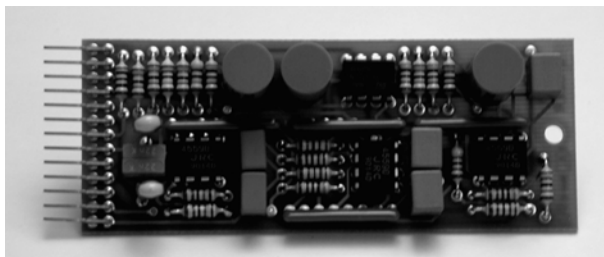


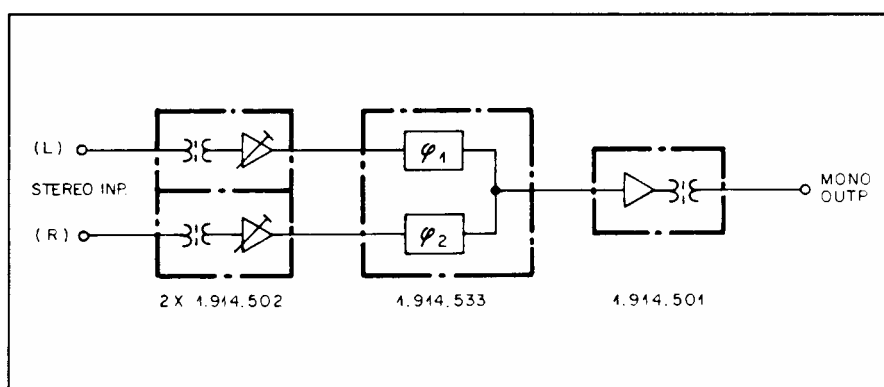
## 90° Filter

1.914.533

This active 90° filter is used to form a monophonic signal from the left and right channel of stereo signals. Simple mixing of the left and right channel will not produce a mono signal of satisfactory quality, but results in an emphasis of the center information. By summing the stereo signals in a 90° phase-shifted manner, this undesirable effect can be avoided.



The 90° filter consists of two all-pass filter chains, producing a uniform 90° phase difference across the whole audio range. The left and the right stereo signals are each passed through one of these filters and added at the filter's output. Doubling of equally-phased signal components as well as canceling of opposite-phased components is thus avoided.



The filter circuits are of unbalanced configuration. For this reason a summing circuit usually consists of two high-level amplifiers with balanced inputs (1.914.502), one 90° filter, and one high-level output amplifier (1.914.501), all accommodated on one MSC motherboard, as shown in the diagram above.

The gain of this combination can be adjusted. A correlated stereo input of equal level in both channels will provide a mono signal of identical level. With only one input channel (left or right), the mono output level will be lower by 3 dB.

Since the 90° filter with its input and output cards can be realized on a single, Euro-card size MSC motherboard, it can possibly be combined with other Audio Components, such as limiters and isolation amplifiers. Such stereo-to-mono combinations are in use at various radio stations to feed the stereo programs to the monophonic AM-transmitter in a correctly summed manner.

Technical Specifications

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**Input:** Max. level **+20 dBu**  
Impedance **4 k $\Omega$**

**Output:** Max. level **+20 dBu**  
Impedance **6.8 k $\Omega$**   
Frequency response **30 Hz...16 kHz,  $\pm 0.3$  dB**  
Phase **90°  $\pm 3^\circ$ ; 30 Hz...16 kHz**  
THD  **$\leq -80$  dB**  
Noise **< -95 dBu**

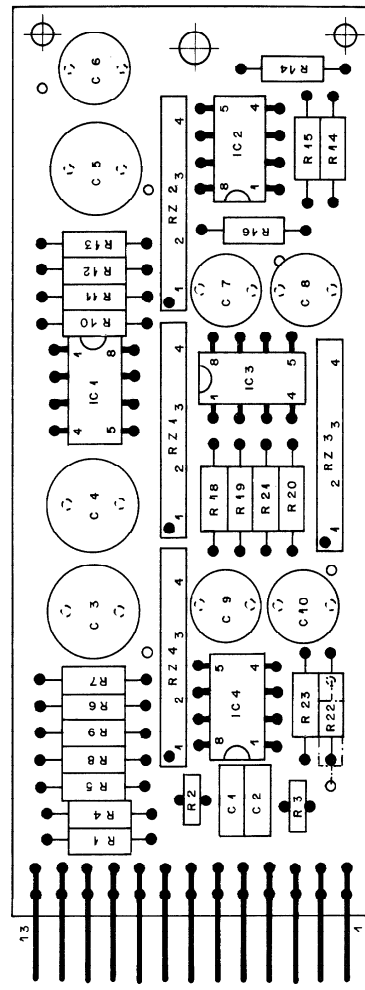
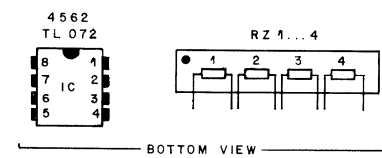
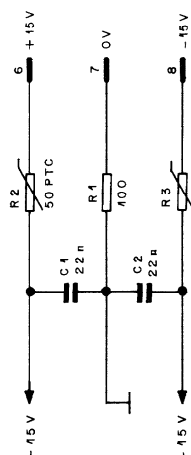
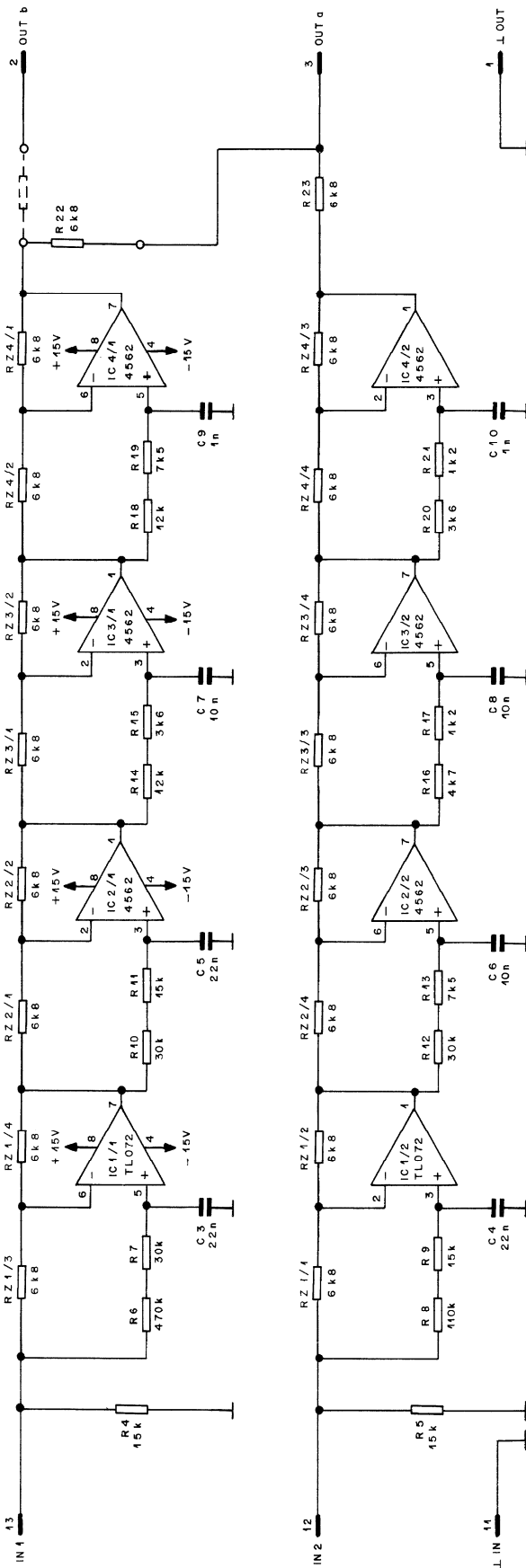
**Supply:**  **$\pm 15$  V** (18 mA idling)

**Dimensions:** **MS-card**, 34  $\times$  85 mm

**Ordering Information:** 90° filter stereo/mono

1.914.533.xx

MSC 90° FILTER



CIS	PIN	①	②	③	④
IN 1	13	1	7	21	27
IN 2	12	2	8	22	28
⊥	11	3	9	23	29
	10				
	9				
-15 V	8	14			
0 V	7	15			
+15V	6	16			
	5				
	4				
OUT a	3	4	10	24	30
OUT b	2	5	11	25	31
⊥	1	6	13	26	32

## MSC 90° FILTER

Ad	..POS..	...REF.No...	DESCRIPTION.....	MANUFACTURER
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C....1	59.06.0223	22 nF	PE	
C....2	59.06.0223	22 nF	PE	
C....3	59.05.1223	22 nF 1%	PP	
C....4	59.05.1223	22 nF 1%	PP	
C....5	59.05.1223	22 nF 1%	PP	
C....6	59.05.1103	10 nF 1%	PP	
C....7	59.05.1103	10 nF 1%	PP	
C....8	59.05.1103	10 nF 1%	PP	
C....9	59.05.1102	1 nF 1%	PP	
C....10	59.05.1102	1 nF 1%	PP	
IC....1	50.09.0101	TL072	dual op.amp.	TI
01 IC....2	50.09.0107	RC4559	dual op.amp.	Ra
01 IC....3	50.09.0107	RC4559	dual op.amp.	Ra
01 IC....4	50.09.0107	RC4559	dual op.amp.	Ra
P....1	54.01.0273		CIS, 13 pin	
R....1	57.11.3101	100 Ohm		
R....2	57.99.0206	50 Ohm	PTC	
R....3	57.99.0206	50 Ohm	PTC	
R....4	57.11.3153	15 kOhm		
R....5	57.11.3153	15 kOhm		
R....6	57.11.3474	470 kOhm 1%		
R....7	57.11.3303	30 kOhm 1%		
R....8	57.11.3114	110 kOhm 1%		
R....9	57.11.3153	15 kOhm 1%		
R....10	57.11.3303	30 kOhm 1%		
R....11	57.11.3153	15 kOhm 1%		
R....12	57.11.3303	30 kOhm 1%		
R....13	57.11.3752	7.5 kOhm 1%		
R....14	57.11.3123	12 kOhm 1%		
R....15	57.11.3362	3.6 kOhm 1%		
R....16	57.11.3472	4.7 kOhm 1%		
R....17	57.11.3122	1.2 kOhm 1%		
R....18	57.11.3123	12 kOhm 1%		
R....19	57.11.3752	7.5 kOhm 1%		
R....20	57.11.3362	3.6 kOhm 1%		
R....21	57.11.3122	1.2 kOhm 1%		
R....22	57.11.3682	6.8 kOhm 1%		
R....23	57.11.3682	6.8 kOhm 1%		
RZ....1	57.88.2682	6.8 kOhm	Resistor-Network	
RZ....2	57.88.2682	6.8 kOhm	Resistor-Network	
RZ....3	57.88.2682	6.8 kOhm	Resistor-Network	
RZ....4	57.88.2682	6.8 kOhm	Resistor-Network	

PE = polyester, PP = polypropylen

(01) 90/06/21 IC 2...4 RC 4562 replaced by RC 4559

MANUFACTURER TI=Texas Instruments, Ra=Raytheon

1.914.533.00	90 DEGREE FILTER	HAM88/02/2400
1.914.533.00	90 DEGREE FILTER	FRI90/06/2101