

Z E T R O N

**Model 27 Receiver Monitor Panel
Technical Manual**

#025-9186D

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WARRANTY

Zetron, Inc. warrants that all equipment sold pursuant to any resultant agreement shall be free from defects in material or workmanship at the time of delivery. Such warranty shall extend from the time of delivery for One Year. Buyer must provide written notice to Zetron within this prescribed warranty period of any defect; if the defect is not the result of improper usage, service, maintenance, or installation and equipment has not been otherwise damaged or modified after delivery, Zetron shall either replace or repair the defective part or parts of equipment or replace the equipment or refund the purchase price at Zetron's option after return of such equipment by buyer to Zetron. Shipment to Zetron's facility shall be borne on account of buyer.

1. Consequential Damages: Zetron shall not be liable for any incidental or consequential damages incurred as a result of any defect in any equipment sold hereunder and Zetron's liability is specifically limited to obligation described herein to repair or replace a defective part or parts covered by this warranty.

2. Exclusive Warranty: The warranty set forth herein is the only warranty, oral or written made by Zetron and is in lieu of and replaces all other warranties, expressed or implied, including the warranty of merchantability and the warranty of fitness for particular purpose.

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MODEL 27 RECEIVER MONITOR PANEL

OPERATION

The Model 27 Receiver Monitor Panel contains two identical and independent audio circuits: one on the left and one on the right. Each circuit features four receiver audio inputs, each with its own "Call" LED, "Mute" LED, and "Mute" button. In addition, each circuit has a knob to adjust the overall volume of the circuit's speaker.

"Call" LED

When audio traffic is present on a receiver, its "Call" LED will blink.

The "Call" LED will illuminate steady if the receiver is being muted externally. Normally external muting is performed if the receiver is on the same frequency as a transmitter that is being operated within acoustic range of the Monitor Panel. External muting prevents audio feedback.

"Mute" Button and LED

Pressing the receiver's button will mute the receiver's audio. This is indicated by the illumination of the "Mute" LED. Pressing the button again will unmute the audio causing the "Mute" LED to extinguish.

Speaker Volume

The knob under the speaker is the master volume control for the four receivers associated with the speaker. Turning the knob clockwise will increase the volume level. Turning the knob counter-clockwise will decrease the volume level. Turning the knob fully counter-clockwise may not completely turn off the volume (depending on adjustments made at installation).

SPECIFICATIONS

Power	11 to 16 Volts DC. 0.3 A typ standby, 2.0 A max (full output).
Size	5.25" high, 19.00" wide, 1.50" deep
Weight	5 lb.
Configuration	Two independent audio circuits each with four mutable audio inputs summed to feed a single speaker with volume control.
Busy/Mute Inputs	Each audio input has an associated Busy/Mute Input which when shorted to ground mutes the audio input.

MODEL 27 RECEIVER MONITOR PANEL

Audio Inputs

Impedance: 10,000 ohms or 600 ohms balanced (60 dB), DC blocking.
Level For Full Output: -30 to +10 dBm adjustable (unmuted).
Mute Level: 0 to 40 dB adjustable level reduction compared to unmute.
Frequency Response: 150 to 12K Hz

Speaker Outputs (at 13.8 VDC power, 1 kHz tone)

0.2 % typ. distortion at 2 Watts output.
10 % maximum distortion at 5 Watts output.

INSTALLATION

The Model 27 Receiver Monitor Panel is designed to be installed in 19" EIA compatible rack furniture. The rear cover of the Monitor Panel gives clear indications of signal names and locations.

Power

The removable screw terminal block, J1, located near the center of the rear cover is used to route power to the Panel. 11 to 16 Volts DC should be used. The positive lead should connect to pin 5 or 6 of J1. The negative lead (which is also connected to chassis) should connect to pin 7 or 8 of J1. When the Panel is used in conjunction with other Series 4000 products, it may share the power from those products. Keep in mind that if full output power is desired the Monitor Panel may draw as much as 2.0 Amperes.

Audio Signals

Both circuits, labeled "Left" and "Right", have four receiver audio channels, labeled "A", "B", "C" and "D". These correspond to the Buttons and LEDs on the front of the Panel as follows: top="A", next down="B", next down="C" and bottom="D".

Each receiver audio input is transformer coupled with a DC blocking capacitor in series. The impedance of the audio input is 600 ohms as set at the factory. The impedance may be altered to 10K ohms by changing jumpers located on the circuit board to the "B" position.

Audio signal pairs are connected to the panel using removable screw terminal blocks, J1, J2 and J3 as follows:

Channel	Block	Pins	Impedance Jumper
Right-A	J1	3 & 4	JP1
Right-B	J2	3 & 4	JP2
Right-C	J2	7 & 8	JP3
Right-D	J2	11 & 12	JP4
Left -A	J1	11 & 12	JP5
Left -B	J3	3 & 4	JP6
Left -C	J3	7 & 8	JP7
Left -D	J3	11 & 12	JP8

Busy/Mute Signals

Each receiver audio input has an associated Busy/Mute input which when shorted to ground will completely mute the audio input and steadily illuminate the receiver's "Call" LED. This is most often used if the associated receiver is monitoring the same frequency as a transmitter that is operated from a location within acoustic range of the Monitor Panel. The Busy/Mute input is usually derived from the PTT signal of such a transmitter.

Busy/Mute signal pairs (labeled "X-Busy" on the rear cover) are connected to the panel using removable screw terminal blocks, J1, J2 and J3 as follows:

Channel	Block	Pins
Right-A	J1	1 & 2
Right-B	J2	1 & 2
Right-C	J2	5 & 6
Right-D	J2	9 & 10
Left -A	J1	9 & 10
Left -B	J3	1 & 2
Left -C	J3	5 & 6
Left -D	J3	9 & 10

Input Level Adjustments

Each receiver audio input has two adjustments; the "Input Level" and the "Mute Level".

The "Input Level" adjustment is a four-turn trim potentiometer located within the cut-out area of the rear cover. Turning this pot clockwise will decrease the attenuation of the input signal. When turned fully clockwise a -30 dBm level (25 mVrms) will be capable of producing the full 5-Watt rating on the associated speaker.

Recommended Procedure: Turn the "Input Level" adjustment fully counter-clockwise (no more than four turns or until clicking is heard). Place a signal of typical level across the associated audio input pair while observing the associated "Call" LED. Turn the "Input Level" adjustment clockwise until the "Call" LED begins to blink. Turn the adjustment one additional turn clockwise to ensure proper dynamic range of the "Call" LED.

Once each of the four inputs have been adjusted it may be desirable to compare the listening level of each and readjust the "Input Level" to bring all inputs to a comparable listening level.

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Mute Level Adjustments

The "Mute Level" adjustment is a single turn potentiometer located next to the associated "Input Level" pot. Turning this pot clockwise will decrease the attenuation of the mute level. This adjustment sets the mute level relative to the "Input Level" adjustment (i.e. the absolute mute level is affected by the "Input Level" adjustment).

In order to adjust the "Mute Level" the associated mute function must be activated by pressing the "Mute" Button such that the "Mute" LED turns on. The "Mute Level" may then be adjusted to the desired listening level. If full mute is desired the adjustment should be turned fully counter-clockwise.

Minimum Volume Level Adjustments

Each speaker has a "Minimum Volume Level" adjustment. This allows the setting of the lowest volume achievable when the master knob on the front panel is turned fully counter-clockwise. When this single turn trim potentiometer is turned fully counter-clockwise the minimum volume level is zero (no sound). Turn the trim pot clockwise in order to increase the minimum volume level above zero.

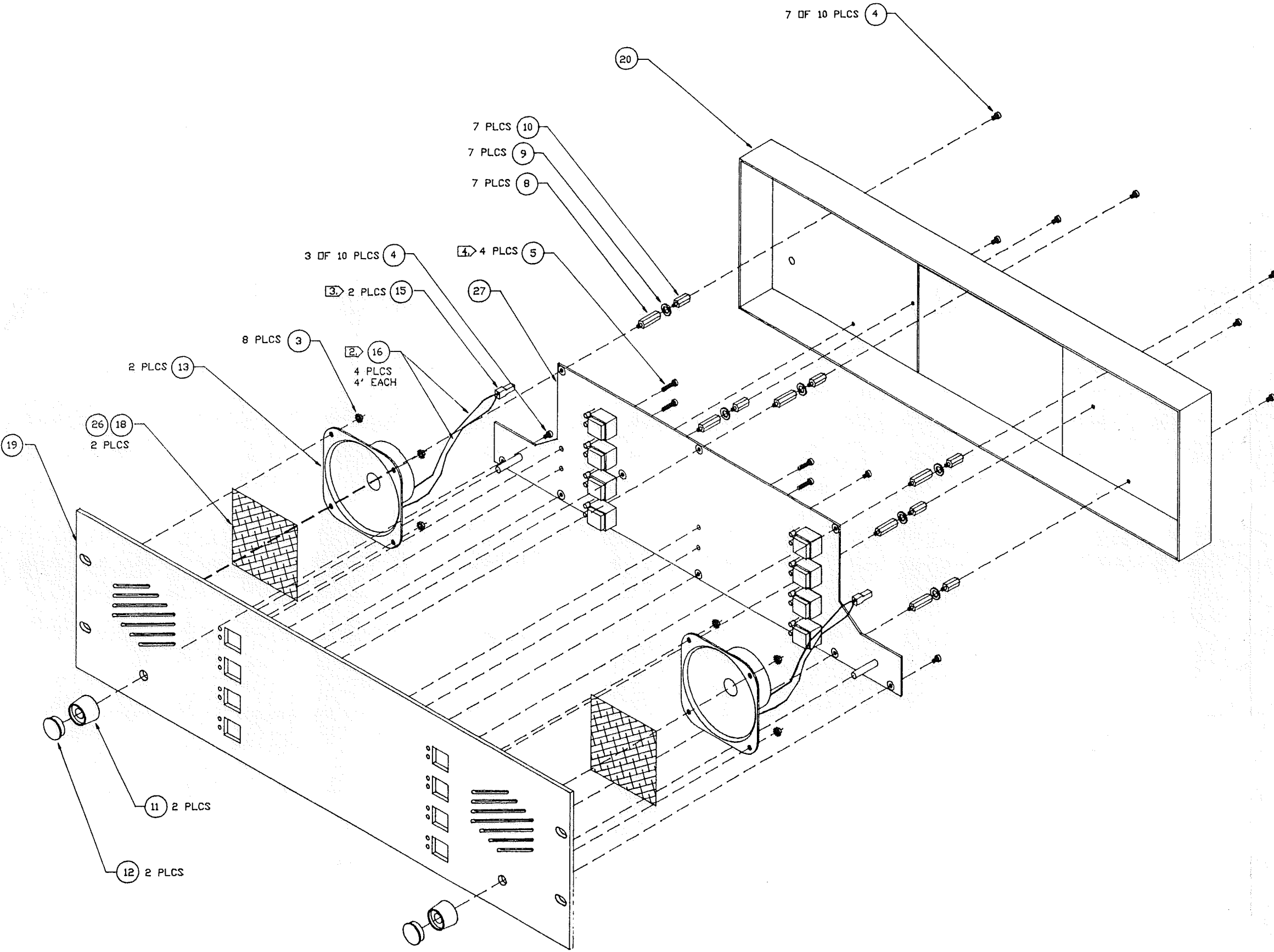
LABELING

The "Mute" Buttons feature removable transparent covers. It is suggested that labels be inserted under the covers which identify the name of the associated receiver.

REVISIONS				
REV	DESCRIPTION	DRAWN	APPROVED	DATE
A	RELEASE	AH		
A1	HCN 1617	ME		
B	HCN 1831 A	AH	VW	8-92

- NOTES:
- TEST AND CALIBRATE ACCORDING TO PROCEDURE 020-0127.
 - CUT WIRE, ITEM 16, INTO FOUR 4' PIECES. SOLDER 2 TO EACH SPEAKER, ITEM 13, (ONE PER TAB). CRIMP THE OTHER ENDS TO IDC CONNECTOR, ITEM 15.
 - INSTALL IDC CONNECTOR, ITEM 15, INTO JP9 AND JP10 OF BOARD, ITEM 27.
 - SECURE U19, U20, U28, U29 TO BOARD ITEM 27, AND FRONT PANEL, ITEM 19, WITH SCREWS, ITEM 5.
 - PLACE ITEMS IN PLASTIC BAG, ITEM 23.
 - PLACE ITEMS IN PLASTIC BAG, ITEM 24.
 - PLACE UNIT IN BAG, ITEM 25.
 - PLACE LABEL, ITEM 17, ON BACK OF UNIT.

27	1	702-9372	M27 REC. MON. BOARD
26	A/R	561-0003	ADHESIVE
25	1	449-9052	BAG, PLAS. 10X8X24 1.5 GA
24	1	449-9042	BAG, PLASTIC 2X3 .004 GA
23	1	449-9019	BAG, PLASTIC 5X7 .004 GA
22	1	449-9016	BOX, CDD W/FOAM ENDS
21	1	416-1202	FUSE AGC 2A
20	1	415-9584-1	M27 DL MN PN REAR COV
19	1	415-9582-1	M27 REC MN FRONT PANE
18	2	415-9193	M20 TBLTOP SPEAKER GRIL
17	1	415-9003	DECAL, TI-5100 PN/SN/OPT
16	16'	408-2201	22 GA, WIRE, WHITE
15	2	401-0175	2 COND IDC, 26 GA X .1
14	3	401-0016	12 POS BLOCK FEMALE
13	2	305-0021	SPEAKER 4 OHM 5W
12	2	265-0013	CAP FOR 265-0012
11	2	265-0012	KNOB W/ INDICATOR BLK
10	7	251-1239	440X.031 NYLON
9	7	250-0105	440X3/8 W/STUD
8	7	250-0103	440X3/4 W/STUD
7	4	236-0004	WASHER, NYLON #10 BLACK
6	4	220-0250	1032X3/4 FLT HD PHIL B.K
5	4	220-0108	440X1/4 PAN PHILLIPS
4	10	220-0107	440X3/16 PAN PHILLIPS
3	8	210-0001	440 KEPT NUT PLATED
2	1	108-0000	ALIGNMENT TOOL
1	1	025-9186	M27 REC. MON. PANL MANUA
ITEM	QTY.	PART #	DESCRIPTION
DRAWN	AH	7/29/91	
CHK			
APV			
TO BE CHECKED			
RECD	EXC	2-01	
RECD	EXC	2-0001	2-0005
ANGULAR		± 1°	
SCALE		= 1	
SHEET		OF 1	
			ZETRON
			ZETRON, INC. 12805 134TH COURT NE, REDMOND, VA 98060
			TITLE
			MODEL 27
			RECEIVER MONITOR
			PANEL
			DRAWING NUMBER
			901-9233
			REV
			B
			2
			NO NET SCALE DRAWING



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Model 27 Receiver Monitor Parts List (702-9372E)

LEGEND:

= NOT INSTALLED

^ = INSTALLED ON HIGHER ASSY

+ = OPTION (INSTALLED PER CUSTOMER ORDER)

ITEM	QTY	COMPONENT REFERENCE	PART NO.	DESCRIPTION	MANUFACTURE P/N
1	6	R4,R42 R123,R130,R168, R176	101-0010	1 OHM 1/4W 5% CARBON FILM	1/4-5%
2	4	R120,R128,R132,R175	101-0013	2.2 OHM 1/4W 5% CARBON FILM	
3	14	R18,R40,R57,R81,R96,R115, R127,R129,R131,R140,R160, R170,R171,R172	101-0057	220 OHM 1/4W 5% CARBON FILM	
4	2	R179,R180	101-0061	330 OHM 1/4W 5% CARBON FILM	
5	8	R6,R23,R24,R64,R65,R70, R103,R104	101-0068	620 OHM 1/4W 5% CARBON FILM	
6	18	R10,R12,R32,R34,R46,R48, R73,R75,R87,R89,R107, R109,R125,R133,R152,R154, R174,R178	101-0073	1K 1/4W 5% CARBON FILM	
7	8	R22,R44,R61,R85,R100, R119,R144,R164	101-0085	3.3K 1/4W 5% CARBON FILM	
8	52	R1#,R2,R3#,R5,R7,R8,R9, R11,R13,R14,R16,R21,R25#, R26,R27,R28,R29,R30,R31#, R33,R35,R36,R37,R45,R47, R49,R50,R55,R60,R68,R69, R74,R76,R77,R78,R86,R88, R90,R91,R94,R99,R108, R110,R111,R112,R134,R135, R136,R138,R143,R153,R155, R156,R158,R165,R177	101-0097	10K 1/4W 5% CARBON FILM	
9	1	R149	101-0105	22K 1/4W 5% CARBON FILM	
10	1	R148	101-0121	100K 1/4W 5% CARBON FILM	
11	8	R19,R41,R58,R82,R97,R116, R141,R161	101-0125	150K 1/4W 5% CARBON FILM	
12	10	R15,R17#,R38,R39#,R54, R56#,R79,R80#,R93,R95#, R113,R114#,R122,R137, R139#,R157,R159#,R167	101-0145	1M 1/4W 5% CARBON FILM	
13	2	R173,R126	107-0002	10K ROTORY POT	RK1631110-10 KB
14	2	R169,R121	107-0202	2K POT 1 TURN	3386P-1-202
15	8	R53,R63,R67,R72,R102, R106,R147,R151	107-0502	50K POT 1 TURN	3386P-1-503
16	2	R166,R124	107-0504	200K POT 1 TURN	3386P-1-204
17	8	R52,R62,R66,R71,R101, R105,R146,R150	108-0103	10K POT 4 TURN	1102P-1-103K
18	8	C4,C15,C17,C23,C26,C42, C48,C55	150-0096	1000 PF 1KV +-20% CERAMIC DISC	GE-102G
19	1	C56	150-0110	.01 UF 50V 80%-20% CERAMIC DISC	DF-103Z

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Model 27 Receiver Monitor Parts List (702-9372E) cont'd

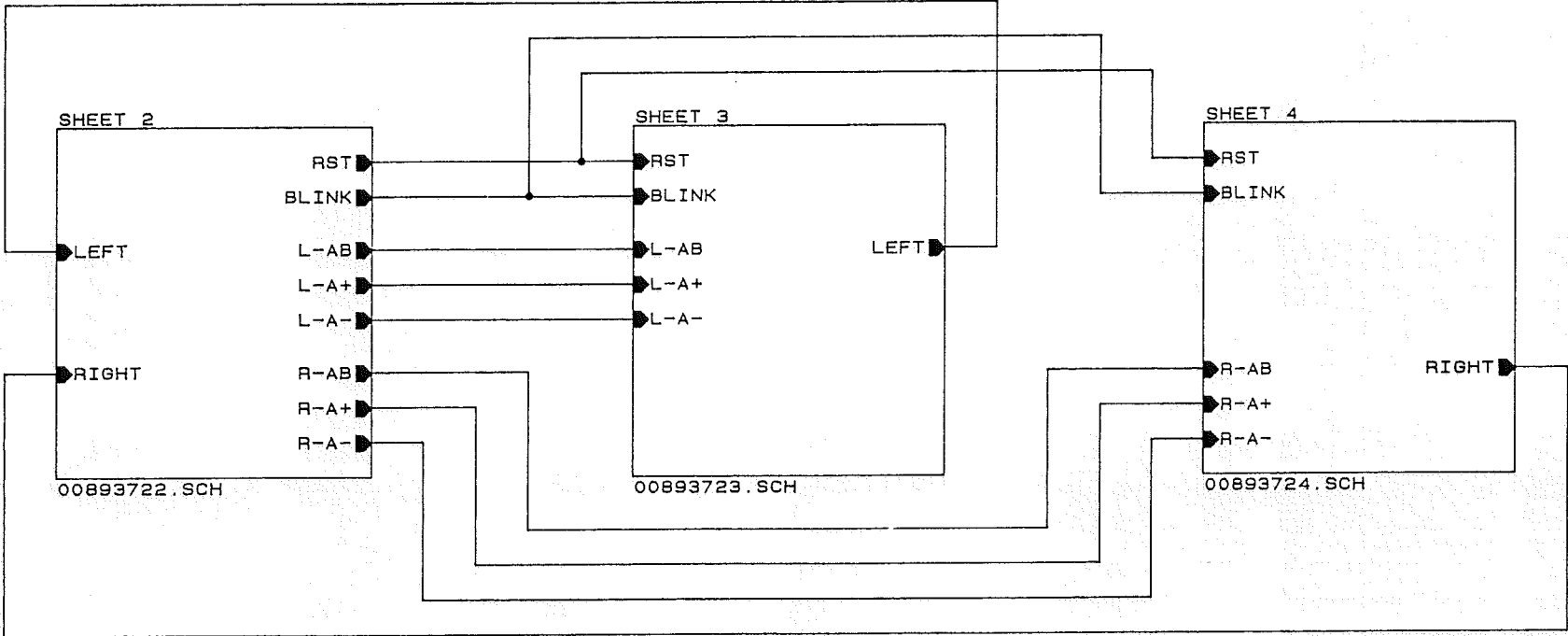
ITEM	QTY	COMPONENT REFERENCE	PART NO.	DESCRIPTION	MANUFACTURE P/N
20	8	C1,C12,C16,C22,C24,C25, C30,C47	151-0180	.1 UF 50V +-10% CERAMIC, UNSTABLE	AVXSR205E104MAA
21	4	C34,C35,C49,C52	151-0181	.1 UF .1SPACE 50V CERAMIC TEMP. STABLE	CW20C104K
22	2	C58,C59	151-0199	.47 UF 50V +-5% POLYESTER	ECQVIH474JZ
23	8	C5,C6,C10,C11,C18,C19, C20,C21	152-0030	2.2 UF 250V +-10% POLYESTER	ECQ-E2225KS
24	2	C53,C37	152-0085	.01 UF 50V +- 5% POLYESTER	ECQ-VIH103JZ
25	11	C2,C3,C9,C13,C14,C36,C40, C41,C45,C46,C54	154-0025	1 UF 35V TANTALUM	ECS-F-35E1
26	4	C27,C31,C33,C38	154-0100	10 UF 16V TANTALUM	ECS-FICE106K
27	4	C8,C43,C44,C57	155-0052	10 UF 35V +-20% RADIAL ALUMINUM ELECTROLYTIC	ECEA1VU100
28	3	C7,C28,C51	155-0077	100UF 25V +-20% RADIAL ALUMINUM ELECTROLYTIC	ECEA1EU101
29	4	C29,C32,C39,C50	155-0083	470 UF 10 VOLT RADIAL ALUMINUM ELECTROLYTIC	ECEA-1AU471
30	8	T1,T2,T3,T4,T5,T6,T7,T8	305-0103	10K:10K OHM AUDIO	MR671-1459
31	16	DS1,DS2,DS3,DS4,DS5,DS6, DS7,DS8,DS9,DS10,DS11, DS12,DS13,DS14,DS15,DS16	311-0022	LED RED, T-1	LTL-4221
32	2	VR1,VR2	316-0005	REGULATOR 5V LOW POWER	LM78L05
33	4	U19,U20,U28,U29	316-2003	8W AUDIO AMP HORIZ MOUNT	TDA2002H
34	8	U2,U6,U8,U12,U14,U18,U22, U27	316-3403	QUAD OP AMP	MC3403P
35	4	U1,U5,U13,U17	323-4013	DUAL D-FF	MC14013B
36	8	U3,U4,U9,U10,U15,U16,U23, U25	323-4053	3PDT SWITCH	MC144053
37	5	U7,U11,U21,U24,U26	323-4093	QUAD NAND SCHMITT	MC14093B
38	8	Q1,Q3,Q5,Q7,Q10,Q12,Q14, Q16	340-3904	NPN 40V/200MA	2N3904
39	8	Q2,Q4,Q6,Q8,Q9,Q11,Q13, Q15	340-3906	PNP 40V/200MA	2N3906
40	10	CR1,CR2,CR3,CR5,CR6,CR7, CR8,CR9,CR10,CR11	342-3009	SILICON .50 SP	1N4148
41	1	CR4	343-3108	1W 15V +-5% .50 SP	1N4744A
42	8	SW1,SW2,SW3,SW4,SW5,SW6, SW7,SW8	371-0003	SINGLE KEY-NO LIGHT	JM2005#01
43	3	J1,J2,J3	401-0015	12 POS BLOCK MALE	1103.6
44	0	P1#	401-0079	6 PIN TELCO PERP	520258-3
45	2	JP10,JP9	403-0002	2 OF 401-0052	
46	8	JP1,JP2,JP3,JP4,JP5,JP6, JP7,JP8	403-0003	3 OF 401-0052	
47	1	F1	416-6025	FUSE AGC 2.5ASB-LITTLEFUSE	NDL 2.5ASB
48	16	XDS1,XDS2,XDS3,XDS4, XDS5,XDS6,XDS7,XDS8, XDS9,XDS10,XDS11,XDS12, XDS13,XDS14,XDS15,XDS16	251-3125	440x5/16 SPACER	

MODEL 27 RECEIVER MONITOR PANEL

Model 27 Receiver Monitor Parts List (702-9372E) cont'd

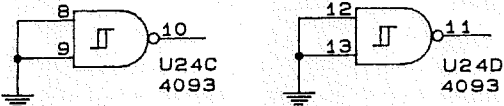
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49	8	XJP1,XJP2,XJP3,XJP4, XJP5,XJP6,XJP7,XJP8 (POS A)	402-3040	MINI JUMPER	
50	17	XU1,XU2,XU5,XU6,XU7,XU8, XU11,XU12,XU13,XU14,XU17, XU18,XU21,XU22,XU24,XU26, XU27	407-0014	SKT, 14 PIN DIP	
51	8	XU3,XU4,XU9,XU10,XU15, XU16,XU23,XU25	407-0016	SKT, 16 PIN DIP	
52	2	J6-J7,J17-J18	408-0001	WIRE JUMPER	
53	1	PCB	410-9372C	PCB, DUAL MONITOR SPEAKER BOARD	
54	2	XF1	416-3040	FUSE CLIPS	

REV	DESCRIPTION	DR	APRD	DATE
A	RELEASE	KN		
B	HCN 1604	KN		
C	HCN 1695A	DW		
D	HCN 1790	KM		
E	HCN 1840	DW		



- NOTES: UNLESS OTHERWISE SPECIFIED.
- ALL CAPACITORS ARE IN MICROFARADS.
 - ALL RESISTORS ARE IN OHMS, 1/4W, 5%.
 - ALL POTENTIOMETERS ARE 1 TURN.

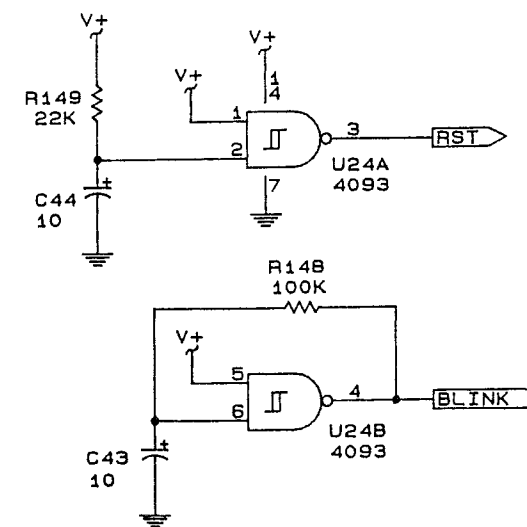
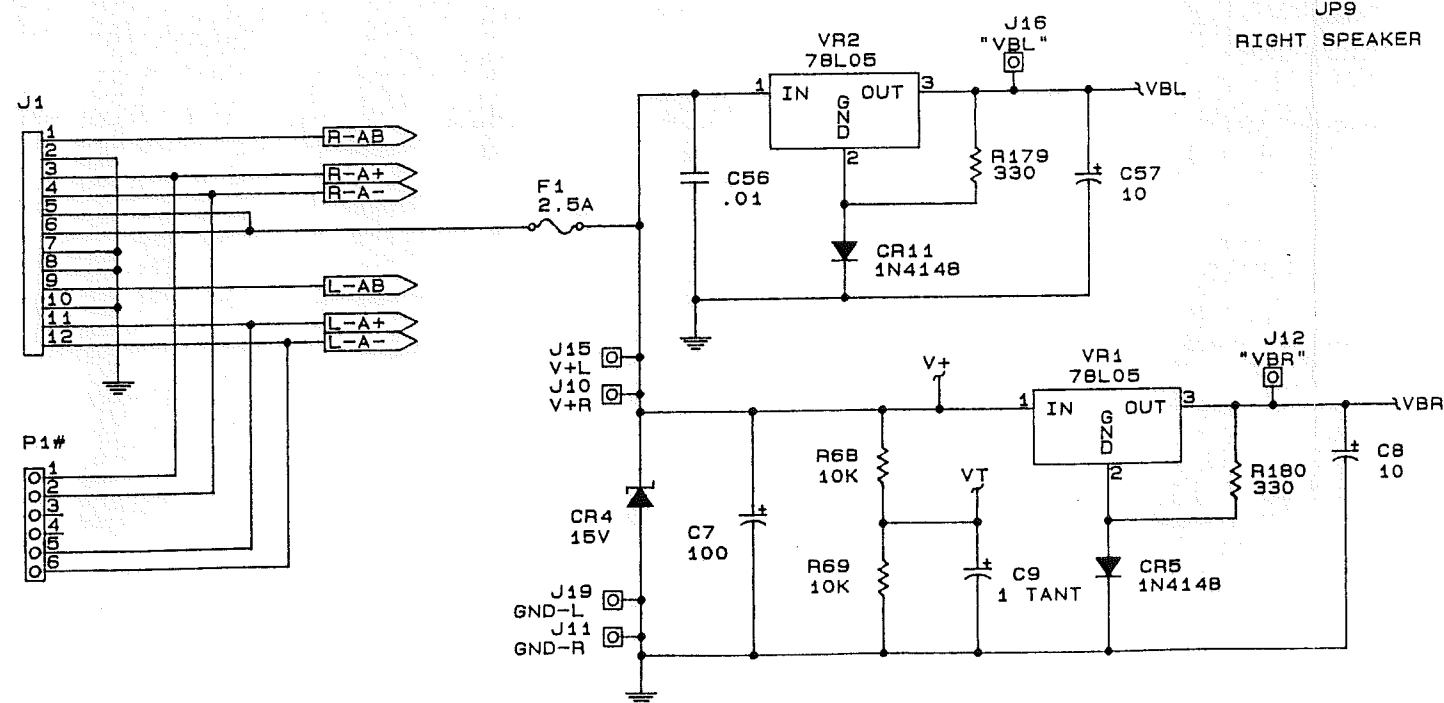
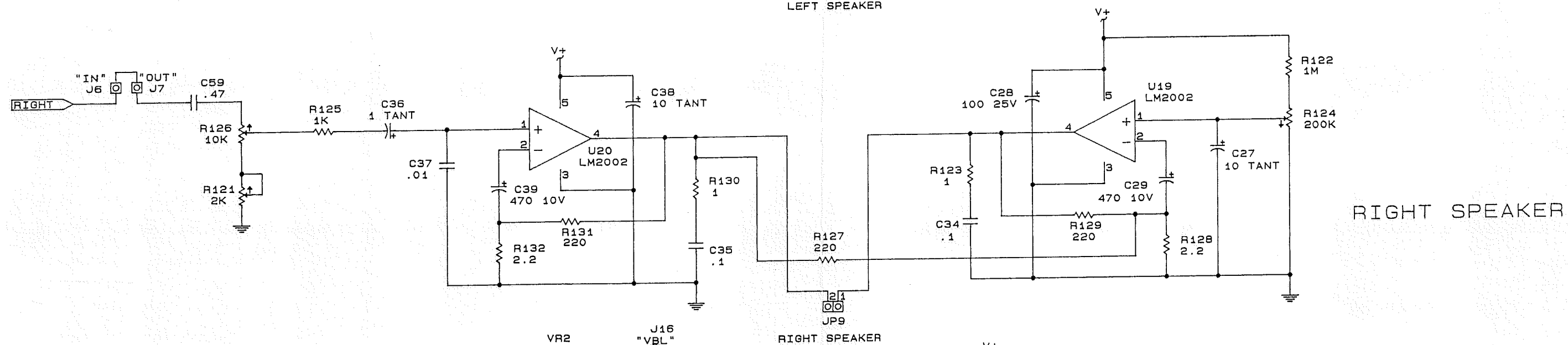
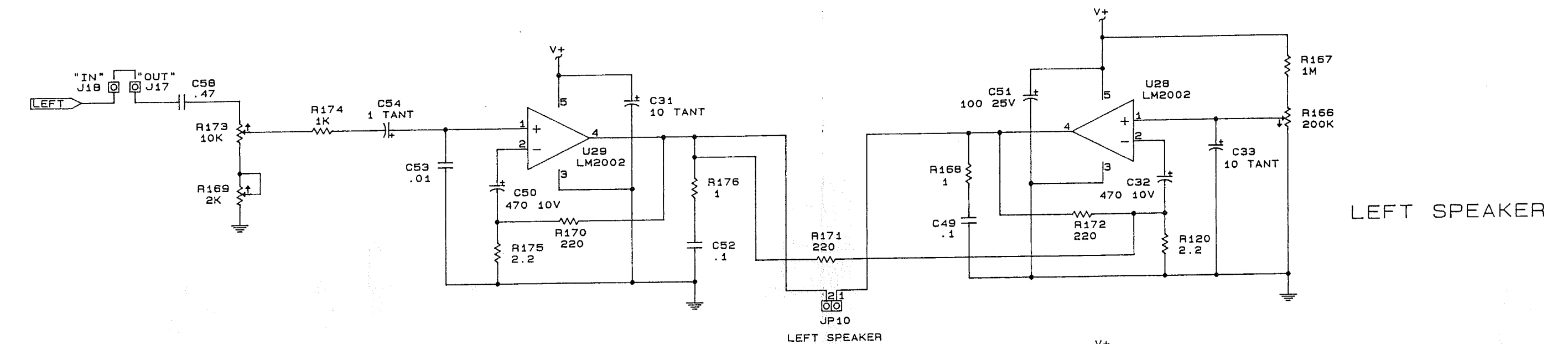
UNUSED PARTS:



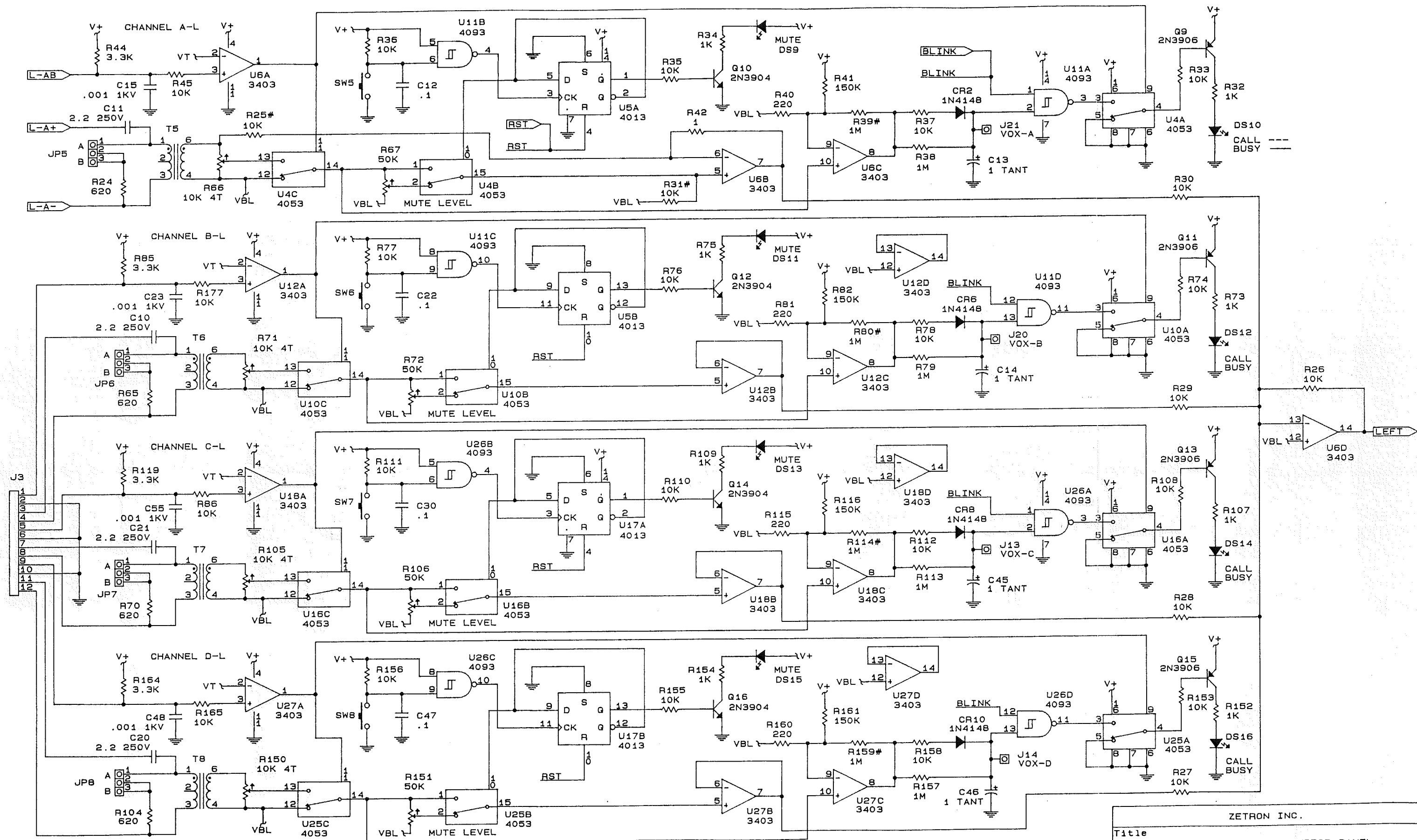
LEGEND:

- + OPTION, INSTALL PER CUSTOMER ORDER.
- ~ INSTALLED ON HIGHER ASSEMBLY.
- * NOT INSTALLED.
- X- CUT TRACE.
- JUMPER WIRE.

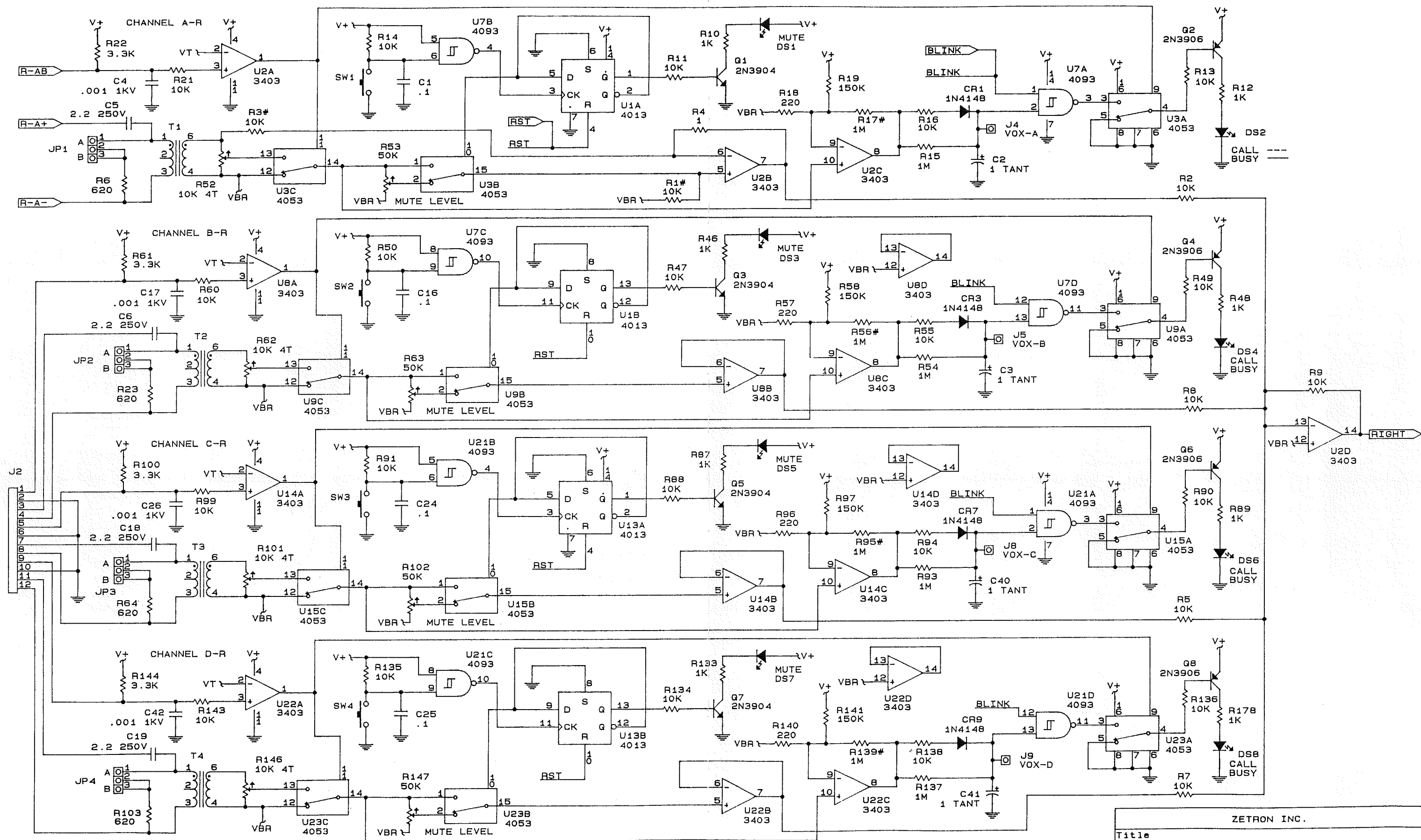
ZETRON, INC. 12335 134TH COURT N.E. REDMOND, WASHINGTON, 98052-2433			
Title MODEL 27 RECEIVER MONITOR PANEL			
Size	Document Number	REV	
B	008-9372	E	
Date:	April 7, 1992	Sheet	1 of 4



ZETRON INC.		
Title		
MODEL 27 RECEIVER MONITOR PANEL		
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B	008-9372	E
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Title	MODEL 27 RECEIVER MONITOR PANEL	
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Title	MODEL 27 RECEIVER MONITOR PANEL	
Size	Document Number	REV
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ZETRON DUAL MONITOR SPEAKER BOARD SILSCREEN

