

Lab Info. -- SYNCHRONOUS MACHINE EXPERIMENTS

EXPERIMENT NO. 19 LOAD CHARACTERISTICS OF AN ALTERNATOR ABOVE AND BELOW RATED SPEED

PURPOSE:

To study the load characteristics of an alternator above and below rated speed while generating rated voltage.

APPARATUS REQUIRED:

1. One SM-100-3 Synchronous Machine as Three-Phase Alternator
2. One DM-100 DC Machine as Motor
3. One SLA-100 Strobe-Tachometer (or other tachometer)
4. One RLC-100 Load Bank
5. One 0 to 300 Volt AC Voltmeter
6. One 0 to 0.5 Amp AC Ammeter
7. One 0 to 1.0 Amp DC Ammeter
8. One 0 to 150 Volt/1 Amp DC Power Supply
9. One 0 to 125 Volt/5 Amp DC Power Supply

PROCEDURE:

1. Couple the Alternator to the DC Motor and make the connections shown in Figure 29. Adjust the motor's field rheostat to its minimum resistance, fully CCW position. Adjust the 125 volt DC Supply to 125 Volts.
2. Have the instructor check your connections and then start the motor. Adjust the motor's speed to 2000 RPM by adjusting the motor's rheostat. Adjust the alternator's output to 220 volts by adjusting the 150 Volt DC supply.
3. Perform a load test on the alternator from no-load to approximately 0.4 amp load. It will be necessary to adjust the motor's rheostat after each load step is applied to maintain 2000 RPM. Record the armature volts, load current, field current and speed in Table 28.
4. Perform another load test at 1600 RPM. Record this data in Table 29.

SUGGESTIONS FOR CONCLUSION:

Using the data in Tables 28 and 29, plot the armature volts as ordinate versus the load amps as abscissa for the two different speed settings. Discuss the effects of and reasons for the variation in voltage regulation between the two curves.

TABLE 28: ABOVE RATED SPEED

SPEED	2000 --->						
Armature Volts							
Load Amps							
Field Amps							

TABLE 29: BELOW RATED SPEED

SPEED	1800 --->						
Armature Volts							
Load Amps							
Field Amps							

DC MOTOR

Start FLD.

3Ø ALTERNATOR

