

TECHNICAL SERVICES



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DIRECTOR**

In retrospect, 1979 was a year of significant accomplishments for the technical support arm of the Lewis research and technology team. It was also one of some frustration, in that limited manpower has to some extent compromised in-house research operations by forcing the use of composite crews both in the 8 x 6-foot and 10 x 10-foot propulsion wind tunnels, and in the PSL altitude tanks and, also, by restricting the large users of the central process air systems to one shift (midnight to 7 a.m.). To alleviate some of this skill-mix problem, Dr. McCarthy has prescribed certain facility closures and a modest increase in support service contracting. To this end, PSL 1 and 2 have been put on standby, QCSEE hangar test stand has been terminated, CTS operations were successfully completed, the Pressurized Fluidized Coal Bed

has been terminated, and the Cyclotron operation is in the process of being transferred to the Cleveland Clinic Foundation.

The High Pressure Facility (HPF) has enjoyed priority "numero uno" and received strong in-house technical support. Tests have recently been initiated in the combustor side. Many developmental problems had cropped up in the facility installation and have been overcome to maintain schedule.

The Cyclotron facility has been highly successful in providing neutron therapy for over 210 cancer patients this year. We are very proud of this Lewis contribution.

The Wind Turbine system at Plum Brook has had significant modifications this year. These include a synchronous generator, teetered hub, fixed-pitch tip controls and an overrunning clutch assembly. Most are aimed at reducing system costs and improving the already attractive, potential cost of electricity for wind energy systems.

The list of completed in-house program activities is quite long and I can only point to a few: Full Authority Digital Electronic Controls (FADEC) on the F-401 engine (PSL), the Multivariable Control Synthesis program on the F-100 engine (PSL), Upper Volta Photovoltaic Power Sys-

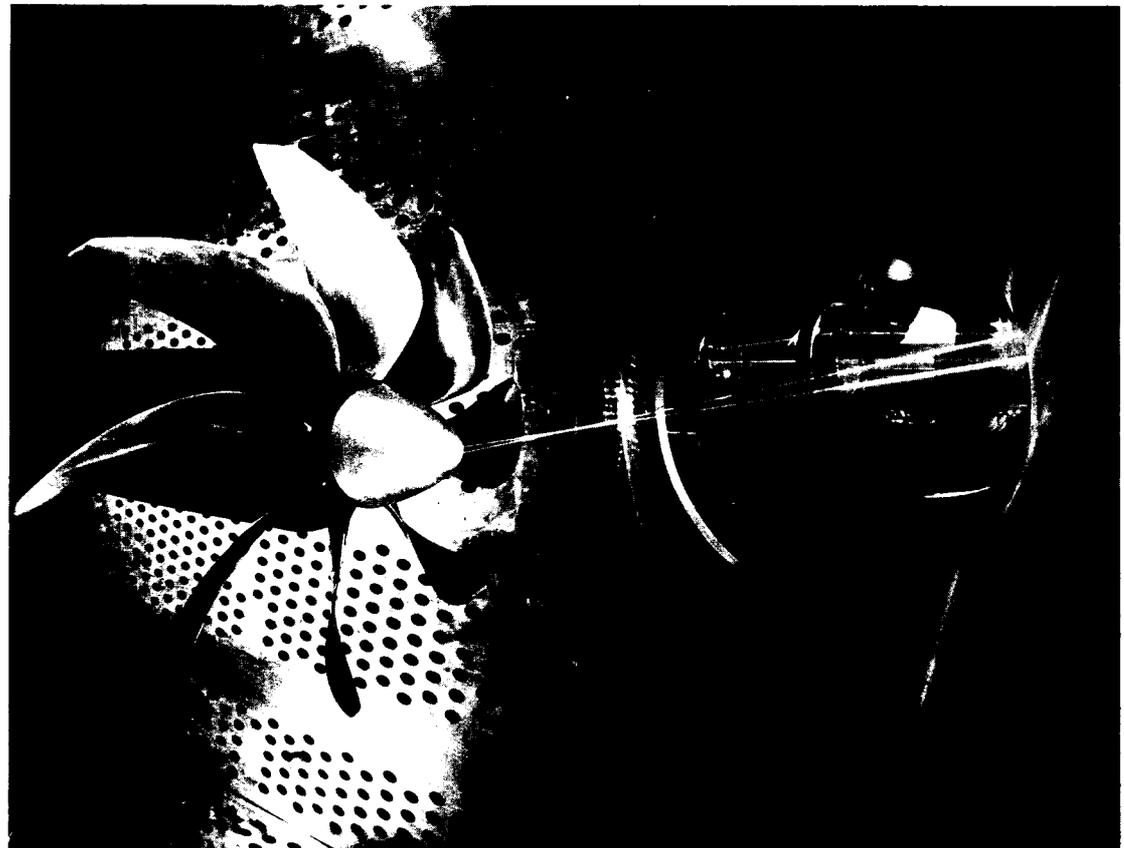
tem, ASDAR (Aircraft to Satellite Data Relay) system, Redox, Chrysler Turbine advanced heat exchanger tests (SPL), JT15D engine at Vertical Lift Facility, etc. New activities coming into operation included the T-700 helicopter engine (ECRL), aeroelasticity spin rig (HEFL), Beale free-piston Stirling engine (ERB), Laser Velocimeter Measurements on the advanced Turboprop (8 x 6 SWT), Chrysler turbine (ERB), Heraeus induction furnace for processing ceramics, etc.

The Lewis in-house program from the support standpoint is really exciting

and aggressive in advancing the Center's energy conversion technologies. It also represents quite a challenge to us to meet all the attendant work requirements. We are constrained by technical support manpower (both in numbers and in the heavy attrition of senior craftsmen). People, of course, are our most critical asset!

A major effort has been expended in updating technicians (and engineers) in hands-on training in electronic systems. Extensive programs have been conducted in-house on microprocessors and computers.

In anticipation of the Lewis role in space communications (20/30 GHz range), in-house training programs are being readied in microwave techniques and solid state devices. Cross-trade training has been conducted (e.g., mechanics taking basic courses in electricity) to expand their individual capabilities and versatility and, thus, personal growth. The trades technician/apprentice program is being modified to attract two-year college graduates as entering candidates and to install a co-op technician feeder program. Recently, *(Continued on page 9)*



Conducting velocimeter measurements on advanced turboprop.