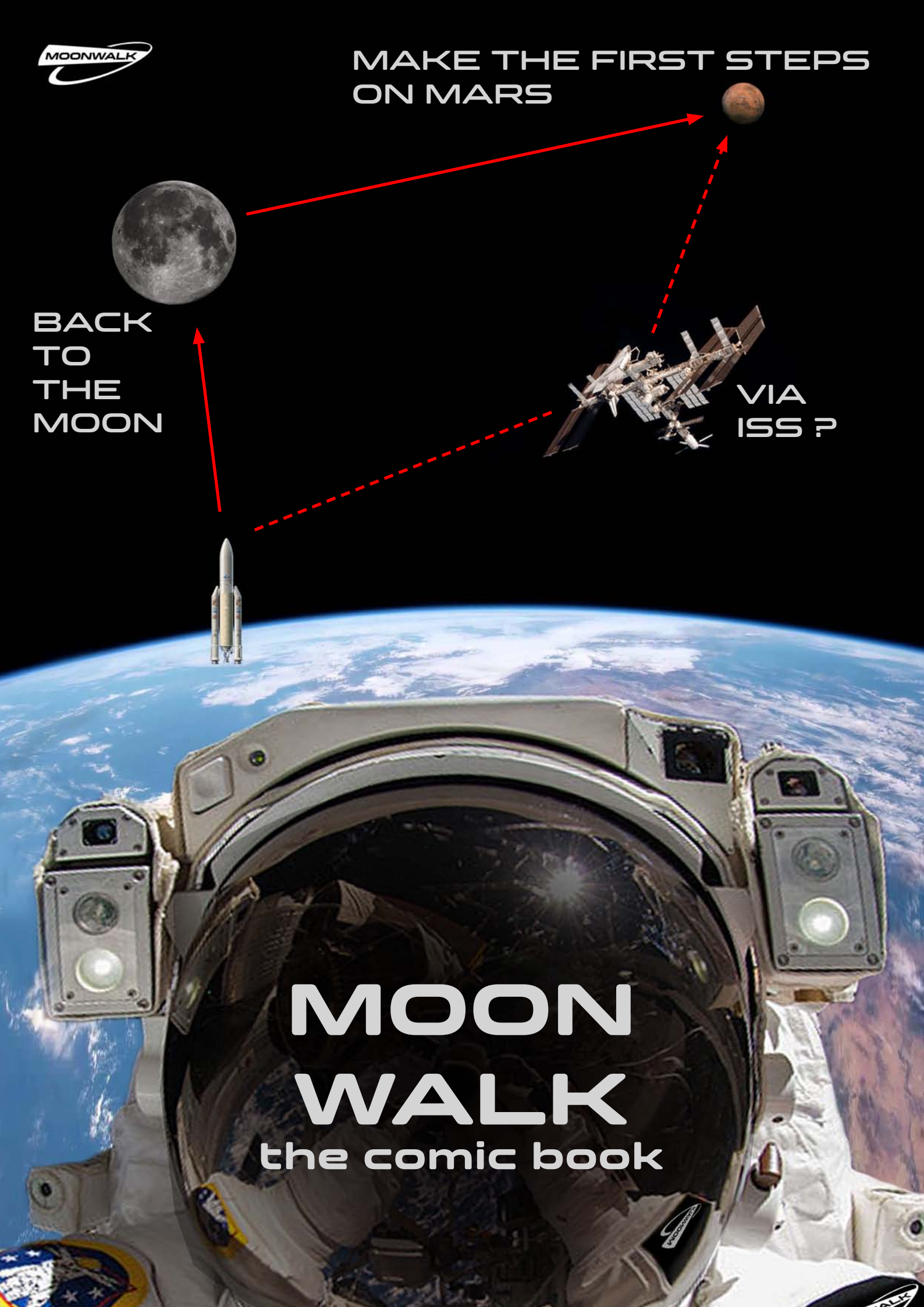


MOON WALK

the comic book

. . . THERE HAS BEEN RESEARCH . . .

CHILDREN BETWEEN SIX AND TWELVE ARE THE MOST APPROPRIATE CANDIDATES . . .

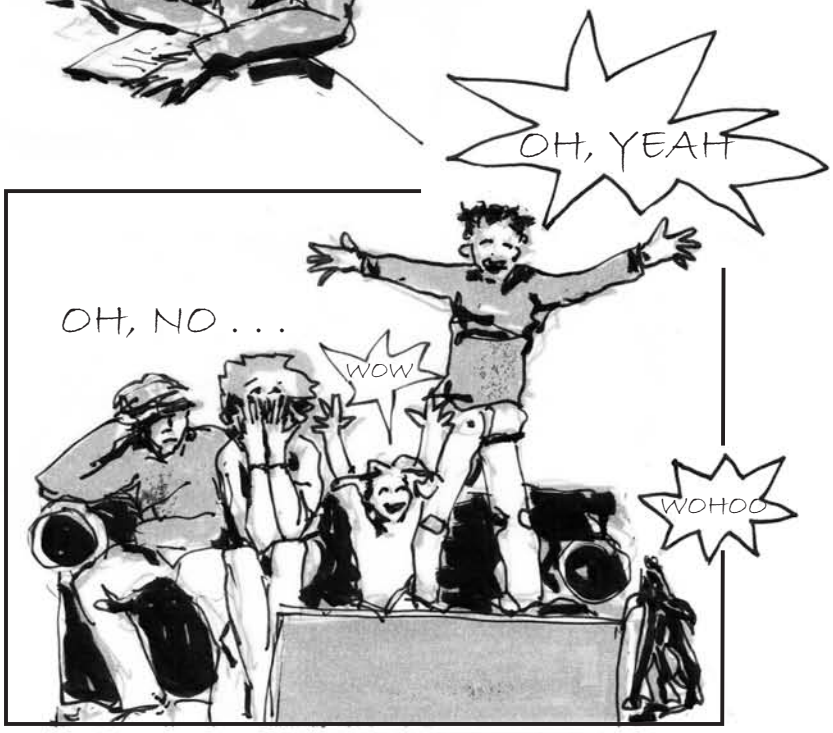
. . . OVER MANY YEARS TO FIND OUT WHO WILL BE THE RIGHT PERSONS TO GO TO MARS

THOUSANDS OF TESTS . . .

. . . HAVE BROUGHT THE TOTALLY SURPRISING RESULT . . .

BECAUSE:

- THEY ARE THE MOST FLEXIBLE IN THEIR OPINION
- THEY CAN FIGHT AND GET ALONG WELL WITHIN MINUTES
- THEY DO VERY WELL WITH ROBOTS
- THEY CAN HANDLE BOREDOM
- THEY LEARN VERY QUICKLY
- THEY . . .
- . . . . .



WILL THERE BE SCHOOL ?

WILL WE GO ALONE ?

WHO WILL GO ????

WHEN CAN WE FLY ?

I WANT TO GO !!!

I HOPE MY BROTHER DOES NOT COME . .

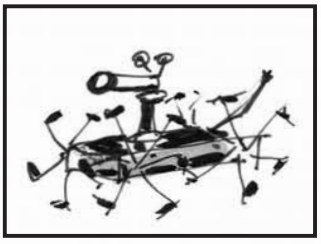
WHOM CAN I TAKE WITH ME ?

THOUSANDS OF QUESTIONS POP UP . . . WHAT ELSE IS IMPORTANT ? ? ? ?

HOW TO SELECT ?

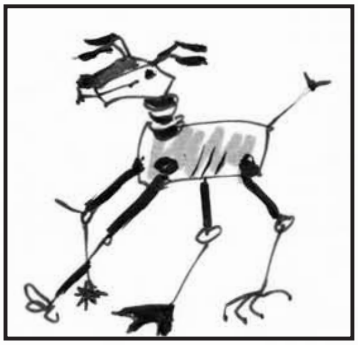
THE CREW OF FOUR HUMANS AND FOUR ROBOTS

ONLY FOUR ROBOTS ARE READY . . . . . SO . . . . NO BIG CHOICE



YEMO - THE SCOUT

JESS - THE CLIMBER



IAN - WITH FOUR DIFFERENT FEET

MIA - THE NANOCOPTER

BUT THERE ARE MILLIONS OF CHILDREN WHO WANT TO GO !!!!!

WHO SHOULD SELECT THEM ? THE GROWN-UPS ?

NEVER !

THE CHILDREN OF EACH SCHOOL . . .

THE TEACHERS ARE ONLY ALLOWED TO WATCH

. . . SELECT . . .

. . . THEIR HEROS . . .

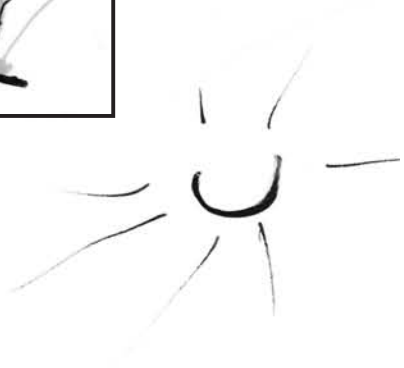
KAJA - 11 YEARS
FROM FRANCE

. . . AND HERE IS THE FINAL CHOICE:

PETE - 7 YEARS
FROM NORWAY

LISSA - 7 YEARS
FROM ESTONIA

TOM -
12 YEARS
FROM
ENGLAND

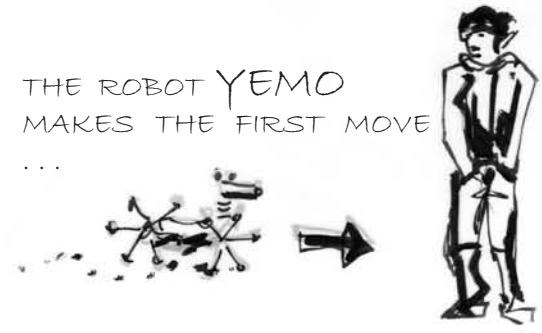


THEY ALL MEET . . .

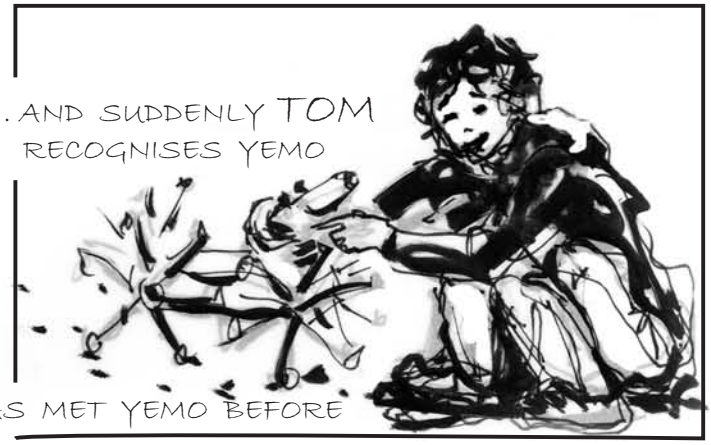
. . . FOR THE FIRST TIME ON A REMOTE ISLAND

WOULD THEY GET ALONG?

THE ROBOT YEMO
MAKES THE FIRST MOVE
. . .

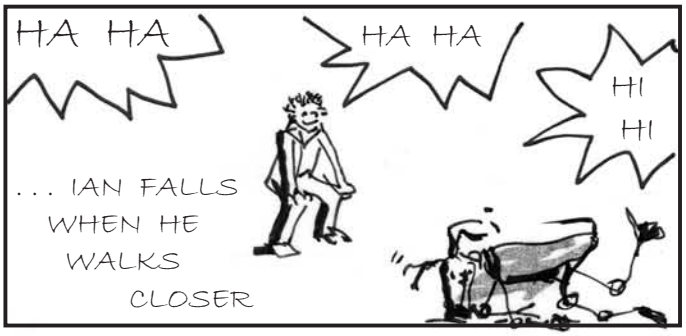


. . . AND SUDDENLY TOM
RECOGNISES YEMO



HE HAS MET YEMO BEFORE

MIA, MIA, MIA . . .



. . . SUDDENLY THEY ALL START TO TALK . . .

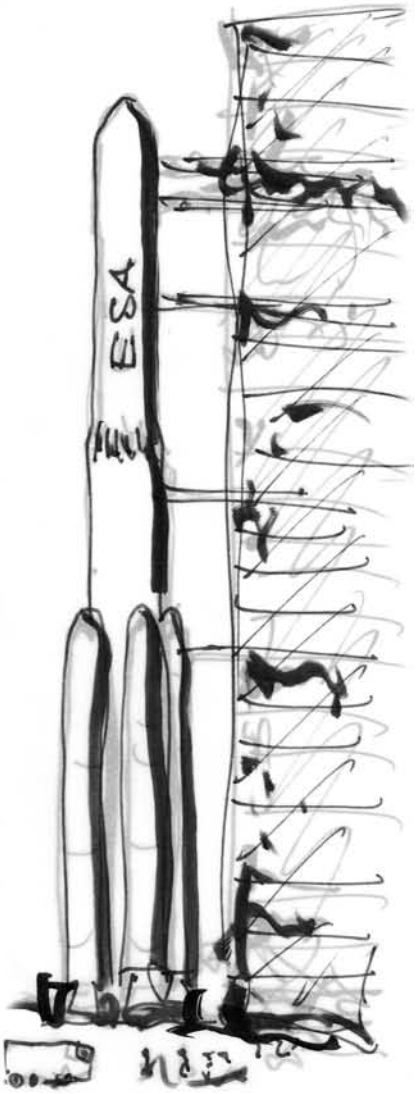
THREE MONTHS LATER..

...AND AFTER MANY FIGHTS AND HUGS...

...THEY ARE READY FOR THEIR FIRST SPACE ADVENTURE

ALL OVER EUROPE

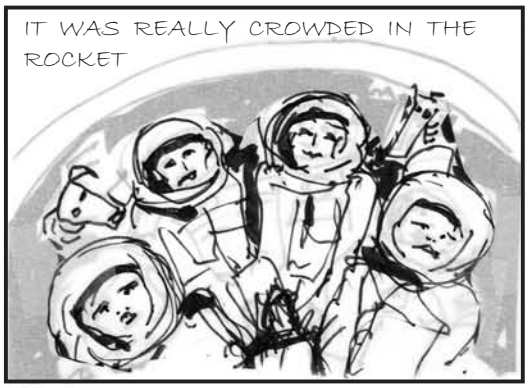
A HUGE PARTY IS CELEBRATED

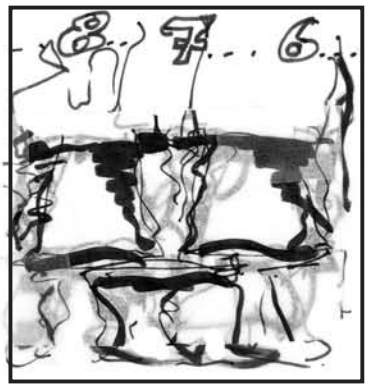


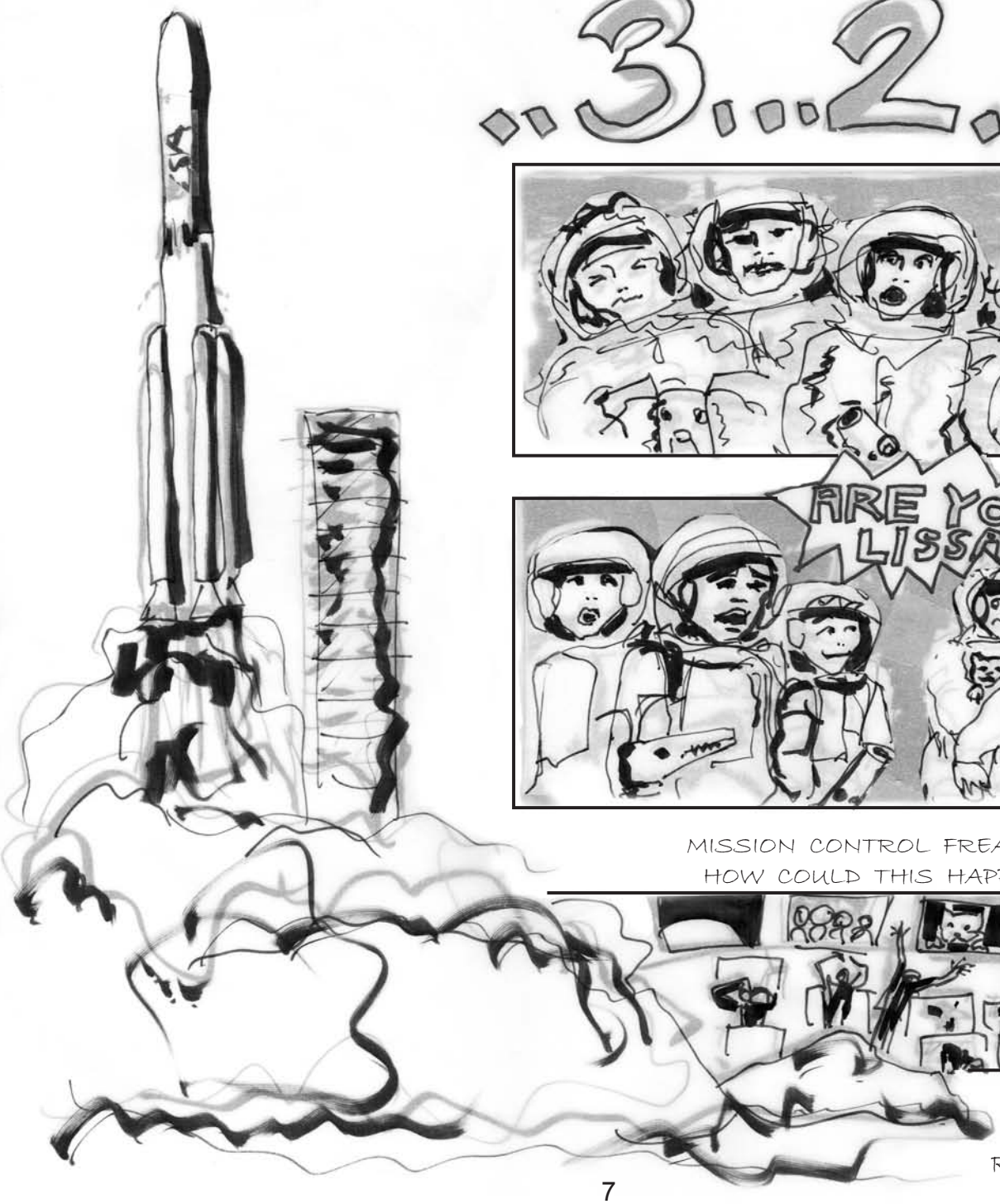
THEY HAD DECIDED THAT GOING TO THE MOON BEFORE GOING TO MARS MAKES SENSE. THEY CAN TEST THEIR EQUIPMENT AND TEAM CONSTELLATION AND STILL QUICKLY RETURN TO EARTH WHEN THEY WISH TO...

...BUT JUST FOR A WHILE...

...THEY ALL ARE SURE WHERE THEY REALLY WANT TO GO... FINALLY ...TO MARS







MISSION CONTROL FREAKS OUT
HOW COULD THIS HAPPEN???

A CAT IN THE ROCKET!!!

LOOK OUTSIDE !

LOOK AT THE EARTH !

HOW BEAUTIFUL IT IS !

THREE DAYS TRAVEL FOR 380 000 KM

ORBITER

ORBITING THE MOON

THE MOON IS BIG AND FULL OF PRECIOUS RESOURCES:

MILLIONS OF CRATERS HAVE BEEN CREATED BY METEORITES.

RIGHT IN THE MIDDLE OF EACH CRATER STILL LIES A METEORITE HOLDING A MYSTERIOUS MESSAGE FROM OUTER SPACE

LANDING

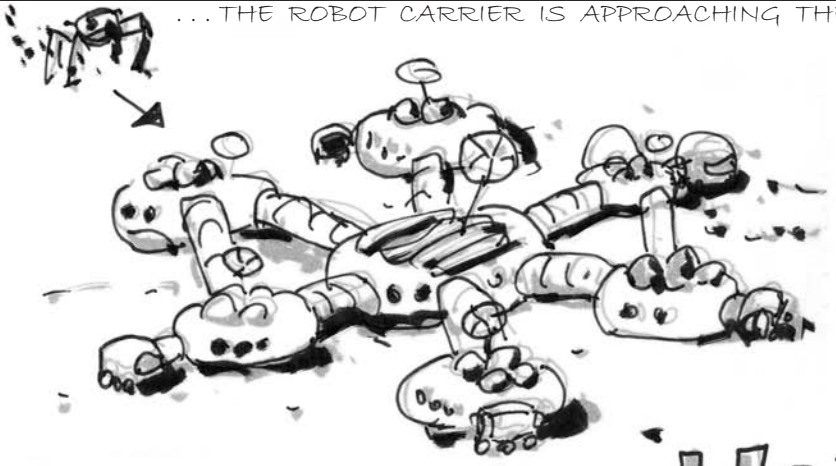
ON THE MOON, THERE IS NO ATMOSPHERE AT ALL . . .

A BIG ROBOT CARRIER LEAVES THE . . .

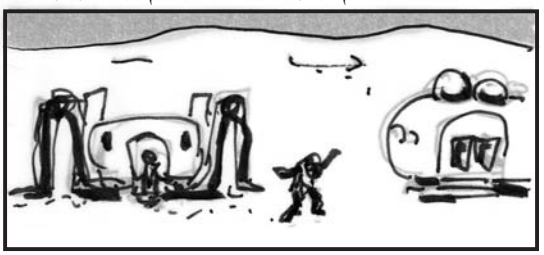
. . . LANDER

... JUST ENDLESS VACUUM ... AND THERE IS NO MAGNETIC FIELD TO PROTECT AGAINST DANGEROUS SOLAR STORMS ... BRINGING DEADLY RADIATION ...

... THE ROBOT CARRIER IS APPROACHING THE BASE

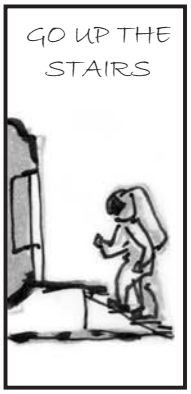


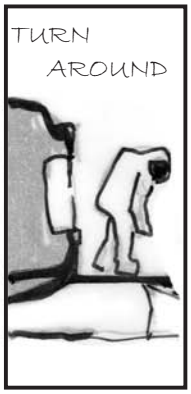
WALKING IS STRANGE ...

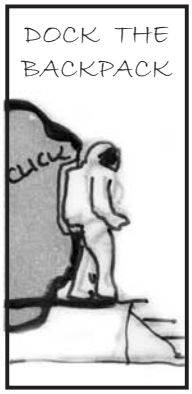


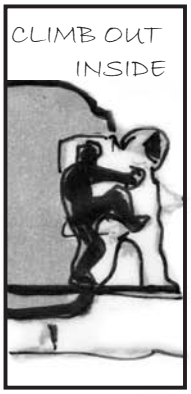
... YOU HOP LIKE A KANGAROO

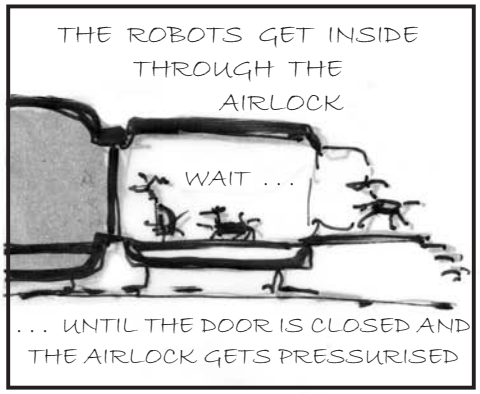
HOW TO GET INSIDE?

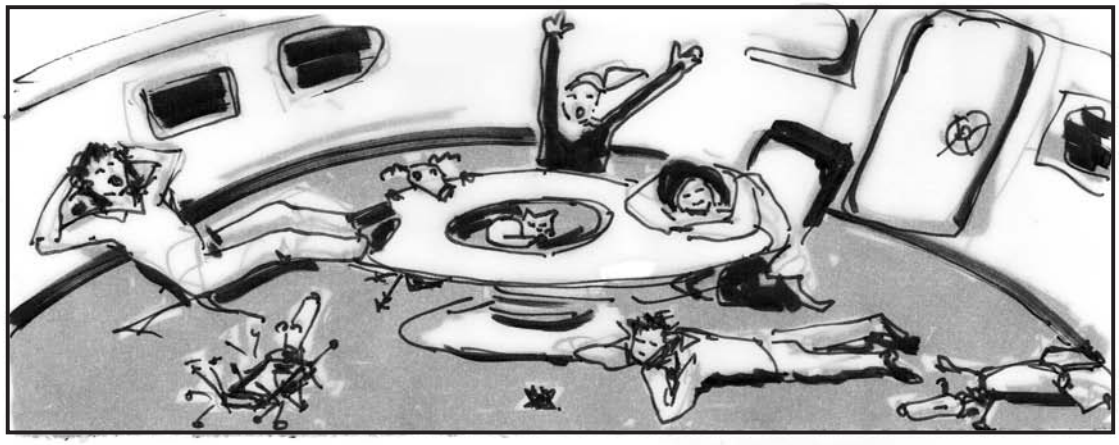










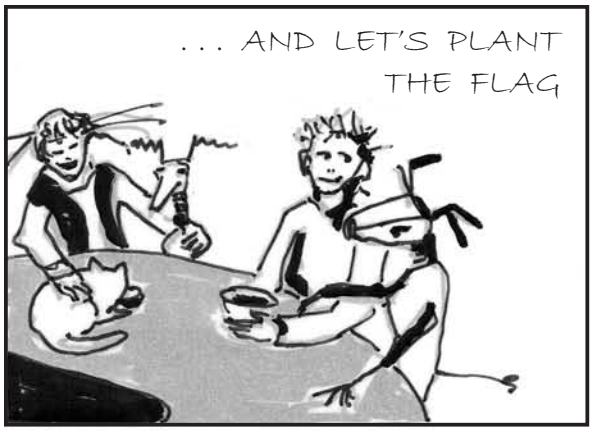


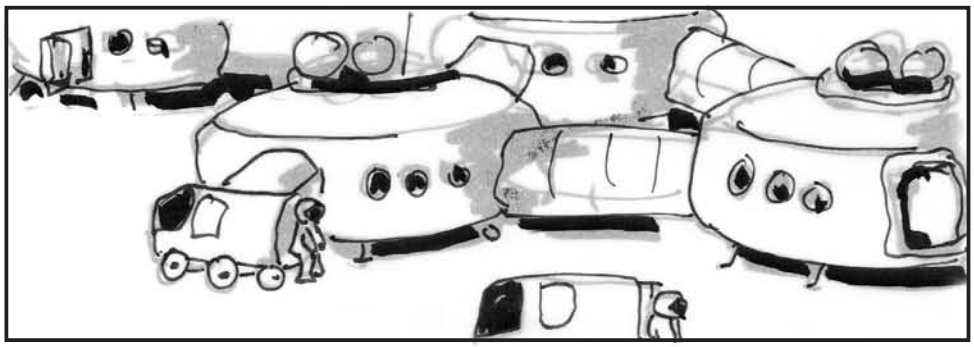
ONCE INSIDE THEY BECOME SUDDENLY REALLY TIRED ...

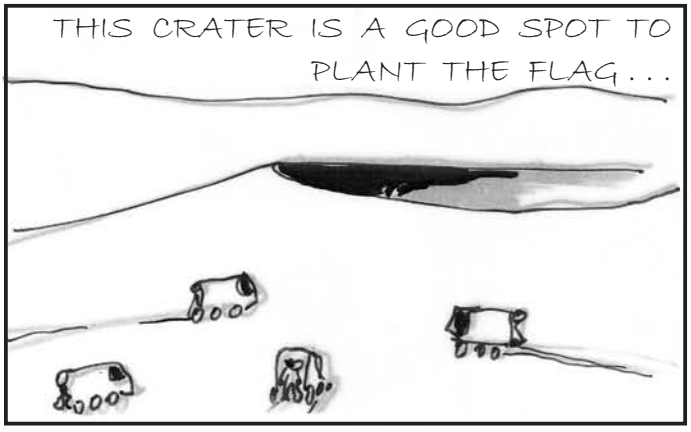
A DAY ON THE MOON LASTS 14 DAYS ON EARTH,
SAME WITH THE NIGHT

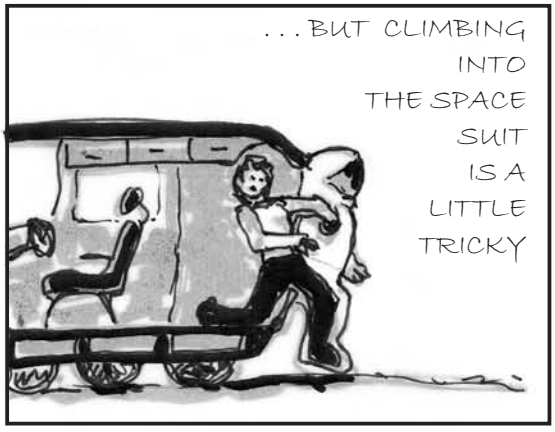
HOW CAN ONE SLEEP?! Z Z Z Z Z Z

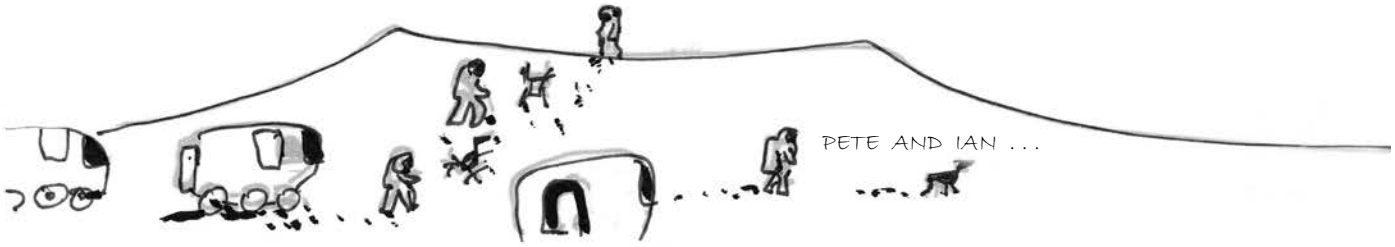
12 HOURS LATER

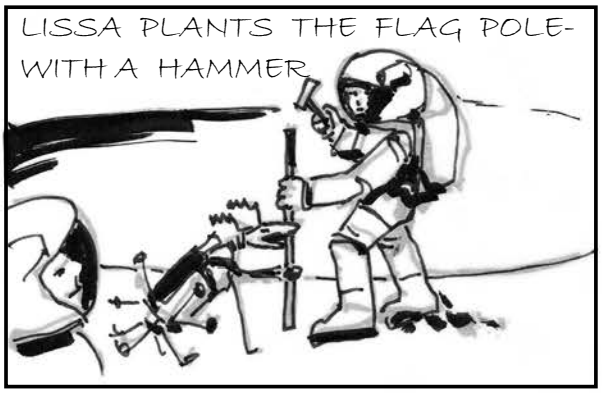


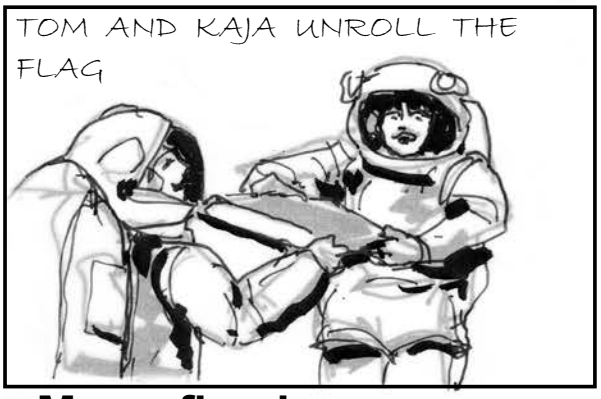






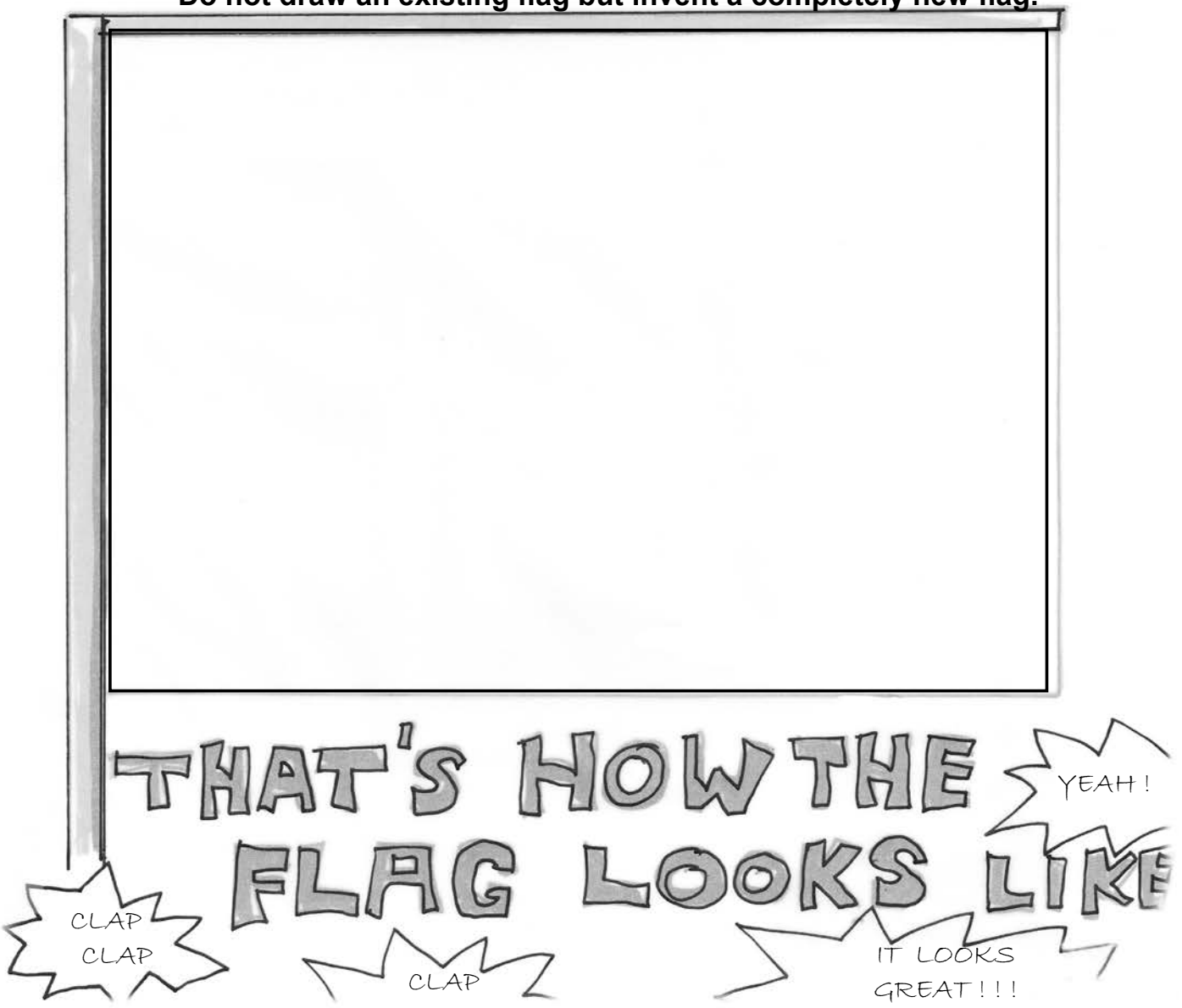






Draw your idea for a Moon flag here:

Do not draw an existing flag but invent a completely new flag.



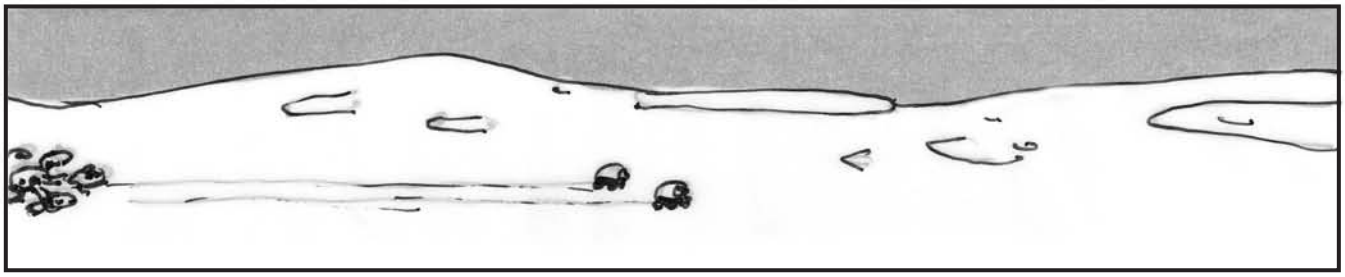
Scan or photograph this page with your flag drawing and upload it on the Moonwalk website for the Moon simulation.

www.projectmoonwalk.net/moonwalk/participate

A WEEK LATER THE CREW GOES ON A SEVERAL DAYS MISSION

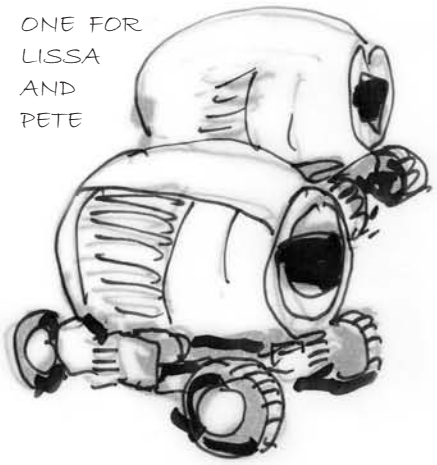
TO EXPLORE THE MOON SURFACE

FOR POSSIBLE FUTURE HABITAT LOCATIONS



THE TEAM USES THEIR TWO EXPLORATION MOBILE HOMES

ONE FOR LISSA AND PETE



AND ONE FOR KAJA AND TOM

LABORATORY

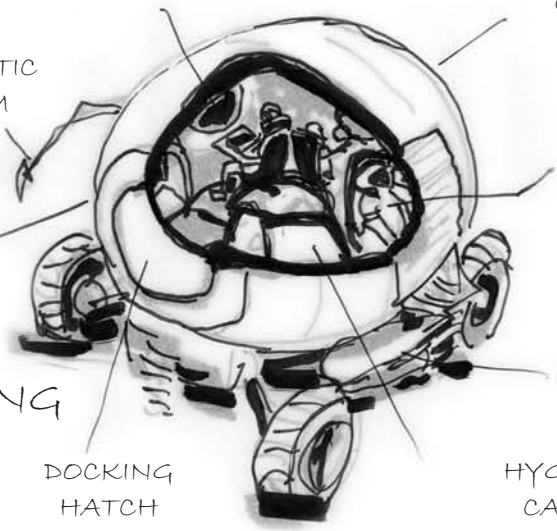
COCKPIT

ROBOTIC ARM

SUITPORT

KITCHEN

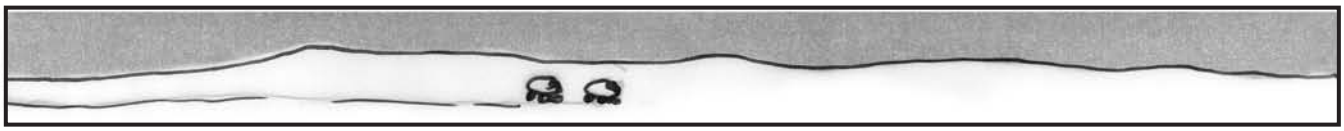
EXTERNAL TANKS

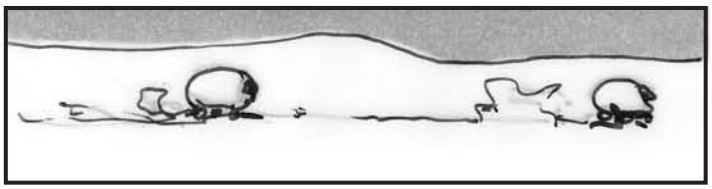


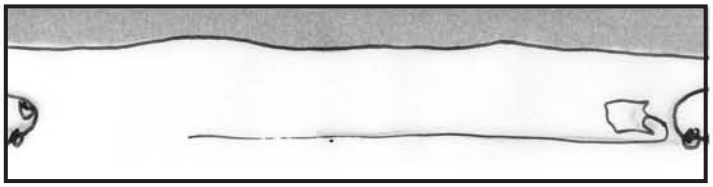
LOOKING INTO THE UPPER DECK

DOCKING HATCH

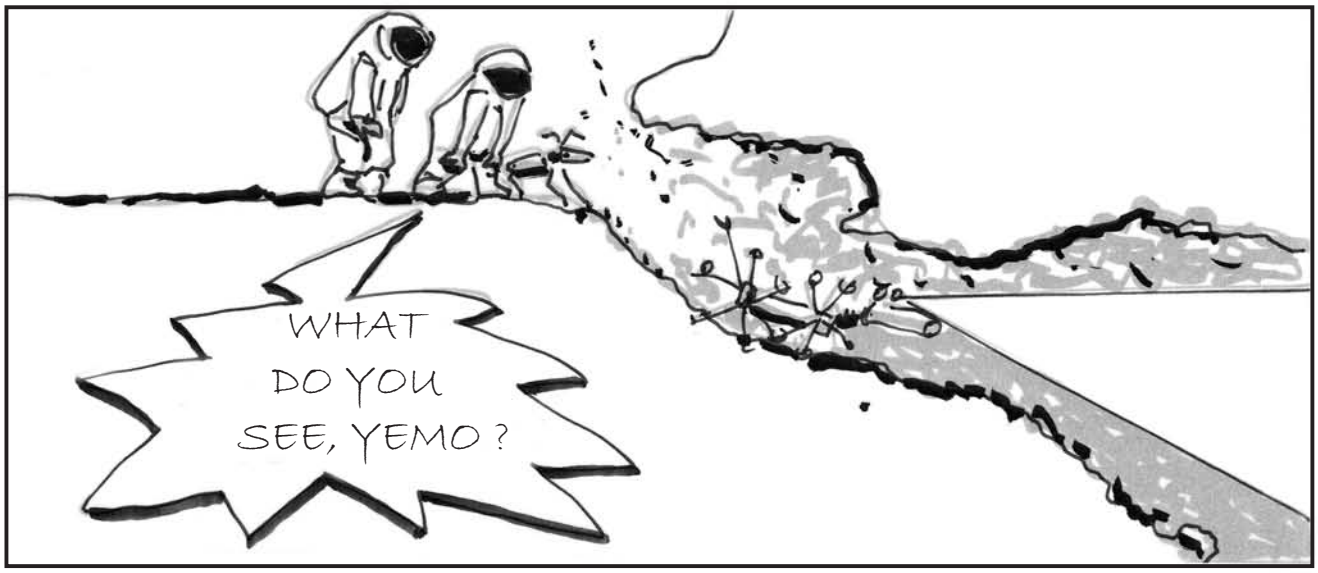
HYGIENE CABIN

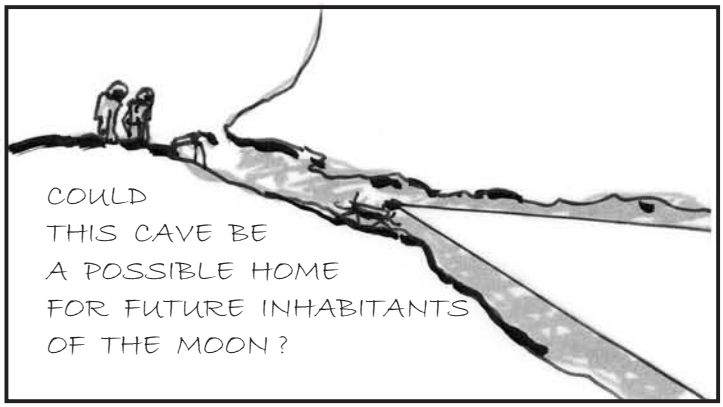


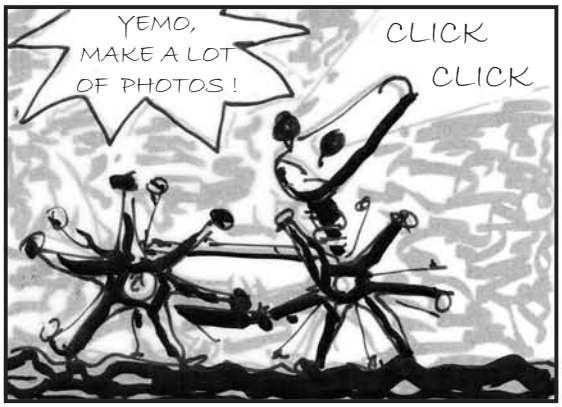




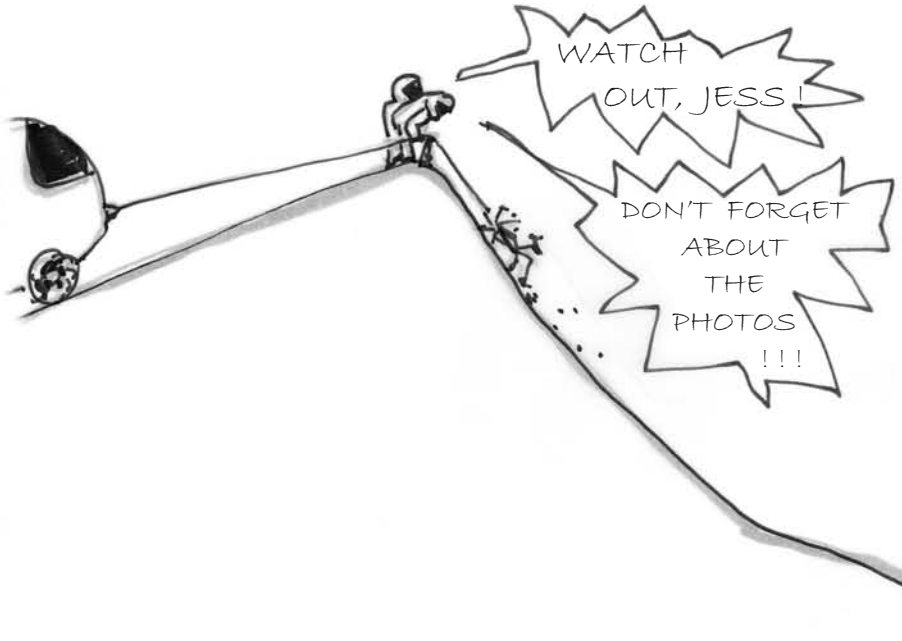
A CREW CABIN WITH TWO BEDS IS ON THE LOWER DECK IN A "STORM SHELTER" WHICH PROTECTS AGAINST THE DEADLY RADIATION OF SOLAR STORMS. THERE IS A WARNING SYSTEM SO THAT THE CREW KNOWS THREE HOURS IN ADVANCE WHEN A SOLAR STORM ARRIVES: BUT IT WOULD BE SAFEST TO LIVE UNDERGROUND.



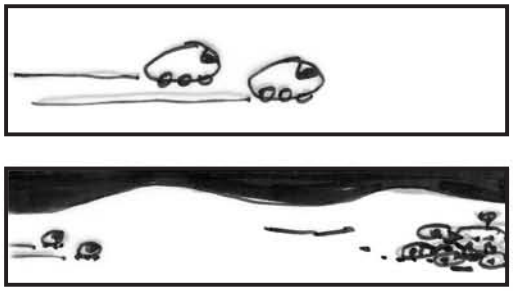




IN THE MEANTIME KAJA, LISSA, JESS AND MIA EXPLORE A CRATER



LATER



THEY DRIVE BACK TO
THE BASE

TODAY WE DO THE

MOON RACE

YEAH !
YEAH !

FOUR SPECIAL RACING MACHINES HAVE BEEN DESIGNED ON EARTH WAITING FOR THEIR FIRST TEST ON THE MOON

HERE COMES KAJA'S TRIS

PETE'S COSMO BIKE

THE ROBOTS ARE THE CO-PILOTS

TOM'S DRAGGY

AND LISSA'S SPIDER GIRL

THEY HAD BIG DISCUSSIONS WITH MISSION CONTROL . . .

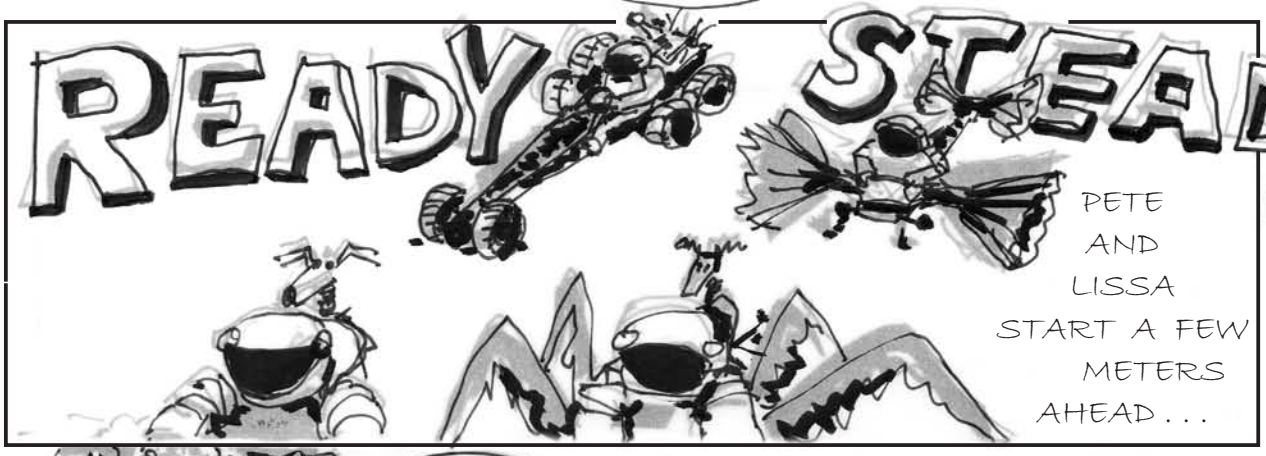
BUT THE MOON CREW WON: THEY WOULD ALL TEST TOGETHER THEIR VEGICLES LIKE IN A FORMULA 1 RACE.

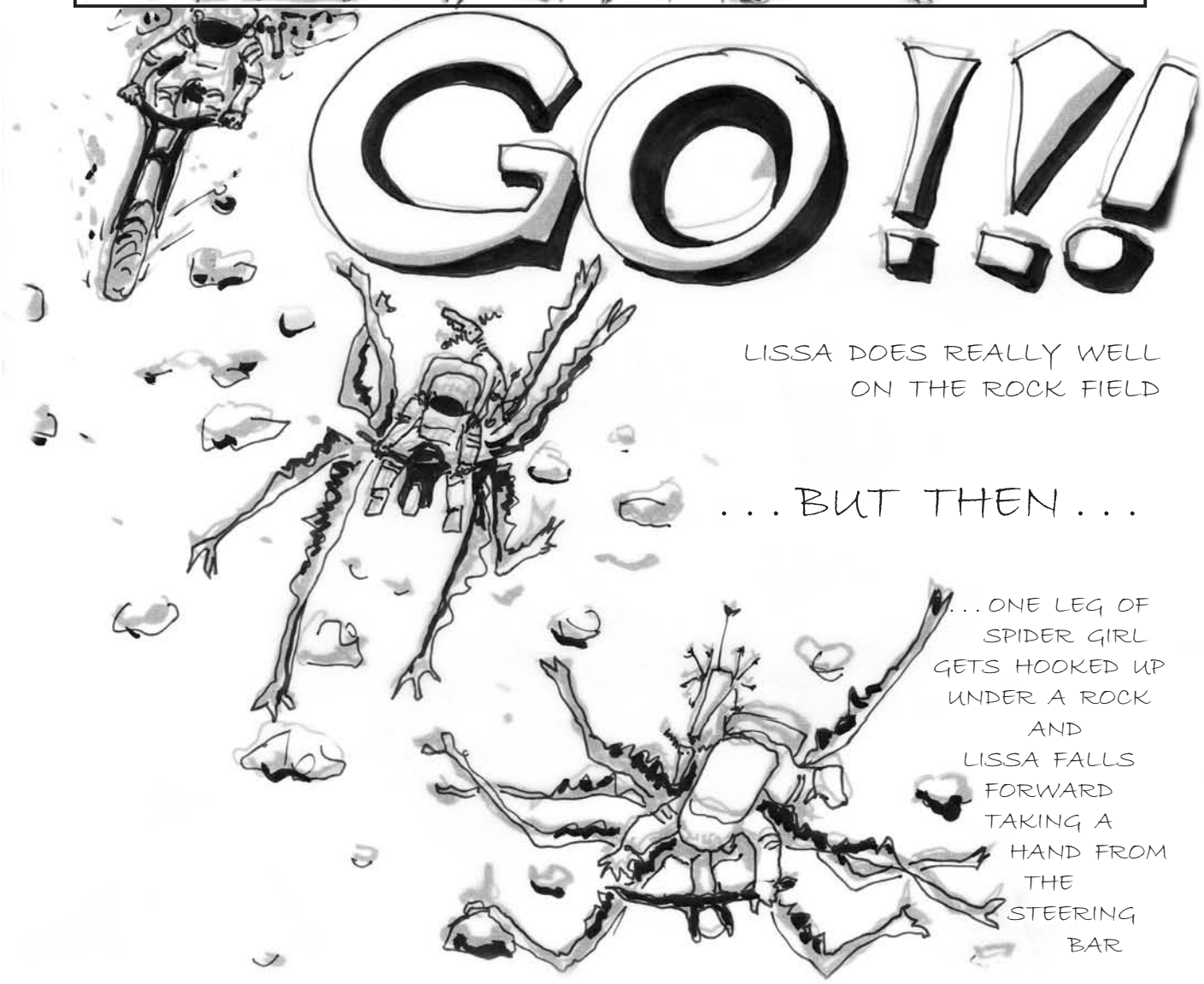
MISSION CONTROL IS AWARE THAT THERE WILL NOT BE MUCH INFLUENCE LATER ON MARS BECAUSE THE DISTANCE IS TOO LONG FOR REAL TIME COMMUNICATION . . . THE CREW WILL BE EVEN MORE AUTONOMOUS . . .

AND THIS IS THE RACING COURSE

THIS IS THE ONLY WAY IN AND OUT OF THE CRATER


. . . WE REPORT LIVE FROM THE MOON RACE WITH COMMENTS FROM THEIR RACING COACH HANK
YEAH !
YEAH !
. . . THEY ARE VERY WELL PREPARED


READY
STEADY
PETE AND LISSA START A FEW METERS AHEAD . . .

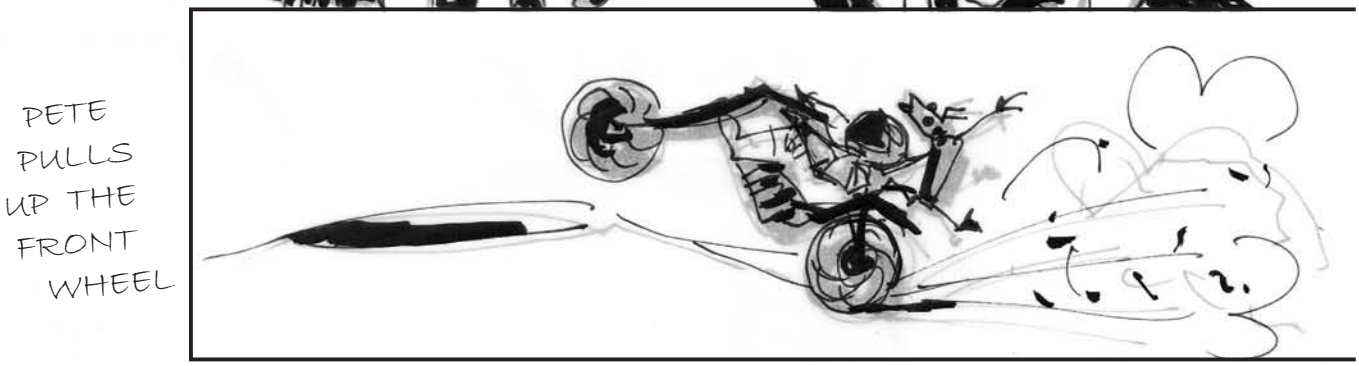

GO!!!
LISSA DOES REALLY WELL ON THE ROCK FIELD
. . . BUT THEN . . .
. . . ONE LEG OF SPIDER GIRL GETS HOOKED UP UNDER A ROCK AND LISSA FALLS FORWARD TAKING A HAND FROM THE STEERING BAR

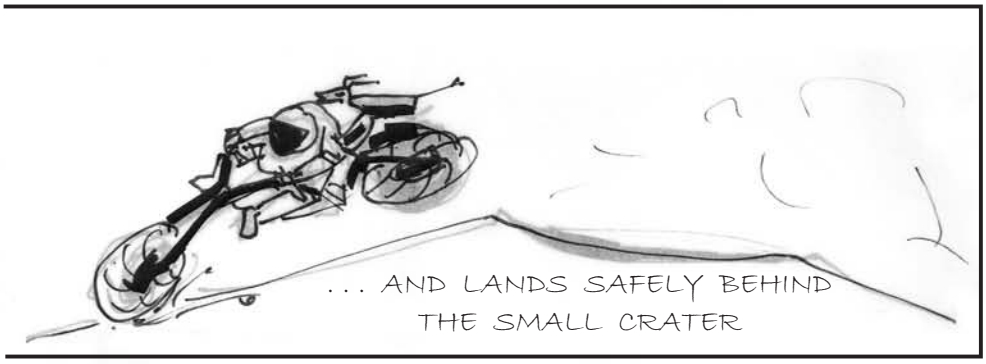

JESS GRABS THE STEERING BAR WITH THE TEETH
UNTIL LISSA RECOVERS

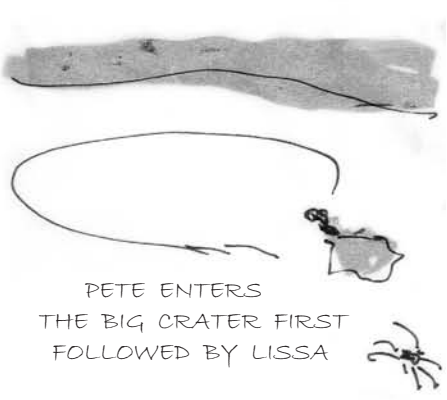

PETE REALISES HIS CHANCE


LISSA'S FAN COMMUNITY
NO
OH, NO

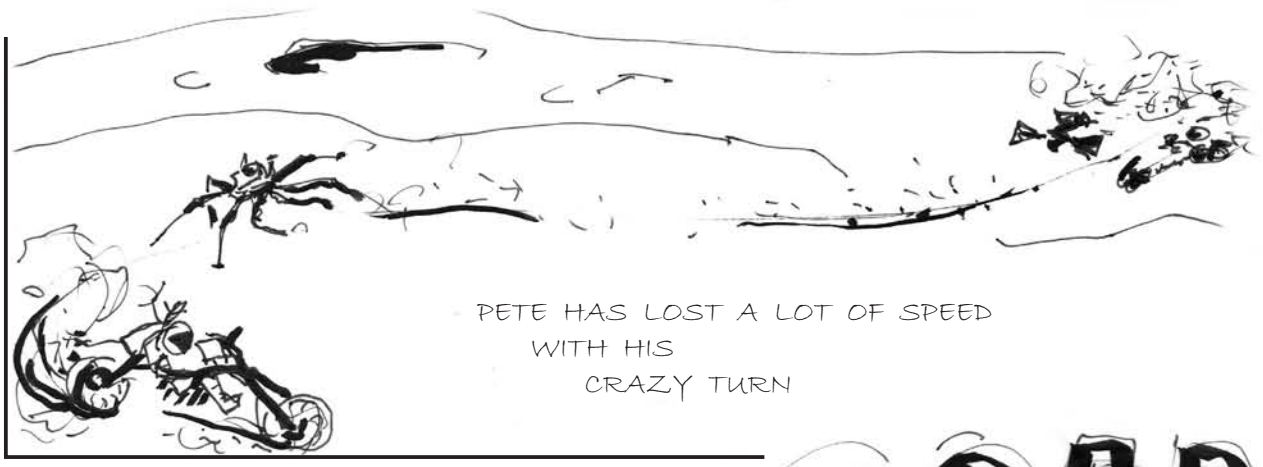

GO
PETE'S FANS
YEAH


PETE PULLS UP THE FRONT WHEEL


. . . AND LANDS SAFELY BEHIND THE SMALL CRATER

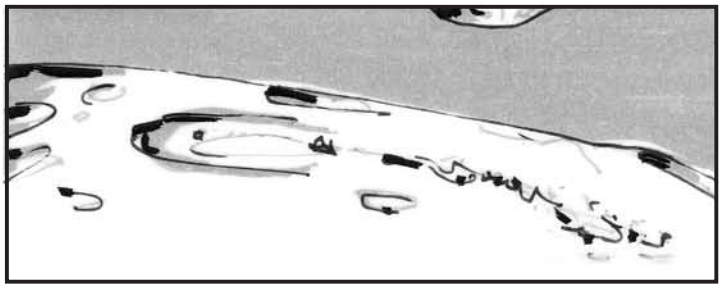

PETE ENTERS THE BIG CRATER FIRST FOLLOWED BY LISSA


GO PETE GO!!
YEAH
IN THE CRATER PETE MAKES SUCH A HARD TURN . . .
. . . HE NEARLY LOSES IAN

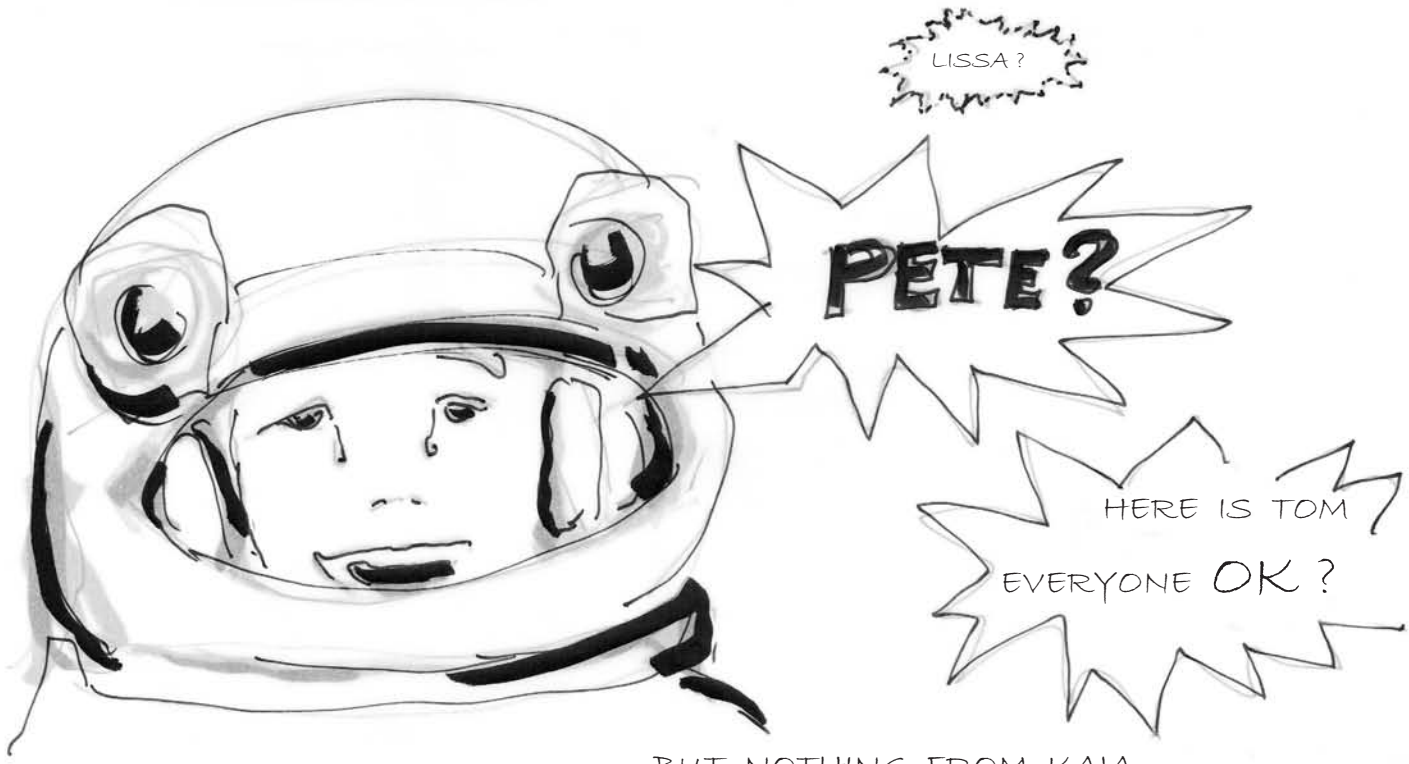

PETE HAS LOST A LOT OF SPEED
WITH HIS
CRAZY TURN


ROAR
IF I SPEED LIKE MAD I CAN MAKE IT TO THE CRATER ENTRANCE BEFORE THE OTHERS COME IN !
ROAR
IAN TREMBLES TERRIBLY
BUT PETE IS TOTALLY FURIOUS
PETE'S FANS

* REMEMBER: THE MOON HAS NO ATMOSPHERE, THERE IS ONLY VACUUM. NO SOUND CAN BE TRANSMITTED IN VACUUM. YOU CANNOT HEAR A CRASH.

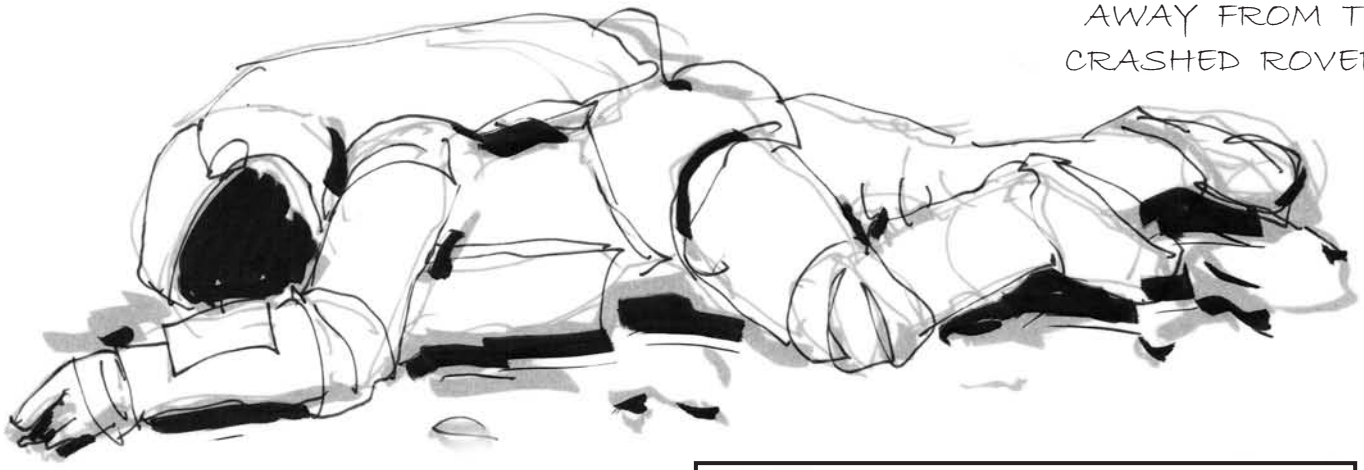


MISSION CONTROL IS IN SHOCK



BUT NOTHING FROM KAJA . . .

KAJA IS LYING A FEW METERS AWAY FROM THE CRASHED ROVERS



PETE HAS A HARD TIME

GETTING UP . . .

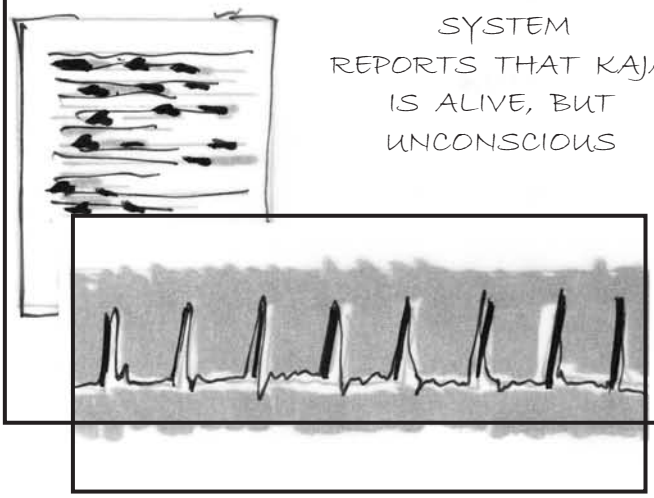
IAN COMES TO HELP

THE RESCUE ROBOT REACHES KAJA . . .

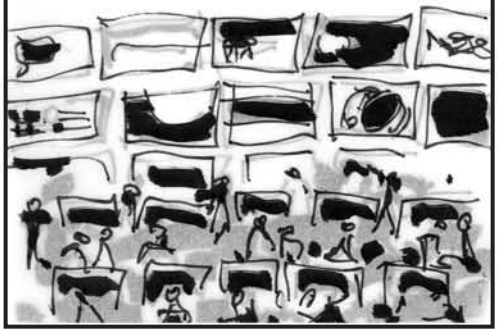
. . . AND LIFTS HER CAUTIOUSLY OFF THE GROUND

. . . AND CARRIES HER BACK TO THE BASE

THE BIOMONITORING SYSTEM REPORTS THAT KAJA IS ALIVE, BUT UNCONSCIOUS



BIG RELIEF IN MISSION CONTROL



SUDDENLY THEY ALL HEAR A SONG FROM KAJA'S MICROPHONE

...WE ... ARE .. THE ... CHAMPIONS ...

BUT IT IS NOT KAJA'S VOICE !

KAJA OPENS HER EYES

IT IS MIA IN KAJA'S HELMET SINGING THE SONG ... WHICH HER MOTHER HAD BEEN SINGING WHEN KAJA WAS SICK AS A LITTLE CHILD ...

KAJA ! THIS IS PETE ... ... ARE YOU OK ? I WILL REPAIR YOUR ROVER ...

... AND THEN WE WILL HAVE ANOTHER RACE AND THEN I WILL WIN !

LISSA AND TOM LAUGH IN RELIEF

JUST KEEP ON DREAMING BUDDY

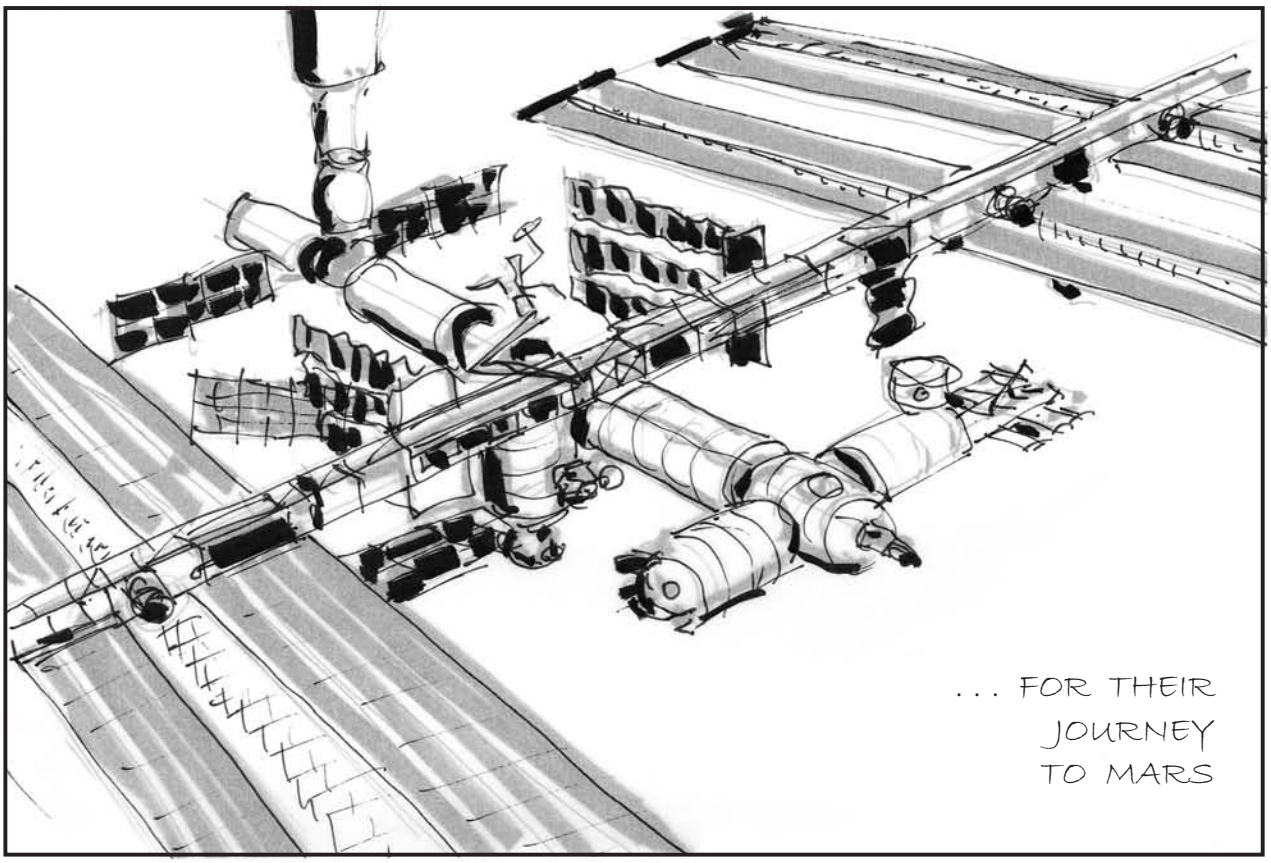
I WILL WIN

BUT PETE SUDDENLY THINKS:

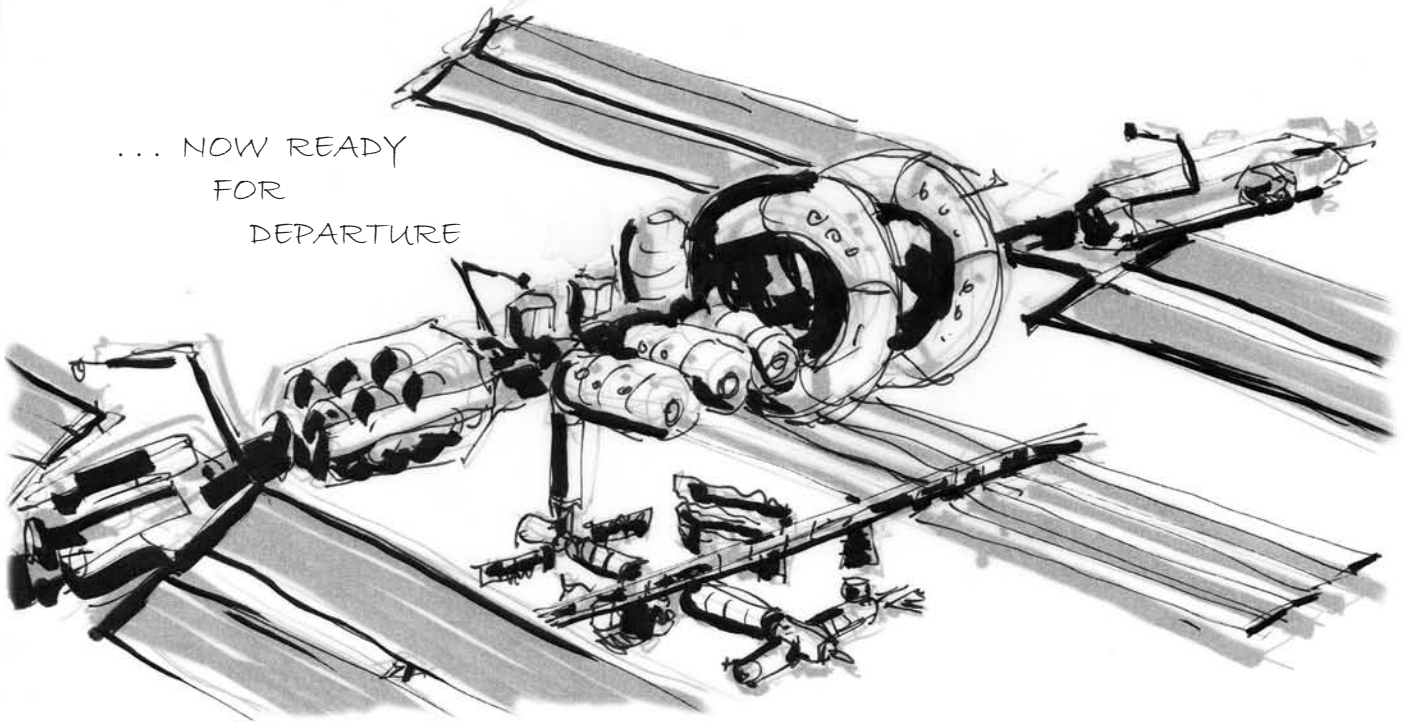
WHAT WILL MISSION CONTROL SAY ? WILL THEY ALLOW ME TO GO TO MARS ?

SIX MONTHS LATER:
THE CREW IS TRAINING ON THE

INTERNATIONAL SPACE STATION ISS



THE HUGE MARTIAN SPACE SHIP BASED ON THE NASA DESIGN NAUTILUS-X WAS BUILT HERE AND IS . . .



THE CREW HAS MADE PLANS WHAT TO DO DURING THEIR SIX MONTHS TRAVEL:

LISSA HAS BROUGHT HER FLYING 3D-PRINTER TO PRINT ROBOTS.

IT FOLLOWS HER EVERYWHERE ... DRIVING JESS CRAZY

GRRRR

PETE IS WORKING HARD ON A COMPUTER GAME ... FOR A NEW SOCIETY

... NEW VALUES, NEW BELIEFS, NEW PRIORITIES

KAJA IS A REAL GOOD OBSERVER

AFTER THE CRASH ON THE MOON SHE REALISED THAT EMOTIONS AND HOW TO DEAL WITH THEM IS VERY IMPORTANT FOR MISSION SUCCESS

SHE HAS PREPARED A HUGE PSYCHOLOGICAL STUDY ON CREW BEHAVIOUR
- HOW TO DEAL WITH BORING ENVIRONMENTS
- HOW TO ...
- HOW TO ...

MIA SUPPORTING HER BEING A GREAT SPY

TOM IS REACHING FOR THE STARS

HE IS DREAMING OF CREATING LIFE!!

TOM LOVES PHYSICS, CHEMISTRY AND BIOLOGY, AND HAS BROUGHT SOME VERY SPECIAL

HYBRID SEEDS ...

THE CREW ON ISS

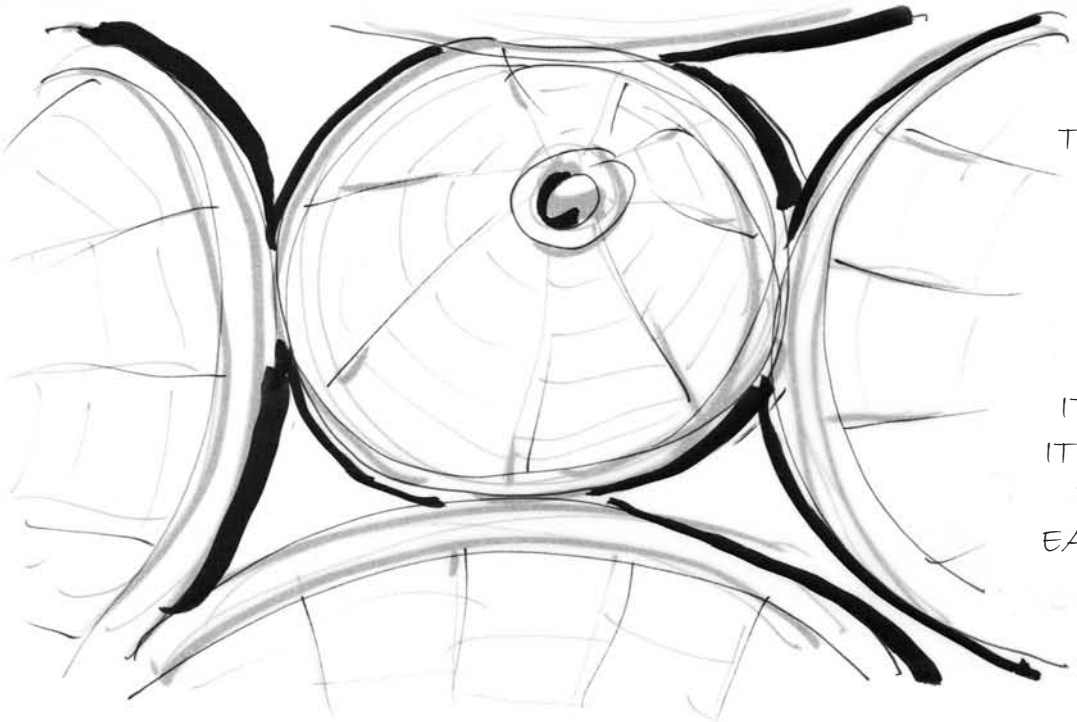
MISSES
THE MARS
CREW
THE MOMENT
THE
TWO SPACE
SHIPS
SEPERATE

. . . BUT . . .

PETE, LISSA, KAJA AND TOM

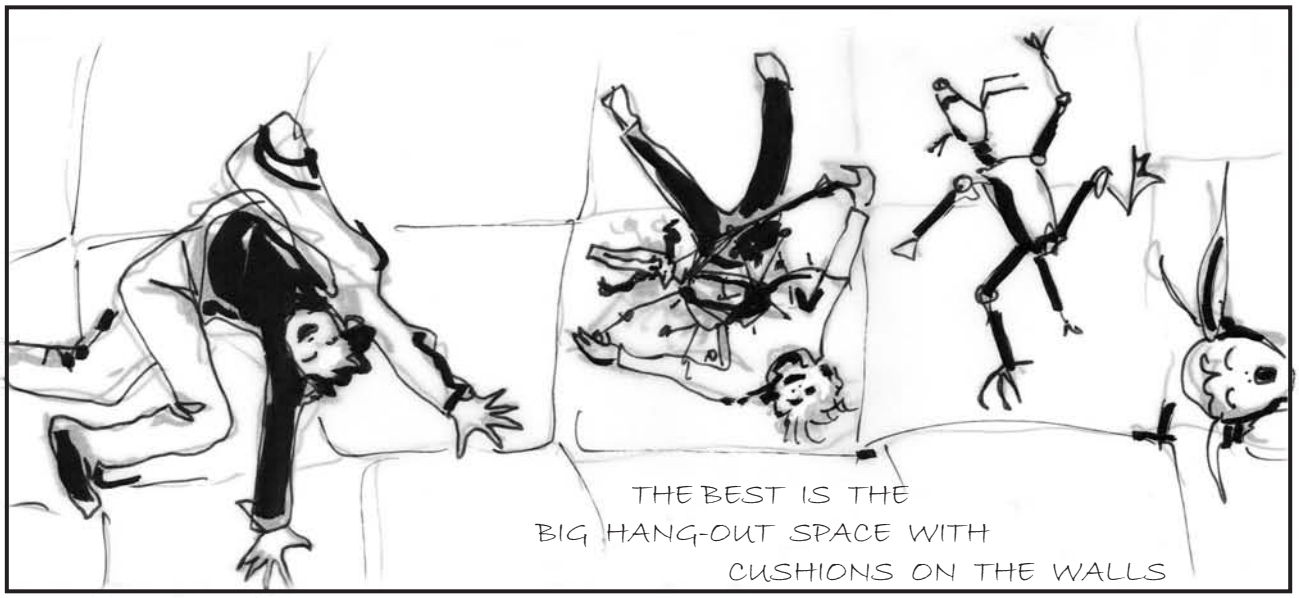
ARE COMPLETELY EXCITED

TO GO . . .



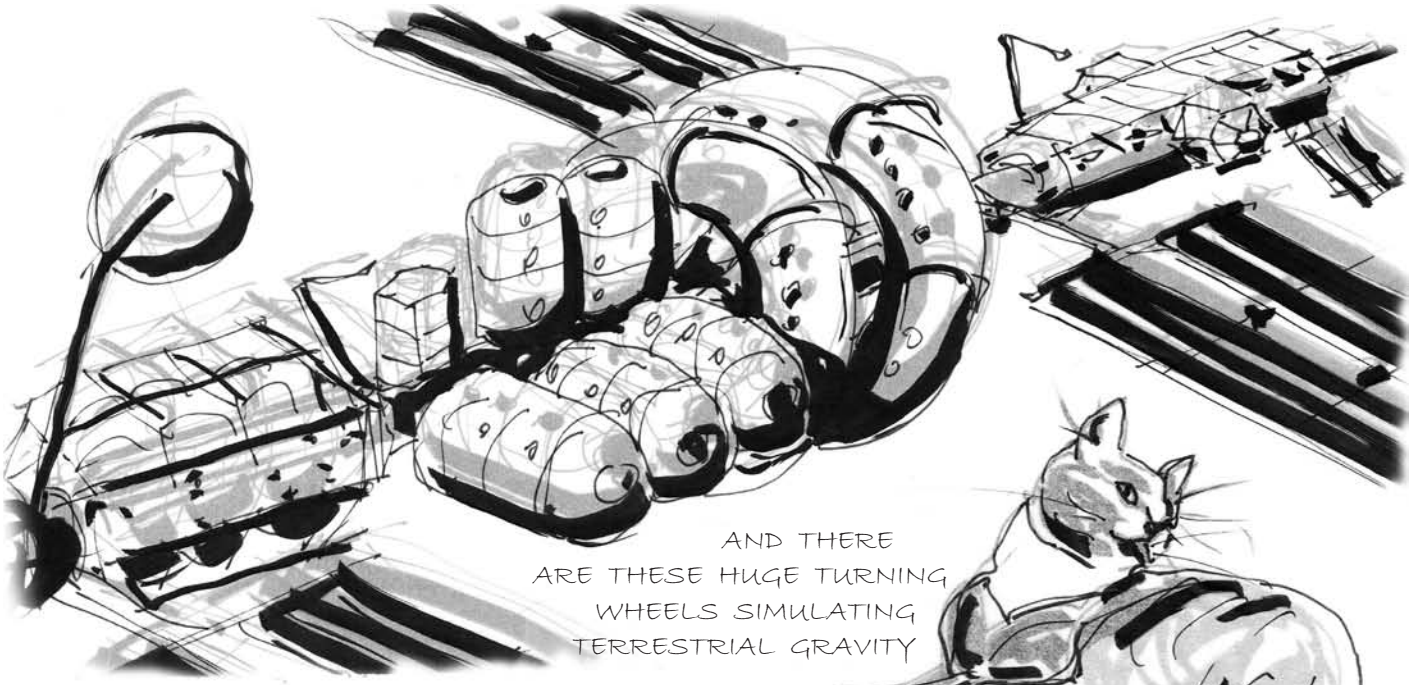
THE INTERIOR
OF THE
SPACE SHIP
IS
INCREDIBLE

IT IS SO BIG THAT
IT CAN HAPPEN
THEY DO NOT SEE
EACH OTHER DURING
A WHOLE DAY



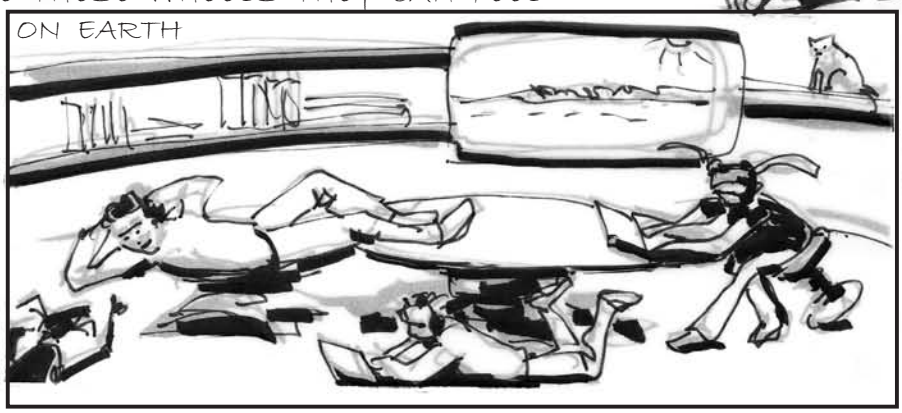
THE BEST IS THE
BIG HANG-OUT SPACE WITH
CUSHIONS ON THE WALLS

WHERE THEY CAN PLAY WITH
ZERO GRAVITY
AND DO ALL KINDS OF ACROBATICS



AND THERE ARE THESE HUGE TURNING WHEELS SIMULATING TERRESTRIAL GRAVITY

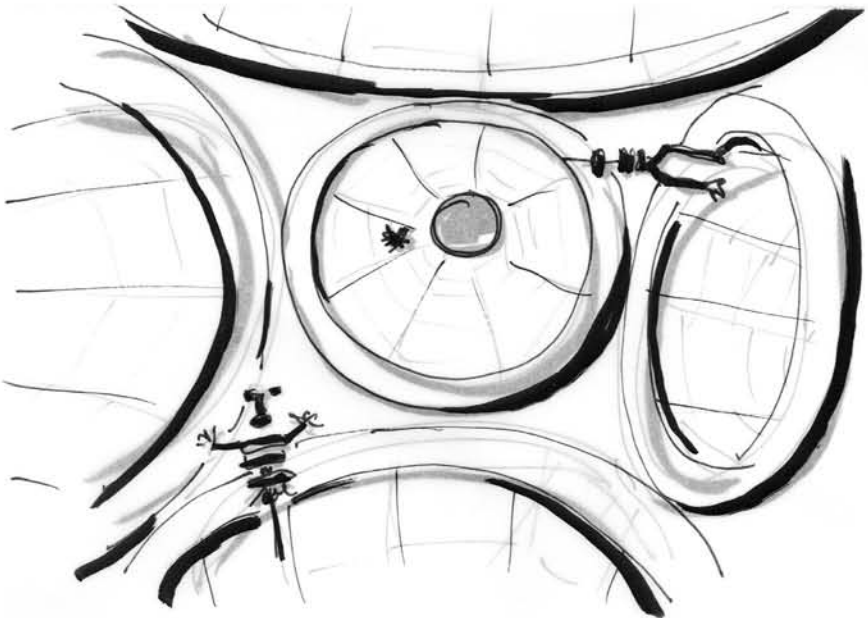
INSIDE THESE WHEELS THEY CAN FEEL LIKE ON EARTH



THE SPACE SHIP IS SELF-CLEANING SELF-REPAIRING AND COLLECTS ALL THE ENERGY IT NEEDS. WATER IS RECYCLED. COOKING IS DONE BY THE FULLY AUTONOMOUS KITCHEN ROBOT . . .

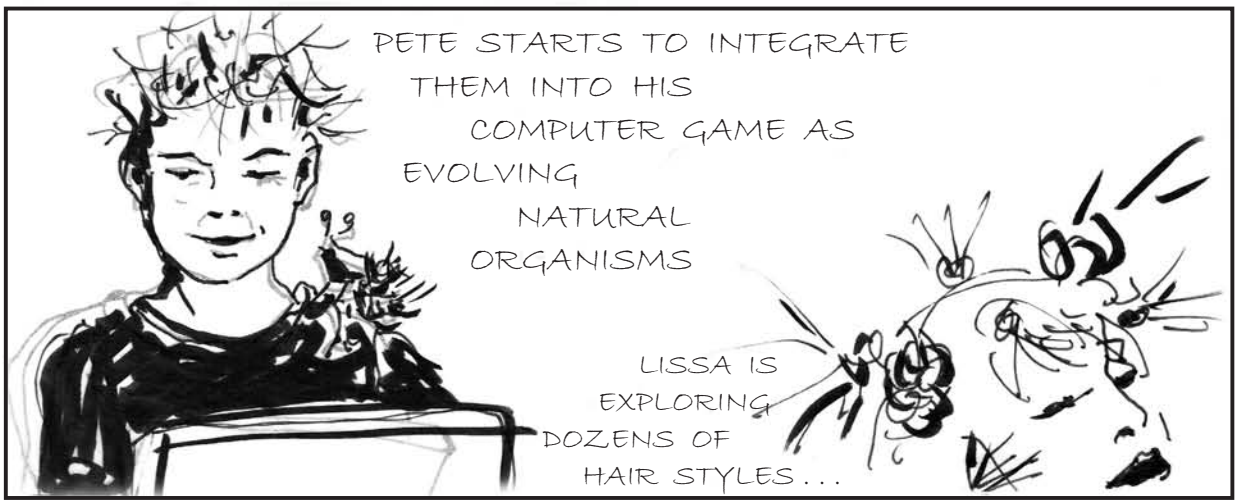
THEY CAN ORDER THEIR FAVOURITE DISHES, THEY ONLY HAVE TO EAT A FEW VEGGIES AND FRUITS A DAY

APART FROM THAT . . . THERE IS NOTHING TO CARE ABOUT . . .

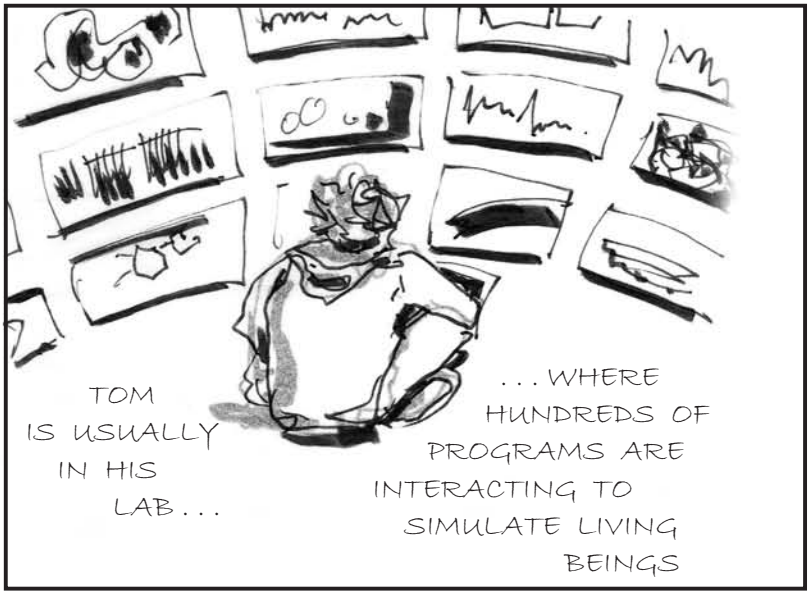


IT'S LIKE BEING ON VACATION . . . WITHOUT GROWN-UPS

TIME PASSES BY . . .
STRANGE OBJECTS APPEAR OBVIOUSLY FROM LISSA'S 3D-PRINTER, SOME OF THEM HANG AROUND IN CORNERS WITHOUT MOVING . . . OTHERS CIRCULATE AROUND THE SPACECRAFT



. . . WHILST HER FLYING 3D-PRINTERS ARE PRODUCING AND REPRODUCING ON THEIR OWN



KAJA GOT A LITTLE BORED WATCHING AND ANALYSING HER CREW MATES BECAUSE THEY OBVIOUSLY DO NOT CHANGE MUCH

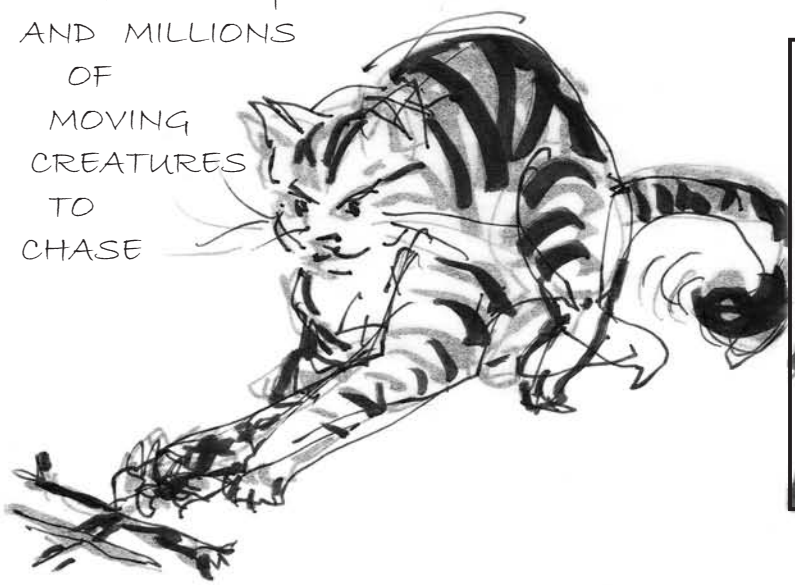
SO SHE AND MIA START TO GROW PLANTS ALL OVER THE PLACE - FROM SEEDS A FRIEND GAVE HER AS A GOOD-BYE PRESENT

AFTER A FEW MONTHS

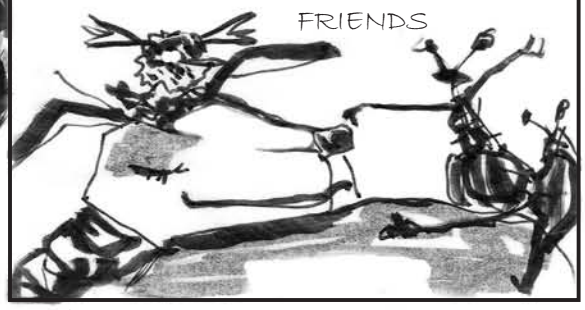
THE SPACE SHIP LOOKS

COMPLETELY DIFFERENT

REDHEAD IS REALLY HAPPY: THOUSANDS OF PLACES TO HIDE-AWAY AND MILLIONS OF MOVING CREATURES TO CHASE



FINALLY ALSO THE ROBOTS GET ALONG WITH ALL THESE COMPETITORS FOR ATTENTION AND MAKE FRIENDS

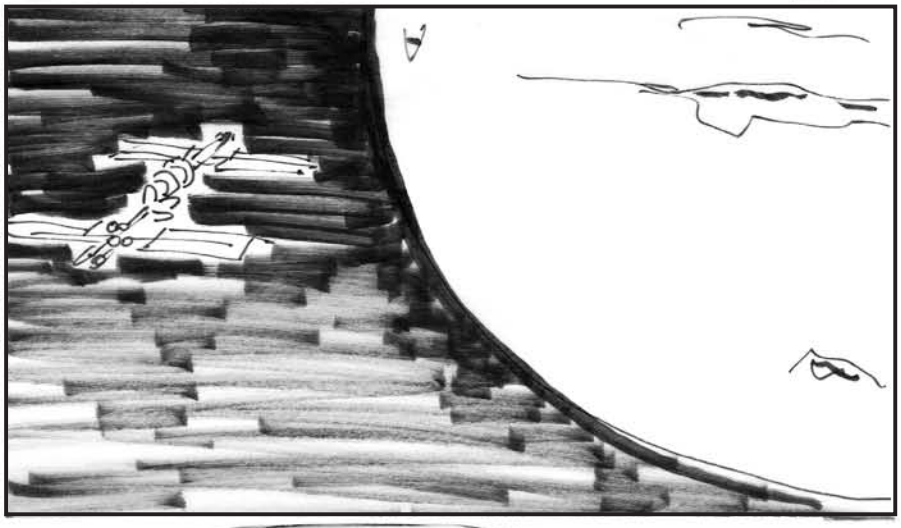


AMONGST THE NEWCOMERS

ONE DAY THERE IS AN ANNOUNCEMENT FROM MISSION CONTROL

. . . APPROACHING MARS . . .
. . . LANDING IN TWO DAYS . . .

WHAT ?
ALREADY ?
. . . . THERE ?



THEY CAN
EVEN SEE
THEIR BASE
THROUGH
THE TELESCOPE
WHILE THEY ORBIT
MARS

THE CREW STEPS DOWN THE STAIRS OF THE LANDER TOGETHER AND SCREAMS OUT LOUD:

What would you say if you were the first person to step on Mars?

Write your phrase here!

Scan or photograph this page with your phrase and upload it on the Moonwalk website for the Mars simulation.

More information on space technology

ATHLETE

ATHLETE stands for All-Terrain Hex-Limbed Extra-Terrestrial Explorer. ATHLETE is a NASA design for a robot which can lift up big items and can move with its six legs over varied terrain. The prototype vehicles are used for simulations of space missions on Earth.

Find more information under http://athlete.jpl.nasa.gov/
Comic book, page 8 and 9: The big robot carrier resembles ATHLETE


courtesy of NASA

INTERNATIONAL SPACE STATION ISS

The International Space Station (ISS) circulates around the Earth at a distance of approximately 400 km with an average speed of 27,600 km/h. The space station has been continuously inhabited by astronauts and cosmonauts since the year 2000.

Find more information under https://en.wikipedia.org/wiki/International_Space_Station
Comic book, page 22: The International Space Station ISS


courtesy of NASA

NAUTILUS-X

Nautilus-X stands for Non-Atmospheric Universal Transport Intended for Lengthy United States Exploration. Nautilus-X does not really exist. It is a NASA concept design for longer space missions.

Find more information under https://en.wikipedia.org/wiki/Nautilus-X
Comic book, page 22 and 25: The Martian space ship is based on the Nautilus-X design


courtesy of NASA

ROCKETS: ARIANE FAMILY

A series of European rockets are named Ariane. Several versions have been developed. Many satellites were sent to space with Ariane rockets. Ariane rockets have also helped to resupply the International Space Station.

Find more information under
https://en.wikipedia.org/wiki/Ariane_%28rocket_family%29
Comic book, page 6 and 7: The rocket resembles Ariane rockets from outside


courtesy of NASA

SPACE EXPLORATION VEHICLE (SEV)

The rover is a NASA design for astronauts exploring the Moon or Mars.
The built concept vehicle which you can see in the image is used for simulations of space missions on Earth like the ATHLETE.

Find more information under
http://www.nasa.gov/exploration/technology/space_exploration_vehicle/index.html
Comic book, page 10: The personal rovers resemble SEV


courtesy of NASA

SUITPORT

A suitport is a way of getting in and out a habitat or a rover with a space suit. You step into the space suit through the back of the suit, close your backpack and dock from the habitat or the rover to explore the Lunar or Martian surface. It is used in simulations, also on SEV.

Find more information under
https://en.wikipedia.org/wiki/Suitport
Comic book, page 9 and 10: How to get inside ...


courtesy of NASA

More information on MOONWALK space technology

YEMO ROVER

YEMO is the rover robot working with the astronaut in the MOONWALK simulations. It has very special wheels to go over difficult rocky terrain. It is equipped with a camera which can make panorama images and videos.
YEMO in the comic book is derived from the real YEMO design.
YEMO in the comic book is a fictional comic personality with possible future capabilities.


Photo © Annemarie Hirth, DFKI GmbH

Find more information about the real YEMO under
http://robotik.dfki-bremen.de/de/forschung/robotersysteme/yemo.html
Comic book: Tom's personal robot YEMO resembles the real YEMO.

GANDOLFI 2 SPACE SUIT

The Gandolfi 2 suit is designed for Earth either underwater or on ground. The Gandolfi 2 suit is used to train astronauts underwater in Lunar gravity for missions on the Moon and to train astronauts on ground for missions on Mars.


gettyimages AFP


gettyimages AFP

Find more information about Gandolfi 2 under
http://www.projectmoonwalk.net/moonwalk/?p=1157
http://www.comex.fr/space.html

BIOMEDICAL MONITORING

Biomedical monitoring is integrated into the GANDOLFI 2 space suit for the MOONWALK simulations. The system supervises the astronaut's health and warns if it detects any irregularities.

Find more information about under
http://www.projectmoonwalk.net/moonwalk/?page_id=13

HUMAN-MACHINE INTERFACES

A wearable information system is integrated in the GANDOLFI 2 space suit and the YEMO rover during MOONWALK simulations. The information system allows communication between astronaut, rover and Mission Control Centre in Brussels. The astronaut has a chest display, a wrist display and communication elements in the helmet and can also communicate with the rover through gestures.

Find more information about under
http://www.projectmoonwalk.net/moonwalk/?page_id=13

SHEE - HABITAT

The SHEE habitat will be part of the Mars simulation in Rio Tinto. SHEE stands for Self Deployable Habitat for Extreme Environments. It is the first deployable simulation habitat in Europe to train astronauts on Earth for future missions to the Moon and to Mars. The SHEE habitat needs less space during transport; it can automatically deploy and double its size after arrival.Two astronauts can live in the habitat.

SHEE consortium, photo: Bruno Stubenrauch

Find more information about SHEE under
http://www.shee.eu

IMPRINT

editor: MOONWALK consortium, 2016

www.projectmoonwalk.net

The project has received funding from the Europen Union's Seventh Framework programme for research, technological development and demonstration under grant agreement no 607346.

Idea, story and comic design drawings: Waltraut Hoheneder, LIQUIFER Systems Group, Vienna
Cover image: Barbara Imhof, Waltraut Hoheneder, LIQUIFER Systems Group, Vienna;
original images: courtesy of NASA