

simple auto slide changer

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Automatic slide changers are extremely useful when a recorded commentary is used to accompany a programme of slides. Most auto slide changers make use of a control signal. This may be a high frequency low level signal, recorded on the same track as the commentary, which is unobtrusive but which may be extracted for control purposes by a filter. Alternatively, an audio tone may be recorded on a parallel track.

The slide changer described here uses neither of these methods but senses the drop in signal level of the commentary when the commentator stops speaking for more than one second.

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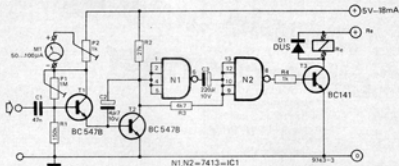


Figure 1 shows the simple circuit of the auto slide changer. In the absence of an audio signal at the input T1 and T2 are cut off. When a signal exceeding a predetermined level (set by P1) appears at the input then T1 will conduct on the positive peaks of the signal. The output from the emitter of T2 is integrated by C2 and T2.

The collector voltage of T2 will be below the negative-going threshold of Schmitt trigger N1, so the output of N1 will be high. The input of N2 also floats high, its output is low and T3 is turned off, so the relay is not energised.

If the input signal to T1 drops below the threshold, then T1 turns off. If the

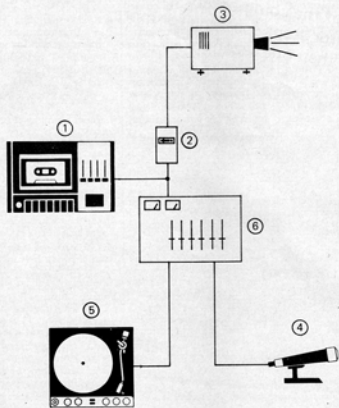
input voltage to T1 remains low then after a delay of about one second T2 will also turn off taking the input of N1 high. The output of N1 will go low and pull down the input of N2 via C3. The output of N2 will go high, turning on T3 and energising the relay. The relay contacts are connected to the remote change jack of the slide projector, so the slide will change.

C3 will charge via R3 until the positive-going threshold of N2 is exceeded, when the output of N2 will go low ready for the sequence to repeat, and the relay will drop out. Diode D1 protects T1 against the back e.m.f. generated by the relay coil.

P1 provides a preset bias on the base of T1 and thus determines the threshold voltage at which T1 starts to conduct. By suitable adjustment of P1 it is possible to have background music underlying the commentary at a low level. P1 is adjusted so that T1 is not turned on with background music only present, but will turn on during the much louder speech passages.

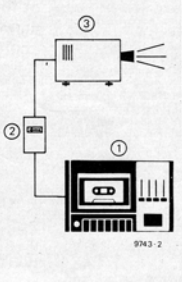
Figure 2 shows a typical setup for preparing a slide commentary. Recorded music and speech are mixed together and recorded onto tape. The slide changer is placed at the output of the mixer to check that the slide change does take place during pauses.

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Figure 1. Circuit of the auto slide changer.

Figure 2. Showing the setup for recording a commentary of speech and music to accompany a slide programme. When the output of the mixer drops below the preset level the slide will change.

Figure 3. For playback the slide changer is connected to the line output of the tape deck.

Notes: 1: Tape deck. 2: Auto slide changer. 3: Slide projector. 4: Microphone. 5: Record deck. 6: Audio mixer.

During the slide show the slide changer is connected to the line output of the cassette recorder (figure 3), or some other point in the system where the signal level fed to it is unaffected by volume or tone controls, since once the changer has been set up the signal level must not be altered.

To set up the slide changer during recording potentiometers P1 and P2 should first be set to their mid-position. P1 is then adjusted until the slide change will occur when a pause of about one second occurs in the commentary. P2 calibrates meter M1 to provide an indication of the threshold level. P2 should be adjusted so that M1 reads about a quarter scale when P1 is correctly set.

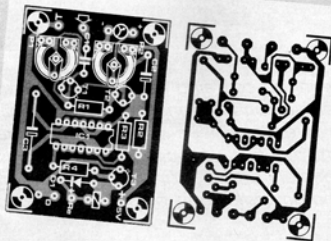
Figure 4. Printed circuit board and component layout for the auto slide changer (EPS 9743).

If the record and replay levels of the tape deck are correctly matched then no adjustment will be required when playing back the commentary. If, however, the playback level is different from the record level then it may be necessary to adjust P1 to set the correct threshold level for playback.

A p.c. board and component layout for the slide changer are shown in figure 4.

The unit requires a supply of 5 V at 18 mA (excluding the relay) which can easily be supplied by a simple zener stabiliser. A separate supply pin is provided for the relay, so that if a 5 V - 6 V type is not available some other voltage can be used, possibly derived from the unregulated input to the power supply.

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Parts List

Resistors:

R1 = 150 k
R2 = 27 k
R3 = 4k7
R4 = 1 k
P1 = 1 M preset
P2 = 1 k preset

Capacitors:

C1 = 47 n
C2 = 4 μ 7/10 V
C3 = 220 μ /10 V

Semiconductors:

T1, T2 = BC547B or BC107B
(or equivalents)
T3 = BC141 or BC142
D1 = DUS
IC1 = 7413

Miscellaneous:

Relay 5 V - 6 V coil 68 Ω or greater, see text; normally open contact rated to suit current taken by projector remote change.