

MCDONNELL DOUGLAS

PHANTOM III



Tactical/Reconnaissance

For The 1990s And Beyond...

The Enhanced PHANTOM II

The U.S. Air Force is committed to extending the service life of the combat-proven RF-4C Phantom II through the 1990s and into the 21st Century. Since entering service in the 1960s the Phantom family of aircraft has proven itself many times over — in peacetime and in times of conflict. Currently, there are some 2,500 Phantoms in service with nations around the world. As the builder of the Phantom II, McDonnell Aircraft Company is committed to helping the USAF keep this capable aircraft up-to-date and ready to fly in the defense of the free world.

Numerous enhancements that improve the Phantom II's operations and that extend its service life are currently being implemented. Among these are upgraded avionics, smokeless engines, structural improvements and electro-optical (E-O) reconnaissance sensors. These and other changes give the Phantom II more accurate navigation and target acquisition, enhanced safety, and, coupled with improved reliability and maintainability, significantly advanced combat capability.



Reconnaissance T

RF-4C Modernization

Quick Anti-Jam Equipment

ALE-40 ECM Chaff Enhancement

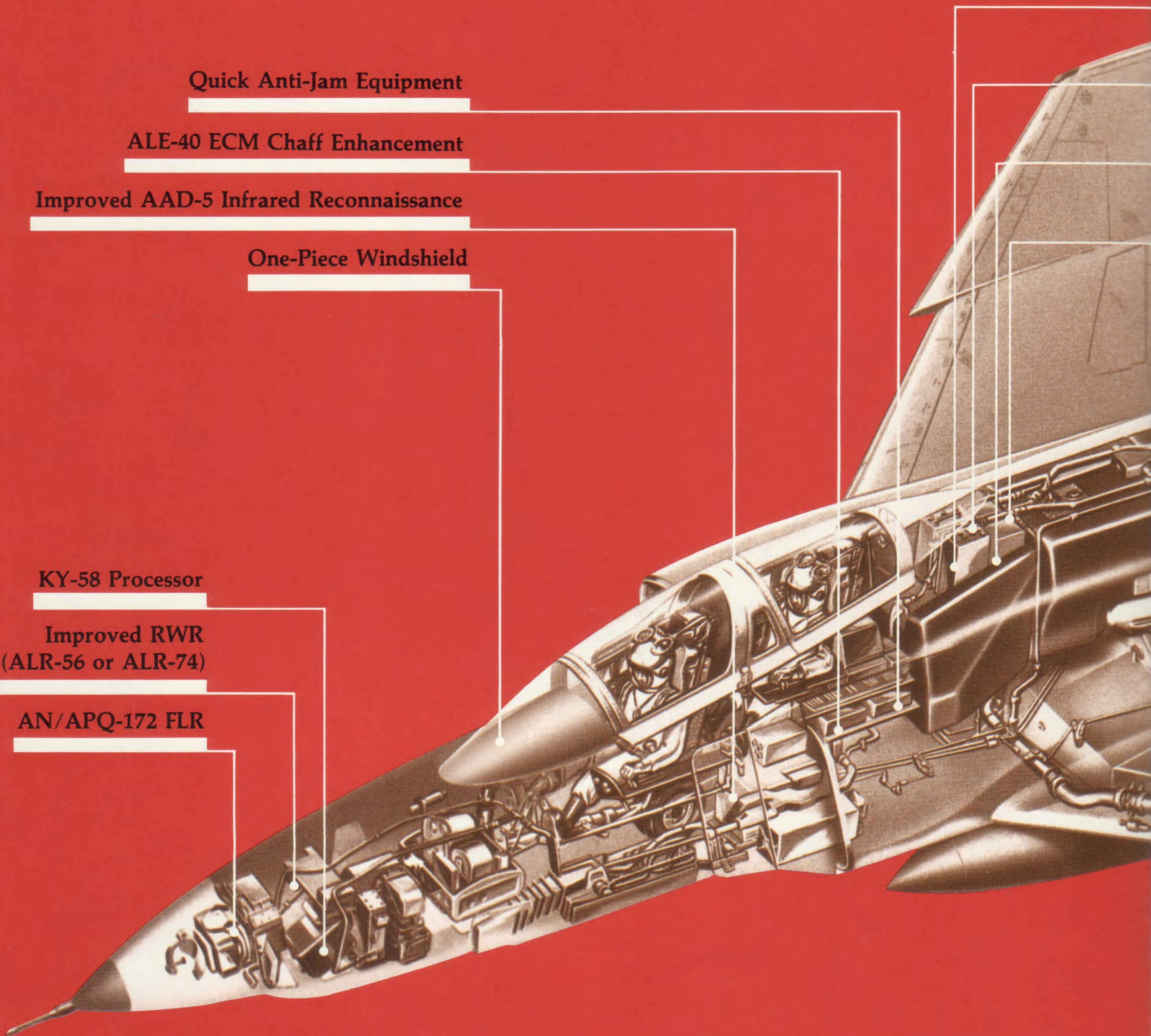
Improved AAD-5 Infrared Reconnaissance

One-Piece Windshield

KY-58 Processor

Improved RWR
(ALR-56 or ALR-74)

AN/APQ-172 FLR



Through Years Of

Technology Refined

Compact Airborne
Video Recorder

Navigation/Weapons
Delivery System

Combined Altitude
Radar Altimeter

Standard Central
Air Data Computer



ARC-190 HF with KY-75 (Parkhill)
HF Secure Voice Equipment

Combat Experience

Enhancement Highlights For A New Age Of Reconnaissance

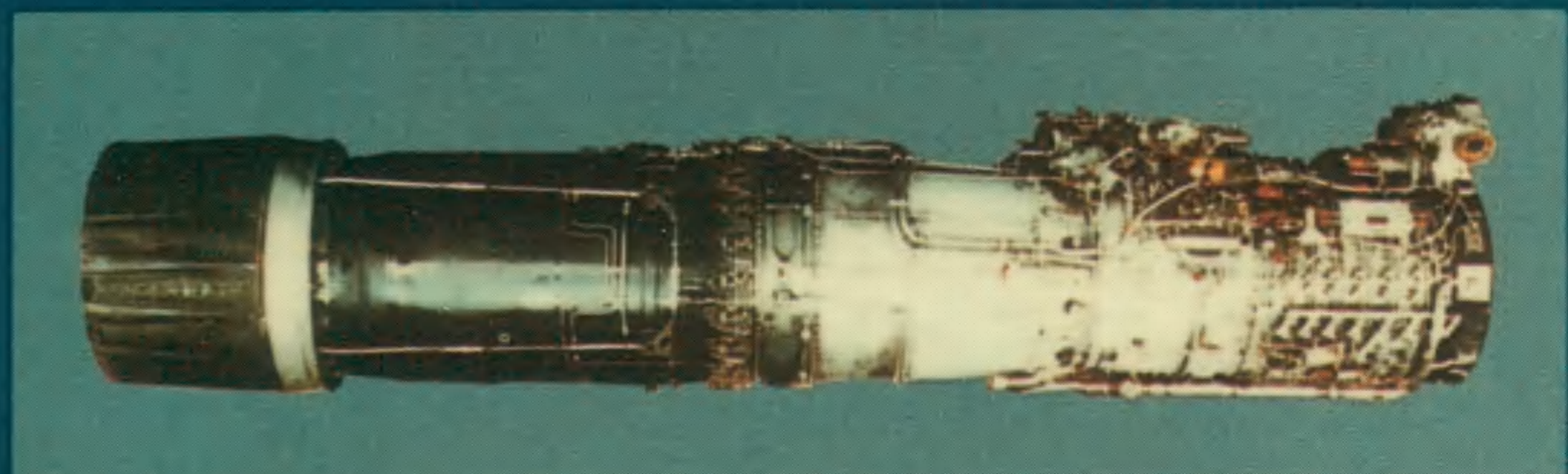
One-Piece Windshield

The new multi-ply acrylic/polycarbonate laminated windshield increases the pilot's forward visibility and is bird-strike resistant. At a speed of 500 knots per hour, this one-piece windshield can withstand the impact of a four-pound bird. This windshield weighs less than the original, which consisted of three separate pieces.



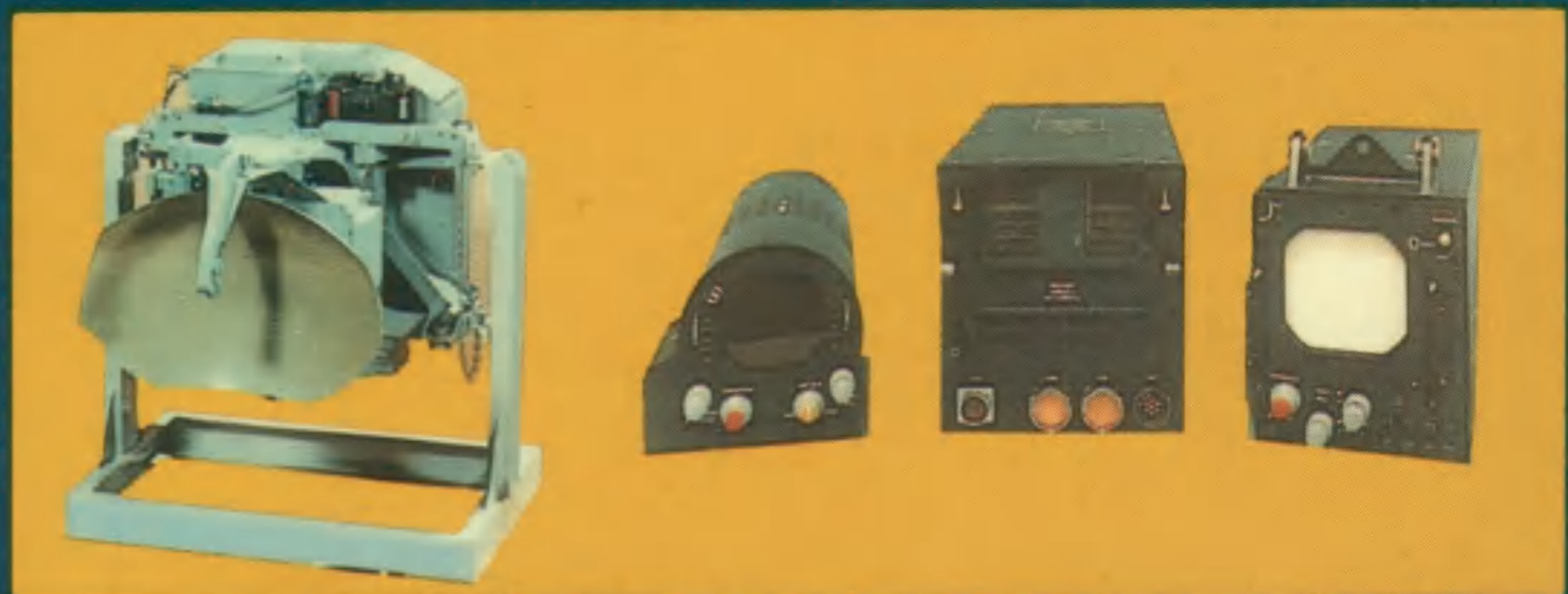
Low-Smoke Engines

The Phantom II is powered by two General Electric J-79 turbojet engines that can deliver nearly 18,000 pounds of thrust each. Most recent modifications have all but eliminated the telltale trail of smoke, thus making the Phantom II more elusive and more survivable.



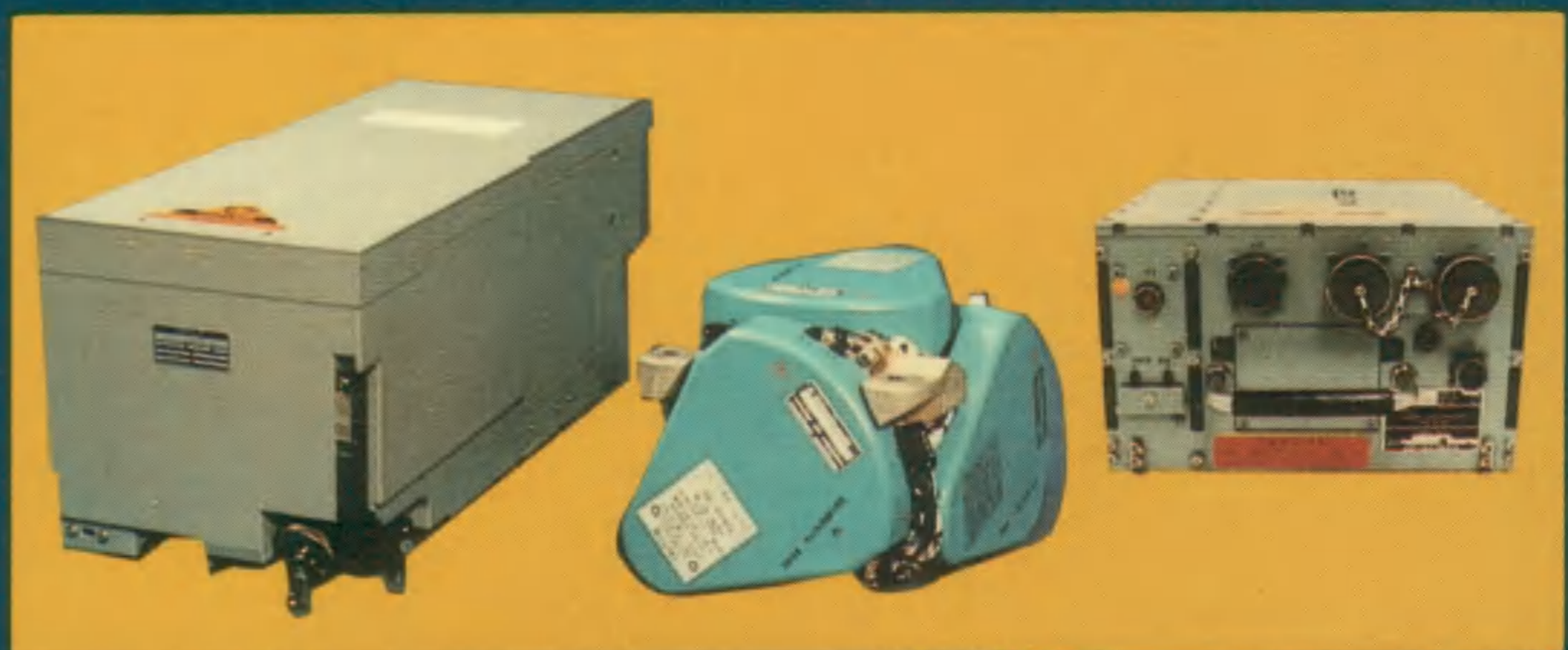
Forward-Looking Radar

With the addition of a digital scan converter and a cockpit display, the APQ-99 forward-looking radar has been renamed the APQ-172. This enhanced system converts analog radar signals into digital signals that are easier to manipulate, transmit and store. Digital signals also deliver a better data display to the pilot.



Navigation/Weapons Delivery System (NWDS)

This improved inertial navigation system uses a ring laser gyro for pitch, roll, true heading and magnetic heading. It is much improved compared to the aircraft's preceding mechanical system. It also features a mission computer, 1553B multiplex bus, standard central air data computer, and control display unit.



And More . . .

- An improved Radar Warning Receiver (ALR-56 or ALR-74) to detect the enemy's most advanced radars.
- Combined Altitude Radar Altimeter (CARA) - more reliable and maintainable equipment for height-above-ground measurement.
- AN/ARC-190 HF Radio - new and improved unit for long-range, high-frequency radio communications.
- New Secure Voice Devices - for radio communications that the enemy cannot tap into.
- Enhanced Electronic Countermeasures - smarter controls, more reliable hardware, new infrared flares to counter advanced enemy systems.
- Global Positioning System - a navigation system that works with space satellites to determine precise aircraft position.
- Modified AAD-5 Infrared Line Scanner - new subsystems for major improvement in reliability and maintainability.

Electro-Optical

The standard for tactical reconnaissance for more than 20 years, the new electro-optical sensor suite being developed as part of the

The sensor suite - consisting of modular E-O sensors, a data processor, and a display, is in common use by the Air Force, Navy and Marine Corps in both

E-O sensors are a new generation of imagery/data acquisition sensors that produce digital signals rather than photographic images on film. The data can be displayed immediately to the aircrew or stored for

later evaluation. Expensive, but effective, they are

There are many E-O sensor and processing approaches to determine the ones for use in the new reconnaissance suite. With modular avionics integration, the

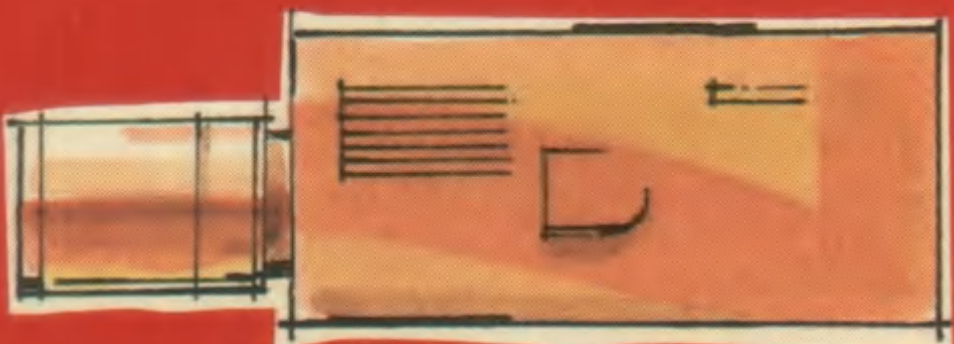
avionics integration, the

recon

Numerous Approaches Funnel Into An

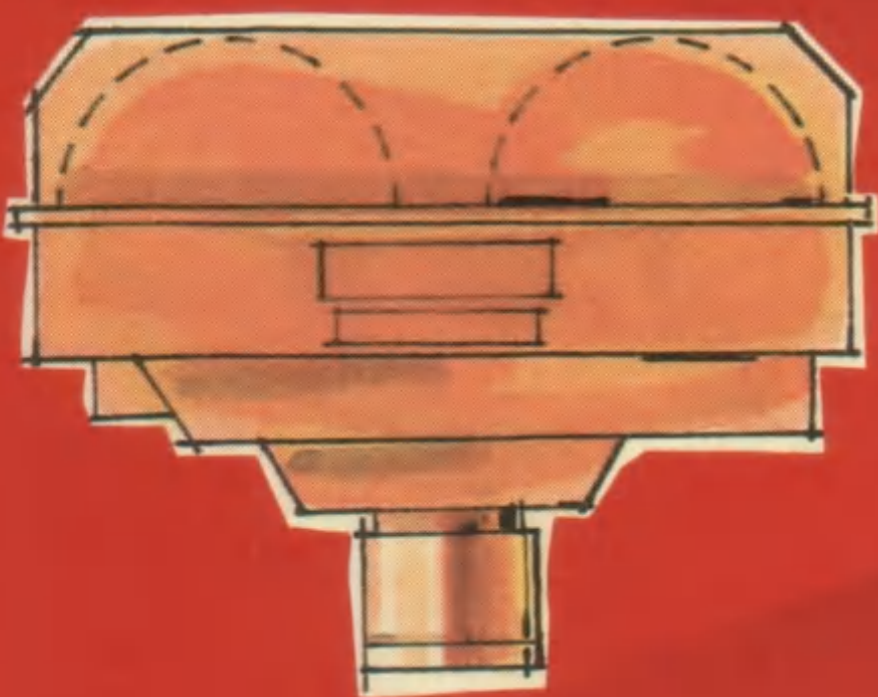
Sensor Concepts

Sensor Separate From Electronics

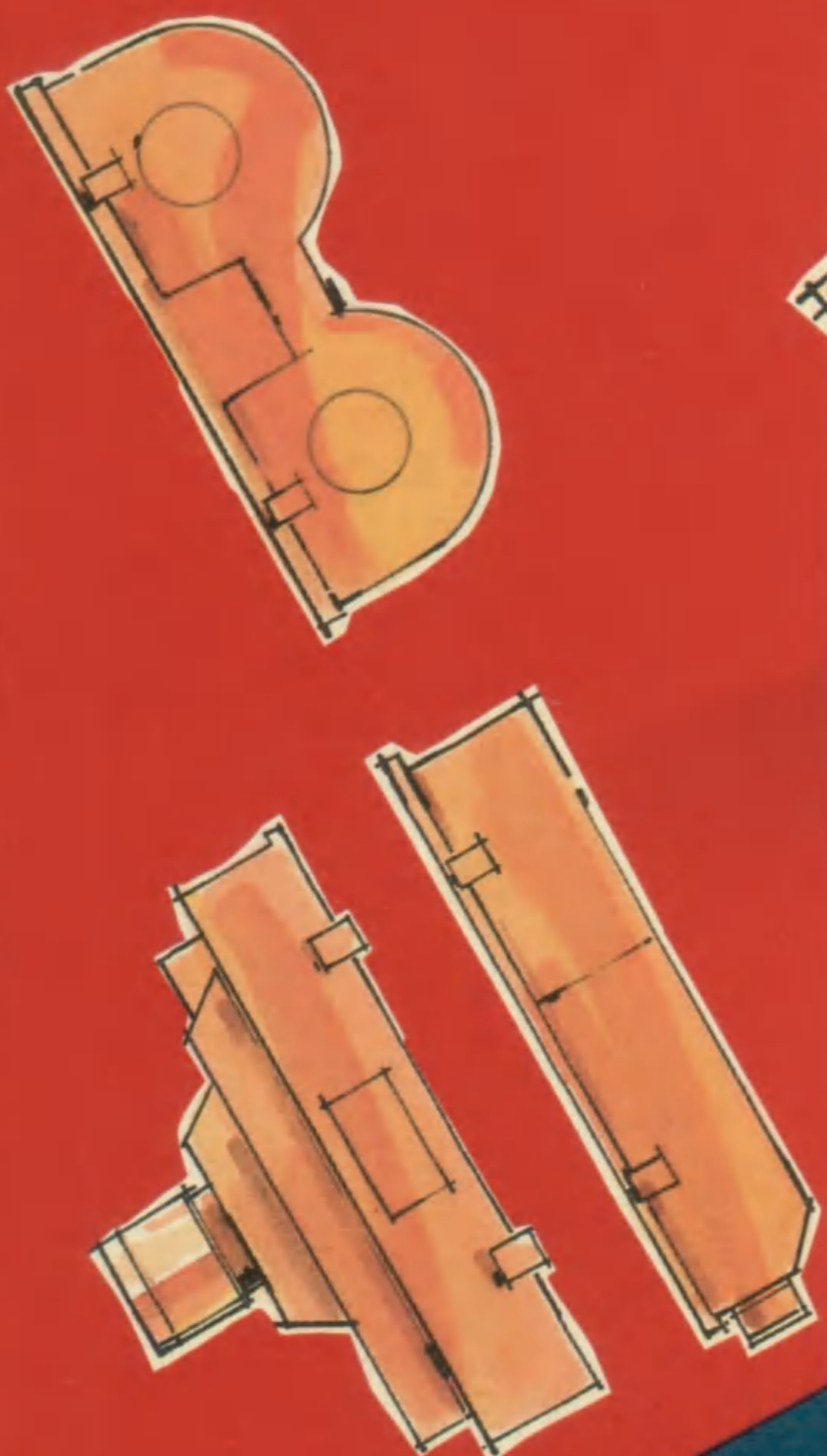


Integral Sensor And Processing Electronics

Modified Film Sensor



Interchangeable Film And E-O Back



Wide Field-of-View Design

Tri-Lens



Wide-Angle Lens

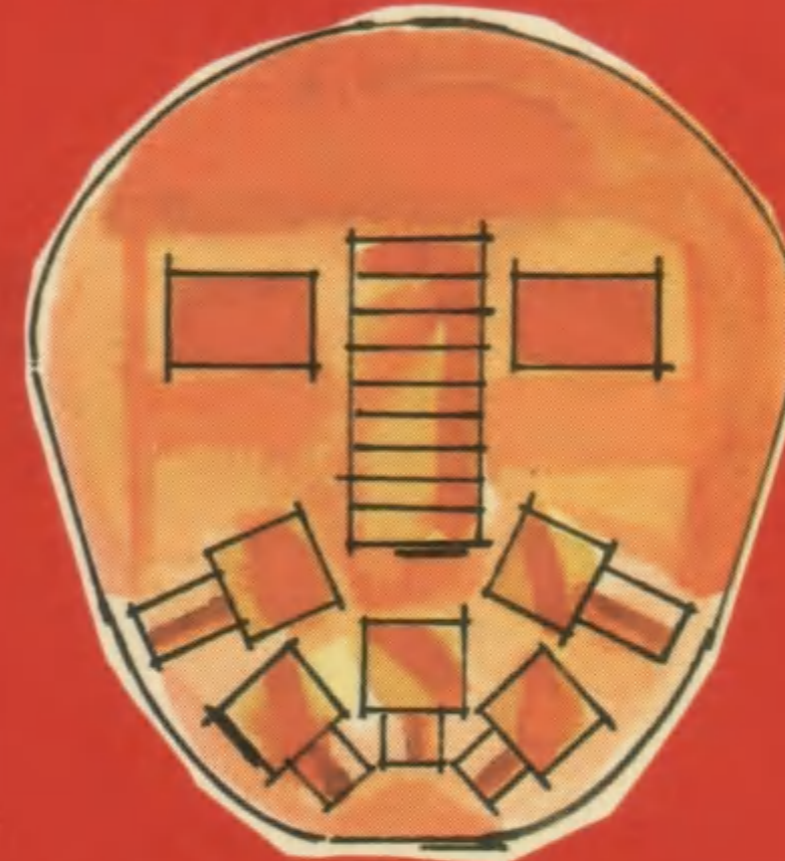


Sensor Array



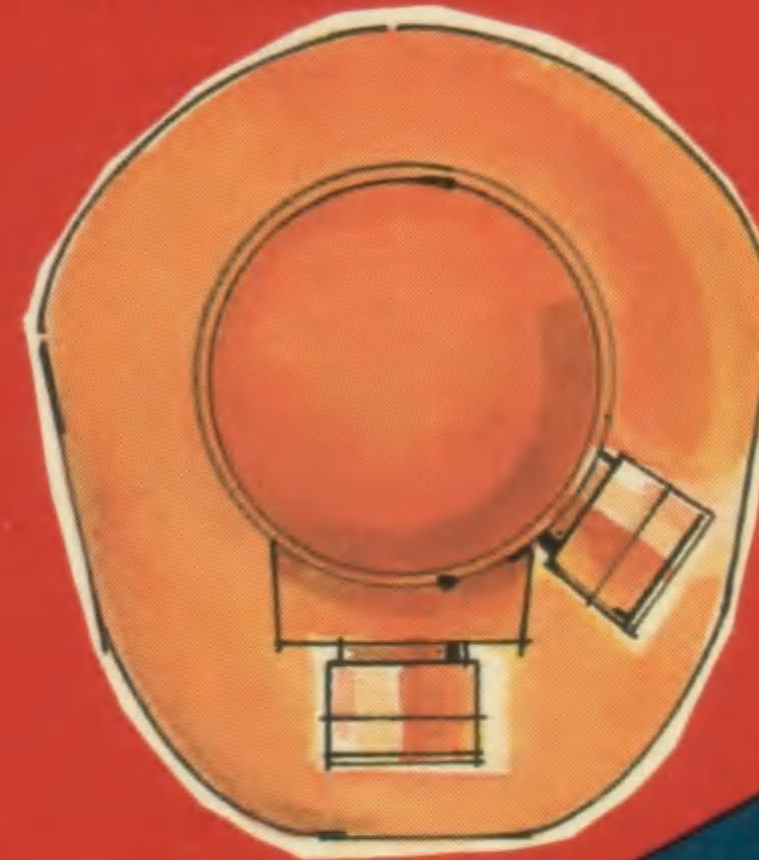
Integration Concepts

Two Approaches To Capture The Field In One Layout

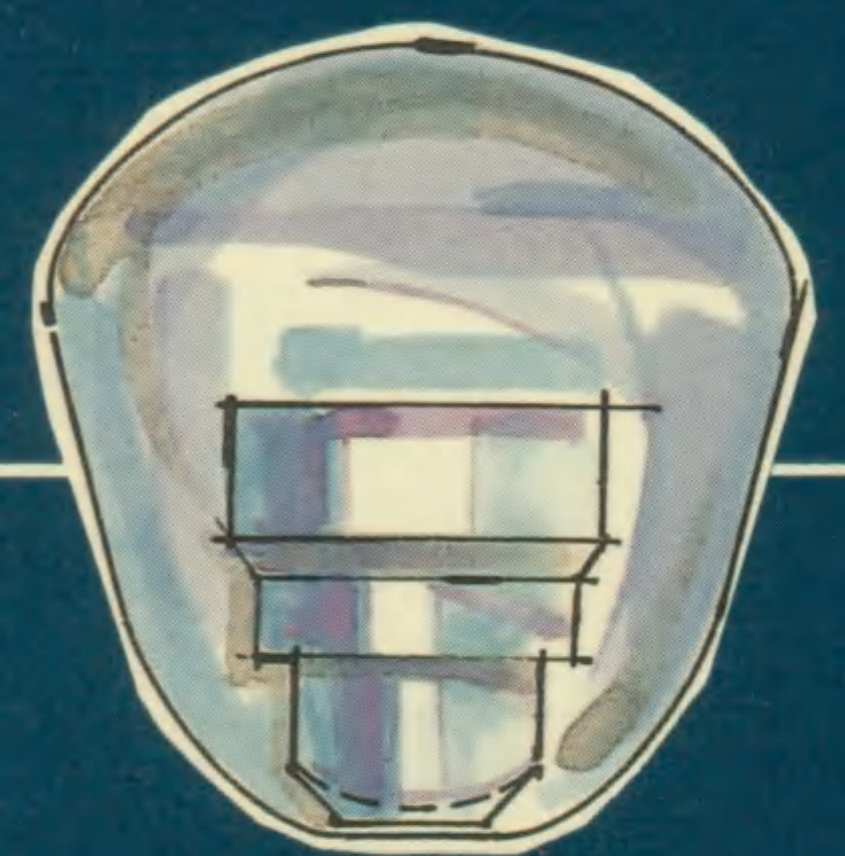


Small, Modular And Multiple

Large, Aerial Camera-Like In The Traditional Sense



Single Wide Angle Low-Altitude



Approaches to Electro-Optical Sensors and Recorders

Reconnaissance

ears, the Phantom II is being considered by the U.S. Air Force to be the first aircraft to receive the Tactical Air Reconnaissance System (TARS) program.

link, a recorder/playback device, and an imagery data management system – is destined for manned and unmanned aircraft.

athering devices. They generate reconnaissance information in the form of computerized

. Low-quality images can be computer enhanced or "cleaned up" and the information

transmitted to decision-makers on the ground. It can also be recorded and stored for

oxic and time-consuming chemical/film processing is eliminated.

data management systems on the market. The challenge is to

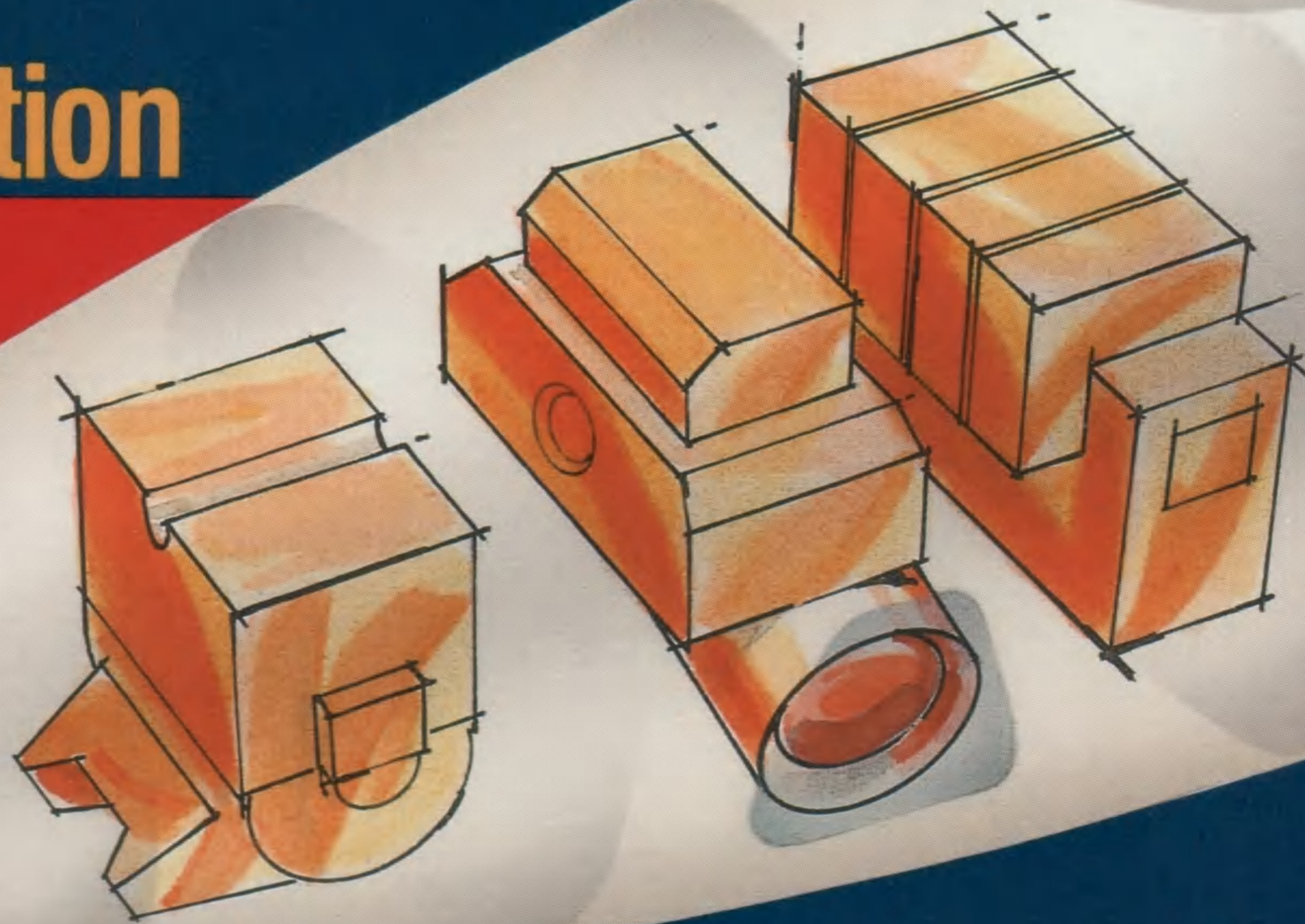
phantom II and other aircraft that are selected to receive the TARS

re than 40 years of experience in military aircraft production and

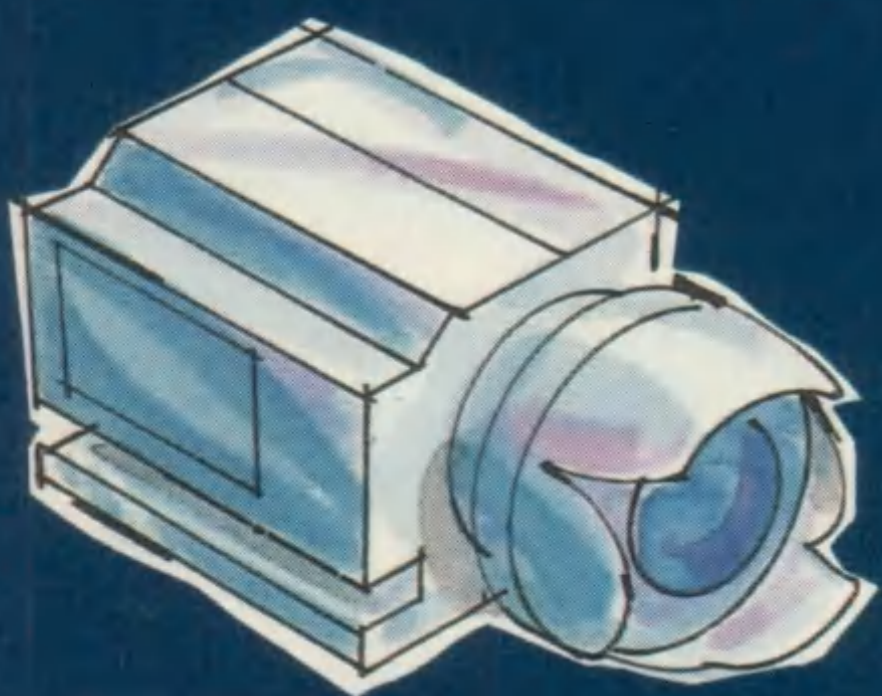
Donnell Aircraft Company can develop the most effective

reconnaissance system for the 1990s and beyond.

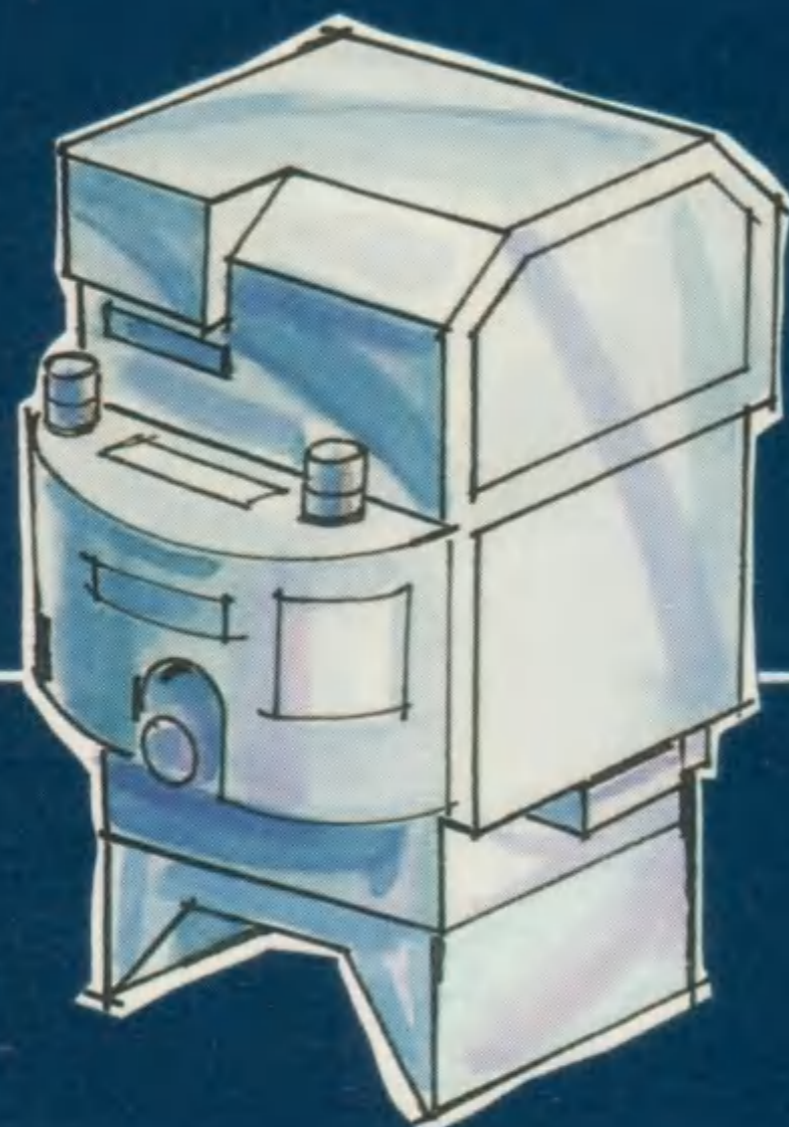
Air Force Solution



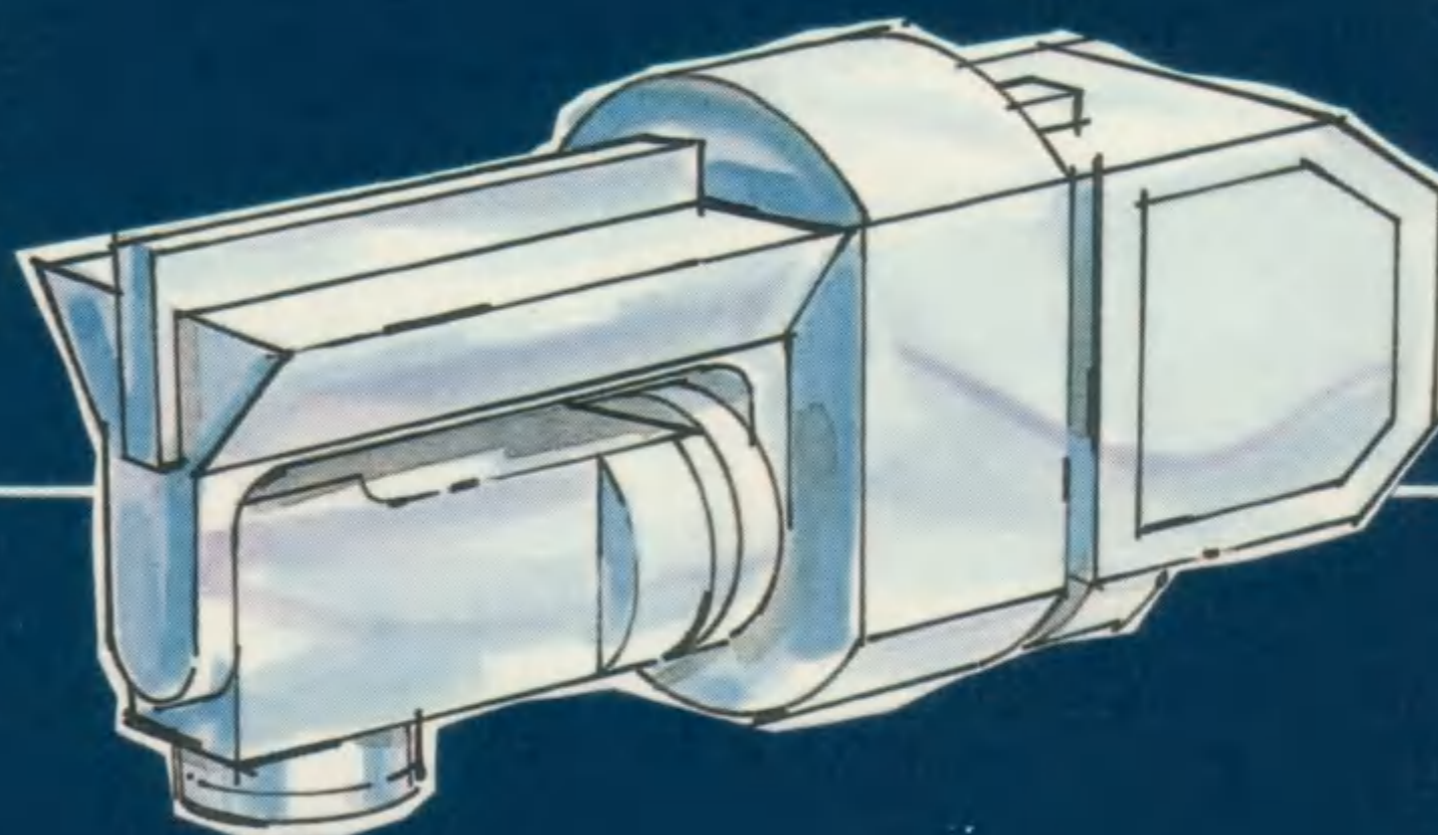
Tri Lens — Wide Angle,
Modular Array



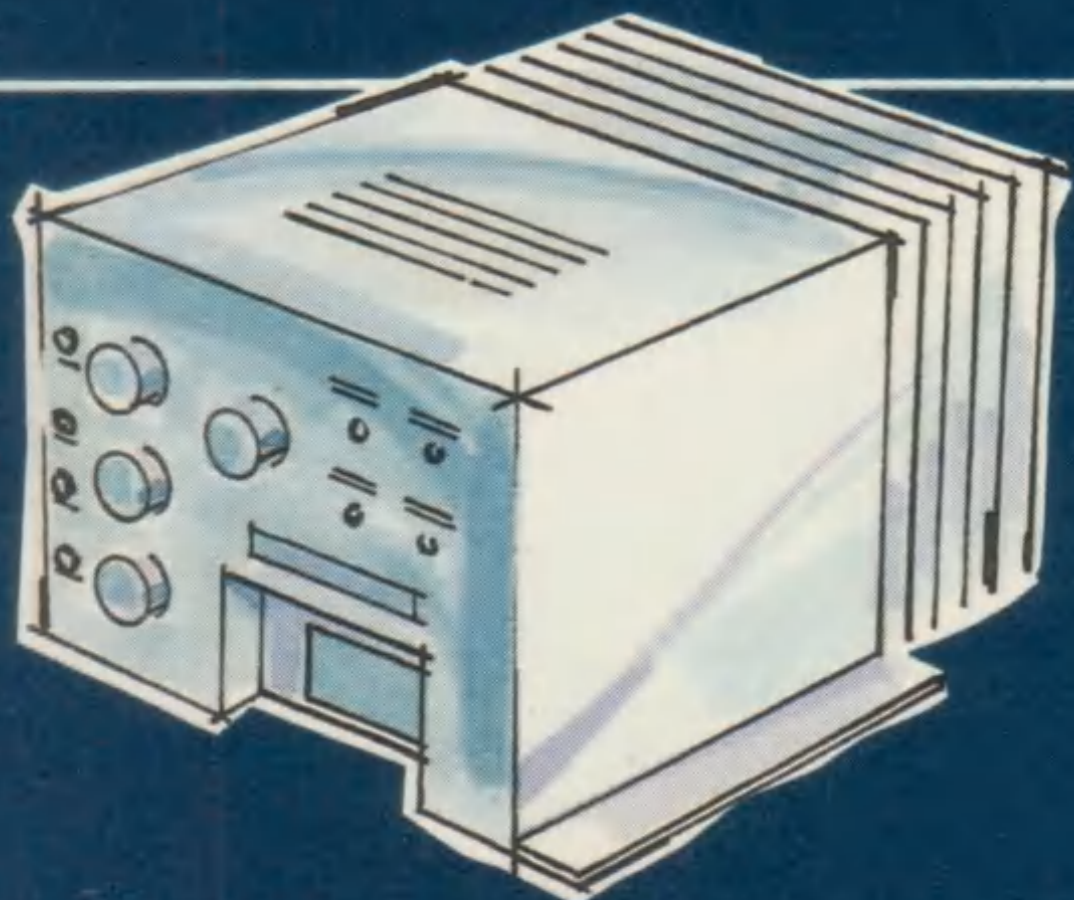
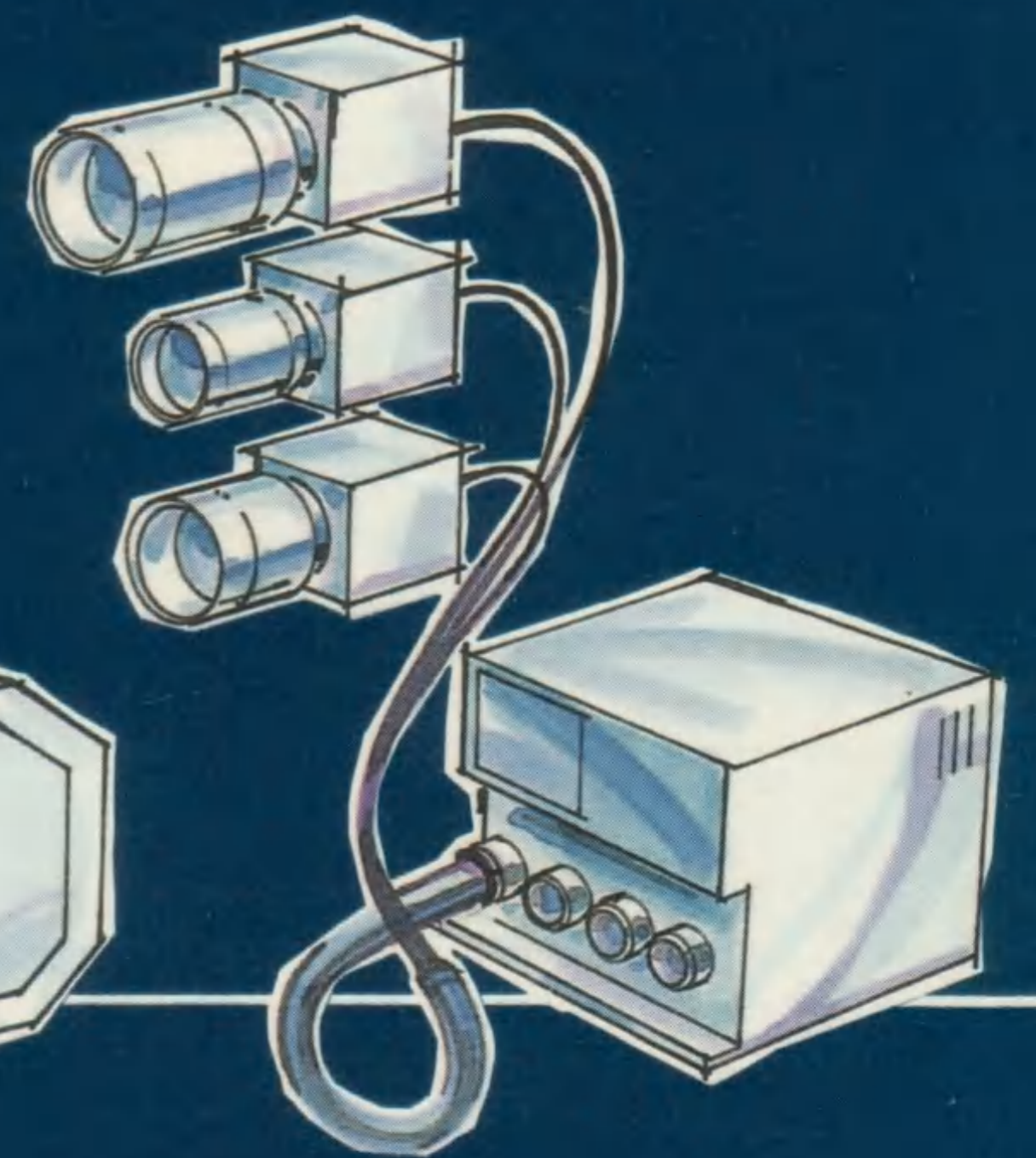
Low-Altitude



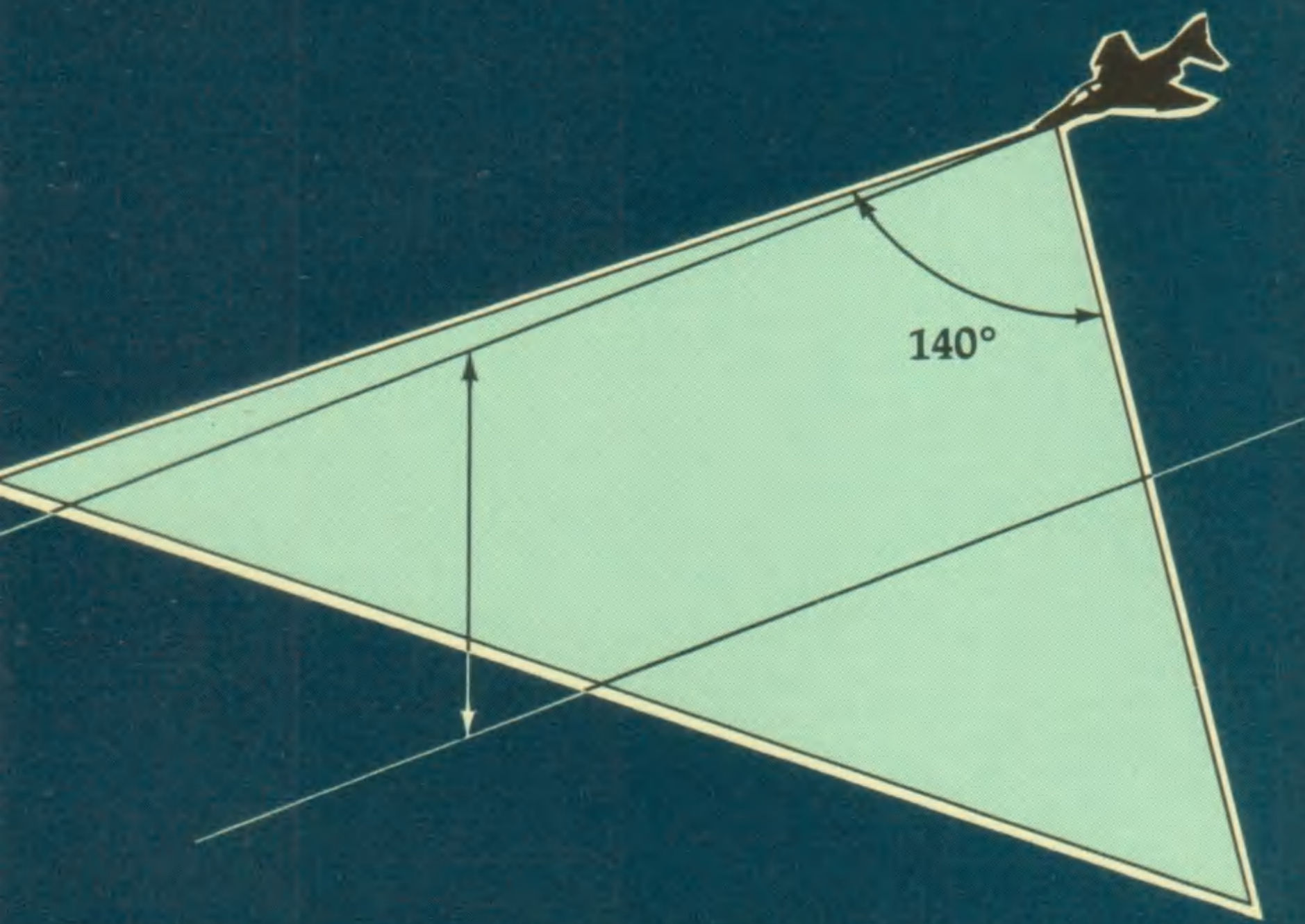
24 In Focal Length
Medium-Altitude



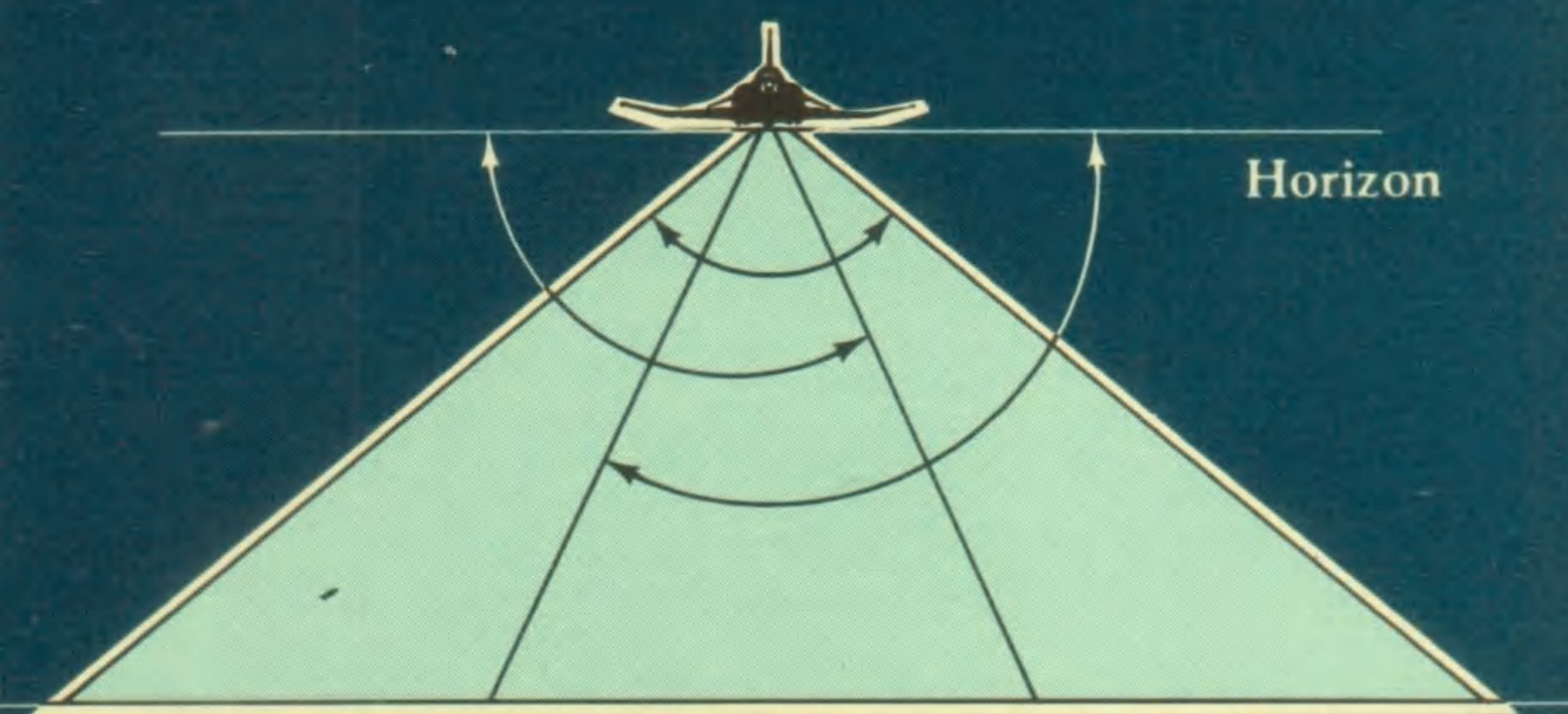
Sensor Array



Collection Modes



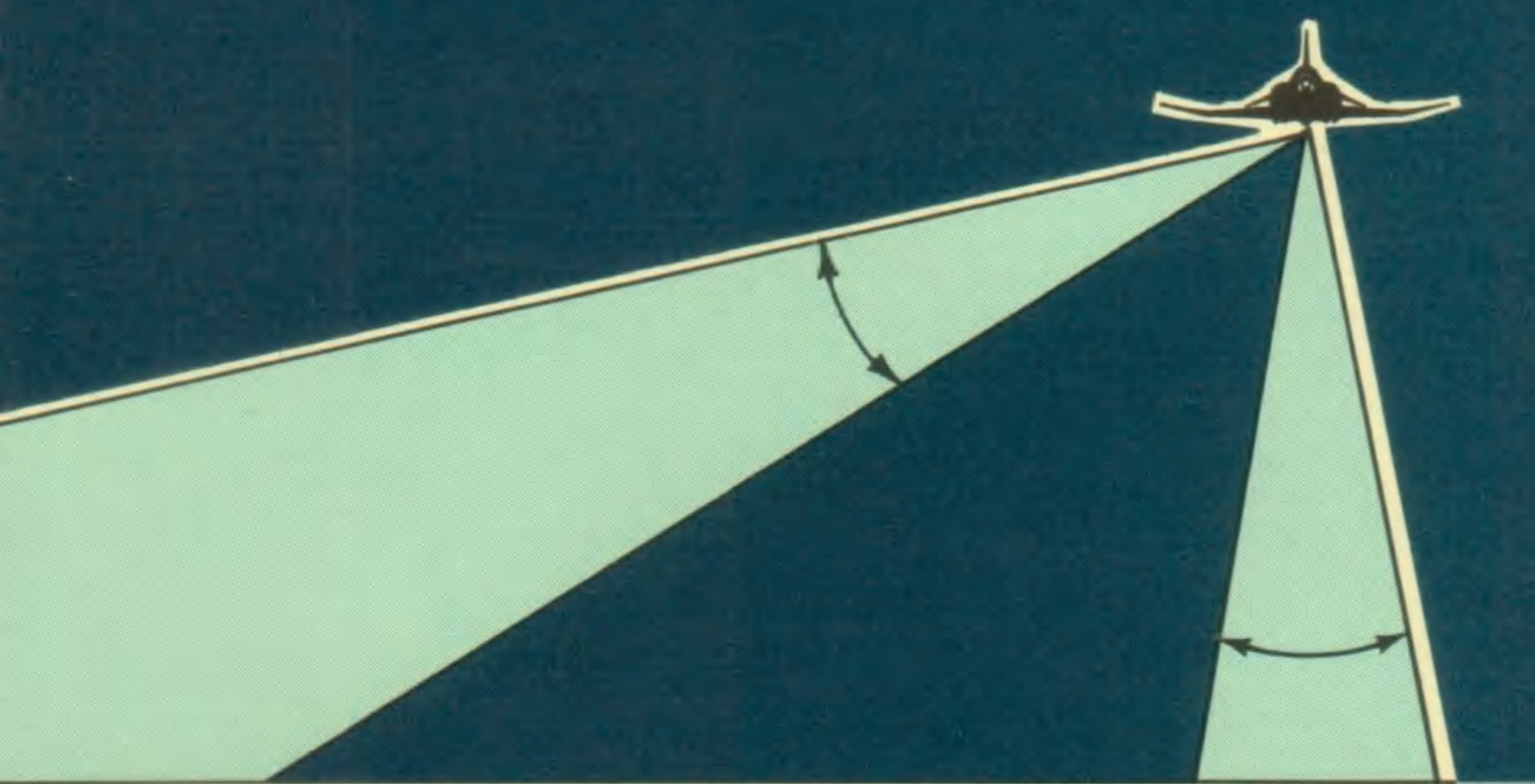
EO FOB "Pushbrooms" a strip in front of the aircraft



IRLS (Modified AAD-5) - Left Oblique, Right Oblique, Vertical - in either 60 or 120 degrees FOV



EO Wide Angle, Vertical has 140° FOV

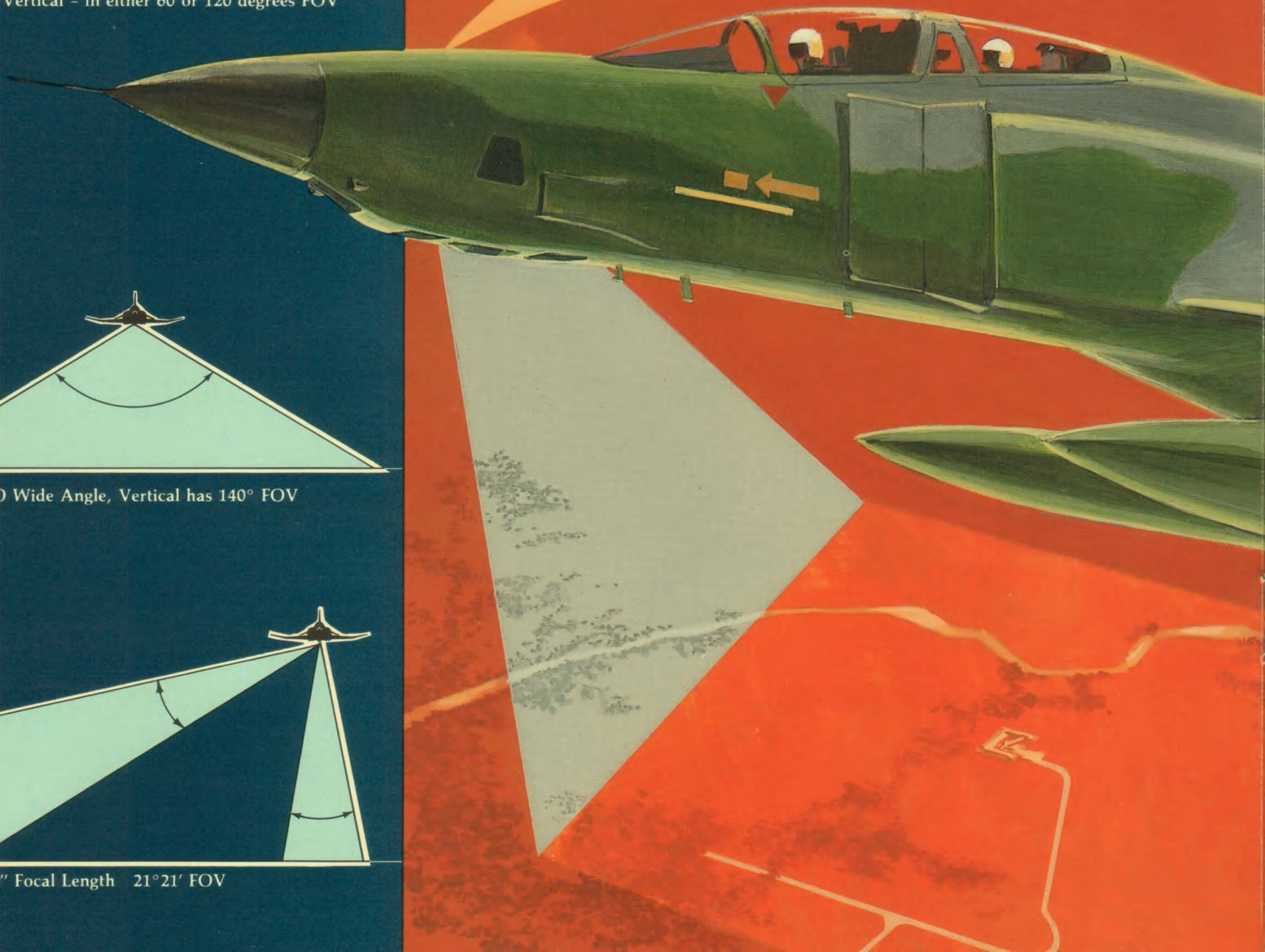


EO 24" Focal Length 21°21' FOV

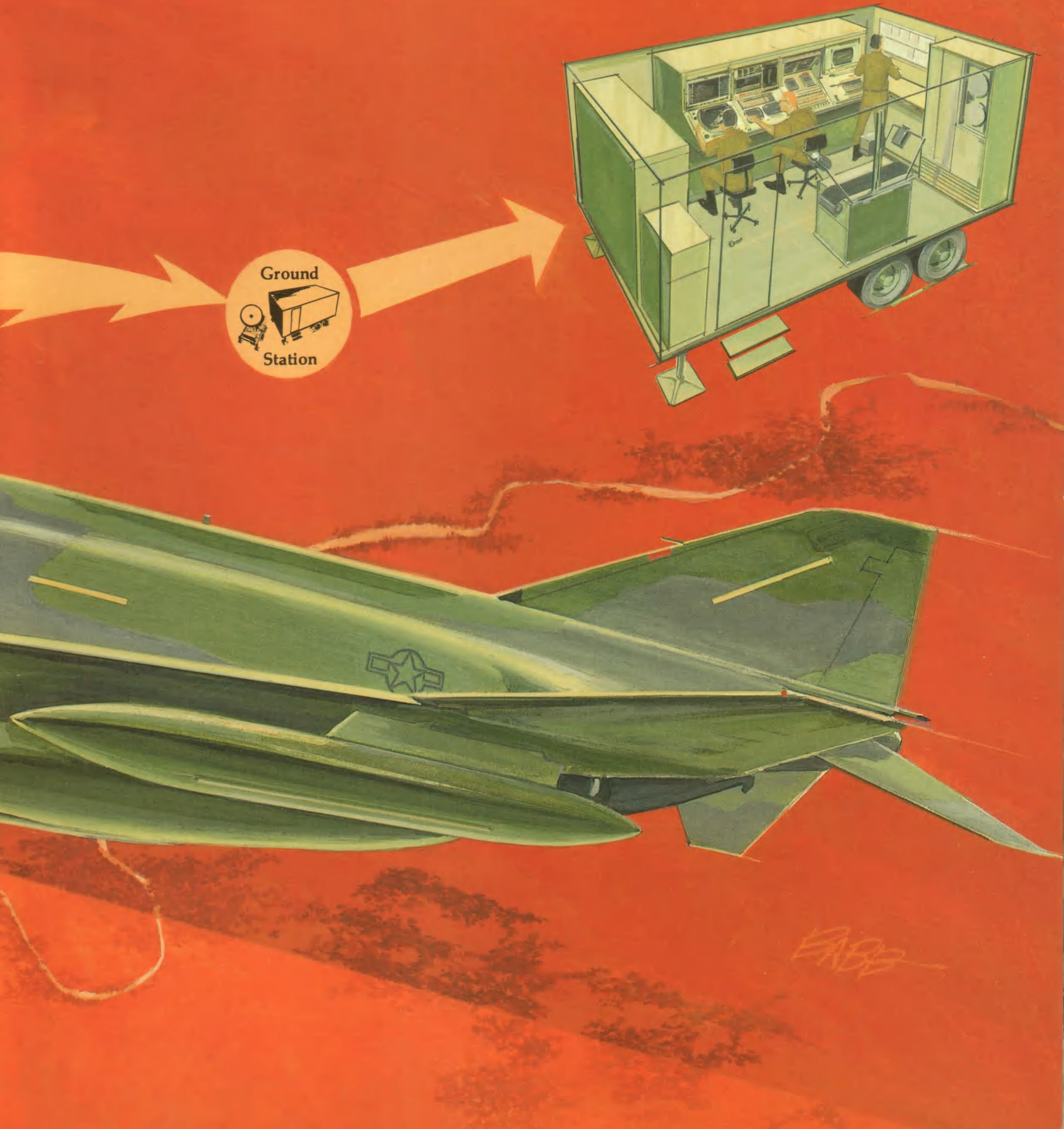
Real-Time

With data link capabilities, reconnaissance information that is gathered by either manned or unmanned aircraft can be instantaneously transmitted to a ground station where commanders can use it to make decisions quickly. Both aircraft and the ground station can store the data for later manipulation and/or evaluation.

DATA LINK



Scenario



The Most...
The Best...



During the past three decades, McDonnell Douglas Corporation has built more than 1,200 tactical-reconnaissance aircraft — more than any other manufacturer in the free world. Included in this number are the following:

- 505 RF-4C – U.S. Air Force
- 46 RF-4B – U.S. Navy and Marine Corps
- 162 RF-4E – Six foreign countries
- 252 RF-101 – U.S. Air Force
- 102 RA-3B – U.S. Navy
- 200 RB-66 – U.S. Air Force
- 60 F-2HP2 – U.S. Navy

MCDONNELL DOUGLAS

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