

## BEHAVIORS OF CONTROL CIRCUIT

This control circuit is a frequency generator servo type that detects output of the dynamo synchronizing with the motor

so that this detected output is considered frequency, thereby controlling the speed of a disk to be used.

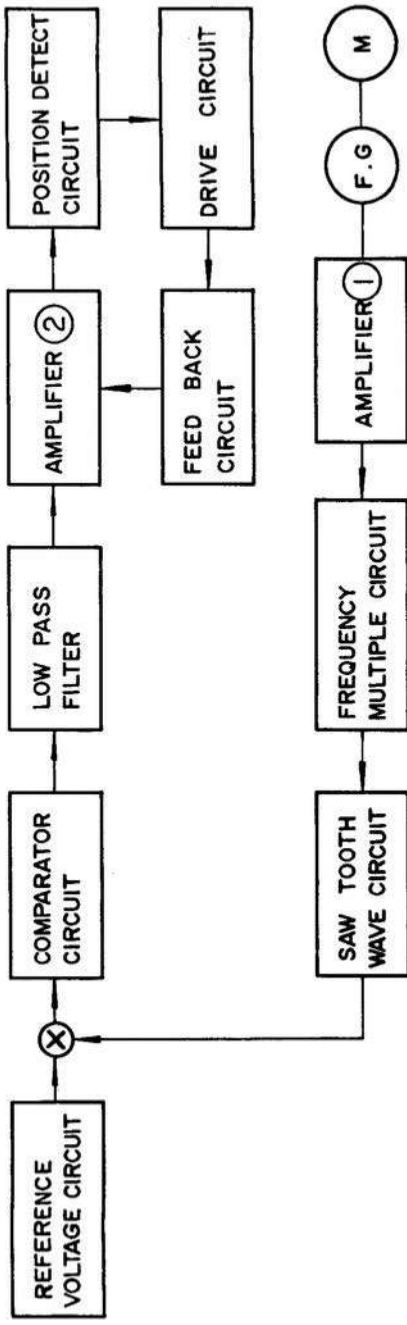


Figure 4-1 BLOCK DIAGRAM

\* Refer to Figures 4-1, 4-2 and 5-1.

### 1) FREQUENCY GENERATOR

The frequency generator consists of 72-pole magnet, 36-tooth multi-gap head and coil and it creates sine waves of 20 Hz and 27 Hz respectively when an LP disk and EP disk are played.

### 2) AMPLIFIER CIRCUIT ①

The amplifier circuit is of 2-stage differential type and it amplifies the output of frequency generator to produce square wave of 50% duty cycle.

Semi-variable resistor VR1 (330 ohm B) is to adjust the square wave so that its duty cycle becomes 50%; this is because that the output of this circuit will be permitted to be multiplied by the frequency multiple circuit.

### 3) FREQUENCY MULTIPLE CIRCUIT

The frequency multiple circuit is to differentiate conversion output and non-conversion output (the two are of square wave) obtained from the said amplifier circuit so as to create pulses each having a swifter rising and a narrow width. Each of the pulses is then applied to the switching transistor in which it will be shaped to a saw tooth wave. Each of the switching transistors can be turned on when given a positive pulse so that the frequency be multiplied (doubled).

### 4) SAW TOOTH WAVE GENERATOR CIRCUIT

The generator circuit is composed of a C/R circuit which serves as charging unit and a switching transistor which works to discharge the voltage stored in the capacitor in an instant, and it is thus able to obtain saw tooth waves with the height being nearly in proportion to a given frequency.

### 5) REFERENCE VOLTAGE CIRCUIT

The reference voltage circuit is to produce a reference voltage that determines the rotation number of motor, in which output of the voltage regulated circuit is resistor-divided to be made a constant voltage. Variable resistor is provided to permit the voltage-division ratio be varied, thereby the motor's rotation number being variable.

Waveforms of the Circuits (with DC 20 V)  
(The points ① to ④ are identical to those indicated in the annexed "Circuit Diagram" Figure 5-1.)

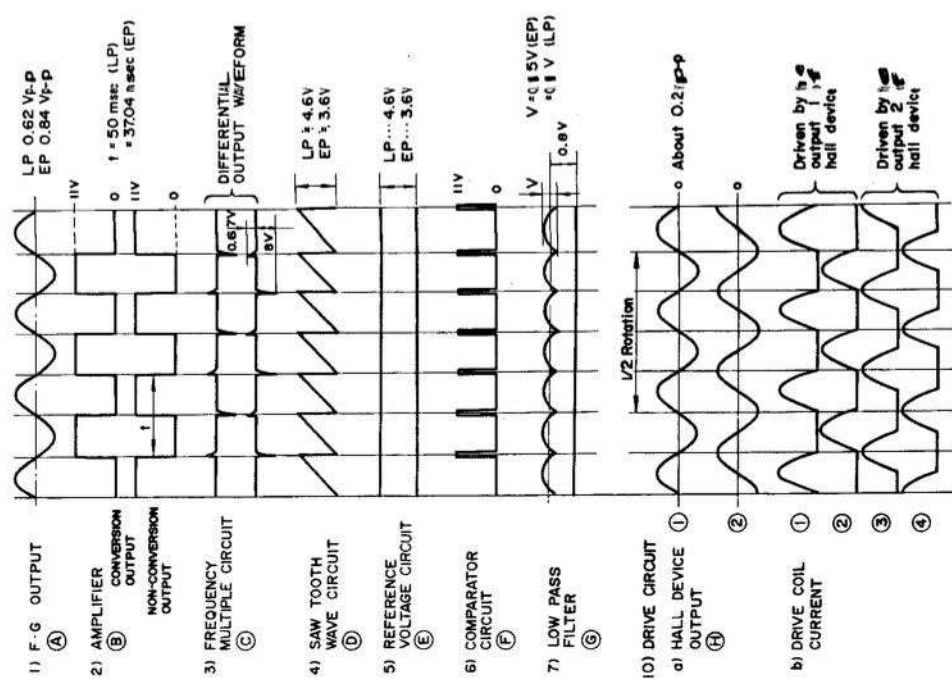


Figure 4-2 WAVE FORMS OF THE CIRCUIT