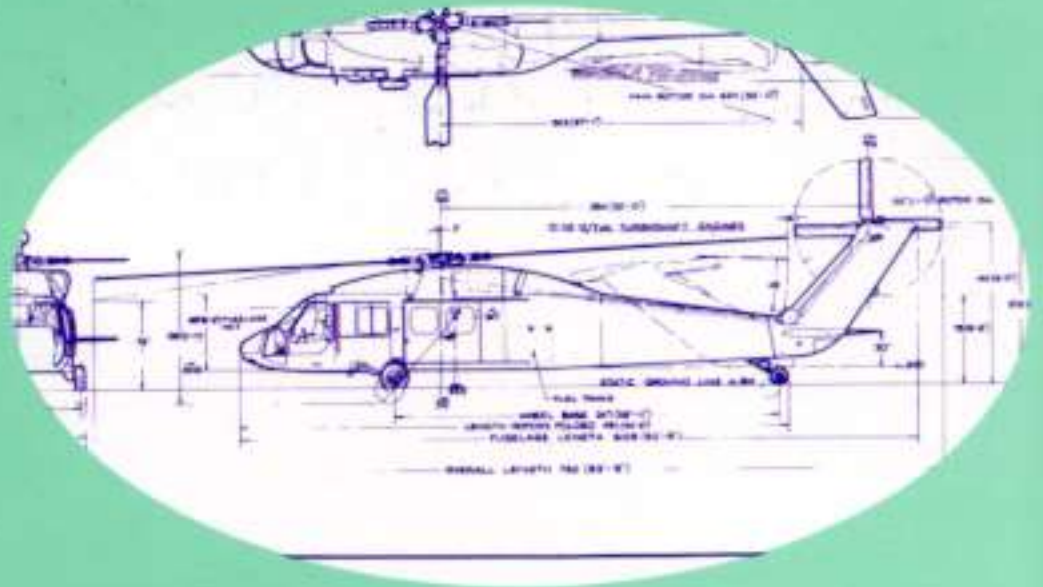




SIKORSKY LAMPS MKIII AIR VEHICLE

Proven Technology That's
Production Ready



Evolution of

SIKORSKY LAMPS MKIII



GERALD J. TOBIAS
PRESIDENT

The success of the LAMPS MK III Program depends directly on the quality of the air vehicle chosen to be integrated with the avionics and mission equipment. The Sikorsky S-70L aircraft that we have proposed for this important Navy program is production ready and I have full confidence in the ability of the Sikorsky Aircraft LAMPS team to produce the MK III air vehicle on time and on cost.

I am confident because our Sikorsky LAMPS team is not a newly formed activity. We have over 25 years of highly valued ASW experience with the Navy and we have been supporting the LAMPS mission specifically for the last several years. Our detailed responses to Navy inquiries from the several operational commands in the early stages of the LAMPS program and our mock-up tours to Navy facilities have demonstrated our understanding of the mission environment in which precision, reliability, support and an all-up status is so essential.

I am also confident because the S-70L gives the Navy a proven helicopter system specially adapted to LAMPS mission requirements at minimum development cost. Most of the extensive testing that would be required for an all-new configuration has already been completed. As a result, Navy adaptations can be made with confidence, using the Government-sponsored UH-60A development and testing program as a foundation. The entire S-70L dynamics system, for example, is based on factual documented test results.

Mr. Harry J. Gray, the Chairman and President of United Technologies has pledged the resources of the Corporation in support of our own proven capabilities to participate in the successful design and production of this advanced U. S. Navy weapons system. We welcome the opportunity to cooperate with the Navy and IBM, the system prime contractor, to provide for this success.


G. J. Tobias
President

GJT:ch



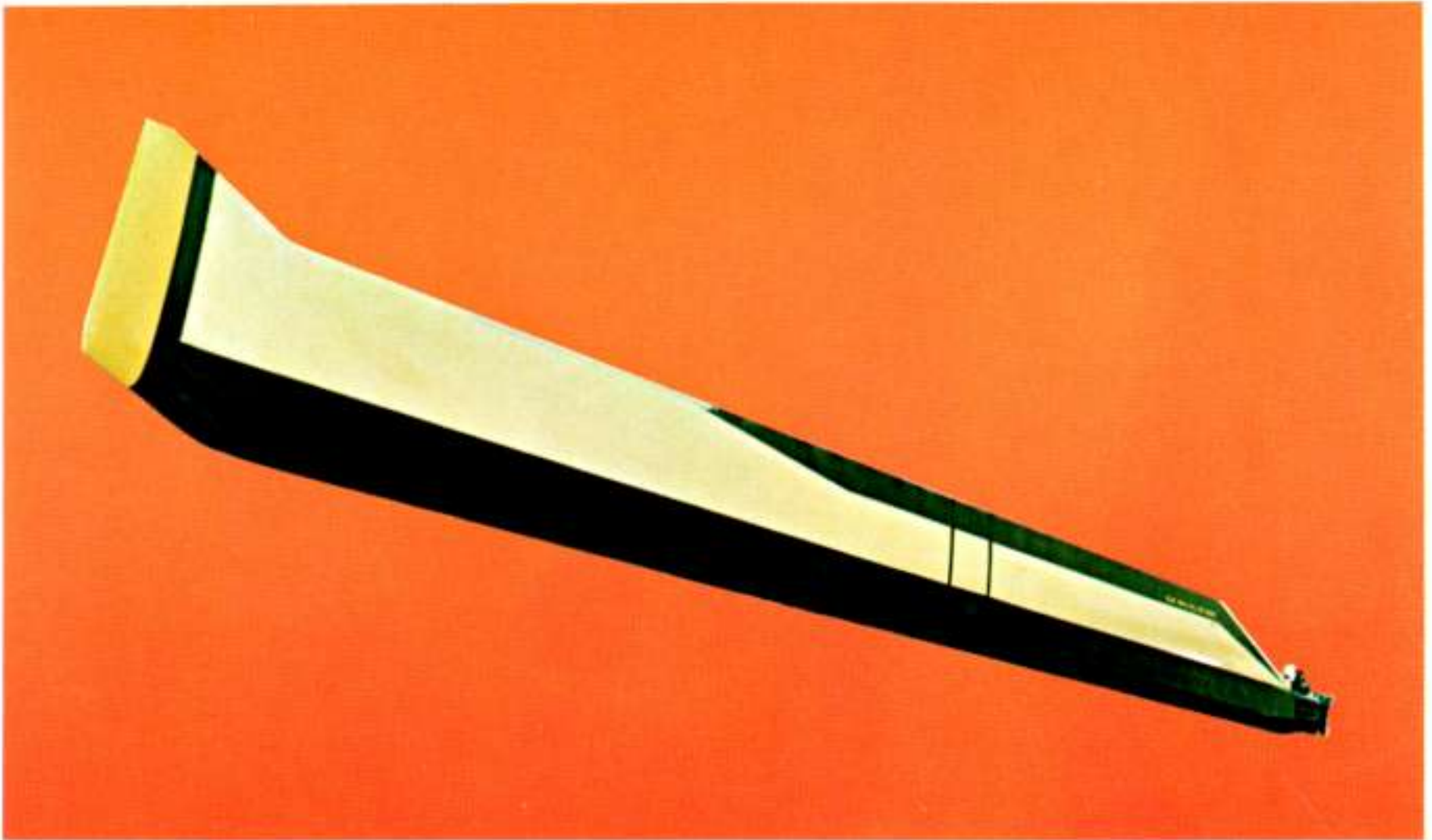
Introduction



The U.S. Navy LAMPS MK III system is intended to perform the vital anti-submarine warfare (ASW) and anti-ship surveillance and targeting (ASST) missions. In addition, it will perform the secondary missions of search and rescue (SAR), communications relay, medical evacuation (MEDEVAC) and vertical replenishment (VERTREP) without reconfiguration.

The Sikorsky LAMPS MK III Air Vehicle is a Navy oriented version of the UTTAS helicopter designed to achieve the Navy's stated objective to obtain an optimum LAMPS aircraft for the lowest cost. During Government Competitive Tests the Sikorsky UTTAS met or exceeded all major performance, reliability, and maintainability goals. The basic LAMPS design is a low risk configuration retaining the rotors, transmissions, propulsion, control systems and primary structure of the UTTAS aircraft, while incorporating the LAMPS avionics and mission equipment. Noteworthy in the integration of Navy subsystems is the demonstrated capability that Sikorsky brings to the project in support of the System Prime Contractor. The combination of advanced, but proven, helicopter design and manufacturing technology and demonstrated ASW experience can provide the Navy with the required capability based on proven technology that's production ready.

Technology

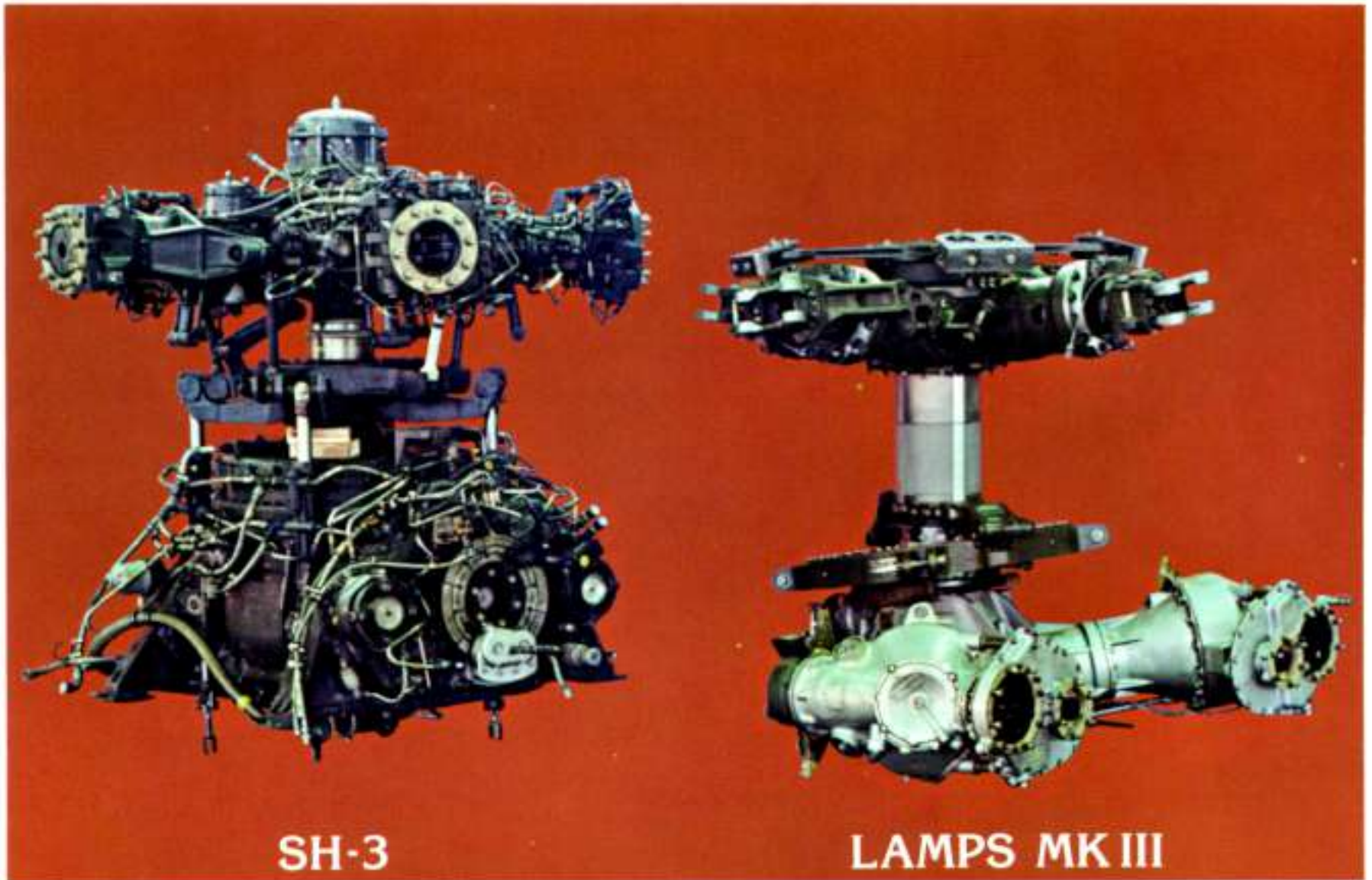


The design concept for both the Sikorsky UTTAS and the Sikorsky LAMPS MK III is to incorporate only those advanced features and components that have been proven to be of little or no technical risk. Advanced engines, improved air foils and rotor geometry, new materials, innovative design, plus the most modern manufacturing techniques and methods provide substantial improvements in performance, safety, reliability and reduced or eliminated maintenance.

One of these features is the composite main rotor blade. It has a titanium spar, Nomex honeycomb filler and fiberglass graphite composite skin. This combination of materials eliminates corrosion. It also permits the incorporation of an optimum airfoil twist, the use of automated production equipment and enhances the interchangeability of blades.

Another advanced feature is the CBR™ helicopter tail rotor consisting of two graphite flex spars placed at 90° to each other to form a four-bladed configuration. No bearings, seals or lubricants are required. It has fewer parts than a conventional tail rotor.

Applied to LAMPS



The Sikorsky LAMPS MK III main transmission and rotor head are dramatically simpler than the U.S. Navy SH-3 previous units of equivalent power ratings. Every appropriate proven advance has been incorporated that will improve reliability, reduce maintenance and increase performance.

The main transmission consists of one main module, two interchangeable input modules and two interchangeable accessory modules. Each module can be changed aboard ship using standard hand tools. Chip detectors in each module and fault indicators in the cockpit pinpoint possible transmission problems. Modularization also reduces spares procurement and the need to stock complete transmissions. The main rotor head is a simple, propeller-type, titanium casting within which are contained the spindles and elastomeric bearings. The rotor requires no lubrication while retaining the desirable features of the fully articulated head - low vibration, excellent gust response, fine handling qualities and inherent stability - especially at high speeds where more rigid rotors tend to pitch up.

Performance

The S-70L Exceeds LAMPS MK III Primary Mission Requirements With T700-GE-400 Engines.

PRIMARY MISSION CAPABILITY (T700-GE-400 Engines)

| | <u>S-70L ASW Mission</u> | <u>S-70L ASST Mission</u> |
|---|--------------------------|---------------------------|
| Required Mission Take-Off G.W. | 19,246 Lbs | 17,443 Lbs. |
| Desired Mission Take-off G.W. | 19,658 Lbs | 17,850 Lbs |
| HOGE @ SLS | 20,829 Lbs | 20,829 Lbs. |
| Exceeds Required Mission Station Loiter Time by | 56 min. | 50 min. |
| Exceeds Desired Mission Station Loiter Time by | 25 min. | 20 min. |
| OEI ROC | 390 FPM | 390 FPM |
| Two Engine VROC @ TOGW | 509 FPM | No Stated Requirement |

PRIMARY MISSION CAPABILITY (T408-GE-400 Engines)

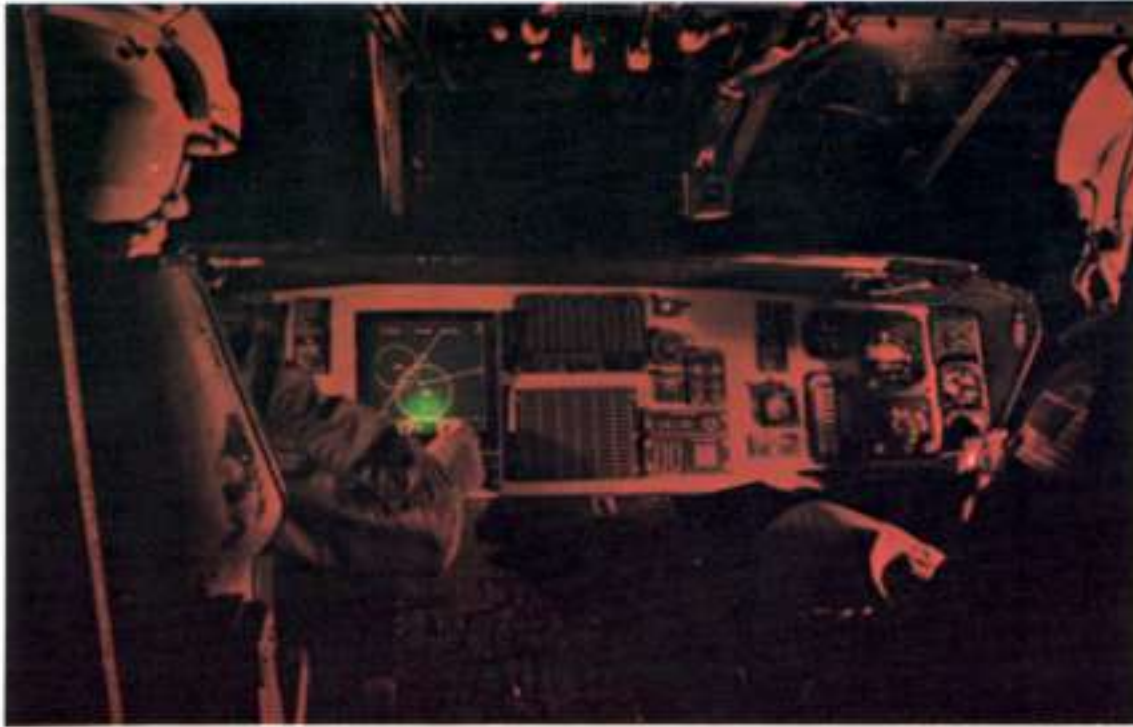
| | <u>S-70L ASW Mission</u> | <u>S-70L ASST Mission</u> |
|---|--------------------------|---------------------------|
| Required Mission Take-Off G.W. | 19,370 lbs | 17,550 lbs |
| Desired Mission Take-off G.W. | 19,804 lbs | 17,963 lbs |
| HOGE @ SLS | 21,884 lbs | 21,884 lbs |
| Exceeds Required Mission Station Loiter Time by | 52 min. | 45 min. |
| Exceeds Desired Mission Station Loiter Time by | 17 min. | 15 min. |
| OEI ROC | 770 FPM | 770 FPM |
| Two Engine VROC @ TOGW | 1192 FPM | No Stated Requirement |

PRIMARY MISSION CAPABILITY (T405-LD-400 Engines)

| | <u>S-70L ASW Mission</u> | <u>S-70L ASST Mission</u> |
|---|--------------------------|---------------------------|
| Required Mission Take-Off G.W. | 19,541 lbs | 17,881 lbs |
| Desired Mission Take-off G.W. | 20,013 lbs | 18,333 lbs |
| HOGE @ SLS | 21,884 lbs | 21,884 lbs |
| Exceeds Required Mission Station Loiter Time by | 47 min. | 30 min. |
| Exceeds Desired Mission Station Loiter time by | 17 min. | Meets Requirement |
| OEI ROC | 1000 FPM | 1000 FPM |
| Twin Engine VROC @ TOGW | 1287 FPM | No Stated Requirement |

NOTE: S-70L performance data derived from actual flights at the UH-60A alternate structural design gross weight of 19,930 pounds demonstrated by the U.S. Army during the Engineering Test portion of UTTAS Government Competitive Test.

Reliability and

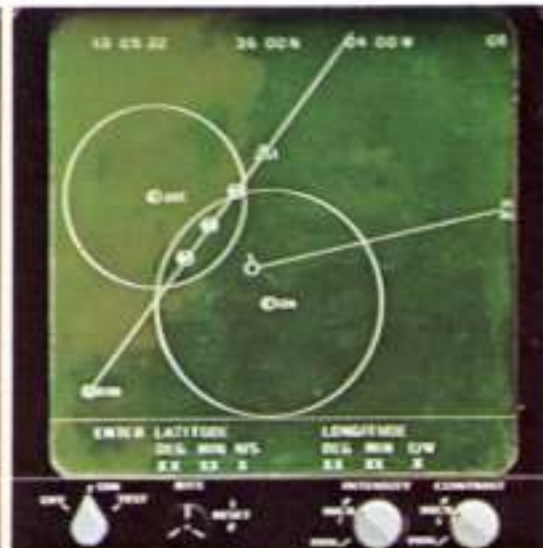


- Low Vibration – less than 0.1g
- Lubrication-Free Rotor System
- Fluidic Stability Augmentation System
- Corrosion-Proof Rotor Blades
- On-Condition Maintenance
- 500 Hour Periodic Examination
- Modular Hydraulics
- Interchangeable Components
- Pre-Tracked Blades
- On-board APU

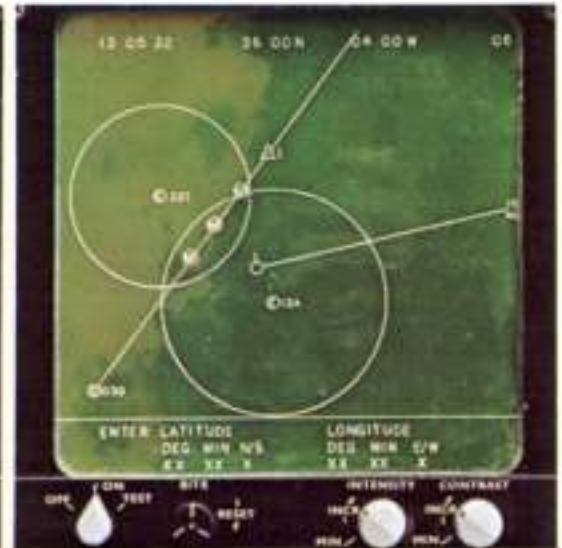
The LAMPS MK III Helicopter is designed to operate in and be maintained in the austere, harsh environment in which LAMPS - dedicated ships operate. Only common hand tools are required. In addition, the Periodic Examination inspection is at 500 hours for aircraft components, permitting long periods of uninterrupted deployment at sea.



1.0g. Prior technology produces vibration levels as high as 1.0g that cause flight crew fatigue, decrease mean time between failure (MTBF)



0.4g. vibration levels look like this.



0.08g. In Sikorsky's LAMPS MK III unique advanced technology produces vibration levels at 0.08g improving pilot concentration, increasing aircraft reliability.

Maintainability

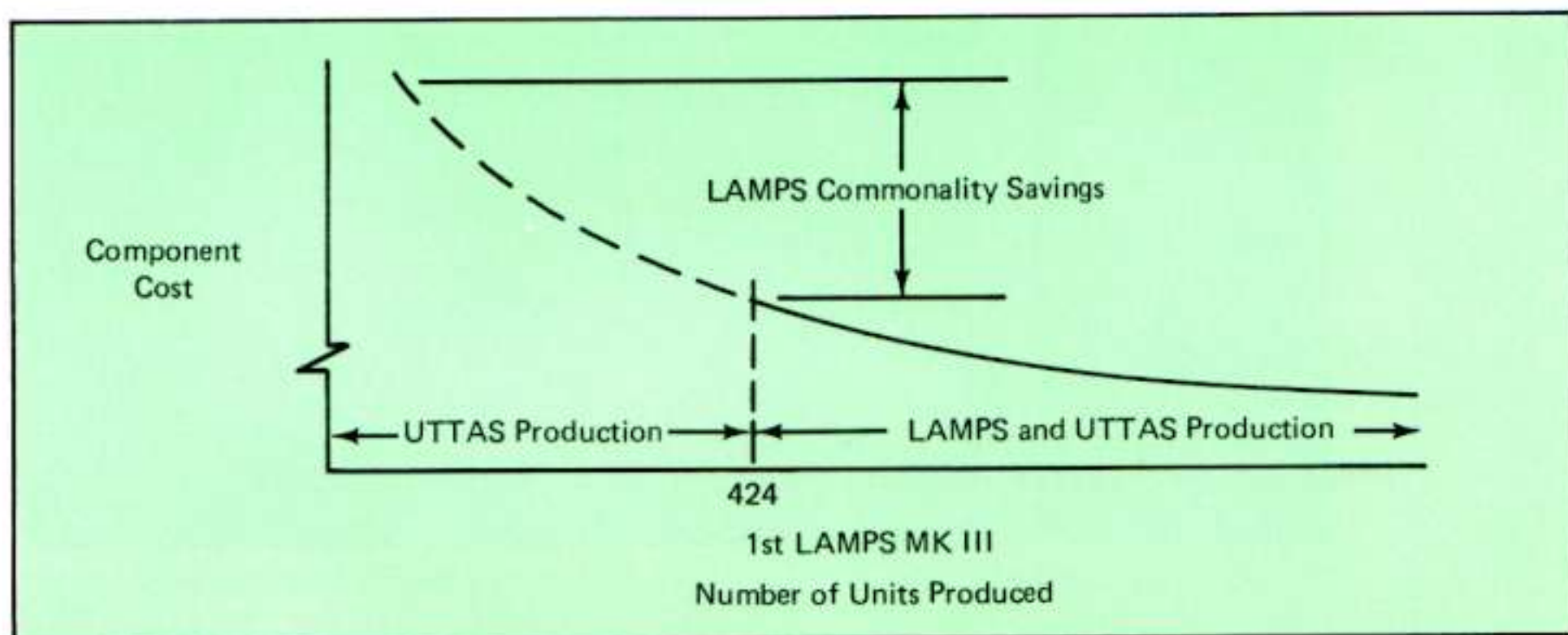


The MK III air vehicle's advanced technology provides a helicopter that is highly reliable and easily maintained at sea. The YUH-60A evaluation has confirmed the reliability and manpower requirements. Contributing significantly to the maintainability characteristics, with the attendant reduction in procurement and logistics costs, is the interchangeability, left and right side, of the following major components:

- Engine inlets and exhausts
- Engine cowlings
- Generators
- Accessory gearbox modules
- Input gearbox modules
- Main landing gear
- Main rotor blades
- Stabilators

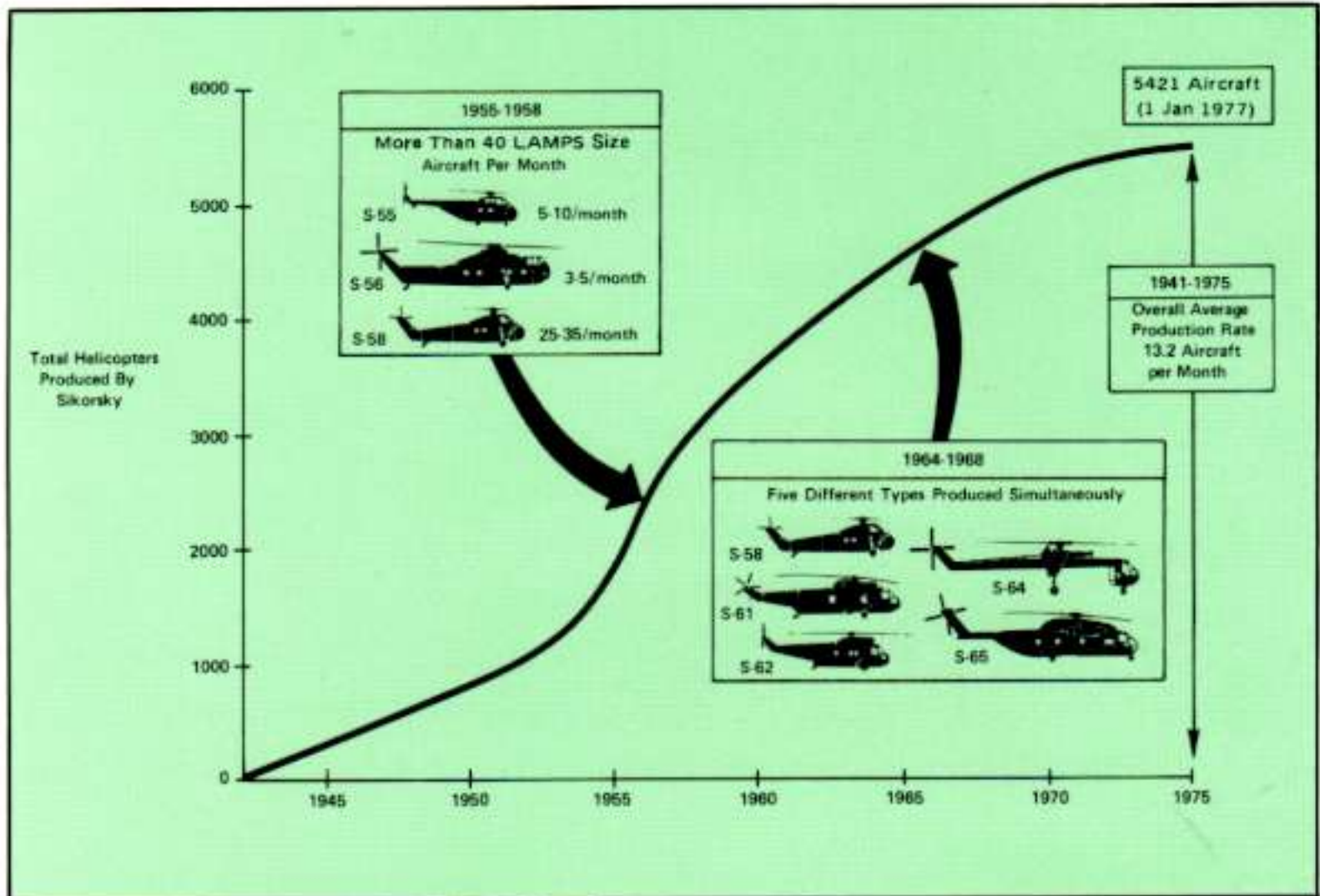
Affordable

Our intensive, disciplined design-to-cost effort makes the S-70L LAMPS MK III helicopter economical to acquire and economical to operate. Cost savings are greatly enhanced by the high degree of commonality between the S-70L and U.S. Army UH-60A UTTAS parent aircraft. The first production LAMPS MK III helicopter is scheduled for delivery four years after the first UH-60A. The S-70L, therefore, benefits from production efficiency attained by first producing 424 of the parent aircraft. The figure below shows how efficiency improvements achieved in producing a UH-60A component carry over to the same component on the S-70L.



Design-to-cost and commonality savings apply to the research and development and operating and support phases as well. Design commonality means elimination of duplicated design, development, and testing. Production commonality means lower cost for spares, trainers, publications, overhauls, and support equipment. Program acquisition cost savings are estimated to be substantial compared to a LAMPS MK III air vehicle without a parent aircraft production base.

Manageable



Sikorsky's most valuable asset is our management team, technical staff and labor force. No other helicopter company can boast of the depth and breadth of experience and competence that we have. Nor can any other company match the record number of different models, sizes, and configurations that we have produced in almost 40 years of building helicopters.

In addition to our facilities and experienced personnel, we have developed modern management tools for the conduct of our business. We have well developed, computerized management systems that are used by all levels of management.

In summary, Sikorsky Aircraft is dedicated solely to the development, manufacturing and support of helicopters. The Corporation encourages and supports the continued modernization of facilities which are in place to produce LAMPS. The management is experienced and dedicated to the support of the LAMPS project. The management tools are modern, highly skilled, and easily expanded to meet the requirements of the program.



SIKORSKY AIRCRAFT



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