STUDENT HANDOUT

AIRMOBILE OPERATIONS

5-594-4	6-594-2
30-594-4	8-594-2
69-594-4	22-594-2
71-594-4	55-594-2

OCTOBER 1968

UNITED STATES ARMY AVIATION SCHOOL
FORT RUCKER, ALABAMA

DEPARTMENT OF TACTICS
UNITED STATES ARMY AVIATION SCHOOL
Fort Rucker, Alabama

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55-594-2 71-594-4

ADVANCE SHEET

AIRMOBILE OPERATIONS

PURPOSE: This subject is designed to help prepare you to take part in airmobile operations as an aviator or liaison officer. The purpose of the Advance Sheet is to enable you to participate in the conference portion of the class.

STUDY ASSIGNMENTS:

1. STUDY: Advance Sheet.

2. SCAN: FM 57-35, Airmobile Operations.

SPECIAL INSTRUCTIONS:

1. Bring computer to class.

2. Bring this Advance Sheet to class.

BASIC CONCEPT:

1. Definition of an airmobile operation. An airmobile operation is the movement of troops and equipment about the battle area, in aircraft, under the control of a ground commander, to engage in ground combat.

2. How it works. A ground commander, usually the commander of a brigade, takes charge of the whole operation. He plans the assault and employs his troops in the ground fighting. He does not have his own aircraft, so they are "lent" to him for the operation. This is usually done by giving him operational control over the aviation units during the mission. This means, simply, that he tells the aviation unit what he wants them to do, but doesn't give them any supplies. The aviation unit gets its fuel and other supplies from the "parent" aviation unit; that is, the one they belong to. All elements obey the designated ground commander.

3. Your job. You will fly in airmobile assaults, or you will advise a ground commander. In either case, you have to understand certain definitions and abbreviations used in planning and carrying out a combat assault.

KEY PERSONNEL:

1. Airmobile force commander. The ground commander with overall responsibility for the operation. He controls both aviation and ground elements, and has final authority

in all decisions during the operation. He is normally the commander of an infantry brigade, but there is no rule about this. A quick way for you to identify the airmobile force commander is to locate the commander in the ground elements who has operational control over the aircraft. The airmobile force commander has final authority over the selection of landing zones, and he establishes the weather minimums for the operation. In both of these decisions, he relies on advice from an aviator. The airmobile force commander is not normally an aviator.

2. Mission commander. The mission commander is the aviation unit commander who controls all of the aviation elements used during the operation. He advises the airmobile force commander about all aspects of aviation employment. The mission commander is usually the commander of an aviation battalion.

3. Lifted unit commander. The commander of one of the ground units going on the operation. He is subordinate to the airmobile force commander. Our job is to support the lifted unit commander, but he does not control aviation elements.

4. Aviation unit commander. The commander of an aviation unit going on the assault, who is subordinate to the mission commander. Usually, this term means the commander of an aviation company. In a single-company mission, the aviation unit commander and the mission commander are the same man.

5. Liaison officer. In this case, an officer sent by the aviation unit commander to the lifted unit commander, to advise him about the employment of the aircraft. The liaison officer must understand the lift capabilities of his unit's aircraft, the typical loads to be carried, and who is responsible for changes in aircraft loading. To help him to keep his own commander advised, he uses a liaison checklist. A sample checklist is given in this Advance Sheet.

THE INVERSE PLANNING SEQUENCE:

Airmobile planning is done inversely, or backwards, starting with the fighting that will take place on the ground, so that all actions support the ground operation. The names of the steps in the inverse planning sequence are (in order of planning):

1. The ground tactical plan. This is the ground commander's plan for attack, and includes all supporting fires, the method of seizing the objective, aerial resupply, armed helicopter, and TAC air support. All other plans must support the ground tactical plan.

2. The landing plan. This means the how, when, and where of arrival in the landing zone (LZ). The airmobile force commander establishes priorities for landing, deciding which elements must land first, and which elements may arrive later. If you become a liaison officer, you should be aware of the following considerations:

a. Early in our military history, somebody establishes that winning is largely a matter of getting there "firstest with the mostest." It is still true, and your operation stands a better chance, usually, if you can put the "mostest" amount of force in the LZ on the first lift. Remember, it's a lot easier for Charley to overrun a platoon than a battalion.

b. You must keep the ground units together. Ground unit integrity is one of the most important considerations in these operations. We will split up aviation units if we must, if it will keep a ground unit together as a fighting team. It's not really unusual for

a small number of aircraft from one organization to fly with another unit for just that reason: to keep an infantry unit together.

c. Landing time is established by the airmobile force commander. He will often use meteorological data furnished by the Air Force weather detachment in deciding the best time for landing. Some terms you may not be familiar with are given as follows:

(1) Nautical twilight. The time of day when the sun is 12° below the horizon. It occurs twice a day, at BMNT (beginning morning nautical twilight) and EENT (end evening nautical twilight). Generally, an airmobile operation may easily be started whenever the sun is higher than at nautical twilight, but you will still have a little trouble in the LZ seeing where you will land. At BMNT, your crew chief will still have to use a flashlight to "daily" the aircraft.

(2) Civil twilight. The time of day when the sun is 6° below the horizon. Any operation between BMCT and EECT is a simple daylight operation.

d. Final selection of the landing zones is up to the airmobile force commander. He relies on competent aviation advice about the usefulness of each landing zone considered for the assault.

e. It is usually necessary to mark the landing zone. The LZ may be marked by pathfinders, but this is not normal in Vietnam. In RVN operations, the LZ is usually marked by aircraft. If pathfinders are used, the decision to use them is made by the airmobile force commander.

3. The air movement plan. This is the plan used to get the aircraft and troops into the LZ on time. It consists of two parts:

a. The flight plan. This is the part of the air movement plan that shows the route to be taken, altitudes and speeds to be maintained, and the formation to be flown.

b. The air movement table. This is the time schedule for the operation. It shows the landing time in the LZ, times at which the flights must cross various checkpoints, and the places and times of takeoff and loading.

NOTE: The air movement table may never be written in operations you will take part in, but you should know the names of the various checkpoints. If the air movement table is not written, you will still call the checkpoints by certain names given below. (It is unlikely that you will ever have to produce a formal table, but if you must, there is an example of one in FM 101-5 and another in TM 57-210.)

c. Checkpoints used in the flight route diagram:

(1) SP (or IP). The start point or initial point. The first navigation checkpoint on the route. You must be flying at the given altitude and speed, and in the given formation when you cross this point.

(2) ACP. An air control point. A clearly defined place or feature on the ground used to show the outline of the route on a map. Changes in direction are made at these points, and the mission commander uses them to check on the timing of the flight.

(3) CCP. The communications checkpoint. At the CCP, the flight leader contacts the pathfinders to find out about the LZ. Often in operations in Vietnam, there will be no CCP on the route. Instead, the flight leader will contact the armed helicopters in the LZ at a certain time away from the LZ. For example, the flight leader may be instructed to contact the gunships "3 minutes out."

(4) RP. The release point. This is the last navigation checkpoint on the route before landing. It is usually a good idea to have the RP about 5 to 7 kilometers from the LZ, because this is where the flights are split up to get into small LZ's or to go from the RP into different LZ's.

4. The loading plan. In the pickup zone (PZ), there are two important pieces of paper and two groups of people to be dealt with as follows:

a. Forms.

(1) The air loading tables. These are lists, prepared by the lifted unit commander, showing what he wants on each aircraft. The air loading tables show the names of pieces of equipment and the job titles or personnel to go on each aircraft. They do not give the names of the personnel.

NOTE: The air loading tables are used by the lifted unit commander, such as the infantry company commander, to insure ground unit integrity. By using them, he makes sure that there is ammunition for each weapon, and that his key people are split up. He is responsible for changes to the tables when there are not enough aircraft to carry all of his troops. Usually, the air loading tables are part of the lifted unit SOP and match the lift capacity of your aircraft.

(2) The flight manifests. These are written, if there is time to write them. They show who, by name, rank, and serial number, is aboard each aircraft. They are intended as a record for the ground unit. Their accuracy is the responsibility of the senior member of the lifted unit on each ship.

b. Personnel.

(1) Loading zone control center. These are the pathfinders or unit terminal guidance personnel who guide aircraft into the pickup zone.

(2) Loads control group. These are the personnel from the lifted unit who are not going on the assault, organized to prepare loads in the pickup zone. They use their own equipment in preparing sling loads and internal loads for the assault and for resupply flights. The supply officer from the lifted unit supervises the LCG.

5. The staging plan. This is the plan used to get all the assault and support elements into the pickup zone before the operation begins. The individual aviator is not normally concerned with this plan, but you should be aware that the aviation unit is responsible for providing its own refueling and maintenance during the mission. These provisions are made during the staging plan. Setting up refueling operations may place a heavy burden on the aviation battalion S4, who must not only procure the fuel, but must arrange for its transportation to the staging area.

DETERMINING AIRCRAFT REQUIREMENTS:

1. There are two general situations you may encounter in matching up troops, supplies, and aircraft.

a. When sufficient aircraft are available, the problem will be to determine the number required to lift a given number of troops and a given amount of supplies.

b. When only a limited number of aircraft are available, the problem will be to determine the amount which can be lifted, and then to tailor or alter the air loading tables of the lifted unit to take advantage of a limited lift capability. In other words, cut down on the number of troops and amount of supplies to be taken into the LZ.

2. In either case, the basic procedure is as follows:

a. Compute the total amount of fuel required for the lift, including reserve and runup fuel.

b. Add the weight of the fuel to the operating weight of the aircraft. (Operating weight includes the weight of the crew, oil, special equipment, and crew baggage, plus the basic weight of the aircraft.)

c. Subtract the aircraft weight, including operating weight and fuel, from the maximum gross weight of the aircraft. The result is the allowable cargo load (ACL) for the aircraft. (The maximum gross weight is found in the "-10" for the aircraft. It may be necessary to adjust the maximum gross weight, depending on experience in the field. The "-10" or operator's manual, won't help you to know how old the engines are, or what the aircraft can safely do in a combat situation).

d. Divide the weight to be lifted by the allowable cargo load for each aircraft. The result is the number of aircraft required for the mission.

EXAMPLE:

Given

Fuel consumption for UH-1D (from -10)	=	487 pounds/hour.
Distance from PZ to LZ (one way)	=	13 nautical miles
Groundspeed	=	70 knots
Time for runup, taxi, loading	=	15 minutes

First, convert all figures into time required. To fly 26 nautical miles at 70 knots (one flight to LZ and return) takes 22.2 minutes. (You can usually drop the .2 or other similar factional time, since the times indicated on the air movement table are rounded to the nearest minute or 30 seconds.) The runup time is furnished by the aviation unit commander, in this case, 15 minutes. Add a reserve of 30 minutes and multiply the total time by the rate of fuel consumption.

22 (flying time) + 15 (runup time) + 30 (reserve) = 67 minutes total

Then,

67 minutes x 487 pounds/hour = 544 pounds of fuel

Given

Basic weight of aircraft (from records)	=	5,110 pounds
Four crewmembers at 200 pounds each	=	800 pounds
Oil	=	24 pounds
Special equipment, weapons, and armor	=	109 pounds
Crew baggage (survival gear, rations)	=	25 pounds
Operating weight	=	6,068 pounds

Add,

Fuel for one lift	=	544 pounds
Operating weight	=	6,068 pounds
to find Aircraft weight	=	6,612 pounds

Then subtract the aircraft weight from the maximum gross weight found in the "-10," as follows:

Maximum gross weight (from manual)	=	8,400 pounds
Aircraft weight (computed)	=	6,612 pounds
to find Allowable cargo load (ACL)	=	1,788 pounds

Suppose you had to lift a number of troops and an amount of cargo that totaled 27,500 pounds. Divide the weight to be lifted by the ACL for each aircraft, as follows:

$$\frac{27,000}{1,788 \text{ (ACL)}} = 15.4 \text{ aircraft}$$

Since you can't carry anything with .4 of a helicopter, you must round the figure up to 16.0; the total number of aircraft required to carry the load in a single lift.

e. The example given above is intended only to show the basic procedures involved in computing aircraft requirements. But, it is too simple to apply in a combat situation. You don't have time to weigh everything going on the lift for one thing, and each of your aircraft will vary in performance. You won't normally use the weight method shown above, unless there are unusual conditions in the operation. You should be prepared; however, to work the problem in this manner if you must. The basic procedures are used to set up the other methods of determining aircraft requirements, the space method, and the type-loads method.

f. CAUTION: At no time can you exceed the ACL of the type aircraft used. You can't load more than the ship will carry, and you can't squeeze cargo aboard if it won't fit through the cargo doors.

3. The space method.

a. The space method is a much simpler and faster way of computing aircraft requirements. To use it, convert both the ACL and the weight to be lifted to increments of 240 pounds, the weight of one combat-equipped trooper. Divide the spaces to be carried by the spaces available in each aircraft; the result is the number of aircraft required.

b. Before applying the space method, you need to understand some basic facts.

(1) There are different kinds of spaces. For example, a parachutist with backpack and combat gear weighs 260 pounds. A crewmember weighs 200 pounds. Unless otherwise indicated, use the space for an infantryman, 240 pounds.

(2) Don't let the small size of the Vietnamese trooper fool you. He weighs a little less than you do, but he's carrying just about as much as an American. He can weigh as much as 230 pounds, when he climbs on the helicopter. A good rule of thumb is to use 200 pounds for his space until you are sure.

(3) The 4.2-inch mortar and 106mm recoilless rifle are not included in the weight of the trooper. You must figure spaces for these weapons separately.

(4) "Spaces" and "seats" are not the same thing. A UH-1D has 11 troop seats. That does not mean it will lift 11 troopers on any given day. Spaces are purely a measure of weight.

c. Rules.

(1) One trooper weighs one space.

(2) Use half or whole spaces in your computations.

(a) If you divide the weight of cargo to be lifted, and it doesn't come out exactly to a whole number or to a whole number plus .5, round up to the nearest half or whole space.

EXAMPLE: A 1/4-ton truck weighing 2,440 pounds is converted to spaces:

$$\frac{2,440}{240} = 10.2 \text{ spaces, rounded up to } 10.5$$

(b) If you divide the allowable cargo load in the aircraft by 240, and it doesn't come out exactly to a whole number or a whole number plus .5, round down to the nearest half or whole space.

EXAMPLE: The ACL computed earlier for the UH-1D was 1,738 pounds:

$$\frac{1,738}{240} = 7.2 \text{ spaces, rounded down to } 7.0$$

(3) When computing spaces for major items of equipment, such as vehicles, compute the number of spaces for each vehicle separately, even when you have two or more vehicles weighing exactly the same amount.

EXAMPLE: Two each, 1/4-ton trucks @ 2,440 pounds:

One vehicle weighs 10.2 or 10.5 spaces, computed above.
Two such vehicles weigh 21.0 spaces.

d. Applying the space method to a troop lift is a simple matter of counting troops and obtaining the weight of supplies.

EXAMPLE: Suppose you had to compute the number of aircraft required to lift 85 troops and 6,400 pounds of cargo. After determining the fuel requirements for the lift, you figure that the ACL for the aircraft is 1,738 pounds, as before, then:

85 troops = 85 spaces

$\frac{6,400}{240}$ pounds (supplies) = 26.7, rounded up to 27.0 spaces

Then,

85
+27.0
112.0 total spaces to be lifted

$\frac{112.0}{7.0}$ (spaces aboard each aircraft) = 16.0 number of aircraft required

4. The type-loads method.

a. The type-loads method is the fastest method. It is applied by determining different numbers of troops and quantities of supplies that can be loaded and carried on aircraft with a given amount of fuel.

EXAMPLES: With 02+00 hours of fuel aboard, the allowable cargo load for a UH-1D might be determined to be 1,700 pounds. The following type loads could be published in the aviation unit SOP:

UH-1D, ACL 1,700 (02+00 hours fuel)

TYPE	CARGO	WEIGHT	TOTAL
1.	Seven personnel	1,680	1,680
2.	Bulk cargo	1,700	1,700
3.	One each mule (sling)	900	
	Load on mule	800	1,700
4.	One each, 1/4-ton trailer	565	
	Load on trailer (external load)	500	1,065

Thus, to carry 140 troops would require 20 UH-1D's, each loaded with a type 1 load; 3,400 pounds of supplies would require two UH-1's, both loaded with type 2 loads, and so forth.

b. The real advantage of the type-loads method is that the type loads can be made part of the unit SOP, so that both liaison officers and lifted unit commanders can refer to them quickly. Time required for planning is greatly reduced, and confusion is kept to a minimum. Once the fuel requirement is known, aircraft are fueled to the amount required (or they may be habitually fueled to a certain amount as a matter of SOP), the liaison officer knows immediately how much may be loaded on each aircraft, and the infantry unit commander knows how to break down his troops and equipment into suitable loads.

c. It should be remembered that the type load can be adjusted as fuel is burned off. If 120 pounds or more of fuel are burned off during a lift, an extra half-space can be carried on each ship. Once 240 pounds or more are burned off, each ship can carry another trooper, or another space of cargo.

5. Sometimes a planning worksheet may be used to compute aircraft requirements. Usually, this is unnecessary, or there is simply not enough time to fill one out. A planning worksheet may be used to determine either the number of spaces to be lifted, or to form up troops and supplies into type loads. In the worksheet given below, the number of spaces is figured correctly. Note that all of the vehicles are too heavy to be lifted by UH-1's. It would be necessary for the planner to request CH-47 aircraft to lift the vehicles.

Unit Pers	Additional Supplies Wt (lbs)	Additional Supplies No. Spaces	Major Items of Equipment	Wt (ea)	Spaces (ea)	No. Items	Total Spaces	Total Column Remarks 2, 4, & 9
Co A 176	3048	13	Trk, 1/4T w/AN/VRC-47	2408	10.5	1	10.5	
			Trk, 1/4T w/1/4T tlr	2838	12	1	12	
			Trk, 1/4T w/AN/GRC-125 mtd and 1/4T tlr	2922	12.5	1	12.5	251
			Trk, 1/4T M38	2665	11.5	2	23	
			106mm RR	460	2	2	4	

TOTAL SPACES: 251

Spaces per UH-1 this lift: 7.0

In this case, the 176 troops and the 3,048 pounds of supplies can be lifted by UH-1's.

$$\left(\frac{189 \text{ spaces}}{7 \text{ spaces per aircraft}} = 27 \text{ aircraft in one lift}\right)$$

Two or three CH-47's (depending on method of loading) must be requested for the vehicles.

THE LIAISON OFFICER CHECKLIST:

1. The checklist shown below is a good general checklist to be employed by the aviator sent to advise a ground commander. The one you will find in your unit SOP in Vietnam

may not be exactly like this one, but it will resemble this one in essential headings and procedures.

2. This Advance Sheet will not answer all of your questions about the checklist, but the classroom presentation of this subject, combined with your other classes on organization and employment of Army aviation, should enable you to use the checklist when you must.

3. One of the purposes of this class is to prepare you for jobs in which you will work with lists like this one. You will have time to ask questions in the classroom. Ask them. If you have to wait till you get to Duc Hoa or Song Be or Pleiku, you might be too late.

LIAISON OFFICER CHECKLIST (HELICOPTER)

1. ACTIONS PRIOR TO DEPARTURE TO SUPPORTED UNIT

   a. Obtain briefing from S3:

      (1) Current unit status (mission readiness).

      (2) Mission requirements (supported unit).

      (3) Specific problem areas.

      (4) Communications.

   b. Check out with CO.

   c. Obtain necessary equipment:

      (1) Communications.

      (2) Maps, overlays, and SOI extracts.

      (3) Transportation.

      (4) Personal gear.

2. ACTIONS AT SUPPORTED UNIT

   a. Establish communications.

   b. Contact CO or S3:

      (1) Enemy situation and trend.

      (2) Mission.

      (3) Supported ground units.

      (4) Other supporting aviation units.

      (5) Pickup zone (time, location, formation, loads, pickup zone, release point, size).

(6) En route (initial point, air control point(s), formation, communications checkpoint, landing zones, formation).

(7) Assault (landing zone release point, landing zones, formation).

(8) Alternate flight routes.

(9) Escort procedures.

(10) Air Force support.

(11) Return mission and subsequent lifts.

(12) Communications.

(13) Artillery fires support plan.

(14) Refueling.

(15) Aircraft maintenance.

c. Disseminate necessary information to your unit.

d. Maintain close coordination with S3.

e. Monitor situation.

f. Keep your unit informed.

g. Advise on employment of your unit (be aggressive).

h. Prior to returning to your unit:

(1) Obtain copies of current operations orders, plans, overlays, SITREPS.

(2) Times and location of pertinent conferences.

(3) Current situation.

3. ACTIONS UPON RETURN TO UNIT

a. Brief the S3.

b. Check in with CO.

NOTES

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22-594-2 69-594-4
55-594-2 71-594-4

PERFORMANCE OBJECTIVES

AIRMOBILE OPERATIONS

1. KNOWLEDGES:

(All presentations, periods one and two)

Without notes or references and with an accuracy of at least 70 percent, the student will select from a list:

a. The title of the officer who has final authority in all decisions during an airmobile operation.

b. The title and normal location, during operations in Vietnam, of the officer who controls the movement of aircraft during the airmobile operation.

c. The steps, in order, of the inverse planning sequence.

d. The command relationship between the airmobile force commander and aviation elements in an airmobile operation.

e. The characteristics of a good landing zone.

f. The unit or aircraft which will mark LZ's in Vietnam.

g. The characteristics of a good flight route.

h. The commonly used abbreviation for a checkpoint in the flight route diagram, given the function of the checkpoint.

i. The purpose of the air movement table.

j. The primary consideration in forming flights.

k. The commander responsible for completing the air loading table and his considerations in its preparation.

l. The unit which prepares loads in the pickup zone.

m. The unit responsible for refueling and maintenance of the aviation unit.

n. The method most often used in Vietnam for determining aircraft requirements.

o. Given an elementary type load or space method problem, the aircraft requirements for a lift.

2. SKILLS:

(Periods three and four of 4-hour presentations)

With the degree of speed and accuracy determined by the instructor to be appropriate for the student's grade and experience, the student will:

a. Apply the characteristics of a good flight route to flight routes overprinted on map sheet 6342 III, identifying those portions of the route which are or may be used in a combat operation, and selecting the best flight route.

b. Given an overprinted ground tactical situation on the map sheet and the airmobile force commander's concept of operation, the student will recommend two appropriate landing zones in the objective area and a suitable pickup zone.

c. Given two fuel gauge readings for a UH-1D and the time of flight elapsed between readings, the student will determine the fuel requirements for one aircraft making two repetitive assaults into a selected landing zone.

d. Given a suitable listing of type loads and the number of aircraft available, the student will determine the number of troops and amount of supplies which can be lifted during the initial assault.

e. Using the space method, the student will adjust a type load to allow for fuel burn-off during the operation.

f. Given groundspeed, flight route diagram, and landing time in one landing zone, the student will complete an air movement table of the type described in TM 57-210.

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PERFORMANCE CHECK

AIRMOBILE OPERATIONS

1. What is the title of the officer who has final authority in all decisions in the airmobile operation? task-force C. O.

2. Who controls movement of aircraft in an airmobile operation? mission C. O.

3. Where is the mission commander normally found during operations in Vietnam? C + C aircraft.

4. What are the titles of the five steps in the inverse planning sequence (in order)?

a. ground tactical

b. landing plan

c. air movement

d. loading plan

e. staging

SH-15

5. What is the normal command and control relationship between the airmobile force commander and the aviation unit? operational control OPCON

6. What are the characteristics of a good landing zone? near the objective

7. Who has final authority in the selection of landing zones? task force C.O.

8. Who will normally mark the LZ to be used in an airmobile operation? pathfinder and gunships

9. What are the characteristics of a good flight route? avoids enemy position

10. The last navigation checkpoint on the flight route is called the— release point R.P.

a. IP or SP.

b. RP.

c. ACP.

d. PZ.

11. What is the name of the time schedule used in airmobile operations? air movement table

12. What is the primary consideration in forming flights? ground unit integrity

13. What time must be known before the air movement table can be completed?

L-Z time first

14. Who fills out the air loading tables? lifted unit C.O.

15. What is the name of the organization that prepares loads in the PZ? loads control group LCG

16. Who supervises the LCG in a battalion lift? In a company lift? S-4 X-O.

17. Who is responsible for procuring and transporting fuel for the aviation unit? mission C.O.

18. What method is used most often in Vietnam to determine aircraft requirements? type load method

19. How many spaces are required to lift 15 soldiers and a trailer weighing 520 pounds? 15 soldiers spaces and 2.1 or 2.5 spaces for the trailer or 17.5 spaces

NOTES