Master Class: Building the Perfect 100m Sprinter From Start to Finish

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Assistant Track & Field Coach
Brown University
Background

Brown University
Assistant Track & Field Coach 1st Year

Wheaton College
Co-Head Track & Field Coach 2008-2010

Wheaton College
Assistant Track & Field Coach 2004-2008

University of Houston
Assistant Track & Field Coach 2001-2004

Sam Houston High School
Assistant Track & Field Coach 1999-2001

Bridgewater State College
Assistant Track & Field Coach 1998-1999
Training & Philosophy

- Vince Anderson
- Fletcher Brooks
- Leroy Burrell
- Ed Delgado
- Steve Dudley
- Ron Grigg
- Reuben Jones
- Todd Lane
- Boo Schexnayder
- Dennis Shaver
- Paul Souza
- Mike Takaha
- Tom Tellez
- Latif Thomas
- Kebba Tolbert
- Derek Yush
- All The Athletes I Have Worked With
3 Major Factors to Consider

- Biomechanical Aspect
- Physical Aspect (Training)
- Psychological Aspect
Biomechanical Aspect

- Block Set Up
- “On Your Mark”
- “Set”
- “Bang”
- Acceleration
- Maximum Velocity
- Deceleration
Block Set Up

• Which foot goes in the front block?
  – Legs Example
Block Set Up

• Approximately 2 feet from the starting line for the front block
• Approximately 3 steps from the starting line for the back block
• Front block at 45 degrees (water hose)
• Back block at 55 degrees
"On Your Mark"

Back block 3+ foot lengths behind line so that back knee is 4+ inches in front of the front toe.
Back thigh is perpendicular to ground.
Back toe is just touching the ground.
Back block at 55 degrees.

Front block 2 foot lengths from line so that front knee splits mid line of arm.
Front shin parallel to ground.
Front toe has 1+ inch on track for dorsiflexion.
Front block set 45 degrees.

The athlete should be in a comfortable position with weight evenly distributed between 2 hands, back knee and front hip balanced from front to back and from left to right.

Back slightly rounded.
Head in natural alignment with spine.

Hands in bridge.
Shoulders directly over hands.
“Set”

Hips significantly higher than shoulders. “Seesaw”
Knee angles of approximately 90 and 135 degrees.
Weaker athletes need higher hips and larger knee angles.
Shins are parallel to one another.
Front shin is at about a 45 degree angle with ground.

Back slightly rounded.

Head remains in natural alignment with spine. Focus of eyes shift back as body rises to set.

Place the back foot on the back block by lightly pressing the heel and putting achilles on stretch. (This picture does not show full footed pressure).

Front shin and foot angle should form a 90 degree angle.
Raise simultaneously and in harmony with hips and both knees in unison. There may be a SLIGHT displacement forward. Allow the center of mass to be as high as possible. Weight remains evenly distributed. No additional weight left on hands from the “on your mark” position. You may feel the weight shift from middle finger to index finger. Bulk of the weight is felt on front hip, not the hands. This is achieved by placing your feet on the blocks as you come up to set rather than pressing your feet into the blocks (this causes a push forward). Weight is distributed between 2 hands and front hip. If one is balanced, this position can be held for a considerable amount of time.
Hip Height
Too Much Forward Lean?
“Bang”/Block Clearance/Zero Step

The back arm (left in this case) will sweep long and low at the gun corresponding to the long force application on the front block. The arms stroke from the shoulders. The back arm will open significantly at the elbow. The front arm will stroke forward and up with the hand high and well in front of head. This longer arm action will allow time for hip to extend forcefully and completely.

You will see the back foot move backwards on block quickly, eliciting a stretch shortening across the achilles. There should be no effort to pull the back foot off the block. It will come forward naturally in reaction to the long forceful application on the front block. The path of the foot will be low and piston like. It will not cycle forward to the butt.

Head and shoulders WILL come up quite a bit, creating a line of power from the ankle through the knee, hip, torso and head. Head remains in natural alignment. Line of sight changes as body angle changes.
“Bang”/Block Clearance/Zero Step

At the gun the athlete will drive the front foot on the front block extending at the hip, knee, and eventually the ankle (triple extension). Relatively equal horizontal and vertical force will be in use to project the body at a 45-degree angle. The arms will stroke violently. There should be NO ATTEMPT to be quick here. There needs to be long and complete force application. While this may “feel slow” to the athlete, the body will actually be moving toward the finish line faster. The athlete must “re-set their hasty timing to a new sense of time and get accustomed to spending longer in that movement”. This new feeling allows the body to get into the best position for continued acceleration even further down the track.

***ROM Drill
Retrain the Brain

• The greatest teacher of all time once said, “You must unlearn everything that you have learned.”

• The athlete may feel slow, but they are putting their body into the right position to continue to drive/push.

• They may feel slow, but they are moving faster through space as evidenced by the drill we just did.

• The pushing will allow them to continue to accelerate down the track (not just stand up and run).
Flight of the Back Foot

- The path of the back foot should be low and piston like.
- The back foot should travel forward through the front /opposite ankle (skate).
- After the back foot “skates” through the opposite ankle it will continue forward causing the knee to move in front in a “Hard Z” position.
- The foot should not cycle toward the butt.
Banana Hurdle Start
Prerequisites to Block Work

• These drills need to be mastered before having athletes come out of blocks.
  * Wall Drill
  * Push Up Start
  * Rollover-Push Up Start
  * Skate Start
  * Hop-hop-split-skate Start
  * Donkey Kick Start
  * 3 Point Start
  * 4 Point Start
  * Stick Drills Without Blocks
  * Explosive Medicine Ball Throws

• Using blocks is a reward, not a gift.
Wall Drill
Push Up Start
Roll Over Push Up Start
Skate Start
Hop-Hop-Split-Skate Start
Donkey Kick Start
3-Point Start
4-Point Starts
Stick Drill Without Blocks
Explosive Medicine Ball Throws
OHB
Explosive Medicine Ball Throws
UHF
Explosive Medicine Ball Throws
UHF + Chase
Block Work

- Block Blast onto PV wedge (0,1,2 steps)
- Block Blasts with Resistance (Bullet Belt)
- Block Bounds
- Banana Hurdle Start (already covered)
- Stick Drill Out of Blocks
Block Blasts on PV Wedge
Block Blasts with Resistance (Bullet Belt)
Stick Drill Out of Blocks
FUN FACTS:
Top athletes can generate 30% of their top velocity in the initial thrust (zero step).
They can generate more than 50% by their 2nd step.
By step 10, 80% or more of their top velocity can be achieved.
Acceleration

• Defined as the rate of speed increase.

• Athletes are always trying to accelerate as fast as possible.

• We need to retrain this as well.

• Athletes should not rush this process.
• The amount of time on the ground is significantly greater and the time in the air is shorter during this process than later in the race. (feels slow)
• The ratio changes through acceleration and transition to maximum velocity as ground contacts shorten and air time increases.
• The body angle will increase 5 to 10 degrees with each step, therefore so should the shin angle at the point of contact.
• The body remains in a power line from ankle, through the knee, hip, torso, and head. (POGO Stick)
• Avoid collapsing at the ankle, knee, or hip.
• Stable strike on the ball of your foot under or even behind the center of mass.
• Full strides down and back allowing the hip and knee to extend.
• Arm strokes remain full in a downward and backward direction, the elbow straightens and re-flexes on the backside.
• “Run on your feet but with your hands”.
• There is absolutely nothing quick or small about acceleration.
• Cue power, not quickness.
• It requires patience to push violently.
• Each push becomes a little less horizontal and a little more vertical.
• Correct extension into and off the track with one leg will yield effective reactionary recovery of the opposite leg.
Acceleration Drills

• Acceleration Drills With Build Ups
  • Straight leg bound
• Acceleration Drills With Bullet Belt
  • Walk, March, and Run & Release
• Light Sled Pulls
• Various Starts w/ Weighted Vest
• Short Hills
• Short Stick Drills (Vince Anderson)
Straight Leg Bound w/ Build Up
Acceleration Drills w/ Bullet Belt Walk
Acceleration Drills w/ Bullet Belt
A Skip
Acceleration Drills w/ Bullet Belt
Power A Skip
Acceleration Drills w/ Bullet Belt
Accelerate & Release
Acceleration Workouts

- Block Work (10-30m)
- Light Sled/Tire Pulls with various starting techniques (up to 30m)
- Short Hill Work (up to 30m)
- Longer Stick Drills (up to 30m)
- Combination Workouts
  - 4 x 4 x 30m 2-3’ btw reps and 5’ btw sets
    - even sets with light tire
    - odd sets with no resistance
“10 Stride Test”

• Measure how far the athlete can push their hips down the track in 10 steps from the starting position of your choice (blocks, 3pt, push up, etc…).

• Rules:
  – Proper block and acceleration mechanics.
  – No reaching!
  – Once mechanics break down the attempt does not count.
  – Do not compare athletes to one another.
Legends of the Sprints
Maximum Velocity

- Posture
- Upper Body
- Lower Body
Undulation should occur if proper posture, arm, and leg mechanics are being applied. Vern Gambetta preaches P.A.L.

- P = Posture
- A = Arm Action
- L = Leg Action
Drill for Posture

• While standing, put the knee and toe in running posture, then extend onto ball of the foot to feel the running position.
  – Pose with help, pose without help, walk it, march it, step over low hurdles (just stay tall).
  – Most people do not feel this in max v.
  – They need to learn it, love it, live it.
Drill for Posture
Good Posture With A Lean

- Forward lean is a function of acceleration, not maximum velocity.
- Forward lean comes from the ankles.
- No bubble butts – hips tall.
- Cues for body position while standing:
  - Keep hips forward
  - Bring belly button to your spine
  - Slight forward lean from the ankles
- Drill – ankle pops with tiny hops forward.
Body Position
Body Position Drill
Double Ankle Pops
Single Ankle Pops
1. POSTURE. Dynamically stable core with slightly posterior facing pelvis (hips rotated up slightly) to help stay erect.
2. HIP EXTENSION. High speed sprinting creates great flight times.
3. FOOT CONTACTS (see slide on lower body).
4. ARM STROKE (see slide on arms).
5. RELAXATION. While working maximally and optimally from the hips and shoulders, having relaxed head and chin positions and poised execution of mechanics allows for uninhibited force application and graceful yet minimized deceleration.
Arm Action

The arms stroke from the shoulders (just as the legs work from the hips). Arms are used to counterbalance and loosely mimic the movements of the legs. The arm stroke is a downward movement that will cause the angle of the elbow to open and the arms to swing backward. The backward swing will cause a stretch across the shoulders and chest, which will assist in the arms movement forward. On the front side the arm angle will close to about 60 degrees. As the arm strokes down, it will open up to 90 degrees as it passes the hip, and it will reflex to a backside angle of about 100 degrees.
The arm stroke also contributes to vertical impulse (up to 10%), as both arms travel downwards and upwards simultaneously. There should be no breaking or flipping at the wrist. The thumbs should remain neutral. Open fingers may help an athlete “feel” the stroke by creating a slightly longer lever. However open hands should not be a cause for tightening in the arms or shoulders. Relaxation is of supreme importance. The hands should not be rigid regardless if they are open or closed. If they are closed use a cue like “catch a butterfly”. Arm tempo and range of motion may help an athlete easily attain proper tempo and range of motion in the legs.
Arm Drill
Lower Body

- Cues for lower body while running:
  - Think knee up and foot down.
  - Too much to think toe up, knee up, heel up then foot down.
  - Latif Thomas says, “Step over and drive down”.
  - Push underneath your center of mass.
  - No reaching.
  - Force application at ground contact is most important.
As the foot approaches the track (moving down and backward due to extension at the hip) and ankle is stabilized in a neutral position (approx 90 degree angle with shin) in preparation for ground contact, it looks as though the heel will strike first. However, due to proper flight times from previous vertical forces and great rotational speeds of the upper leg, the heel just misses the ground. The outside ball of the foot will touchdown first on the spike plate and at mid-stance there is a yield or amortization as the heel does lightly touch the ground (athletes does not feel this). The foot/ankle is loaded and unloads in a spring like fashion with another vertical force. Leg stiffness will increase vertical impulse and decrease ground contact time. As the foot touches the ground the knees should be close together and the back heel should be high.
Max Velocity Drills

- A skips, high knees, and butt kicks
- Resisted runs into build ups
- Wicket drills (Vince Anderson)
- 30m three different ways
A Skips
High Knees
Butt Kicks
30m Three Different Ways

• Increasing stride length or stride frequency should increase speed
  – Long Strides
  – Short Strides
  – Middle Strides
Max Velocity Workouts

• Assisted runs (pulley or bungee)
• Light downhill running
• Fly work (10, 20, 30, etc…)
• In and outs
## Fly 30m

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Acceleration + Max V

• Race Modeling Drill (Dennis Shaver)
  – 10m Straight Leg Bound
  – 10m Drive/Acceleration
  – 10m Transition
  – 10m Max V/Striking
  – 10m Float/Deceleration

• After this drill is mastered you can have the athletes come out of blocks and start to adjust the segments to match the race.
Acceleration + Max Velocity
Deceleration

- Stay relaxed!
- No antagonistic muscles.
- Maintain mechanics.
Race Distribution

• 100 Meters
  – (1) Starting Block (set up)
  – (2) Starting Block Clearance (0-5 meters)
  – (3) Drive Phase/Acceleration (5-15 meters)
  – (4) Transition (15-30 meters)
  – (5) Maximum Velocity (30-60 meters)
  – (6) Speed Maintenance (60-100 meters)
Dipping at the Line

• Pet peeves

Charlie Paddock
Physical Aspect (Training)

• Vocabulary
• Triangle Training Method
• Training Within a Micro Cycle
• Strength Training
• Multi Throws & Jumps
• Testing
Vocabulary

• Acceleration
• Maximum Velocity
• Speed Endurance
• Extensive Tempo
• Intensive Tempo
• Special Endurance I
• Special Endurance II
Vocabulary

- **Acceleration:**
  - Always done at 100% intensity
  - Length of runs are 10-30m
  - Total volume ranges from 180-360m
  - 2-6’ recovery (3’ for ATP to fully restore)
  - Examples include:
    - Light sled pulls with various starting techniques (up to 30m)
    - Short hill work (up to 30m)
    - Longer stick drills (up to 30m)
    - Block 10-30m runs
    - Combination workouts
      - 4 x 4 x 30m 2-3’ btw reps and 5’ btw sets
        » even sets with light tire
        » odd sets with no resistance
Vocabulary

• **Maximum Velocity:**
  – Always at a 100% intensity
  – Length of runs are 40-150m
  – 120-450m of total volume
  – Examples include:
    • Assisted runs (pulley or bungee)
    • Light downhill running
    • Fly work (10, 20, 30, etc…)
    • In and outs
Vocabulary

• **Speed Endurance:**
  – Once the athlete has improved their maximum velocity and can produce this new max v consistently, you can begin the speed endurance phase.
  – 2 types of Speed Endurance
    • Short Speed Endurance
    • Long Speed Endurance
Vocabulary

- **Short Speed Endurance**
  - Greater emphasis on speed
  - Used to bridge capacity and power while maintaining technique
  - Submaximal runs with controlled recoveries
  - Length of runs are 30-80m (around race distance)
  - Example:
    - 4x4x60m @ 90-95% w/ 1-3’ rec. btw reps and 6-8’ btw sets
Vocabulary

- Long Speed Endurance
  - Lactacid power and capacity
  - 90-95%
  - 3-8’ recovery
  - Length of runs are 80-220m (longer than race distance)
  - 300-900m of total volume
  - Example:
    • 4-6 x 120m at 90-95% with 3-6’ recovery
Vocabulary

• Extensive Tempo:
  – Aerobic Capacity
  – 70-79% of P.R.
  – 15”-3’ recovery
  – Length of runs greater than 100m
  – 1200-1800m in total volume
  – Examples include:
    • 6-10 x 200m @ 70-79% with 2-3’ recovery
    • 4 x 4 x 100m @ 75% with 1’ rec btw reps and 3’ btw sets (16x100m=1600m)
Vocabulary

• **Intensive Tempo:**
  – Lactacid capacity (mixture of aerobic & anaerobic)
  – 80-89% of P.R.
  – 30”-6’ recovery
  – Length of runs greater than 80m
  – 800-1800m of total volume
  – Examples include:
    • 6-10 x 150m @ 80-89% with 2-4’ recovery
    • 4 x 250m @ 80-85% with 2-3’ recovery
• **Special Endurance I:**
  – Lactacid power
  – 90-98% of P.R.
  – 8’ or more for recovery
  – Length of runs are 80-300m
  – 300-1000m of total volume
  – Examples include:
    • 60, 90, 120, 150m at 95% with 10-15’ recovery
    • 4 x 120-200m at 90-95% with 10-12’ recovery
Vocabulary

• **Special Endurance II:**
  – Lactacid tolerance
  – 95-100% of P.R.
  – Full recovery
  – Length of runs are 60-300m
  – 180-900m of total volume
  – Examples include:
    • 3 x 150m @ 100% with full recovery
    • 2-3 x fly 100m runs with full recovery (confidence builder)
Triangle Training Method

Old School 12 Week Triangle

Weeks 1-3: 70%
- Slow paced intervals with very short recoveries

Weeks 4-6: 80%
- Medium paced intervals with short recoveries

Weeks 7-9: 90%
- Fast intervals with longer rest

Weeks 10-12: 100%
- Speed
Triangle Training Method

Speed Triangle

Tempo Triangle
Triangle Training Method

Special Endurance II
Special Endurance I
Intensive Tempo
Extensive Tempo

Tempo Triangle
Triangle Training Method

- Speed Endurance, Max V, & Acceleration
- Max V & Acceleration
- Acceleration

Speed Triangle
Triangle Training Method

\[ \text{Green Triangle} + \text{Yellow Triangle} = \text{Hexagram} \]
Special Endurance I & II are the main focus

Acceleration and Extensive Tempo

Championship Season

Acceleration, Max V, and Speed Endurance

Beginning of the Season

Acceleration, Max V, and Intensive tempo

Acceleration and Extensive Tempo
Triangle Training Method

- Each section prepares you for the next section.
- Each section builds your work capacity.
  - Work Capacity
    - Defined as capacity at high intensity plus reasonable volume, NOT high volume with low intensity.
- Each section better prepares you for race distances at the highest possible speeds.
Training Within A Micro Cycle

• Each day of the week has a theme.
• Try to stay with that theme throughout the day.
• Micro cycle without a meet (early season).
  – Monday – Acceleration
  – Tuesday – Tempo
  – Wednesday – General
  – Thursday – Max Velocity
  – Friday – Tempo
  – Saturday – General
  – Sunday – Rest or Restoration
Training Within A Micro Cycle

- Micro cycle with a track meet (mid-season)
  - Monday – Acceleration/Max Velocity
  - Tuesday – Tempo or Speed Endurance
  - Wednesday – General
  - Thursday – Tempo or Speed Endurance
  - Friday – Pre Meet Ritual
  - Saturday – Track & Field Meet
  - Sunday – Rest or Restoration
Training Within A Micro Cycle

• Micro cycle with a track meet (late season)
  – Monday - Special Endurance I or II
  – Tuesday - General
  – Wednesday - OFF
  – Thursday- Acceleration
  – Friday – Pre Meet Ritual
  – Saturday - Track & Field Meet
  – Sunday – Rest or Restoration
Training Micro Cycle

• What do you do if you have more than one track meet during a week?
Training Within A Micro Cycle

• Things to use during any given session:
  – Specific Warm Ups
  – Technique
  – Running Workouts
  – Multi Jumps
  – Multi Throws
  – Strength Training
  – Static Flexibility
Training Within A Micro Cycle

• Not only does each day have a theme, but each week should have a theme.
• Examples include:
  – Speed/Technique
  – Strength
  – Work Capacity
  – Restoration
• Another example includes:
  – Week 1 Medium
  – Week 2 Hard
  – Week 3 Medium
  – Week 4 Easy
Testing

• 5 Biomotor Abilities (USATF Coaches Ed.)
  – Speed
  – Strength/Power
  – Coordination
  – Flexibility
  – Endurance

• Assesses Strength & Weaknesses
Testing

• 2 Day Testing
• Day 1 Testing includes:
  – SLJ (standing long jump) which tests power & coordination
  – Fly 30m which tests speed
  – OHB (over head backwards throw w/ shot put) which tests power and coordination
  – 150m which tests speed and speed endurance
Testing

• **Day 2 testing includes:**
  – STJ (standing triple jump) which also tests power and coordination, but also aids in identifying acceleration capabilities
  – Block 30m which tests power and coordination, but also aids in identifying acceleration capabilities
  – UHF (underhand forward throw w/shot put) which tests power and coordination
  – 300m which tests endurance, overall fitness level, and it helps find out who the “gaming” are in the group
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</table>
Strength Training

• Weight Room
• Multi Throws
• Multi Jumps
Weight Room

• Variety of Lifts

• Timing is Everything!!!
Weight Room

• Weight Room Exercises
  – General Strength
  – Static/Body Building Lifts
  – Olympic Lifts
  – Ballistic Lifts
Weight Room

• General Strength
  – Body weight exercises that do not involve any external loading.
  – These activities improve muscular strength, strength endurance, coordination, and active flexibility.
  – If an athlete can manipulate their own body weight, then external loading may make sense.
General Strength

Circuit 1
- Push Ups
- Prisoner Squats
- V-Sits
- Back Hypers
- Push Ups w/ Clap
- Dips
- L-Overs
- Leg Toss
- Prone Opposite Arm/Leg
- Crunches

Circuit 2
- Incline Push Ups
- Single Leg Squats
- Crunches w/ Twist
- Decline Push Ups
- Yogis
- Side Ups
- Back Hypers w/ Twist
- Single Leg Toe Raises
- Toe Touches
- Rocket Jumps
General Strength

Monster:
25 V-Sits
25 Prisoner Squats
50 In-Place A-Skips
25 Chinnies
25 Push Ups
25 Fire Hydrants
25 Trail Leg Circles
15 Four Count Thrusts
25 Crunches
10 Rocket Jumps
# General Strength Scramble Circuit

<table>
<thead>
<tr>
<th>Exercise</th>
<th>1 – Fwd Summersault</th>
<th>1 – Rocket Jump</th>
<th>10m Sprint</th>
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<tr>
<td>Push Ups</td>
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<tr>
<td>Push Ups w/ Clap</td>
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<td>Dips w/ Hip Thrust</td>
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<td>Speed Skaters</td>
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<td>L-Overs</td>
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<td>Back Bend Push Ups</td>
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<td>Flutter Kicks</td>
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<td>Hyland Fling</td>
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<td>4-Count Thrust</td>
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</table>
General Strength

• Alternatives to body weight circuits:
  – Med ball exercises
  – Kettle bell exercises
General Strength Medicine Ball Routine

Medicine Ball B

1. Seated Roll Toss: 2x10
   - Sit on the ground with your legs slightly bent and feet flat on the ground.
   - Hold the ball over your head with your arms completely outstretched.
   - Roll back with your arms still over your head until the ball touches the ground.
   - Then roll forward releasing the ball when your reach the starting position.

2. Standing Shoulder Toss (L & R): 2x10
   - Stand with your torso slightly twisted to one side with the ball at shoulder length close to your body.
   - Throw the ball from the shoulder.

3. Reach and Hike: 2x10
   - Stand with your back facing your partner.
   - Bend at the waist keeping your head, neck, and back inline.
   - Toss the ball through your legs.

4. Kneeling Good Morning: 2x10
   - Kneel on the ground holding the ball over your head.
   - Bend at the waist keeping your head, neck, and back inline.
   - Once your torso is parallel to the ground return to the upright position.

5. Hurdle Reach: 2x10 (R & L)
   - Stand with the ball short height in front of you.
   - Bring one leg up and touch the ball.

6. Lunges Crossover: 2x10
   - In the lunge position; knees slightly flexed, hold the ball at your chest.
   - Lower body bending at the hips and knees. Keep torso upright.
   - Once your have reached the full lunge position, twist your trunk toward the side your are lunging to.
   - Twist back and return to the starting position.

7. Kneeling Forehead Forward Face: 2x10
   - Kneel facing your partner.
   - Hold the ball over your head.
   - Toss the ball using your arms and some of your upper body.

8. Back Toss:
   - Stand holding the ball behind your back.
   - Squat slightly and toss the ball over your head.

9. Kneeling Overhead Exchange: 2x10
   - Kneel on the ground with your partner standing behind you.
   - Reach back over your head to give your partner the ball.

10. Seated Russian Twists: 2x10
    - Sit back to back with your partner. There should be a slight space in between you.
    - Twist your torso to pass the ball to your partner.
    - Then turn to the opposite side to retrieve the ball from your partner.

11. Pike Shoot: 2x10
    - Lay on the floor.
    - Place the ball in between your feet.
    - Kneel your legs in the air.
    - Bring your legs slightly forward releasing the ball in the air.

12. Ice Ice Baby: 2x10
    - Standing, roll the ball onto your toes. Toss the ball using your toes.
General Strength

• Core, Core, and More Core
  – Abs, obliques, and lower back.
  – Crunches?
  – Variety is the spice of life.
Core Circuits

Killer Pillar
- L-Overs
- Crunches
- Side Hip Thrusts
- Sky Diver w/ Twist
- Straight Leg Crunches
- Hip Thrust
- Toes Touches
- Leg Toss
- V-Sits

Planks
- Elbow & Hand Planks
  - Prone
  - Supine
  - Left Side
  - Right Side
  - Arm Raise
  - Leg Raise
  - Arm and Leg Raise
Core Circuits

Brown Abs 10
10 crunches, 10 sit ups (right), 10 sit ups (left), 10 leg toss
9 crunches, 9 sit ups (right), 9 sit ups (left), 9 leg toss
8 crunches, 8 sit ups (right), 8 sit ups (left), 8 leg toss
7 crunches, 7 sit ups (right), 7 sit ups (left), 7 leg toss
6 crunches, 6 sit ups (right), 6 sit ups (left), 6 leg toss
Etc…
Core Circuits

Brown Abs 10

10 crunches, 10 sit ups (right), 10 sit ups (left), 10 leg toss
9 crunches, 9 sit ups (right), 9 sit ups (left), 9 leg toss
8 crunches, 8 sit ups (right), 8 sit ups (left), 8 leg toss
7 crunches, 7 sit ups (right), 7 sit ups (left), 7 leg toss
6 crunches, 6 sit ups (right), 6 sit ups (left), 6 leg toss
Etc…
Core Circuits w/ Medicine Ball

Medicine Ball Ab's:

1. Single Leg V-Ups: 2x10
   - Lay flat on the ground with one leg slightly bent.
   - Hold the ball over your head.
   - Contract your abs bringing the ball up while your bring your straight leg up.

2. Oblique Twists: 2x10
   - Lay on the ground face up.
   - Place the ball between your knees.
   - Rotate your legs back and forth slowly.

3. Transfer Crunch: 2x10
   - Lay on the ground with your arms over your head holding the ball.
   - Contract your abs once your abs are contracted bring the ball up and your legs up.
   - Once you have reached the "V" or pike position, pass the ball to your feet.
   - Return to lying flat on the ground.
   - Once the ball has reached the ground, contract your abs and return to the "V" or pike position and pass the ball to your hands.

4. Reverse Crunch: 2x10
   - Lay facing up on the ground with knees bent and arms stretched out.
   - Hold the ball in between your knees.
   - Contract your abs and bring your knees to your chest.
   - Hold and return your feet to the floor.
   - *Advance tip: Once your have brought your knees to your chest, return your feet to the start position but keep them a couple inches off the ground then bring your knees back to your chest.

5. Swiss Ball Crunch: 2x10
   - Place the Swiss ball under the small of your back and hold the medicine ball over your head.
   - When holding the medicine ball over your head, lock your elbows to keep your arms straight.
   - Contract your abs lifting your shoulders off the ball.

6. Weighted V-Sits: 2x10
   - Sit at a 45 degree angle.
   - Hold the ball at stomach height.
   - Hold your feet 6" off the ground keeping your abs contracted.
   - Rotate by twisting back and forth touching the ball on the ground on each side.

7. Lateral Fusion with Swiss Ball: 2x10
   - Lie on your side over the Swiss ball and spread your legs for balance.
   - Hold the medicine ball over your head and curl up towards ceiling and lay back down across the ball and repeat the movement.
   - Repeat with other side.
Weight Room

• Static/Body Building Lifts
  – Traditional weight lifting exercises involving major muscle groups.
  – Single and double extension lifts.
  – Example include bench press, squat, bicep curls, tricep extensions, etc…
  – Tempo lifts (3/1/1/0).
  – 3-4 sets of 6-12 repetitions.
  – Utilized mostly in absolute strength and hypertrophy phases of lifting weights.
Weight Room

• Olympic Lifts
  – Explosive lifts that involve major muscle groups.
  – Examples include clean, snatch, and clean & jerk.
  – 3-6 sets of 1-4 repetitions.
  – Utilized in developing absolute strength, power, and coordination.
  – Triple extension lifts.
  – Closely resembles track work.
Power Clean
Progression of the Power Clean

- High Pull
- High Pull & Catch
- Hang Pull & Catch
Power Clean Progression Video
Weight Room

• **Ballistic Lifts**
  – Lifts that involve elastic qualities and are fast, rhythmical and usually involve jumping or throwing.
  – Examples include jump squats, bench press throw, and weighted jumps.
  – Utilized in developing absolute strength, power, and elastic qualities.
  – “Greatly resembles demands of competition.”
Ballistic Lift
Jump Squat 1
Ballistic Lift
Jump Squat 2
Weight Room

- Vocabulary
- Why do you lift at 100% each time you are in the weight room?
- Setting up lifting days
Weight Room

• **Coupling**: defined as moving back and forth between two exercises using alternating sets.
  – In most cases these exercises are **opposing** muscle groups.
  – Example:  A. Front Squat  4 x 6  3/1/1/0  60
    A. Romanian DL  4 x 6  3/1/1/0  120
Weight Room

• **Tempo**: defined as the time it takes the bar to go through each motion in a lift.
  – Example:
    • Squat 4 x 6 3/1/1/0
      – 3 = 3 counts on the way down to the bottom of a squat
      – 1 = 1 count at the bottom of the squat
      – 1 = 1 count on the way up (more powerful)
      – 0 = 0 count for rest at the top of the lift
Weight Room

• Lift at 100% Intensity!!!
  – The athlete should feel like they have exhausted the muscle group they are working on for each coupling.
  – Let the sets and reps dictate the weight.
    • 4x4 vs 4x6 vs 4x8 vs 4x10
  – The stronger and more powerful the athlete gets the faster they will run.
Weight Room

• Weight room and other strength training should be written in conjunction with track workouts.

• Order of lifts:
  – Most powerful full body lifts
  – Large muscle groups
  – Small muscle groups
# Track & Field Weight Training

## Fall Lifting Week 10

### Day 1

<table>
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<tr>
<th>Exercise</th>
<th>Sets/Reps</th>
<th>Tempo</th>
<th>Rest</th>
<th>Set 1</th>
<th>Set 2</th>
<th>Set 3</th>
<th>Set 4</th>
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<td>4 X 4</td>
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<td>A. Box Jumps</td>
<td>4 X 4</td>
<td></td>
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<td>B. Front Squat</td>
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<td>60</td>
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<tr>
<td>B. Glute/Ham Raise</td>
<td>4 X 6</td>
<td>1/1/3/0</td>
<td>120</td>
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<tr>
<td>C. Calf Raises w/ wt.</td>
<td>3 X 8</td>
<td>1/1/3/0</td>
<td>60</td>
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<tr>
<td>C. Hanging Curl Up</td>
<td>3 X 8</td>
<td>1/1/1/0</td>
<td>120</td>
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D. Static Stretch for 10 Minutes

Lifting Partner’s Signature: ____________________________________

### Day 2

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<th>Set 3</th>
<th>Set 4</th>
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<td>A. Pull Ups</td>
<td>4 X 6</td>
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<td>B. Military Press w/DB</td>
<td>3 X 6</td>
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<td>B. Tricep Extensions</td>
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<td>120</td>
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<td>C. Hanging Obliques</td>
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<td>C. Back Hypers + wt</td>
<td>3 X 8</td>
<td>3/1/1/0</td>
<td>60</td>
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D. Static Stretch for 10'

Lifting Partner’s Signature: ________________________________
**Setting Up Lifting Days**

**Alternating Upper & Lower**
- Monday – Lower Body
- Tuesday – BW or Core
- Wednesday – Upper Body
- Thursday – BW or Core
- Friday – Lower Body
- Saturday – Race
- Sunday – Rest

**Types of Lifts**
- Monday – Neurological
- Tuesday – Body Building
- Wednesday – Core
- Thursday – Combo
- Friday – BW or Core
- Saturday – Race
- Sunday – Rest
## Weekly Schedule
(Lower, Upper, Lower)

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<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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<td><strong>Warm Up</strong></td>
<td>Acceleration Warm Up</td>
<td>Brown Warm Up</td>
<td>Bear Warm Up</td>
<td>Brown Warm Up</td>
<td>Max V Warm Up</td>
<td>30m Warm Up</td>
<td>Rest or Restoration</td>
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<td><strong>Workout</strong></td>
<td>Accl Runs, Block Work, Resisted Runs</td>
<td>Tempo</td>
<td>Strides, Pool Workout, or something low key</td>
<td>Tempo</td>
<td>Max Velocity Runs</td>
<td>Big Active Day</td>
<td>Rest or Restoration</td>
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<td><strong>Post Workout Exercise</strong></td>
<td>Barefoot Walk, Jog, or Skip</td>
<td>Barefoot Walk, Jog, or Skip</td>
<td>Barefoot Walk, Jog, or Skip</td>
<td>Barefoot Walk, Jog, or Skip</td>
<td>Barefoot Walk, Jog, or Skip</td>
<td>Barefoot Walk, Jog, or Skip</td>
<td>Rest or Restoration</td>
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<td><strong>Lower, Upper, Lower</strong></td>
<td>Body Weight or Core Circuit</td>
<td><strong>Upper, Lower, Upper</strong></td>
<td>Body Weight or Core Circuit</td>
<td><strong>Lower, Upper, Lower</strong></td>
<td>Body Weight or Core Circuit</td>
<td>Rest or Restoration</td>
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<tr>
<td><strong>Cool Down</strong></td>
<td>Static Stretch</td>
<td>Static Stretch &amp; Foam Roll</td>
<td>Static Stretch</td>
<td>Static Stretch &amp; Ice Bath</td>
<td>Static Stretch &amp; Foam Roll</td>
<td>Static Stretch &amp; Ice Bath</td>
<td>Rest or Restoration</td>
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</table>
### Weekly Schedule (Themed Lifts)

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<th>Tuesday</th>
<th>Wednesday</th>
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<td>Tempo</td>
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<td>Rest or Restoration</td>
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<td><strong>Olympic Lifts</strong></td>
<td><strong>Upper, Lower, or Combo</strong></td>
<td>Core</td>
<td><strong>Olympic + Upper, Lower, or Combo</strong></td>
<td>Core</td>
<td>Body Weight or</td>
<td>Rest or Restoration</td>
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<td>Static Stretch</td>
<td>Static Stretch &amp; Foam Roll</td>
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<td>Static Stretch &amp; Foam Roll</td>
<td>Static Stretch &amp; Ice Bath</td>
<td>Rest or Restoration</td>
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Multi Throws

- Multi Throws
  - Core work, double extension, and triple extension.
  
  - Progression
    - Handoffs – high volume, low intensity
    - Passes – still higher volume and lower intensity
    - Throws – lower volume, but very high intensity
    - Throws coupled with jumps – low volume, but extremely high intensity
Multi Throws

Handoffs
(high v, low i)
• Over and Under
• Side to Side
• Twist Handoffs
• Russian Twists
• Back Hyper Handoff
• Overhead Squat
• Med Ball Push Up

Passes
(medium v, medium i)
• Chest Pass
• Hamstring Curl
• Overhead Pass
• One Handed Pass
• Leg Pass
• Back Hyper Pass
• Adductor Pass
Multi Throws

Throws (low v, high i)
- UHF
- OHB
- Straight Up
- Hop-Hop Throw
- Caber Toss

Throws w/ Jumps (low v, high i)
- SLJ Throw
- Hurdle Hop w/ Throw
- Eccentric Jump w/ Throw
- Combination Throw
Multi Jumps

• Multi Jumps
  – Develop elastic strength (small to large movements).
  – Progression
    • In-place Hops 150-300 contacts per session
    • Displaced Hops 100-250 contacts per session
    • Double Leg Jumps/Bounds 30-50 “
    • Alternating Jumps/Bounds 20-40 “
    • Single Leg Jumps/Bounds 10-30 “
    • Depth Jumps 5-20 “
    • Depth Jumps with jump over hurdle(s) or throw 4-15 “
Multi Jumps

In Place Hops & Jumps
(high v, low i)
- Ankle Pops
- Butt Kick Hops
- Line Hops
- 180’s
- Hyland Fling
- Tuck Jumps
- Squat Freeze Jumps
- Lunge Jumps

Displaced Hops & Jumps
( medium v, medium i)
- Mogul Jumps
- Speed Skaters
- Single Leg Squat Jumps
- Continuous SLJ
- 4 Corner Jumps
- Star Jumps
- Zig Zag Jumps
Multi Jumps

• Bounds (low v, high i)
• Bound Progression:
  – Double Leg Bounds
    • Continuous SLJ for Distance
  – Alternating Bounds
    • Straight Leg Bounds
    • Continuous STJ
    • RRLL
    • RLRL
  – Single Leg Bounds
    • RRRR
    • LLLL
Multi Jumps

- Depth Jumps (very high i, very low v)
- Depth Jump w/ Hurdle Hop
- Depth Jump w/ Hurdle Hop + Weighted Vest
- Depth Jump w/ Hurdle Hop + Med Ball Throw
- Depth Jump w/ Hurdle Hop + Med Ball Throw + Weight Vest
# Bridging the Gap with Various Strength Training

<table>
<thead>
<tr>
<th>Weeks</th>
<th>1-6</th>
<th>7-12</th>
<th>13-18</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight Room</strong> – General Strength, Body Building/Static Lifts, and Core</td>
<td><strong>Weight Room</strong> – Body Building/Static Lifts and Core</td>
<td><strong>Weight Room</strong> – Olympic Lifts and Core</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Focus on Hypertrophy</em></td>
<td><em>Focus on Absolute Strength</em></td>
<td><em>Focus on Power</em></td>
</tr>
<tr>
<td></td>
<td><em>Introduce Multi Throws and Jumps into training to prepare body for the Olympic Lift Progression</em></td>
<td><em>Introduce Olympic Lift Teaching Progression</em></td>
<td><em>Start to use Ballistic Lifts</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Get more advanced with Multi Throws and Jumps</em></td>
<td><em>Use most advanced Multi Jumps and Throws</em></td>
</tr>
</tbody>
</table>
Psychological Aspect

- Characteristics
- Pre-Race Preparation
- Race Day Preparation
Psychological Aspect

• Characteristics include:
  – High self esteem
  – Aggressive attitude
  – Confidence in competition and practice
  – Relaxed in pressure situations

• These characteristics can be practiced and instilled over time.
Psychological Aspect

• Race Preparation (visualize)
  – 100m
    • Use acceleration to reach maximum controllable speed in 4-7 seconds as opposed to achieving maximum speed in 3-4 seconds.
    • Relaxation important to maintain technique over course of race.
  – 200m
    • Take advantage of ATP stores by using maximal acceleration during first 40-60m.
    • Vary intensity of effort to promote relaxation and technical execution.
    • Controls the onset of CNS fatigue
    • Latif Thomas workout
Psychological Aspect

• Race Day Preparation
  – When do I warm up?
  – What do I do for a cool down?
  – Can I eat?
    • If so, what can I eat?
Recap

• Building Speed:
  – 3 major aspects
    • 1. Acceleration (10-30m)
    • 2. Max Velocity (30-60m)
    • 3. Speed Endurance (60-150m)
• Blocks to 10 meter mark = drive/acceleration phase - long arms with feet striking behind the center of mass.
• 10 meter mark to 30 meter mark = transition phase - with every foot strike the foot begins to move under the athletes center of mass/hips.
• 30 meters to 60 meters = maximum velocity phase - the foot strike has now moved under the athletes center of mass/hips and the athlete is moving at top speed.
• 60 meters to the finish = speed endurance phase - the foot strike is still underneath the athletes center of mass while still trying to maintain the same stride pattern.
• All 3 aspects need to relate to building overall work capacity.
Recap

• Just remember:
  – We are trying to build rockets, but it is not rocket science.
Marc Mangiacotti
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Brown University