



***GEMINI OBSERVATORY  
Northern Operations Center  
VISITING OBSERVER'S GUIDE***



**GEMINI NORTH  
670 N. A'ohoku Place  
Hilo, Hawaii 96720**

**Lisa Uyetake  
Visitor Coordinator  
January 2005**

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Fax: 808-935-9235  
[luyetake@gemini.edu](mailto:luyetake@gemini.edu)**



# WELCOME TO THE BIG ISLAND!



Congratulations on being awarded time to observe on the Gemini telescope. It is important that you, as Principal Investigator, relay all pertinent information required for your observing run, and to complete all forms requested by Gemini in order for us to provide the support to enable your observations to be undertaken successfully. All visiting observers will be given an operations and safety briefing prior to their proceeding to the summit of Mauna Kea. This is mandatory.

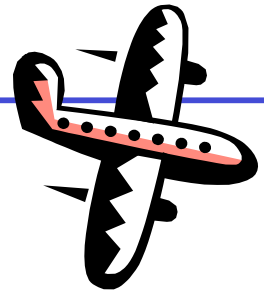
Attached are the forms that need to be completed. Please complete and return them promptly.

Included in this document is pertinent information in preparation for your observing run. It is imperative that you review the contents. It will help you in understanding the risks of working at the summit of Mauna Kea, and guide you through the operations of Gemini Observatory. Upon your arrival in Hilo, I will review the information in this packet.

Good luck on a successful observing run!

Aloha and welcome to Hilo on the Big Island of Hawaii!

*Lisa Uyetake*



**DIRECTIONS TO  
GEMINI OBSERVATORY  
Northern Operations Center  
FROM HILO INTERNATIONAL AIRPORT**

Stay on the exit road from the airport until you reach a traffic light. At the traffic light, turn **LEFT** onto Highway 11 also known as Kanoelehua Avenue.

Stay on Highway 11, in the right hand lane, pass three stop lights until you reach the fork at Puainako (Prince Kuhio Plaza is on your left and Tesoro gas station in on your right), and at the light, bear to your **RIGHT** onto Puainako. Continue on Puainako for about 3 miles, until you reach Komohana Street at the top of the hill, where Puainako ends at a “T” intersection. Turn **RIGHT**.

Stay in the right hand lane on Komohana Street until you see the University Park sign on your right (about a ½ mile distance). Turn **RIGHT** on Nowelo Street.

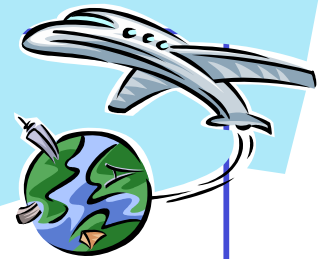
Proceed downhill on Nowelo Street. Turn **LEFT** on A’ohoku Place. The first building on your left, with seven flag poles and seven flags, a red roof, is the Gemini Observatory. Turn left up the hill onto the drive way and park in any available parking space. Enter the lobby through the front glass double doors.

**GEMINI OBSERVATORY**  
University Park  
670 N. A’ohoku Place  
Hilo, Hawaii 96720



**IN HILO, CALL 974-2500 IF YOU NEED FURTHER DIRECTIONS OR HAVE QUESTIONS.**

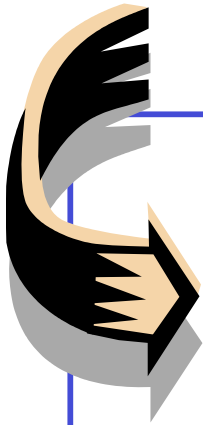
# **DIRECTIONS TO HOTELS ON BANYAN DRIVE FROM HILO INTERNATIONAL AIRPORT**



Stay on the exit road from the airport until you reach a traffic light. At the traffic light, turn **RIGHT** onto Highway 11 also known as Kanoelehua Avenue.

Stay on Highway 11 to the next traffic light. Be sure to stay in the middle lane. At the light, go straight onto what now becomes Banyan Drive. Continue on Banyan Drive to your hotel. All hotels are located on the right side.





## **DIRECTIONS TO GEMINI OBSERVATORY NORTHERN OPERATIONS CENTER FROM BANYAN DRIVE HOTEL AREA**

Exit the hotel and make a left onto Banyan Drive. At the traffic light, proceed straight thru. The street now becomes Highway 11, also known as Kanoiehua Avenue.

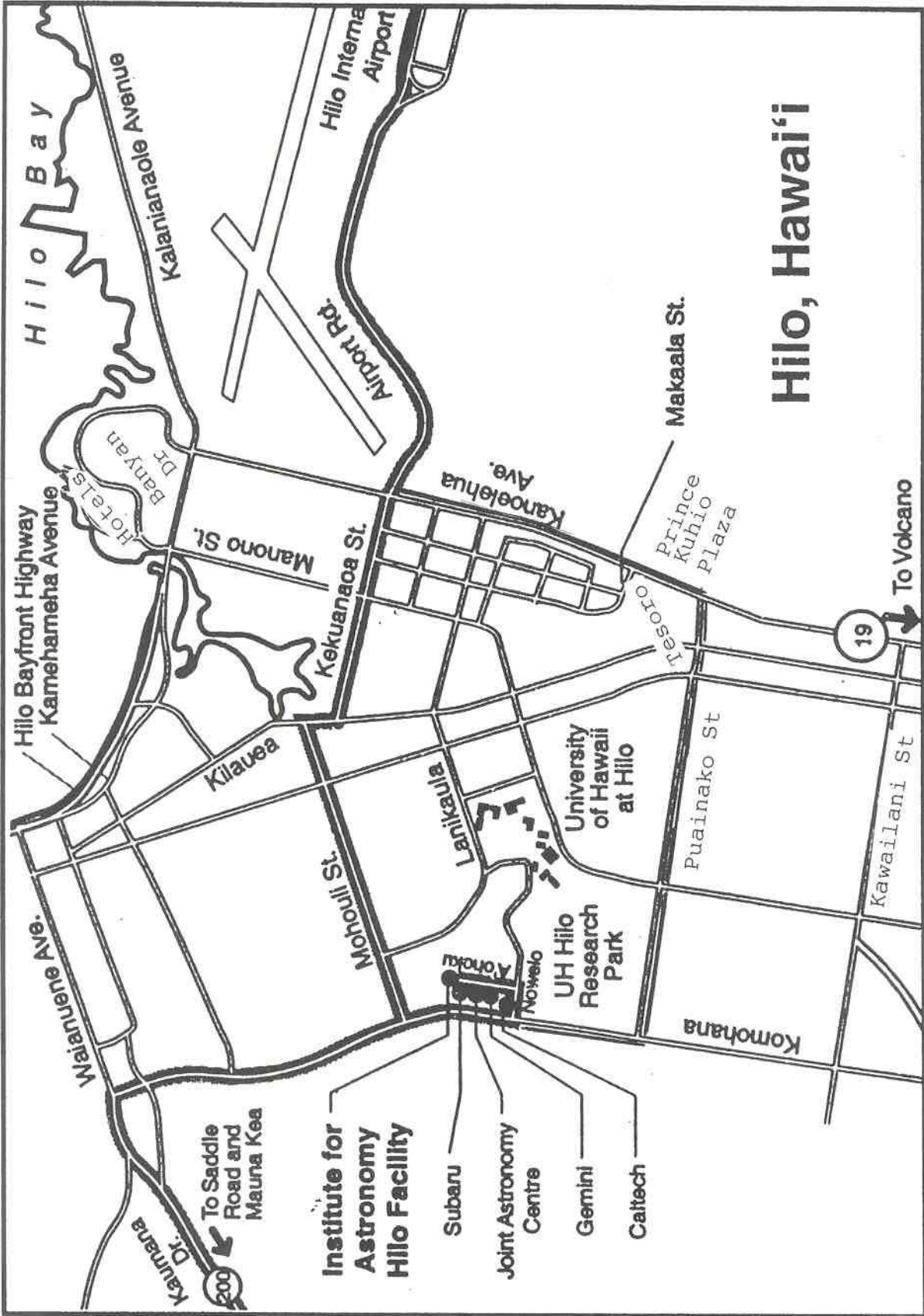
Stay on Highway 11, in the right hand lane, pass four stop lights until you reach the fork at Puainako (Prince Kuhio Plaza is on your left and Tesoro gas station is on your right), and at the light, bear to your RIGHT onto Puainako. Continue on Puainako for about 3 miles, until you reach Komohana Street at the top of the hill, where Puainako ends at a “T” intersection. Turn RIGHT.

Stay in the right hand lane on Komohana Street until you see the University Park sign on your right (about a ½ mile distance). Turn RIGHT on Nowelo Street.

Proceed downhill on Nowelo Street. Turn LEFT on A’ohoku Place. The first building on your left, with seven flag poles and seven flags, and a red roof, is the Gemini Observatory. Turn left up the hill to the drive way and park in any available parking space. Enter the lobby through the front glass double doors.

**GEMINI OBSERVATORY**  
University Park  
670 N. A’ohoku Place  
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**IN HILO, CALL 974-2500 IF YOU NEED FURTHER DIRECTIONS OR  
HAVE QUESTIONS.**



# Hilo, Hawai'i

Hilo Bay

Institute for  
Astronomy  
Hilo Facility

Subaru

Joint Astronomy  
Centre

Gemini

Caltech

University  
of Hawaii  
at Hilo

UH Hilo  
Research  
Park

Prince  
Kuhio  
Plaza

Makaala St.

To Volcano

19

To Saddle  
Road and  
Mauna Kea

200

Hilo Bayfront Highway  
Kamehameha Avenue

Waiunene Ave.

Kaunaha  
Dr.

Hotels  
Bryan  
Dr.

Manono St.

Kekuanaoa St.

Kilauea

Mohouli St.

Lanikula

Konohe

Nowelo

Kanoelohua  
Ave.

Tesoro

Puainako St.

Kawailani St.

Komohana

Hilo Interna  
Airport

Airport Rd.

Kalamale Avenue



# HOTEL INFORMATION



## Hotels on Oahu

Best Western Plaza Hotel  
3253 N. Nimitz Highway  
Honolulu, HI 96819  
(808) 836-3636

Located 1/2 mile from the Honolulu International Airport  
Free 24-hour airport shuttle service to/from hotel  
\$95.00 per night, includes \$10 meal credit

Queen Kapiolani Hotel  
150 Kapahulu Avenue  
Honolulu, HI 96815  
(808) 922-1941

Located at far end of Waikiki  
\$70.00/night

Honolulu Airport Hotel  
3401 N. Nimitz Highway  
Honolulu, HI 96819  
(808) 836-0661

Located at the entrance to the Honolulu International Airport  
Free 24-hour airport shuttle service to/from hotel  
\$89.00 per night, includes \$10 meal credit

## Hotels in Hilo

Hilo Hawaiian Hotel  
71 Banyan Drive  
Hilo, HI 96720  
(808) 935-9361  
\$84.00 per night

Hawaii Naniloa Resort  
93 Banyan Drive  
Hilo, HI 96720  
(808) 969-3333  
\$72.00/night

Uncle Billy's Hilo Bay Hotel  
87 Banyan Drive  
Hilo, HI 96720  
(808) 935-0861  
\$51.00/night

## Hotels in Kona

Royal Kona Resort  
75-5852 Alii Drive  
Kailua-Kona, HI 96740  
(808) 329-3111  
\$70.00/night

Uncle Billy's Kona Bay Hotel  
75-5739 Alii Drive  
Kailua-Kona, HI 96740  
(808) 329-1393  
\$51.00/night

Ohana Keauhou Beach Resort  
78-6740 Alii Drive  
Kailua-Kona, HI 96740  
(808) 322-3441  
\$89.00/night

The above hotel rates are corporate rates for Gemini Observatory, and are subject to an 11.42% combined state and room tax and are subject to change without notice.





# BED AND BREAKFAST LOCATIONS

## **BAY HOUSE**

42 Pukihae Street  
Hilo, HI 96720  
\$100/night  
808/961-6311  
Christine Jiminez  
[www.stayhawaii.com/bay/bay.html](http://www.stayhawaii.com/bay/bay.html)  
E-mail: Bayhouse@interpac.net

## **EMERALD POOLS B & B**

272 Kaiulani Street  
Hilo, HI 96720  
\$95/night  
808/934-7338, 888/224-0784  
Barbara & Earl Bolkan  
[www.emeraldpoolhawaii.com](http://www.emeraldpoolhawaii.com)  
E-mail: info@emeraldpoolhawaii.com

## **HILO OCEANFRONT B & B**

1923 Kalaniana'ole Street  
Hilo HI 96720  
\$105-\$140/night  
808/934-9004, 800/363-9524  
Jacqueline Brittain, Owen Sheets  
[www.stayhawaii.com/hiloocean/hiloocean.html](http://www.stayhawaii.com/hiloocean/hiloocean.html)  
E-mail: oceanfrt@gte.net

## **HILO SEASIDE RETREAT**

1941 Kalaniana'ole Street  
Hilo, HI 96720  
\$95-\$115/night  
808/934-9462, 800/961-9602  
Pattie Oliver  
[www.hilo-inns.com](http://www.hilo-inns.com)  
E-mail: pattio@aloha.net

## **HOLMES' SWEET HOME**

107 Koula Street  
Hilo, HI 96720  
\$60-\$75/night  
808/961-9089  
John & Charlotte Holmes  
[www.stayhawaii.com/holmes.html](http://www.stayhawaii.com/holmes.html)  
E-mail: homeswhom@gte.net

## **INN AT KULANIPIA**

Box 11338  
Hilo, HI 96720  
\$99-\$119/night  
808/966-6373, 888/838-6373  
Len Sutton  
[www.waterfall.com](http://www.waterfall.com)  
E-mail: waterfalls@prodigy.net

## **IRONWOOD HOUSE B & B**

2262 Kalaniana'ole  
Hilo, HI 96720  
\$50-\$85/night  
808/934-8855, 888/334-8855  
Piper & Douglas McKern  
<http://wwte.com/hawaii/ironwood.htm>  
E-mail: ironwd@aloha.net

## **SHIPMAN HOUSE B & B INN**

131 Kaiulani Street  
Hilo, HI 96720  
\$140-\$150/night  
808/934-8002, 800/627-8447  
Barbara Ann & Gary Andersen  
<http://hilo-hawaii.com>  
E-mail: bighouse@bigisland.com





# CAR RENTAL AGENCIES

Except for the two rental agencies listed below, car rental agencies prohibit the use of their vehicles on the Saddle and Mauna Kea Access Roads. A four-wheel drive vehicle is required to drive from Hale Pohaku to the summit of the mountain where the telescopes are located, as the road above 9,300 feet has a long unpaved portion, which is often in poor condition. Harper Car & Truck Rental and National Car Rental will allow only their 4x4 vehicles to be driven above Hale Pohaku. Be sure to lock your vehicle at all times.

Gemini does not provide a vehicle for observers, but will provide transportation between Hale Pohaku and the summit of Mauna Kea. It is suggested that you rent a vehicle to get to Hale Pohaku, or it may be possible to ride up with Gemini staff pending the vehicle schedule.

## **NATIONAL CAR RENTAL: 1-800-227-7368; Hilo 935-0891**

National will waive the "Saddle Road prohibition clause" for Gemini employees, observers and associates. To

benefit from the waiver, please contact Lisa Uyetake to make these reservations with National. Vehicles will then be allowed only on Saddle Road and Mauna Kea Access Road to Hale Pohaku, and four-wheel drive vehicles can be driven all the way to the summit.

## **HARPER CAR & TRUCK: Hilo 969-1478**

Harper will allow only their four-wheel drive vehicles on Saddle Road and Mauna Kea Access Road to Hale Pohaku and to the summit of Mauna Kea.

## **Other Car Rental Agencies:**

**ALAMO: 1-800-327-9633; Hilo 961-3343**

**AVIS: 1-800-831-8000; Hilo 935-1290**

**BUDGET: 1-800-527-7000; Hilo 935-7293**

**DOLLAR: 1-800-800-4000; Hilo 961-6059**

**HERTZ: 1-800-654-3011; Hilo 935-2896**



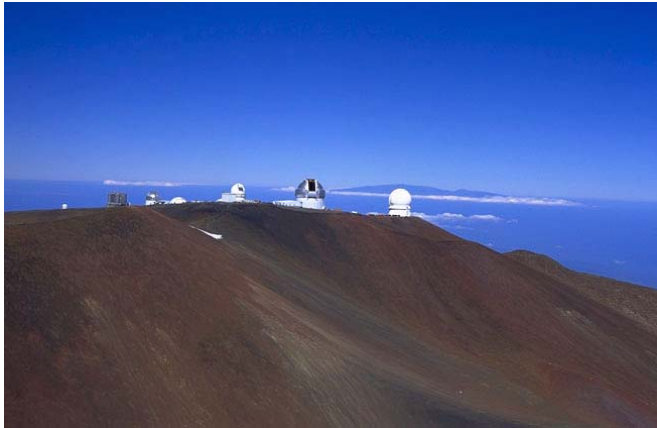


# PREPARING FOR THE SUMMIT OF MAUNA KEA

Be prepared for the altitude and the cold at the summit of Mauna Kea. At the altitude of 13,800 feet, weather at the Mauna Kea summit can be severe, especially during the winter months. Conditions can change radically in a very short period of time. We suggest that you prepare for weather conditions to deteriorate to 20 degrees F, with 70 mph winds possibly blowing snow. Wind chill and high altitude can make it seem much colder. We suggest you bring the following:

- Warm clothes, skiing style, including hat and gloves
- Warm shoes with good insulation
- Lip balm and lotion for dry skin
- Wind-proof Jacket
- Long duration flashlight and batteries
- Analgesic for headaches (aspirin or acetaminophen)
- Dark sunglasses

Remember, you can always take extra clothes off, but you cannot put them on if you do not bring them! ***STAY WARM!***



## HIGH ALTITUDE ILLNESSES



There are risks in going to high altitude and it's important to understand these risks. The summit of Mauna Kea is a hostile and potentially hazardous working environment. All Gemini staff need to pass a strict medical examination in order to be allowed to work up at the telescope. This medical certificate will not be required for observing visitors; however, Gemini will require that a medical disclaimer be signed by all visitors prior to going to Mauna Kea. This disclaimer transfers the emphasis of awareness of the potential medical difficulties and their symptoms from the administration directly to the observers themselves. It is the observers' responsibility to ensure they are sufficiently healthy to work on Mauna Kea.

Altitude sickness is primarily caused by a lack of oxygen – hypoxia. At the summit of Mauna Kea, the oxygen content of the reduced atmosphere is a mere 60% of that at sea level. The major cause of altitude illnesses is going too high too fast. A preventive measure to altitude illness is acclimatization. Your body can adapt to the decrease in oxygen at a specific altitude in 1-3 days. Gemini requires that all observers take about one hour to drive from Hilo to Hale Pohaku, then acclimatize at Hale Pohaku (9,300 feet) for 24 hours before proceeding to the summit.

Keep in mind that different people will acclimatize at different rates. Make sure all of your team members are properly acclimatized before going higher. Stay properly hydrated, so drink lots of fluids 24 hours before, during, and for 12 hours after your trip to the summit! Take it easy – don't over-exert yourself. Avoid tobacco, alcohol and other depressant drugs. Eat a high carbohydrate diet while at altitude. Avoid gas producing food the day before and the day of your trip.

Remember, the cure for altitude sickness is an immediate descent to sea level!





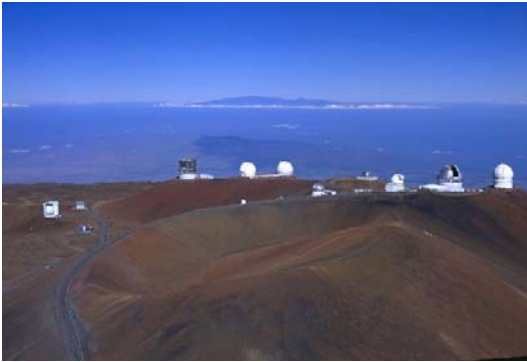
## HIGH ALTITUDE HEALTH HAZARDS

The Gemini Observatory is located near the summit of Mauna Kea at 13,800 feet elevation, where the atmosphere has only 60% of the oxygen found at sea level, about 10% of the moisture, and the average temperature is about 32° (0°C). The human body reacts to high altitude in a variety of ways. **Individuals who are pregnant, have a head cold or suffer from cardio-pulmonary disease should not attempt to work at or visit the summit.**

One of the body's reactions to high altitude is water dumping to allow the blood to carry more oxygen. Frequent urination is a symptom of this process. Failure to replace lost body fluids can lead to dehydration, severe headaches and hypothermia. High altitude dilation of the brain's blood vessels, combined with dehydration, can lead to a headache as severe as a migraine. Individual responses to altitude can vary greatly. **No one is immune from the effects or the potential dangers.** To lessen the risk of high altitude health hazards, be in good health, dress warmly, drink lots of fluids, avoid alcohol and drugs and pace yourself. **MOVE SLOWLY** when at the summit of Mauna Kea! Always pace yourself!

**It's important to acclimatize at Hale Pohaku before going to the summit.**

You may not always recognize the symptoms of altitude sickness in yourself. If you feel the onset of any unusual feeling or symptom, **let someone know immediately.** If you notice someone who appears to be suffering from some unusual feeling or symptom, ask them how they feel.



# HIGH ALTITUDE HEALTH HAZARDS

## MINOR SYMPTOMS/SIGNS:

Mild Shortness of Breath  
Dizziness  
Lightheadedness  
Headaches  
Tunnel Vision  
Slight Disorientation  
Giddiness  
Palpitations  
Chest Tightness  
Nausea

## MAJOR SYMPTOMS/SIGNS:

Sudden Unrelenting Headaches  
Shortness of Breath  
Chest Pain  
Abdominal Pain  
Slurred Speech  
Visual Disturbance  
Paralysis  
Loss of Coordination  
Fainting  
Seizures  
Collapse  
Slow or Rapid Heart Beat  
Labored Breathing  
Unrelenting Nausea or Vomiting

## STEPS TO BE TAKEN:

Inform Duty Officer  
Slow Down  
Rest  
Drink Fluids  
Pressure Breathe (take a fairly deep breath; slowly  
Expel 1/3-1/2 of breath through pursed lips; do not  
hold breath; blow out remaining breath; repeat 5-6  
times a minute for 2-4 minutes)  
Oxygen Application  
If No Improvement: Descend to lower altitude with  
someone else driving  
If Symptoms Persist: Proceed to Hilo Medical  
Center Emergency Room

## STEPS TO BE TAKEN:

Inform Duty Officer  
Drink Fluids (Gatorade)  
Take Aspirin, Tylenol  
Pressure Breathe  
Oxygen Application  
Lie Down Until Feeling Better  
Leave the Summit Immediately  
Follow the MKSS Emergency Procedure Plan  
Call 911



## **HALE POHAKU, THE MID-LEVEL FACILITY**

Located at the 9,300 ft elevation is Hale Pohaku, the mid-level facility. You must spend at least one night at Hale Pohaku before your observing run. The dormitory buildings provide sleeping quarters. Each room contains a single bed, air humidifier, heater, desk, lamp, chair, and a "Hale Pohaku User's Manual". Bed linen, towels, and washcloths are provided, but personal laundry service is not available. There is no maid service.

Upon check in, you will receive two keys, one for your dormitory room, and one for the main dormitory building entrance door. Check out time is 2:00 p.m. To avoid paying an additional night, you must return your keys at the front desk at or before that time.

Lunch and dinner are served, cafeteria style, from 12 noon to 1:00 p.m. and from 4:00 to 6:00 p.m. Breakfast is served from 6:00 to 8:30 a.m. Summit lunches are served from 11:30 a.m.-12:30 p.m. Meals are included with the cost per night lodging fee of \$90, starting with dinner upon check-in and ending with lunch upon check-out. Any meal consumed prior to check-in and after check-out is subject to an additional charge.

Warm clothes are essential. Warm shoes with good insulation are important. Parka and overalls can be rented at Hale Pohaku for \$6.00 each, per day.

Hale Pohaku has normal telephone service. The number is (808) 935-7606. Local phone calls from the facility can be made by first dialing 9. Long distance calls can only be made from the Gemini office or with a calling card.

No toiletries (except for towel and soap), stationery, and postage stamps are available at Hale Pohaku, so please bring a sufficient supply with you.



## INFORMATION FOR GUESTS AT HALE POHAKU

**DORMITORY LOCATIONS:** See map on next page.

**COMBINATION LOCKS:** The outside doors are equipped with combination locks. Press 2 and 4 simultaneously, press 3, and turn the knob to open. This combination is for the convenience of authorized users and should not be divulged to others.

**MEALS INCLUDED IN ROOM PACKAGE:** The room charge of \$90.00/night includes all meals, beginning with Dinner on your check-in day, and ending with lunch on your check-out day. Extra charges are made for additional meals: Dinner \$13, Lunch \$8, Breakfast \$6. All meals must be signed for legibly. The weekly menu is posted on the bulletin board by the service line. If you require vegetarian meals, or are on another diet plan, please let the cooks know and they will make something for you. Once you have been given a reservation, the staff expects you for each dinner. If you have a change in plan, please inform the Hale Pohaku staff as soon as possible. Please write or print **legibly** when signing for meals!

**Dinner:** Served from 4:00 to 6:00 p.m. If you will be late, let the cooks know and they can pack a dinner to be left in the refrigerator for you.

**Summit Lunch:** Check time/location if you are working days at the summit and staying at HP.

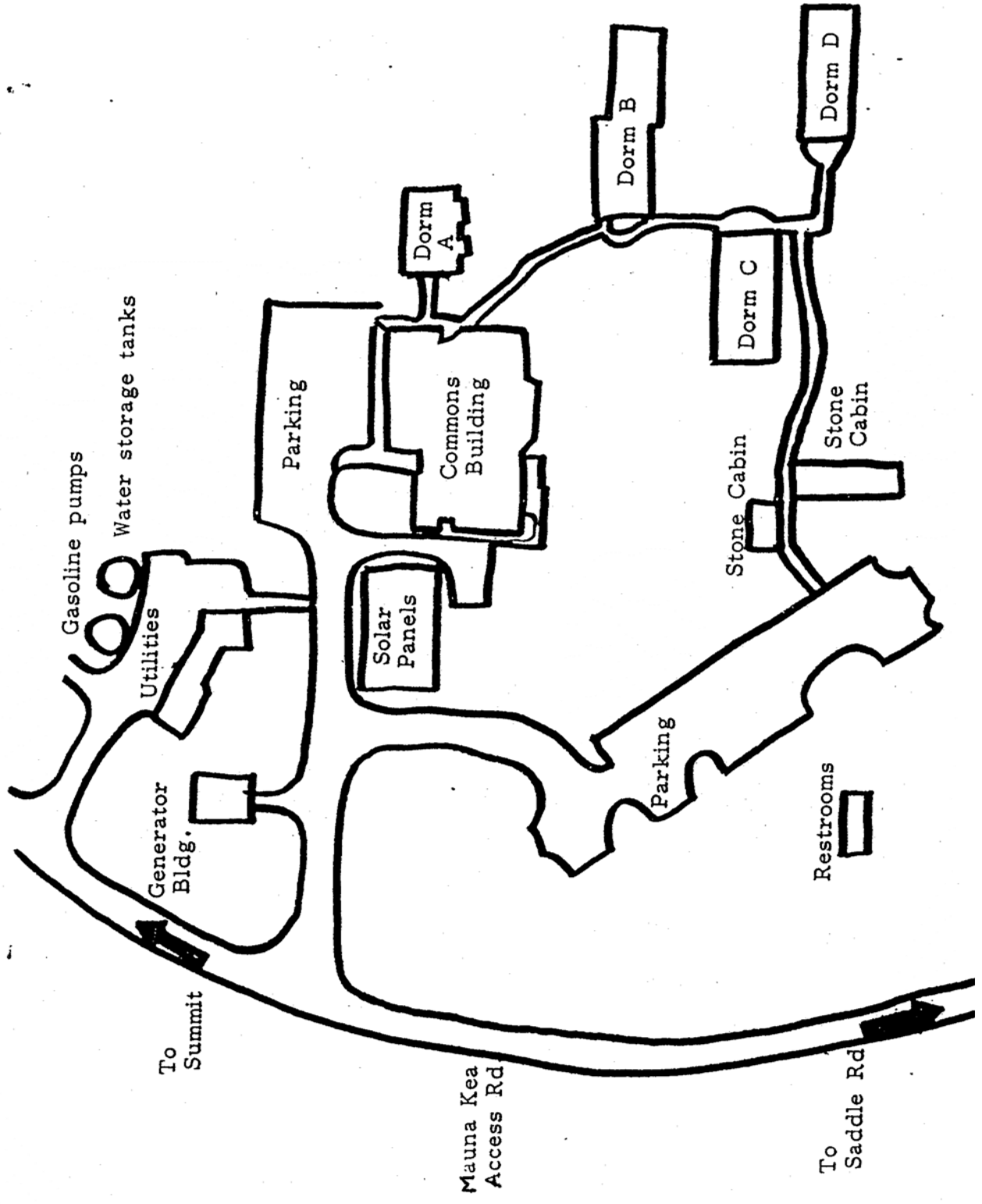
**Breakfast:** Breakfast is served from 6:00-8:30 a.m. Eggs, pancakes, French toast and breakfast meats are prepared to order by the cooks.

**Night Lunch:** Sandwiches and microwave dinners are available for you to take to the summit yourself. The night lunch forms are located by the salad bar island, and should be filled out by 3:00 p.m. The prepared meal will be placed in the refrigerator at dinner time.

**Open Food Stocks:** Some food items are made available for your convenience. Frozen "TV" dinners, waffles and pancakes are located in the freezer. Sandwich meats, fruit, yogurt, sodas and juice are available in the refrigerators. Cereals and breads are available near the coffee service line.

**COLD WEATHER GEAR:** Parkas and insulated coveralls are available for rental at \$6 each, per day.

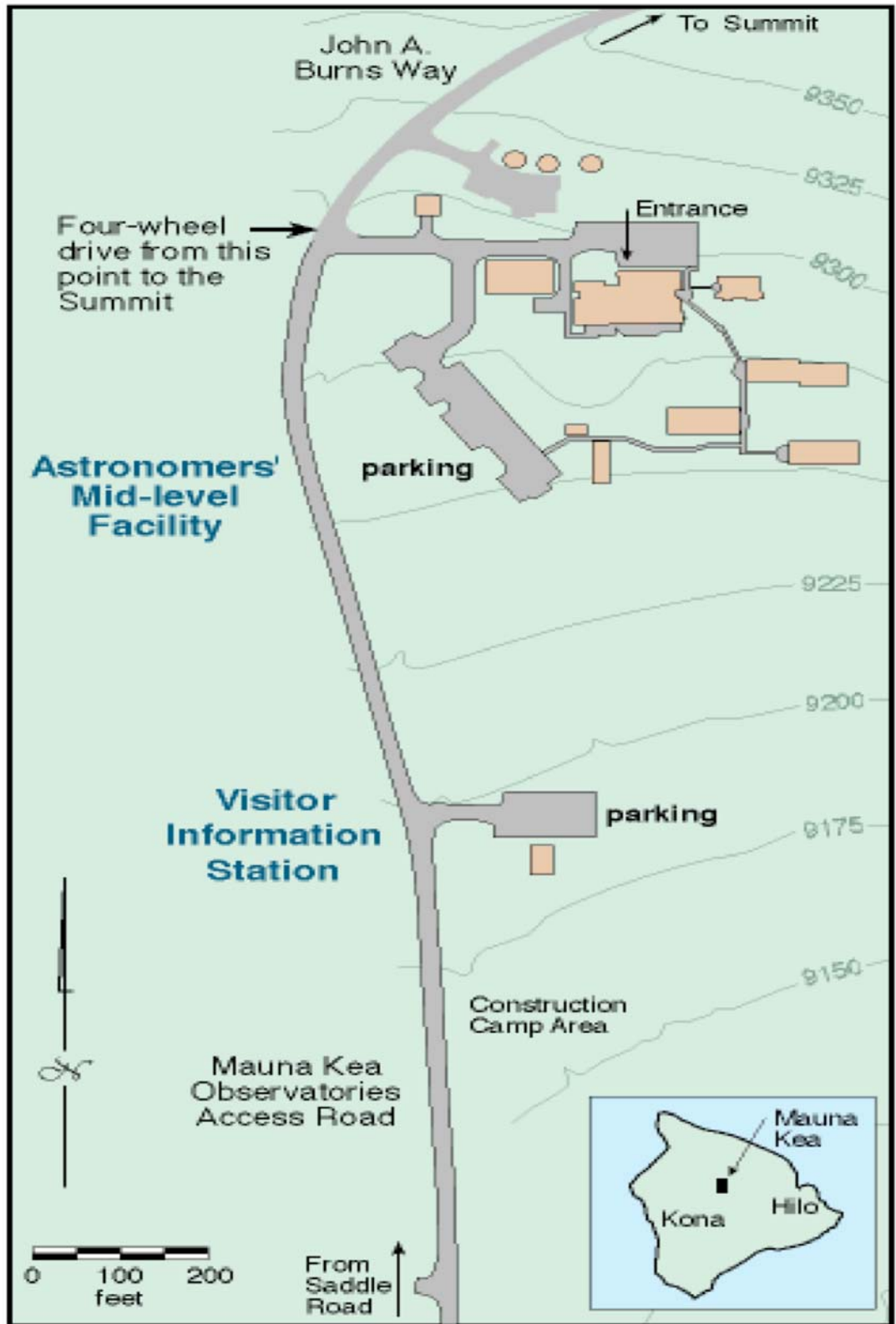
**GASOLINE:** *Use only in emergencies.* The gas pumps are located near the utilities shop. Use the key on the gas log clipboard at the front desk. Please remember to fill out the gas log.





# MAP TO HALE POHAKU







# IMPORTANT MEDICAL ALERT



The Gemini Observatory's northern telescope site is located on the summit of Mauna Kea, at approximately 14,000 feet.

Ascent to this altitude exposes you to a reduction in atmospheric pressure, which can result in a variety of medical conditions. In certain cases, severe illness and even death can result.

Visitors to the Gemini site may suffer headaches, tiredness, irritability, anorexia, insomnia, reduced intellectual capacity, impaired exercise/exertion tolerance, and possible vomiting. It is also possible to develop one or more of the more severe mountain sicknesses, pulmonary or cerebral edema, both of which can be fatal.

The altitude may also aggravate pre-existing disease, particularly cardio-vascular and respiratory diseases. Individuals with these conditions are advised to seriously consider the advisability of proceeding.

Gemini *strongly* urges all visitors to bring the above information to the attention of his/her medical practitioner and to seek medical advice and clearance before visiting the summit.

AURA/Gemini does not undertake a duty properly to warn or otherwise to relinquish its rights, immunities or other protections under Hawaii Revised Statutes, Chapter 520. This WARNING is given freely *without* legal obligation.

Under NO circumstances will Gemini allow visitors under the age of sixteen (16) to visit the Gemini site.

***AURA/GEMINI DOES NOT ACCEPT ANY LIABILITY FOR VISITORS TO MAUNA KEA WITH RESPECT TO THE POTENTIAL ADVERSE EFFECTS OF ALTITUDE. IF YOU INTEND TO VISIT THE TELESCOPE SITE, YOU ARE REQUIRED TO SIGN A DECLARATION TO BE PROVIDED. YOU THEREFORE ASSUME ALL RISK.***



# IMPORTANT SAFETY ALERT



Safety is paramount at our AURA facility. While AURA works diligently to maintain a safe environment for workers, the site may still pose safety hazards. *Always* do the following when at the summit:

- Sign in on the white board upon arrival.
- Carry a flashlight and a two-way radio
- Notify the SSA/Duty Officer of your whereabouts.
- Sign out on the white board upon departure.

The observatory is located at almost 14,000 feet above sea level, which means that your mental capabilities and judgment will be substantially impaired due to lack of oxygen. The following, while not an exhaustive list, are *examples* of some of the hazards of which you should be cognizant while in the observatory:

- There are floor areas that may be slightly uneven, and there may be an occasional temporary electrical cord or hose lying on the floor in traffic areas. Watch where you step to avoid tripping.
- During inclement weather, some water may leak inside the facility and freeze on the floor. Watch carefully for ice on floors, and also watch your step when descending or climbing the outside stairs to the main entry doors.
- There are vertical drops that are separated by guardrails or handrails throughout the facility and telescope. Be careful in these areas.
- Be aware of and stay completely away from pinch points when the telescope is in motion. This is generally in the area of the emergency exit and Platform Lift guardrail at the north side of Level 5. These pinch points can be encountered by standing either on the stationary floor or the rotating telescope floor.
- In the event of a fire or injury, transport down the mountain may take as long as an hour and a half or similar time will elapse before any emergency services can reach the observatory because of its remote location.



# SAFETY PRECAUTIONS



## **DRIVING**

The summit access road is winding, steep and dangerous. Weather can deteriorate rapidly and ice, snow, wind, or fog are factors that require special attention. Speed limits are for passenger and vehicle safety and must be obeyed. There are grades up to 17% on the access road, and brakes will overheat if lower gears are not used on the descent. Always downshift to keep engine rpms between 3000 and 4000, and never in the “red zone”.

Black ice can occur during freezing fog/mist conditions, and a number of vehicles have overturned over the years. If black ice conditions are suspected, use Tyre-Grip, keep vehicle in four-wheel drive and drive slowly. Each Gemini vehicle has a first aid kit and an emergency blanket.

Judgment impairment at high altitude cannot be over-emphasized! Do not take chances. In the case of an accident or vehicle malfunction whereby you may be stranded:

- \* Call from the cellular phone (with the ignition switch on).
- \* It is easier to find a vehicle than someone wandering about; stay with the vehicle until assistance or rescue arrives; use emergency kit supplies.
- \* Blinding snow or white-out conditions can lead to severe vertigo.
- \* Extreme cold and wind chill can lead to serious hypothermia and frostbite.

## **FIRST AID**

All Gemini summit staff are certified in first aid and CPR. First aid kits are located in the Operating Room, Level 1 outside the workshop, and Level 5 outside the elevator vestibule, and all summit vehicles. Emergency oxygen is available in the Operations Room and Level 5 outside the elevator vestibule. The supply is limited so please inform the support scientist or system support associate whenever oxygen is consumed. There is nothing worse than having an emergency only to find an empty oxygen cylinder!

Mild discomfort at high altitude is common among first time visitors. Symptoms are usually confined to headache, slight tunnel vision and/or mild disorientation. Drink plenty of fluid, pressure breathe, slow down, and avoid excess exertion. Report any changes in symptoms and watch for physical or behavioral changes in others. Leave the summit immediately if you feel bad, as it will only get worse at altitude.

## **WEATHER**

Carry a flashlight when going outside. Night vision is reduced 30-50% at this altitude; obstacles become more dangerous. Snow and ice are common year round; install tire chains if there is snow/ice on the road. Watch for slippery surfaces and falling ice. High winds can exacerbate the situation. Wind often gusts 35 mph or more; sustained winds above 50 mph are not uncommon, nor are gusts of 100 mph or more. Blowing debris can cause serious injury. A wind of 30 mph added to a normal night temperature of 0°C will result in a wind chill equivalent of -20°C. Any exposed skin will quickly freeze. Never leave the building without proper attire. Hypothermia is life-threatening.



## GUIDELINES FOR MINIMUM RISK AT THE MAUNA KEA SUMMIT

**DRINK WATER**...the human body shifts large volumes of body water and dumps some of it to help with short-term adjustments to altitude. Give your body water to work with and to cope with losses into the very dry air. If you start to get a pounding, hang-over type headache, drink three or four cups of plain water; it often works in 4-5 minutes.

**LEARN HOW TO BREATHE**...take slow, even breaths.

**MOVE SLOWLY**...always pace yourself at the summit. Sit down. Use the chairs that are available. Don't stand for long periods.

**STAY RESTED**...avoid exhausting tasks/fun and short sleep the day before you are scheduled for a trip to the summit. This provides more cardio-respiratory reserves for adjustment to altitude stress.

**AVOID ALCOHOL**...for at least 10 hours prior to ascent. This avoids dehydration and irritation of the arteries of the brain that will be forced to adjust to hypoxia.

**AVOID MARIJUANA**...it stays with an individual for 5-6 days and can be an unpredictable, extremely potent constrictive agent for the coronary arteries. It has caused sudden death by unpredictably shutting off the blood supply in the hearts of even young, healthy people without warning.

**AVOID TOBACCO SMOKING**...nicotine constricts arteries and further inhibits adjustments to the need for increased blood flow. Stop smoking 48 hours before ascent to allow carbon monoxide in your bloodstream to dissipate.

**AVOID HEAVY MEALS**...before ascent to the summit, since this tends to tie up a significant part of the available blood flow for longer than light meals (of high carbohydrate items such as pasta, rice, or other starch). Avoid skipping meals or eating or drinking nothing but sugared snacks or drinks; sharp changes in blood sugar can trigger increased altitude stress.

**AVOID UNPROTECTED EYE EXPOSURE**...to glare and bright sunlight by wearing dark lenses, preferably UV-coated lenses. This reduces fatigue and will prevent the loss of 50% of night vision for up to two nights after glare exposure of only 1 hour. It also blocks out the significantly greater ultraviolet exposure that Hawaii's ideal astronomical conditions permit, possibly leading to early cataracts. You may wish to wear sunscreen, as the sun can burn even in cold temperatures



Excerpted from:  
"High Altitude Safety Protocol" by Mountain Medical Services



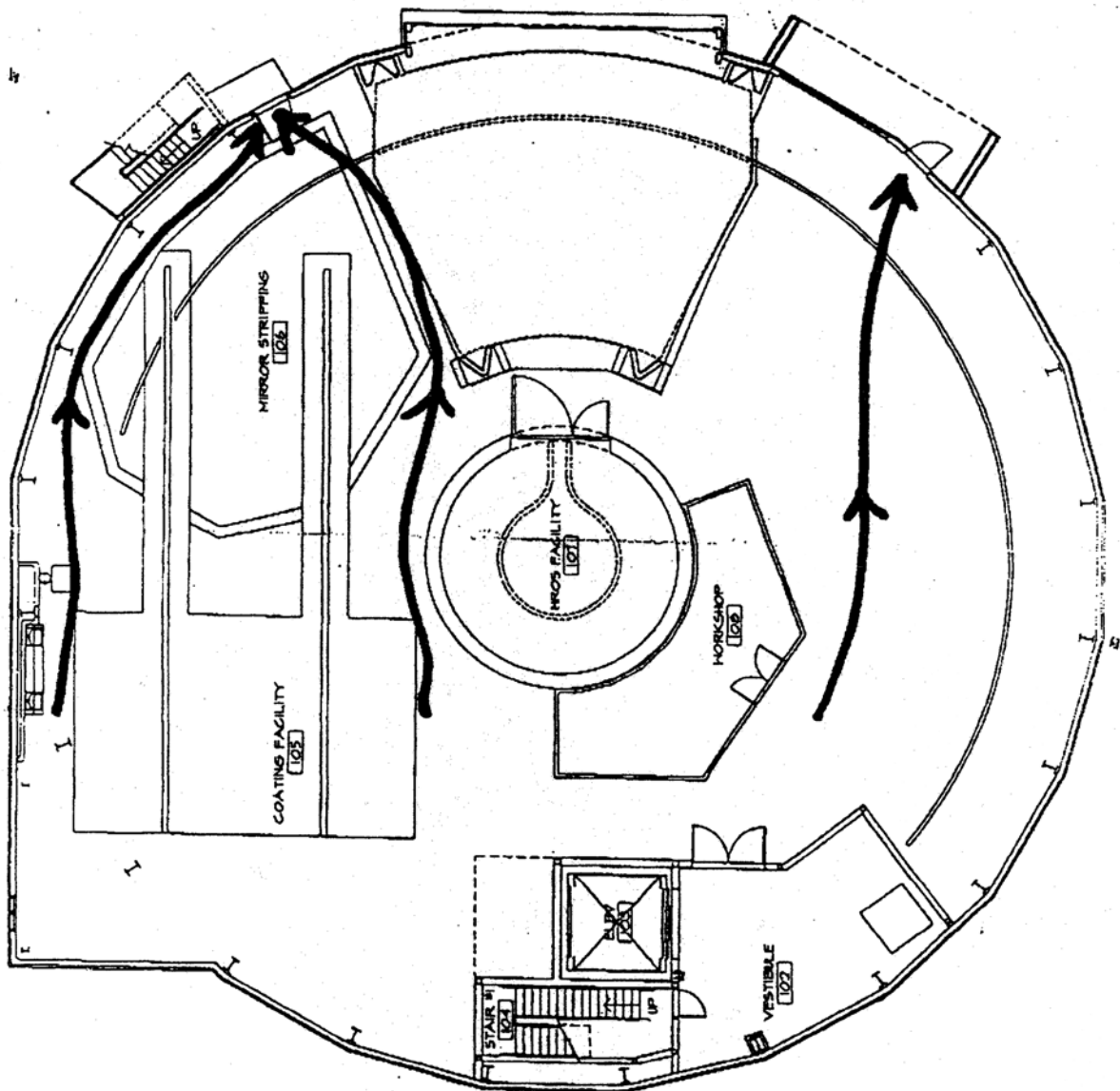
**Purpose:**

To increase overall safety during the evening observing process.

**Procedures:**

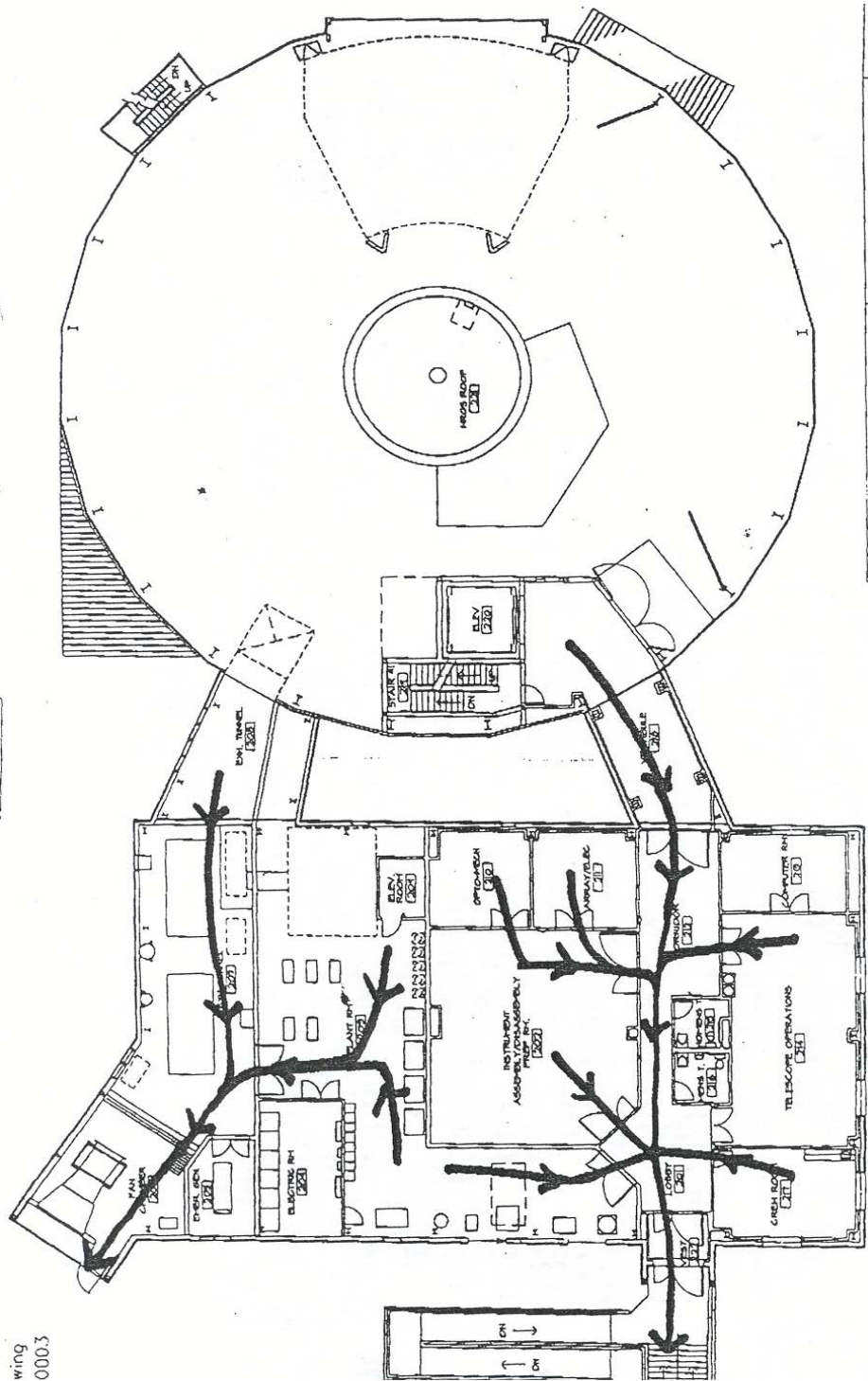
1. General. Each Night Shift shall have a Duty Officer assigned who has been trained as a Duty Officer. The Duty Officer is responsible for knowing who is on the site, where all exits are located, areas where work is being performed, how to turn lights on and off, what to do in an emergency, and how to secure the building when exiting. The evening shift SSA (System Support Associate) shall be the designated Duty Officer.
2. At Hale Pohaku. You should be checked in at Hale Pohaku by 4:00 p.m. If prior arrangements have not been made for you to meet with your Contact Scientist, please leave word with the front desk for the SSA or Contact Scientist that you have checked in at Hale Pohaku. Arrangements need to be made with the Contact Scientist or SSA to ride up together to the summit. Your rental car will be left at Hale Pohaku in the lower parking lot southwest of the main building. Be sure it is locked.
3. At the Summit. Upon arrival, each person is required to sign-in on the vehicle sign-in board next to the vehicle number you came in, hang the vehicle keys on the respective key hook, pick up a two-way radio, and carry a flashlight at all times. The Contact Scientist or the SSA will guide you through this process. On your first night at the summit, you will be given a short safety briefing of the telescope, pointing out precautions for your own personal protection, along with the escape routes (see attached) particularly for the level of the facility that you will be working on. Always keep in mind where the best exit is located with respect to your location. We encourage and appreciate your making us aware of any safety problems so that we can do our best to correct them. Please remain at your station during your observing run. If you must leave your station, please notify the SSA first before doing so. There is a 14-hour and a 2-person rule at the summit, and one vehicle needs to be at the observatory at all times.
4. Leaving the Summit. When leaving the summit, return the two-way radio to a charger and erase your initials from the sign-in board. The SSA will be responsible for securing the building before exiting. The visiting observer and the SSA will always ride up and down the summit together. After an observing run, you are strongly urged to sleep at Hale Pohaku before

# LEVEL 1 ESCAPE ROUTES



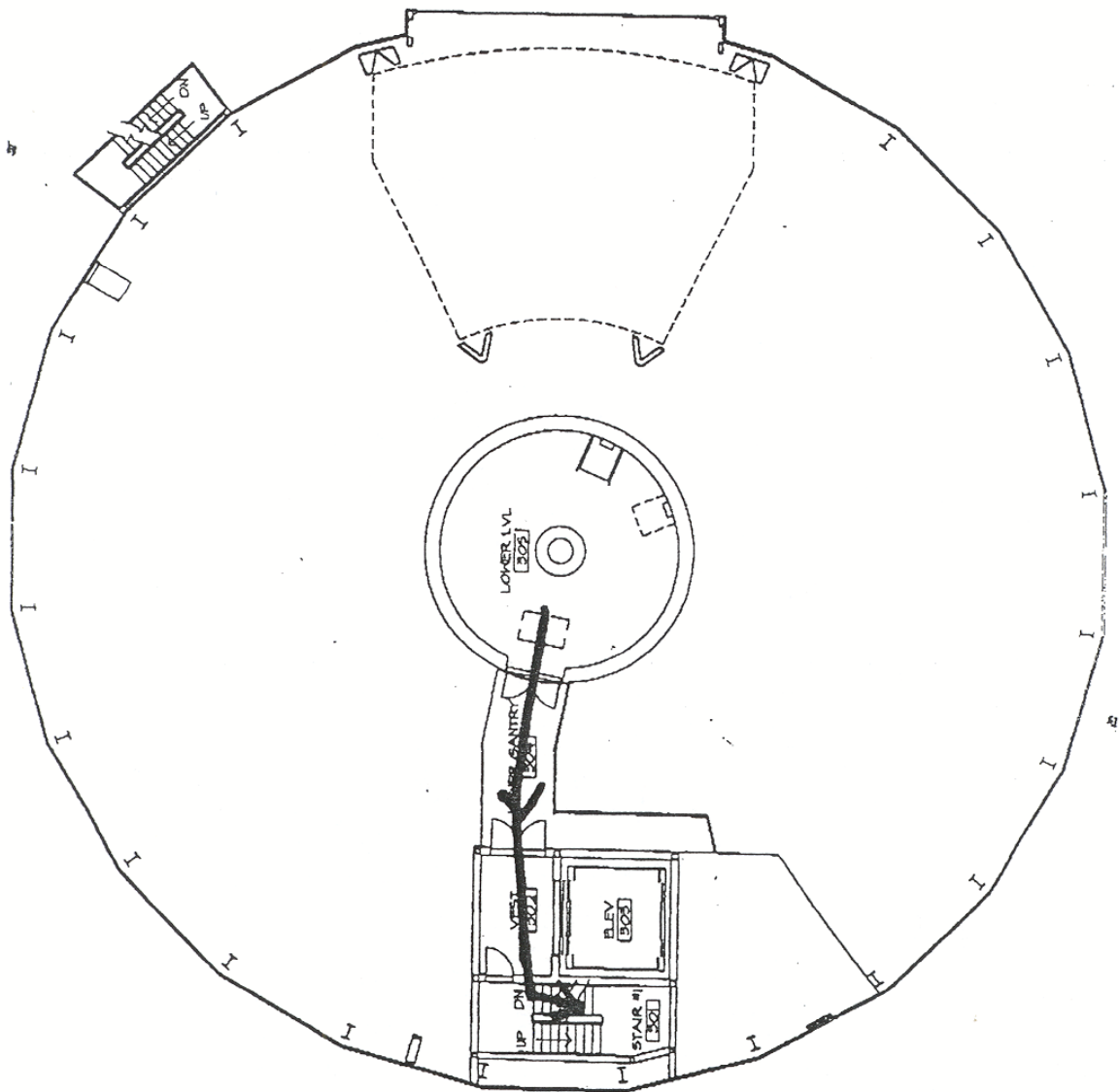


# LEVEL 2 ESCAPE ROUTES

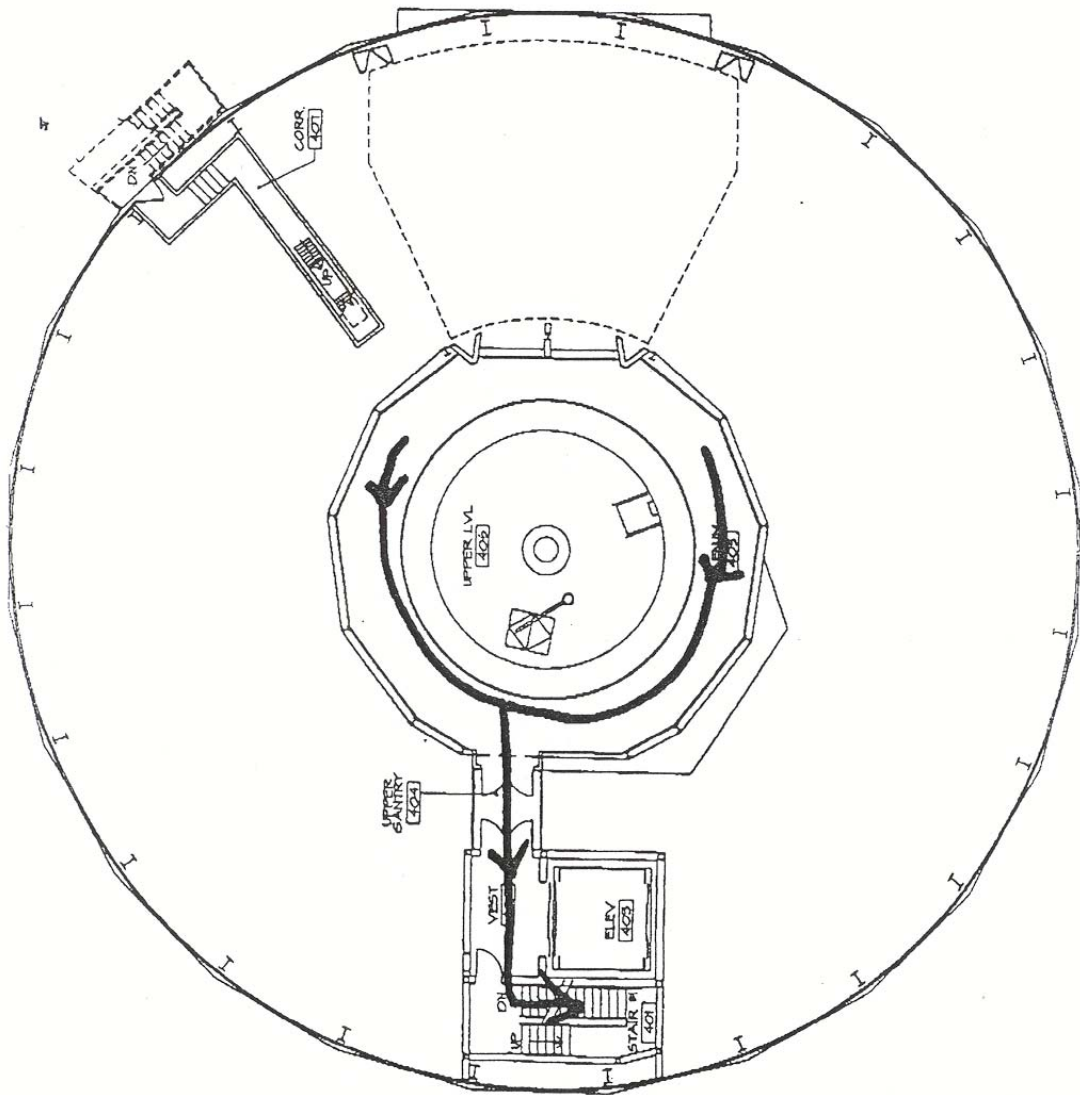


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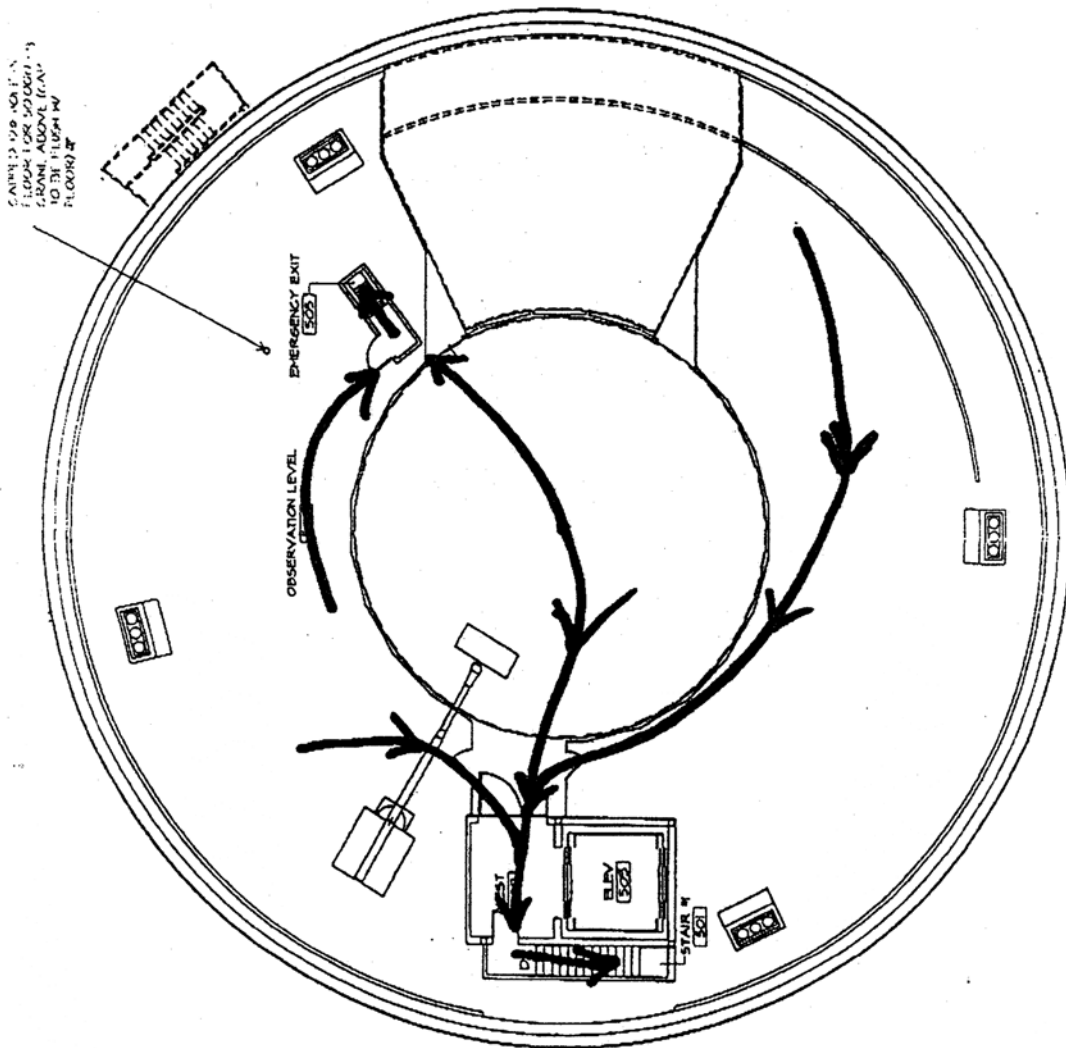
# LEVEL 3 ESCAPE ROUTES

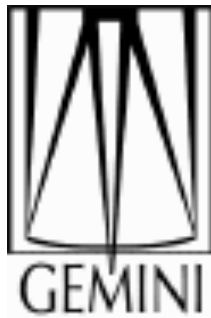


# LEVEL 4 ESCAPE ROUTES



# LEVEL 5 ESCAPE ROUTES





## VISITOR USE OF GOVERNMENT VEHICLES

As provided by law, the use of Government-owned vehicles is restricted to official purposes only. The operator of a GSA vehicle is responsible for the proper use, servicing and protection of the vehicle while in his/her custody, and is responsible for reporting any accidents in which the vehicle is involved.

Smoking is prohibited in GSA-occupied space and Government-owned or leased vehicles assigned by GSA at all times. Agencies may be charged for damage caused by the use of tobacco in a GSA vehicle.



The Vehicle Log is used in order to gather and maintain vehicle information, ensuring proper vehicle maintenance, and overall passenger safety. An aluminum case is used to house the vehicle logs and is located in each vehicle. The sample illustration is to remain in the aluminum holder at all times. If any sheets are removed from the aluminum holder, please return same.

Before starting a trip, you must fill in the log information. One line shall be used for each leg of a trip. For example, the following are considered one leg of a trip: (1) Gemini Northern Operations Center to the summit, with a 30 minute stop-over at Hale Pohaku; (2) Hale Pohaku to the summit, if the trip originates at Hale Pohaku; (3) summit to Hale Pohaku; and (4) summit to the Gemini Northern Operations Center. If a driver is changed mid-trip, then note this change *on a new line*. At the end of a trip, and before leaving the vehicle, record the ending information in the vehicle log. Under Maintenance Notes, a brief note should be listed if there are any vehicle problems, or a maintenance task was done (i.e., added air to tire and location, addition of any fluids, etc.). Bring those maintenance items that require immediate attention to Gemini personnel. Your cooperation in following this program is appreciated.



## EQUIPMENT IN VEHICLES

**All Gemini vehicles contain the following items, in addition to standard equipment supplied with the respective vehicles:**

- Phone Listing
- Vehicle Listing
- Screwdrivers (Philips & Flathead)
- Pliers
- Wrench
- Cross Bar
- Flashlight
- Tire pressure gauge
- Floor Jack
- Tow Strap
- Shovel
- Booster Cables
- Flares
- Fire Extinguisher
- Towel
- Gloves
- First Aid Kit
- Emergency Blanket
- Clear safety goggles
- Light sticks
- Tire Chains
- Safety Triangle
- Roll of tape
- Rain gear



If any of the equipment is missing from the vehicle, please notify Dave Moe (974-2567)

for replacement. Also, just as a reminder, on every trip fuel (G2=diesel) should be

replenished in all vehicles coming back from the summit. You do not want to find yourself

stranded without fuel.



## **RULES CONCERNING USE OF GSA VEHICLES**

To operate a motor vehicle furnished by the GSA IFMS, civilian employees of the Federal Government shall carry a valid State operator's license and some form of agency identification. Non-Government personnel, such as contractors, shall carry a valid State operator's license and company identification. The following are some of the Do's and Don'ts that each operator should be familiar with:

### ***Do Not***

- \* Use the vehicle for private business, personal errands, or recreation.
- \* Transport members of your family or personal friends in a government vehicle without specific written permission from your agency.
- \* Park the vehicle at places of amusement.
- \* Park it at your residence unless you have a valid authorization from the head of your agency and a copy has been furnished to the Fleet Management Center issuing the vehicle.
- \* Leave the engine idling to operate the heater or air conditioner.
- \* Leave ignition keys in the vehicle when it is left unattended.

### ***Do***

- \* Operate the vehicle in a safe and prudent manner, obeying all traffic laws. A traffic violation is your liability.
- \* Safeguard the vehicle, the U.S. Government National Fleet Card, and the ignition keys against theft or misuse by:
  - A. Removing credit card and ignition keys when the vehicle is left unattended.
  - B. Removing credit card when the vehicle is left at a commercial facility for service, inspection, or repair.
  - C. Turning the credit card and ignition keys in to the Gemini HBF when the vehicle is returned.



- \* Fasten seat belts prior to putting the car in motion and ensure that all passengers have their seat belts fastened.
- \* Use self-service pumps when purchasing fuel at commercial stations with self-service pumps.
- \* Use regular unleaded fuel, except when vehicle requires premium.

Operators of Government-owned or leased motor vehicles shall become familiar with and obey all motor vehicle traffic laws of the state(s) and local jurisdiction in which they operate. Violation of State or local motor vehicle traffic laws can result in fines and/or imprisonment of the motor vehicle operator. Fines imposed on a Government-owned vehicle operator for an offense committed by him or her while in the performance of official duties are imposed on the motor vehicle operator personally. Payment of these fines is the personal responsibility of the motor vehicle operator.

When purchasing fuel from the service stations, use the credit card furnished with the vehicle. It is your responsibility to obtain a copy of the credit card delivery receipt for each purchase made, and to verify that all pertinent information is recorded on the ticket prior to signing. The information required includes:

- Name and address of service station and date of delivery
- Correct prices and extended totals for each item received
- A license tag number of the vehicle
- Proper billing address and 10-digit account number as shown on the credit card.
- Vehicle odometer reading

Turn all credit card receipts in to Patricia Dawson of the Accounting Department.





# MOTOR VEHICLE ACCIDENT PROCEDURES WITH INJURIES

**Stop immediately.** Do not leave the scene of an accident without identifying yourself and rendering assistance.

Help the injured.

Call the police (911) with the vehicle's cellular phone. Act promptly but carefully to render aid:

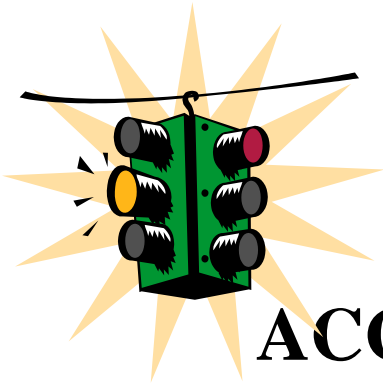
- Do not move the injured. Unskilled handling can increase the risk of greater injury.
- Keep the injured warm while waiting for skilled help. Use the "space blanket" provided in the vehicle.
- If there is severe bleeding, attempt to stop the bleeding with direct pressure. Precautions should be taken to avoid blood contamination (wear rubber gloves, if available).
- Protect the injured from oncoming traffic.

Warn passing traffic of any road hazards (including the injured). Use emergency flares (provided in vehicle), light sticks or reflective warning triangles.

Exchange information with the other driver. *All involved drivers must provide to the other parties their name, address, phone number, vehicle license number, no-fault insurance carrier and policy number, and if requested, exhibit their driver's license to any person injured in the accident or to the driver or occupant of or person attending any vehicle or other property damaged in the accident.*

- Obtain names, phone numbers and addresses of all witnesses.
- Do not make any statement assuming fault, even if you believe you were at fault.

***All motor vehicle accidents must be reported to the Human Resources Department, the Safety Officer and the Facilities Specialist. An internal Accident Form must be completed. Accidents involving passengers or others must be reported to the police.***



# MOTOR VEHICLE ACCIDENT PROCEDURES WITHOUT INJURIES

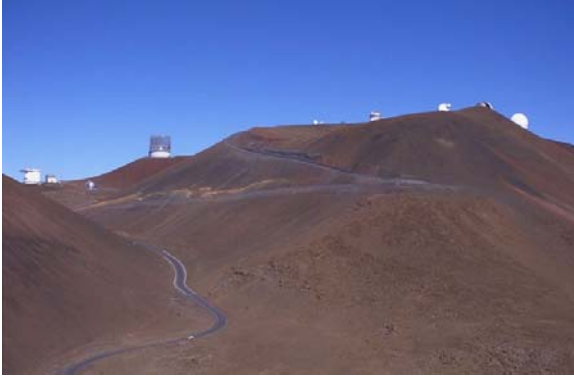
**Stop immediately.**

If you strike another (unattended) vehicle, locate the owner or leave a written notice with your name, address and phone number and a brief description of the circumstances.

If you damage other property, stop and try to locate the owner or leave a written notice with your name, address and phone number and a brief description of the circumstances.

***All motor vehicle accidents must be reported to the Human Resources Department, the Safety Officer and the Facilities Specialist. An internal Accident Form must be completed. Accidents involving passengers or others must be reported to the police.***





# DRIVING SADDLE ROAD AND ON MAUNA KEA

It is Hawaii State law that all drivers and passengers wear a seatbelt. The fine for driving without a seat belt is \$76. If fined, it is your responsibility to make payment. Please check your fuel gauge before heading to Mauna Kea. Unocal 76 is the last gas station on the way to the summit.

The speed limit from Gemini HBF to Hale Pohaku is 35 mph. The speed limit from Hale Pohaku to the summit is 25 mph. Please watch your speed limit at all times. The drive from Gemini offices to the summit can be very hazardous, especially in bad weather. Drive with extreme caution.

The Saddle Road, which connects Hilo with the southern outskirts of Waimea (54 miles distance), begins at Kaumana Drive in Hilo and provides the only road access to Mauna Kea. To get to the Onizuka Center for International Astronomy (also known as Hale Pohaku, Hawaiian for "Stone House"), one drives the Saddle Road to Milepost 28 and then turns right onto the Mauna Kea Access Road. At the turnoff, the altitude is 6,600 feet (2,000 meters) above sea level. It is another 8 miles up the Mauna Kea Access Road to Hale Pohaku, located at 9,200 feet (3,000 meters) above sea level. Headlights need to be on all the way along the full length of Saddle Road. Turn on the headlights once you are on Saddle Road (Milepost 8). You can turn off the headlights once you arrive at the Mauna Kea Access Road turn off. Total driving time from Hilo to Hale Pohaku is usually one hour, but can be longer if it is raining hard or is foggy.

Although paved, both the Saddle Road and the Mauna Kea Access Road are winding with inadequate shoulders and steep grades in places and, thus, are hazardous to drive. Low gear is highly advisable for driving the first four miles downhill from Hale Pohaku toward the Saddle Road.

Also note that beyond the Mauna Kea Access Road turnoff (i.e., beyond Milepost 28), the Saddle Road becomes barely a two lane road.

A four-wheel drive vehicle is required to drive from Hale Pohaku to the summit of the mountain where the telescopes are located, as the road above 9,200 feet has a long unpaved portion which is often in poor condition. Be sure to put the vehicle in four-wheel drive once on the unpaved road. In inclement weather, snow chains are required on all vehicles ascending the summit. If you have rented

# GEMINI'S ROADBLOCK POLICY

## I. GENERAL PRINCIPLES:

- A. Avoid Confrontation
- B. Avoid Debates
- C. Show Restraint
- D. Respect the opinions of others

## II. TYPES OF PROTEST



A. Roadblock - An illegal blockage of traffic on a public road. Although illegal, it is important to avoid confrontation and respect the participants' right to have their own point of view. Follow the guidelines in part III on the next page.

B. Demonstration - Legal form of protest on a public road - no blockage. Participants in a demonstration should be treated with respect. They have a right to their opinion and a right to protest. Unless the road is being blocked, proceed past a demonstration with as little interaction with the participants as possible.

C. Religious or Cultural Ceremony - Legal form of religious expression. The astronomy community should respect religious ceremonies even if they may cause some inconvenience. Sometimes the protocol followed may cause some inconvenience, such as a delay, etc. Be patient and understanding. In some cases individuals may leave shrines or other structures in place. In general, stay away from these and do not disturb them. Do not make a judgment that the shrine is not appropriate and remove it. If it is of concern, ask MKSS to inspect it.



# GEMINI'S ROADBLOCK POLICY

## III. WHAT TO DO IN CASE OF A ROADBLOCK:

A. Announced or otherwise anticipated roadblock or protest. The Hawaii County Civil Defense should be contacted at 935-0031. They will coordinate the various agencies that need to be involved and a specific policy will be worked out prior to the event.

B. Unanticipated roadblock encountered by staff: Under NO circumstances should staff, visiting observers, or contractors working for Gemini attempt to cross through a roadblock. Do not get out of the vehicle. Drive a safe distance from the roadblock and call 9-1-1 from the vehicle cell phone and describe the situation to police. Secondly, call the Gemini Northern Operations Center and inform at least one of the following contacts of the situation: During normal work hours M-F call 974-2500; After hours call Matt Mountain (520)907-3687; Jim Kennedy at (808)987-5798 or Steve Hardash 934-0186(h). Inform MKSS at 935-7606 (Hale Pohaku) or 935-3371(Hilo).

### **Specific actions to take are as follows:**

1. If the roadblock occurs at or near the Gemini Northern Operations Center. From a safe distance, call 9-1-1, then one of the Gemini contacts listed above and then call MKSS. Or if there is no cell phone in your vehicle, drive to the nearest pay phone and call from there.

2. On the Way Up to the Gemini Observatory. Drive back a safe distance from the roadblock, call 9-1-1, then one of the Gemini contacts, and then call MKSS. If it does not appear that the roadblock may end soon, then drive back to the Gemini Northern Operations Center if below Hale Pohaku; drive back to Hale Pohaku if the roadblock is on or above the gravel section of the road. DO NOT proceed up until it is determined by police authorities that the roadblock is clear, and that it will not reform later in the day blocking departure travel.

3. On the Way Down from the Gemini Observatory. Drive back a safe distance from the roadblock, call 9-1-1, call one of the Gemini contacts, and then call MKSS. If it does not appear that the roadblock may end soon, then drive back to the Gemini Observatory if above Hale Pohaku; drive back to Hale Pohaku if the roadblock is below Hale Pohaku. Await for further instructions from police authorities as to when it is safe to proceed.



# GEMINI NORTH OFFICE ALARM SYSTEM

The intrusion detection system at the Hilo Base Facility (HBF) of Gemini Observatory is monitored by Alert Alarm of Hilo. An individual's 4-digit code for arming and disarming the HBF alarm system needs to be programmed into the system prior to entering or exiting the building for the first time after hours. Please be sure you have been given proper instruction before using the alarm system.

There are 5 alarm control panels located throughout the HBF: 2 in the lobby (1 in front of the reception workstation, the other near the copy machine); 1 in the South Wing near the admin offices; 1 in the Lab Wing near the front of the building; 1 in the North Wing near the back door.

## **ARMING THE SYSTEM:**

A sign-in book will be kept at the front shelf of the receptionist area to identify who is in the HBF between 6:30 p.m. and 6:30 a.m. regular workdays and all hours Saturdays, Sundays, and Holidays. When in the facility during these time periods, write your name and arrival time on the appropriate date page. When leaving, write in your departure time. If you are the last person to sign out, you must then ensure that the building is secured before arming the system.

Check that the following exterior doors are locked: the two brick-red doors leading to the courtyard, the north door out of the Instrument Assembly/Disassembly Room, and the glass entrance doors. The remaining doors should automatically be locked when closed. Be sure when locking the courtyard doors to first push the button upward inside the lock slot of the adjacent door before engaging the lock bolt with the thumb turn.

To arm the system, first check to be sure the keypad display reads, "Ready to Arm, Area 1." If the keypad does not display this ready message, then the keypad will display the zone that is not ready. Since motion detectors are typically located near keypads, be sure to avoid movement during the arming process.

Do not use the command buttons, "Perimeter Only" and "No Entry".



# GEMINI NORTH OFFICE ALARM SYSTEM



Once the keypad indicates the system is ready, enter your assigned 4-digit code AND press the "On" button on any keypad to arm the system. You have 60 seconds to exit the HBF after setting the alarm. During this exit delay period, the keypad sounder will activate once every 5 seconds. At 10 seconds and 5 seconds remaining, the keypad sounder will activate 3 times.

## **FORCE ARMING THE SYSTEM:**

If one or more zones are faulted, the system may be Force Armed by bypassing the faulted zone(s). Inform Alert Alarm of the fault condition prior to force arming. Enter your assigned 4-digit code, press the "On" button, and then press the "Bypass" button within 5 seconds. You now have 60 seconds to exit the HBF.

## **DISARMING THE SYSTEM:**

Please enter the building near one of the alarm panels. To disarm the system, enter your assigned 4-digit code on any keypad AND press the "Off" button within 45 seconds of opening a door. The keypad display should then display, "Ready to Arm, Area 1."

## **PROBLEMS WITH THE SYSTEM:**

You will be issued an Alert Alarm Card with a pass code located on the upper right corner of the card (not to be confused with your assigned 4-digit code). Any visitor experiencing difficulty arming or disarming the alarm system or inadvertently setting off the system should contact the Alert Alarm office at 935-5222 (phone number is on the Alert Alarm card and is posted by each keypad). You will need to identify yourself by the pass code on the card.