24 November 1972

SUBJECT: Changes to DIA Fact Book, Communist World Forces

TO: All Recipients

1. In lieu of a full 1 October 1972 issue of the DIA Fact Book, Communist World Forces (U), enclosed are the revised and new pages for insertion into the 1 April 1972 issue (D1-647-1-72).

2. Each revised page and the one it replaces bear the same page number. Each of the seven new pages has a number followed by a suffix.

3. Superseded pages should be destroyed in accordance with pertinent security regulations. Certificates of destruction should be retained by organizations accomplishing destruction.

4. Your 1 April 1973 Fact Book, Communist World Forces (U) is planned to be a complete issue.

FOR THE DIRECTOR:

2 Enclosures
1. List of Pages, (U), 1 Cy
2. 224 Pages, (G/MPS/CD), 1 Cy Ea.

Upon removal of Enclosure 2 this document becomes Unclassified.
LAUNCH VEHICLE

SL-3

LAUNCH INFORMATION
This system has been used to launch:

a. All Vostok spacecraft and precursors.
b. Cosmos reconnaissance vehicles.
c. Electron scientific satellites.
d. All direct-ascent lunar probes.
e. Meteorological satellites.
f. Intelligence collector

First used successfully on 2 January 1959. It has not been observed in the reconnaissance satellite program since 12 May 1967 (Cosmos 157). Since mid-1967 it has been used only for launches of meteorological and collection satellites.

CHARACTERISTICS
The SL-3 system is a modified SS-6 ICBM plus an upper stage first used on the Lunar direct-ascent attempts and called the Lunik third stage. The SS-6 has a parallel configuration, i.e., a central sustainer with four boosters symmetrically wrapped around. The boosters and sustainer operate from lift-off, and after booster burnout and separation the sustainer continues as the effective second stage. The SL-3 has the following weights and dimensions:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Wt (lb)</th>
<th>Prop Wt Used (lb)</th>
<th>Length (ft)</th>
<th>Diam (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster (four)</td>
<td>455,250</td>
<td>415,300</td>
<td>62</td>
<td>27 base</td>
</tr>
<tr>
<td>Sustainer</td>
<td>146,800</td>
<td>128,700</td>
<td>87</td>
<td>6.6-9.7</td>
</tr>
<tr>
<td>Lunik</td>
<td>18,100</td>
<td>15,000</td>
<td>10</td>
<td>3.5</td>
</tr>
</tbody>
</table>

PROPULSION

Booster (each) Four fixed main chambers fed by a liquid bipropellant turbopump system, propellant, LOX/hydrocarbon; thrust (S.L.), 180,000 pounds (for each booster); Isp (S.L.), 258 seconds.
Sustainer Single fixed main thrust chamber and four vernier chambers, all fed from a single liquid bipropellant turbopump system; propellant, LOX/hydrocarbon; thrust (vac), 216,500 pounds; Isp (vac), 313 seconds
Lunik Single main thrust chamber fed by a liquid bipropellant turbopump system; propellant, LOX/TG-02 (50/50 mixture of triethylamine and xylidine); thrust (vac), 11,430 pounds; Isp (vac), 320 seconds.

PERFORMANCE

<table>
<thead>
<tr>
<th>Burn Time</th>
<th>(seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster</td>
<td>118.5 (nominal)</td>
</tr>
<tr>
<td>Sustainer</td>
<td>185.6 (nominal)</td>
</tr>
<tr>
<td>Lunik Stage</td>
<td>310 for earth orbital missions; about 365 seconds for lunar missions (nominal), 421 seconds max.</td>
</tr>
</tbody>
</table>

The nominal payload weight for the Vostok series (launched by this system) is 10,400 pounds. The 100-mm orbital payload capability is approximately 10,000 pounds, NRE. It is capable of placing 800 - 1,000 pounds of payload in the vicinity of the moon.

#Booster and sustainer.

1 October 1972
LAUNCH VEHICLE

SL-4

LAUNCH INFORMATION

This system is used to launch:

a. photo reconnaissance satellites.

b. Soyuz spacecraft.

First used on 16 November 1963, the system has been launched from both Tyuratam Missile Test Range and Plesetsk Missile and Space Center.

CHARACTERISTICS

The SL-4 system is a modified SS-6 booster/sustainer plus the Venik third stage, so named because it was first used to launch a Venus Probe. First and second stage weights and dimensions are basically the same as those of the SL-3.

Venik Stage

Weight: 54,500 lb
Propellant consumed: 47,700 lb
Length: 20 ft
Diameter: 8.75 ft

PROPELLION

Booster: Same as the SL-3 launch booster.
Sustainer: Same propulsion system as SL-3 sustainer, but with a slightly uprated performance: thrust (vac), 227,000 pounds; lsp (vac), 313 seconds.

Venik Stage: Single main engine with four verniers; propellant, LOX/amine; thrust (vac), 67,300 pounds; lsp (vac), 326 seconds.

PERFORMANCE

<table>
<thead>
<tr>
<th>Booster</th>
<th>Burn Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>118.5 (nominal)</td>
</tr>
<tr>
<td>Sustainer</td>
<td>172 (nominal)</td>
</tr>
<tr>
<td>Venik Stage</td>
<td>231</td>
</tr>
</tbody>
</table>

This system is capable of placing about 13,000 pounds of payload into a 100-nm circular orbit, NRE.
LAUNCH VEHICLE
SL-5

LAUNCH INFORMATION
This vehicle was used to launch Cosmos 102 on 27 December 1965, and Cosmos 125 on 20 July 1966. These two spacecraft are believed to be tests of a restartable, in-flight propulsion unit, and a new attitude and control system. These vehicles were launched from Tyuratam Missile Test Range. System not expected to be used again.

CHARACTERISTICS

The SL-5 system has basically an SL-3 launch configuration with an added restartable propulsion stage as payload. The weight and dimensions of the fourth stage have not been determined.

PROPULSION
- Booster/Sustainer/ Lunik Stages: Same as for the SL-3 system.
- Fourth Stage: Type of engine and type of propellant undetermined; thrust (vac), 2,000 pounds; Isp (vac), 235 seconds.

PERFORMANCE
- Burn Time (seconds):
  - Booster: 118.5 (nominal)
  - Sustainer: 188.5
  - Lunik Stage: 365
  - Fourth Stage: 46

This system is estimated capable of placing 10,000 pounds into a 100-nm circular orbit, NAE.

1 October 1972
LAUNCH VEHICLE
SL-6

LAUNCH INFORMATION

This system launches payloads requiring an ejection from parking orbit. It is used for:

a. Interplanetary probes,
   b. Molniya communication satellites,
   c. Lunar probes.

This system was first used on 10 October 1960. It was launched only from Tyuratam Missile Test Range until 19 February 1970. At that time it launched Molniya 1 satellites from Plesetsk Missile and Space Center. On 17 August 1970 Venus 7 was successfully launched on a Venus trajectory from Tyuratam Missile Test Range and made a soft landing on the planet on 15 December.

CHARACTERISTICS

The SL-6 is an SL-4 with a fourth stage. The fourth or interplanetary stage weight is about 13,100 pounds, of which 10,300 pounds are propellant.

PROPULSION

Booster, Sustainer and Venik Stage

Interplanetary Stage
Liquid bipropellant pump-fed single-chamber engine; thrust (vac), 14,800 pounds; isp (vac), 338 seconds; propellant is probably LOX/amine.

PERFORMANCE

<table>
<thead>
<tr>
<th>Component</th>
<th>Burn Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster</td>
<td>118.5 (nominal)</td>
</tr>
<tr>
<td>Sustainer</td>
<td>172 (nominal)</td>
</tr>
<tr>
<td>Venik Stage</td>
<td>231</td>
</tr>
<tr>
<td>Interplanetary Stage</td>
<td>234 (nominal)</td>
</tr>
</tbody>
</table>

Three stage capability of placing 13,000 pounds into 100-nm circular orbit, NRE. Fourth stage then ignites and can inject about 2,600 pounds to Mars or Venus.

1 October 1972
LAUNCH VEHICLE
SL-7

LAUNCH INFORMATION

This system has been used to launch:

a. Small scientific earth satellites from Kapustin Yar Missile Test Center and Plesetsk missile and Space Center.

b. Calibration satellites from Plesetsk Missile and Space Center.

First launch was on 27 October 1961 (failure). All launches to date from Kapustin Yar Missile Test Center have been nominal 49-degree inclination orbits. Scientific satellites from Plesetsk Missile and Space Center were 72° and 82°. Calibration satellites were 49°, 71°, and 91°.

CHARACTERISTICS

The SL-7 launch system is a two-stage tandem vehicle. The first-stage booster is the SS-4 Sandal slightly modified to adapt to a new type of payload.

The following probable weights and dimensions apply:

<table>
<thead>
<tr>
<th></th>
<th>Stage Wt</th>
<th>Prop Wt</th>
<th>Length</th>
<th>Diam</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(lb)</td>
<td>(lb)</td>
<td>(ft)</td>
<td>(ft)</td>
</tr>
<tr>
<td>Booster</td>
<td>88,900</td>
<td>81,300</td>
<td>61.3</td>
<td>5.4</td>
</tr>
<tr>
<td>2nd Stage</td>
<td>19,500</td>
<td>16,900</td>
<td>31.2</td>
<td>5.4</td>
</tr>
</tbody>
</table>

PROPULSION

Booster Turbopump-fed liquid bipropellant engine with four thrust chambers; propellant, nitric acid/ammonium nitrate (S.L), 136,300 pounds; Isp (S.L), 221 seconds.

KY Upper Stage Liquid bipropellant, pump-fed rocket engine with a single thrust chamber; propellant, LOX/UDMH; thrust (vac), 24,100 pounds; Isp (vac), 352 seconds.

PERFORMANCE

Burn Time

<table>
<thead>
<tr>
<th></th>
<th>(seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster</td>
<td>130.5</td>
</tr>
<tr>
<td>2nd Stage</td>
<td>243</td>
</tr>
</tbody>
</table>

This system is capable of placing 800 pounds of payload into a 100-nm circular orbit, NRE.
LAUNCH VEHICLE
SL-8

LAUNCH INFORMATION

This system has launched single and multiple satellite payloads from Tyuratam Missile Test Range and Plavetsk Missile and Space Center. It has launched vehicles for navigation, scientific, surveillance, and communications missions.

First launch was on 18 August 1964 (Cosmos 36, 39 and 40).

CHARACTERISTICS

The SL-8 launch vehicle is a two-stage tandem vehicle with a second-stage restart capability. The first-stage booster is a modified SS-5 IRBM. The second stage has not been given any particular designation. Probable weights and dimensions are estimated to be:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Weight (lb)</th>
<th>Prop Wt (lb)</th>
<th>Length (ft)</th>
<th>Diam (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster</td>
<td>219,100</td>
<td>196,800</td>
<td>70</td>
<td>8</td>
</tr>
<tr>
<td>2d Stage</td>
<td>45,000</td>
<td>40,700</td>
<td>20-27</td>
<td>8 (assumed)</td>
</tr>
</tbody>
</table>

PROPULESION

Booster: Consists of two throttleable liquid bipropellant engines, each having two thrust chambers and one turbopump unit; probable propellant is storable nitric acid/amine; thrust (S.L.) 344,000 pounds; Isp (S.L.), 228 seconds.

2d Stage: Consists of a single turbopump-fed liquid engine with one fixed main chamber and probably four vernier/control engines; probable propellants, N2O4/acid/amine; thrust (vac), 35,100 pounds; Isp (vac), 300 seconds.

PERFORMANCE

<table>
<thead>
<tr>
<th>Burn Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster</td>
</tr>
<tr>
<td>2d Stage</td>
</tr>
</tbody>
</table>

This system is estimated capable of placing 2,700 pounds of payload into a 100-nm earth orbit, NRE.

1 October 1972
LAUNCH VEHICLE

SL-9

LAUNCH INFORMATION

This system has been used to launch Proton satellites into 63.5-degree orbital inclinations. First launch was on 16 July 1965; all launches have been from Tyuratam Missile Test Range.

CHARACTERISTICS

The SL-9 launch vehicle is estimated to have two stages. The exact configuration of this vehicle is not known. Estimated weights and dimensions are:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Av. Stage Wt (lb)</th>
<th>Av. Prop Wt (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster</td>
<td>1,099,000</td>
<td>994,000</td>
</tr>
<tr>
<td>2nd Stage</td>
<td>256,000</td>
<td>229,000</td>
</tr>
</tbody>
</table>

PROPULSION

Booster: Six liquid bipropellant turbopump-fed engines; cryogenic propellants; thrust (S.L.), about 2,600,000 pounds; Isp (S.L.), about 265 seconds.

2nd Stage: Four liquid bipropellant main engines; possibly cryogenic propellants; thrust (vac), about 572,000-600,000 pounds; Isp (vac), about 325 seconds.

PERFORMANCE

<table>
<thead>
<tr>
<th>Stage</th>
<th>Burn Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster</td>
<td>127</td>
</tr>
<tr>
<td>2nd Stage</td>
<td>128</td>
</tr>
</tbody>
</table>

This launch system has placed 26,900-pound payloads into a 340-nm apogee/103-nm perigee orbit. It is estimated that the system could place 27,000 pounds into a 100-nm circular orbit, NRE.
LAUNCH VEHICLE

SL-10

LAUNCH INFORMATION

Used to launch Polyat 1 on 1 November 1963, and Polyat 2 on 12 April 1964. The SL-10 vehicle is not expected to be launched again.

CHARACTERISTICS

The SL-10 system is dimensionally an SL-1/2 system with the Polyat stage added. This Polyat stage burned to achieve orbital velocity, stopped, and then restarted.

Polyat Stage
Weight - 6,400 pounds
Propellant weight - 1,700 pounds
Length - Unknown
Diameter - Unknown

PROPULSION

Booster and Sustainer - Same as for the SL-1/2 system.

Polyat Stage - This stage demonstrated a zero-G start and a multiple restart capability. It has a pressurized propellant feed system using storable, hypergolic propellants. Thrust (vac) is unknown; Isp (vac) was about 300 seconds.

PERFORMANCE

<table>
<thead>
<tr>
<th>Burn Time</th>
<th>(seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster</td>
<td>118.5 (nominal)</td>
</tr>
<tr>
<td>Sustainer</td>
<td>193.5</td>
</tr>
<tr>
<td>Polyat Stage</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

This system is capable of placing about a 6,000 pound payload into 100-nm circular orbit, NRE.

(b)(1), 1.4 (c)
LAUNCH VEHICLE
SL-11

LAUNCH INFORMATION

This system has been used to launch sub-orbital and orbital payloads with nominal 45-degree, 62.2-degree, and 65-degree inclinations. First suborbital launch was on 16 December 1965. First orbital launch was on 17 September 1966. Launches were accomplished at Tyuratam Missile Test Range. Three uses that have appeared are the SS-9 Mod 3 (POES), the orbital anti-satellite system, and "maneuverable" spacecraft with unknown missions.

CHARACTERISTICS

The SL-11 is a two-stage tandem vehicle that consists of a slightly modified SS-9.

<table>
<thead>
<tr>
<th>Stage</th>
<th>WT</th>
<th>Prop WT</th>
<th>Length</th>
<th>Diam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>282,000</td>
<td>265,000</td>
<td>63</td>
<td>9.8</td>
</tr>
<tr>
<td>2nd</td>
<td>114,000</td>
<td>106,500</td>
<td>32.4</td>
<td>9.8</td>
</tr>
</tbody>
</table>

PROPULSION

1st Stage Three fixed liquid bipropellant engines, fed by a turbopump system: propellant, MON/MMH; thrust (S.L.) about 186,300 pounds (for each engine); isp (S.L.), 294 seconds.

2nd Stage Single liquid bipropellant engine and four vernier engines fed by a turbopump system; propellant, MON/MMH; thrust (vac), 223,000 pounds; isp (vac), about 315 seconds.

PERFORMANCE

<table>
<thead>
<tr>
<th>Burn Time</th>
<th>(seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Stage</td>
<td>115.5</td>
</tr>
<tr>
<td>2nd Stage</td>
<td>148</td>
</tr>
</tbody>
</table>

This system is capable of placing about 6,200 pounds into a 100-nm circular orbit, NRE. The demonstrated payload is 9,000 pounds into a 49.6-degree orbital inclination with a 113-nm apogee and a 73-nm perigee. It has demonstrated a nominal 6,500-pound payload at 62.2 degrees inclination in a 130-nm apogee and an 80-nm perigee.

MON: Mixed Oxides of Nitrogen
MMH: Monomethylhydrazine

1 October 1972

7-12
LAUNCH VEHICLE
SL-12/13

LAUNCH INFORMATION

The SL-12 is used to launch Zond (circumlunar), Luna (unmanned orbiter/lander) and
planetary vehicles. The SL-13 was used to launch
Proton 4 (16 November 1968) and the Salyut space
station (19 April 1971). System initial launch
was made from Tyuratam Missile Test Range in
March 1967. Through February, 1970, there were
7 successes in 17 flights. Since the August
1970 engineering test there have been 11 successes
in 12 flights.

CHARACTERISTICS

The SL-12 is a four-stage vehicle consisting
of the two-stage SL-9 (with modified second stage)
plus a third stage. The fourth stage is used
for final injection and orbital maneuvers.

The SL-13 comprises the first three stages
of SL-12.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Step Wt</th>
<th>Prop Wt</th>
<th>Length (ft)</th>
<th>Diam (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>1,044-1,155</td>
<td>94-1,040</td>
<td>51-62</td>
<td>25</td>
</tr>
<tr>
<td>2nd</td>
<td>398-427</td>
<td>398-427</td>
<td>34-65</td>
<td>13</td>
</tr>
<tr>
<td>3rd</td>
<td>130-129</td>
<td>108-116</td>
<td>30-35</td>
<td>13</td>
</tr>
<tr>
<td>4th</td>
<td>42.9</td>
<td>37.8</td>
<td>20-25</td>
<td>Unk</td>
</tr>
</tbody>
</table>

PROPELLION

1st Stage - Six engines; propellant, LOX/amine or N2O4/amine. Thrust (S.L.) is
2,010,000-2,180,000 pounds; Isp (S.L.) 315 seconds.

2nd Stage - Four liquid bipropellant main
engines; propellant, LOX/amine or
N2O4/amine. Thrust (vac) is
572,000-600,000 pounds; Isp (vac),
330 seconds.

3rd Stage - Single-engine; propellant,
LOX/amine or N2O4/amine. Thrust
(vac) is 153,000-160,000 pounds;
Isp (vac), 330 seconds.

4th Stage - Single-engine; propellant, LOX/
amine. Thrust (vac) is 22,000-
28,400 pounds; Isp (vac), 343
seconds.

PERFORMANCE

<table>
<thead>
<tr>
<th>Stage</th>
<th>Burn Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Stage</td>
<td>127</td>
</tr>
<tr>
<td>2nd Stage</td>
<td>212</td>
</tr>
<tr>
<td>3rd Stage</td>
<td>235</td>
</tr>
<tr>
<td>4th Stage</td>
<td>108 (injection to parking orbit)</td>
</tr>
</tbody>
</table>

In demonstrated launches to date, a
260-second coast preceded fourth-stage
ignition.

This system is capable of injecting
50,000 pounds into a 100-nm circular orbit
or 15,000 pounds Earth escape, or 7,000
pounds to geo-stationary orbit.

1 October 1972
SPACECRAFT

RECONNAISSANCE (b)(1), 1.4 (c) PHOTO (b)(1), 1.4 (c)

MISSION
To collect photographic intelligence (b)(1), 1.4 (c)

RESPONSIBLE AGENCY
USSR Ministry of Defense

LAUNCH INFORMATION
1962 - 1968 - 64
1969 - 12
1970 - 12
1971 - 8 (7 successes, 1 failure)
1972 - 6 as of 1 October 1972*
Launch Sites - Tyuratam Missile Test Range.
Plesetsk Missile and Space Center.
Launch Vehicle - SL-4.

CHARACTERISTICS
Flight Duration - 12 days (since mid-1970).
Type - Recoverable unmanned vehicle.
Weight - Nominal 11,000 pounds (probably modified Vostok spacecraft).
Stabilization - Earth-stabilized using horizon sensors, and controlled by gas jet pulses.
Apogee - 180 nm nominal.
Perigee - 110 nm nominal.
Period - 90 minutes nominal.
Inclination - Nominal 51, 65, 72, and 81 degrees.
Power - Internal battery.

* As of 1 October the 1972 record for photo-reconnaissance launches is: 8 successful 15 successful 1 failure.

1 October 1972
SPACECRAFT
RECONNAISSANCE

MISSION
To collect photographic intelligence.

RESPONSIBLE AGENCY
USSR Ministry of Defense

LAUNCH INFORMATION
1963 - 1968 - 48
1969 - 20
1970 - 17
1971 - 20 successes
1972 - 15 as of 1 October 1972 *
Launch Sites - Tyuratam Missile Test Range; Plesetsk Missile and Space Center.
Launch Vehicle - SL-4.

CHARACTERISTICS
Flight Duration - Nominal 13 days (since mid-1970).
Type - Recoverable unmanned vehicle
Weight - 12,600 pounds (probably modified Vostok spacecraft)
Size - 7 feet in diameter, 14 feet in length
Stabilization - Earth-stabilized using horizon sensors, and controlled by gas jet pulses
Apogee - 140-180 nm
Perigee - 80-110 nm
Period - 90 minutes nominal
Inclination - Nominal 51, 65, 72, and 81 degrees
Power - Internal battery

*See footnote on page 7-15

1 October 1972
SPACERACF

SOYUZ

MISSION

To perfect rendezvous and docking techniques, and manned earth orbital tests, in support of manned space station operations.

RESPONSIBLE AGENCY

Possibly Soviet Air Forces.

LAUNCH INFORMATION

Cosmos 133 and Cosmos 140 - Launched 28 November 1966 and 7 February 1967. First and second unmanned flight test of the Soyuz spacecraft.

Soyuz 1 - Launched 23 April 1967. First manned flight in over 2 years. The flight failed after 1 day in orbit, causing the death of Cosmonaut Komarov.

Cosmos 186 and Cosmos 188 - Launched 27 and 30 October 1967. First successful rendezvous and docking mission utilizing two unmanned versions of the Soyuz spacecraft (Cosmos 186 rendezvoused and docked with Cosmos 188, before Cosmos 188 had completed one full orbit). First flight of the Soyuz spacecraft since the death of Cosmonaut Komarov.


Soyuz 2 and Soyuz 3 - Launched 25 October 1968. Soyuz 2 (unmanned) and Soyuz 3 (manned) rendezvoused but were not successful in docking attempts.

Soyuz 4 and Soyuz 5 - Launched 14/15 January 1969. The three-man Soyuz 5 successfully rendezvoused and docked with the one-man Soyuz 4. Two men transferred through space from Soyuz 5 to Soyuz 4.

Soyuz 6, Soyuz 7, Soyuz 8 - Launched 11/12/13 October 1969. Resulted in seven cosmonauts in orbit simultaneously. Experiments were conducted in welding and obtaining earth resources observations and astrophysical data. In addition the Soviets may have attempted orbital observation of SS-7 ICBMs launched when Soyuz vehicles passed over their launch site.

Soyuz 9 - Launched 1 June 1970. Carried two cosmonauts on the longest duration manned spaceflight ever flown and was deorbited in the USSR on 19 June 1970.


Soyuz 11 - Launched 6 June 1971. Three man crew successfully docked with Salyut space station and performed various experiments, principally earth observations. Missile launches from Tyuratam Missile Test Range apparently were observed also. Cosmonauts established a record of 23 days in space. All three cosmonauts died during reentry due to decompression (hatch lost pressure seal).

Cosmos 696 - Launched 25 June 1972. Engineering flight test of unmanned Soyuz capsule performed as result of hatch and other problems encountered with Soyuz 11.
SPACECRAFT

ZOND

MISSION
To develop a circumlunar and return-to-earth capability applicable to future manned lunar missions.

RESPONSIBLE AGENCY
Possibly Soviet Air Forces.

LAUNCH INFORMATION
Zond 4 - Launched 2 March 1968. Simulated circumlunar mission; partially successful.


Zond 6 - Launched 10 November 1968. Repeat of Zond 5 except for lifting re-entry and recovery in the Soviet Union.

Zond 7 - Launched 7 August 1969. Repeat of Zond 6 flight.

Zond 8 - Launched 20 October 1970. Repeat of Zond 5 except it landed in USSR.

Launch Site - Tyuratam Missile Test Range.
Launch Vehicle - SL-12.

CHARACTERISTICS
Type - Unmanned recoverable space vehicle. Design based on re-entry module and instrumentation compartment of Soyuz spacecraft.

Weight - Approximately 13,000 pounds on lunar trajectory.

Power - Batteries and solar cells.

Stabilization - Earth-stabilized using horizon sensors; controlled by gas jet pulses.

(b)(1),(4)(c)
SPACECRAFT

SALYUT

MISSION

Station for use by manned crew to perform various experiments, including earth observation.

RESPONSIBLE AGENCY

Possibly Soviet Air Forces.

LAUNCH INFORMATION

SALYUT was launched on 19 April 1971 into a low earth orbit by an SL-13 launch vehicle from Tyuratam Missile Test Range. It was de-orbited and disintegrated during re-entry in October 1971. A probable launch failure of another Salyut occurred on 29 July 1972.

CHARACTERISTICS

Type - Long life nonrecoverable station.
Weight - 41,000 pounds.
Orbit - Initial of 51.5° inclination; apogee 120-169 nm, perigee 108-153 nm; 83-90 min period. Orbit was frequently adjusted to extend life.
Power - Provided by solar cell arrays and batteries.
Experiments - Astronomy, earth observation, probable missile launch observation, bio-medical monitoring and testing, stellar navigation.

(b)(1), 1.4 (c)

1 October 1972
SPACECRAFT
MOLNIYA I/II

MISSION
Communications relay satellite for military and civil users. Transmits television programs and long-distance two-way multi-channel telephone, photo-telegraphic, telegraphic, and audio communications.

RESPONSIBLE AGENCY
Probably USSR Ministry of Communications.

LAUNCH INFORMATION
1965 - 1966 - 4
1967 - 4
1968 - 4
1969 - 2
1970 - 5
1971 - 1 (Molniya I); 1 (Molniya II). Latter first launched 24 November 1971.
1972 - 1 Molniya I, 2 Molniya II as of 1 October 1972.
Launch Site - Tyuratam Missile Test Range and Plesetsk Missile and Space Center.
Launch Vehicle - SL-6.

CHARACTERISTICS
Type - Nonrecoverable.

(b)(1), 1.4 (c)

Weight - Molniya I (est 2,700 pounds); Molniya II (3,000-4,000 pounds).
Power - solar array and battery.
Stabilization - Sun-oriented satellite with roll-axis momentum wheel control; attitude stabilization and wheel unloading via cold gas nozzles; steerable earth-oriented communications antennas.

(b)(1), 1.4 (c)

Apogee - Molniya I 21,400 nm (nominal).
Molniya II 21,500 nm.
Perigee - Molniya I 263 nm (nominal).
Molniya II 250 nm.
Inclination - 65 degrees.
Period - 12 hrs.

1 October 1972
MOLNIYA IN ORBIT
(according to Pravda)
SPACECRAFT
METEOR

MISSION
To provide photographs of cloud cover through television, camera, and infrared photographic equipment on both the light and dark side of the earth. To assist in long-range weather forecasting, and study of the earth's meteorological phenomena.

RESPONSIBLE AGENCY
Probably Main Administration of Hydro-meteorological Service of USSR Council of Ministers.

LAUNCH INFORMATION
1964 - 1965 - 3
1966 - 2
1967 - 3
1968 - 2
1969 - 3 (2 successes, 1 failure)
1970 - 4
1971 - 4
1972 - 2 as of 1 October 1972
Launch Site - Tyuratam Missile Test Range and Plesetsk Missile and Space Center.
Launch Vehicle - SL-3.

CHARACTERISTICS
Type - Nonrecoverable.
Weight - 3,000-5,000 pounds.
Power - Solar cells and batteries.
Apogee - 350-500 nm.
Perigee - 320-500nm.
Inclination - 81 degrees.

Period - 97 min (nominal).
SPACECRAFT
NAVIGATION

MISSION
To provide navigational assistance to a variety of users.

RESPONSIBLE AGENCY
USSR Ministry of Defense.

LAUNCH INFORMATION
1967 - 1968 - 5
1969 - 4
1970 - 3
1971 - 4
1972 - 4 as of 1 October 1972
Launch Site - Plesetsk Missile and Space Center.
Launch Vehicle - SL-8.

CHARACTERISTICS
Type - Nonrecoverable.
Weight - 1,250-1,800 pounds.
Stabilization - Unknown.
Power - Probable batteries and solar cells, possible RTG.
Orbit - 550 and 650 nm circular.
Accuracy - Potential of approximately 100 meters, single pass.
Inclination - 74 degrees.

(b)(1), 1.4 (c)
SPACECRAFT
SS-9 MOD 3

MISSION
Fractional orbital bombardment system (FOBS) or a depressed trajectory ICBM (DICBM).

RESPONSIBLE AGENCY
USSR Ministry of Defense.

LAUNCH INFORMATION
1965 - 1968 - 14 orbital launches and 5 suborbital launches (10 and 3 successful, respectively).
1969 - 1 orbital launch (successful).
1970 - 2 orbital launches (successful).
1971 - 1 orbital launch (successful).
1972 - none as of 1 October 1972.
Launch Site and Vehicle - Tyuratam Missile Test Range; SL-11.

CHARACTERISTICS
Apogee - 110 nm (nominal).
Perigee - 75 nm (nominal).
Inclination - 49.5 degrees (nominal).
Weight - 8,800 pounds; (operational).
Assessed Yield - 3.5 to 5 megatons.
Retro stage velocity - 5,000 ft/sec.
Assessed CEP - 1 to 2.5 nm as FOBS; .8 nm as DICBM.

Guidance - Inertial
Reentry stage has a liquid bi-propellant engine driven by a turbopump system; propellant, N2O4/MMH; thrust (vac), 11,400-17,000 pounds; Isp (vac), 312 seconds.

1 October 1972
SPACECRAFT

SCIENTIFIC RESEARCH AND MONITORING 1/

MISSION
Satellites used for scientific exploration and environment monitoring of the near earth region of space.

RESPONSIBLE AGENCY
USSR Ministry of Defense.

LAUNCH INFORMATION
1962 - 1968 - 40
1969 - 4
1970 - 10
1971 - 4
1972 - 12 successes as of 1 October 1972
Launch Site - Kapustin Yar Missile Test Center and Plesetsk Missile and Space Center.
Launch Vehicle - SL-7, SL-8, SL-6

CHARACTERISTICS
Type - Nonrecoverable.
Weight - 400-2,500 pounds.
Power - Battery and solar cells.
Stabilization - Slow tumble. Some have had cold gas or aerodynamic control.
Apogee Range - 160 to 110,000 nm.
Perigee Range - 109 to 275 nm.
Period - 90 min to 97 hours.
Inclination - 49, 65, 71 and 82 degrees (nominal).

(b)(1), 1.4 (c)

1/ Includes "Intercosmos" series, a joint cooperative program of socialist countries.

1 October 1972
SPACECRAFT

MISSION
Collect data

RESPONSIBLE AGENCY
USSR Ministry of Defense.

LAUNCH INFORMATION
1967 - 1968 - 3
1969 - 2
1970 - 2
1971 - 6
1972 - 2 as of 1 October 1972
Launch Site - Plesetsk Missile and Space Center.
Launch Vehicle - SL-8.

CHARACTERISTICS
Type - Non-recoverable.
Weight - 2,000 pounds.
Orbit - 74° inclination, 290 nm altitude, 95.3 min period (daily repeat of ground trace).
Deployment - 4 satellites in orbit planes separated by 45°.

(b)(1), 1.4 (c)

Life - 12-24 months.
Power - Solar cells and batteries.
Stabilization - None.

(b)(1), 1.4 (c)
SPACECRAFT

RECONNAISSANCE

MISSION

Collect date

LAUNCH INFORMATION

1970 - 1971 - 2
1972 - 1 as of 1 October 1972
Launch Site - Plesetsk Missile and Space Center.
Launch Vehicle - SL-3

CHARACTERISTICS

Type - Nonrecoverable.
Weight - 3,000-5,000 pounds.
Power - Solar arrays plus batteries.
Orbit - 350 nm circular, 97.8 min period, 81° inclination.
Stabilization - Earth oriented satellite with sun oriented solar arrays.
SPACECRAFT
ORBITAL ANTISATELLITE

MISSION
Intercept orbiting spacecraft.

RESPONSIBLE AGENCY
USSR Ministry of Defense.

LAUNCH INFORMATION
Cosmos 249 - Launched 20 October 1968 to intercept Cosmos 248 but did not acquire target due to displacement in orbit.
Cosmos 252 - Launched 1 November 1968. Acquired, homed on and apparently fired on Cosmos 252 (two revs after launch). Target was sent tumbling, orbit perturbed.
Cosmos 375 - Launched 30 October 1970. Intercepted Cosmos 373 on rev 2. Target was again sent tumbling.

Launch Site - Tyuratam Missile Test Range and Plesetsk Missile and Space Center.
Launch Vehicle - SL-1, SL-8 (last three targets).

CHARACTERISTICS
Type - Interceptor spacecraft.
Weight - 5,500-6,500 pounds.
Mode - Co-planar intercept (spacecraft adjusts plane after launch) with relative velocity of 1,300 ft/sec.
Demonstrated intercept altitude = 120-530 km.
Present altitude capability = At least 2,000 km.
Test inclinations = 62.2° to 65.8°.
Guidance - Probable radar acquisition and homing set.
Power - Batteries.

(b)(1), 1.4 (c)

1 October 1972

SECRET
SPACECRAFT

COMMUNICATIONS RELATED VEHICLES

MISSION

Suspected military support delayed communications repeater.

RESPONSIBLE AGENCY

USSR Ministry of Defense.

LAUNCH INFORMATION

1964 - 1965 - 6 (24 satellites)
1970 - 1971 - 5 (24 satellites)
1972 - 1 (8 satellite) as of 1 October 1972

Launch Site - Tyuratam Missile Test Range (before 1970)
Plesetsk Missile and Space Center (since 1970).

Launch Vehicle - SL-8.

CHARACTERISTICS

Type - Nonrecoverable.
Weight - 150 pounds.
Orbit - Earlier sets in 300, 800, and 110/1050 nm orbits, 56° inclination.
Last 3 sets in 850 nm orbit, 74° inclination.
Deployment - Random distribution in orbit plane.
Stabilization - Spin stabilized.

(b)(1), 1.4 (c)
SPACECRAFT 
LUNA

MISSION
Lunar orbit, soft landing, rover, or earth return.

RESPONSIBLE AGENCY
USSR Academy of Sciences.

LAUNCH INFORMATION
Luna 4, 2 April 1966 - Missed moon by 5,050 km. Mid-course guidance maneuver probably failed.
Luna 5, 9 May 1965 - Crashed on lunar surface when retrorockets failed to slow it for a soft landing.
Luna 6, 8 June 1965 - Missed moon by 86,000 km when mid-course guidance engines failed to turn off.
Luna 7, 4 October 1965 - Crashed on the lunar surface when retrorockets failed.
Luna 8, 3 December 1965 - Impacted moon, but transmissions ceased shortly after touchdown.
Luna 9, 31 January 1966 - Successful soft landing and transmissions of video signals.
Luna 10, 31 March 1966 - Successful lunar orbiter.
Luna 11, 24 August 1966 - Successful lunar orbiter.
Luna 12, 22 October 1965 - Successful lunar orbiter.
Luna 13, 21 December 1965 - Successful lunar orbiter.
Luna 14, 7 April 1968 - Successful lunar orbiter.
Luna 16, 12 September 1970 - Successfully reached lunar orbit. Soft-landed on moon and obtained lunar soil samples. Made successful lift-off from moon and returned to earth. Spacecraft was recovered in the USSR.
Luna 17, 10 November 1970 - Successfully reached lunar orbit. Soft-landed on moon with Lunokhod 1 (moon walker), which carried out successive investigations during many lunar days.
Luna 18, 6 September 1971 - Successfully reached lunar orbit. Crashed on lunar surface attempting soft landing.
Luna 19, 28 September 1971 - Successfully reached and remained in lunar orbit.
Luna 20, 14 February 1972 - Duplicated mission of Luna 16, except that soil sample was obtained from different location.

Launch Site - Tyuratam Missile Test Range.
Launch Vehicle - SL-6, SL-12.

In addition to the launches listed above, there have been at least 13 failures since the program was initiated on 4 January 1963. The failures which achieved parking orbits have been assigned Cosmos designators (Cosmos 60, 111, 300 and 305).

CHARACTERISTICS
Type - Lunar probes utilizing a parking orbit technique
Payload weight - SL-6 launched, 3,500 pounds on translunar trajectory. SL-12 launched, 12,000 pounds on translunar trajectory.

Power - Batteries

(b)(1),1.4 (c)
SPACECRAFT

VENUS LANDER

MISSION

To collect and transfer scientific data during interplanetary flight. To pass sufficiently close to Venus to allow collection and transmission of environmental data. To land an instrument package on the surface of Venus.

RESPONSIBLE AGENCY

USSR Academy of Sciences.

LAUNCH INFORMATION


Venus 2 - Launched 12 November 1965 (made Venus fly-by at about 13,000 nm; communications failed at Venus encounter).

Venus 3 - Launched 16 November 1965 (intended to soft land and obtain data on the nature of the Venus atmosphere and surface, but communications failed at Venus encounter).


Venus 5 - Launched 5 January 1969 (made a smooth descent through Venustian atmosphere on 16 May but probably did not continue to transmit from the surface of Venus).

Venus 6 - Launched 10 January 1969 (made a smooth descent through Venustian atmosphere on 17 May but probably did not continue to transmit from the surface of Venus).


Venus 8 - Launched 27 March 1972 (successfully injected into interplanetary trajectory).

Launch Site and Vehicle - Tyuratam Missile Test Range; SL-6

CHARACTERISTICS

Weight - Venus 1, 1,416 pounds; Zond 1, 2,000 pounds; Venus 2, 2,112 pounds; Venus 3, 2,119 pounds; Venus 4, 2,000 pounds; Venus 5, 2,492 pounds; Venus 6, 2,492 pounds.

Trajectory - Three-stage powered flight to parking orbit; fourth-stage ejection on orbit one; midcourse maneuvers by spacecraft to pass near planet (Venus 1 did not have midcourse maneuver capability).

Power - Batteries and solar cells.

NOTE: Since March 1964, failures have been assigned "Cosmos" designators (Cosmos 27, 359, and 482) by the Soviets if parking orbit is achieved. This is true in other Soviet space programs as well.

NOTE: In addition to the partially successful launches listed above there have been at least ten Venus probe failures since 4 February 1961.

1 October 1972
SPACECRAFT

MARS PROBES

MISSION

To collect and transmit scientific data during interplanetary flight. To pass sufficiently close to Mars to allow collection and transmission of environmental data. To orbit/land an instrumented capsule on Mars.

RESPONSIBLE AGENCY

USSR Academy of Sciences.

LAUNCH INFORMATION

Mars 1 - Launched 1 November 1962
(spacecraft communications failure after nearly 5 months of flight).
Zond 2 (30 Nov. 1964), Zond 3 (18 July 1965)
Mars 2 - Launched 19 May 1971.
Mars 3 - Launched 28 May 1971.

There have been seven Mars probe failures since 10 October 1960.

Launch Site - Tyuratam Missile Test Range.
Launch Vehicle - SL-6, SL-12.

CHARACTERISTICS

Weight - Mars 1, Zond 2 and 3 2,000-2,200 pounds; Mars 2 and 3 10,200 pounds
Stabilization - Cold gas jets.

Trajectory - Three-stage powered flight to parking orbit; fourth stage ejection on orbit zero; midcourse maneuvers by spacecraft to pass near planet. Mars 2 and Mars 3 ejected landing capsules as they approached the planet. The Mars 2 capsule impacted and the Mars 3 capsule soft-landed. Both spacecraft are in orbit around Mars.

Power - Batteries and solar cells.

(b)(1), 1.4 (c)
SPACECRAFT

PROTON

MISSION
Investigation of radiation in space, especially at super-high energy levels; e.g., primary cosmic rays up to 10^{14} eV, gamma radiation up to 5 \times 10^{17} eV, solar radiation.

LAUNCH INFORMATION
1965 - 2
1966 - 1
1968 - 1
Launch Site - Tyuratam Missile Test Range.
Launch Vehicle - SL-9 for Protons 1, 2, 3; SL-13 for Proton 4.

CHARACTERISTICS
Type - Nonrecoverable.
Weight - 27,000 pounds for Protons 1, 2, 3; 37,400 pounds for Proton 4.
Power - Tass announced solar panels with rechargeable batteries.
Apogee - 340 nm (Protons 1, 2, 3); 267 nm (Proton 4).
Perigee - 103 nm (Protons 1, 2, 3); 138 nm (Proton 4).
Period - 92 minutes
Inclination - 63.5° (Protons 1, 2, 3); 52° (Proton 4)
**PROTON**

The scientific package, shown at right, comprises (1) spectrometer for medium-energy cosmic rays; (2) telescope to measure high-energy gamma radiation; (3–8) ionization calorimeter and other equipment to measure the energy and nature of cosmic particles of high and superhigh energy and the characteristics of their interaction with matter; and (9) equipment to study high-energy electrons. View of the satellite (left, below) shows (1) solar panels; (2) hermetically sealed section containing scientific package; (3) pickups for axis orientation system; (4) external cover; (5) antennas; and (6) chemical fuel cells charged by solar panels.

Exposed view of Proton 1 (above, right) shows: (1) solar panels; (2) pickups for axis orientation system; (3) hermetic sealers; (4) outer cover; (5) antennas; (6) chemical fuel cells; (7) scientific package; (8) radio equipment; and (9) heat exchange unit.
SPACECRAFT

(b)(1), 1.4 (c)

CALIBRATION SATELLITES

MISSION
Provide

(b)(1), 1.4 (c)

RESPONSIBLE AGENCY
Soviet Defense Forces.

LAUNCH INFORMATION
1962 - 68 - 25
1969 - 12
1970 - 13
1971 - 13
1972 - 8 as of 1 October 1972

CHARACTERISTICS
Type - Nonrecoverable.
Weight - About 500 pounds.
Power - Solar cells and batteries.
Stabilization - Slow tumble.
Apogee - 240-1200 km.
Perigee - 110-150 km.
Inclinations - 49°, 71°, 82°.

(b)(1), 1.4 (c)
## SPACECRAFT
### UNKNOWN MISSIONS

**MISSION**

Undetermined - Development programs of apparent Soviet interest that the U.S. cannot identify as to function. Two developments are the SL-11 launched 9,000 pound class satellite (Cosmos 198, 205, 367, 402, 469, 516, plus 2 failures) and the SL-8 launched Cosmos 236, 372, 407, 468, 494 series.

**RESPONSIBLE AGENCY**

Probably USSR Ministry of Defense.

**LAUNCH INFORMATION**

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<td>Cosmos 367 orbited 3 October 1970</td>
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<td>Cosmos 402 orbited 1 April 1971</td>
<td>Launch Site - Cosmos 198 series, Tyuratam Missile Test Range.</td>
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<tr>
<td>Cosmos 469 orbited 25 December 1971</td>
<td>Cosmos 236 series, Tyuratam Missile Test Range and Plesetsk Missile and Space Center.</td>
</tr>
<tr>
<td>Cosmos 516 orbited 21 August 1972</td>
<td></td>
</tr>
</tbody>
</table>

**CHARACTERISTICS**

Type - Unknown.

Weight - Cosmos 198 series - 9,000 pounds; Cosmos 236 series - 2,000 pounds.

Power - Cosmos 198 series - probably batteries; Cosmos 236 series - solar cells and batteries.

Stabilization - Cosmos 198 series - platform mounted horizon sensors and cold gas rotation control nozzles; Cosmos 236 series - gravity gradient two axis stabilized.

Orbit - Cosmos 198 series - 65° inclination, 150 nm near circular parking orbit, injected into 500 nm near circular final orbit by the "payload", large objects left in parking orbit. Cosmos 236 series - 36° Inclination 320/350 nm orbit, 760 inclination 430 nm orbit.

(b)(1), 1.4 (c)

1 October 1972
# CIVIL AIR CARRIER SERVICES

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**COMMUNIST AIR CARRIERS SERVING FREE WORLD**
(Route network sketches, scheduled services to non-Communist areas.)

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**FREE WORLD CIVIL AIR CARRIERS SERVING COMMUNIST AREAS**  
8-8

**ESTIMATED COMMUNIST NONMILITARY AIRCRAFT STRENGTH**  
(12-passenger or greater capacity)  
8-9

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**NOTE:**

Lines of sketches do not indicate actual flight paths.

En route points within country of origin and routings between Communist countries are not shown; i.e. a stop at Prague en route from Bucharest to Copenhagen would not be shown.

"Tech Stop" indicates landing for technical purposes only (refueling, maintenance); no discharge or pickup of passengers or cargo.

1 October 1972
*Montreal is only a tech stop on Havana lines.*
# FREE WORLD CIVIL AIR CARRIERS SERVING COMMunist AREAS

The following civil air carriers of Free World nations are operating regularly scheduled services to Communist areas:

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<th>Country of Origin</th>
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<td>Air France</td>
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<td>IR</td>
<td>Iranair</td>
<td>Iran</td>
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<td>Japan Airlines</td>
<td>Japan</td>
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<td>KL</td>
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<td><strong>EUROPE</strong></td>
<td></td>
</tr>
</tbody>
</table>

- **Albania**: Tirane: AZ
- **Bulgaria**: Sofia: BE, LH, OS
- **Czechoslovakia**: Prague: AC, AF, AH, AZ, BE, IA, KL, LH, MS, OS, PA, RB, SK, SN, SR
- **East Germany**: Berlin: IA, MS, KL, OS, SK
- **Hungary**: Budapest: AF, BY, BE, KL, LH, OS, SK, SN, SR
- **Poland**: Warsaw: AF, AZ, BE, KL, LH, PA, OS, SK, SN, SR
- **Romania**: Bucharest: AF, AZ, BE, LH, LY, OS, PA, SR
- **Bucharest**: Constanta: AF*
- **Cuba**: Havana: IB

**FAR EAST**
- **Peoples Republic of China**: Canton: PK
- Shanghai: AF, PK

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*Seasonal service only

1 October 1972
ESTIMATED COMMUNIST NON-MILITARY TRANSPORT AIRCRAFT STRENGTH
(12-Passenger or Greater Capacity)

ALBANIA: None

BULGARIA:

- 7 Coke
- 30-40 Colt
- 9 Coot
- 6 Crate
- 6-8 Crusty
- 2 Cub
- 5 Hound
- 1 Careless

PEOPLES REPUBLIC OF CHINA:

- 25 Cab
- 5-6 Classic
- 4 Coach
- 6-8 Coke
- 200-217 Colt
- 11 Coot
- 47 Crate
- 2 Cub
- 2-5 Viscount
- 14-16 Hound
- 1 Tricent

CUBA:

- 4 Britannia
- 8 Coke
- 4 Coot
- 10 Crate
- 2 C-46
- 1 DC-4
- 4 DC-3
- 2 Colt

CZECHOSLOVAKIA:

- 6 Camel
- 4 Classic
- 2 Cookpot
- 8 Coot
- 2 Colt
- 21-22 Crate
- 2-3 Crusty
- 4 L-410
- 1 Hip

EAST GERMANY:

- 2 Classic
- 7 Coke
- 22 Colt
- 12 Coot
- 5 Crate
- 4 Crusty
- 1 Hip
- 1 Hound

HUNGARY:

- 3 Colt
- 6 Coot
- 7 Cratch
- 6 Crusty

NORTH KOREA:

- 3 Cab
- 10-20 Colt
- 2-3 Coke
- 3-4 Coot
- 1 Crate
- 2-3 Hip

MONGOLIA:

- 1 Cab
- 6-7 Coke
- 18-20 Colt
- 6-7 Crate
- 1 Hip

POLAND:

- 2 Classic
- 14 Coke
- 8 Colt
- 8 Coot
- 9-10 Crate
- 5 Crusty

ROMANIA:

- 7 BAC III
- 5-6 Cab
- 9 Coke
- 10 Colt
- 14 Coot
- 14 Crate

USSR:

- 3/5 Cab
- 160 Camel
- 10 Careless
- 80 Colt
- 40 Classic
- 30 Coot
- 2 Coach
- 3 Cock
- 120 Codling
- 600 Coke
- 3,200 Colt
- 85 Cookpot
- 400 Coot
- 400 Crate
- 60 Crusty
- 200 Cub
- 30 Hip
- 65 Hook
- 595 Hound

NORTH VIETNAM:

Transport aircraft are used for military purposes. See Military AOB, Section 3.

YUGOSLAVIA:

- 7 Caravelle
- 25 Colt
- 2 Convair 440
- 4 Crusty
- 2 DC-3
- 10 DC-9
- 3 Boeing 707 (leased)

1 October 1972

(Reverse Blank)