

## **End-Fire Ring Driven Flextensional Transducer**

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A ring driven flextensional transducer is presented as a transducer that is composed of a piezoelectric ring circumscribed by a metal corrugated shell that when drive by the ring, yields a magnified radial motion with a fundamental resonance lower than the piezoelectric ring itself. The lower resonance allows the transducers to operate together as elements of an array with their axis normal to the plane or curvature of the array with spacing similar to that of an array of tonpizl elements. An axially directed end-fire enhanced cardioid type beam may be obtained with two axially-stacked, phased, ring-driven flextensional transducers allowing single ended performance or operation in front of a baffle or mounting plate. Also, because of the wide band performance, the transducer may be used in applications where different tonpizl transducer designs might be necessary to cover a band. The operation and design of this transducer is presented along with element and array calculated and measured performance. This transducer development has been supported by the Naval Undersea Warfare Center, Newport Division.