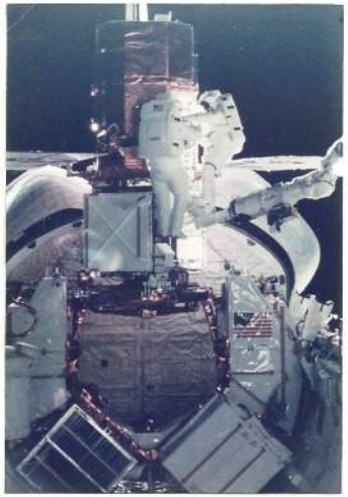
EVA is 50

Space Walking Integral to Shuttle Missions.

The Space Transportation System (STS) which ran from 1981 till 2011 and was commonly known as "the shuttle" employed a space craft easily ten times bigger than the Soviet Soyuz ferry and had a very versatile payload bay big enough to contain a single decker bus.

Accordingly within a full crew of seven astronauts three or more of the Mission Specialists or Payload Specialists would train for EVA on their assigned mission, for example supervising the launching of satellites brought into orbit in the payload bay.

As well as launching satellites shuttle crews have performed maintenance tasks on conventionally launched satellites as these event covers from 1984 (STS–41C) repair of SOLAR MAX and 1991 (STS–37) repair of the Gamma Ray Observatory illustrate.



The repair of SOLAR MAX. Astronauts George D. Nelson, right, and James D. van Hoften use the mobile foot restraint and the Remote Manipulator System (RMS) for moving about.

STS-37 ONBOARD VIEW — Astronaut Jerome (Jay) Apt is in Atlantis' cargo bay. Astronaut Jerry L. Ross would join Jerome Apt in accomplishing a repair task on the Gamma Ray Observatory (GRO). The two had been called upon to manually extend the high-gain antenna on GRO.

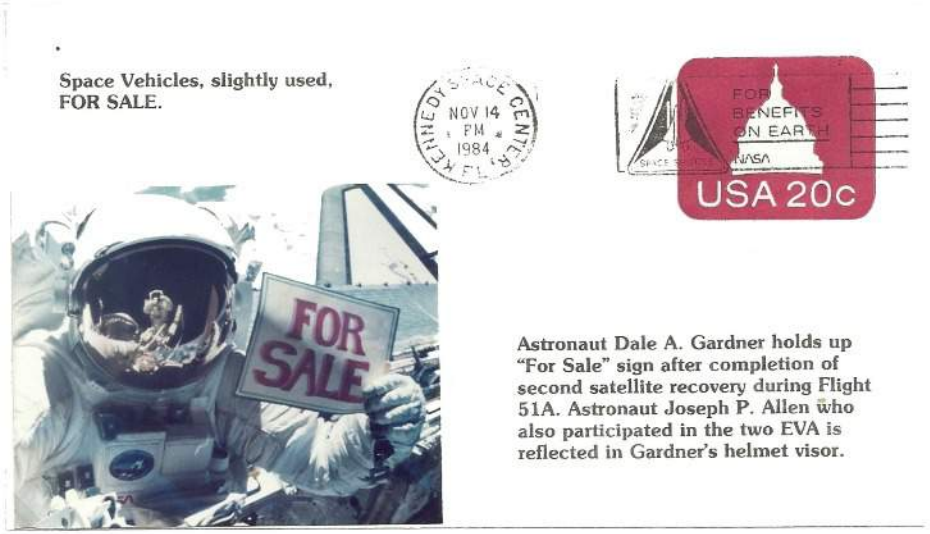
EVA is 50

Space Walking Integral to Shuttle Missions.

Satellite recovery

Sometimes satellites launched conventionally malfunctioned and could not be repaired in the shuttle's payload bay after grasping by astronauts using a space crane or "remote manipulator system" (RMS) shown in the 1986 stamp from Niger below. In such cases the satellites were still very valuable and could be re-launched.

This is suggested by the cover below from STA-51A in November 1984 and by one stamp in an 1988 issue by Ascension for the famous underwriting firm Lloyds of London



Astronaut Dale A. Gardner holds up "For Sale" sign after completion of second satellite recovery during Flight 51A. Astronaut Joseph P. Allen who also participated in the two EVA is reflected in Gardner's helmet visor.

EVA is 50

Space Walking Integral to Shuttle Missions.

NASA's Manned Manuevering Unit

The next stage in the development of spacewalking was to create a modern equivalent of the sedan chair, known to the Americans as the MMU (Manned Maneuvering Unit). This device was either designed as a large pack on the astronaut's back (which is the current standard) - or as a kind of motorised armchair in which the spacewalker sat.

There is no equivalent of the MMU on a US stamp but a cachet on a 1984 cover consists of a NASA photograph depicting the first US mission to feature an untethered spacewalk. The cover indicates that astronaut Bruce McCandless – its first ever pilot, who ventured 90 metres away from the shuttle - is using a hand controller.

Astronaut Bruce McCandless II, one of the two 41-B mission specialists participating in an historical extra-vehicular activity (EVA) is using a nitrogen-propelled, hand-controlled maneuvering unit (MMU), which allows for great mobility in space.

The MMU is shown on a number of stamps from other countries…..

EVA is 50

Space Walking Integral to Shuttle Missions.

The Soviets' MMU equivalent

The tethered Soviet version—dubbed the Icarus unit—is depicted on a 1990 Cosmonautics Day stamp from the USSR whose design gives the impression that it can travel great distances from the Mir Space Station in the background. Actually its range is limited by the tether for close work around the space complex. Further misdirection from the rival programme.

As can be seen the design of the Soviet device is superficially similar to NASA's MMU.

EVA is 50

Soviet space station maintenance

The Soviet Union and then Russia also required cosmonauts to repair their Space Stations before they joined the International Space Station project themselves as these issues show.

The cosmonauts of Soyuz T-9's 150 day mission to the Salyut 7 space station, in the second half of 1983 Lyakhov and Alexandrov, both had to undertake EVAs to install solar panels to the station.

A 1984 mini-sheet marking the 25th anniversary of photography in space shows T-9 cosmonaut Lyakhov installing a solar battery to Salyut 7.

Mir's commander, Anatoly Solovyov, world's most experienced spacewalker, inspecting the damaged solar panel and Spektr science module after the unmanned Progress cargo ship collided with Mir in July, 1997.

This 2007 United Nations stamp shows the Mir space station on the right and future astronauts repairing a satellite.

This 2000 issue from Georgia shows cosmonauts working on a reflector on the Mir space station.

A 2006 Ukrainian issue shows astronauts repairing the ISS

EVA is 50

Launch, maintenance and repair of the Hubble Space Telescope (HST).

Before the construction of the International Space Station, the orbiters' greatest achievement was to provide and maintain the HST which has produced some of the most amazing photographs of the Universe ever seen or dreamt of.

After launch by *Discovery* in 1990, referenced by these items below four subsequent Space Shuttle missions repaired, upgraded, and replaced systems on the telescope. A final servicing mission was completed in 2009. The telescope is still operating and may last until 2020.

Through windows on STS-31 Discovery's aft flight deck, the Hubble Space Telescope (HST) was in the grasp of the remote manipulator system prior to its release.

EVA is 50

Launch, maintenance and repair of the Hubble Space Telescope (HST).

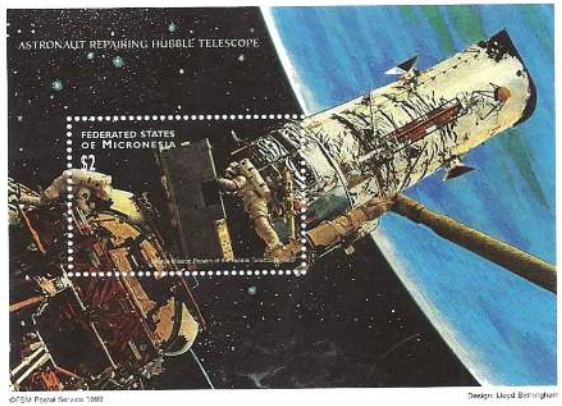
New Glasses for Hubble Space Telescope

Shuttle Mission STS-61/Endeavour 2-12 Dec 1993

Hubble Mission 4554
STS-82/Discovery

Second servicing mission
February 11-21,1997
Astronauts Mark Lee and
Steven Smith patching Hubble's insulation

01040

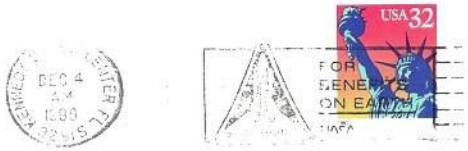


EVA is 50

EVA's part in the construction of the International Space Station

Space walking was self evidently vital to the construction of the multi-moduled space station whose components were flown and docked automatically to the station over more than a decade but which of course required construction work, snagging and maintenance by resident and visiting crew members.

A whole exhibit could be (and has been) devoted to this topic, so these few pages simply hint at the astonishing work done by international astronauts since the turn of the Millennium.



On the very first shuttle flight to the space station (STS-88 in December 1998) which delivered and united the first American component (Unity) to the first Russian module (Zarya), astronauts Ross and Newman conducted three EVA each lasting around 7 hours, installing a cable between the two craft, mounting tools, unfolding the new solar cells and mounting restraints for future EVA work.

The very modest status of the ISS in 1999 is shown in the extreme left stamp in this mini-sheet from Sierra Leone in 2006 which charts the station's modular growth over six years.

EVA is 50

EVA's part in the construction of the International Space Station

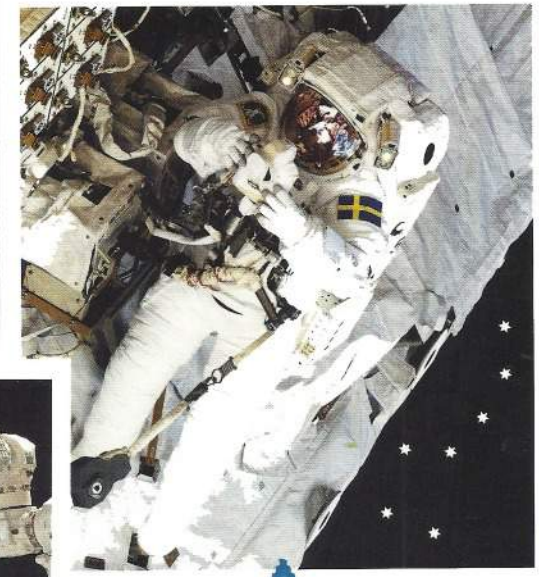
STS-113 launched on 23rd November 2002 enabled seven days of station assembly with the three 7-hours highly technical EVA conducted by mission specialist astronauts Michael Lopez-Alegria and John Herrington shown wearing their white SAFER (life-support and systems) EVA suits in this 2010 issue from Malawi.

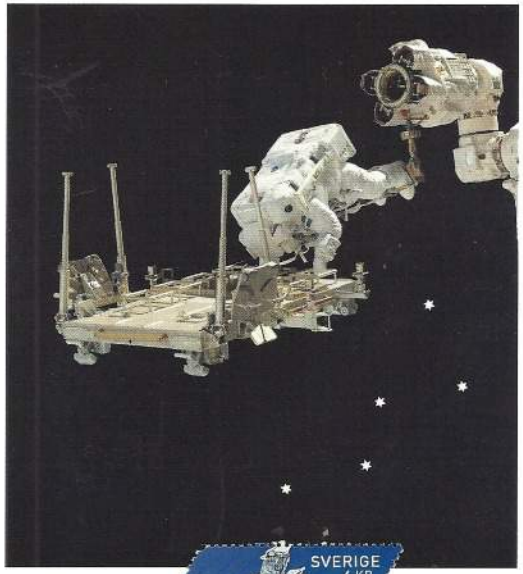
SPACE SHUTTLE
STS-113/ENDEAVOUR

EVA is 50

EVA's part in the construction of the International Space Station

STS-116 (launched 9th December 2006) was unusual in that it saw spacewalks conducted by an ESA (European Space Agency) astronaut, Christer Fuglesang of Sweden *who was much celebrated in stamps by his own country—and a US Zazzle (private post) issue below right* . Fuglesang accompanied by NASA astronaut Robert Curbeam conducted three spacewalks all devoted to the station's electrical systems, averaging around 6 hours.



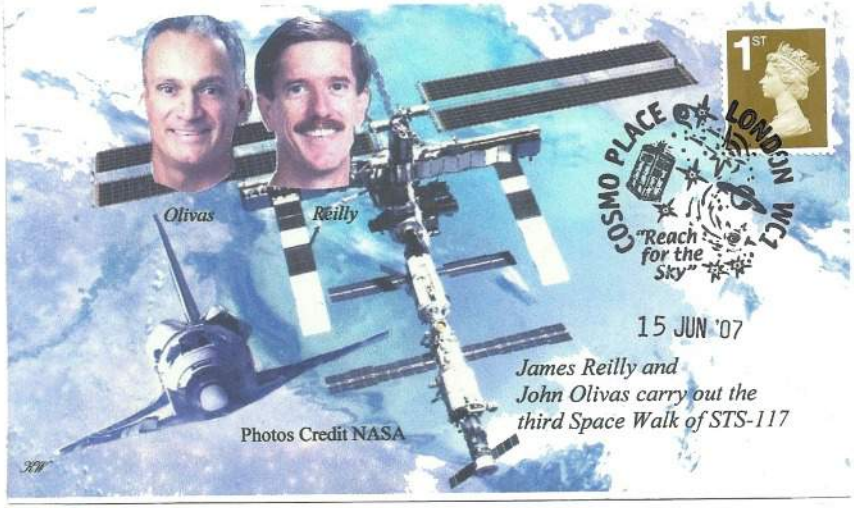


Takao Doi became the first Japanese astronaut to space walk on mission STS-123 in March 2008.

EVA is 50

EVA's part in the construction of the International Space Station

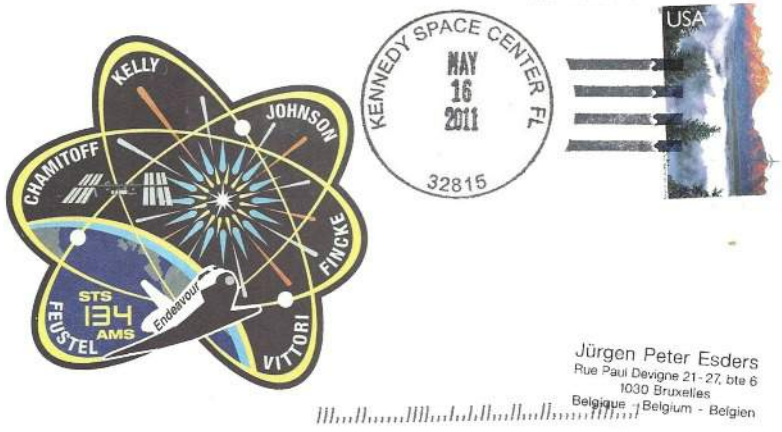
Space walks galore.....



EVA is 50

EVA's part in the construction of the International Space Station

The final four spacewalks conducted by NASA astronauts on the ISS occurred on the penultimate flight STS-134 in May 2011 when combinations of astronauts Drew Feustel, Gregory Chamitoff and Mike Fincke performed final maintenance tasks.



The stamp second from the left (Showing Leonov's maiden spacewalk) in this Australian strip from 2007 and the one extreme right, depicting the ISS, suggest the progress made in human spaceflight in 50 years...

EVA is 50

The First Chinese EVA

China first put a man in space (Yang Liwei) on 15th October 2003, but did not require a space walk until its third manned launch—of Shenzhou 7—five years later when that craft's commander Zhai Zhigang (pictured top left in the 2010 Somalia issue below) emerged from the orbital module of his spacecraft on the 27th September 2008.

The cover below depicts this spacewalk in four ways—on the label attached to the definitive stamp, via two cancels and the indicia of the cover which uses the same illustration as the label.

EVA is 50

A more challenging Chinese EVA—No !

In June 2013 *Shenzhou 10* became the second manned spacecraft to dock with the Tiangong 1 space station.

An approach to an earlier docking is shown in se-tenant stamps from Guiné Bissau issued in 2011 and a space walk from Shenzhou 10 to the space station is depicted in the stamp top right of the Bequia issue of 2013 but this represents a major design error as only one Chinese space walk has ever been made to date and the issue is an example of exploitation of gullible thematic collectors (Guilty !)

EVA is 50

What does the future hold ?

An array of different visions from several countries showing EVA in years to come—on the Moon, on Mars and further afield.

EVA is 50

What does the future hold ?

The vision of space artists Andrei Sokolov (1931-2007) and Alexei Leonov….

The two most important artistic visionaries of the last century (one of whom was the first man to space walk) have cooperated to paint scenarios of what might be in decades or more likely centuries ahead in two sets from Cuba (1974 and 1975).

In three stamps taken from the first set we see from l-r: Spacefarers in a Martian crater, a landing craft beside an amber wave from a strange sea in a distant world and another world being visited by humans who observe its two suns.

In the second set we see (l-r) a Cosmodrome, Earth eclipsing the Sun, landing craft on a strange planet, Astronauts on Mars and in the second row future exploration craft and as astronaut viewing the Earth (which Leonov himself did—on two separate missions)

Left an 1985 design for Cuba sees astronauts welding a huge circular space station together and right for USSR in 1967 astronauts on the Moon.