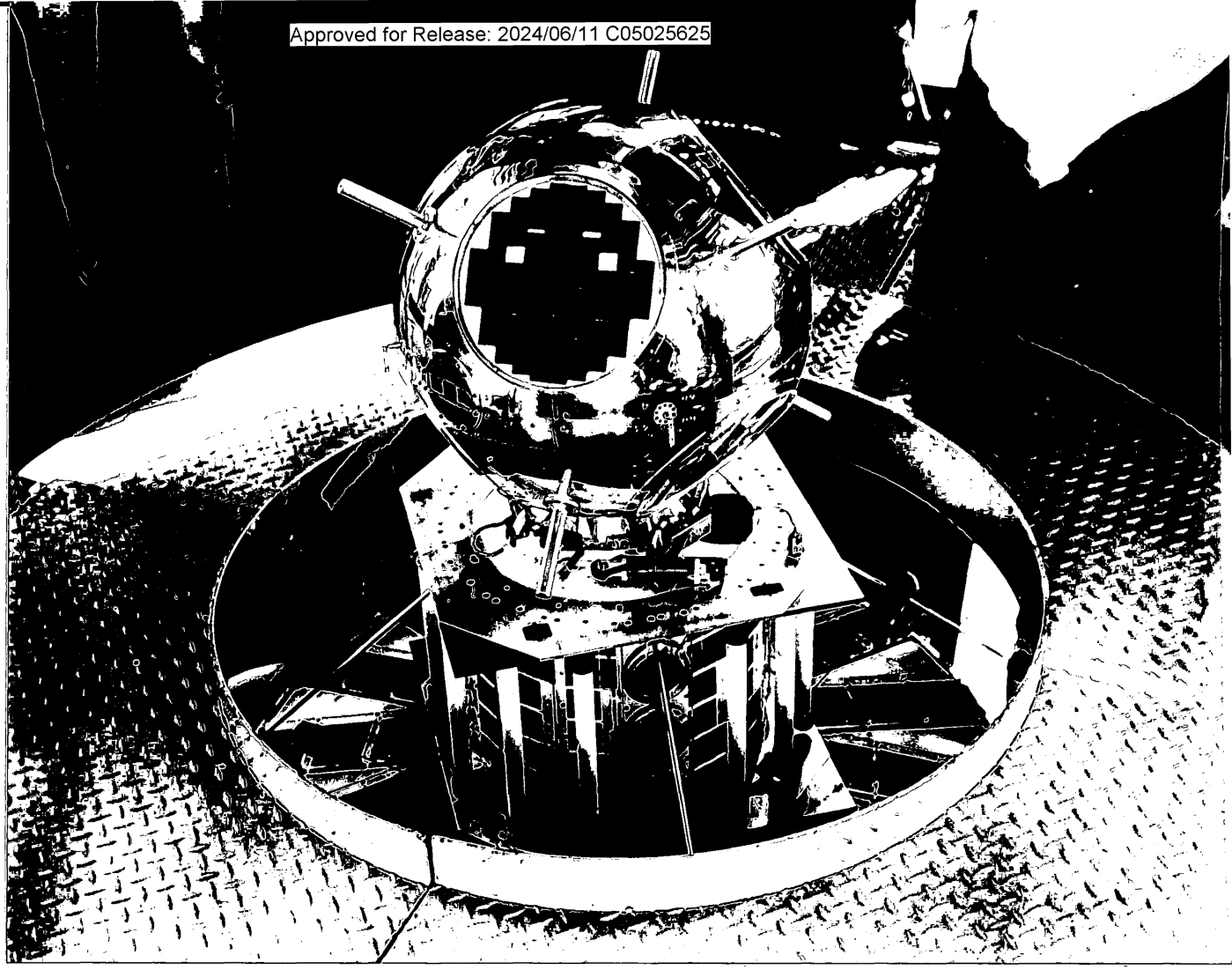

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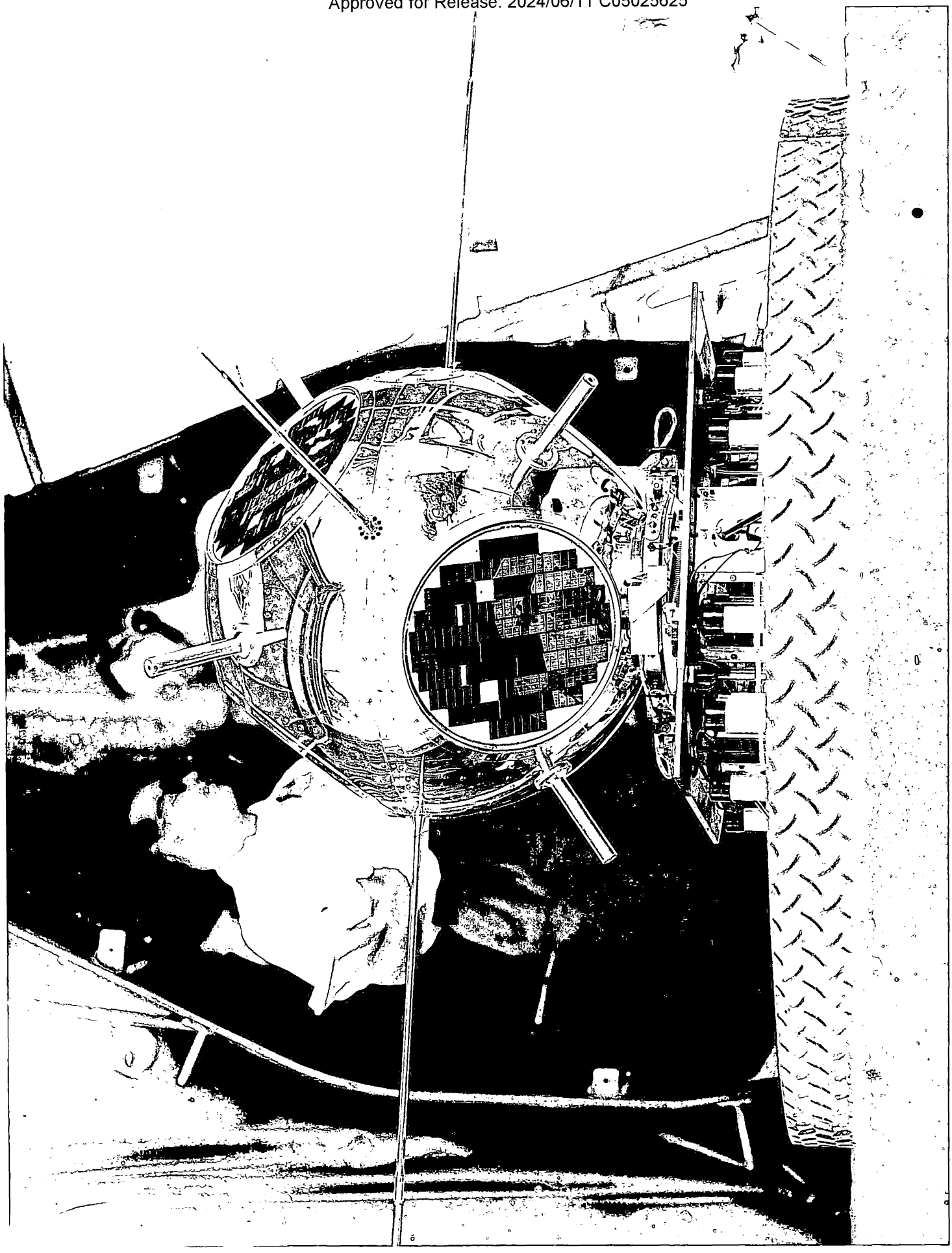

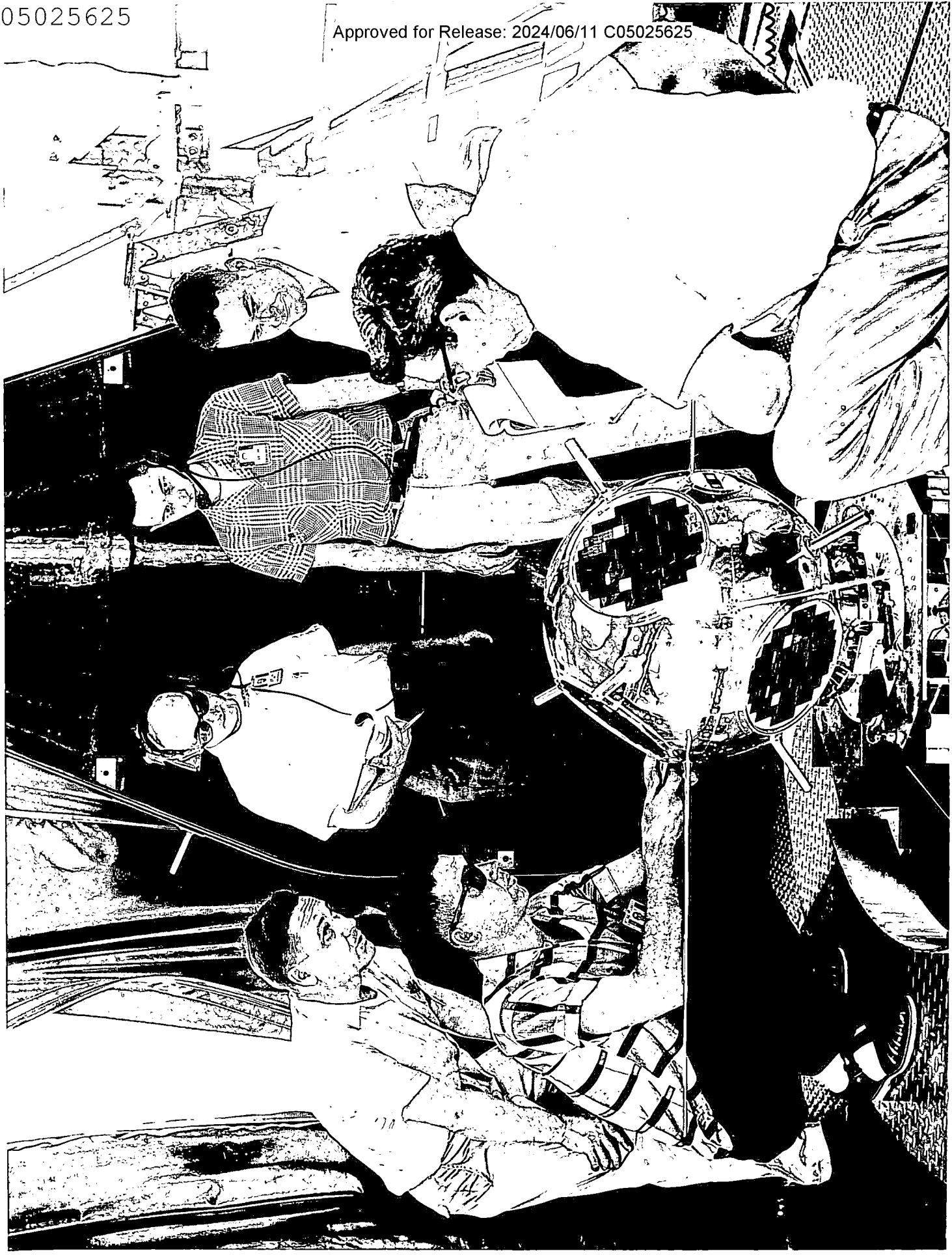

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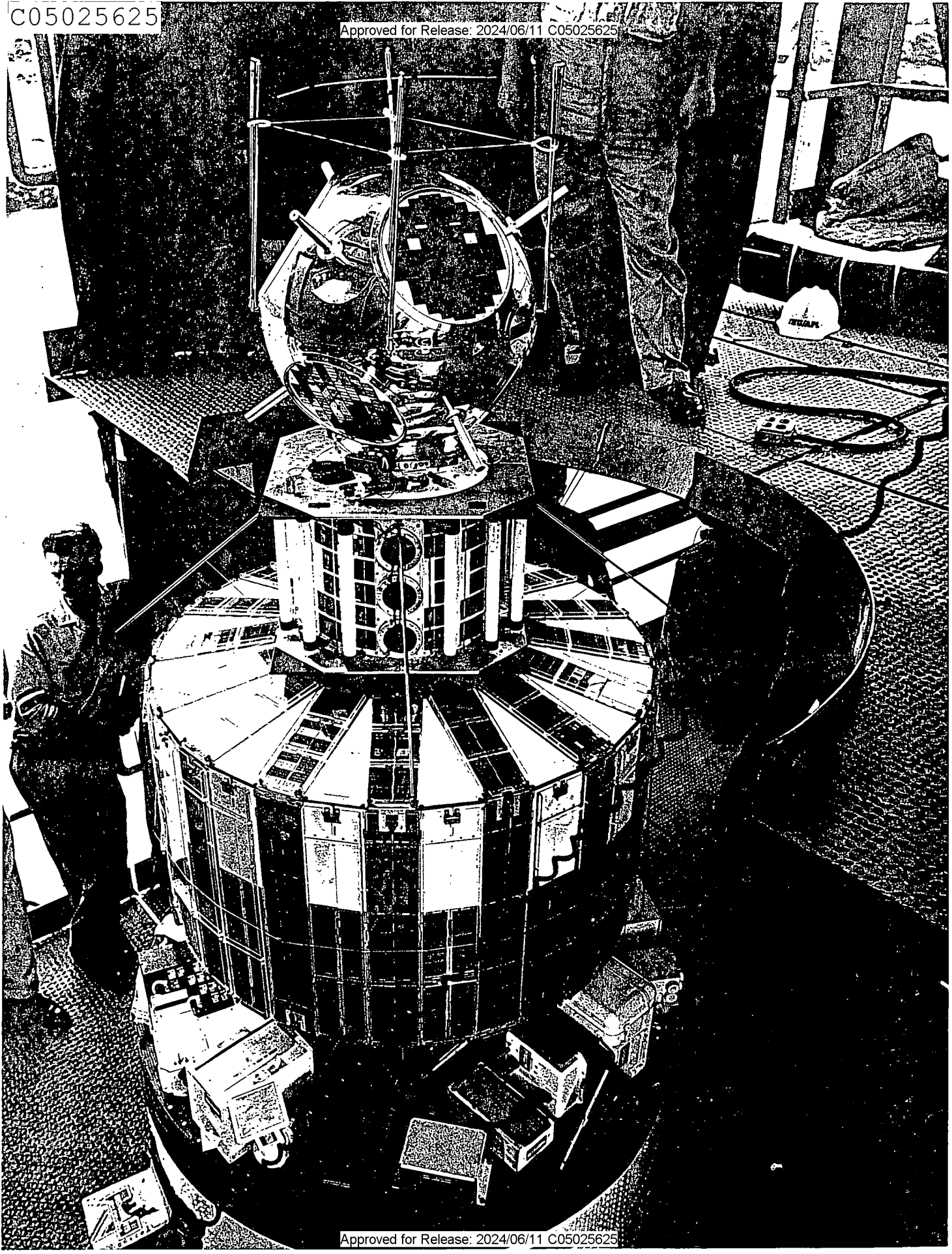
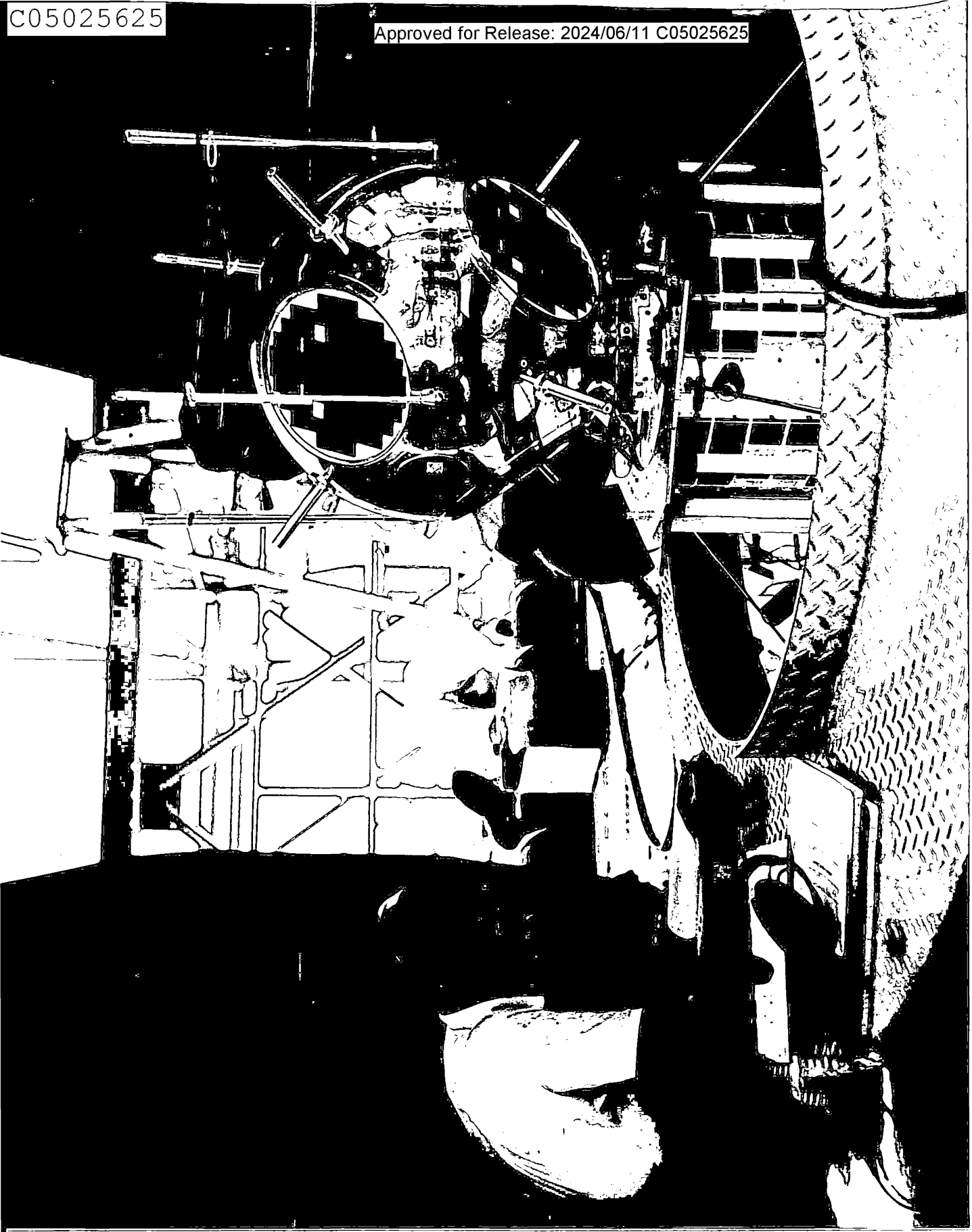
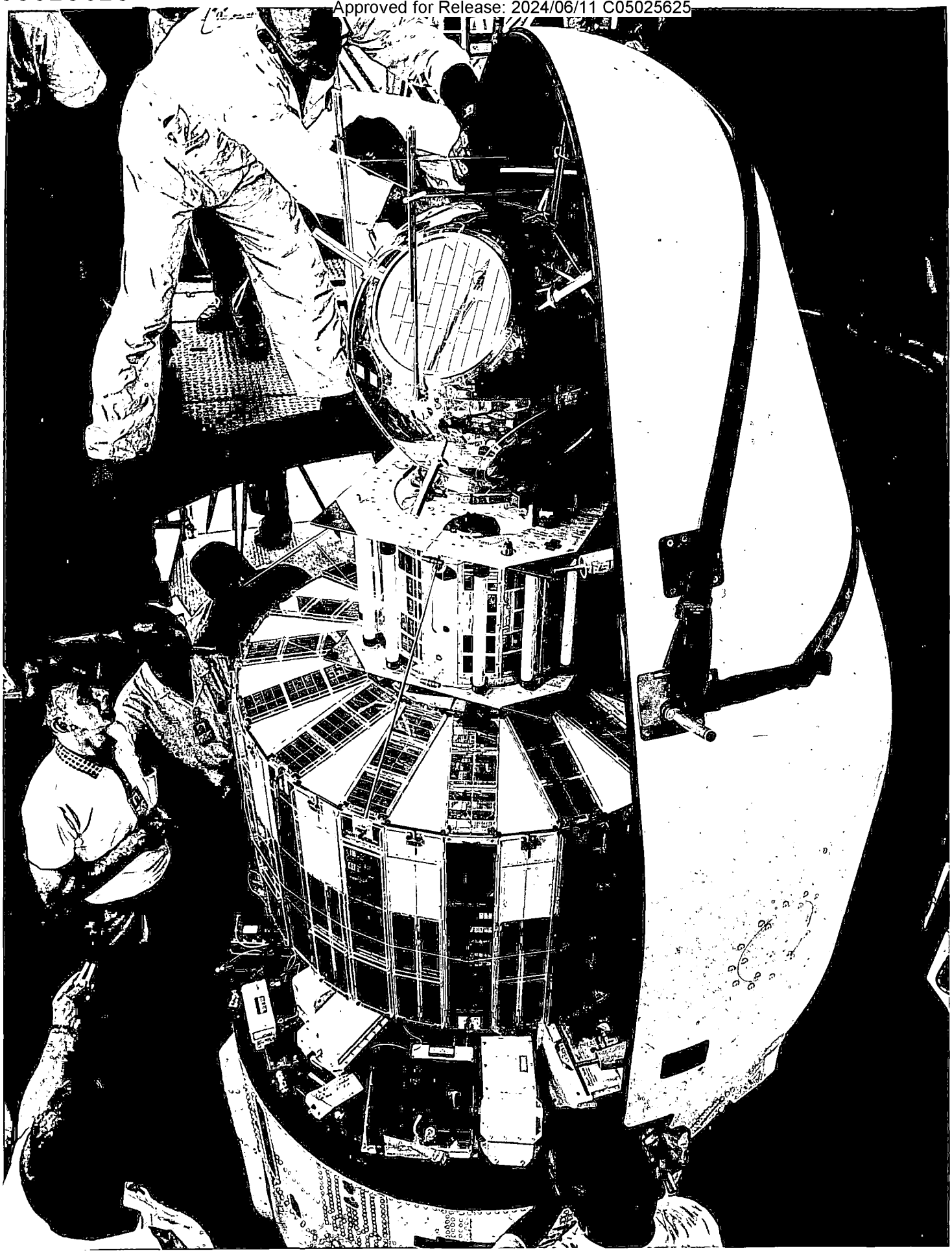
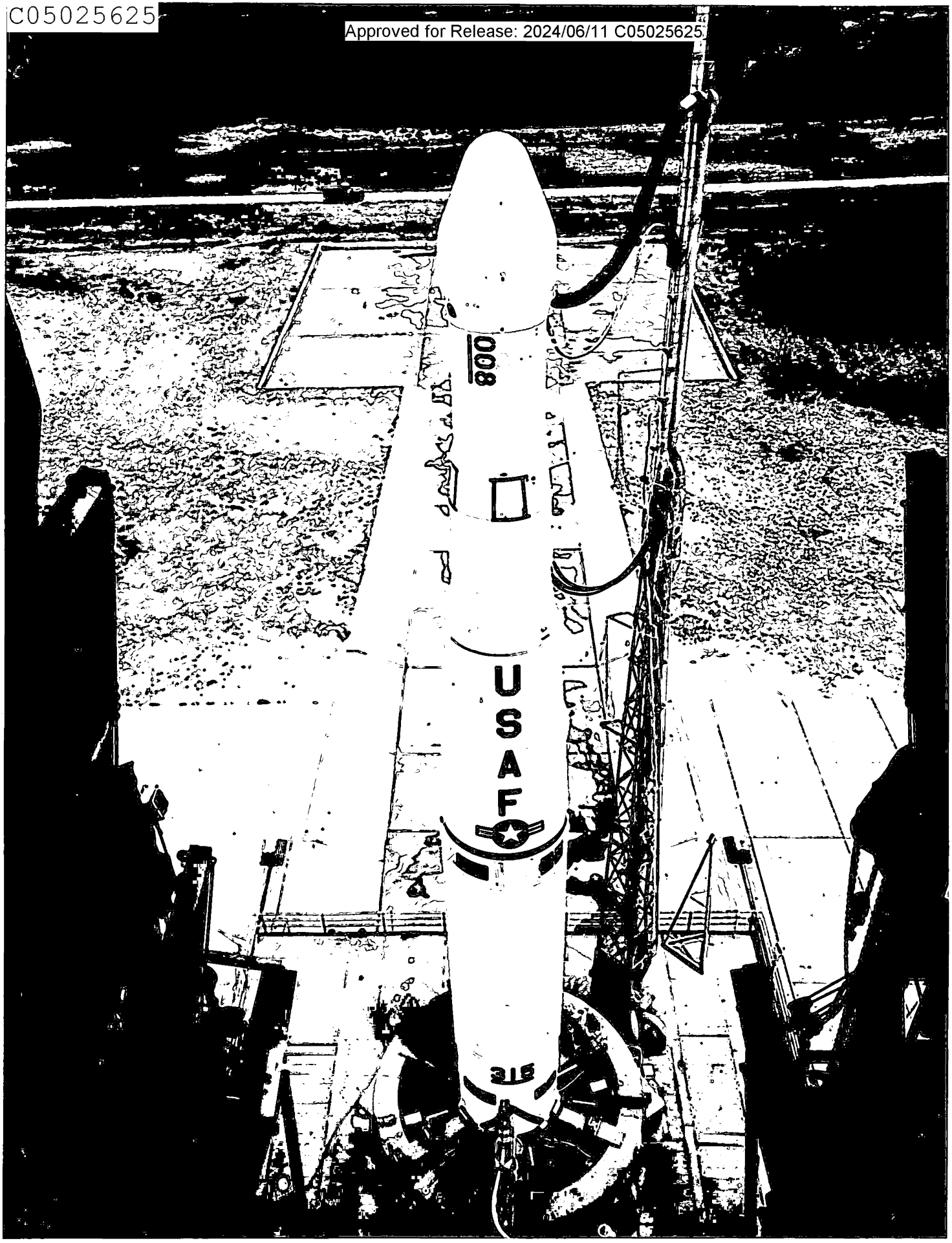
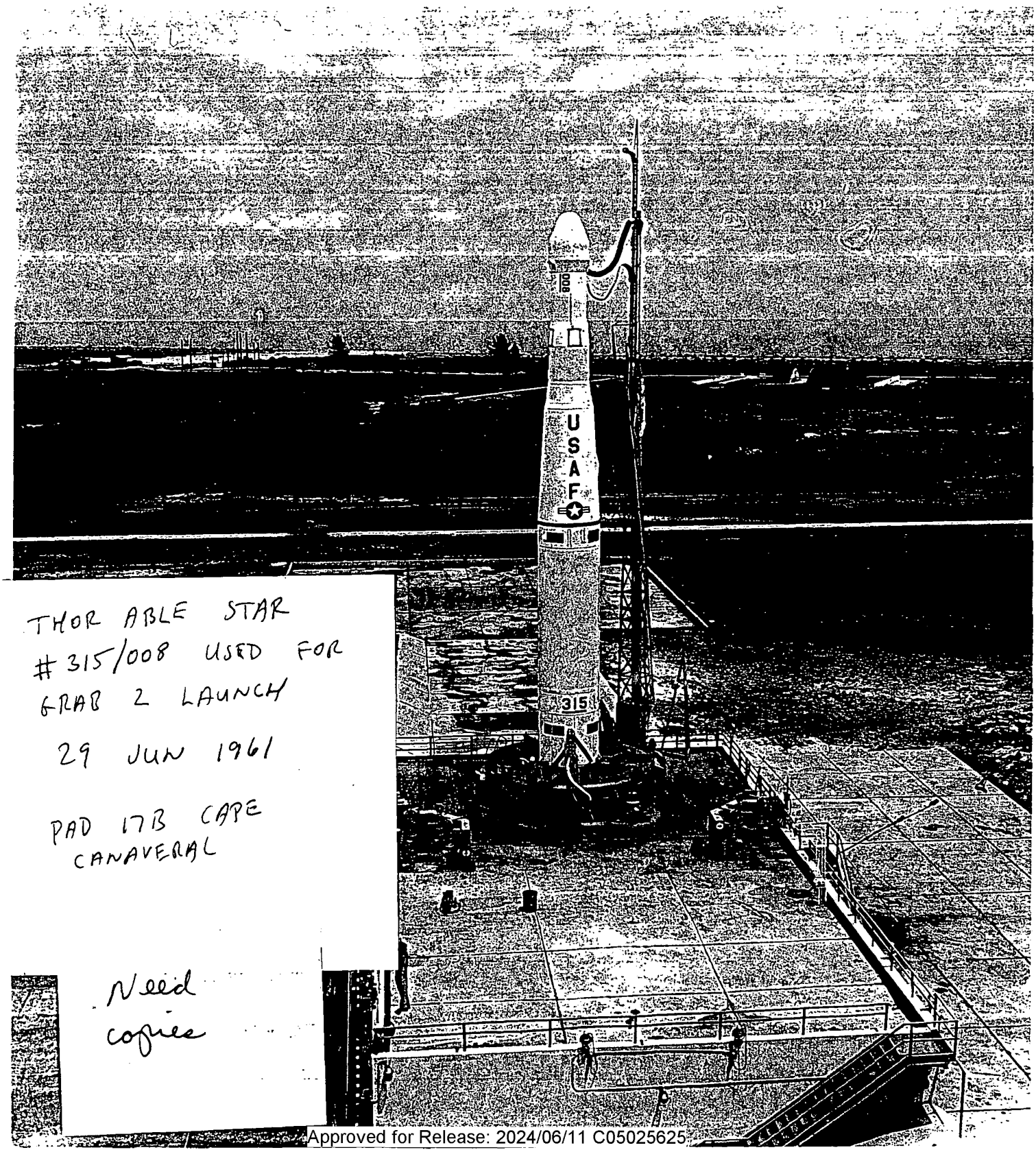






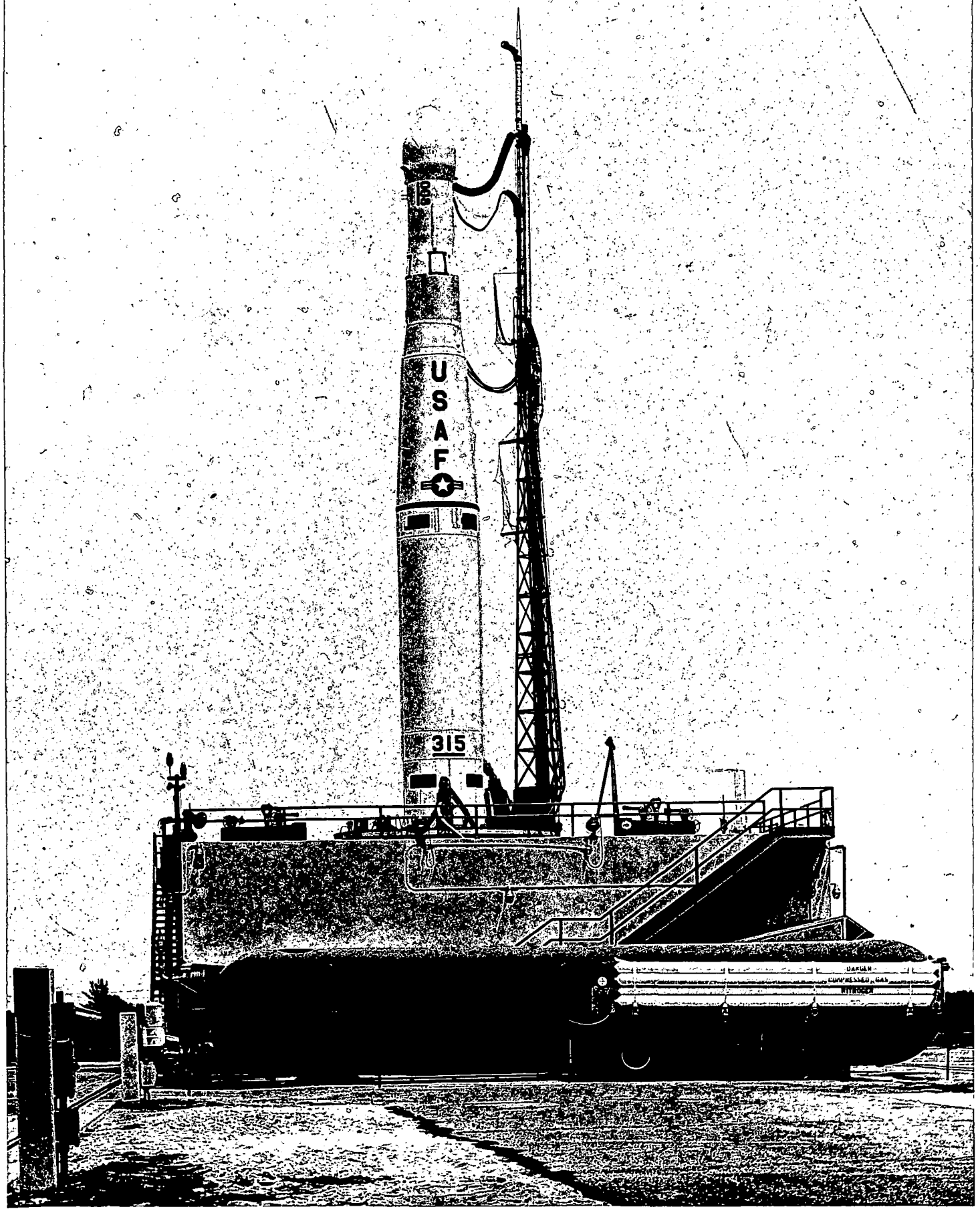




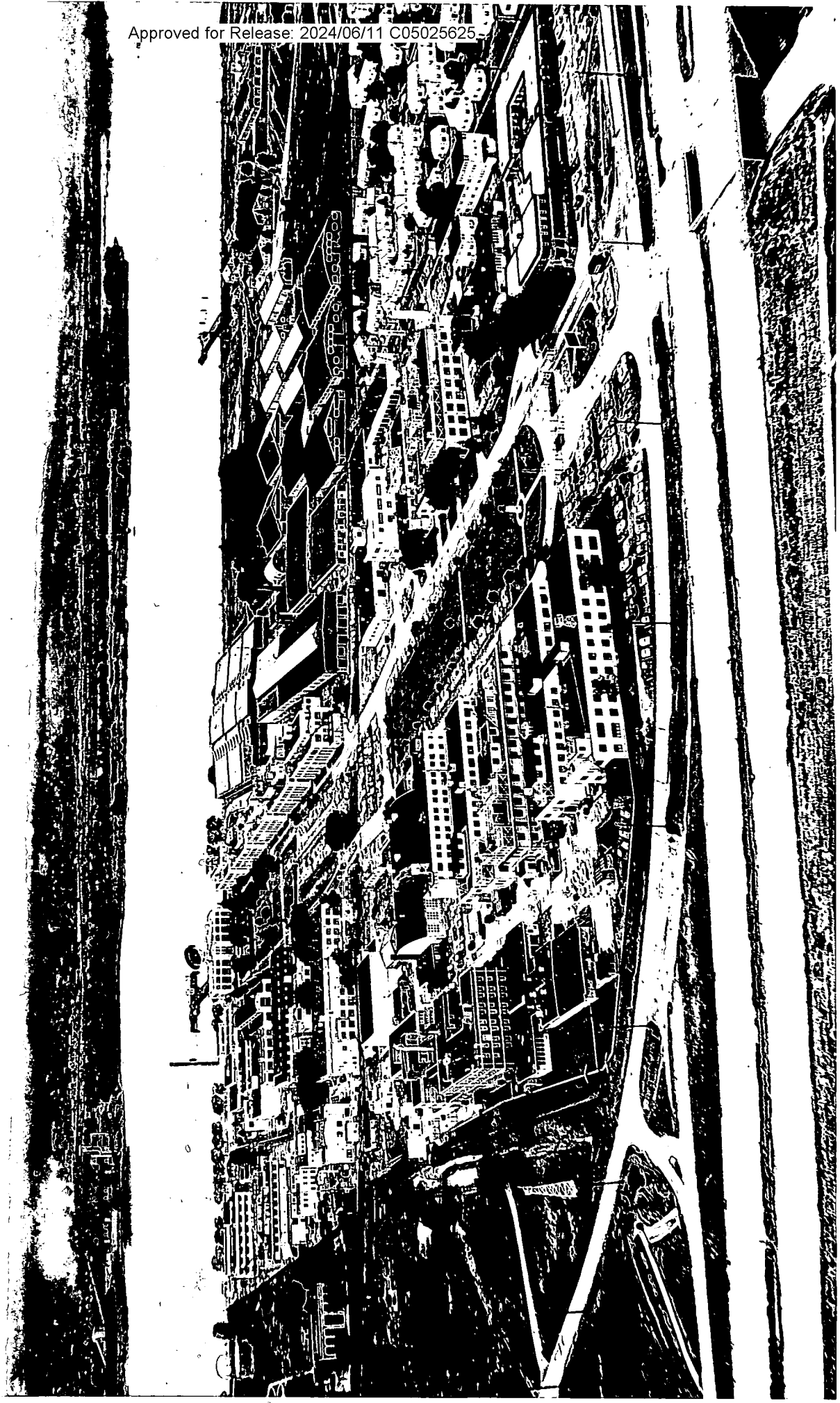
THOR ABLE STAR
#315/008 USED FOR
GRAB 2 LAUNCH
29 JUN 1961

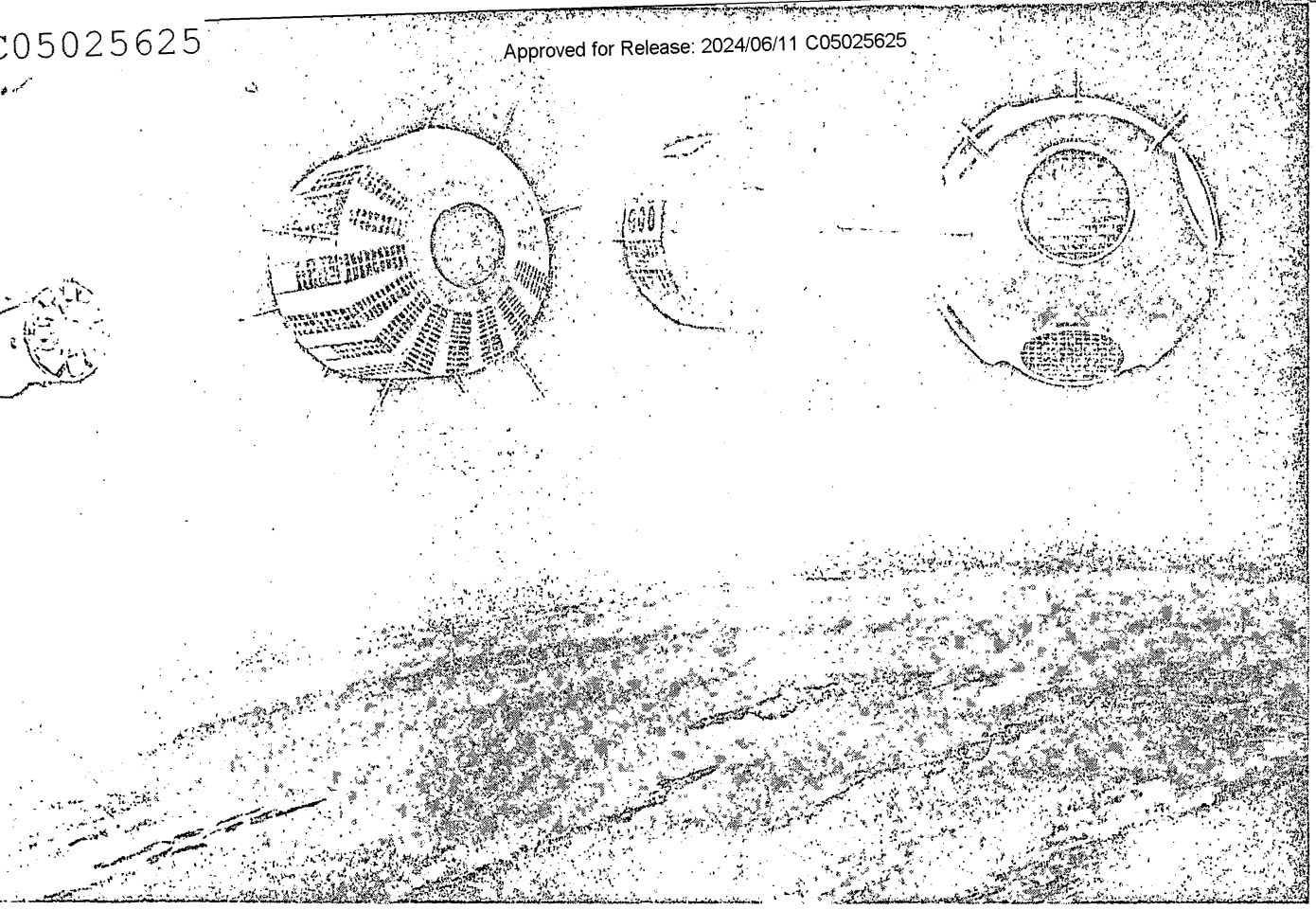
PAD 17B CAPE
CANAVERAL

Need
copies



Opening of new Communications C... June 1961. Personnel present, left to right:





ABLESTAR UPPER STAGE, TRANSIT IV-A, INJUN AND GREB (l to r)

TRANSIT IV-A (1961 OMICRON 1)

Date orbited .....28 June 1961
Other name....."Triple Satellite" Transit and two piggyback satellites, Injun and Greb III (see next items)
Launch site .....Cape Canaveral
Diameter .....43 in. (Transit only, 16-sided polygon)
Length .....31 in. (Transit only)
PAYLOAD:
Gr. Wt. .....1622 lbs.
Net wt. ..265 lbs. (all three satellites)
Net Wt. .....175 lbs. (Transit only)
Orbit .....Equatorial-polar (slantwise); circular
Inclination to equator .....66.68°
Perigee .....550 m.
Apogee .....629 m.
Period (min.) 104
LAUNCH VEHICLE:
Name .....Thor-Able-Star
Lift-off wt. .....120,000 lbs.
INSTRUMENTATION:
Same as Transit III-B plus following ..
➔ Transmitter broadcasting its exact position (data from ground computers) every 11.18 seconds
Transmission ....Still on: could possibly continue for 5 years (but will be turned off before then)
Radio/telemetry frequencies .....Two transmitters, 54 mc and 320 mc (nuclear powered);
Two transmitters, 162 mc and 216 mc (battery/solar-cell powered)
Power supply .....
➔ SNAP 3 variant, producing 2.7 watts; nuclear source is plutonium-238 whose heat is converted to electricity by thermo-couples; dimensions, 5" by 5.5", weight 4½ lbs. (SNAP means System for Nuclear Auxilliary Power)
➔ Conventional nickel-cadmium batteries and solar-cells for other two transmitters
Lifetime .....50 years plus
DISCOVERIES, FEATS, SPACE FIRSTS:
➔ First orbiting of triple satellites
➔ First use of nuclear power unit in a satellite
➔ Broadcasting of Transit's position establishes the most accurate time system known (based on known orbital data) that will be available around the world; previous time-signals (radioed from the official time bureau) bounced off the ionosphere before reaching other places, thus introducing time-lag errors, which Transit's straight-down signals reduce almost to zero.
SPECIAL NOTE:
The use of the nuclear SNAP 3 electrical generator is of high significance, inaugurating long-lifetime power sources needed for coming ComSats, deep-space probes, and such. The 4½ pound atomic-powered "battery", able to deliver no less than 2.5 watts for 5 years, is equivalent to 5 tons of conventional batteries.

INJUN (1961 OMICRON 2)

Diameter .....16 in. (cylindrical)
Length .....13 in.
PAYLOAD:
Net Wt. .....35 lbs.
Orbit .....Slightly different from Transit, after separation. (But Injun and Greb III failed to separate from each other.)
INSTRUMENTATION:
➔ Magnetic attitude control
➔ Photometer (to observe air-glow phenomena)
➔ 6 radiation counters and sensors
Lifetime .....50 years plus
DISCOVERIES, FEATS, SPACE FIRSTS:
Missions are as follows.....
➔ Plotting of auroral phenomena (Northern lights)
➔ Plotting of outer Van Allen Belt
➔ Measurement of charged particles in Van Allen Belts
➔ Observations of air-glow and tracing particle-flux.
➔ Study of oxygen green-line (in auroras)
➔ Study of auroral light intensities

GREB III (1961 OMICRON 2)

Other Name .....NRL Solar Radiation III Satellite
Diameter .....18 in. (spherical)
PAYLOAD:
Net Wt. .....55 lbs.
INSTRUMENTATION:
2 X-ray sensors
Lifetime .....50 years plus
DISCOVERIES, FEATS, SPACE FIRSTS:
Missions are as follows.....
➔ Tabulating solar-X-ray emissions
➔ Plotting how solar X-rays disturb the ionosphere
➔ Seeking basic data on cause of radio blackouts on earth during periods of solar-flare activity

VISTAS IN SCIENCE

By THOMAS R. HENRY

Multi-Mission Satellites at Work

Three Navy satellites, launched into space together with a single rocket and each with a different purpose, now are circling the earth.

First is one in a series in the Navy's program to develop an all-weather, world-wide navigational system based on signals from such man-made moons. This one is described as a considerable improvement on any launched before. It has an improved memory system, including an absolute time system. It will transmit orbital data continuously.

A properly equipped ship at sea, according to the Office of Naval Research report, will be able to compute its own position from this data and its own velocity as revealed in the apparent change in the pitch of the signals. This change in pitch, known as the Doppler effect, is used commonly in radio telescope observations.

Measures Sun's X-Rays

Second is one of a series of Naval Research Laboratory satellites designed to measure the intensity of X-ray emissions from the sun. Solar storms produce changes in the earth's ionosphere, which in turn cause considerable disturbance to long-range radio communications. The disturbances are accompanied by large, rapid increases in solar X-ray intensity.

The third Navy satellite was designed by Dr. James Van Allen of Iowa State University as part of a research program he is directing under the Office of Naval Research. This deals with measuring the intensity of cosmic radidiation and investigating the northern and southern lights.

Dr. Van Allen, who discovered the belts of intense radiation surround the earth that now bear his name, has developed a theory that auroral displays are caused when charged particles, trapped in the outer radiation belt, are dumped into the upper atmosphere in Arctic regions. Indications are that the outer belt has a horn that extends deep into the atmosphere forming a "leak" through which trapped particles enter the atmosphere, especially during magnetic storms.

Data from the satellite will provide more information for use in studies of auroral phenomena on radio propagation in the polar regions, and the connection between solar flares and both auroral displays and radio blackouts.

The Navy has developed a new system for rapid rescues from the sea or remote land areas by means of long range fixed-wing aircraft.

This system now is in the final evaluation stage before acceptance.

In this rescue operation a specially designed packet is dropped to the stranded man. This packet contains a harness which is put on in the same way as a pair of overalls. A 500-foot braided nylon line is attached to the harness and a balloon envelope at the end of the line. A bottle of helium also in the packet is used by the man to inflate the balloon. When ready for the pickup the man releases the balloon which lifts the line to a height of 500 feet.

How It Is Done

The man awaits pickup in a seated position. The aircraft, equipped with a "yoke" or wide fork, approaches the line hanging just below the balloon at a speed of about 150 miles an hour. An automatic device in the crotch of the yoke secures the line to the aircraft and the balloon breaks away.

The man is lifted vertically in the air, slowly at first and then more rapidly as he progresses, in a parabolic trajectory during acceleration of the speed of the aircraft. The crew operating the rescue equipment on board the aircraft hooks a section of the line and secures it to a powered winch inside. The man then is reeled in through the hatch.

The accelerative stress on the man, according to a Navy report, is approximately a third that experienced in a parachute jump. The entire operation requires about seven minutes.

DEPARTMENT OF THE AIR FORCE
AIR INTELLIGENCE AGENCY

[redacted]
Director of History Office
102 Hall Blvd Ste 112
San Antonio TX 78243-7045

[redacted]
Naval Research Laboratory (Code 9100)
4555 Overlook Ave, S. W.
Washington DC

Sir,

A meticulous search through unit histories failed to produce names of collection operators or crew chiefs you requested for your upcoming 75th Anniversary. We are sending along three unclassified photographs. As these have been taken from official unit histories, we ask that you return them as quickly as you have made suitable copies.

Best wishes for a successful anniversary celebration.

Sincerely,

[redacted]
Chief Historian

"Freedom Through Vigilance"

U. S. NAVAL RESEARCH LABORATORY
WASHINGTON 25, D. C.

IN REPLY REFER TO
1850-883:kez
SER: 8685
13 SEP 1961

Mr. Reid D. Mayo
Radio Division
U. S. Naval Research Laboratory
Washington 25, D. C.

Dear Mr. Mayo:

The Naval Research Laboratory is proud that a system conceived and developed at NRL is presently serving a most vital link in our national defense. In recognition of your contribution to this group effort, I am pleased to present your share of an interim incentive award on behalf of the Department of the Navy.

Sincerely yours,

A. E. KRAPF
Captain, U. S. Navy
Director

Encl:
(1) Check