LIMITER/AMPLIFIER

The TBA750C is a limiter/amplifier with f.m. detector, d.c. volume control and a.f. preamplifier. It is intended for 4,5 MHz, 5,5 MHz or 10,7 MHz. The limiter/amplifier is a four-stage differential amplifier that gives very good noise and interference suppression. The detector is of the balanced type. The d.c. volume control stage has excellent control characteristics with a control range of more than 80 dB. The a.f. preamplifier can drive a triode-pentode output stage or a class-A push-pull transistor output stage.

QUICK REFERENCE DATA

Supply voltage	V_{2-5}	typ	12 V
Total current drain	I_{tot}	typ	34 mA
Frequency	f_o		5,5 MHz
Input voltage at start of limiting	$V_{i\,lim}$	typ	130 μV
A.M. rejection at V_i = 1 mV	α	typ	45 dB
A.F. output voltage at $\Delta f = \pm$ 15 kHz at pin 16	$V_{o(rms)}$	typ	2,7 V
D.C. volume control range		>	80 dB

PACKAGES OUTLINES

TBA750C: 16-lead DIL; plastic (SOT-38).
TBA750CQ: 16-lead QIL; plastic (SOT-58).

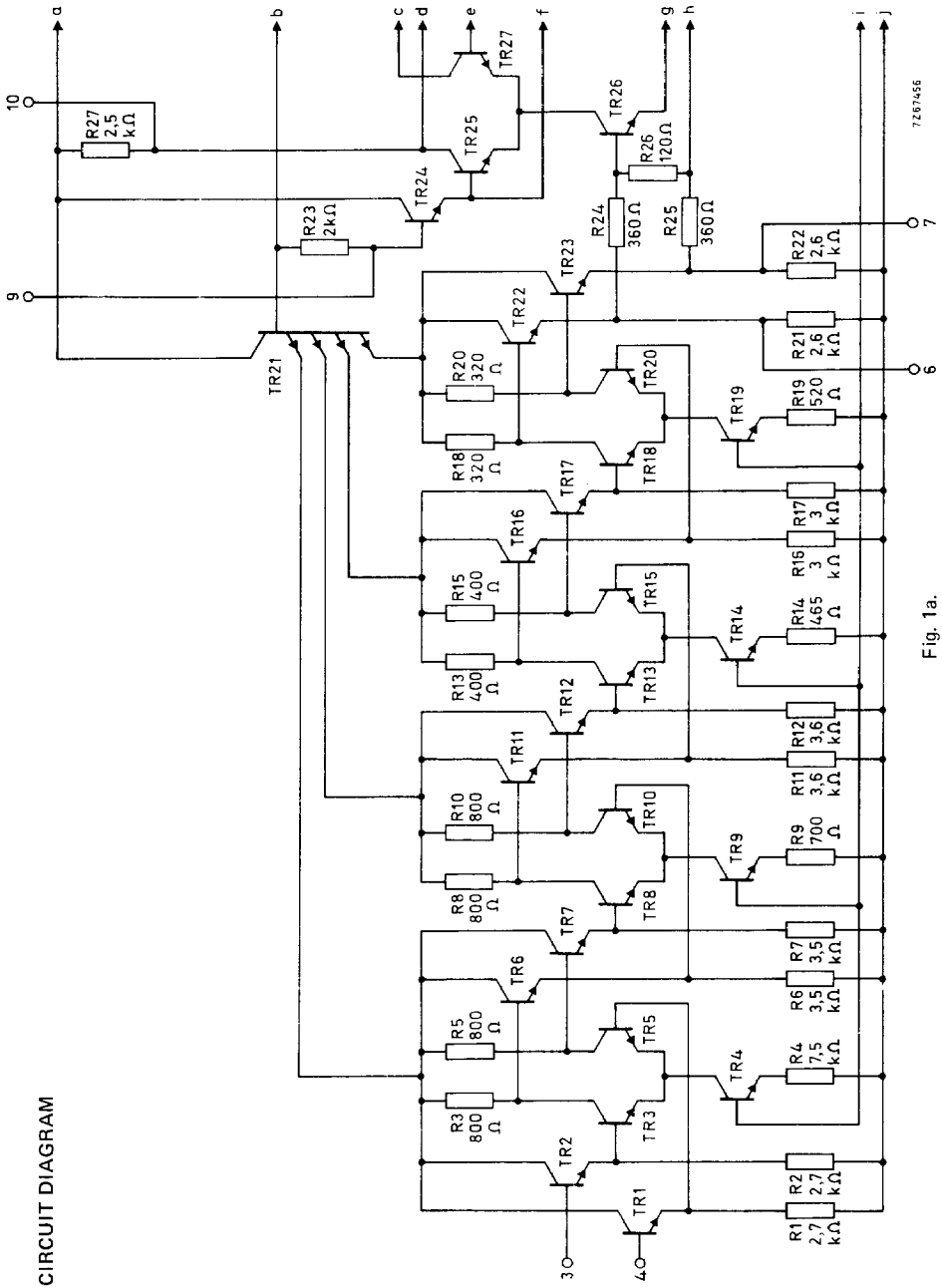

Fig. 1a.

CIRCUIT DIAGRAM

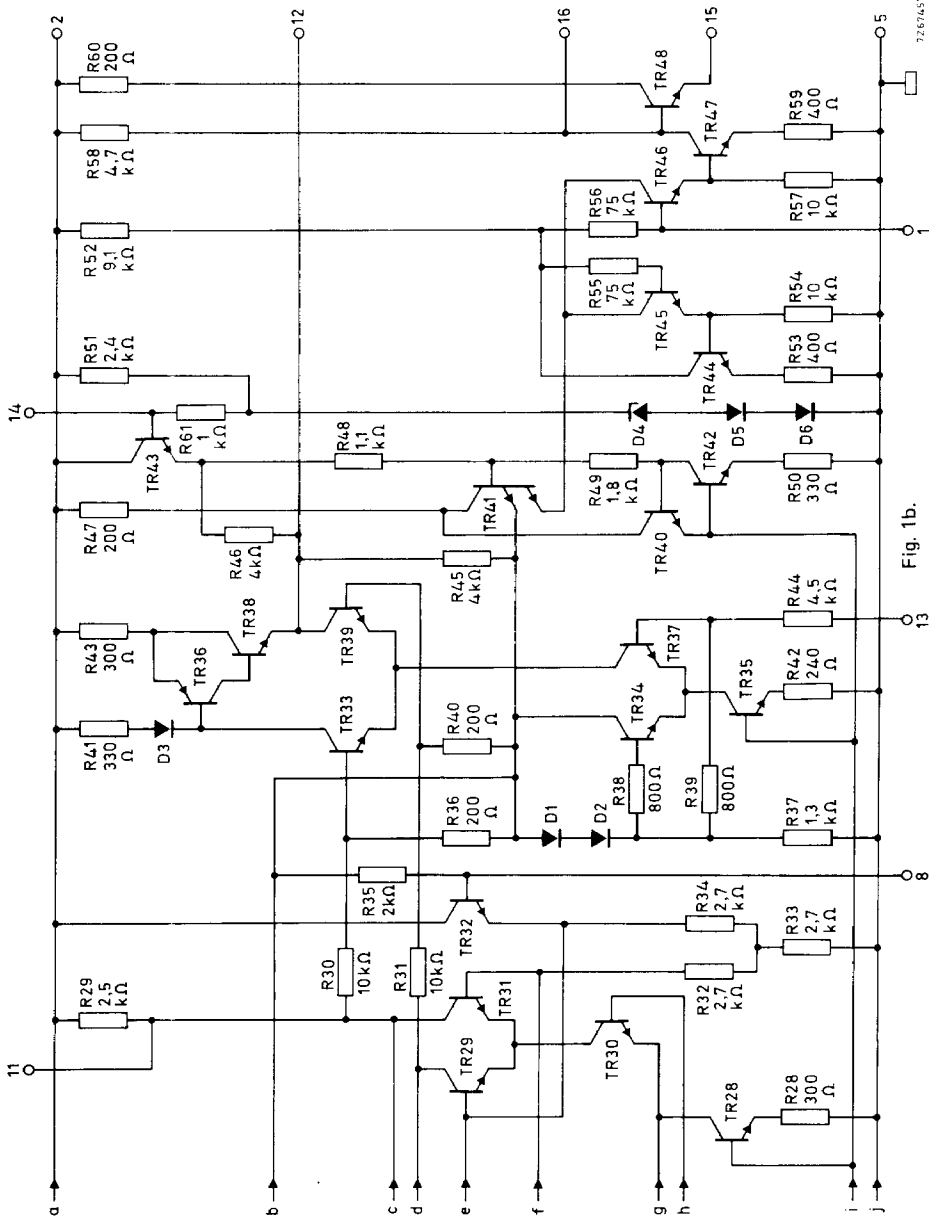
2
12
16
15
5
1
13
8
14
11
R60 200 Ω
R58 4.7 kΩ
R52 9.1 kΩ
R51 2.4 kΩ
R61 1 kΩ
R47 200 Ω
R46 4kΩ
R43 300 Ω
R41 330 Ω
D3
R29 2.5 kΩ
R30 10kΩ
R31 10kΩ
R35 2kΩ
R36 200 Ω
R40 200 Ω
R45 4kΩ
R48 1.1 kΩ
R49 1.8 kΩ
R50 330 Ω
R37 1.3 kΩ
R38 800Ω
R39 800Ω
R42 240 Ω
R44 4.5 kΩ
R53 400 Ω
R54 10 kΩ
R55 75 kΩ
R56 75 kΩ
R57 10 kΩ
R59 400 Ω
R33 2.7 kΩ
R34 2.7 kΩ
R32 2.7 kΩ
R28 300 Ω
D1
D2
D4
D5
D6
TR28
TR29
TR30
TR31
TR32
TR33
TR34
TR35
TR36
TR37
TR38
TR39
TR40
TR41
TR42
TR43
TR44
TR45
TR46
TR47
TR48
a
b
c
d
e
f
g
h
i
j

Fig. 1b.

RATINGS

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

Supply voltage	V_{2-5}	max	16 V *
Storage temperature	T_{stg}		−55 to + 125 °C
Operating ambient temperature	T_{amb}		−25 to + 55 °C
Power dissipation			

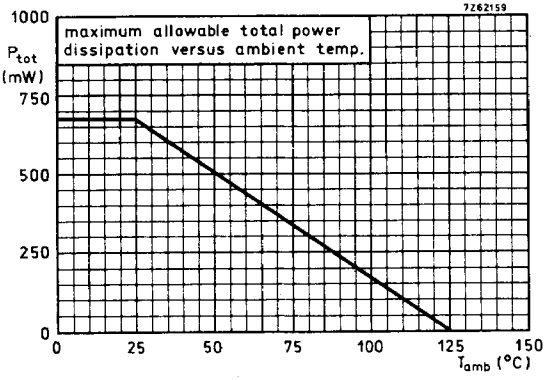

Fig. 2.

CHARACTERISTICS

Measured in test circuit Fig. 3.

Supply voltage range see also Fig. 4	V_{2-5}		10 to 25 V
Total current drain; pin 15 not connected	I_2		25 to 45 mA
Input limiting voltage at V_o = −3 dB (r.m.s. value)	$V_{i\ lim(rms)}$	typ	130 μV
I.F. output voltage at pins 6 and 7 (peak-to-peak value)	$V_{6-5(p-p)}$ / $V_{7-5(p-p)}$	typ	380 mV
A.M. rejection			
V_i = 1 mV	α	typ	45 dB
V_i = 10 mV	α	typ	50 dB
V_i = 100 mV	α	typ	55 dB
D.C. volume control range; see also Fig. 5		>	80 dB
A.F. preamplifier voltage gain pin 1 to pin 16	G_v	typ	10
Input resistance at pin 1	R_i	⩾	35 kΩ

* Allowable only if the dissipation in the IC is limited by means of a series resistor in the supply (see also Fig. 4).

CHARACTERISTICS (continued)

A.F. output voltages (r.m.s. values) $\Delta f = \pm 15$ kHz; $f_m = 1$ kHz			
	$V_{10-5(rms)}$) $V_{11-5(rms)}$)	typ	65 mV
	$V_{12-5(rms)}$	typ	250 mV
	$V_{16-5(rms)}$	typ	2,7 V
Total harmonic distortion			
at pin 12; $\Delta f = 15$ kHz	d_{tot}	typ	3 %
at pin 1 with respect to pin 16; $V_{o(rms)} = 3$ V	d_{tot}	typ	2,6 %

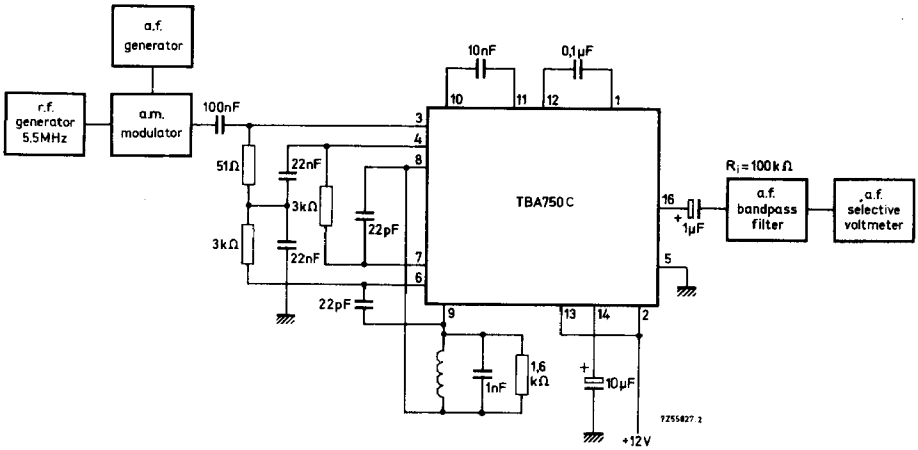

Fig.3 Test circuit; for f.m.: $f_o = 5,5$ MHz; $\Delta f = \pm 15$ kHz; $f_m = 70$ Hz. For a.m.: m = 0,3; $f_m = 1$ kHz.

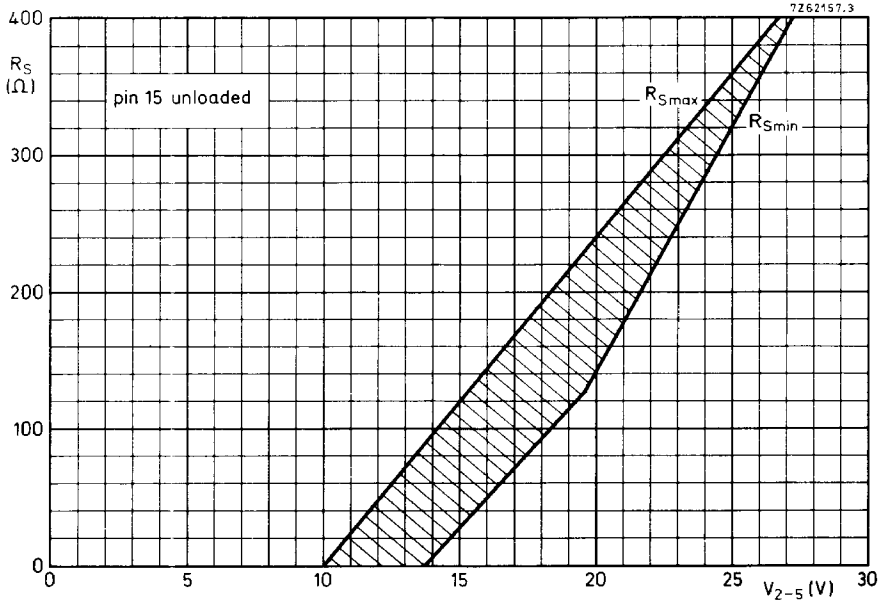

Fig. 4 Maximum and minimum values for the power supply series resistance (R_S).

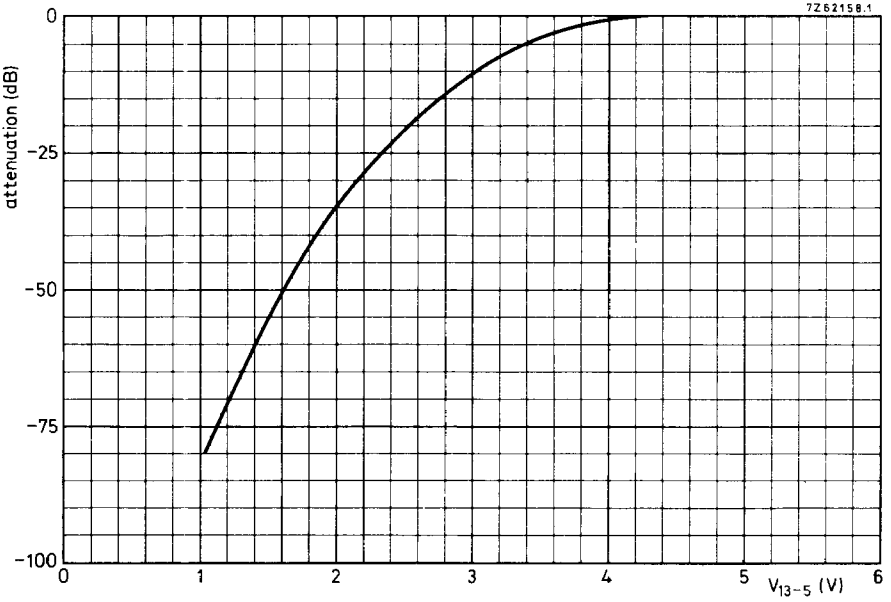

Fig. 5 Remote control characteristic.

APPLICATION INFORMATION at f = 5,5 MHz

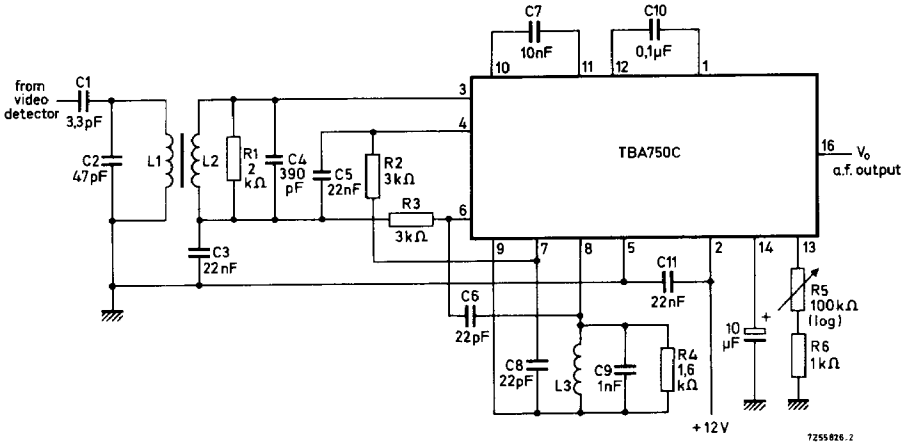

Fig. 6.

L1 = 18 μH; Q_{L1} = 36

L2 = 2,2 μH; Q_{L2} = 21

L3 = 0,84 μH; Q_{L3} = 22

Note

Q_{L1}, Q_{L2} and Q_{L3} are the loaded Q-factors.

The transfer ratio of the input bandpass filter: $\frac{V_2}{V_1}$ = 0,54.

The peak-to-peak bandwidth of the detector S-curve is 300 kHz.