

## A MODEL FOR NEW GYMNASTICS VAULT OF MAXIMUM DIFFICULTY

IVANOV, K.M.; SOMOKIN, A.A  
P.F.Lesgaft State Institute  
of Physical Education  
Leningrad  
USSR

The performance of the cross-horse vault in gymnastics is the most important skill in a sport whose popularity continues to grow rapidly and revolutionary changes occur at every major international competition. The female vaults most commonly performed in national and international competitions today are variations of the round-off, (flic flac) entry.

The purpose of this study was to make a model for a vault which, at present, no one else in the world can perform. It is the unique trick-round-off, flic flac on-piked 2.5 somersault backward-off vault. The characteristics of the model depend upon the vault phase being described. This paper presents the vault beginning with departure from the horse take-off and ending with initial contact of the feet with the landing surface - mat (postflight).

A mathematical model describing the motion of a gymnast is represented by a planar three-segment link system. A model moving purely in the sagittal plane was employed with the lower limbs, trunk (including the neck and head), and upper limbs forming the rigid links. The hip and shoulder angles are  $180^{\circ}$  at the instant in which the gymnast has broken contact with the horse. The degree of flexion of the trunk and lower limbs at the instant of mat contact is  $120^{\circ}$  as in most reasonably executed vaults.