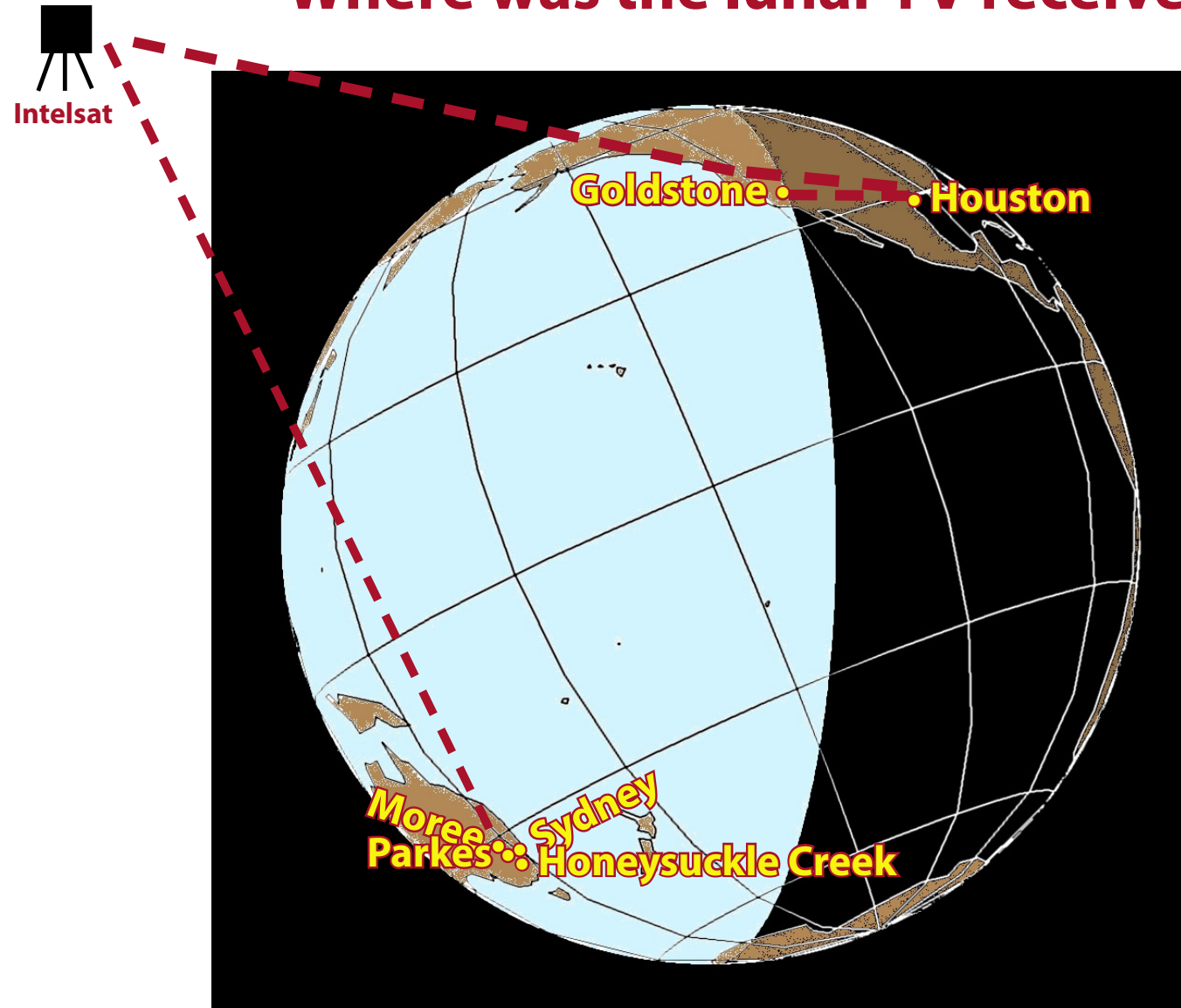


**Comparison photographs of
the Apollo 11 Lunar Television**

**as seen at
Goldstone, Honeysuckle Creek, Parkes
and Houston.**

Where was the lunar TV received?



The Earth as viewed from Apollo 11 at the start of the EVA on 20 July (US time) 1969.

Three stations received the TV:

- Goldstone, California
Apollo station using the DSN 64m dish,
- Honeysuckle Creek
Apollo station
Australia, 26m dish,
- Parkes Radio Telescope
Australia, 64m dish.

Video from Honeysuckle Creek and Parkes was sent from Sydney to the OTC Moree earth station and then to the US via Intelsat.

Video from Goldstone was sent to Houston by landline.

**As Neil Armstrong came down the ladder,
the international TV audience saw very little.**

**The video on the slow scan monitor
at Goldstone
was much clearer than
the scan converted video
which reached Houston and was broadcast
to the world.**

COMPARISONS

After and Before Scan Conversion



Goldstone
– scan converted video at Houston

Scan converted picture.
Kinescope of TV at Houston.



Goldstone
– slow scan TV monitor at Goldstone

Slow scan picture.
Polaroid, mounted camera – black bar produced by incorrect camera shutter speed. (NASA image S69-42583)

GET 109:22:59

Armstrong on the ladder – checks getting back up to the first step.

**Compare the scan converted TV
sent from Goldstone**

**with the same TV frame on the
slow scan monitor
at Honeysuckle Creek.**

COMPARISONS

After and Before Scan Conversion



Goldstone
– scan converted video at Houston

Scan converted picture.
Kinescope of TV at Houston.



Honeysuckle Creek
– slow scan TV monitor at Honeysuckle

Slow scan picture.
Handheld 35mm SLR photo, taken at Honeysuckle Creek.
(HSK-TV05)

GET 109:29:18

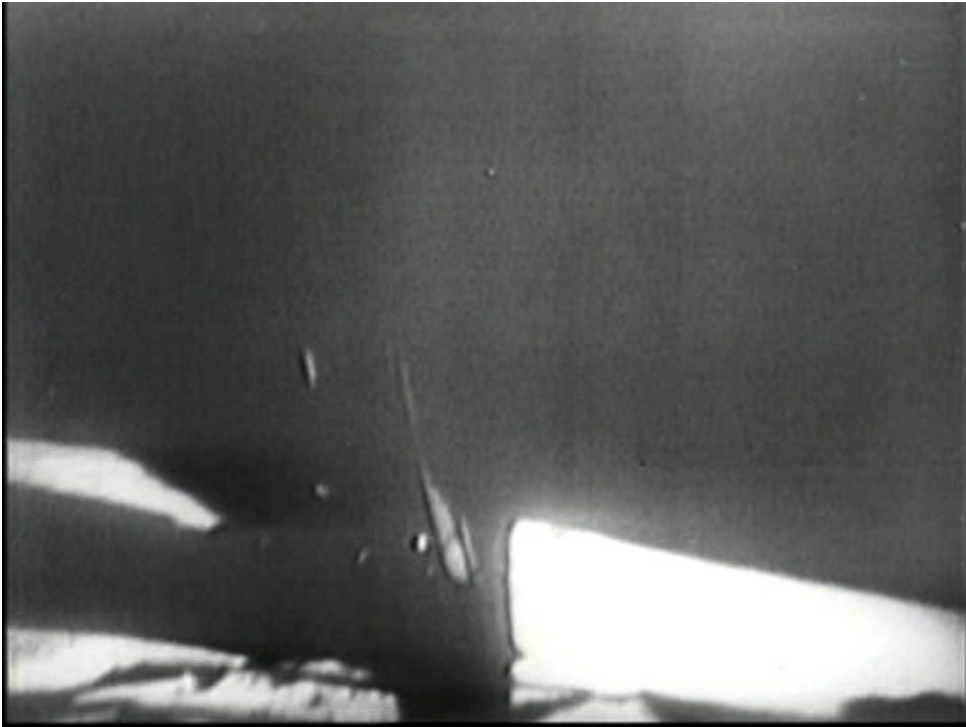
Armstrong installing the LEC on the secondary strut.

**Compare the scan converted TV
sent from Goldstone**

**with a poor photo of
the scan converted picture
at Honeysuckle Creek.**

COMPARISONS

Goldstone and Honeysuckle — Both Scan Converted



Goldstone
– scan converted video at Houston

Scan converted picture, Kinescope of TV at Houston.



Honeysuckle Creek
– scan converted video at Honeysuckle

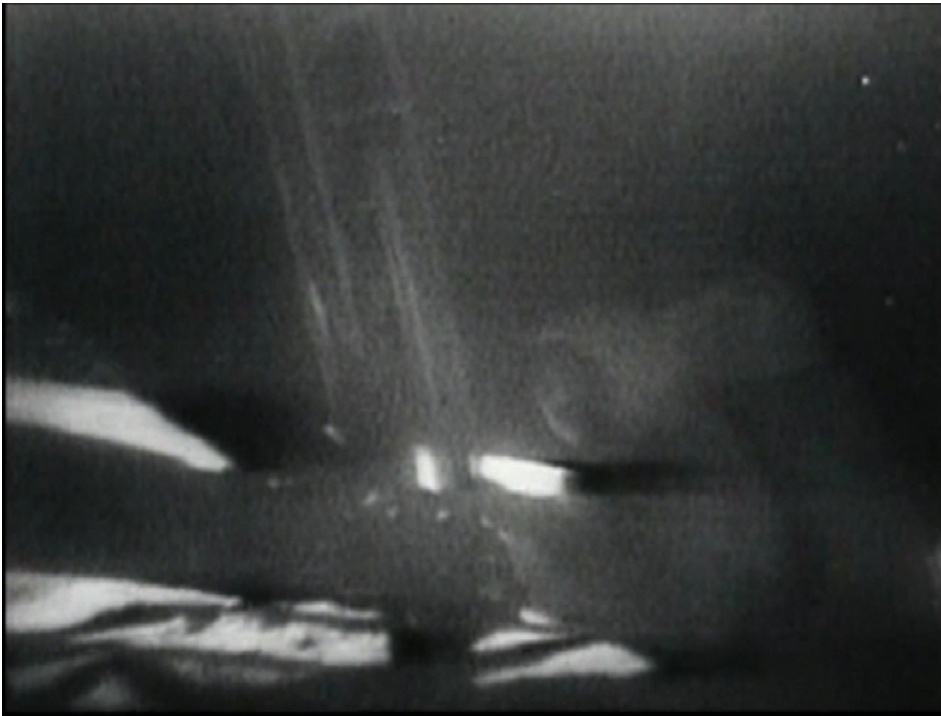
Scan converted picture, Handheld 35mm SLR photo of monitor at
Honeysuckle Creek.
(HSK-TV01)

GET 109:22:40
Armstrong on the ladder.

**Likewise, the TV as seen at Honeysuckle
is degraded by the time it
reaches Houston.**

COMPARISONS

After and Before Scan Conversion



Honeysuckle Creek
– scan converted video at Houston

Scan converted picture.
Kinescope of TV at Houston.



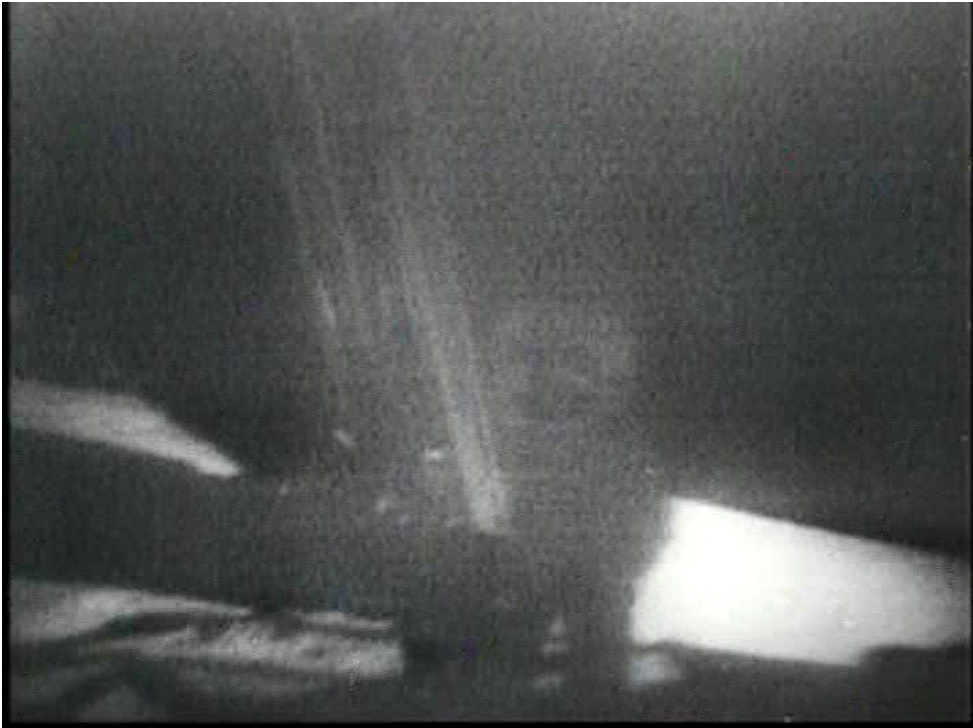
Honeysuckle Creek
– slow scan TV monitor at Honeysuckle

Slow scan picture.
Handheld 35mm SLR photo, taken at Honeysuckle Creek.
(HSK-TV03)

GET 109:25:30
Armstrong on the surface.

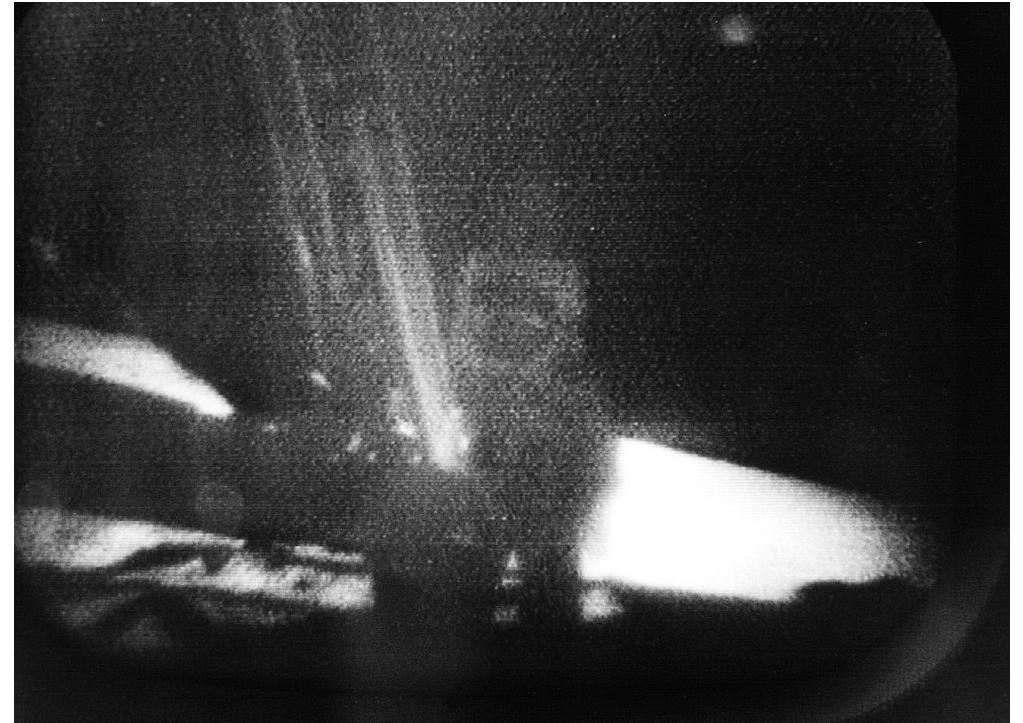
COMPARISONS

Honeysuckle Creek Scan Converted — as seen at both Houston and Honeysuckle



Honeysuckle Creek
– scan converted video at Houston

Scan converted picture.
Kinescope of TV at Houston.



Honeysuckle Creek
– scan converted TV monitor at Honeysuckle

Scan converted picture.
Handheld 35mm SLR photo, taken at Honeysuckle Creek.
(HSK-TV02)

GET 109:24:39

Armstrong on the footpad.

COMPARISONS

After and Before Scan Conversion

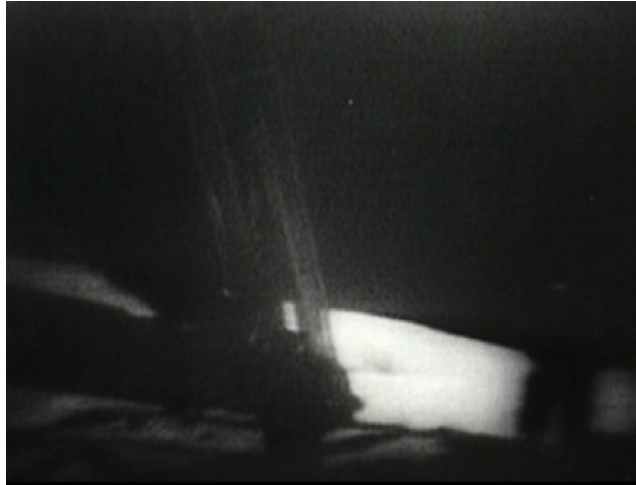


**Goldstone –
scan converted video at Houston.**

Scan converted picture – sent in negative from Goldstone.

ABC Network video feed from Houston.

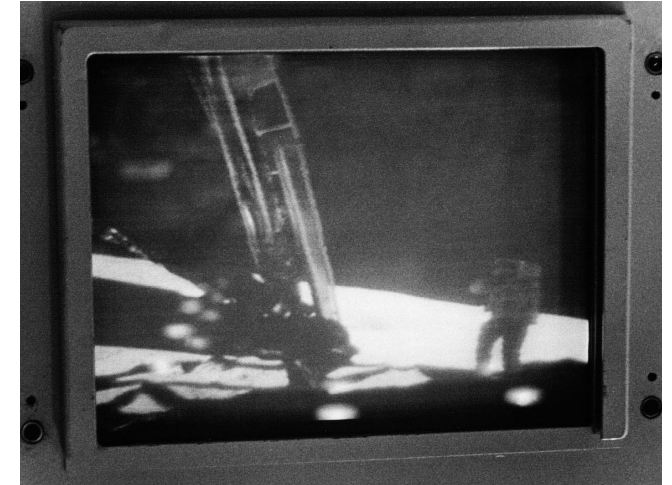
GET 109:27:39



**Honeysuckle Creek –
scan converted video at Houston.**

Scan converted picture – from Honeysuckle.
Kinescope of TV at Houston.

GET 109:27:40



**Honeysuckle Creek –
slow scan TV monitor at Honeysuckle**

Slow scan picture.

Handheld 35mm SLR photo, taken at Honeysuckle Creek.

(HSK-TV04)

GET 109:27:40

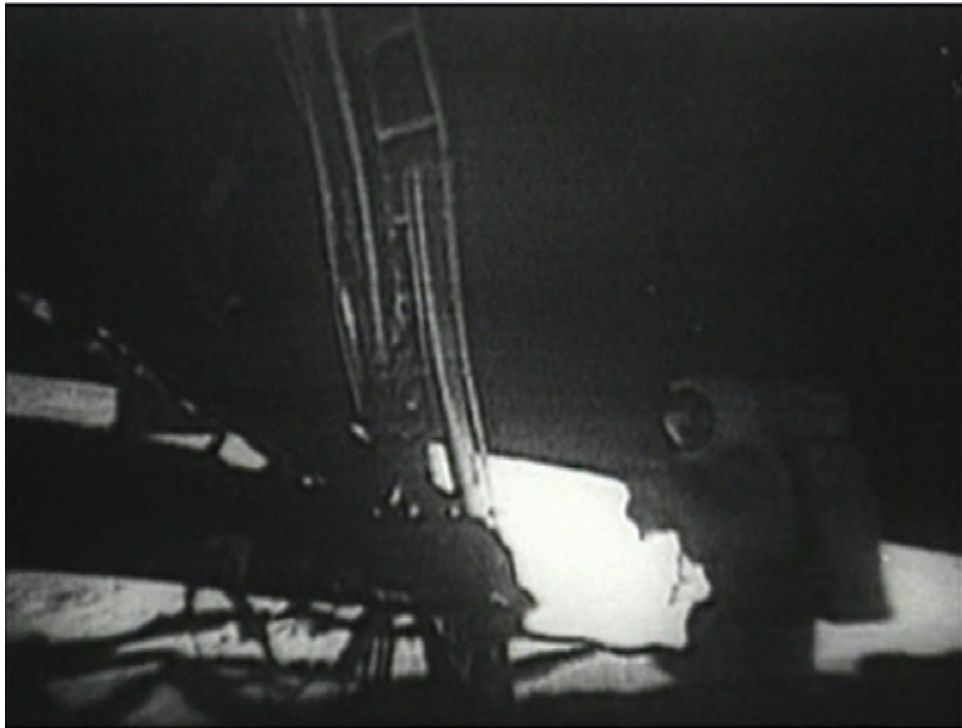
Armstrong deploys the Lunar Equipment Conveyor (LEC).

**Even the excellent picture from
the larger Parkes dish
has lost some quality by the time it
reaches Houston –**

**compare with the pictures
at Honeysuckle Creek.**

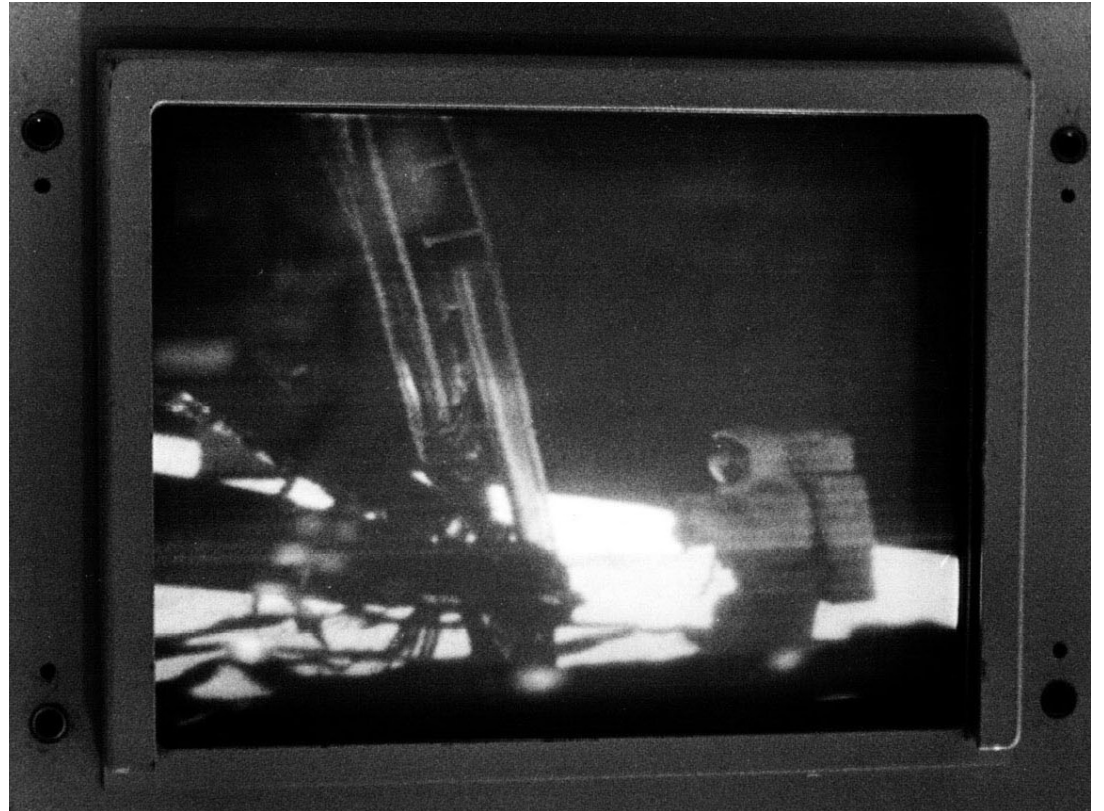
COMPARISONS

After and Before Scan Conversion



Parkes
– scan converted video at Houston

Scan converted picture.
Kinescope of TV at Houston.



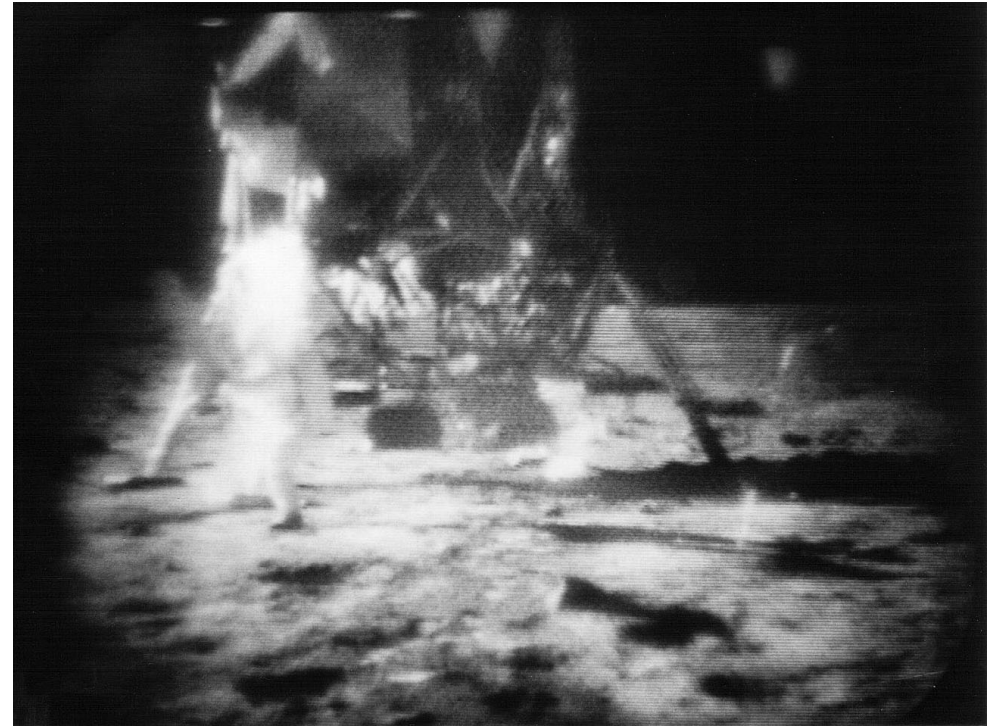
Honeysuckle Creek
– slow scan TV monitor at Honeysuckle

Slow scan picture.
Handheld 35mm SLR photo, taken at Honeysuckle Creek.
(HSK-TV06)

GET 109:31:00
Armstrong talking Aldrin down.

COMPARISONS

Parkes and Honeysuckle — Both Scan Converted



Parkes
– scan converted video at Houston

Scan converted picture.
Kinescope of TV at Houston.

Honeysuckle Creek
– scan converted TV monitor at Honeysuckle

Scan converted picture.
Handheld 35mm SLR photo, taken at Honeysuckle Creek.
(HSK-TV14)

GET 110:02:50

Aldrin removes the cover of the Solar Wind Experiment.

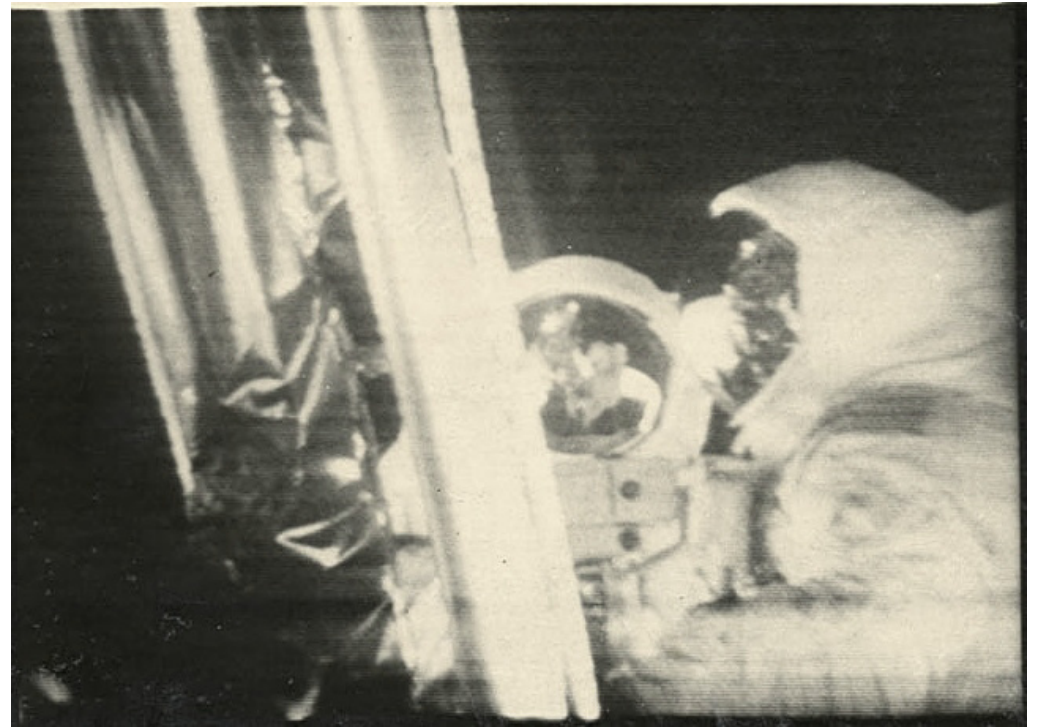
**And what was seen of the Parkes
TV in Houston**

**compared with the only known Polaroid
of the Parkes slow scan TV**

(photographed at Sydney Video).

COMPARISONS

After and Before Scan Conversion



Parkes
– scan converted video at Houston

Scan converted picture.
Kinescope of TV at Houston.

Parkes
– slow scan TV monitor at Sydney Video

Slow scan picture.
4 x 5" Polaroid taken at Sydney Video.

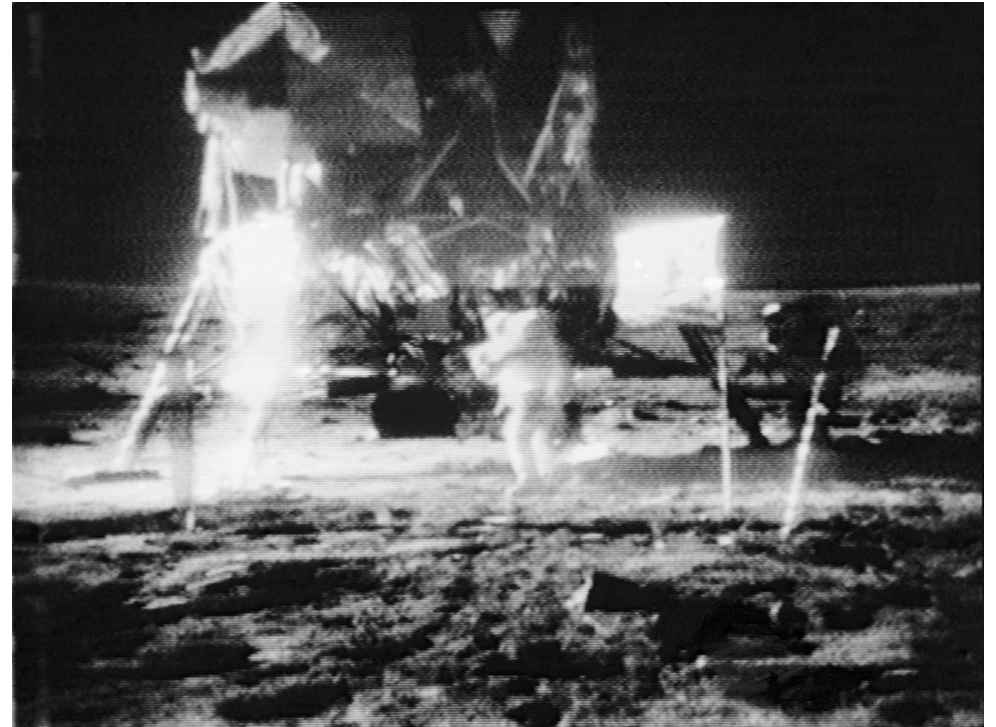
GET 109:52:40

Armstrong (foreground) and Aldrin unveil the plaque.

**The slow scan video at
Goldstone
shows much greater shadow detail
than the scan converted Parkes picture
as recorded at Houston.**

COMPARISONS

After and Before Scan Conversion



Parkes
– scan converted video at Houston

Scan converted picture.
Kinescope of TV at Houston.

Goldstone
– slow scan TV monitor at Goldstone

Slow scan picture.
Mounted Polaroid, taken at Goldstone.
(Photo with thanks to Bill Wood)

GET 110:41:48

Buzz (left) and Neil (right) as Buzz gives a reading on his oxygen levels.

Points to consider when comparing the photographs

- **Difference in antenna size and hence signal gain** – Honeysuckle Creek was 26m (85'); Parkes Radio Telescope and Goldstone DSS-14 each were 64m (210'). Parkes and Goldstone had an 8dB advantage over the smaller Honeysuckle antenna.
- **Different monitors** – Slow scan 320 line 10fps versus the Scan converted NTSC 525 line 30fps.
- **The photos taken under different conditions**
 - frames from kinescope recording made at the Houston Manned Space Flight Center in Houston.
 - mounted Polaroid of slow scan monitor (Goldstone and Sydney Video)
 - handheld Konica 35mm SLR photo of slow scan and scan converted monitors (Honeysuckle Creek) – with ambient light falling on the face of the monitors and room lights reflected also.
- **Degradation of video signal** from Honeysuckle and Parkes due to Australian domestic and trans-Pacific analogue satellite transmission.
- **The NASA archive footage** is kinescope rather than videotape.
- For some other stills taken at Honeysuckle, but not used here, see www.honeysucklecreek.net/Apollo_11_EVA_stills. Other than those Honeysuckle stills, this document contains every still photo of the tracking station monitors known as of December 2005.
- For a discussion of the TV, see www.honeysucklecreek.net/Apollo_11. (And see www.honeysucklecreek.net/dvds for details of the DVD of the Super 8 movie film shot at Honeysuckle during the EVA by Ed von Renouard.)

Acknowledgements

- **TV stills** taken from Mark Gray's Spacecraft Films DVD set of the NASA kinescope archive of the International TV Broadcast as recorded at Houston (except the TV still of Goldstone's picture at GET 109:27:39 – taken from the ABC (US) Network recording of the EVA, as rebroadcast on "As it Happened" in 1989. Supplied by Bill Wood. NASA's archive footage has had the negative section corrected to positive.).
- **Honeysuckle Creek 35mm stills** – photographed by Honeysuckle Creek Video Tech, Ed von Renouard, scanned by Operations Supervisor, John Saxon. Ed photographed both the the Fairchild 320 line slow scan monitor and the NTSC 525 line scan converted monitor. Some photographs were taken in real time, others immediately after the EVA from a replay of the scan converted Ampex video tapes.
- **Parkes still** – Polaroid 4 x 5" photo taken at Sydney Video of the Fairchild 320 line slow scan monitor showing the Parkes slow scan TV, preserved by Bob Goodman. Scan provided by John Sarkissian at Parkes.
- **Goldstone stills**

Image of Armstrong on ladder at 109:22:59 GET is NASA image S69-42583. Who took it is unknown – it appears to be a handheld photo taken of a scan converted monitor – possibly from a tape replay. The black bar across the photo suggests the shutter speed was incorrectly set, and the curved scan lines suggest it was taken fairly close to the convex surface of a CRT monitor. However it could well have been another of the Goldstone Polaroids (see below) that was poorly copied or scanned.

Image at 110:41:48 GET – a mounted Polaroid taken at Goldstone by a Goddard PAO representative, preserved and scanned by Goldstone Unified S-band Lead Engineer Bill Wood.