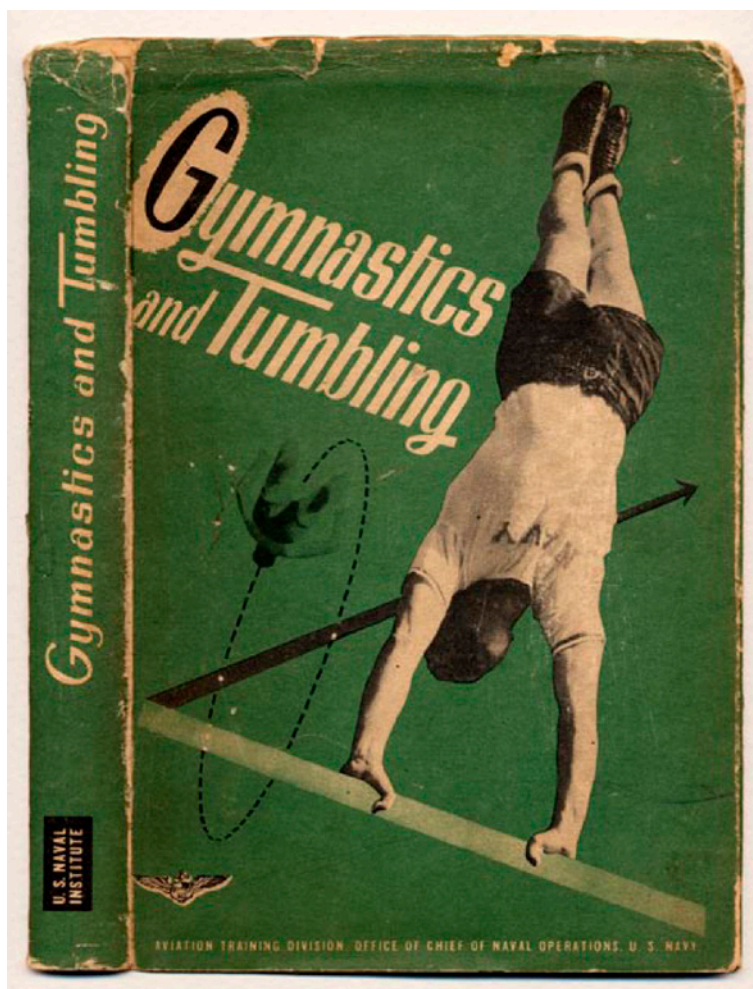


the **CrossFit** JOURNAL ARTICLES

Gymnastics & Tumbling

Greg Glassman



Gymnastics and Tumbling
Issued by the Aviation Training Division, Office of the Chief of Naval Operations,
U.S. Navy. Copyright 1944 by The United States Naval Institute

This month we review a small yet dense out-of-print book titled *Gymnastics and Tumbling*. First published by the U.S. Navy in 1944, *Gymnastics and Tumbling* is today an obscure reference in danger of extinction. We believe it is an indispensable resource for CrossFitters and intend to keep it alive.

Shortly after the United States' entrance into World War II, the United States Navy implemented a physical training program for future pilots based on training and practicing various sports: "Successful coaches were commissioned so that the Navy might have the best instruction available." The successes, methods, and refinements of these coaches-turned-officers culminated in the issuance of the Naval Aviation Physical Training Manuals by the U.S. Navy in 1944.

The manuals were prepared by and for the newly commissioned officers from their experiences in teaching thousands of aviation cadets. Their titles include: *Hand-to-Hand Combat; Boxing; Wrestling; Football; Gymnastics and Tumbling; Soccer; Basketball; Swimming; Mass Exercise, Games, Tests; The Sports Program; Labor Engineering; and Military Track.*

While our focus this month is on the *Gymnastics and Tumbling* manual in particular, much of its virtue may lie in the fact that the U.S. Naval Aviator's physical

1 of 9

Gymnastics & Tumbling (continued...)

training program in total was inspired by war; modeled from successful sport practice, not science; designed and implemented by coaches, not professors; considers sport in the military training sense of physical and mental development and not for the sake of sport or recreation alone; and, finally, was successfully taught to young men of ordinary physical capacity.

The unique and essential contribution of gymnastics to fitness, and by extension to war fighting, is brilliantly articulated in *Gymnastics and Tumbling* (G&T). At the end of the chapter titled “Brief History of Gymnastics,” we find the powerful statement that “gymnastics and tumbling contribute in large measure to the demands of a democracy at war.”

British author D.W. Brogan said of America’s entry into WWII, “For Americans war is almost all of the time a nuisance, and military skill is a luxury like Mah-jongg. But when the issue is brought home to them, war becomes as important, for the necessary period, as business or sport. And it is harder to decide which is likely to be the more ominous for the Axis – an American decision that this is sport, or that it is business.” That we turned to sport and not science to forge defenders was a wise move at a critical moment. It is also pure CrossFit to let successful practice trump more academic approaches.

The link between the values and physical benefits developed through sport training and the demands of war are demonstrated pointedly throughout G&T. The doubleedged benefit of mind and body development through fitness and sport are also well noted:

- “It is our duty to train the cadets to be superior to that enemy, mentally and physically. Rigorous, tough, competitive sports offer an excellent medium to fulfill this mission. Records have proven that mental improvement of the cadets goes hand in hand with better physical condition” (v).
- “Basedow...regarded physical activities as a means to a complete education embracing both the body and mind” (4).
- “Pestalozzi...believed that methodical exercising trained the pupil intellectually, morally and aesthetically” (5).
- “Jahn, the father of German gymnastics... wanted to create “liberty loving, social and independent thinking... by strengthening the degenerated muscle groups of

Sports Program Stunts and Record Performance

For complete descriptions and diagrams, refer to pages: [322-334](#) of the book.

On Floor

1. Balance on toes – record: 49 sec.
2. Forearm balance – record: 1 min. 47 sec.
3. Hand balance – record: 1 min. 50 sec.
4. Hand walk (floor) – record: 186 ft.
5. Hand walk (low parallels) - record: 6 trips
6. Kneeling back-bend – record: 64
7. Leg lifts and sit-ups – record: 500/500
8. Left side support – record: 130
9. Right side support – record: 130
- 10 Extension press-up – record: 4 min. 15 sec.,
no. of times – 25
- 10 a. One-arm extension press-up – record: 2 mins.
11. Push-ups on hands – record: 325
12. Push-ups on fingers – record: 84
13. Push-ups slapping chest – record: 75
14. Push-up with 9 lb. medicine ball – record: 305
15. One-arm push-ups – record: 84
16. One-half lever – record: 80 sec.
17. Sit-ups (feet not anchored) – record: 2326
- 17 a. Sit-ups – back arched – record: 75
18. Skip forward and backward over leg – record: 21
19. Squat (right leg forward) – record: 47
20. Squat (left leg forward) – record: 41
- 20 a. Jump over stick – record: 30
21. Wrestler’s bridge – record: 33
22. Eight-foot jump agility test – record: 2.5 sec.

Gymnastics & Tumbling (continued...)

the body, thus liberating man from the shackles of an environment that made him feeble, that allowed his muscles, and consequently his mental vigor, to decay” (5).

- “It is of interest to note throughout history, the rise and fall of nations has seemed to coincide with the rise and fall of the physical stamina of their people” (7).
- “Athletic professionalism for the few and a lack of strenuous participation among the many brought about a decline in the national physical stamina and a consequent decline in the power of Greece” (7).

Inspired by the demands of a world at war, these historically conscious authors denounce the then-current (1944) level of gymnastics instruction in the U.S. and blame the declining use of gymnastics apparatus in American public schools and colleges on the trend toward “mild recreational activities for the majority while strenuous competition was encouraged for the small minority.” Ironically this complaint came at a time when there were 100,000 American members in one gymnastics organization alone; today there may be fewer than 1,000 American male gymnasts over ten years old.

The Navy utilized gymnastics for the discipline’s training effects, not to make competitive gymnasts. This, in the words of Captain F.T. Ward, the Director of Aviation Training in 1943, “is the reason that the books are unlike other sports publications.” This distinction drives the program’s practical approach and explains why the authors of G&T might have stated the value of gymnastics to physical development and general physical preparedness better than most modern authors.

In the introduction to G&T the authors explain that “Gymnastics and Tumbling is included in the Naval Aviation Physical Training Program because of the strength and skills that are developed through participation in this sport. These include improvement of upper body strength, and training in quick and correct decision and action. Since there is no other activity to develop full upper body strength, agility and balance this sport occupies a prominent place in the Naval Aviation Training Program.”

The brief and powerful chapter titled “Values of Gymnastics and Tumbling” provides a list of further benefits derived from gymnastic training:

Sports Program Stunts and Record Performance *cont’d*

23. Elbow lever on deck – record: 3 min. 46 sec.
24. Forearm balance walk for distance – record: 43 ft. 9 in.
25. Hand walk fifty feet for time – record: 8.3 sec.
26. Hand walk with 9-lb. medicine ball – record: 132 ft.
27. Head balance to hand-balance – record: 8
28. Head balance, straight leg lifts – record: 45
29. Push-ups, crab position – record: 91
30. Squat balance touch knees – record: 45
31. Squat jumps – record: 156
32. Wrestler’s turnover on medicine ball – record: 33
33. Wrist twist – record: 9 1/2
34. Diving roll – record: 14 ft. 4 in.
35. Number of sit-ups in 5 min.; feet unanchored – record: 132
36. Number of sit-ups in 5 min.; feet anchored – record: 157
37. “V” position – record: 20 min. 25 sec.
38. Forearm balance to hand balance – record: 2
39. V-Roll – record: 32
40. Burpees – record: 40 in 30 sec.

On High Bar

1. Back lever – record: 53 sec.
2. Front lever – record: 19.5 sec.
3. Belly grinds – record: 26
4. Chins:
 - a. Ordinary grasp, no kip – record: 46
 - b. Reverse grasp, no kip – record: 46

Gymnastics & Tumbling (continued...)

1. Gymnastics contributes to the development of upper body strength. Over fifty percent of the cadets admitted to the pre-flight schools have been found to be deficient in the upper body strength, especially in the muscles of the shoulder girdle, the triceps, the abdomen, and the back.

2. Gymnastics provides opportunity for the development of power. Rope climbing, throwing the medicine ball for distance, and gymnastic routines require maximum effort and hence develop power.

3. Gymnastics provides for the development of muscular coordination or neuromuscular control. The fundamental activities of running, climbing, and jumping are combined in a unique way in gymnastic routines. Twisting or turning, bending, circling, and swinging movements occur in rapid succession during the routines in the upright or standing position, in the hang, the support, and in various other positions. Perhaps no athletic activity other than gymnastics and tumbling provides the opportunity for the development of maximum muscular coordination and neuromuscular control and perhaps no war activity demands the acme of muscular coordination and neuromuscular control as much as aviation.

4. Gymnastics contributes to the development of suppleness, elasticity, litheness, and flexibility, permitting full range of body movement and control.

5. Gymnastics develops a sense of relocation. A series of fast forward rolls on the mats, or hip circles on the horizontal bar, or a workout on the aerowheel or trampoline, leaves the cadet extremely dizzy at first. Two weeks of practice, however, conditions him effectively so that he makes satisfactory adjustment in a short time. Both the poise and equilibrium are outcomes of the sense of re-location, which affords an awareness on the part of the aviator that he is inverted when he is flying upside down.

6. Gymnastics develops agility – quick, easy, dexterous movements. Vaulting in a variety of positions teaches the fundamental principles of body control. The naval aviator or paratrooper may be called upon to overcome unforeseen hazards and obstacles during landing operations; hence he must be adept in vaulting and in jumping. He must have overlearned the art of vaulting to the side, in a squat position, in a straddle, end-over-end, or in a dive, easily and with minimum effort. Gymnastics, then, dovetails with training on the obstacle course

Sports Program Stunts and Record Performance *cont'd*

- c. Reverse grasp, weighted with 50 lbs. – record: 11
- d. Reverse grasp, weighted with 9-lb. medicine ball – record: 21
- e. Ordinary grasp, wide grasp and touch back of neck – record: 20
- f. Forearm grasp – record: 21
- g. Bicep grasp – record: 6
- h. Ordinary grasp; raise legs to half lever – record: 21
- i. One finger – record: 14
- j. One arm – record: 2
- k. Chin dips – record: 15
- 5. Pull-up both hands leading – record: 12
- 6. Fence vault – record: 6ft. 3 in.
- 7. Monkey hang – record: 20
- 8. Skin the cat – record: 25
- 9. Drop kips – record: 25
- 10. Free hip circles – record: 19
- 11. Forward hip circles – record: 42
- 12. Giant swings – record: 20

On Side Horse

- 1. Giant hip circles – record: 28
- 2. Scissors, ordinary – record: 58

On Low Bar

- 1. Short underswing dismount for distance – record: 10 ft. 3 in.

Parallels

- 1. Dips
 - a. Ordinary – record: 34
 - b. Reverse grasp – record: 20

Gymnastics & Tumbling (continued...)

since the most effective runner is the one who can skillfully, safely, and quickly adapt his gymnastics vaulting experience to the difficulties of the course.

7. Tumbling teaches falling safely. Practically every phase of his life as a cadet, or aviator, (or as a civilian, for that matter) may be materially aided by a knowledge of tumbling. When he first takes "boot" training, when he takes conditioning hikes when he participates in football, basketball, or any other sports activity, the cadet who can tumble is that much better equipped to save himself from injury caused by falling than one who cannot tumble.

8. The cadet who is temporarily incapacitated by minor injuries may participate in specially selected gymnastics, thus keeping in condition despite his handicap.

9. Gymnastics and tumbling develop body balance which is useful to the individual throughout life. Together with climbing, vaulting and falling, these skills are directly useful in various emergency situations.

10. Gymnastics teaches the cadet how to ascend, descend, and rest on a rope, - skills which are of paramount importance from a practical standpoint.

11. Gymnastics develops a sense of daring and courage, yet discourages foolhardiness.

12. Gymnastics develops attitudes vital to the successful naval aviator: fearlessness, initiative, decisiveness, courage, perseverance, presence of mind, selfconfidence, as well as an analytical outlook and the ability to size up a situation quickly.

The intended audience for *Gymnastics and Tumbling*, aviator cadets, were more physically ordinary than might be presumed. Pre-Flight School standards included 20 push-ups, 6 pull-ups, and a 16-inch vertical leap. The endurance and agility tests were similarly lax. Most CrossFitters would easily qualify. The G&T curriculum is designed so that "even the inexperienced officer may do a commendable job in gymnastics if he studies and follows the manual and the lesson program thoroughly."

If the pretest qualifications are too tough, Chapter XII, "Supplementary Programs," offers "Sub-Squad" programs designed to bring the cadet up to snuff. A program is offered so that "an inferior cadet may be brought up to the standards of the base within a five-week period." The sub-squad activities listed

Sports Program Stunts and Record Performance *cont'd*

- c. Ordinary, weighted with 50 lbs. – record: 15
- d. Swinging dips backward – record: 30
- e. Swinging dips forward – record: 43
- f. Swinging dips forward and backward – record: 31
2. Grasshopper walk forward and dips – record: 29
- 2 a. Grasshopper walk backward and dips – record: 31
3. Grasshopper jump and dips – record: 29
4. Grasshopper walk forward and backward dips – record: 22
5. Lion's crawl and dips – record: 16
6. Pirouettes – record: 8

Low Parallels

1. Hand balance – record: 2 min. and 16 sec.
2. Hand balance on one bar – record: 60 sec.
3. Push-ups – record: 202
4. Parrot hand balance on parallel bars – record: 24 sec.
5. Shoulder balance to hand balance – record: 6
6. Push-up (back) – record: 89
7. Tune-table (legs in half lever) – record: 31
8. Elbow lever – record: 3 min. 30.5 sec.
- 8 a. One-hand elbow lever
9. Pirouettes – record: 9
10. Straight-leg, bent-arm press to hand balance

Ropes

1. Rope climb 19 feet – record: 4.9 sec.
2. Double rope climb – record: 7.3 sec.

Gymnastics & Tumbling (continued...)

by apparatus on pages 271- 277 provide hundreds of spectacular drills on the horizontal bar, side horse, stall bars, rings, parallel bars, and medicine balls. Remember, these drills are used to ramp you up to 20 push-ups and 6 pull-ups. Most of the exercises here could be done by anyone. How long have we searched for interesting regimens preparatory to basic calisthenics?

In 450 pages, nearly one thousand exercises, and hundreds of photographs there isn't one exercise of advanced or even intermediate difficulty. The progressions are gentle, sweet, and easy. They were designed for full-grown men of moderate fitness and ability, largely inexperienced and quite possibly terrified, and, as likely as not, disinclined to falling or being upended or inverted. We say the progressions are "gentle" or "universal."

The aviation cadets' training attention was split among eleven "conditioning departments" of which gymnastics and tumbling was but one. Gymnastics was "one period" each day. Not every facility had adequate equipment, so a section titled "When Regulation Equipment Cannot Be Secured" describes homemade substitutions for mats, horizontal bars, parallel bars, vaulting box, springboard, and beat boards. The spirit of G&T is one of inclusiveness and "can-do" resourcefulness.

Mining gymnastics for even fractions of the adaptations of the gymnast and not for artistic expression; employing doable progressions; coupling and compromising gymnastic training with other fitness goals and efforts; and emphasizing the mental and character demands of training are all fundamental to the aims of Gymnastics and Tumbling and a near perfect match to the CrossFit charter.

Essential to the CrossFit concept is balanced competency in the ten general physical skills: cardiovascular/respiratory endurance, stamina, strength, flexibility, power, speed, coordination, agility, balance, and accuracy. Gymnastics has no peer among training modalities for developing the four neurological components of the ten skills—coordination, agility, balance, and accuracy.

In our Santa Cruz, CA, facility, our better athletes play with and practice basic gymnastics movements regularly if not daily. We have parallel bars, rings, mats, and a pommel horse set up at all times. Unfortunately, this aspect of our local athletes' training hasn't carried over strongly to our Internet friends following the WOD (Workout of the Day). A lack of equipment and

Sports Program Stunts and Record Performance *cont'd*

3. Rope climb with 27.5-lb. pack – record: 8.2 sec.
4. Inverted rope climb – record: 7 sec.

Rings

1. Hand balance – record: 45 sec.
2. Pull-ups both hands leading – record: 9
 - 2 a. Inverted hang – record: 36
 - 2 b. Chins with legs in half-lever – record: 20

Stall Bars

1. Flags – record: 23 sec.
2. Leg lifts – record: 81 times
3. Half lever with 9-lb. medicine ball – record: 41 sec.

Medicine Ball

1. Throw for distance - 9-lb. ball – record: 50 ft.
2. Throw for distance - 6-lb. ball – record: 63 ft. 6 in.

general unfamiliarity with the fundamental exercises of gymnastics within our larger community has resulted in the neurological skills development of the CrossFit community not keeping pace with the other components of fitness.

To remedy this, i.e., to increase our community's coordination, agility, accuracy, and balance, we commit to the following:

- Familiarizing the CrossFit community with the U.S. Navy's Gymnastics and Tumbling book (G&T).
- Encouraging those following the WOD to practice and train one of the basic movements from G&T before each workout as part of an extended warm-up.
- Encouraging CrossFitters everywhere to acquire access to parallel bars, rings, mats, etc.
- Posting pictures of athletes' efforts and successes with the basic movements.

Gymnastics & Tumbling (continued...)

- Generally fostering stronger gymnastics awareness, participation, and instruction through the CrossFit website. We want you to use *Gymnastics and Tumbling* for inspiration, as a checklist for movements learned, as a means to discover new low-challenge bodyweight exercises, and as a contextual reference for greater gymnastics involvement and communication.

There is so much right about G&T. It exists solely to quickly and efficiently extract the gymnastic advantage, was tested and proven with full-grown adults, contains nearly 1,000 exercises, many of which anyone can do (check-out the Squad D and C stunts), and is well illustrated and cleverly diagrammed. The stick figures are wonderful, the aviator records for various stunts are motivating, and the spirit and tone is pure CrossFit—serious yet fun, pragmatic, and challenging.

Sadly, our raving about G&T over the past few months has quickly removed enough copies from the market that the few that remain available have risen nearly 400% in price to over \$40. We don't relish *Gymnastics and Tumbling* reaching \$500, but there will always be more CrossFitters than copies—unless we are able to persuade the US Naval Institute to commission another printing. Until that time, we have resolved to share our copy with everyone.

We scanned our copy of *Gymnastics and Tumbling*, sacrificing one book for the cause, and we're making it available chapter by chapter for everyone to download free of charge.

Get to work! Post your frustrations, wounds, and successes to comments.



Table of Contents

(From the book, "Gymnastics and Tumbling")

Cover Pages (7.5 MB)

	PAGE
STAFF (Revised Edition of All Manuals)	iii
STAFF (Revised and First Editions of Gymnastics and Tumbling Manual)	vi
PREFACE	ix
INTRODUCTION (First Edition)	xi
INTRODUCTION (Revised Edition)	xii

CHAPTER

I Brief History of Gymnastics (4.6 MB)	3-9
Earliest History	3
Middle Ages	3
Modern Times	4
Pioneers of Gymnastics in the United States	8
II Values of Gymnastics and Tumbling (1.6 MB)	10-12
Objectives	10
Gymnastics Dovetails with Other Departments	10
The Purpose of the Program	11
Values	11
III Facilities, Equipment, Maintenance, Substitutes (5.6 MB)	13-22
Indoor Facilities and Equipment	13
Indoor Gymnasium	13
Outdoor Facilities and Equipment	17
Outdoor Gymnasium	17
Placement of Equipment in Indoor Gymnasium	19
Care of Equipment	19
Adequate Provision for Safety	21
When Regulation Equipment Cannot Be Secured	21
IV Principles of Teaching Applicable to Gymnastics and Tumbling (1.7 MB)	23-26
V Safety Methods and Devices (12.9 MB)	27-45
The Art of Spotting or Guarding the Performer	29
Hints for Instructor	29
Tumbling and Stumbling	30
Application of Tumbling and Jumping Activity to Parachute Training	37
VI Warm Up and Conditioning (2.4 MB)	46-50
Warm Up Procedures	46
Principles Involved in Lesson Planning	47
Elementary Training or Conditioning	48
Advanced Training or Conditioning	49
VII Gymnastic and Tumbling Nomenclature (20 MB)	51-87
Gymnastic Apparatus and Their Parts	51
Gymnastic Nomenclature or Standard Terminology	59
Miscellaneous Gymnastic Terms	69
Tumbling and Balancing Nomenclature	77
Singles	77

Gymnastics & Tumbling (continued...)

Doubles and Triples	82
Miscellaneous Tumbling Terms	83
Balancing	85
Competitive Terminology	87
VIII Gymnastic Apparatus Activities (51.5 MB)	88-167
Horizontal Bar Grasps (In Side Hang)	88
Low Bar	89
High Bar	97
Parallel Bars	110
Side Parallels	126
Rings	129
Buck	140
Side Horse	142
LongHorse	155
Elephant	158
Tiger Leaping	163
IX Climbing Activities (10.4 MB)	168-183
Ropes	168
Cargo Net	177
Climbing Shelf	181
Poles	182
X Balancing and Tumbling Activities (31.8 MB)	184—238
Balancing	184
Singles	184
Doubles	190
Triples	194
Pyramid Building	198
Balance Beam	212
Jumps	214
Tumbling	216
Singles	216
Doubles	232
Springboard	236
XI Trampoline Activities (21.6 MB)	239-266
The Fundamentals of Trampoline Activity	241
Progressive Series of Trampoline Stunts	244
Additional Trampoline Stunts	250
Comprehensive List of Trampoline Stunts with Difficulty Rating	260
XII Supplementary Programs (10.8 MB)	267-291
Sub-Squad	267
Administrative Forms	267
Sub-Squad Activities	271
Injured Cadets	277
Administrative Forms	277
Activities for Cadets with Leg Injuries	279
Activities for Cadets with Arm and Chest Injuries	281
Free Exercises	282
Climbing Poles	283
Horizontal Ladder	283
Pulley Weights	284



Gymnastics & Tumbling (continued...)

Exercises with Partner	286
Self-Testing Activities (Doubles)	287
Exercises on Benches	288
“Follow the Leader”	289
Individual Development Room	289
Officers’ Conditioning Department	291

XIII Competitive Developmental Gymnastics in an

Intramural Sports Program (21.7 MB)	292-348
Objectives or Desired Outcomes	292
Organization and Administration	292
Rules and Regulations	294
Explanation Day	294
Sports Program Stunt Forms	298
Squad A Varsity Stunts	319
Man Against Man Competition	321
Sports Program Stunts and Record Performances	323
Squad A Inter-Squad Meets	338
Suggested Gymnastic Stunts and Routines	340
Rings	340
Parallel Bars	342
Horizontal Bar	343
Ropes	344
Tumbling	345
Outdoor Gymnasium Sports Program	347
Summary	348

XIV Suitable Relays for Upper Body

Development (7.5 MB)	349-359
Solo Relays	349
Doubles Relays	352
Group Relays	356

APPENDICES (35 MB)

The Naval Aviation Gymnastic and Tumbling Program	
Application to School Teaching	360
APPENDIX I. Lesson Plans	363
APPENDIX II. Core and Supplementary Activities for Flight	
Preparatory and War Training Service Schools	441
APPENDIX III. Elementary Progressive	
Gymnastic Stunts	451
Index (6.7 MB)	463

[Download the Whole Book \(254 MB\)](#)

Greg Glassman is the founder (with Lauren Glassman) of CrossFit, Inc. and CrossFit Santa Cruz and is the publisher of the *CrossFit Journal*.