

FM 31-27

**PACK ANIMALS
IN SUPPORT
OF ARMY SPECIAL
OPERATIONS FORCES**

February 2000

DISTRIBUTION RESTRICTION:

Distribution restricted to United States (U.S.) Government agencies to protect technical or operational information. This determination was made on 15 February 2000. Requests for this document will be referred to Commander, U.S. Army John F. Kennedy Special Warfare Center and School, ATTN: AOJK-DT-SF, Fort Bragg, NC 28310.

DESTRUCTION NOTICE:

Destroy to preclude reproduction or further dissemination.

Headquarters, Department of the Army

Pack Animals in Support of Army Special Operations Forces

Contents

	Page
PREFACE	iv
Chapter 1 OVERVIEW	1-1
Purpose	1-1
Mission	1-1
Capabilities	1-2
Chapter 2 ANIMAL MANAGEMENT	2-1
Selection	2-1
Health and Welfare	2-5
Feed and Water	2-9
Feeding in Garrison	2-17
Feeding in the Field	2-19
Care of Forage	2-21
Chapter 3 ANIMAL CARE AND TRAINING	3-1
Grooming	3-1
Farrier Science	3-4
Field Training	3-9

DISTRIBUTION RESTRICTION: Distribution restricted to United States (U.S.) Government agencies to protect technical or operational information. This determination was made on 15 February 2000. Requests for this document will be referred to Commander, U.S. Army John F. Kennedy Special Warfare Center and School, ATTN: AOJK-DT-SF, Fort Bragg, NC 28310.

DESTRUCTION NOTICE: Destroy to preclude reproduction or further dissemination.

	Page
<u>Chapter 4</u>	<u>ANIMAL HEALTH MANAGEMENT</u>4-1
	<u>Animal Behavior</u>4-1
	<u>Physical Examination</u>4-3
	<u>First Aid Supplies</u>4-6
	<u>First Aid Treatment</u>4-7
	<u>Parasitic Infestation</u>4-12
	<u>Diseases</u>4-13
	<u>Immunization Schedule</u>4-16
	<u>Medical Supply List</u>4-16
	<u>Pharmacological Listing</u>4-17
	<u>Euthanasia</u>4-17
<u>Chapter 5</u>	<u>PACKING EQUIPMENT</u>5-1
	<u>Packsaddles</u>5-1
	<u>Halter and Packing Equipment</u>5-3
	<u>Care of Equipment</u>5-5
	<u>Fitting and Adjusting the Saddle</u>5-6
	<u>Unsaddling the Animal</u>5-10
	<u>Saddling with a Fitted Saddle</u>5-11
<u>Chapter 6</u>	<u>HORSEMANSHIP</u>6-1
	<u>Equipment</u>6-1
	<u>Riding Techniques</u>6-6
	<u>Leading a Pack String</u>6-9
	<u>Combat Considerations</u>6-10
<u>Chapter 7</u>	<u>TECHNIQUES AND PROCEDURES</u>7-1
	<u>Tying and Using Knots</u>7-1
	<u>Wrapping Cargo with a Manta</u>7-1
	<u>Building Loads</u>7-4
	<u>Saddling</u>7-5
	<u>Slings and Hitches</u>7-7
	<u>The Pack String</u>7-11
	<u>Campsites</u>7-14
	<u>Transporting Sick and Wounded Personnel</u>7-17
<u>Chapter 8</u>	<u>ORGANIZATION AND MOVEMENT</u>8-1
	<u>Organization</u>8-1

	Page
Duties and Responsibilities	8-1
Movement Procedures	8-2
Bivouac	8-4
Chapter 9 TACTICAL CONSIDERATIONS	9-1
Security	9-1
Cover and Concealment	9-2
Actions on Contact	9-3
Urban Environments	9-3
Chapter 10 LLAMAS AND OTHER ANIMALS	10-1
Llamas	10-1
Dogs	10-5
Camels	10-6
Elephants	10-7
GLOSSARY	Glossary-1
BIBLIOGRAPHY	Bibliography-1
INDEX	Index-1

Preface

This manual provides guidance for training Army special operations forces (ARSOF) personnel in the techniques of animal pack transport and for organizing and operating pack animal units. It captures some of the expertise and techniques that have been lost in the United States (U.S.) Army over the last 50 years. The chapters on care, feeding, and veterinary medicine compose a considerable portion of the manual; however, this material is not intended as a substitute for veterinary expertise nor will it make a veterinarian out of the reader. ARSOF personnel must have a rudimentary knowledge of anatomy and physiology, common injuries, diseases (particularly of the feet), feeding, and watering to properly care for the animals and to avoid abusing them from overloading or overworking.

Though many types of beasts of burden may be used for pack transportation, this manual focuses on horses, mules, and a few other animals. One cannot learn how to pack an animal by reading; there is no substitute for having a horse or mule while you practice loading a packsaddle. However, the manual is useful for anyone going into an environment where these skills are applicable.

Field Manual (FM) 31-27 is a guide for ARSOF personnel to use when employed in training or combat situations using pack animals. It is not a substitute for training with pack animals in the field.

The proponent of this publication is the United States Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS). Submit comments and recommended changes to Commander, USAJFKSWCS, ATTN: AOJK-DT-SF, Fort Bragg, NC 28310.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

Chapter 1

Overview

The last pack transport unit in the U.S. Army was deactivated after the Korean War. Before then, pack animals were employed in every war fought by the U.S. Army. The Army used approximately 350,000 horses and mules during World War I. Unconventional forces in Italy and in Burma used mules during World War II. Mules were also used during the Korean War.

Since the deactivation of the pack transport units, the Army has relied on air and ground mobility for transporting equipment. Today and throughout the spectrum of conflict, ARSOF may find themselves involved in operations in rural or remote environments. In many of these environments, the indigenous population uses pack animal transportation. Therefore, it may not be possible or practical to use air or ground mobility to move supplies and equipment to the desired locations.

PURPOSE

1-1. This manual is a guide to train select animals and ARSOF personnel used during the conduct of transport operations using pack animals. The pack horse and mule are described exclusively in this manual as they are common worldwide. Mission, enemy, terrain, troops, time available, and civilians (METT-TC) will dictate practicality. This reference assists in understanding the basic principles and techniques that apply in using any animal to pack provisions.

1-2. The success of pack operations, under extreme weather and terrain conditions, depends on the selection and training of personnel and animals. Time, resources, training, and personnel should indicate that the proper and efficient use of available equipment, the sensible care of animals in the field, and the employment of acceptable movement techniques are essential to the success of the mission.

MISSION

1-3. Animal pack transport systems extend or replace other transport means in the support of special operations (SO) missions (tactical or strategic). Animal transport systems can greatly increase mission success when hostile elements and conditions require the movement of combat troops and equipment by foot. The animal's capabilities allow the unit to move with less personnel fatigue.

CAPABILITIES

1-4. Pack animals can transport limited quantities of cargo and weapons over any terrain and under virtually any condition passable by an individual on foot. The pack detachment can traverse steep grades and heavily wooded areas without trail preparation and can maintain acceptable speeds over terrain that is not mountainous, carrying 20 percent of their body maximum (150 to 300 pounds [lb]). This amount should be decreased for loads that are prone to excessive rocking as the animal walks (for example, top-heavy loads and bulky loads). This capability continues indefinitely as long as the animals receive proper care and feed. In mountainous terrain, with no reduction in payload, the mule or horse can travel from 15 to 20 miles per day.

Chapter 2

Animal Management

The survivability of a pack animal detachment and its ability to successfully complete a mission depends on the animals and their management. Historically, animals of all types and sizes have been successfully used for pack transportation throughout the world. Animals indigenous to the area of operations are usually more effective than imported animals. Although native animals may be smaller and not ideally proportioned, they are acclimated to the environment, generally immune to local afflictions, and accustomed to the native forage. However, any animal locally procured needs to be thoroughly inspected for disease and physical soundness. Animal management entails selection, feed, and feeding along with stable management. Poor selection and improper feed and feeding of the pack animals could prove disastrous for the detachment.

SELECTION

2-1. Mobility and effectiveness of the pack animal detachment depend largely on the selection and training of the pack animals. The pack animal, regardless of its color, breed, or size, should have a friendly disposition, a gentle nature, and no fear of man. He should be willing to travel under a load and be sure-footed. Large, draft-type horses usually are not agile and do not make good pack animals. The ideal pack animal should be 56 inches to 64 inches in height or 14 to 16 hands. (Since one hand equals about 10 centimeters [cm], the metric equivalent is 140 cm to 160 cm). It must be tough, compact, sturdy, and well-formed. Figure 2-1, page 2-2, shows specific parts of an ideal pack animal (horse). For additional information and a more detailed illustration of the pack animal see *Care and Feeding of the Horse* by Lon D. Lewis, ISBN 0-68-304967-4.

ANIMAL CONFORMATION

2-2. The single most important conformation factor is good body condition. Thin animals are poor candidates for many reasons. They should be avoided if they do not gain weight once on adequate nutrition. Thin animals do not tolerate the rigors of long pack trips since they have little time to eat or graze. They easily develop saddle or pack sores on their backs because of the prominence of bones. The lack of body condition may only be due to poor nutrition. However, it may be due to more serious problems such as bad teeth or chronic infection. A pack animal should be calm and not easily spooked, easy to work around and not stubborn, and should be able to socialize well with other pack animals so that it is not too timid or too aggressive.

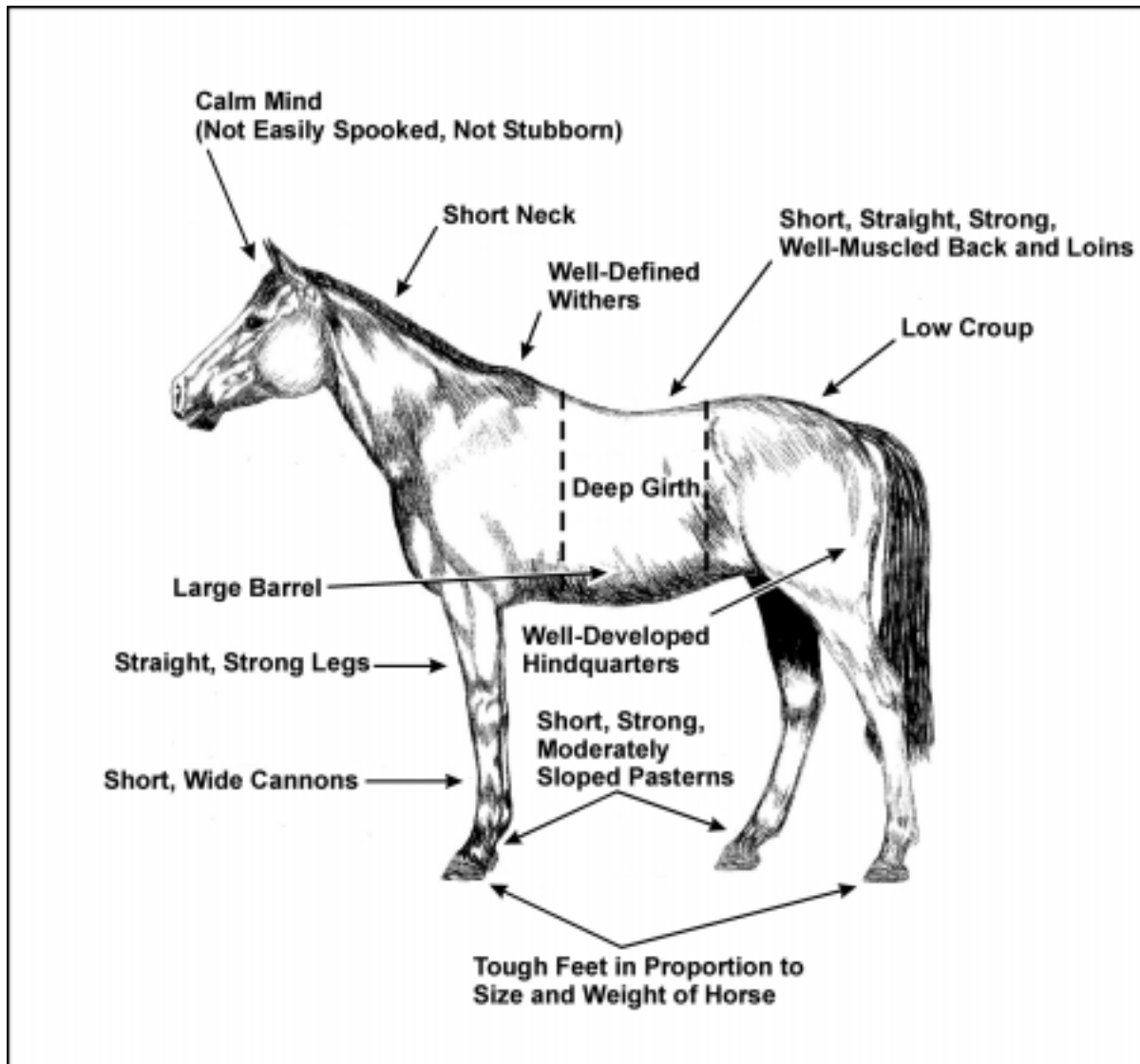


Figure 2-1. Animal Conformation

2-3. The **head** should be proportioned to the neck that supports it. A big head on a long, weak neck does not give the animal a desirable pendulum for balance. A well-formed head is usually a sign of good breeding. The animal's eyes should be clear and free from any cloudiness in the cornea or fluid within the eye. There should be no drainage of tears over the lower eyelids. The white sclera around the eyes should be white with no hint of infection or yellow discoloration (jaundice). The pink conjunctiva (clear membrane that goes over the white of the eye) under the eyelids should be pink, not red, and should have no hint of infection. The animal must also have good vision to pick its way through rough or rocky terrain.

2-4. The **teeth** should match to form a good occlusion. There should not be sharp points or hooks. Although these can be removed by a person skilled in floating teeth, they may soon return due to improper occlusion. **Good teeth, lips, and tongue** are important to the animal's survivability by allowing it to eat and drink properly. It needs good lips to find and pick up grain and water since it cannot see the end of its nose. The junction of the head and neck should be strong without a meaty appearance.

2-5. The **neck** should be proportioned to the animal's body and not too long. The animal needs strength in the neck to use its head as a pendulum and keep its balance in adverse terrain.

2-6. On a pack animal, the **withers** should be prominent, but not so high the packsaddle will rub or ride on it. Flat, rounded, or mutton (flat and thick) withers should be avoided because the packsaddle will not ride well on the animal. Attention is given to the height of the withers in relation to the height of the croup. An animal with withers lower than the croup has greater difficulty carrying a load because the load will constantly ride forward causing greater strain on the shoulders and forelegs. In contrast, an animal with extremely high withers and a low croup has difficulty with the load sliding back into the hip, leaving the possibility of the breast collar impeding movement and breathing.

2-7. The **shoulders** of a pack animal should be long, deep, and sloping to provide a larger surface for bearing the weight of a pack load when the animal is ascending hilly terrain. The **chest** should be muscular and deep but not too broad.

2-8. The **legs** should be straight, well-muscled, and free of any bulging joint capsules. Avoid animals that have any of the following characteristics on any legs or hoofs:

- Club feet (foot pastern axis of 60 degrees or more).
- Long, sloping pasterns (foot and pastern axis less than 45 degrees in front or less than 50 degrees in back).
- Short, upright pastern (foot and pastern axis more than 55 degrees in front or more than 60 degrees in back).
- Thin hoof walls.
- Thin sole.
- Buttress foot (swelling on the dorsal surface of the hoof wall at the coronary band).
- Bull-nosed foot (dubbed toe); unilateral contracted foot.
- Toed-in (pigeon-toed) or toed-out. (Normal animals will toe-in or toe-out if not trimmed correctly. Avoid animals that continue to toe-in or toe-out after trimming to ensure the bottom of the hoof [inside heel to outside heel] is perpendicular to the median plane of the body.)
- Any hoof that is sensitive to moderate pressure applied by a hoof tester to the toes, sole, frog, or across the heels.

2-9. There are also specific defects that pertain only to the front and back legs of the animal. Avoid animals with the following defects:

- Front legs:
 - Open-knees (enlargement of distal physis of the radius and corresponding enlargement in the knee).
 - Calf-knees (backward deviation of knees).
 - Buck-knees (forward deviation of knees).
 - Offset knees or bench knees (knee sets too far medially over lower leg rather than setting centered over lower leg).
- Rear legs:
 - Cow hooks (knock-knees).
 - Sickleg (excessive angle of the hock).

2-10. The **feet** are a critical factor in the animal's ability to perform, stay physically sound, and endure the hardships of packing. Ideally, the horse should stand with its feet at a 45- to 50-degree angle to the ground. The size of the foot should be in proportion to the size of the animal. Small feet are often brittle and do not have the base to support a heavy load or absorb concussion. Large feet could cause the animal to be clumsy and awkward. Mules have a tendency to have smaller feet, but this fact does not present a problem. The sole should be slightly concave and the frog prominent, elastic, and tough. Again, when viewed from the front, an animal that is toed-out should be avoided.

2-11. The **girth** should be deep from the withers to the floor of the body, and the body should be wide and flat. This size indicates ample space for vital organs, such as the heart and lungs. The **barrel** should be large. A large barrel shows a good spread of the ribs that, in turn, give a good load-bearing surface on top.

2-12. The **back** should be short, strong, and well-muscled. A short back is better equipped to carry a load without sagging. Horses with one less vertebrae than others would be good selections. The backbone should be prominent. A pack animal with a rounded back and ill-defined backbone is difficult to pack so that the load rides properly. Chances are good the load will slip or roll and the detachment will waste valuable time repacking the load during movement.

2-13. The **loin** should be of moderate length, well-muscled, and broad. A long loin will cause weakness at that point. The **croup** should be low and of moderate width and slope. The hindquarters should be strong and well-developed to provide power to the animal.

CONFORMATION DEFECTS

2-14. In the selection of a pack animal, the above criteria are ideal, but many serviceable pack animals have defects in their conformation and still perform well. However, it is better in the long run to avoid animals with many defects. Try to ensure that the larger animals carry the heaviest loads, and the gentle, experienced animals carry the fragile, easily breakable items. The smaller

animals or animals with certain conformation defects should be tasked with carrying the light and not-so-fragile loads.

HEALTH AND WELFARE

2-15. The health and welfare of the pack animal is a major concern of pack animal handlers in garrison and in the field. Each individual provides for the welfare of pack animals. Whole pack trains can be lost and missions compromised due to poor animal care. Implementing animal care will be distinctly different for field and garrison conditions even though the requirements and desired endpoints are the same.

FIELD MANAGEMENT

2-16. Rarely will a packer have the luxury of shelter or even corrals to hold animals in when packing. If fencing or corrals are not available, some means of limiting movement is necessary. The packer can limit movement by tying long "stake-out" lines to trees or by using auger devices secured into the ground. These methods permit animals to graze in defined areas and provides wind breaks during cold winds. However, there are some disadvantages. The animals must be moved every few hours as they graze the available forage. Sometimes they become entangled in the stakeout lines or entangle the line in brush or rocks. Some animals panic at loud noises (for example, thunder) and snap the line or pull the auger out.

2-17. The packers can hobble the animals by tying their front legs together with just enough space between their legs to take small steps but not run. They can secure the hobbles around the pastern or above the knees. Pastern hobbles (American hobbles) are easier to apply and maintain but can cause some animals to become entangled in brush or rock. Hobbles above the knees (Australian hobbles) are more difficult to apply and maintain but prevent entanglement with brush and rocks. Packers must slowly acclimate animals to hobbles in garrison before using the hobbles for an extended time on pack trips. Figure 2-2, page 2-6, shows two types of hobbles that the handler can use for various purposes.

2-18. The animals must have as much access to good forage as possible. This need means that packers should include probable grazing areas in their movement schedules. Even with optimal grazing, pack animal detachments take additional supplemental feed (in the form of grain) because the animals do not have enough time to graze and rest after carrying packs for much of the day. Also, the grazing is often less than optimal and the animals have to range over considerable distances to obtain adequate nutrition.

NOTE: Pack animal detachments can also consider using portable electric fencing. However, a few animals are not deterred under normal conditions, and most animals are not deterred if spooked by thunder and lightning.

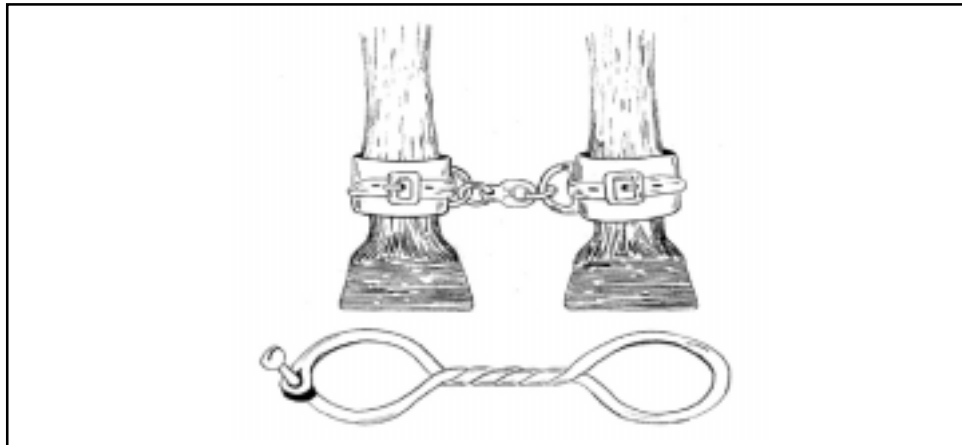


Figure 2-2. Two Types of Hobbles—Buckled Straps Joined by a Chain and Swivel and the Light Rawhide Hobble

SHELTERED HOUSING FACILITY (STABLE BUILDING)

2-19. In an unconventional warfare (UW) scenario, the pack animal detachment will probably not have the luxury of a permanent or semi-permanent stable facility. However, most of the field routines may be applied in stables.

2-20. The detachment commander has command responsibility for stable management and the training of his soldiers. However, subordinate leaders are directly responsible for stable management and the stable routine.

2-21. Stable management includes the supervision and maintenance of the stables and the other facilities. The subordinate leaders will ensure the grounds and buildings in the stable area are kept as clean and sanitary as available time and labor will allow and that the grounds are reasonably level and well drained. They will also ensure the animals are well-groomed, properly shod, and free of injuries and diseases. Since a large number of animals may be involved in a pack animal detachment, subordinate leaders should keep records at the stables on all the assigned animals.

2-22. The design and construction of a stable facility may be limited to the materials at hand. Regardless of the materials used, the stable should provide adequate shelter, good ventilation, and few maintenance requirements. The stable building should provide ready access to the corrals and storage for feed and packing equipment.

STALLS

2-23. Stalls vary in size depending on the average size of the animals, amount of time the animals are expected to spend in the stall, and available space. A 12-foot by 12-foot stall allows freedom for a large horse or mule to maintain fair physical condition during long periods of idleness while confined to stables. Stalls of this size are normally used for recuperation, foaling of mares, and protection in extreme climates. A 10-foot by 10-foot stall is normally satisfactory when animals are in stables only for feeding and rest. To reduce waste in feeding hay and grain, the stalls should be equipped with

hayracks and feedboxes. Stall walls must be free of sharp or rough projections and unfinished woodwork. A major concern when dealing with animal care is the construction and maintenance of stall floors. The floor should be level and have good drainage. It should also be resilient to help maintain a healthy condition of the animals' feet and legs. The floor should also be nonabsorptive for cleanliness and sanitation. Earthen floors composed of clay are satisfactory but require continual work to clean, level, and smooth. Rough-finished concrete provides the best type of floor because it is sanitary, is easy to clean, and requires little maintenance. However, a concrete floor having little resilience must be covered with a bedding of straw or hay for cushion. Wooden floors, even if impregnated, are not desirable since they are slippery and unsanitary. Because of their porosity, they cannot be adequately disinfected during a Salmonella outbreak. Regardless of the floor chosen, a good bed contributes to the comfort and efficiency of the animals. A clean, comfortable bed will induce the animal to lie down and get better rest. It provides a soft surface that will prevent bruising or abrasion of elbows, hocks, and other body parts. It also provides insulation for the body and a comfortable surface for the animal to stand.

2-24. Horses and mules are herd animals and do not thrive in stalls. This confinement can lead to behavioral problems that would not be experienced when the animals are kept in a field environment.

STORAGE

2-25. Storage facilities provide protection and security for feed and tack. They should also be convenient to the stables and corral. Feed storage should provide protection from rodents, water, and any loose animals that may overeat. When possible, stack feed on pallets (best), boards, or plastic sheets (second best) so that it is not in direct contact with the ground. Stack feed at least 6 inches from walls to discourage rodents. Rodents prefer narrow spaces to avoid predators, and the extra distance decreases the frequency of rodent visits. When covering feed outside, ensure there are no pinpoint holes in the cover because they are just enough to cause spoilage if it rains. In addition, arrange to minimize time and personnel necessary for feeding. A tack room should be planned for each stable and partitioned from the stall area. It should have facilities for inspection, cleaning, preserving, repair, and storage of all pack and riding saddles, bridles, halters, panniers, and accessories for the detachment.

CORRALS

2-26. The pack animal detachment should provide corrals for the animals' free movement and exercise when they are not in use or in the stalls. Ensure the corrals are close and easily accessible to the stables, are well drained, and provide good footing. Fill and level, as much as possible, any depressions and heavily traveled areas where water can collect. Set fences at a sufficient height and strength to ensure the safekeeping of the animals. Ensure the fence is free of sharp or rough projections, exposed nails, and edges prone to splintering with pressure or rubbing. Provide water troughs or tanks to give animals free access to water and make sure the containers are large enough to allow the watering of several animals without congestion. Individual feed

boxes or buckets are much better than shared bunks for minimizing fighting and control of contagious diseases. If feed bunks are used, provide at least 3 feet of bunk space per animal and no more than four animals per bunk to decrease fighting over feed and to prevent one dominant animal from eating more feed than another.

2-27. Establish hitching posts or a picket line to groom or pack the animals. Ensure the footing at the picket line will sustain heavy use. Establish the line on high ground so water (even if dry season), urine, and feces do not accumulate around the picket line. Also useful is a foundation of stone cover with coarse (but smooth) gravel or sand. Avoid fine gravel or coarse gravel with rough edges as these can lodge in the frog or sulcus. If there is no natural shelter from the sun and adverse weather, provide one for the animals' protection.

SOCIAL DOMINANCE

2-28. Horses (and mules) develop a social hierarchy or "pecking order." All animals in the herd respect this hierarchy. Fighting and injury prevails until the hierarchy is established. Once the hierarchy is established, fighting decreases. The hierarchy can change as new animals are introduced or as dominant animals age or become debilitated.

2-29. Let the animals establish the hierarchy but manage it so as to minimize the injuries as the hierarchy forms. Introducing new animals to the herd with a wooden fence (or other similar barrier) separating them will help in managing the herd. This method decreases the chances of kick and bite injuries as subordinate animals try to escape.

2-30. The hierarchy can be very helpful if understood and used. The dominant animals fight to be at the front of the pack line and fight to eat first. Identify the dominant and subordinate animals and place them in the pack line according to the hierarchy. Likewise, feed in order to reinforce the existing hierarchy.

SANITATION

2-31. Sanitizing at the stables and in the field is a continuous process for maintaining the health of animals and personnel. Stables and corrals must be kept clean to reduce the breeding of flies, which is one of the most serious sanitation problems that lead to disease and infection. The most effective countermeasure to reduce flies is to reduce moisture and harborage. Good drainage and the removal of wet or soiled bedding helps control moisture. Eliminating areas favorable to fly breeding and hatching—that is, moist, dark areas with organic material—controls fly harborage. Also brush out all feed boxes daily and scrub them monthly. Individual watering buckets or troughs are preferred. If this is not possible, drain and clean the water trough weekly. Allow only animals belonging to the detachment to drink from these troughs. Most importantly, ensure birds cannot defecate in them and rodents cannot swim in them. Any animals suffering from a communicable disease should be watered from a bucket that is thoroughly cleaned and disinfected after each use.

FEED AND WATER

2-32. The health, condition, and effectiveness of a pack animal directly relate to the type and amount of food being consumed. The pack animal handler determines the amount and types of food by the amount and type of work to be performed. The working animal needs a diet containing more concentrates than present in the diet of the idle animal to supply the fuel for energy and the proteins and minerals for the replacement of tissue and maintenance of condition. Personnel in the pack animal detachment need to have a basic knowledge of feed grains and roughage, their characteristics, and their geographical availability. This information is also critical for operational planning.

FEED REQUIREMENTS

2-33. The body requires food for growth, repair of body tissue, and energy for movement. The body also needs food to maintain temperature and energy for such vital functions as circulation, respiration, and digestion. Protein from feeds such as linseed meal, oats, and bran provide for body growth and repair of tissue. Minerals from feeds such as grass, hay, bran, bone meal, and milk are needed for healthy bones. Carbohydrates and fats from feed such as corn, wheat, rye, and oats produce heat and energy or are stored as fat and sugar as an energy food reserve. Bulk feeds such as hay, grass, bran, and oats are necessary for digestion. There is no single food that contains all the required nutrients; therefore, foods are combined to obtain the desired nutritional value. Oats are the best grain feed for stabled animals. For animals on pasture, natural grasses come closest to providing all required nutrients. The nutritional value of feed is measured in terms of the amount and proportions of digestible nutrients it supplies.

2-34. A ration is the feed allowed one animal for 24 hours, usually fed in two portions, morning and evening. The components of a ration depend upon the class and condition of the animals, the work being done, the variety of available foods, the kind of shelter provided, the climate, and the season. Feed must be selected and combined, proportionately, to form a balanced ration that consists of proteins, carbohydrates, fats, minerals, and vitamins. Pack animals cannot thrive on concentrated foods alone. They need both forage and concentrates but the ratios need to be controlled as explained below. Quantities of feed in one ration vary depending on the amount of idle time the animals have, the work being performed, and the availability of the feed. Insufficient feed—particularly bulky feed—causes loss of conditioning, general weakness, and predisposes an animal to disease. Too much feed can be wasteful and cause the animal to be overweight. An animal that is too heavy will tire prematurely and suffer heat stress.

GUIDELINES FOR FEEDING

2-35. All pack animal handlers should adhere to specific principles for optimal feeding. The following paragraphs explain each of these principles.

2-36. *Feed to Maintain a Body Condition Score (BCS) of 5.* Table 2-1, page 2-10, clarifies the differences seen with different BCSs. It is important for

animals to maintain a BCS of 5 for several reasons. If animals are too thin, they will—

- Be prone to saddle sores because the bones (especially the withers) will protrude.
- Have less energy and be sluggish.
- Have less body reserve to sustain them if rations are inadvertently unavailable.
- Be more susceptible to infections and contagious diseases.

2-37. Handlers must also be aware of the opposite effect. If animals become too heavy, they will—

- Be wasting feed that may be needed later.
- Be predisposed to heat stress.
- Be predisposed to premature exhaustion.
- Cause their packs to not fit well.

Table 2-1. Horse’s Appearance Associated With Dietary Energy Intake

Body Score	Descriptions^{a,b,c}
2—Very Thin	Animal emaciated; slight fat covers base of spinous processes; transverse processes of lumbar vertebrae feel rounded; spinous processes, ribs, tailhead, tuber coxae, and tuber ischii prominent; withers, shoulders, and neck structure faintly discernible.
3—Thin	Fat buildup about halfway on spinous process; transverse process cannot be felt; slight fat cover over ribs; spinous processes and ribs easily discernible, tailhead prominent, but individual vertebra cannot be identified visually; tuber coxae appear rounded but easily discernible; tuber ischii not distinguishable; withers, shoulders, and neck not obviously thin.
4—Moderately Thin	Slight ridge along back; faint outline of ribs discernible; tailhead prominence depends on conformation, but fat can be felt around it; tuber coxae not discernible; withers, shoulders, and neck not obviously thin.
5—Moderate	Back is flat (no crease or ridge); ribs not visually distinguishable but easily felt. Fat around tailhead slightly spongy; withers appear rounded over spinous process; shoulders and neck blend smoothly into body.
6—Moderately Fleshy	May have slight crease down back; fat over ribs spongy, fat around tailhead soft; fat beginning to be deposited along the side of withers, behind shoulder, and along the side of the neck.
7—Fleshy	May have crease down back; individual ribs can be felt, but there is a noticeable filling between ribs with fat; fat around tailhead soft; fat deposited along withers, behind shoulders, and along the neck.
8—Fat	Crease down back; difficult to feel ribs; fat around tailhead very soft; area along withers filled with fat; area behind shoulders filled with fat; noticeable thickening of neck; fat deposited along inner thighs.

^a A body condition score of 5 indicates the proper amount of dietary energy intake, 3 or less indicates inadequate energy intake, and 7 or greater indicates excess energy intake.

^b “Nutrient Requirements of Horses.” 5th ed., National Academy Press, Washington, DC, 1989.

^c “Care and Feeding of the Horse.” Lon D. Lewis. 2d ed., Williams and Wilkins, 1996.

2-38. *Feed According to the Animal's Feeding Weight (not necessarily current weight).* Dietary intake is best determined by adjusting the ration first to the animal's feeding weight. Although accurate scales may not be readily available, the animal's weight can be reasonably estimated by measuring around the animal at the girth line. A tape measure is placed around the thorax just behind the withers and follows underneath the animal in the same manner as a cinch strap would. Measurements are taken following respiratory expiration. (Hold the tape snug through several respiration cycles and note the smallest number.)

2-39. This measurement is then converted to an estimated weight shown in Table 2-2. If the animal is not at BCS 5 at the time of measurement, add or subtract 200 pounds per BCS difference. For example, if the BCS was 3, add 400 pounds to the girth measured estimated weight to arrive at a new feeding weight. This extra feed is needed to increase the animal's body. If the BCS is 4, then add 200 pounds. Additional rations may need to be added for compensatory weight gain.

Table 2-2. Estimating a Horse's Weight From Girth Measurements ^a

Measure behind the withers and elbows. The measuring tape should course underneath the thorax in the same location as the cinch strap would be placed.			
Girth Length (inches)	Weight (lb)	Girth Length (cm)	Weight (kg/lb)
55	500	140	230/506
60	650	150	285/627
62	720		
64	790	160	345/759
66	860		
68	930	170	410/902
70	1,000		
72	1,070	180	475/1,045
74	1,140		
76	1,210	190	545/1,199
78	1,290		
80	1,370	200	615/1,353

^a "Care and Feeding of the Horse." Lon D. Lewis. 2d ed., Williams and Wilkins, 1996.

2-40. *Increase Feed for Work Over Maintenance Level.* Animals should be fed two rations: one for idle (not working) and one for working. The inactive ration is calculated to maintain body condition but not to allow for increased weight. Working animals need more nutrients: primarily energy but also protein and other nutrients. The idle ration can be predominantly forage. A small amount of grain is beneficial to ensure protein, amino acids, and trace mineral requirements are met. The idle ration should be of low enough energy content to preclude "typing-up" once they resume strenuous work. It is

best to feed fat, grain with high fat content, or soluble carbohydrates if they are accessible.

2-41. Working rations need to have increased amounts of high energy feed. The animals need this increase for the following reasons:

- Working animals have less time to forage and rest if working long hours. Even on optimal pastures, pack animals need 4 to 5 hours of grazing to meet their nutritional requirement.
- Working animals have an increased demand for energy.
- Grain and oil are easier to transport than forages.
- Small amounts of grain or oiled grain can easily be fed in nosebags (feedbags) during short halts.

2-42. Dietary components directly affect performance and onset of fatigue. High fat diets often enhance aerobic and anaerobic performance and delay fatigue. Fats or oil are preferred over either soluble carbohydrates or proteins. Likewise, soluble carbohydrates are preferred over protein. However, it is more difficult to balance the ration. Using regular grain is simpler, but not as beneficial. Table 2-3 shows amounts of forage and grain to feed for idle and working pack animals.

Table 2-3. Idle (Not Working) and Working Rations ^a

Feeding Weight (lb)	Forage (lb)	Grain (lb)
800	14	7
1,000	15	10
1,200	16	13
Additional grain (or oil) increment for working is as follows: One pound of high quality grain per hour worked up to a maximum of 40 percent grain in the total ration. Over 40 percent will cause some animals to founder (lameness) or colic. Therefore, if more energy is needed, add oil to the grain and forage (for example, vegetable oil, corn oil, soy oil, or animal fat) in the diet. One pint of oil per 5 pounds of grain results in 20 percent added fat in the grain.		
Example: An 800-pound pack animal working for 8 hours would need an additional 80 ounces (8 hours x 10 ounces) or 5 pounds.		
^a These are general guidelines that are suitable for most conditions. More precise rations can be formulated using the references cited at the end of this field manual.		

2-43. *Feed Animals as Individuals.* Some animals will require more feed for the same work even though they may appear to be of similar size, age, and temperament. The following are guidelines to feeding. These should only be considered as a starting point. Rations will have to be adjusted for the animal, weather, terrain, and altitude. In some cases as described below, the ration may need to be increased 50 percent or even more.

2-44. *Adjust as Needed to Maintain Ideal Body Weight.* Once the animal achieves a BCS of 5, the ration should be adjusted to maintain that BCS. Animals should be taped around the girth line regularly to track changes in

body weight. Most people are too subjective and variable in their visual appraisals of weight and often will not detect weight change until the animal gains or loses 100 pounds. The ration will also have to be adjusted for work, weather, and altitude.

2-45. *Adjust Rations to Cold Weather, Hot Humid Weather, and Very High Altitude.* Horses and mules with a long, thick hair coat can tolerate cold weather well if they remain dry and out of the wind. The energy requirement only increases about 1 percent for each degree Fahrenheit (F) below 18 degrees F. However, if they become wet and are subject to wind, the energy requirement can increase 20 percent.

2-46. Hot humid weather can decrease the animal's appetite. Therefore, it may be necessary to increase the palatability by adding molasses to the grain mix. It may also be necessary to feed a high-grain and low-forage diet. Very high altitude can also decrease the animal's appetite. Likewise, it may be necessary to increase palatability of the ration.

2-47. *Change Forages Slowly.* Change forages gradually over 5 days. If introduced to a new pasture, limit grazing to 1 hour the first day and increase by 1 hour for the following 4 days. Feed hay before turning out to graze to preclude overeating on new lush pastures.

TYPES OF RATIONS

2-48. There are three basic types of rations that can be used: the garrison ration, the field ration, and the emergency ration. All three can be altered in quantities and substance depending on conditioning and training taking place, type and health of the animals, season, and combat situation. Table 2-4, page 2-14, shows a recommended allowance for garrison and field rations.

Garrison Rations

2-49. It is used at permanent or semipermanent operational bases where the pack animals are fairly idle. It contains a standard feed allowance of approximately 10 pounds of grain (8 for mules), 14 pounds of hay, and 5 pounds of bedding. Again, this ration can be increased slightly depending on the animal's condition or the training taking place.

Field Rations

2-50. The detachment uses this ration while it is deployed so the pack animals can maintain condition and strength during heavy work. The field ration contains an allowance of about 12 pounds of grain (10 for mules), 14 pounds of hay, and no bedding. Such quantities and combinations of feed could cause a logistic problem in a combat situation and may be altered. If the situation permits, consider pre-positioning or caching the feed. Another way to prevent having to carry all the feed is to consider aerial delivery.

Emergency Rations

2-51. The detachment uses this temporary ration for a short time when the combat situation or environment prohibits the use of a field ration. An emergency ration is a modification of a field ration for reasons such as logistic

problems or the lack of forage in the operational area. Remember that this ration can vary greatly depending on the situation. Small horses are classed as those usually found in overseas areas. Light horses are those weighing less than 1,150 pounds. Heavy horses are those weighing more than 1,150 pounds.

Table 2-4. Recommended Ration Allowances

Garrison Rations			
	Grain (lb)	Hay (lb)	Bedding (straw/sawdust) (lb)
Horses Small	7	14	5
Light	10	14	5
Heavy	12.5	15	5
Mules	8	14	5
Field Rations			
	Grain (lb)	Hay (lb)	Bedding (straw/sawdust) (lb)
Horses Small	9	14	None
Light	12	14	None
Heavy	14	16	None
Mules	10	14	None
<p>NOTES: 1. Bran may be substituted in amounts not to exceed 3 pounds for a like amount of grain. One-half pound of linseed meal may be substituted for 1 pound of grain.</p> <p>2. The substitution of barley, rice, copra meal or any other local product can be made for the grain ration.</p> <p>3. The substitution of native grasses, bamboo shoots, or banana stalks can be made for the hay ration.</p> <p>4. Fifteen pounds of corn fodder or grain sorghum is considered the equivalent of 10 pounds of hay.</p>			

FEED COMPONENTS

2-52. Types of grains and hay or combinations of available grains and hay will depend on the geographic location of the detachment. It is important, however, to come as close as possible to meeting all the nutritional requirements of the pack animals. Some of the grains, hay, and other items that may constitute a ration are described below.

2-53. Oats are the safest and most commonly used of all grains for the pack animal. Usually all other grains are combined with oats or regarded as substitutes. Oats may be safely fed in quantities up to 10 pounds per day but no more than 6 pounds when the animals are idle. Oats may be fed whole or crushed; however, crushing ensures more thorough chewing and digestion. Oats can be steamed or boiled for ill animals but new oats should not be fed until a month after thrashing.

2-54. Corn is best combined with oats and hay for feeding during the colder months since it has a tendency to produce heat and fat. Corn is best fed on the cob, but the animals can be fed shelled corn if it is mixed with oats or

bran. When feeding ear corn, 6 to 12 ears are recommended depending on the amount of work being performed and the individual animal. If substituting corn for oats, make the change gradually. Take care because corn is considered a "hot" feed. That means it contains greater than 16 percent protein. If the change is made too quickly or the animal is fed too much, it could lead to colic or founder. Substitute about 2 pounds of corn for an equal quantity of oats weekly.

2-55. Barley is used extensively in Asia, Southeast Asia, and parts of Europe. It is considered a good grain and may be safely substituted for oats and fed in the same quantities. The change from oats to barley should be made gradually over an extended period, substituting 2 pounds of barley for an equal amount of oats weekly. Barley is very hard and should be crushed or soaked in water for 2 to 3 hours before feeding, but it may be fed whole. Barley is a "hot" feed and the same care taken with corn must be taken with barley.

2-56. Rye is not regarded as a very good feed for horses and mules. If other feeds are scarce, it may be mixed with other feed such as oats or bran when necessary. Rye is very hard and should be rolled or crushed before feeding.

2-57. Wheat alone is not a safe feed for horses. It should be rolled and combined with a bulky grain or mixed with chaff or hay before feeding. One or two pounds should be given at first and the amount gradually increased to a maximum of 6 pounds per day.

2-58. Bran is the seed husk of grains such as wheat, rye, and oats, separated from the flour by sifting. It is an excellent food for the pack animal. Bran, having a mild laxative effect, is most useful as a supplement to a ration consisting largely of grains. It helps in building bone and muscle, has no tendency to fatten, and adds to the general tone and condition of animals. To supply the desired laxative and tonic effect, add necessary bulk, and stimulate more thorough chewing, feed about 2 pounds of dry bran mixed with oats or other grain every day.

2-59. Rice—that is, rough rice, when rolled, crushed, or coarsely ground—may be fed in quantities up to one-half the grain ration. In an emergency it may be fed in quantities up to 8 pounds daily.

2-60. Grain sorghum has a general food value of slightly less than that of corn. Feed the pack animal the same amount of grain sorghum as you would feed corn and under the same circumstances. Grain sorghum is less fattening than corn and has a higher protein content.

2-61. Salt is essential to the health and well-being of all animals. The pack animal's need for salt is greatly influenced by the amount and type of work he is performing since a considerable amount is excreted in his sweat. A supply of salt, adequate to replace that lost through sweating, is an important factor in preventing heat exhaustion during hot weather. Salt (8 to 10 ounces per day) should be available free choice in a salt block. Do not add more than 4 ounces to the daily grain ration. If animals sweat excessively, they will need up to 12 ounces per day. Prolonged sweating depletes the body's store of potassium, which causes muscle weakness and early onset of fatigue. Potassium can be replaced with "lite salt" that is one-half sodium chloride

and one-half potassium chloride. Add 3 ounces "lite salt" per day in grain and add molasses to increase palatability and bind the salt to the grain. Otherwise, the salt will settle out of the grain as the animal eats. If salt blocks are used, they should contain trace minerals. Trace minerals are vitally important. Availability in forages and grains varies by region. Animals must receive supplements of trace minerals unless the rations are analyzed and guaranteed to be adequate. Trace minerals can be conveniently supplemented by providing trace-mineralized salt, either as a loose form or in block. The trace mineral mix should include zinc, manganese, iron, copper, cobalt, and iodine as a minimum. If the region is deficient or marginally variable in selenium, then it should also be added. Areas in which forages contain excessive selenium (over 5 parts per million of the total ration), including selenium in trace minerals, will cause both selenium poisoning and impaired use of other trace minerals. Selenium poisoning causes abnormal hair and hoof growth. The availability of a salt block eliminates the requirement to add salt to the feed except when "lite salt" needs to be used to counter potassium depletion.

2-62. Hay is the basic element of the ration that provides the bulk necessary for the proper performance of the digestive system. The pack animal should not be deprived of hay or something with similar bulk, such as straw, for any considerable length of time. Animals will suffer more on a ration of grain than on one of hay alone. Should the supply of hay normally required for the daily rations be diminished, the animals should be grazed or fed such roughage as can be gathered or produced locally. Oat straw is one of the best substitutes for hay if the oat heads are still on it. Otherwise, it is not a good substitute. Any straw, not spoiled, may be used, but barley and rye straw are not recommended. Do **NOT** feed wet hay to the animals because it can cause compaction in the intestines and may lead to colic. Do **NOT** feed moldy hay to horses and mules; cows can eat it without suffering ill effects, but horses and mules cannot. If bulky feed is unavailable, give the animals green or dried weeds or leaves as substitute roughage. All hays, except for the legumes, have nearly equal feeding values. Some of the more common hays are alfalfa, timothy, prairie, and grain.

2-63. Alfalfa is a protein-rich roughage of high nutritive value that more closely approximates that of grains than the common roughage. Alfalfa is an excellent source of calcium and vitamins. Being high in protein, alfalfa combines well with corn to create a laxative effect. When changing to a ration containing alfalfa, do it gradually; give about 2 or 3 pounds daily. It should compose not more than one-half of the hay allowance.

2-64. Timothy is usually considered the standard hay, although it is not particularly rich in digestible nutrients. Timothy mixed with clover gives a higher nutritive value and a better supply and balance of minerals and vitamins. However, the clover content should not exceed 50 percent. This mixture is common in areas where timothy is available, as timothy and clover are frequently seeded together.

2-65. Prairie hay, or wild hay, is produced from the natural grass growing on prairie land. Upland prairie hay, its feeding value being slightly higher than timothy, makes an excellent hay when properly cured. Midland prairie hay,

which is produced from coarser wild grasses growing on low land, is of lower feeding value and is not considered desirable.

2-66. Grain hay is made from oats, wheat, and barley, cut before maturity, and cured in the same manner as other hay. It has a nutrient value about equal to that of timothy but is richer in protein. Care must be taken when feeding grain hay because it may have high amounts of oats still in it.

GRAZING

2-67. Grazing alone can maintain idle animals satisfactorily. It provides good feed and, moreover, provides exercise for the animals. As with any change in feed components, grazing periods should increase gradually over 5 days to condition the animal's digestive system. For pack animals in the field, grazing is an important source of roughage and should be used at every opportunity to reduce the consumption of hay, which may be difficult to obtain or be of questionable quality. Use of grazing also allows the detachment to carry less. Grazing on wet or frosted alfalfa or clover should be avoided to prevent gas colic. Except in an emergency, Johnson grass and grain sorghum should not be grazed.

PELLET FEED

2-68. This type of feed has several advantages over conventional hay or grain rations. Storage requirements are decreased, it is easily deliverable by air, and nutritious by-products can be included. Total feed intake is usually increased when pellets are fed. One disadvantage is that the cost is higher than conventional feeding. Another disadvantage is the tendency of the animals to begin wood chewing or tail biting, but this problem is avoided if the animals are fed roughage in conjunction with the pellets. The contents of a pelleted feed should be selected according to the type of roughage being fed. Alfalfa, for example, provides more protein and calcium than grasses such as timothy and orchard. Consequently, the protein and calcium content of the pellet should be lower.

WATER

2-69. Drinking water as a feed component is of utmost importance. The nutrients of the feed must be in a solution before they can be absorbed. During work, sweating and other physiological functions greatly deplete the water content of the body's tissues. To compensate for this loss, the body draws from the digestive tract. A deficiency of water in the digestive tract not only affects digestion but may affect the general health of the animal by causing such problems as colic and debility. An animal can survive for a considerable time without food but succumbs in a few days if deprived of water.

FEEDING IN GARRISON

2-70. The times of feeding and watering while in the operational base or rear area should be fixed and regular. Feeding and watering, both as to time and amount, are based on the training, conditioning, and work being performed.

WATERING THE ANIMALS

2-71. It is important to offer the animals water and give them plenty of time to drink before feeding time. Normally, a pack animal requires about 8 gallons of water per day. However, the temperature and amount of work being performed will determine water requirements. The animals should be watered three times per day under normal conditions and four times per day when operating in an extremely warm climate. Under ideal conditions, water should be available to the animals at all times when they are not being used. Feed should not be distributed while the animals are being watered because they will not water properly when they have feed available. If the animal drinks immediately after feeding, the food in the stomach only partially mixes with the gastric juices, causing digestion to be incomplete. The flow of water through the stomach then washes a considerable portion of the stomach contents into the bowels. A loss of nourishment and indigestion or colic may result. Water may be given approximately one hour after feeding.

QUANTITY AND FREQUENCY OF FEEDING

2-72. The stomach of the horse and mule is small and is unable to function properly while holding large quantities of food. Once the stomach is two-thirds full, the feed will pass through the stomach at the rate it is taken into the mouth. Therefore, the stomach functions properly when it is two-thirds full. If the animal is fed too much at one time, the stomach may become excessively distended and feed will be wasted by not being properly digested. A feed of three to four pounds of grain represents the approximate amount an average animal should be fed at a single meal. This feeding may be followed by a long and slow consumption of hay. Under these conditions the gradual passage of food into the intestines then takes place under favorable conditions. If the total amount of grain is increased, it is better to increase the number of feeds rather than to increase the size of the ration at each meal.

WORKING AFTER FEEDING

2-73. Working an animal hard after a full feed interferes with its ability to work and with its ability to digest the feed properly. The animal's ability to work is hampered by difficulty in breathing, which is caused by the swelling of the stomach and bowels against the diaphragm and lungs. Digestion is also accompanied by an increased flow of blood and secretions and increased muscular activity in the bowels. Hard work diverts blood to other parts of the body, tires the intestinal muscles, and reduces secretions needed to aid digestion. As a result, the animal suffers a loss of nourishment from the feed, may develop serious disorders of the digestive tract, and may die. The animals may be worked safely one hour after feeding.

FEEDING AFTER WORKING

2-74. The digestive organs of a tired animal are just as fatigued as the rest of the body. Therefore, a tired animal should not be fed a full ration. Most of the blood supply is still in the muscles, the muscles of the digestive tract are tired, and the glands used to secrete digestive fluids are not ready to function properly. The animal must be cooled and rested before feeding. Give the animal small amounts of water at frequent intervals and permit him to eat

long hay. After about 30 minutes of rest, give him a small portion of grain followed by the balance, a little at a time, after an hour or more. Failure to take these precautions frequently results in colic, laminitis (lameness caused by swelling of the feet), or both. The method of feeding just mentioned is time consuming. If it is not possible to use that method, feed the animals once after waiting 1 to 2 hours after work.

FEEDING PROCEDURES

2-75. Feeding a small amount of hay before feeding grain stimulates an increased flow of saliva and gastric juices, takes the edge off the appetite, and quiets the nervous animal. In the morning, it is not necessary to feed hay first because the animal has probably been eating hay all night. An ideal way to feed hay is to keep it before the animal continuously by replenishing the supply frequently with small quantities. Feeding chaff with the grain adds bulk and forces the animal to eat more slowly, ensuring more thorough mastication.

FEEDING IN THE FIELD

2-76. Feeding pack animals away from garrison in a field or combat environment presents problems that are not present in garrison. The greatest problem is setting a regular schedule of feeding times. The hours that animals work in the field or under combat conditions are seldom the same every day. Therefore, to adhere to the principles outlined above, the animals must be fed smaller rations at more frequent intervals. It is very important to ensure every animal is fed a full ration every day to maintain the strength required to work in the field.

2-77. Due to logistic constraints, there may not be enough hay available to ensure the animal receives the required roughage. In this case, the animal must be allowed to graze at every opportunity to obtain sufficient roughage. Grazing should be allowed while at a bivouac location and at halts while on the march. A halt of an hour or more to feed grain should be planned if the duration of the movement will exceed 5 hours. Important points to consider when feeding in the field are covered below.

WATERING ON THE MARCH

2-78. Watering on the march should be done whenever possible, especially on hot days. When watering a string of animals on the move, such as at a stream crossing, allow the entire string to get in the water before letting any of the animals drink. Otherwise, the lead animals will drink and then try to move down the trail before the rest of the animals in the string have had a chance to drink. Watch to ensure all animals have had the opportunity to drink before moving the string. Angle the string upstream so the animals ahead do not foul the water. Give the animals ample opportunity to drink their fill and not be led away the first time they raise their heads. After watering, keep the animals at a walk for 10 to 15 minutes before increasing the gait or coming to a long halt. This action will prevent digestive disturbances.

FEEDING HALTS

2-79. Try to plan the place for a feeding halt 2 or 3 miles past a watering point. Give the animals a little hay after arriving at the feeding point and tying them to the high line. This procedure will help relax the animals and start the secretion of the gastric fluids.

FEEDING AT BIVOUAC

2-80. When it is necessary to feed and water at a bivouac location, wait at least 45 minutes after arrival to water the animals. Remove the bits if a full watering will be allowed. When watering at the bivouac location, an individual should lead the animals to the water on foot. A person should lead no more than two animals at a time. When they drink, he should stand between the animals so they do not crowd each other. As stated before, the animals should receive ample time to drink and should not be led away from the water the first time they raise their heads. The animals should go to the water and leave the water together. Watch that the animals do not start pawing the water or lie down in it after being watered, as they often do. These actions will stir sediment on the bottom and make the water unfit to drink by other animals.

FEEDING OFF THE GROUND

2-81. Whenever possible keep animals from feeding off the ground. As they eat off the ground they pick up dirt and sand. The sand or dirt will accumulate in the colon. With time the animals will develop colic due to obstruction or they will develop diarrhea due to irritation. Feeding off the ground also causes premature wear of their teeth. For animals that are predisposed to forming sharp points and hooks, this will accelerate their development and subsequently degrade the animal's ability to eat.

WATER SHORTAGES

2-82. When water is scarce, its consumption will have to be regulated. If the bits are removed, animals can drink from a very shallow container. A small quantity will let an animal keep moving if you give the water by the swallow instead of allowing him to take one long draft.

FEEDING HAY

2-83. When the animals are on a high line, break the hay from the bales and distribute it along the high line. Feed the hay in small quantities and replenish it frequently. This procedure is especially important in damp climates or while it is raining. If the rain is expected to be continuous over a long period of time, it is best not to feed hay at all. Feeding damp hay will cause serious colic in the animal, and moldy hay should never be given. As mentioned before, cattle can eat moldy hay without problems, but horses and mules cannot. Wait until the rain is finished. Break the bales of hay apart and distribute only as needed. Personnel should ensure the animals do not work the hay beneath them where they cannot get to it.

FEEDING GRAIN

2-84. When feeding grain in the field, feed the animals from a feedbag and ensure the feedbags fit properly. If they are too loose, the animals will toss their heads trying to get to the feed and grain will be spilled and wasted. Watch the animals while they are feeding from a feedbag, and never allow them access to water until they have finished eating and the feedbags are removed. While attempting to drink, they could get the feedbag filled with water and drown. To conserve feed, spread any feed left in the feedbags on a cloth to dry. The feed can then be used for the next feed. Grain should not be spread on the ground for the animals to eat. When the animals eat it, they also ingest dirt, which can lead to colic. Any grain spilled on the ground in front of the animals should be swept.

CARE OF FORAGE

2-85. The care of forage is extremely important to the health of the herd. Feeding damp or moldy hay can cause colic and could disable a large portion of the herd at once. Inspect the forage at the time of delivery to ensure the quality of it. In garrison, shelters are available to keep the forage dry. In the field, make every attempt to keep it dry. When the feed is packed on animals for transportation, cover it with a manta. This precaution will protect the feed from the elements and keep the animals from getting into it during the movement. During temporary storage, raise the forage off the ground by timbers (or whatever else is available) and cover it to keep it from getting wet and keep loose or stray animals from getting into it.

Chapter 3

Animal Care and Training

The proper care and training of pack animals is essential to the health of the animals and their performance in the field. Without proper care, the animal's health and the unit's ability to complete its mission will suffer. Without proper training, the unit cannot rely upon the animal to behave in a manner that ensures mission accomplishment.

GROOMING

3-1. Grooming is essential to the general health, condition, and appearance of animals. It also provides an excellent time to inspect them for injuries. When grooming before movement, check the animals for injuries. Also, check the condition of past injuries, if any, at this time. When grooming after movement, check the animals for injuries sustained on the trail and for any evidence the saddle or harness may have chafed the animal. These precautions permit treatment of any problems before they get to the point of incapacitating the animal. The value of grooming depends on how thorough the handler does it. The animal handler obtains efficient grooming when he takes pride in the appearance of his animals.

WHEN TO GROOM

3-2. The animal handler should groom every animal thoroughly at least once each day. Always groom an animal before leaving the stable area for work or exercise. Before saddling the animal, be sure the areas where the saddle pad, cinch, breast collar/strap, quarter straps, and britching ride are free of dirt and foreign objects. Failure to clean these areas will result in sores and could cause the animal to be unusable. On return from work or exercise, remove, clean, and put away any equipment. Cool a heated, wet, or sweating animal before grooming it. Give it a brisk rubbing with a cloth to partially dry the coat, then blanket the animal (if a blanket is not available, leave the saddle pad on) and walk it until it is cool. Check for injuries that may have occurred during movement.

EQUIPMENT

3-3. Each individual responsible for the care of animals should have a grooming kit. The basic kit consists of a currycomb, horse or body brush, hoof pick, and a grooming cloth (Figure 3-1, page 3-2).

Currycomb

3-4. The handler can use this circular metal device with sawtooth-like edges to remove caked mud, to loosen matted or dried skin and dirt in the hair, and to clean the body brush while grooming. He should never use it on the legs below the knees or hocks and never use it about the head.

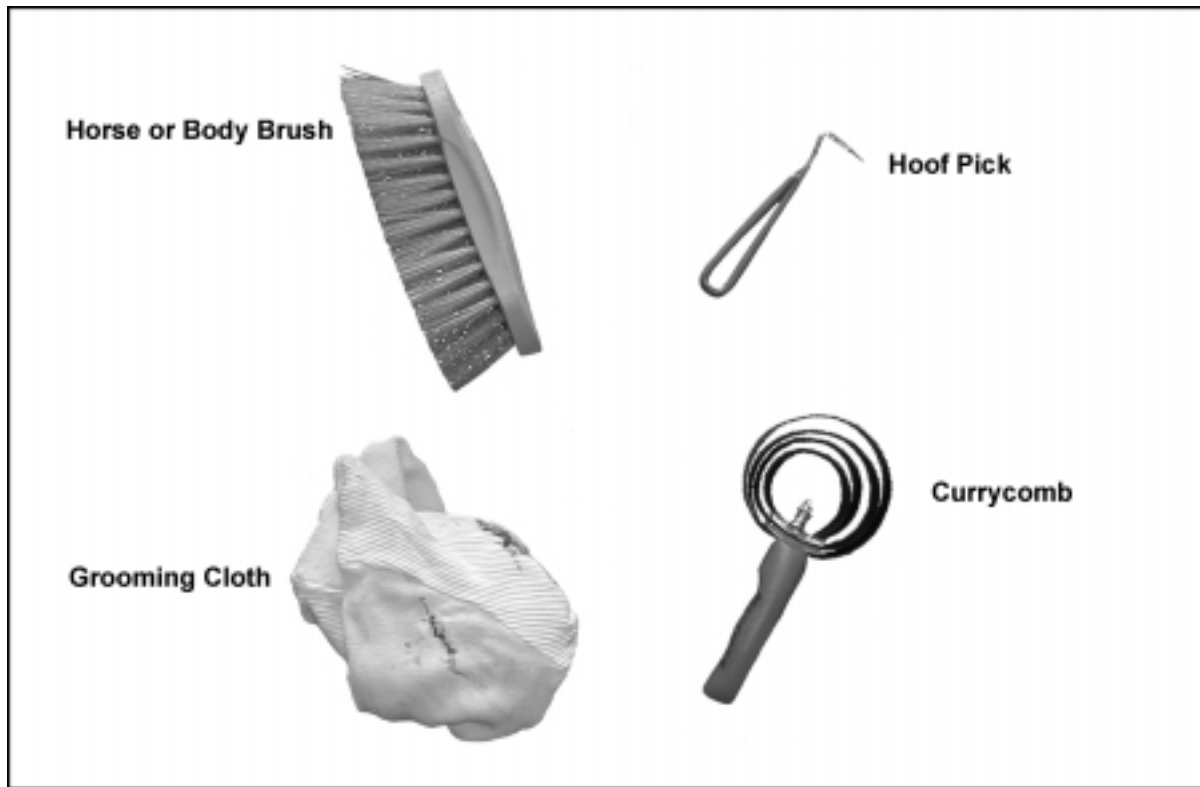


Figure 3-1. Grooming Kit

Horse or Body Brush

3-5. This brush is the main tool used in grooming. When used properly, the bristles of the brush penetrate through the hair of the coat and remove dirt and flaked skin from the hide as well as from the hair. Various brushes are available. Generally, it is better to use a stiffer bristle to better penetrate the hair on the coat.

Hoof Pick

3-6. Hooves should be cleaned daily and trimmed or reshod every 4 to 6 weeks. This small metal pick allows the handler to clean rocks and packed dirt from the hooves. Always use the hoof pick in a downward motion toward the toe.

Grooming Cloth

3-7. The handler uses the grooming cloth to clean the body orifices and to give a final polish to the coat. He can make a grooming cloth, about 2 feet square, from old toweling or any other type of soft cloth.

GROOMING SEQUENCE

3-8. A prescribed sequence of grooming will enable the animal handler to groom effectively and thoroughly. The following paragraphs explain the recommended sequence.

3-9. Check the animal for any signs of lameness as you walk it to the grooming area. If any exist, thoroughly clean the hoof of the affected leg with the hoof pick and look for rocks or other debris causing the problem. Clean **each hoof** every day in working animals. One school of thought is that the soft dirt and debris packed in the hoof gives the animal extra cushion to walk on in rough terrain. Whether cleaned daily or not, the handler should check the animal's feet for thrush, torn frog, loose or missing shoes, and cracks. Report defects at once to the medic or veterinarian.

3-10. Take the currycomb in the right hand and the brush in the left. Go over the left side of the animal with the currycomb beginning at the neck. Continue down to the breast, withers, shoulders, foreleg and knee; then smoothly transition to the back, side, belly, croup, and hind leg to the hock. Strike the currycomb frequently against the heel or side of the brush to free the accumulated dirt and dried skin. Ensure the currycomb follows the natural lay of the hair.

3-11. Brush the entire left side of the animal in the same order as above except brush the legs down to the hoofs. After a few strokes, clean the brush with the currycomb. In using the brush, stand well away from the animal, keeping your arm stiff, and throw the weight of your body behind the brush. A twist of the wrist at the end of each stroke will flick the dirt away from the hair. Ensure the brush follows the natural lay of the hair. This use of the brush is not necessarily a separate activity from currying; you can do both at the same time with a brush stroke following each currycomb stroke. Pass to the right side of the animal, change hands with the brush and currycomb, and groom the right side in the same order as above.

3-12. Brush head, mane, and tail. In cleaning the mane and tail, begin brushing at the ends of the hair and gradually to the roots, separating the locks with your fingers to remove dried skin and dirt. Wipe eyes, nostrils, and lips and rub the head, ears, and muzzle with the grooming cloth. Clean the dock (fleshy part of the tail) and give a final polish to the coat.

NOTE: As a precaution against the spread of skin diseases, wash grooming equipment and drying cloths with soap and water once a week.

ANIMAL INSPECTION

3-13. Inspect the animals, as indicated above, while grooming them. Good grooming offers the opportunity for close examination of the animal and the discovery of injuries or defects that otherwise might pass unnoticed. Correcting or treating these defects or injuries greatly reduces the number of noneffective animals in a unit. Along with wounds or other injuries present, there are others that are not immediately visible to the naked eye. For example, the animal handler can detect some joint and ligament injuries by inflammation or swelling. These injuries are often very slight and subtle, and the handler can best detect them by knowing precisely what is normal. The only method to establish your experience base is to run your hands along the pack animal's body daily with particular attention to the legs. If the animal flinches as you get to the area just to the rear of where the saddle rides, it is a sign that its kidneys are sore. This pain might result from poor saddle placement or improper riding position.

WARNING

Under no circumstances will an untrained soldier attempt to shoe an animal. Improper shoeing or quicking of an animal will result in long-term damage to animal and soldier alike.

GROOMING SICK ANIMALS

3-14. Do not groom animals that are sick, weak, or depressed. They should be hand-rubbed at least once a day. Wipe their eyes and nostrils out with a damp sponge or soft cloth and clean their feet. Leave this cloth near the animal. Do not place near other animals' equipment or feed and do **NOT** use it on any other animal. Groom animals with minor ailments in the usual manner. Do not clean or disturb animals with tetanus in any manner at all.

FARRIER SCIENCE

3-15. While not farriers, individuals must be able to replace, at least, a loose or missing shoe when they are not available. The usefulness of a pack animal depends on the health and condition of its feet. The use of a "hoof boot" should be the first course of action when an animal loses a shoe. This item is part of the Pack Animal First Aid Kit. The feet of a normal animal, due to their structure, require very little care or protection while on free pasture or even under light working conditions. At moderate work levels on good footing, an animal may require no more than cleaning and periodic rasping to trim and level its feet. The hind feet need only moderate care since they receive less shock. The front feet carry 60 to 65 percent of the load. As the workload increases or the terrain becomes more difficult, the animal's feet require additional care and protection. Shoeing protects the feet from excessive wear and enhances balance, support, and traction.

BASIC SHOEING

3-16. Hoof growth, shoe wear, and the work required of the animal governs the frequency of shoeing. On the average, shoes may remain on the animal without change or adjustment for 1 to 2 months, though 3 to 4 months wear is occasionally possible. A farrier does the routine refitting. However, all handlers should have a basic understanding of the shoeing process, and several in each unit should be able to replace or refit a lost or outgrown shoe.

FARRIER TOOLS

3-17. A farrier's kit should contain pincers, a pritchel, clinch cutter, hoof knife, hoof nipper, hoof rasp, blacksmith and driving hammers, clincher, fencing pliers, and assorted shoes and nails (Figure 3-2, page 3-5).

RAISING AND HOLDING THE FOOT

3-18. It is important to know the proper way to raise and hold an animal's foot before doing any farrier work so that you can control the animal and

have both hands free to work. Working with the front and hind legs is slightly different. The following paragraphs explain each procedure.

Pincers	Used to remove the shoe from the hoof, cut off excess length of clinches, or remove improperly driven nails.
Pritchel	Used to enlarge the nail holes on shoes or to assist in extracting reusable nails from shoes.
Clinch Cutter	Used to cut or straighten the nail clinch before removing the shoe. The handler uses the blade end for that purpose. He can use the other end as a pritchel.
Hoof Knife	Used for cutting excess horn from the sole of the hoof and for trimming the frog, if necessary. It is available in right- and left-handed models.
Hoof Nipper	Used to remove the excess growth of wall from the hoof when preparing to replace or refit a shoe.
Hoof Rasp	Used to remove excess hoof wall and to level the bottom surface of the hoof. The rough rasp is a hoof rasp that has become dulled. The handler can use it to remove the burr under the clinches and to smooth the clinch after the shoe has been replaced. He can also use the rough rasp to file away the clinches when removing a shoe.
Blacksmith Hammer	Used to shape the shoes to the animal's feet.
Driving Hammer	Used for driving the nails that secure the shoe to the hoof and for forming the clinches.
Clincher	Useful in finishing the clinches, especially when working on young or lame horses that object to having their feet struck with the hammer.
Fencing Pliers	Have several uses in the kit. They can be used as a hammer or for cutting nails and many other functions in caring for animals' feet. Can also be used to repair saddles and harnesses.

Figure 3-2. Farrier Tools

Front Foot

3-19. To raise a front foot, face the rear and place the hand nearest the animal on its withers and talk to it. Run your hand down the animal's shoulder and leg to the tendon in the back of the leg just above the hoof. Grasp the tendon between your thumb and forefinger and squeeze slightly.

3-20. Allow time for the animal to lift his foot, then slip your hand around and lower on the leg until you are cradling the hoof in the palm of your hand. Move closer to the animal and pass his foot behind your knee nearest the animal and into your other hand, which has been passed between your legs to receive it. To free both your hands for work, press your legs together with the sides of the hoof just above the knees.

3-21. Do not raise the animal's foot too high or too far away from his body. Stand with a pigeon-toed stance, bend your legs, and keep your back straight. This posture will free you to work with both hands. While you are working on the animal's leg, you should be very aware of things around you so that you

can predict the intentions of the animal. Unless suddenly frightened, an animal is quite predictable about wanting his feet on the ground. When an animal is getting a little tired and wants the front leg down, he will test your grasp of his leg with a few jerks. If he is going to hop on his other foot to get away, he will invariably move forward slightly with both hind feet in preparation for this move.

3-22. The farrier should not let an animal take his leg away every time he wants it. Be considerate of the animal, but do not let the animal be the boss. The animal will soon get the idea that he can set his foot down as he sees fit, which can be dangerous.

Hind Foot

3-23. To raise a hind foot, face the rear, place your closer hand on the animal's withers and stroke it across the back to the hip, then down the hip and leg to the fetlock. Grasp the fetlock with your fingers. Draw the leg toward you. The animal will shift his weight and pick up his foot.

3-24. With one fluid motion, slide into position by moving toward the raised leg and put the leg in your lap. Your leg (the one nearest the animal) presses against the inside surface of the fetlock joint, your outer leg holds the other side of the fetlock. Lock the hind leg into position by placing your arm over the hock. Adjust the hind leg and yourself so that the back of the leg is firmly in your armpit. The animal will not be able to pull free. If the animal struggles and tries to kick, release your hold as the animal attempts to kick backwards. By letting go, you have time to move to the side before the animal can pull back and kick you. If you release as the animal is pulling the leg towards his head, you will not have enough time to move.

3-25. An animal will indicate when he wants his hind leg down. He will "cock" his leg by drawing it forward and upward toward his stomach, as if to "cowkick." If he does not cock his leg, he cannot kick with any force.

SHOE REMOVAL

3-26. To replace a shoe that has not come off the animal, you must follow a specific sequence to correctly remove the old or damaged shoe.

3-27. Look at the hoof approximately 1/2 to 5/8 of an inch from the shoe. You should see where the nails holding the shoe have come out of the hoof and are bent over or clinched. Using the clinch cutter and driving hammer, cut or straighten the clinches of the nails holding the shoe in place. Place the blade end of the clinch cutter under the nail point and tap the other end with the driving hammer. You can also use the rough rasp to accomplish the same thing by filing down the clinches. Ensure the clinches are completely gone by straightening or filing. Failure to do so will hinder removal of the shoe or crack the outer hoof wall. This outcome will require a custom shoe with displaced nail holes. Driving a nail in the same location will likely "quick" the animal and make it lame.

3-28. Pull the shoe by wedging the cutting edges of the pincers between the shoe and hoof at the heel and then exert a quick thrust toward the toe. Repeat the procedure, alternating from one side of the shoe to the other,

progressing toward the toe until the shoe is removed. Once you remove the shoe, check to see if all the nails came out with the shoe. If they did not, check the hoof to see if any nails remain. Remove any remaining nails with the pincers.

HOOF PREPARATION

3-29. Using the hoof pick (found in the grooming kit), thoroughly clean dirt and debris from the hoof. Then pare away the dead horn over the white line with the hoof knife. Do not touch the frog unless you cannot insert a hoof pick between the bars of the frog. In such a case, narrow the frog slightly, but try not to involve the surface touching the ground. Be careful not to remove too much of the frog. The frog must be touching the ground and bearing weight. Lack of pressure on the frog will lead to contraction of the heels. Level the foot with the rasp. Use long, smooth strokes from heel to toe. Be careful not to use too much rasp pressure when passing over the heel. You can always take off a little more heel later, but you cannot replace what has been removed. Do not expose live horn except over the white line and the outer border of the sole; the animal needs a covering of dead horn to protect the sensitive sole against bruising. Be sure to leave the bars intact as cutting away these structures can cause contraction of the heels and quarters. Sight across the hoof to see that the surface is flat.

SOFT SHOES OR HARD SHOES

3-30. Regular metal horseshoes throw off a lot of sparks as the animals walk over rocky ground. These can easily be seen from a distance at night and may compromise location and activity. Additionally, these sparks can start fires if the tender is very dry. "Nonsparking" horseshoes made of softer metal or special hard plastic shoes avoid these problems, but do wear out faster.

SHOE REPLACEMENT

3-31. Fit the shoe to the hoof by holding it so that you can see the white line through the nail holes. See that the shoe lays flat on the hoof surface without rocking. Eliminate any wobble between the shoe and hoof by rasping the high spot on the hoof. You may have to bend or shape the shoe as needed since it may have become deformed if it was worn loose for a time. Do not worry about the excess hoof wall in front of the toe of the shoe. You will rasp the excess away later in the shoeing process.

3-32. Before driving nails, position the shoe over the hoof and make absolutely sure all nail holes are outside the white line. The white line measures approximately 1 mm wide and forms the juncture between the fleshy sensitive lamella (attached to the bone inside the hoof) and the hard insensitive lamella (attached to the hoof wall). Driving a nail into the white line can make the pack animal lame.

3-33. Secure the shoe to the hoof with nails and the driving hammer. You should slightly bend the horseshoe nails near the point so that they will turn out of the hoof when pounded into it. The other side of the nail is flat. Always place the flat side of the nail so that it faces the outer edge of the hoof. You can be sure the nail is facing the right way by looking at its head; there is

checkering on one side of the nail head. The checkering should always face the inside of the hoof. Grasp the nail between your thumb and forefinger and make sure the flat side of the nail faces the outer surface of the hoof. Place the point of the first nail through the third nail hole on one side of the shoe, pointing parallel to the horn fibers of the hoof. Tap the nail lightly several times to start it into the hoof wall.

3-34. To force the point of the nail through the outer surface of the wall at the desired spot, continue to apply light blows until the nail is driven approximately two-thirds of the required distance. You should then apply one sharp heavy blow on the head of the nail to force the point through the wall. The bevel on the point of the nail is effective only when driven rapidly through the horn. If the animal twitches or jerks away at any time during the nailing, pull the nail and check for moisture or blood on it. The nail should exit approximately $\frac{3}{4}$ of an inch above the ground surface of the foot to sufficiently hold the shoe. If there are old nail holes in the wall, the new nails should emerge at least $\frac{3}{8}$ of an inch from the old holes. This length puts the new nails in hoof fibers strong enough to properly hold the nail. After the point emerges and you drive the nail head solidly into the crease of the shoe, immediately remove the point of the nail. Do this quickly to avoid serious injury to you should the animal decide to pull his leg away suddenly. To remove the point of the nail, point the claws of the hammer toward the toe of the hoof. Place the claws onto the nail point as deep as possible and close to the hoof wall, bend the nail straight out from the wall, and rotate the hammer. This procedure will "wring" off the point and excess length of the nail. Repeat the process with the same hole on the opposite side of the shoe.

3-35. After you drive in two nails, check the shoe to ensure it still fits properly. You can adjust the fit by tapping lightly with the hammer to move it into place. Then put the remaining nails in the shoe. You may find it easier to "start" the first nail on each side of the shoe before driving either of them all of the way. "Set" the nails by striking the heads sharply with the driving hammer. Make sure you hold a solid metal object (such as the flat side of the pincers) firmly against the end of the nail that protrudes through the hoof when you strike. Some farriers think that the order in which you set the clinches is very important. The recommended sequence is to set the two nails nearest the toe on the opposite side, then the quarter and heel nail on the first side, followed by the remaining heel nail. Cut off the nail points with the pincers. Leave enough length for a proper clinch. The clinch should be approximately $\frac{1}{8}$ of an inch long. A clinch that is too long can cause the wall to break should the shoe become caught on something and pulled off. The wall fibers of the hoof will break when the nail emerges. Remove the resulting burr under the seated clinch with the file side of the rough rasp. Be careful to file away only the burr. Do not file a deep groove around the hoof; make it just large enough to contain the clinch. Use the clincher to bend the clinches down into the groove.

3-36. Once again, take the pincers and the hammer to finish forming the clinch. Hold the pincer jaws against the head of the nail and strike the end of the nail to seat it even with the wall surface. You should bend the nail abruptly at the hoof wall. Ensure the hammer travels parallel and as close to the hoof wall as possible. You can use the clincher for this step if one is

available. The clinches are now finished. Using the file side of the rough rasp, smooth the nails leaving no sharp edges on the wall of the hoof. Rasp and shape the hoof to the shape of the shoe. Most of this rasping will take place in the area of the toe and anterior quarter. Be careful not to rasp too much and rasp away the clinches.

FARRIER'S OBJECTIVE

3-37. The shoeing process will become clearer when it has been demonstrated. Remember, the intent of this section is only to enable you to replace a loose or missing shoe. If possible, you should fit each animal with an extra front and hind shoe. These shoes, their nails, extra nails, and farrier tools should be part of the standard equipment packed whenever you take the animals out. The best way to prevent losing shoes is to catch them early. Check them frequently by tapping them with a hoof pick. Shoes that are loosening will often sound different. The frequency to check them depends on the terrain. Loose shoes may not be lost from a pastured animal for several days. However, loose shoes in rocky terrain can be lost in a few hours. If a shoe becomes loose on the trail, remove it if possible, to avoid its loss or injury to the animal. It would be ideal to replace lost or loosened shoes immediately, in garrison or on the trail. However, there will be times in the field when it is impossible to replace a shoe before 2 or more days have elapsed. This delay is typical and may have little or no adverse results. If this situation occurs, reduce the load of the pack animal or have a rider spend more time walking than riding his mount if it is a riding animal. Finally, there are the urethane "spare tires." Animal handlers can use them as temporary replacements to shoes, to add traction, or to soak an injured hoof. They are commonly known as "easy boots."

FIELD TRAINING

3-38. A pack animal detachment will not always be able to work with animals that are trained and conditioned to pack. Even if the animals are trained to pack, they may need retraining or conditioning. In such cases, you need to know some of the basics of training and conditioning animals. This section should give you enough information to evaluate the level of their training and to train and condition them as necessary for pack operations.

TRAINERS

3-39. The attitude of personnel training pack animals is extremely important. A person assigned to train animals must have a better than average knowledge of animals. He must also have patience, tact, firmness, and a liking and aptitude for animal management. Experienced and knowledgeable trainers seldom need much in the way of restraint. They work confidently, orderly, and efficiently around the animals. As a result, the animals are cooperative, more productive, and sustain few injuries. Inexperienced trainers tend to use more restraint than necessary; are less confident and orderly; and consequently less efficient. Likewise, the animals buck more, are less productive, and sustain more injuries. A person who is afraid of animals or who will become frustrated easily with them will not do well. Above all, the trainer must not take out his frustrations on the animal by beating, kicking,

or using excessive restraint on the animal. A good animal trainer combines an intelligent respect for animals with a lack of fear. An ideal pack animal trainer will be—

- Systematic.
- Patient.
- Tactful and resourceful.
- Moderate.
- Observant.
- Exacting.
- Logical.
- Tenacious.
- Consistent.

REQUIREMENTS

3-40. Previous experience and current abilities will determine the training needs of animals. Along with their physical conditioning, trainers must evaluate the animals on their level of proficiency in leading; packing; riding; picketing; standing; gaiting; swimming; balance; and conditioning to the sights, sounds, and smells of battle. Untrained animals never used for pack purposes will require a complete training and conditioning program.

EXERCISE AND CONDITIONING

3-41. An animal requires good conditioning to perform the work demanded of it without injury to its body and muscular organs. You can acquire and maintain good conditioning through a progressive program of proper exercise and feeding. Objectives of the program are endurance, stamina, a good state of flesh, and resistance to disease. You can attain these objectives only by proper feeding and long periods of conditioning work at the slower gaits, mostly the walk. You must condition both pack and riding animals to carry the weights required in field operations.

3-42. Exercise must be regular, graduated, and always within the capabilities of the animal. Working tired or unfit animals can cause accidents. If an animal is idle for a considerable time, you must repeat its process of conditioning. The minimum period of exercise necessary to maintain an animal in working condition is 2 hours daily. Animals need not be maintained in peak condition for field duty at all times. However, they should remain in such condition that a relatively short period of carefully scheduled work will put them in fit condition for anticipated duty. The kind and amount of exercise given to animals depend on the type of work they are to perform, their current condition, and the number of individuals available to exercise them. Although the most satisfactory exercise is gained by assigning one or two animals to an individual, pack units (with limited manpower) will normally have to adopt other methods. Begin any period of exercise with 10 to 15 minutes of walking to ensure good circulation, particularly in the feet. Instead of hard surface roads, try to select dirt roads for exercise because they are easier on the animals' feet and legs. Also, work the animals on trails or cross-country to maintain their fit condition. If you are exercising two

animals, try to always ride one out and the other in and lead each alternately on his right and left. This habit will get the animals used to both being led and ridden. End each exercise period with a 10-minute walk to return the animals to the stables dry and breathing normally. The walk is the prime conditioning gait. Walking develops muscle, trotting improves balance, and galloping develops wind. If you use either of the faster gaits in excess, the animal will lose rather than gain condition. Determine the length of trot periods by the condition of the animals, but in no case exceed 7 minutes. Vary the routes for exercise from day to day so that the animals will not recognize the route and try to hurry back to the stables. Also use different routes to relieve monotony. Try to set up the training and conditioning program according to the amount of time available and the level of proficiency of the animals and handlers.

PROGRAM DEVELOPMENT

3-43. At the beginning of training, animals may be in poor physical condition and unaccustomed to hard work. To properly condition animals, yet avoid injury, ensure operations are long in duration but mild in character. According to the training principles mentioned above, each animal should receive advanced training that includes gentling, leading, riding, standing, packing, gaiting, swimming, and seasoning to battle conditions. Use actual field movements, progressive in length, throughout the training period to build up endurance. Conduct a part of such field movements and other phases of training at night to prepare the animals for night operations. Pay close attention to the animals during night training to determine if any are night blind. If so, supplement the diet with Vitamin A. Personnel who train animals should know how to use restraining devices for controlling animals. Such devices include the twitch, cross tie, and blinds. Exercise great care, however, when using such devices. It is best to use the mildest and least dangerous method of restraint necessary to achieve the desired results. Remember, kindness, perseverance, and tact oftentimes will accomplish the desired purpose without using restraint.

Restraining Animals

3-44. Many ingenious devices have been developed over the years for restraining animals. Some have proven useful and humane and have helped to quiet and train animals. Others, while they temporarily quiet and subdue the animal, make his attitude worse than it was originally. Once you use these methods on an animal, he will get to the point where he is neither gentle nor likely to carry a load. He will start showing many bad habits, such as bucking off the pack load. Remember, use restraints only when needed and use the least amount of restraint needed.

3-45. *Blinding.* This method is the easiest way to restrain an animal. Make sure to tie the animal securely to a tree or post. Then take a piece of cloth (a gunnysack or jacket) or anything else that can be placed over the eyes and tie it around the back of the animal's head. When blinded, an animal will seldom try to move because he will not be able to see. Once the animal responds to the restraint, vary the amount and use the least amount of restraint necessary. Reward good behavior. By responding with less restraint to the

animal when he behaves correctly, you will gain his trust and respect. He in turn will be more productive and easier to manage.

NOTE: Under no circumstances should you move an animal, no matter how slightly, while it is blinded.

3-46. *Twitches.* Animal handlers use twitches because they are the handiest and most common method of restraint. As it shuts off circulation in the lip, never use it continuously for an extended time and never with greater force than is necessary. Make a twitch by running a small piece of rope or chain through a hole in the end of a rounded piece of wood 2 to 5 feet long, such as a pick handle, and tie it in a short loop (Figure 3-3). Pass the loop of the twitch over the upper lip, which you seize by your hand and draw forward, taking care to turn the edges of the lip in to prevent injury to the mucous membranes. Tighten so the twisting points up over the outside of the upper lip. If the twitch is twisted down towards the end of the upper lip, it will easily slide off as the animal shakes its head or pulls away. Then tighten the loop by twisting the stick until you obtain sufficient pressure. Light changes in pressure with increases against resistance and decreases as the reward for obedience will help keep the animal's mind off the reason for the restraint and reduce the need for severity. These changes also help in training him to be more controllable. You should seldom use the twitch as a restraint while saddling or packing animals. Use the twitch mostly when restraining for medical treatment or shoeing.

CAUTION

Any long handle twitch can be very dangerous. If the animal is successful in pulling free, the twitch becomes a high velocity, high energy object that can fly 50 meters or more. Fractious horses and mules can eventually pull these twitches free from even the strongest and most determined handler. Other twitches are safer. One is the pincher style that can be clipped to the handler.



Figure 3-3. Twitch

3-47. Handlers also use another type of twitch made from a 16-inch piece of cord, such as parachute cord, and a horseshoe. Tie the cord with a square knot to form a continuous loop. Then twist it and fold to form two smaller double loops. Place the double loops over the upper lip in the same manner as a long-handle twitch. Insert one quarter of the horseshoe into the loop so that the cord will tighten against the side (quarter) of the horseshoe. Turn the horseshoe to tighten the loops in the same manner as tightening a tourniquet with a stick. Tighten so the twisting points up over the outside of the upper lip. If the twitch is twisted down towards the end of the upper lip, it will easily slide off as the animal shakes its head. Insert the opposite quarter of the horseshoe into the ring on the halter. If this twitch is applied properly, it will not come off as the horse or mule pulls back and shakes his head. If he tries, let him. After a few failing attempts, he will cease fighting and you can proceed.

3-48. *Cross Tie*. Trainers often use the cross tie as a mild form of restraint. It consists of securing the animal's head in a normal raised position by two tie ropes extending from the ring in the halter to opposite sides of the stall or between two trees (Figure 3-4). When properly adjusted, you may use the cross tie to your advantage while grooming, saddling, or doing any work around the animal. It also prevents an animal from chewing a wound and from lying down when you need him standing.



Figure 3-4. Cross Tie

3-49. *Distractions.* Often a distraction rather than a restraint will enable the handler to accomplish what task needs to be completed. Three forms of distraction are as follows:

- Rubbing the lower eyelid.
- Tapping over the nasal sinuses.
- Hand twitches to the point of the shoulder.

3-50. Merely rubbing the lower eyelid with your index finger will distract the animal while completing short procedures. Place the palm of the hand on the side of the face. Keep the palm of the hand next to the face so that the hand will move as the head moves. Failure to maintain contact with the palm against the face will often result in inadvertently touching the eye as the animal moves its head. Rub the lower eyelid with light to moderate pressure, but ensure the index finger does not slip into the eye. Lightly tapping over the nasal sinuses will also distract the animal enough to complete short procedures. Tap the fingers over the nasal sinuses with light to moderate pressure.

3-51. *Other Restraints.* Trainers use additional types of restraints when treating an animal whose condition is such that complete immobilization of the part to be treated is required. They use these methods only under normal conditions. Giving tranquilizers makes the more severe restraints unnecessary and reduces the danger to the animal from abuse at the hands of the ignorant or inexperienced. Other restraints include the—

- Side stick.
- Muzzle.
- Knee strap.
- Casting rope.
- Side line.
- Running “W” (Both front legs are restricted by rope and can be pulled out from under the horse. Should only be done on soft ground to prevent injuring the horse’s knees).

Calming an Animal

3-52. Fear is one of the animal’s strongest instincts. If fear is allowed to remain a dominant instinct, the animal cannot be trained satisfactorily to do the work demanded of him. The goal of the trainer throughout the training period should be to gain and maintain the confidence of the animal. Horses and mules have a remarkable memory and tend to remember the unpleasant experiences longer than the pleasant ones. Retraining thus becomes more difficult than initial training, especially with a young, impressionable animal. Rewards for accomplishment are extremely valuable in the gentling process. Patting the neck, rubbing the head, and hand-feeding are good aids in gaining the confidence of the animal. The unwarranted use of whips, switches, or other devices to inflict pain or restraint should not be allowed in training. A willing, confident animal will work to the extent of his physical ability while the scared, reluctant animal will expend less productive energy than his trainer.

Catching an Animal

3-53. The most convenient method of catching loose stock is by just walking up to the animal either in a corral or in the field. However, first, you must have gained his trust. Only through love and kindness to the animal will you gain his trust and respect for your presence at his neck. Once you start to catch a loose animal, do not give up just because he walks off or spooks. Do not leave him to go to another animal. If you are not firm, you will soon have an animal that is impossible to catch without either roping or cornering him in a corral. You will have taught him to avoid you by letting him go at the first sign of resistance. Maintain eye-to-eye contact while you are trying to catch a loose animal. The animal often communicates his intentions through his eyes. Also, watch the animal's ears. If they point backwards or cock to one side, you do not have the animal's complete attention and you must have it to catch him. He must respect you above all animals in the immediate area. The head of an animal being caught is not always the first thing a person should touch. Often the middle of the neck or the back area is the best area. Rubbing the animal about the withers and back will enable you to step in close to him and then hook your arm over his neck. Some animals will try to pull away from you at this point. If he pulls away from you more than once, slip the halter rope over his neck when you start to scratch or fondle him. You will then have a loop to hold him. When he starts to move away, stop him firmly. Immediately reward the animal for his obedience with a few reassuring pats and caresses. Do not knock him around for responding to the halter rope around his neck. If you do, the next time you want to catch this animal, you may not be able to get near him. Last, but not least, a little grain in a bucket or feed bag will usually let you catch most animals that are used to being grained. If they get used to being grained immediately after being caught, their anticipation of the grain will make them very easy to catch. Having an apple or carrot to give them after catching them is another way to ensure their cooperation, but be sure to always give it to them. Never tease them with a treat just to coax them into getting close enough to catch, then not give it to them. As mentioned before, horses and mules, especially mules, have good memories and will not forget such an insult.

Breaking to Picket

3-54. Picket breaking is an important thing to teach animals to ensure against halter pulling. If you picket-break an animal before attempting to saddle or pack him, the impression of secure fastening will never leave him. He will feel that any strain put on the halter or halter shank is useless. Trainers have used the following method for picket breaking successfully for many years. It saves time and labor, since the animal does most of the work, and seldom has to be repeated. Catch the animal and put a strong halter with a large halter ring around his neck. Get a good, strong, soft rope, 1 inch or more in diameter. Run one end through the halter ring and tie a fairly snug bowline around the animal's neck. Tie the other end securely to the middle of a smoothly trimmed log approximately 12 inches in diameter and approximately 20 feet long. Place the log in the middle of a smooth, open piece of ground where the animal will not be able to become entangled with anything except the above-mentioned equipment. If no logs are available, use something like a large truck or tractor tire. The animal may pull, tug, and

jerk on the log and try everything he can think of to get away from the log but without success and without harm to himself. Soon the animal will learn that it cannot go anywhere and that a halter and rope mean escape is impossible.

Training to Stand

3-55. You should teach an animal to stand still when the lead rope is hanging. Trainers call this kind of restraint a "ground hitch." Breaking to a ground hitch will prevent an animal from straying or running away if he comes loose from the pack string. One way to train an animal to stand with the lead rope hanging down is to run the lead rope through a ring attached to a spike in the ground. Place a set of hobbles on the animal and run the lead rope through the ring and then tie it to the hobbles. When the animal tries to move, he will not be able. He soon learns he should stand still when the lead rope is hanging. During this period, be sure to observe the animal from a distance to ensure no harm comes to the animal.

Leading

3-56. You must teach all animals to lead. First teach them to lead next to a dismounted packer. Then teach them to lead alongside well-broken animals. Leading should be at the walk, as daily exercise, until the new animals lead quietly and have improved sufficiently in condition to allow them to start their instruction under saddle.

Riding

3-57. You should break all animals to riding and ride with regularity during training before initial work under the pack. Since the mouths of young or untrained animals are tender, you should not use bits during the initial riding periods. Attach the reins to the halter or use a hackamore (a bridle with a loop capable of being tightened about the nose in place of a bit).

Packing

3-58. After the animal has been ridden for about 10 days, you can mount a packsaddle on him. For the first few days, do not load the packsaddle. Ensure the animal is thoroughly familiar with the method of saddling and unsaddling. Also make sure he stands quietly while packers are working before you place any load on the saddle.

3-59. Training under load should be progressive. Initial loads should be light, single-side loads such as sacks of oats. Do not attempt to condition the animal for top loads until he is completely conditioned for full side loads. When the animal is comfortable with this weight, add top loads to the side loads. Gradually increase the load from day to day until the animal is carrying his full payload of from 200 to 250 pounds. After you train the animal to stand, train him to stand while being saddled and packed. If at first he does not stand quietly, you may need to use the blind. As mentioned before, the blind is an exceptional aid and you should only use it when the animal clearly indicates the need. Never move an animal a single step while blinded.

Gaiting

3-60. Animals individually led by dismounted drivers maintain a rate of march of from 3 1/2 to 4 miles per hour and seldom move at a gait faster than a walk. Those led by mounted drivers may be required to take any gait demanded by the situation. The walk and amble are the most satisfactory gaits for mules. The animals can maintain the walk for long periods at 4 miles per hour (a natural gait for the animal) and tend to disturb the load less than at any other gait. The amble is an acquired gait, easily acquired by the mule, that increases the rate of march to slightly over 5 miles per hour. This gait is also easy on the load and hitches and, due to the increased rate of march, is favored over the walk on fairly level going. Trainers teach the amble to pack mules by increasing the rate of march gradually during the training period. In hurrying to keep up to the column, mules will first break into the amble for a few steps. These periods at the amble will gradually increase until they become confirmed in this gait.

Swimming

3-61. Trainers must teach pack animals to swim boldly and freely. Although they are naturally good swimmers, some animals are initially afraid of the water and will resist entering it. When they do go into the water, such animals fight their environment and swim very poorly. Introduce the animals to the water quietly, coax them to wade through shallow water at first, and then lead them into increasing depths gradually until they must swim. Known good swimmers should accompany the green swimmers during this phase of training to give confidence to the novices.

Battle Indoctrination

3-62. Trainers should try to mentally condition their pack animals to as many of the sights, sounds, and smells of combat as possible. Once the animals become accustomed to these sensations, you can feel assured about their docility and good conduct in the field. Trainers must conduct this mental conditioning or battle indoctrination, so that animals will not associate the sight, sounds, or smells with harm or pain to themselves. Following are some tips:

- Conduct a portion of the training in marching, packing, and unpacking close to motor parks. The animal will then be subjected to the—
 - Sounds of motors being started and warmed up.
 - Pounding of metal on metal and an occasional backfire.
 - Smells of exhaust fumes and raw fuel.
 - Sight of many types of vehicles, both moving and at rest.
- Lead the animals as close to active firing ranges as safety will allow, near rail yards and crossings, and in areas near operating airfields. These areas get them used to loud, sharp sounds and the sight of flying aircraft. Another way to accustom the animal to gunfire is to crack a bullwhip near it.

- Place cans containing pebbles, boxes of tin cans, or other noisy cargo on the loads so that creaks, rattles, and unusual noises generated on the load will not “spook” the animal.
- Subject the animals to such odors as iodine, ether, smoke, gasoline, disintegrating flesh, and rotting vegetation.

Training for Balance

3-63. Units normally use pack animals when crossing over terrain that is impassable by any type of motor vehicle. Traversing such ground requires a well-developed sense of balance. The mule naturally has a fine sense of balance. However, saddle and load will interfere with his natural balance unless he has some training under load over difficult terrain and learns to adjust to the actions of this dead weight on his back. Train the animal on terrain that is as similar as possible to the terrain in the operational area. Make him cross extremely narrow bridges, fallen trees, and ditches. Work him on steep, narrow trails, corduroy roads, over swamps and boggy areas, and along rocky slopes where you must select safe footing among loose stones. Trainers should use judgment in handling pack animals on difficult terrain, and they should avoid interfering with their natural balance. The mule, if left to himself, usually shows better judgment than the average handler. Therefore, let the mule pick his way through the very difficult terrain.

Chapter 4

Animal Health Management

Evaluation of the general state of any animal's health is an ongoing process accomplished through daily observation of behavior and routine examination of specific areas of the animal's anatomy. A rudimentary understanding of anatomy and physiology, a few simple examination techniques, and a familiarity with the behavioral patterns of the healthy animal form the foundation of veterinary science. Aided by materials contained in the basic first aid kit, handlers can treat pack animals suffering from minor injury or disease.

ANIMAL BEHAVIOR

4-1. Animals exhibit behavior indicative of emotion and well-being. They express anger, fear, and boredom with characteristic mannerisms. So, too, do they express pain and disability. Regardless of the individual personality traits developed by each animal, general behavioral patterns are common to the species and are useful as tools to evaluate physical status.

HEALTHY ANIMAL BEHAVIOR

4-2. The behavior a well animal exhibits is the benchmark. The handler must become familiar with its behavior patterns and be alert to changes in emotional or physical well-being. The healthy animal looks and acts well, reflecting mannerisms associated with humans. Emotions run the full spectrum from sadness to happiness. Behavior patterns become especially apparent when animals are observed in groups.

4-3. An animal shows its **happiness** by an initial dropping of the head, followed by lifting the muzzle in a circular manner. The upper lip may curl displaying the teeth in a classic "horse smile." Prancing and lifting the tail usually accompanies this behavior. The well animal, pleased with its activities, may also prance with its ears pointed forward, nostrils flared, tail up, and neck arched with head pointed down.

4-4. Intense absorption: nose, eyes, and ears all intently focused on the item or surroundings indicates **curiosity**. Even the stance brings the body into line. The animal will sway its head to better see an object directly to the front.

4-5. Circling, pawing or stamping, head shaking, and sideward dancing characterizes **frustration**. As frustration continues, the animal's activity results in sweating and unruliness. This behavior also typifies nervousness.

SICK ANIMAL BEHAVIOR

4-6. The sick animal, whether its illness is emotional or physical in nature, exhibits behavior indicative of its condition. An unhappy animal that is otherwise healthy will bring illness on itself. Conversely, a sick animal will exhibit mannerisms that aid in early awareness of injury and disease.

4-7. Signs of intense interest characterize **fright**. The animal will shift its head from side-to-side, allowing better vision. It holds its head high and makes audible sniffing sounds. Dancing and shying, often in a circular motion, shivering, and tail swishing accompany increasing nervousness. Its ears will be mobile, seeking the source of threat when it is unapparent. As anxiety increases, profuse sweating occurs. The animal will attempt to flee and, if restrained, may buck and kick. Under extreme conditions, its eyes will roll, showing the whites. Ultimately, the animal becomes terror-stricken. At this point it will scream and, if loose, will attempt to run through any obstruction until it collapses in shock.

4-8. A more common problem is **boredom**. Unchecked, it leads to behavioral problems that will remain a part of its personality. Chewing on wood such as stall doors (cribbing), drawing air into its stomach (wind sucking), and rocking side-to-side (weaving) are common traits adopted by a bored animal.

4-9. A horse demonstrates **irritation** by laying back its ears and swishing or lashing its tail, often exaggerated on one side. The animal will tense its front or hindquarters and lift a hoof in preparation for kicking. It can glare threateningly and bite or kick with surprising swiftness and ferocity.

4-10. **Pain** elicits reaction according to location (internal or external) and severity. With mild pain (fly bites, chafing, or early arthritis) and hoof pain (such as a pebble caught in the shoe), the animal will shrug, shiver, or kick in an effort to dislodge or soothe the area. It may flick its tail and nip at the afflicted area as a means of removing the irritant. Overall activity is fairly continuous, be it biting and bumping against an object or head tossing in distraction. Head shaking and ear twitching may also represent a head injury or uncomfortable bit.

4-11. An **internal injury** may exist when the animal shows signs of generalized listlessness, melancholia, increased distraction, and flagging (pointing the head) towards the affected side. The animal may lay its ears back and nip or rub its side. It lifts its hind legs alternately and hunches its abdomen in attempts to relieve the discomfort. Vocalizations such as groans are common. If pain continues, such as colic pain, the groaning deepens and the animal will bite itself on the side and roll on the ground, worsening the condition.

4-12. Shifting its weight to the unaffected side and limping or refusing to move indicates **leg pain**. The animal will also "point" or extend the affected leg to try to relax it. The head will bob or swing to the side in an effort to bring the afflicted side forward.

4-13. Signs of **illness** may include a dulling of the coat, decrease in appetite, or such obvious symptoms as discharges from the eyes or nose, running sores, or diarrhea. The animal will carry its head down and show a blankness in its eyes. The legs tend to splay outward while standing and the ears point

outward in a splayed fashion also. Progressive illness leads to increased severity in symptoms. Leg splaying, head drooping, eye and coat dullness, fever, shivering, sweating, swaying, and staggering are all manifested to varying degrees.

OVERALL BEHAVIOR PATTERNS

4-14. Through examination of healthy animals and familiarity with their behavior in natural surroundings, handlers gain early recognition of the sick or injured animal. Neglecting small changes in behavior, coupled with ignorance of common maladies, may result in delay of movement or loss of an animal. Although each species demonstrates specific, unique patterns, all animals of this type display similar behavior patterns.

PHYSICAL EXAMINATION

4-15. The physical examination of an animal proceeds in the same overall manner as any physical exam. Certain precautions and allowances for the animal's natural fears and curiosity must be exercised. The examiner should enlist help in controlling the animal and constantly remain alert for signs of bolting, biting, and kicking. He should never assume a position between an animal and a fixed object. By leaning or shying sideways or forward, the animal can pin and injure the examiner or helper.

4-16. Examine the animal when it is quiet and rested. Excitement and heavy exertion will drastically alter the animal's temperature, respiration, and pulse. When the physical examination is combined with routine grooming, the animal will receive it with more cooperation. Also, during every rest period and bivouac, examine every animal briefly for common maladies.

4-17. Follow an orderly sequence during each examination to preclude overlooking any area. Ask the handler to comment on the animal's feeding habits, bowel and bladder habits, general demeanor, and any cough or discharges. The handler should be aware of these areas. Record results of physical examinations in chart form. Include immunizations and maintain an extract version with the animal for future reference.

EQUIPMENT

4-18. A general examination may be performed without the use of any medical equipment. However, when available, use the following items:

- Stopwatch.
- Veterinary rectal thermometer.
- Petroleum jelly or substitute.
- Stethoscope.
- Penlight or ophthalmoscope.
- Equine dental float (file).
- Rubber gloves.
- Several pieces of cloth or gauze.
- Twitch or hobbles for uncooperative animals.

ROUTINE

4-19. Begin the examination with an overall look at the animal, noting general demeanor, carriage, and gait. When unfamiliar with the particular animal, ask the handler about changes in diet and elimination. Also, ask about problems encountered during previous examinations, such as biting or kicking, medical conditions, and injuries. Then examine specific areas of the animal. Many examiners refer to the head, ears, eyes, nose, and throat as HEENT.

Head

4-20. Look for signs of chafe from the halter such as lesions and areas of hair loss. Note how the animal carries its head and if it shakes or rubs it. Encephalitis or concussion and distemper (lockjaw) are detectable by confusion and loss of coordination.

Ears

4-21. Examine the ears gently because they are sensitive. Look for halter chafe, lesions (external and internal), and discharge. Note how the animal carries its ears and watch to see if it shakes its head or rubs its ears. Ear mites, ear flies, and ticks are the main problems encountered.

Eyes

4-22. Perform the eye examination in two parts. First, do an overall examination of the eye, its orbit, and the lids with available light. Check for lesions, foreign matter, and discharges. Note the color of the conjunctiva and the "third eyelid," a whitish membrane that closes to cleanse the eye of particles. Communicable eye infections, biting flies, and gnats pose the main problems. Occasionally, lesions (tumors) will grow on the inner eyelid, requiring surgery. When an animal exhibits photosensitivity by squinting or partially closing an eye, it may be suffering from conjunctivitis or other problems, such as snow blindness. Next, using a light source such as a flashlight, ophthalmoscope, or candle and working in shade, examine the cornea. Shining the light from an angle, look for opacities and surface irregularities. Shining the light from the front, observe the quality and clarity of the reflected image in the eye. There is a fairly high incidence of cataracts, especially among older animals.

Nose

4-23. The nostrils are sensitive and may be moist or dry, according to the environment. Nasal discharge presents a draining moistness, which increases in profusion when the animal's head is down as in grazing. Discharge is usually accompanied by noise, such as snorting or sneezing, and licking or rubbing to clean the lip and nostrils. Sores are minimal unless inflicted by branches or the lead rope. Animals recovering from pneumonia, strangles, or milder respiratory infections may develop sinus infections. These infections are characterized by drainage, which increases when the head is down. Tap lightly with a knuckle on the bone just below each eye. Pain will be elicited in an animal with infection.

Throat

4-24. This examination includes the mouth, lips, gums, teeth, and tongue. The lips may contain splinters or pieces of burrs. Check for areas of abrasion around the mouth where the coat is rubbed away. Such abrasions may indicate an ill-fitting halter or bit. Deformities, such as cleft lip or palate, should be noted during the animal conformation check. Examine the teeth for uneven wear, which occurs naturally but is also a common sign of cribbing (gnawing). Normal wear causes uneven, sharp slopes of the molars, whereas cribbing causes uneven wear on the incisors. Check the inner edges of the lower molars (lingual) and the tongue. When the molars become sharp, the tongue is often ulcerated by contact. Examine the outer edges (buccal) of the upper teeth. Sharp edges here will ulcerate the inner cheek. In either case, use a tooth float (rasp) to smooth the sharp surfaces. Speckling or spotting of the tongue and redness are signs of infection or nephritis (an inflammation of the kidneys). Other lesions of the tongue or cheeks are generally tumorous in nature.

Neck and Mane

4-25. Examine the neck and mane for lesions and signs of chafe from contact with tack items. Ticks and mites are frequent in this area because the animal has difficulty dislodging them. Lymph glands are located in this region and become enlarged from inflammation. Inflammation is somewhat difficult to detect in the glands except in the case of strangles. Take the pulse using the artery that runs along either side of the throat. The pulse will vary with a rate of 36 to 40 beats a minute being normal at rest and a rate of 80 to 100 beats a minute being normal after exertion, especially at higher elevations. Blood samples can be taken easily from the veins in the neck, and the large muscles supporting each side of the neck are good injection sites.

Chest and Shoulders

4-26. Examine the chest and shoulders primarily for lesions caused by foliage and saddle rigging. Note the carriage, which is the distribution of the weight on the forelegs. Step back and record the respirations by observing the rise and fall of the chest from the side. The animal must be rested and acclimatized. Normal rates will vary according to species and altitude. The normal rate of respiration at sea level is 8 to 16 breaths a minute. After exertion, a rate of 30 to 40 breaths a minute is normal. An animal that coughs or has noisy or staggered breathing requires an examination of the chest (lung fields) with a stethoscope. Listen for gurgling, grating or rustling, or an absence of sound.

Flanks and Abdomen

4-27. The flanks and abdomen receive the heaviest amount of wear from the saddle and the associated rigging and loads. Thoroughly examine for signs of chafe and loss of hair. A lesion in this area will rapidly become worse and possibly become infected without early management. Cysts and boils will require lancing and antibiotic dressings. Relief from further irritation is essential. Do not put an ulcerated area back under blanket or harness until it is fully healed and showing hair regrowth. An animal exhibits internal pain, such as colic, the same way a human does with drawing-up and obvious attention to the afflicted region. Be sure you know the animal's recent history

of appetite and thirst. Loss of appetite is a sure sign of disorder or malady. When colic is suspected, use a stethoscope to examine the abdominal region (if colic is present, there will be an absence of normal stomach noises) and supplement with a rectal exam.

Forelegs and Hooves

4-28. Examine the forelegs and hooves by lifting the lower leg rearward. Support the leg in one hand and examine the leg from sole upward. Pay particular attention to the entire hoof and each joint of the leg. To examine the hoof, you may need a hoof pick or similar device to clean the sole prior to examination. Become familiar with the section on specific injuries common to the legs and hooves found later in this chapter. Also, study the chapter on conformation to increase awareness of specific hoof and bone deformities.

Hind Legs

4-29. The hind legs are best examined from slightly to the side, never directly to the rear. Lift the leg rearward and examine the hoof. Return the hoof to the ground and examine the leg from the bottom up. Pulling the tail down and to the side will encourage the animal to stand with both hooves firmly on the ground. Injuries and conformation problems are less common than on the forelegs.

Temperature

4-30. While holding the tail down and to the side, take a rectal temperature ensuring the thermometer is well-inserted and remains in place for three minutes. Normal temperature for a horse is 99 to 101 degrees F (100 to 101.5 degrees F for a mule).

OVERALL OBJECTIVES

4-31. Grooming is an essential part of animal care. The daily grooming period is the ideal time to perform a routine examination, excluding temperature, pulse and respiration. These are checked only when illness is suspected. Early detection and correction of problems, such as chafe, is essential in the prevention of more serious disorders and possible loss of the animal. Never overestimate the durability of the animal. A mule is more durable than a horse. However, all animals are vulnerable to a wide variety of problems caused by both the environment and infection passed from animal to animal. Despite great size and strength, these animals are among the most susceptible to injury and disease. Constant vigilance must be exercised to maintain health and effectiveness of animals during sustained operations.

FIRST AID SUPPLIES

4-32. A basic first aid set should be carried specifically for use on the animals because standard bandages are too small for most purposes. Place supplies in a weatherproof container in sufficient quantity to care for 10 percent of the animals. As with all critical items, duplication is suggested.

4-33. Figure 4-1, page 4-7, lists the minimum supplies and equipment needed for treatment of a wounded animal. They include dressing changes since

bandaging supplies (tape, cotton, gauze) will be expended rapidly and will require restocking or supplementing.

4-34. The examiner should include and apply heavyweight sutures with the same considerations as in humans. More sophisticated procedures require additional supplies. In most instances, the same equipment carried for treatment of humans is applicable to treatment of animals. Antibiotics and steroidal anti-inflammatory medicines are a notable exception. With these agents, it is either sensitivity to the drug or altered prescribing principles that pose the exception. A veterinarian must approve all medications prior to their inclusion in the kit. Because replenishment of veterinary supplies may be difficult, you should include possible substitute or expedient materials, resupplies, and caches in mission planning.

ITEM	QUANTITY	ITEM	QUANTITY
Absorbine Thrush Remedy	1 pt btl	Elastic Bandage (4" x 4.5 yds)	10 rolls
Absorbine Vet Liniment	1 pt btl	Gauze Pad 4" x 4" (nonsterile)	1 pkg/w100
Betadine Solution	1 pt btl	Vet Wrap (4" x 5 yds)	6 rolls
Betadine Surgical Scrub	1 pt btl	Gloves, Latex, Surgical (med)	4 pr
Bigeloil	1 pt btl	Gloves, Rubber (med)	1 pr
Blu-Kote	2 ea, 4 oz pump btl	Penlight, Examination	2 ea
Clear Eyes	1 ea, 3.5 oz btl	Razor, Safety w/Blades	1 ea
Corona Ointment	1 ea, 14 oz btl	Stethoscope	1 ea
Fungisan	1 ea, 12 oz btl	Thermometer, Vet Max Registering	1 ea w/case
Isopropyl Alcohol	2 ea, 1 pt btl	Bandage, Scissors (5.5")	1 pr
Lubricating Jelly (KY)	1 ea, 8 oz tube	Blade, Scalpel (#2800)	6 ea
Phisoderm	1 ea, 5 oz btl	Clamp, Surgical (#97-436)	2 pr
Pine Tar	1 qt can	Dressing Forceps (5")	1 ea
Cotton, Roll	1 ea, 1 lb roll	Handle, Scalpel	1 ea
Cotton/Wood Swabs	250 ea	Scissors, Surgical (#PA55-364)	2 pr
Conforming Gauze Bandage (3" x 4.1 yds)	12 rolls	Tissue Forceps, Aillis (#16-6)	1 ea
Conforming Gauze Bandage (4" x 4.1 yds)	2 rolls	Adhesive Tape, Surgical (2" x 10 yds)	2 rolls

Figure 4-1. Supplies and Equipment Needed to Treat a Wounded Animal

FIRST AID TREATMENT

4-35. In the administration of first aid, most principles of care directly parallel treatment of humans; the major difference being in anatomical structure. Ethics will play a lesser role in treatment in the field. The decision to attempt radical procedures to save an animal or just destroy one that could have been saved under normal circumstances will more likely be made. Otherwise, the time involved for an animal to recover from lameness or the debilitation that occurs as a result of a serious injury could hamper the unit's ability to accomplish its mission.

OPEN WOUNDS

4-36. Bleeding, infection, and tissue loss are the main concerns in wounds resulting from external trauma. Give particular attention to any open wound on the hoof or hind leg. These wounds pose the highest threat of contamination and subsequent infection from bacteria contained in feces. Horses and mules are very susceptible to tetanus. Supplement treatment of open wounds, especially punctures, with a tetanus booster.

LACERATIONS

4-37. These wounds, caused by a tearing of the skin, usually result in slight to moderate bleeding. The vessels contract and limit the flow of blood to the affected area. Inspect the injury to determine the severity, depth of penetration, and degree of damage to underlying structures. Clean with soap and water to remove all foreign material. When the wound is small and the edges will remain closed, apply an antibiotic ointment and cover with a clean dressing. Close larger wounds, and those where the edges gape open, with suture or butterfly bandages. Apply antibiotic ointment and a clean dressing. Keep the area dry and change the dressing daily.

INCISIONS

4-38. Incised wounds tend to bleed freely. The first priority is to **STOP THE BLEEDING**. The examiner should use direct pressure, pressure dressings, tourniquets, and ligation with the same indications and precautions as on humans. Circulation to the lower leg is mainly superficial. Consequently, use a tourniquet only when absolutely necessary and release it every 15 minutes. Ligation should be accomplished as soon as practical to restore circulation to the limb. When the wound is dirty, place a constricting band above it to reduce bleeding and quickly, but thoroughly, clean the wound before closing it with a dressing. Use sutures to close large or gaping incisions. When available, give a tetanus booster.

PUNCTURE WOUNDS

4-39. The causative agent may remain in the wound or be withdrawn. In all cases, the first step is to **STOP THE BLEEDING**. Evaluate the severity of the wound and continue to control the bleeding. Puncture wounds are either low or high velocity. Low velocity wounds impact only on the actual tissue penetrated and tend to bleed freely. High velocity wounds impact on the actual tissue penetrated and impart a shock wave into surrounding tissue. This concussion tends to cause contraction of ruptured vessels, temporarily reducing the immediate blood loss. Packing the wound with gauze will aid in stopping blood loss when done in conjunction with standard pressure dressings. Impaled objects can also aid in stopping blood loss and may be left in place for a short period after being trimmed off flush and supported with a dressing. However, if the object impedes joint function, it must be removed. Do not put a topical antibiotic into a puncture wound; such an action causes systemic absorption of a topical medicine. Clean and dress the wound. Administer a tetanus booster, if available, especially in cases where punctures could allow direct access of pathogens into the bloodstream.

4-40. Animal handlers should follow specific steps when dressing wounds. The procedure for applying routine dressings is as follows:

- Inspect the wound and take appropriate measures to stop the bleeding.
- Cleanse the wound and surrounding area with clean, warm water and a nonirritating antibacterial soap. It is usually advisable to shave the area surrounding the wound during cleansing.
- Apply a sulfonamide or other antibiotic topically.
- Cover the wound with gauze.
- Cover the gauze dressing with cotton padding.
- Wrap the area with roll gauze and secure with tape.

4-41. Remember that animals will tear off the dressing if it is loosely applied. There are roll tapes specifically intended for use with animals. This tape (vet wrap) sticks only to itself, diminishing the trauma of dressing changes. Also, beware of overtightening the dressing, creating a tourniquet.

CLOSED WOUNDS

4-42. Closed wounds result from external mechanisms such as overuse, hyperextension (straightening past the normal locking point of the joint), or hyperflexion (bending beyond the normal range of motion). Injuries include bruising, stretching, or tearing of connective tissue; joint dislocation; bursal inflammation or rupture; cartilage damage; and various degrees of bone fracture. Symptoms of these injuries are swelling, stiffness, and a partial or complete loss of function.

4-43. Major second- and third-degree burns and displaced and open fractures require specialized, lengthy treatment and recuperation. Destroying the animal becomes a matter of operational necessity when conducting a mission.

ALLERGIC REACTIONS

4-44. Allergy or anaphylaxis (severe allergic reaction) stems from a variety of causes. Most common are bites, stings, and skin absorption. Less common, but more serious, are reactions caused by substances eaten by the animal and entering the bloodstream.

Bites and Stings

4-45. Allergic reactions to insect bites and stings result in small blistered areas (wheals) or generalized swelling (edema). The extent of swelling is dependent on the number of bites or the toxicity of the venom injected. A single fly bite will result in a wheal, whereas multiple bee stings will result in generalized swelling. Snakebites and scorpion stings produce similar reactions. Treatment is symptomatic. Apply ice to the affected area to reduce swelling and slow the spread of venom. Give antihistamines to reduce the reaction, especially when respiration is impaired. Generally, large animals tolerate venom better than humans. However, antihistamines increase the effect of snake venom and **MUST NOT** be administered. Give tetanus antitoxin and broad-spectrum antibiotics to counteract bacterial infection associated with snakebites. Emergency tracheotomy has been successfully employed in cases of respiratory distress. Constricting bands will slow

dissemination while increasing local necrosis and circulatory obstruction. Anticonvulsants are indicated during the first two hours. After that, treat for shock.

Urticaria (Hives)

4-46. Stinging nettle, poison ivy, and chemical irritants result in blistering or rash formation. These rashes progress rapidly from localized to generalized when an animal becomes sensitized from repeated or heavy exposure to the irritant. Cold soaks and antihistamines will reduce the reaction, especially when respiratory distress develops. Ingestion of a large amount of protein will produce a similar effect. Gorging on food concentrates, spoiled hay, and a variety of other ingested substances will result in an allergic reaction (anaphylaxis). To treat the symptoms, pass a tube to remove the stomach contents and give laxatives, antihistamines, and anticonvulsants. Restricting the diet during recuperation will suffice in most cases.

BURNS

4-47. Except for burns over a large area or those affecting respiration, a comparable wound in humans is more debilitating. The animal's coat offers a higher degree of protection and its skin is less sensitive. Therefore, an animal will display fewer symptoms and recover more rapidly.

First-Degree Burns

4-48. These burns are characterized by reddening of the skin. Vesicle (blister) formation is uncommon. Localized tenderness will necessitate refitting of tack or shifting loads until the animal tolerates pressure on the afflicted area. No other treatment is necessary.

Second-Degree Burns

4-49. Tissue damage from these burns is limited to superficial layers of the skin. Vesicle formation occurs resulting in the peeling away of dead skin after the fluid has drained and the blister dried. Pain lasting several hours after initial injury subsides to localized tenderness. Treatment of the burn consists of trimming the coat over the afflicted area and examining the wound. Apply an appropriate topical medication (such as silvidene ointment). Cover the area for 3 days with a clean, dry dressing to prevent vesicle rupture. Additional padding is required under harness straps when the animal must be harnessed. Drain all vesicles on the fourth day and allow drying for 5 days. Continue to protect the wound during this time to prevent infection. Trim away the dried skin on the tenth day after initial injury. Place padding under tack until healing is completed.

Third-Degree Burns

4-50. These burns are characterized by charring of the flesh and coat. Severe tissue damage extending into underlying layers occurs. Moderate to severe pain, dehydration, and shock are symptoms. Treatment, when small areas are involved, is generally successful. However, severe burns covering a large percentage of the animal require clinical attention or destruction. Treat as second-degree burns. Encourage fluid intake, adequate rest, and diet. Topical burn preparations will lessen pain; however, novocaine (lidocaine) nerve

blocks may be required for the first days. Observe for signs of dehydration, infection, and shock.

LAMENESS

4-51. This general term describes many types of injury and conformation faults. Basically, lameness is caused by pain in one or more legs. Conformation faults, arthritis, and a variety of joint and tendon malfunctions result in lameness, but no first aid treatment is possible. Consequently, lameness, resulting from injury only, will be covered in this section.

4-52. Examine the animal in motion to isolate the limb(s) involved. The animal will step quickly off a painful leg and swing towards its good side. Observe for stiffened joints, reduced range of motion, nodding, limping, or swaying gait. Examine suspect limbs from the sole upwards and always look for a hoof injury first. Do the examination in three parts: inspect the sole, tap the hoof, and flex the individual joints, watching for evidence of pain. Walk the animal after each examination. If the gait is affected, focus on the last area examined. This procedure is time-consuming but is the only practical method for field use.

Hoof Lameness

4-53. The hoof is vulnerable to a variety of injuries and infection. An unshod, untrimmed hoof will develop cracks. Injuries from overtrimming and improper nailing occur during routine trimming and shoeing. An animal can develop corns if it goes too long without reshoeing. While moving, impact forces cause stress on the bones, suspensory ligaments, and tendons. Rocks and a multitude of sharp objects bruise and pierce the sole or lodge under the shoe. These are injuries for the farrier's or the veterinarian's care. Exceptions are thrush and cracked heels as explained below.

4-54. Routine care of the hoof consists of regular trimming and shoeing. During halts, inspect the sole and remove any objects that have lodged there, especially in rocky terrain. Painting the wall (outside) of the hoof with hoof oil will reduce cracking.

4-55. *Thrush* is a fungus or bacteria infecting the frog. It is characterized by a dark, foul-smelling discharge from between the frog and the sole. Most common among stabled animals, it is caused by standing in unsanitary conditions. Treatment consists of thorough cleansing supplemented by application of iodine to the infected area around the frog only.

4-56. *Cracked heel* is actually a skin condition affecting the pastern above the heel of the hoof. Caused by continued incomplete drying of this area, it is seen in animals pastured in wet or muddy fields. The skin develops dry scaling, which degenerates into cracking, as in athlete's foot. Treatment consists of cleansing and thorough drying. Apply an ointment or petroleum jelly. The problem is a result of dryness and chafing. Never treat with an agent that will cause further drying of the area.

Lower Leg Lameness

4-57. Injury to the lower leg is a result of either stress, caused by a misstep or prolonged travel on a hard surface, or trauma from hoof strikes inflicted by

other animals or self-inflicted. Isolated occurrences result in temporary lameness. Repeated or prolonged injury generally results in formation of calluses or calcium deposits in the area. Treatment of isolated occurrences is successful when time for adequate rest is allowed. Formation of calluses and calcium deposits require care by a veterinarian and protracted periods of rest.

4-58. When, as the result of an inflammation, synovial fluid collects around a joint or tendon, the condition is termed *synovitis*. Synovial fluid is produced as a lubricant for joint motion. Inflammation will cause an overproduction of this fluid, which is then trapped in and around the joint. Reabsorption occurs naturally over time in most cases, provided inflammation is reduced. Needle aspiration and cortisone injections are stop-gap measures and may result in the eventual destruction of the joint. With early diagnosis and prompt treatment, these conditions need not result in lameness. Treatment consists of rest, ice packs, or cold soaks and reduction of load or variations in surface traveled. Most of these conditions will leave a permanent deformity in the form of enlarged joint capsules.

4-59. *Sprains* of the flexor tendons or suspensory ligament occur during running or jumping but may be seen when tripping occurs on a wedged hoof. Sprain describes a stretching, tearing, or complete rupture of the affected tendon(s) or ligament. Symptoms consist of lameness, which is often severe, and pain and swelling over the injured region. Inflammation will generate warmth, detectable to the touch. In severe cases (rupture of the tendon), loss of support occurs in the joint during weight bearing. Length of recovery depends on the extent of the stretch or tear.

4-60. Treatment consists of complete rest, ice packs (twice daily), or cold soaks, supplemented by supportive wrapping or casting of the leg. Recovery from a moderate tear or complete rupture requires surgical repair. Needle aspiration and cortisone injections have promoted healing in some cases.

PARASITIC INFESTATION

4-61. Parasites are classified according to location of residence: external (ectoparasites) or internal (endoparasites). Of the two, internal parasites are more debilitating, though it is external parasites that carry the most infectious disease and present the greatest nuisance.

4-62. There are large numbers of different parasites. Of these, some affect only a specific host. Others afflict any warm-blooded animal, including man.

ECTOPARASITES

4-63. These external parasites that reside on or just under the surface of the skin by burrowing include insects such as flies, fleas, lice, mosquitoes, mites, and ticks. The area around the eyes, ears, neck, and anus are the most common sites of infestation because they are areas of secretion, and the skin in these regions offers the easiest penetration.

4-64. Depending on the type of parasite, symptoms range from rashes and blistered areas to patches of hair loss (alopecia). Animals displaying excessive itching, hair loss, or rough, thickened skin should be suspected of hosting

parasites. Closer examination will reveal blisters or burrows, dried blood, or the insect itself.

4-65. Treat for parasites by applying topical insecticides. This treatment works best on those parasites that remain on the host, such as mites. It is less effective on flying insects because the brief feeding period reduces total dosage absorbed. Insect repellents provide relief from these pests and are the only practical solution in a field environment.

ENDOPARASITES

4-66. Internal parasites generally live within the intestinal tract. They remain there throughout their life cycle or migrate out the anus as larva to spend their adult cycle outside the host. Less common are the endoparasites that live in other internal organs or surrounding muscle tissue. Regardless of residence, the mouth is the most frequent point of entry.

4-67. Symptoms are subtle, except for the dramatic appearance of the parasite exiting the anus or contained in manure deposited on the ground. Evidence of unexplained weight loss, chronic tiredness, or dullness of coat is frequently the result of parasites. These anemia-like symptoms result from the loss of nutrients to the parasite, especially a large colony of parasites. Untreated, these colonies debilitate the host, often causing blockages and colic.

4-68. Treatment of internal parasites is more successful than treatment of external parasites because a more consistent dosage of antiparasitic is absorbed by the invading parasites. Preventive administration of antiparasitics is a common practice and is the most convenient method.

DISEASES

4-69. Zoonoses are diseases that usually only affect animals but can be transferred from animals to humans under natural conditions. Anthrax (cattle fever) and rabies are excellent examples. People working with animals are at particularly high risk for zoonotic diseases.

4-70. Currently, there are immunizations for most major infectious diseases affecting horses, mules, and similar animals. The key to disease management is to follow a schedule of routine inoculation and parasite control. Additionally, proper sanitation and hygiene must be maintained.

4-71. Quarantine new and ill animals to prevent the spread of disease among the healthy animals. Frequently, animals will develop flu-like symptoms after being transported or stressed by changes in environment. Disease pathogens congregate in food, bedding, and tack. Therefore, ensure that these items remain clean and are not transferred from animal to animal without some form of disinfection.

DISTEMPER

4-72. The common name for this disease is strangles. This infectious disease occurs in dogs, cats, horses, and several other animals. The causative agent is the bacteria *Streptococcus equine*, a strep bacteria similar to that causing strep throat in man.

4-73. Occurrence is most frequent among young animals but will occur in any equine not previously exposed or immunized. The infectious period is 4 weeks. Incubation period is 3 to 6 days, with flu-like symptoms. A fever with temperatures of 106 degrees F and inflammation of the lymph tracts and mucosa occur. A nasal discharge follows rapidly and is quite heavy. As inflammation of the lymph nodes in the neck continues, abscesses form. The animal will also have a foul smell about it. These are classic symptoms of the disease. The lymph tracts, which run the length of the neck bilaterally, become so swollen that they appear rope-like under the skin. Central nervous system (CNS) damage occurs in some cases. However, pneumonia is the greatest cause of mortality. Mortality may approach 100 percent among animals previously unexposed. Hence the great need for vaccination and isolation of new horses, especially any having nasal discharge, from the herd.

4-74. Treatment is largely symptomatic. It is very important to get the temperature down. Streptococcus responds very well to a variety of penicillins and sulfonamides, but their use inhibits natural immune response and prolongs the period of abscessed lymph nodes. Using hot packs to bring the abscess to maturity is more appropriate. Next, incise and drain (I&D) these mature abscesses using proper techniques to prevent the invasion of other pathogens into the lymphatics. Preventive administration of antibiotics to animals having direct contact with the infected one is recommended, especially when the immunization history of the healthy animal is unknown.

TETANUS

4-75. An acute infectious disease, tetanus is caused by introduction of contaminated soil into tissue and the bloodstream and affects the CNS. This anaerobic neurotoxin is normally inactive and lives in a spore state. Usually introduced through a wound, the disease causes tissue decay, which provides the anaerobic environment required for reproduction. After reproduction, the bacteria rupture, resulting in the release of the neurotoxin, migrates along the nerves to the spinal cord.

4-76. Symptoms of tetanus, either ascending (motor nerve to spinal cord) or descending (lymphatic to CNS), consist of a characteristic muscle spasm after even mild stimulation and localized stiffness increases to generalized rigidity. Especially prone to spasms are the muscles in the jaw and neck, giving rise to the common name of lockjaw. Symptomatic progression leads to rigidity of the ears, spine, and legs. The stance widens (sawhorse) and the nostrils dilate. Closing (prolapse) of the third eyelid, profuse sweating, continued excitation spasm, rapid respiration, cardiac irritability, and arrhythmia are present in the latter stages.

4-77. Treatment is begun by preventive immunization of all animals, followed by routine booster injection (tetanus toxoid). After an animal is wounded, it should receive good wound care, consisting of thorough cleansing and disinfecting of the wound site, followed by a tetanus booster. In animals that have contracted the disease, treatment consists of drainage and disinfection of the wound, removal of all dead tissue, and injection of tetanus toxoid and tetanus antitoxin (1,500 to 3,000 immunizing unit [IU]). Treatment with sedatives, barbiturates, and increased dosages of antitoxin (300,000 IU every 12 hours) has succeeded in moderately severe cases. Supplement treatment

by keeping the animal in a darkened, quiet stall. Avoid any incidence of startling the animal. Elevate food and water since the animal has difficulty lowering its head. Recovery periods average 2 to 6 weeks.

EQUINE INFECTIOUS ANEMIA

4-78. Commonly known as swamp fever, equine infectious anemia is a viral disease very common among horses worldwide. Transmission occurs from blood-to-blood interaction such as in the use of contaminated syringes or scalpels. It can reach epidemic proportions when transmitted by blood-sucking flies.

4-79. The disease is characterized by flu-like, low-grade fevers, yellowing of the gums, depression of appetite and demeanor, weight loss, and obvious signs of anemia during microscopic blood examination. Continued weight loss, enlarged spleen, swelling of the infected area, debilitation, and death follow if the disease is untreated. Diagnosis through the use of a serological test (Coggins test) is done in the clinical environment. This test shows the presence of antibodies in the blood of an infected animal. Vaccines exist although their effectiveness is questionable. Quarantine of any suspect or new animal and symptomatic treatment is the only therapy. Control of vectors, by use of insect repellents and insecticides, plus proper sterilization of medical instruments will minimize the impact of this disease on the herd.

COLIC

4-80. Although not a disease, colic causes debilitation and occurs in sufficient incidence to require more definitive explanation. Colic is a distention of the bowel resulting from excessive gas production (flatulent colic), impaction of feces or bowel obstruction from colonies of intestinal parasites (obstructive colic), twisted intestine (torsional colic), or gorging or overfeeding (spasmodic colic). Colic may also result from circulatory problems due to the inactivity of bowel segments.

4-81. Regardless of the type of colic and its cause, the animal exhibits a sudden loss of appetite, depression, and frank attention to the abdominal region (refer to Internal Injury, page 4-2). Bowel sounds frequently diminish or alter. Rectal examination may locate the obstructed region. Marked distention of the flanks may be present, especially in young animals or in severe stages.

4-82. Treatment is largely symptomatic. Keep the animal on its feet to reduce the chance of complications. Pass a bloat tube (nasogastric) to relieve gastric distention. Administer mineral oil (2 to 4 liters) by stomach tube to disperse impactions. You may supplement the mineral oil by administering an osmotic laxative (magnesium sulfate) or an irritant (neostigmine). Analgesics, to prevent self-injury, may be indicated (meperidine 0.5–1 mg/lb [1–2 mg/kg] IM, phenylbutazone 1–2 mg/lb [2–4 mg/kg] IV or similar drugs). Decompression through the use of a large-bore needle (trocharization) inserted into the upper flank is effective in relief of severe distention. Prevention, through proper diet, dental care, and parasite control, is the most effective method of dealing with colic.

IMMUNIZATION SCHEDULE

4-83. The following paragraphs list several diseases that plague animals and provide a suggested immunization schedule.

- Encephalomyelitis, Eastern and Western strains: For all horses of all ages, two injections each spring or summer, 7 to 14 days apart.
- Distemper (Strangles): Three weekly injections initially, followed by an annual booster, until the horse is 5 years old. Incidents of anaphylaxis (injection reaction) have occurred, to include hoof sloughing.
- Equine Influenza: Two injections initially (1 year old), 4 to 8 weeks apart, followed by a booster each successive year.
- Venezuelan Equine Encephalomyelitis (VEE): One injection (yearly) during spring or summer.
- Tetanus (Lockjaw): Two injections the first year, 4 to 8 weeks apart, followed by a booster each successive year.

MEDICAL SUPPLY LIST

4-84. In addition to the supplies contained in the veterinary first aid kit, Figure 4-2 lists the items that are consolidated into a single kit for use in more definitive care.

Kit, Minor Surgical	NSN 6545-00-957-7650
Float, Dental, Vet	NSN 6515-00-938-4301
Needle, Hypodermic, 14 gal, 1/2"	NSN 6515-00-938-4411
Needle, Hypodermic, 15 gal, 3"	NSN 6516-00-938-4378
Needle, Hypodermic, 15 gal, 3 3/4"	NSN 6515-00-938-4377
Set, IV Injection, Vet	NSN 6515-00-938-4678
Pump, Injection and Suction, Vet	NSN 6515-00-938-4718
Suture, Nonabsorbable, Surgical Size	NSN 6515-00-938-4722
Suture, Nonabsorbable, Surgical Size	NSN 6515-01-035-5601
Twitch, Chain	NSN 3770-00-191-8055
Clipper, Hair	NSN 3770-00-804-4700
Stethoscope, Bell/Diaphragm	NSN 6515-01-304-1027
Thermometer, Maximum Registering, Vet	NSN 6515-00-812-7000
Tube, Nasogastric, Vet	NSN 6515-01-153-5387
Gloves, Examination, Vet	NSN 8415-01-359-7935
The Merck Veterinary Manual	ISBN 0911910557

Figure 4-2. Consolidated List of Items Used for Definitive Care

PHARMACOLOGICAL LISTING

4-85. Figure 4-3 lists antibiotics, antiparasitics, and antifungals used to treat pack animals. It also lists the recommended drugs, dosages, and routes of each item used.

Antibiotics	
Penicillin	Sodium pcn G, IV, IM 10,000–20,000 IU/kg, q6 hrs Potassium pcn G, po 25,000 IU/kg, q6 hrs Procaine pcn G, IM, subq 10,000–30,000 IU/kg, q12–24 hrs Benzathine pcn G, IM 10,000–40,000 IU/kg, q48–72 hrs Ampicillin, IV, IM, subq 5–10 mg/kg, q8-12 hrs, oral 10–25 mg/kg, q6–12 hrs Amoxicillin, IM 4–7 mg/kg, q12–24 hrs
Cephalosporin	Cefazolin IV, IM 20–25 mg/kg, q6–8 hrs
Aminoglycosides	Gentamicin, IM, subq 1–2 mg/kg, q8 hrs Kanamycin, IM, subq 4–5 mg/kg, q8 hrs
Tetracycline	Oxytetracycline, IV 5 mg/kg, q12–24 hrs
Sulfonamides	Sulfathiazole, po (initial) 66 mg/kg (maintenance) 66 mg/kg, q8 hrs Sulfadiazine, po (initial) 50 mg/kg (maintenance) 50 mg/kg, q12 hrs
Antiparasitics	
Anthelmintic	Thiabendazole po 44 mg/kg, q24 hrs or 22 mg/kg, q12 hrs
Antifungals	
Iodine	Topical
Copper Sulfate	Topical
Tolnaftate	Topical

Figure 4-3. Pharmacological Listing

EUTHANASIA

4-86. The term “euthanasia” refers to the ending of a life, in a humane manner, to relieve suffering from illness or injury. While caring for animals during combat conditions, you may find that serious illness or injury will necessitate the destruction of an animal that is beyond the scope of available medical treatment. Euthanasia under field conditions is frequently a rather brutal affair, without the poisonous gases and injectable venoms used in the clinic. Despite this lack of “civilized” methods of destruction, every effort should be taken to effect euthanasia as rapidly and painlessly as possible. In addition, any personnel near the animal must exercise caution to avoid injury to themselves should the animal be grievously wounded but not immediately killed. The thrashing of these powerful animals will result in injury to bystanders and could create panic among other animals stationed nearby. Keep other animals as far away from the site as possible.

4-87. A variety of methods are available for field euthanasia. Of these, most are impractical because they require a very advanced degree of anatomical expertise or require dosages of common drugs in amounts larger than would logically be available. Consequently, simple mechanical methods of destruction are all that will be available to the average soldier.

SMALL ARMS FIRE

4-88. The most preferable method of expedient destruction is to shoot the animal in the base of the skull. A bullet fired at a point centered on and slightly above the eyes or from the side slightly above and behind the root of the ear is also acceptable. Because of the penetration needed to enter the skull, a rifle is more effective than a pistol for this purpose. Another area that will result in death but will produce only grievous injury if improperly aimed is the heart. This area is located low in the chest, just under the rear portion of the foreleg.

HEMORRHAGE

4-89. Bleeding the animal out by severing the large blood vessels located in the neck has been suggested as a silent method for use when detection is likely. Although effective, this method is less humane than shooting. Expect the animal to react violently during the initial 1 to 2 minutes of hemorrhaging. Take the necessary precautions to avoid injury to others. Along this line, it is entirely feasible to place a large bore needle, such as an IV catheter, in the veins located in the animal's neck (jugular) and bleed the animal out in this manner. Although this method will be considerably slower than a large incision of these veins, it will be virtually painless.

4-90. Equines, despite their immense size and strength, are fairly fragile animals. Nearly any injury resulting in a fracture of the legs will necessitate destruction of the animal. If the animal was otherwise healthy, the meat of the animal may be used as food. Avoid eating animals who were ill or infested with internal parasites. Examination of the liver and the external surfaces of the intestines will offer evidence of parasitic colonies.

NOTE: When a veterinarian is available to the pack animal detachment, obtain supply and instruction in the use of commercially available drugs that produce euthanasia in a rapid, humane, and silent manner.

Chapter 5

Packing Equipment

This chapter explains some of the most commonly used packing equipment, how it should be maintained, and how it should be fitted to the animal. There are variations in equipment. However, the principles for using it remain the same.

PACKSADDLES

5-1. The two types of packsaddles discussed in this chapter are the sawbuck or crosstree and the Decker saddles. They are both very adaptable to different types of loads and, therefore, are the best type to use in carrying cargo of different weights and sizes. The Decker saddle can carry side loads, top loads, or a combination of the two. Both saddles can accommodate standard packing hitches with a minimum requirement for tying and threading lash ropes to secure a load. They can be quickly and easily packed and unpacked. Both saddles also require a harness.

SAWBUCK SADDLE

5-2. The sawbuck saddle is one of the oldest types of packsaddles still in use throughout the world. It is the simplest and most easily constructed. The sawbuck saddle consists of two side bars connected at the front and rear by crosspieces (bucks) forming an "X" over the spine. The two side bars are called "humane bars" if they are curved to fit the shape of the animal's body. The humane bars allow the saddle to fit the animal better and make carrying the load more comfortable to the animal. Most sawbuck saddles produced today have humane bars. Cargo is carried on the saddle in panniers, pannier bags or boxes, hung from the bucks, or carried by hitches and slings.

DECKER SADDLE

5-3. The Decker saddle is made basically the same way as the sawbuck. The difference is that it has metal hoops instead of crossbucks holding the humane bars together (Figure 5-1, page 5-2). Some packers prefer the Decker to the sawbuck saddle because the humane bars on the Decker can be adjusted by bending the metal hoops to fit the animal better. The animal carries cargo in nearly the same manner as on the sawbuck. The difference with the Decker is that the panniers are hung over the hoops instead of the crossbucks. Sometimes Decker saddles have "ears" welded to the hoops to keep the panniers from slipping off or to run the sling rope around when using one. The ears are pieces of metal stock approximately 2 inches long and 1/2 inch in diameter and are welded to the hoops near the top on either side. Panniers with adjustable straps are sometimes secured to the Decker by running the strap under the hoops and then fastening the buckle.

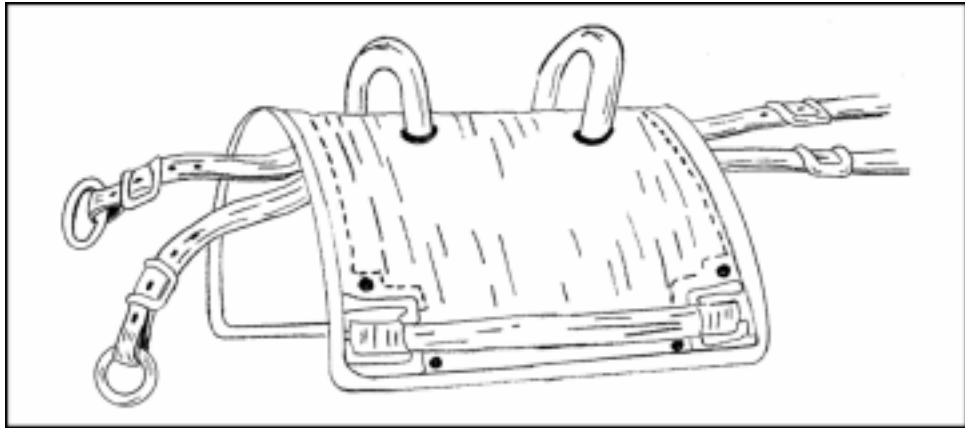


Figure 5-1. Decker Saddle

SADDLE HARNESS

5-4. A variety of different straps form the harness. It holds and stabilizes the saddle to the animal. The main components of the harness are the cinches, breast collar, breeching, and crupper. The packer secures all of the straps either directly to the saddle or to the rigging.

Rigging

5-5. The rigging is a leather strap that wraps around the crossbucks on the sawbuck and around the hoops on a Decker. Secure it to the humane bars with screws and allow the ends to hang below the bars. Attach the rigging rings to the ends of the straps. Then secure the latigos (which are used to secure the cinches) and the connecting straps (which help hold the breeching and breast collar in place) to the rigging rings.

Cinches

5-6. Cinches are the part of the harness that hold the saddle to the animal and provide stability to the saddle once it is packed. Most packsaddles have two cinches, one in front and one in the rear. They fit around the belly or barrel of the animal. Secure the cinches to the rigging rings by the latigos.

Breast Collar

5-7. The breast collar provides stability to the saddle while the animal is traveling uphill. It keeps the saddle from moving rearward over the animal's kidneys and rump. The breast collar is usually made of leather or cotton duck material and is approximately 4 inches wide. Two connecting straps from the front of the humane bars secure the breast strap, which is usually made of wool or tail and mane hair.

Breeching

5-8. The breeching fits around the animal's hips and keeps the saddle from moving forward over its withers while traveling downhill. The breeching is made of leather or cotton duck material and is approximately four inches wide. It is held in place by connecting straps, back straps, quarter straps, and

hip straps. The connecting straps run from the rigging rings to the ends of the breeching. The back straps run from the rear of the humane bars to a metal ring (called a spider) that rests on the animal's rump. The hip straps run from the metal ring to the breeching.

Crupper

5-9. The crupper is a leather strap that runs under the animal's tail and attaches to the metal ring. It keeps the saddle from slipping forward. Cruppers serve the same purpose as the breeching but are not widely used. You can use them in place of, or with, the breeching.

HALTER AND PACKING EQUIPMENT

5-10. A halter is a control device that fits around an animal's head and must be placed on the animal prior to packing it. By controlling its head, a person can control the animal. The halter is used mainly for leading rather than riding an animal. Without one it would be next to impossible to maintain control of an animal for any length of time. Halters are simple devices constructed generally of nylon webbing or rope. Another essential item for controlling an animal is the lead line or lead rope. A lead line is a piece of rope usually 3/4 inch in diameter, made of pliable material, usually cotton or nylon, and approximately 10 feet long. The line attaches to the halter under the chin of the animal. It can either be permanently spliced into the lead line ring or attached by means of a snap (Figure 5-2).



Figure 5-2. Halter With Lead Line

5-11. To place a halter on an animal, hold the halter with the lead line ring down, the closed end to the front of the animal's nose, and the open end to the rear of the animal's head. Slip the closed end over the nose, bring the running end of the open end over the back of the animal's head behind his ears, and attach it. It helps to keep one foot on the running end of the lead line to prevent the animal from pulling the halter away as you are putting it on him.

5-12. Good pack equipment is essential to a successful mission. Proper adjustment of all equipment for the pack animal is necessary. There are many variations of equipment, and the animal packer should be familiar with all types. The following paragraphs explain the basic packing gear.

SADDLE PAD

5-13. The saddle pad provides the only protection between the loaded saddle and the animal's hide. Pack pads are usually thicker than riding pads because a pack animal carries "dead" weight. A riding animal carries "live" weight, which means that a rider will shift his weight as the animal traverses different types of terrain. A pack load is "dead weight," which means it will not move with the animal. It is important that the saddle pad be made of a material that will stay soft and not compress and get hard during use.

5-14. Some packers use what is called a cheater pad on animals that have high withers. These small pads are usually made of tail and mane hair sewn between two pieces of canvas. The cheaters can be placed between two regular pack pads in the wither area to raise the front of the packsaddle off the withers and yet have the saddle sit evenly on the pack animal's back.

SADDLE COVER

5-15. The saddle cover, sometimes called a half breed, is used when it is necessary to protect the animal's flanks from the load or the saddle rigging. It is commonly made of two pieces of canvas sewn together with slots cut in it so that it will fit over the crossbucks or hoops. The saddle cover can have padding sewn into it or it can have stuffing slits so that the user can fill it with as much padding as is necessary for the load. It usually has sideboards made of wood, 2 to 4 inches wide, attached near the bottom to provide further protection to the animal's flanks. The saddle cover can be placed over the saddle once it is on the animal, or it can be placed over the humane bars and under the rigging.

MANTA

5-16. A manta is the cover, usually made of canvas, that you place over the entire load after securing the load to the packsaddle. It protects the load from trees, bushes, rocks, or anything else the animal may brush against while it is moving. The manta also provides a degree of protection for the load from rain and snow. The size is generally 8 feet by 10 feet. Each manta has an assigned cargo rope that goes with it. Mantas are folded four to a bundle with ropes located in the center. However, you can use any size that will protect the load.

LASH ROPE AND CINCH

5-17. The lash rope and cinch secure the load and manta to the animal by means of different types of packing hitches. The lash rope is usually 45 to 50 feet long, 1/2 to 5/8 inch in diameter, and made of manila or nylon. The lash cinch is usually made of heavy cotton duck material with a ring at one end and a hook at the other. The lash rope is spliced to the cinch at the end with the ring.

SLING ROPE

5-18. The sling rope fastens to the front crossbuck on a sawbuck saddle or the front hoop on a Decker. It secures loads that will not fit in panniers or secures panniers that do not have straps. A sling rope is usually 33 feet long, 1/4 to 3/8 inch in diameter, and made of hemp, nylon, or polyester.

PANNIERS

5-19. Panniers are cargo containers that hang from the crossbucks on a sawbuck saddle or the metal hoops on a Decker saddle. Some panniers do not have straps to hold them to the saddle. If they don't have straps, you can use the sling rope to hold the panniers in place. The dimensions of most commercially made panniers are approximately 26 inches long, 19 inches high, and 12 inches deep. They are made of many different types of materials. Some of the most popular are canvas, hard plastic, plywood covered with fiberglass, or a wood frame covered with cowhide.

CARE OF EQUIPMENT

5-20. The packer has the primary responsibility for the care and preservation of packsaddlery. You should perform the routine cleaning, preservation, and daily inspection for the following equipment to ensure mission readiness:

5-21. Check saddles daily to ensure there are no cracked, broken, or loose parts. Also check the crossbucks (or hoops), humane bars, rigging, and latigos. Tighten any loose items and repair or replace cracked or broken parts. Clean any mud or other debris from the saddles that may have collected during the day's movement. The packer should check all parts of the harness for signs of wear, breaks, cleanliness, and serviceability (Figure 5-3, page 5-6).

5-22. Brush or shake out the saddle pads after you remove them from the animal. Check them thoroughly for any foreign objects that can come in contact with the animal's hide. Lay the saddle pads where they can air out and dry.

5-23. Treat the saddle cover in the same manner as you treat the saddle pad. In addition, check the wooden bars for serviceability. Check the padding to see if some should be added or taken out. Check the manta for rips, holes, and general serviceability.

5-24. Check the lash and sling rope for signs of wear. Replace or repair them immediately if there are signs of excessive wear. Breaking a lash or sling rope on the trail is a sure way to cause a wreck. Try to keep the ropes as dry as possible, especially if the rope is made of hemp. Wet weather causes hemp

ropes to become hard to manage. Wet hemp ropes will dry and stretch out leaving the pack loose or uneven. Don't throw the ropes on the wet ground while packing or unpacking an animal. Hang them on a tree limb or lay them on a tarp or any dry surface until you are ready to use them.

Cinches	Check cinches for any broken strands. Check the cinch rings for any signs of cracking or metal fatigue. Repair or replace any damaged pieces.
Breast Collar	Check the breast collar and connecting straps for any signs of wear or debris collected during the day's movement. Check the fastening devices to ensure serviceability. Repair or replace items as necessary.
Breeching	Check the breeching and all associated straps for cleanliness and serviceability. Pay close attention to all fastening devices. Repair or replace items as necessary.
Crupper	Check the crupper (if used) for cleanliness and serviceability.

Figure 5-3. Parts of the Harness

5-25. Check the lash cinch often for signs of the material fraying. Badly frayed material can tear on the trail and cause a load to come loose. Frayed material can also rub on the animal's belly and cause a sore. Check the cinch ring for signs of wear and metal fatigue. Replace or repair items as necessary.

5-26. Clean panniers and check them for overall serviceability. Most important, check the straps and fasteners on the straps that hold them to the saddle.

5-27. Keep all leather items clean and free of grit and dirt. In cleaning off mud or excessive dirt, use a grooming brush or a blunt piece of wood. Use a sponge, lukewarm water, and saddle soap. After cleaning, apply neat's-foot oil to the leather for both protection and appearance. Clean all metal parts as well.

5-28. Keep equipment made from canvas and duck material free of dirt and mildew. A frequent brushing will remove dirt. The best remedy for mildew is air and sunlight.

FITTING AND ADJUSTING THE SADDLE

5-29. The proper positioning of the saddle and correct cinch adjustment are very important factors. Improper adjustment may cause injury to the animal or may affect the time and distance the animal can carry its load. Before placing anything on the animal's back, it is important to be sure that the animal feels comfortable about it. Many will get skittish if they are unfamiliar with the equipment. A good way to get the animal accustomed to the equipment is to hold it in front of the animal and let him see it and smell it. You should saddle the animal with the packer standing on the left (on-side) of the animal. When making adjustments to the saddle or harness, you will have to move to the right (off-side) of the animal. You should always move around the rear of the animal when moving from one side to the other

while saddling. To do this, get close to the animal and maintain contact with it by keeping a hand on its rump. If the animal should kick while you are moving around it, receiving a kick from a short distance is much better than from a long distance after the full force of the kick has been generated.

GROOMING

5-30. Always groom the pack animal before saddling. While grooming, remove any debris from the animal that may cause saddle sores. Also check for any sores from the previous movement or sores that may have occurred during the night. Treat the sores as necessary or ask the medic or vet for assistance. If there is any question as to the ability of the animal to carry a load, ask the medic or vet to make a determination. You do not want to aggravate existing sores.

PAD PLACEMENT

5-31. Check the saddle pad thoroughly for any foreign objects before placing it on the animal. Place the saddle pad square on the animal's back forward of where you want it to rest and then slide it rearward into position. Sliding the pad rearward will make the hair lay naturally and prevent sores. The forward portion of the pad should be over the withers with its forward edge about a hand's breadth in front of the rear edge of the shoulder blade.

5-32. The animal may need more than one pack pad or cheater pad depending on the shape of its back. The best way to determine how many pads the animal needs is to set the packsaddle on him and then check the clearance between the saddle and his withers. Allow for the saddle settling down on the pads after the animal is loaded. If there is any chance of the saddle forks coming in contact with the top of the withers, put another pack pad under the saddle. Be careful not to get too much padding on the withers so that the packsaddle is pinching the withers from the pads being too thick. The purpose of putting extra padding on a high withered animal is to raise the packsaddle off the tops of the withers. If the pads being used are the same thickness throughout you haven't gained much. The pad must be thicker over the withers and thinner towards the rear of the animal. A cheater pad sits on the withers only and that is why it is usually the best thing to use for a high-withered animal. Remember, pads always have a tendency to slip to the rear of the animal.

SADDLE PLACEMENT

5-33. Place the saddle square on the pack pads allowing 4 to 6 inches of padding to be exposed in the front and rear of the saddle. The forward edge of the saddle will be approximately 2 to 3 inches to the rear of the shoulder blades. It is important to ensure there is adequate saddle pad forward of the saddle to protect the animal's back from the leading edge of the saddle.

5-34. Fasten the cinches, the front one first, making sure there are no twists in the off-side latigos or the cinches themselves. The front cinch should be a hand's breadth to the rear of the front leg.

5-35. Tighten the cinches just enough to hold the saddle in place until the breast collar and breeching are adjusted. At this time, also attach the breeching and breast collar. The instructions for adjustment follow.

BREAST COLLAR

5-36. The breast collar should ride just above the point of the animal's shoulder and go around the breast below the animal's neck. It should not be tight; its only function is to keep the saddle from slipping back. Adjust the breast collar so that it is snug when a front leg is fully extended. Ensure the two connecting straps are adjusted to the same length so that the breast collar rides evenly.

BREECHING

5-37. Once the saddle is in place and cinched lightly, adjust the breeching. Perform the following steps to adjust the breeching:

5-38. Place the spider on the animal's rump and adjust the back straps so that it rests on the highest point of the animal's shoulder. Ensure that both straps are the same length so the ring will stay centered. Adjust the hip straps so the breeching rides approximately halfway between the base of the tail and the bottom of the hindquarters. Adjust the straps on both sides to the same length to ensure the breeching rides level.

5-39. Attach the crupper if used. Lift the animal's tail and slide the crupper under it. Always be very careful when working around the animal's hind end. Some will want to try to kick. The best thing to do is stay very close to the animal with your side touching the animal's flank. The animal will telegraph any intention to kick by tightening its muscles. Also watch the animal's ears. If he intends to kick, he will lay his ears back. As you lift the tail to slide the crupper under it, talk to the animal reassuringly. Talking will help calm the animal. The crupper should be snug against the base of the tail but not tight. Ensure both connecting straps on the crupper are the same length so the crupper will ride evenly.

5-40. Adjust the connecting straps. A good rule of thumb to follow for adjusting the connecting straps is to make sure that, when the animal is walking and one hind leg reaches its rearmost position in the stride, the breech strap is firmly against the animal's rump. The breeching should not be so tight as to hinder the animal's natural gait. However, if it is too loose it is useless.

5-41. Connect the quarter straps to the front cinch ring. Adjust them snugly to keep the front cinch from moving forward while the animal is moving. *Make sure the upper quarter strap is snug and the lower quarter strap has a 1-inch sag to it.* After the initial adjustment of the breeching is made, you must pull the animal's tail out from under the breeching. See the method for crupper adjustment above for the best method to do this.

5-42. The breeching is now adjusted approximately to where it should be. Walk the animal around to check how the breeching is riding on the animal and make adjustments as necessary.

5-43. When traveling down long steep slopes, it may be necessary to tighten the back and connecting straps some to keep the saddle from slipping over the withers and shoulders.

CINCHING

5-44. Proper cinching is essential because the packsaddle covers so great an area of moving surface. Excessive binding of the front cinch may injure the back and sides, interfere with breathing, or cause cinch sores. You should use the front cinch to secure the saddle in place and make sure it is tighter than the rear cinch. The rear cinch keeps the saddle from rocking from front to rear as the animal is walking; therefore, it does not need to be as tight as the front cinch. Since the hind legs are the propelling members, the hindquarters move from side to side and up and down. Make sure these movements are not restricted by cinch pressure. There must be no interference with the animal's locomotion. Only experience can teach you how to determine the exact amount of cinch pressure needed. A safe rule to follow is to give the front cinch sufficient pressure to hold the saddle in place. Usually one finger should pass easily between the front cinch and the animal's chest.

5-45. Tighten the rear cinch enough to limit the rocking motions of the saddle and to help prevent the saddle from slipping forward. Make sure the rear cinch is not so tight that the whole hand cannot be slipped under it. In testing cinch pressure, you should be able to insert a finger from the rear to the front so that, when it is withdrawn, the hair does not ruffle. Ruffled hair may cause sores. Excessive binding of the rear cinch will cause a pack animal to tire quickly. It is very important to center the cinch on the animal's belly. The cinch rings on either side of the cinch should be the same distance from the rigging when the cinch is pulled tight. This type of fit is called a ring-to-ring check. An uneven cinch could cause cinch sores or cause the saddle to slip. Secure the latigos on both sides of the saddle with a quick release knot. This knot is important because it allows the load to be released quickly from an animal if the load should fall onto its side or upside down. With other knots it is necessary to cut the load away from the animal. Having to cut the load may cause injury to the animal and will ruin the latigos or cinches on the saddle.

5-46. To fasten the cinch on the animal, run the latigo through the cinch ring (the end of the latigo is run through the cinch ring so that it comes through the ring towards the packer) and back up through the rigging ring (the end of the latigo is run through the rigging ring so that it goes through the ring towards the animal). If the latigos are long, or the animal has a small barrel, you may have to wrap them more than once to take up the excess length of the latigo. The knot used is a "half-Windsor." To form this knot, bring the running end of the latigo around the portion of the latigo running through the rigging ring, up through the rear of the rigging ring, and down through the loop just formed. Form the quick release by passing the running end of the latigo up through the knot just formed (Figure 5-4, page 5-10).

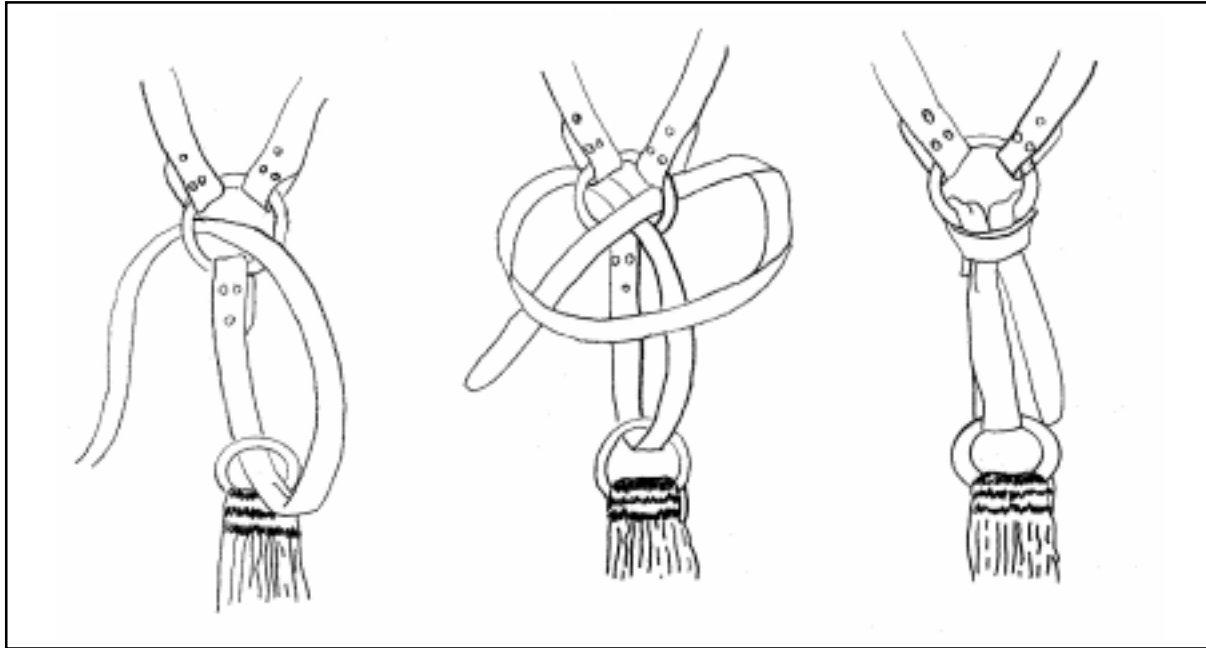


Figure 5-4. Latigos Fasten the Cinches to the Rigging Ring

FINAL ADJUSTMENTS

5-47. When the saddle is in the right position on the animal and the breast collar, breeching, and cinches are snug, it is time to “untrack” the animal prior to packing it. Many times an animal will force air into its lungs and belly when it realizes that it is going to be saddled. It does this to make the saddle fit more comfortably. Once the animal starts moving, it will expel the air and the saddle will fit more loosely. If the animal is packed without untracking it, the saddle could slip shortly after movement begins and the whole load will have to be repacked. To untrack an animal, take it from the place it was saddled and walk it around for approximately 30 seconds. Tie it up and tighten the cinches again if needed. The animal is now ready to be packed.

MARKING SADDLES

5-48. After fitting the saddle to the pack animal, mark it with the animal's name or number and use it with the same animal throughout the movement. The same saddle pads and, if needed, cheater pads should be kept with the animal so the saddle fits the same every time. This technique will save time refitting the packsaddles every time the unit prepares to move.

UNSADDLING THE ANIMAL

5-49. Unsaddle the animal in the opposite sequence that it is saddled. By following this sequence the saddle will be stored in a manner that will make saddling the animal quick and easy the next time it is needed. Since the breast strap, breeching, and cinches were adjusted properly when the animal was saddled, the rider can maintain a proper fit if he loosens only the quarter

straps, cinches, and breast collar (on-side strap and the strap going to the hobble ring). Follow the procedures below to properly unsaddle an animal:

5-50. Unfasten the breast collar strap from the front hobble ring on the front cinch. Unfasten the breast collar strap from the on-side connection. Take the breast collar strap from around the neck of the animal. Run the on-side breast collar strap under the bucks from the rear to the front leaving the buckle visible at the rear of the saddle. Lay the excess strap on the animal's neck. Fold the excess breast collar into the center of the saddle between the bucks.

5-51. Unfasten the quarter straps and hook them onto the rear rigging rings. Unfasten the rear cinch. Put the running end of the latigo through the rigging ring twice. Bring the running end around the latigo, up through the rear of the rigging ring and down through the loop just formed. Repeat the procedure for the front cinch.

5-52. Slide the saddle rearward to loosen the breeching. If a crupper is used, unfasten the on-side strap and lift the animal's tail to remove the breeching. Lift the breeching over the rump and place the spider and crupper, if used, between the bucks. Lay the breeching across the saddle between the bucks. Fold the excess straps into the center of the saddle between the bucks. Fold the cinches into the center of the saddle on top of the breeching.

5-53. Take in the portion of the breast strap that runs under the bucks and loop it around the breeching and cinches folded into the center of the saddle. Ensure the strap runs diagonally across the saddle so the strap will tighten as much as possible. Secure the strap with the buckle.

5-54. The saddle is now ready to be put on the animal the next time it is needed. Place it wherever it is to be stored.

5-55. Remove the saddle pads from the animal. Shake them out or brush them. Place the pads over the saddle with the side that was against the animal facing out so they will dry. If a sling rope is used, wrap it around the bucks in a figure eight manner.

5-56. If the lash rope is not going to be used for a high line, the proper way to roll it is as follows. Hold the lash cinch by the cinch ring and coil the rope. Grasp the lash cinch by the hook and wrap it around the coiled rope once and place the hook through the cinch ring. Hang it by the hook for storage.

SADDLING WITH A FITTED SADDLE

5-57. Saddling an animal with a saddle that has been fitted to it is much less time-consuming than saddling and having to adjust the breeching. Figure 5-5, page 5-12, lists the steps for saddling with a fitted saddle.

1. Properly groom the animal.
2. Place the saddle pad on the animal.
3. Place the saddle on the animal correctly.
4. Loosen the strap holding the cinches and rigging together between the bucks.
5. Let the cinches fall to the off-side of the animal.
6. Pull the breeching from the stowed position and fit it around the rump of the animal.
7. Ensure the saddle is in its proper position.
8. Attach the front cinch loosely.
9. Attach the rear cinch.
10. Attach the quarter straps to the front cinch ring.
11. Attach the crupper, if used.
12. Attach the breast collar.
13. Tighten the front cinch.
14. Since the saddle has already been adjusted to the animal, it should fit properly without further adjustment. However, check the fit of the saddle and all the rigging to make sure it does fit properly.

Figure 5-5. Steps for Saddling With a Fitted Saddle

Chapter 6

Horsemanship

This chapter discusses horsemanship and should help guide unfamiliar personnel. In many cases, authorities vary on how to perform many functions of good horsemanship, even when presented with the same task. Tactical, environmental, social, and other factors influence how animals are used in a combat environment. The descriptions of equipment and techniques are based on the American-Western style of riding. This style of riding is most familiar to U.S. soldiers and the most easily adaptable to sustained combat operations.

The emphasis on American-Western style is one of functionality and stability, but as in any style of riding, success is dependent on rider performance. As in most cases, any basic flaws in technique can most likely magnify during combat operations. A pack animal unit will have to improvise equipment or adapt to indigenous equipment in many cases. A basic knowledge of animals, equipment design and function, and tactics should be sufficient for a detachment to perform their mission given any set of circumstances. It should be noted that reading this chapter is in no way any substitute for experience.

EQUIPMENT

6-1. The following equipment descriptions and instructions for use come from the American-Western style of equipment. In the horse industry, these items are known as tack. Variations of these items are commonplace but the principles of their design and use remain constant.

BRIDLE AND REINS

6-2. The rider uses the bridle to control the animal when he rides. The bridle consists of various lengths of leather or nylon that you can adjust to fit the animal (Figure 6-1, page 6-2). Its basic components include the following:

6-3. The **bit** rests against the back of an animal's mouth and controls the animal by transferring pressure from the reins to the animal's mouth. The rider uses the **reins** or steering lines to command the animal. They are generally leather, approximately 72 to 84 inches long, and can be either split reins (not joined at the ends) or joined at the end. They are attached to the bit at the side rings. The **curb chain** or **strap** gives the animal pressure on the bottom of the jawbone when the reins are pulled and assists in stopping the animal. **Cheek straps** run the length of the bridle. Their purpose is to join the bit and the headpiece.

6-4. The **headpiece** runs behind the ears and gives long axis anchor to the bridle. The **browband** runs across the forehead and holds the headpiece in

place. The **throatlash** runs from the junction of the headpiece and the browband on each side and under the animal's throat. It serves to further anchor the headpiece. The **noseband** fits around the animal's nose several inches behind the mouth. It serves to keep the animal from opening its mouth too wide and to provide stability for the bridle.

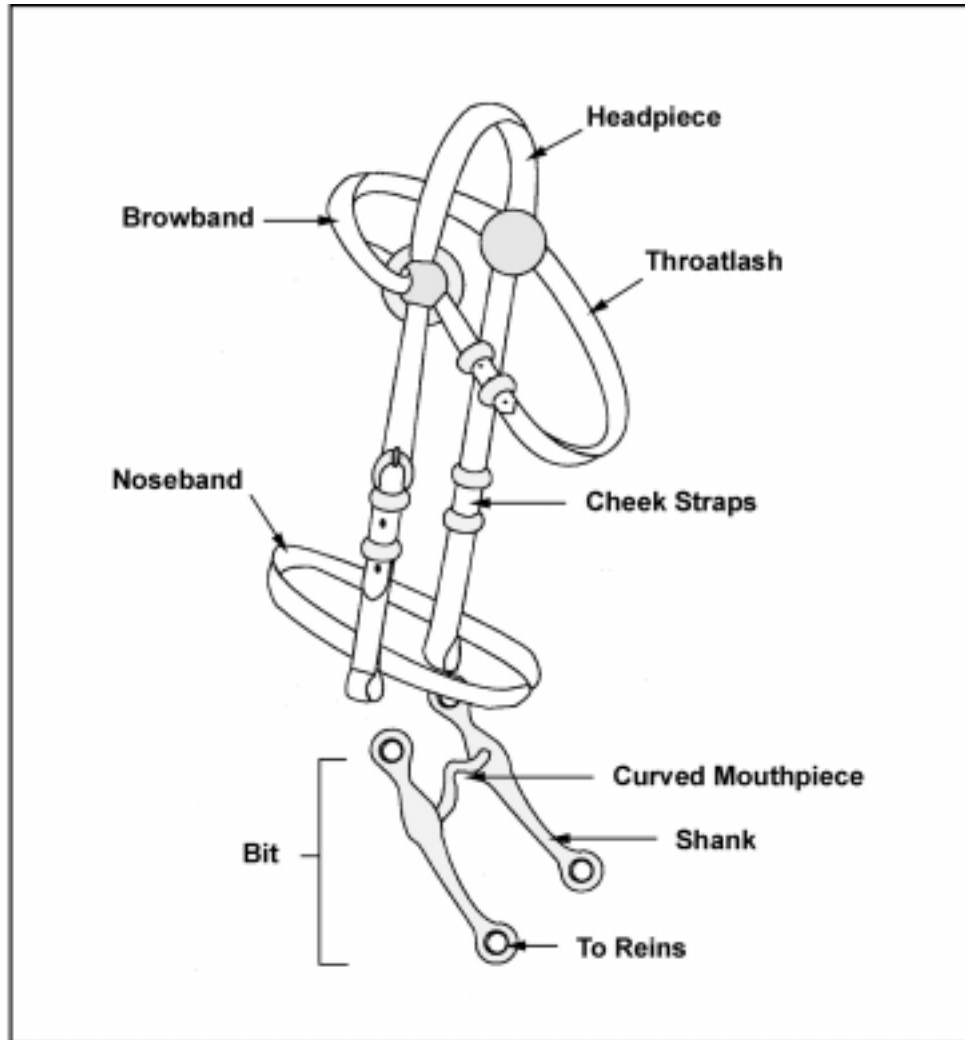


Figure 6-1. Typical Horse Bridle and Standard Bit

NOTE: There are many types of bridles. The components identified are not necessarily present on all bridles. Figure 6-2, page 6-3, explains how to put the bridle on the animal.

SADDLE PAD

6-5. Riding pads are generally the same as the pads used on packing animals. The average size is 30 by 30 inches. For information on the use and care of saddle pads see Chapter 5.

CHEATER PADS

6-6. Cheater pads can be used on riding animals as on packing animals. See Chapter 5 for use of cheater pads.

1. Stand on the on-side of the animal, untie the animal, and remove the halter. Place the reins behind the animal's head and drape them over its neck or your arm.
2. Unbuckle the throatlash.
3. Hold the headpiece in your right hand.
4. Hold the bit in your left hand with your thumb pointed up the axis of the animal's head.
5. Place your right hand on the animal's head between the ears to keep it down.
6. With your left hand, open the animal's mouth at the corner by putting your thumb between its canine and back teeth (the taste of your thumb will cause the animal to open its mouth). Then slide the bit in by pulling with the headpiece in your right hand.
7. Slide the headpiece behind the ears and place the browband on the forehead.
8. Buckle the throatband loosely.
9. The bit should be adjusted so that the back of the animal's mouth is drawn up into a slight "smile."
10. Pull loose any restricted mane that is caught under the bridle straps.

Figure 6-2. Steps for Putting the Bridle on the Animal

SADDLE

6-7. The modern Western saddle is a direct descendant of the deep-seat saddle brought to the Americas by the Spanish Conquistadors in the sixteenth century. Among the characteristics common to Western saddles are the deep seat, saddle horn, long stirrups, and high cantle. It also comes with a complement of tie-down straps to secure personal equipment to the saddle.

6-8. Western saddles are constructed of wood or synthetics for the tree (frame) and stirrups and covered in leather. If the manufacturer has placed padding in the bars of the saddle, a saddle pad still must be used.

6-9. The typical Western saddle will have one cinch to secure the saddle to the animal and may or may not have a flank cinch. Figure 6-3, page 6-4, explains the steps for saddling the animal.

RIDER'S EQUIPMENT

6-10. The problem encountered with equipping a U.S. soldier for mounted operations is that no consideration has been given to the requirements for this type of operation in quite some time. This time lapse can pose various challenges in each mission.

6-11. Many items that are critical for dismounted use are critical to use while mounted as well, but may not perform suitably in both situations. Boots are a

prime example. Boots suited for dismounted operations may be detrimental to mounted operations. The very nature of combat operations demands interoperability. This section will address such difficulties. It will be the responsibility of the commander who assigns a unit to perform mounted operations to properly equip those units.

1. Ensure the animal is properly groomed.
 2. Place the saddle pad on the animal.
 3. Ensure the saddle is properly "rolled" for placement on the animal. Being rolled means that the cinch, off-sides stirrup, and any tie-down straps are pulled over the seat of the saddle.
 4. Grasp the saddle by the front center under the horn and the rear center.
- NOTE:** If the animal is skittish, or if it doesn't know the handler, allow it to see and smell the saddle at this time. Make sure the animal is never surprised.
5. From the on-side set the saddle on the animal's back. The front edge of the saddle should be 1 to 2 inches from front edge of the pad and above the rear of the withers. Grasp the front edge of the pad and lift it up into the tree to allow a space for air to circulate under the pad.
 6. Pull down the cinch and connect. Initially, snug the cinch tight enough to secure it to the animal.
 7. Connect the flank (rear) cinch, if one is present. It should rest just against the animal's flank and be secured snugly. Connect it to the front cinch in the center with the connecting strap.
 8. Lower the stirrups into place. Never drop them against the animal's side.
 9. Ensure that no saddle strings or any other objects are between the saddle and the animal.
 10. Walk the animal around for a short distance and then adjust the cinches again. The main cinch should be tight enough that three fingers can be slid underneath it without much effort.
 11. After riding or waiting for a time, recheck the cinches. Exertion or excitement may cause the animal's girth size to change.

Figure 6-3. Steps for Saddling the Animal

Boots

6-12. Their leather construction, pull-on design, high one-piece uppers, smooth sole, pointed toes, and high heels characterize boots normally associated with American-Western style riding (often referred to as cowboy boots). Boots normally associated with dismounted operations have treated multipiece leather uppers, a lace-up design, lug soles, broad toes, short heels, and are generally shorter than riding boots. Soles that provide traction and footing on the ground can be dangerous when trying to dismount a horse. Lug soles tend to catch on stirrups. Boots with buckles or those with hooks used for speed lacing are not good because the buckles or hooks can catch on the saddle. Boots designed for riding are totally unsuitable for carrying loads over any irregular terrain while walking or for walking any appreciable distance. Riding boots are more difficult to fit and break in as well. Standard military boots, in most cases, will not accept spurs. Standard riding boots will not

accept mountaineering equipment (for example, crampons, snowshoes, and skis). Modifying stirrups is not advisable or simple to accomplish. The more suitable approach would be to use military boots with the minimum amount of lug required and shaving down the edges of the soles to prevent the stirrups from becoming wedged into the lug. Use the widest stirrup available. When using military boots, exercise care when removing the foot from the stirrup and pay particular attention to how a low heel will affect the rider's ability to maintain the correct seat.

Spurs

6-13. Spurs are removable metal devices that attach to the heel of a rider's boots and assist in the use of his legs as riding aids. There are hundreds of variations of spurs but two basic designs. The classic or cavalry type is a short one-piece spur. The Western style is the star or wheel shape that rotates on a pin. Spurs are not essential for riding but can be useful in controlling an animal. Experience, tactical considerations, the animal's training, and availability of spurs will influence the choice of using them or not. Inexperienced riders may tend to use spurs improperly, which can cause more problems than are corrected. Inexperienced animals may not understand what the rider is asking of them when spurs are applied. When using spurs, never poke an animal with their points. Their purpose is to enable the horse to better feel the commands of the rider's legs. When applying spurs to the animal's flanks, use the side of the spur and roll it upward. A military user must remember that spurs may not be usable with his boots and will impair him when dismounted.

Chaps

6-14. Chaps are leather leggings worn to protect the legs while riding. Chaps are not required for riding but do provide considerable protection against the tendency to chafe the legs raw from the friction between the legs and the stirrup leathers. They also protect the leg against foliage, limbs, and other such items the rider can brush against while riding. Chaps come in two basic designs. The first are shotgun chaps, which are narrow and zip up the side. The second are open or bat-wing chaps that connect by ties at the side. The shotgun type, if not too tight, provides the best compromise between tactical use considerations and horse-related work. Shotgun chaps are quieter and will not snag as easily when the rider dismounts. When doing farrier-type work, bat-wings are preferred if a farrier's apron is unavailable.

Uniform

6-15. Other than the items already addressed, the requirements for a suitable uniform are the same as for conventional dismounted operations. Consider some of the following points:

- ALWAYS wear leather gloves when leading pack animals.
- Wear a hat to protect the head from low limbs. It should not restrict hearing or vision (particularly peripheral). A chinstrap is helpful since wind and obstructions may cause the hat to be lost and recovery from horseback is impossible. A good choice is the jungle hat or watch cap.
- Carry nothing in your rear trouser pockets.

NOTE: Items such as load-carrying equipment (LCE) will be addressed in a later section.

Necessary Bag

6-16. A necessary bag is a small kit carried by a rider to make field repairs to tack or other equipment. It is normally carried in a saddlebag. There is no specific item list, but typical contents are as follows:

- Leather punch or sharp awl.
- Assorted leather or sailmaker's needles.
- Beeswax.
- Waxed sailmaker's thread.
- Sewing palm.
- Rivets (for leather).
- Leather boot laces.
- Small bits and pieces of leather.

Saddlebags

6-17. Saddlebags are of particular importance to the military rider. There are many different styles of saddlebags. Construction is usually of nylon, canvas, or leather. For military uses, heavy nylon is preferable because it is rot resistant, abrasion resistant and easily repaired. Saddlebags are attached to the rear of the saddle and tied down with the saddle strings located to the rear of the cantle. Locally fabricated models can be designed to work with issued LCE, perhaps attaching to the rider's back. Typical dimensions of saddlebags are 11 inches wide by 11 inches long by 5 inches thick. When used, as with pack loads, saddlebags must be balanced and sharp contents packed away from the animal.

RIDING TECHNIQUES

6-18. As stated previously, this manual discusses the American-Western style of riding. Riding basics for combat applications are no different from those for pleasure riding. What makes a difference is the skill level required of the rider. Combat conditions force the mounted soldier to be a master of the basic skills of riding if he is expected to accomplish his mission. Riders must conduct actual training and practice on a regular basis for the skills of a mounted soldier to remain of high enough caliber to conduct combat operations.

PREPARING TO MOUNT

6-19. Once a rider's animal has been prepared to ride (for example, it is properly groomed and all tack is on and properly adjusted), the rider must ensure that he is ready to ride. All equipment he wishes to carry must already be in place on the animal and himself.

MOUNTING

6-20. Untie the animal from its hitch and hold both reins in the left hand before mounting. From the on-side, stand just in front of the saddle, face to the animal's rear, and turn the stirrup around so you can place your left foot into it. With your left foot in the stirrup, place your right hand on the saddle horn and left hand on top of the animal's neck. Swing your right leg over the animal's back. Place your right foot in the stirrup when seated.

NOTE: Only when seated properly in the saddle can the stirrup length be judged to be proper or not. If proper, the knee will have a slight bend in it (approximately 20 degrees) and the rider should just be able to see the tip of the toe over the knee. Another way to tell if you are seated properly is to stand in the stirrups. There should be enough room to place two fingers between the saddle and your crotch. Ensure that the stirrup adjustment hardware is secure after adjustments are made.

PROPER SEAT AND AIDS

6-21. The proper seat, or how the rider positions himself in the saddle, is very important to proper riding. The animal will become confused with the commands the rider gives and will not have the proper stability he needs to traverse difficult terrain if the rider does not sit correctly.

6-22. The position of the rider in the saddle and the way he uses that position is referred to as the "aids." Mastering the aids is the single most important function of riding in control. (Assuming, of course, that the animal has been properly trained.) When in the saddle, the position of the rider's body should be as follows:

6-23. The **legs** are used to create and control the forward motion of the animal and to assist in steering. When at the normal position, the legs should lie against the animal's side with the heel resting just behind the girth. The feet are placed in the stirrup with the rider's weight resting on the balls of his feet. This position remains the same unless the rider must give the animal a kick. The variance comes from the pressure delivered to the side of the animal by squeezing the leg muscles. To increase forward motion, squeeze more in equal amounts to both sides. When turning, keep the inside leg at the girth, and the outside leg back. When halting, apply light pressure with both legs. When applying any aid, cease the pressure when the animal responds.

6-24. The primary objective of how the rider distributes his **weight** is to remain in contact with the animal and feel its movements so he can move with the animal. The majority of the rider's weight will be in the stirrups; thus the saying "standing tall in the saddle." The spine should be straight but not stiff. The remaining weight should be distributed evenly in the seat. If the rider is about to change pace, he should press down in the seat with his pelvis momentarily, without leaning forward, to warn the animal. When riding uphill, the rider must lean forward slightly and when riding downhill lean slightly to the rear. In either case, the rider must not exaggerate the movement but keep the weight in the seat. These adjustments are made to assist the animal when it must change its center of gravity.

6-25. The primary function of the **hands** as an aid is to control the reins. Western style riding (and horses trained Western style) responds to the technique known as “neck-reining.” This style allows the reins to be controlled with only one hand. The reins are held in the dominant hand slightly above the saddle horn. The reins should be held with slight pressure, just enough to maintain light contact with the animal’s mouth and low on the neck. To turn the animal, the rider simply moves the rein hand in the direction he wishes to turn. Do not over-rein. Just give sufficient pressure so that the animal will understand what is expected. Some experts insist that the animal responds to the pressure created by the reins on the neck while others maintain that it is a combination of the movements that makes the animal react. In any case, all aids (legs, weight, and hands) must be applied simultaneously and with only enough pressure to achieve the desired effect.

PACES

6-26. As with anything, a rider must “learn to walk before he runs.” When training a new rider, it must be done in a controlled environment such as a corral. Start with the easiest pace first and progress only when a rider is comfortable with the level at which he is working.

6-27. The rider gets the horse to **start** moving by making light contact with the horse’s side by squeezing his legs. The rider must maintain the proper seat and balance. Riding one hour a week, bareback, will improve a rider’s balance rapidly. The rider must not allow his weight or rein hand to come too far forward, as is often the tendency. Keep the shoulders square to the animal always. A rider may hold the saddle horn if he needs to steady himself at first but should NEVER use the reins for any purpose other than controlling his mount.

6-28. Unless the animal has been started in a violent manner, he should assume a **walk** when given the command to start out. Maintain all aids as described above when riding at the walk. Also, be on the lookout for anything that may be affecting the animal such as a piece of saddle string under the pad. The rider must remember to “stand” in the stirrups, keeping approximately 2/3 of his weight on the balls of his feet.

6-29. To **halt** the horse, close the lower legs against the animal’s side and lightly tighten, not pull, the reins. When the animal responds, release the pressure but not the control. It will take a rider a little time to determine how responsive any given animal is to this or any other command.

6-30. The **jog and lope** paces are two different paces, but are closely related. The aids are the same as for any pace except that the rider’s weight shifts slightly forward. In the jog the horse will bounce quite a bit and the rider must learn to move with the animal. To initiate the jog from a walk, repeat the steps used to start the animal from a halt into a walk. The lope is a more relaxing riding pace for the rider. The animal will tend to bounce less and it is easier for the rider to maintain the proper balance. The lope is slightly faster than the jog and is initiated from the jog.

6-31. The **gallop** is the fastest pace of a ridden animal and the most dangerous. It is very easy for a rider to lose control of an animal at the gallop if the animal becomes overexcited, which is often the case when an animal is

ordered to gallop. When at the gallop, maintain control with the aids as previously described. The rider must transfer his weight from the seat to the stirrups and the knees. Contact should be maintained on the reins.

6-32. The rider uses the **rein back** to make the animal move straight back. It should not be used over any distance. It is always performed from the halt. The rider performs the rein back by using an “elastic” and staggered pull on the reins and positions his weight slightly forward of center.

LEADING A PACK STRING

6-33. One of the principle advantages of using animals in the era of modern combat is that mounted elements can move large quantities of material in areas not suitable for conventional transport. When using pack animals, it is often preferable to lead them from horseback to take advantage of the animal's superior speed. Leading pack animals from horseback is not difficult but you must observe the following rules:

6-34. **Never** tie a pack string to the lead (ridden) animal. If an accident occurs or the pack string becomes frightened, you are in certain danger if you cannot release the string. This point also applies to leading a single animal. Always hold the lead line in one hand. Form a bight over the saddle horn if needed but be sure that the lead line can be jettisoned immediately, if required.

6-35. You should **never** move a pack string faster than the animals in it can comfortably navigate obstacles or difficult terrain. Keep in mind, the pack animals are carrying dead weight and, often, heavy loads. It is often preferable to give the string more slack when traversing an obstacle so they can pick their way.

6-36. It is preferable to have **two riders** per pack string, a puller and a drag man. The puller observes the trail to the front to anticipate problems. More important, the drag man observes the pack string and assists in correcting any problems that may arise such as a shifted load. If a rider is alone and does not have someone to watch the string for him, he can ride in a figure eight to get a good look at the string.

6-37. **Always be wary at halts!** The majority of accidents occur at halts when the animals have the freedom to mill about and can become entangled. **Never** allow a lead line to run under the tail of any animal, pack or ridden.

6-38. If negotiating dense terrain (timber or rocks) and the pack animals choose a different route than the lead animal, it is better to **drop** the lead line and **recatch** the string than it is to become entangled in an obstacle with the string.

6-39. **Never** allow the pack string to get in front of the rider because if the string should become startled, the rider could get caught up in them.

6-40. The normal distance between the lead pack animal and the rider's animal varies according to terrain and the animals' training and experience. A rule of thumb is the lead pack animal's **nose** should be **even** with the back of the rider's **flank** while traveling over easy terrain.

COMBAT CONSIDERATIONS

6-41. There are too many types of missions and units that could be assigned to mounted duty to allow this manual to encompass all aspects of military riding. Weapons, climatic conditions, and table of organization and equipment (TOE) will vary too greatly for this chapter to provide specific standing operating procedures (SOP) and doctrine capable of covering all applications. This document will try to assist the user in formulating his procedures with general guidance.

WEAPONS

6-42. Individual weapons are as important to the mounted soldier, regardless of his duty, as they are to the dismounted soldier. They must be ready to be brought into action at all times. Achieving this state of readiness from horseback poses certain difficulties. A soldier normally will carry his weapon in his hands when in a high state of readiness. While mounted, a soldier's hands are often occupied. Also, there is the problem of keeping the weapon free of the animal and the equipment surrounding the rider. For a rider there is also the ever-present danger of being separated from his animal. So a primary weapon cannot be kept attached to an animal.

Side Arms

6-43. There is a very real requirement for all mounted personnel to be issued a side arm. The preferred method of carry is the shoulder holster. The holster serves two functions. One, the weapon will be out of the way of tack and lines, always making it instantly accessible. Two, the weapon will always be with the soldier. Due to the large number of duties that mounted soldiers must perform with their hands (to include tactical movement), a side arm, because of its ever-present availability, becomes a necessity.

Personal Weapons

6-44. While the use of animals provides a commander a valuable asset for getting individuals and equipment to a battle, fighting from horseback is not considered a primary function of mounted soldiers today. However, when a unit is in a hostile environment it must be ready to fight at anytime. For a mounted unit this includes while on the move. As stated, side arms are a requirement for mounted soldiers but they are insufficient as a primary weapon.

6-45. The standard weapons of the U.S. military (M16A2, M4, M60 MG, M203, and M249 squad automatic weapon [SAW]) have a serious defect in their size for mounted operations. It is difficult to handle the reins of a horse and a lead line while holding a large rifle. These weapons also demand a certain degree of accuracy that is next to impossible to achieve from horseback. To compromise between effective firepower and effective size, carbines are recommended. U.S. M16 variants such as the CAR-15 are acceptable or, if operations were conducted in a UW environment, an AK folding stock variant would be acceptable. The ability of a submachine gun to lay a heavy base of fire from an unstable position makes it a valuable choice. A selective fire weapon with a folding stock, extended for accuracy when required, is the ideal choice. A very good choice of immediate suppression

weapon for the mounted unit is the U.S. M79 grenade launcher. It is much shorter and lighter than the M203 and can be maneuvered with one hand. Its compact size will allow it to be placed in a scabbard and still be quickly brought to bear. Several M79s dispersed through a moving unit would greatly improve that unit's chance of surviving an ambush.

6-46. Another consideration would be the adoption of shotguns as standard weapons for mounted troops conducting operations in dense terrain. Their unequalled killing ability at close range and less severe accuracy requirement would make them a good choice as a weapon for mounted troops. The M249 SAW would be a superior choice for a general fire support weapon than an M60 due to its size. The box magazine of the M249 is recommended because a belt of ammunition is too unwieldy around animals. The main problem with any of the weapons described is still how their size relates to how they can be carried effectively and still be brought into action when needed. As discussed before, the selection of carbine style or folding stock weapons goes a long way in helping with this problem. However, further mention must be made about how these weapons should be carried. As stated before, a scabbard can be used but only when enemy contact is highly unlikely, such as traveling in a secure area. **A cross-chest carry with a top-mounted sling is the best choice.** Great care must be made that weapons **DO NOT** endanger the rider or his mount by becoming entangled in reins and lead lines or by hitting the animal.

ADDITIONAL WEAPON CONSIDERATIONS

6-47. The nature of modern battle dictates that mounted units carry more types of weaponry than the cavalry of old. Mortars, antiarmor weapons, air defense weapons, and sniper weapons are just a few that must be considered. Again the METT-TC factors determine what weapons will be carried and in what fashion. This manual discusses only a few typical weapons and generic considerations of each.

Antiarmor Weapons

6-48. U.S. antiarmor weaponry of any effect is generally too cumbersome to be carried on horseback. The possible exception is the M72 light antitank weapon (LAW). You can use the LAW in many different roles but is sufficient against main armor vehicles in only selected manners. You can conveniently attach one or two LAWs to the rear of a saddle, behind the seat, and rig them to be quickly released for action. Backblast must be considered if LAWs are fired around animals. The larger antiarmor weapons (M47 Dragon and TOW) are, in all respects, too heavy and large to be mounted with a rider but can be mounted on a pack animal. Keep in mind, though, that they cannot be brought quickly to bear if needed.

Air Defense Weapons

6-49. The only air defense weapons suitable for mounted operations are the man-portable generation of weapons (for example, the Stinger or SA-7 GRAIL). These will be too unwieldy to be carried for any distance on a ridden animal but can be packed easily on a pack animal with consideration given to

speedy access. They should be placed within the pack animal strings where the qualified users are as well.

Sniper Weapons

6-50. Sniper weapons are not fired from a mounted position and generally not from a hasty position. They, usually, will not have to be brought quickly to bear. The sensitivity of their sighting mechanisms demands that they be protected when around animals.

PERSONAL EQUIPMENT

6-51. Standard U.S. personal equipment will serve a mounted soldier well when certain considerations are given. In most cases, an assault vest is preferable to the "web gear" style because it fits closer to the body. You can carry all items higher and out of the way of lines and reins. A standard ALICE pack is too large and heavy for the mounted soldier to carry. However, it adapts easily to being packed on an animal. You can place it on packsaddles just like panniers. You should carry all essential and sensitive items in your LCE. Using saddlebags and a small "day-pack" style rucksack can greatly enhance your ability to survive if your ALICE pack gets lost.

6-1. A mounted soldier carries the essential items with him. These include, but are not limited to, the following:

- Knife.
- Water.
- Rope.
- Necessary bag.
- Personal hygiene kit.
- Required first aid supplies.
- Compass.
- Chemlights, all colors to include infrared.

ADDITIONAL EQUIPMENT

6-52. Modern combat operations depend on communications. If a soldier is designated to carry unit radio equipment, it must be carried with him. For this reason, commanders should make every effort to provide a mounted unit with the smallest and lightest communications equipment.

NOTE: Never carry sensitive and/or classified communications items on a pack animal.

Chapter 7

Techniques and Procedures

It is easier to demonstrate how to pack an animal than it is to try to explain how to do it. The **ONLY** way to learn this skill is by attending a school on packing or spending time with a knowledgeable person who can show you how it is done.

TYING AND USING KNOTS

7-1. There are a variety of knots useful in packing; this section introduces a few and is by no means inclusive. There are several knots most frequently used and you may perhaps know, or learn, of others equally useful. As horses and packing become more familiar, you may even come up with some of your own invention. There is no one perfect way to throw a hitch or tie a sling; use what feels comfortable and works best with the horse and the load you have to pack.

7-2. You cannot learn to tie a knot just by reading about it. As with packing and horse handling, the only way to learn this skill is by doing it. Figure 7-1, page 7-2, and Figure 7-2, page 7-3, explain and illustrate several commonly used knots. The recommended method is to get a length of rope and practice tying the various knots until you become proficient.

WRAPPING CARGO WITH A MANTA

7-3. A manta is a tarp that is either lashed over the top of the load secured on a packsaddle or used to wrap up cargo that is to be placed or slung on a packsaddle. This cargo could be duffel bags, kit bags, sacks of grain, or hay for the animals. Large duffel and sleeping bags that are to be slung on a pack load should be wrapped regardless of the type of material with which they are made. If you sling them next to a pack animal without wrapping them, they will pick up the sweat and oil off the animal. Besides soiling the articles, they will end up smelling like a sweaty packhorse.

7-4. If you can wrap a present, you can use a manta on any item you want to put on a pack animal. Remember that the side next to the animal will have to be flat and smooth. As in wrapping the present, take pride in the appearance of the finished package. One-quarter-inch rope is usually used to tie the manta load together. The following steps explain how to use a manta on a bale of hay:

- Center the bale on the tarp diagonally.
- Wrap one side around the bale. Fold the other side so it reaches only to the center of the bale.
- Fold the ends inward.

- Make a loop around the bale, then pull tight.
- Make three half hitches around the bale, or two if it's a small load.
- Tie off with a sliding clove hitch.

Hitch Knot or Slip Knot	Used to tie a horse to the hitching rail. NOTE: This knot will slip and tighten up; NEVER tie this knot or any other slip knot around an animal's neck; it could possibly choke the animal before the knot could be released.
Round Turn With Two Half Hitches	Used with two half hitches to tie the end of a rope around an object such as a post, tree, or part of the packsaddle.
Bowline	Used in various ways and is one of the best knots for forming a single loop that will not tighten or slip under strain. The ONLY knot that should ever be tied around an animal's neck. Forms a loop that may be of any length desired. (When tying a horse to a tree or a picket pin, use the bowline since it will not tighten.) The loop remains loose and will not wind up if the animal walks in a circle around the tree or picket pin.
Clove Hitch	Used to fasten a rope to a pole, post, or similar object. Can be tied at the end of a rope or at any point along the length of a rope.
Timber Hitch	Used for moving heavy timbers or poles. The more tension applied, the tighter the hitch becomes. Will not slip, but will loosen easily when released.
Sheepshank	Used to shorten a rope without cutting it. Also used to take the strain off a weak spot in a rope. It is a temporary knot unless the eyes are fastened to the standing part on each end of the knot.
Double Sheet Bend	Used to tie together the ends of ropes of equal or unequal diameter, to tie wet ropes, or to tie a rope to an eye. Also used to tie the ends of several ropes to one rope. Will not slip or draw tight under heavy loads.
Butterfly Knot	Used to form a fixed loop or loops in place along the length of a rope without using the ends of the rope. Can be used to attach the middleman on a climbing party, tighten installed ropes, and make tie points on a picket line.
Cat's Paw	Used to form a loop along the length of a rope without using the ends of the rope. It can be used to tighten installed ropes and to make tie points on a picket line.
Dutchman and Double Dutchman	Used to take the place of a pulley. The pulley knot can also be used to make tie points on a picket line.
Quick-Tie and Quick-Release Tie	Used when you need a knot that is quick to tie and quick to untie.
Square	Used only in simple applications. Used to tie packages and for binding rolls. It is easy to tie, will not jam, and is always easy to untie.

Figure 7-1. Commonly Used Knots

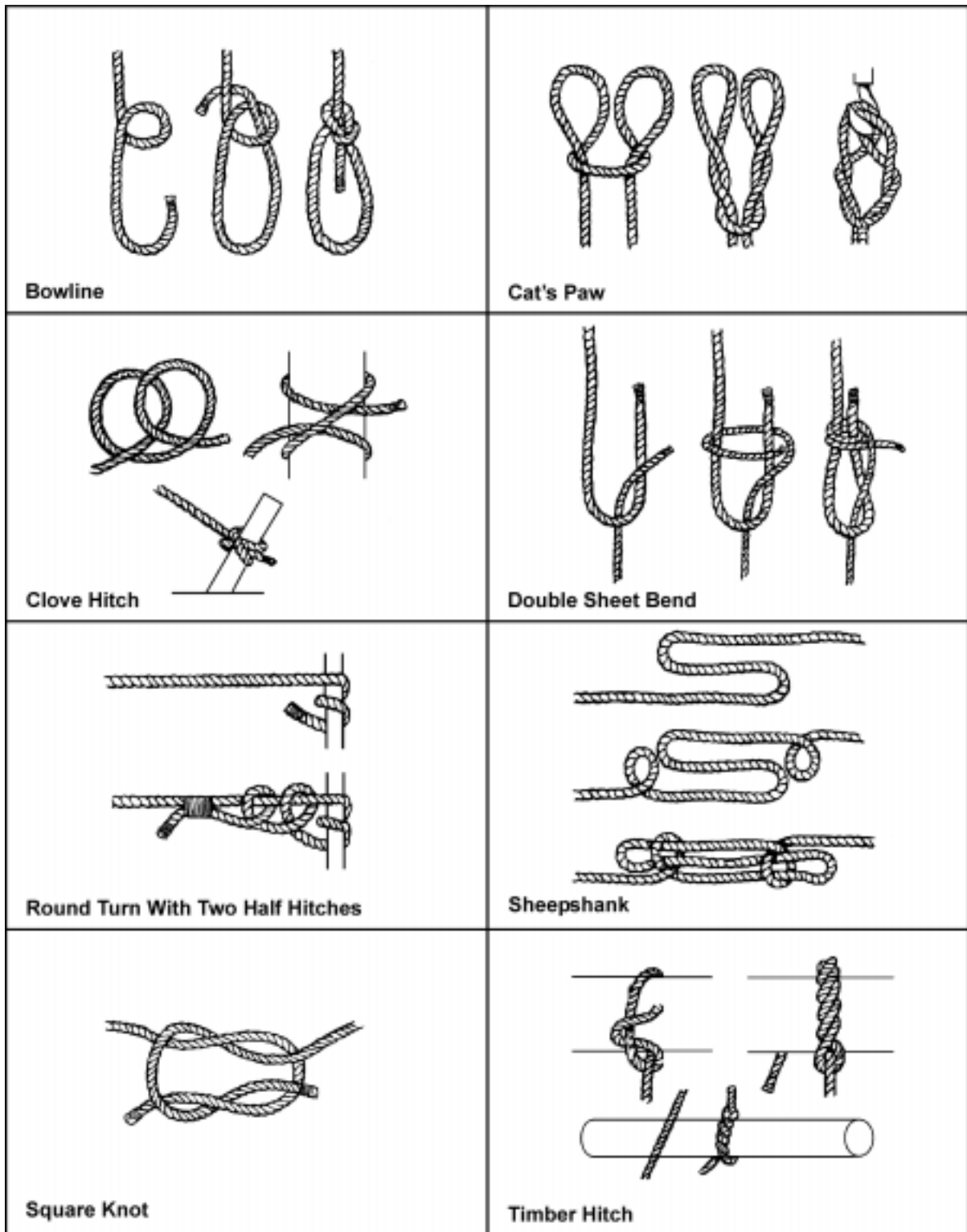


Figure 7-2. How to Tie Specified Knots

7-5. The load can be slung using a basket or barrel sling. You can also use short ropes to loop the load to the bucks, then tie off with a lash rope and box hitch.

BUILDING LOADS

7-6. Whether you are packing one animal or 20, it takes a plan of attack. In reality, a pack animal is packed in your mind before the actual pack is ever loaded on the animal. Planning is the most important part of packing. You should decide which animal will carry which load best, which will be your lead pack, and which can be trusted to stand without trying to lie down or roll while the others are loaded.

7-7. A very good method to follow in planning your pack loads is to lay out several tarps or mantas on the ground to keep the items clean and dry. If you have several personnel whose gear is being loaded in the packs, have them put it all on the tarps. Explain that once you start to lay out the packs, they cannot take anything out or add to the pile of gear without asking you first. Any item taken out of a duffel bag you have already hefted for weight will throw you off by the weight of that item. This amount could be just enough weight variation to either sore the pack animal or slip the pack on the trail.

7-8. When preparing to pack, load the equipment each man is responsible for onto one animal as neatly as possible, and if more than one animal is needed, keep them together in the string. This practice makes things simple at overnight halts and when the final destination is reached, so one man does not have to go through the panniers of several different animals searching for what he needs.

7-9. One of the many secrets of packing—possibly the most important—is to keep the weight down at the bottom of the pack. This gives the packer a good solid foundation on which to build the rest of the load. A good load for most horses or mules is 160 to 170 pounds. However, if you have some small animals in the pack string, this amount could be too much for them. We are speaking of 1,100- to 1,200-pound packhorses and 800- to 1,000-pound mules. In extreme circumstances, you can load an animal with up to 250 pounds; however, this amount would limit his speed and endurance. The horse gear (shoes, nails, hobbles, bells, picket chains, ropes) usually will fit in one set of panniers (two panniers). Remember this set of panniers well, as it will be the first item needed when you unpack at your destination. Try to keep all your camp tools (shovel, ax, saw, currycomb, brush) on this pack load; it will save you a lot of time when you arrive at your camp for the night. You will know exactly where all your tools are.

7-10. When loading the bottom of box panniers, you want everything to fit as snugly as possible to keep from rattling. A pile of gunnysacks close at hand is good for chinking up any rattles. Distribute the items through several sets of panniers, if necessary. Two layers of heavy items in a pannier are a big bottom load. If you have plenty of pack animals and box panniers, one layer of heavy items in several boxes will be better than trying to get it all on one pannier. Pack lighter items on top to keep the weight mostly in the bottom of the pannier.

7-11. Canvas panniers come in all sizes, shapes, and forms. Their general use in packing is to load them with bulky items that will not fit the box panniers. The loading method as mentioned before is the same: keep the weight down at the bottom. Just because a canvas pannier sometimes looks like a big sack, do not make the serious mistake of loading it like a grocery bag. There is nothing between the load in the canvas pannier and the pack animal but a thin layer of canvas. Load the canvas pannier so it is smooth and flat on the side next to the pack animal. If there are a lot of odd-shaped sleeping bags and duffel bags, here is a good place to put them. This method is also the best way to pack the grain for the animals. Having numbers on all the panniers is a great help in keeping them in sets of two. Whether there are numbers on the panniers or not, keep the sets together when you have finished loading.

7-12. When you have all the supplies, horse gear, grain, and other things packed in the panniers and any sling loads wrapped, you are ready to finish your pack loads with personal gear of the party. Select two items of equal weight and put one in each pannier, all the time keeping in mind what each pannier weighs. Next, you may need a top pack. Select two duffel bags or sleeping bags of equal weight and place these on each pannier. Now is a good time to recheck the weight of your panniers to make sure they are still equal. Have a scale you can suspend from a tree limb to weigh the panniers; a difference of only a few pounds between them can make all the difference once you start down the trail. If you feel that both panniers together weigh under approximately 150 pounds, find a third sleeping bag or duffel bag for a center load. Lay this third item across both panniers, showing it as the center load, place a manta and lash rope over the entire pile, and allow no one to disturb it until you are ready to load it on a pack animal.

7-13. After you have gone through the pile of things to be packed, there will probably be several items that look like they will not fit any of the loads you have laid out. If they are small and light enough to make another pack load, you can often find a place for them as you pack out the other loads. You will have to keep these items in mind while loading the other panniers or you will end up with one or two things left out.

SADDLING

7-14. Listed here are some techniques and lessons learned that will stand you in good stead (see Chapter 5 for saddling details). There are quite a few different types of packsaddles, and each has to be rigged differently to get the pack on it. These saddles may have any number of different riggings and may or may not have quarter straps. Whatever the type, all saddles must properly fit the pack animal.

7-15. The padding between the pack animal and the saddle is a very important piece of pack gear. Pack pads as a rule are larger and thicker than regular riding pads, and for good reason. Once you pack the animal and the load rests on these pads, they will stay there until the animal is unpacked. Pack pads are made of many materials, the best being one that will stay soft and not pack down. The most commonly used pads have a fiber or hollow hair filling between two layers of light canvas.

7-16. Whatever type of pad you are using, check it thoroughly for any foreign objects before placing it on the animal. Sweat will build up but can be scratched off with the currycomb. Wet pads will gall or cause sores on a pack animal. Lay the saddle pads out where they can air out and dry when possible. Always try to place the pack pads square on the packhorse, leaving at least 4 inches to the front of the packsaddle. Depending on the shape of the pack animal's back, you may need more than one pack pad. The best way to gauge is to set the packsaddle on the animal, then check the clearance between the saddle and the animal's withers; there should be enough space for two fingers.

7-17. Allow for the saddle settling down on the pads after the animal is loaded. If there is any chance of the saddle forks coming in contact with the top of the withers, put another pack pad under the saddle. Also make sure you do not put too much padding on the withers and cause the packsaddle to pinch from being too thick. Most good pack pads are thin down the center of the pads. Your aim in a high-withered animal is to raise the packsaddle off the tops of the withers. Some packers use what is called a cheater, a small pad usually made of a wool. You can place these cheaters between two regular pack pads in the wither area to raise the front of the packsaddle off the withers and yet have the saddle sitting evenly on the pack animal's back.

7-18. Now is the time to again check the pack animals to see if the saddles on them are rigged for the type load the animals will be carrying. If you have one or two sling loads, you know you will need that many sling ropes on the saddles and have them tied off ready to use in saddling the pack animal. Recheck the pack pads to make sure they are loose over the withers of the animal and that the packsaddle sits in the middle of the pads.

7-19. During all the loading of the panniers and other gear, **DO NOT** lead the pack animal around to pick up parts of the load. It is a very serious mistake. Once you begin loading an animal, wait until the pack load is lashed down before ever moving him, or you will be picking up parts of your load from the ground after they have slipped off.

7-20. If you are going to move the pack animal from where he was saddled to where the pack load is sitting, pull the cinches up snug before you lead him to the pack load, then finish tightening the cinches just before loading. This technique is called "untracking" the animal. If pack animals that have been saddled and standing with a loose cinch have the cinches tightened and are then loaded without moving around first, they could experience some discomfort from being pinched or having a fold in their skin caught under the cinch. This pain will often cause them to throw the whole load off. When you pull up the cinch on a pack animal, untrack him before you put the pack load on him; moving around a bit allows the cinch to settle into place, and the animal will be more comfortable. This practice also applies when the packing is completed. You should be continually checking the animals and how the loads are riding anyway, but especially watch the animal as he takes the first few steps after being packed; if the load looks like it's shifting, make whatever adjustments are necessary.

7-21. Whenever possible, get some help in loading the panniers onto the animals because when packing alone you will have to keep moving from side

to side. While you are moving to the opposite side, the load on one side is pulling the packsaddle over and pinching the animal's withers. With a heavy load, this could cause the animal enough discomfort to buck off the load or at least turn the packsaddle.

7-22. Some panniers have ropes or straps that you can adjust to set the height at which the panniers will sit on the pack animal, while others are slung with the sling rope. Regardless of the method you use, the panniers must be even in height on the pack animal. A pannier low on one side pulls the saddle in that direction and either causes a sore on the animal or slips the entire pack. After loading the panniers on the animal, step to the rear and check that they are evenly placed.

7-23. With any center load, such as a duffel bag, make sure the opening is to the front of the animal. The motion of the animal usually shifts things around, and with the opening to the front, you can see if any items are working their way out of the bag while on the trail. Regardless of what is center packed, make sure that after the load is lashed down it will not rub the animal.

7-24. The manta or pannier tarp is next. Pull the manta down evenly on both sides of the boxes and tuck in the ends around the panniers. Keep checking to make sure the pigtail on the packsaddle is clear and out where you can tie into it. A good solid pack will look sloppy if you do not take the time to use the manta neatly and tie it up right. Be as proud of a good-looking pack as you would be of a well-wrapped present.

SLINGS AND HITCHES

7-25. The packer uses the "sling" to initially attach the load (panniers, manta, hay) to the saddle. Once you do that, throw a manta across it and use a "hitch" to secure the entire load to the animal. You then tie the sling to the saddle and the hitch to the animal.

7-26. The basic purpose of a hitch is to secure the entire load to the packsaddle and the animal as a balanced unit and still not have to use 100 feet of rope. You have to throw these hitches so they can be taken off the load with little effort.

7-27. The different means of tying a load down on a pack animal are not as confusing as they might sound. You will hear and read about such things as a one-man diamond, half diamond, full diamond, double diamond, squaw hitch, box hitch, and many other means of tying. You do not have to learn them all, but if you learn one or two of the most commonly used hitches, you can tie down almost any load you encounter.

7-28. To "throw a hitch," means just that. You throw the loops and coils of your hitch on the pack in such a way that when you give the hitch its last pull, all the ropes pull tight. When you release the hitch to unpack the animal, you don't have to spend time unwinding or untying knots in the lash rope.

7-29. Most new lash ropes are approximately 40 to 50 feet long. They come in many diameters and are made of several materials. In most cases lash ropes

are approximately 5/8 inch in diameter and either of manila or nylon material. Polyester rope makes the best lash ropes because wet weather makes grass or hemp ropes very difficult to handle.

7-30. If you pack an animal with wet slings or lash ropes made of hemp, you may not go very far up the trail before the slings and hitches start to dry and stretch out. This stretching will make your pack loose or uneven and could cause a considerable delay in reaching your destination. In camp, or wherever you find yourself, keep any hemp lash and sling ropes dry if at all possible. Don't throw them on the wet ground while packing an animal. Hang them on a tree limb or lay them on a tarp or dry place until you are ready to use them.

7-31. The lash cinch (on the end of the lash rope) needs checking often for signs of fatigue in the cinch materials. It has a ring in one end and a hook in the other end to simplify the makings of a hitch. The lash cinch is really, in most hitches, the beginning and the end of a hitch. The packer throws the lash cinch across a loaded pack animal and very often the person on the off-side forgets to duck or watch for it to come over. It does not take many knots on the head to learn respect for this piece of pack gear.

7-32. Whatever hitch you use on the pack load must hold the ends, sides, and bottom of the panniers, besides holding the top pack. If you balance the pack on the animal properly, the lash rope can hold the pack down and together. You cannot balance a pack with the lash rope. After you pack everything inside so it won't rattle or break and the wrapping is on, you are ready to lash. You want something that looks good yet holds the wrapping and box together. You have other loads to wrap, so it has to be tied up fast and simple and yet hold tight.

7-33. Handling a lash rope while throwing a hitch can be dangerous if you become tangled in the rope and the animal gets spooked or starts bucking. Make sure you don't have coils around your feet or arms, as they could cause you to get dragged or seriously injured. The safest way to handle this situation is to keep the tail, or excess, rope thrown out to the right while throwing the hitch.

7-34. Whatever hitch you choose to use, always check the pigtail on the packsaddle to make sure it is still clear and ready for use. Again, check the entire load, front and rear, to see if it is sitting straight. If it looks like the entire pack load has shifted to one side, lift up on the low sides and see if it will rock back straight. If it doesn't, completely repack the entire load. This rechecking will save you time on the trail repacking where you may not have help or a place to tie up. It can also prevent sores (rubbing a raw place on his back or side) from developing on the animal. Check any loose rope or manta ends sticking out and tuck them in.

7-35. The following are several methods of securing cargo. The first two are slings; they are used to attach the load to the saddle. The next two are hitches; they are used to secure the entire load to the horse. If you tie the sling on a sawbuck saddle, you can tie the same sling onto a Decker saddle by running the ropes through the loops at the top of the saddle rather than behind the bucks. With a little imagination and ingenuity, you can adapt any of the slings and hitches to whatever type saddle (to include riding saddles) and load is on hand.

BARREL SLING

7-36. If the saddle does not already have a sling rope attached to it, tie one onto the sawbuck saddle by using a clove hitch in the center of the rope and onto the Decker using two bowlines. Make sure the sling rope is around 50 feet long, though this may vary according to the size of the cargo.

7-37. Starting on the right side of the animal, make a large loop at the forward end of the saddle, pass the rope behind the bucks to the rear, then make another large loop at the rear of the saddle. Bring the rope back behind the rear buck, then down to the sling ring (Figure 7-3, A, page 7-10).

NOTE: Repeat this procedure on the left side of the animal.

CAUTION

After running the ropes under the forks of a sawbuck saddle, check the clearance between the ropes and the withers to make sure the ropes will not rub the animal's back raw.

7-38. Slip the cargo through the loops, then tighten up by running the end around the section of rope behind the bucks, pulling tight, and then tying off onto the sling ring (Figure 7-3, B, page 7-10).

CROWFOOT SLING

7-39. As with the barrel sling, start by tying a sling rope onto the saddle. Draw the rope around the cargo, through the back hoop, down between the cargo and the animal, then back out and up the center of the outside of the load.

7-40. Pull one loop through the horizontal portion of the rope, then pull another loop through that one. Pull the first loop tight, then expand the second to fit around the bottom of the cargo. Allow enough slack so the bottom of the loop can pass through the cinch ring. Thread the end of the rope through this loop. Pull the sling tight, then pull another loop through the horizontal section, and secure it with two half hitches (Figure 7-4, page 7-11).

BOX HITCH

7-41. The packer begins the hitch by standing on the left side of the animal and throwing the cinch over its back, catching it and pulling it under the belly. The hitch does not tie off anywhere on the saddle.

DIAMOND HITCH

7-42. The diamond is useful for soft loads. The one-man diamond is easiest to tie (Figure 7-5, page 7-12). Again, this hitch does not tie off anywhere on the saddle.

7-43. This section is not meant to totally encompass slings and hitches—just enough of the basics to suffice for the most commonly encountered situations. As stated before, you cannot learn this skill by reading about it; you must find

someone knowledgeable on the subject and have him demonstrate how it is done.

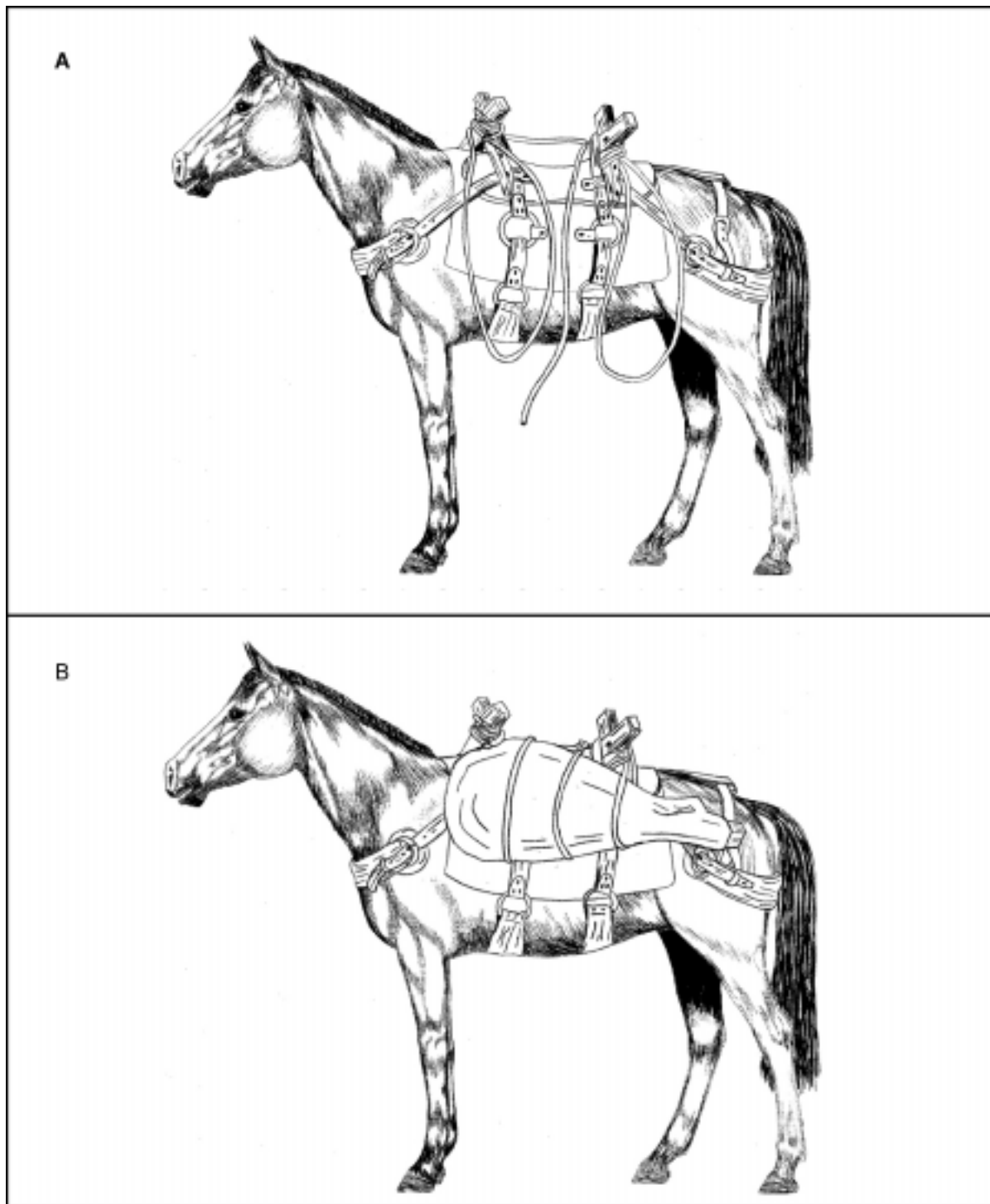


Figure 7-3. Barrel Sling

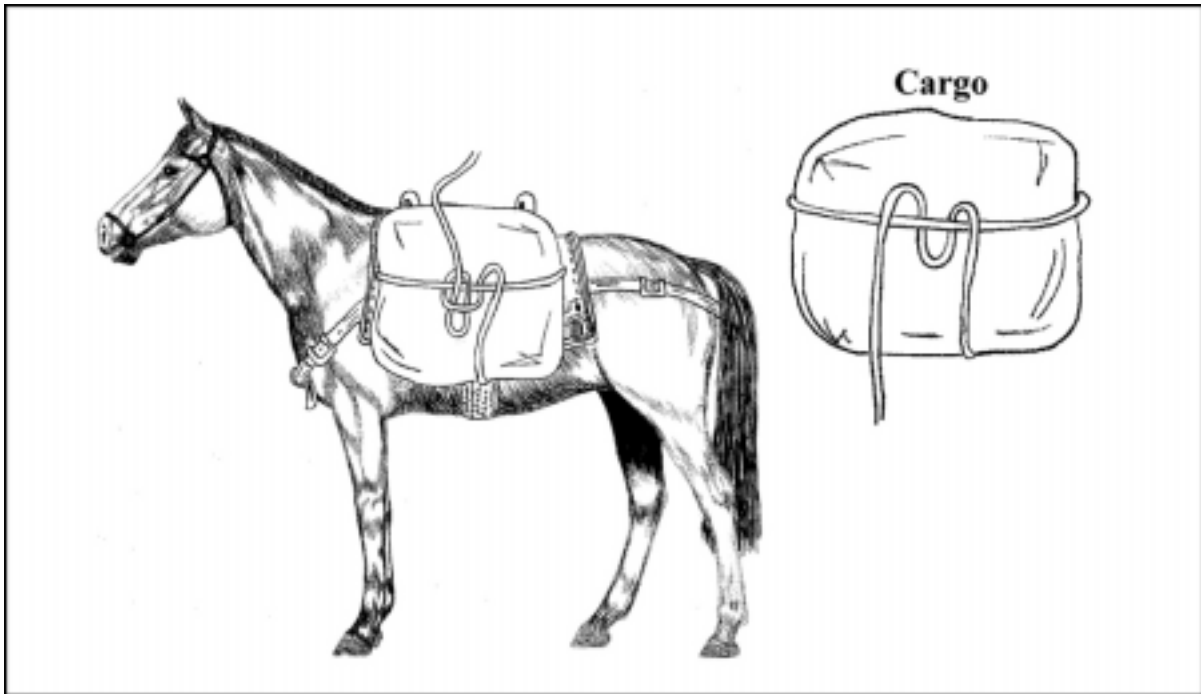


Figure 7-4. Crowfoot Sling

THE PACK STRING

7-44. Now that you have first class, well-balanced packs on the pack animals, you need to make up the pack string. It helps to know your animals in selecting which one you will use for a lead pack. Should you select an animal that will not lead up on a slack rope, you will spend your time dragging this animal along behind you all day. Many pack outfits using mules have a horse they call the Bell Mare. You can put a bell on this particular horse and lead just the one animal and the rest will usually follow. Using horses as pack animals is another situation. Horses and mules form habits, just as teams do, as to what position in the string they should be. If you know this position when tying a string together, you will have a well-organized pack train going up the trail. Often one of your pack animals will have a very fragile load that needs special attention on the trail. You may find that this is the animal you want as lead, so keep this in mind when loading out the packs.

7-45. An important safety rule to remember whenever you are afoot around pack animals tied together is to always be in the clear. Many things can happen, even with the most gentle pack stock. Two animals with box panniers can definitely put the squeeze to you if you get between them. It does not have to be the pack animal you are working on that causes the trouble. It can be any one of the animals in the pack string. If one jumps or bucks, the whole string, being tied together, has to go along. If you are in the middle of several loaded pack animals, try to keep them standing apart and in a line. Do not get in the middle of them when they are bunched up.

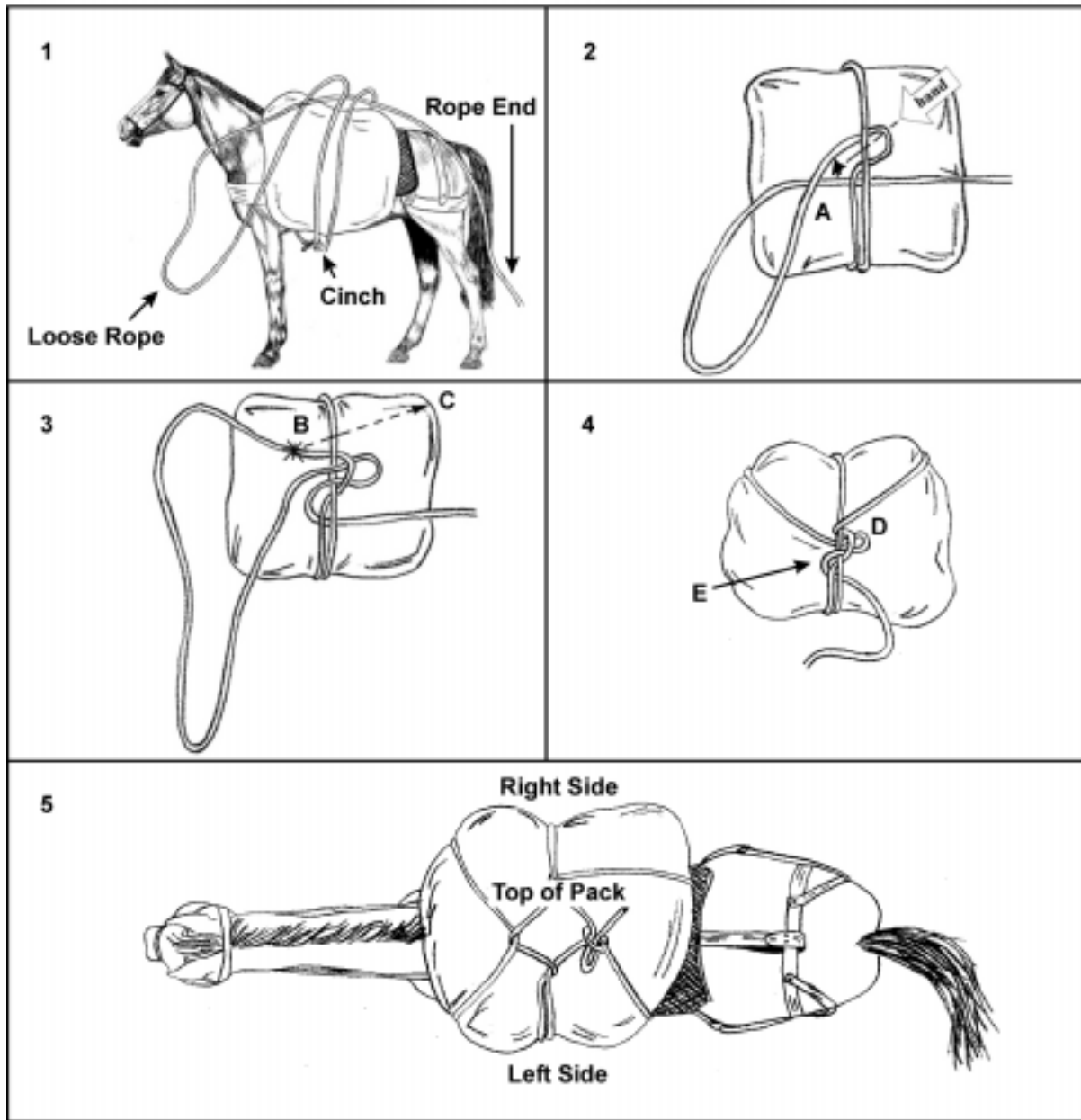


Figure 7-5. Diamond Hitch

7-46. Never get off your saddle horse into a crowd of spooked and bucking pack animals. You should try to keep them circling or headed straight out until they settle down. You do not stand a chance afoot until you have them where you can get a hold on the head of whichever animal is causing the problem. You may feel helpless sitting on your saddle horse, watching all that gear being thrown off and trampled, but just remember that you could very easily be the one that is getting trampled or kicked.

7-47. Tying the pack string together takes just a little common horse sense. You want to give the animals all the room possible between them and yet not have so much lead rope that they can get a leg over the rope when their heads are down. A good gauge for the length of rope is to use the hoof of the pack animal you are tying off to. If the animal you are tying off is standing approximately nose to rump to the other animal and the lead rope is down about to the hoof on the lead pack animal, this length is just about right.

7-48. You can tie the pigtail on a packsaddle in several ways. One opinion is to run it through the rear forks of the packsaddle and down to the front rigging rings. Installing a pigtail this way pulls only on the cinch and not on the packsaddle. A nylon or polyester piece of 3/8-inch rope braided at the rings makes a very substantial pigtail.

7-49. Often it is a good idea to have a "breakaway" in the end of the pigtail where you will be tying the lead ropes of the pack string. You can make the breakaway with light 1/4-inch hemp rope. Should there be an emergency where the pack animal needs to break loose, it can usually break this light rope.

7-50. When leading a string of pack animals, you want to be all eyes. The first mile on the trail is the most important. This short distance helps you find out if the packs are tight and well-balanced and if you missed some rattles in the panniers. You will want to look back over the pack string about as much as you look ahead. When you come to a turn in the trail, get a side view of the packs. Often you can see something coming loose that can easily be fixed, but if left unattended could cause a pack to slip or something to be lost on the trail.

7-51. One of the most common mistakes a green packer makes is not giving the pack string time. When you cross a ditch, rock, or downed trees in the trail, your saddle horse most likely will just step over or around it and keep right on going. Possibly the next pack animal (the lead) will keep up easily enough, but the second pack animal will have to really hurry to get across the obstacle. When it comes to the third animal, he will either have to jump or pull back and so on down the line. When you cross or go around any obstacle on the trail, slow up until all your pack animals have gotten around or over it.

7-52. If you have steep country to climb in, give the pack string a lot of time to stop and get their breath. Pick a good spot where they are all standing square on the trail. You cannot use your saddle horse as a gauge for when to stop to breathe the pack string. The saddle horse may be carrying a 200-pound load, but that load is in balance with him while he is climbing. The pack animal has dead weight and needs more air to pack his load up the hill.

7-53. On long trips and especially when climbing, periodic rest stops will be necessary but do not overdo them. Stopping for long periods on the trail can cause more packs to needlessly slip. If you have to stop for lunch or whatever, take the pack string apart and tie each animal to a tree. If at all possible, keep the pack string in motion. The pack load is continuous on the animals and the quicker it can be taken off, the better for the animals.

7-54. When you come to a stream or any fresh water, let the animals drink. Do not just ride in and stop, make sure there is room for them all to drink at

once if possible. When they are done drinking, make sure one of them does not have a foot over the lead ropes as you start out. Whenever you stop on the trail for even a short time, always be sure the pack animals are ready to go before moving out. Often one will be spread out relieving himself and is in no position to step out.

7-55. One of the most irritating things in leading a pack string is to have a pack animal in the string that is always going around a tree the opposite way the rest of the string is going. Often you can shorten the lead rope and correct this. If that does not work you may have to lead him. This behavior is usually a sign of a green pack animal and quite often disappears as the animal learns what is expected of him. Others just do not ever seem to learn. If you have one of these in your string, remember him well and leave him behind on the next trip.

CAMPSITES

7-56. Should you have several animals in your outfit and not picket all of them, you might find it almost impossible to keep the loose animals in the area if there is insufficient grass. Unless you spend the entire night watching them, they might wander off in search of good pasture and be gone in the morning. Grass and water go together. An animal without water will act much the same as one with insufficient grass. For this reason, every handler should sleep with his weapon and bridle. A spring of good, sweet, cold water is by far the best, but make sure these springs run water far enough **BELOW** the camp for your stock. Another problem is that there is in most all pack or saddle stock the tendency to want to return to the last camp, or worse yet, go home. This urge is even more evident in them if you should be heading towards home after a few days out on a mission.

SETTING UP CAMP

7-57. If you remember which items are in which pack you will know which load goes where in the camp area. It will save a lot of time and labor to be able to lead each pack animal to wherever his load goes. As soon as you get the pack off the animal, loosen the cinches on the packsaddle.

7-58. Keeping the saddles and pads off the ground even in dry weather is a sign of good organization. It only takes a minute to lash a pole between two trees to put the saddles and pads on. A tree limb makes a good hanger for lash ropes and halters. When unsaddling an animal, always keep the pad and saddle together. If the saddle is marked for which horse it fits, you won't have to refit the pad next time you saddle up. If the weather is clear, let the pads air out and dry before covering them with the mantas off the pack loads that evening. While you are unsaddling the animals, you will need the brush and currycomb. Ruffle the hair on the backs of the animals and check for any tenderness or sores. If you do have a sore-backed animal, take care of it before turning him out.

7-59. When setting up for the night, many of the items of pack gear will serve a dual purpose. Box panniers turn into tables and stools, lash ropes turn into high lines and corrals, mantas turn into ground tarps and covers, and so on.

THE HIGH LINE

7-60. The high line is a section of rope strung between two or more trees, with tie points for the horses. The knot used for these tie points (sometimes called the high-line knot) can be either the pulley knot used for a single or double dutchman, a butterfly knot, or a cat's paw. Use the high line as a place to tie the horses during the night.

7-61. The high line can often be temporarily put up when first arriving in camp. It will serve as an ideal place to tie up the pack string while laying out the camp area. Often, your lariats will serve for the first high line until you have a lash rope off the packs. By tying up to a line when you first arrive at camp, you often prevent damaging equipment and gear on a pack. Tying keeps the pack animal from getting under low limbs or trying to rub the pack off against the tree he is tied to. A very frequent mistake is tying an animal to a small dead tree. Quite often just a light pull on the dead tree in the right direction will cause it to fall, possibly injuring the animal or spooking him and others into running off. In selecting the area for a high line, pick a spot that is level and has some shelter for the animals. Shade during the daytime will usually offer some shelter in a rainstorm.

7-62. To put up the high line, start with the lash cinch and go around an average-sized tree approximately 7 feet off the ground. Hook the lash cinch into the rope. If possible, run the line so another tree is approximately in the center of the line. Tie a high-line knot approximately every 2 feet until you come to the first tree. Go around this tree and tie high-line knots until you get approximately 2 feet from the tree to which you intend to tie off. Use the last knot to set up a dutchman, then go around the tree and pull the whole line as tight as possible. Some other considerations are as follows:

- When tying to a high line, stagger the animals tied to it: one on one side and then one on the other side.
- The high line can also make a good line to dry saddle pads when they are not being used for the animals.

PICKETING

7-63. Picketing is tying an animal up by a line attached to either a stake or a heavy log. It allows the animal a certain freedom of movement to walk around and get to grass and perhaps water but does not afford him the opportunity to wander off.

7-64. You can picket an animal in several ways. Animal handlers normally use either a halter and picket line or a hobble and picket line off one front leg. Depending on the animal's experience with the picket line, picketing by a leg is the safest. An animal picketed with a halter will sometimes hook a shoe in the halter while scratching his ear with a hind leg. If the picketed animal hooks the shoe of his hind leg in the picket halter he usually falls down. If not found soon after falling, he may just die in this position.

7-65. The anchor end of the picket line can be either a good dry stake driven into solid ground or a drag log. In selecting picket stakes, make sure they are stout and not brittle. When placing the stakes, make sure there is plenty of room between the stakes so two picket lines cannot cross. The drag log, when

used, should be heavy enough so the animal picketed to it cannot move it, yet light enough so, if need be, it can be pulled to another picket area using a saddle animal and a line off the saddle horn.

7-66. In tying off a picket line to the stake, use a small bowline knot. Make sure it is down at ground level on the stake. This level will let the line turn around the stake and still not turn the stake and loosen it in the ground. An animal that pulls a stake and runs loose with the line is a danger to himself and the mission. Should the animal get into the timber and hang up the stake and line, it could cause a day's delay looking for him. Should the animal not be found, it most likely will die a slow death of thirst and starvation.

7-67. Several things have to be considered when picketing by any method. You should determine how much feed is in the picket area and if there is any obstacle in the ring that the picket line can foul on, thus shortening the ring area. The best area is usually on a good, grassy creek bank where the animal can get both feed and water off the same picket line.

7-68. When selecting which animals will go on the picket line, pick out any new animals to the outfit and any of them you know to be the leaders. Also consider any renegades or loners who hole up by themselves when running loose. Maybe you have a mare that has a weaner colt at home. She for certain needs to go on a picket or on the high line. After she has had time to fill up on grass, she just might decide to go home.

THE NIGHT HORSE

7-69. If you have some of your stock running loose during the night, a night horse is a must. The night horse is one you keep picketed near where you sleep for use in emergencies during the night and for running down loose stock in the morning.

7-70. The night horse does not come in any particular color, size, or shape. He could easily be the most inefficient looking animal in the outfit. What counts is what is between his ears. Many an animal used as a pack animal when on the trail, though not considered a riding horse, might make a good night horse. The only way to come up with a top night horse is to try them all at different times. A good night horse has to have several good points. They are listed here, though not necessarily in order of importance:

- While on a picket, you must be able to trust the animal to graze and fill up during the night and not just run in circles and whinny at the other loose animals all night.
- He must handle well while running loose animals. One of the best reining animals in the whole outfit may develop a lot of bad habits, such as trying to buck you off, when with loose animals. Worse yet, after you start the loose animals running, he may just stampede out of control with you, which is a very dangerous situation.
- He should be easy to approach after dark and able to be ridden bareback. Quite often, should the loose animals start to leave during the night, it is possible to turn them very easily if you are right there at the time. If the animal cannot be ridden bareback, the time it takes to saddle up might make it too late to easily turn the loose animals.

7-71. Many night horses develop the habit of watching where the loose animals go at night. Their hearing is far superior to humans. Often, while wrangling with a good night horse, he will want to head in a direction you may believe is wrong. This friction can be a mistake on your part should you not trust him to help lead you to the loose animals. Quite often a night horse will want rein so he can smell the ground. Here again, his sense of smell is far better than yours and he is using it to help locate the other animals. However, do not leave everything to the horse. You most certainly will want to be reading tracks along with using the night horse's senses. Between the two of you it is usually possible to locate the loose animals in short order.

7-72. The night horse is often required to do quite a bit of running in bringing in the loose stock. This is bound to heat up the animal. Under such conditions, cooling out the hot animal is a must. The most common mistake is for the wrangler to tie up the hot and lathered animal and head for the cook fire for coffee. In civilian pack outfits, many a supposedly experienced wrangler has been discharged for this one grave mistake. The best way to cool out a hot and lathered animal is to first unsaddle the animal. Using a currycomb and brush, ruffle the hair over the back area. If you have some gunnysacks available, rub him down. Above all, DO NOT grain the animal or allow him any water until he is dry and cooled out. It could very possibly kill the animal or at the least cause a bellyache or colic. Walking the animal will also keep him from stiffening up. If the animal was good enough to keep on the night horse picket, he deserves the best of care when his job is done.

7-73. A night horse should be kept on the best grass and water and as close as possible to the area you intend to sleep. A faint nicker from where the night horse is picketed may be the first sign you get that the other animals are moving out. The old mountain men may have slept with their rifles, but you should sleep with your bridle if you are the one responsible for the night horse.

TRANSPORTING SICK AND WOUNDED PERSONNEL

7-74. Every situation varies according to what equipment you have with you when confronted with an emergency. Look over the horses for what equipment is on them that can be used in your situation. There are many parts of saddles and gear strapped on them that can be pressed into service for other than what they were intended. This section is not meant to be an all-inclusive review of emergency procedures in the field. It is merely a brief look at things to consider and how you can make expedient use of what you have with you. By using your imagination and common sense and being observant of what you have to work with, you can devise almost any type splint, bandage, sling, stretcher, or rig slings for transportation with equipment not necessarily intended for that purpose but which is at hand.

7-75. Bear in mind that your use of any part of the equipment may hinder future plans to ride out for help or transport the victim. Most of the items of equipment mentioned can be unbuckled or unsnapped rather than cut. If you must cut off a strap, cut it close to a ring, buckle, or snap. This tip will possibly save you hours of needless repair later.

MOVEMENT

7-76. In most cases of back, neck, or any spinal injury, it is best not to transfer the victim any great distance using horses. There is a lot to take into consideration, such as whether the victim is on an emergency backboard and how far it is to the nearest medical help. In most cases where the victim will need to be transported only a short distance, a hand-held stretcher or travois pulled by a member of the team will be faster than rigging a horse for transportation. This way largely depends on how much help you have available. There are several things you must **NOT** do when transporting a victim with horses:

- Do not drape a wounded man head-down across a saddle.
- If the victim is inclined to pass out or is unsteady, do not let him ride by himself. Find out if the horse will ride double by sliding behind the saddle yourself, without the victim. If the horse will ride double, ride behind the victim and hold him in the saddle.
- With a seriously sick or wounded victim, do not, in your haste to get to help, trot or run the horse the victim is on. A slow, easy walk will get the victim to assistance in better condition.
- Do not at any time leave a horse unattended with a victim strapped or tied to the saddle. Maintain control of the horse's head at all times.

TRAVOIS

7-77. One of the simplest and fastest means of transporting a victim who cannot ride is a travois drawn behind one horse. This method requires getting a gentle horse used to pulling the travois before putting the victim on one for transportation. You can construct a stretcher with two long poles running through the stirrups on two riding saddles that are cinched on horses. Again, it takes the horses a little while to get used to this rigging. If you are alone with the victim and he is conscious, place the victim's head towards the horse and have him hold the reins. If this is not possible, tie the bridle reins to the poles, one on each side. This type of emergency stretcher is good for rough country or long distance transportation. Most horses will tolerate the stretcher between them when they have a little time to become accustomed to the stretcher.

7-78. You can also stretch a large tarp or tent between two saddle horses that are side by side if you have a wide trail to travel. To rig your horses for this type of stretcher, it is wise to tie the horses' tails together to keep them from turning apart at the rear. A small pole tied between the bridle bits will keep them together at the head end. Pull the tarp or tent completely over the saddle and tie to the outside of the saddle. Two small poles, either run through or laced to the tarp, will make a stretcher in a very short time. In most cases it is best to have the victim's head to the rear. Surprising as it may seem, this type stretcher rides very comfortably.

STRETCHERS

7-79. You can use gunnysacks, canvas panniers, raincoats or saddle slickers, pannier tarps, saddle pads, and blankets to make a stretcher. In most pack outfits there are some gunnysacks used either to chink up a pannier or

possibly to carry grain. By cutting two holes in the bottom corners of the sack and inserting two good poles, you have a first-class wilderness stretcher. Largely depending on what packhorses are present at the time, there is usually a set of deep canvas panniers. These canvas panniers have several emergency uses. You can make a stretcher with them, as with the gunnysacks. Another very important use is for lowering or raising an unconscious victim over such obstacles as a cliff or deep cut. You can cut two holes the size of the victim's legs in the bottom corners. Then slip the victim's legs through these two holes and pull up the fabric around his chest. Test the knots used in tying a rope to the pannier with your weight before trusting them on the injured victim. Raincoats, heavier coats, jackets, and saddle slickers also make a short distance stretcher by buttoning them up the front. Zippers are the best and most reliable. Two poles run through the inside of the garment and out the armholes make an emergency stretcher. Pannier tarps and large double saddle pads can make an emergency stretcher.

SPLINTS

7-80. You can use stirrup straps and fenders, pack pads, pannier tarps, pieces of wood, box panniers, and the bars out of packsaddles to make splints. There are many items of equipment and often items loaded on a packhorse that make an emergency splint. You can make a backboard by taking wood box panniers apart and either lashing or using the old nails in the box to nail or lash the flat boards to two small dry poles. The bars out of a packsaddle (using the flat surface) can also make a serviceable splint in a situation where other natural materials are not available. The stirrup straps and fenders out of a riding saddle are by far the best and simplest to obtain. You can unlace or unbuckle them and pull them out of the saddle without damaging the equipment. The stirrup straps and fenders from a riding saddle are already formed to the legs, and by using both straps and fenders you can completely immobilize the legs of a victim. These work well also for the arms by using just one stirrup strap. Several small poles lashed flat and then padded with pack pads can make a backboard. You can open a rifle scabbard either down the seam or lay it flat to make a splint.

STRAPS FOR LASHING TO BACKBOARDS

7-81. Latigos, lash cinches, saddle cinches, breast collars, brichens, and bridle reins can all be pressed into service. There are many large, heavy straps and cinches on a pack outfit or riding saddle. You can take off almost all of these very simply and make them serviceable for the bindings of splints or backboards. As mentioned before, you can take off most all of these items without cutting them and thus damaging the equipment unnecessarily.

SMALL STRAPS TO BIND BANDAGES AND SPLINTS

7-82. Bridle reins, halter ropes, sling and lash ropes, saddle stirrups, and many of the straps on a packsaddle are useful as ties to hold things in place. There are many such straps on packsaddles and riding saddles. Bridle reins, for example, make a good long strap, and in an emergency that requires continuous use of the bridle, you can get by in most instances with one bridle rein. Almost all of the ropes, such as halter ropes and lash and sling ropes, can be unwound and one strand taken out while still leaving the rope

serviceable. If small, tight bindings are required, do not overlook tail and mane hair from the horses you have with you. Do not make the mistake of using your or the victim's clothing to bind wounds and leave either of your bodies unprotected when there are so many other items available on your equipment. If you should consider leaving the victim and riding for assistance, your saddle pads laid on the ground under the victim will help in keeping him warm and dry. Often there are two pads on a horse and, in an emergency, you could possibly get by with just one.

DIRECT PRESSURE IN SEVERE BLEEDING

7-83. Severe bleeding is always an emergency. If you should find yourself faced with this situation and not have readily available dressings to stop the flow of blood, a very good item on your horse is the sheepskin lining on the underside of a saddle. A small pad of this sheepskin with a clean dressing between it and the wound will in most instances pass for many layers of other dressing. If you should have what is called a cool-back saddle pad, it also makes a good emergency compress for severe bleeding.

Chapter 8

Organization and Movement

Certain combinations of adverse weather, thick vegetation, and harsh terrain deny the use of wheeled or tracked vehicles in either a combat or logistics role. Mountainous terrain often restricts operations to those conducted by foot infantry. Heavily wooded areas, especially when associated with steep grades, have the same effect. Swamps, jungle-like vegetation, and certain types of cultivation may restrict the use of vehicles in lowlands. Weather, in combination with unfavorable terrain, may also deny or greatly restrict the use of aircraft in a combat or logistics role. In such situations, the commander that can move his troops, weapons, supplies, and equipment with the greatest speed and facility has a distinct advantage. Properly organizing, training, and equipping a combat pack animal detachment can give a commander this advantage.

ORGANIZATION

8-1. The pack animal detachment is usually the smallest fighting element. It can be a section, squad, or team of 10 to 20 individuals. The number of animals required to support these elements depends upon both the TOE and mission requirements.

8-2. The commander may task organize the detachment squads or sections according to needs and requirements. For example, an 81-mm mortar section would not need as many individuals and animals to transport the system as a 107-mm mortar section. The mission will also have an impact on the size of the section; a raid with an 81-mm section will use fewer animals than sustained operations would employ using the same weapons system. The squad or section requirements may vary from as few as five animals to as many as ten to twelve.

8-3. Other factors bearing on the organization of a pack detachment are load weight and the size of the items to be carried. The greater the total weight of the load, the more animals you will need to carry it. If the items are large, even though they may be lightweight, it will take more animals.

DUTIES AND RESPONSIBILITIES

8-4. A pack animal detachment has unique duties and responsibilities. Most of these are leadership-related and some are skills common to all.

8-5. The **train commander** is the commissioned officer or senior noncommissioned officer assigned responsibility for the pack train. He oversees the training, operation, and administration of the unit.

8-6. The **packmaster** should be the platoon or team sergeant and the most knowledgeable about packing. He provides for the presence, care, and maintenance of all pack equipment and the animals in the unit. He rides the entire column to check all loads and to observe the condition of the individuals and animals. His specific duties include—

- Training personnel in the proper methods of packing, to include saddling, adjusting equipment, balancing loads, and tying of standard hitches.
- Training personnel in the proper care of animals and maintenance of pack equipment.
- Ensuring maximum unit effectiveness through daily inspection of pack animals for injury.
- Supervising packing, conduct of the march, maintenance of animals and equipment, and discipline of the soldiers.
- Inspecting loads and making sure the animals on the march are not injured by shifting loads or saddles, ensuring prompt correction of deficiencies.
- Inspecting and directing prompt repair of packsaddlery.

8-7. The **cargadores**, usually squad or section leaders, assist the packmaster in all his duties and are qualified to perform the duties of the packmaster in his absence. In addition, cargadores must be able to make all repairs normally made by the unit saddler. Their specific duties are to—

- Assign a load to each pack animal, ensuring the loads are balanced.
- Assign pack equipment, loads, and animals to the packers.
- Maintain order and discipline among the packers and ensure quiet and gentle treatment of the animals.
- Select areas for cargo piles and rig line in bivouac.
- Ensure proper care of pack equipment.
- Keep a memorandum of all cargo and equipment under his care, marking and tagging it if necessary.

8-8. The **packers** must train and care for both pack and riding animals. In the field, their duties include the maintenance, adjustment, and use of pack and riding saddlery and associated equipment. In addition, they prepare the cargo for packing and sling and lash loads using a variety of hitches. All detachment personnel should be packer-qualified.

MOVEMENT PROCEDURES

8-9. The pack detachment should begin movement soon after the pack animals are loaded. Packers mount their riding animals. Two detailed riders move ahead of the train to contain any animals that are out of control. The detachment moves out in the march order directed by the commander in pack strings of no more than five animals. One rider leads each string and another follows it. You should always lead the strings from the on-side of the pack animals (the string will be on the rider's off-side). Normally the detachment moves in file with the riders keeping the pack strings closed up to ensure

communication between strings and to maintain column integrity. Keep in mind, however, that terrain and probability of enemy contact from ground or air dictates the distance between strings or squads. When moving during hours of limited visibility, you should keep the column close to facilitate control. Troops riding on the flanks and rear of the strings make frequent counts of the animals to ensure against strays. Make halts as necessary to inspect and adjust loads and saddles. The commander, packmaster, and cargadores make frequent inspections of the detachment en route, whether moving during daylight or at night.

STREAM CROSSING AT FORDS

8-10. Pack units will frequently come across streams or bodies of water where no bridges exist. Although horses and mules can ford fairly deep water and are generally good swimmers, the crossing of even fordable water requires care and good judgment. Unit training must include accepted methods and techniques of stream crossing. Units should conduct ford reconnaissance before attempting to cross with a loaded pack unit. The load makes the animal somewhat top-heavy. Try to cross streams with the animals moving against the current (upstream). The loads in combination with swift current, water deep enough to bear against the animal's body, and poor footing may cause the animal to lose its balance, fall, and drown. Under such circumstances, you should unload the animals and either lead or herd them across the stream. You can ferry loads across in the same manner as described in the following paragraph.

CROSSING UNFORDABLE WATER

8-11. It is impractical to swim animals with loads and packsaddles. Though the animal might be physically capable of swimming under the load, it upsets the animal's natural balance. When the pack unit must cross unfordable water with nothing but its organic equipment, be sure to unload the pack animals as close to the water's edge as possible. Loosen the breeching and secure it on top of the saddle. Also secure any loose latigo ends. You may or may not need to unsaddle the riding animals. Selected personnel swimming their riding animals, herd or lead the pack animals to the far shore and secure them while others prepare a one-rope bridge and hauling system. You should pull the equipment load by load to the far shore. If the crossing is too wide for a one-rope bridge, you can build poncho rafts to ferry the equipment.

8-12. Operating the pack animal detachment with individually led animals is considered uneconomical in terms of personnel. However, there are certain circumstances under which other factors are more important. Members of the weapons crews lead the animals that are assigned to combat units for the transport of heavy weapons and accompanying ammunition. Animals used in proximity to known hostile action areas are usually led individually to take advantage of all available cover and concealment. Evacuating casualties to aid stations by animal transport also requires this method of operation to ensure the easiest ride for the casualty as well as to take maximum advantage of existing cover and concealment. Although training time for this

operation may be reduced, the following elements of training and operation need to be remembered:

- Train personnel to pack both lashed and hanger loads. Although the animal will normally proceed at a walk, with the rate of march seldom exceeding 3 1/2 miles per hour, make sure the loads are balanced and securely tied.
- Ensure the pack driver (person leading the animal) only exerts sufficient control over the led animal to maintain his position on the trail or in the column. He should not interfere with the animal's freedom of movement or balance. A clumsy driver can cause a loaded animal to fall.
- Train the driver to lead the animals from the on-side. He should guide the animal with his right hand grasping the lead rope with the remainder of the lead rope in the left hand. He should give the animal enough slack so that there is room enough for the animal to walk without stepping on him. If there is noise, danger, or confusion on the off-side, the driver may reverse his position to offer some protection to the animal and quiet it.
- Train personnel to regulate the speed of the animal by the gentle, but effective, use of the lead rope. In column, always maintain the prescribed interval to prevent accordion action and undue fatigue in the rear elements.
- Teach the driver to counter the tendency of the animal to trot down slopes or jump over obstacles so he can maintain the normal rate of march and prevent displacement of the load.
- When leading an animal up steep slopes or over very rugged terrain, make sure the driver precedes the animal with about 3 feet of loose lead rope so that the animal may pick his footing. If the terrain is very rough or steep and he falls behind, it may be best to drop the lead rope and let the animal go. He can then catch the animal after the obstacle is passed.

CAUTION

Under no circumstances will personnel hold the saddle breaching or the animal's tail to assist them in climbing.

BIVOUAC

8-13. The pack animal unit should select its camps based on the results of both map and ground reconnaissance, if feasible. The selection depends on the requirements for the safety, health, and comfort of individuals and animals and the operational plans of the unit. In hostile environments, concealment from air or ground observation and as much cover as possible are essential. The first consideration is always security, but unless you are packing with you all the feed the pack and saddle animals will need, the next concern should be grass and water for the stock. It is a grave mistake to

sacrifice grass, water, wood, and shelter for anything but security considerations. In selecting the grass, make sure it is grass that the stock will feed on all night. Just because a meadow looks green does not mean it has plenty of grass in it; ride out and look. Often in high alpine meadows, most of the vegetation consists of flowers and weeds that a horse will not eat. Should you be unfortunate enough to camp in such a meadow, your stock will be weakened from lack of grass the next day on the trail. It is very irritating to ride or be leading an animal that insists on trying to graze as you go down the trail. After security, your next concern should always be the care of the animals. Reconnaissance personnel should next look for the best footing for animals available in the area. Picket lines, high lines or, in more secure and extended situations, temporary corrals, should offer level standing and good drainage with little possibility of flooding in sudden rains. Make sure the selected area is large enough to provide adequate dispersion and is free from briars, debris, and poisonous plants. An area convenient to the route of march offers additional operational advantages.

8-14. The detachment or train commander, accompanied by selected personnel, precedes the train into camp and selects areas for the rigging line, high line, and the cargo so that the animals and equipment will be arranged systematically and readily available night or day. Upon arrival in camp, the pack train conducts the following procedures:

- Select personnel designate the cooking and sleeping areas, keeping in mind that they will always be located upstream from the animals.
- Upon arrival of the train, all personnel except for the “wranglers” dismount, secure their riding animals, unload the cargo and “slack off” cinches. Personnel unpack all animals before the first is unsaddled. They coil the lash and sling ropes. The wranglers remain mounted and ready to stop any animals that try to bolt from the camp.
- Personnel secure the animals as they are unloaded.
- When all loads are removed, the train commander gives the command to unsaddle.
- If conditions are favorable, handlers turn the animals out to graze or picket so they may roll and relax. If not, the animals stay on the high line while personnel clean the equipment and improve the site.
- Handlers feed the animals 45 minutes after arrival and water them 1 hour after arrival. Personnel then prepare their equipment for the next day’s movement.

Chapter 9

Tactical Considerations

A pack animal detachment during movement, regardless of its combat mission once it reaches its destination, is a logistical transportation element. This fact alone severely limits the detachment's tactical capabilities. Even though the detachment may be considered a highly mobile unit, the presence of pack animals precludes the capability of maneuver.

The mission of the detachment while moving is the safeguarding and delivery of the cargo to its destination, not to stand and fight. This point is not to say that all is lost tactically while moving; it just means that compensation has to be made for the lack of maneuver and concentrated fires.

SECURITY

9-1. The pack detachment configured for movement forms into pack strings and usually in column formation. This alignment presents a long, linear target for the enemy. The troops are dispersed, making it difficult to bring concentrated, effective fire to bear upon enemy contact. The diligent use of scouts and outriders for flank security, along with extreme caution, are needed to a greater extent than for dismounted troops to make up for maneuver limitations.

9-2. Two factors figure in not using overwatch formations. First is terrain. The primary reason for using pack animals is difficult terrain. That necessitates using column formations. Second, the act of bounding requires one element to remain static. Animals that are loaded, strung together, and not moving are an accident waiting to happen. The following paragraphs explain how the detachment should cross specific types of areas.

9-3. *Crossing at Linear Danger Areas (roads, trails, streams).* When the scouts reach a danger area, they conduct a thorough reconnaissance for the best possible crossing point and attempt to reach the far side. Once they establish far-side security, the scout leader returns to the column to lead it to the crossing point. Once the column arrives at the crossing point, the lead personnel take up far-side security and free the scouts to continue their mission.

9-4. *Crossing Open or Large Danger Areas.* Commanders consider large open areas as dangerous and their use must be negotiated accordingly. The scouts should provide as much information about the area to the commander as possible. With this information, the commander decides how best to negotiate the obstacle. Bypassing the area is by far the best method but is not always

practical. However, in arriving at a decision about movement, the leader must always consider the METT-TC.

9-5. Whether during long or short halts, lead personnel establish and maintain security using the same procedures as a dismounted combat unit. The difference is the terrain to be defended and whether the animals will be in or out of the perimeter. The following principles apply:

- Animals kept on a high line within the perimeter may offer a reduction to security personnel but unique problems can arise if the position is attacked. Casualties may arise from animals becoming frightened and breaking loose or stampeding.
- Animals kept on picket lines outside of the perimeter require listening posts or observation posts placed at a greater distance. During an attack on the detachment, these animals are susceptible to both enemy and friendly fire. The chances are good that a large percentage of the animals will either flee or be wounded.

COVER AND CONCEALMENT

9-6. The pack detachment must continuously consider concealment options during movement. Admittedly, it is next to impossible to conceal the evidence (animal waste, vegetation, devastation, and tracks) that a pack unit has moved through an area. However, you can take the following precautions to avoid being observed while on the move.

- Avoid skylining.
- Stay well within the tree line (if any).
- Contour the terrain.
- Camouflage the loads.
- Avoid open areas, if possible, or cross them quickly.

9-7. During extended halts (when loads are unsaddled), use the proper camouflage. Cover for the animals, while desirable, may not be possible or practical. Remember to consider animal noise, both vocal and from movement. Also address the odors associated with animals. There are no clear-cut solutions to the problems of concealment. Use a common-sense approach and practice the following tips:

- Use as much natural cover and foliage as possible.
- Use camouflage nets.
- Apply proper field sanitation techniques, to include keeping animal waste policed.
- Control animal noise as much as possible. If the animals' vocal cords have not been cut, keep the animals quiet by maintaining a relaxed atmosphere.

ACTIONS ON CONTACT

9-8. As previously mentioned, a pack detachment organized for movement is not a maneuver unit. Therefore, it must act accordingly when contact is made.

9-9. When *ambushed*, those elements caught in the kill zone escape in any feasible direction as fast as possible. Forward elements, not in the kill zone, move in the direction of march as fast as possible. Those in the rear should move in the direction away from the kill zone, quickly but cautiously. All elements should make every effort to link up at a preplanned rally point. Elements not under direct fire should make all attempts to maintain, control, and safeguard the animals.

9-10. Actions under *indirect fire* are handled in much the same way as an ambush. It may not be necessary to move to a rally point. The unit may stay out of harm's way until the barrage has been lifted and then continue in the direction of march. The commander states the actions for these events and incorporates them in the unit's SOP before movement.

9-11. The key to surviving an *air attack* is dispersion and continuous movement. The pack detachment always accounts for personnel, weapons, and equipment *after* it moves to the designated rally point, establishes security, and reestablishes the chain of command.

NOTE: Common sense, preparation, and good planning are the keys to surviving as a pack detachment in a hostile environment.

URBAN ENVIRONMENTS

9-12. Use of any kind of animals in an urban environment requires detailed planning and preparation. Even a clean, secure urban setting wears down the animal and its shoes rapidly. A damaged city with extensive rubble provides more danger in the form of sharp rock, broken glass, and other debris that can permanently damage the animals. The best choice when planning to use pack animals to support an urban operation is to halt them at a secure location outside of any built-up areas and move your supplies in by foot. However, if you must move the animals through a built-up area, be careful to avoid rubble, broken glass, nails, and other debris that will injure the animal.

9-13. A well-equipped farrier has special shoes for pack animals if the detachment is expected to stay in an urban environment for any period of time. Thick rubber horseshoes work well on pavement and concrete, but do not provide any traction on grass or any kind of dirt. Police departments sometimes use a complex shoe with a plastic plate to protect the inner hoof, a steel shoe over that, and carbide bits welded to the shoe. The carbide bits provide traction on asphalt and concrete, the shoe itself provides traction off road and the plastic protects the horse's inner hoof from nails, glass, and other debris.

9-14. Normally the pack animal detachment will not have access to any special equipment to protect the animals. As mentioned earlier in this manual, shoes wear out much quicker on rocky or rough terrain. This is even more apparent when operating in any kind of urban environment. The

detachment must check the animals' feet for any damage constantly throughout the day and must pay close attention to the animals during movement to watch for any injuries as soon as they occur. Routes must be selected and checked ahead of time to reduce the danger to the animals as they move. Special care must be taken to avoid any rubble, concrete, or asphalt along the route.

Chapter 10

Llamas and Other Animals

Although this manual focuses on horses and mules, this chapter provides basic information about other types of pack animals that a team may encounter. With the exception of llamas, these animals will normally come with a native handler that should be considered the primary source of information for the use of that animal.

LLAMAS

10-1. Llamas are members of the camel (camelid) family. In addition to the well known, one-humped dromedary camel of the Middle East and the two-humped Bactrian camel of Asia, there are four native members of the camel family in the Americas today: the llama, a domesticated beast of burden regarded throughout the world as the premier symbol of South American animals; the alpaca; the free-ranging guanaco; and the wild vicuna.

CHARACTERISTICS

10-2. While viewed in the pasture or close contact, all llamas have a striking beauty owing to their elegant wool and graceful posture. Llama wool ranges from white to black, with shades of gray, brown, red, and roan in between. Markings can be in a variety of patterns from solid to spotted. Little variation is found in guanacos or vicunas, which are light brown with white undersides.

10-3. Mature llamas weigh an average of 280 to 350 pounds, but range from 250 to 500 pounds. Full body size is reached by the fourth year and, while there are no obvious differences between the sexes, males tend to be slightly larger. They are long-lived, with a normal life span of 15 to 20 years.

10-4. Like cattle and sheep, llamas are multistomached and chew the cud. They have a hard upper gum (no upper teeth in front), grinding upper and lower molars in back, and a cleverly designed upper lip for grasping forage in unison with the lower incisors. Adult males develop large, sharp upper and lower canines ("wolf teeth" or "fangs") for fighting. You should ask your veterinarian to remove these to prevent injury to males pastured together or to females being bred.

10-5. The llamas' unique, specially adapted foot makes them remarkably surefooted on a variety of terrain, including sandy soils and snow. It is two-toed with a broad, leathery pad on the bottom and curved nails in front. The small, oblong, bare patches on the side of each rear leg are not vestigial toes ("chestnuts" as found on horses), but metatarsal scent glands, suspected to be associated with the production of alarm pheromones. An additional scent gland is located between the toes.

HOUSING AND FENCING

10-6. Fencing can be woven wire, cattle wire panels, wooden rails or poles, chain link, or electric. Barbed wire is not recommended. Your fences should be at least 4 feet high and dog proof if possible.

10-7. The llamas should have a three-sided shelter to provide shade and protection from extreme heat, cold, wind, and rain. If the area has severe chill factors in winter, a completely enclosed shed is necessary. Heat stress should be a concern if there are hot and especially humid summers. You may want to consider shearing or clipping your llama for this type of weather. If you do not intend to shear your stock, then a sprinkler, wading pool, or small pond may be helpful in keeping your llamas cool for the summer.

10-8. If your animals are kept in a large pasture, a small 12- to 20-foot square catch pen will make it easier to catch them. Feeding and watering troughs should be clean, high enough to be free of possible fecal contamination, and spacious enough to allow access by all animals. You should always ensure that fresh water is available.

TRANSPORTATION

10-9. Llamas are easy to transport and require no specialized equipment. A covered, windproof pickup, van, and horse or utility trailer with sufficient room for animals to stand comfortably works well. Good ventilation is important in both summer and winter. Straw makes excellent bedding in a windproof enclosure. Be sure to provide hay for food and offer water free-choice at least every 6 hours depending on heat (it will spoil if left with the animals). Llamas normally lie down (kush) once the vehicle starts moving. When transporting babies and mothers on long hauls, stop periodically to allow nursing.

CARE AND FEEDING

10-10. If you are familiar with the care of other domestic livestock, you will find llamas comparatively easy to care for, with a minimum of veterinary assistance required. If you are uncertain of the health of your new animal, consider isolating it in sight of but separate from your others for the first 2 weeks to prevent accidental introduction of any illnesses and to give you both a chance to get acquainted. Make sure it is eating and ruminating, and eliminating pelleted feces.

10-11. If you have not already done so, locate a veterinarian in your area. If he is inexperienced with llamas, information and assistance is available through various animal clinics in Canada and the United States. It is recommended that you have your veterinarian give your newcomer a general health check and take a fecal sample to determine if worming is necessary.

10-12. Llamas are amazingly hardy animals and have very few problems with disease. But to ensure good health, you should establish a regular schedule for cleaning their dung piles and a preventative medicine program that may include protection from enterotoxemia, tetanus, leptospirosis, and internal and external parasites. Llamas should be dewormed at least every 6 months. Be sure to check with your veterinarian or agricultural extension agent to see if any vital trace elements or minerals are deficient or present in

toxic amounts in your area. Consult your veterinarian for other preventative medicine suggestions or to see if any special circumstances (meningeal worm, selenium levels, toxic plants) are problems in your area.

10-13. Although llamas have long been arid land dwellers, they thrive in the wide array of temperate environments throughout Canada and the United States, including Alaska. They are highly adaptable feeders, being both grazers (grasses and forbs) and browsers (shrubs and trees).

10-14. Because of a relatively low protein requirement due to their efficient digestive systems, they can be kept on a variety of pastures or hay. They eat about 2 to 4 percent of their body weight in dry matter each day. Without pasture, a 100-pound bale of hay will last an adult llama around 10 days, much longer than the same amount would last an adult horse. If you're going to graze your llamas, plan on about three to five animals per acre on a moderate-producing pasture.

10-15. When good hay is available, grain is recommended only for working pack animals and nursing females. Sheep mineral blocks and salt blocks (with selenium wherever necessary) should be available free-choice. Granulated minerals are somewhat more wasteful than mineral blocks, but are easier to eat. High-protein grain mixes prepared for other livestock should generally not be given to a healthy llama on a good diet, unless it's a female nursing or close to giving birth. Llamas are not prone to bloat, but have been known to do so if they get into a grain bin.

10-16. Llamas require less water than most domestic animals, but should have an unlimited, fresh, clean supply at all times. They tend to drink less in winter and when on lush, green pasture and more when working or lactating, especially in summer.

10-17. Unless your llamas are pastured on hard or rocky ground, you may have to trim their toenails once or twice a year. It's easy to do yourself with horse hoof trimmers or sheep toenail nippers, but consult your veterinarian before your first attempt.

HABITS AND BEHAVIOR

10-18. Llamas have a dignified, aristocratic manner about them. Because of their curiosity, they have a delightful habit of coming close to sniff strangers. But despite your natural temptation to hug and cuddle them, they prefer not to be petted except on their necks and woolly backs. They are gentle, don't spook easily, and rarely bite or kick unless provoked. They are highly social animals and need the companionship of other llamas.

10-19. Llamas communicate their moods with vocalizations and a series of tail, body, and ear postures. Learning this llama language is one of the joys of ownership. Humming is a common manner of communication between llamas and indicates a variety of moods from contentedness to concern. Another interesting llama expression is the shrill, rhythmic alarm call emitted at the sight of a strange animal (especially coyotes and dogs) or a frightening situation.

10-20. Seldom directed at people, spitting is usually related to food disputes and to establish a pecking order between llamas. The exception to this is if a

llama has been mishandled or become imprinted on people (through bottle-feeding as a baby). As with bottle-fed stallions, bulls, and rams, bottle-fed male llamas who have not been gelded at an early age can be potentially dangerous as adults (because they lack a normal fear of people and regard them as competitors). Therefore, males not intended for breeding and males that were bottle-fed must be gelded as early as possible to avoid undesirable behavior.

10-21. Llamas are remarkably clean and even large herds are quite odorless. Dung-piling behavior is an important means of spacial orientation and territorial marking for these historically open habitat animals—a convenience when you clean their pens. By taking advantage of this habit, you can encourage your animals to establish dung piles in a new pen by “probating” four to five sites per acre with a shovelful of llama dung. You may frequently see your llama rolling in the dirt, taking a dust bath to help maintain a healthy, fluffy coat of wool.

USES AND TRAINING

10-22. “What are they used for?” is a question commonly asked of llama owners. The domesticated llama in South America is used for low fat meat, wool, hide, manure (for fertilizer and fuel), and as a beast of burden. This multipurpose animal lends itself well to the needs of the South American people. The llama in North America is used for investment, breeding, wool production, packing, tourism, sheep guards, shows, competitions, and as a source of diversification.

10-23. Llama wool production is a multimillion dollar industry in South America and makes llamas appealing to spinners and weavers here. Llamas have soft, fine wool for insulation against cold and heat. The llama’s wool can also be harvested yearly by clipping or shearing and be made into beautiful garments and blankets. The yearly wool harvest produces 3 to 8 pounds of grease-free fleece with a fiber length of 4 to 7 inches. Year-round brushing yields about the same results and leaves the long, coarser guard hairs in place.

10-24. The llama’s centuries-old ability as a beast of burden has been rediscovered by hikers, hunters, and forest work crews. The llamas’ hardiness, surefootedness, and common sense make them an excellent pack animal, trail companion, and even a great golf caddy. They are quiet, unobtrusive, and so easy to manage that children love to lead them. Their great agility allows them to negotiate terrain that would be difficult or impossible for traditional pack animals. Because of their padded feet and ability to browse, they have minimal impact on the backcountry. When confronted by other pack stock, unexpected situations, and sudden movement or noises, llamas remain calm and unruffled.

10-25. Males are most commonly used for packing and, depending on maturity, weight, and condition, will tote 50- to 120-pound packs 10 to 15 miles a day. A variety of packs and halters are available for llama use.

10-26. Because they are gentle and easy to train, llamas are popular attractions in parades, shows, fairs, and community events, and are fun to take to school, hospital, or nursing home visits.

10-27. Llamas are fast becoming the choice for protecting sheep flocks from predators such as stray dogs and coyotes. They are also good competitors. Conformation is judged at llama shows to determine the best of each halter class. The llama's training and disposition are judged in performance competitions such as obstacle and driving classes.

10-28. Surprisingly, there is a market for llama manure. It is high in nitrogen, basically odorless, weed-free, and easily collected. It is a valuable plant and garden fertilizer.

10-29. Their docile nature makes llamas extremely easy to train to accept a halter, lead, kush, carry a pack, load in and out of a vehicle, pull a cart, or carry a lightweight rider. With just a few repetitions, they will pick up and retain any of these skills. Llamas with minimum training are easy to handle when you are trimming nails, brushing or shearing, or when health problems necessitate touching them in sensitive places.

DOGS

10-30. The use of dogs as an auxiliary in war is as old as war itself. Primitive man used dogs to guard his family, his belongings, and himself. He also took his dog into battle with him when rival tribes clashed. Throughout the history of warfare, dogs have gone into combat at the side of their masters or have been used in direct support of combat operations.

10-31. Dogs have long been recognized by the military as important for war and security purposes. The Army has employed various dog breeds and has determined the German shepherd to be the most suitable for scouting because of its working ability, temperament, size, availability for procurement, and adaptability to all types of climate and terrain. These dogs are especially good at detecting ambushes. While "reading" the dog, the handler must prevent him from barking, growling, whining, or otherwise making a noise, which would be audible to a lurking enemy. Such a reaction on the dog's part might be fatal to both dog and handler in combat.

10-32. Next the dog is urged to move silently through built-up areas. After learning the basic rules, the dog is then trained to detect an enemy decoy planted farther and farther away. Lessons are repeated under varied conditions at different times of the day and night until the animal becomes expert enough to detect an enemy at distances up to 500 yards or more.

10-33. Dogs have many uses in combat and were valued especially by the infantryman. Taken with patrols into no-man's-land, their keen senses reduce the chance of fatal surprise or ambush by giving silent warning of a concealed enemy. During the hours of darkness or when visibility is poor, dogs can guard command or observation posts against enemy infiltration, a problem that was acute in Korea and Vietnam.

10-34. After he develops a strong fondness for two or more handlers, the dog is taught to run from one to the other. One handler releases the dog and commands the animal to "report." As soon as the dog reaches the second handler he receives warm praise. Just before the dog runs, his "choke" chain is removed and a "messenger" collar is put on. Soon he learns to associate this collar with his job of running from one man to the other. As the lessons

proceed, the distance between the men is increased beyond the range of the dog's vision. He now learns to trail his masters by scent. Frequent repetition and runs of varied distances over different kinds of terrain finally develop his dependability as a messenger.

10-35. In training, the dog customarily carries a pack, which can be loaded with supplies or ammunition. He also learns to lay field telephone wire from a spool mounted on a specially constructed pulling harness. Before being graduated as fully trained, he must be able to follow a scent up to distances of 5 miles. He must be able to carry up to 30 pounds of ammunition and supplies over rough terrain. He must also demonstrate his capability in carrying and stringing a 1-mile spool of telephone wire between two points. Using dogs as pack animals has advantages and disadvantages.

10-36. The advantages of using a dog are that he—

- Has intelligence, making him a tool that can be used for tactical advantage.
- Has keen senses of sight, smell, and hearing.
- Can trail handlers by scent over great distances.
- Can sleep anywhere the handlers sleep.
- Can eat the same food as his handlers.
- Can carry packs up to 35 pounds.
- Can perform various duties; for example, string communications wire and carry messages.
- Shows early warning against possible enemy, mines, or boobytraps.
- Requires short periods of time to recover.
- Adapts well to changes in climate.

10-37. The disadvantages of using a dog are that he—

- Is a 24-hour-a-day responsibility of the soldier.
- Adds additional stress to the handler by being an additional responsibility.
- Needs proper equipment to operate continuously in summer, winter, and in rugged terrain.
- Can have his performance adversely affected by extreme temperatures.
- Can be rendered completely ineffective by pad injuries.
- Needs additional food and water.
- Can be adversely affected by noxious odors.

CAMELS

10-38. There are two basic types of camels: Arabian (short fur, one hump) and Bactrian (long fur, two humps). Arabians can carry packs weighing 200 to 300 kg for a distance of 30 to 35 km. Bactrians can carry a load of 150 kg for 7 to 8 hours for a distance of 25 to 35 km. Camels can also pull loads of 1,650 pounds or 3,300 pounds by two, per day at normal walking speed.

10-39. Camels have broad, flat, leathery pads with two toes on each foot. When the camel places its foot on the ground, the pads spread, preventing the foot from sinking into the sand. When walking, the camel moves both feet on one side of its body, then both feet on the other. This gait suggests the rolling motion of a boat, explaining the camel's "ship of the desert" nickname. They need very little water and can travel for days without drinking at all. Camels are clumsy-looking, rather ugly animals, and have a lousy reputation because they are believed to spit and kick at people. This perception is not accurate because well-handled camels are safe to work with and be around.

10-40. As stated above, camels will come with native handlers to take care of them. The handler should be considered the detachment's first choice when planning operations using a camel.

ELEPHANTS

10-41. Elephants are considered an endangered species and as such should not be used by U.S. military personnel. There are about 600,000 African elephants and between 30,000 and 50,000 Asian elephants. Approximately 20 percent are in captivity so it is difficult to estimate their numbers exactly. The Convention of International Trade in Endangered Species regards both species as threatened. Elephants are not the easygoing, kind, loving creatures that people believe them to be. They are, of course, not evil either. They simply follow their biological pattern, shaped by evolution. The secret of becoming a good trainer is to learn this pattern. You can then apply it on yourself and the elephants under your control.

Glossary

ALICE	all-purpose, lightweight individual carrying equipment
ARSOF	Army special operations forces
auger	Any of various tools or devices used for boring holes or moving loose material.
BCS	body condition score
btl	bottle
cm	centimeter(s)
CNS	central nervous system
cross tie	A mild form of restraint in which the animal's head is secured in a normal raised position by two tie ropes extending from the ring in the halter to opposite sides of the stall or between two trees.
ea	each
EIA	equine infectious anemia
F	Fahrenheit
farrrier	A person who shoes horses.
FM	field manual
forb	A broad-leaved herbaceous plant, as distinguished from the grasses, sedges, shrubs, and trees.
gal	gallon
general support	Support that is given to the supported force as a whole and not to any particular subdivision thereof. (FM 101-5-1)
GRAIL	Soviet SA-7 surface-to-air missile
hackamore	A bridle with a loop capable of being tightened about the nose in place of a bit or with a slip noose passed over the lower jaw.
harborage	A place of shelter or lodging.
HEENT	head, ears, eyes, nose, and throat
hr(s)	hour(s)
I&D	incise and drain
IM	intramuscular
ISBN	International Standard Book Number
IU	immunizing unit
IV	intravenous

kg	kilogram(s)
km	kilometer(s)
LAW	light antitank weapon
lb	pound(s)
LCE	load-carrying equipment
manta	A piece of canvas, from 7 by 7 feet up to 10 by 12 feet, used to throw over the load as a cover to protect it.
METT-TC	mission, enemy, terrain, troops, time available, and civilians
mg	milligram(s)
military operations other than war	Military activities during peace and conflict that do not necessarily involve armed clashes between two organized forces.
NSN	national stock number
operational continuum	The general states of peace, conflict, and war within which various types of military operations are conducted.
pannier	A large container or basket often carried on the back of an animal.
pcn G	penicillin G
pkg	package
po	by way of mouth
pr	pair
pt	pint
q	every
running "W"	A type of restraint where both front legs are restricted by rope and can be pulled out from under the horse. Should only be done on soft ground to prevent injuring the horse's knees.
SAW	squad automatic weapon
SO	special operations
SOP	standing operating procedures
TOE	table of organization and equipment
TOW	tube-launched, optically tracked, wire-guided missile
travois	A simple vehicle, drawn behind one horse, that consists of two trailing poles serving as shafts and bearing a platform or net for the load or person.
twitch	A loop of rope or chain that is tightened over a horse's lip as a restraining device.
U.S.	United States

USAJFKSWCS	United States Army John F. Kennedy Special Warfare Center and School
UW	unconventional warfare
VEE	Venezuelan Equine Encephalomyelitis
withers	The ridge between the shoulder bones of a horse.
yds	yards

Bibliography

- AR 40-905. Veterinary Health Services, August 1994.
- FM 21-76. Survival, June 1992.
- FM 25-5. Training for Mobilization and War, January 1985.
- FM 41-10. Civil Affairs Operations, January 1993.
- FM 55-15. Transportation Reference Data, October 1997.
- FM 100-1. The Army, June 1994.
- FM 100-20. Military Operations in Low Intensity Conflict, December 1990.
- Animal Management*, London: His Majesty's Stationary Office, 1923.
- Animal Management*, London: His Majesty's Stationary Office, 1933.
- Back, Joe. *Horses, Hitches, and Rocky Trails*. Boulder: Johnson Books, 1959.
- Brelis, Dean, and Peers, William R. *Behind the Burma Road*. Atlantic-Little, Brown and Company, 1963.
- Cavalry Combat*, The Cavalry School, U.S. Army, Norristown: Telegraph Press, 1937.
- Daly, H.W. *Manual of Pack Transportation*. 1917.
- Davis, Francis. *Horse Packing in Pictures*. New York: Charles Scribner's Sons, 1975.
- de Romaszkan, Gregor. *Fundamentals of Riding*. New York: Knoph, 1982.
- Encyclopedia Americana*, No. 17, Chicago: Encyclopedia Americana, Inc., 1963.
- Encyclopedia Britannica*, No. 22 and No. 8. New York: Encyclopedia Britannica, Inc., 1963.
- Green, LTC. *The Guerrilla and How to Fight Him*, New York: Frederick and Praeger, Inc., 1962.
- History for 1943 Veterinary Service in North Africa and Mediterranean Theater of Operations*, USAMEDS Historical Unit, Office of Surgeon General, Washington, D.C.
- Lewis, Lon D. *Care and Feeding of the Horse*. 2d Ed. Williams and Wilkins, 1996.
- Manual of Horsemanship, Equitation and Animal Transport*, London: His Majesty's Stationary Office, 1937.
- Nelson, Bud. *Skills of Packing and Shoeing*. Vol. 2, Jackson Hole, WY, 1975.
- Nutrient Requirements of Horses*, 5th Ed. National Academy Press, Washington, DC: 1989.

- Osanka, Franklin March, Editor. *Modern Guerrilla Warfare*, New York: The Macmillan Company, 1962.
- Parrino, Michael F. *Pack Transport and Pack Artillery*. New York: The Queensland Publishing Company, 1956.
- Randolph, John. *Marsmen in Burma*. Houston: Gulf Publishing Company, 1946.
- Twelveponies, Mary. *There Are No Problem Horses, Only Problem Riders*. Boston, MA: Houghton Mifflin, 1982.
- United States Army in World War II, China-Burma-India Theater Stilwell's Command Problems*, Office of the Chief of Military History, Department of the Army, Washington, DC, 1956.
- U.S. Fifth Army History, 7 October to 15 November, Part II, AVolturno to the Winter Line*.
- Army, "A Bray for the Army Mule," CPT Gaspard, George L., USA, March 1964: 70.
- Army, "Where the Troops Are," LTC Rathburn, Frank F., March 1964: 39.
- The Army Times*, "No Plans for Those Mules, Long Ear Type," 25 March 1964: 3.
- The Marine Corps Gazette*, "Guerrilla Warfare in China," Griffith, James B., June 1951: 20.
- The New York Times*, "Mules in India," New York: 7 June 1964.
- Animal Management Transportation*, USAJFKSWCS, Fort Bragg, NC: May 1964.
- Drivers Horse Transport*, HQ RASC Training Centre, Malaysia: January 1964.
- Employment of Pack Animals*, Basic School, Marine Corps School, Quantico, VA: November 1961.
- Officers Animal Transport Course*, HQ RASC Training Centre, Malaysia: April 1963.
- Special Operations Animal Packing Course (SOAP-C)*, 2nd Battalion, 5th Special Forces Group, Fort Campbell, KY, 42223-5000, June 1996.

Index

A

animal conformation, 2-1 through 2-4

B

bridle, 6-1, 6-2

C

camels, 10-7,
cinching, 5-9, 5-10
combat considerations
 weapons, 6-10, 6-11
 equipment, 6-12
cover and concealment, 9-2

D

detachment personnel, 8-1, 8-2
dogs, 10-5, 10-6

E

elephants, 10-7
euthanasia, 4-17, 4-18

F

farrier tools, 3-4, 3-5
feeding, 2-9 through 2-13

first aid

 supplies, 4-6, 4-7
 treatment, 4-7 through 4-15

G

grooming, 3-1 through 3-3

H

halter, 5-3, 5-4
harness, parts of, 5-6
high line, 7-15
hobbles, 2-5, 2-6

I

immunization, 4-16

K

knots, 7-1 through 7-3

L

llamas, 10-1 through 10-5

M

medical supply list, 4-16
mission, enemy, terrain, troops,
 time available, and civilians
 (METT-TC), 1-1, 6-11

movement procedures, 8-2
 through 8-4

N

night horse, 7-16, 7-17

P

packsaddles, 5-1, 5-2
pack string, 7-11 through 7-14
pharmacological listing, 4-17
picketing, 7-15

R

rations, types of
 garrison, 2-13
 field, 2-13
 emergency, 2-13
restraints, 3-11 through 3-14
riding techniques, 6-6 through 6-8

S

saddle, fitting of, 5-6 through 5-8
security, 9-1
slings and hitches, 7-7 through 7-11

U

urban environments, 9-3

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army

DISTRIBUTION:

Active Army, Army National Guard, and U.S. Army Reserve: To be distributed in accordance with initial distribution number ?????, requirements for FM 31-27.