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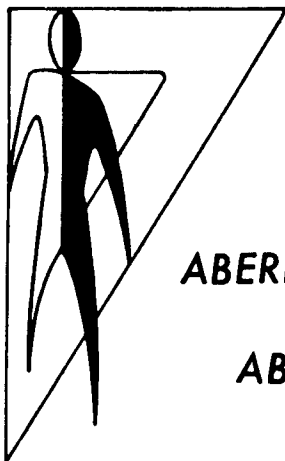
U. S. ARMY PRIMARY HELICOPTER SCHOOL
TRAINING PROGRAM PERFORMANCE NORMS

John A. Barnes
Flavous D. Statham

April 1970

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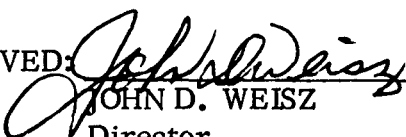
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ABSTRACT

The helicopter training program of the United States Army differs from those of the other services in that nonpilot servicemen rather than fixed wing pilots are trained to fly helicopters. This report provides the performance norms of trainees at the United States Army Primary Helicopter School, Fort Wolters, Texas. The period covered is 10 November 1968 through 30 March 1969. This information is given by trainee type (officer or warrant officer candidate), by aircraft used, by maneuver part, and by maneuver.

CONTENTS

ABSTRACT	iii
INTRODUCTION	1
METHOD	2
RESULTS	6
CLASS 19 AND 20 PERFORMANCE NORMS	69
DISCUSSION	80
REFERENCES	82

FIGURES

1. Performance Norm for Solo Maneuver with SD Plot	25
2. Summary of Flight Performance for All Students	81

TABLES

1. Pre-Solo Norms	7
2. WOC Pre-Solo Performance Norms	8
3. Officer Pre-Solo Performance Norms	9
4. Ground Operation Performance Norms	10
5. WOC Ground Operation Performance Norms	10
6. Officer Ground Operation Performance Norms	11

7.	Takeoff and Landing to Hover Performance Norms.	11
8.	WOC Takeoff and Landing to Hover Performance Norms	12
9.	Officer Takeoff and Landing to Hover Performance Norms	12
10.	Hovering Flight Performance Norms	13
11.	WOC Hovering Flight Performance Norms	14
12.	Officer Hovering Flight Performance Norms	15
13.	Normal Takeoff Performance Norms	16
14.	WOC Normal Takeoff Performance Norms	17
15.	Officer Normal Takeoff Performance Norms	18
16.	Normal Approach Performance Norms	19
17.	WOC Normal Approach Performance Norms	20
18.	Officer Normal Approach Performance Norms	21
19.	Traffic Patterns Performance Norms.	22
20.	WOC Traffic Patterns Performance Norms	23
21.	Officer Traffic Patterns Performance Norms	24
22.	Primary I Performance Norms	27
23.	WOC Primary I Performance Norms	28
24.	Officer Primary I Performance Norms	29
25.	Normal Takeoff Performance Norms	30
26.	WOC Normal Takeoff Performance Norms	31
27.	Officer Normal Takeoff Performance Norms	32
28.	Traffic Patterns Performance Norms.	33
29.	WOC Traffic Patterns Performance Norms	34

30.	Officer Traffic Patterns Performance Norms	35
31.	Normal Approach Performance Norms	36
32.	WOC Normal Approach Performance Norms	37
33.	Officer Normal Approach Performance Norms	38
34.	Maximum Performance Takeoff Performance Norms	39
35.	WOC Maximum Performance Takeoff Performance Norms	40
36.	Officer Maximum Performance Takeoff Performance Norms	41
37.	Steep Approach Performance Norms	42
38.	WOC Steep Approach Performance Norms	43
39.	Officer Steep Approach Performance Norms	44
40.	Takeoff from the Ground Performance Norms	45
41.	WOC Takeoff from the Ground Performance Norms	46
42.	Officer Takeoff from the Ground Performance Norms	47
43.	Approach to the Ground Performance Norms	48
44.	WOC Approach to the Ground Performance Norms	49
45.	Officer Approach to the Ground Performance Norms	50
46.	Autorotations; Straight, Performance Norms	51
47.	WOC Autorotations; Straight, Performance Norms	52
48.	Officer Autorotations; Straight, Performance Norms	53
49.	Primary II Performance Norms	55
50.	WOC Primary II Performance Norms	56
51.	Officer Primary II Performance Norms	57
52.	Confined Area Operations Performance Norms	58

53.	WOC Confined Area Operations Performance Norms	59
54.	Officer Confined Area Operations Performance Norms	60
55.	Pinnacle Operations Performance Norms	61
56.	WOC Pinnacle Operations Performance Norms	62
57.	Officer Pinnacle Operations Performance Norms.	63
58.	Formation Flying Performance Norms.	64
59.	WOC Formation Flying Performance Norms	65
60.	Officer Formation Flying Performance Norms	66
61.	Slope Operations Performance Norms	67
62.	WOC Slope Operations Performance Norms	67
63.	Officer Slope Operations Performance Norms	68
64.	Class 19 (WOC) and Class 20 (O) Pre-Solo Performance Norms . . .	70
65.	Class 19 (WOC) Pre-Solo Performance Norms	71
66.	Class 20 (O) Pre-Solo Performance Norms	72
67.	Class 19 (WOC) and Class 20 (O) Primary I Performance Norms . . .	73
68.	Class 19 (WOC) Primary I Performance Norms	74
69.	Class 20 (O) Primary I Performance Norms	75
70.	Class 19 (WOC) and Class 20 (O) Primary II Performance Norms . . .	76
71.	Class 19 (WOC) Primary II Performance Norms	77
72.	Class 20 (O) Primary II Performance Norms	78

U. S. ARMY PRIMARY HELICOPTER SCHOOL

TRAINING PROGRAM PERFORMANCE NORMS

INTRODUCTION

The helicopter pilot training program of the Army differs from those of the other services in concept; it does not train fixed wing pilots to fly rotary wing aircraft, but rather it takes nonpilot servicemen and trains them to fly helicopters. This program is conducted at the United States Army Primary Helicopter School (USAPHS), Fort Wolters, Texas. The training program is 20 weeks in length for Warrant Officer Candidates (WOC) and 16 weeks for officers. The additional four weeks of training the WOC receive provides these men with a general knowledge of the essential military subjects necessary to prepare them to accept the responsibilities of a Warrant Officer. The stated aim of the training program is "To qualify commissioned officers and warrant officers in the primary flying techniques of Army observation type helicopters and to provide a working knowledge of related academic subjects." This program is divided into three parts: Pre-Solo, Primary I, and Primary II. Pre-Solo training extends over a four-week period, as does Primary I; Primary II extends over an eight-week period.

The flight training portion of this program consists of 110 hours of actual flight time, of which 50 hours is dual instruction. Pre-Solo consists of 20 hours of actual flight time, most of which is dual instruction. Primary I consists of 30 hours of actual flight time, of which about half is dual instruction. Primary II consists of 60 hours of actual flight time, of which 20 hours is dual instruction. The flight-training aircraft in use at this time were the OH-13, OH-23, and TH-55. A student received all of his training in the same type of aircraft. If he started his training in a TH-55, he completed all phases of his training at the USAPHS in the TH 55. Upon completion of the work at USAPHS the student must continue his training at Fort Rucker, Alabama, before he becomes a rated Army helicopter pilot.

This study provides normative performance data for a pilot trainee in an Army light observation helicopter. It was a first step toward establishing normative data for pilot performance in all Army helicopters.

METHOD

The data used in this study is the total flight time of a student when, in the opinion of the instructor, the student is able to safely perform the particular maneuver and/or part of the maneuver.

The Pre Solo performance data was recorded on the following maneuvers and parts of maneuvers.

1. Ground Operation
 - a. Pre-flight inspection
 - b. Cockpit procedure
 - c. Shutdown procedure
2. Takeoff and Landing to Hover
 - a. Maintain proper pedal control
 - b. Maintain proper pitch and RPM
 - c. Maintain proper cyclic control
3. Hovering Flight
 - a. Have proper pedal control
 - b. Maintain proper altitude
 - c. Remain over selected spot
 - d. Maintain proper RPM
 - e. Maintain proper ground speed
 - f. Make proper clearing turns
4. Normal Takeoff
 - a. Enter climb properly
 - b. Maintain proper power setting and airspeed
 - c. Maintain proper pedal and cyclic
 - d. Maintain ground track
 - e. Maintain proper RPM
5. Normal Approaches
 - a. Start at correct altitude and airspeed
 - b. Maintain proper glide path and RPM
 - c. Maintain proper rate of closure
 - d. Terminate properly at hover

6. Traffic Patterns

- a. Maintain airspeed, altitude and RPM
- b. Coordinate climbs, turns and descents
- c. Maintain ground track
- d. Enter and exit properly

7. Solo

The Primary I performance data was recorded on the following maneuvers and parts of maneuvers:

1. Normal Takeoff

- a. Enter climb properly
- b. Maintain proper power settings and airspeed
- c. Maintain proper cyclic and pedal
- d. Maintain ground track
- e. Maintain proper RPM

2. Traffic Patterns

- a. Maintain airspeed, altitude and RPM
- b. Coordinate climbs and turns
- c. Maintain proper ground track
- d. Enter and exit properly
- e. Descend properly, base leg

3. Normal Approach

- a. Start at correct altitude and airspeed
- b. Use correct sight picture
- c. Maintain glide path and RPM
- d. Maintain lane alignment
- e. Maintain proper rate of closure
- f. Terminate properly at hover

4. Maximum Performance Takeoff

- a. Use correct pitch and throttle
- b. Establish proper climb
- c. Maintain directional control
- d. Return to normal climb

5. Steep Approach

- a. Start at correct altitude and airspeed
- b. Use correct sight picture
- c. Maintain proper glide rate and RPM
- d. Maintain lane alignment
- e. Maintain proper rate of closure
- f. Terminate properly at hover

6. Takeoff from the Ground

- a. Use correct pitch and throttle
- b. Establish airspeed properly
- c. Maintain directional control
- d. Maintain proper ground track

7. Approach to the Ground

- a. Start at correct airspeed and altitude
- b. Use correct sight picture
- c. Maintain glide path and RPM
- d. Maintain lane alignment
- e. Maintain proper rate of closure
- f. Use proper touch-down technique

8. Autorotations, Straight

- a. Make proper entry
- b. Maintain proper airspeed control
- c. Make proper deceleration
- d. Make correct pitch application
- e. Touch down level
- f. Maintain directional control

The Primary II performance data was recorded on the following maneuvers and parts of maneuvers:

1. Confined Area Operations

- a. Make proper high reconnaissance
- b. Make proper approach and landing
- c. Properly secure aircraft
- d. Make proper ground reconnaissance
- e. Use proper takeoff procedure

2. Pinnacle Operations

- a. Make proper high reconnaissance
- b. Make proper approach and landing
- c. Properly secure aircraft
- d. Make proper ground reconnaissance
- e. Use proper takeoff technique

3. Formation Flying

- a. Maintain proper interval
- b. Maintain proper pedal setting
- c. Maintain proper angle
- d. Maintain proper altitude control
- e. Maintain proper RPM
- f. Divide attention properly

4. Slope Operation

- a. Maintain proper pedal and cyclic
- b. Maintain proper pitch and RPM
- c. Use proper touch down technique

5. Hovering Autorotations

These data were furnished by the USAPHS and were recorded during the period 10 November 1968 through 30 March 1969. This period of the year is marked by many days of adverse flying weather which causes flight training problems; therefore, the program performance norms obtained from data collected during this time period will be conservative.

RESULTS

The following tables present the performance norms -- as given in these tables, the mean value of the time required by the students to perform the maneuver satisfactorily -- and standard deviation values for the maneuvers and parts of maneuvers listed above.

These tables show the values for WOC, for officers, and for all students; in addition the values are also presented by aircraft for each of the aforementioned groups. The standard deviation was given to show the amount of variability within each group. Figure 1 shows the application of this measure to the data for the Solo performance norm. This figure indicates that 68.26 percent of the students soloed between 12 hours, 26 minutes and 16 hours, 28 minutes of flight instruction; 95 percent soloed between 10 hours, 25 minutes and 18 hours, 29 minutes.

Data from students who had been recycled; i.e., sent back to a previously attempted phase of the training because of flying and/or training deficiencies, were not used to compile these performance norms.

TABLE 1
Presolo Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Ground Operations	OH-13	82	4	27	2	21
	OH-23	347	5	20	2	16
	TH-55	570	5	29	2	40
	All	999	5	21	2	31
Takeoff & Landing to Hover	OH-13	82	6	49	2	40
	OH-23	347	7	59	2	42
	TH-55	570	7	43	3	6
	All	999	7	44	2	57
Hovering Flight	OH-13	82	8	3	3	1
	OH-23	347	9	35	2	56
	TH-55	570	8	28	3	19
	All	999	8	50	3	3
Normal Takeoff	OH-13	82	8	54	2	40
	OH-23	347	9	45	2	43
	TH-55	570	9	52	2	58
	All	999	9	46	2	52
Normal Approaches	OH-13	82	11	18	2	40
	OH-23	347	11	34	2	43
	TH-55	570	11	34	2	54
	All	999	11	33	2	49
Traffic Patterns	OH-13	82	10	10	2	41
	OH-23	347	10	32	3	13
	TH-55	570	11		3	3
	All	999	10	46	3	5
Solo	OH-13	82	14	4	2	15
	OH-23	347	14	11	1	55
	TH-55	570	14	40	2	10
	All	999	14	27	2	1

TABLE 2

WOC Pre-Solo Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Ground Operations	OH-13	82	4	27	2	21
	OH-23	197	5	42	2	46
	TH-55	345	5	25	2	24
	All	624	5	23	2	26
Takeoff & Landing to Hover	OH-13	82	6	49	2	40
	OH-23	197	8	14	2	52
	TH-55	345	7	42	3	2
	All	624	7	45	2	58
Hovering Flight	OH-13	82	8	3	3	1
	OH-23	197	9	38	3	9
	TH-55	345	8	35	3	9
	All	624	8	51	2	55
Normal Takeoff	OH-13	82	8	54	2	40
	OH-23	197	9	46	2	58
	TH-55	345	10	11	2	59
	All	624	9	53	2	59
Normal Approaches	OH-13	82	11	18	2	40
	OH-23	197	11	40	2	54
	TH-55	345	11	49	2	55
	All	624	11	42	2	53
Traffic Patterns	OH-13	82	10	10	2	41
	OH-23	197	10	48	2	55
	TH-55	345	11	16	2	57
	All	624	10	58	2	55
Solo	OH-13	82	14	4	2	15
	OH-23	197	14	15	2	3
	TH-55	345	14	55	2	19
	All	624	14	36	2	15

TABLE 3
Officer Pre-Solo Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Ground Operations	OH-13	0	0	0	0	0
	OH-23	150	4	51	1	54
	TH-55	225	5	33	3	01
	All	375	5	16	2	39
Takeoff & Landing to Hover	OH-13	0	0	0	0	0
	OH-23	150	7	40	2	26
	TH-55	225	7	43	3	13
	All	375	7	42	2	56
Hovering Flight	OH-13	0	0	0	0	0
	OH-23	150	9	30	2	37
	TH-55	225	8	18	3	34
	All	375	8	47	3	16
Normal Takeoff	OH-13	0	0	0	0	0
	OH-23	150	9	44	2	22
	TH-55	225	9	22	2	51
	All	375	9	31	2	41
Normal Approaches	OH-13	0	0	0	0	0
	OH-23	150	11	28	2	28
	TH-55	225	11	11	2	48
	All	375	11	18	2	41
Traffic Patterns	OH-13	0	0	0	0	0
	OH-23	150	10	12	3	32
	TH-55	225	10	36	3	8
	All	375	10	26	3	18
Solo	OH-13	0	0	0	0	0
	OH-23	150	14	06	1	44
	TH-55	225	14	17	1	53
	All	375	14	13	1	50

TABLE 4

Ground Operation Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Pre-Flight Inspection	OH-13	82	3	56	2	0
	OH-23	347	4	42	2	11
	TH-55	569	4	26	2	17
	All	998	4	29	2	15
Cockpit Procedure	OH-13	82	4	18	2	16
	OH-23	347	4	54	1	57
	TH-55	570	5	12	2	17
	All	999	5	2	2	11
Shut down Procedure	OH-13	82	4	0	1	59
	OH-23	347	4	42	1	48
	TH-55	570	5	11	2	15
	All	999	4	55	2	7

TABLE 5

WOC Ground Operation Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Preflight Inspection	OH-13	82	3	56	2	0
	OH-23	197	5	2	2	24
	TH-55	344	4	23	2	17
	All	623	4	32	2	20
Cockpit Procedure	OH-13	82	4	18	2	16
	OH-23	197	5	18	2	2
	TH-55	345	5	17	2	20
	All	624	5	10	2	16
Shut down Procedure	OH-13	82	4	0	1	59
	OH-23	197	5	3	1	48
	TH-55	345	5	10	2	32
	All	624	4	59	2	10

TABLE 6

Officer Ground Operation Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Preflight Inspection	OH-13	0	0	0	0	0
	OH-23	150	4	16	1	48
	TH-55	225	4	31	2	15
	All	375	4	25	2	5
Cockpit Procedure	OH-13	0	0	0	0	0
	OH-23	150	4	24	1	44
	TH-55	225	5	4	2	11
	All	375	4	48	2	3
Shutdown Procedure	OH-13	0	0	0	0	0
	OH-23	150	4	16	1	42
	TH-55	225	5	12	2	10
	All	375	4	55	2	7

TABLE 7

Takeoff and Landing to Hover Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Proper Pedal Control	OH-13	82	5	36	2	50
	OH-23	347	6	43	2	25
	TH-55	570	6	34	3	7
	All	998	6	33	2	57
Maintain Proper Pitch and RPM	OH-13	81	6	24	2	39
	OH-23	347	7	2	2	40
	TH-55	570	7	2	3	2
	All	998	6	59	2	54
Maintain Proper Cyclic Control	OH-13	81	6	36	2	34
	OH-23	347	7	42	2	43
	TH-55	570	7	32	3	1
	All	998	7	31	2	54

TABLE 8

WOC Takeoff and Landing to Hover Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Proper Pedal Control	OH-13	81	5	36	2	50
	OH-23	197	6	50	2	48
	TH-55	345	6	31	3	4
	All	623	6	33	2	57
Maintain Proper Pitch and RPM	OH-13	81	6	24	2	39
	OH-23	197	7	17	2	49
	TH-55	345	7	8	3	1
	All	623	7	5	2	56
Maintain Proper Cyclic Control	OH-13	81	6	36	2	34
	OH-23	197	7	56	2	48
	TH-55	345	7	34	2	55
	All	623	7	33	2	54

TABLE 9

Officer Takeoff and Landing to Hover Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Proper Pedal Control	OH-13	0	0	0	0	0
	OH-23	150	6	34	2	25
	TH-55	225	6	38	3	11
	All	375	6	36	2	54
Maintain Proper Pitch and RPM	OH-13	0	0	0	0	0
	OH-23	150	6	43	2	25
	TH-55	225	6	53	3	3
	All	375	6	50	2	54
Maintain Proper Cyclic Control	OH-13	0	0	0	0	0
	OH-23	150	7	23	2	34
	TH-55	225	7	29	3	10
	All	375	7	31	2	54

TABLE 10

Hovering Flight Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Pedal Control	OH-13	82	6	21	2	52
	OH-23	347	7	13	2	55
	TH-55	569	6	33	3	1
	All	998	6	46	2	59
Proper Altitude	OH-13	82	6	23	2	48
	OH-23	347	7	4	2	44
	TH-55	570	6	56	3	2
	All	999	6	56	2	55
Remain Over Selected Spot	OH-13	82	7	18	2	35
	OH-23	347	8	17	2	49
	TH-55	570	7	32	3	3
	All	999	7	47	2	58
Proper RPM	OH-13	82	7	18	2	59
	OH-23	347	7	49	3	3
	TH-55	570	7	5	3	3
	All	999	7	21	3	4
Proper Ground Speed	OH-13	82	6	51	2	42
	OH-23	347	7	38	2	36
	TH-55	570	7	9	3	0
	All	998	7	23	2	45
Clearing Turns	OH-13	81	7	39	2	53
	OH-23	347	9	6	2	49
	TH-55	568	8	9	3	9
	All	996	8	27	3	4

TABLE 11

WOC Hovering Flight Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Pedal Control	OH-13	82	6	21	2	52
	OH-23	197	7	14	3	3
	TH-55	344	6	39	3	3
	All	623	6	48	3	3
Proper Altitude	OH-13	82	6	23	2	48
	OH-23	197	7	6	2	46
	TH-55	345	7	6	3	5
	All	624	7	1	2	57
Remain Over Selected Spot	OH-13	82	7	18	2	35
	OH-23	197	8	14	2	59
	TH-55	345	7	32	3	3
	All	624	7	44	3	0
Proper RPM	OH-13	82	7	18	2	59
	OH-23	197	7	54	3	15
	TH-55	345	7	21	3	4
	All	624	7	31	3	8
Proper Ground Speed	OH-13	82	6	51	2	42
	OH-23	197	8	2	1	56
	TH-55	345	7	19	3	5
	All	623	7	30	2	44
Clearing Turns	OH-13	81	7	39	2	53
	OH-23	197	9	1	2	50
	TH-55	343	8	11	3	7
	All	621	8	23	3	2

TABLE 12

Officer Hovering Flight Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Pedal Control	OH-13	0	0	0	0	0
	OH-23	150	7	13	2	44
	TH-55	225	6	24	2	56
	All	375	6	44	2	53
Proper Altitude	OH-13	0	0	0	0	0
	OH-23	150	7	2	2	42
	TH-55	225	6	39	2	56
	All	375	6	48	2	51
Remain Over Selected Spot	OH-13	0	0	0	0	0
	OH-23	150	8	21	2	36
	TH-55	225	7	31	3	4
	All	375	7	51	2	55
Proper RPM	OH-13	0	0	0	0	0
	OH-23	150	7	44	2	46
	TH-55	225	6	40	3	0
	All	375	7	6	2	57
Proper Ground Speed	OH-13	0	0	0	0	0
	OH-23	150	7	38	2	36
	TH-55	225	6	54	2	50
	All	375	7	12	2	46
Clearing Turns	OH-13	0	0	0	0	0
	OH-23	150	9	12	2	47
	TH-55	225	8	6	3	13
	All	375	8	32	3	6

TABLE 13

Normal Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Enter Climb Properly	OH-13	82	7	9	2	9
	OH-23	347	8	21	2	35
	TH-55	570	8	32	3	1
	All	999	8	19	2	56
Proper Power Setting and Airspeed	OH-13	81	8	25	2	30
	OH-23	347	9	17	2	45
	TH-55	567	9	26	2	56
	All	995	9	18	2	51
Proper Pedal and Cyclic	OH-13	82	7	53	2	30
	OH-23	347	8	48	2	42
	TH-55	570	8	58	2	56
	All	999	8	50	2	50
Maintain Ground Track	OH-13	82	7	43	2	34
	OH-23	347	8	26	2	38
	TH-55	570	8	54	3	1
	All	999	8	39	2	53
Proper RPM	OH-13	82	8	8	2	36
	OH-23	347	8	32	2	45
	TH-55	570	8	33	3	5
	All	999	8	31	2	56

TABLE 14

WOC Normal Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Enter Climb Properly	OH-13	82	7	9	2	9
	OH-23	197	8	21	2	44
	TH-55	345	8	49	3	5
	All	624	8	24	3	6
Proper Power Setting and Airspeed	OH-13	81	8	25	2	30
	OH-23	197	9	18	2	57
	TH-55	342	9	44	2	56
	All	620	9	25	2	55
Proper Pedal and Cyclic	OH-13	82	7	53	2	30
	OH-23	197	8	48	2	55
	TH-55	345	9	18	3	1
	All	624	8	58	2	57
Maintain Ground Track	OH-13	82	7	43	2	30
	OH-23	197	8	33	2	46
	TH-55	345	9	13	3	2
	All	624	8	49	2	56
Maintain Proper RPM	OH-13	82	8	8	2	36
	OH-23	197	8	31	3	0
	TH-55	345	8	54	3	9
	All	624	8	41	3	3

TABLE 15

Officers Normal Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Enter Climb Properly	OH-13	0	0	0	0	0
	OH-23	150	8	21	2	21
	TH-55	225	8	6	2	38
	All	375	8	12	2	31
Proper Power Setting and Airspeed	OH-13	0	0	0	0	0
	OH-23	150	9	15	2	28
	TH-55	225	8	58	2	51
	All	375	9	5	2	42
Proper Pedal and Cyclic	OH-13	0	0	0	0	0
	OH-23	150	8	49	2	22
	TH-55	225	8	27	2	44
	All	375	8	36	2	36
Maintain Ground Tract	OH-13	0	0	0	0	0
	OH-23	150	8	16	2	27
	TH-55	225	8	26	2	56
	All	375	8	22	2	45
Maintain Proper RPM	OH-13	0	0	0	0	0
	OH-23	150	8	34	2	24
	TH-55	225	8	0	2	51
	All	375	8	14	2	42

TABLE 16

Normal Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Altitude and Airspeed	OH-13	82	9	32	2	50
	OH-23	347	9	23	2	56
	TH-55	569	9	42	3	12
	All	998	9	35	3	6
Proper Glide Path and RPM	OH-13	82	10	56	2	48
	OH-23	347	11	4	2	54
	TH-55	567	11	13	2	57
	All	996	11	8	2	57
Proper Rate of Closure	OH-13	82	10	54	2	47
	OH-23	347	11	3	2	56
	TH-55	567	11	8	3	0
	All	996	11	6	2	58
Terminate Properly at Hover	OH-13	82	10	41	2	38
	OH-23	347	10	50	2	43
	TH-55	567	10	17	2	59
	All	996	10	46	2	57

TABLE 17

WOC Normal Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Altitude and Airspeed	OH-13	82	9	32	2	50
	OH-23	197	9	38	3	1
	TH-55	344	10	5	3	21
	All	623	9	52	3	12
Proper Glide Path and RPM	OH-13	82	10	56	2	48
	OH-23	197	11	13	3	5
	TH-55	343	11	32	2	57
	All	622	11	21	2	59
Proper Rate of Closure	OH-13	82	10	54	2	47
	OH-23	197	11	7	3	14
	TH-55	342	11	24	3	4
	All	621	11	15	3	6
Terminate Properly at Hover	OH-13	82	10	41	2	38
	OH-23	197	10	55	2	49
	TH-55	342	11	1	3	12
	All	621	10	56	3	1

TABLE 18

Officers Normal Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Altitude and Airspeed	OH-13	0	0	0	0	0
	OH-23	150	9	4	2	45
	TH-55	225	9	7	2	54
	All	375	9	6	2	51
Proper Glide Path and RPM	OH-13	0	0	0	0	0
	OH-23	150	10	51	2	38
	TH-55	224	10	45	2	54
	All	374	10	46	2	51
Proper Rate of Closure	OH-13	0	0	0	0	0
	OH-23	150	11	0	2	29
	TH-55	225	10	44	2	51
	All	375	10	50	2	43
Terminate Properly at Hover	OH-13	0	0	0	0	0
	OH-23	150	10	44	2	36
	TH-55	225	10	17	2	59
	All	375	10	46	2	57

TABLE 19

Traffic Patterns Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Airspeed, Altitude and RPM	OH-13	79	9	3	2	52
	OH-23	346	9	9	2	53
	TH-55	570	9	51	3	16
	All	995	9	33	3	8
Coordinate Climbs, Turns and Descents	OH-13	79	9	56	2	55
	OH-23	346	10	18	2	57
	TH-55	567	10	47	3	6
	All	992	10	33	3	3
Maintain Ground Track	OH-13	79	8	51	3	4
	OH-23	346	8	47	2	45
	TH-55	566	9	24	3	3
	All	991	9	10	2	59
Enter and Exit Properly	OH-13	79	8	45	3	15
	OH-23	348	8	38	2	55
	TH-55	569	8	57	3	18
	All	994	8	49	3	11

TABLE 20

WOC Traffic Patterns Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Airspeed, Altitude and RPM	OH-13	79	9	3	2	52
	OH-23	196	9	14	3	0
	TH-55	345	10	11	3	9
	All	620	9	44	3	7
Coordinate Climbs, Turns and Descents	OH-13	79	9	56	2	55
	OH-23	196	10	22	3	2
	TH-55	342	11	1	3	5
	All	617	10	41	3	5
Maintain Ground Track	OH-13	79	8	51	3	4
	OH-23	196	8	58	2	44
	TH-55	345	9	50	3	3
	All	620	9	26	3	0
Enter and Exit Properly	OH-13	79	8	45	3	15
	OH-23	196	9	8	3	5
	TH-55	344	9	11	3	22
	All	619	9	7	3	16

TABLE 21

Officer Traffic Patterns Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Airspeed, Altitude and RPM	OH-13	0	0	0	0	0
	OH-23	150	9	3	2	43
	TH-55	225	9	23	3	22
	All	375	9	15	3	8
Coordinate Climbs, Turns and Descents	OH-13	0	0	0	0	0
	OH-23	150	10	15	2	48
	TH-55	225	10	26	3	7
	All	375	10	22	3	0
Maintain Ground Track	OH-13	0	0	0	0	0
	OH-23	150	8	33	2	46
	TH-55	221	8	45	2	57
	All	371	8	44	2	56
Enter and Exit Properly	OH-13	0	0	0	0	0
	OH-23	150	7	58	2	32
	TH-55	225	8	35	3	11
	All	375	8	21	2	58

CLASS 69 - ALL

PHASE
PRE-SOLO

MANEUVER
SOLO

FLIGHT ALL

NORM = 14 Hr. 27 Min.

δ = 2 Hr. 01 Min.

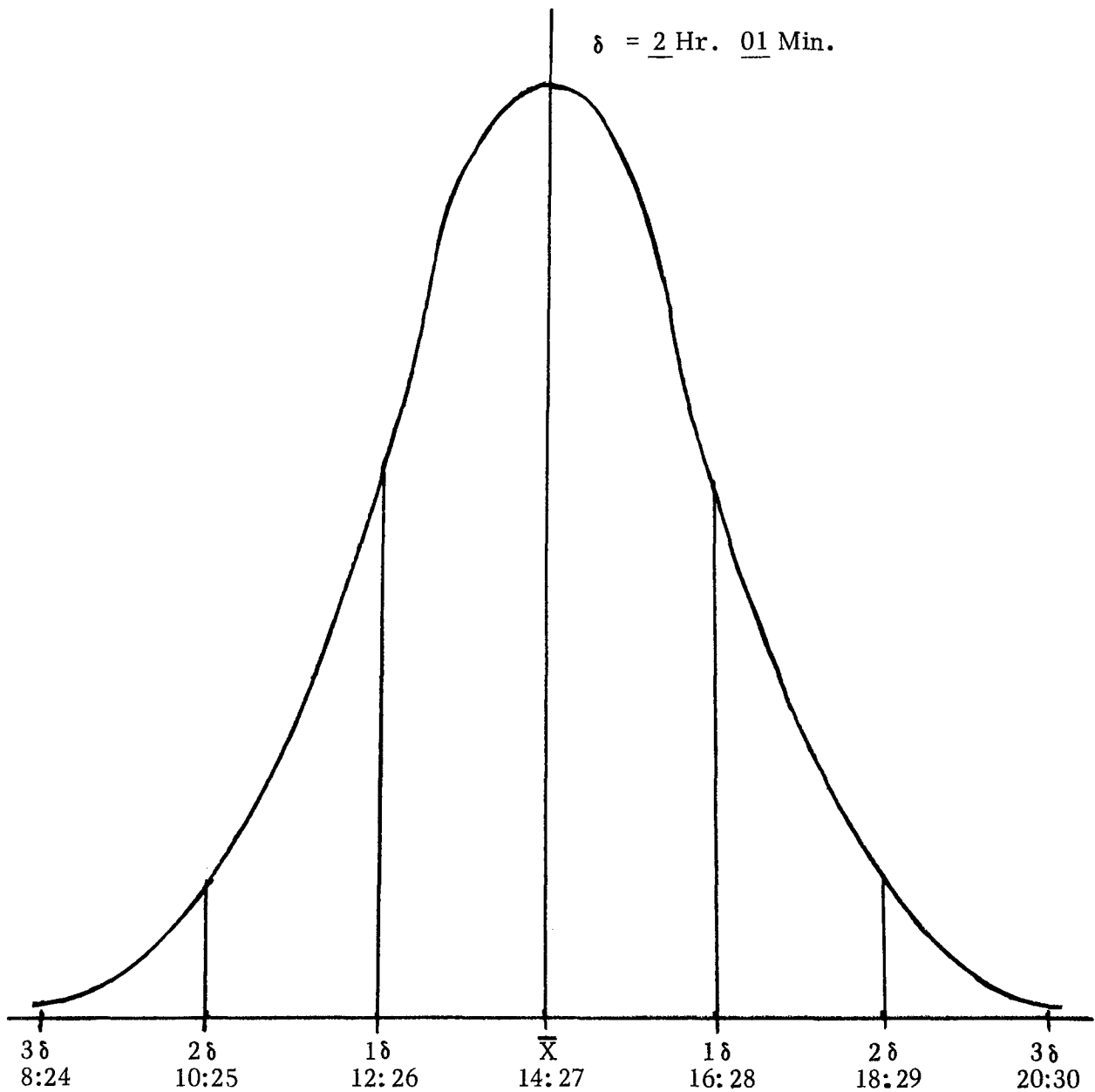


Fig. 1. PERFORMANCE NORM FOR SOLO MANEUVER WITH SD PLOT

TABLE 22

Primary I Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Normal Takeoff	OH-13	82	19	36	8	14
	OH-23	343	19	43	10	45
	TH-55	563	20	59	9	7
	All	988	20	25	9	40
Traffic Patterns	OH-13	82	23	10	10	26
	OH-23	343	23	9	11	58
	TH-55	563	25	31	11	0
	All	988	24	30	11	22
Normal Approach	OH-13	82	23	12	9	46
	OH-23	343	22	44	11	15
	TH-55	563	25	5	10	50
	All	988	24	7	10	57
Maximum Performance Takeoff	OH-13	82	26	52	8	9
	OH-23	343	28	8	9	34
	TH-55	563	30	1	8	37
	All	988	29	6	8	59
Steep Approach	OH-13	82	26	38	7	47
	OH-23	343	27	4	8	51
	TH-55	563	29	25	8	30
	All	988	28	22	8	40
Takeoff from the Ground	OH-13	82	26	53	6	47
	OH-23	343	28	31	8	0
	TH-55	563	30	17	7	46
	All	988	29	23	7	51
Approach to the Ground	OH-13	82	28	40	7	22
	OH-23	343	29	38	8	42
	TH-55	563	31	58	8	18
	All	988	30	53	8	28
Autorotation Straight	OH-13	82	34	50	8	35
	OH-23	343	35	23	10	30
	TH-55	551	34	46	9	7
	All	976	34	59	9	36

TABLE 23

WOC Primary I Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Normal Takeoff	OH-13	82	19	36	8	14
	OH-23	197	17	31	10	28
	TH-55	345	21	27	9	51
	All	624	19	58	10	1
Traffic Patterns	OH-13	82	23	10	10	26
	OH-23	197	21	19	12	25
	TH-55	345	25	50	11	50
	All	624	24	3	12	2
Normal Approach	OH-13	82	23	12	9	46
	OH-23	197	20	33	11	5
	TH-55	345	25	37	11	31
	All	624	23	42	11	24
Maximum Performance Takeoff	OH-13	82	26	52	8	9
	OH-23	197	27	30	9	18
	TH-55	345	30	38	9	5
	All	624	29	9	9	11
Steep Approach	OH-13	82	26	38	7	47
	OH-23	197	26	17	8	24
	TH-55	345	30	3	8	48
	All	624	28	24	8	44
Takeoff from the Ground	OH-13	82	26	53	6	47
	OH-23	197	27	45	7	46
	TH-55	345	31	10	8	12
	All	624	29	32	8	6
Approach to the Ground	OH-13	82	28	40	7	22
	OH-23	197	29	5	8	34
	TH-55	345	32	16	8	28
	All	624	30	47	8	32
Autorotation Straight	OH-13	82	34	50	8	35
	OH-23	197	34	31	11	37
	TH-55	333	35	38	9	20
	All	612	35	10	10	3

TABLE 24

Officer Primary Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Normal Takeoff	OH-13	0	0	0	0	0
	OH-23	146	22	41	10	24
	TH-55	218	20	14	7	45
	All	364	20	36	9	33
Traffic Patterns	OH-13	0	0	0	0	0
	OH-23	146	25	38	10	52
	TH-55	218	25	11	9	31
	All	364	25	15	10	5
Normal Approach	OH-13	0	0	0	0	0
	OH-23	146	25	39	10	50
	TH-55	218	24	15	9	36
	All	364	24	49	10	8
Maximum Performance	OH-13	0	0	0	0	0
	OH-23	146	28	59	9	51
	TH-55	218	29	2	7	42
	All	364	29	1	8	38
Steep Approach	OH-13	0	0	0	0	0
	OH-23	146	28	7	9	19
	TH-55	218	28	26	7	56
	All	364	28	18	8	31
Takeoff from the Ground	OH-13	0	0	0	0	0
	OH-23	146	29	33	8	11
	TH-55	218	28	53	6	48
	All	364	29	9	7	23
Approach to the Ground	OH-13	0	0	0	0	0
	OH-23	146	30	23	8	49
	TH-55	218	31	30	8	9
	All	364	31	3	8	22
Autorotation Straight	OH-13	0	0	0	0	0
	OH-23	146	36	33	8	37
	TH-55	218	33	27	8	37
	All	364	34	41	8	46

TABLE 25

Normal Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Enter Climb Properly	OH-13	63	19	12	6	42
	OH-23	323	17	45	10	1
	TH-55	532	19	33	8	43
	All	918	18	54	9	6
Maintain Proper Power Setting and Airspeed	OH-13	63	21	29	7	15
	OH-23	321	19	3	10	30
	TH-55	532	20	2	9	2
	All	916	19	42	9	33
Maintain Proper Pedal and Cyclic	OH-13	62	20	31	7	1
	OH-23	323	18	32	10	23
	TH-55	533	19	47	8	42
	All	918	19	24	9	15
Maintain Ground Track	OH-13	63	20	16	7	6
	OH-23	322	17	51	10	0
	TH-55	530	19	22	6	9
	All	915	18	54	9	3
Maintain Proper RPM	OH-13	63	20	47	6	39
	OH-23	322	18	14	10	14
	TH-55	531	19	36	8	50
	All	916	19	13	9	14

TABLE 26

WOC Normal Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Enter Climb Properly	OH-13	63	19	12	6	42
	OH-23	179	15	26	9	52
	TH-55	331	20	19	9	26
	All	573	18	40	9	35
Maintain Proper Power Setting and Airspeed	OH-13	63	21	29	7	15
	OH-23	177	16	53	10	35
	TH-55	332	20	30	9	44
	All	572	19	25	9	59
Maintain Proper Pedal and Cyclic	OH-13	62	20	31	7	11
	OH-23	179	16	17	10	5
	TH-55	332	20	24	9	27
	All	573	19	8	9	37
Maintain Ground Track	OH-13	63	20	16	7	6
	OH-23	179	15	56	9	59
	TH-55	331	20	0	5	30
	All	573	18	45	9	33
Maintain Proper RPM	OH-13	63	20	47	6	39
	OH-23	178	16	1	10	3
	TH-55	330	20	9	9	33
	All	571	18	58	9	37

TABLE 27

Officer Normal Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Enter Climb Properly	OH-13	0	0	0	0	0
	OH-23	144	20	37	9	25
	TH-55	201	18	24	7	12
	All	345	19	16	9	35
Maintain Proper Power Setting and Airspeed	OH-13	0	0	0	0	0
	OH-23	144	21	41	9	48
	TH-55	200	19	15	7	39
	All	344	20	9	8	49
Maintain Proper Pedal and Cyclic	OH-13	0	0	0	0	0
	OH-23	144	21	21	10	4
	TH-55	201	18	45	7	13
	All	345	19	50	8	37
Maintain Ground Track	OH-13	0	0	0	0	0
	OH-23	143	20	15	9	29
	TH-55	199	18	20	6	58
	All	342	19	8	8	10
Maintain Proper RPM	OH-13	0	0	0	0	0
	OH-23	144	20	57	9	48
	TH-55	201	18	40	7	24
	All	345	19	38	8	33

TABLE 28

Traffic Patterns Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Airspeed Altitude and RPM	OH-13	62	24	8	8	16
	OH-23	320	20	9	11	2
	TH-55	535	22	59	10	9
	All	917	22	4	10	27
Coordinate Climbs and Turns	OH-13	62	25	26	8	14
	OH-23	319	21	33	10	58
	TH-55	529	24	15	9	6
	All	910	23	20	10	32
Maintain Proper Ground Track	OH-13	62	23	24	7	51
	OH-23	320	19	47	11	3
	TH-55	533	21	55	9	32
	All	915	21	16	10	3
Enter and Exit Properly	OH-13	61	22	49	7	57
	OH-23	320	18	36	10	14
	TH-55	535	20	42	9	12
	All	916	20	6	9	34
Descend Properly, Base	OH-13	62	26	27	9	1
	OH-23	315	23	3	12	3
	TH-55	521	25	9	10	57
	All	898	24	27	11	23

TABLE 29

WOC Traffic Patterns Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Airspeed, Altitude and RPM	OH-13	62	24	8	8	16
	OH-23	178	18	3	11	16
	TH-55	331	23	10	10	49
	All	571	21	40	11	0
Coordinate Climbs and Turns	OH-13	62	25	26	8	14
	OH-23	177	19	45	11	19
	TH-55	327	24	26	10	23
	All	566	23	5	10	58
Maintain Proper Ground Track	OH-13	62	23	24	7	51
	OH-23	178	17	44	11	13
	TH-55	329	22	32	10	24
	All	569	21	8	10	41
Enter and Exit Properly	OH-13	61	22	49	7	54
	OH-23	178	16	59	10	8
	TH-55	330	21	11	10	1
	All	569	20	3	10	4
Descend Properly, Base	OH-13	62	26	27	9	1
	OH-23	174	20	59	10	57
	TH-55	322	25	35	11	43
	All	558	24	18	11	54

TABLE 30

Officer Traffic Patterns Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Maintain Airspeed, Altitude and RPM	OH-13	0	0	0	0	0
	OH-23	142	22	46	10	8
	TH-55	204	22	42	8	56
	All	346	22	44	9	26
Coordinate Climbs and Turns	OH-13	0	0	0	0	0
	OH-23	142	23	46	10	4
	TH-55	202	23	56	6	28
	All	344	23	52	9	46
Maintain Proper Ground Track	OH-13	0	0	0	0	0
	OH-23	142	22	21	10	15
	TH-55	204	20	55	7	48
	All	346	21	30	8	55
Enter and Exit Properly	OH-13	0	0	0	0	0
	OH-23	142	20	39	9	59
	TH-55	205	19	55	7	38
	All	347	20	12	8	41
Descend Properly, Base	OH-13	0	0	0	0	0
	OH-23	141	25	36	10	57
	TH-55	199	24	17	9	31
	All	340	24	42	10	28

TABLE 31

Normal Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Altitude and Airspeed	OH-13	62	23	33	7	40
	OH-23	326	19	55	11	1
	TH-55	535	21	56	9	34
	All	923	21	20	10	4
Use Correct Sight Picture	OH-13	40	23	29	6	35
	OH-23	323	20	34	10	47
	TH-55	432	22	57	9	39
	All	795	22	0	10	4
Maintain Glide Path and RPM	OH-13	62	25	7	8	18
	OH-23	325	22	3	11	20
	TH-55	531	24	29	10	35
	All	918	23	40	10	47
Maintain Lane Alignment	OH-13	40	24	50	7	18
	OH-23	325	20	3	10	20
	TH-55	432	23	15	10	5
	All	797	22	1	10	13
Maintain Proper Rate of Closure	OH-13	61	24	40	8	21
	OH-23	326	21	31	11	0
	TH-55	531	22	52	12	40
	All	918	23	10	10	20
Terminate Properly at Hover	OH-13	62	23	58	8	12
	OH-23	324	20	49	10	52
	TH-55	530	22	51	9	50
	All	916	22	12	10	20

TABLE 32

WOC Normal Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Altitude and Airspeed	OH-13	62	23	34	7	40
	OH-23	182	17	38	10	45
	TH-55	332	22	41	10	15
	All	576	21	11	10	27
Use Correct Sight Picture	OH-13	40	23	29	6	35
	OH-23	180	8	22	10	33
	TH-55	267	23	58	10	15
	All	487	21	52	10	28
Maintain Glide Path and RPM	OH-13	62	25	7	8	18
	OH-23	182	19	50	11	9
	TH-55	329	25	8	11	0
	All	573	23	26	11	4
Maintain Lane Alignment	OH-13	40	24	50	7	18
	OH-23	181	18	6	10	10
	TH-55	267	24	7	10	32
	All	488	21	57	10	36
Maintain Proper Rate of Closure	OH-13	61	24	40	8	21
	OH-23	182	19	15	10	50
	TH-55	328	24	50	11	0
	All	571	23	2	10	20
Terminate Properly at Hover	OH-13	62	23	58	8	12
	OH-23	180	18	29	10	15
	TH-55	327	23	37	10	29
	All	569	22	1	10	28

TABLE 33

Officer Normal Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Altitude and Airspeed	OH-13	0	0	0	0	0
	OH-23	144	22	48	10	41
	TH-55	203	20	43	8	13
	All	347	21	35	9	23
Use Correct Sight Picture	OH-13	0	0	0	0	0
	OH-23	143	23	20	10	26
	TH-55	165	21	17	8	21
	All	308	22	14	9	25
Maintain Glide Path and RPM	OH-13	0	0	0	0	0
	OH-23	143	24	55	10	53
	TH-55	202	23	26	9	46
	All	345	24	3	10	16
Maintain Lane Alignment	OH-13	0	0	0	0	0
	OH-23	144	22	29	10	0
	TH-55	165	21	51	9	6
	All	309	22	7	9	36
Maintain Proper Rate of Closure	OH-13	0	0	0	0	0
	OH-23	144	24	24	10	33
	TH-55	203	19	41	14	25
	All	347	23	22	9	46
Terminate Properly at Hover	OH-13	0	0	0	0	0
	OH-23	144	21	51	14	19
	TH-55	203	21	36	8	33
	All	347	22	29	10	6

TABLE 34

Maximum Performance Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Use Correct Pitch and Throttle	OH-13	67	27	21	7	0
	OH-23	340	26	59	8	57
	TH-55	555	28	33	8	7
	All	962	24	48	15	18
Establish Proper Climb	OH-13	67	27	35	7	33
	OH-23	341	26	49	8	48
	TH-55	557	28	39	8	10
	All	965	27	55	8	24
Maintain Directional Control	OH-13	67	26	16	6	46
	OH-23	341	26	23	8	30
	TH-55	557	27	45	7	55
	All	965	27	9	8	5
Return to Normal Climb	OH-13	67	28	20	7	23
	OH-23	337	27	57	9	37
	TH-55	551	29	44	8	30
	All	955	29	0	8	53

TABLE 35

WOC Maximum Performance Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Use Correct Path and Throttle	OH-13	67	27	21	7	0
	OH-23	195	26	17	8	30
	TH-55	340	29	15	8	39
	All	602	23	05	18	6
Establish Proper Climb	OH-13	67	27	35	7	33
	OH-23	195	26	9	8	22
	TH-55	340	29	30	8	38
	All	602	28	12	8	34
Maintain Directional Control	OH-13	67	26	16	6	46
	OH-23	195	25	40	7	59
	TH-55	340	28	34	7	4
	All	602	27	22	8	10
Return to Normal Climb	OH-13	67	28	20	7	23
	OH-23	194	27	24	9	18
	TH-55	337	30	13	9	0
	All	598	29	6	9	1

TABLE 36

Officer Maximum Performance Takeoff Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Use Correct Path and Throttle	OH-13	0	0	0	0	0
	OH-23	145	27	54	9	25
	TH-55	215	27	28	7	5
	All	360	27	39	8	6
Establish Proper Climb	OH-13	0	0	0	0	0
	OH-23	146	27	43	9	15
	TH-55	217	27	18	7	12
	All	363	27	28	8	5
Maintain Directional Control	OH-13	0	0	0	0	0
	OH-23	146	27	21	9	3
	TH-55	217	26	28	7	4
	All	363	26	49	7	56
Return to Normal Climb	OH-13	0	0	0	0	0
	OH-23	143	28	41	9	59
	TH-55	214	28	58	7	38
	All	357	28	51	8	39

TABLE 37

Steep Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Altitude and Airspeed	OH-13	68	26	7	6	0
	OH-23	343	25	8	7	22
	TH-55	557	26	43	7	52
	All	968	26	7	7	47
Use Correct Sight Picture	OH-13	43	25	28	5	52
	OH-23	342	25	18	7	58
	TH-55	444	27	45	7	53
	All	829	26	37	7	55
Maintain Proper Glide Rate and RPM	OH-13	67	27	40	6	50
	OH-23	341	26	36	8	40
	TH-55	551	29	8	8	24
	All	959	28	8	8	29
Maintain Lane Alignment	OH-13	43	25	23	6	11
	OH-23	343	25	12	7	57
	TH-55	442	27	34	7	45
	All	828	26	26	7	57
Maintain Proper Rate of Closure	OH-13	68	27	24	7	16
	OH-23	343	26	27	8	33
	TH-55	552	28	45	8	23
	All	963	27	50	8	26
Terminate Properly at Hover	OH-13	68	26	58	6	50
	OH-23	341	26	14	8	18
	TH-55	555	27	43	8	13
	All	964	27	8	8	11

TABLE 38

WOC Steep Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Altitude and Airspeed	OH-13	68	26	7	6	0
	OH-23	196	24	21	7	22
	TH-55	341	27	21	8	8
	All	605	26	14	7	48
Use Correct Sight Picture	OH-13	43	25	28	5	52
	OH-23	196	24	33	7	27
	TH-55	270	28	45	8	9
	All	509	26	52	7	59
Maintain Proper Glide Rate and RPM	OH-13	67	27	40	6	50
	OH-23	196	25	45	7	59
	TH-55	339	29	36	8	43
	All	602	28	8	8	29
Maintain Lane Alignment	OH-13	43	25	23	6	11
	OH-23	196	24	32	7	35
	TH-55	268	28	30	7	45
	All	509	26	36	7	58
Maintain Proper Rate of Closure	OH-13	68	27	24	7	16
	OH-23	196	25	51	8	12
	TH-55	338	29	15	8	33
	All	602	27	56	8	26
Terminate Properly at Hover	OH-13	68	26	58	6	50
	OH-23	195	25	31	7	51
	TH-55	340	28	18	8	29
	All	603	27	15	8	13

TABLE 39

Officer Steep Approach Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct	OH-13	0	0	0	0	0
Altitude and Airspeed	OH-23	147	26	12	8	22
	TH-55	216	27	42	7	20
	All	363	25	54	7	47
Use Correct Sight	OH-13	0	0	0	0	0
Picture	OH-23	146	26	17	8	30
	TH-55	174	26	12	7	9
	All	320	26	14	7	48
Maintain Proper Glide	OH-13	0	0	0	0	0
Rate and RPM	OH-23	145	27	45	9	24
	TH-55	212	28	22	7	50
	All	357	28	7	8	31
Maintain Lane Alignment	OH-13	0	0	0	0	0
	OH-23	147	26	6	8	20
	TH-55	174	26	7	7	32
	All	321	26	6	7	54
Maintain Proper Rate	OH-13	0	0	0	0	0
of Closure	OH-23	147	27	15	8	57
	TH-55	214	27	57	8	3
	All	361	27	40	8	26
Terminate Properly	OH-13	0	0	0	0	0
at Hover	OH-23	146	27	10	8	45
	TH-55	215	26	48	7	41
	All	361	26	57	8	8

TABLE 40

Takeoff from the Ground Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Use Correct Pitch and Throttle	OH-13	68	27	52	0	0
	OH-23	338	28	4	7	40
	TH-55	554	29	33	7	31
	All	960	28	53	7	39
Establish Airspeed Properly	OH-13	68	27	40	6	3
	OH-23	340	28	14	7	52
	TH-55	555	29	42	7	43
	All	963	29	3	7	42
Maintain Directional Control	OH-13	68	26	36	6	9
	OH-23	342	27	24	7	32
	TH-55	555	28	49	7	23
	All	965	28	9	7	24
Maintain Proper Ground Track	OH-13	68	25	57	5	36
	OH-23	341	26	42	7	28
	TH-55	555	28	21	6	33
	All	964	27	30	7	18

TABLE 41

WOC Takeoff from the Ground Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Use Correct Pitch and Throttle	OH-13	68	27	52	0	0
	OH-23	193	27	26	7	29
	TH-55	339	30	12	7	51
	All	600	29	0	7	54
Establish Airspeed Properly	OH-13	68	27	40	6	3
	OH-23	194	27	25	7	35
	TH-55	339	30	42	8	7
	All	601	29	18	7	54
Maintain Directional Control	OH-13	68	26	36	6	9
	OH-23	195	26	40	7	15
	TH-55	339	30	0	7	4
	All	602	28	32	7	34
Maintain Proper Ground Track	OH-13	68	25	57	5	36
	OH-23	195	26	6	7	12
	TH-55	339	29	15	7	33
	All	602	27	51	7	25

TABLE 42

Officer Takeoff from the Ground Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Use Correct Pitch and Throttle	OH-13	0	0	0	0	0
	OH-23	145	28	54	7	49
	TH-55	215	28	31	6	51
	All	360	28	40	7	15
Establish Airspeed Properly	OH-13	0	0	0	0	0
	OH-23	146	29	19	8	6
	TH-55	216	28	8	6	45
	All	362	28	37	7	21
Maintain Directional Control	OH-13	0	0	0	0	0
	OH-23	147	28	20	7	42
	TH-55	216	26	59	6	28
	All	363	27	32	7	4
Maintain Proper Ground Track	OH-13	0	0	0	0	0
	OH-23	146	27	31	7	43
	TH-55	216	26	56	4	10
	All	362	26	54	7	1

TABLE 43

Approach to the Ground Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Airspeed and Altitude	OH-13	68	26	0	5	18
	OH-23	343	26	23	7	32
	TH-55	557	28	3	7	45
	All	968	27	19	7	34
Use Correct Sight Picture	OH-13	43	26	8	6	0
	OH-23	343	26	29	7	35
	TH-55	445	28	44	7	47
	All	831	27	40	7	43
Maintain Glide Rate and RPM	OH-13	68	27	54	6	50
	OH-23	341	27	50	8	15
	TH-55	556	30	1	8	14
	All	965	29	6	8	13
Maintain Lane Alignment	OH-13	43	26	55	6	58
	OH-23	343	26	33	7	36
	TH-55	445	28	50	7	32
	All	831	27	48	7	42
Maintain Proper Rate of Closure	OH-13	68	28	7	6	51
	OH-23	343	27	45	8	13
	TH-55	553	29	57	7	57
	All	964	29	2	8	3
Use Proper Touchdown Technique	OH-13	68	29	49	6	55
	OH-23	338	29	41	8	47
	TH-55	547	31	45	8	22
	All	953	30	53	8	29

TABLE 44

WOC Approach to the Ground Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Airspeed and Altitude	OH-13	68	26	0	5	18
	OH-23	196	25	48	7	25
	TH-55	340	28	48	7	58
	All	604	27	30	7	40
Use Correct Sight Picture	OH-13	43	26	8	6	0
	OH-23	196	26	4	7	34
	TH-55	269	29	40	7	58
	All	508	27	58	7	52
Maintain Glide Rate and RPM	OH-13	68	27	54	6	50
	OH-23	196	27	31	8	6
	TH-55	339	30	50	8	24
	All	603	29	25	8	18
Maintain Lane Alignment	OH-13	43	26	55	6	58
	OH-23	196	26	20	7	36
	TH-55	269	29	24	7	42
	All	508	28	1	7	45
Maintain Proper Rate of Closure	OH-13	68	28	7	6	51
	OH-23	196	27	16	8	2
	TH-55	336	30	29	8	4
	All	600	29	10	8	4
Use Proper Touchdown Technique	OH-13	68	29	49	6	55
	OH-23	193	29	16	8	39
	TH-55	333	32	1	8	30
	All	594	30	52	8	29

TABLE 45

Officer Approach to the Ground Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Start at Correct Airspeed and Altitude	OH-13	0	0	0	0	0
	OH-23	147	27	9	7	38
	TH-55	217	26	52	7	14
	All	364	26	59	7	24
Use Correct Sight Picture	OH-13	0	0	0	0	0
	OH-23	147	27	3	7	34
	TH-55	176	27	18	7	20
	All	323	27	11	7	27
Maintain Glide Rate and RPM	OH-13	0	0	0	0	0
	OH-23	145	28	16	8	26
	TH-55	217	28	46	7	48
	All	362	28	34	8	4
Maintain Lane Alignment	OH-13	0	0	0	0	0
	OH-23	147	26	50	7	36
	TH-55	176	27	59	7	11
	All	323	27	27	7	36
Maintain Proper Rate of Closure	OH-13	0	0	0	0	0
	OH-23	147	28	24	8	24
	TH-55	217	29	6	7	42
	All	364	28	49	8	0
Use Proper Touchdown Technique	OH-13	0	0	0	0	0
	OH-23	145	30	15	8	56
	TH-55	214	31	21	8	7
	All	359	30	54	8	28

TABLE 46

Autorotations; Straight, Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Make Proper Entry	OH-13	39	29	55	9	30
	OH-23	329	27	9	11	55
	TH-55	336	30	33	9	35
	All	704	28	33	10	53
Maintain Proper Airspeed Control	OH-13	61	31	31	9	52
	OH-23	322	28	46	11	53
	TH-55	430	31	50	9	49
	All	813	30	36	10	48
Make Proper Deceleration	OH-13	60	34	53	9	0
	OH-23	314	32	55	11	4
	TH-55	419	34	3	9	33
	All	793	33	37	9	58
Make Proper Pitch Application	OH-13	59	34	52	8	28
	OH-23	311	34	41	10	28
	TH-55	414	34	39	9	25
	All	784	34	41	9	48
Touchdown Level	OH-13	39	34	6	8	22
	OH-23	307	35	7	10	28
	TH-55	326	34	21	9	22
	All	672	34	41	9	51
Maintain Directional Control	OH-13	61	31	45	10	22
	OH-23	312	33	7	10	49
	TH-55	410	33	24	9	19
	All	783	33	10	10	2

TABLE 47

WOC Autorotations; Straight, Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Make Proper Entry	OH-13	39	29	55	9	30
	OH-23	191	26	23	12	40
	TH-55	218	31	56	9	21
	All	448	28	47	11	26
Maintain Proper Airspeed Control	OH-13	61	31	31	9	52
	OH-23	184	27	46	12	48
	TH-55	275	32	55	10	17
	All	520	30	56	11	27
Make Proper Deceleration	OH-13	60	34	53	9	0
	OH-23	177	31	49	12	3
	TH-55	265	34	38	9	54
	All	502	33	36	10	25
Make Proper Pitch Application	OH-13	59	34	52	8	28
	OH-23	177	33	44	11	38
	TH-55	264	35	13	9	47
	All	500	34	39	10	21
Touchdown Level	OH-13	39	34	6	8	22
	OH-23	171	34	24	11	29
	TH-55	213	35	1	9	36
	All	423	34	40	10	18
Maintain Directional Control	OH-13	61	31	45	10	22
	OH-23	175	32	24	11	58
	TH-55	258	34	16	9	1
	All	494	33	18	10	32

TABLE 48

Officer Autorotation; Straight, Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Make Proper Entry	OH-13	0	0	0	0	0
	OH-23	138	28	13	12	40
	TH-55	118	28	1	8	45
	All	256	28	7	9	50
Maintain Proper Airspeed Control	OH-13	0	0	0	0	0
	OH-23	138	30	5	10	24
	TH-55	155	29	56	8	36
	All	293	30	0	9	30
Make Proper Deceleration	OH-13	0	0	0	0	0
	OH-23	137	34	20	9	28
	TH-55	154	33	4	8	47
	All	291	33	40	9	9
Make Proper Pitch Application	OH-13	0	0	0	0	0
	OH-23	134	35	57	8	34
	TH-55	150	33	40	8	37
	All	284	34	43	8	44
Touchdown Level	OH-13	0	0	0	0	0
	OH-23	136	36	1	8	57
	TH-55	113	33	5	8	46
	All	249	34	41	9	0
Maintain Directional Control	OH-13	0	0	0	0	0
	OH-23	137	34	3	9	4
	TH-55	152	31	56	9	1
	All	289	32	56	9	6

TABLE 49

Primary II Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Confined Area Operations	OH-13	154	52	40	3	15
	OH-23	453	54	3	5	6
	TH-55	798	53	33	5	47
	All	1407	53	47	5	34
Pinnacle Operations	OH-13	154	56	9	3	48
	OH-23	455	57	39	5	10
	TH-55	796	57	18	5	53
	All	1407	57	27	5	36
Formation Flying	OH-13	154	103	20	6	10
	OH-23	455	103	15	6	6
	TH-55	798	103	34	6	38
	All	1407	103	32	6	41
Slope Operations	OH-13	154	55	18	4	8
	OH-23	455	56	44	5	40
	TH-55	798	57	47	7	8
	All	1407	57	19	6	41
Hovering Autorotations	OH-13	67	77	57	19	51
	OH-23	424	79	36	19	17
	TH-55	727	81	2	18	42
	All	1218	80	11	19	3

TABLE 50

WOC Primary II Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Confined Area Operations	OH-13	154	52	53	3	54
	OH-23	283	54	12	5	49
	TH-55	496	53	15	2	2
	All	933	53	40	4	47
Pinnacle Operations	OH-13	154	56	18	4	20
	OH-23	283	57	45	5	38
	TH-55	496	57	10	4	23
	All	933	57	15	4	49
Formation Flying	OH-13	154	103	50	6	35
	OH-23	283	103	37	7	21
	TH-55	496	103	46	5	45
	All	933	103	45	6	41
Slope Operations	OH-13	154	55	33	4	39
	OH-23	283	56	54	5	52
	TH-55	496	57	43	6	3
	All	933	57	10	5	53
Hovering Autorotations	OH-13	67	77	57	19	51
	OH-23	255	83	43	18	25
	TH-55	441	81	52	18	31
	All	763	81	48	18	47

TABLE 51

Officer Primary II Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Confined Area Operations	OH-13	0	0	0	0	0
	OH-23	172	53	27	2	44
	TH-55	302	54	12	7	46
	All	474	54	0	6	51
Pinnacle Operations	OH-13	0	0	0	0	0
	OH-23	172	57	27	4	10
	TH-55	302	57	45	7	10
	All	474	57	27	5	36
Formation Flying	OH-13	0	0	0	0	0
	OH-23	172	102	38	3	5
	TH-55	302	103	14	7	52
	All	474	103	6	6	40
Slope Operations	OH-13	0	0	0	0	0
	OH-23	172	56	20	5	19
	TH-55	302	58	14	8	51
	All	474	57	37	8	2
Hovering Autorotations	OH-13	0	0	0	0	0
	OH-23	169	73	28	18	56
	TH-55	286	79	44	18	54
	All	455	77	24	18	55

TABLE 52

Confined Area Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper High Recon	OH-13	153	52	21	3	57
	OH-23	456	53	15	4	5
	TH-55	795	53	18	5	41
	All	1404	53	11	5	3
Proper Approach and Landing	OH-13	153	52	33	3	55
	OH-23	456	53	50	4	59
	TH-55	795	53	35	5	47
	All	1404	53	33	5	3
Secure Aircraft	OH-13	153	52	33	3	55
	OH-23	456	53	12	3	47
	TH-55	793	53	32	5	3
	All	1402	53	15	5	0
Proper Ground Recon	OH-13	153	52	45	3	54
	OH-23	456	53	29	4	4
	TH-55	795	53	31	5	42
	All	1404	53	25	5	3
Proper Takeoff Technique	OH-13	153	52	53	3	54
	OH-23	456	53	53	4	53
	TH-55	793	53	35	6	2
	All	1402	53	36	5	29

TABLE 53

WOC Confined Area Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper High Recon	OH-13	153	52	21	3	57
	OH-23	284	53	33	4	48
	TH-55	493	52	53	3	53
	All	930	53	0	4	13
Proper Approach and Landing	OH-13	153	52	33	3	55
	OH-23	284	54	9	5	55
	TH-55	494	53	11	3	57
	All	931	53	22	5	19
Secure Aircraft	OH-13	153	52	33	3	55
	OH-23	284	53	24	4	25
	TH-55	492	53	15	2	2
	All	929	53	4	4	8
Proper Ground Recon	OH-13	153	52	45	3	54
	OH-23	284	53	43	4	45
	TH-55	494	53	10	3	57
	All	931	53	16	4	14
Proper Takeoff Technique	OH-13	153	52	53	3	54
	OH-23	284	54	12	5	49
	TH-55	493	53	13	4	39
	All	930	53	28	4	57

TABLE 54

Officer Confined Area Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper High Recon	OH-13	0	0	0	0	0
	OH-23	172	52	44	2	21
	TH-55	302	53	58	7	45
	All	474	53	31	5	3
Proper Approach and Landing	OH-13	0	0	0	0	0
	OH-23	172	53	17	2	43
	TH-55	301	54	14	7	51
	All	473	53	54	6	30
Secure Aircraft	OH-13	0	0	0	0	0
	OH-23	172	52	52	2	19
	TH-55	301	54	0	7	45
	All	473	53	35	6	22
Proper Ground Recon	OH-13	0	0	0	0	0
	OH-23	172	53	5	2	28
	TH-55	301	54	5	7	44
	All	473	53	43	6	21
Proper Takeoff Technique	OH-13	0	0	0	0	0
	OH-23	172	53	21	2	36
	TH-55	300	54	12	7	46
	All	472	53	54	6	24

TABLE 55

Pinnacle Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper High Recon	OH-13	154	55	21	4	25
	OH-23	456	56	34	4	33
	TH-55	793	56	36	5	38
	All	1403	56	27	5	19
Proper Approach and Landing	OH-13	154	55	54	4	18
	OH-23	454	57	31	5	17
	TH-55	792	57	9	5	31
	All	1400	57	8	5	20
Secure Aircraft	OH-13	154	55	35	4	24
	OH-23	456	56	25	4	27
	TH-55	793	56	41	5	41
	All	1403	56	25	5	11
Ground Recon	OH-13	154	55	50	4	27
	OH-23	456	56	46	4	32
	TH-55	793	56	39	6	0
	All	1403	56	36	5	24
Proper Takeoff Technique	OH-13	154	56	18	4	20
	OH-23	453	57	35	5	6
	TH-55	790	57	23	5	36
	All	1397	57	20	5	20

TABLE 56

WOC Pinnacle Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper High Recon	OH-13	154	55	21	4	25
	OH-23	284	56	44	4	54
	TH-55	493	56	24	4	18
	All	931	56	20	4	32
Proper Approach and Landing	OH-13	154	55	54	4	18
	OH-23	283	54	39	5	51
	TH-55	492	56	54	4	10
	All	929	56	58	4	48
Secure Aircraft	OH-13	154	55	35	4	24
	OH-23	284	56	30	4	45
	TH-55	493	56	26	4	22
	All	931	56	19	4	30
Proper Ground Recon	OH-13	154	55	50	4	27
	OH-23	284	56	51	4	52
	TH-55	493	56	29	5	0
	All	931	56	30	4	53
Proper Takeoff Technique	OH-13	154	56	18	4	20
	OH-23	283	57	45	5	38
	TH-55	492	57	10	4	23
	All	929	57	12	4	49

TABLE 57

Officer Pinnacle Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper High Recon	OH-13	0	0	0	0	0
	OH-23	172	56	16	3	55
	TH-55	300	56	55	7	19
	All	472	56	41	6	35
Proper Approach and Landing	OH-13	0	0	0	0	0
	OH-23	171	57	18	4	8
	TH-55	300	57	33	7	12
	All	471	57	27	6	16
Secure Aircraft	OH-13	0	0	0	0	0
	OH-23	172	56	15	3	54
	TH-55	300	56	51	7	21
	All	472	56	38	6	19
Proper Ground Recon	OH-13	0	0	0	0	0
	OH-23	172	56	36	3	55
	TH-55	300	56	56	7	18
	All	472	56	48	6	18
Proper Takeoff Technique	OH-13	0	0	0	0	0
	OH-23	170	57	20	4	2
	TH-55	298	57	45	7	10
	All	468	57	36	6	13

TABLE 58

Formation Flying Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Interval	OH-13	150	103	16	6	34
	OH-23	432	103	14	5	30
	TH-55	762	103	51	4	40
	All	1344	103	37	5	11
Proper Pedal Setting	OH-13	150	103	17	6	33
	OH-23	422	103	22	5	32
	TH-55	761	103	49	5	42
	All	1333	103	37	5	46
Proper Altitude Control	OH-13	150	103	21	6	34
	OH-23	422	103	22	5	32
	TH-55	760	103	49	5	44
	All	1332	103	38	5	46
Proper Angle	OH-13	150	103	23	6	33
	OH-23	422	103	29	5	30
	TH-55	767	104	21	4	54
	All	1332	103	41	5	46
Proper RPM	OH-13	150	103	24	6	34
	OH-23	422	103	26	5	28
	TH-55	761	103	53	5	45
	All	1333	103	41	5	46
Divide Attention Properly	OH-13	149	103	50	6	35
	OH-23	422	103	29	5	28
	TH-55	760	103	54	7	14
	All	1331	103	43	5	47

TABLE 59

WOC Formation Flying Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Interval	OH-13	150	103	16	6	34
	OH-23	265	103	49	6	33
	TH-55	467	104	14	1	30
	All	882	103	57	4	38
Proper Pedal Setting	OH-13	150	103	17	6	33
	OH-23	255	103	56	6	38
	TH-55	466	104	9	4	25
	All	871	103	57	5	35
Proper Altitude Control	OH-13	150	103	21	6	34
	OH-23	255	103	55	6	37
	TH-55	465	104	9	4	30
	All	870	103	56	5	35
Proper Angle	OH-13	150	103	23	6	33
	OH-23	255	104	3	6	35
	TH-55	476	104	24	4	24
	All	870	104	0	5	34
Proper RPM	OH-13	150	103	24	6	34
	OH-23	255	103	58	6	34
	TH-55	466	104	11	4	30
	All	871	104	0	5	33
Divide Attention Properly	OH-13	149	103	50	6	35
	OH-23	255	104	3	6	30
	TH-55	465	104	13	4	36
	All	869	104	3	5	35

TABLE 60

Officer Formation Flying Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Interval	OH-13	0	0	0	0	0
	OH-23	167	102	30	3	1
	TH-55	295	103	15	7	13
	All	462	102	59	6	2
Proper Pedal Setting	OH-13	0	0	0	0	0
	OH-23	167	102	30	3	1
	TH-55	295	103	17	7	14
	All	462	103	0	6	4
Proper Altitude Control	OH-13	0	0	0	0	0
	OH-23	167	102	33	3	1
	TH-55	295	103	18	7	14
	All	462	103	2	6	4
Proper Angle	OH-13	0	0	0	0	0
	OH-23	167	102	39	3	0
	TH-55	291	104	17	5	38
	All	462	103	6	6	5
Proper RPM	OH-13	0	0	0	0	0
	OH-23	167	102	38	3	0
	TH-55	295	103	23	7	15
	All	462	103	6	6	5
Divide Attention Properly	OH-13	0	0	0	0	0
	OH-23	167	102	36	3	2
	TH-55	295	103	22	7	14
	All	462	103	6	6	4

TABLE 61

Slope Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Pedal and Cyclic	OH-13	154	55	20	5	23
	OH-23	455	56	36	5	37
	TH-55	794	57	54	7	17
	All	1403	57	12	6	35
Proper Pitch and RPM	OH-13	154	55	23	4	39
	OH-23	455	56	38	5	34
	TH-55	794	57	54	7	18
	All	1403	57	13	6	35
Proper Touchdown Technique	OH-13	154	55	33	4	39
	OH-23	454	56	40	5	37
	TH-55	792	57	0	7	14
	All	1400	57	15	7	4

TABLE 62

WOC Slope Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Pedal and Cyclic	OH-13	154	55	20	5	23
	OH-23	283	56	50	4	45
	TH-55	494	57	42	6	8
	All	931	57	3	5	54
Proper Pitch and RPM	OH-13	154	55	23	4	39
	OH-23	283	56	54	5	51
	TH-55	494	57	42	6	9
	All	931	57	4	5	53
Proper Touchdown	OH-13	154	55	33	4	39
	OH-23	283	56	54	5	52
	TH-55	494	57	43	6	3
	All	931	57	7	6	42

TABLE 63

Officer Slope Operations Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Proper Pedan and Cyclic	OH-13	0	0	0	0	0
	OH-23	172	56	12	5	11
	TH-55	300	58	12	8	51
	All	472	57	28	7	47
Proper Pitch and RPM	OH-13	0	0	0	0	0
	OH-23	172	56	12	5	4
	TH-55	300	58	14	8	51
	All	472	57	30	7	45
Proper Touchdown	OH-13	0	0	0	0	0
	OH-23	171	56	17	5	10
	TH-55	298	58	0	8	51
	All	469	57	30	7	46

CLASS 19 AND 20 PERFORMANCE NORMS

To compare these students with past students, data was compiled on the members of Classes 19 and 20 in all three phases of the training at USAPHS. This data also provided an idea of the student loss rate of a class. Class 19 was made up of 192 WOC at the beginning of flight training; at the conclusion of Primary II 170 of the original WOC were still in Class 19, a loss rate for all causes of 11 percent. Class 20 started with 76 officers and finished with 73 of the original group, a loss rate of three percent. These loss rates compare favorably with overall loss rates of approximately 10 percent for combined groups of officers and WOC shown by other work in this area.

The following tables give the performance norms and standard deviation for the men of these classes who successfully completed their training in the allotted time.

TABLE 64

Class 19 (WOC) and Class 20 (O) Pre-Solo Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Ground Operation	OH-13	42	3	22	2	9
	OH-23	81	4	54	2	0
	TH-55	120	6	0	3	36
	All	243	5	10	3	3
Takeoff and Landing to Hover	OH-13	42	5	48	1	59
	OH-23	81	7	53	2	45
	TH-55	120	7	37	3	8
	All	243	7	23	2	56
Hovering Flight	OH-13	42	6	54	2	18
	OH-23	81	9	53	3	3
	TH-55	120	8	6	3	54
	All	243	8	29	3	34
Normal Takeoff	OH-13	42	8	11	2	6
	OH-23	81	10	0	2	38
	TH-55	120	9	32	3	8
	All	243	9	27	2	53
Normal Approaches	OH-13	42	10	25	2	26
	OH-23	81	12	13	2	42
	TH-55	120	11	42	3	8
	All	243	11	39	2	59
Traffic Patterns	OH-13	42	9	16	2	36
	OH-23	81	10	34	4	29
	TH-55	120	11	5	3	8
	All	243	10	36	3	37
Solo	OH-13	42	13	24	1	55
	OH-23	81	14	54	1	59
	TH-55	120	14	36	2	19
	All	243	14	29	2	12

TABLE 65

Class 19 (WOC) Pre-Solo Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Ground Operation	OH-13	42	3	22	2	9
	OH-23	46	5	37	1	47
	TH-55	82	5	36	2	20
	All	170	4	58	2	58
Takeoff and Landing to Hover	OH-13	42	5	48	1	59
	OH-23	46	8	5	2	45
	TH-55	82	7	33	3	5
	All	170	7	15	2	53
Hovering Flight	OH-13	42	6	54	2	18
	OH-23	46	10	8	3	9
	TH-55	82	8	18	3	20
	All	170	8	26	3	17
Normal Takeoff	OH-13	42	8	11	2	6
	OH-23	46	10	6	2	43
	TH-55	82	9	39	3	12
	All	170	9	24	2	56
Normal Approaches	OH-13	42	10	25	2	26
	OH-23	46	12	13	2	51
	TH-55	82	11	48	3	8
	All	170	11	34	2	59
Traffic Patterns	OH-13	42	9	16	2	36
	OH-23	46	10	59	2	59
	TH-55	82	11	1	3	4
	All	170	10	34	3	2
Solo	OH-13	42	13	24	1	55
	OH-23	46	14	59	1	47
	TH-55	82	14	30	2	21
	All	170	14	21	2	11

TABLE 66

Class 20 (O) Pre-Solo Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Ground Operation	OH-13	0	0	0	0	0
	OH-23	35	4	22	2	0
	TH-55	38	6	48	5	18
	All	73	5	38	4	14
Takeoff and Landing to Hover	OH-13	0	0	0	0	0
	OH-23	35	7	36	2	43
	TH-55	38	7	48	3	17
	All	73	7	42	3	2
Hovering Flight	OH-13	0	0	0	0	0
	OH-23	35	9	32	2	53
	TH-55	38	7	43	4	54
	All	73	8	36	4	10
Normal Takeoff	OH-13	0	0	0	0	0
	OH-23	35	9	52	2	30
	TH-55	38	9	16	2	56
	All	73	9	33	2	45
Normal Approaches	OH-13	0	0	0	0	0
	OH-23	35	12	13	2	30
	TH-55	38	11	30	3	18
	All	73	11	51	2	58
Traffic Patterns	OH-13	0	0	0	0	0
	OH-23	35	10	4	5	51
	TH-55	38	11	15	3	18
	All	73	10	41	4	44
Solo	OH-13	0	0	0	0	0
	OH-23	35	14	47	2	10
	TH-55	38	14	47	2	18
	All	73	14	47	2	14

TABLE 67

Class 19 (WOC) and Class 20 (O) Primary I Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Normal Takeoff	OH-13	42	16	18	8	14
	OH-23	81	17	18	9	30
	TH-55	120	19	48	11	5
	All	243	18	37	10	14
Traffic Patterns	OH-13	42	18	31	10	36
	OH-23	81	19	12	10	0
	TH-55	120	22	28	11	53
	All	243	20	42	11	11
Normal Approach	OH-13	42	19	0	9	33
	OH-23	81	19	34	9	22
	TH-55	120	21	48	11	2
	All	243	20	34	10	19
Maximum Performance Takeoff	OH-13	42	23	22	7	18
	OH-23	81	26	7	7	43
	TH-55	120	29	2	10	10
	All	243	27	5	9	12
Steep Approach	OH-13	42	23	13	6	58
	OH-23	81	25	13	6	51
	TH-55	120	27	46	9	33
	All	243	26	8	8	30
Takeoff from the Ground	OH-13	42	24	4	5	57
	OH-23	81	26	50	6	20
	TH-55	120	29	24	9	11
	All	243	27	37	8	3
Approach to the Ground	OH-13	42	25	30	7	3
	OH-23	81	27	45	7	0
	TH-55	120	30	38	9	48
	All	243	28	46	8	47
Autorotation Straight	OH-13	42	35	55	8	47
	OH-23	81	34	8	10	41
	TH-55	120	30	8	10	18
	All	243	32	28	10	28

TABLE 68

Class 19 (WOC) Primary I Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Normal Takeoff	OH-13	42	16	18	8	14
	OH-23	46	10	24	2	45
	TH-55	82	20	27	12	17
	All	170	16	42	10	27
Traffic Patterns	OH-13	42	18	31	10	36
	OH-23	46	12	2	4	42
	TH-55	82	23	19	13	20
	All	170	19	6	11	54
Normal Approach	OH-13	42	19	0	9	33
	OH-23	46	12	24	2	47
	TH-55	82	22	49	12	20
	All	170	19	3	10	48
Maximum Performance Takeoff	OH-13	42	23	22	7	18
	OH-23	46	20	49	4	5
	TH-55	82	29	40	10	59
	All	170	25	43	9	33
Steep Approach	OH-13	42	23	13	6	58
	OH-23	46	20	40	3	1
	TH-55	82	28	35	10	13
	All	170	25	6	8	46
Takeoff from the Ground	OH-13	42	24	4	5	57
	OH-23	46	22	53	3	31
	TH-55	82	30	19	10	1
	All	170	26	46	8	30
Approach to the Ground	OH-13	42	25	30	7	3
	OH-23	46	23	30	5	17
	TH-55	82	30	36	10	0
	All	170	27	25	8	45
Autorotation Straight	OH-13	42	35	55	8	47
	OH-23	46	31	20	11	49
	TH-55	82	32	0	11	10
	All	170	32	47	10	58

TABLE 69

Class 20 (O) Primary I Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min.
Normal Takeoff	OH-13	0	0	0	0	0
	OH-23	35	26	25	7	17
	TH-55	38	18	24	7	46
	All	73	22	15	8	32
Traffic Patterns	OH-13	0	0	0	0	0
	OH-23	35	28	34	6	52
	TH-55	38	20	36	7	28
	All	73	24	25	8	13
Normal Approach	OH-13	0	0	0	0	0
	OH-23	35	28	59	6	5
	TH-55	38	19	36	7	0
	All	73	24	5	8	4
Maximum Performance Takeoff	OH-13	0	0	0	0	0
	OH-23	35	33	5	5	33
	TH-55	38	27	42	7	59
	All	73	30	16	7	25
Steep Approach	OH-13	0	0	0	0	0
	OH-23	35	31	13	5	47
	TH-55	38	26	0	7	37
	All	73	28	30	7	17
Takeoff from the Ground	OH-13	0	0	0	0	0
	OH-23	35	32	2	5	23
	TH-55	38	27	23	6	59
	All	73	29	36	6	28
Approach to the Ground	OH-13	0	0	0	0	0
	OH-23	35	33	20	5	17
	TH-55	38	30	42	9	27
	All	73	31	54	8	47
Autorotation Straight	OH-13	0	0	0	0	0
	OH-23	35	37	49	7	32
	TH-55	38	26	6	6	27
	All	73	31	43	9	7

TABLE 70

Class 19 (WOC) and Class 20 (O) Primary II Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Confined Area	OH-13	42	52	29	1	30
	OH-23	81	52	48	2	53
	TH-55	120	54	29	9	15
	All	243	53	34	6	48
Pinnacle Operation	OH-13	42	55	36	2	6
	OH-23	81	56	29	4	10
	TH-55	120	57	30	9	12
	All	243	56	50	6	59
Formation Flying	OH-13	42	104	25	2	54
	OH-23	81	102	56	6	20
	TH-55	120	102	39	10	23
	All	243	103	3	8	13
Slope Operation	OH-13	42	55	59	2	42
	OH-23	81	56	12	4	30
	TH-55	120	58	18	9	42
	All	243	57	12	7	28
Hovering Autorotations	OH-13	0	0	0	0	0
	OH-23	58	73	40	16	3
	TH-55	81	74	36	17	47
	All	139	74	1	17	5

TABLE 71

Class 19 (WOC) Primary II Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Confined Area	OH-13	42	52	29	1	30
	OH-23	46	52	9	0	56
	TH-55	82	53	18	3	27
	All	170	52	48	2	37
Pinnacle Operation	OH-13	42	55	36	2	6
	OH-23	46	55	31	1	36
	TH-55	82	56	48	4	38
	All	170	56	10	3	33
Formation Flying	OH-13	42	104	25	2	54
	OH-23	46	102	32	7	42
	TH-55	82	102	33	10	11
	All	170	103	0	8	13
Slope Operation	OH-13	42	55	59	2	42
	OH-23	46	55	12	1	36
	TH-55	82	57	48	5	42
	All	170	56	39	4	25
Hovering Autorotations	OH-13	0	0	0	0	0
	OH-23	23	74	1	15	4
	TH-55	62	75	57	16	45
	All	85	75	25	16	20

TABLE 72

Class 20 (O) Primary II Performance Norms

Maneuver	Aircraft	N	Norm		SD	
			Hrs	Min	Hrs	Min
Confined Area	OH-13	0	0	0	0	0
	OH-23	35	53	40	4	2
	TH-55	38	56	59	15	34
	All	73	55	23	11	32
Pinnacle Operation	OH-13	0	0	0	0	0
	OH-23	35	57	42	5	53
	TH-55	38	59	1	14	43
	All	73	58	24	11	24
Formation Flying	OH-13	0	0	0	0	0
	OH-23	35	103	29	3	45
	TH-55	38	102	53	10	48
	All	73	103	10	8	14
Slope Operation	OH-13	0	0	0	0	0
	OH-23	35	57	30	6	21
	TH-55	38	59	24	15	0
	All	73	58	30	11	44
Hovering Autorotations	OH-13	0	0	0	0	0
	OH-23	35	72	40	16	38
	TH-55	19	70	14	20	10
	All	54	71	48	18	0

To determine whether Classes 19 and 20 were representative in their progress through flight training, their flight performance evaluation records were inspected and the following weak areas were discovered:

Primary I:

The OH-13 students were evaluated at a mean flight time of 34 hours and were significantly (P .05) below performance norms in:

- a. 180⁰ clearing turns
- b. 360⁰ clearing turns
- c. Maximum performance takeoff
- d. Steep approach
- e. Normal takeoff from the ground
- f. Normal approach to the ground

The OH-23 students were evaluated at a mean flight time of 35 hours, 36 minutes and were not significantly different from any of the Primary I performance norms.

The TH-55 students were evaluated at a mean flight time of 37 hours, 42 minutes and were significantly below performance norms in:

- a. 90⁰ clearing turns
- b. 180⁰ clearing turns

Primary II:

No OH-13 students were evaluated because of adverse weather conditions.

The 21 OH-23 students that were evaluated had a mean flight time of 88 hours, 30 minutes and were significantly below the performance norms in:

- a. Confined area high recon
- b. Confined area takeoff preparation
- c. Pinnacle high recon
- d. Pinnacle takeoff preparation
- e. Pinnacle takeoff

The TH-55 students that were evaluated had a mean flight time of 87 hours, 18 minutes and were significantly below the performance norms in:

- a. Pinnacle takeoff preparation
- b. Pinnacle takeoff
- c. Hovering autorotation
- d. Forced landings

Adverse weather conditions forced the cancellation of the evaluation flights for the B Division of these classes; hence, there were no OH-13 students evaluated. Of the 46 OH-23 students in A Division, 21 were evaluated; therefore, we do not have a good picture of the comparisons for Primary II. It appears that in general these classes are a bit below normal in their overall progress at USAPHS. It is possible that the weather conditions during their training were such as to account for some of this lack of progress.

DISCUSSION

The division of the performance norms into those for the WOC and those for the officers was made for two reasons; first, to show the differences in performance of these two categories of personnel, and second, to provide a general division by age and education. Again the uniqueness of the Army Rotary Wing Flight Training Program provides two mutually exclusive types of trainees. The typical WOC is a high school graduate in the age range of 18 to 20 years, while the typical officer trainee is a college graduate in the age range of 22 to 24 years. This study did not record the age and educational background of each subject, but the above figures, while not absolute, do represent the typical WOC and officer trainee that participated in this study.

There are several maneuvers in Primary I whose performance norms would indicate that the trainees were proficient in the maneuver before they started Primary I. In addition, there was a large standard deviation shown for these maneuvers. This condition occurred because, in the opinion of some of the instructors, the student was able to perform the maneuver satisfactorily to meet the Primary I requirements while in the Pre-Solo phase. Other instructors felt that these maneuvers were more demanding in this phase and required more flight instruction to acquire the proficiency desired for Primary I. Therefore, the distribution is skewed toward the 20-hour level but actually extends to the 30+ hour level in many cases. This gives performance norms of $\bar{x} = 20$ hours and standard deviations of $\sigma = 10$ hours.

Figure 2 summarizes the performance norms for all students in all aircraft for the three phases of flight training as given at USAPHS. The maneuvers are listed so that the curve is ever-increasing in flight-hours value. This is the picture of the general order in which an Army flight trainee now learns to fly a helicopter.

The purpose of this study was to present the performance norms of the trainees at USAPHS so that these data may be used in other research and for general information.

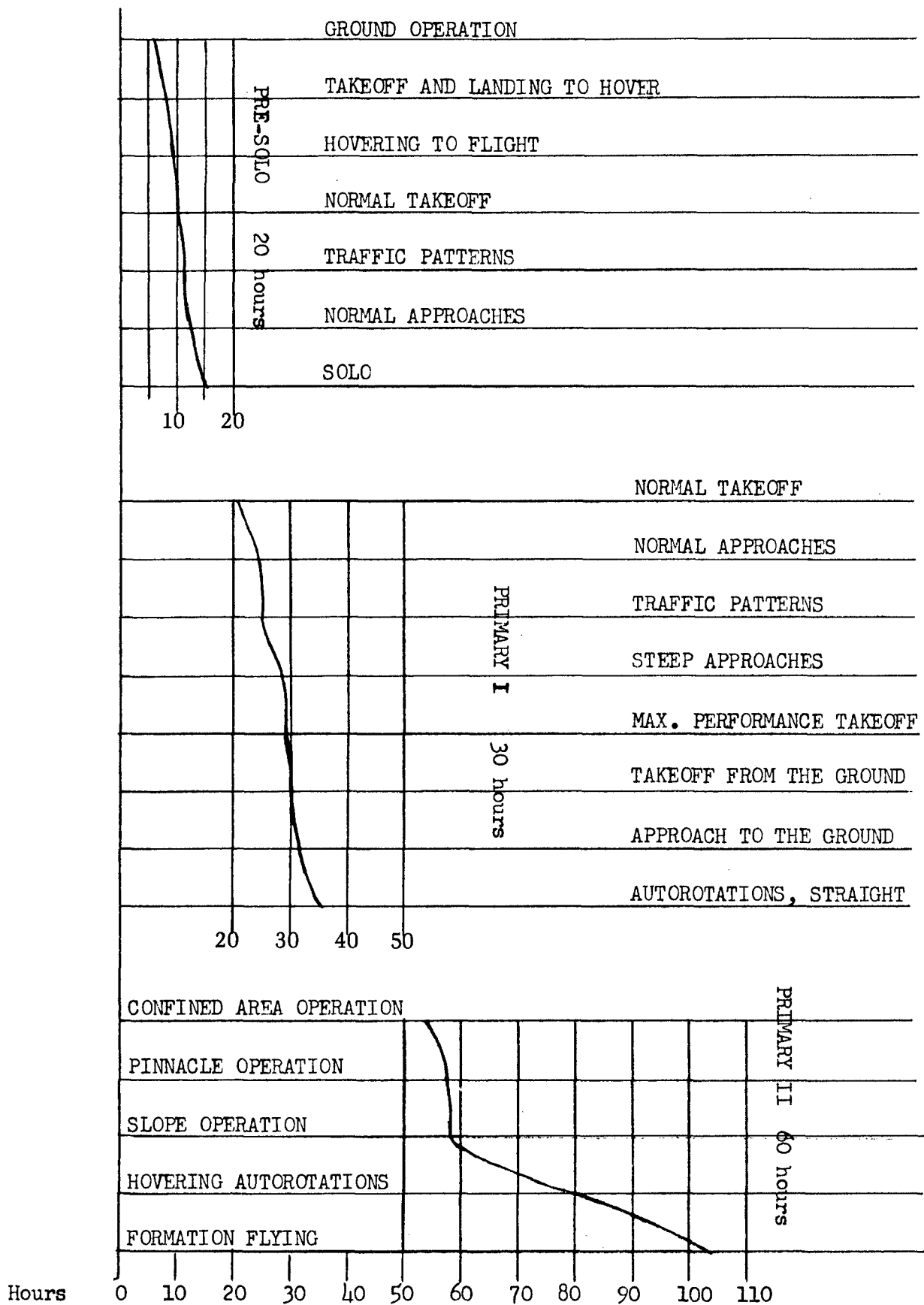


Fig. 2. SUMMARY OF FLIGHT PERFORMANCE FOR ALL STUDENTS

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13. ABSTRACT The helicopter training program of the United States Army differs from those of the other services in that nonpilot servicemen rather than fixed wing pilots are trained to fly helicopters. This report provides the performance norms of trainees at the United States Army Primary Helicopter School, Fort Wolters, Texas. The period covered is 10 November 1968 through 30 March 1969. This information is given by trainee type (officer or warrant officer candidate), by aircraft used, by maneuver part, and by maneuver.			

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