

# PLANNING OF MACROCYCLES

By Prof. Atko Viru

*Professor Viru at the University of Tartu discusses general principles involved in the planning of macrocycles and looks in detail into the latest information in the design of concentrated strength blocks in the training program. The article is a translated summary by the editor from Kehakultuur, Vol. 47, No. 19, 1986, Tallinn, Estonian SSR.*

A macrocycle in training covers normally a period of six months or a full year and is single or double periodized according to the need for one or two competition periods in the year. The choice is restricted in events that can be performed only outdoors. However, if two competitive periods are avoided by lengthening the summer season, athletes are overlooking the physiological principles of maintaining their performance capacity.

## CONSIDERATIONS

Keeping in mind the physiological principles and the competition calendar, the following important factors must be taken into consideration in the planning of macrocycles:

- The design of a macrocycle should closely follow the long term training plan. Emphasis, according to this, should be placed on the planned changes to the organism and the development of the planned physical capacities in a given year. If there is a conflict between the long term plan and the competition demands, the first must take priority.
- There are limits to the adaptation of the organism to training and the adaptation capacity has to be restored by relative recoveries (reduced training load). To continue intensive training and competition without restoration leads to a drop of performance and even over-training. It is therefore wrong to expect an athlete to maintain top form six months or more during a year.
- Practical experience and studies by Verhoshansky have led to the conclusion that high performance level athletes have sufficient adaptive energy, or capacity, for 18 to 22 weeks. After this time period it is necessary to change the contents of training and plan for a restoration phase.
- The temporary loss of adaptive energy and its restoration has made it necessary to employ a cyclic structure in training, considered by Matveyev

as the basic principle in the planning of training. The structure is based on changes in the training loads and recoveries in the microcycles (4 to 7 days) and mesocycles (4 to 6 microcycles) that make up a macrocycle.

- It is advisable to divide long competition seasons into separate stages to exploit best an athlete's adaptive energy. Each of these stages, according to Tsherenkov, is made up of three phases: general, event specific and final form preparations. The first phase aims to allow the central nervous system to recover and to restore the adaptation capacity. It is made up from 1 to 2 restoration and 2 general preparation microcycles. The second phase consists of 2 to 3 event specific microcycles to reach competitive form, while the third phase establishes top form, with control competitions and event specific technical and tactical final corrections.
- The two major tasks of all macrocycles are the creation of movement potential and its realization. The first refers to the fulfillment of certain quantitative demands, the second to the improvement of technique to correspond to the newly acquired level of physical capacities. As the quantitative demands of training lead to a considerable fatigue level of the organism, it is necessary to solve the two tasks separately.
- More time should be allocated to the development of movement potential of the young athletes with a lower preparation level. The preparation period must in this situation be lengthened and the competition period shortened.

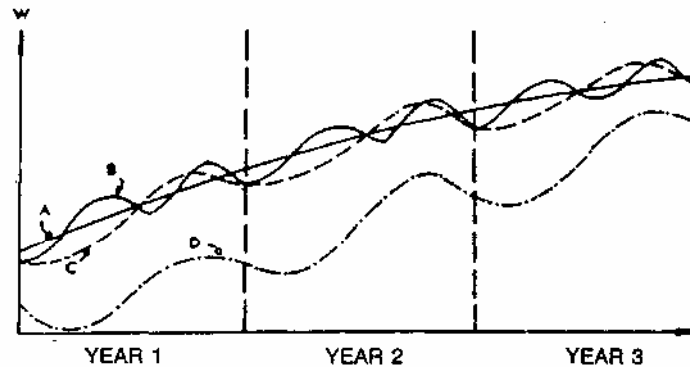
To put the above mentioned facts into the training program is relatively simple. Usually the preparation period begins with an emphasis on general physical preparation, aiming to lay a foundation for specific training. This emphasis is gradually reduced, leading to more specific training that culminates in competitions. The training load is in the first half of the preparation period increased by adding to the work volume. As the competition period approaches, the volume is gradually reduced and the intensity increased.

## PROBLEMS

Such a simple scheme is applicable to the preparation of young and lower performance level athletes. It is responsible for a wave-like gradual improvement of functional capacities and the performance level. Well prepared athletes, who plan to use this scheme, are faced with two problems. Firstly, the training effect will be step by step reduced and the performance level will soon reach a plateau. Secondly, they will be forced to increase considerably the training load in order to secure further improvement, which in turn will lead to complete exploitation of adaptative energy.

The work capacity, according to Erashinkov, drops in the general preparation training in the second or third month, and in the event specific training in the third

or fourth month. It is also noticeable that improvements in the performance capacity are correlated with an increased training volume only over the first three or four months. The volume of event specific exercises, however, is positively related to an increased performance capacity virtually throughout the preparation period.



**FIG. 1 DYNAMICS OF PERFORMANCE CAPACITIES**  
*A — Best performance. B and C — Functional indicators related to performance.*  
*D — Realisation of the movement potential.*

Taking all the above into consideration indicates that it is advisable to make use of a control competition cycle. This will help to speed up the development of performance capacities, reduces monotony and allows evaluating of the effectiveness of training. Indoor competitions can therefore be recommended, provided the training load is not drastically reduced prior to the competitive cycle and sufficient recovery is allowed before training is resumed.

The adaptation that takes place in the training processes can be graphically shown as a steadily rising curve (fig.1, A). However, looking the same way at the different functional indicators that are related to the performance capacity and how they reflect the changes that have taken place in the organism, a rising wave-like pattern appears (fig. 1, B and C). Even more pronounced differences can be seen in the realization of the movement potential (fig. 1, D).

It appears that two different types of adaptive changes take place in the athlete's organism during training, some that are only temporary, others that are more durable. Protein synthesis, without doubt, is responsible for both types of changes, although the realization takes place differently in the durable adaptation and is strictly correlated to the work load employed. Changing the direction of the load brings with it a re-distribution of reserves, allowing for durable adaptive changes to occur through the protein synthesis and with it improved performances.

The stabilization of an effective training can follow two different structures. The choice is to develop several performance capacities year-round or to concentrate on certain capacities in separate mesocycles. The first possibility can be

responsible for a drop in performance and also brings with it monotony. The second possibility has the danger that a concentration on a single aspect in one stage can lead in the next stage to a drop of the achieved adaptation level.

## CONCENTRATED BLOCKS

A typical example of how to avoid the shortcomings of the second possibility is the use of the blocks method. Verhoshansky, who has thoroughly studied this method, came to the conclusion that a large volume of concentrated strength development (strength blocks) is best performed over 5 to 6 microcycles, provided the volume does not reach the maximum limit of an athlete. If it does, the duration of the block should be reduced to 3 to 4 microcycles.

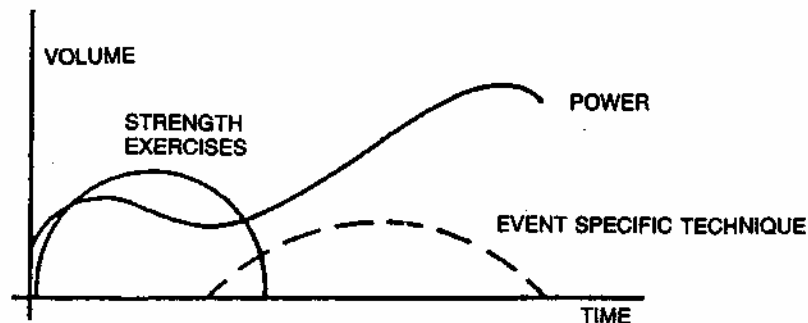


FIG. 2. STRENGTH DEVELOPMENT SCHEME  
*Suitable for power orientated events.*

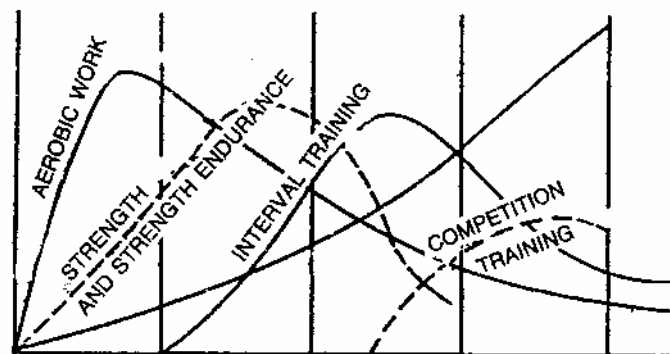


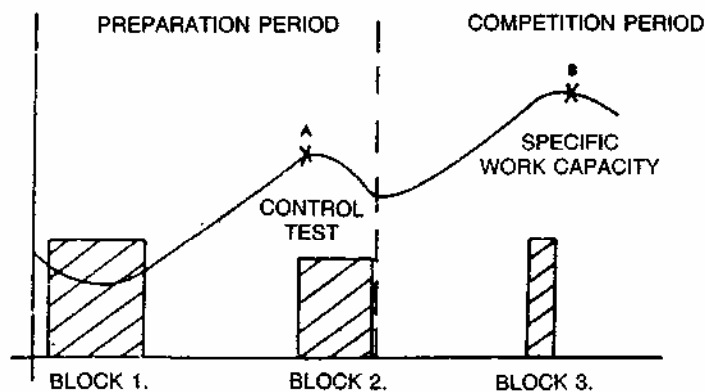
FIG. 3. ENDURANCE EVENTS  
*Principles of the distribution of different training methods.*

It is also recommended that three days of strength training should be allocated to each microcycle. Athletes in the high performance category can use three

consecutive phases of concentrated strength development, provided that each phase is followed by 7 to 10 days of recovery and restoration processes.

Strength training is responsible for a high level of fatigue, the indicators of work capacity drop and muscular strength is reduced. However, the work capacity is restored and strength indicators exceed the starting level after the direction of training is changed (fig.4). This time is most effective for the realization of the movement potential in order to adjust the technique to the level of the increased performance capacities.

While event specific physical preparation is emphasized in the movement potential development stage, its realization takes place in the stage that stresses the development of fine technique. This means, above all, the employment of competitive type exercises with close to maximum effort and imitation exercise with a structure close to the real technique.



**FIG. 4. CONSTRUCTION OF STRENGTH BLOCKS**  
*A — The level of event specific capacity is tested at the end of the preparation period.*  
*B — The planned specific capacity for major competitions.*

Competition type exercises, in addition to their role to develop dynamic stereotypes, are also responsible for the maintenance of physical capacities reached during the use of concentrated strength blocks. The level of muscular power will not drop but actually improves. It has been shown, for example, that the employment of event specific jumping training allowed top class high jumpers to maintain the effects of concentrated strength development for more than two months.

The more the organism is exhausted during the stages of large training volumes, the better are the super-compensation results. Of course, there are limits and complete exhaustion usually shows up in the restoration phase. If the limits are exceeded, the recoveries must be extended, first between the workouts and, when necessary, also between the micro-cycles. After both fail to bring the desired recovery, the use of a large concentrated training volume must be stopped and a longer restoration phase introduced to the program.

The strategy of using concentrated strength blocks in training is as follows:

- The performance expected at a certain time of the season is planned according to the demands of the competition calendar.
- The required event specific work capacity for this performance is determined and the expected control tests results for the end of the preparation period are set.
- The pattern for the development of the event specific work capacities, including the time periods for the inclusion of concentrated strength blocks, is planned.
- The contents and the volume of event specific physical and technical preparations are established.

It should be kept in mind in this strategy that the time available from the first concentrated strength block to the peak of the competition season is limited to 18 to 22 weeks. After this, training must be again changed to a large volume but low intensity general physical preparation phase.