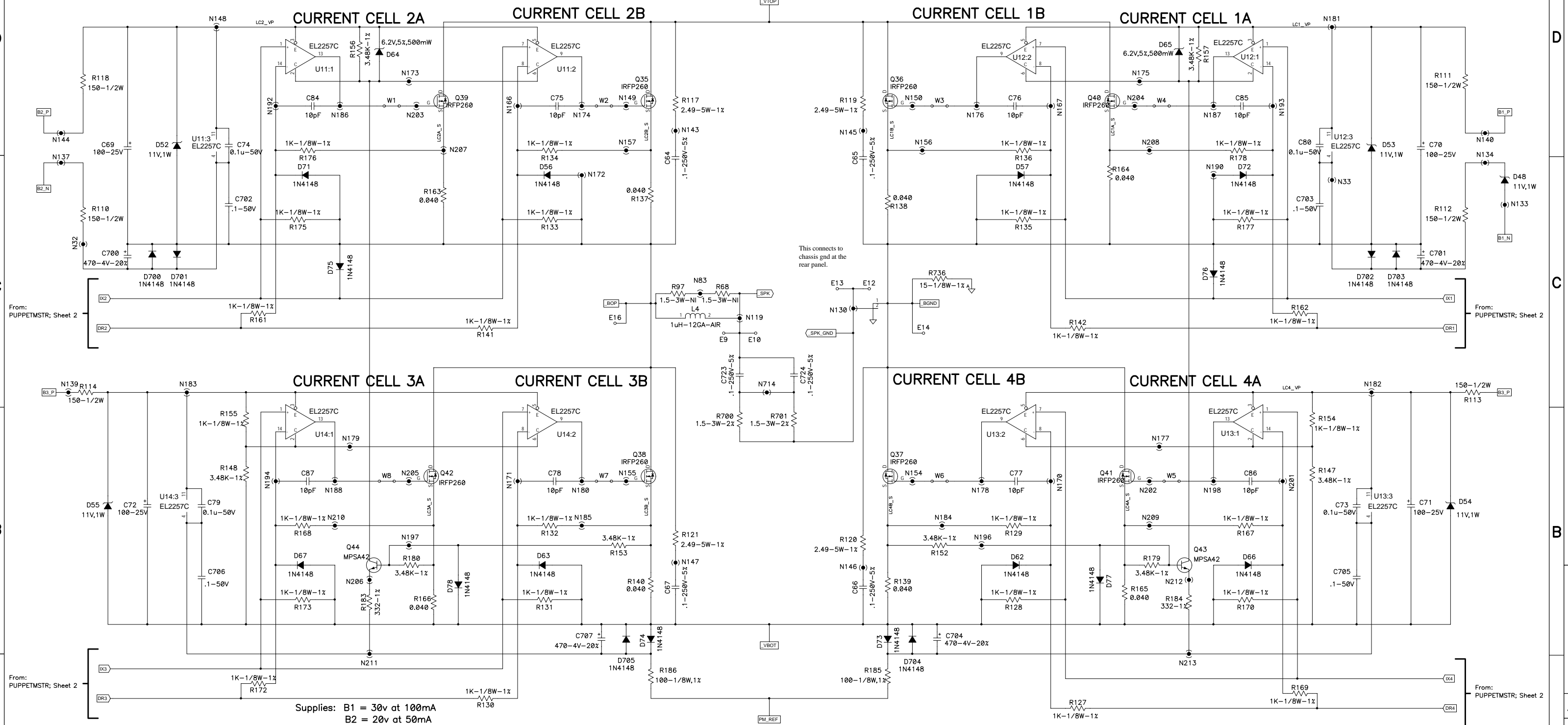


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# LC\_OUTPUTS



Supplies: B1 = 30v at 100mA  
 B2 = 20v at 50mA  
 B3 = 40v at 60mA  
 B4 = 27v at 50mA

1. THIS DRAWING USED IN CONJUNCTION WITH ASSEMBLY WP-000261-00 AND FABRICATION DRAWING PC-000171-00.
2. COMPONENTS WITH VALUE PREFIXED WITH A "\*" REPRESENT SMT COMPONENTS.
3. ALL CAPACITORS 100V, TOLERANCE 20% FOR ELECTROLYTIC TYPES, 10% ON ALL OTHERS.
4. R1 IS A POSITIVE TEMPERATURE COEFFICIENT RESISTOR MOUNTED TO HEAT SINK. RESISTANCE IS 100 MAX OHM COLD.

NOTES: UNLESS OTHERWISE SPECIFIED

QTY	ITEM NO.	PART NO.	DESCRIPTION	VENDOR
<b>PARTS LIST</b>				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DIMENSIONS PER ANSI Y14.5-1982 TOLERANCES ARE:			CONTRACT NO.	
DECIMALS	DECIMALS	ANGLES	APPROVALS	
.XX ±	.XXX ±	0	DATE	
DRAWN R. BALTHAZAR			1/25/99	
CHECKED				
ISSUED				
CAD SEED FILE NO.			PLOT DATE: Thu, May 04, 2000	
APPLICATION			SCALE NONE	
DO NOT SCALE DRAWING			DWG NO. SH-000261-00	
			SHEET 1 OF 7	

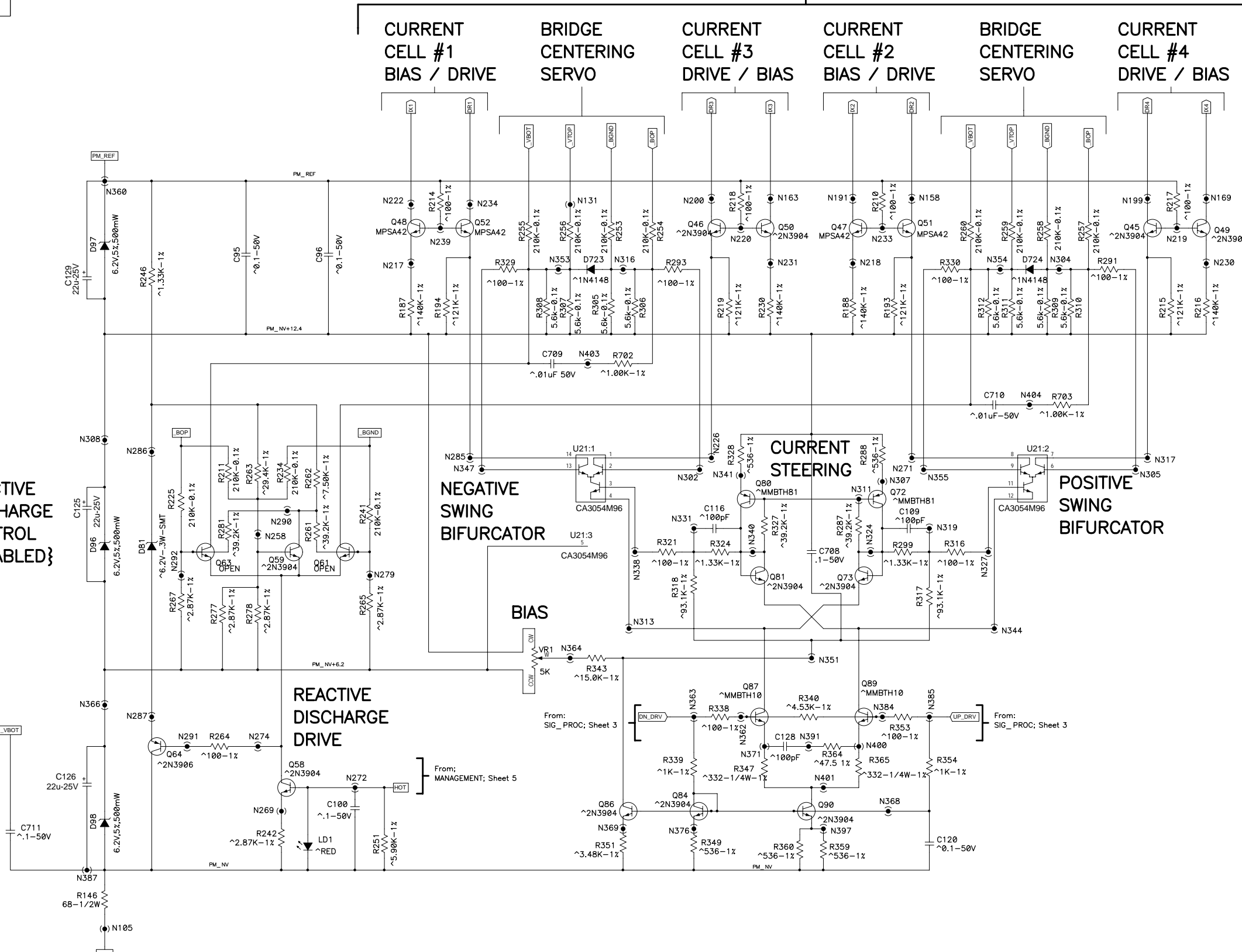
1 SH-000261-00

A

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# PUPPETMSTR

To:  
LC\_OUTPUTS; Sheet 1



REACTIVE DISCHARGE CONTROL {DISABLED}

NEGATIVE SWING BIFURCATOR

POSITIVE SWING BIFURCATOR

REACTIVE DISCHARGE DRIVE

CURRENT STEERING

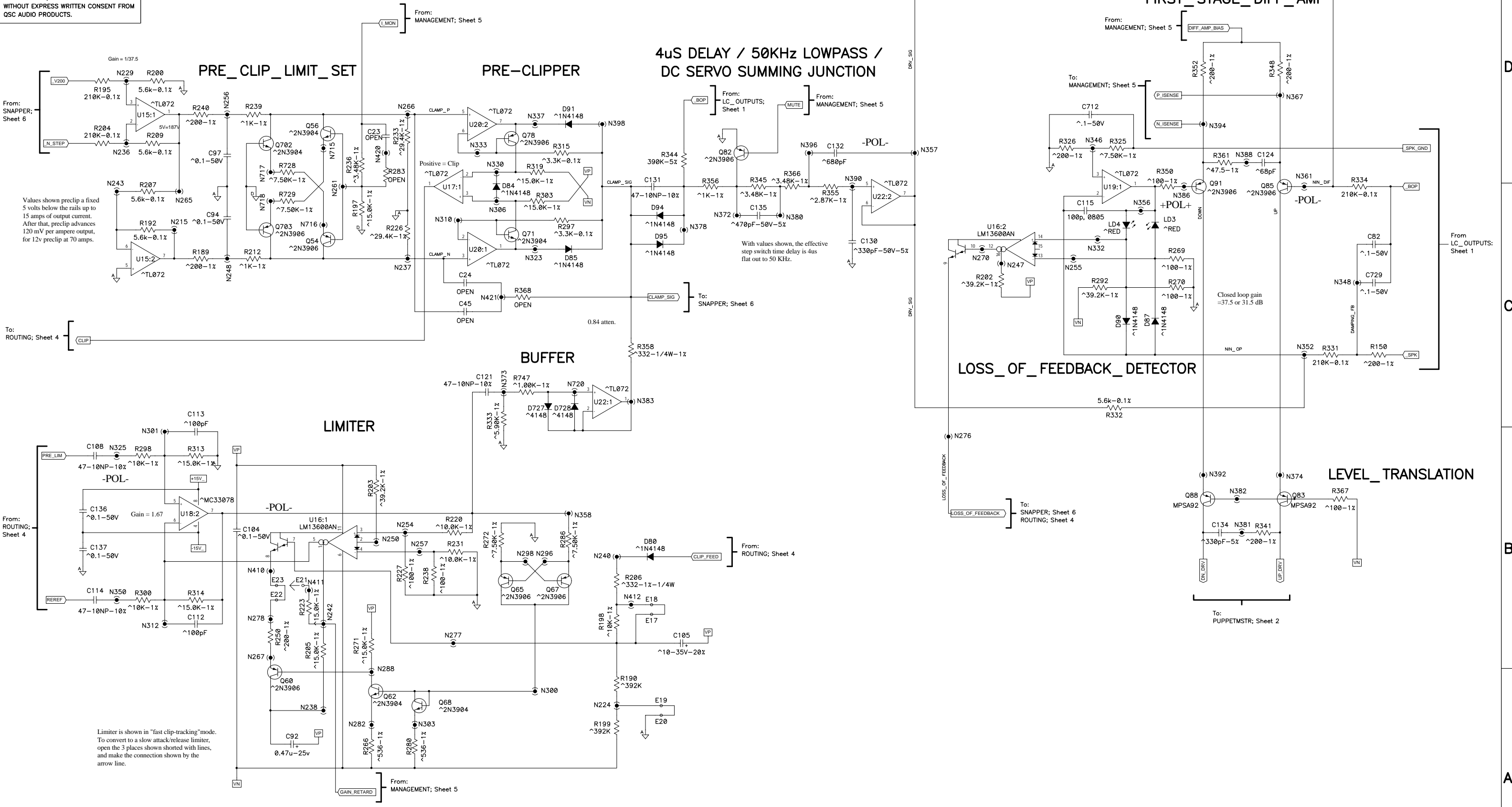
BIAS

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# SIG\_PROC

Gain = 1/37.5

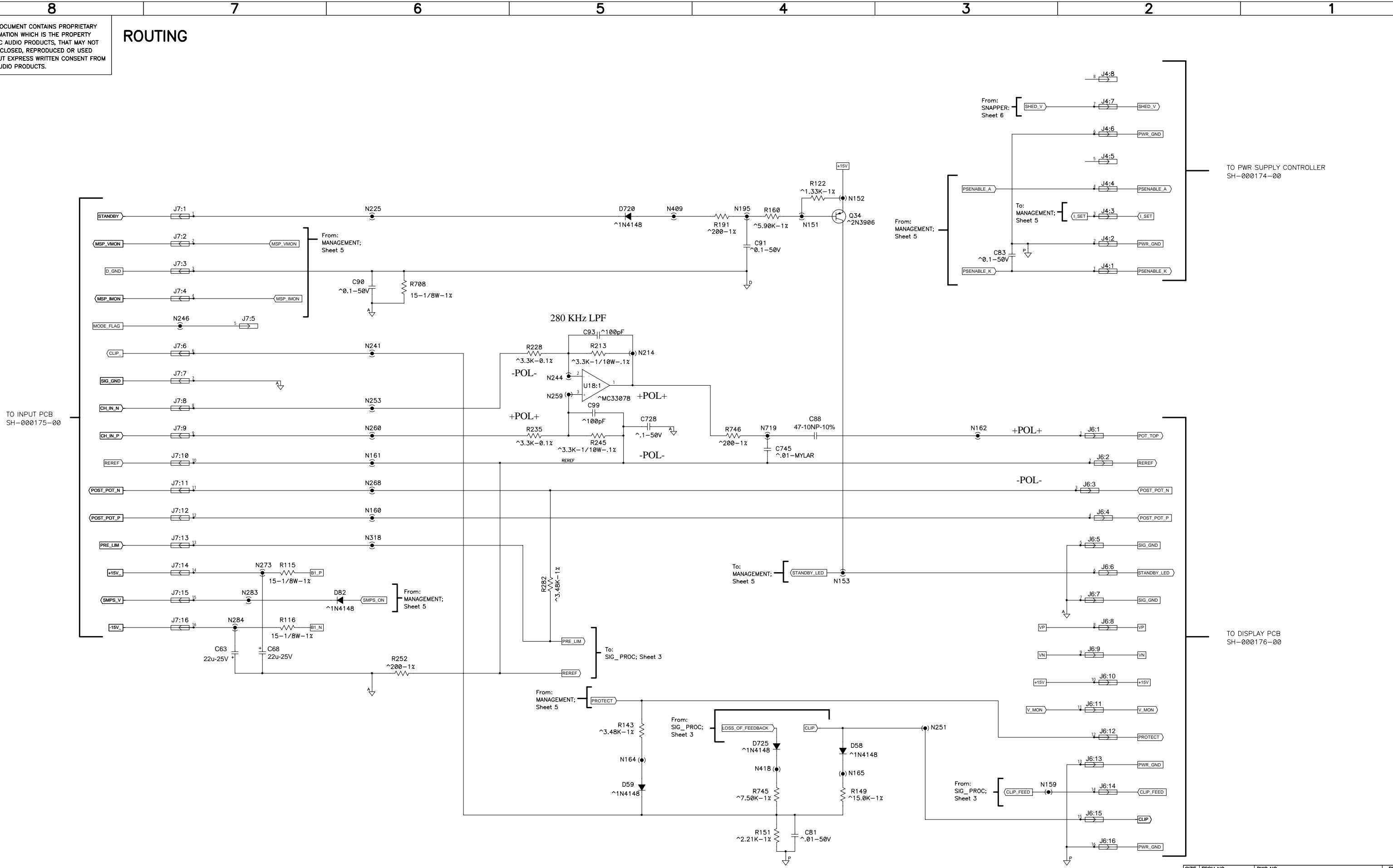
Values shown preclip a fixed 5 volts below the rails up to 15 amps of output current. After that, preclip advances 120 mV per ampere output, for 12v preclip at 70 amps.



Limiter is shown in "fast clip-tracking" mode. To convert to a slow attack/release limiter, open the 3 places shown shorted with lines, and make the connection shown by the arrow line.

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# ROUTING



DWG NO. SH-000261-00  
 REV. 4

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**MANAGEMENT**

**AMPLIFIER ACTIVATION CIRCUIT**

Nominal L\_SET = 3ma to 5ma. Amp is fully on at L\_SET > 1ma. Above 3ma fan is unaccelerated. From 3ma to 1ma speed rises. Below 1ma fan speed reduces back linearly to normal speed.

**FAN CONTROL**

**OVERTEMP KILL / REACTIVE DISCHARGE CONTROL**

**DIFF-AMP BIAS**

**MUTING**

600ms delay to enable audio.  
200ms delay to disable audio.

**THERMAL**

**CURRENT CUTBACK**

Current gain: 22,460.  
3.0 mA total set current results in 68A peak output.  
Minimum at full cut-back is 250 uA or 5.6A output.

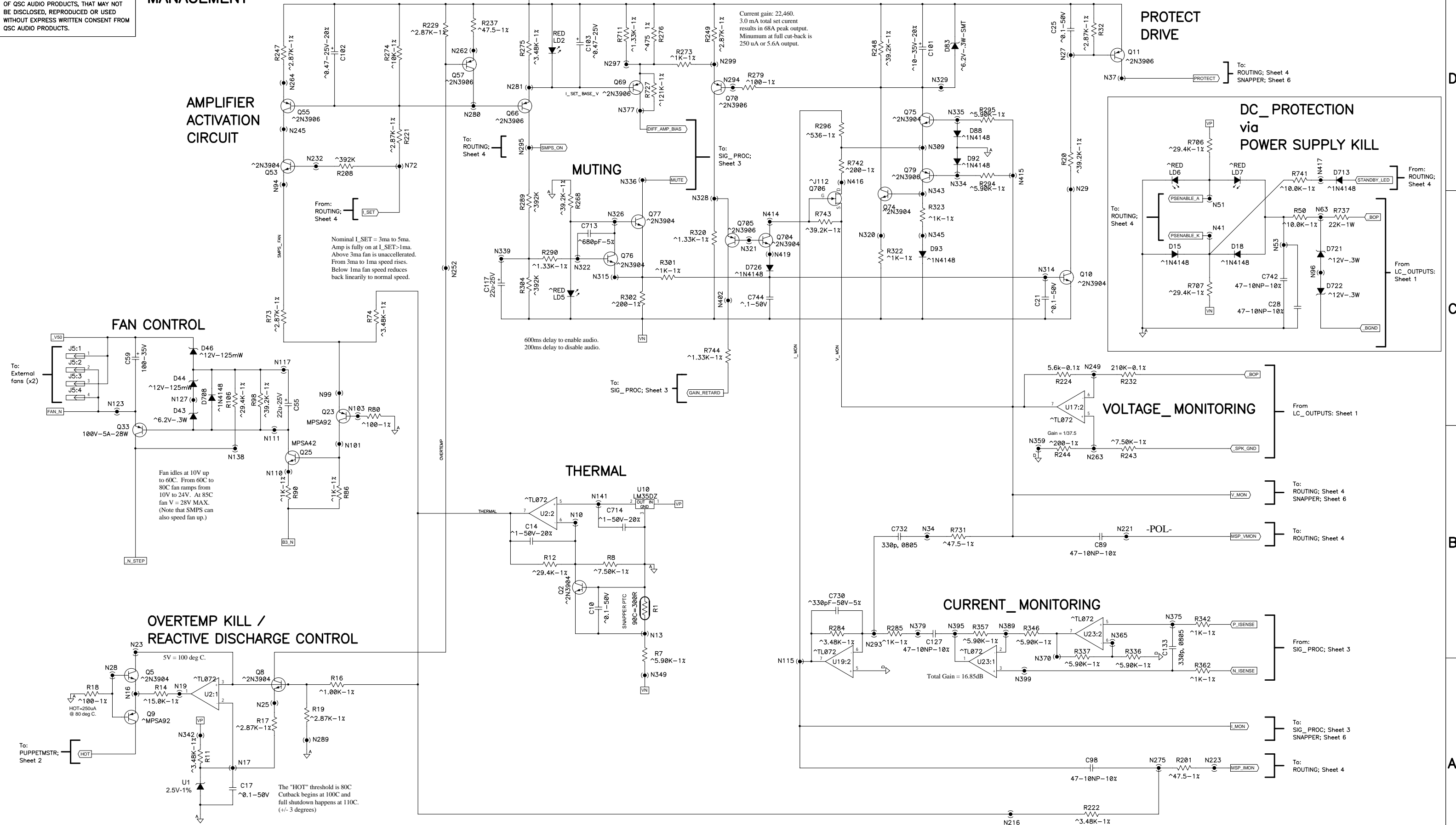
**CURRENT\_MONITORING**

Total Gain = 16.85dB

**PROTECT DRIVE**

**DC\_PROTECTION via POWER SUPPLY KILL**

**VOLTAGE\_MONITORING**



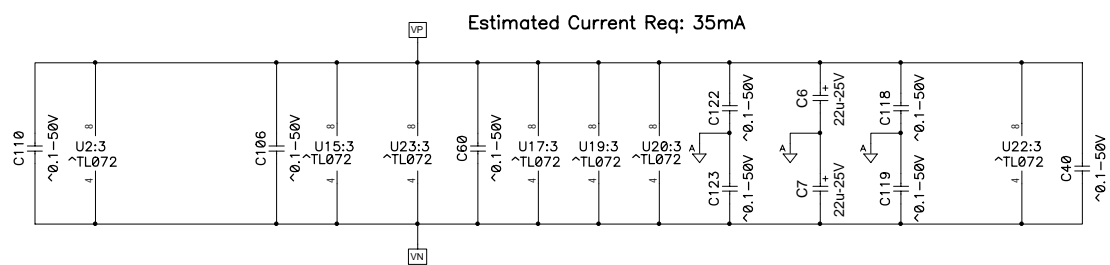
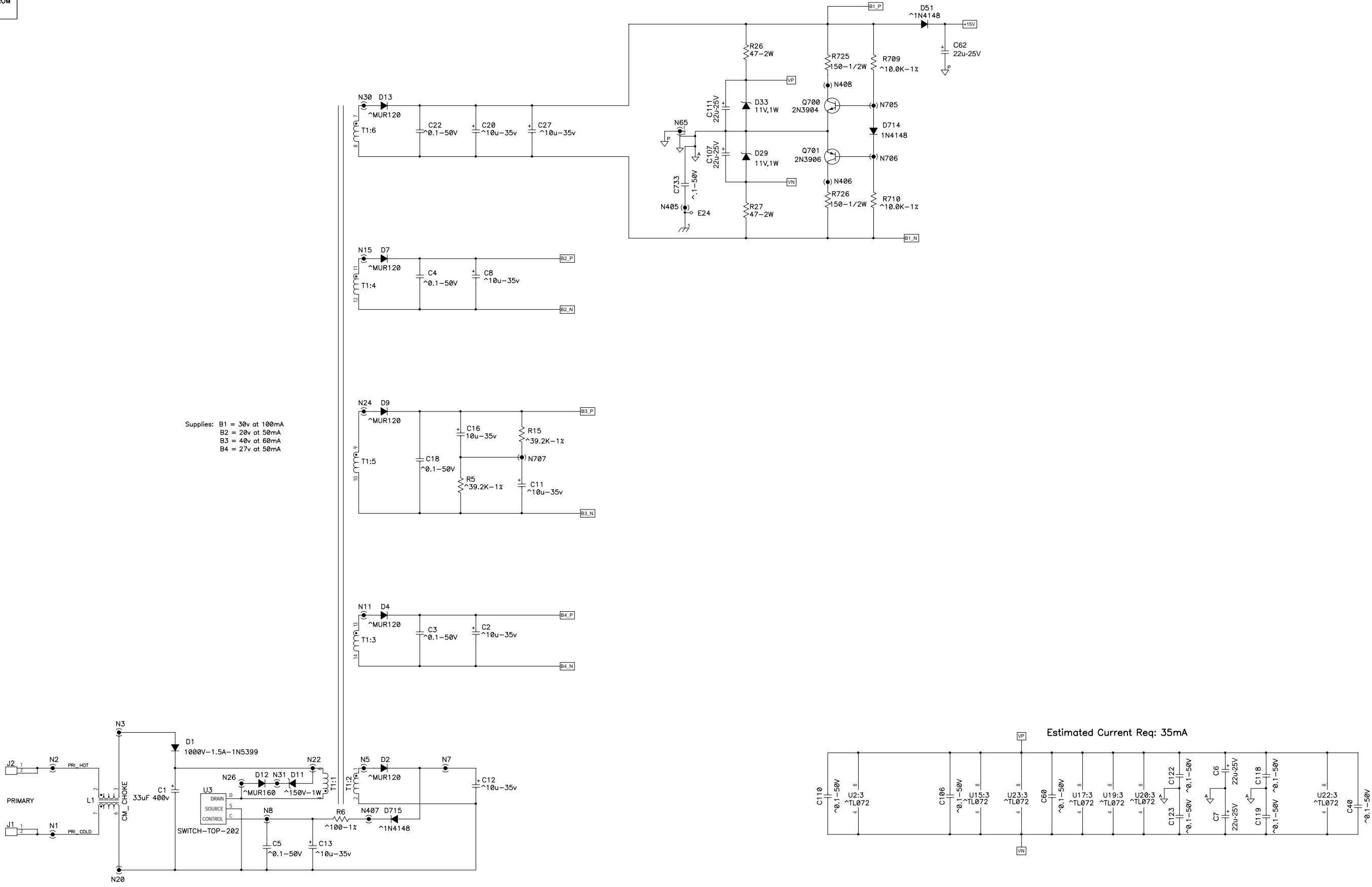
DWG NO. SH-000261-00 REV 5



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# HK\_SUPPLY

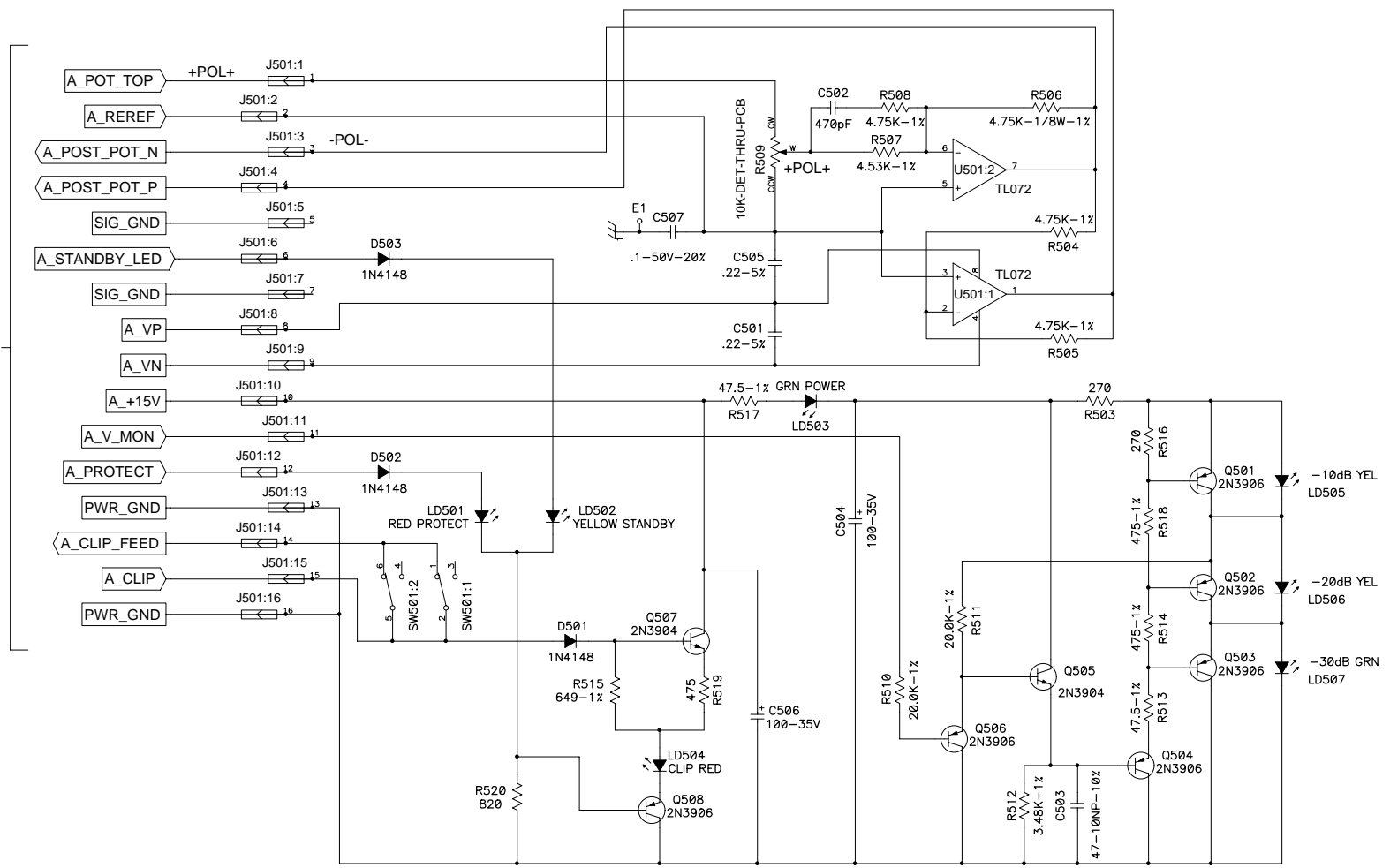
Supplies: B1 = 30v at 100mA  
 B2 = 20v at 50mA  
 B3 = 40v at 60mA  
 B4 = 27v at 50mA



Estimated Current Req: 35mA

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TO MAIN PCB  
SH-000171-00  
SHEET 4



- 4. CH 1 COMPONENTS NUMBERED 501-599.  
CH2 COMPONENTS NUMBERED 601-699.
  - 3. ALL CAPACITORS ARE IN MICROFARADS.
  - 2. ALL RESISTORS ARE IN OHMS, 1/4W, 5%.
  - 1. THIS DRAWING USED IN CONJUNCTION WITH ASSEMBLY WP-000176-00  
AND FABRICATION DRAWING PC-000176-00.
- NOTES: UNLESS OTHERWISE SPECIFIED

QTY	ITEM NO.	PART NO.	DESCRIPTION	VENDOR
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DIMENSIONS PER ANSI Y14.5-1982 TOLERANCES ARE: DECIMALS    DECIMALS    ANGLES .XX ±        .XXX ±        0			CONTRACT NO.	
DRAWN P. Ierymenko CHECKED RCM ISSUED TIM SHOOK CAD SEED FILE NO.			DATE 11-30-95 5-13-98 5-15-98	
APPLICATION			DO NOT SCALE DRAWING	
WP-000176-00    PL 9.0			SIZE D	
NEXT ASSY    USED ON			FSCM NO.    DWG NO. SH-000176-00	
			PLOT DATE: Thu May 04, 2000	
			SCALE NONE    CAD FILE NO. Sh176-b.sch    SHEET 1 OF 2	

**QSC AUDIO PRODUCTS, INC.**  
COSTA MESA, CALIFORNIA

**SCHEMATIC DIAGRAM**  
**DISPLAY PCB, PL 9.0 & 6.0**

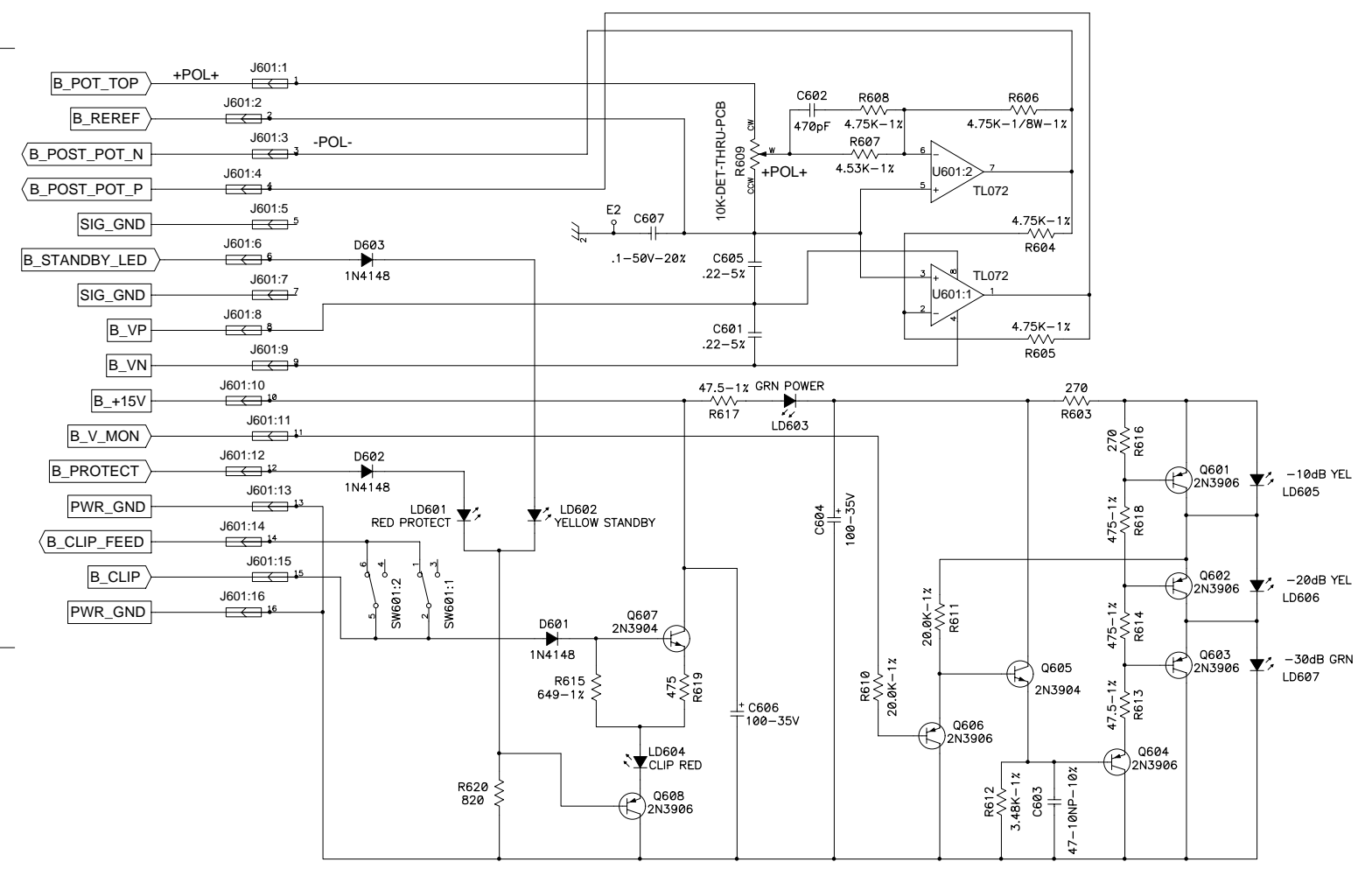
1 SH-000176-00 DWG NO.

A



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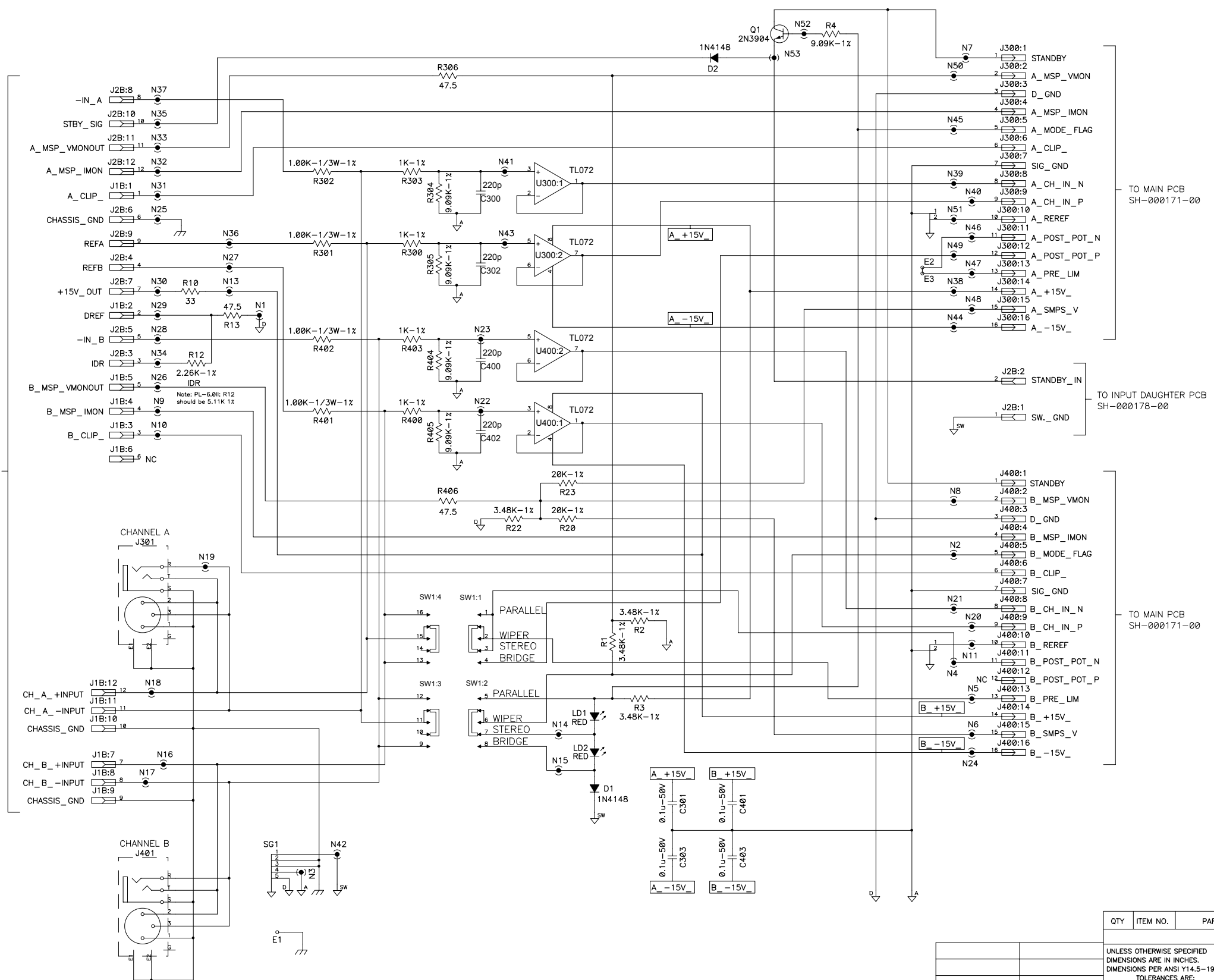
TO MAIN PCB  
SH-000171-00  
SHEET 4



SIZE	FSCM NO.	DWG NO.	REV
D		SH-000176-00	
SCALE	CAD FILE NO.	SHEET	REV
	Sh176-b.sch	2 OF 2	

REV 2 SH-000176-00 DWG NO.

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1. THIS DRAWING USED IN CONJUNCTION WITH ASSEMBLY WP-000265-00 AND FABRICATION DRAWING PC-000175-00.

NOTES: UNLESS OTHERWISE SPECIFIED

QTY	ITEM NO.	PART NO.	DESCRIPTION	VENDOR
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DIMENSIONS PER ANSI Y14.5-1982 TOLERANCES ARE:			CONTRACT NO.	
DECIMALS	DECIMALS	ANGLES	APPROVALS	DATE
.XX ±	.XXX ±	0	DRAWN	1/25/99
DEBURR EDGES .XXX R MAX MATERIAL			CHECKED	
WP-000265-00	PL 6.0	FINISH	ISSUED	SIZE FSCM NO.
NEXT ASSY	USED ON		CAD SEED FILE NO.	DWG NO. SH-000265-00
APPLICATION			DO NOT SCALE DRAWING	REV
			PLOT DATE: Thu Apr 03 2003	SCALE NONE
			CAD FILE NO. SH0265-A.SCH	SHEET 1 OF 1
				P:V6.0

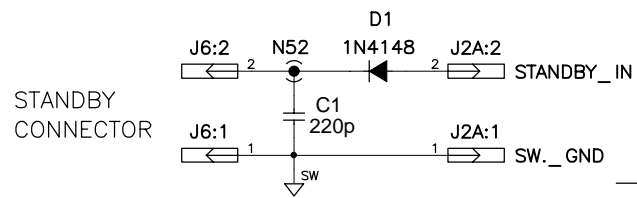
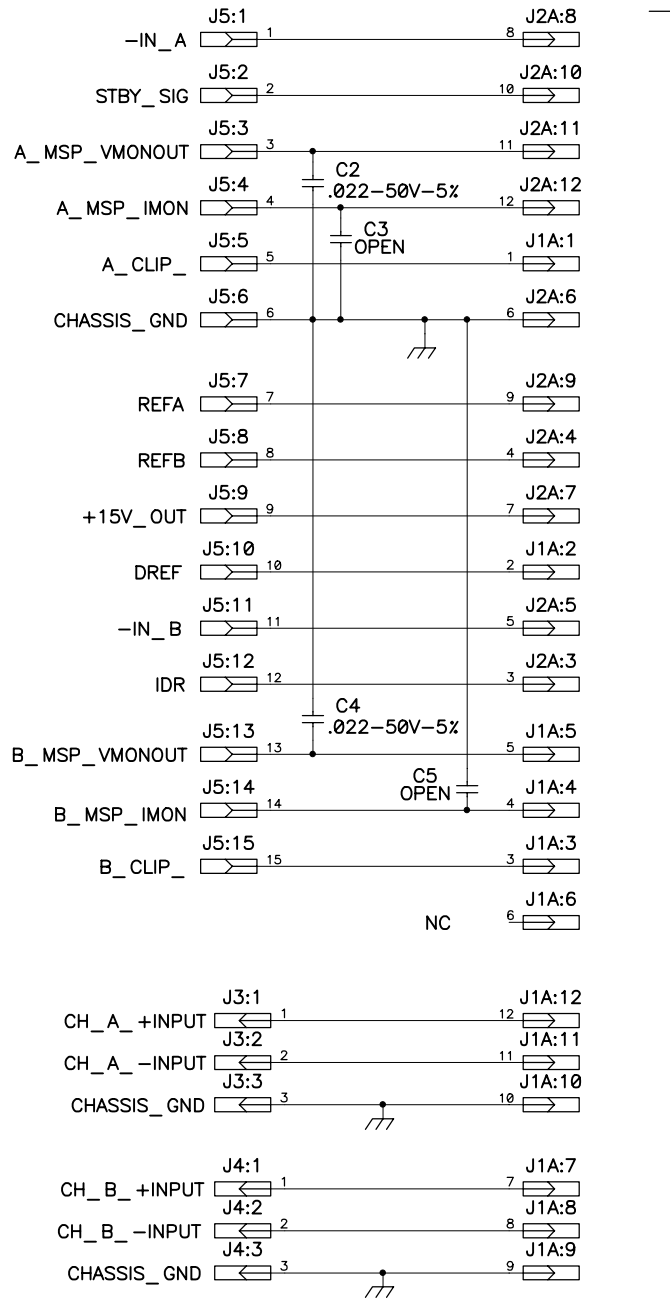
**QSC AUDIO PRODUCTS, INC.**  
COSTA MESA, CALIFORNIA

**SCHEMATIC DIAGRAM**  
**INPUT PCB, PL 6.0**

1 SH-000265-00 DWG NO.

A

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TO INPUT PCB  
SH-000175-00

QTY	ITEM NO.	PART NO.	DESCRIPTION	VENDOR
<b>PARTS LIST</b>				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DIMENSIONS PER ANSI Y14.5-1982 TOLERANCES ARE: DECIMALS    DECIMALS    ANGLES .XX ±        .XXX ±        0 DEBURR EDGES .XXX R MAX MATERIAL			CONTRACT NO.	
FINISH			<b>AUDIO PRODUCTS, INC.</b> COSTA MESA, CALIFORNIA	
NEXT ASSY    USED ON			APPROVALS	DATE
APPLICATION			DRAWN A. CERRILLO	3-18-96
DO NOT SCALE DRAWING			CHECKED	
			ISSUED	
			SIZE	FSCM NO.
			<b>C</b>	
			DWG NO. <b>SH-000178-00</b>	
			CAD SEED FILE NO. SH0178-1.SCH	Thu May 04, 2000
			SCALE	CAD FILE NO. sh178-a3.sch
			SHEET	1 OF 1

**QSC** AUDIO PRODUCTS, INC.  
COSTA MESA, CALIFORNIA

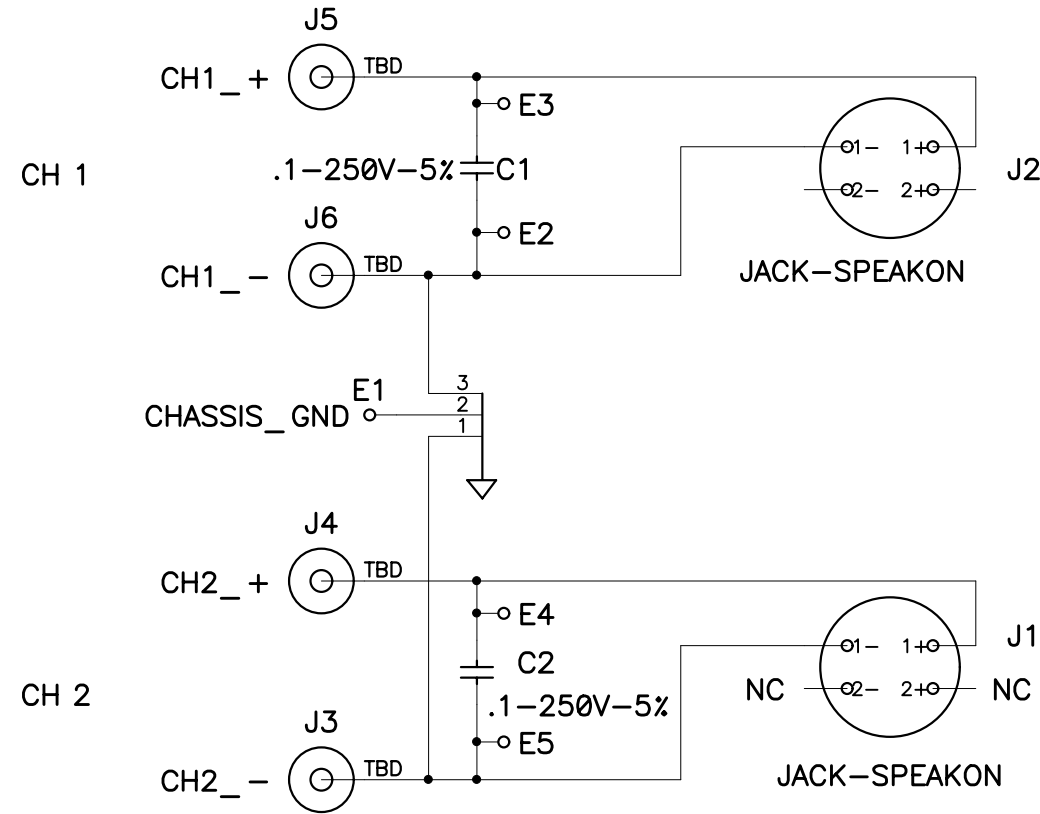
**SCHEMATIC DIAGRAM**  
**INPUT DAUGHTER PCB, PL9.0**

SIZE **C** FSCM NO. DWG NO. **SH-000178-00** REV

SCALE CAD FILE NO. sh178-a3.sch SHEET 1 OF 1

P:\MEGAMP\TANGO\HD15

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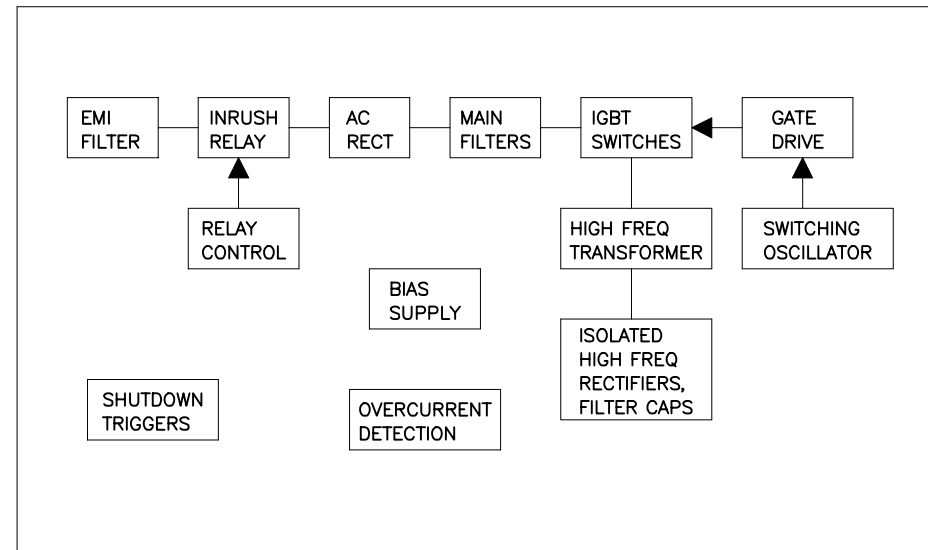
1. THIS DRAWING USED IN CONJUNCTION WITH ASSEMBLY WP-000179-00 AND FABRICATION DRAWING PC-000179-00.

NOTES: UNLESS OTHERWISE SPECIFIED

QTY	ITEM NO.	PART NO.	DESCRIPTION	VENDOR
<b>PARTS LIST</b>				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DIMENSIONS PER ANSI Y14.5-1982 TOLERANCES ARE: DECIMALS    DECIMALS    ANGLES .XX ±        .XXX ±        0 DEBURR EDGES .XXX R MAX MATERIAL			CONTRACT NO.	
			<b>QSC AUDIO PRODUCTS, INC.</b> COSTA MESA, CALIFORNIA	
			APPROVALS	DATE
			DRAWN A. CERRILLO	6-11-97
			CHECKED	
			ISSUED	
WP-000179-00	PL 9.0	FINISH	SIZE B	FSCM NO.
NEXT ASSY	USED ON		DWG NO. SH-000179-00	
APPLICATION		DO NOT SCALE DRAWING	SCALE NONE	CAD FILE NO. sh0179-A.sch
			SHEET 1 OF 1	

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REVISION				
REV	DESCRIPTION	EFF. DATE	CHK	APPROVED / DATE
A	PROD RELEASE PER ECO 4249 WR	3-24-00		DD 4-12-00
B	REVISED PER ECO 4295 AA	5-5-00		



SWITCHING  
POWER  
SUPPLY  
SHEET 2

TABULATION BLOCK			
DASH NO.	F1	①	R321, 322, 326, 328 ②
-00 (120V)	25A, 125V		487K
-01 (100V)	30A, 125V		392K
-02 (230V)	15A, 250V		487K

QTY	ITEM NO.	PART NO.	DESCRIPTION	VENDOR
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DIMENSIONS PER ANSI Y14.5-1982 TOLERANCES ARE: DECIMALS    DECIMALS    ANGLES .XX ±        .XXX ±        ° DEBURR EDGES .XXX R MAX MATERIAL			CONTRACT NO.	
FINISH			APPROVALS	DATE
NEXT ASSY    USED ON			DRAWN BOB MUNIZ	2-5-2K1
APPLICATION			CHECKED	
DO NOT SCALE DRAWING			ISSUED	
CAD SEED FILE NO.			PLOT DATE: Thu Apr 03, 2003	SCALE NONE
			CAD FILE NO. PC8266RA.SCH	SHEET 1 OF 4

**QSC** AUDIO PRODUCTS, INC.  
COSTA MESA, CALIFORNIA

**SCHEMATIC DIAGRAM**

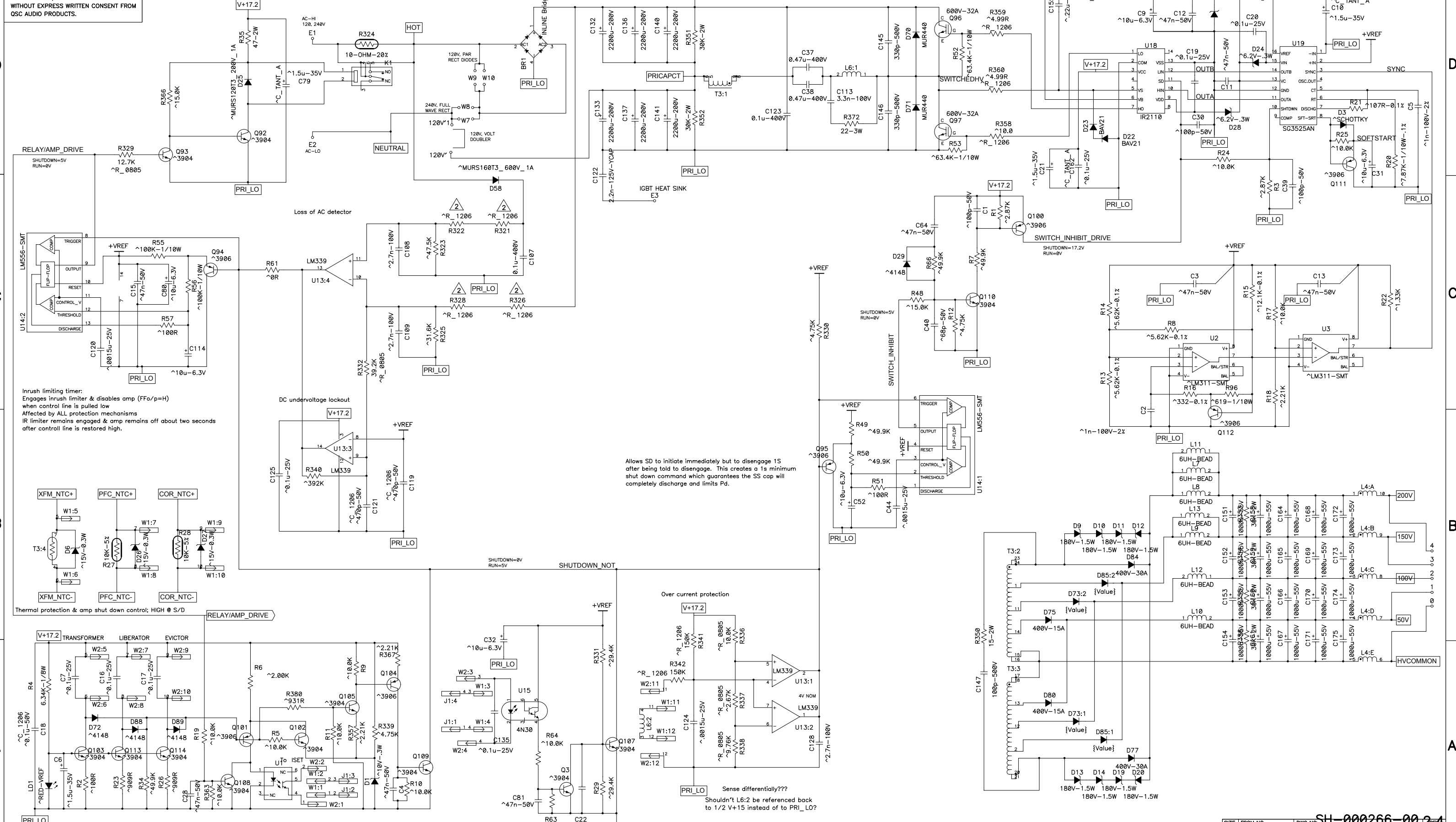
**EVICTOR**

SIZE **D** FSCM NO. DWG NO. **SH-000266-00** REV **2.4**

2. COMPONENTS WITH VALUE PREFIXED WITH A "\*" REPRESENT SMT COMPONENTS.  
1. THIS DRAWING USED IN CONJUNCTION WITH ASSEMBLY WP-003606-XX.  
NOTES: UNLESS OTHERWISE SPECIFIED

2.4 1 SH-000266-00 DWG NO.

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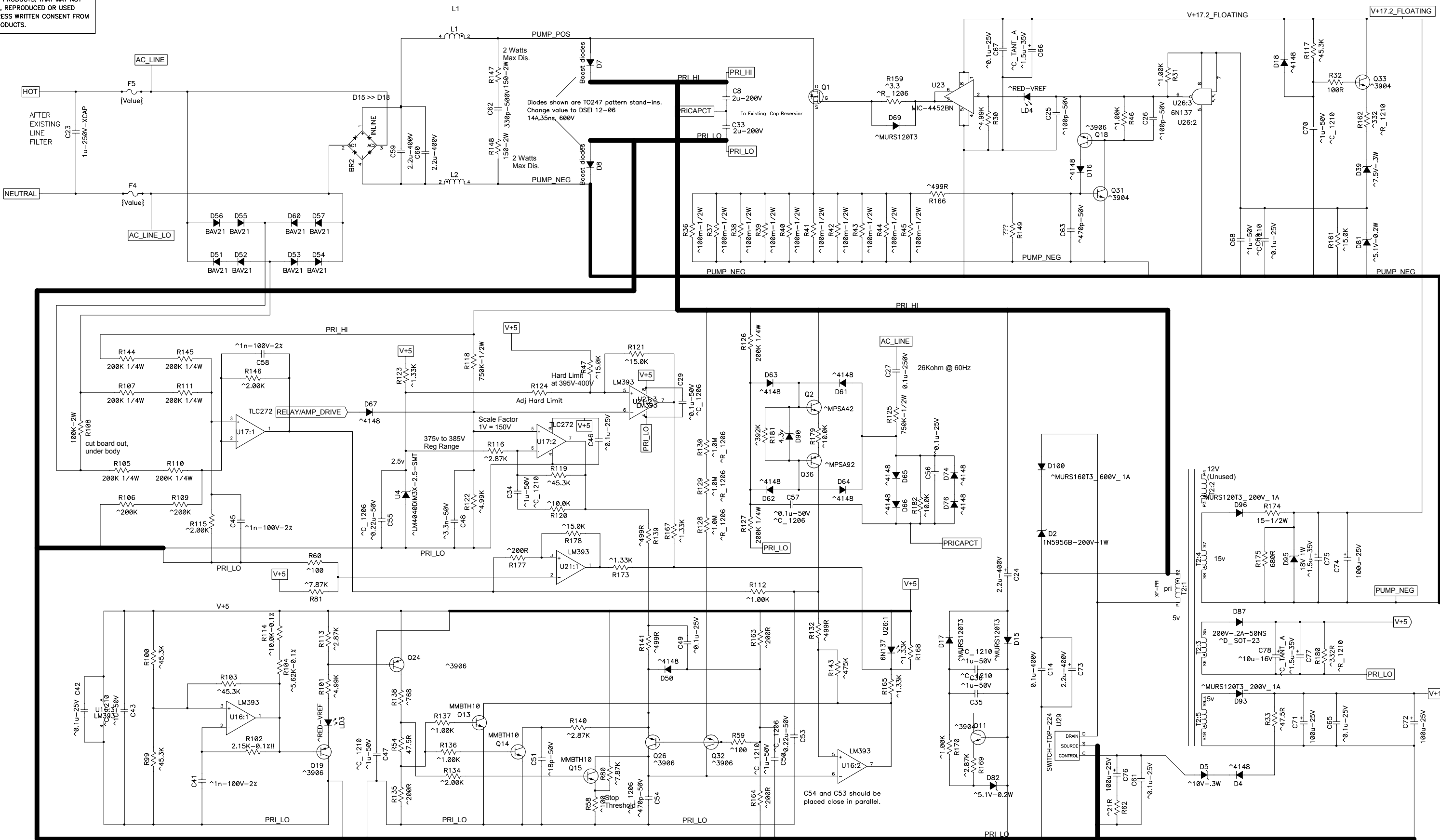
Inrush limiting timer:  
Engages inrush limiter & disables amp (FFo/p=h)  
when control line is pulled low  
Affected by ALL protection mechanisms  
IR limiter remains engaged & amp remains off about two seconds  
after control line is restored high.

Allows SD to initiate immediately but to disengage 1S  
after being told to disengage. This creates a 1s minimum  
shut down command which guarantees the SS cap will  
completely discharge and limits Pd.

Over current protection

Sense differentially??  
Shouldn't L6:2 be referenced back  
to 1/2 V+15 instead of to PRI\_LO?

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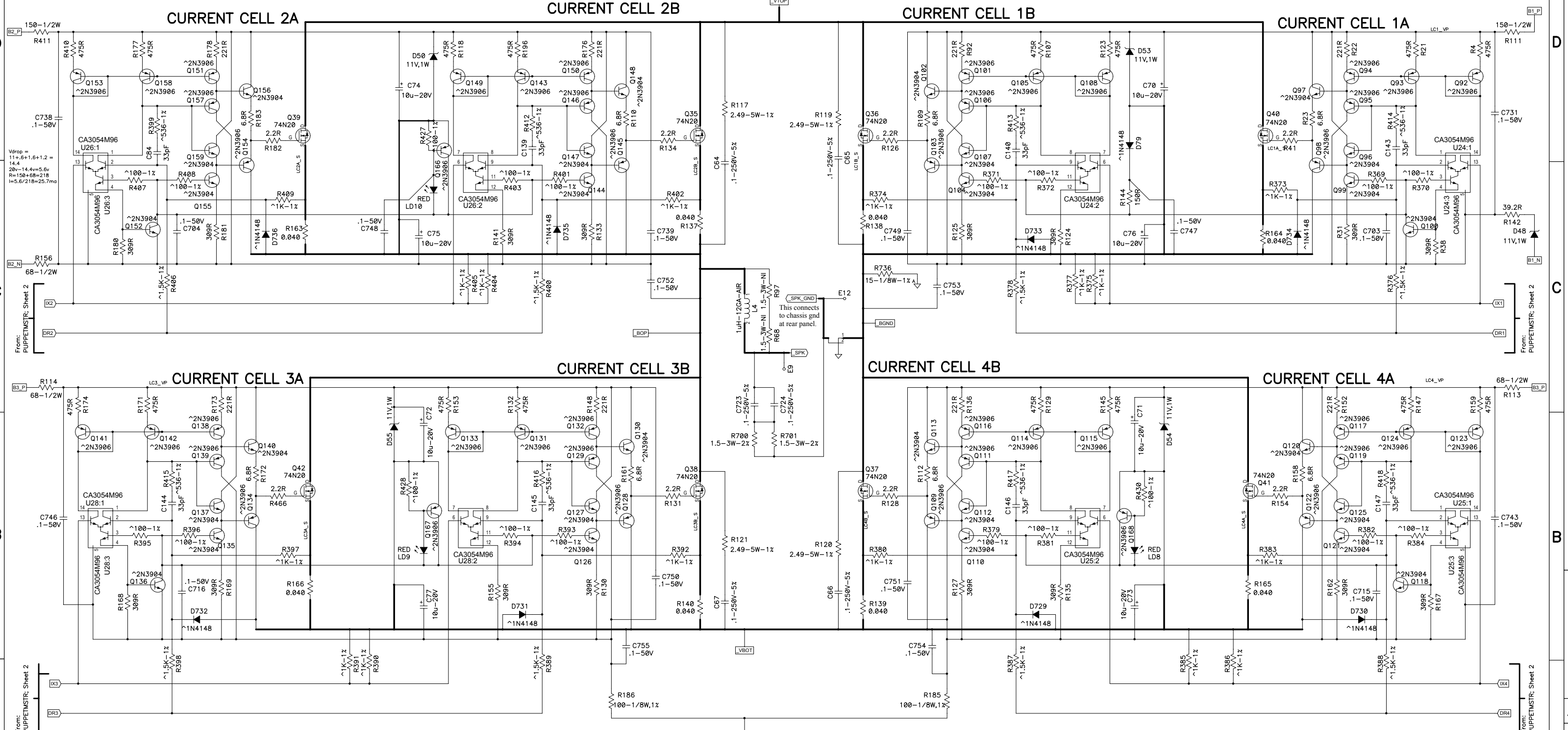
FULL AC LINE VOLTAGE EVERYWHERE.  
NO EARTH REFERENCE, USE CAUTION WHEN MEASURING!

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# LC\_OUTPUTS

Supplies: B1 = 30v at 100mA  
 B2 = 20v at 50mA  
 B3 = 40v at 60mA  
 B4 = 27v at 50mA

REVISION		EFF. DATE	CHK	APPROVED / DATE
REV	DESCRIPTION			
A	PRODUCTION RELEASE PER ECO 5894 AA	9-12-03		



- THIS DRAWING USED IN CONJUNCTION WITH ASSEMBLY WP-000276-00.
  - COMPONENTS WITH VALUE PREFIXED WITH A "\*" REPRESENT SMT COMPONENTS.
  - ALL CAPACITORS 100V, TOLERANCE 20% FOR ELECTROLYTIC TYPES, 10% ON ALL OTHERS.
  - R1, shown on MANAGEMENT sheet, IS A POSITIVE TEMPERATURE COEFFICIENT RESISTOR MOUNTED TO HEAT SINK. RESISTANCE IS 100 MAX OHM COLD.
- NOTES: UNLESS OTHERWISE SPECIFIED

Supplies: B1 = 30v at 100mA  
 B2 = 20v at 50mA  
 B3 = 40v at 60mA  
 B4 = 27v at 50mA

Puppetmaster voltages:  
 18.6 volts of zener in series with 56 ohms.  
 Stackup:  
 11  
 2.4  
 1.2  
 18.6  
 = 33.2 volts of zener drop  
 40 volts available.

QTY	ITEM NO.	PART NO.	DESCRIPTION	VENDOR
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DIMENSIONS PER ANSI Y14.5-1982 TOLERANCES ARE:			CONTRACT NO.	
DECIMALS .XX ±	DECIMALS .XXX ±	ANGLES 0	APPROVALS	
DEBURR EDGES .XXX R MAX			DATE	
MATERIAL			DRAWN P. IERYMENKO	11-30-95
FINISH			CHECKED	
NEXT ASSY			ISSUED	
USED ON			CAD SEED FILE NO.	PLOT DATE: Mon Nov 13, 2006
APPLICATION			DO NOT SCALE DRAWING	

**QSC AUDIO PRODUCTS, INC.**  
 COSTA MESA, CALIFORNIA

**SCHEMATIC DIAGRAM**  
**MAIN PCB, PL 6.0**

SIZE: D FSCM NO. DWG NO. SH-000276-00 REV A

SCALE: NONE CAD FILE NO. SH00276A.SCH SHEET 1 OF 7

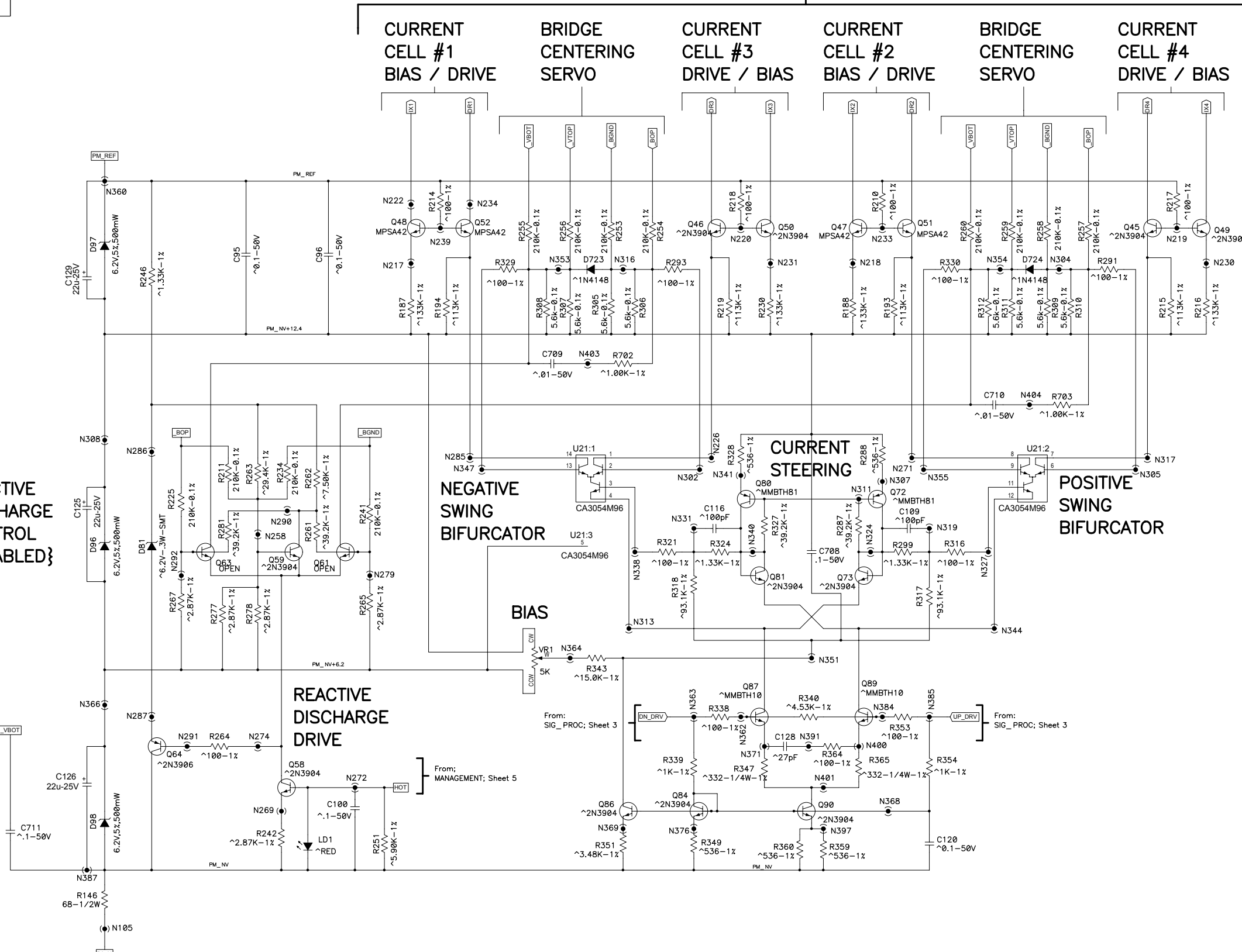
A REV 1 SH-000276-00 DWG NO.



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# PUPPETMSTR

To:  
LC\_OUTPUTS; Sheet 1



REACTIVE DISCHARGE CONTROL {DISABLED}

NEGATIVE SWING BIFURCATOR

BIAS

CURRENT STEERING

POSITIVE SWING BIFURCATOR

REACTIVE DISCHARGE DRIVE

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# SIG\_PROC

From: SNAPPER; Sheet 6

Values shown preclip a fixed 5 volts below the rails up to 15 amps of output current. After that, preclip advances 120 mV per ampere output, for 12v preclip at 70 amps.

To: ROUTING; Sheet 4

From: ROUTING; Sheet 4

Limiter is shown in "fast clip-tracking" mode. To convert to a slow attack/release limiter, open the 3 places shown shorted with lines, and make the connection shown by the arrow line.

A

B

C

D

8

7

6

5

4

3

2

1

## PRE\_CLIP\_LIMIT\_SET

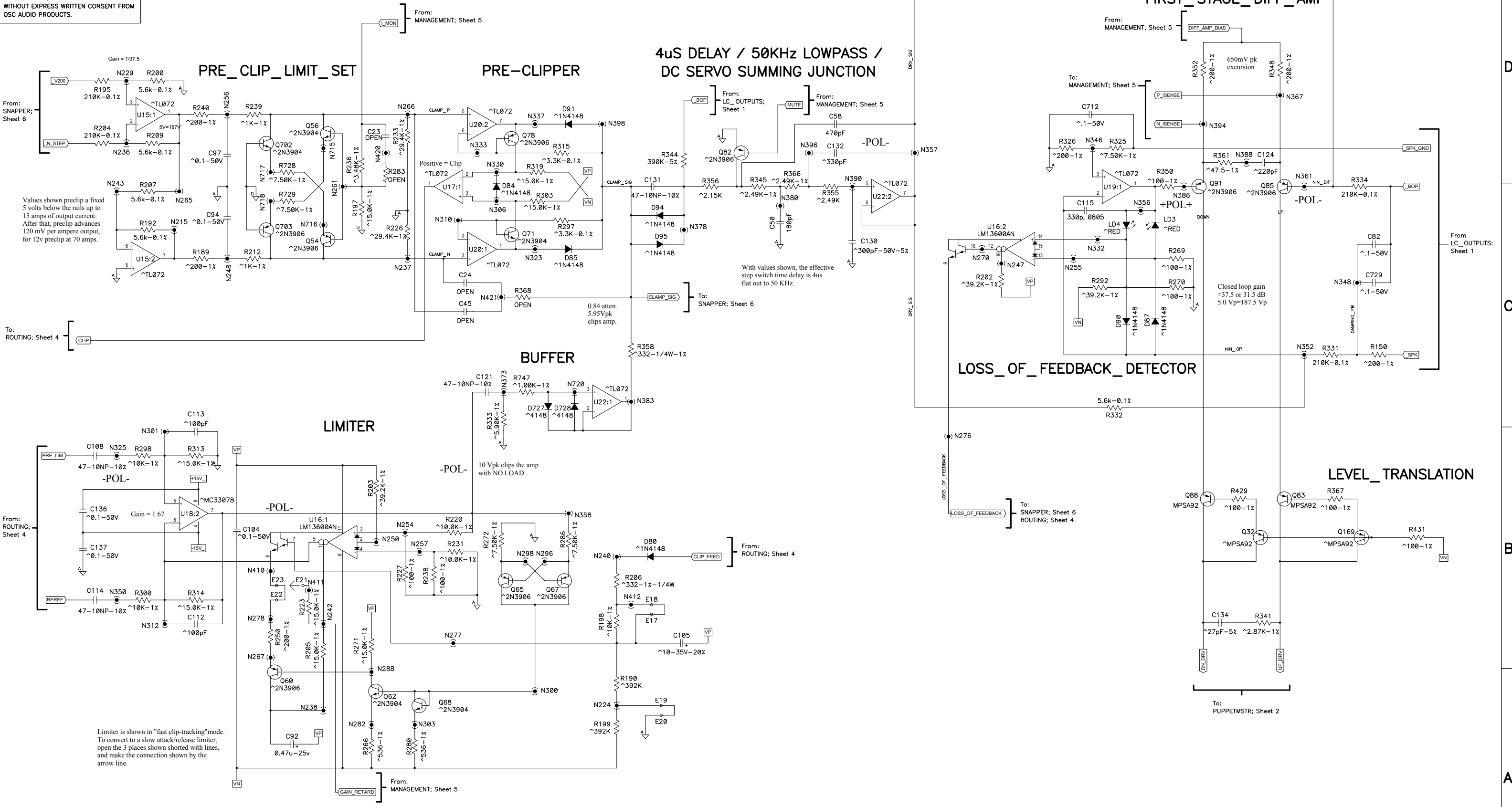
## PRE-CLIPPER

## 4μs DELAY / 50KHz LOWPASS / DC SERVO SUMMING JUNCTION

## FIRST\_STAGE\_DIFF\_AMP

## LOSS\_OF\_FEEDBACK\_DETECTOR

## LEVEL\_TRANSLATION



From: MANAGEMENT; Sheet 5

From: LC\_OUTPUTS; Sheet 1

From: MANAGEMENT; Sheet 5

From: MANAGEMENT; Sheet 5

From: LC\_OUTPUTS; Sheet 1

With values shown, the effective step switch time delay is 4us flat out to 50 KHz.

To: SNAPPER; Sheet 6

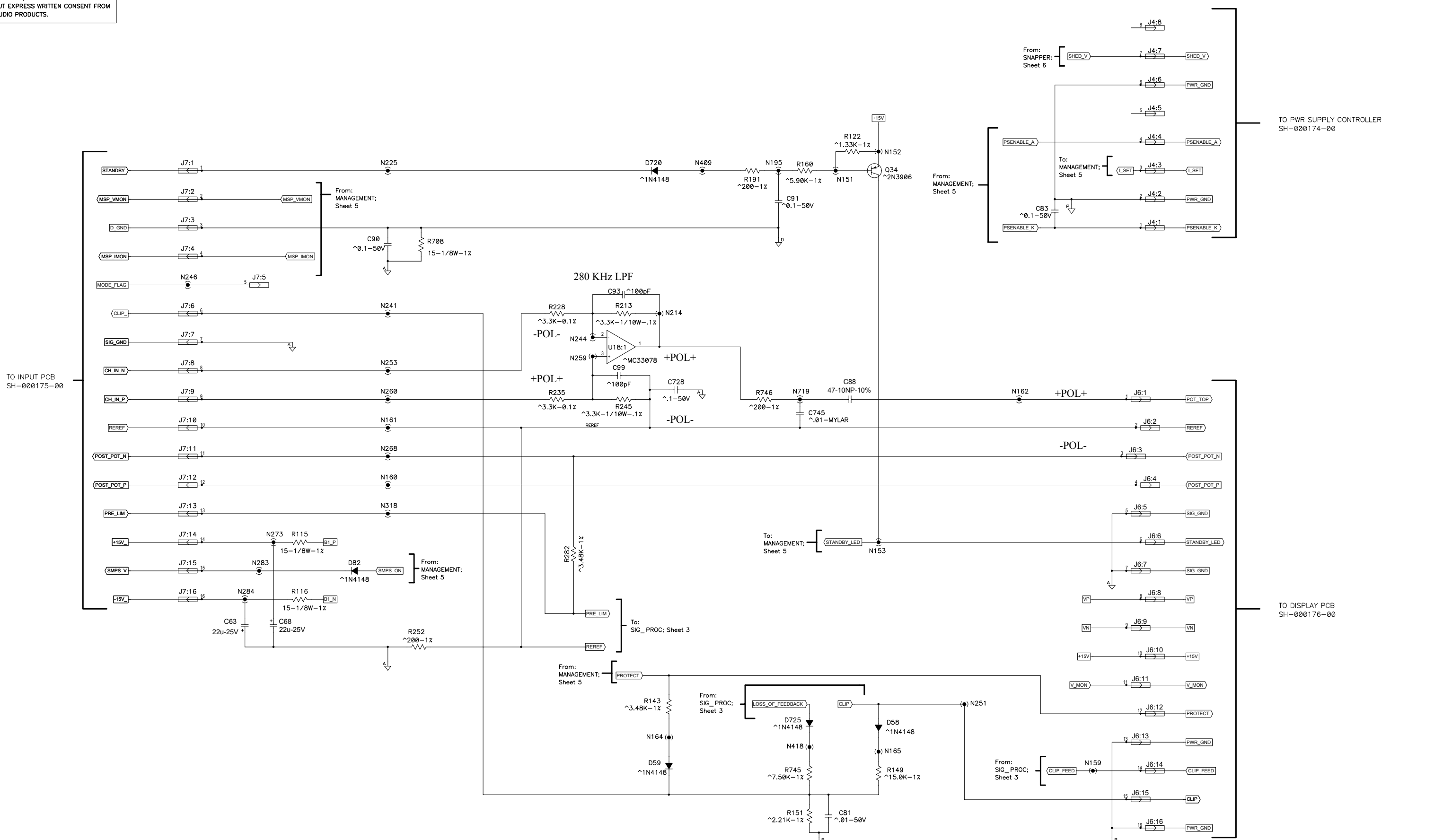
To: SNAPPER; Sheet 6  
ROUTING; Sheet 4

From: ROUTING; Sheet 4

To: PUPPETMSTR; Sheet 2

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# ROUTING

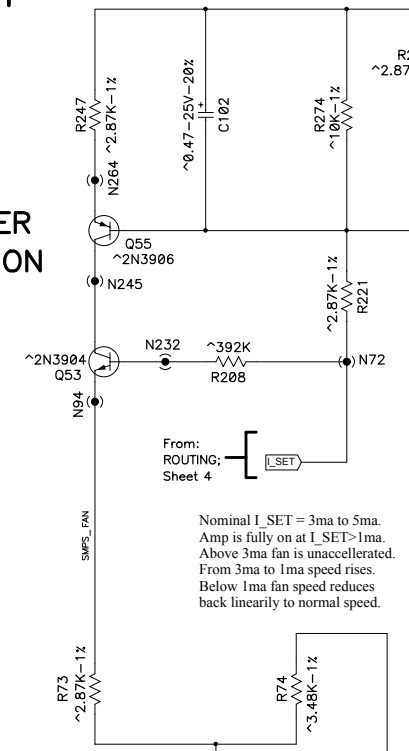


DWG NO. SH-000276-00  
 REV. 4  
 A

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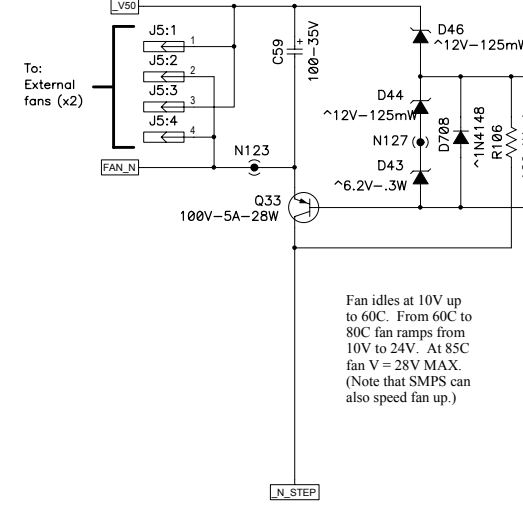
### MANAGEMENT

#### AMPLIFIER ACTIVATION CIRCUIT



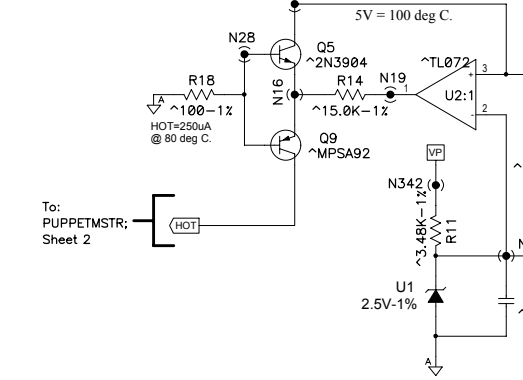
Nominal I<sub>SET</sub> = 3ma to 5ma.  
Amp is fully on at I<sub>SET</sub> = 1ma.  
Above 3ma fan is unaccelerated.  
From 3ma to 1ma speed rises.  
Below 1ma fan speed reduces  
back linearly to normal speed.

#### FAN CONTROL



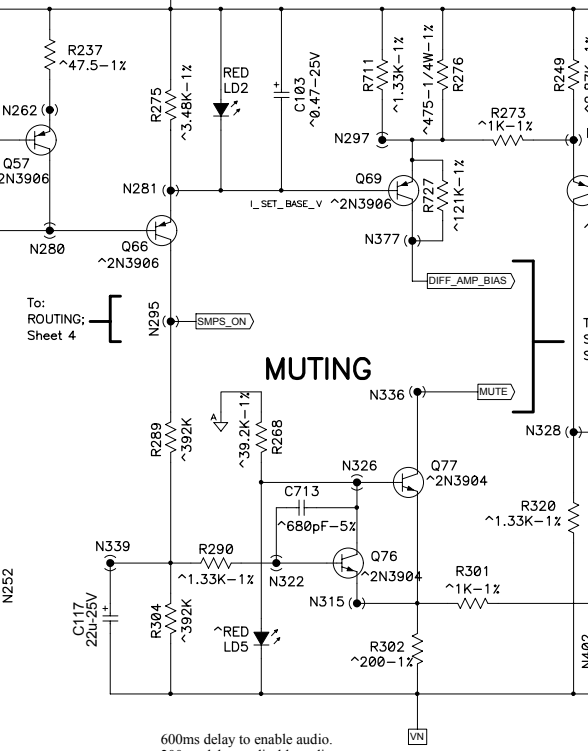
Fan idles at 10V up to 60C. From 60C to 80C fan ramps from 10V to 24V. At 85C fan V = 28V MAX. (Note that SMPS can also speed fan up.)

#### OVERTEMP KILL / REACTIVE DISCHARGE CONTROL

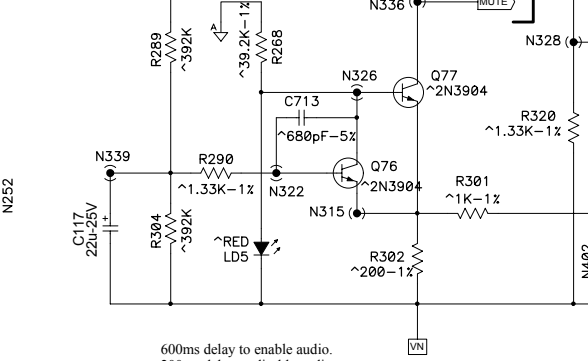


The "HOT" threshold is 80C  
Cutback begins at 100C and  
full shutdown happens at 110C.  
(+/- 3 degrees)

### DIFF-AMP BIAS

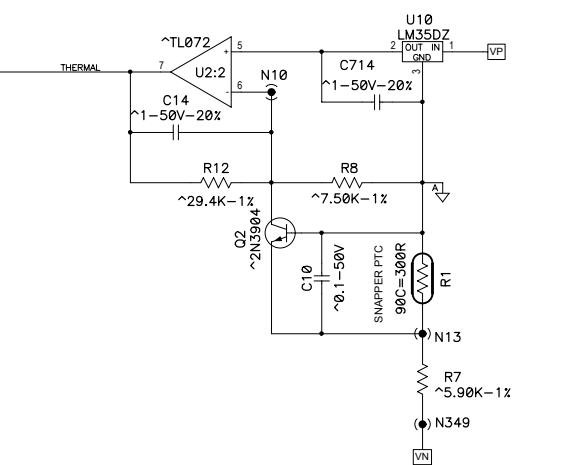


#### MUTING

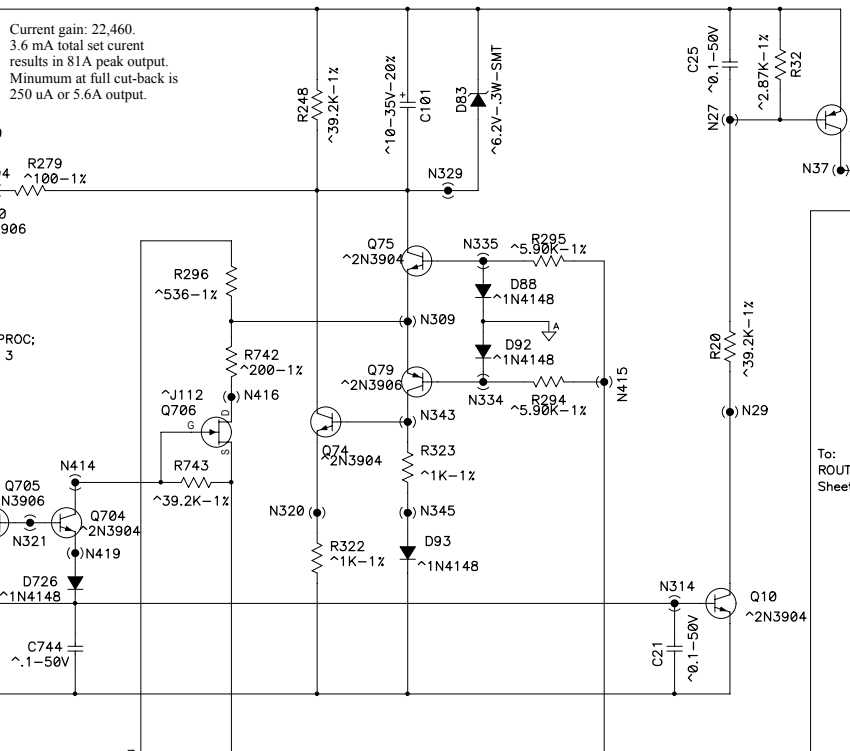


600ms delay to enable audio.  
200ms delay to disable audio.

#### THERMAL

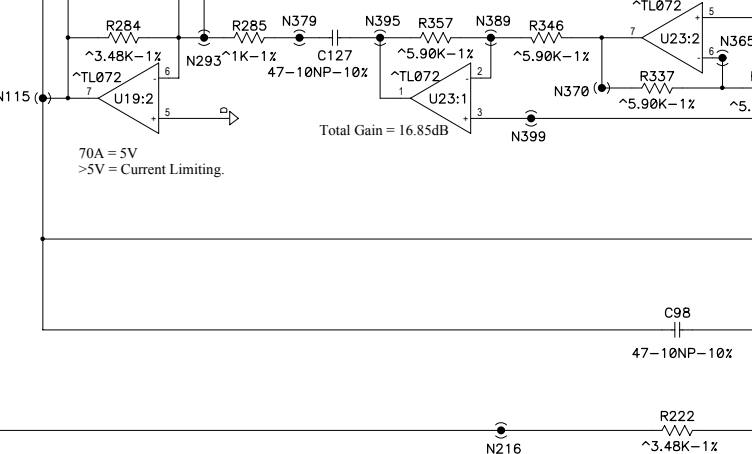


### CURRENT CUTBACK



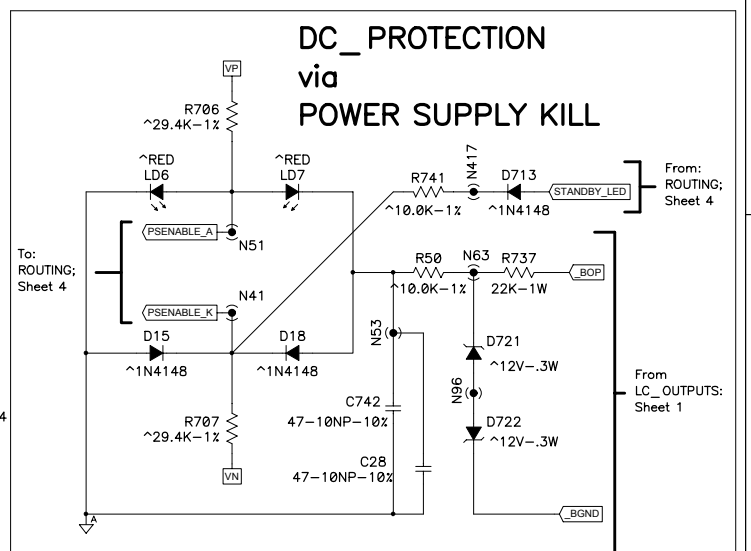
Current gain: 22,460.  
3.6 mA total set current  
results in 81A peak output.  
Minimum at full cut-back is  
250 uA or 5.6A output.

### CURRENT\_MONITORING

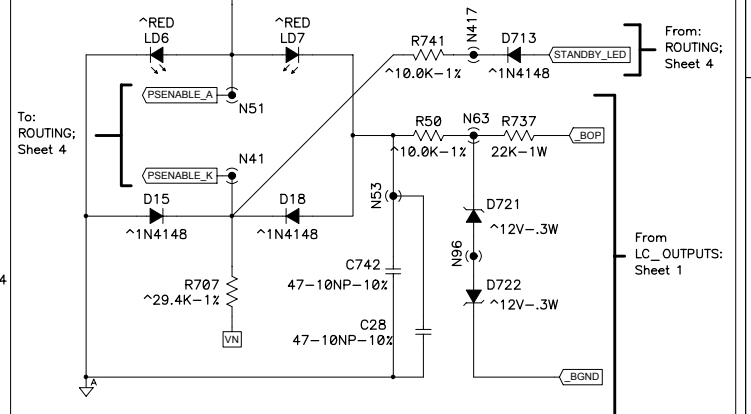


70A = 5V  
>5V = Current Limiting.

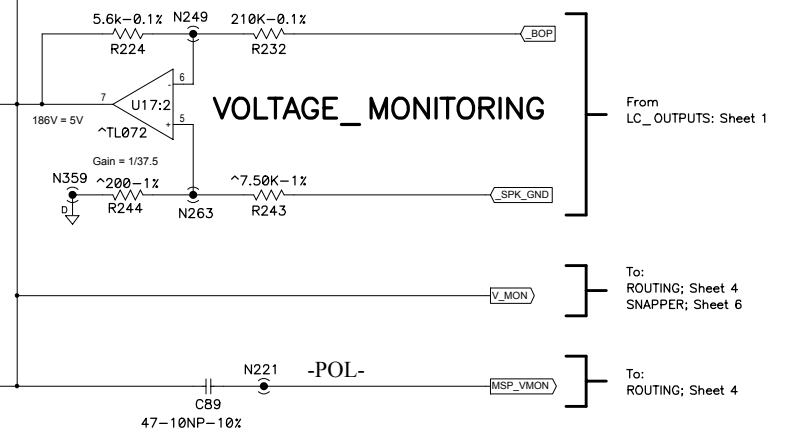
### PROTECT DRIVE



#### DC\_PROTECTION via POWER SUPPLY KILL



### VOLTAGE\_MONITORING



From LC\_OUTPUTS: Sheet 1

To: ROUTING; Sheet 4  
SNAPPER; Sheet 6

To: ROUTING; Sheet 4

From: SIG\_PROC; Sheet 3

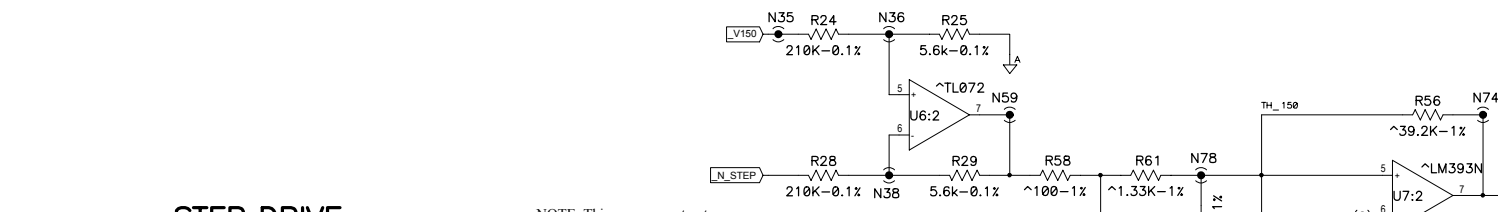
To: SIG\_PROC; Sheet 3  
SNAPPER; Sheet 6

To: ROUTING; Sheet 4

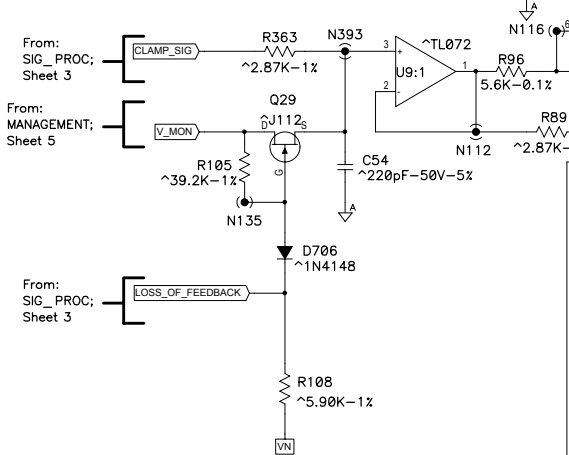
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# SNAPPER

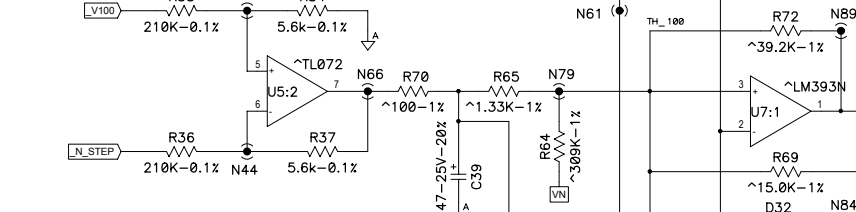
## THRESHOLD DETECTOR / COMPARATOR



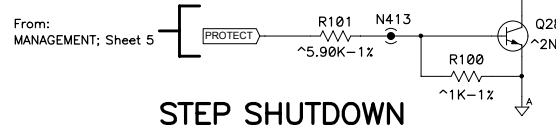
## STEP DRIVE SELECTOR / RECTIFIER



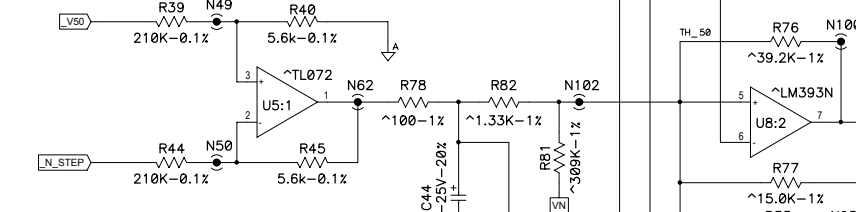
## THRESHOLD DETECTOR / COMPARATOR



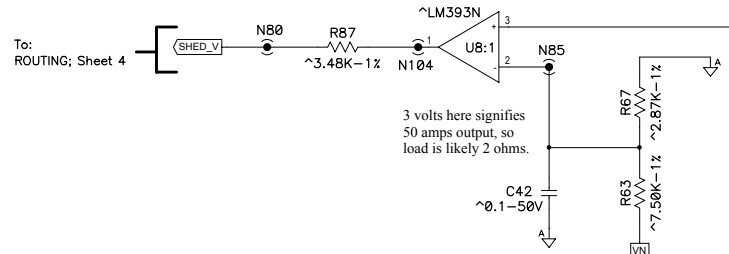
## STEP SHUTDOWN



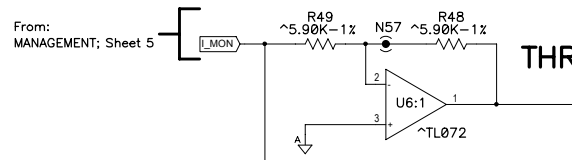
## THRESHOLD DETECTOR / COMPARATOR



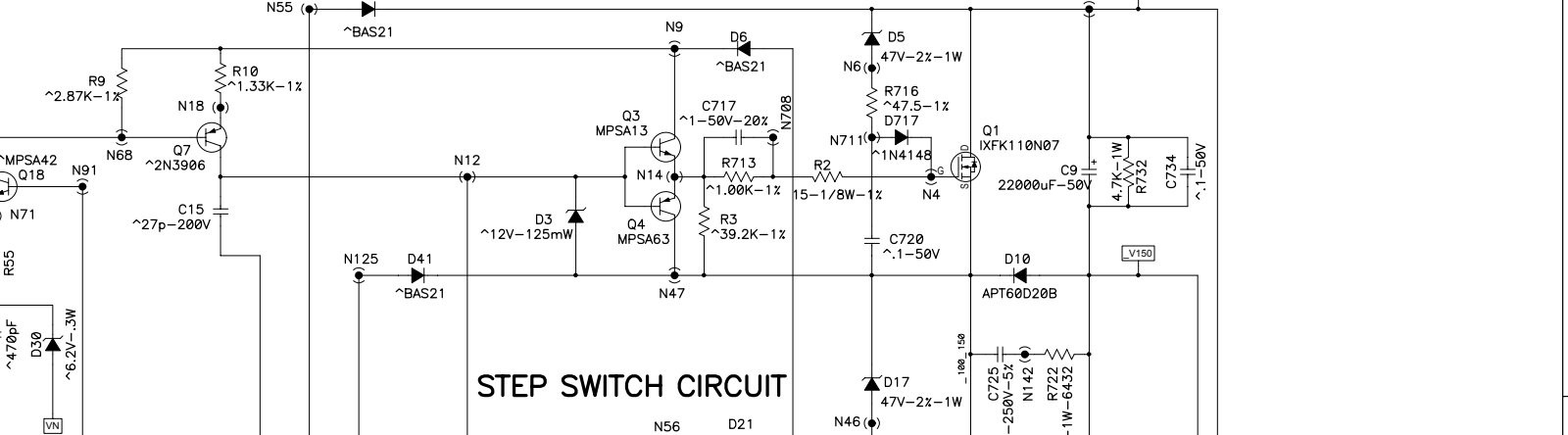
## Power Limiter {Disabled via SMPS}



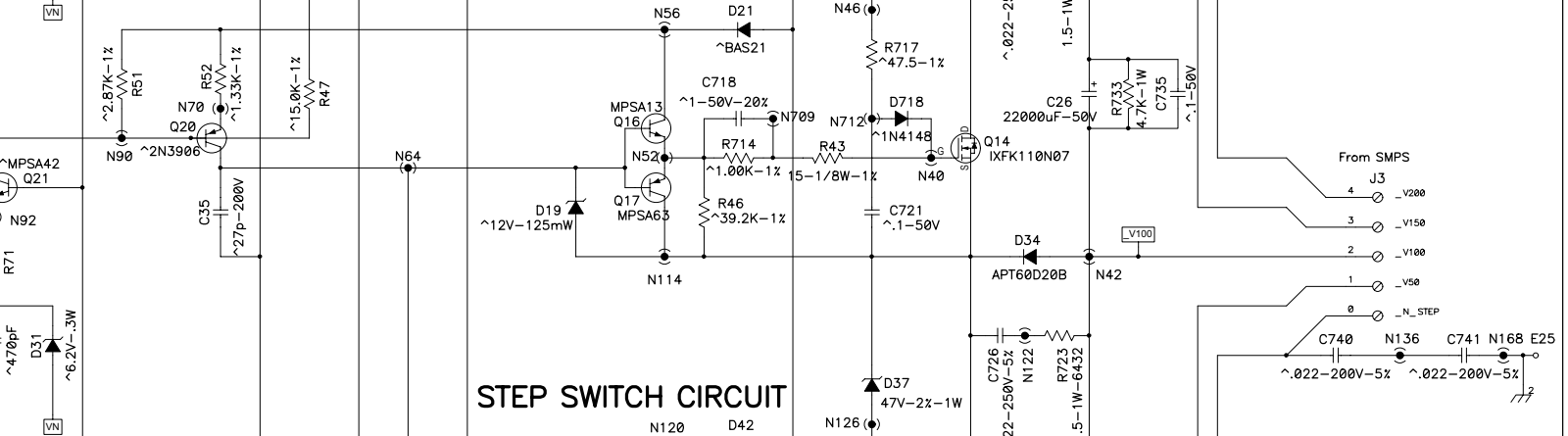
## THRESHOLD COMPENSATION



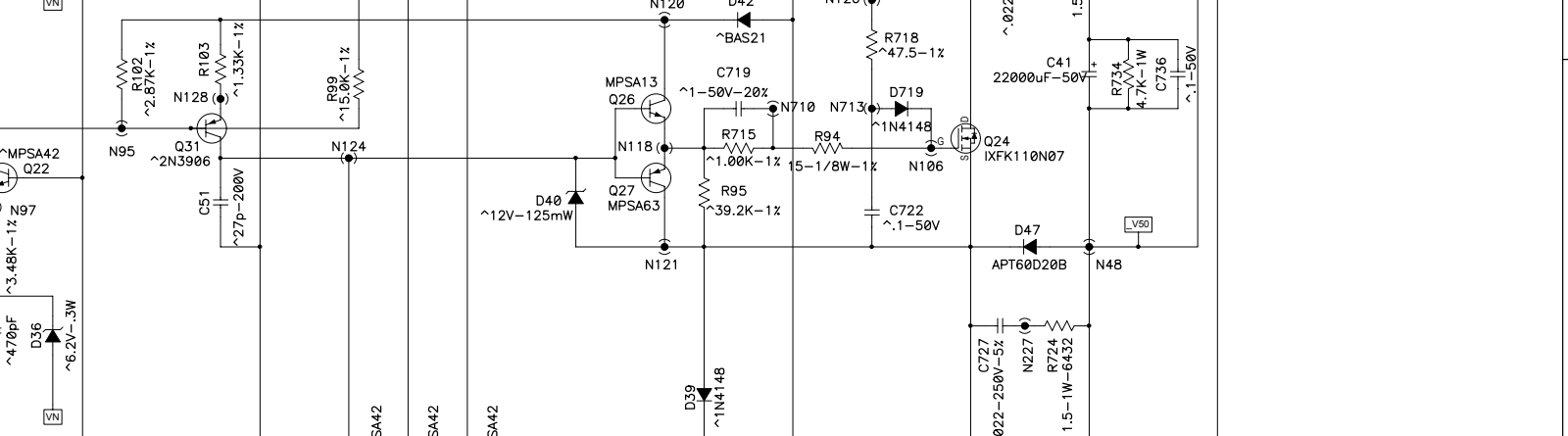
## STEP SWITCH CIRCUIT



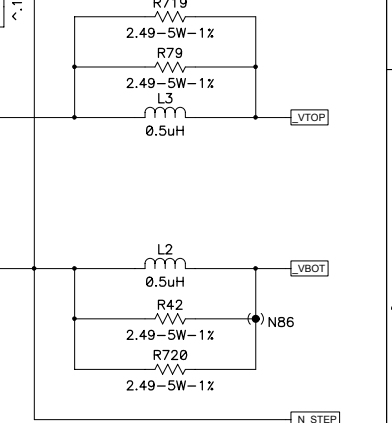
## STEP SWITCH CIRCUIT



## STEP SWITCH CIRCUIT



## ISOLATION



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# HK\_SUPPLY

Supplies: B1 = 30v at 100mA  
 B2 = 20v at 50mA  
 B3 = 40v at 60mA  
 B4 = 27v at 50mA

