STEREO PROCESSING PANEL PA8/296

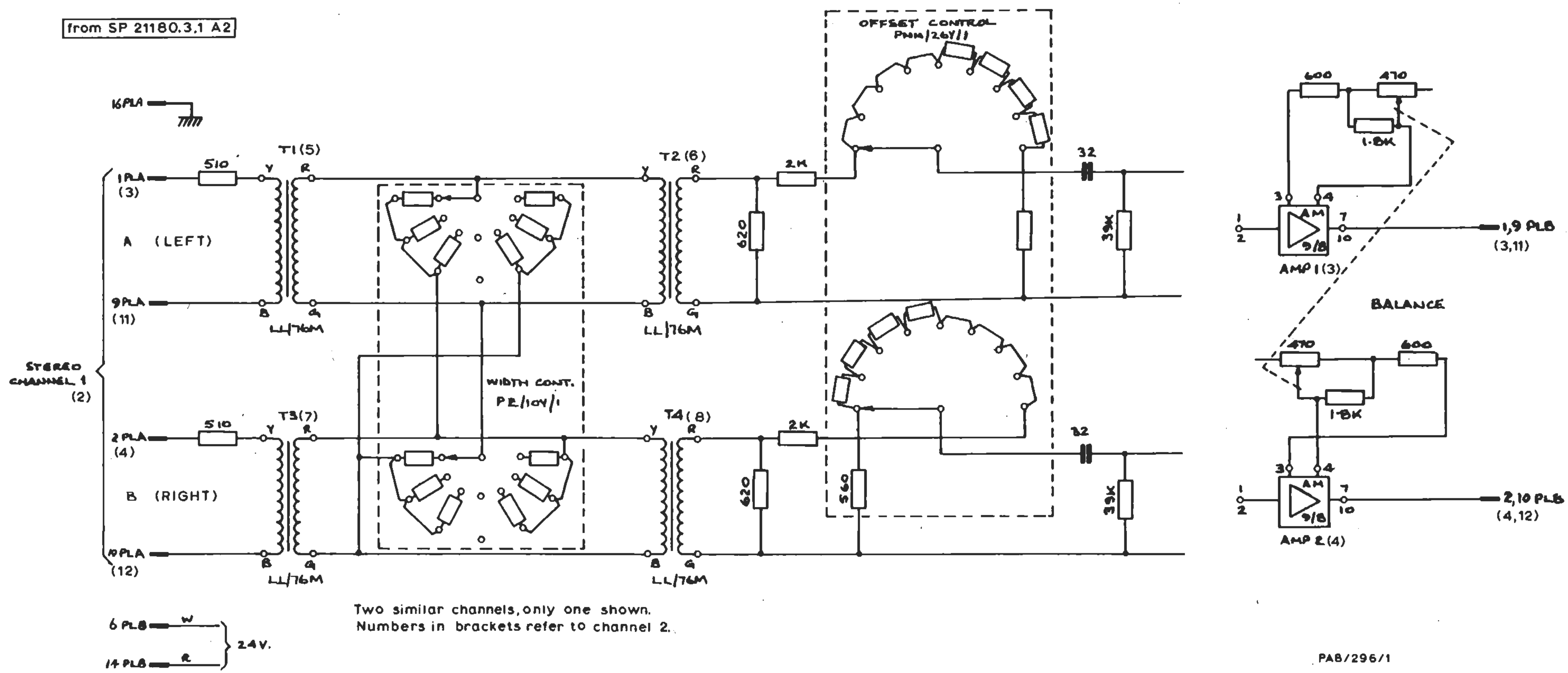

Fig. 1. Circuit of the PA8/296

Introduction

The PA8/296 is an auxiliary panel in the Type-D range of sound-control equipment and it is normally connected to two channel modules to provide additional stereo facilities. The front panel mounts width, offset and microphone-balance controls for two stereo channels. There are amplifiers AM9/8 in both chains of the two channels and the gains of the pairs of amplifiers are adjusted differentially by the microphone-balance control.

The equipment is mounted in a chassis CH1/37A having overall dimensions of 7 by 2¼ by 10½ inches.

General Description

There are two sets of controls on the front panel, one for each channel. From the top, these are:

Double-ganged 470-ohm carbon-track resistors for microphone balance.

Attenuator PNN/26Y/1 for offset control.

Double fader PZ/10Y/1 for width control.

Mounted internally on each side of a central mounting plate there are two amplifiers AM9/8 and two screening cans each containing two transformers LL/76M.

Circuit Description (Fig. 1)

The circuits of the two channels are identical. At the inputs of the A and B chains there are input transformers, and following these the cross-mix width control is bridged across the two lines. The width control adds a variable proportion of the A signal to the B signal and vice-versa, to narrow the image, and subtracts the signals to widen the image.

The widening effect has a limited range. The offset control, which follows the width control and is separated from it by transformers, reduces the level of the A signal by up to 5 dB in steps of 1 dB when rotated anticlockwise from its mid position, and similarly for the B signal when rotated clockwise. The chains are completed by amplifiers to restore the level. The gains of the two amplifiers are adjusted differentially by the microphone-balance control, which has a range of about 3 dB.

Test Procedure

Apparatus Required

Tone Source TS/10
A.C. Test Meter ATM/1
Oscilloscope
24-volt d.c. Stabilised Supply
Amplifier AM7/4
Resistor 560 ohms ±2 per cent
Resistor 91 ohms ±2 per cent
Two Resistors 10 ohms ±2 per cent
Resistor 100 ohms
Two McMurdo 16-way Sockets

D.C. Conditions

Connect the 24-volt supply to pins 6 (negative) and 14 (positive) of socket B, and connect pin 16 of socket A to earth.

The total current consumption should be about 50 mA.

Transmission Tests (Fig. 2)

General

Connect the resistors as shown in the test circuit, Fig. 2, to form an input pad, and connect this pad to the input tags shown on the test circuit for all tests as required. Make all measurements using the high-impedance input of the ATM/1.

Gain and Frequency Response

1. Set the offset control to its central position. Set the width control to its out-of-circuit position. Set the microphone-balance control to its mechanical mid point.
2. Apply 1-kHz tone to the input of chain A and chain B in turn via the pad. Adjust the level across the 5-ohm resistor to −33 dB. Measure the level at the outputs. This should be −33 ±0·5 dB.
3. Repeat the measurements at 20 Hz and 20 kHz. The output should be within ±1 dB at 20 Hz, and ±0·2 dB at 20 kHz, relative to that at 1 kHz.
4. Set the microphone-balance control to give equal gains in chains A and B.
5. Terminate the input of the undriven chain with a 100-ohm resistor.
6. Apply 1-kHz tone to the input of chain A.
7. Measure the levels at the A and B outputs over the six widening positions. (The A output should be in phase with the input and the B output should be in antiphase with the A input.)
8. The difference, (B − A) dB, between the six corresponding A and B outputs should be:

Switch Position	*B − A*
1	−27·1 ±0·2 dB
2	−18·8 ±0·2 dB
3	−16·2 ±0·2 dB
4	−13·3 ±0·2 dB
5	−11·0 ±0·2 dB
6	−10·0 ±0·2 dB

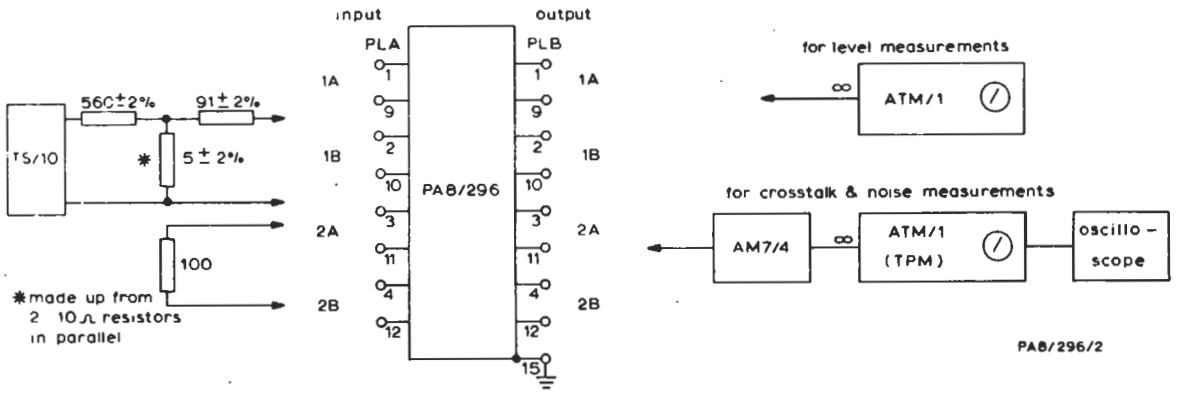

Fig. 2. Test Circuit for the PA8/296

Microphone Balance Control

Apply 1-kHz tone as before to the inputs of chain A and chain B, and measure the level at the outputs with the microphone-balance control turned first fully clockwise and then anticlockwise. The difference between the outputs of the two chains, for either condition, should be about 3·0 dB but not more.

Offset Control

Apply 1-kHz tone as before to the input of chain A. Clockwise rotation of the offset control from its centre position should reduce the output of chain A in five 1-dB steps, while anticlockwise rotation should have no effect.

With tone applied to the input of chain B, anti-clockwise rotation of the offset control from its centre position should reduce the output of chain B in five 1-dB steps and clockwise rotation should have no effect.

Width Control

1. With the original test conditions, set the
6. Measure the A and B output levels over the 14 narrowing positions. (The A and B outputs should both be in phase with the A input.)
7. The difference, (B − A) dB, between the 14 corresponding A and B outputs should be:

Switch Position	*B − A*
1	−27·1 ±0·2 dB
2	−18·8 ±0·2 dB
3	−16·2 ±0·2 dB
4	−13·3 ±0·2 dB
5	−11·0 ±0·2 dB
6	−10·0 ±0·2 dB
7	−8·3 ±0·2 dB
8	−7·2 ±0·2 dB
9	−6·3 ±0·2 dB
10	−4·9 ±0·2 dB
11	−2·9 ±0·2 dB
12	−1·8 ±0·2 dB
13	−0·8 ±0·2 dB
14	0 dB

Similar results should be obtained with the tone applied to input B.

Crosstalk

1. Restore all the controls to their original settings. Terminate the input of the undriven chain with a resistor of 100 ohms.
2. Apply 10-kHz tone to the A chain input.
3. Measure the A chain output via the amplifier AM7/4 as shown on Fig. 2 and adjust the amplifier gain to give a reading of 0 dB on the TPM.
4. Transfer the AM7/4 and meter to the B chain output.
5. The level measured on the TPM should not exceed −40 dB.

The oscilloscope is used to check the presence of 10-kHz tone.

Noise

Noise measurements should not be made until the unit has been powered for 15 minutes. The noise volume measured at the output of each chain with a TPM peaking to 6 should not be more than −68 dB, and should be constant within ±1 dB. The AM7/4 and oscilloscope may be used to check the character of the noise.

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