

Dr. Allen

AN EXPERIMENT IN THE TESTING OF
ABILITY AND PROGRESS IN BASKETBALL

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INTRODUCTION

This experiment is an attempt to develop and use some tests and measurements in the field of motor ability and in the specific activity of basketball. Although there has been considerable work attempted in the field of physical efficiency, very little has been attempted in the field of motor ability tests. The principal contributions to this field are contained in "Measuring Motor Ability" (1) by Brace, and "Tests and Measurements in Physical Education" (2) by Bovard and Cozens. The writer has been helped very materially from these two sources.

During the past seven years as a basketball coach I have used various means of determining the varied abilities of my men. For the past two years I have used a battery of specific basketball tests as a means of measuring the abilities of all the varsity men in the fundamentals of basketball. Along with these tests we scored all the players on actual playing ability as demonstrated in competition. These tests and scoring methods were reported in a paper entitled "Basketball Efficiency Tests," for the department of Psychology at the University of Chicago.

During the past year my studies have shifted from the varsity player to the many individuals who play basketball in the Y.M.C.A. and school physical education classes and not as members of a team. It is this particular group that needs to be encouraged and helped but which altogether too often is left to its own resources. My interest here centered around two phases of the problem of measurements. I wanted first to devise a means of determining the progress of an individual in the learning of specific motor skills, and second to develop a combination of tests which when applied might prove an index to basketball ability.

The study concerned itself around three major problems.

1. Can a series of tests be developed which would adequately measure progress in basketball?
2. Can a series of tests be developed which might be used as a means of predicting potential basketball ability?
3. Is there any carry-over from specific basketball skills to general ability skills?

The Method Used:

1. The groups used are:
 - a. An experimental group consisting of thirty members of a beginners' class in basketball.
 - b. A control group of thirty members, of varied basketball ability.

(1) David Brace "Measuring Motor Ability." New York, A. S. Barnes.

(2) Bovard and Cozens "Tests and Measurements in Physical Education."
Philadelphia, W. B. Saunders-

2. The tests used were:

a. Eight tests of specific ability in basketball skill -

Speed Pass	Dribble
Accuracy Pass	Dribble and Shoot
Accuracy Shooting	Ball Handling
Pivot and Shoot	Opposition Shot

Description of tests can be found at end of article.

b. Four tests of general athletic ability

Agility	Speed
Endurance	Coordination

c. Brace Motor Ability Tests of Neuro-Muscular Co-ordination.

3. The method:

The basketball, general ability, and Brace tests were given to the Experimental Group at the beginning of the quarter, and the basketball tests were given to the Control group at the same time. After two months of instruction, of forty minutes per day, in basketball fundamentals and two weeks of actual play, the experimental group was again tested, to determine whether or not any progress had been made in motor skill. At this same time the control group was again tested to see whether or not there had been any progress in this group who had not been instructed. This group was used primarily in the basketball test to determine the validity of this particular test.

The raw scores of each test have been reduced to T - scale scores, to make all scores comparable and to properly place each student in relation to other students.

At the conclusion of the period of instruction, the experimental group was scored and rated on their actual playing ability as indicated in their performance in organized teams. These data were recorded by student coaches and scorers who watched particular men at play.

The Brace Motor Ability Tests were also given to the experimental group to allow a comparison of three types of tests and to determine whether or not one test had a greater degree of predictability than either of the other tests.

A definite technique of instruction and drills were used during the training period. Twenty different correlations have been made using the Otis Correlation Method. Sixteen of these are the individual and total basketball and general ability tests which were correlated with the actual playing ability score to determine the reliability of the test. The other four correlations were made between the general ability, basketball ability, and Brace Motor Ability tests.

RESULTS: 1. The mean T-Score of the Basketball Tests of the Experimental group is: pre-test, 45.5 and final test, 54.1; while in the Control group the pre-test is 50.1 and final test, 50.5. The average

percent of increase is 20.1% in the experimental group, with only 4.2% in the control group.

2. The final test average T-Score of the general ability tests gave an increase of 17.3% over the pre-test of the same series of tests.
 3. The correlations of each of the eight basketball tests with actual ability separated these tests into two groups. Five of the tests had correlations ranging from .42 to .64, and three of them had correlations from minus .13 to .33. The total basketball test correlations with actual play is .73 on the pre-test and .77 on the final test.
 4. The individual general athletic ability tests correlations with actual play ranged from .50 to .72 and the total general athletic test was .73 for the pre-test and .77 in the final.
 5. The correlation between total basketball tests and general athletic tests was .76 for the pre-test and .52 for the final test.
 6. The correlation between the Brace Test and general ability is .14, the Brace test with Basketball tests is .59 and with actual playing ability is .16.
- I. a. The results of this experiment seem to indicate that progress in the fundamentals of basketball can be measured. From the eight tests used in the experiment the author recommends the use of test numbers 1, 2, 4, 5, and 8 as a battery of reliable tests for the measurement of basketball skill in fundamentals.
- b. The similar percentage of increase and the high correlation between basketball and general athletic ability proves the close relationship of these two groups of skills even though the correlation of improvement was very low.
- c. The lack of correlation in improvement indicates that learned skill in one activity does not carry over in the same amount to another skill.
- d. To objectively test an individual for potential basketball ability the test must of necessity measure untaught skills. If this were not so the individual could not be tested on his first appearance and the individual who had never played before would automatically be ruled out. The high correlation between general ability tests scores and specific basketball test scores on the one hand and general ability test scores and actual playing ability scores on the other hand which are brought out in this study seem to warrant the use of this general ability test as a predictive test for potential playing ability.
- e. The advisability of using this series of tests in contrast with the standard Brace Motor Ability test was clearly shown in the poor correlation between the Brace test and General Ability and Actual Ability score, but it must be remembered that the Brace Test was designed to test native neuro-muscular ability.

II. What About it? The author recognizes the limitations of this experiment where only 60 cases were used and therefore does not make any claim of finality, but it is hoped that this experiment might be suggestive to many physical directors who are attempting scientific teaching in physical education. There are several places in physical education in which this type of effort might be made. The following might be suggestive:

1. Individual instruction is enhanced when the instructor knows the skills of each pupil. This is only possible when each student has been tested in the particular activity in which he is engaged.
2. Pupil interest is developed when the pupil can see the progress he is making as shown by periodic testing.
3. Final grades can be more accurately given when actual scores are present.
4. The coaches of basketball teams will make wiser choices and better elimination of men from their squads when men remain on the squad on the basis of actual performance in tests rather than mere opinion of one man.

Dr. Allen

INDIVIDUAL SKILL
TESTS
IN
PHYSICAL ACTIVITIES



TESTS
OF
SKILL AND PROGRESS

IN

Aquatics
Badminton
Base Ball
Basket Ball
Golf
Gymnastics
Hand Ball
Ping Pong
Squash Racket
Tennis
Volley Ball

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WHY A TESTING PROGRAM

Physical educators, who are interested in more accurately measuring the effects of their teaching must be more and more guided by facts produced through objective measurement of their program.

Testing has a real and vital place in any teaching method. To teach activities to a child one must know the child. A testing program makes that possible.

1. Tests aid in determining the present skill of each member of the class. This aids in any classification that may be necessary.

2. Tests make it possible to note the progress each participant makes over a given period.

3. Tests also serve as a diagnostic element in the analysis of an activity. The results will indicate the place at which the greatest amount of teaching is necessary. We can only have good correction practice where the deficiencies are known.

4. Testing may serve as a real means of motivation of the pupil, knowing where the pupil is in relation to others. The class may stimulate him to greater effort. The wholesome competition against him; what he is and what he might be seems to have some advantages worth noting.

5. A testing program may be a real aid to the teacher in providing a check on results obtained from one method of teaching over and against another method.

ABILITY TESTS IN AQUATICS



1. Speed Tests

Score. Do all events and record the date of competition and time, in the following events. Record Gain.

1. 20 Yd. Crawl
2. 20 Yd. Back Crawl
3. 20 Yd. Breast Stroke
4. 20 Yd. Side Stroke
5. ~~Underwater Swim~~
6. ~~Plunge-Distance-Time~~

2. Diving Tests

Score. 10 dives to be selected as follows--4 from Class A--3 from Class B--2 from Class C--one from Class D. Score results of a pre-test and percentage of gain after a certain period of practice. Record those performed.

Test.

- A 1--Swan Dive
- A 2--Back Dive
- A 3--Front Jack Knife
- A 4--Back Jack Knife
- B 1--Front Dive- $\frac{1}{2}$ Twist
- B 2--Back Dive- $\frac{1}{2}$ Twist
- B 3--Run Front Dive Full Twist
- B 4--Run Front Dive $1-\frac{1}{2}$ Twist
- C 1--Run Front Somersault
- C 2--Stand Back Somersault
- C 3--Run $1-\frac{1}{2}$ Front Somersault
- C 4--Stand $1-\frac{1}{2}$ Back Somersault
- D 1--One-Half Gainer
- D 2--Full Gainer
- D 3--Double Front Somersault

3. Water Stunt Tests.

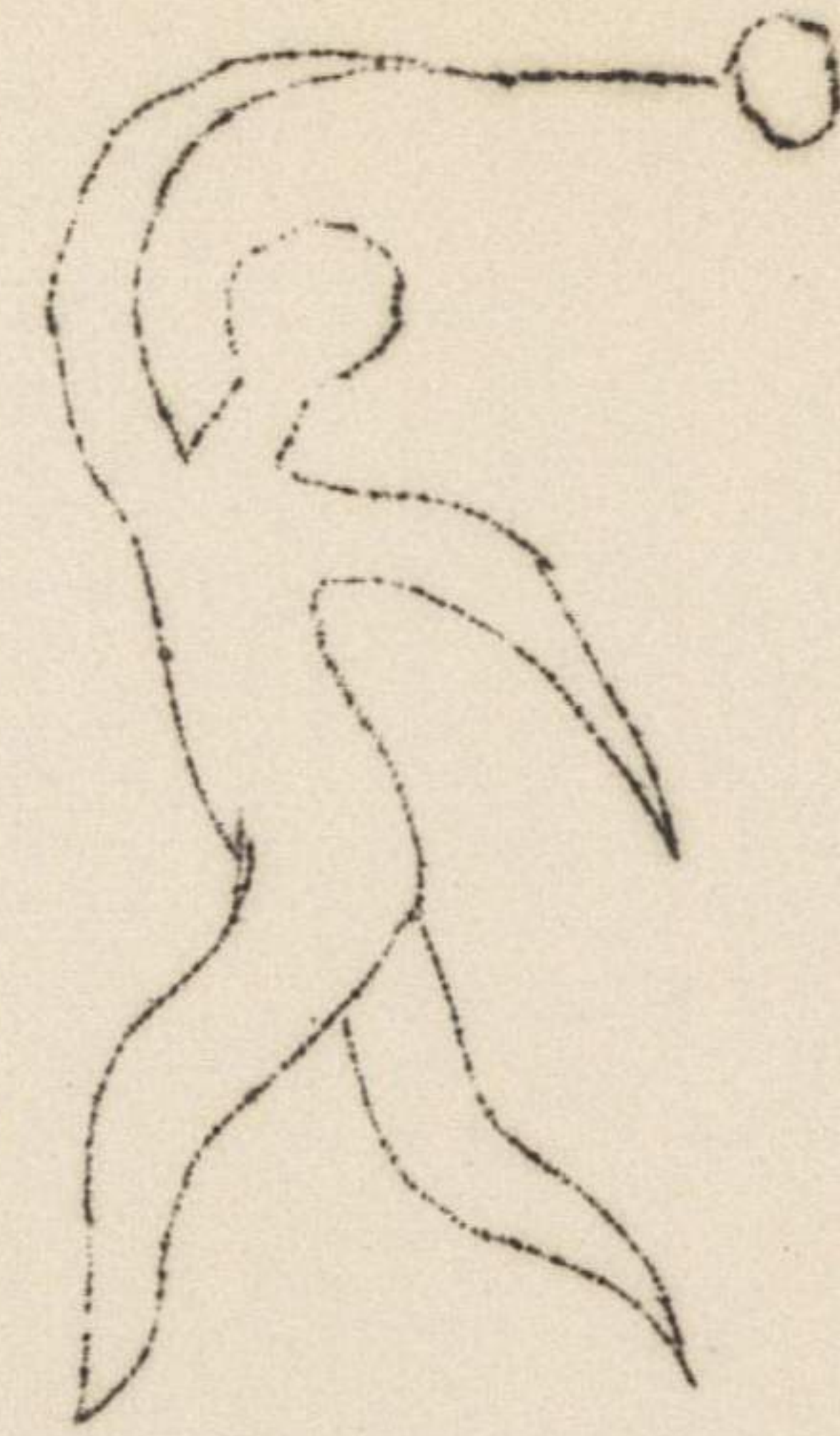
Score. 10 stunts counting 10 points each. Record date of stunts and time.

1. Back somersaults in Water (5)
2. Porpoise Swim--20 Yds.
3. Crab Swim--20 Yds.
4. Submarien--10 Yds.
5. Treading--10 Yds.
6. Bobbing--30 times
7. Crocodile (hands on hips, crawl kick)
8. 20 Yd. Swim--Hands Only
9. Floating--30 Seconds
10. Push off--4 times across pool.

WATER STUNT TESTS

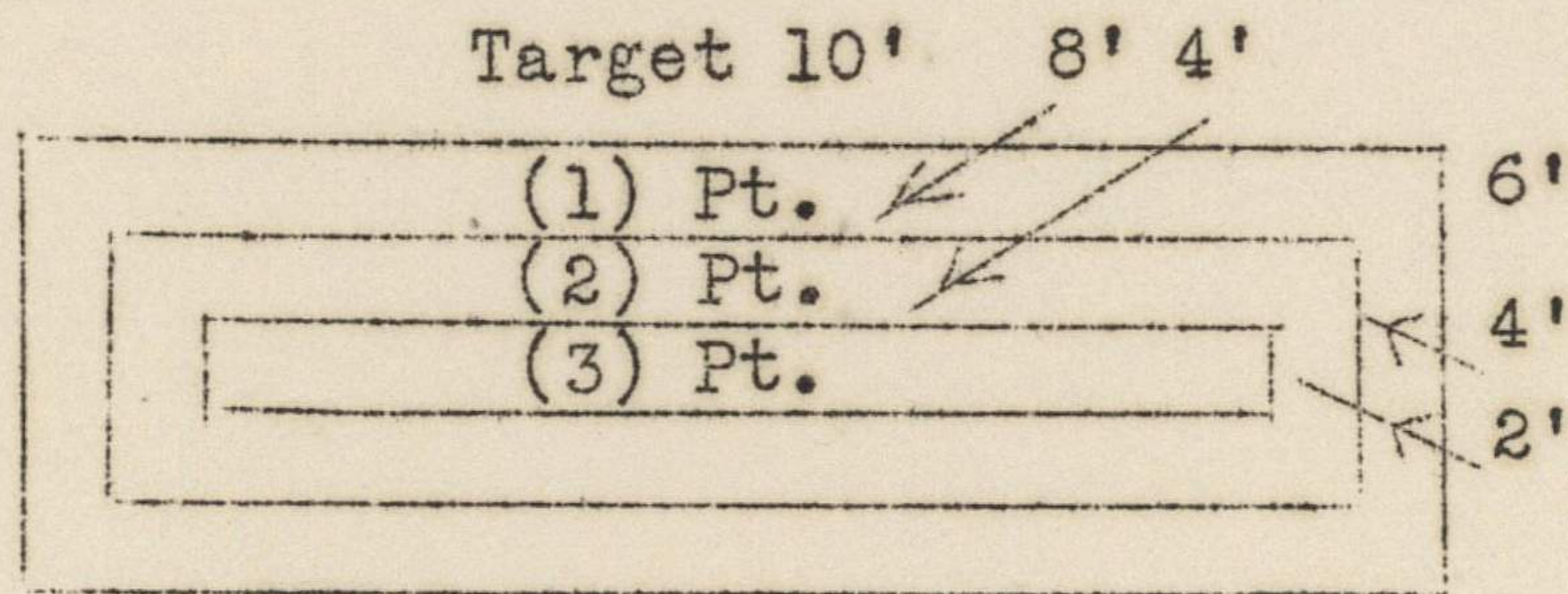
1. Back Somersault: (5 times)
The performer works in water 7 to 9 feet deep. He is supposed to successfully execute 5 back somersaults without coming up for air. Judges should score 2 points for each successful revolution, body must be tucked as in doing a back somersault in the air. The arms are to be the only means of propelling the body. Possible 10 points.
2. Porpoise--20 Yards
Start from deep end, dive to bottom, immediately pushing off from the bottom with the feet, go to surface, take a quick breath without a stop, and by a jack-knife moving of body and upward pull of arms, go to bottom again. Continue this procedure for one length of pool. Performer must appear 5 times--2 points for each successful movement if progress is continuous. Possible 10 points.
3. Crab Swim: (20 Yards)
The performer starts at the deep end and swims feet first face down; he propels his body by a sculling motion of the hands. His feet may be kept in motion--to keep them afloat. 1 point for each 6 feet. Possible 10 points.
4. Submarine: (10 Yards)
The performer starts by sculling head first (face up); as he travels head first he raises one foot out of the water (periscope) he submerges until this foot is out of sight; it must disappear and again reappear while the performer travels 30 feet.
5. Treading Water; (10 Yards)
The performer travels 30 feet by use of his feet only, body vertical in the water, hands out of the water. Possible 10 points.
6. Bobbing; (30 times)
Performer bobs up and down inhaling as the head comes to the surface; the hands may be used to aid in going down or up--body must be vertical. Three times per one point. Possible 10 points.
7. Crocodile Swim; (30 feet)
Performer placed hands on his hips and travels 30 feet using a flutter (crawl) kick; face down but not necessarily submerged. One point for each three feet. Possible 10 points.
8. Swim Hands Only; (20 Yards)
Performer must swim 20 yards--without the use of the feet; use the crawl stroke with the hands. Possible 10 points.
9. Floating; (30 seconds)
Hands and feet must be motionless.
10. Push-Off; (4 times)
The performer must be able to push off and travel across the pool without swimming. $2\frac{1}{2}$ points for each successful push-off across the pool. Possible 10 points.

BADMINTON

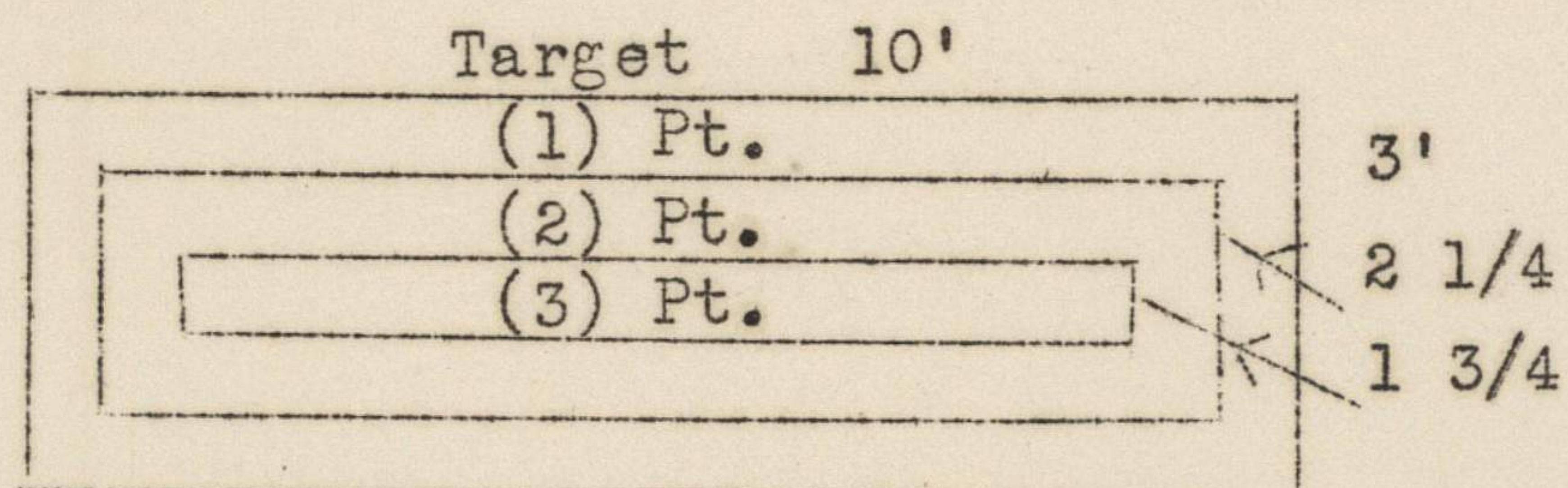


1. Service tests

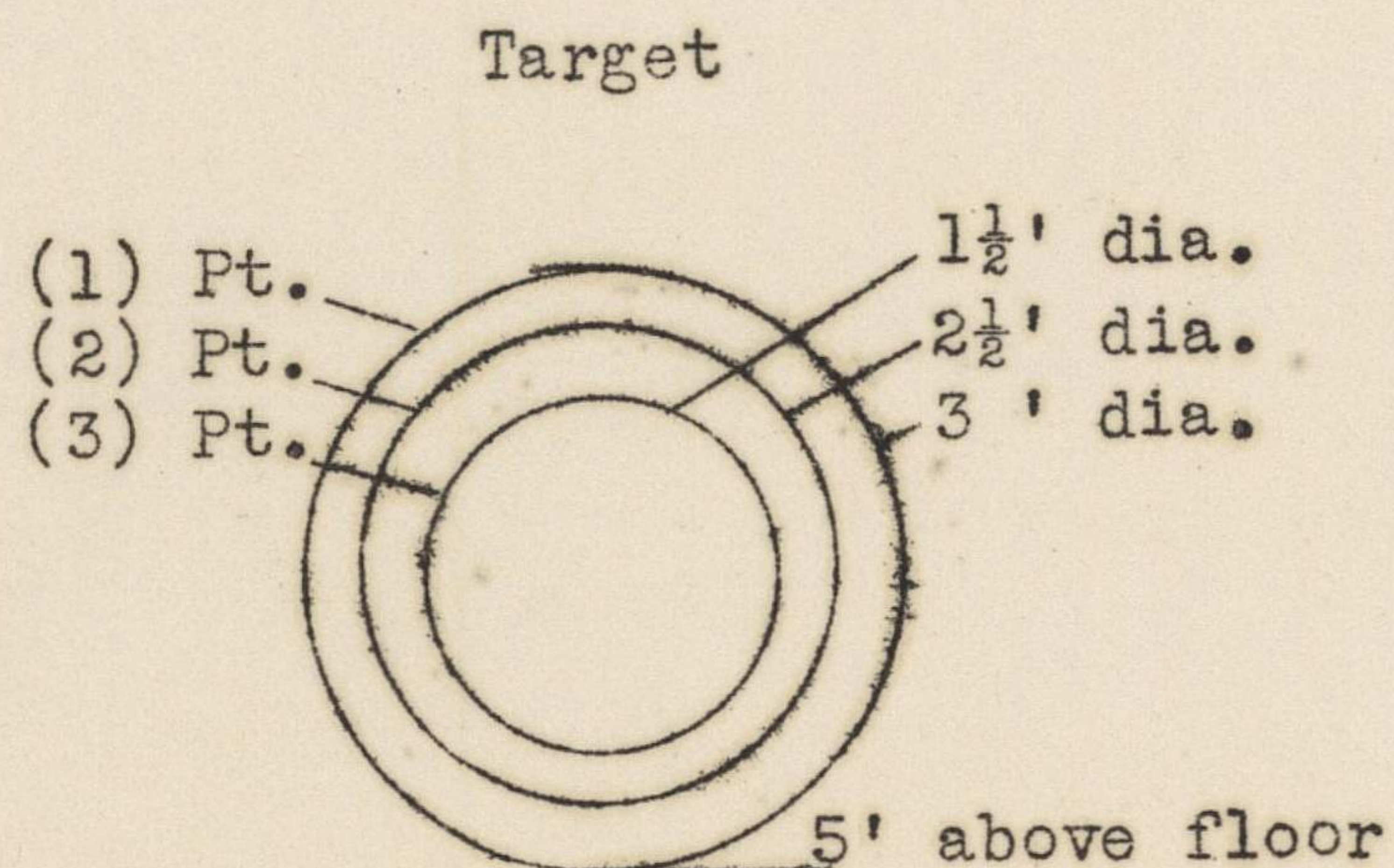
A. Long serve--The serve is made from behind the service line 6'6" from the net. Bird must be hit over the net to the target on the floor. Hit into the net or out of target is no score. Back line against baseline. Score five attempts.



B. Short serve--Target placed against short service line. Score five attempts. If bird hits net and falls on other side, allow to repeat.

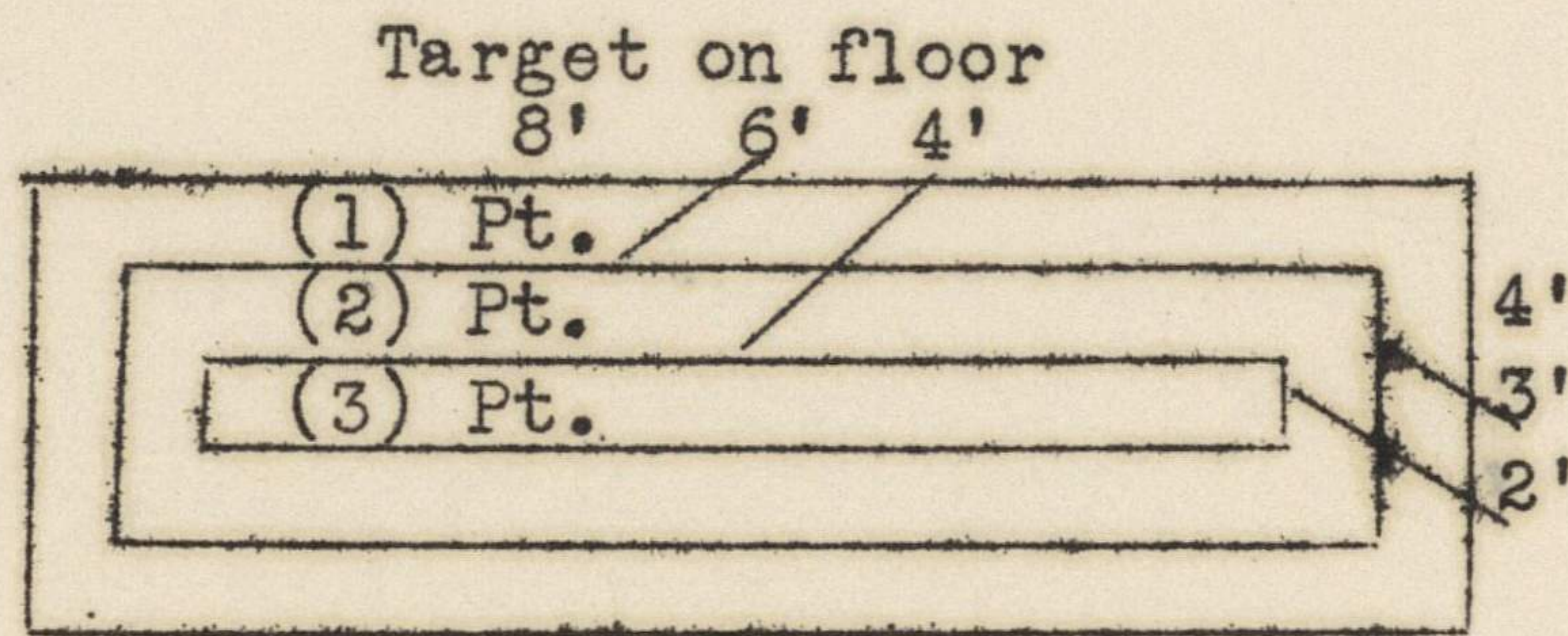


C. Direct hit or Drive serve--Serve from spot 10 1/2' from 5' high net to hit target on wall 11 1/2' on other side of net. This distance is approximately the distance from server to receiver in a driven service. Score five attempts.



2. Lob Strokes

A. Overhead lob. (forehand) The bird is hit over a line 10' high to cross court. Person being tested moves from a position in opposite court 3 feet away from center line to next court to play the bird. He must not move until bird is started by tester. Overhead lob stroke must be used to hit bird at target in center of floor, four feet in front of baseline. The bird must cross the 10' line on its return to the target. Score five attempts.



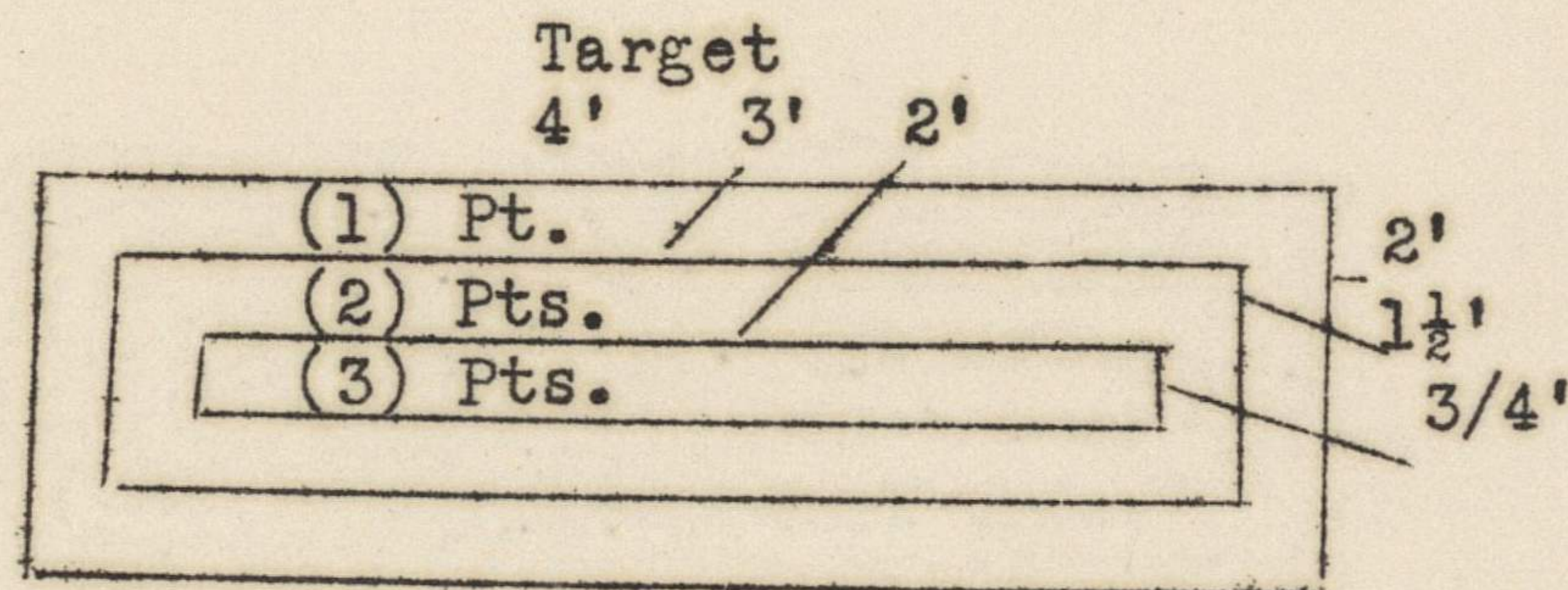
B. Backhand Overhead lob--Repeat test four but reverse positions and use backhand overhead stroke. Score five attempts.

C. Underhand forehand lob--Bird must be hit below the waist. Use same target as in number four. The bird is hit by the tester over a five foot net beyond the service line. Score five attempts.

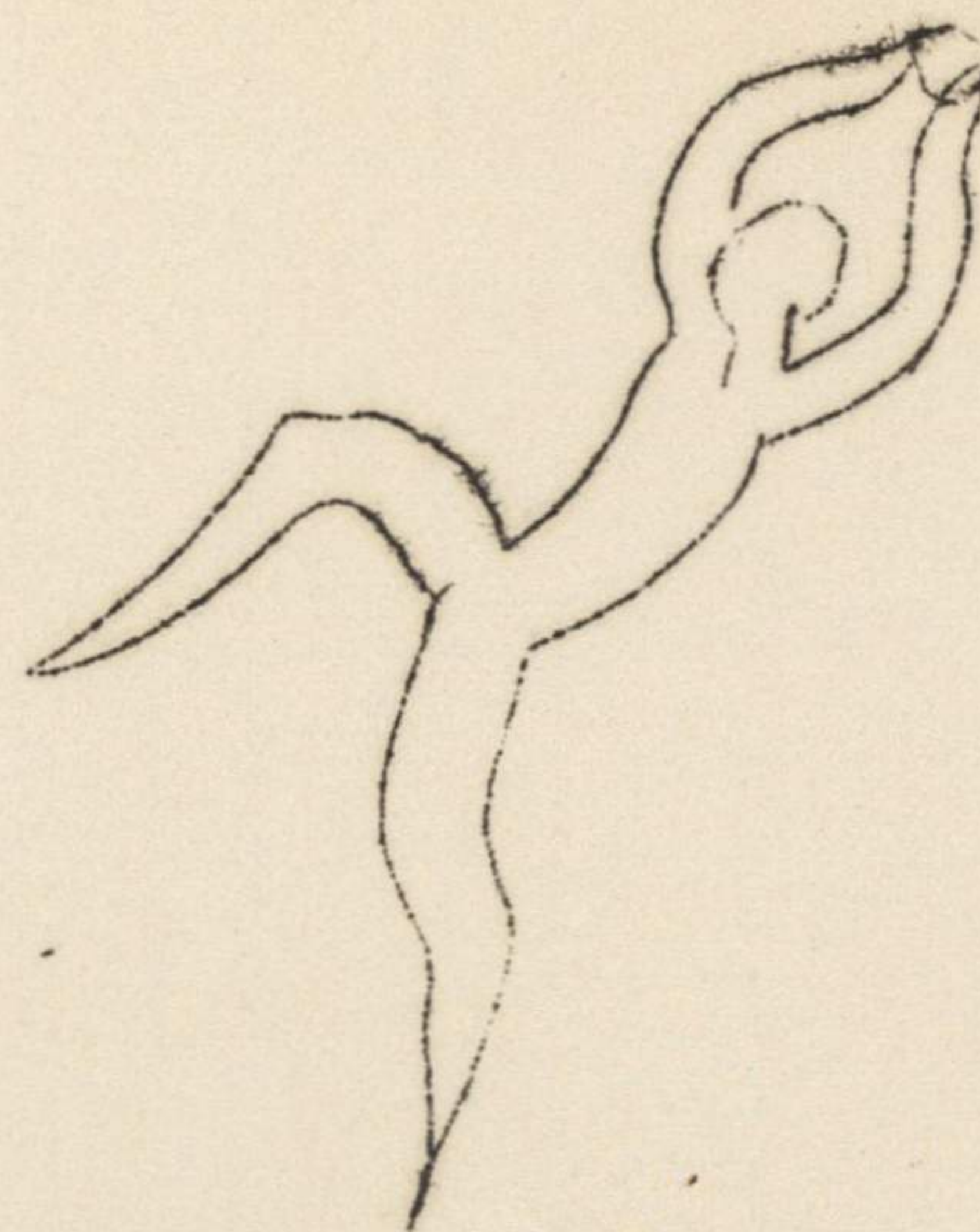
D. Backhand Underhand lob--Repeat number six but reverse sides and use backhand stroke. Score five attempts.

3. Smash

Target is placed on wall $5\frac{1}{2}'$ from floor and 12 feet away from start of the smash. Bird is thrown over 10' high rope to person tested who stands behind a 12 foot line.

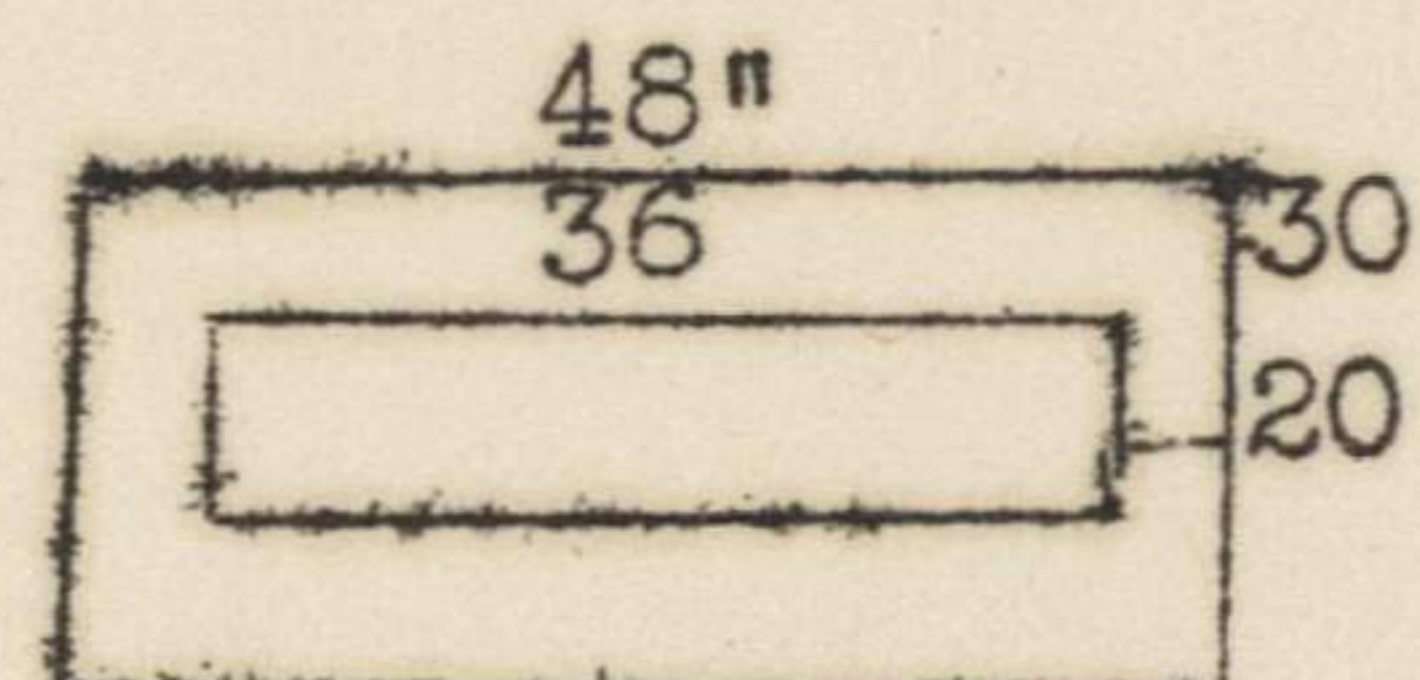


PLAYGROUND BASEBALL



1. Accuracy Throw

Equipment: A solid wall is used for the target and on it is marked a rectangle 30" x 48"; the lower edge is 20" from the floor. Inside of this another rectangle 20" x 36".



Underhand Test

The individual taking the test stands with the toes of both feet on the pitching line--30' away. He is allowed five throws using the regulation underhand throw.

Overhand Test

The individual taking this test stands on or behind a line 60' away. He is allowed five throws using an overhand throwing motion.

Score

Score two points for each throw which hits within the inner rectangle and one point for each throw which hits within the outer rectangle. A line ball shall be scored 0, 1 or 2 depending where the majority of the ball hit.

2. Batting

Equipment--1 16" ball. Indoor bat. Pitcher's mark 30 feet away from home plate.

Fungo Hitting Test

The individual being tested is given a ball and bat and five attempts to hit the ball into the air. While holding the bat on his shoulder he tosses the ball into the air and then tries to hit the ball before it touches the ground.

Score

One point for each successful fly hit.

Hitting Pitched Balls

The pitcher stands 30 feet away and delivers a legal underhand throw. The batter has five trials. He need hit only at good balls.

Score

Score one point for each batted ball striking the floor in the infield and two points for ball striking the floor in the outfield.

1 & 2 Rodgers, E.G. & Heath, M.L., An Experiment in the Use of Knowledge and Skill tests in Playground Ball, Research Quarterly, 1934

3. Fielding

Fly Balls. Equipment: A solid wall, 16" ball and a line marked 15' above the floor, a stop watch.

Test. The individual throws the ball repeatedly against the wall over the 15' line for a period of 30 seconds catching it on the rebound.

Score. Score the number of successful catches within the 30 second period. Balls hitting below the 15 foot line score 0.

Ground Balls. Equipment: A solid wall, two lines parallel to the wall 20 and 30 feet away from the wall, stop watch, and ball.

Test. The individual throws the ball against the wall from the thirty foot line. He catches the ball on the rebound and continues to throw as many balls as possible within the 30 second period. At no time must he go beyond the 20 foot restraining line.

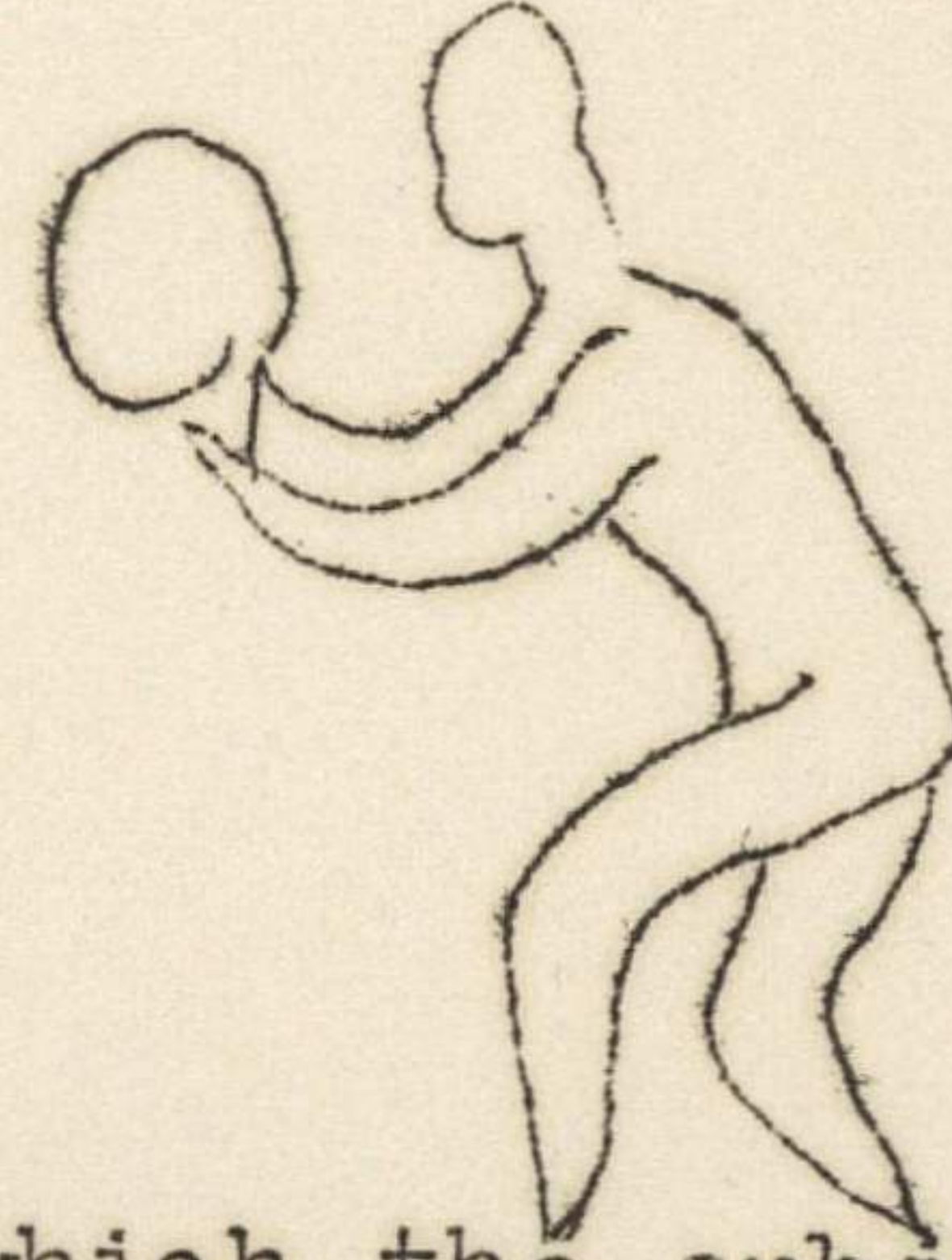
Score. The number of successful catches in the 30 second period.

4. Base Running

Equipment: Bat and ball, home plate, pitcher mark 30 feet away and first base 35 feet away (distance from home to first base in indoor baseball), stop watch.

Test. The individual hits a legally thrown underhand throw from the pitcher and runs to first base immediately after the hit.

BASKETBALL



γ 1. Speed Pass (1)

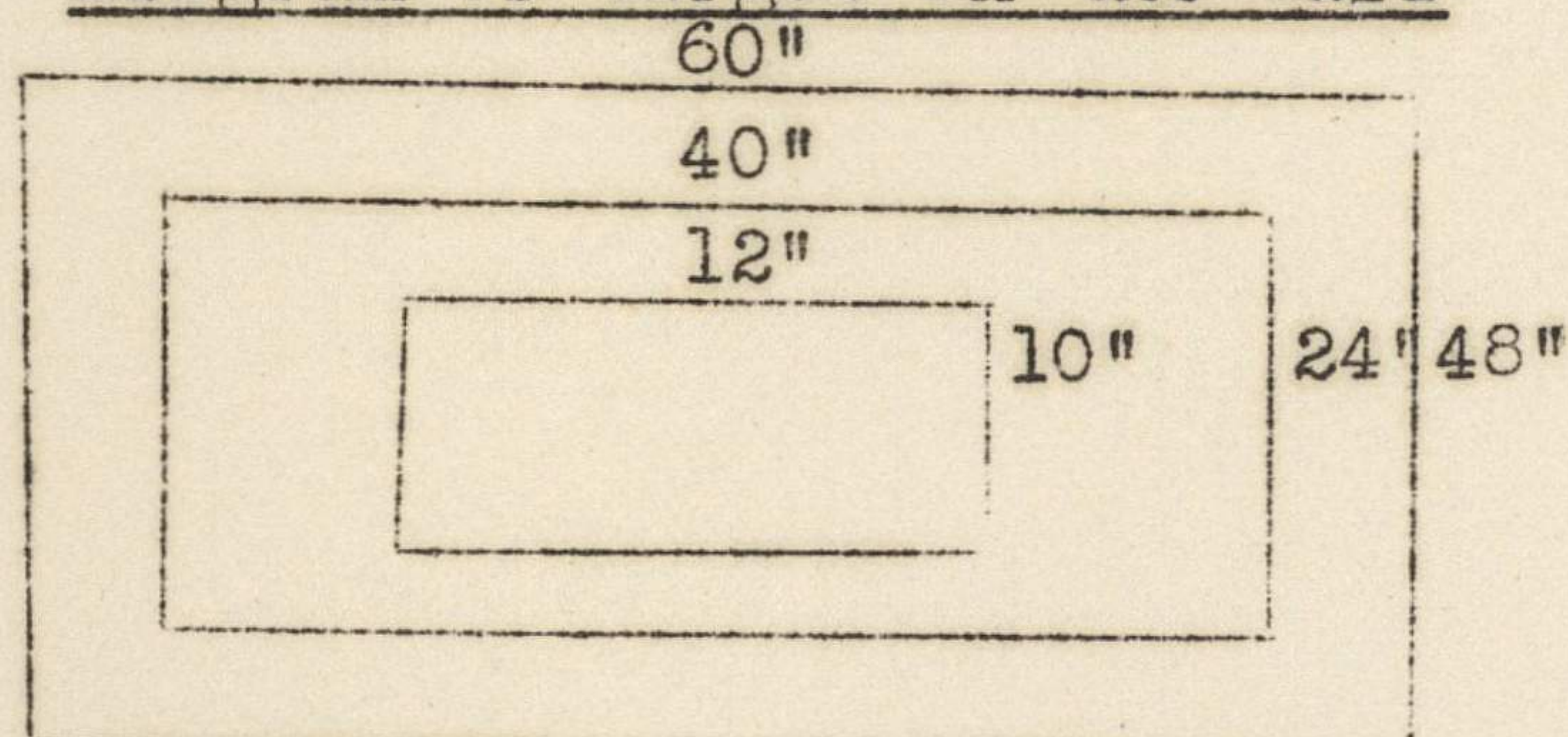
This test measures the rapidity with which the subject can receive and pass a basketball ten times against a wall. The subject stands behind a line eight feet from the wall and parallel to it. He passes the ball as rapidly as possible ten times against the wall. Time is started when the ball leaves his hands on the first pass and stopped when the tenth pass returns to his hands. The subject must not only stand behind this eight foot line, but must also receive and pass the ball from behind this line. Any kind of pass may be used.

γ 2. Accuracy pass (2)

This test is designed to measure the accuracy of the subject in using two different passes. The subject stands back of a line drawn parallel to a target. This line is fifteen feet from the target in case of the underhand pass and thirty feet from it in the case of the shoulder pass. Five throws are made with each kind of pass. The ball may be passed at any speed for accuracy alone is being tested. Passes are scored on the following basis.

Inner square or line marking it	-----	3 points
Middle " " " "	-----	2 points
Outer " " " "	-----	1 point

Diagram of Target on the Wall

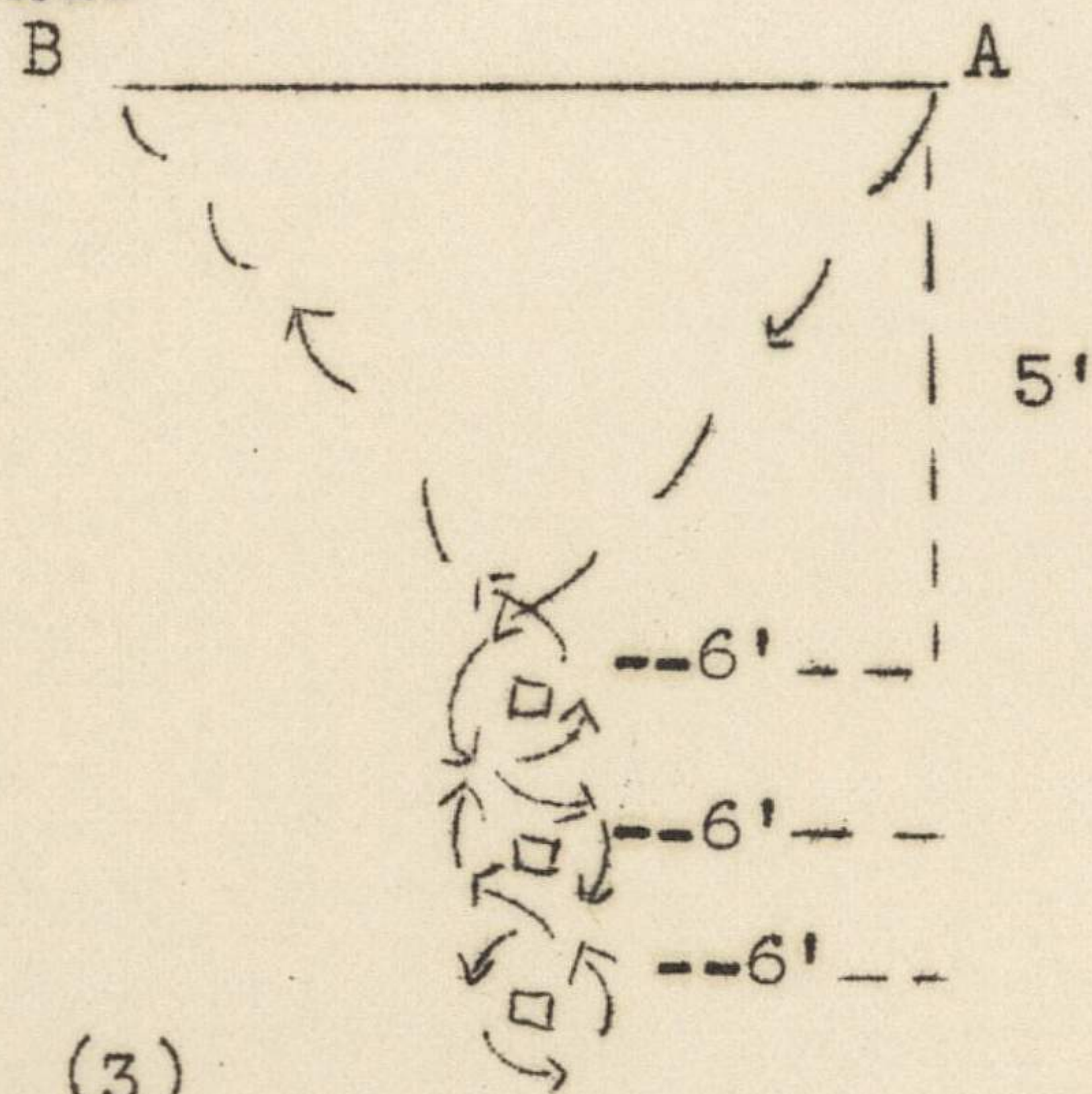


This size target is used for it approximates the reach of an individual in catching the ball.

3. Speed Dribble

Even though speed is not always desirable in dribbling, the efficient dribbler is able to dribble with great rapidity. This test is developed to test the subject's ability to manipulate the ball around objects. The subject is urged to go as fast as possible but to keep the ball under control. The watch is started when the subject leaves the starting line at "A" and is stopped

when he crosses the starting line at "B" (see diagram) score in tenths of seconds



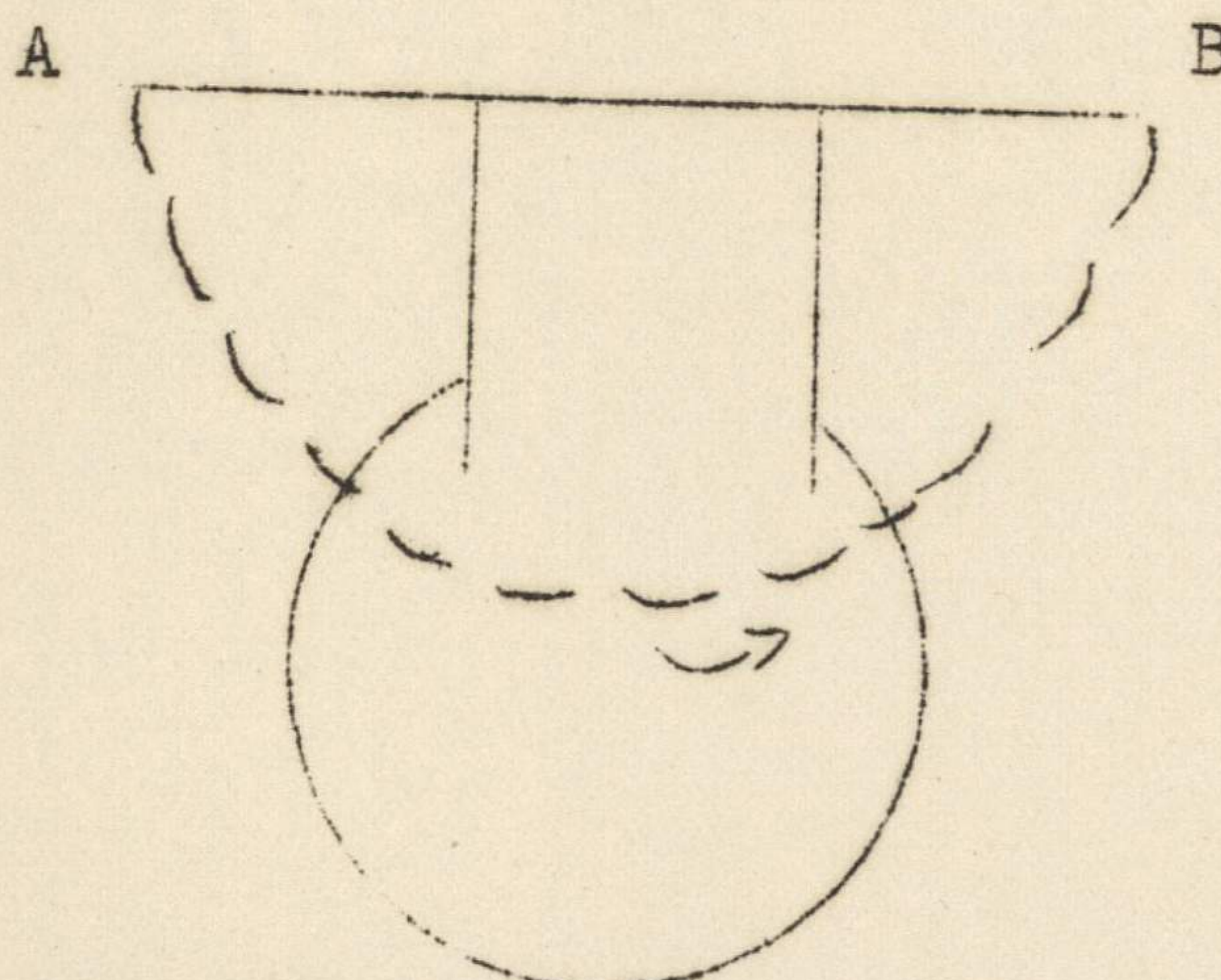
15' to first box or chair
6' between remaining objects

X 4. Dribble and shoot (3)

The object of this test is to measure the ability of the subject to handle the ball when he is forced to combine a dribble, a short shot, retrieving the ball on the rebound and repeating the procedure. He is urged to score as many baskets as possible but to make the five trips as fast as possible. The subject starts at "A" dribbles around the freethrow line, and takes a short shot as he approaches the basket. He then retrieves the ball from the basket and repeats the process a total of five times. The time is taken from the second that he leaves the line at "A" until he recovers the fifth shot from the basket.

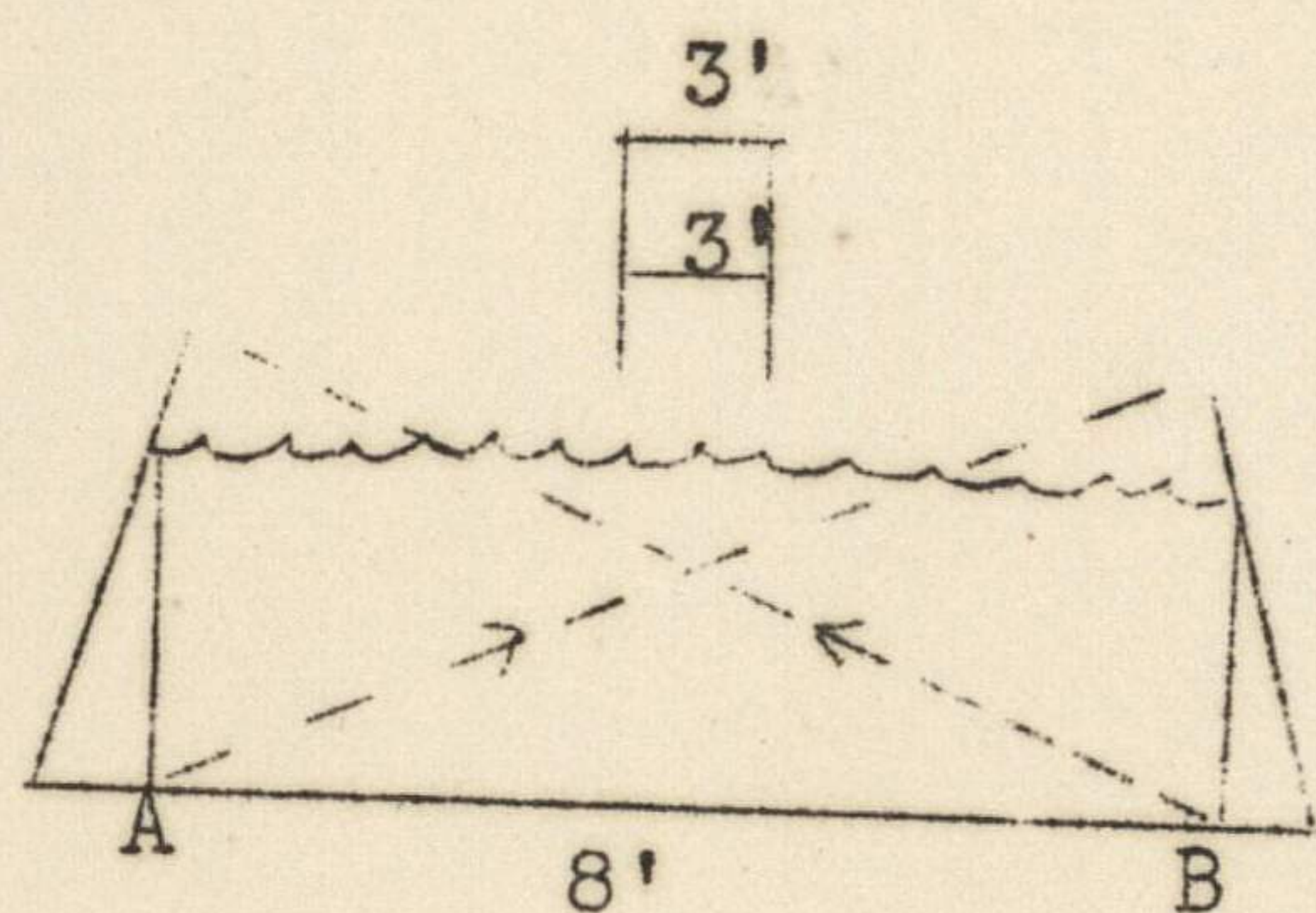
He is scored by dividing the number of baskets made out of the five attempts into the total time in seconds.

Diagram



Y 5. Ball Handling

This test is constructed to measure the subject's ability in ball handling and body coordination. He must pass the ball, follow the ball with the body, receive the ball, stop forward progress and start back in the opposite direction.



A three foot wide mat about two inches thick is hung on the wall in the center of a six foot lane. Another line is drawn on the floor eight feet from the wall and at right angles to the six foot line.

The subject starts at "A" and on the signal throws the ball against the wall across and outside of the mat and receives the ball at "B." Here he immediately passes from "B" across mat as indicated by dotted line and receives ball at "A." The subject may carry the ball back to "A" or "B" before throwing the ball if he chooses. He makes ten passes and the time is started when the ball leaves his hands on the first pass and is stopped when he recovers the tenth pass.

6. Agility Test

This test was designed to measure the ability of the individual to lift his body directly upward with a jump and reach. The distance of the jump was recorded by measuring the difference between the highest point of a standing reach and the highest point of a jump reach. a $\frac{3}{4}$ piece of chalk is used for the entire test. To get the full benefit of the jump, the subject must stand close to the wall and jump parallel to it.

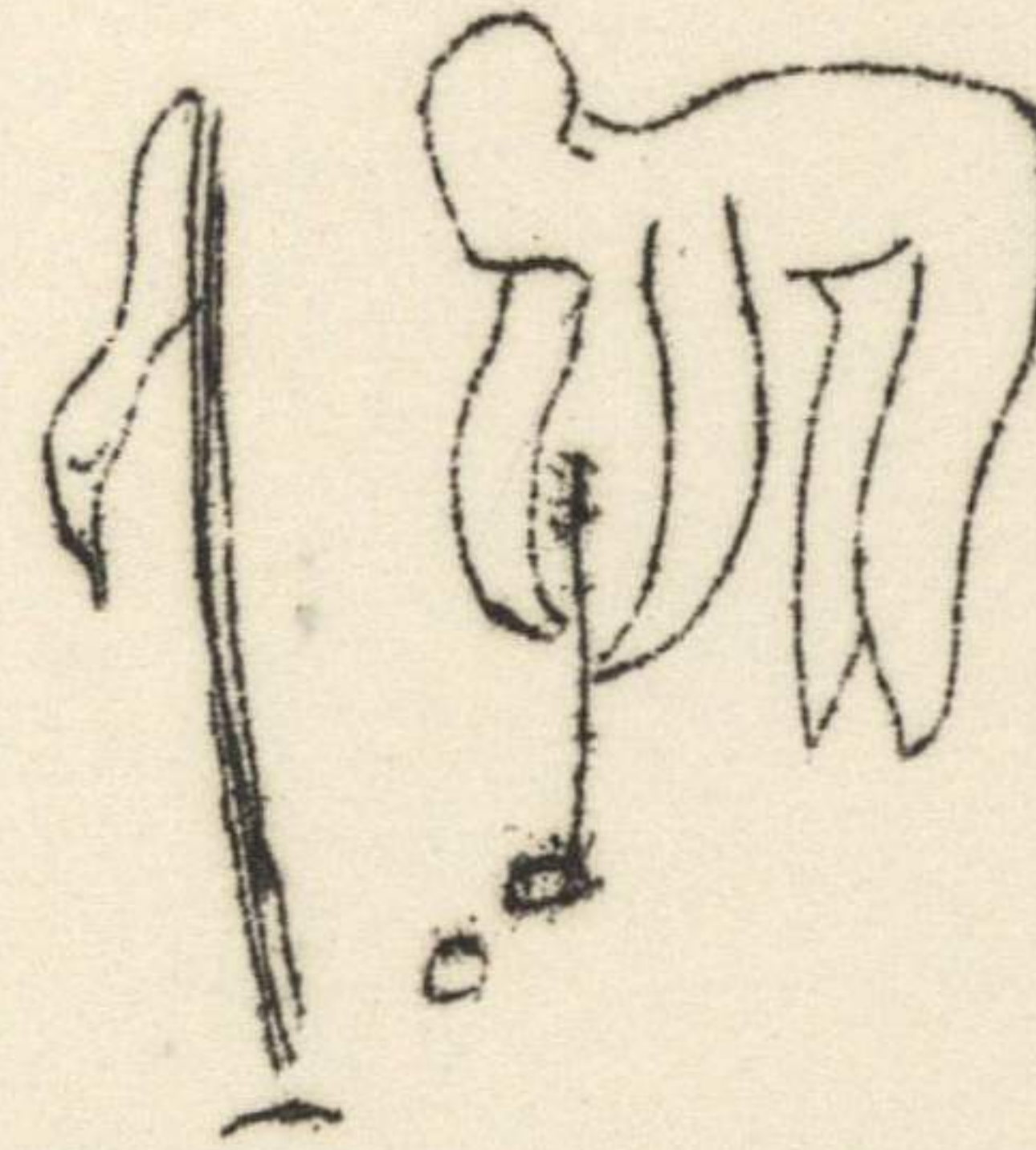
7. Coordination Test

This test was devised as a means of judging the ability of an individual to shift his body from left to right similarly to what a basketball player is forced to do when guarding an opponent. The subject must work with the feet spread in a good base and must then shift the body across an eight foot lane. The subject worked inside the lane and needed only to touch the line with the outside foot on each shift. He was scored on the time it took to make ten shifts from left to right and from right to left. One shift across counted as one time.

X 8. Free Throw

Count the number of free throws made in 10 attempts.

GOLF



1. Driver or Brassie

Drive ball to target (using driving net.) Score according to number in each square of target. Score the total of 10 attempts. Drive off mats to target. ¹Target at end of net.

10'

	4	6	6	6	2	
	4	8	10	8	2	
10'	4	9	10	9	2	10'
	3	7	10	7	1	
	3	5	5	5	1	

2. Midiron Test

Repeat the same test as #1 using no. 2 iron. Score total for 10 attempts.

10'

	4	6	6	6	2	
	4	8	10	8	2	
10'	4	9	10	9	2	10'
	3	7	10	7	1	
	3	5	5	5	1	

10'

1. M.C. Clevett

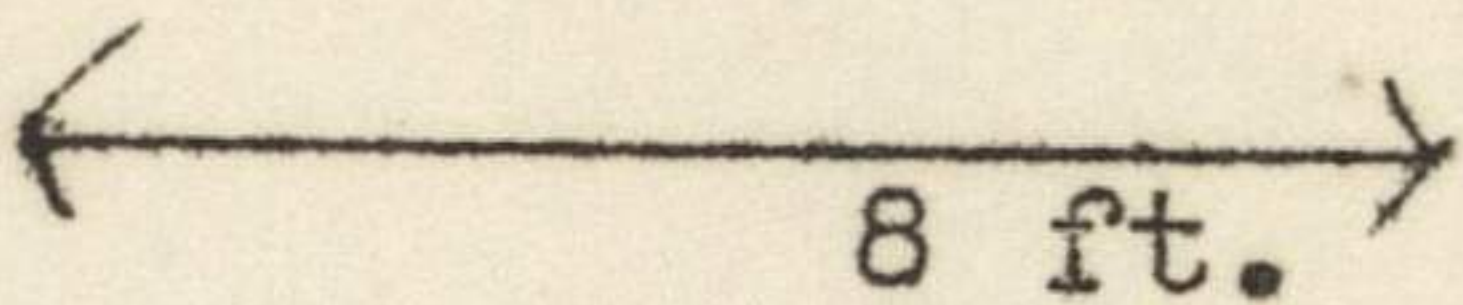
3. Mashie test

Repeat same test as #1 using mashie. Score total for 10 attempts. Target parallel to floor 10'

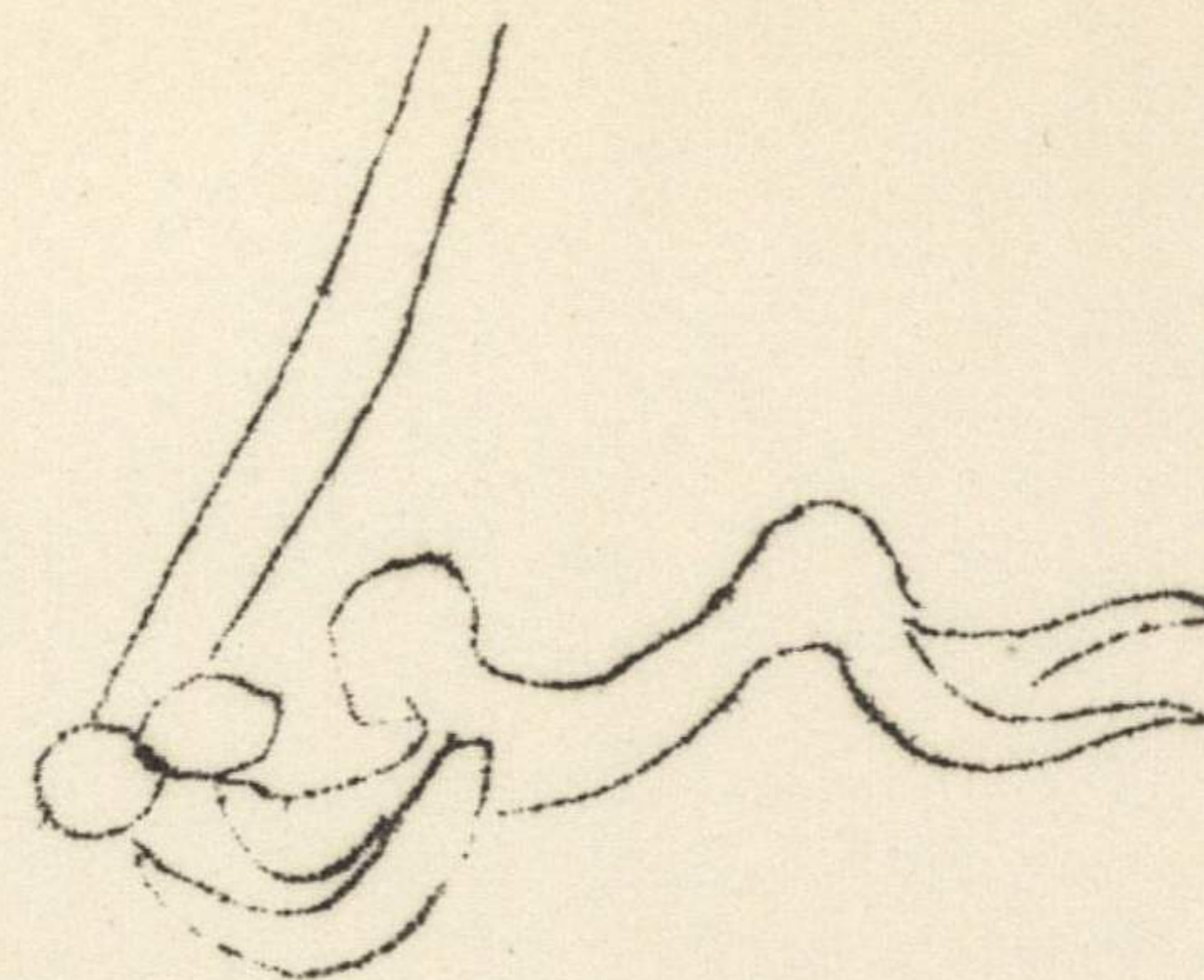
	1	4	5	4	1	
	1	7	7	7	1	
10'	3	9	10	9	3	10'
	3	8	8	8	3	
	2	6	6	6	2	
						10'

4. Putter test (carpet floor)

Target on floor, using 10 inch squares in the target. Score total of 10 attempts.

	1	1	1	1	2	2	2	2	6	7	7	5	5	3	3
	1	1	1	1	2	2	2	6	6	9	8	8	8	4	4
	1	1	1	1	2	2	2	2	6	7	7	5	5	3	3

GYMNASTICS



In all heavy apparatus work the stunts are either completed or not completed. How well, is a subjective evaluation by a judge. We have therefore omitted any reference to points for form or execution. The following stunts on different pieces of apparatus are designed to be progressive and are listed according to degree of difficulty.

Check date of achievement when stunt is completed.

A HORIZONTAL BAR

Date of Achieve- ment.	Exercise
1.	Skin the cat
2.	Hang, backward hip circle to mat
3.	Hook upstart
4.	Upstart swing
5.	Backward hip circle to front rest
6.	Backward single knee circle
7.	Cross straddle crotch circle
8.	Backward double knee circle
9.	Forward crotch circle
10.	Swing-hook upstart
11.	Upstart
12.	Drop back upstart
13.	Rear uprise to seat
14.	Forward heel circle
15.	Backward seat circle
16.	Uprise
17.	Double outside knee mount
18.	Knee or hawk dismount
19.	Reverse grasp upstart
20.	Forward toe circle
21.	Muscle grind
22.	Free backward hip circle
23.	Reverse grasp, rear uprise to seat
24.	Giant swings (ordinary)
25.	Reverse giant swings
26.	Combination giant swings
27.	Fly away

B PARALLEL BARS

1.	Series of straddles--forward
2.	Series of straddles--backward
3.	Rear vault
4.	Front vault
5.	Cut-off--right and left leg
6.	Cut-in--right and left leg
7.	Combination left-in-right-out

Date of Achiev- ment	Exercise (Cont'd)
8.	Double cut in
9.	Double cut out
10.	Forward shoulder roll
11.	Upper arm hang-backward roll
12.	Shoulder balance
13.	Upper arm hang upstart
14.	Upper arm hang front uprise
15.	Upper arm hang rear uprise
16.	Short underswing upstart
17.	Long underswing upstart
18.	Shoulder rolls backward
19.	Shoulder rolls forward
20.	Long underswing upstart shoulder balance
21.	Hand walk
22.	Hand balance
23.	Long underswing upstart hand balance
24.	Hand balance and pirouette
25.	Swing-double rear vault dis- mount
26.	Hand balance-backward somersault to upper arm hang.

FLYING RINGS

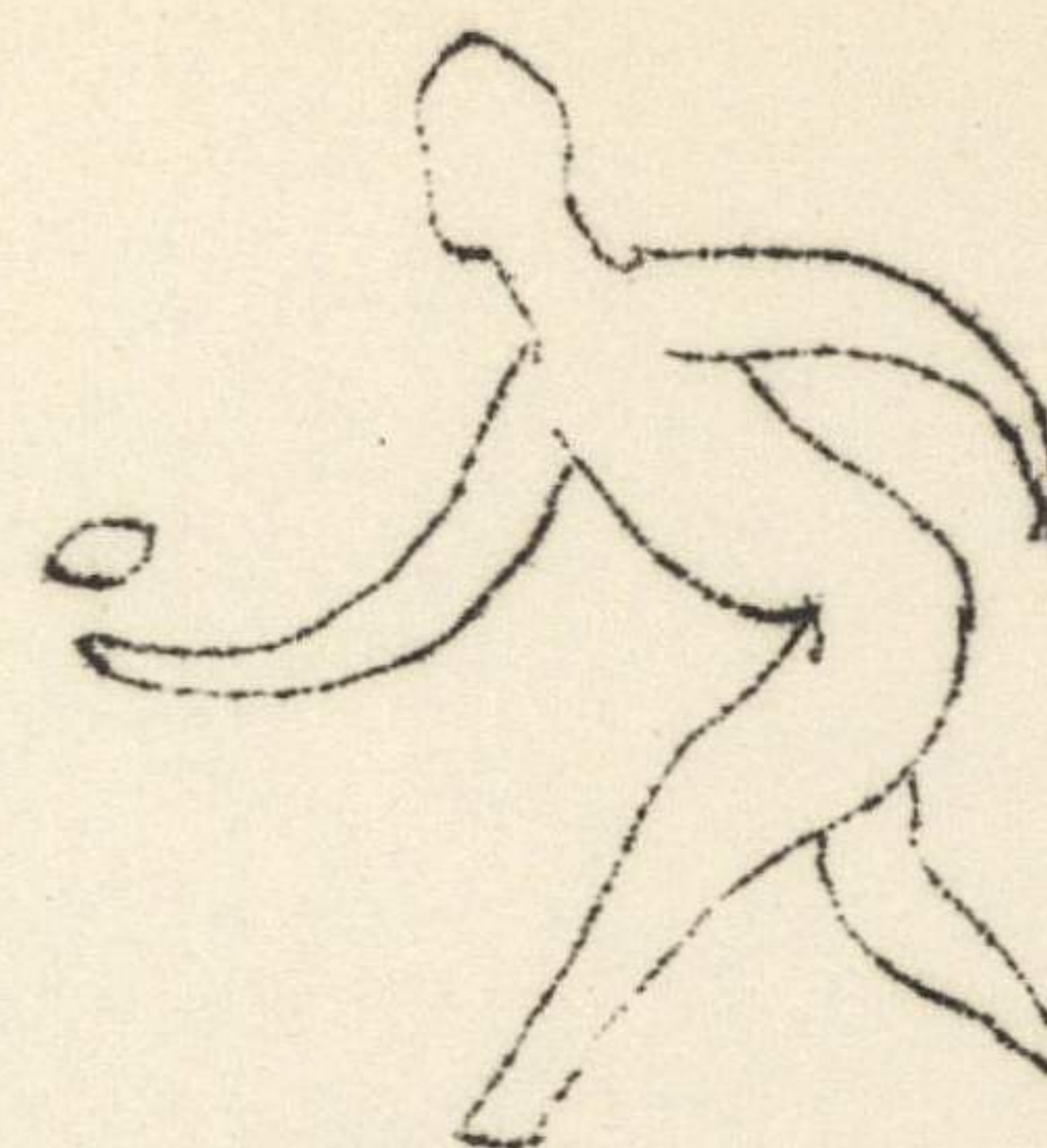
1.	Swing two beat rhythm
2.	Swing-one-half turn at each end
3.	Swing one full turn at each end
4.	Swing inverted hang
5.	Swing bird's nest
6.	Swing bird's nest release one hand and opposite foot
7.	Swing bird's nest drip dismount
8.	Backward cut-off on front swing
9.	Front cut off on rear swing
10.	Upstart at front end of swing
11.	Upstart at rear end of swing
12.	Dislocate on rear swing
13.	Dislocate on forward swing
14.	Uprise on rear swing
15.	Uprise on forward swing
16.	Inlocate at rear end of swing
17.	Swing forward hip circle-front end
18.	Swing-cut off and catch rear swing
19.	Swing-bird up to hand stand
20.	Fly away at forward end.

Date of Achievement	Exercise	C---Side Horse
1.	Squat Vault	
2.	Side Vault	
3.	Front Vault	
4.	Rear Vault	
5.	Wolf Vault	
6.	Straddle Vault	
7.	Thief Vault	
8.	Front scissors	
9.	Back scissors	
10.	Single leg circles (half)	
11.	Feint-rear vault dismount	
12.	Single leg circles (full)	
13.	Double leg circles	
14.	Side scissors over neck and croup	
15.	Neck spring	
16.	Left feint-double leg circle left	
17.	1. $\frac{1}{2}$ R.-R. $\frac{1}{2}$ L.-L. $\frac{1}{2}$ L. R. $\frac{1}{2}$ R.	
18.	R. Feint-R.-R. L. $\frac{1}{2}$ L. With vault swing dismount far side.	
19.	Screw vault	
20.	Left feint and double rear vault swing dismount	
21.	From stand, double rear vault mount to back rest on near side of saddle.	

D---Tumbling

1.	Forward roll
2.	Backward roll
3.	Dive
4.	Cartwheel
5.	Headstand
6.	Round-off
7.	Neck spring, Head spring
8.	Hand spring
9.	Hand stand
10.	Front somersault
11.	Back somersault
12.	Back handspring
13.	Back Bends
14.	Hand stand and "walk over"

HAND BALL



1. Speed Test

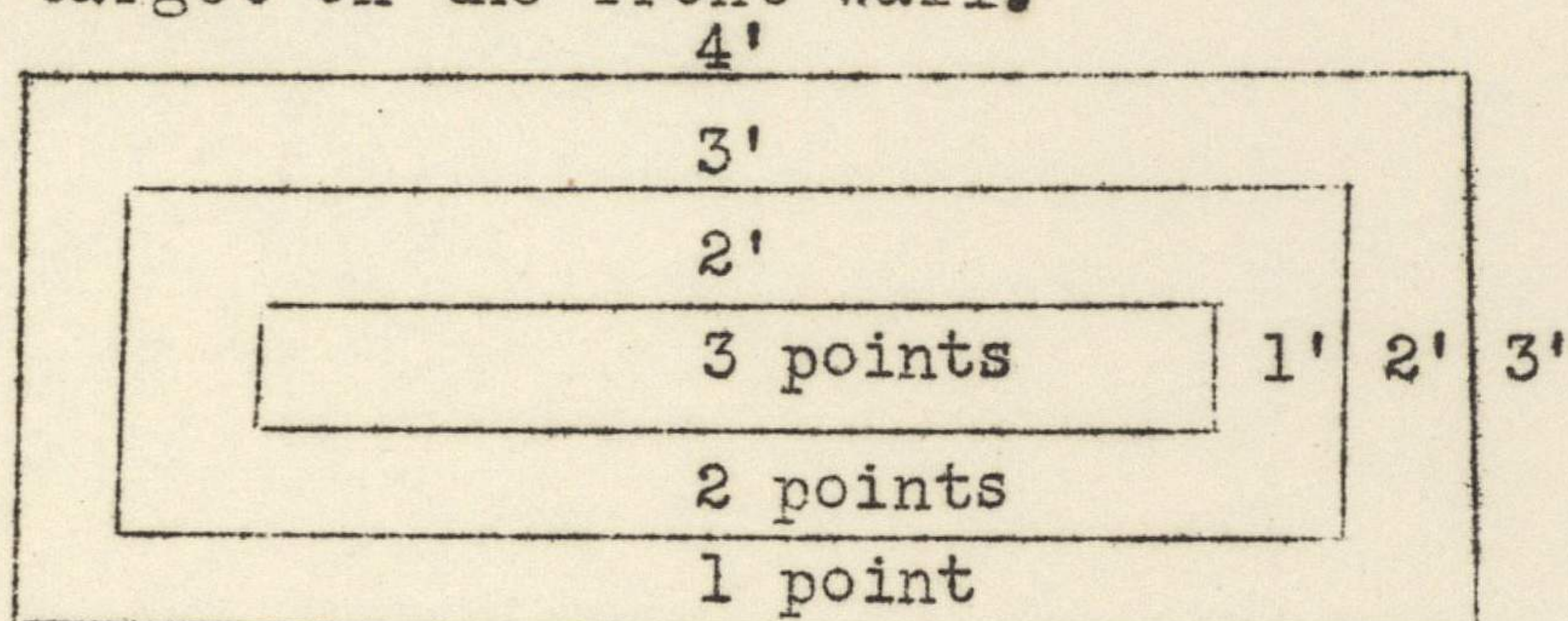
1. Hit ball with right hand against a wall 15 feet away as many times as possible in 15 seconds. Start by dropping ball to the floor. Score total returns.

2. Repeat test over but alternate left and right hand returns.

2. Accuracy Test.

From a position behind service line drop the ball from hand to floor and hit ball at target on the front wall.

Score total points in five attempts.

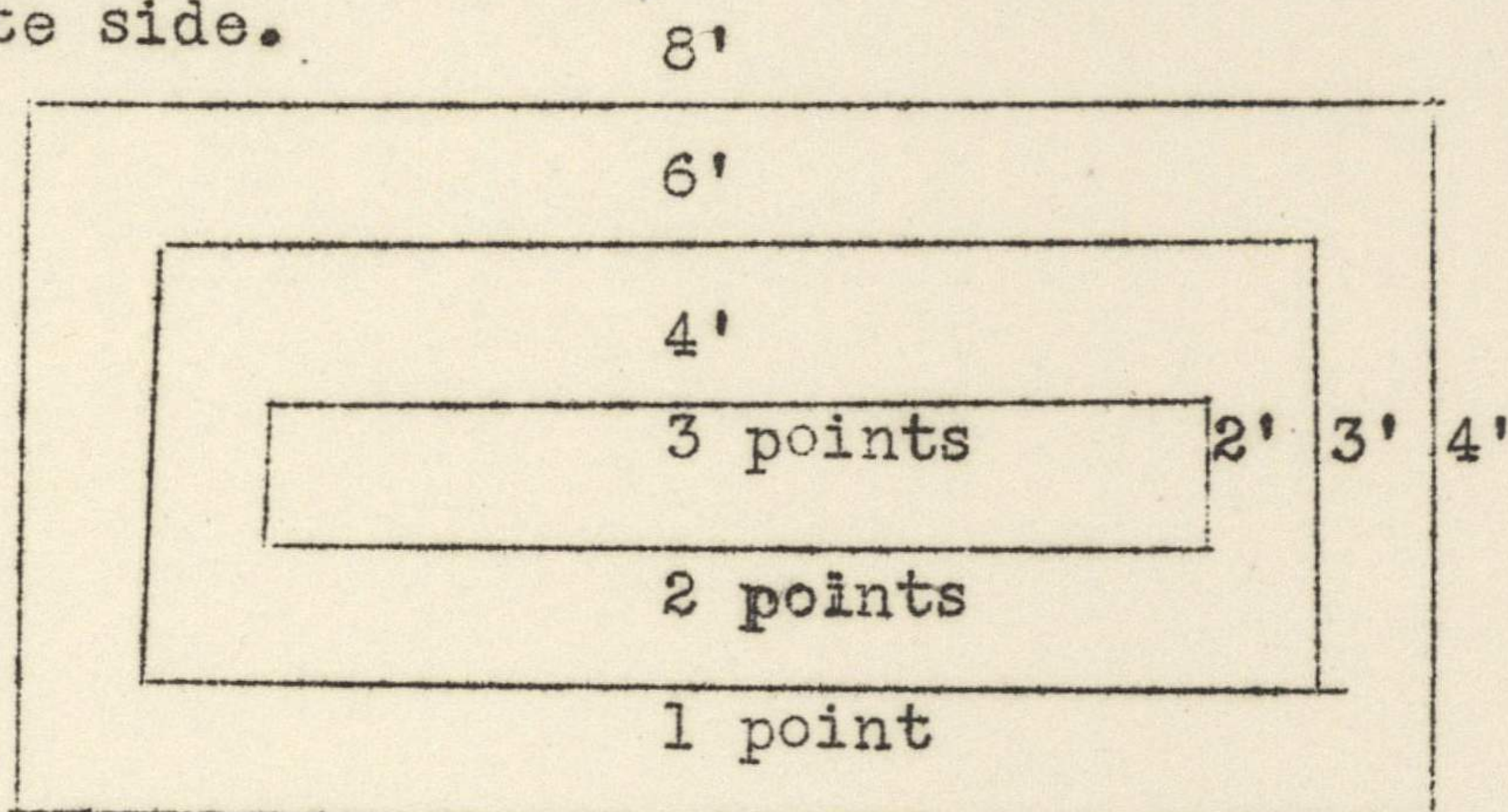


3. Volley Test

Hit the ball on a volley against a wall 10 feet away as many times as possible in 15 seconds. Use either or both hands. Score total returns.

4. Service Test

From a position behind the service line hit 5 balls at front wall and to the target on the floor in service area. Use a cross court service that is served from one side of the court to the service court on the opposite side.

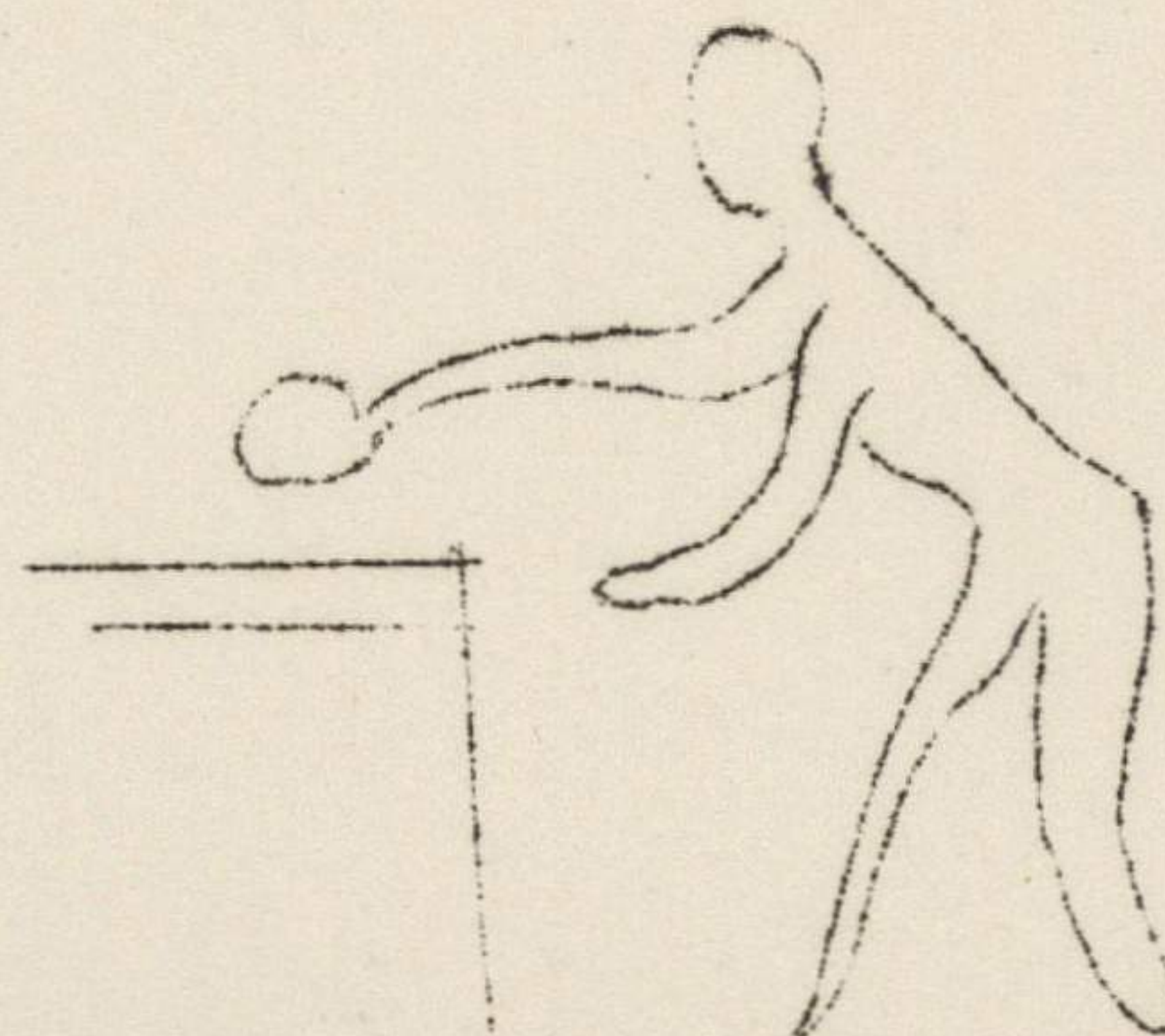


Score total points

5. Back Wall Return

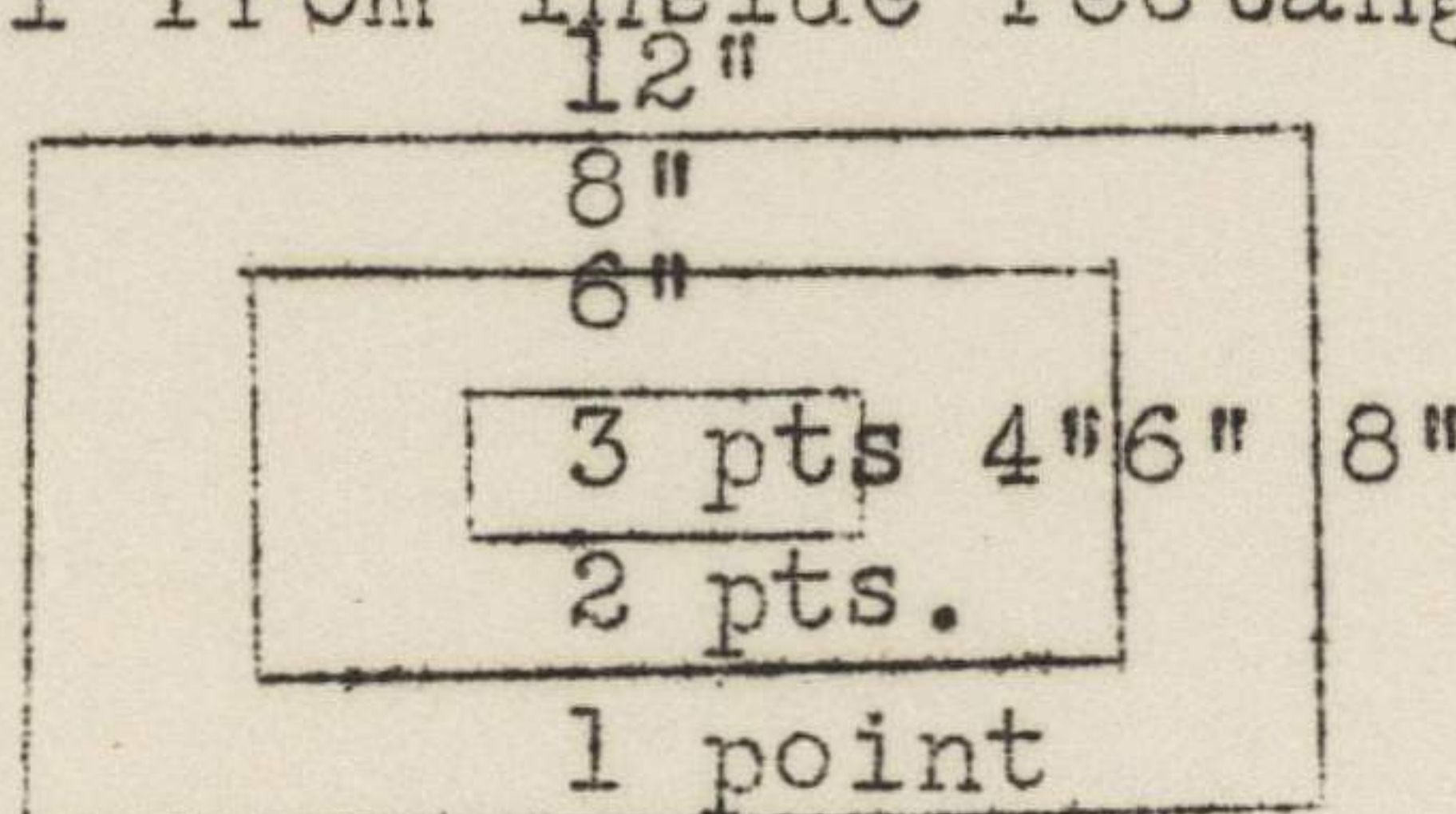
Stand 3 feet from the corner of the back and side wall--toss ball to the back wall and by use of right hand full arm swing play the ball to front wall. Score according to value on the target. Record score for five balls. The target is the same as used in test 2.

PING PONG



1. Accuracy Test

Bounce ball in last six inches of table and hit at target which is placed against the net. Hit 5 balls at the target placed at the height of the net--target is 6" high and 12" wide. Score 3, 2, or 1 from inside rectangle out. Score total in five tries.

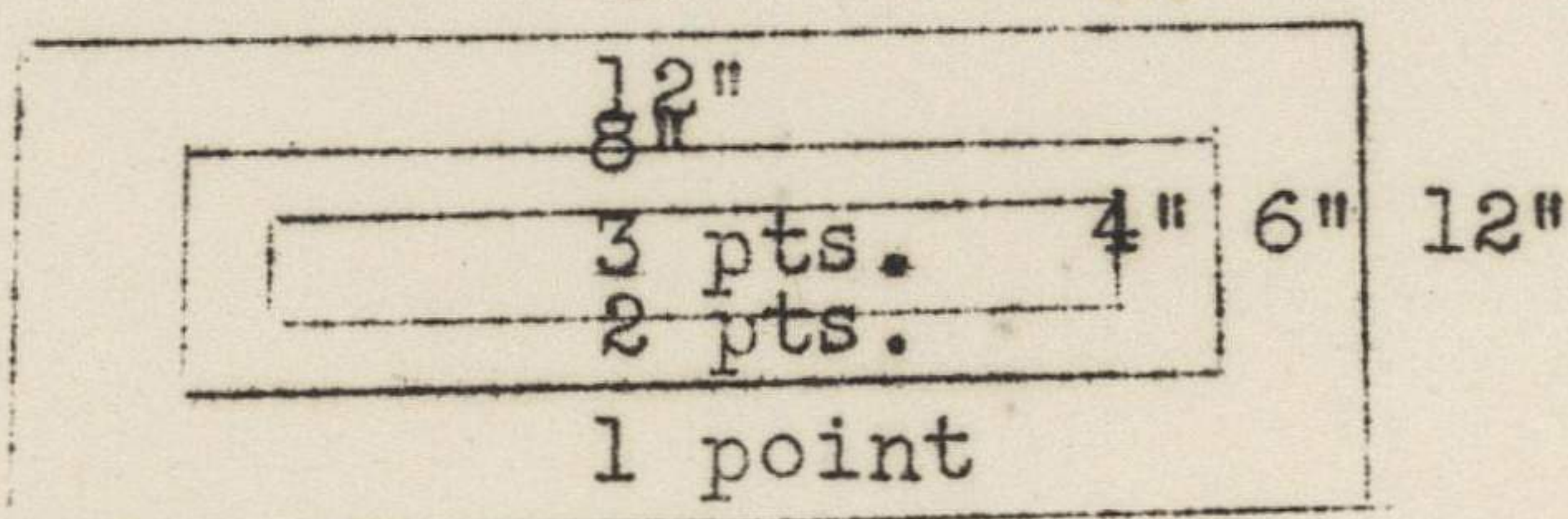


2. Speed Test

Back table up against wall, remove the net and play the ball from bounce at a position full length of table from the wall. Score number of successful returns in 15 seconds. On any unsuccessful returns, secure ball and continue play. Time continues. Score total hits against the wall.

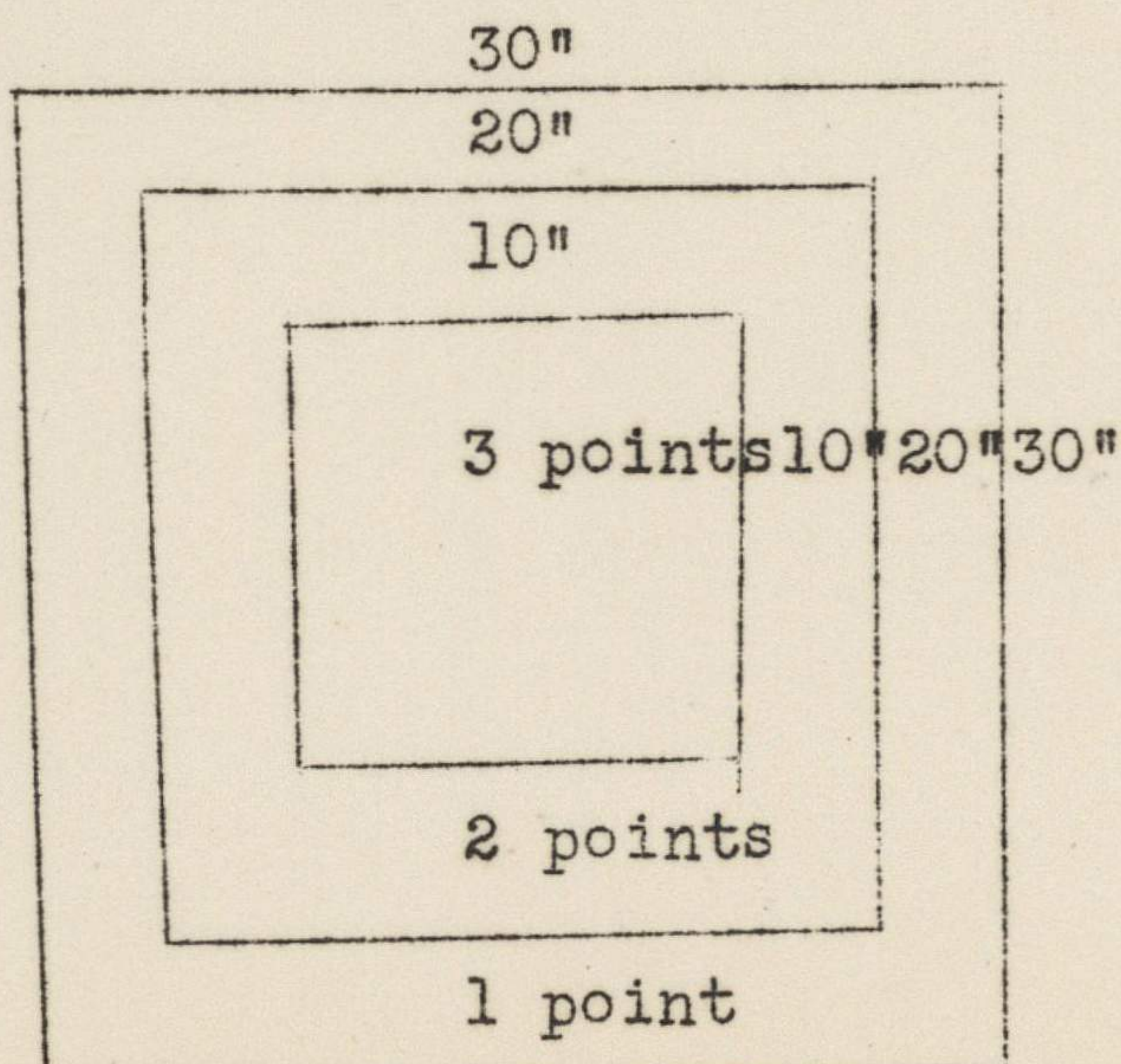
3. Serve Test

Hit ball from behind table into service area diagonally across the net. Score according to rectangle in which the ball hits. Record the total score of 5 different attempts. Score 3 points for small rect., 2 points for middle rect., and 1 point for outer rect.

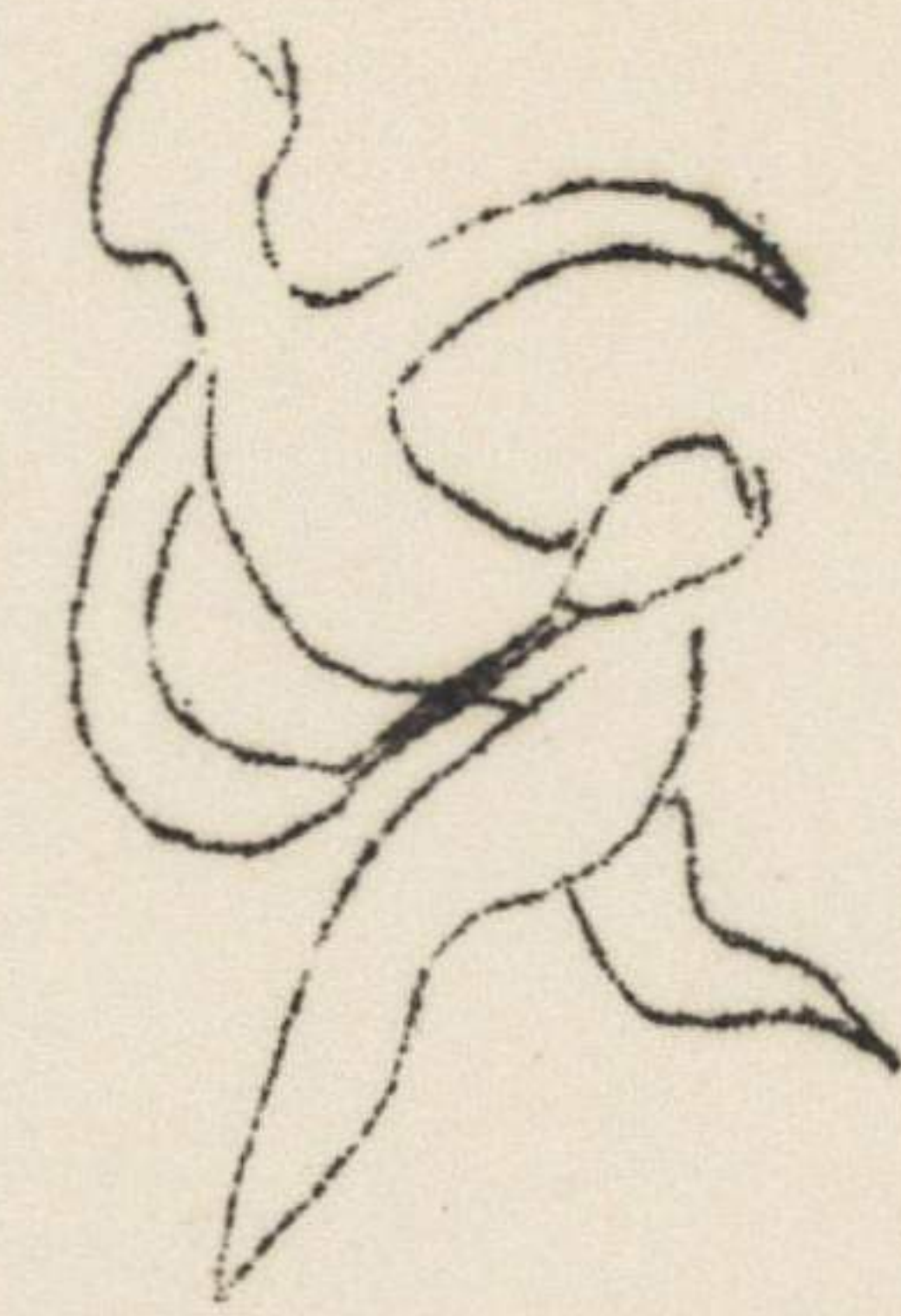


4. Lob Test

Ball is thrown from far end of the table and testee hits the ball on the first bounce below the level of the table. Target is placed across net on far end of the table. Target 30" by 30" outer square. Score 3, 2, or 1 point, according to square in which ball hits. Score total points in five attempts.

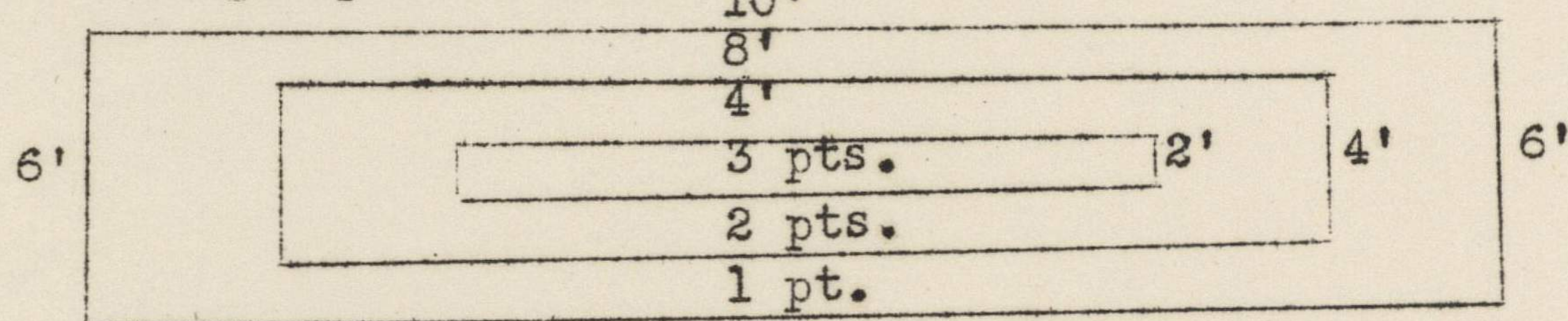


SQUASH RACKETS



- Test #1** Speed Test.
Hit ball against wall 25 feet away as many times as possible in 20 seconds. Start by dropping ball, ground stroke or volley is optional. Score total returns.
- Test #2** Volley Control Test.
Hit the ball on a volley against a wall 15 feet away as many times as possible in 15 seconds. If testee misses the ball, have him secure it and continue until the total 15 seconds has elapsed. Score total returns.
- Test #3** Overhead Service Test.
From a position in the service box hit 5 balls using overhead service, at front wall and to the target on the floor in T service area.

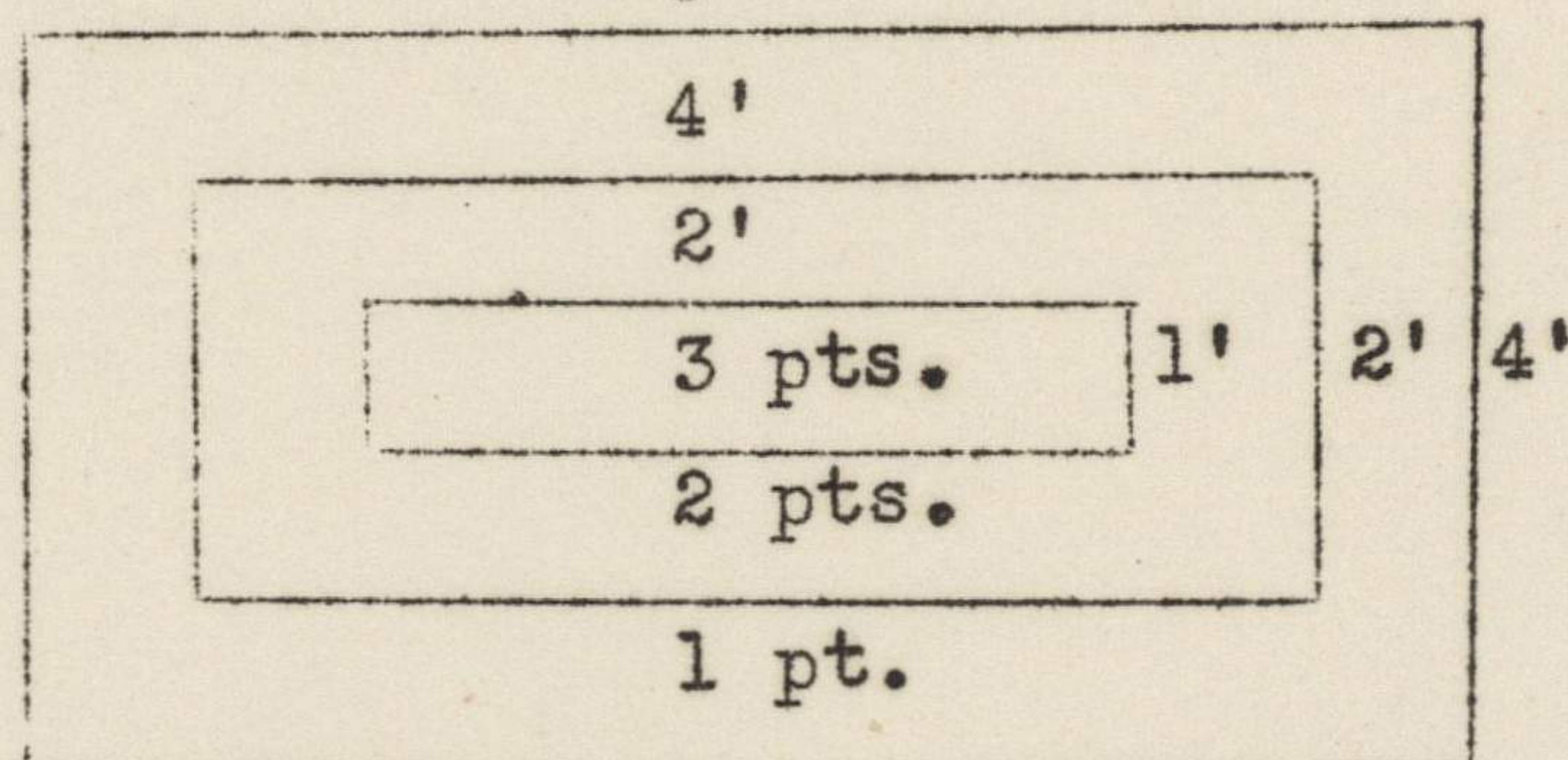
---Target placed in center of service area



Score total points made in 5 attempts. Inside rect. 3 points, middle rect. 2 points, outside rect. 1 point.

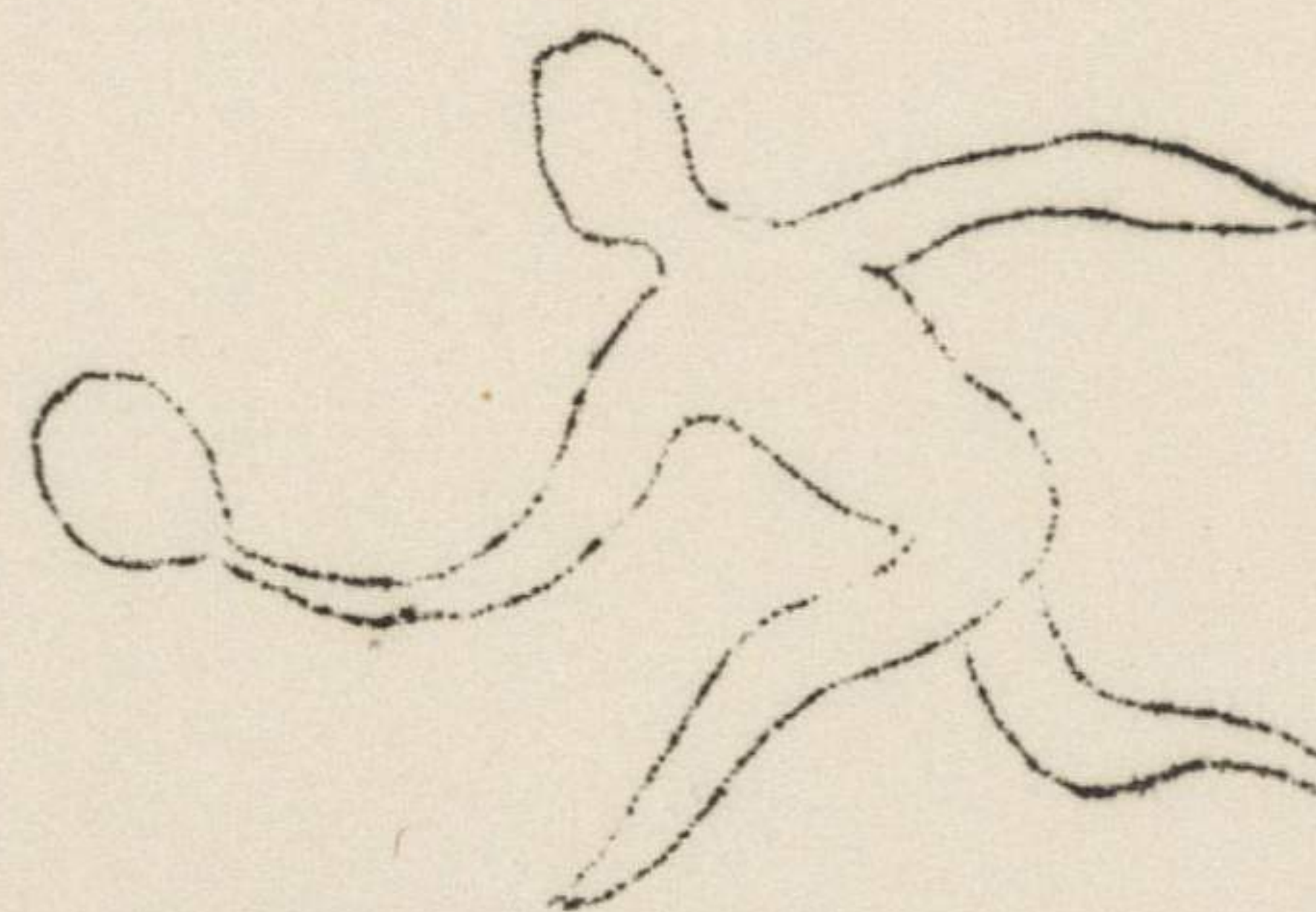
- Test #4** Underhand Lob Service
From a position in the service box hit 5 balls at target located same as in test #3. Score same.
- Test #5** Accuracy Test
From a position behind the service line, drop ball from hand to racket and hit ball at target on the front wall.

Target



Score 3, 2, 1, from inside rect. to outside, score five attempts.

TENNIS



1. Accuracy Serving Test

Hit five balls using overhead service, stroke the target 39 feet away.

Target 2' x 10 feet divided into five parts.

0	1	2	1	0
1	2	3	2	1
0	1	2	1	0

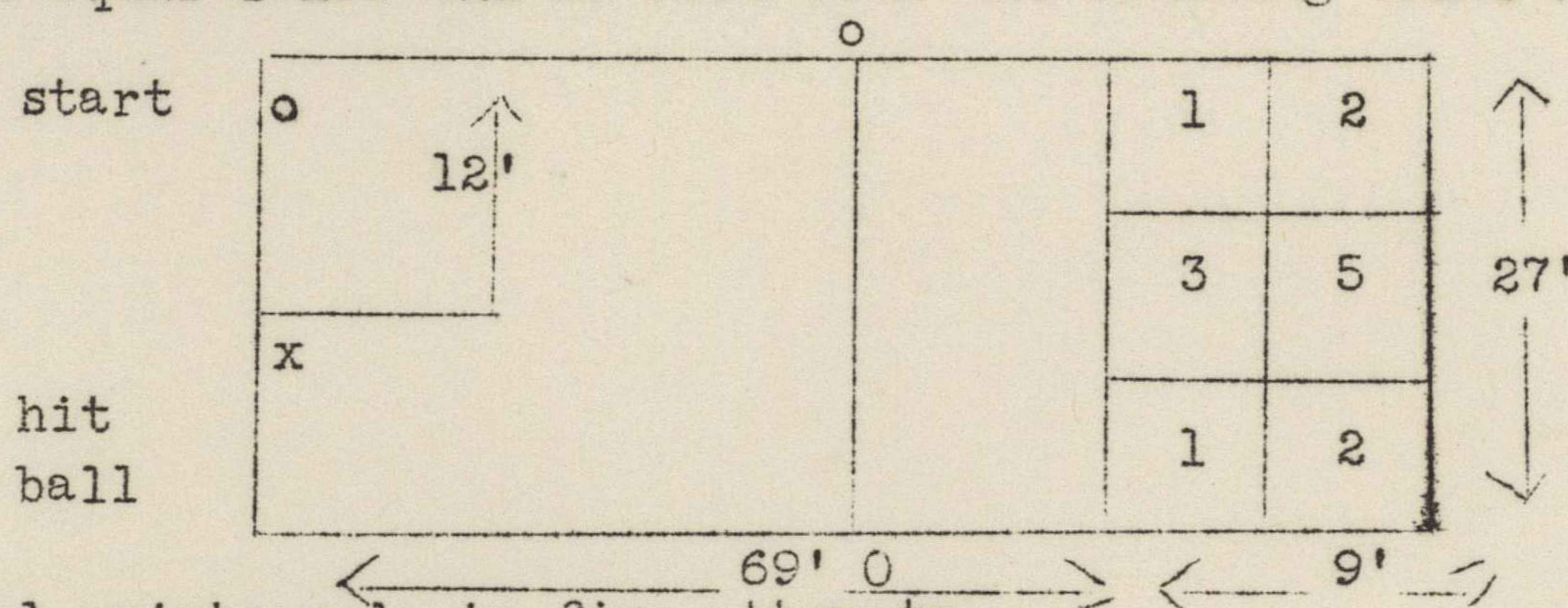
Score total points made in 5 attempts

2. Speed Test.

Hit ball against wall 15 feet away as many times as possible in 15 seconds. Start by bouncing ball from the floor. Ground stroke or volley is optional. Score total returns.

3. Ground Stroke Accuracy (forehand)

Start at left end of back court, toss ball over line 12' away along baseline; run and hit ball on first bounce into scoring zones across the net. Scoring zone 9 x 27 feet divided into three equal zones and 69 feet from the starting line.



Score total points made in five attempts.

4. Repeat test #3, starting from right side of court and use back-hand score.

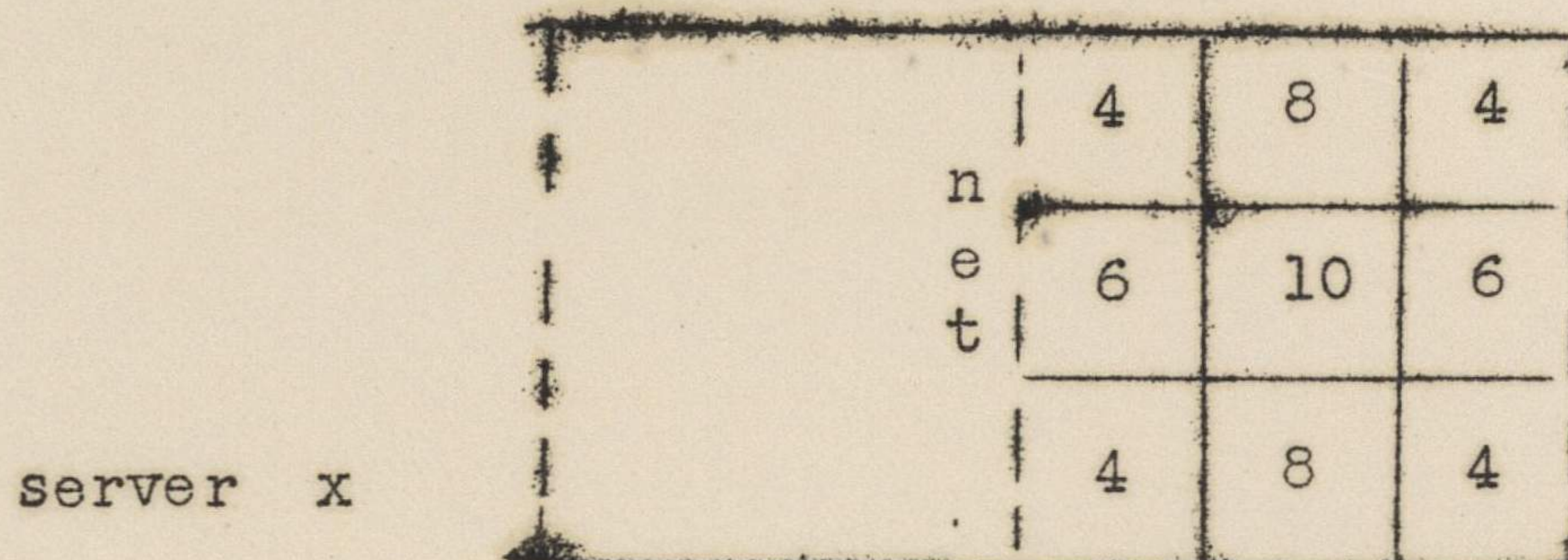
5. Volley

Hit the ball on a volley against a wall (15' away) and above a line 8' high as many times as possible in 15 seconds. If he fails to volley the ball, record the last successful return.

VOLLEY BALL

1. Service Test.

Equipment: A regulation volley ball court, one-half of which is marked off in nine equal parts, of different numerical values.



Underhand Serve

The individual being tested is allowed five serves over the net and attempts to score as many points as possible. The final score is the total of the five attempts.

Note: Line balls are determined in or out depending on which side of the line the majority of the ball lands.

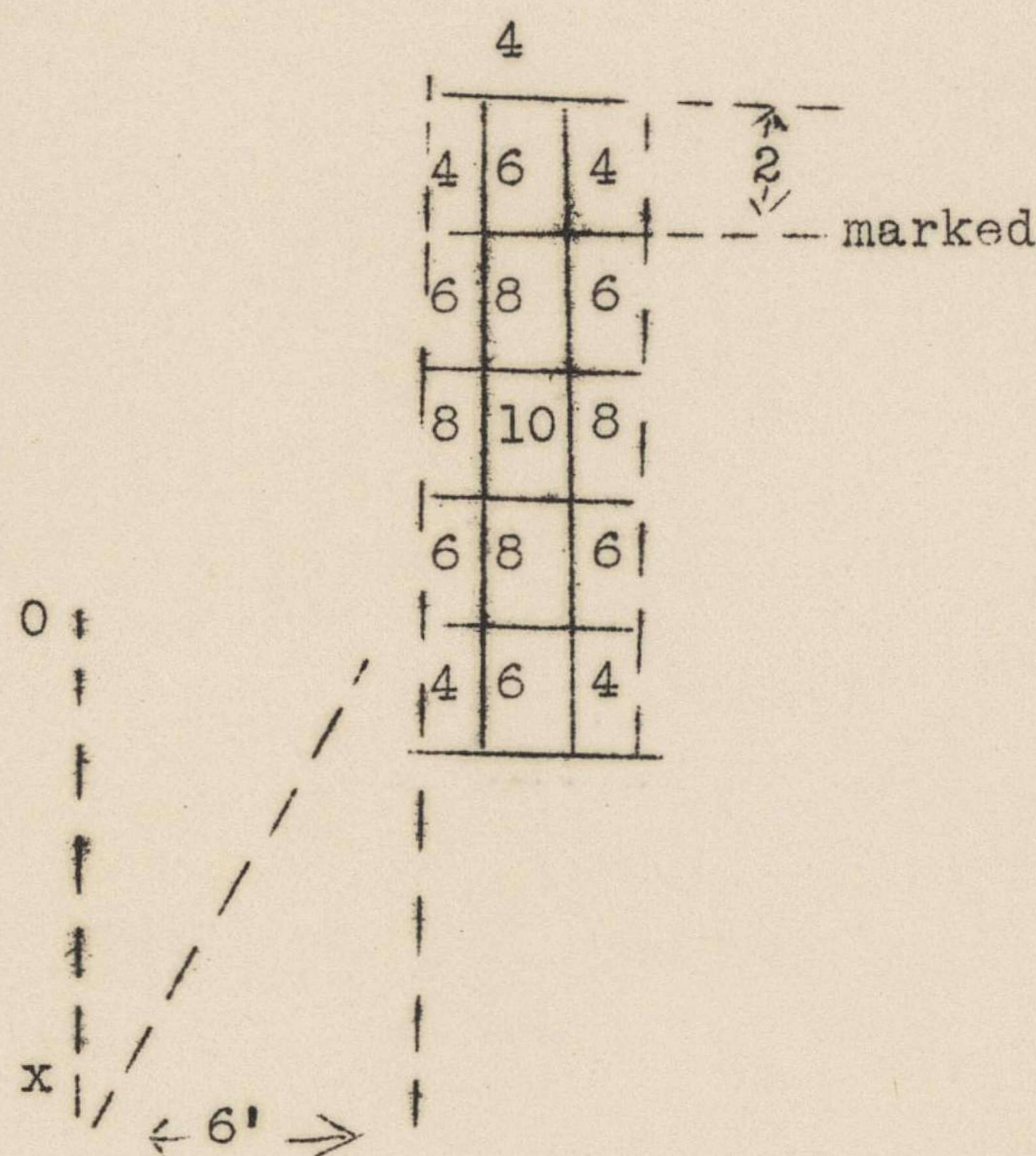
Overhead Serve

Repeat No. 1 test. The ball must be tossed in the air and struck at with a full over-head motion.

2. Passing Test

This test is made to test the ability of a person to pass a ball from back-court to a set up man at the net. The equipment needed: one ball, an assistant, a diagram on floor, with five separations, each 2 feet by 4 feet, and of different numerical values.

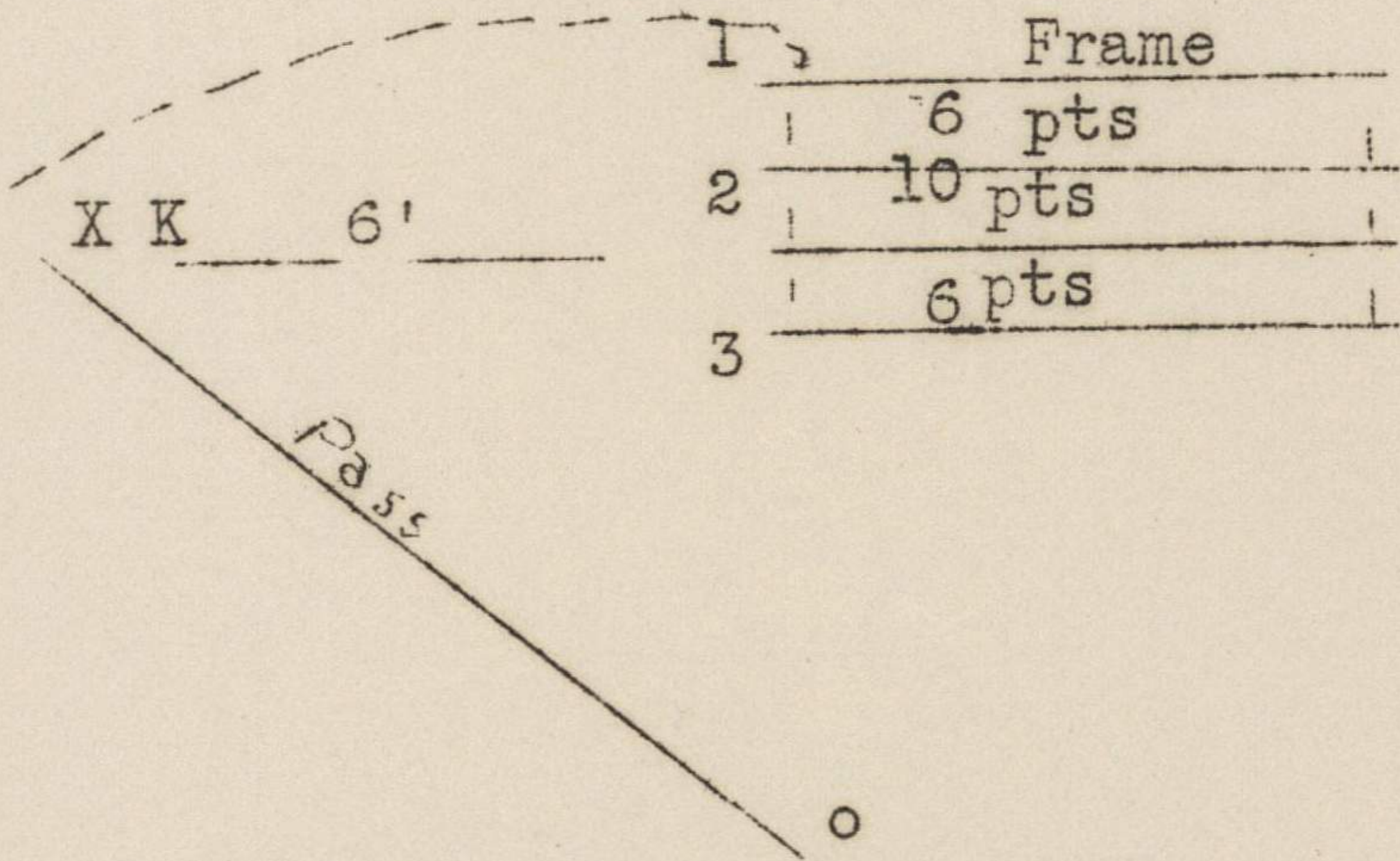
The ball is tossed from O to X and subject at X attempts to score a perfect pass. Five attempts are allowed. The subject must pass at an angle 6 feet from the lane of scoring.



3. Set-Up Test

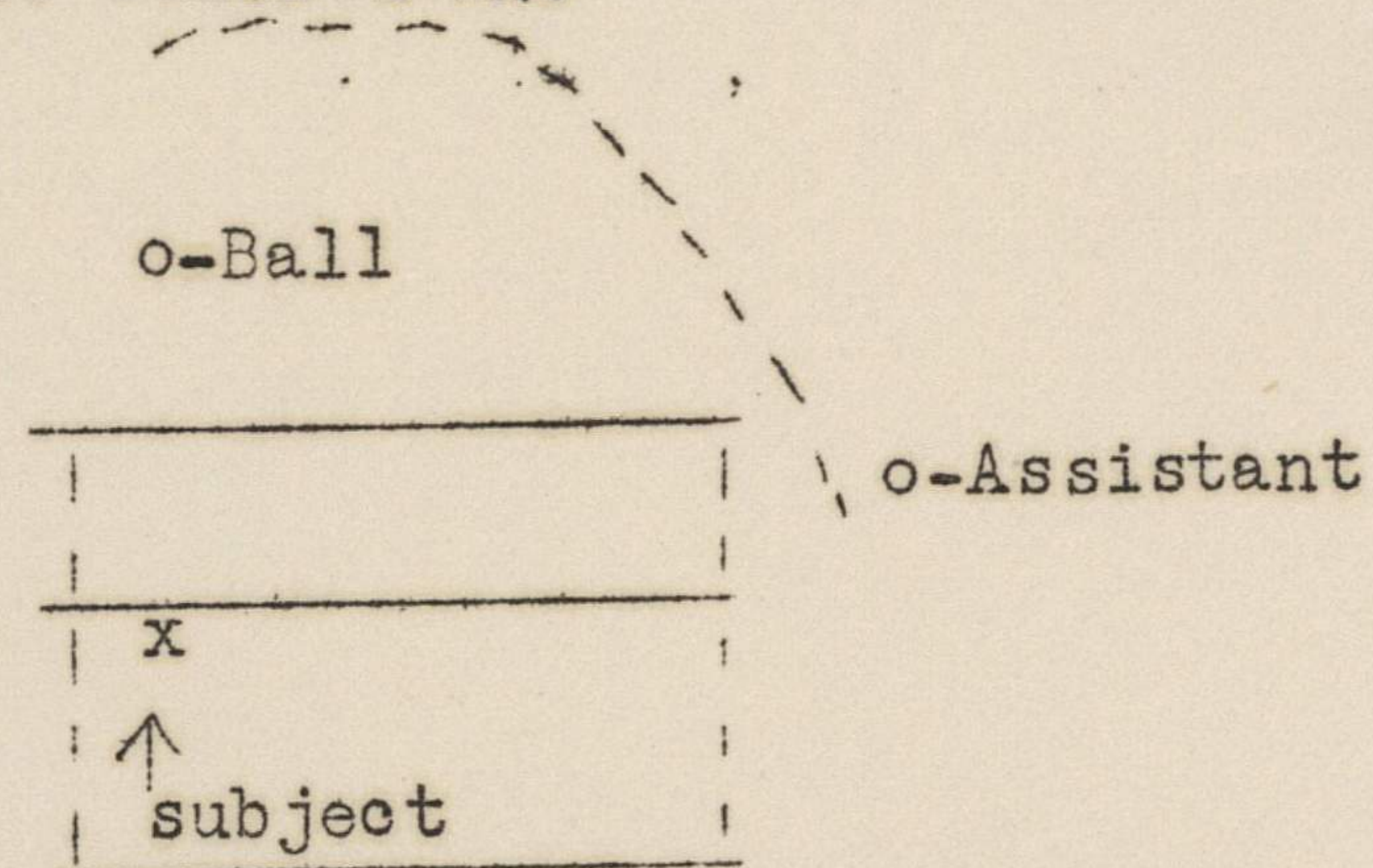
Equipment: A large frame, 6 feet by 3 feet, with 3 divisions, 1 foot by 6 feet. This frame is hung 5 feet above

the net, with No. 1 lane next to the net. The assistant tosses the ball from O in front of frame to subject at X. The subject being tested then attempts to make set-up passes from X to frame, a distance of 6 feet. Five attempts are allowed. The frame is hung parallel to the floor.

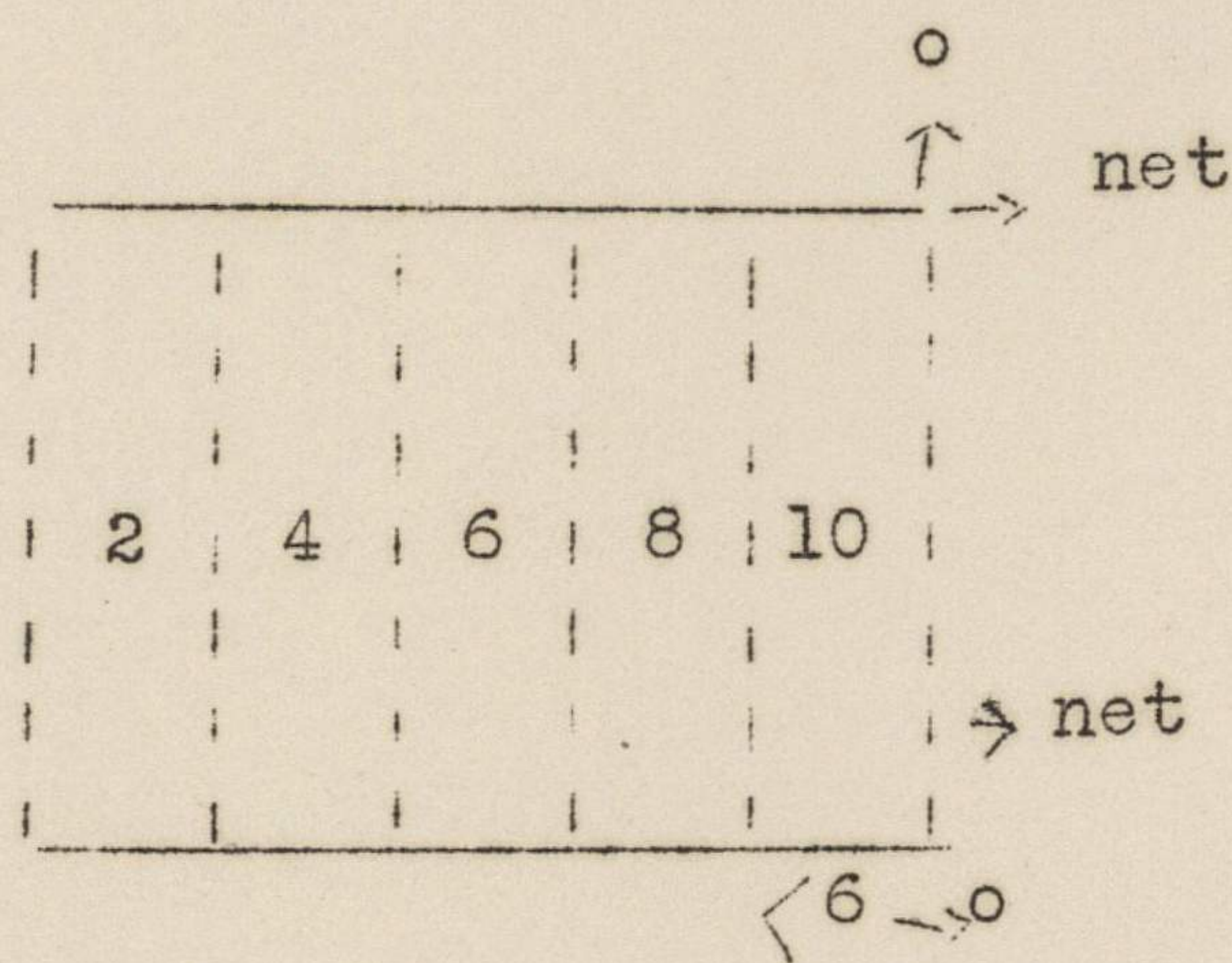


4. Attack Test

Equipment: The balls are tied to a string and passed over a pulley or pipe over the net. The ball is dropped so as to be 1 foot in front of the net as it comes down. The court across the net is marked into scoring lanes, from the net to the back line, each 6 foot wide.



Five attempts are allowed each subject. Final score is the combined score of the five attempts.



5. Defense Test

The subject stands 8 feet from the net, while an assistant stands above the net across the court and throws five balls directly at the subject, at uniform speed. The subject scores 10 points for each ball he is able to pass at least 10 feet in the air. No points are allowed for pass less than 10 feet.

Note. The author's recognize the difficulty of controlling the speed and accuracy of the pass. They would suggest that some mechanic invent a gun which would release a ball at uniform speed for this test.

October 20, 1937.

Mr. J. R. Elliott,
R. S. Elliott Arms Co.,
1422-24 Grand Avenue,
Kansas City, Mo.

Dear Jack:

Thanks for your letter of the 18th. We received the Lastbilt Soccer balls Monday, and also the Lastbilt Volley balls which were immediately returned to you.

We appreciate your making a price to us of \$10.00 each on these soccer balls. I might say, however, that within the past two weeks a Lowe & Campbell representative gave us the same price on the balls, but as we like to divide up the business a little we did not purchase them from him.

I was glad to see you at the Iowa State-Kansas game Saturday. It was a nice game, and everybody here is very happy over it.

With all good wishes, I am

Sincerely yours,

Director of Physical Education.

P.S. As soon as we receive your bill for the soccer balls and the extra bladder that was ordered our requisition will be sent through the University business office.

"It Pays to Play"



Yours for Sport
R.S. Elliott ARMS CO.
1422-24 GRAND AVE KANSAS CITY, MO.
"SPORTING GOODS EXCLUSIVELY"

SOLD TO

- Kansas University
- % F C Allen
- Lawrence, Kansas

OCT 19 1937

DATE

YOUR ORDER No.

TERMS

SHIP VIA

2	#STV	Volley balls	10.00	20	00
		Postage			<u>17</u>
				20	17

CREDIT MEMO

**R.S. Elliott ARMS
-CO-**

SPORTING GOODS EXCLUSIVELY

1422-24 GRAND AVENUE

KANSAS CITY, MO. October 18, 1937

ack

Dr. Forrest C. Allen
c/o University of Kansas
Lawrence, Kansas

Dear Phog:

In answer to your letter of the 16th, referring to a price of \$10.00 on Lastbilt Official Soccer Balls by Lowe and Campbell, we wish to say that on July 15th the manufacturers making the Lastbilt balls advanced the price from \$10.00 to \$12.00.

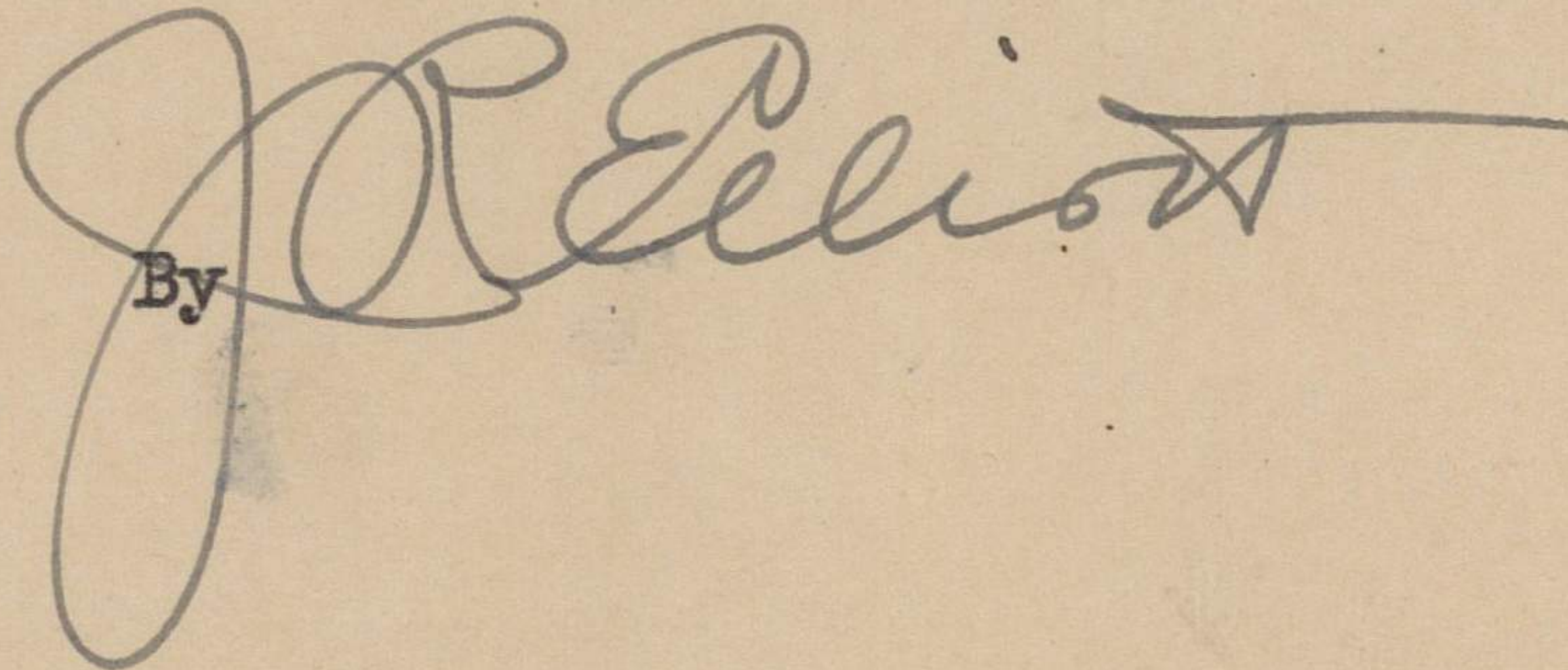
Evidently Lowe and Campbell's catalog was printed prior to that time and no correction in price has been made.

However, in view of the fact that they are listing it at \$10.00, we will bill you those two balls at that price, which we hope will be satisfactory.

Phog, I surely enjoyed the football game up there Saturday and want to congratulate Ad Lindsey and all of the team for the wonderful showing they made.

Best wishes.

Very truly yours,
R. S. ELLIOTT ARMS COMPANY

By 

jre;m

"It Pays to Play"