AN IMPROVED CARRYING CASE FOR SNOW TUBES[1]

by

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INTRODUCTION

Any one who carries snow tubes for long distances can appreciate the need to do so comfortably.

Since the early 1900s' man has travelled the backcountry in search of snow to measure. Church (1912) is credited with being the pioneer of the snow survey. He moved about on skis and snowshoes often spending weeks in the backcountry making snow measurements. Although he describes his snow sampler in detail, he failed to mention how it was transported in the field. However, he did say that two men where needed to carry it over mountain slopes which on occasion was managed by one. This is no doubt attributable to the material used in the construction of the snow tube and its overall length.

With time, the snow tube underwent several modifications in an attempt to obtain a better snow sample. The need for a strong, light tube led George D. Clyde to use aluminum in 1923. This is still the main material for construction of the snow tubes.

During the development of the snow tubes, a case for carrying the tubes was designed. Conversations with several of the "old timers" failed to turn up a date when a case first came into existence. In 1935, the U.S. Department of Agriculture used the best features of several samplers in designing a snow sampler for their snow survey program (Criddle 1950). The design included making the snow sampler in joinable 76.2 cm (30 inch) sections. It is conceivable that this is when the snow tube carrying case came into existence. Basically, the case consisted of four, six or eight slots with pockets for the scale, driving wrench and couplers (figure 1). The case "rolled up" and was cinched in a round bundle with an external strap. The rolled bundle was carried like a golf bag which in time was equipped with backpack style carrying straps. This design is still in use today.

Material for the construction of the original snow tube case was canvas. This was mainly due to the durability and availability of canvas (P. Farnes, pers. comm.). Over time, other materials from light canvas to nylon/plastic were used but these did not find widespread use. Recently, to provide a carrying case at a reasonable cost yet functionally strong, several states are having the carrying case built with cordura pack cloth (G. Clagett, pers. comm.). Others have improved upon the original design. In Arizona, R. Jones (pers. comm.) made several modifications which included reinforcing major wear points with material used in making armoured vests. Internal pockets for carrying the scale and driving wrenches were sealed with velcro. He also added a "belly band" or hip belt to the case to make it hug the body during field transport.

Attempts to develop a new and improved carrying case were sporadic and done by individuals in search of a better case. In British Columbia, during the late 30s', an effort was made to have a case similar to a rigid golf bag used. Several of these were built but did not seem to gain wide acceptance.

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At one point a special case was designed to fit onto a backpack frame (R. Kaiser, pers. comm.) but for the most part it was similar to the existing carrying case lashed to a packboard frame (B. Whaley, pers. comm.). British Columbia also saw the debut of a modified leather suitcase complete with carrying straps to fully protect the snow tubes during transportation and still be available for field use. Only one of these exist yet it seems to be a design which is recently talked about by R. Jones for shipment of snow tubes on commercial carriers.

For the most part the snow tube carrying bag seems to have changed little in design since it inception sometime in the mid-30s'. Some things just never die.

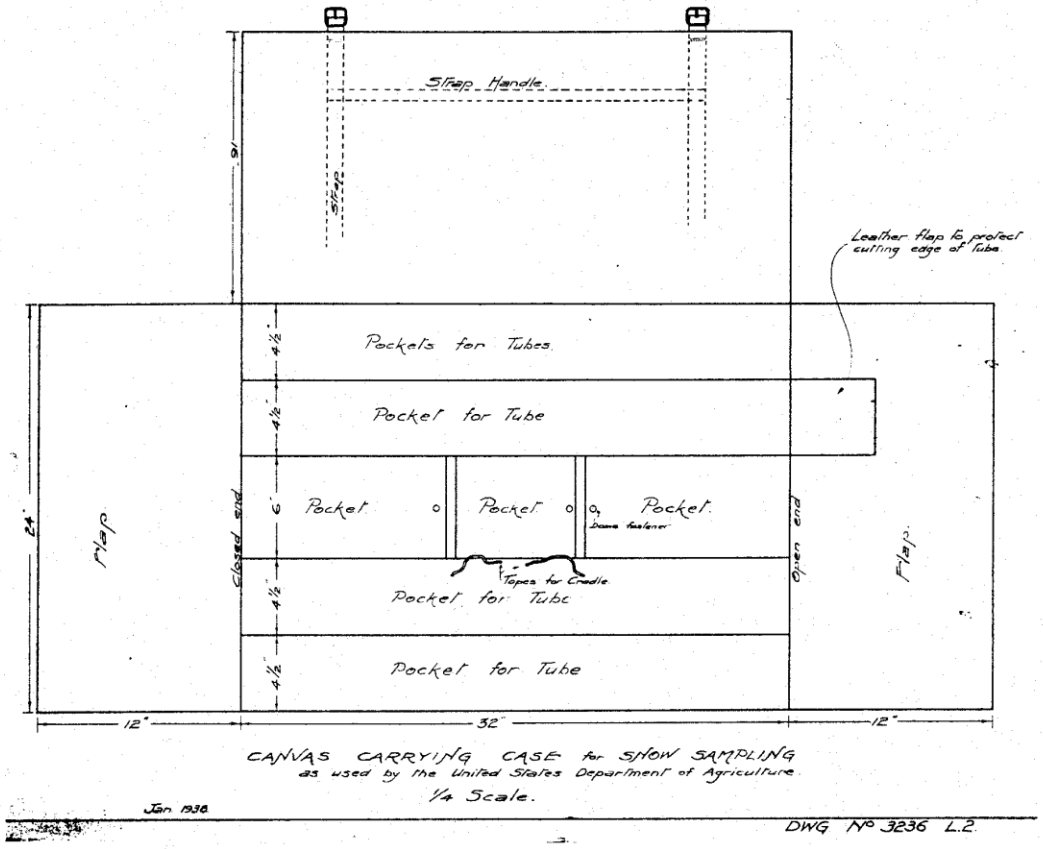

Figure 1. Drawing of an early snow tube carrying case (from the archives of the Ministry of Environment, Water Management Division, Snow and Hydrometric Operations).

DESIGN IMPROVEMENTS

To improve upon the existing design we asked ourselves -- what is needed in a good snow tube pack? We came up with several design criteria:

- protection of snow tubes during field transportation
- carrying comfort for person transporting the tubes
- easy access to the tubes and accessories
- durability of the tube carrying pack
- reasonable cost
- ability to carry survival gear along with snow tube kit
- ability to carry out rigorous activity like skiing while carrying the tubes.

The snow tube case of the 30s' fails to meet a number of these criteria as a good carrying case for field use. It has been pointed out in this modern age of helicopters and snow machines that snow surveying from skis and snowshoes is no longer needed and hence the ability to carry snow tubes long distances is not required. We disagree. There still exists special courses which require foot transport and as long as these courses exist, a means of carrying snow sampling tubes exist. This need led us to redesign a carrying case.

THE DESIGN

The design we came up with meets most of the criteria for a snow tube pack. Figure 2 is a photograph of the prototype snow tube pack dubbed the "Kootenay Snow Cruiser". Cruiser because it is designed to cruise on the back of an existing frameless backpack equipped with compression straps. This in turn takes advantage of the comfort level of an existing pack where such items as adjustable shoulder straps, waist strap and sternum strap exist.

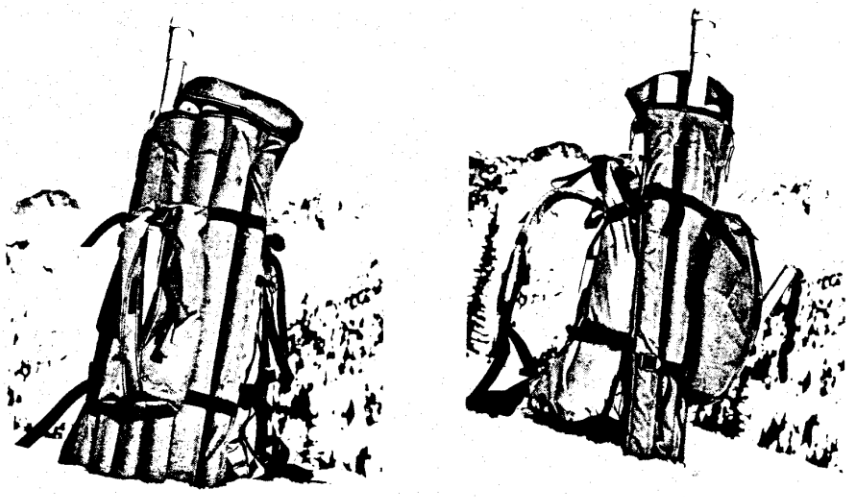

Figure 2. Two views of the snow tube carrying case dubbed the "Kootenay Snow Cruiser". The case is attached to a softback pack equipped with compression straps.

Two prototypes of the Kootenay Cruiser were made each with different fabrics. The case shown in Figure 2 is made from 1000 denier cordura nylon padded with 1/8" urethane foam and liner. Zippers are #10 YKK continuous coil polypropylene with nickel plated sliders which act as closing devices on the main tube slots as well as an external pocket for scale and driving wrench. The webbing is 100% nylon. All plastic fasteners are from Duraflex or Fastex and made of acetal. Stitching is a minimum of seven stitches per inch with interlock stitching. Thread used is 100% nylon CBB 6 9 mainseams and CSB 4 6 for bartacks. The other prototype is made with vintex -- a very waterproof, strong material which is used to line packs for carrying rock samples.

FIELD TESTING AND IMPROVEMENTS

Most individuals using the Kootenay Cruiser found it to be a major improvement over the old design for transporting snow tubes. Comfort and tube security while skiing was rated number one. This is a reflection of the pack upon which the Cruiser is attached. Having the ability to carry extra clothing and survival gear along with the tubes was appreciated by surveyors working alone.

For the most part the carrying cases were not tested under adverse field conditions because this year we did not have any. The coldest temperature during use was -8^{0}C. Concern was expressed about zipper functioning at much colder temperatures. The Vintex material did not offer as much protection as the padded cordura. The rigidity and feel of the Vintex material did not lend itself to favoured use.

With the cordura pack, the most obvious improvements are reinforcing certain wear points particularly the bottom and top of the pack where the tubes rub the material. Also a leather patch is necessary where the cutting teeth meet the fabric. The addition of a second external pocket is planned to provide further storage for couplers.

Further improvement suggestions are welcome.

LITERATURE CITED

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Criddle, W. D. 1950. History of snow survey equipment and use. The Snow Surveyors' Forum 4:9-11.

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