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Broadcast Devices, Inc.

Technical Reference Manual

ACS-400 Audio Controller

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Rev A. 08/07

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I. Introduction

The ACS-400 Audio Controller is comprises of eight audio amplifiers that can be configured for microphone or line input. Each output is a balanced +4 dBm configuration. Each amplifier level can be remotely controlled by use of a companion REM-400 remote control panel. This panel also has provision to remotely turn on and off channels with mute status. The ACS-400 also has a remote dimming function of any combination of channels. Dim levels can be adjusted by placing a jumper on the motherboard for each channel. Factory default is 20 dB of dimming. Suggested uses include adding additional microphone inputs to a console, control of 5.1 multi channel audio monitoring, or in any application where remote control of level and on off control is required.

II. Unpacking and Inspection

Carefully inspect the unit after unpacking and make certain that no damage has occurred during shipping. If damage is noted, contact the shipper immediately and file a claim for damages. Each unit is carefully packed and carries full insurance against damage. Inspect the packing list and make sure that the contents of the package match those described on the packing list.

III. Installation and Connections

As shipped from the factory, the ACS-400 is designed to accept +4 dBm balanced audio and produces +4 dBm balanced audio outputs when connected to an accompanying ACS-REM remote panel. If this optional panel is not used the output level from the ACS-400 unit will be +10 dBm. This is due to the internal gain structure and use of voltage controlled amplifiers within the unit. There is provision to change the input level sensitivity from +4 dBm to -55 dBm if desired for microphone input use. To do so, remove the top cover and locate the Audio Controller motherboard. To set the input levels to – 55 dBm level sensitivity locate the attenuator jumpers which are just to the rear of each module. Place a pair of jumpers in the right hand most set of contacts for each channel that microphone level is desired. Next, feed a -55 dBm signal to the desired input and adjust the trimmer control on the desired module channel for +10 dBm with the remote control full open. This will insure that +4 dBm can be attained with sufficient room in the remote control volume control to boost level if desired.

Connection to the unit is via the three DB-25 connectors. Inputs are connected to the input connector utilizing a standard DB-25 to XLR breakout cable with female XLR connectors utilizing the Tascam® ADAT format. Cables for this purpose are available from Broadcast Devices, Inc. or can be purchased from a reseller. Outputs are taken from the “Output” DB-25 connector again utilizing a standard DB-25 breakout cable with male XLR connectors. Remote control connections are made via the “Remote” connector. The following remote control and status are available:

Global Mute – simultaneously for all channels
Stereo pair mute - with corresponding status to light an LED for channels 1 / 2 , 3 / 4, 5 / 6 and 7 / 8
Global Dim – all channels simultaneously by 10, 20, or 30 dB
Remote level - control for each of eight channels

When the ACS-400 is used in conjunction with the ACS-REM series remote control panels simply connect a standard male to female 25 conductor cable Pins 1-25 identical on each end.

See the remote control/status chart for connection information if the ACS-REM panel is not used.

IV. Features and Operation

The ACS-400 contains eight balanced input to balanced output amplifiers. Each channel has provision for remote control of level using voltage controlled amplifier techniques. Each pair of channels can be turned on and off remotely and there is also provision for a programmable global on/off control of channels. There is also provision for each channel to be dimmed by 10, 20 or 30 dB. This is also a programmable feature whereby any combination of channels can be dimmed by one remote control command. Each remote control command of on/off and dimming function can be programmed to accept a momentary closure for a toggle function or for a maintained closure for operation.

Standard factory default input level for the ACS-400 is +4 dBm balanced connection. The unit can also be modified to accept -55dBm sensitivity for microphone input use. Standard output level is +4 dBm balanced. Each output is servo steered such that grounding one of the balanced outputs will not cause any damage or loss of level.

V. Remote Control and Status Connections

Refer to the following table for remote control and status pin out of the remote DB-25 connector at the rear of the unit:

Pin 1	CH 1 VCA control
Pin2	CH 2 VCA control
Pin 3	CH 3 VCA control
Pin 4	CH 4 VCA control
Pin 5	Fused +5 VDC VCA source voltage
Pin 6	CH 5 VCA control
Pin 7	CH 6 VCA control
Pin 8	CH 7 VCA control
Pin 9	CH 8 VCA control
Pin 10	Fused +5 VDC VCA source voltage
Pin 11	Global dim control
Pin 12	Global mute control
Pin 13	Chassis Ground
Pin 14	CH ½ Mute On/Off control
Pin 15	CH ½ Mute On/Off status
Pin 16	CH 3/4 Mute On/Off control
Pin 17	CH 3/4 Mute On/Off status
Pin 18	Control/Status common ground
Pin 19	CH 5/6 Mute On/Off control
Pin 20	CH 5/6 Mute On/Off status
Pin 21	CH 7/8 Mute On/Off control
Pin 22	CH 7/8 Mute On/Off status
Pin 23	Control/Status common ground
Pin 24	Global Dim Status
Pin 25	Global Mute Status

For command lines a simple momentary or maintained closure to control common ground will activate the desired function. See programming instructions for setting up toggle or maintained operation. VCA control of each input is accomplished by connecting the +5 VDC source to the high side of a **10 K ohm linear** potentiometer, the low side to control/status common ground and the wiper to the desired channel VCA control input.

Programming the ACS-400 Mother board

The ACS-400 can be programmed via jumper placement for the following:

1. Toggle or maintained closure of remote control inputs
2. Global mute and dimming assignment

Refer to the Jumper Assignment Pictorial Diagram for the following discussion

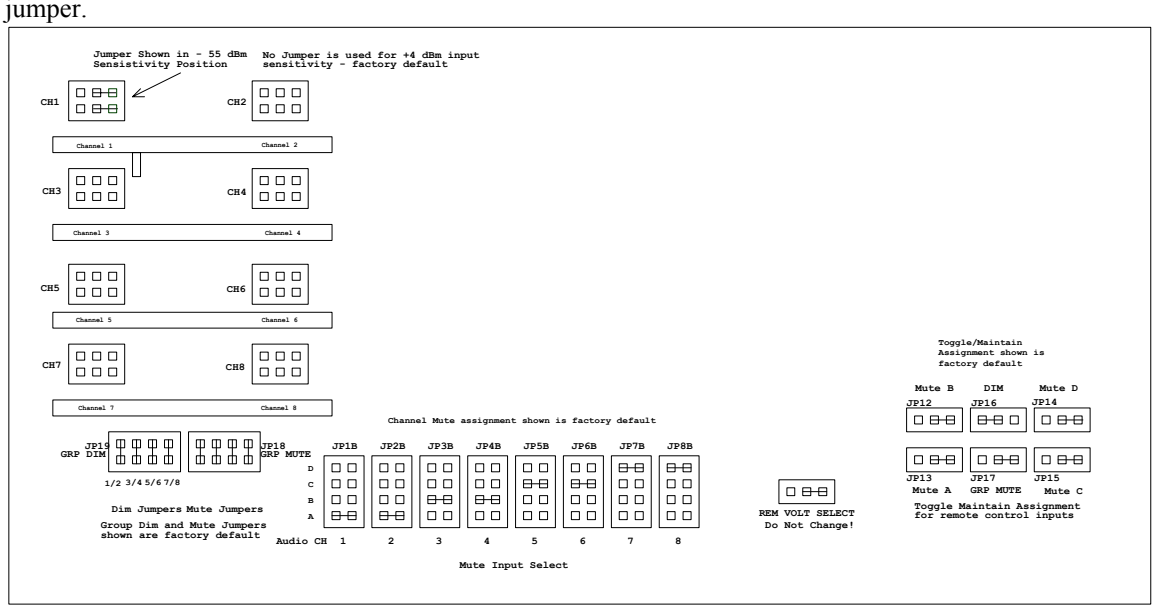
Functional description of jumpers:

JP12-17 Toggle/Maintain control of remote control inputs. Place a jumper to the left if maintained closure to ground will hold a command in the desired function. Place a jumper to the right if toggle control is desired. Toggle control is momentary closure for alternate on/off function.

JP19 GRP DIM – assigns by stereo pair which channels will accept a dim command when remote control dim line is pulled low. Place a jumper in each line where a stereo dim is desired. Place all jumpers for group dim

JP18 GRP MUTE – assigns by stereo pair which channels will accept a mute command from the remote control group mute control. – This is a separate mute command that can provide a group mute of all channels and is not to be confused with the individual channel mutes which are possible by use of the mute input select jumpers discussed below

JP1B-8B MUTE INPUT SELECT – allows for remote control input lines to be assigned to mute a specific grouping of channels to be muted. There are four remote mute lines A, B, C, and D. Each can be assigned to command a specific channel to be muted. Simply select which channel will be controlled by which remote control input by placing a jumper in the A, B, C, or D, row as desired on the desired channel jumper.



Jumper Assignment Pictorial Diagram

V. Specifications

Inputs Sensitivity:	+4 dBm or -55 dBm any imput
Outputs:	+4 dBm balanced 600 ohms
Frequency Response:	+/- 0.2 dB from 20 Hertz to 20 KHz
Total Harmonic Distortion:	less than .05% any channel at any frequency At +4 dBm nominal operating level
Maximum Output level:	+17 dBm
Mute Isolation:	70 dB or greater all channels from 20 Hertz to 20 KHz
Remote Control:	Custom remote control via ACS-REM Panel
Remote Status:	Active low ground, +5 VDC inactive TTL compatible
Power Requirements:	120/240 V.A.C. @ 0.25A; 50 – 60 Hz.
Operating Environment:	0 – 60 Degrees Celsius Non Condensing Atmosphere
Physical:	19”W X 10”D X 1.75”H Mounted via Standard E.I.A. 19” rack one rack unit occupied. Weight: 12 LBS.

VI. Warranty

Broadcast Devices, Inc. products are warranted against failure due to faulty materials or workmanship for a period of one year from the date of shipment to the ultimate user. The warranty covers repair or replacement of defective parts at the factory, provided the unit has been returned prepaid by the user. All shipments to the factory shall have affixed to the outside of the container an R. A. number obtained from the factory. The above warranty is void if the unit has been modified by the user outside of any recommendations from the factory or if the unit has been abused or operated outside of its electrical or environmental specifications. If customer conducted field tests suggest that the unit may be faulty, whether or not the unit is in warranty, a full report of the difficulty should be sent to Broadcast Devices, Inc. factory at Cortlandt Manor, New York. The office may suggest further tests or authorize return for factory evaluation.

Units sent to the factory should be well packed in the original packing if possible and shipped to Broadcast Devices, Inc. 5 Crestview Avenue, Cortlandt Manor, NY 10567. Remember to affix the R.A. number to the outside of the carton. Any packages received without such R.A. number will be refused. Note: freight collect shipments will also be refused. When the unit has been received, inspected and tested, the customer will receive a report of the findings along with a quotation for recommended repairs, which are found falling outside of the standard warranty. Units returned for in-warranty repairs which are found not to be defective will be subject to an evaluation and handling charge. In-warranty units will be repaired at no charge and returned via prepaid freight.

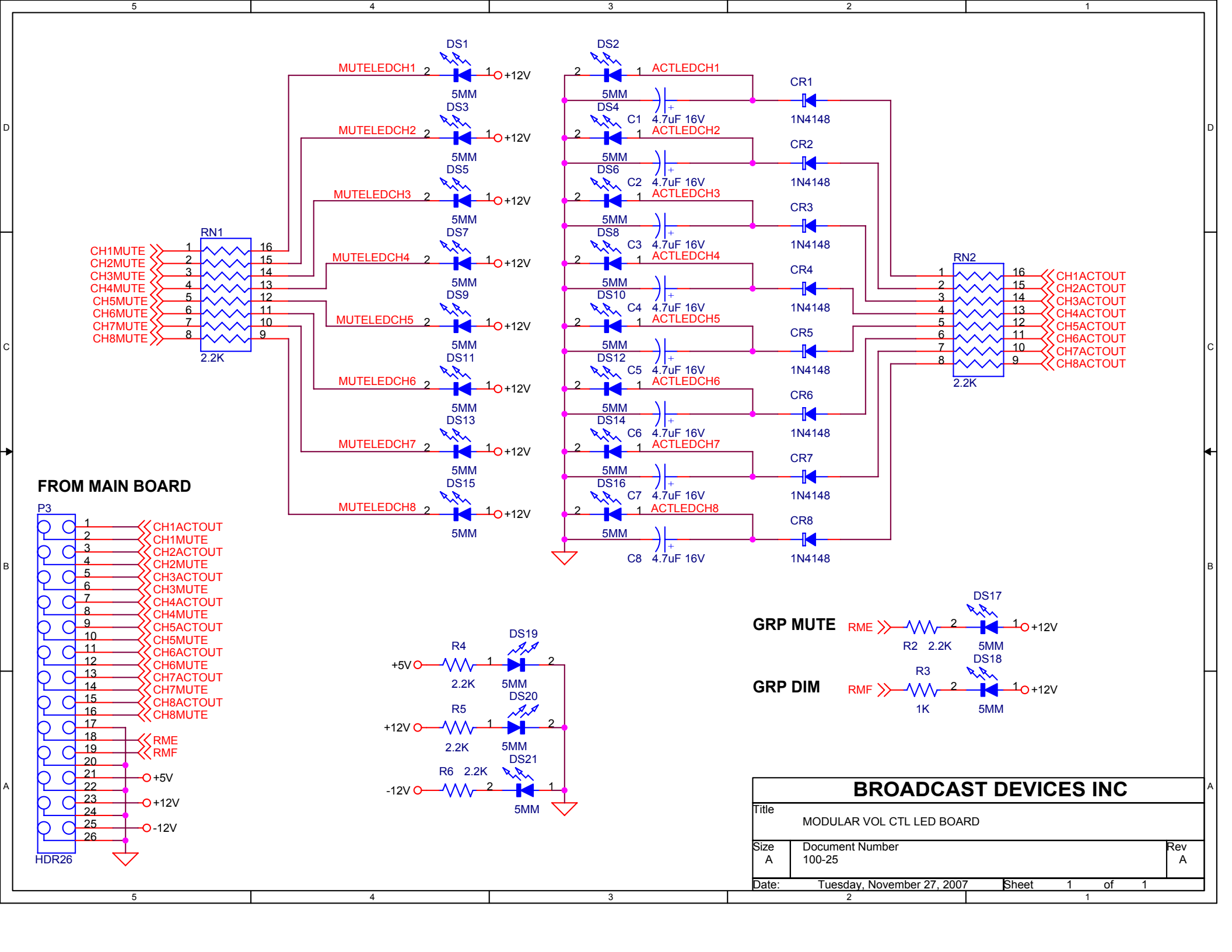
Out-of-warranty units needing repair require a purchase order and will be invoiced for parts, labor, and shipping charges.

When ordering replacement part, always specify A) Part number or Description, and Quantity; B) Date of Purchase, Where Purchased; C) Any Special Shipping Instructions. Always specify a street address, as shipping companies cannot deliver to a postal box.

Broadcast Devices, Inc. is not responsible for any other manufacturer’s warranty on original equipment. Nor are we responsible for any failure, damage, or loss of property that may occur due to the installation or operation of our equipment outside of recommended specifications.

Broadcast Devices, Inc. may from time to time make changes to the materials used in the manufacture of its equipment and reserves the right to do so without further notice.

VII. Schematic Diagrams



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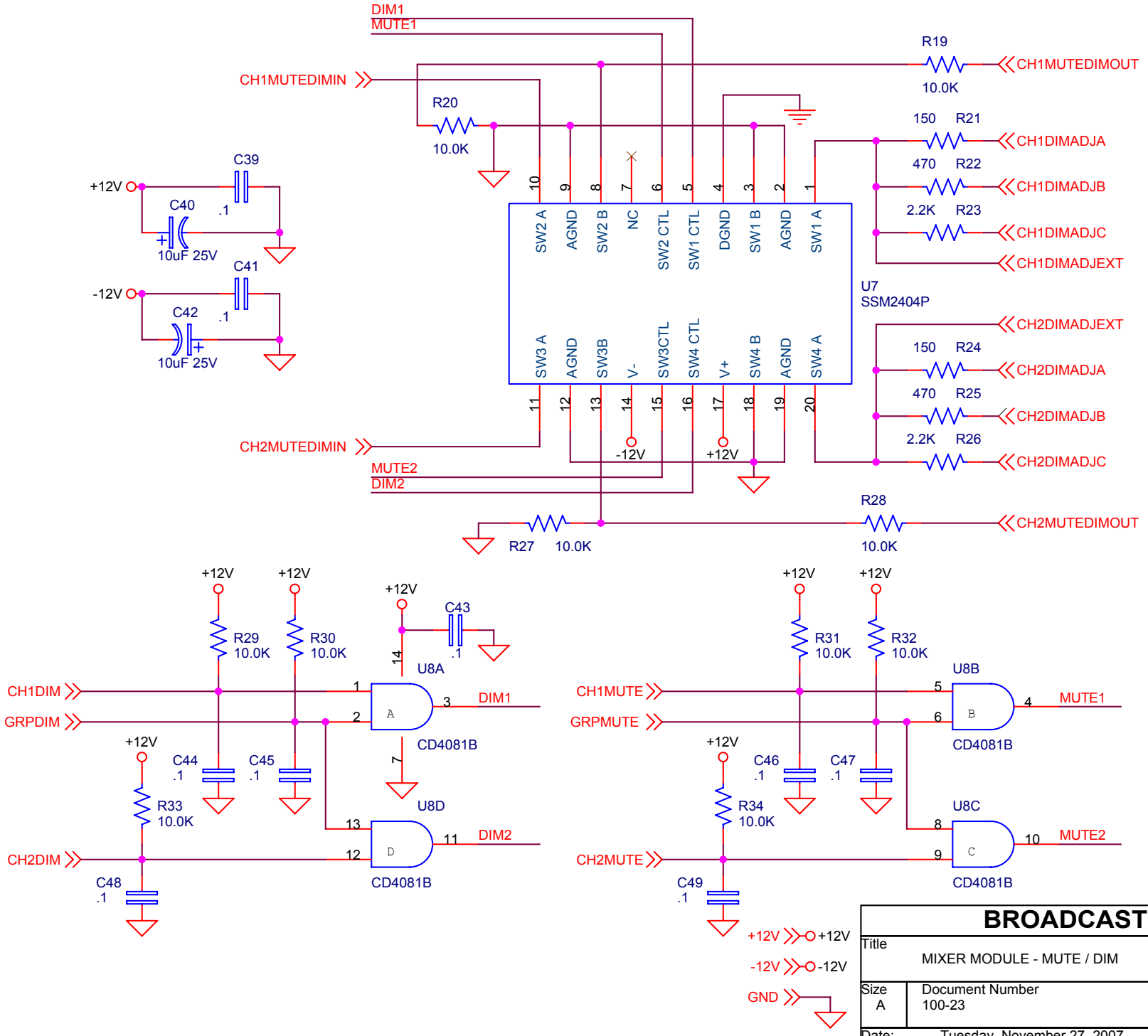

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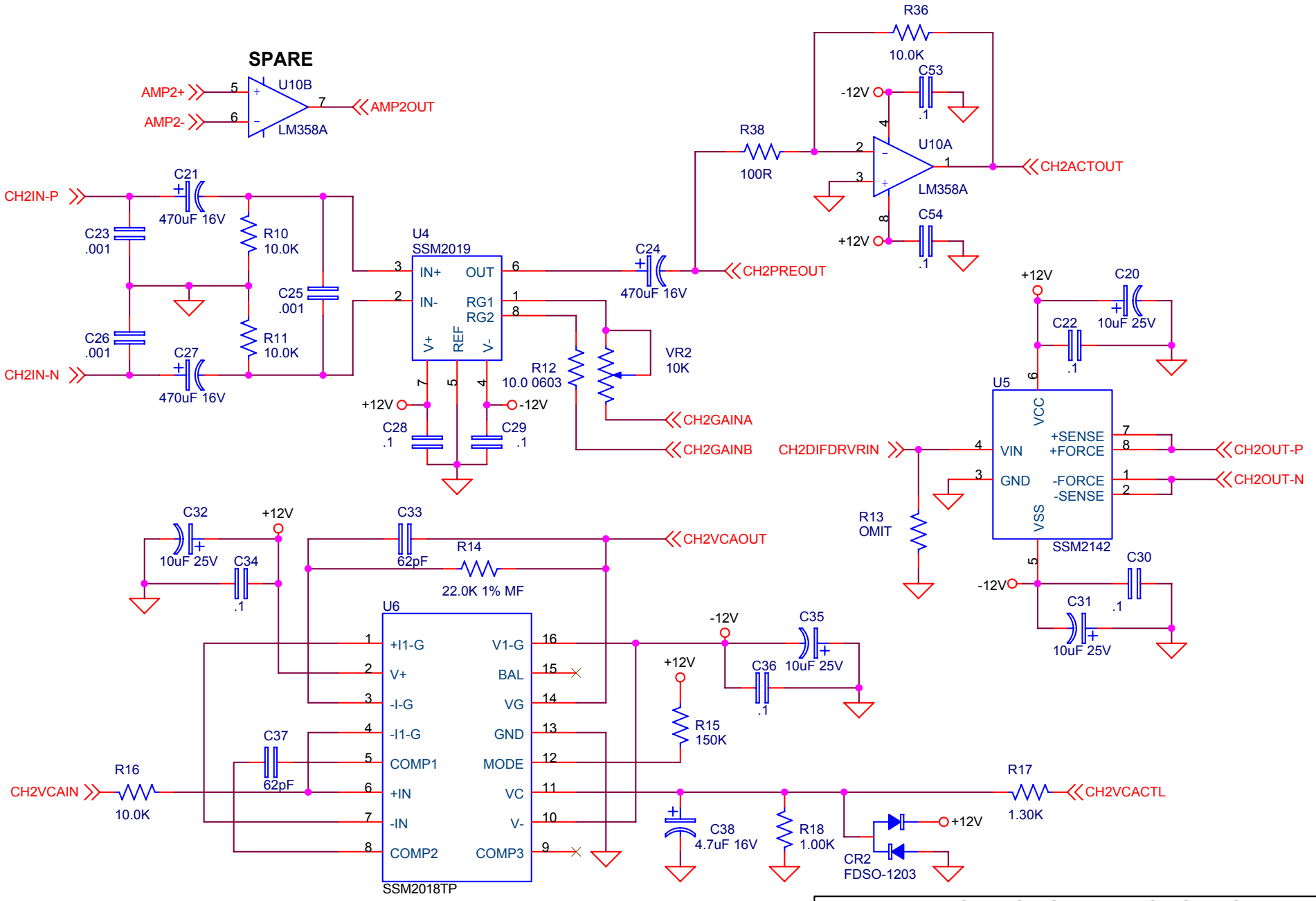

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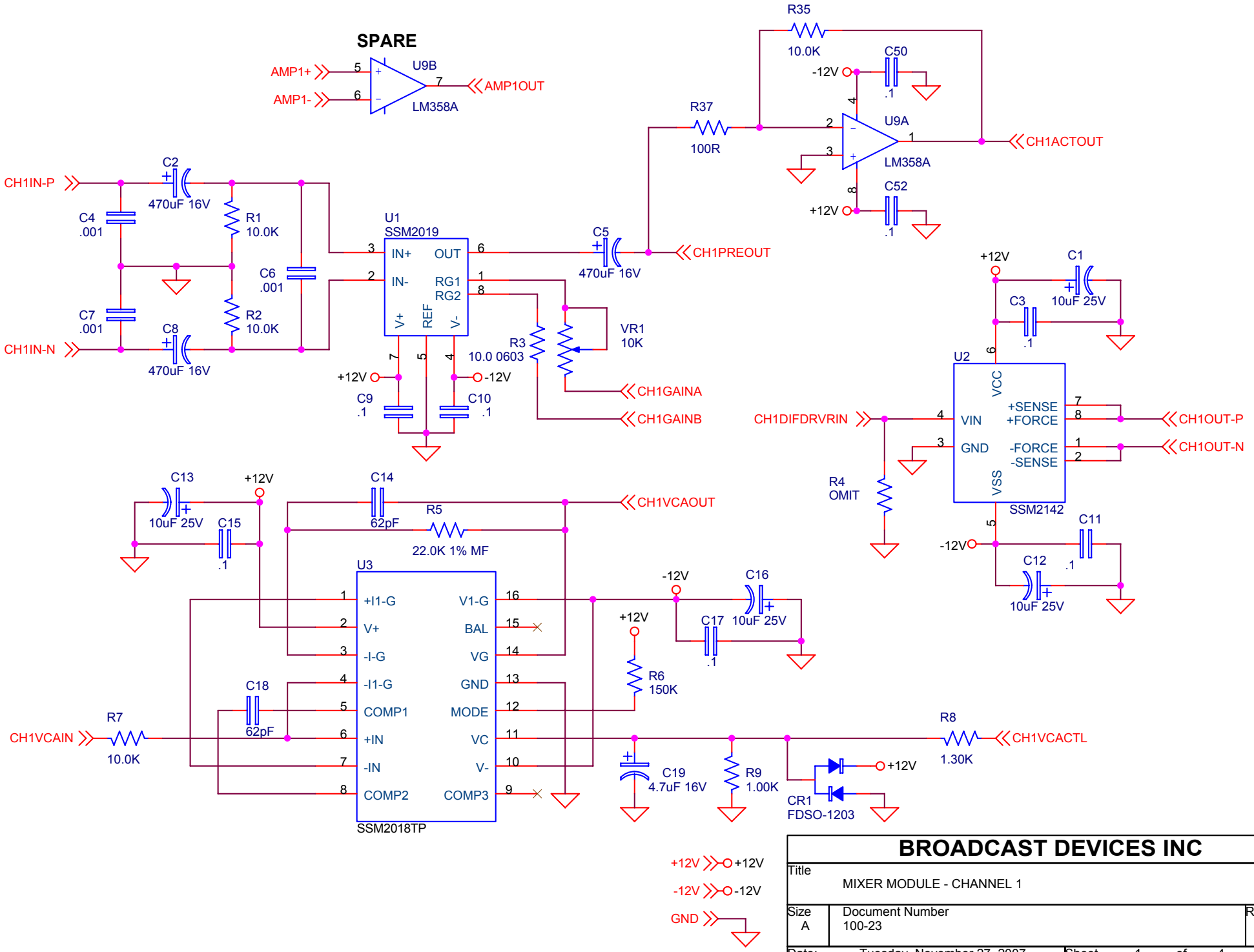

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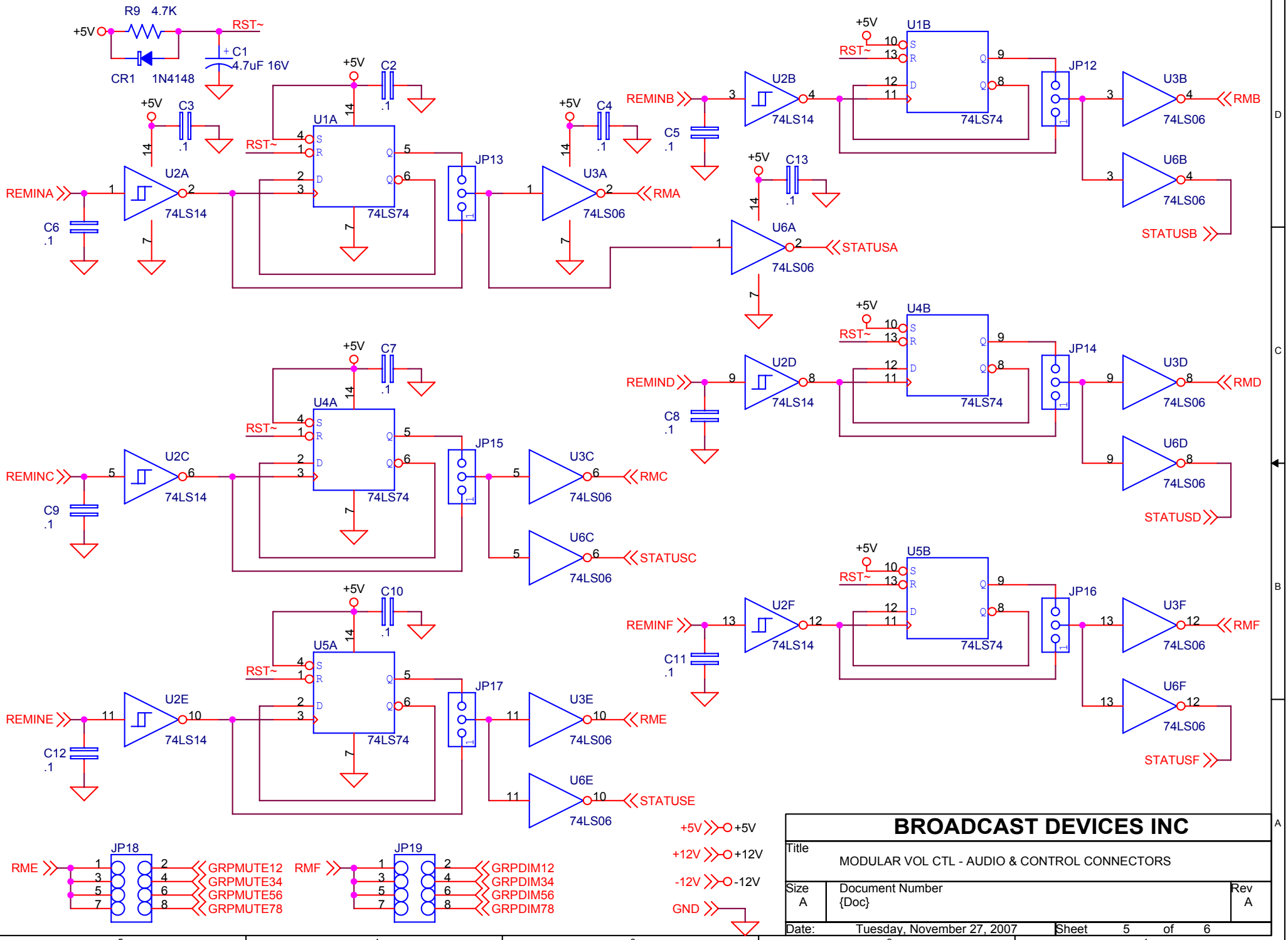

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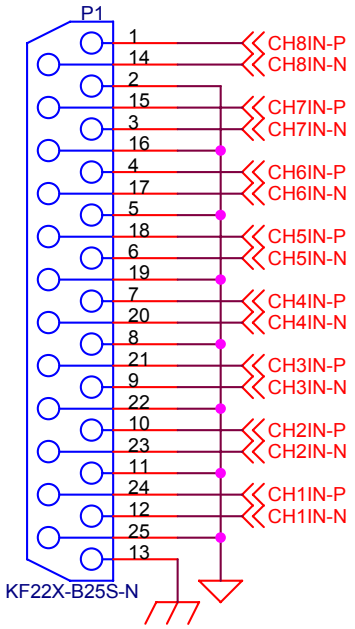
AUDIO IN



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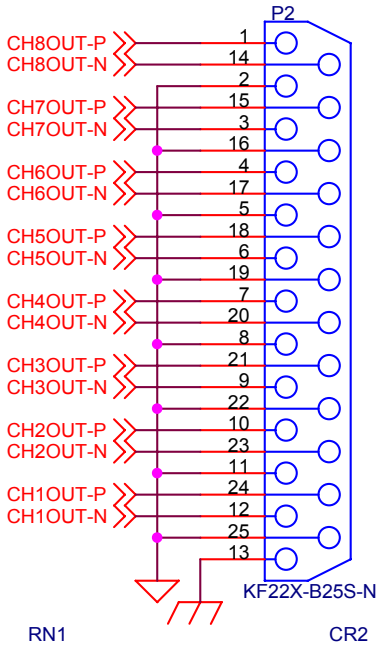

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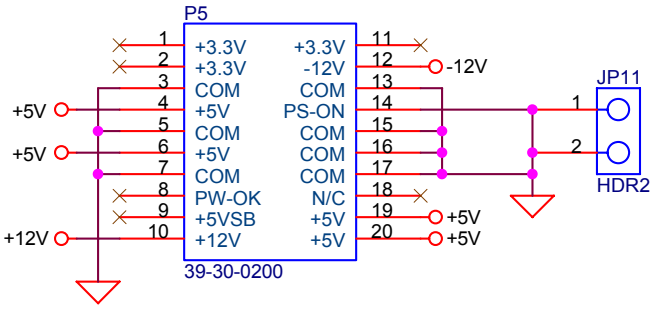
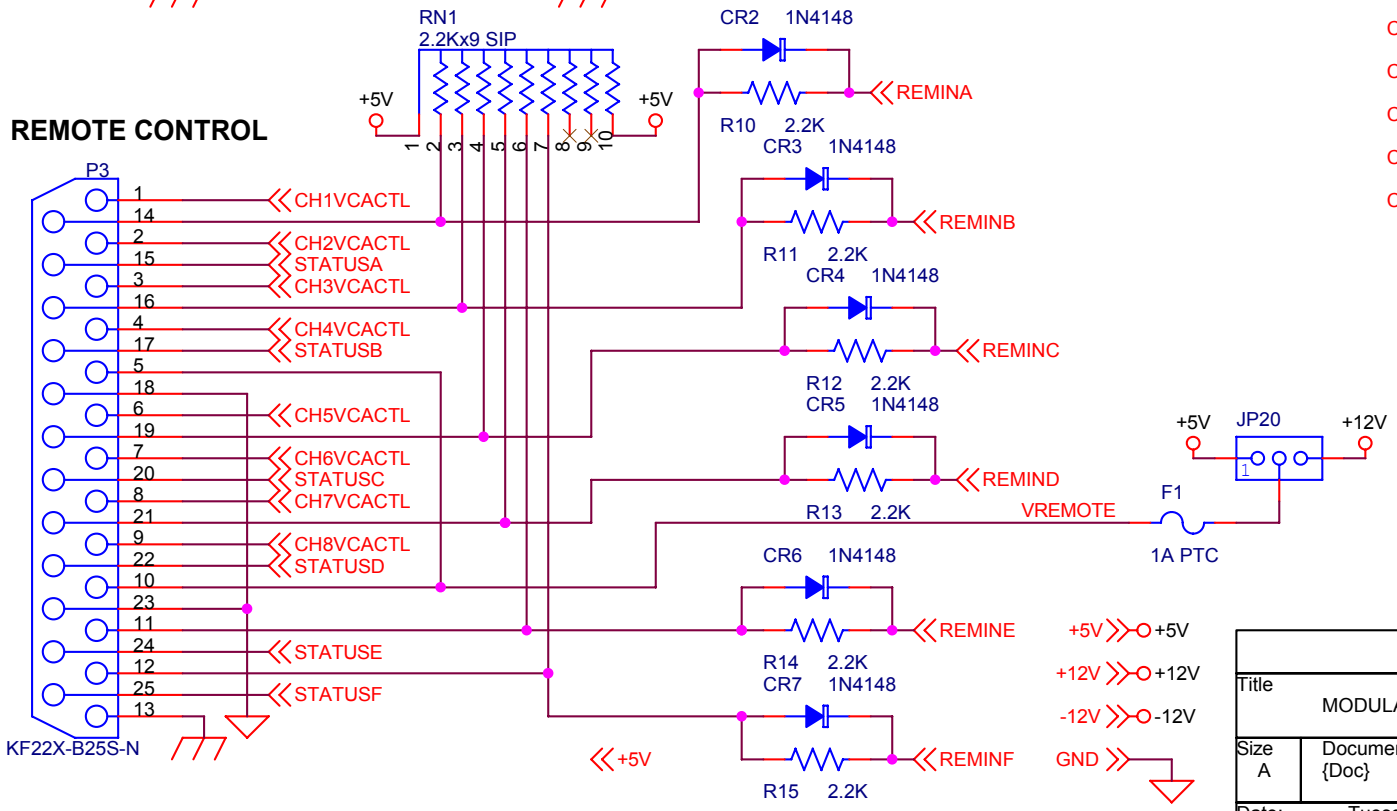
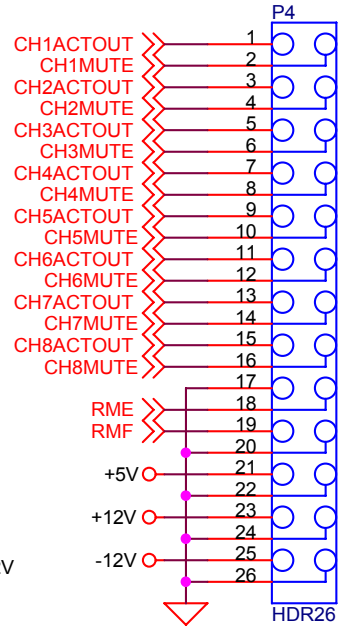


REMOTE CONTROL





FRONT PANEL INDICATORS

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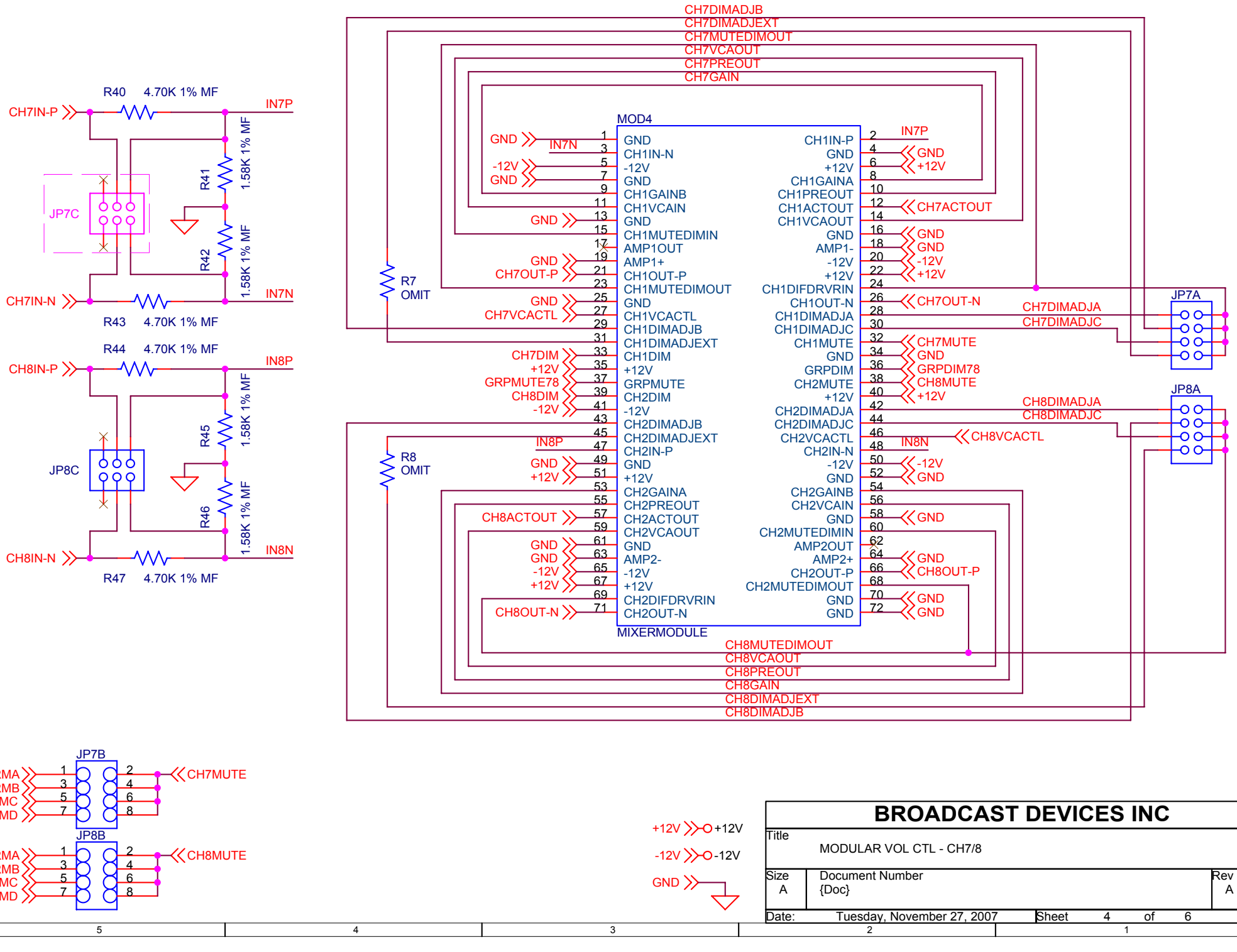

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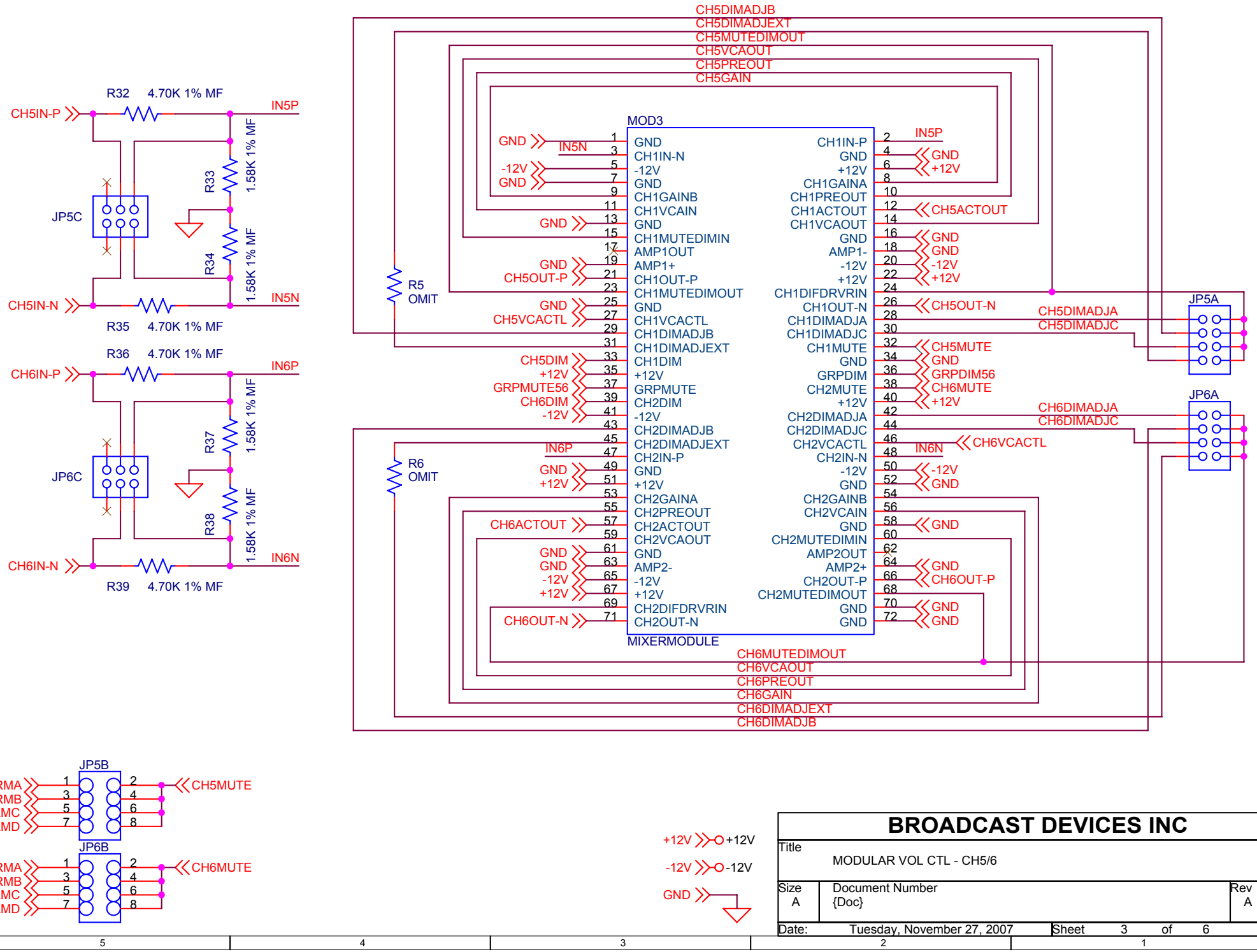
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CH5DIMADJEXT
CH5MUTEDIMOUT
CH5VCAOUT
CH5PREOUT
CH5GAIN
MOD3
GND 1 GND
IN5N 3 CH1IN-N
-12V 5 -12V
GND 7 GND
9 CH1GAINB
11 CH1VCAIN
GND 13 GND
15 CH1MUTEDIMIN
17 AMP1OUT
GND 19 AMP1+
CH5OUT-P 21 CH1OUT-P
23 CH1MUTEDIMOUT
GND 25 GND
CH5VCACTL 27 CH1VCACTL
29 CH1DIMADJB
31 CH1DIMADJEXT
CH5DIM 33 CH1DIM
+12V 35 +12V
GRPMUTE56 37 GRPMUTE
CH6DIM 39 CH2DIM
-12V 41 -12V
43 CH2DIMADJB
45 CH2DIMADJEXT
IN6P 47 CH2IN-P
GND 49 GND
+12V 51 +12V
53 CH2GAINA
55 CH2PREOUT
CH6ACTOUT 57 CH2ACTOUT
59 CH2VCAOUT
GND 61 GND
GND 63 AMP2-
-12V 65 -12V
+12V 67 +12V
69 CH2DIFDRVRIN
CH6OUT-N 71 CH2OUT-N
2 CH1IN-P IN5P
4 GND GND
6 +12V +12V
8 CH1GAINA
10 CH1PREOUT
12 CH1ACTOUT CH5ACTOUT
14 CH1VCAOUT
16 GND GND
18 AMP1- GND
20 -12V -12V
22 +12V +12V
24 CH1DIFDRVRIN
26 CH1OUT-N CH5OUT-N
28 CH1DIMADJA
30 CH1DIMADJC
32 CH1MUTE CH5MUTE
34 GND GND
36 GRPDIM GRPDIM56
38 CH2MUTE CH6MUTE
40 +12V +12V
42 CH2DIMADJA
44 CH2DIMADJC
46 CH2VCACTL CH6VCACTL
48 CH2IN-N IN6N
50 -12V -12V
52 GND GND
54 CH2GAINB
56 CH2VCAIN
58 GND GND
60 CH2MUTEDIMIN
62 AMP2OUT
64 AMP2+ GND
66 CH2OUT-P CH6OUT-P
68 CH2MUTEDIMOUT
70 GND GND
72 GND GND
MIXERMODULE
CH6MUTEDIMOUT
CH6VCAOUT
CH6PREOUT
CH6GAIN
CH6DIMADJEXT
CH6DIMADJB
R5 OMIT
R6 OMIT
JP5A
JP6A
CH5DIMADJA
CH5DIMADJC
CH6DIMADJA
CH6DIMADJC
R32 4.70K 1% MF
CH5IN-P
IN5P
R33 1.58K 1% MF
JP5C
R34 1.58K 1% MF
CH5IN-N
IN5N
R35 4.70K 1% MF
R36 4.70K 1% MF
CH6IN-P
IN6P
R37 1.58K 1% MF
JP6C
R38 1.58K 1% MF
CH6IN-N
IN6N
R39 4.70K 1% MF
JP5B
RMA 1 2 CH5MUTE
RMB 3 4
RMC 5 6
RMD 7 8
JP6B
RMA 1 2 CH6MUTE
RMB 3 4
RMC 5 6
RMD 7 8
+12V +12V
-12V -12V
GND
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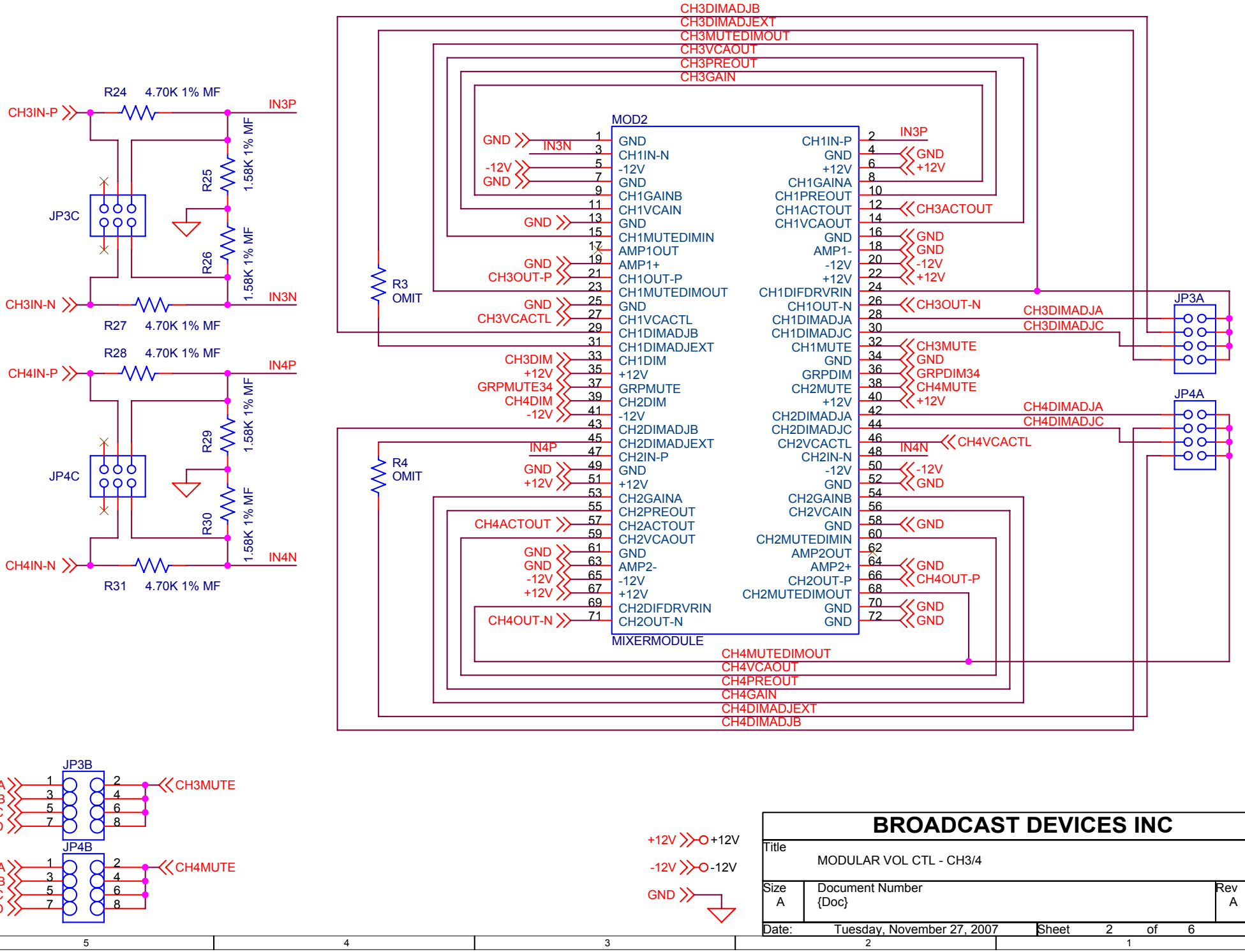
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CH3VCAOUT
CH3PREOUT
CH3GAIN
MOD2
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IN3N 3
-12V 5
GND 7
9
11
GND 13
15
17
GND 19
CH3OUT-P 21
23
GND 25
CH3VCACTL 27
29
31
CH3DIM 33
+12V 35
GRPMUTE34 37
CH4DIM 39
-12V 41
43
45
IN4P 47
GND 49
+12V 51
53
55
CH4ACTOUT 57
59
GND 61
GND 63
-12V 65
+12V 67
69
CH4OUT-N 71
GND
CH1IN-N
-12V
GND
CH1GAINB
CH1VCAIN
GND
CH1MUTEDIMIN
AMP1OUT
AMP1+
CH1OUT-P
CH1MUTEDIMOUT
GND
CH1VCACTL
CH1DIMADJB
CH1DIMADJEXT
CH1DIM
+12V
GRPMUTE
CH2DIM
-12V
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CH2DIMADJEXT
CH2IN-P
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CH2PREOUT
CH2ACTOUT
CH2VCAOUT
GND
AMP2-
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CH2DIFDRVRIN
CH2OUT-N
MIXERMODULE
CH1IN-P 2
GND 4
+12V 6
8
CH1GAINA 10
CH1PREOUT 12
CH1ACTOUT 14
CH1VCAOUT 16
GND 18
AMP1- 20
-12V 22
+12V 24
CH1DIFDRVRIN 26
CH1OUT-N 28
CH1DIMADJA 30
CH1DIMADJC 32
CH1MUTE 34
GND 36
GRPDIM 38
CH2MUTE 40
+12V 42
CH2DIMADJA 44
CH2DIMADJC 46
CH2VCACTL 48
CH2IN-N 50
-12V 52
GND 54
CH2GAINB 56
CH2VCAIN 58
GND 60
CH2MUTEDIMIN 62
AMP2OUT 64
AMP2+ 66
CH2OUT-P 68
CH2MUTEDIMOUT 70
GND 72
GND
IN3P
GND
+12V
CH3ACTOUT
GND
GND
-12V
+12V
CH3OUT-N
CH4VCACTL
IN4N
-12V
GND
GND
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GND
CH4MUTE
GND
GRPDIM34
CH4MUTE
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CH4OUT-P
GND
GND
CH4MUTEDIMOUT
CH4VCAOUT
CH4PREOUT
CH4GAIN
CH4DIMADJEXT
CH4DIMADJB
R3
OMIT
R4
OMIT
JP3A
CH3DIMADJA
CH3DIMADJC
JP4A
CH4DIMADJA
CH4DIMADJC
R24 4.70K 1% MF
CH3IN-P
IN3P
R25
1.58K 1% MF
JP3C
R26
1.58K 1% MF
CH3IN-N
IN3N
R27 4.70K 1% MF
R28 4.70K 1% MF
CH4IN-P
IN4P
R29
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JP4C
R30
1.58K 1% MF
CH4IN-N
IN4N
R31 4.70K 1% MF
JP3B
RMA 1
RMB 3
RMC 5
RMD 7
2
4
6
8
CH3MUTE
JP4B
RMA 1
RMB 3
RMC 5
RMD 7
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6
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CH4MUTE
+12V +12V
-12V -12V
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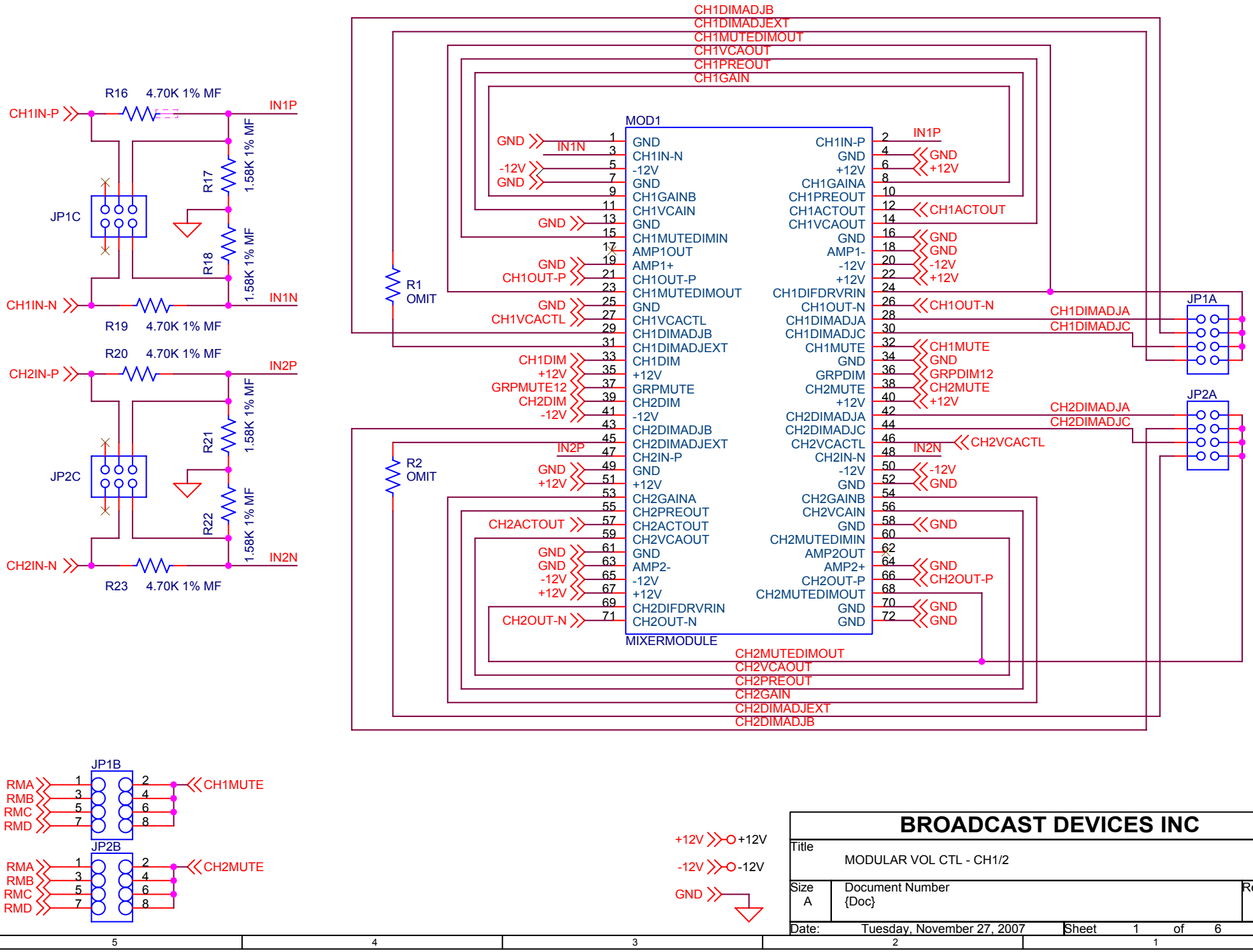

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