

No	Name	Part No
1	Customer Receptacle → 7618	532969
2	7618 → Power Converter	532967
3	7618 → Power Converter	532970
4	7618 → Power Converter	532542
5	Customer Receptacle → Data Channel	532953
6	Tape Drive → Tape Drive	532098
7	Console → 7618	532542
8	Data Channel 1 → 7618	532542
9	Data Channel 2 → 7618	
10		
11		
12		
13		
14		
15	Data Channel 8 → 7618	
16	Memory → 7618	
17	Multiplexor → 7618	
18	CPU 1 → 7618	
19	CPU 2 → 7618	
20	Data Channel 1 → 7618	
21		
22		
23		
24		
25		
26		
27	Data Channel 8 → 7618	532973
28	Memory → 7618	532554
29	Multiplexor → 7618	532973
30	CPU 1 → 7618	532973
31	CPU 2 → 7618	532973
32	7618 → Printer	585655
33	Printer → Punch	320187
34	Printer → Reader	513320
35	Console → 7618	532553
36	Console → 7618	532554
37	Data Channel → Tape Drive	532536
38	Printer → Data Channel	532535
39	Memory Heater Input → 7618	532537

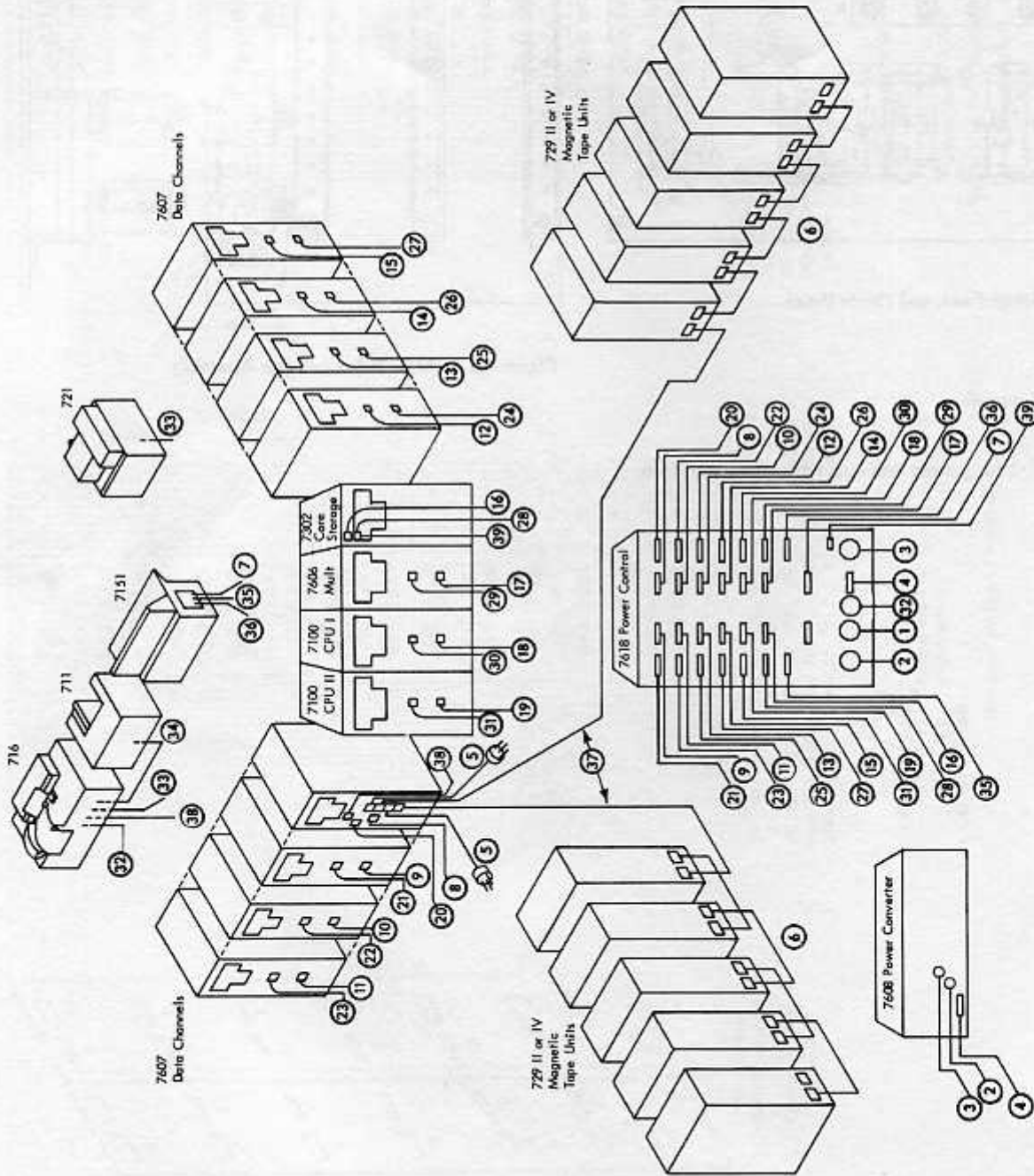


Figure 5.1-1. Power Connections to 7090 System

## 5 Service Aids

### 5.1 Power Connections in the 7090 System

See Figure 5.1-1 for power connections in the 7090 system.

### 5.2 Measurements

#### 5.2.1 Generator Frequency

Connect a Tektronix oscilloscope across any generator output terminal and ground. Adjust the oscilloscope controls for one cycle and convert the time required for one cycle to frequency.

$$\text{Frequency (cps)} = \frac{1}{\text{time (seconds) required for 1 cycle}}$$

The acceptable frequency tolerance is 389 to 441 cycles per second.

#### 5.2.2 Voltage and Current per Phase

Measure terminal voltage and current in each phase of the 400 cycle generator output. Phase voltages should be within about 2 volts of each other and 208 volts AC  $\pm 1$  volt. Current in each phase should be not more than 70 amps and within about 2 amps of the other phases.

#### 5.2.3 Amplitude Modulation

Modulation of the generator waveform (Figure 5.2-1) may be caused by harmonics in the generator output, noise because of arcing brushes, or noise introduced in the generator field by the regulator circuit. The combination of these effects should not modulate the output waveform on any phase by more than 2 percent. Amplitude modulation of the generator output waveform is measured with a Tektronix oscilloscope and calculated as follows:

$$\text{Percent Modulation} = \frac{E_{\text{MAX}} - E_{\text{MIN}}}{E_{\text{MAX}} + E_{\text{MIN}}} \times 100$$

#### 5.2.4 Power Factor

This measurement requires specialized test equipment not supplied to each installation. This equipment must be purchased locally or obtained from an IBM district service center.

Connect a three-phase watt meter in series with the generator output wires and record the apparent power. Measure the actual power by connecting an ammeter in series and a voltmeter in parallel with each phase.

Calculate the power factor as follows:

$$\frac{\text{Apparent Power (kW)}}{\text{Real Power (kVA)}} = \text{Power Factor}$$

Maximum permissible values are:

$$\frac{30.0 \text{ kW}}{37.5 \text{ kVA}} = 0.8$$

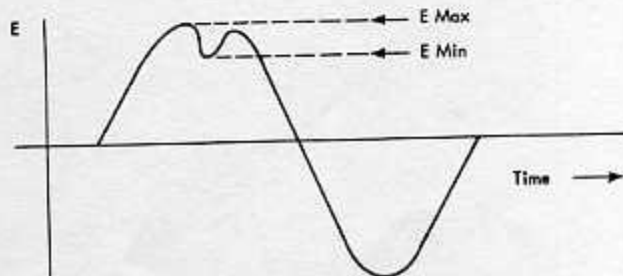


Figure 5.2-1. 400 Cycle Generator Output Waveform