A. **Action: Shoulder joint flexion.** This action is done to create a forceful forward and upward swing of the arms to help project the body into the air. This action is accomplished by the shoulder flexors working concentrically as agonists for this action. The main individual muscles are anterior deltoid and clavicular pectoralis major. The rotator cuff muscles are also probably active to hold the humeral head firmly in the glenoid fossa during this vigorous arm swing. They act approximately isometrically as stabilizers.

B. **Action: Shoulder girdle protraction followed by upward rotation + elevation.** These actions are done to assist with the forceful forward and upward swing of the arms. These actions are accomplished by the protractors, upward rotators, and elevators acting concentrically* as agonists for these actions. The main individual muscles are serratus anterior, trapezius (probably all), and levator scapulae. *Trapezius III (if active) would act eccentrically during the protraction an then isometrically during the upward rotation + elevation.

C. **Action: T+L spine extension.** This action is done to accelerate the torso forward and upward to help project the body into the air. This action is accomplished by the T+L spine extensors working concentrically as agonists for this action. The main individual muscles are the T+L portions of the erector spinae and deep posterior spinal group.

D. **Action: Hip extension.** This action is also done to accelerate the torso forward and upward to help project the body into the air. This action is accomplished by the hip extensors working either concentrically or isometrically as agonists for this action. The main individual muscles are the uniarticular gluteus maximus (acting concentrically) and the biarticular hamstrings (semitendinosus, semimembranosus, and biceps femoris long head) working approximately isometrically (because they also cross the knee joint).

E. **Action: Knee extension.** This action is done to accelerate the thighs and torso forward and upward to help project the body into the air. This action is accomplished by the quadriceps group working either concentrically or isometrically as agonists for this action. The main individual muscles are the biarticular rectus femoris working approximately isometrically (because it also crosses the hip joint) and the uniarticular vastus medialis, vastus intermedius and vastus lateralis acting concentrically. The active hamstrings also act as antagonists and help stabilize the knee during forceful knee extension.

F. **Action: Ankle plantar flexion** (preceded by a short interval of dorsiflexion). These actions are done to accelerate the lower leg (and all the body above it) forward and upward to help project the body into the air. These actions are accomplished by the triceps surae group working as agonists for plantar flexion. The main individual muscles are biarticular gastrocnemius working approximately isometrically (because it also crosses the knee joint) and the uniarticular soleus acting eccentrically (during dorsiflexion) then concentrically (during plantar flexion).