

THEORY OF OPERATION AR-315  
BALANCED MODULATOR

The module has two inputs, called X and Y. Signals from these are fed to U1, which is a 4-quadrant multiplier I C. Its output is amplified by U2, an op amp connected as a differential amplifier. When trimmed, the output voltage should equal  $XY$  over 10. If either input, or both, are 0, the output will be 0. R10 trims the output to within a small fraction of a volt when Y is 0, and R11 does so when X is 0. When both inputs are 0, R21 is used to trim the output to 0 volts D C.

Finally, with 10 volts applied to BOTH inputs, R8 trims the gain for 10 volts output. By multiplying (modulating) two different audio waveform together, a wide variety of new sounds may be generated. The AR-315 module also has two independent controls with inputs and outputs, for use as a variable attenuator, or level control, anywhere in a synthesizer patch.