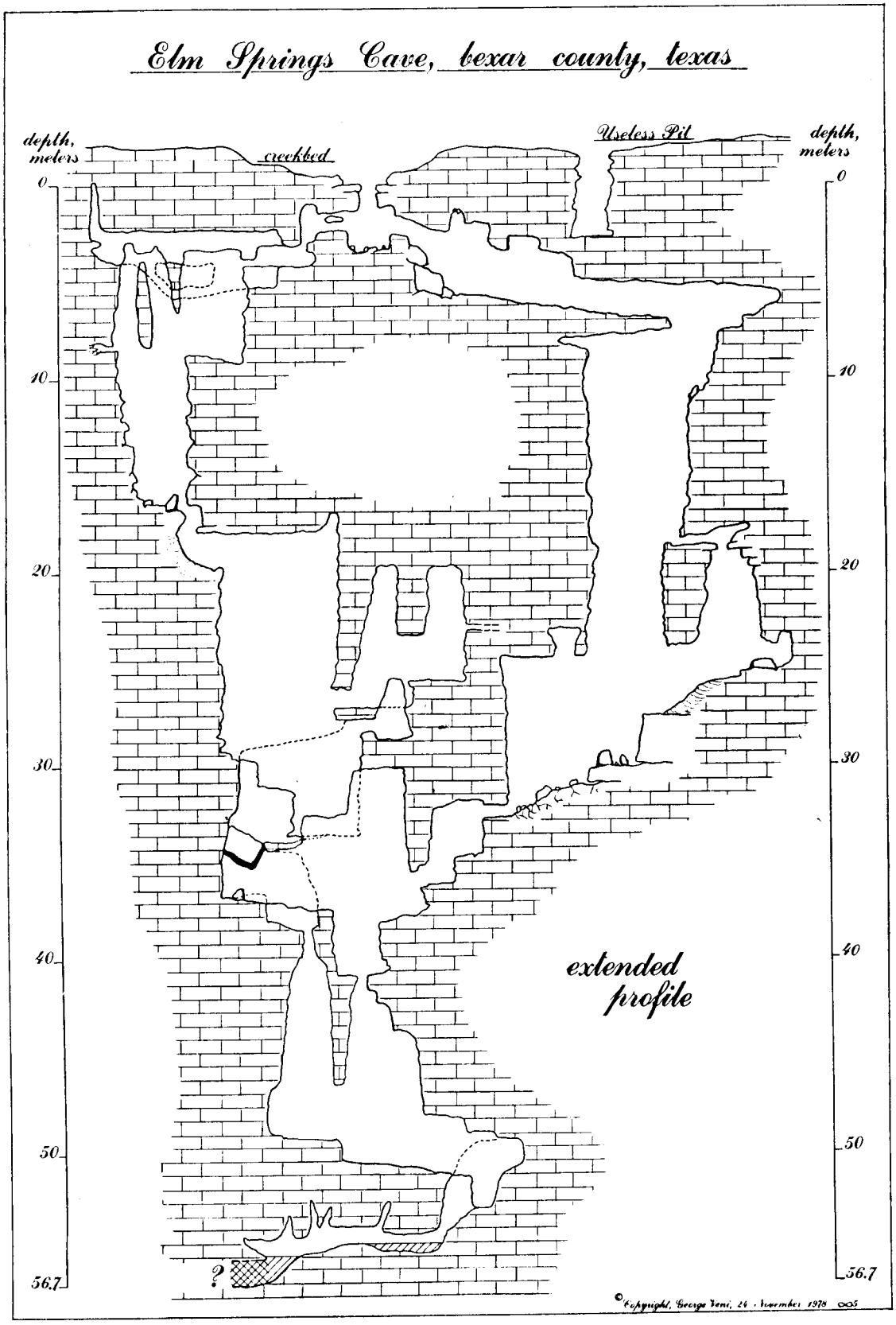
Compass & Tape



Volume 3 Number 2 Fall 1985

COMPASS & TAPE

Volume 3 Number 2 FALL 1985

COMPASS & TAPE is the quarterly newsletter of the Survey & Cartography Section of the National Speleological Society, Cave Ave., Hunstville, Alabama, 35810, U.S.A. Dues are $4.00 per year and include 4 issues. When paying dues, please make checks payable to Survey & Cartography Section, and include your NSS number, if applicable. Subscriptions for Clubs or anyone interested in cave mapping are the same price. Foreign members and subscribers are welcome! Rates are US$4.00 per year for surface mail: inquire for air rates. We regret that payment must be in US$, and checks drawn on U.S. banks. The volume runs from the annual NSS Convention: those paying later will in most cases receive for that year. Expiration dates are printed on mailing labels. Volumes 1 and 2 are available for $4.00 each.

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Cover: Profile view of Elm Springs Cave, Bexar County, Texas.
By George Veni.

CONTENTS

Survey Team Protocol - The Hidden Efficiency

by Paul A. Hill
Salt Lake City, Utah

Have you ever gone surveying with a friend from another caving area and found that the survey moves along a lot slower than you were used to? Have you ever thought that a new cave surveyor from out of the area seemed confused by what you consider normal survey methods? Both of these situations are often the result of the mostly unspoken, but often highly-refined, protocol that cave surveyors use to coordinate their actions.

Those who think that they don't have any protocol may wish to consider the following:

1.) How do you know when the person on the other end of the tape is ready for you ? 2.) How do you know that the book person got the reading written down, and got it written down right? 3.) How do you know that the shot is complete and that you can begin to move on to the next?

Most will agree that there is something that indicates to each of us when it's time for each step of a survey. Some of us solve this problem by putting ourselves in complete control of every movement of the survey party, but if you've ever had the experience of being on a quick-yet-accurate, relaxed-yet-organized survey team, you will know how enjoyable it can be.

A little analysis may help us to realize where different groups differ in their solution to the problem, and where a particular solution is either error-prone or wasteful of time.

Synchronize, Read, Transmit & Acknowledge

If cave surveyors were replaced by machines, they would need to perform the following steps in order to take one reading.

Step 1: Synchronize - Establish that the other surveyor is ready to perform the requested step.

Step 2: Transmit - Take the reading and transmit it to the recorder of the information.

Step 3: Acknowledge - Receive a reply and acknowledge either positively or negatively to verify that the recorder received it correctly.

While we are not machines, it is a good idea to keep these steps in mind when passing information back and forth.

Towards a Refined Protocol

One of the easiest steps to take to ensure that everyone is ready for each step at the same time is to pre-order the steps. Often the order is chosen by the person keeping the book. It is easier to keep things straight and avoid writing the wrong number in the wrong column if the readings are coming in a predictable order.

Even if the order of the readings of survey shots is predictable, it is still necessary to check that the person on the other end of the shot is ready for the reading, and not still climbing into position. To help keep synchronized the easiest thing to do is have a unique word for each type of measurement. The person at the end of the tape is waiting for only two messages; hold the tape tight to the station, or hold the light on the station so the instrument reader can sight. On the other hand, the book person is typically awaiting seven different readings while trying to sketch the cave. In this case, unique words are necessary to keep things straight.

An Organized Team

The following dialog illustrates just one possible communications sequence, but one that is fairly lean and flexible enough to keep messages straight without excess babble.

The first thing to do is start the whole sequence and check that the point person (the one who holds the end of the tape and illuminates the survey station) is ready to take the first reading.

Instrument:
"Chain!"
Point:
"Chain."

The tape is pulled, the distance is measured and passed to the book person.

Instrument:
"Chain, Twelve-point-five."
Book:
"One-two-dot-five."
Instrument:
"Check." (nearly anything works well here.)

(Note: The word "Chain" comes from the land surveying profession, but other words, like "distance" or "tape" serve as well. The actual words make little difference, as long as everyone in the survey party agrees on them.)

The book person should always reply, by reading the value recorded, in a different 'mode' than that which the value was sent in. This helps to eliminate mental errors on the part of both the instrument person and bookkeeper, and to eliminate copying errors in the book.

The point person should also listen in on this dialog to give an added check. This assumes that the point person is not out of earshot, and will not be slowing things down by making sure he heard everything correctly.

If the echo of the reading was bad, the reply, from the person who thought he heard it wrong, might be something like:

Instrument:
"No. Chain, Twelve point five."
Book:
"Chain, One-two-dot-five."

If the reading is correct, it is time for the next one. Again making sure that everyone is ready, and the light being sighted on is really on the target.

Instrument:
"Light on station? "
Point:
"Light on station!"

As before, the reading is taken and relayed to the bookkeeper:

Instrument:
"Azimuth. One-hundred-and-ten-point-five."
Book:
"Azimuth. One-one-zero-dot-five."
Instrument:
"Check."
Instrument:
"Inclination. Minus-seven-point-zero."
Book:
"Ink. Minus seven-dot-zero."
Instrument:
"Check."

It is often the case that cross section measurements (left wall, right wall, ceiling and floor distances from the station) are taken by the point person and relayed to the bookkeeper. The only problem with this is that the full sequence of synchronize, transmit and acknowledge seems to cause more delay than appears to be necessary for these less-important measures.

A compromise to full communication sequencing is represented by the following example. This sequence eliminates (positive) acknowledgement and resynchronizing. This works well, if the order is agreed upon. Note also that the convention of ending all numbers with either a fractional part or "Point-zero" is followed even for these inherently inaccurate numbers. This is done for consistency's sake. It's easier to always do things the same than to have different methods for different measurements.

Book:
"Cross section?"
Point:
"Left. Five-point-zero."
Book:
"Five-dot-zero."
Point:
"Right. Four-point-five."
Book:
"Right. Four-dot-five."
Point:
"Ceiling. Fifteen-point-zero."
Book:

"Ceiling. One-five-dot-zero."

Point:

"Floor. Three-point-five."

Book:

"Floor. Three-dot-five."

Point:

"Check."

In a quieter passage, particularly when the survey party is small, the cross section values can be spoken in quick succession and acknowledged similarly.

When the point person gets out of easy communication distance with the bookkeeper, or the values get into the several-digits range, the full synchronize, transmit and acknowledge sequence should be used. If any shortening of the sequence is done, it should be by mutual agreement and not due to laziness on someone's part.

Other Chitchat

You might think that the above sequence leaves no time or place for the ever popular activity of idle talk. But more often than not, when the real information is easy to sort from the caver conversation, less time is spent on surveying, leaving more instead of less time for fun.

One way to interject a comment into a survey party is to make sure you don't start a sentence with one of the key words being used to communicate the survey values. Another simple trick is to address someone not when it's their turn to exchange data, but after they have finished; don't break the protocol, talk around it. It's also easier on everyone, particularly in an area where talking is difficult to hear, to address everyone by name. When someone is concentrating on taking a shot , it is easier to hear something addressed to someone else and ignore it, than to listen to everything going on and sort out what is not important.

Conclusions

The previous sample protocol illustrates the basic sequence of synchronizing , transmitting and acknowledging, a sequence common to surveyors whether man or machine. Further examination uncovers that communication starts with the instrument reader, includes the point person when a shot is being taken, is followed by an exchange with the bookkeeper and finally finishes with the same person who started the sequence.

While at first glance this technique appears to be overly structured, organized use of a good clean protocol can leave more time for enjoying the cave as well as surveying.

So the next time you survey with people outside your usual group of friends , consider the protocol in use, and explain what you're used to saying and hearing, and ask them to do the same. In all probability, you'll enjoy the trip more.

Random Ramblings About This Year's Map Salon

by Carol Vesely
Goleta, California

The Cartographic Salon at this year's NSS Convention in Frankfort, Kentucky , was one of the best yet, with more maps of better quality being entered than any other since perhaps the International Salon in 1981. Yet, despite the high quality and large number of ribbons awarded there were a number of complaints. I would like to address some of the issues raised at the Salon in an effort to generate some discussion which may lead to improvements in future years.

Judge Burnout

With apparent interest in the Salon increasing and more maps being entered each year the judging is naturally becoming more difficult and timeconsuming. Into their already busy schedules the three judges had to cram 4-1/2 hours for evaluating maps. By the end of this marathon session they had missed the allotted time for dinner, and the evening programs were about to begin.

Is there any way to alleviate the problem of "judge burnout" and still allow ample time for judging? One solution would be to adopt the photo and graphics arts salon's policies of requiring that all entries be submitted several weeks in advance of the Convention. The problem with this idea is that some maps are even larger and harder to ship than 16 x 20-inch prints and this requirement might cut down on the number of entries.

A second alternative, which Doug Medville, one of this year's judges mentioned was to have the judging take place in two shorter sessions rather than one long one. At the first session judges would make a rough decision, dividing the maps into two categories: those that probably deserve an award, and those that don't. At the second session a more careful analysis would be made to determine which maps would receive awards. While this sounds like a good idea there is always the possibility that at a map which was eliminated on the first round may not have received the close consideration that it deserved. Another potential problem is that the two short sessions may grow into two long sessions as more maps are entered , resulting in even greater judge burnout. Nevertheless, the "two-session" idea is worth considering.

Map Salon Workshop

To my knowledge this is the first year there has been a workshop after the Salon judging in which cartographers could receive feedback about their maps. This is an excellent idea, and I hope that such workshops will become a staple at future Conventions. However, I do have a few suggestions on possible ways to improve these workshops.

The natural questions on every cartographer's mind at the workshop are: Why didn't my map win?, and, How can I improve my maps so that I can win next year? In other words, people are looking for specific feedback to help them improve. There were two possible sources of feedback at this year's workshop: the judges, and the forms the judges filled out with comments on each map. But many cartographers found both these sources lacking. First, only one of the three judges, Doug Medville, was able to attend the workshop. This left poor Doug alone to fend off the inevitable onslaught of questions

and criticisms from those who didn't win the awards they thought they deserved. While Doug did an admirable job trying to defend his selections, he certainly couldn't be expected to speak for the other judges, leaving the cartographers wondering what the other judge's opinions were. Thus, people turned to the second source of information: the individual comment forms on each map. I don't know about the other people's forms, but I found that the three for my maps contained many compliments and few (or sometimes no) criticisms. While I certainly appreciate the ego-restoring positive comments, when there are no negative ones it's impossible to know where you went wrong or how you could improve in the future. I suspect that the judges had more comments than they took the time to write down. Otherwise, how can I explain why my map didn't win? Perhaps if the judging process were made a bit less hectic, the judges would have more time to write down their comments, perhaps including a '*' by those they all agree are most important in their decision.

Number of Awards

At this year's Convention there were a total of 38 maps entered and 20 ribbons awarded: 10 blue and 10 green. In other words, over half of all the maps won a ribbon: a rather high percentage compared to, say, the Photo Salon. By talking with the judges I learned that only about 5 of the 10 blue ribbon winners were contenders for the overall winner. This implies that these five were somehow better than the other blue ribbon winners, yet no one would know this by the awards. My point is that with so many ribbons being given and only two different types of ribbons available, the only award that seems to carry much weight is the medal. Perhaps, as Ernst Kastning (the Salon Chair) suggested, the maps have just been getting better each year, such that if the same standards that were used in the past are applied to today's maps many more deserve ribbons. This is probably true and it is also likely that the quality of maps will continue to improve in the future. Does this mean that 5 years from now 90% of the maps entered should be awarded ribbons?

To avoid the "cheapening" of ribbons by having so many there are several possibilities. 1) We could leave the judging standards the same as they have been in the past (if this is possible) and simply give every map that meets a certain minimum acceptable level an honorable mention. Then have one or more higher awards to be given to only the best maps. 2) Set a percentage limit on the number of ribbons of each type that can be awarded in each Salon. For example, perhaps no more than 1/2 or 1/4 of the total number of maps should receive ribbons in a given year. Of course, this means that a map which did not receive a ribbon one year because of stiff competition might win in a less competitive year, but then there's really no way to avoid judging a map by comparing it to others. 3) Instead of just two types of an award, and a medal, more categories or gradations could be added to the awards. For example, each year there could be a medal, two second place winners (and maybe even three third place winners) followed by numerous blue and green ribbon winners. I actually like this idea because it would distinguish between those maps that "almost won" and the other maps that definitely deserve an award, but were not serious contenders for the medal. Again, there should be only a couple of second and third place winners to avoid trivializing these awards. 4) The judging system could be made somewhat more objective by going to a point system similar to what is used in the Photo Salon. For example, under this system each judge would rate the map on a scale of 1 to 10 in each of several categories, such as: layout, drafting skill, completeness, etc., according to specific guidelines.Then the points would be totalled for each map. All maps with point totals above various cutoff points would receive awards accordingly.

Judging Maps, Not Caves

Finally, I have one last stone (boulder?) to throw before I leave you readers in peace. At the Salon Workshop, I asked Doug Medville what was wrong with my map of the sea caves of Shell Beach. Under the pressure of my questioning he couldn't immediately come up with any flaws in my map, so he replied, "Well, it's just a bunch of sea caves, you can't really expect them to win." Taken in isolation, Doug's comment could simply be excused as an attempt at humor by a person who's obviously never seen a sea cave. However, at the Survey & Cartography Session, I presented a talk in which I compared two cave maps of mine: one of which won a medal in a previous year, and a similar one which didn't win anything. When I asked for comments about the possible reasons for the judge's selections, Doug responded that the medal-winning map simply depicted a cave which was obviously more interesting and had a nicer shape to it! Correct me if I'm wrong, but I thought the purpose of the Salon was to judge MAPS, not caves! EXCUSE ME, if all we have out here to map are sea caves! EXCUSE ME, if my cave doesn't have the proper shape! Maybe I should put it on a diet. Maybe I should only map "attractive, well-shaped" caves and quit wasting my time on those plain ones. Alternatively, I could always invent a well-shaped cave or maybe rearrange or embellish a few of the passages in the ones I am actually mapping.

I noticed that John Ganter's medal-winning map, Corinth Church Cave, showed a nice sinuous meandering stream cave: very well-shaped, indeed. If it wasn't obvious from John's other work that he is a good cartographer, I might wonder if it was John's drafting skill or his choice of caves which won him the medal. While it is clear that a nice-looking cave can not make up for poor drafting skill, it does seem to affect which map wins. The type of cave chosen to be mapped also presents a a problem, as in the case of the maps of the underwater caves entered in this year's Salon. Can these really be compared with the maps of dry caves? Perhaps separate categories for other types of caves need to be included, but it doubtful that there would ever be enough entries in any of these categories to make for a meaningful competition (although there were 5 sea cave maps entered this year.)

Perhaps I'm being too critical. Obviously, one can neither alter the shape of the cave passage, nor totally ignore the inherent interest of the cave when judging maps. I'm sure the Photo Salon judges must face similar problems when it comes to judging beautiful formation shots, even though they try to be objective in weighing the "technical merit" of the photos as the most important criteria. Perhaps the only thing that the Cart Salon can do is to remind the judges that they are judging the cartographer's skill at producing a map, and not his selection of a cave. I think the judges should ask themselves: given this particular cave, is this the best way it could have been portrayed? ...Is this the best possible layout?, etc.

Anyway, enough of my ramblings. I would welcome any comments, criticisms, suggestions, etc. on any aspect of the Cart Salon. PLease send them to me at: 408 Ellwood Beach Dr. #3, Goleta, CA 93117.

BASIC 35 MM SLIDE PREPARATION AND PRESENTATION OF CAVE MAPS

By Bob Richards

This past NSS convention I saw many fine cave maps in the Cartographic salon. However, during the Exploration, Geology, and other sessions I saw maps, or what appeared to be maps, in slide format that were uncacceptable to be shown at the convention or any other meeting. Cave maps seen in publications and NSS salons can seldom be photographed properly for slide presentation; its really a different medium.

The average convention paper is 20 minutes long; it is not an academic lecture where students are given details of a subject for 10 weeks. Rather, a convention paper offers an up-to-date capsule of a specific ongoing or completed project; the purpose is to bring fellow cavers up to date on activities in their field.

When presenting a convention paper, a few notes or an outlines are usually all that are required to maintain organization. Slides, of course, can serve the same purpose, but poor slides should not be used just because they serve as an outline for your talk. If you want your audience to really grasp the content and assimilate it as information, you must not distract or annoy them by making the slide difficult to read. You will only lose their attention and interest, and therefore their reception and memory of the information. If you need a pointer to show a location or subject on a slide, it may be too crowded or difficult to see. If you can't read the print on a slide clearly when holding it in your hand, it is probably inadequate for viewing with a slide projector in any size room.

The general opinion is that slides will always be accompanied by an oral explanation. This gives the presenter an incentive to maintain simplicity. Slides can be an invaluable aid to the speaker, but they cannot be expected to speak for him or her. If a slide is not clear and simple it should not be shown. A confusing slide could bring more harm than benefit, while on the other hand one forceful picture could be worth thousands of words.

Never, but never show a slide and then apologize for it. Don't show bad slides! They never help; they always hurt. And don't stay on one slide too long; put blanks between slides if you have a lot to say before the next slide. Get your timing down. No one minds your going a minute or two overtime, but five or more minutes are inexcusable.

Slide art preparation cannot be a standardized form of design because of varied ideas and uses. The preparation can be enjoyable and rewarding if you follow a few basic rules: (1) use one central idea on each slide; (2) limit the number of words on each slide; and (3) keep lines and curves to a minimum--work towards simplification. Awareness of simplicity, lettering size, color and weight of line contrast must be used at all times. These cardinal points apply equally to maps, charts, and all types of graphs and photographs.

When preparing the slide art, keep in mind that a slide should be used to emphasize a point or idea; it should not be relied upon to make the presentation. It may be preferable to express ideas on two or more slides

rather than cluttering a single slide with too many ideas and needless detail. The use of color will make the slide more attractive, easier to read, and reduce the amount of glare on the screen.

The art work for a 35 mm slide is prepared within an AREA which has a 2:3 ratio. The 2:3 ratio is derived from the area of the slide that is projected on a screen. The art work for the slide can be designed using the 2 portion as the height or the width. The 3 portion is, therefore, the remaining dimension as shown in Figure 1 and Figure 2.

Figure 1- Projection Area

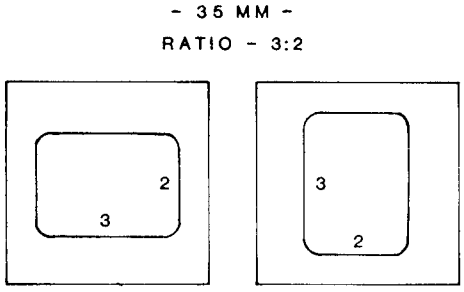


Figure 2- Original Art Work

RATIO = 3:2

2 PORTION CAN BE HEIGHT OR WIDTH

3 PORTION IS OTHER DIMESION

EXAMPLE 2 PORTION = 6"
3 PORTION = 9"

Too little importance has been attached to the selection of typography for maps. This weakness is accentuated when the slide is enlarged upon the screen, therefore very serious thought and experimentation should be applied before the final drafting of maps for reproduction. Fancy or ornamental lettering is not recommended; in fact, simple, graceful, widely spaced letters and numerals are preferred.

Use simple Gothic lettering such as produced by the Leroy lettering guide and on Kroy machines. USE ALL CAPITAL LETTERS. Use wide spacing between lines, words, and letters. (If normal spacing is used, the letters and words will appear to run together). The MINIMUM SIZE lettering to use is figured from the 3 portion of the 2:3 ratio. Figure 3 shows the minimum size lettering to use for legibility.

Figure 3- Minimum Size Letters

3 PORTION INCHES	MIN. HEIGHT INCHES	MIN. LEROY TEMP.	MIN. POINT SIZE
8	.126	140	14
10	.157	175	18
12	.188	200	20
15	.235	240	24
20	.314	350	32
24	.377	425	40

Lettering height must be at least 2% of the maximum dimension of the artwork.

LEROY LETTERING		MACHINE LETTERING		
TEMPLATE NO.	EXAMPLE	POINT SIZE	APPROX HEIGHT OF LETTERS IN INCHES	EXAMPLE
120	ABC	12 Pt.	0.120	ABC
140	DEF	14 Pt.	0.140	DEF
175	GHI	18 Pt.	0.175	GHI
200	JKL	24 Pt.	0.200	JKL
240	MN		0.240	
290	OP	30Pt.	0.290	OP
350	QR	36Pt.	0.350	QR
425	ST	42Pt.	0.425	ST
500	U	48Pt.	0.500	U

Line weight chart (Figure 4) showing commonly used lines for slide originals.

Figure 4- Line Weights

PEN NUMBER	PEN LINE SAMPLE	MEASURED INCHES
00		.013
1		.021
2		.026
3		.035
4		.043
5		.055

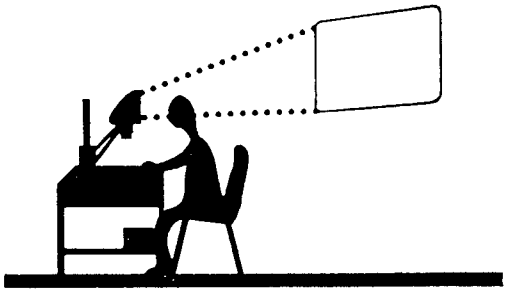
SUGGESTED USE	
LIGHTEST Line Weight:	Cave Floor Detail- Breakdown Blocks, Drops, Pools, Slope, etc..
MEDIUM Line Weight:	Lettering- Sub title, Room Names, Passage Walls, Scale.
HEAVY Line Weight:	Lettering- Title (Cave Name), Border

It is recommended that all ink lettering and ink line work be done on matt film (mylar, or vellum) or tracing paper. If there is a correction to make, it can be done easily on the film. After the ink work is complete, run a PMT (Photo Mechanical Transfer) print for your black and white copy. This will give your map a professional finish. PMT's are blind to light blue and they produce clean black and white prints from "paste-up" art, i.e. you can work on a blue grid paper with the freedom to cut and paste, use white and clear tape, machine lettering tapes, etc. This permits fast art production and easy changes.

PMT's can be shot on various types of paper. For slide copy it is best to shoot as a clear overlay, with colors layed on mylar under the clear overlay. Several types of color media may be used; self-adhesive film, airbrushing, marking pens, and colored pencils are among some possible media. I have found that self-Adhesive colored tint films such as Zipatone and Panetone work best. They produce even, bright, colored areas quickly and easily from a large selection of colors. They apply well to mylar and the light colors are transluscent enough to permit black lettering and line work to show through well.

Before photographing, double check the slide art work by backing away six times the 3 portion dimension. (Example: 3 portion= 9" x 6"=54" back). If the slide art is easy to read at a glance and the color is appealing to the eye, the 35 mm slide should project well.

The figures and examples in this text are to help design basic slide art work. For more information, refer to the American Association of Petroleum Geologists (AAPG) Slide Manual. Always remember, the context a map is shown in is vital to consider--a blue ribbon Salon map may be poor when projected and may need some modification to successfully achieve this change of medium.



When is a Cave a Cave ?

by Phil Lucas
Altavista, Virginia

Have you been "ridge walking" and discovered a hole or perhaps a rockshelter/overhang that was smallish, and did not know whether to call it a cave? Exactly what is a cave anyway ? What is the definition of a cave ? What should the dimensions of a hole in the ground be to "really" be a cave ?

And how about rock shelters and rock overhangs ? Are they caves ? They come in all sizes and shapes. They're found all over the place ... anywhere rock is exposed. Should we count all rock shelters as caves (there's a blue zillion of them) ?

Wait - before you make up your mind - let me tell you this: The Virginia Speleological Survey has recently received reports of over 200 caves including rock shelters and overhangs where archeological evidence has been either discovered or suspected. These "new" caves will greatly add to the grand total of Virginia caves, but more importantly, we will be able to better document their significance. This documentation might make more protection and conservation possible in the future. How do we justify calling some of these smaller features "caves" ?

In the introduction to his book DESCRIPTIONS OF VIRGINIA CAVES, Dr. John R. Holsinger states on page 4, " As a rule, small solution cavities, fissures and other small openings in bedrock less than 20 to 25 feet long and deep were not counted as caves. Exceptions were made for 'shelter caves' with conspicuous entrances or cavities with speleothems or 'cave-like interiors' that were otherwise shorter than the cutoff point of 20 to 25 feet." This rule (definition) has allowed the necessary flexibility for us to call a "cave" a cave and has not been changed by the VSS for the last 20 years. But perhaps it is time for a better definition. Care to try your hand at it?

(from VAR/FYI (Virginia Region news flyer), Vol 97-98, July/Sept 1985.)

(For more on cave definitions, see: "On the Definition of A Cave", by Rane Curl, NSS BULLETIN, Vol 26:1, Jan 1964, p. 1., and "Mapping and Measuring Caves: A Conceptual Analysis", by Claude Chabert and R.A. Watson, NSS BULLETIN, Vol 43:1, Jun 1981, p.3. For thoughts on mapping small caves, see: "Mapping the Tiny Cave", by George Veni, COMPASS & TAPE, Vol 2:3, Winter 1985, P. 54. <<Ed.)

Note To Readers

Bound Copies of Volume 1 (1983-1984) and Volume 2 (1984-1985) are available for $4.00 each from the Treasurer.

The Pennsylvania Cave Database and the Microcomputer

by Keith D. Wheeland

The cave database and supporting programs, running since 1981 on an IBM 3081-D mainframe, has been successfully transferred to a microcomputer. (See "The Pennsylvania Cave Survey," C&T Vol 1:2, Fall 1983, p. 17-22. <<Ed.)

General Use

Upon activating the system, the user is presented with a screen on which to enter the name of a cave. The program searches the database for the cave and presents the asked-for name, the name of the cave which was actually found, and the county in which the cave is located. The user need not know the exact spelling for the cave in order to get a response. At the same time this data is being displayed the user is also presented with the main menu. The program asks the user to select an option from the menu. The menu items are as follows:

Display the data for the cave which was found
Search forward in the list
Search backward in the list
Allow the user to select another cave name
Print the data for the cave
Finish caving

The following is a brief description of these options:

DISPLAY DATA - The program decodes all the coded data and displays the first page of the standard two-page cave report. At the same time, it displays a menu which allows the user to display either page of data, print the data on paper, or return to the main menu. The program decodes 18 data items so that the user is presented with a meaningful description rather than a code. For example, the entrance size for a show cave is stored as W, but the description on the screen will read WALK-IN.

SEARCH FORWARD - The program finds the next cave in alphabetic sequence and displays the name of the cave and the county in which it is located. It also displays the main menu.

SEARCH BACKWARD - similar to above, but searching in reverse-alphabetical order.

LOOK FOR ANOTHER CAVE - the program presents a screen which asks for another cave name.

PRINT DATA - The program prints the cave data on the attached printer.

FINISH CAVING - The program cleans up loose ends and terminates.

Printing Data Sheets For Selected Caves

A program has been written which will allow the operator to specify selection criteria for a group of caves, the data sheets for which will then be produced. The sequence in which the data sheets are printed is also specified by the user. The user must insert some selection criteria and the needed sort information into a routine. The

program will then search the database and tell the user how many caves meet the criteria. The user is given the choice of continuing or quitting. Should the user elect to continue, the program then produces individual data sheets in the sequence specified earlier. Because the program must search the database and subsequently decode the data, this program is very slow. But it works!

Unfinished Business

Using the facilities of the software it is possible to print any requested report as long as full decoding is not required. For example, a list of show caves would print the entrance size as W, instead of WALK-IN. A simple approach to allow fully-decoded data to be printed is under study.

Technical Information

The cave data has been copied from the mainframe disks onto a floppy diskette in the IBM format. It has been converted onto a hard disk attached to an IBM PC. The database management software is Knowledgeman from Micro Data Base Systems of Lafayette, Indiana. The system is designed to present the user with decoded data. The code meanings are stored on a file ('table' to KMan), separate from the cave data. It is simple to add another code, or to change the meaning of a code without changing the computer program.

In order to randomly retrieve a data record, KMan employs an index file for each data file which needs random access. Because the cave and code files require random access, the system uses four files. They are listed here, along with their size (in bytes) on disk:

	Bytes	Records
Caves	229,592	905
Caves index	16,512	
Codes	61,960	1600
Codes index	26,752	

The program decodes 18 data elements by randomly accessing the codes file. The decoding is not done until the user asks that the data be displayed or printed. All decoding is done before the the first page of data is displayed, therefore switching between pages is fast.

The index to the cave file provides the user with two features. The name of the cave need not be an exact match. This means that a poor speller has a good chance of finding the correct cave. It also provides a necessary feature. There are at least five caves in this state with the name "Indian." The program will find the first one, and allow the user to step through the list until the correct one is found.

Here are some typical amounts of time required for tasks using the hard disk:

Find the cave which is first	1 second
Find the cave which is last in the file	3 seconds
Decode the data & display the first page	23 seconds
Search forward or backward	8 seconds

The Search, Display and Print functions are all implemented using the KMan

language. The Create, Change and Delete functions are implemented using the native routines in KMan.

As indicated earlier in this article, I will be adding facilities to the system. If you are interested in additional information, please contact me: Keith D. Wheeland, 2191 Mt. View Ave, State College, PA 16801. Home: 814-238-2057 Office: 814-863-2423.

(from the NITTANY GROTTO NEWS, Vol 32:4, August 1985, pp. 6 - 8.)

A Computer Program For Finding Pennsylvania Quadrangle Names By Using Coordinates

by Keith D. Wheeland

I have found it necessary on occasion to determine the code and quadrangle name when given the coordinates for a cave. This has been especially true when working on the Pennsylvania Cave Database. (See "The Pennsylvania Cave Survey," C&T Vol 1:2, Fall 1983, p. 17, and "The Pennsylvania Cave Database and the Microcomputer," this issue.<<Ed.) Because of this need, I wrote a computer program on a large machine which ran in batch mode. I have since converted this program to run on a microcomputer.

The user is presented with a screen and is asked to key-in the latitude and longitude for the cave location. Once this is done, the program presents the user with the quadrangle name and code. The process continues indefinitely until the user depresses the END key.

The program is written in BASIC. It uses a data file which contains the boundary coordinates of each quadrangle in Pennsylvania, the name of the quadrangle and the code for the quadrangle. The code is the one that is used in the Pennsylvania Cave Database, and was adapted from those used by the PA Department of Environmental Resources. This is also the source of the boundary coordinates.

The program reads the data into an array and uses a binary search technique to find the quad name and code. I have the program running on an IBM PC with a monochrome monitor.

I will make the program and data file available for your use. If you try it and decide to use it, I would appreciate a small donation. Send me a floppy diskette and I will copy the program and data file onto it and return the diskette to you. Send requests or inquiries to: Keith D. Wheeland, 2191 Mountain View Ave, State College, PA 16801. Home: 814-238-2057 Office: 814-863-2423.

(from the NITTANY GROTTO NEWS, Vol 32:4, August 1985, P. 13.)

(Keith indicates that he is willing to help those in other states to set up similar programs. All that is needed is the quadrangle boundaries, which are often available from some agency within the state.<<Ed.)

Large Cave Rooms of the World: An Interim Report

by John Ganter

I've accumulated a large collection of data since publication of my first article on cave rooms. (See: "Comparison of Cave Room Sizes in West Virginia and the World," GEO2 (Geology & Geography Section of the NSS), Vol 11:2, Spring, 1984, pp. 30-31.) Some of this has been through research done by myself and dedicated helpers, and some is the result of spectacular new finds. Consequently, the admittedly rough estimates of rankings previously available (for example, see Courbon, Paul (1983) ATLAS DES GRANDS GOUFFRES DU MONDE, Marseille: Editions Jeanne Laffitte, p. 20.), are now also out of date.

The table below summarizes the top ten rankings I've come up with:

Large Cave Rooms, Ranked By Projected Area.
Compiled by John Ganter, 11-85.

Rank	Room	Country	Projected Area m2	Volume million m3
1	Sarawak Chamber	Malaysia	162,700 m2	12.0
2	Torca del Carlista	Spain	76,620	3.4
3	Majlis al Jinn	Oman	58,000	4.0
4	Belize Chamber	Belize	50,050	?
5	Salle de la Verna	France	45,270	3.4
6	Grutas de Villa Garcia	Mexico	40,820	?
7	Gruta del Palmito	Mexico	39,730	?
8	Carlsbad Big Room	USA	33,210	?
9	Golandrinas	Mexico	33,110	5.0
10	Chiquibul Chamber	Belize	32,090	?

Notes:

1) Rank is based solely on projected floor area- the area of shadow a room would cast on a horizontal plane. Area of entrance(s) through ceiling may not exceed 10% of total area, or else it's a pit. Secondary depositional features (i.e. large speleothems) are, in theory, ignored in defining the boundaries of the rooms. 2.) Areas were measured with a Nutronics Digital Planimeter, on the largest scale map available. Survey quality, accuracy and precision varies greatly. 3.) Volume is included where available. Most are gross estimates by Courbon, cited above. The reason volume is not used as a ranking criteria is that current survey practices don't support it. The Majlis al Jinn figure is believed reliable. 4.) All specifications are subject to change without notice, pending further examination or new data.

A full article is in preparation, with diverse information on somewhere in the neighborhood of thirty rooms, and comparative graphics of several types. The cut-off point will probably be 5,000 m2 projected area.

References on the above ten rooms have not been included, but are available on request from the author. Anyone having comments or additional information on large rooms is invited to contact me. Comments on ranking criteria are particularly welcome. (John Ganter, 1016 Taylor St, State College, PA 16801 USA. 814-238-0957.)

Representing Standing Water in Caves Through the Use of Shading

by John Ganter

Representing the range of materials in the class of cave features known collectively as "floor detail" is a challenging task for the cave cartographer. Of these features, water is the most "continuous"- it is uniformly smooth and essentially without detail. This flatness is in contrast to cobble fills, flowstone, etc., which are also somewhat continuous, but have texture, and often pattern and direction. (Water, of course, will often have movement and direction, but since most maps "freeze" time, and thus movement, an arrow usually serves to convey this aspect.)

Traditionally, water has been represented with line symbols, as shown in Figure 1.

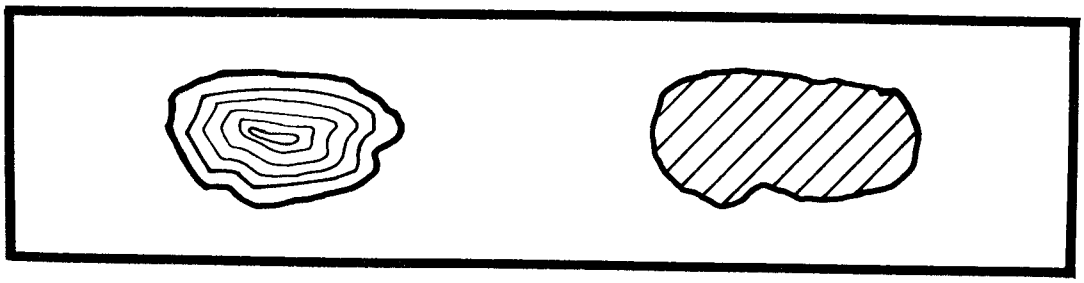


Figure 1: Use of Lines to Represent Water

There are a number of problems with this approach, mainly having to do with the fact that lines are used for so many other things on a typical cave map. It is difficult for the human mind to adapt to the changing meanings of lines as they are used repeatedly to represent different things on the same map.

The left example in Fig. 1 follows an old technique, in which the water body looks as if it has concentric ripples on it. Sea monsters are often inserted in areas of deficient data. The U.S. Geological Survey used this technique for its topographic maps until sometime in the 1950s. The main reason it was discontinued is the distracting visual effect of concentric or closely spaced parallel lines- it is impossible for the eye to focus properly on them. Another problem is that the technique becomes unwieldy in areas with peculiar configurations, for example a cave like the one shown in Figure 2.

(I might also mention some other, less common, variations in the use of lines to represent water. One occasionally sees short "wiggle worm" line segments [~~~~~], usually parallel to passage direction, depicting flowing water. I have not seen any impressive examples yet: this may simply be a result of poor drafting skills. Those who map sea caves are faced with a complex {water body - shoreline - cave} interface zone, with maps typically showing all three. Discussion of the some of the cartographic schemes adopted, and examples, may be found in Carol Vesely's "The Uncharted Waters of Sea Cave Surveying." (C&T, Vol 2:3, Winter 1985, pp.46-51, esp. p. 50.)

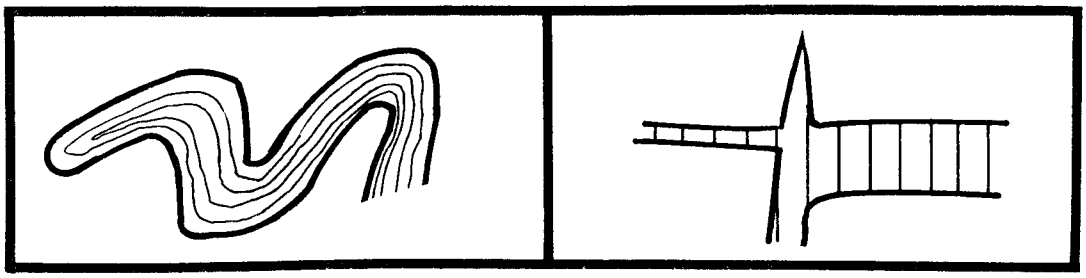


Fig. 2:
Ripple Effect
in Sinuous Passage

Fig. 3:
Effect of Passage Direction
on Parallel Lines Depicting
Water

The next method (on the right side of Fig. 1) works somewhat better, provided that the cave is of one predominant orientation. But visual confusion can still result (Fig. 3) from using the same cartographic element (lines) for both water and cave walls. If you do use this straight parallel lines method, make sure they are straight, parallel and evenly spaced.

Some have tried varying the direction of the water lines (e.g. drawing them so that they are always perpendicular to the passage), but this is of questionable visual effectiveness.

As we've seen in the above examples, the representation of water by means of lines is a straight-forward and relatively simple task using a medium already in hand for drawing the rest of the cave. However, it has problems relating to overuse of lines to depict so many features, and the unpleasant sensations that viewing parallel lines can produce.

Alternatives to Line Symbols

An obvious solution to the conflicting overuses of lines is to find "something new" to represent water with. In the first part of this article, I remarked that water is a "continuous" feature: it looks nearly the same everywhere, with little in the way of texture and direction- an amorphous substance.

What LOOKS amorphous? Solid black comes to mind. But a solid is bold and distracting: it can easily make parts of a map appear heavy and distorted. You can often see this effect in cave maps that use solid black to represent bedrock "pillars" or deposits of flowstone. Nevertheless, using black to represent water has been done very effectively on some maps. A couple of examples which come immediately to mind are Phillippe Ackermann's maps of "El Popoca" (Association for Mexican Cave Studies Activities Newsletter 12, April 1982, p. 62.) and "Sumidero de Atliliaka" and "Gruta de Tecuanapa," (on pages 5 and 6, AMCS Activities Newsletter 14, Sept. 1984.) These maps "work," what more can you say? If you study them carefully, you will see that they work by very careful design.

Another solution which may occur to you is the use of color. Color, particularly a nice blue, is very effective for showing water. Unfortunately, the use of color requires considerably more work and planning than a black and white map. If you want to make a color map, my advice is to find an interested, generous, printer and discuss the project with him or her. In other words, make your cartographic technique conform to your

printer's suggestions, not the other way around. This is all I will say about color mapping in this article- the subject is complex, to say the least. A fine application of color is "Painted Cave" by Bob Richards and Carol Vesely. (NSS News, Vol 41:2, Feb. 1983, p.89.) Bill Stone has used a light blue for open water and a dark blue for sumps in his superb "Cueva de la Pena Colorado" (NSS News, Vol 41:6, June 1983, p.175.) In each case, color was possible because of cooperation and support by then-editor Jay Arnold, and skilled printing.

Getting back to our "basic black" idea above: what if we could make it a little less striking? Say, a nice greyish tone. This is possible, but in a roundabout way. The reason is that printing equipment is binary: it prints black or white (or, sometimes, cyan or magenta or yellow), but nothing in between. So, you fool the human eye: you print a whole bunch of tiny black dots and we see them not as a pattern of tiny black dots, but grey. An example is "Cueva de la Pena Colorado," a black & white fold-out version of Stone's map mentioned above. (AMCS Activities Newsletter #14, Sept. 1984, p.54.) Other examples are "Chick Cave," "Corinth Church Cave," and "Dickenson Cave," by me. (Folded maps, 1985 Western Kentucky Speleological Survey Annual Report) Portions of these maps have appeared on the covers of C&T. (Compass & Tape, Vol 2:3, Winter 1985, and Vol 2:4, Spring 1985.)

As you can see from these examples, the technique has promise for some maps. There are a number of ways to make the requisite dots, but for the sake of simplicity, I will discuss only shading transfer films.

Shading Transfer Films

What is a transfer film? It is a very thin sheet of transparent plastic with something, in this case a dot pattern or "screen", printed indelibly on it. On one side is a very thin, but tenacious film of adhesive related to rubber cement. The film, and its cement coating, reside on a sheet of durable backing until you peel it off. In other words, it's a fancy sticker.

There are numerous brands of transfer film, as you will quickly learn by visiting a few retailers. I've tried most of them, and will unhesitatingly recommend Zip-A-Tone brand. The film itself is tough and forgiving, but what I really like is the super-tough backing. It's almost impossible to accidentally cut through with a razor knife. All transfer films are perishable: they can only sit around so long before they lose their stickiness. Try to get film which is fresh; buy from high-volume sources, and ask how often they restock. Store the film under reasonable conditions: no hot, dry rooms. The same goes for your finished maps.

The shade on the shading film is produced by a "dot screen": a pattern of dots which are interpreted by the eye as being a shade of grey. The characteristics of a particular screen are given by two measures: lines per inch and percent dots. The lines per inch measure tells how many rows of dots there are in each inch of transfer film. Obviously, if the number of lines per inch is high, the screen is very "fine": in fact, you may have difficulty seeing the dots. The other measure is percent dots, which expresses how light or dark the screen is, a natural result of the percentage of surface covered by dots. In combination, these two measures provide a unique signature for a dot screen and allow matching and comparisons. (Provided, of course, that the screens being compared are made by the same company!)

Restrictions On Use

Now there are some problems with this stuff, and they must be dealt with long before you get out the razor knife and start hacking it up and sticking it all over your map and other nearby objects. The first problem is that you are going to be putting something on the surface of your map besides ink. Transfer film is not terribly durable, so the finished map must be handled and stored with care. Fortunately, most modern transfer films are heat-resistant, and thus can tolerate being run through various reproduction equipment.

The second problem, far more serious, is that reproduction equipment is finicky about what it will reproduce. It would seem that the best way of making a grey tone is to use the finest (i.e., the one having the most lines of dots per inch) dot screen available. Unfortunately, this is not always possible, because each reproduction method has a limit to the size dot that it can reproduce. If you are making maps for NATIONAL GEOGRAPHIC, you can use 300 line per inch screens with dots so small you need a magnifying glass to see them. And, the super-presses, in combination with glass-smooth paper containing more clay than wood pulp, will reproduce the dots perfectly. An average offset press may only be able to reproduce 150 lines per inch, and a high-speed photocopier, only 40 or 50. Because of these limitations, it is critical that screens be carefully tested before the labor-intensive task of applying them to the map begins.

Making A Test Strip

The obvious solution is to do "test runs." Don't wait until after you've spent 20 or 30 hours slicing Zip-A-Tone to find that, oops, no copier within 4000 miles of your home can reproduce it! Get some shading film that looks "about right" and put it on a test strip as shown in Fig. 4. (Make sure the strip is, say, a foot or so long if you plan to send it through a feed device like a Diazo machine. Otherwise, you get to take the machine apart to retrieve the strip, which is always a fun way to spend a few hours.)

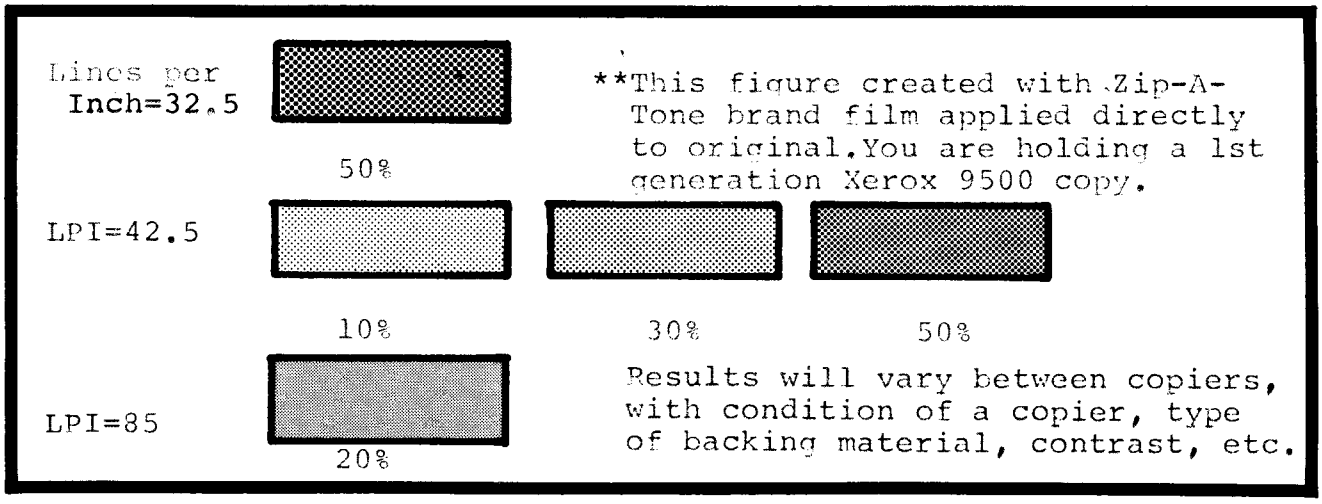


Fig. 4: A Test Strip for Shading Films.

It's important that the strip go through every process that you have CAREFULLY PLANNED (that's a hint) for a particular map. If, for example, you're going to reduce the map with a process camera, then send one copy to an offset press, another copy through a large-format photocopier, then that result through a Diazo machine, you'd better make sure that the test strip goes through every stage. And the transfer film that looks the best in the end is the one to put on your map.

Mixed reproduction techniques, reduction or enlargement, and base materials can all have unpredictable effects on the outcome. The map segments on the covers of C&T mentioned above are good examples. Both were created from scraps of Xerox 2080 large-format photocopies, and all the newsletters were printed on a Xerox 9500 high-speed photocopier. But the screens on the Winter issue did not reproduce well on the first run. The apparent reason: the run took place late in the working week, and the machine needed service. Not enough to be obvious with most material, but enough to have trouble reproducing those dots!

Applying Transfer Shading Film

At this point, you may finally be ready to try applying some film. The task is not complicated, but has been known to cause frustration. My favored approach is to hold the sheet of transfer film on the map with my left hand, then cut out the required shapes of film with my right, while maintaining registration. It takes a little practice. I prefer a razor knife like the one shown in Fig. 5.

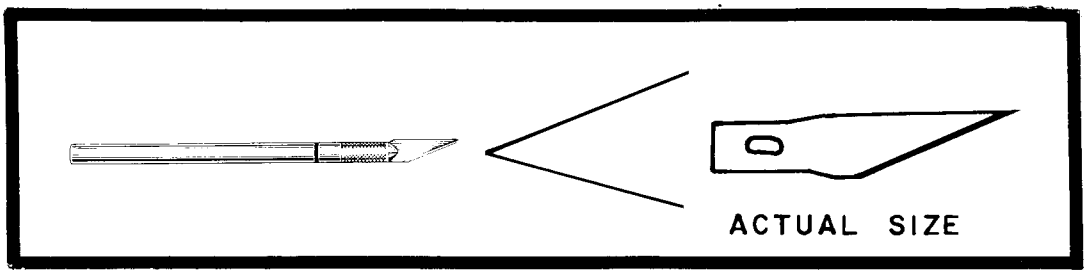


Fig. 5: Xacto-brand Blade Holder and #11 Blade

I try to cut very large pieces to minimize splices. When a splice is necessary, it's best to try to put it near a feature which interrupts the expanse of water: a splice out in the middle of a pool is obvious to the viewer of the map. Also of importance is the matching of the lines of film: all the dots must run the same way. This is especially important when splicing is done. When the section of film looks perfect, it is slowly burnished down by covering it with something smooth (like sticker-backing or the backing from KROY tape) and rubbing it firmly.

A Few Other Suggestions

1.) Practice on a few simple shapes before deciding to use transfer film. Not everyone finds it enjoyable to work with. 2.) Keep your hands and work area spotlessly clean. Dirt under the film will not make you happy. 3.) Apply the film with care to avoid trapping air bubbles. Burnish the film down only after you are sure that it is perfect. 4.) If there are any flaws or imperfections that you can detect without careful searching, then be assured that they will be immediately obvious to any viewer of the map. This technique is not forgiving - if you're not going to do it RIGHT, don't do it at all!

The use of alternative media on cave maps is demanding both in terms of planning and execution, and thus is fairly rare. It is certainly not worth the trouble for most cave maps. But for the cartographer with a special cave in mind, and lots of patience, the results can be worthwhile.

Addresses:
AMCS, P.O. Box 7672, Austin, TX 78713.
WKSS, c/o Dr. John Mylroie, Box 2194, Mississippi State, MS 39762.

More Cave Map Symbols: Passage Terminations

by Mike Futrell
Blacksburg, Virginia

I have found the distinction between good leads and worthless leads to be rather vague on some cave maps. Often on a map a passage is shown to end with dashed lines. Occasionally, additional comments such as "TT" (too tight), "TL" (too low), "Air", or "goes 60' unsurveyed" are added. Of these passages, some are potential leads, some are not. What I feel are lacking are symbols describing exactly what types of persuasion are necessary to further the passage.

Therefore I propose the following symbols:

Dig

Blast

Hammer

These symbols would be put at the potential excavation site so that a caver in the future will be able to look at the map and have some idea of the implements of destruction needed. Text accompanying a map is a good source for lead description, but is not always available and can be confusing in describing the location of the lead in the cave. I believe that every attempt should be made to complete the cave during the first survey. But, as we all know, some caves are never really "finished." So publish the map and show how and where more cave can be found.

So far I've only come up with one real negative argument, and that is that one is giving away his leads by putting information about them on the map. But seriously now.... we could keep saving them in hopes of one day returning ourselves. Or bestow them upon friends as favors. Or trade them for beers when we are too old and decrepit to crawl around in those holes anymore.

What do you think??

Cave Mapping Publications

The NSS Bookstore has released its new pricelist in time for Christmas. The following titles are available on cave mapping.

An Introduction to Cave Mapping. Kenneth C. Thomsen & Robert L. Taylor, 1981. 123 pages. $9.00

A Systematic Guide to Making Your First Cave Map. John Ganter, 1985. 28 pages. $2.50

Caving Information Series
CIS #2: Cave Surveying. Jim Nieland. 9 pages. $.75
CIS #16: Map Symbols (1962). $.20
CIS #35: Drafting of Cave Maps. Jim Nieland. 6 pages. $.65

Allow 4 weeks for delivery. Postage & Handling: $1.00 per order. Include NSS number when ordering. Non-NSS members, add 10%. Send Check or Money Order to National Speleological Society Bookstore, Cave Ave, Huntsville, AL 35810 USA.

Queries to the Editor

Folks have been writing in with all kinds of questions, so we've decided to print them here for your edification.

October 2, 1985

Dear Editor,

I'm a beginner in cave surveying and cartography, and like most am always looking for more accurate ways to map. Specifically, I am concerned with how to accurately locate cave entrances on a topographic map.

I have asked this question of several people who are land surveyors. Typical answer: Extend the survey to some road, house or structure that you can locate on a map. My objection: A lot of cave entrances are far from roads or houses; miles away, on occasion.

Another approach that I have considered after reading some basic literature on surveying is using triangulation to sight on known objects and use trigonometry to determine the angles and distances involved. But the problem with this is that we often cannot see anything from the cave entrance. This is particularly true here in Puerto Rico where the karst areas are heavily vegetated. Do you have any alternatives to these ideas?

Thalia D. Veve
Sociedad Espeleologica de Puerto Rico, Inc.
Villa Rica Bay, Puerto Rico.

--> Certainly an old problem, and one which won't be solved for some time. Since the sky is always visible, an early approach was to simply triangulate on a celestial scale, using stars and other heavenly bodies as landmarks. Unfortunately, this requires a fair amount of training, and to be accurate enough for most purposes will require very expensive equipment, e.g. a theodolite. A similar approach is the use of satellites and electronics instead of visual sightings. At present this is nearly accurate enough, but prohibitively expensive. The future looks good, but it will be awhile. See Keith Wheeland's article on GEOSTAR in this issue.

Meanwhile, I've found that fast, fairly accurate surface surveys can be run with two poles, two operators, a tape, and an instrument reader using standard cave equipment. The poles provide good bases for reading the instruments on if they are about 3 feet long. You can also use a French-made "Topofil" device or the Forestry Suppliers "Hip-Chain": these dispense nylon string in measured increments and replace the tape. I object to leaving string lying around, though. I'm not sure I would want to do a lot of this type of surveying in hot karst, but it works.

Perhaps the most promising technique in your case is the use of aerial photos. These are usually available at scales larger than that of 7.5-minute topographic maps, which means that they show more detail. They would possibly allow you to see small vegetation changes, outcrops of karren, sinks, etc. which don't show up on quads. Having found a location on a photo, you could then transfer it to a map and determine the geographic coordinates. Shooting your own photos is generally not practical for cost and technical reasons. Fortunately, they are widely available from all sorts of agencies and firms. First stop in any search is your local U.S. Department of Agriculture Soil Conservation Service and/or State Geological Survey. (In foreign countries, there are usually equivalents.) Another approach is to write to the National Cartographic

Information Center, US Geological Survey, 507 National Center, Reston, VA 22092, with a specific statement of your needs. This agency maintains a massive computerized listing, called the Aerial Photography Summary Record System (APSRS), which lists imagery for many areas.

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This urgent message recently came across the computer system to which Section member George Veni and I are connected. Read on in suspense!

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Date: 1 October 1985, 12:09:10 EDT
From: V54 at PSUVM
Subject: SPOTS
To: GL0

I need the advice of an individual properly trained in cartographic techniques. How do you remove India ink from clothing? It's not a tremendous mess, just new pants. Is it possible? Could make a great article for Compass and Tape ! I'm working on the one I promised you. You should have it within a week or decade. --George.

==========

Date: 1 October 1985, 13:14:43 EDT
From: GL0 at PSUVM
Subject: spots
To: V54

George--- Good luck! I don't think it's possible. India is a particle ink, which is why it's so opaque. When it dries, the particles lock together... in this case they're locked to your cotton fibers too! You can try bleach, but that means you don't have any color at all Save them for cave clothes, or wear them proudly as the badge of a cartographer. --JG.

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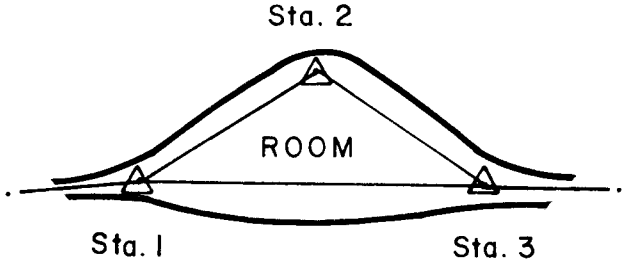
October 10, 1985

John -

When determining the total length of a cave to be written on the final map, does that include any unsurveyed, but drawn in, passage? As for surveyed passage, what about closure loops in a room? Exactly what distances are included, as in the sketch below:



Thanks for your help,

Walt Hamm
Pittsburgh Grotto

--> In a theoretical sense, cave length is a very tough question. Suggested reading on the subject is "Mapping and Measuring Caves: A Conceptual Analysis," by Claude Chabert and Red Watson, in the NSS BULLETIN, Vol 43:1, January 1981, pp. 3-11. This article proposes several standard criteria for giving cave length and raises a number of interesting questions.

Getting back to your questions, they hinge on what you want the 'length' figure to say. In other words, are you trying to show how much work went into the survey or the total length of passages in the cave? In the first case, you simply add all survey shots together. This, along with a tally of the number of stations set, gives useful information on the amount of work done and how long the average survey shot was.

On the other hand, most people are primarily concerned with "how much cave is there." In theory, this would be determined by running a measure down the centerline of each passage. Obviously, this is not practical, but many normal surveys give an approximation which is in the ballpark. I always add an estimated length for all "sketched-in" passage. The passage is there as the result of speleogenesis, and that's what I'm trying to quantify. The technicality of whether I've actually run a tape through the passage is completely irrelevent. Remember: the object is not to try to get as much length as you can, but to describe the cave. In your example above, the Sta.1 to Sta.3 line looks like a pretty good measure of how much cave length is there.

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Readers are encouraged to submit their own comments on the above.

Official 1985 Cartographic Salon Results

At the right are Salon Chair Ernst Kastning's official 1985 Cart Salon results, reprinted from the Aug. 1985 NSS NEWS, p. 255. My unofficial list of all entries appears in the Summer , 1985 C&T, pp.20-21. It looks like I missed at least one: Laurie Adam's "Bat Cave System." <<JG.

Category	Award	Map	Cartographer
0-0.5 km	Merit Award	Pink Panther Cave, New Mexico	Bruce Rogers
	Merit Award	Chandelier Cave, Palau	Bruce Rogers
	Merit Award	Shell Beach Sea Caves, CA	Carol A. Vesely
	Honorable Mention	Pellet Mound Cave, Oklahoma	Sue Bozeman
	Honorable Mention	Spout Cave, West Virginia	George Dasher
	Honorable Mention	Cueva de el Canon, Mexico	John Ganter
	Honorable Mention	Blimp Hanger Cave, California	Bob Richards
	Honorable Mention	Roaring Spring, Virginia	Ron Simmons
	Honorable Mention	Point Buchon Area Sea Caves, CA	Carol A. Vesely
	Honorable Mention	Santuario Adentro, Mexico	Carol A. Vesely
0.5-1.0 km	Merit Award	Crystal Drano Cave & Roto-Rooter Cave, CA	Randy Boyd
	Merit Award	Chick Cave, Kentucky	John Ganter
	Merit Award	Millerton Lake Caves, CA	Bob Richards
1.0-3.0 km	Merit Award	Alabaster Caverns, Oklahoma	Sue Bozeman
	Merit Award	Corinth Church Cave, Kentucky	John Ganter
	Merit Award	Dickenson Cave, Kentucky	John Ganter
	Honorable Mention	Bat Cave System, North Carolina	Laurie Adams
	Honorable Mention	Sump Cave, Indiana	David Black
	Honorable Mention	Skaggs Cave, Missouri	Scott House & Mick Sutton
	Honorable Mention	Windy Run Cave, West Virginia	Ron Simmons
over 3.0 km	Merit Award	Cameron Cave, Missouri	Scott House
	Merit Award	Great Spirit Cave, Missouri	Scott House, Jerry Wagner & Doug Baker
	Honorable Mention	Indian Cave, Tennessee	Jeff Bowers and R. Hamm
Overall	Medal	Corinth Church Cave, Kentucky	John Ganter

More On Transfer Films For Photocopiers

As mentioned under "More Things To Buy," [C&T Vol 2:3, Winter 1985, p.72] adhesive-backed transfer films which can be run through photocopiers have become a handy way to convert typography and other materials from one media to another. Calvin Alexander explains how this technique has been used by the Minnesota Speleological Survey:

The reduction of the data in the Mystery Cave (MN.) Survey is currently handled by Bob Thrun's CMAP 13 computer program. That program will print out a "stick" map of the survey line. The plotter that we have access to is limited to a 15 inch wide format. A 1 to 3000 scale version of the map will fit, barely, on a 15 inch wide page. A copy of this computer plotted map is run through an enlarging photocopier to produce a roughly 1 to 2000 scale map. All of the place names have been listed in a separate computer file and a sheet of those names is printed out on the University's (University of Minnesota) laser printer in several formats. This sheet is then run through a photocopier and reproduced (1 to 1) onto a sheet that has a peel-off sticky back. These names are then cut out and stuck at the appropriate place on the map. The caption block and other symbols are added from standard "rub on" materials. The map is then reduced to the final scale (roughly 1 to 4150) and reproduced at a print shop.

(from a letter to J. Ganter: see also
the MINNESOTA SPELEOLOGY MONTHLY, Vol 16:12, Dec 1984, pp. 191-193.)

A Precocious Mapper of Caves

Dr. Art Palmer is one of the best known cave geologists in the world. His highly-readable books on a number of large cave systems are favorites of both cavers and academics. He reflects on his early days of caving:

" Right off, I was interested in mapping. I realized that without a map I wouldn't be able to understand the cave. I'm not sure that is really true, but I began mapping with my brother who at that time was 8 years old. We went in there (Bakers Quarry Cave, MA, about 120 feet long) alone on several trips. It took several trips to finish it at 15 minutes a trip... we didn't want to push our luck. Using a compass and string and various other pieces of equipment like protractors, we made a map that was 4 feet long with 23 cross sections, in multi-color."

---- Art Palmer, describing how he started caving at the age of fourteen. From an interview with Thom Engel in THE NORTHEASTERN CAVER, (NE Region of the NSS) Vol 16:3, Fall 1985.

Survey Book Paper Available

Section member Jim Hixon has recently had some customized note-paper printed. It's on bond paper with smear-resistant blue ink, and fits the standard 6-ring plastic binders. Price is $5.00 for 100 sheets. Contact Jim if you're interested. (Jim Hixon, Box 73, Maxwelton, WV 24957. 304-645-7904.)

COMPASS & TAPE
Survey & Cartography Section of the
National Speleological Society
c/o John Ganter, Editor
1016 Taylor Street
State College, PA 16801 U.S.A.

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Report address changes/corrections to Lance Lide, Box 2601, Little Rock, AR 72203.

The Ultimeter Altimeter/Barometer

by John Ganter

Altimeters are handy for surface reconnaissance in some types of karst areas, for weather forecasting, and as an aid to getting vertical control in low-quality cave surveys. Since altimeters (an altimeter, incidentally, is just a barometer with an extra scale set up for reading elevations) must sense minute changes in air pressure, they have always required very elaborate jeweled-bearing mechanisms in order to get reasonable precision in measurement. For example, if 5-foot precision was desired, you had to spend about a thousand dollars and gingerly carry around a clock-sized unit. Thommen sells a device for about $140 that has a precison of plus-or-minus 40 feet, and while it is pocket-sized, fragility is still a problem.

I have long wondered when altimeters would follow timepieces and even compasses (e.g. the Digital Brunton) in going solid-state. This revolution seems to have finally taken place. Included with all the Christmas goodies in the latest REI catalog is the Model 12 Ultimeter. According to the advertisement, the device is extremely rugged and has no moving parts. It can display either metric or English units, and displays altitude in 10-ft. or 10-meter increments from 980 feet below sea level to 21,000 feet above. It displays absolute and sea level pressure to 0.01 inch or 1mm of mercury, with temperature compensation. It displays temperature and even has a remote temperature sensor on a 10 ft. cord. Audible alarms can be set for altitude or temperature, and a number of power sources are accommodated. The 6.5 oz. device is made in the USA, and costs $179.95. (REI, P.O. Box C-88125, Seattle, WA. 98188-0125.)

Sounds high-tech! Grab a few for stocking stuffers.