



## Northrop Grumman Introduces New CEA Tubes for UHF Television Transmitters

April 18, 2001

WILLIAMSPORT, Pa., April 18, 2001 -- Litton Industries' Electron Devices Division (EDD), a subsidiary of Northrop Grumman Corporation (NYSE:NOC), today announced the release of its new Constant Efficiency Amplifier (CEA) tubes for UHF television transmitters. The new CEAs are Inductive Output Tubes (IOT) that feature twice the power efficiency of standard IOTs, thus providing television stations with substantial cost savings through decreased power consumption.

The patented CEA represents the first significant technology advance for UHF television transmitters in 10 years. The CEA combines IOT technology with a multiple stage depressed collector (MSDC), a combination which allows the CEA to operate at a total power conversion efficiency of about 60% compared with 30% for conventional IOTs in digital 8VSB TV service, which translates to a savings of roughly \$20,000/yr/tube in power expenses.

"The Litton CEA is the only IOT for UHF transmitters that can slash power costs while increasing reliability and stability," stated Robert Symon, Litton EDD technical director. "Given the additional expenses that television stations have faced in the transition to digital, as well as ever increasing power costs, a product like the CEA that increases performance while reducing operating expenses is a very exciting development for the industry as a whole."

The CEA is a combination of two proven Litton technologies, an IOT with an MSDC. Because of the electron collection efficiency of the MSDC, power consumption is reduced by about one half compared with any other electron tube or solid state technology. Correctable average power output of 27 kW has been demonstrated, matching the power available from conventional IOTs. The collector is oil-cooled using Poly Alpha Olefin oil, which allows operation at high average power.

Litton CEAs will be available from leading transmitter manufacturers in new transmitters in the fourth quarter of 2001. The Litton content will consist of the CEA tube and a circuit assembly that contains the input and output RF cavities plus electromagnets. Retrofit kits that allow CEAs to be used in older transmitters are under development with leading transmitter OEM.

Litton Electronic Devices in Williamsport, Pa., has been part of Litton Industries Inc. since 1965. The factory produces the industry's most comprehensive line of magnetrons, klystrons, cross-field amplifiers, traveling wave tubes, thyratrons and broadcast IOTs. Litton IOTs incorporate the latest developments in material science, computer modeling and vacuum technology. Combining pyrolytic graphic grids and innovative collector cooling technology, Litton IOTs provide many years of trouble-free operation.

Northrop Grumman Corporation is a \$15 billion, global aerospace and defense company with its worldwide headquarters in Los Angeles. Northrop Grumman provides technologically advanced, innovative products, services and solutions in defense and commercial electronics, systems integration, information technology and non-nuclear shipbuilding and systems. With 80,000 employees and operations in 44 states and 25 countries, Northrop Grumman serves U.S. and international military, government and commercial customers.

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