I.F. LIMITER-AMPLIFIER
with very low current consumption

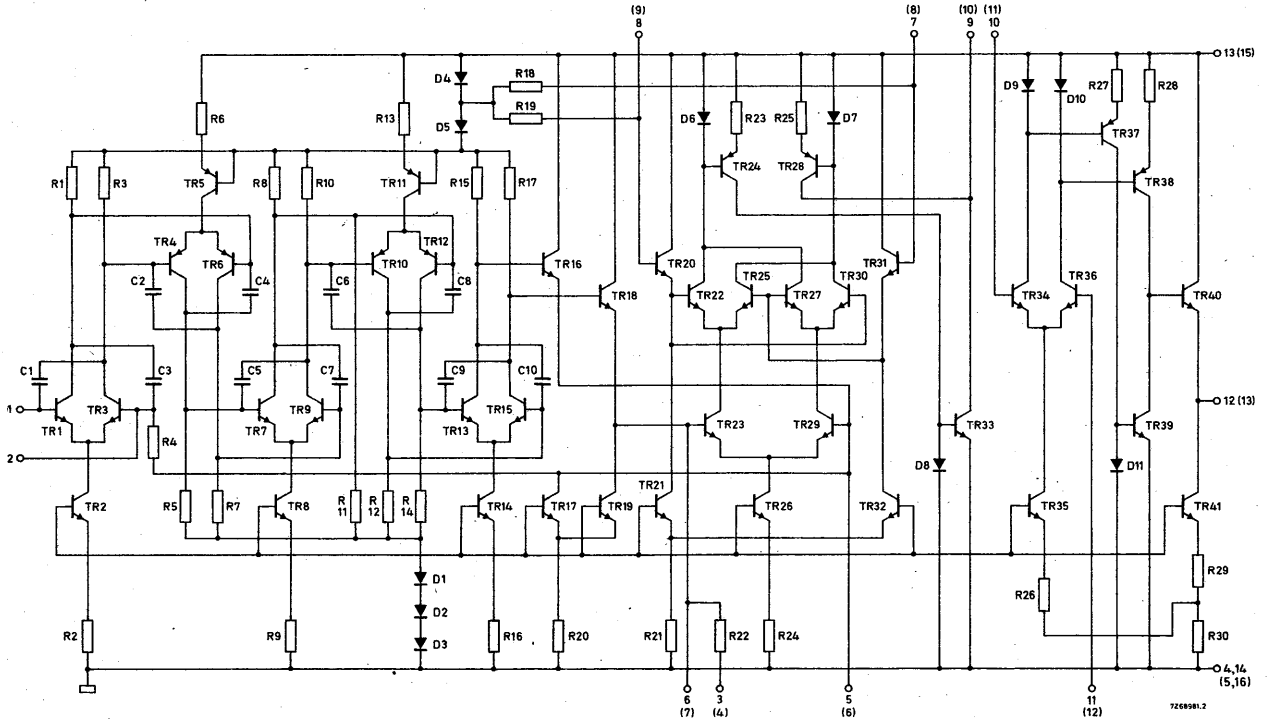
The TCA770 is a limiter-amplifier with a balanced f.m. detector and an audio pre-amplifier intended for a frequency range of 100 kHz to 500 kHz with narrow band f.m. The circuit is especially intended for use in portophone sets, where low current consumption and high sensitivity are important.

QUICK REFERENCE DATA				
Supply voltage	V_P	typ.	7,5	V
Ambient temperature	T_{amb}	typ.	25	°C
Frequency	f_o	typ.	100	kHz
Total current consumption	I_{tot}	typ.	450	μA
Input limiting voltage (-3 dB)	$V_{i\,lim}$	typ.	30	μV
A.F. output voltage at $\Delta f = \pm 3,5$ kHz (r.m.s. value)	$V_{o(rms)}$	typ.	90	mV
A.M. rejection at $\Delta f = \pm 3,5$ kHz; m = 0,3; f_m = 1 kHz V_i = 1 mV	α	typ.	50	dB
Open loop voltage gain	G_v	typ.	600	

PACKAGE OUTLINES (see general section).

TCA770 : SOT-43 (plastic; 14-lead).
TCA770A : plastic 16-lead dual in-line.
TCA770D : SO-14 (plastic 14-lead flat pack).

CIRCUIT DIAGRAM (pin numbers between brackets for TCA770A only).



RATINGS Limiting values in accordance with the Absolute Maximum System (IEC 134)

Supply voltage (pin 13 or 15)	V_P	max. 15	V
Storage temperature	T_{stg}	−55 to +125	°C
Operating ambient temperature	T_{amb}	−30 to +70	°C

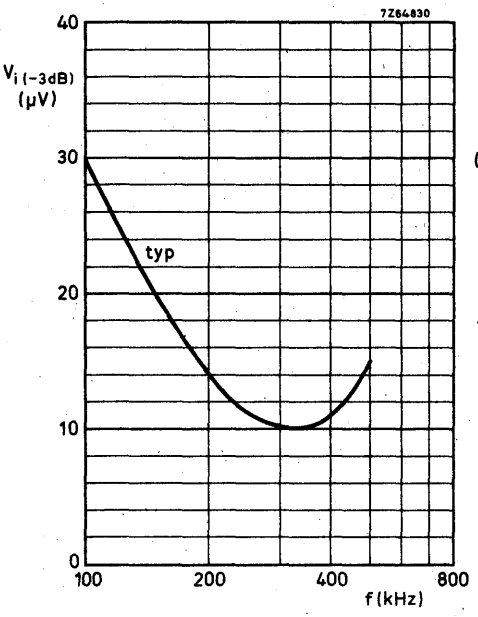
CHARACTERISTICS at V_P = 7,5 V; T_{amb} = 25 °C; f_o = 100 kHz; measured in circuit on page 4. The pin numbers between brackets for TCA770A only.

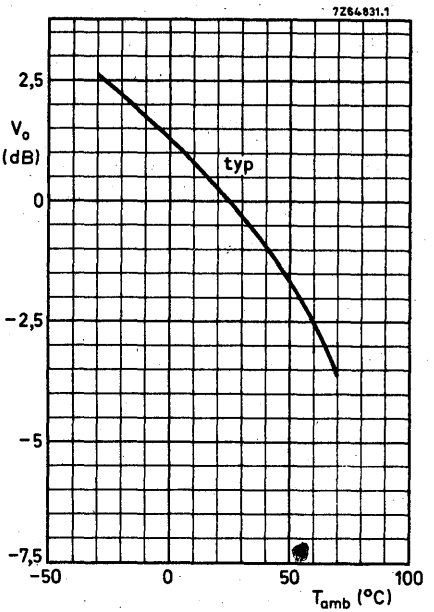
Total current consumption	I_{tot}	typ.	450	µA
			300 to 600	µA
Supply voltage range	V_{13-14}		5 to 10	V
Power dissipation	P_{tot}	typ.	3,4	mW
			2,5 to 4,5	mW
I.F. limiter-amplifier and f.m. detector				
Input limiting voltage (-3 dB)	$V_{i\,lim}$	typ.	30	µV [1]
A.M. rejection				
f.m. signal: Δf = ±3,5 kHz; f_m = 70 Hz				
a.m. signal: m = 0,3; f_m = 1 kHz				
at V_i = 300 µV	α	typ.	40	dB
at V_i = 1 mV	α	typ.	50	dB
at V_i = 10 mV	α	typ.	60	dB
Input impedance; pin 1	$\lvert Z_i \rvert$	>	10	kΩ
A.F. output voltage; pin 9 (10)				
load = 100 kΩ; Δf = ±3,5 kHz;				
f_m = 1 kHz; V_i = 10 mV (r.m.s. value)	$V_{o(rms)}$	typ.	90	mV
Influence of ambient temperature on output voltage		typ.	6,2	dB/100 °C [2]
Distortion at Δf = ±5 kHz; f_m = 1 kHz		typ.	2	%
		<	3	%
A.F. amplifier [3]				
Open loop voltage gain (R_{load} = ∞)	G_v	typ.	600	
Input bias current; pins 10 and 11 (11 and 12)	I_i	typ.	270	nA
Current of current sink in output stage	I_C	typ.	56	µA

1) See also left-hand graph on page 4.

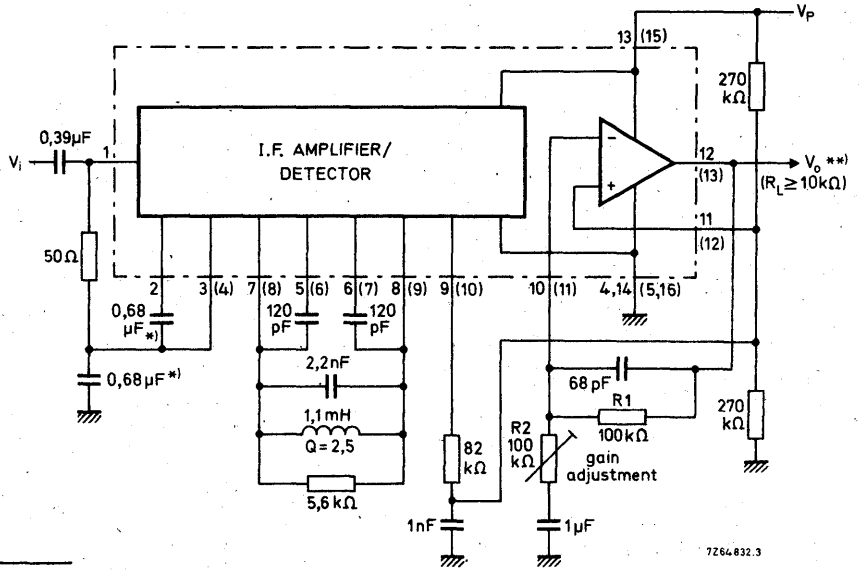
2) See also right-hand graph on page 4.

3) If the a.f. amplifier is not used, pin 11 (12) must be connected to Vp.





TEST CIRCUIT (pin numbers between brackets for TCA770A only).



*) The input limiting voltage depends on capacitor values. (Suggested type: solid aluminium capacitor, 2222 122 56687; 0,68 μF/25 V).

**) $V_o = (R_1 + R_2)/R_2 \times V_{11-4}$.