DPS-475/575

Multi-Function Analog/ Digital A/V Synchronizer

Service Manual

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Caveats

Information in this document is subject to change without notice and does not represent a commitment on the part of Digital Processing Systems Inc.

This product requires technical and mechanical ability and requires precautions against electrostatic discharge. The user assumes all risks when this product is installed by anyone other than an authorized Digital Processing Systems dealer.

TABLE OF CONTENTS

Chapter 12: Menus: System Config 73

INTRODUCTION

The Digital Processing Systems *DPS-475*™ and *DPS-575*™ *Multi-Function Analog/Digital AV Synchronizers* are equally suited for analog, digital or hybrid facilities, and represent the ideal choice for broadcasters making the transition to digital television (DTV). Available in video-only and audio/video configurations, these synchronizers provide an ideal bridge from analog video signals, such as satellite and microwave feeds, to digital production facilities. The DPS-475 is an NTSC-only model while the DPS-575 is an auto-sensing dual-standard (PAL/NTSC) device.

The DPS-475 and DPS-575 offer unparalleled I/O flexibility. Four input and five output formats are provided standard:

- Serial Component Digital Video (SDI) input and output
- Component Analog Video (Betacam) input and output
- S-Video (S-VHS / Hi8) input and output
- Composite Video input and output
- RGB-S output

DV (IEEE-1394) I/O with transport control is available as an option. A built-in auto-sense TBC circuit provides seamless mode switching between direct color and heterodyne sources such as camcorders and VTRs.

The versatile DPS 12-bit comb filter offers three processing modes: Simple, Adaptive-2D and Adaptive-3D. 3D combing utilizes a proprietary DPS algorithm to combine information from previous frames to eliminate residual subcarrier artifacts, such as cross luminance and cross chrominance. 3D combing can also be applied to non-composite sources, to clean up component video that was previously decoded from a composite source using lower-quality combing in other equipment. Combining the high-quality comb filter with DPS' proprietary advanced 12-bit analog encoding provides maximum signal transparency and optimum transcoding.

The DPS-475 and DPS-575 also feature adjustable temporal and spatial digital noise reduction, as well as variable 2D filtering with separate horizontal and vertical bandwidth controls. Applying digital bandwidth filtering and noise reduction prior to MPEG encoding can improve overall MPEG performance through entropy reduction.

DPS' exclusive DigiDuplex mode provides bi-directional connectivity between analog tape machines and digital audio/video routing systems. DigiDuplex saves space and money by enabling digital to analog transcoding with simultaneous analog to digital frame synchronization - all in one compact box. In DigiDuplex mode, the unit's SDI video input is routed directly to the analog video outputs, which feed the inputs of an analog device. The analog output of the device can be simultaneously connected to the synchronizer's analog inputs, where it is processed and sent to the SDI video outputs. Conversion between digital and analog audio is handled in a similar fashion.

With the addition of the four-channel audio synchronizer module, the DPS-475 and DPS-575 can provide dual stereo audio and video synchronization in a single rack-unit-high package. The internal audio synchronizer option supports analog, AES/EBU

digital, and embedded SDI and DV audio I/O (with the DV I/O Module installed). All audio outputs are simultaneously active, which enables both analog and digital audio devices to be connected at the same time. All four audio channels can dynamically track the internal delay of the video synchronizer, and a fixed delay can also be specified, ensuring proper lip sync regardless of the program source. Audio test tones can be generated at operator-specified frequencies.

The DPS-475 and DPS-575 are more than just synchronizers. In addition to the features listed above, other functions include: Time Base Corrector, Audio Synchronizer, Digital Framestore with Linear Keyer, Digital Noise Reduction, DV Transcoder (optional), Video AGC, 10-bit Video Test Signal Generator with Zone Plate, Audio Test Signal Generator, VITS Inserter, Video Bandwidth Processor, Serial Digital Audio Embedder/De-Embedder and Animated Logo Inserter (optional). These functions can be accessed from the front panel, or from an optional DPS RC-475™ or RC-4000™ remote control.

The DPS-475 and DPS-575 represent ideal choices for broadcasters transitioning to DTV. When interfacing analog audio and video sources to serial digital equipment, nothing offers their flexibility, performance, reliability or economy.

This manual provides operating instructions for both the DPS-475 (NTSC) and DPS-575 (auto-switching NTSC/PAL). Differences between these two units are noted where applicable.

CHAPTER 1: INSTALLATION AND CONFIGURATION

Installation

Unpacking and Inspection

This unit has been thoroughly calibrated and inspected, both electronically and mechanically, to ensure that it meets the published specifications. The following items are included with each unit:

Description	Quantity
DPS-475 or DPS-575 Multi-Function AV Synchronizer	1
Operations Manual	1
AC Power Cord (Part # 773-254 or 773-505)	1
Rear Support Bracket (Part # 741-983)	1
Video Breakout Cable (Part # 774-753)	1
Audio Breakout Cable (Part # 774-755)	1
(included only with the DPS-475AV and DPS-575AV)	
2 x Analog Audio Terminal Blocks (Part # 722-184)	1
(included only with the DPS-475AV and DPS-575AV)	
(these may be pre-installed on your unit)	

Mounting

The size of the DPS-475 and DPS-575 allows them to fit into most standard consoles or 19-inch racks. If the unit is to be mounted in a rack, then the included rear support bracket must be used. Care must be taken to select a dry, well-ventilated location with a minimum of dust and vibration. Also, leave sufficient clearance from the unit's sides to allow for proper air circulation.

After unpacking the unit and before installing it in a console or rack, allow at least 30 minutes for temperatures to equalize and to eliminate any condensation that may have developed.

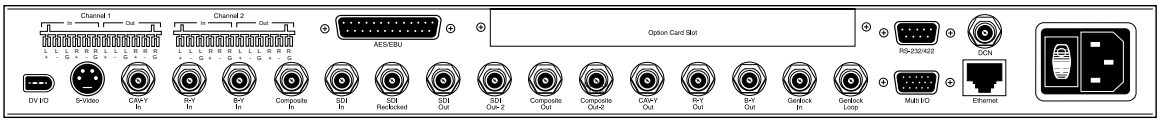
Hardware Options

If you purchased hardware options such as the Audio Synchronizer Module, the Animated Logo Option, or the DV I/O module separately from the main unit, you will need to install them. Please see Appendix C for detailed instructions for installing your options safely and correctly.

CHAPTER 2: CONNECTIONS

This chapter describes the connections on the DPS-475 and DPS-575 used to interface the unit with other video and audio equipment in your system.

DPS-475AV/575AV: Back Panel



Breakout Cables

Some connections to the DPS-475/575 are provided on the supplied breakout cables. These breakout cables must be connected to the following ports on the back of the unit.

Multi-I/O Breakout Cable

This breakout cable, part number 774-753, connects to the DB-15F high-density connector labeled *Multi I/O* on the right side of the rear of the unit. This cable provides connections for RGB output, sync/key/auxiliary-composite output, S-Video output, and GPI.

AES/EBU Audio Breakout Cable *[on audio-equipped units only]*

This breakout cable connects to the DB-25F connector labeled *AES/EBU* on the rear of the unit. This cable provides connections for AES/EBU audio input and output. The standard AES/EBU Audio Breakout cable (part number 774-755) provides BNC connections; an optional Audio Breakout cable, part number 774-470, provides BNC and XLR connections.

Video Connections

The following are the video connections on the rear of the DPS-475/575, in left-to-right order, followed by those on the supplied breakout cable.

DV Input/Output

This 6-pin IEEE-1394 connector, labeled *DV I/O*, is used to connect DV (often referred to as “Firewire”) devices. In addition to carrying DV video and audio input and output, this port also provides DV device control, allowing control of the DV device directly from the DPS-475/575. This connection is active only if the optional DV I/O Module is installed.

S-Video Input

The 4-pin connector on the rear of the unit, labeled S-*Video*, is used for S-Video (Y/C) signals, such as from an S-VHS or Hi8 device. It is normally connected to the S-Video output of a playback VTR using a standard 4-pin to 4-pin S-Video cable. Some JVC 'industrial' type S-VHS players use a 7-pin connector for their S-Video output. To interface with such machines, a 7-pin to 4-pin adapter cable is required from the manufacturer of the VTR.

Component Analog Video Input

These three BNC connectors, labeled *CAV-Y In*, *R-Y In*, and *B-Y In*, are used to input the signals from analog component devices, such as Betacam® VTRs.

If component analog video input is not needed, the *CAV-Y In* connection can be reassigned as a second composite video input with the *CAV-Y Composite* option in the Video Setup menu (see Chapter 5, "Menus: Video Setup").

Composite Video Input

This BNC connector, labeled *Composite In*, is used to feed composite 1 Vp-p 75Ω video to the DPS-475/575. In Synchronizer mode, the input video signal must be direct color or monochrome (such as from a satellite feed or live camera); in Timebase Corrector or auto switching mode, the input signal can be connected to the video output of a heterodyne source such as a camcorder or VTR.

Serial Digital Input

This BNC connector, labeled *SDI In*, accepts serial digital ITU-R BT.601 video and embedded audio data at a rate of 270 megabits per second.

Serial Digital Reclocked Output

This BNC connector, labeled *SDI Reclocked*, provides a digitally-regenerated copy of the SDI Input, with no processing applied.

Serial Digital Outputs

These BNC connectors, labeled *SDI Out* and *SDI Out-2*, provide the processed and synchronized serial digital ITU-R-BT.601 video and embedded audio, 270 megabits-per-second output.

Composite Video Output

These BNC connectors, labeled *Composite Out* and *Composite Out-2*, provide processed, synchronized/timebase-corrected versions of any of the input signals. If the unit is set to Bypass mode, the Composite Input is bypassed directly to the *Composite Out* output (the left-most of the two connectors), providing an unprocessed signal. *Composite Out-2* operates as normal (providing processed output from the selected video input). The Composite Input is automatically bypassed to the *Composite Out* output when the unit is off.

Component Analog Video Output

These three BNC connectors, labeled *CAV-Y Out, R-Y Out*, and *B-Y Out*, provide processed, synchronized/timebase-corrected analog component video output.

Genlock Reference

These BNC connectors, labeled *Genlock In* and *Genlock Loop*, are used to loop a genlock signal through the unit to establish the timing for its video output signal. The signal for this input must always be stable, such as the output from a black-burst or color-bar generator. Do not attempt to use a signal that has not been timebase-corrected. When a valid signal is connected to the *Genlock In* input, the video output of the DPS-475/575 will be genlocked to this signal, and the *Genlock* LED will be on. When no external reference is supplied to the genlock input, the unit will operate using its own internal sync generator. If the *Genlock Loop* is unused, terminate it with a 75Ω terminator.

S-Video Output *(on breakout cable)*

This 4-pin connector on the Multi-I/O breakout cable provides processed, synchronized/timebase-corrected S-Video (Y/C) output.

RGB(S) Video Output *(on breakout cable)*

These four BNC connectors on the Multi-I/O breakout cable, comprising auxiliary Red, Green, Blue, and Sync, provide processed, synchronized/ timebase-corrected RGB(S) [RGB with auxiliary sync] video output. If RGB without auxiliary sync is sufficient, the *Aux. Sync* connection can be reassigned as an auxiliary Composite output. If RGB(S) output is not required, these outputs can be reconfigured to provide a key channel output.

Auxiliary Composite Output *(on breakout cable)*

The *Aux. Sync* connection on the Multi-I/O breakout cable, normally used for sync in RGB(S) [RGB with auxiliary sync] video output, can be reassigned to provide an auxiliary Composite video output with the *Aux Sync/Comp* option in the Video Setup menu.

Key Output *(on breakout cable)*

The *Aux. Sync* connection on the Multi-I/O breakout cable, normally used for sync in RGB(S) [RGB with auxiliary sync] video output, can be reassigned to provide a key channel output with the *Aux Output* option in the Video Setup menu.

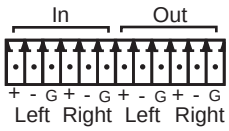
Audio Connections

The DPS-475AV and DPS-575AV can process 2 stereo pairs of analog, AES/EBU, Serial Digital (SDI) or DV audio (with the optional DV I/O Module). The audio inputs can be selected from the front panel or Audio Setup menu, and the operator can specify which of the stereo channels are to be processed. All of the outputs are active simultaneously.

Analog Audio Inputs and Outputs *(Terminal Strips)*

Two stereo pairs of analog audio input and output are supported, designated *Channel 1* and *Channel 2* on the rear of the unit. Each is comprised of a left and right component. Each analog audio input channel can be configured as 600Ω or high-impedance. Each channel can be configured as balanced or unbalanced.

Two terminal strips (one for channel 1, one for channel 2) provide analog audio connections. Each terminal strip uses the following pinouts:



AES/EBU Inputs *(on Audio breakout cable)*

Two BNC connectors (one for each of Channel 1 and 2) are provided on the standard Audio breakout cable (part number 774-755) for AES/EBU input.

An optional Audio breakout cable, part number 774-470, provides four connectors for AES/EBU input: two XLR (one for each of Channel 1 and 2), and two BNC (one for each of Channel 1 and 2). The XLR connectors are used for AES/EBU balanced audio input, while the BNC connectors are used for unbalanced AES/EBU input. Note that only two of the above input connections can be used at a time (one for Channel 1, and one for Channel 2), and they must be of the same type (XLR or BNC). The *AES Source* menu option selects between the XLR and BNC connections.

AES/EBU Outputs *(on Audio breakout cable)*

Two BNC connectors (one for each of Channel 1 and 2) are provided on the standard Audio breakout cable (part number 774-755) for AES/EBU output.

An optional Audio breakout cable, part number 774-470, provides four connectors for AES/EBU output: two XLR (one for each of Channel 1 and 2), and two BNC (one for each of Channel 1 and 2). The XLR connectors are used for AES/EBU balanced audio output, while the BNC connectors are used for unbalanced AES/EBU output. Both BNC and XLR output is available concurrently.

Audio Delay Pulse/GPI Output *(on Multi-I/O breakout cable)*

The general-purpose GPI output, a BNC connection on the Multi-I/O breakout cable, can be configured for use as an audio delay pulse output, to be sent to an external audio delay box or synchronizer.

Serial Digital Embedded Audio Input (SDI)

The unit accepts four channels of embedded audio on the SDI input port. The four channels can be selected from any group on the SDI input.

Serial Digital Embedded Audio Output (SDI)

Any of the selected audio inputs can be embedded into the output of the SDI stream. The operator can select which group of four audio channels (of the 16 available in the SDI format) the output will be embedded into.

Remote Control Ports

In addition to GPI input (for remote triggering of functions such as Freeze) and output (for triggering external devices), all functions of the DPS-475 and DPS-575 can be remotely controlled by devices capable of either RS-232 or RS-422. Two additional remote control methods are supported: *DPS Coaxial Network* (*DCN*), for use with controllers such as the DPS RC-4000 and RC-475 Remote Control Systems, and 10BaseT Ethernet networking for control through a TCP/IP-based network. The type of control, and any appropriate parameters, are selected in the System Config menu, under the Remote Control sub-menu (see Chapter 12, “Menus: System Config”).

RS-232 and RS-422

This DB-9F connector, labeled *RS-232/422* on the rear panel of the unit, is used to remotely control the DPS-475/575 via either RS-232 or RS-422. When this port is in use, a Unit Address must be set to an appropriate value in the range of 1-127 (see Chapter 12, "Menus: System Config"). This allows the unit to be used in a multi-drop configuration where only the unit addressed will respond to remote commands. The RS-232 port is also used for transferring files to the unit from a Microsoft Windows-based workstation via custom software (included). See Appendix D for information on transferring files from a Microsoft Windows system.

Ethernet Port

The 10BaseT Ethernet connector, labeled *Ethernet* on the rear of the unit, is used to connect the DPS-475/575 to a TCP/IP-based network for remote control and status monitoring. Control of the unit is then handled through web-browsing software or an RC-475 remote control panel. See Appendix F for details of controlling the unit from your web browser. Ethernet can also be used to control additional DPS-475/575 units from the front panel of this unit. When using Ethernet, the *IP Address*, *Netmask*, and *Gateway* settings of the unit must be configured for your network; your network administrator can provide you with these settings. These settings are located in the System Config menu, under the Remote Control sub-menu (see Chapter 12, "Menus: System Config").

DCN Port

The BNC connector labeled *DCN* on the rear of the unit is used to provide a DCN (DPS Coaxial Network) interface for remote control and status monitoring. DCN is a proprietary network in which 75Ω coax is used as a multi-drop, bi-directional network. Using a BNC T-connector on the DPS-475/575, loop coax between each unit and the remote controller (such as the RC-4000 and RC-475). At each end of the chain, install a 75Ω terminator. Every DPS-475/575 is assigned a unique DCN address at the factory, so there is no software configuration required. Maximum cable length (total) in a DCN configuration should be limited to 2000 feet. DCN can also be used to control additional DPS-475/575 units from the front panel of this unit.

Use with RC-4000 and RC-475

DCN is used to control the unit from an RC-4000 remote control panel. The *Search for devices* menu option on the RC-4000 can be used to find all DPS devices attached to it's DCN port and configure itself to control them. This may be done for any number of units at one time. DCN also allows multiple RC-4000s to control a single DPS-475/575.

It is possible to remotely disable and enable the front panel of the DPS-475/575 from the RC-4000 using the "KeyLock" option. If this option is not activated, then it is possible for a local user to modify the remote-user's settings from the front panel. However, the RC-4000 will periodically poll the device and show the new parameters if the local user changes them. If remote control is the usual case, then it is probably best to disable front-panel access once the device has been installed.

The RC-475 remote control provides an Ethernet port, which permits it to be conveniently connected to a TCP/IP network. For instructions on using the DPS RC-475 remote control, please see the RC-475 manual.

For use with the DPS-475/575, the RC-4000 must have firmware version 1.3c or higher. Note that not all functions of the DPS-475/575 will be accessible through the RC-4000 remote control.

GPI Inputs *(on Multi-I/O breakout cable)*

Two RCA-jack GPI inputs are provided on the Multi-I/O breakout cable. These allow a GPI-based external controller to trigger functions of the unit such as Freeze. The function triggered by each GPI input is configured in the System Config menu, under the Misc. Setup sub-menu (see Chapter 12, “Menus: System Config”).

GPI Output *(on Multi-I/O breakout cable)*

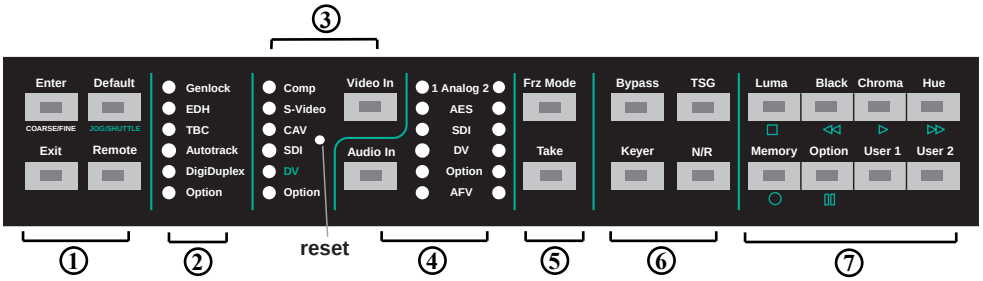
A user-configurable general-purpose BNC output is provided on the Multi-I/O breakout cable This output can be used for feeding an audio delay pulse to an external audio synchronizer, or can be configured as a GPI output to trigger external devices. The functionality of this output is configured with the *GPO Output* option in the System Config menu (see Chapter 12, “Menus: System Config”).

CHAPTER 3: OPERATION - FRONT PANEL CONTROLS

DPS-575: Front Panel

The front panel controls of the DPS-475/575 are organized into seven main functional areas:

1. Menu Controls
2. Status Indicators
3. Video Input Selection
4. Audio Input Selection
5. Freeze Controls
6. Mode Selection
7. Proc Amp Controls and User Keys



DPS-475/575: Front Panel Control Area

In addition, while in DV Control mode (selected from the Main Menu), the control knob and specific keys become dedicated to device control of a DV deck or camcorder (see the "DV Control Mode" section of this chapter).

Certain keys on the front panel can be user-programmed to specific functions (see the "User-Programmable Keys" section of this chapter), and some keys activate special functions when they are held down during power-up of the unit (see the "Power-Up Keys" section of this chapter).

Menu options, selections, and feedback are shown on the Vacuum Fluorescent Display (VFD) display panel. When the unit is first powered-up, the display will first show the DPS logo and product information, which will then be replaced by the **Idle Screen**:

The **Idle Screen** is a real-time status screen which provides feedback about various parameters of the currently selected inputs. The Idle Screen is shown when the user is not adjusting parameters or browsing the menus.

The first three lines of the Idle Screen provide real-time feedback of the Luma, Black, and Chroma levels of the currently selected video input source.

On DPS-475AV and DPS-575AV units , and DPS-475 and DPS-575 units that have the Audio Synchronizer Module installed, the next two lines of the display show real-time feedback of the channel 1 and 2 audio input levels.

On units with the DV I/O Module installed, the bottom line of the Idle Screen displays the current DV Time Code reported by the connected DV device, and just to the left of this, the current DV transport state.

The *Machine Name* specifed in the System Config menu (see Chapter 12) is also shown on the Idle Screen. On units without DV or audio capability, the Idle Screen will display the current measured video delay through the unit.

Note that at regular intervals, the display will "invert" itself. In the initial state, text and information appears lit, over an "unlit" background. In the inverted state, the background will be lit, with the text and information appearing "unlit" (black). THIS PERIODIC INVERSION IS NORMAL; it does not indicate any kind of problem nor status. The inversion is done to preserve the lifespan of the display panel (leaving the display in a single state can cause display pixels to burn out prematurely).

Resetting the Unit

In the Video Input Selection section of the front panel, just to the right of the CAV and SDI indicators, is a small hole. This hole provides access to the RESET button, which will reset the DPS-475/575 unit. This is equivalent to power-cycling the unit.

Menu Controls

All options and parameters for the DPS-475/575 are accessed through configuration menus, which appear on the display panel. Selecting and using any of the menu and sub-menu options follows the same general procedure. See Chapter 4, "Menu Overview and Feature Cross-Reference," for a chart of the menu structure.

Moving Through the Menus

1. With the Idle Screen displayed, press the *Enter* button. (If the Idle Screen is not displayed, press *Exit* repeatedly until it is.) The display panel will show the Main Menu options.

2. Scroll through the list using the control knob, until the desired sub-menu is highlighted. Press the *Enter* button to enter the sub-menu.
3. Use the control knob and *Enter* button to choose and activate the option you want. If there are further sub-menus, use the procedure in step 2 to select between them, and to select the option you wish to change.

Pressing the *Exit* button while in a menu or sub-menu will return you to the previous sub-menu, or if you are at the Main Menu, to the Idle Screen.

Changing Parameters

Once you have selected the option you wish to change, use the control knob to set the new value for the parameter. When setting parameters that have discrete value options (such as selecting Field, Frame, or Strobe mode), the control knob will cycle through the valid settings.

For parameters which have a numerical range of values, the display will show both a numeric and a visual representation of the range, and the control knob can be used to set the new value.

Note that adjustments affect the output immediately as the knob is turned.

When setting parameters with a numerical range of values, you can switch the control knob between Fine and Coarse adjustment mode. When you first enter the parameter adjustment screen, the control knob is in Fine mode. Pressing the *Enter* button switches to Coarse adjustment mode, and the *Enter* button lights up. This allows you to make large adjustments more quickly. Pressing *Enter* again returns the control knob to Fine mode.

For example, when setting a parameter, the control knob may adjust the value in increments of 0.02 while in Fine Mode, and 0.50 in Coarse mode.

Pressing the *Default* button will reset the configuration parameter to its default values. The *Default* button will be lit whenever the current value of the parameter is equivalent to the default value, whether you reached this value by pressing the *Default* button, or scrolling to it with the control knob.

Press the *Exit* button to accept your new value, and return to the previous menu or sub-menu.

Remote Control

By placing the DPS-475/575 in Remote mode, you can control additional DPS-475/575 units on the same DCN or Ethernet network from the front panel of this unit.

Pressing the *Remote* front-panel key will bring up a list of available units that can be controlled. <*local device*> will always be an option on this list, representing the unit you are physically using. Use the control knob to scroll through the list of available devices and highlight the unit you wish to control, then press the *Enter* button to activate it. Selecting <*local device*> exits Remote mode, resuming normal single-unit operation.

Once you have selected a remote unit to control, all front-panel features operate as if you were actually at the front panel of that remote unit. The VFD display, status indicators and button lights all reflect the status of the remote unit; all buttons and controls, with the exception of the Remote key, control the remote unit, not the one you are physically operating. To stop controlling the remote unit, use the *Remote* key to select a new unit (or the local device) to control.

The light on the *Remote* key flashes while the unit is remotely controlling a device.

Status Indicators

The status indicator lights provide visual feedback on the current mode and operating conditions of the unit.

Genlock

This light indicates the current status of the external genlock source. If the unit is configured to Auto Genlock mode, this indicator will be lit as long as a stable genlock source is connected to the unit. If no genlock source is present, the unit will automatically switch to Internal Genlock mode, and this indicator will flash.

If the unit is configured to Internal Genlock mode, it will operate on its own internal crystal, and this indicator will be unlit.

EDH

This light indicates the current configuration and status of Error Detection Handling (EDH) in the input Serial Digital video stream. This indicator is unlit when EDH Detection is turned off in the unit.

This indicator will flash briefly when EDH Detection is enabled and EDH errors have been detected and not yet cleared by the operator. The actual count of these errors is reported in the *EDH Error Count* menu option.

TBC

This light indicates whether or not the composite input signal is being time base corrected by the unit's TBC circuitry. If the unit is in Synch mode, the internal TBC is not active, and this indicator will be off. If the unit is in TBC mode, the unit will time base correct the input signal (generally for heterodyned signals from sources such as a VTR), and this indicator will be lit. If the unit is in Auto-Switch mode, the unit will sense the incoming composite video signal and select between Synch and TBC modes automatically; in this mode, the indicator will flash when the TBC is active.

Autotrack

This light indicates whether or not the audio Auto Track mode is enabled. When enabled, this indicator will be lit, and the unit will automatically delay the audio data to match the delay of the video data through the synchronizer (up to 4 fields). This indicator will be off when Auto Track is disabled.

DigiDuplex

This light indicates whether or not the unit is in DigiDuplex mode. In DigiDuplex mode, the indicator is lit, and the unit's SDI video input is routed to the analog video outputs, while the selected analog video input is simultaneously synchronized and sent to the SDI output. With an audio-equipped unit, conversion between digital and analog audio is handled in similar fashion, simultaneously with the video. This indicator is unlit when DigiDuplex mode is off. See Appendix E, "DigiDuplex Mode", for a detailed explanation of DigiDuplex mode and its settings.

Option

This light indicates the status and/or configuration of the currently installed option card module (if any). The meaning of this indicator varies depending on the particular option installed; please see the documentation for your option module for further details.

Video Input Selection

The current (active) video input format selection is shown by these indicator lights. The current input is selected by pressing the *Video In* button until the desired input LED becomes lit. Selectable inputs are:

- *Comp* (Composite)
- *S-Video*
- *CAV* (Component Analog Video)
- *SDI* (Serial Digital)

With the optional DV module installed, *DV* will also be selectable as an input.

If an option card module is installed that includes an additional video input, it will be selectable as *Option*.

If no input signal is present on the selected video input, the corresponding indicator light will flash.

Audio Input Selection

On DPS-475AV and DPS-575AV units, and DPS-475 and DPS-575 units with the Audio Synchronizer Module installed, the current (active) audio input format selection is shown for each channel by these indicator lights.

Pressing the *Audio In* button takes you to a menu for selecting the Channel 1 audio input; this is the same as the *Ch1-Input* menu option. Pressing the *Audio In* button a second time takes you to a menu for selecting the Channel 2 audio input; this is the same as the *Ch2-Input* menu option.

Selectable audio inputs are:

- *Analog*
- *AES/EBU*
- *SDI Embedded*

With the optional DV module installed, *DV* will also be selectable as an input. If an option card module is installed that includes an additional audio input, it will also be selectable.

The selection menus also provide access to two “special” audio modes:

- *Mute* disables audio output; while in this mode, *all* input source indicator lights for that channel will be on.
- *Test Tones* outputs audio test tones from the unit. The parameters of the test tones (Level, Frequency) are set from the Audio Setup menu (see Chapter 6, “Menus: Audio Setup”). While in *Test Tones* mode, all input source indicator lights for that channel will flash.

If *AFV (Audio-Follows-Video)* mode is enabled through the audio menus (see Chapter 6, “Menus: Audio Setup”), the *AFV* indicator for that channel will be lit. In this mode,

each of the selectable video inputs has an audio input selection linked to it. Whenever the video input selection is changed, the audio input selection for any AFV-enabled channel automatically changes correspondingly.

- You can override AFV mode by manually selecting a different audio input even when AFV is enabled. This does not, however, turn AFV mode off; the next time the video input selection is changed, the audio will again follow it. AFV mode can only be disabled through the audio menus.
- The AFV link to each of the video inputs is set through the Audio Setup menu (see Chapter 6, "Menus: Audio Setup").

The input selection for channels 1 and 2 cannot be selected independently if *96 kHz AES Output* mode (see Chapter 6, "Menus: Audio Setup") is enabled; they must then always be set to the same input source.

When *Dolby-E (Data) Mode* is enabled (see Chapter 6, "Menus: Audio Setup"), the audio input selection for channel 1 is locked to AES/EBU, and only this channel supports Dolby-E Data. SDI Embedded Audio cannot be used while in this mode.

Pressing and holding the *Audio In* button for one second will take you to the Audio Setup menu (the same as is available through the Main Menu), from which you can set additional audio configuration options.

When one input channel is being routed to both output channels through the *Channel In->Out* or *Aud Follows Vid* menu options (see Chapter 6, "Menus: Audio Setup" for details), only that input channel's LED will be lit to indicate the audio input source.

On DPS-475 and DPS-575 units without audio capability, the *Audio In* button is user-programmable; that is, the user can assign the button to a desired menu function. See the "User-Programmable Keys" section later in this chapter for instructions on assigning this button to a menu function.

Freeze Controls

The freeze controls provide instant access to freezing individual frames or fields of the incoming video source, strobing the incoming video, or performing a 3:2 pulldown on the input source.

Pressing the *Frz Mode* button takes you to a menu setting for selecting which freeze mode will be applied to the incoming video. This is the same as the *Freeze Mode* menu option under the Video Setup menu.

Pressing the *Frz Mode* button multiple times will cycle through the different modes, or the control knob can be used for selection. The available modes are:

- *Frame* - freezes an entire frame of the incoming video
- *Field* - freezes a single field of the incoming video
- *Strobe* - strobes the incoming video
- *Film* - applies a 3:2 pulldown to the incoming video, effectively giving a simulated 24fps look to the video output

Pressing the *Take* button activates the selected freeze mode and applies it to the incoming video. The light on the *Take* button will flash while freeze mode is active. Press *Take* again to return to the live video feed.

- If Field freeze mode is selected, the display panel will indicate which field of the video is frozen (1, 2, 3, or 4). This will initially be the same as the value of the *Field Select* menu option; the control knob changes the currently selected field (and the *Field Select* menu option is updated accordingly).
- If Strobe freeze mode is selected, the display panel will indicate the current strobe rate (number of frames per update) applied to the incoming video (1 to 255). This will initially be the same as the value of the *Strobe Rate* menu option; the control knob changes the rate (and the *Strobe Rate* menu option is updated accordingly).
- Pressing the *Frz Mode* button while Frame or Field freeze mode is already active will toggle between Frame and Field freeze mode.
- The *Mute In Freeze* audio menu option (see Chapter 6, "Menus: Audio Setup") specifies whether or not audio output will be muted while the video is frozen in *Frame* or *Field* mode.

Mode Selection

The mode selection controls provide direct access to Bypass, Test Signal Generator, Keyer, and Noise Reduction functions.

Bypass

The *Bypass* key toggles between Process and Bypass mode. The *Bypass* key must be held in for one second to activate Bypass mode; a normal press will return to Process mode.Process mode is the normal mode of operation. In Bypass mode, no processing is applied to the *Composite In* video signal; it is passed directly to *Composite Out*. Similarly, in Bypass mode, no processing is applied to the analog and AES/EBU audio inputs; they are routed directly to the outputs.

The light on the *Bypass* button flashes while the unit is in Bypass mode.

Composite In and the analog and AES/EBU audio inputs are also bypassed when the power to the unit is off.

TSG

The *TSG* key sets the unit to Test Signal Generator mode. Pressing the *TSG* key activates the Test Signal Generator, sending the currently selected test pattern to all video outputs. This will initially be the test pattern selected in the *TSG:* menu option of the Video Setup menu. When TSG mode is active, the light on the *TSG* button flashes, and the display panel shows a list of available test patterns (and indicates which one is active); you can change the displayed pattern by scrolling through the list with the control knob, and pressing the *Enter* key to select a new pattern.

Pressing the *TSG* key again returns the outputs to the incoming video feed.

Keyer

The *Keyer* button provides access to the unit's linear keyer. Pressing the *Keyer* button once takes you directly to the Keyer Setup menu, from which you can enable the keyer, and configure the keyer settings.

If a file (animation or still) to be displayed has been selected previously, pressing the *Keyer* button a second time will fade in the animation or still over the live video; pressing the *Keyer* button a third time will fade it back out. Note that if it is an

animation being keyed, the animation will fade out automatically after the number of repetitions specified in the *Repeat* option of the keyer settings, if not faded out manually first.

If no file has been previously selected, pressing the *Keyer* button a second time takes you to the keyer's file selection list (equivalent to the *File* option of the Keyer Setup menu), from which you can select a file from among the still images and animations stored in the unit. These images could have been uploaded to the unit from a PC (see Appendix D, "The Uploader Software" and Appendix F, "Ethernet Control") or grabbed from video from the TSG/Image Grabbing menu.

The image or animation to be displayed or keyed is selected by scrolling through the list with the control knob, and pressing the *Enter* key to select the desired file. The file will be loaded, and you will be returned to the Keyer Setup menu. Pressing the *Keyer* button again will fade in the file, and a subsequent press will fade it back out.

The light on the *Keyer* button will flash while the key is in transition (fading in or fading out), and be lit while the key is being displayed.

See Chapter 7, "Menus: Keyer Setup" for more information about the Keyer Setup menu.

N/R

Pressing the *N/R* button accesses the noise reduction functions of the unit. Pressing the *N/R* button once takes you directly to the Noise Reduction menu, from which you can configure noise reduction settings. See Chapter 8, "Menus: Noise Reduction" for a detailed description of the Noise Reduction menu.

Pressing the *N/R* button subsequent times toggles the noise reduction features on and off. The light on the *N/R* button will be lit when noise reduction is enabled.

Proc Amp Controls and User Keys

The proc amp controls allow the modification, storing, and recalling of proc amp settings.

Automatic Proc Amp Setup ("Gimme Bars")

The luminance gain, black level, chrominance gain and hue can all be automatically set by the unit based on incoming SMPTE bars.

To use the "Gimme Bars" automatic setup mode, SMPTE bars (or other 75% bars) must be supplied to the currently selected video input. Press and hold the *Luma* button; the four proc amp parameters are automatically adjusted.

Luma

Pressing the *Luma* button allows you to adjust the luminance gain by using the control knob and menu controls (see the Menu Controls section earlier in this chapter). This is equivalent to the *Luma Gain* menu option in the Video Setup menu.

While setting the luminance gain, the display panel will also show the maximum luminance level (in IRE or mV) of the incoming video signal.

Valid Range: -99.99 dB to 6.00 dB (Y/C, SDI, DV)
-8.01 dB to 4.04 dB (Composite, CAV)

Default Setting: 0.00 dB

Black

Pressing the *Black* button allows you to adjust the black level by using the control knob and menu controls (see the Menu Controls section earlier in this chapter). This is equivalent to the *Black Level* menu option in the Video Setup menu.

While setting the black level, the display panel will also show the minimum luma level of the incoming video signal.

Valid Range: -30.0 IRE to 30.0IRE (525-line mode)
-210.0 mV to 210.0 mV (625-line mode)

Default Setting: 0.0 IRE (525-line mode)
0.0 mV(625-line mode)

Chroma

Pressing the *Chroma* button allows you to adjust the chrominance gain by using the control knob and menu controls (see the Menu Controls section earlier in this chapter). This is equivalent to the *Chroma Gain* menu option in the Video Setup menu.

While setting the chrominance gain, the display panel will also show the saturation peak (in %) of the incoming video signal.

Valid Range: -99.99dB to 6.00dB (Y/C, SDI, DV, Composite)
-8.01 dB to 4.07 dB (CAV)

Default Setting: 0.00 dB

Hue

Pressing the *Hue* button allows you to adjust the output phase by using the control knob and menu controls (see the Menu Controls section earlier in this chapter). This is equivalent to the *Hue Phase* menu option in the Video Setup menu. This button can be reprogrammed by the user if not needed. See the section User-Programmable Keys later in this chapter for instructions on assigning this button to a different function.

Valid Range: -45.010° to 44.080°

Default Setting: 0.000°

Memory

Pressing the *Memory* button provides access to the Proc Amp Memory controls, which allow you to store and recall Proc Amp settings profiles. Up to 10 settings profiles can be stored, containing the settings for Luma Gain, Black Level, Chroma Gain, and Hue.

Storing Settings

1. Press the *Memory* button.
2. Use the control knob to select *Store*, and press the *Memory* key again.
3. Use the control knob to select one of the 10 available memory locations, and press *Memory* again. The current Proc Amp settings will be saved.

Recalling Settings

1. Press the *Memory* button.

2. Use the control knob to select *Recall*, and press the *Memory* key again.
3. Use the control knob to select the desired profile from one of the 10 available memory locations, and press Memory again. The Proc Amp settings will be changed to those stored in the specified profile. In addition to the 10 memory locations, you can select the Unity Values profile, which resets the Proc Amp settings to factory preset unity.

User 1 and User 2

The *User 1* and *User 2* keys are user-programmable, and have no default function. See the section User-Programmable Keys later in this chapter for instructions on assigning these buttons to desired functions.

Option

On units in which an option module has been added, this key may be used to control functions of that hardware option. Please see the documentation for your option module for further details. If the option board does not require the Option key to be used, it user-programmable, and has no default function. See the section User-Programmable Keys later in this chapter for instructions on assigning this button to a different function.

DV Control Mode

When a DV device (such as a deck or camcorder) is connected to the DPS-475/575 by IEEE-1394 (Firewire), transport control can be done from the front panel of the unit.

To enable DV device control, select *DV Control* from the Main Menu. (To reach the Main Menu, press the *Enter* button while the Idle Screen is displayed.) The display will change to show the current time code of the DV device, as well as the transport status (play, stop, etc.). While in DV mode, the normal functionality of the front panel controls is replaced by DV device control.

If you look carefully at the front panel of the unit, you'll see standard representations of transport controls below many of the buttons. The buttons used for DV device control are as follows:

Key	Function
Luma	Stop
Black	Rewind/Scrub Backward
Chroma	Play
Hue	Fast-Forward/Scrub Forward
Memory	Record (used in conjunction with Play)
Option	Pause
Default	Toggle the control knob between Jog mode and Shuttle mode

The control knob functions as a jog or shuttle controller, depending on the currently selected mode.

To exit DV Control Mode and return to normal operation, press the *Exit* key.

User-Programmable Keys

Many of the front-panel keys on the DPS-475/575 are user-programmable; that is, you can program them to take the user to a menu or specific function of your choice.

On all units, the *User 1*, *User 2*, and *Hue* keys are user-programmable. On units that do not have audio capability, the *Audio In* key is also programmable. On units in which an added option board does not require the *Option* key to be used, it can be programmed as well.

Of these keys, only the *Hue* key has a default function. If the user presses one of the other keys before it is programmed, the following message appears on the display panel:

> *This key has not yet been assigned a function. To program it, select the desired menu or setting that you wish to assign to it, using the normal menu controls. Then press and hold this key for five seconds.*

Whether a programmable key already has a function assigned to it or not, it is easy to reprogram the key. Holding down a programmable key for five seconds will assign to it whatever menu or option is currently displayed on the display panel.

For example, to assign the *User 1* key to adjust the video AGC Bias, select the *AGC Bias* option from the Video Setup menu as normal. With the *AGC Bias* adjustment screen displayed, press and hold the *User 1* key for approximately five seconds. All LED's on the unit will then flash once to indicate successful programming. If programming fails for any reason (for example, if you attempt to program a button to the Idle Screen), all LED's on the unit will flash three times quickly. Note that if the programming fails, any function previously assigned to that key will have been erased, so the key will have to be reprogrammed.

Programmable keys can be assigned to jump to menus (at a specified point, if desired) in a similar fashion.

Once the key has been programmed, pressing it will jump to the menu or option assigned to it. Pressing it again while already at that screen will cycle through the values (if the key is assigned to an option) or select the active menu choice (if the key is assigned to a menu).

In our above example, pressing the *User 1* key will now take the user to the AGC Bias adjustment screen. Each additional press of the *User 1* key will cycle through the allowed adjustment values.

Power-Up Keys

Certain special functions of the DPS-475/575 are accessed by holding down specific front panel keys while turning on the unit.

Force Firmware Download

Holding down the *Enter* key while turning on the unit will force the unit into Firmware Download mode.

Under normal circumstances, the unit will automatically enter Firmware Download mode whenever the Windows-based Uploader software attempts to upload a firmware upgrade file to the unit. (see Appendix D, "The Uploader Software"). However, if the

firmware within the unit becomes corrupted (possibly during a failed firmware upgrade), the unit may not start up properly, and thus would be unable to automatically enter Firmware Download mode. Using this power-up key will allow you to upload new firmware to the unit from the Uploader software.

Self-Test Mode

Holding down the *Bypass* key while turning on the unit will force the unit into Self-Test mode. Self-Test mode will allow the operator to test the front-panel controls and indicators of the unit. The display panel will indicate which particular controls and indicators are being tested.

When testing buttons, each press of a button will be reported on the display panel, with the name of the button. Turning the control knob ends the testing of buttons.

When testing LEDs, each column of indicators on the buttons will light consecutively left-to-right. Each row of indicators on the buttons will then light consecutively top-to-bottom. The columns and rows of the stand-alone indicators will follow the same pattern, and the process will repeat. Press any button to end the testing of LEDs.

When testing the control knob, each turn of the control knob is reflected in a numeric value shown on the display panel. Pressing any button ends the testing of the control knob, and begins the testing of buttons again.

To exit Self-Test mode, the unit must be turned off and back on, or reset using the Reset Button.

Erase Firmware

Holding down the *Keyer* key while turning on the unit will erase all FPGA and firmware files from the unit's memory. This will have to be done if you are attempting to upgrade the unit's FPGA's or firmware, but there is not enough available memory to upload the new file. **WARNING: after performing this operation, replacement FPGA and firmware files must be uploaded to the unit before the unit will be operational again.**

Factory Reset

Holding down the *Memory* key while turning on the unit will perform a factory reset by clearing the unit's non-volatile memory. **WARNING: all configuration options will be reset to factory defaults. All saved settings presets will be lost.**

CHAPTER 4: MENU OVERVIEW AND FEATURE CROSS-REFERENCE

Menu Controls

All options and parameters for the DPS-475/575 are accessed through configuration menus, which appear on the display panel. The menus of the DPS-475 and DPS-575 are organized into eight main functional areas:

- Video Setup
- Audio Setup *(on audio-equipped units only)*
- Keyer Setup
- Noise Reduction
- DV Control *(on units with DV I/O Module only)*
- Timing Setup
- TSG/Image Grabbing
- System Config

Moving Through the Menus

Selecting and using any of the menu and sub-menu options follows the same general procedure.

1. With the Idle Screen displayed, press the *Enter* button. (If the Idle Screen is not displayed, press *Exit* repeatedly until it is.) The display panel will show the Main Menu options.
2. Use the control knob to select one of the sub-menus listed in the main menu. To do so, scroll through the list using the control knob, until the desired sub-menu is highlighted. Press the *Enter* button to enter the sub-menu.
3. Use the control knob and *Enter* button to choose and activate the option you want. If there are further sub-menus, use the procedure in step 2 to select between them, and to select the option you wish to change.

Pressing the *Exit* button while in a menu or sub-menu will return you to the previous sub-menu, or if you are at the main menu, to the Idle Screen.

Changing Parameters

Once you have selected the option you wish to change, use the control knob to set the new value for the parameter. When setting parameters that have discrete value options (such as selecting Field, Frame, or Strobe mode), the control knob will cycle through the valid settings.

For parameters which have a numerical range of values, the display will show both a numeric and a visual representation of the range, and the control knob can be used to set the new value.

Note that adjustments affect the output immediately as the knob is turned.

When setting parameters with a numerical range of values, you can switch the control knob between Fine and Coarse adjustment mode. When you first enter the parameter adjustment screen, the control knob is in Fine mode. Pressing the *Enter* button switches to Coarse adjustment mode, and the *Enter* button lights up. This allows you to make large adjustments more quickly. Pressing the *Enter* button again returns the control knob to Fine mode.

For example, when setting the a parameter, the control knob may adjust the value in increments of 0.02 while in Fine Mode, and 0.50 in Coarse mode.

Pressing the *Default* button will reset the configuration parameter to its default values. The *Default* button will be lit whenever the current value of the parameter is equivalent to the default value, whether you reached this value by pressing the *Default* button, or by scrolling to it with the control knob.

Press the *Exit* button to accept your new value, and return to the previous menu or sub-menu.

Menu Tree

This section provides an overview of the menu structure of the DPS-475/575, and where specific menu selections are located. Detailed explanations of the menus and options appear in subsequent chapters.

Main Menu

- **Video Setup**
  - Luma Gain
  - Black Level
  - Chroma Gain
  - Hue Phase
  - Color Balance - Cb
  - Color Balance - Cr
  - Video AGC
  - AGC Bias
  - Input H-Position
  - Input Y/C Delay
  - Sync Mode
  - 3D Comb Decoder
  - 3D Chroma Motion Bias
  - Comb Decoder
  - DigiDuplex Mode
  - Self Setup to Bars
  - *More Video Settings*
    - Hot Switch
    - Hot Switch Delay
    - Trouble Slide
    - Trouble File
    - Freeze Mode

Main Menu (continued)
- **Video Setup** (continued)
  - *More Video Settings* (continued)
    - Field Select
    - Strobe Rate
    - Input Source
    - Test Signal Out
    - TSG
    - Output Burst
    - SDI Clip
    - EDH Detection
    - EDH Error Count
    - Clamp Speed
    - Aux Output
    - Aux Sync/Comp
    - Aux Sync Level
    - CAV-Y Composite
    - Analog Width
    - Chroma Pairing Filter *[DPS-575 only]*
- **Audio Setup**
  - *Channel 1 Only*
    - Ch1-Input
    - Ch1-Analog Bypass
    - Ch1-AES/EBU
    - Ch1-Gain-R
    - Ch1-Gain-L
    - Ch1-DDPlex Gain-R
    - Ch1-DDPlex Gain-L
    - Ch1-Fixed Delay
    - Ch1-In Op. Level-R
    - Ch1-In Op. Level-L
    - Ch1-Headroom-R
    - Ch1-Headroom-L
    - Ch1-Out Op. Level-R
    - Ch1-Out Op. Level-L
    - Ch1-Tone Level
    - Ch1-Test Freq-L
    - Ch1-Test Freq-R
    - Ch1-Balanced
    - Ch1-Termination
    - Ch1-Stereo Mode
    - Ch1-Phase Invert L
    - Ch1-SDI In
    - Ch1-Aud Follows Vid
    - Ch1-AFV-Composite
    - Ch1-AFV-SVideo
    - Ch1-AFV-CAV
    - Ch1-AFV-SDI
    - Ch1-AFV-DV
    - Ch1-AFV-Option
  - *Channel 2 Only*
    - Ch2-Input
    - Ch2-Analog Bypass
    - Ch2-AES/EBU

Main Menu (continued)
Audio Setup (continued)
Channel 2 Only (continued)
Ch2-Gain-R
Ch2-Gain-L
Ch2-DDPlex Gain-R
Ch2-DDPlex Gain-L
Ch2-Fixed Delay
Ch2-In Op. Level-R
Ch2-In Op. Level-L
Ch2-Headroom-R
Ch2-Headroom-L
Ch2-Out Op. Level-R
Ch2-Out Op. Level-L
Ch2-Tone Level
Ch2-Test Freq-L
Ch2-Test Freq-R
Ch2-Balanced
Ch2-Termination
Ch2-Stereo Mode
Ch2-Phase Invert L
Ch2-SDI In
Ch2-Aud Follows Vid
Ch2-AFV-Composite
Ch2-AFV-SVideo
Ch2-AFV-CAV
Ch2-AFV-SDI
Ch2-AFV-DV
Ch2-AFV-Option
Both Channels
Ch1-Input
Ch2-Input
Ch1-Analog Bypass
Ch2-Analog Bypass
Ch1-AES/EBU
Ch2-AES/EBU
Ch2-Gain-R
Ch1-Gain-L
Ch2-Gain-L
Ch1-Gain-R
Ch1-DDPlex Gain-R
Ch1-DDPlex Gain-L
Ch2-DDPlex Gain-R
Ch2-DDPlex Gain-L
Ch1-Fixed Delay
Ch2-Fixed Delay
Ch1-In Op. Level-R
Ch2-In Op. Level-R
Ch1-In Op. Level-L
Ch2-In Op. Level-L
Ch1-Headroom-R
Ch2-Headroom-R
Ch1-Headroom-L
Ch2-Headroom-L

Main Menu (continued)
Audio Setup (continued)
Both Channels (continued)
Ch1-Out Op. Level-R
Ch2-Out Op. Level-R
Ch1-Out Op. Level-L
Ch2-Out Op. Level-L
Ch1-Tone Level
Ch2-Tone Level
Ch1-Test Freq-L
Ch2-Test Freq-L
Ch1-Test Freq-R
Ch2-Test Freq-R
Ch1-Balanced
Ch2-Balanced
Ch1-Termination
Ch2-Termination
Ch1-Stereo Mode
Ch2-Stereo Mode
Ch1-Phase Invert L
Ch2-Phase Invert L
Ch1-SDI In
Ch2-SDI In
Ch1-Aud Follows Vid
Ch2-Aud Follows Vid
Ch1-AFV-Composite
Ch2-AFV-Composite
Ch1-AFV-SVideo
Ch2-AFV-SVideo
Ch1-AFV-CAV
Ch2-AFV-CAV
Ch1-AFV-SDI
Ch2-AFV-SDI
Ch1-AFV-DV
Ch2-AFV-DV
Ch1-AFV-Option
Ch2-AFV-Option
Global Audio Config
Auto Track
Master Mute
Audio Bypass
AES Data Grade
AES Elec. Levels
AES Source
96kHz AES Output
Digiduplex Input
DDPlex AES/EBU Out
SDI Out
Channel In->Out
Sample Rate
SDI Embedding
SDI L/R De-Embed
Pitch Change
Mute In Freeze

Main Menu (continued)
- **Audio Setup** (continued)
  - *Global Audio Config* (continued)
    - Dolby-E (Data) Mode
    - Voice-Over Pgm Level
    - Voice-Over Fade
    - Voice-Over
- **Keyer Setup**
  - Fade Out
  - Cut Out
  - Fade In
  - File
  - Settings
  - *Change Settings*
    - Shift X
    - Shift Y
    - Fade In Time
    - Max Opacity
    - Fade Out Time
    - Repeat Count
    - Frame Rate
    - Loop Mode
    - Bumper Style
    - Save These Settings
- **Noise Reduction**
  - Noise Reduction
  - Split Screen
  - Spatial Filter
  - Spatial Filter Mix
  - Horizontal Bandwidth
  - Vertical Bandwidth-Y
  - Vertical Bandwidth-C
  - Temporal NR-Luma
  - Temporal NR-Chroma
- **DV Control**
- **Timing Setup**
  - Genlock
  - Subcarrier Phase
  - Horizontal
- **TSG/Image Grabbing**
  - Grab 10-bit Video
  - Grab 8-bit Video
  - ...grab linear key
  - Grab & Apply Luma Key
  - Luma Key Gain
  - Threshold
- **System Config**
  - Line Standard (525/625) *[DPS-575 only]*
  - *Misc Setup*
    - Internal Temp
    - Video Delay
    - Keylock
    - Function Bypass
    - GPI-1 Function
    - GPI-2 Function

Main Menu (continued)
- **System Config** (continued)
  - *Misc Setup* (continued)
    - GPO Function
    - Genlock Changes
    - VFD Brightness
    - LED Brightness
    - Idle Timeout
    - Idle Cycle Time
  - *One-time Video Setup*
    - Source ID
    - Setup Level (in)
    - Setup Level (out)
    - Chroma Coring
    - VITS/Blanking Fld1
    - VITS/Blanking Fld2
  - *Remote Control Setup*
    - Baud Rate
    - Remote Control
    - RS-422 Termination
    - Unit Address (Serial)
    - IP Address
    - Netmask
    - Gateway
    - Machine Name
    - DCN Address
    - Remote Watch
    - Ethernet Address
  - Version Information
  - *Flash Memory Mgmt*
    - List Files
    - Memory Usage
    - Backup All Settings
    - Restore All Settings
  - Warm Reset
  - Reset to Factory Defaults
  - Enable Extra Options
  - Factory Calibration

Feature Cross-Reference

This section provides a cross-reference between the key features of the DPS-475/575, and the primary menu options and controls associated with their use. Detailed explanations of these menu options appear in subsequent chap-ters. The menu options are listed in the format **Menu/Sub-Menu/Option**. If all options in a menu or sub-menu are relevant to the feature, only the menu or sub-menu will be listed.

Animated Logo Insertion

Keyer Setup menu	(chapter 7)
Front Panel Controls: Mode Selection/Keyer	(chapter 3)
The Uploader Software	(appendix D)

DV Device Control

DV Control menu	(chapter 9)
Front Panel Controls: DV Control	(chapter 3)

Framestore/Linear Keyer

Keyer Setup menu	(chapter 7)
Front Panel Controls: Mode Selection	(chapter 3)
The Uploader Software	(appendix D)
TSG-Image Grabbing menu	(chapter 11)
System Config/Flash Memory Mgmt sub-menu	(chapter 12)

Genlock Timing

Timing Setup menu	(chapter 10)
System Config/Misc Setup/Genlock Changes	(chapter 12)

GPI Control

System Config/Misc Setup/GPI-1 Function	(chapter 12)
System Config/Misc Setup/GPI-2 Function	(chapter 12)
System Config/Misc Setup/GPO Function	(chapter 12)

Hot-Switch/Trouble Slide

Video Setup/More Video Settings/Hot Switch	(chapter 5)
Video Setup/More Video Settings/Hot Switch Delay	(chapter 5)
Video Setup/More Video Settings/Trouble Slide	(chapter 5)
Video Setup/More Video Settings/Trouble File	(chapter 5)

Key Channel Output

Video Setup/More Video Settings/Aux Output	(chapter 5)

Noise Reduction

Front Panel Controls: Mode Selection	(chapter 3)
Noise Reduction menu	(chapter 8)
Video Setup/More Video Settings/Chroma Pairing Filter	(chapter 5)
Video Setup/3D Comb Decoder	(chapter 5)
Video Setup/3D Chroma Motion Bias	(chapter 5)
Video Setup/Comb Decoder	(chapter 5)

NTSC / PAL Configuration

System Config/Line Standard (525/625)	(chapter 12)

Proc Amp

Front Panel Controls: Proc Amp Controls	(chapter 3)
Video Setup menu	(chapter 5)

Remote Control

Connections	(chapter 2)
System Config/Remote Control sub-menu	(chapter 12)
Ethernet Control	(appendix F)

Test Signal Generator

Front Panel Controls: Mode Selection	(chapter 3)
Video Setup/More Video Settings/Test Signal Out	(chapter 5)
Video Setup/More Video Settings/TSG	(chapter 5)
The Uploader Software	(appendix D)
TSG-Image Grabbing/Grab 10-bit Video	(chapter 11)

Time Base Corrector

Video Setup/Sync Mode	(chapter 5)

Upgrading the Firmware

The Uploader Software	(appendix D)
Ethernet Control	(appendix F)

Vertical Blanking
- System Config/One-Time Video Setup/VITS-Blanking (chapter 12)

Video Configuration
- Video Setup menu (chapter 5)
- Front Panel Controls: Proc Amp Controls (chapter 3)

Video Freeze Mode
- Video Setup/More Video Settings/Strobe Rate (chapter 5)
- Front Panel Controls: Freeze Controls (chapter 3)
- Video Setup/More Video Settings/Freeze Mode (chapter 5)
- Video Setup/More Video Settings/Field Select (chapter 5)
- Audio Setup/Global Audio Config/Mute In Freeze (chapter 6)

Video Input Selection
- Front-Panel Controls: Video Input Selection (chapter 3)
- Video Setup/More Video Settings/Input Source (chapter 5)
- Video Setup/More Video Settings/CAV-Y Composite (chapter 5)

Video Strobe Mode
- Front Panel Controls: Freeze Controls (chapter 3)
- Video Setup/More Video Settings/Freeze Mode (chapter 5)
- Video Setup/More Video Settings/Strobe Rate (chapter 5)

VITS Insertion
- System Config/One-Time Video Setup/VITS-Blanking (chapter 12)

Voice-Over Mixing
- Audio Setup/Global Audio Config/Voice-Over Pgm. (chapter 6)
- Audio Setup/Global Audio Config/Voice-Over Fade (chapter 6)
- Audio Setup/Global Audio Config/Voice-Over (chapter 6)

CHAPTER 5: MENUS: VIDEO SETUP

The Video Setup menu contains the video configuration options that the user may wish to change in the course of normal operation. Video configuration options that are usually set only during initial integration of the unit (VITS insertion, line standard (525/625), etc.) are found in the System Config menu.

Luma Gain

Adjusts the luminance gain. While setting the luminance gain, the display panel will also show the maximum luminance level (in IRE or mV) of the incoming video signal.

Valid Range: -99.99dB to 6.00dB (Y/C, SDI, DV)
-8.01 dB to 4.04 dB (CAV, Composite)

Default Setting: 0.00 dB

Black Level

Adjusts the black level. While setting the black level, the display panel will also show the minimum luma level of the incoming video signal.

Valid Range: -30.0 IRE to 30.0IRE (525-line mode)
-210.0 mV to 210.0 mV (625-line mode)

Default Setting: 0.0 IRE (525-line mode)
0.0 mV(625-line mode)

Chroma Gain

Adjusts the chrominance gain. While setting the chrominance gain, the display panel will also show the saturation peak (in %) of the incoming video signal.

Valid Range: -99.99 dB to 6.00 dB (Y/C, SDI, DV, Composite)
-8.01 dB to 4.07 dB (CAV)

Default Setting: 0.00 dB

Hue Phase

Adjusts the output phase.

Valid Range: -45.010° to 44.080°

Default Setting: 0.000°

Color Balance - Cb

Adjusts the amount of the Y-B component in the processed video.

Valid Range: -100.0% to 100.0%

Default Setting: 0.0%

Color Balance - Cr

Adjusts the amount of the Y-R component in the processed video.

Valid Range: -100.0% to 100.0%

Default Setting: 0.0%

Video AGC

Enables or disables Automatic Gain Control (AGC) for the composite input.

Valid Settings: Disable, Enable

Default Setting: Disable

Related Setting: AGC Bias

AGC Bias

Biases the video AGC targeting. Normally, the AGC targets the sync tip at -40 IRE, which would result in white at 100 IRE. There are situations where it may be desirable to adjust the targeting (for example, to boost the signal before distribution over an exceptionally long cable run); this setting provides that adjustment.

Valid Range: -16 to 16

Default Setting: 0

Related Setting: Video AGC

Input H-Position

Adjusts the Y/C horizontal delay (and thus horizontal position) applied to the input video signal.

Valid Range: -592 ns to 518 ns

Default Setting: 0 ns

Input Y/C Delay

Adjusts the Y/C vertical delay applied to the input video signal.

Valid Range: -1185 ns to 1111 ns

Default Setting: 0 ns

Sync Mode

Specifies whether or not the composite input signal is to be time base corrected by the unit's TBC circuitry.

Valid Settings: Synch, TBC, AutoSwitch

Default Setting: AutoSwitch

In *Synch* mode, the internal TBC is not active, and the *TBC* indicator on the front of the unit will be off. The composite input must be a stable, RS-170A signal (such as a satellite or live camera feed).

In *TBC* mode, generally for heterodyned signals from sources such as a VTR, the unit will time base correct the composite input signal. The *TBC* indicator on the front of the unit will be on.

In *Auto-Switch* mode, the unit will sense the incoming composite video signal and select between *Synch* and *TBC* modes automatically as required. In this mode, the *TBC* indicator will flash when the TBC is active.

The TBC is always used for S-Video input, independent of this setting.

3D Comb Decoder

Configures the operation of DPS' proprietary 12-bit adaptive 3-dimensional comb filter decoder. This option selects between adaptive 2D and adaptive 3D combing, and for 3D combing, whether to comb luminance, chroma, or both. 3D combing combines information from previous frames in order to cancel eliminate residual subcarrier artifacts such as cross luminance and cross chroma.

3D combing can be utilized even for non-composite input signals. For example, if the component input video source was decoded from composite by a less sophisticated decoder, the 3D comb filter in the DPS-475/575 can be used to clean up the signal and remove cross luminance and chroma artifacts.

Valid Settings: Disable, Luma, Chroma, Both Y+C

Default Setting: Both Y+C (525-line mode)
Luma (625-line mode)

Related Settings: Temporal NR-Luma, Temporal NR-Chroma, 3D Chroma Motion Bias

When set to *Disable*, 3D combing is disabled; adaptive 2D combing is used.

The *Luma* and *Chroma* settings enable 3D adaptive combing on luminance and chrominance, respectively, while *Both Y+C* enables 3D adaptive combing on both.

Under normal circumstances, *Both Y+C* will be the desirable 3D combing mode. It is not possible, however, to use both Temporal Noise Reduction and 3D combing on the same channel simultaneously. (For example, if *Temporal NR-Luma* is enabled, 3D combing of luminance is not possible, so the 3D comb decoder must be disabled or set to *Chroma*.) This is not a problem; with a sufficient Temporal Noise Reduction setting, there would be no benefit to using the 3D comb filter simultaneously.

Setting this option to *Luma* or *Both Y+C* automatically disables *Temporal NR-Luma* (sets it to *3D Comb* mode). Similarly, setting this option to *Chroma* or *Both Y+C* automatically disables *Temporal NR-Chroma* (sets it to *3D Comb* mode).

This setting will be automatically changed accordingly (disabling 3D combing on luminance and/or chrominance) when *Temporal NR-Chroma* and/or *Temporal NR-Luma* are enabled by the user.

See Chapter 8, "Menus: Noise Reduction" for more information on the Temporal Noise Reduction settings.

3D Chroma Motion Bias

Adjusts the algorithm of the adaptive 3D comb decoder to compensate for high-motion, color-intensive footage.

Valid Settings: Low, Normal, High, Extreme

Default Setting: Normal (525-line mode)
Low (625-line mode)

Related Setting: 3D Comb Decoder, Comb Decoder

The *Normal* setting should be ideal for most applications. If chroma lag is visible in footage that contains color-intensive, high-speed motion, the *Low* setting should be used. The *High* and *Extreme* settings may be useful when processing images with little or no motion, to provide the highest level of cross-color reduction .

Comb Decoder

Selects the mode of the comb filter decoder, between notch filtering and adaptive combing.

Valid Settings: Notch, Adaptive

Default Setting: Adaptive

Related Setting: 3D Comb Decoder, 3D Chroma Motion Bias

The *3D Comb Decoder* option detailed earlier in this section specifies whether adaptive combing will be 2D or 3D.

DigiDuplex Mode

Enables or disables DigiDuplex mode. When enabled, the *DigiDuplex* indicator on the front panel is lit, and the unit's SDI video input is routed to all analog video outputs, while the selected analog video input is simultaneously synchronized and sent to the SDI output. With an audio-equipped unit, conversion between digital and analog audio is handled in similar fashion, simultaneously with the video.

Valid Settings: Disable, Enable

Default Setting: Disable

Related Settings: DDPlex Gain-R, DDPlex Gain-L, Digiduplex Input, DDPlex AES/EBU Out (*all in* Audio Setup *menu*)

The video input selection front-panel controls and menu option specify the analog video input which will be synchronized and sent to the SDI output. Thus, *SDI* is not a valid video input selection while in DigiDuplex mode. If the user enables DigiDuplex mode while the currently selected video input is *SDI*, the video input selection will automatically be changed to *Composite*.

The audio input selection front-panel controls and menu option specify the audio input (analog, AES/EBU, SDI, Test Tones, or Mute) which will be synchronized and sent to the digital audio outputs (SDI Embedded and/or AES/EBU). Note that in DigiDuplex mode, audio input selection for channels 1 and 2 are locked together, and must have the same input format. The *Digiduplex Input* option of the Audio Setup menu determines which digital input (AES/EBU or SDI) will be fed to the analog outputs. Audio configuration for DigiDuplex mode is controlled through the Audio Setup menu (see Chapter 6, "Menus: Audio Setup").

DigiDuplex mode cannot be enabled when the *Dolby-E (Data) Mode* is enabled in the Audio Setup menu. If DigiDuplex mode is already enabled, it will be automatically disabled if *Dolby-E (Data) Mode* is then turned on in the Audio Setup menu.

See Appendix E, "DigiDuplex Mode", for a detailed explanation of DigiDuplex mode and its settings.

Self Setup to Bars

Activates Automatic Proc Amp Setup ("Gimme Bars") mode, in which the luminance gain, black level, chrominance gain and hue can all be automatically set by the unit based on incoming SMPTE bars.

To use the "Gimme Bars" automatic setup mode, SMPTE bars (or other 75% bars) must be supplied to the currently selected video input when this option is selected. The four proc amp parameters will be automatically adjusted.

This is equivalent to pressing and holding the *Luma* front-panel button.

More Video Settings

Hot Switch

Specifies what the unit will do when the selected input video signal is lost.

Valid Settings: Off, Freeze, To Black, To Tr. Slide, Goto Comp, Goto S-Video, Goto CAV, Goto SDI

Default Setting: Off

Related Settings: Hot Switch Delay, Trouble File

When this setting is *Off*, no action will be taken when the input video signal is lost.

In *Freeze* mode, the outputs will hold the last good field of the input video signal.

In *To Black* mode, when the input video signal is lost, the outputs will hold the last good field of the input video signal for the time specified in *Hot Switch Delay*, after which the outputs will fade to black.

In *To Slide* mode, when the input video signal is lost, the outputs will hold the last good field of the input video signal for the time specified in *Hot Switch Delay*, after which the outputs will fade to a user-specified trouble slide. The trouble slide to be displayed is selected in the *Trouble File* option documented later in this section.

When this option is set to *Goto Comp, Goto S-Video, Goto CAV,* or *Goto SDI*, the unit will switch to the specified video input (composite, S-video, component, or SDI, respectively) when the input video signal is lost. Once this has happened, the video input selection will NOT switch back to the original video input once video is restored; it must be manually reset.

Hot Switch Delay

Specifies the length of time, after the input video signal is lost, that the outputs will hold the last good field of the input video signal before fading to black or a trouble slide (as specified in the *Hot Switch* option).

Valid Range: 10 fields to 3600 fields

Default Setting: 120 fields

Related Setting: Hot Switch

Trouble Slide

Enables or disables the output of the currently selected trouble slide.

Valid Settings: Disable, Enable

Default Setting: Disable

Related Setting: Trouble File

Enabling *Trouble Slide* immediately sends the currently selected trouble slide to all video outputs. The trouble slide to be displayed is selected in the *Trouble File* option documented later in this section.

Trouble File

Selects the image to be output when the trouble slide display is enabled (either manually, by GPI trigger, or by the *Hot Switch* option).

Valid Settings: <list of test patterns>

Default Setting: <default>

Related Setting: Trouble Slide, Hot Switch

When this option is selected, the display panel shows a list of available images, and indicates which one is currently selected (*active*). The currently selected image is changed by scrolling through the list with the control knob, and pressing the *Enter* key to select the desired file. The file will be loaded, and you will be returned to the Video Setup menu. This does *not* activate the trouble slide; it simply loads the file into memory. If the trouble slide output is already enabled when a new image is selected, the output will be switched to the new image.

These images could have been uploaded to the unit from a PC or grabbed from video from the TSG/Image Grabbing menu. See Appendix D, “The Uploader Software” or Appendix F, “Ethernet Control”, for instructions on uploading new images to the unit, and Chapter 11, “Menus: TSG/Image Grabbing,” for instructions on grabbing images from video.

A standard trouble slide, named <*default*>, is always selectable from this list, and consists of Full Field Bars (NTSC) or EBU Bars (PAL) behind the Source ID text specified in *Source ID* option of the System Config menu.

Freeze Mode

Selects which freeze mode will be applied to the incoming video. The selected mode is activated by the *Take* button on the front panel of the unit.

Valid Settings: Frame, Field, Strobe, Film

Default Setting: Field

Related Settings: Field Select, Strobe Rate, Mute in Freeze

Frame mode freezes an entire frame of the incoming video.

Field mode freezes a single field of the incoming video; which field will be frozen is set in the *Field Select* menu option.

Strobe mode strobes the incoming video; the strobe rate is set in the *Strobe Rate* menu option.

Film mode applies a 3:2 pulldown to the incoming video, effectively giving 24fps output from the video input.

The *Mute In Freeze* audio menu option (see Chapter 6, "Menus: Audio Setup") specifies whether or not audio output will be muted while the video is frozen in *Frame* or *Field* mode.

Field Select

Selects which field of the incoming video will be frozen when Field Freeze Mode is activated.

Valid Settings: 1, 2, 3, 4

Default Setting: 1

Related Settings: Freeze Mode

Strobe Rate

Selects the strobe rate (number of frames per update) applied to the incoming video when Strobe Freeze Mode is activated.

Valid Range: 1 frame to 255 frames

Default Setting: 10 frames

Related Settings: Freeze Mode

Input Source

Selects which video input source is active.

Valid Settings: Composite, S-Video, Component, SDI, DV*, Option*

Default Setting: Composite

* DV and Option settings will only be available if the corresponding hardware module is installed.

The corresponding video input indicator light on the front panel will turn on to match the selection. If no input signal is present on the selected video input, the corresponding indicator light will flash.

Test Signal Out

Enables or disables the Test Signal Generator.

Valid Settings: Disable, Enable

Default Setting: Disable

Related Setting: TSG

Enabling *Test Signal Out* activates the Test Signal Generator, sending the currently selected test pattern to all video outputs. The test pattern to be displayed is selected in the *TSG* option documented later in this section.

The Test Signal Generator can also be enabled and disabled using the *TSG* key on the front panel of the unit.

When TSG mode is active, the light on the *TSG* button flashes.

TSG

Selects the test pattern to be output when the Test Signal Generator is enabled.

Valid Settings: <list of test patterns>

Default Setting: this option has no default setting

Related Setting: Test Signal Out

When this option is selected, the display panel shows a list of available test patterns, and indicates which one is currently selected (*active*). The current pattern is changed by scrolling through the list with the control knob, and pressing the *Enter* key to select a new pattern.

The list will include all built-in test patterns, and additional test patterns uploaded to the unit by the user or grabbed from video. See Appendix B, "Test Signals," for a list of built-in test patterns. The *Source ID Slide* test pattern consists of Full Field Bars behind the Source ID text specified in *Source ID* option of the System Config menu. See Appendix D, "The Uploader Software" or Appendix F, "Ethernet Control", for instructions on uploading new test patterns to the unit, and Chapter 11, "Menus: TSG/Image Grabbing," for instructions on grabbing test signals from video. If the Test Signal Generator is enabled when a new test pattern is selected, that pattern will automatically be loaded, and the output switched to the new pattern.

Output Burst

Controls whether or not color burst will be provided in the output video signal.

Valid Settings: Auto-Yes, Auto-No, Force-Yes, Force-No

Default Setting: Force-Yes

When *Force-Yes* is selected, chroma burst will be provided in the output signal irrespective of whether it is present in the input signal.

When *Force-No* is selected, chroma burst will *not* be provided in the output signal irrespective of whether it is present in the input signal.

When *Auto-Yes* is first selected, chroma burst will initially be provided in the output signal irrespective of whether it is present in the input signal; when the input signal subsequently changes, the provision of chroma burst will automatically follow the input signal (chroma burst will be provided in the output if and only if it is present in the input).

When *Auto-No* is first selected, chroma burst will initially *not* be provided in the output signal, irrespective of whether it is present in the input signal; when the input signal subsequently changes, the provision of chroma burst will automatically follow the input signal (chroma burst will be provided in the output if and only if it is present in the input).

SDI Clip

Enables or disables the black clip level of the SDI video outputs.

Valid Settings: Yes, No

Default Setting: No

When this option is set to *Yes*, all levels below black (digital level 64) are clipped in the SDI output; when set to *No*, digital levels below 64 are allowed.

EDH Detection

Enables or disables the Error Detection Handling (EDH) polling for the SDI data stream.

Valid Settings: Off, Poll On

Default Setting: Off

Related Setting: EDH Error Count

When this setting is off, EDH errors are neither detected nor reported, and the *EDH* indicator on the front panel is off.

When this option is set to *Poll On*, EDH errors are detected, and the *EDH* indicator will flash when EDH errors have been detected.

The actual count of EDH errors is reported in the *EDH Error Count* option detailed later in this section.

EDH Error Count

Reports the count of EDH errors detected when *EDH Detection* (detailed earlier in this section) is enabled. Turning the control knob clears the count.

Clamp Speed

Specifies the input video clamp speed.

Valid Settings: Normal, Fast

Default Setting: Normal

This option is only applicable when the selected input video source is *Composite* or *Component*.

Normal sets the input video clamp to a 30-line time constant; *Fast* sets the input video clamp to a 3-line time constant

Aux Output

Specifies whether the Auxiliary Red, Green, Blue, and Sync connections on the Multi-I/O breakout cable will provide key channel output, or RGB(S) output.

Valid Settings: Main, Key

Default Setting: Main

Related Setting: Aux Sync/Comp, Aux Sync Level

When *Main* is selected, the *Aux Red*, *Aux Blue*, and *Aux Green* connections will provide RGB output; the *Aux Sync* connection will provide sync (thus forming RGB-S output) or an additional composite output, depending on the current setting of the *Aux Sync/Comp* option detailed later in this section.

When *Key* is selected, the *Aux Red*, *Aux Blue*, *Aux Green* and *Aux Sync* connections will provide key channel output (for routing to an external keyer), irrespective of the current setting of the *Aux Sync/Comp* option.

Aux Sync/Comp

Specifies whether the *Aux Sync* connections on the Multi-I/O breakout cable will provide sync or composite output.

Valid Settings: RGB+Comp, RGB+Sync

Default Setting: RGB+Comp

Related Setting: Aux Output, Aux Sync Level

When *RGB+Sync* is selected, the *Aux Sync* connection will provide sync, which in combination with the *Aux Red*, *Aux Blue*, and *Aux Green* connections forms RGB-S output.

When *RGB+Comp* is selected, the *Aux Sync* connection will provide composite output, while the *Aux Red*, *Aux Blue*, and *Aux Green* connections form RGB output.

This setting is ignored when the *Aux Output* option detailed earlier in this section is set to *Key*.

Aux Sync Level

Selects the level of the *Aux Sync* connection.

Valid Settings: 300mv, 8v

Default Setting: 300mv

CAV-Y Composite

Enables the use of the component analog video input's Y input as a second composite input source, instead of for component video.

Valid Settings: Disable, Enable

Default Setting: Disable

When this option is enabled, the *CAV-Y In* connection on the rear of the unit functions as a second composite video input. This input is then selected as *CAV* from the front-panel controls or *Component* from the *Input Source* option of the Video Setup menu.

When this option is disabled, the *CAV-Y In* connection functions as normal, as the luminance input for component video input.

Note that the unit will have been calibrated based on the *CAV-Y In* connection being used for component analog video. If the connection is to be used for composite video, a minor adjustment of trimpot IRV2 (CAV-Y) may optionally be desired to attain perfect video level match between inputs.

Analog Width

Specifies the number of "samples" per video line. A standard analog NTSC signal consists of 704 "samples" per line; setting this option to 720 (common for digital signals) allows information to be stored outside of the normal NTSC width, but may cause problems with some equipment.

Valid Settings: Normal (704), Digital (720)

Default Setting: Normal (704)

Chroma Pairing Filter *[DPS-575 Only]*

Controls the degree of filtering of chroma line pairing artifacts. This option is only available in 625-line mode [PAL], and is only active when the unit's TBC is active. This option has no effect when the unit is in 525-line mode or the TBC is not in use.

Valid Settings: Off, Norm, Max

Default Setting: Norm

The *Norm* setting should be ideal for most situations, while the *Max* setting should be used in cases of severe chroma line pairing artifacting.

NOTE: Users familiar with the DPS-470 (the predecessor to the DPS-475 and DPS-575) may notice that the SDI Edge Insertion option available on the DPS-470 is not configurable on the DPS-475/575. SDI Edge Insertion *is* present in the DPS-475/575, and is always enabled. "Blanking-to-setup" level transitions are dynamically added by the unit based on the current input video signal levels. If the input signal lacks setup (for example, super-black), no unnecessary transitions are generated. If the input signal has setup, correctly shaped edges are added to conform with RS-170A specifications (140ns rise time).

CHAPTER 6: MENUS: AUDIO SETUP

Channel 1 Only, Channel 2 Only, Both Channels

The *Channel 1 Only* and *Channel 2 Only* sub-menus of the *Audio Setup* menu contain the same option settings, and differ only in which channel the settings affect. For example, the *Channel 1 Only* sub-menu contains the option *Ch1-Input*, while the *Channel 2 Only* sub-menu contains the option *Ch2-Input*. These perform the same function, selecting the audio input, for their respective channels. The functions of these options will be documented only once each below (following the example above, as *Input*). The *Both Channels* sub-menu is simply a concatenation of the *Channel 1 Only* and *Channel 2 Only* sub-menus, allowing you access to options for each channel from a single menu.

These settings affect the channel specified in the prefix of the option, *Ch1* or *Ch2*, in the audio menus.

Input

Selects which audio input source is active.

Valid Settings: Analog, AES/EBU, SDI, DV*, Option*, Mute, Test Tones

Default Setting: Analog

Related Setting: 96 kHz AES Output

* DV and Option settings will only be available if the corresponding hardware module is installed.

Mute disables audio output; *Test Tones* outputs audio test tones from the unit. The parameters of the test tones (Level, Frequency) are set in the *Tone Level*, *Test Freq-L*, and *Test Freq-R* options detailed later in this section.

If *AFV (Audio-Follows-Video)* mode is enabled, changing the *Input* setting performs a one-time override of AFV mode; the next time the video input selection is changed, the audio will again follow it.

The *Input* selection for channels 1 and 2 cannot be selected independently if *96 kHz AES Output* mode (detailed later in this chapter) is enabled; they must then always be set to the same input source.

When *Dolby-E (Data) Mode* is enabled (see Chapter 6, “Menus: Audio Setup”), the audio input selection for channel 1 is locked to AES/EBU, and only this channel supports Dolby-E data. SDI Embedded Audio cannot be used while in this mode.

Analog Bypass

Toggles between bypassing and processing the analog audio inputs.

Valid Settings: Process, Bypass

Default Setting: Process

Process mode is the normal mode of operation. In Bypass mode, no processing is applied to the analog audio inputs; they are bypassed directly to the analog audio outputs.

The analog audio input is also bypassed when the power to the unit is off.

This setting is overridden by the master *Bypass* key on the front panel of the unit, and the *Function Bypass* option in the System Config menu. If either is used to select the master Bypass mode, the analog audio input will be bypassed regardless of the setting of this option.

AES/EBU

Toggles between bypassing and processing the AES/EBU audio inputs.

Valid Settings: Process, Bypass

Default Setting: Process

Process mode is the normal mode of operation. In Bypass mode, no processing is applied to the AES/EBU audio inputs; they are bypassed directly to the AES/EBU audio outputs.

The AES/EBU audio input is also bypassed when the power to the unit is off.

This setting is overridden by the master *Bypass* key on the front panel of the unit, and the *Function Bypass* option in the System Config menu. If either is used to select the master Bypass mode, the analog audio input will be bypassed regardless of the setting of this option.

Gain-R

Adjusts the right output audio gain.

Valid Range: -20.0 dB to 20.0 dB

Default Setting: 0.0 dB

When *Dolby-E (Data) Mode* (detailed later in this chapter) is enabled , this setting is forced to unity (0.0 dB) for channel 1.

Gain-L

Adjusts the left output audio gain.

Valid Range: -20.0 dB to 20.0 dB

Default Setting: 0.0 dB

When *Dolby-E (Data) Mode* (detailed later in this chapter) is enabled , this setting is forced to unity (0.0 dB) for channel 1.

DDPlex Gain-R

Adjusts the right audio gain for DigiDuplex mode. This setting will not be available when DigiDuplex mode is not enabled.

Valid Range: -20.0 dB to 20.0 dB

Default Setting: 0.0 dB

Related Setting: DigiDuplex Mode (Video Setup menu)

DDPlex Gain-L

Adjusts the left audio gain for DigiDuplex mode. This setting will not be available when DigiDuplex mode is not enabled.

Valid Range: -20.0 dB to 20.0 dB

Default Setting: 0.0 dB

Related Setting: DigiDuplex Mode (Video Setup menu)

Fixed Delay

Specifies the fixed delay to be added to the audio stream. The valid fixed delay range is dependent on the currently selected *Sample Rate*.

Valid Range: 0.00 ms to 867.52 ms (96 kHz sample rate)*
0.00 ms to 1735.05 ms (48 kHz sample rate)
0.00 ms to 1892.78 ms (44.1 kHz sample rate)
0.00 ms to 2602.58 ms (32 kHz sample rate)

Default Setting: 0.00 ms

Related Setting: Auto Track, Pitch Change, Sample Rate, 96kHz AES/EBU Output

* The 96kHz sample rate is used when the audio *Input* selection is set to AES/EBU and the *96kHz AES/EBU Output* option (detailed later in this chapter) is enabled. If the audio *Input* selection is set to anything other than AES/EBU and the *96kHz AES/EBU Output* option is enabled, the 48 kHz sample rate is used (but AES/EBU Output is still 96kHz).

When *Auto Track* is enabled, the total audio delay will be the sum of the fixed delay specified here, and the amount of *Auto Track* delay (the automatic delay of the audio data to match the delay of the video data through the synchronizer).

In Op. Level-R

Selects the right input operating level for the analog audio input.

Valid Settings: +8 dBu, +4 dBu, 0 dBu, -4 dBu, -10 dBu

Default Setting: 0 dBu

Related Setting: Headroom-R

* The clipping level of the DPS-475/575 is +24 dBu. Hence, the sum of this setting and *Headroom-R* cannot exceed +24 dBu. If this setting is changed, and the change would cause the +24 dBu maximum to be exceeded, *Headroom-R* will automatically be adjusted.

In Op. Level-L

Selects the left input operating level for the analog audio input.

Valid Settings: +8 dBu, +4 dBu, 0 dBu, -4 dBu, -10 dBu

Default Setting: 0 dBu

Related Setting: Headroom-L

* The clipping level of the DPS-475/575 is +24 dBu. Hence, the sum of this setting and *Headroom-L* cannot exceed +24 dBu. If this setting is changed, and the change would cause the +24 dBu maximum to be exceeded, *Headroom-L* will automatically be adjusted.

Headroom-R

Specifies the right headroom -- the level between the input operating level (*In Op. Level-R*) and the maximum input level (at which clipping may occur).

Valid Range: 0.0 dB to (24.0 - *In Op. Level-R*) dB *

Default Setting: 18.0 dB

Related Setting: In Op. Level-R

* The clipping level of the DPS-475/575 is +24 dBu. Hence, the sum of this headroom setting and *In Op. Level-R* cannot exceed +24 dBu; the unit will not allow a headroom setting that will exceed this maximum. If *In Op. Level-R* is changed, and the change would cause the +24 dBu maximum to be exceeded, this setting will automatically be adjusted.

Headroom-L

Specifies the left headroom -- the level between the input operating level (*In Op. Level-L*) and the maximum input level (at which clipping may occur).

Valid Range: 0.0 dB to (24.0 - *In Op. Level-L*) dB *

Default Setting: 18.0 dB

Related Setting: In Op. Level-L

* The clipping level of the DPS-475/575 is +24 dBu. Hence, the sum of this headroom setting and *In Op. Level-L* cannot exceed +24 dBu; the unit will not allow a headroom setting that will exceed this maximum. If *In Op. Level-L* is changed, and the change would cause the +24 dBu maximum to be exceeded, this setting will automatically be adjusted.

Out Op. Level-R

Selects the right output operating level for the analog audio outputs.

Valid Settings: +8 dBu, +4 dBu, 0 dBu, -4 dBu, -10 dBu

Default Setting: 0 dBu

Out Op. Level-L

Selects the left output operating level for the analog audio outputs.

Valid Settings: +8 dBu, +4 dBu, 0 dBu, -4 dBu, -10 dBu

Default Setting: 0 dBu

Tone Level

Selects the output level of audio test tones.

Valid Range: -38.0 dBFS to 0.0 dBFS

Default Setting: -18.0 dBFS

Audio test tones are generated by the unit when Test Tones are selected as the audio input source from the front panel controls or the *Input* option of the Audio Setup menu.

Test Freq-L

Selects the frequency of the left audio test tone. The maximum selectable test tone frequency is dependent on the currently selected *Sample Rate*.

Valid Range: 100 Hz to 21.5 kHz (48 kHz sample rate)
100 Hz to 20.0 kHz (44.1 kHz sample rate)
100 Hz to 14.5 kHz (32 kHz sample rate)

Default Setting: 1000 Hz (channel 1)
2000 Hz (channel 2)

Related Setting: Sample Rate

Test Freq-R

Selects the frequency of the right audio test tone. The maximum selectable test tone frequency is dependent on the currently selected *Sample Rate*.

Valid Range: 100 Hz to 21.5 kHz (48 kHz sample rate)
100 Hz to 20.0 kHz (44.1 kHz sample rate)
100 Hz to 14.5 kHz (32 kHz sample rate)

Default Setting: 2500 Hz (channel 1)
3000 Hz (channel 2)

Related Setting: Sample Rate

Balanced

Specifies whether the analog audio inputs are balanced (Yes) or unbalanced.

Valid Settings: Yes, No

Default Setting: Yes

Termination

Sets the analog input termination to 600Ω (600R) or high-impedence (High-Z).

Valid Settings: 600R, High-Z

Default Setting: High-Z

Stereo Mode

Selects which stereo mode will be used for the configuration of the left and right outputs of the channel.

Valid Settings: Mono Sum, Stereo, Swap L-R, Mono-L, Mono-R, Mute-L, Mute-R

Default Setting: Stereo

In *Mono Sum* mode, both the left and right output are comprised of the sum of the left and right inputs, divided by 2 (i.e. (L+R)/2).

Stereo mode routes the left input to the left output, and right input to the right output.

In *Mono-L* mode, the left input is routed to both outputs.

In *Mono-R* mode, the right input is routed to both outputs.

In *Swap L-R* mode, the left and right inputs are reversed to the outputs. That is, the left output is routed from the right input, and vice versa.

Mute-L mode routes the right input to the right output, and mutes the left output.

Mute-R mode routes the left input to the left output, and mutes the right output.

Phase Invert L

When enabled, this mode phase-shifts the left channel by 180° to compensate for incorrect wiring (+ and - reversed) in either the left or right of balanced analog audio connections.

Valid Settings: Off, On

Default Setting: Off

SDI In

Selects which two channels of SDI Embedded audio will be used from the incoming SDI video input.

Valid Settings: Ch 1-2, Ch 3-4, Ch 5-6, Ch 7-8, Ch 9-10, Ch 11-12, Ch 13-14, Ch 15-16

Default Setting: Ch 1-2 (for DPS-475/575 Audio Channel 1)
Ch 3-4 (for DPS-475/575 Audio Channel 2)

Aud Follows Vid

Enables or disables AFV (Audio-Follows-Video) mode. In this mode, each of the selectable video inputs has an audio input selection linked to it. Whenever the video input selection is changed, the audio input selection for the channel automatically changes correspondingly.

Valid Settings: Off, On

Default Setting: Off

Related Settings: AFV-Composite, AFV-SVideo, AFV-CAV, AFV-SDI, AFV-DV, AFV-Option

- AFV mode can be overridden by manually selecting a different audio input (from the front panel or with the *Input* audio menu selection) when AFV is enabled. This does not, however, turn AFV mode off; the next time the video input selection is changed, the audio will again follow it. AFV mode can only be disabled through this setting.
- When AFV mode is enabled, the AFV indicator for the channel on the front panel of the unit will be lit.

The AFV link to each of the video inputs is set through the *AFV-Composite, AFV-SVideo, AFV-CAV, AFV-SDI, AFV-DV,* and *AFV-Option* menu options described later in this chapter.

AFV-Composite, AFV-SVideo, AFV-CAV, AFV-SDI, AFV-DV, AFV-Option

The AFV-<*format*> options specify which audio input the channel will automatically switch to when the video input selection is changed to that video <*format*>. (For example, the *AFV-SDI* option specifies which audio input will be switched to when the video input selection is changed to *SDI*).

Valid Settings: Off, Analog, AES-EBU, SDI, DV*, Option*, Mute, Test Tones, Chan 1 *or* Chan 2

Default Setting: Analog

Related Setting: Aud Follows Vid

* DV and Option settings will only be available if the corresponding hardware module is installed.

If this option is set to *Off*, the audio input selection will NOT change when the video input selection is changed to the specified format; it will remain at its current selection.

Mute disables audio output; *Test Tones* outputs audio test tones from the unit. The parameters of the test tones (Level, Frequency) are set in the *Tone Level*, *Test Freq-L*, and *Test Freq-R* options detailed earlier in this section.

When this option is being set for channel 1, *Chan 2* will be listed as an option; when this is selected, the audio input selection for channel 1 will switch to match that of channel 2 when the video input selection is changed to the specified format. When this option is being set for channel 2, *Chan 1* will be listed as an option; when this is selected, the audio input selection for channel 2 will switch to match that of channel 1 when the video input selection is changed to the specified format. This overrides the swapping of channels with the *Channel In->Out* option.

For example, if *AFV-Composite* is set to *Analog*, the audio input selection for this channel will automatically switch to *Analog* when the video input selection is changed to *Composite*.

These settings are ignored when AFV (Audio-Follows-Video) mode is disabled (i.e. *Aud Follows Vid* is set to Off).

Global Audio Config

The settings in the *Global Audio Config* sub-menu affect BOTH audio Channel 1 and Channel 2 of the DPS-475 and DPS-575.

Auto Track

Enables or disables audio Auto Track mode. When *Auto Track* is enabled, the unit will automatically delay the audio data to match the delay of the video data through the synchronizer (up to 4 fields).

Valid Settings: Off, On

Default Setting: On

Related Setting: Fixed Delay, Pitch Change

Note that the total audio delay will be the sum of the *Auto Track* delay, and any delay specified in the *Fixed Delay* option detailed earlier in this chapter.

The *Autotrack* indicator on the front panel of the unit will be lit when this option is enabled.

Master Mute

When enabled, this option mutes all of the audio output channels.

Valid Settings: Off, On

Default Setting: Off

Audio Bypass

Toggles between bypassing and processing the analog and AES/EBU audio inputs.

Valid Settings: Process, Bypass

Default Setting: Process

Process mode is the normal mode of operation. In Bypass mode, no processing is applied to the analog and AES/EBU audio inputs; they are bypassed directly to the outputs.

The analog and AES/EBU audio inputs are also bypassed when the power to the unit is off.

This setting is overridden by the master *Bypass* key on the front panel of the unit. If the front panel is used to select the master Bypass mode, the analog and AES/EBU audio inputs will be bypassed regardless of the setting of this option.

AES Data Grade

Specifies the AES/EBU grade as either professional or consumer, which affects how the channel status bits in the AES data stream are handled.

Valid Settings: Pro, Consumer

Default Setting: Pro

AES Elec. Levels

Specifies the AES/EBU electrical levels as either AES or S/PDIF.

Valid Settings: AES, SPDIF

Default Setting: AES

Related Setting: AES Data Grade

The *AES Data Grade* option may need to be changed in conjunction with this setting to properly process certain AES data streams.

AES Source

Specifies whether the BNC or XLR connections on the optional 774-470 AES/EBU Audio Breakout Cable are used for AES/EBU input.

Valid Settings: BNC, XLR

Default Setting: BNC

96kHz AES Output

Enables or disables 96 kHz AES/EBU output mode.

Valid Settings: Disable, Enable

Default Setting: Disable

Related Setting: Sample Rate, Input, Fixed Delay

A number of restrictions apply when this option is enabled:

- The *Sample Rate* setting is forced to 48 kHz.
- The audio *Input* source for channels 1 and 2 cannot be selected independently; they must always be the same input source.
- If the audio *Input* selection is set to AES/EBU, the system will use a 96 kHz sampling rate, thus providing 96 kHz input *and* output. While using this 96 kHz sampling rate, only AES/EBU outputs are active; all other outputs are muted. The use of the 96 kHz sampling rate results in the maximum valid value of the *Fixed Delay* option (detailed earlier in this chapter) being reduced.
- If the audio *Input* selection is set to anything other than AES/EBU, the system will use the 48 kHz sampling rate, and up-sample to 96 kHz for the AES/EBU output. All other outputs remain at 48 kHz.

Digiduplex Input

Specifies which digital audio input source (SDI Embedded or AES/EBU) will be transcoded to the analog audio outputs when the unit is in DigiDuplex mode. If the *DDPlex AES/EBU* Out option is set to *Transcode*, this is also the source that will be fed to the AES/EBU outputs.

Valid Settings: SDI, AES-EBU

Default Setting: SDI

Related Setting: DigiDuplex Mode (Video Setup menu), DDPlex AES/EBU Out

See Appendix E, “DigiDuplex Mode”, for a detailed explanation of DigiDuplex mode and its settings.

DDPlex AES/EBU Out

Specifies the source for the AES/EBU outputs when the unit is in DigiDuplex mode.

Valid Settings: Transcode, Sync

Default Setting: Sync

Related Setting: DigiDuplex Input, DigiDuplex Mode (Video Setup menu)

When this option is set to *Transcode*, the source of the AES/EBU outputs in DigiDuplex mode is the digital audio input which has gone through the transcoder, and is also being sent to the analog outputs. This input could be either SDI Embedded or AES/EBU audio, determined by the *DigiDuplex Input* setting detailed earlier in this section.

When this option is set to *Sync*, the source of the AES/EBU outputs in DigiDuplex mode is the selected audio input which has gone through the synchronizer.

CAUTION: If this option is set to *Transcode*, and the *SDI Embedding* option has been disabled (thus disabling the embedding of audio into the SDI stream), the selected audio input which has gone through the synchronizer will not be present on any of the audio outputs.

See Appendix E, "DigiDuplex Mode", for a detailed explanation of DigiDuplex mode and its settings.

SDI Out

Selects which four channels of the SDI video output the unit's four audio streams (left and right of channels 1 and 2) will be embedded into. This setting will be ignored if the *SDI Embedding* option is off.

Valid Settings: Ch 1-4, Ch 5-8, Ch 9-12, Ch 13-16

Default Setting: Ch 1-4

Related Setting: SDI Embedding

Channel In->Out

Configures the routing of the input and output channels of the unit. The output channels (1 and 2) can be swapped, or one input channel can be routed to both output channels.

Valid Settings: 1-1 / 2-2, 1-1 / 1-2, 2-1 / 2-2, 1-2 / 2-1

Default Setting: 1-1 / 2-2

Related Setting: Aud Follows Vid

1-1 / 2-2 routes input channel 1 to output channel 1, and input channel 2 to output channel 2.

1-1 / 1-2 routes input channel 1 to both output channels.

2-1 / 2-2 routes input channel 2 to both output channels.

1-2 / 2-2 routes input channel 1 to output channel 2, and input channel 2 to output channel 1, thus swapping the output channels.

When one input channel is being routed to both output channels, only that input channel's LED will be lit to indicate the audio input source.

This setting is overriden if *Aud Follows Vid* (detailed earlier in this chapter) is enabled, and the current video input source is AFV-linked to *Chan 1* or *Chan 2* (which will re-route the channel settings).

Sample Rate

Adjusts the sampling rate of the audio input.

Valid Settings: 48 kHz, 44.1 kHz, 32 kHz

Default Setting: 48 kHz

Related Settings: Test Freq-L, Test Freq-R, Fixed Delay, 96 kHz AES Output

As the SDI specification requires 48 kHz audio, this option must be set to 48 kHz for SDI audio embedding to work. If the sample rate is set to a value other than 48 kHz,

SDI and DV inputs will be converted to the specified sample rate (except in DigiDuplex mode), but SDI audio embedding will not function. The sample rate is forced to 48 kHz when *96kHz AES Output* mode (detailed earlier in this section) is enabled.

The *Sample Rate* setting affects the valid range of the *Test Freq-L*, *Test Freq-R*, and *Fixed Delay* options (detailed earlier in this chapter).

SDI Embedding

Enables or disables embedding of digital audio into the SDI data stream. When enabled, the channels of the SDI video output into which the audio is embedded are determined by the *SDI Out* option detailed earlier in this section.

Valid Settings: Off, On

Default Setting: On

Related Setting: SDI Out

NOTE: SDI embedded audio is not supported when the *Dolby-E (Data) Mode* (detailed later in this chapter) is enabled.

SDI L/R De-Embed

Selects between interpretations of the SDI specification for embedded audio, to compensate for variations in SDI audio implementation (how left and right are found in the data stream). This setting should be left at the default unless compatibility problems occur.

Valid Settings: Normal, Strict

Default Setting: Normal

Pitch Change

Controls the rate of frequency (pitch) change introduced by the system while delaying the audio.

Valid Settings: Fast, Normal, Slow

Default Setting: Normal

Related Settings: Auto Track, Fixed Delay

The *Slow* setting corresponds to 0.54% (1/64 tone) pitch change for *Auto Track* delay, and 6.67% for *Fixed Delay*.

The *Normal* setting corresponds to 1% pitch change for *Auto Track* delay, and 10% for *Fixed Delay*.

The *Fast* setting corresponds to 1.5% pitch change for *Auto Track* delay, and 20% for *Fixed Delay*.

Mute In Freeze

Specifies whether or not audio output should be muted when the incoming video is frozen in *Frame* or *Field* mode (see Chapter 5, “Menus: Video Setup”).

Valid Settings: On, Off

Default Setting: On

Related Settings: Freeze Mode (Video Setup menu)

Dolby-E (Data) Mode

Enables or disables Dolby-E (Data) mode, which allows Dolby-E compressed data streams to be routed through the DPS-475/575.

Valid Settings: Off, On

Default Setting: Off

A number of restrictions apply when this option is enabled:

- DigiDuplex mode cannot be enabled when the Dolby-E (Data) mode is enabled. If DigiDuplex mode is already enabled, it will be automatically disabled when *Dolby-E (Data) Mode* is turned on.
- The Dolby-E (Data) mode operates only on channel 1. When *Dolby-E (Data) Mode* is enabled, the audio input selection for channel 1 automatically switches to AES/EBU.
- When *Dolby-E (Data) Mode* is enabled, gain for channel 1 is forced to unity. That is, the *Ch1-Gain -R* and *Ch1-Gain-L* options (detailed earlier in this chapter) are automatically set to 0.0dB, and cannot be changed until Dolby-E (Data) mode is disabled.
- SDI embedded audio is not supported.

Voice-Over Pgm. Level

Specifies the amount to attenuate the program audio on input channel 1 when voice-over mixing is active.

Valid Range: -20.0 dB to 0.0 dB

Default Setting: -8 dB

Related Settings: Voice-Over Fade, Voice-Over

See the *Voice-Over* option detailed later in this section for a full explanation of voice-over mixing.

Voice-Over Fade

Specifies the duration over which the program audio on input channel 1 will be ramped down and up to and from the specified *Voice-Over Pgm. Level* when voice-over mixing is activated and deactivated.

Valid Range: 0.0 seconds to 5.0 seconds

Default Setting: 2.0 seconds

Related Settings: Voice-Over Pgm. Level, Voice-Over

See the *Voice-Over* option detailed later in this section for a full explanation of voice-over mixing.

Voice-Over

Activates and de-activates audio voice-over mixing.

Valid Settings: Off, Active

Default Setting: Off

Related Settings: Voice-Over Pgm. Level, Voice-Over Fade, GPI-1 Function, GPI-2 Function, GPO Function

Voice-over mixing in the DPS-475/575 allows the program audio on input channel 1 to be ramped down, mixed with voice-over audio on input channel 2, and ramped back up upon completion of the voice-over.

When *Voice-Over* is activated, the program audio on input channel 1 will immediately begin ramping down to the setting of the *Voice-Over Pgm. Level* option. The duration of the ramp-down is specified in the *Voice-Over Fade* option. The voice-over audio on channel 2 is muted during this ramp-down. Once the ramp-down is complete, the program audio on input channel 1 will be mixed with the voice-over audio on input channel 2. When the *Voice-Over* option is later set back to *Off* (upon completion of the voice-over), the voice-over audio on channel 2 is again muted, and the program audio on input channel 1 will begin ramping back up to its original level.

Note that the gain of the voice-over audio on channel 2 will not be automatically adjusted. It is recommended that the user adjust the gain of channel 2 using the *Gain-L* and *Gain-R* options detailed earlier in this chapter, to compensate for the averaging/mixing that is occuring between channels 1 and 2 during the voice-over. The recommended gain for the voice-over audio on channel 2 is -0.5 * the value specified in *Voice-Over Pgm. Level*. For example, if *Voice-Over Pgm. Level* is set to -6db, it is recommended that the user set *Gain-L* and *Gain-R* for channel 2 to 3db.

Voice-over mixing may be also be triggered through GPI control. When the *GPI-1 Function* or *GPI-2 Function* options (see Chapter 12, “Menus: System Config”) are set to *Voice-Over,* the unit’s audio voice-over mode will be activated by a GPI signal, exactly as if manually enabled. Voice-over mixing remains active while the GPI signal is present. Voice-over mixing is stopped and program audio begins ramping back up upon release of the GPI trigger, similar to setting *Voice-Over* back to *Off*.

When the *GPO Function* option of the System Config menu is set to *Voice-Over*, a GPI signal will be continuously output while the audio voice-over mixing is active. This signal will NOT be output during the fade-down and ramp-up of program audio that preceed and follow, respectively, voice-over mixing.

CHAPTER 7: MENUS: KEYER SETUP

The Keyer Setup Menu is used configure and control the unit's linear keyer and digital framestore. **Note that settings related to playback of animations (Repeat Count, Frame Rate, Loop Mode, Bumper Style) will only be available if the Animated Logo Option is installed. Without the Animated Logo Option, the keyer will be limited to the display and keying of still images.**

The Uploader Software is used to convert image and animation files into formats usable by the linear keyer, and upload them to the unit. **See the section "Field Ordering in Stills and Animations" in Appendix D, "The Uploader Software," for important information about field ordering in graphics and animation files to be used with the keyer.**

Fade Out

Fades out the key currently being applied to the video. The duration of the fade is determined by the *Fade Out Time* option in the Change Settings sub-menu of the Keyer Setup Menu. This is equivalent to pressing the *Keyer* button on the front panel of the unit while a key is currently applied and the Keyer Setup Menu is displayed. The light on the *Keyer* button will flash while the key is fading out.

Related Settings: Fade Out Time

Cut Out

Immediately removes (cuts) the key currently being applied to the video.

Fade In

Fades in the currently selected key image or animation. The duration of the fade is determined by the *Fade In Time* option in the Change Settings sub-menu of the Keyer Setup Menu. This is equivalent to pressing the *Keyer* button on the front panel of the unit while the Keyer Setup Menu is displayed.

If no key file has been previously selected, selecting the *Fade In* option will open the keyer's file selection list (equivalent to the *File* option of the Keyer Setup menu), from which you can select a file from among the still images and animations stored in the unit. These images could have been uploaded to the unit by the user (see Appendix D, "The Uploader Software" or Appendix F, "Ethernet Control") or grabbed from video from the TSG/Image Grabbing menu. (see Chapter 11, "Menus: TSG/Image Grabbing.")

The light on the *Keyer* button will flash while the key is fading in, and be lit while the key is being fully displayed.

Related Settings: Fade In Time, File

File

Selects the key image or animation to be displayed. Selecting the *File* option displays a list of all image and animation files stored in the unit. The image or animation to be keyed is selected by scrolling through the list with the control knob, and pressing the

Enter key to select the desired file. The file will be loaded, and you will be returned to the Keyer Setup menu. This does *not* activate the keyer; it simply loads the file into memory.

These images could have been uploaded to the unit from a PC or grabbed from video from the TSG/Image Grabbing menu. See Appendix D, "The Uploader Software" or Appendix F, "Ethernet Control", for instructions on uploading new images to the unit, and Chapter 11, "Menus: TSG/Image Grabbing," for instructions on grabbing images from video.

Settings

Selects a stored keyer settings profile. Selecting the *Settings* option displays a list of stored keyer settings profiles. The profile to be loaded is selected by scrolling through the list with the control knob, and pressing the *Enter* key to select the desired profile. In addition to profiles previously stored by the user, the factory default keyer settings can be recalled.

Related Settings: Change Settings

Change Settings

The Change Settings sub-menu provides configuration options determining how a key will be transitioned and displayed.

Shift X

Adjusts the horizontal position of the key over the incoming video. If the key is active (currently being displayed), it will be repositioned in real-time on the live outputs as this value is adjusted.

Valid Range: 0 pels to 718 pels

Default Setting: 0 pels

Shift Y

Adjusts the vertical position of the key over the incoming video. If the key is active (currently being displayed), it will be repositioned in real-time on the live outputs as this value is adjusted. Adjustments are in increments of 2.

Valid Range: 0 lines to 486 lines (525-line mode)
0 lines to 572 lines (625-line mode)

Default Setting: 0 lines

Fade In Time

Specifies the duration of the fade-in when a key is transitioned onto the video outputs.

Valid Range: 0 fields to 3600 fields

Default Setting: 60 fields (525-line mode)
50 fields (625-line mode)

Related Settings: Fade In

Max Opacity

Specifies the opacity percentage of a key when it is completely "displayed" (after it has been faded in). Once the key has faded in to the specified opacity percentage, the fade-in will be considered complete. If the key is active (currently being displayed), the opacity is adjusted in real-time on the live outputs as this value is adjusted.

Valid Range: 0% to 100%

Default Setting: 100%

Fade Out Time

Specifies the duration of the fade-out when a key is transitioned off.

Valid Range: 0 fields to 3600 fields

Default Setting: 60 fields (525-line mode)
50 fields (625-line mode)

Related Settings: Fade Out

Repeat Count

Specifies the number of times an animated key (.dan file) will be repeated before automatically fading out. The user may override this setting and manually *Fade Out* or *Cut Out* the key from the Keyer Settings Menu, or use the *Keyer* front-panel button to fade out the animation. Note that this value has no effect on still image keys, which will be displayed until manually faded or cut out.

This value is ignored if the *Loop Mode* option is set to *Forever*.

Valid Range: 1 to 255 repetitions

Default Setting: 2 repetitions

Related Settings: Loop Mode

Frame Rate

Specifies the speed at which an animated key (.dan file) will be played back. This effectively allows the animated key to be played in slow motion.

Valid Settings: Normal, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7

Default Setting: Normal

Loop Mode

Specifies whether an animated key (.dan file) will loop indefinitely until manually stopped by the user, or will loop the number of times specified in the *Repeat Count* option.

Valid Settings: Repeat, Forever

Default Setting: Repeat

Related Settings: Repeat Count

In *Repeat* mode, the animation will loop the number of times specified in the *Repeat Count* option, then automatically fade out. The user may override the *Repeat Count*

and manually *Fade Out* or *Cut Out* the key from the Keyer Settings Menu, or use the *Keyer* front-panel button to fade out the animation.

In *Forever* mode, the animation will loop indefinitely until the user manually fades or cuts out the key from the Keyer Settings Menu, or uses the *Keyer* front-panel button to fade out the animation.

This setting has no effect on still image keys, which will always be displayed until manually faded or cut out.

Bumper Style

Specifies whether an animated key (.dan file) will be playing during fade-in and fade-out, or held on the first and last frame, respectively, during the transition.

Valid Settings: None, Single Frame

Default Setting: None

When the *Bumper Style* is set to *None*, the animation will be playing as it is fading in and out.

When the *Bumper Style* is set to *Single Frame*, the first frame of the animation will be shown and held during the fade-in; the animation will begin playing once fade-in is complete. The last frame of the animation will be held during fade-out (for both manual and automatic fade-out).

Save These Settings

Stores the current keyer settings into the next available settings profile, for later recall with the *Settings* option of the Keyer Settings menu. The settings will be stored under the name **KeySettings *X***, where *X* is the next available free profile number. Settings files can be renamed or deleted from the *Flash Memory Mgmt* option of the System Config menu.

Related Settings: Settings; Flash Memory Mgmt (System Config menu)

CHAPTER 8: MENUS: NOISE REDUCTION

The Noise Reduction Menu is used to configure and enable the noise reduction features of the DPS-475/575.

Noise Reduction

Enables or disables the noise reduction features of the unit.

Valid Settings: Disable, Enable

Default Setting: Disable

When this setting is enabled, the noise reduction features will follow the configuration specified in the options detailed later in this section. When disabled, no noise reduction options will be applied, regardless of the configuration settings.

Noise reduction can also be enabled and disabled using the *N/R* key on the front panel of the unit.

The light on the *N/R* key on the front panel of the unit will be on when noise reduction is enabled.

Split Screen

Splits the video output image in half (between video with and without noise reduction applied), providing a visual reference for adjusting noise reduction settings.

Valid Settings: Off, On, Auto

Default Setting: Off

When this option is set to *Off*, the output video is not split, and the currently enabled noise reduction settings are applied to the entire output image.

When this option is set to *On*, the output video image is split in half. The left half of the screen shows the video with the currently enabled noise reduction settings applied; the right half of the screen shows the video with no noise reduction applied.

When this option is to *Auto*, the output video image is split while a noise reduction setting is being adjusted; when no adjustment is being actively done, the output video is not split, and the currently enabled noise reduction settings are applied to the entire output image.

This option is ignored if the *Noise Reduction* option is set to *Disabled*.

Spatial Filter

Controls the strength of the spatial noise reduction filter.

Valid Settings: Off, On, Max

Default Setting: Off

Related Setting: Spatial Filter Mix

When this option is set to *Off*, no spatial noise reduction is applied.

When this option is set to *Max*, the spatial noise reduction filter examines all 8 pixels adjacent to each target pixel, plus the target pixel itself.

When this option is set to *On*, the spatial noise reduction filter examines 5 pixels for its calculations.

This option is ignored if the *Noise Reduction* option is set to *Disabled*.

Spatial Filter Mix

Controls the weighting in the output of the results of the spatial noise reduction filter vs. the original input.

Valid Range: Min, 1 to 6, Max

Default Setting: Max

Related Setting: Spatial Filter

When this option is set to *Max*, the output is based entirely on the results of the spatial noise reduction filter.

When this option is set to *Min*, the output is based entirely on the original input.

When this option is set to a middle value (such as 3 or 4), the output is roughly the average of the original input, and the results of the spatial noise reduction filter.

This option is ignored if the *Noise Reduction* option is set to *Disabled*.

Horizontal Bandwidth

Adjusts the horizontal setting of the 2D digital bandwidth filtering. Digital bandwidth filtering is particularly useful when the output will be fed to a downstream digital device such as an MPEG encoder.

This option is ignored if the *Noise Reduction* option is set to *Disabled*.

Valid Range: Min, 1 to 15, Max

Default Setting: Max

Related Setting: Vertical Bandwidth-Y, Vertical Bandwidth-C

Vertical Bandwidth-Y

Adjusts the degree of the digital vertical bandwidth filtering on the luminance of the signal. Digital bandwidth filtering is particularly useful when the output will be fed to a downstream digital device such as an MPEG encoder.

This option is ignored if the *Noise Reduction* option is set to *Disabled*.

Valid Range: Min, 1 to 7, Max

Default Setting: Max

Related Setting: Horizontal Bandwidth, Vertical Bandwidth-C

Vertical Bandwidth-C

Adjusts the degree of the digital vertical bandwidth filtering on the chrominance of the signal. Digital bandwidth filtering is particularly useful when the output will be fed to a downstream digital device such as an MPEG encoder.

This option is ignored if the *Noise Reduction* option is set to *Disabled*.

Valid Range: Min, 1 to 7, Max

Default Setting: Max

Related Setting: Horizontal Bandwidth, Vertical Bandwidth-Y

Temporal NR-Luma

Enables and controls the strength of the luminance temporal noise reduction.

Valid Range: Comb-3D, Min, 2 to 15, Max

Default Setting: Comb-3D

Related Setting: 3D Comb Decoder, Temporal NR-Chroma

When this option is set to *Comb-3D*, luminance temporal noise reduction is disabled, allowing the use of the 3D comb filter decoder on luminance.

The other valid settings control the averaging effect of previous frames on the output; i.e. how heavily the output is weighted towards past frames vs. the current frame being processed.

When this option is set to *Min*, the output is based almost entirely on the current frame being processed. When this option is set to *Max*, the output is based almost entirely on information from past frames, creating an undesirable shadowing effect.

It is not possible to use both Temporal Noise Reduction and 3D combing on the same channel simultaneously. (For example, if *Temporal NR-Luma* is enabled, 3D combing of luminance is not possible, so the 3D comb decoder must be disabled or set to *Chroma*.) This is not a problem; with a sufficient Temporal Noise Reduction setting, there would be no benefit to using the 3D comb filter simultaneously.

Setting this option to any value other than *Comb-3D* automatically disables 3D combing of luminance in the *3D Comb Decoder* option.

This setting will be automatically disabled (set to *Comb-3D*) if the user enables 3D combing on luminance (by setting *3D Comb Decoder* to *Luma* or *Both Y+C*).

This option is ignored if the *Noise Reduction* option is set to *Disabled*.

Temporal NR-Chroma

Enables and controls the strength of the chrominance temporal noise reduction.

Valid Range: Comb-3D, Min, 2 to 15, Max

Default Setting: Comb-3D

Related Setting: 3D Comb Decoder, Temporal NR-Luma

When this option is set to *Comb-3D*, chrominance temporal noise reduction is disabled, allowing the use of the 3D comb filter decoder on chrominance.

The other valid settings control the averaging effect of previous frames on the output; i.e. how heavily the output is weighted towards past frames vs. the current frame being processed.

When this option is set to *Min*, the output is based almost entirely on the current frame being processed. When this option is set to *Max*, the output is based almost entirely on information from past frames, creating an undesirable shadowing effect.

It is not possible to use both Temporal Noise Reduction and 3D combing on the same channel simultaneously. (For example, if *Temporal NR-Chroma* is enabled, 3D combing of chrominance is not possible, so the 3D comb decoder must be disabled or set to *Luma*.) This is not a problem; with a sufficient Temporal Noise Reduction setting, there would be no benefit to using the 3D comb filter simultaneously.

Setting this option to any value other than *Comb-3D* automatically disables 3D combing of chrominance in the *3D Comb Decoder* option.

This setting will be automatically disabled (set to *Comb-3D*) if the user enables 3D combing on chrominance (by setting *3D Comb Decoder* to *Chroma* or *Both Y+C*).

This option is ignored if the *Noise Reduction* option is set to *Disabled*.

CHAPTER 9: MENUS: DV CONTROL

On units with the DV I/O Module installed, selecting *DV Control* from the Main Menu puts the unit into DV Control Mode. In DV Control Mode, transport control of a DV device (such as a deck or camcorder) connected to the DPS-475/575 by IEEE-1394 (Firewire) can be done from the front panel.

When *DV Control* is selected, the display will change to show the current time code of the DV device, as well as the transport status (play, stop, etc.). While in DV mode, the normal functionality of the front panel controls is replaced by DV device control.

On the front panel of the unit, standard representations of transport controls appear below many of the buttons. The buttons used for DV device control are as follows:

Key	*Function*
Luma	Stop
Black	Rewind/Scrub Backward
Chroma	Play
Hue	Fast-Forward/Scrub Forward
Memory	Record (used in conjunction with Play)
Option	Pause
Default	Toggle the control knob between Jog mode and Shuttle mode

The control knob functions as a jog or shuttle controller, depending on the currently selected mode.

To exit DV Control Mode and return to normal operation, press the *Exit* key.

CHAPTER 10: MENUS: TIMING SETUP

The Timing Setup Menu is used to time the unit to an external genlock source. **Note that changes to these options will not be available if the *Genlock Changes* setting in the System Config menu is disabled.**

Genlock

Determines whether the unit will use an external genlock source or its own internal crystal for timing.

Valid Settings: Auto, Internal

Default Setting: Auto

If the unit is configured to *Auto* genlock mode, it will use the timing of a connected stable genlock source, and the *Genlock* indicator of the unit will be lit. If no genlock source is present, the unit will automatically switch to using its own internal crystal for timing, and this indicator will flash.

If the unit is configured to *Internal* genlock mode, it will operate on its own internal crystal, and the *Genlock* indicator will be unlit.

Subcarrier Phase

Adjusts the subcarrier genlock timing, with 0.176° resolution.

Valid Range: 0.000° to 360.000°

Default Setting: 0.000°

Horizontal

Adjusts the horizontal position genlock timing, with 4.630ns resolution.

Valid Range: -4.741 µs to 4.736 µs

Default Setting: 0.000 ns

CHAPTER 11: MENUS: TSG/IMAGE GRABBING

The TSG/Image Grabbing Setup Menu is used to capture frames from video for use as test patterns or keyed still images.

Grab 10-bit Video

Captures a 10-bit frame from video for use as a test pattern in the Test Signal Generator.

When this option is selected, a frame is grabbed from the currently selected input video signal. While the frame is grabbed, the video output will be briefly frozen, then resume live operation.

The captured frame is saved as a file named ***Grabbed***. **This file *must* be renamed in the *Flash Memory Mgmt* option of the System Config menu, or else it will be overwritten by the next video grab.**

Related Settings: Flash Memory Mgmt (System Config menu)

Grab 8-bit Video

Captures an 8-bit frame from video for use with the unit's linear keyer.

When this option is selected, a frame is grabbed from the currently selected input video signal. While the frame is grabbed, the video output will be briefly frozen, then resume live operation.

When used by itself, this option creates a still image file that will be output full-screen by the keyer. The *Grab Linear Key* option (detailed later in this section) can be used in conjunction to add a key channel, thus creating a file that will be keyed over the incoming video. The *Grab 8-bit Video* option captures the fill (the "content" of the keyed image); the *Grab Linear Key* option is then used immediately afterward to grab an incoming key channel. (The key channel can be captured from a separate input, or the connections of the currently selected video input must be changed to provide the key signal.)

The captured frame is saved as a file named ***Grabbed***. **This file *must* be renamed in the *Flash Memory Mgmt* option of the System Config menu, or else it will be overwritten by the next video grab. The file should *not* be renamed until the *Grab Linear Key* option has been applied, if a key channel is desired.**

Related Settings: Flash Memory Mgmt (System Config menu),
Grab Linear Key

Grab Linear Key

Captures a linear key to be applied to the 8-bit video image just captured.

This option is used only in conjunction with the *Grab 8-bit Video* option detailed earlier in this section.

When this option is selected, a frame is grabbed from the currently selected input video signal, which must contain the key channel to be applied to the captured image. (The key channel can be captured from a separate input from that of the image, or the connections of the currently selected video input must be changed to provide the key signal.)

The key channel is incorporated into the image file named ***Grabbed***. **This file *must* then be renamed in the *Flash Memory Mgmt* option of the System Config menu, or else it will be overwritten by the next video grab.**

Related Settings: Flash Memory Mgmt (System Config menu), Grab 8-bit Video

Grab & Apply Luma Key

Captures an 8-bit frame from video for use with the unit's linear keyer, with its key channel defined by the current settings of the *Luma Key Gain* and *Threshold* options (detailed later in this section).

When this option is selected, a frame is grabbed from the currently selected input video signal. While the frame is grabbed, the video output will be briefly frozen, then resume live operation. The settings of the *Luma Key Gain* and *Threshold* options are used to define the key channel for the image from a luminance key, thus creating a file that will be keyed over the incoming video by the linear keyer. The settings of the *Luma Key Gain* and *Threshold* options must be specified prior to the use of the *Grab & Apply Luma Key* function.

The captured frame is saved as a file named ***Grabbed***. **This file *must* be renamed in the *Flash Memory Mgmt* option of the System Config menu, or else it will be overwritten by the next video grab.**

Related Settings: Flash Memory Mgmt (System Config menu), Luma Key Gain, Threshold

Luma Key Gain

Adjusts the gain of the luminance key used to define the key channel in the *Grab & Apply Luma Key* option (detailed earlier in this section).

Valid Settings: Hard Key, 1% to 100%

Default Setting: Hard Key

Related Settings: Grab & Apply Luma Key, Threshold

Threshold

Adjusts the threshold of the luminance key used to define the key channel in the *Grab & Apply Luma Key* option (detailed earlier in this section).

Valid Range: 0.8 IRE to 99.9 IRE (525-line mode)
5.3 mV to 699.3 mV (625-line mode)

Default Setting: 7.5 IRE (525-line mode)
52.5 mV (625-line mode)

Related Settings: Grab & Apply Luma Key, Luma Key Gain

CHAPTER 12: MENUS: SYSTEM CONFIG

The System Config menu is used for configuration of the DPS-475/575. Settings in the System Config menu are generally used for initial setup of the unit, not in regular operation.

Line Standard (525/625) [DPS-575 Only]

Selects between 525-line (NTSC) and 625-line (PAL) standards.

Current

Displays the line standard currently in use:

525 lines	Using 525-line standard, user-specified.
625 lines	Using 625-line standard, user-specified.
Auto (525)	Using 525-line standard, auto-detected.
Auto (625)	Using 625-line standard, auto-detected

Switch to 525

This option is only available when the DPS-575 is currently running in 625-line mode (either user-specified or automatically detected). Selecting this option disables line standard auto-switching, and switches the unit to 525-line mode.

Switch to 625

This option is only available when the DPS-575 is currently running in 525-line mode (either user-specified or automatically detected). Selecting this option disables line standard auto-switching, and switches the unit to 625-line mode.

Disable Autoswitch / Switch to Auto

Enables or disables line standard auto-switching. When line standard auto-switching is enabled, the unit will automatically switch line standards based on the current input signal, and the *Current* field (described earlier in this section) will report *Auto (XXX)*, where XXX is the detected line standard.

When line standard auto-switching is disabled, the unit will remain in the currently selected line standard, regardless of the video input.

Misc. Setup

Internal Temp

Reports the internal temperature of the unit, in Celsius.

Video Delay

Reports the current measured video delay, in ms.

Keylock

Enables the Keylock feature of the unit, which disables front-panel controls.

Valid Settings: Normal, Enable

Default Setting: Normal

This feature should be used only when the DPS-475/575 is being controlled remotely (for example, from a DPS RC-4000 remote controller). If this option is not activated (i.e. in *Normal* mode), then it is possible for a local user to modify the remote-user's settings from the front panel. When enabled, this option disables front-panel access, so all control must be done remotely.

To return to *Normal* mode, press and hold the *Enter* and *Exit* front-panel buttons simultaneously, or change the *Keylock* setting from the remote controller.

Function Bypass

Toggles between the master Process and Bypass modes. Process mode is the normal mode of operation. In Bypass mode, no processing is applied to the *Composite In* video signal; it is passed directly to *Composite Out*. Similarly, in Bypass mode, no processing is applied to the analog and AES/EBU audio inputs; they are routed directly to the outputs.

Valid Settings: Process, Bypass

Default Setting: Process

This is equivalent to the user of the *Bypass* button on the front panel. The light on the *Bypass* button flashes while the unit is in master Bypass mode.

Composite In and the analog and AES/EBU audio inputs are also bypassed when the power to the unit is off.

This option can override the *Analog Bypass* and *AES/EBU* bypass options in the Audio Setup menu. If *Function Bypass* is enabled (set to *Bypass*), the analog and AES/EBU audio inputs are bypassed, regardless of their setting in the Audio Setup menu.

GPI-1 Function

Selects which function should be triggered when a GPI pulse is received on the *GPI-1* connection of the Multi I/O breakout cable.

Valid Settings: Disabled, Freeze, Keyer, Trouble Slide, User 1, Voice-Over

Default Setting: Disabled

When *Disabled*, no action will be taken on receipt of a GPI pulse.

When set to *Freeze*, the currently selected *Freeze Mode* (see Chapter 5, "Menus: Video Setup") will be applied to the incoming video while a GPI signal is present, similar to pressing the *Take* button on the front panel of the unit. The live video feed will be resumed when the GPI trigger is released.

When set to *Keyer*, the unit's linear keyer will turn on and remain active while a GPI signal is present. The keyer will turn off upon release of the GPI trigger.

When set to *Trouble Slide*, the currently selected trouble slide is displayed on the outputs while a GPI signal is present. The *Trouble File* option of the Video Setup menu is used to select the trouble slide to be displayed. The trouble slide is removed from the display upon release of the GPI trigger.

When set to *User 1*, an incoming GPI pulse is equivalent to pressing the user-programmable *User 1* key on the front panel of the unit. In this manner, the unit can be configured to select almost any function on an incoming GPI pulse. See the section on User-Programmable Keys in Chapter 3, "Operation - Front Panel Controls," for details on assigning a function to the *User 1* key.

For example, if the *User 1* key is assigned to the AGC Bias function, and the *GPI-1 Function* option is set to *User 1*, the first incoming GPI pulse will take the user to the AGC Bias adjustment screen; each subsequent GPI pulse will cycle through the allowed adjustment values.

When set to *Voice-Over,* the unit's audio voice-over mode (see Chapter 6, "Menus: Audio Setup") will be activated by a GPI signal. When the GPI signal is first received, program audio begins fading down, then voice-over mixing begins. Voice-over mixing continues while the GPI signal is present. Voice-over mixing is stopped and program audio begins ramping back up upon release of the GPI trigger. This GPI option is similar to activating and de-activating the *Voice-Over* option of the Global Audio Config sub-menu.

GPI input can be contact closure to ground or TTL signal (0 to 5 volts max.).

GPI-2 Function

Selects which function should be triggered when a GPI pulse is received on the *GPI-2* connection of the Multi I/O breakout cable.

Valid Settings: Disabled, Freeze, Keyer Off, Trouble Slide, User 2, Voice-Over

Default Setting: Disabled

When *Disabled*, no action will be taken on receipt of a GPI pulse.

When set to *Freeze*, the currently selected *Freeze Mode* (see Chapter 5, "Menus: Video Setup") will be applied to the incoming video while a GPI signal is present, similar to pressing the *Take* button on the front panel of the unit. The live video feed will be resumed when the GPI trigger is released.

When set to *Keyer Off*, the unit's linear keyer will be turned off upon receipt of a GPI pulse.

When set to *Trouble Slide*, the currently selected trouble slide is displayed on the outputs while a GPI signal is present. The *Trouble File* option of the Video Setup menu is used to select the trouble slide to be displayed. The trouble slide is removed from the display upon release of the GPI trigger.

When set to *User 2*, an incoming GPI pulse is equivalent to pressing the user-programmable *User 2* key on the front panel of the unit. In this manner, the unit can be configured to select almost any function on an incoming GPI pulse. See the section on User-Programmable Keys in Chapter 3, "Operation - Front Panel Controls," for details on assigning a function to the *User 2* key.

For example, if the *User 2* key is assigned to the AGC Bias function, and the *GPI-2 Function* option is set to *User 2*, the first incoming GPI pulse will take the user to the

AGC Bias adjustment screen; each subsequent GPI pulse will cycle through the allowed adjustment values.

When set to *Voice-Over,* the unit's audio voice-over mode (see Chapter 6, "Menus: Audio Setup") will be activated by a GPI signal. When the GPI signal is first received, program audio begins fading down, then voice-over mixing begins. Voice-over mixing continues while the GPI signal is present. Voice-over mixing is stopped and program audio begins ramping back up upon release of the GPI trigger. This GPI option is similar to activating and de-activating the *Voice-Over* option of the Global Audio Config sub-menu.

GPI input can be contact closure to ground or TTL signal (0 to 5 volts max.).

GPO Function

Selects the functionality of the *GPI Output/Audio Delay Pulse* connection of the Multi I/O breakout cable.

Valid Settings: Audio Pulse, Bad Input, Keyer Active, SDI Input, Voice-Over

Default Setting: Audio Pulse

When set to *Audio Pulse*, a pulse will be sent on this output at a regular interval (approximately every two frames).

When set to *Bad Input*, a signal will be continuously output when no valid video signal is present on the currently selected video input.

When set to *Keyer Active*, a signal will be continuously output when the unit's linear keyer is active.

When set to *SDI Input*, a signal will be continuously output when the unit's input video selection is set to *SDI*.

When set to *Voice-Over*, a signal will be continuously output while the audio voice-over mixing is active. This signal will NOT be output during the fade-down and ramp-up of program audio that preceed and follow, respectively, voice-over mixing.

"Active" output is TTL compatible, 5 volts / 20 mA max.

Genlock Changes

Enables or disables the ability of the operator to make changes to the genlock timing settings found in the Timing Setup menu.

Valid Settings: Enabled, Disabled

Default Setting: Enabled

When this setting is disabled, changes cannot be made to the unit's genlock timing options.

VFD Brightness

Adjusts the brightness level of the Vacuum Fluorescent Display (VFD) display panel on the front of the unit.

Valid Range: 1 to 15

Default Setting: 7

Note that higher values will shorten the lifespan of the display panel.

LED Brightness

Adjusts the brightness level of indicator LEDs on the front of the unit.

Valid Range: 0 to 15

Default Setting: 7

Idle Timeout

Adjusts the duration of time the unit waits before returning the display to the Idle Screen, when the display has been left at another setting. For example, if the user adjusts a parameter and leaves the display on the parameter setting screen, the unit will return to the Idle Screen after the delay specified in this option. Any key press or turn of the control knob starts the delay time over.

Valid Range: 10 seconds to 2500 seconds

Default Setting: 300 seconds

Idle Cycle Time

Adjusts the frequency at which information on the Idle Screen is refreshed. This setting specifies the amount of time between each refresh.

Valid Range: 10 ms to 2500 ms

Default Setting: 50 ms

One-Time Video Setup

Source ID

Specifies the Source ID text. The text can be up to 23 characters long, and is set by using the *Enter* key and control knob.

Pressing the *Enter* key cycles through which character position (1 to 23) is to be modified; the control knob selects a new character for that position. Two consecutive spaces are not allowed; attempting to move to the next character position after a space will return to the first character position.

Pressing the *Exit* key stores the new *Source ID*.

Setup level (in)

Specifies whether or not the input video signal includes setup. This setting is not applicable in 625-line mode [PAL].

Valid Settings: With, Without

Default Setting: With

Setup level (out)

Specifies whether or not setup should be included in the video output. This setting is not applicable in 625-line mode [PAL].

Valid Settings: Add, No Setup

Default Setting: Add

Chroma Coring

Specifies whether or not to disable chroma coring of the video signal.

Valid Settings: Normal, Disable

Default Setting: Normal

Chroma coring should only be disabled when multiple generational passes of the same video signal are being processed through the unit. Disabling chroma coring reduces "chroma contamination" that can occur after four or five recursive passes (Analog -Digital - Analog - Digital, etc.).

Note that disabling chroma coring may have a slight effect on chroma gain, as units are factory-calibrated with the *Chroma Coring* option in the *Normal* setting.

VITS/Blanking Fld1

Specifies blanking and Vertical Interval Test Signal insertion options for field 1 of the video.

In 525-line mode (NTSC), the first 9 lines of field 1 are always blanked. The **Narrow Blanking** option sets lines 10 through 20 of field 1 to *Bypass*, so they are unchanged from the input. **Wide Blanking** sets lines 10 through 20 of field 1 to *Blank*, so they are blanked. **Enable Source ID** inserts the text specified in the *Source ID* option into lines 10 through 20.

In 625-line mode (PAL), the first 5 lines of field 1 are always blanked. The **Narrow Blanking** option sets lines 6 through 22 of field 1 to *Bypass*, so they are unchanged from the input. **Wide Blanking** sets lines 6 through 22 of field 1 to *Blank*, so they are blanked. **Enable Source ID** inserts the text specified in the *Source ID* option into lines 6 through 22.

These options can be overriden on a line-by line basis with the remaining settings of this option. Each of lines 10 through 22 can be individually configured. Each of lines 10 through 20 can be set to:

- *Blank:* the line will be blanked
- *Bypass:* the line will be sampled from the input video, then passed through a notch filter before output. This mode assumes that color information may be present in the line.
- *Data:* the line will be sampled from the input video, and output without any processing. This mode should be used for high-speed signals that may be corrupted by filtering.
- *Source ID:* the text specified in the *Source ID* option is inserted
- a Vertical Interval Test Signal

In 625-line mode, lines 21and 22 can each be set to any of the above values. In 525-line mode, lines 21 and 22 can each be set to either *Bypass* or *Blank*.

Related Setting: Source ID, VITS/Blanking Fld2

VITS/Blanking Fld2

Specifies blanking and Vertical Interval Test Signal insertion options for field 2 of the video.

In 525-line mode (NTSC), the first 8 lines of field 2 are always blanked. The **Narrow Blanking** option sets lines 9 through 19 of field 2 to *Bypass*, so they are unchanged from the input. **Wide Blanking** sets lines 10 through 19 of field 2 to *Blank*, so they are blanked. **Enable Source ID** inserts the text specified in the *Source ID* option into lines 10 through 19. Line 9 of field 2 is always set to *Bypass*.

In 625-line mode (PAL), lines 314 through 318 are always blanked. The **Narrow Blanking** option sets lines 319 through 335 to *Bypass*, so they are unchanged from the input. **Wide Blanking** sets lines 320 through 335 to *Blank*, so they are blanked. **Enable Source ID** inserts the text specified in the *Source ID* option into lines 320 through 335. Line 319 is always set to *Bypass*.

These options can be overriden on a line-by line basis with the remaining settings of this option. Each of lines 10 through 21 (525-line mode) or 320 through 335 (625-line mode) can be individually configured. Each of lines 10 through 19 (320 through 335 in 625-line mode) can be set to:

- *Blank:* the line will be blanked
- *Bypass:* the line will be sampled from the input video, then passed through a notch filter before output. This mode assumes that color information may be present in the line.
- *Data:* the line will be sampled from the input video, and output without any processing. This mode should be used for high-speed signals that may be corrupted by filtering.
- *Source ID:* the text specified in the *Source ID* option is inserted
- a Vertical Interval Test Signal

In 525-line mode, lines 20 and 21 can each be set to either *Bypass* or *Blank*.

Related Setting: Source ID, VITS/Blanking Fld1

Remote Control Setup

Baud Rate

Specifies the data rate for serial remote control. This setting must match the data rate of the remote controller.

Valid Settings: 9600 bps, 38400 bps

Default Setting: 9600 bps

Remote Control

Specifies the protocol used for serial remote control. This setting must match the protocol of the remote controller.

Valid Settings: RS-232, RS-422

Default Setting: RS-232

RS-422 Termination

Specifies the termination of the RS-422 serial port: 120Ω (120R) or high-impedence (Hi-Z).

Valid Settings: Hi-Z, 120R

Default Setting: Hi-Z

Unit Address (serial)

Specifies the address of the unit for remote serial control. The unit will only respond to commands sent to this serial address, allowing it to be used in a multi-drop configuration. Each unit must have a unique address setting.

Valid Range: 1 to 127

Default Setting: 1

IP Address

Specifies the IP address of the unit on a TCP/IP network. The IP address is used when the unit is to be controlled via the 10BaseT *Ethernet* port.

The IP address must be set to be consistent with your existing TCP/IP network and the remote machine that will be controlling the unit. Your network administrator can provide you with an appropriate IP address to use.

IP addresses are represented as four numbers (each from 0 to 255), separated by periods (for example, 10.0.0.1).

The *IP Address* option is set by using the *Enter* key and control knob. Pressing the *Enter* key cycles through which of the four numeric components of the IP address is being modified; the control knob sets the value of that numeric component, from 0 to 255. Pressing the *Exit* key stores the IP address.

Default Setting: 10.0.*XX.YY* where *XXYY* is the unit serial number

Related Settings: Netmask, Gateway

Netmask

Specifies the subnet mask of the unit on a TCP/IP network. The subnet mask is used when the unit is to be controlled via the 10BaseT *Ethernet* port, and is represented as four numbers separated by periods (for example, 255.240.0.0).

The subnet mask must be set to be consistent with your existing TCP/IP network and the remote machine that will be controlling the unit. Your network administrator can provide you with an appropriate subnet mask to use.

Valid Range: 128.0.0.0 to 255.255.255.240

Default Setting: 255.255.0.0

Related Settings: IP Address, Gateway

Subnet mask settings are often represented as hexidecimal digits, for example 0xFFFF0000. Translation of this notation is straightforward, as each pair of hexidecimal digits is converted to its decimal equivalent (FF = 255, F0 = 240, etc.). Thus, the above example is equal to 255.255.0.0; 0xFFFFF000 is equal to 255.255.240.0.

Gateway

Specifies the IP address of the network gateway for the unit on a TCP/IP network. The *Gateway* setting is used when the unit is to be controlled via the 10BaseT *Ethernet* port.

The gateway address must be set to be consistent with your existing TCP/IP network and the remote machine that will be controlling the unit. Your network administrator can provide you with the gateway IP address to use.

Gateway IP addresses are represented as four numbers (each from 0 to 255), separated by periods (for example, 10.0.0.1).

Using a gateway IP address of 0.0.0.0 disables the use of the default gateway.

The *Gateway* option is set by using the *Enter* key and control knob. Pressing the *Enter* key cycles through which of the four numeric components of the gateway IP address is being modified; the control knob sets the value of that numeric component, from 0 to 255. Pressing the *Exit* key stores the gateway IP address.

Default Setting: 0.0.0.0

Related Settings: IP Address, Netmask

Machine Name

Specifies the name which the unit will appear as to remote controllers and networks. This allows the unit to be visually recognized on a remote station by name, rather than by an address number.

The name can be up to 23 characters long, and is set by using the *Enter* key and control knob.

Pressing the *Enter* key cycles through which character position (1 to 23) is to be modified; the control knob selects a new character for that position. Two consecutive spaces are not allowed; attempting to move to the next character position after a space will return to the first character position.

Pressing the *Exit* key stores the new *Machine Name*.

Default Setting: No-name

DCN Address

Reports the address at which the unit will be found on a DCN network (DPS Coaxial Network). This address is set at the factory, and cannot be changed by the operator.

Remote Watch

Enables or disables visual feedback, on the display panel, of commands executed by remote control.

Valid Settings: Enabled, Disabled

Default Setting: Enabled

When this setting is disabled, commands executed by a remote controller (such as the DPS RC-475 or RC-4000) are not visually reported on the front panel of the DPS-475/575.

When this setting is enabled, and the unit is at the Idle Screen, any commands executed by a remote controller are shown visually on the front panel of the unit.

Ethernet Address

Reports the Ethernet Media Access Control (MAC) address of the unit. This address may be needed in some network configurations. This address is set at the factory, and cannot be changed by the operator.

Flash Memory Mgmt

This sub-menu provides backup, restore, and file management of the unit's flash memory. From this menu, stored files (images, animations, keyer settings, etc.) can be deleted and renamed, and configuration settings can be backed up.

List Files

Displays a list of all user files stored in the unit's flash memory, including still images, animations, user-defined test patterns, keyer settings profiles, and configuration backup profiles.

File management (including renaming and deleting) of these files can be done by first selecting the file to manipulate. Select the file by scrolling through the list with the control knob, and pressing the *Enter* key to select the highlighted file.

Information about the selected file will then be shown, including the file name, size, and internal type code. Press Exit to return to the file listing, or select one of the two file management options: *Delete This File* or *Rename This File*.

Delete This File will remove the file from the unit's flash memory, making its memory space available for additional files.

Rename This File will change the name the file is stored under. The new name can be up to 23 characters long, and is set by using the *Enter* key and control knob. Pressing the *Enter* key cycles through which character position (1 to 23) is to be modified; the control knob selects a new character for that position. Two consecutive spaces are not allowed; attempting to move to the next character position after a space will return to the first character position. Pressing the *Exit* key stores the new file name.

Memory Usage

Reports the amount of flash memory installed in the unit, currently in use, available for file upload, and fragmented (unusable).

Backup All Settings

Saves all current configuration parameters and settings into a file in flash memory.

The settings will be stored under the name **NVBackup*X***, where *X* is the next available free settings profile number. Settings files can be renamed or deleted from the *List Files* option detailed elsewhere in this section.

Restore All Settings

Recalls configuration parameters and settings from a stored settings profile. Selecting this option displays a list of stored settings profiles. The profile to be loaded is selected by scrolling through the list with the control knob, and pressing the *Enter* key to select the desired profile.

WARNING: all current configuration settings will be overwritten by those in the stored profile.

Version Information

Reports the serial number of the unit and the version numbers (or dates) of the firmware and field-programmable gate arrays of the unit, as well as any installed option modules. The version numbers of the following are reported:

Flash Firmware (with checksum)
Video FPGA 525
Video FPGA 625
Audio FPGA
DV-Gear
Option Card
HTML Files
Boot EPROM
Extra Options

Warm Reset

Resets the DPS-475/575.

WARNING: the output video signals will be briefly interrupted (no output/sync) during the reset.

Reset to Factory Defaults

Performs a factory reset by clearing the unit's non-volatile memory.

You will be asked to *Cancel* or *Confirm* the factory reset.

WARNING: if you *Confirm* the factory reset, all configuration options will be reset to factory defaults. All saved settings presets will be lost.

Enable Extra Options

Enables additional options that you have purchased for the DPS-475/575. An unlock code, consisting of eight hexadecimal digits, will be provided to you when you purchase the option; once the option is installed into the unit, this unlock code must be entered here to enable the option.

The unlock code is entered using the *Enter* key and control knob. Pressing the *Enter* key cycles through which digit position (1 to 8) is to be modified; the control knob selects a new digit for that position.

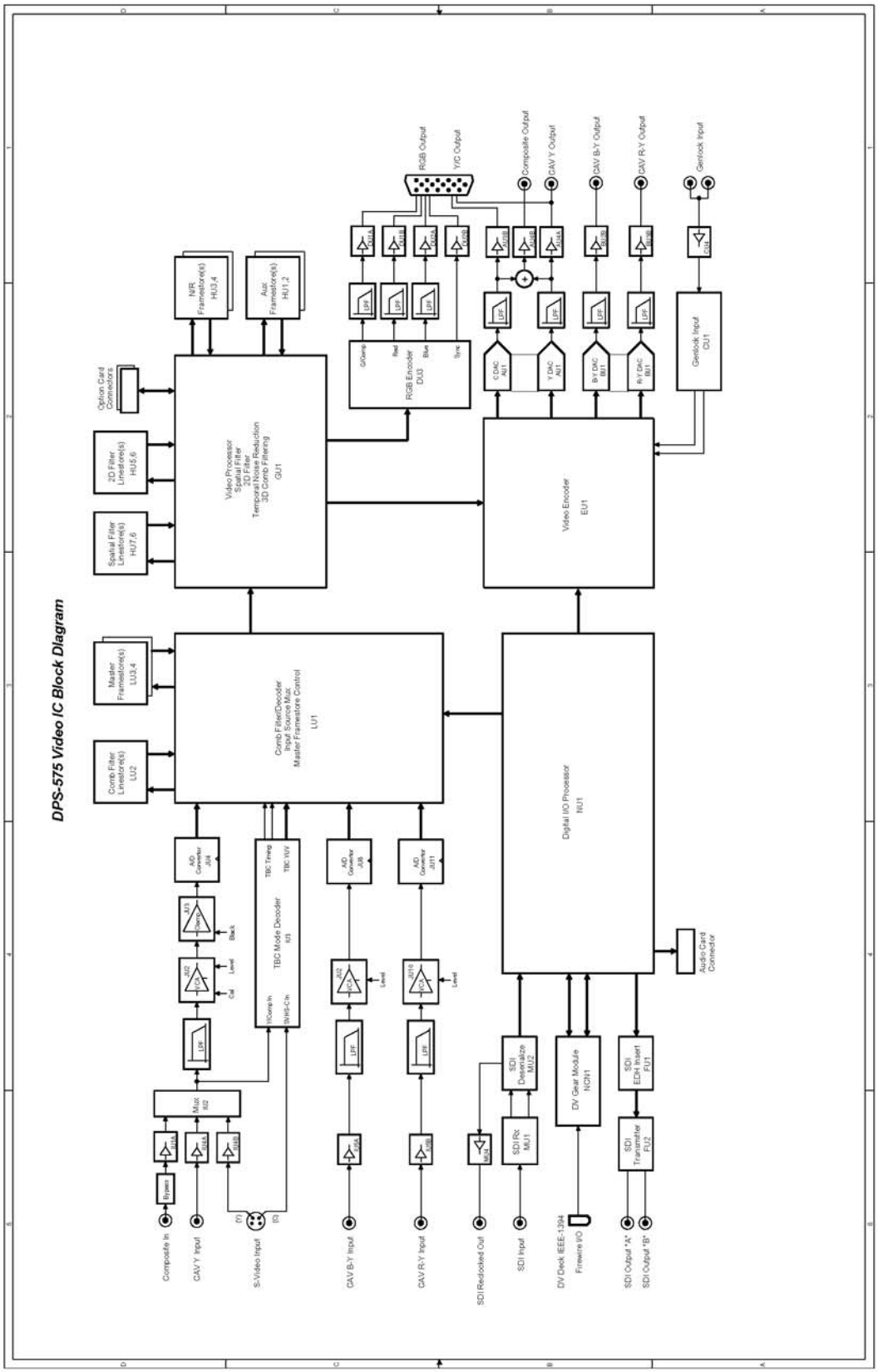
Pressing the *Exit* key stores the unlock code. An error message will be reported if the unlock code is invalid.

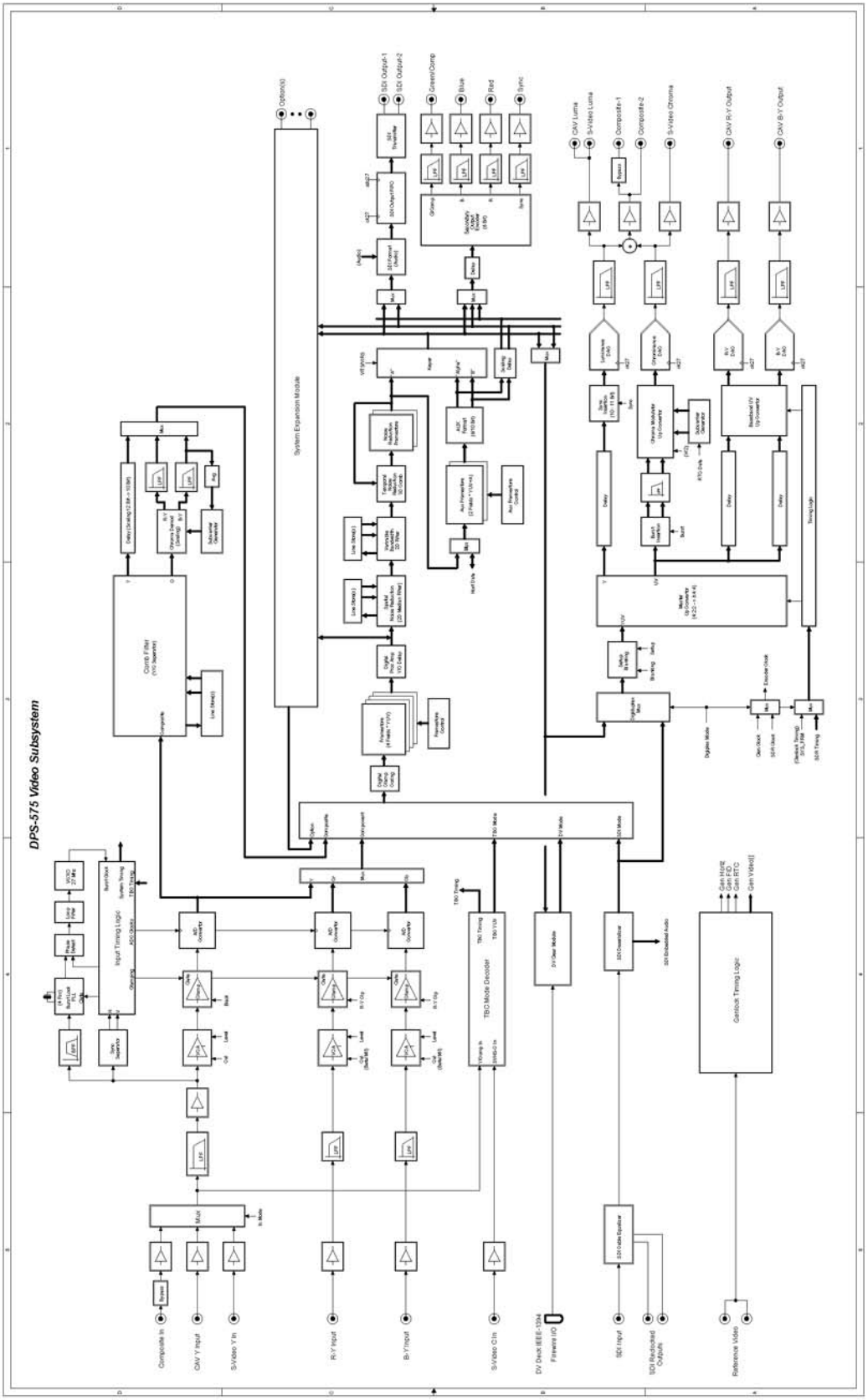
Factory Calibration

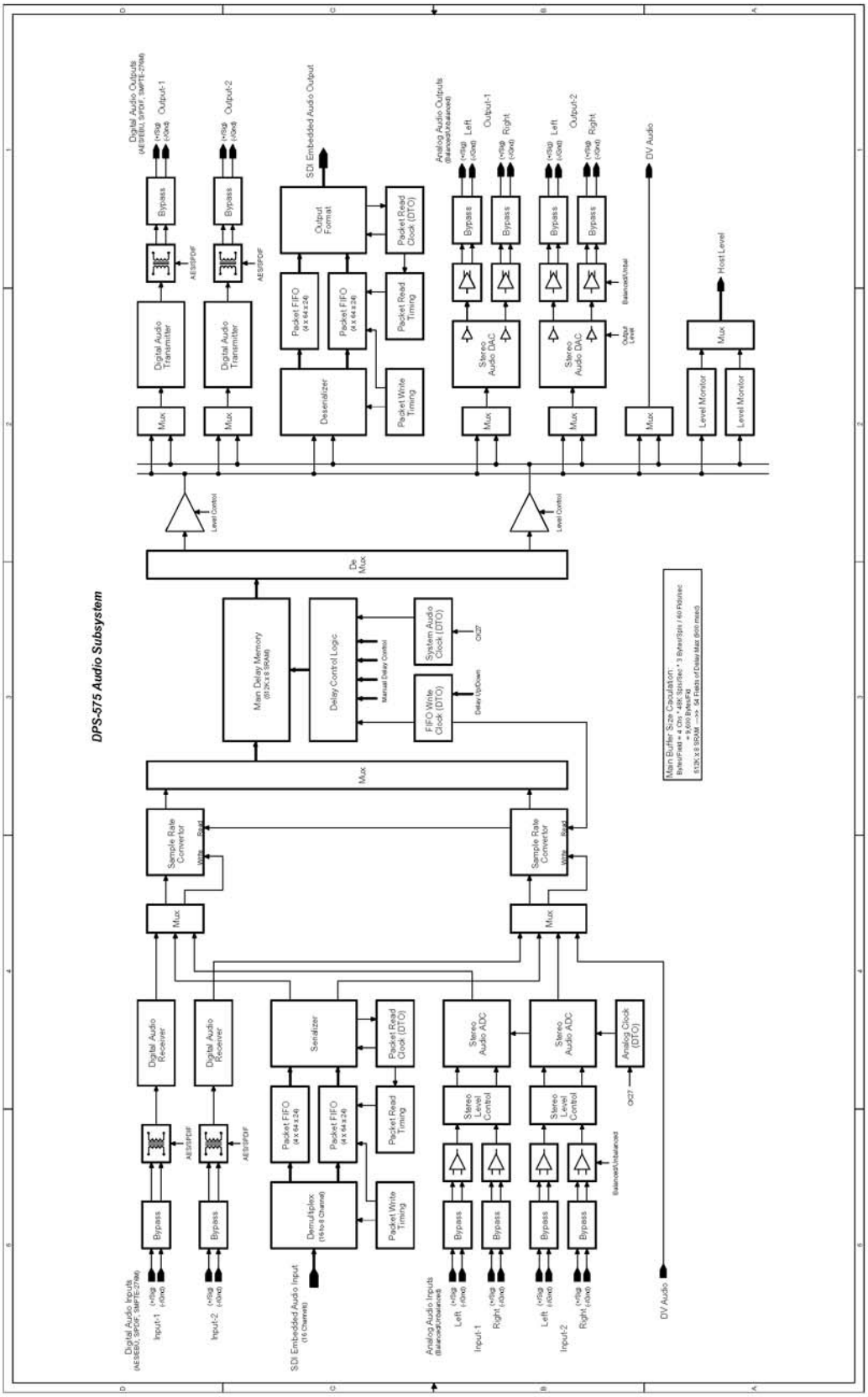
Adjusts the calibration of the DPS-475/575.

WARNING: DO NOT enter this menu unless instructed to do so by DPS Technical Support. Modification of calibration parameters will affect video performance, and may degrade operation of the unit.

CHAPTER 13: THEORY OF OPERATIONS







Audio Synchronizer Module

Block Diagram

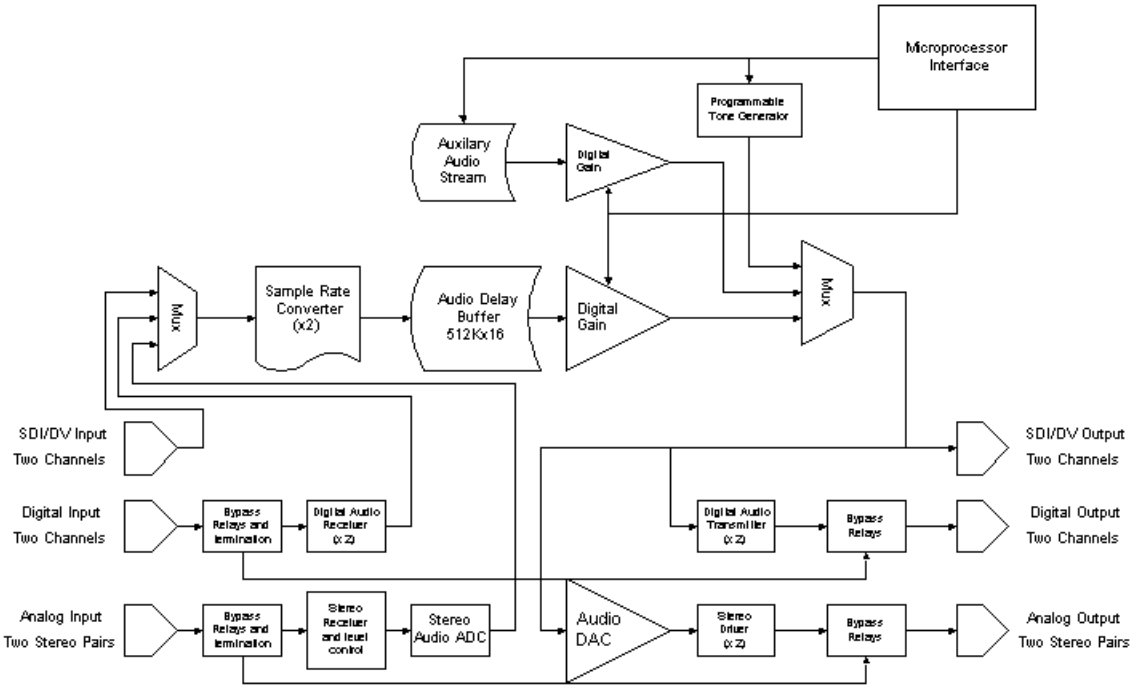


Figure 1

Analog Input

The analog input is received through a 12-position terminal block. Each signal has connections for positive, negative and ground.

The bypass relays allow the analog input signal to be routed to the analog output signal in the absence of power to the unit. The termination relays allow for user-specified input termination configurations, grouped by stereo-pair. The supported options are balanced or unbalanced, and 600Ω or high impedance (>20KΩ) inputs.

Stereo Receiver and Level Control

The receiver converts balanced analog audio to single-ended analog audio, and scales them to the internal working voltage range of +/- 3.75V. The maximum input level accepted by the receiver is +24 dBu.

*dBu = 20 log (E / 0.7746), where E is the RMS voltage. Peak voltage = sqrt(2) * RMS voltage for a sine wave*

The stereo level control is to allow for different studio operating levels for the analog audio. The *In Op. Level* parameter, in conjunction with the *Headroom* parameter, sets the gain of this stage. The sum of the headroom and level cannot exceed the operational levels of the input, which are +24dBu. Typical values for level and headroom are 0dBu and 18dB, respectively.

Stereo Audio ADC

This block converts the analog audio to digital. The sample rate will be one of 32kHz, 44.1kHz, or 48kHz (user configurable), with a word length of 20 bits. All channels share a common sample rate. The output of this block is serial I^2S format. Since ADC devices are clocked from the same sample clock, a four-wire interface, with two data channels is used.

The sample clock is derived from the 27MHz system clock, using a PLL and dividers. This clock is also used to drive the MCLK for the sample rate converters.

Digital Input

The digital input connector is a 25-pin D-sub-miniature connector. An external breakout cable provides the physical AES/EBU connectors. The digital input supports both 110Ω and 75Ω formats, selectable through menu options. Bypass relays allow the digital output to be connected to the digital input in the absence of power to the unit.

The digital audio receiver accepts the AES/EBU data and converts it to the I^2S format. The digital input also accepts a data format. One of the AES/EBU receivers may be designated as the data channel. In this mode, the SDI embedding function is not available. The analog audio channels function normally. The primary use for this mode is to allow Dolby AC3 or E streams to pass through the synchronizer with a fixed delay.

SDI/DV Embedded Audio Input

The SDI and DV video formats may also carry embedded audio. The video processor card extracts the embedded audio and sends it to the audio card via an I^2S interface. The SDI/DV multiplexing is done on the video card. The input data available will be either two stereo-pair channels available from SDI, or one stereo-pair channel available from DV. In the case of SDI, both stereo-pair channels share a common sample clock. The SDI / DV sample clock is not necessarily synchronous to the output system clock.

Multiplexor

The multiplexor selects which of the six stereo-pair streams is processed by each of the two delay streams. The selection is controlled from the microprocessor. A DigiPlex path allows the SDI/DV pairs to bypass the delay processor and go directly to the analog or digital outputs. In addition, the unprocessed digital and analog inputs may be routed to any of the outputs.

Sample Rate Converter

The sample rate converter block performs two functions. When the AES, SDI, or DV data is received, it must be converted to a sample rate that is locked to the output video clock. In addition, when Auto-Track is enabled, the sample rate converter provides for the digital filtering of the audio when the audio delay is changed.

The sample rate converter output clock is derived from a second PLL. This PLL has incremental increases or decreases in frequency to implement the incremental changes in delay. The output of the sample rate converter block is two I^2S format serial audio streams.

Audio Delay Buffer

The audio delay buffer stores the converted samples in a circular buffer. The samples are read out the appropriate time later. The audio delay can be specified in two parts: fixed and variable. The variable delay is used for the Auto-Track feature, and is implemented through control of the sample rate converter. The operator specifies the fixed delay as a number of milliseconds of delay. With 521Kx16 memory, and three words of memory for each sample of a channel pair, and two channel pairs, the maximum fixed delay is 87381 samples. At a sample rate of 48kHz, this translates into 1.8 seconds of delay. The variable delay may be disabled under control of the operator.

The audio delay buffer is controlled through the FPGA.

Auxiliary Audio Stream

The auxiliary audio stream allows for insertion of an arbitrary user-specified audio stream into the processed channel. The stream is downloaded into the auxiliary audio stream buffer, using a bank-switched buffer allocation scheme. Software support allows for downloading the auxiliary stream from an external computer, and then playing it back through the audio port. The stream may be of any arbitrary length, subject to memory restrictions on the main processor. The stream may be processed as one stereo pair of channels, or as two mono channels.

Programmable Tone Generator

The programmable tone generator allows for four digital audio tones to be generated. Each tone has a buffer size of 8K samples. The number of samples in the buffer will determine the accuracy of the desired tone frequency. For standard audio tones of 1KHz, 2KHz 4KHz, 10KHz, and 440Hz, 8K samples are sufficient.

Multiplexor

The output multipleorx allows for insertion of the test tones or the auxiliary data stream on to the regular channel streams. The multiplexor also allows for manipulation of the Left and Right signals of the stereo pair. Possible actions are mute L or R, swap L or R, Mono L or R, Mono-Sum (L and R are set to (L+R)/2), tone substitution L/R, Auxiliary stream substitution L/R, or Auxiliary stream mixing (L is set to AL+L)/2).

Digital Gain

The digital gain allows for adjusting the audio levels in the digital domain. The adjustment can be up to +/- 20dB. This control is implemented inside the FPGA. Each channel of the stereo pair has a different gain value applied to it, allowing for balance adjustments. The output of the digital level control is two I^2S streams that are locked together.

The actual level of the audio sample is monitored. The maximum value during the monitoring period is stored as an 8-bit number. Separate numbers are stored for the L and R channels. The microprocessor reads the numbers and clears them on a periodic basis.

Independent digital gain and level blocks are applied to the regular processed data streams (2), the SDI Digi-Plex streams (2), and the auxiliary audio stream (1).

Digital Audio Transmitter

The digital audio transmitter accepts the I^2S serial data stream and generates the AES/EBU serial data stream. The transmitter supports both 110Ω and 75Ω formats.

Both formats are available concurrently on the breakout cable. For the BNC output, the operator may select AES Consumer or SPDIF levels.

Stereo Audio DAC and Level Control

The stereo audio DAC is contained within the same device as the ADC. This device has a built-in analog level control to adjust for output headroom of the user installation. The DAC shares a common output sample rate with the ADC.

Analog Output

The analog output consists of balanced audio drivers. The drivers are configured for output impedance of 10Ω, and are capable of driving 600Ω input impedance loads to levels of +24dBu.

Microprocessor Interface

The microprocessor interface allows communication with the control microprocessor. The interface is a parallel interface, to map the audio card into the microprocessor's memory space. The format for the interface will be defined later in this document.

Connectors and Signals

External Analog Audio Connector

The two 12-position terminal blocks are divided into four sections of three terminals. The left terminal block is channel 1 and the right terminal block is channel 2. The positions of the terminal block are labelled (from left to right), IN1+, IN11-, IN1G, IN2+, IN2-, INSG, OUT1+, OUT1-, OUT1G, OUT2+, OUT2-, and OUT2G.

External Digital Audio Connector

The digital audio connector is a 25 pin D-Sub-Miniature connector. An audio breakout cable allows for the XLR and BNC connectors for the different AES/EBU standards, with pin assignments given in the table.

Pin	Function	Pin	Function
1	NC	14	NC
2	XLR_AES2_OUT_1	15	BNC_AES2_OUT_C
3	XLR_AES2_OUT_3	16	BNC_AES2_OUT_S
4	XLR_AES2_OUT_2	17	NC
5	XLR_AES2_IN_1	18	BNC_AES2_IN_S
6	XLR_AES2_IN_3	19	BNC_AES2_IN_C
7	XLR_AES2_IN_2	20	NC
8	XLR_AES1_OUT_1	21	BNC_AES1_OUT_S
9	XLR_AES1_OUT_3	22	BNC_AES1_OUT_C
10	XLR_AES1_OUT_2	23	NC
11	XLR_AES1_IN_1	24	BNC_AES1_IN_S
12	XLR_AES1_IN_3	25	BNC_AES1_IN_C
13	XLR_AES1_IN_2		

Microprocessor and Power Connector

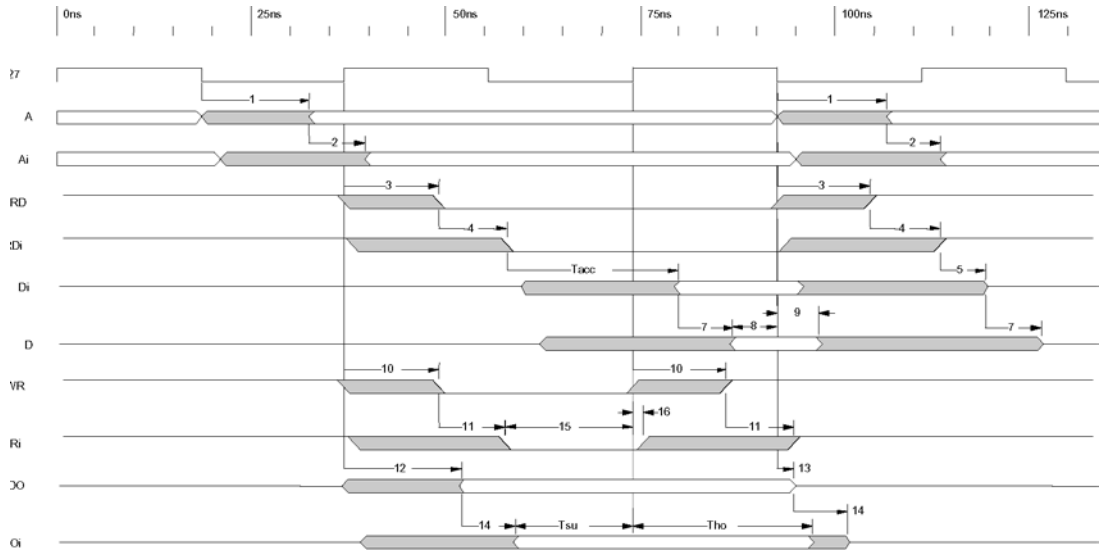
The microprocessor access signals and the power signals are carried on a single 80-pin connector, such as Samtec CLP-140-02-G-D-BE. The pin definitions are as per the table, shown as if the connector was mounted on the component side. The connector is mounted on the solder side of the board to minimize inter-connection height. Therefore, the even and odd pins should be swapped.

1	+5V	2	+3.3V	41	A0	42	A1
3	+5V	4	+3.3V	43	A2	44	A3
5	+5V	6	+3.3V	45	A4	46	A5
7	-12V	8	+3.3V	47	A6	48	A7
9	-12V	10	GND	49	GND	50	GND
11	+12V	12	GND	51	INSTALLED	52	RD
13	+12V	14	GND	53	RESET	54	WR
15	GND	16	GND	55	IRQ	56	GND
17	GND	18	GND	57	GND	58	C27MHz
19	GND	20	GND	59	GND	60	GND
21	D0	22	D1	61	SDI_IN_256FS	62	SDI_IN_CH0
23	D2	24	D3	63	SPARE_3	64	SDI_IN_CH1
25	D4	26	D5	65	SDI_IN_BCLK	66	SDI_IN_CH2
27	D6	28	D7	67	SDI_IN_LRCLK	68	SDI_IN_CH3
29	GND	30	GND	69	GND	70	GND
31	D8	32	D9	71	SDI_OUT_BCLK	72	SDI_OUT_CH0
33	D10	34	D11	73	SDI_OUT_LRCLK	74	SDI_OUT_CH1
35	D12	36	D13	75	SPARE_2	76	SDI_OUT_CH2
37	D14	38	D15	77	SPARE_1	78	SDI_OUT_CH3
39	GND	40	GND	79	GND	80	GND

The timing waveforms for the protocol are shown in the diagram. The diagram assumes that the address drivers and receivers are LVTH logic devices. The address decoder CPLD device should be connected in parallel with the address drivers or receivers. The system clock is 27MHz, and may not be delayed between the target circuitry and the microprocessor clock. The maximum propagation delay of the address decode device on the main card is 5nS. The chip select is programmed for 1w.s. (2 clock cycles). The read and write strobes are 1 clock wide. They are a combinatorial function of the microprocessor CS, A, and RD/WR signals.

The target card generates CS signals as a combinatorial function of the address lines only. The CS generator of the target card has a maximum output time of 10nS. For read cycles, this allows a maximum device access time on the target board of 24nS.

For write cycles, the target should latch the data on the rising edge of C27 when WR and the internally generated CS is valid. The WR signal should not be latched at the interface, but should pass through to the target device. The device set-up time for writes is 14nS.



Row		Name	Formula	Min	Max	Margin	Comment
1	D		[0,14]	0	14		Clock to out, A, AT91
2	D		(2*[1.2,3.5])	2.4	7		Delay, A, Main+Target, 2@LVTH
3	D		[0,12]	0	12		Clock to out, RD, AT91, Std. Protocol
4	D		([0,5]+[1,3.8])	1	8.8		Delay, RD, Target, CPLD(M)+CPLD(T)
5	D		[2,6]	2	6		Deactivate Time, Target
6	D	Tacc	[22,]	22			Access time, Target
7	D		(2*[1.2,3.5])	2.4	7		Delay, D(rd), Target+Main, 2@LVTH
8	C		[3,]	3		<2.76,>	Setup, D(rd), AT91
9	C		[2,]	2		<3.4,>	Hold, D(rd), AT91
10	D		[0,12]	0	12		Clock to out, WR, AT91
11	D		([0,5]+[1.2,3.5])	1.2	8.5		Delay, WR. CPLD(M)+CPLD(T)
12	D		[0,15]	0	15		Clock to out, D(wr), AT91
13	D		[2,]	2			Valid to float, D(wr), AT91
14	D		(2*[1.2,3.5])	2.4	7		Delay, D(wr), Main+Target, 2@LVTH
15	C		[12,]	12		<4.64,>	Setup, WR, Target
16	C		[1,]	1		<0.2,>	Hold, WR, Target
17	C	Tsu	[13,]	13		<2.04,>	Setup, D(wr), Target
18	C	Tho	[1,]	1		<21.92,>	Hold, D(wr), Target

FPGA Programming Connector

Pin #	Xilinx Program Interface
1	+5V
2	GND
3	CCLK
4	NC (INIT)
5	DONE
6	DIN
7	-PROGRAM

The FPGA on all cards is programmable from the local microprocessor for normal operation. If the FPGA programming connector is to be used, a jumper disables the microprocessor control. The procedure for programming the FPGA device under software control is as follows:

1. Drive "FPGA_prog" inactive to start.

2. Drive "FPGA_prog" active. Wait until "FPGA_init" and "FPGA_done" go active.
3. Drive "FPGA_prog" inactive. Wait until "FPGA_init" goes inactive.
4. Drive "FPGA_write" active.
5. Drive "FPGA_reset" active This enables the data write cycles for the FPGA
6. Write the bytes to the FPGA program portal. After every byte or group of bytes, check that "FPGA_init" is still inactive. If "FPGA_init" is active, it indicates that there is a programming error, or the data is corrupted.
7. Drive "FPGA_write" and "FPGA_reset" inactive.
8. Wait for "FPGA_done" to go active.
9. Pulse "FPGA_reset" active to bring the FPGA device into the operational state. Wait for "Clock_OK" to become asserted prior to configuring any of the SPI devices.

Note that "FPGA_init" is active low and "Clock_OK" and "FPGA_done" is active high, as read at the microprocessor interface. "FPGA_prog", "FPGA_write", and "FPGA_reset" are active high as written at the microprocessor interface.

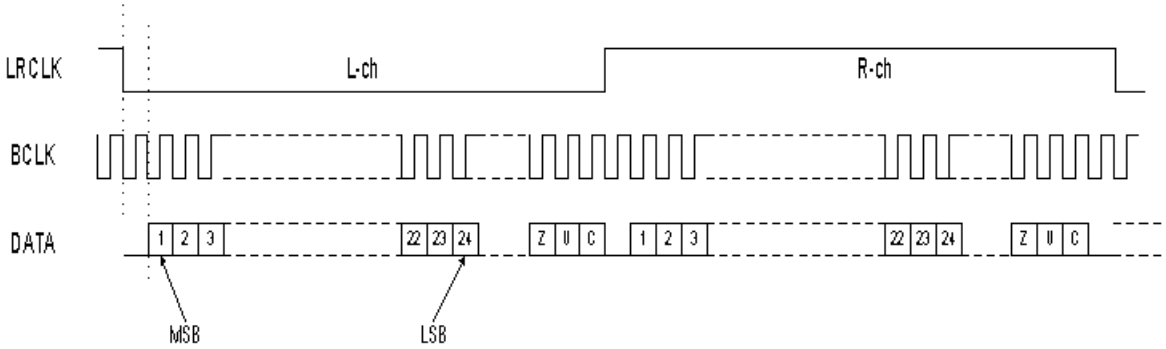
CPLD Programming Connector

Pin #	JTAG Program Interface
1	+5V
2	GND
3	TCK
4	TDC
5	TDI
6	TMS

The CPLD device is soldered to the PCB first then programmed using the JTAG connector afterward.

I²S Data Format

The format for the audio serial protocol is 24-bit I²S, as per the diagram.



I²S Format for Serial Audio Bus

For 20-bit audio data, bit locations 21 through 24 are set to '0'. The 'U' and 'C' bits carry User data and Channel Status data, respectively. The 'Z' bit is a flag indicating the start of a 192-bit block of user and channel status information. Note that the Z, U, and C bits are reserved for future expansion and are not used within the audio sub-system. The I2S bus has 32 bits within one time slot and 2 time slots. The frame sync (or LRCK) is advanced by 1 bit compared to the data. Bits 0, 25, 26, 27, and 31 are reserved.

Implementation

Analog Input Stage

The maximum input levels to the card are +24dBu. This translates into a voltage of 17.36Vp across the input terminals. The programmable gain control device (Crystal CS3310, two required) has input levels that are 3.75Vp, single ended. If a differential receiver with gain of -6dB is used (AD SSM2143 or BB INA137, two required), the output voltage will be 17.36Vpp. Therefore, the input receiver section needs an additional attenuation of 7.5/17.36 (0.4320). This attenuation is implemented using a resister divider network.

The ADC (Crystal CS4222, two required) has a differential input of $2V_{rms}$ (typical - 5.6Vpp). The output of the gain control device is 3.75Vp. Therefore, the section between the gain control device and the ADC requires both a gain of 1.4/3.375 (0.415), and a single-ended to differential converter.

Analog Output Stage

The D/A converter (Crystal CS4222) has a differential voltage output of 5.6Vpp, centred around 2.3Vdc. The D/A also has a programmable gain control, eliminating the need for an external one. The output stage needs to remove the DC component, and to pass through an anti-alias filter (3^{rd} -order Butterworth low pass, 25kHz). The filter is implemented with a gain to reduce the required gain in the output stage.

The output of the card should have levels of +24dBu. For balanced outputs, this translates to voltage levels of 17.35Vpp per output. Due to the 50Ω output impedance of commercially available differential drivers (Burr-Brown DRV135), there is insufficient drive strength to achieve +24dBu into a 600 Ω termination with power supply rails of +/-12V. Output impedance is reduced to 10 Ω and uses separate drivers (Burr-Brown OPA4134, two required) for the positive and negative outputs to achieve the +24dBu output rating. Taking into account the output impedance, the gain of the output stage will be 17.35/5.6 (3.098).

The sample rate for the CODEC is determined by the data sent to the output stage. This can be one of two sources: the SDI/DV recovered data, or the system sample rate. The SDI/DV data is used in "Digi-Plex" mode only.

PLL Control

The Sample Rate PLL generates one of six system sample rates, based on the video 27MHz clock. This PLL is sent to the analog CODEC and the AES/EBU transmitters. It is also used to read the data out of the delay buffer.

The Variable Rate PLL generates the same sample rate, but is allowed to change in frequency to accommodate the variable video synchronisation delay. This PLL drives the sample rate converters, and is used to write data into the delay buffers.

The dividers for both PLL (TI TLC2932) are generated inside the FPGA device. The FPGA generates the sample clocks and bit clocks, as required.

Digital Input and Output

The digital AES transceiver (Crystal CS8420, two required) is used to convert the AES stream to the I²S format The multiplexing between the 110Ω input and the 75Ω input is done by an analog multiplex device (IDT QS4A205Q) prior to feeding the AES receiver. A global parameter (*AES Source*) selects XLR or BNC (110Ω or 75Ω). A built-in sample rate converter automatically converts the input data to the system sample rate.

A digital AES transmitter is built into the AES receiver to convert the I²S stream to AES format. The output of the transmitter drives both the 110Ω balanced and the 75Ω unbalanced outputs. The levels for the 75Ω unbalanced output may be selected as SPDIF or AES with a global programmable parameter (*AES Elec. Levels*).

For transcoding operations, the received digital input may be fed directly to the analog output, and vice-versa.

Test Pattern Buffer

The test pattern buffer contains the test tone generator buffers and the auxiliary audio stream buffers. It is implemented as a 256Kx16-word memory device. Each sample uses 2 words of storage. With 8K samples utilized for each of the test tones, this leaves 96K samples for the auxiliary audio stream. Since the auxiliary stream needs both a Left and Right buffer, and since there needs to be double-buffer capability, each buffer is 24K samples deep. This depth requires the microprocessor to fully fill two auxiliary buffers every one-half second.

The FPGA controls addressing the test pattern buffer, and interfacing it to the microprocessor.

Microprocessor Interface

The microprocessor interface is implemented in an FPGA and a CPLD. The CPLD is responsible for those controllable signals which need to be available after power is applied, but before the FPGA has been programmed. The FPGA is responsible for all other programmable signals. The CPLD is responsible for providing the SPI-like interface to those devices which require it.

An interface to the variable gain device is required. This is a SPI interface. A second SPI interface is required to control the output level of the CODEC. A SPI or IIC interface is required to communicate with the four sample rate converters. The relay drivers need an interface, preferably parallel and non-volatile. The FPGA requires a programming interface, SPI-like in nature. The previously mentioned interfaces are implemented in a CPLD (XC9536XL).

The microprocessor interface consists of 16 data signals, 8 address signals, a RD signal, a WR signal, and an IRQ signal. Additional signals include a "card installed" signal that the audio card drives low when valid. The SPI/IIC interface is implemented as a portal to the microprocessor I/F, with D15 being the SPI data line. It is possible in some cases to implement reading of the SPI data under microprocessor control. Reading the portal will yield the basic life-status of the card.

If A7 is high, the CPLD device is being addressed. Otherwise, the FPGA device is being addressed. For the CPLD device, D7 through D0 always read the card status, as defined in the table:

D7	CLOCK_OK	The FPGA has waited sufficient time for the PLL to stabilise after a sample rate change. 1 = Clock stable 0 = Continue to wait, clock not stable
D6	FPGA_DONE	Used for configuring the FPGA 0 = Inactive 1 = Active; configuration complete
D5	FPGA_INIT	Used for configuring the FPGA 1 = Inactive, initialisation complete 0 = Active; initialisation in progress or configuration error
D4		Unused - read 0
D3	SPI_ON	The SPI interface has been activated 0 = SPI interface active 1 = SPI interface not active
D2	FPGA_JDOWN	The FPGA download jumper is installed. The microprocessor does not have control over the FPGA program port. This is an installation error 0 = Jumper installed 1 = Normal operation
D1	FPGA_JSER	The FPGA serial program jumper is installed. Microprocessor must use serial algorithm instead of parallel algorithm. This may be an installation error. 0 = Normal operation 1 = Jumper installed.
D0	SPI_LSB	This is the serial bit received from the addressed SPI device. May be used to read back the SPI data. 0 = Low logic level 1 = High logic level

D11 through D8 are not used for the CPLD device.

D15 through D12 are the control signals required by the card. All signals are read-write accessible. The functions are defined according to the table:

A[2:0]	Bit	Name	Comments
000	15	BYP_RLY4	Digital Channel 2 Bypass relay. Set to '1' to disable bypass (i.e. channel active). The signal will be inhibited from going high until the FPGA has been successfully programmed.
	14	BYP_RLY3	Digital Channel 1 Bypass relay.
	13	BYP_RLY2	Analog Channel 2 Bypass relay.
	12	BYP_RLY1	Analog Channel 1 Bypass relay.
001	15	ANA_RLY4	Set the input mode for analog channel 2. 1 = balanced, 0 (default) = unbalanced
	14	ANA_RLY3	Set the termination for analog channel 2. 1 = 600Ω, 0 (default) = high impedance (>20KΩ)
	13	ANA_RLY2	Set the input mode for analog channel 1. 1 = balanced, 0 (default) = unbalanced
	12	ANA_RLY1	Set the termination for analog channel 1. 1 = 600Ω, 0 (default) = high impedance (>20KΩ)

010	15	AES_BNC	Select the digital input sources 1 = 75Ω unbalanced, 0 (default) = 110Ω balanced
	14	SPDIF	Select the digital output levels for the BNC: 1 = SPDIF, 0 (default) = AES Consumer
	13:12		<not used>
011	15	FPGA_PROG	Puts the FPGA into program mode.
	14	FPGA_RST	Resets the FPGA after configuration.
	13	FPGA_WR	Forces the FPGA Write signal active when set. This should only be used during FPGA programming.
	12		<not used>
100	15:13	SPI_SEL	Select the active SPI device. 000: Variable Rate SRC, Stream 1 001: Variable Rate SRC, Stream 2 010: Digital Transceiver SRC, Channel 1 011: Digital Transceiver SRC, Channel 2 100: Digital Gain Control, Channel 1 101: Digital Gain Control, Channel 2 110: Analog CODEC, Channel 1 111: Analog CODEC, Channel 2 Writes to this register will set the SPI_ON control signal. Reads to this register will not affect the SPI_ON control signal. Reads or writes to any other register except register 7 (SPI_PORTAL) will clear the SPI_ON control signal. The microprocessor must access some other register (such as unused registers 5 or 6) to terminate the SPI transfer.If the CLOCK_OK status signal is not active, then the SPI_ON signal will not be activated.
	12		<not used>
101:110	15:12		<not used>
111	15	SPI_PORTAL	This is the bit that is written to the SPI serial line. It is suggested that the microprocessor read a word of data, then repeatedly write the word to register 7, followed by a left-shift, until all bits of the word have been shifted out (16 cycles). This method should make SPI accesses reasonably fast. NOTE: The microprocessor must allow at least six 27MHz clock cycles between successive writes to the SPI portal. Probably the software will generate more than this time through inherent delays.
	14:12		<not used>

Prior to the FPGA programming, the "CLOCK_OK" signal will be inactive (low). During this condition, neither the SPI register nor the bypass relay register will be available. Attempting to write to the bypass relay register will cause all the bypass relays to open, meaning all channels are in bypass mode. The SPI register will write as usual, but the SPI_ON signal will not become active.

To program the FPGA, set the FPGA_PROG signal as described above. Ensure that neither of the FPGA jumpers are installed. Write a byte of program data into D[7:0]

of SPI_PORTAL. Reads or writes to other registers will not interrupt the programming process, as is the case with normal SPI accesses. When the entire programming data has been written, verify that the INIT and DONE signals are correct. After pulsing the FPGA_RST signal, wait for the CLOCK_OK signal to become valid, indicating that the FPGA and clocks are functional. The SPI portal and bypass registers should now work as described.

If a change in the sample rate is written to the FPGA, the CLOCK_OK signal will go inactive for approximately 10 milliseconds, indicating that the clocks are not stable. Care must be taken not to write to the SPI or bypass relays during this period. It is recommended that the sample rate be written to the FPGA immediately after the FPGA_RST signal has been pulsed. If the sample rate changes, the SPI devices must be reconfigured.

Calibration

The calibration for the DPS-575 audio card involves two functional blocks: the analog output drivers and the analog input receivers. The functional blocks may not be calibrated independently, due to the nature of the system. The operator will require an Audio Precision test unit, and the DPS-575 main chassis for interface control. The analog processing sections have been designed such that the trimmer is just sufficient to compensate for all the cumulative tolerances of the components. If any of the measurements can not be brought into spec, it indicates that the circuit may have a faulty or out of tolerance component.

Analog Output Driver

The analog output drivers must be calibrated first. The procedure is to set the analog output channels to use a 1kHz audio test pattern, with amplitude of -18dBFS. The output operating level should be set to 0dBu, with +18dB headroom. The Audio Precision input should be set for 600Ω balanced termination. The analog output should be adjusted using the appropriate trimmer until the Audio Precision reads an input level of 0dBu. Repeat the procedure for the remaining three analog output channels.

Analog Input Stage

The analog input drivers are calibrated after the analog output drivers. The procedure is to connect the Audio Precision outputs to the analog card inputs. The input card should be set for high impedance balanced termination. The Audio Precision outputs should be set to 0dBu, balanced, with 40Ω impedance. The input operating level should be set to 0dBu with +18dB headroom. The Auto-Track feature should be disabled. With the same output configuration as in the previous analog output driver configuration, make the same measurements. Adjust the input trimmer until the Audio Precision reads an input level of 0dBu. Repeat the procedure for the remaining three channels.

CHAPTER 14: TEST/ALIGNMENT PROCEDURES - VIDEO

Test Equipment Required

- NTSC/PAL, SVHS, CAV Beta/MII Test Signal Generator
- Serial (Digital) Test Signal Generator
- Serial Component Monitor (WFM601)
- Waveform Monitor
- Vectorscope (NTSC and Component)
- Oscilloscope
- Colour Monitor
- Cable Clone Box (cable length simulator for SDI testing)
- Remote Control (eg. RC-4000, RC-475)
- DV Camera or DV Deck
- Network Hub

General Procedures

- Check front and rear panel for defects, etc.
- Check that switches operate normally and do not stick.
- Check board for missing parts, unsoldered parts, bent pins, dirt or other contaminants.
- Tighten AC Power ground strap.
- Tighten all connectors, cables, screws, nuts, etc.
- Ensure that cables are routed properly so that they are not pinched, and do not block air flow through the unit.
- Push down all socketed ICs.
- Connect Rear Panel Assembly remote control board (843-572), but do not screw it down, as access to the RGB potentiometers may be required.
- Connect all video cables, and 9-pin serial cable for upload of firmware if required.

Check Supply Voltages

Using an ohmmeter, check that these points are not shorted to Ground. Then, using a voltmeter, ensure proper voltage measurement:

1) positive side of EC10 (+3.3V),

2) negative side of EC9 (-12V).

3) positive side of EC8 (+12V).

4) positive side of EC7 (+5V).

Firmware Upload

Ensure that the latest firmware files have been uploaded to the unit. If new firmware files must be uploaded, see Appendix D, “the Uploader software,” for instructions on uploading firmware to the unit.

DPS-475 units should contain at least one file with each of the following extensions: **.VF5**, **.HTDB**, and **.FRM**. DPS-575 units should also contain a file with the extension **.VF6**. Audio-equipped units should also contain a file with the extension **.AFG**.

DCN Port Check

1. This test requires another DPS-475, DPS-575, RC-4000 or RC-475 unit to be connected to the same DCN network as the unit to be tested. Disconnect *Ethernet* from the unit to be tested.
2. On the front panel, press the *Remote* button. If the DCN connection is established, the other remote units (DPS-475, DPS-575, or RC-475) should appear in the list of selectable Remote Units. Note that it may take a couple of minutes for network polling to detect all remote units.
3. From an RC-4000 remote control, select *Search for Devices*. RC-4000 remote

controls with firmware revision 1.3c or higher will detect the unit being tested if the DCN connection is functioning properly.

Ethernet Port Check

1. This test requires another DPS-475, DPS-575, or RC-475 unit to be present and accessible through the network hub. Connect the unit to be tested to the same hub.
2. On the front panel, press the *Remote* button. If the Ethernet connection is established, the other remote unit should appear in the list of selectable Remote Units. Note that it may take a couple of minutes for network polling to detect all remote units.
3. To test Ethernet web browser control of the unit, configure the unit for your TCP/IP network as described in Appendix F, "Ethernet Control." Follow the Web Browser Control section of Appendix F to access the unit through your web browsing software, and verify correct control operation.

GPI Check

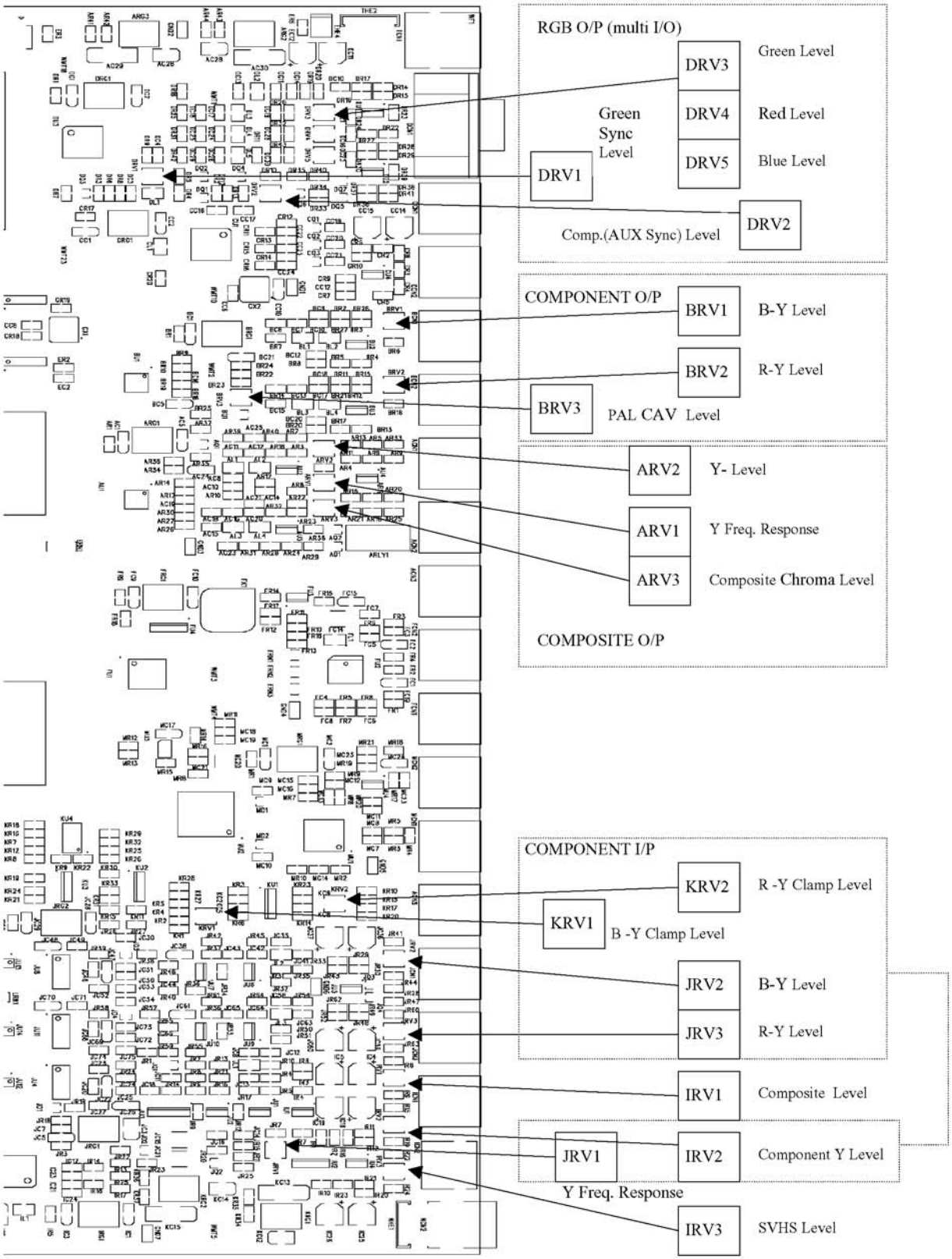
1. From the menus, select the *Misc. Setup* sub-menu from the System Config menu, to provide access to the GPI and GPO configuration options.
2. Verify that the white BNC connector labelled *Audio Delay/GP Out* on the Multi I/O Breakout Cable has a TTL pulse coming out on the scope.
3 Verify that the *GPI 1 State* and *GPI 2 State* menu readouts correctly display OFF and ON when the corresponding RCA connector on the Multi I/O Breakout Cable is opened and shorted.

RS-422 Port Check

If the Uploader software was used to upload firmware to the unit through the *RS-232/422* port, the port has been verified to be working. If not, use the Uploader software to upload at least one file (image, firmware, etc.) to verify correct operation. See Appendix D, "the Uploader software" for instructions.

Adjustment Potentiometer Locations

The diagram on the following page shows the locations of the potentiometers on the main board that will be used to calibrate the unit.



Calibration: NTSC

Before starting, ensure that a valid NTSC reference is connected to *Genlock In* of the unit, and that the unit is in 525-line mode (select *Line Standard* from the System Config menu, and switch if necessary). Also ensure that *VITS/Blanking* (under One-Time Video Setup in the System Config menu) is set to *Narrow* for both fields.

Component Output Level

1. Select FULL FIELD BARS as the test pattern and activate the unit's Test Signal Generator.
2. Adjust **ARV2** for 1.00Vpp on *CAV Y OUT* (or 714mV white-to-blanking).
3. Adjust **BRV1** (B-Y) and **BRV2** (R-Y) for 700mVpp on *B-Y OUT* and *R-Y OUT* respectively (or to get dots in their boxes on the component vectorscope).

Composite Output Level

1. Adjust Chroma **ARV3** to get vectors dots in their vectorscope boxes on *Composite Out*.
2. Switch the test pattern to LUMA SWEEP 5.5MHz, and adjust **ARV1** for flattest frequency response.
3. Switch back to FULL FIELD BARS, and verify that *S-Video-Y OUT* is 1.00Vpp on the Multi I/O Breakout Cable.
4. Verify that *S-Video-C OUT* on the Multi I/O Breakout Cable has 286mVp-p Burst, and that the vector dots are in their boxes on the NTSC vectorscope.

RGB Output Level

1. Adjust **DRV1** for 286mV sync level on the GREEN Output, and then adjust **DRV3** for 714mV White-to-Blanking on the GREEN Output.
2. Adjust **DRV4** for 714mV White-to-Blanking on the RED Output.
3. Adjust **DRV5** for 714mV White-to-Blanking on the BLUE Output.
4. Adjust **DRV2** for 1.00Vp-p on Composite/AUX SYNC Output.

SDI Output Check

1. Verify both SDI outputs on the serial digital component monitor. Observe the display in parade, vector and lightening modes.
2. Select the EYE function on the WFM601 monitor at 10Hz CLOCK BW. Select CONFIG-EYE PATTERN-CLOCK BW-10HZ.
3. The EYE amplitude should be approximately 740mVpp, and the line jitter should not exceed 560pS at the 10Hz Clock Bandwidth.
4. Select the SHALLOW RAMP test pattern in the unit.
5. Connect the cable clone box between the *SDI OUT* and the WFM601 input. Select 250M and run the EDH DET test for 2 minutes. (Press RESET on the WFM601 to start the timer).
6. Repeat step 5 for *SDI OUT-2*.
7. Repeat step 5 for *SDI Reclocked*.

DigiDuplex

1. Check **MU3-3**, **MU3-4**, and **MU3-5** for valid clock signals on scope.

Composite Input Level

1. Turn off the unit's Test Signal Generator. Select the COLOR BARS test pattern in the external test signal generator, and set the unit to Process Mode (the unit is in Process Mode when the light on the *Bypass* front-panel button is not flashing; if the Bypass indicator is flashing, press the *Bypass* button to return to Process Mode). Set the proc amp settings to unity for all input modes. This can be done easily by pressing the *Memory* front-panel button three times in succession.
2. From the menus, select the *Factory Calibration* sub-menu from the System Config menu. Press enter to confirm that you wish to enter the *Factory Calibration* sub-menu. From here, change *Calibration Mode* to ON. This will turn digital clamp tracking OFF. Press *Exit* to return to the *Factory Calibration* sub-menu.
3. While still in the *Factory Calibration* sub-menu, select the *Blk-Cal Comp 525* option and press *Enter*. Turning the control knob automatically selects the *Composite* input.
4. Adjust the front panel control knob for 0 Setup, while at the same time adjusting **IRV1** for 714mV White-to-Blanking on the output monitor. Press *Exit* to store the new setting.

Component Input Level

1. With Calibration Mode still ON, from the menu select *Blk-Cal CAV 525* and press *Enter*. Turn the control knob to automatically select *CAV* input. Adjust the front panel control knob for 0 Setup, while at the same time adjusting **IRV2** for 714mV White-to-Blanking on the output monitor.
2. Switch the test pattern to LUMA SWEEP, and adjust **JRV1** for flattest frequency response. Switch the test pattern back to FULL FIELD BARS.
3. Monitoring R-Y output on CH-A2 on the waveform monitor, adjust **JRV3** (the the R-Y Level) for 700mVp-p, and adjust **KRV2** (R-Y Clamp) to line up the zero crossing of the waveform, and settle at a quiet state.
4. Monitoring B-Y output on CH-A3 on the waveform monitor, adjust **JRV2** (the B-Y Level) for 700mVp-p, and adjust **KRV1** (B-Y Clamp) to line up the zero crossing of the waveform, and settle at a quiet state.

S-Video Input Level

1. Select the S-Video input source using the *Video In* front-panel button.
2. From the *Factory Calibration* sub-menu, turn OFF *Calibration Mode.* Press *Exit* to return to the *Factory Calibration* sub-menu.
3. Select each of the individual controls *SVid-Cal Luma* and *SVid-Cal Black*. Adjust each of these options with the front panel control knob for correct setup level and 714mV White-to-Blanking on the output monitor.
4. Select the *SVid-Cal Chroma* option, and adjust it with the front panel control knob for correct chroma on the vectorscope.
5. From the *Factory Calibration* sub-menu, select *Save Calibration*, and press *Exit*.

SDI Input Check

1. Select SDI as the video input source. Verify both SDI inputs on the output monitor.
2. Select the SHALLOW RAMP test pattern.
3. Enable *EDH Detection* in the Video Setup menu. Select the *EDH Error Count* option in the Video Setup menu, and turn the control knob to reset the count to zero.
4. Connect the cable clone box between the unit's *SDI In* and the SDI source. Select 300M and run the EDH test for 2 minutes. (Press RESET on the WFM601 to start the timer). The EDH light on the unit will flash if errors are detected.

Timing and General

1. Cycle through all input video sources, and observe composite, S-Video, analog component and SDI outputs on appropriate waveform monitors to ensure they are within spec.
2. Select the *Horizontal* option in the Timing Setup menu. Use the control knob to adjust this option to line up the output sync falling edge with the black reference sync edge.
3. Select the *Subcarrier* option in the Timing Setup menu. Use the control knob to adjust this option to line up the output burst with the black reference burst.

DV Module Check

1. Install the DV I/O Module, as detailed in Appendix C, "Installation of Hardware Options." Be sure to install the cable between the DV I/O Module and connector NHE1.
2. Connector a DV Camcorder or a DV deck to *DV I/O* on the back of the unit.
3. Play and record a clip to check that DV video and audio are working.

Calibration: PAL

Before starting, ensure that a valid PAL reference is connected to *Genlock In* of the unit, and that the unit is in 625-line mode (select *Line Standard* from the System Config menu, and switch if necessary). Also ensure that *VITS/Blanking* (under One-Time Video Setup in the System Config menu) is set to *Narrow* for both fields.

Component Output Level

1. Select EBU BARS as the test pattern and activate the unit's Test Signal Generator.
2. Adjust **ARV2** for 1.00Vpp on *CAV Y OUT* (or 714mV white-to-blanking).
3. Disconnect reference from *Genlock In,* or change to an NTSC reference signal.
4. From the menus, select *Line Standard* from the System Config menu, and switch to the 525-line standard.
5. Select FULL FIELD BARS as the test pattern
6. Adjust **BRV1** (B-Y) and **BRV2** (R-Y) for 700mVpp on *B-Y OUT* and *R-Y OUT*

respectively (or to get dots in their boxes on the component vectorscope).

7. From the menus, select *Line Standard* from the System Config menu, and switch back to the 625-line standard. Select EBU BARS as the test pattern.
8. Adjust **BRV3** for 525 mVp-p on *B-Y Out* and *R-Y Out* on the waveform monitor (the same pot affects both outputs).
9. Reconnect PAL reference to *Genlock In*.

Composite Output Level

1. Adjust Chroma **ARV3** to get vectors dots in their respective vectorscope boxes on *Composite Out*.
2. Switch the test pattern to LUMA SWEEP 5.5MHz, and adjust **ARV1** for flattest frequency response.
3. Switch back to EBU BARS, and verify that *S-Video-Y OUT* is 1.00Vpp on the Multi I/O Breakout Cable.
4. Verify that *S-Video-C OUT* on the Multi I/O Breakout Cable has 300mVp-p Burst, and that the vector dots are in their boxes on the vectorscope.

RGB Output Level

1. Adjust **DRV1** for 300mV sync level on the GREEN Output, and then adjust **DRV3** for 714mV White-to-Blanking on the GREEN Output.
2. Adjust **DRV4** for 714mV White-to-Blanking on the RED Output.
3. Adjust **DRV5** for 714mV White-to-Blanking on the BLUE Output.
4. Adjust **DRV2** for 1.00Vp-p on Composite/AUX SYNC Output.

SDI Output Check

1. Verify both SDI outputs on the serial digital component monitor. Observe the display in parade, vector and lightening modes.
2. Select the EYE function on the WFM601 monitor at 10Hz CLOCK BW. Select CONFIG-EYE PATTERN-CLOCK BW-10HZ.
3. The EYE amplitude should be approximately 740mVpp, and the line jitter should not exceed 560pS at the 10Hz Clock Bandwidth.
4. Select the SHALLOW RAMP test pattern in the unit.
5. Connect the cable clone box between the *SDI OUT* and the WFM601 input. Select 250M and run the EDH DET test for 2 minutes. (Press RESET on the WFM601 to start the timer).
6. Repeat step 5 for *SDI OUT-2.*
7. Repeat step 5 for *SDI Reclocked.*

DigiDuplex

1. Check **MU3-3**, **MU3-4**, and **MU3-5** for valid clock signals on scope.

Composite Input Level

1. Turn off the unit's Test Signal Generator. Select the COLOR BARS test pattern in the external test signal generator, and set the unit to Process Mode (the unit is

in Process Mode when the light on the *Bypass* front-panel button is not flashing; if the Bypass indicator is flashing, press the *Bypass* button to return to Process Mode). Set the proc amp settings to unity for all input modes. This can be done easily by pressing the *Memory* front-panel button three times in succession.

2. From the menus, select the *Factory Calibration* sub-menu from the System Config menu. Press enter to confirm that you wish to enter the *Factory Calibration* sub-menu. From here, change *Calibration Mode* to ON. This will turn digital clamp tracking OFF. Press *Exit* to return to the *Factory Calibration* sub-menu.
3. While still in the *Factory Calibration* sub-menu, select the *Blk-Cal Comp 625* option and press *Enter*. Turning the control knob automatically selects the *Composite* input.
4. Adjust the front panel control knob for 0 Setup, while at the same time adjusting **IRV1** for 714mV White-to-Blanking on the output monitor. Press *Exit* to store the new setting.

Component Input Level

1. With Calibration Mode still ON, from the menu select *Blk-Cal CAV 625* and press *Enter*. Turn the control knob to automatically select *CAV* input. Adjust the front panel control knob for 0 Setup, while at the same time adjusting **IRV2** for 714mV White-to-Blanking on the output monitor.
2. Switch the test pattern to LUMA SWEEP, and adjust **JRV1** for flattest frequency response. Switch the test pattern back to EBU BARS.
3. Monitoring R-Y output on CH-A2 on the waveform monitor, adjust **JRV3** (the the R-Y Level) for 525mVp-p, and adjust **KRV2** (R-Y Clamp) to line up the zero crossing of the waveform, and settle at a quiet state.
4. Monitoring B-Y output on CH-A3 on the waveform monitor, adjust **JRV2** (the B-Y Level) for 525mVp-p, and adjust **KRV1** (B-Y Clamp) to line up the zero crossing of the waveform, and settle at a quiet state.

S-Video Input Level

1. Select the S-Video input source using the *Video In* front-panel button.
2. From the *Factory Calibration* sub-menu, turn OFF *Calibration Mode.* Press *Exit* to return to the *Factory Calibration* sub-menu.
3. Select each of the individual controls *SVid-Cal Luma* and *SVid-Cal Black*. Adjust each of these options with the front panel control knob for correct setup level and 714mV White-to-Blanking on the output monitor.
4. Select the *SVid-Cal Chroma* option, and adjust it with the front panel control knob for correct chroma on the vectorscope.
5. From the *Factory Calibration* sub-menu, select *Save Calibration*, and press *Exit*.

SDI Input Check

1. Select SDI as the video input source. Verify both SDI inputs on the output monitor.
2. Select the SHALLOW RAMP test pattern.
3. Enable *EDH Detection* in the Video Setup menu. Select the *EDH Error Count* option in the Video Setup menu, and turn the control knob to reset the count to

zero.

4. Connect the cable clone box between the unit's *SDI In* and the SDI source. Select 300M and run the EDH test for 2 minutes. (Press RESET on the WFM601 to start the timer). The EDH light on the unit will flash if errors are detected.

Timing and General

1. Cycle through all input video sources, and observe composite, S-Video, analog component and SDI outputs on appropriate waveform monitors to ensure they are within spec.
2. Select the *Horizontal* option in the Timing Setup menu. Use the control knob to adjust this option to line up the output sync falling edge with the black reference sync edge.
3. Select the *Subcarrier* option in the Timing Setup menu. Use the control knob to adjust this option to line up the output burst with the black reference burst.

DV Module Check

1. Install the DV I/O Module, as detailed in Appendix C, "Installation of Hardware Options." Be sure to install the cable between the DV I/O Module and connector NHE1.
2. Connector a PAL DV Camcorder or a DV deck to *DV I/O* on the back of the unit.
3. Play and record a clip to check that DV video and audio are working.

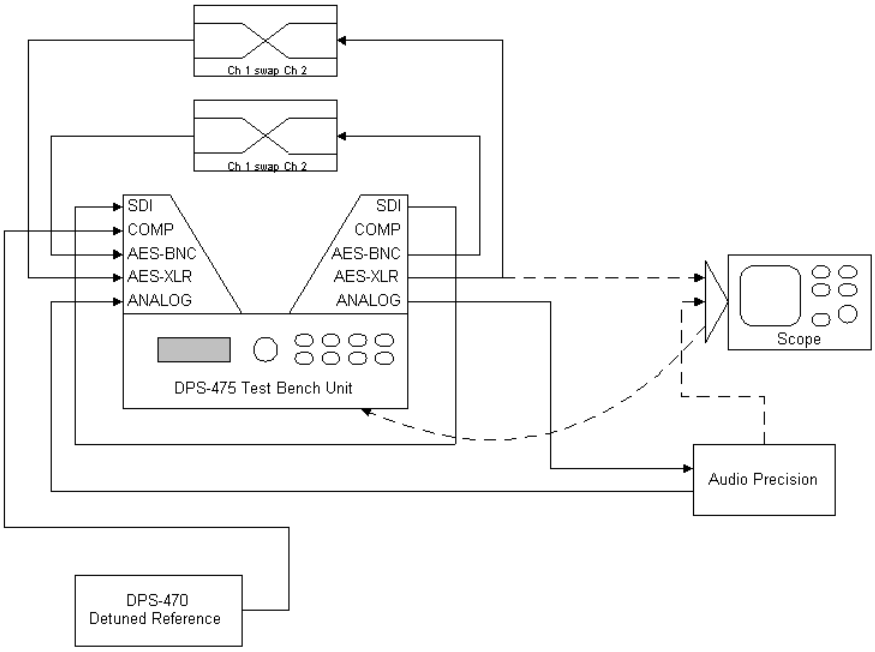
CHAPTER 15: TEST/ALIGNMENT PROCEDURES - AUDIO

This chapter describes the necessary practices and equipment involved in conducting a complete functional and verification test of the DPS-475/575 Audio Option assembly.

Test Equipment Required

- Audio Precision Test Station
- Oscilloscope, 100MHz or better
- Two matched scope probes
- DPS-470 De-tuned Reference Unit or alternative (see below)
- Cabling
- Digital Volt Meter
- PC with Xilinx JTAG Download cable and software.

The equipment should be wired according to the following diagram. Note that AES1-XLR output from the unit is connected to the AES2-XLR input, and vice versa.



DPS-475 Audio Test Connection Diagram

Basic Parameters

The following sections tabulate the basic default parameter settings for the various instruments in the test. Unless stated otherwise, these settings should be used for all of the test procedures.

DPS-475 Test Bench Unit

Parameter	Channel 1	Channel 2
Input	Analog	Analog
Analog Bypass	Process	Process
AES/EBU	Process	Process
Gain-R and -L	0dB	0dB
DDplex Gain -R and -L	0dB	0dB
Fixed Delay	0mS	0mS
Input Operating Level	0dBu	0dBu
Headroom	18dB	18dB
Output Operating Level	0dBu	0dBu
Test Tone Level	-18dBFS	-18dBFS
Test Tone Freq. Left	1000Hz	1000Hz
Test Tone Freq. Right	1000Hz	1000Hz
Balanced	Balanced	Balanced
Termination	High-Z	High-Z
Stereo Mode	Normal Stereo	Normal Stereo
Fix Invert	Off	Off
SDI In	Ch 1-2	Ch 3-4
AFV Enable	Off	Off
Auto Track	OFF	
Master Mute	OFF	
Audio Bypass	Process	
AES Data Grade	Pro	
AES Elec. Levels	AES	
AES Source	BNC	
96kHz AES Output	Disable	
DigiDuplex Output	SDI	
SDI Out	Ch 1-4	
Channel In->Out	1->1 2->2	
Sample Rate	48KHz	
SDI Embedding	On	
SDI L/R De-embed	Strict	
Pitch Change	Normal	

DPS-470 De-Tuned Reference

The DPS-470 de-tuned reference is to provide a composite video source with a clock reference significantly different than that of the test bench DPS-475. This is accomplished by removing the top cover of the DPS-470 and adjusting the pot **GRV1** full to the right position. The top cover may be replaced after the adjustment is made.

If a DPS-470 unit is not available, you can substitute any composite video source that has a frequency reference (colour sub-carrier) well outside the NTSC/PAL specification. This is primarily used to test the Auto Track feature. You will also need the DPS-475 Test Program running on the Audio Precision test station.

Audio Precision

	Generator	Analyzer	
Tone	1KHz		
Level	+18dBu	Units in dBu	Units in dBu
Impedance	40Ω	600Ω	600Ω
Configuration	Balanced - GND	XLR-Balanced	XLR-Balanced

Visual Inspection and Power-Up Test

The purpose of this test is to ensure that the board is capable of being tested and will not cause problems with the rest of the system.

Visual Inspection

Visually check that all components on the Audio Option module have been installed properly. This check should include the following points as a minimum:

- Verify that all necessary components have been installed.
- Verify correct orientation on polarized devices and integrated circuits.
- Search for the presence of solder balls and shorts.

Installation of the card

Install the audio card in the DPS-475 chassis, as detailed in Appendix C, “Installation of Hardware Options.”

Apply Initial Power

Apply power to the chassis, using the main AC power switch. Check the audio card for signs of overheating. Verify that power supplies to the audio board are within limits, according to the table:

Supply	Measuring Point	Nominal (VDC)	Minimum (VDC)	Maximum (VDC)
+12V	AC14 +	+12	+11.4	+12.6
-12V	AC6 -	-12	-12.6	-11.4
+5V	AC10 +	+5	+4.75	+5.25
+3.3V	AC8 +	+3.3	+3.14	+3.46
+2.5V	BD1 -	+2.5	+2.38	+2.62
+5V Analog	CD1 -	+5	+4.75	+5.25
-5V Analog	CD2 +	-5	-5.25	-4.75

If any voltage fails the test, it is probably due to incorrect component installation. If all components are installed correctly, check the regulators (**BQ1**, **CQ1**, and **CQ2**) for proper functionality.

Initialising the Audio Sub-system

This section will program the CPLD on the audio card, and will ensure that the audio card can be controlled from the main board.

Programming the CPLD

Install the JTAG Programming Cable into header **AJ1** on the audio board. Connect the other end of the cable to the PC parallel port.

On the PC, invoke the program *Xilinx JTAG Programmer*.

From the File menu, select Open, and open the chain description file **843-573.cdf**.

From the Operations menu, select Chain Operations and press Execute. The CPLD device should now be programmed. If it does not, the device may be faulty or the cable connections may not be reliable.

Once the CPLD has been programmed correctly, remove the JTAG Programming Cable.

Verifying the FPGA

At this point, it is necessary to restart the DPS-475. On power-up, the front panel display should indicate that the audio card is present and loaded. If there is a problem configuring the FPGA, the front panel display will indicate this. The problem is likely due to an inter-board communication issue. Refer to page 1of the audio schematic 743-573, reference D-2 for one possible problem area.

Once the FPGA has been loaded, the DPS-475 will enter normal operation. Verify that the FPGA is operational by reading the version number in the system configuration register. Compare this value with the current version number.

The Analog Audio Interface

This group of tests will ensure that the analog interface of the audio card is functioning correctly and within specifications.

Bypass Relays

Set the audio precision analyzer impedance to 100KΩ on both channels. Mute the outputs on the audio card. With the DPS-475 in BYPASS position, the audio precision should measure +18dBu on both inputs. Switching the BYPASS relays off should cause the audio precision to measure the noise floor of the audio card, at a level somewhere below -40dBu. If the measurement is above this level, it indicates that one or more of the bypass relays are not switching properly.

Restore the audio channels to active outputs. The audio precision should now measure approximately +18dBu on both inputs, indicating that the audio card is processing the analog data.

Input Termination Relays

Change both channels to unbalanced inputs. This should result in the audio precision indicating a drop of approximately –6dB on both channels, to approximately +12dBu. Restore the channels back to balanced inputs, and then change the termination to 600Ω. The reading on the audio precision should drop approximately –0.6dB to +17.4dBu. If the results are not as expected, the termination relays or their driver circuits are suspect. Restore the termination relays and the audio precision to the default configuration

Output Driver Calibration

Assign both channels to test tones, 1KHz at –18dBFS. All other settings should be as per the default values. The audio precision should indicate levels of approximately 0dBu. Adjust the appropriate output driver trim controls (**CR4**, **CR37**, **CR65**, or **CR98**) until the audio precision reads 0dBu, ±0.005dB on both channels. Remove the test tones and switch back to analog inputs.

Input Receiver Calibration

Configure the audio precision generator for 0dBu output levels. The audio precision analyzer levels should indicate approximately 0dBu. Adjust the appropriate input receiver trim controls (**CR2**, **CR33**, **CR64**, and **CR95**) until the audio precision reads 0dBu, ±0.005dB on both channels. The analog processing section is now ready for specification testing.

Specifications

For all specification measurements, the DPS-475 headroom parameter should be set to 24dB, and the Audio Precision output level should be set to +23dBu. All other parameters are set to the default values.

Phase: The phase measurement may be read directly from the audio precision display screen.

THD+N: The audio precision analyzer Function Reading section should select THD+N Ratio. The BW limits should be set to 22Hz and 22kHz. Two measurements should be made per channel; first with no filter selected, and second with the A-Weighting filter selected.

Full Scale Output: Set the audio precision output level to +23.1dBu. Verify that the audio precision analyzer levels are at least 23.1dBu, and that the THD+N (un-weighted) measurement is less than 0.01%. If the analyzer indicates levels are slightly low, adjust the audio precision output levels accordingly. When the test is complete, restore the output level to +23dBu

Signal to Noise Ratio: The audio precision analyzer Function Reading section should select Amplitude, with the A-weighting filter selected. The analyzer dBr A and B fields should be set to the level reading of channel A and B respectively. This value should be approximately +23dBu. The measurement units of channel A should be set to dBr-A, and the measurement units of channel B should be set to dBr-B. Disable the outputs of the audio precision generator. The signal to Noise Ratio of each channel is read as the Amplitude measurement. The measurement is a negative value, and should be interpreted as a positive value for the purposes of this test. When completed, restore the Audio Precision outputs.

Cross talk: Set the Function Reading to Cross-talk. With channel A selected for measurement, remove the source signal from channel A. The resulting measurement is an indication of how much of the signal from channel B is affecting channel A. Restore the source to channel A and perform the same test on channel B.

Frequency Response: With both generators active, and with the Bandwidth set to maximum (<10Hz and >500kHz), the frequency response of the unit can be plotted. Set the DPS-475 headroom back to its nominal value of 18dB. Set the generator output levels to 17.5dBu. Set dBr A and B values to their respective readings. Invoke the Audio Precision Sweep table. Set Data 1 and Data 2 to "Anlr Level" A and B respectively. Set the top and bottom limits for both channels to +0.5dBr and –0.5dBr A or B as appropriate. Set Source 1 to "Gen.Freq", with a start of 20Hz and a stop of 20kHz, for a total of 200 steps. Press the "go" button. The sweep will take several seconds to complete. Evaluate the graph to determine if the measurement is within specifications.

Measurement	Maximum	Minimum
Phase	+0.2°	-0.2°
THD+N – Non weighted	0.005%	
THD+N – A-weighting	0.005%	
Full Scale Output (THD+N < 0.01%)		23.1dBu
Signal to Noise Ratio – A-weighted		-71dB
Channel Separation (Cross-talk)	+0.005%	-0.005%
Frequency Response 20Hz ~ 50Hz	+0.2dB	-0.2dB
Frequency Response 50Hz ~ 15kHz	+0.05dB	-0.05dB
Frequency Response 15kHz ~ 20kHz	+0.5dB	-0.5dB

Remaining Audio Channels

Repeat allof the above tests for the remaining two channels.

The Digital Audio Interfaces

This group of tests will ensure that the digital interface of the audio card is functioning correctly and within specifications. For all of these tests, the basic parameters of the DPS-475 Test Bench Unit should be modified as follows, unless otherwise indicated:

Parameter	Channel 1	Channel 2
Input	AES	AES
AES/EBU	Process	Process
Test Tone Freq. L	1000Hz	3000Hz
Test Tone Freq. R	2000Hz	4000Hz

Bypass Relays

The two AES/EBU channels must be tested independently. To test Channel 1, set the channel 2 input source to “Test Tones”. Connect the analog audio outputs from channel 1 to the Audio Precision test set. Connect the Audio Precision monitor outputs to the oscilloscope. With the AES/EBU inputs in the “process” position, the two sine waves should be observed on the scope. Change the channel 1 AES/EBU inputs to “bypass”, and the sine waves should disappear. Changing back to “process” should restore the sine waves.

Change the global AES/EBU input source to XLR and repeat the previous tests.

Repeat the above tests with the remaining Channel 2.

AES/EBU output modes

Connect the two AES/EBU BNC output signals to the oscilloscope. When 96kHz AES output mode is disabled, the eye frequency of both signals should be 6.144MHz. When 96kHz AES output mode is enabled, the eye frequency should double to 12.288MHz. Restore the 96kHz Output mode to the “disable” state.

When the AES Electrical level is set to “AES”, the signal voltage should be 1Vpp+/-0.1V, not counting overshoot. When the level is set to “SPDIF”, the signal voltage should be 0.5Vpp+/-0.1V, not counting overshoot.

SDI Embedding and DigiDuplex

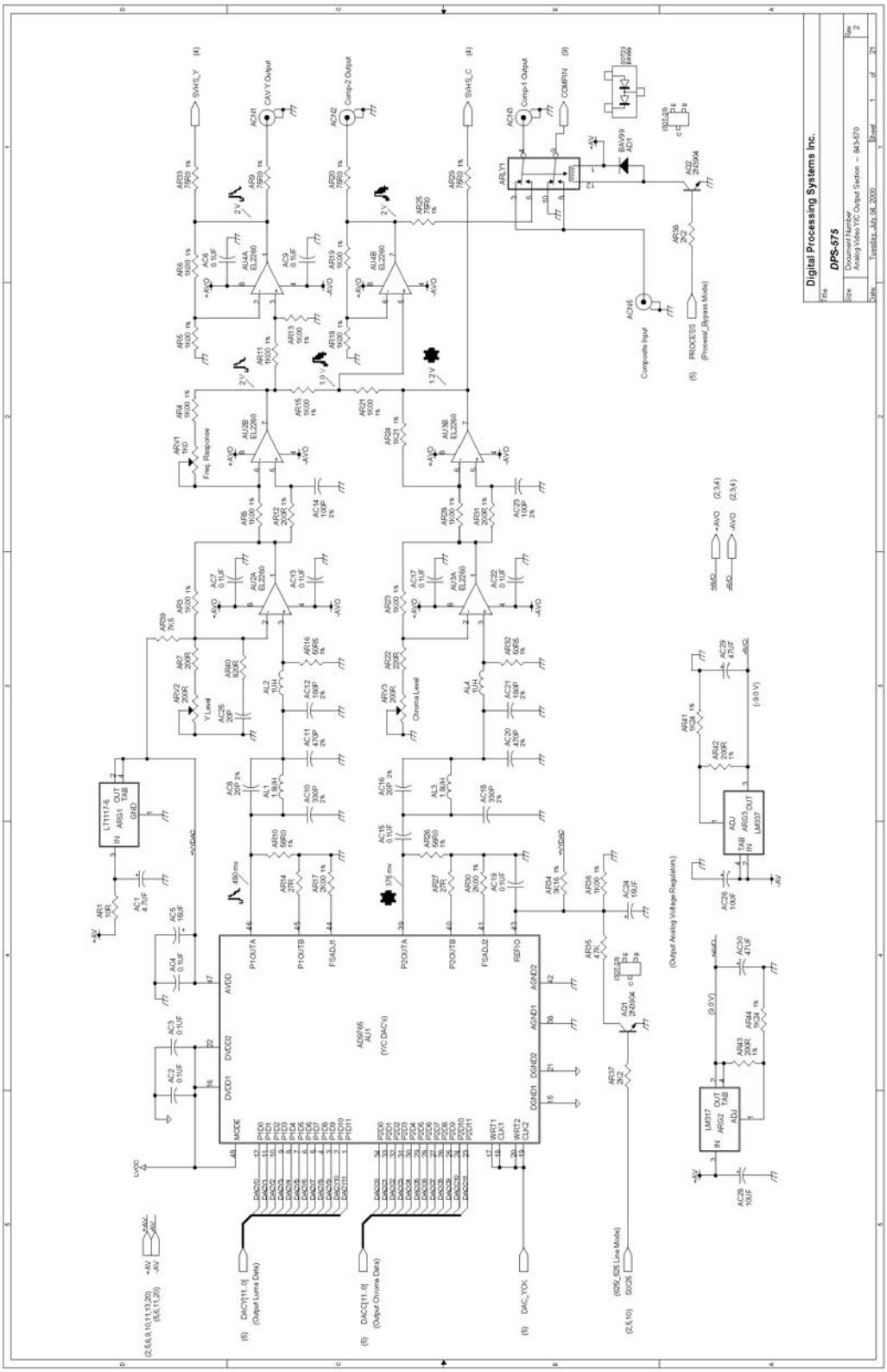
Put the DPS-475 test bench unit in DigiDuplex mode. The SDI output should be looped back to the SDI input. The de-tuned reference composite video source is applied to the composite input of the DPS-475. The audio DigiDuplex output should be selected as SDI. Connect the oscilloscope to the audio precision monitor outputs. With the Audio Precision generators active, the scope should indicate valid tones.

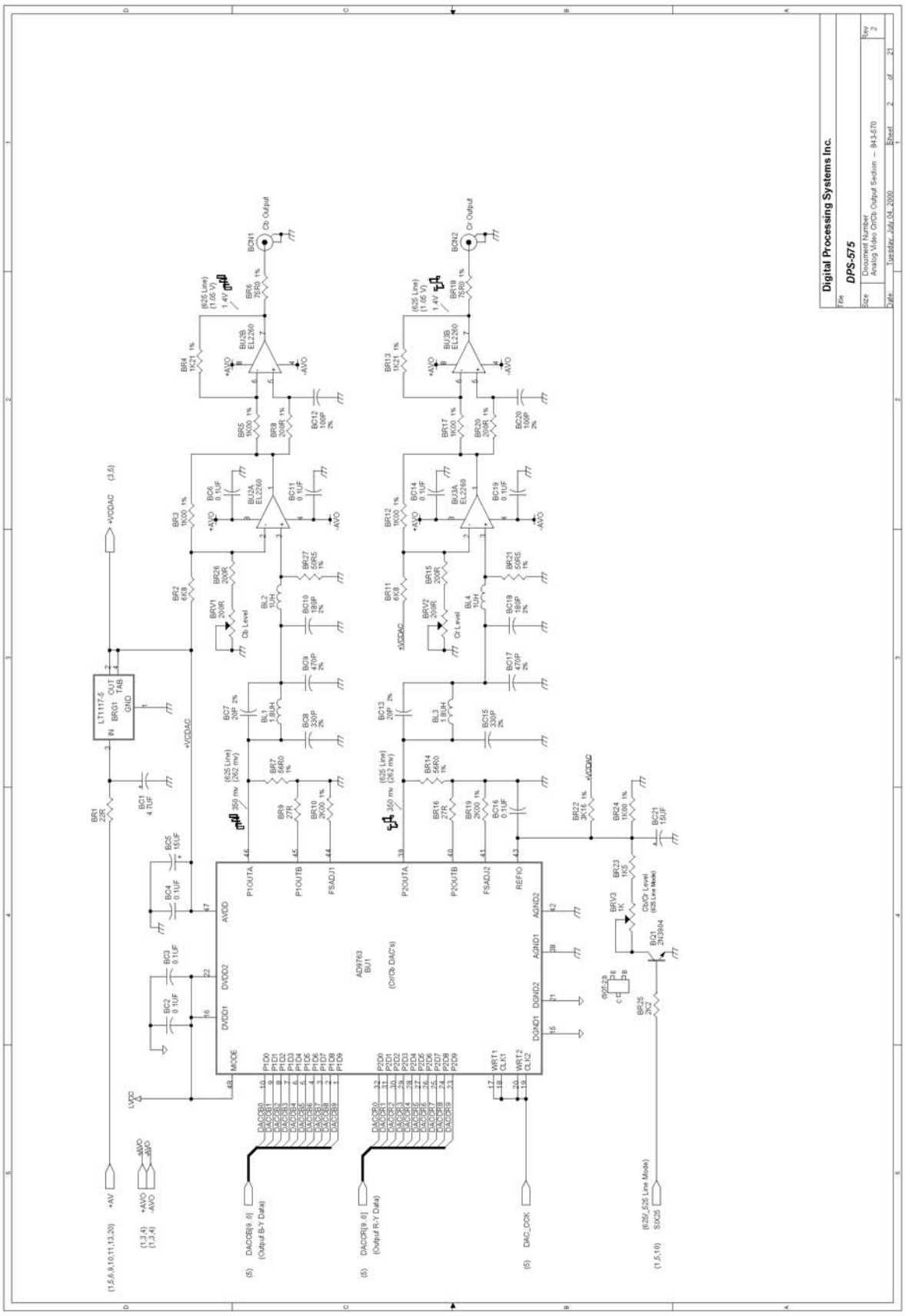
Auto-Track

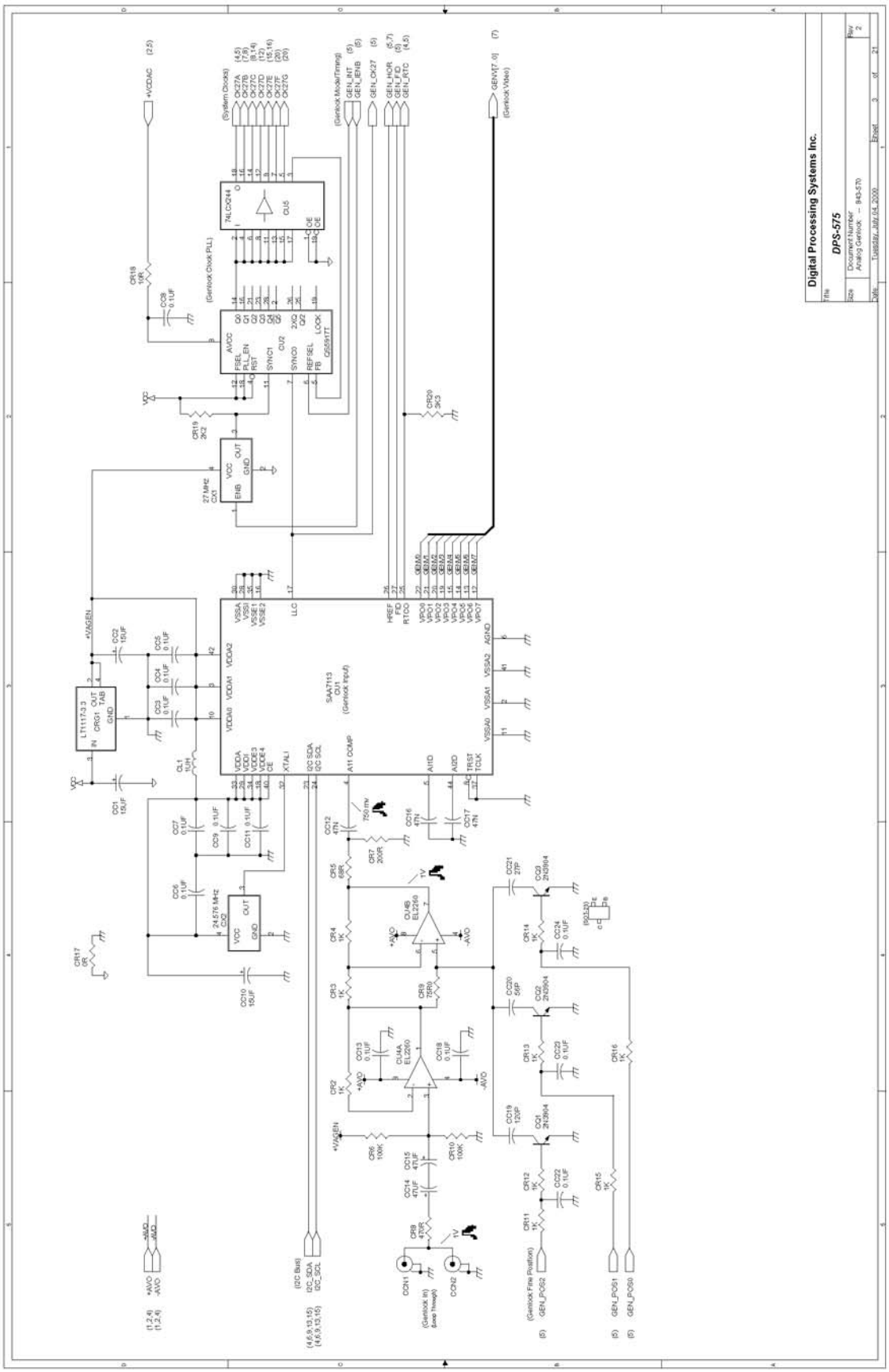
Connect one of the scope probes to **BTP1** and the other to **BTP2**. Apply the de-tuned reference composite video source to the composite input of the DPS-475. Select the video source as COMP. With Auto-Track disabled, the two waveforms displayed on the scope will be stable with respect to each other. With Auto-Track enabled, then one of the traces should jump periodically, compared to the other trace. Disabling Auto-Track should restore the two traces to stability.

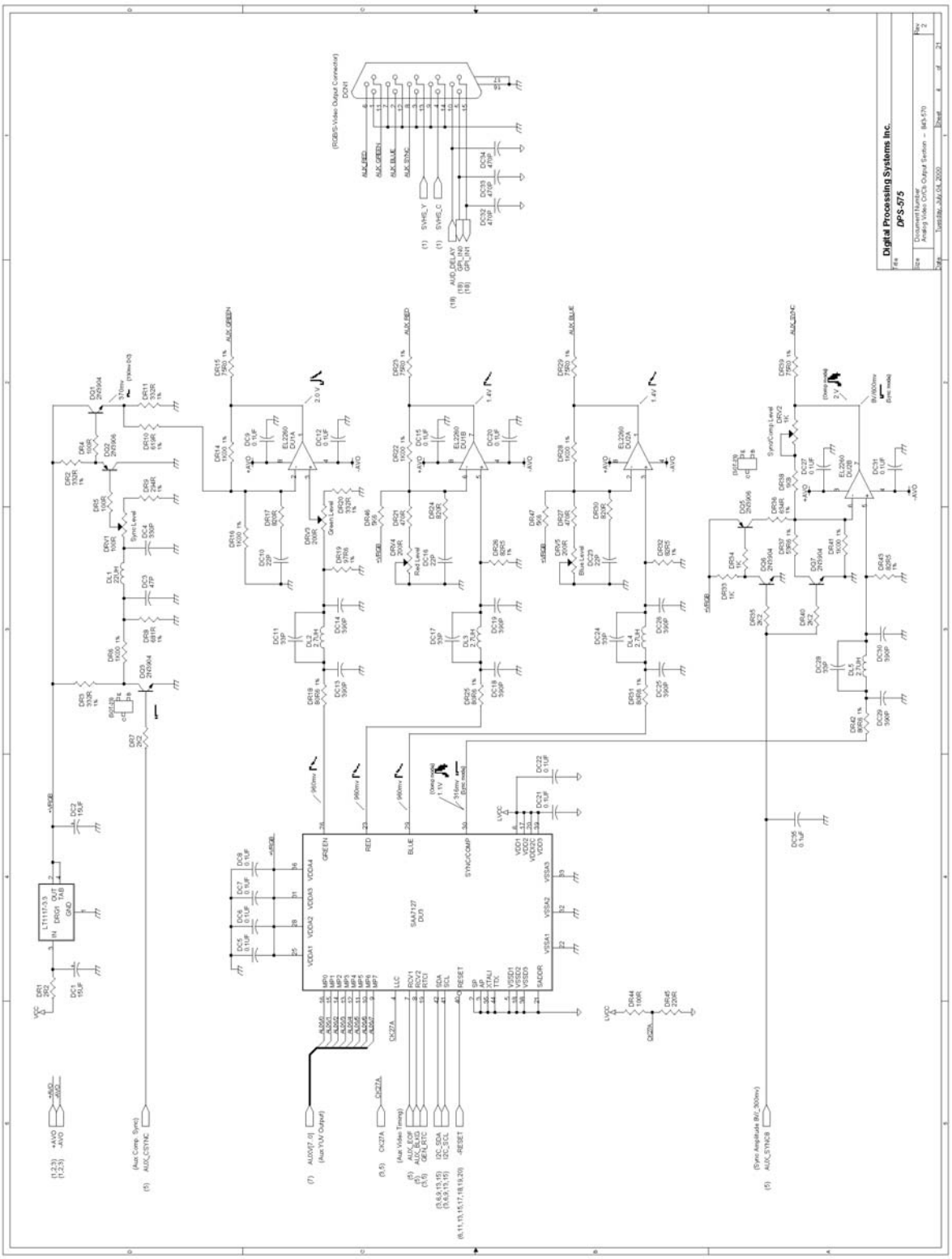
CHAPTER 16: SCHEMATICS

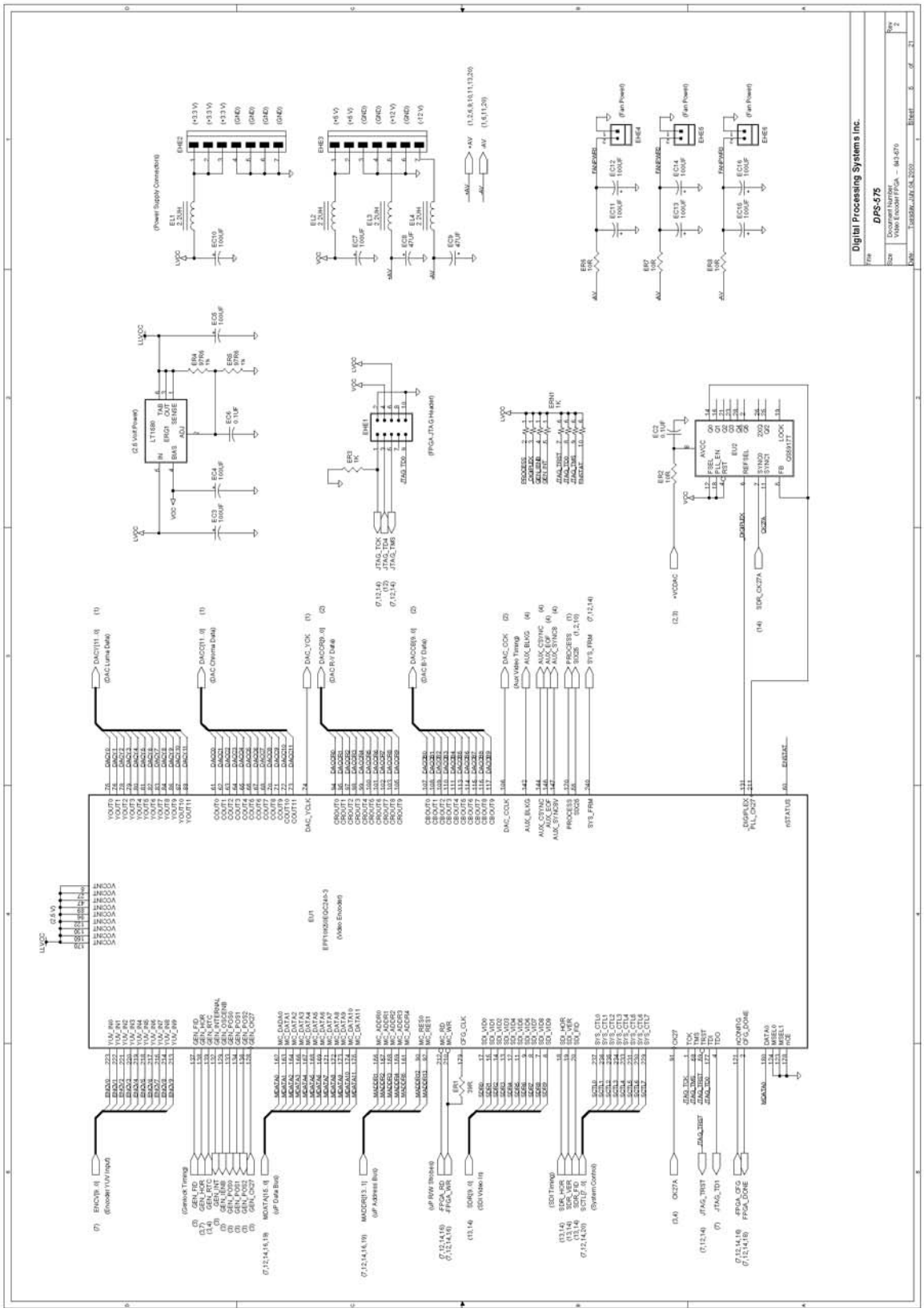
DPS-475/575 Main Board

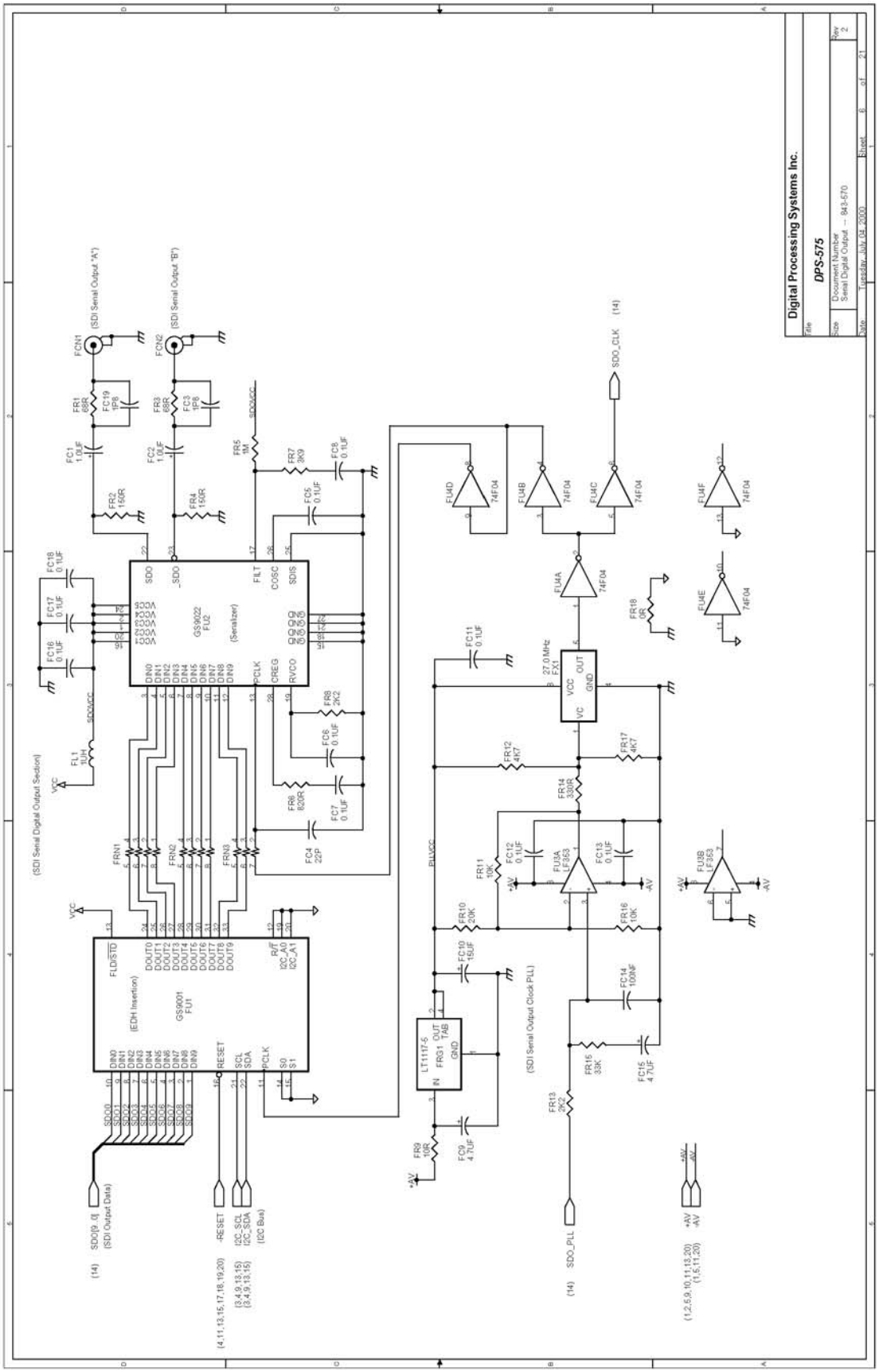


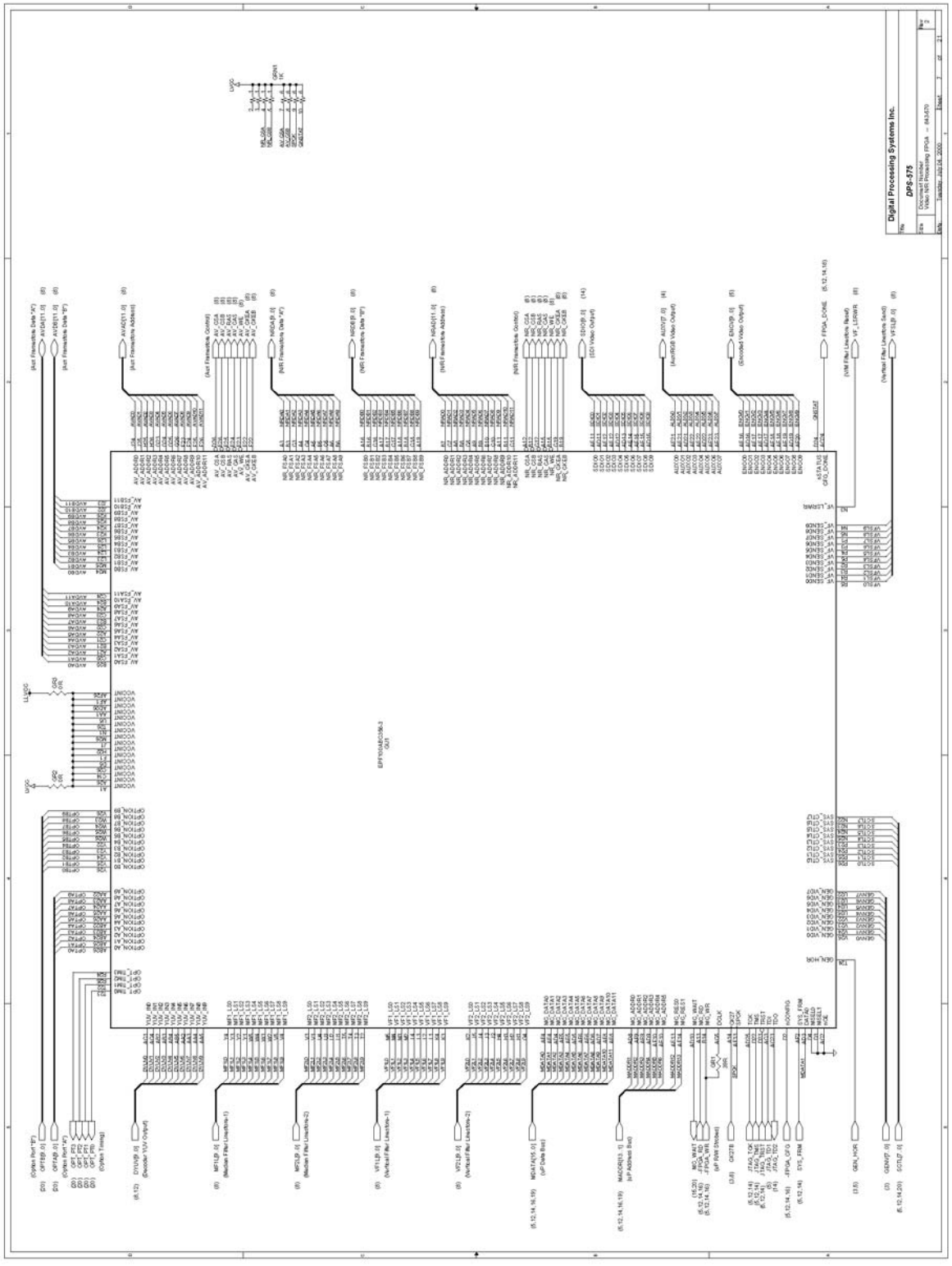


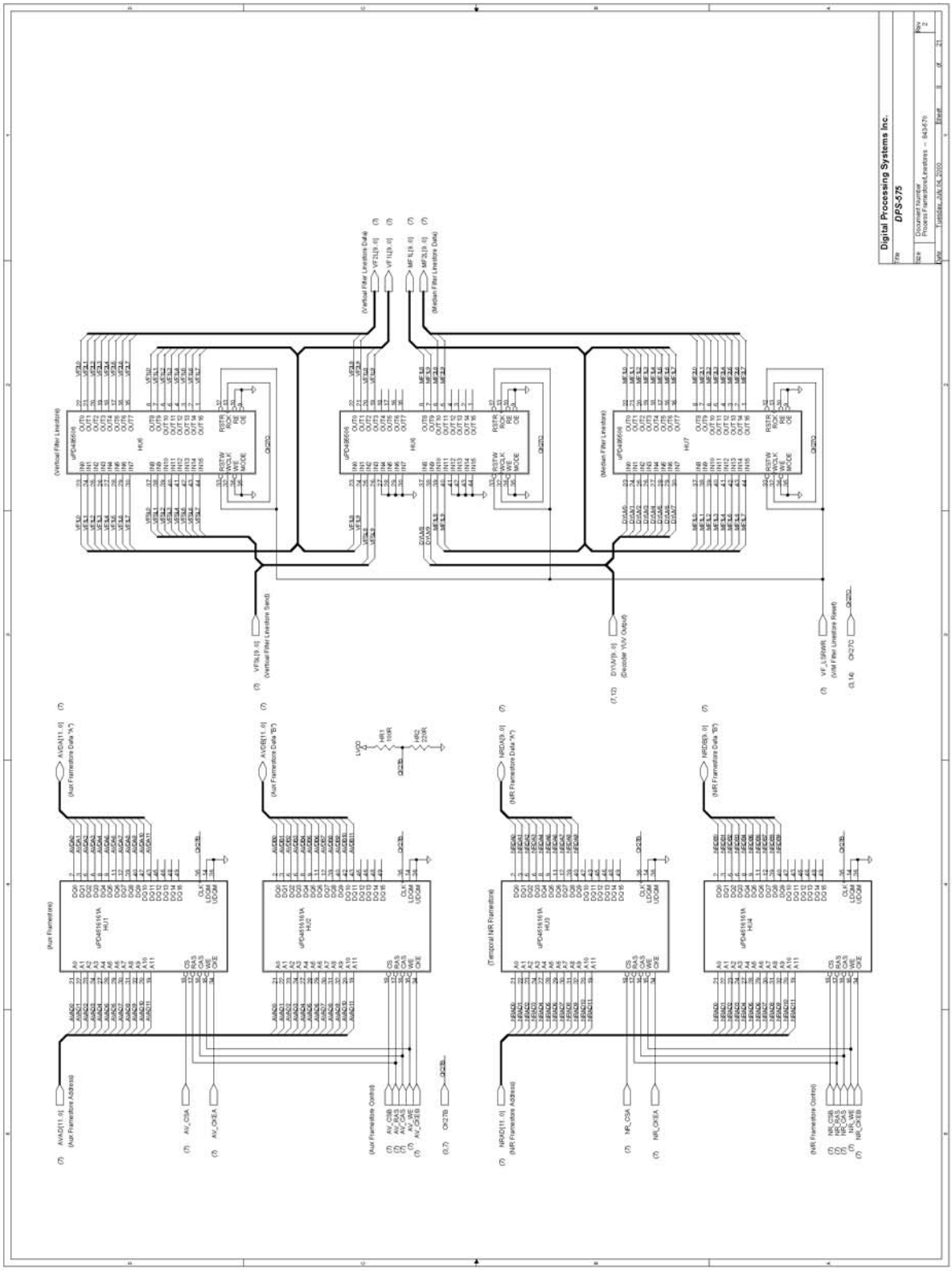


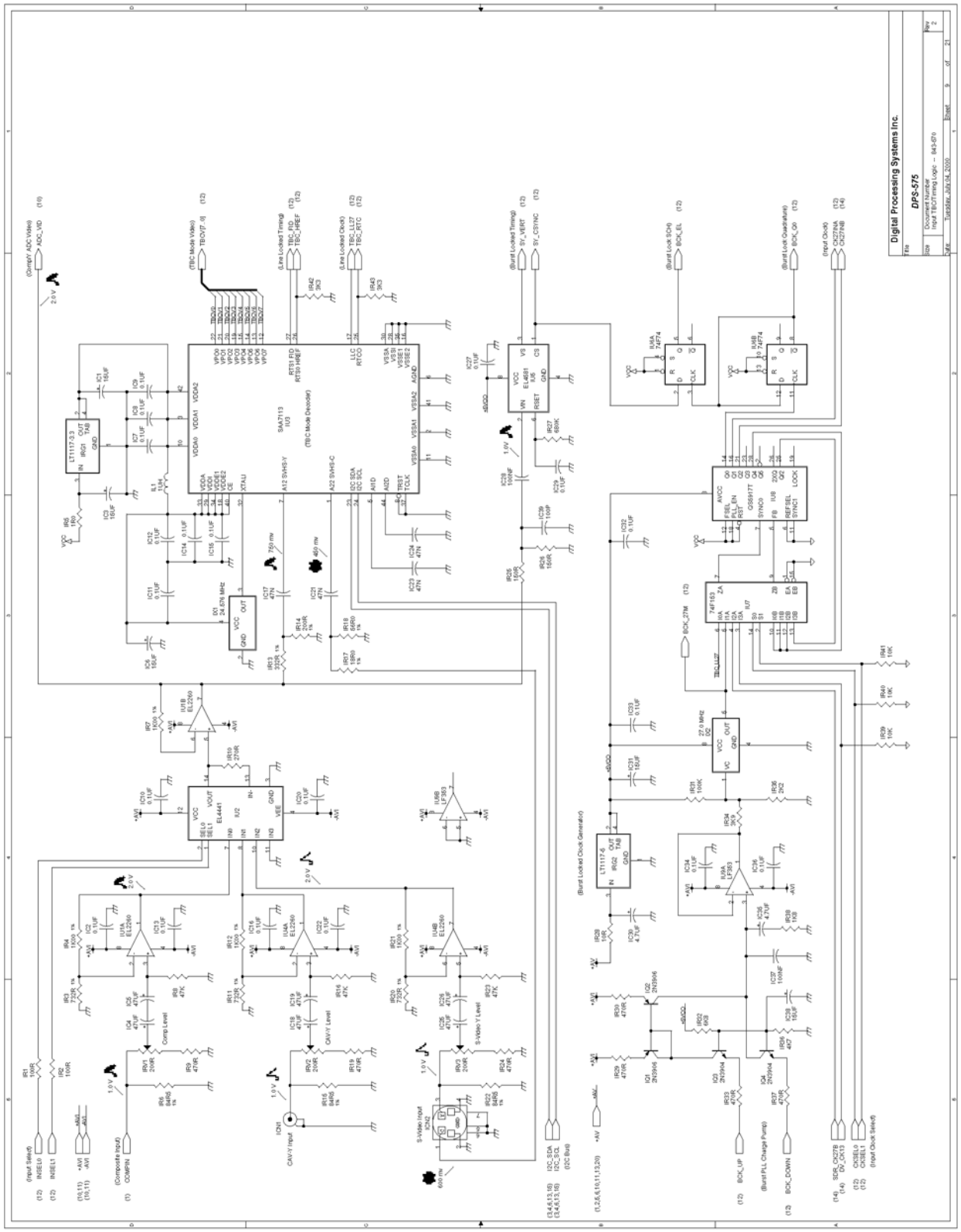


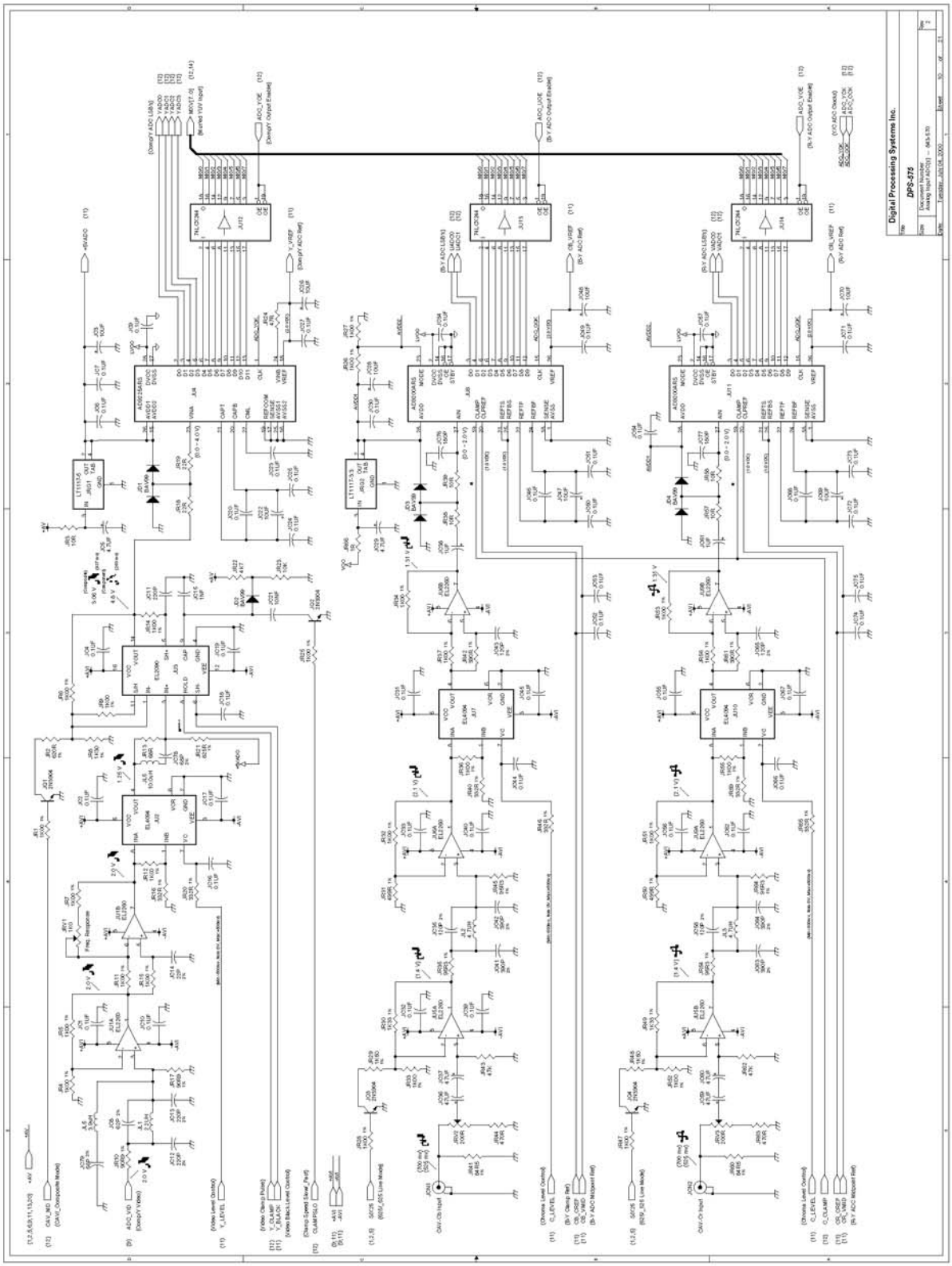


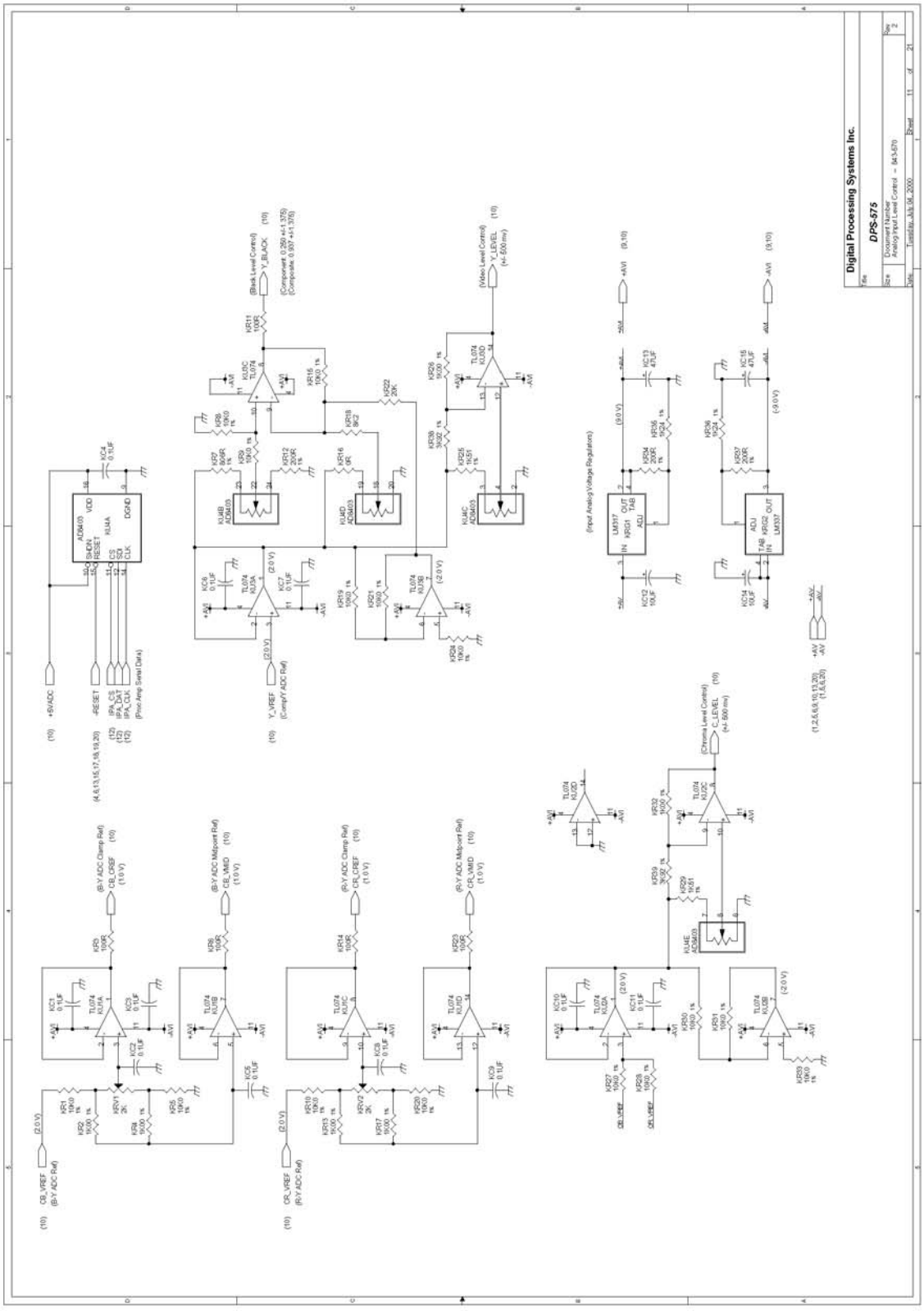


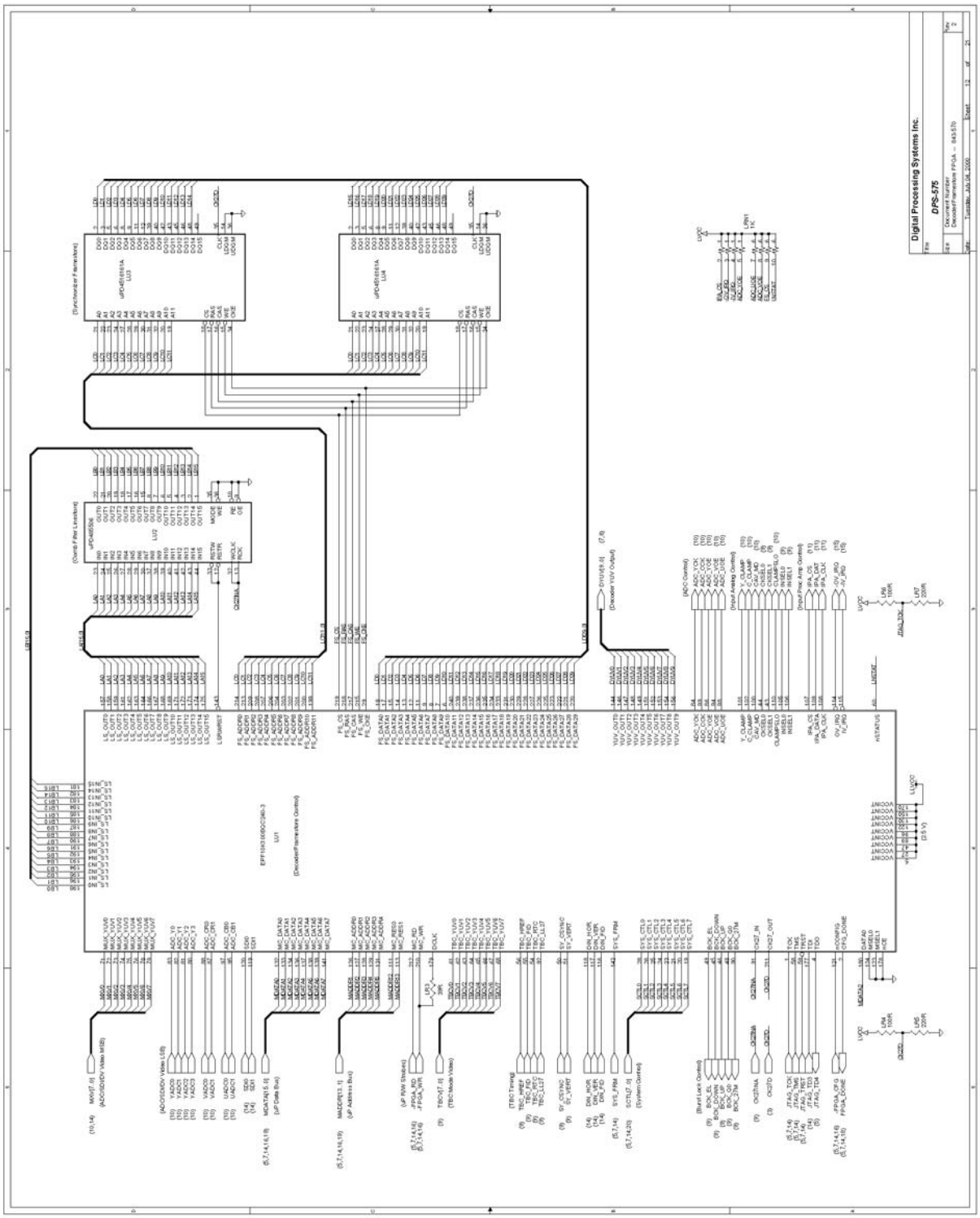


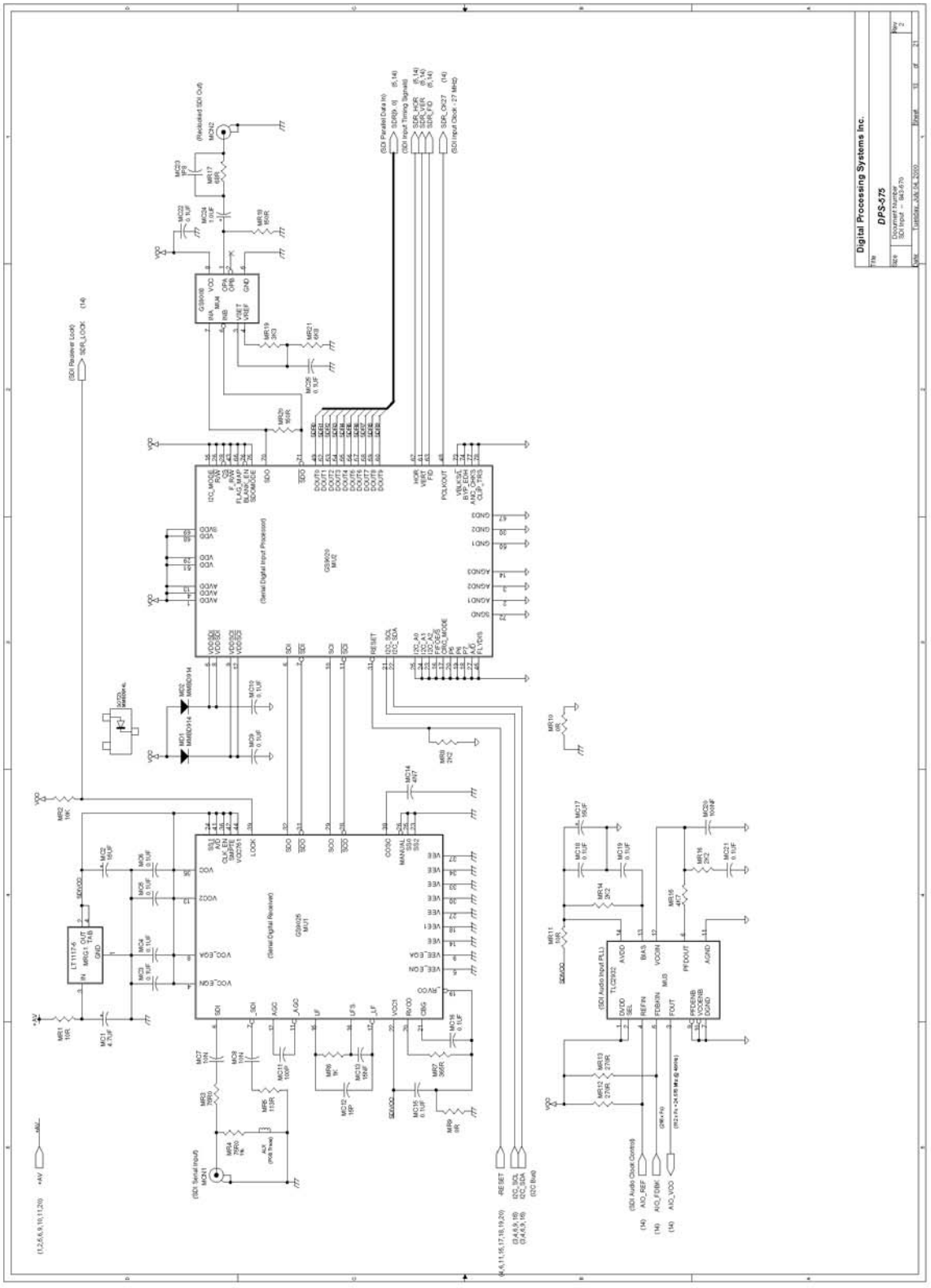


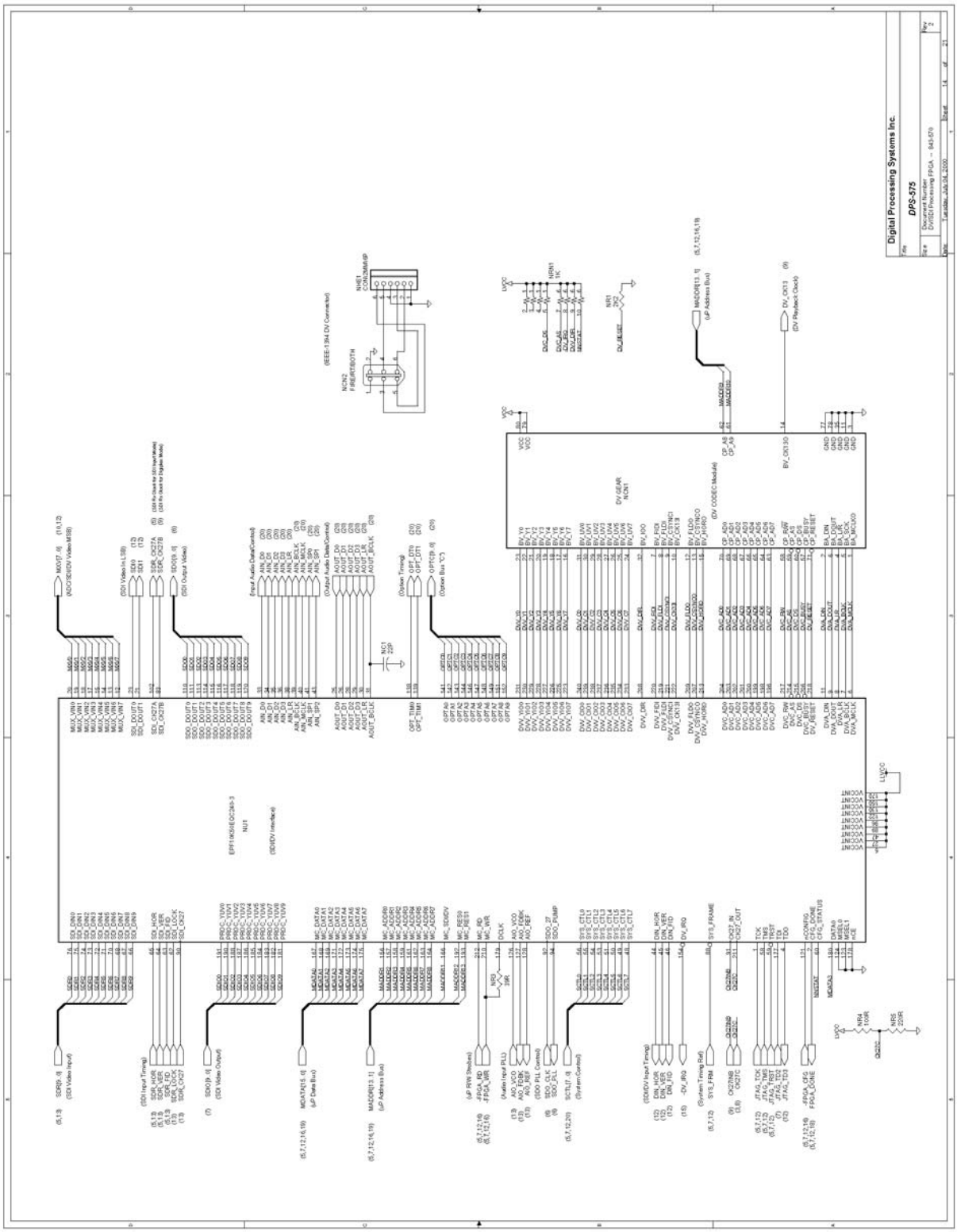


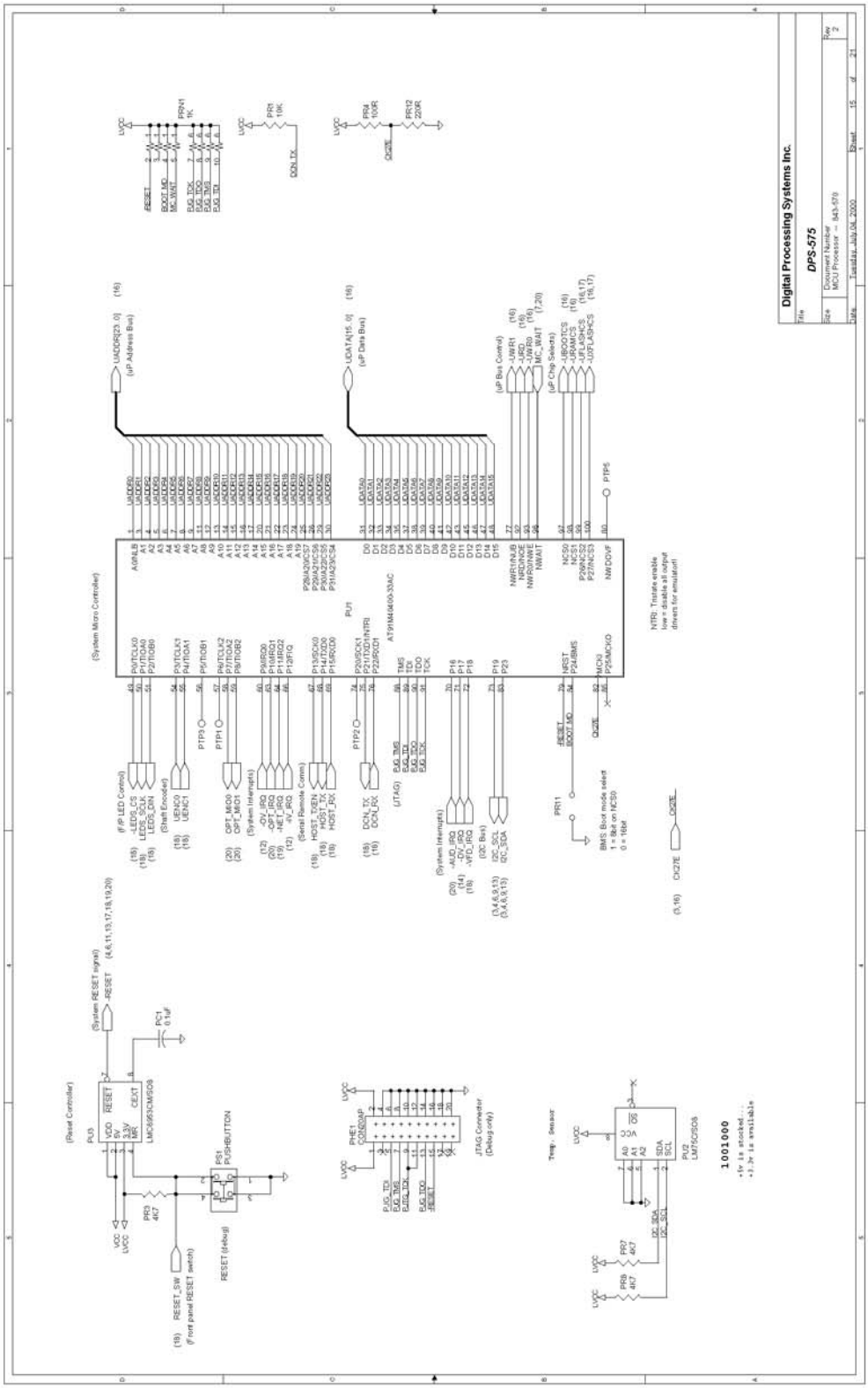


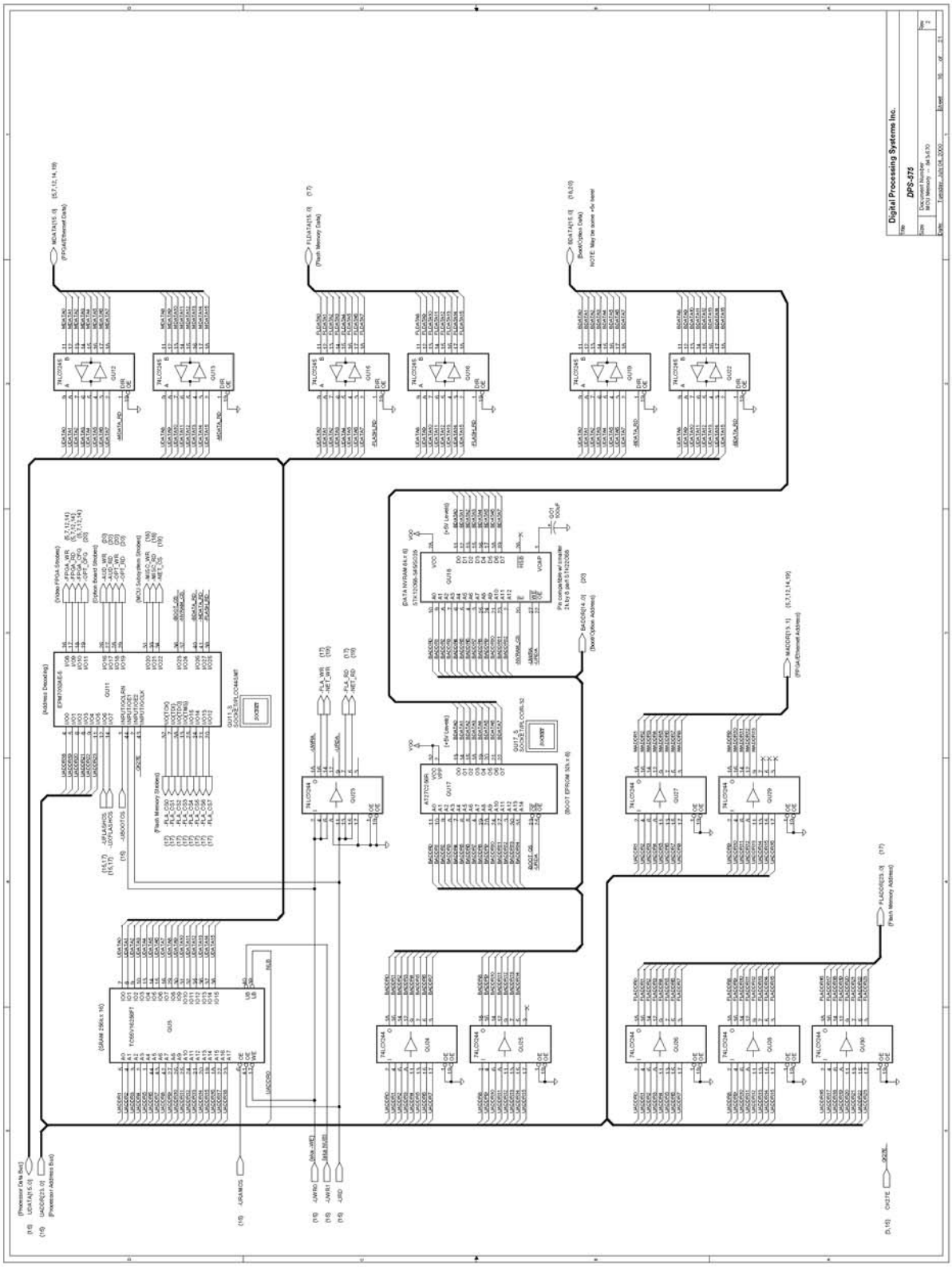


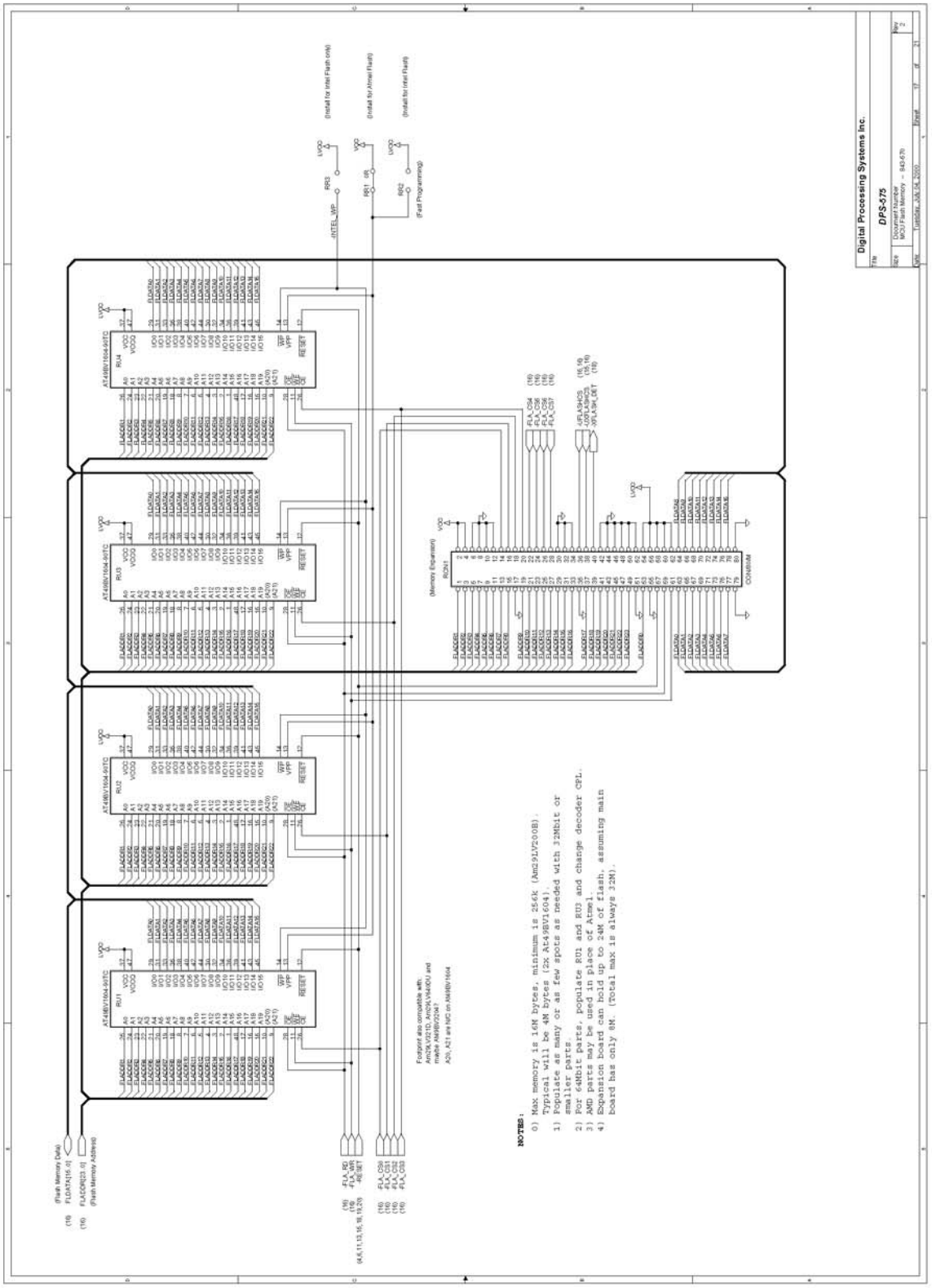


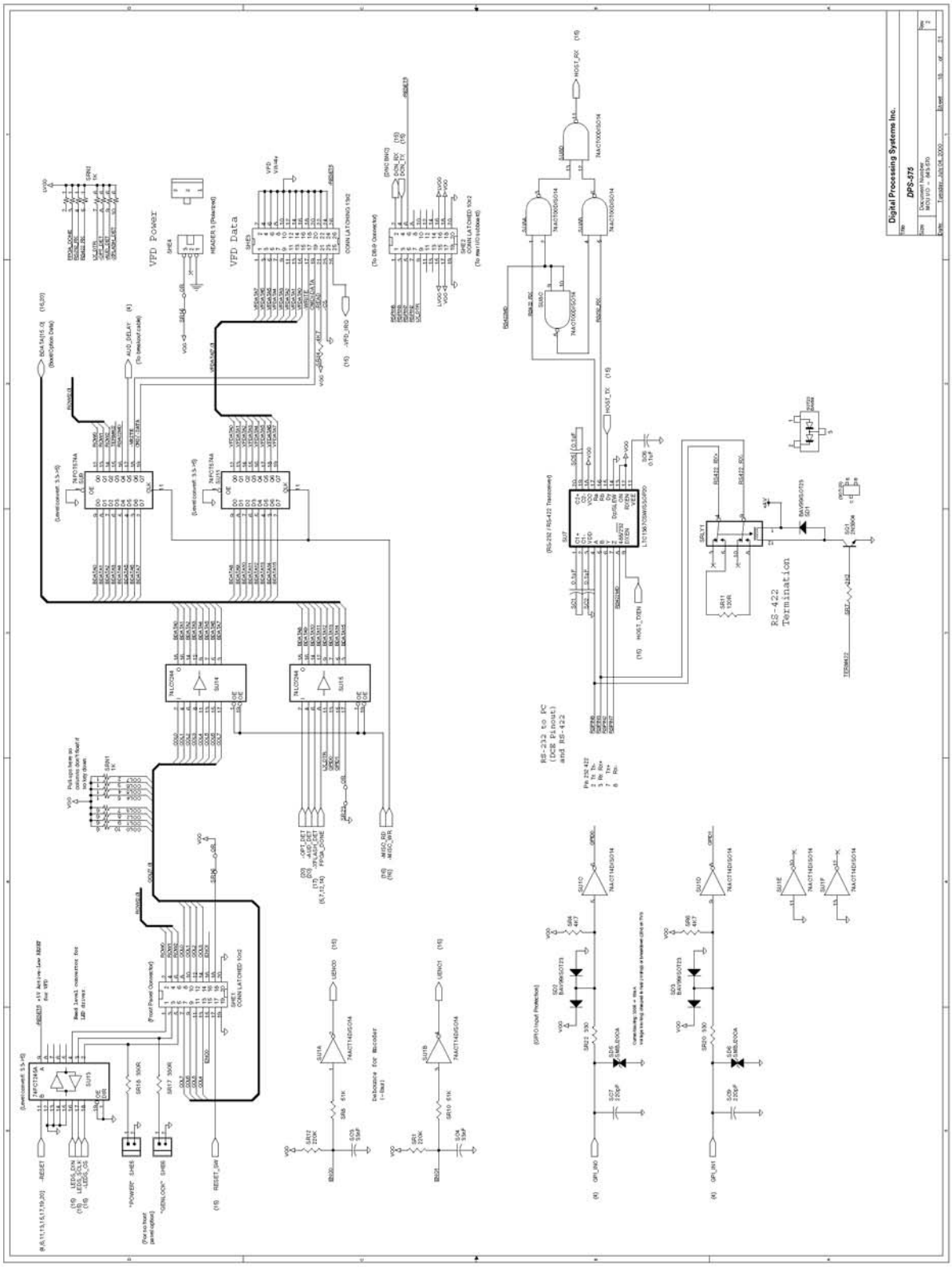


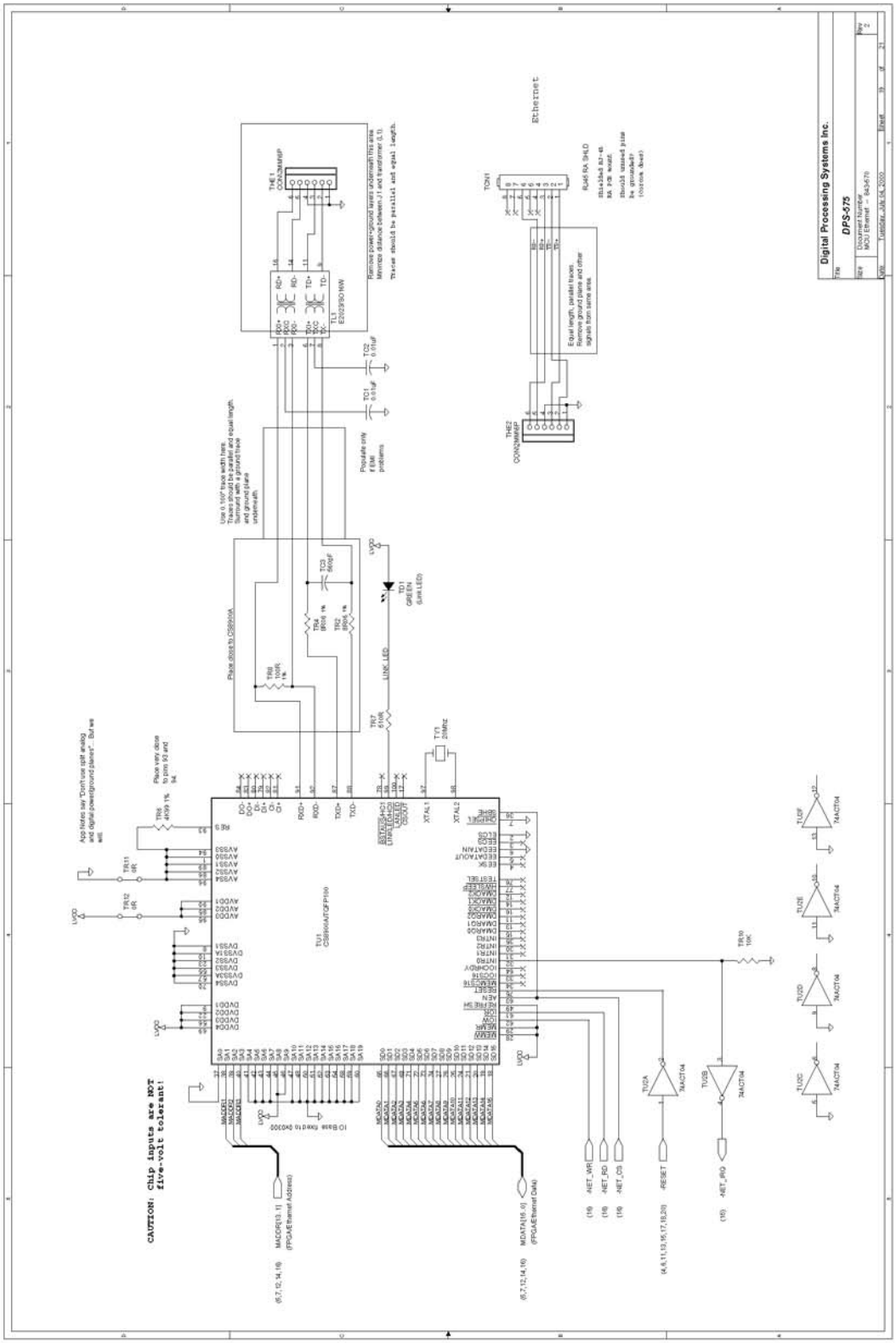


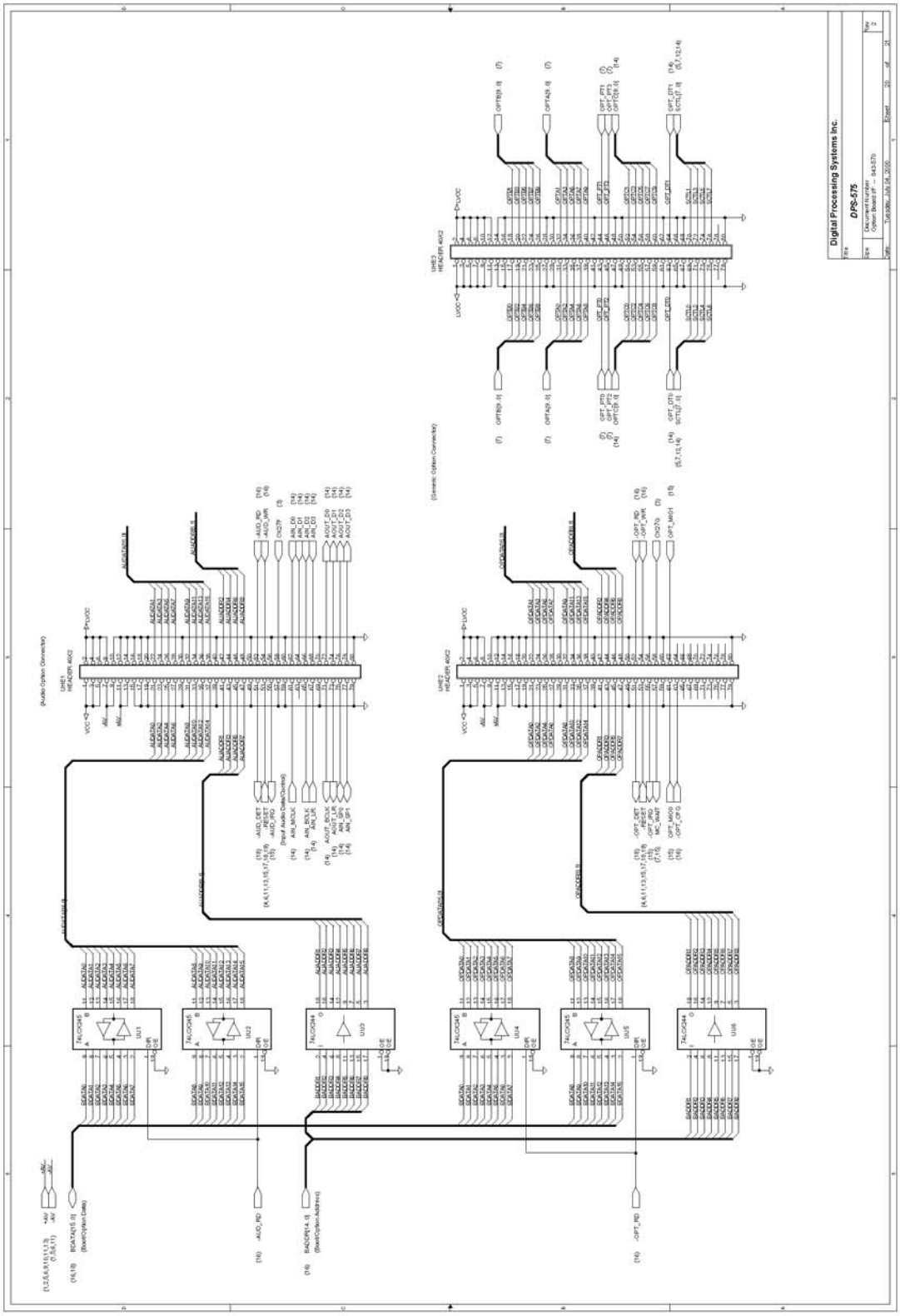


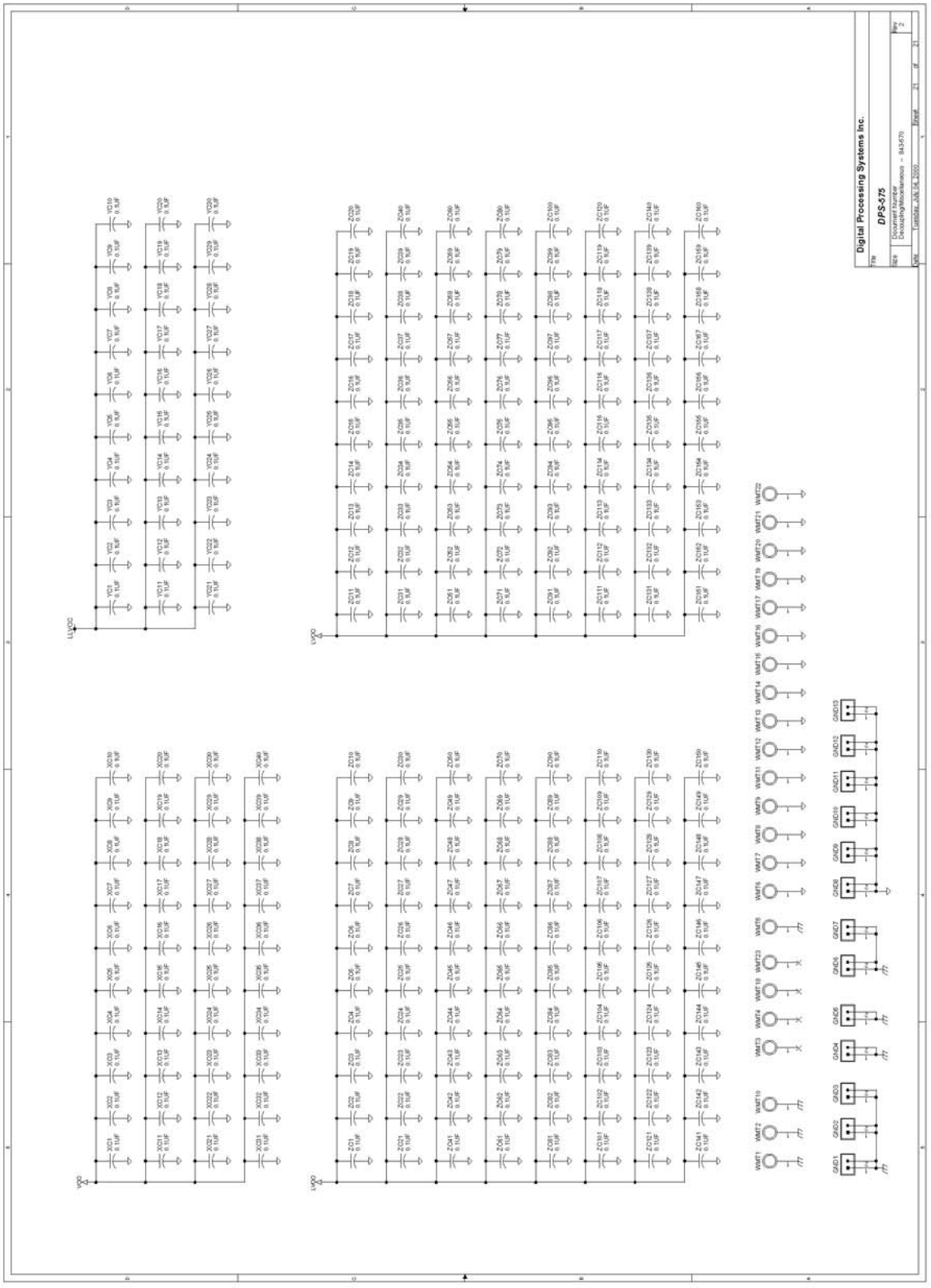




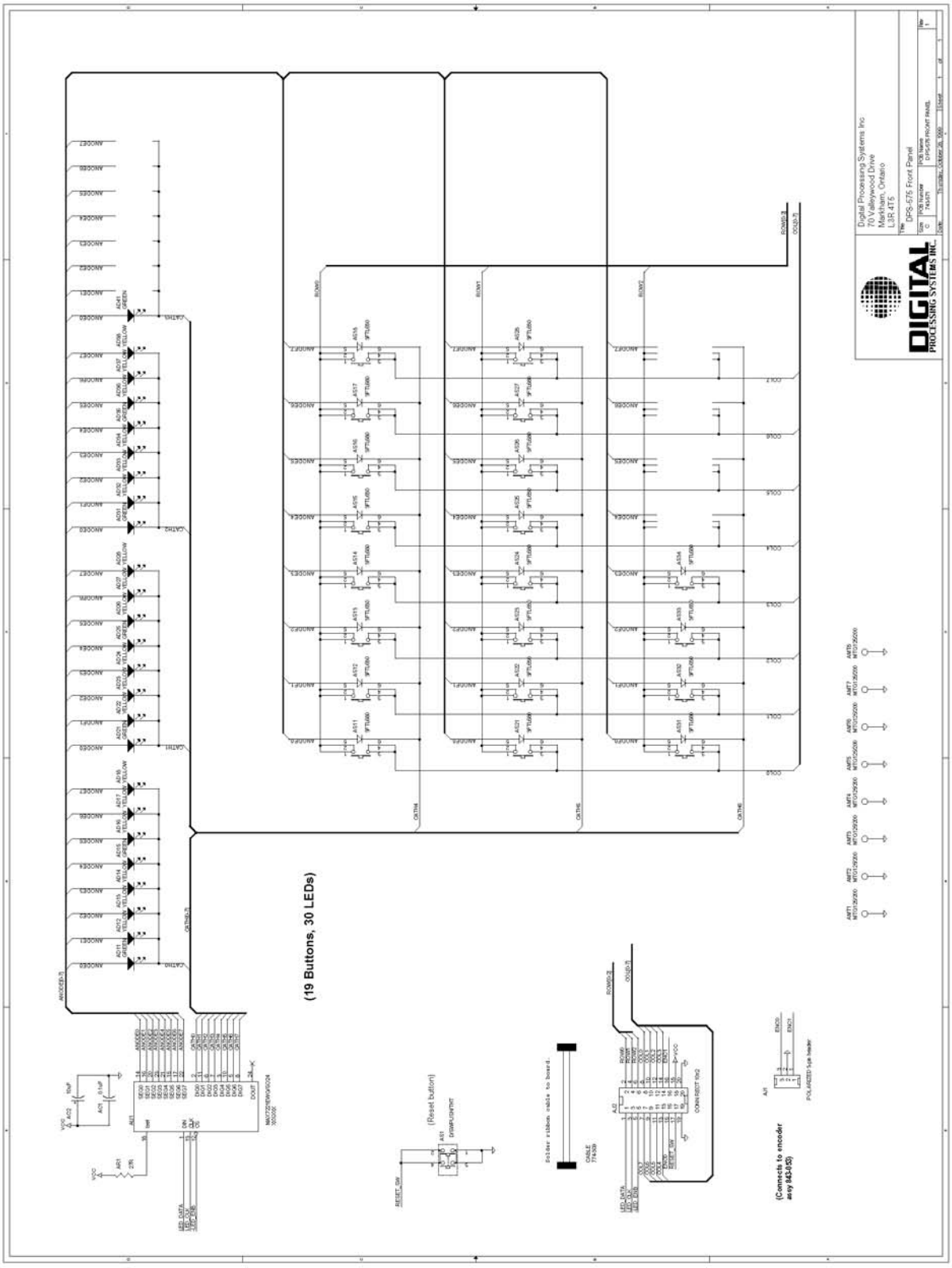




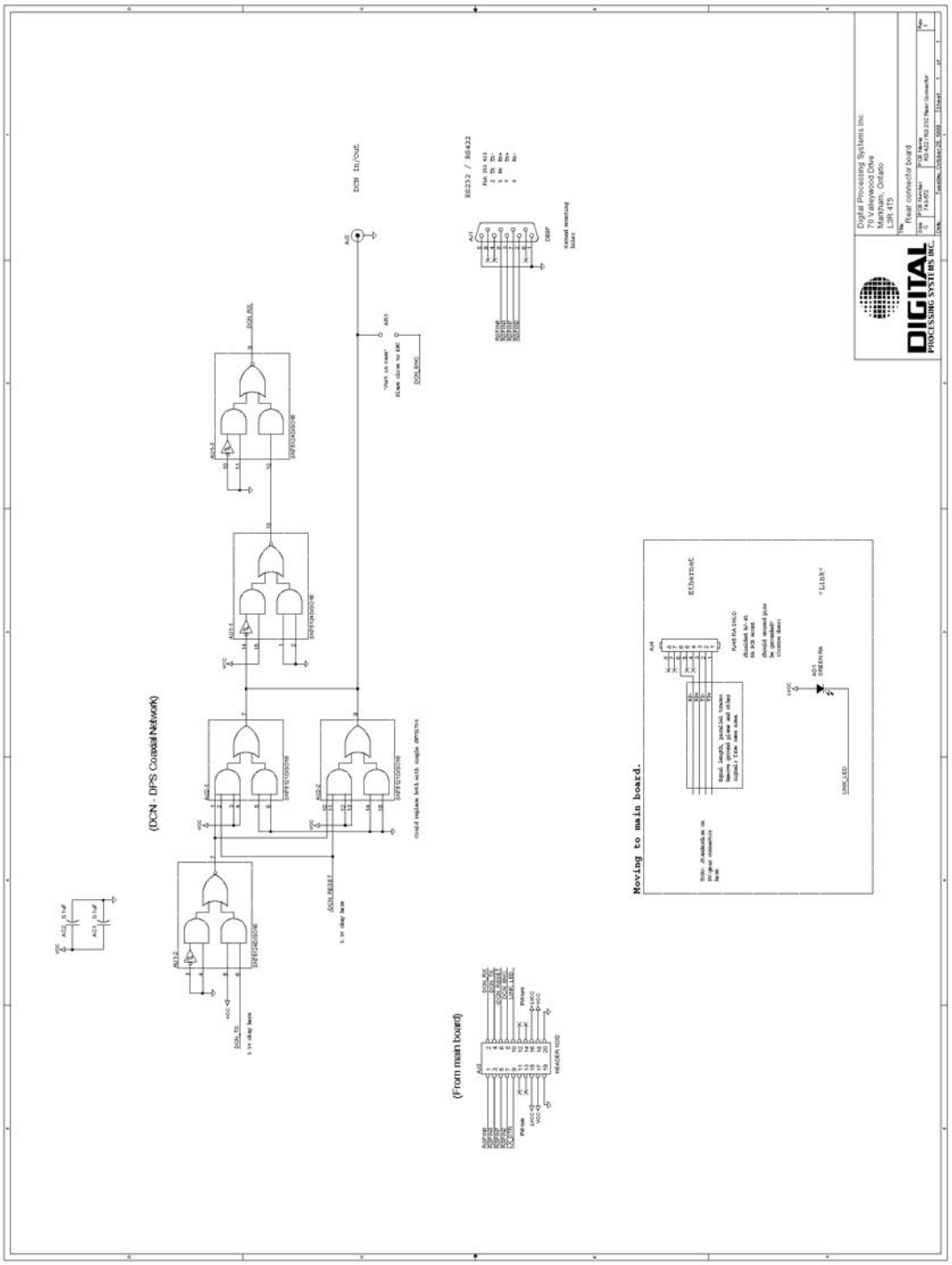




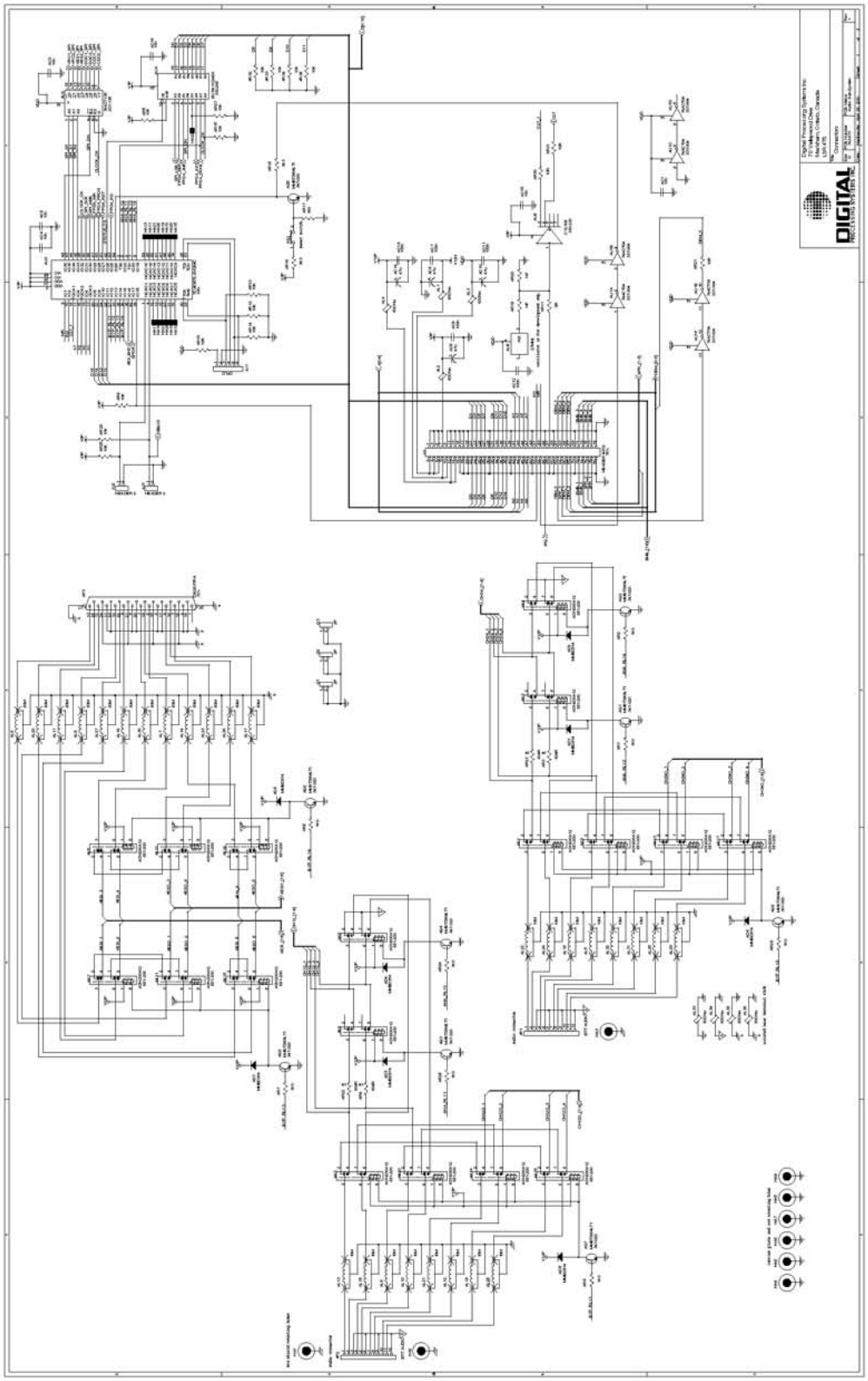
DPS-475/575 Front Panel

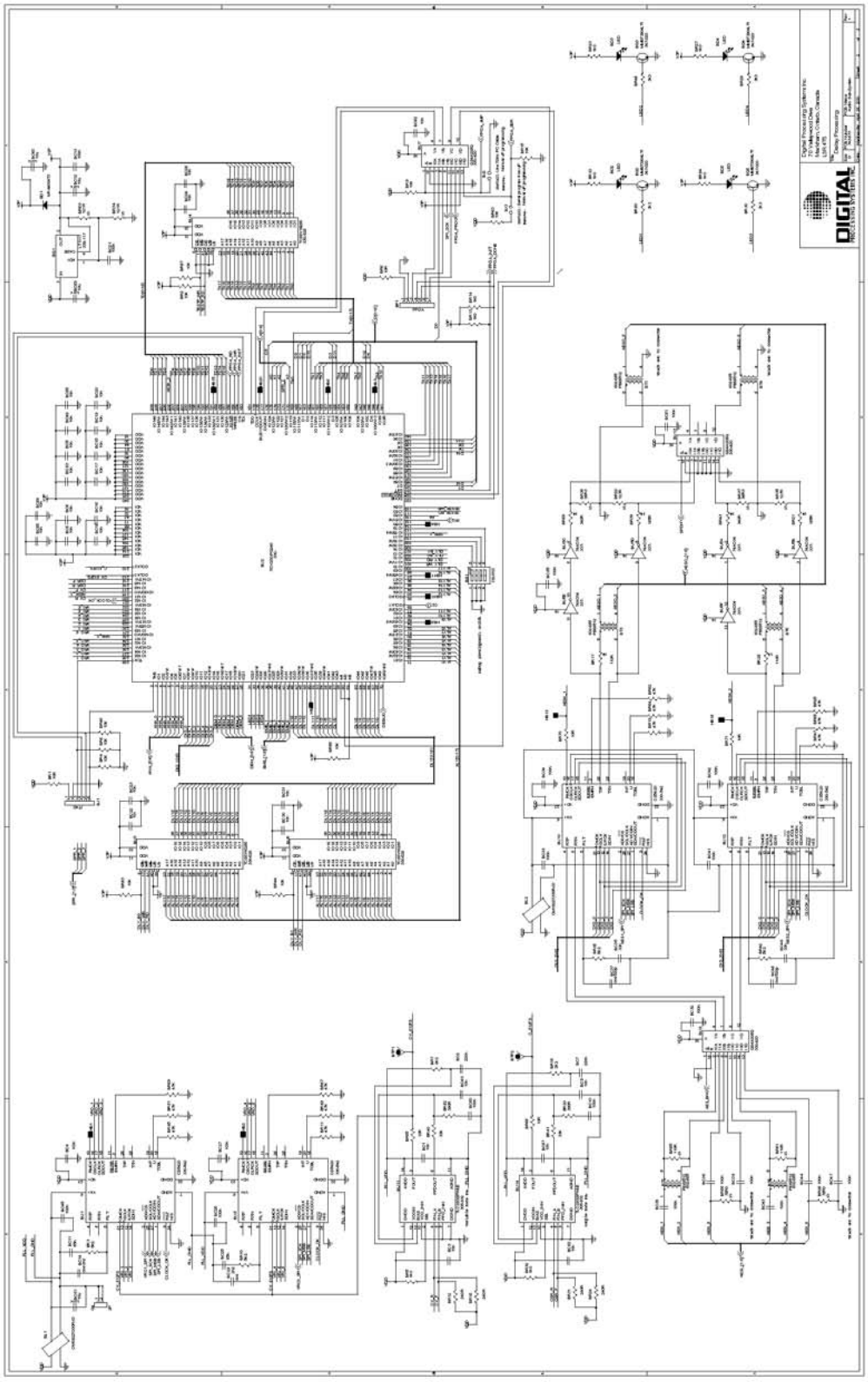


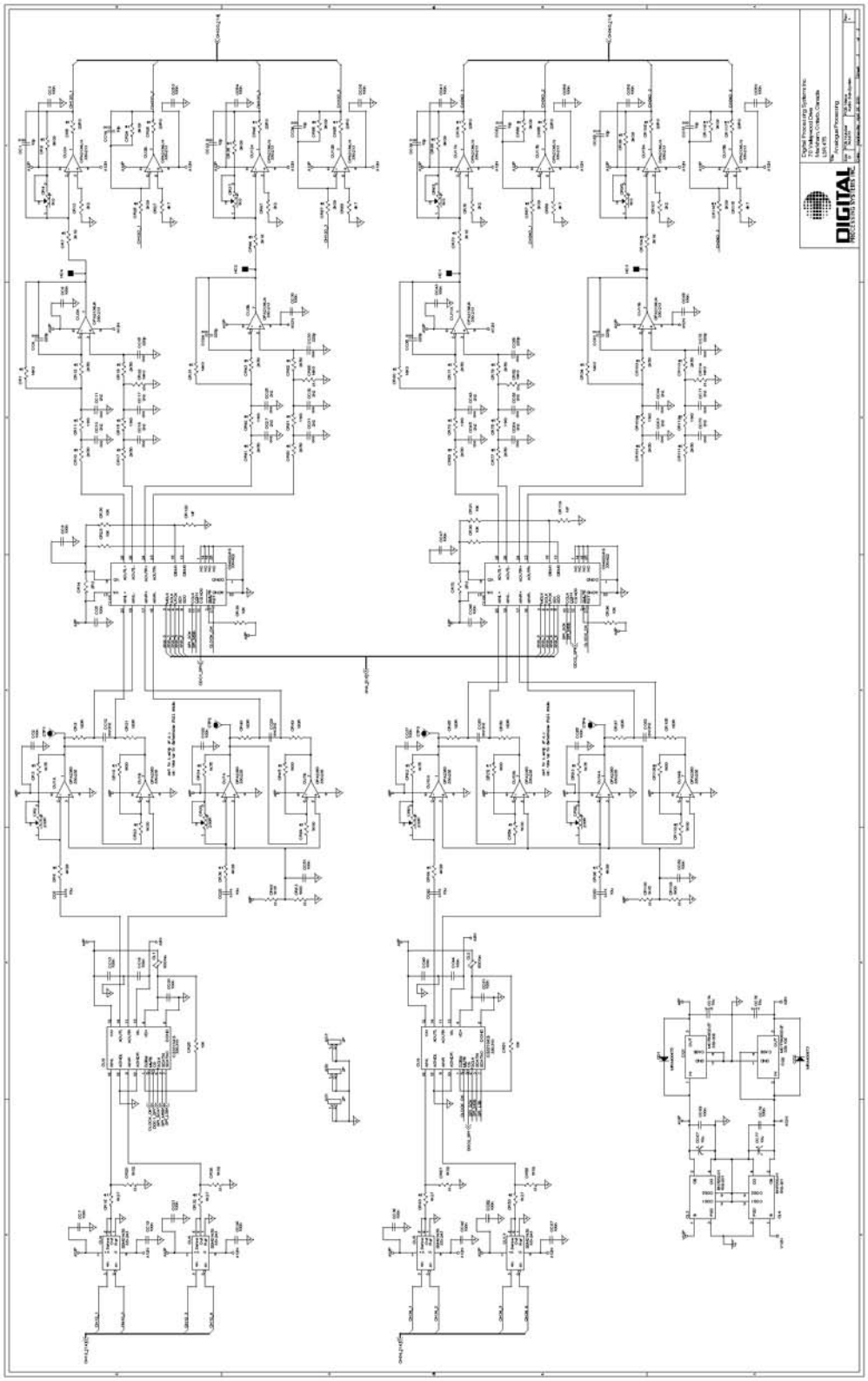
DPS-475/575 Rear Connector



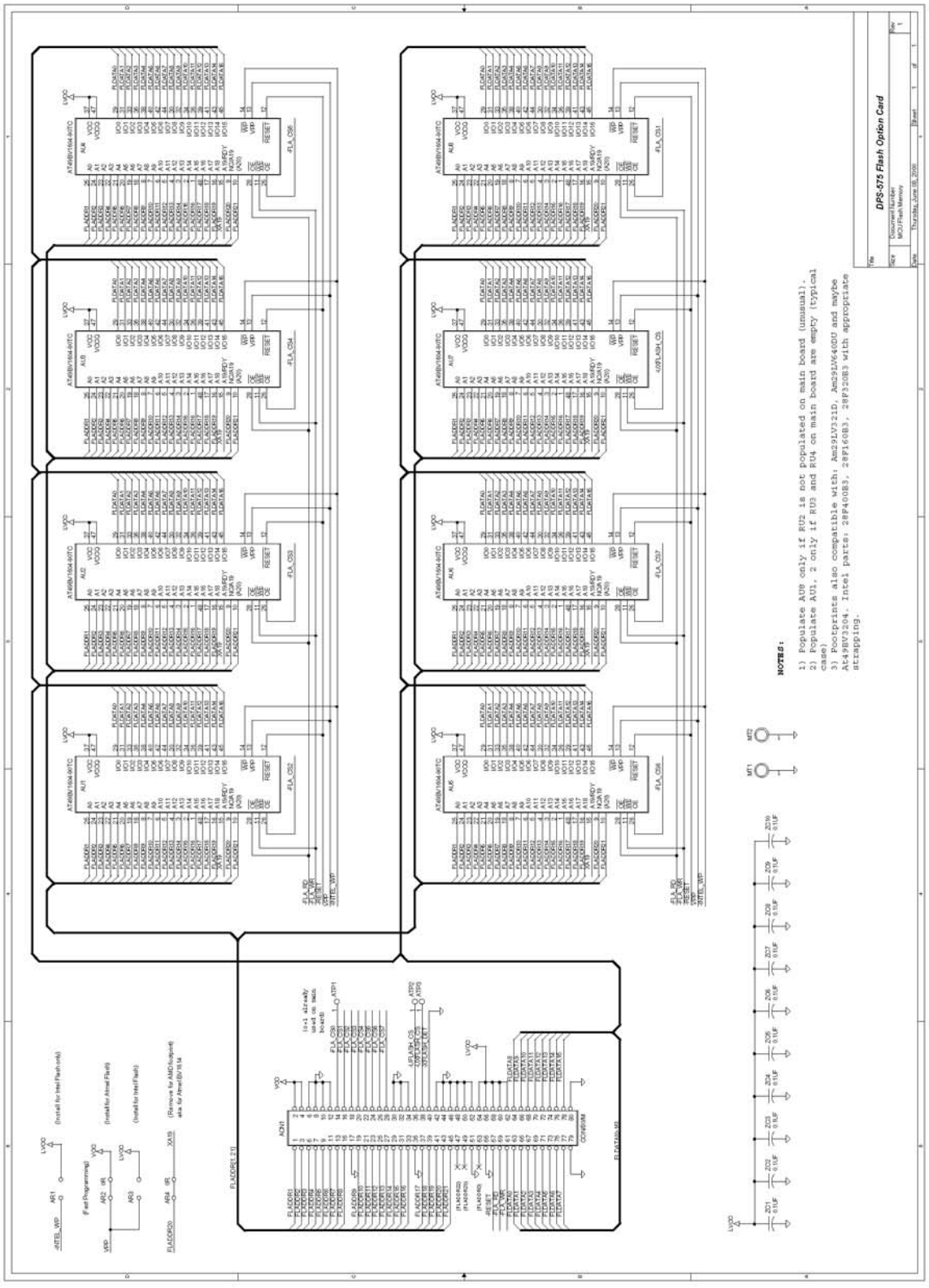
DPS-475/575 Audio Synchronizer Module







DPS-475/575 Animated Logo Option



CHAPTER 17: BILL OF MATERIALS

804-575: DPS-475/575 Unit Overview

Designation	Description	DPS Part Number
3PINCBLE	CABLE ASSY 3” 78211-003&48049	773-771
AC_CORD	POWER CORD BELDEN 17254-EUROPE	773-254 *[Europe]*
AC_CORD	POWER CORD AC 120V	773-505 *[North America]*
BLOWER	FAN BFB0712H 12VDC 0.36A	701-575
BOTSCREW	SCREW 440X3/16SS UNDERCUT PH.	751-052
CABLETIE	CABLE TIE MOUNTING DEVICE	762-138
CHASSIS	MTL DPS575 CHASSIS	741-978
CORCONN	CONN CORCOM 3CFS1 LINE FILTER	722-300
DCN_PCB	ASSY REAR PNL DPS575	843-572
DISPCBL2	CABLE 20 PIN RIBBON 575	774-752
ENC_ASSY	ASSY SHAFT ENCODER DPS-475/575	843-575
FAN_12V	FAN MICRO	701-485
FAN_SCRW	SCREW 4-40 X 1 PH ZN PHILL	751-054
FANBRKT	MTL DPS575 FAN BRACKET SET	741-980
FANCOVER	MTL FAN COVER PLATE	741-988
FISH_570	FISHPAPER DPS-575 VIDEO BOARD	764-570
FISHPTOP	FISH PAPER 290/575 TOP COVER	764-097
FLTRLENS	PLASTIC FILTER/LENS FOR VFD MD	740-022
FOAM	PACK FOAM STABILIZER 7 3/4X17	742-040
FOAM2	PACKING FOAM-ENDS (SET of 4)	742-203
FRNT_BRD	ASSY FRONT PNL DPS575	843-571
FRNTPNL1	MTL DPS575 F/PANEL INNER	741-984
FRNTPNL2	MTL DPS575 F/P OUTER	741-984A
GROMET	GROMET RUBBER 1/2” DIA	754-575
HANDLES	METAL DIE CAST HANDLES -465	741-006
HEATSHRK	HEATSHRINK TUBING 3/16”	764-144
JACKSCRW	JACK SCREW 621250104115	762-142
KNOB	KNOBS C210-0X RE AN	733-024
KNOBCAP	KNOB CAP T210-OX RE AN	733-025
LANCABLE	CABLE FIREWIRE/6PIN MOLEX	774-140
LBL_FCC	LABEL FCC	704-017
LBL_VOLT	LABEL-CAUTION RISK OF ELEC SHO	704-137
LBL_WIRE	LABEL DPS-575/475 PS wiring	704-012
LEXANLBL	LABEL 475/575 FP LEXAN	704-575
LGEBOX	PACKING BOX DPS-LARGE STUDIO	742-038
MAIN_PCB	ASSY MAIN BOARD DPS575	843-570
MTLCOVER	MTL DPS575 COVER	741-979
NUT_BNC	BRASS NP PANEL HEX NUT NK	753-025
NUT_HNDL	6-32 K-LOCK NUT ZINC	753-011
NUT_PSU	6-32 K-LOCK NUT ZINC	753-011
NUTS_FAN	NUT HEX 6-32 #4 BLANK	753-050
PCB_SCRW	SCREW 4-40 X 1/4 PH ZN PH	751-010
POLYBAG	PACKING POLY BAG 22” X 22”	742-045

Designation	Description	DPS Part Number
PSUBRKT	MTL DPS575 PWR SUPPLY BRKT	741-981
PSUCABLE	CABLE 570 PWR SUP TO MAINBRD	774-750
PWRHARNS	CABLE 570 AC TO PWR SUP	774-751
PWRSUPP	POWER SUPPLY MPU150-4530 PWR1	621-116
RCKGUIDE	MTL DPS575 R/GUIDE 2SET	741-983
REARFILL	MTL FILLER DPS575 SET OF 2	741-986
REARPANL	MTL REAR FILLER PANEL	741-987
SCREW_RG	SCREW 4-40 X 3/8 PH ZN PHIL	751-007
SCRW_BCK	SCREW 4-40 X 1/4 PH ZN PH	751-010
SCRW_BLO	SCREW 4-40 X 1 PH ZN PHILL	751-054
SCRW_CVR	SCREW 4/40 X 3/16 FLAT UNDER	751-107
SCRW_HDL	SCREW 6-32 X 5/16 PAN PHI MS	751-021
SCRW_PSB	SCREW 6-32 X 1/4 PH ZN PHILL	751-029
SCRWFANC	SCREW 4-40 X 1/4 PH ZN PH	751-010
SCRWFRNT	SCREW 4-40 X 5/16 PH ZN PHIL	751-006
SHRINK	HEAT SHRINK TUBE 1/8” DIA.	764-122
STNDOFDV	STANDOFF 4-40 X 5/16 M/F	762-575
STNDOFFM	4-40 X 1/4 M/F 3/16 HEX SS	762-2300
TOPSCREW	SCREW 440X3/16SS UNDERCUT PH.	751-052
VFDISPLY	LCD GU128X32-800 128X32 VFD	104-128
VFDPSCBL	CABLE 570 VFD POWER CABLE	774-754
VIDCABLE	CABLE VIDEO BREAKOUT CABLE 575	774-753
WASH_BNC	LOCKWASHER 1-329632-2 AMP	752-025

804-575AV: DPS-475/575AV Unit Overview

Designation	Description	DPS Part Number
3PINCBLE	CABLE ASSY 3” 78211-003&48049	773-771
AC_CORD	POWER CORD BELDEN 17254-EUROPE	773-254 *[Europe]*
AC_CORD	POWER CORD AC 120V	773-505 *[North America]*
AUDCABLE	CABLE AUDIO BREAKOUT CABLE	774-755
AUDIOPCB	ASSY AUDIO BOARD DPS575	843-573
BOTSCREW	SCREW 440X3/16SS UNDERCUT PH.	751-052
CABLETIE	CABLE TIE MOUNTING DEVICE	762-138
DCN_PCB	ASSY REAR PNL DPS575	843-572
DISPCBL2	CABLE 20 PIN RIBBON 575	774-752
ENC_ASSY	ASSY SHAFT ENCODER DPS-475/575	843-575
FAN_SCRW	SCREW 4-40 X 1 PH ZN PHILL	751-054
FANCOVER	MTL FAN COVER PLATE	741-988
FISH_570	FISHPAPER DPS-575 VIDEO BOARD	764-570
FISH_573	FISHPAPER DPS-575 AUDIO BOARD	764-573
FISHPTOP	FISH PAPER 290/575 TOP COVER	764-097
FOAM	PACK FOAM STABILIZER 7 3/4X17	742-040
FOAM2	PACKING FOAM-ENDS (SET of 4)	742-203
FRNT_BRD	ASSY FRONT PNL DPS575	843-571
FRNTPNL1	MTL DPS575 F/PANEL INNER	741-984
FRNTPNL2	MTL DPS475 F/P OUTER	741-984B
GROMET	GROMET RUBBER 1/2” DIA	754-575
HEATSHRK	HEATSHRINK TUBING 3/16”	764-144
JACKSCRW	JACK SCREW 621250104115	762-142
LANCABLE	CABLE FIREWIRE/6PIN MOLEX	774-140
LGEBOX	PACKING BOX DPS-LARGE STUDIO	742-038
MAIN_PCB	ASSY MAIN BOARD DPS575	843-570
NUT_BNC	BRASS NP PANEL HEX NUT NK	753-025
NUT_HNDL	6-32 K-LOCK NUT ZINC	753-011
NUT_PSU	6-32 K-LOCK NUT ZINC	753-011
NUTS_FAN	NUT HEX 6-32 #4 BLANK	753-050
PCB_SCRW	SCREW 4-40 X 1/4 PH ZN PH	751-010
POLYBAG	PACKING POLY BAG 22” X 22”	742-045
PSUCABLE	CABLE 570 PWR SUP TO MAINBRD	774-750
PWRHARNS	CABLE 570 AC TO PWR SUP	774-751
RCKGUIDE	MTL DPS575 R/GUIDE 2SET	741-983
REARFILL	MTL FILLER DPS575 SET OF 2	741-986
SCREW_RG	SCREW 4-40 X 3/8 PH ZN PHIL	751-007
SCRW_AUD	SCREW 4-40 X 7/16 PH ZN PHILL	751-057
SCRW_BCK	SCREW 4-40 X 1/4 PH ZN PH	751-010
SCRW_BLO	SCREW 4-40 X 1 PH ZN PHILL	751-054
SCRW_CVR	SCREW 4/40 X 3/16 FLAT UNDER	751-107
SCRW_HDL	SCREW 6-32 X 5/16 PAN PHI MS	751-021
SCRW_PSB	SCREW 6-32 X 1/4 PH ZN PHILL	751-029
SCRWFANC	SCREW 4-40 X 1/4 PH ZN PH	751-010
SCRWFRNT	SCREW 4-40 X 5/16 PH ZN PHIL	751-006
SHIELD	MTL DPS575 AUDIO CARRIER PLT	741-982
SHRINK	HEAT SHRINK TUBE 1/8” DIA.	764-122
STANDOFF	STANDOFF 4 X 40 4505-440B12RAF	762-170
STNDOFDV	STANDOFF 4-40 X 5/16 M/F	762-575
STNDOFFM	4-40 X 1/4 M/F 3/16 HEX SS	762-2300
TERM_AUD	CONN 1840463 PLUG COMBICON	722-184

Designation	Description	DPS Part Number
TOPSCREW	SCREW 440X3/16SS UNDERCUT PH.	751-052
VFDPSCBL	CABLE 570 VFD POWER CABLE	774-754
VIDCABLE	CABLE VIDEO BREAKOUT CABLE 575	774-753
WASH_BNC	LOCKWASHER 1-329632-2 AMP	752-025

843-570: Main Board Assembly

Designation	Description	DPS Part Number
AC1	CAP TANT 4.7UF 16V SMT 3216	359-475
AC2	CAP SMT 0.1UF CER 0805	345-105
AC3	CAP SMT 0.1UF CER 0805	345-105
AC4	CAP SMT 0.1UF CER 0805	345-105
AC5	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
AC6	CAP SMT 0.1UF CER 0805	345-105
AC7	CAP SMT 0.1UF CER 0805	345-105
AC8	CAP 20pF 50V COG 2% 0805	349-201
AC9	CAP SMT 0.1UF CER 0805	345-105
AC10	CAP 330pF 2% 50V COG 0805	349-332
AC11	CAP 470pF 2% 50V COG 0805	349-472
AC12	CAP 180PF 2% 50V COG 0805	349-182
AC13	CAP SMT 0.1UF CER 0805	345-105
AC14	CAP 100pF 2% 50V COG 0805	349-102
AC15	CAP SMT 0.1UF CER 0805	345-105
AC16	CAP 20pF 50V COG 2% 0805	349-201
AC17	CAP SMT 0.1UF CER 0805	345-105
AC18	CAP 330pF 2% 50V COG 0805	349-332
AC19	CAP SMT 0.1UF CER 0805	345-105
AC20	CAP 470pF 2% 50V COG 0805	349-472
AC21	CAP 180PF 2% 50V COG 0805	349-182
AC22	CAP SMT 0.1UF CER 0805	345-105
AC23	CAP 100pF 2% 50V COG 0805	349-102
AC24	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
AC25	CAP 20pF 50V COG 2% 0805	349-201
AC26	CAP SMT 10UF TANT 16V 3528	358-106
AC28	CAP SMT 10UF TANT 16V 3528	358-106
AC29	CAP SMT 47UF TANT 7343	357-476
AC30	CAP SMT 47UF TANT 7343	357-476
ACN1	CONN.LOW PROFILE AMP#413879-1	722-369
ACN2	CONN.LOW PROFILE AMP#413879-1	722-369
ACN3	CONN.LOW PROFILE AMP#413879-1	722-369
ACN5	CONN.LOW PROFILE AMP#413879-1	722-369
AD1	DIODE BAV99 SOT23 DUAL SWITCHG	354-099
AL1	COIL 1.8uH FLSU2520	601-180
AL2	COIL 1UH TOKO FSLU2520-1R0J	601-100
AL3	COIL 1.8uH FLSU2520	601-180
AL4	COIL 1UH TOKO FSLU2520-1R0J	601-100
AL5	COIL 0.1uH FSLU2520-R10J SMT	601-101
AQ1	TRANS SMT 2N3904 NPN	347-020
AQ2	TRANS SMT 2N3904 NPN	347-020
AR1	RES SMT 10R 5% 0805	342-101
AR3	RES SMT 1K 1% 0805	343-1003
AR4	RES SMT 1K 1% 0805	343-1003
AR5	RES SMT 1K 1% 0805	343-1003
AR6	RES SMT 1K 1% 0805	343-1003

Designation	Description	DPS Part Number
AR7	RES SMT 200R 5% 0805	342-202
AR8	RES SMT 1K 1% 0805	343-1003
AR9	RES SMT 75R 1% 0805	343-7501
AR10	RES SMT 56R 1% 0805	343-5601
AR11	RES SMT 1K 1% 0805	343-1003
AR12	RES 200R 1% 0805	343-2002
AR13	RES SMT 1K 1% 0805	343-1003
AR14	RES SMT 27R 5% 0805	342-271
AR15	RES SMT 1K 1% 0805	343-1003
AR16	RES 50R5 1% 0805	343-5051
AR17	RES SMT 2K 1% 0805	343-2003
AR18	RES SMT 1K 1% 0805	343-1003
AR19	RES SMT 1K 1% 0805	343-1003
AR20	RES SMT 75R 1% 0805	343-7501
AR21	RES SMT 1K 1% 0805	343-1003
AR22	RES SMT 220R 5% 0805	342-222
AR23	RES SMT 1K 1% 0805	343-1003
AR24	RES 1K21 1 % 0805	343-1213
AR25	RES SMT 75R 1% 0805	343-7501
AR26	RES SMT 56R 1% 0805	343-5601
AR27	RES SMT 27R 5% 0805	342-271
AR28	RES SMT 1K 1% 0805	343-1003
AR29	RES SMT 75R 1% 0805	343-7501
AR30	RES SMT 2K 1% 0805	343-2003
AR31	RES 200R 1% 0805	343-2002
AR32	RES 50R5 1% 0805	343-5051
AR33	RES SMT 75R 1% 0805	343-7501
AR34	RES 3K16 1% 0805	343-3163
AR35	RES SMT 47K 5% 0805	342-474
AR36	RES SMT 1K 1% 0805	343-1003
AR37	RES SMT 2K2 5% 0805	342-223
AR38	RES SMT 2K2 5% 0805	342-223
AR39	RES SMT 7K5 5% 0805	342-753
AR40	RES SMT 820R 5% 0805	342-822
AR41	RES 1K24 1% 0805	343-1243
AR42	RES 200R 1% 0805	343-2002
AR43	RES 200R 1% 0805	343-2002
AR44	RES 1K24 1% 0805	343-1243
ARG1	REG 1117-5.0 SOT223 SMT	339-001
ARG2	IC LM317 SMT SOT-223	330-317
ARG3	IC LM337 SMT SOT-223	330-337
ARLY1	RELAY TX2-12V AROMAT	651-111
ARV1	POT SMT 1K 3MM	348-103
ARV2	POT 200R 4MM SMT	348-202
ARV3	POT 200R 4MM SMT	348-202
AU1	IC AD9765AST	330-765
AU2	IC LT1229CS8/EL2260CS SOIC	308-229
AU3	IC LT1229CS8/EL2260CS SOIC	308-229
AU4	IC LT1229CS8/EL2260CS SOIC	308-229
BC1	CAP TANT 4.7UF 16V SMT 3216	359-475
BC2	CAP SMT 0.1UF CER 0805	345-105
BC3	CAP SMT 0.1UF CER 0805	345-105

Designation	Description	DPS Part Number
BC4	CAP SMT 0.1UF CER 0805	345-105
BC5	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
BC6	CAP SMT 0.1UF CER 0805	345-105
BC7	CAP 20pF 50V COG 2% 0805	349-201
BC8	CAP 330pF 2% 50V COG 0805	349-332
BC9	CAP 470pF 2% 50V COG 0805	349-472
BC10	CAP 180PF 2% 50V COG 0805	349-182
BC11	CAP SMT 0.1UF CER 0805	345-105
BC12	CAP 100pF 2% 50V COG 0805	349-102
BC13	CAP 20pF 50V COG 2% 0805	349-201
BC14	CAP SMT 0.1UF CER 0805	345-105
BC15	CAP 330pF 2% 50V COG 0805	349-332
BC16	CAP SMT 0.1UF CER 0805	345-105
BC17	CAP 470pF 2% 50V COG 0805	349-472
BC18	CAP 180PF 2% 50V COG 0805	349-182
BC19	CAP SMT 0.1UF CER 0805	345-105
BC20	CAP 100pF 2% 50V COG 0805	349-102
BC21	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
BCN1	CONN.LOW PROFILE AMP#413879-1	722-369
BCN2	CONN.LOW PROFILE AMP#413879-1	722-369
BL1	COIL 1.8uH FLSU2520	601-180
BL2	COIL 1UH TOKO FSLU2520-1R0J	601-100
BL3	COIL 1.8uH FLSU2520	601-180
BL4	COIL 1UH TOKO FSLU2520-1R0J	601-100
BQ1	TRANS SMT 2N3904 NPN	347-020
BR1	RES SMT 22R 5% 0805	342-221
BR2	RES SMT 6K8 5% 0805	342-683
BR3	RES SMT 1K 1% 0805	343-1003
BR4	RES 1K21 1 % 0805	343-1213
BR5	RES SMT 1K 1% 0805	343-1003
BR6	RES SMT 75R 1% 0805	343-7501
BR7	RES SMT 56R 1% 0805	343-5601
BR8	RES 200R 1% 0805	343-2002
BR9	RES SMT 27R 5% 0805	342-271
BR10	RES SMT 2K 1% 0805	343-2003
BR11	RES SMT 6K8 5% 0805	342-683
BR12	RES SMT 1K 1% 0805	343-1003
BR13	RES 1K21 1 % 0805	343-1213
BR14	RES SMT 56R 1% 0805	343-5601
BR15	RES SMT 200R 5% 0805	342-202
BR16	RES SMT 27R 5% 0805	342-271
BR17	RES SMT 1K 1% 0805	343-1003
BR18	RES SMT 75R 1% 0805	343-7501
BR19	RES SMT 2K 1% 0805	343-2003
BR20	RES 200R 1% 0805	343-2002
BR21	RES 50R5 1% 0805	343-5051
BR22	RES 3K16 1% 0805	343-3163
BR23	RES SMT 1K5 5% 0805	342-153
BR24	RES SMT 1K 1% 0805	343-1003
BR25	RES SMT 2K2 5% 0805	342-223
BR26	RES SMT 200R 5% 0805	342-202
BR27	RES 50R5 1% 0805	343-5051

Designation	Description	DPS Part Number
BRG1	REG 1117-5.0 SOT223 SMT	339-001
BRV1	POT 200R 4MM SMT	348-202
BRV2	POT 200R 4MM SMT	348-202
BRV3	POT SMT 1K 3MM	348-103
BU1	IC AD9763AST	330-763
BU2	IC LT1229CS8/EL2260CS SOIC	308-229
BU3	IC LT1229CS8/EL2260CS SOIC	308-229
CC1	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
CC2	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
CC3	CAP SMT 0.1UF CER 0805	345-105
CC4	CAP SMT 0.1UF CER 0805	345-105
CC5	CAP SMT 0.1UF CER 0805	345-105
CC6	CAP SMT 0.1UF CER 0805	345-105
CC7	CAP SMT 0.1UF CER 0805	345-105
CC8	CAP SMT 0.1UF CER 0805	345-105
CC9	CAP SMT 0.1UF CER 0805	345-105
CC10	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
CC11	CAP SMT 0.1UF CER 0805	345-105
CC12	CAP SMT 0.047UF CER 0805	345-474
CC13	CAP SMT 0.1UF CER 0805	345-105
CC14	CAP 47uF 16V ELEC SMT	356-476
CC15	CAP 47uF 16V ELEC SMT	356-476
CC16	CAP SMT 0.047UF CER 0805	345-474
CC17	CAP SMT 0.047UF CER 0805	345-474
CC18	CAP SMT 0.1UF CER 0805	345-105
CC19	CAP 120pF 2% 50V COG 0805	349-122
CC20	CAP SMT 56PF CER	345-561
CC21	CAP SMT 27PF CER	345-271
CC22	CAP SMT 0.1UF CER 0805	345-105
CC23	CAP SMT 0.1UF CER 0805	345-105
CC24	CAP SMT 0.1UF CER 0805	345-105
CCN1	CONN.LOW PROFILE AMP#413879-1	722-369
CCN2	CONN.LOW PROFILE AMP#413879-1	722-369
CL1	COIL 1UH TOKO FSLU2520-1R0J	601-100
CQ1	TRANS SMT 2N3904 NPN	347-020
CQ2	TRANS SMT 2N3904 NPN	347-020
CQ3	TRANS SMT 2N3904 NPN	347-020
CR2	RES SMT 1K 5% 0805	342-103
CR3	RES SMT 1K 5% 0805	342-103
CR4	RES SMT 1K 5% 0805	342-103
CR5	RES SMT 68R 5% 0805	342-681
CR6	RES SMT 100K 5% 0805	342-105
CR7	RES SMT 200R 5% 0805	342-202
CR8	RES SMT 470R 5% 0805	342-472
CR9	RES SMT 75R 5% 0805	342-751
CR10	RES SMT 100K 5% 0805	342-105
CR11	RES SMT 1K 5% 0805	342-103
CR12	RES SMT 1K 5% 0805	342-103
CR13	RES SMT 1K 5% 0805	342-103
CR14	RES SMT 1K 5% 0805	342-103

Designation	Description	DPS Part Number
CR15	RES SMT 1K 5% 0805	342-103
CR16	RES SMT 1K 5% 0805	342-103
CR17	RES SMT 0R 5% 0805	342-000
CR18	RES SMT 10R 5% 0805	342-101
CR19	RES SMT 2K2 5% 0805	342-223
CR20	RES SMT 3K3 5% 0805	342-333
CRG1	REG 1117-3.3 SOT223 SMT	339-002
CU1	IC SAA7113HB-S QFP44	330-716
CU2	IC QS5917T-70TQ QSOP	330-591
CU4	IC LT1229CS8/EL2260CS SOIC	308-229
CU5	IC 74LCX244	332-244
CU6	IC 74F08D SOIC	334-008
CX1	XTAL OSC FOX-3345 27.00MHZ	321-027
CX2	CRYSTAL OSC SG636SCE24.576MC	321-001
DC1	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
DC2	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
DC3	CAP SMT 47PF CER	345-471
DC4	CAP 330pF 2% 50V COG 0805	349-332
DC5	CAP SMT 0.1UF CER 0805	345-105
DC6	CAP SMT 0.1UF CER 0805	345-105
DC7	CAP SMT 0.1UF CER 0805	345-105
DC8	CAP SMT 0.1UF CER 0805	345-105
DC9	CAP SMT 0.1UF CER 0805	345-105
DC10	CAP SMT 22PF CER 0805	345-221
DC11	CAP SMT 33PF CER	345-331
DC12	CAP SMT 0.1UF CER 0805	345-105
DC13	CAP SMT 390PF CER 0805	345-392
DC14	CAP SMT 390PF CER 0805	345-392
DC15	CAP SMT 0.1UF CER 0805	345-105
DC16	CAP SMT 22PF CER 0805	345-221
DC17	CAP SMT 33PF CER	345-331
DC18	CAP SMT 390PF CER 0805	345-392
DC19	CAP SMT 390PF CER 0805	345-392
DC20	CAP SMT 0.1UF CER 0805	345-105
DC21	CAP SMT 0.1UF CER 0805	345-105
DC22	CAP SMT 0.1UF CER 0805	345-105
DC23	CAP SMT 22PF CER 0805	345-221
DC24	CAP SMT 33PF CER	345-331
DC25	CAP SMT 390PF CER 0805	345-392
DC26	CAP SMT 390PF CER 0805	345-392
DC27	CAP SMT 0.1UF CER 0805	345-105
DC28	CAP SMT 33PF CER	345-331
DC29	CAP SMT 390PF CER 0805	345-392
DC30	CAP SMT 390PF CER 0805	345-392
DC31	CAP SMT 0.1UF CER 0805	345-105
DC32	CAP SMT 470PF CER	345-472
DC33	CAP SMT 470PF CER	345-472
DC34	CAP SMT 470PF CER	345-472
DC35	CAP SMT 0.1UF CER 0805	345-105
DCN1	CONN 15P DSUB DB15HDRF	722-015
DL1	COIL FSLU2520-220 SMT INDUCTOR	601-221

Designation	Description	DPS Part Number
DL2	COIL INDUCTOR 2U7 SMT	601-252
DL3	COIL INDUCTOR 2U7 SMT	601-252
DL4	COIL INDUCTOR 2U7 SMT	601-252
DL5	COIL INDUCTOR 2U7 SMT	601-252
DQ1	TRANS SMT 2N3904 NPN	347-020
DQ2	TRANS SMT 2N3906 PNP	347-021
DQ3	TRANS SMT 2N3904 NPN	347-020
DQ5	TRANS SMT 2N3906 PNP	347-021
DQ6	TRANS SMT 2N3904 NPN	347-020
DQ7	TRANS SMT 2N3904 NPN	347-020
DR1	RES SMT 2R2 5% 0805	342-220
DR2	RES 332R 1% 0805	343-3322
DR3	RES 332R 1% 0805	343-3322
DR4	RES SMT 100R 5% 0805	342-102
DR5	RES SMT 100R 5% 0805	342-102
DR6	RES SMT 1K 1% 0805	343-1003
DR7	RES SMT 2K2 5% 0805	342-223
DR8	RES 681R 1% 0805	343-6812
DR9	RES 294R 1% 0805	343-2942
DR10	RES 619R 1% 0805	343-6192
DR11	RES 332R 1% 0805	343-3322
DR14	RES SMT 1K 1% 0805	343-1003
DR15	RES SMT 75R 1% 0805	343-7501
DR16	RES SMT 1K 1% 0805	343-1003
DR17	RES SMT 820R 5% 0805	342-822
DR18	RES SMT 80R6 1% 0805	343-8061
DR19	RES 97R6 1% 0805	343-9761
DR20	RES 332R 1% 0805	343-3322
DR21	RES SMT 470R 5% 0805	342-472
DR22	RES SMT 1K 1% 0805	343-1003
DR23	RES SMT 75R 1% 0805	343-7501
DR24	RES SMT 820R 5% 0805	342-822
DR25	RES SMT 80R6 1% 0805	343-8061
DR26	RES 82R5 1% SMT 0805	343-8251
DR27	RES SMT 470R 5% 0805	342-472
DR28	RES SMT 1K 1% 0805	343-1003
DR29	RES SMT 75R 1% 0805	343-7501
DR30	RES SMT 820R 5% 0805	342-822
DR31	RES SMT 80R6 1% 0805	343-8061
DR32	RES 82R5 1% SMT 0805	343-8251
DR33	RES SMT 1K 5% 0805	342-103
DR34	RES SMT 1K 5% 0805	342-103
DR35	RES SMT 2K2 5% 0805	342-223
DR36	RES SMT 634R 1% 0805	343-6342
DR37	RES SMT 53R6 1% 0805	343-5361
DR38	RES SMT 1K8 5% 0805	342-183
DR39	RES SMT 75R 1% 0805	343-7501
DR40	RES SMT 2K2 5% 0805	342-223
DR41	RES SMT 1K 1% 0805	343-1003
DR42	RES SMT 80R6 1% 0805	343-8061
DR43	RES 82R5 1% SMT 0805	343-8251
DR44	RES SMT 100R 5% 0805	342-102
DR45	RES SMT 220R 5% 0805	342-222
DR46	RES SMT 5K6 5% 0805	342-563
DR47	RES SMT 5K6 5% 0805	342-563

Designation	Description	DPS Part Number
DRG1	REG 1117-3.3 SOT223 SMT	339-002
DRV1	POT SMT 100R 3MM	348-102
DRV2	POT SMT 1K 3MM	348-103
DRV3	POT 200R 4MM SMT	348-202
DRV4	POT 200R 4MM SMT	348-202
DRV5	POT 200R 4MM SMT	348-202
DU1	IC LT1229CS8/EL2260CS SOIC	308-229
DU2	IC LT1229CS8/EL2260CS SOIC	308-229
DU3	IC SAA7127H	330-727
EC2	CAP SMT 0.1UF CER 0805	345-105
EC3	CAP TANT 100UF 10V 7343 LOW	362-107
EC4	CAP TANT 100UF 10V 7343 LOW	362-107
EC5	CAP TANT 100UF 10V 7343 LOW	362-107
EC6	CAP SMT 0.1UF CER 0805	345-105
EC7	CAP TANT 100UF 10V 7343 LOW	362-107
EC8	CAP SMT 47UF TANT 7343	357-476
EC9	CAP SMT 47UF TANT 7343	357-476
EC10	CAP TANT 100UF 10V 7343 LOW	362-107
EC11	CAP SMT ELEC 100UF CASE D 16V	346-101
EC12	CAP SMT ELEC 100UF CASE D 16V	346-101
EC13	CAP SMT ELEC 100UF CASE D 16V	346-101
EC14	CAP SMT ELEC 100UF CASE D 16V	346-101
EC15	CAP SMT ELEC 100UF CASE D 16V	346-101
EC16	CAP SMT ELEC 100UF CASE D 16V	346-101
EHE2	CONN JST B7P-VH	722-176
EHE3	CONN JST B7P-VH	722-176
EHE4	CONN 2PIN .06 OF 722-480	722-482
EHE5	CONN 2PIN .06 OF 722-480	722-482
EHE6	CONN 2PIN .06 OF 722-480	722-482
EL1	COIL 2.2UH	601-000
EL2	COIL 2.2UH	601-000
EL3	COIL 2.2UH	601-000
EL4	COIL 2.2UH	601-000
ER1	RES SMT 39R 5% 0805	342-391
ER2	RES SMT 10R 5% 0805	342-101
ER3	RES SMT 1K 5% 0805	342-103
ER4	RES 97R6 1% 0805	343-9761
ER5	RES 97R6 1% 0805	343-9761
ER6	RES SMT 10R 5% 0805	342-101
ER7	RES SMT 10R 5% 0805	342-101
ER8	RES SMT 10R 5% 0805	342-101
ERG1	IC LT1580CQ REG	339-158
ERN1	RES NET SMT 1K	431-004
EU1	IC EPF10K50SQC240-3	330-500
EU2	IC QS5917T-70TQ QSOP	330-591
EXT570	EXT ASSY MAIN BOARD DPS575	843-570EX

Designation	Description	DPS Part Number
FC1	CAP TANT 1.0UF 16V SMT 3216	359-105
FC2	CAP TANT 1.0UF 16V SMT 3216	359-105
FC3	CAP SMT 1P8 CER 0805	345-180
FC4	CAP SMT 22PF CER 0805	345-221
FC5	CAP SMT 0.1UF CER 0805	345-105
FC6	CAP SMT 0.1UF CER 0805	345-105
FC7	CAP SMT 0.1UF CER 0805	345-105
FC8	CAP SMT 0.1UF CER 0805	345-105
FC9	CAP TANT 4.7UF 16V SMT 3216	359-475
FC10	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
FC11	CAP SMT 0.1UF CER 0805	345-105
FC12	CAP SMT 0.1UF CER 0805	345-105
FC13	CAP SMT 0.1UF CER 0805	345-105
FC14	CAP 100nF WIMA SMD 2220 50V	350-102
FC15	CAP TANT 4.7UF 16V SMT 3216	359-475
FC16	CAP SMT 0.1UF CER 0805	345-105
FC17	CAP SMT 0.1UF CER 0805	345-105
FC18	CAP SMT 0.1UF CER 0805	345-105
FC19	CAP SMT 1P8 CER 0805	345-180
FCN1	CONN.LOW PROFILE AMP#413879-1	722-369
FCN2	CONN.LOW PROFILE AMP#413879-1	722-369
FL1	COIL 1UH TOKO FSLU2520-1R0J	601-100
FR1	RES SMT 68R 5% 0805	342-681
FR2	RES SMT 150R 5% 0805	342-152
FR3	RES SMT 68R 5% 0805	342-681
FR4	RES SMT 150R 5% 0805	342-152
FR5	RES SMT 1M 5% 0805	342-106
FR6	RES SMT 820R 5% 0805	342-822
FR7	RES SMT 3K9 5% 0805	342-393
FR8	RES SMT 2K2 5% 0805	342-223
FR9	RES SMT 10R 5% 0805	342-101
FR10	RES SMT 20K 5% 0805	342-204
FR11	RES SMT 10K 5% 0805	342-104
FR12	RES SMT 4K7 5% 0805	342-473
FR13	RES SMT 2K2 5% 0805	342-223
FR14	RES SMT 330R 5% 0805	342-332
FR15	RES SMT 33K 5% 0805	342-334
FR16	RES SMT 10K 5% 0805	342-104
FR17	RES SMT 4K7 5% 0805	342-473
FR18	RES SMT 0R 5% 0805	342-000
FRG1	REG 1117-5.0 SOT223 SMT	339-001
FRN1	RES NET 100R SMT	344-101
FRN2	RES NET 100R SMT	344-101
FRN3	RES NET 100R SMT	344-101
FU1	IC GS9001-CQM	641-901
FU2	IC GS9022-CPJ	641-922
FU3	IC LF353 DUAL JFET OP-AMP SMT	330-353
FU4	IC MC74F04AD SMT HEX INVERTER	334-004
FX1	XTAL 27.000MHZ VCXO 1/2 SIZE	521-270

Designation	Description	DPS Part Number
GND1	HEADER 2 PIN OF 761-141	761-152
GND2	HEADER 2 PIN OF 761-141	761-152
GND3	HEADER 2 PIN OF 761-141	761-152
GND4	HEADER 2 PIN OF 761-141	761-152
GND5	HEADER 2 PIN OF 761-141	761-152
GND6	HEADER 2 PIN OF 761-141	761-152
GND7	HEADER 2 PIN OF 761-141	761-152
GND8	HEADER 2 PIN OF 761-141	761-152
GND9	HEADER 2 PIN OF 761-141	761-152
GND10	HEADER 2 PIN OF 761-141	761-152
GND11	HEADER 2 PIN OF 761-141	761-152
GND12	HEADER 2 PIN OF 761-141	761-152
GND13	HEADER 2 PIN OF 761-141	761-152
GR1	RES SMT 39R 5% 0805	342-391
GR2	RES SMT 0R 5% 0805	342-000
GRN1	RES NET SMT 1K	431-004
GU1	IC EPF10K100ABC356-3 BGA	328-100
HR1	RES SMT 100R 5% 0805	342-102
HR2	RES SMT 220R 5% 0805	342-222
HU1A	IC UPD4564163G5-A10L SDRAM 1M4	330-416
HU2A	IC UPD4564163G5-A10L SDRAM 1M4	330-416
HU3	IC IS42S16100-10T SDRAM 52	330-616
HU4	IC IS42S16100-10T SDRAM 52	330-616
HU5	IC UPD485506G5-25 TSOP44	330-506
HU6	IC UPD485506G5-25 TSOP44	330-506
HU7	IC UPD485506G5-25 TSOP44	330-506
IC1	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
IC2	CAP SMT 0.1UF CER 0805	345-105
IC3	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
IC4	CAP 47uF 16V ELEC SMT	356-476
IC5	CAP 47uF 16V ELEC SMT	356-476
IC6	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
IC7	CAP SMT 0.1UF CER 0805	345-105
IC8	CAP SMT 0.1UF CER 0805	345-105
IC9	CAP SMT 0.1UF CER 0805	345-105
IC10	CAP SMT 0.1UF CER 0805	345-105
IC11	CAP SMT 0.1UF CER 0805	345-105
IC12	CAP SMT 0.1UF CER 0805	345-105
IC13	CAP SMT 0.1UF CER 0805	345-105
IC14	CAP SMT 0.1UF CER 0805	345-105
IC15	CAP SMT 0.1UF CER 0805	345-105
IC16	CAP SMT 0.1UF CER 0805	345-105
IC17	CAP SMT 0.047UF CER 0805	345-474
IC18	CAP 47uF 16V ELEC SMT	356-476
IC19	CAP 47uF 16V ELEC SMT	356-476
IC20	CAP SMT 0.1UF CER 0805	345-105
IC21	CAP SMT 0.047UF CER 0805	345-474
IC22	CAP SMT 0.1UF CER 0805	345-105
IC23	CAP SMT 0.047UF CER 0805	345-474
IC24	CAP SMT 0.047UF CER 0805	345-474
IC25	CAP 47uF 16V ELEC SMT	356-476

Designation	Description	DPS Part Number
IC26	CAP 47uF 16V ELEC SMT	356-476
IC27	CAP SMT 0.1UF CER 0805	345-105
IC28	CAP 100nF WIMA SMD 2220 50V	350-102
IC29	CAP SMT 0.1UF CER 0805	345-105
IC30	CAP TANT 4.7UF 16V SMT 3216	359-475
IC31	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
IC32	CAP SMT 0.1UF CER 0805	345-105
IC33	CAP SMT 0.1UF CER 0805	345-105
IC34	CAP SMT 0.1UF CER 0805	345-105
IC35	CAP TANT 4.7UF 16V SMT 3216	359-475
IC36	CAP SMT 0.1UF CER 0805	345-105
IC37	CAP 100nF WIMA SMD 2220 50V	350-102
IC38	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
IC39	CAP SMT 100PF CER 0805	345-102
ICN1	CONN.LOW PROFILE AMP#413879-1	722-369
ICN2	CONN 4 PIN RT ANG W/O TAB SVHS	722-490
IL1	COIL 1UH TOKO FSLU2520-1R0J	601-100
IL2	COIL 0.12uH FSLU2520-R12J SMT	601-121
IQ1	TRANS SMT 2N3906 PNP	347-021
IQ2	TRANS SMT 2N3906 PNP	347-021
IQ3	TRANS SMT 2N3904 NPN	347-020
IQ4	TRANS SMT 2N3904 NPN	347-020
IR1	RES SMT 100R 5% 0805	342-102
IR2	RES SMT 100R 5% 0805	342-102
IR3	RES 732R 1% 0805	343-7322
IR4	RES SMT 1K 1% 0805	343-1003
IR5	RES SMT 1R 5% 0805	342-100
IR6	RES 84R5 1% 0805	343-8451
IR7	RES SMT 1K 1% 0805	343-1003
IR8	RES SMT 47K 5% 0805	342-474
IR9	RES SMT 470R 5% 0805	342-472
IR10	RES SMT 270R 5% 0805	342-272
IR11	RES 732R 1% 0805	343-7322
IR12	RES SMT 1K 1% 0805	343-1003
IR13	RES 332R 1% 0805	343-3322
IR14	RES 200R 1% 0805	343-2002
IR15	RES 84R5 1% 0805	343-8451
IR16	RES SMT 47K 5% 0805	342-474
IR17	RES 18R0 1% 0805	343-1801
IR18	RES SMT 56R 1% 0805	343-5601
IR19	RES SMT 470R 5% 0805	342-472
IR20	RES 732R 1% 0805	343-7322
IR21	RES SMT 1K 1% 0805	343-1003
IR22	RES 84R5 1% 0805	343-8451
IR23	RES SMT 47K 5% 0805	342-474
IR24	RES SMT 470R 5% 0805	342-472
IR25	RES SMT 150R 5% 0805	342-152
IR26	RES SMT 150R 5% 0805	342-152
IR27	RES SMT 680K 5% 0805	342-685
IR28	RES SMT 10R 5% 0805	342-101
IR29	RES SMT 470R 5% 0805	342-472
IR30	RES SMT 470R 5% 0805	342-472
IR31	RES SMT 100K 5% 0805	342-105

Designation	Description	DPS Part Number
IR32	RES SMT 6K8 5% 0805	342-683
IR33	RES SMT 470R 5% 0805	342-472
IR34	RES SMT 3K9 5% 0805	342-393
IR35	RES SMT 2K2 5% 0805	342-223
IR36	RES SMT 4K7 5% 0805	342-473
IR37	RES SMT 470R 5% 0805	342-472
IR38	RES SMT 1K8 5% 0805	342-183
IR39	RES SMT 10K 5% 0805	342-104
IR40	RES SMT 10K 5% 0805	342-104
IR41	RES SMT 10K 5% 0805	342-104
IR42	RES SMT 3K3 5% 0805	342-333
IR43	RES SMT 3K3 5% 0805	342-333
IRG1	REG 1117-3.3 SOT223 SMT	339-002
IRG2	REG 1117-5.0 SOT223 SMT	339-001
IRV1	POT 200R 4MM SMT	348-202
IRV2	POT 200R 4MM SMT	348-202
IRV3	POT 200R 4MM SMT	348-202
IU1	IC LT1229CS8/EL2260CS SOIC	308-229
IU2	IC EL4441CS	330-441
IU3	IC SAA7113HB-S QFP44	330-716
IU4	IC LT1229CS8/EL2260CS SOIC	308-229
IU5	IC EL4581CS SOIC	330-459
IU6	IC 74F74D SOIC	334-074
IU7	IC 74F153AD SOIC16 SMT	334-153
IU8	IC QS5917T-70TQ QSOP	330-591
IU9	IC LF353 DUAL JFET OP-AMP SMT	330-353
IX1	CRYSTAL OSC SG636SCE24.576MC	321-001
IX2	XTAL 27.000MHZ VCXO 1/2 SIZE	521-270
JC1	CAP SMT 0.1UF CER 0805	345-105
JC2	CAP SMT 0.1UF CER 0805	345-105
JC3	CAP SMT 10UF TANT 16V 3528	358-106
JC4	CAP SMT 0.1UF CER 0805	345-105
JC5	CAP TANT 4.7UF 16V SMT 3216	359-475
JC6	CAP SMT 0.1UF CER 0805	345-105
JC7	CAP SMT 0.1UF CER 0805	345-105
JC8	CAP 62pF 2% 50V COG 0805	349-621
JC9	CAP SMT 0.1UF CER 0805	345-105
JC10	CAP SMT 0.1UF CER 0805	345-105
JC11	CAP SMT 220PF CER	345-222
JC12	CAP 220PF 2% 50V COG 0805	349-222
JC13	CAP 220PF 2% 50V COG 0805	349-222
JC14	CAP SMT 22PF CER 0805	345-221
JC15	CAP 1nF WIMA SMD 2220 50V	350-100
JC16	CAP SMT 0.1UF CER 0805	345-105
JC17	CAP SMT 0.1UF CER 0805	345-105
JC18	CAP SMT 0.1UF CER 0805	345-105
JC19	CAP SMT 0.1UF CER 0805	345-105
JC20	CAP SMT 0.1UF CER 0805	345-105
JC21	CAP 10nF WIMA SMD 2220 50V	350-101
JC22	CAP 10uF TANT 6.3V 3216	359-106
JC23	CAP SMT 0.1UF CER 0805	345-105
JC24	CAP SMT 0.1UF CER 0805	345-105

Designation	Description	DPS Part Number
JC25	CAP SMT 0.1UF CER 0805	345-105
JC26	CAP 10uF TANT 6.3V 3216	359-106
JC27	CAP SMT 0.1UF CER 0805	345-105
JC28	CAP 10uF TANT 6.3V 3216	359-106
JC29	CAP TANT 4.7UF 16V SMT 3216	359-475
JC30	CAP SMT 0.1UF CER 0805	345-105
JC31	CAP SMT 0.1UF CER 0805	345-105
JC32	CAP SMT 0.1UF CER 0805	345-105
JC33	CAP SMT 0.1UF CER 0805	345-105
JC34	CAP SMT 0.1UF CER 0805	345-105
JC35	CAP 120pF 2% 50V COG 0805	349-122
JC36	CAP 47uF 16V ELEC SMT	356-476
JC37	CAP 47uF 16V ELEC SMT	356-476
JC38	CAP TANT 1.0UF 16V SMT 3216	359-105
JC39	CAP SMT 0.1UF CER 0805	345-105
JC40	CAP SMT 0.1UF CER 0805	345-105
JC41	CAP 390pF 2% 50V COG 0805	349-392
JC42	CAP 390pF 2% 50V COG 0805	349-392
JC43	CAP 120pF 2% 50V COG 0805	349-122
JC44	CAP SMT 0.1UF CER 0805	345-105
JC45	CAP SMT 0.1UF CER 0805	345-105
JC46	CAP SMT 0.1UF CER 0805	345-105
JC47	CAP 10uF TANT 6.3V 3216	359-106
JC48	CAP 10uF TANT 6.3V 3216	359-106
JC49	CAP SMT 0.1UF CER 0805	345-105
JC50	CAP SMT 0.1UF CER 0805	345-105
JC51	CAP SMT 0.1UF CER 0805	345-105
JC52	CAP SMT 0.1UF CER 0805	345-105
JC53	CAP SMT 0.1UF CER 0805	345-105
JC54	CAP SMT 0.1UF CER 0805	345-105
JC55	CAP SMT 0.1UF CER 0805	345-105
JC56	CAP SMT 0.1UF CER 0805	345-105
JC57	CAP SMT 0.1UF CER 0805	345-105
JC58	CAP 120pF 2% 50V COG 0805	349-122
JC59	CAP 47uF 16V ELEC SMT	356-476
JC60	CAP 47uF 16V ELEC SMT	356-476
JC61	CAP TANT 1.0UF 16V SMT 3216	359-105
JC62	CAP SMT 0.1UF CER 0805	345-105
JC63	CAP 390pF 2% 50V COG 0805	349-392
JC64	CAP 390pF 2% 50V COG 0805	349-392
JC65	CAP 120pF 2% 50V COG 0805	349-122
JC66	CAP SMT 0.1UF CER 0805	345-105
JC67	CAP SMT 0.1UF CER 0805	345-105
JC68	CAP SMT 0.1UF CER 0805	345-105
JC69	CAP 10uF TANT 6.3V 3216	359-106
JC70	CAP 10uF TANT 6.3V 3216	359-106
JC71	CAP SMT 0.1UF CER 0805	345-105
JC72	CAP SMT 0.1UF CER 0805	345-105
JC73	CAP SMT 0.1UF CER 0805	345-105
JC74	CAP SMT 0.1UF CER 0805	345-105
JC75	CAP SMT 0.1UF CER 0805	345-105
JC76	CAP SMT 180PF CER	345-182
JC77	CAP SMT 180PF CER	345-182
JC78	CAP SMT 68PF CER	345-681
JC79	CAP SMT 56PF CER	345-561
JCN1	CONN.LOW PROFILE AMP#413879-1	722-369

Designation	Description	DPS Part Number
JCN2	CONN.LOW PROFILE AMP#413879-1	722-369
JD1	DIODE BAV99 SOT23 DUAL SWITCHG	354-099
JD2	DIODE BAV99 SOT23 DUAL SWITCHG	354-099
JD3	DIODE BAV99 SOT23 DUAL SWITCHG	354-099
JD4	DIODE BAV99 SOT23 DUAL SWITCHG	354-099
JL1	COIL 2.2UH TOKO FSLU2520-2R2J	601-220
JL2	COIL 4.7uH FLSU2520	601-470
JL3	COIL 4.7uH FLSU2520	601-470
JL4	COIL 10uH SMT	601-026
JL5	COIL 3.9uH SMT	601-027
JQ1	TRANS SMT 2N3904 NPN	347-020
JQ2	TRANS SMT 2N3904 NPN	347-020
JQ3	TRANS SMT 2N3904 NPN	347-020
JQ4	TRANS SMT 2N3904 NPN	347-020
JR1	RES SMT 1K 1% 0805	343-1003
JR2	RES 619R 1% 0805	343-6192
JR3	RES SMT 10R 5% 0805	342-101
JR4	RES SMT 1K 1% 0805	343-1003
JR5	RES SMT 1K 1% 0805	343-1003
JR6	RES SMT 1K 1% 0805	343-1003
JR7	RES SMT 1K 1% 0805	343-1003
JR8	RES SMT 1K33 1% 0805	343-1333
JR9	RES SMT 1K 1% 0805	343-1003
JR10	RES 90R9 1% 0805	343-9091
JR11	RES SMT 1K 1% 0805	343-1003
JR12	RES SMT 1K 1% 0805	343-1003
JR13	RES SMT 68R 5% 0805	342-681
JR14	RES SMT 1K 1% 0805	343-1003
JR15	RES SMT 1K 1% 0805	343-1003
JR16	RES 332R 1% 0805	343-3322
JR17	RES 90R9 1% 0805	343-9091
JR18	RES SMT 22R 5% 0805	342-221
JR19	RES SMT 22R 5% 0805	342-221
JR20	RES 332R 1% 0805	343-3322
JR21	RES SMT 825R 1% 0805	343-8202
JR22	RES SMT 4K7 5% 0805	342-473
JR23	RES SMT 10K 5% 0805	342-104
JR24	RES SMT 47R 5% 0805	342-471
JR25	RES SMT 1K 1% 0805	343-1003
JR26	RES SMT 1K 1% 0805	343-1003
JR27	RES SMT 1K 1% 0805	343-1003
JR28	RES SMT 1K 1% 0805	343-1003
JR29	RES 1K5 1% SMT 0805	343-1503
JR30	RES SMT 1K33 1% 0805	343-1333
JR31	RES 499R 1% 0805	343-4992
JR32	RES SMT 1K 1% 0805	343-1003
JR33	RES SMT 1K 1% 0805	343-1003
JR34	RES SMT 1K 1% 0805	343-1003
JR35	RES 95R3 1% 0805	343-9531
JR36	RES SMT 1K 1% 0805	343-1003
JR37	RES SMT 1K 1% 0805	343-1003
JR38	RES SMT 10R 5% 0805	342-101
JR39	RES SMT 10R 5% 0805	342-101

Designation	Description	DPS Part Number
JR40	RES 332R 1% 0805	343-3322
JR41	RES 84R5 1% 0805	343-8451
JR42	RES 390R 1% 0805	343-3902
JR43	RES SMT 47K 5% 0805	342-474
JR44	RES SMT 470R 5% 0805	342-472
JR45	RES 95R3 1% 0805	343-9531
JR46	RES 332R 1% 0805	343-3322
JR47	RES SMT 1K 1% 0805	343-1003
JR48	RES 1K5 1% SMT 0805	343-1503
JR49	RES SMT 1K33 1% 0805	343-1333
JR50	RES 499R 1% 0805	343-4992
JR51	RES SMT 1K 1% 0805	343-1003
JR52	RES SMT 1K 1% 0805	343-1003
JR53	RES SMT 1K 1% 0805	343-1003
JR54	RES 95R3 1% 0805	343-9531
JR55	RES SMT 1K 1% 0805	343-1003
JR56	RES SMT 1K 1% 0805	343-1003
JR57	RES SMT 10R 5% 0805	342-101
JR58	RES SMT 10R 5% 0805	342-101
JR59	RES 332R 1% 0805	343-3322
JR60	RES 84R5 1% 0805	343-8451
JR61	RES 390R 1% 0805	343-3902
JR62	RES SMT 47K 5% 0805	342-474
JR63	RES SMT 470R 5% 0805	342-472
JR64	RES 95R3 1% 0805	343-9531
JR65	RES 332R 1% 0805	343-3322
JR66	RES SMT 1R 5% 0805	342-100
JRG1	REG 1117-5.0 SOT223 SMT	339-001
JRG2	REG 1117-3.3 SOT223 SMT	339-002
JRV1	POT SMT 1K 3MM	348-103
JRV2	POT 200R 4MM SMT	348-202
JRV3	POT 200R 4MM SMT	348-202
JU1	IC LT1229CS8/EL2260CS SOIC	308-229
JU2	IC EL4094CS	330-094
JU3	IC EL2090CM SOIC	308-091
JU4	IC AD9225ARS	330-766
JU5	IC LT1229CS8/EL2260CS SOIC	308-229
JU6	IC LT1229CS8/EL2260CS SOIC	308-229
JU7	IC EL4094CS	330-094
JU8	IC AD9200ARS	330-767
JU9	IC LT1229CS8/EL2260CS SOIC	308-229
JU10	IC EL4094CS	330-094
JU11	IC AD9200ARS	330-767
JU12	IC 74LCX244	332-244
JU13	IC 74LCX244	332-244
JU14	IC 74LCX244	332-244
KC1	CAP SMT 0.1UF CER 0805	345-105
KC2	CAP SMT 0.1UF CER 0805	345-105
KC3	CAP SMT 0.1UF CER 0805	345-105
KC4	CAP SMT 0.1UF CER 0805	345-105
KC5	CAP SMT 0.1UF CER 0805	345-105
KC6	CAP SMT 0.1UF CER 0805	345-105
KC7	CAP SMT 0.1UF CER 0805	345-105

Designation	Description	DPS Part Number
KC8	CAP SMT 0.1UF CER 0805	345-105
KC9	CAP SMT 0.1UF CER 0805	345-105
KC10	CAP SMT 0.1UF CER 0805	345-105
KC11	CAP SMT 0.1UF CER 0805	345-105
KC12	CAP SMT 10UF TANT 16V 3528	358-106
KC13	CAP SMT 47UF TANT 7343	357-476
KC14	CAP SMT 10UF TANT 16V 3528	358-106
KC15	CAP SMT 47UF TANT 7343	357-476
KR1	RES SMT 10K0 1 % 0805	343-1004
KR2	RES SMT 1K 1% 0805	343-1003
KR3	RES SMT 100R 5% 0805	342-102
KR4	RES SMT 1K 1% 0805	343-1003
KR5	RES SMT 10K0 1 % 0805	343-1004
KR6	RES SMT 100R 5% 0805	342-102
KR7	RES SMT 806R 1% 0805	343-8062
KR8	RES SMT 10K0 1 % 0805	343-1004
KR9	RES SMT 10K0 1 % 0805	343-1004
KR10	RES SMT 10K0 1 % 0805	343-1004
KR11	RES SMT 100R 5% 0805	342-102
KR12	RES 200R 1% 0805	343-2002
KR13	RES SMT 1K 1% 0805	343-1003
KR14	RES SMT 100R 5% 0805	342-102
KR15	RES SMT 10K0 1 % 0805	343-1004
KR16	RES SMT 0R 5% 0805	342-000
KR17	RES SMT 1K 1% 0805	343-1003
KR18	RES SMT 8K2 5% 0805	342-823
KR19	RES SMT 10K0 1 % 0805	343-1004
KR20	RES SMT 10K0 1 % 0805	343-1004
KR21	RES SMT 10K0 1 % 0805	343-1004
KR22	RES SMT 20K 5% 0805	342-204
KR23	RES SMT 100R 5% 0805	342-102
KR24	RES SMT 10K0 1 % 0805	343-1004
KR25	RES 1K5 1% SMT 0805	343-1503
KR26	RES SMT 1K 1% 0805	343-1003
KR27	RES SMT 10K0 1 % 0805	343-1004
KR28	RES SMT 10K0 1 % 0805	343-1004
KR29	RES 1K5 1% SMT 0805	343-1503
KR30	RES SMT 10K0 1 % 0805	343-1004
KR31	RES SMT 10K0 1 % 0805	343-1004
KR32	RES SMT 1K 1% 0805	343-1003
KR33	RES SMT 10K0 1 % 0805	343-1004
KR34	RES 200R 1% 0805	343-2002
KR35	RES 1K24 1% 0805	343-1243
KR36	RES 1K24 1% 0805	343-1243
KR37	RES 200R 1% 0805	343-2002
KR38	RES SMT 3K92 1% 0805	343-3923
KR39	RES SMT 3K92 1% 0805	343-3923
KRG1	IC LM317 SMT SOT-223	330-317
KRG2	IC LM337 SMT SOT-223	330-337
KRV1	POT SMT 2K 3MM	348-203
KRV2	POT SMT 2K 3MM	348-203
KU1	IC TLO74 SOIC QUAD OP AMP	308-075
KU2	IC TLO74 SOIC QUAD OP AMP	308-075

Designation	Description	DPS Part Number
KU3	IC TLO74 SOIC QUAD OP AMP	308-075
KU4	IC AD8403ARU1 TSSOP24 DIGITAL	330-403
LR3	RES SMT 39R 5% 0805	342-391
LR4	RES SMT 100R 5% 0805	342-102
LR5	RES SMT 220R 5% 0805	342-222
LR6	RES SMT 100R 5% 0805	342-102
LR7	RES SMT 220R 5% 0805	342-222
LRN1	RES NET SMT 1K	431-004
LU1	IC EPF10K100EQC240-3 ALTERA -S	330-103
LU2	IC UPD485506G5-25 TSOP44	330-506
LU3	IC IS42S16100-10T SDRAM 52	330-616
LU4	IC IS42S16100-10T SDRAM 52	330-616
MC1	CAP TANT 4.7UF 16V SMT 3216	359-475
MC2	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
MC3	CAP SMT 0.1UF CER 0805	345-105
MC4	CAP SMT 0.1UF CER 0805	345-105
MC5	CAP SMT 0.1UF CER 0805	345-105
MC6	CAP SMT 0.1UF CER 0805	345-105
MC7	CAP SMT 0.01UF CER 0805	345-104
MC8	CAP SMT 0.01UF CER 0805	345-104
MC9	CAP SMT 0.1UF CER 0805	345-105
MC10	CAP SMT 0.1UF CER 0805	345-105
MC11	CAP SMT 100PF CER 0805	345-102
MC12	CAP SMT 15PF CER 5% 0805	345-151
MC13	CAP SMT 0.015UF CER 0805	345-154
MC14	CAP SMT 4N7 CER 0805	345-473
MC15	CAP SMT 0.1UF CER 0805	345-105
MC16	CAP SMT 0.1UF CER 0805	345-105
MC17	CAP TANT 15UF 6.3V/10VSMT 3216	359-156
MC18	CAP SMT 0.1UF CER 0805	345-105
MC19	CAP SMT 0.1UF CER 0805	345-105
MC20	CAP 100nF WIMA SMD 2220 50V	350-102
MC21	CAP SMT 0.1UF CER 0805	345-105
MC22	CAP SMT 0.1UF CER 0805	345-105
MC23	CAP SMT 1P8 CER 0805	345-180
MC24	CAP TANT 1.0UF 16V SMT 3216	359-105
MC25	CAP SMT 0.1UF CER 0805	345-105
MCN1	CONN.LOW PROFILE AMP#413879-1	722-369
MCN2	CONN.LOW PROFILE AMP#413879-1	722-369
MD1	DIODE SMT MMBD914LT1	354-914
MD2	DIODE SMT MMBD914LT1	354-914
MR1	RES SMT 10R 5% 0805	342-101
MR2	RES SMT 10K 5% 0805	342-104
MR3	RES SMT 75R 5% 0805	342-751
MR4	RES SMT 75R 1% 0805	343-7501
MR5	RES SMT 110R 5% 0805	342-112
MR6	RES SMT 1K 5% 0805	342-103
MR7	RES, 365R 1% 0805	343-3652
MR9	RES SMT 0R 5% 0805	342-000
MR10	RES SMT 0R 5% 0805	342-000

Designation	Description	DPS Part Number
MR11	RES SMT 10R 5% 0805	342-101
MR12	RES SMT 270R 5% 0805	342-272
MR13	RES SMT 270R 5% 0805	342-272
MR14	RES SMT 2K2 5% 0805	342-223
MR15	RES SMT 4K7 5% 0805	342-473
MR16	RES SMT 2K2 5% 0805	342-223
MR17	RES SMT 68R 5% 0805	342-681
MR18	RES SMT 150R 5% 0805	342-152
MR19	RES SMT 3K3 5% 0805	342-333
MR20	RES SMT 150R 5% 0805	342-152
MR21	RES SMT 6K8 5% 0805	342-683
MRG1	REG 1117-5.0 SOT223 SMT	339-001
MU1	IC GS9025A SDI RECEIVER	641-925
MU2	IC GS9020-CFV INPUT PROCESSOR	641-920
MU3	IC TLC2932 IPWLE ANALOG PLL	308-932
MU4	IC GS9008-CKA	641-908
NC1	CAP SMT 22PF CER 0805	345-221
NCN1	CONN AMP#917628-3	722-683
NCN2	CONN IEEE 1394	722-139
NHE1	CONN HDR 2.00MM STRAIGHT	722-532
NR1	RES SMT 2K2 5% 0805	342-223
NR3	RES SMT 39R 5% 0805	342-391
NR4	RES SMT 100R 5% 0805	342-102
NR5	RES SMT 220R 5% 0805	342-222
NRN1	RES NET SMT 1K	431-004
NU1	IC EPF10K50SQC240-3	330-500
PC1	CAP SMT 0.1UF CER 0805	345-105
PCB570	PCB DPS-575 MAINBOARD	743-570
PR1	RES SMT 10K 5% 0805	342-104
PR3	RES SMT 4K7 5% 0805	342-473
PR4	RES SMT 100R 5% 0805	342-102
PR7	RES SMT 4K7 5% 0805	342-473
PR8	RES SMT 4K7 5% 0805	342-473
PR12	RES SMT 220R 5% 0805	342-222
PRN1	RES NET SMT 1K	431-004
PS1	E-SWITCH BUTTONS FOR LCD	733-004
PU1	IC AT91M40400-33AC MICRO TQFP	330-400
PU2	IC DS75S TEMP SENSOR S08	330-075
PU3	IC LMC6953CM SOIC	330-695
QC1	CAP SMT 100UF ELEC 20% 6V	356-107
QU3	IC TC55V16256FT-153.3V TSOPP44	330-625

Designation	Description	DPS Part Number
QU11	IC EPM7032AELC44-4	305-703
QU11_S	SOCKET PCS-044SMU-12 (AGT)	721-044
QU12	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
QU13	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
QU15	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
QU16	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
QU17	IC AT27C256R-15JC 32KX8 PLCC32	330-270
QU17_S	SOCKET PCS-032SMU-12	721-032
QU18	IC STK12C68-S45 8KX8 45NS	330-268
QU19	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
QU22	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
QU23	IC 74LCX244	332-244
QU24	IC 74LCX244	332-244
QU25	IC 74LCX244	332-244
QU26	IC 74LCX244	332-244
QU27	IC 74LCX244	332-244
QU28	IC 74LCX244	332-244
QU29	IC 74LCX244	332-244
QU30	IC 74LCX244	332-244
RCN1	CONN AMP 80 PINS DO NOT BUY	722-043
RR1	RES SMT 0R 5% 0805	342-000
RU1	IC AT49BV1604-12TC 16MB FLASH	330-160
RU2	IC AT49BV1604-12TC 16MB FLASH	330-160
SC1	CAP SMT 0.1UF CER 0805	345-105
SC2	CAP SMT 0.1UF CER 0805	345-105
SC3	CAP SMT 33NF CER 10% 50V 0805	345-334
SC4	CAP SMT 33NF CER 10% 50V 0805	345-334
SC5	CAP SMT 0.1UF CER 0805	345-105
SC6	CAP SMT 0.1UF CER 0805	345-105
SC7	CAP SMT 220PF CER	345-222
SC9	CAP SMT 220PF CER	345-222
SD1	DIODE BAV99 SOT23 DUAL SWITCHG	354-099
SD2	DIODE BAV99 SOT23 DUAL SWITCHG	354-099
SD3	DIODE BAV99 SOT23 DUAL SWITCHG	354-099
SD5	DIODE SMBJ9.0CA TVS 10V BI-DIR	354-009
SD6	DIODE SMBJ9.0CA TVS 10V BI-DIR	354-009
SHE1	CONN PAN WITH LOCK 050-020-153	722-459
SHE2	CONN PAN WITH LOCK 050-020-153	722-459
SHE3	HEADE LOCKING 26 PIN	722-430
SHE4	CONN DUPONT 69167-103	722-001
SHE5	CONN 2PIN .06 OF 722-480	722-482
SHE6	CONN 2PIN .06 OF 722-480	722-482
SQ1	TRANS SMT 2N3904 NPN	347-020
SR1	RES SMT 220K 5% 0805	342-225
SR4	RES SMT 4K7 5% 0805	342-473
SR6	RES SMT 4K7 5% 0805	342-473
SR7	RES SMT 2K2 5% 0805	342-223
SR8	RES SMT 51K 5% 0805	342-514
SR10	RES SMT 51K 5% 0805	342-514

Designation	Description	DPS Part Number
SR11	RES SMT 120R 5% 0805	342-122
SR12	RES SMT 220K 5% 0805	342-225
SR14	RES SMT 4K7 5% 0805	342-473
SR15	RES SMT 0R 5% 0805	342-000
SR16	RES SMT 0R 5% 0805	342-000
SR17	RES SMT 330R 5% 0805	342-332
SR18	RES SMT 330R 5% 0805	342-332
SR20	RES SMT 330R 5% 0805	342-332
SR22	RES SMT 330R 5% 0805	342-332
SR23	RES SMT 0R 5% 0805	342-000
SRLY1	RELAY TX2-12V AROMAT	651-111
SRN1	RES NET SMT 1K	431-004
SRN2	RES NET SMT 1K	431-004
SU1	IC 74ACT14D SOIC	337-140
SU7	IC LTC1387CG RS232/422 XCEIVR	330-138
SU8	IC 74ACT00D SOIC	337-000
SU9	IC 74FCT574A QSOP	338-574
SU11	IC 74FCT574A QSOP	338-574
SU13	IC 74FCT245ATQ	338-245
SU14	IC 74LCX244	332-244
SU15	IC 74LCX244	332-244
TC1	CAP SMT 0.01UF CER 0805	345-104
TC2	CAP SMT 0.01UF CER 0805	345-104
TC3	CAP SMT 560PF CER	345-562
TCN1	CONN RJ45 SHIELDED R/A SOCKET	722-583
TD1	LED GREEN RIGHT ANGLE	104-115
THE1	CONN HDR 2.00MM STRAIGHT	722-532
THE2	CONN HDR 2.00MM STRAIGHT	722-532
TL1	XFMER 10BASET ISOLATION SO16	602-202
TR2	RES SMT 8R2 5% 0805	342-820
TR4	RES SMT 8R2 5% 0805	342-820
TR6	RES SMT 4K99 1% 0805	343-4993
TR7	RES SMT 510R 5% 0805	342-512
TR8	RES SMT 100R 1% 0805	343-1002
TR10	RES SMT 10K 5% 0805	342-104
TR11	RES SMT 0R 5% 0805	342-000
TR12	RES SMT 0R 5% 0805	342-000
TU1	IC CS8900A-CQ ETHERNET CONTROL	330-900
TU2	IC 74ACT04D SOIC	337-004
TY1	XTAL 20MHZ 18PF SMT	321-020
UHE1	40X2 PIN SMT BRD STACKER .050	722-143
UHE2	40X2 PIN SMT BRD STACKER .050	722-143
UHE3	40X2 PIN SMT BRD STACKER .050	722-143
UU1	IC QS74LCX245CQ/IDT74LVC245AQ	332-245

Designation	Description	DPS Part Number
UU2	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
UU3	IC 74LCX244	332-244
UU4	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
UU5	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
UU6	IC 74LCX244	332-244
XC1	CAP SMT 0.1UF CER 0805	345-105
XC2	CAP SMT 0.1UF CER 0805	345-105
XC3	CAP SMT 0.1UF CER 0805	345-105
XC4	CAP SMT 0.1UF CER 0805	345-105
XC5	CAP SMT 0.1UF CER 0805	345-105
XC6	CAP SMT 0.1UF CER 0805	345-105
XC7	CAP SMT 0.1UF CER 0805	345-105
XC8	CAP SMT 0.1UF CER 0805	345-105
XC9	CAP SMT 0.1UF CER 0805	345-105
XC10	CAP SMT 0.1UF CER 0805	345-105
XC11	CAP SMT 0.1UF CER 0805	345-105
XC12	CAP SMT 0.1UF CER 0805	345-105
XC13	CAP SMT 0.1UF CER 0805	345-105
XC14	CAP SMT 0.1UF CER 0805	345-105
XC15	CAP SMT 0.1UF CER 0805	345-105
XC16	CAP SMT 0.1UF CER 0805	345-105
XC17	CAP SMT 0.1UF CER 0805	345-105
XC18	CAP SMT 0.1UF CER 0805	345-105
XC19	CAP SMT 0.1UF CER 0805	345-105
XC20	CAP SMT 0.1UF CER 0805	345-105
XC21	CAP SMT 0.1UF CER 0805	345-105
XC22	CAP SMT 0.1UF CER 0805	345-105
XC23	CAP SMT 0.1UF CER 0805	345-105
XC24	CAP SMT 0.1UF CER 0805	345-105
XC25	CAP SMT 0.1UF CER 0805	345-105
XC26	CAP SMT 0.1UF CER 0805	345-105
XC27	CAP SMT 0.1UF CER 0805	345-105
XC28	CAP SMT 0.1UF CER 0805	345-105
XC29	CAP SMT 0.1UF CER 0805	345-105
XC30	CAP SMT 0.1UF CER 0805	345-105
XC31	CAP SMT 0.1UF CER 0805	345-105
XC32	CAP SMT 0.1UF CER 0805	345-105
XC33	CAP SMT 0.1UF CER 0805	345-105
XC34	CAP SMT 0.1UF CER 0805	345-105
XC35	CAP SMT 0.1UF CER 0805	345-105
XC36	CAP SMT 0.1UF CER 0805	345-105
XC37	CAP SMT 0.1UF CER 0805	345-105
XC38	CAP SMT 0.1UF CER 0805	345-105
XC39	CAP SMT 0.1UF CER 0805	345-105
XC40	CAP SMT 0.1UF CER 0805	345-105
YC1	CAP SMT 0.1UF CER 0805	345-105
YC2	CAP SMT 0.1UF CER 0805	345-105
YC3	CAP SMT 0.1UF CER 0805	345-105
YC4	CAP SMT 0.1UF CER 0805	345-105
YC5	CAP SMT 0.1UF CER 0805	345-105
YC6	CAP SMT 0.1UF CER 0805	345-105
YC7	CAP SMT 0.1UF CER 0805	345-105
YC8	CAP SMT 0.1UF CER 0805	345-105
YC9	CAP SMT 0.1UF CER 0805	345-105
YC10	CAP SMT 0.1UF CER 0805	345-105

Designation	Description	DPS Part Number
YC11	CAP SMT 0.1UF CER 0805	345-105
YC12	CAP SMT 0.1UF CER 0805	345-105
YC13	CAP SMT 0.1UF CER 0805	345-105
YC14	CAP SMT 0.1UF CER 0805	345-105
YC15	CAP SMT 0.1UF CER 0805	345-105
YC16	CAP SMT 0.1UF CER 0805	345-105
YC17	CAP SMT 0.1UF CER 0805	345-105
YC18	CAP SMT 0.1UF CER 0805	345-105
YC19	CAP SMT 0.1UF CER 0805	345-105
YC20	CAP SMT 0.1UF CER 0805	345-105
YC21	CAP SMT 0.1UF CER 0805	345-105
YC22	CAP SMT 0.1UF CER 0805	345-105
YC23	CAP SMT 0.1UF CER 0805	345-105
YC24	CAP SMT 0.1UF CER 0805	345-105
YC25	CAP SMT 0.1UF CER 0805	345-105
YC26	CAP SMT 0.1UF CER 0805	345-105
YC27	CAP SMT 0.1UF CER 0805	345-105
YC28	CAP SMT 0.1UF CER 0805	345-105
YC29	CAP SMT 0.1UF CER 0805	345-105
YC30	CAP SMT 0.1UF CER 0805	345-105
ZC1	CAP SMT 0.1UF CER 0805	345-105
ZC2	CAP SMT 0.1UF CER 0805	345-105
ZC3	CAP SMT 0.1UF CER 0805	345-105
ZC4	CAP SMT 0.1UF CER 0805	345-105
ZC5	CAP SMT 0.1UF CER 0805	345-105
ZC6	CAP SMT 0.1UF CER 0805	345-105
ZC7	CAP SMT 0.1UF CER 0805	345-105
ZC8	CAP SMT 0.1UF CER 0805	345-105
ZC9	CAP SMT 0.1UF CER 0805	345-105
ZC10	CAP SMT 0.1UF CER 0805	345-105
ZC11	CAP SMT 0.1UF CER 0805	345-105
ZC12	CAP SMT 0.1UF CER 0805	345-105
ZC13	CAP SMT 0.1UF CER 0805	345-105
ZC14	CAP SMT 0.1UF CER 0805	345-105
ZC15	CAP SMT 0.1UF CER 0805	345-105
ZC16	CAP SMT 0.1UF CER 0805	345-105
ZC17	CAP SMT 0.1UF CER 0805	345-105
ZC18	CAP SMT 0.1UF CER 0805	345-105
ZC19	CAP SMT 0.1UF CER 0805	345-105
ZC20	CAP SMT 0.1UF CER 0805	345-105
ZC21	CAP SMT 0.1UF CER 0805	345-105
ZC22	CAP SMT 0.1UF CER 0805	345-105
ZC23	CAP SMT 0.1UF CER 0805	345-105
ZC24	CAP SMT 0.1UF CER 0805	345-105
ZC25	CAP SMT 0.1UF CER 0805	345-105
ZC26	CAP SMT 0.1UF CER 0805	345-105
ZC27	CAP SMT 0.1UF CER 0805	345-105
ZC28	CAP SMT 0.1UF CER 0805	345-105
ZC29	CAP SMT 0.1UF CER 0805	345-105
ZC30	CAP SMT 0.1UF CER 0805	345-105
ZC31	CAP SMT 0.1UF CER 0805	345-105
ZC32	CAP SMT 0.1UF CER 0805	345-105
ZC33	CAP SMT 0.1UF CER 0805	345-105
ZC34	CAP SMT 0.1UF CER 0805	345-105
ZC35	CAP SMT 0.1UF CER 0805	345-105
ZC36	CAP SMT 0.1UF CER 0805	345-105

Designation	Description	DPS Part Number
ZC37	CAP SMT 0.1UF CER 0805	345-105
ZC38	CAP SMT 0.1UF CER 0805	345-105
ZC39	CAP SMT 0.1UF CER 0805	345-105
ZC40	CAP SMT 0.1UF CER 0805	345-105
ZC41	CAP SMT 0.1UF CER 0805	345-105
ZC42	CAP SMT 0.1UF CER 0805	345-105
ZC43	CAP SMT 0.1UF CER 0805	345-105
ZC44	CAP SMT 0.1UF CER 0805	345-105
ZC45	CAP SMT 0.1UF CER 0805	345-105
ZC46	CAP SMT 0.1UF CER 0805	345-105
ZC47	CAP SMT 0.1UF CER 0805	345-105
ZC48	CAP SMT 0.1UF CER 0805	345-105
ZC49	CAP SMT 0.1UF CER 0805	345-105
ZC50	CAP SMT 0.1UF CER 0805	345-105
ZC51	CAP SMT 0.1UF CER 0805	345-105
ZC52	CAP SMT 0.1UF CER 0805	345-105
ZC53	CAP SMT 0.1UF CER 0805	345-105
ZC54	CAP SMT 0.1UF CER 0805	345-105
ZC55	CAP SMT 0.1UF CER 0805	345-105
ZC56	CAP SMT 0.1UF CER 0805	345-105
ZC57	CAP SMT 0.1UF CER 0805	345-105
ZC58	CAP SMT 0.1UF CER 0805	345-105
ZC59	CAP SMT 0.1UF CER 0805	345-105
ZC60	CAP SMT 0.1UF CER 0805	345-105
ZC61	CAP SMT 0.1UF CER 0805	345-105
ZC62	CAP SMT 0.1UF CER 0805	345-105
ZC63	CAP SMT 0.1UF CER 0805	345-105
ZC64	CAP SMT 0.1UF CER 0805	345-105
ZC65	CAP SMT 0.1UF CER 0805	345-105
ZC66	CAP SMT 0.1UF CER 0805	345-105
ZC67	CAP SMT 0.1UF CER 0805	345-105
ZC68	CAP SMT 0.1UF CER 0805	345-105
ZC69	CAP SMT 0.1UF CER 0805	345-105
ZC70	CAP SMT 0.1UF CER 0805	345-105
ZC71	CAP SMT 0.1UF CER 0805	345-105
ZC72	CAP SMT 0.1UF CER 0805	345-105
ZC73	CAP SMT 0.1UF CER 0805	345-105
ZC74	CAP SMT 0.1UF CER 0805	345-105
ZC75	CAP SMT 0.1UF CER 0805	345-105
ZC76	CAP SMT 0.1UF CER 0805	345-105
ZC77	CAP SMT 0.1UF CER 0805	345-105
ZC78	CAP SMT 0.1UF CER 0805	345-105
ZC79	CAP SMT 0.1UF CER 0805	345-105
ZC80	CAP SMT 0.1UF CER 0805	345-105
ZC81	CAP SMT 0.1UF CER 0805	345-105
ZC82	CAP SMT 0.1UF CER 0805	345-105
ZC83	CAP SMT 0.1UF CER 0805	345-105
ZC84	CAP SMT 0.1UF CER 0805	345-105
ZC85	CAP SMT 0.1UF CER 0805	345-105
ZC86	CAP SMT 0.1UF CER 0805	345-105
ZC87	CAP SMT 0.1UF CER 0805	345-105
ZC88	CAP SMT 0.1UF CER 0805	345-105
ZC89	CAP SMT 0.1UF CER 0805	345-105
ZC90	CAP SMT 0.1UF CER 0805	345-105
ZC91	CAP SMT 0.1UF CER 0805	345-105
ZC92	CAP SMT 0.1UF CER 0805	345-105
ZC93	CAP SMT 0.1UF CER 0805	345-105

Designation	Description	DPS Part Number
ZC94	CAP SMT 0.1UF CER 0805	345-105
ZC95	CAP SMT 0.1UF CER 0805	345-105
ZC96	CAP SMT 0.1UF CER 0805	345-105
ZC97	CAP SMT 0.1UF CER 0805	345-105
ZC98	CAP SMT 0.1UF CER 0805	345-105
ZC99	CAP SMT 0.1UF CER 0805	345-105
ZC100	CAP SMT 0.1UF CER 0805	345-105
ZC101	CAP SMT 0.1UF CER 0805	345-105
ZC102	CAP SMT 0.1UF CER 0805	345-105
ZC103	CAP SMT 0.1UF CER 0805	345-105
ZC104	CAP SMT 0.1UF CER 0805	345-105
ZC105	CAP SMT 0.1UF CER 0805	345-105
ZC106	CAP SMT 0.1UF CER 0805	345-105
ZC107	CAP SMT 0.1UF CER 0805	345-105
ZC108	CAP SMT 0.1UF CER 0805	345-105
ZC109	CAP SMT 0.1UF CER 0805	345-105
ZC110	CAP SMT 0.1UF CER 0805	345-105
ZC111	CAP SMT 0.1UF CER 0805	345-105
ZC112	CAP SMT 0.1UF CER 0805	345-105
ZC113	CAP SMT 0.1UF CER 0805	345-105
ZC114	CAP SMT 0.1UF CER 0805	345-105
ZC115	CAP SMT 0.1UF CER 0805	345-105
ZC116	CAP SMT 0.1UF CER 0805	345-105
ZC117	CAP SMT 0.1UF CER 0805	345-105
ZC118	CAP SMT 0.1UF CER 0805	345-105
ZC119	CAP SMT 0.1UF CER 0805	345-105
ZC120	CAP SMT 0.1UF CER 0805	345-105
ZC121	CAP SMT 0.1UF CER 0805	345-105
ZC122	CAP SMT 0.1UF CER 0805	345-105
ZC123	CAP SMT 0.1UF CER 0805	345-105
ZC124	CAP SMT 0.1UF CER 0805	345-105
ZC125	CAP SMT 0.1UF CER 0805	345-105
ZC126	CAP SMT 0.1UF CER 0805	345-105
ZC127	CAP SMT 0.1UF CER 0805	345-105
ZC128	CAP SMT 0.1UF CER 0805	345-105
ZC129	CAP SMT 0.1UF CER 0805	345-105
ZC130	CAP SMT 0.1UF CER 0805	345-105
ZC131	CAP SMT 0.1UF CER 0805	345-105
ZC132	CAP SMT 0.1UF CER 0805	345-105
ZC133	CAP SMT 0.1UF CER 0805	345-105
ZC134	CAP SMT 0.1UF CER 0805	345-105
ZC135	CAP SMT 0.1UF CER 0805	345-105
ZC136	CAP SMT 0.1UF CER 0805	345-105
ZC137	CAP SMT 0.1UF CER 0805	345-105
ZC138	CAP SMT 0.1UF CER 0805	345-105
ZC139	CAP SMT 0.1UF CER 0805	345-105
ZC140	CAP SMT 0.1UF CER 0805	345-105
ZC141	CAP SMT 0.1UF CER 0805	345-105
ZC142	CAP SMT 0.1UF CER 0805	345-105
ZC143	CAP SMT 0.1UF CER 0805	345-105
ZC144	CAP SMT 0.1UF CER 0805	345-105
ZC145	CAP SMT 0.1UF CER 0805	345-105
ZC146	CAP SMT 0.1UF CER 0805	345-105
ZC147	CAP SMT 0.1UF CER 0805	345-105
ZC148	CAP SMT 0.1UF CER 0805	345-105
ZC149	CAP SMT 0.1UF CER 0805	345-105
ZC150	CAP SMT 0.1UF CER 0805	345-105

Designation	Description	DPS Part Number
ZC151	CAP SMT 0.1UF CER 0805	345-105
ZC152	CAP SMT 0.1UF CER 0805	345-105
ZC153	CAP SMT 0.1UF CER 0805	345-105
ZC154	CAP SMT 0.1UF CER 0805	345-105
ZC155	CAP SMT 0.1UF CER 0805	345-105
ZC156	CAP SMT 0.1UF CER 0805	345-105
ZC157	CAP SMT 0.1UF CER 0805	345-105
ZC158	CAP SMT 0.1UF CER 0805	345-105
ZC159	CAP SMT 0.1UF CER 0805	345-105
ZC160	CAP SMT 0.1UF CER 0805	345-105

843-571: Front Panel Assembly

Designation	Description	DPS Part Number
AC1	CAP SMT 0.1UF CER 0805	345-105
AC2	CAP SMT 10UF TANT 16V 3528	358-106
AD11	DIODE LED T-1 GREEN	104-234
AD11_S	SPACER .350 BIVAR 908-350	764-350
AD12	DIODE LED T-1 GREEN	104-234
AD12_S	SPACER .350 BIVAR 908-350	764-350
AD13	DIODE LED T-1 GREEN	104-234
AD13_S	SPACER .350 BIVAR 908-350	764-350
AD14	DIODE LED T-1 GREEN	104-234
AD14_S	SPACER .350 BIVAR 908-350	764-350
AD15	DIODE LED T-1 GREEN	104-234
AD15_S	SPACER .350 BIVAR 908-350	764-350
AD16	DIODE LED T-1 YELLOW	104-235
AD16_S	SPACER .350 BIVAR 908-350	764-350
AD17	DIODE LED T-1 GREEN	104-234
AD17_S	SPACER .350 BIVAR 908-350	764-350
AD18	DIODE LED T-1 GREEN	104-234
AD18_S	SPACER .350 BIVAR 908-350	764-350
AD21	DIODE LED T-1 GREEN	104-234
AD21_S	SPACER .350 BIVAR 908-350	764-350
AD22	DIODE LED T-1 GREEN	104-234
AD22_S	SPACER .350 BIVAR 908-350	764-350
AD23	DIODE LED T-1 GREEN	104-234
AD23_S	SPACER .350 BIVAR 908-350	764-350
AD24	DIODE LED T-1 YELLOW	104-235
AD24_S	SPACER .350 BIVAR 908-350	764-350
AD25	DIODE LED T-1 GREEN	104-234
AD25_S	SPACER .350 BIVAR 908-350	764-350
AD26	DIODE LED T-1 GREEN	104-234
AD26_S	SPACER .350 BIVAR 908-350	764-350
AD27	DIODE LED T-1 GREEN	104-234
AD27_S	SPACER .350 BIVAR 908-350	764-350
AD28	DIODE LED T-1 GREEN	104-234
AD28_S	SPACER .350 BIVAR 908-350	764-350
AD31	DIODE LED T-1 GREEN	104-234
AD31_S	SPACER .350 BIVAR 908-350	764-350
AD32	DIODE LED T-1 GREEN	104-234
AD32_S	SPACER .350 BIVAR 908-350	764-350
AD33	DIODE LED T-1 GREEN	104-234
AD33_S	SPACER .350 BIVAR 908-350	764-350
AD34	DIODE LED T-1 RED	104-233
AD34_S	SPACER .350 BIVAR 908-350	764-350
AD35	DIODE LED T-1 GREEN	104-234
AD35_S	SPACER .350 BIVAR 908-350	764-350
AD36	DIODE LED T-1 GREEN	104-234
AD36_S	SPACER .350 BIVAR 908-350	764-350
AD37	DIODE LED T-1 GREEN	104-234
AD37_S	SPACER .350 BIVAR 908-350	764-350
AD38	DIODE LED T-1 GREEN	104-234
AD38_S	SPACER .350 BIVAR 908-350	764-350

Designation	Description	DPS Part Number
AJ1	CONN DUPONT 69167-103	722-001
AJ2	RIBBON CABLE 20 PIN DPS 285	774-309
AR1	RES SMT 27R 5% 0805	342-271
AS1	E-SWITCH BUTTONS FOR LCD	733-004
AS11	SWITCH 3FTL680 W/RED LED	733-015
AS11_C	SW CAP FOR 3FTL680 1Q031	733-016
AS12	SWITCH 3FTL680 W/RED LED	733-015
AS12_C	SW CAP FOR 3FTL680 1Q031	733-016
AS13	SWITCH 3FTL680 W/RED LED	733-015
AS13_C	SW CAP FOR 3FTL680 1Q031	733-016
AS14	SWITCH 3FTL680 W/RED LED	733-015
AS14_C	SW CAP FOR 3FTL680 1Q031	733-016
AS15	SWITCH 3FTL680 W/RED LED	733-015
AS15_C	SW CAP FOR 3FTL680 1Q031	733-016
AS16	SWITCH 3FTL680 W/RED LED	733-015
AS16_C	SW CAP FOR 3FTL680 1Q031	733-016
AS17	SWITCH 3FTL680 W/RED LED	733-015
AS17_C	SW CAP FOR 3FTL680 1Q031	733-016
AS18	SWITCH 3FTL680 W/RED LED	733-015
AS18_C	SW CAP FOR 3FTL680 1Q031	733-016
AS21	SWITCH 3FTL680 W/RED LED	733-015
AS21_C	SW CAP FOR 3FTL680 1Q031	733-016
AS22	SWITCH 3FTL680 W/RED LED	733-015
AS22_C	SW CAP FOR 3FTL680 1Q031	733-016
AS23	SWITCH 3FTL680 W/RED LED	733-015
AS23_C	SW CAP FOR 3FTL680 1Q031	733-016
AS24	SWITCH 3FTL680 W/RED LED	733-015
AS24_C	SW CAP FOR 3FTL680 1Q031	733-016
AS25	SWITCH 3FTL680 W/RED LED	733-015
AS25_C	SW CAP FOR 3FTL680 1Q031	733-016
AS26	SWITCH 3FTL680 W/RED LED	733-015
AS26_C	SW CAP FOR 3FTL680 1Q031	733-016
AS27	SWITCH 3FTL680 W/RED LED	733-015
AS27_C	SW CAP FOR 3FTL680 1Q031	733-016
AS28	SWITCH 3FTL680 W/RED LED	733-015
AS28_C	SW CAP FOR 3FTL680 1Q031	733-016
AS31	SWITCH 3FTL680 W/RED LED	733-015
AS31_C	SW CAP FOR 3FTL680 1Q031	733-016
AS32	SWITCH 3FTL680 W/RED LED	733-015
AS32_C	SW CAP FOR 3FTL680 1Q031	733-016
AS33	SWITCH 3FTL680 W/RED LED	733-015
AS33_C	SW CAP FOR 3FTL680 1Q031	733-016
AS34	SWITCH 3FTL680 W/RED LED	733-015
AS34_C	SW CAP FOR 3FTL680 1Q031	733-016
AU1	IC MAX7221EWG LED MATRIX DRIVR	308-722
EXT_571	EXT ASSY FRONT PNL DPS575	843-571EX
PCB_571	PCB DPS-575 FRONT PANEL	743-571

843-572: Rear Panel Assembly

Designation	Description	DPS Part Number
AC1	CAP SMT 0.1UF CER 0805	345-105
AC2	CAP SMT 0.1UF CER 0805	345-105
AJ1	CONN R/A9F 626-009-262-032EDAC	722-441
AJ2	CONN.LOW PROFILE AMP#413879-1	722-369
AJ3	RIBBON CABLE 20 PIN DPS 285	774-309
AU1	IC SN75124D/SO16	337-124
AU2	IC SN75121D/SO16	337-121
EXT_572	EXT ASSY REAR PNL DPS575	843-572EX
PCB_572	PCB DPS-575 REAR PANEL BRD	743-572

843-573: Audio Synchronizer Module

Designation	Description	DPS Part Number
AC1	CAP SMT 0.01UF CER 0805	345-104
AC3	CAP SMT 0.01UF CER 0805	345-104
AC4	CAP SMT 0.01UF CER 0805	345-104
AC5	CAP SMT 0.01UF CER 0805	345-104
AC6	CAP SMT 47UF TANT 7343	357-476
AC7	CAP SMT 0.1UF CER 0805	345-105
AC8	CAP SMT 47UF TANT 7343	357-476
AC9	CAP SMT 0.1UF CER 0805	345-105
AC10	CAP SMT 47UF TANT 7343	357-476
AC11	CAP SMT 0.1UF CER 0805	345-105
AC14	CAP SMT 47UF TANT 7343	357-476
AC15	CAP SMT 0.1UF CER 0805	345-105
AC16	CAP SMT 0.01UF CER 0805	345-104
AC18	CAP SMT 0.01UF CER 0805	345-104
AD1	DIODE SMT MMBD914LT1	354-914
AD2	DIODE SMT MMBD914LT1	354-914
AD3	DIODE SMT MMBD914LT1	354-914
AD4	DIODE SMT MMBD914LT1	354-914
AD5	DIODE SMT MMBD914LT1	354-914
AD6	DIODE SMT MMBD914LT1	354-914
AD7	DIODE SMT MMBD914LT1	354-914
AD8	DIODE SMT MMBD914LT1	354-914
AG1	HEADER 2 PIN OF 761-141	761-152
AG2	HEADER 2 PIN OF 761-141	761-152
AG3	HEADER 2 PIN OF 761-141	761-152
AJ1	HEADER 6 PIN OF 761-141	761-146
AK1	RELAY AGN200A12	651-200
AK2	RELAY AGN200A12	651-200
AK3	RELAY AGN200A12	651-200
AK4	RELAY AGN200A12	651-200
AK5	RELAY AGN200A12	651-200
AK6	RELAY AGN200A12	651-200
AK7	RELAY AGN200A12	651-200
AK8	RELAY AGN200A12	651-200
AK9	RELAY AGN200A12	651-200
AK10	RELAY AGN200A12	651-200
AK11	RELAY AGN200A12	651-200
AK12	RELAY AGN200A12	651-200
AK13	RELAY AGN200A12	651-200
AK14	RELAY AGN200A12	651-200
AK15	RELAY AGN200A12	651-200
AK16	RELAY AGN200A12	651-200
AK17	RELAY AGN200A12	651-200
AK18	RELAY AGN200A12	651-200
AL1	FERRITE BLM41P600S SMT 1806	331-416
AL2	FERRITE BLM41P600S SMT 1806	331-416

Designation	Description	DPS Part Number
AL3	FERRITE BLM41P600S SMT 1806	331-416
AL4	FERRITE BLM41P600S SMT 1806	331-416
AL5	FILTER NFM51R00P506 EMI SUPP	331-506
AL6	FILTER NFM51R00P106 EMI SUPP	331-106
AL7	FILTER NFM51R00P506 EMI SUPP	331-506
AL8	FILTER NFM51R00P106 EMI SUPP	331-106
AL9	FILTER NFM51R00P506 EMI SUPP	331-506
AL10	FILTER NFM51R00P106 EMI SUPP	331-106
AL11	FILTER NFM51R00P506 EMI SUPP	331-506
AL12	FILTER NFM51R00P106 EMI SUPP	331-106
AL13	FILTER NFM51R00P106 EMI SUPP	331-106
AL14	FILTER NFM51R00P506 EMI SUPP	331-506
AL15	FILTER NFM51R00P106 EMI SUPP	331-106
AL16	FILTER NFM51R00P506 EMI SUPP	331-506
AL17	FILTER NFM51R00P506 EMI SUPP	331-506
AL18	FILTER NFM51R00P106 EMI SUPP	331-106
AL19	FILTER NFM51R00P106 EMI SUPP	331-106
AL20	FILTER NFM51R00P506 EMI SUPP	331-506
AL21	FILTER NFM51R00P106 EMI SUPP	331-106
AL22	FILTER NFM51R00P106 EMI SUPP	331-106
AL23	FILTER NFM51R00P506 EMI SUPP	331-506
AL24	FILTER NFM51R00P106 EMI SUPP	331-106
AL25	FILTER NFM51R00P106 EMI SUPP	331-106
AL26	FILTER NFM51R00P506 EMI SUPP	331-506
AL27	FILTER NFM51R00P506 EMI SUPP	331-506
AL28	FILTER NFM51R00P106 EMI SUPP	331-106
AL29	FILTER NFM51R00P106 EMI SUPP	331-106
AL30	FILTER NFM51R00P506 EMI SUPP	331-506
AL31	FILTER NFM51R00P106 EMI SUPP	331-106
AL32	FILTER NFM51R00P106 EMI SUPP	331-106
AL33	FERRITE BLM41P600S SMT 1806	331-416
AL34	FERRITE BLM41P600S SMT 1806	331-416
AL35	FERRITE BLM41P600S SMT 1806	331-416
AL36	FERRITE BLM41P600S SMT 1806	331-416
AP1	CONN 12 POS 3.5MM MINI-COMBICN	722-404
AP2	CONN 12 POS 3.5MM MINI-COMBICN	722-404
AP3	CONN D-SUB RT ANGLE/FEM. RECEP	722-445
AQ1	TRANS SMT 2N3904 NPN	347-020
AQ2	TRANS SMT 2N3904 NPN	347-020
AQ3	TRANS SMT 2N3904 NPN	347-020
AQ4	TRANS SMT 2N3904 NPN	347-020
AQ5	TRANS SMT 2N3904 NPN	347-020
AQ6	TRANS SMT 2N3904 NPN	347-020
AQ7	TRANS SMT 2N3904 NPN	347-020
AQ8	TRANS SMT 2N3904 NPN	347-020
AQ9	TRANS SMT 2N3904 NPN	347-020
AR1	RES SMT 1K 5% 0805	342-103
AR2	RES SMT 1K 5% 0805	342-103
AR3	RES 604R 1/4W 1%	422-028
AR4	RES 604R 1/4W 1%	422-028
AR5	RES SMT 1K 5% 0805	342-103
AR6	RES SMT 1K 5% 0805	342-103
AR7	RES SMT 1K 5% 0805	342-103
AR8	RES SMT 10K 5% 0805	342-104

Designation	Description	DPS Part Number
AR9	RES SMT 10K 5% 0805	342-104
AR10	RES SMT 10R 5% 0805	342-101
AR11	RES SMT 0R 5% 0805	342-000
AR12	RES SMT 10K 5% 0805	342-104
AR13	RES SMT 10K 5% 0805	342-104
AR14	RES SMT 10K 5% 0805	342-104
AR15	RES SMT 3K3 5% 0805	342-333
AR16	RES SMT 3K3 5% 0805	342-333
AR17	RES SMT 1K 5% 0805	342-103
AR18	RES SMT 10K 5% 0805	342-104
AR21	RES SMT 47R 5% 0805	342-471
AR22	RES 604R 1/4W 1%	422-028
AR23	RES 604R 1/4W 1%	422-028
AR24	RES SMT 1K 5% 0805	342-103
AR25	RES SMT 1K 5% 0805	342-103
AR26	RES SMT 1K 5% 0805	342-103
AR27	RES SMT 10K 5% 0805	342-104
AR28	RES SMT 10K 5% 0805	342-104
AR29	RES SMT 10K 5% 0805	342-104
AR30	RES SMT 10R 5% 0805	342-101
AR31	RES SMT 10R 5% 0805	342-101
AR32	RES SMT 10K 5% 0805	342-104
AR33	RES SMT 10K 5% 0805	342-104
AR34	RES SMT 10K 5% 0805	342-104
AR35	RES SMT 10K 5% 0805	342-104
AS1	HEADER 2 PIN OF 761-141	761-152
AU1	IC 74ACT04D SOIC	337-004
AU2	IC 74ACT138D SMT 16 SOIC	337-138
AU3	IC XC9536XL-5VQ64C CPLD 64VQFP	329-365
AU4	IC QS74LCX245CQ/IDT74LVC245AQ	332-245
AU5	IC CY2305SC-1 PLL CLK DRVR SMT	330-230
BC1	CAP SMT 0.01UF CER 0805	345-104
BC2	CAP SMT 0.22UF 10% 16V 0805	345-225
BC3	CAP SMT 0.01UF CER 0805	345-104
BC4	CAP SMT 0.1UF CER 0805	345-105
BC5	CAP SMT 0.01UF CER 0805	345-104
BC6	CAP SMT 0.01UF CER 0805	345-104
BC7	CAP SMT 0.22UF 10% 16V 0805	345-225
BC8	CAP SMT 0.01UF CER 0805	345-104
BC9	CAP SMT 0.01UF CER 0805	345-104
BC10	CAP SMT 0.1UF CER 0805	345-105
BC11	CAP SMT 68NF 20% X7R 0805	345-684
BC12	CAP SMT CER 10UF 10% 6.3V 1206	362-106
BC13	CAP SMT 0.1UF CER 0805	345-105
BC14	CAP 2.2 NF 5% 50V COG 0805	349-223
BC15	CAP SMT 0.01UF CER 0805	345-104
BC16	CAP SMT 0.01UF CER 0805	345-104
BC17	CAP SMT 0.01UF CER 0805	345-104
BC18	CAP SMT 0.01UF CER 0805	345-104
BC19	CAP SMT 0.01UF CER 0805	345-104
BC20	CAP SMT 0.01UF CER 0805	345-104
BC21	CAP SMT 0.1UF CER 0805	345-105
BC22	CAP SMT 0.01UF CER 0805	345-104
BC23	CAP SMT 0.01UF CER 0805	345-104

Designation	Description	DPS Part Number
BC24	CAP SMT 0.01UF CER 0805	345-104
BC25	CAP SMT 0.01UF CER 0805	345-104
BC26	CAP SMT 0.1UF CER 0805	345-105
BC27	CAP SMT 0.1UF CER 0805	345-105
BC28	CAP SMT 68NF 20% X7R 0805	345-684
BC29	CAP 2.2 NF 5% 50V COG 0805	349-223
BC30	CAP SMT 0.01UF CER 0805	345-104
BC31	CAP SMT 0.01UF CER 0805	345-104
BC32	CAP SMT 0.1UF CER 0805	345-105
BC33	CAP SMT 0.1UF CER 0805	345-105
BC34	CAP SMT 0.1UF CER 0805	345-105
BC35	CAP SMT 0.1UF CER 0805	345-105
BC36	CAP SMT 0.1UF CER 0805	345-105
BC37	CAP 2.2 NF 5% 50V COG 0805	349-223
BC38	CAP SMT 47NF 10% 16V 0805	345-4731
BC39	CAP SMT 0.1UF CER 0805	345-105
BC40	CAP SMT 0.01UF CER 0805	345-104
BC41	CAP SMT 0.1UF CER 0805	345-105
BC42	CAP SMT 0.1UF CER 0805	345-105
BC43	CAP SMT 0.1UF CER 0805	345-105
BC44	CAP SMT 0.1UF CER 0805	345-105
BC45	CAP 2.2 NF 5% 50V COG 0805	349-223
BC46	CAP SMT 47NF 10% 16V 0805	345-4731
BC47	CAP SMT 0.1UF CER 0805	345-105
BC48	CAP SMT 0.1UF CER 0805	345-105
BC49	CAP SMT 0.01UF CER 0805	345-104
BC50	CAP SMT 0.1UF CER 0805	345-105
BC51	CAP SMT 0.1UF CER 0805	345-105
BC52	CAP SMT 0.01UF CER 0805	345-104
BC53	CAP SMT 0.01UF CER 0805	345-104
BC54	CAP SMT 0.01UF CER 0805	345-104
BC55	CAP SMT 0.01UF CER 0805	345-104
BC56	CAP SMT 0.01UF CER 0805	345-104
BC57	CAP SMT 0.01UF CER 0805	345-104
BC58	CAP SMT 0.1UF CER 0805	345-105
BC59	CAP SMT CER 10UF 10% 6.3V 1206	362-106
BC60	CAP SMT CER 10UF 10% 6.3V 1206	362-106
BC61	CAP SMT CER 10UF 10% 6.3V 1206	362-106
BC62	CAP SMT 0.01UF CER 0805	345-104
BD1	MRA4004T3 MOT	354-400
BJ2	HEADER 2 PIN OF 761-141	761-152
BL1	FERRITE CM1922X330R-00 SMT	331-192
BL2	FERRITE CM1922X330R-00 SMT	331-192
BP1	HEADER 7 PINS OF 761-141	761-147
BQ1	REG LT1117- CST ADJUSTABLE	339-118
BR2	RES SMT 10K 5% 0805	342-104
BR3	RES SMT 8K2 5% 0805	342-823
BR4	RES SMT 10K 5% 0805	342-104
BR5	RES SMT 10K 5% 0805	342-104
BR6	RES SMT 10R 5% 0805	342-101
BR7	RES SMT 2K2 5% 0805	342-223

Designation	Description	DPS Part Number
BR8	RES SMT 1K 5% 0805	342-103
BR9	RES SMT 10K 5% 0805	342-104
BR10	RES SMT 8K2 5% 0805	342-823
BR11	RES SMT 47K 5% 0805	342-474
BR12	RES SMT 240R 5% 0805	342-242
BR13	RES SMT 1K 5% 0805	342-103
BR14	RES SMT 1K 5% 0805	342-103
BR15	RES SMT 240R 5% 0805	342-242
BR16	RES SMT 2K2 5% 0805	342-223
BR17	RES SMT 110R 1% 0805	343-1102
BR18	RES SMT 10K 5% 0805	342-104
BR19	RES SMT 47K 5% 0805	342-474
BR20	RES SMT 390R 5% 0805	342-392
BR21	RES SMT 158R 1% 0805	343-1582
BR22	RES, 127R 1% 0805	343-1272
BR24	RES SMT 240R 5% 0805	342-242
BR25	RES SMT 110R 1% 0805	343-1102
BR26	RES SMT 75R 1% 0805	343-7501
BR28	RES SMT 47K 5% 0805	342-474
BR31	RES SMT 240R 5% 0805	342-242
BR32	RES SMT 1K 5% 0805	342-103
BR34	RES SMT 121R 1% 0805	343-1211
BR35	RES SMT 3K 5% 0805	342-303
BR36	RES 95R3 1% 0805	343-9531
BR37	RES 95R3 1% 0805	343-9531
BR38	RES, 127R 1% 0805	343-1272
BR39	RES SMT 158R 1% 0805	343-1582
BR40	RES SMT 33K 5% 0805	342-334
BR41	RES SMT 33K 5% 0805	342-334
BR42	RES SMT 3K 5% 0805	342-303
BR43	RES SMT 340R 1% 0805	343-3402
BR44	RES SMT 10K 5% 0805	342-104
BR46	RES SMT 10K 5% 0805	342-104
BR47	RES SMT 47K 5% 0805	342-474
BR48	RES SMT 47K 5% 0805	342-474
BR49	RES SMT 47K 5% 0805	342-474
BR51	RES SMT 47K 5% 0805	342-474
BR52	RES SMT 390R 5% 0805	342-392
BR53	RES SMT 10K 5% 0805	342-104
BR55	RES SMT 75R 1% 0805	343-7501
BR56	RES SMT 10K 5% 0805	342-104
BR57	RES SMT 10K 5% 0805	342-104
BR58	RES SMT 110R 1% 0805	343-1102
BR59	RES SMT 340R 1% 0805	343-3402
BR60	RES SMT 121R 1% 0805	343-1211
BR61	RES SMT 110R 1% 0805	343-1102
BR62	RES SMT 47K 5% 0805	342-474
BR64	RES SMT 47K 5% 0805	342-474
BR65	RES SMT 47K 5% 0805	342-474
BR66	RES SMT 10R 5% 0805	342-101
BR67	RES SMT 47K 5% 0805	342-474
BR68	RES SMT 10R 5% 0805	342-101
BR69	RES SMT 47K 5% 0805	342-474
BR70	RES SMT 10R 5% 0805	342-101
BR71	RES SMT 10R 5% 0805	342-101
BRKT1	MTL EMI SHIELD DPS575	741-985

Designation	Description	DPS Part Number
BT1	XFMR PE-65812 PULSE	602-658
BT2	XFMR PE-65812 PULSE	602-658
BT3	XFMR PE-65812 PULSE	602-658
BT4	XFMR PE-65812 PULSE	602-658
BT5	XFMR PE-65812 PULSE	602-658
BT6	XFMR PE-65812 PULSE	602-658
BTP1	HEADER 1 PIN OF 761-141	761-151
BTP2	HEADER 1 PIN OF 761-141	761-151
BU1	IC CS8420-CS SMT 28 SOIC	330-842
BU2	IC XCV200-4PQ240C CPLD 240QFP	329-004
BU3	IC TC55V16256FT-153.3V TSOPP44	330-625
BU4	IC TC55V16256FT-153.3V TSOPP44	330-625
BU5	IC CS8420-CS SMT 28 SOIC	330-842
BU6	IC TC55V16256FT-153.3V TSOPP44	330-625
BU7	IC QS4A205Q SMT 16QSOP	330-420
BU8	IC 74ACT04D SOIC	337-004
BU9	IC QS4A205Q SMT 16QSOP	330-420
BU10	IC CS8420-CS SMT 28 SOIC	330-842
BU11	IC TLC2932 IPWLE ANALOG PLL	308-932
BU12	IC CS8420-CS SMT 28 SOIC	330-842
BU13	IC QS4A205Q SMT 16QSOP	330-420
BU14	IC TLC2932 IPWLE ANALOG PLL	308-932
CC1	CAP 10PF 2% 50V COG 0805	349-101
CC2	CAP SMT 0.1UF CER 0805	345-105
CC3	CAP SMT 0.1UF CER 0805	345-105
CC4	CAP 220PF 2% 50V COG 0805	349-222
CC5	CAP SMT CER 10UF 10% 6.3V 1206	362-106
CC6	CAP SMT 0.1UF CER 0805	345-105
CC7	CAP SMT 0.1UF CER 0805	345-105
CC8	CAP SMT 0.1UF CER 0805	345-105
CC9	CAP SMT 0.1UF CER 0805	345-105
CC10	CAP 2.2 NF 5% 50V COG 0805	349-223
CC11	CAP 2.2 NF 5% 50V COG 0805	349-223
CC12	CAP 2.2 NF 5% 50V COG 0805	349-223
CC13	CAP SMT 0.1UF CER 0805	345-105
CC14	CAP 10PF 2% 50V COG 0805	349-101
CC15	CAP SMT 0.1UF CER 0805	345-105
CC16	CAP 2.2 NF 5% 50V COG 0805	349-223
CC17	CAP 2.2 NF 5% 50V COG 0805	349-223
CC18	CAP 220PF 2% 50V COG 0805	349-222
CC19	CAP SMT 0.1UF CER 0805	345-105
CC20	CAP SMT 0.1UF CER 0805	345-105
CC21	CAP SMT 0.1UF CER 0805	345-105
CC22	CAP SMT 0.1UF CER 0805	345-105
CC23	CAP 10PF 2% 50V COG 0805	349-101
CC24	CAP 220PF 2% 50V COG 0805	349-222
CC25	CAP SMT CER 10UF 10% 6.3V 1206	362-106
CC26	CAP SMT 0.1UF CER 0805	345-105
CC27	CAP 2.2 NF 5% 50V COG 0805	349-223
CC28	CAP 2.2 NF 5% 50V COG 0805	349-223
CC29	CAP 2.2 NF 5% 50V COG 0805	349-223
CC30	CAP SMT 0.1UF CER 0805	345-105
CC31	CAP 2.2 NF 5% 50V COG 0805	349-223
CC32	CAP 2.2 NF 5% 50V COG 0805	349-223

Designation	Description	DPS Part Number
CC33	CAP 220PF 2% 50V COG 0805	349-222
CC34	CAP 10PF 2% 50V COG 0805	349-101
CC35	CAP SMT 0.1UF CER 0805	345-105
CC36	CAP SMT 0.1UF CER 0805	345-105
CC37	CAP SMT 0.1UF CER 0805	345-105
CC38	CAP 220PF 2% 50V COG 0805	349-222
CC39	CAP 10PF 2% 50V COG 0805	349-101
CC40	CAP SMT 0.1UF CER 0805	345-105
CC41	CAP SMT 0.1UF CER 0805	345-105
CC42	CAP SMT CER 10UF 10% 6.3V 1206	362-106
CC43	CAP SMT 0.1UF CER 0805	345-105
CC44	CAP SMT 0.1UF CER 0805	345-105
CC45	CAP SMT 0.1UF CER 0805	345-105
CC46	CAP SMT 0.1UF CER 0805	345-105
CC47	CAP SMT 0.1UF CER 0805	345-105
CC48	CAP 2.2 NF 5% 50V COG 0805	349-223
CC49	CAP 2.2 NF 5% 50V COG 0805	349-223
CC50	CAP 2.2 NF 5% 50V COG 0805	349-223
CC51	CAP SMT 0.1UF CER 0805	345-105
CC52	CAP SMT 0.1UF CER 0805	345-105
CC53	CAP 10PF 2% 50V COG 0805	349-101
CC54	CAP 2.2 NF 5% 50V COG 0805	349-223
CC55	CAP 2.2 NF 5% 50V COG 0805	349-223
CC56	CAP 220PF 2% 50V COG 0805	349-222
CC57	CAP SMT 0.1UF CER 0805	345-105
CC58	CAP SMT 0.1UF CER 0805	345-105
CC59	CAP 10PF 2% 50V COG 0805	349-101
CC60	CAP SMT CER 10UF 10% 6.3V 1206	362-106
CC61	CAP 220PF 2% 50V COG 0805	349-222
CC62	CAP 2.2 NF 5% 50V COG 0805	349-223
CC63	CAP 2.2 NF 5% 50V COG 0805	349-223
CC64	CAP 2.2 NF 5% 50V COG 0805	349-223
CC65	CAP SMT 0.1UF CER 0805	345-105
CC67	CAP SMT 10UF TANT 25V 6032	357-106
CC69	CAP SMT 0.1UF CER 0805	345-105
CC70	CAP 2.2 NF 5% 50V COG 0805	349-223
CC71	CAP 2.2 NF 5% 50V COG 0805	349-223
CC72	CAP 220PF 2% 50V COG 0805	349-222
CC73	CAP 10PF 2% 50V COG 0805	349-101
CC74	CAP SMT CER 10UF 10% 6.3V 1206	362-106
CC75	CAP SMT CER 10UF 10% 6.3V 1206	362-106
CC77	CAP SMT 10UF TANT 25V 6032	357-106
CC79	CAP SMT 0.1UF CER 0805	345-105
CC80	CAP SMT 0.1UF CER 0805	345-105
CC81	CAP SMT 0.1UF CER 0805	345-105
CC82	CAP SMT 0.1UF CER 0805	345-105
CC83	CAP SMT 0.1UF CER 0805	345-105
CC84	CAP SMT 0.1UF CER 0805	345-105
CC85	CAP SMT 0.1UF CER 0805	345-105
CC86	CAP SMT 0.1UF CER 0805	345-105
CD1	MRA4004T3 MOT	354-400
CD2	MRA4004T3 MOT	354-400
CL1	FERRITE BLM21P600SG SMT 0805	331-216
CL2	FERRITE BLM21P600SG SMT 0805	331-216
CL3	FILTER PWR LINE BNX002-01	602-201

Designation	Description	DPS Part Number
CL4	FILTER PWR LINE BNX002-01	602-201
CQ1	REG MCT7805CD2T	339-005
CQ2	REG MCT7905CD2T	339-105
CR1	RES SMT 14K 1% 0805	343-1403
CR2	POT 200R 4MM SMT	348-202
CR3	RES SMT 1K78 1% 0805	343-1783
CR4	POT SMT 1K0 4MM 23AR1KTRB	348-1033
CR5	RES SMT 9K09 1% 0805	343-9093
CR6	RES SMT 4K99 1% 0805	343-4993
CR7	RES 3K16 1% 0805	343-3163
CR8	RES SMT 20R0 1% 0805	343-2001
CR9	RES SMT 150R 5% 0805	342-152
CR10	RES SMT 2K80 1% 0805	343-2803
CR11	RES SMT 11K0 1% 0805	343-1104
CR12	RES SMT 2K80 1% 0805	343-2803
CR13	RES SMT 2K2 5% 0805	342-223
CR14	RES SMT 2R2 5% 0805	342-220
CR15	RES SMT 1K27 1% 0805	343-1273
CR16	RES SMT 1K 1% 0805	343-1003
CR17	RES SMT 2K80 1% 0805	343-2803
CR18	RES SMT 11K0 1% 0805	343-1104
CR19	RES SMT 2K80 1% 0805	343-2803
CR20	RES SMT 1K02 1% 0805	343-1022
CR21	RES SMT 150R 5% 0805	342-152
CR22	RES SMT 14K 1% 0805	343-1403
CR23	RES SMT 1K 1% 0805	343-1003
CR24	RES SMT 9K09 1% 0805	343-9093
CR25	RES SMT 9K09 1% 0805	343-9093
CR26	RES SMT 20R0 1% 0805	343-2001
CR27	RES SMT 4K7 5% 0805	342-473
CR28	RES SMT 10K 5% 0805	342-104
CR29	RES SMT 10K 5% 0805	342-104
CR30	RES SMT 10K 5% 0805	342-104
CR31	RES SMT 14K 1% 0805	343-1403
CR32	RES SMT 1K27 1% 0805	343-1273
CR33	POT 200R 4MM SMT	348-202
CR34	RES SMT 1K78 1% 0805	343-1783
CR35	RES SMT 1K02 1% 0805	343-1022
CR36	RES SMT 4K99 1% 0805	343-4993
CR37	POT SMT 1K0 4MM 23AR1KTRB	348-1033
CR38	RES SMT 9K09 1% 0805	343-9093
CR39	RES SMT 10K 5% 0805	342-104
CR40	RES SMT 150R 5% 0805	342-152
CR41	RES SMT 2K80 1% 0805	343-2803
CR42	RES SMT 11K0 1% 0805	343-1104
CR43	RES SMT 2K80 1% 0805	343-2803
CR44	RES 3K16 1% 0805	343-3163
CR45	RES SMT 20R0 1% 0805	343-2001
CR46	RES SMT 1K18 1% 0805	343-1183
CR47	RES SMT 2K2 5% 0805	342-223
CR48	RES SMT 1K 1% 0805	343-1003
CR49	RES SMT 150R 5% 0805	342-152
CR50	RES SMT 2K80 1% 0805	343-2803
CR51	RES SMT 11K0 1% 0805	343-1104
CR52	RES SMT 2K80 1% 0805	343-2803

Designation	Description	DPS Part Number
CR53	RES SMT 1K 1% 0805	343-1003
CR54	RES SMT 1K 1% 0805	343-1003
CR55	RES SMT 14K 1% 0805	343-1403
CR56	RES SMT 9K09 1% 0805	343-9093
CR57	RES SMT 9K09 1% 0805	343-9093
CR58	RES SMT 20R0 1% 0805	343-2001
CR59	RES SMT 4K7 5% 0805	342-473
CR60	RES SMT 14K 1% 0805	343-1403
CR61	POT 200R 4MM SMT	348-202
CR62	RES SMT 1K78 1% 0805	343-1783
CR63	RES SMT 1K27 1% 0805	343-1273
CR64	RES SMT 4K99 1% 0805	343-4993
CR65	POT SMT 1K0 4MM 23AR1KTRB	348-1033
CR66	RES SMT 9K09 1% 0805	343-9093
CR67	RES SMT 1K02 1% 0805	343-1022
CR68	RES SMT 150R 5% 0805	342-152
CR69	RES SMT 2K80 1% 0805	343-2803
CR70	RES SMT 11K0 1% 0805	343-1104
CR71	RES SMT 2K80 1% 0805	343-2803
CR72	RES SMT 2R2 5% 0805	342-220
CR73	RES 3K16 1% 0805	343-3163
CR74	RES SMT 20R0 1% 0805	343-2001
CR75	RES SMT 2K2 5% 0805	342-223
CR76	RES SMT 1K 1% 0805	343-1003
CR77	RES SMT 2K80 1% 0805	343-2803
CR78	RES SMT 11K0 1% 0805	343-1104
CR79	RES SMT 2K80 1% 0805	343-2803
CR80	RES SMT 150R 5% 0805	342-152
CR81	RES SMT 10K 5% 0805	342-104
CR82	RES SMT 14K 1% 0805	343-1403
CR83	RES SMT 1K27 1% 0805	343-1273
CR84	RES SMT 1K 1% 0805	343-1003
CR85	RES SMT 1K02 1% 0805	343-1022
CR86	RES SMT 9K09 1% 0805	343-9093
CR87	RES SMT 9K09 1% 0805	343-9093
CR88	RES SMT 20R0 1% 0805	343-2001
CR89	RES SMT 4K7 5% 0805	342-473
CR90	RES SMT 10K 5% 0805	342-104
CR91	RES SMT 10K 5% 0805	342-104
CR92	POT 200R 4MM SMT	348-202
CR93	RES SMT 1K78 1% 0805	343-1783
CR94	RES SMT 14K 1% 0805	343-1403
CR95	RES SMT 4K99 1% 0805	343-4993
CR96	RES SMT 10K 5% 0805	342-104
CR97	RES SMT 150R 5% 0805	342-152
CR98	POT SMT 1K0 4MM 23AR1KTRB	348-1033
CR99	RES SMT 9K09 1% 0805	343-9093
CR100	RES SMT 1K18 1% 0805	343-1183
CR101	RES SMT 2K80 1% 0805	343-2803
CR102	RES SMT 11K0 1% 0805	343-1104
CR103	RES SMT 2K80 1% 0805	343-2803
CR104	RES 3K16 1% 0805	343-3163
CR105	RES SMT 20R0 1% 0805	343-2001
CR106	RES SMT 1K 1% 0805	343-1003
CR107	RES SMT 2K2 5% 0805	342-223
CR108	RES SMT 150R 5% 0805	342-152
CR109	RES SMT 1K 1% 0805	343-1003

Designation	Description	DPS Part Number
CR110	RES SMT 1K 1% 0805	343-1003
CR111	RES SMT 2K80 1% 0805	343-2803
CR112	RES SMT 11K0 1% 0805	343-1104
CR113	RES SMT 2K80 1% 0805	343-2803
CR114	RES SMT 14K 1% 0805	343-1403
CR115	RES SMT 9K09 1% 0805	343-9093
CR116	RES SMT 9K09 1% 0805	343-9093
CR117	RES SMT 20R0 1% 0805	343-2001
CR118	RES SMT 4K7 5% 0805	342-473
CTP1	HEADER 1 PIN OF 761-141	761-151
CTP2	HEADER 1 PIN OF 761-141	761-151
CTP3	HEADER 1 PIN OF 761-141	761-151
CTP4	HEADER 1 PIN OF 761-141	761-151
CU1	IC OPA2350EA OP AMP SMT 8 SOIC	330-235
CU2	IC OPA2134 SO8 DUAL LOW DIST.	330-213
CU3	IC OPA2134 SO8 DUAL LOW DIST.	330-213
CU4	IC SSM2143S-SOIC8	330-243
CU5	IC CS3310-KS SO VCA CTRL	330-310
CU6	IC SSM2143S-SOIC8	330-243
CU7	IC OPA2350EA OP AMP SMT 8 SOIC	330-235
CU8	IC SSM2143S-SOIC8	330-243
CU9	IC CS3310-KS SO VCA CTRL	330-310
CU10	IC OPA2350EA OP AMP SMT 8 SOIC	330-235
CU11	IC OPA2134 SO8 DUAL LOW DIST.	330-213
CU12	IC OPA2134 SO8 DUAL LOW DIST.	330-213
CU13	IC SSM2143S-SOIC8	330-243
CU14	IC OPA2350EA OP AMP SMT 8 SOIC	330-235
CU15	IC CS4222 SO	330-422
CU16	IC CS4222 SO	330-422
CU17	IC OPA2134 SO8 DUAL LOW DIST.	330-213
CU18	IC OPA2134 SO8 DUAL LOW DIST.	330-213
EXT_573	EXT ASSY AUDIO BOARD DPS575	843-573EX
G1	HEADER 2 PIN OF 761-141	761-152
G2	HEADER 2 PIN OF 761-141	761-152
G3	HEADER 2 PIN OF 761-141	761-152
J1	CONN 40X2 SMT LOW PROFILE .050	722-142
PCB573	PCB DPS-575 AUDIO BRD	743-573

843-574: Animated Logo Option Assembly

Designation	Description	DPS Part Number
ACN1	CONN SFM-140-L2-S-D-LC	722-048
AR2	RES SMT 0R 5% 0805	342-000
AR4	RES SMT 0R 5% 0805	342-000
AU1	IC AT49BV1604-12TC 16MB FLASH	330-160
AU2	IC AT49BV1604-12TC 16MB FLASH	330-160
EXT_574	EXT ASSY FLASH EXPANSION CARD	843-574EX
PCB	PCB DPS-575 FLASH EXPANSION	743-574
ZC1	CAP SMT 0.1UF CER 0805	345-105
ZC2	CAP SMT 0.1UF CER 0805	345-105
ZC3	CAP SMT 0.1UF CER 0805	345-105
ZC4	CAP SMT 0.1UF CER 0805	345-105
ZC5	CAP SMT 0.1UF CER 0805	345-105
ZC6	CAP SMT 0.1UF CER 0805	345-105
ZC7	CAP SMT 0.1UF CER 0805	345-105
ZC8	CAP SMT 0.1UF CER 0805	345-105
ZC9	CAP SMT 0.1UF CER 0805	345-105
ZC10	CAP SMT 0.1UF CER 0805	345-105

843-575: Shaft Encoder Assembly

Designation	Description	DPS Part Number
ENCODER	CONTROL DIGITAL ENCODER FT PNL	411-224
J1	CONN DUPONT 69167-103	722-001
PCB	PCB ENCODER 475/575	743-575

APPENDIX A: SPECIFICATIONS

Video Specifications

Inputs:
- Composite Video (BNC) 1Vp-p, 75Ω
- Serial Digital SDI (BNC) .....75Ω, Auto EQ to 300 M (With Reclocked and Buffered BNC Output)
- Component Analog Video (BNC):
  - Y 1Vp-p, 75Ω
  - R-Y, B-Y 0.7Vp-p, 75Ω
- S-Video (4P Mini-DIN):
  - Y 1Vp-p, 75Ω
  - C (Burst Level) .....286 mV (NTSC), 300 mV (PAL)
- DV I/O Option (6-pin Molex) ...IEEE-1394
- Genlock Ref. (BNC Loop) 1Vp-p, 75Ω

Outputs:
- Composite Video (BNC x2) 1Vp-p, 75Ω
- Serial Digital SDI (BNC x2) 75Ω
- Component Analog Video (BNC):
  - Y 1Vp-p, 75Ω
  - R-Y, B-Y 0.7Vp-p, 75Ω
- S-Video (4P Mini-DIN)*:
  - Y 1Vp-p, 75Ω
  - C (Burst Level) .....286 mV (NTSC), 300 mV (PAL)
- RGB/RGBS Analog Video (BNC)*+:
  - RGB.....1Vp-p, 75Ω
  - Sync.....300 mV or 8Vp-p (selectable)
- DV I/O Option (6-pin Molex) ...IEEE-1394

Signal Processing:
- ADC/DAC and Composite Encoding/Decoding 12-bit
- Component YUV Pipeline.....10-bit
- Synchronizing Range..... Infinite

Frequency Response:
- Synchronizer Mode.....+/– 0.25 dB (0 - 5.5 MHz) –1 dB (5.5 - 5.75 MHz)
- TBC Mode .....–3 dB (0 - 4.2 MHz, Notch at 3.58/ 4.43 MHz)

Signal to Noise:
- TSG/SDI Input Modes.....>75 dB Luminance Weighted
- Synchronizer Mode.....>70 dB Luminance Weighted
- TBC Mode .....>60 dB Luminance Weighted

Differential Phase .....<1° (Modulated Ramp)

Differential Gain.....<1% (Modulated Ramp)

K-Factor (2T) .....<0.5% (2T Pulse)

Luminance Jitter (TBC Mode).....<15 nS

Processor Controls:
- Video Level.....+/- 3 dB
- Setup Level .....+/- 20 IRE
- Chroma Level .....+/- 6 dB
- Hue Phase.....+/- 45°
- Horizontal Genlock Timing.....+/- 6 µs
- Subcarrier Genlock Timing .....360°
- Y/C Horizontal Delay Adj.....–592 nS / +518 nS

Test Signal Generator Mode .....Select from over 30, 10-bit Test Patterns (Available at all Outputs)

VITS / VIRS Inserter .....Source ID or any test pattern can be inserted into any VBI line. (Different lines may contain different patterns.)

Remote Control:
- Serial Remote Port (DB-9F).....RS-232/RS-422 Levels at 9,600/38,400 BPS
- Ethernet 10-Base-T
- GPI Input (RCA x2)* .....TTL or Contact Closure
- GPI Output/Audio
  - Sync Pulse (BNC)*.....TTL Pulse
- Serial Remote (BNC) .....DCN

* These connectors located on supplied breakout cable.
+ RGB port can alternately provide additional composite video output or framestore alpha channel for use with external keyers.

Audio Specifications

Analog Inputs:
- Number of Inputs.....2 Stereo Channels (Balanced or Unbalanced)
- Resolution 24-bit
- Input Impedance .....600Ω or 18kΩ
- Input Operating Levels.....+8, +4, 0, -4 or -10 dBu
- Maximum Input Level.....+24 dBu
- Input Sampling Rate.....32 kHz, 44.1 kHz, 48 kHz
- Connection .....Removable Barrier Strip

AES / EBU Inputs:
- Number of Inputs.....2 AES/EBU Stereo Streams
- Resolution .....24-bit, 96 kHz
- Input Type (Menu Selectable) ...AES3-1992 Balanced XLR or Unbalanced BNC (AES Data on Coax SMPTE 276)
- Input Termination.....110Ω Balanced or 75Ω Unbalanced
- Connection .....XLR and BNC*
- Channel Status Information.....Professional, S/PDIF

SDI Embedded Inputs:
- Number of Inputs.....2 Stereo AES/EBU Channels
- Resolution 20-bit
- Sampling Rate.....48 kHz Synchronous
- Channel Status Format.....AES3-1992 (Professional Mode)
- Connection .....BNC (via SDI Video Input)

Auxiliary Audio Input Stream.....Uploaded WAV files can replace or be mixed with real-time processed audio streams.

Analog Outputs:
- Number of Outputs .....2 Stereo Channels (Balanced or Unbalanced)
- Resolution 24-bit
- Output Operating Levels .....+8, +4, 0, -4 or -10 dBu
- Maximum Output Level .....+24 dBu (-23 dBu into 600Ω)
- Connection .....Removable Barrier Strip

AES / EBU Outputs:
- Number of Outputs .....2 AES/EBU Stereo Streams
- Resolution 24-bit
- Output Type.....AES3-1992 Balanced XLR or Unbalanced BNC (AES Data on Coax SMPTE 276)
- Impedence .....110Ω (Transformer Isolated) or 75Ω
- Connection .....XLR and BNC*

SDI Embedded Outputs:
- Number of Outputs .....2 Stereo Channels of Embedded Audio
- Channel Status Format.....AES3-1992 (Professional Mode)
- Connection .....BNC (via SDI Video Output)

* These connectors located on supplied breakout cable.

Processing.....24 bit Audio System

Sampling Frequencies .....32 kHz, 44.1 kHz, 48 kHz, 96kHz

Maximum Total Delay .....1.75 seconds at 48 kHz

Delay Resolution .....<1 mS

Frequency Response.....50 Hz to 20 kHz, +/- 0.05 dB

THD+N.....<0.005% (typical at +21 dBu, 1 kHz)

Total Dynamic Range.....>90 dB

Signal-to-Noise Ratio.....>70 dB (Full-Scale Output)

Channel Separation .....>85 dB

Audio Test Tone Generators (x4).....100 Hz to 20 kHz, in 100Hz steps; 0 dBFS to -38 dBFS levels

General Specifications

Size (W x H x D) .....17" x 1-3/4" x 20" (43.2cm x 4.4cm x 50.8cm)

Power Requirements .....70 Watts, 100-240 VAC, 50/60 Hz

APPENDIX B: TEST SIGNALS

The following test signals are available with the DPS-475/575:

NTSC

1. SMPTE Bars
2. EIA Bars
3. Full Field Bars
4. Bars / Luma
5. Bars / Reverse
6. Bars / Red
7. Bars 100 %
8. Super Black
9. Black
10. Gray
11. White
12. Luma Ramp
13. Modulated Ramp
14. Luma 5-Step
15. Modulated 5-Step
16. Y-Shallow Ramp
17. Shallow Ramp
18. Multiburst-60IRE
19. Luma Sweep 5.5Mhz
20. Chroma Sweep
21. Pulse and Bar
22. NTC7 Composite
23. NTC7 Combination
24. FCC Composite
25. VIRS
26. Cross Hatch
27. SIN(X)/X
28. Red Field
29. Timing Bowtie

PAL (DPS-575 only)

1. Bars 100%
2. Bars/Red 100%
3. EBU Bars
4. EBU Bars/Red
5. Multiburst 5.0 MHz
6. Multiburst 5.8 MHz
7. Multiburst 420 mV
8. Pulse & Bar 2410t
9. Pulse & Bar 248t
10. Pulse & Bar 2t
11. Luma Ramp
12. Modulated Ramp
13. Luma 5 Step
14. Luma 10 Step
15. Modulated 5 Step
16. Timing Bowtie
17. Valid Ramp
18. Multipulse 5.8 MHz
19. Pluge
20. Shallow Ramps
21. SIN(X)/X
22. Luma Sweep 5.5 MHz
23. Chroma Sweep 2.5 MHz
24. VITS 17
25. VITS 18
26. VITS 19
27. VITS 20
28. VITS 330
29. VITS 331

30. Matrix-1
31. Matrix-2
32. FF Bounce
33. 90% Bounce
34. Pluge
35. Cross Hatch
36. SDI EQ Test
37. SDI PLL Test
38. Zone Plate
39. Digital Ramp
40. Edge Markers
41. Random Bits
42. Source ID Slide

30. VIRS
31. Black
32. Grey
33. White
34. Cross Hatch
35. Red Field 75%
36. Red Field 100%
37. Matrix-1
38. FF Bounce
39. 90% Bounce
40. Ramp 100
41. Ramp 120
42. Shallow Ramp
43. UBM Ramp
44. SDI EQ Test
45. SDI PLL Test
46. Zone Plate
47. Digital Ramp
48. Edge Markers
49. Random Bits
50. Source ID Slide

APPENDIX C: INSTALLATION OF HARDWARE OPTIONS

If you have purchased hardware option boards (such as the Audio Synchronizer Module, Animated Logo Option or the DV I/O Module) separately from the DPS-475/575, you will need to install them. The following instructions guide you through installing these options safely and correctly.

Depending on which upgrade option you have purchased, you may be required to enter an unlock code to enable the new option. See the *Enable Extra Options* setting in Chapter 12, "Menus: System Config" for details. The Audio Module, DV I/O Option, and Animated Logo Option DO NOT require an unlock code.

Precautions

WARNING: Static Electricity!

Static electricity from your body can damage your hardware option boards or the DPS-475/575. Even though you may not notice it, static electricity is being generated every time you move. Usually, it is too small to cause a spark, but it can still cause damage to sensitive electronic components.

- To prevent this damage, you should handle the option board carefully.
- Do not take the option board out of its protective bag until you are ready to install it.
- Do not carry the board around unless it is in its protective bag.
- Avoid wearing wool or polyester clothing while installing the option. These fabrics generate more static electricity than cotton garments.
- Before touching the option board, you should discharge any static electricity from your body by first touching the grounded metal chassis of the DPS-475/575 (**the unit must be plugged in to be grounded**).

IMPORTANT NOTE

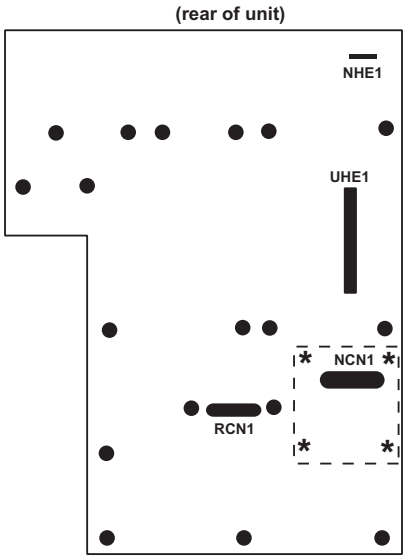
If you have a unit that has the Audio Synchronizer Module installed, you must remove the Audio board temporarily to install the DV I/O Option board. See the instructions later in this appendix for the correct procedures for removing and re-installing the Audio Synchronizer Module, before proceeding.

Starting the Installation

1. Confirm that the DPS-475/575 is turned off, and that the power cord is disconnected from the rear panel. Note that with the power cord disconnected, the unit is no longer grounded, so be cautious about static electricity.
2. Remove the top cover from the DPS-475/575. Use a Phillips screwdriver to remove the fourteen retaining screws, and lift off the top cover. Please keep the screws, as they will be needed to replace the top cover.

Installation of DV I/O Option Board

1. There are four screws that must be removed from the main board of the unit, and replaced with the four supplied standoffs (part number 762-575). [Note: these standoffs may be pre-installed on the main board of your unit.] These screws are designated with * in the following diagram:



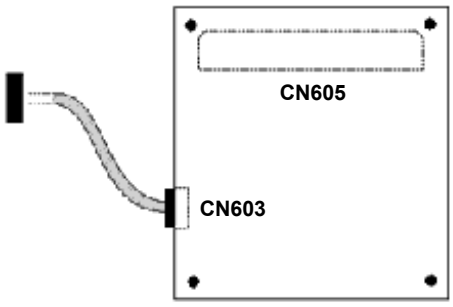
DPS-475/575

Main Board

The dashed rectangle indicates the position into which the DV I/O Option board will be installed.

2. Replace the indicated screws with the standoffs.
3. Remove the DV I/O Option board from its protective bag.
4. Connect one end of the supplied cable (part number 774-140) to the NHE1 connector on the main board (see the above diagram for the location of this connector). Connect the other end of the cable to connector CN603 on the DV I/O Option board. The connectors are keyed, so the cable can only fit in the correct orientation.
5. Inspect the connectors on the DV I/O Option and main board to ensure that all pins are straight. Align the CN605 connector on the bottom of the DV I/O Option

board with connector NCN1 on the main board (see the previous diagram of the main board, and the following diagram of the DV I/O Option board, for positioning). Gently press the DV I/O Option board onto the connector. Be sure to apply pressure evenly across the connector to prevent the pins from bending or breaking.



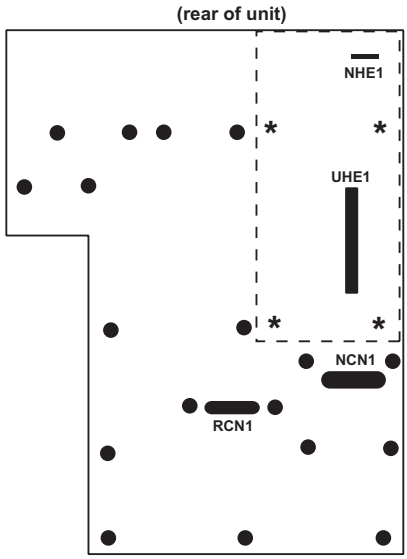
DV I/O Option Board (Top View)

The dashed lines in the above diagram of the DV I/O Option board indicate the position of the connectors on the bottom of the board.

6. Use the supplied screws (part number 751-010) to secure the DV I/O Option board to the standoffs in the main board.

Installation of Audio Synchronizer Module

1. There are four screws that must be removed from the main board of the unit, and replaced with the four supplied standoffs (part number 762-170). [Note: these standoffs may be pre-installed on the main board of your unit.] These screws are designated with * in the following diagram:



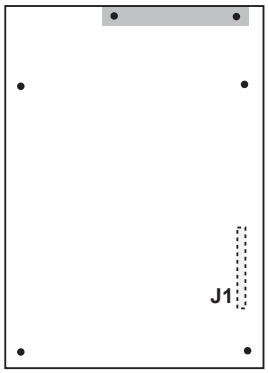
DPS 475/575 Main Board

The dashed rectangle indicates the position into which the Audio Synchronizer Module will be installed.

2. Replace the indicated screws with the standoffs.
3. On the rear of the unit, there is a cover plate where the *AES/EBU* DB25 connector will go. Remove the two screws holding this plate in place, and remove the plate.
4. Remove the included aluminum shield and the Audio Synchronizer Module from their protective bag.
5. Place the aluminum shield onto the standoffs. Line up the holes in the shield as closely as possible with the standoffs.
6. If the terminal blocks for analog audio (part number 722-184) are plugged into their mounting connectors on the Audio Synchronizer Module, remove them.
7. Align the DB25 connector on the Audio Synchronizer Module with the cutout for it on the rear of the unit.
8. Inspect the connectors on the Audio Synchronizer Module and main board to ensure that all pins are straight. With the shield sitting on the standoffs, gently press connector J1 on the Audio Synchronizer Module onto the UHE1 connector on the main board (see the previous diagram of the main board, and the following diagram of the audio board, for positioning). Be sure to apply pressure evenly across the connector to prevent the pins from bending or breaking.

IMPORTANT: **It is imperative that all pins of the connectors on both the main board and the Audio board are lined up properly, both side-to-side and front-to-back. If the connectors are not properly aligned, damage *will* occur to the Module when the unit is powered up.**

When properly aligned front-to-back, the analog audio terminal block mounting connectors will be flush with the rear of the chassis. This does NOT guarantee proper pin alignment, however; alignment MUST be checked visually prior to powering up the unit.



Audio Synchronizer Module (Top View)

The dashed lines in the previous diagram of the Audio Synchronizer Module indicate the position of the connectors on the bottom of the board.

9. Use the supplied screws (part number 751-057) to secure the Audio Synchronizer Module and the metal shield to the standoffs in the main board.

10. Use the two supplied jackscrews (part number 762-142) to secure the DB25 connector to the chassis of the unit.
11. Plug the analog audio terminal blocks back into their mounting connectors on the Audio Synchronizer Module.

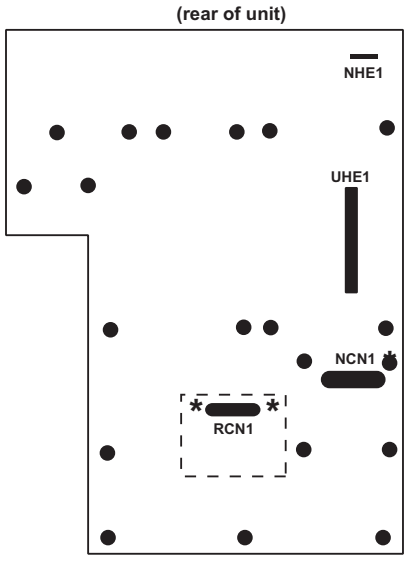
Removal of Audio Synchronizer Module

If you must remove the Audio Synchronizer Module from the unit (for example, to install the DV I/O Option board), the following instructions will walk you through the process properly and safely.

1. Remove the two jackscrews that secure the DB25 connector on the Audio Synchronizer Module to the chassis of the unit.
2. If the terminal blocks for analog audio are plugged into their mounting connectors on the Audio Synchronizer Module, remove them.
3. Remove the four screws that secure the Audio Synchronizer Module. See the diagram of the main board in the "Installation of Audio Synchronizer Module" section of this Appendix to locate the correct screws.
4. Gently lift the Audio Synchronizer Module from it's connector, to disconnect it from the main board. Be sure to lift the board off evenly, to prevent the connector pins from bending or breaking. Inspect the connectors on the Audio Synchronizer Module and main board to ensure that all pins are straight.
5. Once the connector is completely free, you can pull the audio board out to free it from the back panel. Be sure to store the board in a protective bag to protect it from static electricity.

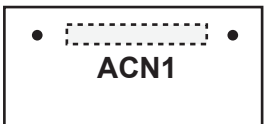
Installation of Animated Logo Option Board

1. The dashed rectangle in the following diagram indicates the position into which the Animated Logo Option board will be installed. Two standoffs (part number 762-2300), into which screws will secure the board, are pre-installed into the main board of the unit and are designated with * in the diagram:



Main Board

2. Remove the Animated Logo Option board from its protective bag.
3. Inspect the connectors on the Animated Logo Option and main board to ensure that all pins are straight. Align the ACN1 connector on the bottom of the Animated Logo Option board with connector RCN1 on the main board (see the previous diagram of the main board, and the following diagram of the Animated Logo Option board, for positioning). Gently press the Animated Logo Option board onto the connector. Be sure to apply pressure evenly across the connector to prevent the pins from bending or breaking.



Animated Logo Option Board (Top View)

The dashed lines in the above diagram of the Animated Logo Option board indicate the position of the connector on the bottom of the board.

4. Use the supplied screws (part number 751-010) to secure the Animated Logo Option board to the standoffs in the main board.

Completing the Installation

1. Replace the top cover, and use the original fourteen screws to secure the top cover.
2. Plug the power cord back in.

APPENDIX D: THE UPLOADER SOFTWARE

The *Uploader* software, which runs on Microsoft Windows 95, 98, and NT 4.0, is used to perform firmware upgrades to the DPS-475 and DPS-575, and to transfer video stills and animations to the unit from the PC.

Be sure to check the DPS web site (www.dps.com) frequently for updates to the *Uploader* software, and for updated firmware for the unit.

This section assumes that you have a working knowledge of the Windows operating system, and that the RS-232/422 port of the DPS unit is connected via a serial cable to one of the RS-232 serial ports on your PC.

Software Installation

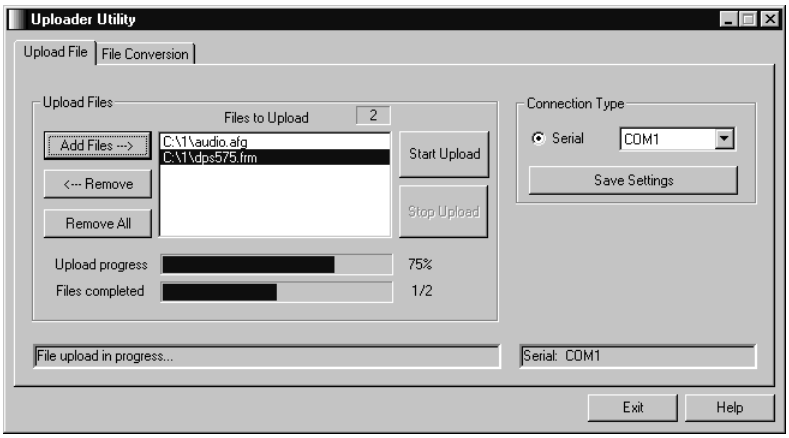
1. If you have downloaded the Uploader software from our web site, unZIP the file into a directory on your hard drive. (The ZIP file format is a compressed format commonly used for file distribution; utilities to uncompress ZIP files are readily available on the web).
2. Open the directory you unZIPed into in step 1 (or the CD-ROM containing the Uploader software), and double-click on the **Setup** icon. The installer will run.
3. Follow the on-screen instructions to install the software onto your system. You may accept the default locations for the software to be installed on your system, or select a directory of your choice. The software will be copied to the appropriate location, and you will be prompted when installation is complete.

Starting the Software

The Uploader software is started by selecting it from the Programs menu of the Windows Start button. You will find the software in the **Start > Programs > DPS > Uploader**. You can run the program from here, or create a shortcut to it on your desktop for convenience.

Using the Software

The Uploader software has two modes of operation: *Upload File*, and *File Conversion*. Upload File mode is used to transfer files to the DPS-475/575, while File Conversion mode is used to convert still image files and animations into formats that can be later uploaded.



The first time you run the Uploader software, you will need to set your serial port configuration in the Connection Type section. Select the serial port on your computer to which you have connected the DPS-475/575. Once you have chosen the correct serial port, click the *Save Settings* button; your serial port choice will then be remembered whenever you run the software.

The following file types can be uploaded directly to the DPS-475/575. The unit recognizes file types based on their filename extension. For example, with the filename **filename.ext**, the following types are recognized, where *.ext* is one of:

.afg	Audio FPGA upgrade file
.vf5	Video FPGA upgrade file (525-line/NTSC)
.vf6	Video FPGA upgrade file (625-line/PAL)
.frm	Firmware upgrade file
.htdb	Ethernet control upgrade file
.dst	8-bit video still image file
.dts	10-bit test pattern file
.dan	Animation file

Note that if you have downloaded upgrade files from the DPS web site, you will have to unZIP them before they can be uploaded to the unit (see above).

The number of files that can be transferred to the DPS-475/575 is contingent on the amount of free memory available in the unit. As the files are stored in a compressed form, file sizes will vary from image to image. For example, a file that consists of solid black will compress easily, and take up less memory in the unit than a complicated image.

NOTE: When upgrading the firmware of the unit (.afg, .vf5, .vf6, or .frm files), if the unit's memory is almost full, it may be necessary to *delete* the existing firmware files from the unit before uploading the new ones. This is a side effect of a safety mechanism of the firmware upgrade process — old firmware is not deleted from the unit until it is confirmed that the new firmware file has been received successfully in its entirety. As a result, uploading firmware requires there to be sufficient free space to store the new firmware files as well as the old ones; once the new firmware files are validated, the old firmware files will be deleted. In cases where available memory is limited and there are multiple firmware files to be uploaded, it is advantageous to upload them one at a time (instead of as a batch); deletion of old firmware files is done only after all files in a batch are uploaded, so a batch upload would require enough free memory to store all new files.

To delete old firmware files prior to uploading new ones, use the *Flash Memory Mgmt* option of the System Config menu (see Chapter 12, "Menus: System Config"

for details) to delete individual files, or the *Erase Firmware* Power-Up Key (see Chapter 3, “Front Panel Controls”) to delete all firmware files.

If you have image files that you wish to transfer to the unit that are not in one of the above recognized formats, you will have to convert them first using the File Conversion mode of the Uploader software (see the section later in this appendix).

Uploading Files

To upload files to the DPS-475/575, ensure that the unit is powered on and that the serial port settings of the Uploader software are correctly set for the connection between the PC and the unit.

Build a list of files to be uploaded by using the following buttons:

Add Files Clicking this button brings up a standard Windows file requester, for you to select which files you wish to upload. Use the *Files of Type* pull-down list to choose between browsing for firmware files, and image/animation files. Select the files you wish to add to the list, and click *Open*. You can use the Add Files button multiple times, to add files from multiple distinct locations to the list.

Remove Clicking on a file in the list of files to be uploaded, then clicking the *Remove* button will delete it from the list.

Remove All Clicking this button clears the list of files to be uploaded.

Once all of your desired files have been added to the upload list, click the *Start Upload* button to begin the transfer.

First, the software will try to establish a connection with the DPS-475/575. During this time, a button labeled *Cancel Connection Attempt* will appear. Clicking this button will abort the upload attempt. Use of this button may be necessary if the software is unable to establish a connection to the unit. If a connection cannot be established, the Connection Type may be set to the wrong serial port, or there may be a physical connection problem with the serial cabling.

Once a connection has been established, all indicators on the DPS-475/575 will light up, and the display panel will show the progress of the transfer of the files. A progress status bar in the Uploader software will show similar information. If there is insufficient memory in the unit to receive the new files, a corresponding message will be displayed, and the Upload will not begin.

During the transfer of files, you may click the *Stop Upload* button to abort the upload process. Do not stop the upload process by any other means (such as by powering down the unit), as this may leave corrupt files in the unit.

Once all selected files have been uploaded, a dialog box will inform you of completion and the number of files transferred successfully.

Converting Files

Prior to uploading to the DPS-475/575, still image files, test patterns and animation image sequences must be converted into the .dst, .dts and .dan file formats recognized by the unit. Clicking the File Conversion tab in the Uploader software brings up an interface to allow you to perform this conversion. It can also be used to convert from DPS .dst and .dts files back to standard Windows file formats or DPS Hollywood files.

The conversion utility supports the standard Windows file formats .jpg, .bmp, .tga, and .tif. It also supports 8-bit and 10-bit .yuv files from the DPS Hollywood.

Single still image files in the above formats are converted to 8-bit .dst files (for use with the linear keyer) or 10-bit .dts files (for use with the test signal generator) for the DPS-475/575.

When converting to .dst, any alpha channel information stored in the source file will be used for the DPS-475/575 keyer. If a source image is too large (greater than 720x486 NTSC, or 720x576 PAL), it will be cropped. If a source image is *smaller* than the screen size, the unused area will be treated as transparent by the keyer. If a 10-bit Hollywood .yuv file is converted to .dst, it will be down-sampled to 8-bit, and the extra resolution will be lost.

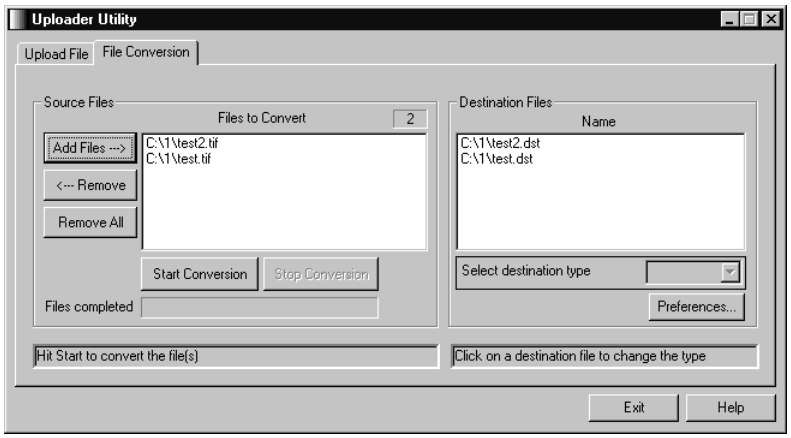
When converting to .dts, any alpha channel information in the source file is lost. 8-bit image formats such as .bmp can be converted to 10-bit .dts files for use as test signals, but no additional resolution will be gained. Ideally, 10-bit Hollywood .yuv files should be used as the source of .dts files, for maximum quality.

Animation files for the DPS-475/575 (.dan files) are created from a numbered sequence of image files, all of which must be stored in the same directory. For example, **anim0001.tga**, **anim0002.tga**, and **anim0003.tga** would be converted into an animation file named **anim.dan**. At least one leading zero is required in the naming convention of image sequences (i.e. anim1.tga, anim2.tga, anim3.tga is not a valid sequence). When selecting the source files to be built into an animation, ***it is important to add only the FIRST image of the sequence into the Files to Convert list***. In the above example, only **anim0001.tga** would be selected for conversion; the rest of the sequence would be converted automatically.

Still image files with a filename ending in a number (such as image0003.tga) are assumed to be part of an image sequence, and are converted to .dan animation files. All other still image files are converted to .dst stills.

The following chart summarizes the source formats recognized by the conversion utility, and the formats to which each can be converted:

SOURCE	DESTINATION
.tga (single image)	.dst, .dts
.tga (numbered image)	.dan
.bmp (single image)	.dst, .dts
.bmp (numbered image)	.dan
.jpg (single image)	.dst, .dts
.jpg (numbered image)	.dan
.tif (single image)	.dst, .dts
.tif (numbered image)	.dan
.yuv (single image)	.dst, .dts
.yuv (numbered image)	.dan
.dts	.tga, .bmp, .tif, .jpg, .yuv
.dst	.tga, .bmp, .tif, .jpg, .yuv



To convert between file formats, first build a list of files to be converted by using the following buttons:

Add Files Clicking this button brings up a standard Windows file requester, for you to select which files you wish to convert. Use the *Files of Type* pull-down list to choose between browsing for standard Windows file formats, and DPS image files. Select the files you wish to add to the list, and click *Open*. You can use the Add Files button multiple times, to add files from multiple distinct locations to the list. Remember that when converting a sequence of frames into an animation file, add only the first source frame to the conversion list.

Remove Clicking on a file in the list of files to be converted, then clicking the *Remove* button will delete it from the list.

Remove All Clicking this button clears the list of files to be converted.

By default, image files are converted to .dst files for use with the keyer. This default can be changed in the Preferences window. To change the destination file type of an individual file, click on that file in the Destination Files window; the *Select Destination Type* drop-down box will become active, and you can choose which output file format you want.

When converting from DPS .dst or .dts image files back into standard Windows file formats, the default output file format is .bmp. This default can be changed (to .dts test signals) in the Preferences window. To change the destination file type of an individual file, click on that file in the Destination Files window; the *Select Destination Type* drop-down box will become active, and you can choose which output file format you want.

If there are more files in the conversion lists than will fit in the window, a scroll bar will appear, allowing you to scroll through the list. Note that scrolling the Source Files window does NOT automatically scroll the Destination Files window with it; simply click on one of the files, and the other window will jump to the corresponding file.

Once all of your desired files have been added to the conversion list, click the *Start Conversion* button to begin processing. Converted files are saved into the same directory as the source images.

During the conversion process, you may click the *Stop Conversion* button to abort the process after the current file has completed.

Field Ordering in Stills and Animations

The graphics files that are uploaded to the DPS-475 and DPS-575 are originally stored in standard graphics file formats. These file formats to do not distinguish between fields or otherwise deal with interlace. Industry convention is to treat each "row" of the file as a separate "line" of video on alternating fields. All of the odd rows will end up in one field and the even rows in the other field. For still images this convention works fine, and it doesn't matter which row ends up in which field. Any parts of the image that are only one row tall will appear to flicker at the field rate (60Hz). Graphics software which is intended to produce graphic files for video applications will perform some vertical filtering to avoid this situation. On the computer screen (which is not interlaced) the image may look “soft” as a result.

On the DPS-475 (and DPS-575 in NTSC mode), the first row of the graphics file will be put into field 2, and the second into field 1. Thus, over the entire height, the even rows (if you start counting from zero on the first row) will be in field two and the odd rows will be shown in field one. On the DPS-575 in PAL mode, however, the opposite is true. For still images, this detail doesn't matter. However, for animations it is critically important.

Original Graphics File:		**NTSC:**		**PAL:**	
Row#	*Image*	*Field*	*Image*	*Field*	*Image*
0	---X---	2	---X---	1	---X---
1	--X-X--	1	--X-X--	2	--X-X--
2	-X---X-	2	-X---X-	1	-X---X-
3	X-----X	1	X-----X	2	X-----X
4	-X---X-	2	-X---X-	1	-X---X-
5	--X-X--	1	--X-X--	2	--X-X--
6	---X---	2	---X---	1	---X---

A smooth animation requires motion blur. To show this blur as it would be captured by a real video camera, the animation must be rendered as separate fields, at 30 frames per second (60 fields per second) for NTSC [most animation software does not support the precise frame rate of 29.97Fps]. Most animation software is aware of broadcast video and can do this very easily. If your software is more primitive, you could render your sequence at 60 frames per second, then take the even lines of the even frames, and the odd lines of the odd frames to make a new sequence that is 30 frames per second (with two fields per frame). In rendering for PAL, you would do the same, but at 25 frames per second or 50 fields per second.

Field two comes out after field one in time, and that's where they get their names from. Therefore, for an NTSC animation, you should have field one (the first field in time) starting on the second row of the graphics file (and on the following odd lines). However, for a PAL animation, the opposite is true: field one should be the first row of your graphics file (and subsequent even lines). Since an animation intended for PAL or NTSC will normally be rendered with a particular frame rate in mind (either 30 or 25), this is not a serious restriction.

Most animation software (for example 3D Studio Max or LightWave 3D) has a software control for determining field dominance, which must be selected by the user before rendering to match these requirements.

Maximum Animation Sequence Length and Frame Size

The maximum length of an animation sequence is a function of the size of the individual frames. Each frame of the animation is "integer tiled" across a buffer that is 720 pixels wide (one video line), and 846 lines tall. To be "integer tiled" means that only an integer number of tiles are allowed horizontally or vertically, and any left over (fractional) space will be wasted. So, for example, an 80x60 frame will fit exactly 720/80 = 9 times across, and 846/60 = 14 times vertically. Therefore, you can have a sequence as long as 126 frames (9*14). If your image is 81x62, however, only 8 will fit across, and 13 down, giving you a total of just 104 frames.

The DPS-475/575 allows any size of frame, as long as it fits into memory. Therefore, you could have an image 720 pixels wide by 16 lines tall, and animate it over 52 frames. It's in your best interest to choose a frame size that is an integer fraction of the line width (720), to reduce wasted buffer memory.

The following table gives examples of the maximum sequence length for various frame sizes:

Frame size		# of Tiles		
Width	Height	X	Y	Max # of frames
80	60	9	14	126
81	62	8	13	104
200	200	3	4	12
720	16	1	52	52
720	486	1	1	1
720	576	1	1	1
40	30	18	28	504

It is not possible to exactly calculate animation file sizes (i.e. the amount of memory needed to store a particular sequence) in advance, because there is a loss-less compression step, and the resulting size will vary depending on the content of the animation file. Without the compression, each pixel would require 3 bytes. Therefore, the 80x60 examples above would take, at most, 1.7M bytes (plus a bit of overhead).

APPENDIX E: DIGIDUPLEX MODE

What Is DigiDuplex?

The exclusive DigiDuplex™ mode of the DPS-475 and DPS-575 provides bi-directional connectivity between analog and digital devices.

In DigiDuplex mode, the unit's SDI video input is routed to all analog video outputs, while the selected analog video input is simultaneously synchronized and sent to the SDI output.

With audio-equipped units, conversion between digital and analog audio is handled in similar fashion, simultaneously with the video. Either the AES/EBU or SDI audio input is transcoded to the analog audio outputs (and, if desired, the AES/EBU outputs), while a separately selected audio input (analog, AES/EBU, SDI, Test Tones, or Mute) is synchronized and sent to the digital audio outputs (SDI Embedded and/or AES/EBU).

DigiDuplex mode is enabled and disabled with the *DigiDuplex Mode* option of the Video Setup menu.

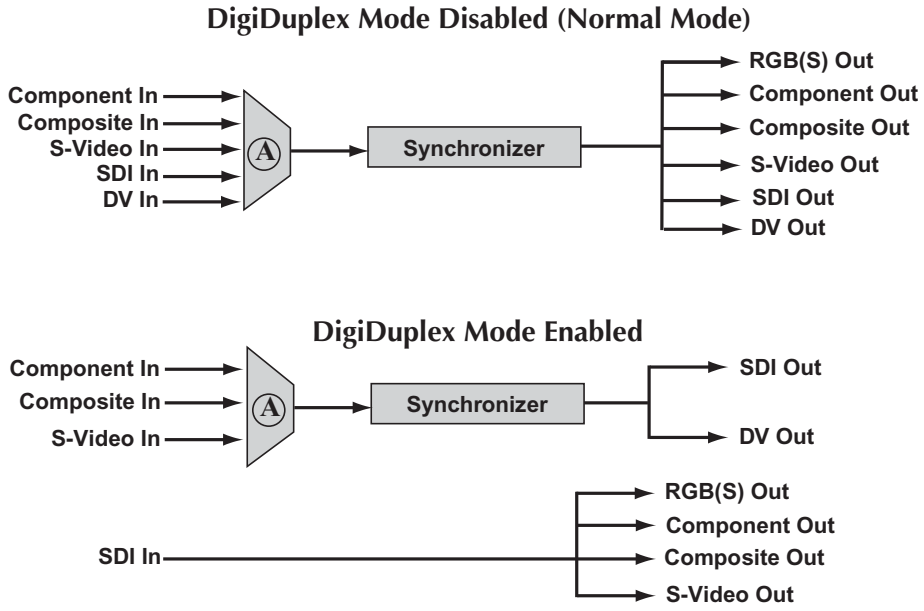
DigiDuplex mode cannot be enabled when the *Dolby-E (Data) Mode* is enabled in the Audio Setup menu. If DigiDuplex mode is already enabled, it will be automatically disabled if *Dolby-E (Data) Mode* is then turned on in the Audio Setup menu.

Controlling the DigiDuplex Signal Path

The signal path in DigiDuplex mode can best be visualized through flow diagrams.

Video

The video signal path is as follows:



With DigiDuplex mode disabled, the video input selection front-panel controls or *Input Source* option of the Video Setup menu are used to select the desired video input **(A)**, which will be synchronized and sent to all video outputs.

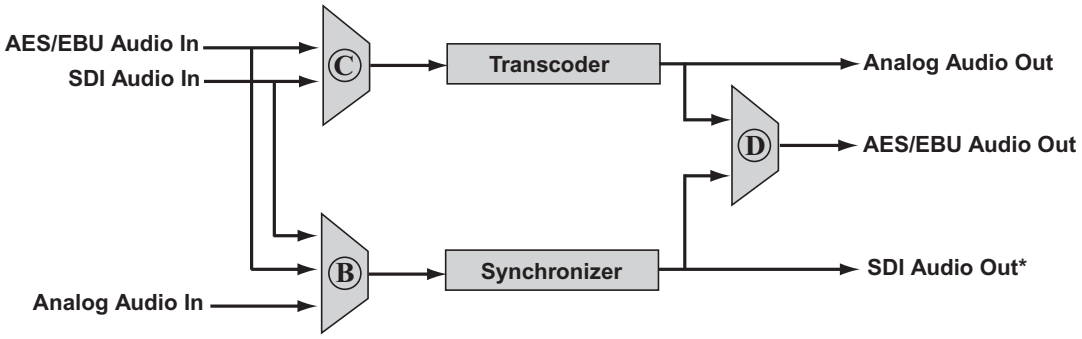
With DigiDuplex mode enabled, the video input selection front-panel controls or *Input Source* option of the Video Setup menu are used to select the analog video input **(A)** which will be synchronized and sent to the SDI output (and the DV output if the optional DV I/O module is installed). The SDI input is transcoded and sent to all analog video outputs. Note that DV input is not available in DigiDuplex mode.

Audio

The audio signal path is as follows:

DigiDuplex Mode Disabled (Normal Mode)

DigiDuplex Mode Enabled



With DigiDuplex mode disabled, the audio input selection front-panel controls or *Input* option of the Audio Setup menu are used to select the desired audio input **(B)**, which will be synchronized and sent to all audio outputs. In addition to the input formats, Test Tones and Mute are valid selections as the audio input source.

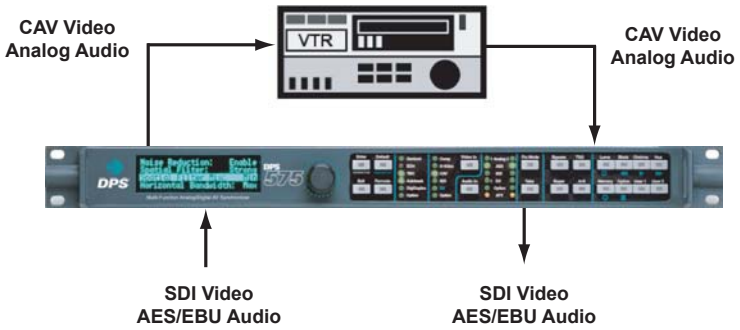
With DigiDuplex mode enabled, the audio input selection front-panel controls or *Input* option of the Audio Setup menu are used to select the audio input **(B)** which will be synchronized and sent to the SDI output. In addition to the input formats, Test Tones and Mute are valid selections as the audio input source. **Note that in DigiDuplex mode, audio input selections for channels 1 and 2 are locked together, and must have the same input format.** DV audio is not supported in DigiDuplex mode.

The *DigiDuplex Input* option **(C)** of the Audio Setup menu selects which digital audio input source (SDI Embedded or AES/EBU) will be transcoded to the analog audio outputs. The *DDPlex AES/EBU Out* option **(D)** of the Audio Setup menu determines whether the AES/EBU Audio Output is fed from the synchronizer or transcoder.

***CAUTION:** If the *SDI Embedding* option of the Audio Setup menu is disabled, SDI audio output will not be available. Thus, if SDI Embedding is disabled, and the *DDPlex AES/EBU Out* option is set to use the transcoder as the source, the output of the audio synchronizer will not be present on any of the outputs; only the transcoded digital audio will be available (at the analog and AES/EBU audio outputs).

Configuration Example

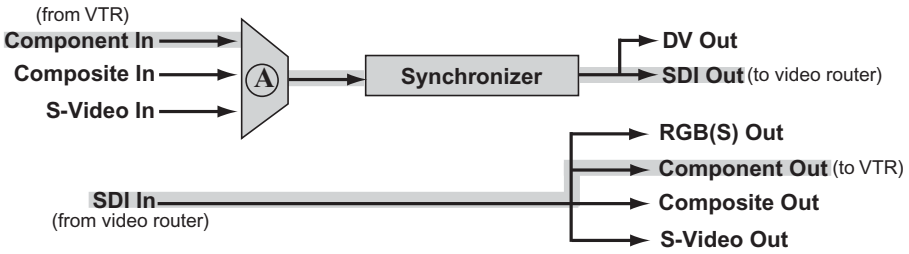
The following example represents one possible application of DigiDuplex mode -- interfacing an analog video tape recorder with a digital routing system. In this example, the video routing system handles SDI video, while the audio routing system uses AES/EBU audio; the VTR uses component analog video with analog audio.

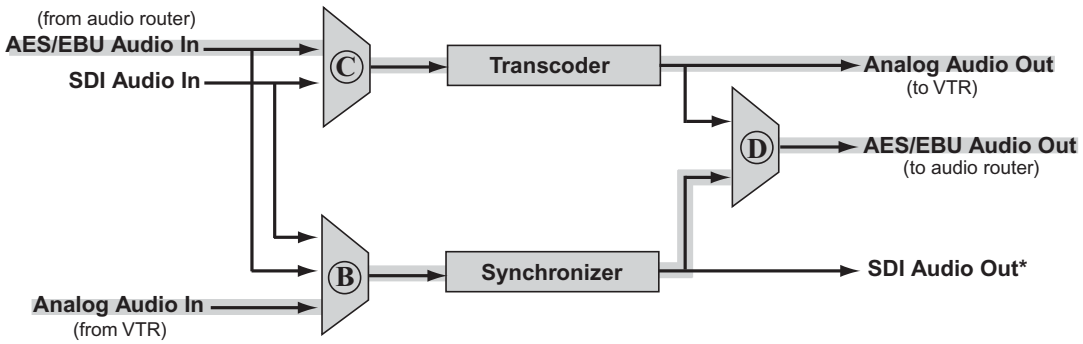


The following configuration settings would be used:

Input Source	Video Setup menu	*Component*
Input	Audio Setup menu	*Analog*
DigiDuplex Mode	Video Setup menu	*On*
DigiDuplex Input	Audio Setup menu	*AES/EBU*
DDPlex AES/EBU Out	Audio Setup menu	*Sync*

With these settings, the signal paths through the DPS-475/575 would be as follows:





As the above diagram shows, the component analog video and analog audio from the VTR are synchronized and sent to the digital routing system as SDI video and AES/EBU audio, respectively. Simultaneously, the SDI video and AES/EBU audio from the routing system are transcoded and sent to the component video and analog audio inputs of the VTR.

APPENDIX F: ETHERNET CONTROL

The 10BaseT Ethernet connector, labeled *Ethernet* on the rear of the unit, is used to connect the DPS-475/575 to a TCP/IP-based network for remote control and status monitoring through web-browsing software.

Configuring Ethernet Control

To utilize Ethernet control of the DPS-475/575, the unit must be configured for your network. Three networking parameters, found in the Remote Control Setup sub-menu of the System Config menu, must be configured for your network:

IP Address
Netmask
Gateway

Your network administrator can provide you with appropriate settings. If you are setting up a new, dedicated network for the DPS-475/575 unit, the default *IP Address* of 10.0.XX.YY should be adequate; the controlling computer would then have another address in this range (eg. 10.0.0.100). See Chapter 12, "Menus: System Config" for details of setting these options.

It is also recommended that you specify a *Machine Name*; this option is found in the same sub-menu. The Machine Name will be used to reference the DPS-475/575 unit by remote control devices such as the RC-475 or additional DPS-475/575's.

Web Browser Control

Once the networking parameters of the DPS-475/575 have been configured, and it is connected to the Ethernet network, the unit can be controlled through standard web browsing software (for example, Netscape Navigator or Microsoft Internet Explorer).

To access the DPS-475/575, start the web browsing software on your computer as normal.

In the *Address*, *Location*, or *URL* field of your web browser (the name given to this field varies between different web browsers), type **http://** followed by the *IP Address* of the DPS-475/575 you are trying to control. For example, the DPS-475/575 is configured with the *IP Address* 10.0.0.1, you would enter the following location into your web browser:

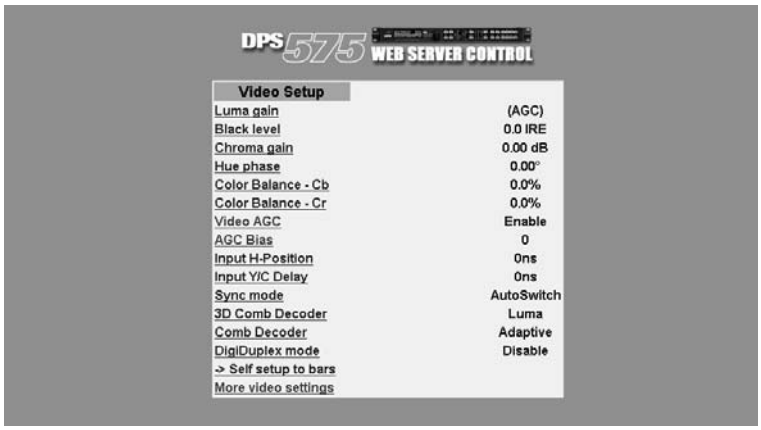
http://10.0.0.1

The browser will then display the DPS-475/575 Web Server Control interface.

Device Control

Clicking *Device Control* from the main Web Server Control interface will present the DPS-475/575 menu structure for selecting and setting options. These menus mirror those accessible through the front panel of the unit.

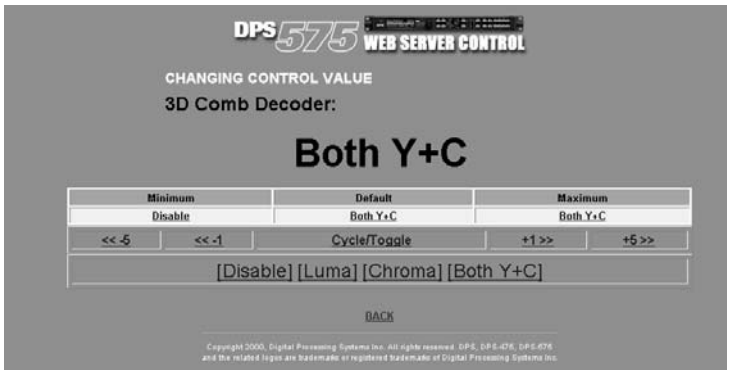
The menu listings will display available options, and their current settings.



Clicking on a menu item brings up the Changing Control Value screen for modifying the value of the option.

The Changing Control Value screen shows the minimum, maximum, and default values for the selected option; clicking on any of these three values will set the option accordingly.

For options with discrete values, such as *3D Comb Decoder* in the Video Setup menu, all of the discrete values will be displayed; clicking on one of them sets the option to that value.



Clicking the *Cycle/Toggle* button will cycle through the valid values, or in the case where there are only two possible values (eg. Disable and Enable), will toggle between them.

For options with a numerical range of valid values (eg. *Luma Gain* in the Video Setup menu), numeric adjustment buttons allow the value to be increased or decreased in fine or coarse increments.

Confidence Monitoring

Clicking *Confidence Monitoring* from the main Web Server Control interface will bring up the information and status screen for confidence monitoring of the unit.

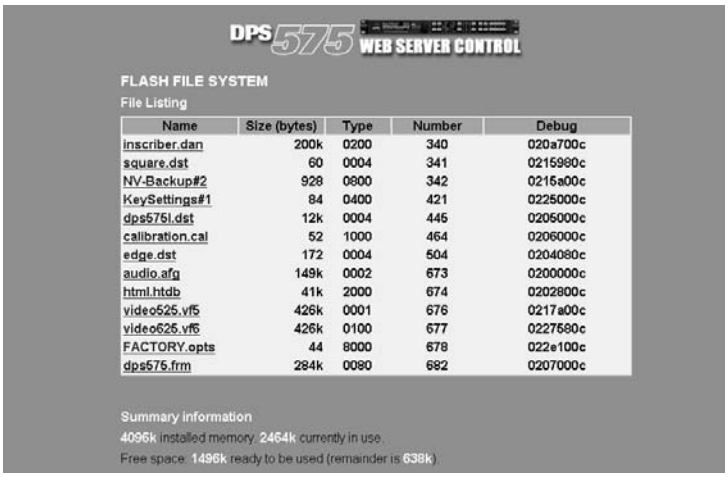
This area is still under development. In the future, an extensive array of status information for both video and audio will be presented on this screen.

Currently, this option allows you to capture a still from the video output of the unit, and download it to your computer in .BMP format in one of four sizes (ranging from full-screen to "postage-stamp" size).

Note that any VITS patterns active in the unit will be disabled during the image grab. Furthermore, if the image is grabbed while the unit is displaying a test pattern (i.e. the Test Signal Generator is active), the video output will flash while the TSG image is downloaded.

Flash File System

Clicking *Flash File System* from the main Web Server Control interface will present a list of the files currently stored in the DPS-475/575.



Clicking a filename in this list will activate your web browser's download function, to transfer the file from the DPS-475/575 to the computer. Note that while your web browser will allow you to rename the file during the download, you should not change the file extension (eg. .dst, .dan). If you are running the Microsoft Windows operating system, once you have transferred a still image or test pattern to your computer, you can use the File Conversion feature of the Uploader software to convert it to a standard graphics file format for use with an image editing application (see Appendix D, "The Uploader Software" for details).

Upload File to Unit

Clicking *Upload File to Unit* from the main Web Server Control interface will allow you to upload firmware upgrades, video stills and animations to the DPS-475 and DPS-575. See Appendix D, "The Uploader Software" for a list of file types uploadable to the unit.

If you are running the Microsoft Windows operating system and you have image files that you wish to transfer to the unit that are not in a supported format, you will have to convert them first using the File Conversion mode of the Uploader software (see Appendix D).

Note that if you have downloaded upgrade files from the DPS web site, you will have to unZIP them before they can be uploaded to the unit. (The ZIP file format is a compressed format commonly used for file distribution; utilities to uncompress ZIP files are readily available on the web).

Type the complete filename (including the directory path) into the *File to Upload* requester, or click the *Browse* button to browse your drives and select the desired file. Click the *Start Upload* button to transfer the specified file to the DPS-475/575. You will be notified upon completion of the upload.

NOTE: After uploading firmware files (.afg, .vf5, .vf6, or .frm files), the unit must be reset (either with the Reset button, or by power cycling).

NOTE: When upgrading the firmware of the unit (.afg, .vf5, .vf6, or .frm files), if the unit's memory is almost full, it may be necessary to *delete* the existing firmware files from the unit before uploading the new ones. This is a side effect of a safety mechanism of the firmware upgrade process — old firmware is not deleted from the unit until it is confirmed that the new firmware file has been received successfully in its entirety. As a result, uploading firmware requires there to be sufficient free space to store the new firmware files as well as the old ones; once the new firmware files are validated, the old firmware files will be deleted.

To delete old firmware files prior to uploading new ones, use the *Flash Memory Mgmt* option of the System Config menu (see Chapter 12, "Menus: System Config" for details) to delete individual files, or the *Erase Firmware* Power-Up Key (see Chapter 3, "Front Panel Controls") to delete all firmware files.

Other Machines on this Network

Clicking *Other Machines on this Network* from the main Web Server Control interface will display a list of other DPS-475/575 units present on the same Ethernet network as the unit you are currently controlling, with their Machine Name, IP Address, and DCN Address.

Clicking on one of the machines in this list will switch you to controlling that specified machine, just as if you had entered its IP address in the *Address*, *Location*, or *URL* field of your web browser.

APPENDIX G: REMOTE CONTROL PROTOCOL

This appendix describes the remote control protocol for the DPS-475/DPS-575, and is intended for users and programmers who want to develop custom control software.

This appendix is available on the DPS web site, at **www.dps.com**.

APPENDIX H: CABLE PINOUTS

Video Cable

The following are the cable pinouts for the Multi I/O Connector (DB-15M) video cable, part number 774-753.

Pin Number on the DB-15M	Connection Type	Description
1	Gnd	Ground
2	BNC	Aux Blue
3	Gnd	Ground
4	S-Video	S-Video Chroma (C)
5	RCA	GPI In 1
6	BNC	Aux Red
7	Gnd	Ground
8	BNC	Aux Sync/Comp. Out
9	Gnd	Ground
10	BNC	Audio Delay/GPI Out
11	BNC	Aux Green
12	Gnd	Ground
13	S-Video	S-Video Luma (Y)
14	Gnd	Ground
15	RCA	GPI In 2

Audio Cable (Standard)

The following are the cable pinouts for the standard AES/EBU (DB-25M) audio cable, part number 774-755, included with the DPS-475/575AV.

Pin Number on the DB-25M	Connection Type	Description
1	NC	
2	NC	
3	NC	
4	NC	
5	NC	
6	NC	
7	NC	
8	NC	
9	NC	
10	NC	
11	NC	
12	NC	
13	NC	
14	BNC – Shield	AES2 Out (–)
15	NC	
16	BNC – Center	AES2 Out (+)
17	BNC – Shield	AES2 In (–)
18	NC	
19	BNC – Center	AES2 In (+)
20	BNC – Shield	AES1 Out (–)
21	NC	
22	BNC – Center	AES1 Out (+)
23	BNC – Shield	AES1 In (–)
24	NC	
25	BNC – Center	AES1 In (+)

Audio Cable (Optional)

The following are the cable pinouts for the optional AES/EBU (DB-25M) audio cable with XLR and BNC connectors, part number 774-470.

Pin Number on the DB-25M	Connection Type	Description
1	NC	
2	XLR – 1	Shield
3	XLR – 3	AES2 Out (–)
4	XLR – 2	AES2 Out (+)
5	XLR – 1	Shield
6	XLR – 3	AES2 In (–)
7	XLR – 2	AES2 In (+)
8	XLR – 1	Shield
9	XLR – 3	AES1 Out (–)
10	XLR – 2	AES1 Out (+)
11	XLR – 1	Shield
12	XLR – 3	AES1 In (–)
13	XLR – 2	AES1 In (+)
14	NC	
15	BNC – Shield	AES2 Out (–)
16	BNC – Center	AES2 Out (+)
17	NC	
18	BNC – Shield	AES2 In (–)
19	BNC – Center	AES2 In (+)
20	NC	
21	BNC – Shield	AES1 Out (–)
22	BNC – Center	AES1 Out (+)
23	NC	
24	BNC – Shield	AES1 In (–)
25	BNC – Center	AES1 In (+)

APPENDIX I: IMPORTANT ADDRESSES AND PHONE NUMBERS

Internet

ftp://ftp.dps.com
http://www.dps.com
Support E-mail:

Canada/International	support@dps.com
U.S.	support.us@dps.com
Europe	support.europe@dps.com
Asia-Pacific	support.au@dps.com

Suggestions: suggestionbox@dps.com

Canada

Digital Processing Systems Inc.
70 Valleywood Drive
Markham, Ontario L3R 4T5

Toll-free:	800-775-3314
Voice:	905-944-4000
Fax:	905-944-4200
Customer Service	
Voice Mail:	905-944-4100

USA & Latin America

Digital Processing Systems, Inc.
11 Spiral Drive, Suite 10
Florence, KY 41042

Toll-free:	800-775-3314
Voice:	859-371-5533
Fax:	859-371-3729

Europe

Digital Processing Systems, Ltd.
Romans Business Park, Unit 9
East Street, Farnham
Surrey, GU9 7SX
U.K.

Voice:	+44 1252 718 300
Fax:	+44 1252 718 400

Asia and the Pacific Rim

DPS Asia Pacific
858 King Georges Road
South Hurstville, Sydney
NSW 2221
Australia
Voice: 61-2-9547-0088
Fax: 61-2-9547-0988

APPENDIX J: A BRIEF HISTORY OF DPS

DPS was originally founded in 1975 as Digital Video Systems. We were pioneers in the development of time base correctors (TBCs) and synchronizers. Digital Video Systems was acquired by Scientific Atlanta in 1982 and the focus of the division shifted to satellite encryption technologies. In 1988 the studio video product line was spun off into a new employee-owned company called Digital Processing Systems (DPS). In 1996 DPS went public, with a very successful initial public offering (IPO) of over three million shares.

Post Production

DPS helped start the "desktop video revolution" with the introduction in 1991 of the DPS Personal TBC, the first infinite window TBC on a PC card. The DPS Personal TBC's combination of features, performance and price was unique, and competed with units selling for three times its cost. After the success of this TBC card, DPS followed with the Personal TBC II, III and IV, each of which provided increased features and performance. During this period DPS also introduced the innovative DPS Personal VScope, the world's first combination waveform monitor/vectorscope on a PC card.

The DPS Personal Animation Recorder (PAR), a plug-in card which functioned as a single-frame recording deck, was introduced soon after the first Personal TBC and quickly changed the art of animation forever. Still being used in both PC and Amiga versions — a testament to how far ahead of the rest of the industry it was — the PAR provides component analog video (Betacam, MII), composite and S-Video (Hi8/S-VHS) outputs.

The DPS Perception Video Recorder (PVR) was a significant advancement beyond the PAR. First shipped in 1995, the multiple-award-winning PVR is a PCI-bus digital video disk recorder which features 10-bit video encoding with 2X oversampling, CCIR 601 4:2:2 processing and an integrated SCSI-2 hard drive controller. The PVR was also designed to integrate with third-party non-linear editing software.

Fulfilling the promise of the PVR to be "the heart of an advanced digital video workstation," DPS has built a family of products that work with the PVR to create a complete video-audio editing solution. These products include: the AD-2500/3500 Component Video Capture daughtercard; the SD-2500/3500 Serial Digital Video I/O card; the Perception F/X transition effects accelerator card; and the Perception Audio for Video (A4V) board. More than 17,000 PVR-based systems are in use around the world today.

Digital Processing Systems' 1997 desktop video offerings also became award winners. The DPS Hollywood, an uncompressed digital (D1) video disk recorder, won the "Pick Hit" award at its release during the National Association of Broadcasters (NAB) convention in 1997. At NAB '99 the DPS Hollywood received Post magazine's "Professionals' Choice" Award.

Digital Fusion, the superb resolution-independent compositing and special effects software program brought to market in a strategic partnership between DPS and the creators, eyeon Software, Inc., also won a "Pick Hit" award at NAB '97. Digital Fusion has won numerous awards since – including one of Game Developer magazine's "Front Line Awards" in 1998 – as has Digital Fusion Post, developed for

film production.

At NAB '98 we introduced a major new product: the DPS Perception RT, a dual-stream real-time disk recording and editing system. It won an "NAB Prime Time Product" award from both PC Graphics and Video and Digital Studio magazines, a designation reserved for the most innovative digital products shown at NAB. A 1999 Videography magazine review said: "DPS Perception RT3DX with VideoAction is the best under-$15,000 nonlinear editing bundle I have seen."

In addition to an expanding line of video products that "push the envelope" of price and performance, DPS continues to extend its capabilities in other ways. In the summer of 1997 we purchased the award-winning software company Star Media, creators of the Video Action line of video editing software. They are now "DPS Software." The integration of our traditional hardware strengths with some of the industry's best software help us to maintain our position as a leader in desktop video solutions.

Continuing to evolve with the needs of the animation market, in 1999 DPS introduced dpsReality, a Studio Digital Disk Recorder (SDDR). Designed for animators, 2D artists and broadcast designers, this powerful new animation tool has all the power and functionality of the company's industry-standard-setting DPS Perception (PVR), plus powerful new software. dpsReality sets new industry standards with capabilities such as mixed-mode compressed and/or uncompressed video, alpha-channel storage and playback (4:2:2:4), onboard disk control and video I/O, and more, all on a single universal PCI slot card

Also introduced in 1999 was DPS' new real-time, non-linear video editing solution: dpsVelocity. Designed for digital video professionals, dpsVelocity boasts extensive real-time capabilities such as real-time filters, hundreds of ready to go 2D/3D transitions, rolling/crawling titles, and on-the-fly volume/EQ controls for 8 channels of guaranteed synchronized audio. The combination of dpsVelocity and dpsReality delivers quality that surpasses Digital Betacam and has the ability to handle uncompressed video.

At NAB 2000, DPS ignited the show with its eBroadcast initiative and dpsNetstream technology. These included instantaneous web video output from its new version of dpsVelocity, which featured ultra-fast output of the most popular web video formats, including Ligos GoMotion-powered MPEG-1 and MPEG-2, RealNetworks RealVideo, Microsoft AVI and Apple QuickTime. The new version of dpsReality expanded the definition of Studio Digital Disk Recorder (SDDR) by adding features such as real-time output to popular web-based streaming media formats and real-time output to multicast web servers, along with deck emulation, unrivaled media handling capabilities with support for every major studio file format, improved networking, expanded audio effects and an all-new compositing interface with a direct connection to eyeon Software's Digital Fusion Version 3.0. Strategic agreements with Ligos Technology and RealNetworks enabled the integration of Ligos GoMotion MPEG codec technology and the RealMedia format into the industry-leading dpsNetstream architecture to deliver real-time encoding across DPS's Post Production product lines.

Also at NAB 2000, DPS unveiled a new set of plug-ins enabling compatibility with Adobe Premiere, for users who coveted the performance of DPS' popular dpsReality hardware but were reluctant to leave their familiar Adobe Premiere editing interface.

Security

In 1998 DPS combined its proven digital-disk recording technology with sophisticated software tools and networking capability to create a new security product: the Digital Detective, a truly integrated digital video time-lapse event recorder. The Digital Detective combined a digital video recorder, a motion detector, a multiplexer and a text inserter, plus it had the capability of being accessed remotely.

At the Digital Detective's first major trade show, the 1999 International Security Conference, it was selected to be among twenty-three products designated as "The Industry's Finest" and it went on to win the "Product Achievement Award." Having developed and proven the technology, in late 1999 DPS successfully sold the Digital Detective and the Security Products division to a leading global company specializing in security products.

Broadcast

A key contributor to the quality and remarkable capabilities of DPS's computer video products has been our lengthy experience in the broadcast studio field, and our traditional broadcast product line is now stronger than ever. In the fall of 1997 we introduced a new product, the DPS V-Clips. This is a rackmount full-motion video and still store system, with the unique capability to record real-time, full-frame video and synchronized audio, all instantly accessible through a powerful visual database and keyword search engine. In 1998 we brought out another innovative product, the DPS Whiplash. This is a powerful disk-based slow motion and instant replay system, which uses a proprietary software algorithm to dynamically optimize field and frame data to provide ultra-smooth slow motion playback. Also new for 1998 was the DPS-470AV Serial Digital Component Audio-Video Synchronizer, equally suited for work in analog, digital or hybrid broadcast studios. The 470AV won a "Pick Hit" award at its NAB '98 introduction.

At NAB 2000 DPS introduced two innovative new studio products: the DPS-475 and DPS-575 Multi-Function Analog/Digital AV Synchronizers. Equally suited for analog, digital or hybrid facilities, these synchronizers represent the ideal choice for broadcasters making the transition to digital television (DTV). Available in video only and audio/video configurations, they provide an ideal bridge from analog video signals, such as satellite and microwave feeds, to digital production facilities. The DPS-475 is an NTSC only model while the DPS-575 is an auto-sensing dual standard (PAL/NTSC) device. Both models incorporate a 12-bit adaptive 3-dimensional comb filter decoder of DPS' own design.

Research and Development for both of DPS's major product lines – Broadcast and Post Production – is accomplished by one tightly-knit group of people, working together to ensure that ground-breaking innovations and advances are shared by all our products.

Digital Processing Systems' corporate headquarters and manufacturing facilities are located just north of Toronto, Ontario, Canada. Operations for the Americas are headquartered near Cincinnati, Ohio. A United Kingdom office oversees European, African and Middle Eastern operations from London, and Asia and Pacific Rim countries are serviced by our office in Sydney, Australia.

APPENDIX K: WARRANTY

Warranty Statement

Unless specifically stated otherwise in writing, Digital Processing Systems Incorporated (DPS) warrants the original purchaser that DPS manufactured products will be will be free from defects in material and workmanship for a period of two years from the date of purchase. Should a product, in DPS' opinion, malfunction within the warranty period, Digital Processing Systems will repair or replace the product without charge for parts or labor. Repaired items may incorporate new or reconditioned replacement parts, at the sole discretion of DPS. All defective parts become the property of DPS. This warranty does not apply to products that have been damaged due to misuse, accident, unauthorized alterations, unauthorized repairs or modifications.

Warranty Limitations

This warranty covers only equipment and software manufactured by Digital Processing Systems, Inc. Certain DPS system products contain vendor items, such as hard disk drives and computer motherboards, which are separately warranted by the original equipment manufacturer.

All warranties, expressed or implied, for DPS Products are limited to two years from the date of purchase and no warranties, expressed or implied, will apply after that period. The distributor, its dealers and customers agree that Digital Processing Systems shall not be liable for any loss of use, revenue or profit.

Digital Processing Systems makes no other representations of warranty as to fitness for purpose of merchantability or otherwise in respect to any of the products sold to the distributor pursuant to this agreement. The liability of Digital Processing Systems in respect of any defective products will be limited to the repair or replacement of such products.

In no event shall Digital Processing Systems be responsible or liable for any damages arising from the use of such defective products whether such damages be direct, indirect, consequential or otherwise and whether such damages are incurred by the distributor or third party.

Warranty Service

Units requiring repair under warranty may be sent directly to Digital Processing Systems. To obtain service under this warranty, the purchaser must first contact the DPS customer service department in order to receive a return for repair authorization number. Purchasers should contact the appropriate repair location from those listed below:

U.S.A. and Latin America

Digital Processing Systems, Inc.
Customer Service Department
11 Spiral Drive, Suite 10
Florence, KY 41042
859-371-5533
Fax: 859-371-3729
support.us@dps.com

Canada

Digital Processing Systems, Inc.
Customer Service Department
70 Valleywood Drive
Markham, Ontario L3R 4T5 Canada
905-944-4000
Fax: 905-944-4200
support.ca@dps.com

Europe

Digital Processing Systems, Ltd.
Customer Service Department
Romans Business Park, Unit 9
East Street,
Farnham, Surrey GU9 7SX U.K.
+44 1252 718 300
Fax: +44 1252 718 400
support.uk@dps.com

Asia-Pacific

Digital Processing Systems, Inc.
Customer Service Department
858 King Georges Road
South Hurstville, N.S.W. 2221
Sydney, Australia
61-2-9547-0088
Fax: 61-2-9547-0988
support.au@dps.com

Units returned for repair must display the return authorization number clearly on the packaging. Units shipped without an RMA number will not be accepted. Proof of purchase (including the date of purchase) and a detailed note describing the nature of the problem must be included.

IMPORTANT: When shipping your unit, pack it securely and ship it prepaid and insured. Digital Processing Systems will not be held liable for damage or loss to the product in shipment. Within the continental United States, repaired items will returned to the purchaser prepaid via a surface freight carrier of DPS' choice. If another method of shipping is desired, it must be clearly specified in writing and all priority return freight charges are the responsibility of the purchaser. Outside the U.S., return freight charges for repaired items will be the responsibility of the purchaser.

APPENDIX L: COMPLIANCE

FCC Compliance Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense. Shielded cables must be used with this unit to ensure compliance with the Class A FCC limits.

WARNING: Changes or modifications to this unit not expressly approved by Digital Processing Systems, Incorporated could void the user's authority to operate the equipment.

Canadian Compliance Statement

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

EEC Declaration of Conformity

Application of Council Directive(s):	89/336/EEC - The EMC Directive
Manufacturer's Name:	DIGITAL PROCESSING SYSTEMS INC.
Manufacturer's Address:	70 Valleywood Drive Markham, Ontario Canada L3R 4T5
European Representative's Name:	Pete Cunningham
European Representative's Address:	Romans Business Park, Unit 9 East Street, Farnham Surrey GU9 7SX UK
Equipment Type/Environment:	Information Technology Equipment
Trade Name and Model Number:	DPS-475/DPS-575/ DPS-475AV/DPS-575AV
Year of Manufacture:	2000

Standards to which Conformity is Declared:

• EN 55022:1998	Class A - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment.
• EN 55103-2:1996	Electromagnetic Compatibility Requirements - Product Family Standard - Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use.

WARNING: This is a class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive and Standards.

MANUFACTURER:

Signature:
Full Name: Peter Ling
Position: Director of Operations
Place: Markham, Ontario, Canada
Date: 29 June, 2000