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- Configuring the Duet
- Audio Connections /Control
- Triggering Insertions
- Duet CCMS Mode



# Duet™ and Duet™ SDI

## MPEG 2 Digital Ad Inserter

### Operations Manual



**purely digital**  
create. move. play. save.

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## Chapter 1 Introduction

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### Overview

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*The Duet and Duet-SDI are MPEG2 digital commercial inserters which seamlessly play scheduled MPEG2 ads into an analog or a digital (SDI) main channel feed. The commercial inserters integrate with popular Traffic and Billing software solutions. When used with Adtec's adManage system, they provide turnkey content management, alarm monitoring, schedule importing and as-run log verifications.*

*The Duet-SDI inserts MPEG 2 commercials into a serial digital video (SDI) main channel feed with embedded AES-EBU audio. Designed for cable and broadcast operations with mixed SDI and analog systems, the Duet-SDI will provide SDI concurrent with analog video and audio output.*

### Applications

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- **Cable Digital Commercial Insertion:** The Duet can scale to hundreds of channels with the same incremental cost. (See Appendix D for a system illustration.)
- **Broadcast Digital Commercial Insertion:** The Duet can store thousands of MPEG 2 commercials that can be cued via GPI, DTMF, VBI or a timed schedule.

### Benefits

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- **Generate Revenue from Local Commercial Inserts:** The Duet is known by operators as the "money machine" with a typical return on investment (ROI) within the first week of operation.
- **Insert Commercials with Confidence:** The Duet is a proven ad inserter that delivers reliable operation in over 20,000 network channels worldwide.
- **Economically Scale to Hundreds of Channels:** Unlike some competitive products, the Duet is a completely integrated single-channel commercial inserter that can be replicated to a distributed system with hundreds of channels.
- **Integrate With Your Enterprise:** The Duet can be used with the Adtec adManage™ system for turnkey content management, alarm monitoring, schedule import and as-run log verifications.

### Feature Highlights

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- Locally insert broadcast quality MPEG 2 commercials into an analog or digital (SDI) channel source.
- Scale the system to hundreds of channels with the same incremental cost.
- Store thousands of broadcast quality MPEG 2 commercials.
- Efficiently distribute media with multicast Ethernet transfers.
- Switch SDI with embedded AES-EBU audio.
- Cue via DTMF, GPI, VBI and Time.
- Support NTSC, PAL, PALM and PALN



## Availability

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### Models

Model	Description
DUET	MPEG2 ad inserter with one 80GB removable drive.
DUET-2	MPEG2 ad inserter with two 80GB drives (one removable, one fixed).
DUET-DVD	MPEG2 ad inserter with one 80GB fixed drive and one DVD/CD drive.
DUET-SDI	MPEG2 ad inserter with one 80GB removable drive with SDI in/out.
DUET-SDI-2	MPEG2 ad inserter with two 80GB drives (one removable, one fixed) with SDI in/out.
DUET-SDI-DVD	MPEG2 ad inserter with one 80GB fixed drive and one DVD/CD drive with SDI in/out.

### Options

Part Number	Description
DUET-VBI	VBI bypass and insertion feature for Duet and Duet-SDI
DUET-WL	White line cue feature for Duet and Duet-SDI
DUET-ALC	Audio level control feature for Duet only (not Duet-SDI)
DUET-CCMS	CCMS Mode feature for Duet and Duet-SDI

These additional options can be purchased by contacting our Sales Department. Please refer to the back cover of this manual for contact information.

## What's Included

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The following items are included with the Duet and Duet-SDI:

- Accessory Kit: Includes two drive bay keys, three audio plugs, one tally plug, one cue plug, one power cord strain relief with screws, one ground cable with screw, four rack mount screws with washers, one BOOT key for firmware updates and one RESET key to restore factory default settings.
- Modem Kit to connect the Duet to an external dialup modem (Adtec PN: modemaccessory). The kit includes a DB-25 connector to an included RJ-11 telephone line.
- Communication Kit to connect the Duet to an external PC over a serial port (Adtec PN: COMKIT). The kit includes an RJ-11 line to a DB-9F connector.
- Adtec Startup CD includes Symphony Pro Cable for configuration and control of the Duet and Duet-SDI.
- Duet Operations Manual including Quick Start.
- Ethernet Cable (10 foot long)
- Power Cord (6 foot long)

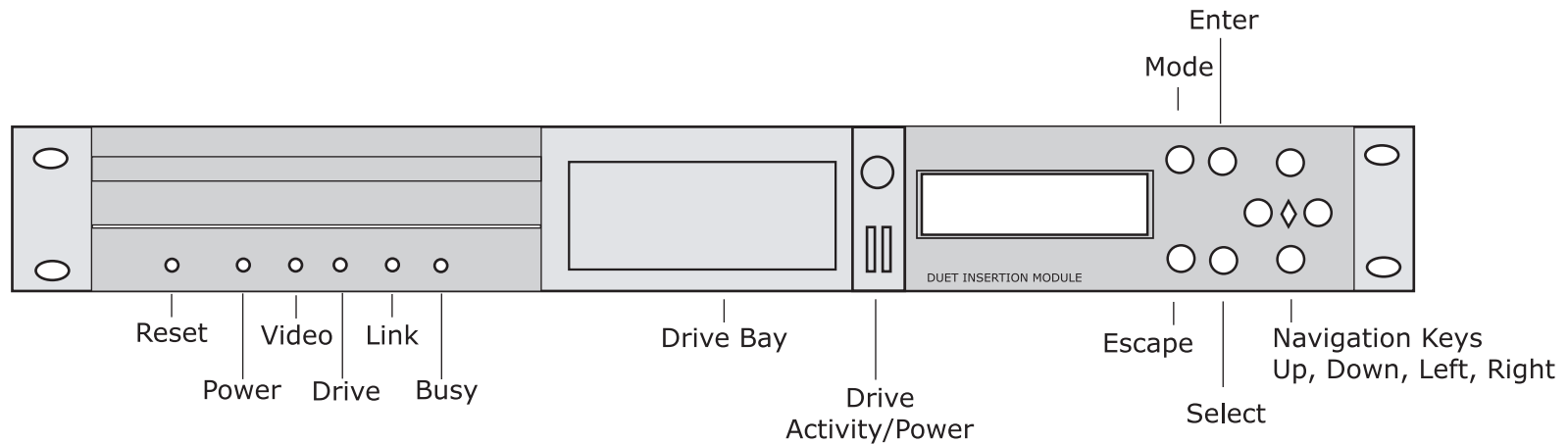
## System Requirements

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The following items are recommended to configure and use the Duet in a commercial insertion environment:

- 10/100baseT TCP/IP compatible Computer Network
- Windows 98, 2000 or XP computer (500Mhz processor, 256MB RAM) for configuration and control.
- Power: 70-240 VAC 50-60Hz and 65 Watts (20 Watts typical) of power.
- Duet-SDI requires SDI channel input video with embedded SMPTE 259M AES-EBU audio and SDI output (or analog output) with BNC

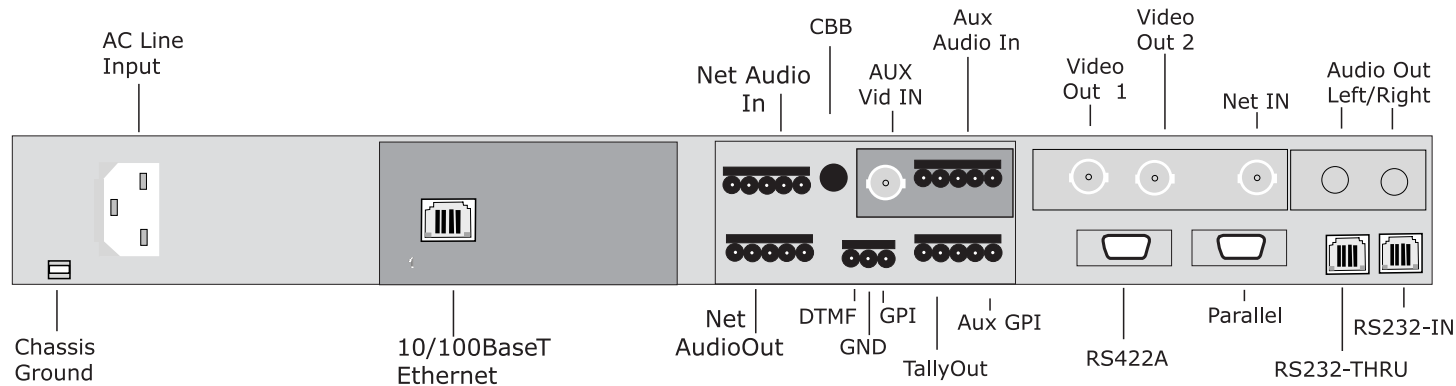
## Front Panel of the Duet



Button	Function
Reset	Recessed reset switch. Must be held for one second to initiate reset.
Power	Power light, illuminates when AC power is applied to unit
Video	Video light, illuminates during video playback
Drive	Drive light, illuminates during any drive host controller activity.
Link	Ethernet Link LED, illuminates when connected to a network.
Busy	Ethernet Busy LED, illuminates when Ethernet activity occurs.
Drive Bay	Removable hard drive bay or fixed DVD Drive
Drive Activity	Removable hard drive activity light
Drive Power	Removable hard drive power light

Button	Function
Drive Lock	Locks the hard drive so it cannot be removed. The Duet cannot use the drive unless it is locked. <b>WARNING:</b> Unplug the Duet before removing the hard drive.
Mode	Sequences through the menus.
Escape	Exits a menu without accepting data and returns to the main menu.
Select	Selects menu item to be edited.
Enter	Accepts changes or new data
Up	Scrolls through a menu when navigating or changes the value when editing an item. (Increases LCD brightness)
Down	Scrolls through a menu when navigating or changes the value when editing and item (Decreases LCD brightness)
Left	Moves the cursor left when editing a menu
Right	Moves the cursor right when editing a menu

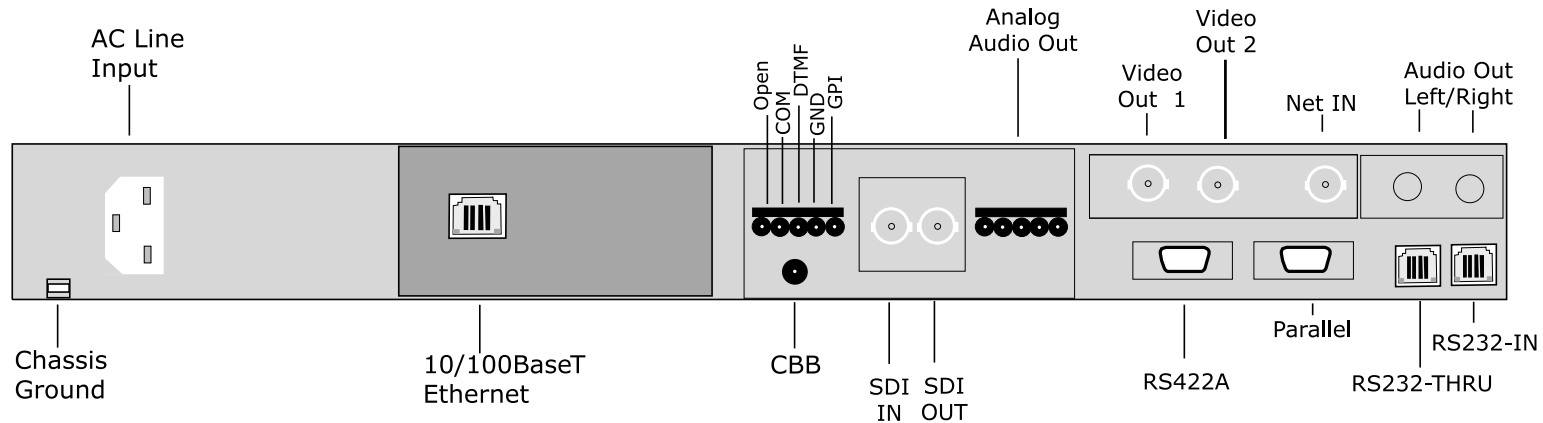
## Back Panel of the Duet



Button	Function
Chassis Ground	External ground direct to the chassis.
AC Line Input	Standard 3-pin computer power plug. (Auto range 70-240 VAC input)
Ethernet	10/100BaseT Ethernet RJ-45 jack.
Net Audio IN	Network Audio IN corresponding to Net IN video.
Net Audio OUT	Network Audio OUT corresponding to Video Out If monaural audio is used, make certain the output connections match the input. (If the left side is used for in use the left side for out.) 600-Ohm output impedance.
CBB	Composite Baseband Input from satellite receiver with an input range 6 to 10 MHz and terminates to 75 Ohms. Used for cue tone extraction on analog delivered networks only: neither audio nor video is extracted from this signal.
DTMF	DTMF audible cue tone positive signal, low Z unbalanced. Range -20 dB to +0 dB. (must be cue tones only without any audio noise)
GND	Ground used for External Cue GPI and Aux GPI.
GPI	External Cue General Purpose Input (GPI) used to trigger a commercial insertion or switch to Auxiliary video. See GND.
Aux Vid IN	Auxiliary video in. Terminates to 75 Ohms.
Aux Audio IN	Auxiliary audio in corresponding to Aux Vid IN.
Aux GPI	Auxiliary General Purpose Input (GPI) used to trigger a commercial insertion or switch to Auxiliary video. See GND. See the Appendix on Configuration Variables for other options.

Button	Function
Tally Out	NO: "On Air" Normally Open contact closure. Closes during insert. C: Tally Common terminal. NC: "On Air" Normally Closed contact closure. Opens during insert. OA: "On Air" Open collector circuit. Ground during insert. See the Appendix on Configuration Variables for other options.
Video Out 1	Video output 1, 75 Ohm. Includes relay bypass. Connect to the modulator.
Video Out 2	Video output 2, 75 Ohm. No relay bypass, preview video output only. WARNING: Do not connect this output to the modulator
Net IN	Network Video In (From IRD/IRT) Must be a crystal-controlled signal.
Audio Out Left/Right	Unbalanced LEFT and RIGHT audio output of commercial insert only, 56K Ohm output impedance. (typically used with Video Output 2).
RS422A Warning	Do Not Connect. This is used internally by the Duet.
Parallel Warning	Do Not Connect. This is used internally by the Duet.
RS232-THRU	THRU port for RS-232 comm port (loop-through)
RS232-IN	IN port for RS-232 comm (loop-through)

## Back Panel of the Duet SDI



Button	Function
Chassis Ground	External ground direct to the chassis.
AC Line Input	Standard 3-pin computer power plug. (Auto range 70-240 VAC input)
Ethernet	10/100BaseT Ethernet RJ-45 jack.
CBB	Composite Baseband Input from satellite receiver with an input range 6 to 10 MHz and terminates to 75 Ohms. Used for cue tone extraction on analog delivered networks only: neither audio nor video is extracted from this signal.
OPEN	Tally Output "On Air" Normally Open contact closure. Closes during insert. See the Appendix on Configuration Variables for other options.
COM	Tally Common terminal used with the Open terminal.
DTMF	DTMF audible cue tone positive signal, low Z unbalanced. Range -20 dB to +0 dB. (must be cue tones only without any audio noise)
GND	Ground used for External Cue GPI.
GPI	External Cue General Purpose Input (GPI) used to trigger a commercial insertion or switch to Auxiliary video. See GND.
SDI IN	SDI Video Input with embedded AES-EBU audio per SMPTE 259M.
SDI OUT	SDI Video Output with relay bypass and switched embedded AES-EBU audio per SMPTE 259M.

Button	Function
Analog Audio OUT	Analog Audio Output corresponding to SDI Out, configurable A or B decode channels in a group. 600-Ohm output impedance.
Video Out 1	Analog Composite Video Output, 75 Ohm, converted from the SDI Out in the same time domain.
Video Out 2	Preview Svideo(Y) video output only. Net IN Preview Svideo(C) video output only.
Audio Out Left/Right	Unbalanced LEFT and RIGHT audio output of commercial insert only, 56K Ohm output impedance. (typically used with Video Output 2).
RS422A - WARNING	Do Not Connect. This is used internally by the Duet.
Parallel - WARNING	Do Not Connect. This is used internally by the Duet.
RS232-THRU	THRU port for RS-232 communications (loop-through)
RS232-IN	IN port for RS-232 communications. (loop-through)

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## Chapter 2 Quick Start

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*Before you install or configure the Duet or Duet-SDI, review the instructions for the appropriate model in this chapter and make sure you have the necessary cables and connectors. If you plan to use the Duet on a computer Ethernet network, you must isolate the network connected to the Adtec equipment with a router/bridge from the rest of your LAN or a WAN. The Adtec Ethernet Multicast Transfer protocol will use in excess of 90% of the available network bandwidth.*

### Installing the Duet

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Note: Do not connect the power or the 10/100BaseT network cable until instructed.

---

1. **Mount the Duet:** The Duet requires a standard 2RU rack space and can be mounted with the four screws provided.
2. **Connect Network Video In:** The network video in from the satellite receiver must be connected to the Net IN of the Duet (BNC Male connector on RG 59 or RG 56 cable). Video levels from the receivers must be adjusted to 1 volt peak to peak.
3. **Connect Network Audio In:** The network audio in from the satellite receiver must be connected to the Net Audio IN of the Duet (supplied 5 pin RST connector on 3 conductor AWG-22G cable). Audio levels from the receivers must be adjusted to 0db. See the Audio Connections and Control chapter for mono/stereo and balanced/un-balanced connection requirements.
4. **Connect Video Out:** The Duet Video Out 1 should be connected to the modulator (BNC Male connector on RG 59 or RG 56 cable). (optional: use Video Out 2 for preview video only).
5. **Connect Audio Out:** The Net Audio OUT of the Duet should be connected to the modulator (supplied 5 pin RST connector on 3 conductor AWG-22G cable). See the Audio Connections and Control chapter for mono/stereo and balanced/un-balanced connection requirements.
6. **Connect Cue/Trigger Method:** Connect one of the following:
  - Ext. Cue GPI:** General Purpose Input that is contact closed with GND to trigger an insert (supplied 3 pin RST connector on 2 conductor AWG-22G cable).
  - DTMF:** audible cue tone only (no audio noise) range -20dB to +0dB (supplied 3 pin RST connector on 2 conductor AWG-22G cable) from the satellite receiver or Weagner card. Connect positive (+) DTMF output of receiver to the DTMF input of the Duet and the DTMF GND of the receiver of the Duet.
  - CBB:** Composite Baseband input from the satellite receiver range 6 to 10 MHz ("F" Male type connector on RG 59 or RG 56 cable).
7. **Connect Computer or Modem:** Connect the RS232-IN serial port to an external computer or modem with the appropriate supplied cable. If this is not the first Duet, daisy chain the RS232-IN to the RS232-THRU of the previous Duet. (Default baud, Data, Stop and Parity is 38400, 8, 1, N)
8. **Connect AC Power Line:** Connect the AC Power to 70 to 240 VAC at 50-60Hz. The Duet should begin to boot up.

## Configuring The Duet

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Once the Duet is mounted, wired and powered on, the following steps will configure the Duet (see next section for Duet-SDI).

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NOTE: If the LCD display is initially hard to read, adjust the contrast by pressing the UP or DOWN keys.

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1. **Set CBD Network:** If the Composite Baseband (CBB) or the DTMF inputs are used to trigger the Duet insertion, configure the CBD Network.
  - a.) Press Menu to enter the CBD Network. Select the desired network and press ENTER.
  - b.) Press the UP key for NetSets PreSet, press SELECT and ENTER which will automatically name the network, name the Duet, set the proper NetSets (with DTMF tones) and configure the CBB input port.
  - c.) Press the UP key and verify the CBD settings.
  - d.) If the CBB port is NOT USED, go back to the CBD Network menu and set the Type to Digital, the Frequency to 9.525 Mhz and the BW to W. This will turn off triggers from the CBB port.
2. **Set Host Mode:** Press Menu to enter the Host Mode Menu: The Duet will typically be configured to SERVER Mode in smaller systems or CCMS in enterprise TBGS systems.
  - a.) Select the appropriate mode and press ENTER.
  - b.) Press the UP key then SELECT to configure a unique static IP address for each unit on the network and press ENTER.
  - c.) Press the UP key then SELECT to configure a common subnet mask (typically 255.255.255.0) for all units and press ENTER.
  - d.) Press the UP key then SELECT to configure the host IP address then press ENTER. The address in CCMS systems is the IP address of the TBGS server.
  - e.) Press the UP key then SELECT to configure a Gateway IP address of the router or bridge used to isolate EMT traffic from the rest of the computer network, then press ENTER.
3. **Network Connection:** Connect the Duet to the Ethernet network router with the supplied network cable. Note that the Duet defaults to the recommended 100Mb/sec Half Duplex.
4. **Set Time:** Press Menu to enter the Date & Time menu. Press SELECT and enter the current time then press ENTER. (optional: See the Appendix on Configuration Variables for automatic time synchronization with a host NTP server.)
5. **Set Network Channel and Headend:** If using CCMS Host Mode, press Menu to enter the channel and headend as specified in the CCMS schedule. Press SELECT and enter the channel (CC) number and Headend (HHH) number then press ENTER.
6. **Set EMT:** Press Menu to enter the Ethernet Multicast Transfer Setting. Press SELECT and enter 16221 for a Solicitor (one per network) or 00101 for a Subscriber, then press ENTER.
7. **Configure NetSet:** Use Symphony Pro or work from the front panel to configure the Net Settings used to trigger a commercial insertion: Refer to the NETSET instructions in Chapter 3 for more information.

## Installing the Duet-SDI

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The following steps are essential for installing the Duet-SDI in a typical system. Do not connect the power or the 10/100BaseT network cable until instructed.

1. **Mount the Duet:** The Duet requires a standard 2RU rack space and can be mounted with the four screws provided.
2. **Connect Network Video In:** The network video in from the satellite receiver must be connected to the SDI IN of the Det (BNC Male connector on RG 59 or RG 56 cable).
3. **Connect Video Out:** The SDI OUT should be connected to the modulator (BNC Male connector on RG 59 or RG 56 cable). (optional: use Video Out 1 for analog composite video converted from the SDI Out with no relay bypass.)
4. **Connect Audio Out:** (optional) The Duet-SDI supplies embedded AES-EBU audio on the SDI OUT port. If analog audio is also needed, connect to the Analog Audio OUT with the supplied 5 pin RST connector on 3 conductor AWG-22G cable). See the Audio Connections and Control chapter for mono/stereo and balanced/un-balanced connection requirements.
5. **Connect Cue/Trigger Method:** Connect one of the following:
  - Ext. Cue GPI: General Purpose Input that is contact closed with GND to trigger an insert (supplied 5 pin RST connector on 2 conductor AWG-22G cable).
  - DTMF: audible cue tone only (no audio noise) range -20dB to +0dB (supplied 5 pin RST connector on 2 conductor AWG-22G cable) from the satellite receiver or Weagner card. Connect positive (+) DTMF output of receiver to the DTMF input of the Duet and the DTMF GND of the receiver to the GND of the Duet.
  - CBB: Composite Baseband input from the satellite receiver range 6 to 10 MHz ("F" Male type connector on RG 59 or RG 56 cable).
6. **Connect Computer or Modem:** Connect the RS232-IN serial port to an external computer or modem with the appropriate supplied cable. If this is not the first Duet, daisy chain the RS232-IN to the RS232-THRU of the previous Duet. (Default baud, Data, Stop and Parity is 38400, 8, 1, N)
7. **Connect AC Power Line:** Connect the AC Power to 70 to 240 VAC at 50-60Hz. The Duet should begin to boot up.

## Configuring The Duet-SDI

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Follow steps 1-7 for Configuring the Duet.

8. **Set SDI Audio:** Configure the Audio Group #, the Audio Decode and Audio Encode. See the SDI Audio section of Chapter 3 for more information



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## Chapter 3 Configuring the Duet

*The Duet and Duet-SDI can be configured from the front panel, remotely from an external computer or from a configuration file. This chapter covers all of the configuration options available from the front panel of the Duet. Refer to the Adtec Symphony software for configuration from an external computer.*

### THE DUET FRONT PANEL

The Duet features an LCD display and key pad that provides a direct interface for configuration and status.

#### How to use the Key Pad

You can use the following steps to configure the Duet:

1. Press the MODE key repeatedly until the desired menu is selected.
2. Press the UP or DOWN arrow key to select the desired menu item.
3. If you want to change a currently selected item:
  - a.) Press the SELECT key to activate the editing mode (a flashing cursor means you are in editing mode).
  - b.) Use the LEFT and RIGHT keys to select the desired field of the item to be edited.
  - c.) Use the UP and DOWN keys to change the value of the item.
  - d.) Press the ENTER key to save the setting to the new value or ESCAPE to cancel the change.
4. Press the ESCAPE key to return to the main menu.

### FRONT PANEL MENUS

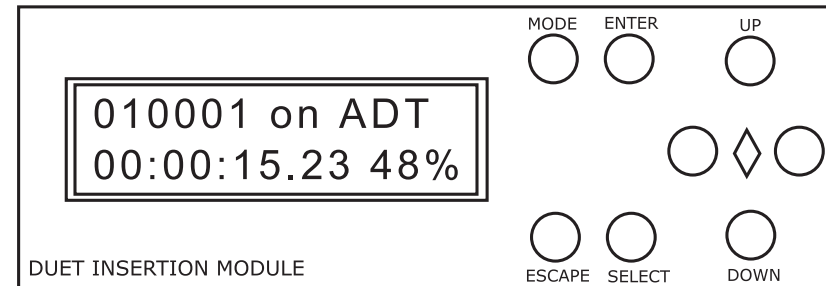
The Duet and Duet-SDI menus are as follows:

8. Main
9. Insert
10. Net Settings (NetSet)
11. Source Feed
12. Audio (Duet Only)
13. Log Settings
14. Date & Time (D&T)
15. Serial Port
16. Unit Name
17. Network Name
18. Network Channel and Headend (CCHH) \*
19. Composite Baseband Demodulator (CBD) Network
20. Host Mode
21. Ethernet Multicast Transfer
22. Duplicate Drive
23. SDI Audio (Duet-SDI Only)

#### Optional Features

24. Bypass Lines
25. WhiteLine Control

These optional features can be purchased by contacting our sales department.



## 1. Main

The main menu is a non-editable display. It displays the current Date and Time along with the configured Channel ID.

When a advertisement is in the configured pre-roll window before the insert, the display will identify the Spot ID.

Message	Description
Xxxxxxxx PreRoll	The spot ID xxxxxxxx is cued and in Pre Roll before the insert is made.

During an insert, the Spot ID and network name is displayed along with the spot running time code and the percentage of the insert completed.

Message	Description
xxxxxxx ON yyyy hh:mm:ss.ff pp%	The spod ID xxxxxxxx on Network yyyy is displayed on the top row during an insert. The second row displays the spot running timecode in hours, minutes, second and frames and percentage of playback completed.

## KEY Functions

While in the main menu, the following navigation keys have special meaning in the operation of the Duet.

Key	Use
UP	Increases LCD brightness
DOWN	Decreases LCD brightness
Hold SELECT and UP	Firmware version and Date Code.
LEFT	The last eight DTMF tones and GPI states. <u>Top Row:</u> tttttttt N-H A-H The 't' represents the last eight external audio or Analog CBD tones. N is the Network and A is the Auxiliary GPI state (H=High, L=Low). <u>Bottom Row:</u> tttttttt C-H W-L The 't' represents the last eight digital subcarrier decoded tones only. C is the CBD GPI state and W is the White Line GPI state (H=High, L=Low). The CBD GPI is for 19 kHz tones used by MTV and VH1.
RIGHT	Network Video and Audio Status. Net Video: (Present, Absent) Net Audio: (dB Level, Initiating) Enabled when Audio Level Control system is on.
Hold RIGHT, ESCAPE and MODE	<b>RESET THE UNIT.</b> This key combination held for 1 second provides a soft reset similar to pressing the reset button on the front panel.

## 2. Insert Menu

Pressing the Mode button once from the main menu calls the Insert Menu. The Insert Menu allows you to End an Insert, Launch an Insert, Add a Test Break, and Toggle a Tally.

### End Insert

Press ENTER to immediately end the current insert. This will end an insert regardless of how it was started. **Note: There is no double prompt for this option as it was designed to perform immediate insert termination.**

### Launch Insert

Press ENTER to start an insert as if a tone or GPI match occurred. If a Network Setting and Break Setting is available, an insert will occur based on those parameters.

### Test Break

Press ENTER to add an Inventory Break in the last position (Break 500) of the Break Settings (Schedule). This creates a Run Of Schedule (Inventory) scheduled event to allow the Duet to either be tested or run the drives inventory. **NOTE: You must have a Net Setting defined.**

### Tally

Press ENTER to toggle the state of the Tally Output. The Tally Output can be manually controlled from this menu item only if the On Air Tally is configured for Manual control. Refer to menu item Serial Port > On Air Tally for more information. **Note: If On Air Tally is set to "ON AIR", the Tally Output cannot be manually controlled.**

## 3. NET Settings (NetSet)

Pressing the Mode button twice from the main menu calls the NetSet menu. You can define up to 100 unique sets of network specific criteria capable of triggering a commercial insertion. Press the LEFT or RIGHT key to select the desired NetSet (1 through 100) and then press the up key to sequence through the following settings:

### Mode

The Insert Mode defines how the NetSet will insert a commercial (typically set to InsertNet). The options include:

- **InsertNet:** (typical setting) This mode will insert a commercial on the network feed when the NetSet is triggered.
- **Insert L.O.:** Play long form media on the network port.
- **Broadcast:** Used with Symphony Broadcast to play long form media on the network port.
- **Auxiliary:** Switch to the Auxiliary port when the NetSet is triggered. No commercial insertion is done unless a separate overlapping NetSet is triggered for the network feed.
- **Inactive:** (default) The NetSet is not used at this time and no action will be taken.

### Days On

The Days On item specifies the specific days of the week that are authorized for insertion. When you edit this item, press the LEFT and RIGHT keys to select the day of the week and the UP or DOWN keys to turn it off (blank space) or on with the day of the week: [S]unday, [M]onday, [T]uesday, [W]ednesday, [T]hursday, [F]riday, [S]aturday

### Time On and Time Off

The Time On and Time Off items specify the start and end time in a 24 hour format (HH:MM:SS) that the Duet should use the NetSet. When you edit this item, press the LEFT

and RIGHT keys to select the Hours, Minutes, or Seconds and the UP or DOWN keys to select the desired time.

**Note: A negative (-) sign in the hour field means that the NetSet will be active every hour. Therefore a Time On of -:15:00 with a Time Off of -:45:00 means that the NetSet will be active every hour of the day from 15 to 45 minutes past the hour.**

### Start Tones

The Start Tones item specifies the valid DTMF tone to start the commercial insert for this event. DTMF cue tones come from theCBD port on the DTMF Audio port. The Start Tones are a 1 to 4 digit DTMF tone cue sequence, including the numbers 0 - 9, A, B, C, D, \* and #. When you edit this item, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired code. Refer to Appendix H for a Channel Cue Directory. Sample start tones are 246\* and 048\*.

---

**NOTE:** The DTMF input port must be cue tones only and must not be mixed with additional network audio channels.

---

### Start GPI (Start Insert Condition)

The Start GPI item specifies the condition that will start a commercial insertion. The following cue settings are available:

- **None:** Detection of the GPI trigger to start an insertion is disabled.
- **NetClosed (NClosed), DeviceClosed (DClosed), NetDeviceClosed (NDClosed):** The commercial insertion will cue when the Net or Aux GPI is closed (all three options perform the same operation).

**NetOpen (NOpen), DeviceOpen (DOpen), NetDeviceOpen (NDOpen):** The commercial insertion will cue when the Net or Aux GPI is opened (all three options perform the same operation).

---

**NOTE:** If the White Line Cue option is enabled and it triggers, then the commercial will cue regardless of this Start GPI setting.

**NOTE:** By default, either the Duet GPI or the Auxiliary GPI input ports will trigger the Start GPI. See the Command Appendix on GPIASSIGN to see how each port can trigger a different NETSET.

---

### Stop Tones

The Stop Tones item specifies the valid DTMF tone to stop the commercial insert for this event. The Stop Tones are a 1 to 4 digit DTMF tone cue sequence, including the numbers 0 - 9, A, B, C, D, \* and #. When you edit this item, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired code. Refer to Appendix H for a Channel Cue Directory. Sample stop tones are 246# and 048#.

### Stop GPI (Stop Insert Condition)

The Stop GPI item specifies the condition that will trigger a commercial insertion to stop. The stop trigger works with the End By condition (see menu item below) to cause an end to the commercial insertion. The following settings for Stop GPI are available:

- **None:** Detection of the GPI trigger to stop an insertion is disabled.
- **NetClosed (NClosed), DeviceClosed (DClosed), NetDeviceClosed (NDClosed):** The commercial insertion will stop when the Net or Aux GPI is closed (all three options perform the same operation).
- **NetOpen (NOpen), DeviceOpen (DOpen), NetDeviceOpen (NDOpen):** The commercial insertion will stop when the Net or Aux GPI is opened (all three options perform the same operation).

---

**NOTE:** If the White Line Cue option is enabled and it triggers, then the commercial will stop regardless of this Start GPI setting. (See Chapter 5 on triggering insertions for more information.)

---

### Pre Roll

The Pre Roll item specifies the time in Seconds and Frames to delay the start of an ad insertion once a valid cue trigger is received. When you edit this item, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired time. Refer to Appendix H for a Channel Cue Directory that specifies the pre-roll used by each channel. Although the Duet is capable of zero pre-roll, a typical network pre-roll time is 6 to 8 seconds.

### Post Roll

The Post Roll item specifies the time in Seconds and Frames to delay the end of an ad insertion once a valid end trigger is received. The Duet will generate genlocked black to fill the space until the switch is made back to the network. When you edit this item, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired time. (Recommended: 00:00:00)

### Avail (Default: 00:00:00)

The Avail item is the total maximum time available for a series of spots played during a commercial insertion specified in Hours:Minutes:Seconds. Note that the Avail time must be greater than the run time for all the spots scheduled for that avail. When you edit this item, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired time.

In CCMS mode, the Duet can dynamically calculate the avail time. Set the Avail time to 00:00:00 for Dynamic Avail and the Duet will dynamically create the avail time based on the sum of all the scheduled spots.

### Check Video (Default: No)

When the Check Video option is set to Yes, the Duet will only insert an ad if there is a valid signal on the Network feed.

### End By

[Default: NetAvailSpot] The End By item specifies the conditions which must be met before a Duet will switch back to the network feed. The following conditions are available:

- **Spot:** Switch back to the network feed when the spots have finished running.
- **Avail:** Switch back to the network feed when the configured Avail time is over.
- **Network:** Switch back to the network feed when the stop condition (tone, GPI, time specified in Stop GPI) is met. Note: use this setting with EXTREAM CAUTION, conditions where nothing is aired exist!
- **NetAvailSpot:** (default and recommended setting) Switch back to the network feed when the spot is finished and either the network stop condition or the configured Avail time is met. Note that the Avail time is typically a fail safe if a network stop tone is not received.
- **NetAvail:** Switch back to the network feed when the network stop condition or the configured Avail time is met.
- **NetSpot:** Switch back to the network feed when the spot is finished and the network stop condition is met.
- **SpotAvail:** Switch back to the network feed when the spot is finished and the configured Avail time is met.

### NetAudio

The NetAudio item sets the relative attenuation or gain of the network audio path when the Duet is not inserting a commercial. To change how loud the network audio is when it comes out of the Duet, set the desired gain from -16dB to +14 dB in 2 dB increments. The default value is -6dB which equivalent to a 600 Ohm termination. Note that

the NetAudio setting has the same effect when the Audio Level Control system is ON or OFF. See the Audio Connections and Control Chapter for more information.

**Note: The NetAudio setting has no effect on the Duet-SDI.**

### ComAudio

The ComAudio item sets the relative attenuation or gain of the audio path when the Duet is inserting a commercial. To change how loud the commercial plays on the Duet, set the desired gain from -16dB to +14 dB in 2 dB increments. If the Audio Level Control (ALC) system is enabled, the ComAudio setting is a relative gain or attenuation from the adjusted network audio. A setting of -2dB will play the inserted commercial's audio 2dB softer than the current network audio level, and +2dB will play the inserted commercial's audio 2dB louder than the network audio. By default, the ComAudio is set to 0dB on ALC systems to make the commercial match the network audio level.

**Note: The ComAudio setting has no effect on the Duet-SDI.**

## 4. Source Feed (Switcher Control)

Pressing the Mode button three times from the main menu calls the Source Feed menu that controls the internal routing switcher. You can override what is routed to the Duet Video Out port by manually selecting the Source to the internal 4 by 1 A/V router. The following Source options can be selected:

- **Network:** Network video and audio is routed to the Video Out.
- **Soloist:** The video and audio played from the MPEG 2 file in the Duet is routed to the Video Out.
- **AUX:** Auxiliary video and audio routed (not available on the Duet-SDI).
- **OFF:** No video and audio routed, off air with no sync (not available on the Duet-SDI).

## 5. Audio (Duet Only)

Pressing the Mode button four times from the main menu calls the Audio menu. The Duet provides relative audio attenuation or gain capabilities for the Network, Soloist (MPEG 2 insertion material) and Auxiliary sources. To change how loud the output audio plays on the Duet, set the desired gain from -16dB to +14 dB in 2 dB increments. Note that this setting is momentary and will revert to the current NetSet once a break starts. Please refer to the Audio Configuration and Control chapter for more information.

---

**NOTE:** This Audio menu is not available on the Duet-SDI. To configure the Audio on the Duet-SDI, please refer to the SDI Audio menu at the end of this chapter.

---

## 6. Log Settings

Pressing the Mode button five times from the main menu calls the Log Settings menu. The Duet can provide a sophisticated log of events that occur. The log file is stored on the main Duet hard drive in a file called YY-MM-DD.log with

YY=YEAR  
MM=MONTH  
DD=DAY

To turn the Log file system ON, use the following command:

TRACE ON - Trace will be set to all drives and partitions (\* \*)  
To set the number of log files to keep, use the following command:

TFM 30 - Set Trace Files Max to 30 for complete LOG Files

---

**NOTE:** The number of trace files can be set from 10 to 500.

---

The Duet also creates a partial log file every host timer (HOT=1200 seconds by default) which is filtered to include schedule based events and stores the results in a .LFR (filtered log file). This .LFR file is typically returned by the Duet in CCMS mode every host timer.

Press the UP and DOWN keys to select the following items can that can be included in the log file:

- **Inserts:** Logs the commercial ID
- **Misses:** Logs missed commercials and the reason why the commercial was missed.
- **No Break:** No Break window was open when the cue was received.
- **Launches:** Logs the cue tone, GPI or user input that launched the insert.
- **Routes:** Logs the switch to/from the commercial insert and the Network or Auxiliary port.
- **Endings:** Logs the way the insert was terminated.
- **Soloist:** Logs internal commands of the Duet.
- **Resets:-**Logs when any reset is made to the Duet.

### 7. Date & Time (D&T)

Pressing the Mode button six times from the main menu calls the Date & Time menu. The Duet keeps accurate time once it has been set and an internal lithium battery maintains the time during power failures.

The Duet has the ability to adjust for Daylight Savings if the option is set to YES.

Display
*D&T* MM/DD/YYYY WD HH:MM:SS DS=Y

When you edit the Date & Time, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired

value. The first line has the day format by Month (MM), Day (DD) and Year (YYYY). The second line has the Weekday (WD), the Time on a 24 hour clock (HH= Hours MM= Minutes, SS= Seconds) and the Daylight Savings (DS=Y/N).

---

**NOTE:** The dates for daylight savings is preset in the Duet to conform to the United States. However, the start and end times for daylight savings can be configured using the SUMMERSTARTEND configuration variable. See the Appendix on Configuration Variables for more information.

---

### 8. Serial Port

The Duet has one serial port setting that must be properly configured in order to communicate with an external computer, modem or another Duet. If a modem is used, press the UP key to select the Modem Preset and Modem Init menus.

#### Connecting to RS232 IN and THRU Ports

The Duet has two RS232 serial ports with RJ-11 connectors used to communicate with external devices. The RS232 "IN" port is used to connect the Duet to an external computer or modem for data communications including scheduling and verification logs.

The RS232 "THRU" plug is used to daisy chain an unlimited number of DuetS together from the first Duet. When multiple Duet units are daisy chained together, the "THRU" connection of the upstream unit connects to the "IN" connection of the downstream unit. Nothing should be plugged into the THRU port of the last Duet in the chain (no termination is required).

---

**NOTE:** When connecting the Duet to an external computer, modem or another Duet, the Serial Ports must have matching BAUD, DATA BITS, STOP BITS and PARITY settings to ensure proper communications (Recommended: 38400, 8, 1, N).

---

Display
* Serial Port * BBBBB,D,S,P

To edit the Serial Port settings, press the LEFT and RIGHT keys to move between fields and the UP or

DOWN keys to select the desired value.



The Serial Port field settings are:

- **BBBBB**: The Baud Rate that data is transferred between the Duet and the external serial device. Value are 300-115200 baud and 38400 baud is recommended for normal operation.
- **D**: Number of Data Bits (5-8) used to transfer each byte of data (Recommend: 8).
- **S**: The number of stop bits (1 or 2) (Recommend 1)
- **P**: The Parity used to validate data within each byte transferred. (Recommend: [N]o parity. Other values include: [O]DD parity and [E]ven parity)

---

**NOTE:** If the Boot Key is used to place the Duet in Boot Mode, the serial port settings are 115200, 8, 1, N.

---

#### MODEM Presets

The Duet has several modem initialization strings that are preloaded into the Duet for some common modem manufacturers. If you do not find the appropriate preset modem, go to the Modem Init menu to enter your desired initialization string. Note that in the Modem Init menu, you can edit one of the preloaded initialization strings and it will become a User Defined string. If you are not using a modem, select NONE for a modem preset (default).

Manufacturer	Model Number	Initialization String
Generic	Generic (default)	ATE0V0&K4S0=1
Best Data	SmartOne 336FLX(36.6 Kbs)	ATE0V0&K4&D0&R1&S0%C3S0=1
Best Data	SmartOne 56SXV.90 (57.6 Kbs)	ATE0V0&K4&D0&R1&S0%C3S0=1
C-Net (Rockwell)	5614XE (57.6 Kbs)	ATE0V0&K4&D0&S0%C1S0=1
Hi-Val	V1456VQE (57.6 Kbs)	ATE0V0&K4&D0&S0%C3S0=1
Practical Peripherals	PM144T (14.4 Kbs)	ATE0V0&K4S0=1
Practical Peripherals	PM336T (36.6 Kbs)	ATE0V0&K4S0=1
USR Sportster 56K	Sportster (57.6 Kbs)	ATE0V0&H2&D0&R1&S0&K2&M4SO=1
User Defined	User Defined	(String manually entered)
None	No modem is used	None

---

**NOTE:** The 0's in the initialization strings are zero's. If you are not using a modem, select NONE.

---

### Modem Init

The modem initialization menu lets you enter an alphanumeric string up to forty characters long that will initialize and configure an external modem connected to a Duet. Please refer to your modem manual for the exact initialization string to function properly. When you edit the modem initialization string, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired code. Press ENTER to accept the completed string.

---

**NOTE:** If multiple Duet's are daisy chained together, only one Duet (preferably the one connected to the modem) should have a modem initialization string. NEVER ENTER THE MODEM INITIALIZATION STRING INTO MORE THAN ONE Duet.

---

### On Air Tally

The On Air Tally item specifies how the Tally Outputs are controlled. The following options are available:

- **ON AIR:** (default) The Duet will automatically set the Tally Output when a commercial is being inserted into the network feed.
- **MANUAL:** When set to Manual, the Tally Output state is only controlled manually from the End Insert > Tally menu. Also the Duet can be configured to set the tally if network communication is lost in order to reset external routers or modems. See the Appendix on Configuration Variables under TOGGLETALLY for more information.

## 9. Unit Name

The Unit Name is a unique 20 character alphanumeric identifier for each Duet. When multiple Duets are daisy chained together, a unique name must be used on each unit so that each one can be properly addressed over RS232 directly or over a modem. **Note: On computer network TCP/IP connections, the unique unit name and the IP address are used to identify the Duet. Typically the Unit Name and the Network Name (see below) are set to the same value. To edit the name, press the LEFT and RIGHT keys to move between characters and the UP or DOWN keys to select the value.**

---

**NOTE:** The factory default for the Unit Name is Duet. Therefore you must change the Unit Name before connecting more than one Duet together in a daisy chain. Each Duet must have a unique unit name.

---

## 10. Network Name

The Network Name is a four character alphanumeric field that helps you identify the network that the Duet will insert commercials on. When the Duet is used with an external traffic system, the Network Name is used to identify the schedule and verification logs.

To edit the Network Name, press the LEFT and RIGHT keys to move between characters and the UP or DOWN keys to select the value. The field is automatically left justified for names less than 4 characters. Typically the Network Name and Unit Name are the same.

## 11. Network Channel and Headend (CCHHH)

When the Duet is configured in CCMS mode, (optional feature) the Network Channel(C) and Headend(H) must be configured as CCHHH. The CC represents the two digit broadcast channel number or billing system channel number associated with the network attached to the Duet. The HHH represents the three digit local Headend number. To edit the Network Channel and Headend, press the LEFT and RIGHT keys to move between numbers and the UP or DOWN keys to select the desired value.

## 12. Composite Baseband Demodulator Network

The Composite Baseband Demodulator (CBD) Network settings specifies how the Duet can extract cue tones from either Analog or Digital subcarriers. The CBD settings can be from defined presets, user defined or the cue tones can be disabled.

---

**NOTE:** If the cue tones are audible or connected to the rear of the Duet via the DTMF input, set the CBD Network to the follow specifications. This prevents the possibility of the internal demodulator picking up noise and possibly miss-cueing the system.

On the CBD Network Menu, select USER DEFINED  
TYPE: Analog                      Frequency: 9.525MHz  
Bandwidth: Narrow (N)

---

### CBD Network Presets

The Duet has a preset list that specifies the CBD settings for many different networks. To activate triggers received on the CBD port, select the desired network preset from the list. To disable cue tone detection on the CBD port, select DISABLED.

### NetSets PreSet

If you select one of the CBD network presets, the Duet can also automatically fill in the DTMF cue tones required by that network in the first few NetSet entries. To enter the DTMF codes in the NetSets, go to the NetSets PreSet menu item, press SELECT and then press ENTER. For more information on NetSets, see the NetSet main menu description in this chapter.

### User Defined CBD Network

If the required network is not in the preset list, select USER DEFINED to enter your own settings. Press the DOWN key once to reach the CBD User Defined menu item.

Display	
* CBD	TYPE *
F.FFF Mhz	BW = BW

To edit the CBD settings, press the LEFT and RIGHT keys to move between fields and the UP or DOWN

keys to select the desired value. The CBD field settings are:

- **TYPE:** The base band modulation type (Analog or Digital)
- **F.FFF:** The subcarrier frequency that the cue tones are carried on MHz (0-9.525MHz)
- **BW:** The Band Width of the subcarrier, Narrow(N) or Wide(W).

## 13. Host Mode (Networking)

The Duet can communicate over a standard 10/100baseT Ethernet computer network using the TCP/IP protocol. Due to the architecture of IP based networking, it is recommended that you consult a PC or network administrator for help with the physical connections and PC setup.

The TCP/IP settings of the Duet are factory default to:

Username = ADTEC  
Password = NONE  
IP Address = 192.168.10.48  
Subnet Mask = 255.255.255.0  
Connection: 100Mb/sec Half Duplex (recommended)

---

**NOTE:** Since each Duet by default has the same TCP/IP settings, you should only connect one unit to the network at a time to prevent conflicts. Change the IP address following the directions below to make sure that each unit is unique.

---

If you are using a computer to connect to the Duet over the network, it should be configured with an IP address within the 192.168.10.XXX range or configured in a fashion that would allow a connection to be made to the IP address of the Duet.

## **Host Mode**

The Host Mode defines how the Duet will act when it is on a computer network. There are several application specific modes that are available, although typically the Host Mode will be set to Server in smaller systems or CCMS in enterprise Traffic and Billing Gateway Server (TBGS) systems.

### ***Client***

The Duet will act as a traditional network client.

### ***Server***

The Duet will act as a network server.

### ***DuetServer***

Not used.

### ***DuetClient***

Not used.

### ***MirrorClient***

When the Duet is configured as a MirrorClient, the unit will replicate the contents of the MirrorServer specified by the Host IP Address. When in mirror mode, the client Duet will maintain an exact replica of the server Duet files on the client Duet's hard drive.

The client Duet will attempt not to delete content on its hard drive until the drive becomes full. Once the drive is full, the client Duet will remove content from its drive that does not match the server Duet and then copy content to match the server.

### ***MirrorServer***

When the Duet is configured as a MirrorServer, the unit serves as a content host for other MirrorClient Duets. As material is added or removed from the MirrorServer, each MirrorClient will replicate the content to their own drives. The MirrorServer is identified on the network by its configured TCP/IP address which is used to set the Host IP Address in the MirrorClient Duets. Note that for proper mirroring to occur, the number of files on the MirrorServer should not exceed 2048 files.

### ***Mirror List***

When the Duet is configured in MirrorList mode, the unit will only replicate the contents of the MirrorServer listed in the Mirror List File. The name of the Mirror List File can be specified in the Duet configuration file (See Duet Configuration File Appendix).

The client Duet will attempt not to delete content on its hard drive until the drive becomes full. Once the drive is full, the client Duet will remove content from its drive that does not match the contents of the server Duet and the Mirror List File before it copies content from the server.

### ***CCMS (Optional Feature)***

CCMS mode is used when the Duet is part of an enterprise system controlled by adManage™ and the Traffic & Billing Gateway Server (TBGS). Refer to the chapter on Duet CCMS Mode for more information.

## **IP Address**

Once you have selected the desired Host Mode, press the UP key and SELECT the IP Address menu item. You must enter a unique static TCP/IP address for each unit on the network (example: 192.168.10.51). Typically you would keep the first numbers the same and only change the last number to a unique number between 2 and 254.

## **IP MASK**

The IP Subnet Mask should be identical in all the units on the network (typically 255.255.255.0).

## **Host 1 IP Address**

The Host IP Address designates the IP address of the server for the group. When the Duet is set to MirrorClient or MirrorList mode, the Host IP Address designates the MirrorServer where files can be mirrored from. When the Duet is in CCMS Mode, the Host IP Address is the address of the Traffic Billing Gateway Server (TBGS) computer. To configure additional redundant Host IP Addresses, refer to the Appendix on Configuration Variables.

### Gate 1 IP Address

The Gateway IP Address designates a pathway between two networks when a bridge is needed from one network to another. The Gateway is usually a host or router (hub) that connects the two networks in a central location. Contact your IT department for the gateway address. To configure additional redundant Gateway IP Addresses, refer to the Appendix on Configuration Variables.

## 14. Ethernet Multicast Transfer (EMT)

Ethernet Multicast Transfer (EMT) is a proprietary protocol designed by ADTEC for high-speed distribution of files over Ethernet.

---

**WARNING:** EMT is highly optimized and will use in excess of 90% of the available computer network bandwidth to multicast files. Therefore, you should isolate the network connected to the Adtec equipment from the rest of your LAN or a WAN. It is highly recommended that a router/bridge be used to block all broadcast transmissions or just EMT of package type ADEC (hex). Please see your network administrator for more details on how to set up a router/bridge.

---

Any number of Duet units can be configured to a single group that will receive files over EMT. An EMT group consists of one Solicitor (a Duet or an edge™-L) that is configured to receive original MPEG media from a central location over a bandwidth-limited computer WAN network based on Broadband, Fiber, fractional T1 or a data stream over satellite.

All the other Duets in an EMT group are configured as Subscribers to the one Solicitor that is the source of all MPEG media for the group. To efficiently move the material from the Solicitor to the Subscribers over the 10/100baseT Ethernet network, the Solicitor will multicast the needed MPEG media to all the Subscribers who receive the files at the same time.

The solicitor will broadcast a solicitation every three seconds to see if any subscriber needs the file. If the solicitor receives any subscriptions it will then begin multicasting the file. The

subscribers will then be required to send periodic renewal acknowledgements until the file is finished multicasting.

### EMT Settings

The EMT Setting item specifies how the Duet is configured to receive MPEG material over Ethernet Multicast. The setting is encoded into a five-digit number consisting of the following fields (the upper 4 digits are reserved): 0000FULSG. The fields are Function(F), Upper Bit Rate(U), Lower Bit Rate(L), Step Size(S), and Group(G).

#### **Function**

The Function (0, 1) setting specifies if the Duet will be a Subscriber or a Solicitor.

0 = Subscriber.

1 = Solicitor.

#### **Upper Bit Rate**

The Upper Bit Rate (0-9) specifies the maximum bit rate of transmission between 1 and 10Mbps with a value of 0 interpreted as 10 Mbps. Note that lowering the Upper Bit Rate will decrease the amount of network bandwidth being used by EMT.

#### **Lower Bit Rate**

The Lower Bit Rate (0-9) specifies the minimum bit rate of transmission between 1 and 10Mbps with a value of 0 interpreted as 10 Mbps. Note that the Duet will not transmit faster than the Upper Bit Rate over EMT.

#### **Step Size for Resend**

A Solicitor Duet uses the Step Size (1-9) to determine the rate in Mbps to lower the transmission speed and retry the transmission until the Subscriber completely receives the requested file. The Step Size for a Subscriber should be set to zero (0)

#### **Group**

The Group field specifies the group of Duet or Edge L servers that will communicate together over EMT.

0 = Member of all groups.

1-9 = Only communicates with units that have the same group number or a number of zero.

## EMT Examples

### *EMT Solicitor Configuration*

Recommended setting: 16221

Function = Solicitor.

Upper Bit Rate = 6 Mbps.

Lower Bit Rate = 2 Mbps.

Step Size = 2.

Group = 1.

### *EMT Subscriber Configuration*

Recommended Setting: 00101

Function = Solicitor.

Upper Bit Rate = 10 Mbps.

Lower Bit Rate = 1 Mbps.

Step Size = 0.

Group = 1.

## 15. Duplicate Drive

The Duplicate Drive feature is used to copy material from the removable hard drive or optional DVD drive to the optional internal fixed hard drive. By assigning a Duplicate Drive as a source, the Duet will automatically copy newer files to the internal fixed hard drive. This feature is useful in systems where MPEG material or configuration files need to be loaded onto a Duet in the absence of a computer network connection or source. Note that the Duplicate Drive feature may only be used with a Duet that has a fixed internal hard drive.

---

**WARNING:** You must unplug the power to the Duet before removing the removable hard drive from the unit. Failure to do so may damage the Duet.

---

### Settings

The Duplicate Drive Source is identified by entering the correct Drive ID number. The following are the typical Drive IDs used in the Duet:

Duplicate Drive Number	Description
OFF	No Duplicate Drive is configured.
0	Main Hard Drive ID. In a unit with a fixed internal hard drive, the ID is zero (0). In a unit with just a removable hard drive, the ID is zero. Do not set the Duplicate Drive to 0.
1	Removable Hard Drive ID in a Duet with two hard drives.
2	Reserved
3	DVD drive.
4-7	Reserved
8-14	Reserved for legacy support of drives with SCSI id 0-6.

## 16. SDI Audio (Duet-SDI Only)

The Duet-SDI uses the embedded AES-EBU audio on the SDI video input for network audio. All 15 embedded channels are passed through and the Duet-SDI inserts stereo (2 ch) audio only on 4 channels. The SDI Audio menu is only available on the Duet-SDI to configure the required audio group, equalization and encode/decode parameters.

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**NOTE:** The Duet-SDI requires commercial MPEG media encoded with 48 KHz synchronous audio sampling only. If material is encoded with 44.1 KHz, the audio will not play back correctly.

---

### SDI Audio Group #

SDI with embedded AES-EBU audio has the capability of carrying 16 discrete audio channels. The Duet-SDI can be configured to operate on any one quad (4 audio channels) group of the 16 possible channels. To configure the SDI Audio Group number, press the UP or DOWN keys to select group 1, 2, 3 or 4.

- Group 1: The Duet-SDI will operate on audio channels 0-3.
- Group 2: The Duet-SDI will operate on audio channels 4-7.
- Group 3: The Duet-SDI will operate on audio channels 8-11.

- Group 4: The Duet-SDI will operate on audio channels 12-15.

### SDI Equalization

The Duet-SDI can provide analog equalization for installations with long cable runs. To configure the SDI Equalization, press the UP or DOWN keys to select whether equalization is turned ON or OFF.

### Audio Decode

The Audio Decode setting determines which pair of channels in the selected SDI Audio Group to decode to the analog outputs when the network feed is passed through the Duet-SDI (ie – when the Duet is not inserting a commercial). To configure Audio Decode, press the UP or DOWN keys to select A or B.

- **Audio Decode A:** Decode the first two audio channels in the Audio Group.
- **Audio Decode B:** Decode the second two audio channels in the Audio Group.

For example, if the SDI Audio Group is set to 3, the Duet-SDI will operate on channels 8-11. When Audio Decode is set to A, channels 8 and 9 will be decoded onto the Analog Audio Out port.

### Audio Encode

The Duet-SDI will encode a stereo pair (two channels) of audio from local MPEG material played on the SDI OUT port. The Audio Encode setting determines where the Duet-SDI will insert the audio in the SDI Audio Group. To configure Audio Encode, press the UP or DOWN keys to select A, B or C.

- **Audio Encode A:** Encode onto the first two audio channels in the Audio Group.
- **Audio Encode B:** Encode onto the second two audio channels in the Audio Group.

- **Audio Encode C:** Encode onto the first two audio channels and the second two audio channels in the Audio Group. This option simply replicates the audio source pair onto the first and second pair of channels in the Audio Group.

## 17. Bypass Lines (Option)

The Duet has an optional purchased feature that will pass a group of scan lines from the Network In to the Video Out port even when a commercial is inserted by the Duet. This feature is useful in systems where teletext data should be passed through the system regardless of whether or not a commercial is locally inserted by the Duet.

To configure the Bypass Lines, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired value. The start and end lines can be configured anywhere between lines 1 and 262.

## 18. WhiteLine Control (Option)

The Duet has an optional purchased feature that will trigger a NetSet based on White Line detection from a configurable underscan line. When the Duet detects 100% white in the even and/or odd fields, the matching NetSet with an open or closed Start GPI setting will trigger.

Note that when the WhiteLine Control enabled, it will trigger a NetSet just like the Duet received a Start GPI that matched the setting of NetClosed, NetOpen, DeviceClosed, DeviceOpen, NetDeviceClosed and NetDeviceOpen. For example, if a NetSet has a Start GPI configured to NetClosed, the NetSet will trigger if it receives an external cue GPI or if it detects a WhiteLine.

To configure the WhiteLine Control, press the LEFT and RIGHT keys to move between digits and the UP or DOWN keys to select the desired value. Enter the desired underscan (1 to 262) and whether the white line is on the even, odd or both fields. To disable WhiteLine detection on the Duet, select None for the field.

## Chapter 4 Audio Connections and Control

The Duet features two channel analog inputs on both the network and auxiliary feeds along with two channel analog output. The Duet-SDI receives and decodes two channels of embedded AES-EBU audio on the SDI video input port. The Duet-SDI will embed two channels of AES-EBU audio on the SDI output and provide the two channels of audio on an analog output.

### Audio Connections

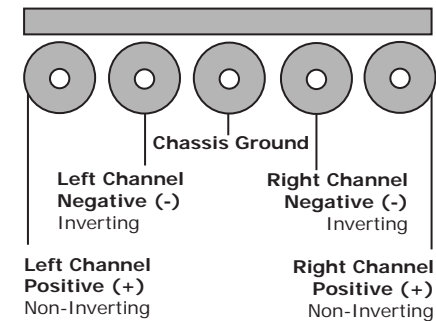
The Duet audio circuits are designed to provide very high input impedances (Hi Z) so that the Duet can support both Hi-Z unbalanced signals (>10K Ohm) as well as Low-Z (600 Ohm) balanced inputs. The Network Audio output is a Low-Z (600 Ohm) balanced output only. The following table provides the input and output specifications:

Input	Impedance	Connector
Network In Left	100K Ohms	5 Pin RST (Removable Screw Terminal)
Network In Right	100K Ohms	
Auxiliary In Left	100K Ohms	5 Pin RST (Removable Screw Terminal)
Auxiliary In Right	100K Ohms	
Network Out Left	600 Ohms	5 Pin RST (Removable Screw Terminal)
Network Out Right	600 Ohms	

### Balanced Stereo or Dual Mono Audio Systems (Recommended)

Each channel of a balanced (differential) 600 Ohm stereo (2 channels) or dual mono audio system typically consists of three-wires: Ground (Earth ground); Non-Inverting (Positive) and Inverting (Negative). The Duet must have Audio connected to BOTH inputs on the network audio input and BOTH outputs on the network audio output. Connect the signals to the appropriate ports for both the Network Audio Input and Network Audio Output.

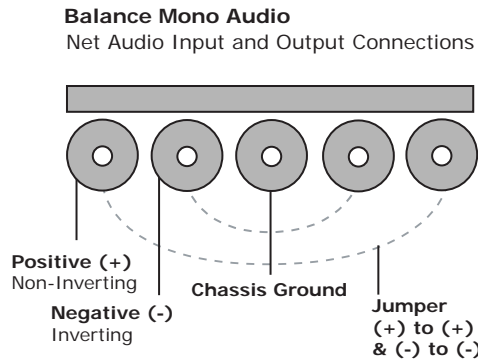
**Balance Stereo or Dual Mono Audio**  
Net Audio Input and Output Connections





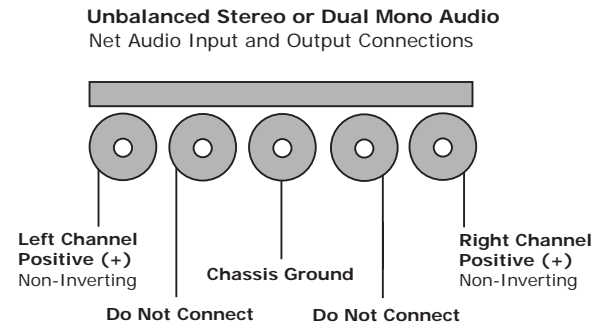
### Balanced Mono Audio Systems

A balanced (differential) 600 Ohm mono audio system typically consists of three-wires: Ground (Earth ground); Non-Inverting (Positive) and Inverting (Negative). The Duet must have Audio connected to BOTH inputs on the network audio input and BOTH outputs on the network audio output. Therefore, if the service is monaural, a jumper MUST be installed to parallel the left and right channels.



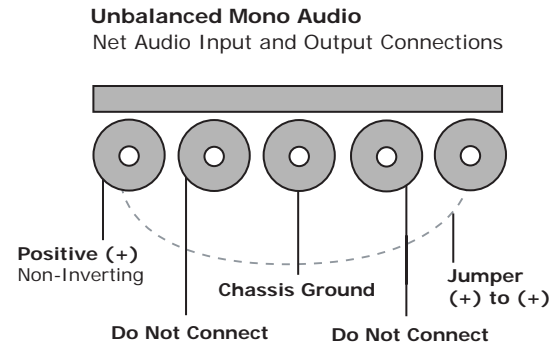
### Un-Balanced Stereo or Dual Mono Hi-Z systems

Each channel of un-balanced (Single Ended) stereo or dual mono audio consists of two-wires: Positive (Tip-DC Offset from ground) and Reference (Ring-Earth ground). Connect only the positive and ground wires for each channel of the Network Audio Input and Network Audio Output.



### Un-Balanced Mono Hi-Z systems

Un-balanced (Single Ended) mono audio consists of two-wires: Positive (Tip-DC Offset from ground) and Reference (Ring-Earth ground). Connect only the positive and ground wires of the Network Audio Input and Network Audio Output. The Duet must have Audio connected to BOTH inputs on the network audio input and BOTH outputs on the network audio output. Therefore, if the service is monaural, a jumper MUST be installed to connect the positive terminal of the left and right channels.



## Configuring the Network Audio Attenuation

Most balanced systems can be connected to un-balanced systems simply by not connecting the Inverted (Negative) signal on the Duet input. Be cautious, as input and output impedances are both very important since they work together to form a system that must be equally loaded to maintain unity through the audio circuit. The table below specifies how to achieve Network Audio unity depending on the impedance of the input device (typically a satellite receiver or studio feed) and the output device (typically a modulator).

Input Device	Output Device	Network Audio	Notes
600 Ohm Balanced	600 Ohm Balanced	-6DB	(Recommended) If the input device (receiver) and output device (modulator) are both balanced Low-Z devices, the gain block in the Duet circuit will effectively cut the voltage level by ½ with this NetSet setting. This is necessary since the Duets Hi-Z input does not load the receiver's 600-ohm output impedance.
56K Ohm (Hi-Z) Un- Balanced	600 Ohm Balanced	0 dB	If the input device (receiver) is Hi-Z and the output device (modulator) is balanced Low-Z, the gain block in the Duet circuit will not be required to reduce the input voltage.
600 Ohm Balanced	56K Ohm (Hi-Z) Un- Balanced	-6 dB	If the input device (receiver) is Low-Z and output device (modulator) is Hi-Z, the gain block in the Duet circuit will effectively cut the voltage level by ½ with this NetSet setting. This is necessary since the Duets Hi-Z input does not load the receiver's 600-ohm output impedance.

Note: The factory default Audio setting of -6dB which provides active termination equal to 600-Ohms for balanced input when the receiver is powered on. In the event of a power loss to the Duet, the active -6 dB termination is disabled and the receiver will see the 600-Ohm load on the modulator, eliminating the possibility of dual termination. If the 600-Ohm termination can be disabled on the modulator, the use of a passive 600-Ohm resistor on the Duet input will provide proper termination in both power on and off states.

Note: Un-balanced Hi-z audio typically has input impedance of 10K-Ohms or higher so there is no need for passive termination in the form of a resistor or active termination in the form of a -6 dB network setting.

---

**NOTE:** If the audio sounds distorted after trying both termination methods, the input level to the Duet must be lowered to .5 volt peek to peek.

---

## Standard Audio Settings

### Duet

The Duet provides relative audio attenuation or gain capabilities for the Network, Soloist (MPEG 2 insertion material) and Auxiliary sources. To change how loud the output audio plays on the Duet, refer to the Audio menu and set the desired gain from -16dB to +14 dB in 2 dB increments. Note that this setting is momentary and will revert to the current NetSet once a break starts. You can also specify the attenuation or gain (-16dB to +14 dB in 2 dB increments) of the network and commercial inserts in the NetSet configuration. The NetAudio item sets the relative attenuation or gain of the audio path when the Duet is not inserting a commercial. The ComAudio item sets the relative attenuation or gain of the audio path when the Duet is inserting a commercial. See NET Settings (NetSet) menu in Chapter 3 for more information.

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**NOTE:** To monitor the network audio level, press the right cursor key LCD control panel. The display will show the status of the network video and the currently sample network audio level.

---

### Duet-SDI

The Duet-SDI uses the embedded AES-EBU audio on the SDI video input for network audio. All 15 embedded channels are passed through and the Duet-SDI inserts stereo (2 ch) audio only on 4 channels. The SDI Audio menu configures the required audio group, equalization and encode/decode parameters. See the SDI Audio menu in Chapter 2 for more information.

---

**NOTE:** The Duet-SDI requires commercial MPEG media encoded with 48 KHz synchronous audio sampling only. If material is encoded with 44.1 KHz, the audio will not play back correctly.

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### Audio Level Control (ALC) System

The Duet Audio Level Control (ALC is not available on the Duet-SDI) is an optional feature locked system to automatically adjust the audio level of the inserted commercial to the average audio level of the network source. The ALC constantly monitors and samples network audio and normalizes the sampled commercial audio level to maintain full fidelity in the audio signals.

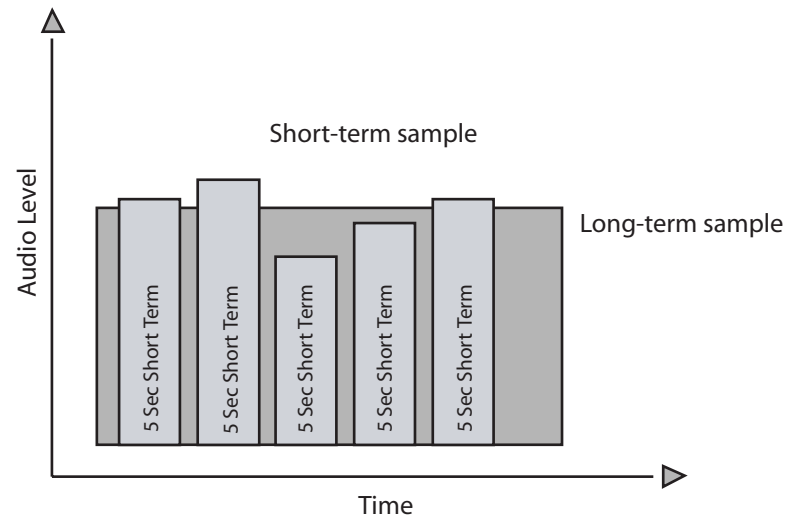
The Audio Level Control System can be configured in terms of dB (based on the formula:  $dB = 20 \log_{10}(\text{out/in})$ ). The Duet's audio sampling system has been calibrated for an input of 0 dB and has a range from -16 dB to +9 dB, although the practical ALC range is from -14dB to +2dB.

### Network Audio Averaging

The network analog audio input from the left and right (stereo) channels is combined into one signal and passed through a time delay filter to attenuate instantaneous audio peaks. The resulting signal is continually sampled when no inserts are playing and entered into the Duet's Audio averaging tables. The sampling process is always delayed by 3 seconds after any transition from insert to network, or network to insert, to allow the time delay

filter to adjust to the correct audio level and prevent incorrect sampling. The network sampling occurs only in network mode and is suspended when inserting or in LO mode.

Since most network audio levels change over time, the Duet takes both long and short-term samplings to provide an accurate running sample that accounts for the peaks and valleys associated with dynamic audio presentations. The Duet can be configured to skew towards Long Tem (0%) or Short Term (100%) sampling providing a mechanism to deal with networks with differing dynamic properties.



The short term average is a running average based on samples from the last four or five seconds. The long term average is a running average based on short term averages taken at sub-minute intervals over the last five or six minutes. The overall network audio average is calculated using a combination of these two tables to allow the insert's audio level to respond slowly or quickly to changes in the network's audio level (see AUDIOLVLSSENSITIVITY configuration for details).

## Commercial Audio Averaging

Each commercial MPEG file on the Duet can contain an average audio level to allow the Duet to more accurately match the inserted commercial's audio level with the current network audio level. The insert's audio level can be set up automatically or manually.

### Auto-Average

The first time an insert is played, the Duet will not attempt to adjust the insert's audio to match the network. However, the insert's audio is sampled during the initial play in sub-second intervals and an average audio level is calculated based on 2 second timeslices. This average is recorded and used on all subsequent plays of the insert for audio matching. The audio is not sampled in the first 3 seconds or in the last 0.5 seconds, and the insert must be a longer than five seconds for averaging to function. Inserts that are longer than two minutes will only be sampled for the first two minutes, and that result will be recorded as the audio level for the entire insert.

### Manual Setup

If desired, the user may manually enter the audio level of each spot manually using the SPOTAUDIOLEVEL command. The audio level can be entered in 1 dB increments from -16 dB to +9 dB (the effective usable range is -14dB to +2dB). The manual setup can also be used to 'clear' the average of the insert, so that it can be auto-averaged during the next play, or to 'disable' audio level control for a particular insert. The 'disable' option allows the Duet to be configured for Audio Level Control, but to ignore matching on any inserts that are set to 'disable'. There is not a time restriction on the length of an insert for a manual setup. See the SPOTAUDIOLEVEL command for details.

---

**Note:** Whenever MPEG material is copied to another Duet, the audio level is included. The audio level must be set by the auto-average function during the first play or it can be entered manually. A spot that was 'disabled' must be 'disabled' again after a move to another unit.

---

## Control Limitations

The flexibility of the configuration settings and the wide range of network and insert audio levels create the potential for a dB level adjustment that is out of range (less than -16 dB or greater than +9 dB). In these cases, the Duet will make the maximum adjustment possible but will not log a messages in the event of an out of range condition occurred.

---

**NOTE:** In practice, the usable audio dynamic range of the Audio Level Control system is from -14 dB to +2 dB.

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## Symphony Auto Level Control Options

The Symphony software assists with the setup of the Audio Level Control System. The configuration screen is used to enable Audio Level Control (see AUDIOLEVELENABLE command for details), set the sensitivity of the matching function to the short term or long term network audio average (see AUDIOLVLSSENSITIVITY command for details).

### Audio Level Matching for Duets:

The NetAudio item sets the relative attenuation or gain of the network audio path when the Duet is not inserting a commercial. To change how loud the network audio is when it comes out of the Duet, set the desired gain from -16dB to +14 dB in 2 dB increments. The default value is -6dB which equivalent to a 600 Ohm termination. Note that the NetAudio setting has the same effect when the Audio Level Control system is ON or OFF. When the Audio Level Control system is enabled, the ComAudio setting is a relative gain or attenuation from the network audio. A setting of -2dB will play the inserted commercial's audio 2dB softer than the current network audio level, and +2dB will play the inserted commercial's audio 2dB louder than the network audio. By default, the ComAudio is set to 0dB when used with Audio Level

Control. When the Audio Level Control System is disabled, the ComAudio setting globally specifies a fixed output audio level in dB of all breaks for that NetSet.

## Audio Level Control Configuration Commands

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The Audio Level Control System is "Feature Locked". When the feature key is disabled, the Audio Level Control system will be disabled, and the commands will not be available for use. Once the feature key is enabled, the AUDIOLVLENABLE command must be used to enable the system. Please note that whenever the feature key becomes disabled, the Audio Level Control system will be disabled immediately, and the AUDIOLVLENABLE command must be used to enable the system after the feature key is re-activated.

### AUDIOLVLCONTROL

The AUDIOLVLCONTROL is used in the Duet to view the existing level and is not used to set the audio level. The Duet uses the NETSET ComAudio field to specify the commercial audio level.

**Command Form:** ALC AUDIOLVLCONTROL

**Command Response:** NN dB to indicate currently sensed level.

### AUDIOLVLENABLED

The command AUDIOLVLENABLED will activate the Audio Level Control System to control the audio level of the inserts based on the average network audio level. The default value is off. The status of the system can be determined by pressing the LEFT key on the front panel of the unit. If a "period" appears in the lower left corner of the display, then Audio Level Control is enabled.

**Command Form:** ALE AUDIOLVLENABLED [ENABLE]

**Parameter ENABLE:** 0 or 1 (0 = OFF, 1 = Enabled)

### AUDIOLVLESENSITIVITY

This setting determines how the calculation for the overall network average from the two averaging tables is performed. Setting 100 (100%) means that the insert audio level will follow the short term network audio average exclusively. Setting 0 (0%) means that the insertion audio level will follow the long term network audio

average exclusively. Settings in between will use the specified ratio of long term and short term averages for the insert audio level. By changing the audio control sensitivity, the audio response can be tailored to the characteristics of the network audio. A highly dynamic network may achieve better results by following the long term average and a fairly stable network audio could follow the short term average. The default setting is 0% where the Duet will follow the long term average exclusively.

**Command Form:** ALS or AUDIOLVLESENSITIVITY [SENSITIVITY]

**Parameter SENSITIVITY:** 0-100 (0 = 0%, 100 = 100%)

### AUDIOLEVELRESET:

The AUDIOLEVELRESET command clears the network averaging tables and restarts the averaging process. The reset is useful if the input level is adjusted or if the network audio level changes substantially due to program changes. The Duet requires about 8 seconds of network audio after each reset before it can determine the network audio level. Any inserts occurring prior to this initial 8 second period will not be adjusted for audio level, since the network audio level is not known.

**Command Form:** AUDIOLEVELRESET|ALR|AR (no options required)

### AUDIOLVLNETWORK

This will return the currently sensed average dB level of the incoming network. This is the average computed with the current averaging sensitivity setting. If the Audio Level Control System is not enabled, the command will return that information. If the system is enabled, but has not had time to initialize (6 to 10 seconds), the command will return a non-initialized message.

**Command Form:** ALN or AUDIOLVLNETWORK (no options)

**Command Response:** NN dB to indicate currently sensed level or status (NN = db Level, 16 = disabled, 17 = not initialized).

## SPOTAUDIOLEVEL

The SPOTAUDIOLEVEL command is included to allow the user to 'customize' the audio level of a spot for spots that have lengthy quiet sections or have a large dynamic range. The auto-average algorithm is a straightforward averaging method that may not accurately calculate the audio level for inserts with widely varying audio levels.

**Command Form:** SAL or SPOTAUDIOLEVEL [DDSN] <OPTIONS>  
**DDSN (required parameter)** : The DDSN argument may include the drive, disc, and spot number, name (no extension required), and placeholders.

**OPTIONS:** The options include a range of dB levels in 1dB increments from -16dB to +9dB and the special terms CLEAR and DISABLE.. Option values are:  
-16DB (terse = 0); -15DB (terse = 1); -14DB (terse = 2); +0DB (terse = 16); +8DB (terse = 23); +9DB (terse = 24)

CLEAR (terse = 25) will remove the existing recorded audio dB level for that spot. When the spot is inserted again, the system will recalculate and record the average audio level for that spot. Please note that the insert will not be adjusted for the network audio level until the average has been recorded.

DISABLE (terse = 26) will 'exempt' a spot from having its audio level adjusted on playback, even when the Audio Level Control system is enabled. The system will not attempt to record the spots audio average when it is played. To re-enable audio level control for a spot, set the SPOTAUDIOLEVEL to CLEAR or manually specify a dB level.

**Note:** If no OPTIONS are given, the command returns existing value for the DDSN, with no update.

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## Chapter 5 Triggering Insertions

There are four methods for triggering commercial insertions:

- General Purpose Input (GPI)
- Audio DTMF
- Composite Base Band (CBB) DTMF
- Whiteline Triggering

The Duet manages these four triggering options through the use of Network Settings (NetSets) that are enabled for specific times and interpret the trigger condition appropriately. Refer to the NET Settings section in Chapter 3 for more information.

### General Purpose Input (GPI)

The Duet provides a GPI input that can be used to trigger a commercial insertion. When the GPI input is electrically connected to the GND input, the GPI is considered closed.

Refer to the Start GPI and Stop GPI sections in Chapter 3 for more information on configuration.

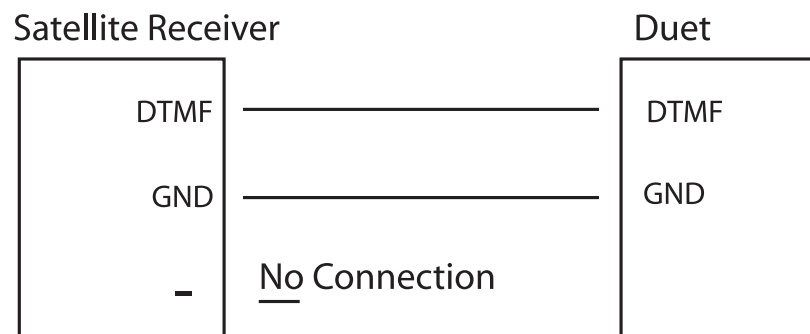
### Audio DTMF

The Duet includes a Dual Tone Multi-Frequency (DTMF) decoder which accepts tones for triggering commercial inserts. The Integrated Satellite Receiver Decoder (IRD) typically has a DTMF port which provides audio cue tones. Alternately, some networks use the secondary audio (SAP) channel to provide the cue tones.

The DTMF tones should be nominally spaced by 50msec and be between 0.5v and 1.0v peak to peak. You can check the tone sequences received by the Duet by pressing the left key on the Duet from the main menu. If no tones are received, try adjusting the DTMF tone voltage.

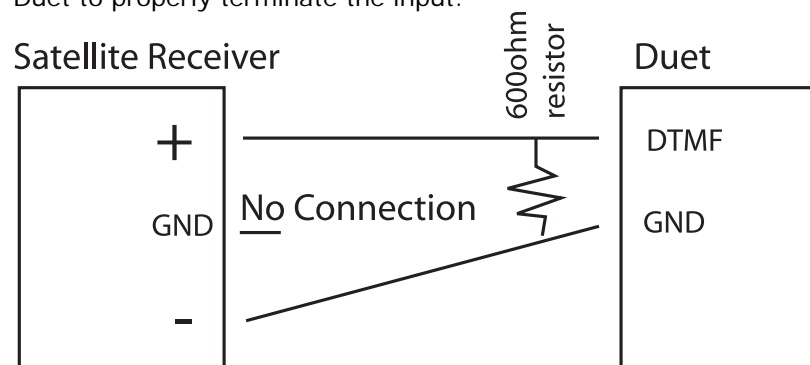
### DTMF Single Ended Wiring

The recommended connection between IRD and the DUET for DTMF cue tones is to connect the Positive terminals together and the ground terminals together as illustrated below:



### DTMF Differential Wiring

If a DTMF ground wire is not available from the satellite receiver to the Duet, the differential output (plus and minus) from the receiver can be connected to the Duet. You must add a 600 ohm resistor between the Duet DTMF Input and the DTMF GND at the Duet to properly terminate the input.





## **Composite Base Band (CBB) DTMF**

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Composite Baseband Input port is used to provide DTMF triggers from satellite receiver with an input range 6 to 10 MHz and terminates to 75 Ohms. The CBB port is used for cue tone extraction on analog delivered networks only and neither audio nor video is extracted from this signal.

## **WhiteLine Triggering**

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The Duet has an optional purchased feature that will trigger a NetSet based on White Line detection from a configurable underscan line. When the Duet detects 100% white in the even and/or odd fields, the matching NetSet with an open or closed Start GPI setting will trigger.

Note that when the WhiteLine Control enabled, it will trigger a NetSet just like the Duet received a Start GPI that matched the setting of NetClosed, NetOpen, DeviceClosed, DeviceOpen, NetDeviceClosed and NetDeviceOpen. For example, if a NetSet has a Start GPI configured to NetClosed, the NetSet will trigger if it receives an external cue GPI or if it detects a WhiteLine.

Refer to Chapter 3 on how to configure the whiteline trigger option.

## Chapter 6 Duet CCMS Mode

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*The CCMS Mode is a purchased feature of the Duet and can be integrated with Adtec's adManage™ system for turnkey content management, alarm monitoring, schedule importing and run-log verification.*

*Note: You must use Duet Firmware 11/12/04 or later*

### Duet Setup for CCMS Mode

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1. Make sure all Avail times in the Netsets are 00:00:00. CCMS mode uses dynamic avails. Also, set all active Netsets to EndBy NetAvailSpot. (Front Panel or Software)

2. Verify the CCHHH setting to the Channel # and Headend #. (Front Panel or Software) specified in the traffic schedule.

Please see Appendix F for Configuration Variables specific to CCMS Mode.

### Trace Messages for CCMS

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Trace messages for the CCMS mirror were added to assist with tracking communication issues between the units and the gateway. In addition, the FTP system will reset if it senses several consecutive communication errors.

The following trace message is generated when mirroring fails to connect to the gateway.  
FTP\_CCMS\_NO\_COM

The following trace message is generated when the system does not have a gateway configured.  
FTP\_CCMS\_NO\_HIP

The following trace message is generated when the system has failed to connect with the gateway for three consecutive mirror sessions. This condition also forces a reset of the entire LAN system (Same as: NTS RESET).  
FTP\_CCMS\_RESET

The following trace message is generated when the system has failed to send an FTP command to the gateway for ten consecutive attempts. This condition also forces a reset of the entire LAN system (Same as: NTS RESET).  
FTP\_SNDCMD\_RESET

### Insert Verification (Legacy and CCMS Native mode)

A spot is not verified if any of the following error conditions are found. Three new trace log messages have been added to track these errors. The error conditions are checked for all ad-insertion systems (Legacy and CCMS Native mode).

**File Read Error:** If any file read errors occur during play, the spot will not be verified, even if the system was able to continue reading from the drive. The trace log error for this condition is 4130. The CCMS Native mode VER file will contain a condition code of 006 (Bad video) for this error condition. The trace log includes the name of the spot, the actual play length and the expected play length according to the registered spot length. This information can be used for calculating partial verifications if needed. The error code is also posted to the NV files.  
004130,02:31:06,ABCD1234, 22.123, 30.145

**Play Stalled Error:** If any stall conditions occur during playback, the spot will not be verified, even if the system was able to continue after the stall condition. The trace log error for this condition is 4131. The CCMS Native mode VER file will contain a condition code of 012 (Unknown error) for this error condition. The trace log includes the name of the spot, the actual play length and the expected play length according to the registered spot length. This information can be used for calculating partial verifications if needed. The error code is also posted to the NV files.  
004131,02:56:29,ABCD5678, 22.123, 30.145

**Decode Errors:** A configuration option has been added (See VERIFYERRORLMT command explanation below) to set a threshold of decode errors. If the system senses more than the allowed decode errors during playback of a spot, then the spot will not be

verified. The default value for this option is OFF. The trace log error for this condition is 4132. The CCMS Native mode VER file will contain a condition code of 006 (Bad Video) for this error condition. The trace log includes the name of the spot and the number of decoder errors detected during play. The error code is also posted to the NV files.

004132,04:18:05,WXYZ5391, 37

Configuration option VERIFYERRORLMT was added to allow the user the option to prevent spot verification if too many decoder errors were detected. The HELP.TXT contains the following description:

#### PARTIAL TONE LOGS

Partial tone logging was added to assist with troubleshooting cue tone reception. When tones have been received, but the system has timed out waiting for a match (3 seconds) a trace log entry will be added.

The two new trace log entries are LOGID\_EXTTONES (4208) which is generated from DTMF tones and LOGID\_CBDTONES (4209) which is generated by CBD tones. The entry to the trace log will indicate when the tone detection timed out and will display the partial tones received at that time. (April 2, 2004)

Examples of the trace log entries are listed below:

004208,13:17:24, 17#  
004209,13:47:03, 541\*

If a break ends by GPI trigger it is now logged as a CMSVER\_TIMEOUT (0013) instead of CCMSVER\_UNKNOWNERROR (0012). (Aug 16, 2004)

A new trace log event has been added. LOGID\_INSERTNOSPOT (4129) indicates a spot was not present on the drive when the break list was generated. (May 13, 2004)

A break duration of zero in the Native Mode Schedule is now interpreted as being open until the end of the day. (March 3, 2004)

The trace log message for LOGID\_MISSBREAKSPOT (4144) will always include the spot ID name even if the spot does not exist on the local system. (Feb 25, 2004)

Added trace log message for any adjustment to the real time clock which includes the original time, the updated time, the source of the update and the status of the transport.

#### Source

- 0 – Task Clock initialization
- 1 – Real Time Clock unresponsive for more than 10 seconds
- 2 - Daylight Savings time update
- 3 – TIME command updated the time
- 4- TIMEZONE command updated the time
- 5- Network Time Protocol (NTP server set by command NIP) updated the time
- 6 – Time updated from LCD front panel

#### Transport Status

- 1- Idle
- 2- Stop
- 3- Play
- 4- Next
- 5- Previous
- 6- Pause
- 7- Slow
- 8- Index
- 9- Rewind

#### FILE SYSTEM

The system will automatically close files that have been left open by the Symphony style file I/O commands (OPEN, READ, SEEK, WRITE, CLOSE). If a file is closed, a message is logged to the trace log file. If a file has seen no activity from any of the IO commands in three minutes, it will be closed.

#### FILE\_IO\_TIMEOUT

LAN Trace message will be generated if the LAN task has to destruct for any reason. This message can be used to help track LAN issues by using the trace logs.

LAN\_DEST 00000000

The CCMS FTP process now sends updates to the trace log file when it is started and when it is completed. The completed message does not indicate success, but does indicate the end of the mirror attempt. The requestor is indicated by the message type and the IP address is the last HIP address that was used by the mirror process (if a backup HIP is used (HIP 1), the trace message will show that address instead of the HIP 0 address).

The messages are as follows:

```
FTP_CCMS_TIMER
FTP_CCMS_COMMAND
FTP_CCMS_DONE
```

The log filter file (LFR) now contains transport messages (001000 and 002000) along with the Duet messages (004000). This will allow the LFR file to be a better diagnostic when checking the verification file. The FTP CCMS mirror now waits 10 seconds instead of 2 seconds for the LFR to be built before attempting to FTP the updated file.

OSD Log trace function now logs the correct file name in the log entry. An additional field has been added to indicate the blend value used when the "OSD D" command is issued. The OSD Crawl process now logs the end of the crawl process.

The "100" is the blend value used for this OSD command:

```
013000,00:41:29,00,13,036,B3 ,OSD,100, , ,
, ,OSD_OSD_ON
```

The "OSD" command to display the status of the OSD will display the file name if the original "OSD L" command used the DDSN instead of the file name to load the OSD.

## Appendix

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## Appendix A Contacting Customer Support

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*Technical Support and Customer Service includes troubleshooting product/system functional operations concerning Adtec equipment, embedded systems and single device issues; Service Order generation, processing and tracking; Warranty claim processing; and on-site system evaluation and maintenance. Technical Support plans do not include customer training programs. Programs incorporating customer training are defined in the Training Services Policy. Customer Services technicians provide limited instruction during a support call/email/fax in order to facilitate checking for proper equipment operation.*

Telephone and Email Support

**Telephone:** 615.256.6619

**Email:** support@adtecinc.com

**Internet:** www.adtecinc.com/supportrequest/

Adtec Digital offers telephone, email and fax support, warranty and service related inquiries during normal business hours (9:00 AM to 5:00PM Central Standard Time CST, Monday thru Friday, except holidays. Support Requests can also be submitted on-line.

All inquiries will be processed in the order in which they are received and by the criteria outlined in the Call Response Order. Inquiries and inquiry responses made after 5:00 PM (CST) weekdays, Saturday, Sunday or on an Adtec recognized holiday will be processed the next business day in the order received.

Callers on hold and returned calls will be prioritized by the following criteria:

- **Priority-24 Subscription Customers**
- **Standard-Priority Subscription Customers**
- **All customers that have purchased Installation & Training, within 90 days of the installation**
- **Adtec Certified Operators (ACO)**
- **Limited Level Support, Warranty & Service Requests**
- **Multi-device system installations that have purchased Installation & Training from Adtec**
- **Distributors**
- **System Integrators**
- **Multi-device systems**
- **Single device users**

Information needed for Support

To help expedite the troubleshooting process, please be prepared to provide the following information to the support representative.

Product(s) affected:

Please provide a list of the Adtec Products involved including the Revision Number for each affected product.

Description of the Problem:

Please include a detailed description of the problem. Include the approximate time and day the problem occurred, the spot ID of the material being inserted and what the operator reported about the incident. It is also helpful to note any recent changes to the system. More information is always better than too little information.

Your Contact Data:

Please include contact information so we can reach you to discuss how to fix the problem, additional troubleshooting steps that are required or to gather more complete information regarding the problem. Please include your

facility name (or call letters), your name, title, email address, telephone number, hours of work, and other contact persons if you are not available.

**Data Specific to the Duet:**

Please make available a full trace log file for the day in question and at least the previous day. If using CCMS use the current VER file and the previous days. Additionally, please have the following

BANNER  
MFG  
DIR U  
CFG  
UNITS

If it is a file problem, please provide some basic history on when the file first appeared in the system and if it is playing successfully on other units.

**Advanced Support Plans**

In addition to our basic Inquiry Response Policy, Adtec offers two advanced levels of priority inquiry support: Standard-Priority and Priority-24. The Standard-Priority & Priority-24 plans provide guaranteed\* response times with the Priority-24 plan offering after hours and holiday support. Standard-Priority support is included with the Adtec Certified Operator (ACO) training. Contact Adtec Sales to upgrade your current support plan.

SUPPORT PLAN	PRIORITY –24	STANDARD-PRIORITY	LIMITED
Hours	24 Hours/Day 7 Days/Week	9 AM – 5 PM (CST), Excluding Weekends & Holidays	9 AM – 5 PM (CST) Excluding Weekends & Holidays
Call Response Time: Guaranty*	Same Day: 2 Hours (1 <sup>st</sup> in order of call list)	Same Day: 4 Hours (2 <sup>nd</sup> in order of call list)	48 Hours
Discounted Site Visits	25%	10%	None
Discounted Training	25%	10%	None
Repair Service: Guaranty*	1 Day Turnaround	3 Day Turnaround	None

One month free service extension will be awarded if Adtec fails to meet its service guarantee.

**Standard-Priority Support Plan:**

Customers can improve upon our normal call processing times and can expedite inquiry support responses through our subscription Standard-Priority service plan. Under this plan all telephone inquiries are guaranteed\*\* a telephone response of no more than 4 hours after they are received (within the designated hours of operation). Telephone inquiries received by 4:00 PM (CST) on weekdays, excluding Adtec holidays are guaranteed a same-day telephone response. However, inquiry responses may be made after hours until 8:00 pm (CST). Email and fax inquiries are

limited in scope to normal business hours, excluding holidays. Standard-Priority customers are entitled to a 10% discount on site visit and training charges after the initial system/product installation and training. Standard-Priority customers also receive a 3-day turnaround time guaranty\* on warranty and non-warranty repairs on Adtec manufactured equipment, excluding Studio Encoders.

**Priority - 24 Support Plan (24 Hour):**

In addition to our Standard-Support plan, after hours, weekend and holiday support is available with the Priority-24 support plan. This plan is a subscription only service available for service inquiries 24 hours a day, 7 days a week. All telephone inquiries are guaranteed\* a telephone response of no more than 2 hours. Email and fax inquiries are limited in scope to normal business hours, excluding holidays. Calls after 5:00 PM will be forwarded to a Customer Services representative on call. Priority-24 customers are entitled to a 25% discount on site visit and training charges after the initial system/product installation and training. Priority-24 customers also receive a 1- day turnaround time guaranty\* on warranty and non-warranty repairs on Adtec manufactured equipment, excluding Studio Encoders.



## **Appendix B Frequently Asked Questions (FAQ)**

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Q) How many computers can connect to a Duet at the same time?

A) A Duet can only be accessed by 2 PCs using different connections. One PC using the Serial/ Modem connection and another using the Ethernet network connection.

Q) Why are my Discovery Networks channels missing breaks?

A) Though there is a CBD Network Preset for Discovery Networks, some customers may experience intermittent cue tones from the network. This may cause some inserts to fail. The best solution to this is to add a Wegener Mainframe and tone demod card. This Wegener product will convert the Composite Base Band signal from the receiver into DTMF tones which the Duet can use.

Q) My EMT solicitor unit has more files on it than the subscriber units. Why?

A) This could be an indication of EMT settings being incorrect or a networking issue. Insure that all units have the proper EMT setting. Also, verify network connectivity, hub and Ethernet cabling. If CDs or DVDs are being used to transfer files to the headend, using the DUPLICATE DRIVE function, the disc may still be inserted. Since the Duet reads both the disc drive, as well as the hard drive, it may report more files than the subscriber units. It may even report duplicates. The DUPLICATE EJECT option will automatically eject the disc when it is finished transferring files, preventing issues such as this. You may find this setting in the CONFIGURATIONS applet.

Q) Is there any special equipment needed to insert commercials on Tech TV?

A) You will need an EEG VBI Control Decoder Model DE 304.

Q) I received the error, "No Open NetSets". What does that mean?

A) "No Open NetSets" means that the Duet received a cue from the network but did not know what to do with it. Look at the NetSets in Conductor. Make sure that there is a window open to insert with using the DAYS ON, TIME ON and TIME OFF settings. For example, the NetSets tell the Duet that it is to INSERT on NET1 when it hears the START TONE between 1AM and 2AM (01:00:00 and 02:00:00). It will also check the AVAIL TIME to see how long it should insert for.

Q) What does the error, "No Cue in Prior Break" mean?

A) The "No Cue in Prior Break" error is telling you which commercials were missed. It never received a trigger from the NetSets during the schedules open time window. This may also occur if there are more commercials scheduled than available time. Essentially, the commercials listed are "leftovers". That is why the time of the "No Cue" errors match the end time of the scheduled break.

Q) Which "Mode" should I use when setting up Network Settings and Schedules in Conductor?

A) In Network Settings, the MODE indicates what you would like the Duet to do when it receives the proper cue. Typically, this is to INSERT a commercial on NETWORK #1 (InsertNet1). The Duet is a single network inserter. There are other Adtec products which are dual network inserters. Therefore, an INSERTNET2 option is available. "InsertNet1" tells the Duet to look at the Schedule Mode when a cue is received. If the Schedule Mode is "ListNet1", the Duet knows to insert from that list of files onto network #1. If the Schedule Mode was "InventoryNet1", it would insert from the inventory on the drive rather than from a specific list.

Q) If I format or change drives in my Duet, will it lose my settings?

A) Yes and No. The Duet saves the Schedule, Network Settings and Verification Logs to the drive. Those items will be lost if the .NV files are deleted or removed for any reason. These files are re-created when the Duet restarts. Retrieve your Verifications and save your NetSets before changing or formatting the drive. Afterwards, you can resend the NetSets and Schedules. All other settings, such as IP Address, Name, CBD Network, etc., will not be affected.

Q) My Duet is inserting spots from this time last year.

A) The Schedules folder shared by Symphony Cable and a given traffic software application contains files that are month and day specific, but not year specific. Clear out old schedules and auto fill files (files with a .FIL extension). Similar results can be seen with verifications from the previous year in the Verifications folder.

Q) I have two 30-second spots scheduled for my 1-minute local avails, but only one airs.

A) First try adjusting the avail time on the Network Settings tab (Console applet in SymCable). This should be 00:01:02 (one minute and two seconds). If the avail is set to exactly one minute, it is possible that the

Duet will pass on the second MPEG to avoid cutting over the network, as many MPEG's will have a few extra frames at the end. Two 30-second spots with extra frames will add up to over one minute.

Q) My Duet's tone history shows an out-of-sequence series of numbers and sometimes some alpha characters. Why does the Duet insert intermittently or not at all?

A) The voltage from the receiver on the DTMF port is too high. This voltage can be measured with an oscilloscope or meter. Make adjustments to reach a voltage of 0.5 volt peak-to-peak to clean up tones and to optimize insertions.

Q) Can I use 8-character file naming with my traffic and billing software and my Duets?

A) You can. This requires a software tweak available from our support department and an option change in the Symphony software.

Q) I can only hear the commercial audio (audio from the MPEG's on the hard drive) from my Duet. There is no audio from the network broadcast.

A) Make sure that the audio cabling to the modulator is coming from the 5-pin 'Net Audio Out' port on the back of the Duet. The RCA audio connectors output only the audio from hard drive playback, and are intended for monitoring purposes only.

Q) How do I test or play a spot manually once it is in a Duet?

A) After the NetSets have been configured, either manually or from the CBD Network menu, you can add a "Test Break" from the front panel. Hit MODE one (1) time then UP arrow until you see TEST BREAK, ENTER TO ADD. You should now be able to LAUNCH BREAK from the same menu. This can also be done through Symphony Cable's Conductor applet. Upload a Schedule with INVENTORY as the MODE. Then, from the Unit Monitor tab, you can TRIGGER NET1 to insert a break.

## Appendix C - Duet Technical Reference

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### **MPEG 2 ISO-13818**

- System and Program Streams
- GOP of 1 to 15, Full IBP, IP or I only
- Data rates from 1 to 15 Mbs
- MPEG Layer 1 and Layer 2 Audio Sampling rates of 44.1 kHz or 48 kHz
- Mono, Dual Mono, Stereo or Joint Stereo
- Data rates supported for Layer 1 32 Kbits/s to 448 Kbits/s in 32 K steps
- Data rates supported for Layer 2 64, 96, 112, 128, 160, 192, 224, 256, 320, 384 Kbits/s

### **MPEG 1 ISO-11172-2**

- System Stream
- GOP of 1 to 15, Full IBP, IP or I only 0.50 Mbs to 5 Mbs
- MPEG Layer 1 Audio
- Sampling rates of 44.1 kHz or 48 kHz Mono, Dual Mono, Stereo or Joint Stereo

### **Standards, Resolutions and Color Frequency**

#### NTSC

720-480, 30 fps, Full D1  
352-480, 30 fps, Half D1  
352-240, 30 fps, SIF  
Color Frequency: 3,579,545 Hz

#### PAL

720-576, 25 fps, Full D1  
352-576, 25 fps, Half D1  
352-288, 25 fps, SIF  
Color Frequency: 4,433,618.75 Hz

#### PAL-M

720-480, 30 fps, Full D1  
352-480, 30 fps, Half D1  
352-240, 30 fps, SIF  
Color Frequency: 3,575,611.49 Hz

#### PAL-N

720-576, 25 fps, Full D1  
352-576, 25 fps, Half D1  
352-288, 25 fps, SIF  
Color Frequency: 3,582,056.25 Hz

### **DUET A/V Inputs**

- Channel Video, BNC
- Auxiliary Video, BNC
- Channel 1 & 2 Audio, 5 Pin RST
- Auxiliary Audio, 5 Pin RST

### **DUET A/V Outputs**

- Channel Video 1, BNC, (Relay bypass protection)
- Channel Video 2, BNC (Channel and Content Preview output)
- Channel 1 & 2 Audio, 5 Pin RST (Relay bypass protection)
- Channel 1 & 2 Audio, RCA (Content Preview output)

### **Video Switcher**

- Vertical Interval: Line 10 NTSC and Line 6 PAL
- Input Impedance: terminating to 75 W
- Maximum Input Level: 1 V p-p
- Output Impedance: terminating to 75 W Return Loss <sup>3</sup>40 dB to 6 MHz
- Crosstalk: -65 dB to 4.43 MHz
- Frequency response:  $\pm$  0.15 dB 10 Hz to 5 MHz
- Tilt: <0.5%
- Differential Phase:  $\leq$  0.1° at 3.58 MHz or 4.43 MHz
- Differential Gain:  $\leq$  0.1% at 3.58 MHz or 4.43 MHz
- Hum and Noise: 70 dB
- Throughput Delay: 30 ns

### **Audio Switcher**

- Input Range: -20 dB to +8 dB
- Output Range: Unity,  $\pm 2$  dB from -16 to + 8 dB
- Output Impedance: < 600 W, balanced or unbalanced
- Crosstalk: > 75 dB at 20 KHz
- Frequency response:  $\pm 0.5$  dB 30 Hz to 20 KHz
- Hum and Noise: - 70 dB
- Harmonic Distortion: < 0.5% 30 Hz to 20 KHz

### **Cue Inputs**

- Composite Base Band, :Type "F", 75 W Terminating (6 to 10 MHz range with 0.001 Hz agile adjustment
- Analog or Digital Narrowband and Wideband tuning with DTMF tone generation and 1 KHz tone GPI. Presets for most ALL cable TVRO channels)
- Audible DTMF: 3 Pin RST, -10 to +0 dB
- Channel GPI: 3 Pin RST, NO/NC CC
- Auxiliary GPI: 5 Pin RST (Tally), NO/NC CC
- White Line Cue: (WLC can monitor the video undersan lines 6 – 23 for 100% white in field 1, 2 or both), Time, Crystal Controlled RTC, Optional NTP service

### **Tally Outputs**

- NO, NC, OA (Open Collector Grounding), 5 Pin RST

### **Serial Communications**

- RS232 DCE, RJ-11 Loop Through
- Baud: 300 to 1,036,800
- Data: 7, 8
- Stop: 1, 2
- Parity: Odd, Even, None
- Ethernet (Telnet, FTP and FCMP)

### **Networking**

10/100baseT

#### Protocols

- TCP/IP
- EMT (Adtec proprietary physical layer multicast) Ethernet Multicast Transfer
- FCMP (Adtec proprietary UDP multicast) File Control Multicast Transfer
- XCP (Adtec proprietary communication protocol)

#### Services

- FTP Client/Server, Telnet, FTP Push and Pull with Passive Mode support
- Support Gateways : User Name and Password Security, Stealth IP Address, virus immune OS
- LAN/WAN and Satellite data and control

### **Front Panel User Interface**

- LCD Display: 16 by 2 backlit (Contrast control via cursor up and down keys)
- Key Pad: Mode, Escape, Enter, Select, Cursor
- LED's: Power, Video, Drive, Link, Busy

### **Physical and Operational**

- 1 Rack Unit
- 19" 1.75" 14" (WHD)
- 482 mm 44 mm 355 mm (WHD)
- 70-240 VAC 50-60 Hz
- 65-Watts maximum power consumption
- 50/90 Degrees F, 30/70 RH
- CE Certified

## Appendix D – Duet SDI Technical Reference

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### **MPEG 2 ISO-13818**

- System and Program Streams
- GOP of 1 to 15, Full IBP, IP or I only
- Data rates from 1 to 15 Mbs
- MPEG Layer 1 and Layer 2 Audio Sampling rate of 48 kHz only
- Mono, Dual Mono, Stereo or Joint Stereo
  - Data rates supported for Layer 1 32 Kbits/s to 448 Kbits/s in 32 K steps
- Data rates supported for Layer 2 64, 96, 112, 128, 160, 192, 224, 256, 320, 384 Kbits/s

### **MPEG 1 ISO-11172-2**

- Decoded Streams (from hard drive)
- MPEG 2 Program 1 to 15 Mbs
- MPEG 2 Transport 1 to 12 Mbs
- MPEG 1 400 System Kbs to 5Mbs

### **Standards, Resolutions and Color Frequency**

#### NTSC

720-480, 30 fps, Full D1  
352-480, 30 fps, Half D1  
352-240, 30 fps, SIF  
Color Frequency: 3,579,545 Hz

#### PAL

720-576, 25 fps, Full D1  
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Color Frequency: 4,433,618.75 Hz

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720-480, 30 fps, Full D1  
352-480, 30 fps, Half D1  
352-240, 30 fps, SIF  
Color Frequency: 3,575,611.49 Hz

#### PAL-N

720-576, 25 fps, Full D1  
352-576, 25 fps, Half D1  
352-288, 25 fps, SIF  
Color Frequency: 3,582,056.25 Hz

### **SDI Video Input (Supports embedded AES-EBU)**

- SDI Channel Video, BNC

### **Video Outputs (Supports 4 Channel AES-EBU)**

- SDI Video 1, BNC, (Relay bypass protection)
- Analog Video, BNC (Channel and Content Preview output)
- Analog Audio, 5 Pin RST (Channels are user defined, 1&2 or 3&4)

### **SDI Video Switcher**

- SMPTE 259M-C Compliant
- Vertical Interval: Line 10 NTSC and Line 6 PAL
- Input Impedance: terminating to 75 W
- Nominal Input Level: 0.8 V p-p
- Output Impedance: terminating to 75 W
- Nominal Output Level 0.8 V p-p
- Return Loss <sup>3</sup>15 dB to 270 MHz
- Throughput Delay: 350 ns

### **AES-EBU Audio Switcher**

- AES-EBU Audio, BNC embedded with video
- SMPTE 272M A, B, C Compliant
- 48 KHz Synchronous Sampling Only
- Passes all 15 embedded channels
- Inserts Stereo Audio only (2 CH) on 4 channels

### **Cue Inputs and Tally Outputs**

- Composite Base Band, Type "F", 75 W Terminating (6 to 10 MHz range with 0.001 Hz agile adjustment Analog or Digital Narrowband and Wideband tuning with DTMF tone generation and 1 KHz tone GPI. Presets for most ALL cable TVRO channels)

- Audible DTMF, 3 Pin RST, -10 to +0 dB
- Channel GPI, 3 Pin RST, NO/NC CC
- White Line Cue (WLC can monitor the video undersan lines 6 – 23 for 100% white in field 1, 2 or both) Time, Crystal Controlled RTC, Optional NTP service
- Tally Output: Contact closure for On-Air or external device control.

### **Serial Communications**

- RS232 DCE, RJ-11 Loop Through
  - Baud, 300 to 1,036,800
  - Data, 7, 8
  - Stop, 1, 2
  - Parity, Odd, Even, None
- Ethernet (Telnet, FTP and FCMP)

### **Networking**

10/100baseT

#### Protocols:

- TCP/IP
- EMT (Adtec proprietary physical layer multicast) Ethernet Multicast Transfer
- FCMP (Adtec proprietary UDP multicast) File Control Multicast Transfer
- XCP (Adtec proprietary communication protocol)

#### Services:

- FTP Client/Server, Telnet, FTP Push and Pull with Passive Mode support
- Support Gateways, User Name and Password
- Security, Stealth IP Address, virus immune OS LAN/WAN and Satellite data and control

### **Front Panel User Interface**

- LCD Display: 16 by 2 backlit (Contrast control via cursor up and down keys)
- Key Pad: Mode, Escape, Enter, Escape, Cursor
- LED's: Power, Video, Drive, Link, Busy

### **Physical and Operational**

- 1 Rack Unit
- 19" 1.75" 14" (WHD)
- 482 mm 44 mm 355 mm (WHD)
- 70-240 VAC 50-60 Hz
- 65-Watts maximum power consumption
- 50/90 Degrees F, 30/70 RH
- CE Certified

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## Appendix E – Ad Insertion Enterprise Solution

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### 1 - adManage/TBGS

At the core of the adVantage solution is the TBGS traffic and billing gateway server and the adManage software application. This is the gateway that invisibly coordinates the complex flow of media and data across the enterprise. adManage streamlines the process of getting the right ads, schedules and verifications to the right places at the right times, resulting in high customer satisfaction levels and increased revenues. The powerful server architecture and SQL database offers rapid access to current data via the browser interface supporting customizable alarms with notification via paging, email or text messaging.

### 2 - Traffic and Billing

adManage merges local and interconnect schedules to create a master insertion schedule for each channel at each headend. After commercials are played, adManage creates and sends separate verification files to local and interconnect traffic and billing systems facilitating seamless media and data management across your enterprise.

### 3 - eyeMonitor

The eyeMonitor interface graphically displays the status of all headends and channels in the enterprise on a single screen. It provides visibly better real time status and highlights exceptions so that corrections can be easily made.

### 4 - autoDialer

The autoDialer application provides a back channel for schedule distribution and verification retrieval over a simple phone line. This feature is essential for disconnected remote headends and adds redundancy in networked headends, all for the price of a phone call.

### 5 - adCode

New media is ingested and prepared by adCode and sent to adManage for storage and distribution to the headends. Sources can be tapes, DVDs or over FireWire™ from nonlinear editors. The architecture of adCode supports Cable Labs VOD and SCTE encoding standards, an important aspect that future proofs your investment. Use adCode to seamlessly bridge the transition from analog and SDI digital insertion to DPI. adCode prepares the highest quality DPI ready media in the industry. Compatibility with other ad insertion systems is standard innovation at Adtec.

### Headends

In an ad insertion enterprise, there are likely to be several different types of headends with varying levels of connectivity available. From networked LAN/WAN to satellite to disconnected remote, adManage can work with them all. Flexibly better by design.

### 6 - Networked Headend

A networked headend has an existing broadband LAN/WAN connection, such as a T1 line or cable modem. adManage uses this connection to send ads and schedules and receive verifications and status monitoring. Ad insertion is performed by Adtec's scalable single-channel Duet or Duet-SDI. Since each Duet is a single-channel modular unit that is totally self-contained, the system is fault tolerant by design. Media distribution within the headend is invisibly performed via multicast techniques making it available to all inserters all the time.

### 7 - Disconnected Remote Headend

What can you do when a headend is so small or remote that it has no economical network connection and satellite is not an option? Media can be ingested by adCode and burned onto a CD or DVD and sent to the headend where the disk is simply placed into a Duet-DVD unit. The Duet-DVD automatically makes all the ads available to every unit at the headend. At the remote headend, adManage performs schedule distribution, status monitoring and verification retrieval over standard phone lines (PTSN) via dial-up modem through autoDialer.

### 8 - Optional Satellite Serviced Headend

In headends without a network connection, media and data distribution can easily be achieved via satellite. Here's how it works. At the central office, adManage sends the media and schedules to Adtec's FCMP server which prepares the data by adding forward error correction then multicasting it to the Adtec DTA-3050 multiplexer for encapsulation and encrypting prior to the multicast uplink. At each satellite headend, an Adtec edge-1123 with built-in satellite data receiver unscrambles and distributes the media to the Duet, Duet-SDI or DPI-1200 units. At the satellite headend, adManage performs schedule distribution, status monitoring and verification retrieval over a simple phone line with a dial-up modem through autoDialer.

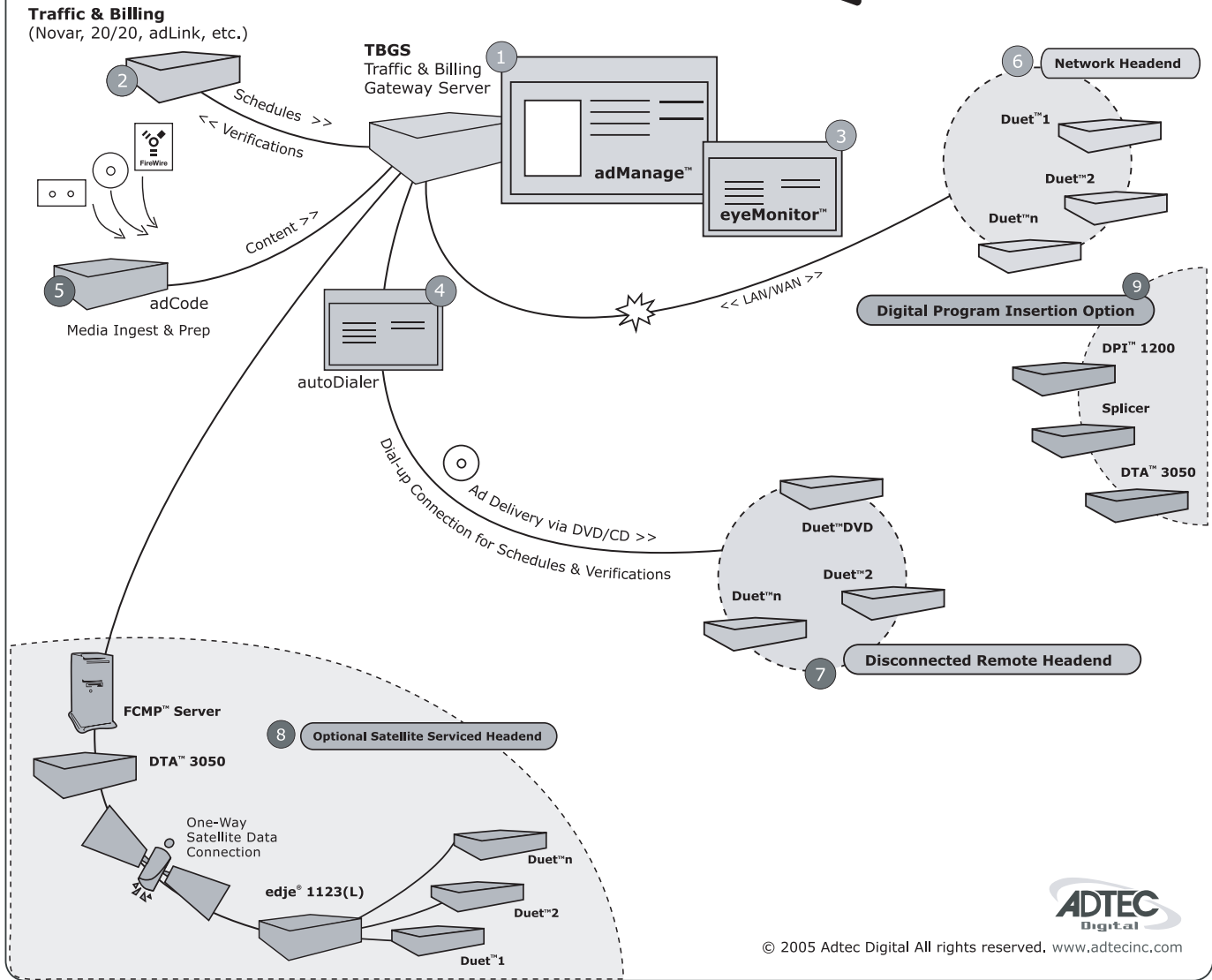
### 9 - Digital Program Insertion Option

Adtec's DPI-1200 digital-into-transport (DIT) ad server takes the place of up to twelve Duets. Designed for the all-digital headend, the DPI-1200 will deliver seamless splicing effortlessly in concert with Duets in your analog systems. The DPI-1200 can deliver up to twelve programs to the ad splicer. adManage transparently delivers media and schedules and retrieves verifications and status monitoring in the DPI environment just as in any other type of headend. The adGroomer provides automated transcoding of media from legacy encoders making the media compliant with Cable Labs VOD standard which has been chosen by major MSOs as the standard for DPI media ingest.



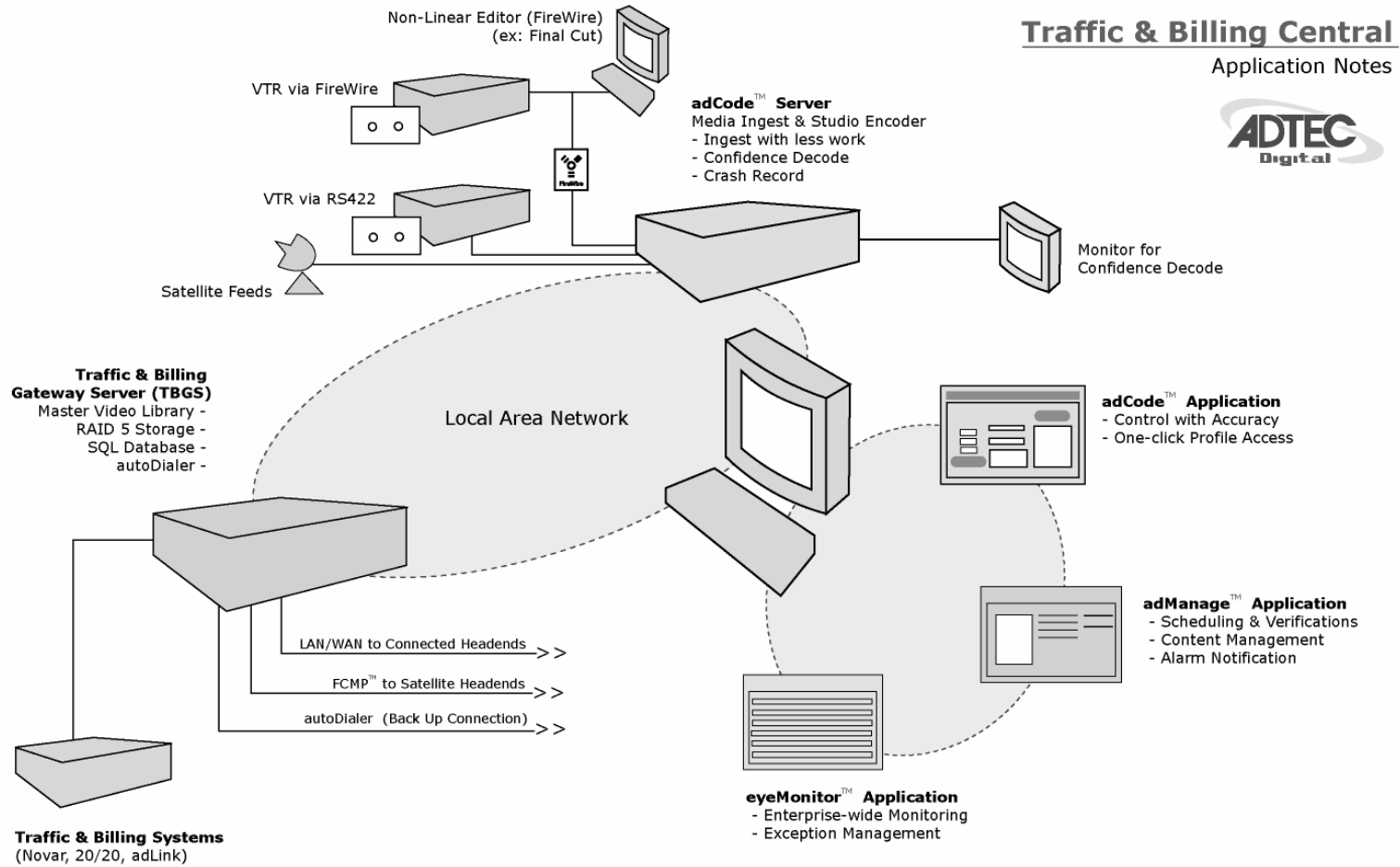
# adVantage

Enterprise Ad Insertion Solution



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## Appendix E-1 Traffic & Billing Central

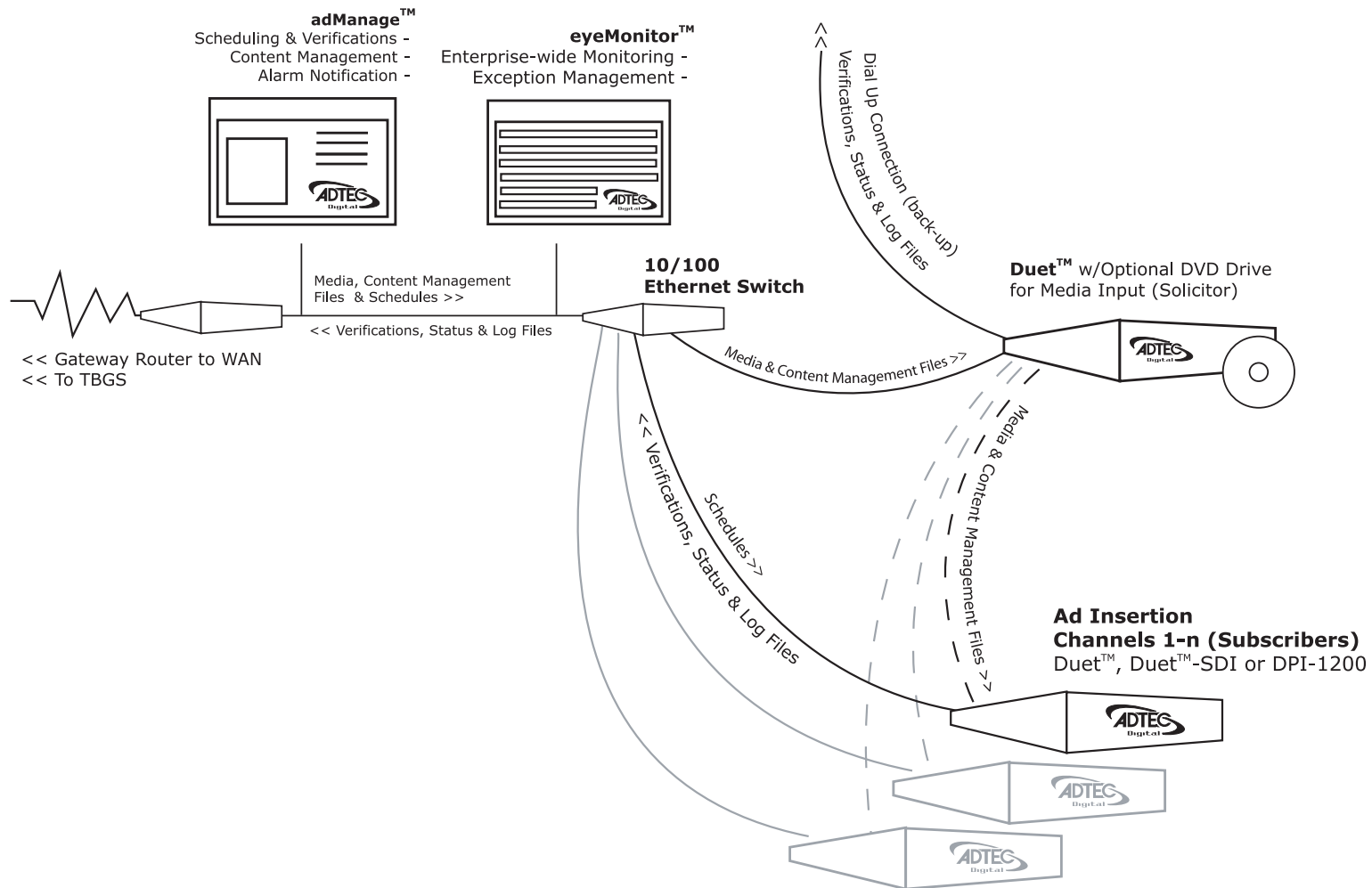


The Adtec commercial insertion enterprise solution centers around the Traffic & Billing Gateway Server (TBGS) which hosts adManage, the Master Video Library and the content management database. adManage merges new local and interconnect schedules to create a master insertion schedule for each channel at a headend. After each commercial insertion is completed, the verification file is created for both

the local and interconnect traffic systems. New content is ingested by adCode and released to adManage for distribution as needed by each headend. Enterprise wide monitoring is provided by eyeMonitor which displays the status of commercial insertion and content management for each channel and highlights exceptions for corrective action.

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[www.adtecinc.com](http://www.adtecinc.com)

## Appendix E-2 Connected Headend

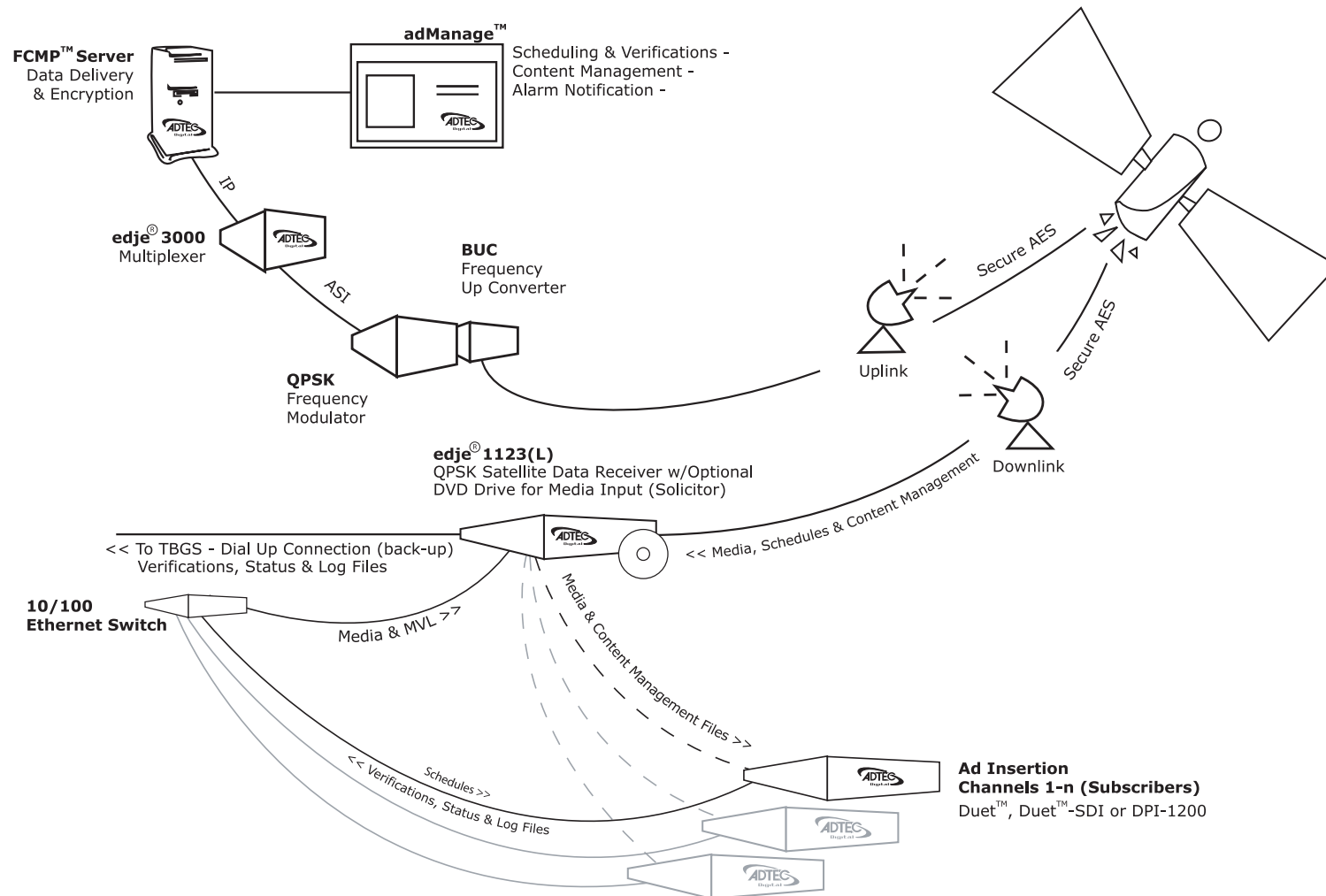


Adtec supports network connected headends through a LAN/WAN for delivery of media and commercial insertion schedules and central monitoring of status, verifications and content management. To minimize network traffic of large media files, the commercials and content

management directives are retrieved once by the headend solicitor over FTP and then passed on locally to the other commercial inserter subscribers using an Ethernet Multicast Transfer (EMT). Each commercial inserter is responsible for retrieving insertion

schedules and providing status, verifications and content management by FTP back to adManage.

## Appendix E-3 Satellite Serviced Headend



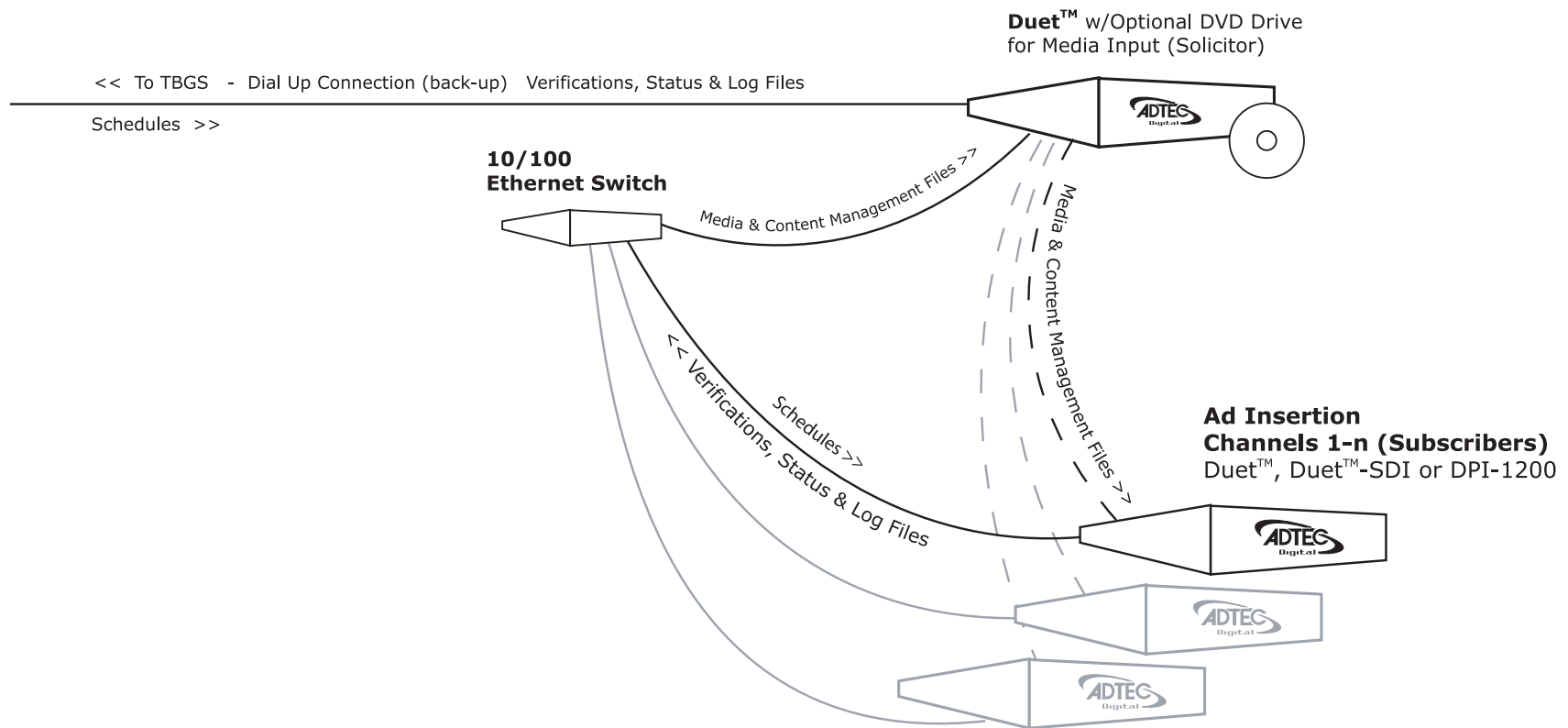
Adtec supports remote headends through satellite delivery of media and commercial insertion schedules using the File and Command Multicast Protocol (FCMP) system. Commercials and schedules are sent by adManage to the FCMP server and then to the

DTA-3050 multiplexer for data encapsulation and secure AES encryption.

The modulated data can be directed to one or more downlink facilities for receipt by the edje 1123(L) and use by the Duet or DPI commercial insertion servers. Central

monitoring of status, verifications and content management can be provided through a dialup connection back to adManage.

## Appendix E-4 Disconnected Headend



A headend with just telephone access is supported by the Adtec enterprise solution. Scheduling and central monitoring of status, verifications and content management is done through a dialup connection back to adManage.

New commercials can be loaded into the headend solicitor DVD drive which are automatically passed on locally to the other commercial inserter subscribers using an efficient Ethernet Multicast Transfer (EMT).

## Appendix F Creating Compatible MPEG 2 Files

**MPEG 2 Encoding Parameters** Adtec players are designed to play high performance MPEG 2 MP@ML ISO13818 constant or variable bit rate files and decode them to analog NTSC, PAL, PAL-M or PAL-N video formats.

Item	Spec	Type Stream	Notes
MPEG 1	ISO-11172-2	System	Data rates from 128Kbs to 5Mbs
MPEG 2	ISO-13818	Video Elementary, System, Program, or Transport (Mixed mode auto detect)	Data rates from 500 Kbs (0.5 Mbs) to 15 Mbs
GOP	NA	NA	Adjustable from 1 to 60, Full IBP, IP or I only. Open & closed GOP's supported.
Video Sampling	4:2:0	NA	Chroma (Cr and Cb) values are subsampled in both the horizontal and vertical dimensions by a factor of 2.
Video Resolution NTSC	NA	720-480, 30 fps 352-480, 30 fps 352-240, 30 fps	Full D1 Half D1 SIF Color Frequency: 3,579,545 Hz
Video Resolution PAL	NA	720-576, 25 fps 352-576, 25 fps 352-288, 25 fps	Full D1 Half D1 SIF Color Frequency: 4,433,618.75 Hz
Video Resolution PAL-M	NA	720-480, 30 fps 352-480, 30 fps 352-240, 30 fps	Full D1 Half D1 SIF Color Frequency: 3,575,611.49 Hz
Video Resolution PAL-N	NA	720-576, 25 fps 352-576, 25 fps 352-288, 25 fps	Full D1 Half D1 SIF Color Frequency: 3,582,056.25 Hz
Audio Sampling	NA	Mono, Dual Mono, Stereo or Joint Stereo	Sampling rates of 48 kHz (recommended) or 44.1 kHz
Audio	ISO-11172-3	Layer 1	Data rates supported for Layer 1 are 32 Kbits/s to 448 Kbits/s in 32 K steps.
Audio	ISO-13818-3	Layer 2	Data rates supported for Layer 2 are 64, 96, 112, 128, 160, 192, 224, 256, 320, 384 Kbits/s. Free formatted or variable audio bit rates are not compatible.

Adtec Players require video to be captured and recorded in the interlaced (Field) scan mode (1,3,5...2,4,6...). Adtec players DO NOT support video captured in progressive scan mode (1,2,3,4...). Note that many DV cameras and PC capture cards by default record in progressive scan mode. Adtec players purchased prior to 03/01/02 require the encoded file to be made top field (field 1) first. Some encoders may have a parameter setting which allows change from a bottom field first interlaced scan to a top field first encode.

Audio must be MPEG Layer 1 or Layer 2 and multiplexed with Video in either System or Program or Transport stream format. Dolby AC-3 (Dolby Digital), ACC, PCM and WAV audio files are not supported.

Adtec players DO NOT support DVD files made with PCM (Pulse Code Modulation) or Dolby Digital (formerly AC-3) audio. DVD files made with MPEG audio level 2 are qualified.  
MPEG Data Rate and Storage Calculations

The storage requirements for MPEG media is dependent on the data rate used to encode the file. Typically MPEG data rates are labeled in Mega Bits per Second (Mbs). To convert Mbs to Mega Bytes per Second, divide the data rate in Mbs by eight (8). The table below lists some typical data rates and resultant storage required for each minute of media.

Data Rate Mb/s	Data Rate MB/s	Data Rate MB/minute	Data Rate GB/minute	Minutes/GB of Storage
1.0	0.125	7.5	0.0075	133.3
2.0	0.250	15.0	0.015	66.7
4.0	0.500	30.0	0.03	33.33
6.0	0.750	45.00	0.045	22.22
8.0	1.0	60.00	0.060	16.66
10.0	1.250	75.00	0.075	13.33
12.0	1.500	90.00	0.090	11.11
14.0	1.750	105.00	0.105	9.52
15.0	1.875	112.50	0.1125	8.88

From the table above, if material is encoded at 8Mb/s, it will require 16.66 gigabytes of data for each minute encoded.

## Appendix G The Configuration Variables

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### Duet CMDAUTO Configuration File

A CMDAUTO file is a text file that contains API commands. These commands will be executed on bootup or when manually executed using a RUN command. The CMDAUTO (command auto load file) contains most all configuration settings needed to configure a Duet in CCMS mode. However, knowledge of each command is needed to be successful during deployment of a new Duet in the field.

```
#####
# cmdauto.dvc
# Test Lab Zone 1
# Adtec Digital Inc.
# 2005-04-05 MRB
# This script forces standard settings for all inserters.
#####
### GENERAL SETTINGS
# Host Mode of the Duet
HOM CCMS
#
# Turn trace logs on for any drive
TRACE * *
#
# Maximum number of trace logs to store on the system
TFM 45
#
# Audio Level Control Enable (the Duet must be feature enabled to work)
ALE ON
#
# Spot Level Default (typically 0db) is the level the spot plays the first time
SLD 0
#
#####
### SCHEDULE SETTINGS
# Specifies CCMS schedule file format compatibility
CNV P NOVAR
#
# Break Repeat (default OFF) prevents commercials from playing a second time.
BRP OFF
#
# Time in minutes between insert cues (NetSets) before the DUET will log error number 146
NTO 90
#
# The time zone relative to GMT (-11 to +11) the Duets are currently operating in.
TIZ -5
#
# Day Light Savings needs to be turned on in order for NTP to work
DLS YES
#
#####
### NETWORK SETTINGS
```



```
# Username and Password NOTE Change to the correct username & password below:
CPW username,password
#
# Linux Mirror CCMS mode login compatibility (uses lower case username/password)
LINUXMIRROR ON
#
# Lanmode default is Auto, but should be fixed to 100BH (recommended) or 100BF, 10BF, 10BH.
LANMODE 100BH
#
# Host Timer specifies how often the Duet will log in to check for new schedules and media. Should be set to 600 seconds
HOT 600
#
# FTP Data Port range should be set between 10000 and 50000
FDP 10000 50000
#
# FTP Timeout set to 30 Seconds
FTO 30
#
# NTP Server IP Address.
NIP 0 192.168.10.9
#
# Host Server IP Address. (In CCMS mode, typically the IP address of the TBGS)
HIP 0 192.168.10.9
#
# Gateway IP Address, typically the address of the gateway router to access the WAN.
GIP 0 192.168.90.1
#
# This enables XCP communication over every Duet within a network
XCP ON

#####
### SAVES THE CONFIGURATION
CF SAVE
```

#Make sure you place a carriage return & line feed at the end of the file.

## Configuration Variables

Parameter	Setting (Verbose)	Notes
Name	<i>DUET</i>	User defined 20-character alphanumeric name used for communications. This field is critical for serial communications in a multi-drop installation.
Video	<i>NTSC</i>	United States video Standard.
	<i>PAL</i>	Pal-B or German PAL used primarily in Europe.
	<i>PALM</i>	PAL used primarily in Brazil.
	<i>PALN</i>	PAL used primarily in Argentina.
Talk	<i>OFF</i>	Unit responds when spoken to.
	<i>COM1</i>	Unit automatically outputs messages based on status without query commands. Ideal for debugging or constant status monitoring of unit via RS232
	<i>COM2</i>	Unit automatically outputs messages based on status without query commands. Ideal for debugging or constant status monitoring of unit via RS422
	<i>On</i>	Files will play randomly from List. Not recommended for commercial insertion.
Start Up	<i>On</i>	Unit will play on power up.
	<i>OFF</i>	Unit will <u>NOT</u> play on power up.
Shuffle	<i>Off</i>	Files will play sequentially from List.
	<i>On</i>	Files will play randomly from List.
Blank (BLK)	<i>No Video</i>	No video or SYNC is output. This is ideal for use with the AVS2 or other "NO SYNC" Video switchers.
	<i>Black</i>	Black video is output between files. This video is timed with the SYNC input.
	<i>Hold Still</i>	Holds last frame of video. This is displayed in memory and does not require constant drive reads.
	<i>White</i>	White screen is output
	<i>Yellow</i>	Yellow screen is output
	<i>Cyan</i>	Cyan screen is output
	<i>Green</i>	Green screen is output
	<i>Magenta</i>	Magenta screen is output
	<i>Red</i>	Red screen is output
	<i>Blue</i>	Blue screen is output
	<i>Color Bars</i>	Color Bars
	<i>Seamless</i>	No video frames inserted between commercials (This requires the exact same MPEG 2 file characteristics for ALL files)
Error Limit	<i>3</i>	Number of drive read errors before a file is dumped. 0-999.
Attenuate	<i>0</i>	Level of attenuation in dB. 0-99. Any number other than 0 (zero) mutes the audio.
Com1	<i>38400,8,1,N</i>	Baud, Data, Stop, Parity for RS 232 Port.

Parameter	Setting (Verbose)	Notes
Com2	<i>38400,8,1,N</i>	Baud, Data, Stop, Parity for RS 422 Port. Firmware locked by DUET.
Modem	String	Modem initialization string. See Modem specific documentation.
Output	<i>Composite</i>	Composite video. Only DUET Option.
	Component	Component (YUV and SYNC). Requires four cables. Not available.
	RGB	RGB (RGB = SYNC) video. Requires four cables. Not available.
Repeat	Off	Play a single file or List, and then stop.
	One	Play a single file continuously.
	All	Play all files or list (if loaded) continuously.
	Last	Play a List, and then repeat the last file.
Chroma Phase	<i>0</i>	Value in degrees of color phase adjustment. 0-360 degrees.
Spinup	<i>30</i>	Time in seconds after a power-up or reset the DUET waits before reading the hard drive. 0-60.
SPW	<i>Username,password</i>	The username and password of the Duet for external client telnet sessions.
IP Address	<i>192.168.10.100</i>	32 bit alpha number representing IP address.
IP Mask	<i>255.255.255.0</i>	Sub Net mask address.
Gateway IP Address	<i>000.000.000.000</i>	Gateway IP addresses. 4 possible gateways.
Host IP Address	<i>000.000.000.000</i>	Mirror FTP server IP addresses. 4 possible servers.
LANMODE	<i>100BH</i>	Default is Auto, but should be fixed to 100BH (recommended) or 100BF, 10BF, 10BH.
Host Mode	<i>Server</i>	Server mode. Provides Server and Client concurrent. Also supports automatic mirroring if valid HIP is entered.
Host Timer	<i>600</i>	Time in seconds before unit compares its directory listing to that of a remote FTP server
Server user Password	<i>ADTEC,NONE</i>	Server user name and Password for FTP.
Client User Password	<i>ADTEC,NONE</i>	Server user name and Password for FTP.
EMT	<i>Off</i>	EMT setting. See EMT documentation.
UDP	<i>0</i>	Decimal number up to 5 digits for UDP port. Not used with DUET.
Network Name/Channel	Name/Channel	User defined channel name and number.
CBD	Demod Setting	Based on database of network settings. Select network from list.
White Line	Line Number/Field	Line number and field for white line cue signal.
Balanced Audio	NA	Not implemented.
Level Control	NA	Not implemented.
Daylight Savings	Yes	Enabled Daylight Saving.
	No	Disable Daylight Savings.
Duplicate Drive	<i>None</i>	No duplicate drive.
	<i>0</i>	IDE Drive 0 (Always the primary internal hard drive)

Parameter	Setting (Verbose)	Notes
	1	IDE Drive 0
	2	IDE Drive 0
	3	<i>IDE Drive 0 (IDE host 3 primary, CD Default)</i>
	4	IDE Drive 0
	5	IDE Drive 0
	6	IDE Drive 0
	7	IDE Drive 0
	8	SCSI Drive ID 0
	9	SCSI Drive ID 1
	10	SCSI Drive ID 2
	11	SCSI Drive ID 3
	12	<i>SCSI Drive ID 4 (External Jaz drive factory default ID)</i>
	13	SCSI Drive ID 5
	14	SCSI Drive ID 6
Freeze	<i>Field</i>	Decoder uses 1 field and duplicates the field to eliminate flicker on a pause.
	Frame	Decoder uses both fields to freeze a frame. This will flicker if the pause is during any motion sequence.
Net Set Timeout	45	Time in minutes between insert cues (NetSets) before the DUET will log error number 146. 0-1440. (1440 minutes in a day)
Avail Pad	0	Time in seconds the DUET will add to an avail time to provide extra fill. 0-600. Typically used with spots that do not have standard lengths.
Break repeat	ON	A break list will run and repeat if additional cues are received in the open window.
	Off	A break list will run and stop when the entire list has been played if additional cues are received in the open window, they are ignored and logged as error number 148. This new mode is recommended if no list repeating is on.
Encryption Key	EKY	Eight digit (xxxxxxx) encryption key.
Trace	Drive x, Disk x	Drive and Disk number where the Trace (Log) files are written.
Trace Files Max	30	Default is 10, max is 500. This is the total number of Trace (log) files maintained by the system. Recommended number is 45.

## Configuration Variables – CCMS Mode

Parameter	Setting (Verbose)	Notes
BRP	OFF	Break repeat must be turned off when using CCMS mode
CPW	Username,Password	FTP client password Username and Password to log
TRACE ON	ON	Trace will be set to all drives and partitions
TFM 30	30	Set Trace Files Max to 30 for complete LOG files
NTO 90	90	NetSet Timeout set to 90
TIZ	-5	The time zone relative to GMT (-11 to +11) the Duets are currently operating in.
DLS	YES	Day Light Savings needs to be turned on in order for NTP to work
HIP		This setting must be the IP address of the Gateway
CNV P	NOVAR, 20/20, NONZERO, LEFT	This allow a setting of NOVAR, 20/20, NONZERO, or LEFT file distinction.
CNV E	OFF	LFR Report is disabled (Default option).
HOT 600		Host Timer should be set to 600 seconds
FTO	30	FTP Timeout set to 30 Seconds
ALE	ON	This enables Audio Level Control
SLD 8		Spot Level Default should be set to 0 db
HOM CCMS		This enables CCMS mode
XCP	ON	This enables XCP communication over every Duet within a network
FDP	10000 50000	FTP Data Port range should be set between 10000 and 50000
NIP	0 000.000.000.000	The TBGS server should be configured as an NTP server to ensure that all the inserters are operating on the same time in sync with the adManage schedules.

## Appendix H Firmware Updates

---

### Firmware Update From Symphony IFP

The firmware on the Duet and Duet-SDI can be updated using In Field Programming (IFP) applet in the Symphony Pro software. IFP inspects the new firmware (an S19 file) to make sure that it is compatible with the Duet and verifies that the firmware is not missing any data prior to erasing the existing firmware. By conducting several checks, IFP helps prevent problems from accidentally loading the wrong firmware and ensuring that the new firmware is loaded correctly. Note that the firmware upgrade process will not allow transport commands (such as PlaySpot) to interfere with update.

---

**CAUTION: DO NOT** open unzipped Firmware (S19) Files as it will corrupt the file. If you download the Firmware (S19) File from the internet or email, make sure to save as "All Files" with a .s19 extension.

---

To install the firmware using IFP, follow the following steps:

1. Push the RESET button on the front of the Duet.
2. Start Symphony Pro, select the Duet you want to upgrade and Launch the IFP applet. You should see a small window with a large buttons "Program Application" button. The software should identify each unit in the left window.
3. Click on Browse and select the new S19 firmware file and verify the information about the file displayed in the IFP.
4. Click on the "Program Application" button and follow the prompts. While code is downloaded into the Duet, the progress bar will advance and the LCD front panel will display "firmware update in progress". Once all of the code has been downloaded and verified, the Duet will erase & reprogram it's flash memory. A message box will be displayed when the update is successfully installed.
5. Once successfully upgraded, power cycle (Unplug it, then Plug it back in) the Duet to verify that the new firmware is running.

If the Trace File is enabled on the Duet, the success or failure of a firmware upgrade is added to the Trace File. The trace contains the time/date of the upgrade and an indication that the upgrade was done using IFP. Please note that if an IFP attempt fails, multiple "fail" messages will be sent to the log due to retries by IFP to correct problems. If the final log entry indicates success, then the "fail" messages can be ignored, they were most likely retransmits due to communication errors.

### Firmware Update From A DVC File

The firmware on the Duet and Duet-SDI can also be applied to the unit using a DVC file. The DVC file will load automatically when the unit is reset or it can be manually loaded using the command: "RUN ROMfile.DVC". The valid names for the ROMfile.DVC firmware are:

Duet: ROMDuet.DVC  
Duet-SDI: ROMDuetS.DVC

The Duet will verify that the ROMfile.DVC file contains the correct firmware for its product type, and will also verify that the file is not corrupted before attempting to update the Flash memory. When the new firmware is loaded, the LCD front panel will display "firmware update in progress". Note that the firmware upgrade process will not allow transport commands (such as PlaySpot) to interfere with update.

If the Trace File is enabled on the Duet, the success or failure of a firmware upgrade is added to the Trace File. The trace contains the time/date of the upgrade and the DVC file name. If the RUN command is used to load the firmware and the file version matches the existing firmware, then the Flash is not updated and the trace log will indicate a "match" was found.

### Distributing Firmware Updates Using EMT

Firmware updates can easily be sent to all units on the same network configured to use EMT. The ROMfile.DVC firmware upgrade files can be sent to all the units and each unit will only load the DVC file that matches its product type.

The EMT 'all' option is used on the Solicitor to send the firmware upgrade file to all the EMT subscribers. At the command prompt (Symphony> Terminal) enter the command EMT A ROMfile.DVC to send the firmware file to all the subscribers who do not have the firmware already. Since each unit will only load a ROM file that matches its unit type (Duet, Duet-SDI, or Soloist2, etc), this command can be used to distribute firmware updates to different types of units on the same network at the same time.

## Appendix I Channel Cue Directory

Cable Network	WEBSITE ADDRESS	PHONE	MODULATION TYPE	DTMF TONE	LOCAL AVAIL TIMES	PRE-ROL L	TONES	WEGENER CARD
A&E	aetnjustclick.com	212/210-9714	6.8 MHz Wideband	807*/#	2 min/hr** @ between :10-:20 & :40-:50 (Except: 5-7am ET breaks @ :29 & :59)	8 sec	DTMF	1717-01
ABC Family	abccng.com	818/569-7645	6.8 MHz Wideband	414*/#	2 min/hr @ approximately :15 & :45 (Day & Prime ) and approximately :28 & :58 (Overnight)	8 sec		
AMC	amcnetworks.com	917/542-6247	7.7 MHz Wideband	121*/#	2 min/hr; (2) 1-minute floating breaks per hour, in program	8 sec		1710
AMERICA 1	americaone.com	214/868-1939	6.2 MHz Wideband	509*/#	1 min/hr**	8 sec	DTMF	1716
AMERICA'S VOICE	americasvoice.com	202/544-3200	6.2 MHz Wideband	782*/#	1 min/hr**	7 sec	DTMF	None
Animal Planet	discoveryaffiliate.com	420/662-7508	L2 audio channel	047*/#	3 min/hr; (3) 1-minute breaks float within hour	8 sec	DTMF/ #2 L	1710
BBC AMERICA			R2	*257	3 min/hr; (3) 1-minute breaks float within hour			
BET	mtvn.com	202/608-2247	7.3575 MHz Digital	406*/#	2 min/hr; between :13-:23 & :40-:50 (:29 & :59 during Inspirational block); no tone 4:59 am ET	8 sec	DTMF	2046-09
BET JAZZ	mtvn.com	202/608-2247	7.3575 MHz Digital	406*/#	2 :90s/hr @ :28 & :58	8 sec	DTMF	2046-09
BIOGRAPHY Channel	biographychannel.com	212/210-1440		129*/#	2 min/hr @ between :10-:20 & :40-:50 (Except: 5-7am breaks @ :29 & :59)		DTMF #2 R	
Black Family Channel					2 min/hr: 1-min @ top of hour; 1-min @ bottom of hour			
Bloomberg TV	bloombergaffiliate.com	212.318.2784			2min/hr @ :29 & :59			
BOX	thebox.com	305/674-5000 ext. 5066	No demod required	045*/#	4min/90min: (2) 2 min breaks float within 90 min	8 sec	DTMF/ #2 L	None
BRAVO East	nbcunicable.com	866/379-7624		973*/#	2 min/hr**; times vary	8 sec		
BRAVO West	nbcunicable.com	866/379-7624		121*/#	2 min/hr**; times vary	8 sec		
CARTOON NETWORK	turnerresources.com	404/827-3409	7.3575 MHz Digital	309*/#	2 min/hr @ :25 & :55	8 sec	DTMF	2046-09
						8 sec	DTMF	2046-09
CMT	www.country.com	203/965-6217	6.2 MHz Wideband	468*/#	2 min/hr @ :10 & :40	8 sec	DTMF	1716
CNBC	nbcunicable.com	201/585-6202	7.3575 MHz Digital	622*/#	3 min/hr between :03-:17, :24-:34 & :41-51 (except :sponsored programming :90 hard break @ :28:30 & :58:30)	8 sec	DTMF	2046-09
				667*/#				
CNN Edited	turnerresources.com	404/827-3409	7.3575 MHz Digital	017*/#	2 min/hr @ :19 & :40	8 sec	DTMF	2046-09
				024*/#	2 min/hr @ :48 (1 additional min @ :40, if system carries HLN & TBS)	8 sec		
CNN Non-Edited	turnerresources.com	404/827-3409		658*/#N	2 min/hr @ :19 & :40 (Live Broadcast)	7 sec		
				541*/#N	2 min/hr @ :48 (1 additional min @ :40, if system carries HLN & TBS) (Live Broadcast)	7 sec		
CNN en Espanol	turnerresources.com	404/827-3409	7.3575 MHz Digital	397*/#	2 min/hr: (2) 1 min @ :29 & :59	8 sec	DTMF	2046-09
CNNfn-Financial Network	turnerresources.com	404/827-3409	7.3575 MHz Digital	024*/#	2 min/hr: (2) 1 min @ :29 & :59	8 sec	DTMF	2046-09
CNN INTERNATIONAL	turnerresources.com	404/827-3409	7.3575 MHz Digital	024*/#	2 min/hr: (2) 1 min @ :29 & :59 (IRD Cue tone output)	8 sec	DTMF	2046-09
CNN HEADLINE NEWS	turnerresources.com	404/827-3409	7.3575 MHz Digital	635*/#	2 min/hr: (2) 1 min @ :29 & :59	8 sec	DTMF	2046-09
				135*/#				
				235*/#	12 min/hr: (2) 6 min @ :24 & :54	8 sec		
CNN Sports Illustrated	turnerresources.com	404/827-3409	7.3575 MHz Digital	036*/#	2 min/hr: (2) 1 min @ :29 & :59	8 sec	DTMF	2046-09

COMEDY CENTRAL	comedycentral.com	212/767-8770	7.73575 MHz Digital	951*/#	3 min/hr @ :18, :40 & :55 (+/-5 min) M-F 8am-4am, S/S 7am-4am; 1 min/hr @ :28 & 2 min/hr @ :58 (+/-5 min) M-F 4am-8am, S/S 4am-7am	8 sec	DTMF	2046-09
COURT TV	www.courtstv.com	212/973-3346	6.2 MHz Wideband	138*/#	3 min/hr: 1-min @ :28; 2 min @ :53 (times are approximate)	8 sec	DTMF	1716
DISCOVERY	discoveryaffiliate.com	420/662-7508	6.8 MHz Wide (East Feed) R2 audio channel (west feed)	826*/#	2 min/hr**; 1-min breaks float within hour (10am-3am M-F ET/PT & 9am-3amS/SET/PT); 9am-10am summer months only)	8 sec	DTMF	1717-01(REQ)
DISCOVERY HEALTH	discoveryaffiliate.com	420/662-7508	R2	357*/#	3 min/hr; 1-min breaks float within hour	8 sec	DTMF	
DISCOVERY KIDS	discoveryaffiliate.com	420/662-7508	R2 Audio Channel	263*/#	3 min/hr; 1-min breaks float within hour	8 sec	DTMF	
DIY NETWORK	diynetwork.com				2 min/hr**; between :11-:23 & :39-:52 (7am-3am ET)			
E! TV	eonline.com	860/239-3700	6.2 MHz Wideband	386*/#	2 min/hr** @ :15 & :45 (M-F 8am-4am; M-Su, 7am-4am)	7 sec	DTMF	1716
ESPN	espnnetogo.com	(860) 766-2264.	7.3575 MHz Digital	048*/#	2.5 min/hr on average; times vary; :60 positions (except ESPN Sunday Football, MLB, NHL & World Cup Soccer games with :90 positions)	6 sec	DTMF	2046-09
ESPN Classic		(860) 766-2264.	7.3575 MHz Digital		2 min/hr on average; times vary; :60 positions/hr in all dayparts	6 sec	DTMF	2046-09
ESPNNews	espnnetogo.com	(860) 766-2264.	7.3575 MHz Digital	136*/#	2 min/hr on average; times vary; :60 positions/hr in all dayparts	6 sec	DTMF	2046-15
ESPN 2	espnnetogo.com	(860) 766-2264.	7.3575 MHz Digital	692*/#	2 min/hr on average; times vary; :60 positions in all dayparts (except World Cup Soccer, MLB, NBL & NHL games with :90 positions)	6 sec	DTMF	2046-09
FINE LIVING	fineliving.com	865/694-2700			2 min/hr** between :08-:23 & :38-:53 (7am-5am ET)			
FIT TV	no website	630/990-8999	R2 Audio Channel	414*/#	2 min/hr**	8 sec	DTMF	1716-01
FOOD NETWORK	tvfood.com	212/802-4319	6.2 MHz Wideband	235*/#	2 min/hr between :18-:19 & :48-:49	8 sec	DTMF	1716
FOX	foxinteractive.com	310/447-7321	6.2 MHz Wideband	Digicyper GPI	4.5 min/hr: (3) 90 sec breaks float within hour	8 sec	Audio DTMF	1716
FOX FAMILY CHANNEL	foxinteractive.com	630/990-8999	6.8 MHz Wideband	414*/#		8 sec	DTMF	1717-01
FOX NEWS	foxinteractive.com	212/462-5647	6.2MHz Wideband	465*/#	3 min/hr @ :18 (60 sec.) & :45 (120 sec.)	8 sec	Audio DTMF	1716
FOX NET	foxinteractive.com.com	310/664-6907			2-3 min/hr; vary; 2-min/hr @ :15 & :45 in network programming; 3 min/hr in non-network programming	8 sec	DTMF	1716
FOX SPORTS	www.foxinteractive.com	310/286-6300	6.2MHz Wideband	Digicyper GPI	2 min/hr; times vary (60 sec)	8 sec	GPI	1716
FOX SPORTS NET OHIO	foxinteractive.com	516-354-0145		121*/#				
FUSE	fusetv.com	212-382-5016		419*/#	2min**/hr @ :20 & :50		DTMF	
FX	foxinteractive.com	212/822-7055	6.2 MHz Wideband	328*/#	3 min/hr** @ :20, :35 & :55 (7am-2am)	8 sec	DTMF	1716
				454*/#		8 sec		
G4 TECH TV	affiliate.g4tv.com	310-979-5000			2 min/hr** @ :15 & :45 (9am-5am ET)			
GSN	www.sony.com	212/833-6444	6.2 MHz Wideband	119*/#	3 min/hr** varies (9am-4am ET)	8 sec	DTMF	1716
GOLF CHANNEL	thegolfchannel.com	407/345-4653	6.2 MHz Wideband	762*/#	2min/hr floating breaks: 2nd & 5th break of every hour	9 sec	DTMF	1716
				789*/#		9 sec		
GAC	countystars.com	303/784-8800	No demod required	054*/#	4 min/hr - 2 mins @ :15 & :45	8 sec	DTMF	None
GALAVISION					2 min/hr between the 1st & 3rd quarter of every hour			



HALLMARK CHANNEL	hallmarkchannel.com	818/755-2400			2 min/hr; varies with programs. Breaks occur inside program.			
HISTORY CHANNEL	historychannel.com	212/210-9714	6.8 MHz Wideband	131*/# Canada	2min/hr @ :29 & :59	8 sec	DTMF	1717-01
				638*/# USA	2min/hr @ :29 & :59	8 sec		
HISTORY INTERNATIONAL	www.historyinternational.com	212/210-9109		775*/#			DTMF	
HGTV	hgtv.com	423/694-2700 EXT. 3876	7.3575 MHz Digital	157*/#	2 min/hr** between :08-:23 & :38-:53 (7am-4am ET)	8 sec	DTMF	2046-15
INSPIRATION NETWORK	insp.com				2 min/hr; at top of hour, approximately :56			
INTERNATIONAL CHANNEL	www.internationalchannel.com	212/527-9917		794*/#	2min/hr: @ :29 & :59			
JCN	www.jones.com	303/792-3111	No demod required	489*/#	2min/hr: @ :28 & :58	8 sec	DTMF	DSR 2200 DSR2400
LIFETIME	lifetimeconnection.com	(718) 706-3600	5.715 MHz Wideband; IRD Terminal Block	361*/#	2 min/hr between :10-:30 & :40-:00 straight up (except Sun 2-min avail between :55-:00 straight up, 6am-10am ET/PT)	8 sec	DTMF	1620-06
LIFETIME MOVIE	lifetimeconnection.com	(718) 706-3600	IRD Terminal Block	820*/#	48 one-minute local avails/24 hour day; 2 :60s float each hour (times vary)			
LIFETIME REAL WOMEN	lifetimeconnection.com	(718) 706-3600	IRD Terminal Block	133*/#	2 min/hr between :10-:30 & :40-:00 straight up (except Sun 2 min avail between 55-:00 straight up, 7am-10am ET)	8 sec	DTMF	
MIDWEST SPORTS CHANNEL	www.msports.com	612/330-2631	6.2 MHz Wideband	813*/#		8 sec	DTMF	1716
MILITARY CHANNEL		420/662-7508	R2 Audio Channel	124*/#	3 min/hr		R2	
MSG NETWORK	www.msgnetwork.com	212/465-5940	6.8 MHz Wideband	767*/#		8 sec	DTMF	1717-01
MSNBC	nbcunicable.com	201/346-6513	7.3575 MHz Digital	268*/#	3 min/hr; float between :03-:17, :27-:31 & :44-:55.	8 sec	DTMF	2046-09
MTV	www.mtv.com	212/258-8409	5.8 MHz Wideband	19KHz Tones	2 min/hr @ :20 & :50	8 sec	19KHz	1712
			Cue out or 2nd Audio	683*/#			DTMF	
MTV2	www.mtv.com	212/258-8409	5.8 MHz Wideband	GPI	3 min/hr between :14-:32, :34-:52 & :46-:04 ET	8 sec	GPI	1710-14
MUCH MUSIC	www.muchmusic.com/usa	516/393-5304	7.7MHz Wideband	419*/#		8 sec	DTMF	1620
MUN2	nbcunicable.com	(866) 379-7624		473*/#	2 min/hr between :10-:20 & :40-:50; sponsored programming :60 hard breaks @ :28:30 & :58:30	8 sec	DTMF #2 R	
NATIONAL GEOGRAPHIC CHANNEL	www.nationalgeographic.com/channel/	202/912-6500		858*/#	2 min/hr** between :15-:30 & :45-:57 (9am-3am, M-Su)		DTMF	
NETWORK 1	www.n1.com	N/A	7.5 MHz Wideband	298*/#		8 sec	DTMF	Unknown
				461*/#		10 sec		
				339*/#		8 sec		
NEWSTALK	www.newstalk.com	212/643-2200	6.2 MHz Wideband	262*/#		8 sec	DTMF	1716
				137*/#		8 sec		
				137*/#		8 sec		
				262*/#		8 sec		
				480*/#		8 sec		
				480*/#		8 sec		
NICKELODEON	www.nick.com	212/258-8409	6.8 MHz Wideband	749*/#	1 min/hr** @ :55, 6am-8pm (No local avails 9am-11am M-F Nick Jr.); 2 min/hr** 8pm-6am @ :20 & :55.	8 sec	DTMF	1717-01

NICK AT NIGHT	www.tvland.com/nickatnig hte/	212/258-8000			2 min/hr** @ :20 & :55 (9pm-6am, Sun-Thu & 10pm-6am, Fri-Sat)			
NOSTALGIA	www.nostalgia-tv.com/home	212/888-5890	6.8 MHz Audible	872*/#		7 sec	DTMF	None
ODYSSEY CHANNEL	www.odysseychannel.com	212/261-9420						
OUTDOOR CHANNEL	www.outdoorchannel.com	909/699-6991	5.8 MHz Wideband	345*/#	2 min/hr; varies (:28:30 & :58:30 typically)	8 sec	DTMF	1710
OUTDOOR LIFE NETWORK	www.outdoor.com	203/406-2500	3.780 MHz Wideband	011*/#	3 min/hr @ :10-:20, :30, :40-:52	6 sec	DTMF	Digicypher
OXYGEN	www.oxygen.com	212/651-2000			3 min/hr; :90 in each half-hour @ :20 & :45 (+/- 5 minutes)			
PASS SPORTS	no website	313/222-7277	5.8 MHz Wideband	495*/No Stop Tones		8 sec	DTMF	1710
PREVUE CHANNEL	www.prevuenet.com	800/447-7388	GPI	GPI		8 sec	GPI	None
PRIME SPORTS	no website	310/286-3731	GPI	GPI		8 sec	GPI	None
THE SCIENCE CHANNEL	discoveryaffiliate.com	420/662-7508	R2 audio channel	397*/#	3 min/hr	8 sec	DTMF	
SCI-FI	nbcunicable.com	212/413-5156 212/408-8858	6.2 MHz Wideband	706*/#	3 min/hr—varies w/program. Breaks occur inside programs.	8 sec	DTMF	1716
SPEED	speedTV.com	203/406-2500	5.8 MHz Wideband	020*/#		6 sec	DTMF	1710
SPIKE TV	www.spiketv.com	203/965-6217	6.2 MHz Wideband	674*/#	2 min/hr**; floating :60 breaks @ approximately :15 and :45	8 sec	DTMF	1716
SPORTSOUTH	www.foxsports.com	800/334-1744	5.58 MHz Wideband	GPI		8 sec	GPI	Controller 1815-04
SOAP NET	www.soapnet.com	818/569-7500			3 min/hr; (1) 1:30 in half-hour program; (2) 1:30 in hour program			
STYLE NETWORK	www.eonline.com	212/852-5100		386*/#	2 min/hr** @ :15 & :45 (Mon-Sun, 6am-3am)		DTMF	
TBS	www.turner.com	404/827-2458	7.357 MHz	309*/#	2 min/hr, times vary; two floating :60s per hour	8 sec	DTMF	2046-09
TLC	discoveryaffiliate.com	240/662-7508	5.8 MHz (East Feed) L2 audio channel (west feed)	872*/#	2 min/hr** (excluding READY, SET, LEARN!, 6am-9am, M-F) 2 :60s float in program (9am-3am ET/PT M-Sun)	8 sec	DTMF R2	#1710 (East Feed Only)
TNT	www.turner.com	404/827-2458	7.3575 MHz Digital	309*/#	3 min/hr (Three 1-minute breaks float within the hour; avail formats vary for sports programming)	8 sec	DTMF	2046-09
TOON DISNEY	www.toondisney.com	212/782-0600			2 min/hr on average; :60 breaks activated by a start event, followed by an end event, each has 8-second pre-roll	8 sec		
TRAVEL CHANNEL	www.crawford.com	420/662-7508	R2 Audio Channell	519*/#	3 min/hr** (3 :60s float within hour, 9am-3am ET )	8 sec	DTMF	16-14-E
TRIO								
TURNER SOUTH	turnerresources.com		IRD Cue tone Out	309*/#	2 min/hr @ Random times	8 sec		
TV GUIDE					10 min/hr** between :00:00-:59:59 from 11am-2am ET/PT, 2min/hr (2am-11am ET/PT)			
TV LAND	www.tvland.com/	404/814-7800	5.8Mhz Wideband	227*/# 431*/#	3 min/hr @ :20, :40 & :55	8 sec	DTMF	1710-14
USA	nbcunicable.com	212/408-9156	6.2 MHz Wideband	601*/#	2 min/hr; times vary (breaks are :60 units inside programs)	8 sec	DTMF	1716
VH-1	vh1.comamerica online	212/258-8409	6.8 MHz Wideband	19 KHz Tone	2 min/hr @ :23 & :53	8 sec	19 KHz	1717-01
WEATHER CHANNEL	www.weather.com	770/226-2850	GPI	350*/#	2 min/hr @ approximately :17 & :47 (except 9-11pmET/PT @ approximately :20 & :50); 280	8 sec	GPI	None
WE: WOMEN'S ENTERTAINMENT	amcnetworks.com	212/382-5010	7.7Mhz Wideband or Digital AES 2L	121*/#	2 min/hr** 2 :60s float/hr in program @approximately :20 & :50 (10am-5am ET, Mon-Sun)			

<b>Z MUSIC TELEVISION</b>	no website	615/871-7858	6.2MHz Wideband	968*/#		8 sec	DTMF	1716
<i>**All network insertion times are 24 hours, unless otherwise indicated.</i>								

## Appendix J Duet Log Trace Messages

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- 0 - No Trace Message
- 1 - Raw Log Message
- 2 - Log Comment
- 3 - Trace Log Banner

### Transport Log Messages (1000 Series)

- 1000 - PLAY
- 1001 - TOP SPOT
- 1002 - NEXT SPOT
- 1003 - PREVIOUS SPOT
- 1004 - PAUSE SPOT
- 1005 - SLOW SHUTTLE SPOT
- 1006 - INDEX TO TIMECODE
- 1007 - REWIND TO BEGINNING OF SPOT
- 1008 - CUE SPOT
- 1009 - PLAY SPOT
- 1010 - MULTICAST RECEIVE ON
- 1011 - MULTICAST RECEIVE OFF
- 1012 - MULTICAST RECEIVE RST

### Transition Log Messages (2000 Series)

- 2000 - TRACE\_MSG\_TRANSITION\_PLAY
- 2001 - TRACE\_MSG\_TRANSITION\_STOP

### FCMP Log Messages (3000 Series)

- 3000 - Receive file opened
- 3001 - Partial receive file opened
- 3002 - Replacement file opened
- 3003 - Partial replacement file opened
- 3004 - Receive file closed as complete
- 3005 - Receive file closed as partial
- 3006 - Replacement file renamed
- 3007 - End normally (received end message)
- 3008 - End abort (received end message with abort)
- 3009 - End due to error (something wrong, file not erased)
- 3010 - Abort due to error (file i/o error or something wrong, file erased)
- 3011 - Receive process timed out
- 3012 - System command received and processed
- 3013 - System command sent
- 3014 - Error running report, probably not enough RAM
- 3015 - Unknown condition or error
- 3016 - FEC queue is full

### Scheduling Log Messages (4000 Series)

- 4128 - Insert message type (only 1 network)
- 4129 - CCMS mode only - indicates missing spot in playlist
- 4130 - Indicates error in insert
- 4131 - Indicates that insert ran shorter than expected
- 4132 - Indicates that decode errors exceeded preset threshold
- 4133 - Indicates that the insert timed out
- 4144 - Miss BREAK SPOT in prior break
- 4145 - Miss NO OPEN NETSET
- 4156 - Miss NO NETSET TRIGGER
- 4147 - Miss INSERT by no network video present
- 4148 - Miss INSERT by No Break
- 4149 - Miss INSERT by No Spots
- 4150 - Miss TRANSPORT WOULD NOT START
- 4151 - Miss DUET BOARD NOT PRESENT
- 4160 - Launch message type
- 4160 - Launch INSERT by Time
- 4161 - Launch INSERT by Tone
- 4162 - Launch INSERT by GPI
- 4163 - Launch INSERT by Keypad
- 4164 - Launch INSERT by Terminal
- 4176 - Route message type
- 4176 - Route Satellite
- 4177 - Route Insert
- 4187 - Route Auxillary
- 4179 - Route Off
- 4192 - End INSERT by Time
- 4193 - End INSERT by Tone
- 4194 - End INSERT by GPI
- 4195 - End INSERT by Spot
- 4196 - End INSERT by Avail
- 4197 - End INSERT by Video Loss
- 4198 - End INSERT by Keypad
- 4199 - End INSERT by Terminal
- 4208 - Partial Tones EXT
- 4209 - Partial Tones CBD
- 4224 - Duet reset
- 4240 - Reset message type
- 4240 - Power Up
- 4241 - Soft Reset
- 4242 - Net Sets in NV file updated
- 4243 - Break Sets in NV file updated
- 4244 - Net Sets in NV file updated

4245 - Net Sets in NV file updated  
4246 - Break Sets in NV file updated  
4247 - Net Sets in NV file updated  
4248 - Save the CCMS VER file  
4249 - Load the CCMS VER file  
4250 - Load the CCMS SCH file  
4251 - CCSM Sch not fully loaded, buffer not big enough  
4252 - CCSM Ver not fully loaded, buffer not big enough

#### 5000 Series

5000 - FTP Server Get  
5001 - FTP Server Put  
5002 - FTP Client Get  
5003 - FTP Client Put  
5004 - FTP Send Command longterm failure  
5010 - FTP CCMS mirror started by timer  
5011 - FTP CCMS mirror started by command  
5012 - FTP CCMS mirror done  
5013 - FTP CCMS mirror done - no connection  
5014 - FTP CCMS mirror done - no HIP configured  
5015 - FTP CCMS mirror HIP comm longterm failure

#### 6000 Series

6000 - Telnet Connected  
6001 - Telnet Disconnected  
6002 - Telnet Bad Username/Password  
6003 - Telnet Connection Timed Out

#### 7000 Series

7000, - EMT Subscription received  
7001 - EMT Subscription received  
7002 - EMT Subcribed  
7003 - EMT File sent  
7004 - EMT File received  
7005 - EMT turned ON  
7006 - EMT turned OFF

#### 8000 Series

8000 - Issued Lan chip reset and kickstart  
8001 - Netstats reset was issued  
8002 - LanKickStart was issued  
8003 - LanMux received bad message  
8004 - TASK\_Lan destructed  
8900 - Relay reset, pings failed to find it

#### 10000 Series

10000 - Rom upgrade successful (IFP, or Rom DVC file)  
10001 - Rom upgrade failed (IFP, or Rom DVC file)

10002 - Rom upgradematch failed (IFP, or Rom DVC file)  
10100 - ParPin6 status change  
10109 - (all possible argsPARPIN6 entries)

#### 11000 Series

11000 - ScanDisc OK  
11001 - ScanDisc No Drive/Disc  
11002 - ScanDisc Read Error  
11003 - ScanDisc Write Error  
11004 - ScanDisc Unit Error  
11005 - ScanDisc Volume Error  
11006 - ScanDisc Directory Error  
11007 - ScanDisc Deleted a Crosslinked File  
11008 - ScanDisc Deleted a Bad FAT Chain File  
11009 - ScanDisc Freed up FAT  
11010 - ScanDisc had problem scanning and bailed

#### 12000 Series

12000 - File System Powered Up  
12001 - File System Reset  
12003 - No File  
12004 - Read Error  
12005 - Buffer Stalled  
12006 - No GOP found in video buffer from Play Entry  
12007 - Alternate Entry is a mismatch to Play Entry  
12008 - No GOP found in Alternate Entry File  
12009 - No File  
12010 - Read Error  
12011 - Buffer Stalled  
12012 - No File  
12013 - Read Error  
12014 - No File  
12015 - Read Error  
12016 - Write Error  
12017 - File is read only  
12018 - Drive/disc missing  
12019 - Drive/disc empty  
12020 - Drive/disc loaded  
12021 - Drive/disc removed  
12022 - Drive/disc inserted  
12023 - No File  
12024 - Not Open  
12025 - Continue Copy/Move  
12026 - No Copy/Move streams, no more messages accepted  
12027 - No Source File  
12028 - No Destination File  
12029 - File is read locked, max number of streams hit

12030 - File is write locked  
12031 - Resize Error  
12032 - Read Error  
12033 - Write Error  
12034 - Cancelled  
12035 - No Drive/Disc  
12036 - Read Error  
12037 - Write Error  
12038 - File already exists  
12039 - Disc is full  
12040 - No File  
12041 - Read Error  
12042 - Write Error  
12043 - File or drive is read only  
12044 - File is read locked, max number of streams hit  
12045 - File is write locked  
12046 - No File  
12047 - No Filename to create  
12048 - No File could be created  
12049 - Resize failed  
12050 - File is read only  
12051 - File is read locked, max number of streams hit  
12052 - File is write locked  
12053 - File is already open  
12054 - No File  
12055 - Not Open  
12056 - Read size greater than buffer size  
12057 - Not Read Stream  
12058 - Read Error occurred  
12059 - EOF reached  
12060 - No File  
12061 - Read Error  
12062 - No File  
12063 - Read Error  
12064 - Write Error  
12065 - File is read only  
12066 - No File  
12067 - Read Error  
12068 - Write Error  
12069 - File is read only  
12070 - Disc is full  
12071 - File is corrupted  
12072 - No File  
12073 - Read Error  
12074 - Write Error  
12075 - No File  
12076 - Read Error  
12077 - Write Error

12078 - File is read only  
12079 - No File  
12080 - Read Error  
12081 - Write Error  
12082 - No File  
12083 - Not Open  
12084 - Write size greater than buffer size  
12085 - Not Write Stream  
12086 - Write Error occurred  
12087 - Disc is Full  
12088 - No directory entry found  
12089 - Write to LBA was not successful  
12090 - Read from LBA was not successful  
12091 - File is read locked but open for write  
12092 - File is read locked but open for write  
12093 - File is read locked but open for write  
12094 - File is read locked but open for write  
12095 - Error in Transport file parse or copy

#### 14000 Series

14000 - FEC Decode start  
14001 - FEC Decode complete and ok  
14002 - FEC Type is Turbo NonInterleaved  
14003 - FEC Type is Turbo Interleaved  
14004 - FEC Type is ReedSolomon NonInterleaved  
14005 - FEC Type is ReedSolomon Interleaved  
14006 - FEC bad PPR Header  
14007 - FEC File corrupt, too many lost packets  
14008 - FEC detected singular matrix  
14009 - FEC File not found  
14010 - FEC File read error  
14011 - FEC File write error  
14012 - FEC File open error  
14013 - FEC File disc full  
14014 - FEC File create fail  
14015 - FEC File read size error (not multiple of N\*BlockSize)  
14016 - FEC File resize error  
14017 - FEC File bad filename  
14018 - FEC Unique File error  
14019 - FEC File register error  
14020 - FEC Stop  
14021 - FEC Kill  
14022 - TASK\_Fec queue is full  
14023 - FEC File rename error

#### 15000 Series

15000 - CMDVIRT Index procedure  
15001 - TRACE\_MSG\_CMDVIRT\_INDEX\_FAILED

#### 16000 Series

16000 - Tuner in locked state  
16001 - Tuner Task constructor done  
16002 - Tuner in unlocked state  
16003 - Tuner in unlocked state  
16004 - Tuner in unlocked state  
16005 - Tuner in unlocked state  
16006 - Tuner in unlocked state  
16007 - Tuner in unlocked state  
16008 - Tuner in unlocked state  
16009 - Tuner in unlocked state  
16010 - Tuner in unlocked state  
16011 - Tuner in unlocked state  
16012 - Tuner in unlocked state  
16013 - Tuner transitioned to unlocked state  
16099 - Max # of trace messages for this unlocked state

#### 17000 Series

17000 - XCP System command received and processed  
17001 - XCP System command sent

#### 18000 Series

18000 - Real Time Clock updated successfully(formatted in TASK\_Clock)  
18001 - Real Time Clock update failed (formatted in TASK\_Clock)

#### 19000 Series

19000 - IO stream operation timed out (OPEN,CLOSE,SEEK,READ,WRITE)

#### 20000 Series

20000 - Multicast Insert: Start Cue Received  
20001 - Multicast Insert: Start Cue Received, ignored transports off  
20002 - Multicast Insert: Start Cue Received, ignored transports off  
20003 - Multicast Insert: Stop Cue Received  
20004 - Multicast Insert: Stop Cue Received, ignored extended window active  
20005 - Multicast Insert: Stop Cue Received, ignored, insert not active  
20100 - Multicast Insert: Schedule loaded  
20101 - Multicast Insert: Schedule load failed  
20102 - Multicast Insert: Schedule cleared

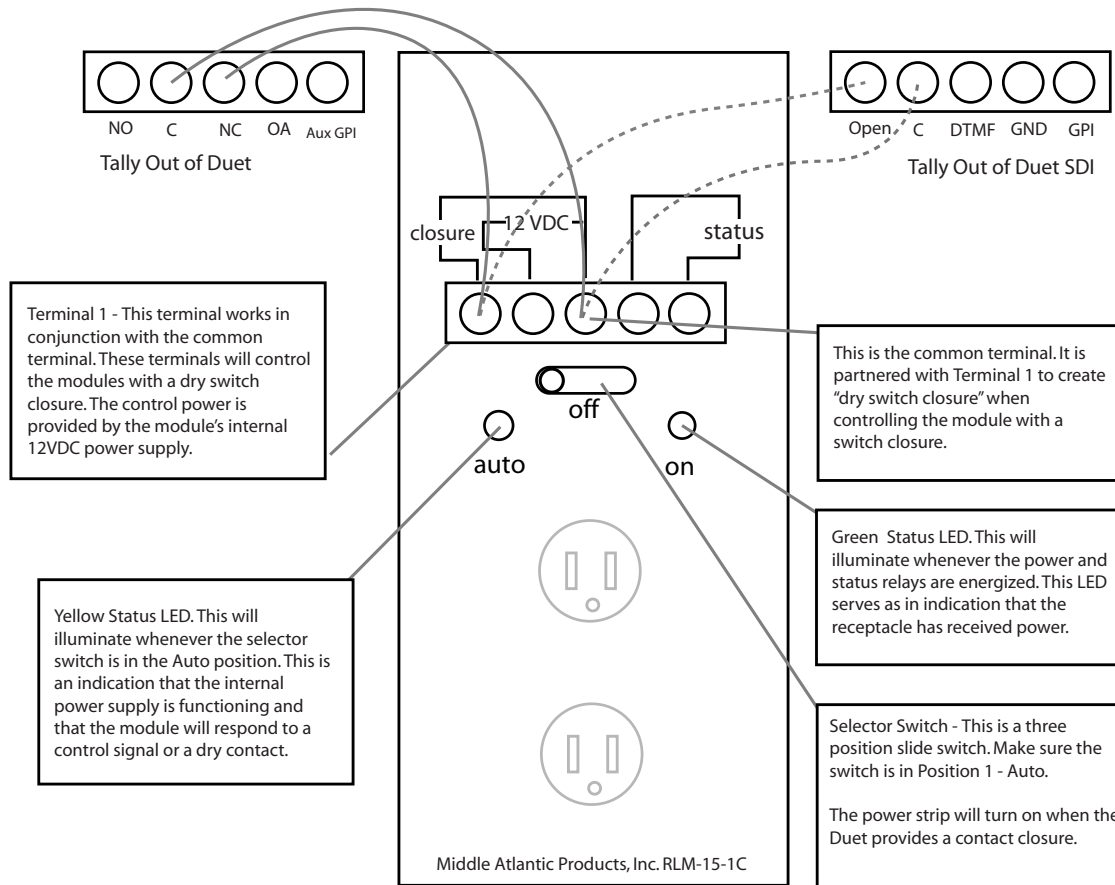
#### CCMS Trace Messages

FTP\_CCMS\_NO\_COM - Mirroring fails to connect to the gateway.  
FTP\_CCMS\_NO\_HIP - System does not have a gateway configured.  
FTP\_CCMS\_RESET - System has failed to connect with the gateway for three consecutive mirror sessions. This condition also forces a reset of the entire LAN system (Same as: NTS RESET).

FTP\_SNDCMD\_RESET - System has failed to send an FTP command to the gateway for ten consecutive attempts. This condition also forces a reset of the entire LAN system (Same as: NTS RESET).

4130 - File Read Error  
4131 - Play Stalled Error  
4132 - Decode Errors  
4208 - LOGID\_EXTTONES  
4209 - LOGID\_CBDTONES  
4129 - LOGID\_INSERTNOSPOT

## Appendix K Wiring for the Power Relay



1. DUET - Connect tally out between the C (common) and NC (normally closed). (see diagram)

1. DUET SDI - Connect tally out between the C (common) and Open . (see diagram)

2. From the Front Panel, go the Serial Menu and set the Tally to Manual mode.

3. Test the tally from the front panel to make sure the electrical connections are right.

Scroll to the Insert Menu, press the down arrow. The LCD shows the current status. Pressing ENTER will toggle the relay on and off. The green LED on the power strip is on when closed and off when open.

4. Once you verify that it works, set the following commands from a terminal connection to the Duet:

TOGGLETALLY TOGGLE

HIP 0 xxx.xxx.xxx.xxx

(the valid IP address to the Host computer like the TBGS)

GIP 0 xxx.xxx.xxx.xxx

(valid IP address to the Gateway for the WAN)



## Appendix L CCMS Schedule Format

A schedule file exists for each channel of insertion. The file name will always be eight characters in length plus the three character extension of SCH.

MDDCCHHH.SCH

M -

Represents month of intended airing.  
Range 1 - C Ex. 1 = January, C = December  
Hexadecimal format

DD -

Represents day of month of intended airing  
Range 01-31 Ex. 05

CC -

Numeric identifier or Channel ID  
Range 01-99

HHH -

Numeric identifier or Headend ID  
Range 001- 099

The records within the SCH file follow the following format. Each record is terminated by a carriage return and line feed. Each record will all be at least 77 bytes in length. The fields of each record are determined by its byte position. Each field is separated by a space character. All times are formatted in military time.

The record format is as follows :

Field #	Field Name	Bytes	Description
1	Event Type	1-3	Type of event defined by record (LOI, REM,END, NUL)
2	Scheduled Date	5-8	T&Bs approximation of the date when the event will occur (formatted - MMDD)
3	Scheduled Time	10-15	T&Bs approximation of the time of day when the event will occur (formatted - HHMMSS)
4	Window Start Time	17-20	Time of day to begin window of opportunity for event to occur (formatted - HHMM)

Field #	Field Name	Bytes	Description
5	Window Duration Time	22-25	Length of window of opportunity for event to occur (formatted - HHMM)
6	Break Number Within Window	27-29	Break sequence number within window of opportunity for event to occur
7	Position Number Within Break	30-33	Position sequence number for event within break
8	Scheduled Length	35-40	Scheduled event length (formatted - HHMMSS)
9	Actual Aired Time	42-47	Actual aired time of day used in VER file. (Formatted HHMMSS)
10	Actual Aired Length	49-56	Actual aired length used in VER file (formatted - HHMMSSCC)
11	Actual Aired Position Within Break	58-60	Actual sequential position number that event occurred in. Used in VER file
12	Spot Identification	62-72	T&Bs spot identification code used by adManage as the commercial file name. See Headend>File Name Length configuration on how this spot ID is converted into a file name.
13	Status Code	74-77	Completion status Code used in VER file. (See Appendix E for definition of Status Codes)
14	Advertiser Name	79-110	Advertiser's name as identified in T&B.
15	Advertiser Spot Name	112-131	Advertiser's Spot Name as identified in T&B
16	Scheduled/Fill	133-136	Identifies the spot as either being scheduled contractually or used as filler in order to complete a commercial break.
17	Traffic System Reserved	138-143	Reserved for use by the Traffic System
18	User Defined	145-NNN	For use in tracking other data. adManage uses this field in Merged schedules to identify the event line as a local or interconnect event.

## Appendix M Verification Status Codes

Status Code	Definition	Possible Cause
0001	Aired Successfully	
0002	Generic Failed to Air	The scheduled event was not run by the Duet. All events are marked with a 0002 at the beginning of the broadcast day. As the event is run by the Duet, the status code is changed to an actual error code.
0004	Failed, Bypass On	
0006	Failed, Bad Video	The video stalled during playback. The actual air time will be updated. 1. File read errors occur during playback from a bad file or hard drive problem. Try replacing the video file. 2. The VERIFYERRORLMT threshold of decode errors was exceeded. Try to re-encode the file. See the Duet manual for details.
0008	Failed, User Abort	The active insert was aborted by operator intervention.
0010	Failed, Device Not Ready	Possible hard drive issue. The hard drive may not be partitioned.
0012	Failed, Unknown Error	If any stall conditions occur during playback, the spot will not be verified, even if the system was able to continue after the stall condition. The actual played length will be updated in the VER file for partial verifications.
0013	Failed, Time Out	The break was closed before all spots could be aired.
0015	Failed, System Error	Possible hardware failure.
0020	Failed, No Ad Copy in Inserter	The commercial inserter did not have the scheduled ad copy to play. Causes include: - Material not copied into adManage MasterVideoLibrary. - The material is not in the inserter because of a communication error. - The material is on the headend PURGE list (see Content Management Purge).

Status Code	Definition	Possible Cause
0023	Failed, No Cue in Window	No cue was received in the scheduled window. See the Duet manual chapter on Cue Methods for more information.

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