

## DAVE SMART

### BALL DRILLER TO THE PROFESSIONALS

The development and testing of these drilling techniques was completed by Dave Smart, Technical Tour Representative for Columbia 300.



Dave's experience includes 2 years of running a pro shop and 4 years as chief technician for the PBA Players Services Division, which included mapping out and drilling over 35,000 bowling balls for the pros. Currently, in addition to following the pro tour full-time, Dave gives technical seminars worldwide and works on promoting his techniques through videotapes, drillsheets such as this, etc.

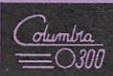
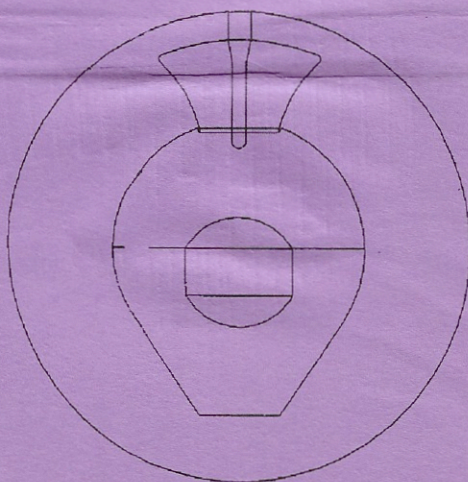
### EXPLAINING AXIS TILT

*"To effectively take advantage of the QUAKE™'s dynamic inner core, it is helpful to first identify your axis tilt before choosing a particular drilling layout. Although the axis point is an important locator of a player's track, the axis tilt is more instrumental in determining how a ball will react to the lane, and more importantly when it will begin to react to the lane. In general, a bowler with a 90° axis tilt will naturally produce a later reaction to the lane than a bowler with 0° axis tilt (forward roll) who will produce a much earlier reaction to the lane. For this reason, I have illustrated the 3 basic types of axis tilts and paired each of them up with 2 lane conditions. Choose the axis tilt illustration which best resembles your roll, then choose the lane condition which most resembles the one at your bowling center and use that drilling pattern (or a variation thereof). As shown on the CUDA/C™ drill chart, the "Pin Location Theory" should be used when drilling the QUAKE™ with a pattern different from the ones mentioned in this drill chart. These are just a few suggestions to make the QUAKE best suit your game."*

Dave Smart, Technical Tour Representative  
Columbia 300, Inc.



## DRILLING TECHNIQUES



COLUMBIA 300

Columbia bowls the world over.™

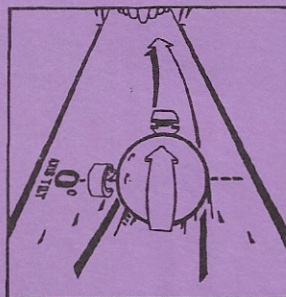
# FORWARD ROLL WITH MINIMAL AXIS TILT

## DRILLINGS CONDUCTIVE TO ROLL:

1. Positive Weights
2. Label or Leverage Type

## CONDITION MOST CONDUCTIVE TO ROLL:

Wet/Dry

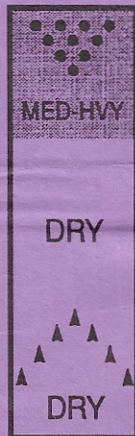


### CONDITION:

Medium Oil in Heads & Pines with Moderate Carrydown

### BALL CHOICE:

QUAKE, Pin 0" to 1" Out  
Top Weight 3.5 to 4.0 oz.



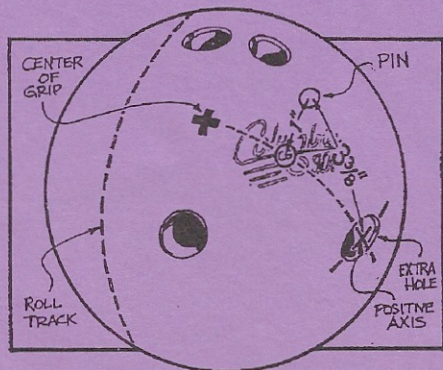
### CONDITION:

Dry Heads & Pines with Moderate to Heavy Carrydown

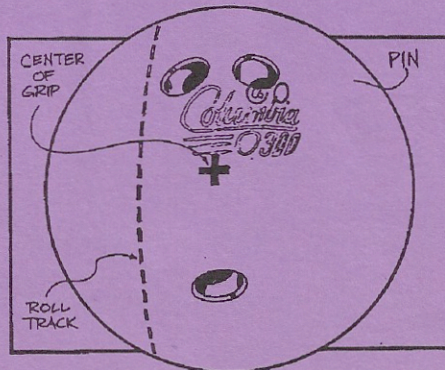
### BALL CHOICE:

QUAKE, Pin 0" to 1" Out  
Top Weight 3.5 to 4.0 oz.

Position pin at 12:00 from CG, position CG 3-3/8 inches from positive axis. Drill extra-hole on axis point and bring back to 1/2 positive.



Position pin at 1:30 from CG, position CG to yield 1/2 positive side weight and 1/2 finger weight. No extra-hole required.



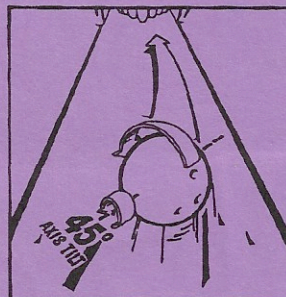
# MEDIUM ROLL WITH 45° AXIS TILT

## DRILLINGS CONDUCTIVE TO ROLL:

1. Positive or Negative Weights
2. Label or Leverage or Axis Leverage

## CONDITION MOST CONDUCTIVE TO ROLL:

Blended



### CONDITION:

Heavy Oil in Heads & Pines with Dry Backends

### BALL CHOICE:

QUAKE, Pin 3" to 4" Out  
Top Weight 2.0 to 3.0 oz.



### CONDITION:

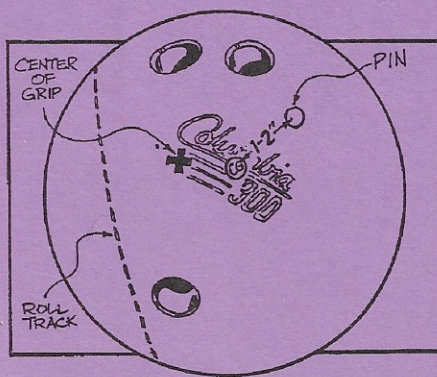
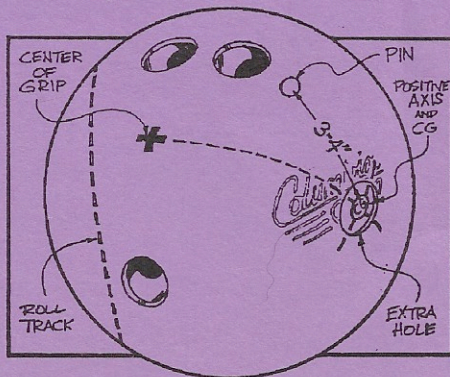
Dry Heads & Pines with Moderate to Heavy Carrydown

### BALL CHOICE:

QUAKE, Pin 1" to 2" Out  
Top Weight 3.5 to 4.0 oz.

Position CG on positive axis point with pin positioned at 1:30 from grip center. Drill extra-hole on positive axis point (through CG), bring back to 1/2 positive.

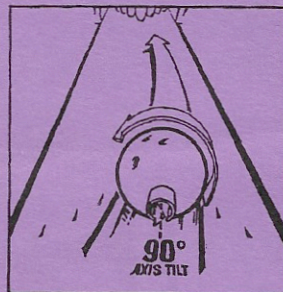
Position pin at 1:30 from CG. Position CG 1/2 positive side. No extra-hole is required. (Select a "pin-in" ball for more length due to less track flare.)



# MAXIMUM SIDE ROLL WITH 90° AXIS TILT

## DRILLINGS CONDUCTIVE TO ROLL:

1. Negative Weights
2. Leverage or Axis Leverage or Axis



## CONDITION MOST CONDUCTIVE TO ROLL:

Hooking Heads with Heavy Carrydown

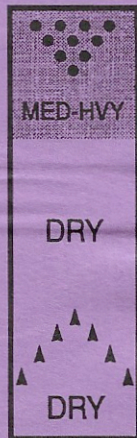


### CONDITION:

Heavy Oil in Heads & Pines with Dry Backends

### BALL CHOICE:

QUAKE, Pin 2" to 3" Out Top Weight 2.0 to 2.5 oz.



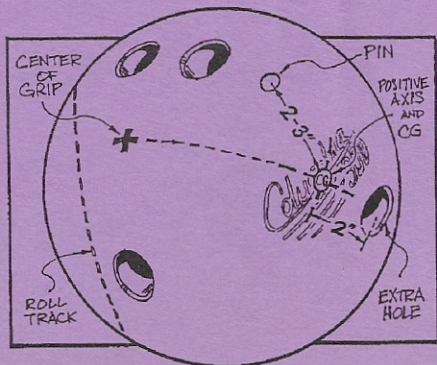
### CONDITION:

Dry Heads & Pines with Moderate to Heavy Carrydown

### BALL CHOICE:

QUAKE, Pin 2" to 3" Out Top Weight 3.0 to 3.5 oz.

Position CG on positive axis with pin positioned at 1:30 from grip center. Drill extra-hole 2 inches past axis point and bring back to 1/2 positive.



Position CG 3-3/8" from positive axis. Place pin 5" from positive axis positioned near the ring finger. Drill extra-hole on axis and bring back to 1/2 positive. (Bring to negative for earlier roll if desired.)

