~~SECRET~~ [redacted]

DECLASSIFIED UNDER AUTHORITY OF THE
INTERAGENCY SECURITY CLASSIFICATION APPEALS PANEL,
E.O. 13526, SECTION 5.3(b)(3)

ISCAP APPEAL NO. 2009-068, document no. 238
DECLASSIFICATION DATE: May 14, 2015

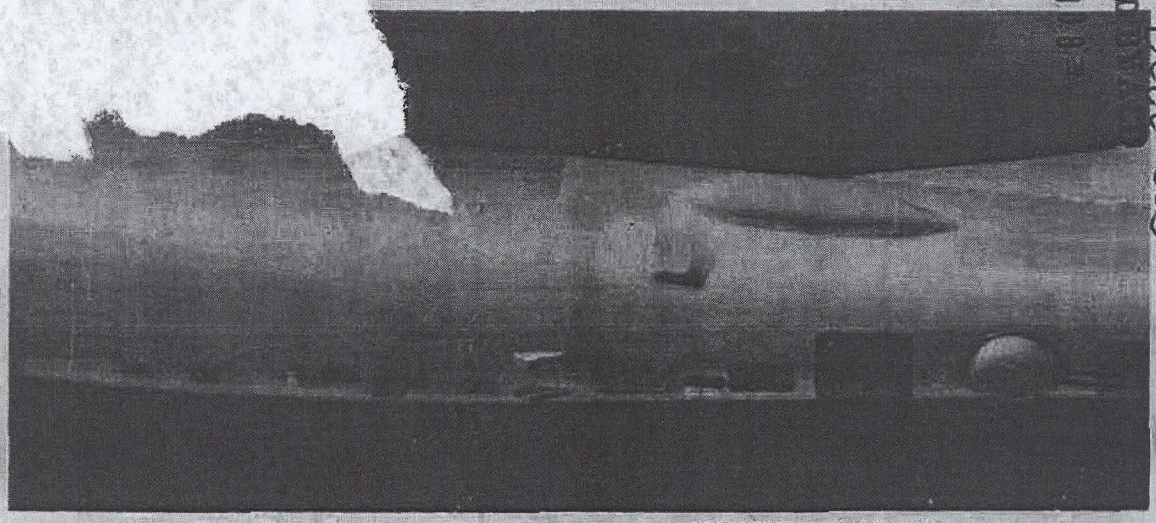
NORTH AMERICAN AIR DEFENSE COMMAND

WIR

WEEKLY INTELLIGENCE REVIEW (U)

PRIVILEGED INFORMATION

SEE INSIDE COVER FOR SAFEGUARDING GUIDE



MICROFILMED BY ADM

[redacted] ~~SECRET~~

SPECIAL HANDLING REQUIRED
This document is releasable only
to U.S. and Canadian Nationals

~~EXCLUDED FROM AUTOMATIC REGRADING, DOD DIRECTIVE 5200.10 DOES NOT APPLY~~ Group 1

WIR 6/70
6 Feb 70
NITA-P&E 70-456

MAR 3 - 1970
Postal Registry No. 1286621

SEP 21 1970
Postal Registry No. 45532

RAND LIBRARY
MAR-3 1970
K440 607-371
00080835
SCANNED
6 Feb 70

[redacted] SECRET

[redacted]

NORAD Weekly Intelligence Review

Issue No. 6/70, 6 February 1970

RETURN TO USAFHRC MAXWELL AFB AL 36112-6678

K410.607-371

The WIR in Brief

Portion identified as non-responsive to the appeal

Portion identified as non-responsive to the appeal

Space

RECSAT COSMOS 322 DEORBITED ~~(S)~~ 7
Normal mission of nearly 8 days flown.

SL-X, SAID TO BE LARGER THAN SATURN V, MAY BE OF ADVANCED PLUG-NOZZLE DESIGN ~~(S)~~ 7
This design suitable for large rockets with several small engines arranged in ring.

SL-7 LAUNCH ATTEMPT FROM PLESETSK FAILS ~~(S)~~ 8

Portion identified as non-responsive to the appeal

COVER: Belly of BEAR D (from COMICEDEFOR) (OFFICIAL USE ONLY)

NOTE: Pages 26, 28, 29, 32, 33, 36, 37, and 40 of this issue are blank.

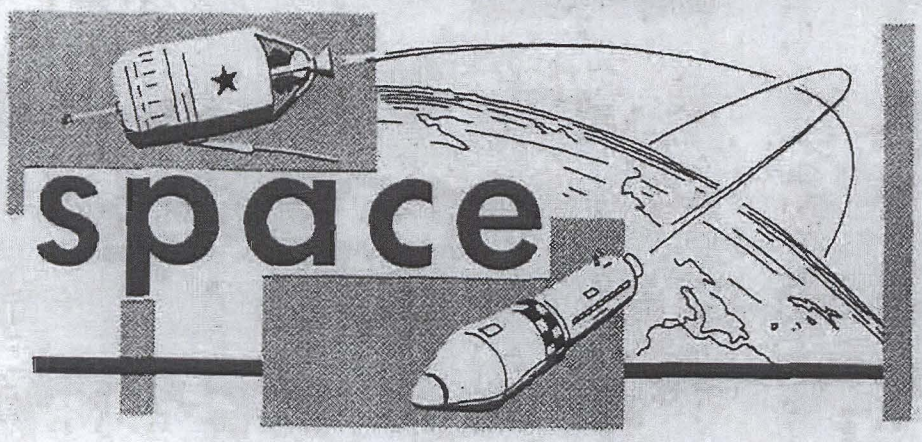
00880835

[redacted] FOR OFFICIAL USE ONLY

MICROFILMED BY ADM

[redacted]

SECRET



significant intelligence on space developments and trends

Recsat Cosmos 322 Deorbited (~~S~~)

Cosmos 322, the Soviets' second military recsat launched this year, was deorbited on Revolution 125 on 29 January after a flight of nearly 8 days. Impact is estimated to have occurred at about 0647Z at coordinates 5030N-5715E, or about 15 n.m. north of Aktyubinsk. (NORAD)
~~(SECRET)~~

SL-X, Said to be Larger than Saturn V, May Be of Advanced Plug-Nozzle Design ~~(S)~~

The USSR has thoroughly investigated advanced plug-nozzle rocket design, according to a key engineer of the Soviet space and missile programs.

A prime potential user of this design is the Soviets' SL-X (Western designation), a space booster which would develop 12-14 million pounds of thrust -- almost twice the 7.5 million pounds of the Saturn V, which launches the Apollo mooncraft.

In plug-nozzle design, many small engines are arranged in a ring around a shaped central plug which projects beyond the rocket nozzles (drawing on p. 31). The shape and location of the plug cause it to exert a nozzle effect for all the engines, augmenting over-all thrust.

The Soviet engineer, in discussing a sketch of a plug nozzle, indicated that the plug has a rounded base and that propellant tankage extends into the plug, thereby increasing propellant capacity slightly.

He earlier offered the concept of coaxial or concentric tankage as a means of reducing "boil-off" of cryogenic propellants, in which one propellant tank is surrounded by another, sharing a common wall. Ordinarily the propellant tanks are arranged in tandem. Concentric tankage would simplify propellant piping to the many small engines of a plug-nozzle design and facilitate redistribution of propellants to working or throttled

engines (which the Soviets favor) without any increase in weight or complexity.

A major problem of plug-nozzle design is rocket gas stagnation at the base of the plug. Temperatures of stagnated gas can reach several thousand degrees during launch. The Soviet engineer said, however, that rocket exhaust recirculation (which causes stagnation) was not a problem if the engine was small in relation to the base of the vehicle -- which would be the case for the plug-nozzle design.

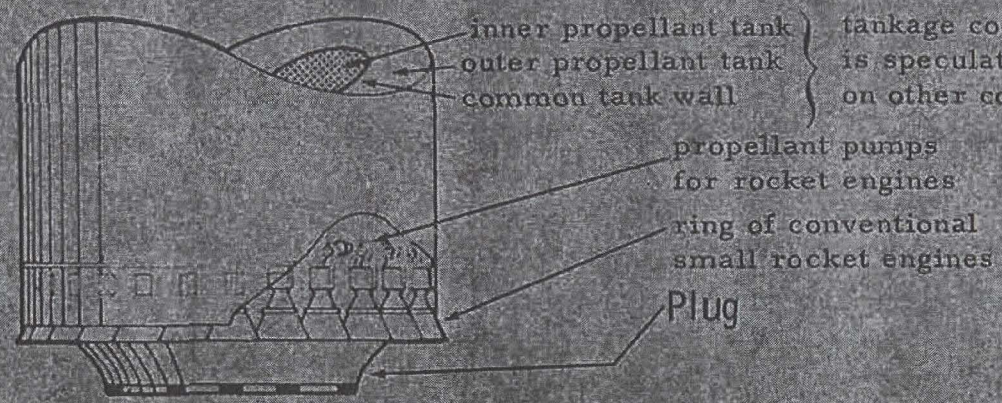
If the Soviets have adopted a plug-nozzle design for the SL-X, they presumably believe -- and may have experimentally confirmed -- that they have a workable design. The Soviet engineer's comments indicate at least that this design has been given serious consideration. They also provide insight into possible Soviet design solutions.
(DIA)
~~(SECRET)~~

SL-7 Launch Attempt from Plesetsk Fails ~~(S)~~

A Soviet attempt to launch a small payload with an SL-7 propulsion system (the Soviets' smallest) at about 1540Z, 30 January, failed when the second stage apparently malfunctioned.

Three small Cosmos-series payloads have been launched so far this year with the SL-7 -- two from Plesetsk and one from Kapustin Yar.
(NORAD)
~~(SECRET)~~

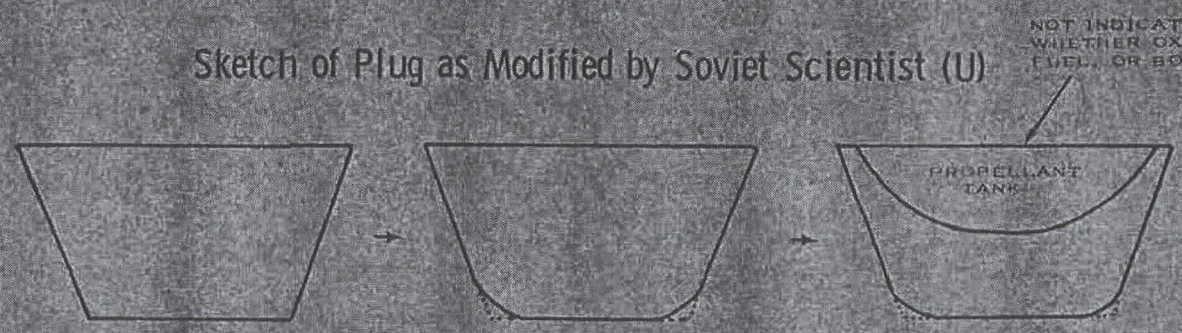
Large Multi-Engine Plug-Nozzle Rocket Concept (U)



(DIA)

NORAD WIR 6/70
6 Feb 70

Sketch of Plug as Modified by Soviet Scientist (U)



original sketch of plug made by non-Soviet

rounded base added by Soviet scientist

final sketch by Soviet scientist