

Dear Subscribers and Friends:

Within the next few weeks you will receive a questionnaire—the first comprehensive survey made of the Park Practice audience since its publications were started fourteen years ago. Usually twenty percent is a good return from such a survey, but if possible, I would like to see a greater return—a wider base to plan your future Park Practice on. Assist us, assist yourself by getting your questionnaires returned as soon as possible. Thank you.

James A. Burnett

The squeaky wheel gets the grease, so we'll start this little grist mill squeaking. We still need your contributed ideas on any recreation-related subject, and would like, especially, to receive ideas from urban park and recreation activities:

- methods of handling crowds and children.
- your programs that have been popular.
- interpretive ideas that attract children and teenage visitors.
- safety gadgets and ideas for summer activities.
- examples of attractive signs.
- shop ideas and maintenance.
- variations in recreational forms that tend to invigorate participation.

Your past steady support has been most appreciated. Many thanks from the staff and me. Ed.

## BRIGHT ANGEL OPERATION "FLY-DOWN" FOR HELICOPTERS

By their very nature, bridges are normally "put up", but the one shown here and two others were "put down"—way down—about a mile from the vertical rim of the Grand Canyon.

In 1966 the Canyon's greatest flood in 1500 years destroyed three aluminum bridges and a nearly-completed trans-canyon pipeline project designed to increase the National Park's water supply which was under construction by Halverson-Lent. Bright Angel Creek, normally a serene knee-deep, 20-foot wide feeder stream of the Colorado River, flowing amid the beauty and majesty of rock strata that reveal at least two billion of the earth's four-billion year history, had to be returned to its course. Twenty thousand feet of 6- and 8-inch pipe had to be replaced, and three steel bridges installed for trail use and conveying the pipeline.

To make the bridges as inconspicuous as possible, U.S. Steel's COR-TEN, a high-strength, low-alloy steel, which when in the unpainted condition weathers to a rich, dark, earthy color, was used. It provides the required strength and also meets the aesthetic requirement. Its non-reflective surface blends well into the coloration of the area and is not conspicuous from any part of the Canyon rims. Crescent Steel fabricated and completely assembled the bridges in Phoenix.

Working from a staging area on the south rim of the Canyon at Yaki Point, Halverson-Lent airlifted a half million pounds of heavy construction equipment (trucks, tractors, bulldozers) with a large Sikorsky-built helicopter. Some equipment, too large and heavy for one lift,

was dismantled. It took five trips to put down a 35-ton, D-7 Caterpillar tractor, for instance. Two B-1 Bell helicopters transported the 50-foot long truss sections weighing 750 pounds maximum per trip, to their positions on Bright Angel. A "fly-down" from rim to floor took only minutes.

How different from the operations required when the nearby Kaibab suspension bridge was constructed some years ago. Steel sections, which could be no longer than eight feet, had to be taken down into the gorge by mules and the cable carried down by men.

On their many trips into and out of the Canyon, the helicopter pilots, headed by chief pilot Arthur Ranger, passed prismatic waves of color, the full succession of geological strata down to granite and a temperature change of 35 degrees. The temperature difference is comparable to changes that would occur in a trip from Canada to Mexico.

When the project was completed there was no evidence of construction other than the bridge and the pipeline slung under it. The rest of the pipe is buried 18 inches under the mule trail. Approximately 750,000 pounds of construction equipment and materials were flown out.

Last year marked the fiftieth anniversary of the establishment of Grand Canyon as a national park and the 100th anniversary of Major John Wesley Powell's first expedition down the Colorado River through the Grand Canyon, which he named. True to President Theodore Roosevelt's admonition while visiting Grand Canyon, "Do nothing to mar its grandeur..." the National Park Service is keeping the awesome beauty as untouched as possible.



## PARK PRACTICE GRIST

a bimonthly publication of the nonprofit, educational Park Practice Program cooperatively conducted by the National Park Service, U.S.D.I., the National Conference on State Parks, and the National Recreation and Park Association as listed hereafter.

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NATIONAL PARK SERVICE, U.S. DEPARTMENT OF the INTERIOR  
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Printed by District Creative Printing, Inc., Washington, D. C.  
Not printed at Government expense.

## Speaking of Interpretation

PANDORA'S EASY OPEN POP TOP BOX—  
Chief of Sales, Audiovisual Center, National Archives & Records Service, Washington, D.C. 20409.

These combine a look at the psychological basis for the creative process with an attitude toward uncontrolled applications of technology.

## Second Program

A MATTER OF TIME — Conservation Foundation, 1250 Connecticut Ave., N.W., Washington, D.C. Attn.: Anna Schultz.  
FOR ALL TO ENJOY — Capitol Film Library, 470 E Street, S.W., Washington, D.C. 20024.

The accelerating nature of technological development and application, contrasted with a sardonic review of what outdoor recreation means to some people.

## Third Program

TOO THICK TO DRINK, TOO THIN TO CULTIVATE — Isaac Walton League, 1326 Waukegan Road, Glenview, Ill. 60025.  
THE RIVER MUST LIVE — Shell Film Library, 450 N. Meridian St., Indianapolis, Indiana 46204.

A vivid and prophetic look at Lake Michigan and Lake Erie, and an example of how water pollution can be controlled.

## Fourth Program

THE SQUEEZE — Henk Newenhouse, Inc., 1017 Longaker Rd., Northbrook, Ill. 60062.  
MY OWN YARD TO PLAY IN — McGraw-Hill, 828 Custer Ave., Chicago, Ill. 60202.  
THE GREEN YEARS — Center for Urban Education, 105 Madison Ave., New York, N.Y. 10016. Attn.: Mr. James Elsbery, Asst. Director.

A summation of the population explosion, and analysis of children's play in slum areas, and an example of how a city can use parks creatively.

## Fifth Program

THE MYTHS AND THE PARALLELS — Association Films, 1620 Dragon St., Dallas, Texas 75207.  
THE AGE OF THE BUFFALO — Encyclopedia Britannica Education Corp., 425 N. Michigan Ave., Chicago, Ill. 60611.

A review of conservation and a prize-winning Canadian Film Board production on the results to the Plains Indian of his primary food source and cultural support.

## Sixth Program

THE GREAT SWAMP — Bureau of Sports Fisheries, Department of the Interior, Washington, D.C. 20242.  
THE CONCESSION — Henk Newenhouse,

Inc., 1017 Longaker Road, Northbrook, Ill. 60062.

Two ways of managing a wildlife area, with results demonstrated.

## Seventh Program

CITIES IN CRISIS — University of Indiana Audiovisual Center, University of Indiana, Bloomington, Indiana.

OPEN SPACE, GOING GOING — Modern Talking Picture Service, 1411 Slocum St., Dallas, Texas 75207.

Urban decay and suburban growth—and approaches to rational solutions.

## EXTENDING USEFULNESS OF TWO-FACED SIGNS

Don Black, Twentynine Palms, California, has improved upon his idea of using both sides of silk screen printed signs. To increase the choice of sites where the plant-marking signs may be used, he makes up a five-year supply of the signs in the following pattern.

Fifty signs are printed with illustration and legend A. Then illustrations and legends B, C, D, E, and F are printed on the backs of these 50 signs in quantities of 10 each.

This makes it possible to use sign A at six different sites; helps balance out the differences in vandalism of signs at different sites.

*Prejudice is a great time saver — it enables one to form opinions without bothering to get the facts.*

—THE RIDGE RUNNER

URBAN ENVIRONMENT—  
INTERPRETATION

The urban environment receives special attention in five papers published by the Association of Interpretive Naturalists, Inc. The titles: "Attitudes Toward the Outdoors as Related to the Inner-City Residents," by Harry H. Feldman; "An Interpretive Naturalist's Philosophy of Urban Environmental Education," by Bettison E. Shapiro; "What's Real? What's Needed? and What's Worthwhile?," by Catherine V. Richards; "Some Thoughts on Interpretation for Urbanities," by William Howenstine; and "Nature Interpretation for the Inner-City Child," by Elizabeth Roller. Single copies of these papers are available through the Association, 1251 East Broad Street, Columbus, Ohio 43205.

## MAN ALIVE! IT'S YOUR WORLD

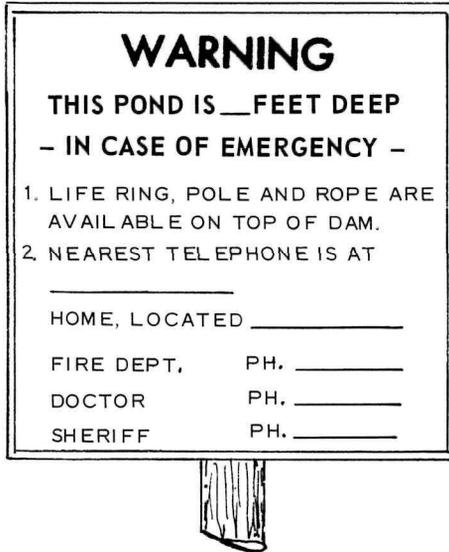
With citizen concern mounting for our critically endangered environment, Frank Smith at Chamizal National Memorial and Fort Davis National Historic Site decided to rally some community help to provide showings of some of the excellent film material he knew to be available. He planned the program series, got public agencies (the university, art museum, and libraries) to provide the staging area, and together they presented for the benefit of the citizens of El Paso an "Environmental Awareness Film Festival." Here are Frank's programs.

## First Program

WHY MAN CREATES — Kaiser Aluminum & Chemical Corp., P.O. Box 2099, Oakland, Calif. 94204. Attn.: Mr. Gordon Ainsworth, Mgr., Public Relations Service.

**WATER WARNINGS**

Fun on the farm often comes these days in the form of swimming, fishing, boating, hunting, and skating on the many recently created ponds. This, of course, brings with it a safety hazard—the possibility of drowning.



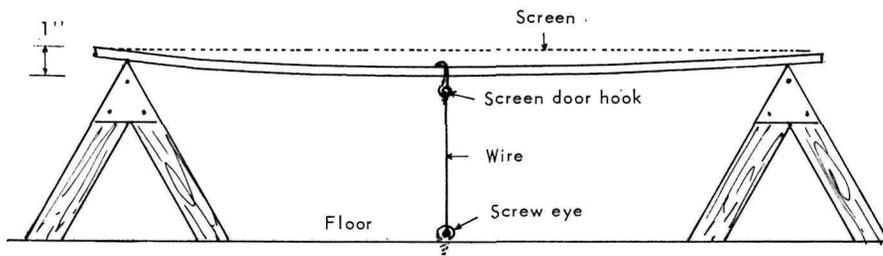
The Soil Conservation Service of the U.S. Department of Agriculture reminds farm pond owners of their moral and legal responsibilities to users. They suggest the following precautions which obviously can apply just as well to park management.

1. Know the legal requirements in your area. Discuss with an attorney the legal requirements regarding precautions and safety and the liability in case of serious accident or death.
2. Help prevent an accident or save a life by—

**REPLACING SCREEN ON DOORS**

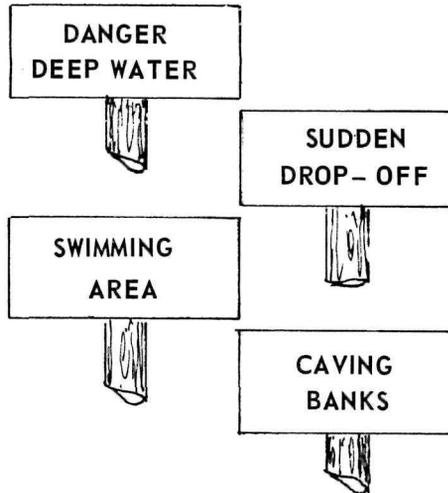
Thirty-four cabins at Watoga State Park, West Virginia, needed rescreening. As anyone knows who has tried it, the big problem is how to get the screening tight so that it won't be bulging before you get the door rehung. Superintendent Richard Dale found a way.

Place a sawhorse under each end of the door. On the floor, under each side of the



Using appropriate signs to warn of specific dangers.

Placing life saving equipment near the pond.



Here are some warning signs which they suggest and some construction suggestions.

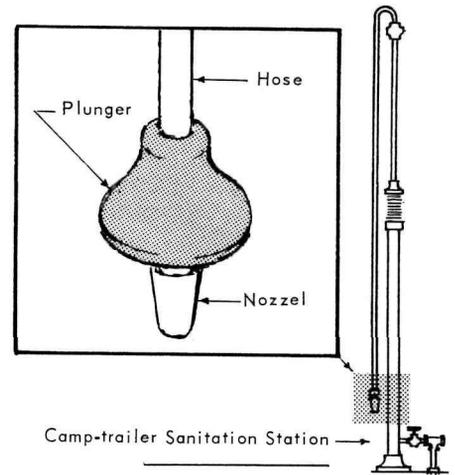
1. Make small signs 6"x8". Post 4' above ground surface.
2. Make large signs 3'x3'. Post bottom edge of sign 4' above ground where easily seen when approaching pond.
3. Use dark lettering on white background. Large letters 2" high, small letters 1" high.

**PROTECTOR FOR HOSE CONNECTION**

The connection of a sanitation filler hose swinging from the standpipe noisily banged against the pipe and damaged the threads.

Bud Veine, supervisor at Charles Mears State Park in Michigan, stopped the noise and the damage with a "plumber's friend."

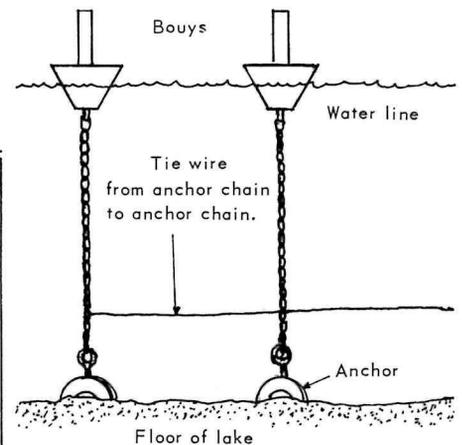
Cut a hole, the same size as the hose, in the top of the rubber plunger. Remove the hose end fitting and slip the plunger over the hose. Replace the hose fitting and the plunger will drop down to form an umbrella-like protector over it as shown in sketch. No more banging either.



**GUIDELINE LOCATOR FOR BEACH BUOY ANCHORS**

Many parks use beach buoy anchors made of concrete where they have beaches on a large body of water. It is nearly impossible to pull these heavy anchors from the lake bottom, but if left there they are difficult to find in the spring when the buoys must again be attached.

Lifeguards John Cameron and Frederick Eisenhardt of Island Lake Recreation Area in Michigan, devised the method of attaching one end of a long wire to the first anchor in the series. The other end of the wire is threaded through the eye of each of the other anchors and attached to the last



one. This wire is left permanently fastened to the anchors, and in the spring it is a relatively simple matter for a lifeguard, or skin diver to locate it. Once any part of the wire is found, it is easy to follow it from anchor to anchor and attach the buoys.

Paul Wigg, park supervisor at Island Lake sent the idea along for the benefit of our GRIST readers.

TEMPORARY ICE SKATING RINK

Acting Park Superintendent Gene Williamson, Fairfax County Park Authority in Virginia, has forwarded for the benefit of GRIST readers plans for temporary installation of ice rinks on flat areas such as ball fields or multi-use courts. The plans and instructions are the work of Paul Vogel.

The location should be chosen with care for it must be relatively flat and level.

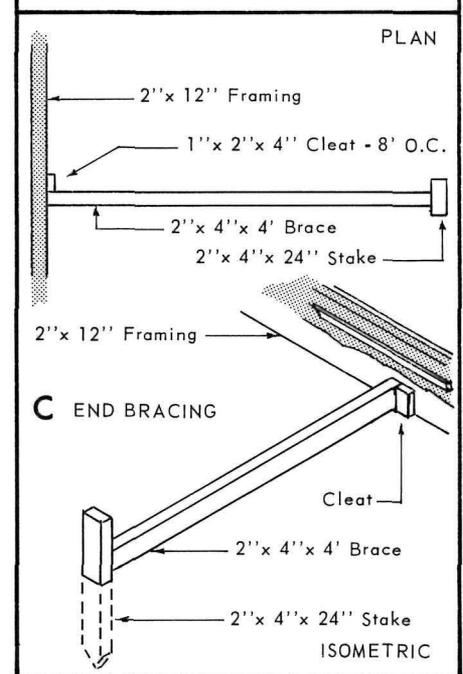
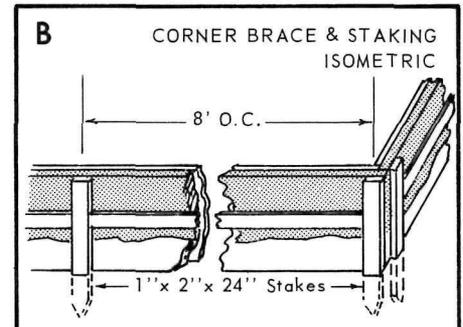
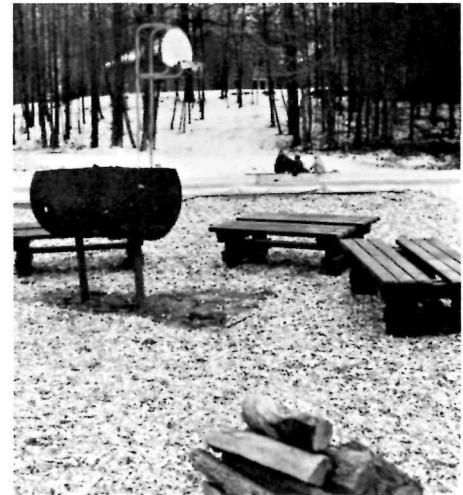
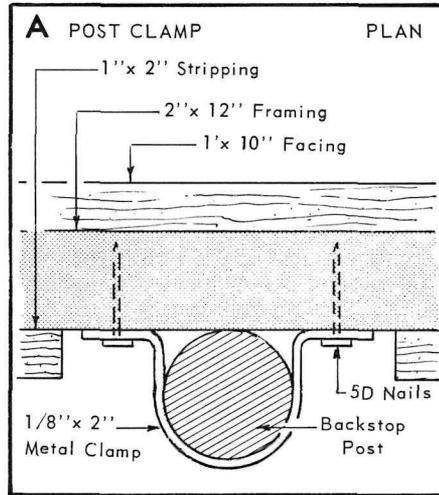
A commercial liner or regular 6 mm. plastic may be used. The total area should not exceed 50' x 100' as the plastic is available in 40' and 50' rolls. Lay out the area 40' x 90', if using 50' plastic. Drive 1 1/2" pipe 13" into the ground, placing corner pipes 3" inside the corners and the remainder at 10' intervals, with the first pipe placed 10' from actual corner. A 2" x 8" x 20' frame held in place by carriage bolts and flat washers should join at the pipes. When constructing the skating area on a multi-use court, install the frame around the outside edge.

When construction of the frame is completed, spread sand to a depth of 3 to 4 inches over entire surface to help prevent punctures in the plastic. When the sand is leveled, spread the plastic, making sure that it is tight in corners and perfectly flat.

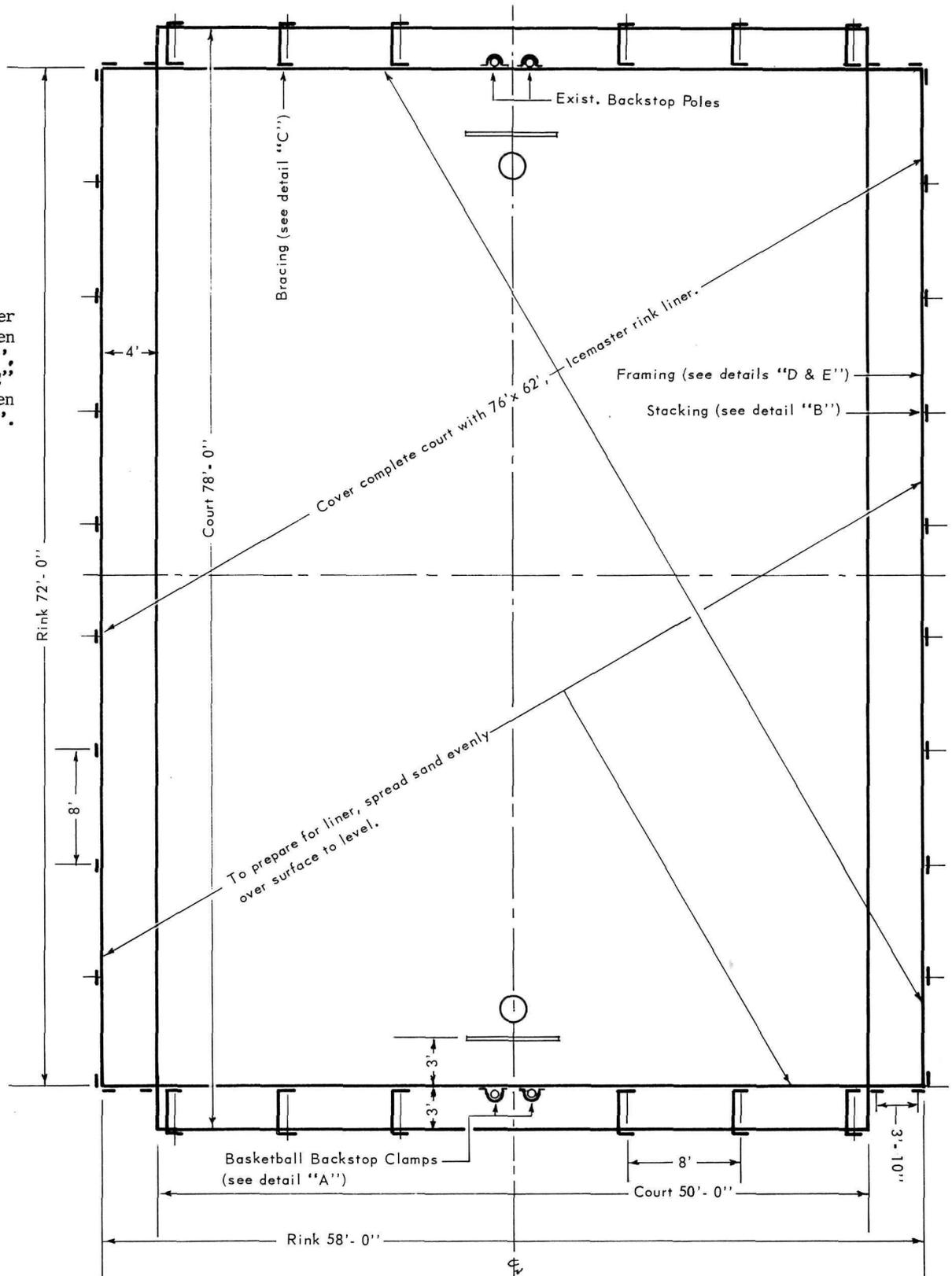
Fit the hold-down unit over the plastic as shown in the sketch. The 2" x 8" frame must be tight enough to hold the plastic in place, but loose enough to prevent cutting it. The hold-down unit not only keeps the plastic in place, but prevents skaters from cutting the plastic.

The skating area should be filled with water not over 6 inches deep.

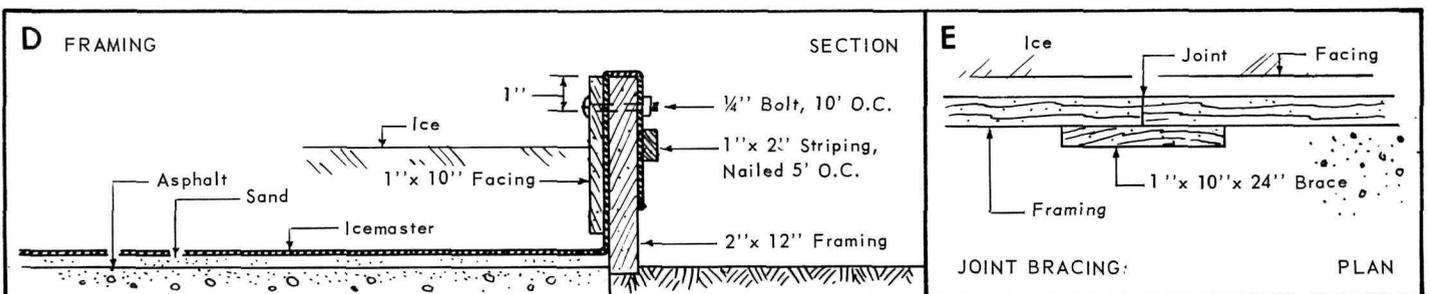
Wood chips placed around the rink and a couple of warming barrels and benches will finish the skating area.



NOTE: Icemaster liner to run between 1" x 10" and 2" x 12", over top of 2" x 12" and down between 1" x 2" and 2" x 12".



ICE RINK PLAN



## CAN YOU BETTER THESE CUSTODIAL CONTRACT SPECS?

The following set of specifications for contract custodial services in recreation areas is used by Florida National Forests of the U.S. Forest Service. Forester J. E. Carroll points out the difficulty in setting and enforcing specifications for cleanup and policing and suggests that perhaps you, the readers of GRIST, might have some suggestions for improvement of these used in the Florida Forest Service. If you have a set of specifications in use which you think are an improvement over these, or if you have suggestions for changes to be made in the set given here, send them in to GRIST. They will be analyzed, and then in a future issue we will give you the results of the analysis.

### I. GENERAL SPECIFICATIONS

#### Description of Work

Furnish all labor, and a means of transporting garbage and perform the services for cleanup and policing, including mowing all open grassed areas of the Fore Lake, Mill Dam and Halfmoon Lake Recreation Areas, in accordance with the following specifications.

#### Location

1. Fore Lake-Marion County, Florida, approximately 10 miles east of Ocala on Highway No. 40 and then 6 miles north on Florida 314.

2. Mill Dam-Marion County, Florida, approximately 17 miles east of Ocala on Highway No. 40 and 1/4 mile north on Forest Road 58.

3. Halfmoon Lake-Marion County, Florida, 18 miles east of Ocala, Florida on Highway No. 40 and then south approximately 1 mile on Forest Road 79-1 and 79-D.

#### Experience & Financial Questionnaire

Bidder may be requested to submit an attested statement of his business and labor organization available for the contemplated work, including his financial resources, experience, reference from previous employers, and other pertinent information required to determine his ability to successfully complete the contract. The Government expressly reserves the right to reject any bid in which facts as to business and labor organization, financial resources, experience of past performance on previous similar contracts compared with the requirements of the project bid upon, justify such rejection.

#### Facilitating Equipment Requirement

The Forest Service will furnish expendable supplies such as toilet paper, paper towels, disinfectant, plastic bags,

soap, chlorine, mops, brooms, and sponges. Hand tools such as rakes and wheelbarrows and special tools or equipment such as lawn mowers or special supplies that the contractor prefers to use instead of those supplied by the Forest Service shall be furnished at the contractor's expense. The contractor will also be required to furnish a means of transporting garbage, trash and debris from the areas. He will also furnish all gas, oil, supplies, and other things necessary for the operation of his transportation equipment. The transportation vehicle shall be so arranged as to not allow any garbage, trash and debris to shake or blow free and the equipment and personnel shall be maintained so as to present a neat appearance.

### II. TECHNICAL SPECIFICATIONS FOR CLEANING AND POLICING FOREST RECREATION AREAS

#### A. Family Units

1. Pick up trash and litter within the area of the family units. Place trash and litter in garbage cans.

2. Rake within the family units as needed to maintain the appearance and level of the ground or wearing surface and remove all foreign matter such as bottle caps, broken glass, etc.

3. Rake the tent bases to a smooth level surface. Allow no mounds, holes, large rocks, wood, etc., to collect on the tent bases—OMIT THIS PARAGRAPH IF THE FAMILY UNIT IS A PICNIC UNIT.

4. Wash the table tops and seats with soap and water, using a brush.

5. Rinse the tables with clean water.

6. Remove excess water with a sponge.

7. Spray a thin mist of disinfectant solution over the table tops and seats.

Wipe the excess disinfectant from the table tops and seats, using a sponge.

8. Clean fireplace of ashes, or garbage which may have collected. Remove the ashes and garbage to the garbage can and stack the wood, which may not have been burned, neatly alongside of the fireplace.

9. Omit Steps 1, 2, 3, 4, 5, 6, 7 and 8 when family unit is in use or is clean enough to meet Steps 1 through 8.

10. Empty garbage can, removing garbage and trash from area. Spray a thin mist of disinfectant solution inside can and replace plastic liner. If the plastic liner has been broken and the inside of the can has been soiled, wash the garbage can with soap and water, rinse with clean water and spray a thin mist of disinfectant inside and outside before replacing plastic liner. Unsoiled plastic bags shall be reused when possible. All garbage, trash and debris shall be deposited in nearby sanitary landfills which are maintained by the Marion County Health Department or disposed in other sanitary ways acceptable to the

Marion County Health Department and the District Ranger.

11. Spray around and under the garbage can mount with disinfectant including the outside of the garbage can.

12. Once each week clean fireplace grill with steel brush to remove spilled grease, etc.

#### B. Specifications for Cleaning and Policing Flush Toilets, Dressing Rooms and Showers (Twice Daily During Period from June 1 thru Sept. 3)

1. Open vents and doors; hook up length of hose, empty and wash out trash cans.

2. Pour in 2 ounces of 5 percent calcium hypochlorite solution in each toilet and urinal; let stand.

3. Next pour approximately 2 ounces of 5 percent calcium hypochlorite solution into a quart of water in a plastic bucket and, using the toilet bowl brush, clean the sides (inside) of the urinal paying special attention to the hidden lip at the front of the urinal.

4. Using the bowl brush set the water and chlorine in the commode into motion, paying special attention to lip of china bowl where the water comes into the bowl.

5. After cleaning the inside of the toilet bowl, using the bowl brush, go over the outside of the bowl front, back and sides.

6. Once a week muratic acid or its equal shall be used in the place of the chlorox 5 percent. REMEMBER, NEVER, NEVER POUR WATER INTO ACID. POUR THE ACID INTO THE WATER SLOWLY. NEVER USE MURATIC ACID ON THE LAVATORIES, OR CHROMED FIXTURES.

7. Clean lavatories with scouring powder, using a sponge. Polish chrome-ware including faucets, soap dispenser, etc.

8. Polish plumbing and trap beneath lavatories.

9. At least once a week scrub walls and floor, both inside and outside, with a stiff brush, soap and water.

10. Clean the toilet and urinal partitions with soap and water, using a sponge. Clean with car cleaner and re-wax if wax is worn thin.

11. Take hose and wash down everything, walls, floor, toilets, urinals, partitions, etc. If the building is an old style wooden structure, omit the walls and partitions from items 9, 10, and 11.

12. Pick up the excess water with sponge and mop. (Sponge for the walls, partitions, toilets, etc., and the mop for the floor area.)

13. After all excess water has been taken up, spray everything with a fine mist solution of disinfectant. Do not spray the mirrors.

14. Clean the mirrors with soft paper

towels and cleaner. Flush all toilets and urinals.

15. Sweep and clean out dressing room. Scrub the walls, seats and floor with soap and water.

16. Wash down dressing room with hose and take up excess water with sponge and mop.

17. Spray a fine mist solution of disinfectant over walls, seats and floor.

18. Leave the disinfectant solution on the one side of the bathhouse until the other side has been cleaned; then wipe dry the following only: toilet seats, partitions, lavatories, soap dispenser, all chromed fixtures, paper towel dispenser. Leave everything else with the thin mist of disinfectant on it.

19. Fill all paper towel dispensers, toilet paper holders, soap dispensers as needed. Replace plastic liner and bring in cleaned trash can sprayed with disinfectant. Once each week wash shower curtains and re-hang.

20. Use insecticide spray around and inside building whenever wasps, bees, spiders, etc., are present.

21. Notify District Ranger of any breakage or vandalism.

C. Fountains and Hydrants

1. Clean with soap and water, using sponge and brush.

2. Spray with a thin mist of disinfectant solution.

3. Spray a thin mist of disinfectant one foot wide all the way around the base.

4. Wipe the fountains, bowls, facets and pumps with a sponge to remove the excess disinfectant.

5. Notify the District Ranger of any breakage or vandalism.

D. Grounds

1. Go over all used area and improvements including roads, roadsides, trails, paths, parking areas, buildings, shelters, signs, etc., and pick up all paper, trash, cans, bottles and other debris and remove from the area.

2. Remove nails, rope, wire, etc., from trees, shelters, etc.

3. Check all signs in the area to be sure they are in place and in good condition. Clean any dirty signs with soap and water. Wipe dry.

4. At least once a month, or as often as necessary to keep grass and weeds under 4 inches in height, mow all open grassed areas including roadsides back to the existing brush line.

E. Swimming and Other Waterfront Areas

1. Follow the specifications for cleaning and policing grounds.

2. Remove all trash, bottles, glass, cans, etc., from the water edge and as

far out as trash, bottles, etc., can be seen.

3. Rake gravel beach for foreign matter such as glass, bottles, cans, etc., and to give that well-kept appearance.

4. If a grass beach, grass shall be kept free of foreign matter such as glass, bottles, can, trash, etc.

F. Boating

1. Follow the specifications for cleaning and policing grounds.

2. Check boat ramp for trash, broken bottles, nails, etc.

3. Remove bottles, trash, cans, etc., from edge of water and as far out in the water as can be reached.

G. Cleanup and Policing Pit Toilets

1. Block door to toilet open.

2. Sweep interior of building paying close attention to corners around roof where cob webs may collect.

3. Scrub seats with soap and water. Do not pour soapy water into pit.

4. Spray thin mist of disinfectant on seat and floor.

5. Replace paper in paper holder.

6. Close door and sweep down outside of building and roof.

7. Spray outside of building with insecticide.

8. If smell is objectionable or at least once each month prepare chloroben or deodorant powder and pour into pit.

9. Report damages to the Contracting Officer's Representative.

HISTORICALLY COMPATIBLE TRASH CAN CONCEALERS

Modern trash containers just weren't in keeping with the 1865 scene created at Appomattox Court House National Historical Park. But the absence of trash cans along the historical walking tour within the restored village resulted in a trail of visitor litter droppings: the usual empty cigarette packs, camera film wrappings, candy wrappers, and cups from the country store operation.



Foreman Raymond Godsey solved the problem by guilding a housing for an ordinary galvanized trash can which re-

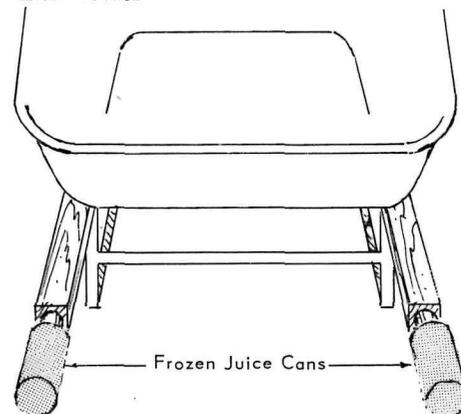
sembles a chicken coop or dog house typical of the place and period. The materials used are identical to those used in some of the surrounding buildings. The only evidence that it is a trash receptacle is the word LITTER stenciled under the roof where the gable is left open for deposit. The entire roof can easily be lifted off, or it could be hinged, and the can emptied by removing the plastic liner.



The design and materials could be changed to conform to structures in your own area. Ray suggests that old well covers make a good camouflage for litter cans in historical areas.

AVOID SPLIT WHEELBARROW HANDLES

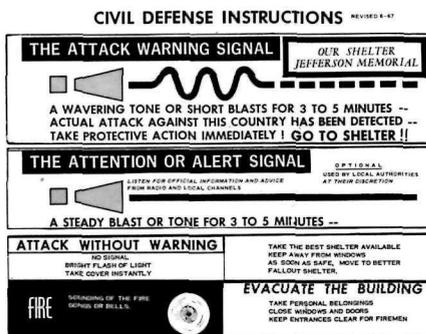
Weather splitting and cracking of wooden wheelbarrow handles can be avoided by making protectors for them from juice cans (see sketch). Donald M. Black, chief park naturalist, Joshua Tree National Monument, uses them on metal handles as well because the shade they provide from that burning sun out there in Twentynine Palms keeps the handles a little cooler.



If you want the protectors to be longer, just cut both ends out of a second can and tape it to the first.

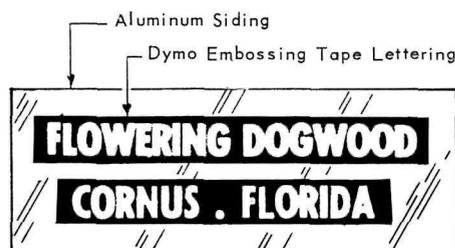
## CIVIL DEFENSE INSTRUCTIONS

Clifford Chadderston of the Safety Division, National Capital Parks, National Park Service used the back off old Interior Department directories containing civil defense instructions on bulletin boards. The name of the appropriate shelter for each area was taped in. In the sample which he provided, the inserted words are: "Our shelter—Jefferson Memorial," black letters on white background taped in with red plastic tape.



## ATTENTION-GETTING TREE LABELS

Tree labels are getting more attention in Miami Conservancy District in Ohio. Superintendent of Parks I. J. Peddemore accomplished that by using light-catching aluminum instead of wood for the labels.



The aluminum siding is cut to 2 1/2" x 7", and the desired information on label-maker strips affixed to it. Visitors have been making nice comments about the change.

## ELECTRONIC ROAD EDGE

## LOCATION METHOD

A new method for locating the road edge for snow removal has been introduced and accepted in Lassen National Park as reported by Fred Novak, acting assistant regional director for park management, Western Regional Office.

Instead of using the old customary metal pole rodding method, a Delcon Model 4900A Buried Cable Fault Locator, costing \$650 and built by the Delcon Division/Hewlett-Packard Company, 333 Logue Avenue, Mountain View, California, 94040, is now used on approximately 10 miles of the Mineral-Manzanita Highway.

## Description

The fault locator is a tone transmitter and receiver system for locating earth return faults (grounds) and low resistance conductor faults in buried and aerial communications and power cable. In addition, it can be used to precisely trace the path and determine depth of buried cable and pipe.

The transmitter produces a 990 Hz (cycles-per-second) tone which is interrupted at a 7 Hz rate. Output power is adjustable in seven steps to match the loading of the cable under test. The transmitter is powered by an Eveready #731 (or equivalent) lantern battery which has a life in excess of 50 hours of continuous operation.

The sensitive, tuned receiver is designed to pick up only the 990 Hz tone from the transmitter. This has the effect of eliminating most of the interference present in the vicinity of the cable under test, including power line components. The receiver contains a built-in speaker and logging meter for monitoring the received tone strength. A jack is also provided for connecting a standard 600-ohm headset when operating in extremely noisy areas. Weighing only 3 lbs., the receiver is designed to be carried around the neck and is extremely portable for working on poles, ladders, in manholes, etc.

A volume control permits setting up reference levels for accurate trouble tracing. The receiver is powered by three Eveready E-12 (or equivalent) mercury batteries, which have a life in excess of 100 hours of continuous operation.

The search wand furnished is used to locate path, depth, and faults in buried cable. The wand contains a ferrite core coil, tuned to 990 Hz, to pick up the field from the buried cable carrying the pulsed 990 Hz signal. It is connected to the receiver unit through a 6-foot coil cord and is constructed of lightweight aluminum.

## Operation

With a little experience, the user soon becomes adept at pinpointing the fault or pipe within a few inches. At the same time, the cable path can be easily and accurately mapped and the depth at any point determined. By scanning the cable path with the search wand and watching the level meter, the user can locate the cable by merely pointing at it. Similarly, by holding the search wand at a 45 degree angle, he can precisely measure cable depth.

Faults in aerial cable are quickly located by exploring both sides of splices, T-zones, and other likely trouble spots with an exploring coil.

By burying a single (stranded), insulated conductor a minimum of 8" deep (deeper where soil permits) along the road edge and connecting the transmitter portion of the fault locator to the wire and ground,

the receiver and probe can accurately locate the wire through better than 60 feet of snow. The signal in the wire, with the far end grounded, will operate satisfactorily in excess of 10 miles. A lateral wire tapped to the main line at 2 or 3 mile intervals and extended up a convenient tree (or pole) is recommended in order to attach the transmitter at more than one point, if desired. A ground wire should also be installed up the tree, both wires sufficiently high to allow (access to wire) for maximum expected snow fall.

Any flexible, non-shielded, insulated wire can be used for the installation (ground wire should be bare), but a tough insulation on the wire is recommended, equal to PWC (Plastic Wire Cable Corp.), type THHN or THWN, 600 volt, #14, 19 strand copper wire. This wire can be secured readily at a cost of approximately \$25.00 per 1,000 feet, or 500 for 2,500 feet reels, from Black & Egbert Associates, 2025 McKinnon Avenue, San Francisco, California, 94124, or most large wire distributors.

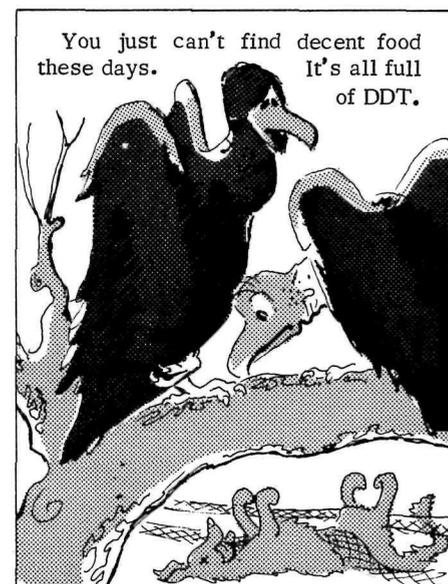
All areas now using snow stakes or other manual methods for snow removal should explore the possible use of this electronic system. Lassen considers the electronic system superior to any known method and recommends its use 100 percent.

It is also considered the best cable fault locator on the market today and any area having need for such equipment should secure one, even if they have no snow removal problems.

This equipment could also be modified for use on snowplows or other moving equipment if desired.

For further information on its features or installation methods, please contact the Western Regional Office or the Superintendent of Lassen Volcanic National Park.

## THE SURVIVAL KIT



Jim Burnett