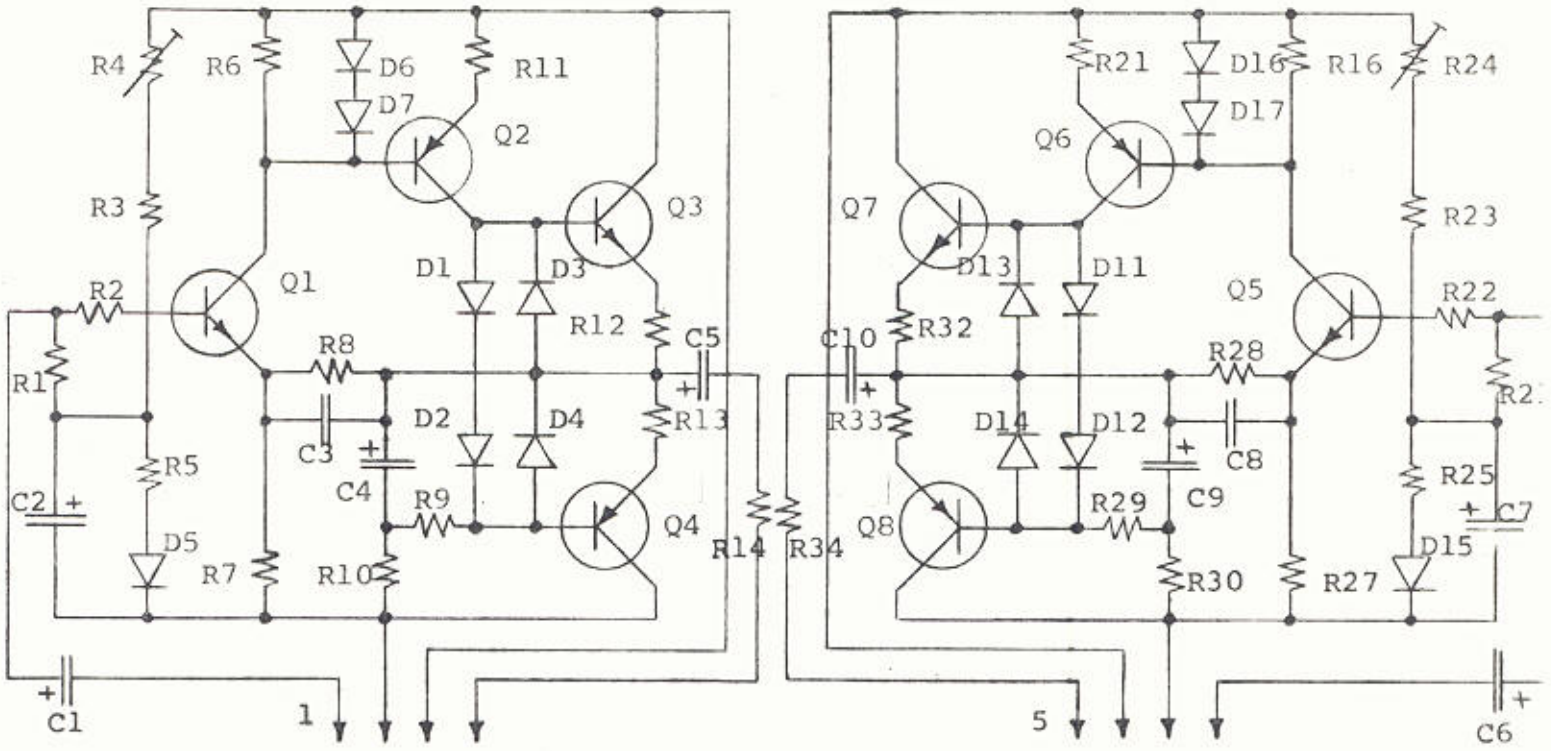
28 dB Line or Monitor (Cue) Amp 1.919.225-11



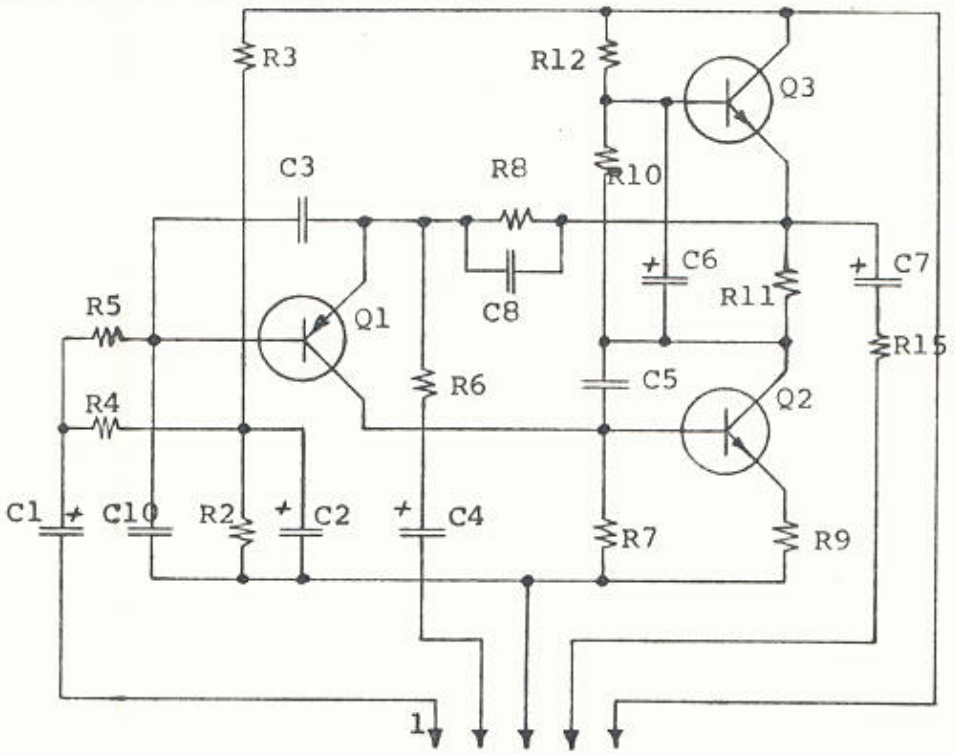
Resistors				Capacitors			
R1, R21	100k 1/8W	5%	B-GmbH SZC-0309	C1, C6	3.3ufd	35V	Matsuo
R2, R22	2.2k 1/8W	5%	B-GmbH SZC-0309	C2, C7	47ufd	16V	Frako EP-2
R3	10k 1/8W	5%	B-GmbH SZC-0309	C3, C8	22pf		RMC Disc
R23	4.7k 1/8W	5%	B-GmbH SZC-0309	C4, C9	47ufd	16V	Frako EP-2
R4, R24	20k Pot	PT	10H (2.5) Piher	C5, C10	220ufd	40V	Frako EP-2
R5, R25	470Ω 1/8W	5%	B-GmbH SZC-0309				
R6, R26	2.7k 1/8W	5%	B-GmbH SZC-0309				
R7, R27	220Ω 1/8W	5%	B-GmbH SZC-0309				
R8	5.6k 1/8W	5%	B-GmbH SZC-0309				
R28	2.2k 1/8W	5%	B-GmbH SZC-0309				
R9, R29	4.7k 1/8W	5%	B-GmbH SZC-0309				
R10, R30	2.2k 1/8W	5%	B-GmbH SZC-0309				
R11, R31	68Ω 1/8W	5%	B-GmbH SZC-0309				
R12, R32	3.9Ω 1/2W	10%	A-B EB-39G1				
R13, R33	3.9Ω 1/2W	10%	A-B EB-39G1				
R14, R34	10Ω 2W	10%	IRC/TRW BWH				

Diodes		Transistors	
D1, D11	1N4003	Q1, Q5	BC107B Siemens
D2, D12	1N4003	Q2, Q6	BC177B Siemens
D3, D13	1N4003	Q3, Q7	2N6291 RCA
D4, D14	1N4003	Q4, Q8	2N6108 RCA
D5, D15	1N4448	XQ3,XQ7	Heat Sink Boza
D6, D16	1N4448	XQ4,Xq8	Heat Sink Boza
D7, D17	1N4448		

CB 1.919.225-11 P.C.I.

DATE: SCALE:

Microphone Input Amp 1.919.120-12



Resistors
(All 1/8W, 5%, carbon film
B-GmbH SZC 0309 unless noted)

R2	330k
R3	330k
R4	100k
R5	1k
R6	150Ω
R7	15k
R8	10k
R9	47Ω
R10	8.2k
R11	150Ω
R12	100k
R13	not assigned
R14	not assigned
R15	1k

Capacitors

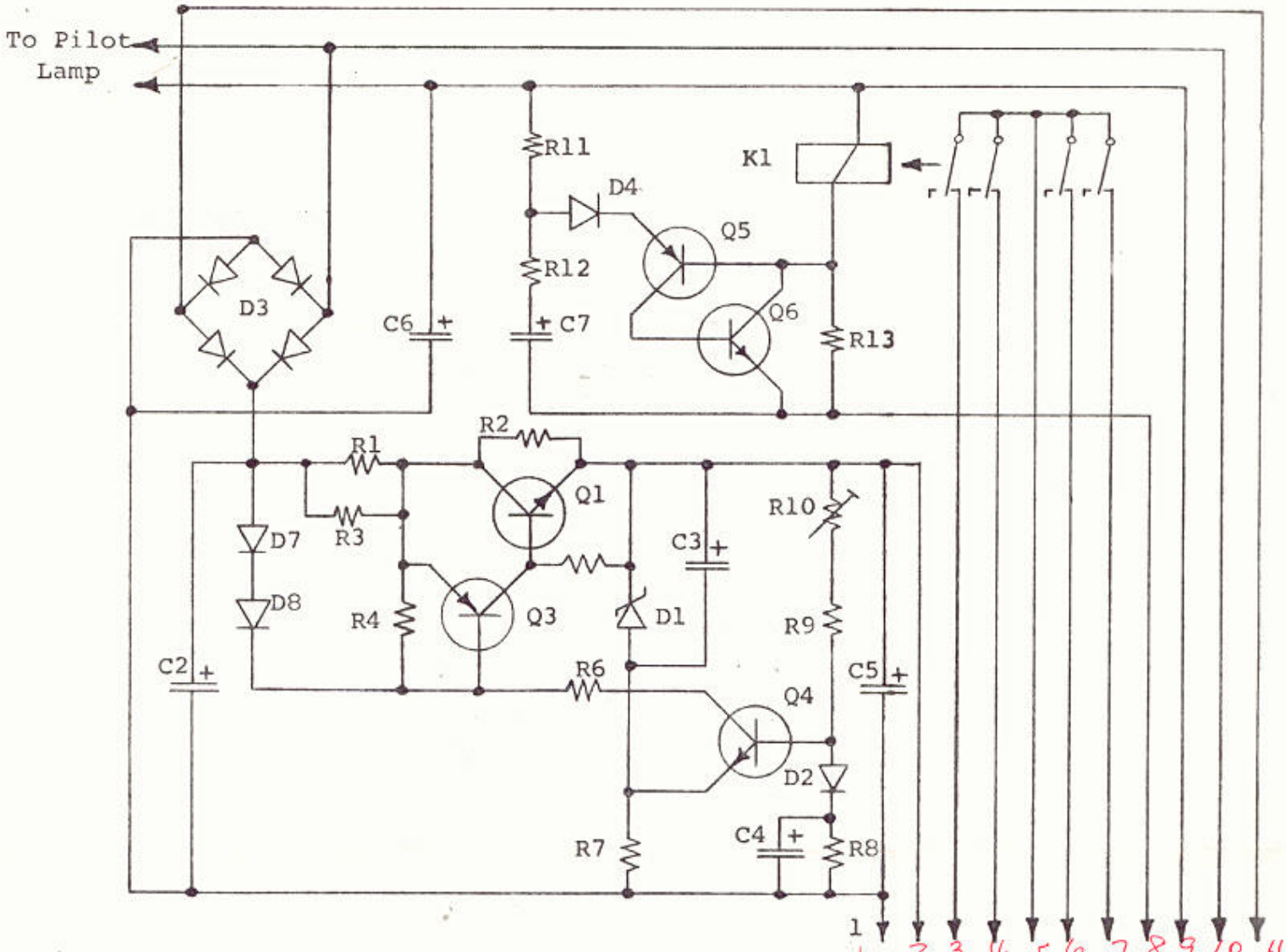
C1	.68ufd	250V 10%	Evox.
C2	22ufd	40V	Frako EP-2
C3	220pf	10%	RMC Disc
C4	100ufd	40V	Frako EP-2
C5	3.3pf	10%	RMC Disc
C6	47ufd	16V	Frako EP-2
C7	10ufd	63V	Frako EP-2
C8	10pf	10%	RMC Disc
C9 not assigned			
C10	68pf	10%	RMC Disc

Transistors

Q1	PNP	BC 177B	Siemens
Q2	NPN	BC 107B	Siemens
Q3	NPN	BC 107B	Siemens

CB 1.919.120-12 P.C.I.

Power Supply & Relay Board 1.919.240-13



Resistors
(All 1/8W, 5% carbon film
B-GmbH SZC-0309 unless noted)

R1, R3	2.2Ω			
R2	1.5k	2W	WW IRC/TRW	BWH
R4	2.2k			
R5	220Ω			
R6	10k			
R7, R13	4.7k			
R8	56k			
R9	27k			
R10	20k	Potentiometer Philer PT-10H-2.5		
R11	15k			
R12	100Ω			

Transistors

*Q1	NPN	2N3055	RCA
Q2	Not assigned		
Q3, Q5	PNP	BC-177B	Siemens
Q4, Q6	NPN	BC-107B	Siemens

Capacitors (+40VDC)

C1	Not assigned		
C2	1000uf	63V	Frako EF
C3, C4	22ufd	50V	Frako KE I
C5	100ufd	50V	Frako KE I
C6	10ufd	63V	Frako EP 2
C7	220ufd	25V	Frako KE I

Diodes

D1	15V Zener Sescosem BZX55-C15
D2, 4, 7, 8	1N4448 UPI
D3	Bridge Rect. Gen. Int. W02M
D5, D6	not assigned

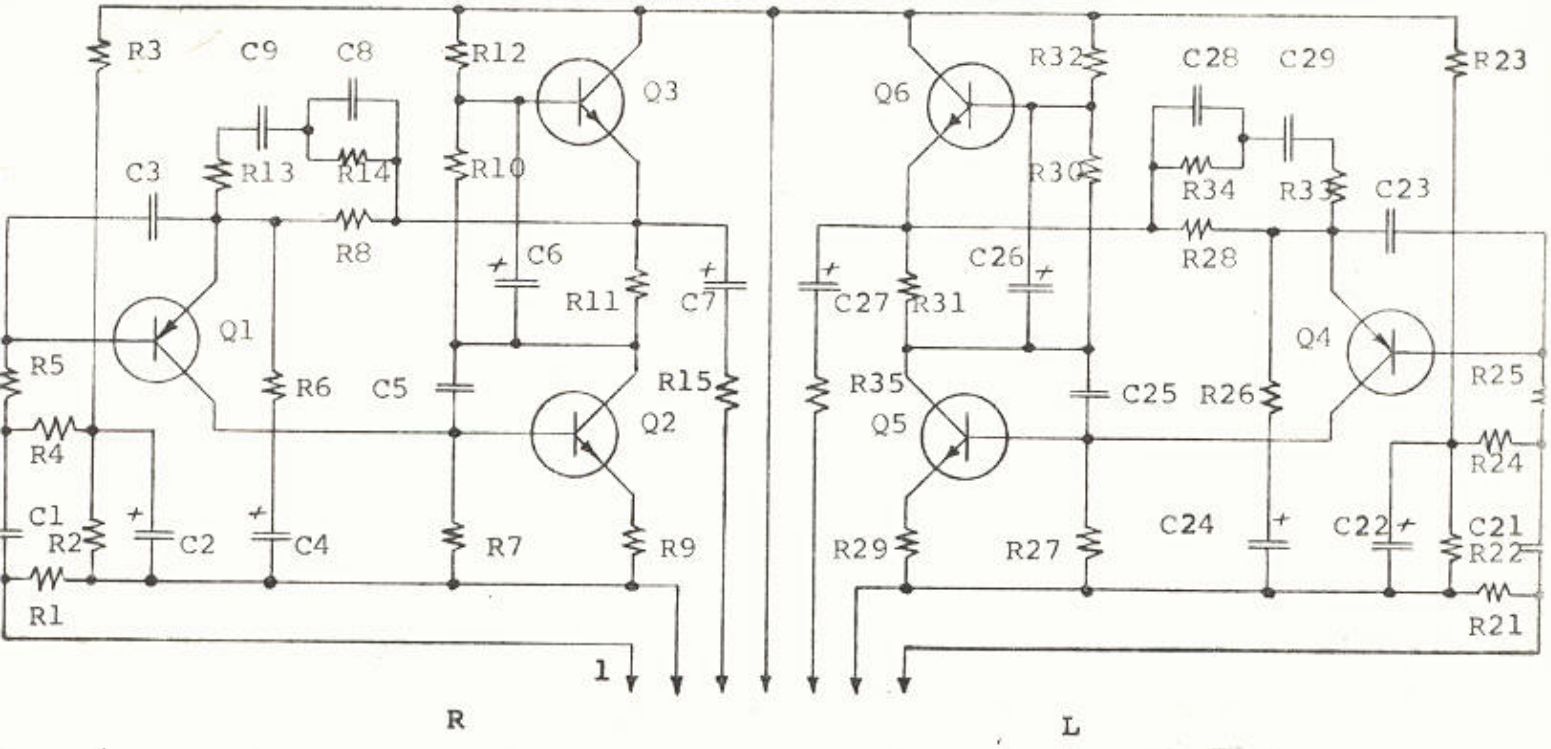
K1 4PDT Relay Babcock NF4-24V-1200Ω

CB 1.919.240-13

* can be substituted by 2N3773
MJ3772
MJ3773

DATE: SCALE:

RIAA Phono Input Amp 1.919.100-14



Resistors

(All 1/8, 5%, carbon film B-GmbH SZC 0309 unless noted)

R1, R21	1M
R2, R22	56k
R3, R23	330k
R4, R24	56k
R5, R25	1k
*R6, R26	150Ω, 330Ω
R7, R27	15k
R8, R28	180k
R9, R29	47Ω
R10, R30	8.2k
R11, R31	150Ω
R12, R32	100k
R13, R33	470Ω
R14, R34	12k
R15, R35	1k

R16 through 20 not assigned

* 330Ω for Model 919
150Ω for Model 10-2-DL

Capacitors

C1, C21	3.3ufd	35V	Matsuo Tan.
C2, C22	22ufd	40V	Frako EP-2
C3, C23	560pf	10%	RMC Disc Z5U
C4, C24	100ufd	16V	Frako EP-2
C5, C25	22pf	10%	RMC Disc
C6, C26	47ufd	6.3V	Matsuo
C7, C27	3.3ufd	35V	Matsuo
C8, C28	.0068ufd		Siemens
C9, C29	.018ufd		Siemens

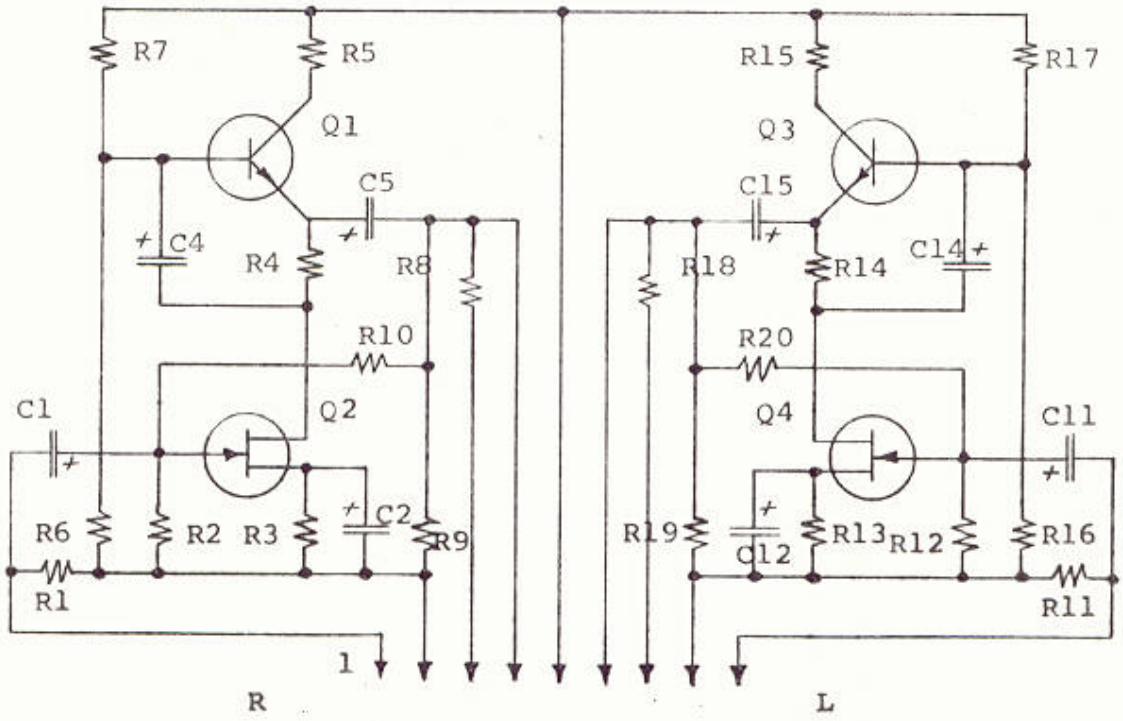
Transistors

Q1, Q4	PNP BC 177B	Siemens
Q2, Q5	NPN BC 107B	Siemens
Q3, Q6	NPN BC 107B	Siemens

CB 1.919.100-14 P.C.I.

DATE | SCALE:

Summing Amp 1.919.140-12



Resistors
(All 1/8W, 5%, carbon film
B-GmbH SZC 0309 unless noted)

R1, R11	1M	
R2, R12	1M	
R3, R13	470Ω	
R4, R14	470Ω	
R5, R15	330Ω	
R6, R16	470k	
R7, R17	220k	
*R8, R18	6.8k	0.0Ω
R9, R19	100k	
R10, R20	120k	

Capacitors

C1, C11	10ufd	100V DC 35V AC	Frako ETF
C2, C12	47ufd	6.3V	Matsuo
C3, C13	not assigned		
C4, C14	10ufd	63V	Frako EP-2
C5, C15	10ufd	63V	Frako EP-2

Transistors

Q1, Q3	NPN BC 107B	Siemens
Q2, Q4	FET 2N 3822	Teledyne
CB 1.919.140-12		P.C.I.

* 6.8k for Model 919
Wire jumper for Model 10-2-DL

DATE:
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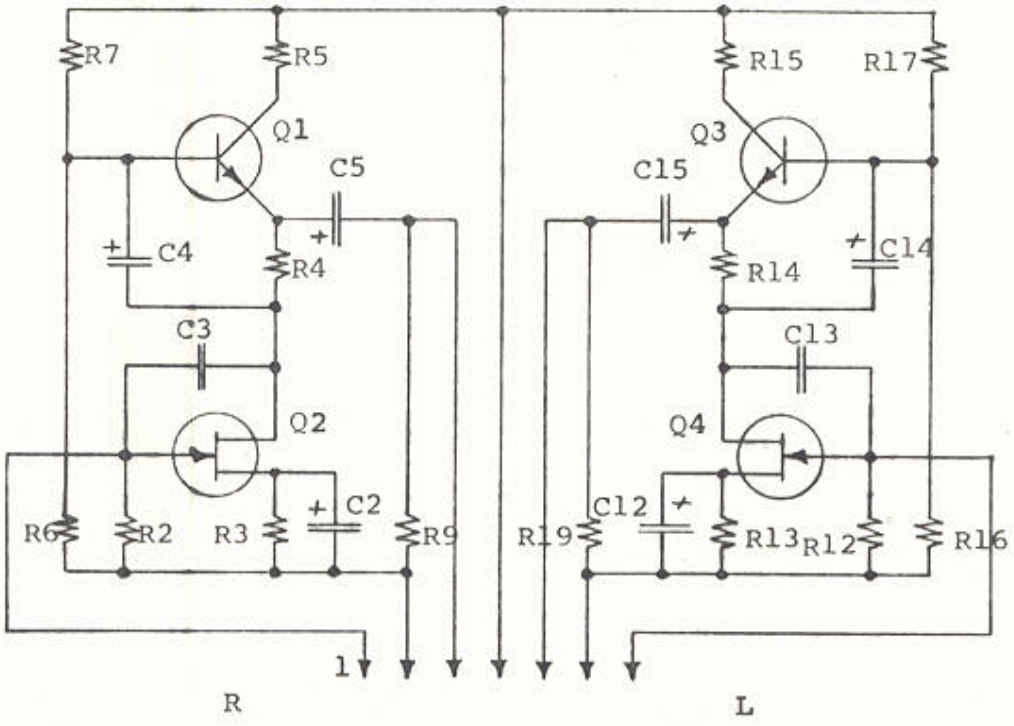
Tone Control Amp 1.919.180-12



Resistors
(All 1/8W, 5%, carbon film
B-GmbH SZC-0309 unless noted)

R2, R12	1M
R3, R13	220Ω
R4, R14	470Ω
R5, R15	330Ω
R6, R16	470k
R7, R17	220k
R8, R18	Not assigned
R9, R19	100k

Capacitors

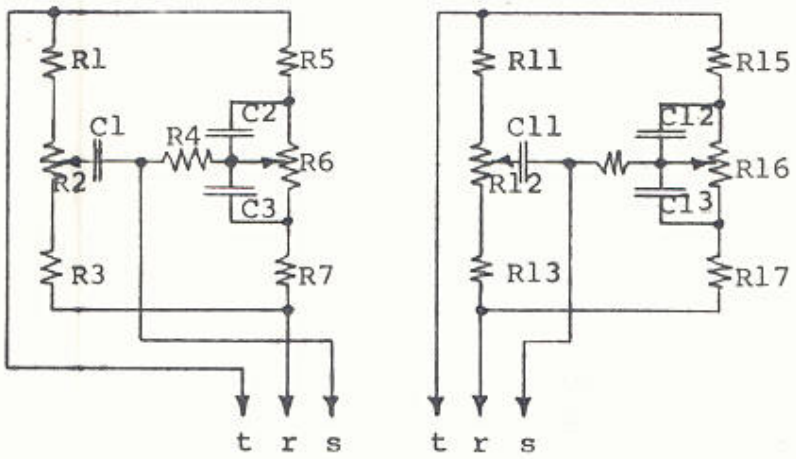
C2, C12	47ufd	16V	Frako EP-2
C3, C13	10pf	10%	RMC Disc
C4, C14	47ufd	6.3V	Matsuo
C5, C15	10ufd	63V	Frako EP-2

Transistors

	GE-20	
Q1, Q3	NPN BC 107B	Siemens
Q2, Q4	FET 2N 3822	Teledyne
	FET-1	
CB	1.919.180-12	P.C.I.

SCALE

Tone Control Board TC-1-3



NOTE: Schematic shows 2 individual boards; 1 for left, 1 for right. Both circuits are not on same board.

Comp. Resistors

R1, R11	3.3k	1/2W	10%	AB
R2, R12	50k	Pot		AB
R3, R13	3.3k	1/2W	10%	AB
R4, R14	6.8k	1/2W	5%	AB
R5, R15	12k	1/2W	1%	AB
R6, R16	50k	Pot		AB
R7, R17	12k	1/2W	1%	AB

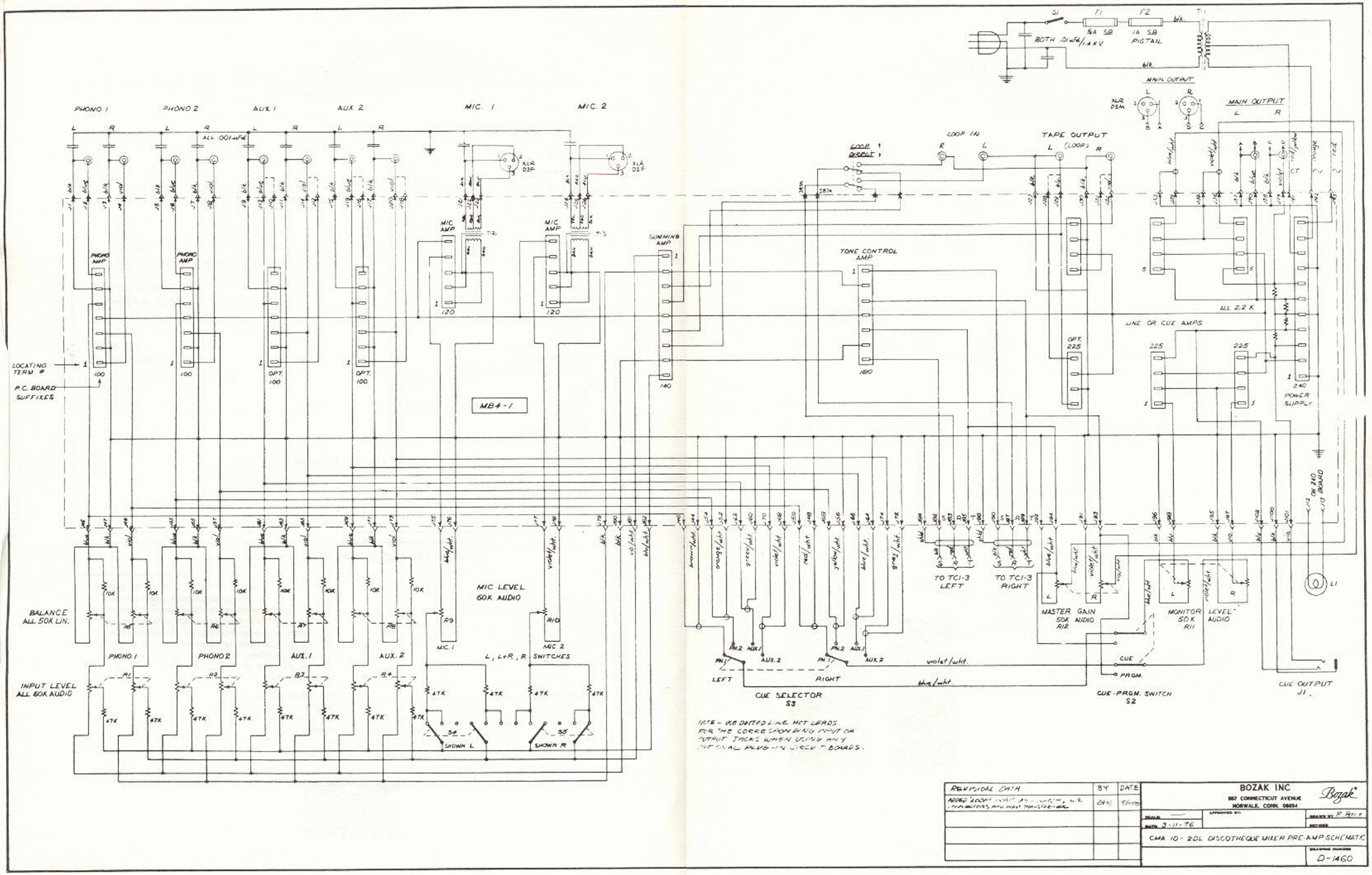
Capacitors

C1, C11	.0022uf 160V	5%	Siemens
C2, C12	.068uf 100V	5%	Siemens
C3, C13	.068uf 100V	5%	Siemens

Contact Pin .3775 Vogt

CB TC-1-3

SCALE



PHONO 1
PHONO 2
AUX 1
AUX 2
MIC. 1
MIC. 2
ALL .001 uFd.
XLR D3F
MIC AMP
PHONO AMP
SUMMING AMP
TONE CONTROL AMP
LOOP IN
TAPE OUTPUT (LOOP)
LOOP DIRECT
MAIN OUTPUT
XLR D3M
BOTH .01 uFd / 1.4 KV
1/4A SB
1A SB PIGTAIL
ALL 2.2 K
LINE OR CUE AMPS
POWER SUPPLY
LOCATING TERM. #
P.C. BOARD SUFFIXES
MB4-1
BALANCE ALL 50K LIN.
INPUT LEVEL ALL 50K AUDIO
MIC LEVEL 50K AUDIO
L, L+R, R. SWITCHES
SHOWN L
SHOWN R
TO TC1-3 LEFT
TO TC1-3 RIGHT
MASTER GAIN 50K AUDIO R12
MONITOR LEVEL 50K AUDIO R11
CUE SELECTOR S3
CUE-PRGM. SWITCH S2
CUE OUTPUT J1
NOTE - USE DOTTED LINE HOT LEADS FOR THE CORRESPONDING INPUT OR OUTPUT JACKS WHEN USING ANY OPTIONAL PLUG-IN CIRCUIT BOARDS.
REVISION DATA
BY
DATE
BOZAK INC
587 CONNECTICUT AVENUE
NORWALK, CONN. 06854
Bozak
DATE 3-11-76
CMA 10-20L DISCOTHEQUE MIXER PRE-AMP SCHEMATIC
D-1460

Bozak CMA-10-2DL Pt.2 – Notes

POSTED ON JUNE 27, 2019 JULY 3, 2019 BY FABRIC ASTRONAUT ENGINEERING POSTED IN DJ MIXERTAGGED ANALOG, AUDIO, BOZAK, DJ MIXER, REPAIR, VINTAGE AUDIO

Before I start on the repair, here are some notes on the Bozak. Firstly, I'm working off the same schematics as everyone else since I've only come across one version, but I'll include them for the sake of completeness.

All PCBs affix to the motherboard using 0.15'' spaced pins. I haven't been able to locate a replacement for the original stamped sheet metal units with two mounting points. For my replacement cards I used a generic Molex KK254 style right angle pin header, which fit slightly tighter than the original units, being a square extrusion rather than stamped metal. I can't comment on how the original connectors will hold up with larger pins, but I assembled and disassembled this unit a huge number of times throughout the job and no problems. It feels much more solid. This unit has a motherboard labeled MB-4, which didn't have mounting points for the bracket affixed to the output amps – a shame as they are top heavy and I'd prefer not to rely on foam for stability. There were a few different foam compounds in this unit which had either turned rock solid or disintegrated over the motherboard.

Removal of the balance controls is an obvious change to make. The original mixer used a B50K pot with a 10K slugging/law resistor, which (25K||10K) more or less gives you a pot centre position voltage divider equivalent of ~6K8 and 25K, with the 25K to ground. This means you wind up with a balance network loss of almost 2.2dB.

Removing the pots does not require the installation of equivalent fixed resistors, in fact I'd advise against it. Start to finish, the mixer has headroom no human will come close to hitting. I have driven 30VPk-Pk out of it with no issue. The increase of 2.2dB subsequently improves the noise floor and the removal of the pot also drops crosstalk between channels and increases the input impedance.

If you don't want the pots, just remove them and do not replace them with anything.

This unit arrived with two different era of phono preamplifier cards, though all had the same PCB as identified by serial number. Two of the cards came with nice Beyschlag resistors as detailed in the original schematics. The newer units came across as built down to a much lower pricepoint, with generic looking carbon resistors and 10uF electrolytics replacing tantalum caps in positions C7 and C27.

Since water damage affected the original uncoated film capacitors in the response network (C8/C28, C9/C29) I replaced these with matched polystyrene capacitors.

All capacitors were changed, with the exception of a couple. The full list of capacitors and the replacements I used is here:

Bozak Caps (https://fabricastronautblog.files.wordpress.com/2019/06/bozak-caps-sheet1-2.pdf)

2N3822 J-FETs in the summing and equaliser amplifiers had severe tin whiskers – though after cleaning I decided to keep them installed. I have a decent stash of original motorola units so I matched then taped four of them inside the mixer for a future repair if required.

The Fset capacitors on the front panel equaliser PCB (C1,C11 C2,C12 C3/C13) were the only caps to make it through the process unscathed.

The output amplifier is a solid Push-Pull output amplifier. The trimpot adjusts the bias of the input stage, used to make sure the amp clips symmetrically. Gain is set by R7/R27, 220R is used for the nominal 28dB in the schematics. To adjust the gain of the output amplifier change these resistors and recalibrate the bias trimpot. (Simulated) resistor changes are:

(Note this table references my Pathos Mixer schematic, so the resistor is lised as R407, not R7/R27)

(I also don't recommend you use every value listed as changing the bias of the amp dramatically can affect the sound. I calculated them down to 0dB out of curiosity. In my Pathos mixers I used 750R)

Interestingly, this unit arrived with different values. The two output cards are arranged by channel, with the front facing amplifier on the PCB taking care of the headphones and the rear amp handling the main outputs on the back.

Transformer is a 36VCT unit. The power supply collapses in simulation at roughly 280mA. It has a soft start, with roughly ~7 seconds or so passing before the supply hits 40VDC. This PCB contains a 4P relay for Output and Headphone muting which is still easily available at cost, though I simply cleaned and actuated the relay a few times.

The schematics floating around on the web split the motherboard other 2 files, so I stitched them together, you should be able to open and download a full sized version.

The original front panel is Brushed aluminium, the remainder of the chassis being sheet steel – tough to machine with my setup. This steered me towards an isolator solution that took advantage of existing mounting holes.

The knobs are Buckeye Shapeform DSN Series, still manufactured by the original company, though to my knowledge aren't available for consumer purchase via any usual avenues. Minimum orders are by weight. A close equivalent are the EHC Knobs Designer series, which are available with a little hunting.