PatchAmp
PA-6000-310 Differential Input Analog Distribution Amplifier

March 13, 2003

PA-6000-310

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PA-6000-310 Differential Input Analog Distribution Amplifier with Signal Monitor

Technical Specifications:

Applications:
Analog Video
Analog High Definition
RF

Monitoring:
Signal Loss
Black Detect
Frozen Picture
High/Low Video Level
Power Health

Input:
Input Type: Differential
Number of Inputs: 1 or 2
Video Input Level: 1Vp-p nominal
Max. Input Level: 2.5Vp-p centered at OV
Input Impedance: 75 Ohm bridging or HIZ
Coupling: A.C or D.C.
Input Return Loss: >40dB to 5 MHz
Common Mode: 10 Vp-p
Common Mode Rejection Ratio:
> 40dB to 10kHz

Outputs:
Number of Outputs: 9 or Dual 4
Connector: PCB Edge Launch BNC
Impedance: 75 Ohm
Return Loss: >40dB to 5MHz
Phase Match Between Outputs:
< +/- 0.2° at 3.58MHz
Output Isolation: >35dB at 5MHz
Response Variation:
< 0.1dB, 1 to 5 loads at 5 MHz

Performance:
Gain Range: +/- 3dB
Frequency Response:
< +/- 0.05dB to 5MHz
+/- 0.2dB at 20MHz
> -3dB at 120MHz typically
Differential Gain (10-90% APL): < 0.15%
Differential Phase (10-90% APL): < 0.15%
Line Window Tilt: < 0.20%
Field Rate Window Tilt: < 0.20%
S/N: > 70dB
Hum: < 1 mVp-p
Propagation Delay: 15 +/- 1.0 nS

Indicators:
Signal present
PS Current

Equalization:
Range: 250 ft Belden 1694A cable
Response:
< +/- 0.05 dB to 5 MHz
< +/- 0.15 dB to 10MHz

Power System:
Input Voltage: +48 V dc
Power Dissipation: < 3 Watts
Hot Swappable: Yes
(True hot swappable power before signal)

External Power Supply:
AC Input: Universal
Volts: 100-240 AC
Frequency: 47-63 Hz
Redundant: Yes (N+1)
Hot Swappable: Yes

Temperature:
Performance: 5 - 40°
Operating: 0 - 50°

Jumper settings for the PA-6000-310:

1) Dual channel, Unbalanced, AC coupling, int 75ohm term:

JPR7:	1-2 (ch1 BNC/GND)
JPR9:	15-16 (ch2 term)
JPR9:	9-10 (ch2 BND/GND)
JPR9:	3-4 (connects J12 BNC to channel 2 input)
JPR16:	3-4 (ch1 term)

2) Dual channel, High Z:

JPR7:	1-2 (ch1 BNC/GND)
JPR9:	9-10 (ch2 BND/GND)
JPR9:	3-4 (connects J12 BNC to channel 2 input)

3) Dual channel, DC coupling: same as above, but add DC coupling jumpers:

JPR1:	1-2, 3-4 (channel 1 DC Coupling)
JPR7:	1-2 (ch1 BNC/GND)
JPR9:	15-16 (ch2 term)
JPR9:	9-10 (ch2 BND/GND)
JPR9:	3-4 (connects J12 BNC to channel 2 input)
JPR9:	5-6, 7-8 (channel 2 DC Coupling)
JPR16:	3-4 (ch1 term)

4) Single channel, 9 output:

JPR16:	1-2 (connects both input amps to J1)
JPR9:	1-2 (connects Out9 to J12)

For single channel input term, install JPR9: 15-16
For DC coupling install JPR1:1-2, 3-4 and JPR9: 5-6, 7-8

6	5	4	3	2	1

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

D C B A

J6 73415-2740 · J5 73415-2740 · J4 73415-2740 · J3 73415-2740 · J1 73415-2740 · JPR2 SM2MD08SXYY · JPR5

R27 TBD 1% INPUT1 · R22 TBD 1% AN_B · RJ1 0 Ohm · P1-1 · P1-2 · P1-3 DIG_A · P1-4 AN_A · P1-5 +48V · P1-6 · P1-7 DIG_B · P1-8 · P1-9 · P1-10

D10 TBD · FC2 FC0805 600 · FC1 FC0805 600 · +48V · F1 200mA · S2B:100Vr/If=2A/S2BMSCT-ND · D4 · R9 TBD 1% · R39 10 · I_SENSE+ · I_SENSE-

AGND · INPUT1 · R47 75 · C23 TBD · R10 22.1K · R3 604 · R6 100 · R5 604 · R70 TBD CW · R67 TBD · VINPUT+

C36 .047uF 100V · C37 4.7uF 75V · C56 4.7uF 100V · L1 1uH · L8 10uH · C3 .047uF 100V · C58 4.7uF 100V · C57 4.7uF 100V · C47 10uF 75V

C2 33uF · C1 33uF · C15 33uF · C16 33uF · R7 100 1% · R4 22.1K 1% · U3-A CLC412 · R1 604 · L2 .22uH · R12 75 · R41 75 · R8 604 · U3-B · U3-C

C12 10uF 10V · C27 TBD · C28 10uF 10V · C29 TBD · -5V

R21 75 1% · R20 75 1% · R19 75 1% · R18 75 1% · R28 75 1%

U4 · VINPUT+ · OPT._ON/OFF · VINPUT- · VOUT+ · GND · VOUT-

R42 · C24 TBD · R11 100 LEVEL CW · R40 75 · R13 500 BANDWIDTH CW · R14 100 · C25 TBD · U1-A AD8010D · R15 604 1% · R16 500 RESPONSE CW · R17 221 · C4 330pf · C21 TBD · R36 TBD · R66 182 1% · C14 4.7pf

R30 75 1% · C26 10uF 10V · R50 10K · +5V

U9 LM7805CT · C22 4.7uF 20V · C10 10uF 10V · U2 LM7905CT · C9 4.7uF 20V · C11 10uF 10V · -5V

TP1 · TP2 · R49 1K · R48 1K · R2 2.2 1% · L3 22nH

FN1

R32 475 1% · R31 22.1 1% · R33 475 1% · MMBD914LT1 D1 · MMBD914LT1 D3 · MMBD914LT1 D2 · MMBD914LT1 D5 · U10-A LM339M · R60 47.5K · R61 475 1% · R63 10K · DS11 H178CRD RED · VIDLEVA · VIDSTATA · R35 47.5K · .47uF C13

R62 475 1% · DS12 H178CGD GREEN · U10-B LM339M · U10-C LM339M · U10-D LM339M · R65 10K · R64 10K · U10-E LM339M

C18 TBD · C19 10uF 10V · C30 TBD · C33 33uF · C32 .1uF · U1-B AD8010D · C17 TBD · C20 10V 10uF · C31 TBD

DRAWN:	DATED:	COMPANY:			
CHECKED:	DATED:	TITLE:			
QUALITY CONTROL:	DATED:	CODE:	SIZE:	DRAWING NO:	REV:
RELEASED:	DATED:	SCALE:		SHEET: OF	

REVISION RECORD			
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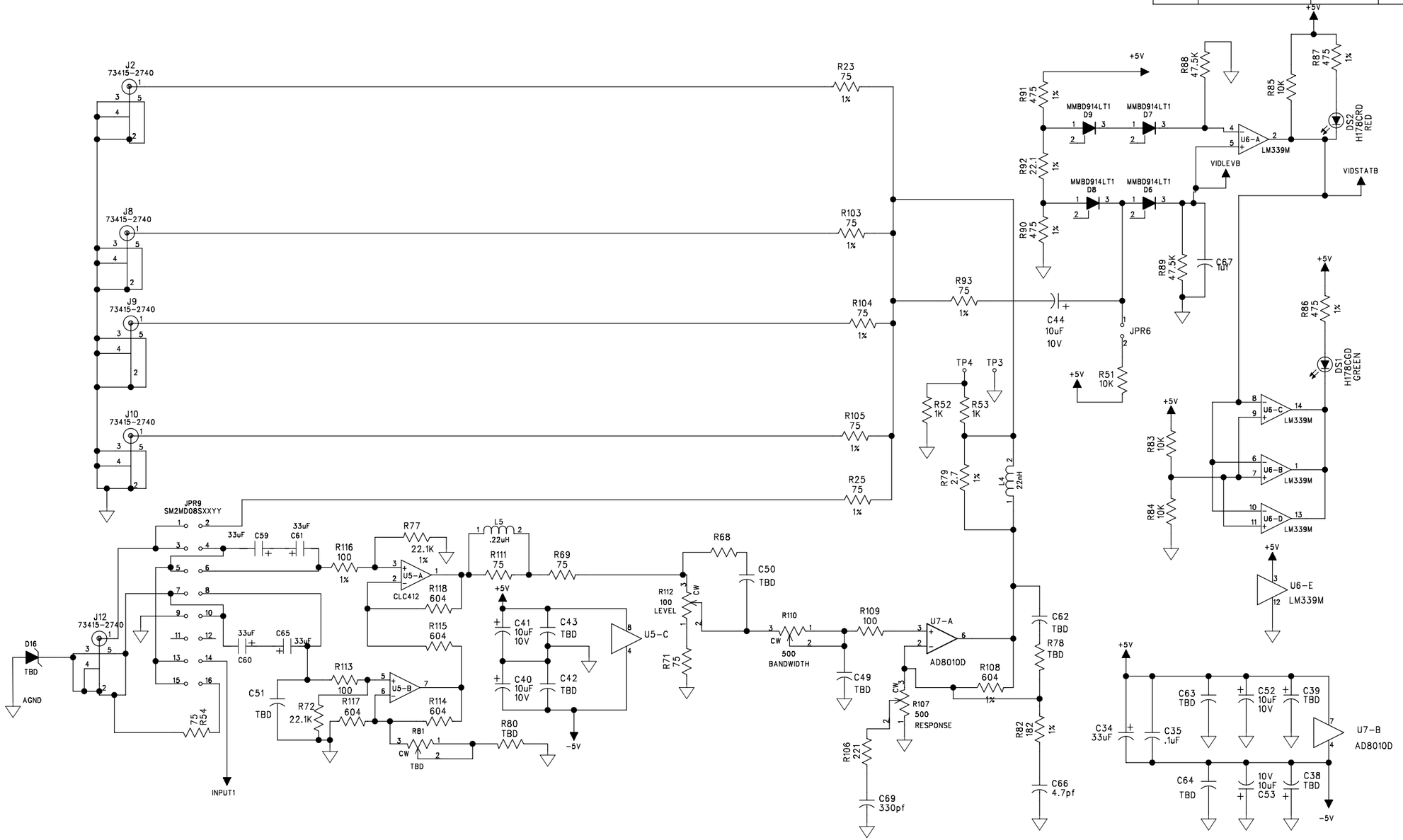

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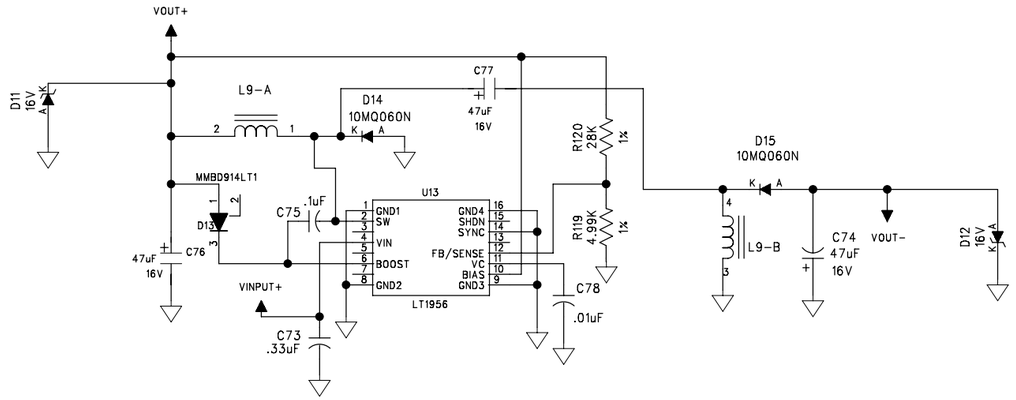

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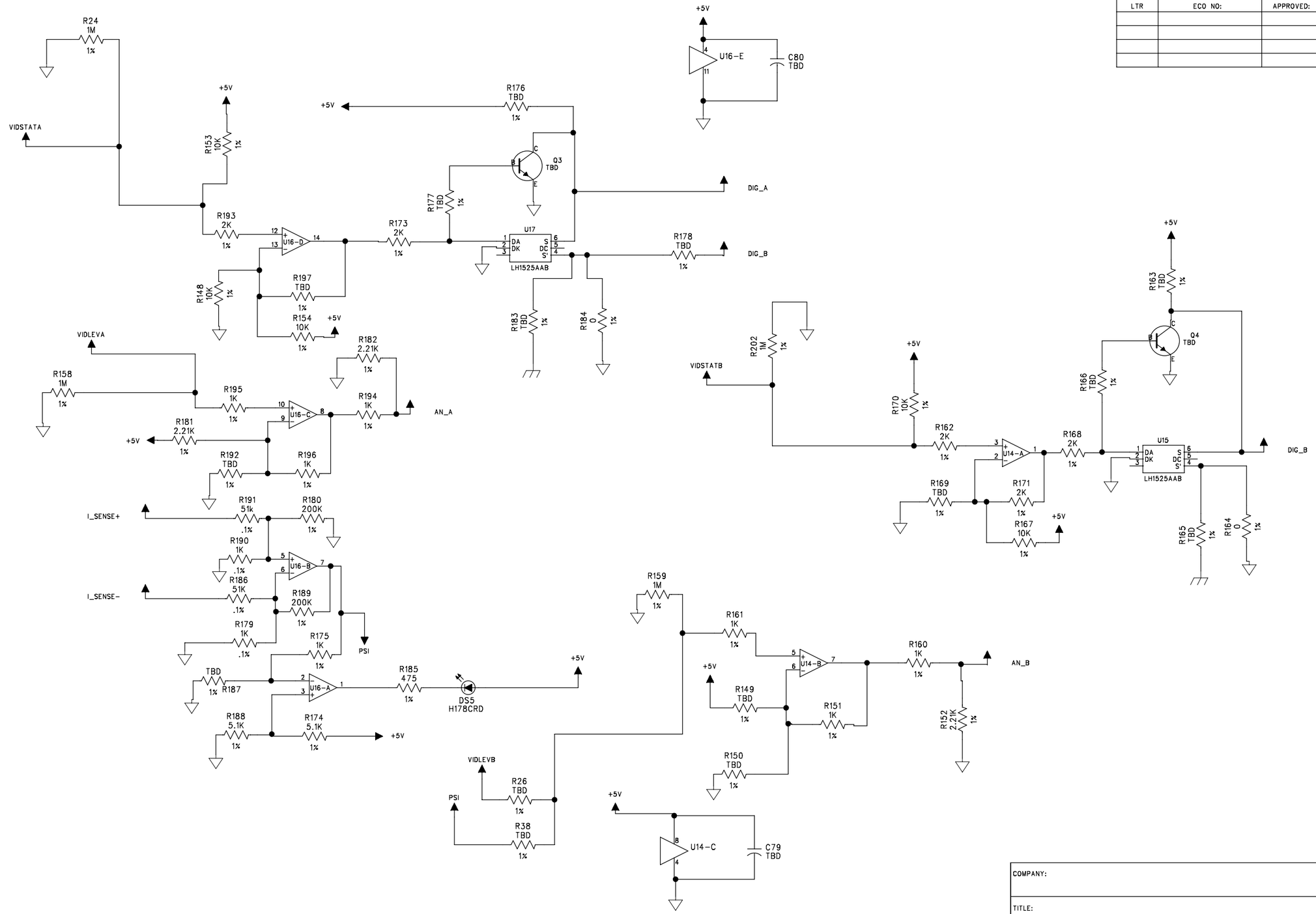

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QUALITY CONTROL:	DATED:				
RELEASED:	DATED:	SCALE:		SHEET: OF	

PA-6000-310 VIDEO DISTRIBUTION AMPLIFIER

S/N [redacted]

REV [redacted]

VIEWED FROM PRIMARY SIDE

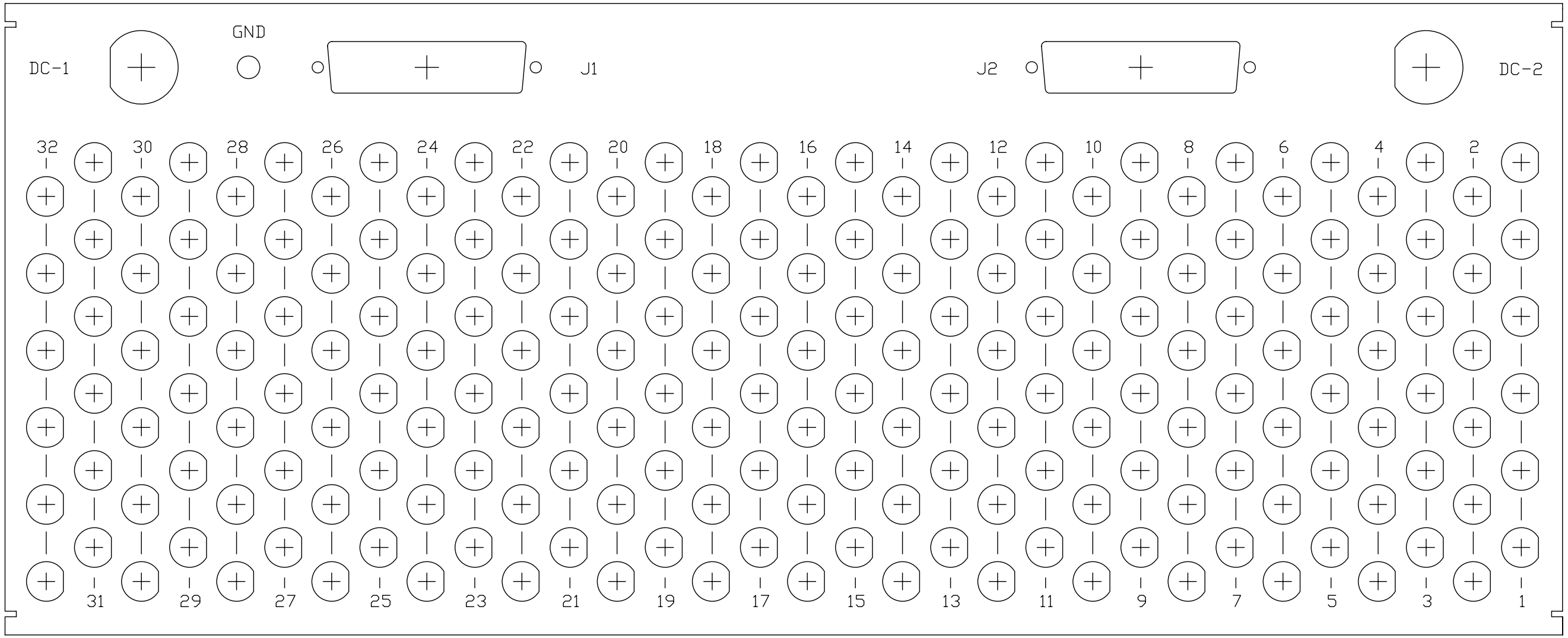
PATCHAMP P/N: VIDEO DA BD. REV B	
EST P/N: 040318	
DESIGNED BY: EST	DATE: 06MAY04
PRIMARY SIDE SILKSCREEN	

Item	Qty	REF-DES	MFG.	PART NUMBER	PART DESC	VALUE	TOLERANCE	WATT	VOLTAGE RATING	
1	8	C1, C2, C15, C16, C59, C60, C61, C65	KEMET	T491C336K016AS	CAP TANTALUM C SIZE	33uF	10%		16V	
2	12	C10, C11, C12, C19, C20, C26, C28, C40, C41, C44, C52, C53	PANASONIC	ECS-T1AX106R	CAP TANTALUM B SIZE	10uF	20%		10V	
3	1	C13	PANASONIC	ECJ-3VB1C474K	C1206	.47uF	10%		16V	
4	2	C14, C66	PANASONIC	ECJ-2VC1H050C	C0805	5pf	10%		50V	
5	10	C17, C18, C23, C27, C29, C42, C43, C51, C63, C64	TBD	TBD	C0805	TBD	10%		50V	
6	4	C21, C62, C79, C80	TBD	TBD	CAP CERAMIC CHIP TYPE 0805	TBD				
7	4	C24, C25, C49, C50	TBD	TBD	C0805	TBD				
8	2	C3, C36	AVX	12101C473KAT2A	C1210	.047u	F 10%		100V	
9	4	C30, C31, C38, C39	AVX	TAJB106K020R	CAP TANTALUM B SIZE	10uF	20%		20V	
10	2	C32, C35	KEMET	C0805C104J5RACTU	CAP CERAMIC CHIP TYPE 0805	.1uF	5%			
11	2	C33, C34	PANASONIC	ECS-T1DD336R	CAP TANTALUM D SIZE	33uF	20%		20V	
12	1	C37	THROUGHHOLE	2222 021 39339	CAP ELECTROLYTIC	33uF	20%		100V	
13	2	C4, C69	YAGEO	0805CG331J9B200	CAP CERAMIC CHIP TYPE 0805	330pf	5%		50V	
14	1	C47	THROUGHHOLE	2222 021 39479	CAP ELECTROLYTIC	47uF	10%		75V	
15	3	C56, C57, C58	TBD	TBD	CERAMIC CHIP CAPACITOR	4.7uF	20%		100V	
16	1	C67	KEMET	C1206C105K4RACTU	C1206	1uf	10%		16V	
17	1	C73	TBD	TBD	C1210	.33uF	10%		100V	
18	3	C74, C76, C77	TBD	TBD	CAP TANTALUM D SIZE	47uF	20%		16V	
19	1	C75	TBD	TBD	C0805	.1uF	10%		25V	
20	1	C78	TBD	TBD	C0805	.01uF	10%		50V	
21	2	C9, C22	PANASONIC	ECS-T1DX475R	CAP TANTALUM B SIZE	4.7uF	20%		20V	
22	8	D1, D2, D3 D5, D6, D7, D8, D9	ON SEMICONDUCTOR	MMBD914LT1						
23	2	D10, D16	GENERAL	TBD		16V				
24	2	D11, D12	TBD	TBD	DIODE	16V				
25	1	D13	TBD	TBD						
26	2	D14, D15	TBD	TBD	DIODE					
27	1	D4	MICROSEMI	S2B	RECTIFIER 2AMP SILICON	100V				
28	2	DS1, DS12	THROUGHHOLE	LUG53W	GREEN LED					

29	3	DS2, DS5, DS11	THROUGHHOLE	LUR53W	RED LED					
30	1	F1	THROUGHHOLE	MF-R017	FUSE, RESETTABLE, .20 LEAD SPACING				60	
31	2	FC1, FC2	STERWARD	HZ0805E601R-00	CHOKE 600OHMS	600				
32	3	FN1, JPR5, JPR6	TBD	TBD	JUMPER BERG 2 PIN .1 CENTERS					
33	10	J1, J2, J3, J4, J5, J6, J8, J9, J10, J12	TBD	73415-2740	CON BNC CARD EDGE 5 PIN					
34	2	JPR2, JPR9	SAMTEC	TMM-108-01-LDSM	16 PIN BERG JUMPER HEADER					
35	1	L1	PANASONIC	ELJ-PA1R0MF	INDUCTOR HIGH CURRENT POWER	1uH				
36	2	L2, L5	J.W. MILLER	PM1210-R22J	L1210	.22uH				
37	2	L3, L4	PANASONIC	ELJ-RE22NJF2	L0603	22nH	5%			
38	1	L8	NIC	ELJ-PA100KF	INDUCTOR HIGH CURRENT POWER	10uH				
39	1	L9	TBD	TBD	TRANSFORMER 1:01	20uH				
40	1	P1		BOARD EDGE FINGERS	CON 10 PIN EDGE					
41	2	Q3, Q4	TBD	TBD						
42	10	R1, R3, R5, R8, R15, R108, R114, R115, R117, R118	PANASONIC	ERJ-6ENF6040V	R0805	604	1%	1/10W		
43	2	R11, R112	TOCOS	G4STB101K		100				
44	1	R119	TBD	TBD	R0805	4.99K	1%	1/10W		
45	20	R12, R18, R19, R20, R21, R23, R25, R28, R30, R40, R41, R47, R54, R69, R71, R93, R103, R104, R105, R111	PANASONIC	ERJ-6ENF75R0V	R0805	75	1%	1/10W		
46	1	R120	TBD	TBD	R0805	28K	1%	1/10W		
47	4	R13, R16, R107, R110	TOCOS	G4STB501K		500				
48	4	R150, R152, R182, R192	PANASONIC	ERJ-6ENF2211V	R0805	2.21K	1%	1/10W		
49	6	R162, R168, R171, R173, R193, R197	PANASONIC	ERJ-6ENF2001V	R0805	2K	1%	1/10W		
50	2	R17, R106	PANASONIC	ERJ-6ENF2210V	R0805	221	1%	1/10W		
51	1	R170	PANASONIC	TBD	R0805	10K	1%	1/10W		
52	2	R174, R188	PANASONIC	ERJ-6ENF5111V	R0805	5.11K	1%	1/10W		
53	2	R179, R190	PANASONIC	ERA-6YEB102V	R0805	1K	0.10%	1/10W		
54	2	R180, R189	PANASONIC	ERJ-6ENF2003V	R0805	200K	1%	1/10W		
55	1	R186, R191	PANASONIC	ERA-6YEB513V	R0805	51K	0.10%	1/10W		
56	2	R2, R79	PANASONIC	9C08052A2R74FGHFT	R0805	2.7	1%	1/10W		

57	12	R27, R38, R149, R163, R165, R166, R176, R177, R178, R181, R183, R187	TBD	TBD	R0805	TBD	1%	1/10W		
58	4	R24, R158, R159, R202	PANASONIC	ERJ-6ENF1004V	R0805	1M	1%	1/10W		
59	2	R31, R92	PANASONIC	ERJ-6ENF22R1V	R0805	22.1	1%	1/10W		
60	9	R32, R33, R61, R62, R86, R87, R90, R91, R185	PANASONIC	ERJ-6ENF4750V	R0805	475	1%	1/10W		
61	4	R35, R60, R88, R89	PANASONIC	ERJ-6ENF4752V	RESISTOR THICK FILM TYPE 0805	47.5K		1/10W		
62	2	R36, R78	TBD	TBD	RESISTOR THICK FILM TYPE 0805	TBD		1/10W		
63	1	R39	THROUGHHOLE	41F10R-ND		10				
64	4	R4, R10, R72, R77	PANASONIC	ERJ-6ENF2212V	R0805	22.1K	1%	1/10W		
65	2	R42, R68	TBD	TBD	R0805			1/10W		
66	11	R48, R49, R52, R53, R151, R160, R161, R175, R194, R195, R196	PANASONIC	ERJ-6ENF1001V	R0805	1K	1%	1/10W		
67	13	R50, R51, R63, R64, R65, R83, R84, R85, R148, R153, R154, R167, R169	PANASONIC	ERJ-6ENF1002V	R0805	10K	1%	1/10W		
68	6	R6, R7, R14, R109, R113, R116	PANASONIC	ERJ-6ENF1000V	R0805	100	1%	1/10W		
69	2	R66, R82	TBD	TBD	R0805	182	1%	1/10W		
70	2	R67, R80	PANASONIC	TBD	R0805	TBD		1/10W		
71	2	R70, R81	TBD	3306F		TBD				
72	1	R9	TBD	TBD	R1210	TBD	1%	1/8W		
73	5	RJ1, R22, R26, R164, R184	PANASONIC	ERJ-6GEY0R00V	R0805	0	5%	1/8W		
74	4	TP1, TP2, TP3, TP4	TBD	TBD	TERMINAL W/POST					
75	2	U1, U7	ANALOG DEVICES	AD8010AR	VIDEO OUTPUT AMP					
76	1	U13	TBD	TBD	LT1956					
77	1	U14	ANALOG DEVICES	AD8602AR						

78	2	U15, U17	CLARE	LCA110LS	SOLID-STATE RELAY SMD 6-PIN					
79	1	U16	ANALOG DEVICES	AD8604AR						
80	1	U2	THROUGHHOLE	LM7905CT						
81	2	U3, U5	NATIONAL	LMH6715MA						
82	1	U4	THROUGHHOLE	BXA10-48D12		48Vin				
83	2	U6, U10	NATIONAL	LM339M						
84	1	U9	THROUGHHOLE	LM7805CT						



	PatchAmp, Inc. 20 E. KENNEDY ST., HACKENSACK, N.J. 07601 (201)457-1504		
ENGINEER: JT DRAWN BY: APPRV. BY:	32-CHANNEL REAR LAYOUT		
FILE NAME: 32POS	SIZE: D	DESCRIPTION: MECHANICAL	REV. A
LOCATION:	SCALE: 1 = 1	DATE: 06/17/04	SHEET 1 OF 1

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