TECHNOLOGY TRANSFER

within the

NASA GODDARD SPACE FLIGHT CENTER

presented to

CIVIL SPACE TECHNOLOGY DEVELOPMENT

a workshop on

TECHNOLOGY TRANSFER AND EFFECTIVENESS

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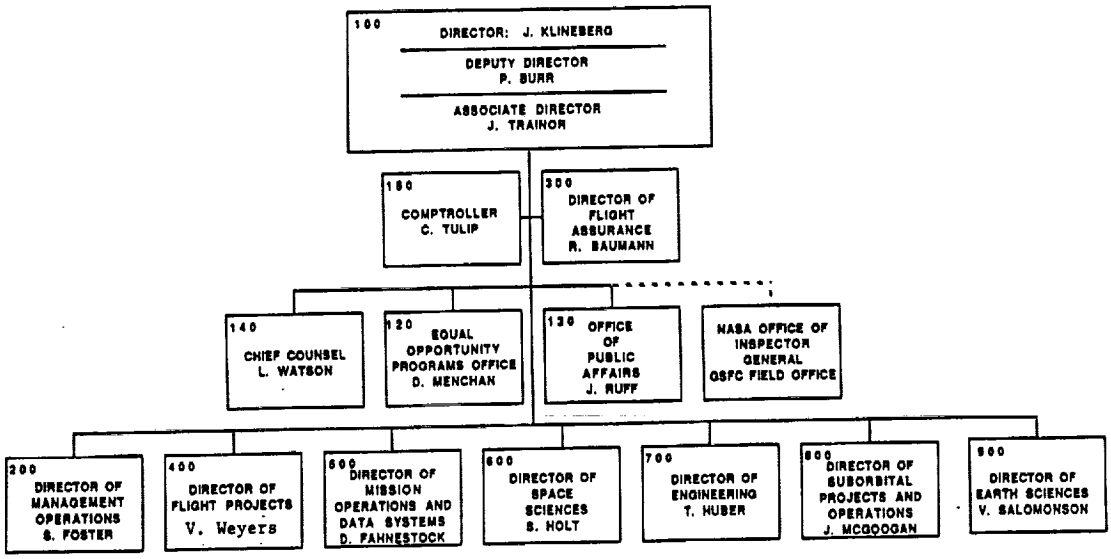
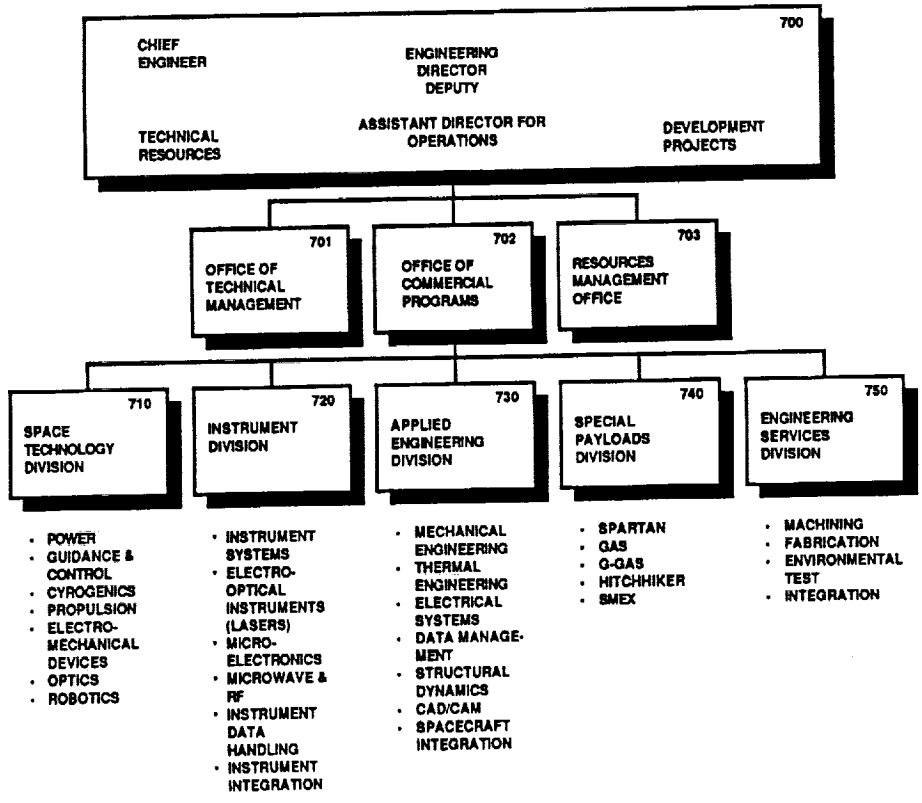
OBSTACLES TO TECHNOLOGY TRANSFER - I

- Goddard principal functions are:
  - Development, Flight, and operation of earth-orbiting spacecraft and instruments for earth and space sciences
  - Carrying out a comprehensive program in the earth and space science
  - Developing and operating the network for mission control and data acquisition
  - Conducting analysis, interpretation, and modelling, involving massive volumes of data
- Goddard has a relatively modest role in developing advanced technology directly relevant to our missions and where we have particularly strong skills.
- Goddard missions must incorporate beneficial new technology developed in-house, at other NASA centers, or outside NASA.

GODDARD SPACE FLIGHT CENTER



ENGINEERING DIRECTORATE



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OBSTACLES TO TECHNOLOGY TRANSFER - II

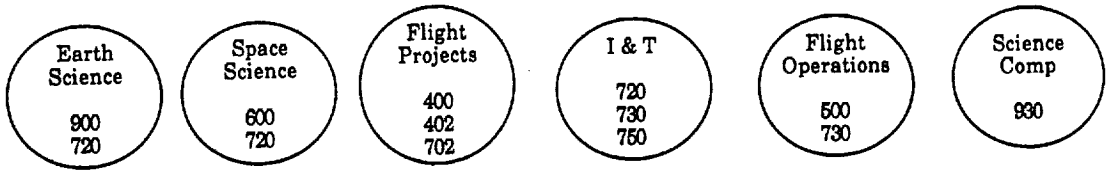
- Space Flight project manager has little incentive to incorporate new technology
  - Increased perceived risk and up-front costs are serious detriments
  - Objectives are to meet performance specs, not to exceed them or to reduce life-cycle costs
  - Reluctance to fly un-proven (i.e., in-flight) technology
- Scientists develop plans and algorithms based on existing technology: efficiencies and cost reduction are considered undesireable in light of the uncertainties of research.
  - The up-front cost of new technology may become cost-effective during later operational phases.

TECHNOLOGY TRANSFER IMPROVEMENT PROGRAM AT GSFC:
Communication between Technology Developers and Users

- Establish committee of technologists to study strategic plans of User organizations: infer technology needs; performance goals expected to strain capabilities.
- Conduct an in-house Symposium/Workshop to present the on-going technology program (both in-house and NASA-wide) to the GSFC user community: products, delivery dates, expected benefits.
- Conduct (separate) meetings of technologist committee with key user points-of-contact: evaluate program with respect to user strategic vision. Recommend revisions, deletions augmentations.
- Repeat technology workshop annually: obtain feedback on relevance, quality, and utility.

TECHNOLOGY TRANSFER WORKSHOP

Technology Users



Technology Development

		Network and Operations Automation
		Flight Data Systems
Code	500	Scientific Computation
	600	Thermal Control
	700	Structural Dynamics
	900	Science Remote Sensing
		Telerobotics
		Space Communications
		Optics

USER FEEDBACK TO TECHNOLOGISTS: Joint Actions

- Feedback
  - Will the users accept new technology products if successful?
  - Which missions will benefit? When?
  - Should program be adjusted so as to be more relevant?
- Steps necessary to implement new technology
  - Demonstration in test beds, field experiments, aircraft, shuttle experiments
  - Plans for joint transfer process: Co-funding, off-line new technology in operational environment.
- Prepare individual "white papers" proposing specific actions: e.g., demonstrations.
  - Obtain Project concurrence for implementation
  - Enlist HQ support