MICROPHONE AMPLIFIER AM9/10

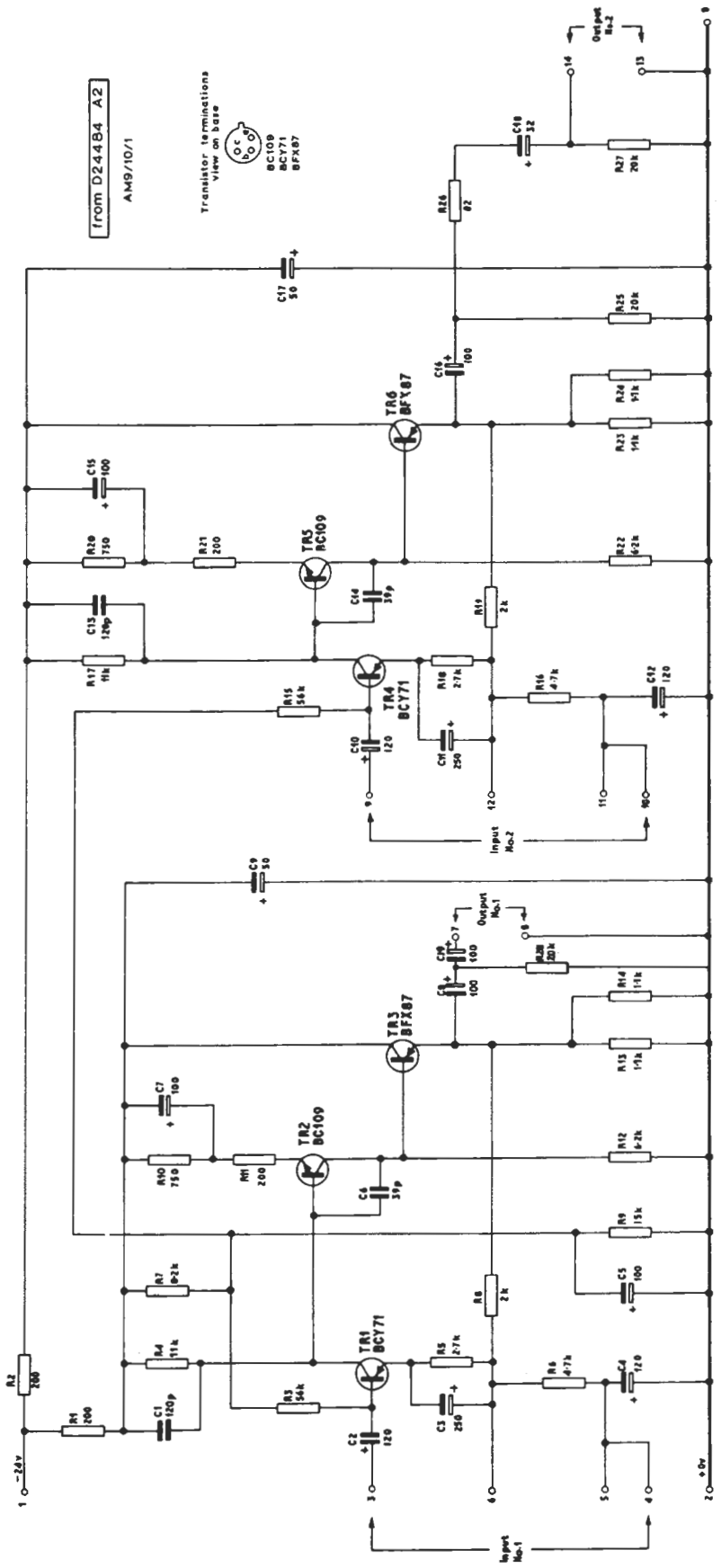

Fig. 1. Circuit of the AM9/10

General Description

The AM9/10 was designed for use as a microphone channel input stage in Type-D sound-control equipment, and for this purpose it supersedes the AM9/9. It is physically and electrically similar to the AM9/9, but is not a direct replacement for it.

The voltage gain is adjustable to any value between 4 and 30 dB.

Circuit Description (Fig. 1)

The circuit is generally similar to that of the AM9/9, but uses transistors having better characteristics than those fitted in the AM9/9, thus eliminating the need for selection. As in the AM9/9 the gain is set by inserting a resistor between tags 5 and 6 for the first section or 11 and 12 for the second section, and the value may vary from 12 kilohms for a gain of 4 dB to 68 ohms for a gain of 30 dB.

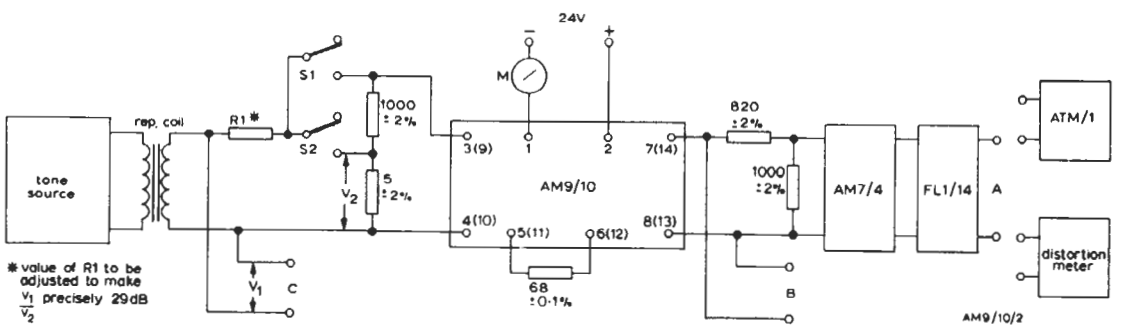

Fig. 2. Test Circuit for the AM9/10

Test Procedure

Apparatus Required

Low-distortion Tone Source
Amplifier Test Meter ATM/1
Distortion Test Set
Oscilloscope
Avometer Model 8
Amplifier AM7/4
Filter FL1/14
24-volt d.c. Power Supplier PS2/49
Precision Resistance Box (100 kilohms total)
Resistor, 5 ohms ±2 per cent
Two Resistors, 1000 ohms ±2 per cent
Resistor, 820 ohms ±2 per cent
Resistor, 68 ohms ±0·1 per cent

Test Circuit (Fig. 2)

Set up the test circuit as shown. The value of R1 must be obtained using the resistance box, with the amplifier under test disconnected, and S1 open and S2 closed. This value (about 140 ohms) should be such that V_2/V_1 equals −29·0 dB.

Each test should be carried out for both the amplifiers on the board. The procedure for the first amplifier is marked (a) and that for the second(b).

The high-impedance input of the test meter should be used for all tests except in the position marked **A** which requires the 600-ohm input.

The current consumption measured by the meter M should be 42 ±3 mA.

Gain

(a) Close S1 and S2. Connect the ATM/1 to point C and adjust the level of 1-kHz tone at this point to 0 dB. The amplifier output level measured at B (tags 7 and 8) should be +0·6 ±0·2 dB.

(b) The second amplifier output level measured at B (tags 13 and 14) should be 0 ±0·2 dB.

Maximum Output

(a) Close S1 and open S2. Connect the ATM/1 to the amplifier output at point B (tags 7 and 8) and also connect the oscilloscope to this point. Adjust the level of 1-kHz tone from the tone source until the waveform on the oscilloscope begins to be clipped. The level measured by the ATM/1 should be not less than +14 dB.

Frequency Response

(a) Open S1 and close S2. Adjust the level at point C to 0 dB with tone at 1 kHz, 20 Hz and 20 kHz. The amplifier output level at tags 7 and 8 relative to the level at 1 kHz should be:

20 Hz	±0·2 dB
20 kHz	±0·1 dB

(b) Repeat the test at 20 Hz, 50 Hz and 20 kHz. The second amplifier output (tags 13 and 14) relative to that at 1 kHz should be:

20 Hz	+0 −0·3 dB
50 Hz	±0·1 dB
20 kHz	±0·1 dB

Distortion (a and b)

Open S2 and close S1. Adjust the levels at the amplifier outputs, measured at B, to be +12 dB at 1 kHz. The total harmonic distortion should not exceed 0·1 per cent.

Noise (a and b)

1. Open S1 and close S2.
2. Set the FL1/14 to the bandpass position. Connect the ATM/1 (600-ohm input) to point C. Adjust the level of 1-kHz tone measured at this point to −51 dB.
3. Transfer the ATM/1 to point A and adjust the gain of the AM7/4 so that the level at this point is as close to 0 dB as possible.
4. Open S2 and measure the noise at A with the TPM peaking to 5. The TPM dial setting should be least as negative as −41·5 dB, and the meter reading should be steady within 1 dB.
5. Set the FL1/14 to the allpass position, and again measure the noise. The TPM reading should not exceed −37 dB.

Impedances

Input Impedance at 1 kHz	55 kilohms
Output Impedance at 1 kHz	(a) 1·2 ohms
	(b) 85 ohms
Normal Source Impedance	1000 ohms
Normal Load Impedance	1200 ohms

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