

AIR CREW AND SPACE CREW - COMPARATIVE OBSERVATIONS DE LEGE FERENDA

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From April 12, 1961 up to the present 299 persons - nationals of 26 states (1) - participated in manned space flight. This number is relatively not too high but the space activity carried out by nearly 300 astronauts in many aspects yielded results of major importance in space research and peaceful uses of outer space. In the future manned space activity will play a more intensive role in the field of space activities. All the more is the criticism justified that while space conventions contain some sporadic provisions, the legal framework for manned space flight remains unclear in many important aspects (K.-H. Böckstiegel) (2) and international law has been lagging behind the tendency of internationalization of manned space undertakings (Y.M. Kolossov) (3).

The principles derived from positive international space law rules give a certain aid for future law-making.

These concern the rights and duties - in general: the legal status of astronauts. Sources of de lege ferenda considerations also may be the municipal space laws. In the U.S. legislation the relevant rules of the National Aeronautics and Space Act (1958) and NASA regulations promulgated in the Code of Federal Regulations (CFR Title 14) (4). Recently the Russian Federation enacted a comprehensive regulation named Law of the Russian Federation of Space Activities (August 20, 1993). The most important undertaking of preparing the codification of the law of manned space flight is at present the Draft for a Convention on Manned Space Flight (hereinafter: Draft). The authors respectively the institutes represented by them. Professors Karl-Heinz Böckstiegel, Vladlen Vereshchetin and Stephen Gorove had the primary objective "to initiate and promote international discussions in appropriate form in the hope that eventually they will lead to negotiations between interested States either in the U.N. Committee on the Peaceful Uses of Outer Space (COPUOS) or elsewhere.) (5).

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This paper attempts to be a modes contribution to the first part of above intentions by some observations concerning the legal notion of space crew.

Manned Space Flight

The Draft (Article 1) defines manned space flight as

a flight of a space object with a person or persons on board from Earth to outer space or in outer space

manned space object as

a space object on which a person or persons effect a space flight.

Professor S.E. Doyle referring to a current trend in the legal literature supports the use of sexually neutral language in connection with space activities involving men and women equally. A sexually neutral terminology in his opinion even demands a revised title: Convention on Human Flight in Outer Space instead of Manned Space Flight. In the same way Professor S.E. Doyle suggests that the term "manned" be suppressed throughout the Draft in favour of the term "crewed". (6)

For a foreign author it could be pretentious to intervene in a question of English terminology. My modest remark is only that for me the term "manned space flight"

never associated the idea of a space undertaking carried out only by men. Here in a German-speaking area is not meaningless to refer to the difficulty of neutralization of corresponding terms "bemannter Raumflug", "bemanntes Raumobjekt".

The Hungarian term "emberes űrrepülés" is in this respect neutral "ember" means namely "human being". Otherwise the term "űrrepülés" = space flight itself does not meet the scientific requirements. "Űr" means emptiness. Though everybody knows that outer space is not empty, this traditional term can not be extirpated from the language of space sciences. (7)

The same is true for "astronaut". The German "Raumfahrer" or the Russian "Cosmonaut" are more precise. Astronauts do not fly to the stars - at least today.

This term, however, has been accepted by the Space Treaty and other space law instruments. For future law-making de lege ferenda I would generally accept it and "manned space flight" for the activity to be regulated.(8)

Back to the definition of manned space flight: the Draft would define "manned space object" and "manned space flight" in their mutual inter-dependence without stating what is a space object. It

would be useful also to add the legal meaning of space object to Article I. Definitions of the Draft. Without attempting to formulate such a definition I refer only to my idea launched 21 years ago at the XV. Colloquium of our Institute in Vienna, namely that it should be based on a functional element, i.e. the activity of the object realized by orbital movement.(9).

Otherwise the Draft provides that "space flight" should extend to the embarkation, launch, in orbit, deorbit, re-entry, landing and disembarkation phases. I share the opinion of Professor S.E. Doyle: the definition should be limited to mean the entire conduct of the flight sequence from launching to landing or "from lift-off to touch - or splash-down" excluding activities on the surface of the Earth prior to and following the conduct of the flight.(10)

"Envoys of Mankind"

Rules of international space law do not differentiate between members of the crew and other persons on board. All participants of the manned space flight are considered as astronauts independently of the circumstance whether they have duties in the technical realization of the space activity or not. Consequently the provisions of the space law treaties and conventions concern every person on board a manned space object. They are all

"envoys of mankind". (S.T. Art. V.1.)

I agree with the majority of authors, representing the view that this principle may be interpreted as a moral qualification of human beings in outer space only. Unfortunately the mankind does not constitute a political unity, it is no subject of international law. Conclusions that this general clause by international agreement transfers rights of envoys under international law to the astronauts would be absurd.

Professor V. Vereshchetin correctly states also that the status of being envoys of mankind in outer space neither causes the recognition of astronauts as subjects of international law or their deprivation of nationality nor acquisition by them of a supranational status. (11) On the other hand the legal rights and obligations laid down in basic space law instruments constitute the materialization of this moral principle.

The main stipulations concerning the legal status of astronauts are:

- ♦ they have to render all possible assistance to the astronauts of other States Parties;
- ♦ in case of an accident, distress, emergency or unintended landing states shall take all possible steps to rescue them in

territory under their jurisdiction or extend assistance in search and rescue operations in any other place;

- ◆ they shall be safely and promptly returned;
- ◆ any person on the Moon shall be regarded as an astronaut within the meaning of S.T. Art. V. and as part of the personnel of a spacecraft within the meaning of the Rescue Agreement;
- ◆ states shall adopt all practicable measures to safeguard the life and health of persons on the Moon;
- ◆ states shall offer shelter in their stations to persons in distress on the Moon.

According to generally accepted view in respect of these all persons on board in sense of today positive space law should be considered as "astronauts". The Draft in conformity with this interpretation of Article V. of the Space Treaty provides that

States shall regard any person in outer space as an astronaut within the meaning of Article VIII. of the Outer Space Treaty and as part of the personnel of a space-craft within the meaning of Article VIII. of the Outer Space Treaty and the Rescue Agreement. (Art. 6. Para 6.)

At the present stage of manned space flights I hold attempts to bind this EoM quality on any subjective, therefore questionable conditions to be dangerous. (12).

Air crew and space crew

Persons on board in general and crew or operating crew in air law are treated differently. Flying personnel includes anyone "who normally performs his duties during the flight and whose presence on board throughout the flight is essential: the commander, the copilot and flight attendants". (I.H.Ph. Diederiks-Verschoor) (13).

Passengers having concluded an air transport contract have nothing to do with duties and regulations binding only members of the personnel except one element: the right of the commander to issue orders to them in special situations.

International air law (Chicago Convention and bilateral agreements) contains the strict obligation that every aircraft engaged in international navigation has to carry appropriate licenses for each member of the crew. (Ch. C. Art. 29)

Per analogiam: the 299 astronauts who participated in manned space activity till today - were they all members of space crews? (14)

First of all, the lexical meaning of crew is confined to a restricted circle: "persons who have duties on an aircraft in flight" (15) the body of persons manning a ship, aircraft etc." (16) Consequently the term would not cover indiscriminately all persons named in international space law instruments

- ◆ astronauts
- ◆ personnel of a space object
- ◆ personnel conducting activities on the Moon
- ◆ persons on board of a space object
- ◆ persons on the Moon.

Municipal space laws give the impression that this difference between crew members and other persons on board on national administrative level has been already accepted, consequently in future law-making it should be taken into consideration.

In the United States after January 1986 concerning non-NASA astronaut flights NASA declared in statement at 14 CFR V. § 1214.303.:

All Shuttle flights will be planned with a minimum **NASA crew** of five astronauts (commander, pilot and three mission specialists). When payload or other mission requirements define a need and operational constraints permit, the crew size can be

increased to a maximum of seven.

(4) NASA policy and terminology are revised to recognize two categories of persons other than NASA astronauts, each of which requires separate policy treatment:

(i) **Payload specialists**, redefined to refer to persons other than astronauts (commanders, pilots and mission specialists), whose presence is required on board the Space Shuttle to perform specialized functions with respect to operation of one or more payloads or other essential mission activities.

(ii) **Space flight participants**, defined to refer to persons whose presence on board the Space Shuttle is not required for operation of payloads or for other essential mission activities, but is determined by the Administrator of NASA to contribute to other approved NASA objectives, or to be in national interest.

For Space Transport Systems CFR rules make a distinction between the crew and personnel on board. Former consists of the commander, pilot and mission specialist(s), latter

refers to astronauts or other persons during any flight phase of an STS flight including any persons performing extravehicular activity associated with the mission.
(1214. 701b, f.)

In the Agreement on Space Station Freedom the crew appears as "qualified personnel" provided by the partners to serve on an equitable basis as crew members. (Article 11.1.)

Finally we refer to a brand-new product of national space law legislation: the Russian Space Act of 1993. This Law on Space Activities clearly differentiate between crew and persons not belonging to it:

The commander of the crew of a manned space object is responsible for the safety of the crew and other persons participating in the flight.
(Article 20-3/1.)

Under Article I. Para 6. of the Draft

The term "crew" means persons who effect professional activities during a space flight.

Though the intention of the authors was obviously directed to differentiation, by this definition persons effecting professional activities e.g. as scientists, which have nothing to do with the

technical completion of space flight, would belong to the crew.

To my mind the restriction of professional activities to "mission-specific and registered professional activities" (Rafael Lorza Pitt) (17) is not satisfying.

I would prefer a definition of crew only covering persons charged with technical tasks essential for the safe completion of space flight.

Jurisdiction

The Draft confirms that pursuant to Article VIII. of the S:T. the State on whose registry the manned space object or flight element is carried shall retain jurisdiction and control over such object and any persons thereof while in outer space or on a celestial body or anywhere beyond the limits of the jurisdiction of any state.

As a logical consequence under Article IV. Para 1

the preparation of the manned flight, determination of composition and functions of the crew and participation of other persons as well as their rights and obligations fall within the competence of the State exercising jurisdiction and control.

This principle prevails in municipal laws.

The U.S. NASA Act authorized NASA (Section 203) to make promulgate, issue and amend rules and regulations governing the manner of its operations. Under these provisions NASA has established the rules to govern the selection and training and conduct of astronauts. (18)

In the Russian Federation this right is vested in the Russian Space Agency and the Ministry of Defense while rights and duties of the cosmonauts will be fixed in contracts.

The citizens of the Russian Federation who expressed their wish to participate in space flights and qualify to the established professional and medical requirements are chosen on the basis of competition for training and performing space flight. (Art. 20. Para 1.)

The order and terms of the competition are determined by above authorities.

The determination of rights and duties of astronauts and rules of conduct during the space flight and their qualification as well sometime will demand unification by international agreement and a kind of international standardization. Law-making in this field will follow common denominators of national rules.

Commander of the manned space object

The parallel between the legal status of the aircraft commander and rights and duties of the commandant of a space object is obvious. To this comparison Professor V. Vereshchetin twenty years after the first manned space flight correctly observed that in view of the extraordinary conditions of cosmic flight the executive power of the commander of a spacecraft can not be less than that of the commander of an aircraft or ship. (19)

The U.S. Code of Federal Legislation (§ 1214, 702.) the Russian Law on Space Activities (Art. 20. Para 3.) and the Draft (Art. IV. 2-7.) in this respect more or less are based upon generally accepted air law rules. To my mind this circumstance would make international law-making more easy for legal status of the spacecraft commander than any other issues of legal aspects of manned space flight.

The commander of the manned space object is the "brevi manu" executor of jurisdiction of the State of registry on board.

His main rights and duties from the sources mentioned above may be summarized: absolute authority to make action necessary to enforce order and discipline, provide for the

safety and well-being of all personnel on board, provide for the protection of the space object and any payload. He has the right to use any reasonable means including the use of physical force to achieve this end. He is responsible for the fulfillment of the flight program within the limits of his powers. (20)

U.S. space law and the Draft extend the authority of the commander to all persons participating in the same flight: "whether or not they are U.S. nationals" and "irrespective of their nationality". The Russian Space Act is more extensive providing that

the citizens of foreign states undergoing training for a space flight in the Russian Federation or participating in a flight on a board manned space object of the Russian Federation are bound to comply with the legislation of the Russian Federation if otherwise is not provided for by international treaties of the Russian Federation. (Art 20-5.)

The authority of the commanders, however, should be different in relation to the crew and all other persons on board. Members of the crew namely contrary to other persons have their duties in the safe completion of the space flight. Directions of the commander to the crew consequently differ from

orders rightly given to other persons on board not being involved in the technical performance of the space flight.

Space passengers

Professor V. Kopal in his commentary on Article VI. Para 6 of the Draft refers to the possibility that still other persons than members of the crew may appear on board the space object, not only members of other crews e.g. rescued astronauts or participants of other missions but also simple passengers who will enjoy the space travel. He puts the question: all this persons should be entitled to be considered as astronauts sharing their special treatment? (21) I would answer, yes they should be - mutatis mutandis..

Today space flight demands special training but no doubt the time will come when space passengers will board a spacecraft without special preparations. Then it will be obvious that law-making should differentiate between the crew ("flying personnel") and other persons: "space passengers" on board a spacecraft. In this respect the realization of the aerospace-craft will be the decisive landmark of a new development in air and space legislation. Coming generations of space lawyers will be faced with this biggest challenge since the first space flight 32 years ago.

FOOTNOTES

1. In chronological order:
USSR (from January 1, 1992
Russia) U.S.A.,
Czechoslovakia, Poland,
G.D.R. (from January 1, 1989
Germany), Bulgaria, Hungary,
Vietnam, Cuba, Mongolia,
Rumania, France, F.R.G.,
India, Canada, Saudi Arabia,
Holland, Mexico, Syria,
Afghanistan, Japan, Great
Britain, Austria, Belgium,
Switzerland, Italy.
2. Manned Space Flight. Legal
Aspects in the Light of
Scientific and Technical
Development. Ed. by **K. - H.
Böckstiegel**. Proceedings of
an Inter-national Colloquium
Cologne, May 20-22, 1992.
(Cologne Proceedings) p.7.
3. Y.M. Kolossov: International
Regulation of Human Beings'
Presence in Outer Space.
Cologne Proceedings p.37.
4. NASA-Act see Space Law
Basic Legal Documents. Ed.
by **K. -, Böckstiegel** and **M.
Benkő** Vol2/1 E.III.1. C.F.R.
see United States Space
Law. Ed. by **S. Gorove**:
National Regulation I.A.3.
Release 85 -1. Relevant rules
cited by **S.E. Doyle**:
Astronauts and Cosmonauts
in International Cooperation:
a View of the American
Experience. Cologne
Proceedings P. 43-66.
5. **K. - H. Böckstiegel**
op.cit. p.7.
6. **S.E. Doyle** op.cit. p. 39.
7. The Hungarian term "világűr"
(empty space) has belletristic
roots. It became general
under the influence of the
famous drama of Imre
Madách "Tragedy of Man"
(1860).
8. **Y.M. Kolossov**
op.cit.p.39.
9. **G. Gál**: Space Treaty and
Space Technology:
Questions of Interpretation. In
Proceedings of the Fifteenth
Coll. Vienna 1972. p.105.
Idem: Space Law 1969
p.208. The definition based
on Article VIII. (jurisdiction) of
the S.T. "object launched into
outer space" (**I.H. Ph.
Diederiks-Verschoor**: An
Introduction to Space Law.
Deventer-Boston 1993. p.9.)
may be completed by this
element.

10. Op.cit. Cologne Proceedings p.62.
11. **V. Vereshchetin**: Legal Problems of Man's Flights into Outer Space (in Russian) Moscow 1986 p.7. Cited by Y.M. Kolossov in Cologne Proceedings p.41. Prof. **Y.M. Kolossov**, however, concluded from above clauses that astronauts "enjoy a special legal regime of a most favored human being."
12. **R. Lorza Pitt**: commentary in Cologne Proceedings p.207. He would confer the privilege of EoM only to astronauts participating in space missions conducted for the good of all mankind. In this respect the definition of **E. Kamenetskaya** deserves attention "cosmonauts are people who carry out professional space activities in accordance with principles and rules of international space law. "Cosmonaut" ("Astronaut") an attempt of International Legal Definition. Proceedings of the Thirty First Coll. Bangalore 1988.p. 177.
13. **I.H.Ph. Diederiks-Verschoor**: An Introduction to Air Law. Antwerp-Boston-London-Frankfurt 1983.p.25.
14. In the publicism this term has been accepted generally even after the appearance of "non-pilots" on board.
15. Webster's Ninth New Collegiate Dictionary. Springfield Massachusetts 1983.p.306.
16. The Oxford Reference Dictionary. Oxford 1986. p.198.
17. Cologne Proceedings p.206.
18. **S.E. Doyle** op.cit. Cologne Proceedings p.44-45.
19. **V.S. Vereshchetin**: On the Elaboration of the Law of Manned Space Flights, Proceedings of the twenty-fourth Coll. Rome 1981.p.145.
20. See **F.N.V. Videla Escalada**: Aeronautical Law. Alphen aan den Rijn 1979. p. 199 et seq., **N. Meteesco Matte**: Treaties on Air-Aeronautical Law. Montreal-toronto 1981. p. 293. **I.H.Ph. Diederiks-Verschoor**. op. cit. 22-24.
21. **V. Kopal**: Some Problems Relating to the in-flight Personnel Regime of Manned Space Objects. Cologne Proceedings p.88.

Annex I.**Gál: Aircrew-Spacecrew*****Astronauts in chronological order - name, country, number of flights***

1	Gagarin J.A.	SU	01	37	Chrunov J.V.	SU	01
2	Titov G.S.	SU	01	38	Schweickart R.	USA	01
3	Glenn J.H.	USA	01	39	Chonin G.S.	SU	01
4	Carpenter M.S.	USA	01	40	Kubassov V.N.	SU	03
5	Nikolaev A.G.	SU	02	41	Filipchenko A.	SU	02
6	Popovich P.R.	SU	02	42	Volkov V.N.	SU	02
7	Schirra W.M.	USA	02	43	Gorbatko V.V.	SU	03
8	Cooper L.G.	USA	02	44	Bean A.L.	USA	02
9	Bikovski V.F.	SU	03	45	Swigert J.L.	USA	01
10	Tereskova V.V.	SU	01	46	Haise F.W.	USA	01
11	Komarov V.M.	SU	02	47	Sevastianov V.	SU	02
12	Feoktistov K.	SU	01	48	Shepard A.B.	USA	01
13	Yegorov B.B.	SU	01	49	Roosa S.A.	USA	01
14	Beliaev P.I.	SU	01	50	Michell E.D.	USA	01
15	Leonov A.A.	SU	02	51	Rukavishnikov	SU	03
16	Grissom V.I.	USA	01	52	Dobrovolski G.	SU	01
17	Young J.M.	USA	06	53	Paoaev V.I.	SU	01
18	McDivitt J.A.	USA	02	54	Worden A.M.	USA	01
19	White J.A.	USA	02	55	Irwin J.B.	USA	01
20	Conrad C.	USA	01	56	Mattingly T.K.	USA	03
21	Borman F.	USA	02	57	Duke C.M.	USA	01
22	Lovell J.A.	USA	04	58	Evans R.E.	USA	01
23	Stafford T.P.	USA	04	59	Schmitt H.H.	USA	01
24	Armstrong N.A.	USA	02	60	Kerwin J.P.	USA	01
25	Scott D.R.	USA	03	61	Weitz P.J.	USA	01
26	Cernan E.A.	USA	03	62	Garriott O.K	USA	02
27	Collins M.	USA	02	63	Lousma J.R.	USA	02
28	Gordon R.F.	USA	02	64	Lazarev V.G.	SU	01
29	Aldrin E.E.	USA	02	65	Makarov O.G.	SU	03
30	Eisele D.F.	USA	01	66	Carr G.P.	USA	01
31	Cunningham R.W.	USA	01	67	Gibson E.G.	USA	01
32	Geregovoi G.T.	USA	01	68	Pogue W.R.	USA	01
33	Anders W.A.	USA	01	69	Klimuk P.I.	SU	03
34	Satalov V.A.	SU	03	70	Lebedev V.V.	SU	02
35	Volinov B.V.	SU	02	71	Artjumin J.P.	SU	01
36	Yeliseyev A.S.	SU	03	72	Sarafanov G.V.	SU	01

73	Djomin L.S.	SU	01	119	Hauck F.W.	USA	03
74	Gubarev A.A.	SU	02	120	Fabian J.M.	USA	01
75	Gretshko G.M.	SU	03	121	Ride S.K.	USA	02
76	Brand V.D.	USA	04	122	Thagard	USA	04
77	Slayton D.K.	USA	01	123	Alexandrov A.P.	SU	02
78	Zholobov V.M.	SU	01	124	Brandenstein D.C.	USA	04
79	Aksyonov V.V.	SU	02	125	Bluford G.S.	USA	04
80	Zudov V.D.	SU	01	126	Gardner D.A.	USA	02
81	Rozhdestvenski	SU	01	127	Thornton W.E.	USA	02
82	Glazkov J.N.	SU	01	128	Shaw B.H.	USA	03
83	Kovalyonok V.V.	SU	03	129	Parker R.A.R.	USA	02
84	Rumin V.V.	SU	03	130	Lichtenberg B.K.	USA	02
85	Romanenko J.V.	SU	05	131	Merbold U.	FRG	02
86	Dshanibekov V.	SU	01	132	Bigson R.L.	USA	04
87	Remek V.	CZ-S	02	133	McCandless B.	USA	02
88	Ivantchenko	SU	02	134	McNair R.E.	USA	01
89	Hermashevski	PO	01	135	Stewart R.L.	USA	02
90	Jahn S.	GDR	01	136	Solovyov V.A.	SU	02
91	Lianhaov V.A.	SU	03	137	Atjkov O.J.	SU	01
92	Ivanov G.	BG	01	138	Sharma R.	I	01
93	Popov L.I.	SU	03	139	Scobee F.R.	USA	01
94	Farkash B.	H	01	140	Hart T.J.	USA	01
95	Malishev J.V.	SU	02	141	Van Hoften	USA	02
96	Pham Tuan	V	01	142	Nelson G.D.	USA	03
97	Tamayo Mendez	CU	01	143	Volk I.P.	SU	01
98	Kizim L.G.	SU	03	144	Coats M.L.	USA	03
99	Strekalov G.M.	SU	04	145	Resnik J.A.	USA	01
100	Savinih V.P.	SU	03	146	Hawley S.A.	USA	03
101	Gurragtohaa Zh.	MO	01	147	Mullane R.M.	USA	03
102	Crippen R.L.	USA	04	148	Walker C.D.	USA	03
103	Prunariu D.	R	01	149	McBride J.A.	USA	01
104	Engle J.H.	USA	02	150	Sullivan K.D.	USA	03
105	Truly R.H.	USA	02	151	Leestma D.C.	USA	03
106	Fullerton C.G.	USA	02	152	Garneau M.	CAN	01
107	Berezovoy A.N.	SU	01	153	Scully-Power P.D.	USA	01
108	Chretien J.L.	F	02	154	Walker D.M.	USA	03
109	Harsfield H.W.	USA	03	155	Fisher A.L.	USA	01
110	Serebrov A.A.	SU	04	156	Shriver L.J.	USA	03
111	Savitskaya S.J.	SU	02	157	Onizuka E.S.	USA	01
112	Overmyer R.F.	USA	02	158	Buchli J.F.	USA	04
113	Allen J.P.	USA	02	159	Payton G.E.	USA	01
114	Lenoir W.B.	USA	01	160	Williams D.E.	USA	02
115	Dobko K.J.	USA	03	161	Seddon M.R.	USA	02
116	Musgrave F.S.	USA	04	162	Hoffman J.A.	USA	03
117	Peterson D.H.	USA	01	163	Griggs S.D.	USA	01
118	Titov V.B.	SU	02	164	Garn E.J.	USA	01

165	Gregory F.D.	USA	03	211	Shepherd W.M.	USA	03
166	Lind D.L.	USA	01	212	Blaha J.E.	USA	03
167	Wang T.G.	USA	01	213	Springer R.C.	USA	02
168	Van Den Berg L.	USA	01	214	Bagian J.P.	USA	02
169	Creighton J.O.	USA	03	215	Lee M.C.	USA	02
170	Lucid S.W.	USA	03	216	Richards R.N.	USA	03
171	Nagel S.R.	USA	04	217	Adamson J.C.	USA	02
172	Baudry P.	F	01	218	Brown M.N.	USA	02
173	Al-Baud S:S.	SAUD	01	219	McCulley M.J.	USA	01
174	Bridges R.D.	USA	01	220	Baker E.S.	USA	02
175	England A.W.	USA	01	221	Carter M.L.	USA	01
176	Henize K.G.	USA	01	222	Thornton K.C.	USA	02
177	Acton É-W.	USA	01	223	Wetherbee J.D.	USA	02
178	Bartoe J.-D. F.	USA	01	224	Ivins M.S.	USA	02
179	Covey R.O.	USA	03	225	Low G.D:	USA	03
180	Lounge J.M.	USA	03	226	Balandin A.N.	SU	01
181	Fisher W.F.	USA	01	227	Casper J.H.	USA	02
182	Vasyutin V.V:	SU	01	228	Thuot P.J.	USA	02
183	Volkov A.A.	SU	03	229	Manakov G.M.	SU	02
184	Grobe R.J.	USA	04	230	Cabana R.D:	USA	02
185	Hilmers D.C.	USA	04	231	Melnick B.E.	USA	02
186	Pailles W.A.	USA	01	232	Akers T.D.	USA	02
187	Dunbar B.J.	USA	03	233	Culbertson F.L.	USA	02
188	Furrer R.	FRG	01	234	Gemar C.D.	USA	02
189	Messerschmid E.	FRG	01	235	Meade C.J.	USA	02
190	Ockels W. J.	NL	01	236	Durrance S.T:	USA	01
191	O'Connor B.D:	USA	02	237	Parise R.A:	USA	01
192	Cleave M.L.	USA	02	238	Afanasyev V.M.	SU	01
193	Pring S.C:	USA	01	239	Akijama T.	J	01
194	Ross J.L.	USA	04	240	Cameron K.D:	USA	02
195	Neri Vela R.	MEX	01	241	Godwin L.M	USA	01
196	Bolden C.F.	USA	03	242	Apt. J.	USA	02
197	Chang-Diaz F.R:	USA	03	243	Hammond L. B.	USA	01
198	Kenner R.J.	USA	01	244	Harbaugh G.J.	USA	02
199	Nelson W.C:	USA	01	245	McMonagle D.R:	USA	02
200	Laveykin A.I.	SU	01	246	Veach C.L.	USA	02
201	Viktorenko A.S.	SU	03	247	Hieb R.J.	USA	02
202	Faris M.A.	SYR	01	248	Arcebarsky A.P.	SU	01
203	Manarov M.H.	SU	02	249	Sharman H.P.	GB	01
204	Levtchenko A.S.	SU	01	250	Guttierrez S.M.	USA	01
205	Solovyov A.J.	SU	03	251	Jernigan T.E.	USA	02
206	Alexandrov A.	BG	01	252	Gaffney F.D.	USA	02
207	Polyakov	SU	01	253	Huges-Fulford	USA	01
208	Mohmand A.A.	A	01	254	Baker M.A.	USA	02
209	Krikalyov S.K.	SU	02	255	Rightler K.S.	USA	01
210	Gardner G.S.	USA	02	256	Aubakirov T.	SU	01

257	Viehbock F.	AU	01	280	Davis N.J.	USA	01
258	Hendricks T:T:	USA	03	281	Jemison M.C:	USA	01
259	Voss J.S.	USA	03	282	Mohri M.	J	01
260	Runco M	USA	02	283	Maclean S.G.	CAN	01
261	Hennen T:J.	USA	01	284	Clifford M.	USA	01
262	Oswald S.S.	USA	02	285	Helms S:J.	USA	01
263	Readdy W.F.	USA	02	286	Polishtchuk A.	RUS	01
264	Bondar R.	CAN	01	287	Cockrell K.D:	USA	01
265	Kaleri A.J.	RUS	01	288	Ochoa E.	USA	01
266	Flade K.D.	FRG	01	289	Precourt C.J.	USA	01
267	Duffy B.	USA	02	290	Harris B.A:	USA	01
268	Foale C.M.	USA	02	291	Walter U.	FRG	01
269	Frimout D.	BE	01	292	Schlegel H.W.	FRG	01
270	Chilton K.P.	USA	01	293	Sherlock N.J.	USA	01
271	Bowersox K.D.	USA	01	294	Wisoff F.J.K.	USA	01
272	Delucas L.J.	USA	01	295	Cibliyev V.V.	RUS	01
273	Trinn E.H.	USA	01	296	Haignere J.P.	F	01
274	Avdeyev S.V.	RUS	01	297	Newman J.H.	USA	01
275	Tognini M.	F	01	298	Bursch D.W.	USA	01
276	Allen A.M.	USA	01	299	Walz C.E.	USA	01
277	Nicollier C:	S	01				
278	Malerba F.	I	01				
279	Brown C.L.	USA	01				

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