we're pleased to share with you today

some really unique video coverage from

last week's Ares 1x launch a Cessna skymaster aircraft flying at 12,000 feet in the vicinity of booster splashdown and equipped with a gyro stabilized camera captured this video this footage gives us some extremely valuable engineering data as well as spectacular footage of the recovery sequence in rarely seen detail first a few words to preview what you will see after booster burnout as some of the events happen quickly first you'll see the thrust
00:00:35.238 --> 00:00:39.649
plume diminish followed by a brief flash

00:00:37.488 --> 00:00:42.379
which is the firing of the booster

00:00:39.649 --> 00:00:44.239
deceleration motor then a smaller flash

00:00:42.380 --> 00:00:46.940
on the side of the booster which is the

00:00:44.238 --> 00:00:48.949
tumble motor firing then after a couple

00:00:46.939 --> 00:00:50.988
of minutes of descent you will see the

00:00:48.950 --> 00:00:54.290
drogue chute deployed to stabilize the

00:00:50.988 --> 00:00:56.089
booster tail down then the forward skirt

00:00:54.289 --> 00:00:57.950
assembly is jettisoned and the drove

00:00:56.090 --> 00:01:00.350
pulls it up and away from the booster

00:00:57.950 --> 00:01:02.210
the three main parachutes follow

00:01:00.350 --> 00:01:04.909
immediately and you will be able to see

00:01:02.210 --> 00:01:07.460
how one deflates and the second remains

00:01:04.909 --> 00:01:09.740
only partially inflated right before
water impact if you look closely at the
nozzle you'll see the jettison or the
nozzle extension and then boost your
splashdown finally you will see the
drogue lowering the forward skirt
assembly in a second splashdown event
just to the left of the booster the
first stage flew very precisely and
smoothly through a set our primary
interest honest included vehicle control
margins roll stability and also an
assessment of thrust oscillation we saw
very positive results with respect to
controllability the roll control system
only fired three times during all of a

00:01:42,920 --> 00:01:47,150
set while our pre-flight analysis

00:01:44,930 --> 00:01:49,220
predicted as many as 20 firings of the

00:01:47,150 --> 00:01:52,430
rock system so this is an excellent

00:01:49,219 --> 00:01:54,560
outcome also we saw minimal vibration

00:01:52,430 --> 00:01:57,259
due to thrust oscillation both in the

00:01:54,560 --> 00:01:59,030
data and from onboard cameras the

00:01:57,259 --> 00:02:01,099
pressure oscillations from the Ares 1x

00:01:59,030 --> 00:02:03,859
booster were well within historical

00:02:01,099 --> 00:02:06,500
levels seen on shuttle flights as the

00:02:03,859 --> 00:02:08,478
booster burns out you see a flash during

00:02:06,500 --> 00:02:10,938
the firing of the booster deceleration

00:02:08,479 --> 00:02:11,380
motor then you see the firing of the

00:02:10,938 --> 00:02:13,900
boost

00:02:11,379 --> 00:02:16,139
tumble motor the booster begins to
rotate and separate from the upper stage

you notice also that the upper stage begins to rotate this was expected as the upper stage did not have a control system in fact the separation event for Ares 1x was more challenging than for the Ares one designed conditions because we only had four segments of propellant we burned out at a lower altitude and higher dynamic pressures 90 pounds per square foot for Ares 1x as compared to only 10 pounds per square foot for the Ares one design so this resulted in a stress case separation and was very
successful one thing to watch during the

descent of the booster is the trailing

smoke from the nozzle this helps us to

see the flight path of the descent which

initially is horizontal to the earth and

later as the vehicle slows will become

more vertical early on in our

engineering assessment for Ares 1x we

were concerned we might have a nose

first re-entry of the booster because of

the forward in weight of the fifth

segment simulator after several

refinements to our weight and balance of

the booster we got our predictions down
to only a three percent probability of a
nose first re-entry which proved to be
valid our 1x flight test as the vehicle
stabilized nozzle down for most of the
descent several oscillations can be seen
in the booster orientation and a speed
decreases the flight path becomes nearly
vertical as seen by the trailing smoke
plume it is interesting to note that
during the vertical descent there was a
slow oscillation and the booster is
actually at about a hundred and ten
degree angle of attack to the flight
path and the drogue chute deploys this
results in several dramatic oscillations

00:03:54,580 --> 00:03:58,450
under the drogue but it performed

00:03:56,500 --> 00:04:01,110
beautifully and the booster stabilizes

00:03:58,449 --> 00:04:03,729
nicely after about four oscillations

00:04:01,110 --> 00:04:05,620
watch closely at the top of the booster

00:04:03,729 --> 00:04:07,599
the forward skirt extension is

00:04:05,620 --> 00:04:10,360
jettisoned and pulled away by the droge

00:04:07,599 --> 00:04:12,189
this entrains the risers of the three

00:04:10,360 --> 00:04:14,380
main parachutes for their initial

00:04:12,189 --> 00:04:17,339
inflation to the reef or partially

00:04:14,379 --> 00:04:17,339
inflated position

00:04:31,699 --> 00:04:36,229
all three shoots make it to a first

00:04:33,949 --> 00:04:39,050
inflation position but the shoot on the

00:04:36,230 --> 00:04:40,850
left quickly deflates and fails trailing

00:04:39,050 --> 00:04:43,069
a streamer which appears to strike the
shoot in the middle perhaps damaging it

as well so just prior to water entry we

essentially have one and a half shoots

suspending the booster also at this point you can see the nozzle extension

pyro technically severed at the bottom of the booster just before water entry

the booster hits at a higher velocity than planned which causes a hard slap down and buckling the aft segment motor

case this has also been experienced in the shuttle program a total of eleven chute deployment failures have occurred in the life of the shuttle program most
recently on sts-128 so we have abundant data to resolve this for future missions

Ares 1x was also a parachute stress test as the booster was nearly 40,000 pounds heavier than an Ares 5 segment booster due to the hardware in the fifth segment simulator the parachutes were a world record-setting 150 foot diameter and were tested at a total payload weight for the first time during Ares 1x now that the booster is down in the water watch for the drogue and forward skirt extension to enter into the image just to the left of the booster all of these
sequences worked exactly as designed

today the booster is on dock at Cape Canaveral and is undergoing teardown

inspections in the next few days we'll be able to recover the data recorders

and begin the detail data analysis of the entire flight