

6

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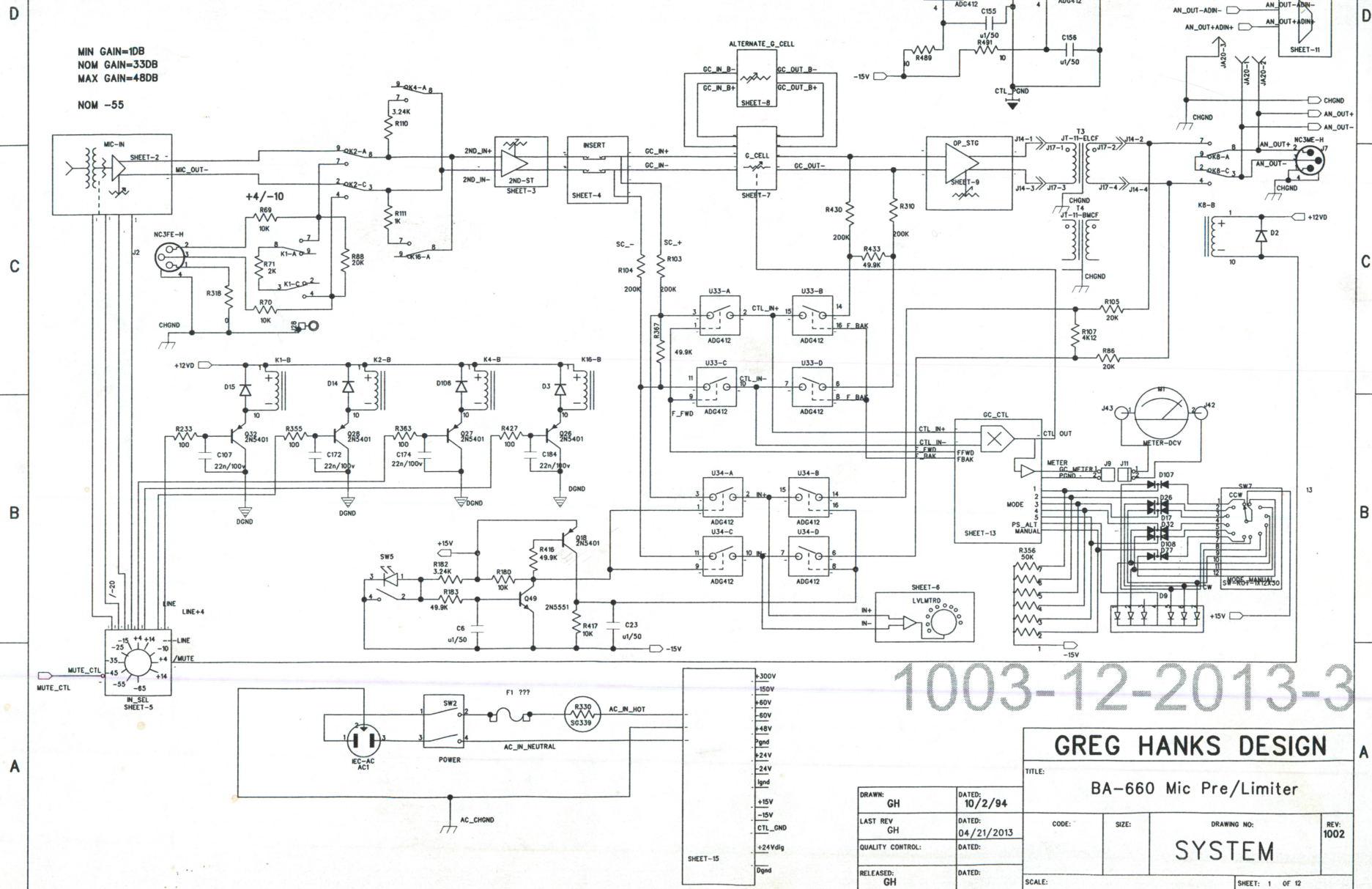
2

1

Unless otherwise specified, All diodes are type 1n4148

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:
1	R07 FROM 4888 to 4823	GH	8/2012
2	4888 to AD0412	GH	1/2014

MIN GAIN=1DB
 NOM GAIN=33DB
 MAX GAIN=48DB
 NOM -55



SYSTEM

1003-12-2013-3

GREG HANKS DESIGN			
TITLE: BA-660 Mic Pre/Limiter			
DRAWN: GH	DATED: 10/2/94	CODE:	SIZE:
LAST REV: GH	DATED: 04/21/2013	DRAWING NO: SYSTEM	
QUALITY CONTROL:	DATED:	SCALE:	REV: 1002
RELEASED: GH	DATED:	SHEET: 1 OF 12	

1003-12-2013-3 v 1002

11-3-13

6

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1

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:
1	Changed R244 and R345		8/2012
2	Changed R124 to 249		8/2012
3	Tied Q36 thru Q39 TO GND		8/2012

D

C

B

A

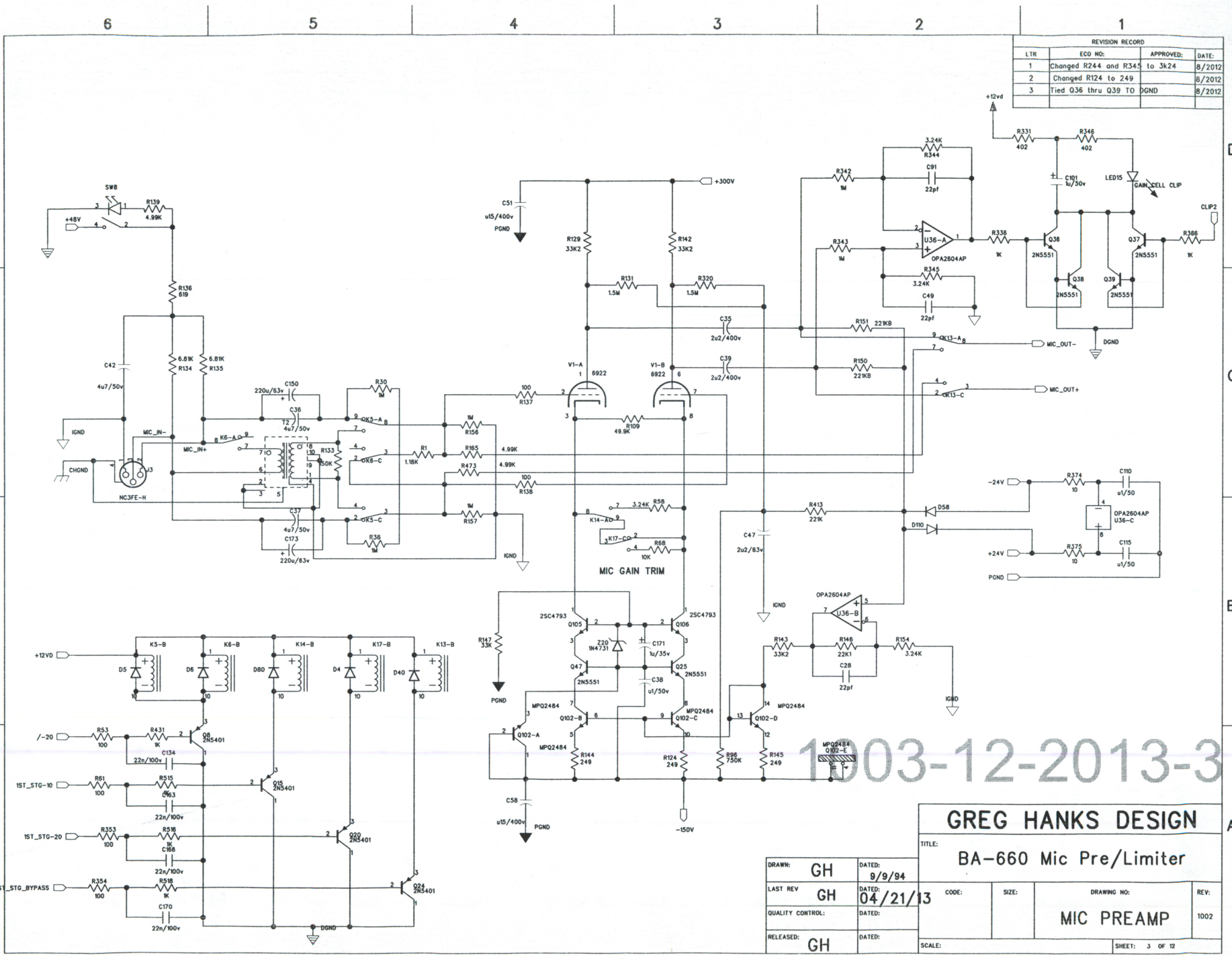
D

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MIC-IN



1003-12-2013-3

GREG HANKS DESIGN

TITLE: BA-660 Mic Pre/Limiter

DRAWN: GH	DATED: 9/9/94	CODE:	SIZE:	DRAWING NO:	REV:
LAST REV: GH	DATED: 04/21/13			MIC PREAMP	1002
QUALITY CONTROL:	DATED:				
RELEASED: GH	DATED:				
SCALE:				SHEET: 3 OF 12	

6

5

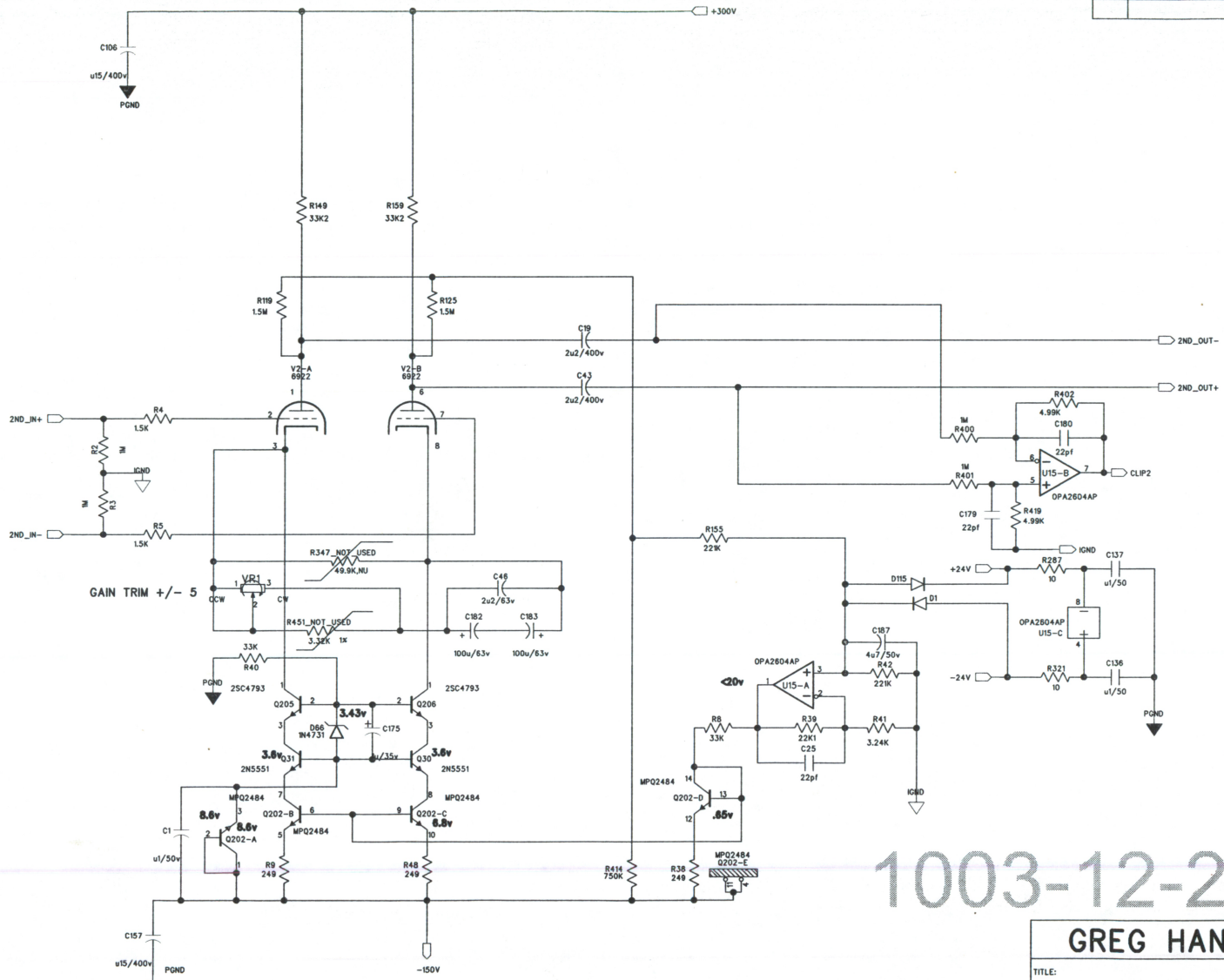
4

3

2

1

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:
1	Changed VR1 to Bourne 91	GH	4/30/12
2	R402 and R419 changed to 4k99	GH	8/2012
3	R38 changed to 249R	GH	8/2012



2ND-ST

1003-12-2013-3

GREG HANKS DESIGN			
TITLE: BA-660 Mic Pre/Limiter			
DRAWN: GH	DATED: 9/9/94	CODE:	SIZE:
LAST REV: GH	DATED: 4/21/2013	DRAWING NO: 2ND STAGE	
QUALITY CONTROL:	DATED:	REV: 1002	
RELEASED: GH	DATED:	SCALE:	SHEET: 4 OF 12

6

5

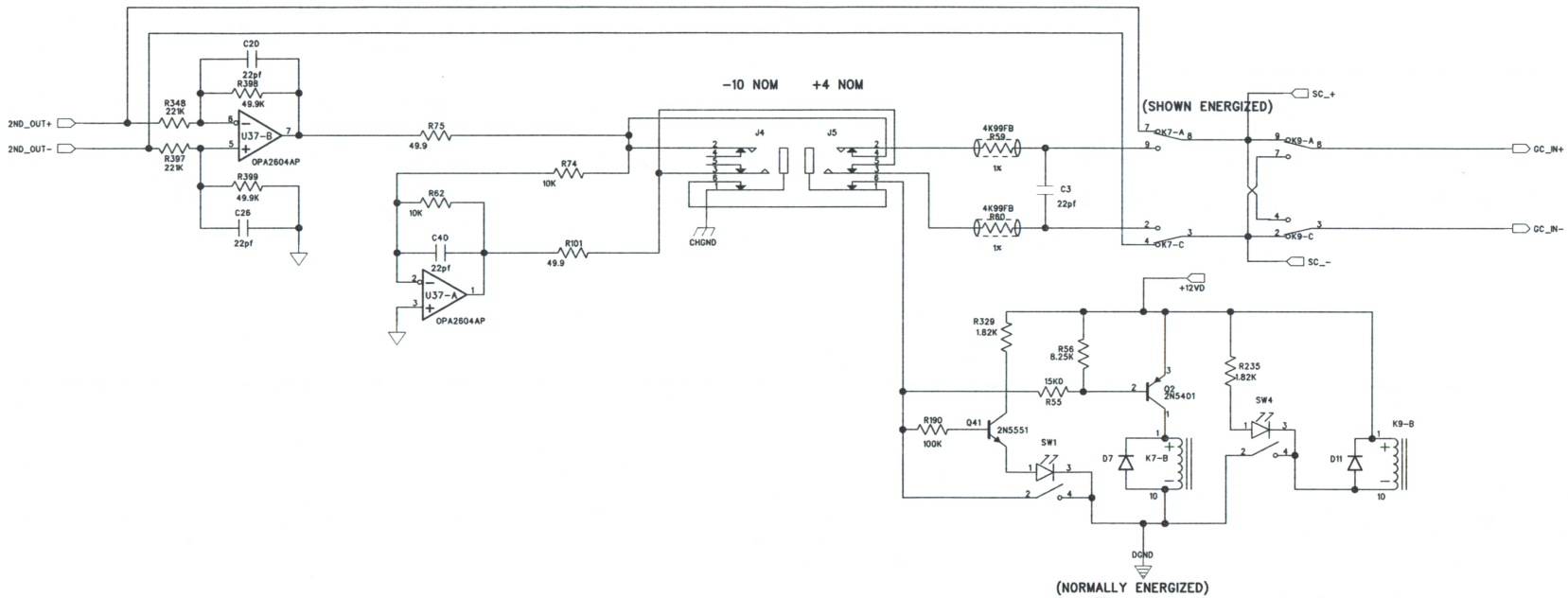
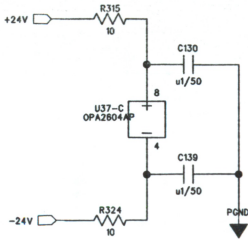
4

3

2

1

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



INSERT

1003-12-2013-3

COMPANY: GREG HANKS DESIGN			
TITLE: BA-660 Mic Pre/Limiter			
DRAWN: GH	DATED: 5/5/95	CODE:	SIZE:
CHECKED:	DATED:	DRAWING NO: INSERT SEND AND RTN	
QUALITY CONTROL:	DATED:	REV:	1002

REVISION RECORD			
LTR	ECO NO.	APPROVED:	DATE:

6

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1

D

C

B

A

D

C

B

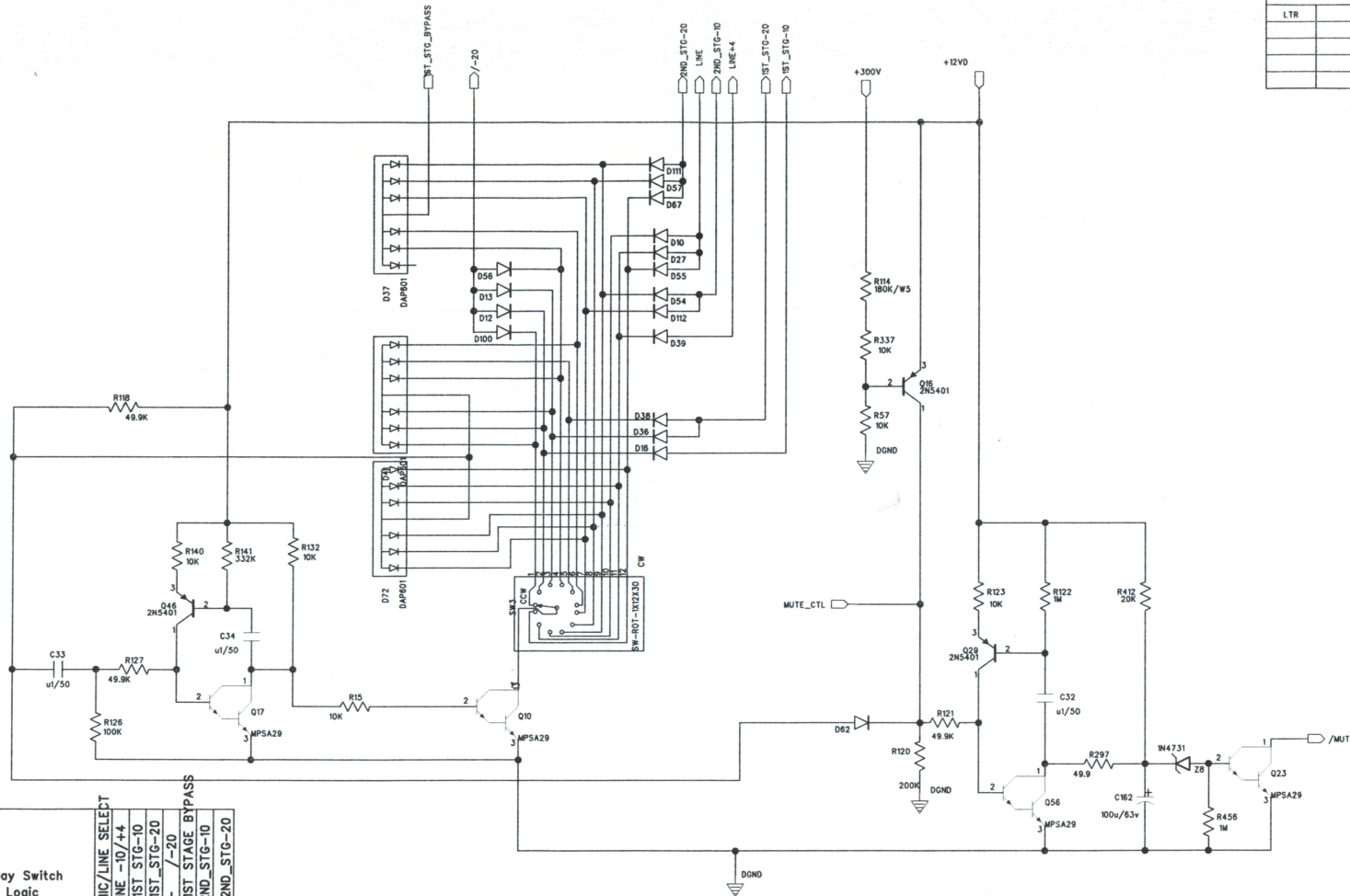
A

Relay Switch Logic		K2- MIC/LINE SELECT	K1- LINE -10/+4	K14- 1ST STG-10	K17- 1ST STG-20	K5, K6- /-20	K13- 1ST STAGE BYPASS	K4- 2ND_STG-10	K16- 2ND_STG-20
CW	X=ON		X	X	X	X	X	X	X
12- LINE +14		X							
11- LINE +4		X	X						
10- LINE -10		X							
9- MIC +14						X	X	X	X
8- MIC +4						X	X	X	X
7- MIC -5						X	X	X	X
6- MIC -15						X	X	X	X
5- MIC -25						X	X	X	X
4- MIC -35				X	X				
3- MIC -45				X	X				
2- MIC -55				X	X				
1- MIC -65				X	X				
CCW									

- K1- LINE -10/+4
 K2- MIC/LINE SELECT
 K4- 2ND_STG-10
 K16- 2ND_STG-20
 K5- /-20 (MIC XFMR BYPASS)
 K6- MIC INP XFMR BYPASS
 K7- INSERT BYPASS
 K8- O/P MUTE
 K9- PHASE INVERT

 K11- OP UNBAL -
 K12- OP UNBAL +
 K13- 1ST STAGE BYPASS
 K14- 1ST STG-10

 K16- GR BYPASS
 K17- 1ST_STG-20

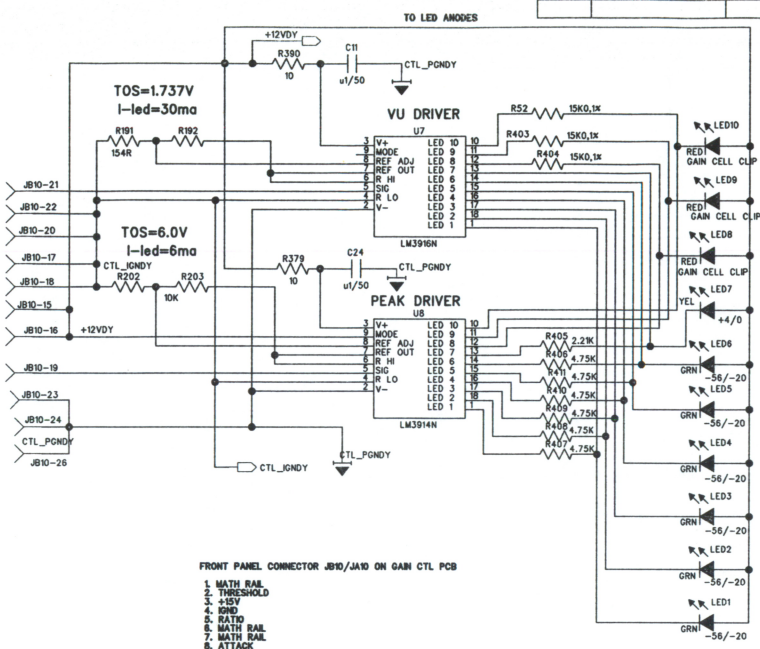
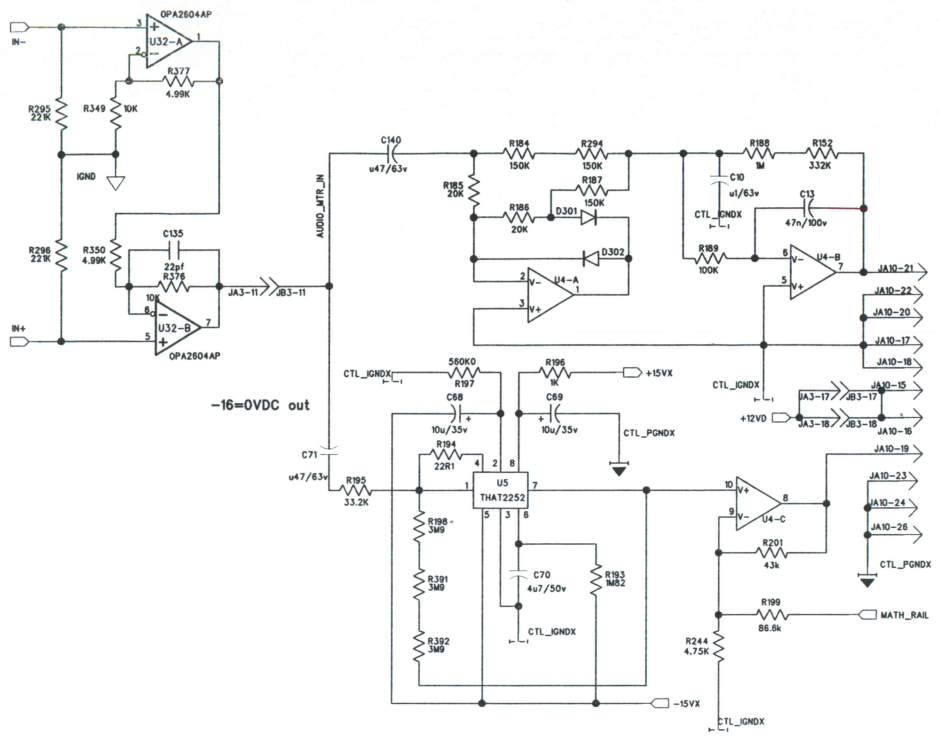


IN-SEL

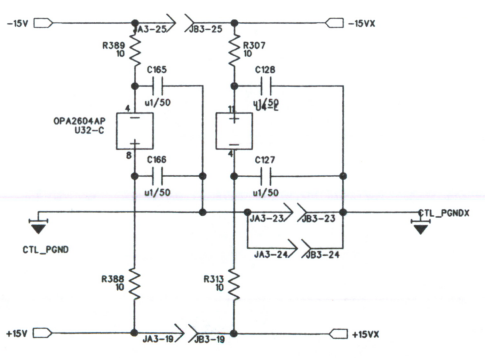
1003-12-2013-3

GREG HANKS DESIGN			
TITLE: BA-66 Mic Pre/Limiter			
DRAWN: GH	DATED: 10/1/94	CODE:	SIZE:
LAST REV: GH	DATED: 04-2013	DRAWING NO:	REV: 1002
QUALITY CONTROL:	DATED:	INP SEL & MUTE CTL	
RELEASED: GH	DATED:	SCALE:	SHEET: 2 OF 12

REVISION RECORD			
LTR	ECO NO.	APPROVED:	DATE:
1	Change C71&C140 from u22 to u47		
		04-20-2013	GH



- FRONT PANEL CONNECTOR .JB10/JA10 ON GAIN CTL PCB
1. MATH_RAIL
 2. THRESHOLD
 3. +15V
 4. I9RD
 5. RATIO
 6. MATH_RAIL
 7. MATH_RAIL
 8. ATTACK
 9. I GND
 10. I GND
 11. RELEASE
 12. MATH_RAIL
 13. +12V+
 14. +12V+
 15. +12V+
 16. +12V+
 17. I GND
 18. I GND
 19. PEAK_MTR_IN
 20. P GND
 21. VU_MTR_IN
 22. P GND
 23. P GND
 24. P GND
 25. PCB_SHLD
 26. GAIN_LVL_+
 27. GAIN_LVL_+
 28. PCB_SHLD
 29. GAIN_CTL_CLIP_LVL_+
 30. GAIN_CTL_CLIP_LVL_+
 31. PCB_SHLD
 32. I GND
 33. GAIN_CTL_CLIP_LED_CATHODE
 34. PCB_SHLD

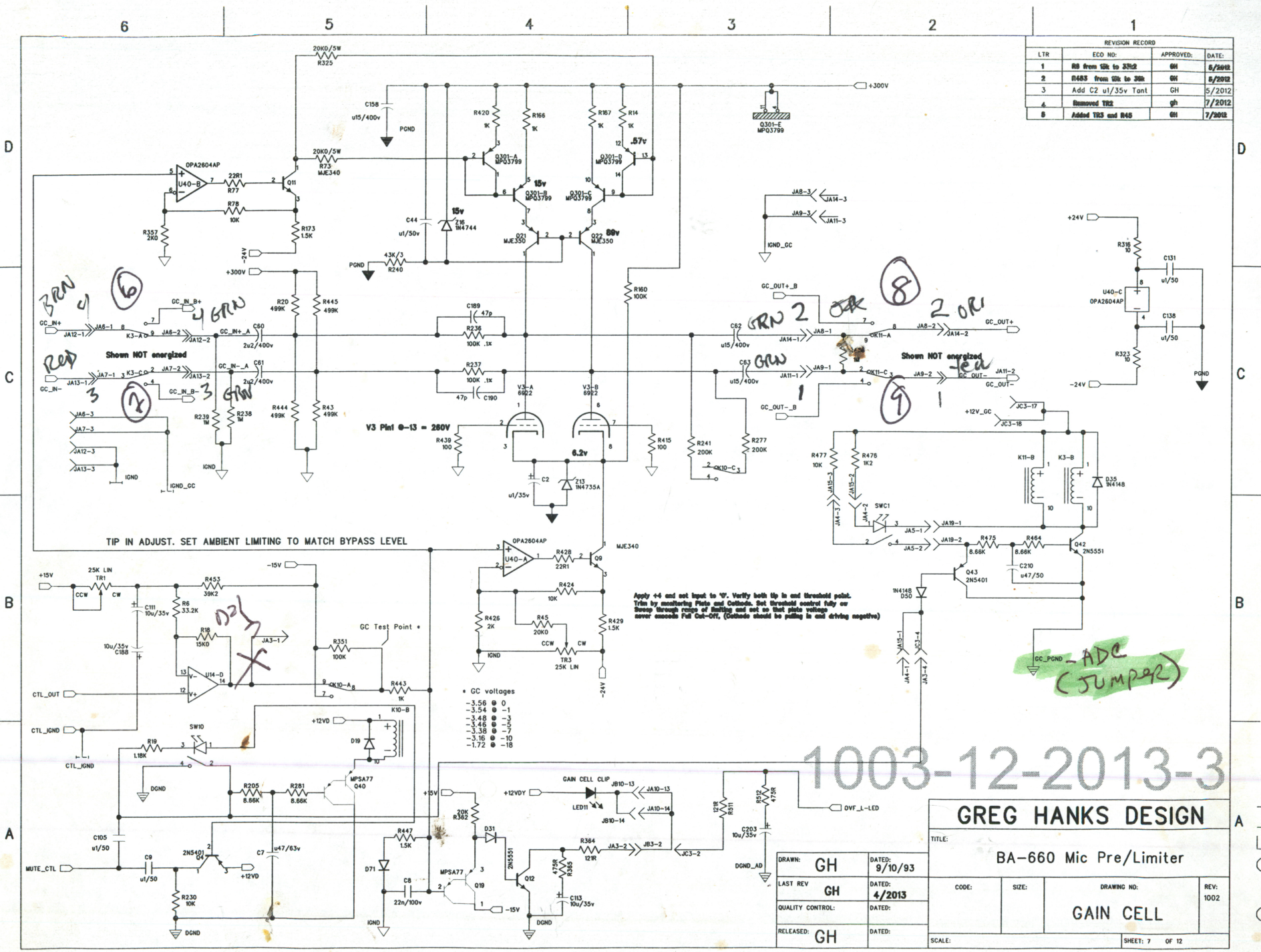


1003-12-2013-3

GREG HANKS DESIGN			
TITLE: BA-660 Mic Pre/Limiter			
DRAWN: GH	DATED: 9/20/94	CODE:	SIZE:
LAST REV: GH	DATED: 4/2013	DRAWING NO:	REV:
QUALITY CONTROL:	DATED:	LEVEL METER	
RELEASED: GH	DATED:	SCALE:	SHEET: 6 OF 12

LVLMTRO

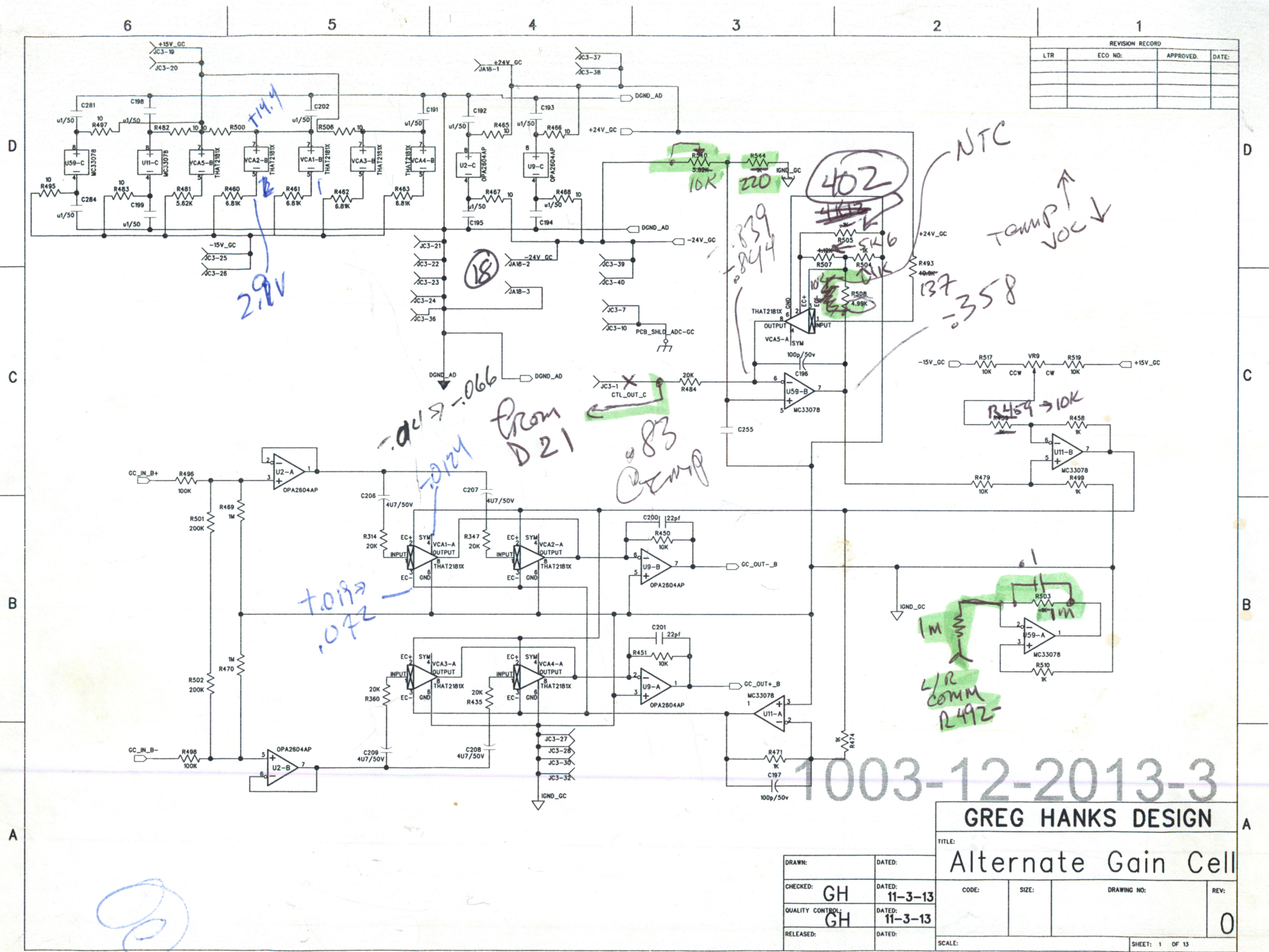
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:
1	RB from 52k to 33k	GH	5/2012
2	R463 from 50k to 30k	GH	5/2012
3	Add C2 u1/35v Tant	GH	5/2012
4	Removed TR2	gh	7/2012
5	Add TR5 and R45	GH	7/2012



GREG HANKS DESIGN			
TITLE: BA-660 Mic Pre/Limiter			
DRAWN: GH	DATED: 9/10/93	CODE:	SIZE:
LAST REV: GH	DATED: 4/2013	DRAWING NO:	REV: 1002
QUALITY CONTROL:	DATED:	GAIN CELL	
RELEASED: GH	DATED:	SCALE:	SHEET: 7 OF 12

G CELL

REVISION RECORD			
LTR	ECO NO.	APPROVED	DATE



NTC
 TEMP ↑
 VOC ↓

0.019 →
 0.024
 from D21

83
 TEMP

1M
 L/R
 COMM
 R492

1003-12-2013-3

GREG HANKS DESIGN

TITLE: Alternate Gain Cell

DRAWN:	GH	DATE:	11-3-13	CODE:	SIZE:	DRAWING NO.:	REV:
CHECKED:	GH	DATE:	11-3-13				0
QUALITY CONTROL:	GH	DATE:	11-3-13				
RELEASED:		DATE:					
SCALE:							SHEET: 1 OF 13

6

5

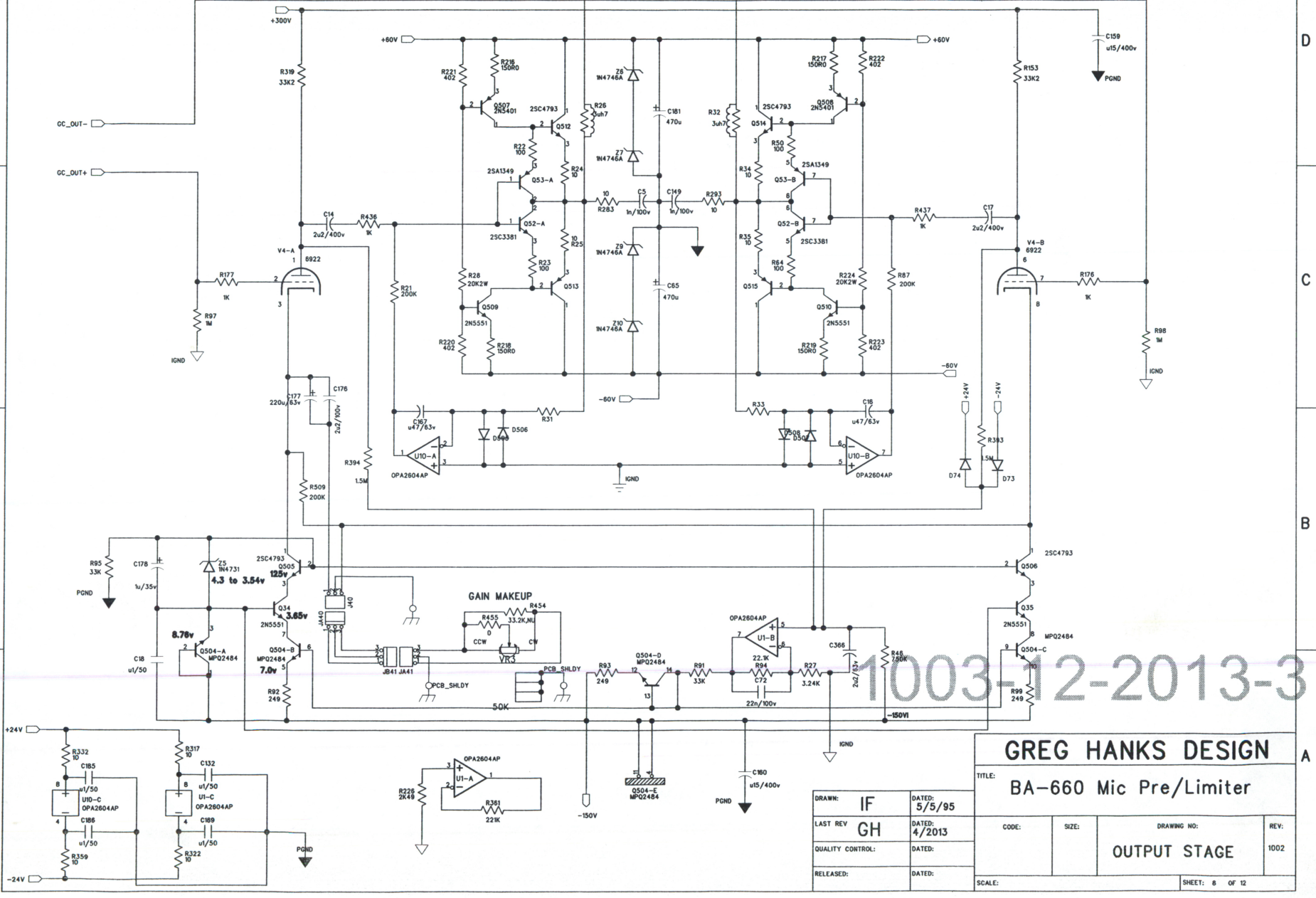
4

3

2

1

REVISION RECORD			
LTR	ECD NO:	APPROVED:	DATE:
	R454 to 0	05-07-12 GH	
	R455 not used	05-07-12 GH	
	R93 changed to 249R	8/2012	
	J4-J5 added to correct BOM		



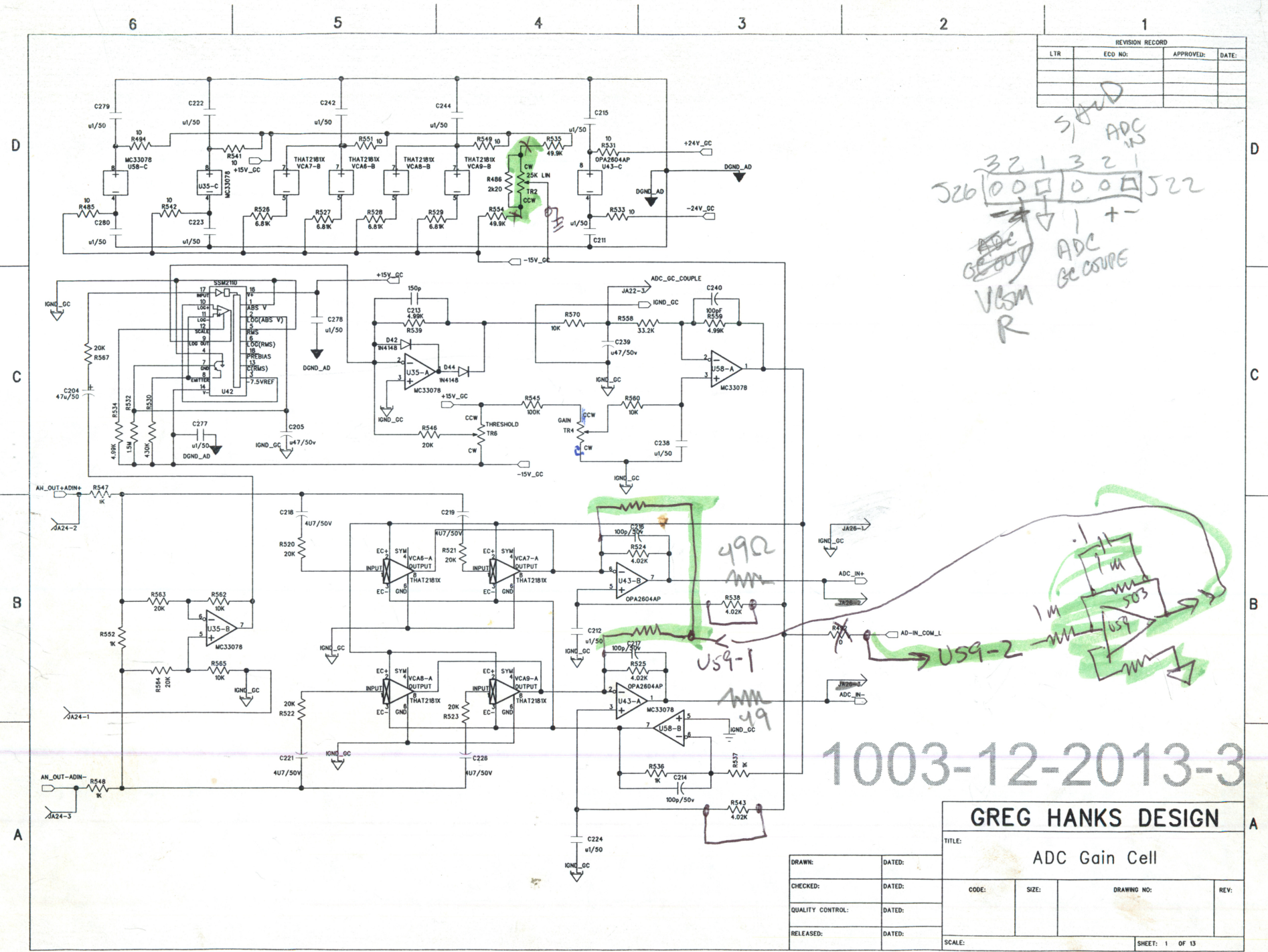
GREG HANKS DESIGN

TITLE: **BA-660 Mic Pre/Limiter**

DRAWN:	IF	DATED:	5/5/95
LAST REV	GH	DATED:	4/2013
QUALITY CONTROL:		DATED:	
RELEASED:		DATED:	

CODE:	SIZE:	DRAWING NO:	REV:
		OUTPUT STAGE	1002
SCALE:		SHEET: 8 OF 12	

REVISION RECORD			
LTR	ECD NO:	APPROVED:	DATE:



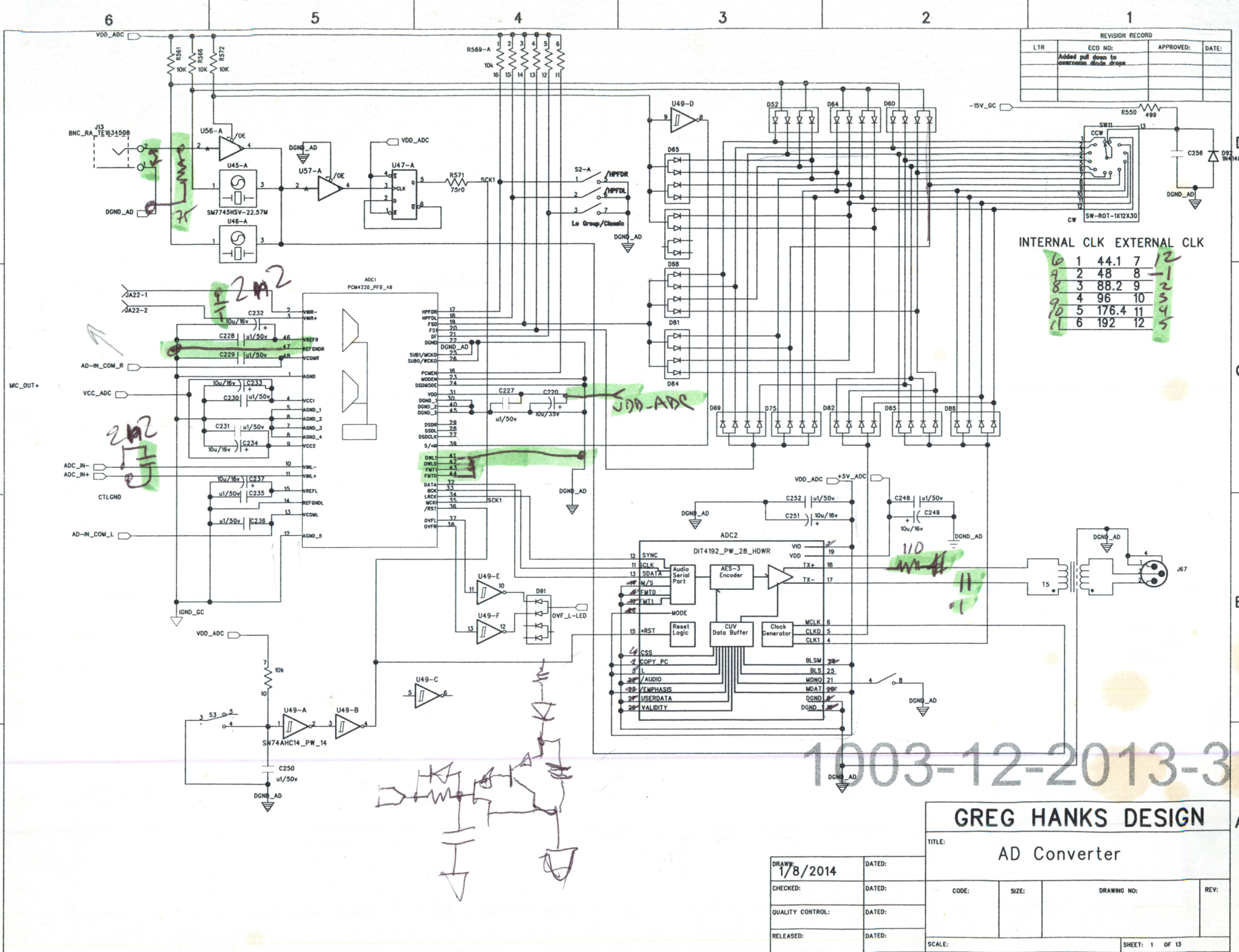
321321
 526 0 0 0 0 522
 ADC BE COUPE
 VGM R

1003-12-2013-3

GREG HANKS DESIGN			
TITLE: ADC Gain Cell			
DRAWN:	DATED:	CODE:	SIZE:
CHECKED:	DATED:	DRAWING NO:	REV:
QUALITY CONTROL:	DATED:	SCALE:	SHEET: 1 OF 13
RELEASED:	DATED:		

REVISION RECORD			
LTR	ECO NO.	APPROVED:	DATE:
	Added pull down to		
	overroom mode drop		

	INTERNAL CLK	EXTERNAL CLK		
6	1	44.1	7	12
8	2	48	8	12
9	3	88.2	9	12
10	4	96	10	12
11	5	176.4	11	12
12	6	192	12	12



GREG HANKS DESIGN

TITLE: **AD Converter**

DRAWN: 1/8/2014	DATED:	CODE:	SIZE:	DRAWING NO:	REV:
CHECKED:	DATED:				
QUALITY CONTROL:	DATED:				
RELEASED:	DATED:				

SCALE: SHEET: 1 OF 13

6

5

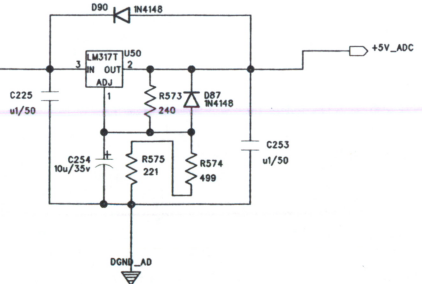
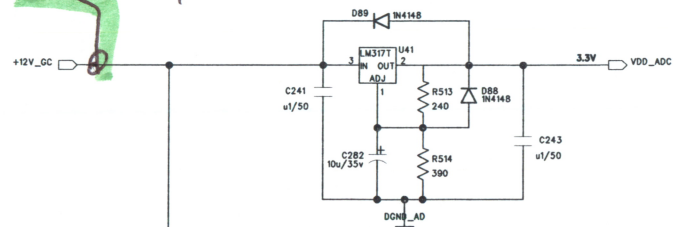
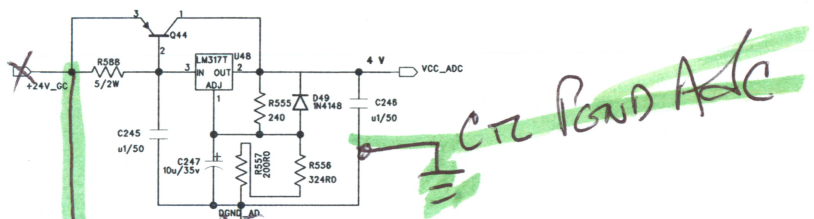
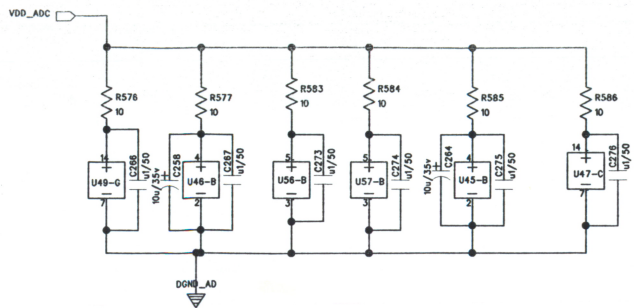
4

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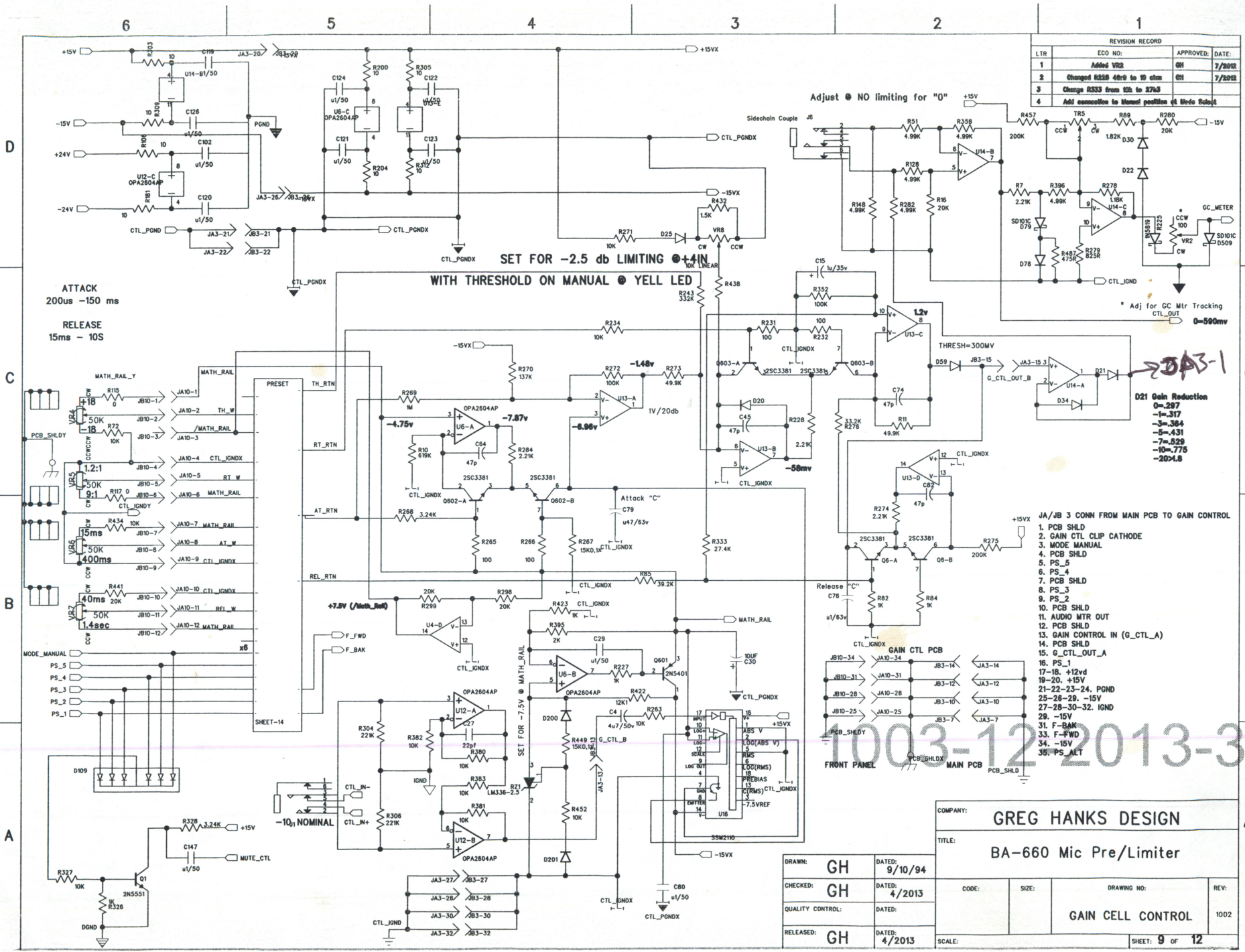
REVISION RECORD			
LTR	ECD NO:	APPROVED:	DATE:



1003-12-2013-3

GREG HANKS DESIGN			
TITLE:			
DRAWN:	DATED:	CODE:	SIZE:
CHECKED:	DATED:	DRAWING NO:	
QUALITY CONTROL:	DATED:		REV:
RELEASED:	DATED:	SCALE:	SHEET: 1 OF 13

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:
1	Added VR2	GH	7/2013
2	Changed R258 40k to 10 ohm	GH	7/2013
3	Change R333 from 10k to 27k		
4	Add connection to correct position of Mute Solenoid		



ATTACK
200us - 150 ms

RELEASE
15ms - 10S

SET FOR -2.5 db LIMITING @ +41N
WITH THRESHOLD ON MANUAL @ YELL LED

Adjust @ NO limiting for "0"

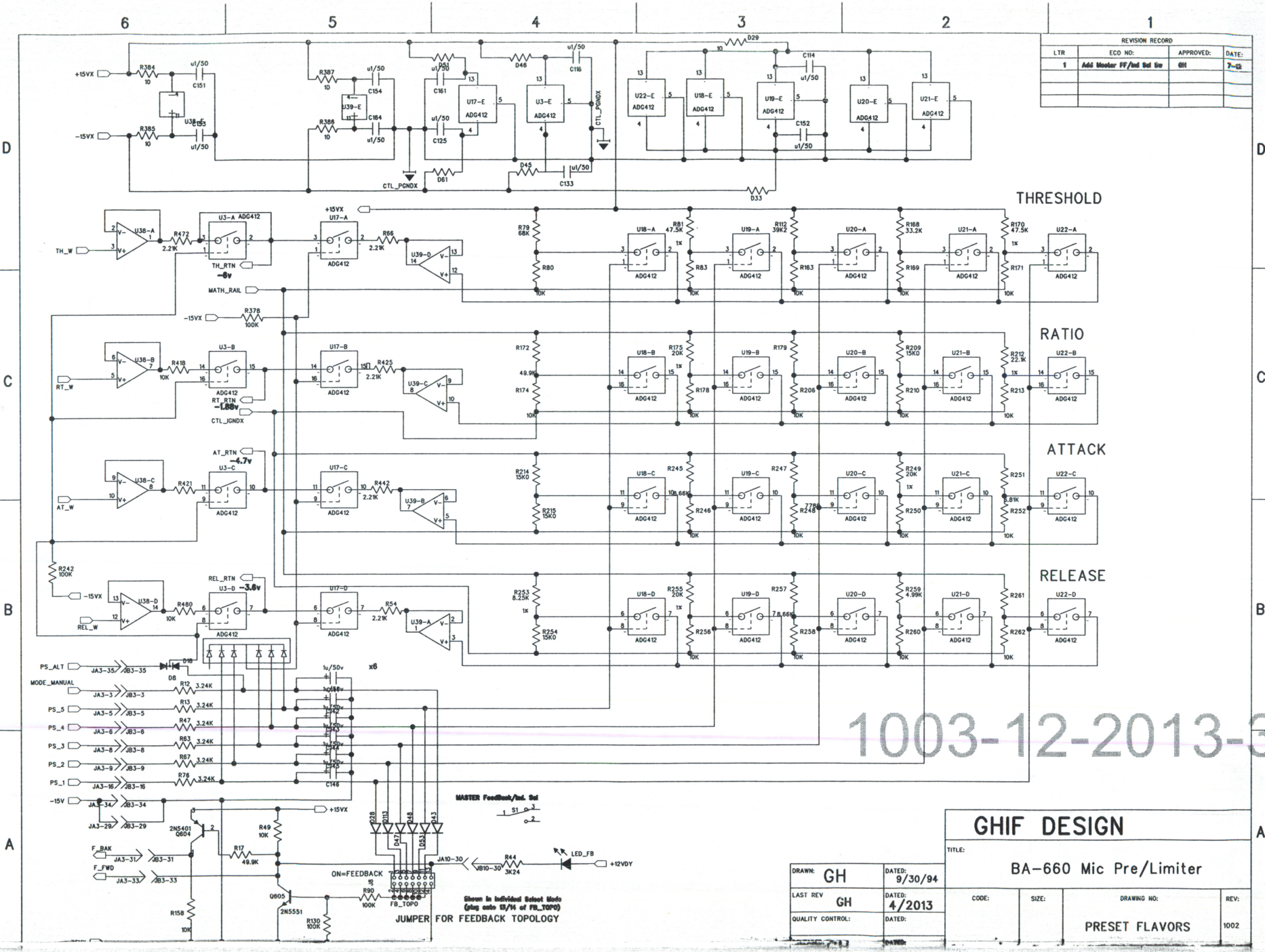
D21 Gain Reduction
0=-287
-1=-317
-3=-364
-5=-431
-7=-529
-10=-775
-20=-1.8

- JA/JB 3 CONN FROM MAIN PCB TO GAIN CONTROL
1. PCB SHLD
 2. GAIN CTL CLIP CATHODE
 3. MODE MANUAL
 4. PCB SHLD
 5. PS_5
 6. PS_4
 7. PCB SHLD
 8. PS_3
 9. PS_2
 10. PCB SHLD
 11. AUDIO MTR OUT
 12. PCB SHLD
 13. GAIN CONTROL IN (G_CTL_A)
 14. PCB SHLD
 15. G_CTL_OUT_A
 16. PS_1
 - 17-18. +12v
 - 19-20. +15V
 - 21-22-23-24. PGND
 - 25-26-28. -15V
 - 27-28-30-32. IGND
 29. -15V
 31. F-BAK
 33. F-FWD
 34. -15V
 35. PS_ALT

1003-12 2013-3

COMPANY:		GREG HANKS DESIGN	
TITLE:		BA-660 Mic Pre/Limiter	
DRAWN:	GH	DATED:	9/10/94
CHECKED:	GH	DATED:	4/2013
QUALITY CONTROL:		DATED:	
RELEASED:	GH	DATED:	4/2013
CODE:	SIZE:	DRAWING NO:	REV:
		GAIN CELL CONTROL	1002
SCALE:		SHEET:	9 of 12

REVISION RECORD			
LTR	ECO NO.	APPROVED:	DATE:
1	Add Master FF/nd Scl Sm	GH	7-02



PRESET

1003-12-2013-3

GHIF DESIGN		TITLE:	
BA-660 Mic Pre/Limiter		PRESET FLAVORS	
DRAWN: GH	DATED: 9/30/94	CODE:	SIZE:
LAST REV: GH	DATED: 4/2013	DRAWING NO.:	REV: 1002
QUALITY CONTROL:	DATED:		

MASTER Feedback/nd. Sel
 1 31 2
 2
 Shown in Individual Select Mode
 (plug into 13/14 of PB_T0P0)
 JUMPER FOR FEEDBACK TOPOLOGY

6

5

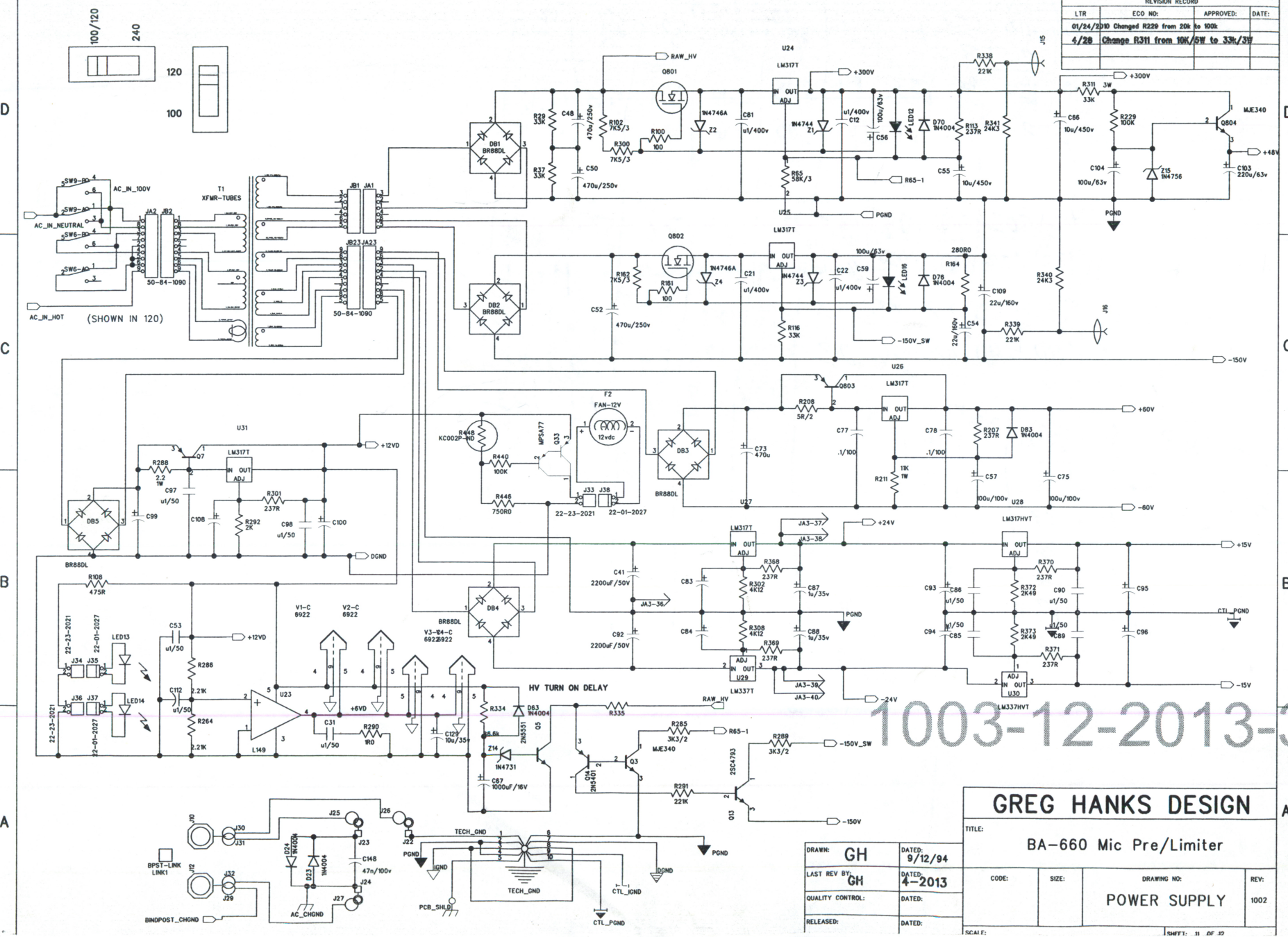
4

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1

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:
	01/24/2010		Changed R229 from 20k to 100k
	4/28		Change R311 from 10K/5W to 33k/3W



PWR

1003-12-2013-3

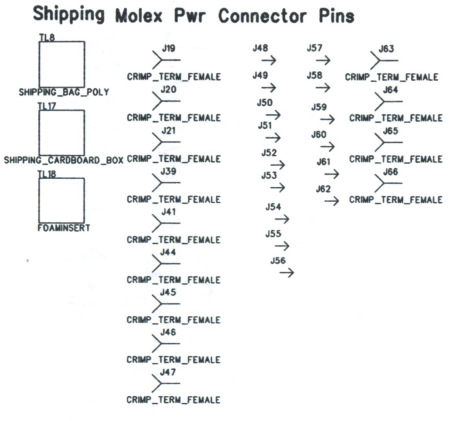
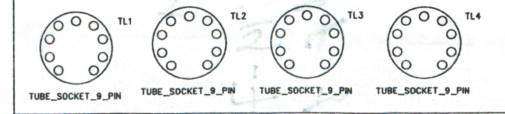
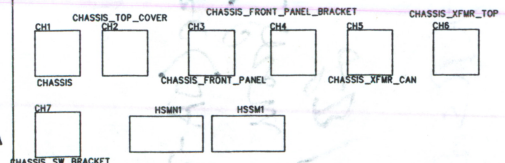
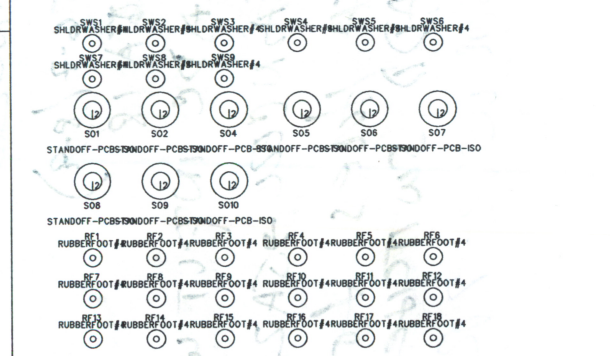
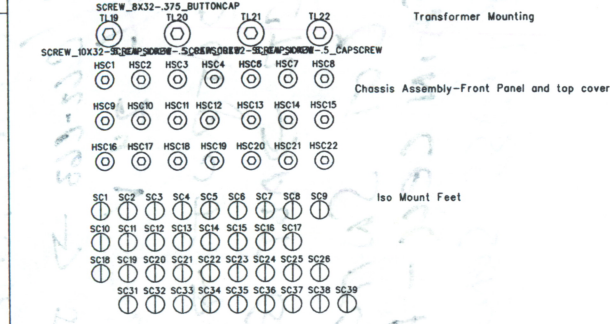
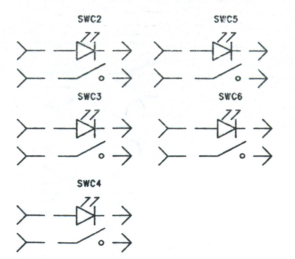
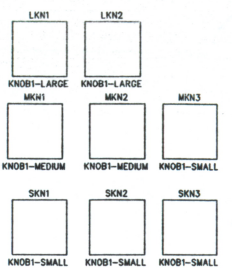
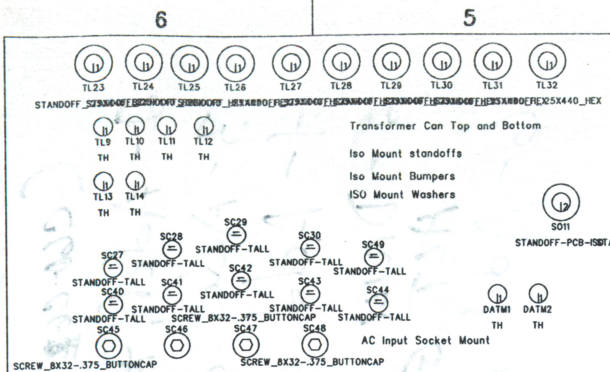
GREG HANKS DESIGN

TITLE: BA-660 Mic Pre/Limiter			
DRAWN: GH	DATED: 9/12/94	CODE:	SIZE:
LAST REV BY: GH	DATED: 4-2013	DRAWING NO:	REV: 1002
QUALITY CONTROL:	DATED:	POWER SUPPLY	
RELEASED:	DATED:	SCALE: 11 OF 10	

A

A

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



1003-12-2013-3

GREG HANKS DESIGN			
BA-660 MIC PRE/LIMITER			
CODE:	SIZE:	DRAWING NO:	REV:
		MECHANICAL PARTS	
SCALE:		SHEET 12 of 12	

DRAWN: GH	DATED: 4/1/96
CHECKED:	DATED:
QUALITY CONTROL:	DATED:
RELEASED:	DATED: 12-2011

INPUT VOLTAGE

	120 +300	150 -150	60	+12	120 +300	120 -150	60	+12	12	
	1	2	3	4	1	2	3	4	5	
90	310	152	65	53	14	278	136	59	46	11.5
100	353	171	73	61	16	305	146	62	52	13
105										
110	412	202	87	72	18.5	335	164	70	58	14.6
120	432	222	90	75	20.6	369	179	77	64	16.2
125	472	230	98	83	21.5	380	186	79	66	16.9
130	490	240	103	86	23	400	196	84	70	17.8
135						406	199	85	71	18.3

Dropout	295.6	88	89	88	90
+300	→ 153.1	89			
-150	→ 59.1	< 88			
60	→ 46.6	< 80			
+/-24	→ 11.7	93			
12					

GREG HANKS - DESIGN
 1110 W. 10th St. - Allentown, PA 18103
 610-261-1234

1- Add CAP/HARNCESS

(C60-C62 / C62-C63 → J6-7/8-9)

2- Add +/- 24 V → JA 18

3- Add OUTPUT → A/D INPUT WIRE (JA-24)

4- Add CTRL → ALT GAIN CELL → JA 21 (from U14-7/8)

5- DRILL OUT SWITCH HOLES FOR LB/FF +
ALT GAIN CELL - ADD SWITCHES

6- Add BYPASS SENSOR WIRE → R19 (R side)

INITIAL Set Up -

1 THRESHOLD - Adjust for oxide @ top of R546

2- ADC GAIN - ~~PTD~~ of SURY CCW

3-