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2:00 p.m., EDT, 31 October 1972

MISSION DIRECTORS BRIEFING

APOLLO 17

PARTICIPANTS:

CHESTER M. LEE, Mission Director, Apollo 17.

GARRETT: Good afternoon.

Before we get started, I'd like to make a few announcements. On Thursday, November the 9th, in the afternoon, we'll have a lunar surface procedures briefing at Houston. Following that at 3 p.m. -- that was at 1 p.m. -- and at 3 p.m. -- these are Central Standard Time -- we'll have a mission science briefing also at Houston.

VOICE: Central times?

GARRETT: Central times, right, 1 p.m. and 3 p.m. November the 9th, Thursday.

VOICE: Are you going to pipe those in?

GARRETT: Are you going to pipe those in, Les?

VOICE: Yes.

GARRETT: You will?

VOICE: Yes.

GARRETT: Okay, we'll pipe them in.

VOICE: If you want.

GARRETT: Do you want it?

VOICE: Yes.

So if they're going to have viewgraphs down there on the lunar surface procedures briefing, can we have them duplicated up here?

VOICE: It's a problem. We'll try.

GARRETT: We'll see what we can do.

Then Friday, November the 10th, in the morning at Houston, we're having a mission planning briefing. I don't have the exact time on that yet, but as soon as we do we'll put out a note. At 1 p.m. that afternoon, Friday afternoon, 1 p.m. Friday, Central Standard Time, the Apollo 17 crew press conference. That's at Houston.

This will be followed by the media interviews that afternoon and the following day, Saturday, November the 11th. On Monday, November the 20th, here at Headquarters, we'll have the Apollo 17 science briefing. At 9:30 in the morning we'll cover orbital science. This is Eastern Standard Time and at 1:30 that afternoon Eastern Standard Time, we'll have surface science.

The main participants will be the new principal investigators, the principal investigators that have new experiments flying this time.

Transcripts of today's briefing will be available. If you'd like a copy, put your address on one of the envelopes in the back of the room. Please use your zip code.

Also, the handout that you have today may differ slightly from the charts that Chet will be using, but not that much.

With that, Apollo 17 Mission Director --

VOICE: One thing, going back to that 3 p.m. Central Time November 9th, what was the subject of that?

GARRETT: Mission Science Briefing.

Any other questions?

Apollo 17 Mission Director, Captain Chester M. Lee.

LEE: Good afternoon, ladies and gentlemen.

I intend to try to give you an overview as I have in the past. As you can see there are a number of briefings that are going to come on that go into much greater detail than I can do here in the time allocated.

I apologize if there are some differences in the handout. In fact, I tried to cut out some viewgraphs this morning just to bring it down to a shorter time and I hope that we can get through it.

Now, I intend to -- many of you, I know, are familiar with the general procedure and outline of the missions. Some of these things I may try to cover very briefly.

Please don't hesitate if you are unfamiliar with it or have a question, interrupt me with your question and

I'll try to answer it. If not, I do have some experts here to back me up and we'll get the answer for you either immediately or a followup later.

Can I have the first slides, please?

(Slide.)

I think maybe if we put the lights out, they can see these better.

On the left here, of course, is the Apollo 17 patch. I think most of you are familiar with the significance of the God Apollo, the Sun God. In back of it is the American Eagle, modern American Eagle,with the stripes of theAmerican Flag and three stars for the three astronauts. You have a nebula here and you have the Saturn with its rings and, of course, the Moon.

The significance of the wing overlapping the moon is we have been there.

We've got a problem on the left here? CAn you get that fixed and in the meantime we'll struggle along with one at a time.

This is the Apollo crew, Gene Cernan, the Commander, a veteran spaceman. He has been in Gemini, as you know. He walked in space and he was an Apollo 10 mission.

Behind him Ron Evans, the Commander, USN, who, this will be his first spaceflight. And on the left, Dr. Jack Schmidt, who is the science astronaut, who will be making this trip as the LMP.

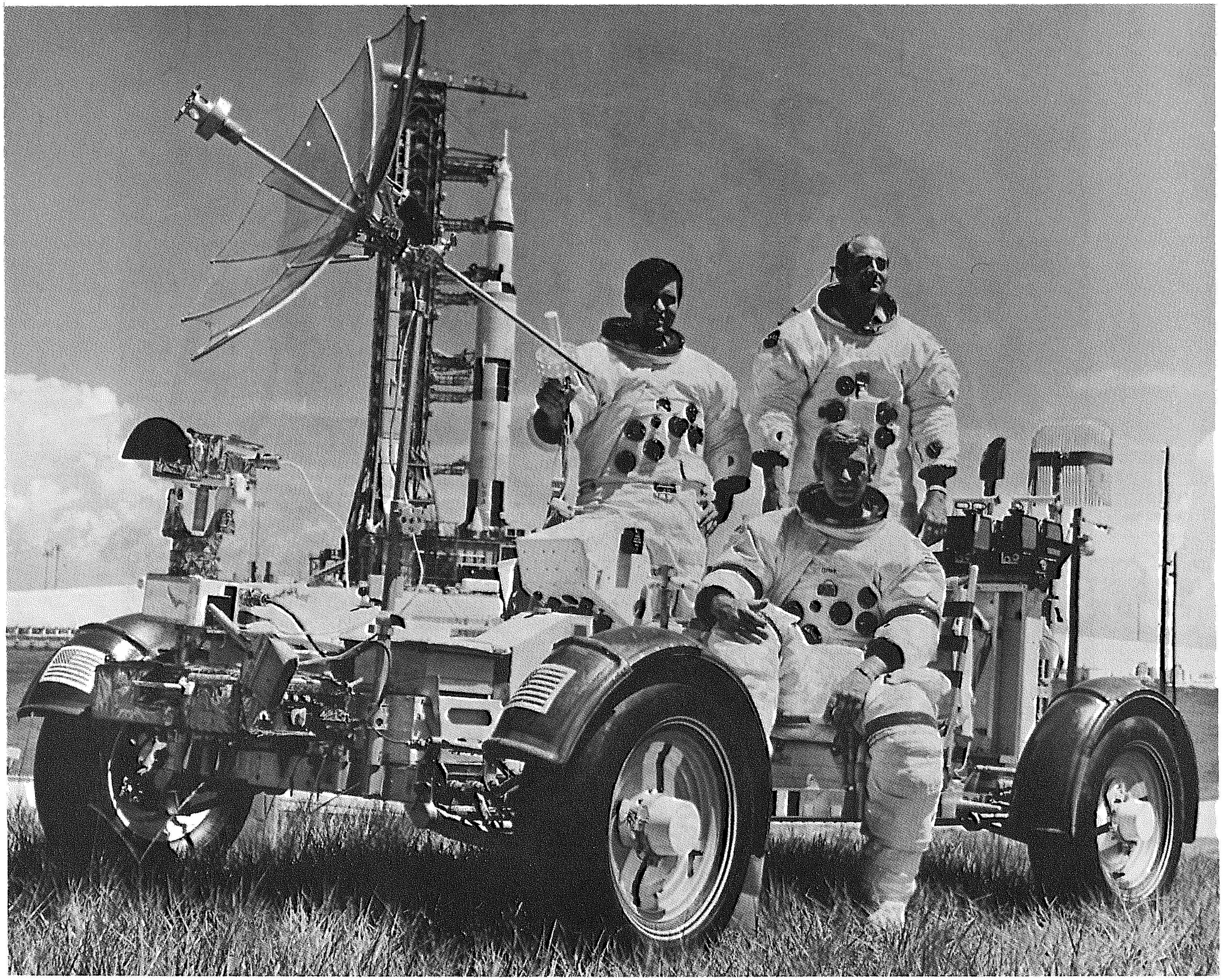
Can I have the next viewgraph?

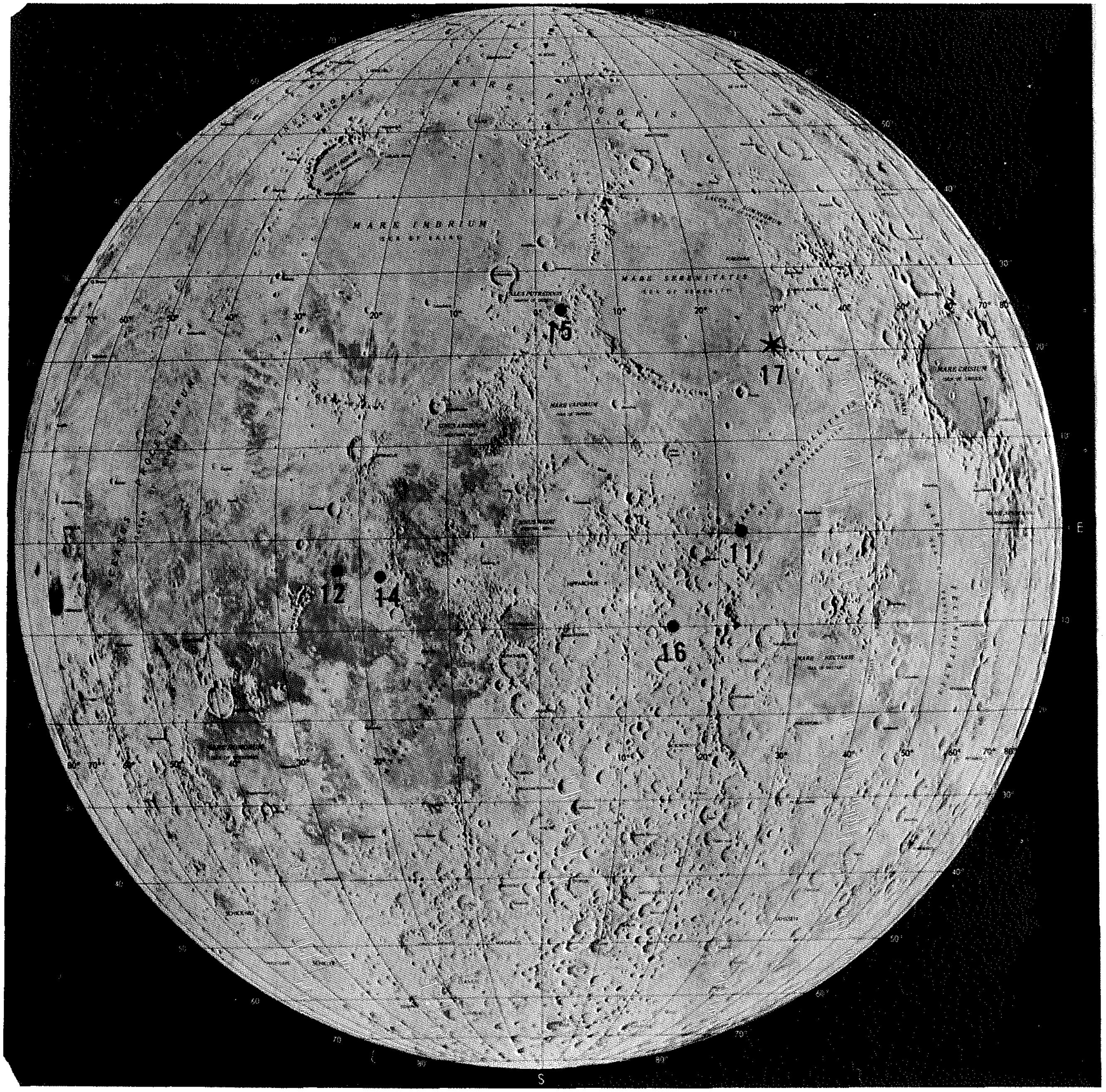
(Slide.)

On this map of the moon, we have shown the previous landings to give you a general idea of where we've been and what we're trying to do and I guess I'd like to make this point. This is a final mission. We've had a number of landings.

As you can see, we've covered the Mare area, the uplands and the highlands. Now, this has given us

APOLLO ★ XVII
CERNAN ★ EVANS ★ SCHMITT





LUNAR LANDING SITES

APOLLO 11
SEA OF TRANQUILIT

APOLLO 12
OCEAN OF STORMS

APOLLO 14
FRA MAURO

APOLLO 15
HADLEY-APENNINE

APOLLO 16
DESCARTES

APOLLO 17
TAURUS-LITTROW

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information that gives us a fundamental, good fundamental, factual knowledge of the moon and as you are well aware of, I know, it has not answered all the questions and, in fact, although it has answered some, it has also created some new questions.

Apollo 17 will be the most easternmost site that we have landed. I'll discuss some details on that a little further. And it's not quite as far north as Apollo 15.

Next viewgraph.

(Slide.)

As far as the science rationale, this is one we've used before. I think the key point here is to show you that we've gone different types. We've gone deep seated. We have the basaltic. We've gone into the uplands. We've gotten some pretty old rocks, as you well know, recently Dr. Weissman reported, I think it was 4.4 billion years of age on some of the lunar samples returned on Apollo 16.

Apollo 17 we're going into an area that's highland, massifs and also landing on a dark mantle that appears to be young. So, in a sense, we're hoping on this mission that we will return with perhaps some of the oldest and perhaps together with that some of the youngest material returned from the lunar surface.

Next viewgraph, please.

(Slide.)

Is there another one that goes up with that? We'll get together here in a second.

I've covered the one on the right. Primary objectives are the same as we have presented in the past. I'd like to point out one thing here. Emplacing and activating the surface experiments, particularly the ALSEP, we have some new experiments.

The ALSEP has really been redesigned to a great extent. It's supposed to have a longer life and on this, as I will go into more detail again, we have some new experiments and we have, we hope, some second generation,

SITE SCIENCE RATIONALE

	APOLLO 11	APOLLO 12	APOLLO 14	APOLLO 15	APOLLO 16	APOLLO 17
TYPE	MARE	MARE	HILLY UPLAND	MOUNTAIN FRONT/ RILLE/MARE	HIGHLAND HILLS AND PLAINS	HIGHLAND MASSIFS AND DARK MANTLE
PROCESS	BASIN FILLING	BASIN FILLING	EJECTA BLANKET FORMATION	• MOUNTAIN SCARP • BASIN FILLING • RILLE FORMATION	• VOLCANIC CONSTRUCTION • HIGHLAND BASIN FILLING	• MASSIF UPLIFT • LOW LAND FILLING • VOLCANIC MANTLE
MATERIAL	BASALTIC LAVA	BASALTIC LAVA	DEEP-SEATED CRUSTAL MATERIAL	• DEEPER-SEATED CRUSTAL MATERIAL • BASALTIC LAVA	VOLCANIC HIGHLAND MATERIALS	• CRUSTAL MATERIAL • VOLCANIC DEPOSITS
AGE	OLDER MARE FILLING	YOUNGER MARE FILLING	• EARLY HISTORY OF MOON • PRE-MARE MATERIAL • IMBRIUM BASIN FORMATION	• COMPOSITION AND AGE OF APENNINE FRONT MATERIAL • RILLE ORIGIN AND AGE • AGE OF IMBRIUM MARE FILL	• COMPOSITION AND AGE OF HIGHLAND CONSTRUCTION AND MODIFICATION • COMPOSITION AND AGE OF CAYLEY FORMATION	• COMPOSITION AND AGE OF HIGHLAND MASSIFS AND POSSIBLY OF LOW-LAND FILLING • COMPOSITION AND AGE OF DARK MANTLE • NATURE OF A ROCK LANDSLIDE

APOLLO 17

PRIMARY OBJECTIVES TAURUS-LITTROW

1. PERFORM SELENOLOGICAL INSPECTION, SURVEY, AND SAMPLING OF MATERIALS AND SURFACE FEATURES IN A PRESELECTED AREA OF THE TAURUS-LITTROW REGION.
2. EMPLACE AND ACTIVATE SURFACE EXPERIMENTS.
3. CONDUCT IN-FLIGHT EXPERIMENTS AND PHOTOGRAPHIC TASKS.

some experiments that will close the gap on some of the knowledge we're seeking.

Next viewgraph, please.

(Slide.)

Now, on this mission, we have some new experiments and those are in yellow. We've tried to give you a summary of all the experiments we've carried. This is the surface experiments, together with what we're carrying on 17 and those which are new.

And I'm going to try to run briefly through, very briefly, through some of the new experiments, which I know you'll get more details on your later briefings that are scheduled.

First one, as part of the ALSEP, we have four new experiments on the ALSEP, the lunar surface gravimeter, which is depicted here on the right screen. And the purpose here is to measure the lunar title deformations to see if there's deformation on the moon surface due to the pull of the sun and earth.

And also to really confirm if, in fact, there are such things as gravity waves and this, perhaps I can best describe as, gravity instead of being constant, its source could be pulsing it and we hope, perhaps with this experiment, some of the data that we can confirm or deny the existence -- perhaps we can't be sure to deny it but perhaps we might be fortunate enough to confirm that there are such things as gravity waves.

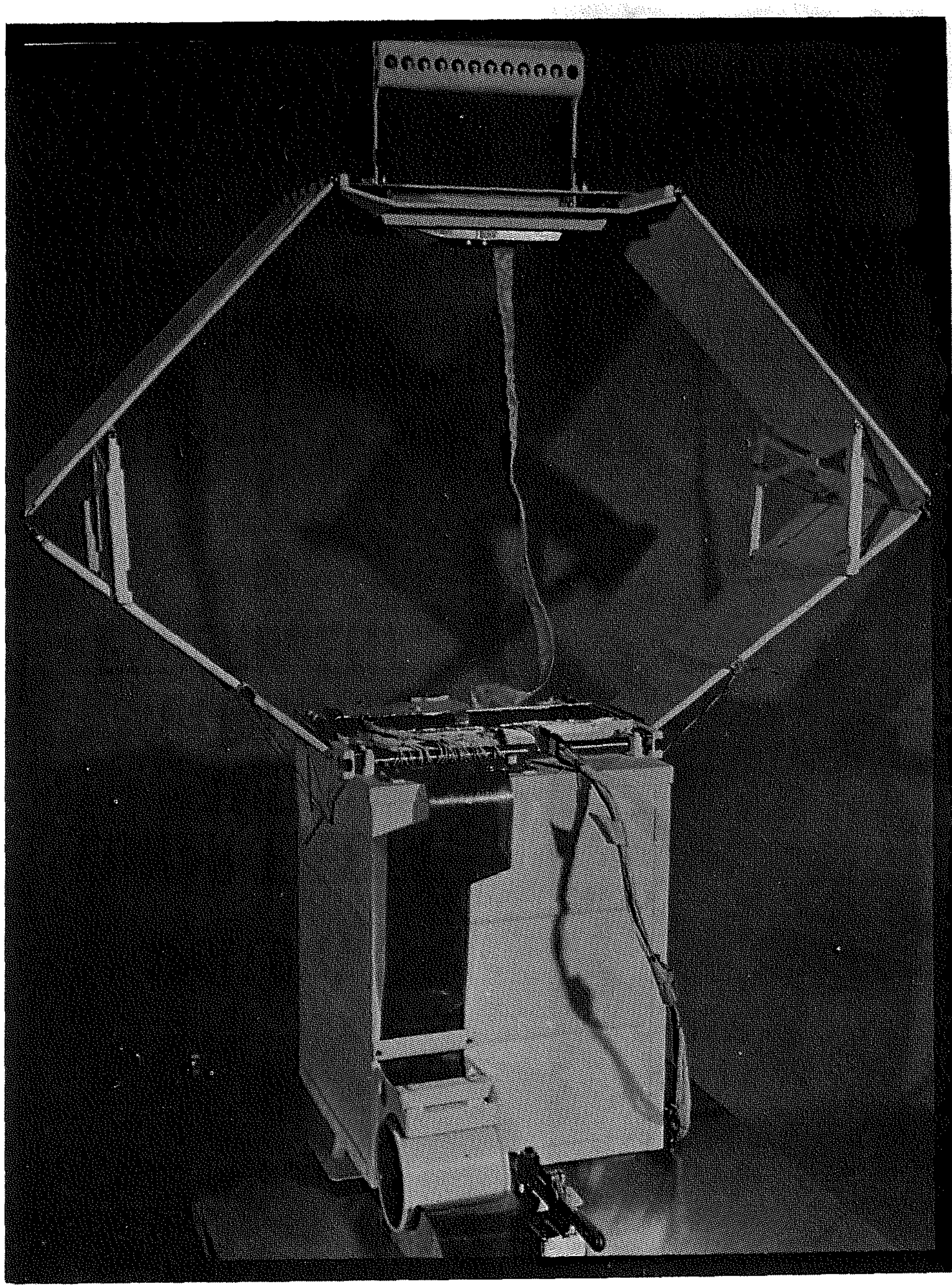
Next viewgraph.

(Slide.)

On the next experiment that's the lunar ejecta and meteorite, this experiment is designed to determine the mass, velocity and frequency of the meteorite impacts on the moon and then also to get the ejecta that comes from these, and you'll notice that we have some plates here that will catch, on the top, that will catch the meteorites coming in and on the sides we have the material that will capture and give us data on the velocity, mass and so forth of the ejecta that is formed from the impact.

APOLLO LUNAR SURFACE SCIENCE MISSION ASSIGNMENTS

	EXPERIMENT	11	12	14	15	16	17
S-031	PASSIVE SEISMIC	X	X	X	X	X	
S-033	ACTIVE SEISMIC			X		X	
S-034	LUNAR SURFACE MAGNETOMETER		X		X	X	
S-035	SOLAR WIND SPECTROMETER		X		X		
S-036	SUPRATHERMAL ION DETECTOR		X	X	X		
S-037	HEAT FLOW				X	X	X
S-038	CHARGED PARTICLE LUNAR ENVIRONMENT			X			
S-058	COLD CATHODE IONIZATION		X	X	X		
M-515	LUNAR DUST DETECTOR		X	X	X		
S-207	LUNAR SURFACE GRAVIMETER						X
S-202	LUNAR EJECTA AND METEORITES						X
S-203	LUNAR SEISMIC PROFILING						X
S-205	LUNAR ATMOSPHERIC COMPOSITION						X
S-201	FAR UV CAMERA/SPECTROSCOPE					X	
S-059	LUNAR GEOLOGY INVESTIGATION	X	X	X	X	X	X
S-078	LASER RANGING RETRO-REFLECTOR	X		X	X		
S-080	SOLAR WIND COMPOSITION	X	X	X	X	X	
S-184	LUNAR SURFACE CLOSE-UP CAMERA	X	X	X			
S-152	COSMIC RAY DETECTOR					X	X
S-198	LUNAR PORTABLE MAGNETOMETER			X		X	
S-199	LUNAR TRAVERSE GRAVIMETER						X
S-200	SOIL MECHANICS			X	X	X	X
S-204	SURFACE ELECTRICAL PROPERTIES						X
S-229	LUNAR NEUTRON PROBE						X



APOLLO 17

LUNAR SURFACE GRAVIMETER

PURPOSE:

TO MEASURE LUNAR TIDAL DEFORMATIONS DUE TO THE SUN AND EARTH AND TO CONFIRM THE EXISTENCE OF GRAVITY WAVES

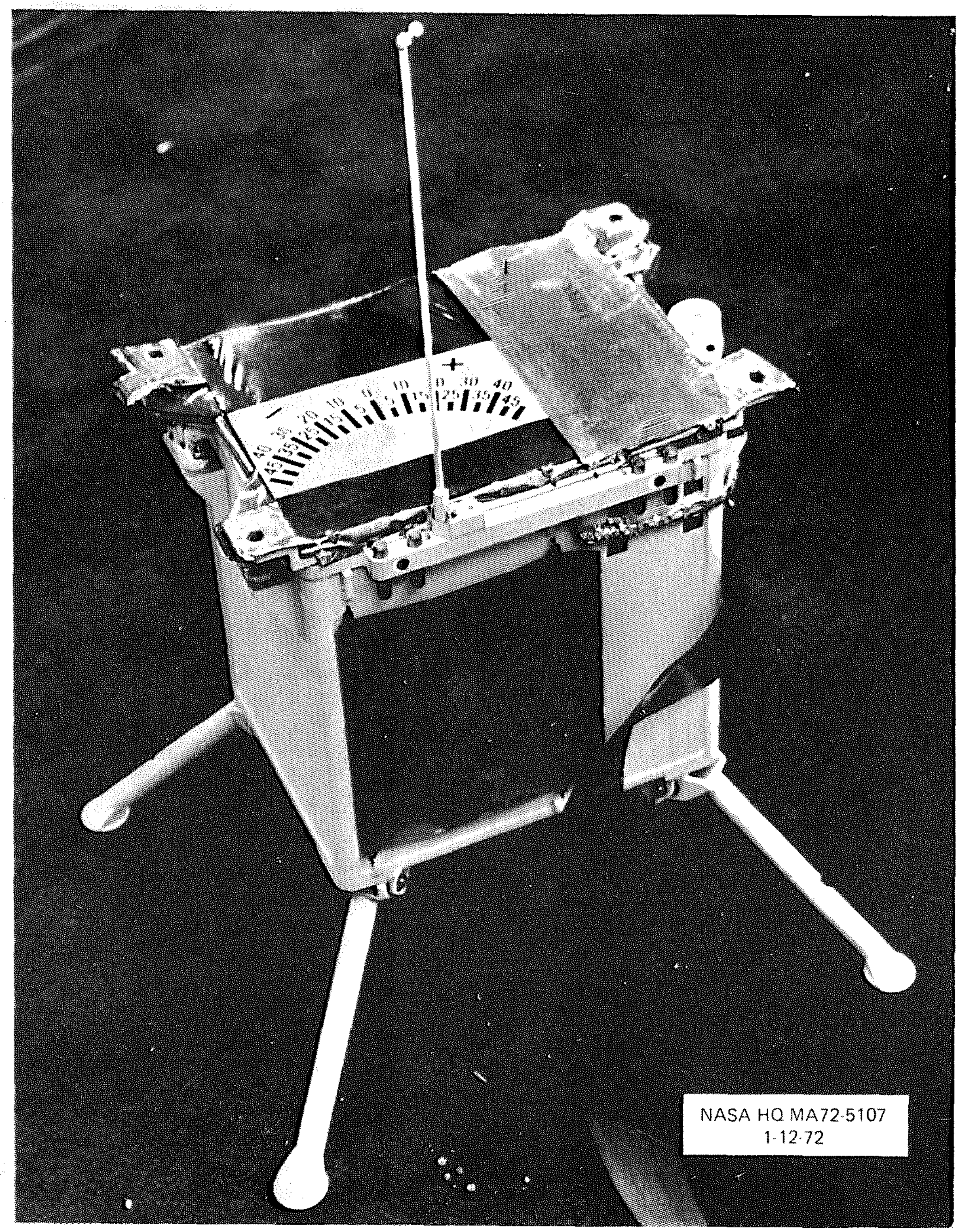
FINAL STATION IN SEISMIC NET

APOLLO 17

LUNAR EJECTA AND METEORITE EXPERIMENT

PURPOSE

TO DETERMINE THE MASS, VELOCITY, AND FREQUENCY OF METEORITE IMPACTS ON THE MOON AND THE NATURE OF LUNAR EJECTA



Now, I guess really one of the things that we hope to get out of this is really the erosion factors, how fast erosion occurs.

Next viewgraph.

(Slide.)

This is the lunar seismic profiling experiment and the purpose is to acquire data on the lunar near surface structure and the layering and we're going to do this by actually setting off, actuating some charges, and there are eight charges and these are the charges laid out; this is the module; and here you see some of the leads to the geophone that will be emplaced. There will be four geophones and I'll describe this a little bit more how they're going to emplace these.

These charges range in size from 1/8 of a pound to 6 pounds and let me pass on now because I want to describe how they'll be laid out and how we intend to set them off a little later.

VOICE: Is this an improvement or something over the earlier lunar active seismic --

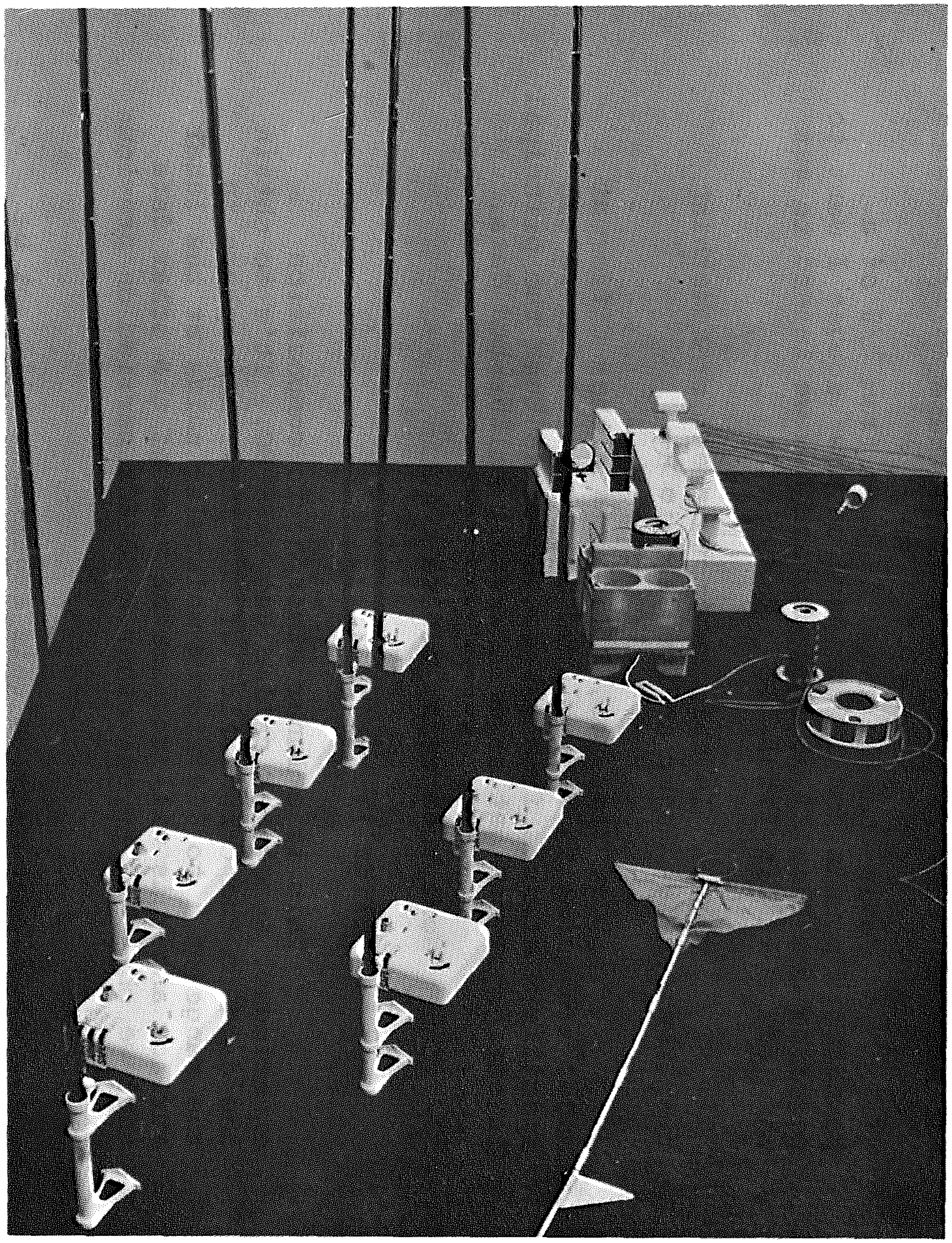
LEE: Yes, yes, Bill, it's either different sizes are going to be emplaced as accurately as we can specific distances from the geophones so that the principal investigator can get more accurately calibrated data.

Next viewgraph, please.

(Slide.)

This is a lunar atmospheric composition experiment, sometimes called the MASSPEC. It's to obtain the data on the composition of the lunar atmosphere in the range of 1 to 110 atomic molecular units at the lunar surface and this will complement some of the other data that we obtained on our other MASSPECs carried on previous missions.

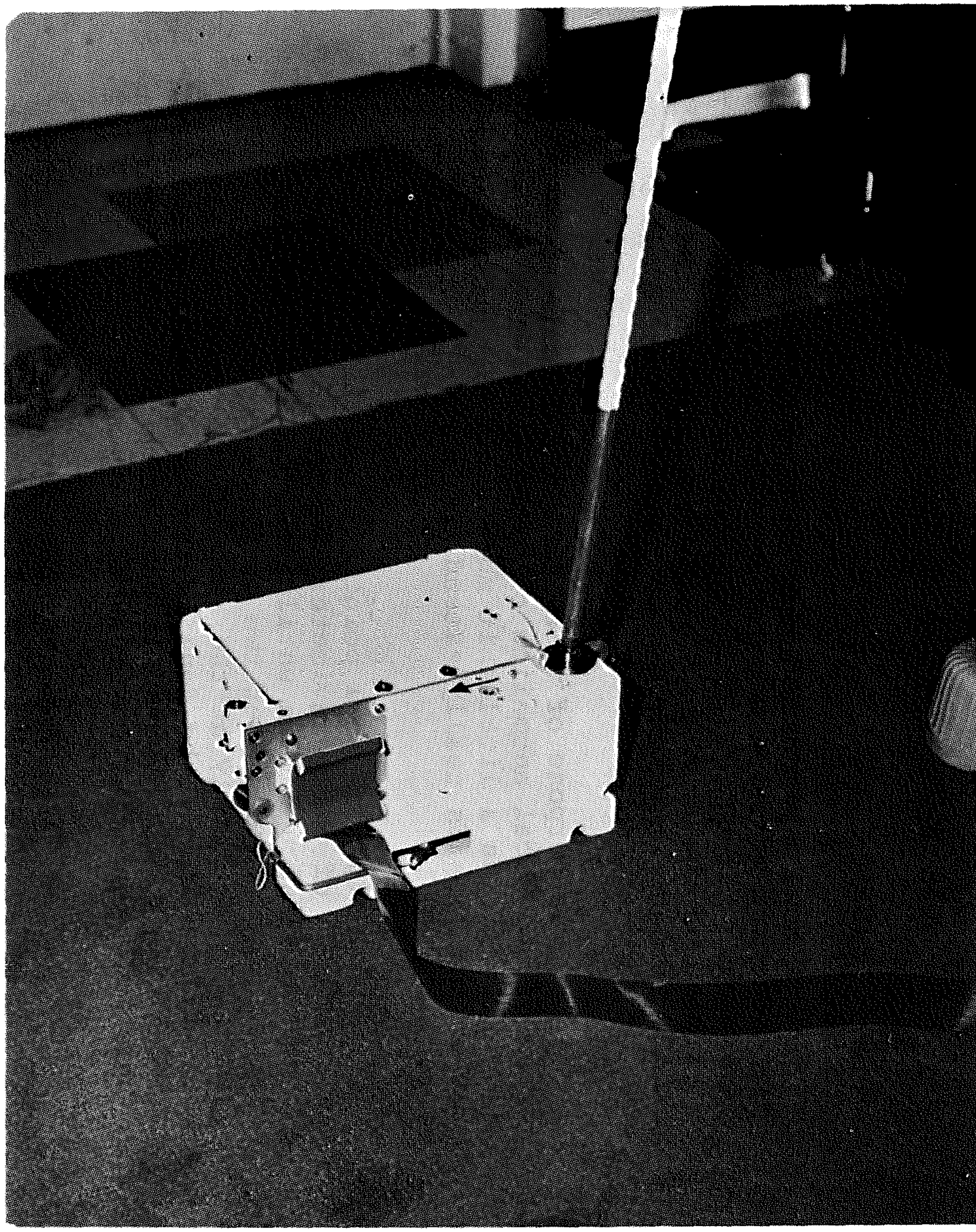
The covers on this experiment will not be removed until after lunar sunset and those will be blown off by command.



LUNAR SEISMIC PROFILING

PURPOSE:

TO ACQUIRE DATA ON LUNAR NEAR SURFACE STRUCTURE AND LAYERING



LUNAR ATMOSPHERIC COMPOSITION

PURPOSE:

TO OBTAIN DATA ON THE COMPOSITION OF THE LUNAR ATMOSPHERE IN THE MASS RANGE OF 1 TO 110 AMU AT THE LUNAR SURFACE

Next viewgraph, please?

(Slide.)

Now, this is not a new experiment. It's really an extension of the one you recall that was a little larger than this. It's carrying many of the same materials for capturing the cosmic rays.

You'll recall on the last one there was a solar flare and so it tended to mass some of the low energy, I believe, particles so this experiment, much smaller but carrying the same material is going to, we hope, be carried out and get us data on a more quiet period on the lunar surface as far as solar flares go.

Next one.

(Slide.)

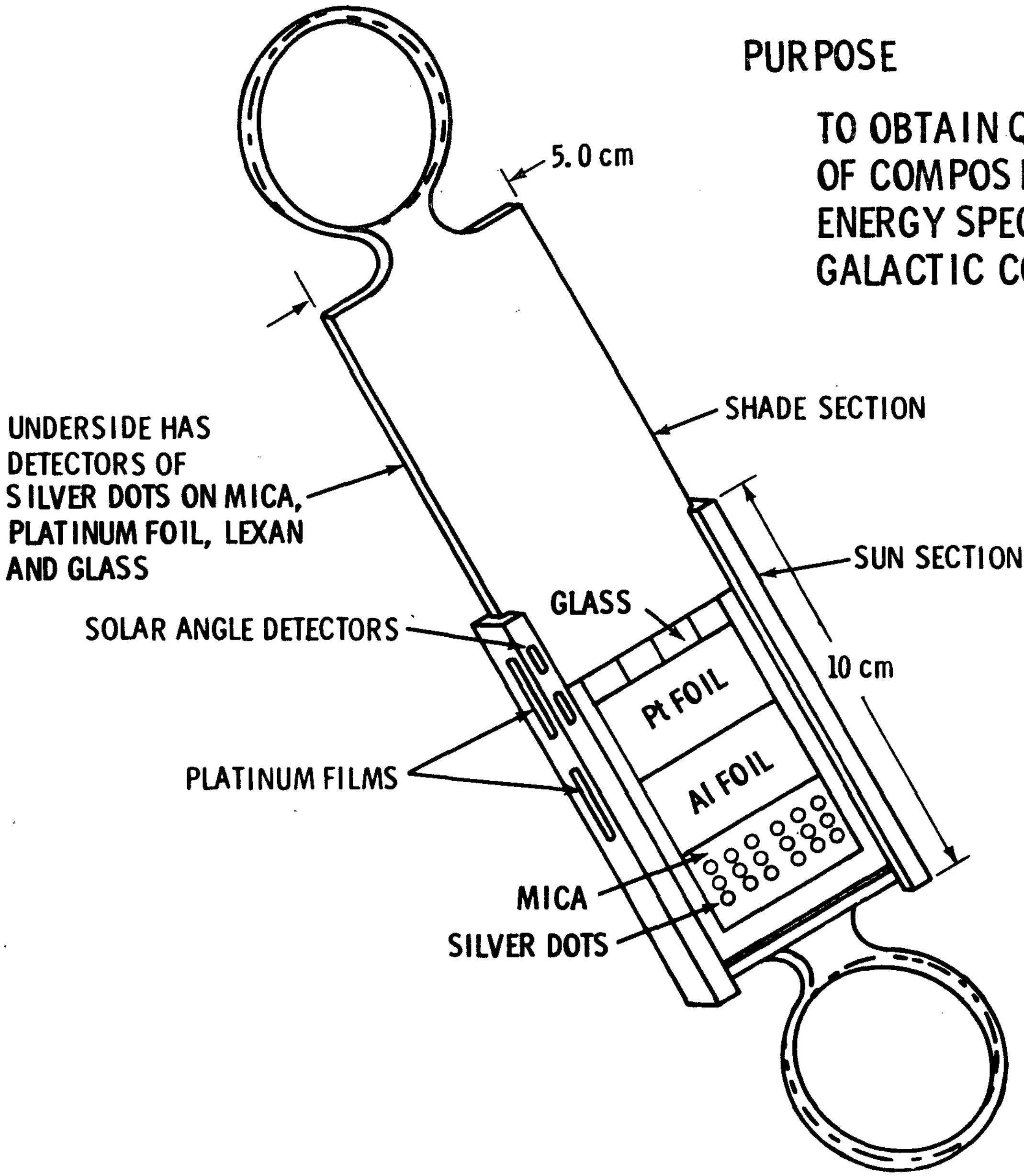
Now, I mentioned once that we have a surface gravimeter and we're also going to carry a lunar traverse gravimeter. And this will be carried, the receiver will be carried on the Rover and readings will be taken at all the science stops and I'll have a few more words on that.

The purpose of this is to really make a relative survey of the local anomalies of gravity and then perhaps this will tell us a little bit more about the substructure, whether the massifs really extend under this valley that we're in.

I might as well point out now that because of the sensitity of this gravimeter, we are not going to pan the television camera until after we have taken the reading. This takes about two or three minutes at the beginning; immediately at the stop of the traverse the first thing that will be done is the camera will be turned on and we won't pan because it does introduce a perturbation in this very sensitive instrument.

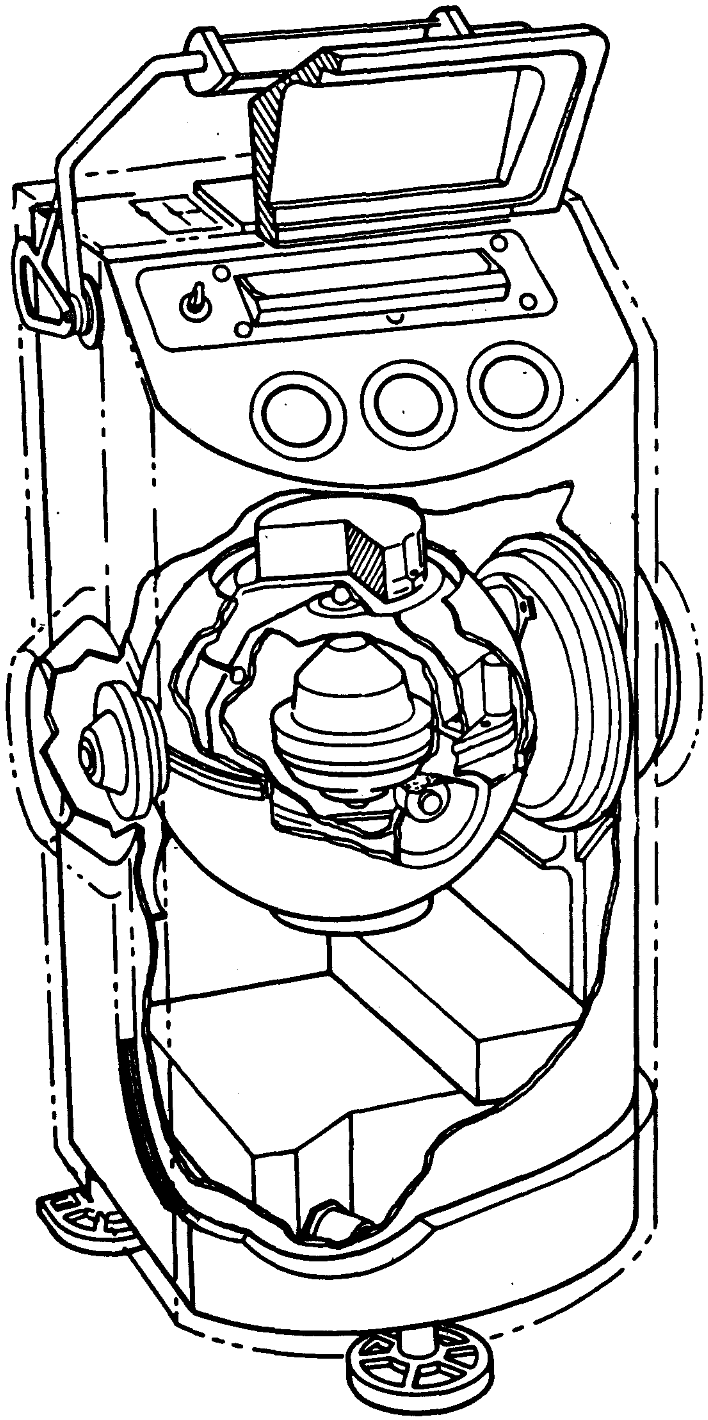
If we find that even that has an impact on the readings, we'll probably go to offloading it from the Rover and putting it on the lunar surface, but we're hoping to avoid this because it does cost some time.

EXTENSION TO COSMIC RAY DETECTOR EXPERIMENT S-152



PURPOSE

TO OBTAIN QUIET SUN MEASUREMENTS OF COMPOSITION, ABUNDANCE, AND ENERGY SPECTRUM OF SOLAR AND GALACTIC COSMIC RAYS



APOLLO 17

TRAVERSE GRAVIMETER

PURPOSE:

TO MAKE A RELATIVE SURVEY OF THE LUNAR GRAVITATIONAL FIELD IN THE LANDING AREA AND TO MAKE AN EARTH-MOON GRAVITY TIE

QUESTION: Aren't you going to be knocking this thing about a good bit just by carrying it from place to place on the Rover?

LEE: We have tested the vibration, Bill, and we think, yes, it will take that. The way it's mounted on the Rover and everything, the vibrations of the Rover as you well know, we've seen pictures that do bounce around, we feel that this will take it.

It's really when you're taking the reading that you've got to be careful about any external perturbations.

QUESTION: Is there any question of the crew moving around? Can one crewman walk around with gear?

LEE: Yes, we considered that. That was discussed and the activity will not interfere with that reading. It's really when it's contiguous to it, I guess is the best word that I can use, right to the instrument where the movement of the television camera and that is almost directly, as you'll see later, located so close to it.

QUESTION: Isn't there a brief moment there when a pan could be taken, the camera stopped before the crewman gets out to take a reading?

LEE: Well, we considered that and it just became so difficult to ask the astronauts to worry about. We're saying we'll turn it on and we'll be looking at the scene and it takes two to three minutes. Maybe it will do better. We're allowing three minutes. They may be able to take a reading sooner.

As soon as they're finished, then we'll start to pan.

QUESTION: The antenna is aligned prior to taking this?

LEE: Well, that will be done, yes. It will be turned on.

VOICE: The other centers can't hear these questions so I'd rather wait until after this is over. They're complaining already.

LEE: Okay, I'm sorry.

I guess I asked you to interrupt me, but if you'll hold them, why we'll get them in later.

Next viewgraph, please.

(Slide.)

Now, this is also a new major experiment, the surface electrical properties. The purpose is to, we hope, to get data that will determine the layering of the lunar surface.

Perhaps it will if water is present in subsurface, search for the presence of a highly reflective surfaces. And it will reflect it although there are a number of different frequencies here, some will go through but if there is water and we have run tests on this here on earth in Greenland and that -- I'm sorry, I'm talking about the lunar sounder; but we have run tests on this that if there is water there we should get an indication on the data received, return from the water surface.

We'll also measure the electrical properties of the lunar materials in place.

I was wondering; I had the depth; I think it is about -- is this just to the regolith, Don, do you recall? What depth do we hope to get on that?

VOICE: About a kilometer or so.

LEE: About a kilometer.

I keep getting my numbers mixed with the lunar sounder which I'll discuss a little bit later.

Next viewgraph, please.

(Slide.)

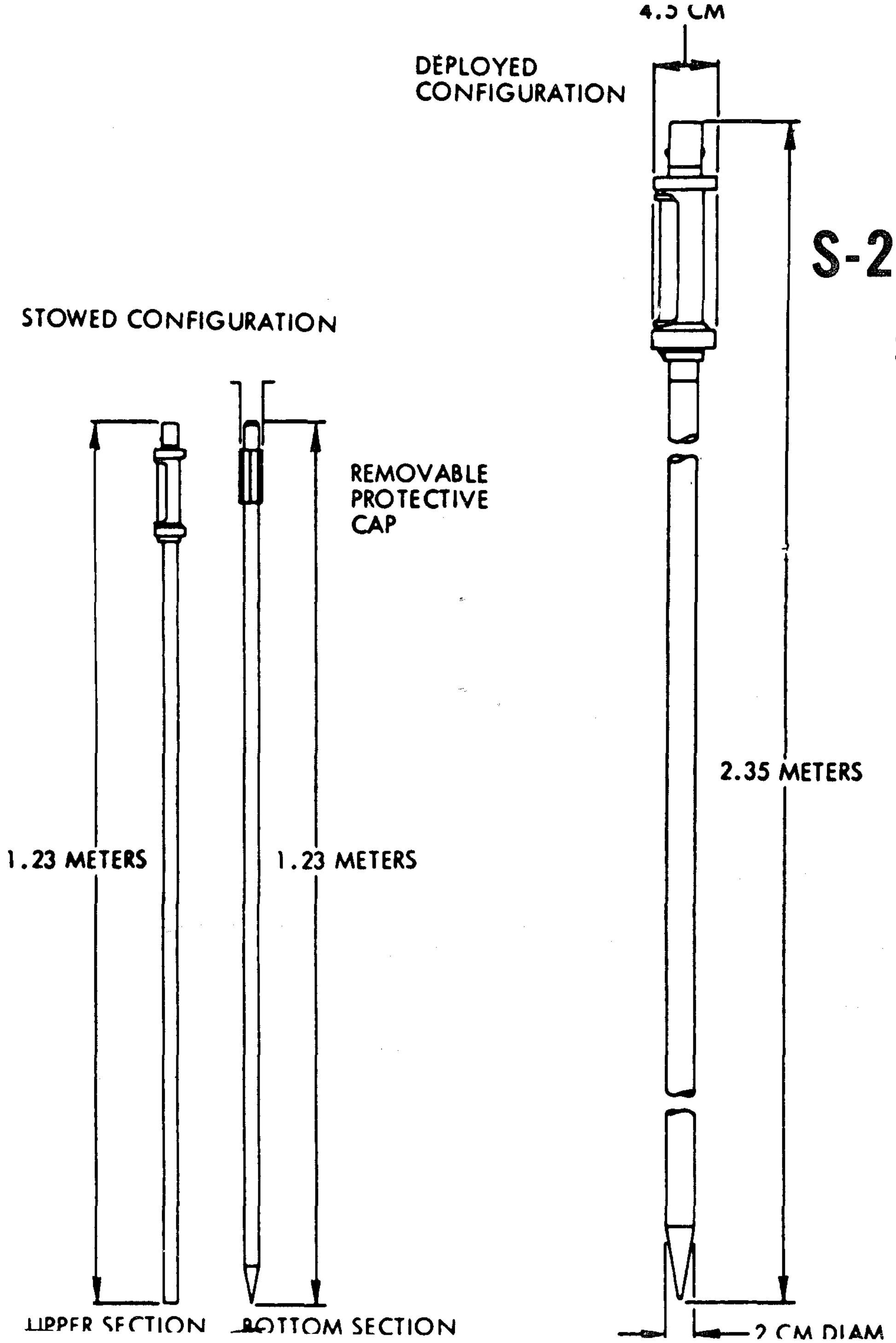
This experiment, called the lunar neutron probe, will be carried for the first time on Apollo 17 and the purpose is to measure the capture rate of the low energy cosmic ray secondary neutrons and a neutron energy spectrum as a function of depth.

S-204 SURFACE ELECTRICAL PROPERTIES EXPERIMENT

- PURPOSE
  - DETERMINE LAYERING IN THE LUNAR SURFACE
  - SEARCH FOR PRESENCE OF HIGHLY REFLECTIVE SURFACES WHICH COULD SIGNAL THE PRESENCE OF SUBSURFACE WATER
  - MEASURE ELECTRICAL PROPERTIES OF LUNAR MATERIAL IN PLACE

S-229 LUNAR NEUTRON PROBE

SURFACE SCIENCE EXPERIMENT



PURPOSE

MEASURE THE CAPTURE RATE OF LOW ENERGY COSMIC RAY SECONDARY NEUTRONS AND NEUTRON ENERGY SPECTRUM AS A FUNCTION OF DEPTH

Now, really, what we're hoping is that we'll get some information here that will tell us how long material has been at the various depths so that the data that's brought back can be used as a standard in the analysis of all these samples that we've brought back and will bring back so that it's not only going to help this particular group of samples coming back but the standard that we hope to get from this as to the neutron capture rate and so forth can give us information that will help us in the analysis of all lunar samples.

This lunar neutron probe will be placed, as you recall, we dig a core with the drill and in that hole where we take the samples we will emplace the lunar neutron probe. That will be left in there and then taken out at the end of EVA-3 and returned here to earth.

Next viewgraph, please.

(Slide.)

Now, we're also carrying some new experiments for the orbital, for Evans to work.

Now, on the right you see the SIM BAY. It's quite familiar to most of you I'm sure and all the new experiments have come into this lower portion here which formerly contained the geochemical, the X-ray, the gamma ray and alpha experiments.

Now, these experiments, new, are first the far UV spectrometer. Can I have the next one?

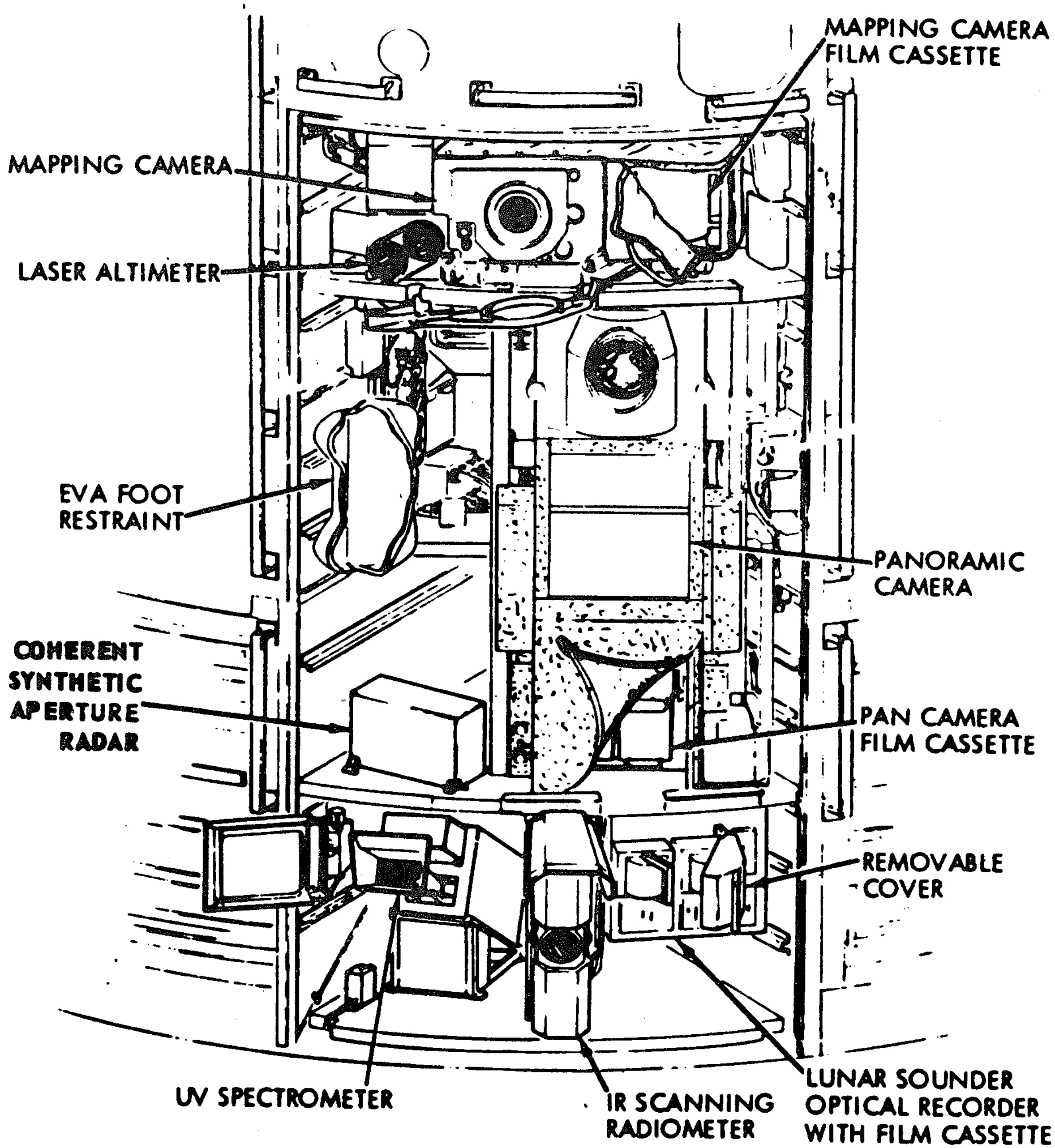
(Slide.)

Far UV spectrometer, you remember we had a far UV spectrometer on the lunar surface last time and it got some pretty exciting information and this time we're carrying one in orbit and it's to determine the composition density of lunar atmosphere. It's to measure the lifetime of the spacecraft exhaust gasses while we're in lunar orbit to get us an idea how long they remain in orbit; and it's also searching for areas of possible surface gas emissions as we orbit the moon.

Next viewgraph, please.

(Slide.)

APOLLO 17
SIM BAY



APOLLO ORBITAL SCIENCE MISSION ASSIGNMENTS

	EXPERIMENT	11	12	14	15	16	17
SERVICE MODULE:							
S-160	GAMMA-RAY SPECTROMETER				X	X	
S-161	X-RAY SPECTROMETER				X	X	
S-162	ALPHA-PARTICLE SPECTROMETER				X	X	
S-164	S-BAND TRANSPONDER (CSM/LM)			X	X	X	X
S-165	MASS SPECTROMETER				X	X	
S-169	FAR UV SPECTROMETER						X
S-170	BISTATIC RADAR			X	X		
S-171	IR SCAN RADIOMETER						X
	SUBSATELLITE:						
S-173	PARTICLE MEASUREMENT				X	X	
S-174	MAGNETOMETER				X	X	
S-164	S-BAND TRANSPONDER				X	X	
S-209	LUNAR SOUNDER						X
	SM PHOTOGRAPHIC TASKS:						
	24" PANORAMIC CAMERA				X	X	X
	3" MAPPING CAMERA				X	X	X
	LASER ALTIMETER				X	X	X
COMMAND MODULE:							
	CM PHOTOGRAPHIC TASKS:	X	X	X	X	X	X
S-158	MULTISPECTRAL PHOTOGRAPHY		X				
S-176	CM WINDOW METEOROID			X	X	X	X
S-177	UV PHOTO EARTH & MOON				X	X	
S-178	GEGENSCHEIN			X	X		
M-211	BIOSTACK					X	X
M-212	BIOCORE						X

S-169 FAR UV SPECTROMETER

PURPOSE

- DETERMINE COMPOSITION AND DENSITY OF LUNAR ATMOSPHERE
- MEASURE LIFETIME OF SPACECRAFT EXHAUST GASES
- SEARCH FOR AREAS OF SURFACE GAS EMISSIONS

Next experiment is the infrared scan radiometer. Now, we do have some thermal maps made here from earth of the lunar surface, the side we see. We hope with this experiment to get data to correlate and confirm the thermal map we made here on earth and certainly give us more details.

We hope that perhaps if there are thermally anomalous regions that the orbits we happen to cover, the area which I'll discuss a little later, that perhaps we might find one of these anomalous regions which certainly would be very exciting.

We'll also measure the cooling rate of these anomalies to indicate the local heat sources and this is sort of tied into the terminator. As the terminator passes over over a period of time, then we can get an idea of how fast they cool.

So this last objective's purpose is really related to the terminator.

Next viewgraph, please.

(Slide.)

Now, the lunar sounder module -- I'm sorry, I almost neglected the lunar sounder which is the very important major experiment -- is to probe the near lunar subsurface and this actually has three frequencies and we should be able to get the depths of one, one and a half kilometers. This should give us a pretty good idea the depth and nature of the regolith which varies of course and which we're very interested in, the gardening effect.

Perhaps we can determine the structure underlying the Mare the we fly over, just what sort of a structure is there; are there layers; how deep are they?

Also hoping that we might find some sites of buried craters just by the data that comes back and is reflected wave. Probe structures underlying rilles and determine the nature of the rille and the data should help us to determine the nature of the subsurface highland Mare contact. Just what is the nature of where the highlands and the Mare reach and how did the Mare get there and maybe tell us more about the Mare.

APOLLO 17

S-171 IR SCANNING RADIOMETER

ORBITAL SCIENCE EXPERIMENT

- PURPOSE
  - PROVIDE THERMAL MAP OF MOON
  - LOCATE THERMALLY ANOMALOUS REGIONS
  - MEASURE COOLING RATE OF ANOMALIES TO INDICATE LOCAL HEAT SOURCES

APOLLO 17

S-209 LUNAR SOUNDER

ORBITAL SCIENCE EXPERIMENT

- PURPOSE
  - PROBE THE NEAR-LUNAR SUBSURFACE TO:
    - DETERMINE DEPTH AND NATURE OF THE REGOLITH
    - DETERMINE STRUCTURE UNDERLYING MARE
    - SEARCH FOR SITES OF BURIED CRATERS
    - PROBE STRUCTURES UNDERLYING RILLES AND DETERMINE NATURE OF RILLE
    - DETERMINE NATURE OF SUBSURFACE HIGHLAND-MARE CONTACT

Next viewgraph, please.

(Slide.)

I think it's very interesting. I wanted to show you this that the antennas, as you can see, are quite long, 34 feet on each side; and these will be deployed like we have previous antennas.

It also has a VHF antenna that is located right here. These antennas will be jettisoned prior to the EVA to recover the film cassettes; the VHF antenna does not get jettisoned.

Next viewgraph, please?

(Slide.)

Carried in the command module is a new medical experiment called the BIOCORE and this experiment is related to the high Z particles. As you know, the blindfold tests that we've had the crews conduct, which we will also have them conduct this time. This is to try to get a little bit more data.

There will be six pocket mice carried in an environmental controlled situation in here and the ECS system is controlled through here. It's entirely passive. It's stowed. Of course, at the regular stowage time. The crew has nothing to do with this so when they return it will be removed and returned to the principal investigators for examination of the mice to see if there's any effect to the high Z particles.

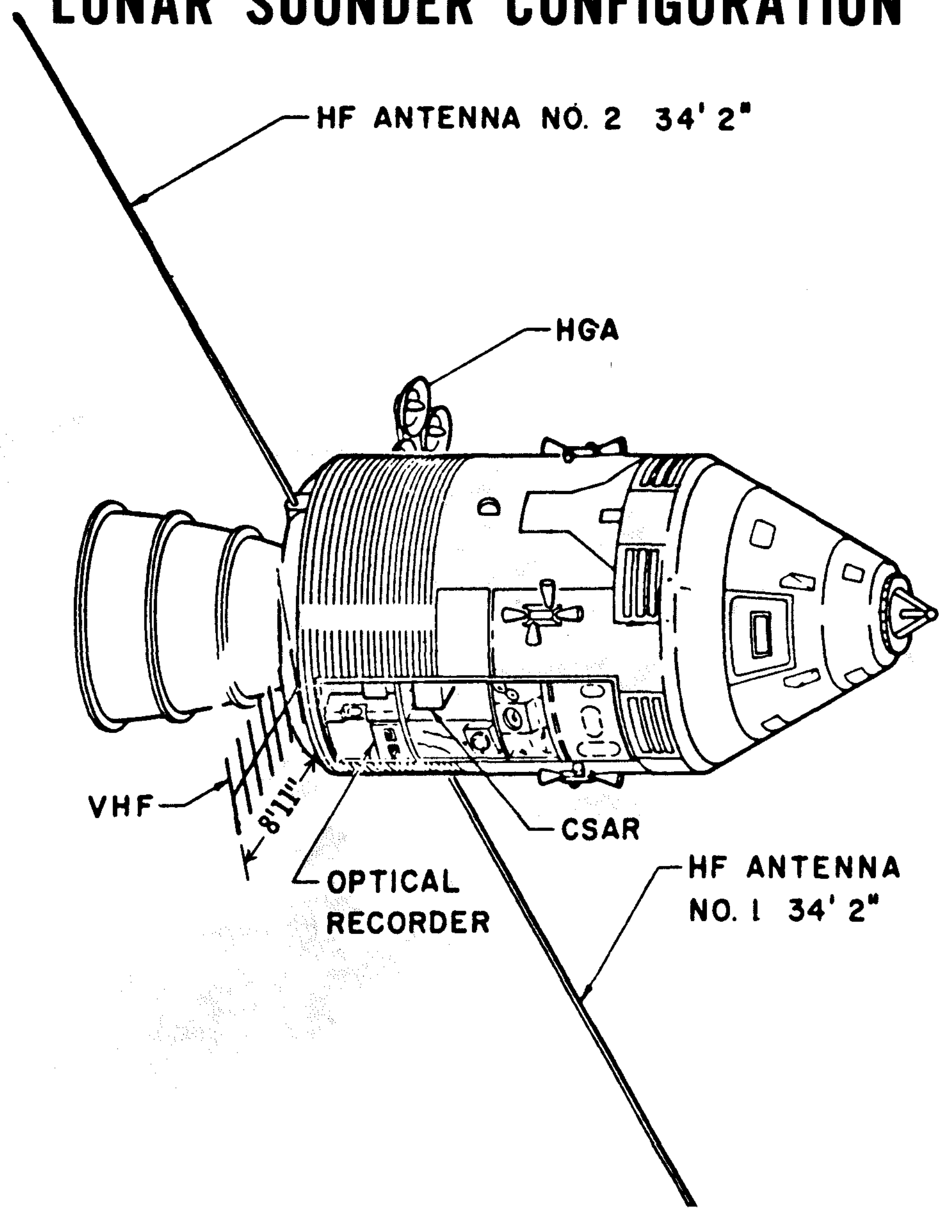
Next viewgraph, please.

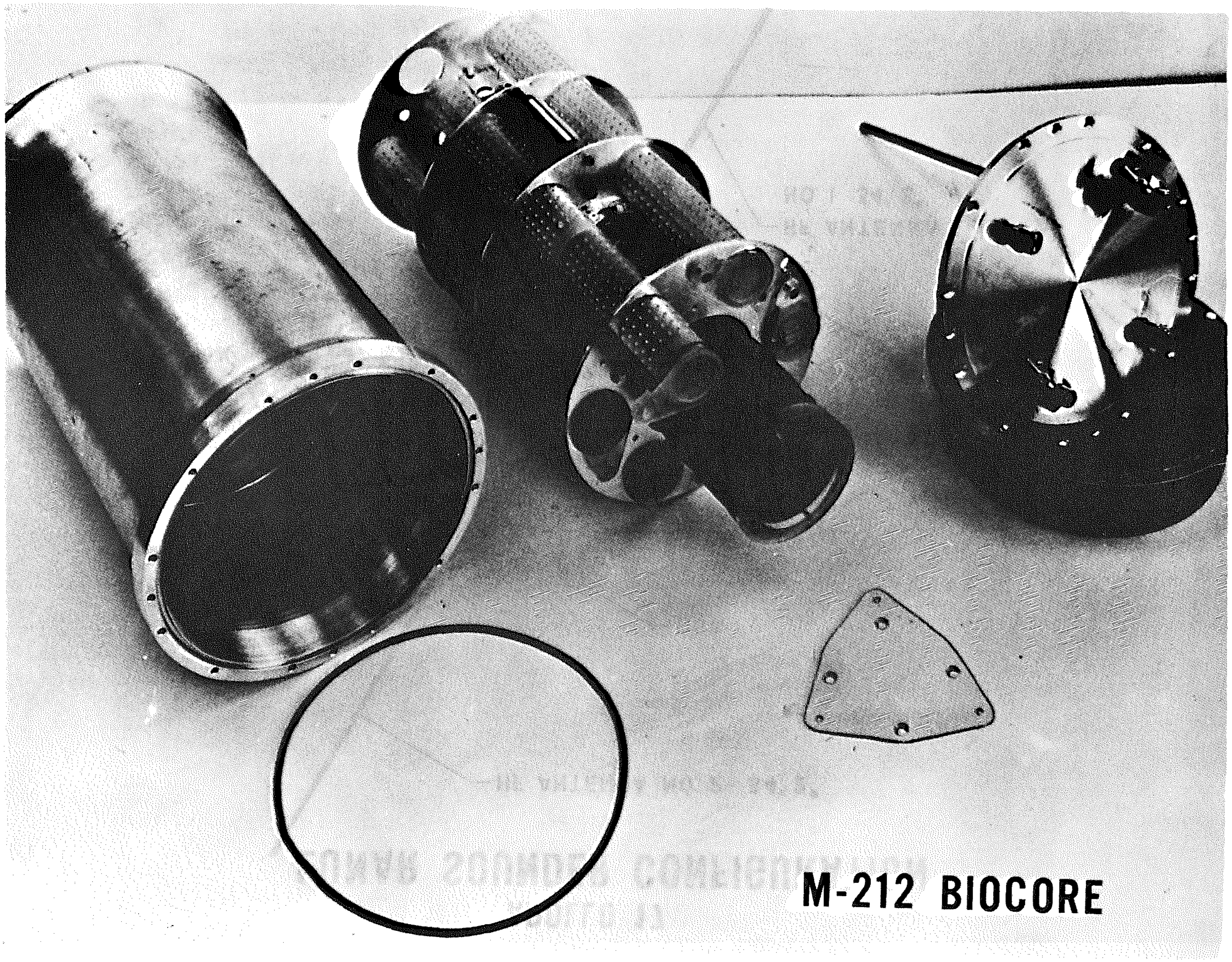
(Slide.)

That covers generally the new experiments, both surface and orbital. As you've heard, you will get more details on these at later briefings.

Now, with regard to the operations of the mission, there are some differences as we've had in the past, and I think one of them, significant ones, is that the launch time on Apollo 17 will occur at night.

APOLLO 17
LUNAR SOUNDER CONFIGURATION




M-212 BIOCORE

APOLLO 17 VS APOLLO 16
OPERATIONAL DIFFERENCES

ITEM	APOLLO 17	APOLLO 16
LAUNCH TIME	NIGHT	DAY
TRANSLUNAR INJECTION	ATLANTIC (3RD REV)	PACIFIC (2ND REV)
DESCENT ORBIT INSERTION	DOI-1 & 2 MANEUVERS	ONE DOI MANEUVER
PERILUNE LOCATION	10° W OF LANDING SITE	16° E OF LANDING SITE
LUNAR SURFACE STAY	75 HOURS	73 HOURS (PLANNED 71 HOURS (ACTUAL)
TRAVERSE DISTANCE	32.9 KM	25.2KM (PLANNED) 26.7 KM (ACTUAL)
LUNAR ORBIT PLANE CHANGES	1	2 (PLANNED)
EARTH RETURN INCLINATION	66.5° DESCENDING	62° ASCENDING
TOTAL MISSION TIME	304:31 (PLANNED)	290:36 (PLANNED) 265:51 (ACTUAL)

This is our first night launch. We have been prepared in the past, as you know, on some of our alternate days to go with a night launch. We have examined it very carefully. There's nothing more difficult than a day launch as far as the crew safety goes. We've examined that very carefully.

The abort procedures and so forth, should that unfortunate necessity arise. The recovery crews have trained in the past on this and there's no problem there, so we're all prepared for all aspects of that.

Our first launch opportunity is December the 6th,

. Eastern Standard Time is 9:53 at night, it opens the window and closes at 1:31 A.M., Dec. 7th.

The sun elevation angle at landing is 13.3 degrees. Now, we do have a T+24 opportunity for December. The sun angle does go higher. We've examined this and we see no problems here. The thermal conditions are a little hotter but we've examined that in our experiments and our consummables and all that, we have plenty of margins for the higher sun angles.

Now, if, for some reason, we miss December, then we have launch windows in January. In this case we have three opportunities, primarily because of the earth's and moon location and the sun angle happens that we can go down to 6.8 degrees on the first opportunity, whereas it was much lower on the 5th of December; it doesn't quite match this but 6.8 is an angle that we have set as acceptable so that we can then take advantage of the first opportunity, which is January the 4th.

The windows are pretty much the same, a little shorter; and the reason this one is shorter is that we are instead of opening the launch window on an azimuth of 72 degrees we're going to an azimuth of 84 degrees to 100 degrees and the purpose here is primarily for the energy requirements.

QUESTION: Chet, you can repeat the gist of this question over the circuit, but I'd like to have it answered: What are the constraints that dictate a night launch at this time?

APOLLO 17

LAUNCH WINDOWS
(E.S.T.)

LAUNCH DATE	LAUNCH OPPORTUNITIES	OPEN (72°)	CLOSE (100°)	SUN ELEVATION ANGLE
DECEMBER 6, 1972	T-0	2153	0131	13.3°
DECEMBER 7, 1972	T+24	2153	0131	16.9°-19.1°
JANUARY 4, 1973*	T-0	2151	2352	6.8°
JANUARY 5, 1973	T+24	2021	2351	10.2°-11.1°
JANUARY 6, 1973	T+48	2028	2356	20.3°-22.4°
FEBRUARY 3, 1973	T-24	1847	2213	13.3°-15.5°
FEBRUARY 4, 1973	T-0	1858	2220	13.3°-15.5°

* LAUNCH AZIMUTH LIMITS FOR JANUARY 4 ARE 84° TO 100°

LEE: The question Mr. Heinz asked was what are the constraints that dictate a night launch at this time?

The dictate really comes, Bill, of the sun angle. The earth-moon relationship, our energy capability of launching. You know, we are going to take longer to get there. We have varied the time on the moon. It's really getting there at the optimum sun angle.

QUESTION: That far east.

LEE: That far east, that's right.

And, again, in February we have two opportunities. We have discarded the third opportunity, which is a T+24 simply because the sun angle, as I recall, the sun angle is something like 26 degrees in landing and this is too high because of the zero phase and out trajectory of landing is 25 so we did not want to accept that. We have not accepted it and we have limited our launch opportunity in FEbruary to two days.

We are going to use this time a T-24 capability, which you may recall means that if we go in the T-24 that we stay in lunar orbit before landing an extra 24 hours in order to allow the sun angle to get up to 13 degrees to get an acceptable angle.

Is there any more that we needed for Bill's answer?

VOICE: I think that's it.

LEE: Now, that's the launch time, the launch window. Another first in this mission is again because of this same relationship in getting to the moon for the proper sun angle and so forth, we are going to do the TLI, the trans-lunar injection, over the Atlantic instead of the Pacific.

Now, as you'll recall, we did this on a second time over the Pacific. As I recall, we did the TLI. Now, here we're going to go past the Pacific and we're going to do the TLI over the Atlantic and this means the TLI will occur about 45 minutes later than we have in the past.

As I recall it was something like two hours and forty minutes, about that time, we'd do the TLI. Now this is going to be a little over three hours. As far as tracking on that, I would like to point out that we should have plenty of good tracking for the TLI -- for preparations of the TLI. Everything has been examined. This is very acceptable and no problems expected here.

Next viewgraph, please.

(Slide.)

I'd like to just point out that the TLI will occur in this region. I've shown here the low side (?) positions. This is a first opportunity and this is the second day opportunity -- or is this the second opportunity same day? It's another rev. If we're not ready to go on the first optimum time, we will then delay a rev and then the TLI will occur in this area here.

Note that the position of TLI walks back as we walk through the launch azimuth, as we walk through the window. If we have to go another rev, then it walks back from this position over here.

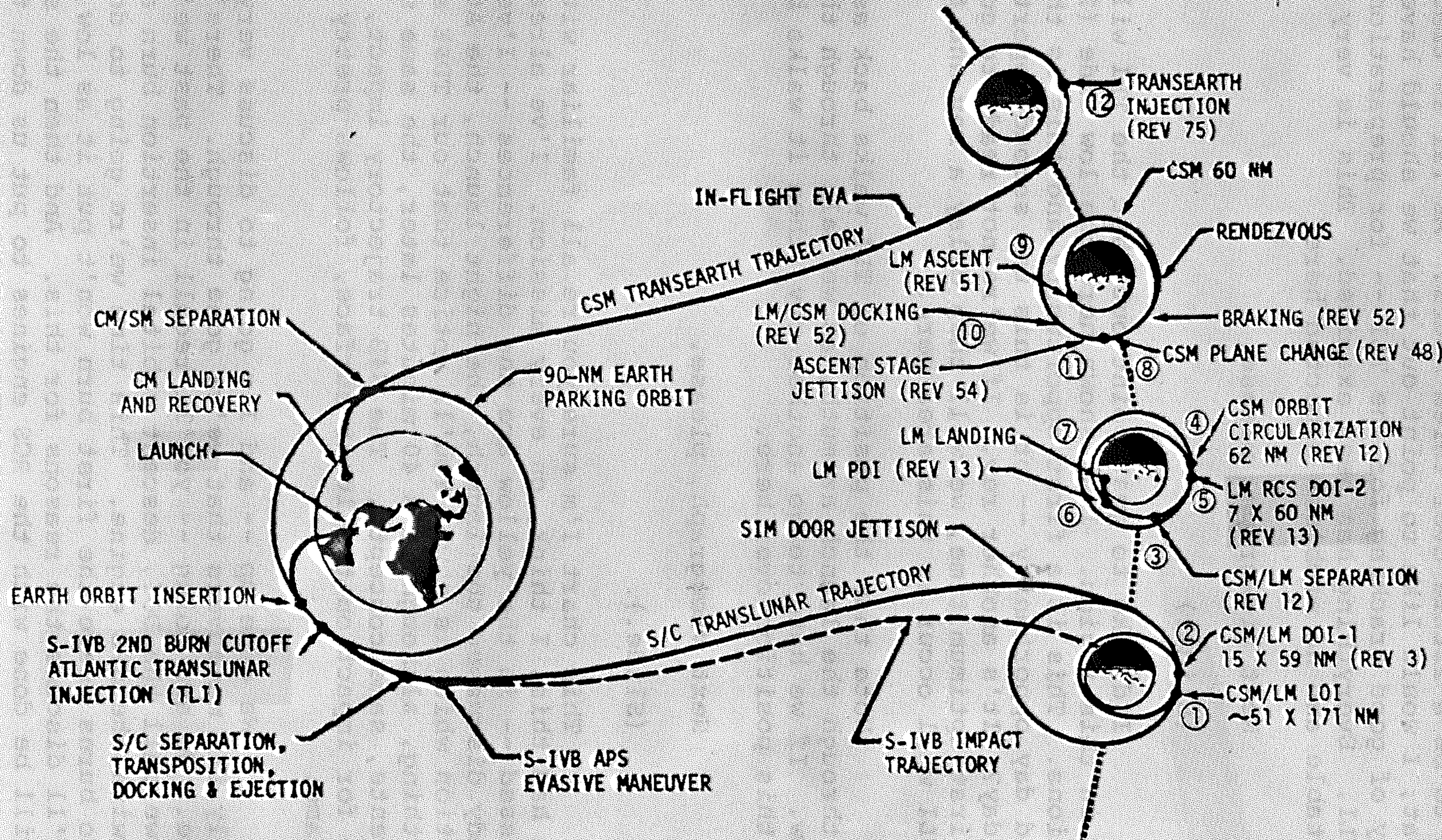
Next viewgraph, please.

(Slide.)

This chart I'm sure you're all familiar with; we've had this, I think, on every mission. I've already discussed -- in the yellow are the differences -- I've already discussed the launch, the night launch, the Atlantic injection which is new. You'll notice that our TD&E and everything, although it's 40 minutes later, the same sequence of events, same concepts. The S4B trajectory impact, lining it up for impact on the lunar surface, follows pretty much the same.

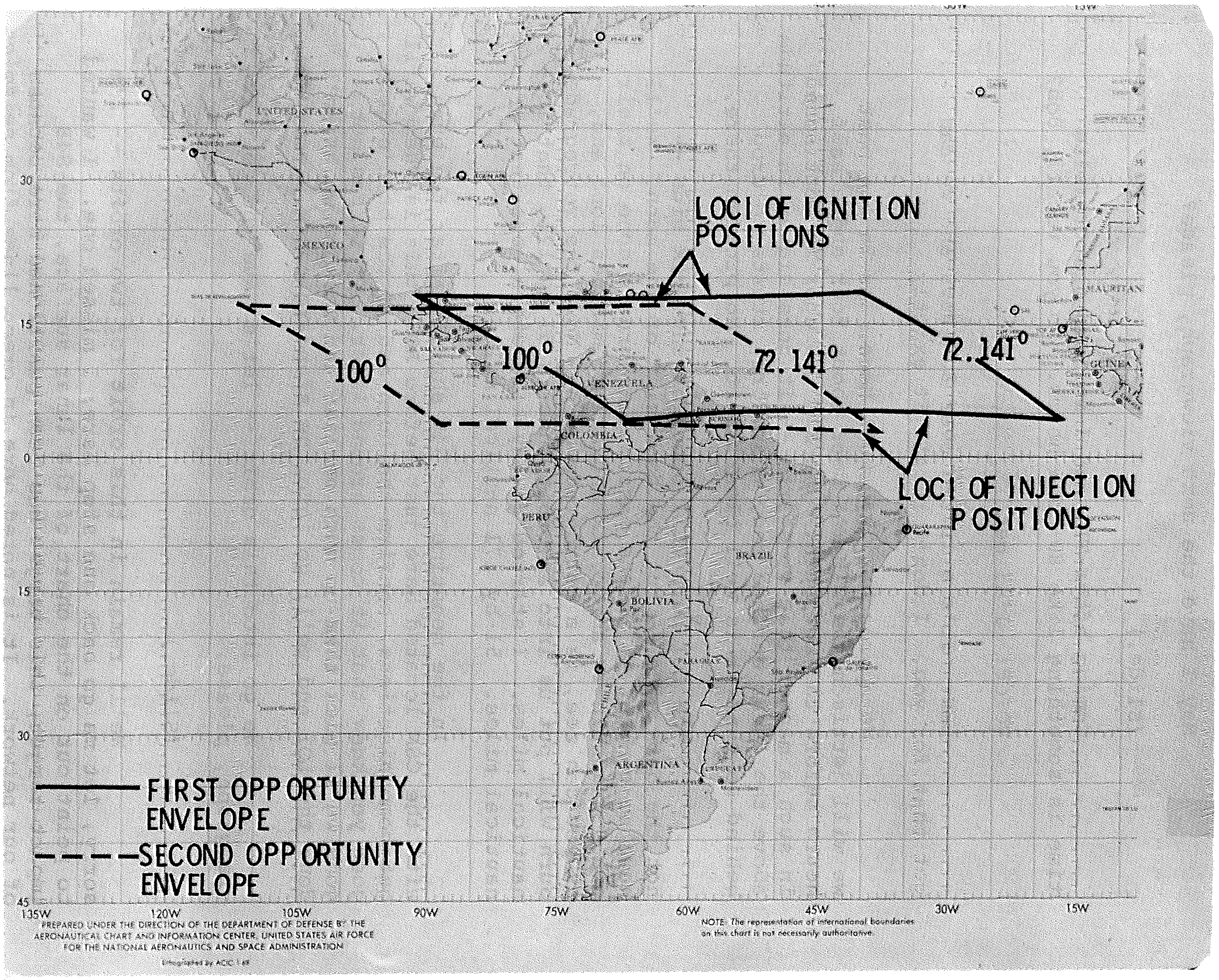
We come up -- and I'm going to discuss very briefly the maneuvers that we've gone through. There's one change. We are doing -- you'll recall in the past we've done what we call the DOI, descent orbital insertion burn and one burn with the SPS engine. This time we're going to do it in two burns where the first burn won't put it as low perigee and I'll discuss the reasons for this. And then the second one will be done with the RCS engines to put us down to the perigee that we want for the landing.

APOLLO 17
FLIGHT PROFILE



NOTE: NUMBERS ASSOCIATED WITH MAJOR LUNAR ORBIT EVENTS INDICATE ORDER OF OCCURRENCE.

4174


LOCI OF IGNITION POSITIONS
100°
100°
72.141°
72.141°
LOCI OF INJECTION POSITIONS
UNITED STATES
MEXICO
CUBA
VENEZUELA
COLOMBIA
PERU
BRAZIL
BOLIVIA
ARGENTINA
GUINEA
FIRST OPPORTUNITY ENVELOPE
SECOND OPPORTUNITY ENVELOPE
30
15
0
15
30
45
135W
120W
105W
90W
75W
60W
45W
30W
15W
PREPARED UNDER THE DIRECTION OF THE DEPARTMENT OF DEFENSE BY THE AERONAUTICAL CHART AND INFORMATION CENTER, UNITED STATES AIR FORCE FOR THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NOTE: The representation of international boundaries on this chart is not necessarily authoritative.

May I have the next viewgraph, please?

(Slide.)

Coming after TLI and I believe the transit time is something like 80-some hours. Do you recall, Bob?

VOICE: I'll get it.

LEE: It's a little over 80 hours and we can get that for you. I don't recall it exactly.

We approach a hyperbola here. As in the past we will jettison the SIM BAY door about four and a half hours before the LOI burn. The SIM BAY door is jettisoned in such a manner that it starts -- it goes higher in altitude above the lunar surface and, therefore, starts to drop behind so that it is well clear of it. No problem there.

The LOI burn will occur on the dark side -- not the dark side -- but the back side of the moon. We'll have no contact as in the past. The burn is done on their own. The burn is about six and a half minutes long and, as you can see, is a retrograde burn. Now, the retrograde burn will put us into an orbit that is 51 by 171, that is nautical miles. I started to say kilometers, but that's nautical miles. 51 by 171 nautical miles.

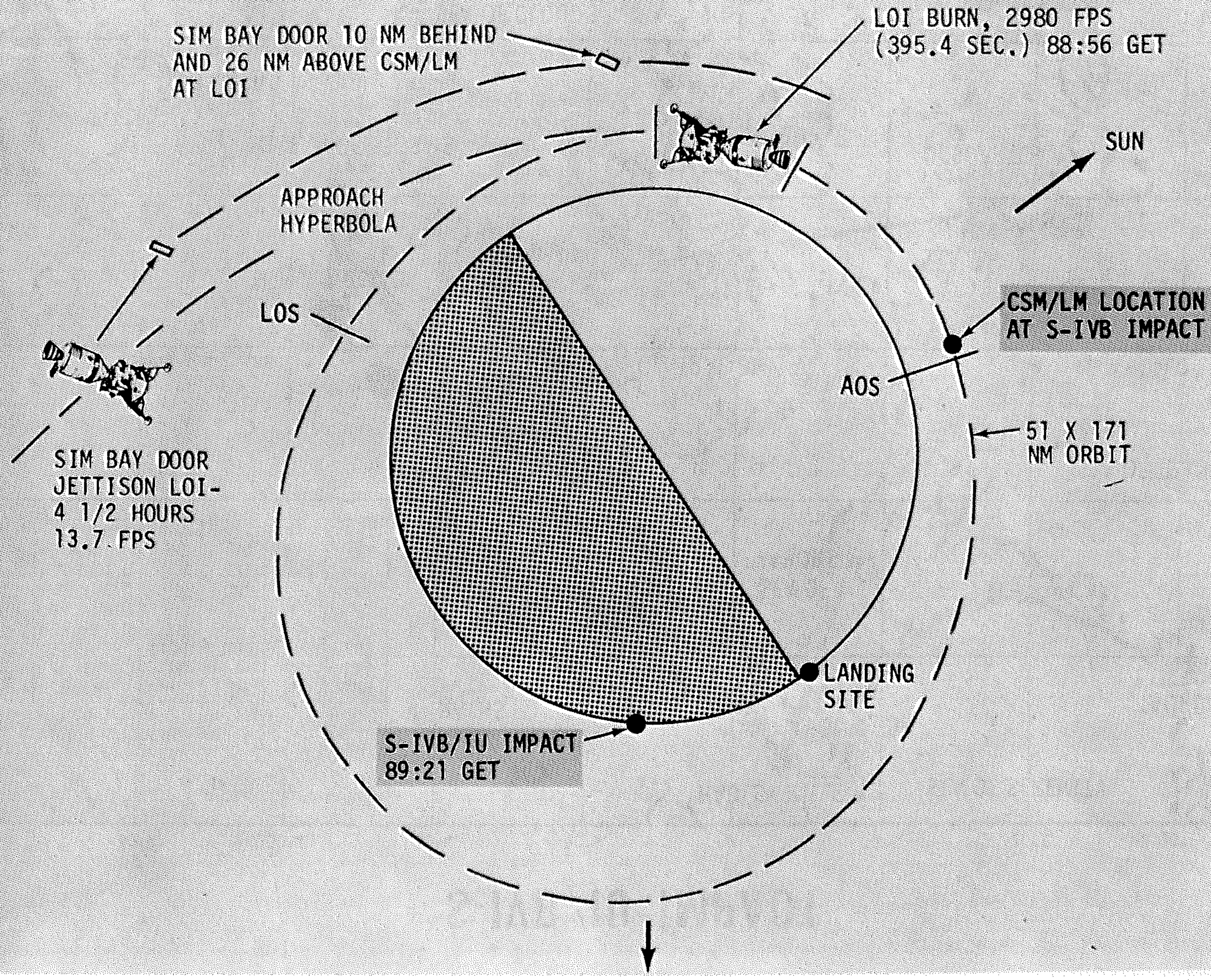
In the meantime the S4B shortly after the burn with the CSM located here just before AOS, this is when we'll get communications, confirm the burn and if the burn's gone good you know that it comes around later. If it has not gone we'll pick them up much earlier and we know we haven't done the LOI and we'll go into the standard abort procedures.

We go into this orbit -- let's have the next viewgraph, please.

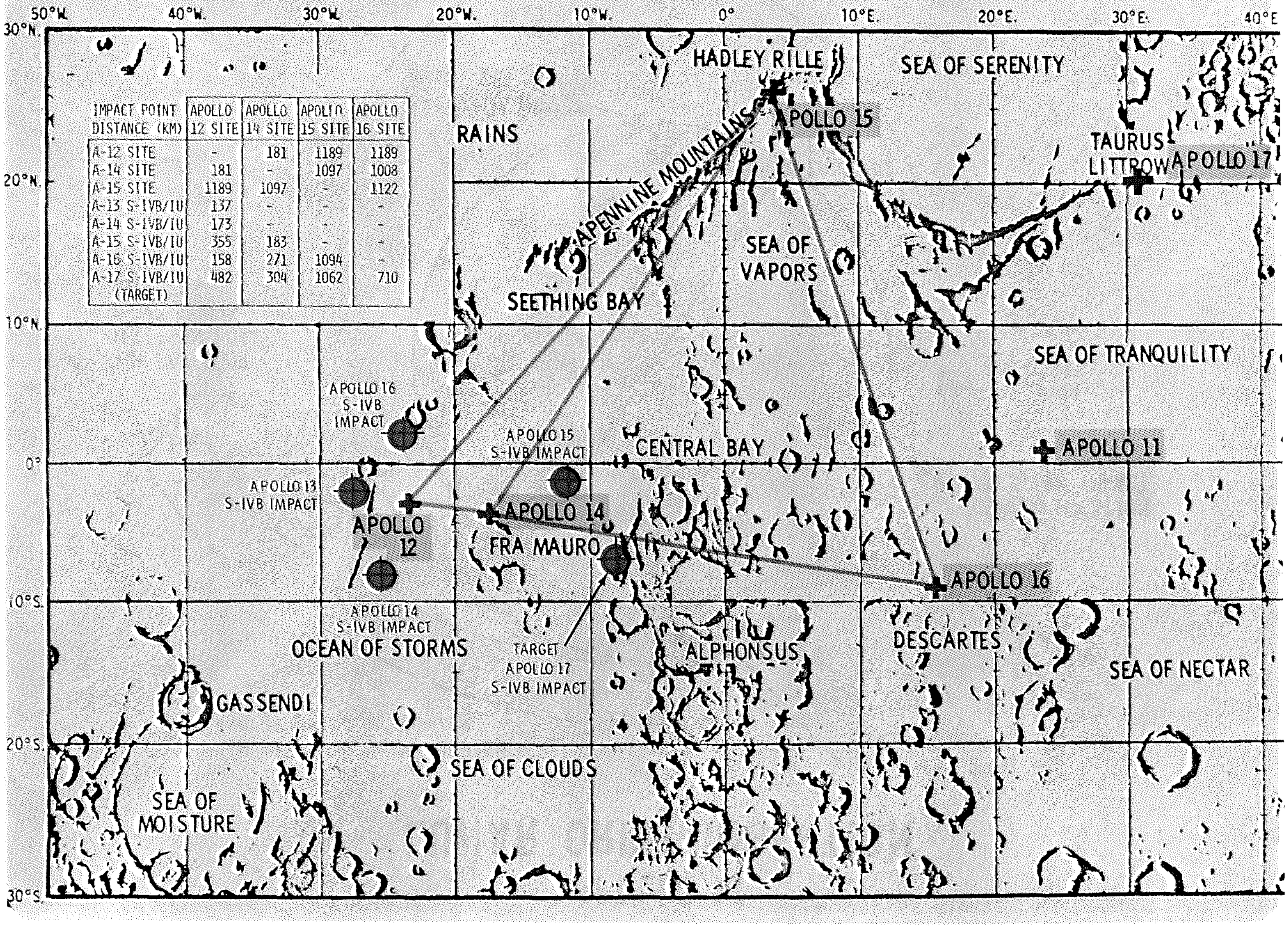
(Slide.)

We'll remain in this orbit for two orbits -- I'm sorry, let me go back one step here; I missed one. I wanted to point out on the chart of the lunar surface, the S4B impact target, this target has been positioned here because of our network. It is noted here in green lines from seismics that have been left there before. Seismic experiments have been left there before.

APOLLO 17
LUNAR ORBIT INSERTION



S-IVB/IU IMPACT



IMPACT POINT DISTANCE (KM)	APOLLO 12 SITE	APOLLO 14 SITE	APOLLO 15 SITE	APOLLO 16 SITE
A-12 SITE	-	181	1189	1189
A-14 SITE	181	-	1097	1008
A-15 SITE	1189	1097	-	1122
A-13 S-IVB/IU	137	-	-	-
A-14 S-IVB/IU	173	-	-	-
A-15 S-IVB/IU	355	183	-	-
A-16 S-IVB/IU	158	271	1094	-
A-17 S-IVB/IU (TARGET)	482	304	1062	710

The purpose here is to try to get the seismic wave transmitted through what appears obviously to be different types of lunar terrain, and we hope that we will get these, pick up these signals as we have in the past. It's a pretty good impact; and, as you know, recently we have indications from the photographs they have picked up the locations of previous S4B impacts.

In the left-hand part of this -- I won't go into details -- but it does tell you the distances from the impact -- of the impact from the various sites. 482 kilometers from Apollo 12. 304 from Apollo 14. It's quite a distance from Apollo 15, as you can see, 1062 kilometers. And about 710 from the Apollo 16.

Slide, please.

(Slide.)

Now, we've done the LOI burn and, as I started to say, we'll go into two orbits. The beginning of the third orbit we will do our first DOI burn and it's done quite similar as in the past. It's the SPS engine. It will be a burn of about 23 seconds. Slows us down into an orbit that is now 15 nautical miles at perilune, and 59 at apolune.

Now, this will change, as you know, due to the mass cons, so I'll mention more about that a little later.

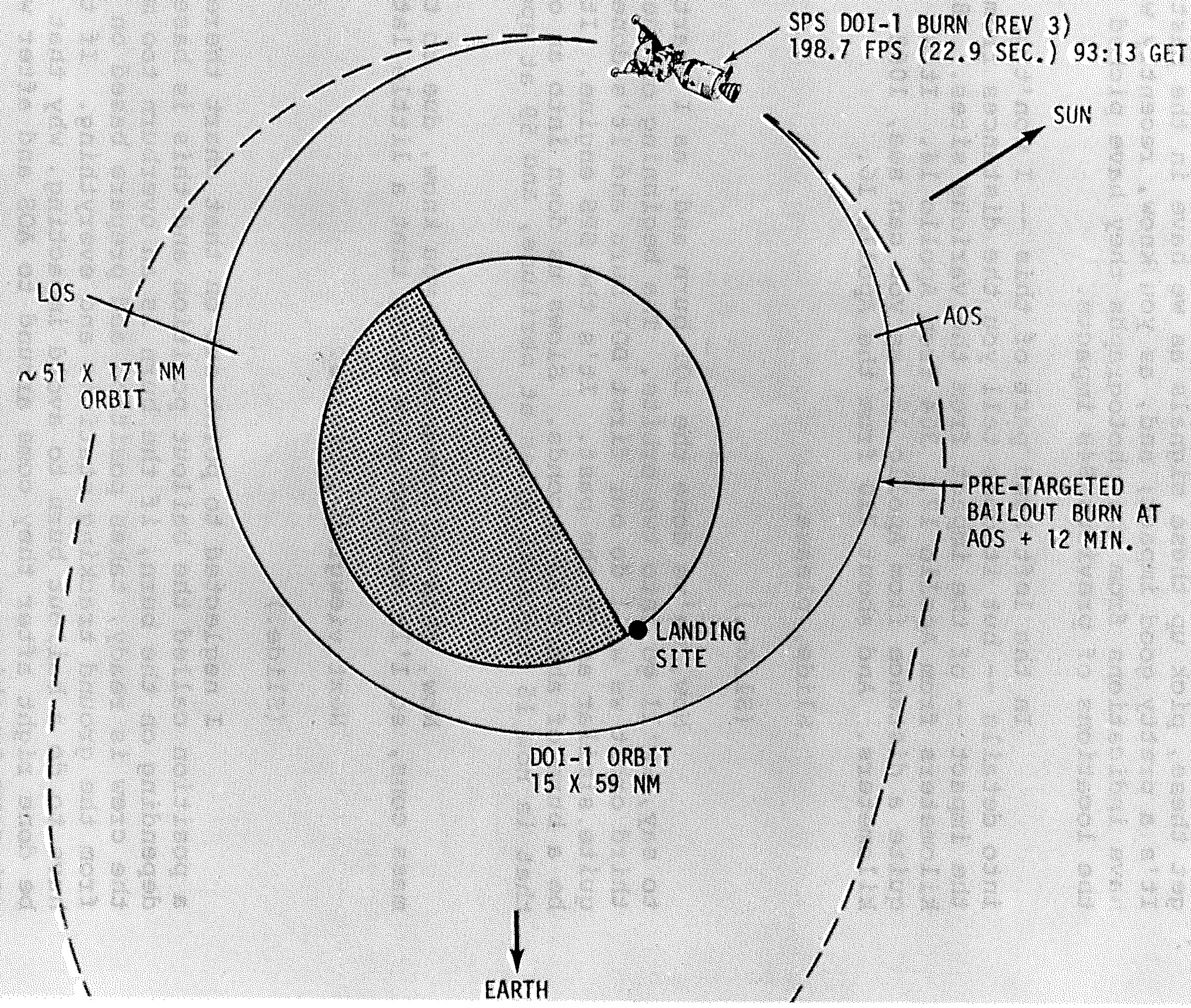
Next viewgraph, please.

(Slide.)

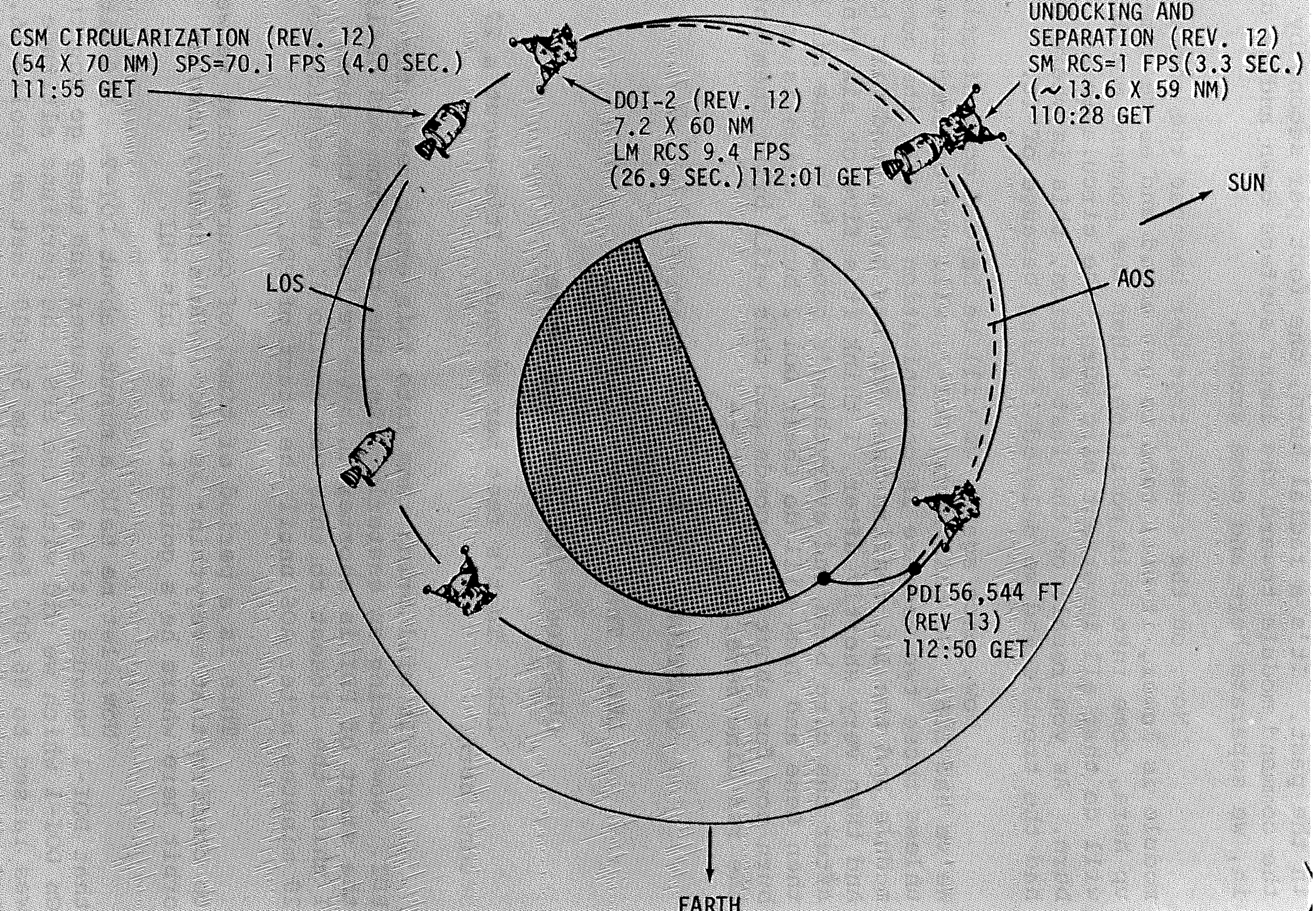
I neglected to point out on that chart there was a position called the bailout position and this is based on, depending on the burn, if the burn is an overburn too much, the crew is ready, takes position and prepare based on reports from the ground tracking stations and everything. If they have to do a bailout burn to avoid impacting, why that will be done right after they come around to AOS and after we've got some tracking.

Now, we remain in that 15 by 51, I believe it was, orbit for nine revs approximately. Now the first thing coming on the backside of the moon, on the rev 12, we will have the separation which is quite similar to what we've done

APOLLO 17
FIRST DESCENT ORBIT INSERTION (DOI-1)



APOLLO 17
CSM/LM LANDING EVENTS



in the past. It's a radial burn, one foot per second by the command module toward the lunar surface down and we do in, we separate here and come around.

Now, on the green, together because the command module is lower, it will tend to get ahead and as we come up here, come into this position, then the command module will do that all important circ burn, the circularizing burn. As you recall on the last mission, this is where we had the trouble and we delayed landing because of it.

Now, once again, we will be beyond communication. We've had LOS. So this burn, DOI-2, will not be conducted unless these two who are in communication by VHF, the command module and the LM, confirm that Ron has had a good circ burn. And then very shortly after, I think it's five or six minutes after the circ burn and everything's good; he's done his burn, then Gene and Jack will do their DOI-2 burn, which is an RCS burn now for about 27 seconds and this will bring them onto the red line here, this orbit --

QUESTION: So it's 9.4, Chet.

LEE: That's feet per second.

QUESTION: Oh, yes, excuse me.

LEE: That's feet per second. It's about a 27 second burn.

It will bring them into this orbit ready for PDI. Now, being an easterly site, the time from AOS until the start of PDI is shorter than we've had in the past. I think the closest to this was Apollo 11 when we had about 20 minutes after AOS until the start of PDI.

This is a period of time, of course, that we want to confirm that everything is good. He's coming into an orbit here where he's going to start his PDI.

Now, let me talk a minute about DOI-2. And with that DOI-1 because it's a dual maneuver and they go together. On DOI-1 which we did with the SPS, the perilune altitude was raised to 86,000 feet versus 54,000 feet on Apollo 16. And what I mean there is if we were just doing the one burn like we did on 16, we immediately brought the perilune down to 54,000 feet for the landing phase, but on this mission the burn is not going to be quite as great and so the perilune is going to be 86,000 feet.

Now, this has certain advantages. In addition to this perilune, we're also shifting the location of the perilune to 10 degrees west of the landing site rather than 16 degrees east as it was on Apollo 16. In other words, if the site is east, -- the perilune is east of the site, then you're starting to go up as you come over the site.

On this mission, with the perilune west we're still coming down. So the perilune after the DOI-2 is actually 40,000 feet. That's the closest you get to the surface. But where we start PDI because we shifted this perilune we will start it about the same altitude as we have in the past, approximately 56,000 feet.

Now what does this do for us? Actually it provides sufficient time for the flight controllers to determine burn characteristics. By moving this perilune we have permitted an earlier AOS. They come around at a higher altitude and therefore we picked up about three minutes of tracking time. In other words, instead of 12 minutes before they start the PDI this gives us about 15 minutes. Adequate time to confirm that everything is good for the start of PDI.

It does, as I pointed out earlier, reduce the probability of a necessity for a DOI-1 bailout maneuver because we're only coming down to 86,000 feet with a big SPS engine where an overburn really gets critical. With 86,000 feet clearance it really reduces the probability of an overburn to such an extent that we'd have to bailout and it also does give us a higher altitude for landmark tracking and the higher we are the more accurate the landmark tracking is, but let me emphasize landmark tracking is not a necessity because of our previous photographs and data we have acquired on the previous mission, but it does make it easier and that's what we want to do.

Now, let's go to -- this is DOI-1; this is what it provided us. DOI-2 which lowers the perilune from 80,000, see, it's degraded from 86,000 to 80,000 by the time we do it due to the mass cons; it lowers it to approximately 43,000 feet. And that perilune, remember now, is west of the landing site.

APOLLO 17
DESCENT ORBIT INSERTION MANEUVERS

- DOI-1
  - PERILUNE ALTITUDE RAISED TO ~86,000 FT VS ~54,000 FT ON APOLLO 16
  - PERILUNE LOCATION SHIFTED TO 10° W. OF LANDING SITE VS 16° E ON APOLLO 16
    - (1) PROVIDES SUFFICIENT TIME FOR FLIGHT CONTROLLERS TO DETERMINE BURN CHARACTERISTICS
    - (2) REDUCES PROBABILITY OF NECESSITY FOR DOI-1 BAILOUT MANEUVER
    - (3) LANDMARK TRACKING ENHANCED BY HIGHER ALTITUDE
  - SHOULD PRECLUDE EARLY CREW WAKEUP FOR A DOI TRIM MANEUVER

- DOI-2
  - LOWERS PERILUNE FROM ~80,000 FT TO ~43,000 FT.
  - 40 LBS OF LM RCS USED
  - NET GAIN IN HOVER TIME OF ~3 SEC.
  - SPS RESERVES INCREASED BY ~25 FPS

It does use up 40 pounds of the LM RCS and by doing that plus a few other little factors, we gain because of the less weight, see, we've burn up that rate, the LM is lighter plus a few other things, we gain three seconds of hover time.

And on this mission we very much wanted to provide all the margin of hover time we can because you'll see later they're going into a really exciting spot.

The net gain of hover time is about three seconds. It might be as much as four or five seconds; we're still calculating those. But there is a net gain and the SPS reserves because of the shorter first burn we pick up about 25 feet per second of the SPS reserves and we know with this we'd like to keep for rescue and for bad weather avoidance on return to earth.

Next viewgraph, please.

(Slide.)

I mentioned why we like to have lots of hover time and I think these -- this is an actual photograph. I think it's a Hasselblad. Is that right, George?

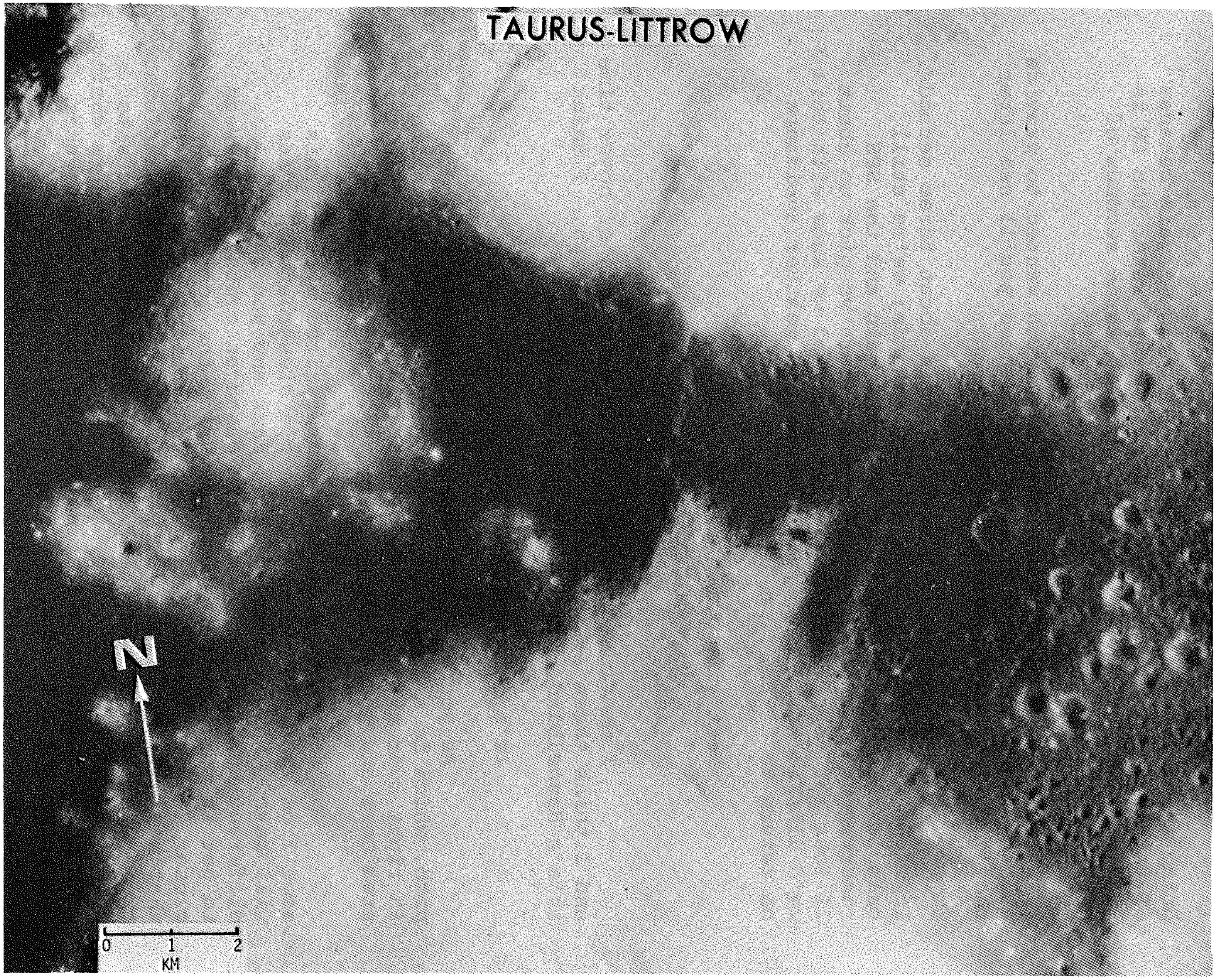
It's a Hasselblad.

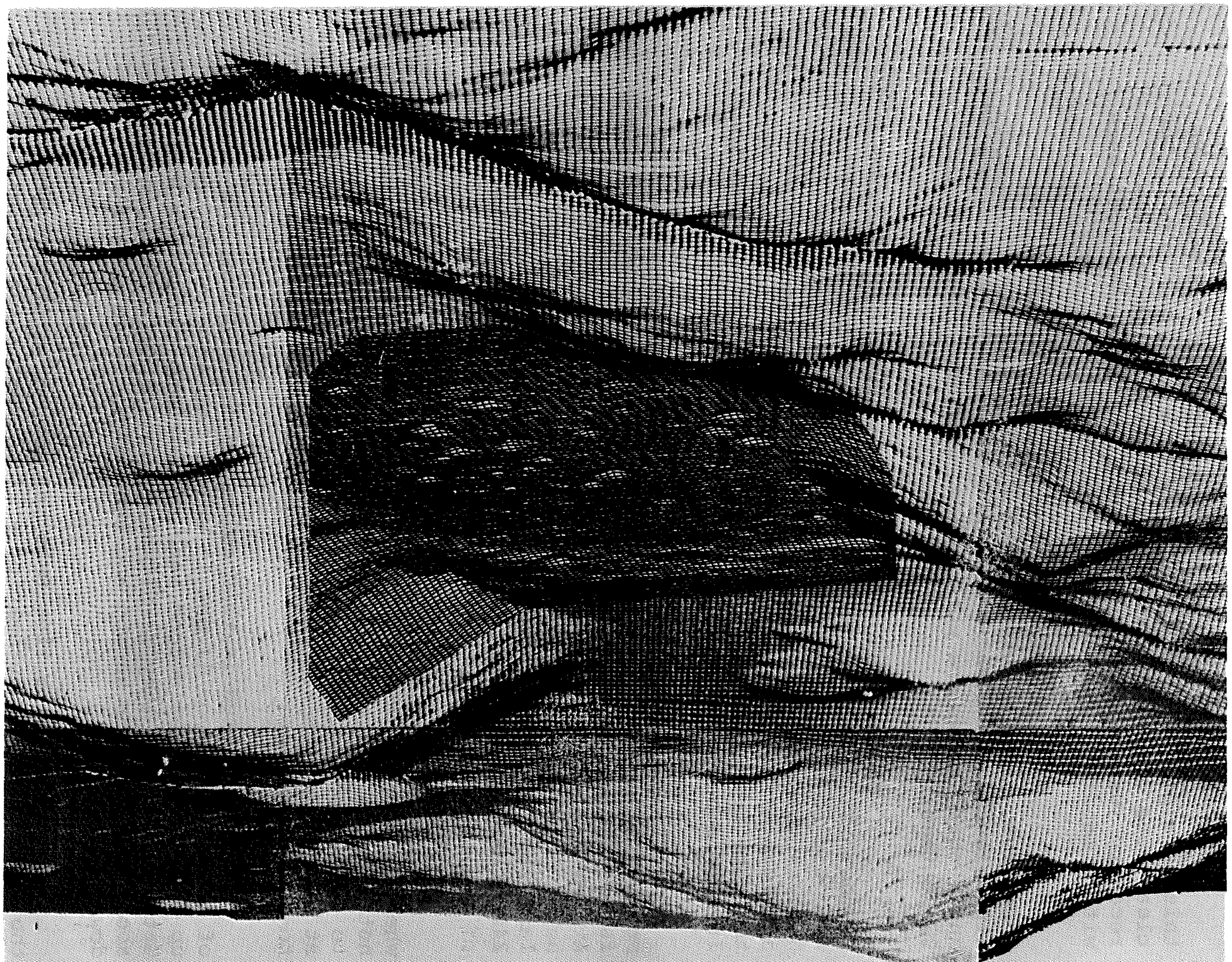
As you see, we're coming in on this approach path, which is a 90 degree approach path and we're coming in right over these highlands, mountains and landing in this area here and you'll see a closeup picture of this.

Now, over here is a computerized view of this area from about 60 miles. This is a view that Ron Evans will have. Now, the reason it's dark and you see the different shades is that this is based on contour lines and to get it more accurate when you bring the contour lines closer it gets darker. It gives you an idea of shadow but that's really not right. Trying to show you the undulations, the mountains and everything and how the landing site sits down between the north and south massif and how you're coming over some sculptured hills and further back of course the mountains and I'll show you some of those views.

Next viewgraph, please.

(Slide.)


TAURUS-LITTROW
N
0
1
2
KM



This is a trajectory coming over. You see here this is a period. This here depicts a vertical view of the clearances as you're coming in and this is dip swallow recovery just before High Gate and High Gate commences here with a landing right here.

Now, the highest mountains back in this area, I believe, are something like 9,000 feet above the landing site elevation and there is plenty of clearance all the way and I think clearance when we get down here is a minimum of 3,000 feet.

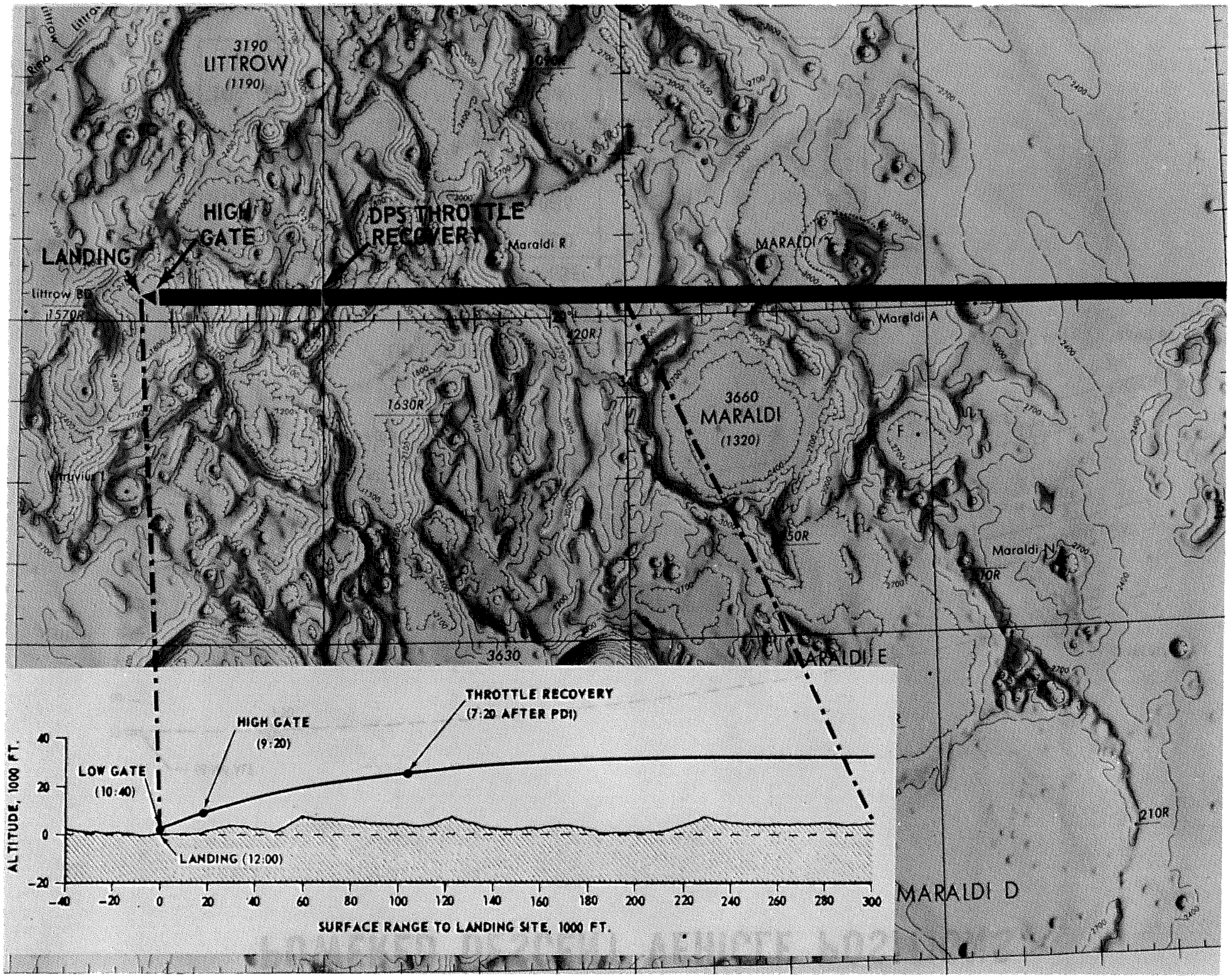
On the right now is the one that you have seen in the past and it depicts the position of the LM together with the command module during the PDI burn. As you'll see here is the range from the landing point. This shows the attitude of the LM as it's doing its PDI burn. You see here the time from ignition, approximately 12 minutes to landing. It's 12 minutes to landing from the start of PDI.

At the actual start of ignition, the command module is some distance back and, of course, because the LM is slowing and it's maintaining its speed, it's catching up. At 7 minutes and 50 seconds in the PDI and that's approximately here, it's just about above the LM, but by the time the LM lands at 12 minutes, the command module will be approximately 240 miles downrange so there will be no effort to take photos of the landing or anything like that.

Now, depicted below here gives you an idea of when we start of the velocity, this is a relative velocity, not inertial velocity to the lunar surface; this is relative to the lunar surface and when we start the LM is traveling at 5,568 feet per second and this shows you how we decrease to zero touchdown.

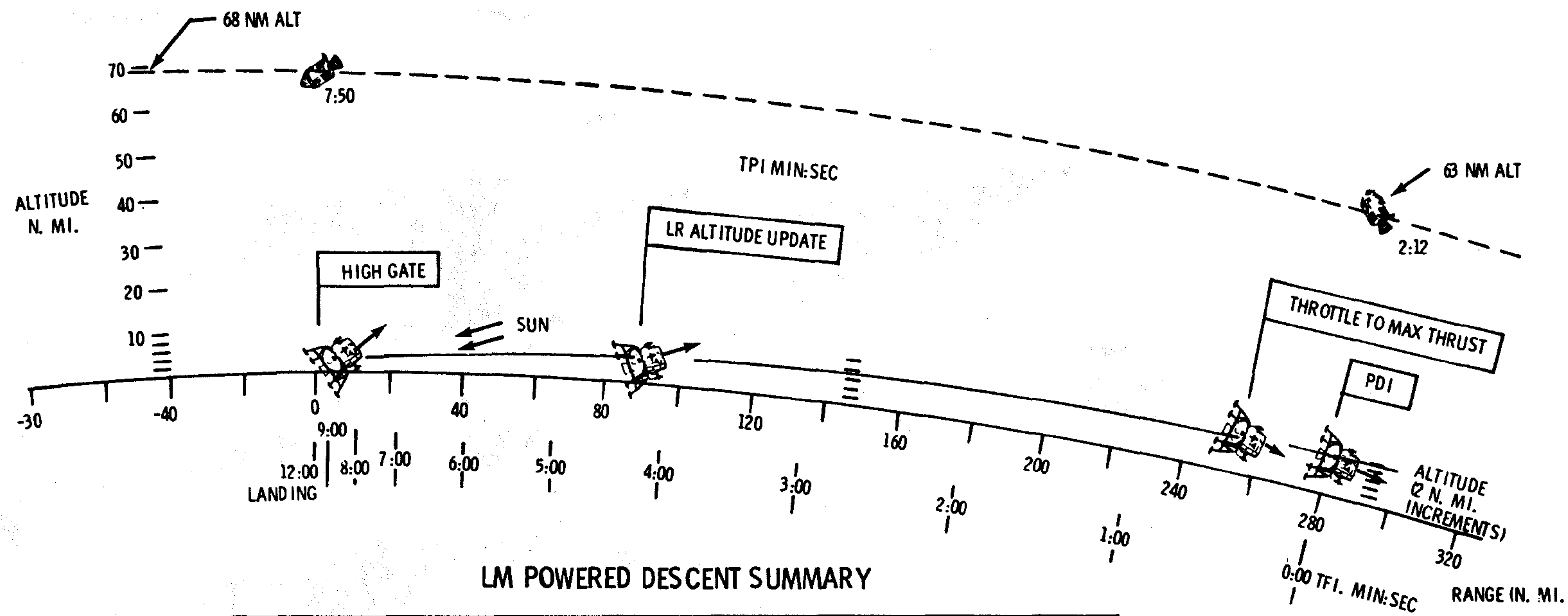
Depicted in this column is the H dot or the rate of descent. As you'll see it starts out at about 67, gets up to 177 feet per second rate of descent, that about High Gate. Just when they're pitching over, they're dropping at about 177 feet per second and then that, of course, slows down to 25.

Now, this five feet per second landing is really the value that the automatic -- if he kept hands off entirely and never touched it, that's the rate of descent that the computer calls for landing.



3190
LITTROW
(1190)
HIGH
GATE
DPS THROTTLE
RECOVERY
LANDING
Maraldi R
MARALDI
Littrow BD
1570R
Maraldi A
1630R
3660
MARALDI
(1320)
Maraldi N
3630
MARALDI E
MARALDI D
210R
THROTTLE RECOVERY
(7:20 AFTER PDI)
HIGH GATE
(9:20)
LOW GATE
(10:40)
LANDING (12:00)
ALTITUDE, 1000 FT.
SURFACE RANGE TO LANDING SITE, 1000 FT.

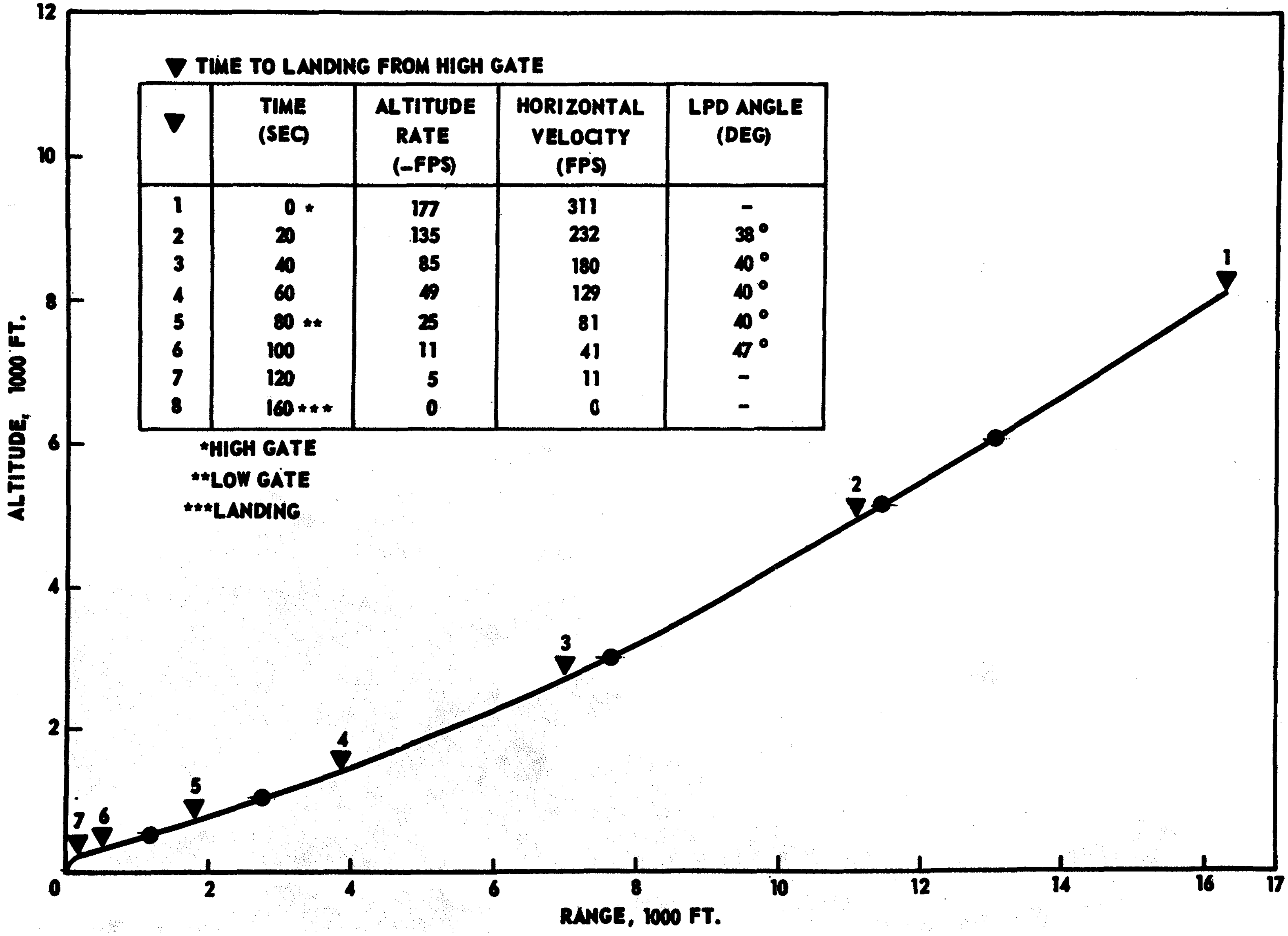
POWERED DESCENT VEHICLE POSITIONS



LM POWERED DESCENT SUMMARY

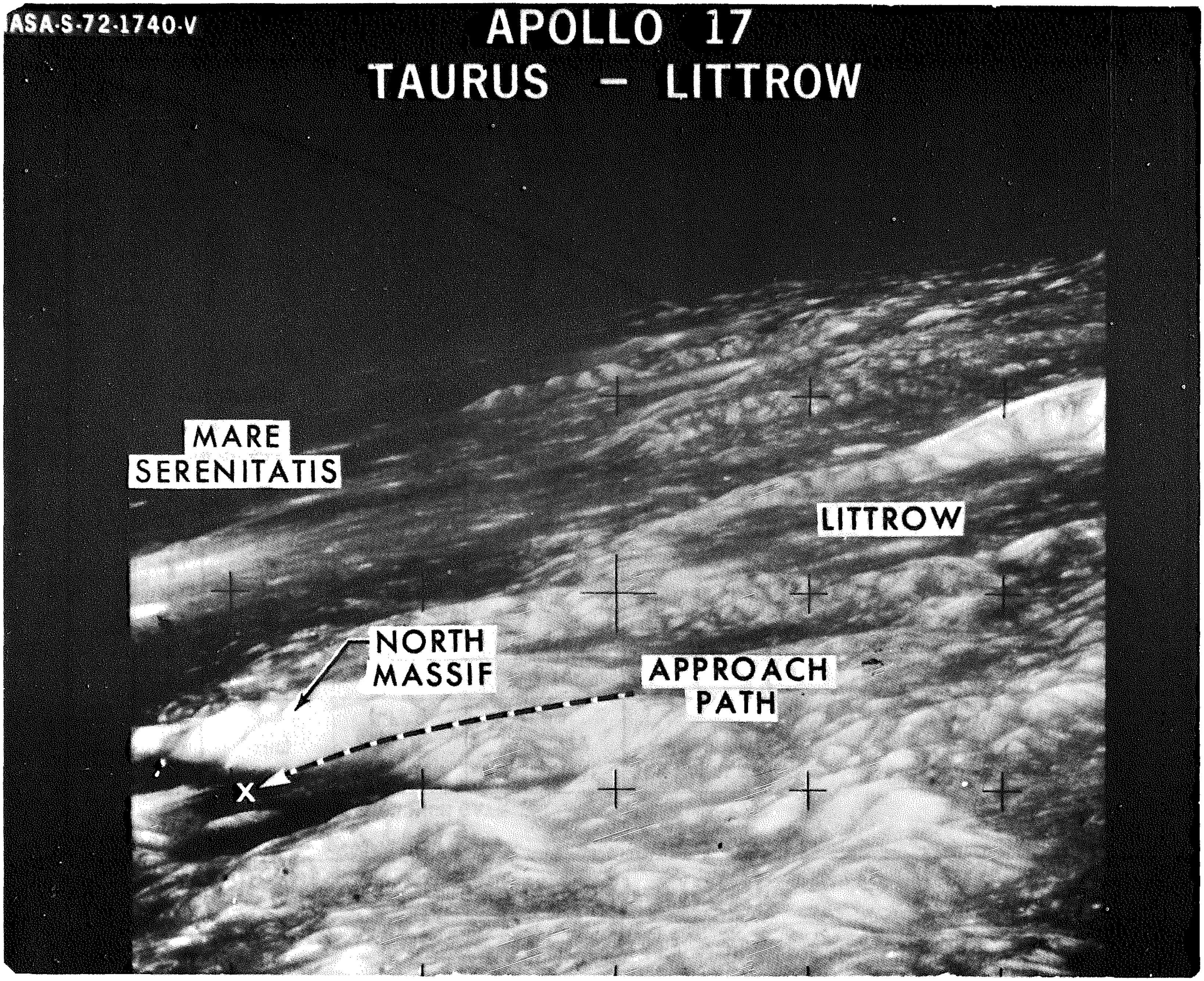
EVENT	TFI, MIN:SEC	V, FPS	Ḣ, FPS	H, FT.
POWERED DESCENT INITIATION	0:00	5568	-67	56,544
THROTTLE TO MAXIMUM THRUST	0:26	5542	-65	54,823
DPS THROTTLE RECOVERY	7:20	1202	-90	25,746
HIGH GATE	9:20	311	-177	8,159
LOW GATE	10:40	81	-25	709
LANDING	12:00	0	-5	6

APOLLO 17
APPROACH PHASE



▼	TIME (SEC)	ALTITUDE RATE (–FPS)	HORIZONTAL VELOCITY (FPS)	LPD ANGLE (DEG)
1	0 *	177	311	–
2	20	135	232	38°
3	40	85	180	40°
4	60	49	129	40°
5	80 **	25	81	40°
6	100	11	41	47°
7	120	5	11	–
8	160 ***	0	0	–

*HIGH GATE
**LOW GATE
***LANDING


NASA-S-72-1740-V
APOLLO 17
TAURUS - LITTROW
MARE
SERENITATIS
LITTROW
NORTH
MASSIF
APPROACH
PATH
X

Next viewgraph.

(Slide.)

Now, this is a picture -- I'm going to try to show you some scenes taken from the simulator and they'll give you an idea, as many of you know, because of the form of the simulator and that you don't get a real true picture of the horizon so forth and we'll try to show you essentially -- this is again a computerized view of the landing area taken right after pitchover and here in the blue is the LMP's window and he can see the landing site, can see one of the key craters used for Gene and Jack to say we're right on, which is Camelot.

Sherlock is the landmark tracking crater. As they pass over this, they'll be taking marks on this and verifying their inertial position and relative position to the lunar surface, confirming how accurate we are, whether we need some corrections.

In the red is the commander's view and you can see that Camelot and the landing site are in his view as well and these are some other craters and we've also depicted here are the traverses which I will be talking about and a little bit later you see the south massif which is about 7,000 or 8,000 feet in altitude above the landing site. The north massif is not quite that high but almost. I think it's around 6,000.

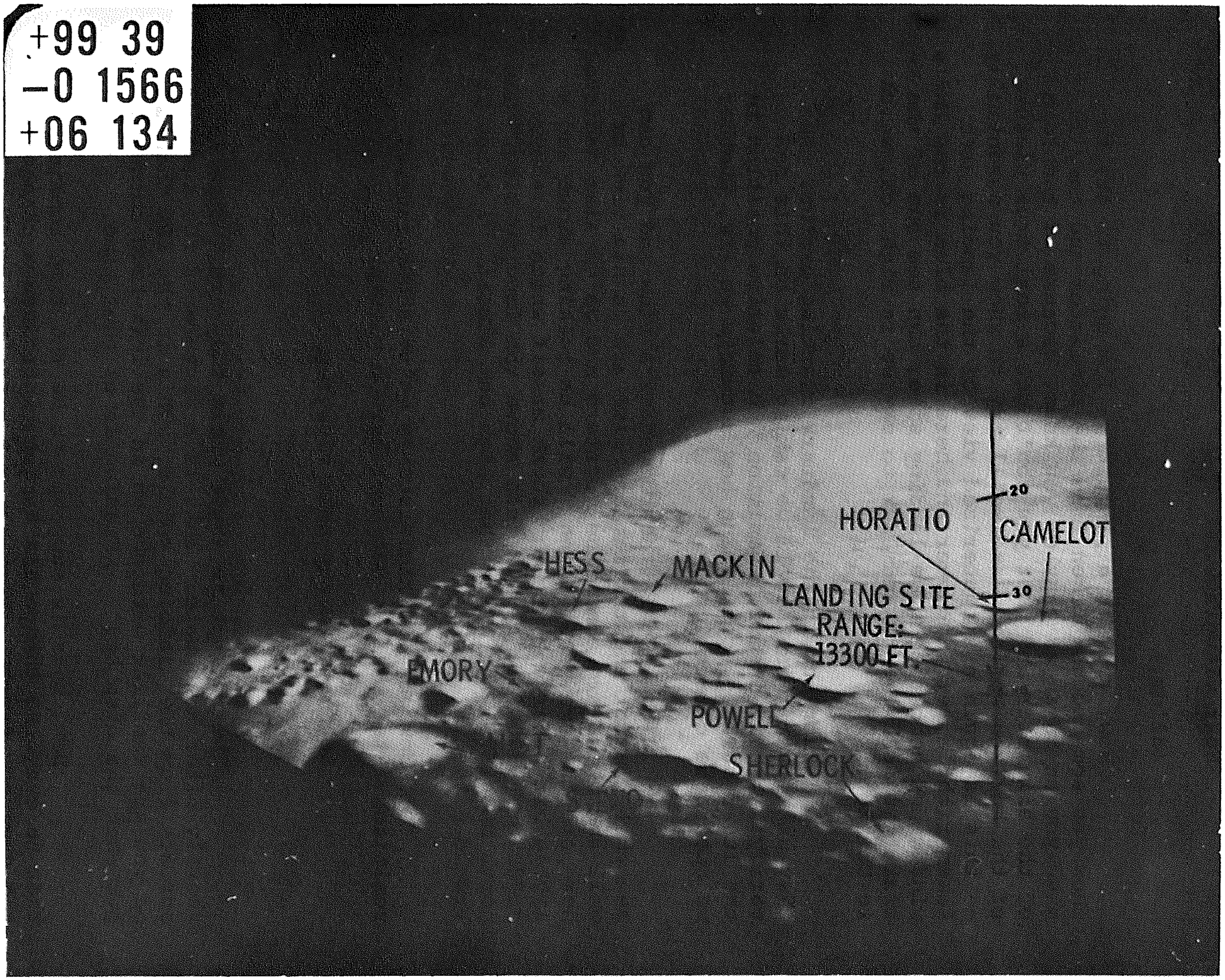
Now, on the right screen we've shown several positions. Let me just get over here a minute.

Let me have the next viewgraph.

(Slide.)

The red dot is about where they are. This is shortly after High Gate. This is a picture of the lunar surface from the training module. This is the LPD that most of you are familiar with and up in the left-hand corner we've put what the disc key reading is at that time.

Now, this is supposed to be the time remaining that he can, LPD change his target, introduce a change to the computer target. That has not come into range yet and you'll see that that remains at 99 seconds and that's really


+99 39
−0 1566
+06 134
HORATIO
CAMELOT
HESS
MACKIN
LANDING SITE
RANGE:
13300 FT.
EMORY
POWELL
SHERLOCK
20
30

on the automatic program so forget that for the moment.

Let's read here: 39 says that your LPD angle for the target is at 39 so he winds up his gun sight and he can tell if he's right on target or where the computer is going to put him, the guidance system.

Now, here in the second column is the rate of descent, the H dot, and there is a decimal point should go right here so that at this point he has passed High Gate when he was going about 177 feet per second rate of descent. He has now slowed down to 156.6 feet per second and he's at 6,134 feet altitude.

He's still 13,000 feet back from in range, horizontal range, from the landing site.

Next viewgraph, please.

(Slide.)

Now, this is the second red dot. He's at 5,000 feet. His rate of descent is now 133 feet per second. His target angle on his LPD is still 39 and this is still two block and has not come into range.

Next viewgraph.

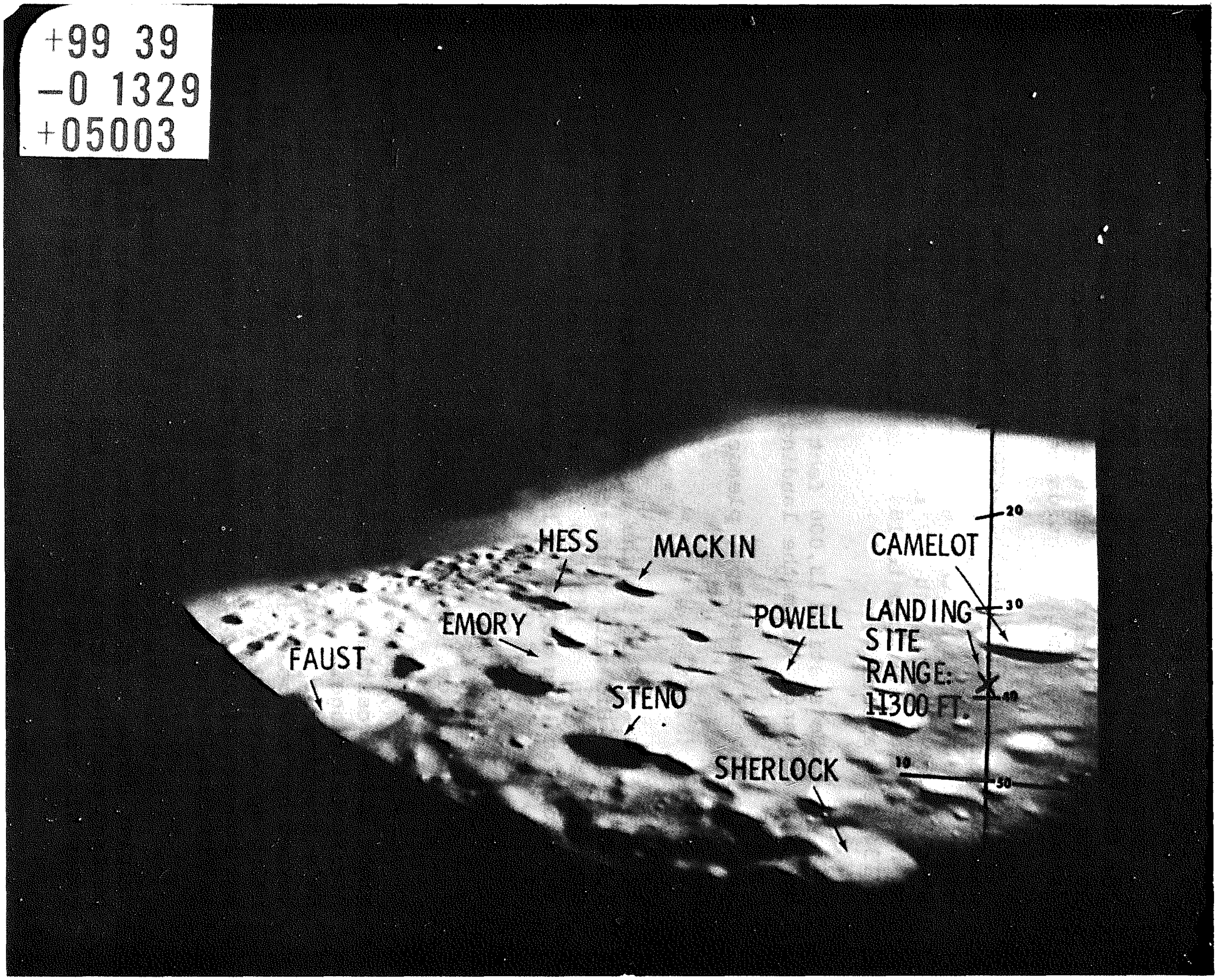
(Slide.)

Now, here in this view he's at the third red dot right above Position 3 there. He's about 7,700 feet in horizontal range. He's a little over 3,000 feet in altitude. He's dropping at about 88.9, feet per second and his target has now gone from 39 on the LPD to 41. Instead of being up here his target is now here. Still the same target but because of his perturbations, that's where the target is for his landing.

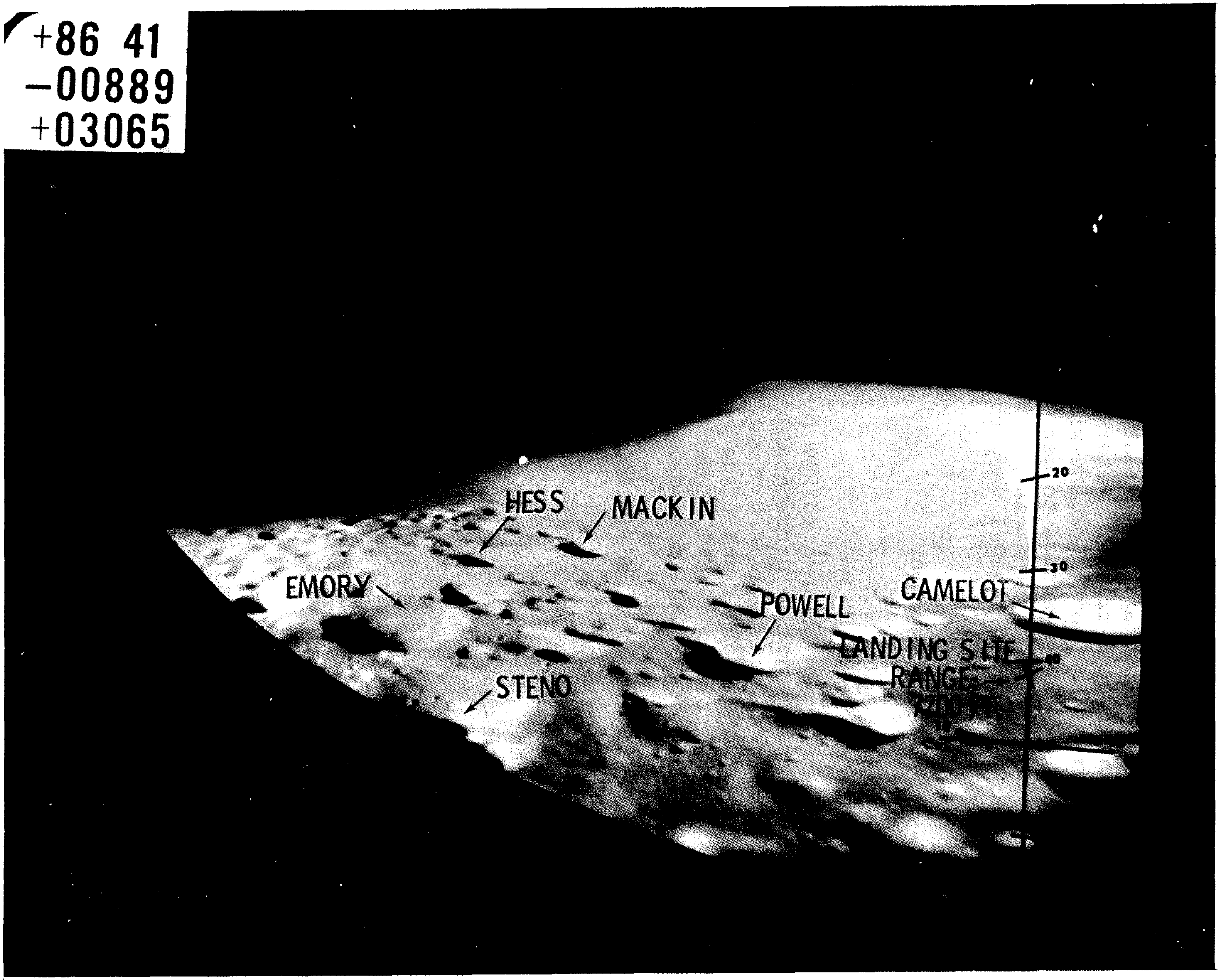
I'd like to point out that this is part of a triplet crater that Gene has been using also to help him in picking out his target, but the main is the Camelot and I guess his triplet for picking out this spot right here.

Next viewgraph, please.

(Slide.)



+99 39
-0 1329
+05003
HESS
MACKIN
CAMELOT
EMORY
POWELL
LANDING
SITE
RANGE:
11300 FT.
FAUST
STENO
SHERLOCK
20
30
40
10
50


+86 41
-00889
+03065
HESS
MACKIN
EMORY
STENO
POWELL
CAMELOT
LANDING SITE
RANGE:
20
30
40

Here we're down to 1,000 feet. We're 2,800 feet horizontal range. Again the LPD angle is still 41. We've found that remains fairly constant. Camelot is just starting to fade out and the triplet craters here are just starting to fade out at the bottom of the window. Now, in actual reality, Gene, if he wanted to get close and look down, he can see below this but to maintain this he sort of stays back a little, but I'm sure he'll vary that and be curious and take some looks.

Next viewgraph.

(Slide.)

Here we're down to 500 feet. We're only 1,100 feet from the target in horizontal range. Our rate of descent is now down to 16.4 feet per second. The target is at 43 now instead of 41 and if he were staying in the automatic program he'd have 32 more seconds that he could make some computer, LPD, changes.

Camelot has faded out, not quite, but it's in right here and he's got this -- he's picking out his spot I'm sure at this point. Low Gate occurs in this mission. This is approximately 700 feet. Each one likes to take over at a different place so we don't know just when Gene will take over and check out the controls and make sure he can slow it down like they like to do and then bring it into his vertical descent, from a vertical descent from around maybe 100, 200 feet. And then we expect again it will probably see dust at around 100 feet.

Next viewgraph.

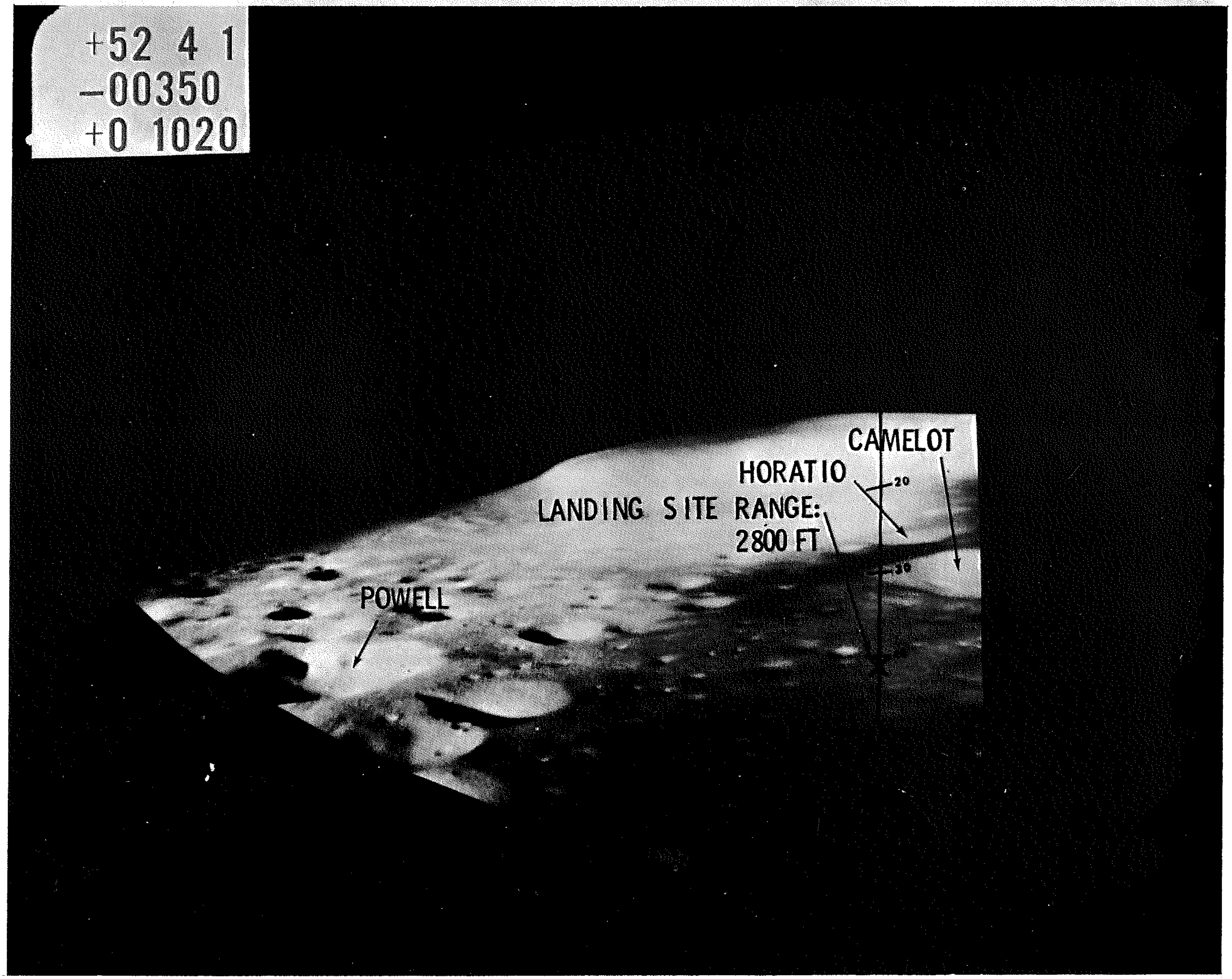
(Slide.)

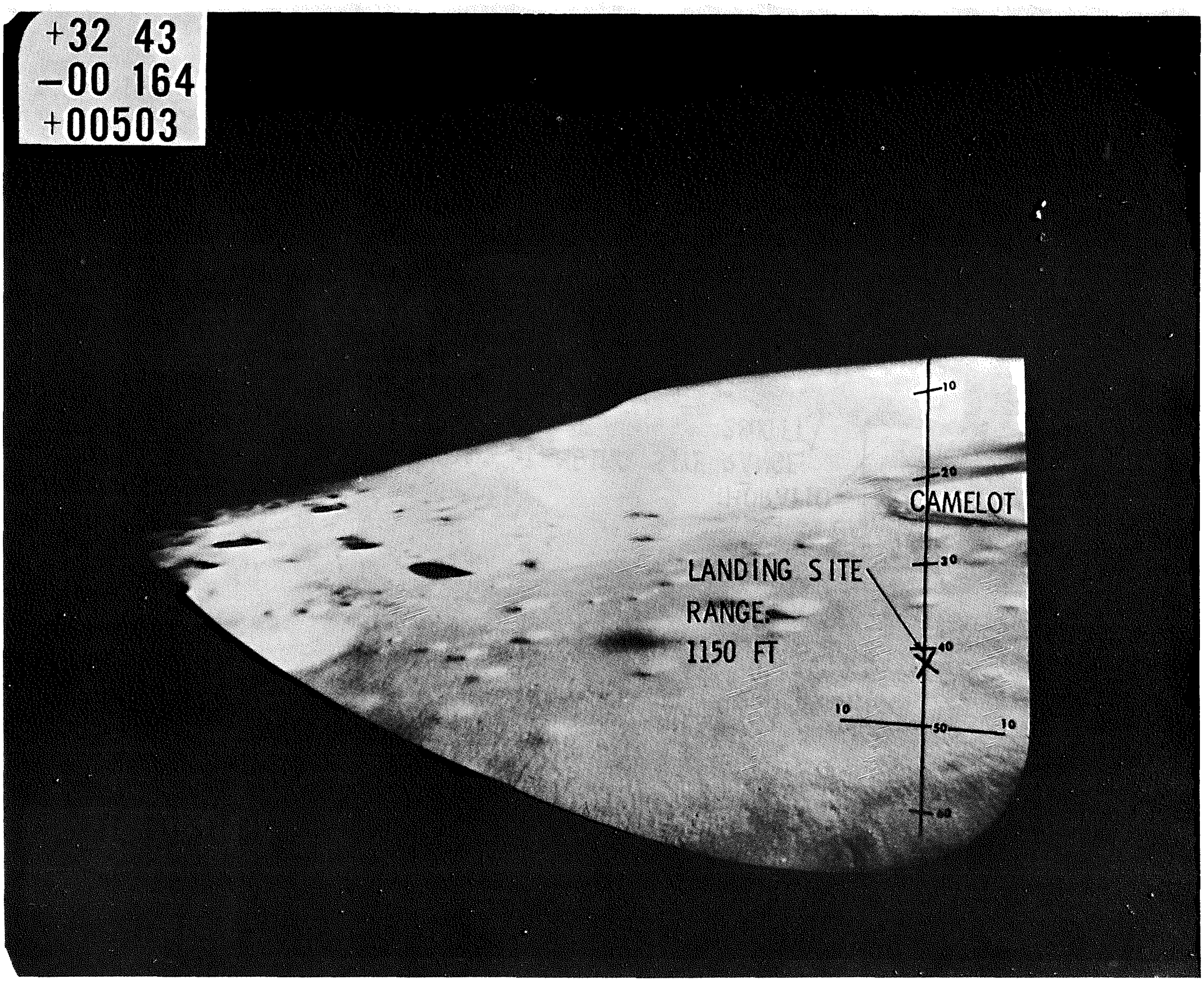
I would now like to take just a few minutes on a film we have taken in the simulator. The film starts with pitchover and takes him down -- we'll cut it off at about 100 feet above the landing point.

(Presentation of film.)

Now, this is askewed slightly. I'm sorry about that, but as you see here's Camelot and this is the landmark tracker tracking what -- what's the name of that one?

VOICE: Sherlock.


+52 4 1
-00350
+0 1020
CAMELOT
HORATIO
LANDING SITE RANGE:
2800 FT
POWELL
20
30


+32 43
-00 164
+00503
CAMELOT
LANDING SITE
RANGE
1150 FT

LEE: Sherlock, thank you.

Here you see how the altitude is changing, now 4,000; the rate of descent is 106.9. Your target is at 41.

Now down to 3,000; the target is at 41; his rate of descent is at 81 feet per second.

Now, 2,000 feet altitude; the rate of descent is down to 56 feet per second.

Here's your triplet. Here's Camelot. The target should be right about in here in the landing spot.

The target is up around here (indicating). Under 500 feet now. Down to about 10 feet per second H Dot vertical descent.

He's now hanging around five feet per second, just sort of holding it there until he gets closer.

Okay, I think we can cut that off. It's just before touchdown there.

Let us go back here to the viewgraphs if we may.

(Slide.)

Now, this is a hand camera view of the landing site. This is the north massif. This is the north massif -- I'm sorry, this is the south massif. This is what appears to be a slide area. The landing spot is about here.

Now, picture yourself here and then over on the right we made some computerized views to give you an indication of what standing here in the LM looking out the window you'll see and looking to the north, you can see the north massifs standing up there about 6,000 feet and from the LM is that about six kilometers, five kilometers?

VOICE: Pretty close.

LEE: And then as you swing around, you'll see as you swing to the east and you start swinging back toward 90 degrees, you come back here and you see the sculptured hills and here you see about the terrain that he came over. Then you start swinging toward the southeast in this area here and

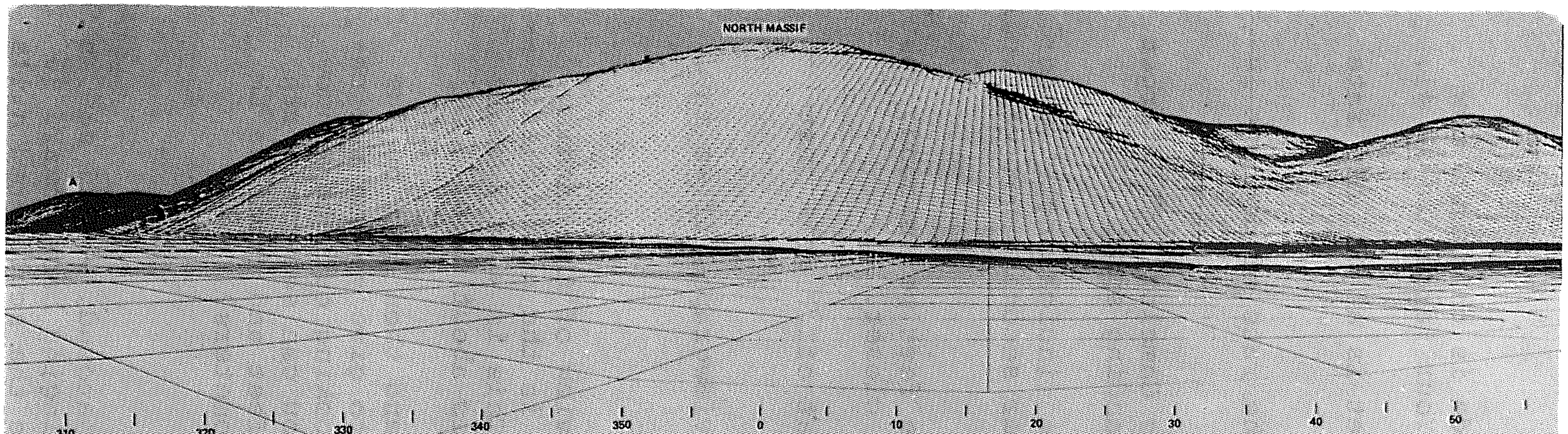


FIGURE 1A - NORTH VIEW FROM APOLLO 17 LM POSITION

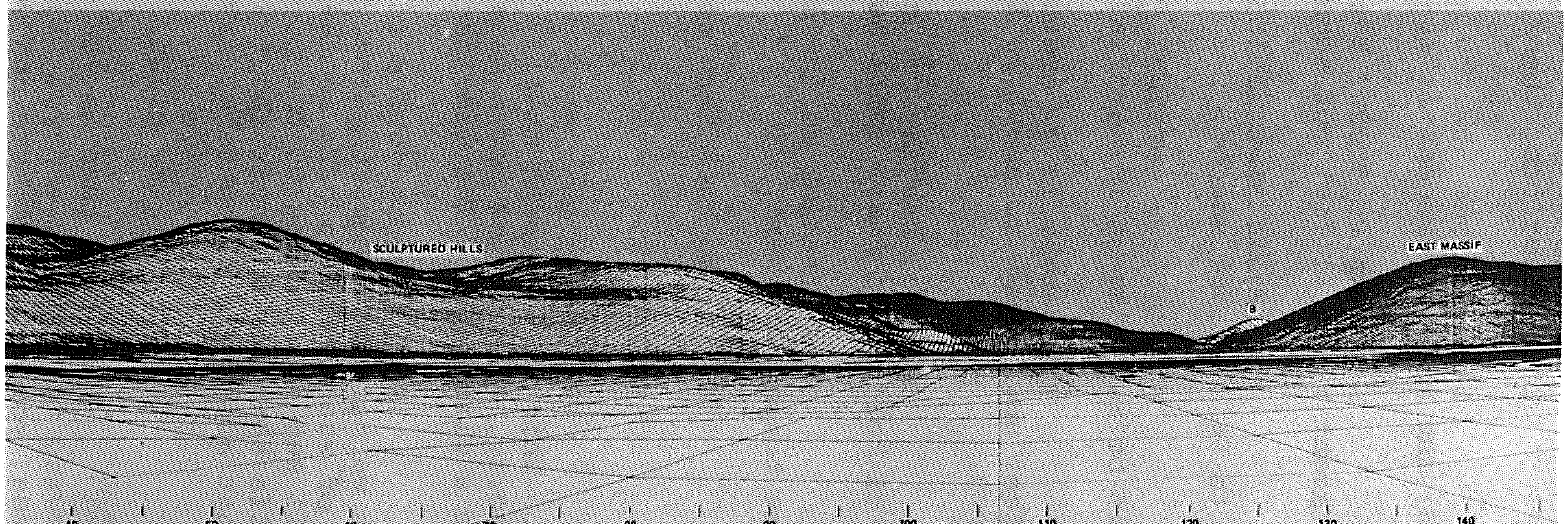
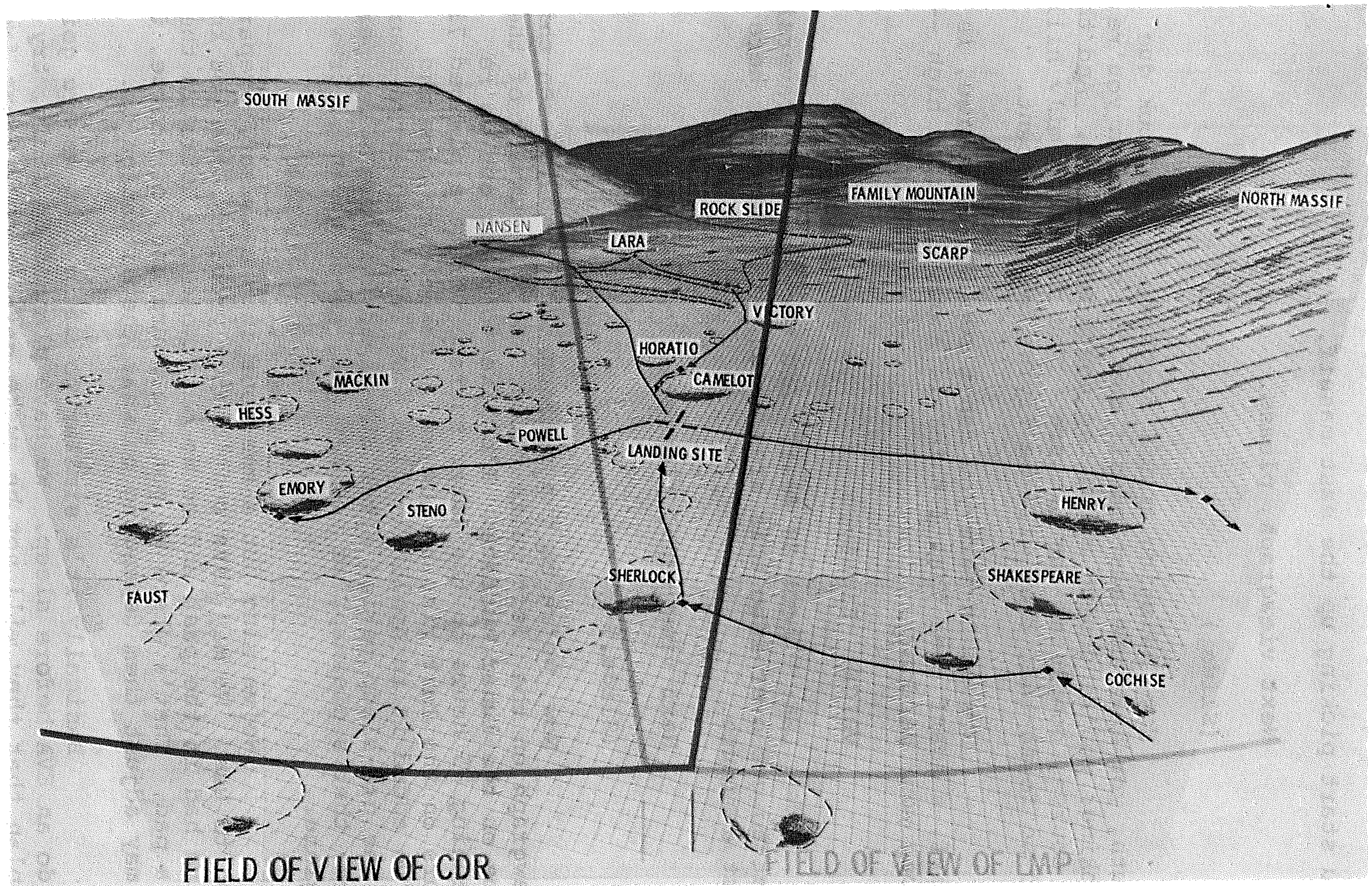


FIGURE 1B - EAST VIEW FROM APOLLO 17 LM POSITION


SOUTH MASSIF
ROCK SLIDE
FAMILY MOUNTAIN
NORTH MASSIF
NANSEN
LARA
SCARP
VICTORY
HORATIO
MACKIN
CAMELOT
HESS
POWELL
LANDING SITE
EMORY
STENO
HENRY
SHERLOCK
SHAKESPEARE
FAUST
COCHISE
FIELD OF VIEW OF CDR
FIELD OF VIEW OF LMP

you start picking up the east massif.

Next viewgraph, please.

(Slide.)

Now, swinging around further, as you look due south, you have the east massif and these and then you're looking; you're coming up on the south massif now. And this, of course, completes the picture. You see the family hills and so forth that they will be flying over on ascent.

Now up in here you can't see it, of course, is a scarf, a scarf area that I think is about 100 feet high -- I beg your pardon?

VOICE: Eighty.

LEE: About 80 feet. And they will be traversing that to get over into this area which we'll describe here in just a minute.

Next viewgraph, please.

(Slide.)

Now, we're on the surface and you have seen this viewgraph on the left quite often. It's a summary of the time on the lunar surface. I'd like to point out we're planning 75 hours on the lunar surface versus a planned 73 hours on the last mission and we've taken that time and we've added it in Apollo 17 plan. We've put an extra hour in the pre-sleep period after EVA-3 and this pre-sleep period here; that's cleanup, as you can see, cabin cleanup, crew hygiene.

We've also put a one hour in the liftoff preparation to use. We may have contingency problems. As you know, we've had in the past and so we put those two hours in there as a pad. That's where we put the hours and, of course, then we may adjust them depending on what the situation is.

Basically it's similar to 16 in that we are going to do an EVA before sleep. We have planned to limit, try to plan that they will not be awake more than 18 hours from the time they get up until cabin depress. We're just trying to avoid getting them overextended and overtired.

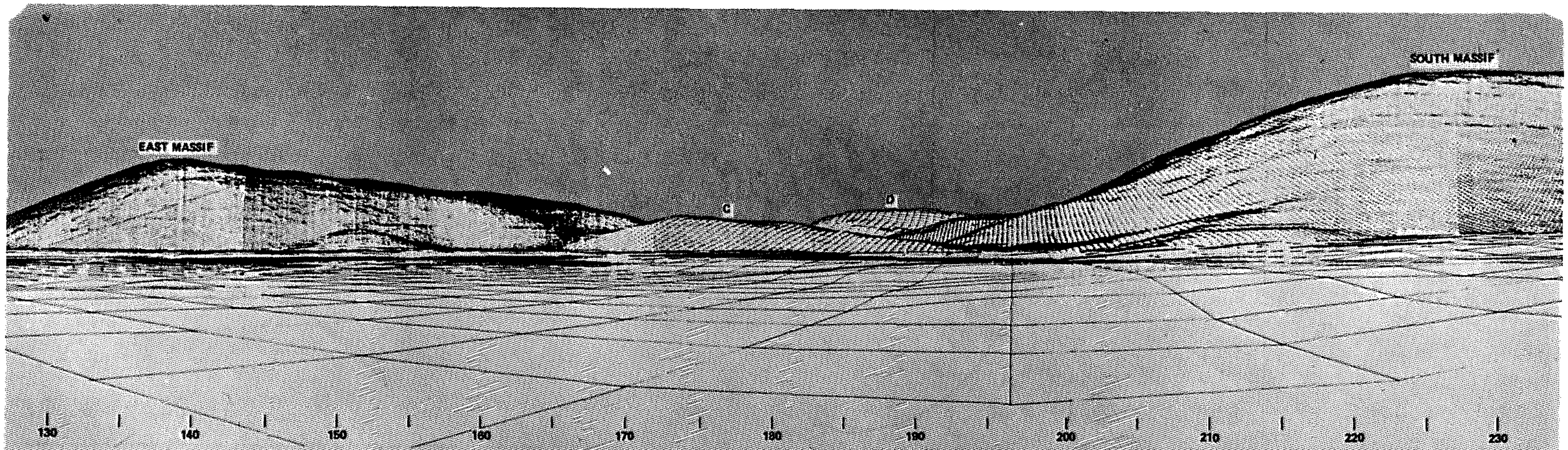


FIGURE 1C - SOUTH VIEW FROM APOLLO 17 LM POSITION

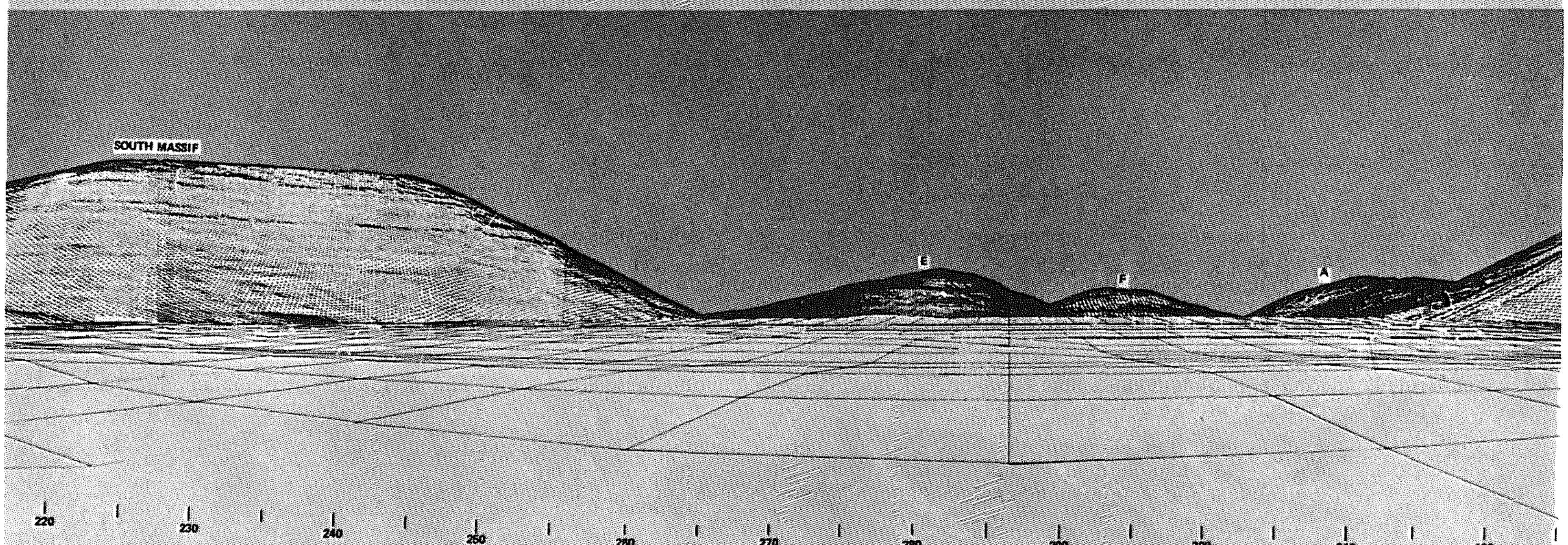
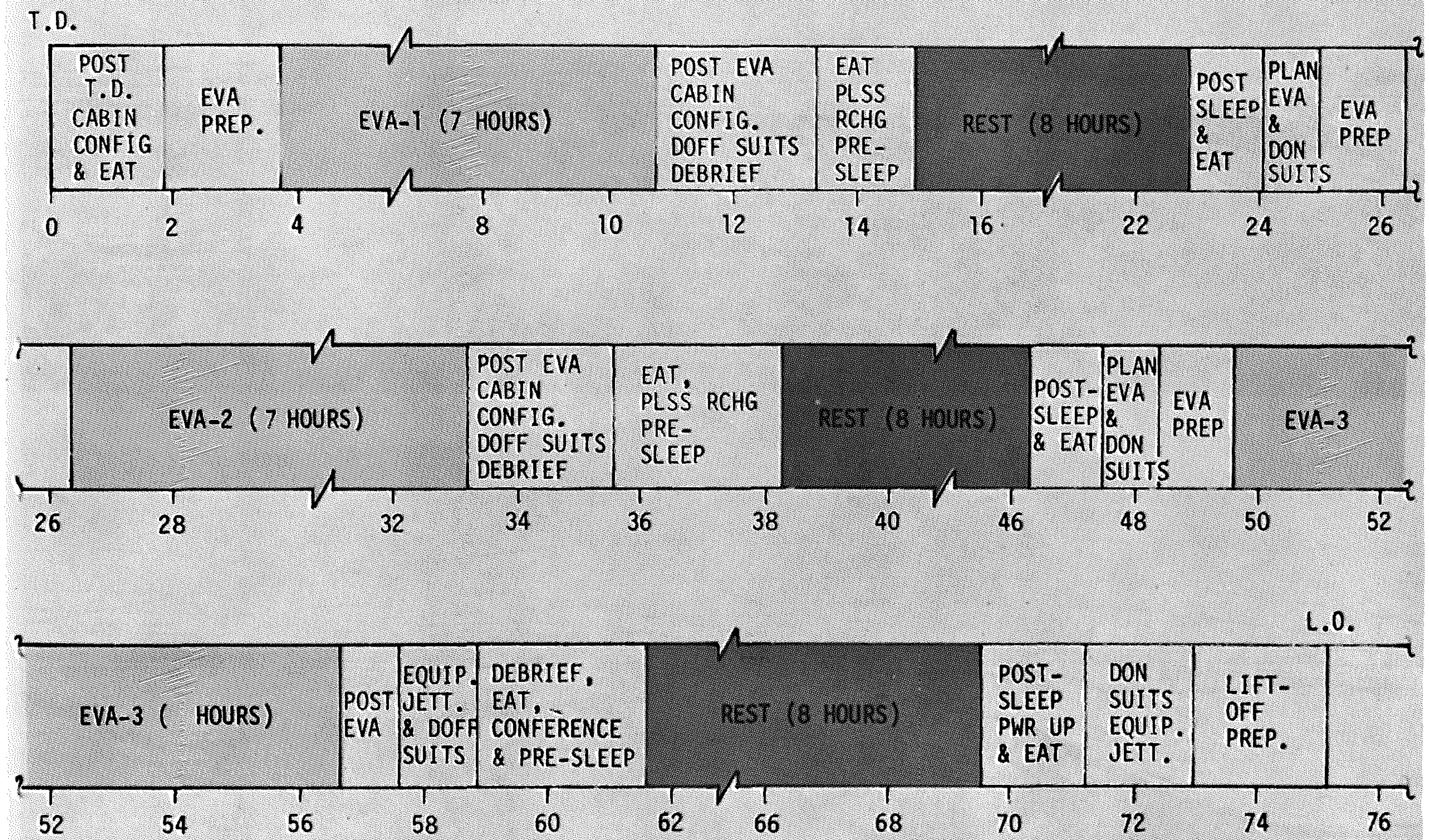


FIGURE 1D - WEST VIEW FROM APOLLO 17 LM POSITION

APOLLO 17 LUNAR SURFACE TIMELINE



APOLLO 17

ADDITIONAL TWO HOURS ON LUNAR SURFACE

- TIME ADDED TO APOLLO 17 PLAN
  - 1-HOUR PRE-SLEEP AFTER EVA 3
  - 1-HOUR IN LIFT-OFF PREPARATION
- PAD FOR
  - CABIN CLEANUP / CREW HYGIENE
  - EVA EXTENSIONS
  - CONTINGENCY PROBLEMS

And we have planned eight-hour sleeps throughout. We are planning a full seven-hour EVAs and we will have, as I'll mention later, two depresses because of the sleep period before liftoff.

Next viewgraph.

(Slide.)

Now, this is a more detailed breakdown. I'm not going to go into all the details. You have it in your handout. I would like to point out on the right here we have a general view of the LM position, facing west. This is the porch that will come down. This is where we'll do the LRV offload. Now, let me point out again, we are not going to have TV until about one hour and ten minutes after landing.

In our desire to increase the hover time on this mission, we really went on a weight-saving program and one of the things we felt was not essential was to carry the TV in the Mesa that we dropped as commander came down and we came on and then we saw him descend from the LM and get on the surface and get acclimated.

We did seriously consider the loss of an LRV, offloading the LRV. We've given this up. We feel that communications would be adequate and we should not have any problems there so the TV, then, will not be placed until -- turned on until the LRV has taken position and had the camera put on.

QUESTION: Chet, do you have any idea how much weight you save by not having the TV connected in the Mesa?

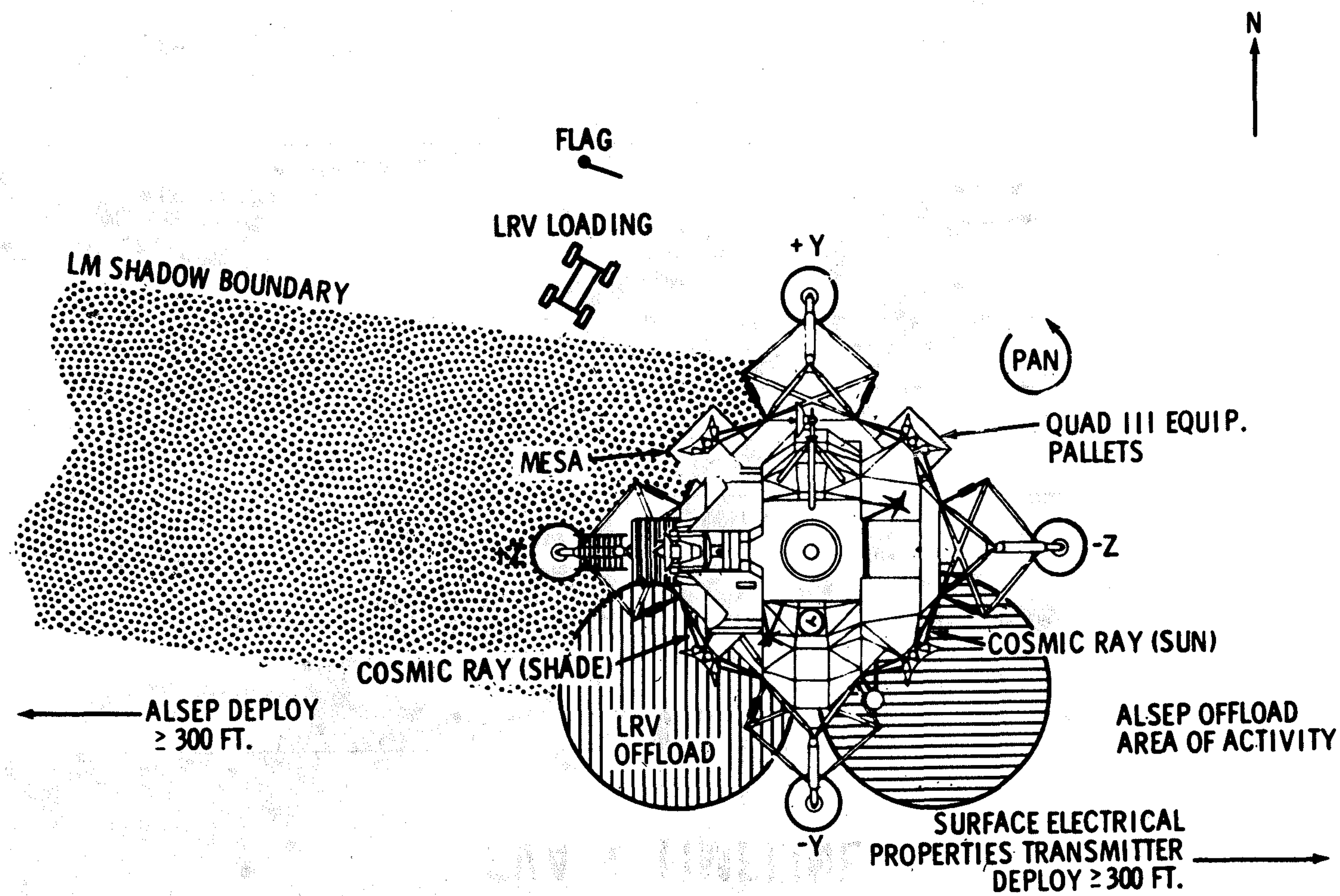
LEE: Over ten pounds.

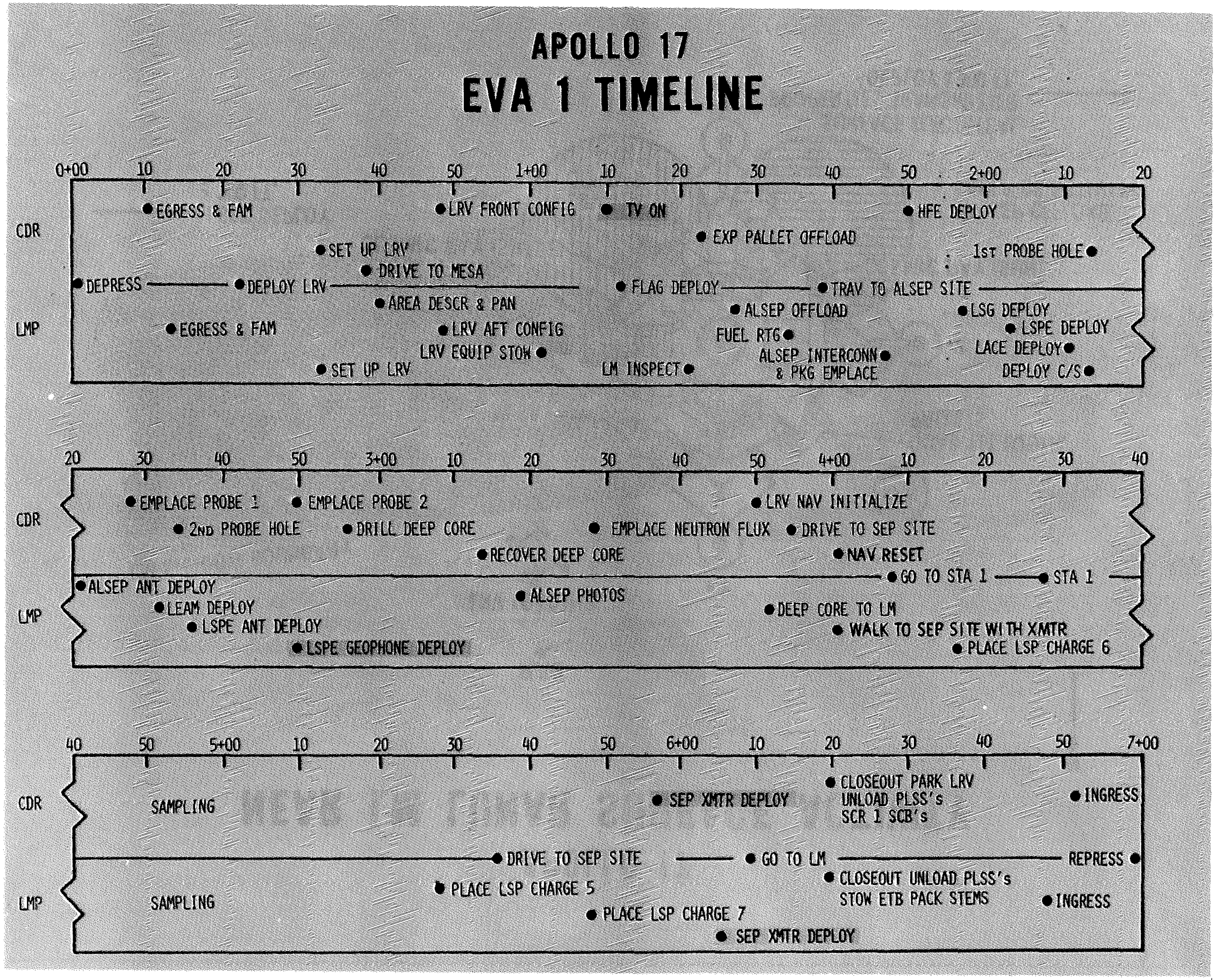
VOICE: I'll have to get a number.

LEE: It was over eight pounds. And 17 pounds of inert weight is worth one second of hover time so we were really -- seconds are very important.

Let me add, I said hover time; there was one other feature. It does save us time on the surface because keeping it here required that the LMP ingress -- after he has come to the surface and we have taken our pictures and then moved the TV, it required him to ingress into the cabin

APOLLO 17
NEAR LM LUNAR SURFACE ACTIVITY





APOLLO 17
EVA 1 TIMELINE
CDR
LMP
EGRESS & FAM
LRV FRONT CONFIG
TV ON
HFE DEPLOY
EXP PALLET OFFLOAD
SET UP LRV
1st PROBE HOLE
DRIVE TO MESA
DEPRESS
DEPLOY LRV
FLAG DEPLOY
TRAV TO ALSEP SITE
AREA DESCR & PAN
ALSEP OFFLOAD
LSG DEPLOY
EGRESS & FAM
LRV AFT CONFIG
FUEL RTG
LSPE DEPLOY
LRV EQUIP STOW
ALSEP INTERCONN
& PKG EMPLACE
LACE DEPLOY
SET UP LRV
LM INSPECT
DEPLOY C/S
EMPLACE PROBE 1
EMPLACE PROBE 2
LRV NAV INITIALIZE
2nd PROBE HOLE
DRILL DEEP CORE
EMPLACE NEUTRON FLUX
DRIVE TO SEP SITE
RECOVER DEEP CORE
NAV RESET
GO TO STA 1
STA 1
ALSEP ANT DEPLOY
ALSEP PHOTOS
LEAM DEPLOY
DEEP CORE TO LM
LSPE ANT DEPLOY
WALK TO SEP SITE WITH XMTR
LSPE GEOPHONE DEPLOY
PLACE LSP CHARGE 6
SAMPLING
SEP XMTR DEPLOY
CLOSEOUT PARK LRV
UNLOAD PLSS's
SCR 1 SCB's
INGRESS
DRIVE TO SEP SITE
GO TO LM
REPRESS
PLACE LSP CHARGE 5
CLOSEOUT UNLOAD PLSS's
STOW ETB PACK STEMS
SAMPLING
INGRESS
PLACE LSP CHARGE 7
SEP XMTR DEPLOY

again to turn off the power amplifiers to save power. And this was time we felt could be better utilized on the surface on this mission.

So we are giving up that TV until about one hour and ten minutes and I think the first event that we'll get on that -- that's why the flag deployment will be shortly after we turn the TV on.

Now, the rest of the time line, I think again is very similar to the past. You've got to deploy the Rover. You've got the loading of the Rover. You've got the offloading of the ALSEP. These take time. We go out and we deploy the ALSEP which we'll talk about a little bit more and after about four hours, four hours plus, we're ready to start our first traverse which we'll go into now.

Next viewgraph.

(Slide.)

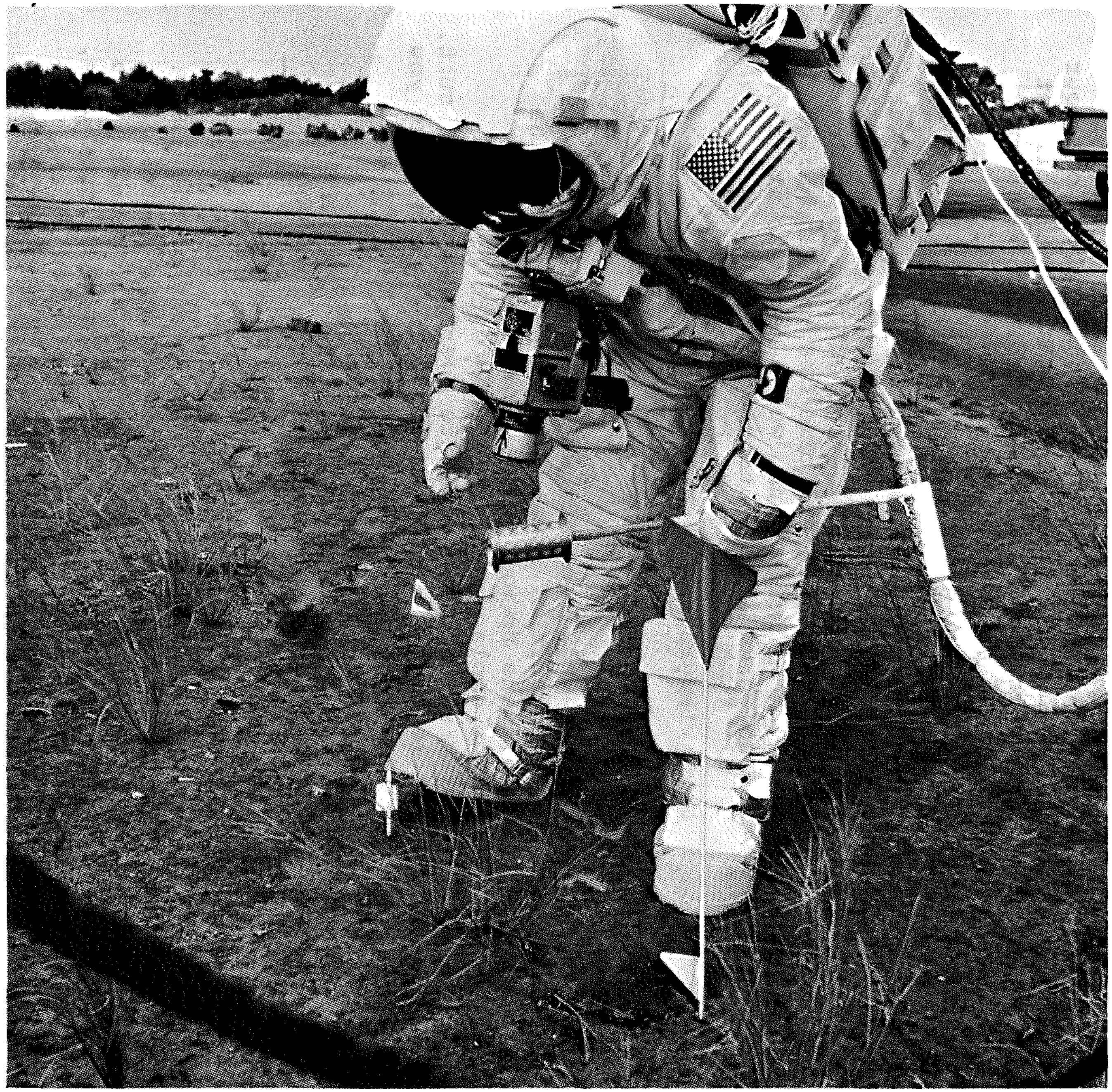
I guess we'll go into it later. I'm going to show some pictures here of some of the experiments. The reason I had this one up was to show you the geophones and the -- how he emplaces the geophones with his foot. We wanted you to see it is a delicate operation in that suit. It takes a little time. It's not very easily done. And you see here the reel that will have the cables that he will reel out the geophones on.

Next viewgraph, please.

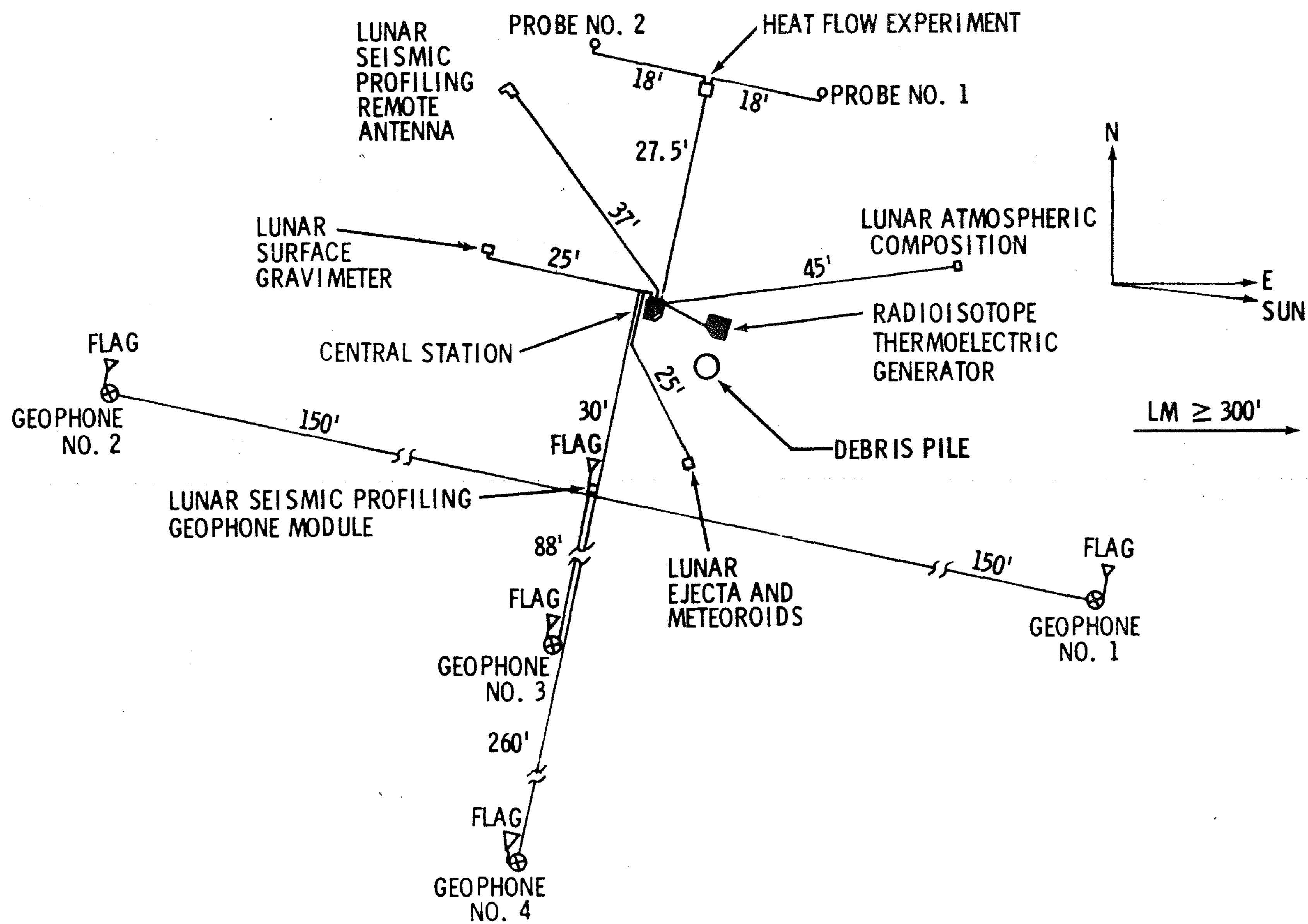
(Slide.)

Here I've tried to show the layout of the ALSEP. The view on the right is taken from about this position. You're looking this way. You see the central station. You see the thermoelectric generator, the RKG sitting over here, and you see in the distance the heat flow. You'll all remember that from Apollo 16 which we're flying again on this mission with some fixes on the cabling. This is an extra pallet; it shouldn't be there. And this is the gravimeter, surface gravimeter. And, extending back here, is the -- which one is that? Lunar seismic profiling module. You can see some of the cables stretching out this way.

This is emplaced, again, we're planning and this could always be changed depending on the surface to deploy



APOLLO 17
ALSEP DEPLOYMENT



this to the west of the lunar module, about 100 yards.

Next viewgraph, please.

(Slide.)

After the ALSEP is deployed, Jack Schmidt will carry to the transmitter to the SEP site, will walk over with the SEP transmitter to about 100 yards east of the LM where the SEP antenna will be placed for the traverse data that we're going to get later.

QUESTION: What's SEP site?

LEE: Surface electrical property, I'm sorry.

You might ask why isn't he riding. Well, Gene's busy at this time and Jack feels it's very easy for him to get over to correlate, to use their time to the maximum efficiency. Gene will be finishing up and Jack will go ahead and take the transmitter over to that spot. Gene will drive over and pick him up and they'll start their traverse to the first station.

Now, all they'll do is place the transmitter and probably not do anything more. If Gene perchance should get done first, he may go over and do some extra items with regard to the surface electrical properties but that's contingent on how he stands in the efforts on the surface EVA.

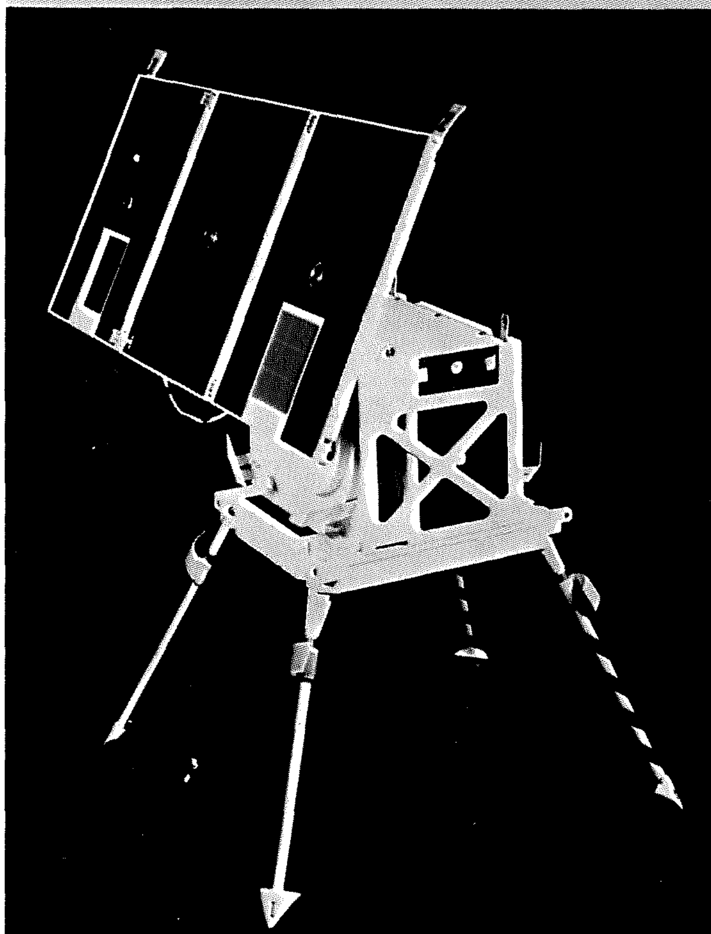
Next viewgraph, please.

(Slide.)

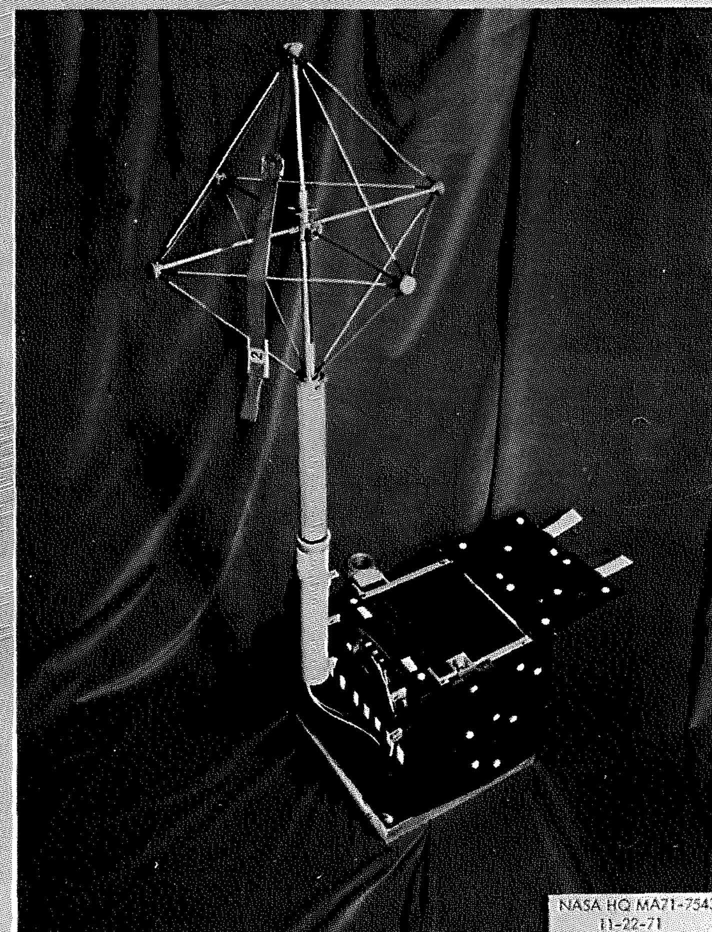
Now, this is a layout of the traverses and the first traverse because we've used a little over four hours on getting ready, getting the Rover out, deploying the ALSEP, this traverse is much shorter. As you can see here, we've laid out station 1 called Emory. This station is quite interesting because of the viewgraphs, the geologists feel that you can see some submantling of a crater here so they're very anxious to get there and see what that holds for them. And this is allowed 52 minutes for that area. They will, as I will discuss later, also be deploying the active seismic charges, several of them on that transit.

Next viewgraph, please.

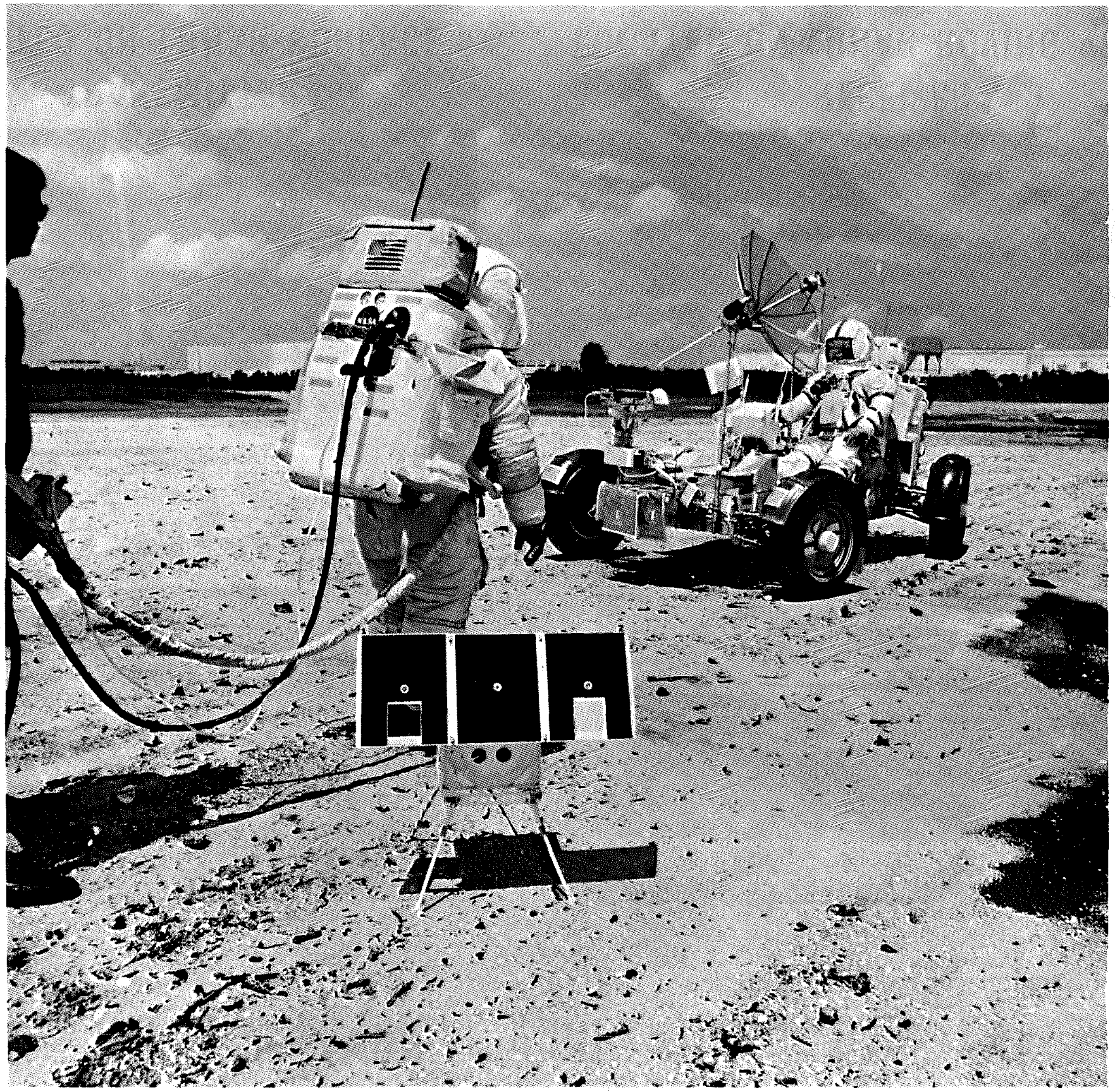
SURFACE ELECTRICAL PROPERTIES EXPERIMENT

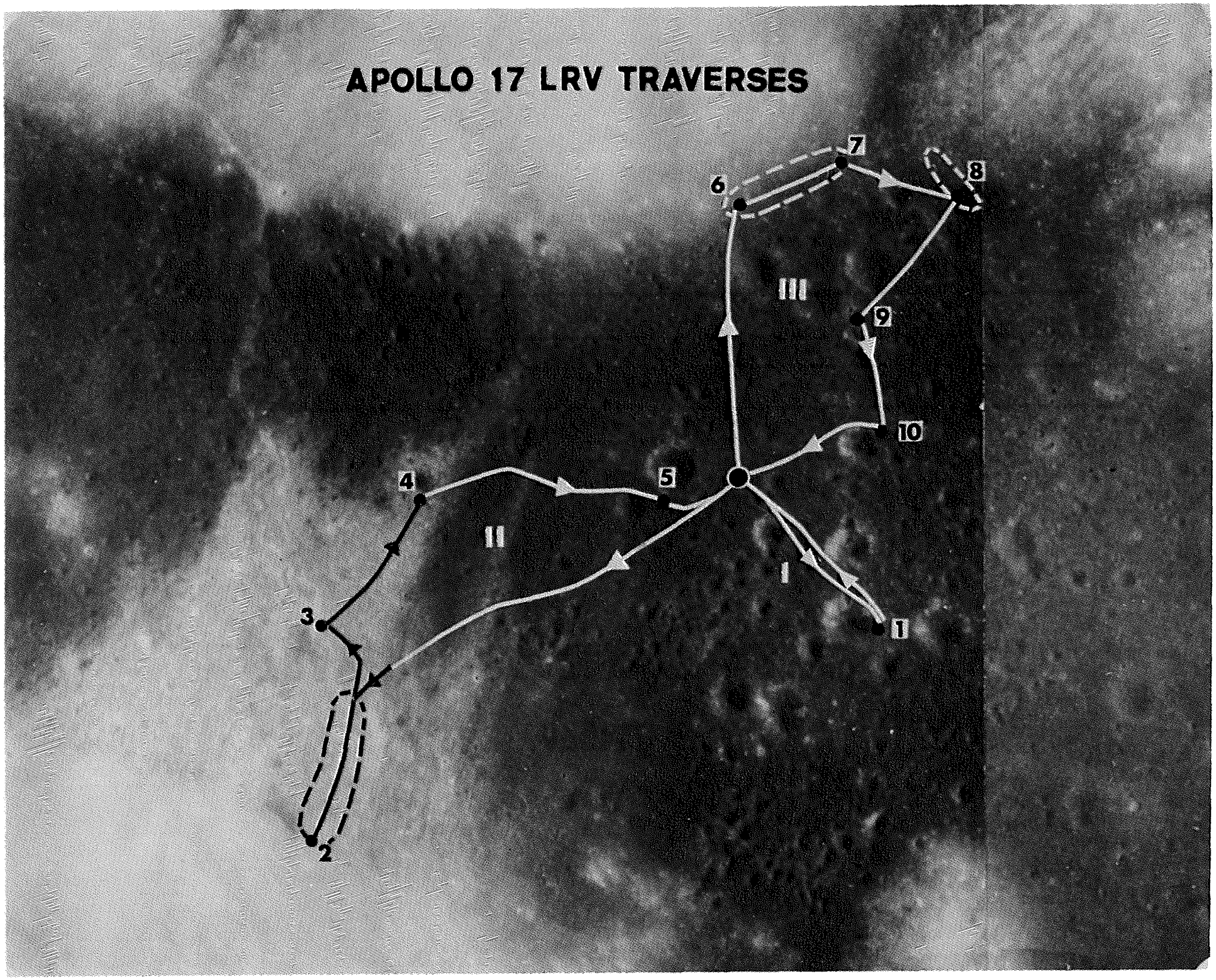


TRANSMITTER
LOCATED ON LUNAR SURFACE



RECEIVER
LOCATED ON LUNAR ROVING VEHICLE




APOLLO 17 LRV TRAVERSES
7
8
6
III
9
10
4
5
II
I
3
1
2

APOLLO 17

TRAVERSE STATION TIMELINE - EVA 1

STATION 1: EMORY (1:06)

CDR	OVERHEAD		DESCRIPTION	SAMPLING	O/H
		:05	:05	·52	:04
LMP	O/H	PAN	DESCRIPTION	RAKE/SOIL SAMPLE AND SAMPLING	O/H

NOTES:
O/H = OVERHEAD

(Slide.)

Following station 1, time permitting; things have gone well, they will return to the surface electrical properties position and deploy it and this is the solar panels. You can see they lay out the cables at right angles and they go about 35 meters on each side of the central unit and they will deploy this and then be ready on EVA-2 to pick up right at this site, take the reading, initialize their navigation, get their initial navigation reading, take a picture and then move out on their traverse.

The idea of Jack taking a picture of this at the start of it is to tie in the location of the lunar Rover to the SEP transmitter.

Next viewgraph, please.

(Slide.)

I'll just use this to say they will then get back in, will doff their suits, debrief and make their preparations, eat and so forth, preparations for their rest eight hours, and then they'll have their preparations for the second EVA.

Next viewgraph, please.

(Slide.)

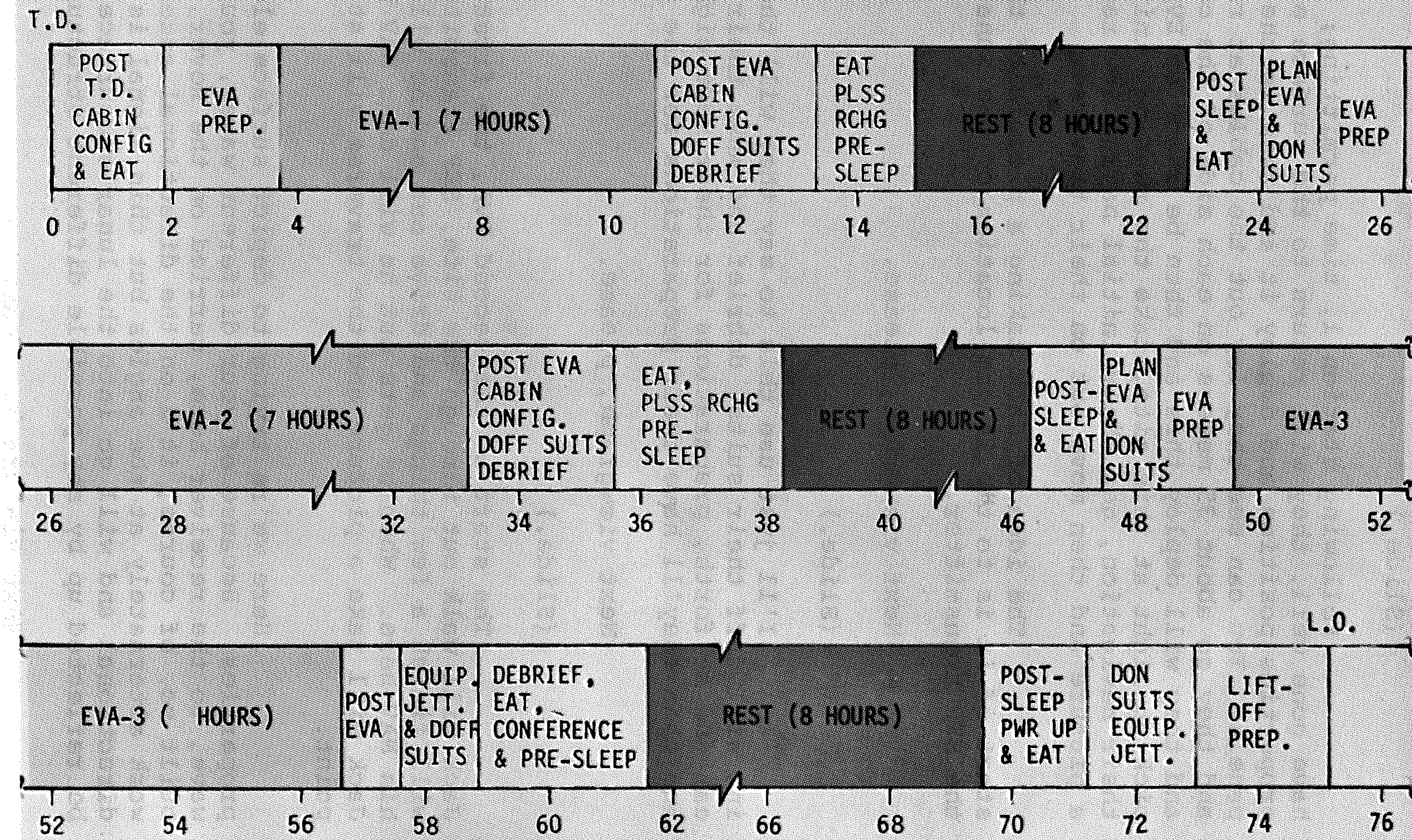
The start of the second EVA, the first thing Jack will walk out through the site, SEP transmitter. Gene will finish a few things and drive out and he will initialize his NAV here. When he gets out he will do a NAV reset, Jack will take a picture and the traverse will start at this point.

Here we're trying to depict surface electrical properties. Because of your different waves, your ground wave, to the receiver here, carried on the Rover, and it's built so, of course, it's on the directional ascents. These work alternately at the angles but this signal is on the directional and will go into the lunar subsurface and then be reflected up by any possible different structural layers.

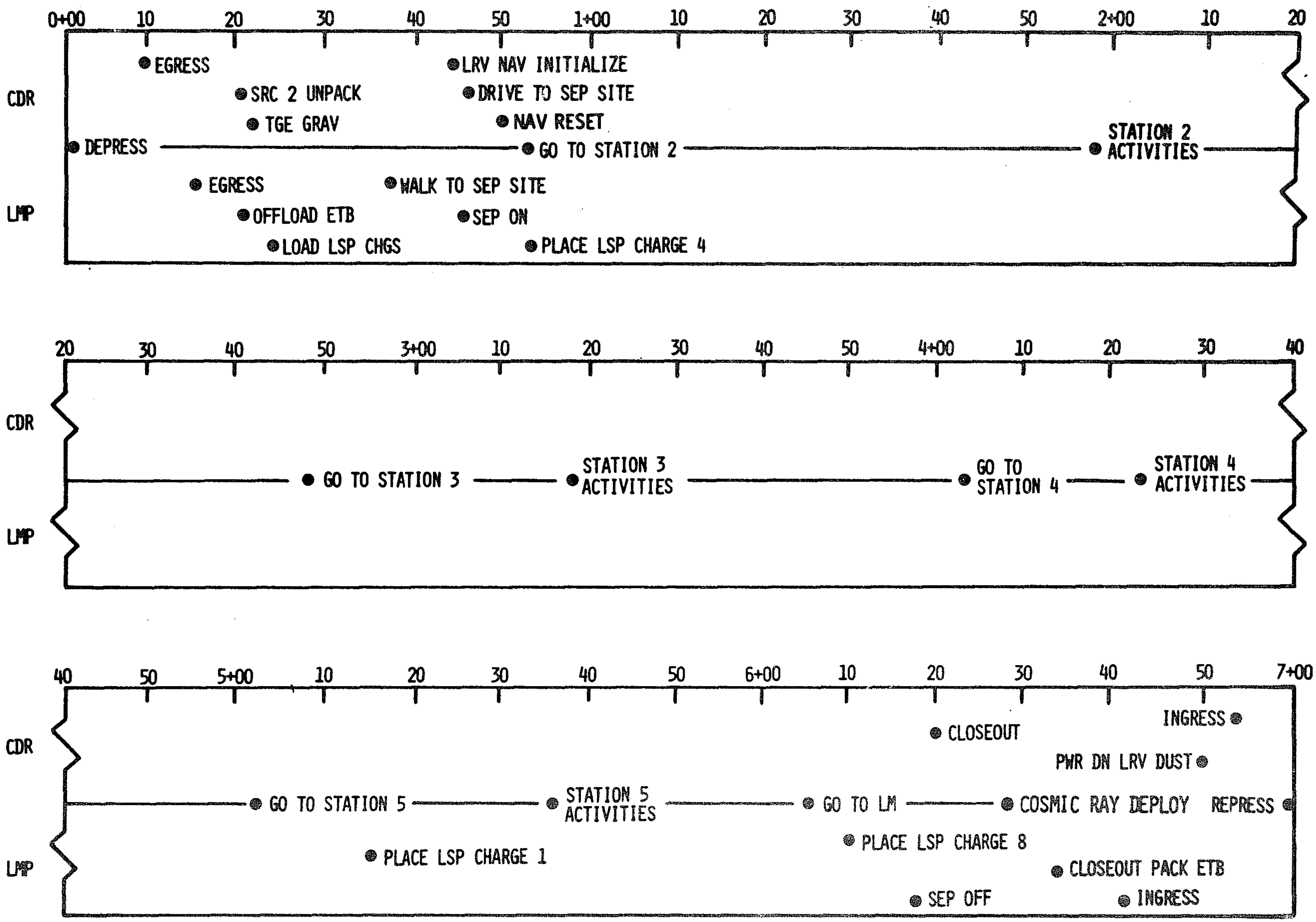
Next viewgraph, please.

(Slide.)

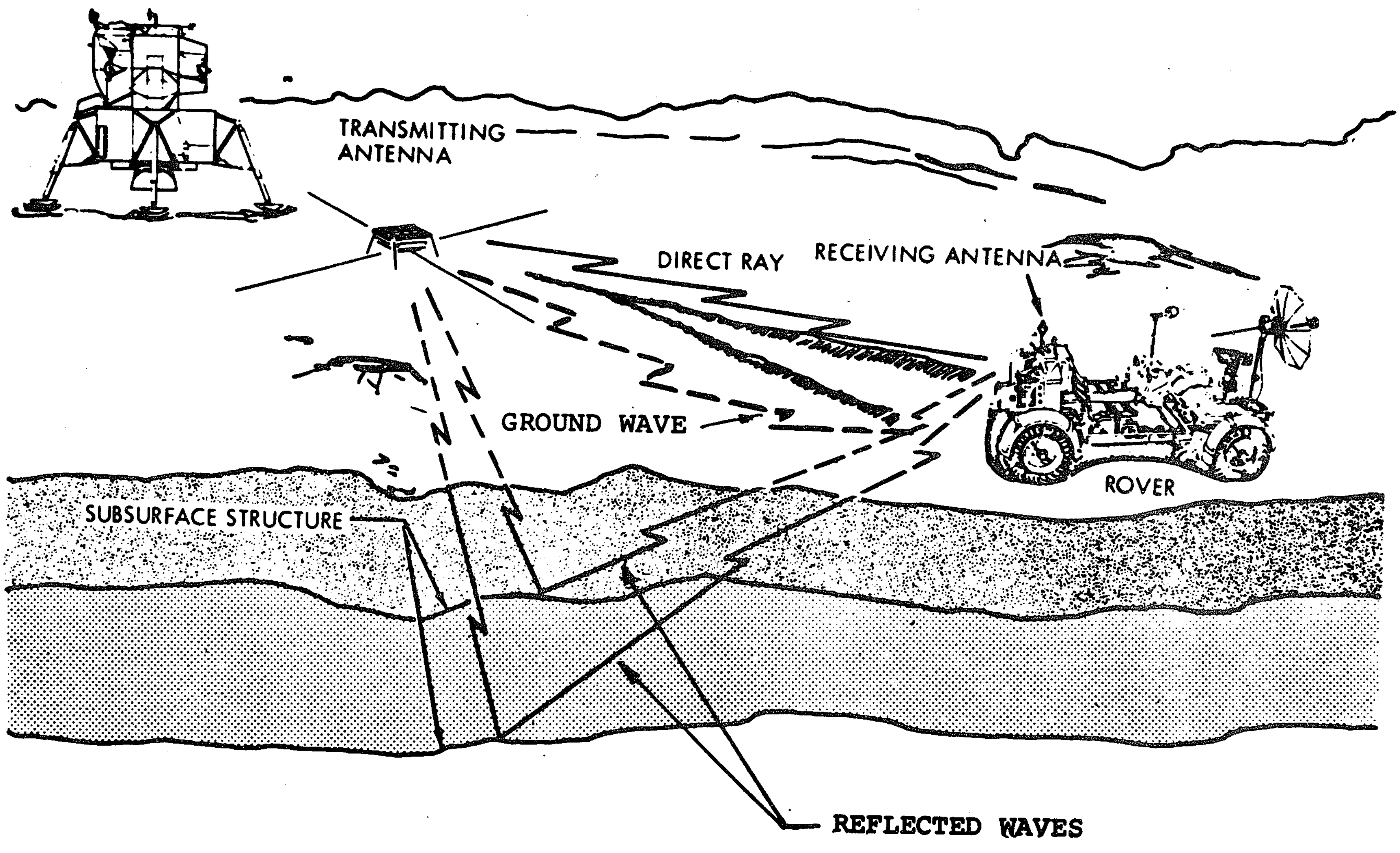
APOLLO 17 LUNAR SURFACE TIMELINE



APOLLO 17
EVA 2 TIMELINE



SURFACE ELECTRICAL PROPERTIES EXPERIMENT



Now, I wanted to show you here the active seismic charges, the current plan. Of course, this is Charlie Duke in the backup crew with John Young, the one on the right. He will carry it on his lap. He carries them back here but at the start he carries one on his lap because I think at least six of the eight they're going to deploy without getting off the Rover. They're going to save time.

Here you see them deploying one of these charges without getting off the Rover. He will, of course, be taking a picture of the locationof that and located here and these locations are going to be located as accurately as possible with the Rover navigation system. Now if we do lose a navigation system for some reason, we have worked out with Goddard a tracking from earth. We found on the last mission that you can get not the same degree of accuracy, but you get a real good degree of accuracy that would be valuable to accurately locate these charges for post analysis work.

Next viewgraph, please.

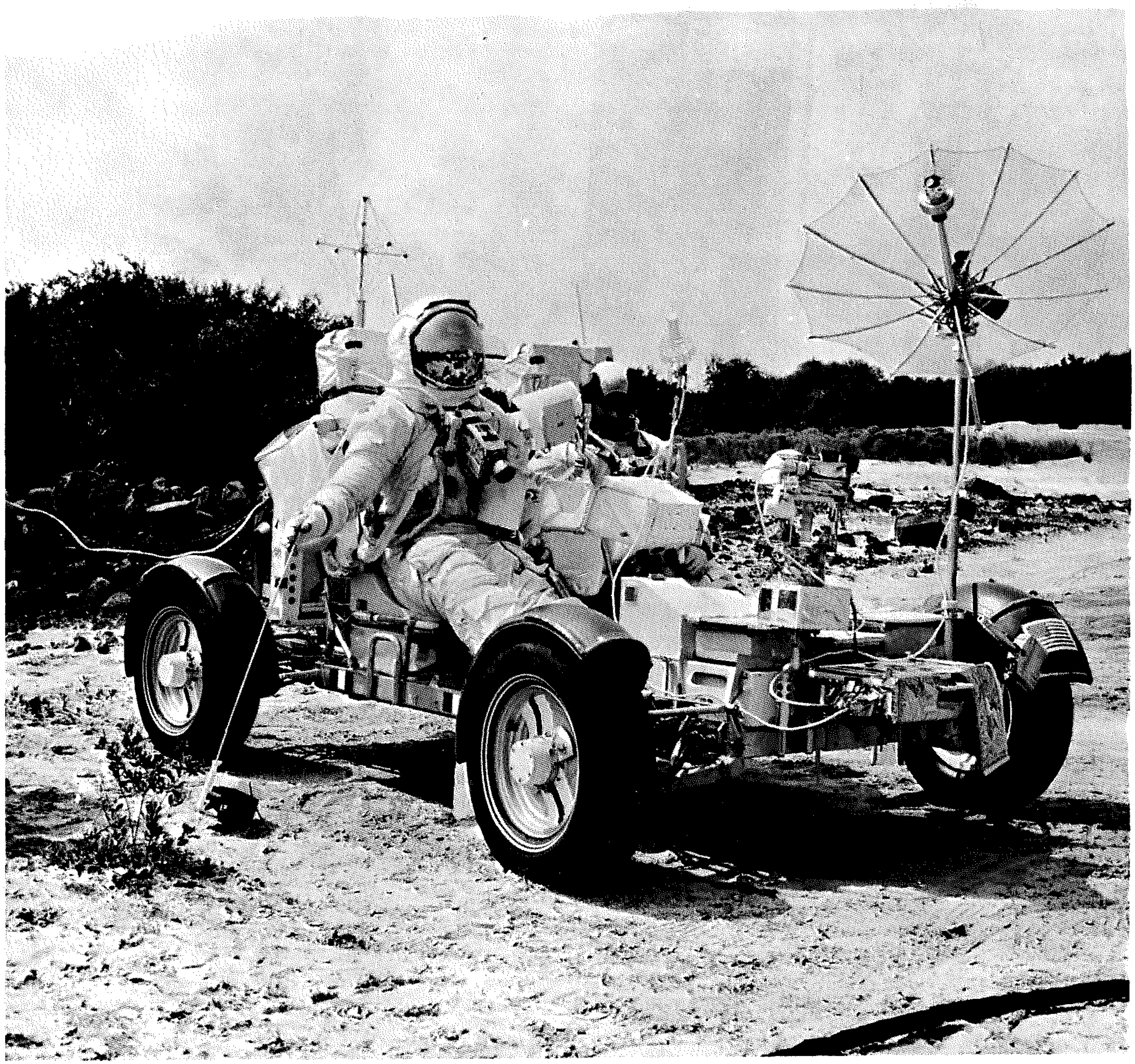
(Slide.)

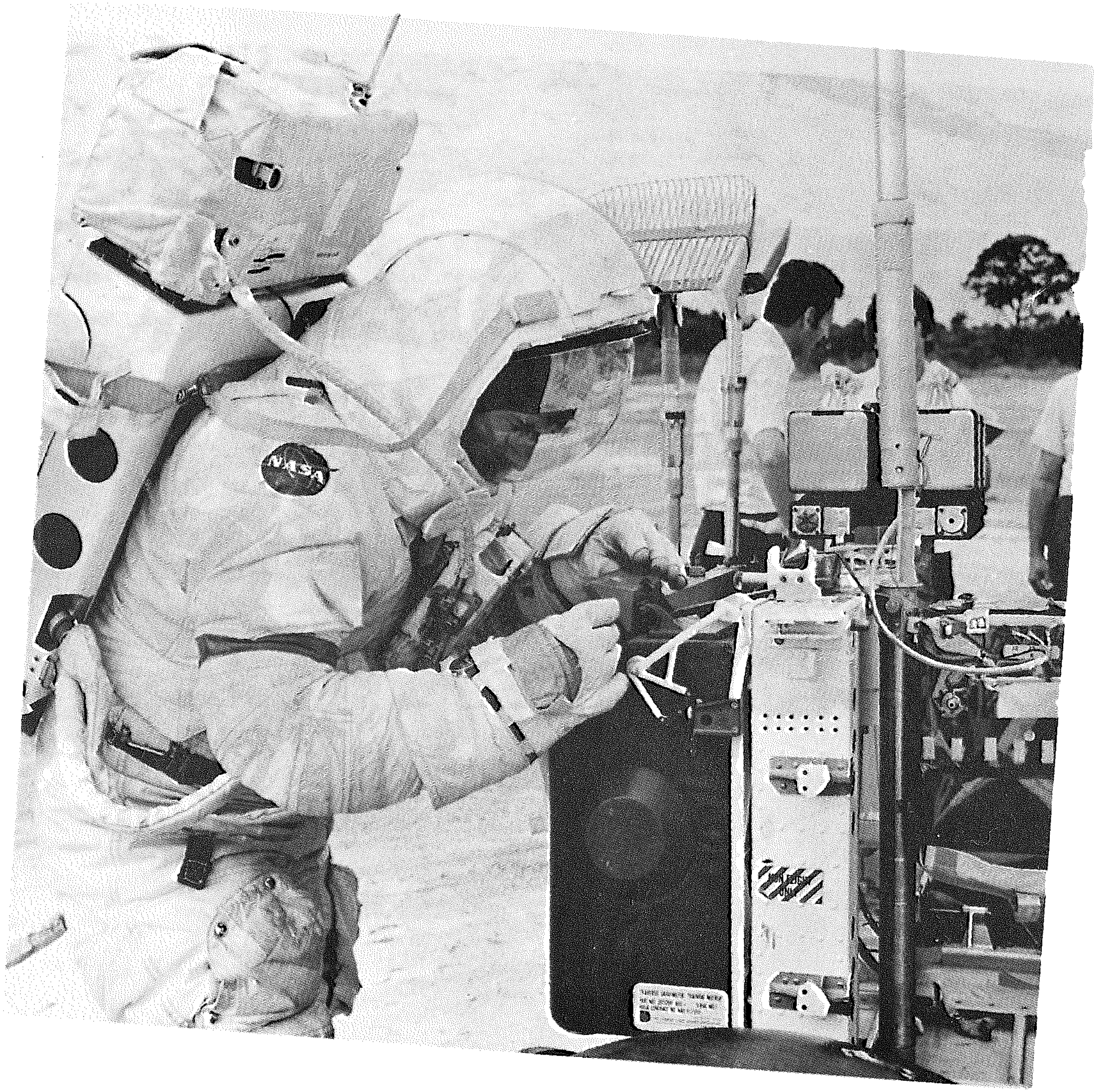
Here I wanted to show you a reading. I believe this is John Young. This is the traverse gravimeter. He's taking a reading. You'll see it's mounted here and I wanted to point out notice how it's mounted and your location of all your TV and that. This is one of the problems you have about having the TV pan at the same time.

Next viewgraph, please.

(Slide.)

This shouldn't take too long and we're going out on our second EVA, our second traverse and, if possible, all things being good, metabolic assessment, the crew and everything fine, overworking fine, the surface here according to John Young from examining the photographs does not appear to be as undulating as he had thought. We should get up somewhere in this area. If things permit, we will get to the edge of the massif here at this point which is about 7.2 kilometers from the LM. However, that is not the primary objective, but we do want to get into this area.




NASA

APOLLO 17

TRAVERSE STATION TIMELINE - EVA 2

STATION 2: NANSEN (:51)

	:05	:05	:21	:16	:04
CDR	O/H	DESCRIPTION AND SAMPLING			O/H
LMP	O/H	PAN	RAKE/SOIL SAMPLE/POLARIMETRY	RAKE SAMPLE, SAMPLING AND SINGLE CORE	O/H

STATION 3: LARA (:45)

	:05	:05	:13	:18	:04
CDR	O/H	DESCRIPTION AND SAMPLING		SAMPLING	O/H
LMP	O/H	PAN	RAKE/SOIL SAMPLING	SAMPLING AND EXPLORATORY TRENCH	O/H

STATION 4: SHORTY (:41)

	:05	:05	0:11	0:16	:04
CDR	O/H	DESCRIPTION AND SAMPLING			O/H
LMP	O/H	PAN	RAKE/SOIL SAMPLING	DOUBLE CORE	O/H

STATION 5: CAMELOT (:30)

	:05	:05	:05	:11	:04
CDR	O/H	DESCRIPTION AND SAMPLING			O/H
LMP	O/H	PAN	RAKE/SOIL SAMPLING	DOUBLE CORE	O/H

Now here the idea is to get some -- there appear to be some boulders and that here -- they want to get some of the highland material. Following sometime, as you can see up here, the things that will be doing on at Station Nansen, 51 minutes, we'll move on to Station 3 and Station 3 is on the scarp, this rise in the lunar surface called the scarp. They'll spend 45 minutes at this point and then traverse to Station 4, Station Shorty and this is a --

QUESTION: Who is that named after?

LEE: I don't have -- I didn't bring mine. I knew you'd ask that question and I went and got the background of all these names but I'll have to get it for you again. I left it.

QUESTION: Anybody we know?

VOICE: No, we don't think so.

LEE: Some of the names that were on were for polar explorers.

Camelot, of course, was taken from Camelot as far as I know and Shorty, we did have that; we don't know.

(Laughter.)

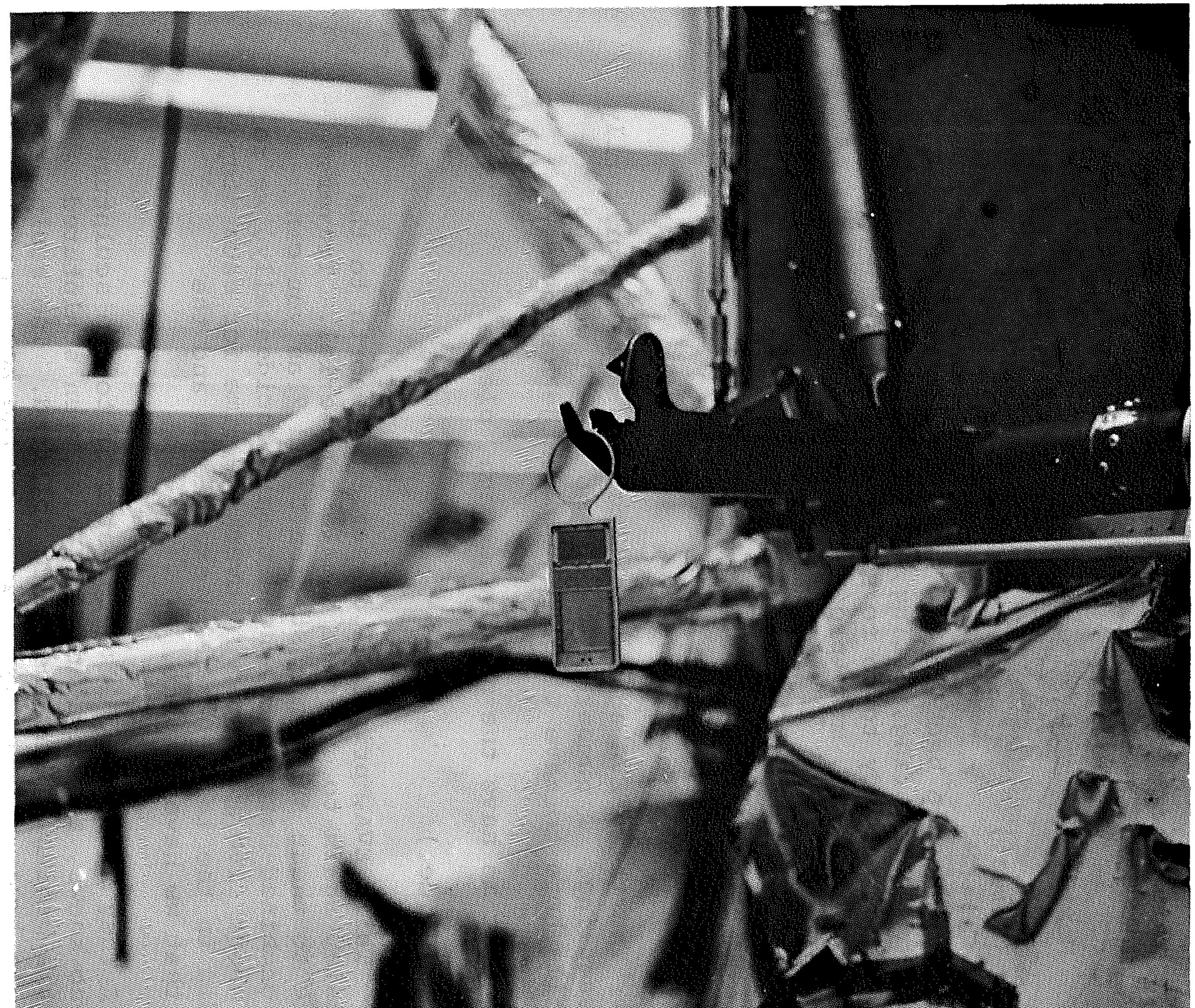
LEE: Station 4 is a dark halo crater that is interesting to the geologists and we'll make a stop there for 41 minutes and then we'll move on to Station 5, the prime objective here seems to be good, dark mantle. That's Camelot crater which should give us some very interesting information. It could be a possible source of the dark mantle. I say "possible," you know, this is just a conjecture.

Following that, of course, return to the LM.

Next viewgraph.

(Slide.)

When we get back to the LM, I talked about the cosmic ray. This is smaller and if time permits on the first EVA they will put these out, one in the sun and one in the shade; if not, this is the time that they will do it on the second EVA.



Next viewgraph, please.

(Slide.)

This is one of them and this is the other. This is in the shade.

Next viewgraph, please.

(Slide.)

Now, we're back in the same process here of doffing suits, debriefing, eating, cleaning up, recharging the PLSS, getting ready to go to sleep for eight hours, we hope, and we get up, make preparations for the third and final EVA.

Next viewgraph.

(Slide.)

The third EVA again the time line here is primarily geology sampling. A number of things go on. I won't go into details here to save time. You have the handouts.

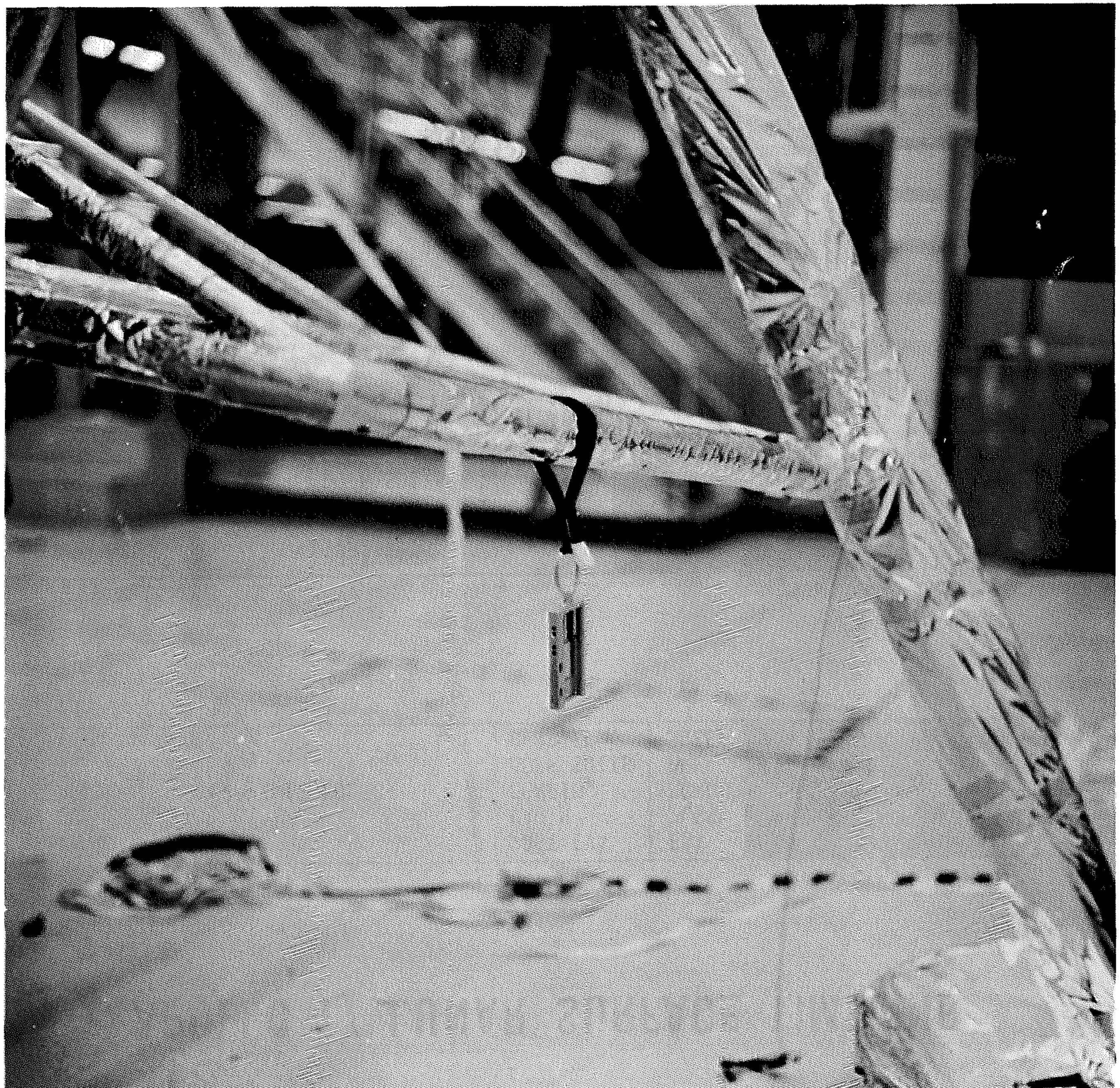
Let me have the next viewgraph, please.

(Slide.)

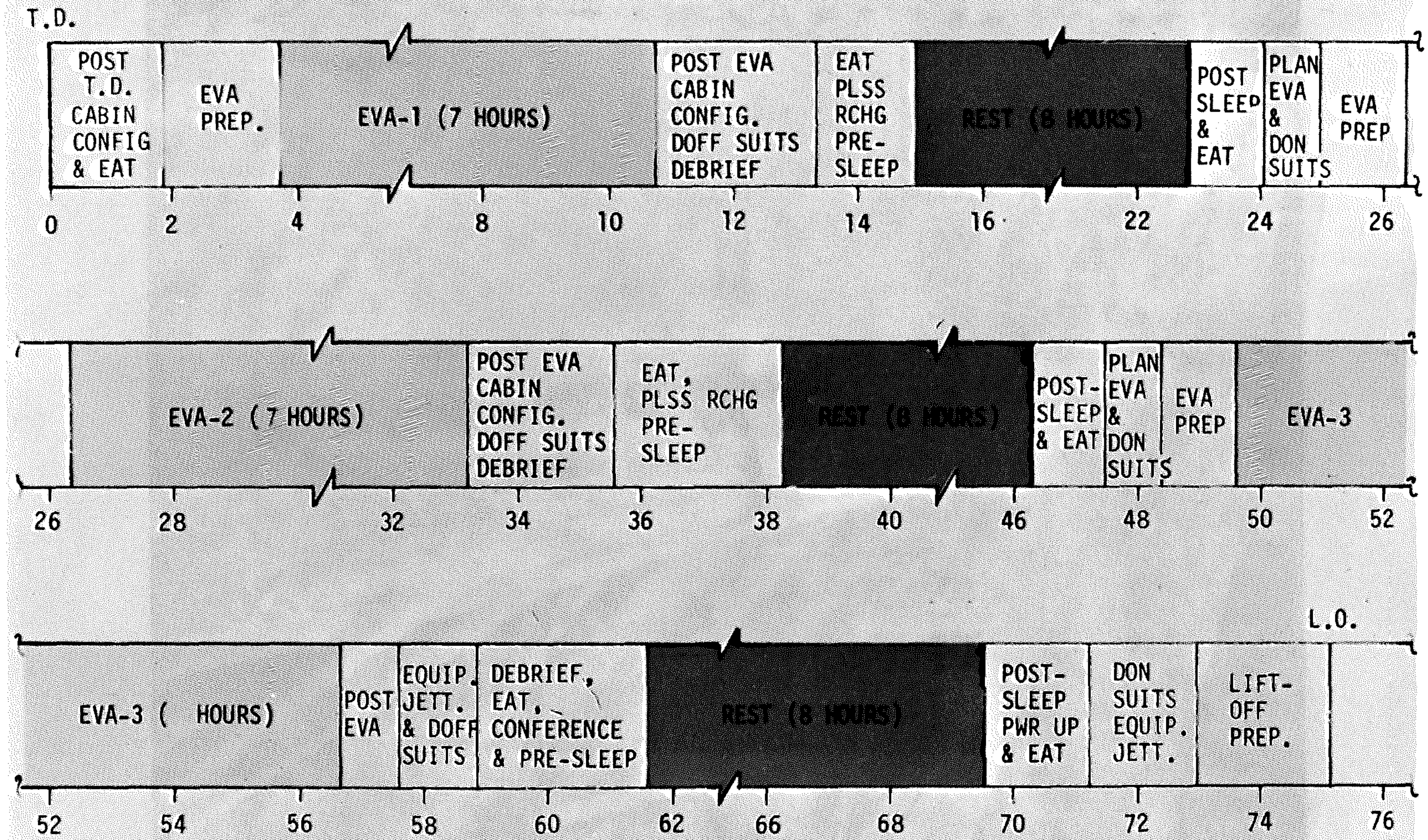
Third EVA, principal direction is north to the north massif, again to get some highland material. Traverse along here to these stations, Station 6 and 7 as you can see, are combined here in overhead time. Incidentally, we're allowing about five minutes more overhead time for each stop than we did in the last, based on experience and the readings that we have to take.

They also would like to get over to the sculptured hills. Who knows, the highlands may have been sculptured hills in the beginning and then were uplifted. The sculptured hills may be lower but at any rate one of the key stops is Station 8 in the sculptured hills area. From there we'll proceed down to what appears to be a small fresh crater. That's Station 9.

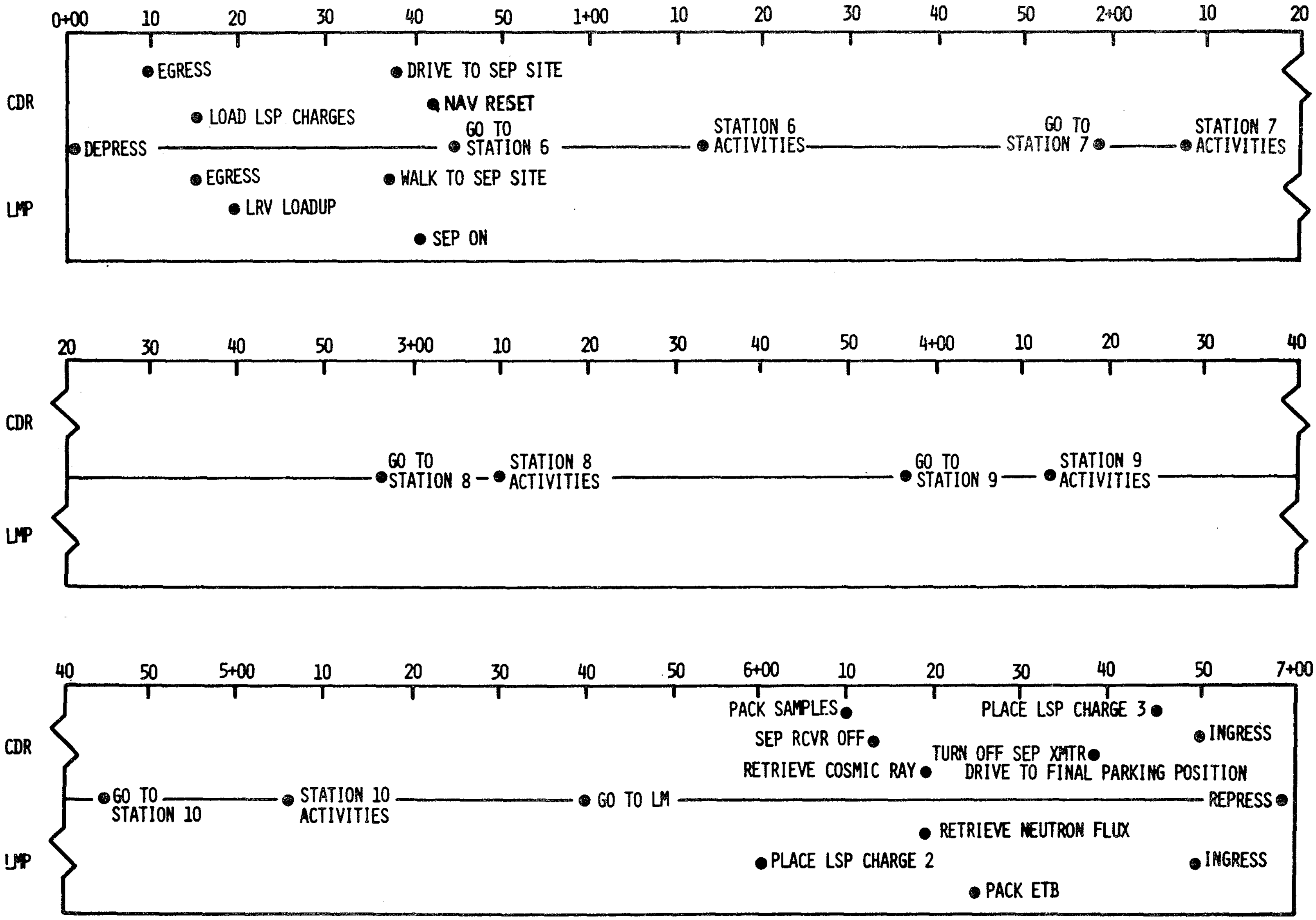
We'll spend 29 minutes and then go to Station 10 which is right at the edge of Sherlock and again for not only the dark mantle, but I believe -- Don, correct me -- I



APOLLO 17 LUNAR SURFACE TIMELINE



APOLLO 17
EVA 3 TIMELINE



APOLLO 17

TRAVERSE STATION TIMELINE - EVA 3

STATION 6 & 7: N. MASSIF AREA (1:28)

CDR	O/H		DESCRIPTION	SAMPLING		PAN AND O/H
	:10		:10	:20	:40	:08
LMP	O/H	PAN	DESCRIPTION	RAKE/SOIL SAMPLING POLARIMETRY	SAMPLING	PAN AND O/H

STATION 8: SCULPTURED HILLS AREA (:44)

CDR	O/H		DESCRIPTION	SAMPLING		O/H
	:05		:05	:20	:10	:04
LMP	O/H	PAN	DESCRIPTION	RAKE/SOIL SAMPLE	SAMPLING	O/H

STATION 9: VAN SERG (:29)

CDR	O/H		DESCRIPTION	SAMPLING	O/H
	:05		:05	:15	:04
LMP	O/H	PAN	DESCRIPTION	RAKE/SOIL SAMPLE	O/H

STATION 10: SHERLOCK (:36)

CDR	O/H		DESCRIPTION	SAMPLING		O/H
	:05		:05	:12	:10	:04
LMP	O/H	PAN	DESCRIPTION	SAMPLING	DOUBLE CORE	O/H

believe we see some submantle there, too, that could be of interest and complement data that they've got -- or supplement data that they've gotten here and return and they'll have to go back at this time to the ALSEP location to get the neutron probe and return that.

Next viewgraph, please.

(Slide.)

Now, very quickly I mentioned -- I showed you pictures of deploying the charges. This chart on the left here tells you the size of the charge, where it's carried, and the deployment location. These are actually kilometers and that is taken from the SEP transmitter as the focal point to tie everything in.

VOICE: No, from the geophone array.

LEE: From the geophone array, I'm sorry, from the geophone array that was laid out previously.

These tell you the deployment times. Now each of these charges has a timer that they, when Jack pulls the switch or one of the crew pull one of the toggle switches -- there are three of them actually you pull about the same time -- these will actuate the timers and these are due to be ready to go on command at about these times -- at these times after deployment. Now there is a plus or minus some minutes where the interlocking of the timers can vary. We're going to be sending a command and then we don't know precisely; in other words, it won't be a command and go off. It's a command and then when the timers mesh properly, then it will go off but we know approximately what that is.

It is our hope that if our TV is still working, we still have the power and the thermal conditions have not gotten so horrible that we can operate it, we do hope that perhaps we can get some TV pictures of six of these charges, some of them as close as 30 meters. That's the small 1/8 pound charge.

This is an outline of essentially where they're deployed. You can see this is EVA-1. You've got a 1/4 pound charge here, 1/8 pound charge here, and EVA-2 you deploy one out here; we deploy this one coming back. And EVA-3, do we deploy any?

LSPE CHARGE DEPLOYMENT PLAN

CHARGE SIZE LB	CHARGE NO.	PALLET NO.	DEPLOYMENT LOCATION, RADIUS FROM ALSEP (KM)	DEPLOYMENT TIME		TIME AFTER DEPLOYMENT OF DETONATION (HOURS)	TIME AFTER LIFTOFF FOR DETONATION* (HR:MIN)	TIME *	
				EVA	HR:MIN FROM EVA START			GET (HR:MIN)	DATE/EST
1	6	2	1.3	1 (OUTBOUND)	4:40	91	24:17	212:20	12/15-1813
3	5	2	2.3	1 (STATION 1)	5:53	92	26:30	214:33	12/15-2026
1/2	7	2	.8	1 (INBOUND)	6:12	93	27:49	215:52	12/15-2145
1/8	4	2	.16	2 (OUTBOUND)	:55	91	43:02	231:05	12/16-1258
6	1	1	2.4	2 (INBOUND)	5:17	92	48:24	236:27	12/16-1820
1/4	8	1	.25	2 (INBOUND)	6:11	94	51:18	239:21	12/16-2114
1/4	2	1	.25	3 (INBOUND)	5:59	93	73:36	261:39	12/17-1932
1/8	3	1	.16	3 (LRV FINAL PARKING)	6:04	94	75:07	263:10	12/17-2113

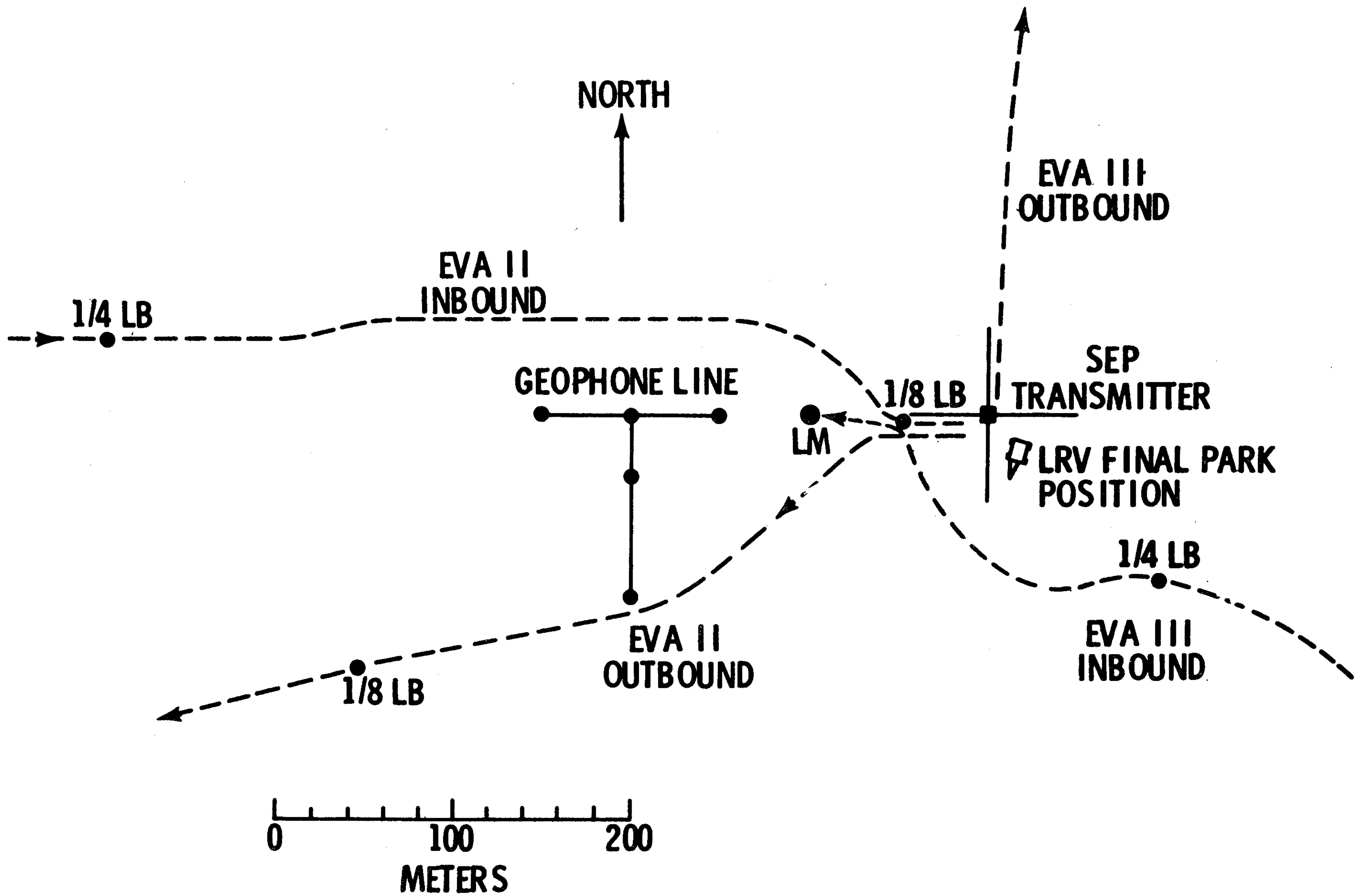
*BASED ON THE FOLLOWING MISSION TIMES:

LANDING	113:02 GET	START EVA 3	162:40 GET
START EVA 1	116:40 GET	LIFTOFF	188:03 GET
START EVA 2	139:10 GET		

OTHER TIMES OF INTEREST:

LM IMPACT:	7:56 AFTER LIFT-OFF	12/15-0152	EST
TEI:	48:37 AFTER LIFT-OFF	12/16-1833	EST

LSPE CHARGE DEPLOYMENT IN LM AREA



VOICE: Yes, a 1/4 pound.

LEE: Yes, so that's an outline of these charges here.

Next viewgraph, please?

(Slide.)

Following EVA-3, of course, get back, rest before liftoff, they will, of course, repress and then doff their suits and then they'll depress to get rid of some of the excess equipment, but since they're sleeping and we want to jettison some of the equipment, of course, they're using for sleeping and that, we will have another depress after sleep and before liftoff.

Next viewgraph.

(Slide.)

This is a picture again. We're going to position the lunar Rover to take a picture of liftoff, televised liftoff, real time and I'll have a summary of the TV times here and we're also hoping that we might be able to televise the LM ascent stage impact.

Next viewgraph.

(Slide.)

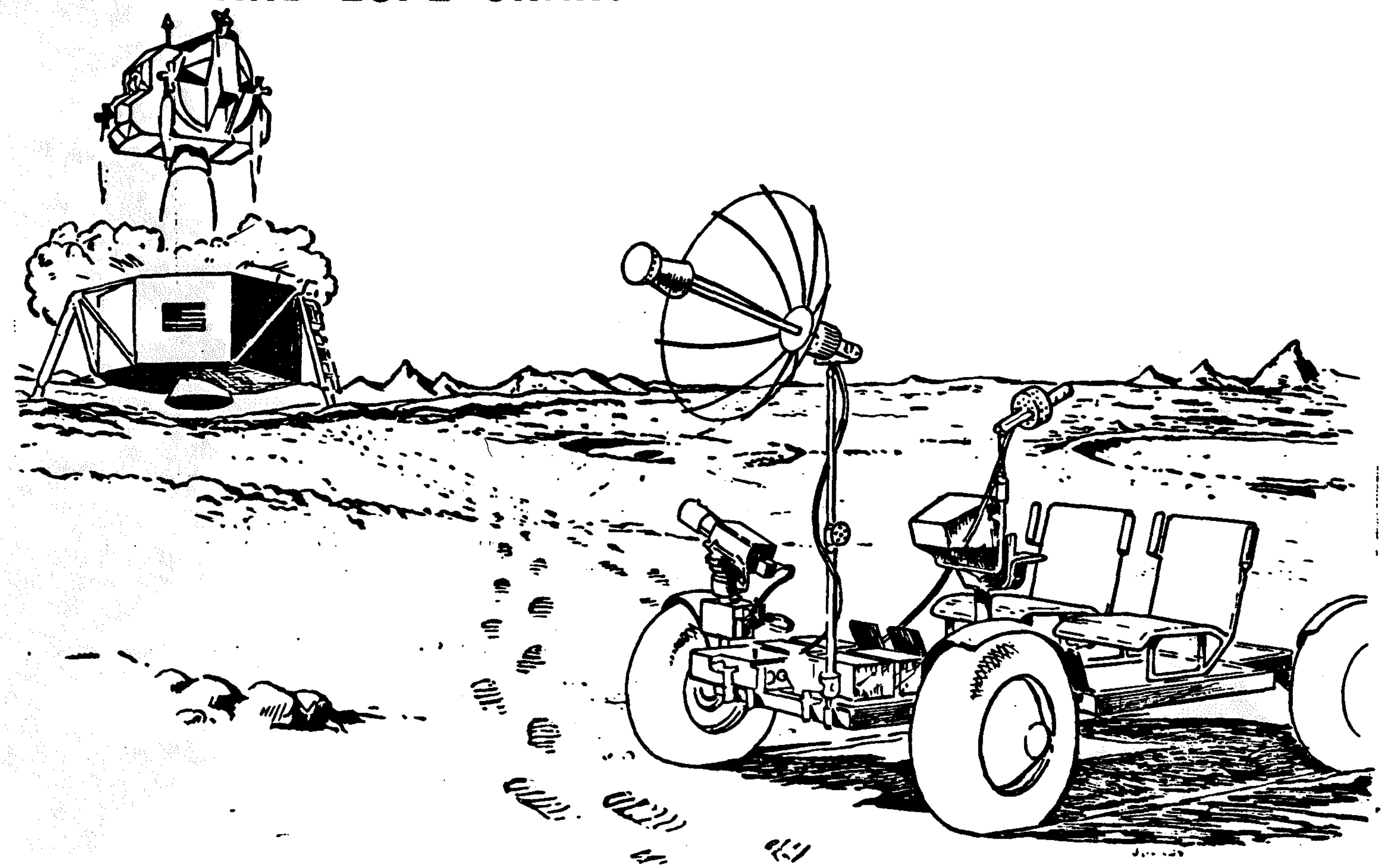
Present plan is to impact the LM on this trajectory onto the south massif at this point. Now, the ALSEP is located here. You're coming from east to west is in this direction. The LM we hope to impact about this point so this is about nine kilometers and you can see it's about nine kilometers from the target point. The target point is on an incline of about 28 degrees so that if we're fortunate and have a TV, there is some hope that we may be able to see the results of the LM impact, the ejecta.

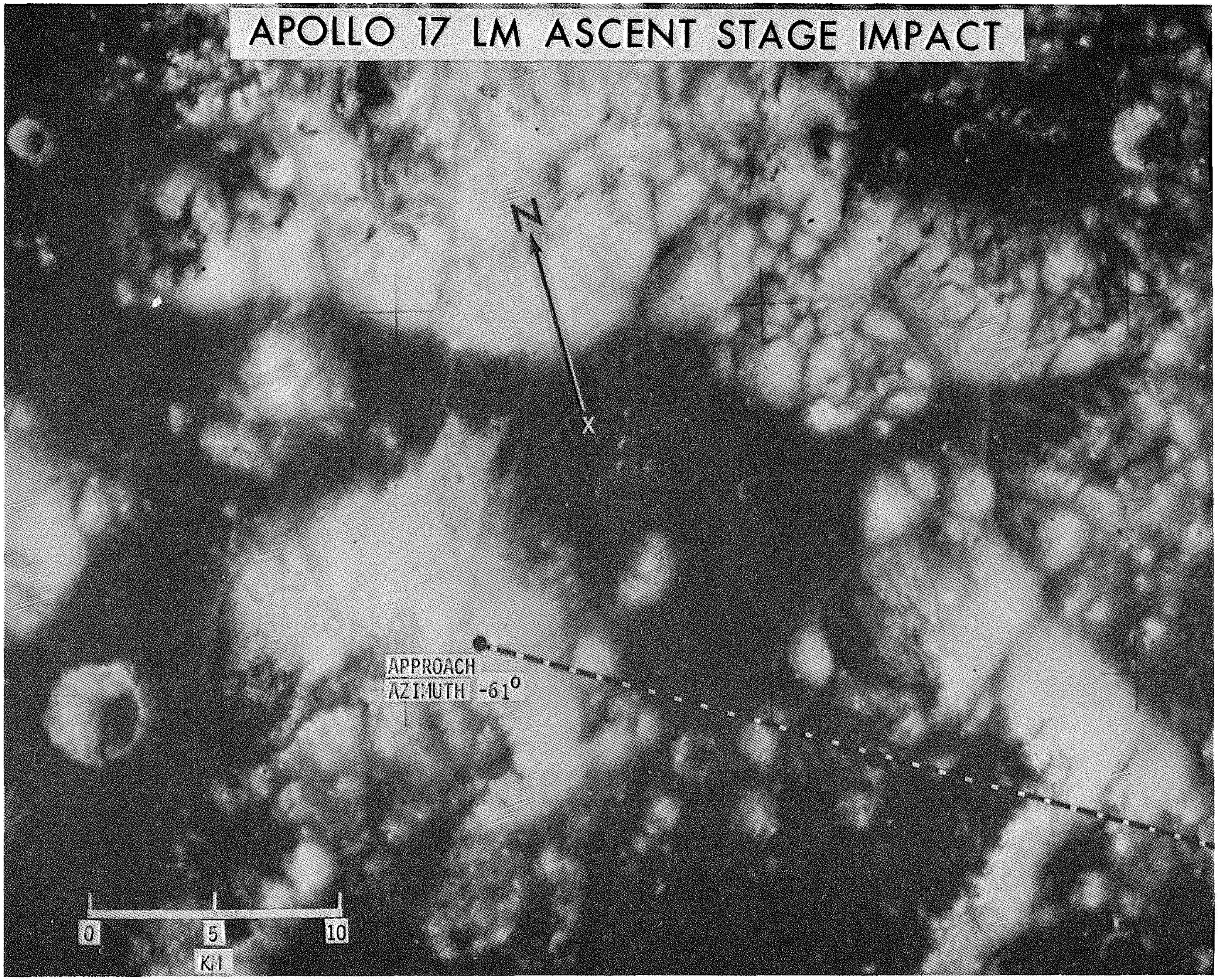
Next viewgraph.

(Slide.)

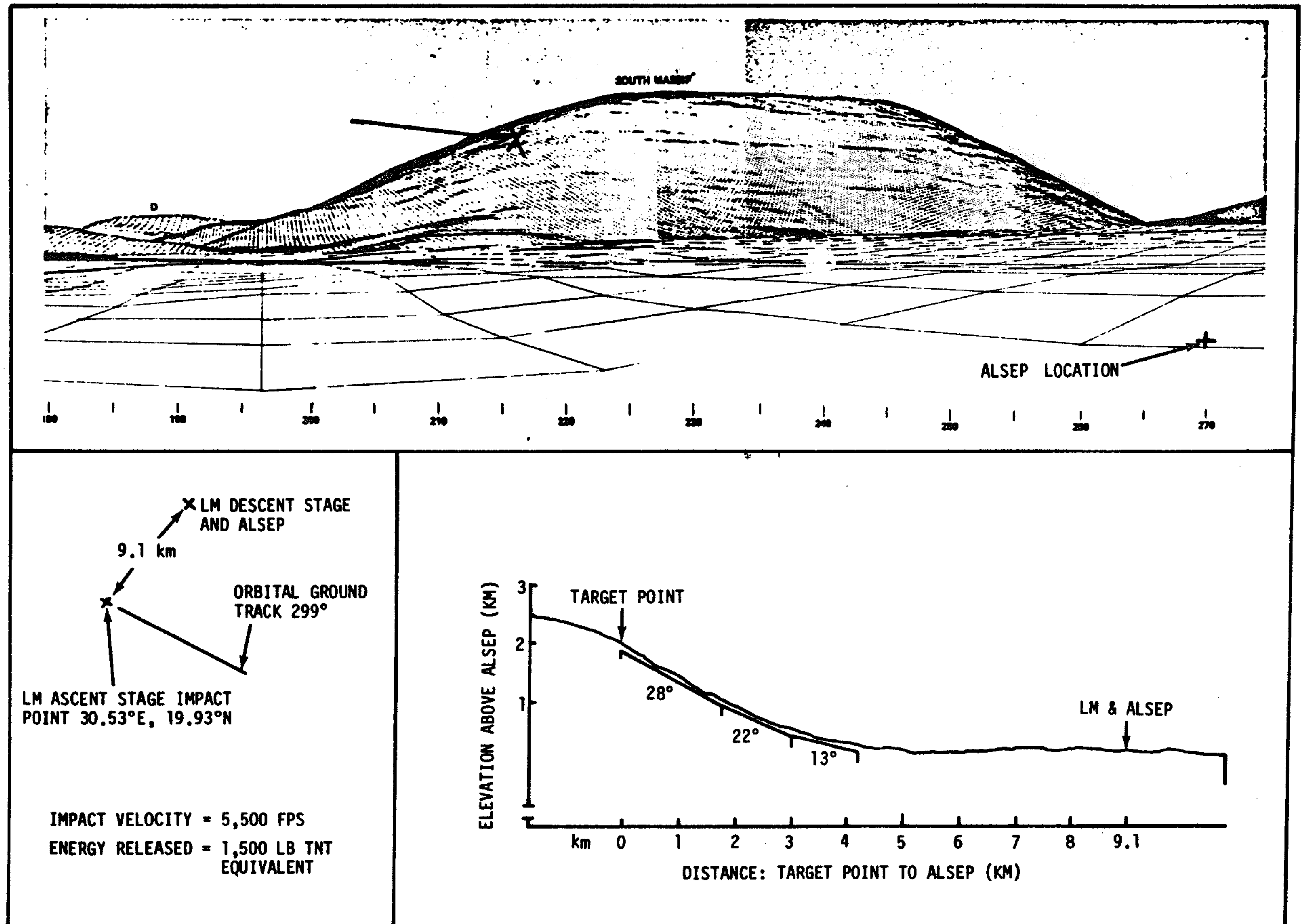
This is just another chart to show the location with relation to all the others. There's very little likelihood -- I guess I don't recall. I tried to get before

TELEVISING LM LIFTOFF, ASCENT STAGE IMPACT AND LSPE CHARGE DETONATIONS

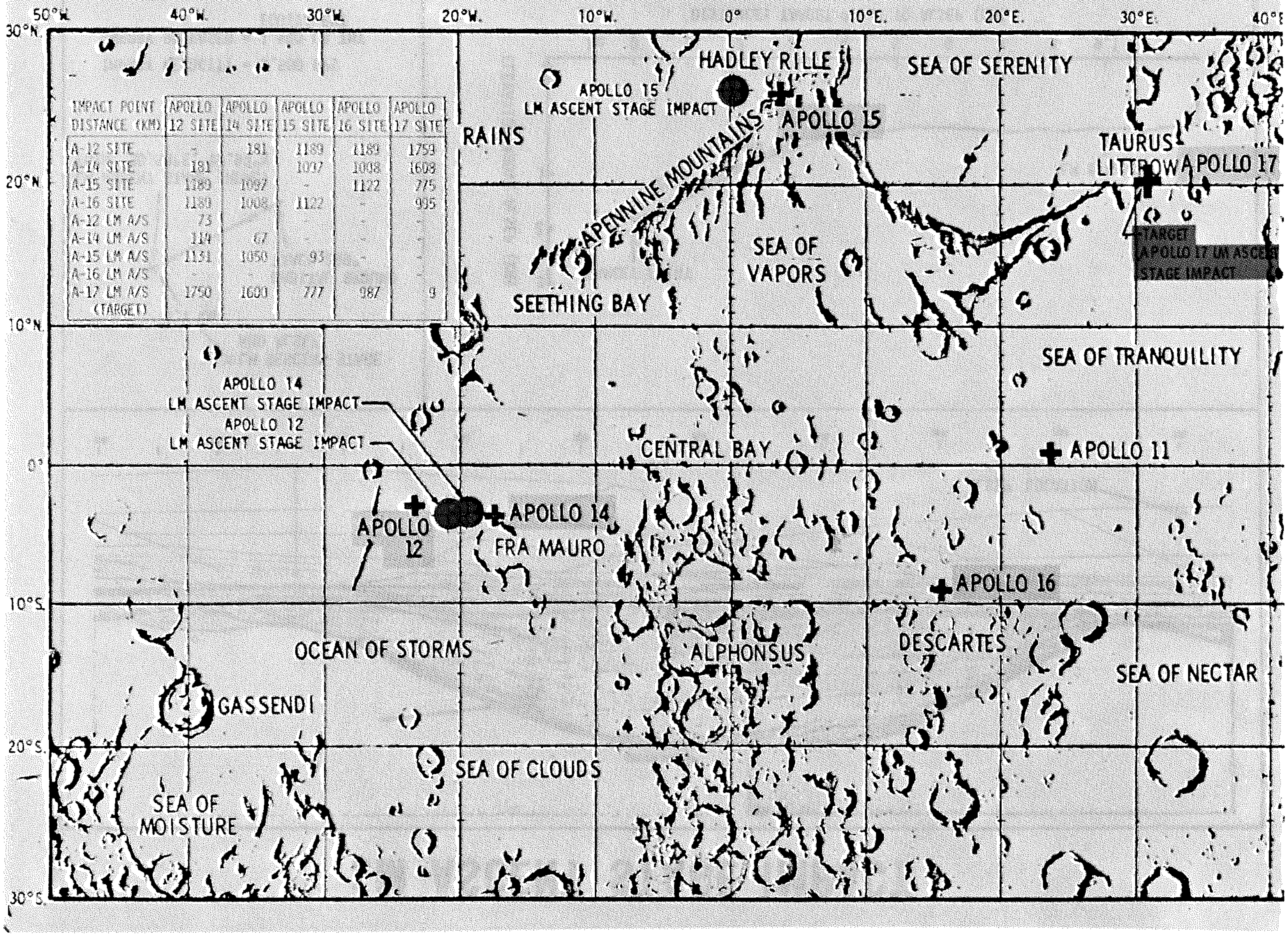



APOLLO 17 LM ASCENT STAGE IMPACT
N
X
APPROACH
AZIMUTH -61°
0
5
10
KM

LM ASCENT STAGE IMPACT



LM ASCENT STAGE IMPACT



IMPACT POINT DISTANCE (KM)	APOLLO 12 SITE	APOLLO 14 SITE	APOLLO 15 SITE	APOLLO 16 SITE	APOLLO 17 SITE
A-12 SITE	-	181	1189	1189	1759
A-14 SITE	181		1097	1008	1608
A-15 SITE	1189	1097	-	1122	775
A-16 SITE	1189	1008	1122	-	995
A-12 LM A/S	73			-	-
A-14 LM A/S	114	67	-	-	-
A-15 LM A/S	1131	1050	93	-	-
A-16 LM A/S	-	-	-	-	-
A-17 LM A/S (TARGET)	1750	1600	777	987	9

I came over here. I think we did to some signal but whether it was distinguishable or not of the LM impact at the far seismic experiments or not; do you recall?

VOICE: Yes, they did see it.

LEE: They did see it. So there is a chance that again Apollo 16 and Apollo 15 may pick it up but I have serious doubts about the others, but it's possible.

Now, the LM impact, of course, is -- will be very interesting to the seismic profiling experiment. The principal investigator feels that this will even give him greater depth. I think the depth that you get is something like about a half of the horizontal distance. It's approximate. So that if this were correct and he got a good impact, that we might get some layering information to four kilometers or so or some seismic wave transmissions. What it tells us is again something else that takes analysis.

Next viewgraph.

(Slide.)

Now, as far as the lunar orbit, in the meantime, all this has been going on and even before DOI, we are activating and operating our orbital experiments. I've covered the viewgraph on the right, the location is SIM BAY. On the left here we just try to depict the orbits and the periods in which these various instruments will be active.

Now I do want to point out that they're not active that entire period, like, you know, you're going to take some pictures and some UV and then turn it of; but most of the time they are active.

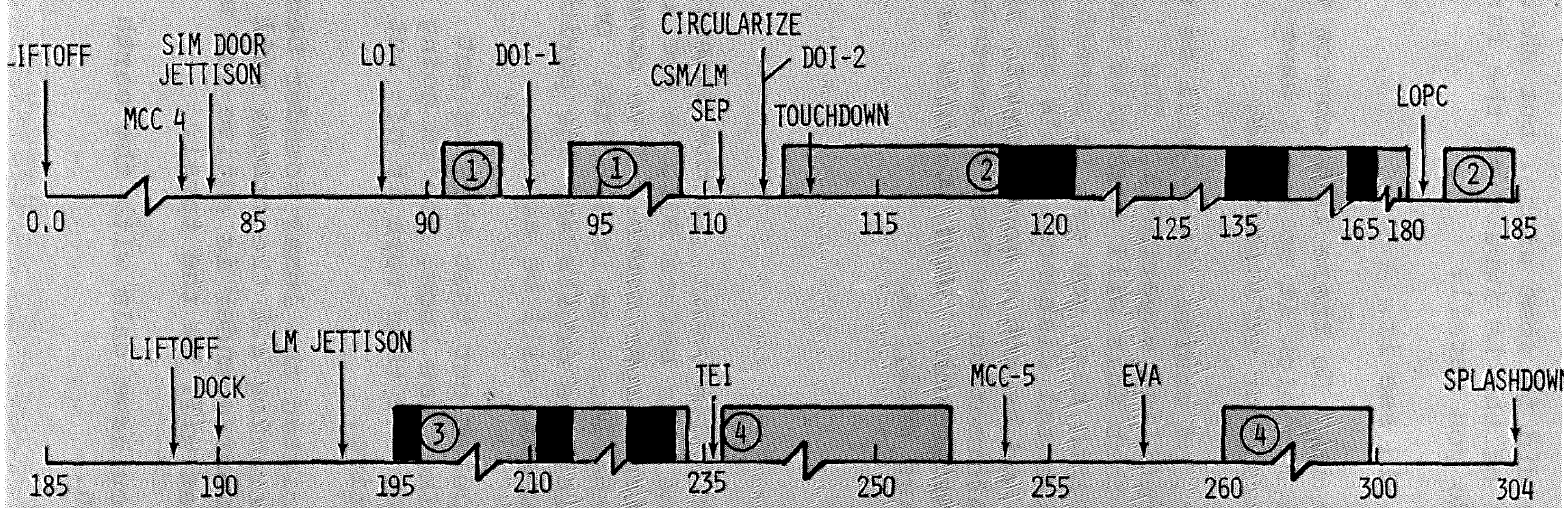
In red we have depicted the lunar sounder because when the lunar sounder is operating all the others will be turned off and I think the lunar sounder is active for what? Four revs? Four revs and that will be the total.

QUESTION: Will you have calm with the earth while the lunar sounder is on.

LEE: Yes, yes.

Next viewgraph, please.

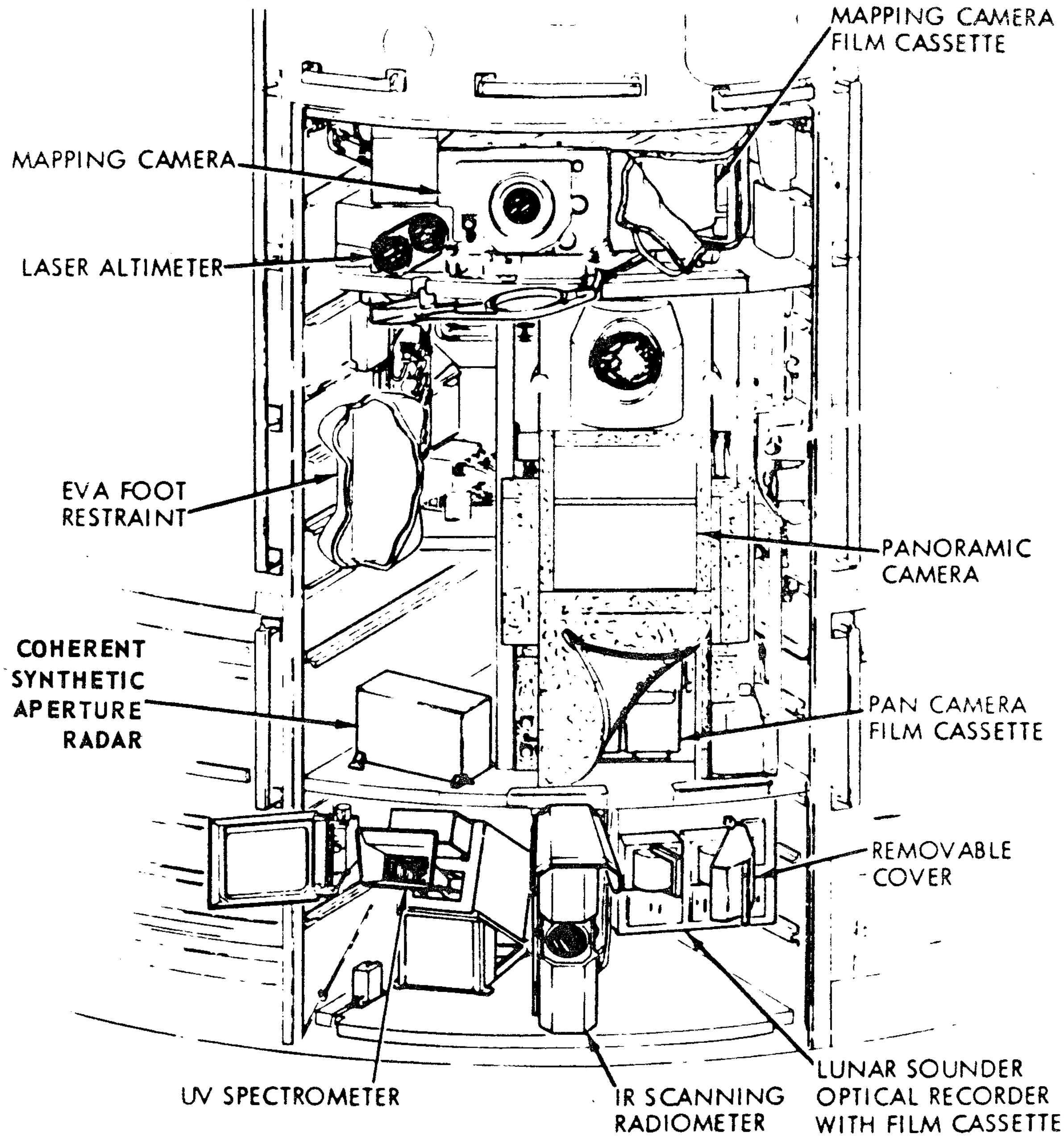
APOLLO 17 ORBITAL TIMELINE



SIM OPERATION PERIODS (NON-CONTINUOUS)

ACTIVITY PERIOD	CONFIG-URATION	FAR UV SPEC	IR SCAN RADIOMETER	LUNAR SOUNDER	MAP CAMERA	PAN CAMERA	LASER ALTIMETER
(1)	CSM-LM						
(2)	CSM						
(3)	CSM						
(2)	CSM						
(3)	CSM						
(4)	CSM						
TOTAL TIME (HOURS IN LUNAR ORBIT)							

APOLLO 17
SIM BAY



(Slide.)

As far as coverage goes, I don't know whether you can see this in the back. We didn't have time to change it but let me just outline for you very briefly the Apollo 15 coverage was this black area here, black line. The Apollo 16 covered this area of lunar surface and Apollo 17 is planned in its orbit will cover some additions so you can see that there is some overlap and this is not all bad because you get some of these areas at different sun angles, but that, of course, is controlled, unless we have the energy to do so, to make a plane change, it's really controlled by the latitude of the site that we're going to.

Now, here we have tried to summarize some of the percentage of lunar surface that we picked up on 15, 16 and 17 and what the total is and rather than read the numbers I think they're there for you to see; we're not getting in itself as much a percentage. You can see the new area photograph for 17 is 2.8 percent and for the pan camera is 2.0 percent, but it does add to the total. And here we're talking total nonredundant to about 17 percent of the lunar surface, so I guess my key point is, gentlemen, that there's still quite a bit of lunar surface we haven't photographed with the pan camera for that resolution.

Next viewgraph, please.

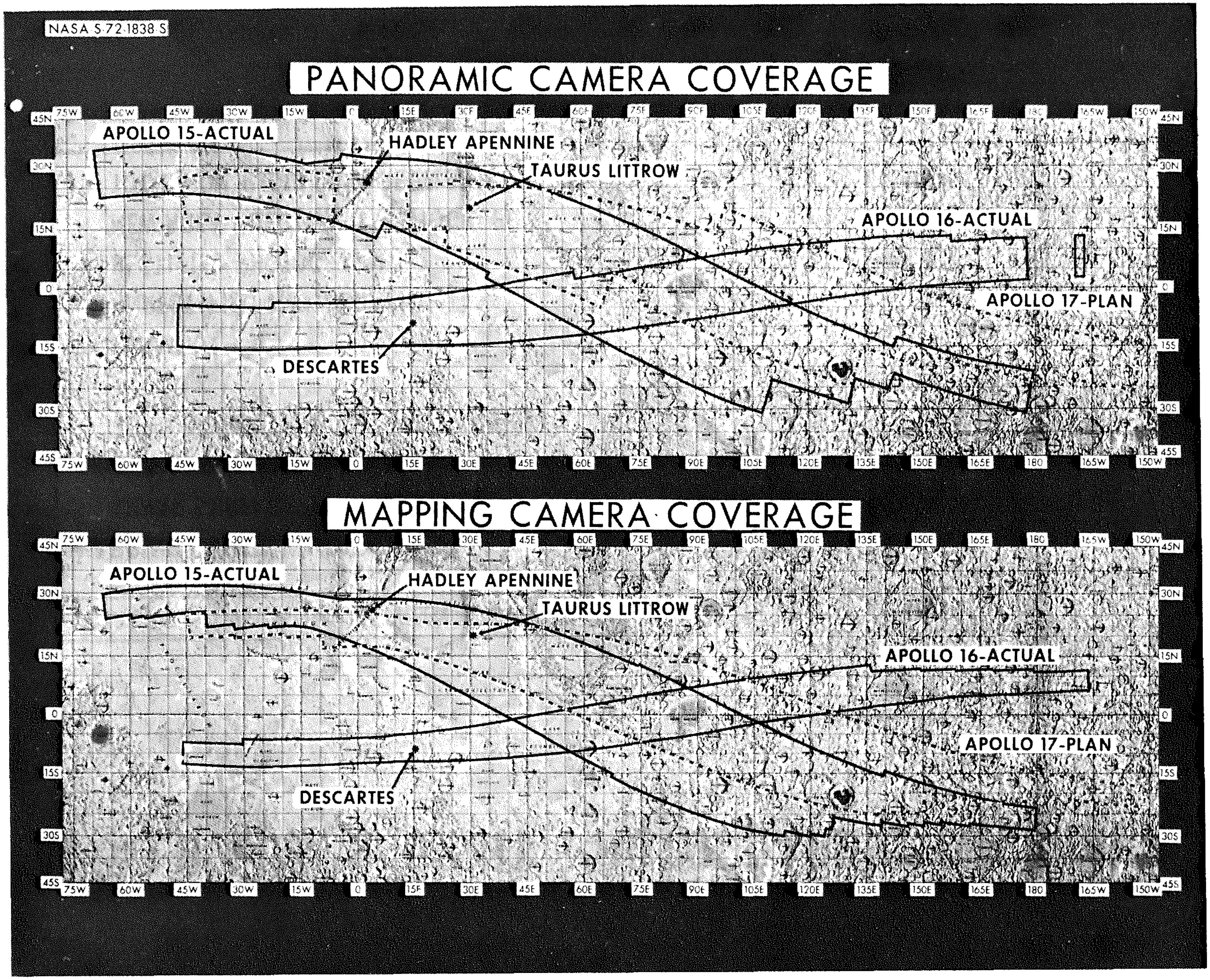
(Slide.)

Post TEI, of course, is the film retrieval. The visual light flash testing, I would like to point out that the actual wearing of the instrument will be done on the way to the moon but on the way back the crew will wear the black patches, just as they did the last time and count the flashes.

We will do a Skylab contamination test, get some data on the contamination from the spacecraft, see the effects on optics and so forth. And, of course, Ron Evans will do an EVA. It's going to last about the same length of time as the previous one and instead of putting up the Mead, the experimental experiment, we do have an extra cassette to retrieve and that's a lunar sounder film cassette and its location is at the bottom, at the base of the SIM BAY there and Don will be reaching for that and he will retrieve three cassettes -- Ron.

APOLLO LUNAR ORBIT PHOTOGRAPHIC COVERAGE

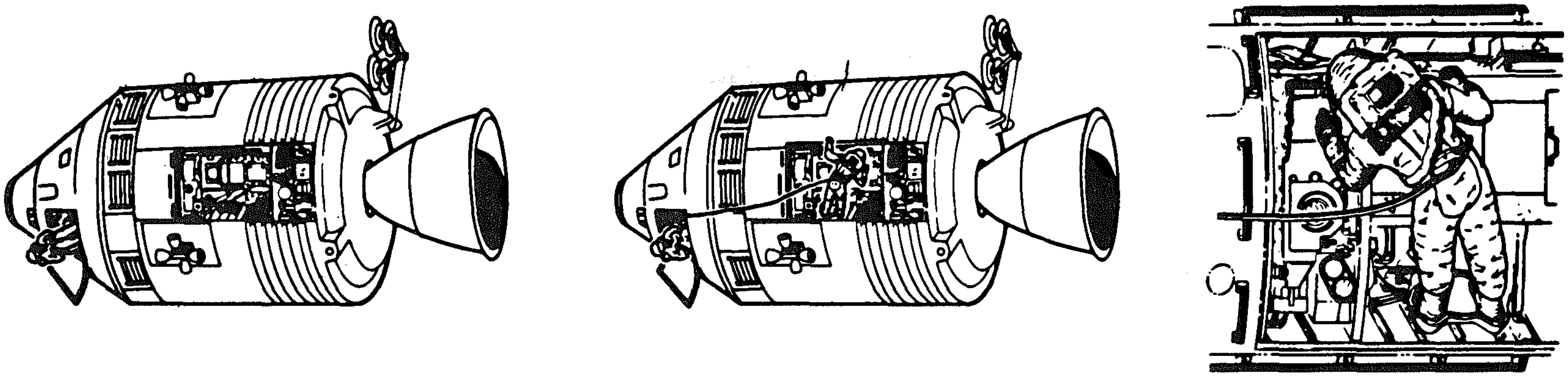
	% LUNAR SURFACE		
	APOLLO 15	APOLLO 16	APOLLO 17
TOTAL AREA OVERFLOWN BETWEEN GROUNDTRACKS LOI-TEI	17.0	7.2	13.5
MAPPING CAMERA - VERTICAL			
LUNAR SURFACE PHOTOGRAPHED	10.3	5.3	8.5
NEW AREA PHOTOGRAPHED	-	3.9	2.8
TOTAL NON-REDUNDANT PHOTOGRAPHY	10.3	14.2	17.0
PAN CAMERA			
UNRECTIFIED PHOTOGRAPHY	11.5	7.2	10.3
RECTIFIED PHOTOGRAPHY	6.7	4.2	6.0
NEW AREA - RECTIFIED PHOTOGRAPHY	-	3.1	2.0
TOTAL NON-REDUNDANT RECTIFIED PHOTOGRAPHY	6.7	9.8	11.8


NASA S-72-1838 S
PANORAMIC CAMERA COVERAGE
APOLLO 15-ACTUAL
HADLEY APENNINE
TAURUS LITTROW
APOLLO 16-ACTUAL
APOLLO 17-PLAN
DESCARTES
75W 60W 45W 30W 15W 0 15E 30E 45E 60E 75E 90E 105E 120E 135E 150E 165E 180 165W 150W
45N 30N 15N 0 15S 30S 45S
MAPPING CAMERA COVERAGE
APOLLO 15-ACTUAL
HADLEY APENNINE
TAURUS LITTROW
APOLLO 16-ACTUAL
APOLLO 17-PLAN
DESCARTES
75W 60W 45W 30W 15W 0 15E 30E 45E 60E 75E 90E 105E 120E 135E 150E 165E 180 165W 150W
45N 30N 15N 0 15S 30S 45S

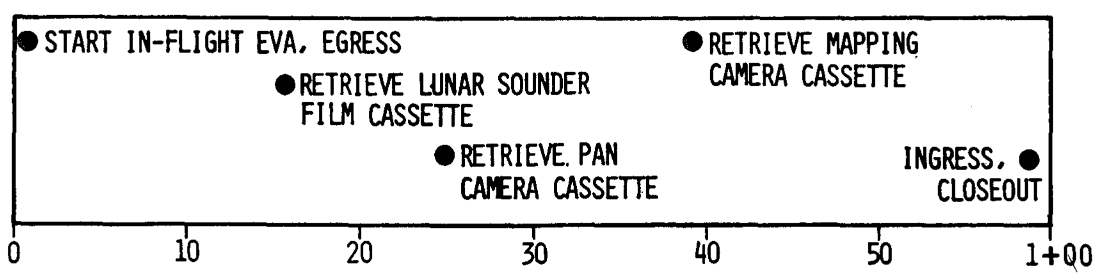
APOLLO 17
POST TEI EVENTS

- FILM RETRIEVAL EVA
- VISUAL LIGHT FLASH TESTING
- SKYLAB CONTAMINATION TEST

FILM RETRIEVAL FROM THE SIM BAY



EVA TIMELINE



Next viewgraph, please.

(Slide.)

On the right is the flashing lights experiment. You'll recall we had these, we did get data; I haven't heard the results but they do have some good data on these plates that are behind here, that starts on a time, lasts for about an hour and they were able to get the angles and so forth on the two plates as they move us to the impact of the high Z particles. This will be only worn on the way to the moon. It will not be worn returning. It's just do one exercise on it.

On the left -- I think we have another viewgraph that should be up here.

(Slide.)

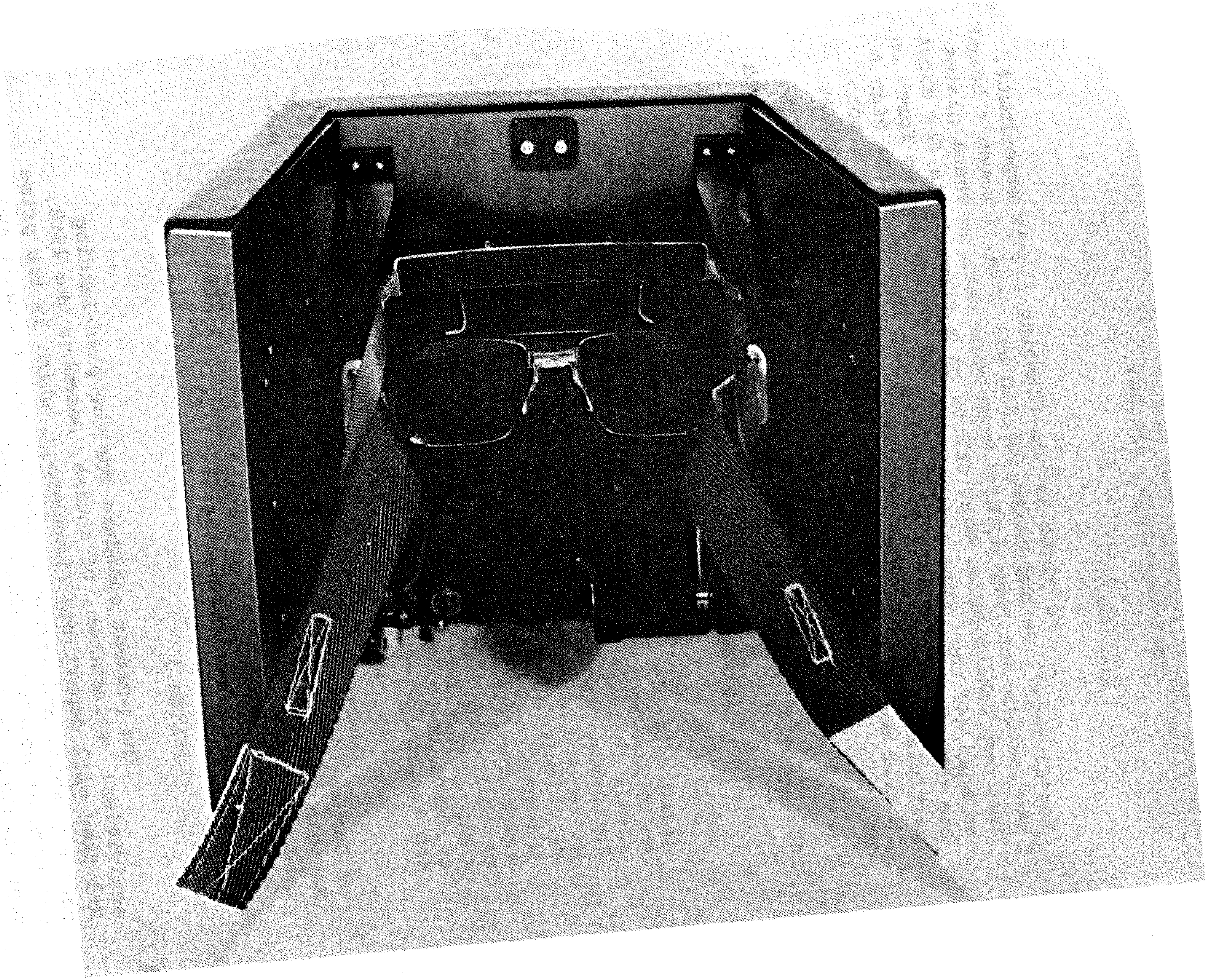
Yes. And this is reentry and here's something a little different than we have had in the past. We're coming from north to south this time. As you recall in the past we've really come over, come up Carnarvon Tracking Station in Australia and that. And we're coming back at 290 RGT because of the difference of velocity, the Earth's rotation, the speed of the spacecraft, the actual ground track is going to be something like this and the landing area is here and on this viewgraph on the left the landing area is at this point which is about 350 miles slightly southeast of Samoa and 2,400 miles from -- I'm sorry, this is the landing point; this is reentry; this is blackout.

Here's Samoa. It's about 350 miles southeast of Samoa. 2,400 miles from Hawaii. Landing is at 2:24 p.m. Eastern Standard Time December the 19th is the nominal landing time.

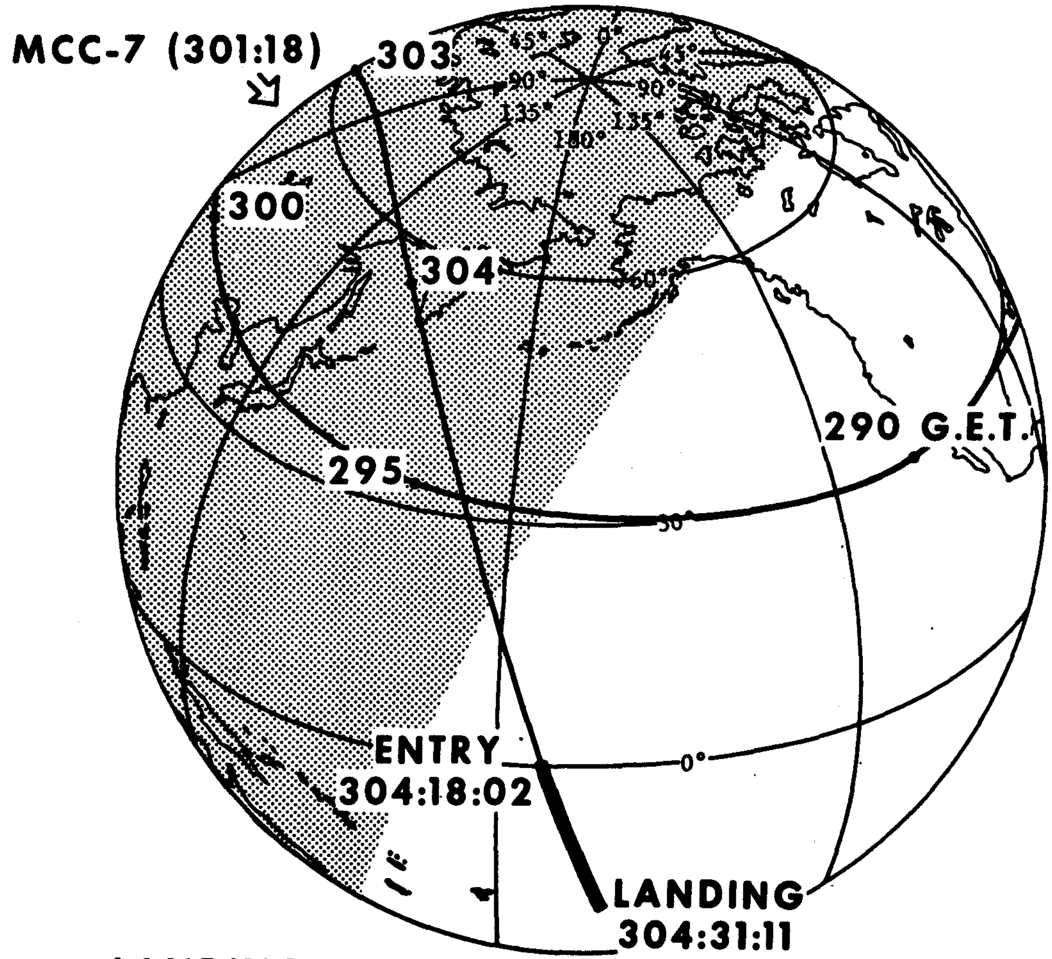
Next viewgraph, please.

(Slide.)

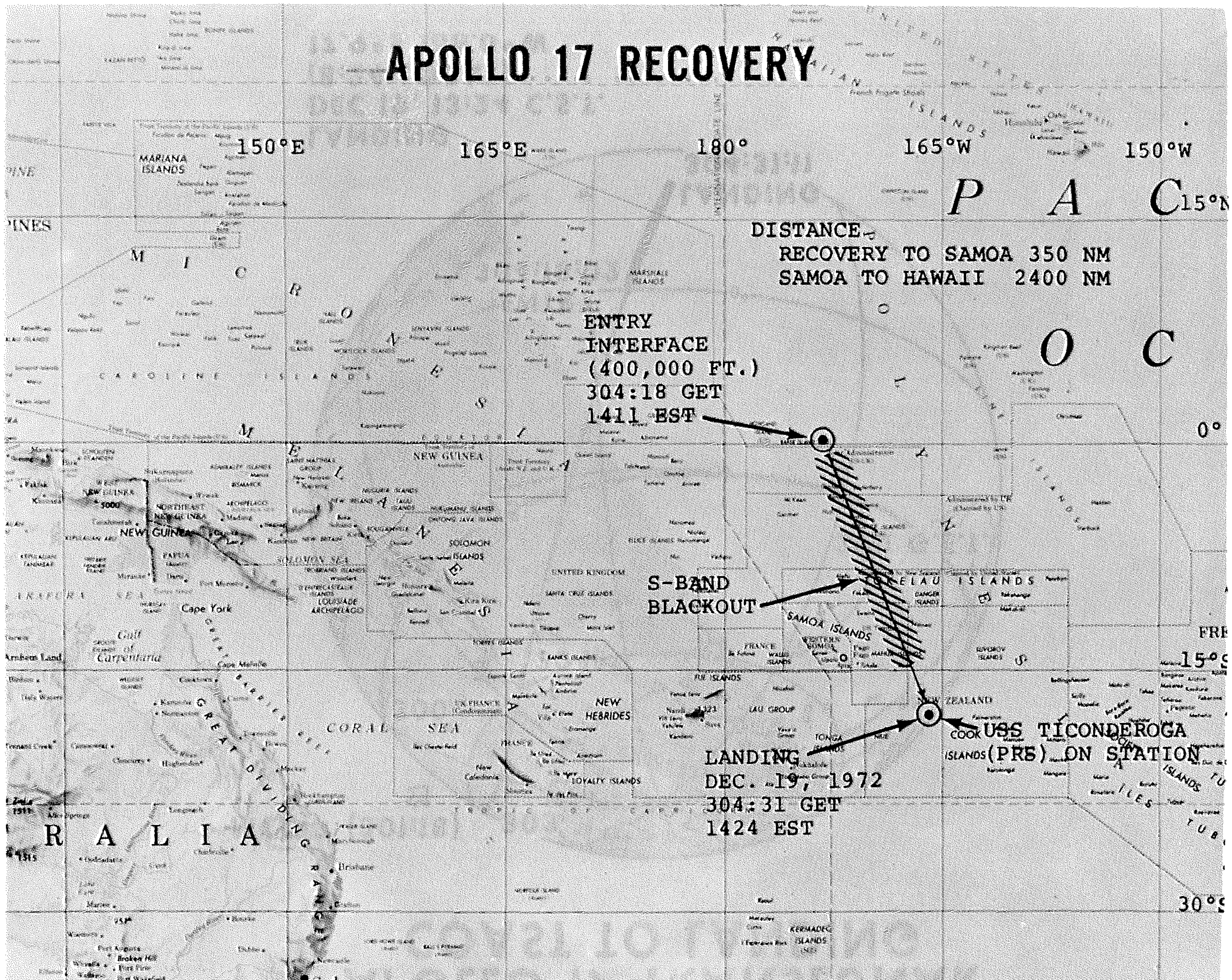
The present schedule for the post-landing activities: splashdown, of course, December the 19th; R+1 they will depart the Ticonderoga, which is the prime recovery ship, and arrive at Hawaii; depart Hawaii and get back at Houston, I think I heard, the time was approximately 7:30 Houston time, the morning of the 21st.



APOLLO 17 TRANSLUNAR COAST TO LANDING



LANDING
DEC 19, 13:24 C.S.T.
(8:24 LOCAL)
17.9°S 166.0°W



APOLLO 17 RECOVERY
150°E
165°E
180°
165°W
150°W
15°N
0°
15°S
30°S
DISTANCE
RECOVERY TO SAMOA 350 NM
SAMOA TO HAWAII 2400 NM
ENTRY
INTERFACE
(400,000 FT.)
304:18 GET
1411 EST
S-BAND
BLACKOUT
LANDING
DEC. 19, 1972
304:31 GET
1424 EST
USS TICONDEROGA
(PRS) ON STATION

APOLLO 17
CREW POST LANDING ACTIVITIES

DAYS FROM RECOVERY	DATE	ACTIVITY
SPLASHDOWN	DEC 19	
R + 1	DEC 20	DEPART SHIP, ARRIVE HAWAII
R + 2	DEC 21	DEPART HAWAII, ARRIVE HOUSTON
R + 3/4	DEC 22,23	CREW TECHNICAL DEBRIEFING PERIOD
	DEC 24 THRU JAN 2	NO DEBRIEFINGS SCHEDULED
	JAN 3	PICKUP CREW DEBRIEFINGS

The crew, of course, will go into technical debriefing as they normally do; but because of the holidays we will not have the normal debriefings, the technical, the management debriefings and all that until after New Year's. And we will pick up the crew debriefings January 3rd. Now, we are working the press conference with them. Right now, I think, tentatively it has been picked but it hasn't received final approval from top level management, January the 3rd.

Is Bill O'Donnell here? Anything further on that?

VOICE: That's correct.

LEE: Right now tentatively we're talking about January the 3rd. And, incidentally, that will be, as we have done in the past, will be held before the management debriefing.

Next viewgraph.

(Slide.)

These are the television events. I think most of them you're familiar with: target docking, EVAs 1, 2 and 3, LM liftoff, the rendezvous and docking. Now the post TEI we've done once before, I think, in Apollo 10. We may have done it on another.

This is the spectacular view. After they've done TEI, as they're pulling away from the moon, you can see the moon get very small. We'd like to see that one again being that this will be the last lunar mission for some time.

The EVA, of course, we will televise and then we do plan a press conference on the return to earth as we have in the past with questions passed up to them.

Next viewgraph, please.

(Slide.)

Very briefly, and I won't spend any time, you have these. This is a comparison of the Apollo missions on the payloads, the EVA durations that we're planning. Remember

APOLLO 17
TELEVISION EVENTS

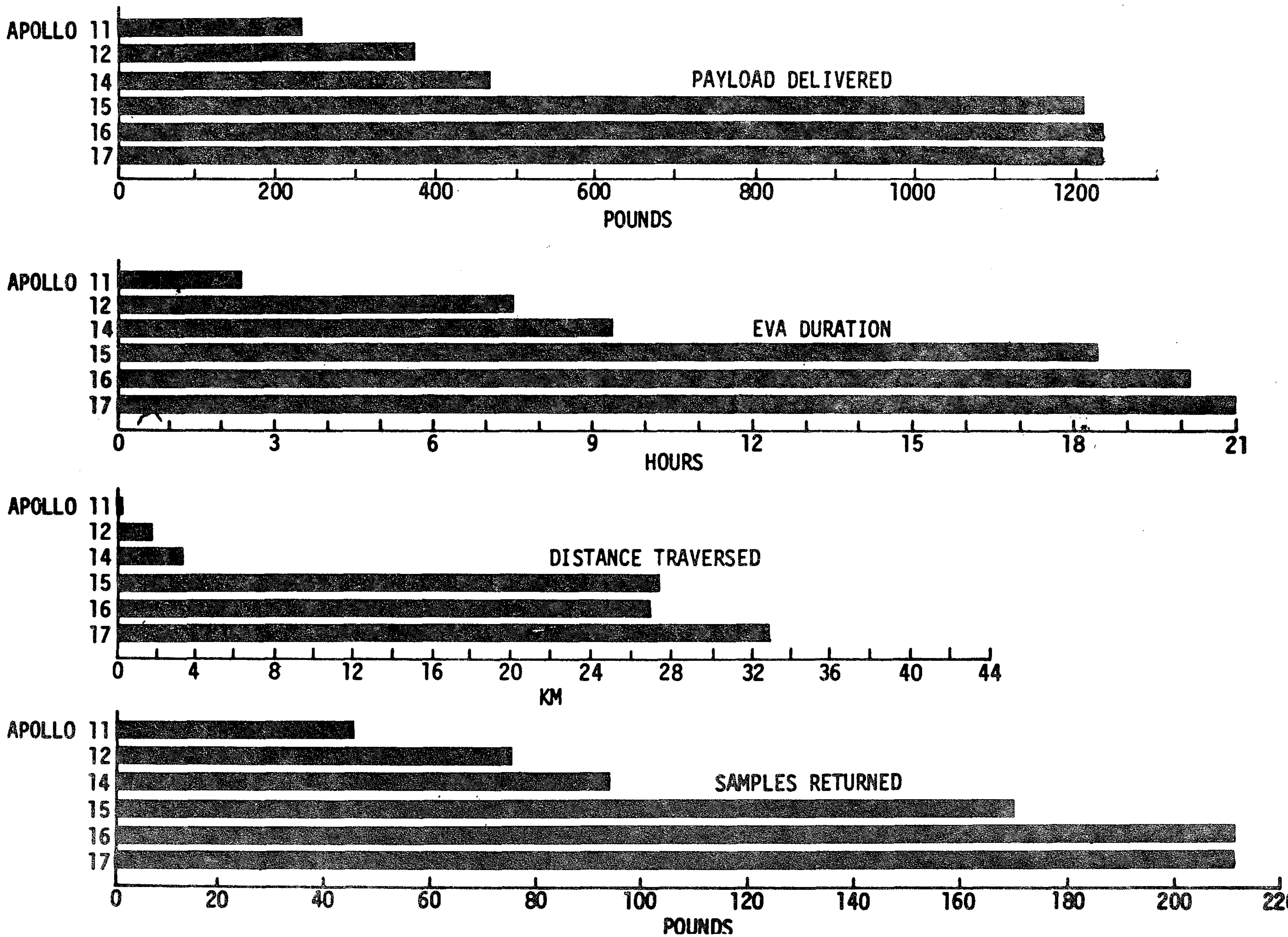
DATE	TIME (GET)	TIME (EST)	DURATION (HRS:MIN)	EVENT
7 DEC	4:12	0205	0:20	TD & E
11 DEC	117:55	1948	5:19	EVA-1
12 DEC	139:38	1731	6:21	EVA-2
13 DEC	163:05	1658	6:35	EVA-3
14 DEC	187:48	1741	0:25	LM LIFT-OFF
14 DEC	189:38	1931	0:06	RENDEZVOUS
14 DEC	190.01	1954	0.05	DOCKING
16 DEC	236:53	1846	0:32	POST TEI
17 DEC	257:26	1519	1:04	CMP EVA
18 DEC	284:07	1800	0:30	PRESS CONFERENCE

*LSPE CHARGES AND LM ASCENT STAGE IMPACT TELEVISION
TIMES ARE NOT SHOWN

COMPARISON OF APOLLO MISSIONS

	PAYLOAD DELIVERED TO LUNAR SURFACE KG	(LBS)	EVA DURATION (HR:MIN)	SURFACE DISTANCE TRAVERSED (KM)	SAMPLES RETURNED KG	(LBS)
APOLLO 11	104	(225)	2:24	.25	20.7	(46)
APOLLO 12	166	(365)	7:29	2.0	34.1	(75)
APOLLO 14	209	(460)	9:23	3.3	42.8	(94)
APOLLO 15	550	(1210)	18:33	27.9	76.6	(169)
APOLLO 16	558	(1228)	20:14	26.7	95.4	(210)
APOLLO 17 (PLANNED)	558	(1228)	21:00	32.9	95.4	(210)

COMPARISON OF LUNAR SURFACE ACTIVITIES



now, this is all planned and the white is all actual. We're planning a little longer lunar Rover traverse and we're hoping to get about the same amount of samples back but this is variable.

Next viewgraph.

(Slide.)

Remaining events: We have completed our flight readiness test with KSC; all went well. Everything is proceeding nominally. We are having our flight readiness review on Thursday and then, of course, the countdown demonstration, wet and dry, will occur on the 20th, 21st, which is before Thanksgiving and the simulations will be continuing at Houston during all this time and then we have the final count launch on the 6th and then this is your post-recovery dates.

Next viewgraph.

(Slide.)

Remaining events -- or, rather, the Apollo final count, this is a rough cut at it just to give you an idea. We'll be picking up on November the 30th. We do have the builtin holes as we have had in the past with the major events you can see as listed here, coming down, culminating liftoff 2153 Eastern STandard Time.

GARRETT: We'll now take questions from here and then we'll go to Houston. If you would, please wait for the microphone before you ask your question.

QUESTION: Chet, I have several questions. I'll try to ask them quickly.

The first one goes back to the television business. The television on the Rover. I don't understand precisely why there cannot be a fast pan between the time the crew turns on the TV and then goes and uses the gravimeter in the back. Isn't there time for a 30-second pan?

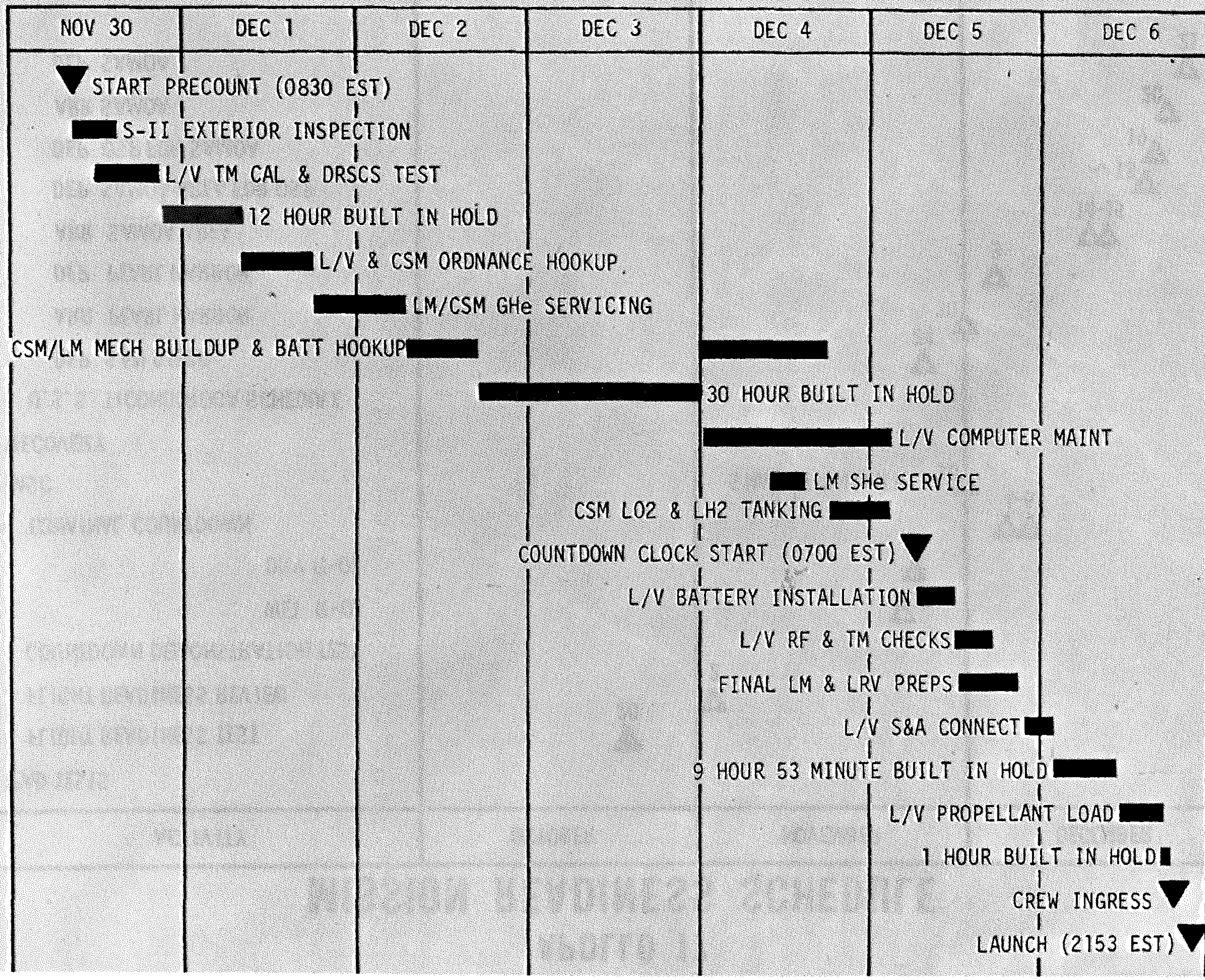
LEE: Don?

VOICE: This is being reviewed. There is still a review going on as to how we'll run the TV camera prior and during the TGE readings. It could be based on some

APOLLO 17
MISSION READINESS SCHEDULE

ACTIVITY	OCTOBER	NOVEMBER	DECEMBER
PAD TESTS			
FLIGHT READINESS TEST	20		
FLIGHT READINESS REVIEW		2	
COUNTDOWN DEMONSTRATION TEST			
WET (T-0)		20	
DRY (T-0)		21	
TERMINAL COUNTDOWN			4-6
MSC		SIMULATION UNTIL 30	
RECOVERY			
U.S.S. TICONDEROGA SCHEDULE			
DEP SAN DIEGO		24	
ARR PEARL HARBOR		30	
DEP PEARL HARBOR			3
ARR SAMOA AREA			14-15
DEP SAMOA AREA FOR OSP			~18
DEP OSP FOR SAMOA			19
ARR SAMOA			20
DEP SAMOA			21

APOLLO 17 LAUNCH COUNTDOWN



late information that we have that we'll even be able to pan during the reading but that hasn't been finally decided yet.

LEE: Let me just say remember that he is lining the antenna and all that and if things work out that we can accept the panning while they're taking a reading, we will do so. We want to see it, too.

QUESTION: The next question has to do with the proximity of the ascent stage impact to the ALSEP. I think you mentioned about 5-1/2 miles. That's considerably closer than was planned on earlier missions and I wonder if that reflects increased confidence for our control and tracking ability.

LEE: That primarily and the fact that with the massif the way it's located -- first of all, let me say, with accuracy the greatest error in accuracy is in range. I think in crossrange the expected accuracy, the error elipse that we work on is something like plus or minus one mile.

VOICE: .7.

LEE: Yes. Now, as far as this mission, I think we have confidence that we can impact it to where we want to and that the crossrange -- we have studied the debris problem, you know, impacting on the massif, the south massif and the debris on the ALSEP, we have examined that very carefully and we are quite confident we won't have any problems from that.

Did you have something to add?

VOICE: One of the reasons we moved it in closer is because the experiment that will be monitoring the impact is the seismic profiling experiment. The sensitivity of the geophones on the seismic profiling experiment are not the same as we have on the passive seismic experiment which was the experiment we had on previously during the impacts.

So for that reason we've had to move the impacting closer to assure that we have enough energy arriving at the geophones to get the first arrivals and do wave form analysis and so forth.

QUESTION: Chet or Don, can you tell us what the dimensions of the valley are that they're going to be landing on in miles from the south massif to the north massif?

LEE: I don't know; do you have that on the viewgraph? Isn't there a scale?

Let's see, it's 7.2 traverse distance to the south massif and it's about 5 or 6 to the north traverse so it would probably be a little less than the total of those, probably around 10 kilometers, 11 kilometers is a rough estimate.

QUESTION: Also, Chet, as I understand with this thing you're going to have explosions going off in that little valley for about three days after we lift off; is that correct?

LEE: Yes. You mean if all charges are actuated?

QUESTION: Yes, right, if they all go up.

And also when does the first one go off? Is it about 36 hours after they lift off roughly or 24?

VOICE: 24.

LEE: 24.

QUESTION: Yes, Chet, I have a question about the lunar sounder. What is the frequency or wavelength of this high frequency signal. Now what will be the radiated power? Do you say a penetration of a kilometer; what kind of power do you have to put out at what wavelength?

VOICE: We have three frequencies, 5, 15 and 150 megaHertz. The peak power is about 100 watts.

QUESTION: And that gives you a penetration of the surface to a depth of a kilometer.

VOICE: Yes, between 1.3 and 1.5 kilometers and that depends upon the particular material and the dialectric constant of that material based upon the current model that's being used with the sounder for its design it would be 1.3 to 1.5 kilometers.

QUESTION: You said earlier that you're going to take longer going out this time. How much longer and why are you taking longer?

LEE: 85 hours and the last time it was 76 about. Does that answer you? Well, it's about 85 hours compared to about 76.

QUESTION: Yes, but why?

LEE: Energy requirements. The energy, because of the earth-moon relationship at the time and that it just takes more energy and in order to allow ourselves some margin there we take a little longer to get out.

QUESTION: It's farther away this time; would you say?

LEE: I don't think it's further away. It could be. That's part of it, but I don't think that's all of it. I can get you that in more detail.

QUESTION: Do you have available anywhere a little more accurate picture of the ground track of the last 15 minutes of this flight than you showed us on there. It was a globe and you showed it coming in over Korea and China and then disappearing behind the west LM and coming back over Siberia and Kamchatka, and I was wondering if you had some sort of a Mercator or other projection with this ground track on it.

LEE: You'll have to update this, Bill (handing document). Put time checks on it.

VOICE: Okay, let's switch to Houston.

QUESTION: Do you once again plan to dose these guys with potassium and, if so, what medium are you using, orange juice again or what?

(Laughter.)

LEE: Orange juice is being carried, but the potassium equivalent, I guess, that they're putting in is not as high as the last time. That's in the food in general.

VOICE: Go ahead, Houston.

QUESTION: Chet, for the last number of missions for the passive seismic experiment, it was so important to get a network on the moon to track down all the current impacts and all, well, why not this mission? Is it all of a sudden not important anymore?

LEE: Well, I think we've established quite a network now that we feel is adequate.

That's another point. The lunar surface gravimeter will give us a vertical access measurement of impacts as well.

VOICE: Go ahead, Houston.

QUESTION: Chet, it seems to be a pretty rugged terrain. Do you consider this landing site more difficult than we had in the (inaudible).

LEE: Do I consider the landing site more difficult; was that the question?

VOICE: Repeat the question, Houston.

QUESTION: Yes, that's it.

LEE: Yes, in a sense, it's more difficult. We have, of course, the increased confidence of experience. We have tightened our guidance limits slightly on this mission over the past.

One of the reasons even like on Hadley rille with the rille in front of us we had maneuvering room beyond the rille that he could go to. It was about the same level. Here we're faced with a scarp that is a number of kilometers down.

On Hadley apenine, for example, he could have designated to the right as an alternate landing spot which was fairly flat and good. Here, because we are surrounded, in a sense, with a sculptured hills at the east, the north massif and the south massif, you are coming into a little tighter valley; but we have great confidence, plenty of clearance, and, obviously, as soon as he pitches over, he's going to know and, of course, we have with our landmark tracking and everything feel quite confident he's going to be coming right down the track and we do have as you recall the late navigtional directions that we can introduce even after the start of the PDI just as we were able to do on Apollo 16 and 15.

VOICE: Go ahead, Houston.

QUESTION: Two questions related to the changes from Apollo 16, on the DOI burns, two of them: Is the use of two burns this time related to the trouble you had last time on the circ burn --

LEE: No, it is not.

QUESTION: -- or that two hours more on the surface of the moon. You called it a contingency pad; is the idea there that you can lengthen the final EVA if other events have conspired to shorten them earlier?

LEE: On the first question, the DOI burn was not related, the two-part burns, or the two burns for DOI, is not related to the anomaly we had before. As I stated earlier, it's primarily to give us some help on the time for AOS and it does give us some increased hover time. These are the benefits.

And, as a matter of fact, I'm sure that perhaps with our experience and everything we might have even done this earlier. We could have done it earlier and would have if we had perhaps given it some more thought.

With regard to the second question, the pad, the time -- we do have the two hours in there. It's put at those spots that I specified, but it is possible like on EVA-1 or EVA-2 or even EVA-3, if the oxygen and water consummables in a PLSS are satisfactory, good, if we haven't been using them to too great an extent, yes, we could extend those EVAs and a real time decision, 15 minutes or so or whatever we feel we can save, we do as we've done in the past as you'll recall.

VOICE: Go ahead, Houston.

QUESTION: There are no further questions from Houston.

QUESTION: Well, for the benefit of the Houston people I'm referring to a picture that appears in the book between the Apollo 17 recovery map and the Apollo 17 crew post-landing activities. It's a picture of a bunch of vans and you didn't make any reference to that and I was wondering what this was about.

LEE: Those are the vans that are going to be used in Skylab. And, we are --

(Laughter.)

-- well, we're going to use them, Bill. Your question is legitimate and a good one. I deliberately left it out because of time to explain it, but these vans will be carried on the Ticonderoga. This is an operational checkout of the scheme that Skylab will use for the astronauts.

I guess if there are no more questions I'd just like to make one statement. This is our final mission, lunar Apollo mission, and I wanted to thank you, gentlemen, for your kindness and consideration on the briefings that I have had the good fortunate to give you and I do appreciate your interest and consideration.

It's been real great working with you and I hope to see you in the future. Thank you.

GARRETT: There's one other announcement. Some of you were given a speech that Dr. Low is giving tonight at a dinner and I'm told that it's embargoed until 8 p.m.

And, Bill, we're going to have out a special on what all the names are for the traverses.

Thank you.

(Whereupon, at 3:45 p.m., the meeting was adjourned.)