

STEREO MONITORING PANEL PA8/289

Introduction

The PA8/289 is an auxiliary panel in the Type-D range of modular equipment for sound desks. It contains the keys, relays and controls required for routing the desk outputs to cubicle and studio loudspeakers, programme meters and other destinations for monitoring and similar purposes. The panel is used in conjunction with the Ring Main Panel PA8/290, which contains the stereo programme selection switches.

The equipment is mounted on a chassis based on the CH1/35 having overall dimensions of 16 by 2¼ by 7½ inches (40.6 by 5.7 by 19 cm).

General Description

The controls mounted on the front panel, from the top, are as follows:

1. Double-ganged attenuator PBB/48Y/1 for cubicle loudspeaker balance control. Rotation clockwise from the mid-position reduces the output to the *B* (right-hand) loudspeaker by 2½ dB in ½-dB steps, and anticlockwise rotation from the mid-position reduces output to the *A* (left-hand) loudspeaker similarly.
2. Two three-position locking keys for selecting an output to be monitored by P.P.M. meters on monitoring panel PA8/288. The three positions of the left-hand key are for reproducer output, main output and clean feed output; the reproducer output can be from any one of three machines selected by the right-hand key, and the main and clean feed outputs are derived from the switching panel UN1/89.
3. Double-ganged attenuator PBB/47Y/1 for the cubicle loudspeaker volume control, giving a range of 16 dB.
4. Two-position locking key to switch prehear to the cubicle headphones. Three-position locking key which in its two operated positions energises either relay MND or relay MNL in the UN1/89 to provide monitoring of the desk output or line. In the normal position the monitoring output is connected to point 11 of the selection switch.
5. Two three-position locking keys to select programme to the cubicle loudspeakers. The left-hand key has positions giving reproducer, cubicle programme selection switch (on panel PA8/290) and point 11. The right-hand key selects one of three reproducer sources for connection via the left-hand key.
6. Two three-position locking keys, the left hand one to reverse the phase of one cubicle loudspeaker, or to dim both, and the other one to connect the *A* and *B* inputs together to give a mono output on either the left-hand speaker or on both speakers.
7. A master-talkback/recording-room intercom key which is a paralleled duplicate of the key on the talkback and equipment switching panel PA8/284.

The items mounted on the left-hand side of the centre division of the chassis, from the top, are network NE1/8 No 1, amplifier AM9/8 No. 1, relays LSO, CDM, AE, EDQ, NLS, SLS, STB, STBR, OSTB, amplifier AM9/8 No. 2, and network NE1/8 No. 2.

On the right-hand side there are the output transformers T3 and T4 (LL/76 MCF), and transformers T1 and T2 (LG/79MCF).

On the rear of the chassis is the fuseholder for the 250-mA antisurge fuse in the 24-volt amplifier supply.

Circuit Description (Fig. 1)

The cubicle and studio loudspeaker programme selection switches are mounted on the panel PA8/290. At the input of the cubicle loudspeaker chain, key KD can select point 11 on the selection switch (studio output), the output of the selection switch, or one of three reproducers selected by key KE.

Following this is the *L.S. Dim* attenuator, switched in by the contacts of relay CDM when operated by key KB. The other throw of KB reverses the phase of the *B* input.

An (*A + B*) output is derived at this point by the network NE1/8 (NE2) and amplifier AM9/8, which has a preset variable gain control to set the line-up level of the (*A + B*) output 3 dB higher than for *A* and *B*. The three outputs *A*, *B* and (*A + B*) are switched by key KC to give the stereo condition in the normal position and either (*A + B*) on line *A* or (*A + B*) on both lines.

Following the key are the ganged volume control giving a range of +10 dB to -6 dB from normal level in 2-dB steps, a balance control which introduces up to 2½ dB of attenuation in ½-dB steps in one or other of the lines, the loudspeaker cut-off relay (LSO) contacts and the output transformer.

Visual monitoring of the main and clean outputs from the programme switch unit UN1/89, and the three reproducer sources is done on the meters in the panel PA8/288, the output required being selected by keys KH and KJ.

The monitoring circuit for the studio loudspeakers is very similar to that described for the monitoring panel PA8/321. A stereo feed is derived from the studio programme select switches on the PA8/290. Contacts of the SLS relay mute the loudspeakers unless the studio microphones are faded out, while for editing purposes the loudspeakers may be connected to the prehear circuit via relay EDQ. The loudspeakers may also be fed from an acoustic effects chain when an earth from the AER channel fader off-normal contacts, via the channel jack sleeve, operates relay AE which connects the loudspeakers to the AER output amplifiers. Talkback may be substituted for programme by the operation of relay STB by the Master or the Studio talkback key.

An (*A + B*) output is derived, using NE1/8 No. 1 together with amplifier No. 1, which feeds cue programme directly to the gram operator, to the cubicle headphones via the back contacts of key KF, to the studio headphones via STBR contacts, and to the outside-source cue and control lines via OSTB contacts.

Talkback overrides programme to the studio headphones when the Master or Studio talkback key operates relay STBR and to the outside sources when the Master or Master O.S. talkback key operates relay OSTB. These talkback keys are all on the talkback and switching panel PA8/284.

Prehear is connected directly to the prehear loudspeaker, and to the cubicle headphones via the prehear key KF.

Test Procedure (Fig. 1)**Apparatus Required**

Tone Source TS/10
 Test Meter ATM/1
 Avometer Model 8
 Loudspeaker Unit LS5/1
 Low-voltage D.C. Test Buzzer
 50-volt D.C. Supply
 Stabilised 24-volt D.C. Supply with low source impedance.
 Desk Panel Tester TE1/13 including cable connectors TE1A/2A-G
 Oscilloscope

General Remarks

These tests are best made with the aid of a tester TE1/13. The tester provides the 24-volt supply but a separate 50-volt d.c. supply is required. All connections to the A and C connectors should be made using the upper row of jacks on each side of the tester, as these provide direct access without terminating resistors.

Power Supplies

1. Connect the 50-volt supply to LB1 and LB13 and the 24-volt supply to RB12 and RB24.
2. Connect the 50-volt positive side to earth at source and connect LB24 to frame earth.
3. Check that relays SLS, NLS and AE have operated.
4. Measure the 50-volt quiescent current, which should be about 52 mA.
5. Measure the 24-volt quiescent current, which should be about 24 mA.

Text continued on page 5

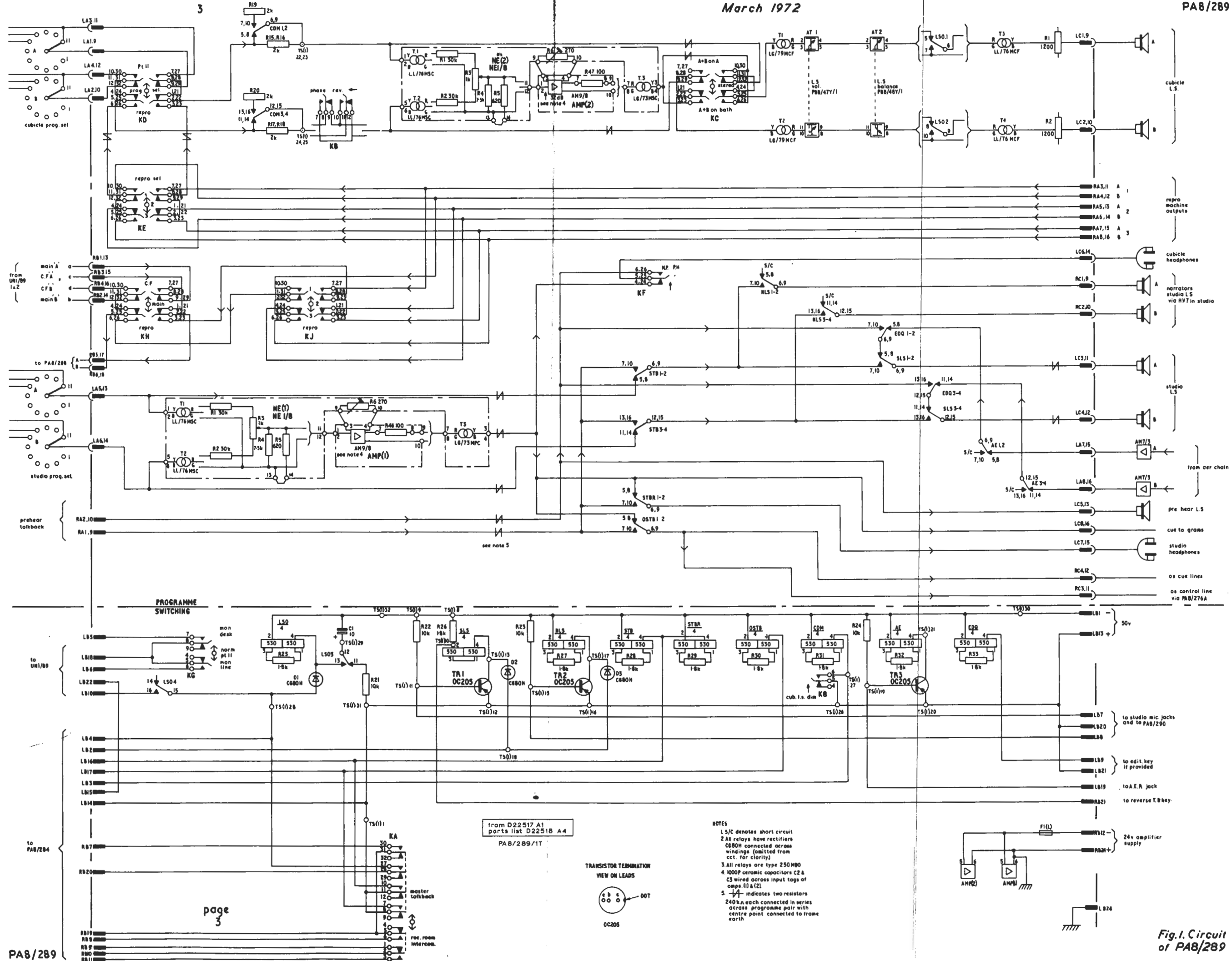


Fig. 1. Circuit of PA8/289

D.C. Continuity

Using a d.c. test buzzer check for continuity between the tags indicated in Table 1 under the conditions stated.

TABLE 1

<i>Condition</i>	<i>Tags</i>	<i>Condition</i>	<i>Tags</i>
All conditions	LB13 to LB14 LB20 LB21	<i>Mon. Desk key operated</i>	LB5 to LB18
	LB15 to LB22	<i>Mon. Line key operated</i>	LB6 to LB18
	LB24 to frame	<i>Rec. Rm. Intercom key operated</i>	RB8 to RB19 RB10 to RB11
<i>Master TB key operated</i>	LB13 to LB16 LB17	<i>Rec. Rm. Intercom key normal</i>	RB10 to RB9
	LB4 to RB20 RB7 to RB19		

A.C. Level Checks

1. Connect the 24-volt and 50-volt d.c. supplies and frame earth to the panel as already described under the heading *Power Supplies*.

2. Using 1-kHz test tone at zero level from a low-impedance (about 5 ohms) balanced source, and a high-impedance (about 50 kilohms) ATM/1, carry out the measurements listed in Table 2.

TABLE 2

<i>Connect tone to</i>	<i>Condition</i>	<i>Measure at</i>	<i>Level dB</i>
LA1,9	(a) <i>Prog. Sel.</i> key normal. <i>Phase Rev.</i> key normal. <i>Stereo</i> key normal. <i>L.S. Vol.</i> on normal <i>L.S. Bal.</i> central	LC1,9	-20.3 ±0.5
	(b) As (a) but with <i>L.S. Dim</i> key operated.	LC1,9	-31 ±1
LA2,10	(a) As (a) above.	LC2,10	-20.3 ±0.5
	(b) As (b) above.	LC2,10	-31 ±1
LA3,11	As above except that <i>Prog. Sel.</i> key is on Point 11.	LC1,9	-20.3 ±0.5
LA4,12	Ditto	LC2,10	-20.3 ±0.5

TABLE 2 (CONTINUED)

Connect tone to	Condition	Measure at	Level dB
LA1,9 and LA2,10 in parallel	(a) <i>Prog. Sel.</i> key normal <i>Phase Rev.</i> key normal <i>Condition</i> key on 'A + B on Both'. <i>L.S. Vol.</i> normal. <i>L.S. Bal.</i> central If necessary, correct the output level by adjusting R6 on NE1/8 No. 2.	LC1,9 LC2,10	-17.3 ±0.5 -17.3 ±0.5
	(b) As above but with <i>Condition</i> key on 'A + B on A'.	LC1,9 LC2,10	-16.7 ±0.5 no signal
	(c) As (b) above, but with <i>Phase Rev.</i> key operated.	LC1,9	<-50
	(d) As (a) above. Check that <i>L.S. Vol.</i> control varies both outputs over range -6 to +10 dB in steps of 2 ±0.5 dB. The two outputs should be within 0.5 dB of each other at all settings.	LC1,9 LC2,10	see condition column
	(e) As (a) above. Check that rotating <i>L.S. Bal.</i> clockwise reduces output at LC2,10 by 2.5 dB in 0.5-dB steps ±0.2 dB and that rotating it anticlockwise reduces output at LC1,9 in a similar manner.	LC1,9 LC2,10	see condition column
	(f) As (a) above. Connect LB4 to LB14 to operate relay LSO.	LC1,9 LC2,10	no signal no signal
RA3,11	<i>Repro Sel.</i> key on 1. <i>Prog. Sel.</i> key on <i>Repro.</i> <i>Phase Rev.</i> key normal <i>Condition</i> key on <i>Stereo.</i> <i>L.S. Vol.</i> normal <i>L.S. Bal.</i> central	LC1,9	-20.3 ±0.5
RA4,12	As above.	LC2,10	-20.3 ±0.5
RA5,13	As above but <i>Repro Sel.</i> key on 2.	LC1,9	-20.3 ±0.5
RA6,14	Ditto.	LC2,10	-20.3 ±0.5
RA7,15	As above but <i>Repro Sel.</i> key on 3.	LC1,9	-20.3 ±0.5
RA8,16	Ditto.	LC2,10	-20.3 ±0.5

TABLE 2 (CONTINUED)

<i>Connect tone to</i>	<i>Condition</i>	<i>Measure at</i>	<i>Level dB</i>
RB1,13	<i>P.P.M. Comp. Check key on Main.</i>	RB5,17	0
RB2,14	Ditto.	RB6,18	0
RB3,15	<i>P.P.M. Comp. Check key on C.F.</i>	RB5,17	0
RB4,16	Ditto.	RB6,18	0
RA3,11	<i>P.P.M. Check key on Repro. P.P.M. Repro Sel. on 1.</i>	RB5,17	0
RA4,12	Ditto	RB6,18	0
RA5,13	<i>As above but P.P.M. Repro Sel. on 2.</i>	RB5,17	0
RA6,14	Ditto	RB6,18	0
RA7,15	<i>As above but P.P.M. Repro Sel. on 3.</i>	RB5,17	0
RA8,16	Ditto.	RB6,18	0
LA5,13	(a) Normal (SLS and NLS operated).	RC1,9 LC3,11	0 0
	(b) <i>Master T.B. key operated (bringing up STB).</i>	RC1,9 LC3,11	no output no output
	(c) Connect LB7 and LB8 to LB20 (releasing SLS and NLS).	RC1,9 LC3,11	no output no output
LA6,14	(a) Normal (SLS and NLS operated).	RC2,10 LC4,12	0 0
	(b) <i>Master T.B. key operated (bringing up STB).</i>	RC2,10 LC4,12	no output no output
	(c) Connect LB7 and LB8 to LB20 (releasing SLS and NLS).	RC2,10 LC4,12	no output no output

TABLE 2 (CONTINUED)

Connect tone to	Condition	Measure at	Level dB
LA5,13 and LA6,14 in parallel	Headphone Prehear key normal.	LC6,14	+3
	As above	LC8,16 LC7,15	+3 +3
	If necessary, correct the output level by adjusting R6 on NE1/8 No. 1.	RC3,11	+3
		RC4,12	+3
RA1,9	(a) Master T.B. key operated (bringing up STB, STBR and OSTB).	LC3,11 LC4,12	0 0
	(b) Master T.B. key normal. Connect LB14 to LB16 operating STB and STBR, and connect LB14 to LB17 operating OSTB.	LC7,15 RC1,9 RC2,10 RC3,11 RC4,12	0 0 0 0 0
RA2,10	(a) Headphone Prehear key operated	LC6,14	0
	(b) Normal	LC5,13	0
	(c) Connect LB9 to LB21 operating EDQ and LB7 to LB20 releasing SLS.	LC3,11 LC4,12	0 0
LA7,15	Connect LB7 to LB20 releasing SLS and LB19 to LB21 releasing AE.	LC3,11	0
LA8,16	As above.	LC4,12	0

Noise and Click Test

- (a) Apply programme at zero volume from a low-impedance (about 5 ohms) balanced source to LA1,9 and connect a loudspeaker at a high listening level across LC1,9. Set all controls at normal and disconnect programme. Operating any of the keys or relays on the module should not cause audible clicks in the loudspeaker.
- (b) Repeat with the signal on LA4,12 and the loudspeaker on LC2,10.
- (c) Repeat (b) but with the *Condition* key switched to 'A + B on Both'.
- (d) Repeat with signal on LA5,13 and loudspeaker on LC3,11 and then on RC1,9.

- (e) Repeat with signal on LA6,14 and loudspeaker on LC4,12 and then on RC2,10.
- (f) Repeat with signal on LA6,14 and loudspeaker on LC6,14.

Phasing

Using an asymmetric test waveform, and an oscilloscope connected to the listen output of the ATM/1, check that all outputs are in phase with all inputs.

An asymmetric wave may be produced conveniently by shunting a tone source (say a TS/10 set for +10 dB output) with a suitable diode (say an AAY 32).

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