

Priority And Control Systems

• Modern communications systems often call for considerable flexibility in routing signals. For instance, a typical paging and announcement system in a transportation terminal may call for wide-area coverage for paging individual passengers, as well as limited-area coverage for announcing boarding information at a particular gate. If we add to this the requirements for overall automatic level control as well as facility for handling automated recorded announcements, it is clear that we have the makings of a very complex system.

On occasion, a sound contractor or consultant will be called upon to design an elementary priority system or a remote control system; these topics are the subject of this month's column.

A SIMPLE SWITCHING SCHEME

Priority systems allow various inputs to take precedence over others. FIGURE 1 shows a simple switching scheme that can handle any number of single inputs arranged in priority order. Paging microphones normally contain manual switches which actuate them. When a given microphone is not in use, the switch shorts it, providing signal continuity around the microphone. When a microphone is actuated, the short is lifted, and the microphone is placed across the line. All microphones of lesser input are shorted and cannot be actuated. The circuit shown in FIGURE 1 can easily be extended to cover more inputs.

The switching arrangement shown in FIGURE 2 provides for a single

wide-area page that can take precedence over any number of local pages. Note that a double-pole switch is used. One section actuates the

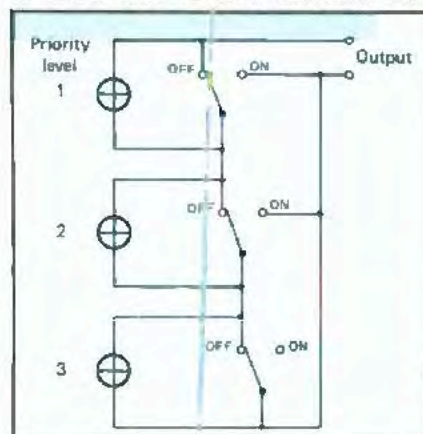


Figure 1. Simple three-level priority switching. Activating an input disables all lower priorities.

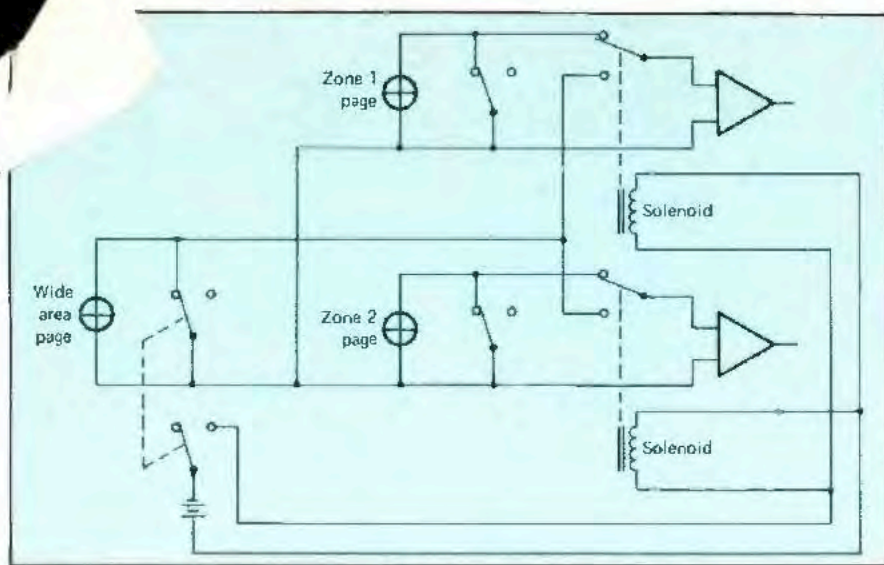


Figure 2. Wide area paging with priority over local zones.

microphone, while the other actuates the distant relays. In practical application, the microphones shown in FIGURES 1 and 2 would be amplified close at hand so that only a high-level signal would be switched.

The circuit shown in FIGURE 3 is unique in that it allows two separate amplifiers, one for paging and the other for background music, to be fed to any number of loudspeakers with

only three wires. In the position shown in the figure, the "program" amplifier is actuated, and the line loudspeakers are fed through the center-tapped transformer. The level at the loudspeaker is 6 dB lower than

if the loudspeaker-distribution transformer array were placed directly across the amplifier's output. However, there is little loss in the center-tapped autotransformers.

When the "paging" amplifier is engaged, the top and bottom of the autotransformer are shorted together, and the loads are fed through the fairly low resistance parallel path through the two halves of the winding. The feature of this circuit is that it provides added system redundancy through the use of two amplifiers. This circuit diagram was provided by David Klepper and Peter Tappan, both well known and respected acoustical consultants.

SIMPLEXING

The term simplexing refers to a method of transmitting both signal (AC) and control (DC) voltages down the same pair of wires. Transformers with center-tapped windings on one side are required for these applications. The method is related to the now common method of remote

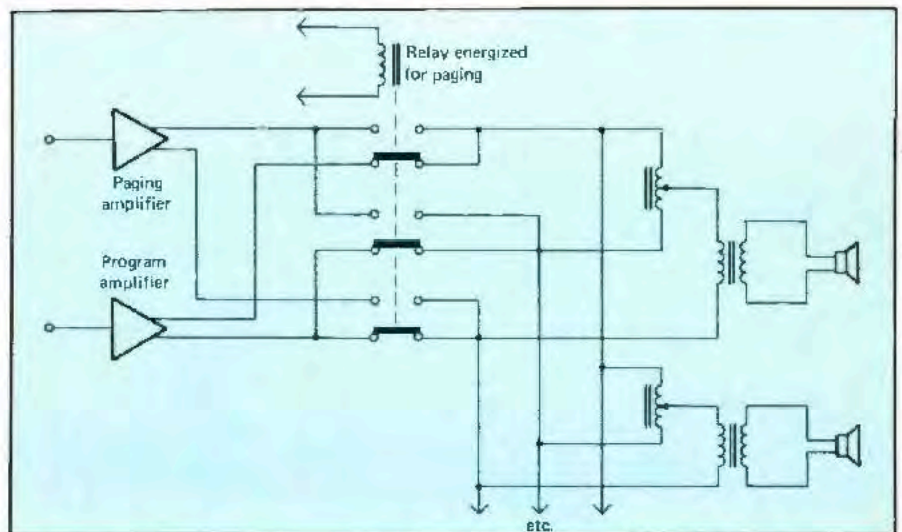


Figure 3. Priority switching at the loudspeakers (circuit courtesy of D. Klepper and P. Tappan).

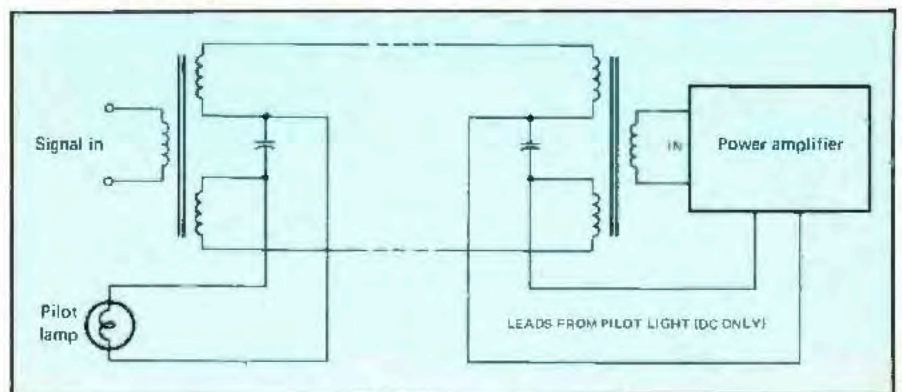


Figure 4. An example of simplexing with remote indication of on-off status.

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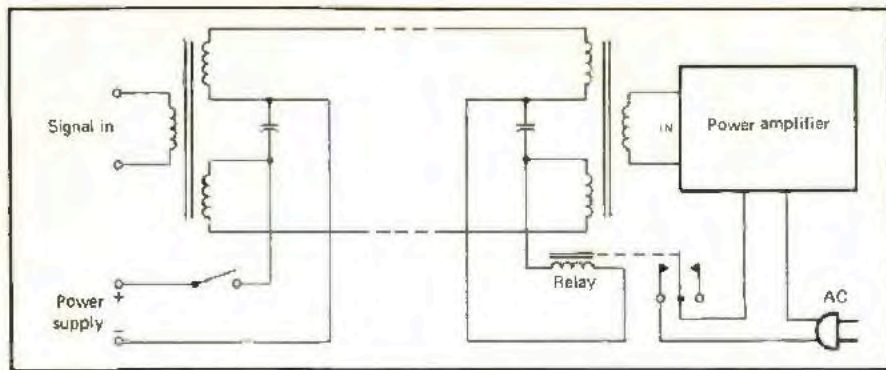


Figure 5. Simplex with remote turn on-off of a power amplifier.

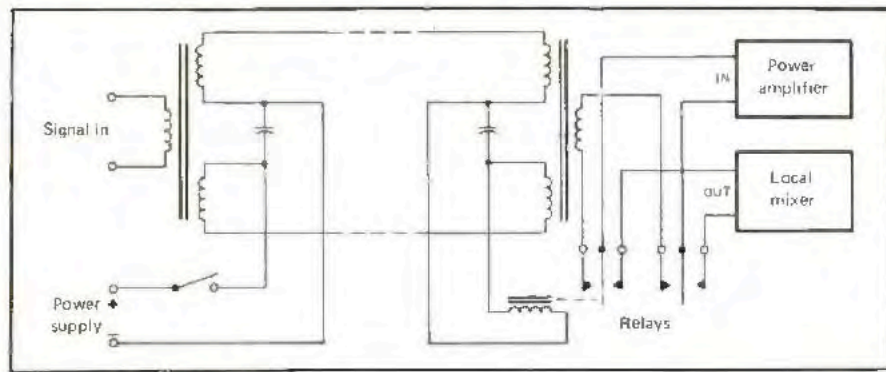


Figure 6 Simplex—a priority system.

powering of capacitor microphones in today's consoles.

The arrangement shown in FIGURE 4 provides a remote indication of the on-off status of an amplifier located at some distance.

The arrangement shown in FIGURE 5 allows remote turn-on or turn-off of a distant amplifier.

Finally, the arrangement shown in FIGURE 6 allows both signal and priority control voltages to be sent down a single pair of wires.

The quality of audio in these applications depends on the quality of the transformers. And, of course, good transformers of the type shown here are quite expensive. Therefore, we are likely to see such circuits as those used in large communications systems where the emphasis is not on audio quality *per se*, but rather on ruggedness and reliability. ■

REFERENCES:

- Altec Technical Letter Number 141, Altec Corporation
- Altec Technical Letter Number 222, Altec Corporation
- Altec Technical Letter Number 224, Altec Corporation