom Etiquette**

## Please DO

- Turn all cellphones to vibrate or off
- Keep all conversations relevant to the current topic
- Feel free to ask questions when needed

# Please DO NOT

- Talk on your cell phone
- Carry on side conversations
- Be afraid to ask questions
- Be disruptive to others in the class



# A Brief Technicolor MCS Product History

- Commercial Gateways for MDU Captiva
- Gateways for Aircraft LiveTV (U.S.) & Azul (Brazil)
- COM24 & COM100 Colony System
- COM200 Chassis with integrated Ethernet switch
- QAM24 Integrated 12 channel modulator
- COM24-FLX SD only, SWM only version of the COM24, Upgradable
- GbE1 Provides access to COM200 backplane slot 1 Gigabit Ethernet port
- QAM6 & SWQAM2- Integrated 6 channel modulator & SW upgrade
- DCI401 MCS Pro:Idiom decrypting set back box
- ATSC8 1 RU, 8 tuner ATSC receiver
- MediaTune Graphical user interface for bars and restaurants



# Evolution of the COM1000 System

2009





# Evolution of the COM1000 System

2012





# Introducing the COM2000 System

2014





# What We Will Cover In This Workshop

- COM360 System Chassis
- COM46 and COM46-FLX satellite receiver cards
- QAM6 Modulator card
- EPG & PSIP (Electronic Program Guide, Program and System Information Protocol)
- Integrating an EAS (Emergency Alert System) solution
- Local Content Insertion (Security cameras, local info video, etc.)
- ATSC8 off air receiver
- DCI401MCS Pro:Idiom decrypting set back box



# System Components - COM360

#### COM360 Chassis

- (2) Gigabit User Defined Ethernet Ports
- (2) QAM Slots
- Provides 3 RU rack mounted enclosure and power supply
- Backplane provides power distribution and integrated Gigabit Ethernet switch
- Redundant fans for cooling





# System Components - COM46

#### COM46 Receiver Card

- Receives Satellite RF stream
- Removes DIRECTV's encryption
- Applies Pro:Idiom digital content protection
- Supports 8 DIRECTV channels
- Outputs IP video in UDP or RTP formats
- Remote software upgrades and management
- LED blinking sequence provides front panel diagnostics
- Only supports SWM RF plants





## System Components - COM46-FLX

#### COM46-FLX Receiver Card

- Receives Satellite RF stream
- Removes DIRECTV's encryption
- Supports 8 DIRECTV SD channels
- Outputs IP video in UDP or RTP formats
- Remote software upgrades and management
- LED blinking sequence provides front panel diagnostics
- Only supports SWM RF plants





## System Components - QAM6 & SWQAM2

#### QAM6 & SWQAM2

- Cost effective, scalable solution for a variety of channel counts
- Reduced feature set specific to
  hospitality market
- QAM6 supports 6 QAM @ 256 with single RF output – Max 12 QAM with update keys
- Two channel upgrade keys can be purchased: Mdl # SWQAM2
- J.83 Annex B, frequency range
  54Mhz 860 MHz





### System Components - ATSC-8



- 1 RU
- 8 available ATSC digital tuners
- IP output
- Configured via COM46 or COM46-FLX HTML interface

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### System Components - DCI401MCS



- QAM input
- HDMI, RF outputs
- Pro:Idiom Decode
- Utilizes PSIP data when present
- MPEG4/MPEG2/DIRECTV legacy decode
- Configured via COM46 or COM46-FLX HTML interface



## Commissioning a COM2000 System - Toolkit

- COM24mdns.exe
- Web browser IE, Chrome, Firefox, Safari
- TFTP server tftpd32
- DHCP server tftpd32
- Syslog server tfpd32, Kiwi Syslog Daemon
- IP video playback utility, VLC
- Packet Capture Wireshark
- DCI401MCS
- Video monitor with HDMI input
- AIM



### Technicolor COM2000 - What's New?

COM46 - Receiver Card

- Overview Page
- Eight tuners per card
- HTML file upload capability
- SWM only
- No front Ethernet port
- Gigabit Ethernet

COM360 - Chassis

- Dual QAM slots
- Integrated gigabit switch
- Two user defined gigabit front Ethernet ports
- Single power supply



### Discovery Tool - COM24mdns.exe



#### MDNS = Multicast Domain Name Service



# Discovery Tool - COM24mdns.exe

Select Card - Internet Explorer, optimized for Bing and MSN		_ & ×
C:\Documents and Settings\generic\Desktop\com24list.htm	💌 🐓 🔀 🔯 Live Search	P -
Back ites Select Card		
		*
Select COM24 Card		
192 168 3 98		
<u>192.168.3.100</u>		
<u>192.168.3.102</u> 192.168.3.104		

After running the COM24mdns.exe tool your default browser will launch and present you with a page of links to the Technicolor COM46/COM24 cards it has discovered



## COM46 - Technicolor Splash Screen

After clicking on a link to a COM46/COM24 card you will see the Technicolor splash screen for a few seconds.



### COM46 - Discover Page



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Overview

• This page presents you with the most used system information on a single page. It provides for tuning and routing configuration.

Discover

 Sends out a multicast discovery request to find all cards installed on the network

PairingInfo

• The PairingInfo page presents the user with links to the syslogs and camlogs for all cards, shows authorization status and provides for simultaneous multiple card software updates



TuneAll

 From this page you can paste in a tuning list and tune all tuners in the system at once and see all current tuning parameters in a plain text format and you copy to a file for future use.

Help

 This page presents the user with a list of the page links with a brief description of each and a link to the Technicolor MCS web site

Refresh

• Refreshes all of the data for cards currently listed, will NOT list data for any cards added since last discover function

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Display

• Relists the current data for all cards installed in the COM2000 system but does NOT refresh the data or discover cards

SysInfo

 This page displays MAC and IP addresses of all the cards in the system by chassis/slot and will show which card(s) are running an EPG

HealthInfo

• This page displays basic IC temperature and fan status information



EPG

 From this page you can configure and manage the Electronic Program Guide and Program and System Information Protocol functionality

Syslog

• Takes you to the Syslog of the card you are currently addressing

Lock

• From this page you can set a system password to restrict write access to all cards in the system



ATSC

From this page you configure and manage the ATSC8 off air receiver

401

• From this page you configure and manage the DCI401MCS Pro:Idiom decrypting set back box

QAM

• From this page you configure and manage the Technicolor QAM



QAM/IP Address

- When streaming to a Technicolor QAM, this field will display the major and minor QAM channel
- If streaming externally, or if there is a problem this field will display the destination IP Address

Bitrate/Port

- If streaming to a Technicolor QAM this field will display a static snapshot of the stream bitrate
- If streaming externally, or if there is a problem this field will display the destination port number



# COM46 - Discover Page - Data Fields

SNR

• Displays the Signal to Noise Ratio of the incoming RF signal in dB. This is an indicator of signal quality, bigger is better

Strength

- This is a measurement of the incoming signal strength expressed in dBm
- Color Coding
- Some fields will change background color if values are outside of nominal. WHITE = nominal, YELLOW = cautionary or warning, RED will be an issue requiring someones attention

Slot ID

 This is a link that will take you to the CAM log of that card. Grey shading indicates log message(s) are in the log file(s) technicolor

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## COM46 - Simple Tune Page



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## COM46 - Advanced Edit Page, Channel Tune

🖉 COM1000 - Internet Expl	orer, optimized for Bing an	d MSN
🔾 🗢 🖉 http://192.:	168.3.100/cgi-bin/webcmd?scre	een=CardEdit?tune=0
Back to COM1000 (Alt+Left)		
COMINDO		
		technicolor
Commands: Overview	, Discover, PairingInfo	o, <u>TuneAll</u> , <u>Help</u>
<u>Refresh</u> , <u>D</u>	isplay, <u>SysInfo</u> , <mark>Health</mark>	Info, EPG, Syslog, Lock, ATSC, 401, QAM
Edit (Chase	sig-6 Slot	-1 Tuper $-1$ TD $-192$ 168 3 98
Channel The	515-0, 5100	-1, 100000000000000000000000000000000000
Channel Tur	ie	
Dest_IP_Address:	192.168.6.11	OR Qam-Sub
Dest_Port_Number:	17	
Protocol_Type:	0 = UDP 💌	
Channel_Object_ID:	3900947	
Major_Number:	202	***
Minor_Number:	65535	
Stream_ID:	111	
Security_Mode:	1 = Pro_Idiom	
Persistent:	1 = TRUE	
Submit Query	Channel_Close	



# COM46 - Advanced Edit, Tuning

Dest\_IP\_Address

- This is usually the IP address of a QAM or a multicast IP address
- Dest\_Port\_Number
  - IP Port numbers usually represent QAM minor channel numbers
- Protocol\_Type
  - Allows user to select UDP or RTP protocol for IP encapsulation

Channel Object\_ID

• This is a unique number that represents a DIRECTV channel. It is filled in when a tuner locks however it can be used, when known, to force a tuner to lock a particular DIRECTV channel

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Major\_Number

• This is where you enter the DIRECTV channel number you wish to tune

Minor Number

• Default value of 65535 is filled in automatically by the COM46 card and generally does not need to be changed

Stream\_ID

 Allows for a unique identifier to be applied to every video stream produced by the COM2000 system



Security\_Mode

- This pull down allows the user to select the encryption mode used to protect the HD streams leaving the COM46 card
- Encryption can be turned off for SD channels

Persistent

• This setting enables the COM46 card to remember all of its settings and return to them after a power cycle or reboot



### COM46 - Advanced Edit Page, Info

Chassis ID:	6	
Slot ID:	1	
Tuner:	1	
Card_IP:	192.168.3.98	
Receiver_ID:	036624337238	
CAM_ID:	003805104902	
Network_ID:	10	
Frequency_Index:	135	
Authorized:	1	
Paired:	1	
Blackout:	0	_
SW Version:	ST03.02.00	

Provides a convenient place to see information from several different pages in one location



## COM46 - Advanced Edit Page, Info

#### Chassis\_ID, Slot\_ID, Receiver\_ID, CAM\_ID, Authorized, Paired

 Names may look slightly different but the functionality is the same across all screens

Network\_ID

• Translates to a specific satellite

Frequency\_Index

• Translates to a specific transponder

Blackout

• A '1' indicates that a coverage-blackout is being enforced in the systems zip code for the program that is tuned

SW\_Version

• Reports the COM46 software version

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### COM46 - Advanced Edit Page, LED Control



- Provides a pull down that allows the user to control the state of LED number 9
- Can be useful for remote identification of a particular card in the system


## COM46 - Advanced Edit Page, Read Cam Log

Read CAM log	
9	
Submit Query	

- Provides one method to get access to the CAM log for review of messages
- CAM log is where the DIRECTV 700 messages will be found if experiencing authorization issues, etc. i.e. 721, 722, 727



#### COM46 - Black Out Screen



When a guest tunes to a channel in the lineup that is tuned to a locally blacked out event (727 message) they are presented with this still frame



#### COM46 - Advanced Edit Page, Reset



#### Performs a software reset of the COM46 card



## COM46 - Advanced Edit Page, File Transfer

	2 = SW Lingrade		
usage:		7	
Server_IP_Address:	192.168.1.254		
Filename:			
Mode:	0 = TFTP 💌		

The primary function of this command is to provide you a method to transfer files to the COM46 card using tftp or ftp protocols



## COM46 - Advanced Edit Page, File Transfer

rile i ransier		
Usage:	0 = NA	-
Server_IP_Address:	0 = NA	
Filename:	2 = SW_Upgrade	
Mode:	3 = Log	
Submit Query	4 = License 5 = B	
	6 = Flash_Image	

- A pull down list is provided to tell the COM46 card which type of file you are transferring.
- Files types include Media Tune, software files of various types and sizes, license files, etc.



## COM46 - Advanced Edit, File Transfer

Usage

• Defines the operation to perform for the COM46 card

IP\_Address

- Sets the IP addess of the ftp or tftp server
- Default: 192.168.1.254

Filename

• Defines the file to retreive or sets the name of the log file

Mode

- Selects which file-transfer protocol to use for the file transfers
- Default: 0 = tftp



User Config	
WARNING: Changing the	settings in this section may cause the card to be unable to communicate. Please record all settings for future reference.
IP_Config: 0=De	fault stands 🔽
Base_IP:	
Subnet:	Recommended: 255.255.0.0. Warning: You may lose communication with the card.
Gateway:	
DNS_IP:	
'ime_To_Live: 3	
.og_IP:	
.og_Level:	a# (app; guide; hw; publish; verifier; 0 - debug; 1- verbose; 2 - info; 3 - warn; 4 - error)
tilConfig:	
Submit Query	

- Allows user to configure the COM46 NIC settings
- Provides ability to set the syslog message level and route it to a remote syslog server when required
- Provides another method to apply special software keys to the COM46



#### **User Config**

WARNING: Changing the settings in this section may cause the card to be unable to communicate. Please record all settings for future reference.

IP_Config:	0 = Default	]
Base_IP:	0 = Default 1 = DHCP_Persistent	
Subnet:	2 = NA	Recommended: 255.255.0.0. Warning: You may lose communication with the card.
Gateway:	3 = NA 4 = Fixed	
DNS_IP:	5 = NA	
Time_To_Live:	6 = NA 7 = NA	
Log_IP:	8 = NoChange	
Log_Level:		a# (app; guide; hw; publish; verifier; 0 - debug; 1- verbose; 2 - info; 3 - warn; 4 - error)
UtilConfig:		
Submit Query		
<u>1</u>		

Pull down provide user with choice of IP modes:

- 0 = Default (Chassis/Slot)
- 1 = DHCP\_Persistent
- 4 = Fixed



IP\_Config

- Allows the user to select one of 3 IP addressing modes
- Default mode is based on the chassis ID and slot number Base\_IP
  - Displays current IP address. This is where you set the COM46 IP address in the Fixed mode

Subnet

- Display or sets the subnet mask, default is 255.255.0.0 Gateway
  - This field is where the user defines the IP address of the gateway

DNS\_IP

 This is where you apply the IP address of the Domain Name System server technicolor



Time\_To\_Live

- This is where you can change the TTL setting for the COM46 card
- The default value is 3

Log\_IP

- Here you define the IP address of a remote syslog server
   Log\_Level
  - This setting allows the user to change the verbosity of the syslog

UtilConfig

 This field is mainly used for development and the application of special software keys



#### COM46 - Advanced Edit Page, Direct Tune

Direct Tune		
Tuner_Index:	1	
Network_ID:	10	
Frequency_Index:	135	
Submit Query		

Allows the user to tune DIRECTV channels using the DIRECTV Network ID and Frequency Index



#### COM46 - Advanced Edit Page, Simulcrypt

Simulcrypt		
SimulcryptIP:	0.0.0.0	Will be copied to all cards in the chassis
Port:	0	
ChassisBitmap:	0x0	
Submit Query		

- Used to support Samsung LYNK encryption method
- Supplies IP address and port value of the encryption key server to all COM24/46 cards in the system once entered into any COM24/46 in the system



## COM46 - Overview Page

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QAM Sum	mary							-					
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Chassis	Slot	Tuner	Security	Channel	Mo	de 1	Major.Minor / IP:Port	Bitrate	SNR	Strength	Status	1	
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		<u>3</u>	Pro:Idiom 💌	271 H2HD		<b>1 ▼</b> 43 ▼	. 1 💌	10.3 Mbps	15	-22			
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		<u>6</u>	Pro:Idiom 💌	283 NGWHD		1 - 44 -	. 2 💌	8.9 Mbps	13	-19			
		2	Pro:Idiom 💌	245 TNTHD		1 - 45 -	. 1 💌	2.6 Mbps	10	-23			
		<u>8</u>	Pro:Idiom 💌	284 SCIHD		1 - 45 -	. 2 💌	5.8 Mbps	10	-26			
		1	Pro:Idiom 💌	241 SpikeHD		1 - 46 -	. 1 💌	7.6 Mbps	8	-23			
		<u>2</u>	Pro:Idiom 💌	242 USAHD		1 - 46 -	_ 2 💌	4.7 Mbps	15	-23			
		<u>3</u>	Pro:Idiom 💌	238 REELZ		1 - 47 -	1	1.9 Mbps	15	-24			
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	2	<u>5</u>	Pro:Idiom 💌	278 DSCHD		1 - 48 -	1	4.8 Mbps	11	-23	This slot can only support o HD streams		
6		<u>6</u>	Pro:Idiom 💌	254 AMCHD		<b>1 ▼</b> 48 ▼	2 -	8.6 Mbps	11	-19			
		2	Pro:Idiom 💌	247 TBSHD		1 - 49 -	1 •	8.5 Mbps	12	-19			
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#### COM46 - Overview Page, Security Pull Down

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## COM46 - Overview Page, Channel Pull Down

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Note:         Construction           Basis         Overview, Discover, Pairing Info, Tune AIL, Hein Zarbezh, Dizuloz, Skuluth, Healthluth, EPG, Skuloz, Lock, 4TSC, 401, QAN           Starmary main         Starmary main           Dagis         Alt IP         Base Ch 2         Base Ch 3         Base Ch 3         Base Ch 3         Skuluth, Healthluth, EPG, Skuloz, Lock, 4TSC, 401, QAN           Starmary main         Channel list and 192168.611         Date Ch 4         Base Ch 2         Base Ch 3         Base Ch 4         Base Ch 3	•	e h	ttp://192.1	68.3.100/cgi-bin/w	vebcmd?screen=	Overview	10								🗾 🗟 🐓 🗙 📴 Live Search
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192168.611         192.168.611         30         34         38           Channel Ist pull down           pily Mode CQAM @IP           Deprivate @Show CHide           Channel Mode IP-Port Bitrate SNR Strength Status           Status           Status           192.168.611         Other Strength Strength Strength Status           Status           Deprivate Status         Status           Prolidiom 202.0NHD         IP 192.168.6         Other Status           1         Prolidiom 202.0NHD         IP 192.168.6         Status           Adv for the status         Status           Adv for the status         Status           2 Prolidiom 202.0NHD         IP 192.168.6         Other Status           Adv for the status         Status           Adv for the status           <	Chassis		IP	Alt IP	Base Ch 1	Base Ch	2 Base C	h 3							
American         Channel list pull down           piblicate         © Show © Hide           axis         Not         Taner         Scarity         Channel         Mode         P:Port         Bitrate         SNR         Strength         Status           axis         Not         Taner         Scarity         Channel         Mode         P:Port         Bitrate         SNR         Strength         Status		<u>192.1</u>	68.6.11	192.168.6.11	30	34	38								
All of the second of	Display N D Dupli	Iode cates	C QAN © Show	M © IP w C Hide	Cha	anel	Made			CIIC IP-Port	Biter	16	SNR	Strength	
1         Prolition         202 CNNHD         112         113         8.6 Mbps         12         -21           2         Prolition         203 LOOK         11         118         8.8 Mbps         14         -22           3         Prolition         203 LOOK         11         118         8.8 Mbps         14         -22           4         Prolition         204 HLNHD         119         192         168         6         11         :66         6 Mbps         16         -21           4         Prolition         206 ESPNHD         207 ESNN         119         192         :168         6         :11         :33         5.6 Mbps         10         -22           6         Prolition         206 ESPNHD         207 ESNN         119         192         :168         6         :11         :60         9.7 Mbps         13         -19           7         Prolition         209 ESPN2         209 ESPN2         119         192         :168         6         :11         :60         :14         -21           8         Prolition         209-2 ESNaHD         119         :192         :168         :11         :97         :68 Mbps         10         -29 <td>1145515</td> <td>5101</td> <td>1 uner</td> <td>Security</td> <td></td> <td></td> <td>Intone</td> <td>100</td> <td>100</td> <td></td> <td></td> <td>ate s</td> <td>10</td> <td>Strength</td> <td>Status</td>	1145515	5101	1 uner	Security			Intone	100	100			ate s	10	Strength	Status
2       Prolidiom *       203 LOOK       203 LOOK       11 **       11 **       18 8.8 Mbps 14 -22         3       Prolidiom *       204 HLNHD       204 HLNHD       11 **       11 **       18 8.8 Mbps 16 -21       201         4       Prolidiom *       206 ESPNHD       206 ESPNHD       11 **       168 .6 .11 :33 5.6 Mbps 10 -22       -22         6       Prolidiom *       207 ESNHD       11 **       11 **       168 .6 .11 :33 5.6 Mbps 12 -22       -22         6       Prolidiom *       207 ESNHD       11 **       11 **       11 **       10 **       12 **       -22         6       Prolidiom *       208 ESPNUHD       11 **       11 **       12 **       -22       -22       -22         7       Prolidiom *       209 ESPN2       11 **       19 **       192 .168 .6 .11 :50 **       8 Mbps 11 **       -21         8       Prolidiom *       209 ESPN2       11 **       19 **       192 .168 .6 .11 :50 **       8 Mbps 11 **       -24         1       Prolidiom *       209 **       19 **       192 .168 .6 .11 **       19 **       -28       -28       -28         2       Prolidiom *       213 MLBNHD       11 **       19 **       192 .168 .6 .11 **       19 ** <td></td> <td></td> <td>1</td> <td></td> <td>202 CNNH 202 CNNH</td> <td></td> <td></td> <td>1192</td> <td>. 168</td> <td></td> <td>8.0 1</td> <td>iops i</td> <td>12</td> <td>-21</td> <td></td>			1		202 CNNH 202 CNNH			1192	. 168		8.0 1	iops i	12	-21	
3       Pro:Idiom       204 HLNHD       1       1       16       6.11       16       6.11       6.6 Mbps       16       -21         4       Pro:Idiom       205 SMXHD       206 ESPNHD       206 ESPNHD       206 ESPNHD       207 ESN       1       1       13       5.6 Mbps       10       -22       0K         5       Pro:Idiom       207 ESN       207 ESNHD       208 ESPNUHD       208 ESPNUHD       208 ESPNUHD       208 ESPNUHD       208 ESPNUHD       209 ESPN2       0K         7       Pro:Idiom       208 ESPNUHD       209 ESPN2       1       1       1       1       1       -21       0K         8       Pro:Idiom       209 ESPN2       209 ESPN2       1       1       1       1       -21       0K         9       1       Pro!Idiom       209 ESPN2       209 ESPN2       1       1       1       -21       0K         1       Pro!Idiom       209 ESNA       209 ESNA       1       -24       0       -29       1       -24       1       1       1       1       -24       1       1       1       1       2       -29       1       -29       1       1       1       1		4	2	Pro:Idiom	203 LOOK 204 HLN			192	. 168	.  6 .  11 :  18	8 8.8 M	Ibps 1	14	-22	
1       4       Pro:Idiom       206 ESPNHD 206 ESPNHD 207 ESNHD 207 ESNHD 207 ESNHD 207 ESNHD 208 ESPNUHD 208 ESPNUHD 208 ESPNUHD 208 ESPNUHD 209 ESPN2HD 209 ESNHD 209 ESNHD 209 ESNAHD 209 FISNHLN 209 ESNAHD 215 NHLN 215 NHLN			3	Pro:Idiom 💌	204 HLNHI 205 SMXH	8 <b>K</b>	IP 🗾	192	168	. 6 . 11 : 60	6.6 N	fbps 1	16	-21	
1       Pro:Idiom •       207 ESN HD 207 ESNHD 207 ESNHD 207 ESNHD 207 ESNHD 207 ESNHD 207 ESNHD 208 ESPNUHD 208 ESPNUHD 208 ESPNUHD 208 ESPNUHD 209 ESPN2 40 209 ESNAHD 210 FM 192 . 168 . 66 . 11 : 149 4.0 Mbps 11 - 24       Image: Comparison of the terms of terms of the terms of the terms of		1	<u>4</u>	Pro:Idiom 💌	206 ESPN 206 ESPN	HD	IP 💌	192	168	. 6 . 11 : 33	3 5.6 M	íbps <mark>i</mark>	10	-22	OK
6       Pro:Idiom •       208 ESPNUHD 208 ESPNUHD 209 ESPN2HD 209 ESPN2HD 209 ESPN2HD 209 ESPN2HD 209 ESPN2HD 209 ESPN2HD 209 ESPN2HD 209 ESPN2HD 209 ESNAHD 209 ESNAHD 212 NFLHD 212 NFLHD 212 NFLHD 213 MLBNHD 213 ML		4	<u>5</u>	Pro:Idiom	207 ESN 207 ESNH		IP 💌	192	168	6.11:34	5.8 N	Ibps 1	12	-22	
1       Pro:Idiom •       209 ESPN2HD         209 ESPN2HD       209 ESPN2HD         209 LESNAHD       209 ESNA         1       Pro:Idiom •         209 ZESNA       209 ZESNA         212 NFL       212 NFL         212 NFL       213 MLBND         213 MLBNHD       213 MLBAHD         213 MLBAHD       213 MLBAHD         213 MLBNHD       213 MLBAHD         213 MLBAHD       213 MLBAHD         213 MLBAHD       215 NHLN         215 NHLND       215 NHLND         215 NHLHD       215 NHLND         215 NHLAD       215 NHLAD         215 NHLAD       215 NHLAD         216 NBAHD       1192 . 168 . 6 . 111 : 181         216 NBAHD       1192 . 168 . 6 . 111 : 182         216 NBAHD       1192 . 168 . 6 . 111 : 181         215 NHLAD       1192 . 168 . 6 . 111 : 182         216 NBAHD       1192 . 168 . 6 . 111 : 181         216 NBAHD       1192 . 168 . 6 . 111 : 182         216 NBAHD       119			<u>6</u>	Pro:Idiom 💌	208 ESPN	JHD	IP 💌	192	168	6 . 11 : 65	5 9.7 N	Ibps 1	13	-19	
8       Pro:/diom       209-1 ESNa 209-1 ESNaHD       IP       192       168       6       11       : [49]       4.0 Mbps       11       -24         1       Pro:/diom       209-2 ESNa 209-2 ESNaHD       209-2 ESNaHD       IP       192       168       6       11       : [97]       6.8 Mbps       10       -29         2       Pro:/diom       212 NFL HD       212 NFLHD       IP       192       168       6       11       : [98]       8.8 Mbps       13       -28         3       Pro:/diom       213 MLBNHD       213 MLBAHD       IP       192       168       6       11       : [145       2.9 Mbps       15       -33         4       Pro:/diom       213 1 MLBaHD       IP       192       168       6       11       : [146       8.8 Mbps       12       -34         5       Pro:/diom       215 NHLN       IP       192       . [168       6       . [11       : [8]       4.4 Mbps       11       -30         5       Pro:/diom       215 NHLAD       IP       192       . [168       . [6]       . [11       : [8]       . [9]       . [9]       . [16]       . [1]       . [12]       . [2]       . [2]       .			2	Pro:Idiom 💌	209 ESPN	2 2HD	IP 💌	192	168	6 . 11 : 50	8.3 N	fbps 1	11	-21	
1         Pro:/diom         209-2 ESNa 209-2 ESNaHD 212 NFL         192         168         6         11         97         6.8 Mbps         10         -29           2         Pro:/diom         212 NFLHD         192         168         6         11         197         6.8 Mbps         10         -29           3         Pro:/diom         213 MLBN 213 MLBN 4         Pro:/diom         213 MLBN 213 MLBAHD         192         168         6         11         :145         2.9 Mbps         15         -33           4         Pro:/diom         213 MLBAHD         192         168         6         11         :146         8.8 Mbps         12         -34           5         Pro:/diom         215 NHLD         192         168         6         11         :81         4.4 Mbps         11         -30           6         Pro:/diom         215 NHLAD         192         168         6         11         :82         5.7 Mbps         11         -28           7         Pro:/diom         216 NBAHD         192         168         6         11         :161         2.5 Mbps         12         -28			8	Pro:Idiom 💌	209-1 ESN 209-1 ESN	a aHD	IP 💌	192	168	6.11.49	4.0 M	fbps 1	11	-24	
2       Pro:/diom •       212 NFL       192 . 168 . 6 . 11 : 98 8.8 Mbps 13 - 28         3       Pro:/diom •       213 MLBN 213 MLBN 213 MLB 213 MLBAHD 213 MLBAHD 213 MLBAHD 213 MLBAHD 213 MLBAHD 214 MAVTV       192 . 168 . 6 . 11 : 146 8.8 Mbps 15 - 33         4       Pro:/diom •       213 · 1 MLB 213 · 1 MLB 213 · 1 MLBAHD 214 MAVTV       192 . 168 . 6 . 11 : 146 8.8 Mbps 12 - 34       This slot can only support 6 HD streams         5       Pro:/diom •       215 · NHLHD 215 · NHLAHD 216 · NBAHD •       192 . 168 . 6 . 11 : 161 2.5 Mbps 11 - 28       This slot can only support 6 HD streams			1	Pro:Idiom	209-2 ESN 209-2 ESN	a aHD	IP 🔹	192	168	6 . 11 : 97	6.8 N	Ibps 1	10	-29	
3       Pro:/diom •       213 MLBN 213 MLBND 213 MLBND 213 MLBAD 213 IMLBAHD 213 IMLBAHD 213 IMLBAHD 213 IMLBAHD 214 MAVTV       IP •       192 . 168 . 6 . 11 : 145 2.9 Mbps 15 -33       -33         4       Pro:/diom •       213 IMLBAHD 213 IMLBAHD 214 MAVTV       IP •       192 . 168 . 6 . 11 : 146 8.8 Mbps 12 -34       -34         5       Pro:/diom •       215 NHLN 215 NHLHD 6       IP •       192 . 168 . 6 . 11 : 81 4.4 Mbps 11 -30       -30         6       Pro:/diom •       215 1 NHL 215 1 NHLAHD 216 NBAHD       IP •       192 . 168 . 6 . 11 : 82 5.7 Mbps 11 -28       This slot can only support 6 HD streams			2	Pro:Idiom	212 NFL 212 NFLHE		IP 💌	192	168	6 . 11 : 98	8.8 N	fbps 1	13	-28	
3 <sup>-</sup> / <sub>-</sub> <sup>-</sup> / <sub></sub>			3	Pro:Idiom	213 MLBN 213 MLBN	HD		192	168	6 11 12	15 2.9 M	fbps 1	15	-33	
3       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1			4	Pro:Idiom	213-1 MLB	aHD		192	168	6 11 12	16 88N	fbps 1	12	-34	
2       1       15 NHLHD       11       132       100       10       11       101       11       -30         6       Pro:/diom       215-1 NHL       11       192       168       6       11       :82       5.7 Mbps       11       -28         7       Pro:/diom       216 NBAHD       192       168       6       .11       :161       2.5 Mbps       12       -28		<u>3</u>		Proildiam	214 MAVT 215 NHLN	V		102	169			fbpc 1	11	30	This slot can only support 6 HD streams
Q         IProvidion		6	2		215 NHLHI			192	. 100		- 4.4 IV	n in	11	-50	
Z  Pro:/diom ▼ 216 NBAHD ▼  P ▼ 192 . 168 .  6 .  11 :  161 2.5 Mbps 12 -28		-	ō	Pro:Idiom	215-1 NHL	aHD		192	. [168	.  6  11:  82	2   5. / N	ibps 1	11	-28	
		8	2	Pro:Idiom	216 NBAH	D 🔽		192	168	.  6   .  11   :  16	51 2.5 M	Ibps 1	12	-28	

technicolor

## COM46 - Overview Page, QAM Mode

COM1000	- Inte	rnet Explo	rer, optimized fo	or Bing and MSN						
00-	🥭 h	ittp://192.1	68.3.98/cgi-bin/we	bcmd?screen=Overview						💌 🗟 🐓 🗙 🔯 Live Search
🚖 Favorites	Ø	COM1000								
					tec	hnicolor				
Comman	ds: <u>O</u> <u>Re</u>	verview, afresh, <u>D</u>	Discover, Pai isplay, <u>SysInfo</u> ,	r <b>ingInfo, TuneAll, H</b> HealthInfo, <u>EPG</u> , S	<mark>lelp</mark> yslog, <u>Lock</u>	; <u>ATSC</u> , <u>401</u> , <u>QAM</u>				
QAM Sumr	mary									
Chassis		IP	Alt IP	Base Ch 1 Base Ch	2 Base Cl		ίονλ	di	icnl	av mode ra
6	<u>192.</u>	168.6.7	192.168.6.99	42 46	50			u	ishi	ay mode is
Submit						cotc t	hor	lic	nla	v mode for
Display N	Mode	© QAI				3013 1		113	pia	y mode for
SD Dupi	icates	• Sho	w O Hide							
Chassis	Slot	Tuner	Security	Channel	Mode	Major.Minor / IP:Port	Bitrate	SNR	Strength	Status
		1	Pro:Idiom 💌	202 CNNHD	QAM -	42 • . 1 •	6.0 Mbps	12	-22	
		2	Pro:Idiom 💌	269 HISTHD	QAM -	42 • . 2 •	3.4 Mbps	13	-23	
		3	Pro:Idiom 💌	271 H2HD		43 • . 1 •	10.3 Mbps	15	-22	
	1	<u>4</u>	Pro:Idiom 💌	290 DISeHD	QAM -	43 • . 2 •	6.9 Mbps	10	-24	OK
	1	5	Pro:Idiom 💌	244 SyfyHD	QAM -	44 💌 . 1 💌	9.0 Mbps	11	-22	on
		<u>6</u>	Pro:Idiom 💌	283 NGWHD		44 🗸 . 2 🗸	e 9 Mbps	D	est	ination set v
		2	Pro:Idiom 💌	245 TNTHD	QAM 🗸	45 • . 1 •	2.6 Mbps			
		<u>8</u>	Pro:Idiom 💌	284 SCIHD	QAM -	45 • . 2 •	5.8 Mbps	С	han	nel pull dov
		1	Pro:Idiom 💌	241 SpikeHD	QAM -	46 🗸 . 1 🔽	7.6 Mbps	, e		1
		2	Pro:Idiom 💌	242 USAHD	QAM -	46 • . 2 •	4.7 Mbps	15	-23	
		3	Pro:Idiom 💌	238 REELZ	QAM -	47 • 1 •	1.9 Mbps	15	-24	
	2	4	Pro:Idiom 💌	277 TRAVHD		47 • . 2 •	3.6 Mbps	9	-26	This dat can call annout 6 UD strooms
	2	5	Pro:Idiom 💌	278 DSCHD	QAM -	48 • 1 •	4.8 Mbps	11	-23	This slot can only support of HD streams
<u>6</u>		<u>6</u>	Pro:Idiom 💌	254 AMCHD		48 • . 2 •	8.6 Mbps	11	-19	
		2	Pro:Idiom 💌	247 TBSHD	QAM -	49 • . 1 •	8.5 Mbps	12	-19	
		<u>8</u>	Pro:Idiom 💌	248 FXHD	QAM -	49 • 2 •	4.8 Mbps	7	-29	
		1	Nana				2 0 1 0	10	25	



#### COM46 - Overview Page, IP Mode

COM1000	- Inter	rnet Explo	orer, optimized fo	r Bing and MSN										
00-	C h	ittp://192.1	.68.3.100/cgi-bin/we	ebcmd?screen=Overv	iew	5								💌 🗟 😽 🗙 🔯 Live Search
👷 Favorites	Ø	Connecting	]											
						te	ech	nic	colo	r				
							-							
Comman	ds: Or <u>Re</u>	fresh, D	, <u>Discover, Pau</u> isplay, <u>SysInfo</u> ,	HealthInfo, EP	<b>II</b> , <u>не</u> G, <u>Sy</u>	slog,	Lock,	<u>ATSC</u> ,	, <u>401</u> , <u>Q</u>	<u>DAM</u>				
										-				
QAM Sumr	nary									Desti	nat	10	n s	et using IP
Chassis		IP	Alt IP	Base Ch 1 Bas	se Ch	2 Bz	ase Cl	h 3						0
10	<u>192.1</u>	168.6.11	192.168.6.11	30 34		38	ć			and p	ort	_		
Submit										;				
Display M	vlode	C QA	M ⊙IP											
SD Dupl	icates	• Sho	w C Hide											
Chassis	Slot	Tuner	Security	Channel		M	ode		I	P:Port	Bitrate	SNR	Strength	Status
		1	Pro:Idiom 💌	202 CNNHD	•	IP	•	192	. 168 .	6 . 11 : 17	8.6 Mbps	12	-21	
		2	Pro:Idiom 💌	269 HISTHD	•	IP	•	192	168	6 . 11 : 18	8.8 Mbps	14	-22	
		3	Pro:Idiom 💌	271 H2HD	-	IP	•	192	168 .	6 . 11 : 66	6.6 Mbps	16	-21	
		4	Pro:Idiom 💌	290 DISeHD	•	IP	•	192	168	6 . 11 : 33	5.6 Mbps	10	-22	OF
	1	<u>5</u>	Pro:Idiom 💌	244 SyfyHD	-	IP	•	192	. 168 .	6 . 11 : 34	5.8 Mbps	12	-22	OK
		<u>6</u>	Pro:Idiom 💌	283 NGWHD	•	IP	•	192	168	6 . 11 : 65	9.7 Mbps	13	-19	
		7	Pro:Idiom 💌	245 TNTHD	•	IP	-	192	168	6 . 11 : 50	8.3 Mbps	11	-21	
		<u>8</u>	Pro:Idiom 💌	284 SCIHD	•	IP	-	192	. 168 .	6 . 11 : 49	4.0 Mbps	11	-24	
		1	Pro:Idiom	241 SpikeHD	•	IP	-	192	168	6 . 11 : 97	6.8 Mbps	10	-29	
<u>6</u>		2	Pro:Idiom	242 USAHD	-	IP	•	192	168	6 . 11 : 98	8.8 Mbps	13	-28	
	1	3	Pro:Idiom 💌	238 REELZ	-	IP	-	192	168 .	6 . 11 : 145	2.9 Mbps	15	-33	
		4	Pro:Idiom 💌	277 TRAVHD	•	IP	-	192	168	6 . 11 : 146	8.8 Mbps	12	-34	
	3	<u>5</u>	Pro:Idiom 💌	278 DSCHD	-	IP	•	192	168	6 . 11 : 81	4.4 Mbps	11	-30	This slot can only support 6 HD stream
		<u>6</u>	Pro:Idiom 💌	254 AMCHD	-	IP	-	192	168	6 . 11 : 82	5.7 Mbps	11	-28	
	1	2	Pro:Idiom 💌	247 TBSHD	•	IP	-	192	168	6 . 11 : 161	2.5 Mbps	12	-28	
	1	8	Pro:Idiom 💌	248 FXHD	-	IP	-	192	168	6 . 11 : 162	8.5 Mbps	10	-31	
		1	Nee-					100	100	C 11 100	1034	15	25	

### COM46 - Overview Page, Mode Pulldown

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Favorites	6	COM1000	1.9		Í	-1					
						tech	nicolor				
						icci					
omman	ds: <u>O</u>	verview	, Discover, Pa	iringInfo, 1	<mark>uneAll,</mark> He	lp					
	Re	<u>fresh, D</u>	<u>isplay, SysInfo</u>	o, <u>HealthInf</u>	o, <u>EPG</u> , <u>Sys</u>	log, Lock,	<u>ATSC, 401, QAM</u>				
ending efreshi	MDNS	- 55									
AM Summ Chassis	nary	P	Alt IP	Base Ch 1	Base Ch 2	Base Ch	3				
5	192.1	68.6.7	192.168.6.99	42	46	50		المعيد			hadia
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Submit Display N SD Dupli	vlode icates	© QA © Sho	M CIP w CHide				mode for	a sin	gle	e tun	er
Submit Display N SD Dupli Chassis	vlode icates Slot	© QA © Sho Tuner	M C IP w C Hide Security	Ch:	annel	Mode	Major.Minor / IP:Port	a sin	gle	strength	er
Submit Display M SD Dupli C <b>ha</b> ssis	vlode icates	⊙ QA ⊙ Sho Tuner 1	M C IP w C Hide Security Pro:Idiom v	Ch:	annel HD 🔽		Major.Minor / IP:Port	Bitrate 8.3 Mbps	gle snr 12	Strength -21	er
Submit Display N SD Duph C <b>ha</b> ssis	vlode icates	© QA © Sho Tuner 1 2	M C IP w C Hide Security Pro:Idiom •	Ch: 202 CNN 269 HIST	annel HD 💌		Major.Minor / IP:Port	Bitrate 8.3 Mbps 8.1 Mbps	<b>SNR</b> 12 13	Strength -21 -23	er
Submit Display M SD Dupk Chassis	Mode icates	© QA © Sho <u>Tuner</u> <u>1</u> <u>2</u> <u>3</u>	M © IP w C Hide Security Pro:Idiom • Pro:Idiom •	Ch: 202 CNNI 269 HIST 271 H2HI	annel HD V HD V	Mode QAM V IP	Major.Minor / IP:Port         42 • . 1 •         43 • . 1 •	Bitrate 8.3 Mbps 8.1 Mbps 6.4 Mbps	<b>SNR</b> 12 13 16	Strength           -21           -23           -21	er
Submit Display M SD Duph Chassis	vlode icates Slot	© QA © Sho 1 2 3 4	M C IP w C Hide Security Pro:Idiom • Pro:Idiom • Pro:Idiom •	Ch: 202 CNNI 269 HIST 271 H2HI 290 DISe	HD HD HD HD HD HD HD HD	Mode QAM • P QAM • QAM •	Major.Minor / IP:Port         42 • . 1 •         42 • . 2 •         43 • . 1 •	Bitrate 8.3 Mbps 8.1 Mbps 6.4 Mbps 5.1 Mbps	<b>SNR</b> 12 13 16 10	Strength -21 -23 -21 -24	er
Submit Display M SD Duph Chassis	Viode icates Slot	© QA © Sho 1 2 3 4 5	M C IP w C Hide Security Pro:Idiom • Pro:Idiom • Pro:Idiom •	Ch: 202 CNN 269 HIST 271 H2HI 290 DISe 244 Syfyh	HD HD HD HD HD HD HD HD HD HD	Mode QAM • IP QAM • QAM •	Major.Minor / IP:Port         42 • . 1 •         42 • . 2 •         43 • . 1 •         44 • . 1 •	Bitrate 8.3 Mbps 8.1 Mbps 6.4 Mbps 5.1 Mbps 4.0 Mbps	<b>SNR</b> 12 13 16 10 11	Strength -21 -23 -21 -24 -22	er
Submit Display M SD Duph Chassis	Iode icates Slot	© QA © Sho 1 2 3 4 5 6	M C IP w C Hide Security Pro:Idiom • Pro:Idiom • Pro:Idiom • Pro:Idiom •	Ch: 202 CNN 269 HIST 271 H2HI 290 DISe 244 Syfyh 283 NGW	HD HD HD HD HD HD HD HD		Major.Minor / IP:Port         42 • . 1 •         42 • . 2 •         43 • . 1 •         44 • . 1 •	Bitrate 8.3 Mbps 8.1 Mbps 6.4 Mbps 5.1 Mbps 4.0 Mbps 5.2 Mbps	<b>SNR</b> 12 13 16 10 11 13	Strength -21 -23 -21 -24 -22 -19	er
Submit Display M SD Duple Chassis	Mode icates Slot	© QA © Sho 1 2 3 4 5 6 7	M C IP w C Hide Security Pro:Idiom • Pro:Idiom • Pro:Idiom • Pro:Idiom •	Ch:           202 CNNI           269 HIST           271 H2HI           290 DISe           245 TNTH	HD HD HD HD HD HD HD HD HD HD	More QAM • QAM • QAM • QAM • QAM •	Major.Minor / IP:Port         42       .         42       .         43       .         43       .         44       .         45       .	Bitrate           8.3 Mbps           8.1 Mbps           6.4 Mbps           5.1 Mbps           4.0 Mbps           5.2 Mbps           3.6 Mbps	<b>SNR</b> 12 13 16 10 11 13 11	Strength           -21           -23           -21           -23           -21           -23           -21           -23           -21           -23           -21           -23           -21           -23           -21           -22           -19           -22	er



## COM46 - PairingInfo Page

COM100	0 - Inl	ternet Explorer, opti	imized for Bing and	MSN								_ 8 ×	
00-	•	http://192.168.3.98/	cgi-bin/webcmd?screen	n≕info						ŀ	💽 🔄 😽 🗙 📴 Live Search	P -	
🔆 Favorites	s 🧃	COM1000											
Commar	nds: <u>(</u>	Overview, Discov Refresh, Display, 1	ver, PairingInfo, SysInfo, HealthIn	TuneAll, Help	cechnicc	Dior Di, <u>QAM</u>						<b>A</b>	
Chassis	Slo	t CardIP	RID	CAM_ID	Serial_Number	Authorized	Paired	SW_Version	Up_Time	Upgrade			
	1	192.168.3.98	036624337238	003805104902	2097316136	1	1	ST03.02.00	3d:0h				
	3	192.168.3.100	036624337402	003805104894	2097316134	1	1	ST03.02.00	16d:23h		7		
6	5	192.168.3.102	036624337519	003805175621	2097314817	1	1	ST03.02.00	1d:19h				
	7	192.168.3.104	036624336545	002299004701	-1	1	1	ST03.02.00	1d:23h		7		
Sarver_ Filenam Mode: Subm Brow IFTP se Upload Chassis 6-1-8 0 6-3-8 0 6-3-8 0 6-7-8 0 Key	IP_A me: iit Que rver a fi 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662 33662	ddress: 192.16 0 = TF any r Upload r at 192.168.3. le to the TFTI d CAM ID to-tuners RID ( 1433702 003800 14337519 003800 14336545 002295 try	298 current fil 298 current fil 2 server at 19 Bro List CAM ID 5104902 5104904 510521 9004701	11es: 22.168.3.98 wse Upload	1		H	TML Mu	. fil	e u ole	pload facility software key	app	lication facility
Enter 1	ist.	of chassis-slo	ot-tuners RID	KEY				4					technicolor



- Reports COM46 uptime since last reboot
- Lists all CAM, RID, and serial numbers for the system
- Reports pairing and authorization status for each card
- Provides links to syslogs and camlogs by card
- Provides interface for simultaneous multi-card COM46 software updates via tftp or ftp
- Provides an HTML file upload facility for putting files on the COM46 card
- Allows for the simultaneous entry of special software keys



## COM46 - SysInfo Page

Favorites	E	COM1000				
					techni	color
Comman	ds: <u>0</u> <u><i>Re</i></u>	verview, <mark>Discov</mark> efresh, <u>Display</u> ,	v <b>er, Pa</b> SysInfo	iringInfo, TuneAll, , <u>HealthInfo</u> , <u>EPG</u> ,	<mark>Help</mark> Syslog, Lock, ATSO	С, <u>401, <b>О</b>АМ</u>
Chassis	Slot	CardIP	EPG	MAC_Address		
6	1	192.168.3.98		c4:27:95:d5:9a:31		
6	3	192.168.3.100		c4:27:95:d5:9a:2f		
6	5	192.168.3.102	EPG	00:26:24:18:0f:7e	•	Displays
10	2	192.168.3.164		00:26:24:39:66:94		numher
10	3	192.168.3.165		00:26:24:39:66:7c		addraca
10	5	192.168.3.166		80:c6:ab:1e:d7:aa		address
10	6	192.168.3.167		00:19:df:d6:00:5a		
10	7	192.168.3.168		28:be:9b:4f:7a:e6		
10	8	192.168.3.169		fc:94:e3:1b:5a:a1	•	Identifie
10	9	192.168.3.170		fc:94:e3:1b:5a:cd		generat
10	11	192.168.3.172		28:be:9b:4f:7a:e2		general
10	12	102 168 3 173		fc-94:e3:1b:5a:c9		

- Displays chassis number, slot number, card IP address & MAC address
- Identifies which card(s), if any are generating an EPG and/or PSIP



## COM46 - Tune All Page

COM1000 - Internet Explorer, optimized for Bing and MSN	
C	💌 🗟 🏘 🗶 📴 Live Search
Favorites COM1000	
techn	
Commands: Overview, Discover, PairingInfo, TuneAll, Help <u>Refresh, Display, SysInfo, HealthInfo, EPG, Syslog, Lock, AT</u>	; <u>401</u> , <u>QAM</u>
Tune All           Chassis-Slot-Tuner, IP_Dest:Port, MajorNum-MinorNum-Mode;           5-2-1, 192.168.100.4:1234, 287-65535-1;           0-0-0, 192.168.100.4:1235, 284-65535-1;           //use any tuner           287sd -> 50-1           //QAM24 mode           284hd -> 50-2	
	<ul> <li>Provides a quick way to tune an entire COM2000 system</li> </ul>
	<ul> <li>Useful for creating test-cases or easily replicating a standard system configuration</li> </ul>
Submit Query	1
Current Tuning Table 6-1-1, 192.168.6.11:17, 202-65335-1; 6-1-2, 192.168.6.11:18, 209-655335-1; 6-1-3, 192.168.6.11:18, 209-655335-1; 6-1-4, 192.168.6.11:39, 209-655335-1; 6-1-5, 192.168.6.11:39, 209-655335-1; 6-1-6, 192.168.6.11:50, 283-655335-1; 6-1-7, 192.168.6.11:50, 245-655335-1; 6-1-8, 192.168.6.11:49, 248-655335-1; 6-3-1, 192.168.6.11:49, 241-655335-1;	
6-3-2, 192.168.6.1198, 242-65535-1;	technicolo



## COM46 - Tune All Page

- After creating/modifying the data in your favorite text-editor to meet your channel line up requirements paste it into the window and click Submit Query to apply
- Works across multiple networked chassis
- Format:

Chassis-Slot-Tuner, IP\_Dest:Port, MajorNum-MinorNum-Pro:Idiom;

6-11-1, 192.168.1.249:1241, 503-65535-0; 6-11-2, 192.168.1.249:1242, 502-65535-0; 6-11-3, 192.168.1.249:1243, 505-65535-0; 8-3-1, 192.168.6.9:33, 284-65535-0; 8-3-2, 192.168.6.9:34, 287-65535-0; 12-9-1, 192.168.1.248:1234, 229-65535-0; 12-9-2, 192.168.1.248:1235, 816-65535-0; 12-9-3, 192.168.1.248:1236, 277-65535-0; 15-3-1, 192.168.6.1:177, 245-65535-1; 15-3-2, 192.168.6.1:178, 244-65535-1; 15-4-1, 192.168.6.16:65, 355-65535-1; 15-4-2, 192.168.6.16:66, 247-65535-1;



## COM46 - HealthInfo Page

	) - Inte	rnet Explorer, opti	mized for Bing and MSM	١					
- 67	0	http://192.168.3.98/d	gi-bin/webcmd?screen=He	althInfo					-
Favorites	C	COM1000							
				teo	chnico	lor			
Comman	ds: 0	verview, Discov	ver, PairingInfo, Tu	neAll, Help	1 1700 10	1.0.04			
	Re	etresh, Display,	Susinto Healthinto	HP(+ Suclos Loc	A A INC ALL	1 11414			
	8.775	<u>, , , , , , , , , , , , , , , , , , , </u>	<u>, , , , , , , , , , , , , , , , , , , </u>	<u>11 0, 5,50</u> , 100	<u>, , 1150, 40.</u>	<u>1, 0,1,111</u>			
Chassis	Slot	CardIP	Card_Temperature	IC_Temperature	PS0 Health	PS1 Health	Fan0 Health	Fan1 Health	
Chassis 6	Slot	CardIP 192.168.3.98	Card_Temperature	IC_Temperature	PS0 Health NA	PS1 Health NA	Fan0 Health OK	Fan1 Health OK	
Chassis 6 6	Slot 1 3	CardIP 192.168.3.98 192.168.3.100	Card_Temperature NA NA	IC_Temperature 54 53	PS0 Health NA NA	PS1 Health NA NA	Fan0 Health OK OK	Fan1 Health OK OK	
Chassis 6 6 6	Slot 1 3 5	CardIP 192.168.3.98 192.168.3.100 192.168.3.102	Card_Temperature NA NA NA	IC_Temperature 54 53 51	PS0 Health NA NA NA	PS1 Health NA NA NA	Fan0 Health OK OK OK	Fan1 Health OK OK OK	

Provides a chassis/slot grid with IC temperature and cooling fan status info

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## COM46 - EPG Page

COM1000 - Internet Explorer, optimized for Bing and MSN	
🚱 💿 💌 🔊 http://192.168.3.98/cgi-bin/webcmd?screen=EpgDestIp&EpgDestIp=0.0.0.0&destPort=0&dimezoneOffset=0&ignoreDST=0&logoTftpServerIP=&logoFilename= 💌	
Favorites COM1000	
tochnicolor	
technicolor	
IP and nort determines major-r	ninor of the
Commands: Overview, Discover, PairingInfo, TuneAll, Help	
Refresh, Display, SysInfo, HealthInfo, EPG, Syslog, Lock, ATSC, 401, OAM FPG channel Set DectID to 1.2	2 1 for DSID
	J.4 IUI F JIF
Electronic Program Guide Display	
Unity 192168611	
raciic-o;Mountain-/;Centrai-o;Eastern-S	
IgnoreDS1: 0	
LogolitpServerlP:	
LogoFilename: 170x60 24bbp bmp bitmap file The format is displayNumber[-minor] majorNumber_[minorNumber]-[hd]sd] gamChassis port	
OR displayNumber-minor NMyChan_Event_info qamChassis port	
The chassis and port are used for PSIP guide generation. Set to -1 to disable.	
2 202-65535-hd 6 17	
Virtual channel number for PSIP channel mapping	
7 244-65535-hd 6 49	
8 283-65535-hd 6 50	
10 284-65535-hd 6 66 Chaccic and nort anables DSID for that chan	nal Sat
	inei. set
14 277-65535-hd 6 98 DOIN IO - I IO AISADIE PSIP.	
15 278-65535-hd 6 113 16 254-65535-hd 6 114	
17 247-65535-hd 6 129	
20 549-65535-hd 6 178 Chassis ID is the ID of the chassis with the C	JAIVI that
21 564-65535-hd 6 193	
is streaming the channel you want to apply	<sup>,</sup> PSIP to
Submit Overy Engl and Least a second se	
- Load currently playing channels.	6 a ala • I
EpgDisable	technicolor



## COM46 - Electronic Program Guide

DIRECTY	DIRECTV Guide		Hilton	-
Wed 12/15	7:00 p	7:30 p	8:00 p	
2 LA2	Quiet Time		<b>Red Slippers</b>	
4 LA4	The Fiesty Black	Cat		
5 LA5	< Local News	Beach City Fun		
7 LA7	< Helicopter Cops			T
9 LA9	Sierra Quest			
10 SPKE	< Batman Begins		Cops	
11 SHO	Tougher in Alaska		Modern Marvels	
12 HBO	All My Children		Emotions	
14 REAL	Judge Alex	NCIS		

- Can include all DIRECTV channels
- SD SMATV & local ATSC off-air that are in the DIRECTV APG
- Allows for static data entry for sources not in the DIRECTV APG
- Provides upcoming programming information
- Allows for DIRECTV & End Customer branding

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## COM46- EPG Page, PSIP



- PSIP is part of the ATSC A/65 standard
- Most current televisions will make use of PSIP data if available
- PSIP is enabled on the EPG page
- Can be used with or without an EPG



## COM46 - Syslog Page

COM1000 - Internet Explorer, optimized for Bing and M5N	
S = 10 http://192.168.3.98/cgi-bin/webcmd?screen=Syslog	💌 🗟 😽 🗙 🔯 Live Search 🖉 🗸
FatForward @COM1000	
technicolor	<u>^</u>
Commands: <u>Overview, Discover, PairingInfo, TuneAll, Help</u> <u>Refresh, Display, SysInfo, HealthInfo, EPG, Syslog, Lock, ATSC, 401, QAM</u>	
Syslog: Feb 11 07:50:10 buildroot user.crit syslog: NDS.CDI DESC HDX_SetDescramble Feb 11 07:50:14 buildroot user.crit syslog: NDS.CDI HDXEA completed: 1 Feb 11 07:50:15 buildroot user.crit syslog: NDS.CDI DESC HDX SetDescramble	r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=93, index=8, x_con=3, stream_pid=4114,rv <sup>.</sup> r: DEMUX DESCRAMBLER SET CONTROL WORD, fd=68, index=3, x con=1, stream pid=4160,rv <sup>.</sup>
Feb 11 07:50:15 buildroot user.crit syslog: NDS.CDI DESC HDX SetDescramble Feb 11 07:50:18 buildroot user.err syslog: m: WARNING mutex swm locked for Feb 11 07:50:19 buildroot user.crit syslog: NDS.CDI HDXEA completed: 2	r: DEMUX DESCRAMBLER SET CONTROL WORD, fd=67, index=2, x_con=1, stream_pid=4162,rv <sup>.</sup> 58 ms by/main/swm.c:722
Feb 11 07:50:19 buildroot user.crit syslog: NDS.CDI DESC HDX_SetDescramble Feb 11 07:50:19 buildroot user.crit syslog: NDS.CDI DESC HDX_SetDescramble Feb 11 07:50:21 buildroot user.notice syslog: a: MOcount(5626,5624,5622,56 Feb 11 07:51:04 buildroot user.crit syslog: NDS.CDI HDXEA completed: 4	<pre>r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=87, index=7, x_con=2, stream_pid=4128,rv<sup>-</sup> r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=86, index=6, x_con=2, stream_pid=4130,rv<sup>-</sup> 20,5617,5615,5613,5610)</pre>
Feb 11 07:51:04 buildroot user.crit syslog: NDS.CDI DESC HDX SetDescramble Feb 11 07:51:04 buildroot user.crit syslog: NDS.CDI DESC HDX_SetDescramble Feb 11 07:51:06 buildroot user.crit syslog: NDS.CDI HDXEA completed: 6	r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=85, index=5, x_con=4, stream_pid=4176,rv r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=84, index=4, x_con=4, stream_pid=4178,rv
Feb 11 07:51:06 buildroot user.crit syslog: NDS.CDI DESC HDX_SetDescramble Feb 11 07:51:06 buildroot user.crit syslog: NDS.CDI DESC HDX_SetDescramble Feb 11 07:51:06 buildroot user.crit syslog: NDS.CDI HDXEA completed: 7 Feb 11 07:51:06 buildroot user.crit syslog: NDS.CDI HDXEA completed: 7	r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=96, index=11, x_con=6, stream_pid=4160,r r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=95, index=10, x_con=6, stream_pid=4162,r r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD_fd=107_index=15_r_con=7_arcorr_pid=4182.
Feb 11 07:51:07 buildroot user.crit syslog: NDS.CDI DESC HDX_BetDescramble Feb 11 07:51:07 buildroot user.crit syslog: NDS.CDI DESC HDX_SetDescramble Feb 11 07:51:07 buildroot user.crit syslog: NDS.CDI HDXEA completed: 0 Feb 11 07:51:07 buildroot user.crit syslog: NDS.CDI DESC HDX SetDescramble	<pre>r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=106, index=13, x_con=0, stream_pid=4194,: r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=61, index=1, x_con=0, stream_pid=4160.rv;</pre>
Feb 11 07:51:07 buildroot user.crit syslog: NDS.CDI DESC HDX_SetDescramble Feb 11 07:51:08 buildroot user.crit syslog: NDS.CDI HDXEA completed: 3	r: DEMUX_DESCRAMBLER_SET_CONTROL_WORD, fd=60, index=0, x_con=0, stream_pid=4162,rv

- Provides a listing of the system log file for the COM46 card you are currently addressing
- Can be highlighted and copied for emailing, etc.

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## COM46 - Lock Page

💪 COM1000 - Internet Explorer, optimized for Bing and M5N	
🕒 💿 🔻 🙋 http://192.168.3.98/cgi-bin/webcmd?screen=Lock	-
Favorites COM1000	
technicolor	
Commands: Overview, Discover, PairingInfo, TuneAll, Help Refresh, Display, SysInfo, HealthInfo, EPG, Syslog, Lock, ATSC, 401, QAM	
Lock	
Password: Submit Query	
This will lock write access to all of the cards. Enter a zero length password to unlock the cards.	

Allows user to set a password to write protect all COM46 cards in the system

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## COM46 - ATSC Page

COM1000 - Internet Explorer, optimized for Bing and MSN	
	🔽 🗟 🎸 🗶 📴 Live Search
Favorites 🏽 🍘 COM1000	
Commands: Overview, Discover, PairingInfo, TuneAll, Refresh, Display, Syshrio, Healthirio, EPG,	echnicolor
ATSC See http://dtv.gov/stationlist.htm Usage: HomeRun_IF Tuner_Index RF_Index Major.M 192.168.2.1 0 21 20.1 192.168.6.9 17 To acquire all of the subchannels, set Major.M 256 to the QAM24 port. When acquiring all s channels can be sent to the same QAM channel	est_IP Dest_Port o '0.0' and add nels, no other
<pre>Set RF_Index to -1 to close the tuner. 192.166.4.3 0 2 6.2 192.168.6.11 145 192.168.4.3 1 25 6.1 192.168.6.11 146 192.168.4.4 0 45 59.1 192.168.6.11 193 192.168.4.2 0 9 8.1 192.168.6.11 161 192.168.4.2 0 9 8.1 192.168.6.11 161 192.168.4.1 0 21 20.1 192.168.6.11 177 192.168.4.1 1 29 29.1 192.168.6.11 178</pre>	<ul> <li>Facilitates configuration and managemen of the ATSC8 off air receiver</li> <li>User can configure ATSC NICs and tuners</li> <li>Cut and paste text file can be used for duplication of a configuration</li> </ul>
Save Run Query	
To discover ATSC boards and set their IP address. TP address. 192,16841	Tuning data format:
Discover Set Load	ATSC8_IP Tuner_Index RF_Index Major.Minor Dest_IP Dest_Pe 192.168.4.1 0 25 4.1 192.168.6.11 33



## COM46 - ATSC Page

COM1000 - Internet Explorer, optimized for Bing and MSN	
C	AtscList=192.168.4.4+0+45+59.1+192.168.6.11+193%0D%0A192.168.4.4+1+45+59.2+192.168.6.11+ 💌
FaForward COM1000	
	The Query function provides the user
Save Run Query	with complete status for all eight tuners
Log: 192.168.4.4 0 0	
ch=auto:45 lock=8vsb ss=75(-15dBmV) snq=92 3: 59.1 WXIN-DT	(27.8dB) seq=100 bps=19394080 pps=1418
4: 59.2 AntTV tsid=0x0469	
192.168.4.4 1 0	(27. 7. 17)
Cn=auto:45 lock=8V8b 33=75(-16dBmV) snq=91 3: 59.1 WXIN-DT	(27.7dB) Bed=100 pps=19394080 pps=284
4: 59.2 AntTV	
tsid=0x0469	
192.168.4.3 0 0	
ch=auto:9 lock=8vsb ss=93(-4dBmV) snq=75(23	3.2dB) seq=100 bps=19394080 pps=221
3: 8.1 WISH-HD	
4: 8.2 LWS	
5; 0.5 Kadar	
Card-OA0101	



#### COM46 - 401 Page

🖉 COM1000 - Internet Explorer, optimized for Bing and M	5N	
🕒 🔊 💌 🔊 http://192.168.3.98/cgi-bin/webcmd?screen=4	01	•
Favorites COM1000		
	technicolor	
Commands: Overview, Discover, PairingInfo, T	uneAll, Help	
Refresh, Display, SysInfo, HealthInfo	, EPG, Syslog, Lock, ATSC, 401, QAM	

#### DCI401MCS

- Provides for configuration and management of all DCI401MCS devices on the distribution network
  - Units can be addressed individually or en masse

Submit	annei_close
MessageType:	0 = Download Now
Receiver_ID:	0xfffffff
RF Channel:	0
Bank:	0
Filename:	
TFTP_IP:	192.168.1.254



## COM46 - 401 Page





## COM46 - 401 Page

<i>(2</i> COM1000 -	Internet Explorer, optimized for Bing and MSN	
00-1	http://192.168.3.98/cgi-bin/webcmd?screen=401	×
🙀 Favorites	€СОМ1000	
		technicolor
Command	s: Overview, Discover, PairingInfo, Tune. <u>Refresh</u> , Display, <u>SysInfo</u> , <u>HealthInfo</u> , <u>EF</u>	II, <u>Help</u> G, <u>Syslog</u> , <u>Lock</u> , <u>ATSC</u> , <u>401</u> , <u>QAM</u>
DCI40	IMCS	

					Chan
Submit Cha	annel_Close	[		•	Exam
MessageType:	12 = Channel	Map 🔽		•	User
Receiver_ID:	0xfffffff				linou
Man Channel	0				
Num Channels:	0				micu
reqIndex-pro	JU gramNum Majo	orNum-Minor	Num Channe	elName	micu
reqIndex-pro	U gramNum Majo	orNum-Minor	Num Chann	elName	
reqIndex-pro	U gramNum Majo	orNum-Minor	Num Chann	elName	
TregIndex-pro	gramNum Majo	orNum-Minor	Num Chann	elName	
reqIndex-pro	gramNum Majo	orNum-Minor	Num Chann	elName	
TregIndex-pro	gramNum Majo	orNum-Minor	Num Chann	elName	

- Provides a method to apply virtual channels via channel mapping
- Example: 30-1 12-0 CNNHD
- User can paste in list for entire channel lineup



## COM46 - QAM Page

	) - Internet I	xplore	, optin	nized fo	r Bin	g and	MSN					
00-	@ http://:	192.168.	3.98/cg	i-bin/wel	ocmd?	screen	=Qarr	18(Qam	=192.1	168.6.11	t 💽 🔄 🔶 X 🧕 Search	
Tavorites	COM1	000	_			_				toc	shnisolor <sup>4</sup>	
										tec		
Comman	ds: <u>Overv</u> <u>Refrest</u>	iew, D 1, Disp	iscove lav, S	e <mark>r, Pai</mark> vsInfo,	ring <u>Hec</u>	l <mark>nfo</mark> , lthIn	Tun fo, <u>F</u>	e <mark>All</mark> , EPG,	Help Sysic	l og, <u>Lock</u>	Address box for managing	
Edge	QAM M dgeQam (1	odu	1at 8.6.1	or	sis	):	192.	168.6	.11		multiple QAMs	
Submi	tQuery	qam Pe	r S	Seco	ond	1					Putton for rotrigging OAM log	
Port = (	QamChanne DortPass	1 * 1 Chen	6 + Ç	amSub	Cha 2	nnel	-	6	-	tatal	Button for retrieving QAM log	
Qam1	16	30	8.3	8.1	0.0	0.0	0.0	0.0	0.0	16.3		
Qam2	32	31	8.6	7.4	0.0	0.0	0.0	0.0	0.0	16.1		
Qam3	48	32	6.4	2.5	0.0	0.0	0.0	0.0	0.0	8.9	Self expanding grid showing OAM	
Qam4	64	33	6.0	7.5	0.0	0.0	0.0	0.0	0.0	13.5	Sen expanding grid showing QAM	
Qam5	80	34	4.5	6.8	0.0	0.0	0.0	0.0	0.0	11.3	major-minor with individual hitrates a	and
Qam6	96	35	4.3	7.9	0.0	0.0	0.0	0.0	0.0	12.1		IIIG
Qam/	112	30	0.5	2.1	1.2	1.8	4.0	1.0	1 1./	12.8	summary hitrates	
Qam9	144	38	2.5	9.5	0.0	0.1	0.0	0.0	0.0	12.1	Summary Steraces	
Qam10	160	39	3.6	2.4	0.0	0.0	0.0	0.0	) 0.0	6.0		
Qam11	176	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Qam12	192	41	13.2	8.4	0.0	0.0	0.0	0.0	0.0	21.6	Control section allows for setting	
Total										149.3		
CONT. chassis MAC = 8	<b>rol</b> Id = 10, 0:c6:ab:0	hwVer 8:26:	sion 80, 1	= 0.6 Licens	5, s seCo	wVer unt	sior = 12	1 = 2	1.9.1	l <mark>o, te</mark> r	base channels, enabling/disabling	50
carrier	on: teIp:	A= 19	2.168.	в= - 1 [1 6.11	1		<sub>B=</sub> 1	1	1	1	carriers, QAM SW updates	
tftpIp: tftpFile reset: Submi	ename: tQuery	0	12.168.	1.100								
											■ technic	olo

QAM IP Addressing

- The QAM has a fixed IP address = 192.168.6.[ChassisID + 1]
- In the COM360 chassis the second QAM, if installed, will have an IP address of 192.168.6.[ChassisID + 1]+16
- For a COM360 chassis with an ID of 1 and two QAMs the IP addresses will be 192.168.6.2 & 192.168.6.18
- An alternate address can be assigned per QAM
- The alternate IP, if assigned, can be either unicast or multicast


baseChannel

- This is where you set the base or starting channel for each upconverter chip
- You can NOT cross bands within one 4 channel chip. Channels within a chip MUST maintain standard 6 Mhz spacing

carrierOn

- Setting this to 1 will enable that RF carrier, 0 to disable alternatelp
- This field can be used to assign a second IP address to QAM

tftplp

 This is the IP address of your tftp server used for file transfer to the QAM



tftpFilename

 This is for the filename of the file to be transferred. Mainly used for software upgrade

Reset

• Setting this to 1 and clicking Submit Query performs a software reset of the QAM



## COM2000 - Local Content Insertion

- The COM2000 system is capable of taking local content and inserting it into your channel lineup
- Local content can be represented in the property EPG
- This is accomplished by routing a Single Program Transport Stream (Mpeg2 transport packets) to the QAM
- Source can be Mpeg2, Mpeg4 or h.264
- All televisions SHOULD be able to correctly play an Mpeg2 stream with AC3 audio
- Available content sources can include security cameras, videos streaming from a PC, etc.



## COM2000 - Implementing an EAS Solution

- The COM2000 system is capable of integrating an EAS system when required
- The QAM has a special port (25600) for EAS. When data arrives at the QAM IP on this port the stream is duplicated on ALL QAM channels. When the incoming stream stops all channels will resume regular programming
- Field application note available for integrating the Trilithic EASyCAP solution
- Technicolor support available for other EAS systems



## Thank you



