CIRCUIT IDEAS

Multiple station two-way intercom

This circuit shows a four-station, two-way intercom, where any station can communicate in privacy with any one of the others. Each two-station link-up is assigned a code, three bits being sufficient as there are six possible link-ups. The appropriate code is selected by Sw 1-4, and is generated at each station. All the station codes are "OR-ed" by IC_3 and decoded by IC_4 to drive a matrix of analogue switches which couple the appropriate audio inputs and outputs. Code 000 is allocated to a system-free status, indicated by l.e.ds 1 and 4 being on. A system-busy status is indicated by the l.e.ds flashing. When a code is selected, the station inhibit output is taken high and this forces the enable inputs on all other stations low, thus preventing any further codes being generated at the station outputs. However, if a station wishes to use the system and selects any of the other stations while the system is busy, it will flash a code for a time determined by CR thus interrupting the established link.

If the electronics are housed in one station, only two code wires are required to the other three. The system can be easily expanded up to six stations, where there are fifteen possible link-ups, by using a 4-bit code and a CD4514, 4-to-16 line decoder with an enlarged matrix of analogue switches.

B. Voynovich,
Norwood,
Middx.

Components

IC_1	CD4071	IC_8	CD4011
IC_2	CD4081	$IC_{9,10}$	CD4025
IC_3	CD4075	A_1	LM380
IC_4	CD4028	A_2	741
$IC_{5,6,7}$	CD4016		

Station links	Code
1 to 2	001
1 to 3	010
1 to 4	011
2 to 3	100
2 to 4	101
3 to 4	110

Electronics housed in station 4 as all three bits are used.