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SHUTTLE PHOTOGRAPHIC PALLET PROGRAM

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OVERVIEW

The Shuttle Photographic Pallet Program provides for the economical development of an operational shuttle search system capable of satisfying the national search requirements of the mid-1980s and beyond. Achievement of this capability is in two phases. The [redacted] uses existing HEXAGON hardware and design concepts to provide an early shuttle capability. This system will provide an STS-based system to: (1) Complement/ augment standing searh requirements satisfaction, (2) Provide a resource to increase imagery flow in support of SALT monitoring, and (3), Serve as a gap filler as well as a backup for other systems.

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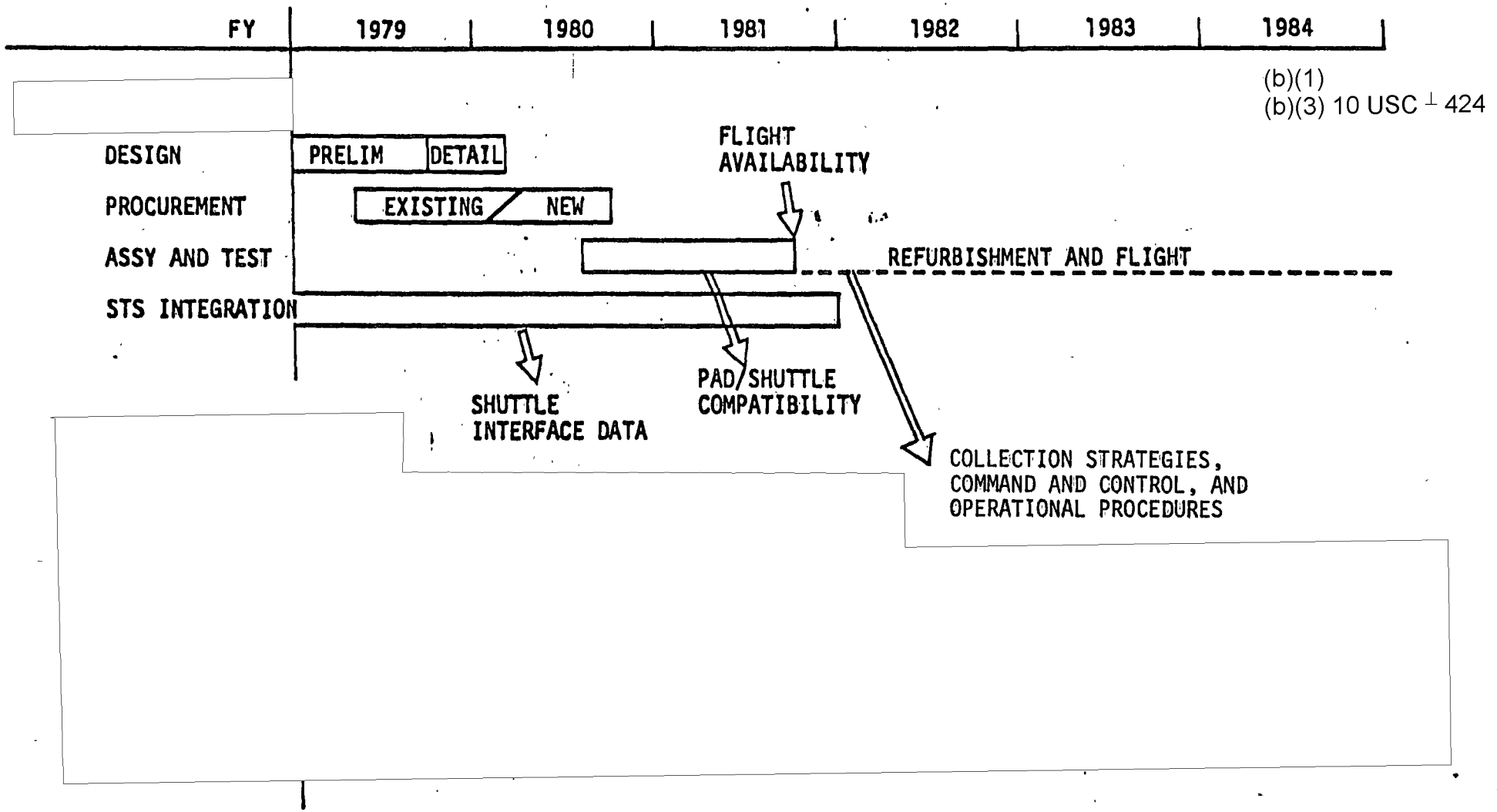
SHUTTLE PALLETS



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PHASE I - [redacted]

OBJECTIVE

Provide an early capability to conduct photographic reconnaissance search missions using the space shuttle to: (1) Complement/augment standing search requirements satisfaction, (2) Provide a resource to increase imagery flow in support of SALT monitoring and (3), Serve as a gap filler as well as a backup for other systems. In addition, the development, integration and operations of the [redacted] will provide the necessary data for the development of the optimized Phase 2 operational system.

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SYSTEM CONCEPT

Hardware

The hardware concept for the [redacted] is to make maximum use of the existing HEXAGON design and available hardware resources. The primary concept is to make use of the HEXAGON sensor subsystem design consisting of the two-camera assembly (TCA). Alternative hardware concepts that might be available are also being evaluated. The use of the HEXAGON system design and current capabilities allow the program to make maximum use of existing flight-quality spares, test equipment, and manpower resources to minimize cost while attaining the earliest availability (late CY81/early CY82).

A single-pallet system with adequate spares to support the factory-to-pad hardware validation tests and recycle requirements during the operational period is envisioned. This pallet system will consist of:

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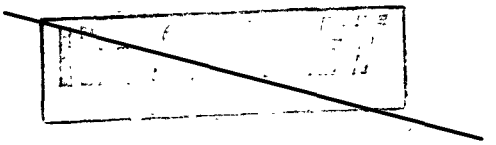

(1) HEXAGON two-camera assembly (TCA) and associated electronics

(2) HEXAGON take-up assemblies as supplies and take-ups

(3) Pallet structure/"Housekeeping" electronics

(4) Pallet shroud for environmental and security protection

The TCA will be assembled using existing flight-quality spares, where possible. Procurement of new assemblies and electronics will be accomplished in areas where there are no existing resources or the existing equipment cannot be reworked to acceptable standards.

The HEXAGON take-up design can be modified to function as the film supply; these design changes will be incorporated into existing take-up hardware. This will allow a film load capacity of 80,000 feet.

The pallet system will be designed and fabricated to support the sensor subsystem in the shuttle bay. This pallet will incorporate existing "housekeeping" subsystem designs and available flight spares, where practical. The type of functions to be incorporated will be defined during the design definition stage of the program. The pallet system will also incorporate a shroud to enclose the sensor subsystem for purposes of both security and shuttle environmental protection (acoustic, thermal, and contamination).

Integration

The integration concept to be pursued will be accomplished in two areas. The first, integrates the existing HEXAGON sensor system with the pallet.

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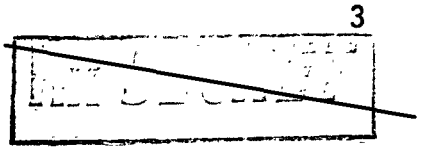

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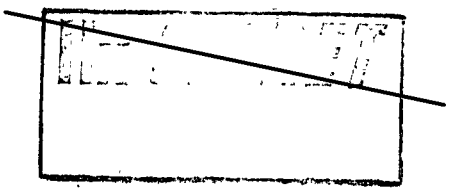


Integration of the TCA with the pallet is being accomplished so that the maximum number of existing interfaces can be maintained in order to reduce new developments, modifications to existing hardware, and uncertainties in operation. With this approach a known element, the [redacted] pallet system, can address the undefined interfaces with the shuttle.

Integration of the [redacted] pallet with the shuttle will be accomplished in these areas:

(1) Orbiter support subsystems (b)(1) (b)(3) 10 USC ⊥ 424

(2) Launch base facilities

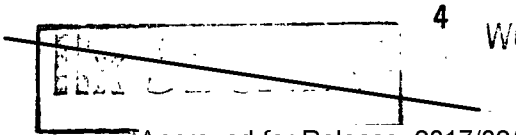
(3) Operating control modes

(4) Security

The integration with the orbiter includes definition of orbiter bay structural interface, environments, interaction with orbiter avionics subsystems, and orbiter operating characteristics. This effort will be ongoing during the entire Phase 1 program.

The launch base integration will be oriented to ETR operations in the initial phase with subsequent effort defined at WTR as that facility becomes operational. The concept of launch base integration will be addressing such areas as security, facility availability, test requirements, and launch pad integration.

The integration effort with the shuttle operational control systems is being approached to define operational responsibilities and concepts in the "pre-controlled mode" time frame. The concept presently



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being evaluated is discussed below.

Operations

The concept of operations for the [redacted] will be a "tailored" one since its availability is prior to the "controlled mode" concept of operations at JSC. The initial concept to be evaluated and further defined is to use existing orbital command and control systems of the Satellite Control Facility (SCF) for photo pallet functions such as payload commanding and telemetry data retrieval; orbiter systems will be serviced by JSC; and an interface established between the SCF and JSC.

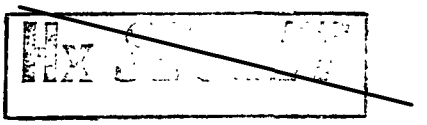
The [redacted] pallet will be capable of returning HEXAGON-quality imagery when flown at HEXAGON-type altitudes. The capability of the shuttle orbiter and the method by which it can fly at the 90 - 100 nm perigee altitudes required is under evaluation.

The operational concept of using the [redacted] pallet is being defined to allow for its use to either augment or back up other systems in support of SALT monitoring.

Management Approach

In order to accomplish the objectives of the [redacted] in the time period allocated an extremely streamlined approach is required. The concept is to form a small project management team within the current SPO to work the efforts of:

- Camera system definition and acquisition
- Pallet structure/electronic subsystem definition, acquisition and integration
- Shuttle integration, ground and flight operations.



This team will define the specific areas of support required of other organizations and contractors. The daily decisions and management actions will be accomplished by this team.

The effort to be accomplished by contract will be added to existing contracts as separate items. The contractors involved will be Perkin-Elmer, LMSC, and Rockwell. The SPO project team will manage the required efforts at each of these contractors to ensure that the total effort is directed according to the acquisition plan.

Interfaces with ETR, WTR, NASA, and other shuttle-related areas will be established through existing interface channels at the onset. After the initial contacts have been established the project team will conduct these activities as required.

PROGRAM PLANS

Schedule

Key milestone schedule points are contingent on full program apporval by 1 February 1979 for unit availability in late 1981. This schedule is heavily dependent upon availability of shuttle interface data, shuttle launch schedule and performance capabilities. The initial flight in 1981 of up to 7 days will confirm the system's capability for continued reuse. Beginning in 1982 the system will be available for flights based on a 2-per-year flight expectancy. The duration of these flights will be driven primarily by shuttle capabilities.

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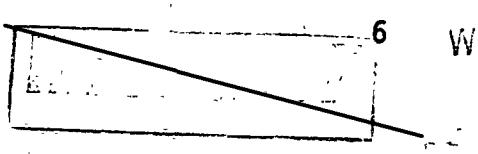

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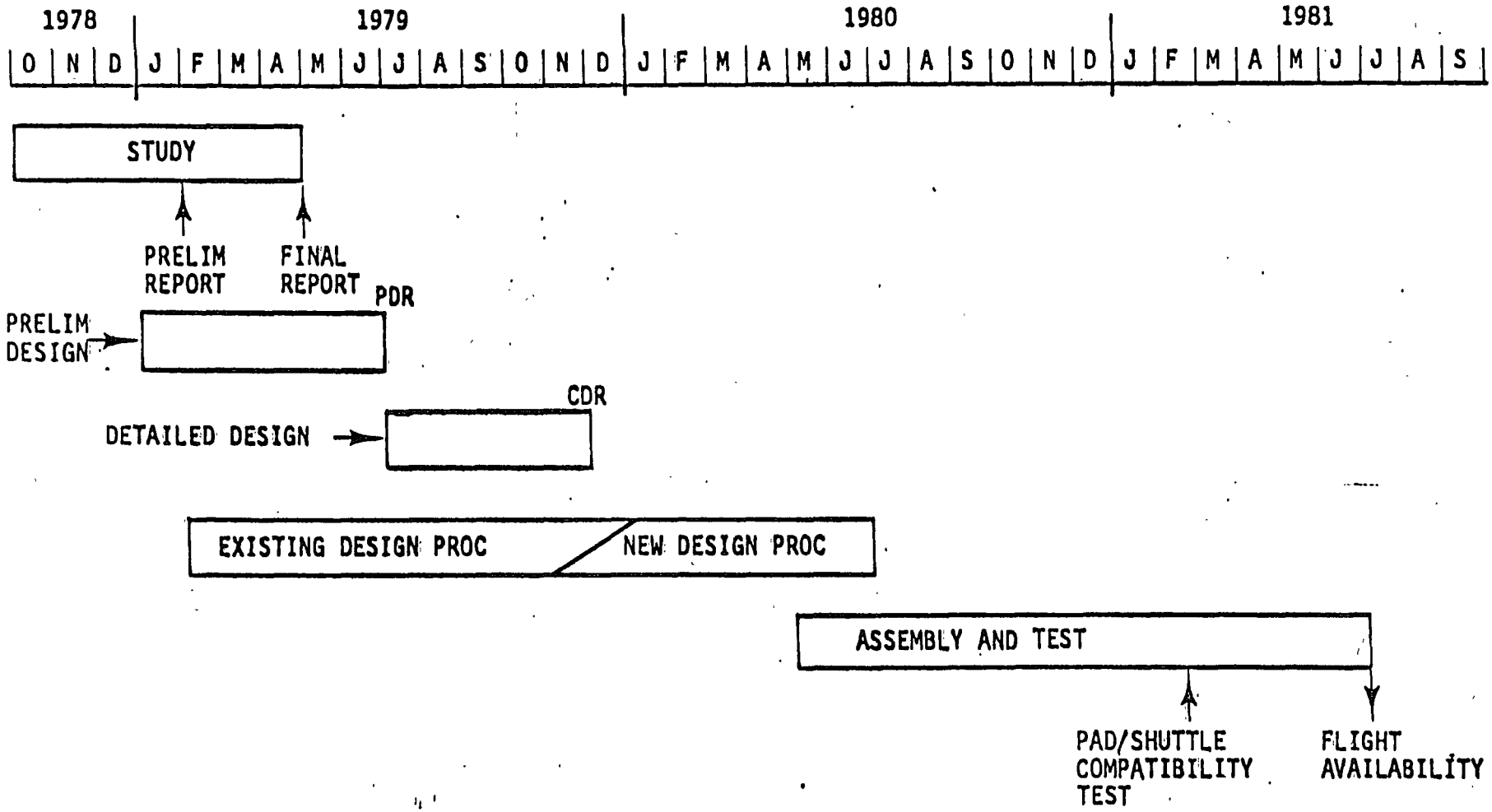
[redacted] PROGRAM SCHEDULE



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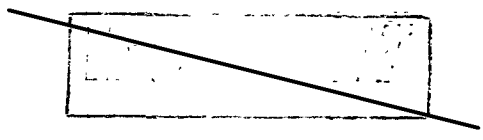

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