

Quasi-Parallel Sound Processor for TV Sets

Technology: Bipolar

Features

- High signal sensitivity
 - Simple filter configuration and few external components
 - Processing of two carrier stereo signals
 - ESD protected
 - Low intercarrier distortions
 - Alignment-free intercarrier mixer
 - Optimum tuning characteristics
 - Improved linearity for NICAM applications
 - AF output level matched to SIMAVELEC condition
- Case:** DIP18

Block Diagram

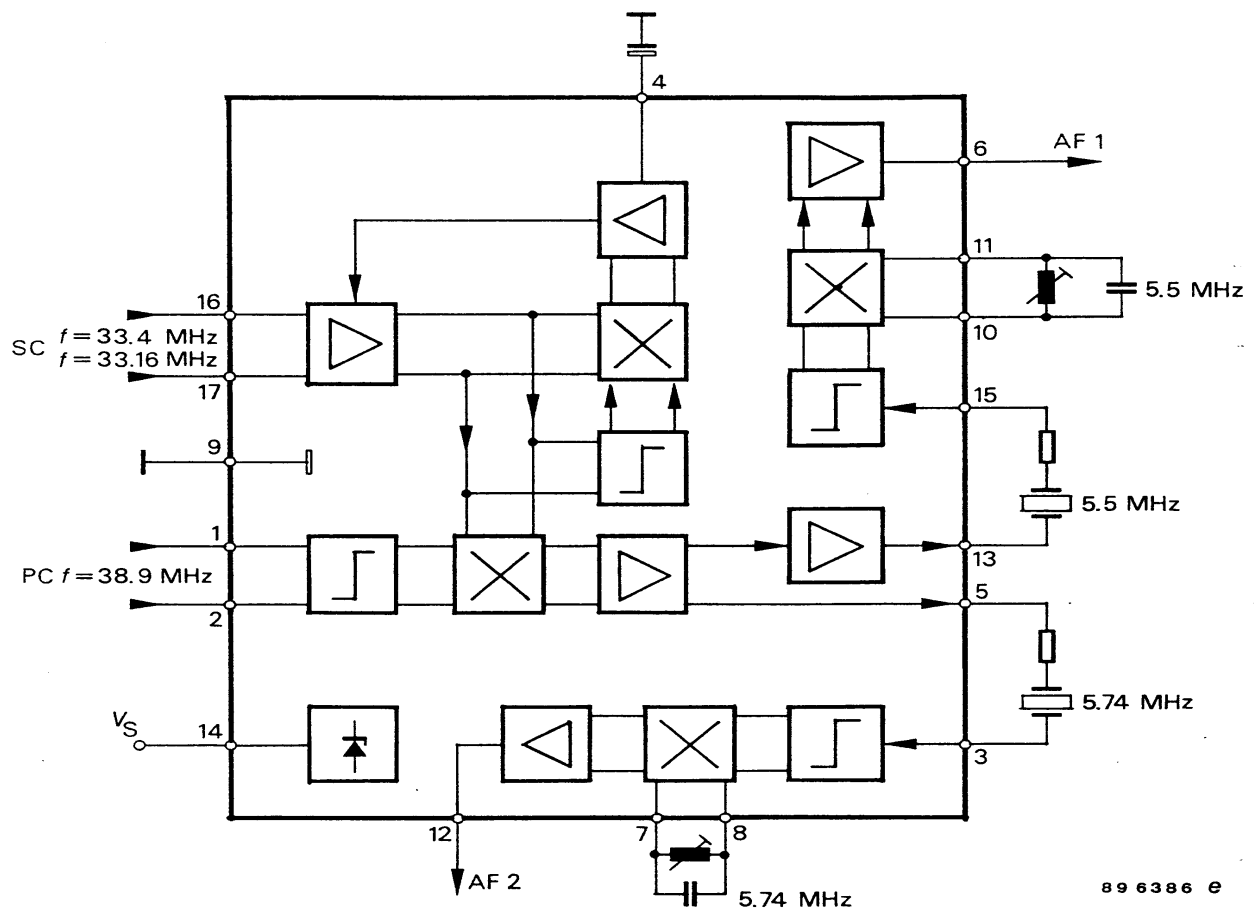


Figure 1.

Pin Configuration

Pin	Function
1–2	Vision-IF-carrier input
3	Intercarrier input 5.74 MHz
4	AGC storage capacitor
5	Intercarrier output 5.74 MHz
6	AF output 1
7–8	FM demod circuit 5.74 MHz
9	Ground

Pin	Function
10–11	FM-demode circuit 5.5 MHz
12	AF output 2
13	Intercarrier output 5.5 MHz
14	Supply voltage
15	Intercarrier input 5.5 MHz
16–17	Sound-IF-carrier input
18	Not connected

Circuit Description

This circuit configuration permits high-quality processing of audio carriers for FM-sound standards, providing separate inputs for the video and audio carrier. The audio carrier signal is passed to two multiplying mixer arrangements via a 3-stage variable wideband amplifier with led level output signals. One mixer generates the gain-control signal. The second mixer operates as an intercarrier demodulator and supplies the intermediate AF carrier. The video carrier signal required from the intercarrier is decoupled in a prelimited and selected form from the demodulator tank of the intermediate video frequency circuit (TDA4453 or

TDA4439) and led to the intercarrier mixer via a limiting amplifier. Depending on the system, the Nyquist range of the IF input filter in the video channel affects the attainable AF signal-to-noise ratio.

The audio PM IF carrier reaches the quadrature demodulators via an inter-connected IF filter and subsequent limiting amplifier. The resulting AF signals are led via a low-pass amplifier with increased level to the buffered output stages. Switching can take place with TTL-equivalent levels.

Absolute Maximum Ratings

Reference point Pin 9, 18, unless otherwise specified

Parameters	Symbol	Value	Unit
Supply voltage Pin 14	V_S	10 to 13.5	V
Supply current Pin 14	I_S	80	mA
External voltages Pins 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 15, 16 and 17	V_{ext}	6	V
Power dissipation (in soldered position)	P_{tot}	1	W
Junction temperature	T_j	125	°C
Ambient temperature range	T_{amb}	–25 to +70	°C
Storage temperature range	T_{stg}	–25 to +125	°C

Thermal Resistance

Parameters	Symbol	Maximum	Unit
Junction ambient	R_{thJA}	60	K/W

Electrical Characteristics

$V_S = 12\text{ V}$, $T_{\text{amb}} = 25^\circ\text{C}$, reference point Pin 9, $f_{\text{PC}} = 38.9\text{ MHz}$, $f_{\text{SC1}} = 33.43\text{ MHz}$, $f_{\text{SC2}} = 33.1578\text{ MHz}$, $\text{SC1/SC2} = 7\text{ dB}$, unless otherwise specified

Parameters	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
Supply voltage range	Pin 14	V_S	10		13.5	V
Supply current	Pin 14	I_S	55	62	80	mA
Output dc voltage	Pin 6, 12	V_0		3.6		V
Picture carrier input voltage	Pin 1–2	v	10	20	30	mV
Min. sound carrier input voltage SC1	(5.5 MHz-output signal –3 dB) Pin 16–17	v		50		μV
AGC range			60	65		dB
Audio output voltage	FM deviation = 27 kHz, Pin 6, 12	v		500		mV
Audio-voltage difference between both outputs	Pin 6, 12	Δv_{AF}			1	dB
Harmonic distortion ¹⁾	$f_{\text{mod}} = 1\text{ kHz}$, FM deviation = 30 kHz Pin 6, 12	THD		0.5		%
Limiting threshold	($V_{\text{AF}} - 3\text{ dB}$)			250		μV
AM rejection	$f_{\text{mod}} = 1\text{ kHz}$, $m = 30\%$ ³⁾ $V_{3(15)} = 10\text{ mV}$, $f = 5.5\text{ (5.74) MHz}$			55		dB
FM amplifier input resistance		$R_{3,15}$		560		Ω
Min. output load	Pin 6,12	R	3			k Ω
Signal-to-noise ratio (standard B/G) according to CCIR 468-2 specifications v_{16-17} : SC1 = 10 mV, SC2 = 4.5 V PC: $v_{1-2} = 20\text{ mV}$, prelimited demodulator picture carrier signal from TDA4453						
Black burst	1. channel/ 2. channel ^{2,3)} Pin 6,12	(S+N)/N		62/60		dB
Grid test signal	1. channel/ 2. channel ^{2,3)} Pin 6,12	(S+N)/N		50/48		dB

- 1) FM tank circuits: operation quality factor = 22
- 2) Standard B/G IF-modulated FBAS signal
- 3) Reference signal: $f_{\text{mod}} = 1\text{ kHz}$, FM deviation = 30 kHz

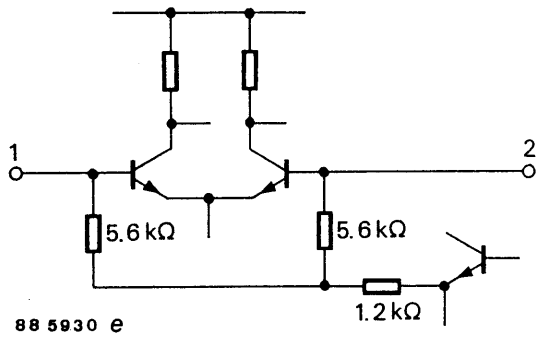


Figure 2. Pin 1, 2: IF input vision carrier

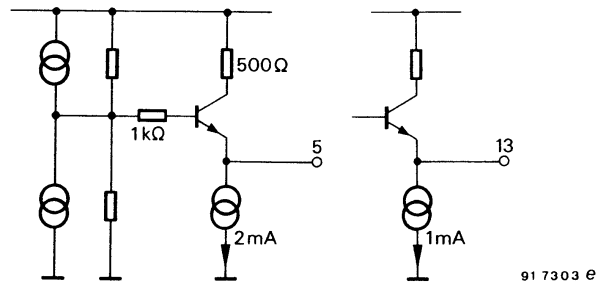


Figure 5. Pin 5 (13): Intercarrier output
Pin 5 = 5.74 MHz, Pin 13 = 5.5 MHz

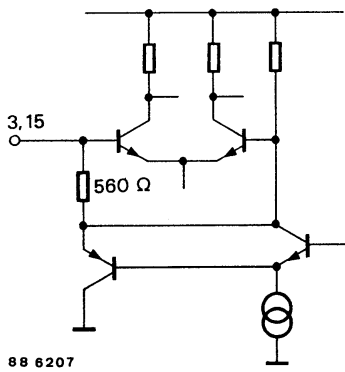


Figure 3. Pin 3 (15): Intercarrier input
Pin 3 = 5.74 MHz, Pin 15 = 5.5 MHz

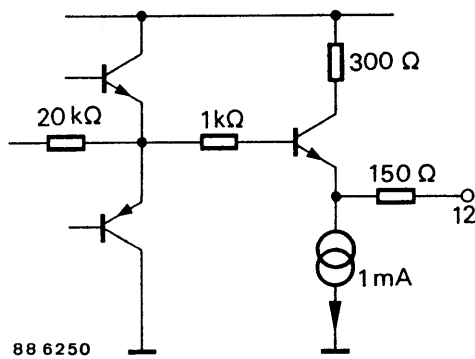


Figure 6. Pin 12: AF output 2

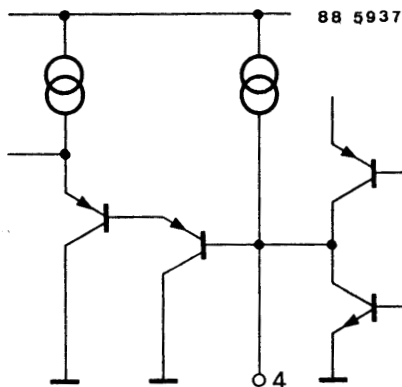


Figure 4. Pin 4: AGC storage capacitor

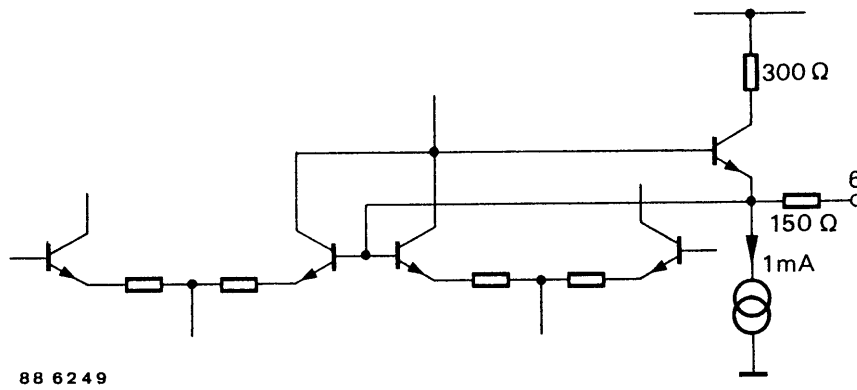


Figure 7. Pin 6: AF output 1

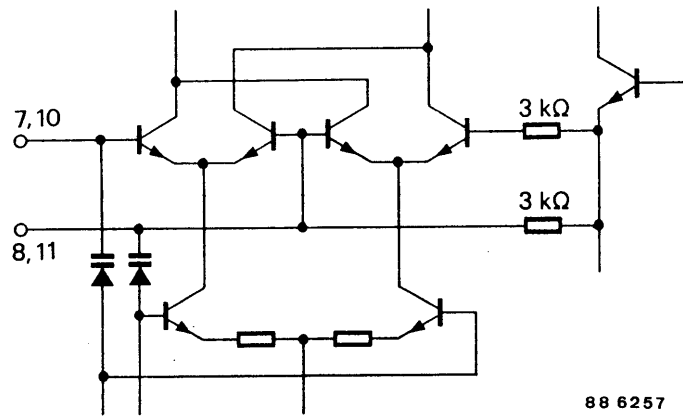


Figure 8. Pin 7, 8 (10, 11) FM demodulator circuit
Pin 7,8 = 5.74 MHz, Pin 10, 11 = 5.5 MHz

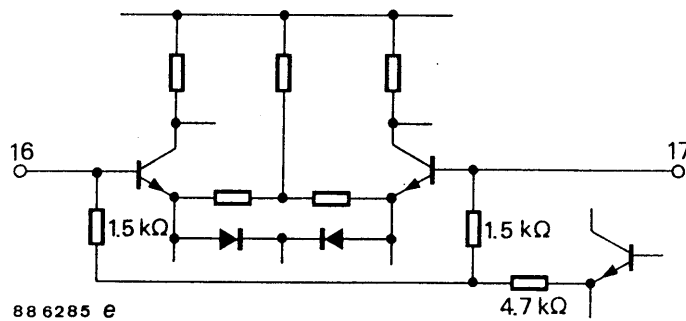
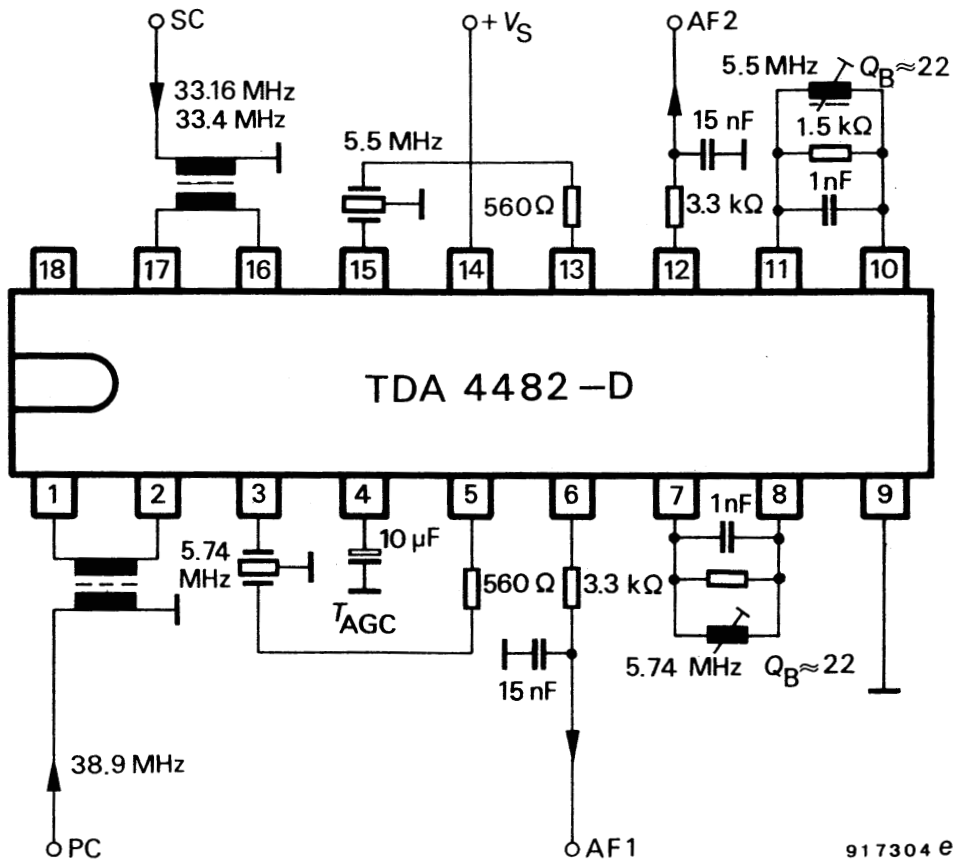


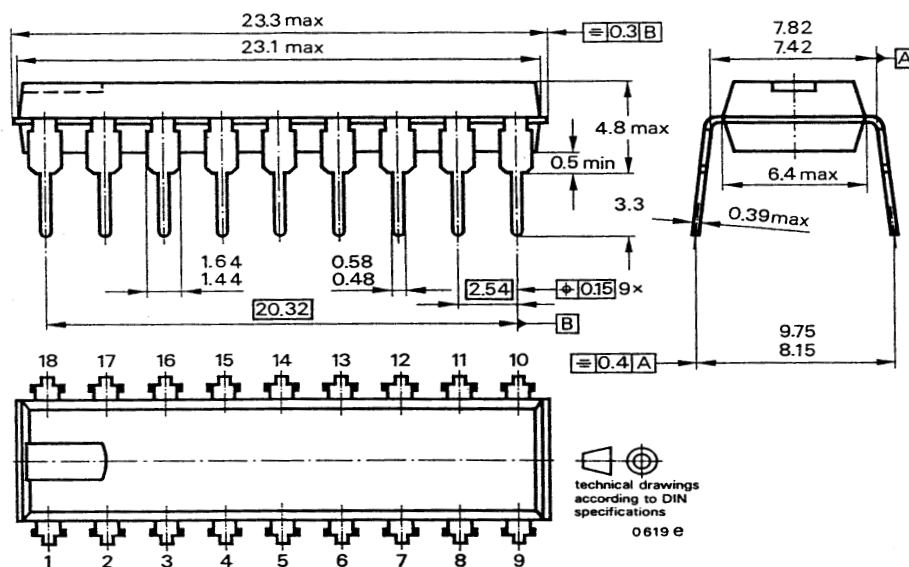
Figure 9. Pin 16, 17: IF input sound carrier

Test Circuit



Dimensions in mm

Case: 18-Pin dual inline plastic



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3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

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