

1977?

BRMRC BASIC CLASS
SESSION #2: ROPEWORK
OUTLINE (SHORT)

I. INTRODUCTION

A. HISTORY OF ROPEWORK AND USES

1. CHANGING ATTITUDES TOWARDS MOUNTAINS IN LATE 1800'S: INTEREST, RATIONAL THAN FEAR
2. EARLY USE OF ROPE BY CLIMBING GUIDES TO PULL UP CLIENTS (GUIDES PAID BY SUCCESSFUL ASCENTS OF CLIENTS)
3. "BELAYING": WRAP THE ROPE AROUND A ROCK IF SOMEONE SHOULD FALL (EARLY)
4. a. MODERN BELAYING *
b. RAPPELLING *
c. PRUSIKING *
5. 3 MAIN ROPEWORK TECHNIQUES
- 5.1. REFINEMENT OF STATIC ROPE TECHNIQUES BY CAVERS
 1. CABLE LADDERS
 2. DEVELOPMENT OF "SINGLE ROPE TECHNIQUES"
 3. DEVELOPMENT OF VERTICAL CAVING GEAR: RAPPEL RACKS, GIGRS, 3-CAM RIGS, STATIC ROPES

① CHAINING / COLOR CODE

B. SAFETY AND CALCULATED RISKS

1. "LEVEL OF RISK" CONCEPT; EACH PERSON HAS A PERSONAL LEVEL OF RISK/DANGER HE/SHE IS WILLING TO ENDURE
2. "A DEAD RESCUER NEVER DID ANYONE ANY GOOD"
 - IMPORTANCE OF SAFETY PROCEDURES IN MOUNTAIN RESCUE; MOUNTAIN RESCUES MUST BE SAFER THAN FORESTAL.
 - a. BAD WEATHER / FATIGUED + EXHAUSTED
 - b. MULTIPLICATION OF RESCUE PROBLEMS FOR OFFICE BY ACCIDENTS
3. RULES
 - a. HARNESS + GLOVES WHERE NECESSARY
 - b. 2ND CHECK

C. ROPES, HARDWARE, AND PERSONAL EQUIPMENT

1. ROPE AND WEBBING: TABLE I (MATERIALS) TABLE II (CONSTRUCTION)
2. CARE OF NYLON ROPE + WEBBING
 - a. CUTTING + SEALING
 - b. COLOR CODING
 - c. UNCOILING + STACKING
 - d. COILING: SPEED COIL, LAP COIL, MOUNTAIN CLIMBER'S COIL, RESCUE COIL (MODIFIED SKIN COIL), CHAIN COILING, TIEING OFF A COIL.
 - e. STORAGE: HANG UP; USE ROPE BAG; AVOID CAR TRUNKS + HOT CARS, SUNLIGHT, ACID.

2-1
2-2

(C2)

- f. DIRT + ROPE; STEPPING ON ROPES IS PROHIBITED DUE TO INTERNAL DAMAGES FROM DIRT
- g. LOGGING USE + ~~STAY~~
- h. INSPECTING WHILE COILING
- i. PULL-TESTING
- j. WASHING (CHAIN COILING IN FRONT-COILING MACHINES, ROPES WASHER)
- k. RETIRING: WHEN? HOW?
 - OBVIOUS SEVERE ABRASION OR HEAT DAMAGE;
 - IMPORTANT FAILS, EXCESSIVE SWELL (PULLING A CAN) OR ^{WIND} BREAKS ON ROPES, BRILL TAPS

3. CARABINERS

- a. MATERIALS
- b. TYPES AND RELATIVE STRENGTHS; GATES + AXIS STRESSES
- c. GATE-OPEN VS. GATE-CLOSED STRENGTH
- d. MAINTENANCE, CARE, RETIRING

4. SEAT HARNESS

- a. "SWISS SEATS" b. ASRC SEAT c. SOUV SEATS

5. OTHER EQUIPMENT

- a. HELMETS (SIDE PROTECTION, TOP IMPACT PROTECTION, ADJUSTMENT, LAMP BRACKETS, CHIN STRAPS)
- b. GLOVES (LEATHER, PROVISION FOR CLIPPING TO BINOC)
- c. FOOTWEAR (SUPPORT)
- d. CLOTHING (RUGGED, NO LOOSE ENDS)

II. KNOTS

A. GENERAL CHARACTERISTICS + CONSIDERATIONS

- 1. TERMINOLOGY: STANDING END, RUNNING END, BIGHT, LOOP, CANTERING, BACKING UP, "STANDING ENDS TO THE OUTSIDE"
- 2. PRINCIPLES: KNOTS VS. HITCHES; KNOTS, BOWS, LOOP KNOTS; STRENGTH, SECURITY, PRONENESS TO JAMMING.
- 3. PROBLEMS + SAFETY PROCEDURES
 - a. SLIPPING → TIGHTEN + LONG RUNNING ENDS + OVERHAND BACKUP (NOT HALF-HITCH)
 - b. IMPROPER KNOT: KNOW KNOT STRENGTHS + CHARACTERISTICS
 - c. IMPROPER TIED: DOUBLE CHECKS, PRACTICE TIED,

(II)

B. SPECIFIC KNOTS

- ① - OVERHAND KNOT ✓
- ② - OVERHAND BOND (WATER KNOT, RING BOND) ✓
- FIGURE EIGHT KNOT (BEND, LOOP) ✓
- a. - SQUARE KNOT (REEF BEND)
- b. - CLOVE HITCH
- = PRUSIK KNOT ✓
- TAILLINE HITCH (TOOT HITCH) ✓
- BOWLINE
- BOWLINE-ON-A-COLL
- c. { BARRER KNOT
- BARRER BOND
- d. BUTTERFLY
- HEADON ✓

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2-3

III. ROPE HANDLING AND ANCHORING

A. RIGGING A SIMPLE STATIC LINE

1. USE OF TREE WRAP
2. PADDING
3. SACKING
4. THROWING

B. ANCHORING

1. TYPES OF ANCHORS! PITONS, CHOCKS, BOLTS, ROCK OUTCROPS, TREES, NATURAL CREVICES....
2. STATIC RIGGING! WANT TO (IF NEED TO USE MORE THAN 1 ANCHOR)
 - a. DISTRIBUTE STRESS AMONG ANCHORS
 - b. AVOID SHOCK LOADS IF I SHOULD FAIL
3. USE OF SLING TO "EQUALIZE" 2 ANCHORS (FIG. 1)
4. USE OF 2 SLINGS TO AVOID SHOCK LOADING IF I SHOULD FAIL (FIG. 2)
5. IMPORTANCE OF TIE-IN ANGLE.
6. GIRTH HITCH
7. DOUBLE RUNNER (+ DOUBLE RUNNER WITH WRAPS)

2.4 a/b.



IV. BELAYING

A. THE SITTING HIP BELAY

1. THEORY OF THE BELAY (GENERAL)
1. THE STANCE
2. THE TIE-IN a.) TIE-IN THUT b.) TIE-IN IN LINE
3. ROPE LOCATION RELATIVE TO TIE-IN
4. GLOVES
5. "BOX" AROUND BODY! PROHIBITED HAND POSITIONS + WHY
6. BRAKING HAND VS. FEEDING HAND
7. UP ROPE
8. SLACK
9. CATCHING A FALL
10. TIPPING OFF A FALL

B. THE TREE BELAY

1. THEORY
2. TREE WRAPS
3. STANCE
4. ROLE OF THE ROPE HANDLING; PROPER FINGER POSITION
5. CATCHING A FALL; MOVING AROUND THE TREE
6. LOWERING ON A TREE BELAY

C. THE MÜNSTER HITCH

1. THEORY
2. RIGGING IT
3. STANCE

2-5

V ASCENDING

A. GENERAL CONSIDERATIONS

1. SAFETY: \rightarrow ^{TRUE} ROUNDDANCE.
2. SPEED + EASE: PROPER STYLE, + WOVEN ADJUSTED RIG (BOTH FROM PRACTICE)
3. EXPENSE VS. EASE: PRUSIK RIG FOR \$5 VS. MITCHELL OR COODINORIAN JUNIOR RIG FOR \$125.

B. ASCENDERS

1. PRUSIK (2 + MULTIPLE WRAP)
2. HERTZOG
3. MONTYON OTHERS (JUNIOR, GIBBS, ETC.)

C. SYSTEMS

2-6

1. TEXAS

- a. BOWLINE ON FOOT; BUTTERFLY KNOT AT KNEE; BOWLINE AT SEAT
- b. SHORT LOOP FOR SEAT

2. OTHERS: TEXAS "4", ETC. 3-KNOT

3. SAFETY NOTE: TRUE ROUNDDANCE

4. ASCENDING STYLE

5. BREAKOVERS: USE OF 3rd ASCENDER + SLING

VI. RAPPILING

A. DANGERS OF RAPPILING @ ANALYSIS OF THE "RANGER RAPPEL"

2. DANGERS OF "LEADING"

3. INHERENT DANGERS

4. BOLAYING: PRO + CON; HOW, BOTH TOP + BOTTOM

B. BODY RAPPERS

2-7

a) 1. ARM RAPPAL ("FRENCH ARM"; BASIC RAPPAL) (FOR INCLINES ONLY)

b) 2. BOOT RAPPAL ("HOTSEAT", "OULFERSITZ") NOTE IMPORTANCE OF PROPER ~~THE~~ PLACEMENT OF ROPE ON BODY.

C. MECHANICAL RAPPERS (DISCUSS ADVANTAGES + DISADVANTAGES)

1. FIGURE 8 (SINGLE + DOUBLE WRAP) "FOOLPROOF"; BUT MAY "LOOKE OFF" GOING OVER ^{OVERHANG}

a) 2. CARABINER WRAP RAPPAL: QUICK, LITTLE EQUIPMENT; BUT TWISTS ROPE

d) 3. G-BINDER RAPPAL: GOOD, BUT NARROW CONTROL RANGE

e) 4. DOUBLE BRAKE BAR RAPPAL: EASY, BUT WEAK + COMPLICATED

f) 5. RAPPAL RAIL: WIDE RANGE OF CONTROL, STRONG, BUT BULKY

D. RAPPEL STYLE + PRACTICE

1. GENERAL STANCE : FEET + HAND POSITION
2. OVER EDGES
3. OVERHANDS
4. WALLS : WALK
5. FREE PROPS
6. TILING OFF
7. BELAYING MECHANICAL RAPPELS

VII PRACTICE (SEE CHECKLIST FOR PRACTICE SESSION)

A. BELAYING