

N72-17419

NSSDC 70-11

**APOLLO 12 PHOTOGRAPHY
70-mm, 16-mm, AND 35-mm FRAME INDEX**

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**NATIONAL SPACE SCIENCE DATA CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GREENBELT, MARYLAND 20771**

JULY 1970

NSSDC 70-11

APOLLO 12 PHOTOGRAPHY
70-mm, 16-mm, and 35-mm Frame Index

Prepared by
Mapping Sciences Laboratory
Manned Spacecraft Center
National Aeronautics and Space Administration
Houston, Texas 77058

Published by
National Space Science Data Center
Goddard Space Flight Center
National Aeronautics and Space Administration
Greenbelt, Maryland 20771

July 1970

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INTRODUCTION

This index contains supporting information about the 70-mm, 16-mm, and 35-mm photography taken during the Apollo 12 mission.

For each 70-mm frame, the index presents information on: (1) the focal length of the camera, (2) the photo scale at the principal point of the frame, (3) the selenographic coordinates at the principal point of the frame, (4) the percentage of forward overlap of the frame, (5) the sun angle (medium, low, high), (6) the quality of the photography, (7) the approximate tilt (minimum and maximum) of the camera, and (8) the direction of tilt. A brief description of each frame is also included.

The index to the 16-mm sequence photography includes information concerning the approximate surface coverage of the photographic sequence and a brief description of the principal features shown. A "remarks" column is included to indicate: (1) if the sequence is plotted on the photographic index map and (2) the quality of the photography. The pictures taken using the lunar surface closeup stereoscopic camera (35 mm) are also described in this same index format.

The National Space Science Data Center (NSSDC) wishes to thank members of the staff of the Mapping Sciences Laboratory, Manned Spacecraft Center, and the personnel of the Lockheed Electronics Company/Mapping Sciences Laboratory for providing their original index pages to NSSDC. The document preparation effort at NSSDC was under the direction of Mr. Arthur T. Anderson.

APOLLO 12 HASSELBLAD PHOTOGRAPHY (70 mm)

MAGAZINE Q

Frames AS12-50-7325 through 7459

This color (S0-368) magazine includes pictures taken just after translunar injection (TLI) and during lunar orbit 3. Three lenses -- 80, 250, and 500 mm -- were used. Earth, moon, spacecraft parts, and spacecraft interior are included. Targets of opportunity (TO) covered (or partially covered) are: 3, 4, 5, 10a, 11, 12, 18, 23, 26, 27, 30, 32, 34, and 35.

In general, the quality of the images is good, although camera movement and positioning of the camera axis near the sun caused nine frames to be nearly useless. Most lunar topography and all earth frames are oblique (or contain the whole sphere); five frames of Petavius-B are near vertical; 12 frames (not numbered) were skipped.

Five usable frames document the smear and liquid droplet movement on the circular hatch window and the left (square) window of the command service module (CSM) and were taken shortly after TLI. Apparently, this liquid was largely outside the innermost glass pane.

High-angle obliques (such as the Eratosthenes and Humbolt frames) tend toward a more reddish brown color, especially when the illumination is from a low to a medium angle.

APOLLO 12 PHOTOGRAPHY

Magazine 0
Film 368

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
AS-12-50											
7325	80	1;15,000,000	32N	88W		Med	Good		S E		Yucatan, Lake Mich. Gulf of Mex. clouds
7326	80			space		Med	good	70°	NW		Earth, SLA near horizon So. Amer., Mexico
7327	250						Fair				LM, SIVB, Prob H ₂ O drops
7328	"						Fair				"
7329	"						Fair				"
7330											blank
7331	"						good				Earth, 1/2 illuminated, N&S America
7332	"						good				"
7333	"						good				"
7334	"						good				"
7335	"						good				B-IV-B
7336	"						good				"
7337	"						good				"
7338	"						good				1/2 Earth, S. Am
7339	"						good				1/2 Earth, S. Am

APOLLO 12 PHOTOGRAPHY

Magazine _____
 Film 368

Time Reference — GET _____ = GMT _____

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7340		250						good			
7341		"						good			S-IV-B
7342		"						"			$\frac{1}{2}$ Earth, S. Am
7343		"						"			S-IV-B
7344		"						"			S-IV-B
7345		"						"			S-IV-B, LM edge
7346		"						"			"
7347		"						"			$\frac{1}{2}$ Earth, S. Am
7348		"						"			"
7349		"						"			S-IV-B LM edge
7350		"						"			"
7351		"						"			$\frac{1}{2}$ Earth, S. Am
7352		"						"			"
7353		"						"			"
7354		80						"			ocean 1/3 earth illuminated.

APOLLO 12 PHOTOGRAPHY

Magazine Q Film 368

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7355	80						good			1/3 Earth illuminated, ocean
7356	80						"			"
7357	80						"			"
7358	500						"			1/3 Earth, Australia on horizon
7359	500						"			"
7360	500						"			"
7361	500						"			"
7362	250						"			"
7363	250						"			"
7364	250						"			"
7365	250						poor			1/3 Earth, Australia, brownish cast
7366	250						fair			1/4 Earth illuminated
7367	250						fair			1/4 Earth illuminated sunglint
7368	80						poor			fouled hatch window, streaks go away from CMS cone apex
7369	80						fair			fouled hatch window, streaks go away from CMS cone apex

APOLLO 12 PHOTOGRAPHY

Magazine 9 Film 368

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
7370		80						Fair				sq. left window rounded max. liquid is along edge away from cone apex
7371		80						Fair				"
7372		80						good				left window; max liquid edge is away from cone apex
7373		80						poor				LM thrusters
7374		80						Fair				Edge of LM
7375		80						poor				Window, Camera Movement
7376		80						poor				"
7377		80						Fair				1/5 Earth, terminator
7378		80						Fair				"
7379		80						"				"
7380		80						"				"
no number		250						very poor				3 under-exposed frames of no use; probably earth
7381		"						good				1/5 Earth terminator probably W. Australia
7382		"						"				"
7383		"						"				"

APOLLO 12 PHOTOGRAPHY

Magazine 0
 Film 368

Time Reference — GET _____ = GMT _____

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
7384		250						good				1/5 Earth terminator probably W. Australia
7385								"				1/5 Earth, terminator
7386								"				"
7387								"				"
7388								"				"
7389								poor				pre-Rev. 1, moon darkside
7390								"				"
7391								fair				1/4 Earth illuminated
7392								"				"
7393								"				"
7394								"				"
7395								"				"
7396		80						poor				window edge, 1/4 Earth
7397		250						poor				window streak; shutter pentagon
7398								"				smear; shutter image

APOLLO 12 PHOTOGRAPHY

Magazine Q Film 368

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7399	250						Poor			Smear; shutter image
7400	"						"			"
7401	"						"			"
7402	500		9N	7E		Low	Fair	50-65°	N	Triesnecker-Hyginus Area TO-21, 22; Rev. 1
7403	"		4N	11E		"	"	"	"	Triesnecker-Agrippe Center Crater, TO-21, 22 Rev. 1
7404	"					Med.	"	60-75°	SE	Between long 140E & 160E; Rev. 2
7405	250		IN	SPACE	80	"	Good	60-70°	N	Mare IX, about 140°E Rev. 2
7406	"		IN	SPACE	80	"	"	"	"	"
7407	"		IN	SPACE	"	"	"	"	"	Mare IX, about 140°E Rev. 2, red window edge
7408	"	1:4,000,000	4N	120E	60	"	"	50-60°	"	Crater 211 near horizon Rev. 2; Partial TO-4
7409	"	"	5N	120.5E	"	"	"	"	"	"
7410	500	1:5,000,000	32S	108E		High	Good	65-75°	S	West of Mare III; Rev. 2
7411	"	"	32S	103E		"	"	"	"	"
7412	"	"	28S	84E	25	"	"	50-60°	SE	East edge of Humbolt; TO-10a; Rev. 2
7413	"	"	28.5S	81E		"	Fair	"	"	Humbolt, S Mare on Horizon, Rev. 2: TO-10a

APOLLO 12 PHOTOGRAPHY

Magazine 9
Film 358

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7414	500	1:5,000,000	29S	78E	25	Hgh	Good	50-60°	S		West edge of Humbolt TO-10a; Rev. 2
7415	"	"	28S	80.5E	"	"	"	"	SE		Humbolt; Mare Australe on horizon; TO-10a Rev. 2
7416	"	"	"	"	"	"	"	"	"		"
7417	"	"	"	"	"	"	"	"	"		"
7418	"	"	"	"	"	"	"	"	"		"
7419	"	"	27.5S	76.5E	"	"	"	"	"		West edge of Humbolt; TO-10a; Rev. 2
7420	"	"	27.5S	"	"	"	"	"	"		"
7421	"	"	"	"	"	"	"	"	"		"
7422	"	1:4,600,000	16.5S	41E	90	Med	"	7-15°	S		Bohoberger area; TO-12; Rev. 2
7423	"	"	"	"	"	"	"	"	"		"
7424	"	"	"	"	"	"	"	"	"		"
7425	250	"	17S	35E	30	"	"	10-15°	SW		Mare Nectaris; GET 36:17, Rev. 2
7426	"	"	17.5S	33E	"	"	"	"	"		"
7427	"	1:1,380,000	10.5S	18E	90	"	Fair	15-24°	SE		Descartes-Kant Area; TO-18, Alt. 153N, Mf.
7428	"	"	"	"	"	"	"	"	SE		" GET 36:22

APOLLO 12 PHOTOGRAPHY

Magazine 0 Film 368

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7429	250		1:1,380,00	8S	7.5E	90	med	good	5-10°	SE	Hipparchus, Albatagnus TO-23; GET ≈ 86:23
7430	"	"	"	8S	7.5E	90	"	"	5-10°	SE	"
7431	"	"	1:1,350,000	4S	6.5E	95	"	"	20-25°	SE	Herschel in center; Rev 2 GET ≈ 86:24; TO 26, 27
7432	"	"	"	4S	6.5E	95	"	"	"	"	"
7433	500		1:2,000,000	15N	11.5W		Low	Fair	65-75°	N	Eratosthenes; Rev. 2 GET ≈ 84:30
7434	"	"	"	16N	4.5W		"	"	70-80°	NE	Apeninus Mts., Rev. 2 Bode R111 II; GET ≈ 86:26
7435	250		1:4,900,000	4S	7W		Low	good	50-40°	NE	Talande, Herschel & Ptolemaeus; TO-30, 32; Rev. 2
7436	"	"	1:4,000,000	2.5S	14W	90	3-5°	Fair	8-14°	E	Gambart in North TO-34, 35 Rev. 2
7437	"	"	"	"	"	"	"	"	"	"	"
7438	"	"	"	"	"	"	"	"	"	"	Gambart in North; TO-34, 35, term. @ west edge Rev. 2
7439	"	"	"	"	"	"	"	"	"	"	"
7440	"	"	"		Ir space		med	good	86°	N	Mare IX; Limb Rev. 3
7441	"	"	"	"	"	"	"	"	"	"	"
7442	"	"	1:2,400,000	15S	130E	30	"	"	65-75°	SE	N. of Tsolkovsky; partial coverage TO-3
7443	"	"	"	"	"	"	"	"	"	"	"

APOLLO 12 PHOTOGRAPHY

Magazine Q Film 368

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7444	250	1:2,400,000	17S	122.5E	80	med	good	55-60°	SE	about 90 N.M. NW of Tsiolkovsky TO-5
7445	"	"	"	123E	"	"	"	"	"	about 60 N.M. NW of Tsiolkovsky TO-5
7446	"	"				"	"		SW	long. 80E to 125E (?)
7447	"	"				"	"		"	"
7448	"	1:10,000,000	25S	84E		high	good	50-60°	S	Humbolt area
7449	"	"	24.5S	83E		"	"	"	S	"
7450	"	"	"	80.5E		"	"	"	"	"
7451	"	"	25S	80E		"	"	"	"	"
7452	"	"	"	77E		"	"	"	"	"
7453	"	"	"	73.5E		"	"	"	"	"
7454	"	"	"	"		"	"	"	"	"
7455	80	1:1,376,00	18S	61E	0	high	good	5-5°	S	East of Petavius B TO-11
7456	"	"	18.5S	59E	0	"	"	3-5°	S	Near Petavius B TO-11
7457	"	"	19S	58.5E	10	"	"	"	"	"
7458	"	"	19.5S	57E	10	"	"	"	"	"

APOLLO 12 PHOTOGRAPHY

Magazine Q

Film 368

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7459	80	1:1,376,000	19.5S	56E	5	high	good	3-5°	S	Petavius B TO-11
no number										about 1/5 of a frame at end of roll.
										The number of blank frames, in groups of 1, & 2, is:
										twelve (12)

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MAGAZINE R

Frames AS12-51-7460 through 7588

Magazine R is 70-mm color photography of the lunar surface, plus some views of the earth. The photographs were taken from the command module (CM) at approximately 60 nautical miles orbital altitude. The majority of the photographs are oblique with a view on track or in a northerly direction. An 80-mm lens was used for all but 20 frames, which were recorded with a 250-mm lens. Photographic quality was good for 90 percent of the magazine. Eighty percent of the frames cover areas of the lunar surface on the near side, with 90 percent of these covering from 35° east longitude to 40° west longitude.

The following targets of opportunity are fully or partially covered:

7, 8, 9, 15, 23, 25, 26, 27, 29, 31, 32, 33, 34, 35, 36, 37, 39, 40, 42, 43, 44, 45, and 47.

APOLLO 12 PHOTOGRAPHY

Magazine B Film SO-368

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
				Lat	Long						
7460	80	1,678,600	12°S	33°E	0	High	Good	30-40	N		Sea of Nectar, Crater Dagnierre
7461	"	"	"	"	90%	"	"	"	"	"	"
7462	"	"	11.5°S	32.5°E	70%	"	"	"	"	"	"
7463	"	"	11°S	31°E	50%	"	"	"	"	"	Crater Madler
7464	"	"	"	30°E	70%	"	"	"	"	"	"
7465	"	"	10.5°S	29°E	60%	"	"	"	"	"	"
7466	"	"	"	28°E	80%	"	"	"	"	"	Craters Theophilus and Madler
7467	"	"	10°S	27°E	70%	"	"	"	"	"	Craters Theophilus & Theophilus B
7468	"	"	"	26.5°E	70%	"	"	"	"	"	Craters Theophilus & Theophilus B
7469	"	"	"	10.5°S	25.5°E	60%	"	"	"	"	"
7470	"	"	"	25°E	90%	"	"	"	"	"	"
7471	"	1,880,100	17°S	3°E	0	Med	"	40-45	SW		Craters Albatagnius and Parrot
7472	250	622,200	9.5°S	0	0	"	"	40-50	S		Crater Ptolemaeus
7473	"	583,000	8.5°S	1°W	"	"	"	35-45	S		Crater Ptolemaeus A
7474	"	"	"	"	3°W	"	"	35-45	S		West side of Crater Ptolemaeus

APOLLO 12 PHOTOGRAPHY
 Magazine B Film SO-368
 Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7475	250	1,622,200	8.5°S	4°W	50%	Med	Good	40-50	S	West Side of Crater Ptolemaeus
7476	"	969,200	14.5°S	7°W		"	"	60-70	S	Craters Lassell and Alpetragius B
7477	"	1,041,100	15°S	8.5°W		"	"	"	"	Craters Davy, Lassell, and Lassell C
7478	"	1,126,100	14.5°S	9°W		"	"	65-70	S	Craters Davy, Lassell and Lassell C
7479	"	"	14°S	9.5°W		"	"	60-70	"	Sea of Clouds, Crater Lassell C
7480	"	503,100	2.5°S	14°W	0	Low	Poor	25-35	W	Area North of Fra Mauro, very dark
7481	"	767,100	9°S	15°W		"	Fair	50-60	S	Craters Parry and Parry A
7482	"	"	8.5°S	15°W		"	"	"	S	"
7483	"	"	8°S	16°W		"	"	"	"	Craters Parry, Fra Mauro
7484	"	"	7.5°S	17°W		"	"	"	"	Very dark- SE Rim of Fra Mauro
7485	"	1,041,100	10.5°S	7°W	0	Med	Good	60-70	SW	Crater Davy, Davy
7486	"					Low	Poor			Very Dark-Terminator Shot Not Plotted
7487	"					"	"			"
7488	"					"	"			"
7489	"						Good			Earth View

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APOLLO 12 PHOTOGRAPHY
 Magazine R Film SO-368
 Time Reference GET = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7490	80				C	High	Poor			Sea of Fertility Not Plotted
7491	"				70%	"	"			Sea of Fertility Not Plotted
7492	"				0	"	"			"
7493	"				70%	"	"			"
7494	"	1,411,200	15°S	4.9°E	0	"	Good	10-15	W	Sea of Fertility, Crater Colombo M
7495	"	1,454,200	"	"	95%	"	"	15-25	W	"
7496	"	1,517,100	"	48.5°E	90%	"	"	20-30	W	Craters Columbo M and McClure A
7497	"	1,572,100	"	48°E	90%	"	"	25-35	"	Craters Columbo M & East Rim of Colombo
7498	"	1,678,600	12°S	19.5°E	0	"	"	30-40	"	Craters Kant, Cyrillus, B and Kant D
7499	"	"	"	"	95%	"	"	"	"	Craters Kant, Kant D, and Cyrillus B
7500	"	"	"	"	"	"	"	"	"	"
7501	"	2,184,900	9°S	5.5°E	0	Med	"	50-55	"	Craters Hind, Halley Albategnius and Muller
7502	"	"	"	5°E	90%	"	"	"	"	Craters Hind, Halley Muller, & Ptolemaeus
7503	"	2,524,600	3°S	0.5°E	50%	"	"	55-60	"	Craters Ptolemaeus Herschel & Müller
7504	"	"	7.5°S	0.5°W	90%	"	"	"	"	Craters Müller, Herschel and Ptolemaeus

APOLLO 12 PHOTOGRAPHY

Magazine B Film SO-368

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
7505	80		2,569,700	7.5°S	1.0°W	80%	Med	Good	55-60		W	Craters Muller, Herschel and Ptolemaeus
7506	"	"	"	"	3.5°W	50%	"	"	55-65		W	Craters Ptolemaeus, Herschel & Lalande C
7507	"	"	2,836,200	7°S	4.5°W	30%	"	"	"		"	"
7508	"	"	4,702,900	HORIZON		30%	"	"	70-75		"	IM Tracking Crater Lalande
7509	"	"	"	"	"	30%	"	"	"		"	IM Tracking, Craters Lalande & Lalande A
7510	"	"	"	"	"	30%	"	"	"		"	"
7511	"	"	"	"	"	"	"	"	"		"	"
7512	"	"	"	"	"	"	"	"	"		"	Earth View
7513	"	"	"	"	"	"	"	"	"		"	"
7514	"	"	3,028,700	11.5°S	9.5°W	0	"	Fair	60-65		SW	Craters Davy and Davy Y Sea of Clouds
7515	"	"	3,519,000	11.5°S	11.5°W	70%	"	"	65-70		"	"
7516	"	"	5,312,600	HORIZON		0	"	"	70-80		N	Oblique View of Copernicus Crater
7517	"	"	"	"	"	30%	"	"	"		"	"
7518	"	"	5,000,000	HORIZON		0	Low	"	70-75		SW	Area Between Craters 293 & 297
7519	"	"	"	"	"	0	"	"	"		"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7520	80	5,312,600	HORIZON		0	low	Fair	70-80	SW	Area Between Craters 293 and 297
7521	"	"	HORIZON		0	"	Good	70-80	NW	Crater IX
7522	"						"			Earth View
7523	"						"		"	"
7524	"		HORIZON				Poor		W	Area Just West of Crater II, Earth Rise
7525	"		"	"			"	"	"	Area Just West of Crater II, Earth Rise
7526	"		"	"			"	"	"	Area Just West of Crater II, Earth Rise
7527	"		"	"			"	"	"	Area Just West of Crater II, Earth Rise
7528	"		"	"			"	"	"	Area Just West of Crater II, Earth Rise
7529	"		"	"			"	"	"	Earth Rise
7530	"	4,223,400	"	"	0	Low	"	65-75	S	Crater 286 at Terminator
7531	"	1,678,600	1°S	25°W	0	Med	Fair	30-40	NE	Crater Lansberg
7532	"	"	"	26°W	80%	"	"	"	"	"
7533	"	1,944,520	2.5°N	13.5°W	0	"	Poor	40-50	N	Crater Gambart, Gambart B, and Gambart C
7534	"	2,284,700	3°N	15°W	0	"	"	50-60	"	Crater Gambart

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7535	80	3,519,000	HORIZON		30%	Med	Poor	65-70	N	Oblique View of Crater Copernicus
7536	"	3,836,800	HORIZON		"	"	"	"	"	Craters Copernicus and Reinhold B
7537	"	1,721,700	0.5°S	26.5°W	0	"	"	35-40	W	Crater Lansberg
7538	"	"	0.5°S	"	95%	"	Fair	"	"	"
7539	"	"	1°N	29°W	0	Low	Good	35-40	NW	Craters Lansberg A and Kunowsky D
7540	"	1,821,900	2°N	31.5°W	40%	"	"	35-45	W	Crater Lansberg A
7541	"	3,253,500	7°N	19.5°W	0	Med	"	60-70	N	Craters Copernicus Rheinhold A & Gambart A
7542	"	"	"	20°W	80%	"	Fair	60-70	"	Craters Copernicus & Rheinhold A
7543	"	2,669,700	2.5°N	22°W	0	"	"	55-60	NW	Craters Rheinhold & Rheinhold B
7544	"	3,519,000	10°N	26.5°W	0	"	Good	65-70	N	Craters Hortensius & Hortensius E
7545	"	"	9.5°N	28°W	80%	"	"	"	"	"
7546	"	3,836,200	"	31°W	50%	"	"	"	"	Craters Hortensius A & Hortensius B
7547	"	4,702,900	HORIZON		0	Low	"	70-75	NW	Craters Kunowsky, Encke and Kepler
7548	"	2,016,100	3.5°N	32.5°W	0	"	"	45-50	NW	Craters Kunowsky and Hortensius A
7549	"	3,028,700	8.5°N	34°W	30%	"	"	60-65	N	Craters Kepler A, Kepler B and Hortensius A

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7550	80	3,253,500	7.5°N	36.5°W	30%	Low	Good	60-70	NW	Craters Encke and Kepler
7551	"	2,397,200	4.5°N	36.5°W	30%	"	"	50-60	W	Craters Encke & Kepler
7552	"	3,253,500	11°N	32.5°W	0	"	"	60-70	N	Craters Kepler B & Milichius A
7553	"	3,519,000	12°N	34°W	70%	"	"	65-70	N	"
7554	"	2,836,200	2.5°N	116.5°E	0	Med	"	60-65	NW	Area Between Craters 206-211
7555	"	3,519,000	6°N	121°E	40%	"	"	65-70	N	Oblique View looking North into Crater 211
7556	"	1,721,700	5°S	119°E	0	Med	Good	30-40	N	Area Just West of Crater 277
7557	"	2,836,200	0°	114.5°E	0	"	"	60-65	NW	Craters 206, 277, 275, and 277
7558	"	1,572,100	5.5°S	114.5°E	30%	"	"	25-35	NW	Southern Half of Crater 277
7559	"	3,519,000	1.5°N	110°E	0	"	"	65-70	NW	Craters 202, 204, 207 and 275
7560	"	3,253,500	0°	108.5°E	60%	"	"	"	"	Craters 202, 204 and 273
7561	"	1,880,100	6°S	109.5°E	20%	"	"	40-45	NW	Crater 273
7562	"	3,028,700	1°S	116.5°E	0	"	"	60-65	NE	Crater 277
7563	"	"	2°S	103.5°E	0	High	"	"	NW	Crater 270
7564	"	2,669,700	9.5°S	113.5°E	0	"	Fair	55-65	E	Crater 276

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
7565	80	3,028,700	5°S	84°E	0	High	Good	60-65	NW	Craters 263, Smyths Sea
7566	"	"	7°S	79°E	30%	"	"	"	"	Crater Kastner
7567	"	2,524,600	10°S	75.5°E	0	"	"	55-60	NW	Craters LaPerouse & LaPerouse F
7568	"	"	9°S	66.5°E	0	"	"	"	NW	Crater Langrenus A
7569	"	3,028,700	8°S	61.5°E	50%	"	"	60-65	NW	Crater Langrenus
7570	"	3,519,000	10.5°S	29.5°E	0	"	"	65-70	W	Craters Daguerre & Madler, Sea of Nectar
7571	"	2,669,700	22.5°S	37°E	0	"	"	55-69	S	Craters Fracastorius B, Central peaks of Piccolomini
7572	250	969,200	10°N	31.5°W		Low	Poor	60-65	N	Craters Milichius and Milichius A
7573	"	907,600	9.5°N	32.5°W		"	"	55-65	N	Crater Milichius A
7574	"	854,300	9°N	34°W		"	"	55-60	N	Ocean of Storms
7575	"	"	"	35°W		"	"	"	"	Crater Kepler B
7576	"	807,900	7.5°N	35°W		"	"	"	"	"
7577	"	"	"	36°W		"	"	"	"	Craters A & Kepler B
7578	"	1,126,100	9.5°N	37°W		"	"	60-70	N	Just North of Kepler B
7579	80	3,836,200		HORIZON	0	High	Good	65-75	S	Craters Alphonsus & Arachael

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7580	80	3,836,200	HORIZON		90%	High	Good	65-75	S	Craters Alphonsus, Arzachel & Alpetragius
7581	"						"			Almost total eclipse of Earth
7582	"						"			Earth View
7583	"						"			"
7584	"						"			Solar Eclipse
7585	"						"			"
7586	"						"			"
7587	"						"			"
7588	"						"			Star Shot

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MAGAZINE S

Frames AS12-52-7589 through 7762

Magazine S contains black and white orbital coverage of the lunar surface taken from an average altitude of 60 nautical miles. It consists of 173 frames, numbered from 7589 through 7762, photographed with 80-, 250-, and 500-mm lenses.

The coverage ranges from 130° east longitude to 45° west longitude and 15° north latitude to about 50° south latitude. Photographic quality ranges from poor to good.

Frames 7589 through 7600 are 80-mm low-oblique stereo coverage of Fra Mauro and target of opportunity 35. All frames are of good quality.

Frames 7669 through 7709 include 500-mm low-oblique to near-vertical stereo coverage of Fra Mauro and are of poor to good quality. The frames are partially exposed due to a camera shutter malfunction. Frames 7631 through 7668 are 500-mm low-oblique stereo coverage of Descartes and are of poor to good quality. Frames 7645 through 7668 are partially exposed due to a camera shutter malfunction.

Frames 7601 through 7630 and 7710 through 7762 were taken with a 250-mm lens. Frames 7605 through 7630 are 250-mm low-oblique to near-vertical stereo coverage of the southern edge of Herschel. The photographic quality is fair to good. Frames 7735 and 7738 through 7740 are 250-mm high-oblique exposures of Copernicus. The photographic quality is good. Frames 7761 and 7762 are blurred and not plottable.

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7589	80	1:1,678,690	5.6°S	13.4°W	95%	Low	30-35°	SW		Fra Mauro TO-35
7590	"	"	5.5°S	14.2°W	95%	"	"	"	"	"
7591	"	1:1,604,100	4.4°S	14.4°W	95%	"	"	S	"	"
7592	"	"	4.7°S	15.8°W	90%	"	"	"	"	"
7593	"	"	4.9°S	16.0°W	90%	"	"	"	"	"
7594	"	1:1,517,100	4.9°S	16.0°W	90%	"	20-25°	E	"	"
7595	"	1:1,821,900	"	17.4°W	85%	"	35-40°	W	"	"
7596	"	1:1,769,300	4.7°S	17.8°W	"	"	35-40°	W	"	"
7597	"	1:1,769,300	4.9°S	18.2°W	"	"	"	SM	"	"
7598	"	1:1,821,900	4.7°S	19.2°W	95%	"	"	"	"	"
7599	"	1:1,678,600	4.8°S	19.3°W	90%	"	"	"	"	"
7600	"	1:1,517,100	4.1°S	18.4°W	95%	"	25-30°	"	"	"
7601	250	1:767,100	12.8°S	65.7°E	95%	"	55-60°	SSW		Directly East of Langrenus G
7602	"	"	12.7°S	65.3°E	95%	"	"	"		Between Lame, Langrenus P and Langrenus G
7603	"	"	12.6°S	65.0°E	95%	"	"	"	"	"

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7604	250		1:699,200	6.6°S	1.7°E		Hgh	Good	45-51°	W	Between Müller and Herschel TO-26
7605	500		1:622,200	6.4°S	2.6°W	95%	"	"	45-60°	W	TO-27 Southern edge of Herschel
7606	"		1:699,200	6.3°S	2.7°W	95%	"	"	"	"	"
7607	"		"	"	2.4°W	"	"	"	"	"	"
7608	"		"	"	"	"	"	"	30-45°	"	"
7609	"		"	"	"	"	"	"	"	"	"
7610	"		"	"	"	"	"	"	"	"	"
7611	"		"	"	"	"	"	"	15-30°	"	"
7612	"		"	"	"	"	"	"	"	"	"
7613	"		"	"	"	90%	"	Fair	0-15°	"	"
7614	"		"	6.4°S	2.6°W	"	"	"	"	"	"
7615	"		"	6.3°S	"	95%	"	"	"	"	"
7616	"		"	6.7°S	2.4°W	90%	"	Good	"	"	"
7617	"		"	"	2.1°W	80%	"	"	Vertical	"	"
7618	"		"	"	"	"	"	Med	"	"	"

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7619	500	1:622,200	6.4° S 2.1° W	90%	Med	Good	45-51°	W			Southern Edge of Herschel
7620	"	1:699,200	"	"	"	"	"	"	"	"	"
7621	"	"	"	80%	"	"	"	"	"	"	"
7622	"	"	"	"	"	"	"	"	"	"	"
7623	"	"	"	90%	"	"	"	"	"	"	"
7624	"	"	"	"	"	"	"	"	"	"	"
7625	"	"	"	95%	"	"	"	"	"	"	"
7626	"	"	"	"	"	"	"	"	"	"	"
7627	"	"	"	90%	"	"	"	"	"	"	"
7628	"	"	"	80%	"	"	"	"	"	"	"
7629	"	"	"	"	"	"	"	"	"	"	"
7630	"	"	"	"	"	"	"	"	"	"	"
7631	"	"	8.7° S 15.0° E	0%	"	"	30-60°	"	"	"	Descartes Looking West into Dolland B. T0-18
7632	"	"	8.7° S 15.0° E	100%	"	"	"	"	"	"	"
7633	"	1:1,222,000	8.8° S 15.3° E	95%	"	"	15-20°	"	"	"	Area of Descartes centered between Taylor, Dolland, T0-18 and Kant D.

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7634	500	1:1,222,000	8.8° S	15.3° E	95%	Med	Good	15-20°	W	Area of Descartes centered between Taylor, Dohland 10-18 and Kant D.	
7635	"	"	"	"	"	"	"	"	"	"	
7636	"	"	"	"	"	"	"	"	"	"	
7637	"	"	"	"	"	"	"	"	"	"	
7638	"	"	"	"	"	"	"	"	"	"	
7639	"	"	"	"	"	"	"	"	"	"	
7640	"	"	"	"	"	"	Fair	"	"	"	
7641	"	"	"	"	"	"	"	"	"	"	
7642	"	"	"	"	"	"	"	"	"	"	
7643	"	"	"	"	"	"	"	"	"	"	
7644	"	"	"	"	"	"	"	"	"	"	
7645	"	"	"	"	"	"	"	"	"	Partial Frame	
7646	"	"	"	"	"	"	Poor	"	"	"	
7647	"	"	"	"	"	"	"	"	"	"	
7648	"	"	"	"	"	"	"	"	"	"	

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7649	500	1:1,222,000	8.8°S	15.3°E	95%	Med.	Poor	15-20°	W		Area of Rescapes centered between Taylor, Dolland, Dolland B, and Kant D. 10-18 Partial Frame
7650	"	"	"	"	"	"	"	"	"	"	"
7651	"	"	"	"	"	"	"	"	"	"	"
7652	"	"	"	"	"	"	"	"	"	"	"
7653	"	"	"	"	"	"	"	"	"	"	"
7654	"	"	"	"	"	"	"	"	"	"	"
7655	"	"	"	"	"	"	"	"	"	"	"
7656	"	"	"	"	"	"	"	"	"	"	"
7657	"	"	"	"	"	"	"	"	"	"	"
7658	"	"	"	"	"	"	"	"	"	"	"
7659	"	"	"	"	"	"	"	"	"	"	"
7660	"	"	"	"	"	"	"	"	"	"	"
7661	"	"	"	"	"	"	"	"	"	"	"
7662	"	"	"	"	"	"	"	"	"	"	"
7663	"	"	"	"	"	"	"	"	"	"	"

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7664	500	1:1,222,000	8.8° S	15.3° E		Med.	Fair	15-20°	W		Area of Descartes centered between Taylor, Doland, and Kant D. (partial frame)
7665	"	"	"	"	"	"	"	"	"	"	"
7666	"	"	"	"	"	"	"	"	"	"	"
7667	"	"	"	"	"	"	"	"	"	"	"
7668	"	"	"	"	"	"	"	"	"	"	"
7669	"	"	3.8° S	17.4° W	0%	Htgh	Poor	10-15°	MSW		Southwest of Fra Mauro (Southwest of Fra Mauro J. (partial frame)
7670	"	"	"	"	"	"	"	"	"	"	"
7671	"	"	"	"	"	"	"	"	"	"	"
7672	"	"	"	"	"	"	"	"	"	"	"
7673	"	"	"	"	"	"	"	"	"	"	"
7674	"	"	"	"	"	"	"	"	"	"	"
7675	"	"	"	"	"	"	"	"	"	"	"
7676	"	"	"	"	"	"	"	"	"	"	"
7677	"	"	"	"	"	"	"	"	"	"	"
7678	"	"	"	"	"	"	"	"	"	"	"

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Frame #	Camera #	f Length _{mm}	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
				Lat	Long						
7679	500	1:1,222,000	3.8°S 17.4°W	75%	High	Poor	10-15°	MSM	Southwest of Fra Mauro Crater and Southeast of Fra Mauro J. (Partial Frame)		
7680	"	"	"	80%	"	"	"	"	"	"	"
7681	"	"	"	"	"	"	"	"	"	"	"
7682	"	"	"	"	"	"	"	"	"	"	"
7683	"	"	"	75%	"	"	"	"	"	"	"
7684	"	"	"	80%	"	"	"	"	"	"	"
7685	"	"	"	"	"	"	"	"	"	"	"
7686	"	"	"	75%	"	"	"	"	"	"	"
7687	"	"	"	75%	"	"	"	"	"	"	"
7688	"	"	"	"	"	"	"	"	"	"	"
7689	"	"	"	80%	"	"	"	"	"	"	"
7690	"	"	"	75%	Med	Fair	"	"	"	"	"
7691	"	"	"	80%	"	"	"	"	"	"	"
7692	"	"	"	75%	"	Good	"	"	"	"	"
7693	"	"	"	80%	"	"	"	"	"	"	"

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7694	500	1:1,222,000	3.8°S	17.4°W	85%	Med.	Good	5-10°	MSW		Southeast of Fra Mauro and southeast of Fra Mauro J. (Partial Frame)
7695	"	"	"	"	"	"	"	"	"	"	"
7696	"	"	"	"	80%	"	"	"	"	"	"
7697	"	"	"	"	85%	"	"	"	"	"	"
7698	"	"	"	"	90%	"	"	"	"	"	"
7699	"	"	"	"	80%	"	"	"	"	"	"
7700	"	"	"	"	85%	"	"	"	"	"	"
7701	"	"	"	"	"	"	"	"	"	"	"
7702	"	"	"	"	"	"	"	"	"	"	"
7703	"	"	"	"	"	"	"	"	"	"	"
7704	"	"	"	"	90%	"	"	"	"	"	"
7705	"	"	"	"	80%	"	"	"	"	"	"
7706	"	"	"	"	95%	Low	Good	"	MSS	"	"
7707	"	"	"	"	"	"	"	"	"	"	"
7708	"	"	"	"	"	"	"	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7709	500	1:1,222,000	3.8°S	17.4°W	95%	Low	Good	5-10°	WSW	Southwest of Fra Mauro G and Southeast of Fra Mauro J. (Partial Frame)
7710	250	1:1,041,100	2.0°N	126°E	95%	"	Poor	60-70°	NE	Craters 283, 282 looking Northeast. TO-4
7711	"	"	1.6°N	125.9°E	"	"	"	"	"	"
7712	"	"			"	"	Fair	"	"	Unplottable due to photography
7713	"				"	"	"	"	"	"
7714	"	1:767,100	4.7°S	38.3°E	"	Med	Good	50-55°	NW	Censorinus F looking Northwest TO-14
7715	"	"	4.2°S	"	"	"	"	"	"	"
7716	"	1:767,100 1:907,600	3.7°S	22.2°E	"	"	"	55-61°	N	Hypatia looking North TO-16
7717	"	"	3.1°S	21.2°E	"	"	"	"	NW	Alfraganus D, F, G, & Hypatia & Hypatiac, looking North TO-16
7718	"	1:907,600 1:1,041,100	2.5°S	20.0°E	80%	"	"	61-65°	NNW	Alfraganus F looking NW to Schmidt & Dionysius TO-16
7719	"	1:907,600	"	21.5°E	80%	"	"	60-65°	N	Alfraganus F looking N to Hypatia C. & Sabine TO-16
7720	"	1:513,300 1:537,100	4.1°S	20.9°E	80%	"	"	31-35°	N	Alfraganus D, F, & G looking N. TO-16
7721	"	1:1,041,100 1:1,351,500	3.0°N	14.3°E	95%	High	Good	65-71°	"	d'Arrest looking N to Rima Ariadaeus
7722	"	1:907,600 1:041,100	3.3°N	14.5°E	90%	High	Good	61-65°	"	d'Arrest looking N to Rima Ariadaeus
7723	"	1:907,600	0°	6.1°E	95%	Med	"	60-65°	"	Lade looking N to Agrippa TO-22

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
				Lat	Long						
7724	250	1:907,600	0.08	8.2°E	80%	Med	Good	60-65°	NNE	Western Edge of Lade Looking N to Dembowski TO-22	
7725	"	"	0.02N	7.2°E	"	"	"	"	NW	Directly W of Lade Looking N across Dembowski TO-22	
7726	"	1:1,071,100	0.7°N	3.5°E	60%	High	"	"	NW	Rhaeticus Looking NW across Trisnecker	
7727	"	"	0.7°N	4.5°E	65%	"	"	"	"	"	
7728	"	"	6.8°N	3.1°W	95%	Med	"	"	N	Pallas, Bode Looking N to Rima Bode I TO-28	
7729	"	"	6.8°N	4.1°W	90%	"	"	"	"	Rima, Bode IV Looking N to Rima Bode I TO-28	
7730	"	"	8.9°N	5.1°W	85%	"	"	"	NW	Rima Bode IV Looking NE to Sinus Aestuum TO-28	
7731	"	1:1,071,100 1:1,351,500	5.7°N	7.7°W	90%	"	"	65-71°	NW	Schroter Looking North to Schroter C & Sinus Aestuum.	
7732	"	"	5.0°N	8.4°W	85%	"	"	"	"	Schroter G Looking N to Schroter C & Sinus Aestuum	
7733	"	1:1,071,100	5.0°N	8.6°W	90%	"	"	"	N	"	
7734	"	"	5.4°N	9.9°W	85%	"	"	"	N	"	
7735	"	1:1,071,100 1:1,351,500	9.7°N	19.7°W	"	"	"	65-71°	NNW	Copernicus & Copernicus H Looking NW	
7736	"	1:767,100 1:907,600 1:622,200 1:699,200	1.4°N	15.3°W	"	"	"	55-61°	N	Gambart Looking N & Including Gambart EA TO-34	
7737	"	"	1.0°N	13.8°W	"	"	"	45-51°	NW	Gambart A Looking NW	
7738	"	1:1,041,100 1:1,351,500	9.6°N	19.3°W	80%	"	"	65-71°	N	Copernicus TO-37	

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
7739	250	1,041,100	10°N	20°W	80%	Med	Good	60-65°	N	Copernicus TO-37
7740	"	1,351,500 907,600	0.4°N	21.7°W	80%	"	"	70-75°	N	"
7741	"	1,041,100	6.5°N	29.4°W	85%	"	"	61-65°	"	Hortensius B Looking N to Mitichus
7742	"	1,041,100	6.8°N	20.0°W	"	"	"	"	NW	"
7743	"	907,600	11.4°N	31.3°W	80%	"	"	"	N	Mitichus & Mitichus A
7744	"	1,041,100	7.2°N	31.8°W	80%	"	"	"	"	Mitichus A
7745	"	1,041,100 1,351,500 622,200	8.3°N	38.3°W	"	"	"	65-71°	NW	Kepler, Kepler A. Kepler F TO-43
7746	"	699,200	2.1°N	32.5°W	"	"	"	45-51°	"	Kumowsky TO-42
7747	"	907,600	8.1°N	38.3°W	"	"	"	60-65°	"	Kepler, Kepler F TO-43
7748	"	440,600 478,200	.07°N	36.5°W	80%	Low	"	3-11°	SSW	Make C TO-47
7749	"	699,200	4.5°S	44.0°W	"	"	"	50-55°	SE	Flamsteed, Flamsteed B TO-50
7750	"	583,000	1.0°N	45.1°W	"	"	"	"	NW	Guess F TO-48
7751	"	1,351,500	6.4°N	53.1°W	"	"	"	70-75°	MNW	Reiner, Reiner A TO-53
7752	"	699,200	4.4°N	47.3°W	80%	"	"	50-55°	NW	Guess, Guess D
7753	"	"	5.0°N	43.2°W	50%	"	"	"	"	Guess

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7754	250	1,041,100 1,227,800				Low	Fair	65-70°	NW	West Central Ocean of Storms near Terminator (not plottable)
7755	"					"			W	"
7756	"	907,600	7.0°N	54.2°W		"	Good, but partially blurred	60-65°	WSW	Reiner Looking North TO-53
7757	"	"	12.8°N	50.3°W	80%	Med	"	"	N	Marius TO-52
7758	"	907,600 1,041,100	7.9°N	54.9°W	80%	Low	"	61-65°	NW	Reiner Looking NE TO-53
7759	"	"	13.9°N	51.5°W	80%	"	"	"	N	Marius TO-52
7760	"	"								Photography Blurred Not Plottable
7761	"	"								Not Plottable, Blurred
7762	"	"								Not Plottable, Blurred

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MAGAZINE T

Frames AS12-54-7948 through 8120

Magazine T is 70-mm black and white photography of the lunar surface, taken from the CM. The entire magazine is a near-vertical stereo strip photographed with an 80-mm lens. The approximate coverage is from 125° east longitude, 3° south latitude to 55° west longitude, 3° north latitude. Sun angles are from low to high, and the photographic quality ranges from poor to good.

Frames 8083 through 8091 cover an area from the north tip of Fra Mauro to landing site 7. Landing site 5 is shown on frames 8108 and 8109. The target of opportunity coverage is as follows: 8 on frames 7954 through 7957; 13 on 8028 and 8029; 15 on 8033 through 8035; 18 on 8048 through 8051; 23 on 8056 through 8059; 26 on 8065 and 8066; 27 on 8068 through 8070; 32 on 8075 through 8077; 35 partially imaged on 8083 and 8084; 39 on 8087 through 8098; and 48 on 8108 through 8111.

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
7948	80mm	1:1,376,900	39S	123°E	60	Low	Poor	Near Vert	Near Vert	Not Usable (Too dark)
7949	"	"	4°S	121.5°E	60	Low	Poor	Near Vert	Near Vert	Stereo Usable (Dark)
7950	"	"	4°S	121°E	65	"	"	"	"	Stereo Usable (Dark)
7951	"	"	45°S	120°E	65	"	"	"	"	Stereo Usable (SE of 277)
7952	"	"	4.5°S	119°E	60	"	"	"	"	Stereo Strip, SE of 277
7953	"	"	45°S	117.5°E	65	"	"	"	"	Stereo Strip, SE of 277
7954	"	"	5°S	116.5°E	70	"	"	"	"	Stereo Strip TO-8 SSE of 277
7955	"	"	5°S	116°E	70	"	"	"	"	Stereo Strip TO-8 So. Part of 277
7956	"	"	5.5°S	115°E	65	"	"	"	"	Stereo Strip TO-8 So. Part of 277
7957	"	"	5.5°S	114°E	65	"	"	"	"	Stereo Strip TO-8 So. Part of 277
7958	"	"	6°S	113°E	65	"	Pair	"	"	Stereo S.E. Part of 273
7959	"	"	6°S	111.5°E	65	"	"	"	"	Stereo S Part of 273
7960	"	"	6°S	110.5°E	65	"	"	"	"	Stereo S Part of 273
7961	"	"	6°S	109.5°E	60	"	"	"	"	Stereo Strip S Part of 273
7962	"	"	6.5°S	108.5°E	65	"	"	"	"	Stereo Strip SW of Grater 273

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
7963	80mm	1:1,376,900	108°E	65	65	Low	Fair	Near Vert	Near Vert	Stereo SW of Crater 273
7964	"	"	107°E	65	65	Low	Fair	Near Vert	Near Vert	Stereo SW of Crater 273
7965	"	"	106°E	65	65	"	"	"	"	"
7966	"	"	105°E	70	70	"	"	"	"	"
7967	"	"	104°E	65	65	"	"	"	"	Stereo SE of Crater 270
7968	"	"	103°E	62	62	"	"	"	"	Stereo S of Crater 270
7969	"	"	102°01E	65	65	"	"	"	"	"
7970	"	"	101°E	65	65	"	"	"	"	"
7971	"	"	100°E	62	62	"	"	"	"	SW of Crater 270
7972	"	"	99°E	65	65	"	"	"	"	"
7973	"	"	98°E	68	68	"	"	"	"	"
7974	"	"	97°E	65	65	"	"	"	"	SE of Crater 266
7975	"	"	96°01E	65	65	"	"	"	"	"
7976	"	"	95°E	62	62	"	"	"	"	SE Part of Crater 266
7977	"	"	94°E	62	62	"	"	"	"	"

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
7978	80mm	1:1,376,900	8.5°S	93°E	67	Med.	Good	Near Vert	Near Vert	Stereo S. Part of Strip Grater 266
7979	"	"	9°S	92°E	65	"	"	"	"	"
7980	"	"	9°S	90.5°E	65	"	"	"	"	Stereo SW of Grater Strip 266
7981	"	"	9°S	89.5°E	65	"	"	"	"	SE of Grater 263
7982	"	"	9°S	88.5°E	65	"	"	"	"	"
7983	"	"	9°S	87.5°E	65	"	"	"	"	"
7984	"	"	9.5°S	86.5°E	65	"	"	"	"	S. of Grater 263
7985	"	"	9.5°S	85.5°E	65	"	"	"	"	"
7986	"	"	9.5°S	84.5°E	65	"	"	"	"	"
7987	"	"	10°S	83.5°E	65	"	"	"	"	"
7988	"	"	10°S	82°E	63	"	"	"	"	SW of Grater 263
7989	"	"	10°S	81°E	65	"	"	"	"	"
7990	"	"	10°S	80°E	65	"	"	"	"	Ia Perouse E Ansgarius M Shown
7991	"	"	10°S	79°E	65	"	"	"	"	"
7992	"	"	10°S	78°E	65	"	"	"	"	"

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
7993	80mm	1:1,376,900	10°S	77°01E	65	Med.	Good	Near Vert	Near Vert	Near Vert	La Perouse	
7994	"	"	10°S	76°01E	65	"	"	"	"	"	"	"
7995	"	"	10°S	75°0E	65	"	"	"	"	"	"	Stereo Frames 7996-8011 Strip
7996	80mm	1:1,376,900	10°S	74°0E	65	Med.	Good	Near Vert	Near Vert	Near Vert	West Part of LaPerouse Crater	
7997	"	"	10.5°S	73°01E	65	"	"	"	"	"	West of La Perouse	
7998	"	"	10.5°S	72°01E	65	"	"	"	"	"	Crater Kapteyn Shown	
7999	"	"	10.5°S	71°0E	65	"	"	"	"	"	"	"
8000	"	"	10.5°S	70°0E	65	"	"	"	"	"	"	"
8001	"	"	10.5°S	69°0E	65	"	"	"	"	"	Crater Langrenus A	
8002	"	"	11°S	68°01E	65	"	"	"	"	"	"	"
8003	"	"	10.5°S	67°0E	67	"	"	"	"	"	Craters Langrenus A and G Shown	
8004	"	"	11°S	66°0E	65	"	"	"	"	"	"	"
8005	"	"	11°S	65°0E	65	"	"	"	"	"	Craters Langrenus A, G, and F Shown	
8006	"	"	11°S	64°0E	63	"	"	"	"	"	Also S. tip of Langrenus	

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
8007	80mm	1:1,376,900		11°S	62.5°E	65	Med.	Good	Near Vert	Near Vert		Graters Langrenus A.C. & P. Shown - Also south tip of Langrenus
8008	"	"	"	12°S	61.5°E	65	"	"	"	"	"	"
8009	"	"	"	11°S	61°E	65	"	Fair	"	"	"	"
8010	"	"	"	11°S	59.5°E	65	"	"	"	"	"	SW Section of Langrenus
8011	"	"	"	11°S	58.5°E	65	"	"	"	"	"	"
8012	"	"	"	11°S	57.5°E	68	"	"	"	"	"	Langrenus D Stereo Strip
8013	"	"	"	11°S	56.5°E	65	"	"	"	"	"	"
8014	"	"	"	11°S	55°E	65	"	"	"	"	"	"
8015	"	"	"	11°S	54°E	65	"	"	"	"	"	Southeast of Langrenus
8016	"	"	"	11°S	53°E	65	"	"	"	"	"	"
8017	"	"	"	11°S	52°E	65	"	"	"	"	"	"
8018	"	"	"	11°S	51°E	65	"	"	"	"	"	North of Crozier
8019	"	"	"	11°S	50°E	63	"	"	"	"	"	"
8020	"	"	"	11°S	49°E	65	"	"	"	"	"	"
8021	"	"	"	11°S	48°E	63	"	"	"	"	"	Sea of Fertility

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
			Lat	Long							
8022	80mm	1:1,376,900	11°S	57.5°E	65	Med.	Fair	Near Vert	Near Vert	Near Vert	Sea of Fertility Stereo Strip
8023	"	"	11°S	45.5°E	65	"	"	"	"	"	"
8024	"	"	11°S	44.5°E	65	"	"	"	"	"	Gutenberg ^D
8025	"	"	10.5°S	43.5°E	65	"	"	"	"	"	"
8026	"	"	11°S	43°E	65	"	"	"	"	"	"
8027	"	"	11°S	42°E	65	"	"	"	"	"	"
8028	"	"	11°S	40.5°E	65	"	"	"	"	"	Stereo Strip TO-13
8029	"	"	11°S	39.5°E	65	"	"	"	"	"	TO-13
8030	"	"	10.5°S	38.5°E	65	"	"	"	"	"	Gaudibert Crater
8031	"	"	10.5°S	37.5°E	65	"	"	"	"	"	"
8032	"	"	10.5°S	36.5°E	65	"	"	"	"	"	"
8033	"	"	10.5°S	35.5°E	65	"	"	"	"	"	TO-15
8034	"	"	10.5°S	34.5°E	65	"	"	"	"	"	TO-15 North Portion of Paganre
8035	"	"	10°S	33.5°E	65	"	"	"	"	"	TO-15
8036	"	"	10°S	32.5°E	65	"	"	"	"	"	North Portion of Paganre

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
8037	80mm	1:1,376,900	10°S	31°01E	65	High	Fair	Near Vert	Near Vert			Stereo Strip Grater Mader
8038	"	"	10°S	30°E	65	"	"	"	"	"	"	"
8039	"	"	10°S	29°E	65	"	"	"	"	"	"	"
8040	"	"	10°S	28°01E	63	"	"	"	"	"	"	Grater Mader (North half of Theophilus)
8041	"	"	10°S	27°E	65	"	"	"	"	"	"	North Half of Theophilus
8042	"	"	10°S	26.5°E	65	"	Poor	"	"	"	"	"
8043	"	"	9°S	25°E	65	"	"	"	"	"	"	"
8044	"	"	8.5°S	24°E	66	"	"	"	"	"	"	NW of Theophilus
8045	"	"	8.5°S	23°01E	63	"	"	"	"	"	"	Kant C Grater
8046	"	"	8.5°S	22°E	65	"	"	"	"	"	"	"
8047	"	"	9°S	21°E	65	"	"	"	"	"	"	Kant Grater
8048	"	"	9°S	19.5°E	65	"	"	"	"	"	"	Kant G Grater
8049	"	"	9°S	19°E	65	"	"	"	"	"	"	TO-18
8050	"	"	9°S	18°E	65	"	"	"	"	"	"	"
8051	"	"	9°S	17°01E	65	"	"	"	"	"	"	"

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
			Lat	Long							
8052	80mm	1:1,376,900	9°S	16°E	65	Hgh	Poor	Near Vert.	Near Vert.	Stereo Strip S 3/4 of Dolland B	Dolland Crater
8053	"	"	9°S	15°E	65	"	"	"	"	"	Dolland Crater
8054	"	"	8°S	13.5°E	65	"	"	"	"	"	Dolland B Crater
8055	"	"	8°S	13.5°E	65	"	"	"	"	"	Andel F Crater
8056	"	"	8°S	11.5°E	65	"	"	"	"	"	E. of Hind
8057	"	"	80°S	10.5°E	65	"	"	"	"	"	E. of Hind TO-23
8058	"	"	8°S	9°E	65	"	"	"	"	"	"
8059	"	"	8.5°S	8°E	65	"	"	"	"	"	Crater Hind TO-23
8060	"	"	7.5°S	7.5°E	65	"	"	"	"	"	Crater Hind Shown
8061	"	"	7.5°S	6.5°E	65	"	"	"	"	"	Craters Hind & Halley
8062	"	"	7°S	5.5°E	65	"	"	"	"	"	Crater Halley
8063	"	"	7°S	4°E	65	"	Pair	"	"	"	Hipparchus
8064	"	"	7°0'S	3.5°E	65	"	"	"	"	"	"
8065	"	"	7°S	2.5°E	65	"	"	"	"	"	Crater Muller TO-26
8066	"	"	6.5°S	1.5°E	65	"	"	"	"	"	TO-26

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
8067	80mm	1:1,376,900	6°S	0°E	65	High	Fair	Near Vert	Near Vert			Stereo East of Herschel Strip
8068	"	"	6°S	1°W	65	"	"	"	"			Crater Herschel TO-27
8069	"	"	6°S	2°W	68	"	Good	"	"			"
8070	"	"	6°S	3°W	65	"	"	"	"			"
8071	"	"	6°S	4°W	65	"	"	"	"			"
8072	"	"	6°S	5°W	65	Med.	"	"	"			Herschel D
8073	"	"	5.5°S	6°W	65	"	"	"	"			La Lande C
8074	"	"	5.5°S	7°W	65	"	"	"	"			"
8075	"	"	5°S	8°W	65	"	"	"	"			Crater La Lande TO-32
												Stereo Strip Frames 8076 - 8091
8076	"	"	5°S	9°W	65	Med.	"	Near Vert	Near Vert			Crater La Lande TO-32
8077	"	"	5°S	10°W	65	"	"	"	"			West Half of La Lande
8078	"	"	4.5°S	11°W	65	"	"	"	"			West of La Lande and NE of Fra Mauro
8079	"	"	4.5°S	12°W	65	"	"	"	"			"
8080	"	"	4°S	13°W	65	Low	"	"	"			NE of Fra Mauro

APOLLO 12 PHOTOGRAPHY
 Magazine T 70mm Film B&W SO-164
 Time Reference — GET — = GMT

Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
				Lat	Long							
8081		80mm	1:1,376,900	4°S	14°W	65	Low	Good	Near Vert	Near Vert	Near Vert	NE of Fra Mauro
8082		"	"	4°S	15°W	65	"	"	"	"	"	Northern Section of Fra Mauro
8083		"	"	4°S	16°W	65	"	"	"	"	"	Northern Tip TO-35 of Fra Mauro Partial
8084		"	"	3.5°S	17°W	65	"	"	"	"	"	"
8085		"	"	3°S	18°W	65	"	"	"	"	"	Fra Mauro J
8086		"	"	2.5°S	19°W	65	"	"	"	"	"	Grater Fra Mauro J
8087		"	"	3.5°S	20°W	65	"	Fair	"	"	"	TO-39
8088		"	"	3°S	21°W	65	"	"	"	"	"	"
8089		"	"	2°S	22°W	65	"	"	"	"	"	"
8090		"	"	2°S	23°W	65	"	"	"	"	"	Site 7
8091		"	"	3°S	24°W	65	"	"	"	"	"	"
												Stereo Strip
												Frames 8092 - 8107
8092		80mm	1:1,376,900	2°S	25°W	65	Low	Fair	Near Vert	Near Vert	Near Vert	TO-39
8093		"	"	1.5°S	26°W	65	"	"	"	"	"	"
8094		"	"	2°S	27°W	70	"	"	"	"	"	South Halt of Lansberg

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 70mm Film B&W SO 164

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
8095		80mm	1:1,376,900	1.5° S	28° W	70	Low	Fair	Near Vert	Near Vert		South Hall TO-39 of Lansberg
8096		"	"	1.5° S	25° W	70	"	"	"	"	"	"
8097		"	"	1.5° S	30° W	65	"	"	"	"	"	"
8098		"	"	1° S	31° W	65	"	"	"	"	"	"
8099		"	"	1° S	32° W	60	"	"	"	"	"	Lansberg A & Kunowsky C
8100		"	"	0.5° S	33° W	65	"	"	"	"	"	Kunowsky C
8101		"	"	0°	34° W	65	"	"	"	"	"	Lansberg F, C, & H of Encke C
8102		"	"	0°	35° W	65	"	"	"	"	"	"
8103		"	"	0.5° N	36° W	65	"	"	"	"	"	Encke C
8104		"	"	0°	36.5° W	65	"	"	"	"	"	"
8105		"	"	0.5° N	37.5° W	65	"	"	"	"	"	West of Encke C
8106		"	"	1° N	38.5° W	70	"	"	"	"	"	East of Encke E
8107		"	"	1° N	40° W	65	"	"	"	"	"	Encke E & Maestlin G
8108		"	"	1° N	41° W	70	"	"	"	"	"	Stereo Strip TO-48

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8109	80mm	1:1,376,900	1.5° N	42° W	70	Low	Fair	Near Vert	Near Vert	Stereo TO-48 Strip
8110	"	"	1.5° N	43° W	65	"	"	"	"	"
8111	"	"	2° N	43.5° W	70	"	"	"	"	"
8112	"	"	2° N	45.5° W	65	"	"	"	"	Suess F Crater
8113	"	"	2° N	46° W	70	"	"	"	"	West of Suess F Crater
8114	"	"	2.5° N	47° W	70	"	"	"	"	East of Reiner E Crater
8115	"	"	2.5° N	48° W	70	"	Poor	"	"	Reiner E Crater
8116	"	"	3° N	49° W	70	"	"	"	"	"
8117	"	"	3° N	50° W	70	"	"	"	"	Southwest of Suess Crater
8118	"	"	3.5° N	51° W	70	"	"	"	"	South of Reiner A Crater
8119	"	"	3.5° N	52° W	70	"	"	"	"	Too Dark (Unusable)
8120	"	"	"	"	"	"	"	"	"	"

MAGAZINE U

Frames AS12-53-7763 through 7947

Magazine U consists of overlapping stereoscopic 70-mm black and white imagery of Fra Mauro (41 frames), Descartes (41 frames), and Lalande (42 frames), photographed with a 500-mm lens. The remaining frames of the magazine are: four frames of the moon, probably taken during transearth coast, and 57 frames of the solar eclipse, 10 of which were exposed during a camera malfunction. The quality of the 500-mm Fra Mauro, Descartes, and Lalande imagery ranges from fair to poor on this magazine. Targets of opportunity 18 and 32 were also photographed on this magazine.

APOLLO 12 PHOTOGRAPHY
 Magazine U
 Film B&W

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
AS-12-58											
7763	500 mm	1:450,000	9.0°S 16.0°E	95%	Hgh	Fair	30-60°	West	Descartes		
7764	"	"	"	"	"	"	"	"	"		
7765	"	"	"	"	"	"	"	"	"		
7766	"	"	"	"	"	"	"	"	"		
7767	"	"	9.0°S 16.0°E	"	"	"	"	"	"		
7768	"	"	"	"	"	"	"	"	"		
7769	"	"	"	"	"	"	"	"	"		
7770	"	1:350,000	9.0°S 16.0°E	"	"	"	"	"	"		
7771	"	"	"	"	"	"	"	"	"		
7772	"	"	"	"	"	"	"	"	"		
7773	"	"	"	"	"	"	"	"	"		
7774	"	"	"	"	"	"	"	"	"		
7775	"	"	"	"	"	"	"	"	"		
7776	"	"	"	"	"	"	0-30°	"	"		
7777	"	"	"	"	"	"	"	"	"		

APOLLO 12 PHOTOGRAPHY

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Time Reference — GET — = GMT

Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7778	500 mm	1:350,000	1:300,000	9.0°S	16.0°E	95%	High	Pair	0-30°	West	Descartes
7779	"	"	1:300,000	"	"	"	"	"	"	"	"
7780	"	"	"	"	"	"	"	"	"	"	"
7781	"	"	"	"	"	"	"	"	"	"	"
7782	"	"	"	"	"	"	"	"	"	"	"
7783	"	"	"	"	"	"	"	"	"	"	"
7784	"	"	"	"	"	"	"	"	"	"	"
7785	"	"	"	"	"	"	"	"	"	"	"
7786	"	"	"	"	"	"	"	"	"	"	"
7787	"	"	"	"	"	"	"	"	"	"	"
7788	"	"	"	"	"	"	"	"	"	"	"
7789	"	"	"	"	"	"	"	"	"	"	"
7790	"	"	"	"	"	"	"	"	"	"	"
7791	"	"	"	"	"	"	"	"	"	"	"
7792	"	"	"	"	"	"	"	"	"	"	"

APOLLO 12 PHOTOGRAPHY

Magazine U Film B&W

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
AS12-53	7793	500 mm	1:300,000	9.0° S	16.0° E	95%	High	Fair	0-30°		West	Descartes
7794	"	"	1:222,000	"	"	"	"	"	0-20°		"	"
7795	"	"	"	"	"	"	"	"	"		"	"
7796	"	"	"	"	"	"	"	"	"		"	"
7797	"	"	"	"	"	"	"	"	"		"	"
7798	"	"	"	"	"	"	"	"	"		"	"
7799	"	"	"	"	"	"	"	"	"		"	"
7800	"	"	"	"	"	"	"	"	"		"	"
7801	"	"	"	"	"	"	"	"	"		"	"
7802	"	"	"	"	"	"	"	"	"		"	"
7803	"	"	"	"	"	"	"	"	"		"	"
7804	"	"	1:450,000	3.55	18.0° W	"	"	"	55-65°		West	Fra Mauro
7805	"	"	"	"	"	"	"	"	55-60°		"	"
7806	"	"	"	"	"	"	"	"	"		"	"
7807	"	"	"	"	"	"	"	"	50-55°		"	"

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Frame # AS12-53	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
7808	500 mm	1:450,000	3.58	18.0° W	95%	High	Fair	52°		West	Fra Mauro	
7809	"	1:349,600	"	"	"	"	"	50°		"	"	
7810	"	1:325,000	"	"	"	"	"	48°		"	"	
7811	"	"	"	"	"	"	"	46°		"	"	
7812	"	"	"	"	"	"	"	44°		"	"	
7813	"	"	"	"	"	"	"	42°		"	"	
7814	"	1:283,000	"	"	"	"	"	40°		"	"	
7815	"	"	"	"	"	"	"	38°		"	"	
7816	"	"	"	"	"	"	"	36°		"	"	
7817	"	"	"	"	"	"	"	37°		"	"	
7818	"	"	"	"	"	"	"	32°		"	"	
7819	"	1:250,000	"	"	"	"	"	30°		"	"	
7820	"	"	"	"	"	"	"	28°		"	"	
7821	"	"	"	"	"	"	"	26°		"	"	
7822	"	"	"	"	"	"	"	24°		"	"	

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
AS12-53												
7823	500 mm	1:250,000		3.5°S	18.0°W	95%	High	Fair	22°		West	Fra Mauro
7824	"	1:232,000		"	"	"	"	"	20°		"	"
7825	"	"		"	"	"	"	"	18°		"	"
7826	"	1:227,000		"	"	"	"	"	16°		"	"
7827	"	"		"	"	"	"	"	17°		"	"
7828	"	"		"	"	"	"	"	12°		"	"
7829	"	"		"	"	"	"	"	10°		"	"
7830	"	"		"	"	"	"	"	8°		"	"
7831	"	"		"	"	"	"	"	6°		"	"
7832	"	"		"	"	"	"	"	17°		"	"
7833	"	"		"	"	"	"	"	2°		"	"
7834	"	"		"	"	"	"	"	0°		Vert.	"
7835	"	1:222,000		"	"	"	"	"	0°		"	"
7836	"	"		"	"	"	"	"	0°		"	"
7837	"	"		"	"	"	"	"	0°		"	"

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
				Lat	Long							
7838	500 mm	1:222,000	3.5°S	18.0°W	95%	High	Fair	2°			West	Fra Mauro
7839	"	"	"	"	"	"	"	4°			"	"
7840	"	"	"	"	"	"	"	6°			"	"
7841	"	"	"	"	"	"	"	8°			"	"
7842	"	"	"	"	"	"	"	8°			"	Fra Mauro Area
7843	"	"	"	"	"	"	"	10°			"	"
7844	"	"	"	"	"	"	"	10°			"	"
7845	"	1:450,000	5.0°S	9.5°W		"	"	30-60°			West	Lajande Crater
7846	"	"	"	"	"	"	"	"			"	"
7847	"	"	"	"	"	"	"	"			"	"
7848	"	"	"	"	"	"	"	"			"	"
7849	"	"	"	"	"	"	"	"			"	"
7850	"	"	"	"	"	"	"	"			"	"
7851	"	"	"	"	"	"	"	"			"	"
7852	"	"	"	"	"	"	"	"			"	"

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Frame #	AS12-53 Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7853		500 mm	1:450,000	3.5°S	18.0°W	95%	High	Fair	30-60°	West	Lalande Crater
7854		"	1:300,000	"	"	"	"	"	"	"	"
7855		"	"	"	"	"	"	"	"	"	"
7856		"	"	"	"	"	"	"	"	"	"
7857		"	"	"	"	"	"	"	"	"	"
7858		"	"	5.0°S	9.5°W	"	High	Fair	20-30°	"	"
7859		"	"	"	"	"	"	"	"	"	"
7860		"	"	"	"	"	"	"	"	"	"
7861		"	"	"	"	"	"	"	"	"	"
7862		"	"	"	"	"	"	"	"	"	"
7863		"	"	"	"	"	"	"	"	"	"
7864		"	"	"	"	"	"	"	"	"	"
7865		"	"	"	"	"	"	"	"	"	"
7866		"	"	"	"	"	"	"	"	"	"
7867		"	"	"	"	"	"	"	"	"	"

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
			Lat	Long							
AS12-53											
7868	500 mm	1:300,000	5.0°	9.5°W	95%	High	Fair	20-30°		West	Land
7869	"	"	"	"	"	"	"	"		"	"
7870	"	1:250,000	"	"	"	"	"	0-20°		"	"
7871	"	"	"	"	"	"	"	"		"	"
7872	"	"	"	"	"	"	"	"		"	"
7873	"	"	"	"	"	"	"	"		"	"
7874	"	1:222,000	"	"	"	"	"	0-15°		"	"
7875	"	"	"	"	"	"	"	"		"	"
7876	"	"	"	"	"	"	"	"		"	"
7877	"	"	"	"	"	"	"	"		"	"
7878	"	"	"	"	"	"	"	"		"	"
7879	"	"	"	"	"	"	"	"		"	"
7880	"	"	"	"	"	"	"	"		"	"
7881	"	"	"	"	"	"	"	"		"	"
7882	"	"	"	"	"	"	"	"		"	"

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
				Lat	Long							
AS12-53												
7883		500 mm	1.222,000	5.0°S	9.5°W	352	High	Fair	0-15°		West	Ialande Crater
7884				"	"	"	"	"	"	"	"	"
7885				"	"	"	"	"	"	"	"	"
7886				5.0°S	9.0°W	"	"	"	"	"	East	"
7887		80 mm		"	"	"	"	Good	"	"	"	Full Moon during Trans Earth
7888				"	"	"	"	Good	"	"	"	Full Moon during Trans Earth
7889				"	"	"	"	Fair	"	"	"	Quarter Moon during Trans Earth
7890				"	"	"	"	Fair	"	"	"	Quarter Moon during Trans Earth
7891				"	"	"	"	Good	"	"	"	Solar Eclipse
7892				"	"	"	"	"	"	"	"	"
7893				"	"	"	"	"	"	"	"	"
7894				"	"	"	"	"	"	"	"	"
7895				"	"	"	"	"	"	"	"	"
7896				"	"	"	"	"	"	"	"	"
7897				"	"	"	"	"	"	"	"	"

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Time Reference — GET — = GMT

Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
AS12-53											
7898		80 mm						Good			Solar Eclipse
7899								"			"
7900								"			"
7901								"			"
7902								"			"
7903								"			"
7904								"			"
7905								"			"
7906								"			"
7907								Poor			Camera Malfunction during Solar Eclipse
7908								"			"
7909								"			"
7910								"			"
7911								"			"
7912								"			"

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7913		80 mm						Poor			Camera Malfunction during Solar Eclipse
7914								"			"
7915								"			"
7916								"			"
7917								"			"
7918								Good			Solar Eclipse
7919								"			"
7920								"			"
7921								"			"
7922								"			"
7923								"			"
7924								"			"
7925								"			"
7926								"			"
7927								"			"

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
				Lat	Long							
7928	80 mm							Good				Solar Eclipse
7929	"							"				"
7930	"							"				"
7931	"							"				"
7932	"							"				"
7933	"							"				"
7934	"							"				"
7935	"							"				"
7936	"							"				"
7937	"							"				"
7938	"							"				"
7939	"							"				"
7940	"							"				"
7941	"							"				"
7942	"							"				"

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Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7943	80 mm						Good			Solar Eclipse
7944	"						"			" "
7945	"						"			" "
7946	"						"			" "
7947	"						"			" "

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MAGAZINE V

Frames AS12-47-6869 through 7021

The first 16 frames of this color magazine are high obliques of the lunar surface taken from the LM while in lunar orbit. Target of opportunity 9 is included.

The remainder of this magazine illustrates the LM, deployed equipment, and the lunar surface around the landing area. Surface photography was exposed with the 60-mm lens. Included are the following four panoramas taken near the landing area:

1. 6941 through 6960

A 20-frame panorama from northwest at the ALSEP to north at the flag, then to east with the LM (sunglint) and Surveyor Crater; then to south and southwest including Bench Crater.

2. 6961 through 6981

A 21-frame panorama northwest from the LM, east to Surveyor Crater, and a 360° panorama back to the LM.

3. 6982 through 7006

A 25-frame panorama, 360°, taken from northeast of the LM looking west at the panel and flag; then to southwest at the LM and counterclockwise to south and west looking into Surveyor Crater; then looking northwest at the TV and back to the panel to complete the 360° circuit.

4. 7011 through 7015

A five-frame panorama from northwest to north showing (from left to right) a blocky mound, the ALSEP, the flag, and the antenna.

APOLLO 12 PHOTOGRAPHY

Magazine VFilm HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6869	80				90	M	Fair	60-70	S	Craters 285, 287, Tsiolkovski
6870	80				90	M	Fair	60-70	S	"
6871	80				90	M	Fair	60-70	W	Crater II
6872	80				90	M	Fair	60-70	W	"
6873	80				90	M	Fair	60-70	W	"
6874	80				90	M	Fair	60-70	W	"
6875	80				100	L	Good	60-70	NE	Copernicus-Rheinhold
6876	80				100	L	Good	60-70	"	"
6877	80				100		Fair			CSM
6878	80				100		Fair			"
6879	80				90	M	Fair	70-80	W	TO-9 Crater II, Craters 276, 273
6880	80				90	M	Fair	70-80	W	"
6881	80				90	M	Fair	70-80	W	"
6882	80				90	M	Fair	70-80	W	"
6883	80				90	M	Fair	70-80	W	"

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 Film HCXX
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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
6884	80	80				90	M	Fair	70-80	W	T0-9, Grater II, Graters 276, 273
6885	80	80				90	M	Fair	70-80	W	"
6886	80	80				90	M	Fair	70-80	W	"
6887	80	80				90	M	Fair	70-80	W	"
6888	80	80				90	M	Fair	70-80	W	"
6889	80	80				90	M	Fair	70-80	W	"
6890	80	80				90	M	Fair	70-80	W	"
6891	80	80				90	M	Fair	70-80	W	"
6892	80	80				90	M	Fair	70-80	W	"
6893	80	80				90	M	Fair	70-80	W	"
6894	80	80				90	M	Fair	70-80	W	"
6895	80	80				90	M	Fair	70-80	W	"
6896	60	60					Low	Good	Med. Obl.	W	Flag on Lunar Surface
6897	60	60					Low	Fair	Med. Obl.	W	" " " " "
6898	60	60					Low	Fair	Med. Obl.	W	Solar Wind Panel

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Magazine V
Film HCX

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point	Lat Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
6899		60					Low	Fair	Med. Obl.	W	LM
6900		60					Low	Fair	Low Obl.	E	LM Footpad
6901		60					Low	Fair	Low Obl.	E	" "
6902		60					Low	Poor	Low Obl.	E	" "
6903		60					Low	Poor	Low Obl.	E	" "
6904		60					Low	Fair	Low Obl.	W	" "
6905		60					Low	Fair	Low Obl.	W	" "
6906		60					Low	Fair	Low Obl.	W	" "
6907		60					Low	Fair	Low Obl.	W	Engine Skirt
6908		60					Low	Fair	Low Obl.	W	LM Footpad
6909		60					Low	Fair	Low Obl.	W	" "
6910		60					Low	Fair	Low Obl.	W	Lower LM Structure
6911		60					Low	Good	Low Obl.	W	Lower LM Structure
6912		60					Low	Poor	Med. Obl.	W	Astronaut & LM
6913		60					Low	Poor	Med. Obl.	W	" "

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6914	60					Low	Poor	Med. Obl.	W	Astronaut & LM
6915	60					Low	Poor	Low Obl.	E	LM Footpad
6916	60					Low	Fair	Low Obl.	W	ALSEP Deployment
6917	60					Low	Fair	Low Obl.	W	" "
6918	60					Low	Fair	Med. Obl.	W	" "
6919	60					Low	Fair	Med. Obl.	W	" "
6920	60					Low	Fair	Low Obl.	W	" "
6921	60					Low	Fair	Med. Obl.	W	" "
6922	60					Low	Fair	Low Obl.	W	" "
6923	60					Low	Fair	Low Obl.	W	" "
6924	60					Low	Fair	Low Obl.	W	" "
6925	60					Low	Fair	Low Obl.	W	" "
6926	60					Low	Fair	Low Obl.	W	" "
6927	60					Low	Fair	Low Obl.	W	" "
6928	60					Low	Fair	Med. Obl.	E	" "

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6929	60					Low	Good	Med. Obl.	W	ALSEP Deployment
6930	60					Low	Fair	Med. Obl.	W	" "
6931	60					Low	Fair	Med. Obl.	W	" "
6932	60					Low	Fair	Low Obl.	W	Lunar Surface
6933	60					Low	Fair	Low Obl.	W	" "
6934	60					Low	Fair	Low Obl.	W	" "
6935	60					Low	Fair	Low Obl.	W	" "
6936	60					Low	Fair	Low Obl.	W	" "
6937	60					Low	Fair	Low Obl.	W	" "
6938	60					Low	Fair	Low Obl.	W	" "
6939	60					Low	Fair	Low Obl.	W	" "
6940	60					Low	Fair	Low Obl.	W	" "
6941	60					Low	Fair	Med. Obl.	W	Start 20-Frame Pan Near LM
6942	60					Low	Fair	Med. Obl.	W	Start 20-Frame Pan Near LM
6943	60					Low	Fair	Med. Obl.		20-Frame Pan Near LM

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Frame #	Camera # mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6944	60					Low	Fair	Med. Obl.		20-Frame Pan Near LM
6945	60					Low	Fair	Med. Obl.		"
6946	60					Low	Fair	Med. Obl.		"
6947	60					Low	Fair	Med. Obl.		"
6948	60					Low	Fair	Med. Obl.		"
6949	60					Low	Poor	Med. Obl.		"
6950	60					Low	Poor	Med. Obl.		"
6951	60					Low	Poor	Med. Obl.		"
6952	60					Low	Poor	Med. Obl.		"
6953	60					Low	Poor	Med. Obl.		"
6954	60					Low	Fair	Med. Obl.		"
6955	60					Low	Fair	Med. Obl.		"
6956	60					Low	Fair	Med. Obl.		"
6957	60					Low	Fair	Med. Obl.		"
6958	60					Low	Fair	Med. Obl.		"

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
				Lat	Long							
6959		60					Low	Fair	Med. Obl.			20-Frame Pan Near LM
6960		60					Low	Fair	Med. Obl.			End of 20-Frame Pan Near LM
6961		60					Low	Fair	Med. Obl.			21-Frame Pan Near LM
6962		60					Low	Fair	Med. Obl.			"
6963		60					Low	Fair	Med. Obl.			"
6964		60					Low	Fair	Med. Obl.			"
6965		60					Low	Fair	Med. Obl.			"
6966		60					Low	Fair	Med. Obl.			"
6967		60					Low	Fair	Med. Obl.			"
6968		60					Low	Fair	Med. Obl.			"
6969		60					Low	Poor	Med. Obl.			"
6970		60					Low	Poor	Med. Obl.			"
6971		60					Low	Poor	Med. Obl.			"
6972		60					Low	Poor	Med. Obl.			"
6973		60					Low	Poor	Med. Obl.			"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min -- Max	Direction of Tilt	Description
			Lat	Long						
6974	60					Low	Poor	Med. Obl		21-Frame Pan Near LM
6975	60					Low	Poor	Med. Obl		21-Frame Pan Near LM
6976	60					Low	Fair	Med. Obl		"
6977	60					Low	Fair	Med. Obl		"
6978	60					Low	Fair	Med. Obl		"
6979	60					Low	Fair	Med. Obl		"
6980	60					Low	Fair	Med. Obl		"
6981	60					Low	Fair	Med. Obl		End of 21-Frame Pan Near LM
6982	60					Low	Fair	Med. Obl		Start of 25-Frame Pan Near LM
6983	60					Low	Fair	Med. Obl		25-Frame Pan Near LM
6984	60					Low	Fair	Med. Obl		"
6985	60					Low	Fair	Med. Obl		"
6986	60					Low	Fair	Med. Obl		"
6987	60					Low	Fair	Med. Obl		"
6988	60					Low	Fair	Med. Obl		"

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
6989		60					Low	Fair	Med. Obl		25-Frame Pan Near LM
6990		60					Low	Fair	Med. Obl		"
6991		60					Low	Fair	Med. Obl		"
6992		60					Low	Fair	Med. Obl		"
6993		60					Low	Fair	Med. Obl		"
6994		60					Low	Poor	Med. Obl		"
6995		60					Low	Poor	Med. Obl		"
6996		60					Low	Poor	Med. Obl		"
6997		60					Low	Poor	Med. Obl		"
6998		60					Low	Poor	Med. Obl		"
6999		60					Low	Poor	Med. Obl		"
7000		60					Low	Fair	Med. Obl		"
7001		60					Low	Fair	Med. Obl		"
7002		60					Low	Fair	Med. Obl		"
7003		60					Low	Fair	Med. Obl		"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7004	60					Low	Fair	Med. Obl.		25-Frame Pan Near LM
7005	60					Low	Fair	Med. Obl.		"
7006	60					Low	Fair	Med. Obl.		End of 25-Frame Pan Near LM
7007	60					Low	Good	Low Obl.	E	Core Tool
7008	60					Low	Good	Low Obl.		"
7009	60					Low	Poor	Low Obl.		Astronaut
7010	60					Low	Poor	Low Obl.		"
7011	60					Low	Fair	Med. Obl.		Start 5-Frame Pan Near LM
7012	60					Low	Fair	Med. Obl.		5-Frame Pan Near LM
7013	60					Low	Fair	Med. Obl.		"
7014	60					Low	Fair	Med. Obl.		"
7015	60					Low	Poor	Med. Obl.		End of 5-Frame Pan Near LM
7016	60					Low	Poor	Med. Obl.		LM Thruster & Antenna
7017	60					Low	Poor	Med. Obl.		"
7018	60					Low	Fair	Med. Obl.		"

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MAGAZINE X

Frames AS12-48-7022 through 7171

Magazine X is 70-mm black and white photography taken before, during, and after the second extravehicular activity (EVA) on the lunar surface. Each of the images has a reseau grid superimposed on the 60-mm lens.

Included in this magazine are panoramic views of the lunar surface taken from the LM window showing the flag, the ALSEP equipment, and the solar wind panel. Surveyor 3, the Surveyor Crater, Block Crater, and the color chart are also included.

Panoramas of areas on the lunar surface near the LM and Surveyor 3 are identified below:

1. 7031 through 7032

A two-frame view from the LM looking northwest at terrain near the LM.

2. 7088 through 7090

A three-frame panorama of the Surveyor Crater and a view to the northwest from the southeastern rim showing Surveyor 3, the LM, and the blocky rim of a small crater on the north slopes of the Surveyor Crater.

3. 7101 through 7105

A five-frame panorama to the northeast, inside Surveyor Crater, and a closeup view of Surveyor 3 with arm extended.

4. 7141 through 7143

A three-frame panorama of Block Crater, with a view to the west from the east rim showing the LM and the Surveyor Crater. Part of Surveyor 3 is visible at the extreme upper left of the panorama.

5. 7144 through 7147

A four-frame panorama of Block Crater with a view to the south from the north rim showing a view into Surveyor Crater. Surveyor 3 is visible in the upper left of the panorama.

6. 7153, 7156, and 7157

These three frames comprise a short panorama of the near terrain to the west of the LM.

7. 7167 through 7169

A three-frame panorama from the LM looking north at the ALSEP and flag.

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
7022						Low	Fair	OBLIQUE Med.	SW	Surface View from IM
7023						"	"	"	W	"
7024						"	Good	"	W	"
7025						"	"	"	"	"
7026						"	"	"	"	"
7027						"	"	"	"	"
7028						"	"	"	NW	"
7029						"	"	"	"	"
7030						"	"	"	"	"
7031						"	"	"	"	"
7032						"	"	"	"	"
7033						"	"	Low	"	"
7034						"	"	"	NE	View of MESA and Fuel Cask
7035						"	"	"	"	View Under IM
7036						"	"	"	W	Photograph of Color Chart

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7037						Low	Good	Med.	W	Color Chart, Solar Wind Panel
7038						"	Fair	Low	E	Color Chart
7039						"	"	"	E	" "
7040						"	"	Med	E	" "
7041						"	Good	"	NW	Solar Wind Experiment
7042						"	"	"	SW	"
7043						"	"	Low	MSW	Small Crater on Lunar Surface
7044						"	"	"	W	"
7045						"	"	Med	"	"
7046						"	"	"	SW	View of Lunar Terrain
7047						"	"	"	"	"
7048						"	"	Low	SSW	Tri-Pod Holder of Core Tube Sampler
7049						"	"	"	"	"
7050						"	"	Med	W	"
7051						"	"	Low	SW	"

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7052						Low	Good	OBLIQUE Low	SM	Area of Core Sample
7053						"	"	"	"	"
7054						"	"	"	W	View of Lunar Terrain
7055						"	"	"	"	"
7056						"	"	Med	W	Crater on Lunar Surface
7057						"	"	"	"	"
7058						"	"	"	"	"
7059						"	"	Low	SM	Tri-Pod Holder for Core Tube, Lunar Terrain
7060						"	"	Med	W	Tri-Pod Holder for Core Tube, Large rock
7061						"	"	"	W	Tri-Pod Holder for Core Tube, Large Rock
7062						"	"	Low	SE	Core Sample
7063						"	"	Med	W	Tri-Pod Holder for Core Tube, Lunar Terrain
7064						"	"	"	"	"
7065						"	"	"	"	Bench Crater
7066						"	"	"	"	"

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Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7067						Low	Good	OBLIQUE Med	W	Tri-Pod Holder for Core Tube, Bench Crater
7068						"	"	"	"	Tri-Pod Holder for Core Tube, Core Sample
7069						"	"	"	"	"
7070						"	"	Low	SW	Tri-Pod Holder for Core Tube, Lunar Terrain
7071						"	"	Med	NW	Astronaut Holding Core Tube, LM in Background
7072						"	"	"	SW	Tri-Pod Holder for Core Tube, Lunar Terrain
7073						"	"	"	"	"
7074						"	"	"	"	Tri-Pod Holder for Core Tube, Astronaut
7075						"	"	"	S	Lunar Terrain
7076						"	"	"	"	"
7077						"	"	"	SW	Lunar Terrain, Core Tube
7078						"	Poor	"	SW	Core Tube
7079						"	"			Washed Out
7080						"	"			"
7081						"	"			"

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
7082							Low	Good	OBLIQUE	Low	W	Tri-Pod Holder for Core Tube, Hand Tool Kit
7083							"	"	"	"	SW	"
7084							"	"	"	Htgh	NE	Surveyor Grater Surveyor III
7085							"	"	"	"	"	"
7086							"	"	"	"	"	"
7087							"	"	"	"	"	"
7088							"	"	"	"	N	"
7089							"	"	"	"	"	"
7090							"	"	"	"	"	Surveyor Grater Surveyor III, LM
7091							"	"	"	"	MN	"
7092							"	"	"	"	MN	"
7093							"	"	"	"	MN	"
7094							"	"	"	Med	"	"
7095							"	"	"	"	"	Surveyor III
7096							"	"	"	"	"	"

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lot	Long							
7097						Low	Low	Good	Med		NW	Surveyor Grater
7098						"	"	"	Low		E	Lunar Soil Near Surveyor Scoop
7099						"	"	"	HIGH		NW	Surveyor III, LM
7100						"	"	"	"		"	"
7101							"	"	"		NE	Surveyor Grater
7102							Low	"	"		NE	Surveyor III Scoop Shovel
7103							"	"	"		"	"
7104							"	"	Med		NE	Surveyor III
7105							"	"	"		"	"
7106							"	"	"		"	Surveyor III Scoop Shovel
7107							"	"	"		"	"
7108							"	"	"		"	"
7109							"	"	"		"	"
7110							"	"	Low		N	Surveyor III, Foot Pad, with Pad Imprint
7111							"	"	"		"	"

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7112						Low	Good	Low	N	Surveyor III Foot Pad, Pad Imprint
7113						"	"	"	"	Surveyor III Foot Pad
7114						"	"	"	"	Surveyor III
7115						"	"	Med	NW	"
7116						"	"	"	"	"
7117						"	"	"	"	"
7118						"	"	Low	NE	Surveyor III Equipment
7119						"	"	"	NW	Surveyor III Foot Pad
7120						"	"	"	"	"
7121						"	"	Med	NE	Surveyor III
7122						"	"	High	N	"
7123						"	"	"	NE	"
7124						"	"	Low	E	Surveyor III Foot Pad
7125						"	"	Med	SE	Surveyor III Equipment
7126						"	"	Low	SE	Surveyor III Foot Pad

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Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7127						Low	Good	OBLIQUE Low	S	Surveyor III Foot Pad
7128						"	"	"	S	Surveyor III Scoop Shovel
7129						"	"	"	SW	"
7130						"	"	High	W	Surveyor III Equipment
7131						"	"	"	"	"
7132						"	"	"	SW	"
7133						"	"	"	NW	View of Astronaut, Surveyor III and LM
7134						"	"	High	NW	"
7135						"	"	"	"	"
7136						"	"	"	"	"
7137						"	"	Med	SW	Surveyor III Equipment
7138						"	"	"	S	"
7139						"	"	"	NW	Surveyor Crater Terrain
7140						"	"	"	S	"
7141						"	"	"	SW	View of Block Crater, Surveyor Crater

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Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7142						Low	Good	OBLIQUE Med	SW	View of Block Crater, Surveyor Crater
7143						"	"	"	W	View of Block Crater, Surveyor Crater, LM
7144						"	"	"	S	Block Crater, Surveyor III
7145						"	"	"	"	"
7146						"	"	"	SW	Block Crater, Surveyor Crater
7147						"	"	"	"	Surveyor Crater
7148						"	"	Low	N	Astronaut using tongs to pick up rock
7149						"	"	"	"	"
7150						"	"	"	"	"
7151						"	"	High	W	View of LM
7152						"	"	"	"	"
7153						"	"	"	"	View of Lunar Terrain from LM
7154						"	"	"	SW	"
7155						"	"	"	W	"
7156						"	"	"	"	"

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
7157						Low		Good	OBLIQUE High	W	View of Lunar Terrain from LM
7158								"	Med	"	"
7159								"	High	NW	View from LM of ALSEP, Lunar Terrain
7160								"	Med	"	Flag, Footprints on Lunar Surface from LM
7161								"	"	"	Footprints on Lunar Surface from LM
7162								"	"	N	Flag, Footprints, Lunar Terrain from LM
7163								"	"	N	"
7164								"	"	NW	"
7165								"	"	"	View of Lunar Terrain from LM
7166								"	"	N	"
7167								"	"	"	Flag, ALSEP, Lunar Terrain from LM
7168								"	"	NW	ALSEP, Lunar Terrain from LM
7169								"	"	"	"
7170								"	"	"	"
7171								"	"	"	"

MAGAZINE Y

Frames AS12-46-6715 through 6868

Magazine Y contains color photographs taken before, during, and after the first EVA. Each of the images has a reseau grid superimposed on the 60-mm lens. Included are the following seven panoramas of the area around the ALSEP deployment:

1. 6730 through 6745

A 16-frame panorama from west to northwest showing an astronaut before ALSEP deployment, to northeast at the flag, antenna, and LM (sunglint), to west with Surveyor Crater.

2. 6746 through 6763

An 18-frame panorama, 360°, taken from north of the LM, including Surveyor Crater, Surveyor, LM, flag, panel, and TV camera, and returning to Surveyor Crater.

3. 6764 through 6782

A complete 360° panorama from southeast of the LM on the rim of Surveyor Crater. This panorama includes Surveyor 3, Surveyor Crater, and the LM.

4. 6807 through 6811

A five-frame panorama from south to southwest showing an astronaut deploying the ALSEP. The LM, flag, and antenna are in the background to the south. A mound to the southwest is in the central portion of the panorama.

5. 6836 through 6844

A nine-frame panorama of "1000 Crater," northwest of Head Crater, showing the entire rim with numerous rocks.

6. 6845 through 6852

An eight-frame panorama of "1000 Crater," northwest of Head Crater, showing the entire rim with numerous rocks.

7. 6853 through 6855

A three-frame panorama to the west, containing Bench Crater to the extreme southwest, Head Crater to the west, and a blocky mound to the northwest.

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCXX

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lat	Long							
6715		60					Low	Poor	Med. Obl.	W		Astronaut on Ladder
6716							"	"	"	"		"
6717							"	"	"	"		"
6718							"	"	"	"		"
6719							"	Fair	Low Obl.	"		Footprints
6720							"	"	"	"		Lunar Surface
6721							"	"	"	"		"
6722							"	"	"	"		"
6723							"	"	"	"		"
6724							"	Poor	Med. Obl.	"		Egress from LM
6725							"	Fair	"	"		"
6726							"	"	"	"		"
6727							"	"	"	"		"
6728							"	"	"	"		"
6729							"	"	"	"		"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HC6X
 Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
6730	60						Low	Fair	Med Obl.	W	Start 16-Frame Pan near LM
6731	"						"	"	"	"	"
6732	"						"	"	"	"	"
6733	"						"	"	"	"	"
6734	"						"	"	"	"	"
6735	"						"	"	"	"	"
6736	"						"	"	"	"	"
6737	"						"	"	"	"	"
6738	"						"	Poor	"	"	"
6739	"						"	"	"	"	"
6740	"						"	"	"	"	"
6741	"						"	Fair	"	"	"
6742	"						"	"	"	"	"
6743	"						"	"	"	"	"
6744	"						"	"	"	"	"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Tilt — Max	Direction of Tilt	Description
				Lat	Long						
6745		60					Low	Fair	Med. Obl.		End 16-Frame Pan near LM
6746							"	"	"		Start 18-Frame Pan near LM
6747							"	"	"		"
6748							"	"	"		"
6749							"	"	"		"
6750							"	"	"		"
6751							"	"	"		"
6752							"	"	"		"
6753							"	"	"		"
6754							"	"	"		"
6755							"	"	"		"
6756							"	"	"		"
6757							"	"	"		"
6758							"	"	"		"
6759							"	"	"		"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HOEX

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
				Lot	Long							
6760		60					Low	Fair		Med Obj		18-Frame Pan near LM
6761							"	Poor		"		"
6762							"	"		"		"
6763							"	"		"		End 18-Frame Pan near LM
6764							"	"		"		Start 19-Frame Pan near LM
6765							"	"		"		"
6766							"	"		"		"
6767							"	"		"		"
6768							"	"		"		"
6769							"	Fair		"		"
6770							"	"		"		"
6771							"	"		"		"
6772							"	"		"		"
6773							"	"		"		"
6774							"	"		"		"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
6775		60					Low	Pair	Med. Obj		19-Frame Pan near LM
6776		"					"	"	"		"
6777		"					"	"	"		"
6778		"					"	"	"		"
6779		"					"	"	"		"
6780		"					"	"	"		"
6781		"					"	"	"		"
6782		"					"	Poor	"		End 19-Frame Pan near LM
6783		"					"	Pair	"	W	ALSEP removal from LM
6784		"					"	"	"		"
6785		"					"	"	"		"
6786		"					"	"	"		"
6787		"					"	"	"		"
6788		"					"	"	"		"
6789		"					"	"	"		"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6790	60					Low	Fair	Med. Obl.	W	ALSEP Removal from LM
6791	"					"	"	"	"	"
6792	"					"	"	"	N	"
6793	"					"	Poor	"	W	Lunar Surface Mound
6794	"					"	Fair	"	"	"
6795	"					"	"	"	"	"
6796	"					"	"	"		(Start) 8-Frame Pan West of LM
6797	"					"	"	"		"
6798	"					"	"	"		"
6799	"					"	"	"		"
6800	"					"	"	"		"
6801	"					"	"	"		"
6802	"					"	"	"		"
6803	"					"	"	"		" (End)
6804	"					"	Poor	"		(Start) 8-Frame Pan ALSEP Package

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APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
6805		60					Low	Poor	Med. Obl.		8-Frame Pan ALSFP Package
6806							"	"	"		"
6807							"	Fair	"		"
6808							"	"	"		"
6809							"	"	"		"
6810							"	"	"		"
6811							"	"	"		" (End)
6812							"	"	Low Obl.	W	Solar Wind Exp.
6813							"	"	Med. Obl.	"	ALSFP Cable
6814							"	"	"	"	Central Station
6815							"	"	"	"	"
6816							"	"	"	"	"
6817							"	"	"	"	"
6818							"	"	"	"	ALSFP Deployment
6819							"	Poor	"	E	"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET — = GMT

Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max	Direction of Tilt	Description
			Lat	Long							
6820	60					Low	Fair	Med Obl.		W	Ion Detector
6821	"					"	"	"		"	ALSEP Deployment
6822	"					"	"	"		"	Mound
6823	"					"	"	"		"	"
6824	"					"	"	Low Obl.		"	"
6825	"					"	"	"		"	"
6826	"					"	"	"		"	ALSEP Deployment
6827	"					"	"	"		"	Mound
6828	"					"	"	"		"	"
6829	"					"	"	"		"	"
6830	"					"	"	"		"	"
6831	"					"	"	"		"	"
6832	"					"	"	"		"	"
6833	"					"	"	"		"	Lunar Surface
6834	"					"	"	"		"	"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HOEX

Time Reference — GET — = GMT

Frame #	Camera #	f Length <small>mm</small>	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lot	Long						
6835		60				Low	Low	Fair	Low Ob1.		Lunar Surface
6836							"	"	Med. Ob1.	W	9-Frame Pan NW of ATSEP (Start)
6837							"	"	"		"
6838							"	"	"		"
6839							"	"	"		"
6840							"	"	"		"
6841							"	"	"		"
6842							"	"	"		"
6843							"	"	"		"
6844							"	"	"		" (End)
6845							"	"	"		8-Frame Pan NW of ATSEP (Start)
6846							"	"	"		"
6847							"	"	"		"
6848							"	"	"		"
6849							"	"	"		"
6879							"	"	"		"

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APOLLO 12 PHOTOGRAPHY

Magazine Y
Film HCX

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Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
6850		60					Low	Fair	Med. Obl.		8-Frame Pan NW of ALSEP
6851							"	"	"		"
6852							"	"	"		"
6853							"	"	Low Obl.	W	3-Frame Pan From LM (Start)
6854							"	"	"		"
6855							"	"	"		" (End)
6856							"	"	"		4-Frame Pan From LM (Start)
6857							"	"	"		"
6858							"	"	"		"
6859							"	"	"		" (End)
6860							"	"	Med. Obl.		ALSEP From LM
6861							"	"	"		Solar Wind Panel Flag/Antenna
6862							"	"	"		3-Frame Pan ALSEP From LM (Start)
6863							"	"	"		"
6864							"	"	"		" (End)

MAGAZINE Z

Frames AS12-49-7172 through 7324

Magazine Z is 70-mm black and white photography taken on the lunar surface during the second EVA. A 60-mm lens with a reseau grid was used. Photographic content includes the core samples, tool kit, and views of Head, Bench, Halo, and Sharp Craters. The following are included in the magazine Z panorama:

1. 7209 through 7212

A four-frame panorama looking west to north showing the lunar surface. The lunar surface hand tool kit is in the center of the panorama.

2. 7213 through 7215

A three-frame panorama to the east over Head Crater, showing the LM.

3. 7223 through 7228

A six-frame clockwise panorama of Bench Crater, rim to rim, looking south from the north rim, showing the east, south, and west inner walls and large rocks on the floor.

4. 7229 through 7233

A five-frame counterclockwise panorama of Bench Crater from the north rim, showing the south and west walls and floor.

5. 7244 through 7256

A 13-frame counterclockwise panorama looking east into the sun, showing an astronaut, the LM, and numerous rocks. The panorama continues to the north and then to due west.

6. 7263 through 7269

A seven-frame counterclockwise panorama of Sharp Crater looking west from outside the eastern rim. Very blocky.

7. 7271 through 7275

A five-frame clockwise panorama of Sharp Crater looking from the east rim to the west.

8. 7308 through 7311

A four-frame panorama looking west showing the lunar surface, the lunar surface hand tool kit, and Astronaut Bean with hand tools.

9. 7321 through 7324

Originally a six-frame panorama of Surveyor Crater; frame 7325 is 90% washout and 7326 will not tie end of panorama. This panorama, which contains four frames, begins on the southwestern rim of Surveyor Crater looking east at Surveyor and the eastern inner slope of the crater, and pans counterclockwise to the LM on the northwestern rim.

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 Magazine Film
 Time Reference — GET — = GMT

Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
				Lat	Long						
7172							Low	Poor	---	S	Lunar Terrain
7173							"	Good	Hgh	"	View into Head Crater
7174							"	"	"	"	"
7175							"	"	"	"	"
7176							"	"	"	"	"
7177							"	"	"	"	"
7178							"	"	"	"	"
7179							"	"	Med.	"	"
7180							"	"	"	"	"
7181							"	"	"	"	"
7182							"	"	"	"	"
7183							"	"	"	"	"
7184							"	"	"	SE	"
7185							"	"	"	"	"
7186							"	"	"	"	"

APOLLO 12 PHOTOGRAPHY

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Time Reference — GET — = GMT

Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point	Lat Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Oblique Tilt	Direction of Tilt	Description
7187							Low	Good	Med.		SE	View into Head Grater
7188							"	"	"		"	"
7189							"	"	Low		N	Tri-Pod Holder for Core Sampler
7190							"	"	"		NW	Core Sampler Lunar Surface
7191							"	"	"		"	"
7192							"	"	"		"	"
7193							"	"	"		N	"
7194							"	"	"		NW	"
7195							"	"	"		N	"
7196							"	"	"		N	"
7197							"	"	"		SE	"
7198							"	"	"		E	"
7199							"	"	"		SE	"
7200							"	"	Med.		SE	View of Lunar Surface
7201							"	"	High		SE	"

APOLLO 12 PHOTOGRAPHY

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
7202						Low	Good	High	SE	View of Lunar Surface
7203						"	"	"	S	"
7204						"	"	"	SM	"
7205						"	"	"	SM	"
7206						"	"	"	W	"
7207						"	"	"	"	"
7208						"	"	"	NM	"
7209						"	"	"	"	"
7210						"	"	Med.	NM	View of Lunar Surface Hand Tool Kit
7211						"	"	"	N	"
7212						"	"	"	N	View of Lunar Surface
7213						"	"	"	NE	Astronaut, IM, Head Grater
7214						"	Pair	Med.	E	IM, Head Grater
7215						"	"	"	E	"
7216						"	"	"	E	Head Grater

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
				Lat	Long						
7217							Low	Good	Low	NW	Core Sampler
7218							"	"	"	"	"
7219							"	"	"	N	Core Sampler, Large Rock
7220							"	"	"	N	"
7221							"	"	Med.	NNE	Core Sampler, Hand Tool Kit
7222							"	"	"	"	"
7223							"	"	"	SE	Bench Crater
7224							"	"	"	S	"
7225							"	"	"	"	"
7226							"	"	"	SW	"
7227							"	"	"	"	"
7228							"	"	"	"	"
7229							"	"	"	W	"
7230							"	"	"	SW	"
7231							"	"	"	S	"

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
7232						Low	Good	Med.	S	Bench Crater
7233						"	"	"	SE	Bench Crater
7234						"	"	Low	"	Core Sampler, Bench Crater
7235						"	"	"	"	"
7236						Low	Good	Low	S	Core Sampler
7237						"	"	"	SE	Core Sampler, Bench Crater
7238						"	"	"	"	"
7239						"	"	"	E	"
7240						"	"	Med.	S	"
7241						"	"	"	"	"
7242						"	"	Low	W	Core Sampler, Hand Tool Kit
7243						"	"	"	"	"
7244						"	"	High	E	View of Lunar Terrain
7245						"	Fair	"	"	View of Lunar Terrain, Astronaut
7246						"	"	"	"	Astronaut Carrying Hand Tool Kit, LM, Lunar Terrain

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Time Reference — GET — = GMT

Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Tilt	Direction of Tilt	Description
				Lat	Long							
7247							Low	Fair	High		NE	Lunar Terrain, LM
7248							"	Good	"		"	"
7249							"	"	"		N	"
7250							"	"	"		NE	Lunar Terrain
7251							"	"	"		N	"
7252							"	"	"		NW	View of Lunar Terrain
7253							"	"	"		"	Large Boulder
7254							"	"	"		W	Lunar Terrain
7255							"	"	"		"	"
7256							"	"	"		"	"
7257							"	"	"		"	"
7258							"	"	"		SW	"
7259							"	"	"		S	"
7260							"	"	Med.		S	Lunar Terrain, Large Rock
7261							"	"	"		SE	Lunar Terrain

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Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Oblique Tilt	Direction of Tilt	Description
				Lat	Long						
7262						Low	Good	Med.	SE		Lunar Terrain
7263						"	"	"	MN		Sharp Crater
7264						"	"	"	W		"
7265						"	"	"	"		"
7266						"	"	"	"		"
7267						"	"	"	"		"
7268						"	"	"	SM		"
7269						"	"	"	"		"
7270						"	"	"	"		"
7271						"	"	"	W		"
7272						"	"	"	"		"
7273						"	"	"	"		"
7274						"	"	"	MN		"
7275						"	"	"	"		"
7276						"	"	Low	S		Core Sampler Near Halo Crater

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Time Reference — GET _____ = GMT _____

Frame #	Camera #	f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Oblique Tilt	Direction of Tilt	Description
				Lat	Long						
7277							Low	Good		S	Core Sampler near Halo Crater
7278							"	"	Med.	SE	Astronaut holding Core Sample
7279							"	Low		S	Core Sampler near Halo Crater
7280							"	"	"	"	"
7281							"	"	Med.	"	Astronaut, Hand Tool Kit
7282							"	"	"	SE	Core Sampler
7283							"	Low		SE	"
7284							"	"	"	"	"
7285							"	"	"	"	"
7286							"	"	Med.	SW	Astronaut and Core Sampler
7287							"	Low		S	Core Sampler
7288							"	"	"	SE	"
7289							"	High		W	View of Lunar Terrain
7290							"	"	"	W	"
7291							"	"	"	SW	"

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Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
			Lat	Long						
7292						Low	Good	High	S	View of Lunar Terrain
7293						"	"	"	"	" "
7294						"	"	"	SE	" "
7295						"	"	"	E	" "
7296						"	Fair	"	"	" "
7297						"	"	"	"	" "
7298						"	"	"	"	" "
7299						"	"	"	"	" "
7300						"	Good	High	NE	View of Lunar Terrain
7301						"	"	"	"	" "
7302						"	"	"	N	" "
7303						"	"	"	"	" "
7304						"	"	"	"	" "
7305						"	"	"	"	" "
7306						"	"	"	"	" "

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Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Oblique	Direction of Tilt	Description
			Lat	Long						
7307					Low		Good	Med.	NW	Astronaut and Hand Tool Kit
7308					"	"	"	"	"	"
7309					"	"	"	High	W	"
7310					"	"	Fair	"	W	View of Lunar Terrain
7311					"	"	"	"	W	"
7312					"	"	Good	Low	SW	Astronaut Collecting Rock
7313					"	"	"	"	NW	"
7314					"	"	"	"	S	Core Sampler, Hand Tool Kit
7315					"	"	"	"	S	"
7316					"	"	"	High	NW	View of LM
7317					"	"	"	"	"	"
7318					"	"	"	Med.	SE	Astronaut and Hand Tool Kit
7319					"	"	"	"	"	"
7320					"	"	"	Low	"	"
7321					"	"	"	Poor	High	View of Lunar Terrain, Surveyor III

MAGAZINE EE

Frames AS12-55-8121 through 8297

Photographic coverage of magazine EE is imaged on 70-mm black and white (SO-164) film. Exposures were made from the CM with camera focal lengths of 80 mm and 250 mm at approximately 60 nautical miles altitude. The 177 exposures are of poor to good quality. The 75-frame 80-mm stereo sequence of near-vertical exposures of the back side of the lunar surface are of good quality. Coverage is from approximately 113° east longitude, 5° south latitude to 34° east longitude, 11° south latitude. Target of opportunity 13 is covered on frames 8197 and 8198. Complete coverage of craters Kapteyn, Langrenus A, and Magelhaens was obtained. La Perouse Crater, excepting the very northern section, and the northern part of Langrenus Crater were also photographed in this near-vertical stereo sequence. Other coverage includes 80-mm high obliques of Reiner Crater in frames 8121 through 8123 and 250-mm high-altitude small-scale transearth injection (TEI) photographs of the eastern part of the lunar surface in frames 8201 through 8297. In this series, frames 8216 through 8225 show good detail. Six exposures of magazine EE are blank.

APOLLO 12 PHOTOGRAPHY
 Magazine EE Film B&W SO-164
 Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8121	80	1:3,519,000	3.5°N	54.5°W	95%	Low	Poor	65-70°	WNW	High Obliques of Reiner Crater
8122	"	1:3,677,900	3.5°N	"	"	"	"	"	"	Reiner Craters A & C
8123	"	1:3,836,899	"	"	"	"	"	"	"	and other small craters in the area
8124										TO-53 Imaged. Stereo Strip 8125 to 8130
8125	"	1:1,376,900	4.0°S	120.5°E	65%	"	"	Near Vertical	W	NNE of Crater 279 & SSE of Crater 211
8126	"	1:1,376,900	"	119.2°E	"	"	"	"	"	N of Crater 279 & SSW of Crater 211
8127	"	1:1,376,900	5.5°S	112.5°E	60%	Med	Fair	"	"	S of Crater 275, N of Crater 276, SW of Crater 277
8128	"	"	"	111.0°E	"	"	"	"	"	E of Crater 273 & NNW of Crater 276
8129	"	"	"	"	"	"	"	"	"	S 3/4 of Crater 273
8130	"	"	"	109.5°E	65%	"	"	"	"	"
8131	"	"	6.0°S	108.5°E	"	"	"	"	"	SW of Crater 273 & SSW of Crater 202
8132	"	"	6.0°S	107.0°E	"	"	"	"	"	WSW of Crater 273 & SE of Crater 270
8133	"	"	6.5°S	106.0°E	"	"	"	"	"	WSW of Crater 273 & SE of Crater 270
8134	"	"	"	105.0°E	"	"	"	"	"	"
8135	"	"	"	104.5°E	"	"	"	"	"	SSE of Crater 270 & WSW of Crater 273

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APOLLO 12 PHOTOGRAPHY

Magazine EEFilm B&W SQ-164

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8136	80	1:1,376,900	7.0°S	103.5°E	65%	Med	Fair	Near Vertical	W	S of Crater 270 & WSW of Crater 273
8137	"	"	"	102.0°E	"	"	"	"	"	Stereop Strip 8137 to 8152 S of Crater 270 & SE of Crater 269
8138	"	"	"	101.5°E	"	"	"	"	"	SE of Crater 269 & SSW of Crater 270
8139	"	"	"	100.5°E	"	"	"	"	"	SE of Crater 269 & SW of Crater 270
8140	"	"	"	99.5°E	"	"	"	"	"	SSE of Crater 269 & SW of Crater 270
8141	"	"	"	98.5°E	"	"	"	"	"	S of Crater 269 & SW of Crater 270
8142	"	"	8.0°S	97.5°E	"	"	"	"	"	SSW of Crater 269 & SE of Crater 267
8143	"	"	"	96.5°E	"	"	"	"	"	SSE of Crater 267 & SE of Crater 266
8144	"	"	"	95.0°E	"	"	"	"	"	SE of Crater 266 & S of Crater 267 & SE Sec. of 266
8145	"	"	"	94.0°E	"	"	"	"	"	SE Section of Crater 266
8146	"	"	"	93.0°E	"	"	"	"	"	S. Part of Crater 266
8147	"	"	8.5°S	92.0°E	"	"	Good	"	"	SW Part of Crater 266
8148	"	"	"	91.0°E	"	"	"	"	"	Small SW Part of Crater 266
8149	"	"	"	90.0°E	"	"	"	"	"	SW of Crater 266 & SE of Crater 263
8150	"	"	9.0°S	89.0°E	"	"	"	"	"	SW of Crater 266 & SE of Crater 263

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APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W 50-164

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
				Lat	Long							
8151	80		1:1,376,900	9.0°S	89.0°E	65%	Med	Good	Near Vertical		W	SE of Crater 263 & SW of Crater 266
8152	"	"	"	8.0°S	87.0°E	"	"	"	"	"	"	SE of Crater 263 & SW of Crater 266
8153	"	"	"	9.0°S	86.0°E	"	Med	"	"	"	"	Stereo Strip 8153 to 8168 of Crater 264
8154	"	"	"	9.5°S	85.0°E	"	"	"	"	"	"	S of Crater 263 & N of Gibbs Crater
8155	"	"	"	"	84.0°E	"	"	"	"	"	"	SSW of Crater 263 & N of Gibbs Crater
8156	"	"	"	"	83.0°E	"	"	"	"	"	"	SW of Crater 263 & NE of Ansgarius
8157	"	"	"	10.0°S	82.0°E	"	"	"	"	"	"	SE of Kastner & SW of Crater 263
8158	"	"	"	"	80.5°E	"	"	"	"	"	"	LaPerouse E & NNE of Ansgarius
8159	"	"	"	"	79.5°E	"	"	"	"	"	"	N of Ansgarius & E of LaPerouse
8160	"	"	"	"	78.5°E	"	"	"	"	"	"	E of LaPerouse & NNE of Ansgarius
8161	"	"	"	"	77.5°E	"	"	"	"	"	"	E Half of LaPerouse
8162	"	"	"	"	76.5°E	"	"	"	"	"	"	E 3/4 of LaPerouse
8163	"	"	"	"	75.5°E	"	"	"	"	"	"	W 3/4 of LaPerouse
8164	"	"	"	"	74.5°E	"	"	"	"	"	"	W 1/4 of LaPerouse
8165	"	"	"	"	73.0°E	"	"	"	"	"	"	W of LaPerouse & E of Kapteyn C

APOLLO 12 PHOTOGRAPHY

Magazine EE Film R&W 50-164

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
8166	80		1:1,376,900	9.0°S	86.0°E	65%	Med	Good	Near Vertical	W	Small Section of E Kapteyn & Area E of Kapteyn
8167	"	"	"	"	71.5°E	"	"	"	"	"	E Half of Kapteyn
8168	"	"	"	"	70.5°E	"	"	"	"	"	Kapteyn & Bordering Area Strip along S of E of Langrenus A & S of Kapteyn E
8169	"	"	"	10.5°S	69.0°E	65%	"	"	"	"	E Half of Langrenus A & W of Kapteyn
8170	"	"	"	"	68.5°E	"	"	"	"	"	Langrenus A
8171	"	"	"	11.0°S	67.0°E	"	"	"	"	"	W Half of Langrenus A & ESE of Langrenus
8172	"	"	"	"	66.5°E	"	"	"	"	"	ESE of Langrenus
8173	"	"	"	"	65.5°E	"	"	"	"	"	W of Langrenus A & ESE of Langrenus
8174	"	"	"	10.5°S	64.0°E	"	"	"	"	"	SE of Langrenus
8175	"	"	"	11.0°S	63.0°E	"	"	"	"	"	SE Section of Langrenus & NE of Lohse
8176	"	"	"	"	62.0°E	"	High	"	"	"	S Part of Langrenus & NE of Lohse
8177	"	"	"	"	61.0°E	"	"	"	"	"	S 1/4 of Langrenus & N of Lohse
8178	"	"	"	"	60.0°E	"	"	"	"	"	SW Part of Langrenus & NNM of Lohse
8179	"	"	"	"	59.0°E	"	"	"	"	"	SW Section of Langrenus & NM of Lohse
8180	"	"	"	"	58.0°E	"	"	"	"	"	SW of Langrenus & NM of Lohse

APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W SO-164

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
8181	80		1:1,376,900	0°S	57.0°E	65%	High	Good	Near Vertical	W	SW of Langrenus & Langrenus D
8182	"	"	"	"	56.0°E	"	"	"	"	"	SE Section of Mare Recunditatis
8183	"	"	"	"	54.5°E	"	"	"	"	"	SE Section of Mare Recunditatis
8184	"	"	"	"	54.5°E	"	"	"	"	"	S Section of Mare Recunditatis
8185	"	"	"	"	52.5°E	"	"	"	Fair	"	Strips of Mare Recunditatis & NE of Crozier NNE of Crozier & SSE of Goclenius U
8186	"	"	"	"	51.5°E	"	"	"	"	"	N of Crozier & ENE of Bellot
8187	"	"	"	"	50.5°E	"	"	"	"	"	E Part of Bellot & N of Crozier H
8188	"	"	"	"	49.0°E	"	"	"	"	"	Most of Bellot & Area N of Bellot
8189	"	"	"	"	48.0°E	"	"	"	"	"	Most of Bellot & Area NW of Bellot
8190	"	"	"	"	47.0°E	"	"	"	"	"	SE Quadrant of Goclenius & NE Sec. of Magalhans
8191	"	"	"	"	46.0°E	"	"	"	"	"	S Half of Goclenius & E Half of Magalhans
8192	"	"	"	"	45.0°E	"	"	"	"	"	Half of Magalhans
8193	"	"	"	"	44.0°E	"	"	"	"	"	SW Quadrant of Goclenius & all of Magalhans
8194	"	"	"	"	43.0°E	"	"	"	"	"	W Half of Magalhans & all of Gutenberg D
8195	"	"	"	"	42.0°E	"	"	"	"	"	Gutenberg D & SE of Gutenberg

APOLLO 12 PHOTOGRAPHY
 Magazine EE
 Film B&W SO-164

Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
8196	80		1:1,376,900	11.08°S	41.0°E	65%	High	Fair	Near Vertical	W	S Edge of Gutenberg & N of Pyraeus
8197	"	"	"	"	40.0°E	"	"	"	"	"	SW of Gutenberg & Gaudibert J: T0-13
8198	"	"	"	"	39.0°E	"	"	"	"	"	E 3/4 of Gaudibert & SW of Gutenberg: T0-13
8199	"	"	"	"	38.0°E	"	"	"	"	"	Gaudibert & surrounding Area
8200	"	"	"	"	36.0°E	"	"	"	"	"	W 1/4 of Gaudibert & SE of Capella
8201	250	"	"	"	"	"	"	"	"	"	THE East Half of Moon
8202	"	"	"	"	"	"	"	"	"	"	"
8203	"	"	"	"	"	"	"	"	"	"	"
8204	"	"	"	"	"	"	"	"	"	"	"
8205	"	"	"	"	"	"	"	"	"	"	"
8206	"	"	"	"	"	"	"	"	"	"	"
8207	"	"	"	"	"	"	"	"	"	"	"
8208	"	"	"	"	"	"	"	"	"	"	"

APOLLO 12 PHOTOGRAPHY
 Magazine EE
 Film R&W SO-164
 Time Reference — GET _____ = GMT _____

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
				Lat	Long							
8209		250						Fair				TEI East Half of Moon
8210								"				"
8211								"				"
8212								"				"
8213								"				TEI E 3/4 of Moon
8214								"				"
8215								"				"
8216								"				"
8217								"				Nadir Near Mare Crisium
8218								"				"
8219								"				"
8220								"				"
8221								"				"
8222								"				"
8223								"				"

APOLLO 12 PHOTOGRAPHY
 Magazine EB
 Film R&W SO-164
 Time Reference — GET — = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
8227	250							Fair			Nadir Near Mare Crisium
8225	"							"			"
8226	"							"			"
8227	"							"			"
8228	"							Poor			Poor Detail
8229	"							"			"
8230	"							"			"
8231	"							"			"
8232	"							"			Dark TEI E 3/4 of Moon
8233	"							"			"
8234	"							"			"
8235	"							"			"
8236	"							"			"
8237	"							"			"
8238	"							"			"

LEC 12969

APOLLO 12 PHOTOGRAPHY

Magazine EB Film B&W 50-164

Time Reference — GET _____ = GMT _____

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
8239		250						Poor			Dark TEI E 3/4 of Moon
8240								"			"
8241								"			"
8242								"			"
8243								"			"
8244								"			"
8245								"			"
8246								"			"
8247								"			"
8248								"			"
8249								"			"
8250								"			"
8251								"			"
8252								"			"
8253								"			"

APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W 50-164

Time Reference — GET — = GMT

Frame #	Camera #	f Length ^{mm}	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
				Lat	Long							
8254		250						Poor				Dark TEI E 3/4 of Moon
8255	"							"				"
8256	"							"				"
8257	"							"				"
8258	"							"				"
8259	"							"				"
8260	"							"				"
8261	"							"				"
8262	"							"				"
8263	"							"				"
8264	"							"				TEI - Very Distant Photos of Moon
8265	"							"				"
8266	"							"				"
8267	"							"				"
8268	"							"				"

APOLLO 12 PHOTOGRAPHY
 Magazine RE Film B&W SO-164

Time Reference — GET _____ = GMT

Frame #	Camera #	f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
				Lat	Long						
8269		250						Poor			THI - Very distant photos of Moon
8270								"			
8271								"			
8272								"			THI - Very distant photos of Moon
8273								"			
8274								"			THI - Very distant photos of Moon
8275								"			
8276								"			
8277								"			
8278								"			
8279								"			
8280								"			
8281								"			
8282								"			
8283								"			

APOLLO 12 PHOTOGRAPHY
 Magazine ~~RB~~ Film B&W SO-164
 Time Reference — GET _____ = GMT _____

Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8284	250						Poor			TEI - Very Distant Photos of Moon
8285	"						"			"
8286	"						"			"
8287	"						"			"
8288	"						"			"
8289	"						"			"
8290	"	Blank								Blank
8291	"	"								"
8292	"	"								"
8293	"	"								"
8294	"	"				Poor				Unidentified Object - Pos. Section of Hatch
8295	"	"				"				Window Rings
8296	"	"				"				Unidentified Object Pos. Section of Hatch
8297	"	"				"				Window Rings

APOLLO 12

LUNAR MULTISPECTRAL CAMERA (LMC)
S-158 Experiment Assembly Photography (70 mm)

For this experiment, four EL Hasselblad cameras with 80-mm lenses were mounted together in such a manner that they could be aimed and operated simultaneously.

Magazine AA - 80-mm lens - infrared black and white S0-246, 87C filter
(black), 114 frames

Magazine BB - 80-mm lens - medium speed black and white 3401, 47B filter
(blue), 150 frames

Magazine CC - 80-mm lens - medium speed black and white 3401, 29+ filter
(red), 150 frames

Magazine DD - 80-mm lens - black and white 3401, 58 filter (green), 150
frames

Camera mounts were perpendicular to the hatch window. Alignment was 57.5° pitched up from the X axis. The camera that used the black and white infrared film did not give as complete a coverage as the other cameras, since it was not turned on until midway into the sequence.

APOLLO 12 PHOTOGRAPHY

Magazine AA
Film SO-246

Filter Blk 87C
Time Reference — GET

Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Min — Max Tilt	Direction of Tilt	Description
			Lat	Long							
8314	80mm	1:1,470,000	10.5°S	101.5°E	60%	Medium	Fair	Vertical	-----		Begin IR Stereo Strip
Thru	"										
8326	"		12.5°S	89.0°E	"	"	"	"			End IR Stereo Strip
8349	"		13.0°S	33.0°E	"	High	"	"			Begin IR Stereo Strip
Thru	"										
8393	"		07.0°S	15.0°W	"	Low	Good	"			End IR Stereo Strip
8394	"		12.0°S	93.0°E	"	High	Fair	"			Begin IR Stereo Strip
Thru	"										
											Ansartus, Kapteyn C, Lame, McClure
8433	"		17.0°S	51.0°E	"	"	Poor	"			End IR Stereo Strip
8434	"		12.0°S	27.0°E	"	"	"	10°-20°	North		Theophilus
8435	"		"	"	"	"	"	"	"		"
8436	"		11.0°S	15.0°E	"	"	"	Vertical	-----		Descartes
8437	"		"	"	"	"	"	"			"
8438	"		07.0°S	15.0°W	"	Medium	Fair	"	-----		Fra Mauro
8439	"		"	"	"	"	"	"			Fra Mauro

APOLLO 12 PHOTOGRAPHY
 Magazine BB, CC, DD Film 3401 MBM

Time Reference — GET = GMT

Frame #	Camera #	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt	Direction of Tilt	Description
			Lat	Long						
8298	80mm	1:1,500,000	07.0°S	133.0°E	None	Low	Good	Vertical	-----	Crater #286
8299	"	"	06.0°S	120.0°E	60%	"	"	"	-----	Begin Stereo Strip Crater II
Thru	"	"	"	"	"	"	"	"	-----	"
8326	"	"	12.58	89.0°E	"	"	"	"	-----	End Stereo Strip
8327	"	"	17.0°S	54.0°E	"	High	Fair	"	-----	Begin Stereo Strip
Thru	"	"	"	"	"	"	"	"	-----	McClure, Theophilus
8393	"	"	07.0°S	15.0°W	"	Medium	Fair to Good	"	-----	Descartes, Lalonde
8394	"	"	13.0°S	93.0°E	"	"	Good	"	-----	Begin Stereo Strip Ansgarius
Thru	"	"	"	"	"	"	"	"	-----	Kapteyn A and C
8433	"	"	17.0°S	51.0°E	"	"	Fair	"	-----	End Stereo Strip McClure
8437	"	"	12.0°S	27.0°E	"	High	Good	10°-20°	North	Theophilus
8435	"	"	"	"	"	"	"	"	"	"
8436	"	"	11.0°S	15.0°E	"	"	"	Vertical	-----	Descartes
8437	"	"	"	"	"	"	"	"	-----	"
8438 & 8439	"	"	07.0°S	15.0°W	"	"	"	"	-----	Era Mauro
									-----	End Experiment

APOLLO 12 SEQUENCE PHOTOGRAPHY (16 mm)

MAGAZINES A through P

Magazines A through P are 16-mm color and black and white sequence photography of the lunar surface taken from the CSM and the LM. There are a total of 15 magazines lettered A through P, with the letter J excluded. All magazines are color with the exception of magazine I. The quality of the photography ranges from poor to good.

Magazines A through D portray (in order): transposition and docking, the LM in formation prior to landing, LM ascent from the CSM, and the LM being jettisoned. Magazine C also contains views of the landing site and the Surveyor 3 site as seen through the sextant. Significant surface features covered on these four magazines are the Pyrenees Mountains, the Mare Nectaris, and the craters of Theophilus, Descartes, and Lalande A.

Magazine E is a sextant photography stereo strip running from east to west covering such features as Theophilus Peaks, Lalande A, and Fra Mauro. Also included are Landmark Tracking Sites (CP-1, CP-2, DE-1, and FM-1). The last section of magazine E was taken after TEI and shows the eastern limb of the moon where Basin II, the farside terminator, and the Mare Smythii and Mare Crisium can be seen.

Magazines F through I include (in order) a sextant photography stereo strip, reentry, the CSM interior, and black and white oblique sequences of Herschel, Fra Mauro, and Lalande.

Magazine K contains exposures of the CSM, Fra Mauro, Lalande, Ptolemaeus, and the LM descent and landing.

Magazines L, M, N, and O were recorded from the LM after landing and include views of the deployed ALSEP, the American flag, the S Band Antenna, and some of the astronauts' activities during the first EVA.

Magazine P shows the earthrise, Basin II, and the nearside terminator.

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: B FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-3715	15°S, 30°E to 8°S, 14°W	LM in formation prior to landing	Good Quality
		Theophilus, Cyrillus, Gyrillus "B", Kant, Descartes, Dollond, Andel,	
		Ritchey, Hind, Halley, Albatagnus,	
		Klein, Muller, Ptolemaeus, Herschel	
		Lalande "A"	
3716-5316		LM in formation prior to landing	Good Quality
		(No Surface)	

LEC 12569

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: E FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-616		Bright yellow dot against black background of space	Poor film quality
617-1677	12S, 41E to 4S, 22W	Sextant photography stereo strip	Fair to Good quality
			(From east to west, photos partially cover
			Daguerre, Theophilus, Kant, Dollond, Ansel,
			Ptolemaeus, Lalande "A" & Fra Mauro)
(720)	11.7°S, 33.3°E	Small bright crater in Daguerre	
(823)	11.5°S, 26.3°E	Theophilus Peaks	
(917)	11.2°S, 20.2°E	South rim of Kant	
(1015)	10.6°S, 14.4°E	Dollond	
(1250)	8.9°S, 1°E	Small wedge-shaped crater on east rim of Ptolemaeus	
(1452)	6.5°S, 10.3°W	West of Lalande "A"	
1678-1859	6°S, 112°E	Sextant photography; landmark tracking site CP-1	Fair Quality
1860-2054	10°S, 56°E	Sextant photography; landmark tracking site CP-2	Poor Quality Over-exposed
2055-2222	09°S, 15.5°E	Sextant photography; landmark tracking site DE-1	Poor
	03°S, 17°W	Sextant photography; landmark tracking site FM-1	Fair Quality

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: E FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
2398-2669	06°S, 112°E	Sextant photography; landmark tracking site CP-1	Fair Quality
2670-2924	10°S, 56°E	Sextant photography; landmark tracking site CP-2	Fair Quality
2925-3115	09°S, 15.5°E	Sextant photography; landmark tracking site DE-1	Poor--over-exposed
3116-3272	03°S, 17°W	Sextant photography; landmark tracking site FM-1	Fair
3273	Centered near 0° Lat. and 100°E Long.	TEI, eastern Limb of Moon; including Basin II, Smyth's Sea Craters 201, 197, 198, 199, 195 192, 191, 189, 202, 204, 206, 207 275, 277, 273, 270, 276.	Good Quality
3478-3643	Centered near 0° Lat. and 90°E Long.	TEI, eastern limb of Moon including farside terminator. Direction of view is south and southwestward. Includes Sea of Crises, Smyth's Sea, Basin II	Good Quality

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: F FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-3386	3°S, 123°E to 3°N, 52°W	Sextant Photography Stereo Strip	Good Quality-High Sun Angle-Views are washed out
(84)	4.5°S, 120°E	Double Crater on Ridge East on Crater 277	Located on Frame AS12-54-7953 (Mag. T)
(203)	6°S, 112°E	Small Sharp Rim Crater East of Crater 273	Located on Frame AS12-54-7958 (Mag. T)
(237)	6°S, 110.5°E	Small Crater on Southeast Rim of Crater 273	Located on Frame AS12-54-7960 (Mag. T)
(323)	7°S, 106.5°E	Rim of Sharp Crater North of Basin II	Located on Frame AS12-54-2964 (Mag. T)
(395)	7.5°S, 104°E	Rim of Crater Complex North of Basin II	Located on Frame AS12-54-7967 (Mag T)
(920)	10.5°S, 76°E	Bright Crater in La Perouse	Located on Frame AS12-54-7994 (Mag T)
(2308)	7°S, 4.0°E	Small Bright Crater South of Hipparchus	Located on Frame AS12-54-8063 (Mag T)
(2336)	7°S, 2.5°E	Old Crater and Small Bright Crater North of Müller	Located on Frame AS12-54-8065 (Mag T)
(2433)	6°S, 3°W	West Rim of Herschel	Located on Frame AS12-54-8070 (Mag T)
(2494)	5.5°S, 6°W	Double Crater East of Lalande "C"	Located on Frame AS12-54-8073 (Mag T)
(2588)	5°S, 11°W	Small Crater West of Lalande	Located on Frame AS12-54-8078 (Mag T)
(2645)	4.5°S, 13.5°W	Small Crater Northeast of Fra Mauro	Located on Frame AS12-54-8081 (Mag T)
(2663)	4°S, 14.5°W	Small Crater Northeast of Fra Mauro	Located on Frame AS12-54-8081 (Mag T)
(2703)	4°S, 16.5°W	Small Sharp Crater North of Fra Mauro	Located on Frame AS12-54-8083 (Mag T)

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: F FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
(2746)	3.5°S, 18.5°W	Juncture of Mare and Highlands North of Fra Mauro	Located on Frame AS12- 54-8083 (Mag T)
(2758)	3°S, 20.5°W	Mare Northwest of Fra Mauro	Located on Frame AS12- 54-8086 (Mag T)
(2917)	1.5°S, 27°W	Small Double Crater South of Lansburg	Located on Frame AS12- 54-8093 (Mag T)
(2968)	1.5°S, 29.5°W	Small Crater and Rille Northwest of Lansberg "G"	Located on Frame AS12- 54-8096 (Mag T)
(3096)	.5°N, 36°W	Small Crater and Rille Southeast of Encke "C"	Located on Frame AS12- 54-8103 (Mag T)
(3144)	1°N, 38.5°W	Small Triple Crater South Encke "T"	Located on Frame AS12- 54-8105 (Mag T)
(3169)	1°N, 40.5°W	Double Crater North of Encke "E"	Located on Frame AS12- 58-8106 (Mag T)
3387-3856	-----	Solar Eclipse by Earth	Good Quality

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: G FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-5519		Re-entry, drag and main parachute	Good Quality
		deployment	

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: H

FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-1103	CSM Interior	Crew shaving, astronaut using	Fair to Good Quality
		Hasselblad 70-mm Camera, Astronaut	
		exercising, drinking.	

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: 1K FILM: B&W, Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-2000	7°S, 8°E to 6°S, 3°W	Oblique Sequence to Herschel,	Poor to Fair Quality
		includes craters Hind, Halley,	
		Muller, North Portion of	
		Ptolemaeus	
2001-3431		Too poor Quality to Plot	Poor Quality
3432-4911	5°S, 11°W to 35°S, 17°W	Oblique Sequence to Fra Mauro	Poor to Fair Quality
4912-6000	6°S, 4°W to 4°S, 9°W	Oblique Sequence to Lalande	Poor to Fair Quality
1-1164	7°S, 0° to 5°S, 20°W	CSM from LM, Fra Mauro, Perry "L"	Poor Quality
		& "C", Lalande, Lalande "A", "C",	
		Herschel, Ptolemaeus	
1165-5494	2°S, 26°W to 3°S, 23°W	LM Descent and Landing	Good Quality

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)
 MAG: _____ M _____
 FILM: _____ Color _____

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-3808	Landing Site (3°S, 23°W)	View from landed LM (window) look-	Good Quality
		ing Northwest. Astronaut during	
		EVA.	
3809-5466	Landing Site (3°S, 23°W)	View from landed LM (window)	Good Quality
		Looking northwest. Shows American	
		Flag, deployed ALSEP, S Band	
		Antenna.	
5467-5576	Landing Site (3°S, 23°W)	View from landed LM looking west.	Good Quality
		Shows LM Shadow.	

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: P FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-332		Overexposed & Unusable	
333-781	2°S, 25°W to 2°S, 27°N	Lansberg "N"	Good Quality
782-1181	10°S, 105°E to 11°S, 100°E	Earthrise, Basin II	Poor Quality
1182-2694	3°N, 40°W to 3°N, 43°W	Terminator, Maestlin "R"	Fair Quality
2695-3157		Blurry CSM from LM	Poor Quality
3158-3456		Too poor quality to plot	

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APOLLO 12 LUNAR CLOSEUP STEREOSCOPIC
PHOTOGRAPHY (35 mm)

MAGAZINE FF
Frames AS12-57-8441 through 8455

Magazine FF consists of 15 stereoscopic frames of 35-mm film. The photography shows the lunar surface and footprint impressions.