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Conductivity Liquid Level Detector Data

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INTERIM REPORT

SUMMARY

This report presents Conductivity Liquid Level Detector (CLLD) data of the Cylindrical Core Test Facility (CCTF) first main test, C1-1 (Run 010), which was conducted by the Japan Atomic Energy Research Institute (JAERI) on June 21, 1979. The objective of the test was to study the effect of pump resistance on reflood behavior under the initial conditions of the base case.

Data from the JAERI supplied instruments is reported in the Quick Look Report on Large Scale Reflood Test-1, CCTF Test C1-1 (Run 010), JAERI-Memo-8453, August 1979, listed in Reference 1. The CLLD Measuring System worked very well with the exception of some of the upper plenum probes which indicated a wet probe during the entire test. The upper plenum bubble plot is a composite of remaining probes.

In this test the CLLDs showed that the time for all assemblies to become wet is 766 s, except the upper plenum and the downcomer above 7000 mm which remained dry for the entire test.

The objective of this report is to determine the effectiveness of the CLLDs during the reflood phase of a Loss-of-Coolant Accident (LOCA) and to show the physical phenomena detected by the CLLDs. The CLLD data in this report were processed at the Idaho National Engineering Laboratory (INEL) from analog tapes using the Loss-of-Fluid Test (LOFT) Data Processing System.

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1 INTRODUCTION

This report presents Conductivity Liquid Level Detector (CLLD) data of the first main test, C1-1 (Run 010), of the Japan Atomic Energy Research Institute (JAERI) Cylindrical Core Test Facility (CCTF).

The CCTF is an experimental test facility designed to model a full-height core section and four primary loops and their components of a Pressurized Water Reactor (PWR). This facility is used to provide information on fluid behaviors in a pressure vessel which simulates a PWR reactor vessel and integral system responses during the refill and reflood phases of a hypothetical loss-of-coolant accident (LOCA) of a PWR. The central part of the test facility is a nonnuclear core with 2000 electrically heated rods arranged in a cylindrical array. The core is housed in a test vessel which includes a downcomer, lower plenum, and upper plenum as well as a core region. The core design is based on 8 x 8 rod assemblies which model typical 15 x 15 fuel assembly PWRs. Volumetric scaling is based on core area scaling.

The objectives of the facility are:

1. Demonstration of Emergency Core Cooling System (ECCS) behavior during refill and reflood

2. Verification of reflood analysis codes

3. Collection of information to improve the thermohydrodynamic model in the analysis codes.

The first main test, C1-1 (Run 010), was successfully conducted by JAERI on June 21, 1979. The objective was to study the effect of pump resistance on the reflood behavior under the initial conditions of the base case, as shown in Table 1.

Data from JAERI are included in Reference 1. Only the data from the CLLDs are included in this report. The objective of this report is to determine the effectiveness of the CLLDs during the reflood phase of a LOCA and to show the physical phenomena detected by the CLLDs.

2. TEST FACILITY

The CCTF was designed in consideration of the following objectives:

1. The facility should provide the capability to reasonably simulate the flow conditions in the primary system of a PWR during the refill and reflood phase of a LOCA

2. The downcomer design should provide ECC flow behavior throughout the test which is reasonably representative of that of the PWR downcomer.

A schematic diagram of the CCTF is shown in Figure 1. The main components of the CCTF are a pressure vessel, three intact loops, a broken loop, two steam generators, four pump simulators, and an ECCS.

The reactor vessel contains approximately 2000 electrically heated rods simulating the fuel elements. The ECCS consists of an accumulator and a Low Pressure Coolant Injection (LPCI) System.

The vertical dimensions and locations of the system components are as close as possible to the reference Trojan reactor in the U.S. and the Ohi reactor in Japan, while the flow areas are scaled down according to the dimensions in Table 2.

Further CCTF information can be found in Reference 1.

3. TEST SPECIFICATIONS

In preparation for the test, the accumulator tank, the LPCI tank, the water tank, and the secondary sides of the steam generator simulators were filled with water which was purified with ion exchange resin. After all the components and instruments were inspected for mechanical and electrical leakages, the instruments were checked for zero points and sensitivity.

After establishing the initial conditions of the test, the electric power for preheating was turned off and the lower plenum was filled to a specified level directly from the water tank. When the water level in the lower plenum reached 0.87 m, and other initial conditions of the test stabilized at an allowable tolerance, electric power was applied to the heater rods in the core and the data recording was started.

When the water level reached the specified height from the bottom of heated length, the injection port was changed from the lower plenum to the three intact cold leg ECC ports. At a specified time after the initiation of accumulator (ACC) injection, the valves in ACC line and LPCI circulation line were closed and the valve in LPCI injection line was opened. These actions transferred the ECC injection from ACC injection mode to LPCI mode. The generated steam and the entrained water flowed via broken and intact loops to the containment tanks.

The measured values of initial test conditions for Test C1-1 (Run 010) and the base case are given in Table 1.

The sequence of events that occurred during Test C1-1 is listed in Table 3.

Further test information can be found in Reference 1.

4. CONDUCTIVITY LIQUID LEVEL MEASUREMENT SYSTEM

The Conductivity Liquid Level Measurement System (CLLMS) consists of the CLLD assemblies, the signal condition electronics, and the interconnecting wiring between them. The system is documented in detail in Reference 3.

4.1 Description

A typical CLLD assembly (see Figure 2) consists of a specified number of detectors or probes arranged in vertically prescribed intervals. These detectors or probes are welded to 1.5875-mm-diameter support wires.

Figure 3 shows a single detector of a typical CLLD assembly. The Inconel probe tip is centered in an Inconel sleeve with a temperature resistant ceramic pressure seal between the two. Impedance is measured between the probe tip and the grounded sleeve. Up to 17 of these individual detectors are combined into a vertical assembly.

The electrical cables from each of the detectors are concentrically placed around the detectors and spacers are located between the detectors. Stainless steel foil wraps the cables tightly to the outside of the detectors and spacers to minimize movement or vibration caused by water flowing around the detectors. Each detector assembly is completely surrounded over its entire length by two concentric cylindrical tubes. The cylindrical tubes are designed to protect the liquid level detector assembly from excessive side loading due to strong lateral flow of the coolant and also to serve as a mechanical support for the detector assembly. These tubes contain a repetitive pattern of slots aligned over each other at the positions of the signal electrodes, with additional aligned slots between detectors.

The slots are designed to admit liquid to the electrodes during a refill or reflood cycle, and at the same time to prohibit rapid lateral splashing of the coolant on the electrodes. This prohibition prevents

erroneous liquid level indications. Operational CLLD assemblies are of the following five basic designs: Incore Narrow-Range, Incore Wide-Range, Lower Plenum, Upper Plenum, and Downcomer. The only essential differences between these designs are the spacing of the electrodes and the type of splash shield. The three types of splash shields can be distinguished in the following way:

1. The slotted ports in the inner and outer tube face each other. This design is used where rapid admission of liquid is important and where facility and installation constraints prohibit the application of external splash shields (Core and Lower Plenum).

2. The slotted ports are 90 degrees offset between the inner and outer tube. This design is used where moderate, bidirectional splashing of liquid is expected (Upper Plenum).

3. Each slotted port of the outer tube is provided with a conically shaped hood mounted directly over the slotted port. This design is used where severe splashing of liquid is expected (Downcomer).

4.2 Probe Locations

The vertical elevations of each probe with respect to the upper surface of the vessel lower head is shown in Figure 4. There are three assemblies each in the lower plenum, upper plenum, and downcomer. In the core there are three assemblies with wide probe spacing and three assemblies with narrow probe spacing.

The probes are numbered from 1 to 5 for the lower plenum assemblies and from 1 to 17 for the remainder. The numbering is sequential with the first and last probe numbers indicated in Figure 4.

The radial distribution of the CLLDs throughout the pressure vessel is shown in Figure 5. The number associated with each symbol corresponds to the assembly number on each plot.

4.3 Principles of Operation

The presence of water in the test vessel is detected by measuring the change in conductance at the sensor, or conductivity probe. Conductance is measured between the pin and the surrounding ground plane.

The conductivity probe, consisting of the electrical pin and body, is connected by cable to a stainless steel hard cable which splices to soft shielded cable just outside of the test vessel. The soft cable carries the probe conductivity measurement to the signal conditioning electronics. The probe and cable impedance forms one leg of a resistance bridge circuit. The bridge is excited by a 10-Hz square wave whose amplitude can be adjusted to be 1, 2, 4, 8, or 16 Vdc peak to peak. The bridge differential is fed into an integrated circuit instrumentation amplifier set for a gain of unity. The amplifier will track the difference in bridge voltage as the probe conductance changes with the presence and absence of water. To enable it to follow small changes in conductance, the bridge amplifier has an input impedance of 2×10^{12} ohm. There is also a dc OFFSET ADJ on the signal conditioning module which may be used to compensate for any dc component which may be present in the system.

The bridge leg resistance of 250,000 ohms corresponds to the midregion between wet and dry conductivity probe impedance. The bridge balance resistor opposite the probe leg of the bridge is adjustable. This allows the operator to perform some adjustment to compensate for probe aging, a phenomenon observed in high-temperature and high-pressure environments. Normally the bridge balance adjustment will be preset to 250,000 ohms.

The signal conditioning system is shielded and isolated to prevent noise from disturbing the data. Some attenuation to noise above 40 Hz occurs due to the combined effects of the input cable capacitance and the bridge impedance. Any noise greater than an acceptable level of $\pm$0.1 V can be removed by switching in a two-pole active filter network.

The automatic threshold electronics discriminates between wet and dry probes. This discrimination process is run during real time and in no way affects the pulse amplitude modulated (PAM) train output data. The automatic threshold electronics samples and averages a selected number (from 1 to 10) of the probes' analog signals, and generates a wet-to-dry threshold for all probes in the electronics crate. The analog signal from each probe is compared to the automatic threshold, and the output is a logical one for wet when the analog is above the threshold or a logical zero for dry when the analog signal is below the threshold.

A separate wet or dry signal is thus generated for each probe. This signal provides a close look at the wet or dry status of the probe. This information could be used as an automatically determined probe status signal and could be recorded in place of the PAM signals. However, this is not done because of the uncertainty involved in automatically setting the wet or dry threshold. By saving the analog data, the wet or dry threshold can be varied after the test until the uncertainty is minimized.

In discriminating between wet and dry, the transfer function between probe resistance and output voltage shown in Figure 6 is used. Probe resistance varies depending on the condition at the probe. All water gives the lowest resistance. Increasing resistance occurs as the fluid state passes through two-phase, liquid film, and complete dryout. The discrimination between wet and dry should be set midway in the two-phase flow region. A typical impedance plot, shown in Figure 7, shows the transitions through each of these conditions. By looking at impedance plots from each probe, the appropriate discrimination level can be selected. Once this level has been selected, liquid flow distribution, bubble plots can be constructed which indicate the wet or dry condition as a function of time for all probes in each assembly. A typical bubble plot is shown in Figure 8, where an "X" indicates a wet condition.

5. DATA PROCESSING

The CLLD data were processed at the INEL from analog tapes using the Loss-of-Fluid Data Processing System. The impedance plots for Test C1-1 are shown in Appendix A. The probe numbers are indicated on the vertical axis of the impedance plots.

The bubble plots for each assembly are shown in Appendix B. Table 4 is a list of the inoperable probes. When the bubble plots are made from the impedance plots the inoperable probes are ignored. The elevations of the working probes are noted on each bubble plot. The electronics for the Downcomer-2 assembly was disabled; therefore there is no information for these probes.

Because of the large number of probe failures in the upper plenum, a composite bubble plot was made of the working probes by assuming radial symmetry of fluid conditions at each level. Table 5 is a list of the probes used to construct the upper plenum bubble plot.

6. TEST RESULTS

The lower plenum assemblies started becoming wet from the bottom to the top from 57 to 66 s. The regions around all three assemblies were completely wet by 66 s except LP-1 which had a few bubbles around it from 733 to 750 s. See Figures B-1 to B-33.

The core wide range assemblies started becoming wet from the bottom by 66 s. The regions around all three assemblies had active two phase flow until 700 s when the core was covered with water. The two phase flow was above 2500 mm around CWR-1 and CWR-3, and above 2900 mm around CWR-2. CWR-1 became completely wet by 744 s, CWR-2 by 747 s, and CWR-3 by 766 s. See Figures B-34 to B-66.

The core narrow range assemblies started becoming wet from the bottom by 78 s. CNR-1 had active two phase flow along its entire length until 665 s. There were some bubbles between 665 to 733 s when CNR-1 became completely wet. CNR-2 and CNR-3 had active two phase flow along their entire lengths until 690 s when they became completely wet. See Figures B-67 to B-99.

The region around DC-1 had some two phase flow below 5500 mm and active two phase flow between 5500 and 6800 mm until 750 s. Except for a few bubbles, DC-1 became completely wet below 6100 mm by 756 s. The region around DC-3 had some two phase flow below 5100 mm and active two phase flow between 5100 and 7100 mm becoming completely wet by 750 s. The regions around both assemblies had steam with a few leaks above 7000 mm during the entire test. See Figures B-100 to B-121.

The composite upper plenum assembly started to become wet at the bottom by 570 s. Above that elevation there was steam with some drops until the end of the test. No fluid reached the upper plenum level above 6700 mm at any time during the test. See Figures B-122 to B-132.

7. CONCLUSIONS

The first main test of CCTF-C1-1 (Run 010) was successfully completed June 21, 1979. There was active two phase flow in the core above 3000 mm with slightly more activity in the region away from the breaks. The downcomer had active two phase flow between 5000 and 7000 mm, with steam above that elevation, with the lower plenum becoming completely wet at 66 s and the downcomer becoming completely wet at 740 s. All CLLD assemblies, except the upper plenum and the downcomer above 7000 mm were completely wet by 766 s.

The CLLD System worked very well in detecting the presence of fluid in the CCTF under the test conditions of pump resistance.

8. REFERENCES

1. K. Hirano et al., Quick-Look Report on Large Scale Reflood Test-1, CCTF Test C1-1 (Run 010), JAERI-Memo 8453, August 1979.

2. K. Hirano et al., Quick-Look Report on Large Scale Reflood Test-2, CCTF Test C1-2 (Run 011), JAERI-Memo 8530, October 1979.

3. R. C. Greninger and M. Meyer-Christians, CCTF Operation and Maintenance Manual, Conductivity Liquid Level Measurement System (CLLMS), EG&G-3D-5046, December 1979.

4. D. L. Batt et al., "LOFT Liquid Level Transducer Application Techniques and Measurement Uncertainty," International Colloquium on Two-Phase Flow Instrumentation, June 1979.

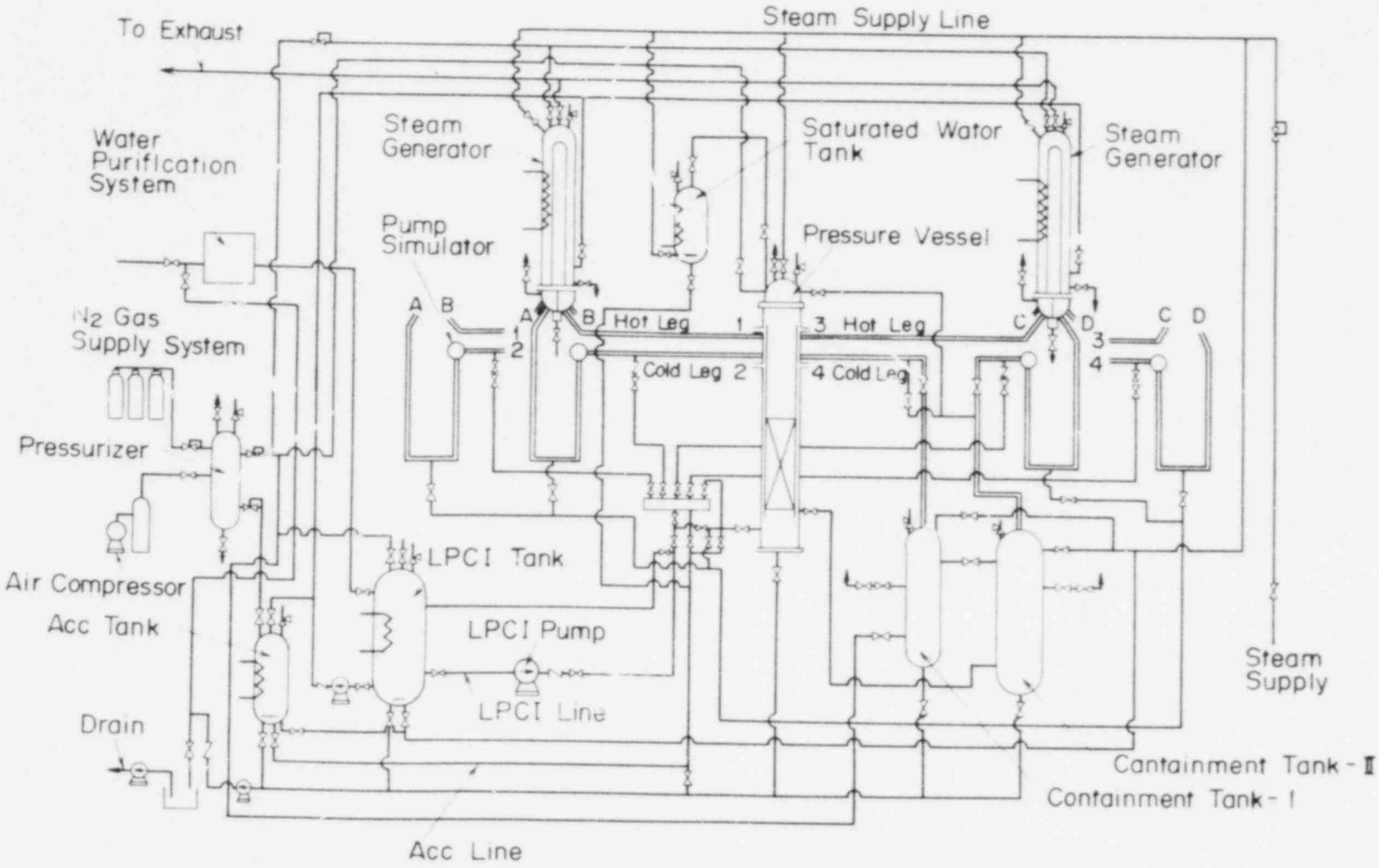


Figure 1. Schematic diagram of Cylindrical Core Test Facility.

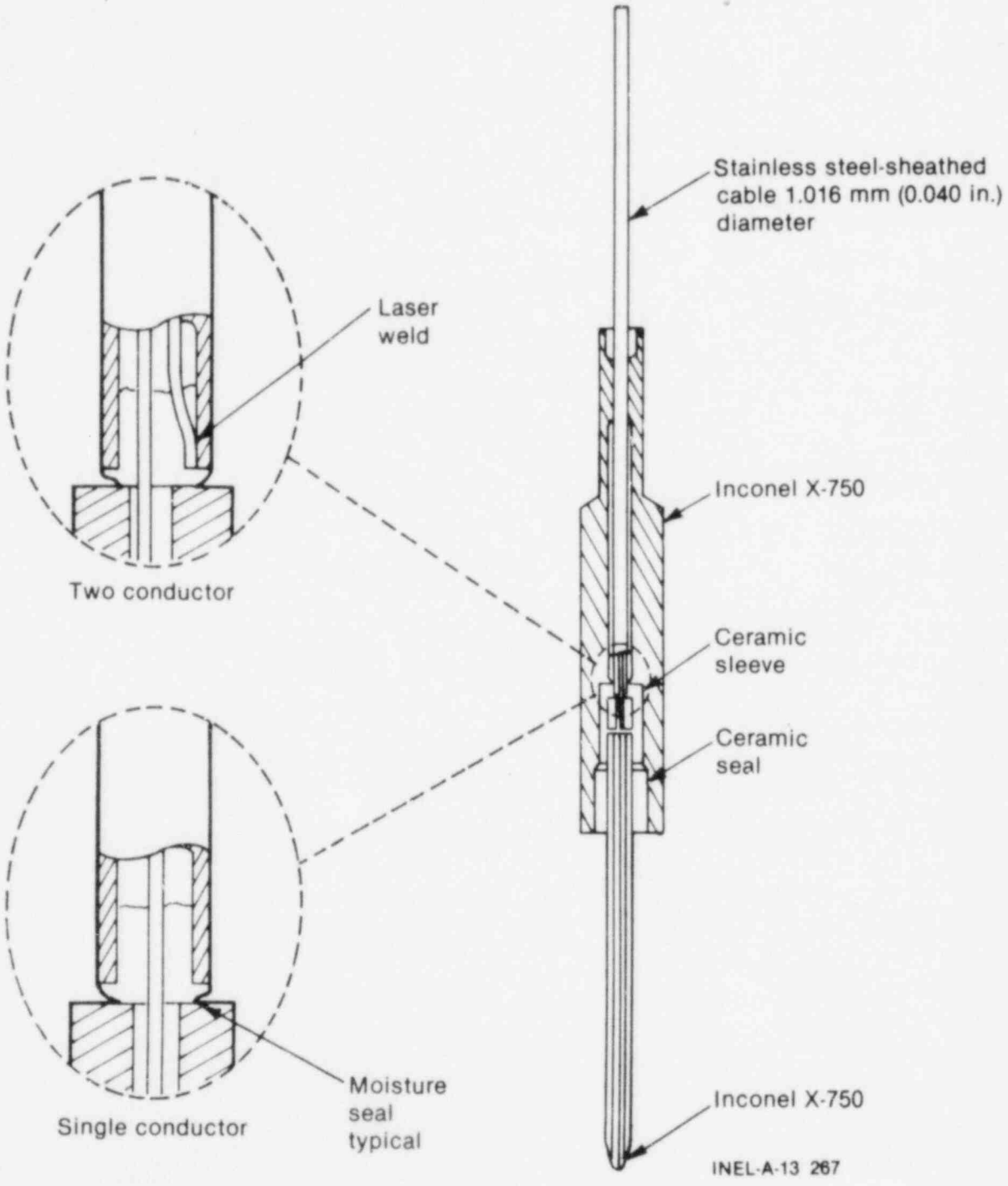


Figure 2. Typical conductivity liquid level detector.

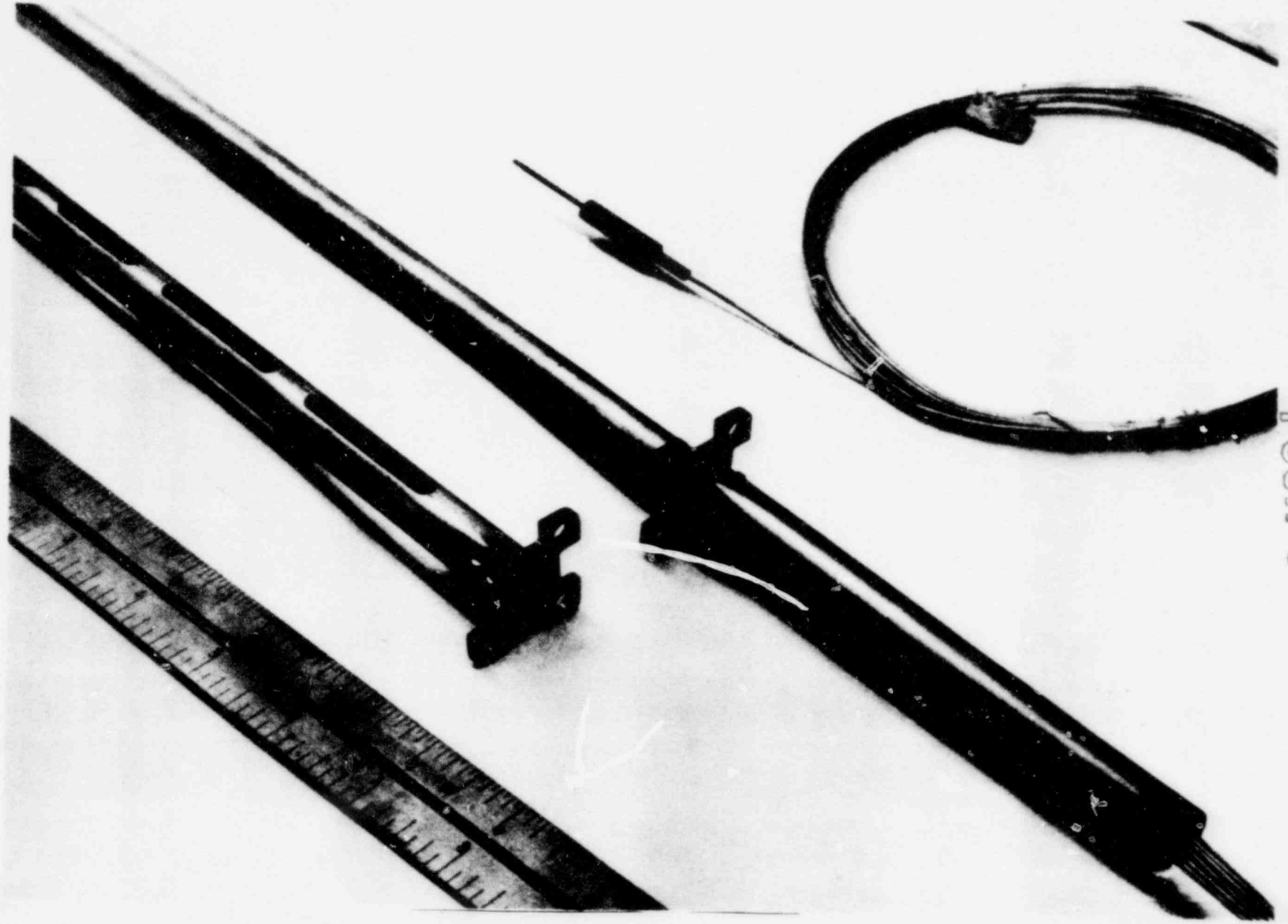


Figure 3. Conductivity liquid level detector assembly components.

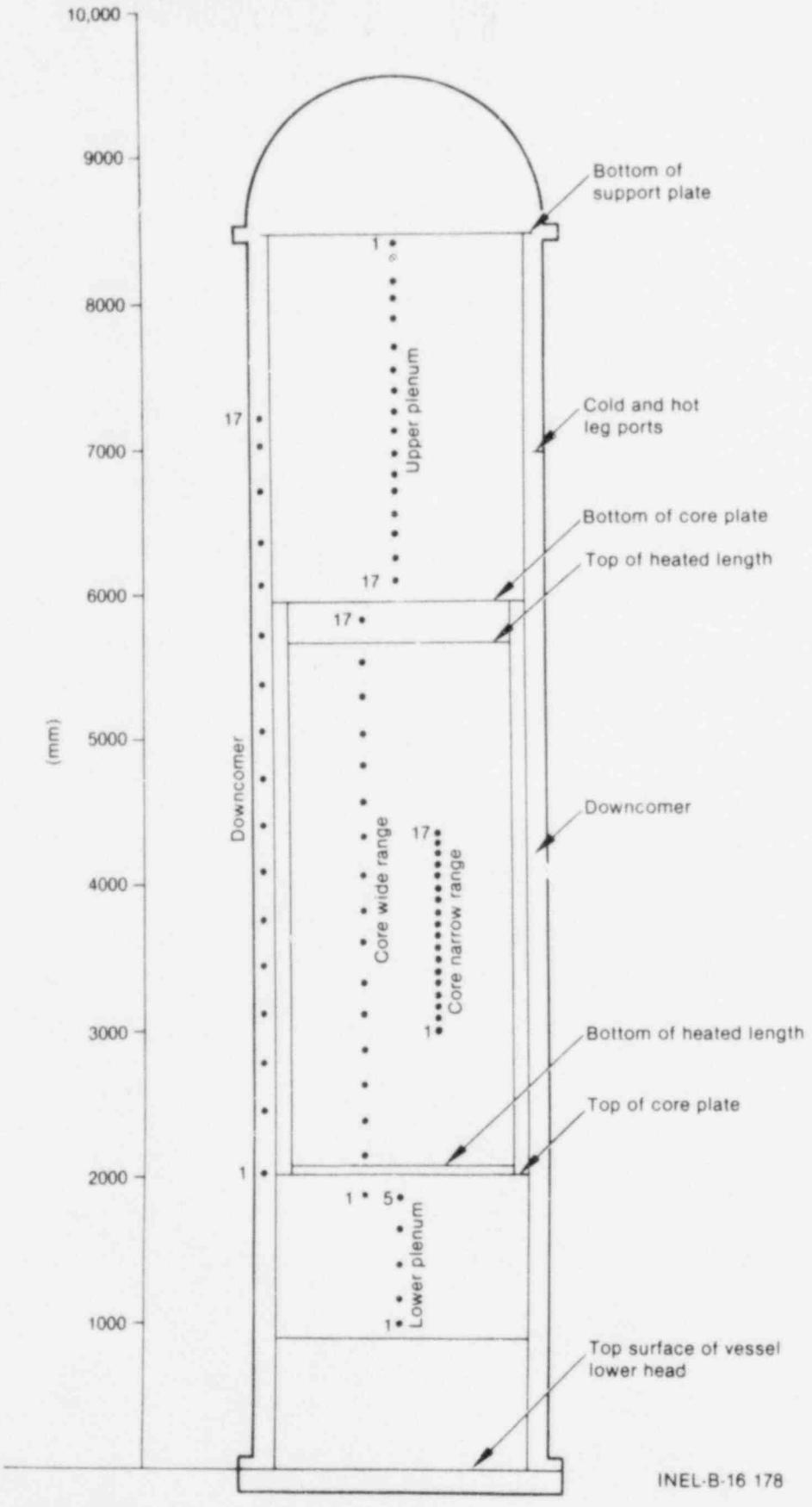


Figure 4. Vertical elevations of each probe with respect to the upper surface of the vessel lower head.

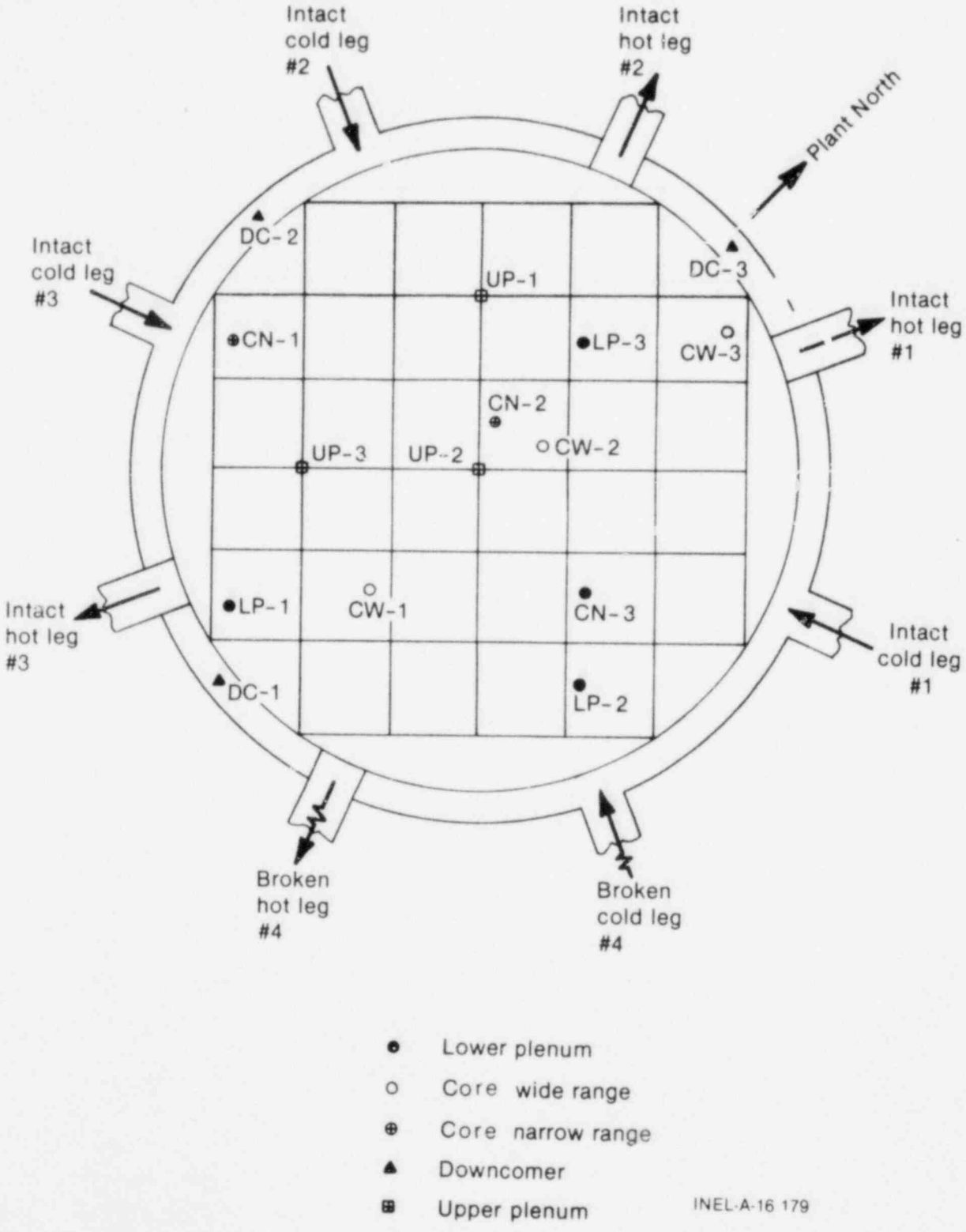


Figure 5. Radial distribution of the CLLDs.

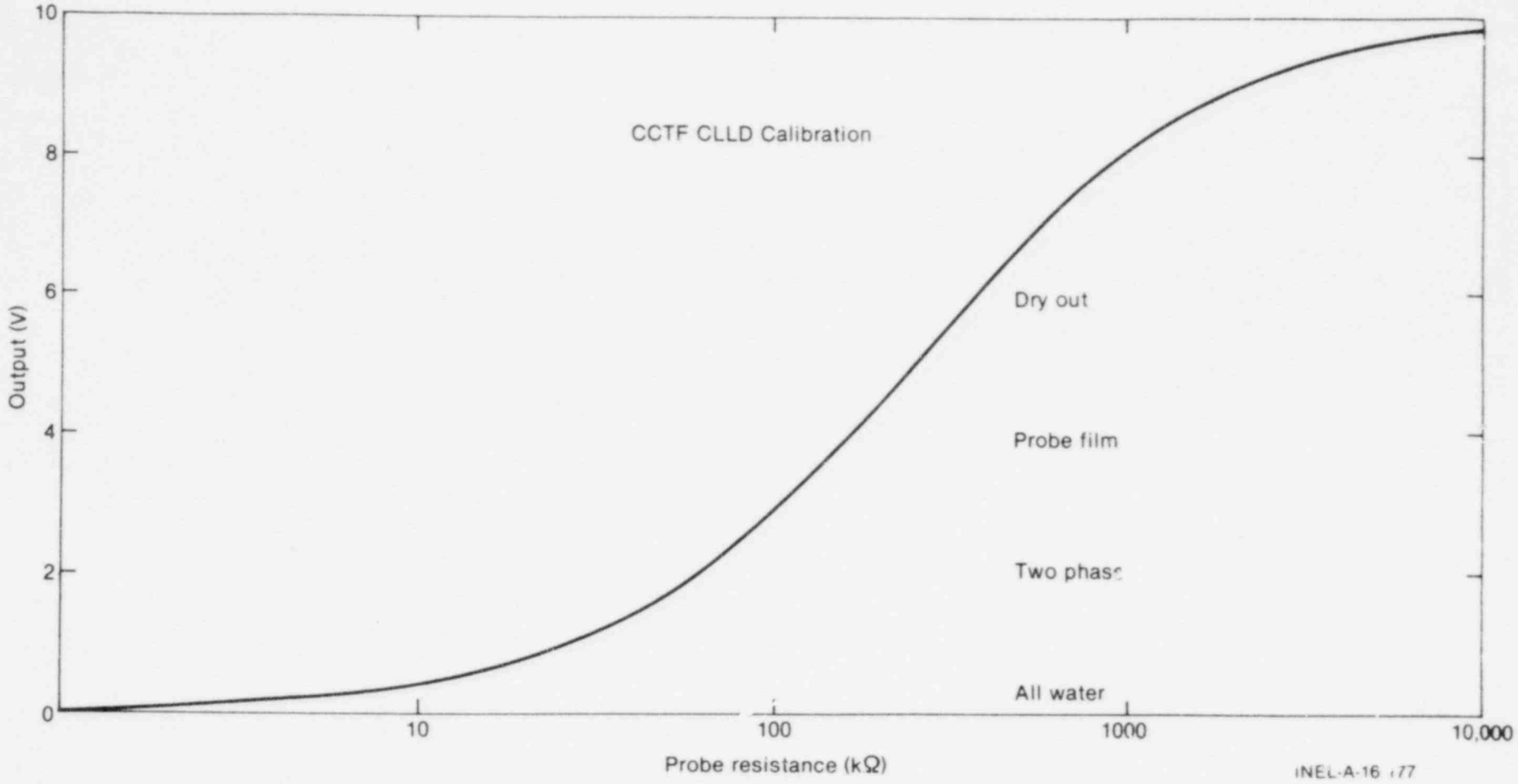


Figure 6. Transfer function between probe resistance and output voltage.

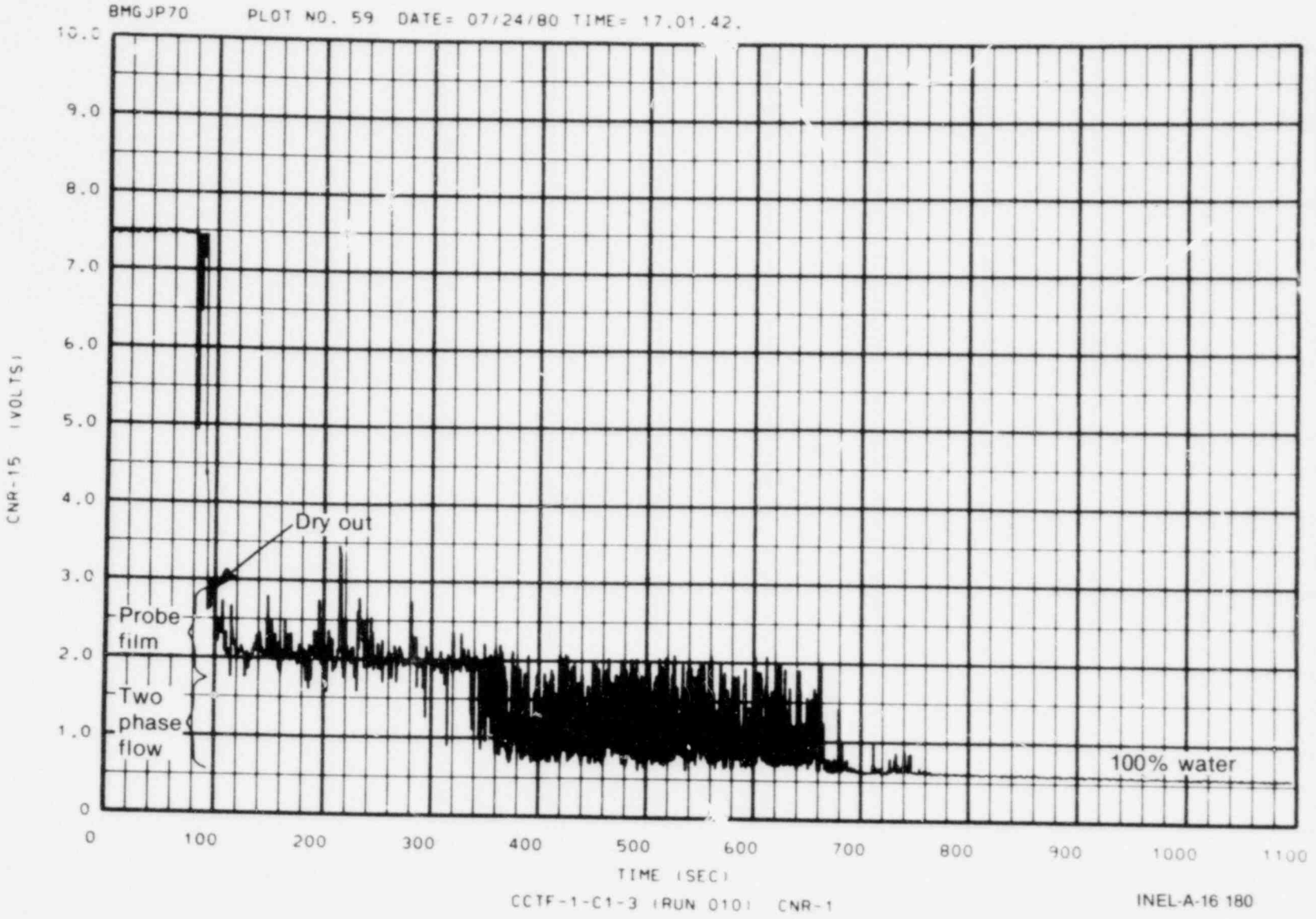


Figure 7. Typical impedance plot.

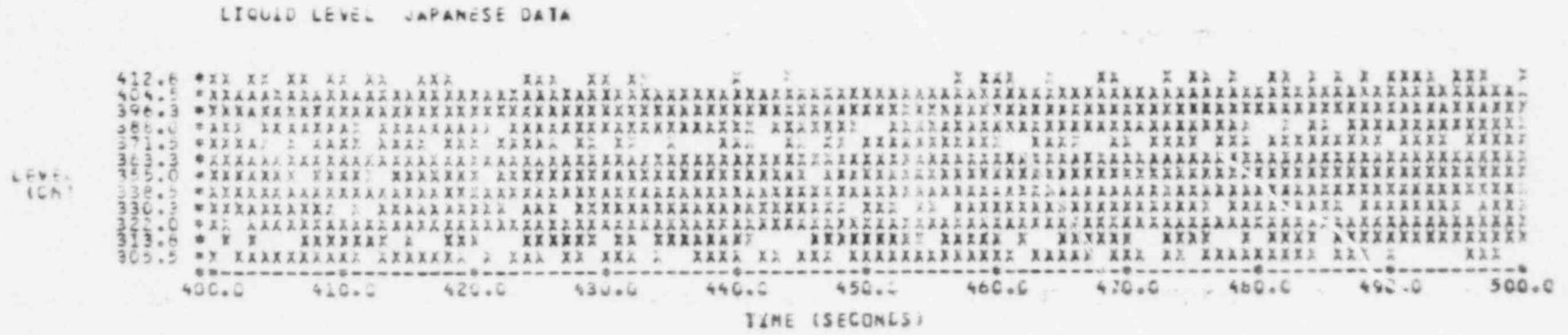


Figure 8. Typical bubble plot.

TABLE 1. INITIAL CONDITIONS FOR TESTS C1-2 AND C1-1

	Base Case (Test C1-2)	Pump Resistance (Test C1-1)
Power		
Total (MW)	9.36	9.35
Linear (kW/m)	1.4	1.40
Radial power distribution	1.07:1.0:0.82	1.08:1.0:0.82
Decay type (ANS x 1.2 + Actinide)	30 s after Scram	30 s after scram
Pressure (kg/cm^2a)		
System	2.07	2.07
Steam generator secondary	50	50
Temperature (K)		
Downcomer wall	460	461
Primary piping wall	391	395
Steam generator secondary	536	536
Peak clad at ECC initiation	775	779
Peak clad at beginning of reflood	890	887
Lower plenum filled liquid	386	389
ECC liquid	312	311
Water Level (m)		
Lower plenum	0.86	0.87
Steam generator secondary	7.3	7.1
Injection Rate (m^3/hr)		
Accumulator	242	264
LPCI	30.9	30.8

TABLE 2. CCTF AND PWR COMPONENT DIMENSIONS COMPARED

Component	PWR	CCTF	RATIO
Pressure Vessel			
Vessel inside diameter (mm)	4394	1084	
Vessel thickness (mm)	216	90	
Core barrel outside diameter (mm)	3874	961	
Core barrel inside diameter (mm)	3760	929	
Thermal shield outside diameter (mm)	4170		
Thermal shield inside diameter (mm)	4030		
Downcomer length (mm)	6066	6066	1/1
Downcomer gap (mm)	114.3	61.5	
Downcomer flow area (m^2)	4.23	0.197	1/21.44
Lower plenum volume (m^3)	29.6	1.38	1/21.44
Upper plenum volume (m^3)	43.6	2.04	1/21.44
Fuel (Heater Rod) Assembly			
Number of bundles	193	32	
Rod array	15 x 15	8 x 8	
Rod heated length (mm)	3660	3660	1/1
Rod pitch (mm)	14.3	14.3	1/1
Fuel rod outside diameter (mm)	10.72	10.7	1/1
Thimble tube diameter (mm)	13.87	13.8	1/1
Instrument tube diameter (mm)	13.87	13.8	1/1
Number of heater rods	39372	1824	1/21.58
Number of nonheating rods	4053	224	1/18.09
Core flow area (m^2)	5.29	0.25	1/21.2
Core fluid volume (m^3)	17.95	0.813	1/21.2
Primary Loop			
Hot leg inside diameter (mm)	736.6	155.2	1/4.75
Hot leg flow area (m^2)	0.426	0.019	1/22.54
Hot leg length (mm)	3940	3940	1/1
Pump suction inside diameter (mm)	787.4	155.2	1/5.07
Pump suction flow area (m^2)	0.487	0.019	1/25.77
Pump suction length (mm)	7950	7950	1/1

TABLE 3. CHRONOLOGY OF EVENTS FOR TEST C1-1 (RUN 010)

Event	TIME (s)
Test C1-1 initiated (Heater rods power on) (Data recording initiated)	0
Accumulator injection initiated	54
Power decay initiated (Beginning of core recovery)	66
Accumulator injection switched from lower plenum to cold leg	69.5
Accumulator injection ended and LPCI injection initiated	75
All heater rods quenched	633
Power off	664
LPCI injection ended	759.5
Test C1-1 ended (Data recording ended)	1073

TABLE 4. CCLD INOPERABLE PROBES

	Assembly	Probes
Core wide range	2	17
	3	7
Core narrow range	1	7, 9
	2	6, 10, 15, 16, 17
	3	16
Downcomer	1	12
	2	1 to 17

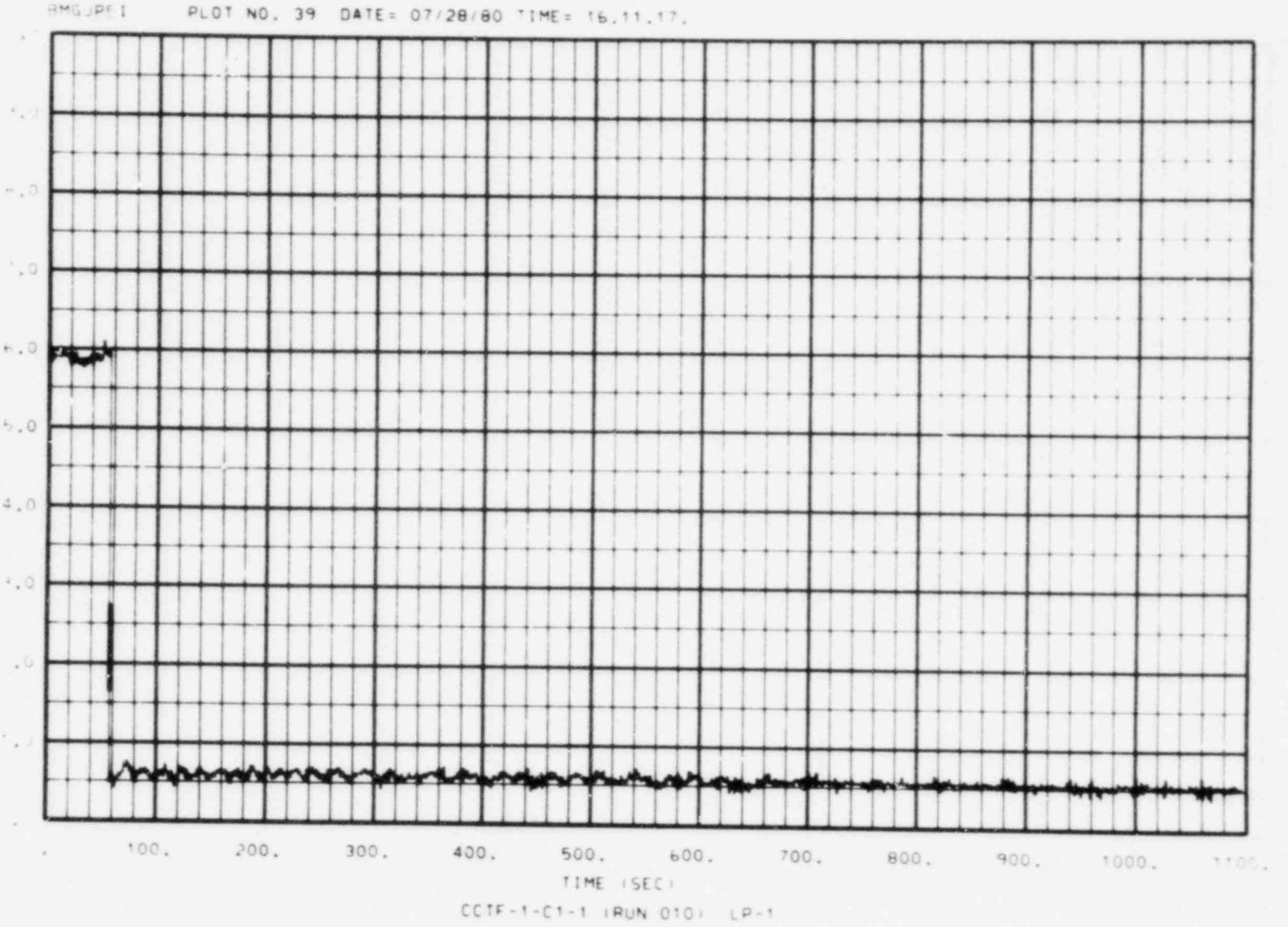
TABLE 5 UPPER PLENUM COMPOSITE ASSEMBLY

Probe	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Track	1	f[a]	1	1	1	f[a]	2	2	f[a]	2	1	1	1	3	3	1	1

a. Failed.

APPENDIX A

IMPEDANCE PLOTS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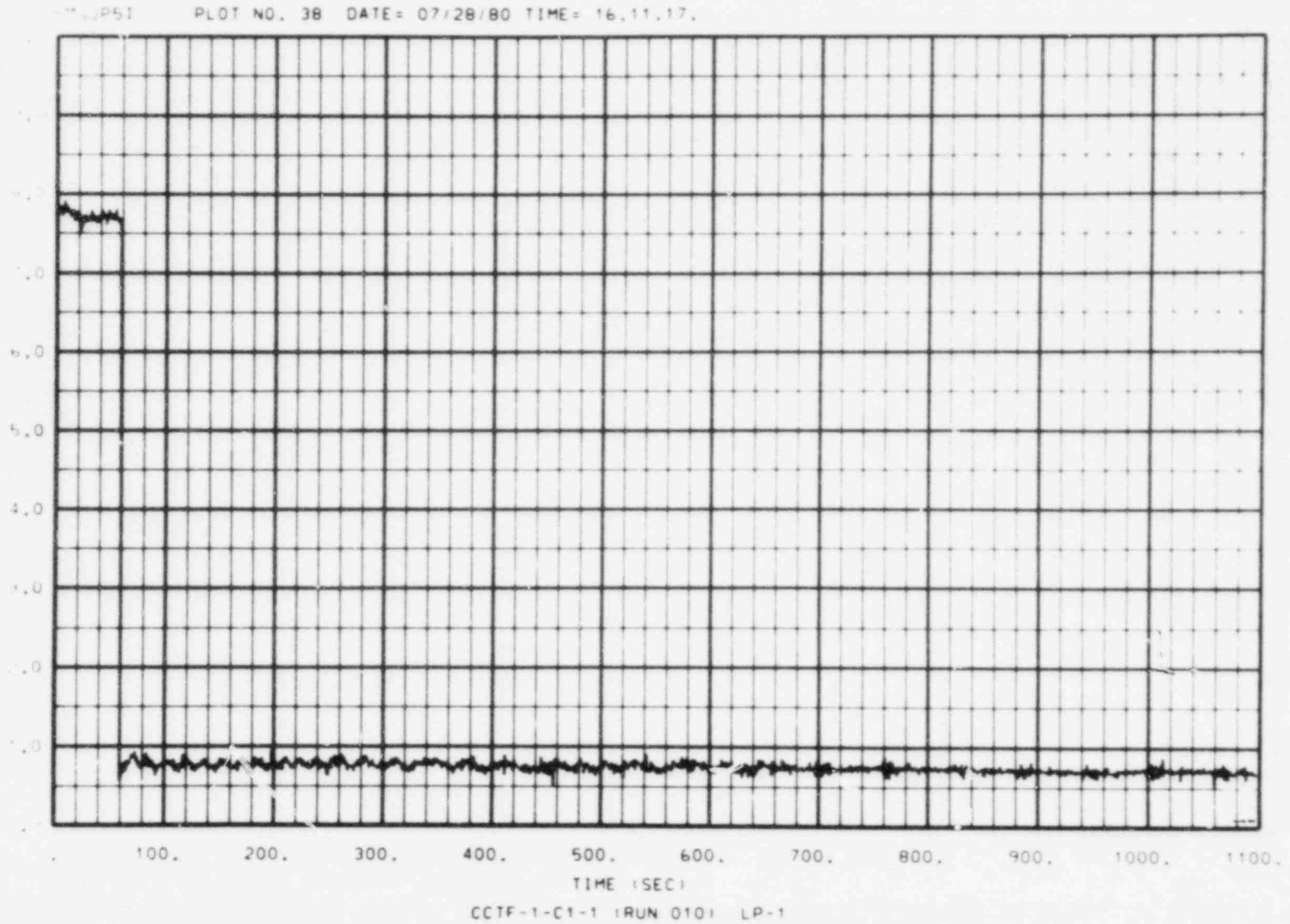
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-1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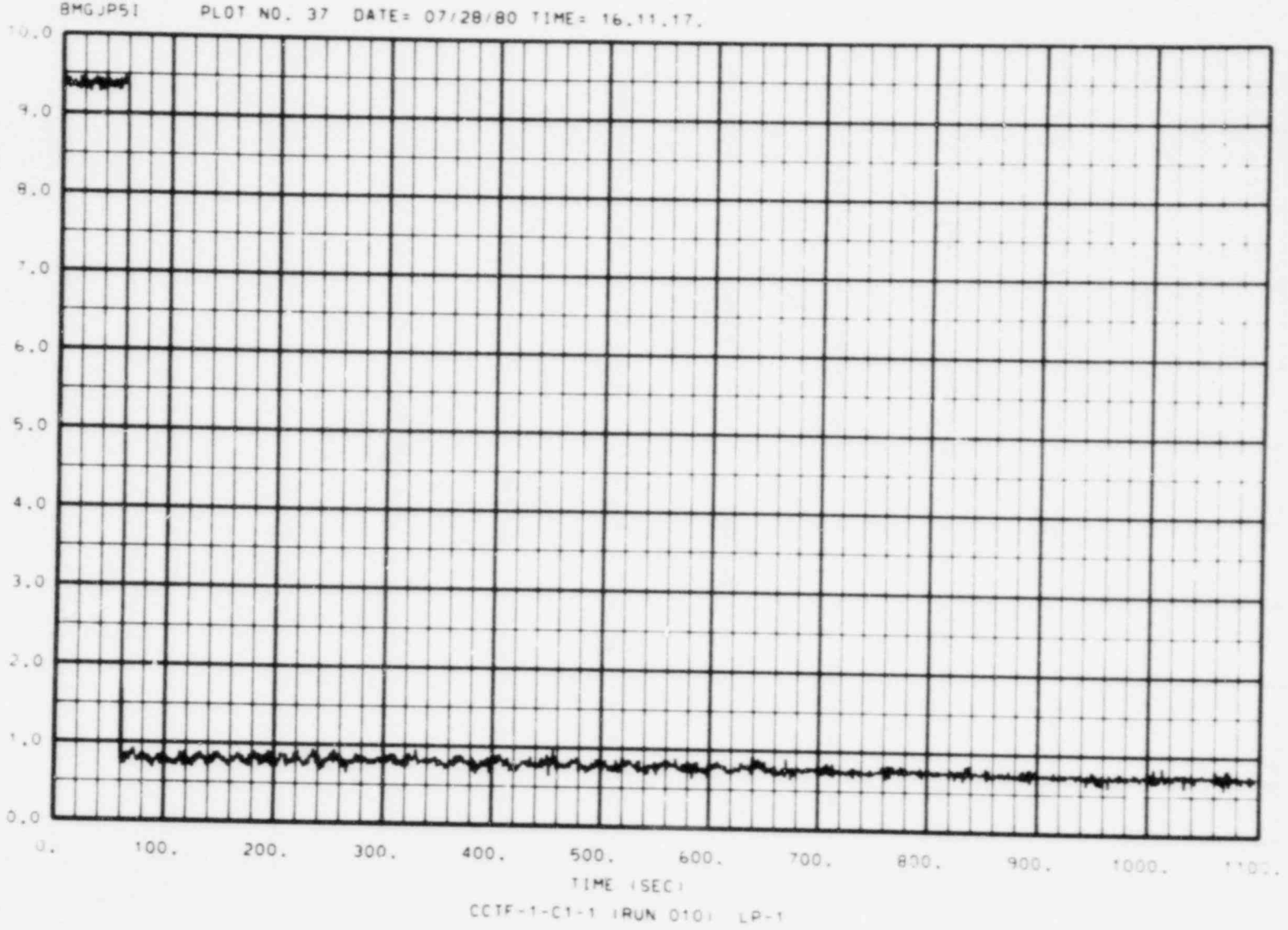
CCTF-1-C1-1 (RUN 010) LP-1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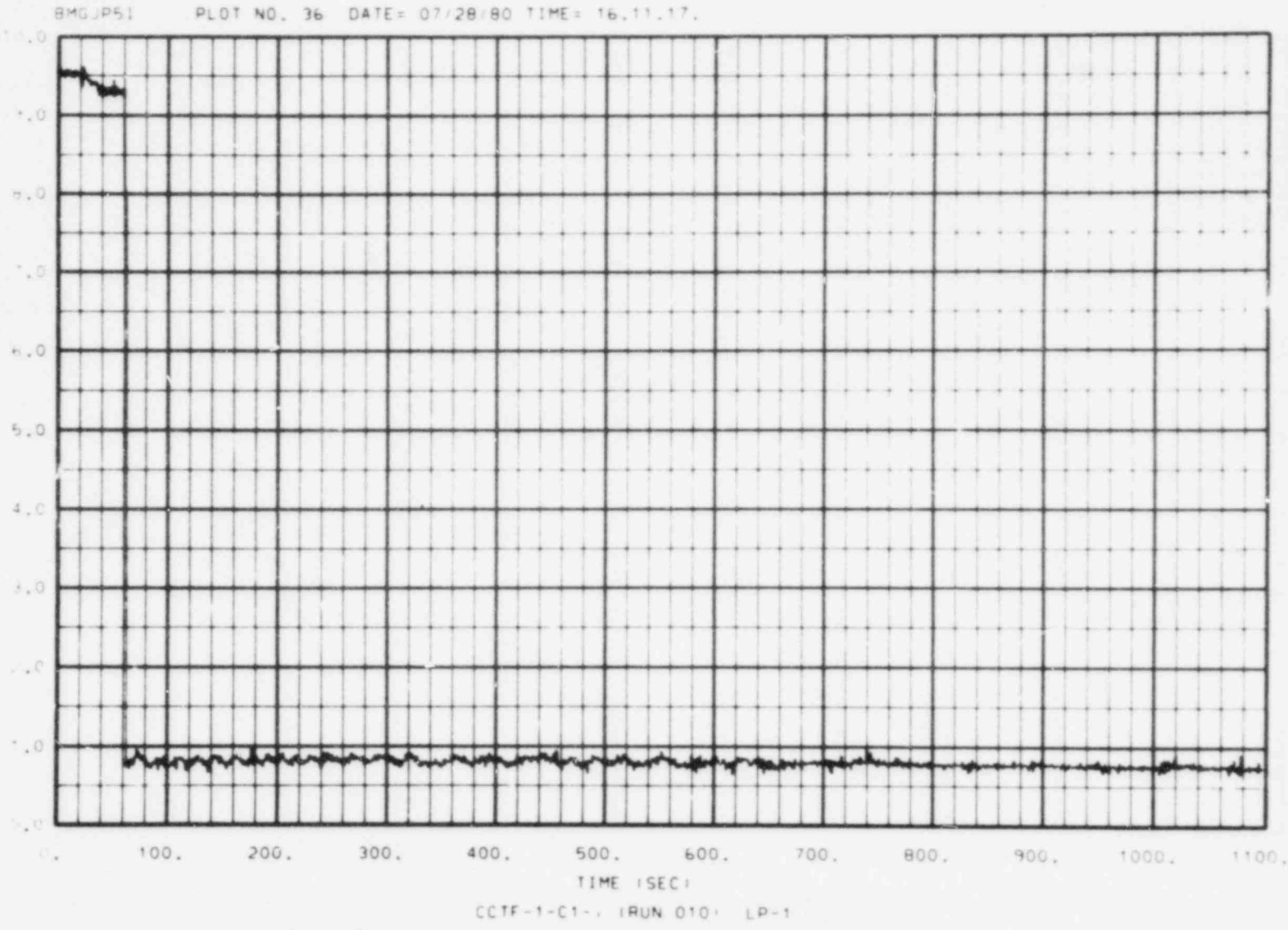
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-1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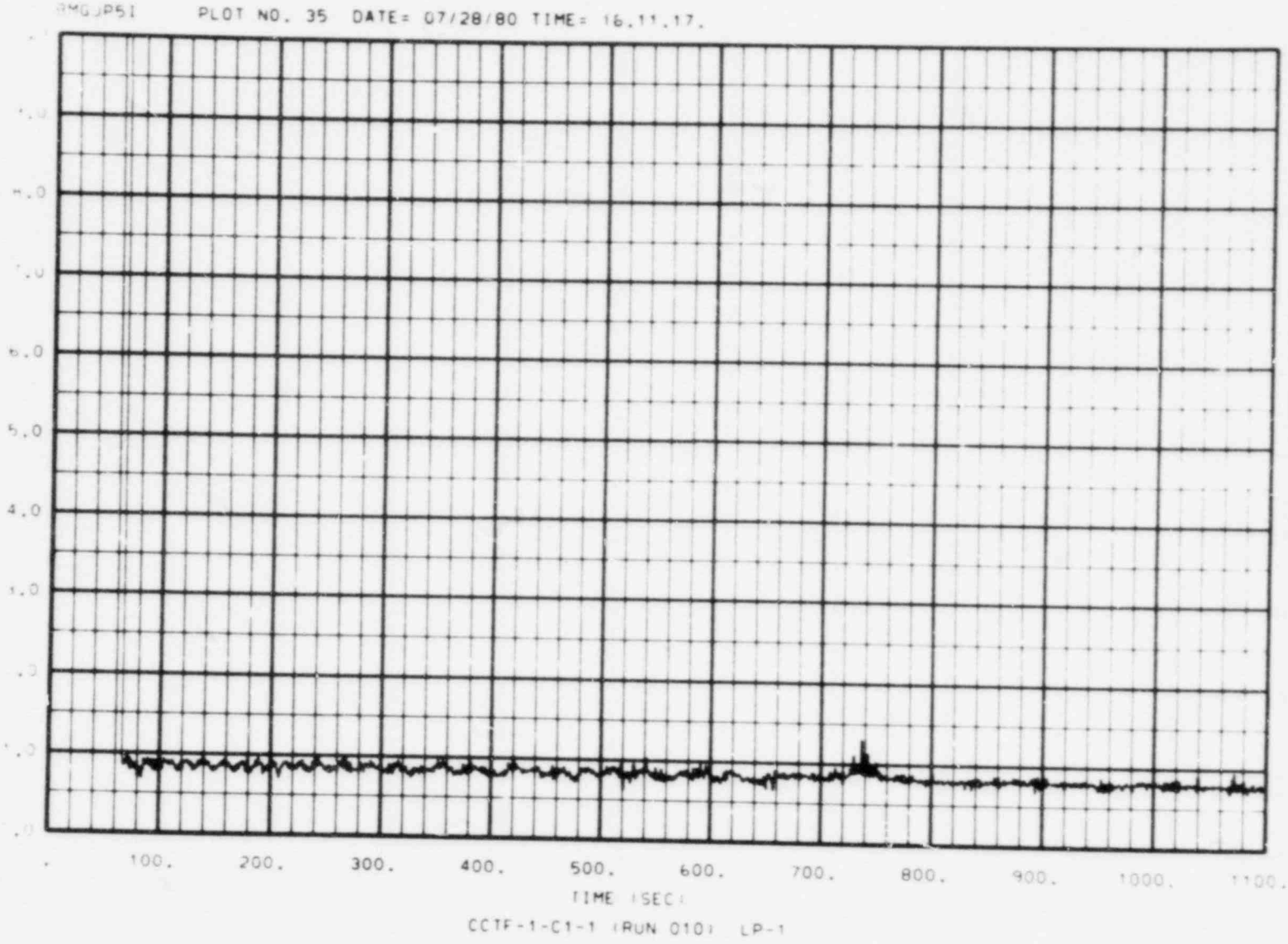
TIME (SEC)
CCTF-1-C1-, (RUN 010) LP-1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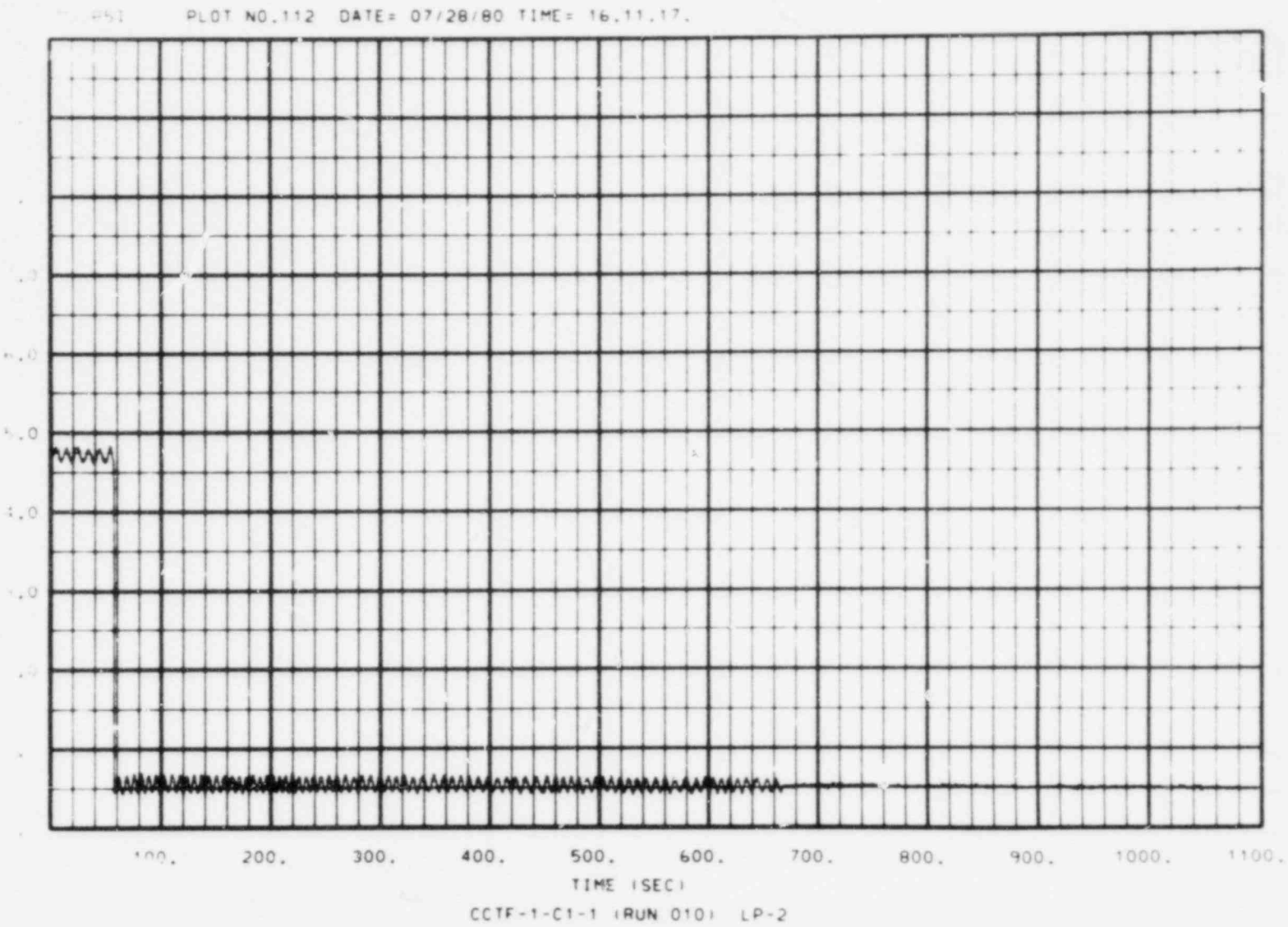
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-1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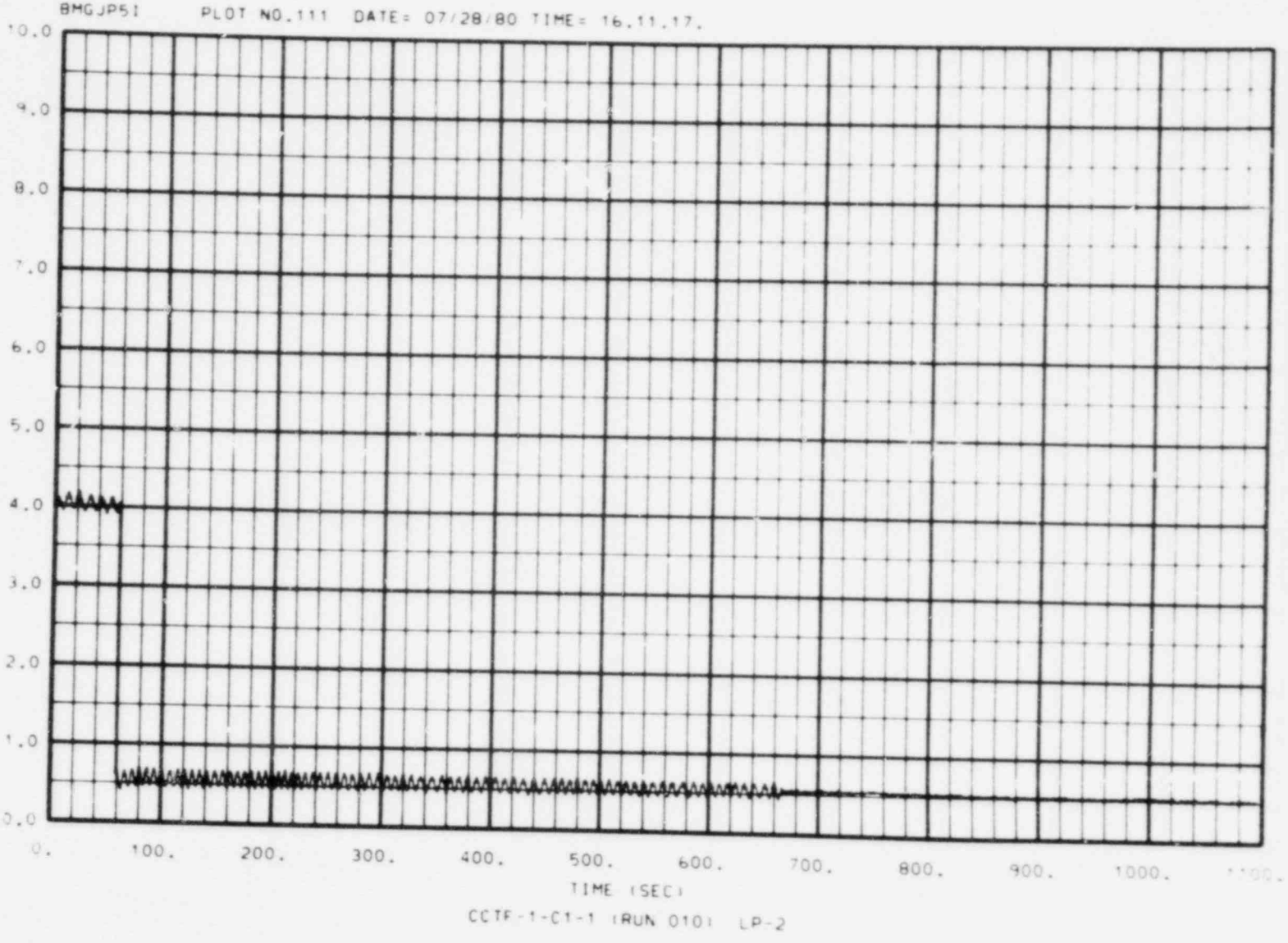
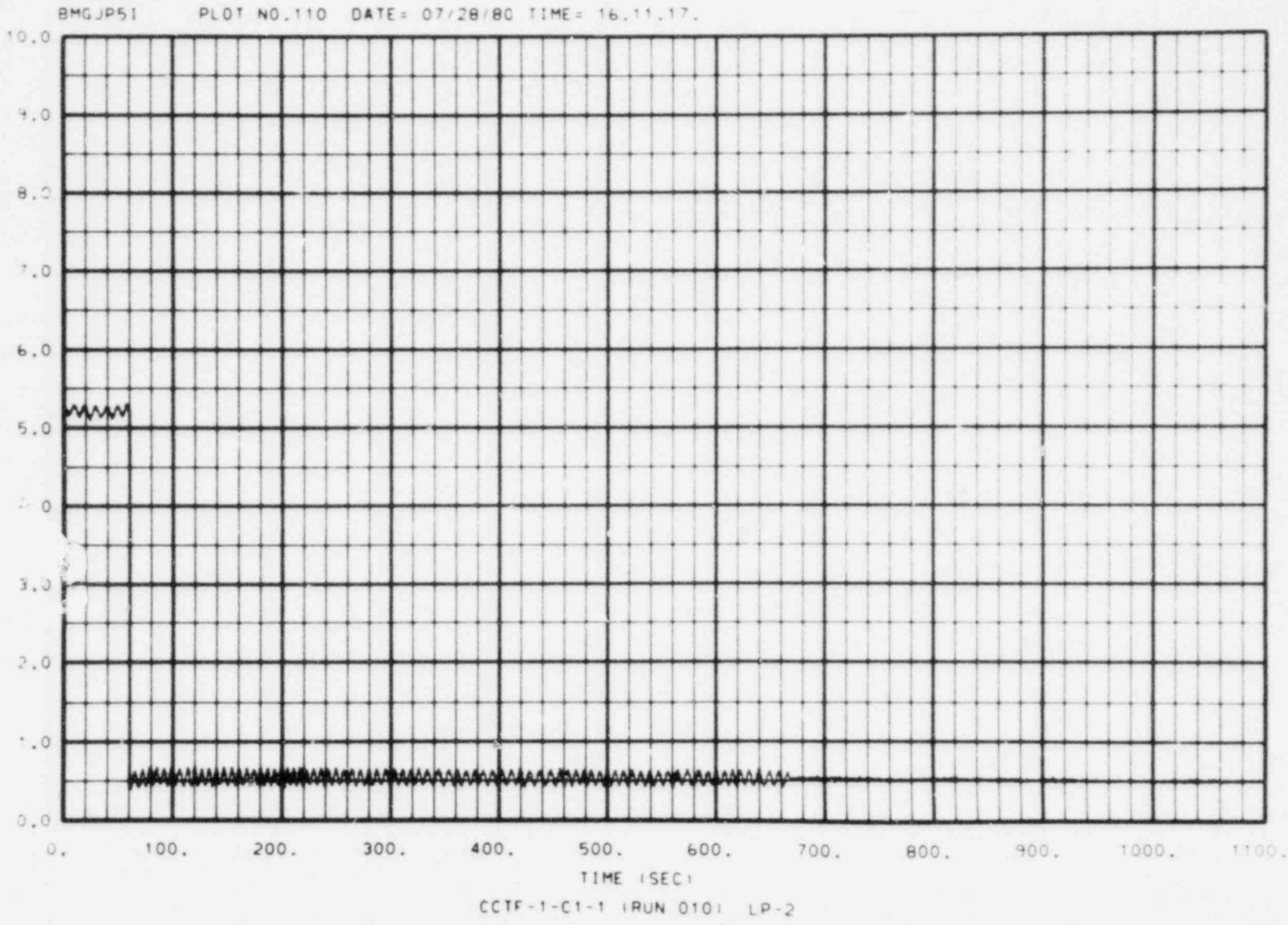
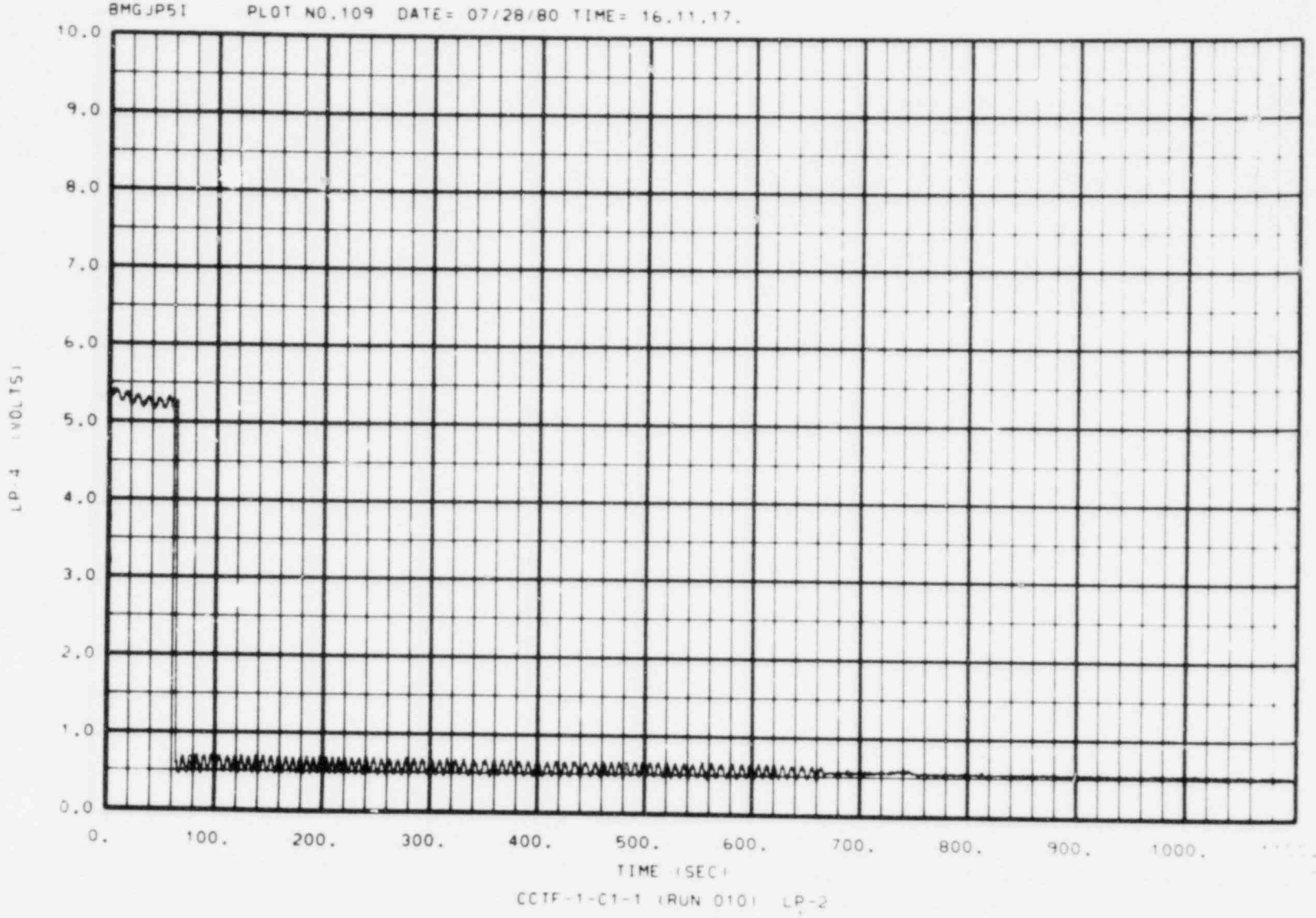
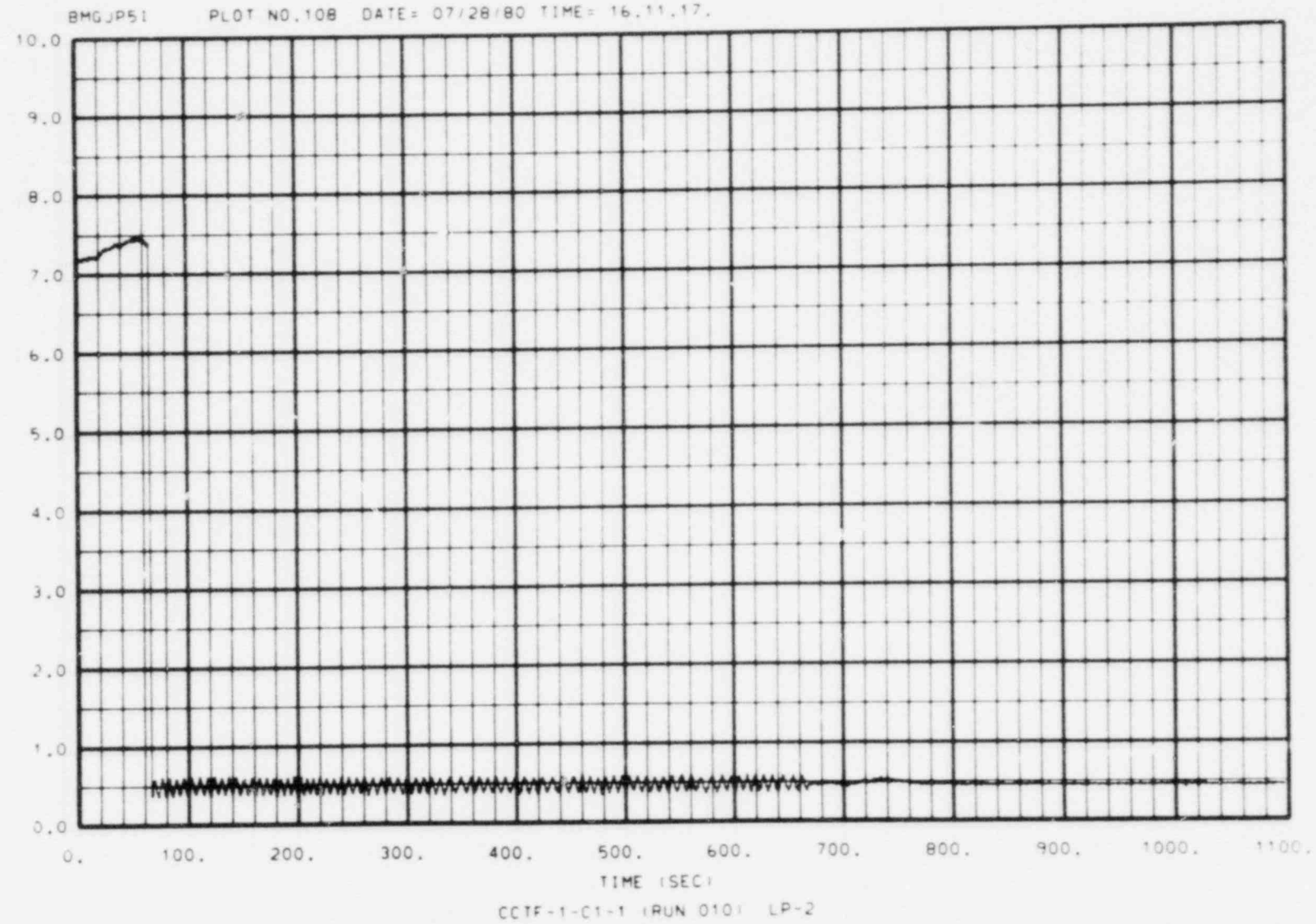
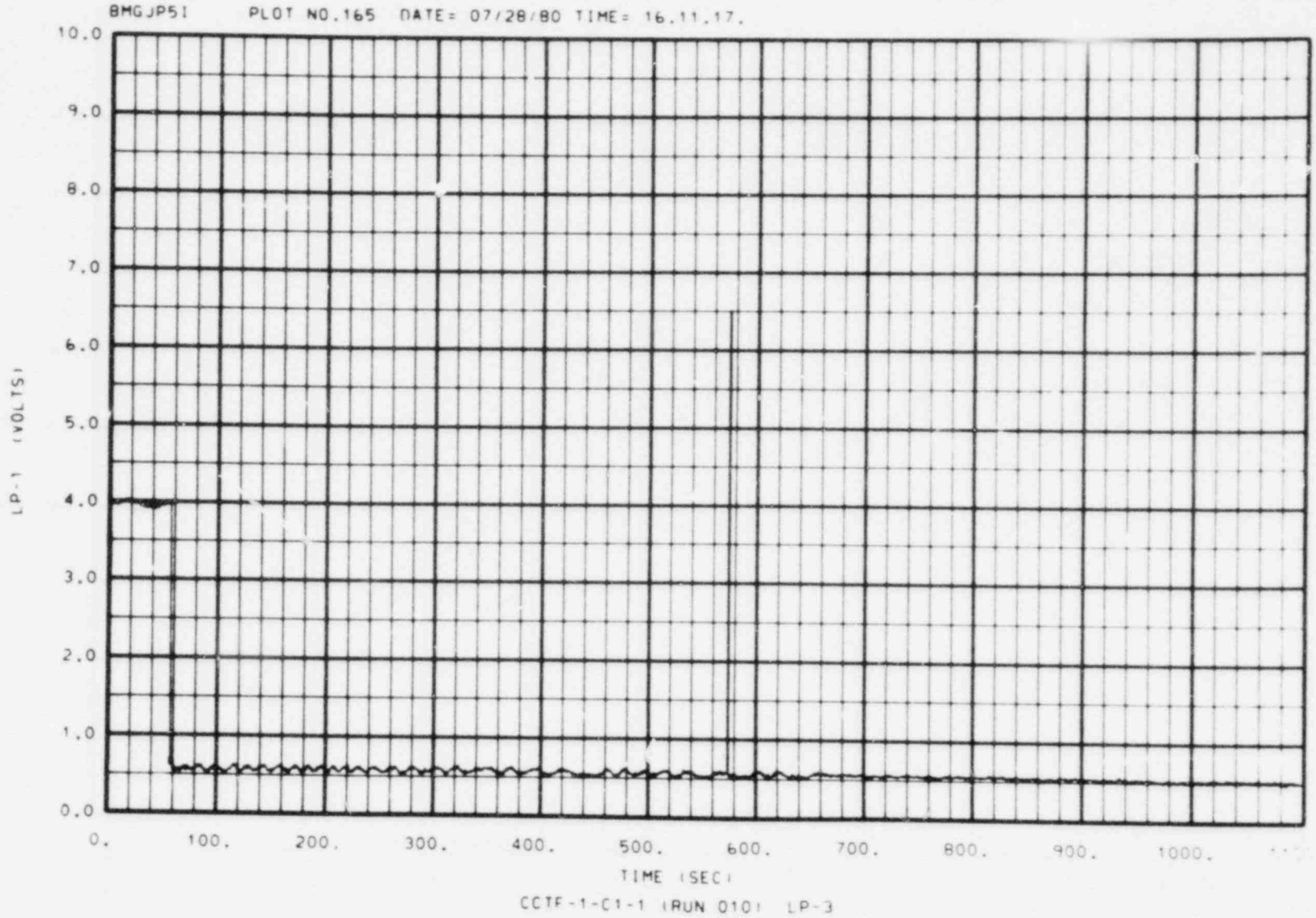
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-2

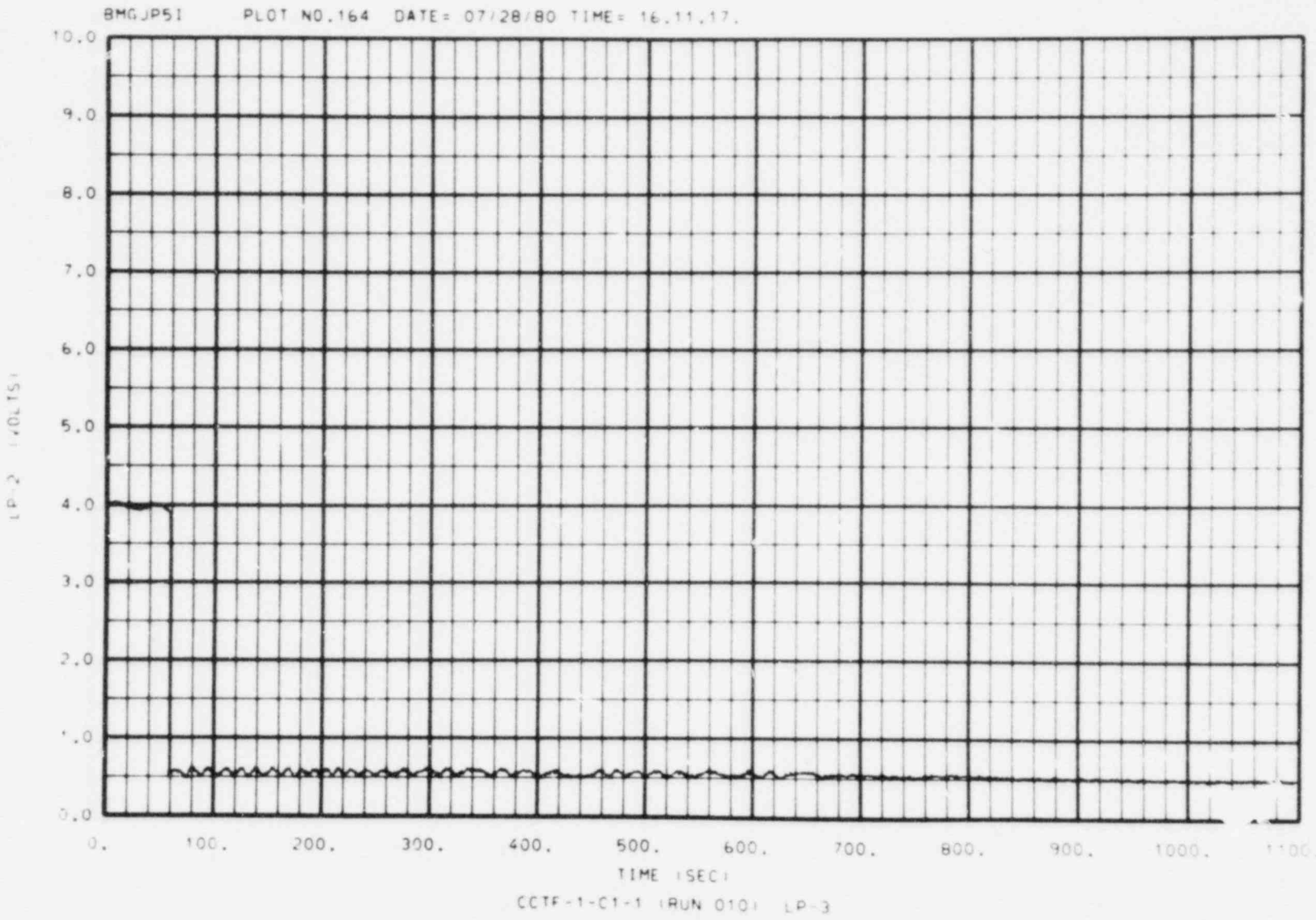

BMGJP51 PLOT NO.111 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-2

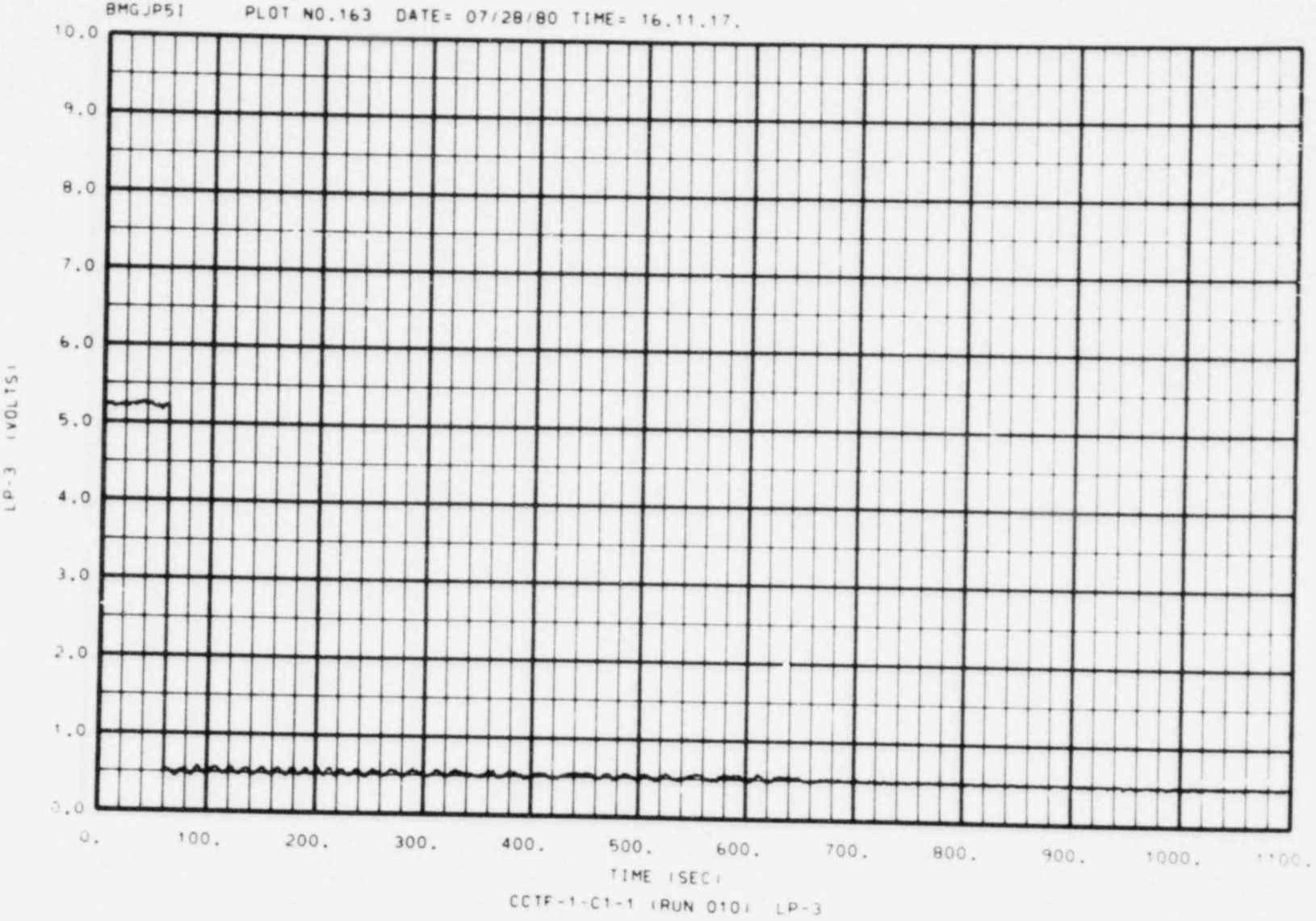

BMGJP51 PLOT NO.110 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-2

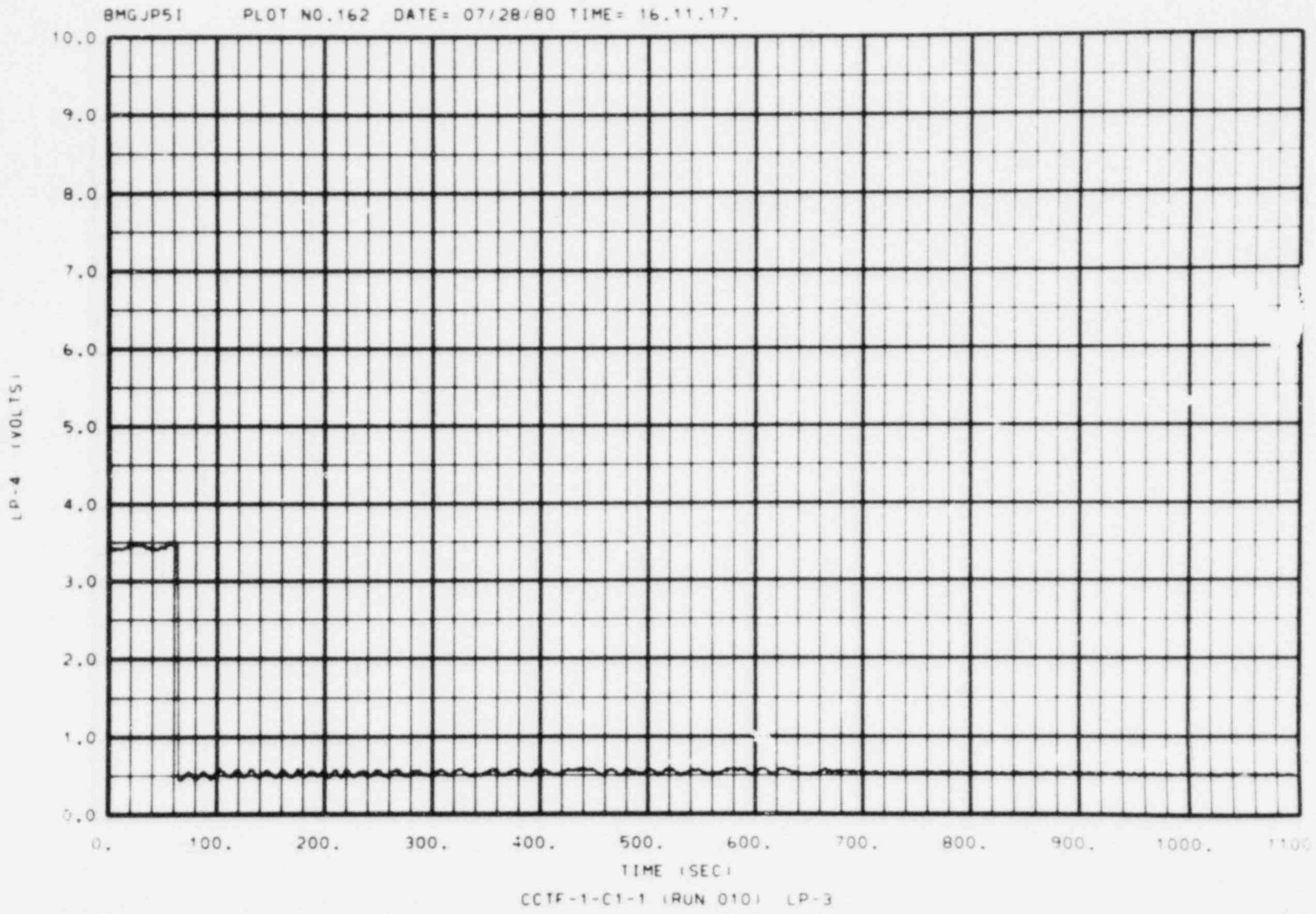

BMGJP5I PLOT NO.109 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-2
LP-4 (VOLTS)

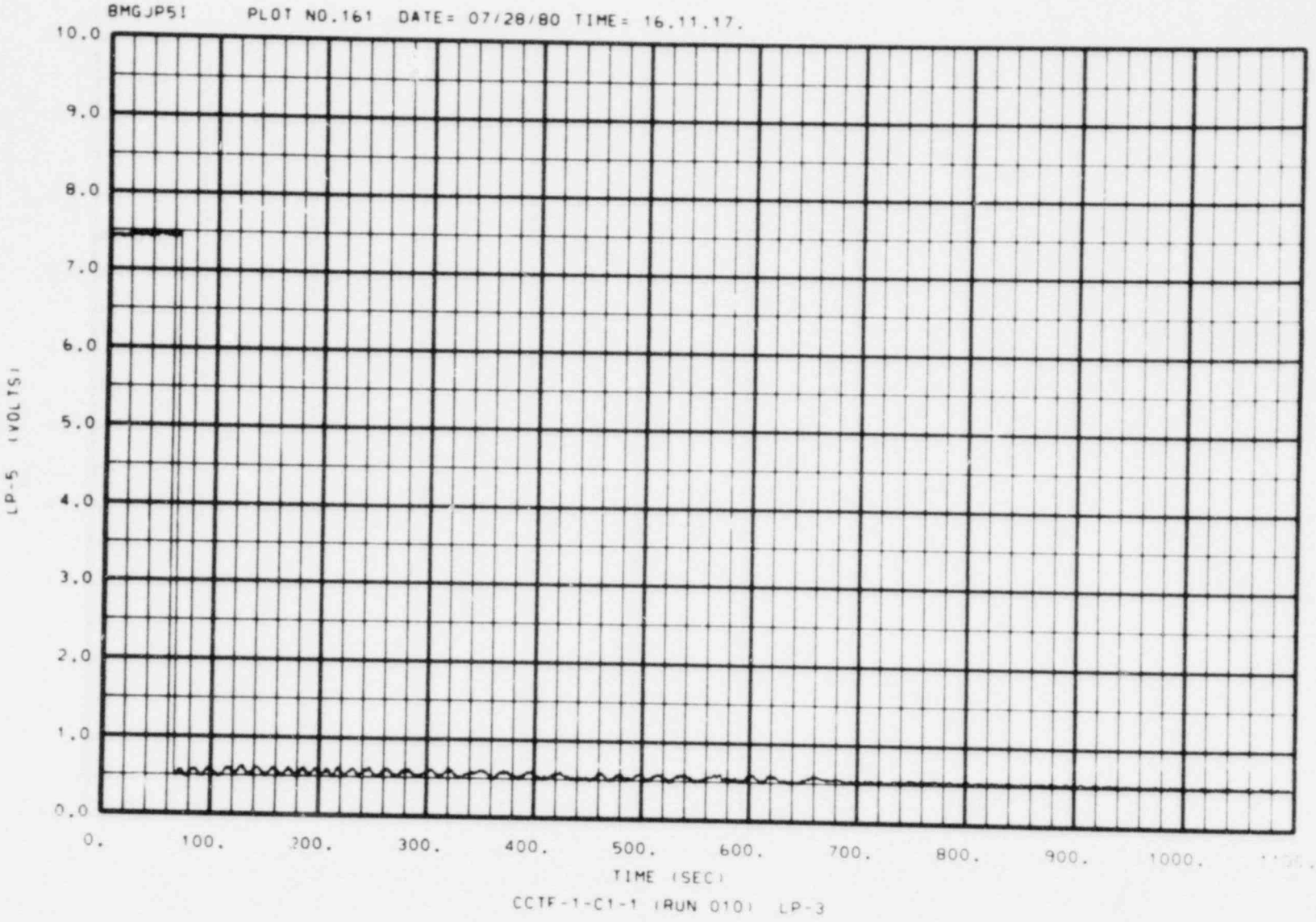

BMGJP51 PLOT NO.108 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-2

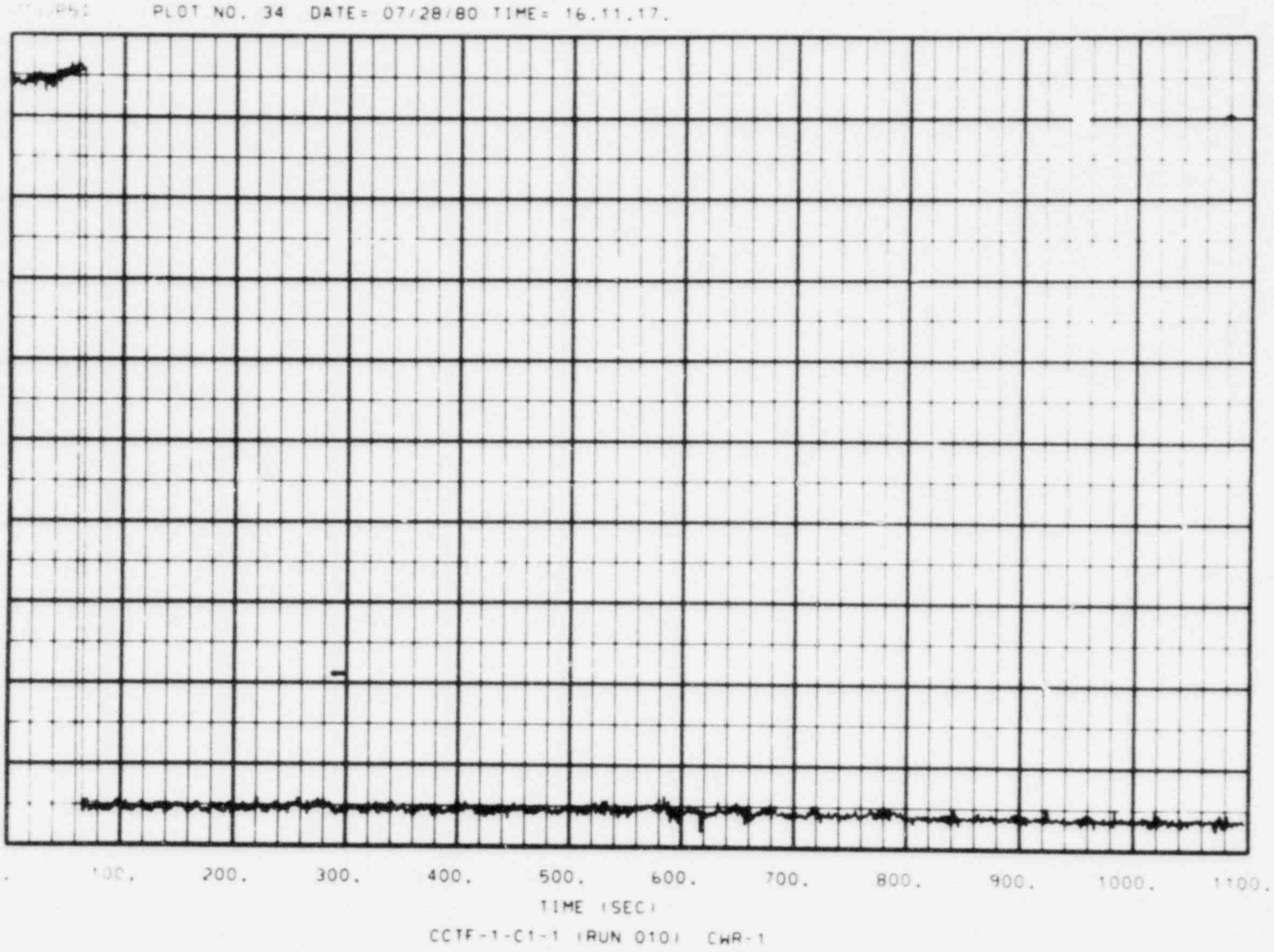

BMGJP5I PLOT NO.165 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
LP-1 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-3

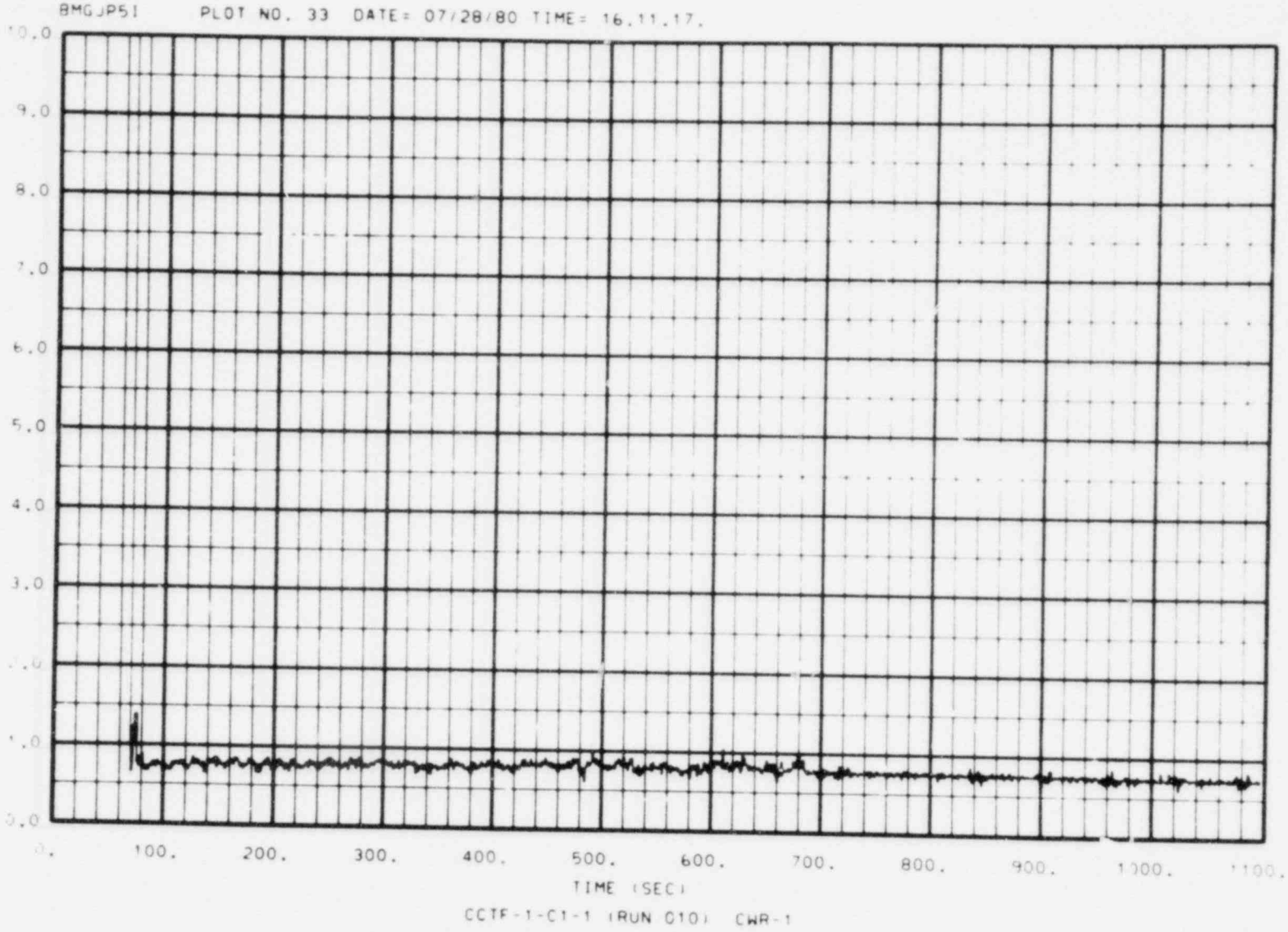

BMGJP5I PLOT NO.164 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
LP-2 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-3

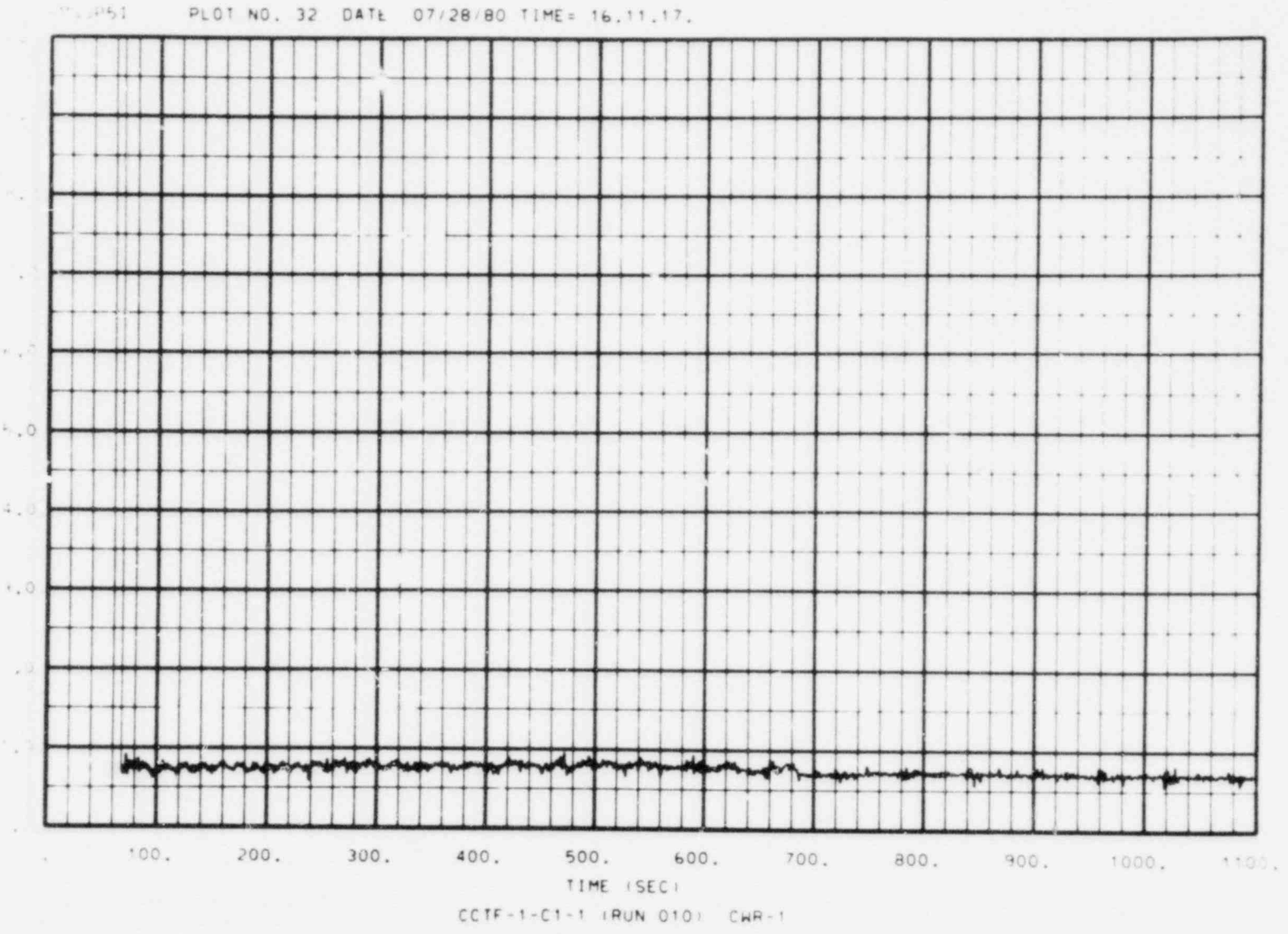

BMGJP5I PLOT NO.163 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
LP-3 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-3

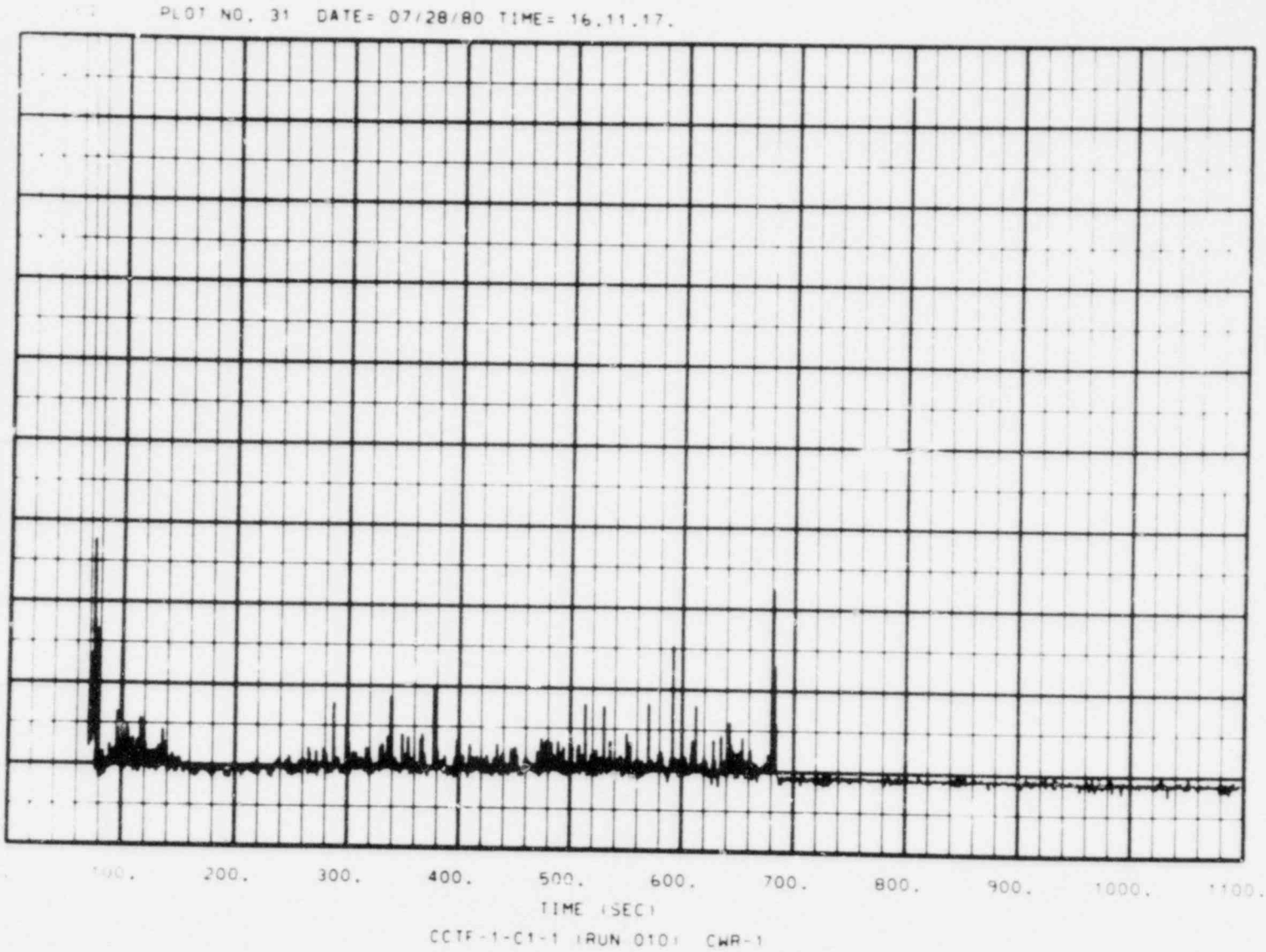

BMGJP5I PLOT NO.162 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
LP-4 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-3

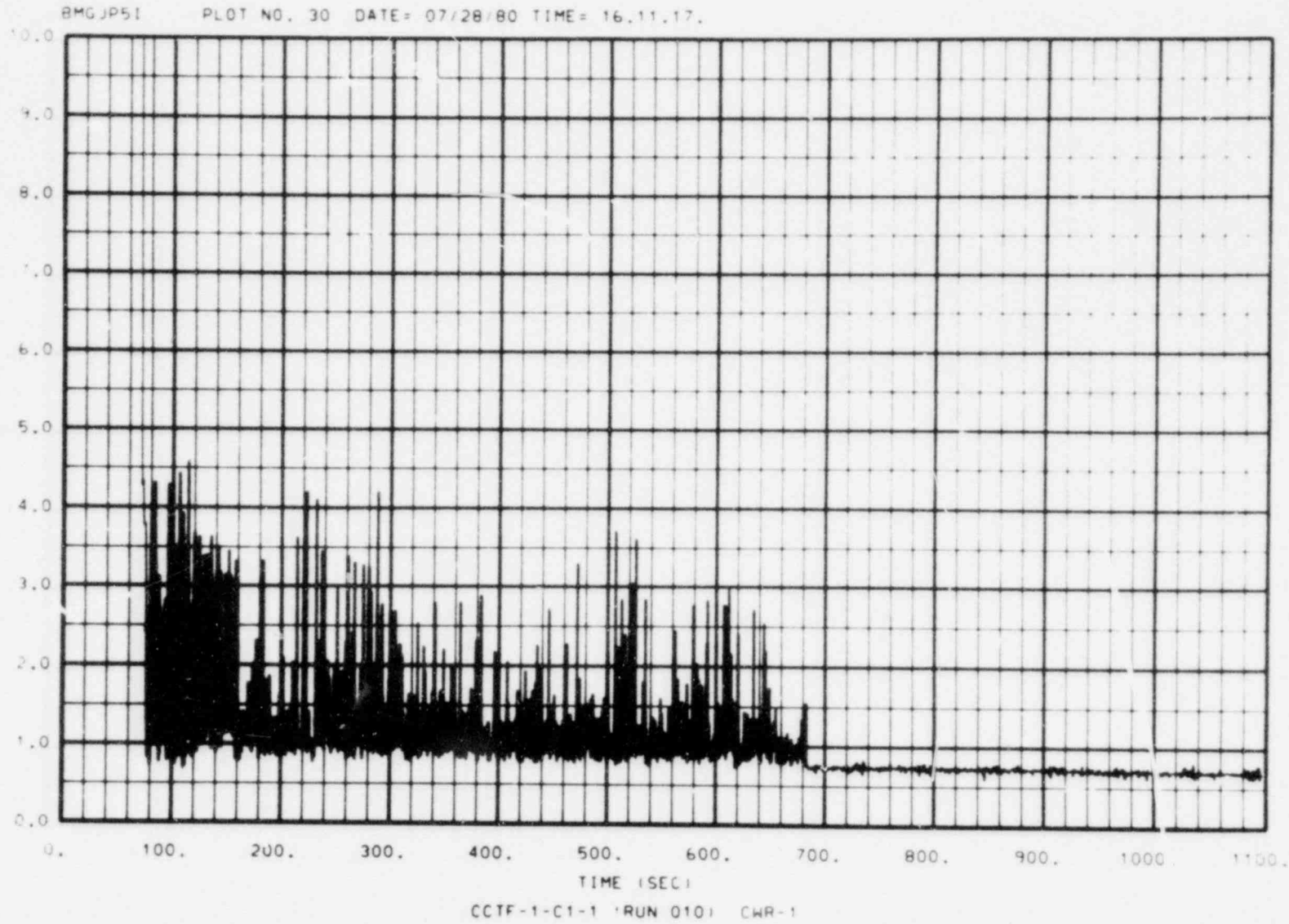

BMGJP5I PLOT NO.161 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
LP-5 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) LP-3

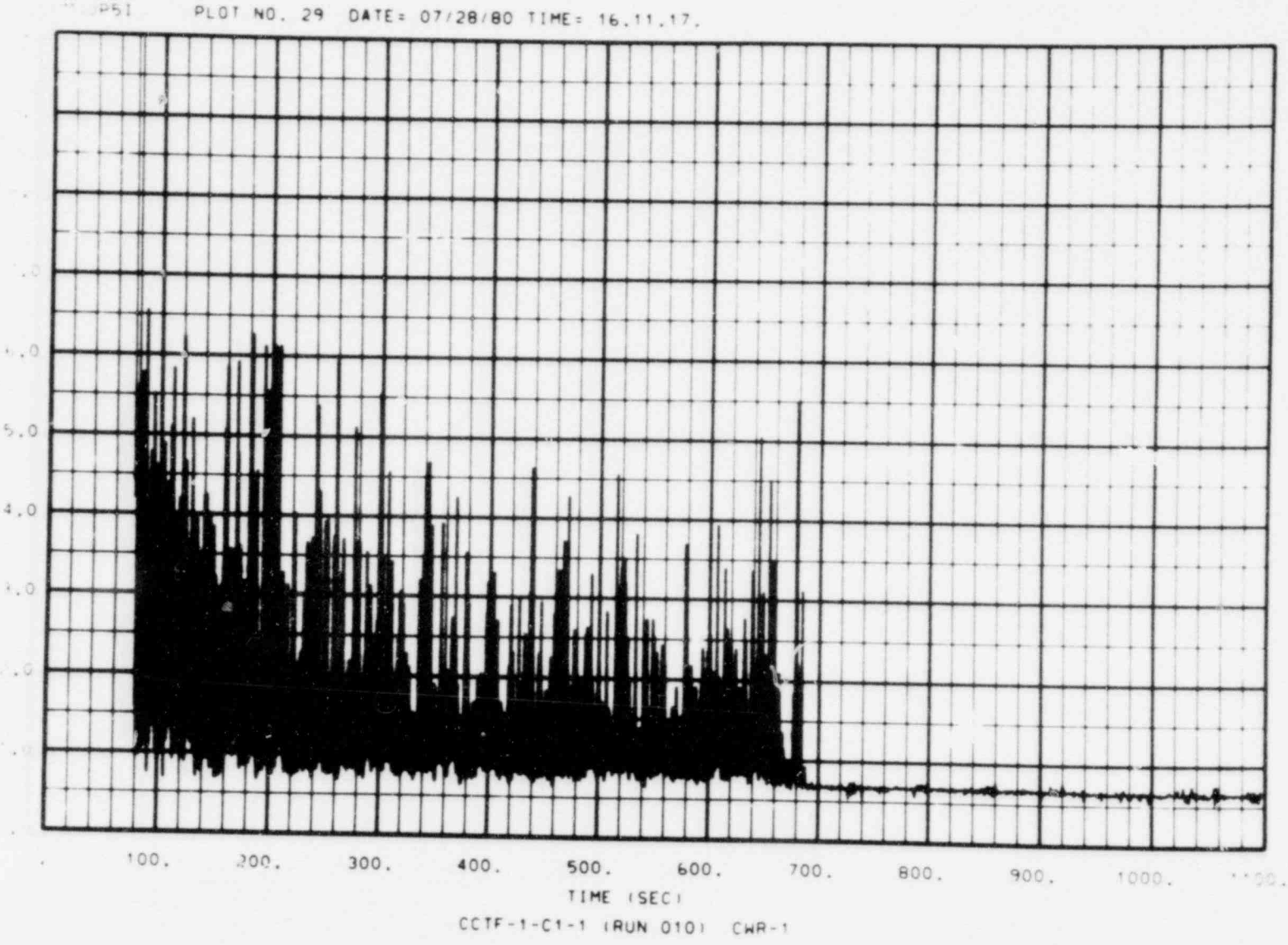

PLOT NO. 34 DATE= 07/28/80 TIME= 16.11.17.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CHR-1

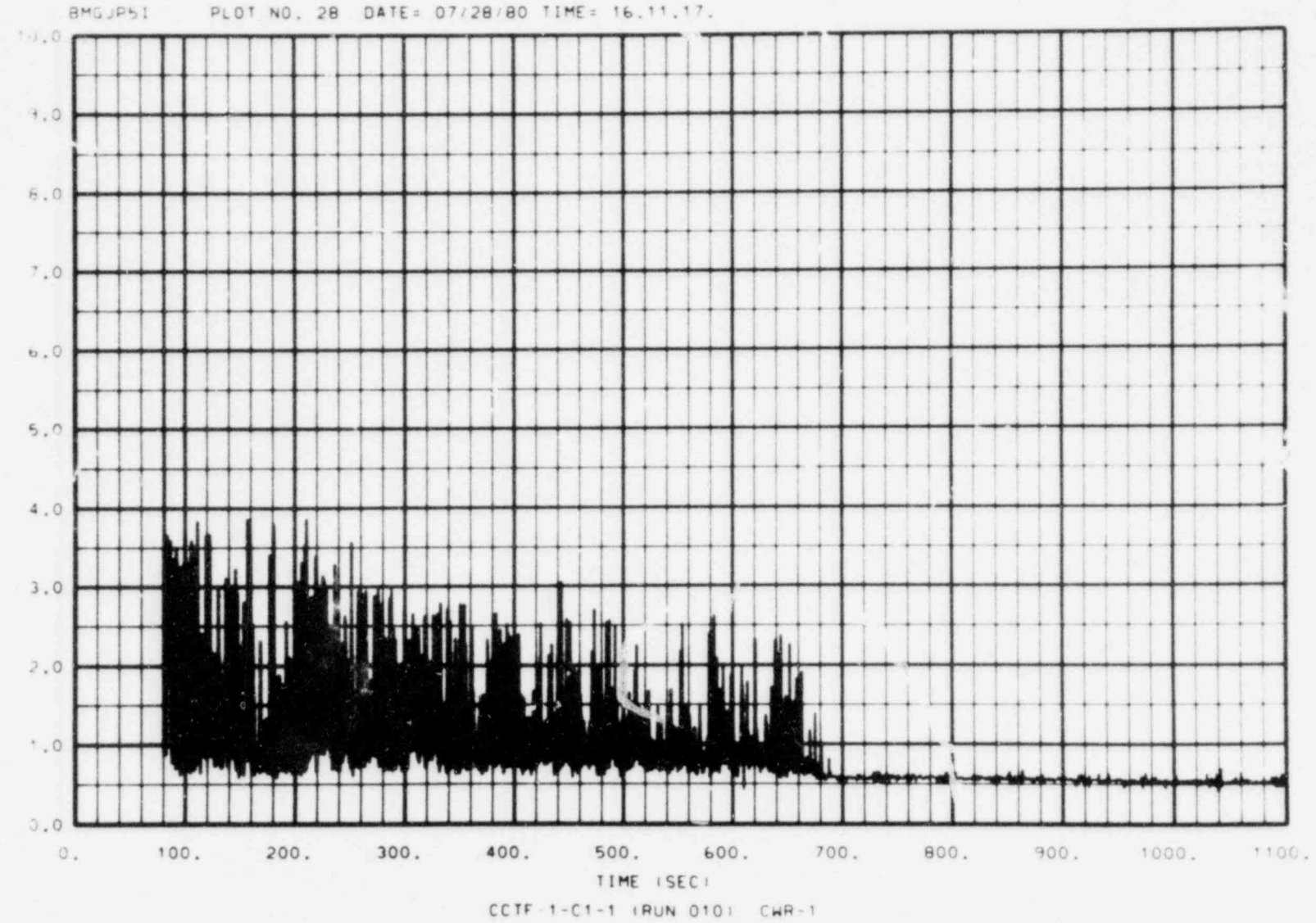

BMGJP5I PLOT NO. 33 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

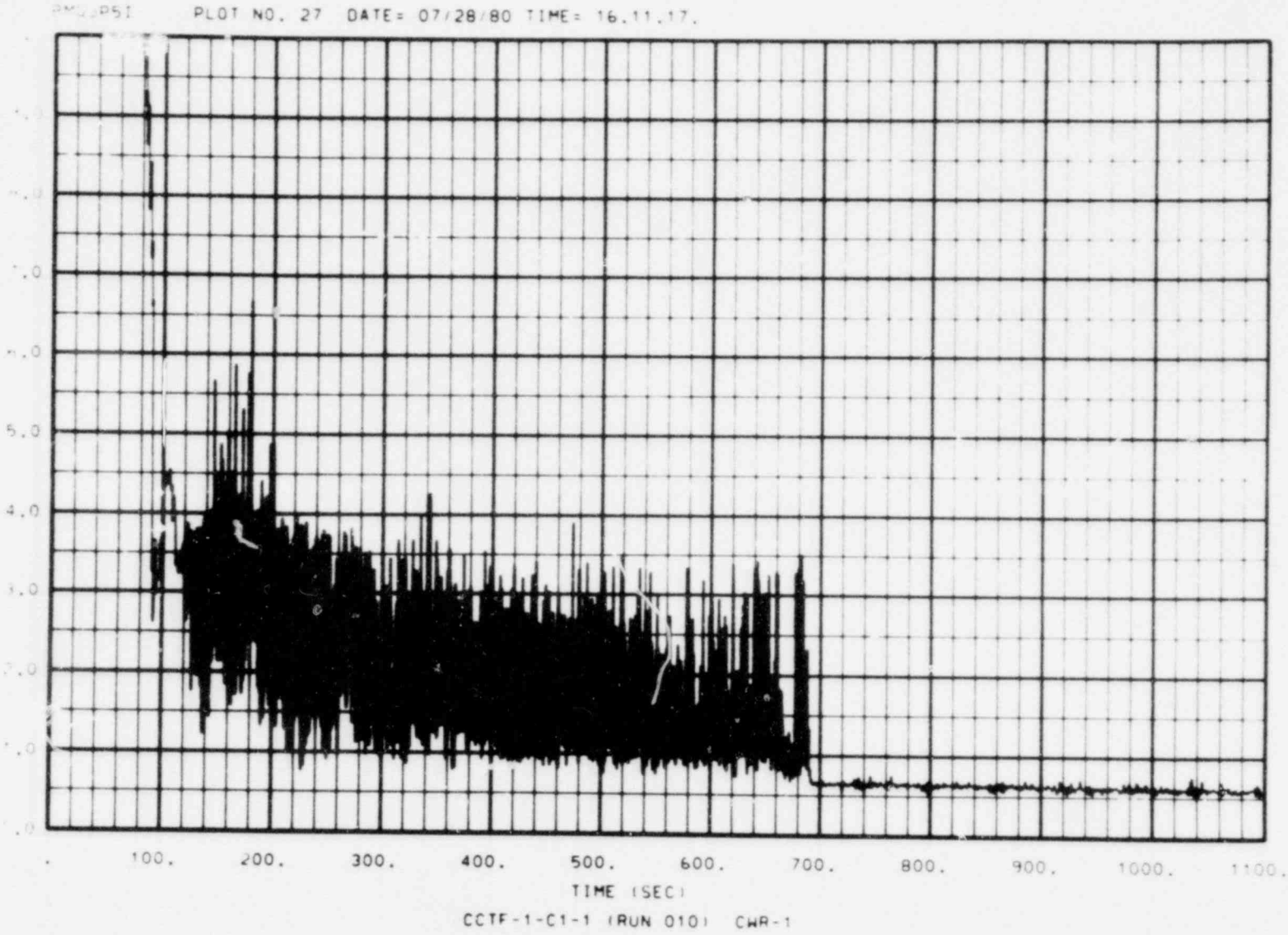

PLOT NO. 32 DATE 07/28/80 TIME= 16.11.17.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

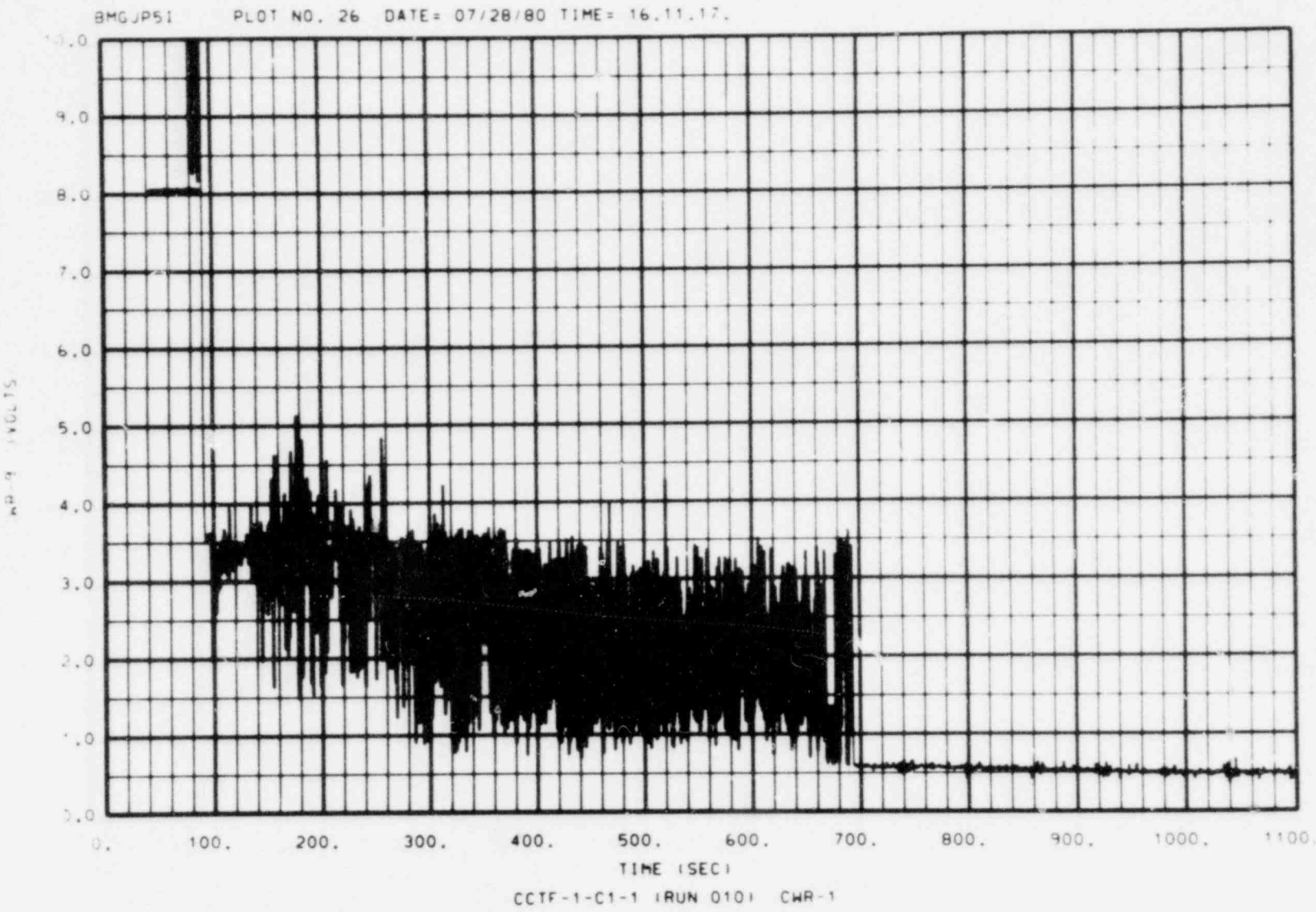

PLOT NO. 31 DATE= 07/28/80 TIME= 16.11.17.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

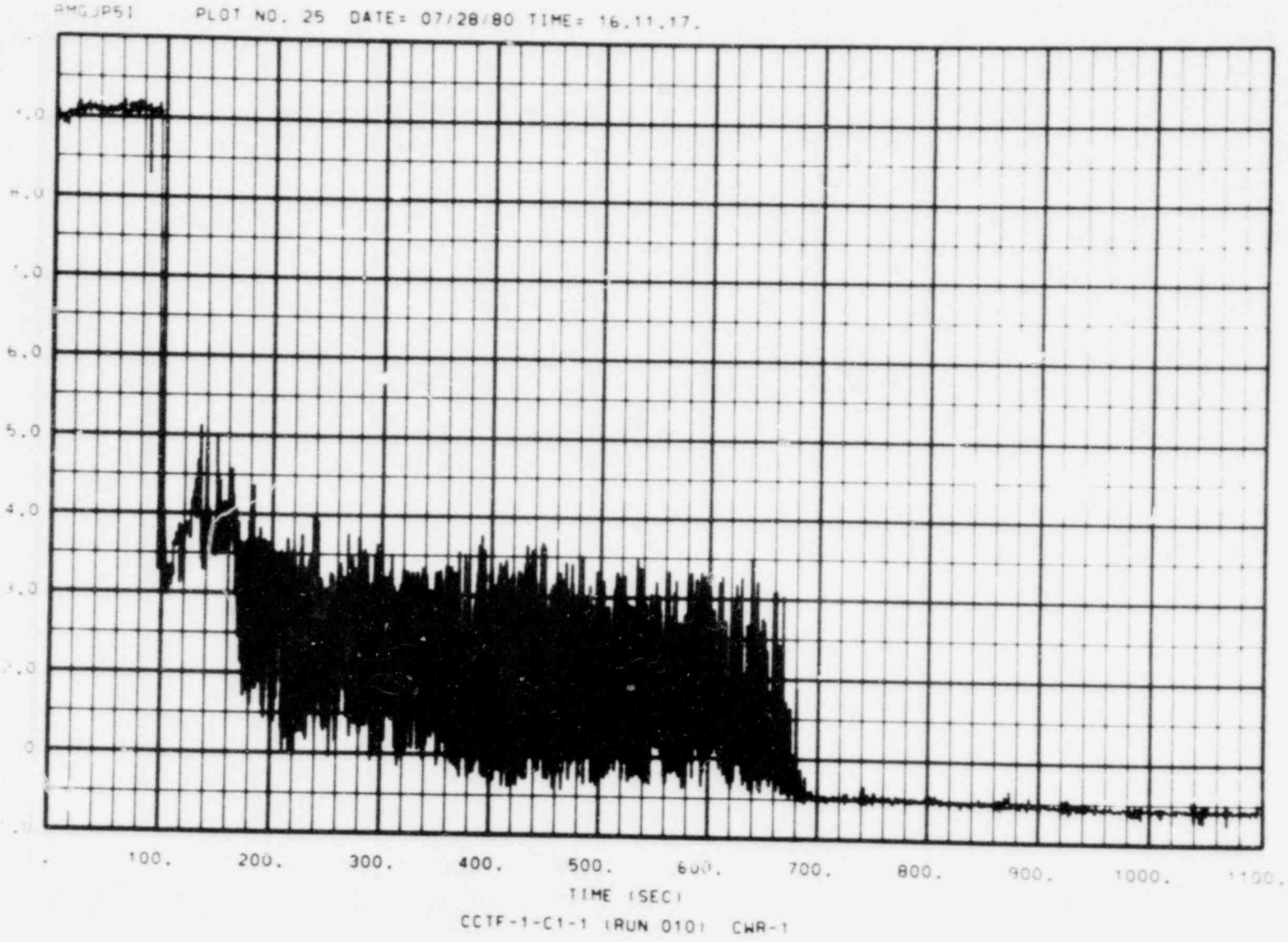

BMGJP5I PLOT NO. 30 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

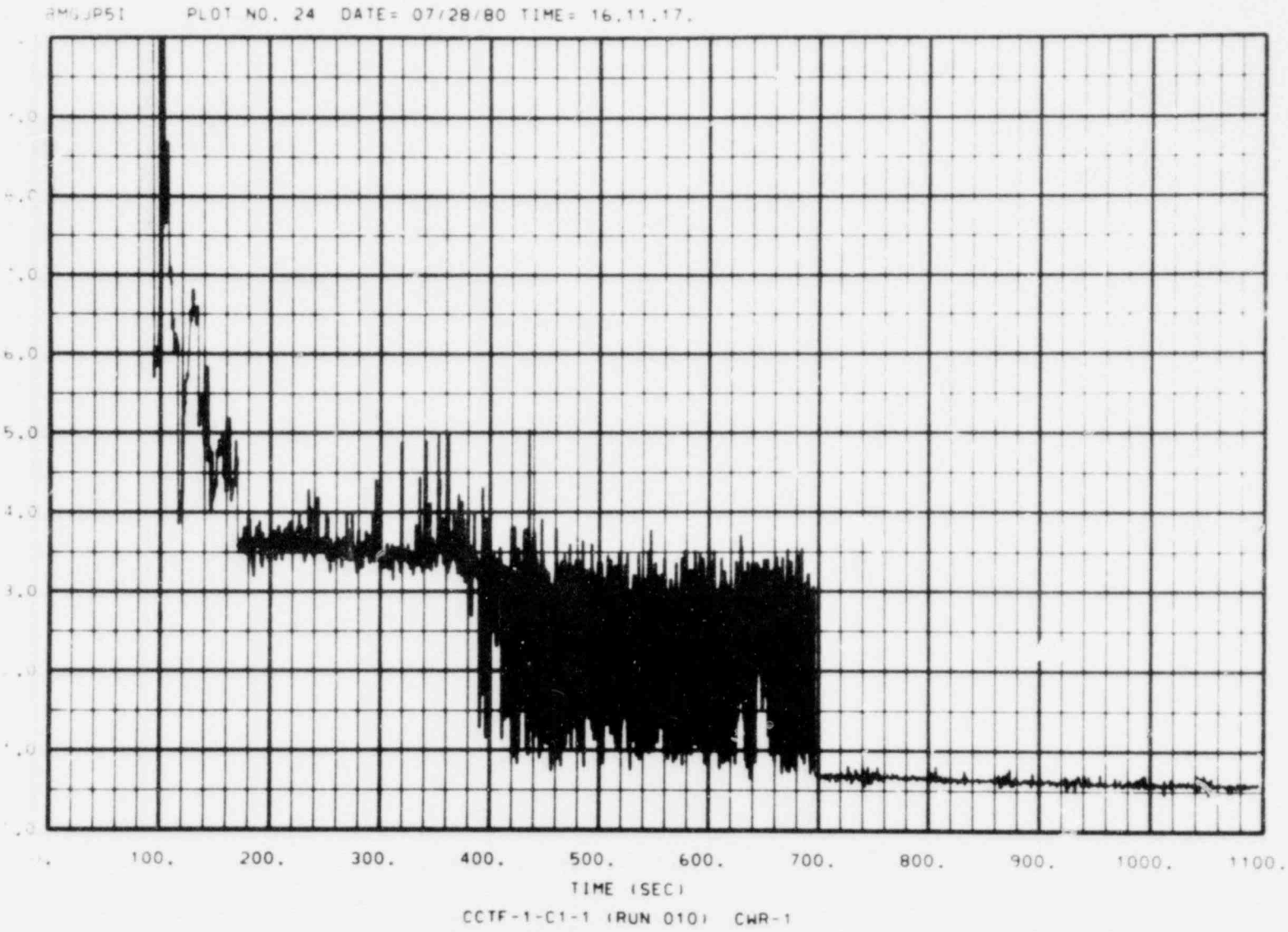

PLOT NO. 29 DATE= 07/28/80 TIME= 16.11.17.
5.0
4.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

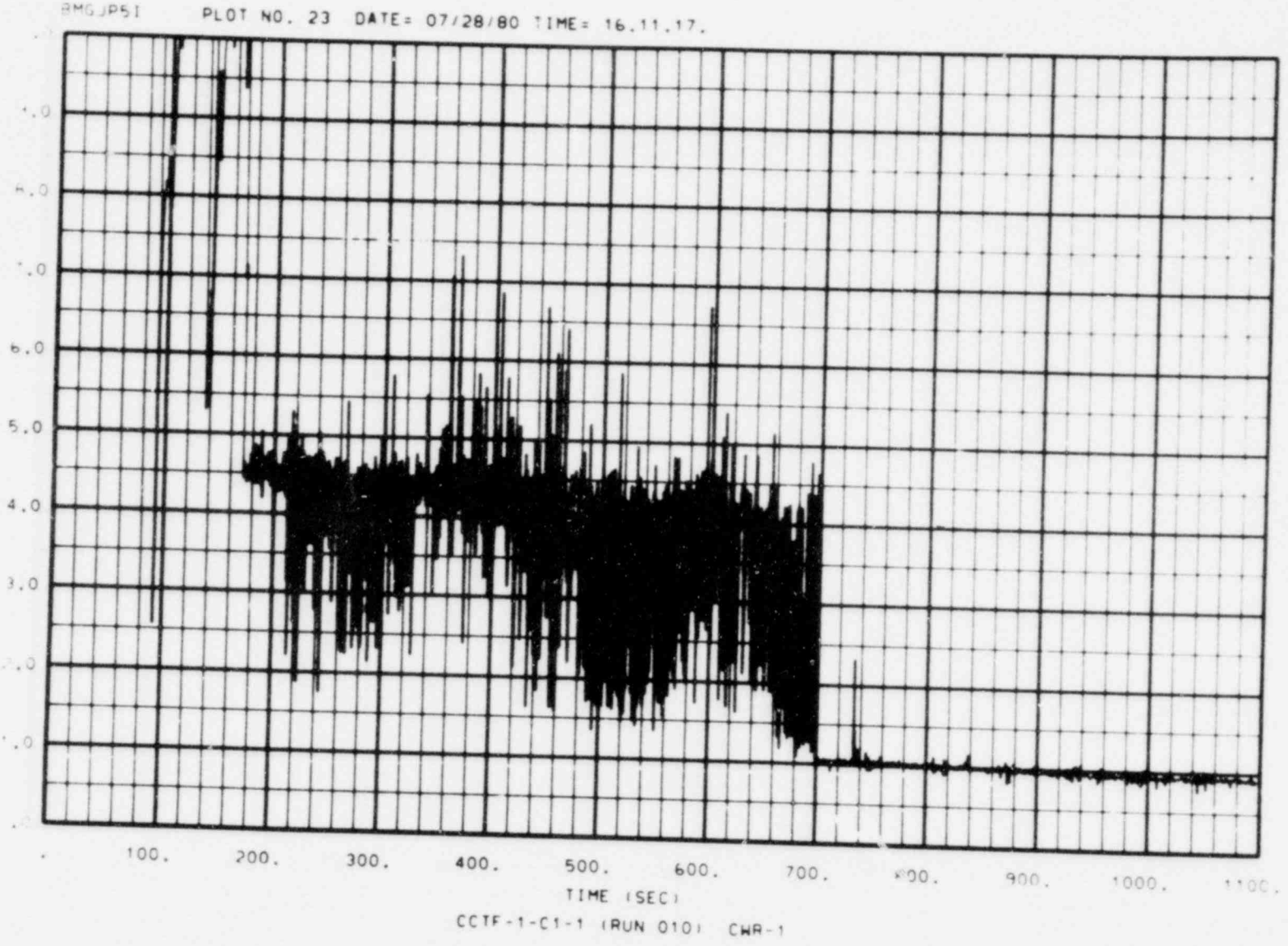

BMGJP51 PLOT NO. 28 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

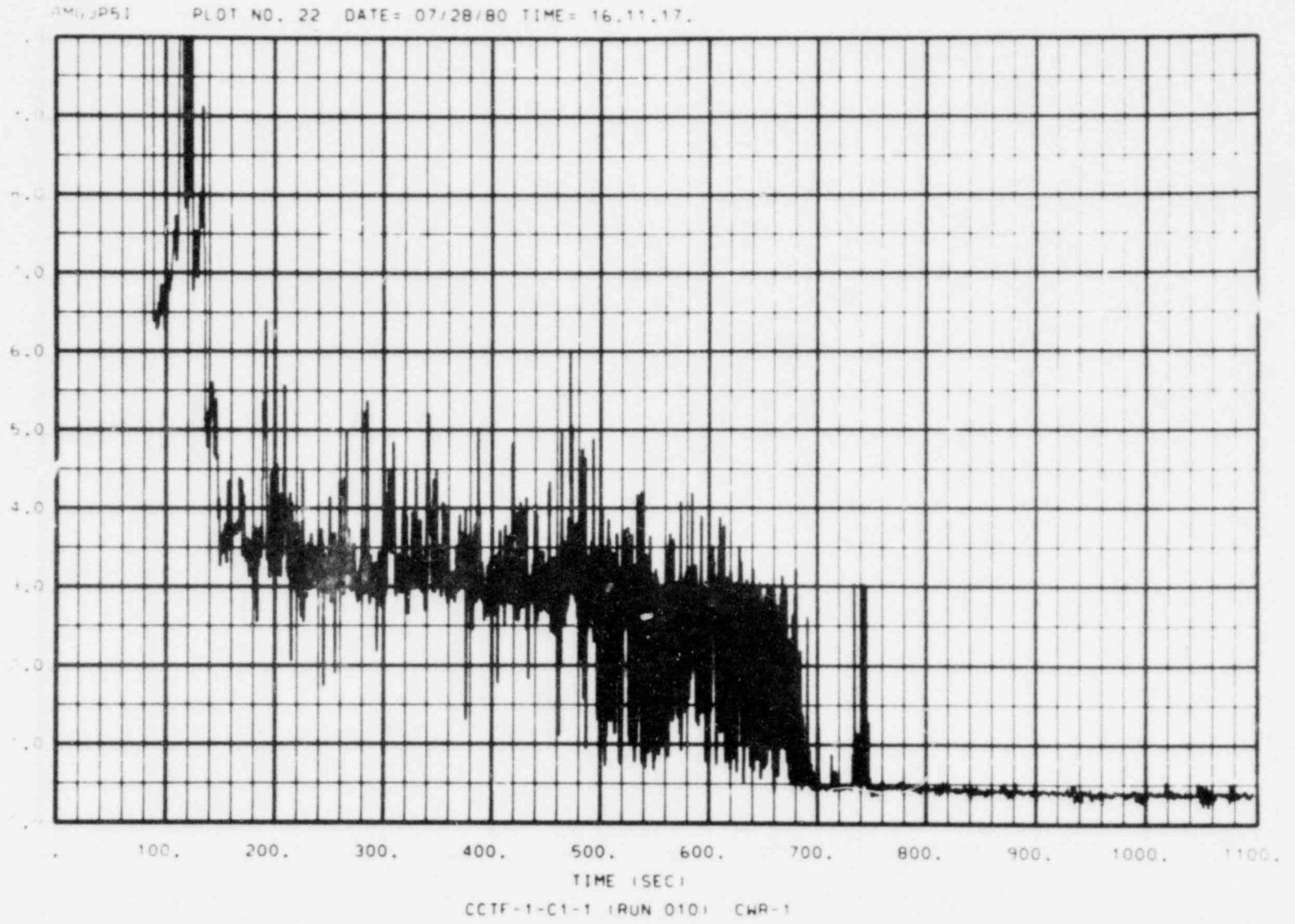

PLOT NO. 27 DATE= 07/28/80 TIME= 16.11.17.
5.0
4.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

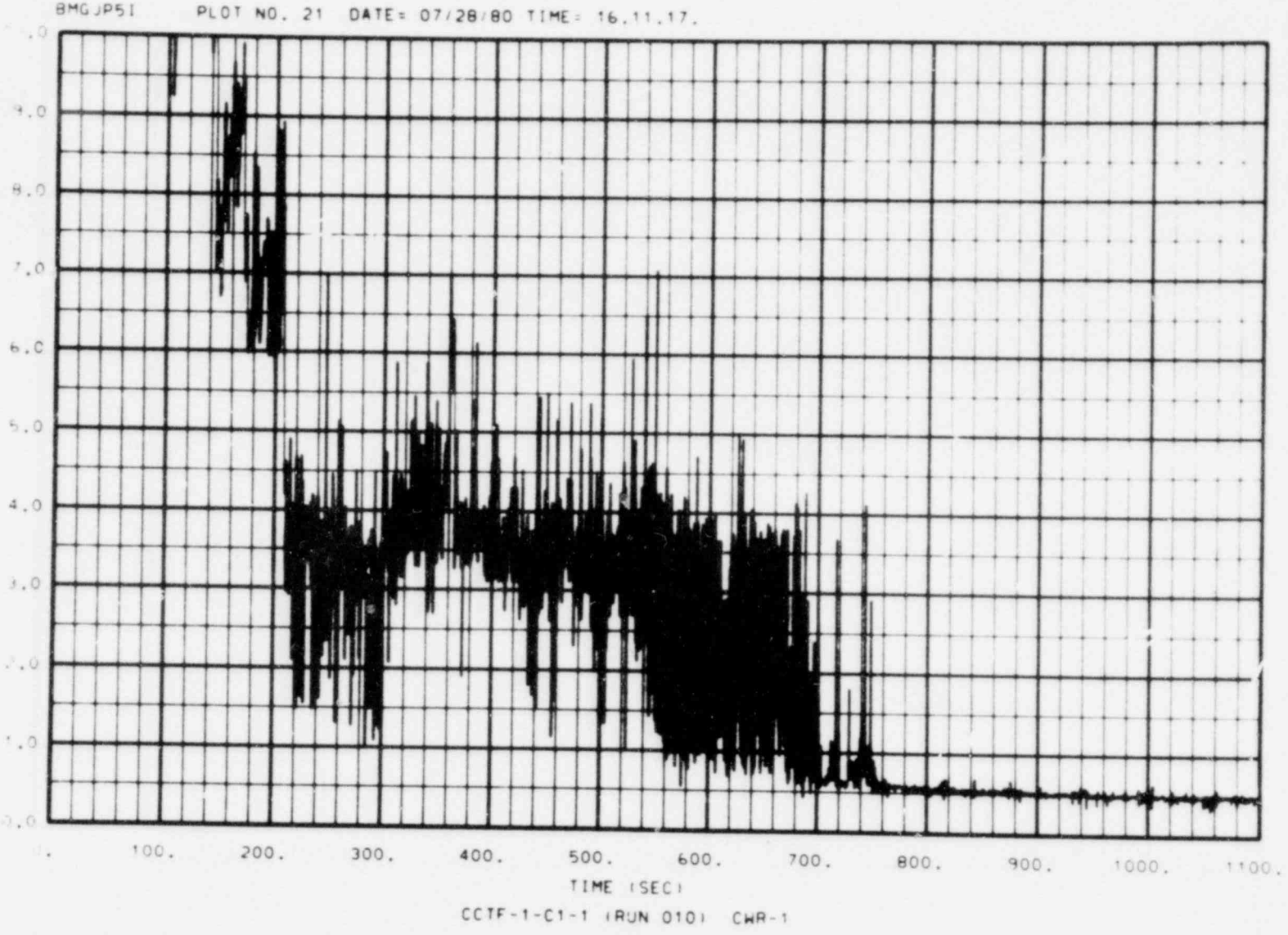

BMGJP51 PLOT NO. 26 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CHR-1

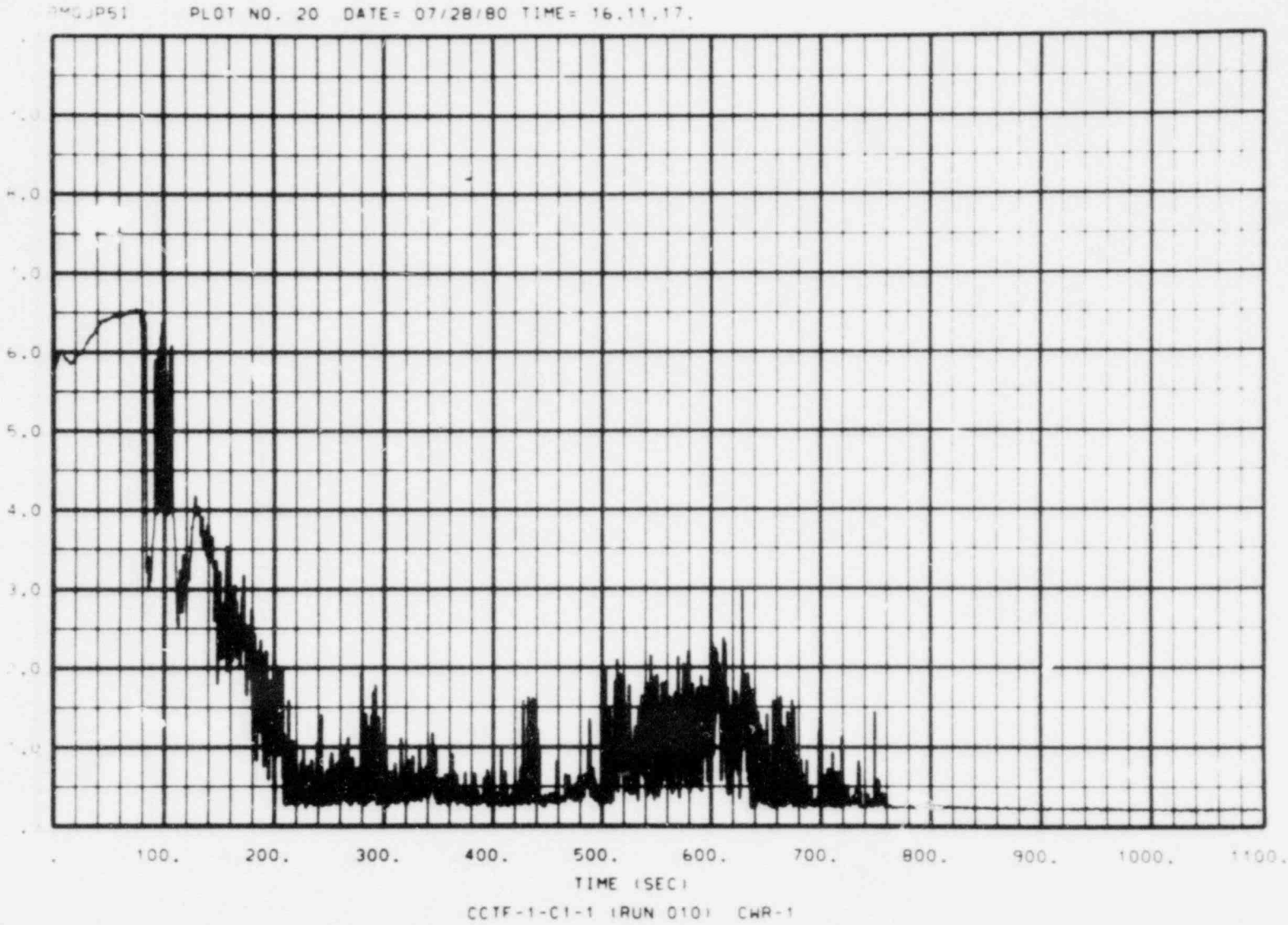

AMGJP5I PLOT NO. 25 DATE= 07/28/80 TIME= 16.11.17.
6.0
5.0
4.0
0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

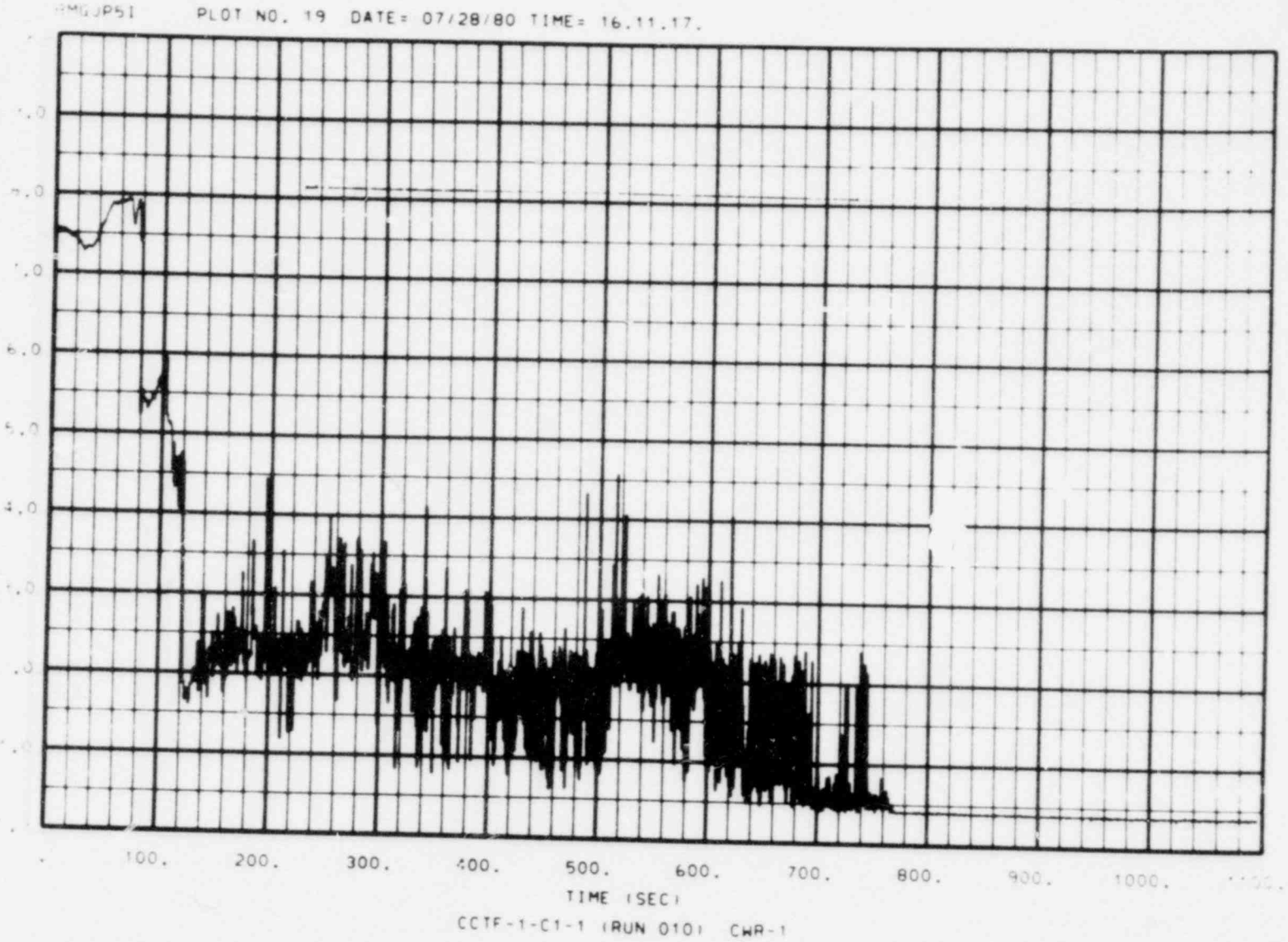

RMSJP5I PLOT NO. 24 DATE= 07/28/80 TIME= 16.11.17.
6.0
5.0
4.0
3.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

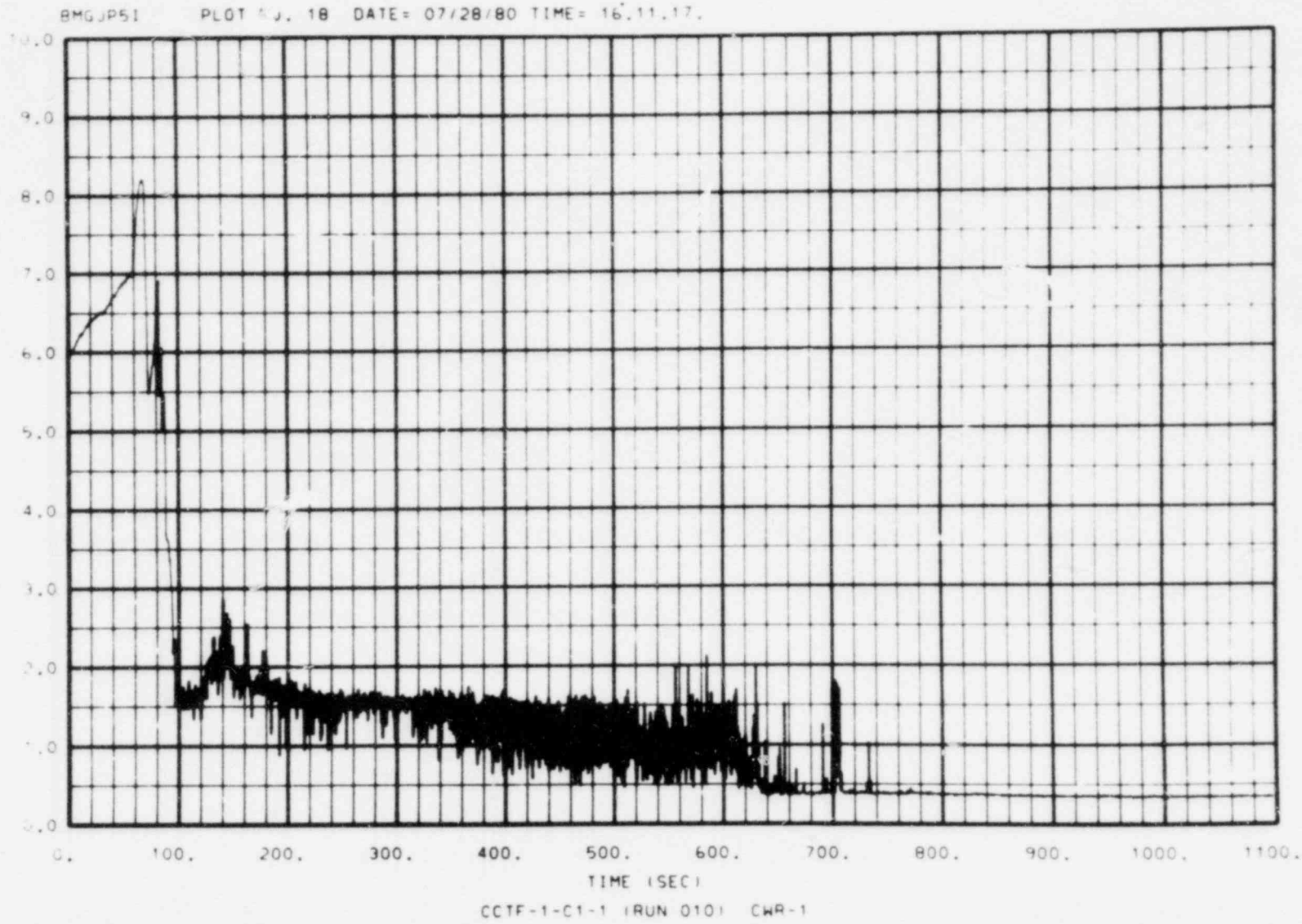

BMG/PSI
PLOT NO. 23 DATE= 07/28/80 TIME= 16.11.17.
6.0
5.0
4.0
100.
200.
300.
400.
500.
600.
700.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

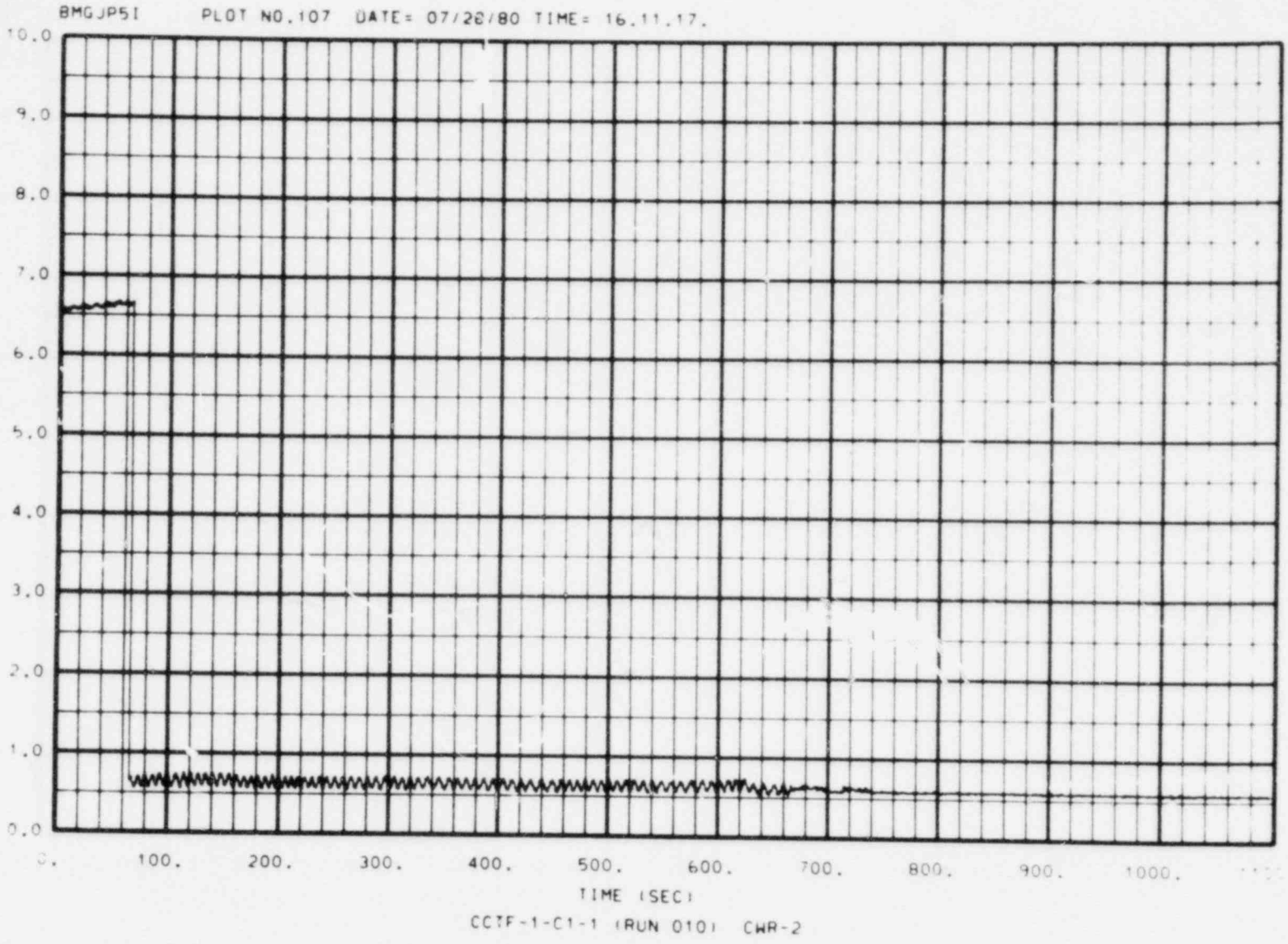

PLOT NO. 22 DATE= 07/28/80 TIME= 16.11.17.
6.0
5.0
4.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

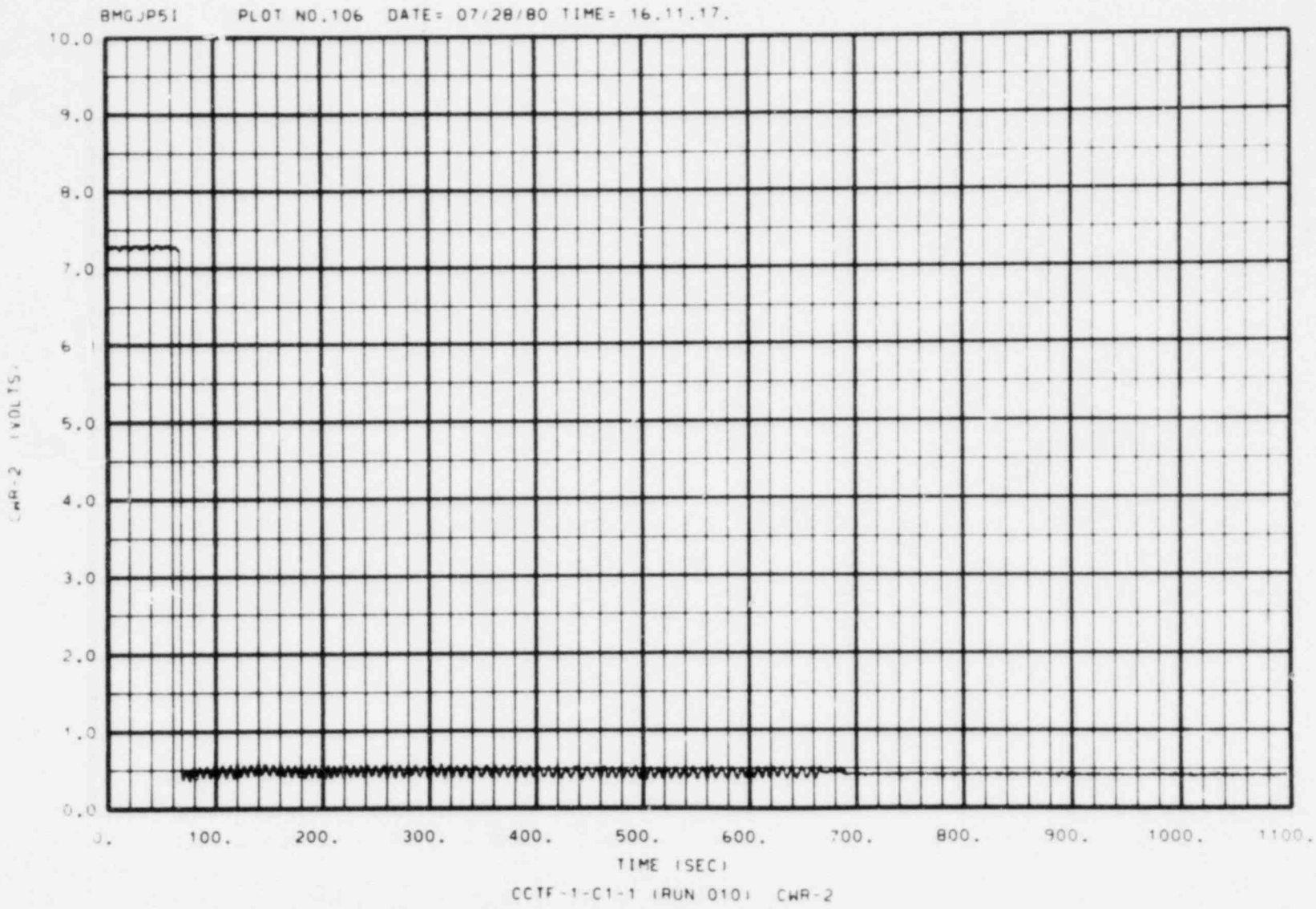

BMGJP5I PLOT NO. 21 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

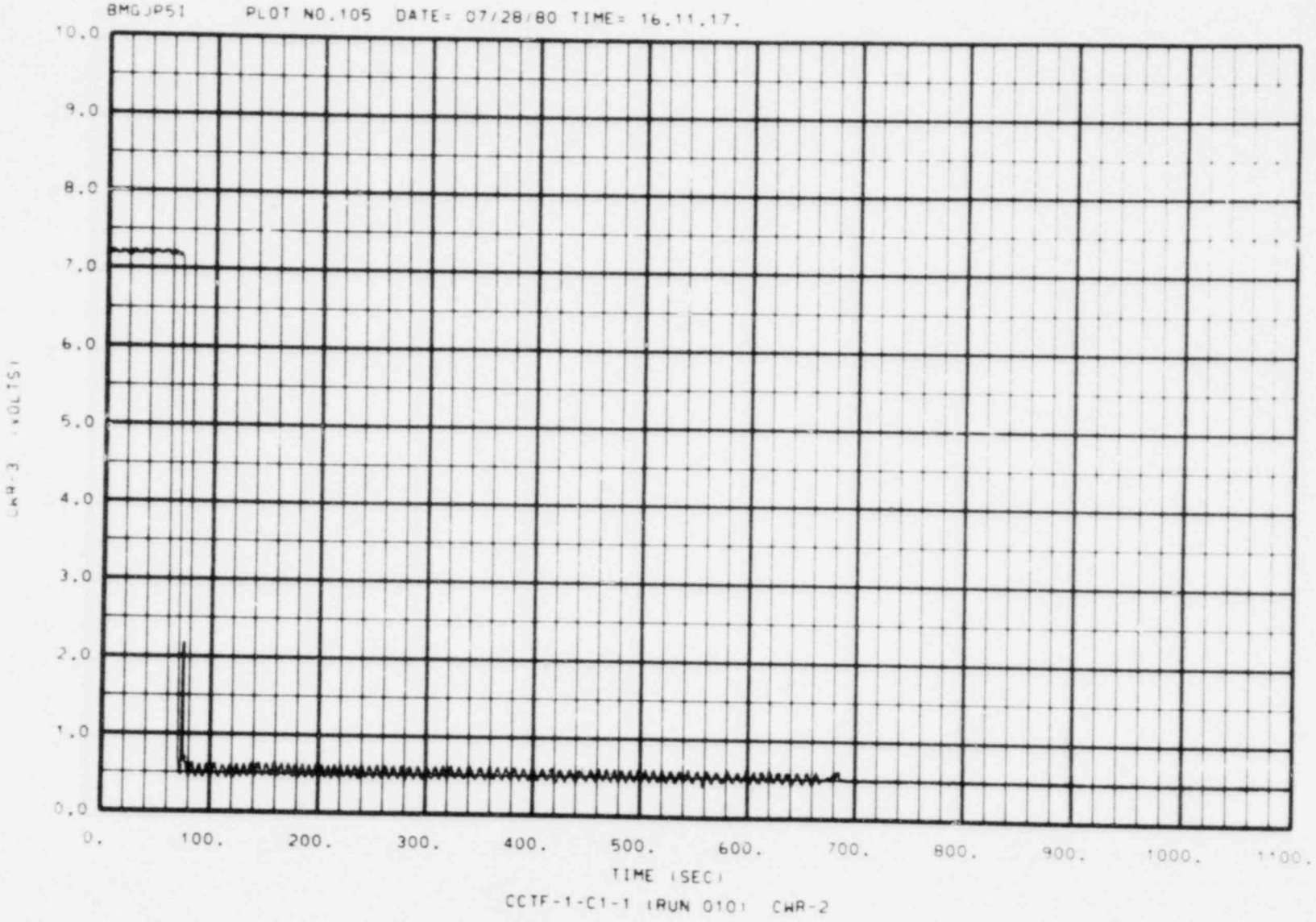

PLOT NO. 20 DATE= 07/28/80 TIME= 16.11.17.
6.0
5.0
4.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

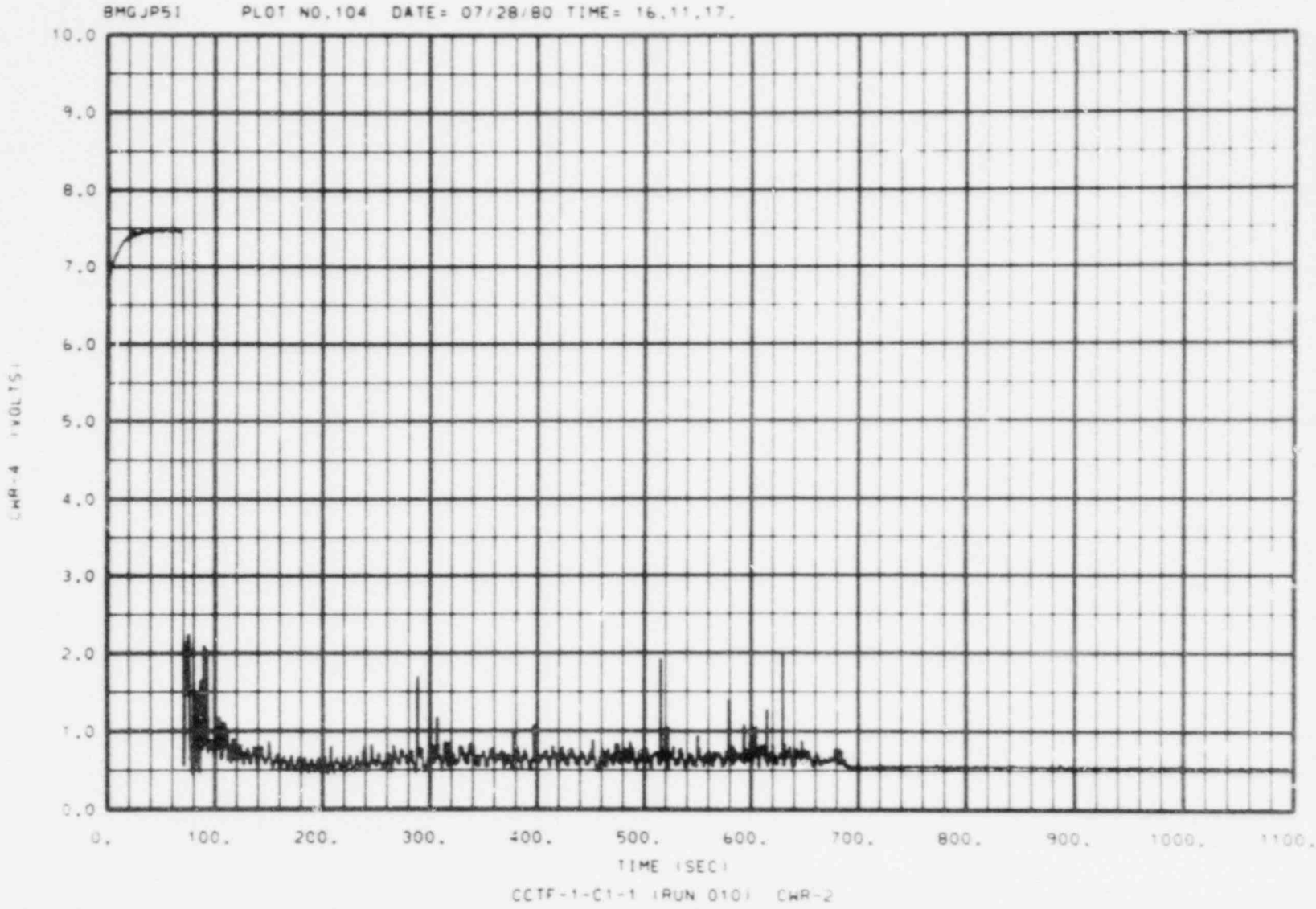

PMGJP5I PLOT NO. 19 DATE= 07/28/80 TIME= 16.11.17.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

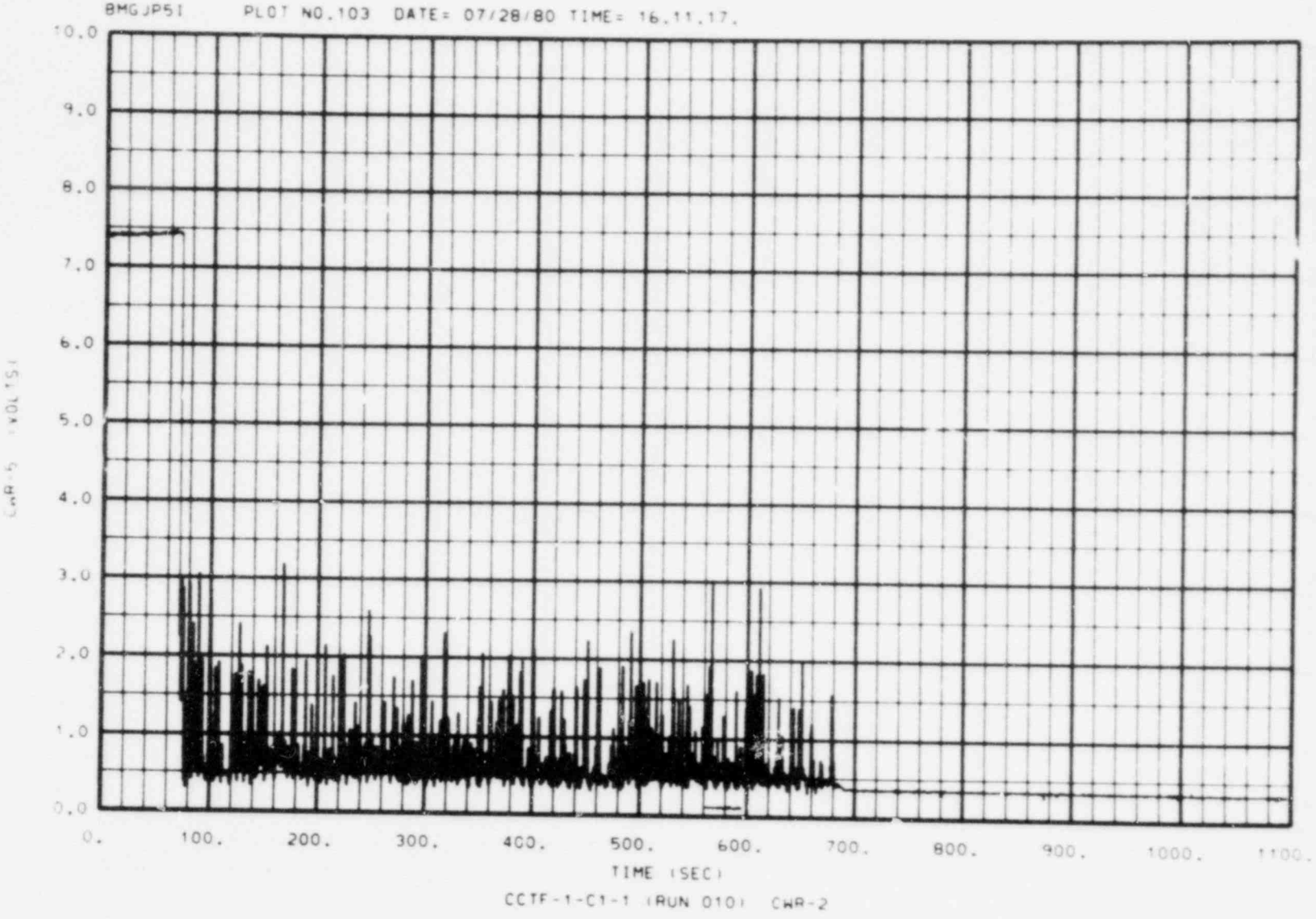

BMGJP51 PLOT NO. 18 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-1

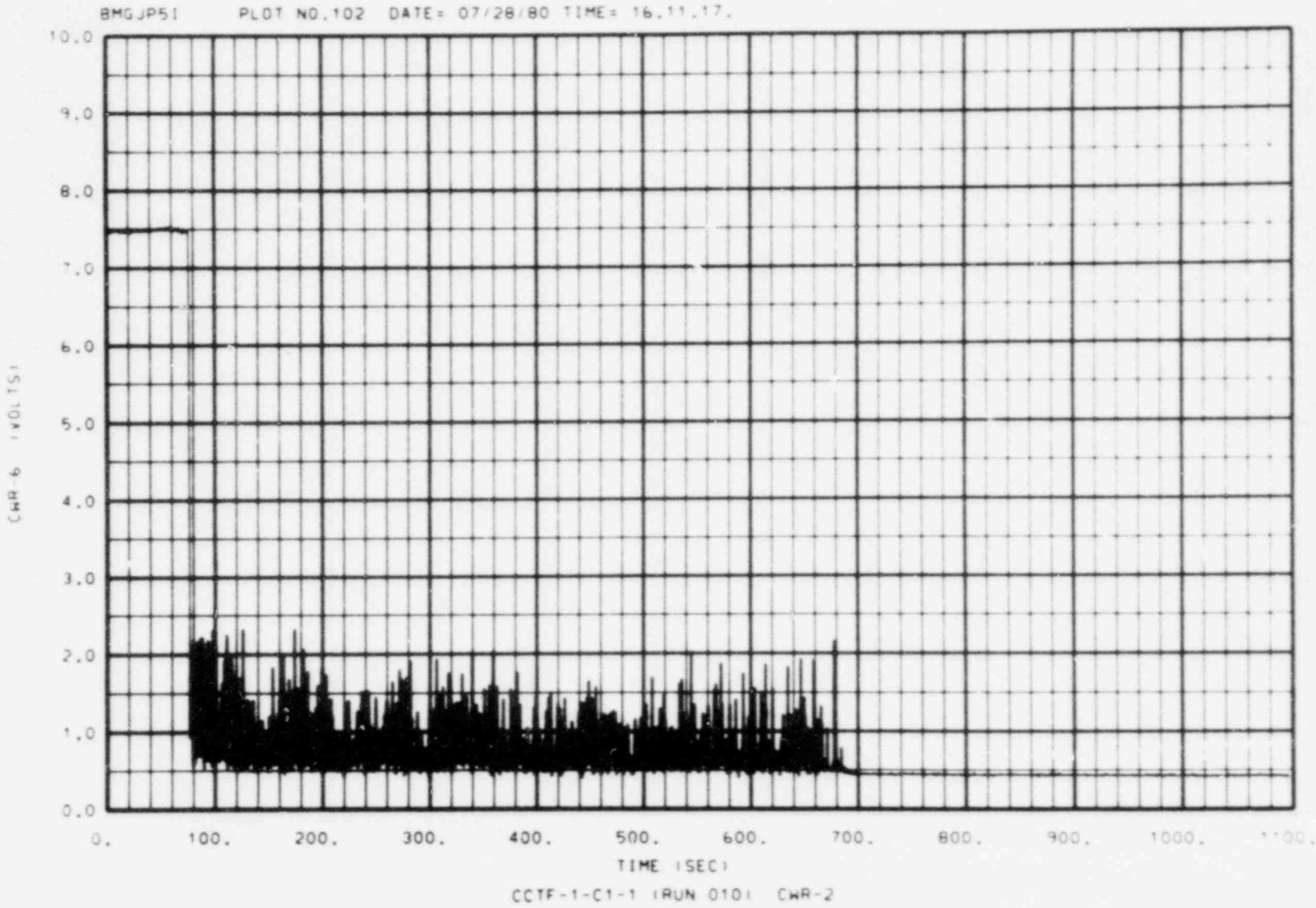

BMGJP5I PLOT NO.107 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CHR-2

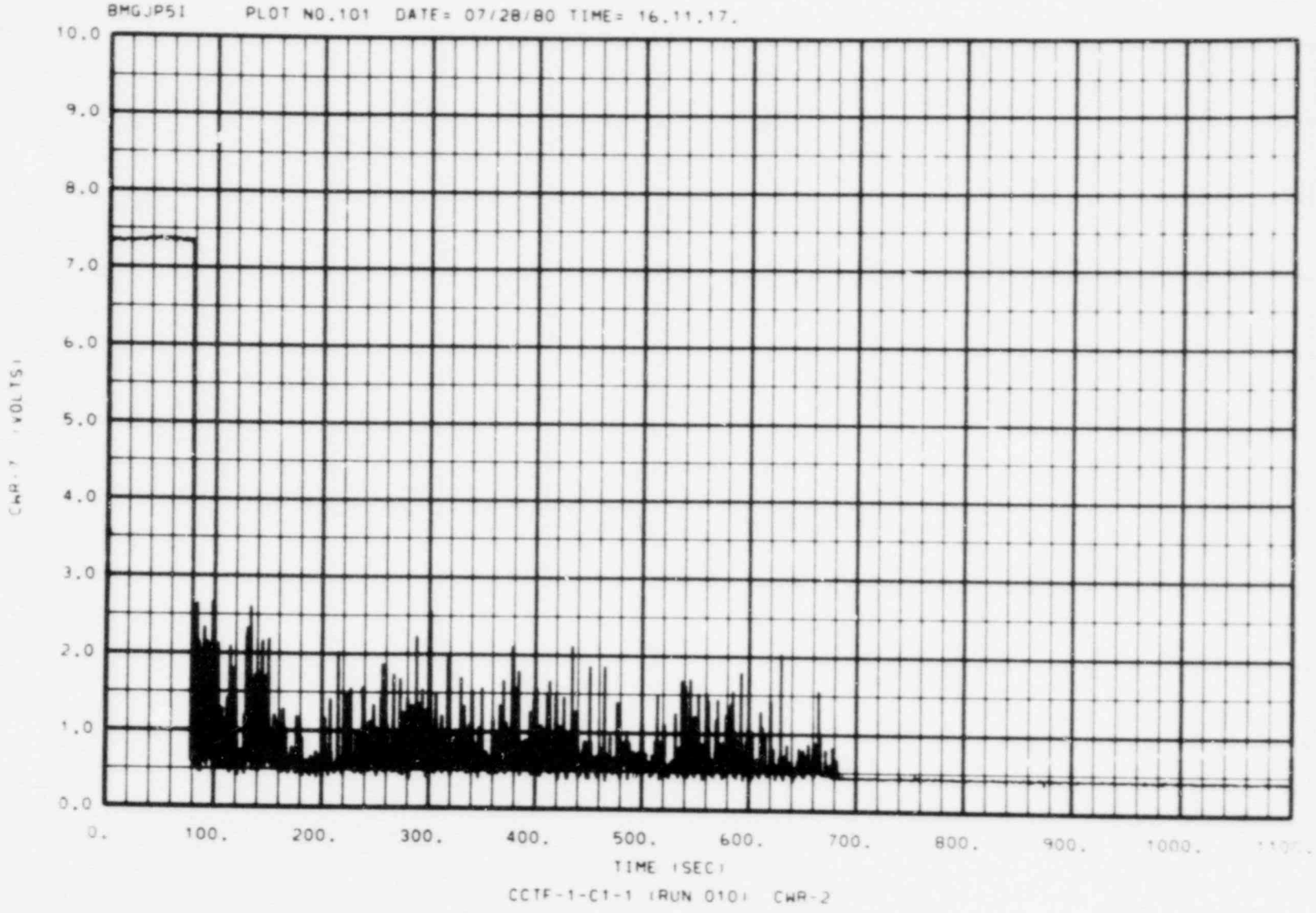

BMGJP5I PLOT NO.106 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-2 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

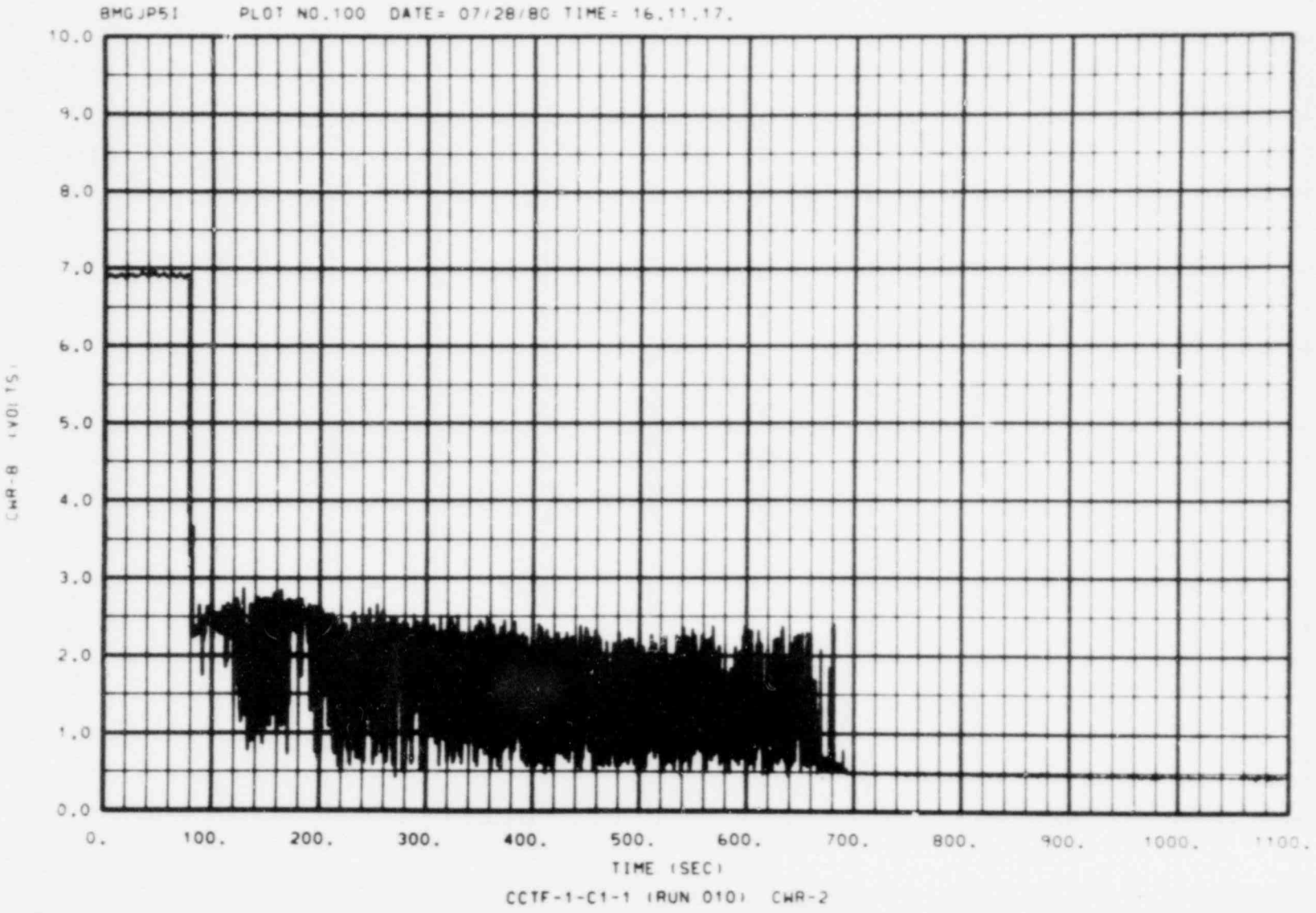

BMGJP51 PLOT NO.105 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

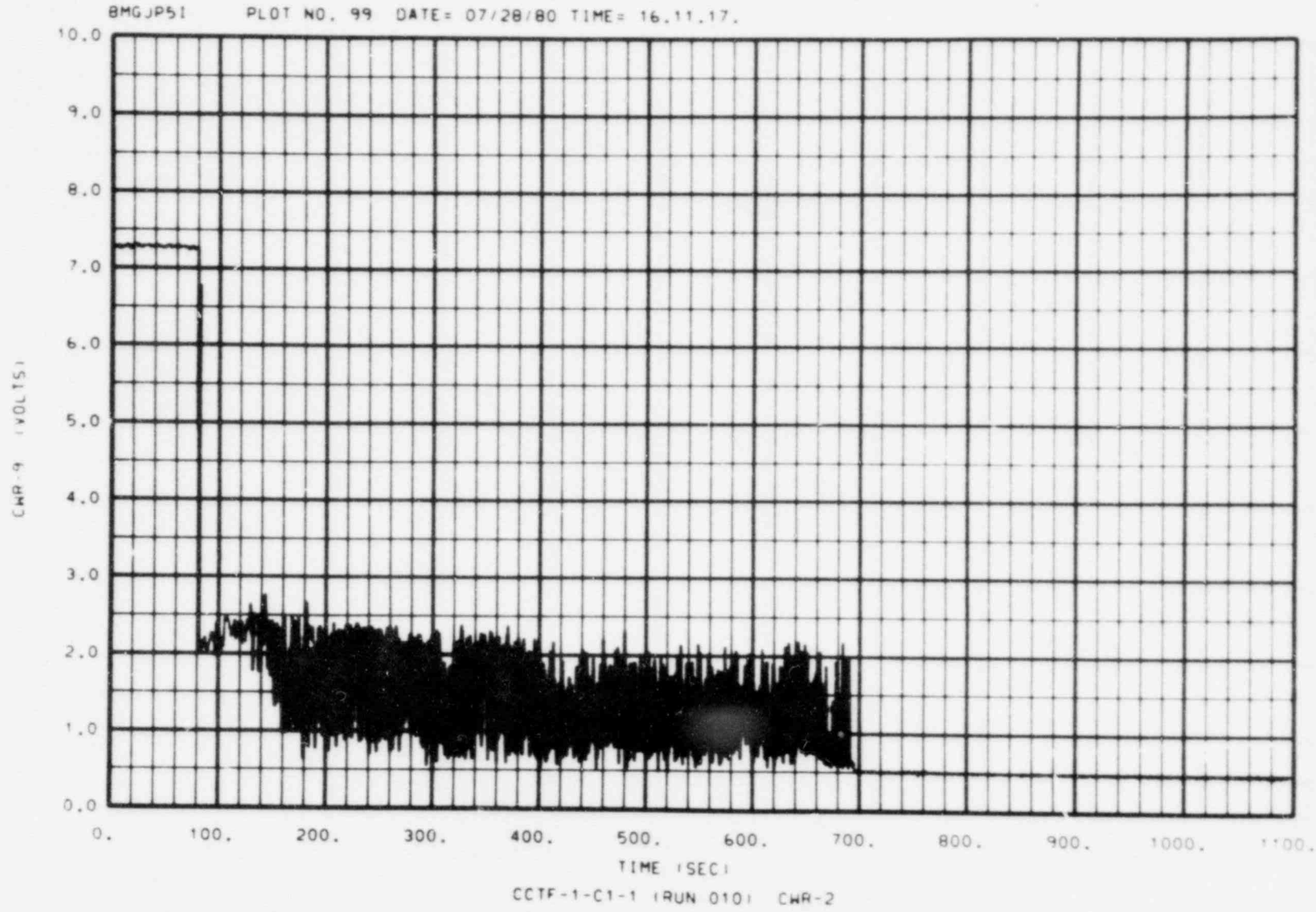

BMGJP51 PLOT NO.104 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-4 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

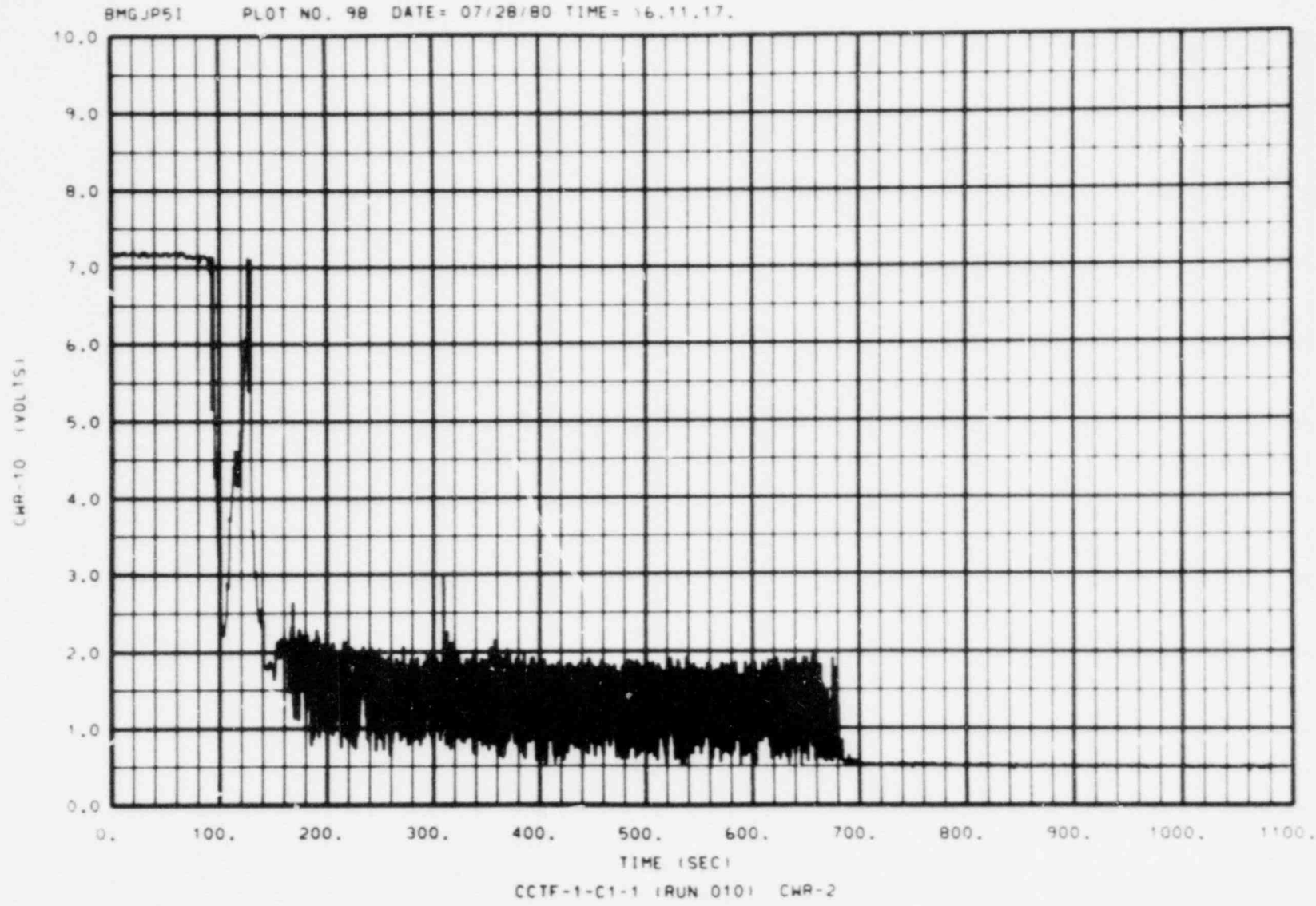

BMGJP5I PLOT NO.103 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

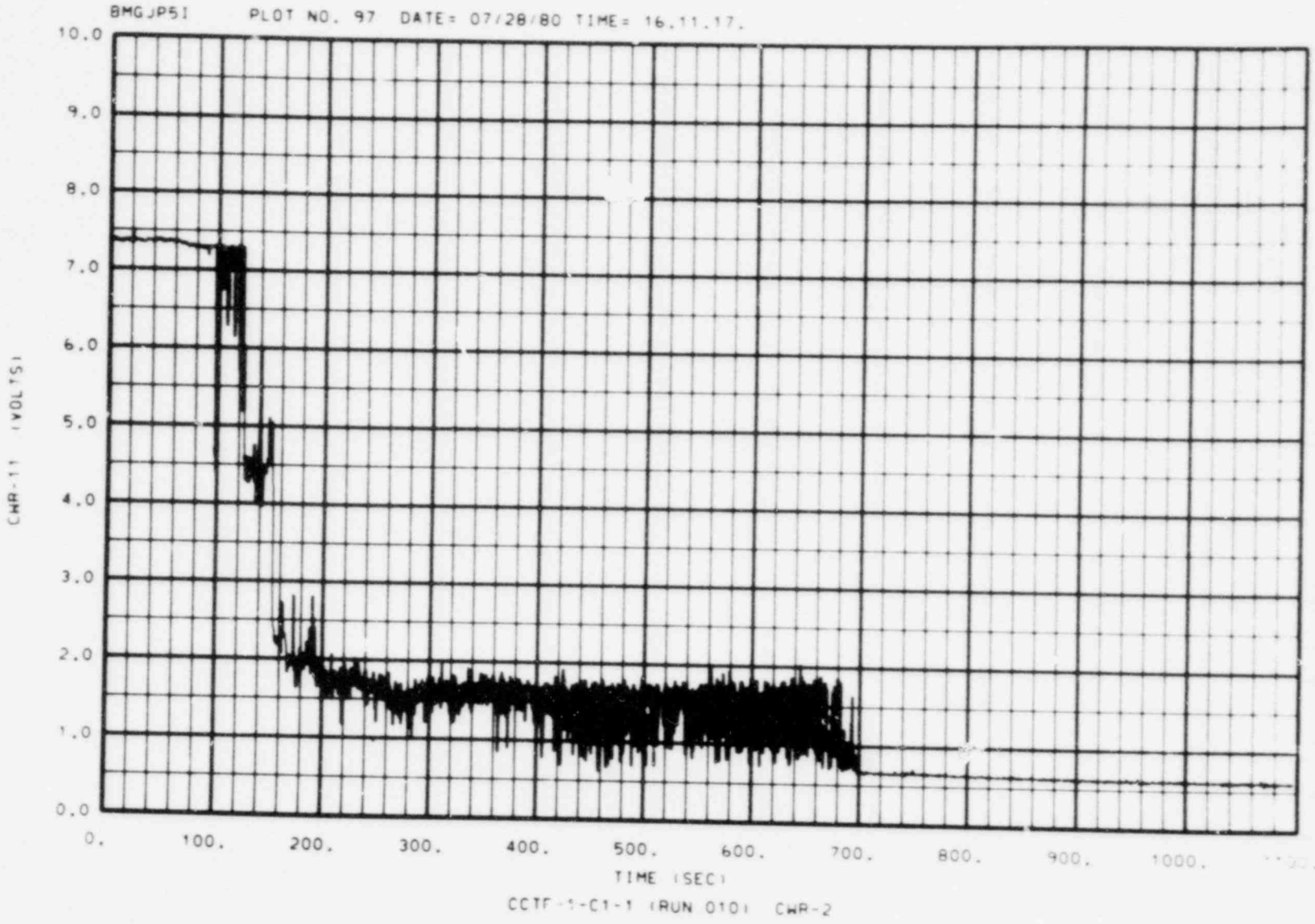

BMGJP51 PLOT NO.102 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-6 (*10**1 PSI)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

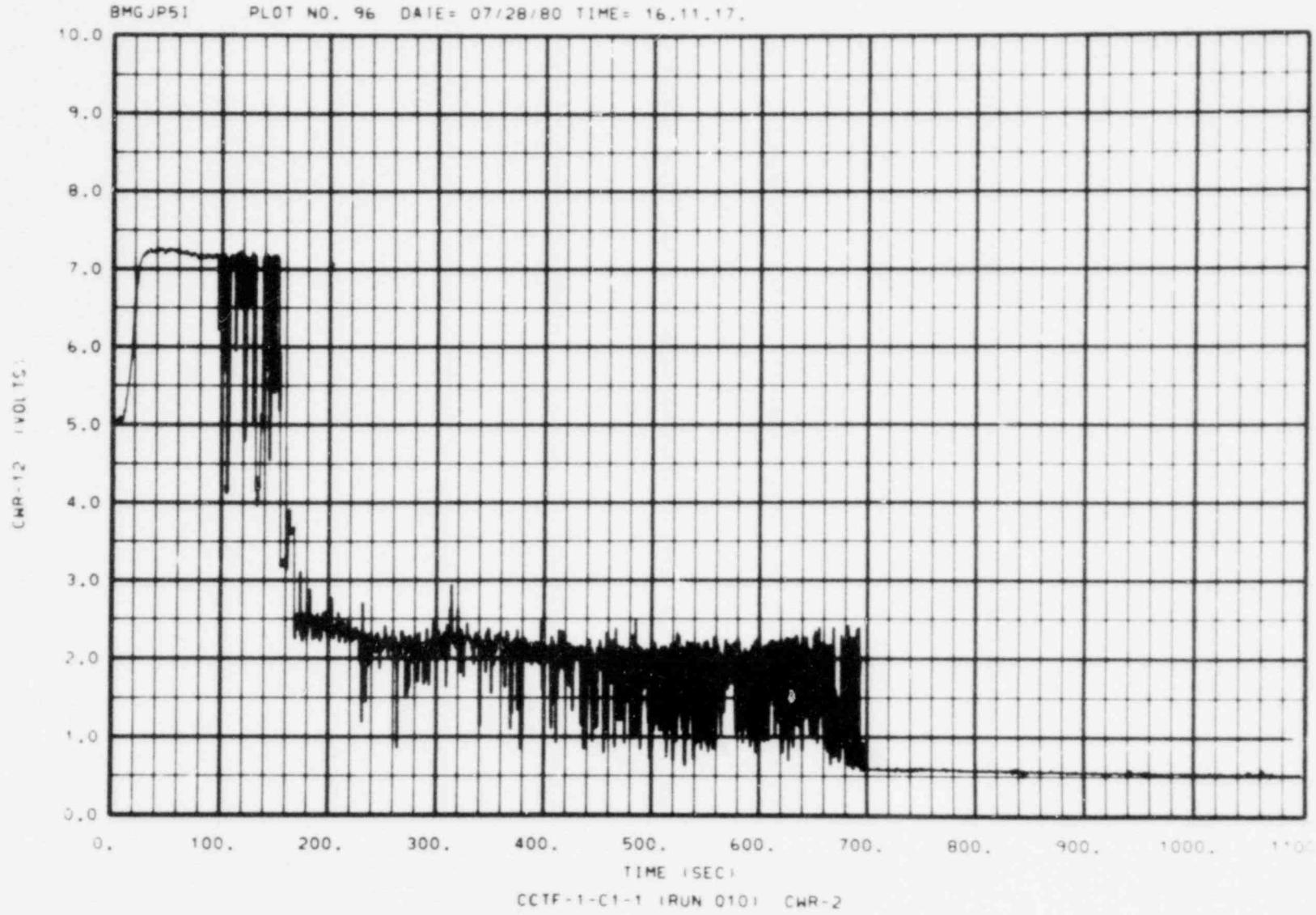

BMGJP5I PLOT NO.101 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

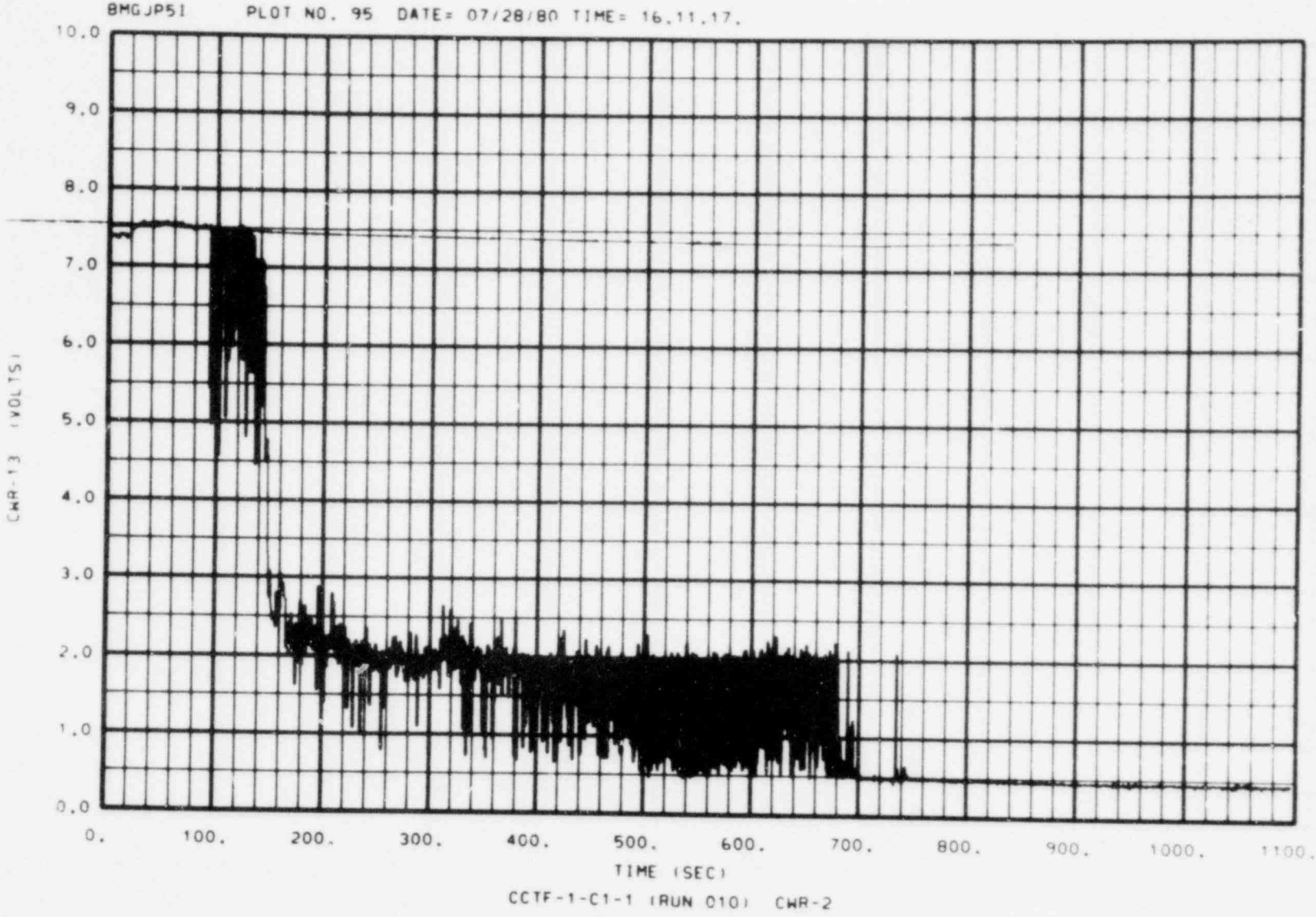

BMGJP5I PLOT NO.100 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-8 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

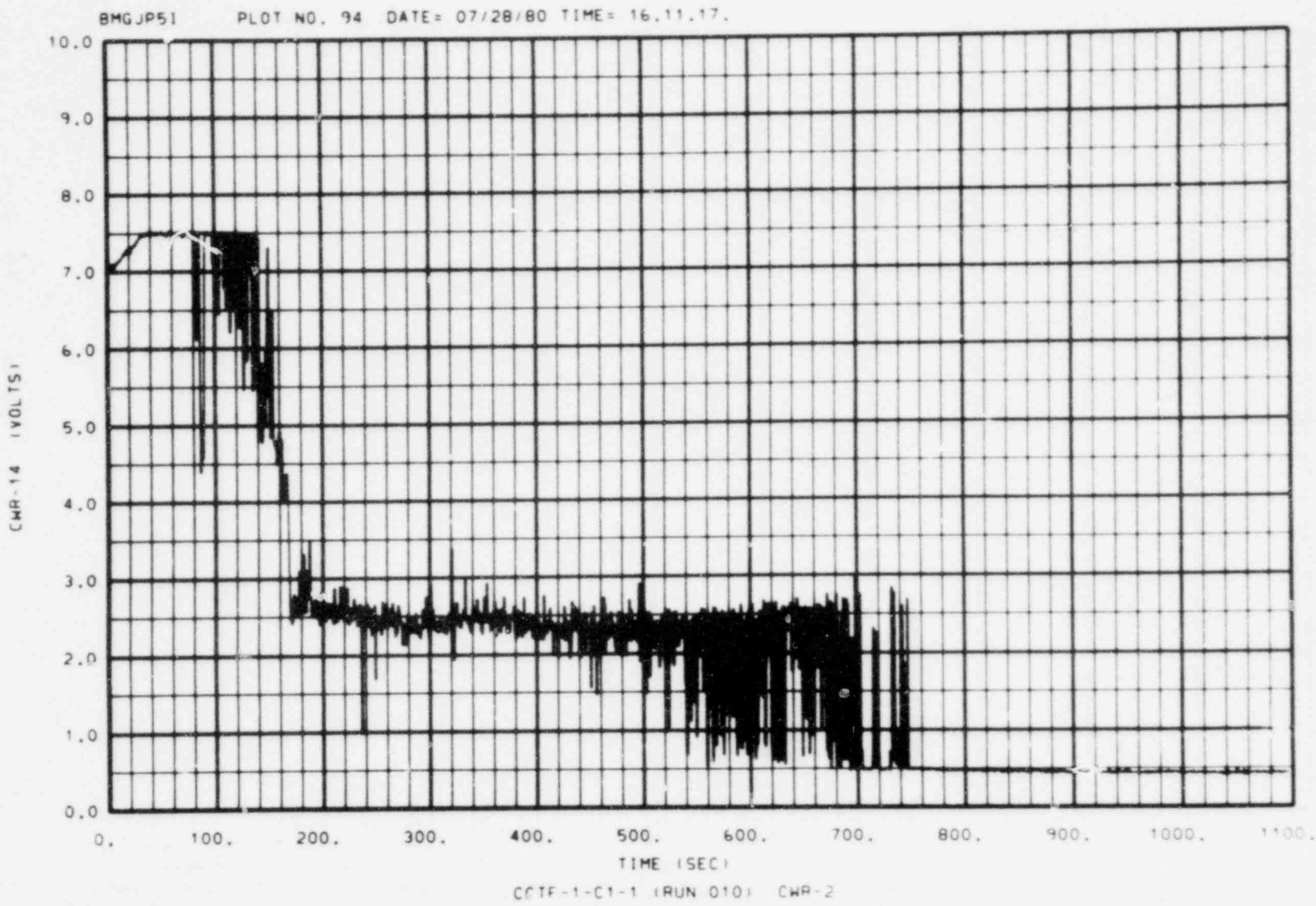

BMGJP51 PLOT NO. 99 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-9 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

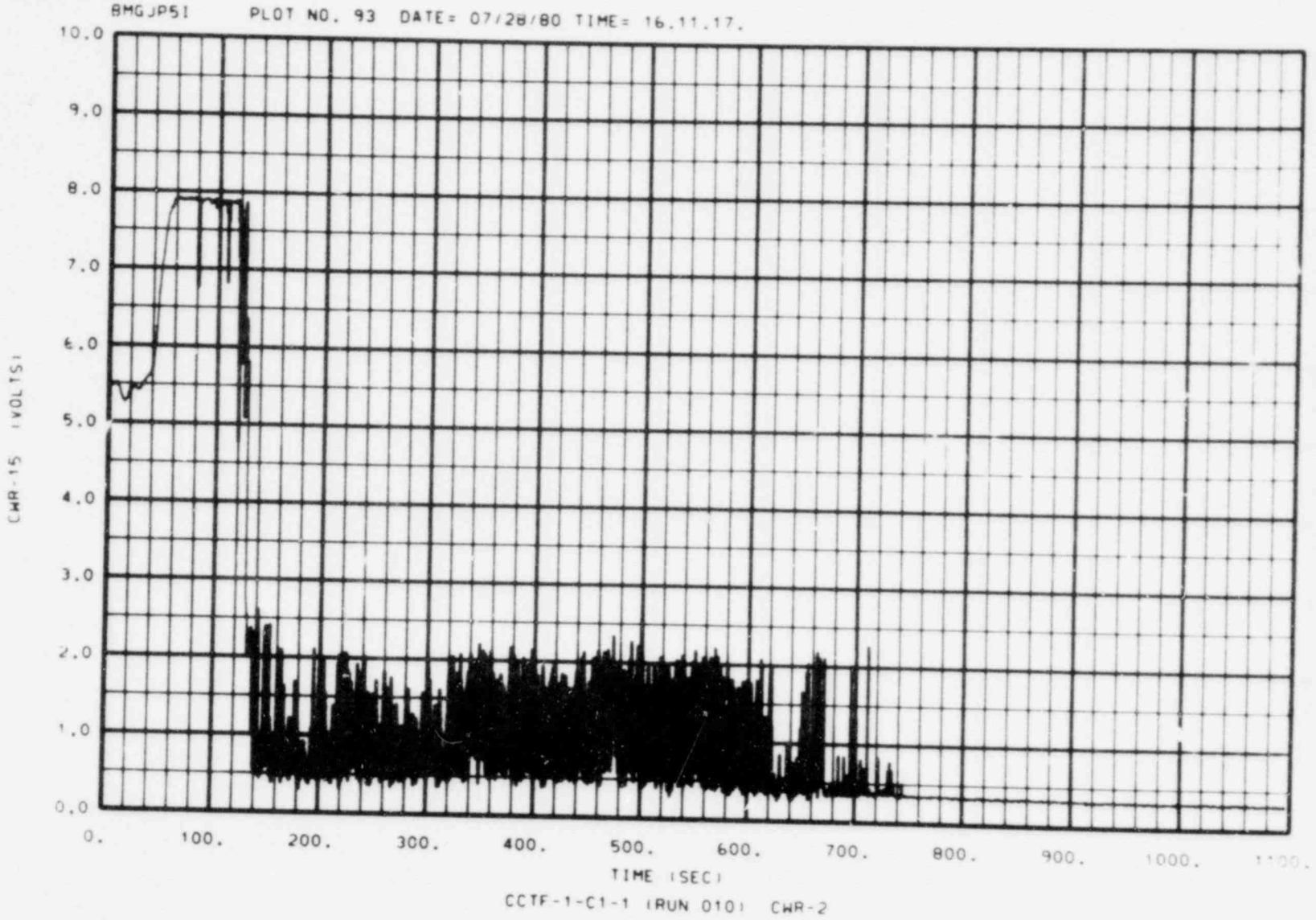

BMGJP5I PLOT NO. 98 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-10 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

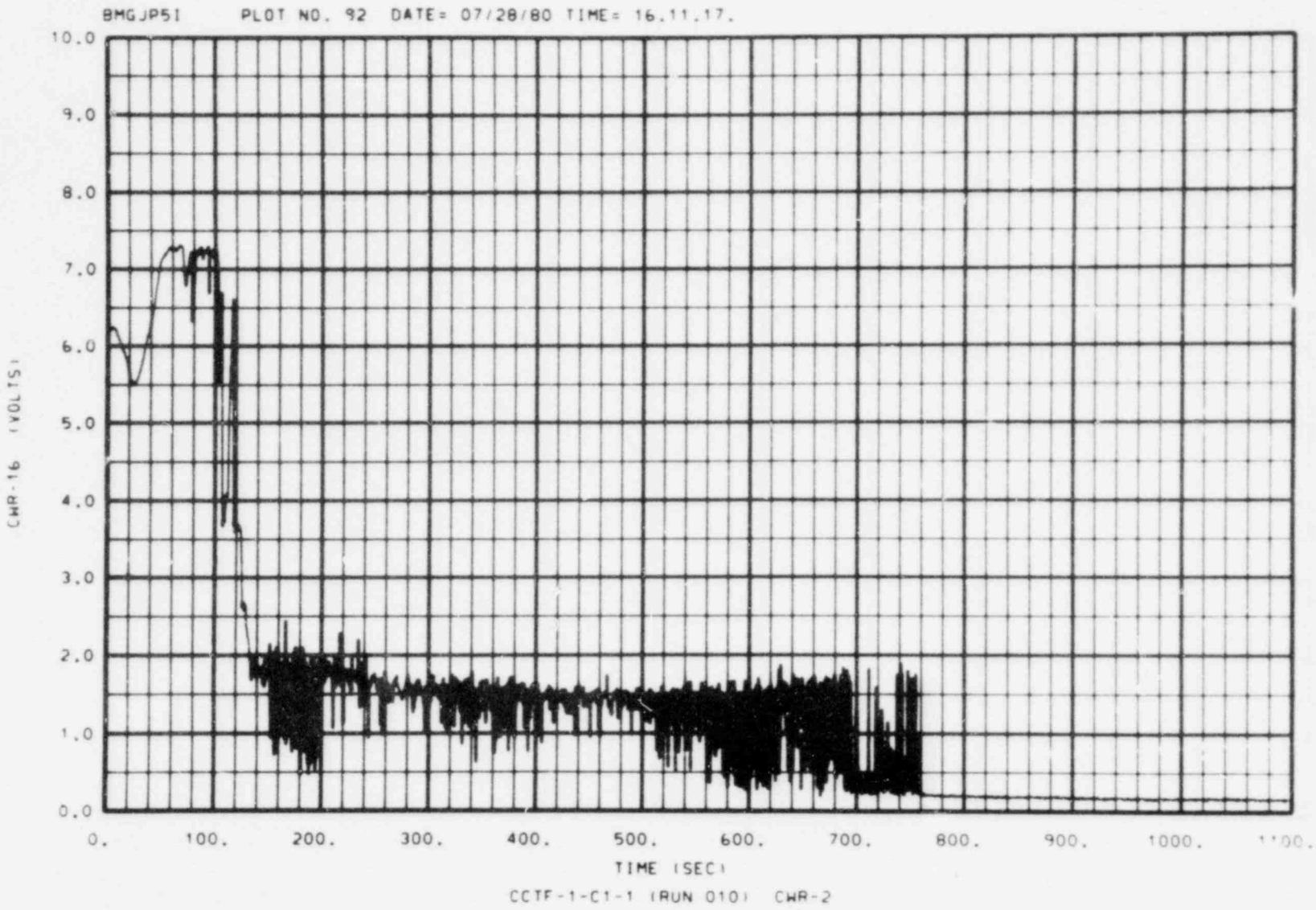

BMGJP5I PLOT NO. 97 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-11 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

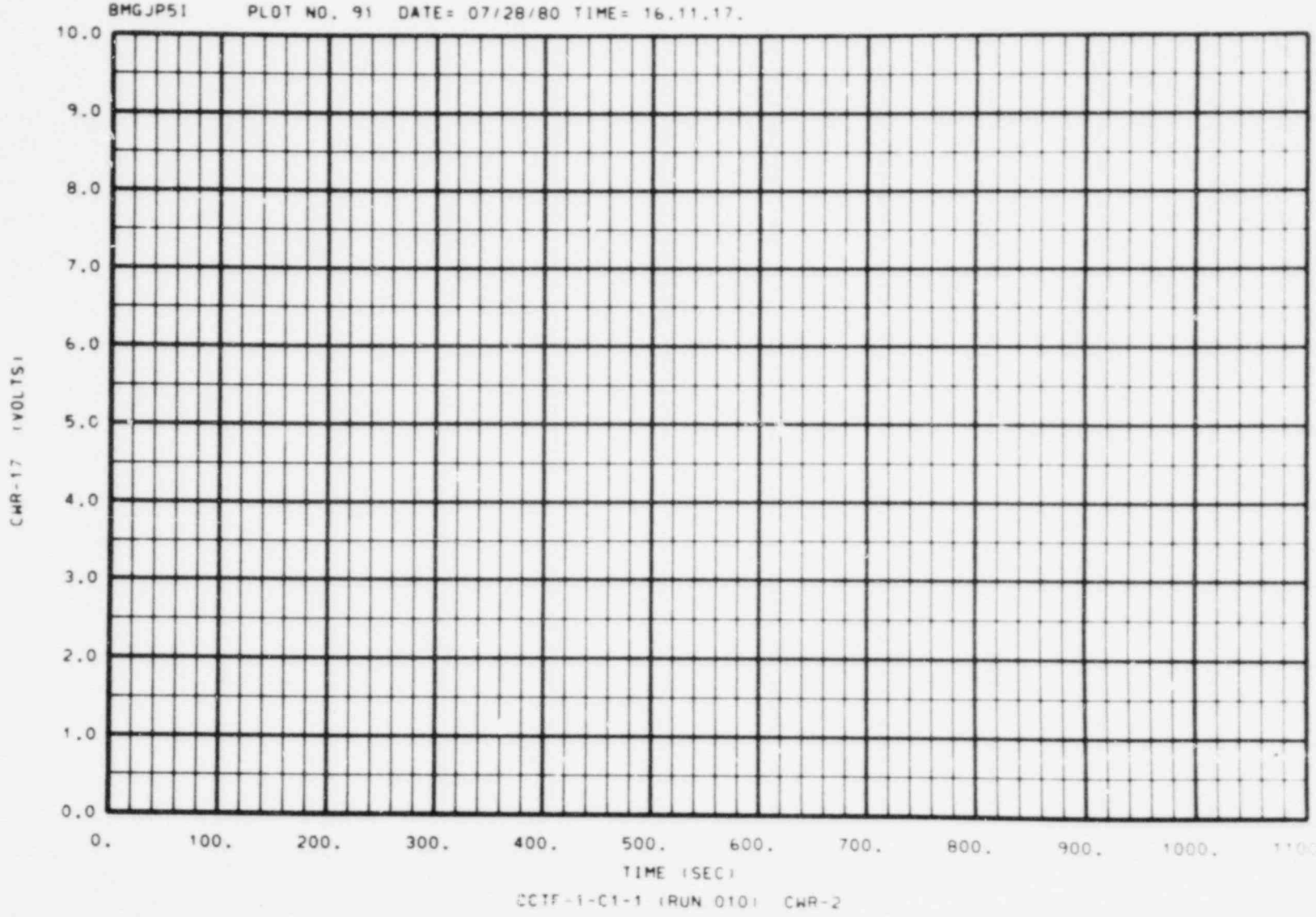

BMGJP51 PLOT NO. 96 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

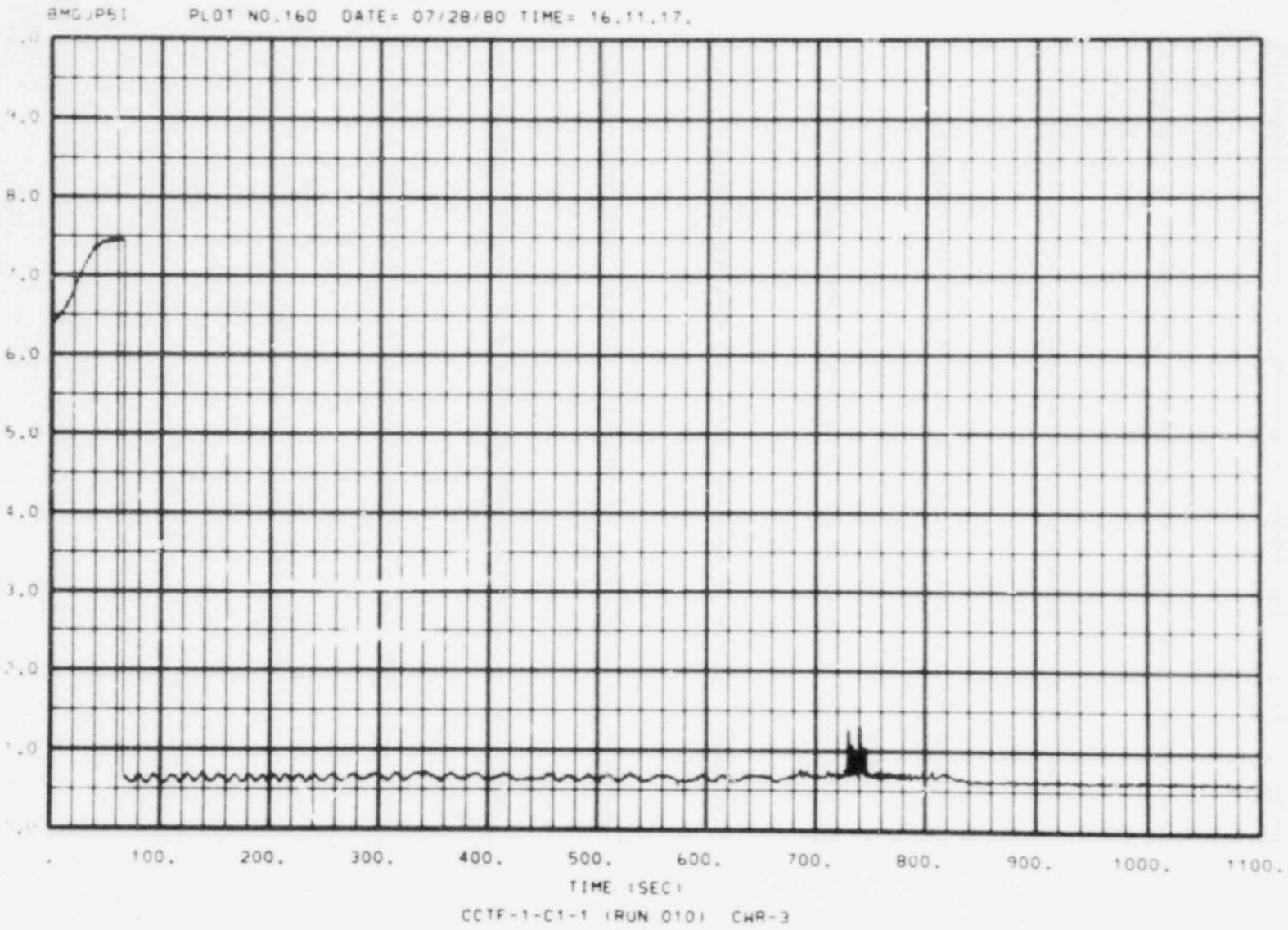

BMGJP51 PLOT NO. 95 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-13 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

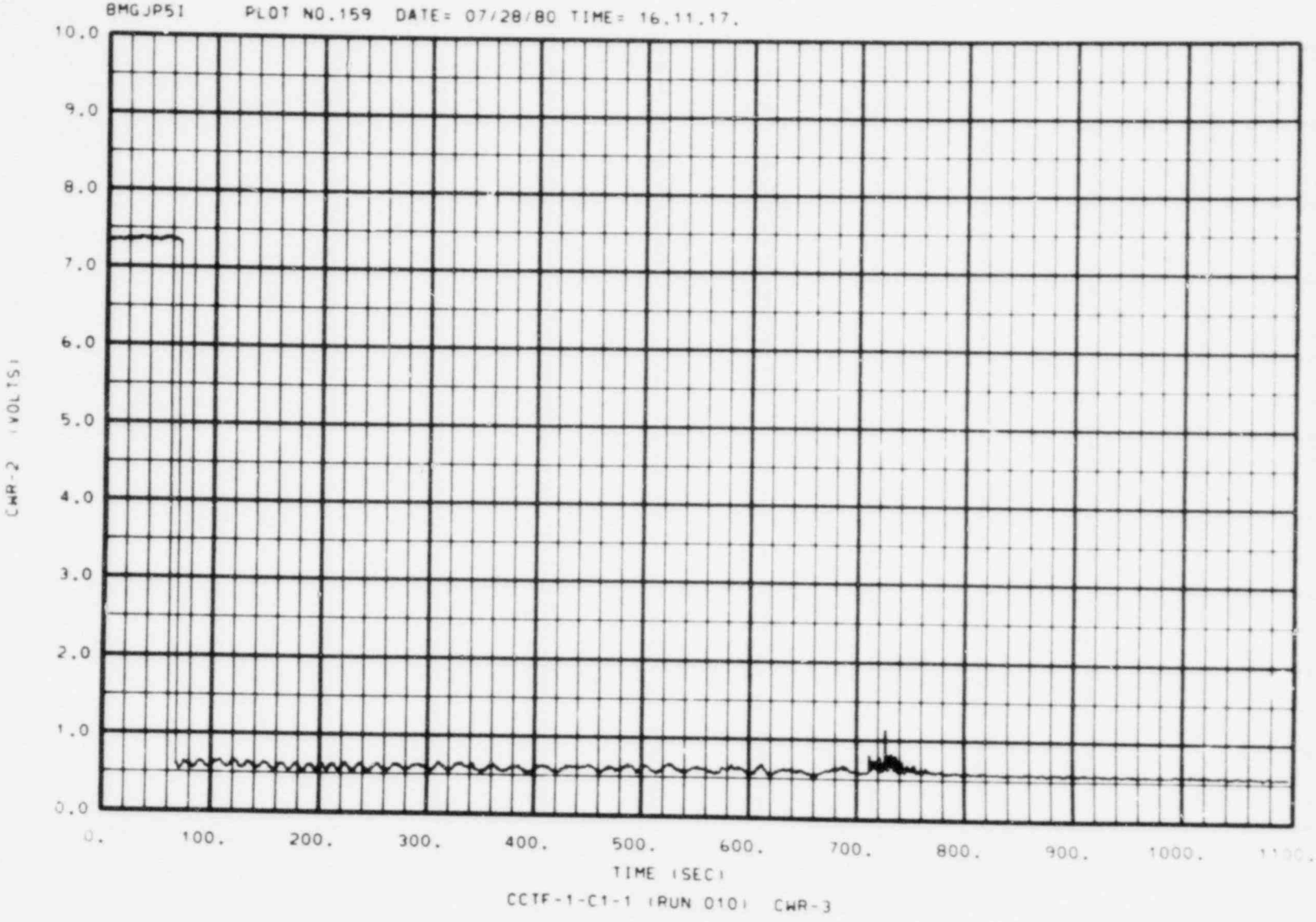

BMGJP51 PLOT NO. 94 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-14 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

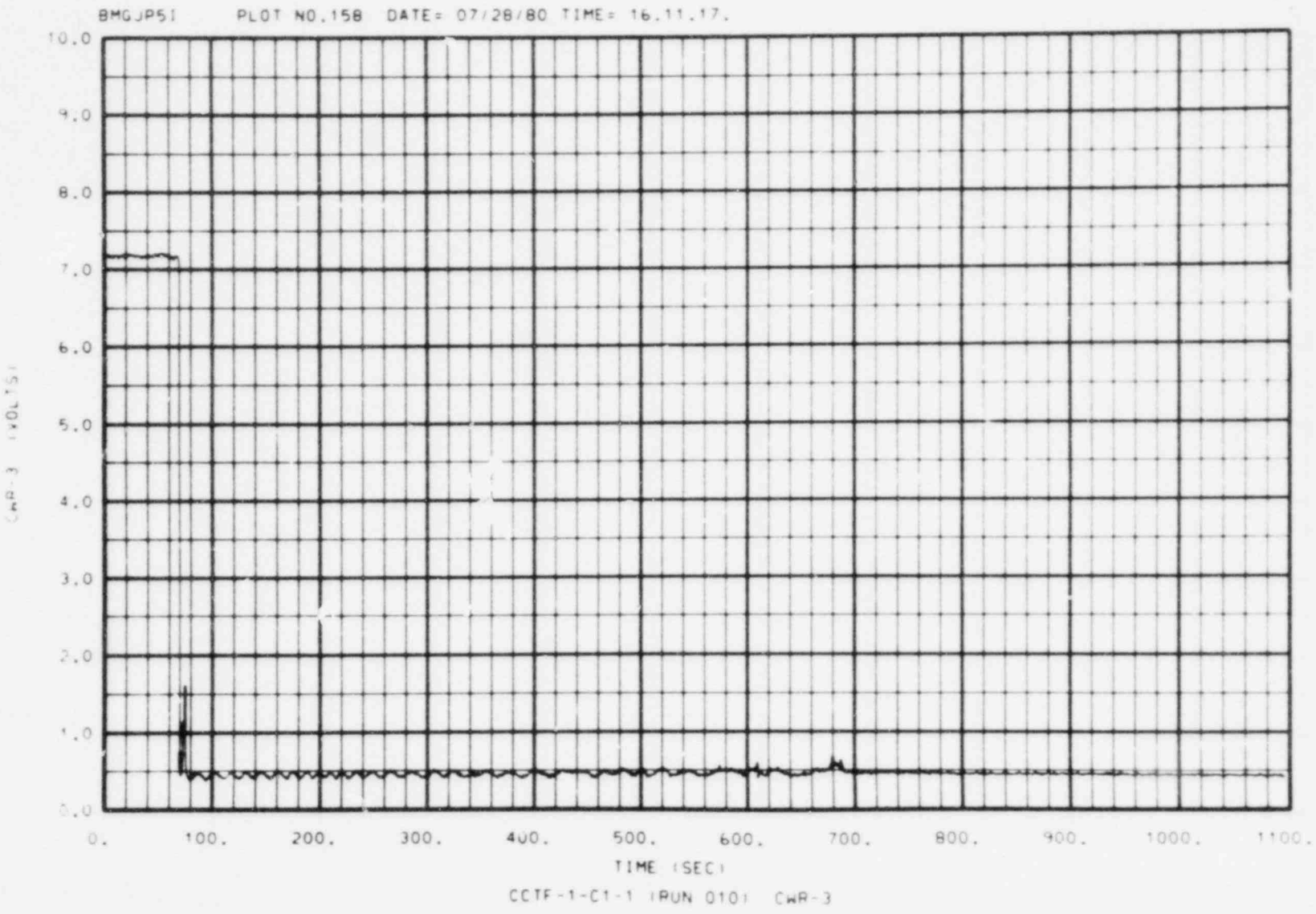

BMGJP51 PLOT NO. 93 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-15 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

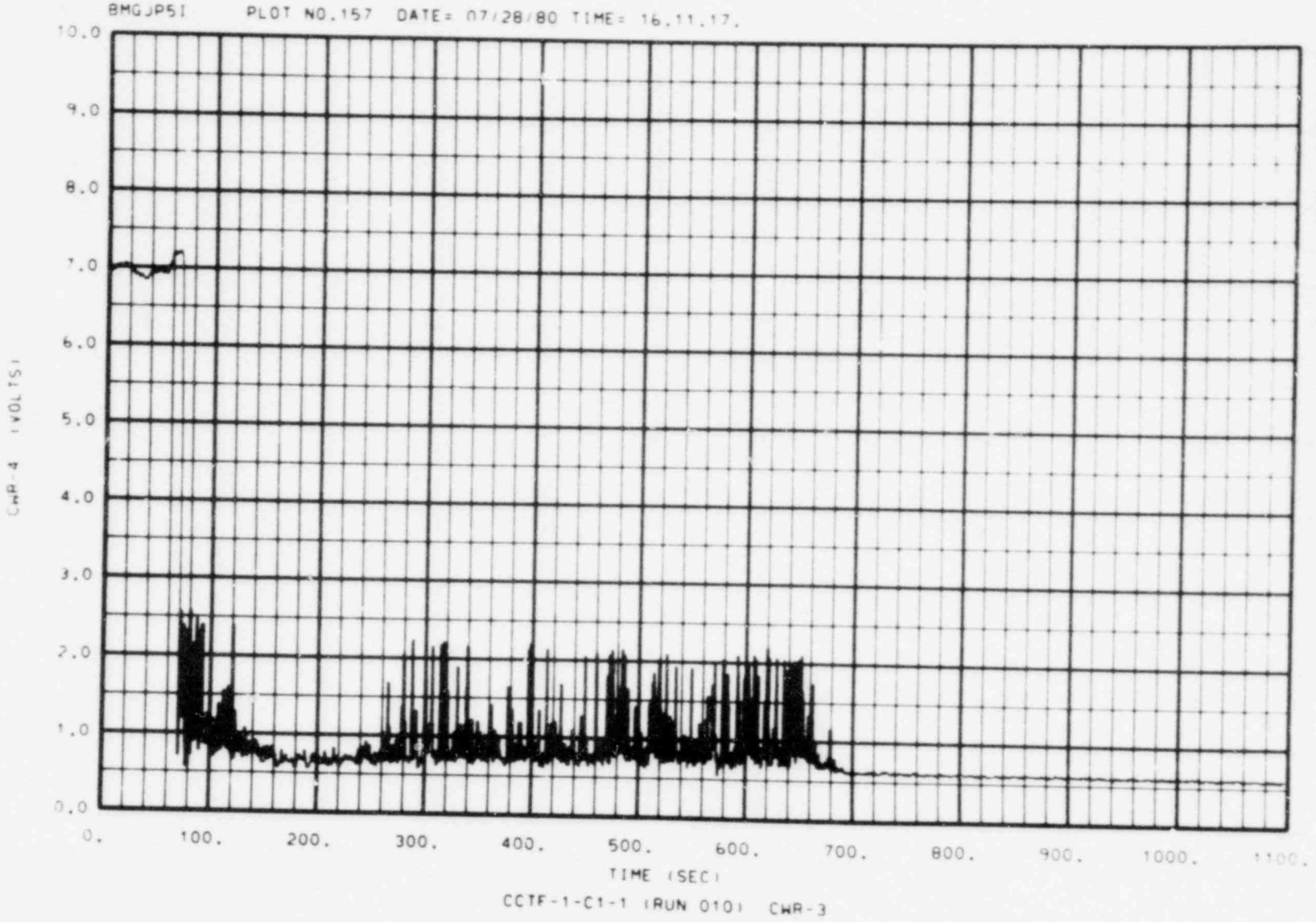

BMGJP51 PLOT NO. 92 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CHR-16 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CHR-2

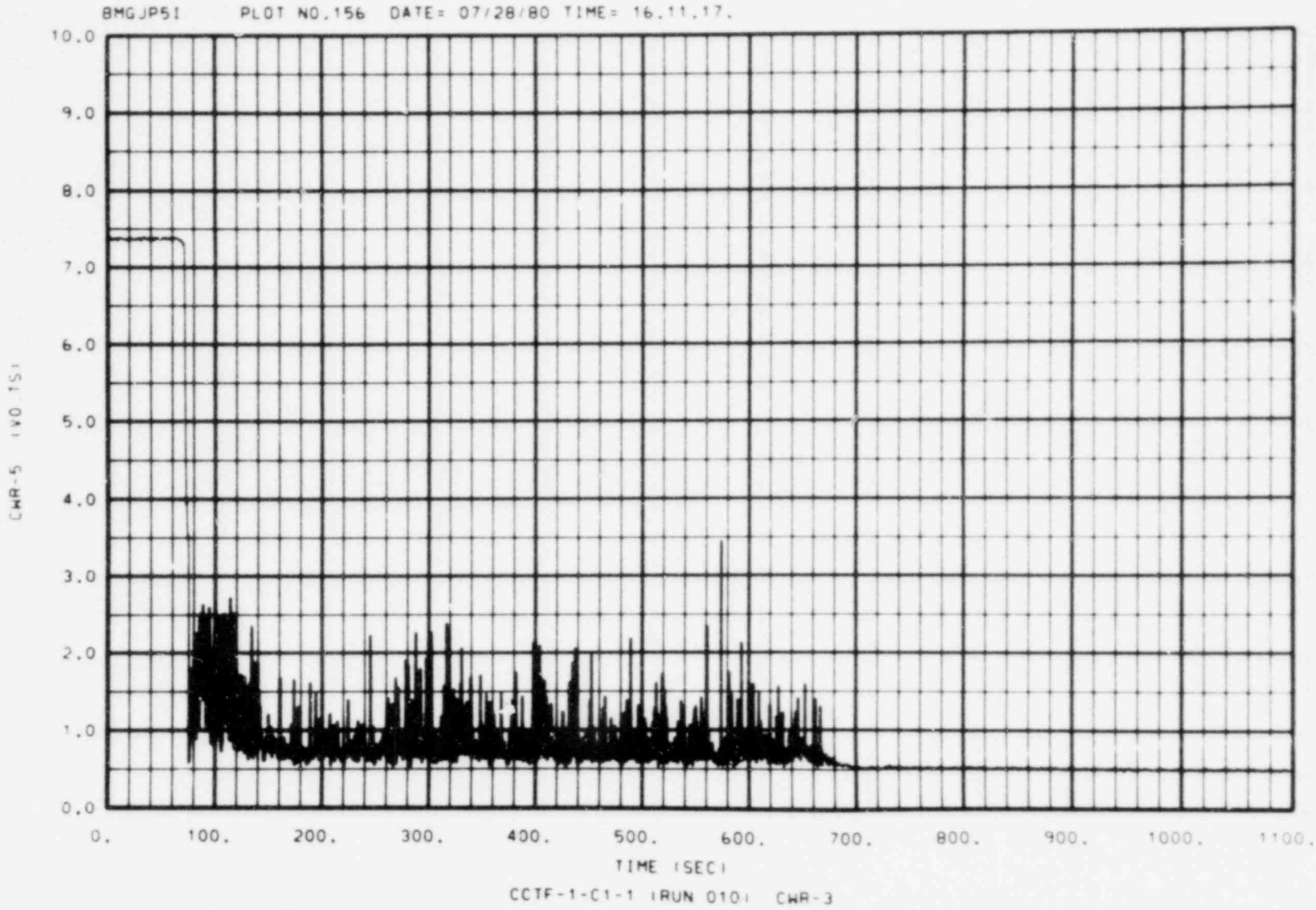

BMGJP51 PLOT NO. 91 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-17 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-2

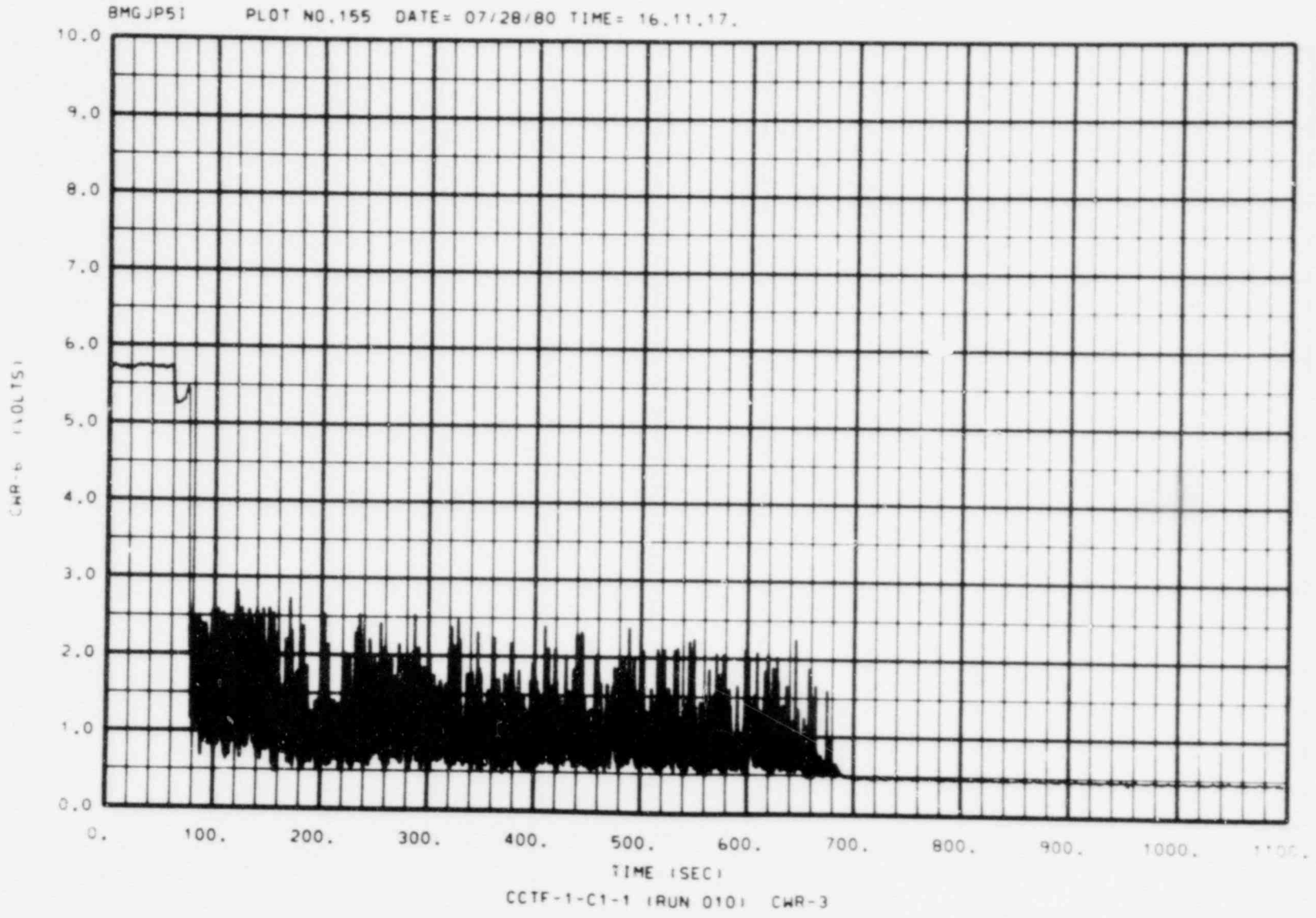

BMG/P5I PLOT NO.160 DATE= 07/28/80 TIME= 16.11.17.
8.0
6.0
5.0
4.0
3.0
1.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

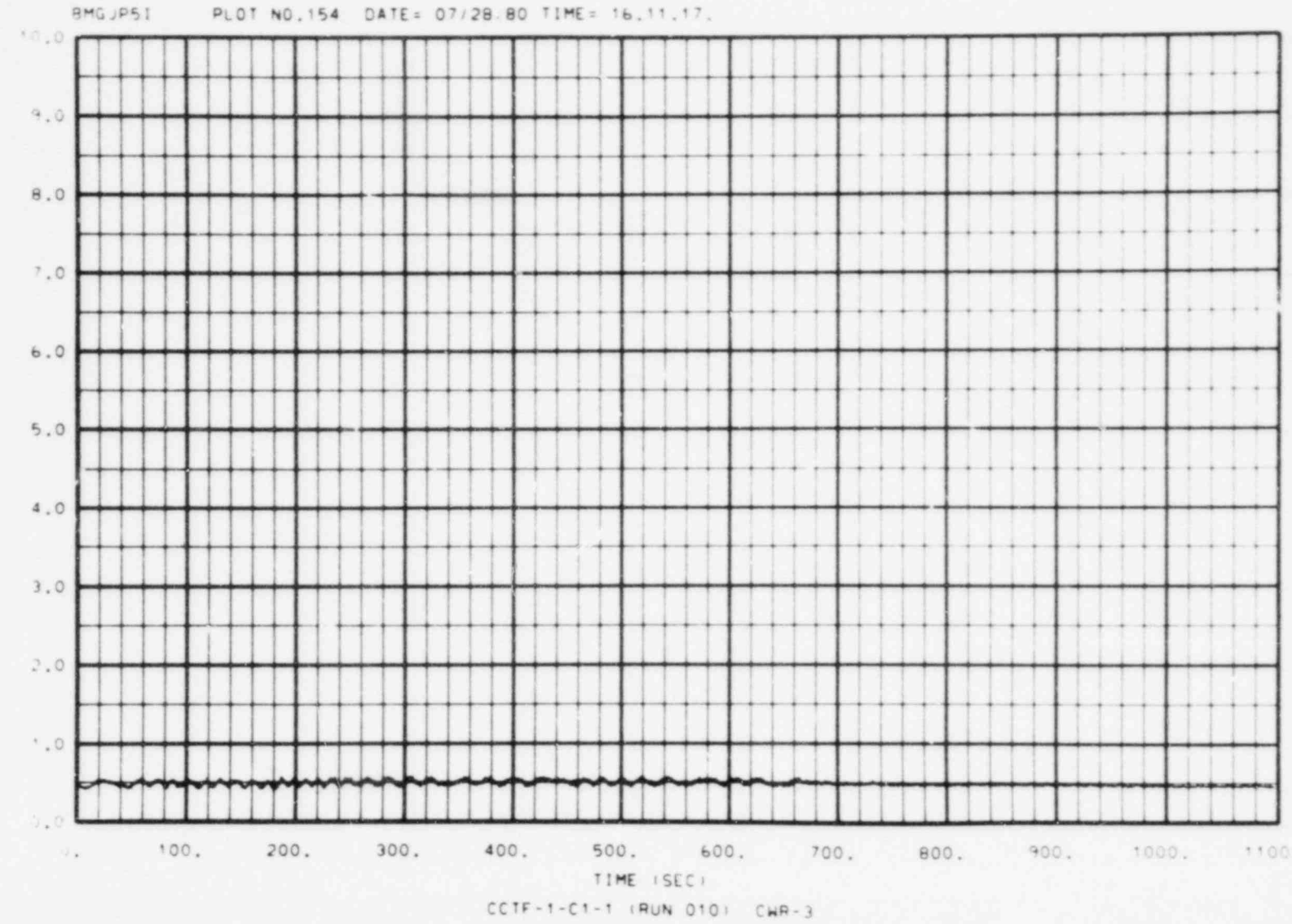

BMGJP5I PLOT NO.159 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-2 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

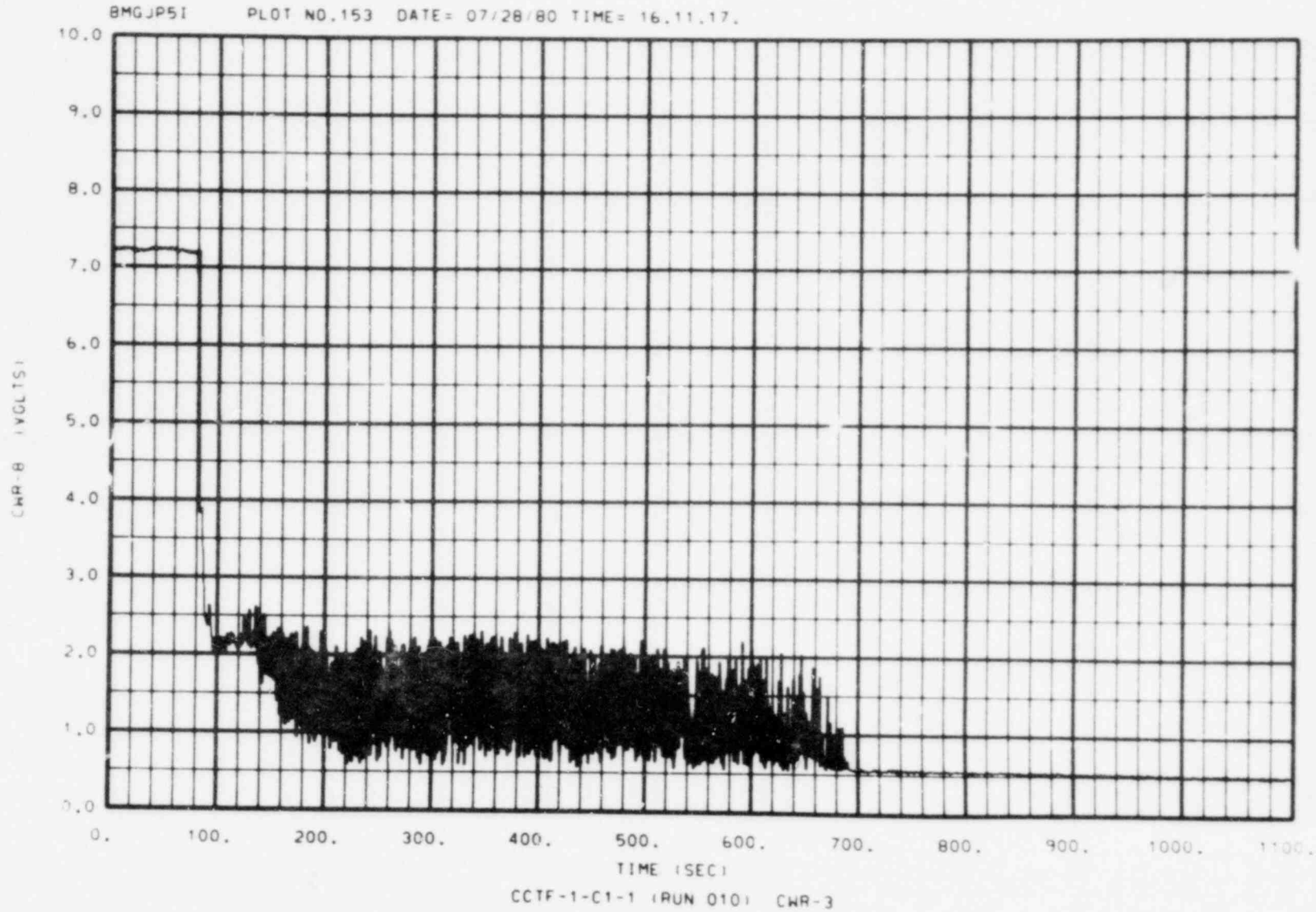

BMGJP51 PLOT NO.158 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

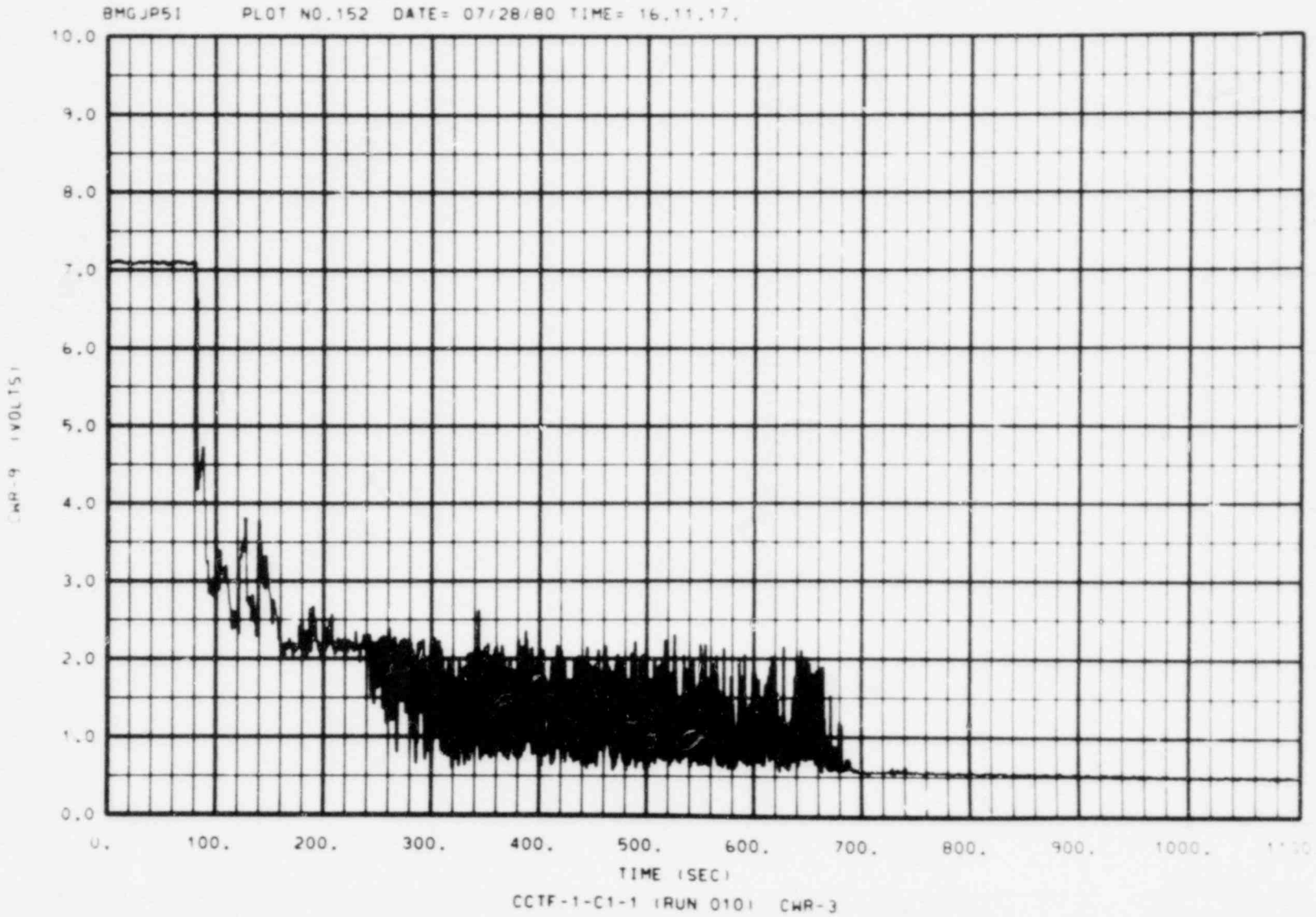

BMGJP51 PLOT NO.157 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-4 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

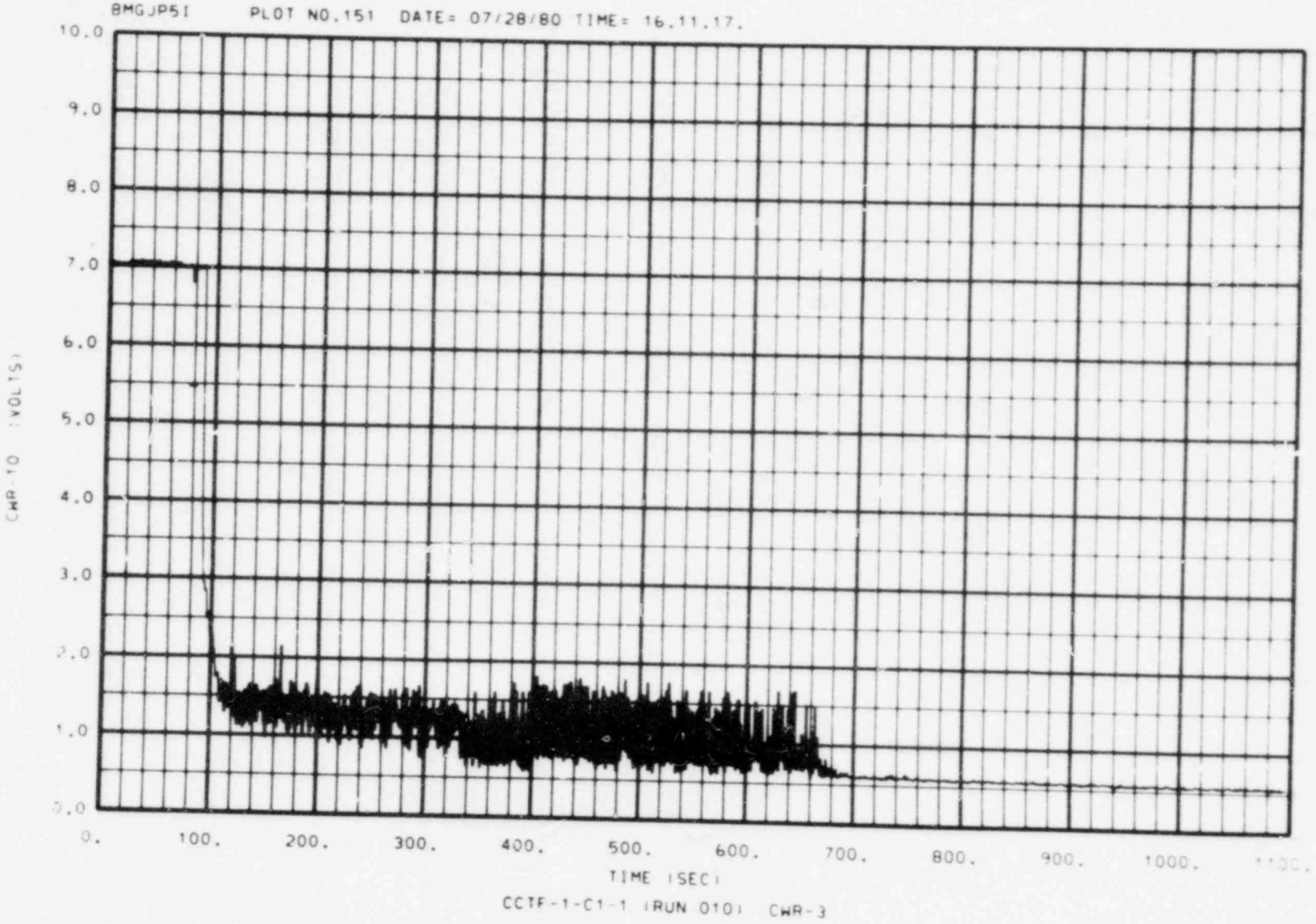

BMGJP5I PLOT NO.156 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-5 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

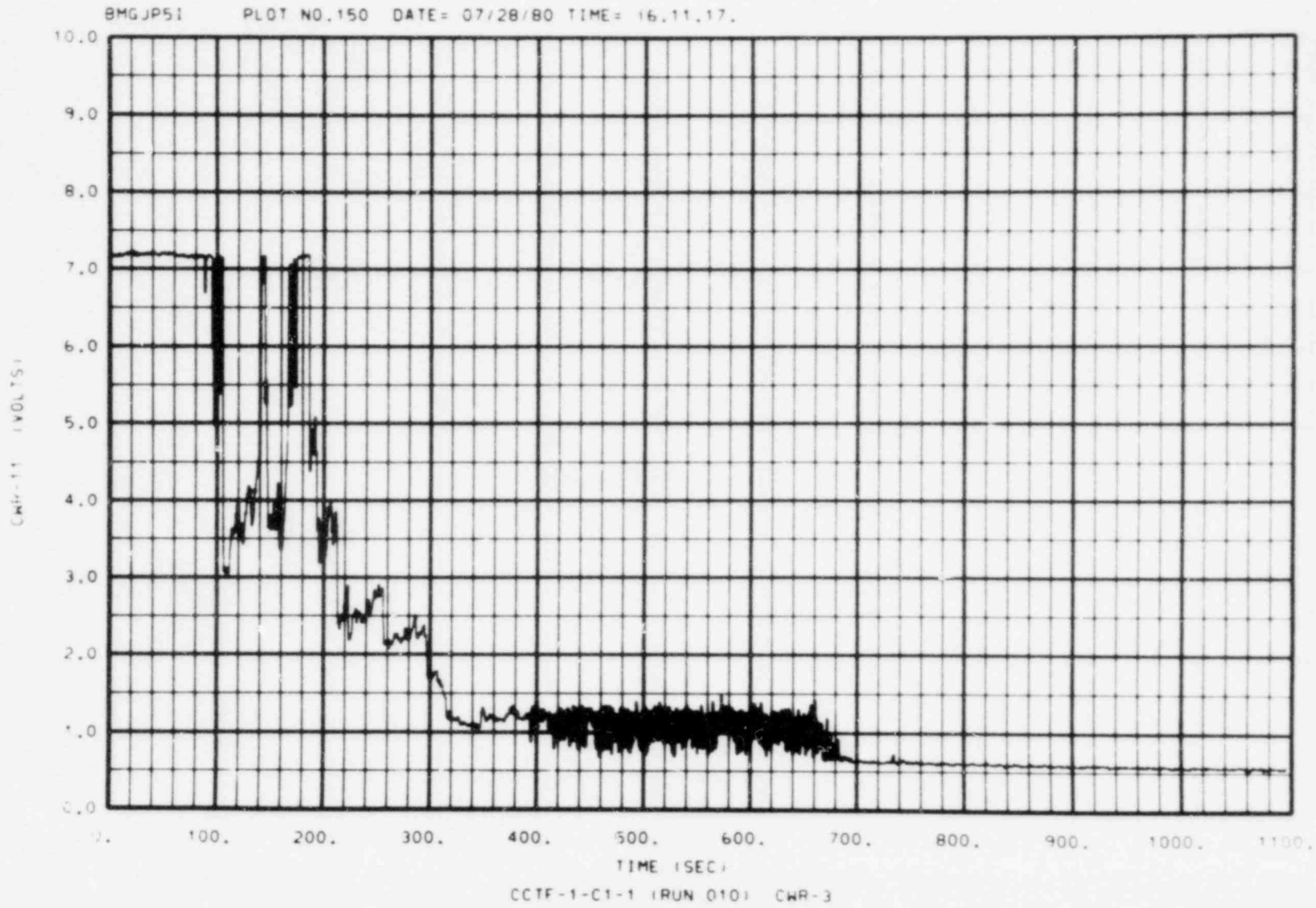

BMGJP5I PLOT NO.155 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

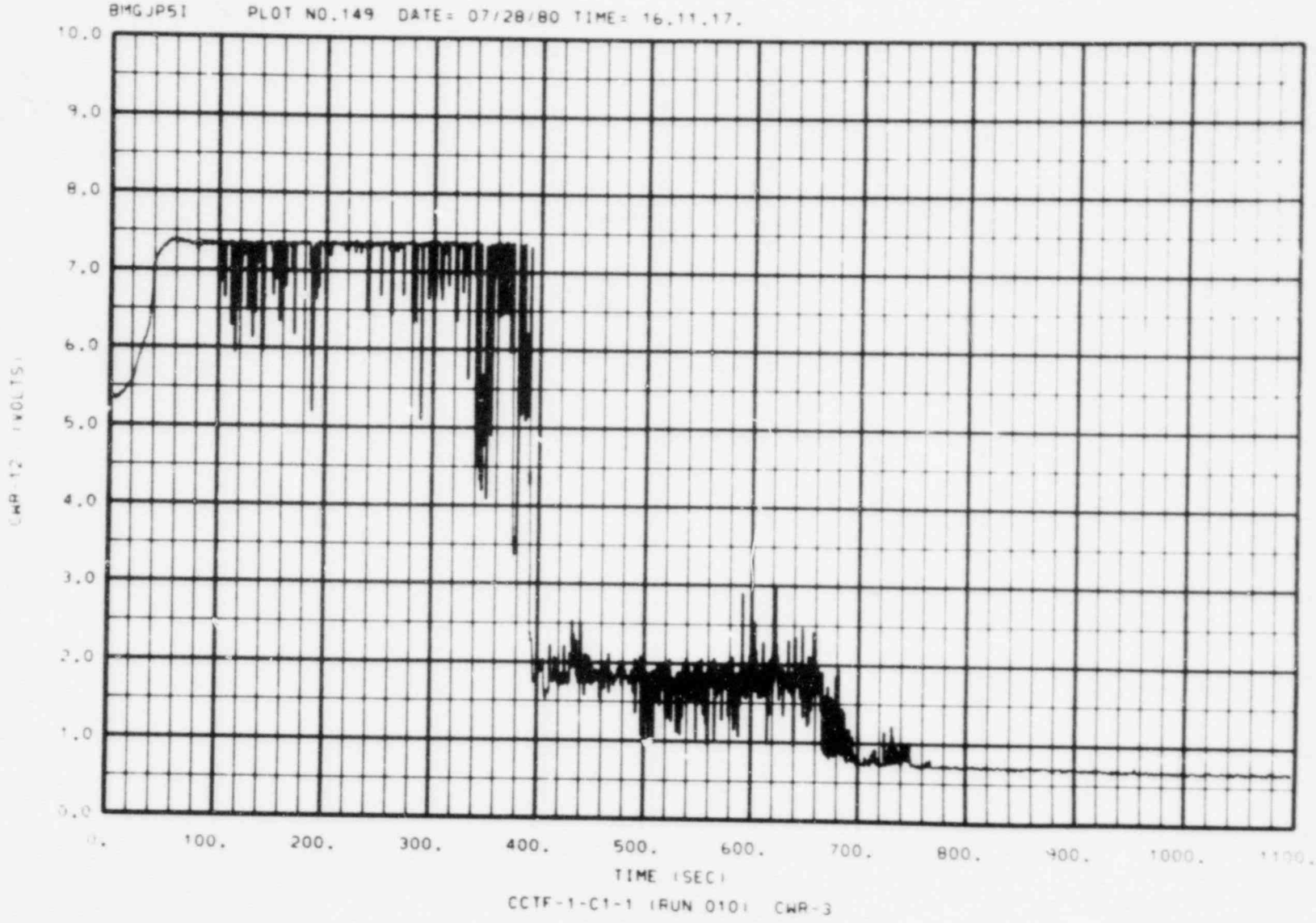

BMGJP51 PLOT NO.154 DATE= 07/28.80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

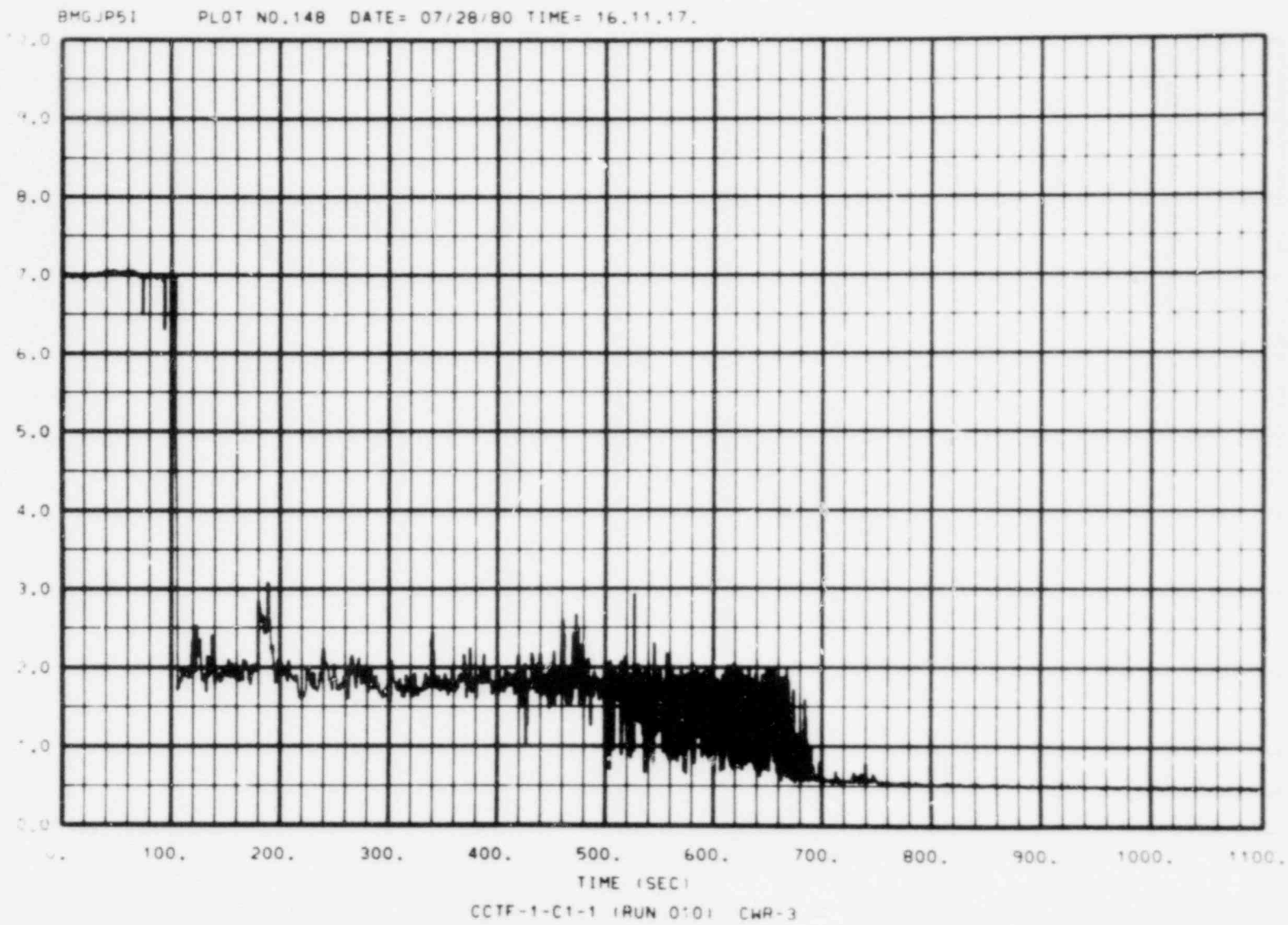

8MGJP5I PLOT NO.153 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-8 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

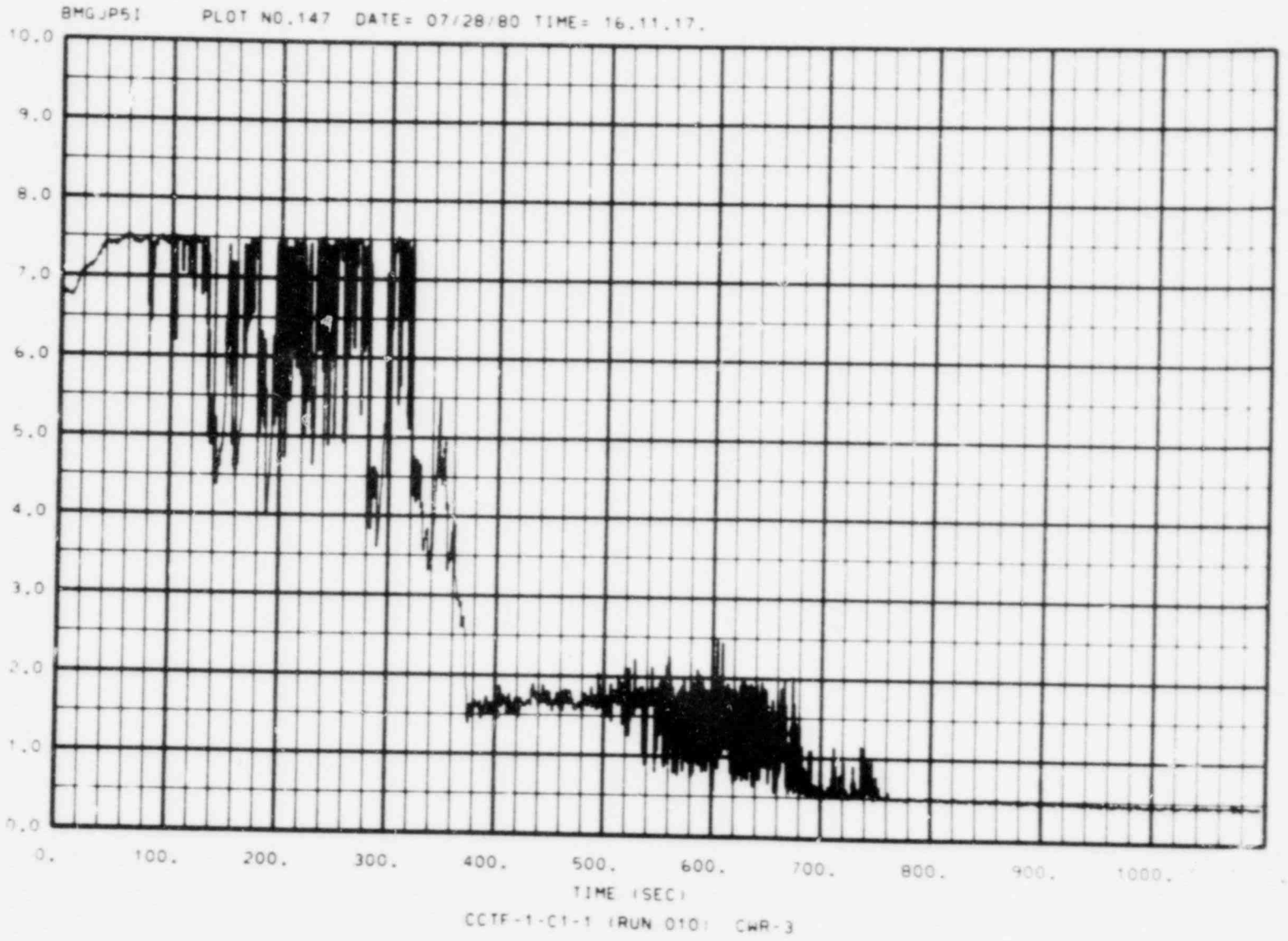

BMGJP51 PLOT NO.152 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-9 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

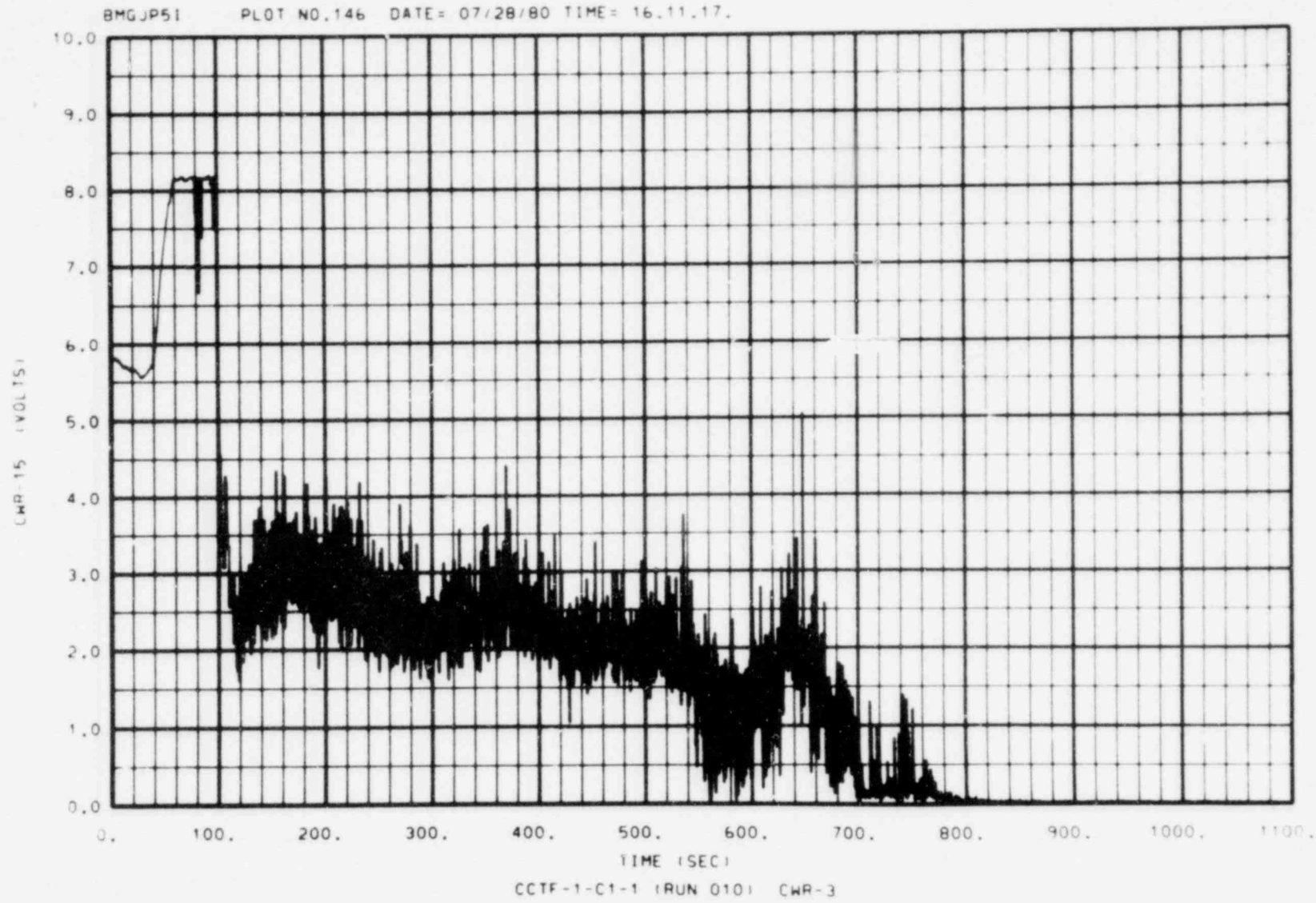

BMGJP51 PLOT NO.151 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-10 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

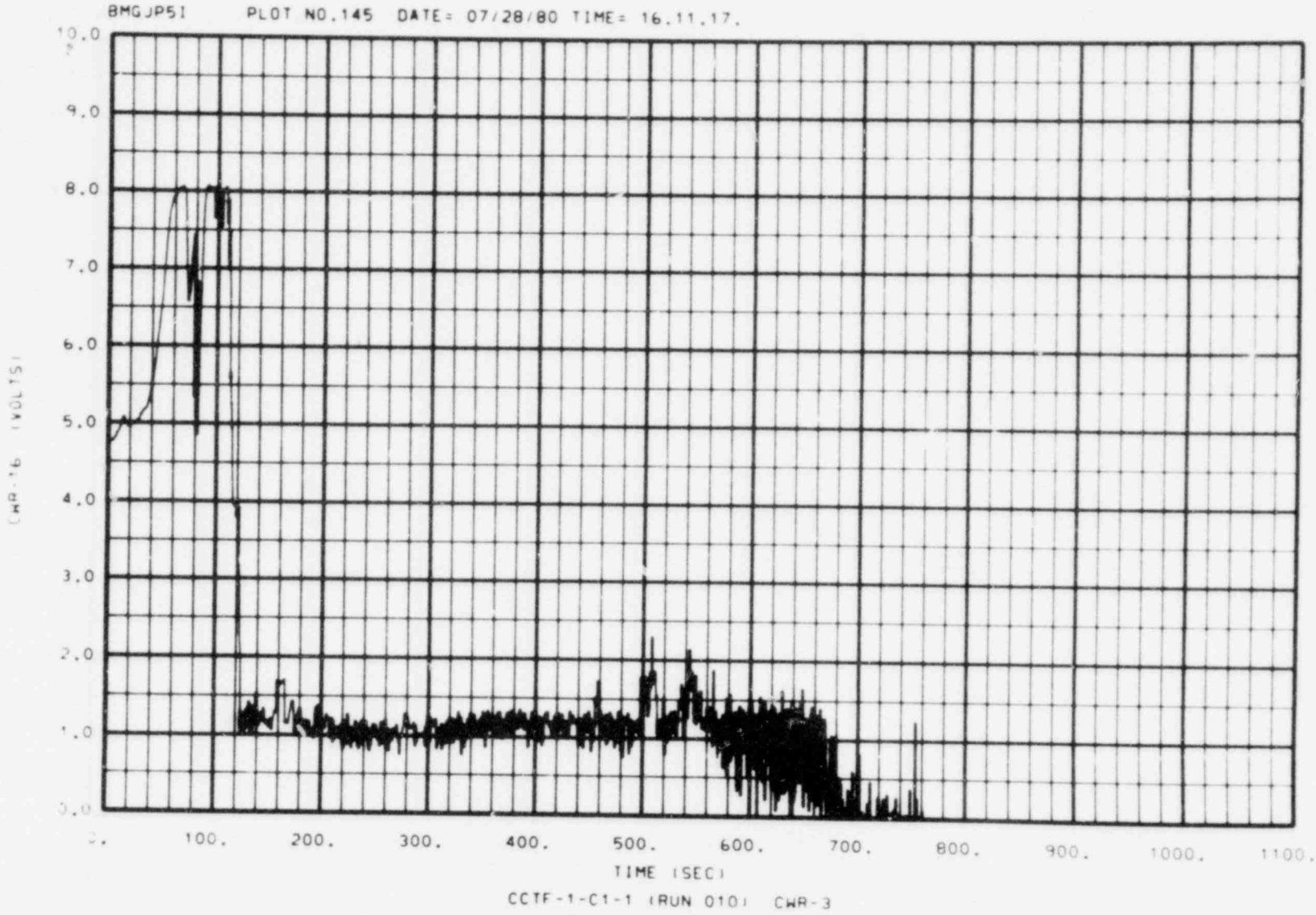

BMGJP51 PLOT NO.150 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

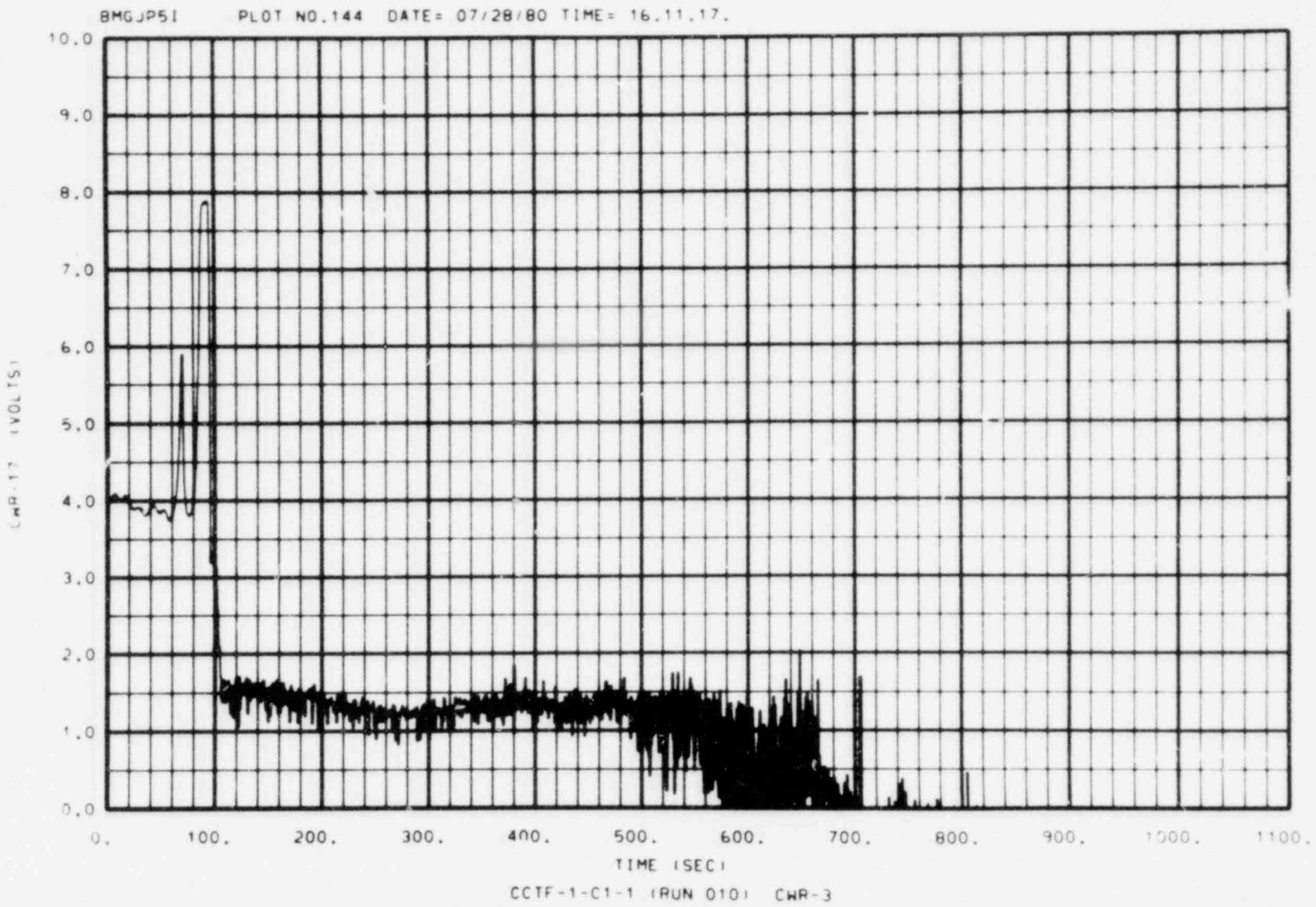

BIMGJPSI PLOT NO.149 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-2 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

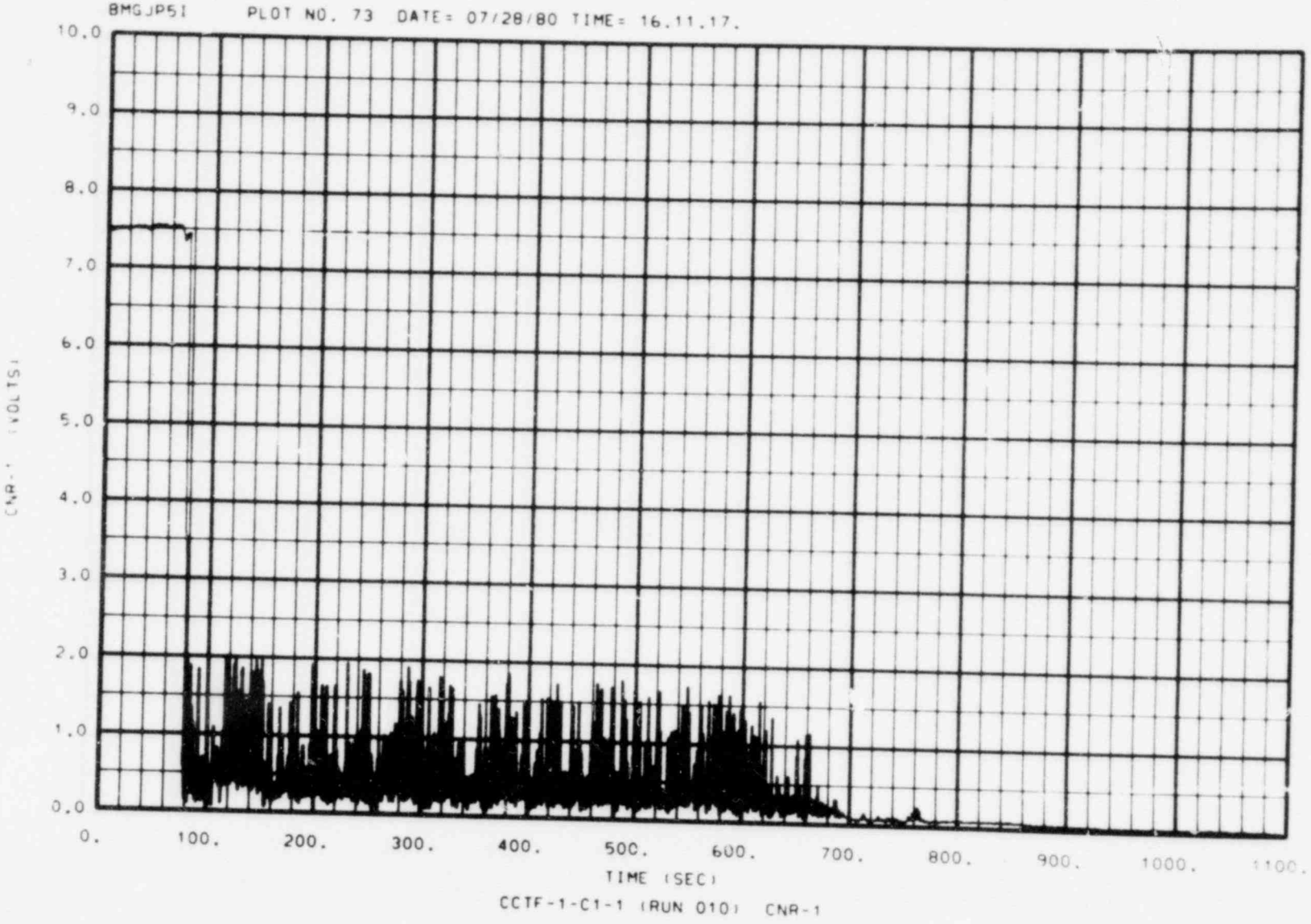

BMGJP51 PLOT NO.148 DATE= 07/28/80 TIME= 16.11.17.
8.0
7.0
6.0
5.0
4.0
3.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

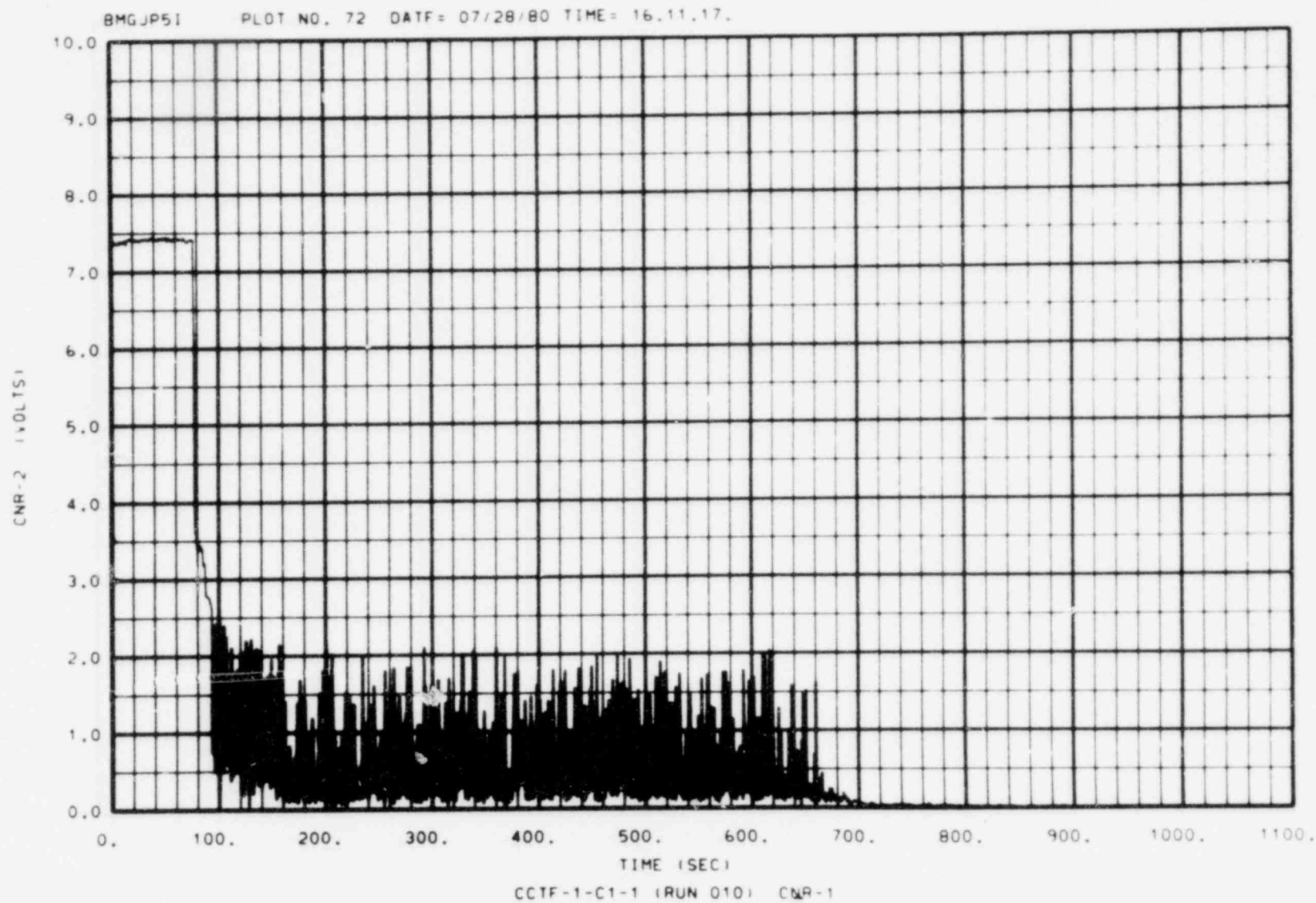

BMGJP5I PLOT NO.147 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

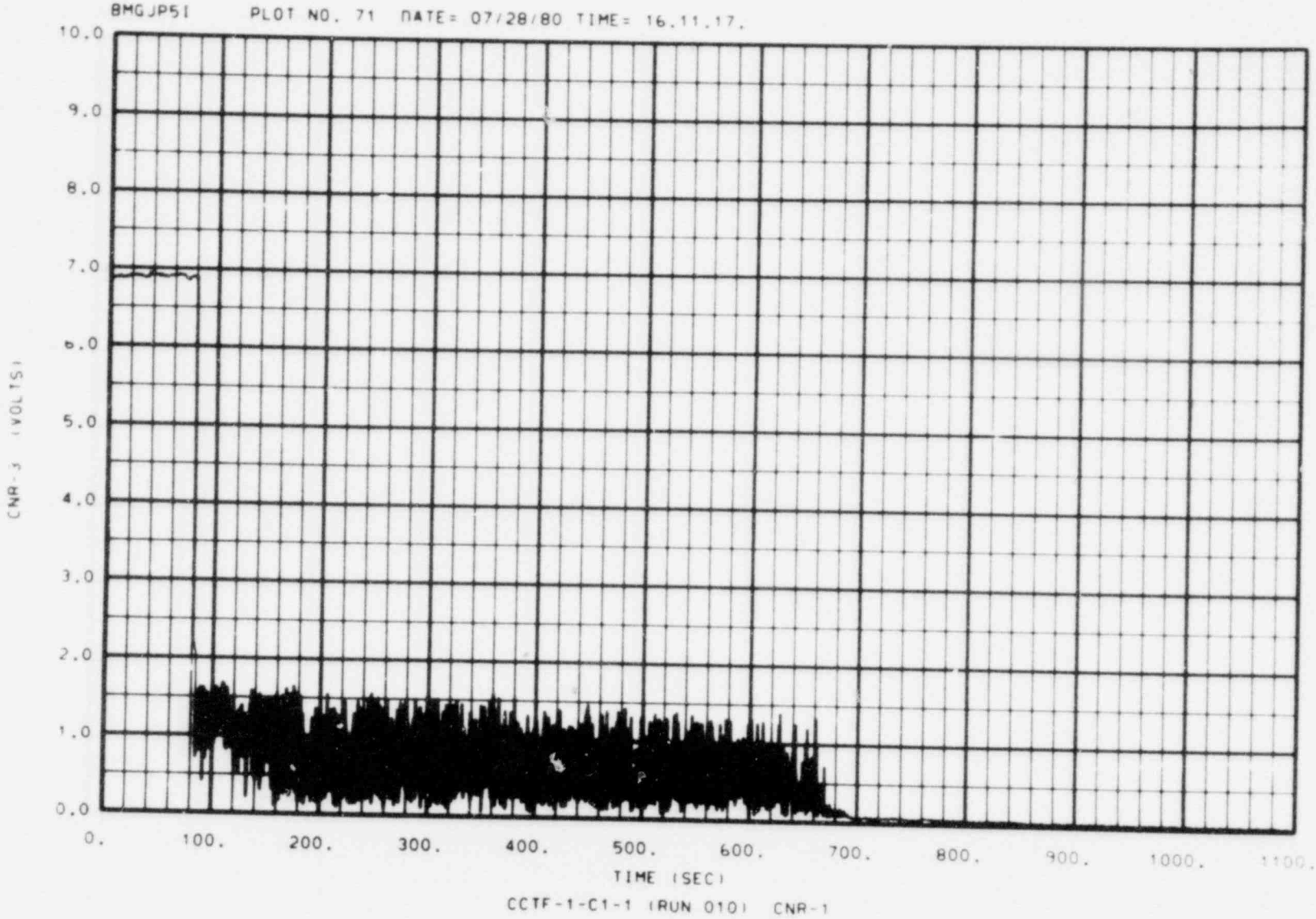

BMGJP51 PLOT NO.146 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CWR-15 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

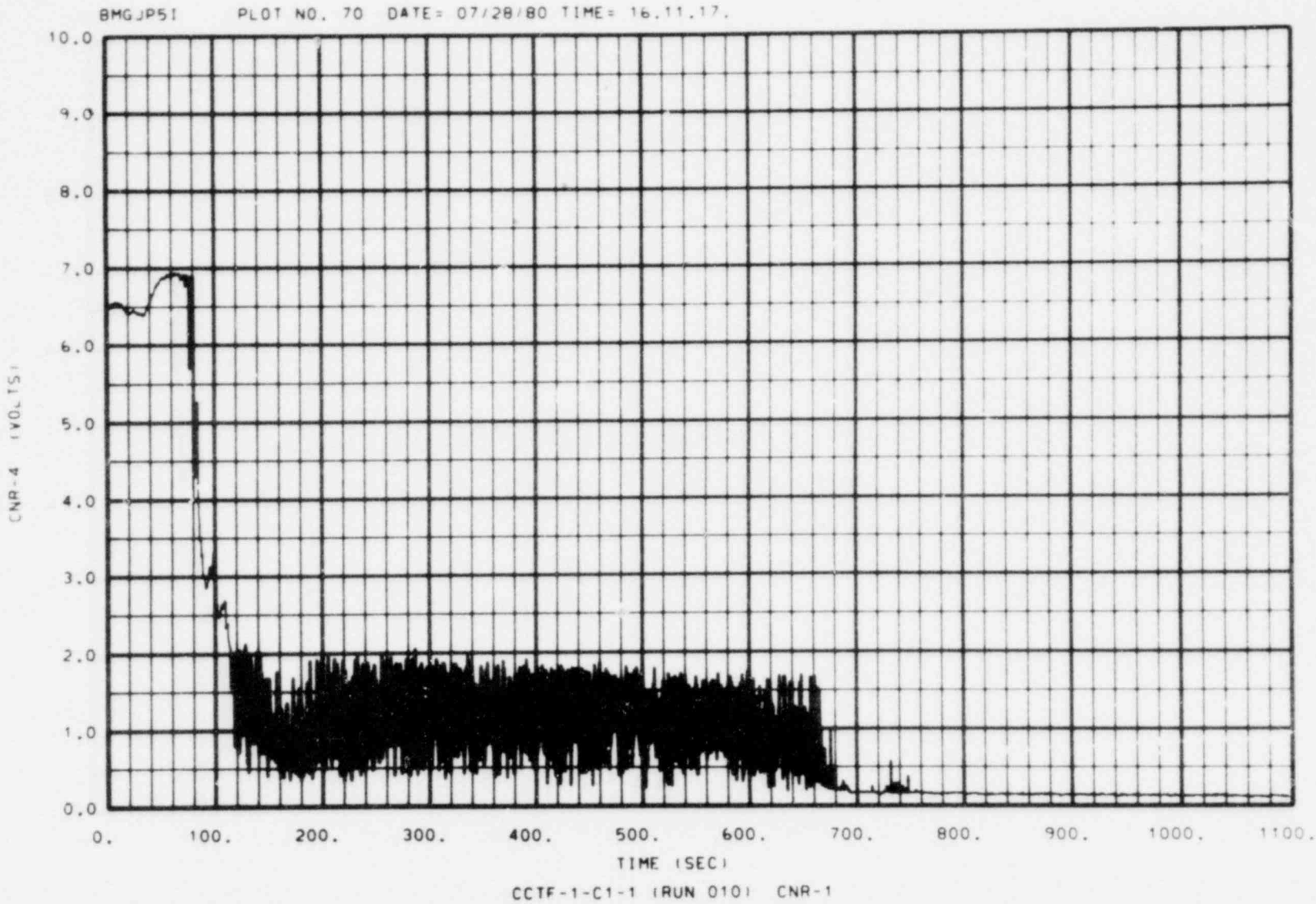

BMGJP51 PLOT NO.145 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

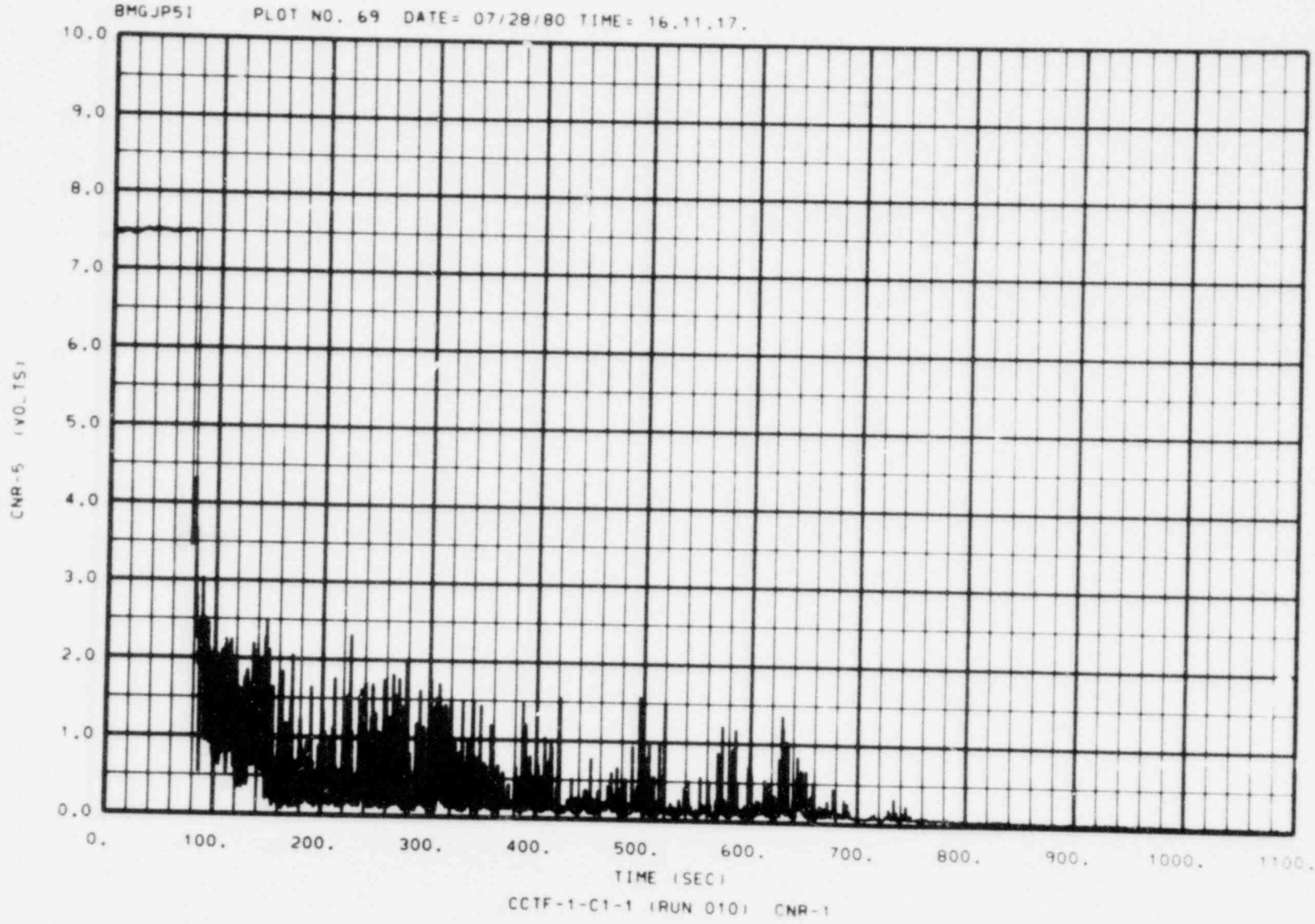

BMGJP5I PLOT NO.144 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
(CWR-17 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CWR-3

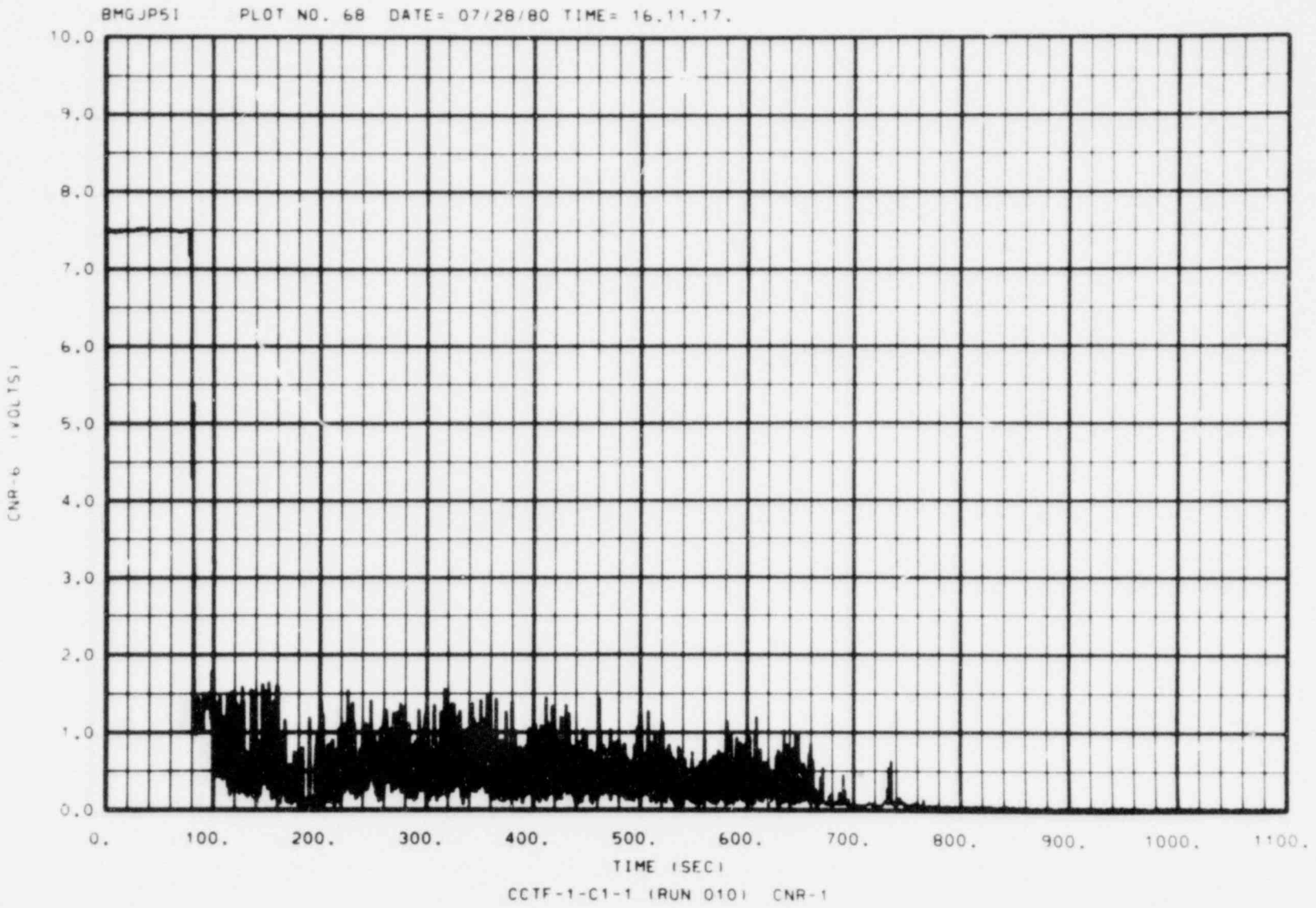

BMGJP5I PLOT NO. 73 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-1 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

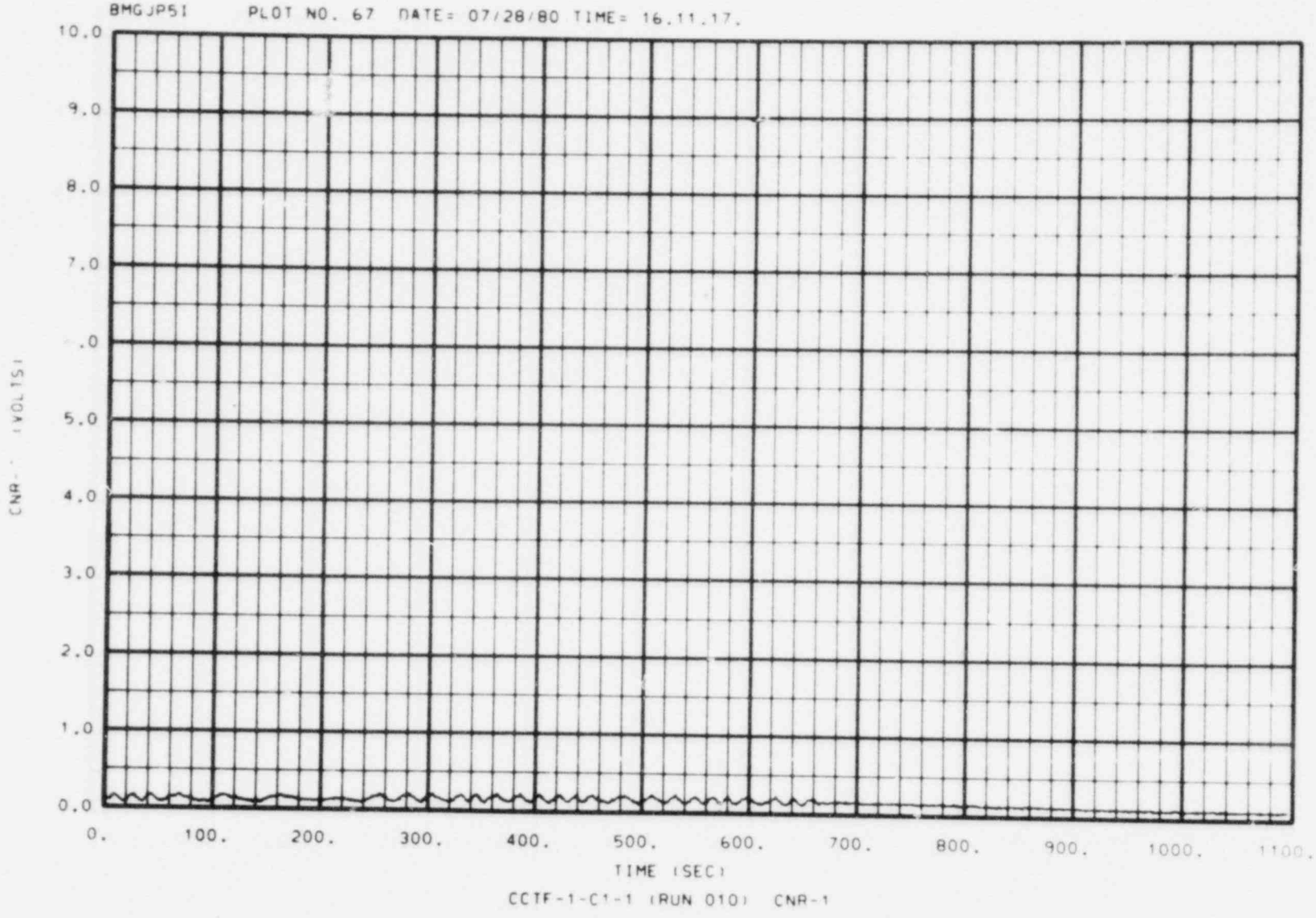

BMGJP51 PLOT NO. 72 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-2 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

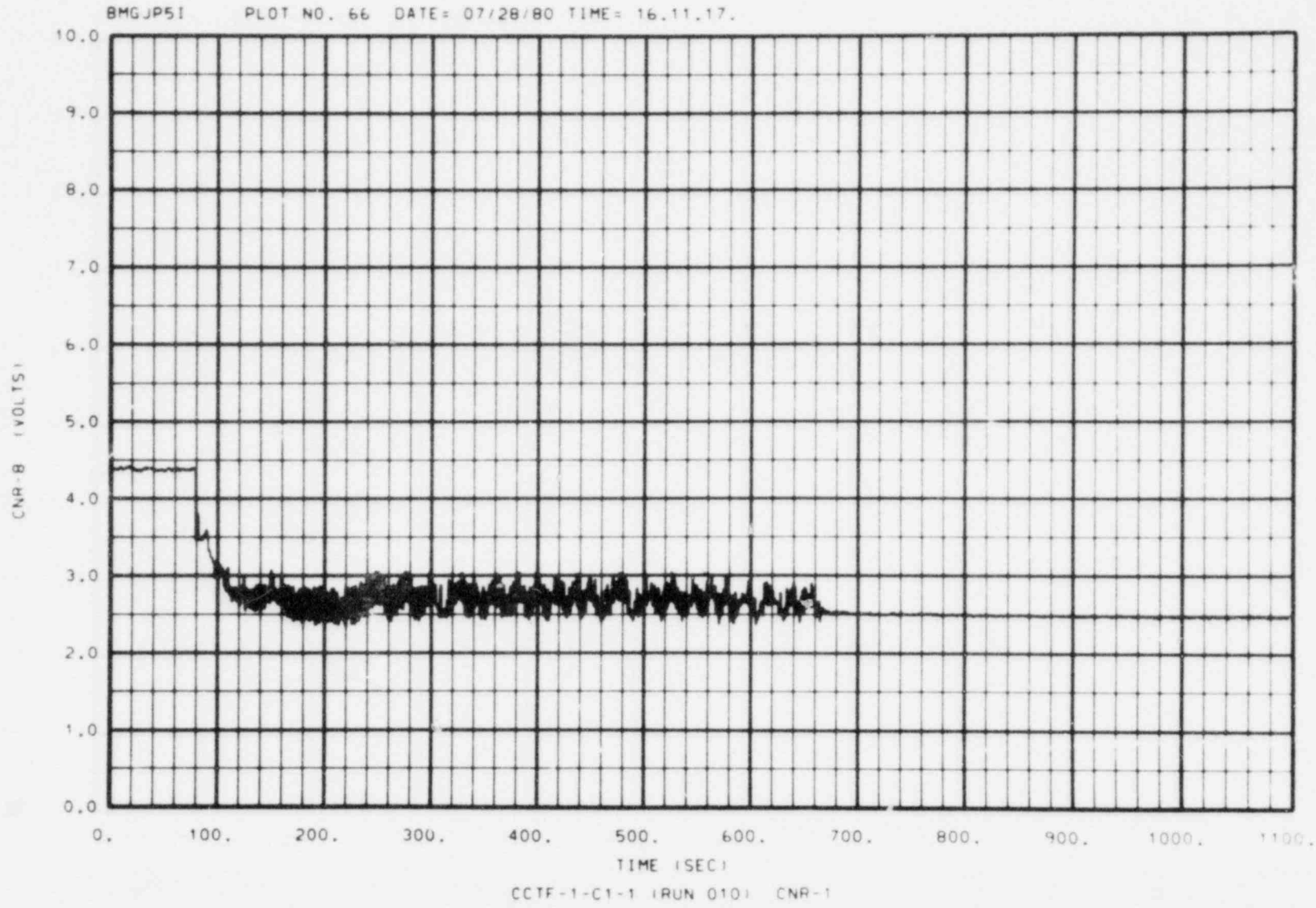

BMGJP51 PLOT NO. 71 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-1 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

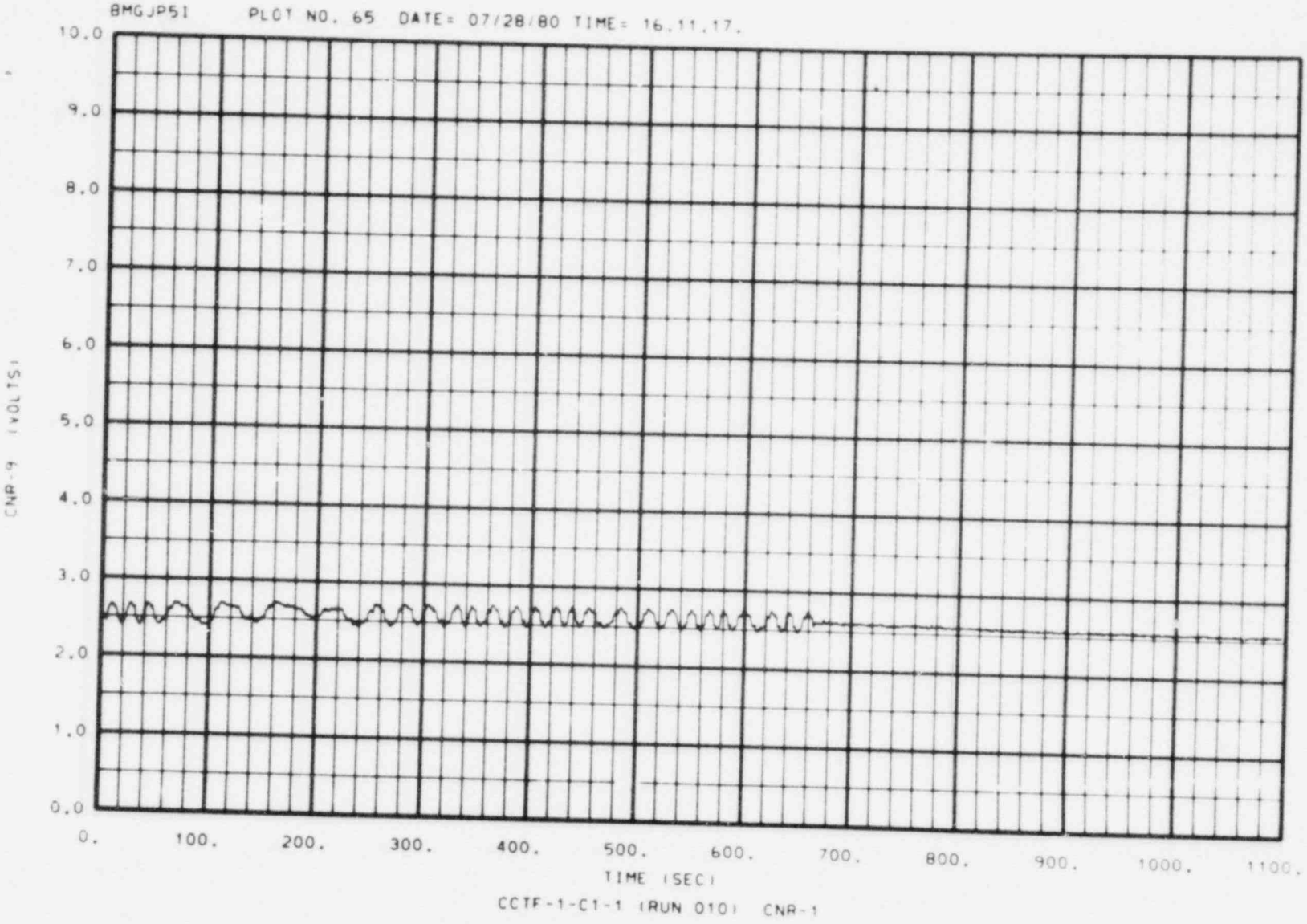

BMGJP51 PLOT NO. 70 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-4 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

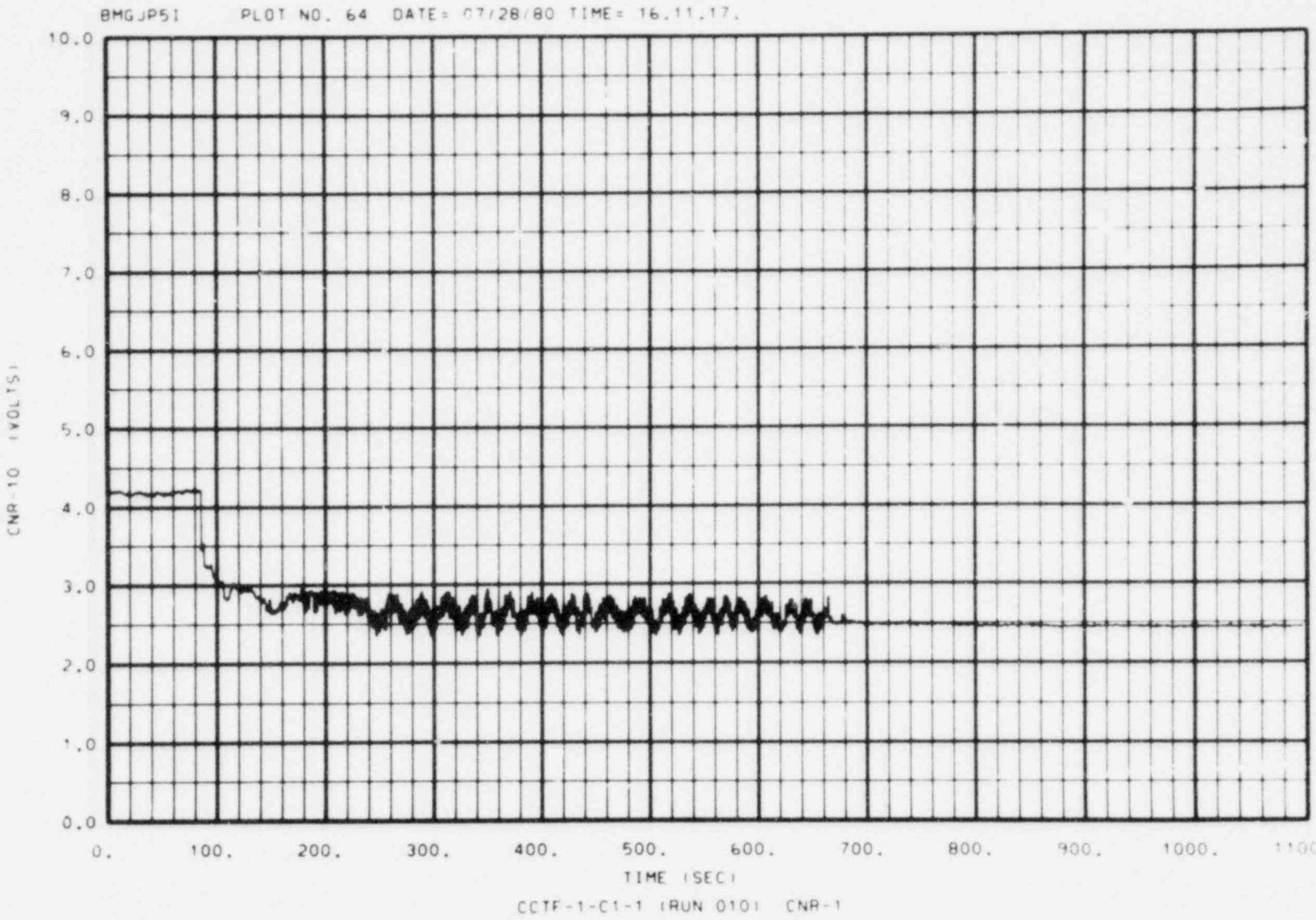

BMGJP51 PLOT NO. 69 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-5 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

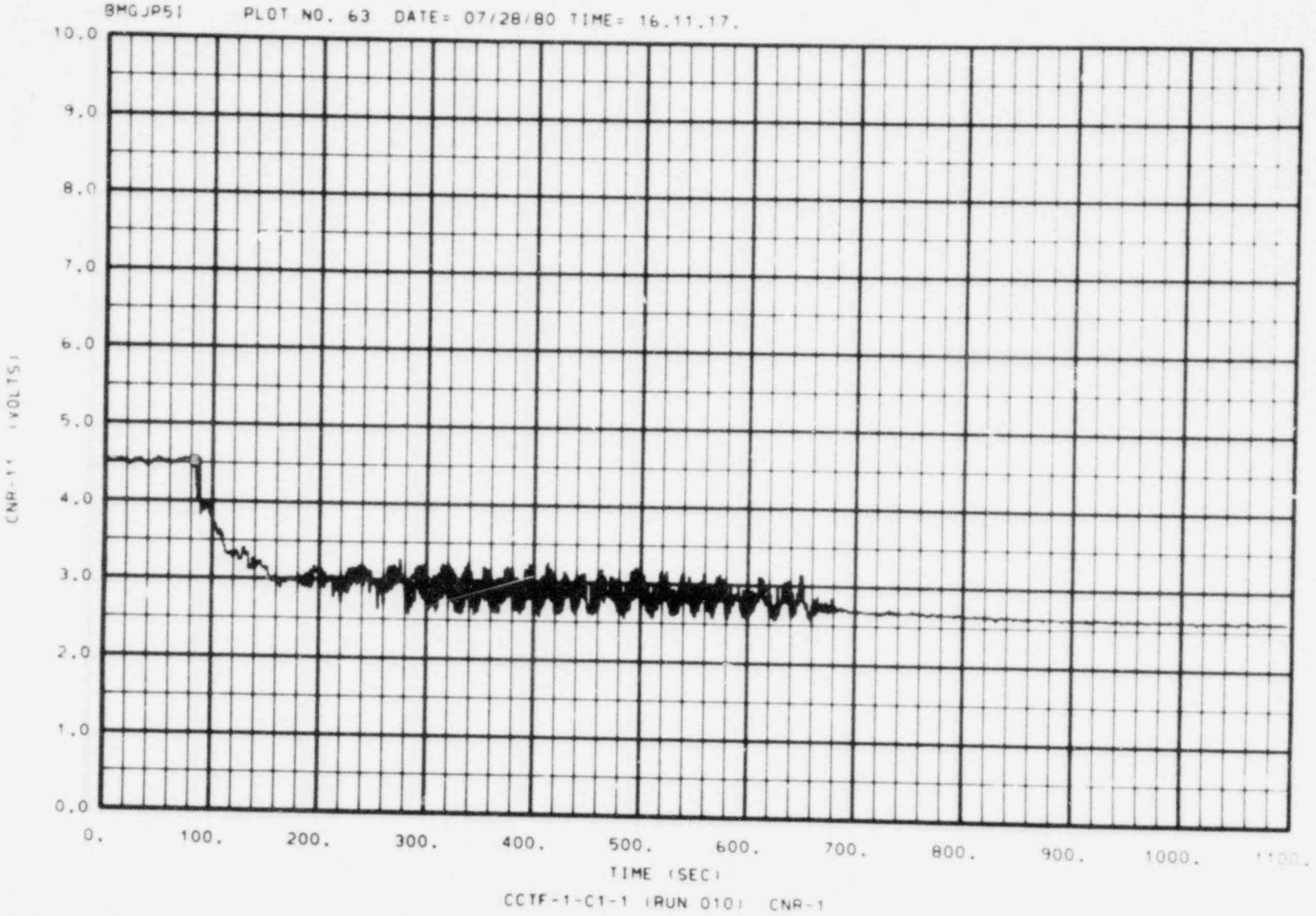

BMGJP51 PLOT NO. 68 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-6 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

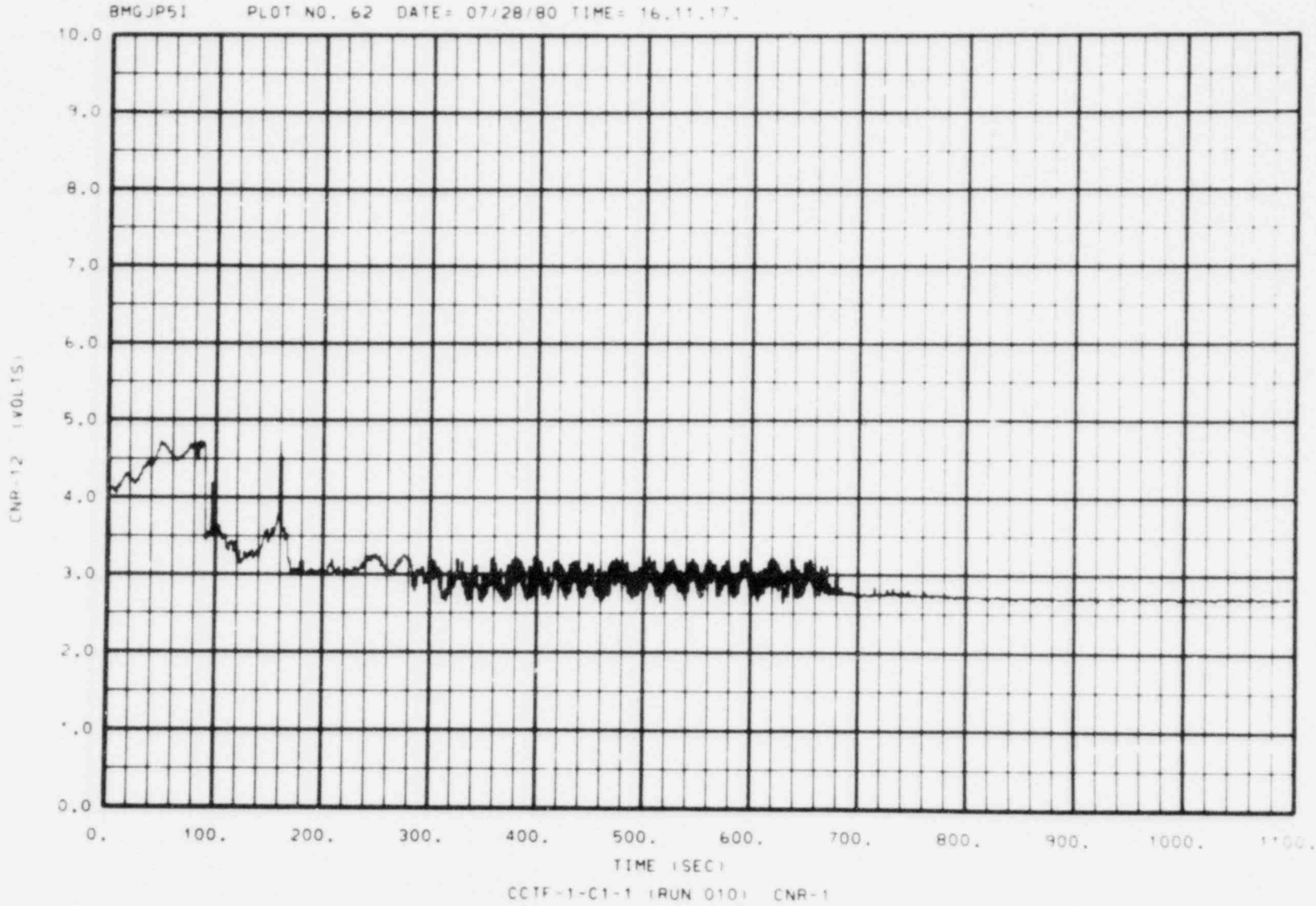

BMGJP5I PLOT NO. 67 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR- (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

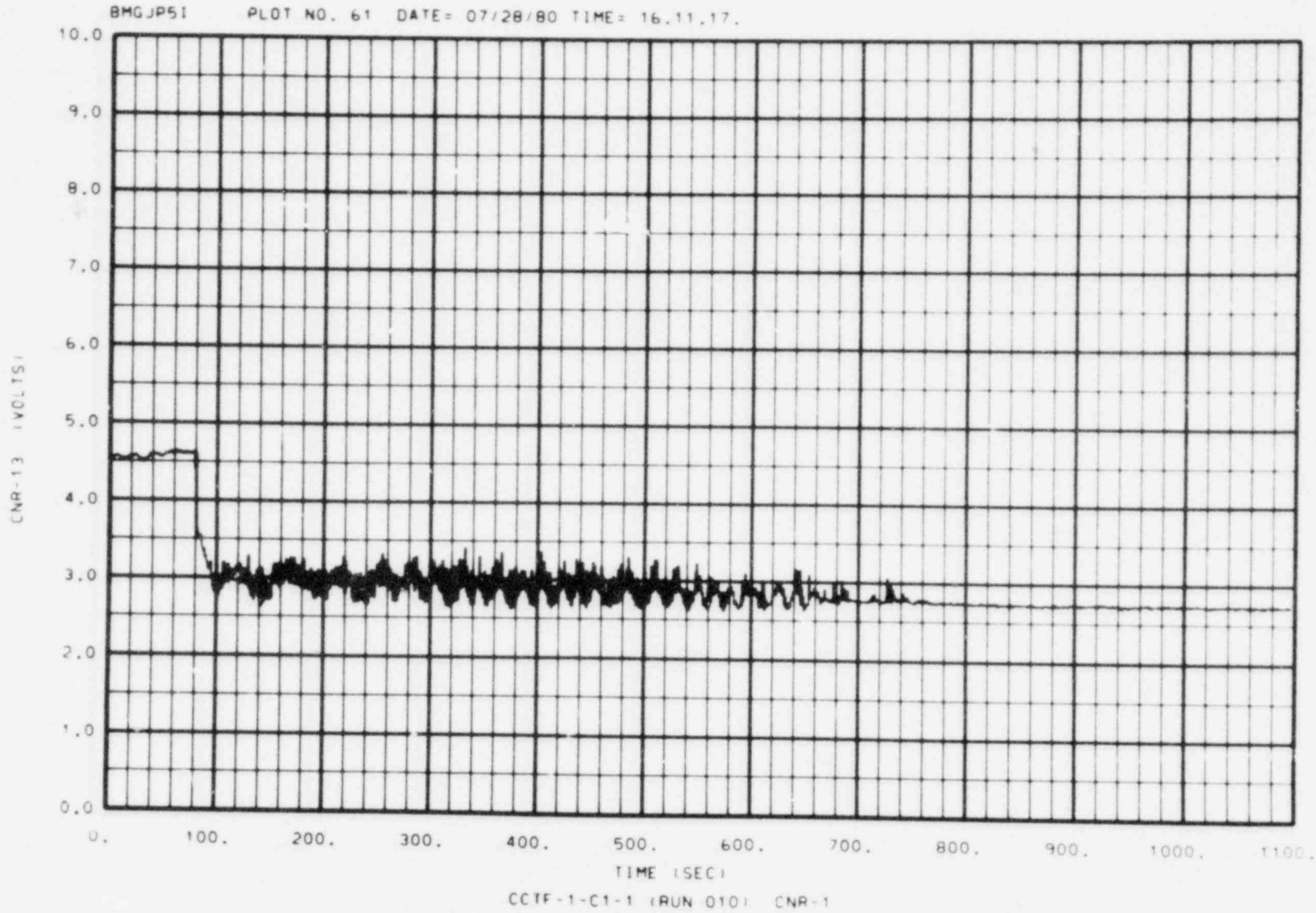

BMGJP5I PLOT NO. 66 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-8 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

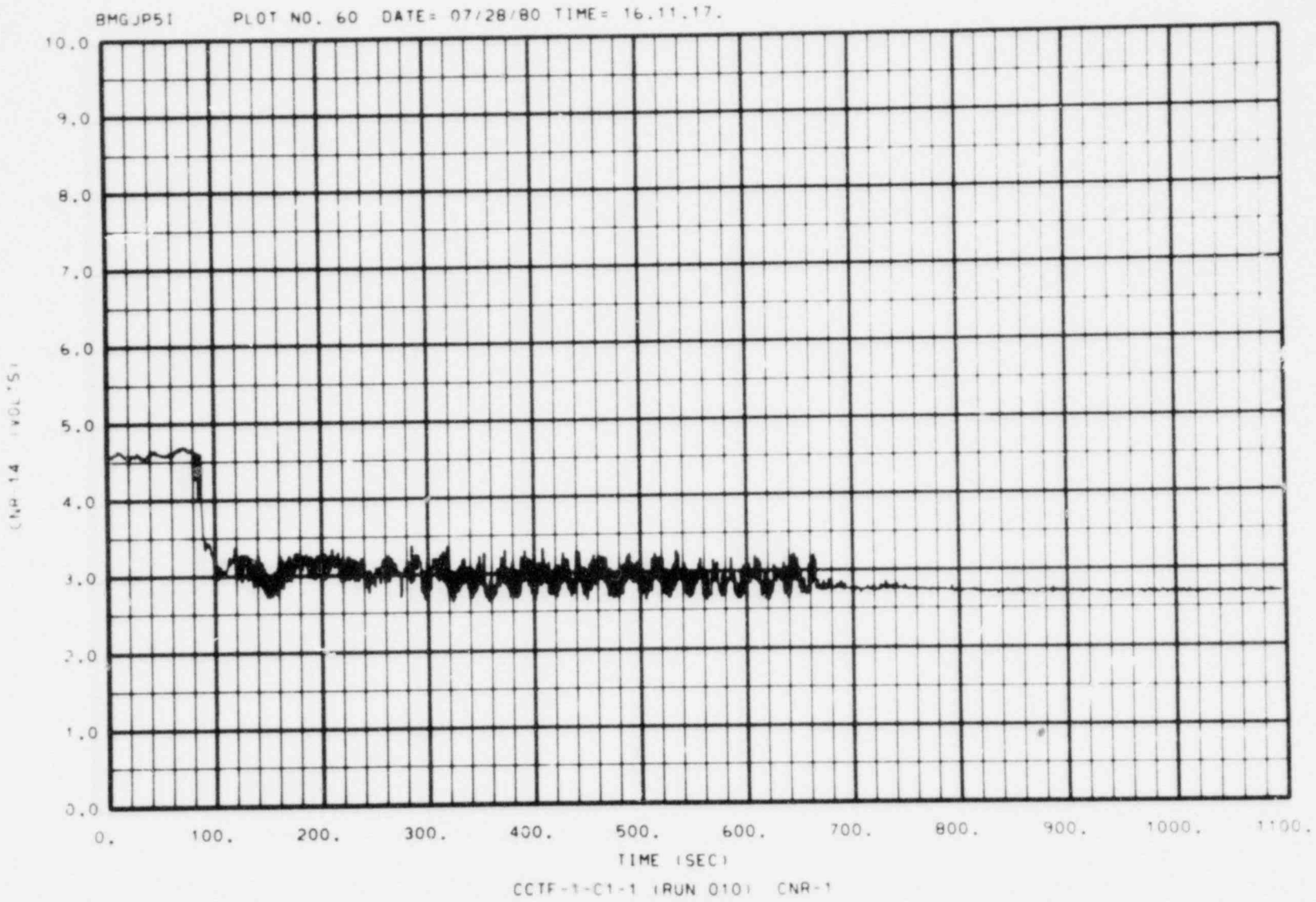

BMGJP51 PLOT NO. 65 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-9 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

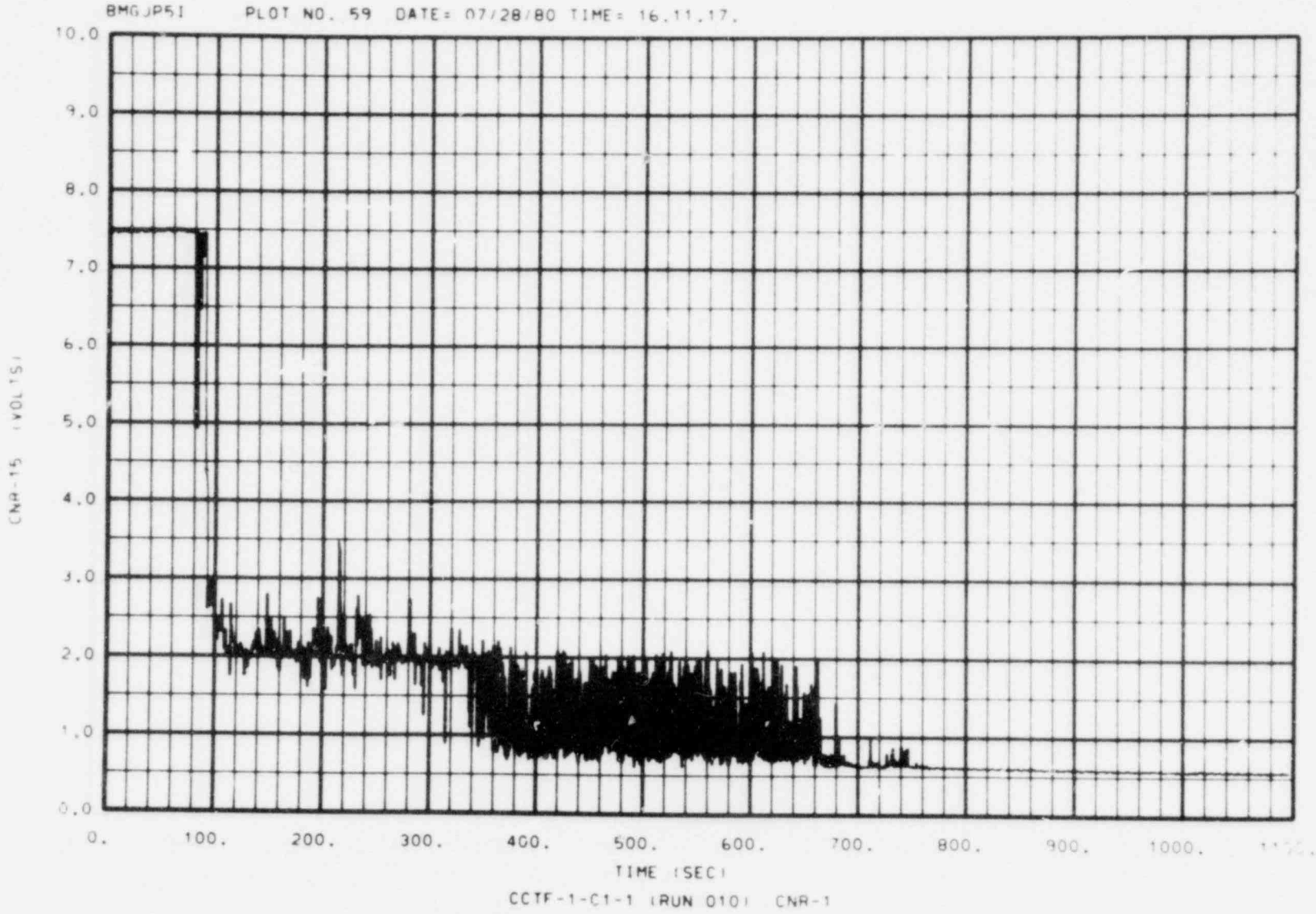

BMGJP5I PLOT NO. 64 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-10 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

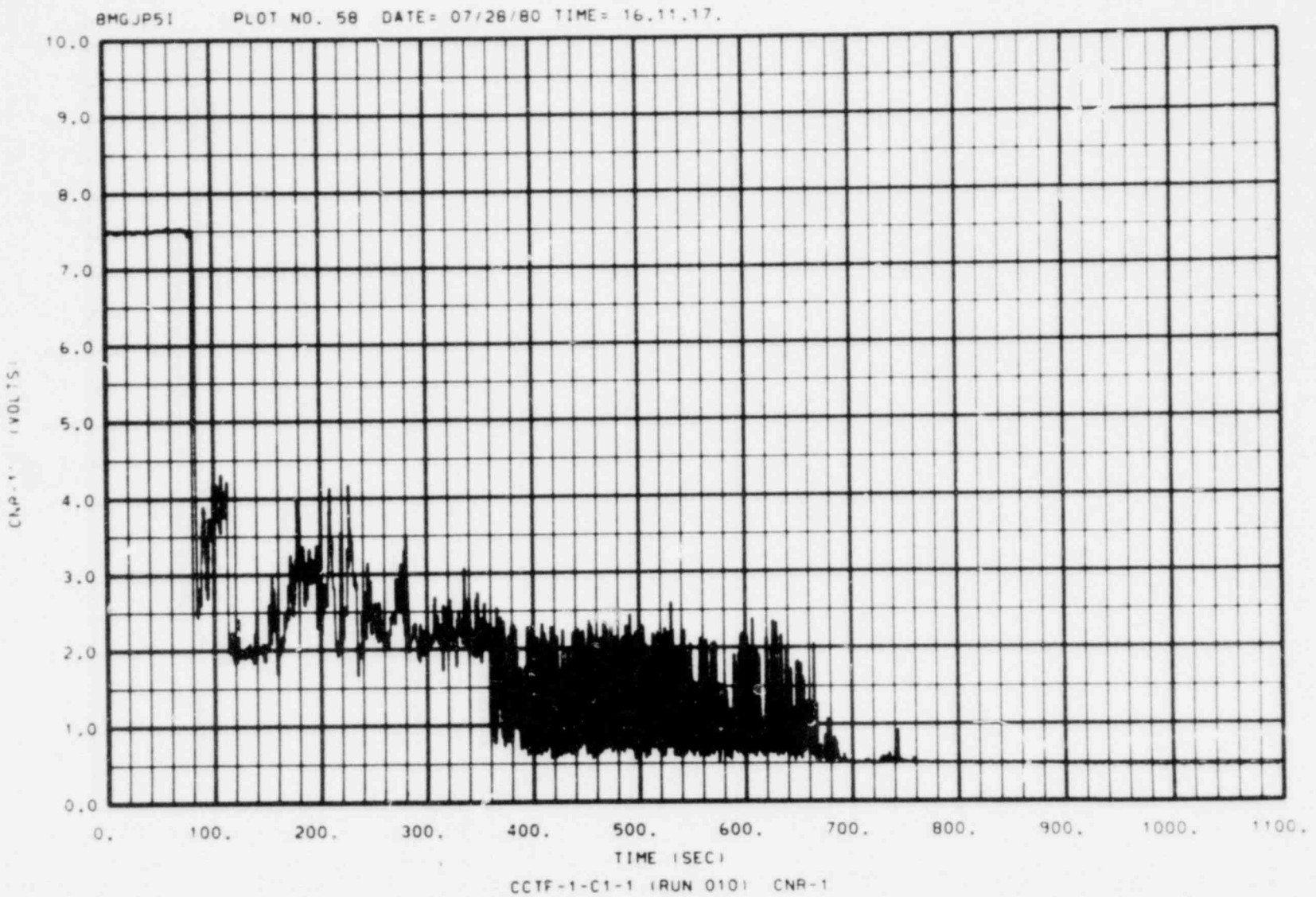

BMGJP51 PLOT NO. 63 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-1 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

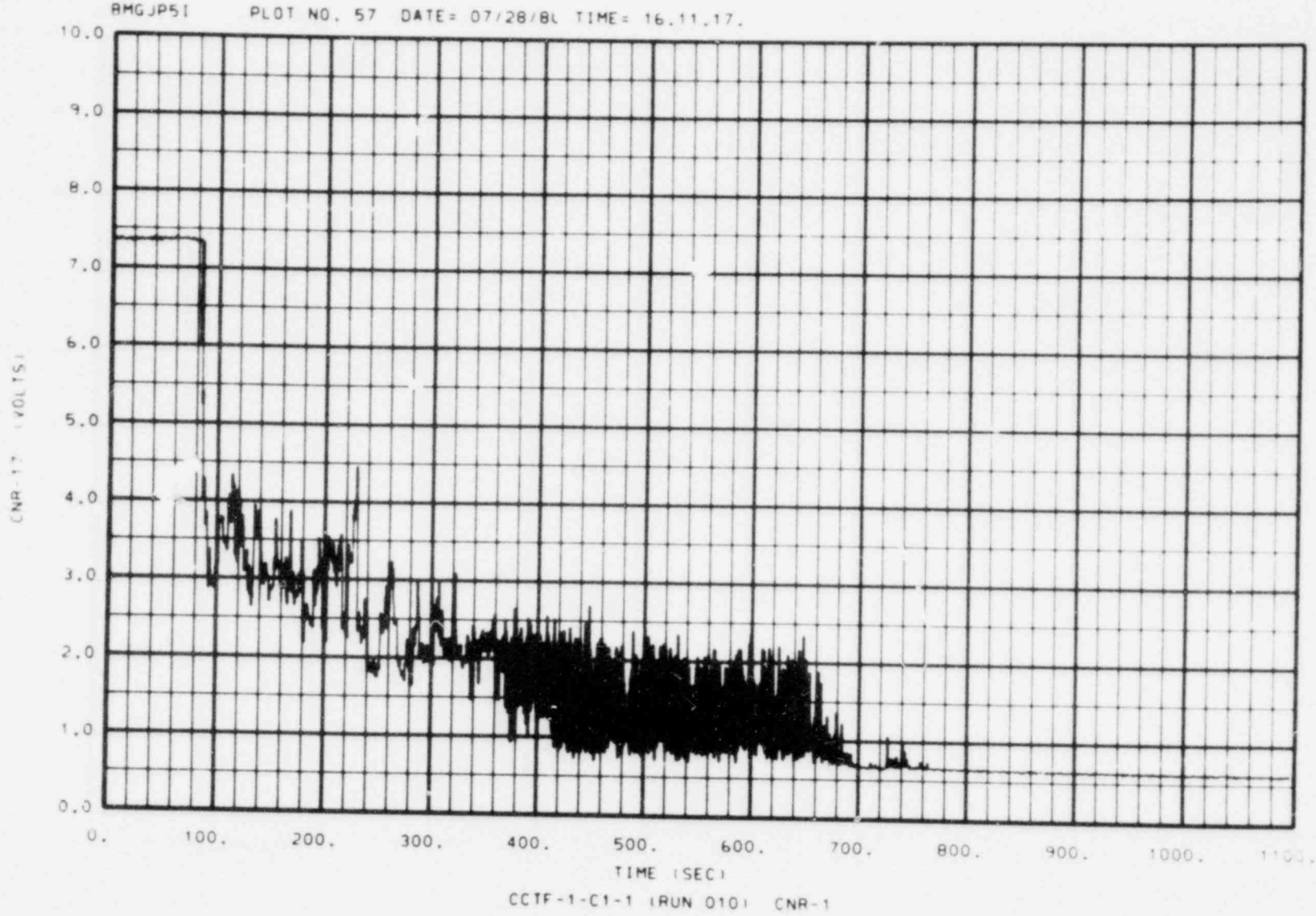

BMGJP51 PLOT NO. 62 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNP-12 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

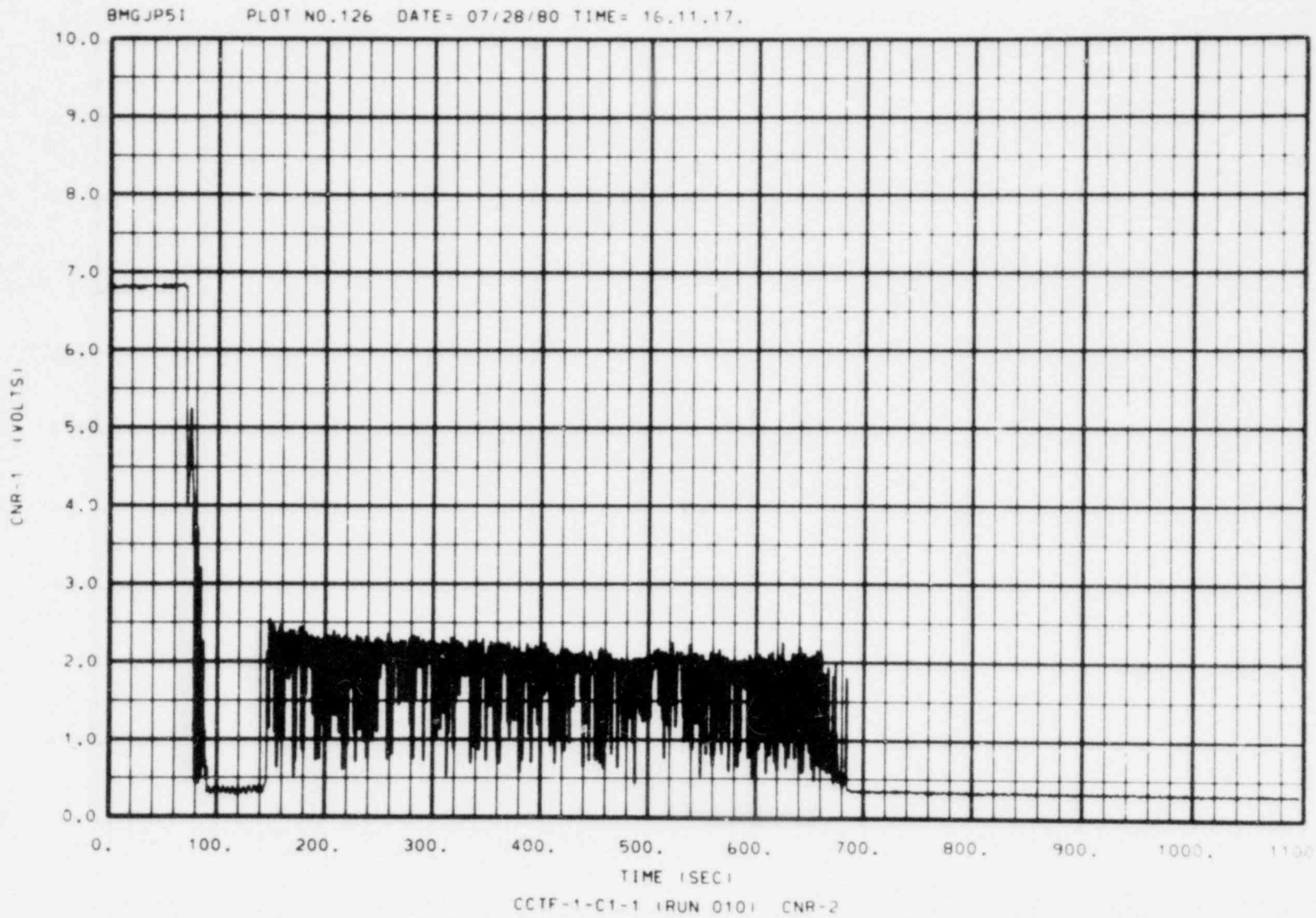

BMGJP5I PLOT NO. 61 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-13 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

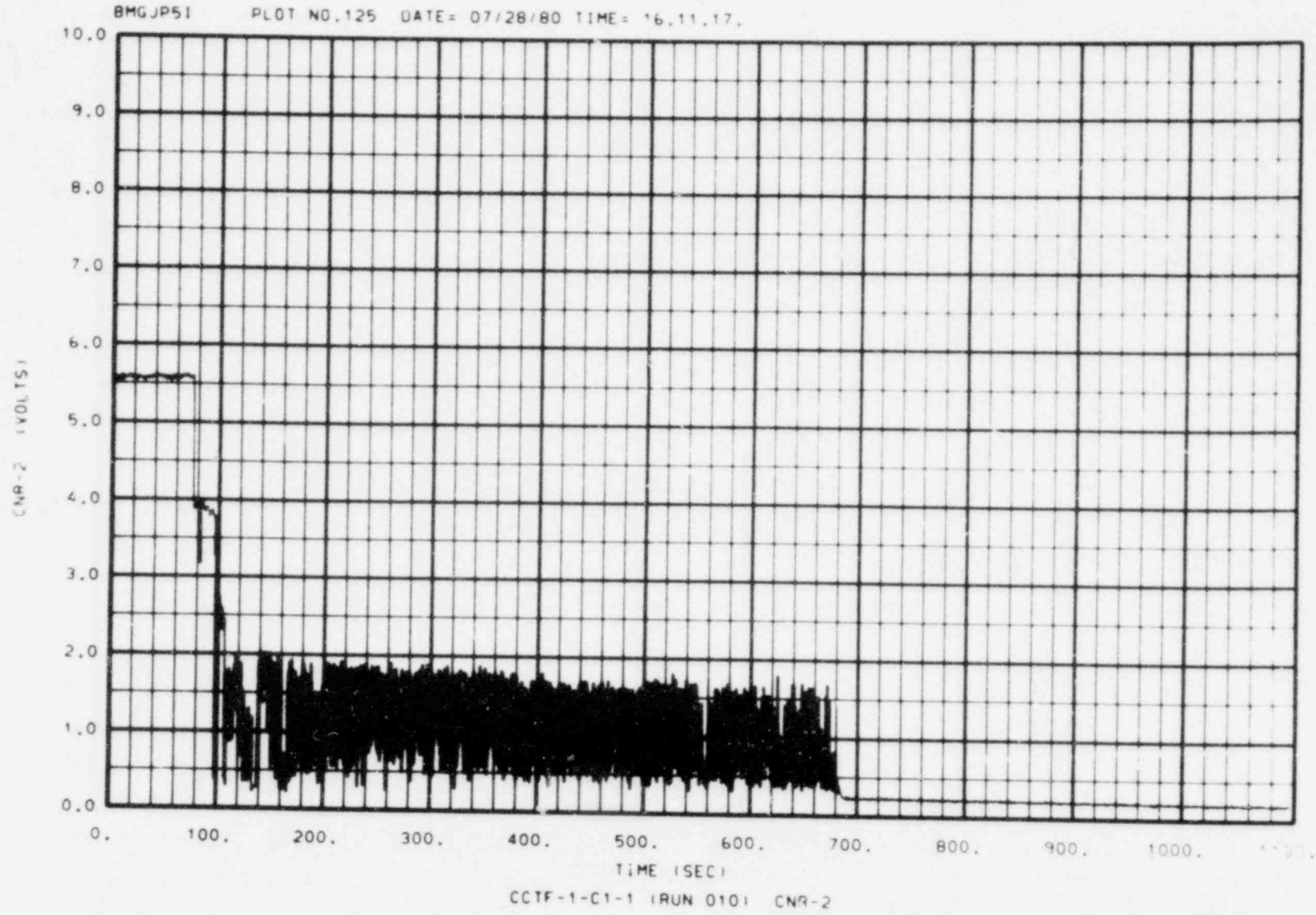

BMGJP5I PLOT NO. 60 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

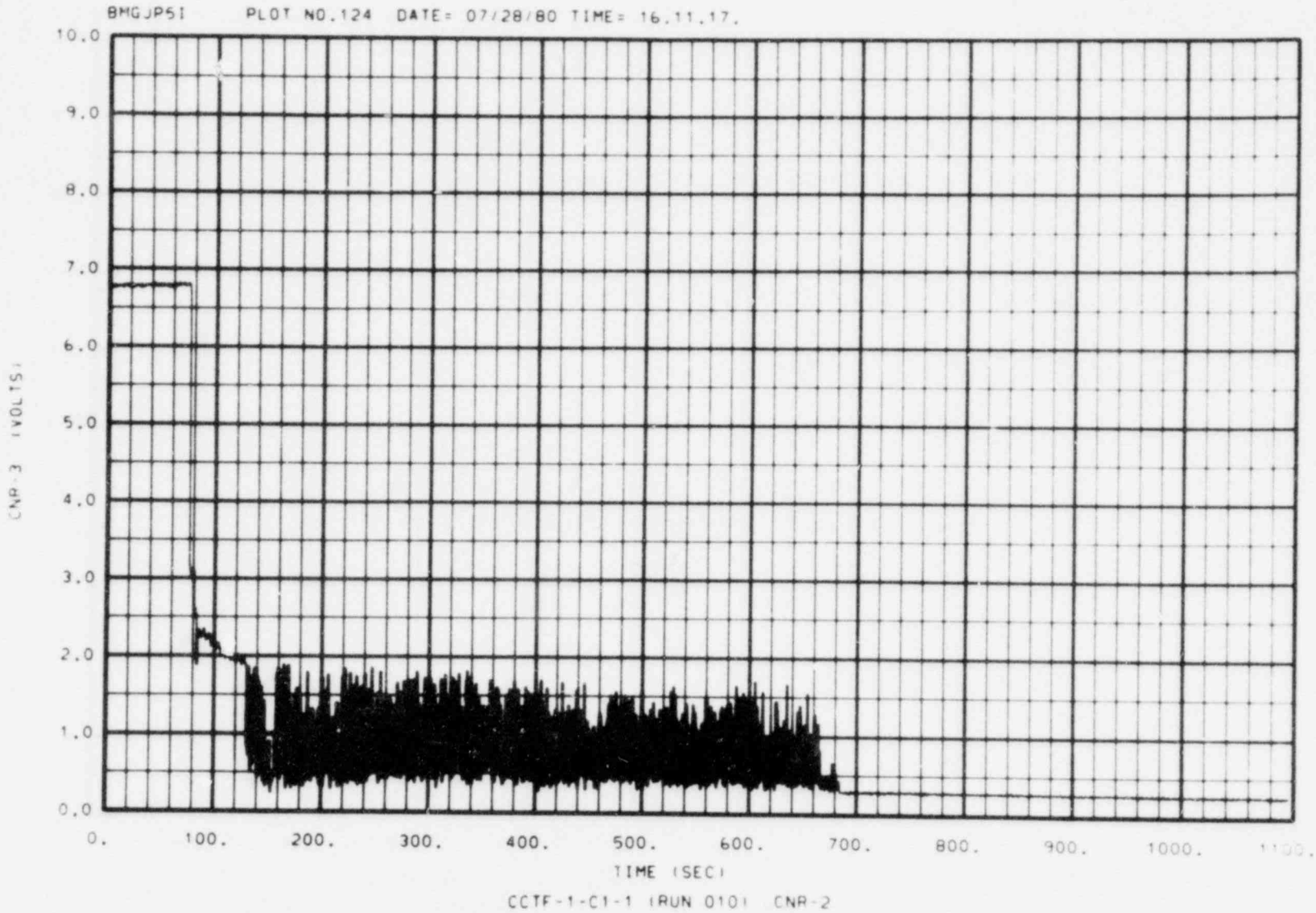

BMGJP51 PLOT NO. 59 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-15 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

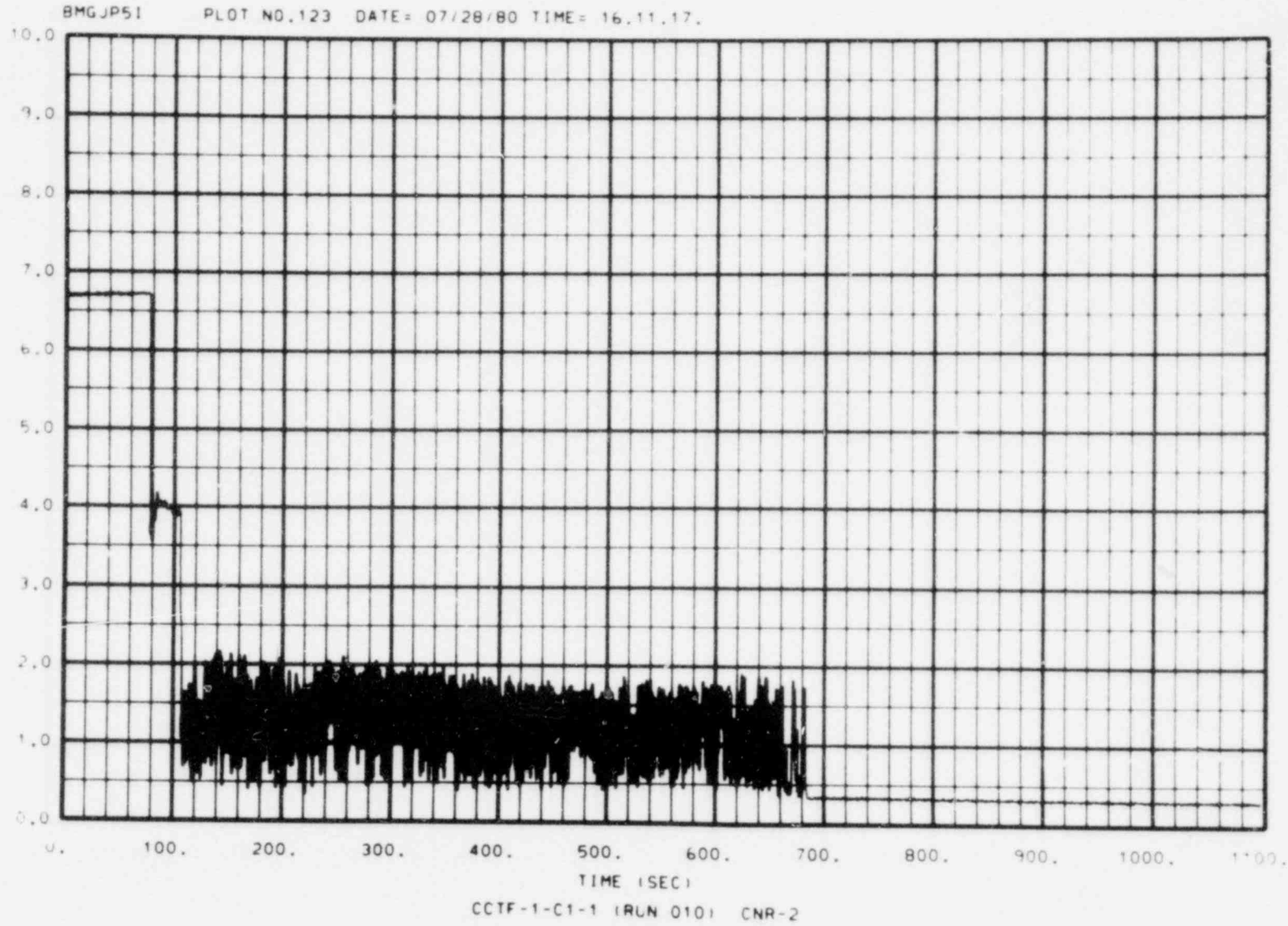

8MGJP51 PLOT NO. 58 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

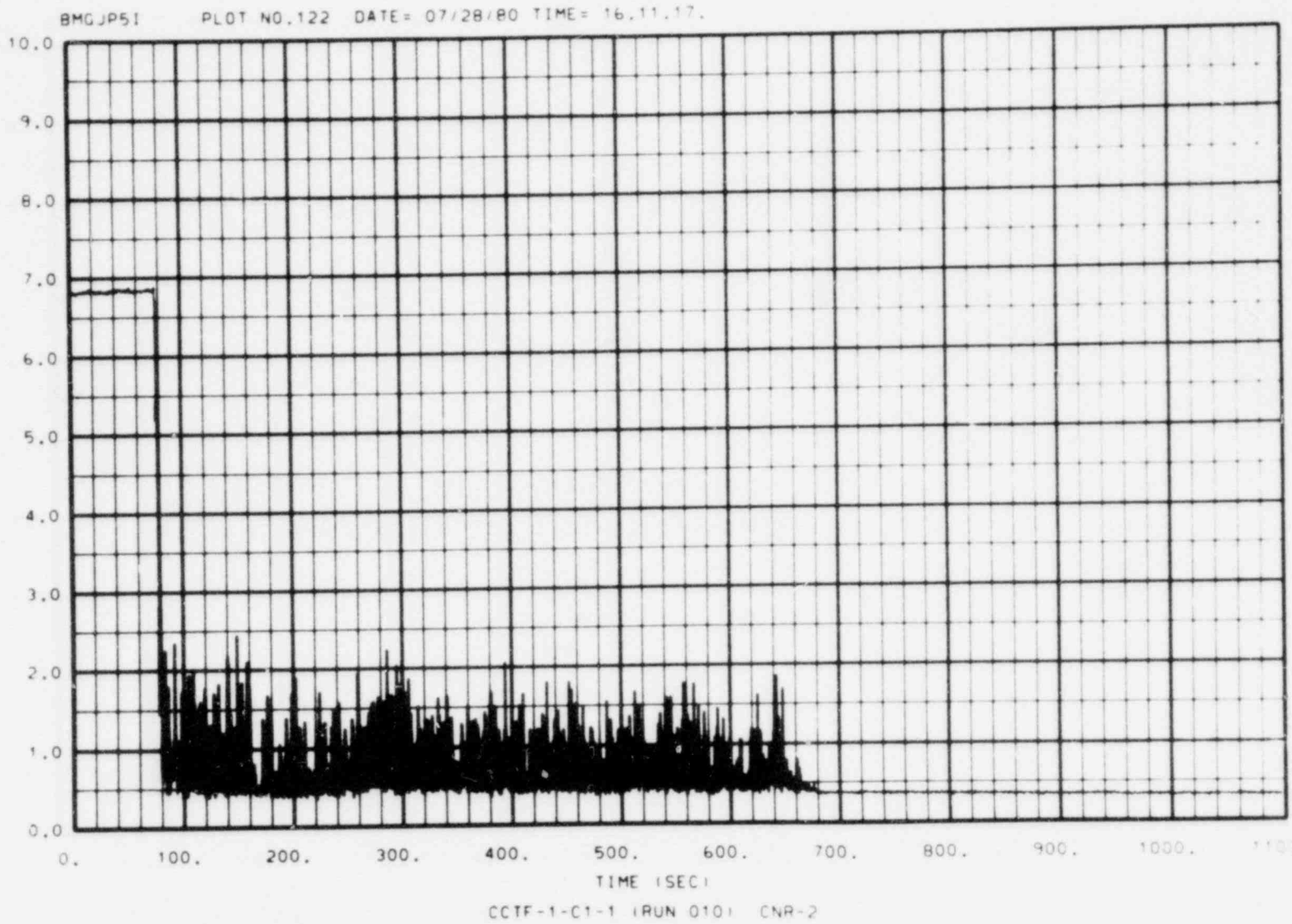

BMGJP5I PLOT NO. 57 DATE= 07/28/8L TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-1

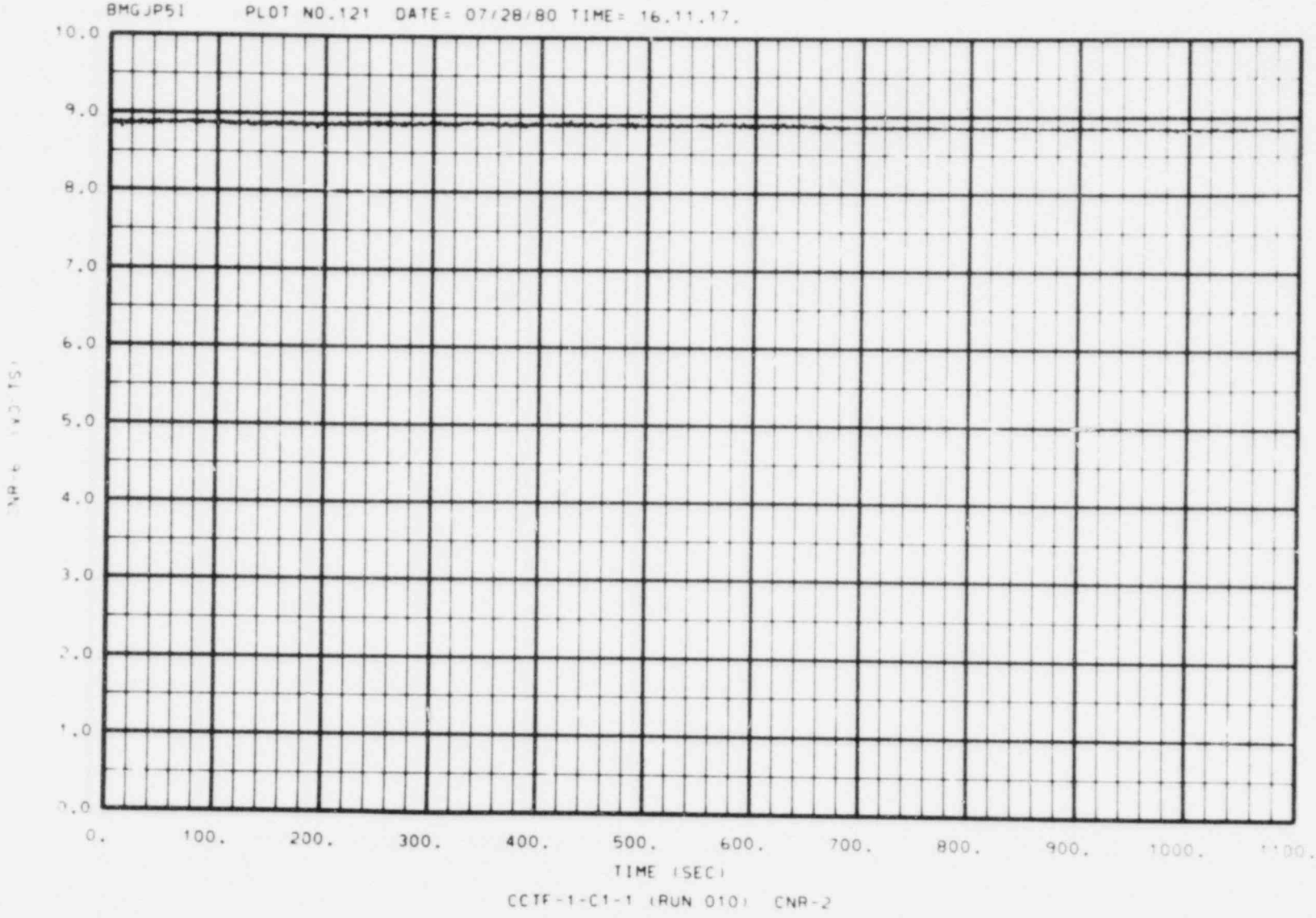

BMGJP51 PLOT NO.126 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-1 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

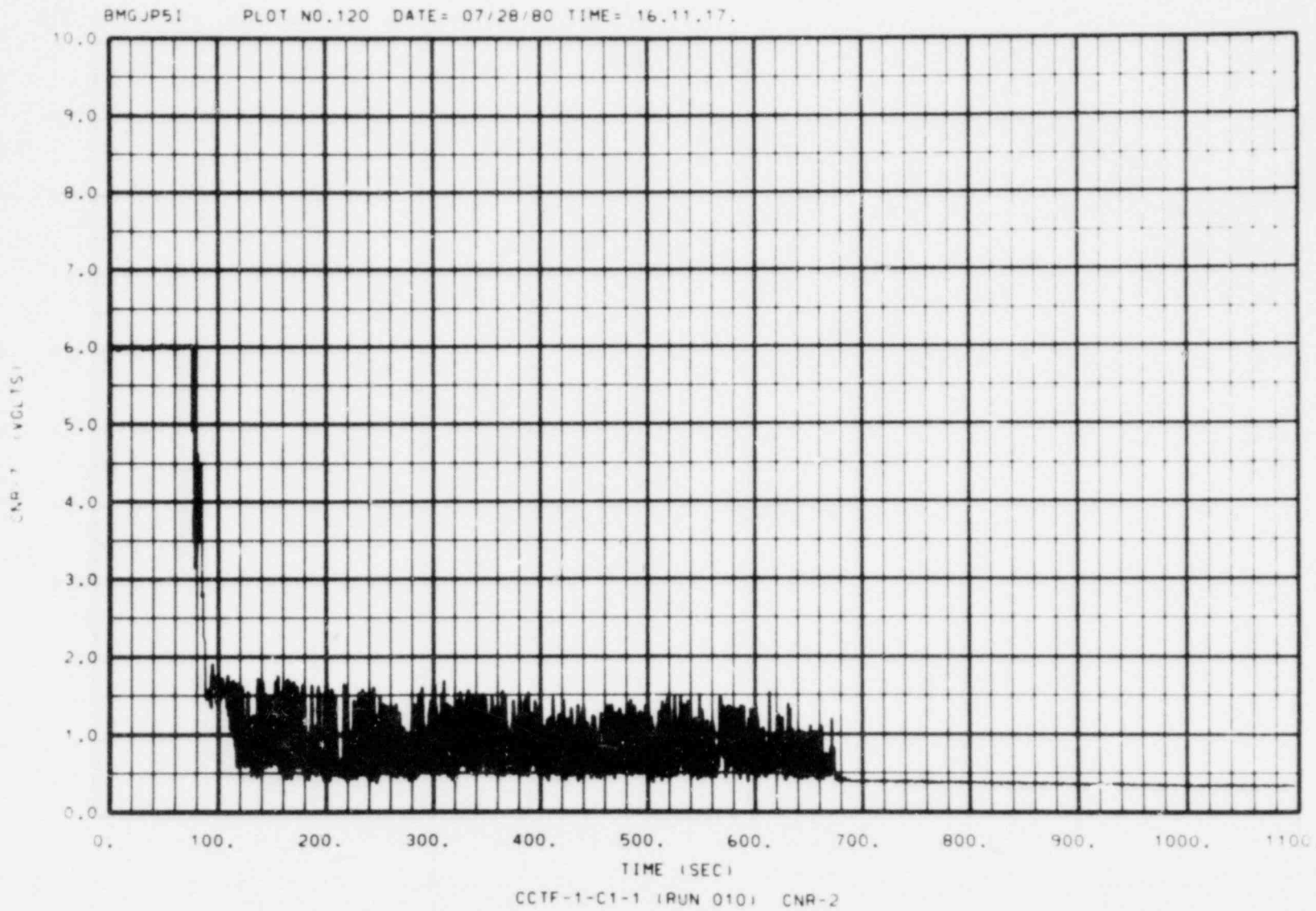

BMGJP51 PLOT NO.125 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-2 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

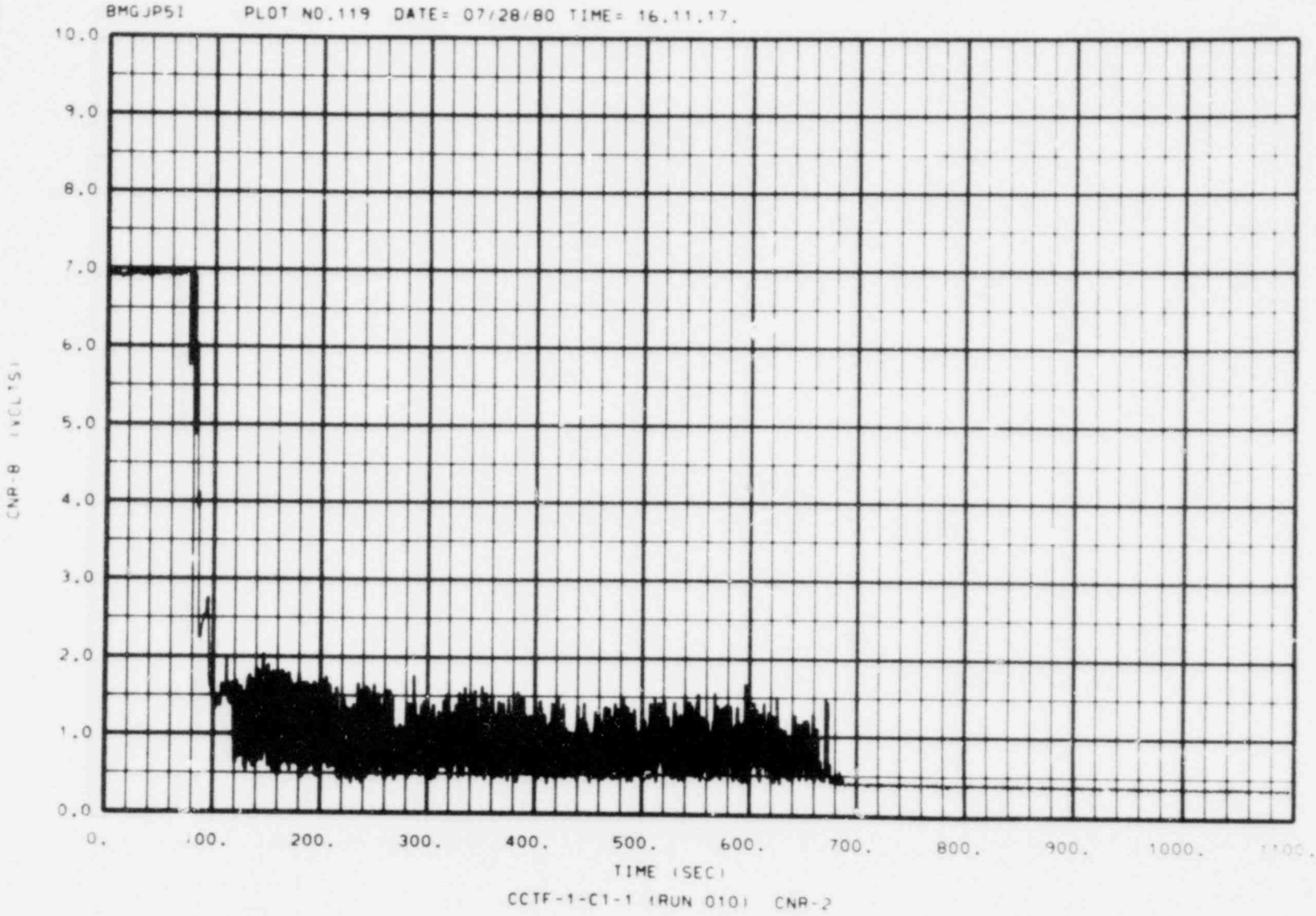

BMGJPSI PLOT NO.124 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-3 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

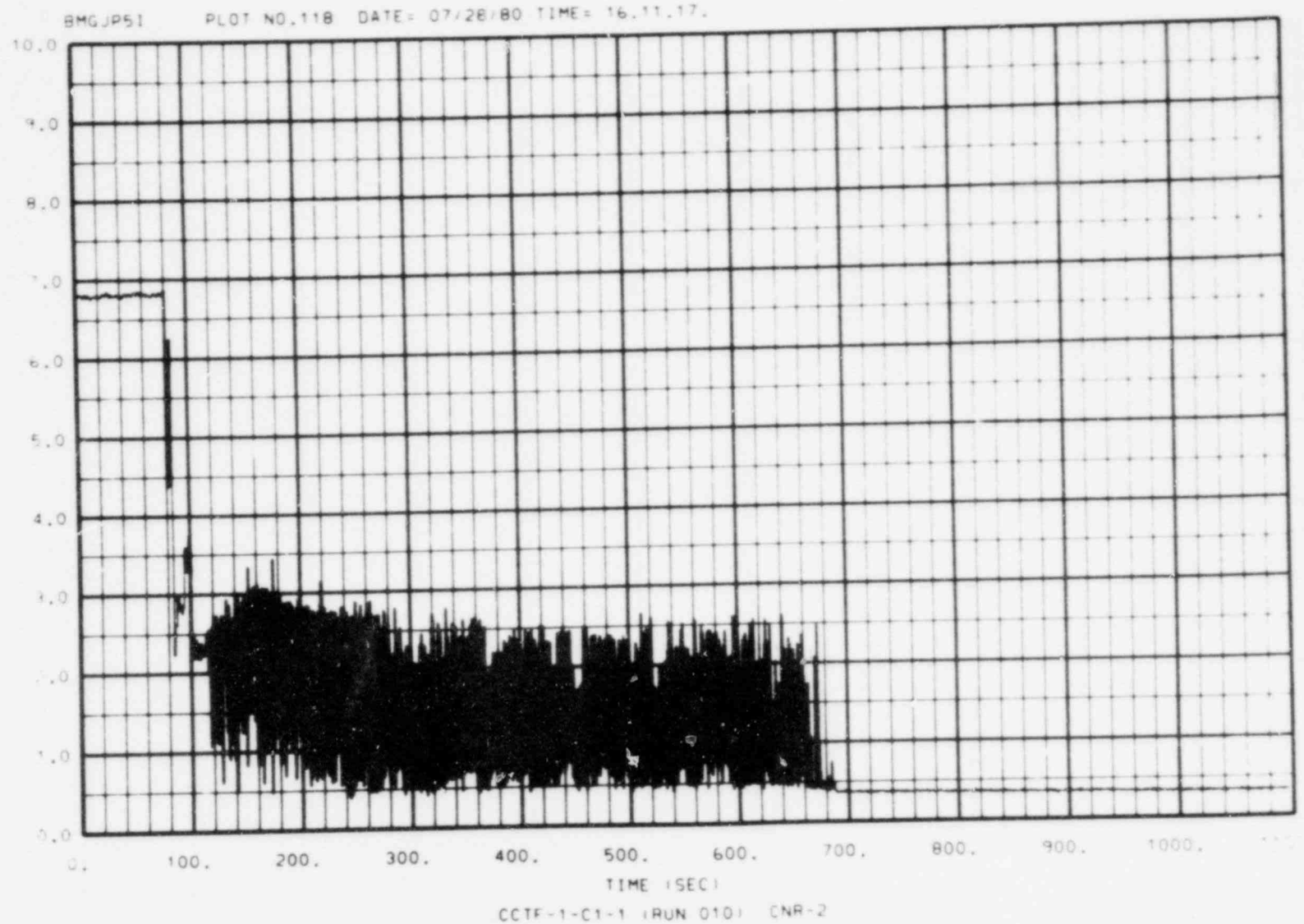

BMGJP51 PLOT NO.123 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

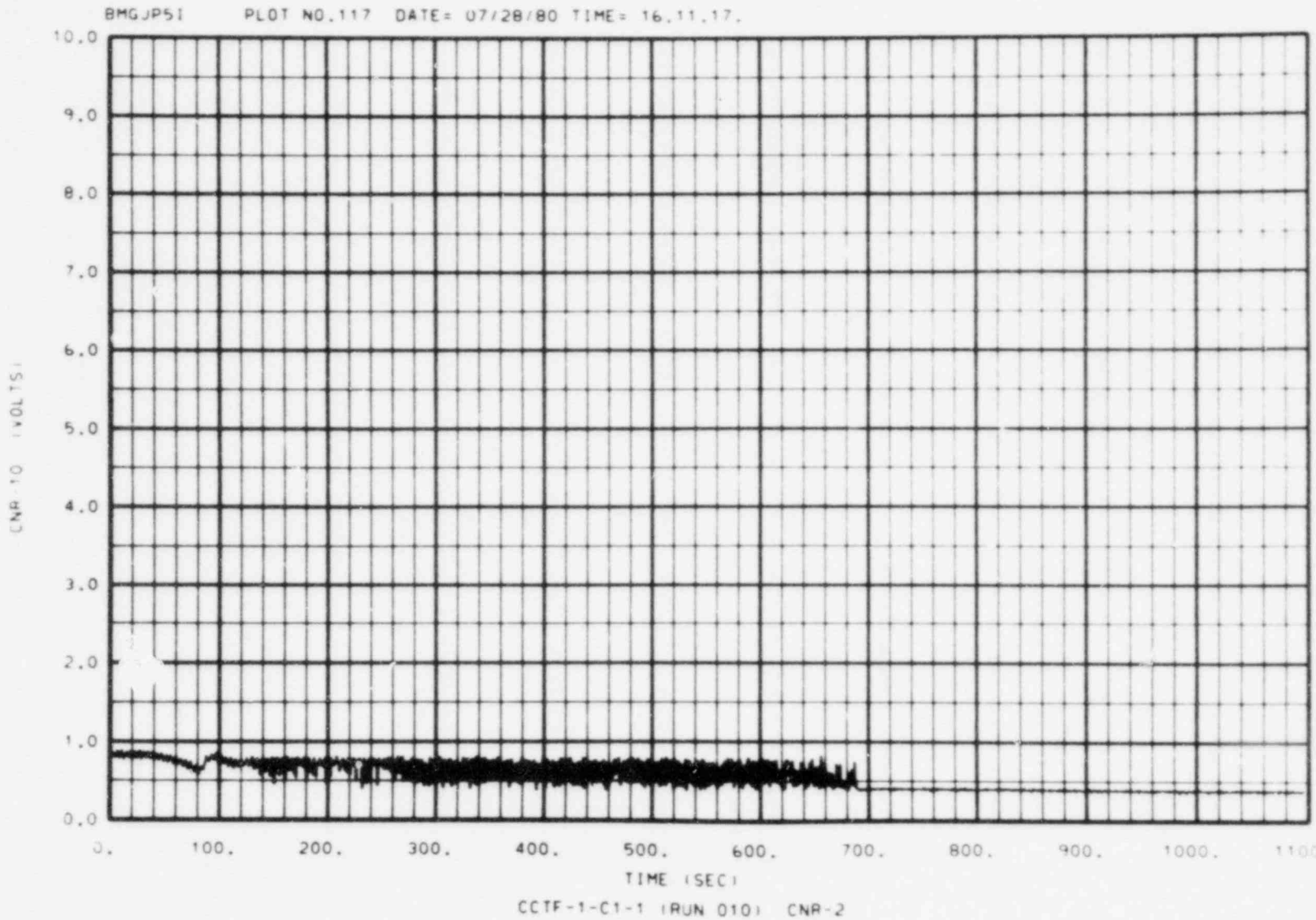

BMGJP51 PLOT NO.122 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

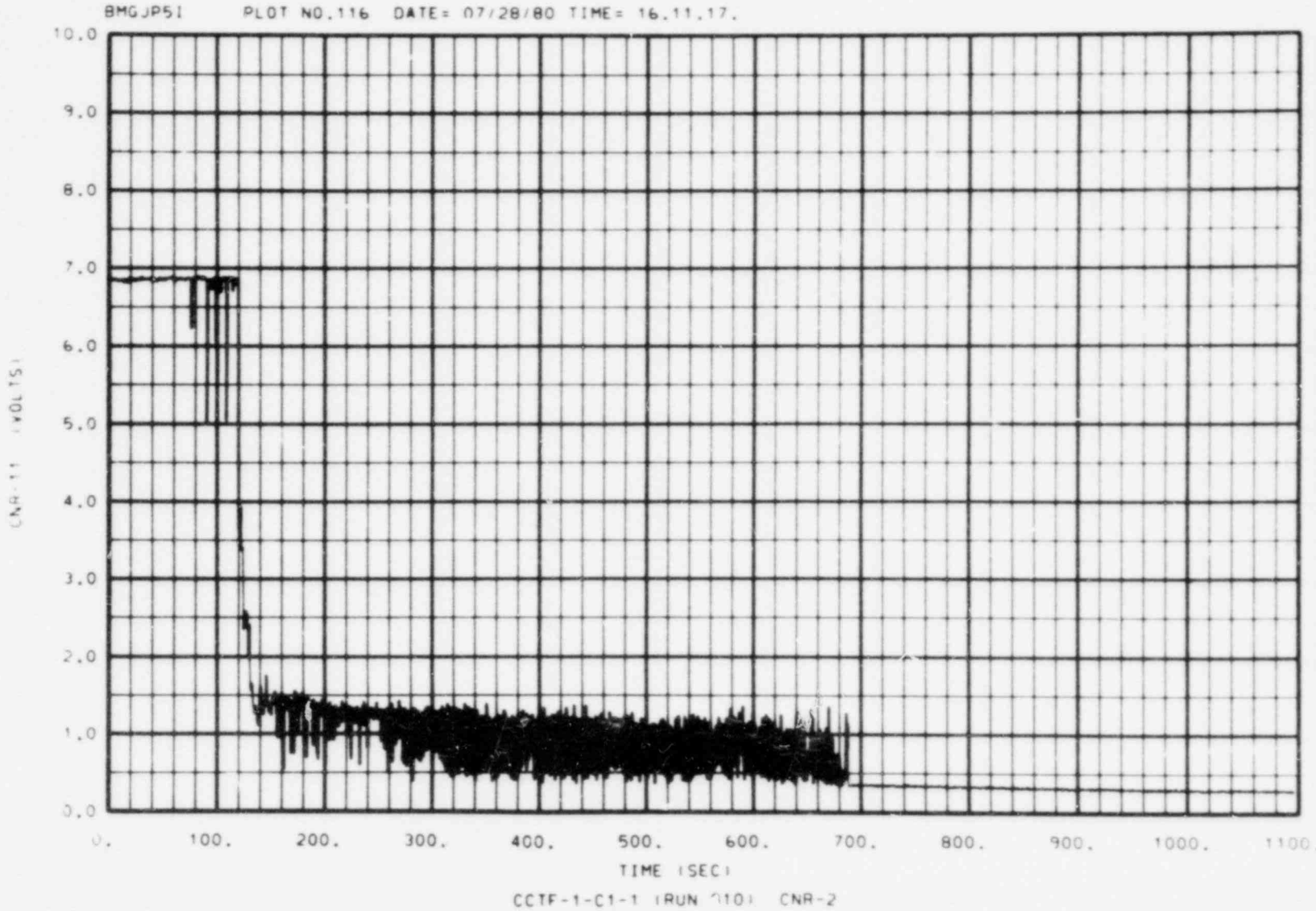

BMGJP51 PLOT NO.121 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

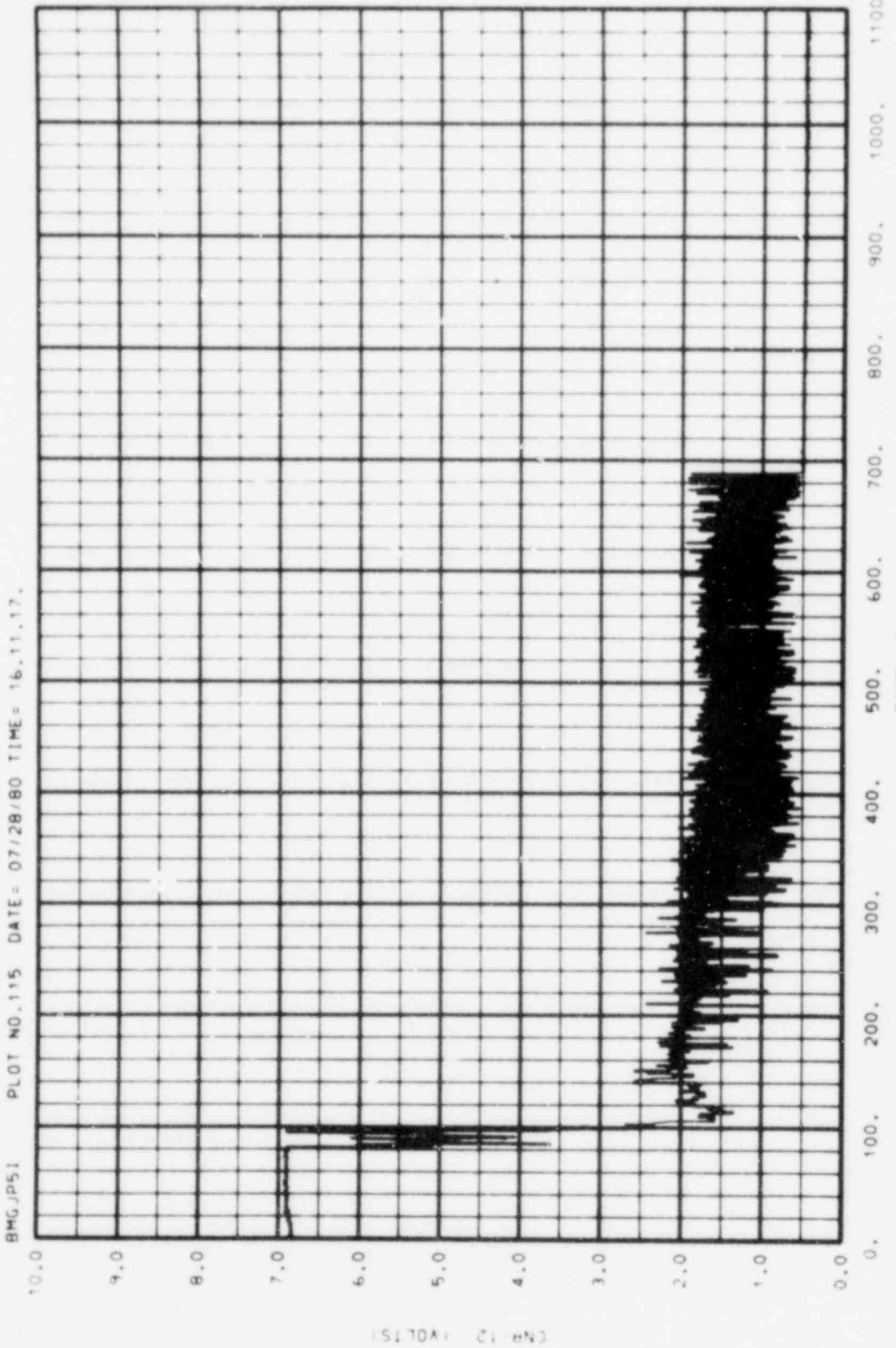

BMGJP5I PLOT NO.120 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

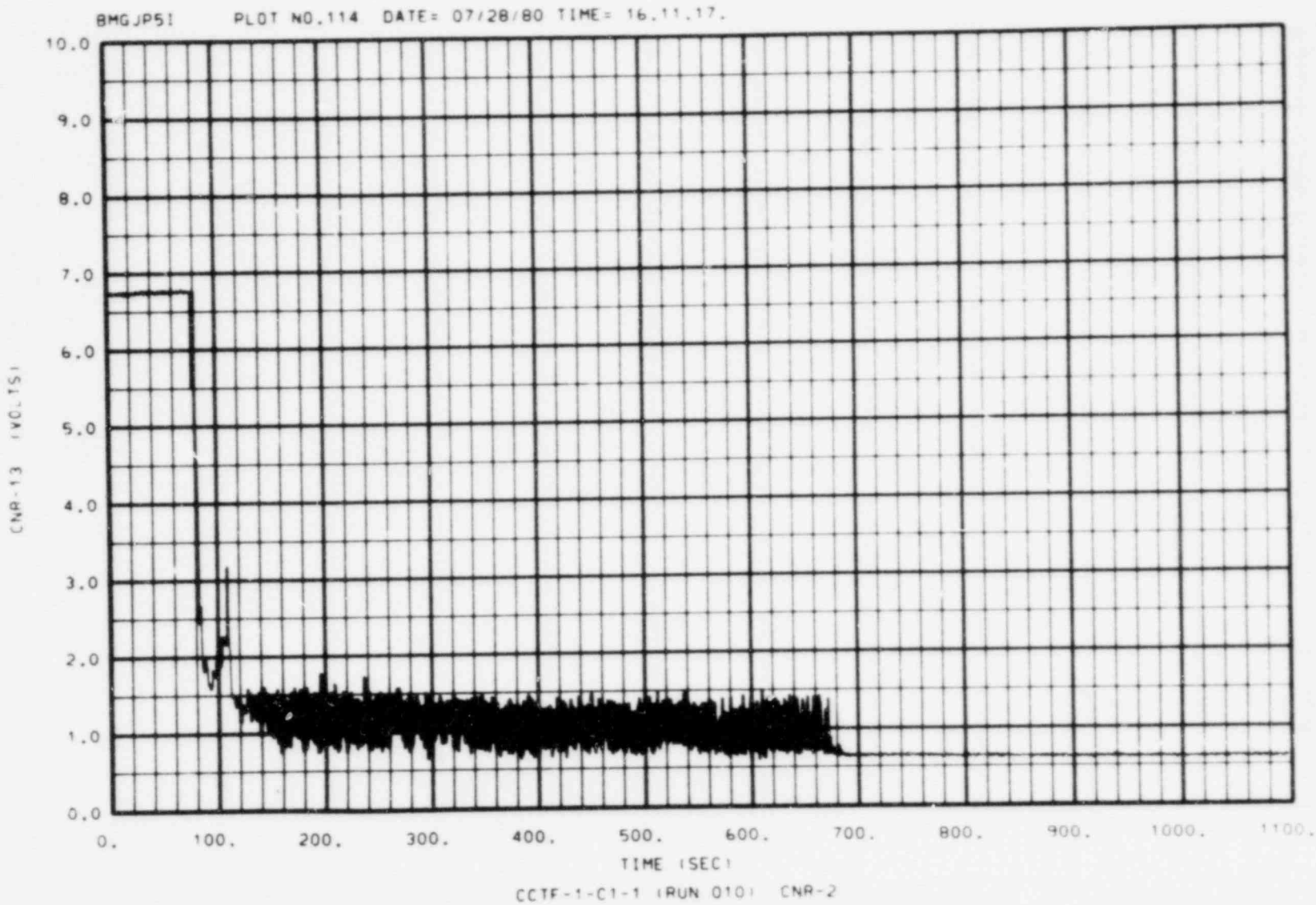

BMGJP51 PLOT NO.119 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

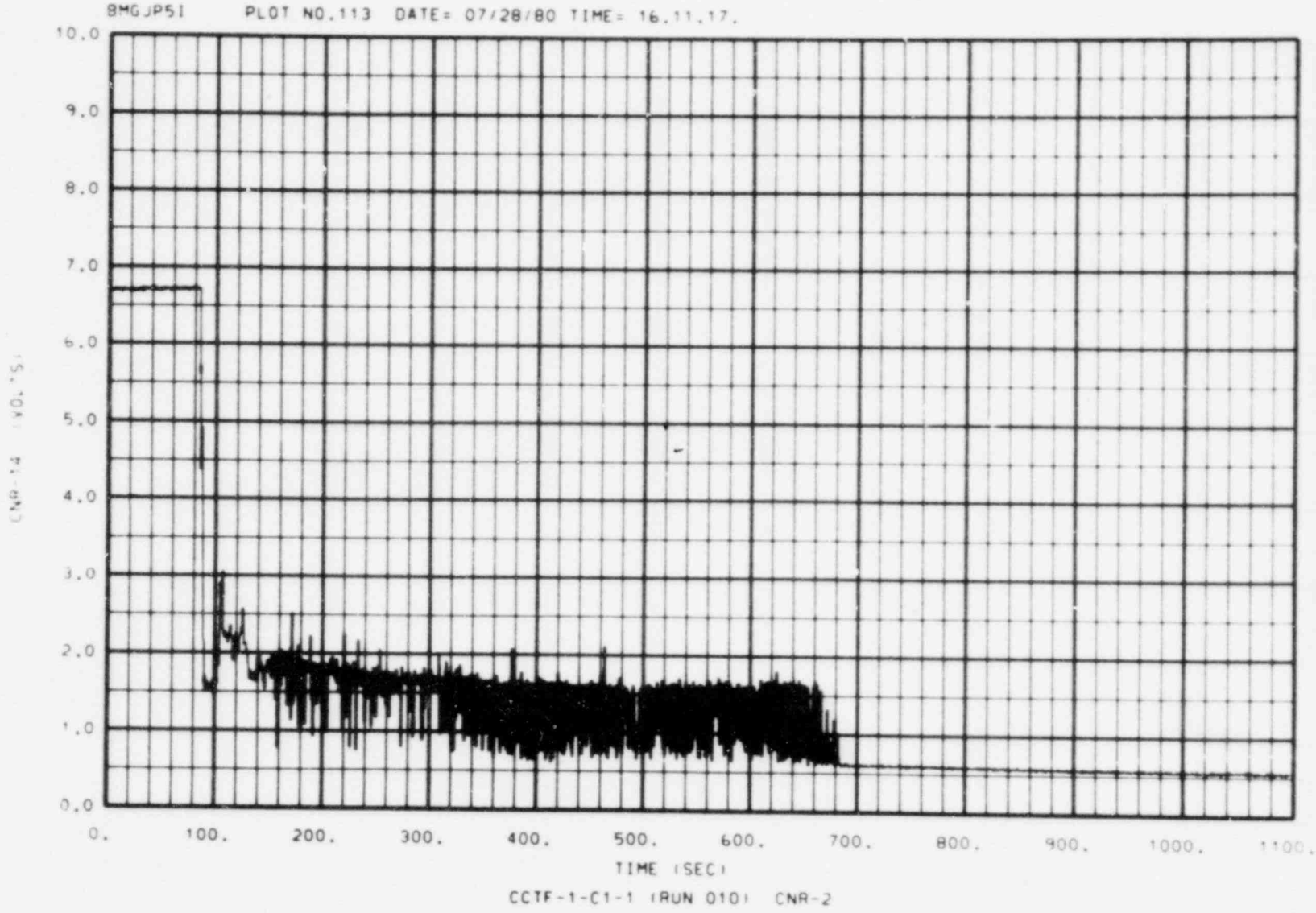

BMGJP51 PLOT NO.118 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

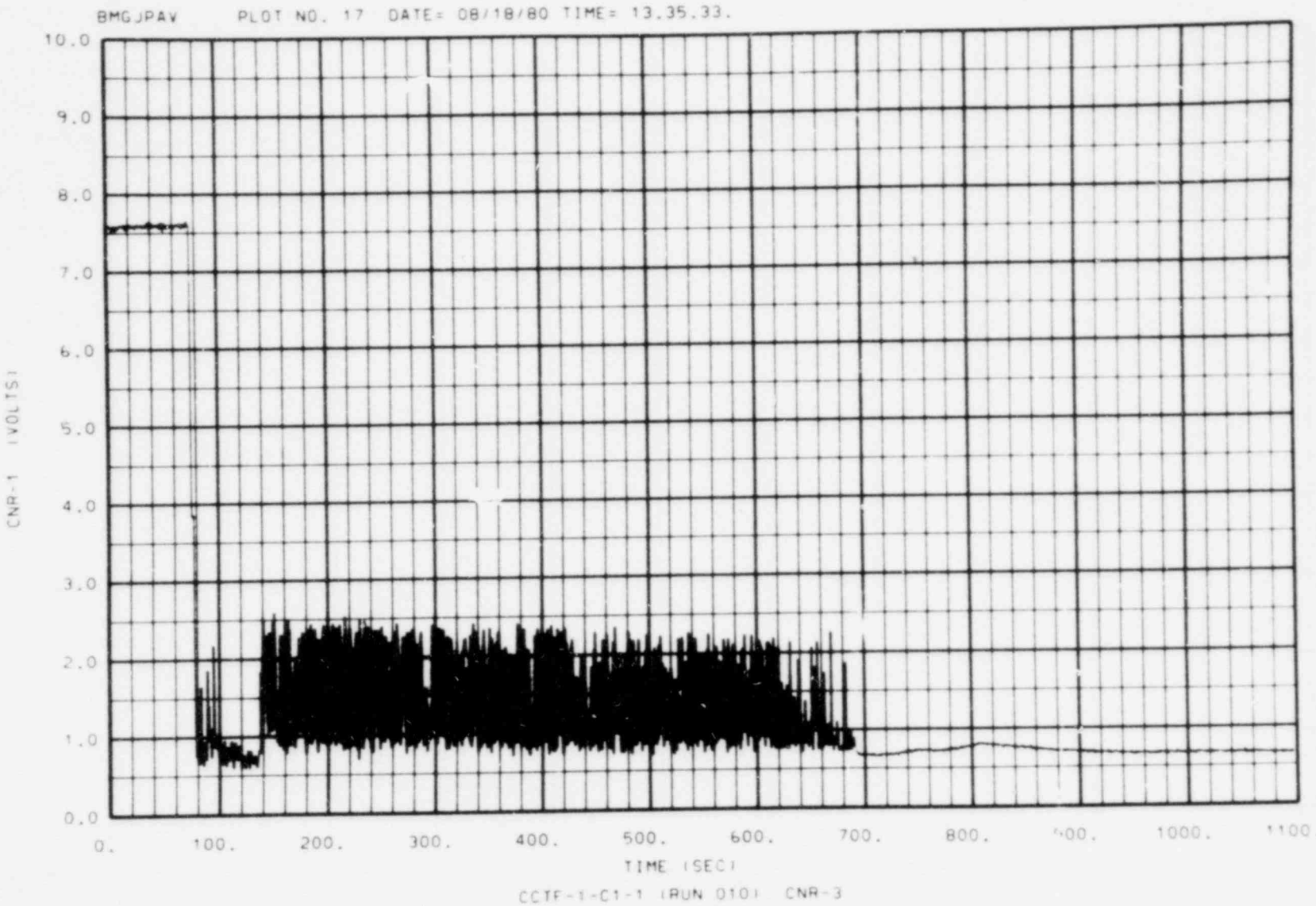

BMGJPSI PLOT NO.117 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-10 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

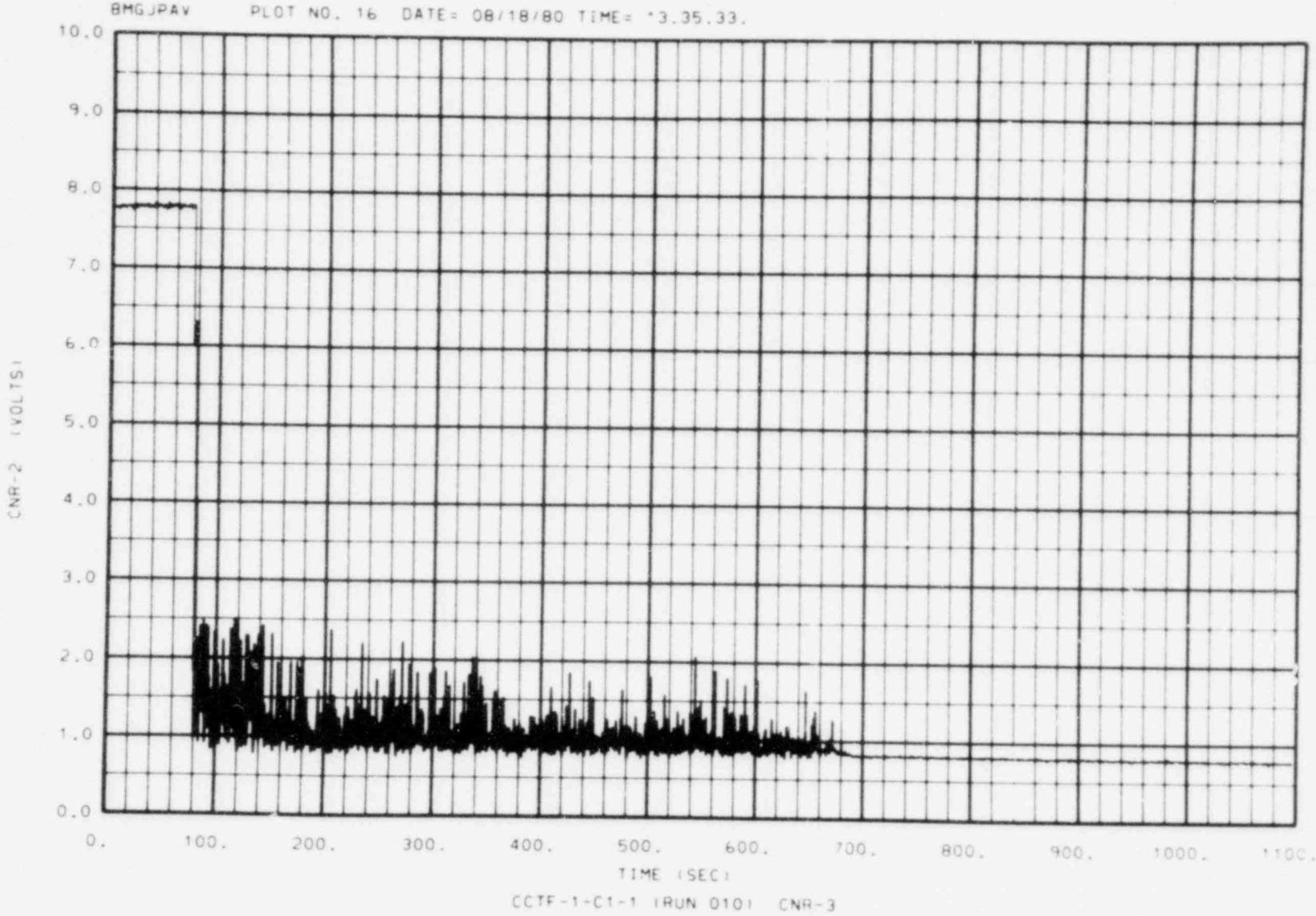

BMGJP51 PLOT NO.116 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 110) CNR-2

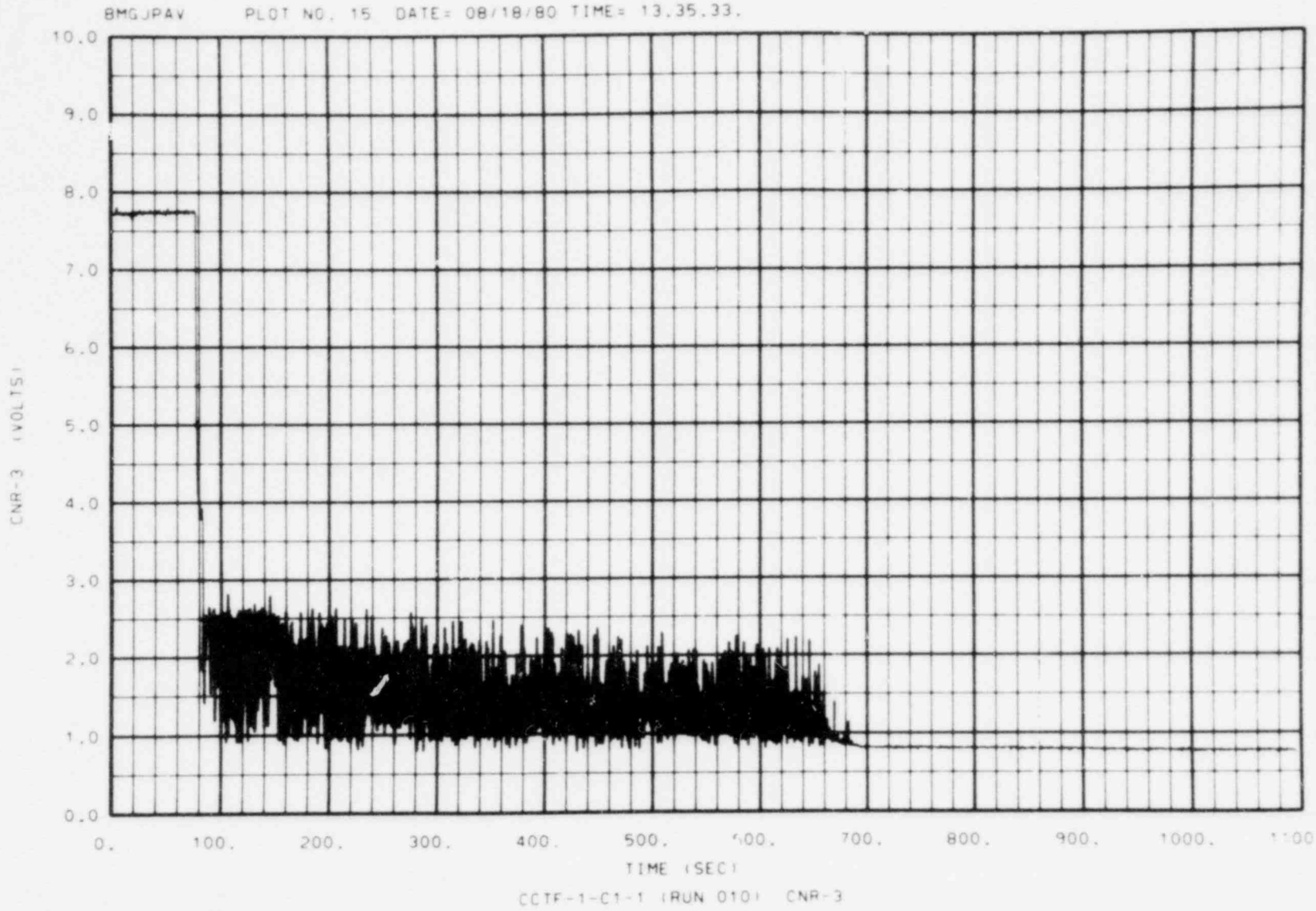

BMGJPSI PLOT NO.115 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

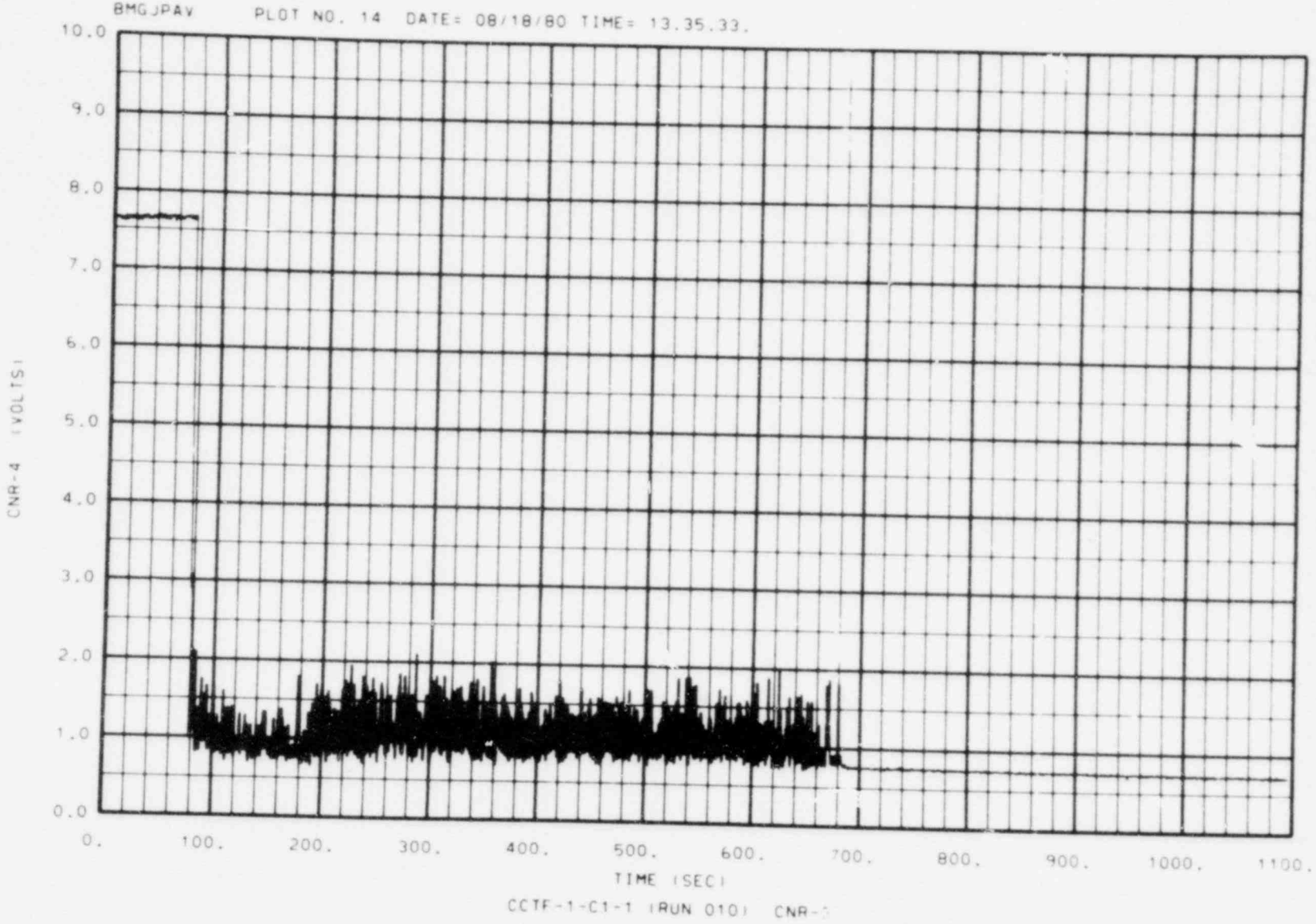

BMGJP5I PLOT NO.114 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-13 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

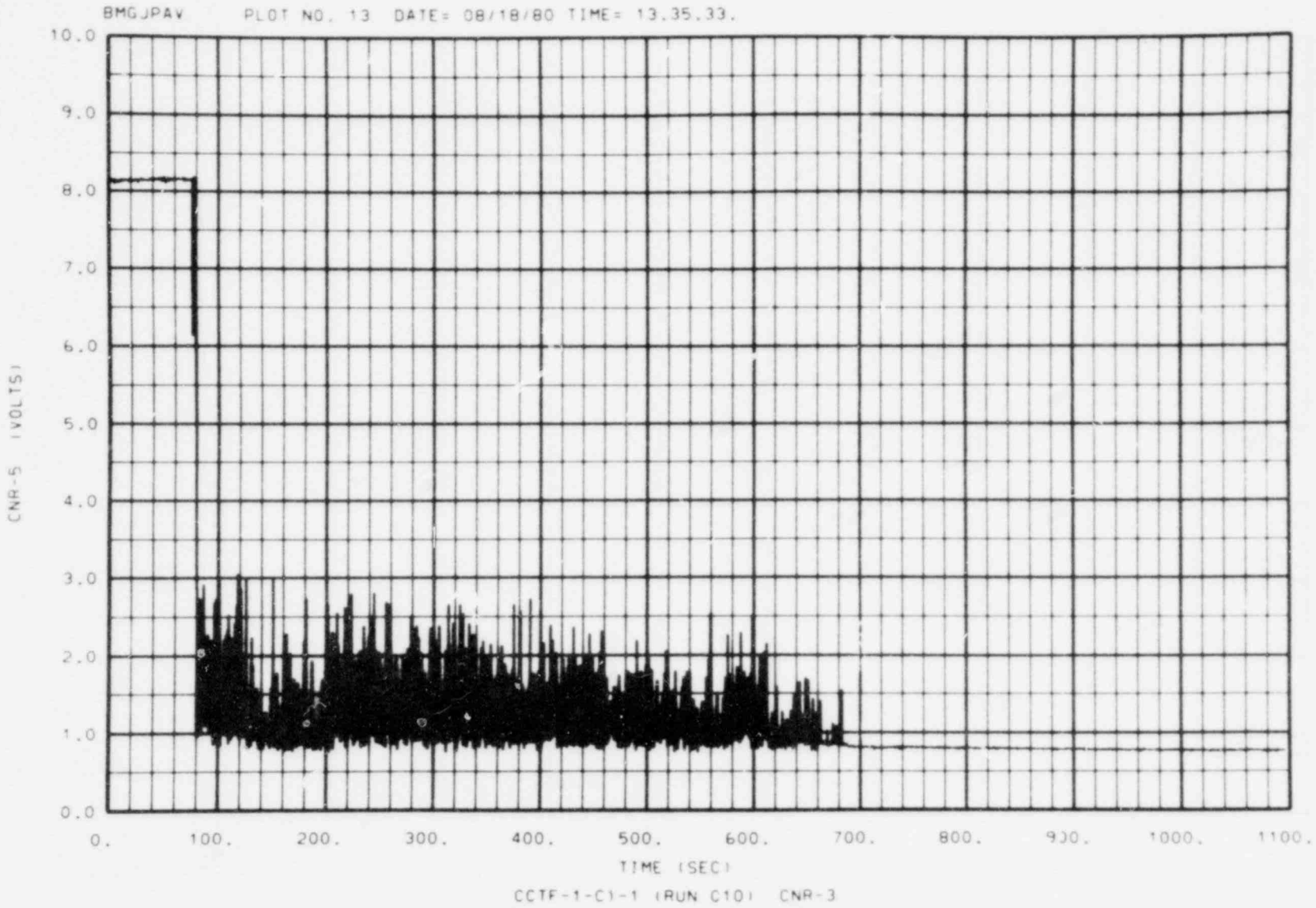

BMGJP51 PLOT NO.113 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-2

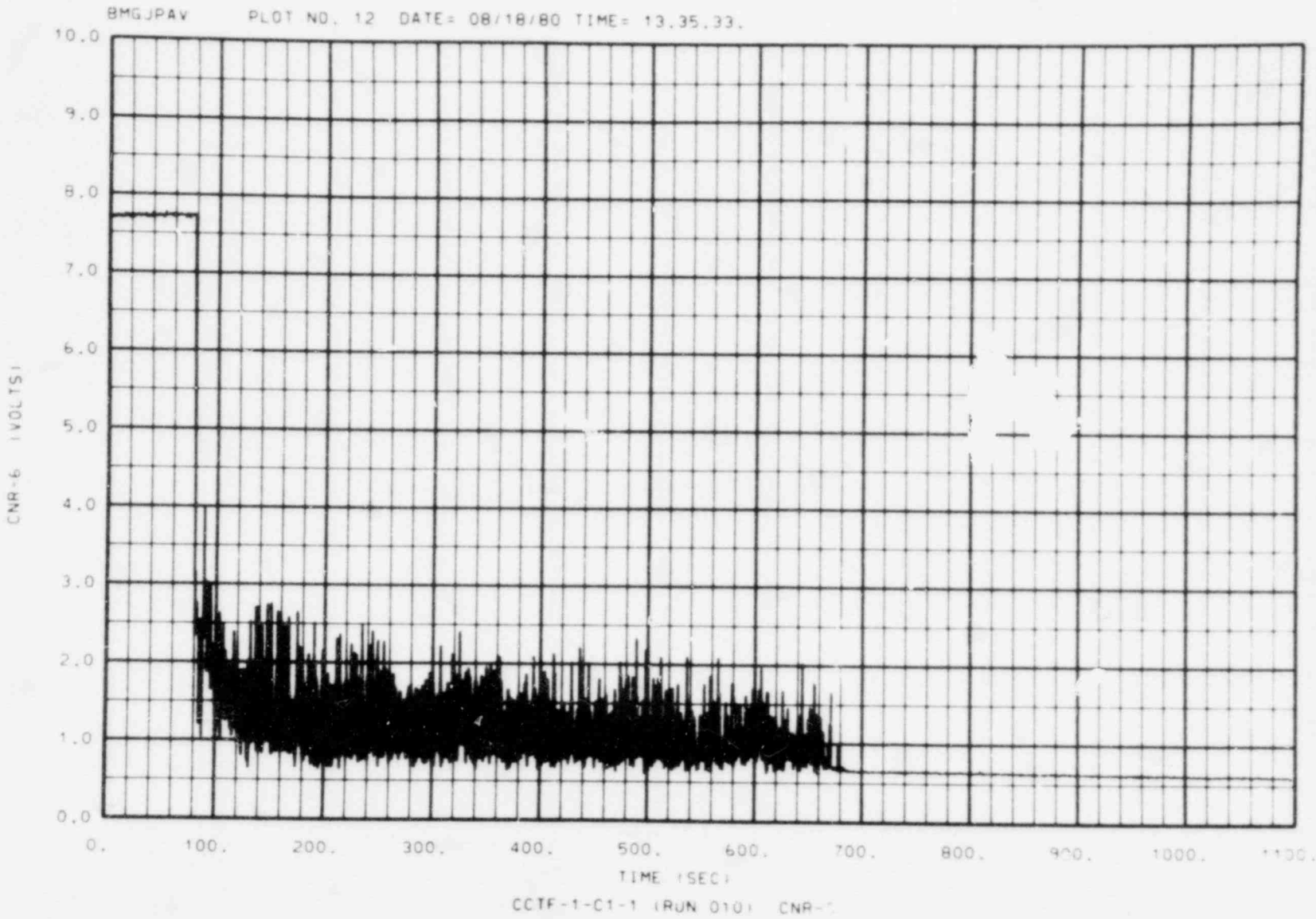

BMGJPAV PLOT NO. 17 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-1 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

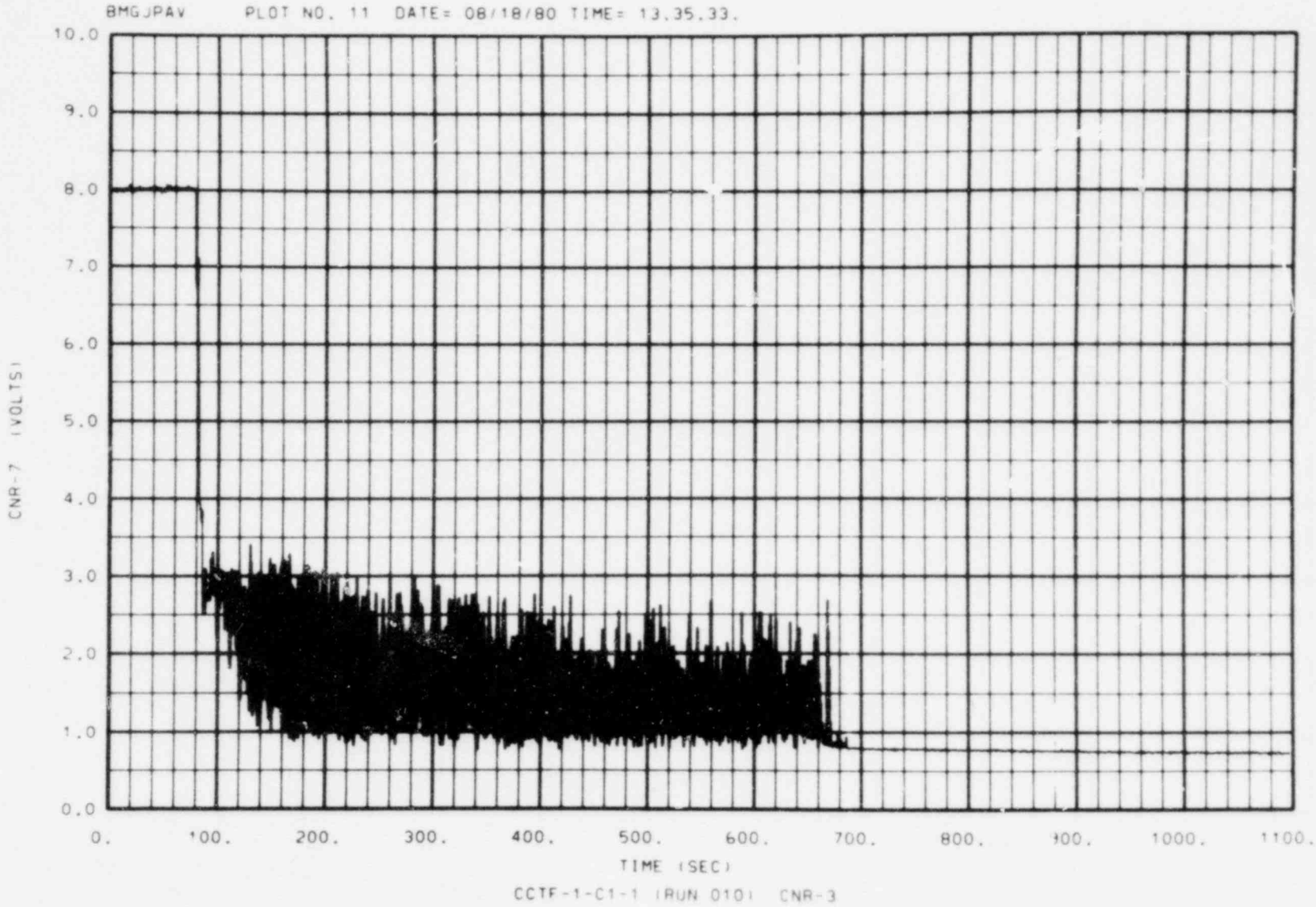

BMGJPAV PLOT NO. 16 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-2 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

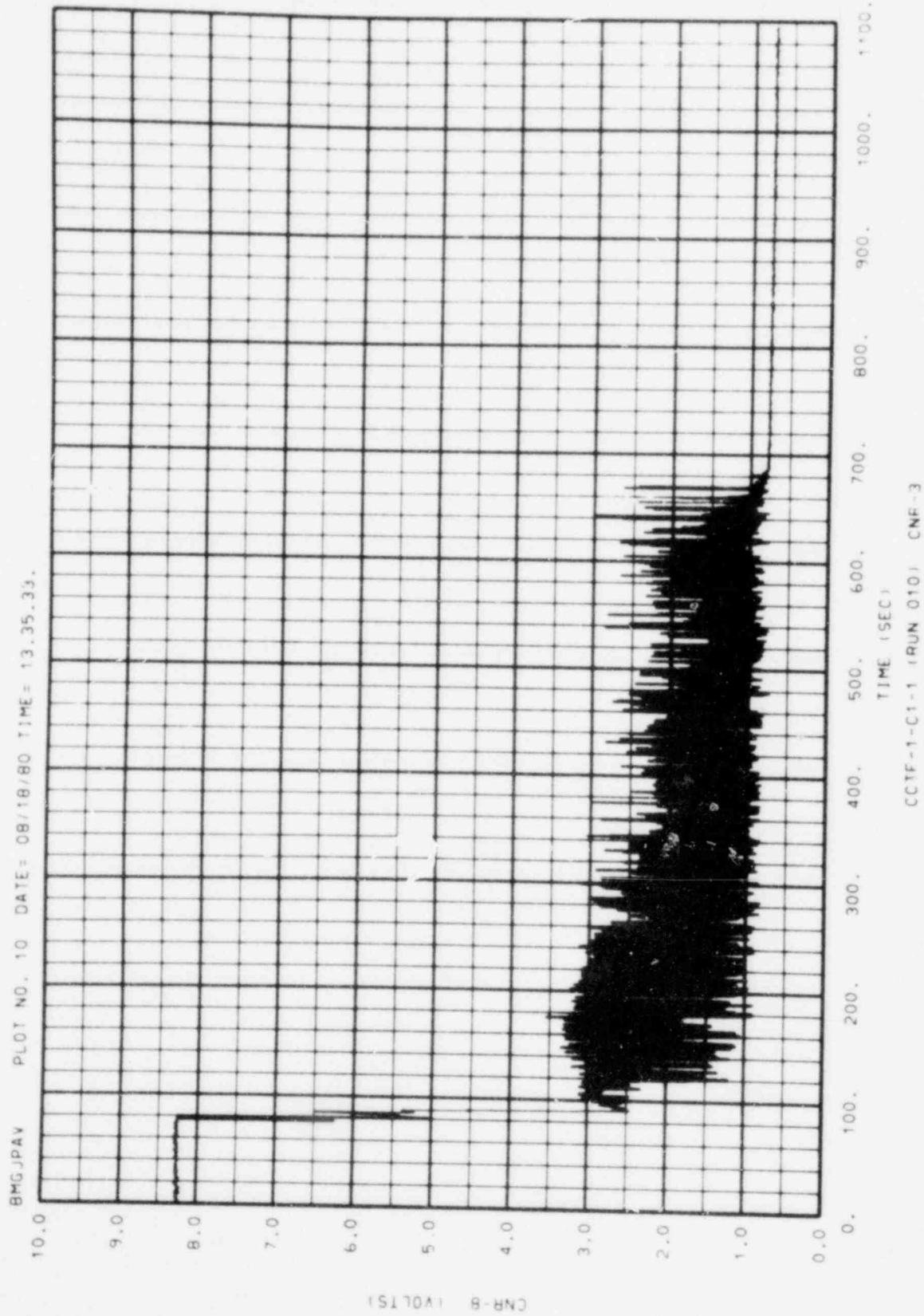

BMGJPAV PLOT NO. 15 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-3 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

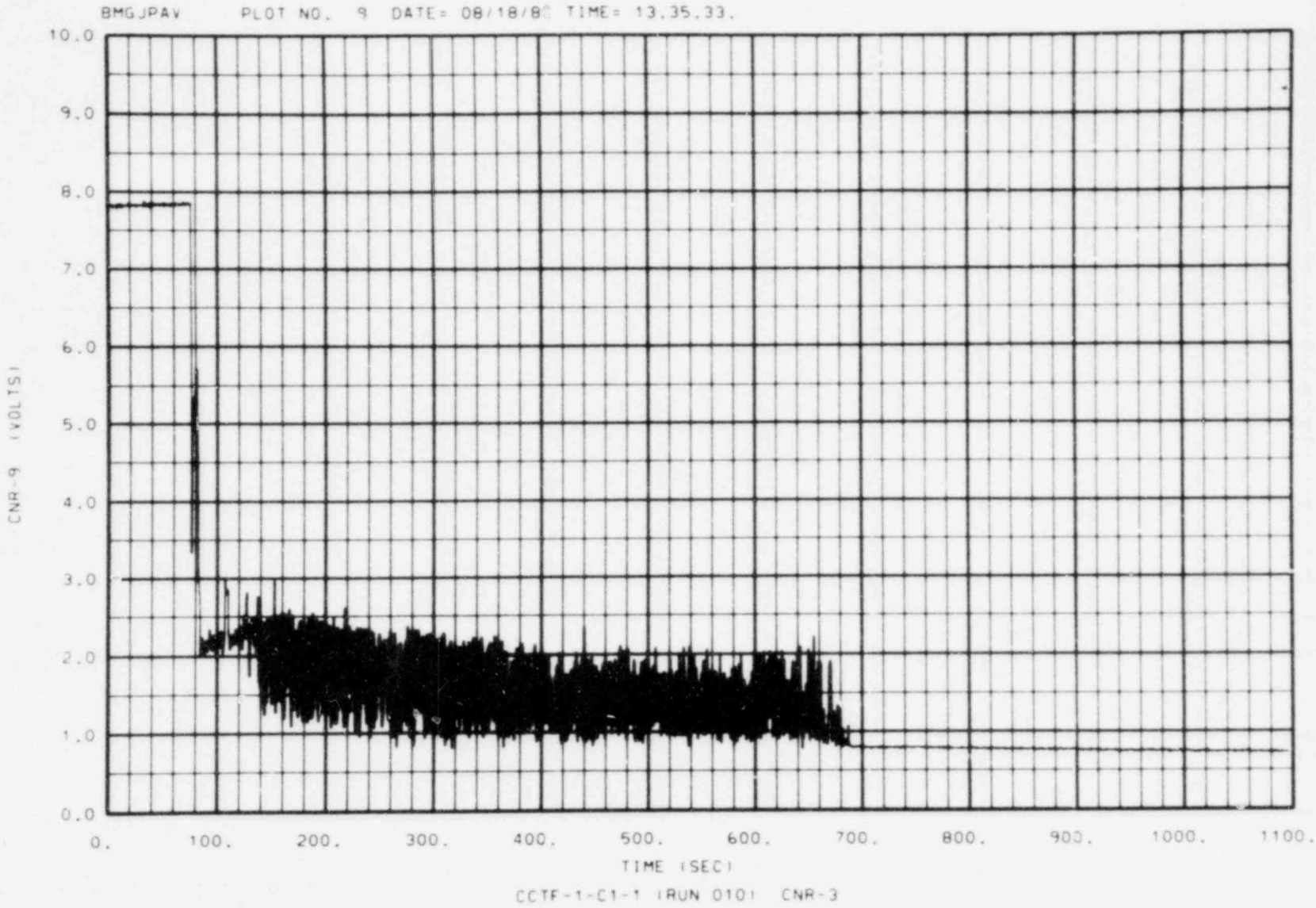

BMGJPAV PLOT NO. 14 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-4 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-4

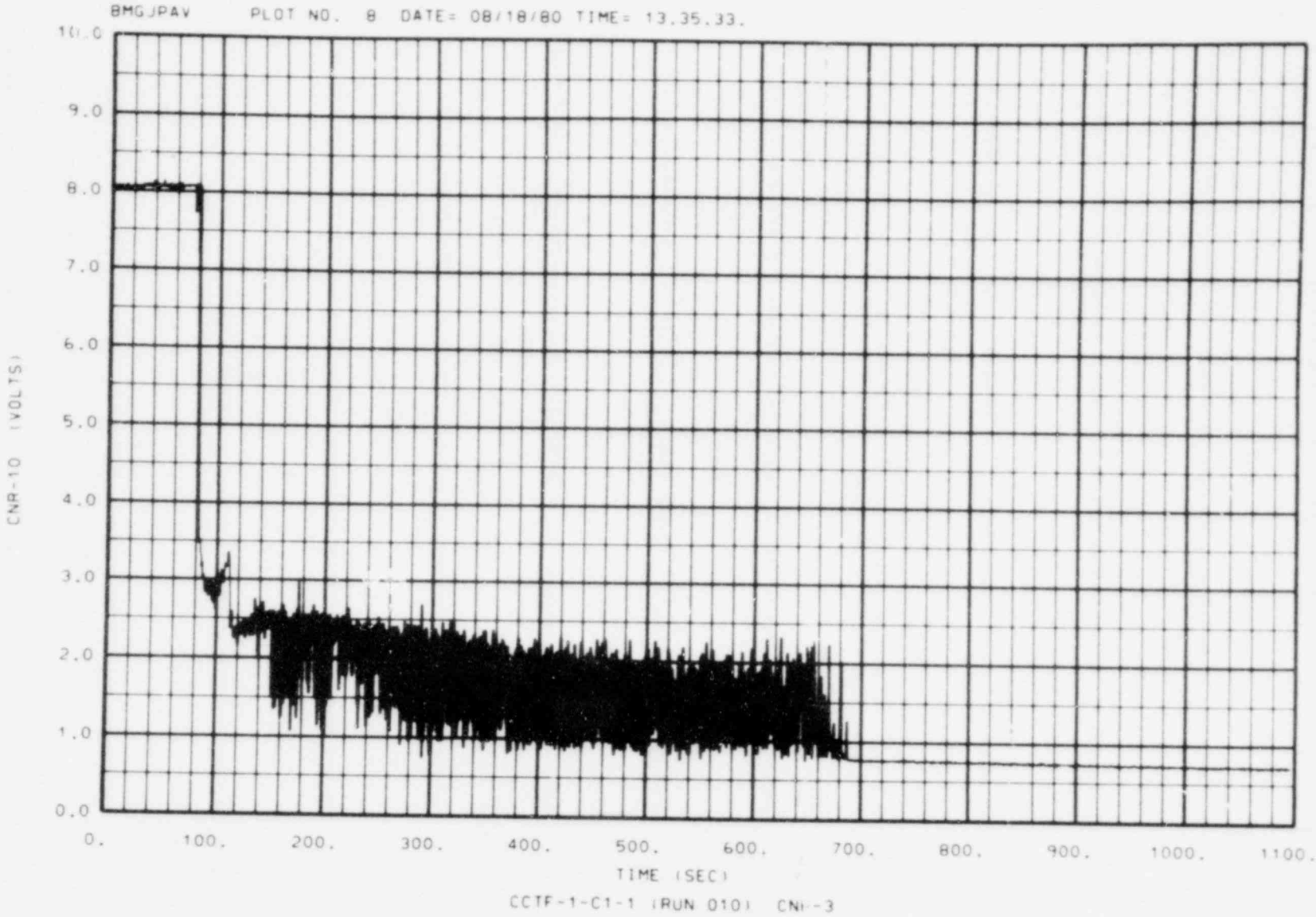

BMGJPAV PLOT NO. 13 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-5 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN C10) CNR-3

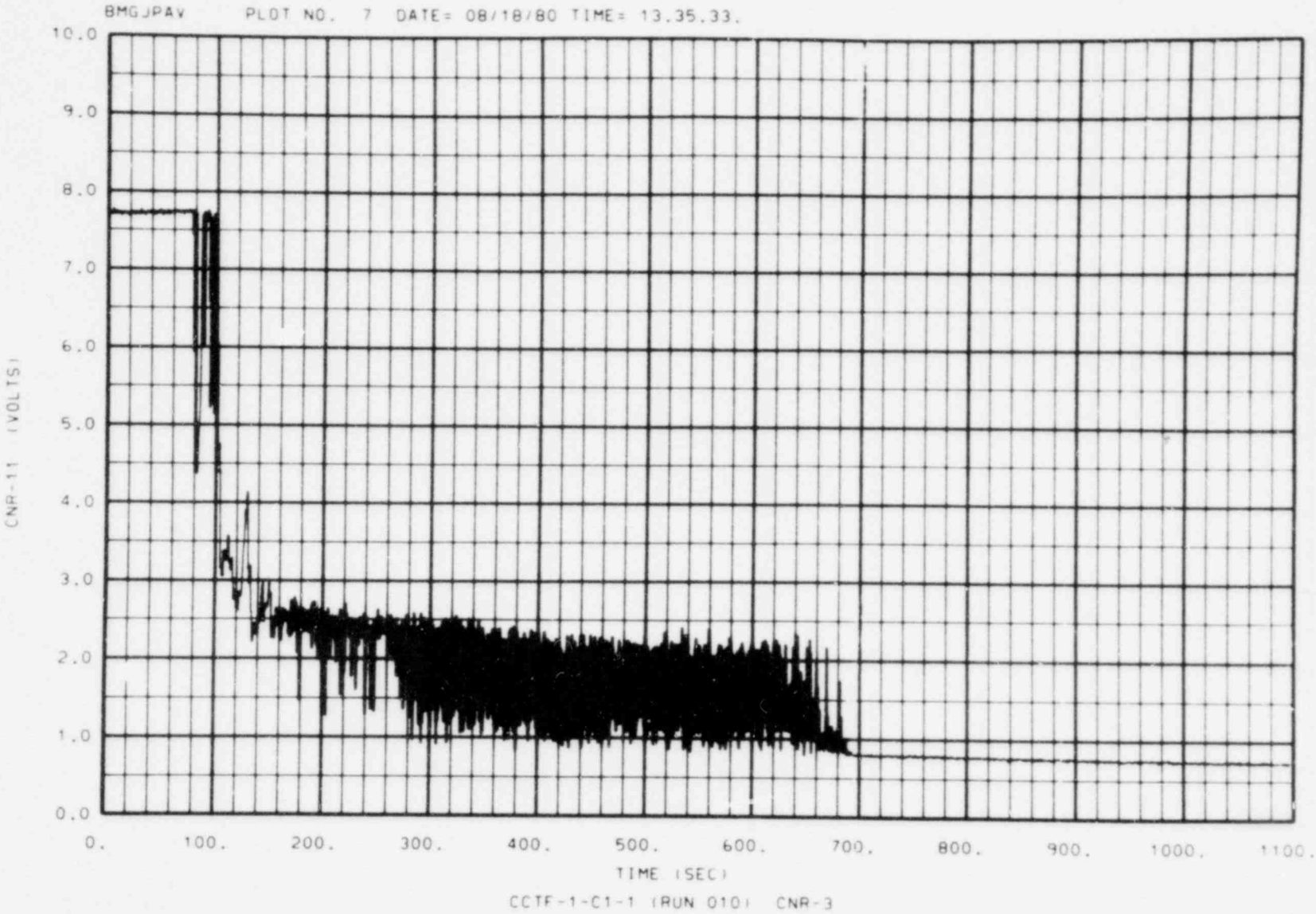

BMGJPAV PLOT NO. 12 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-6 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-

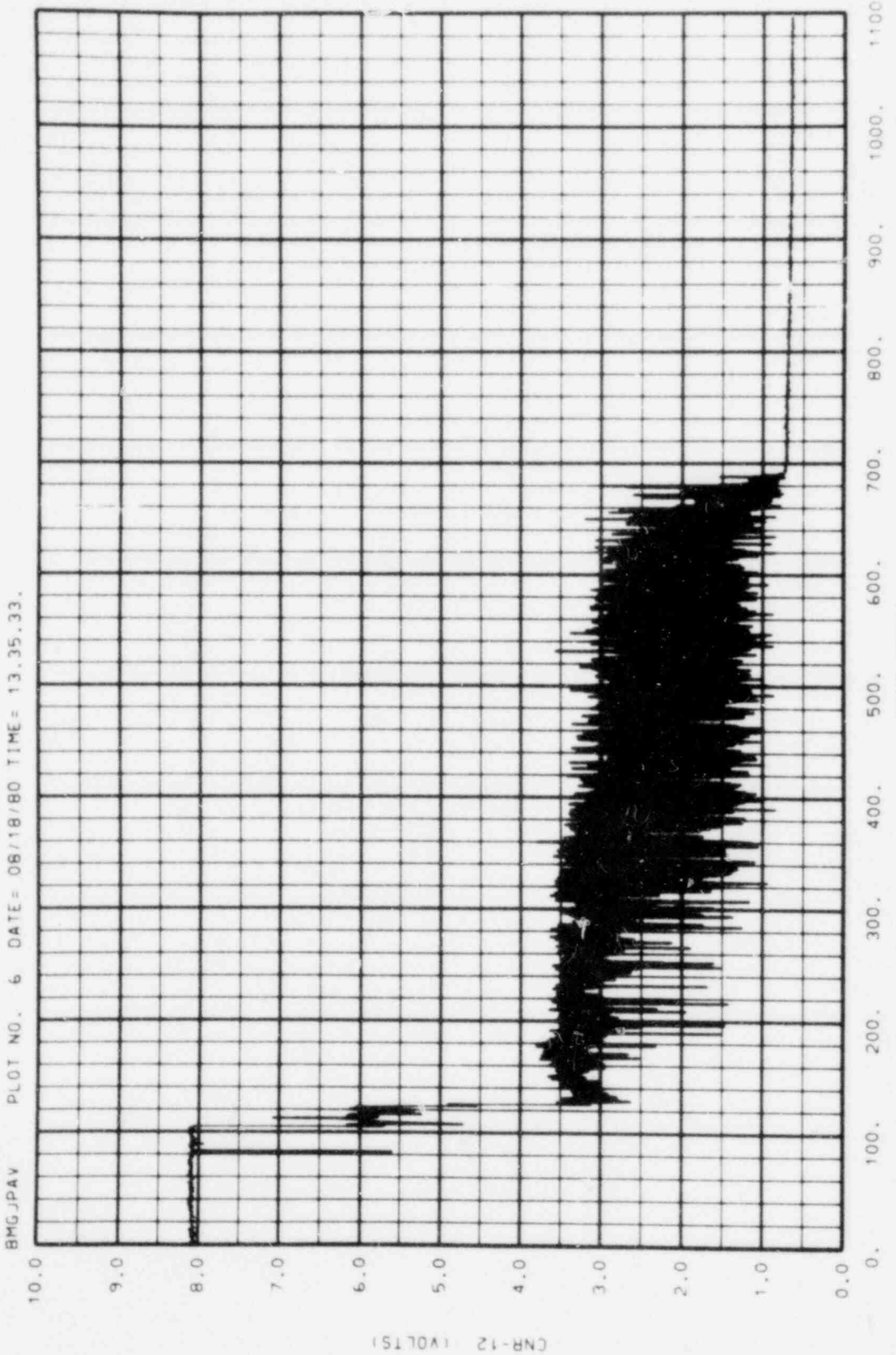

BMGJPAV PLOT NO. 11 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-7 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

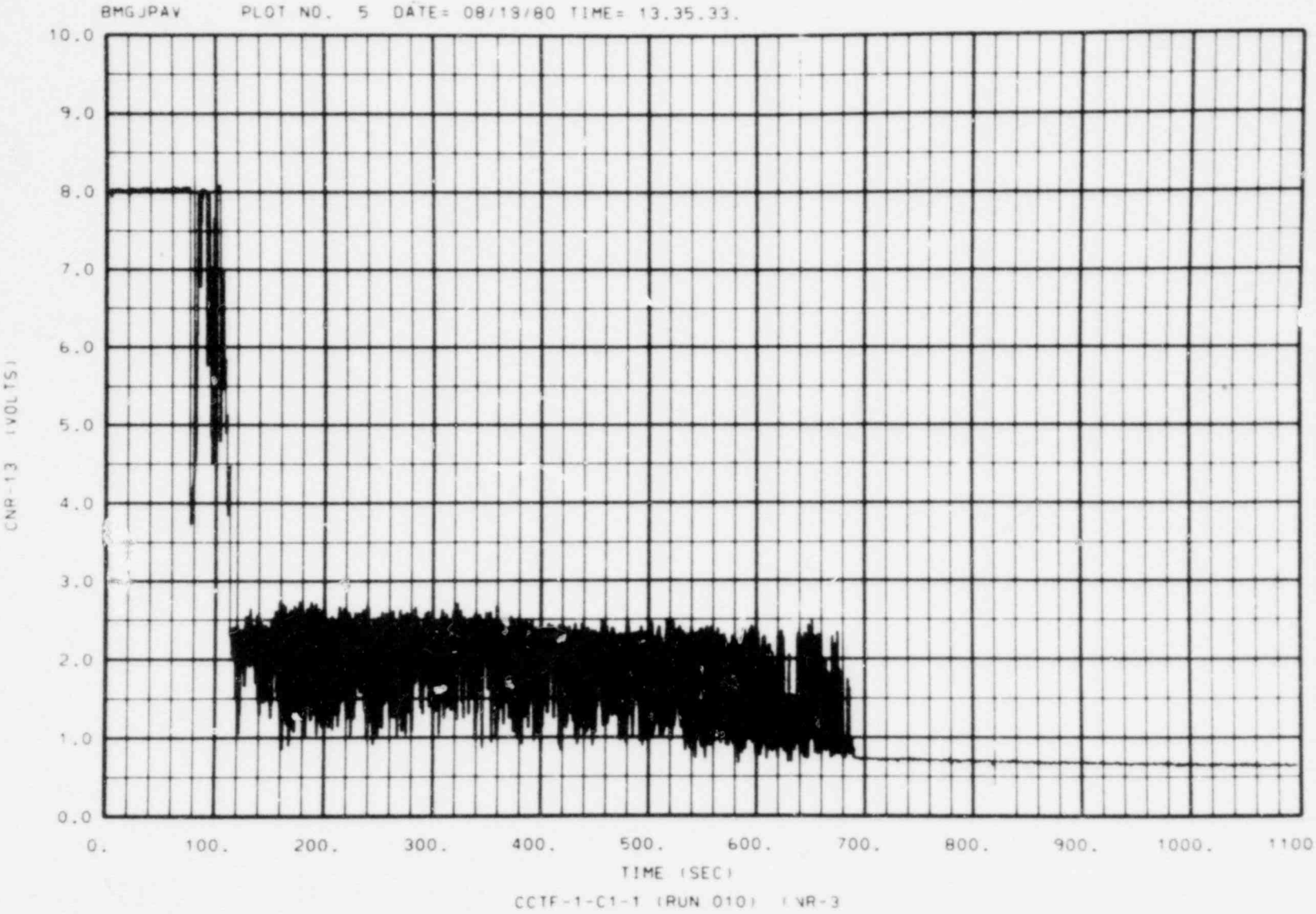

BMGJPAV PLOT NO. 10 DATE= 08/18/80 TIME= 13.35.33.
CNR-8 (VOLTS)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNF-3

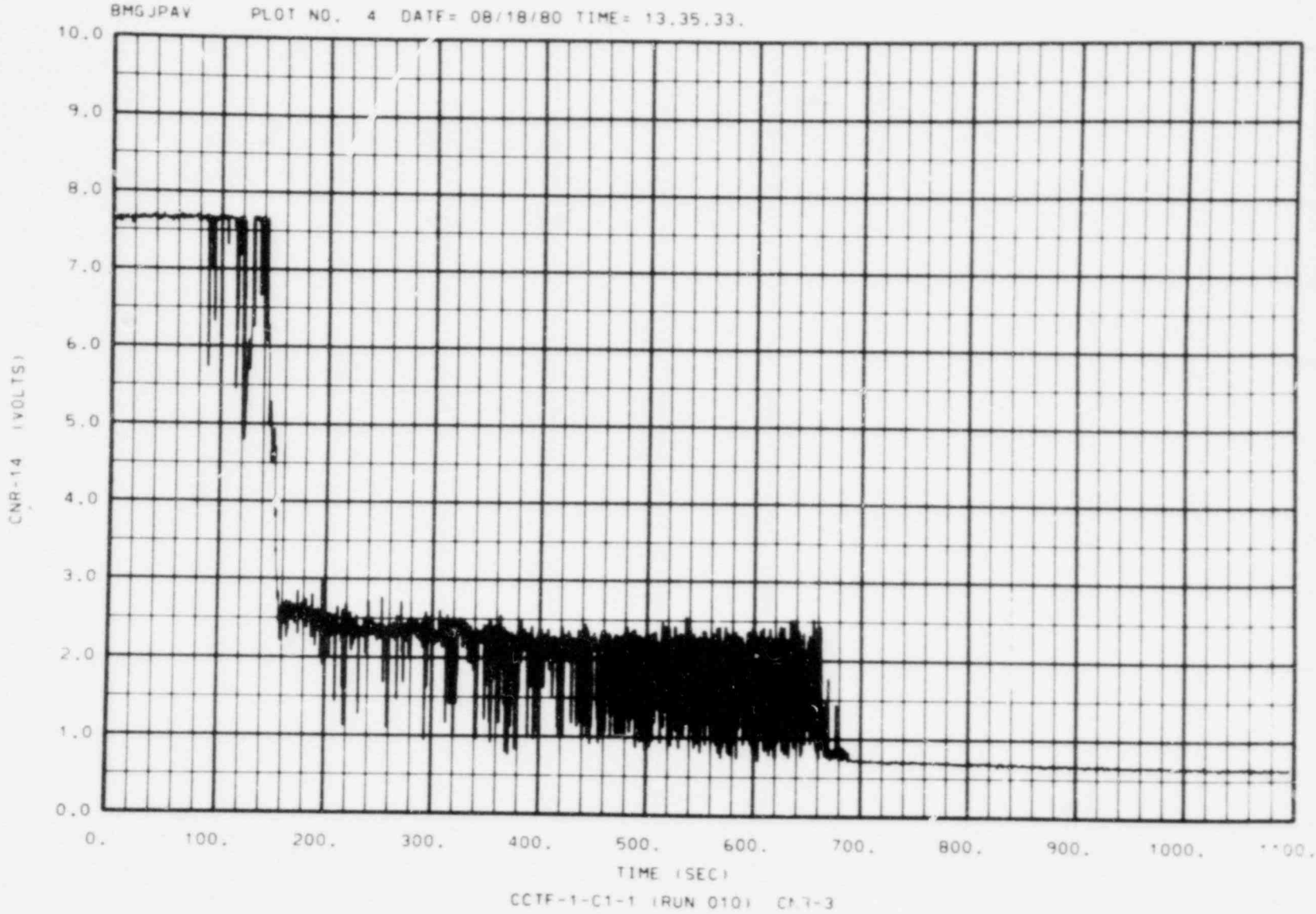

BMGJPAV PLOT NO. 9 DATE= 08/18/8[illegible] TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-3 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

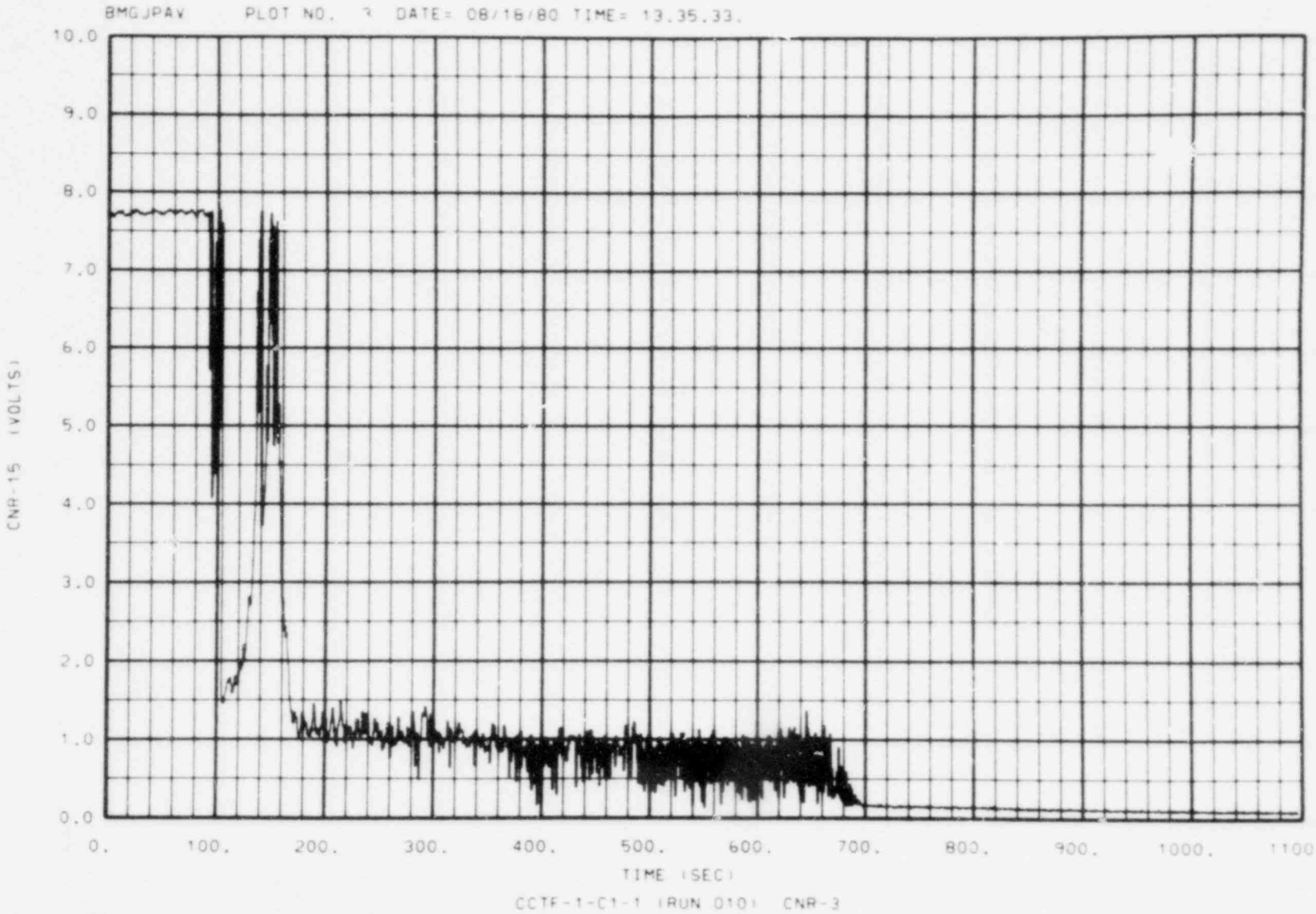

BMGJPAV PLOT NO. 8 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-10 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

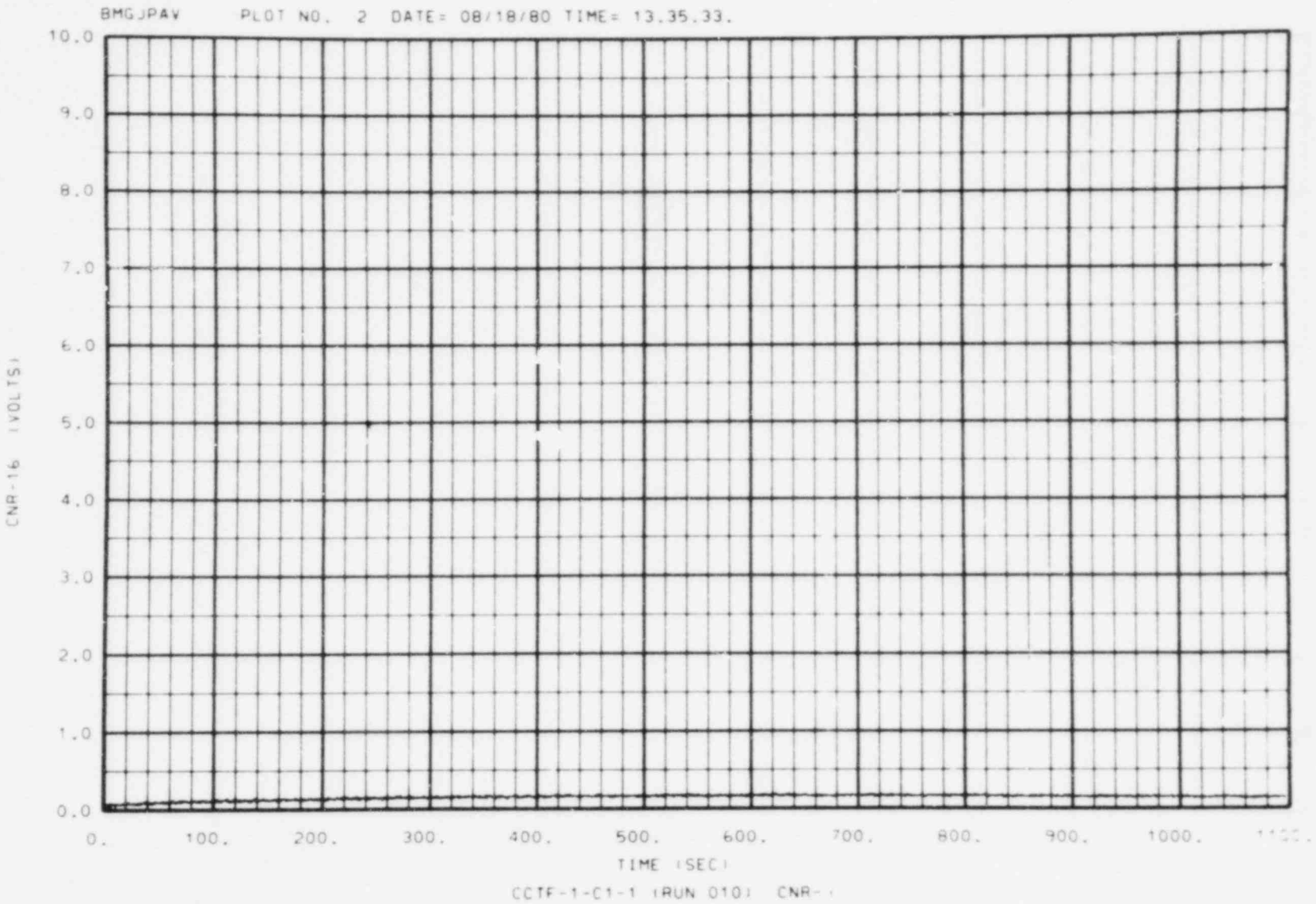

BMGJPAV PLOT NO. 7 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-11 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

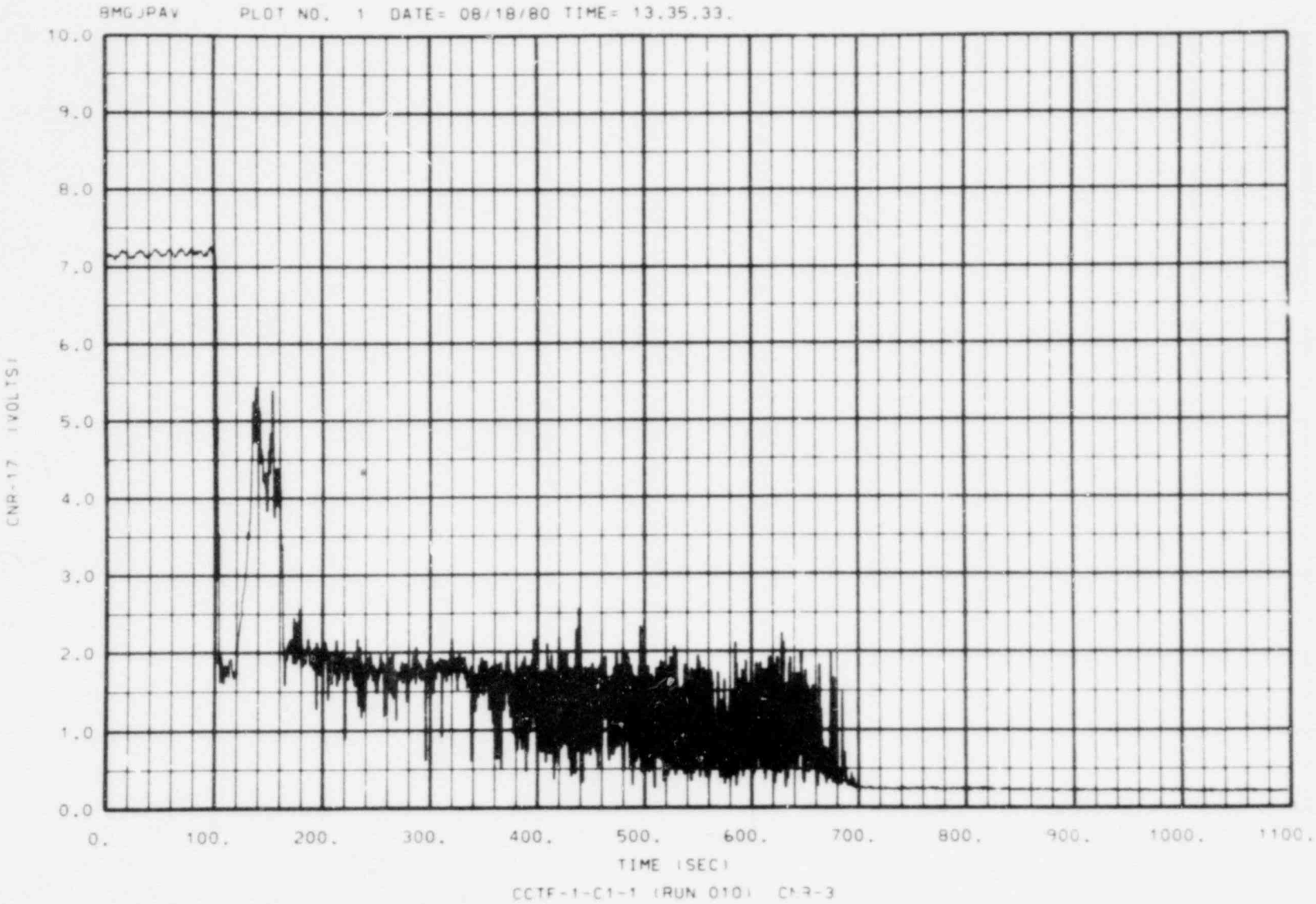

BMGJPAV PLOT NO. 6 DATE= 08/18/80 TIME= 13.35.33.
CNR-12 (VOLTS)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

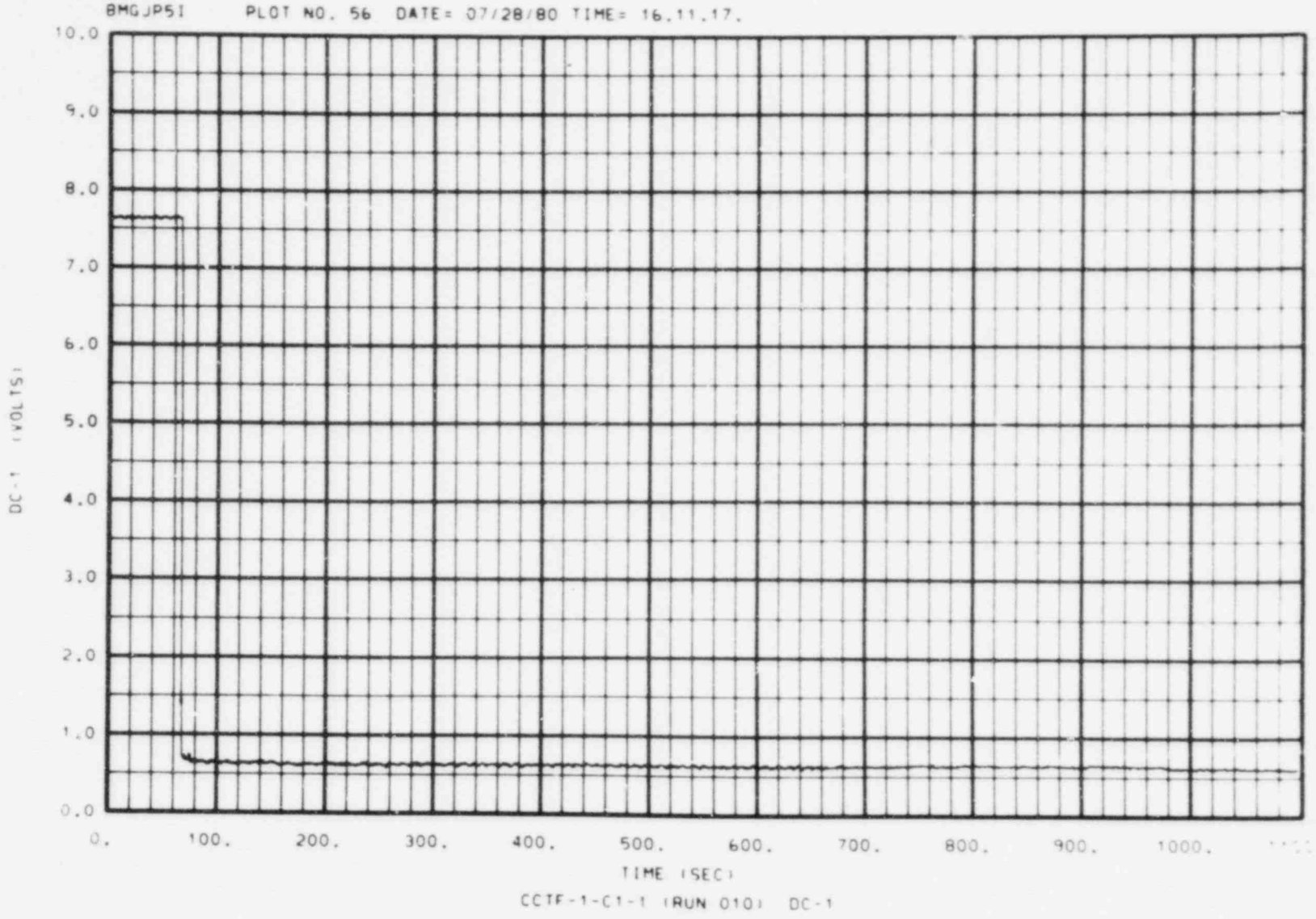

BMGJPAV PLOT NO. 5 DATE= 08/19/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-13 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) (VR-3

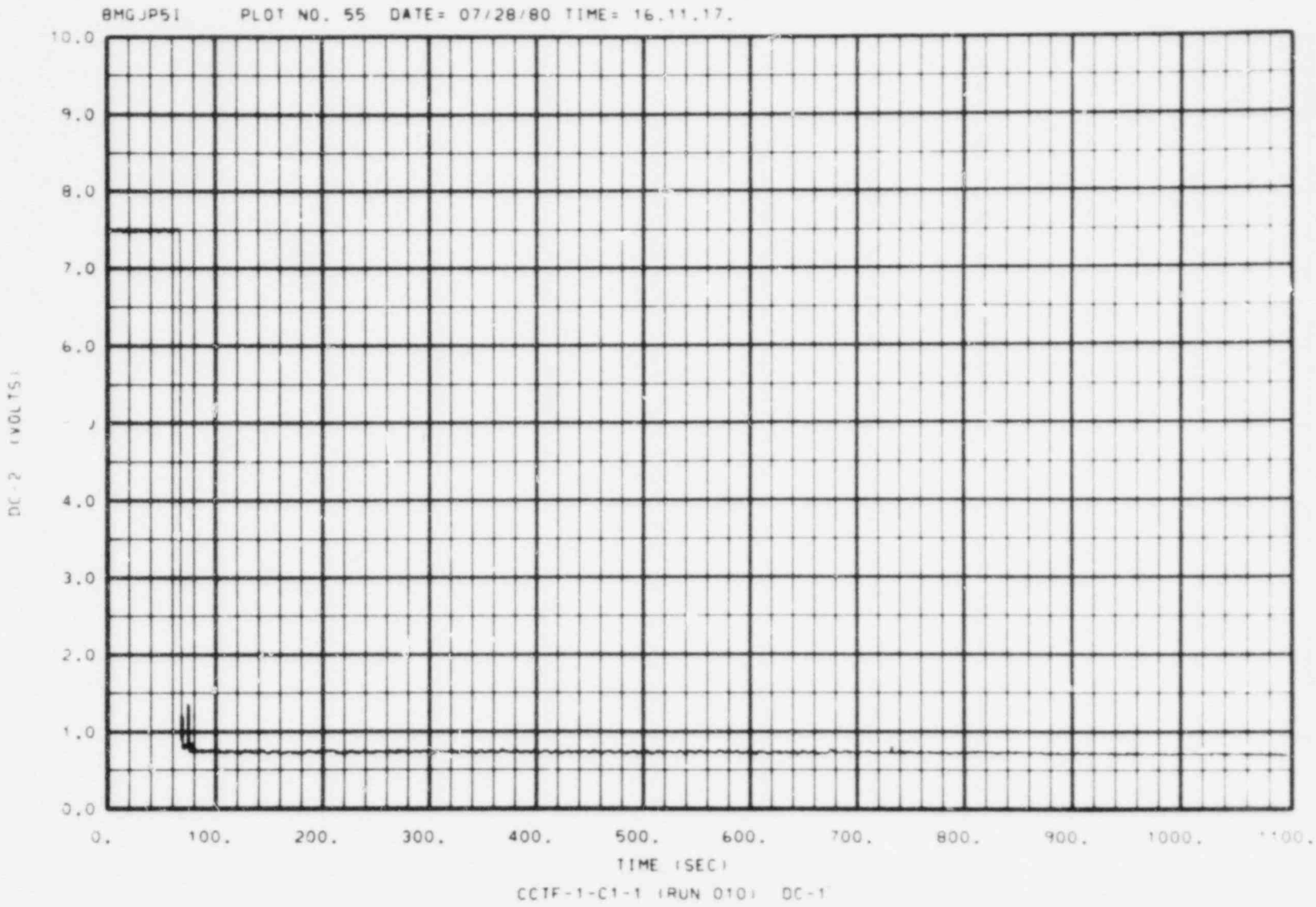

BMGJPAV PLOT NO. 4 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-14 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CH 3

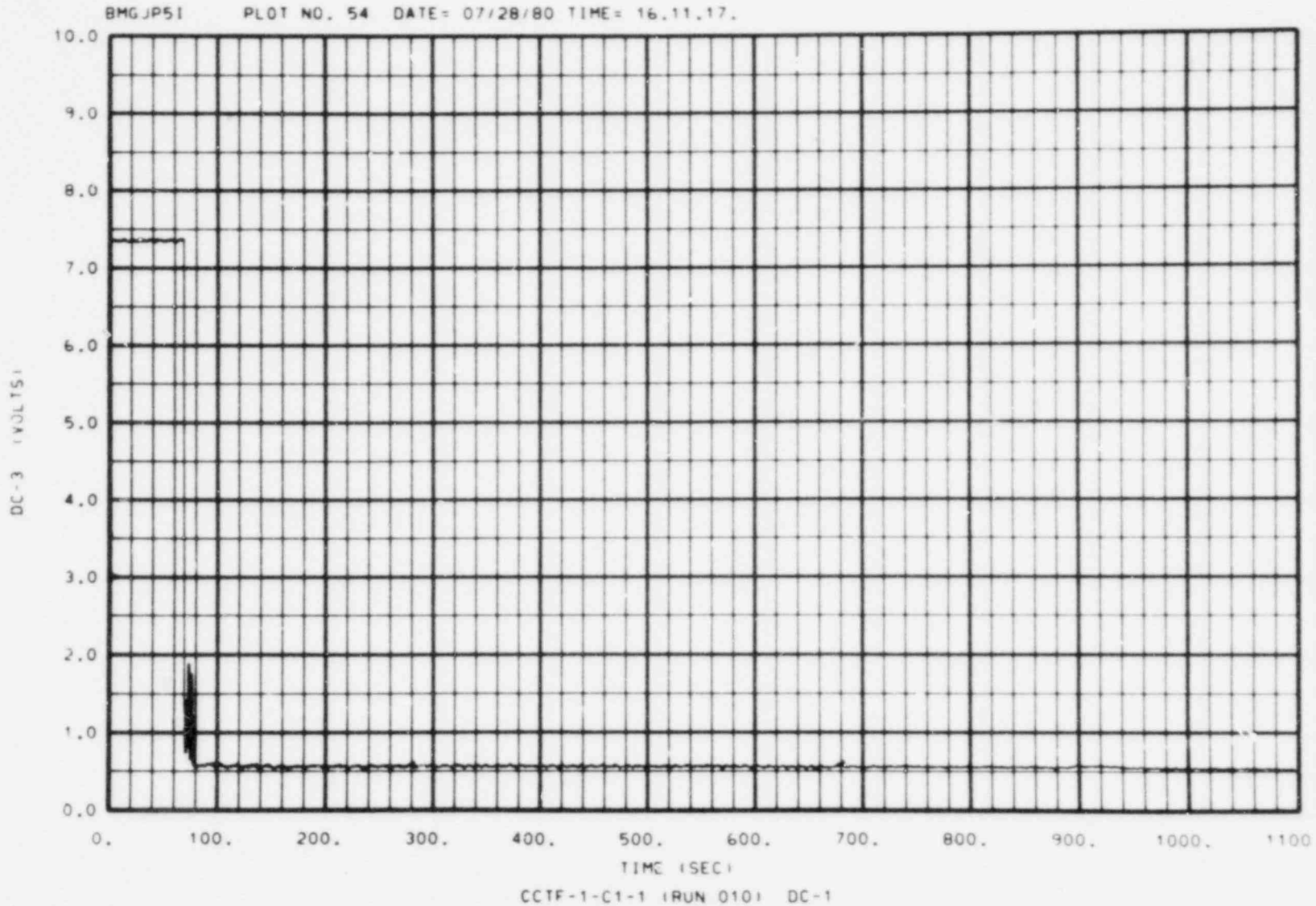

BMGJPAV PLOT NO. 3 DATE= 08/16/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-15 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

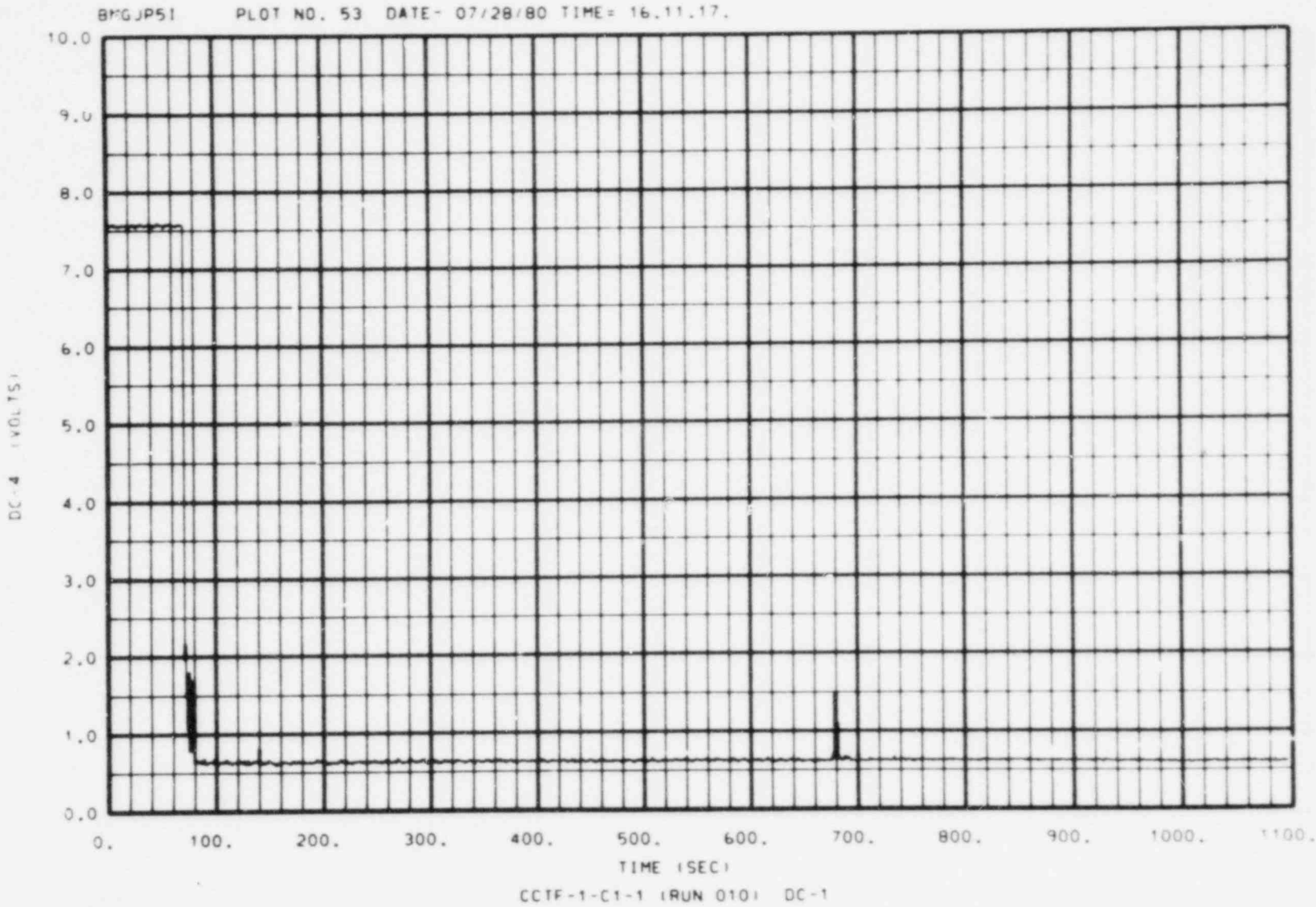

BMGJPAV PLOT NO. 2 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-16 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-

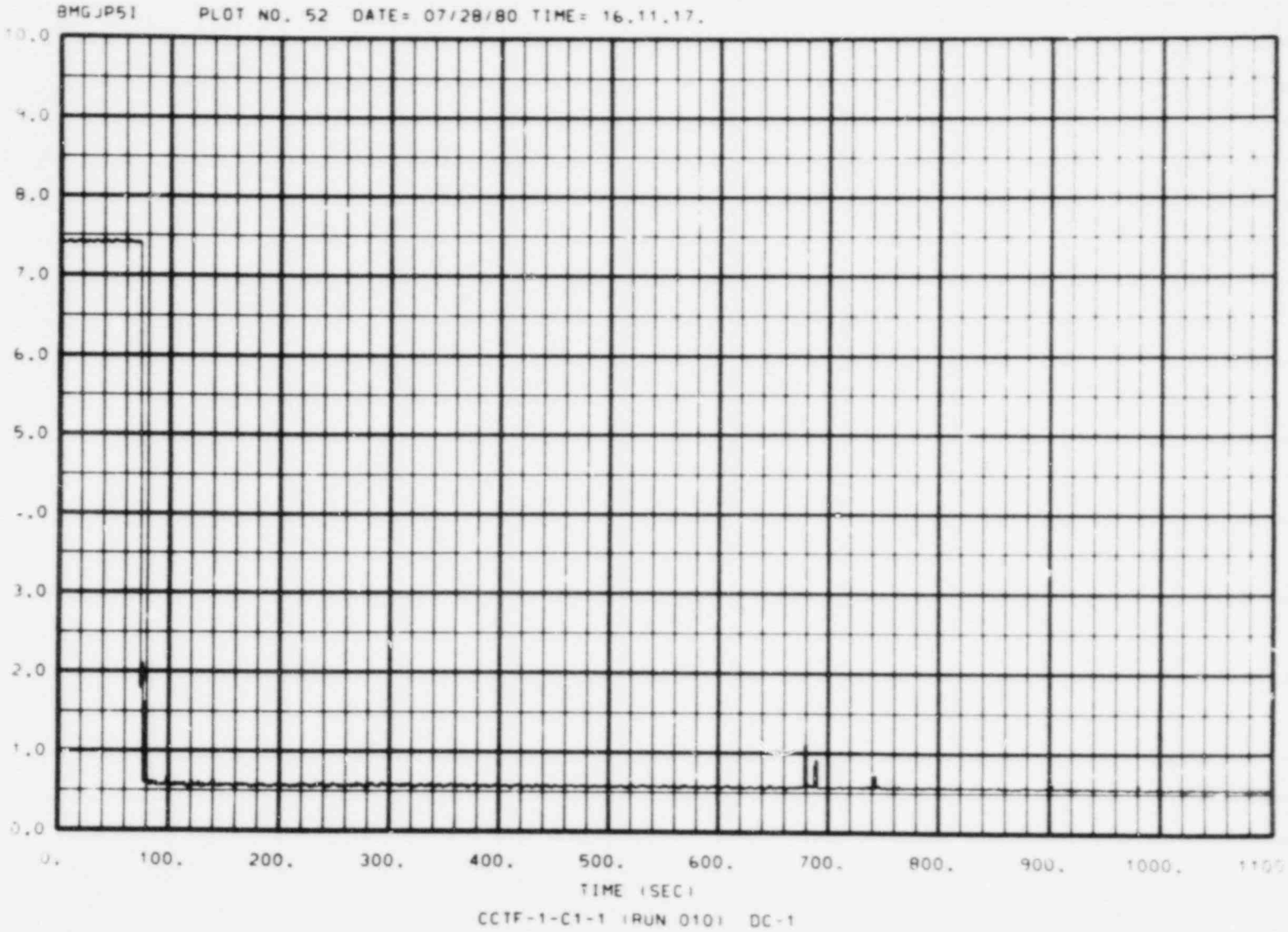

BMGJPAV PLOT NO. 1 DATE= 08/18/80 TIME= 13.35.33.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
CNR-17 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) CNR-3

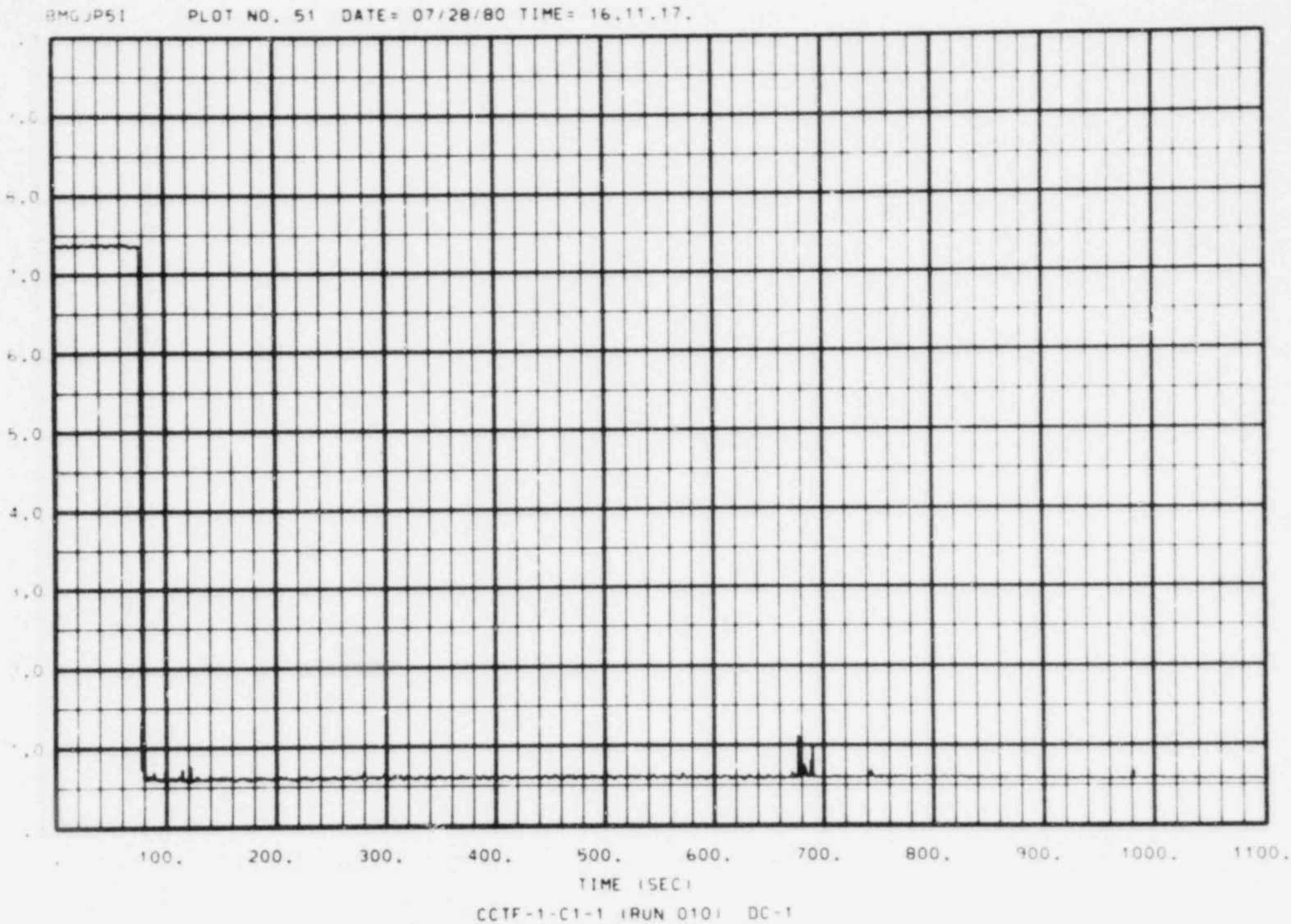

BMGJP5I PLOT NO. 56 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-1 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

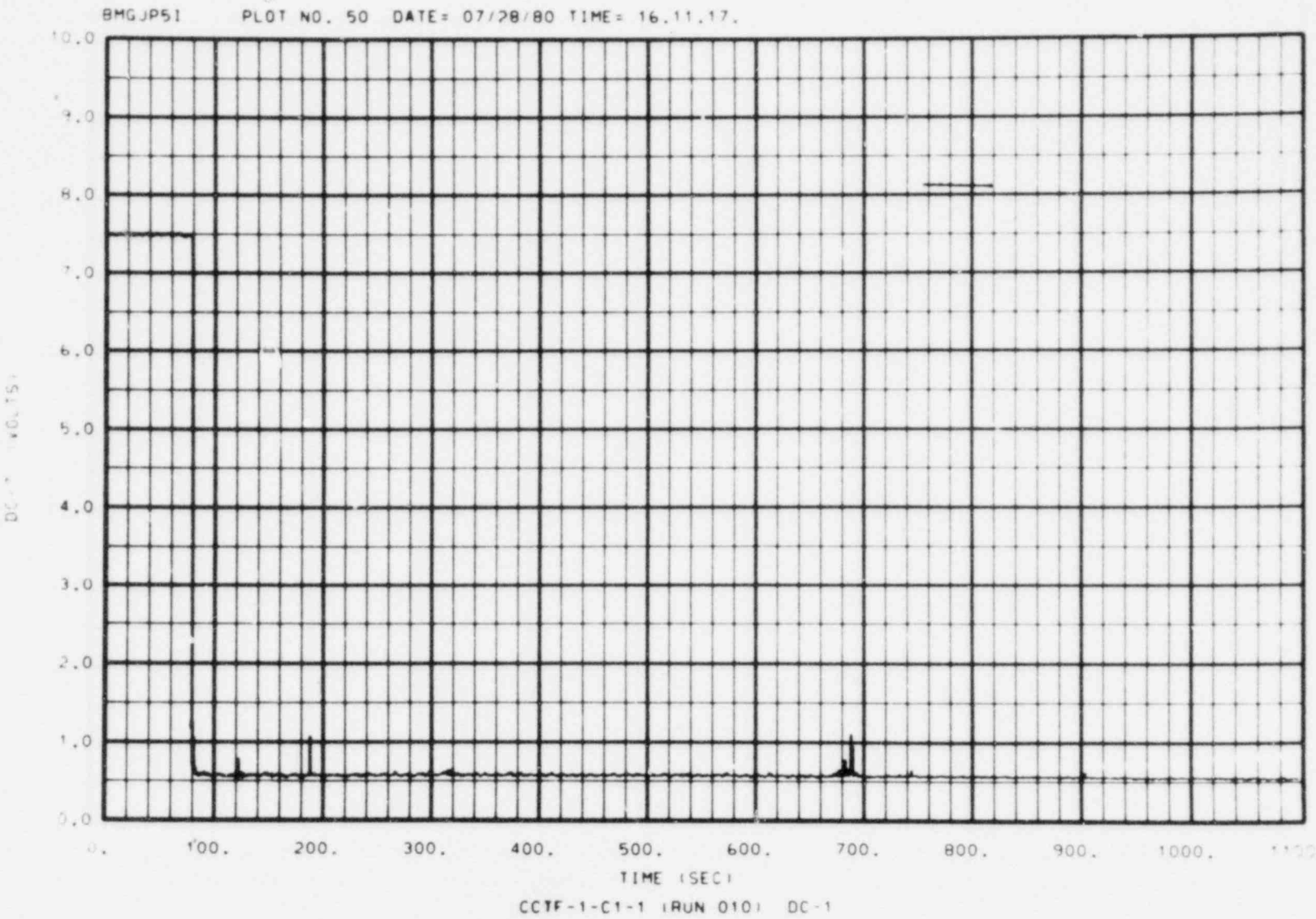

8MGJP51 PLOT NO. 55 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-2 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

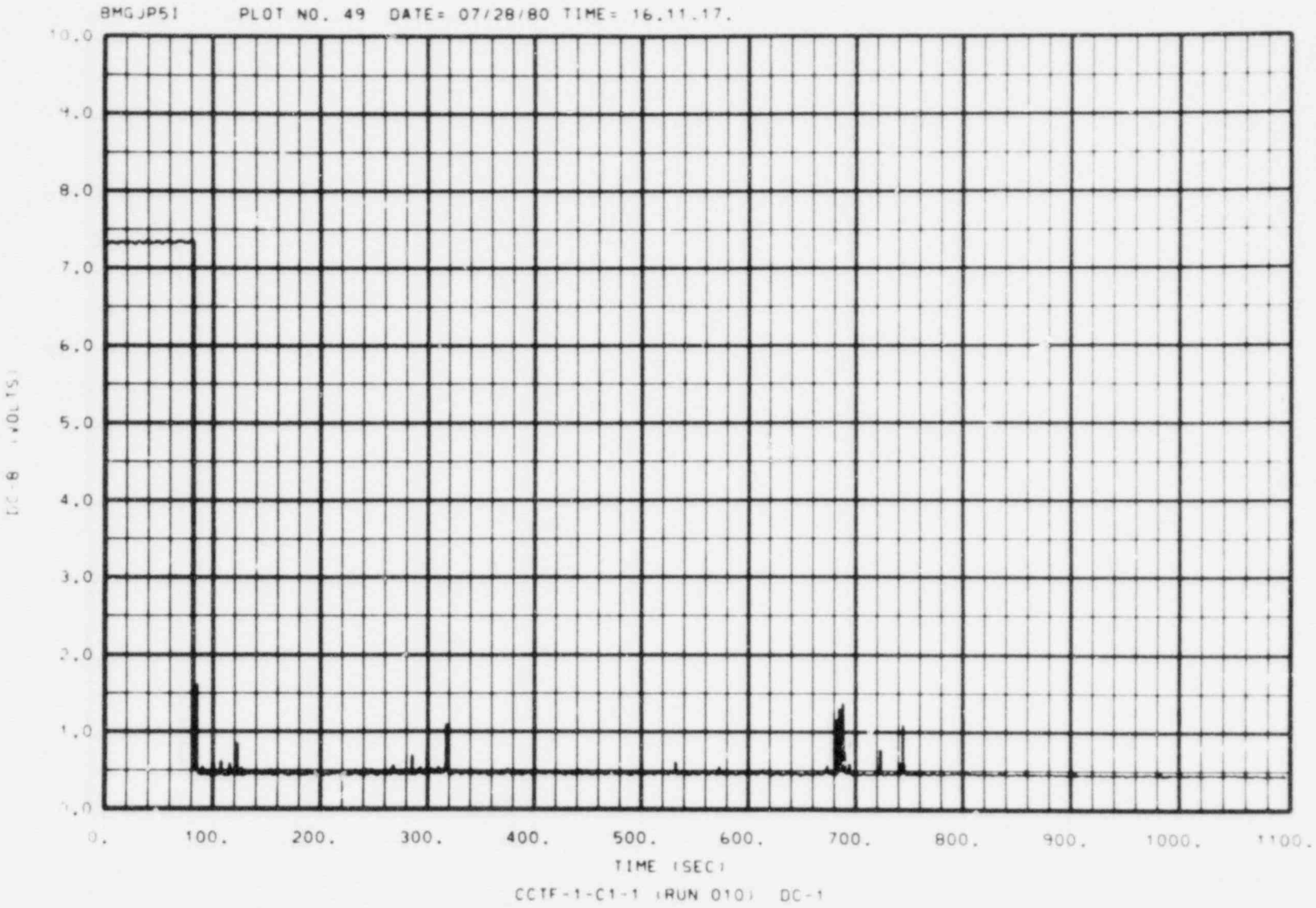

BMGJP51 PLOT NO. 54 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-3 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

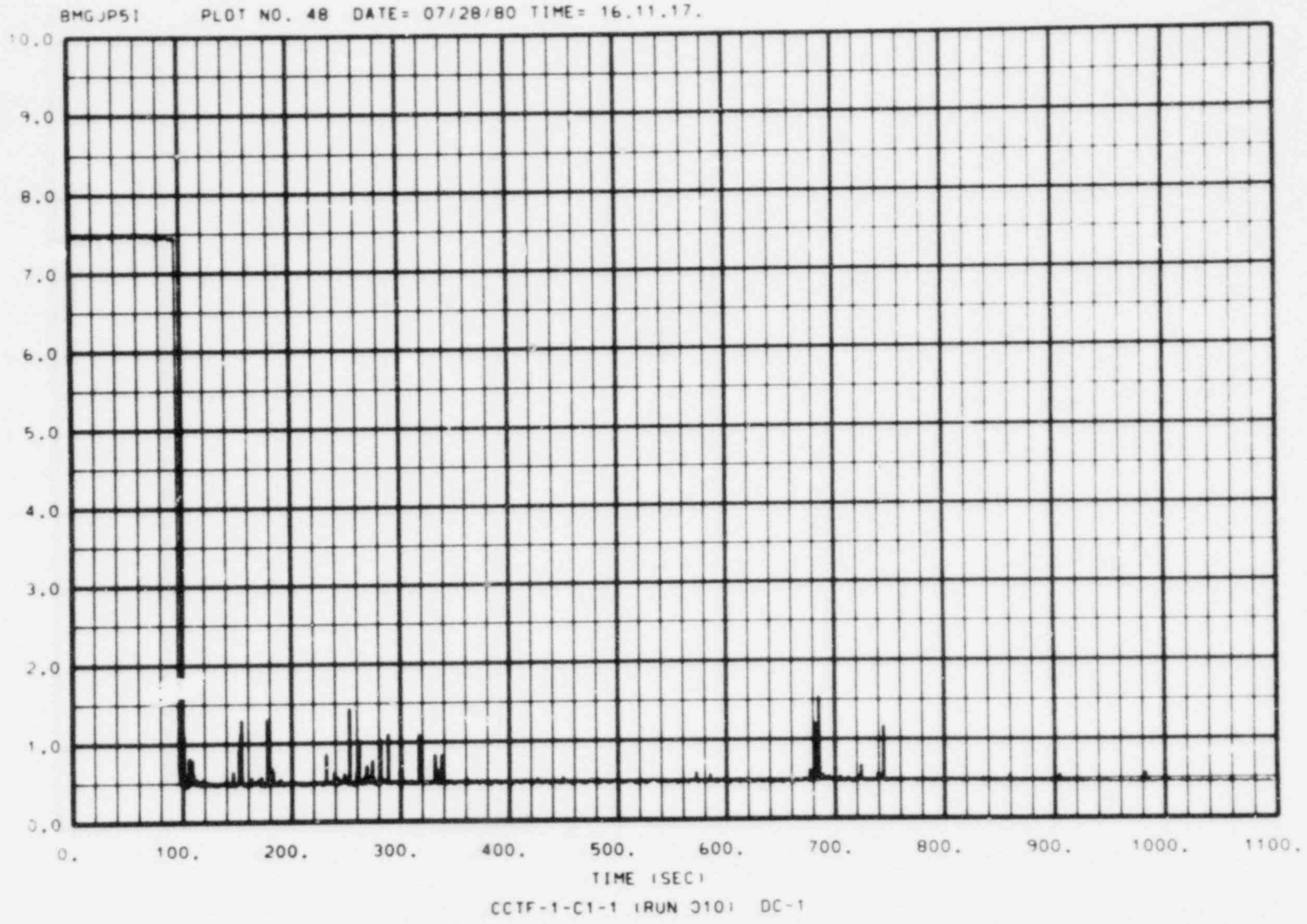

BMGJP51 PLOT NO. 53 DATE- 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

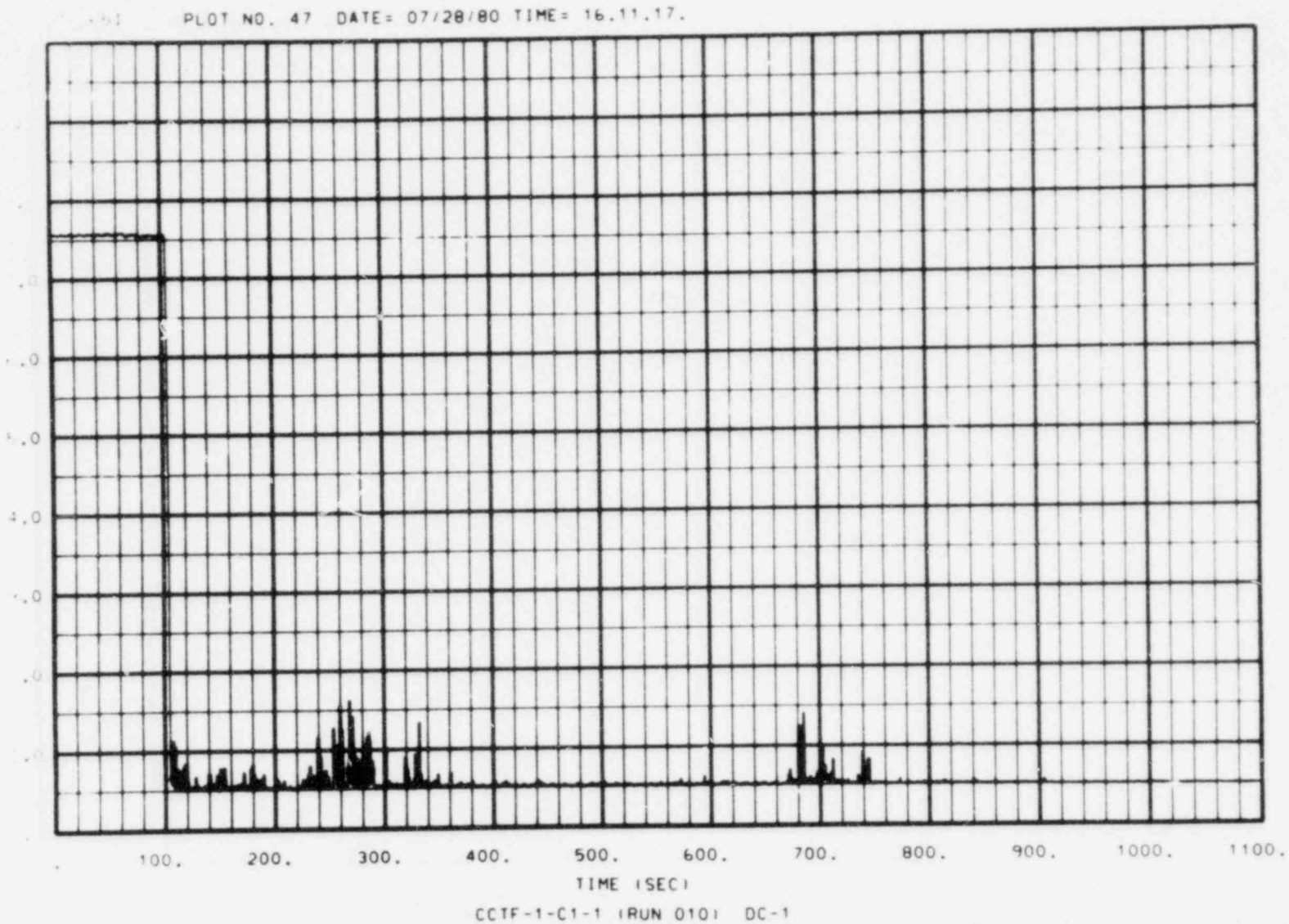

BMGJP51 PLOT NO. 52 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

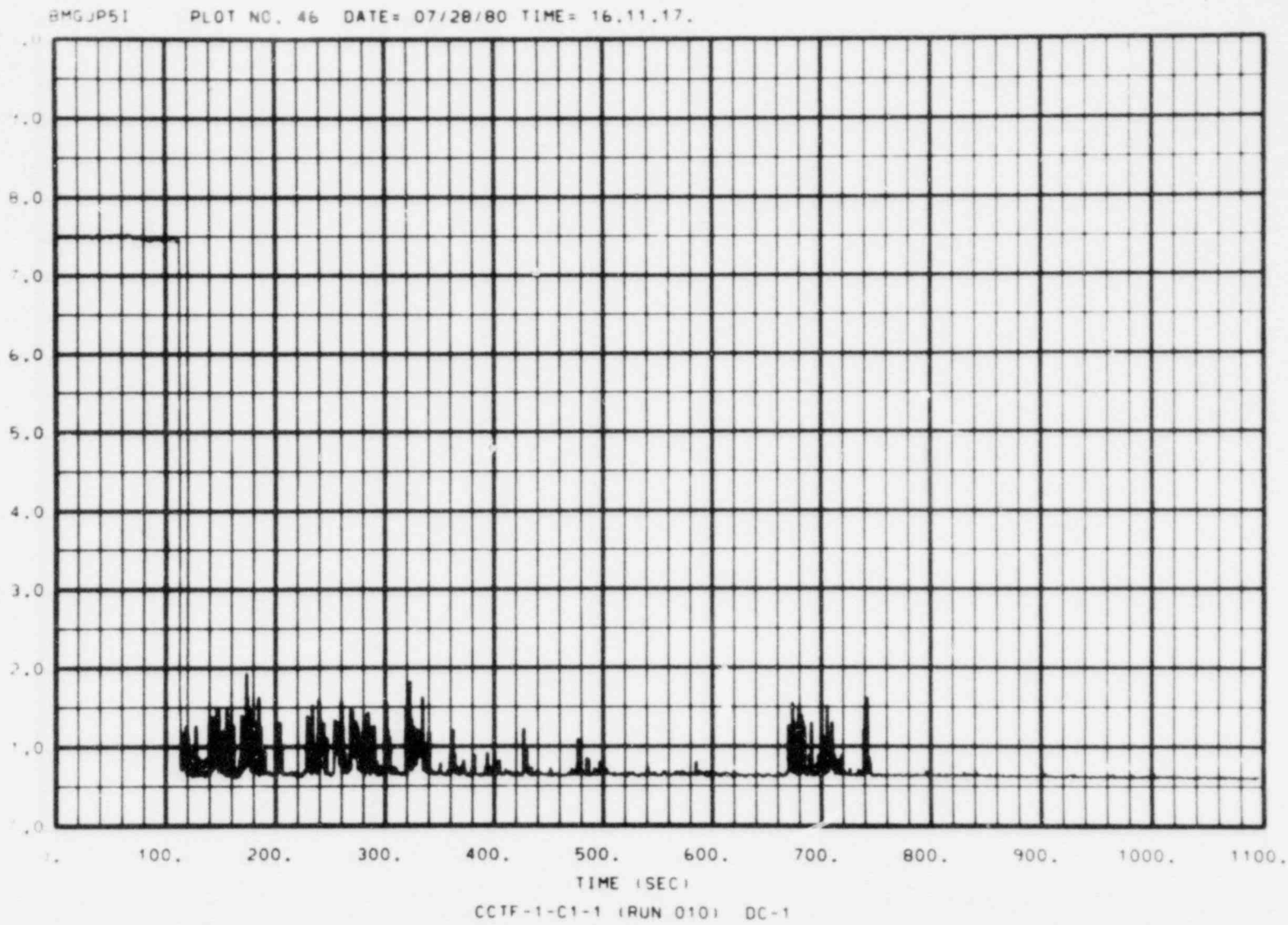

BMGJP51 PLOT NO. 51 DATE= 07/28/80 TIME= 16.11.17.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

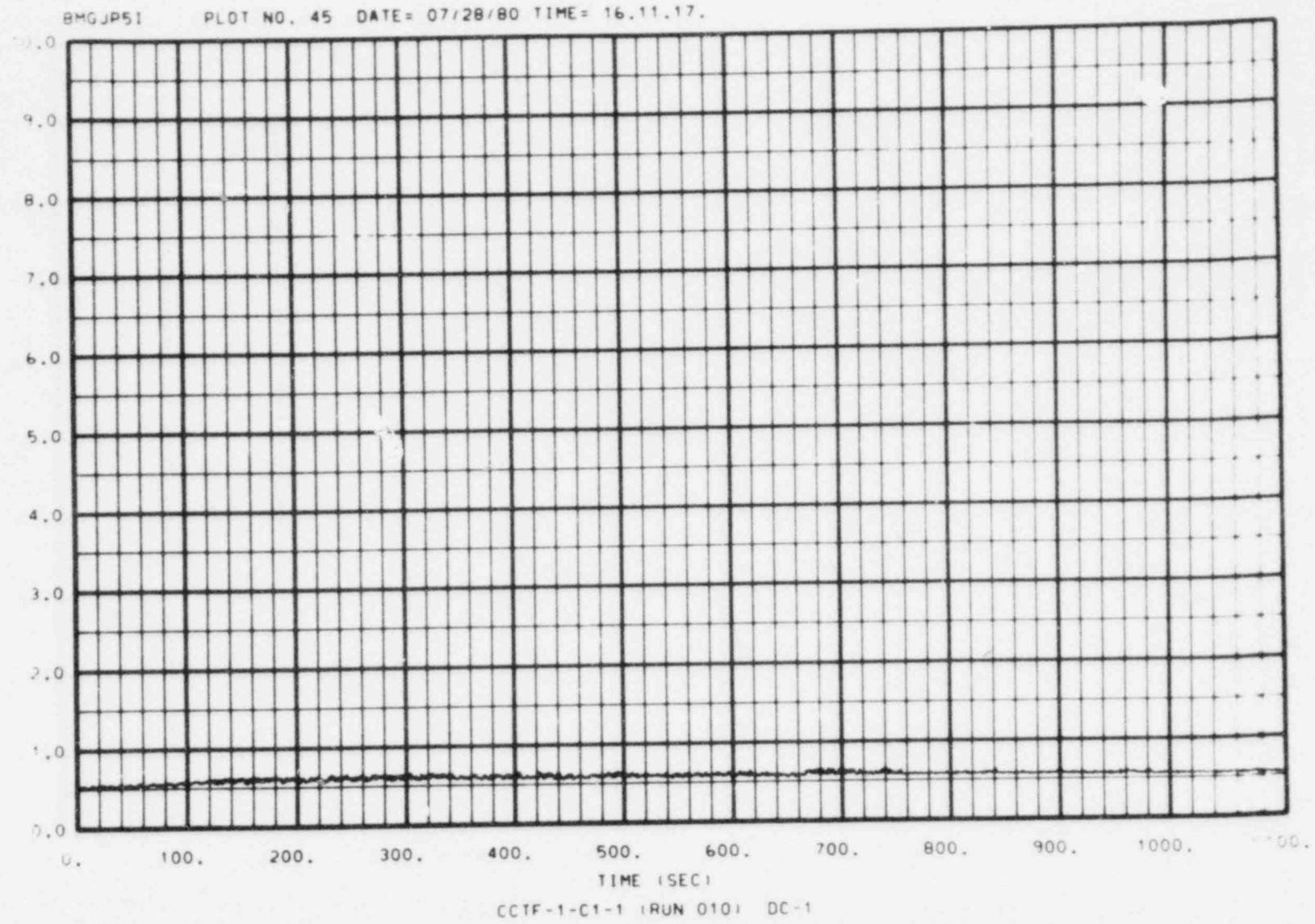

BMGJP5I PLOT NO. 50 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

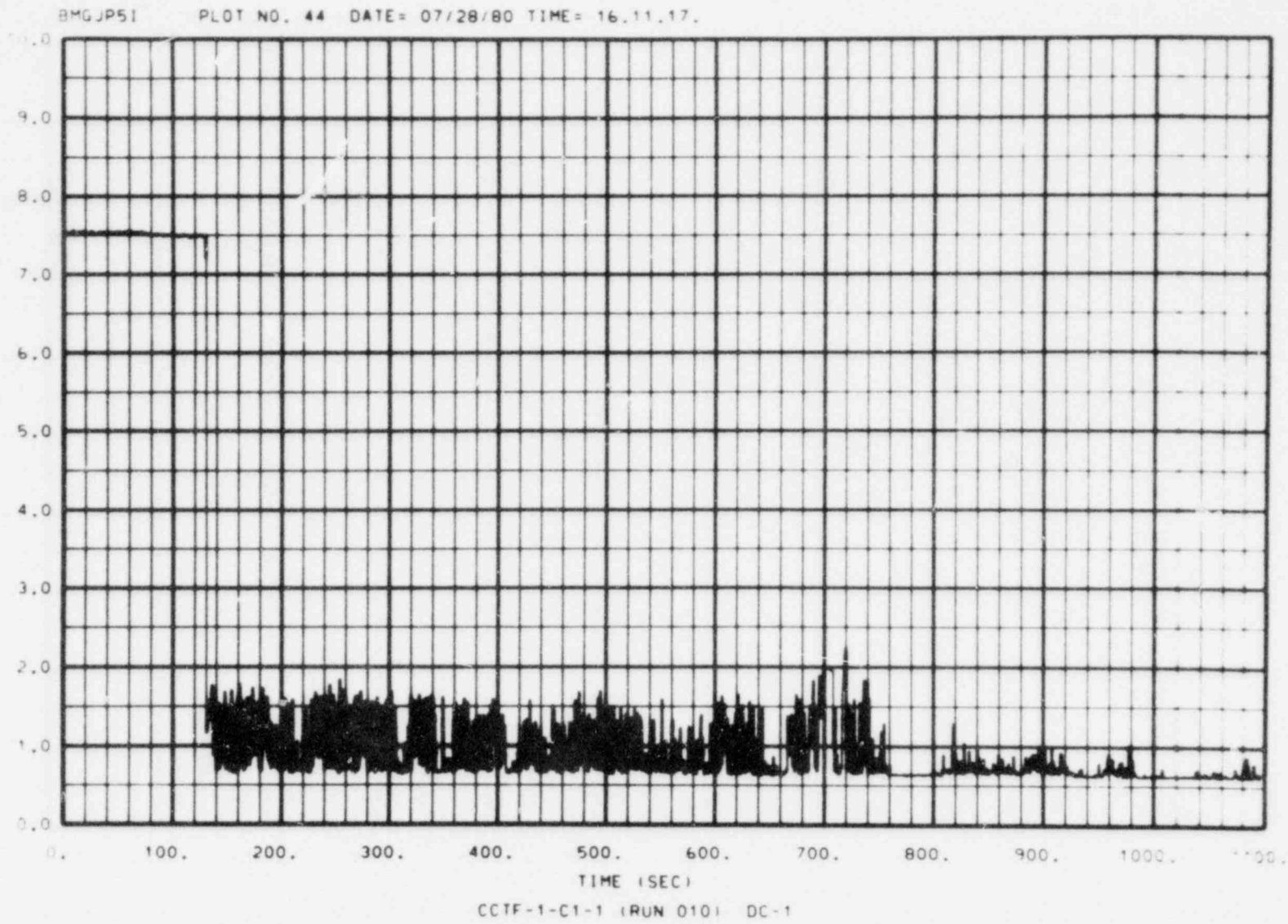

BMGJP51 PLOT NO. 49 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

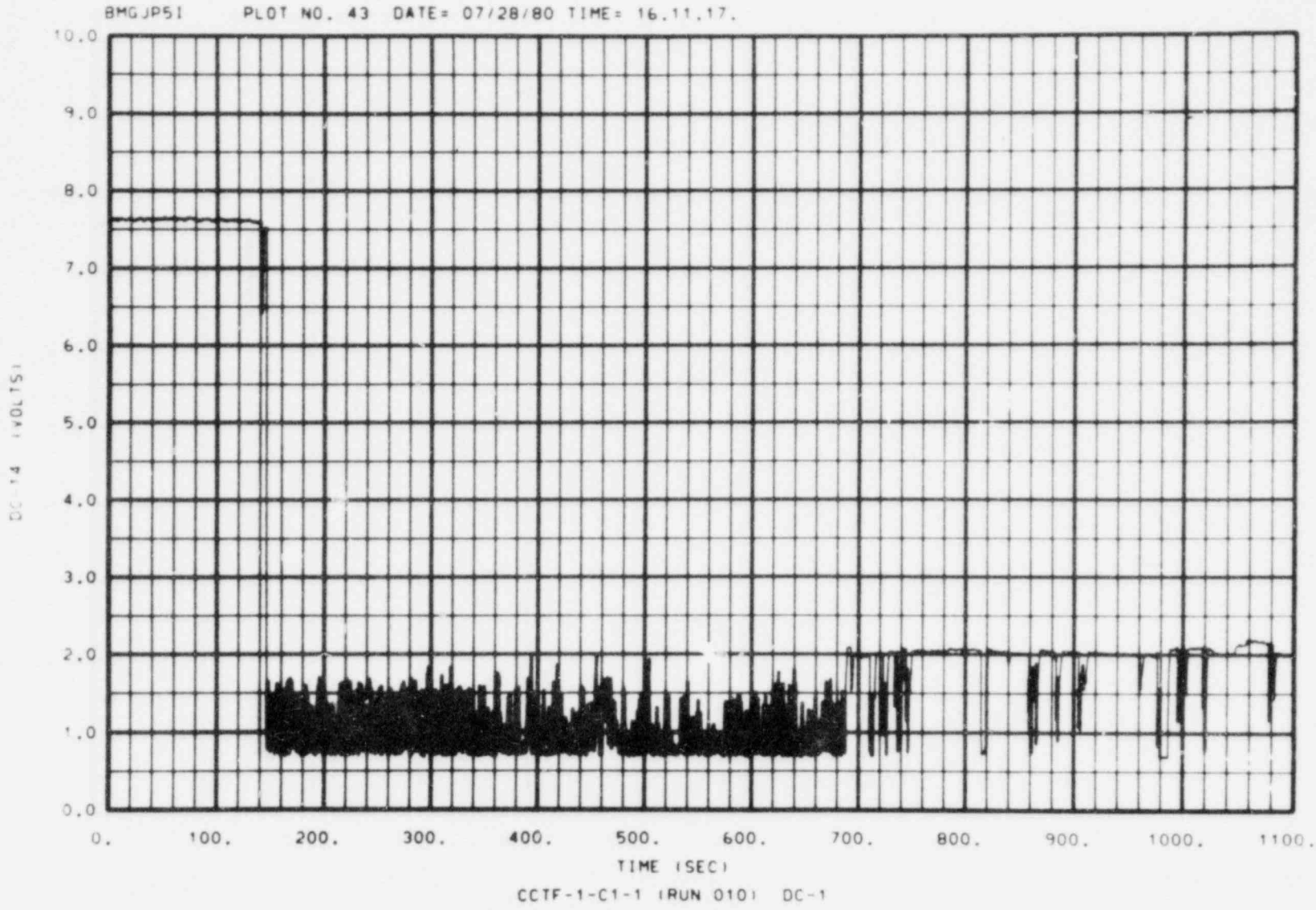

BMGJP51 PLOT NO. 48 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 310) DC-1

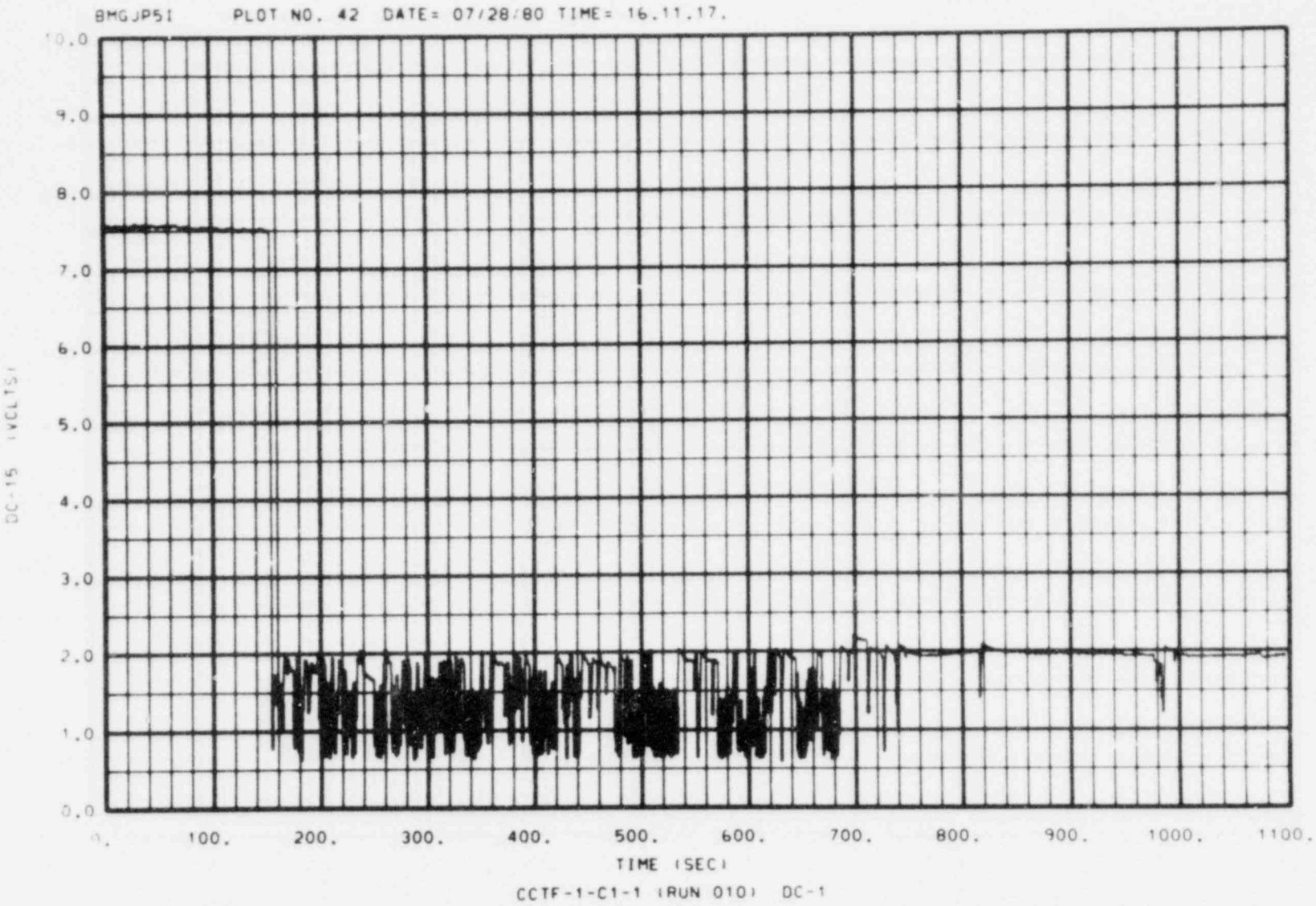

PLOT NO. 47 DATE= 07/28/80 TIME= 16.11.17.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

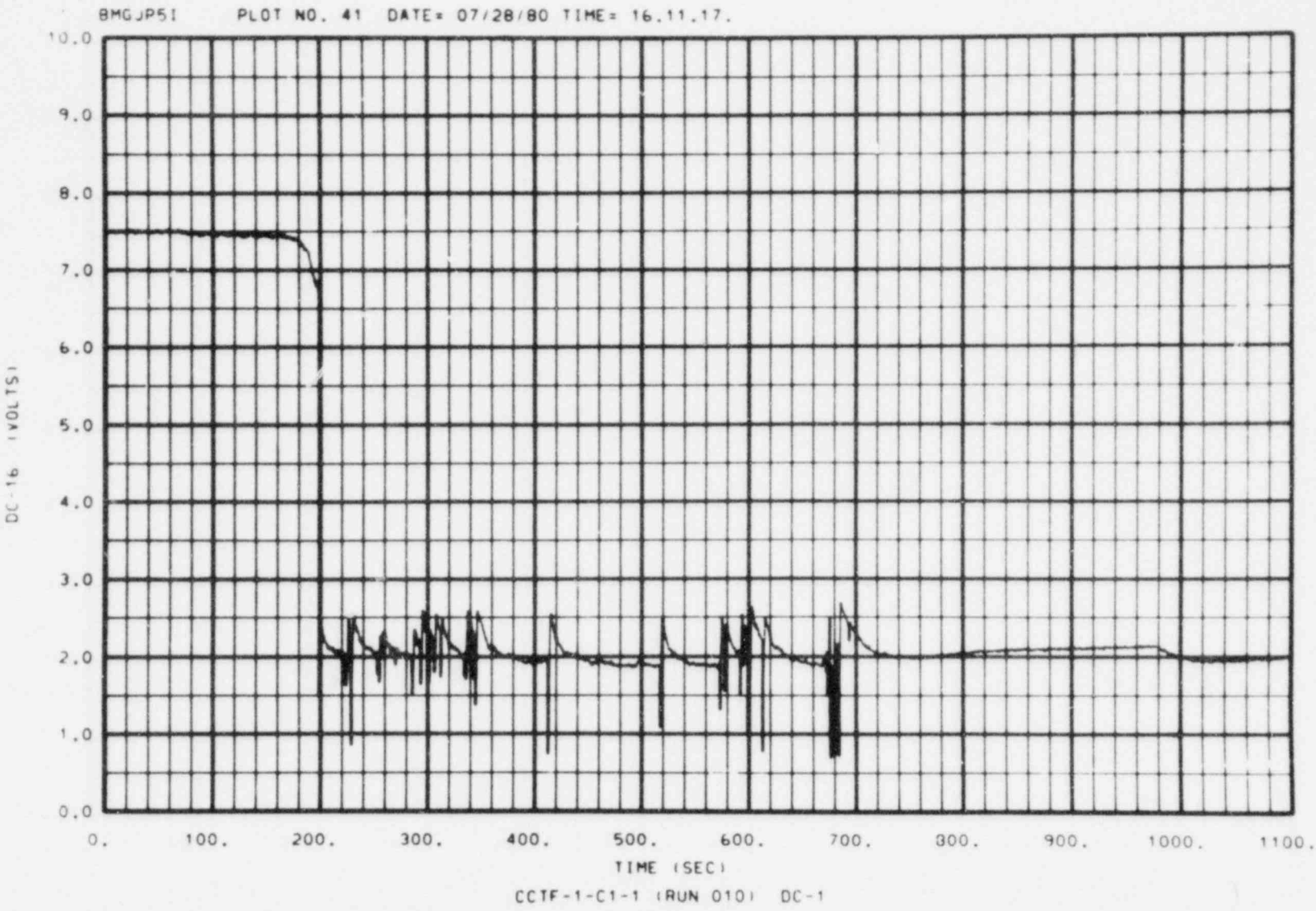

BMGJP5I PLOT NO. 46 DATE= 07/28/80 TIME= 16.11.17.
8.0
6.0
5.0
4.0
3.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

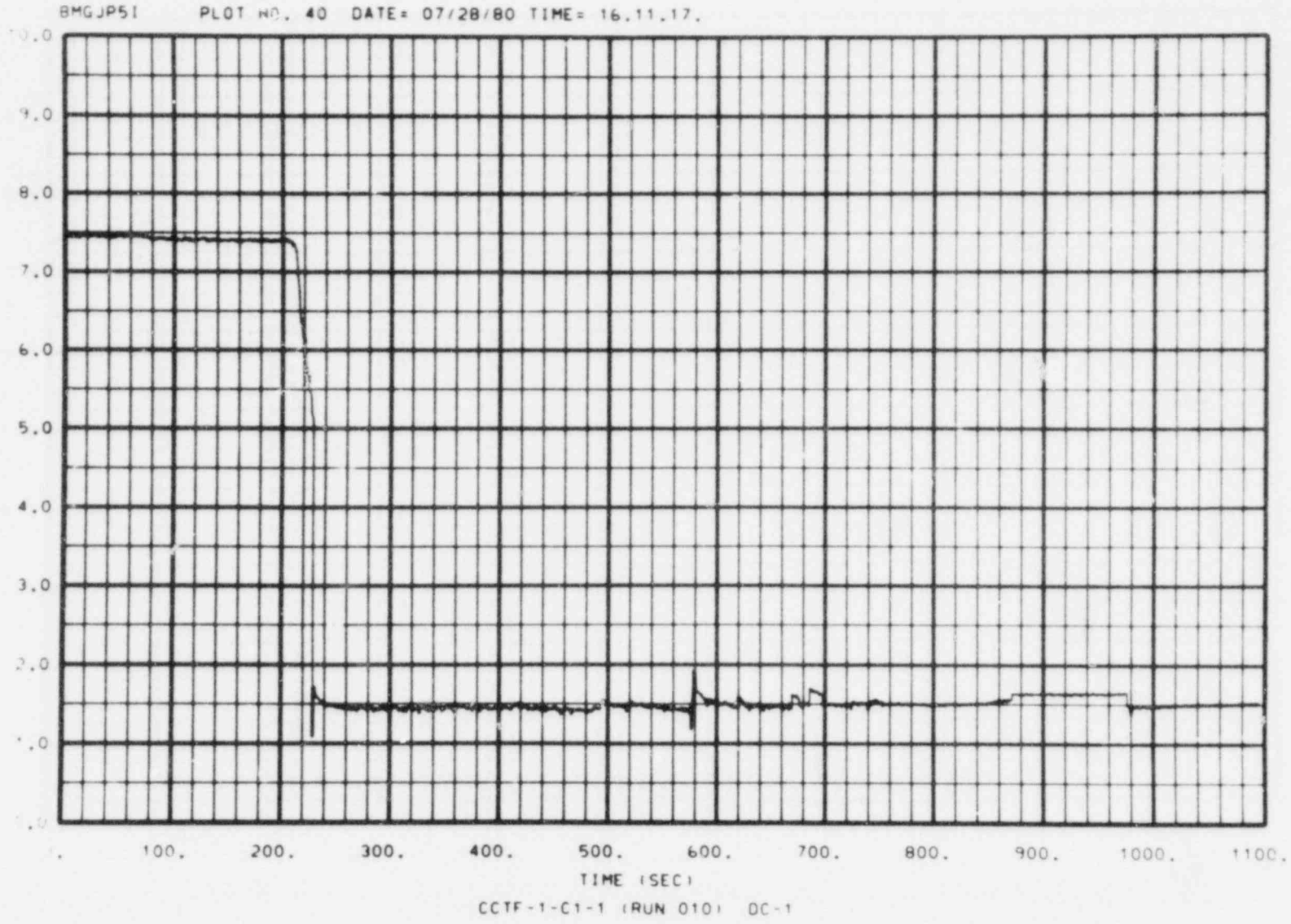

BMGJP51 PLOT NO. 45 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

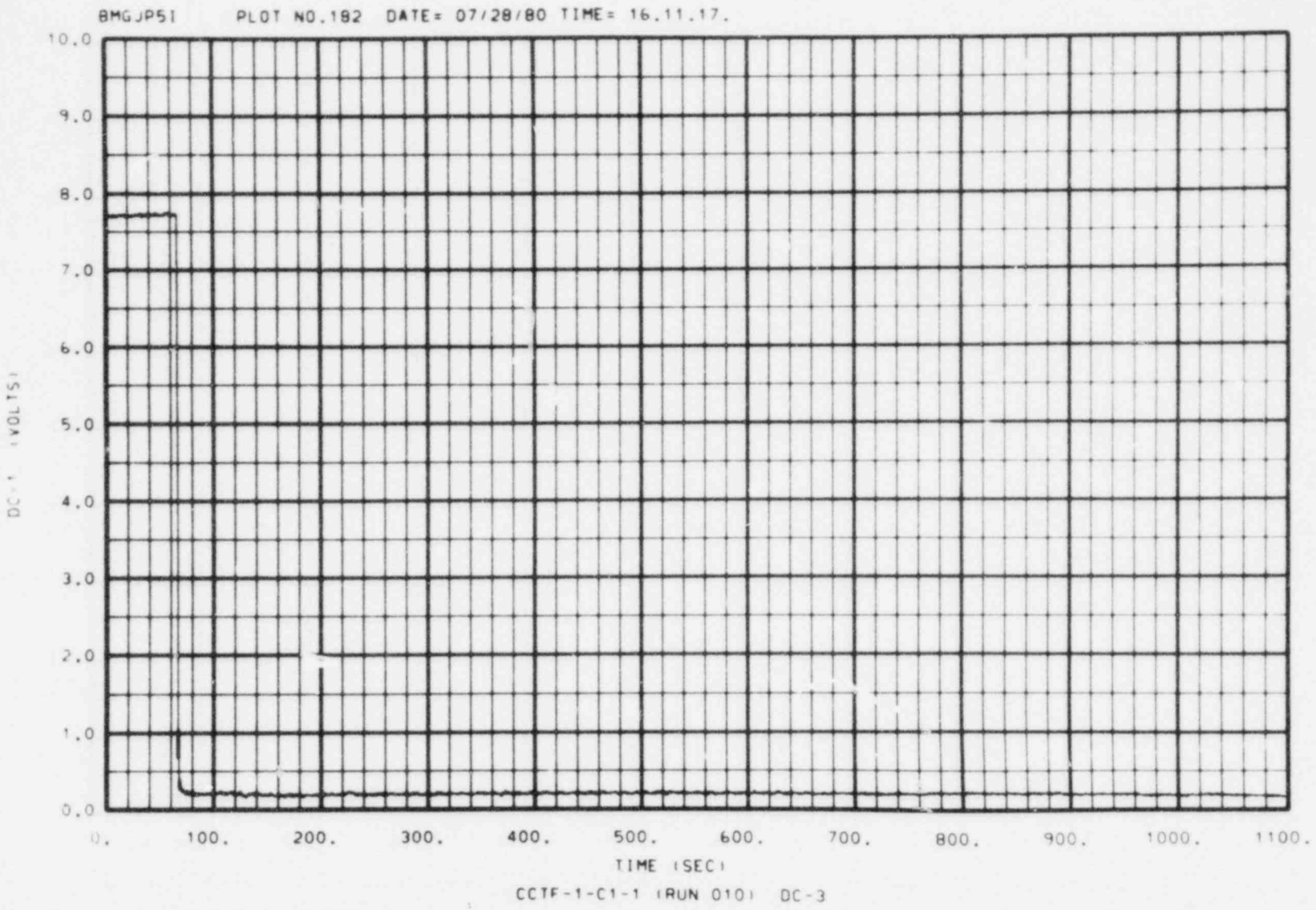

BMGJP51 PLOT NO. 44 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

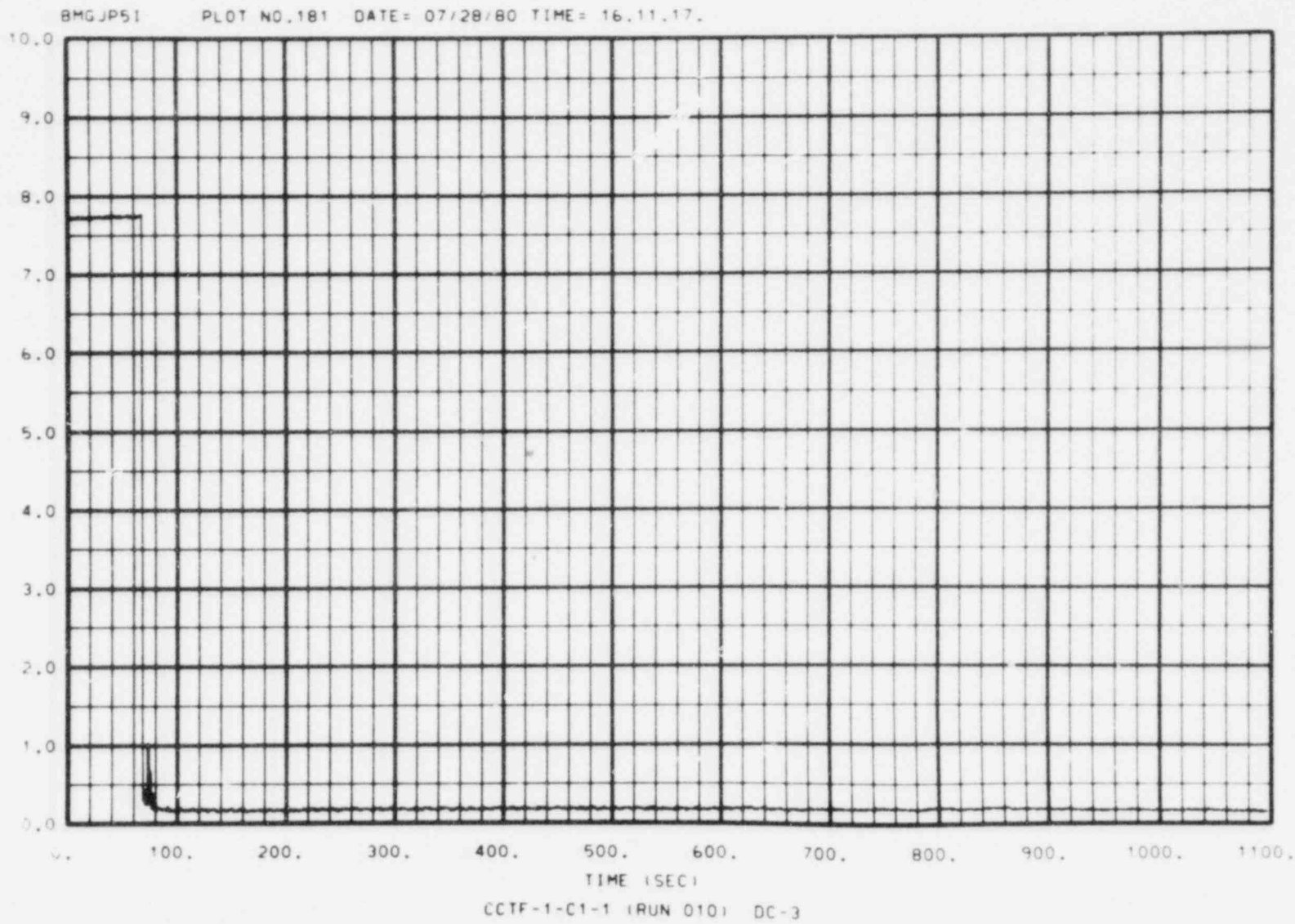

BMGJP51 PLOT NO. 43 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

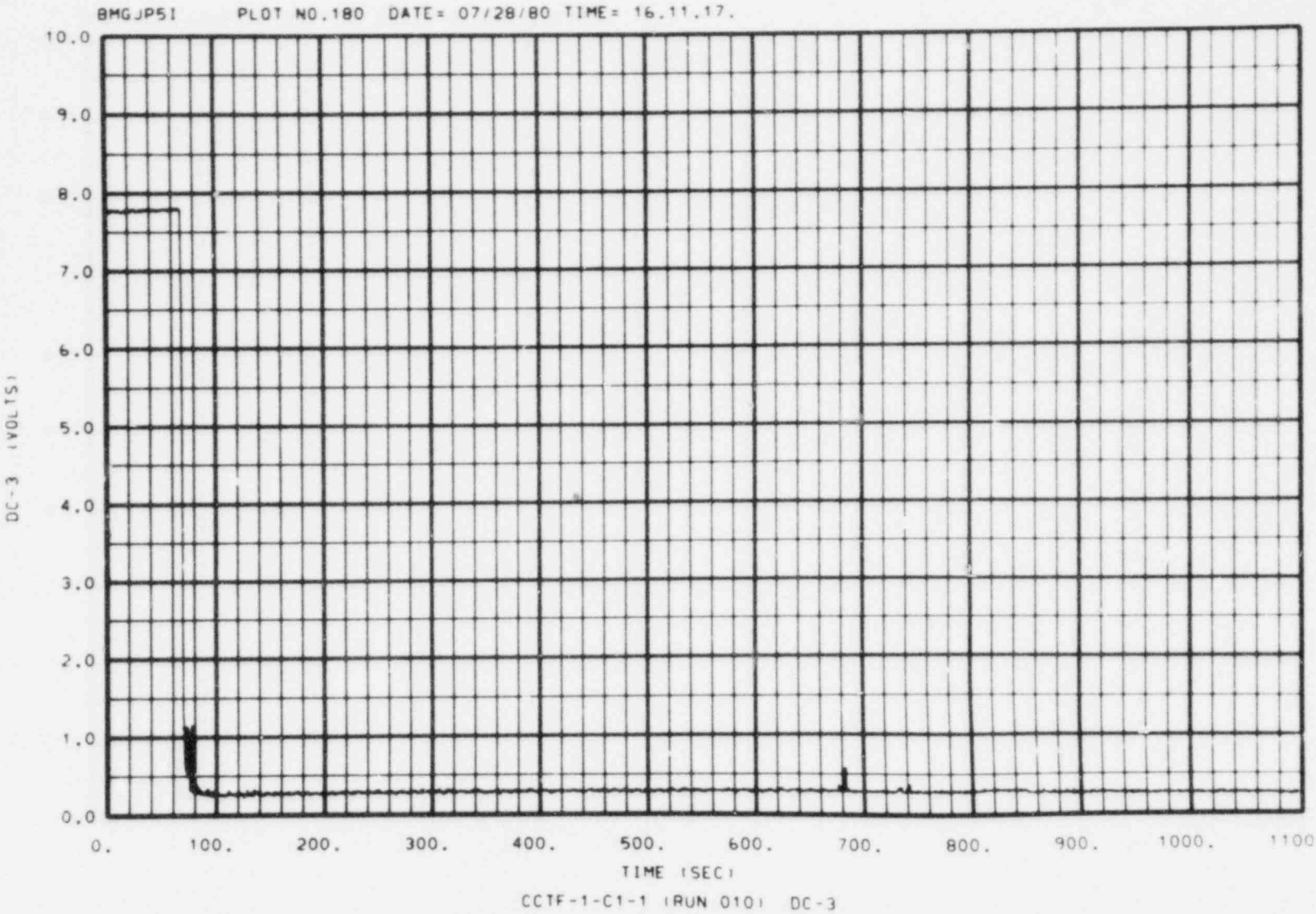

BMGJP51 PLOT NO. 42 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-15 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

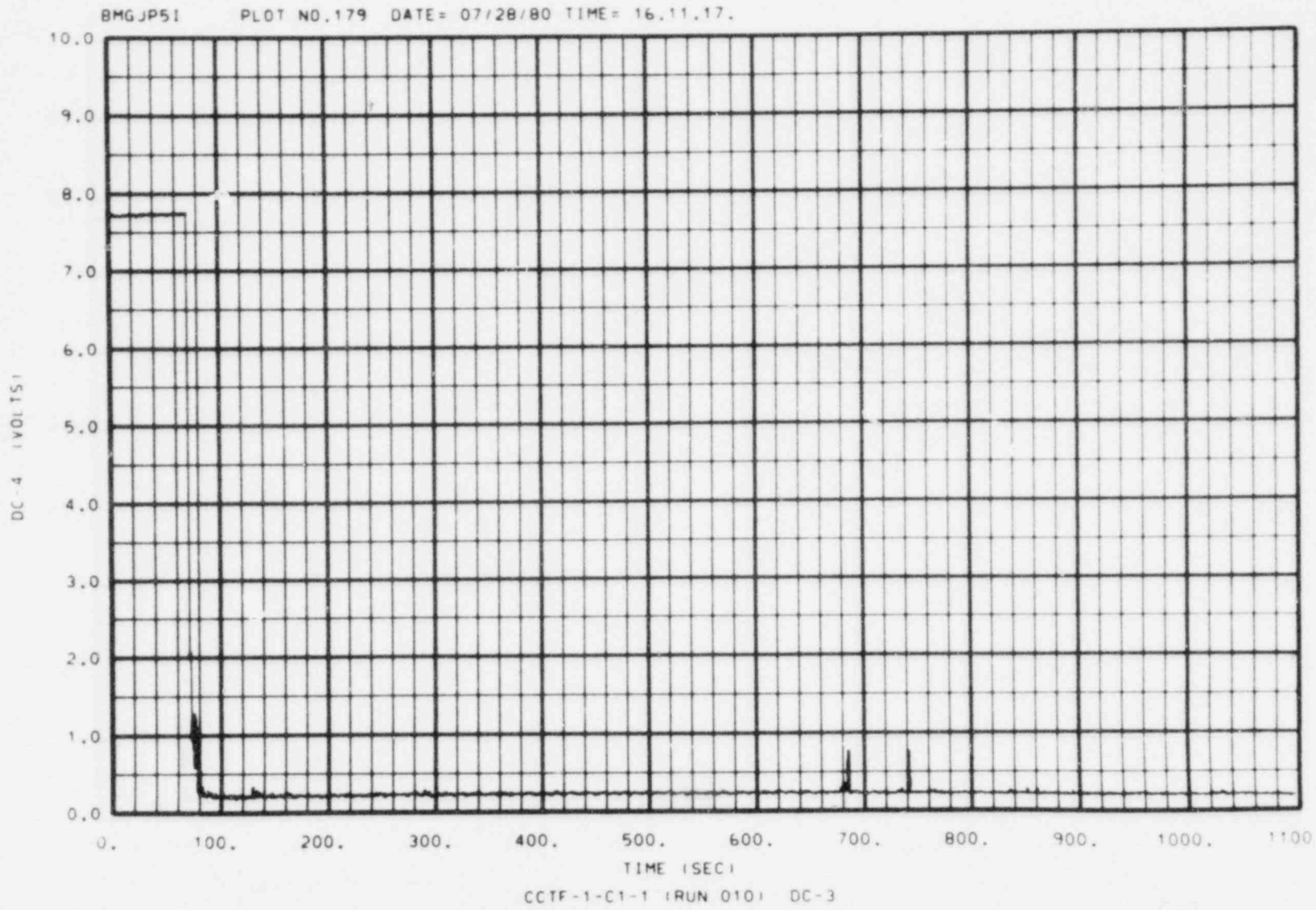

BMGJP5I PLOT NO. 41 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-1b (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

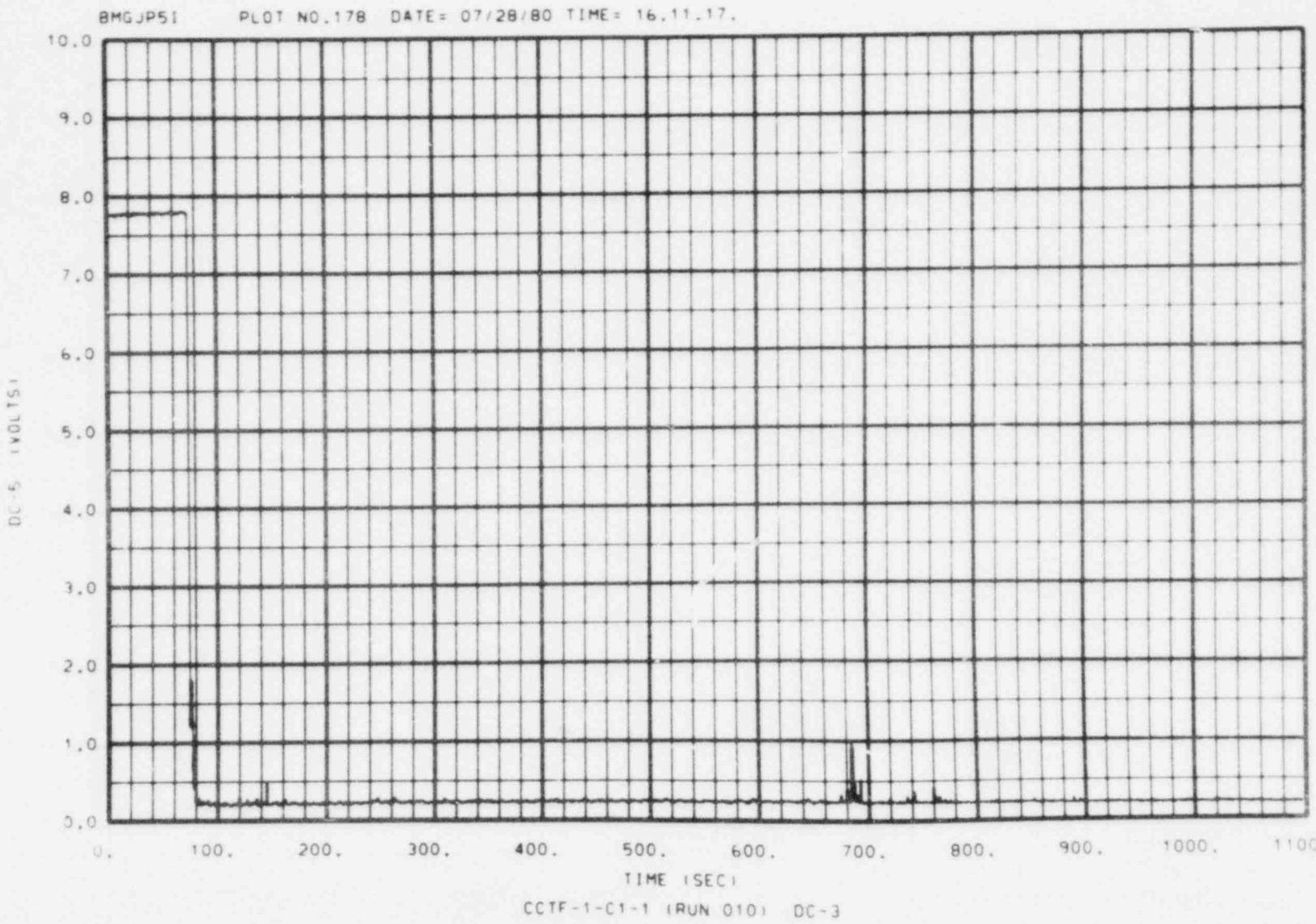

BMGJP5I PLOT NO. 40 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-1

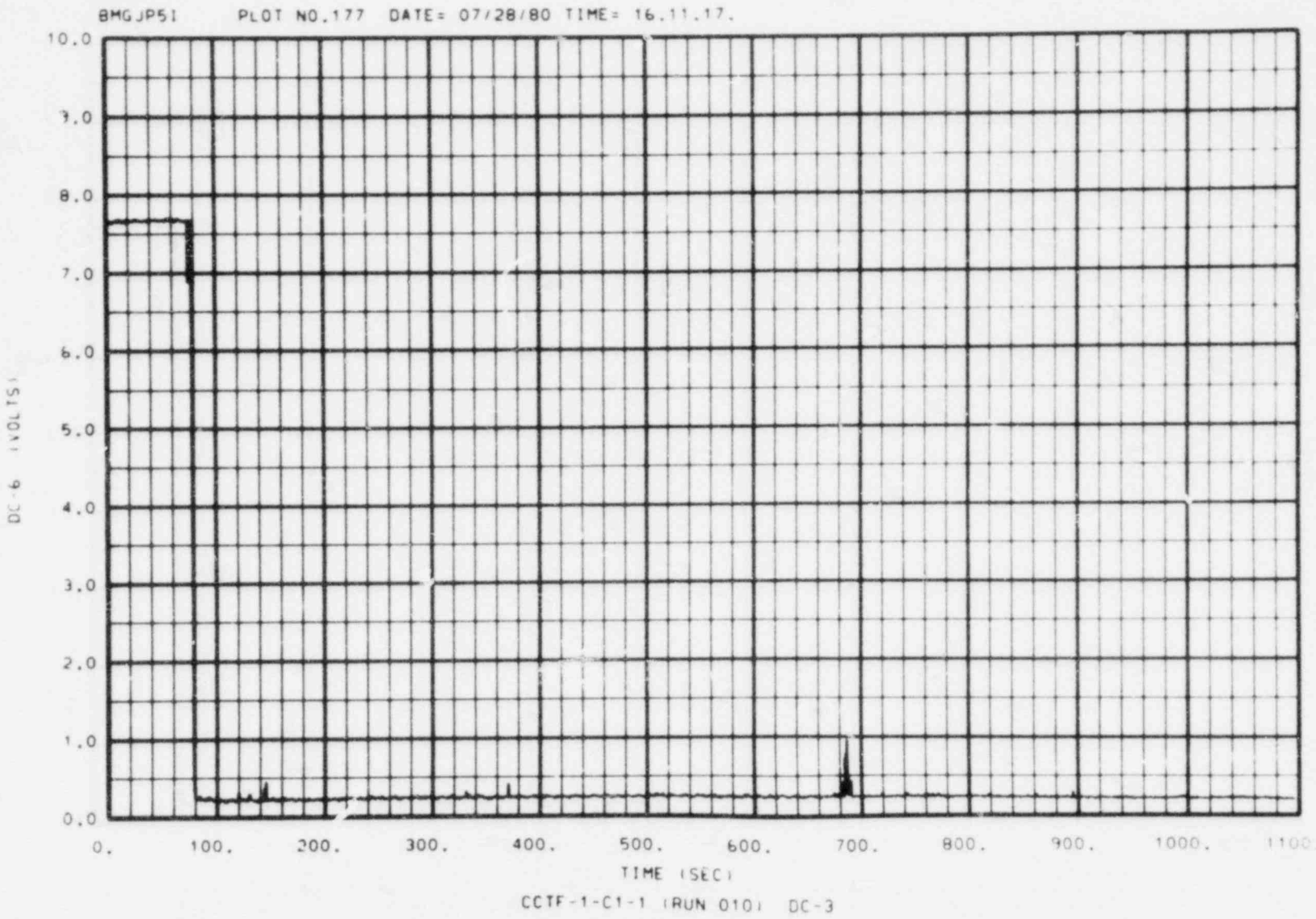

BMGJP51 PLOT NO.182 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

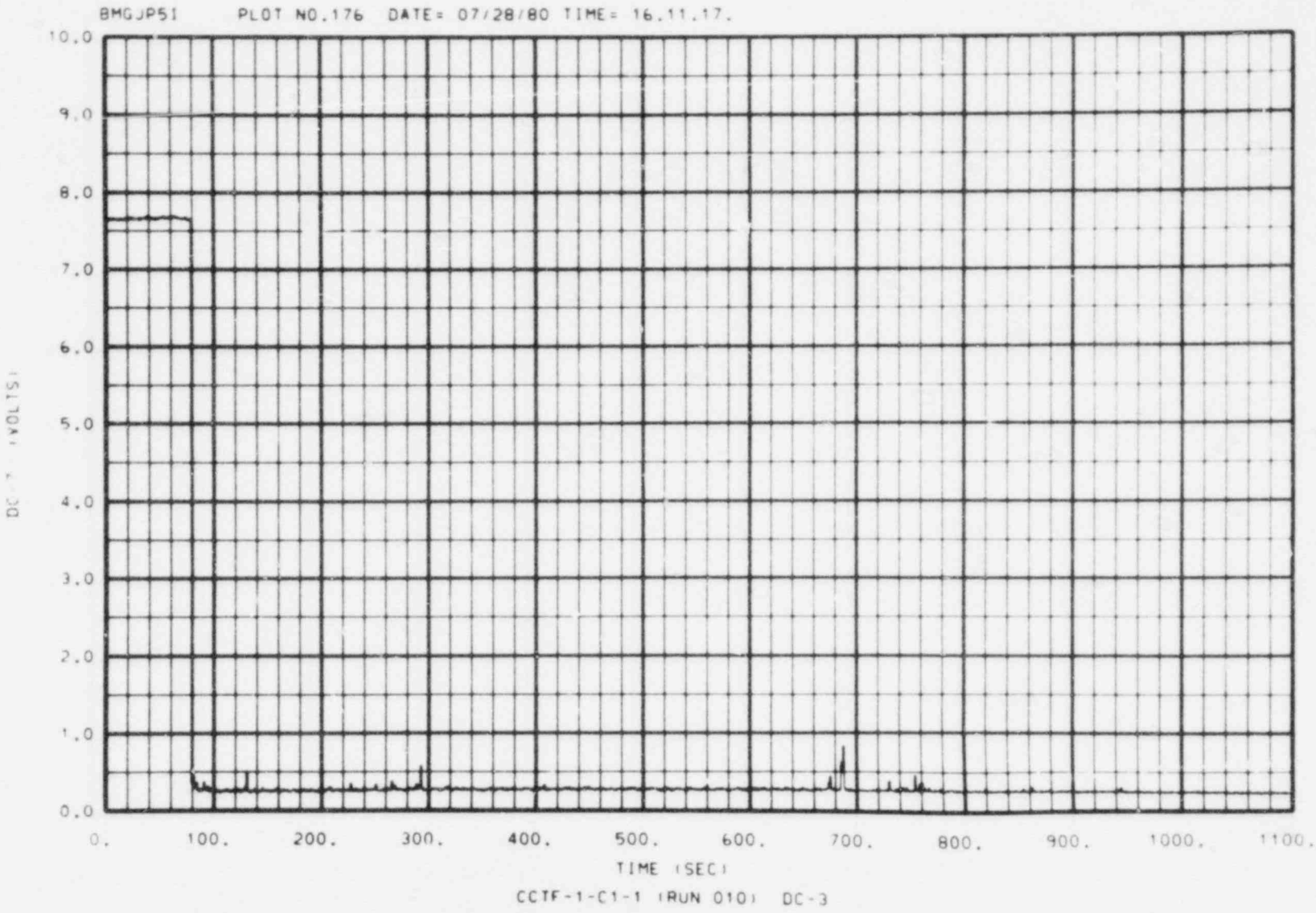

BMGJP51 PLOT NO.181 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

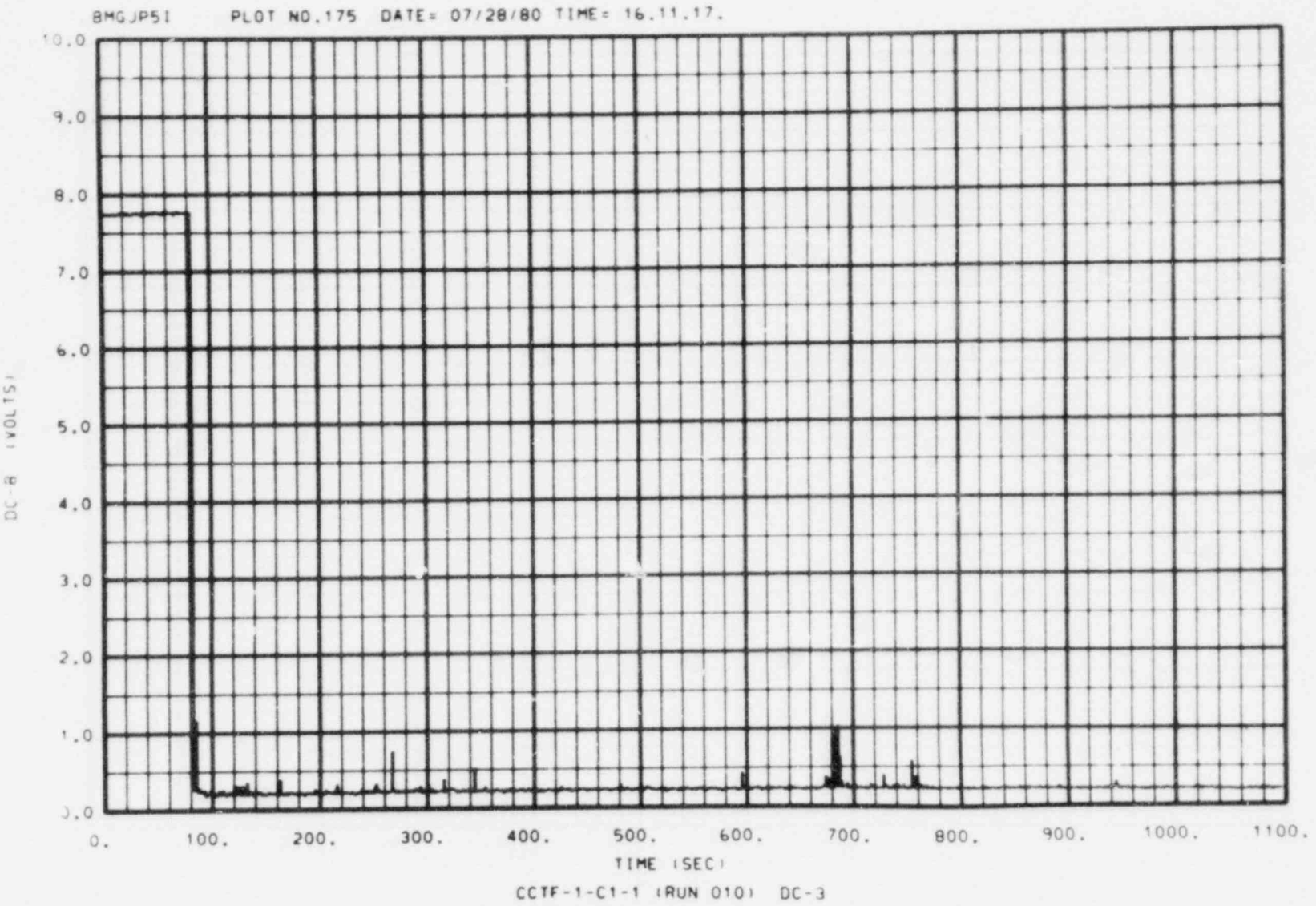

BMGJP5I PLOT NO.180 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-3 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

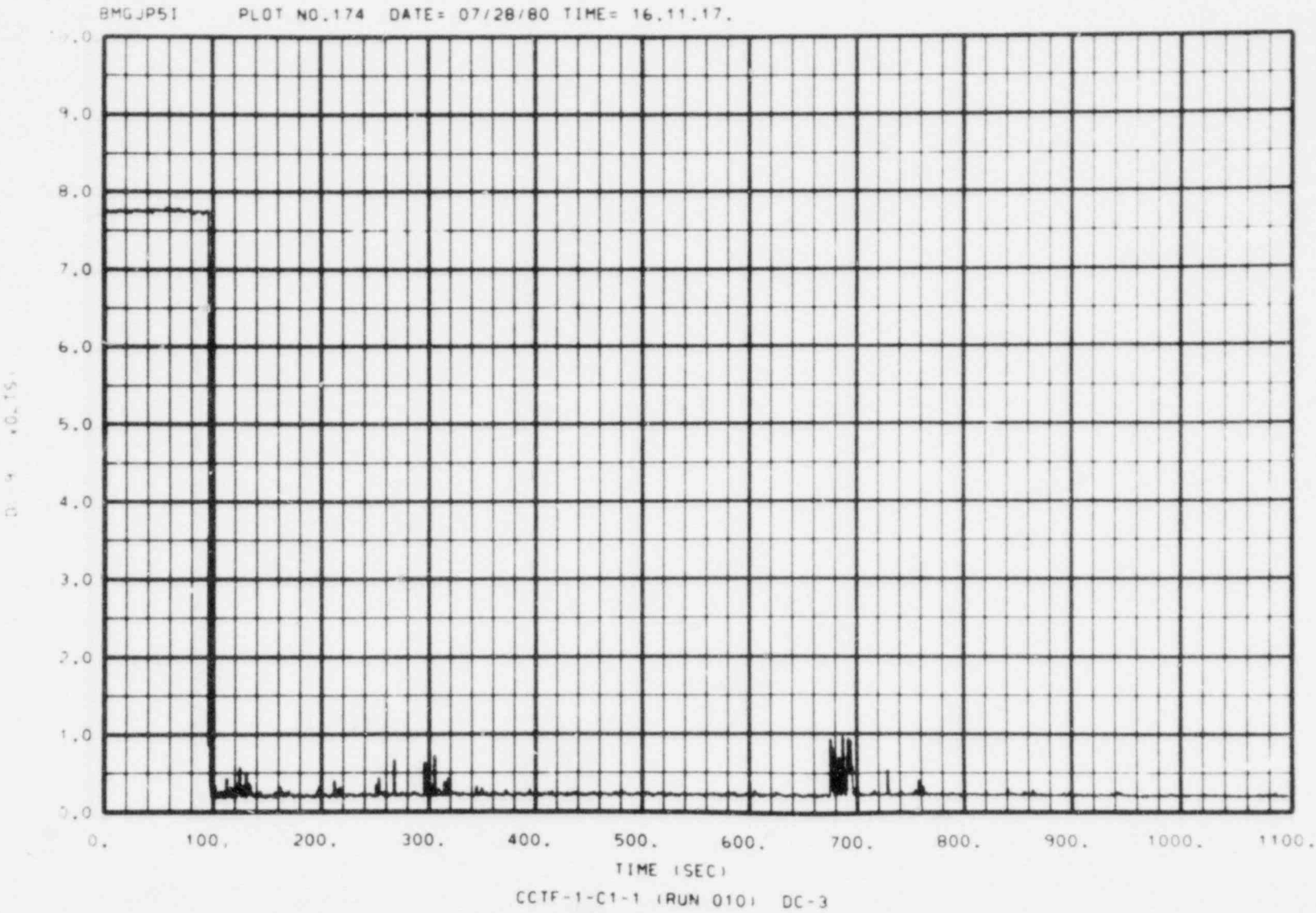

BMGJP51 PLOT NO.179 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-4 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

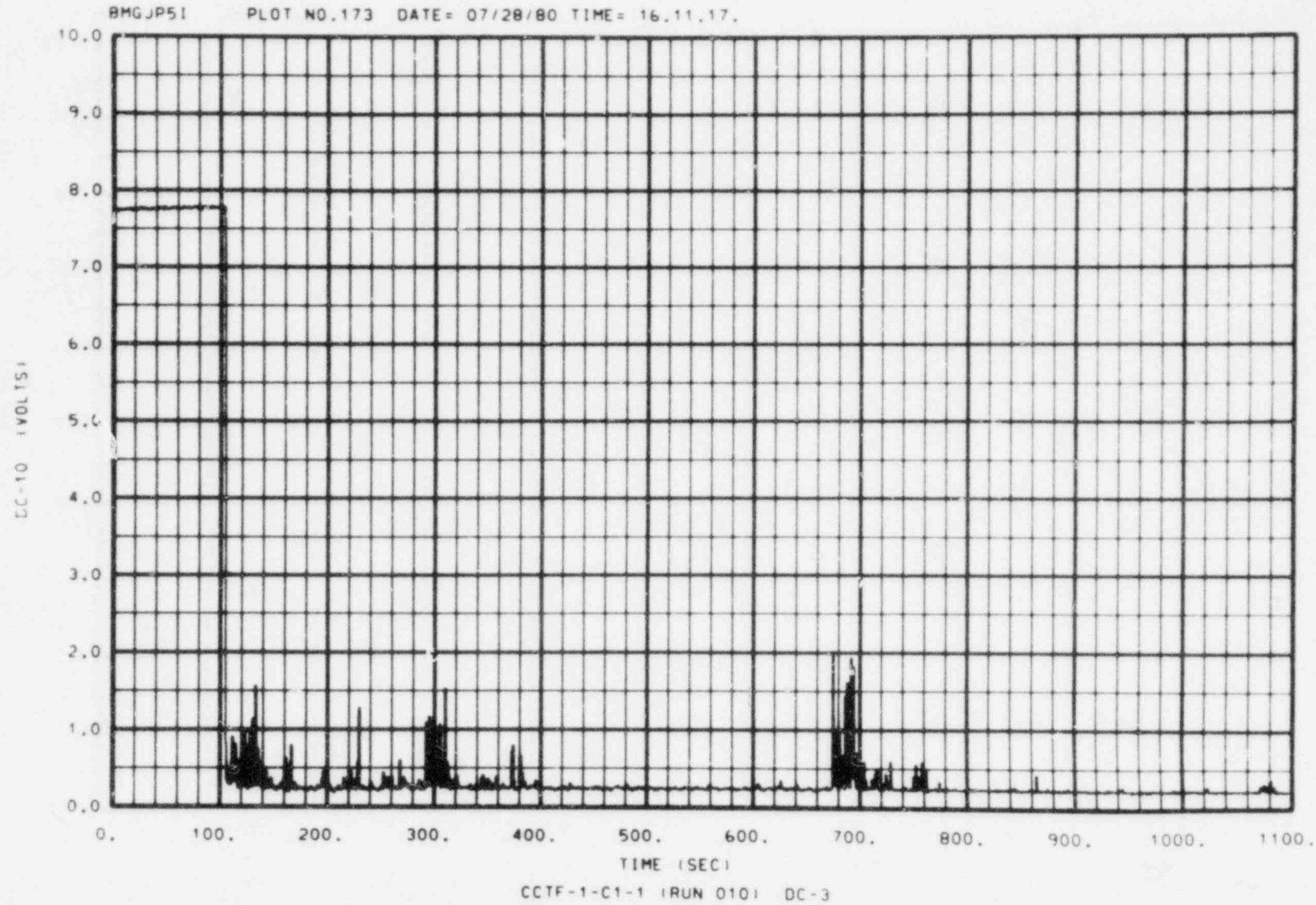

BMGJP51 PLOT NO.178 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-5 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

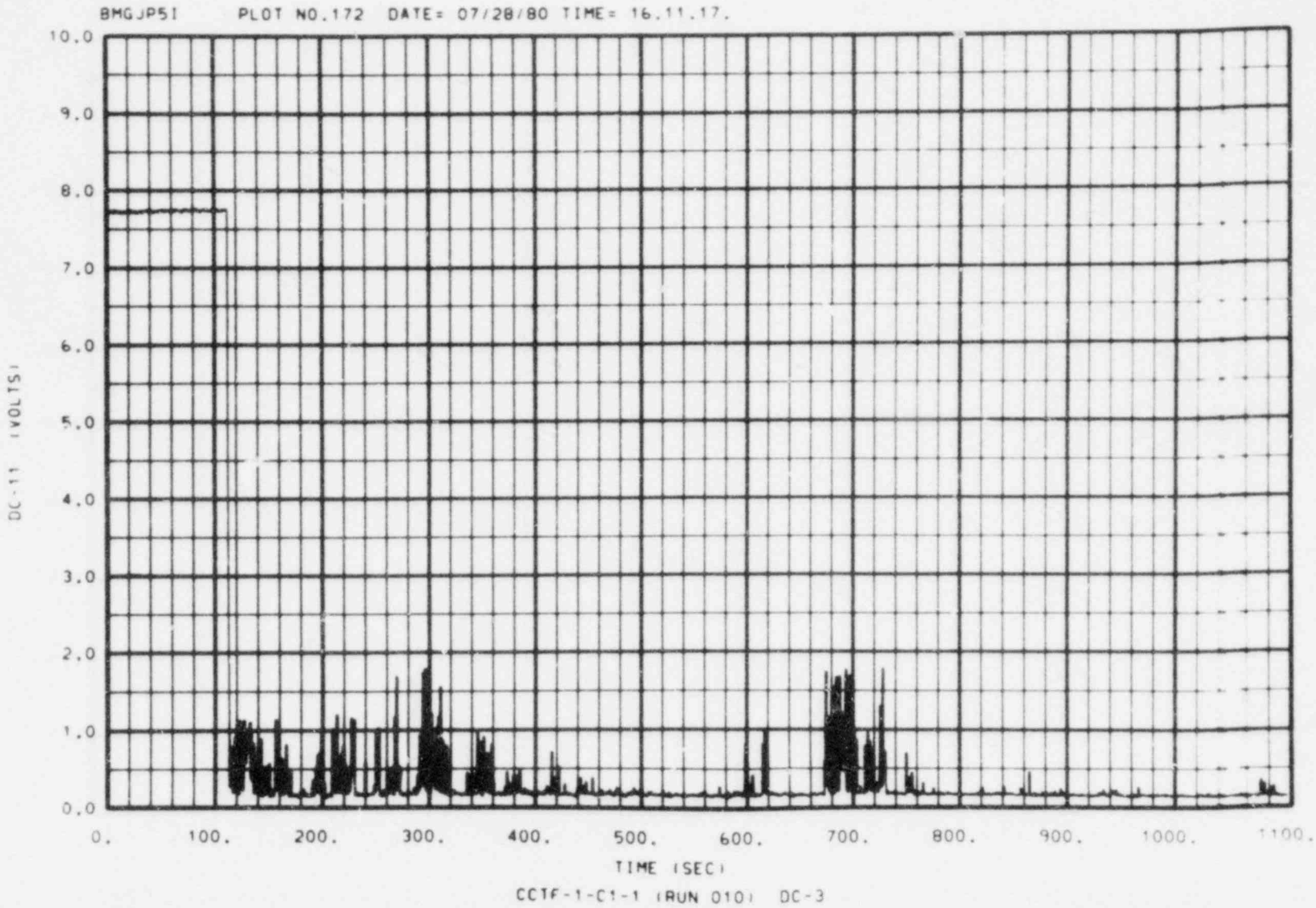

BMGJP5I PLOT NO.177 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-6 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

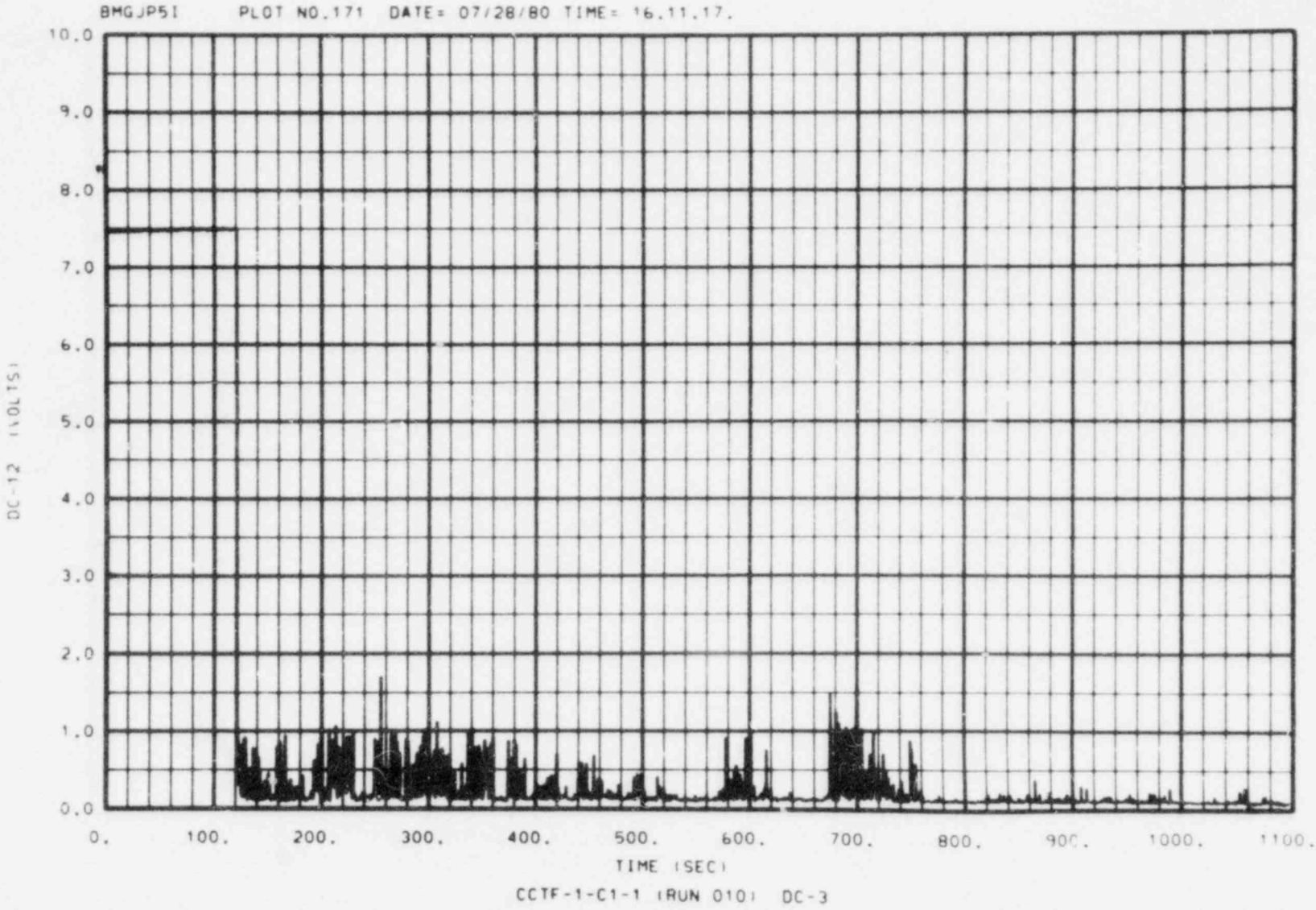

BMGJP5I PLOT NO.176 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

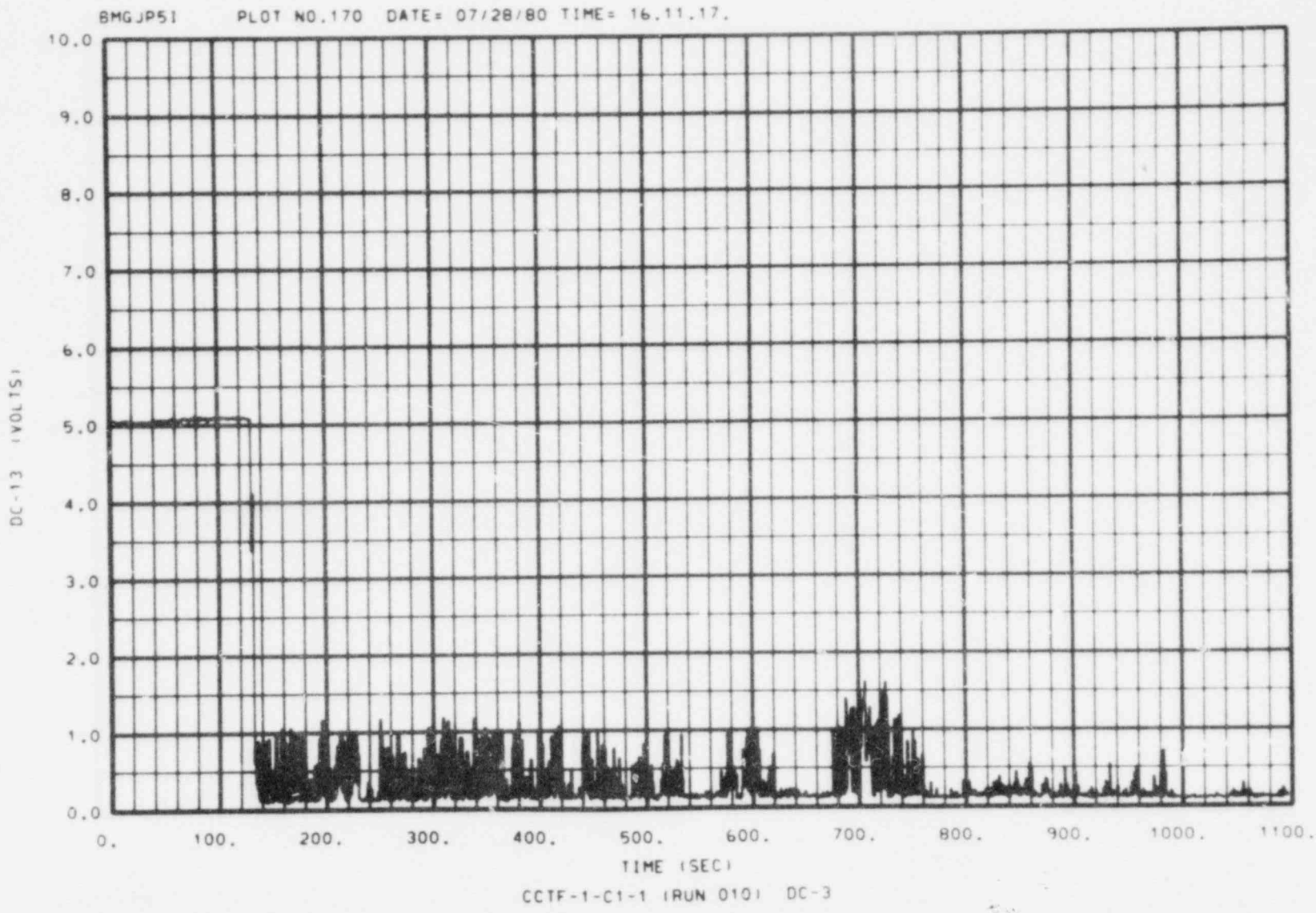

BMGJP51 PLOT NO.175 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-8 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

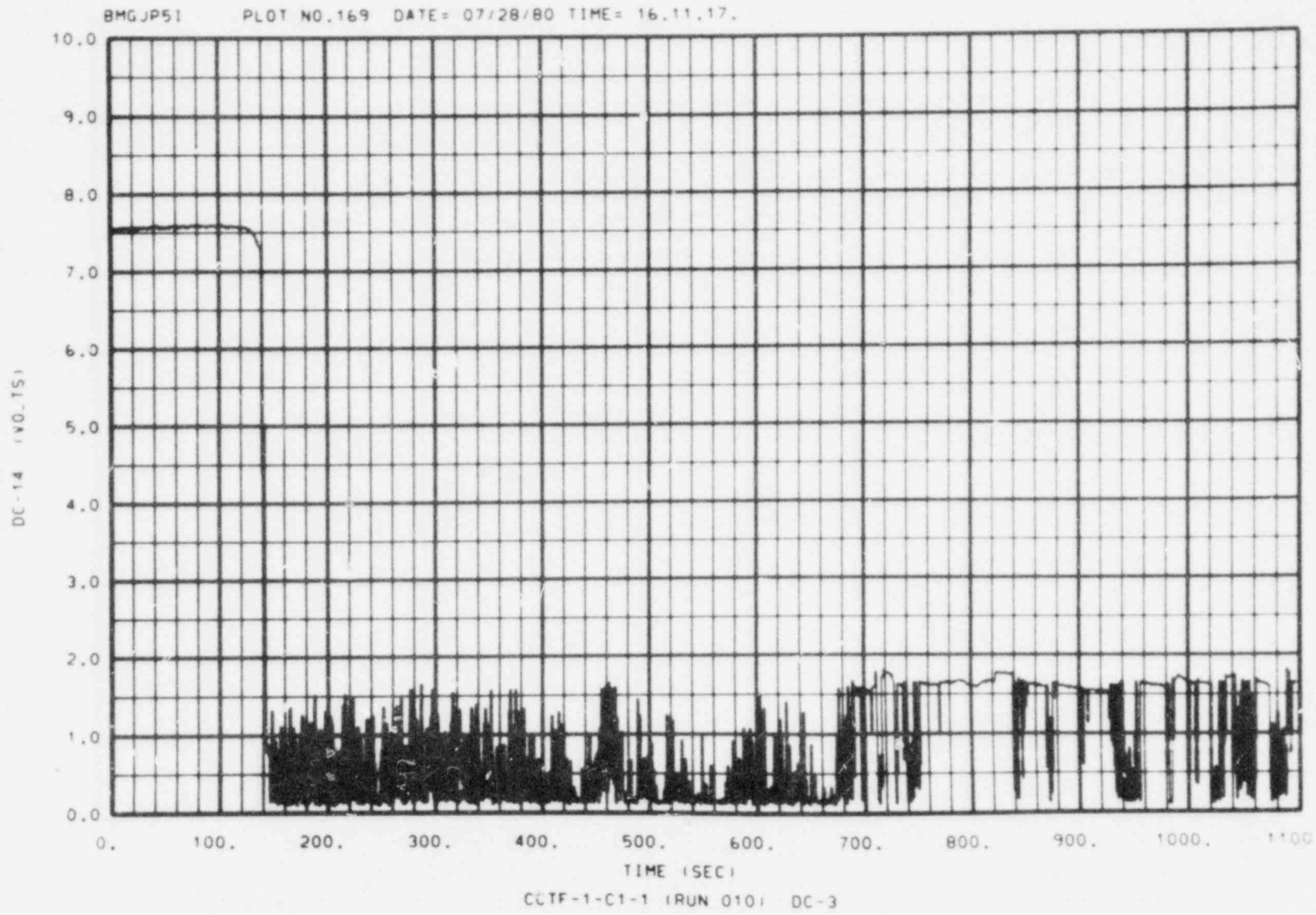

BMGJP5I PLOT NO.174 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

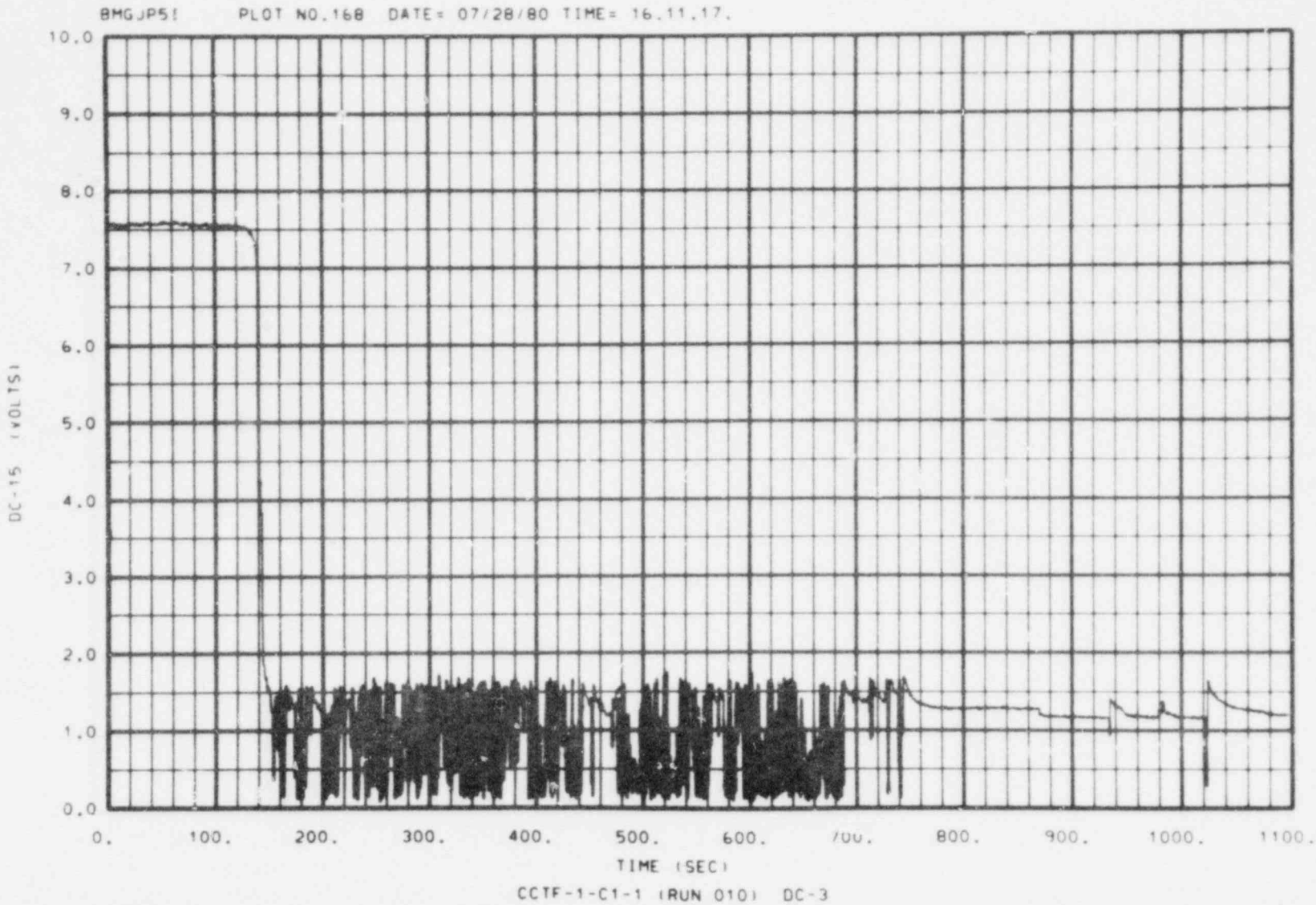

BMGJP5I PLOT NO.173 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-10 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

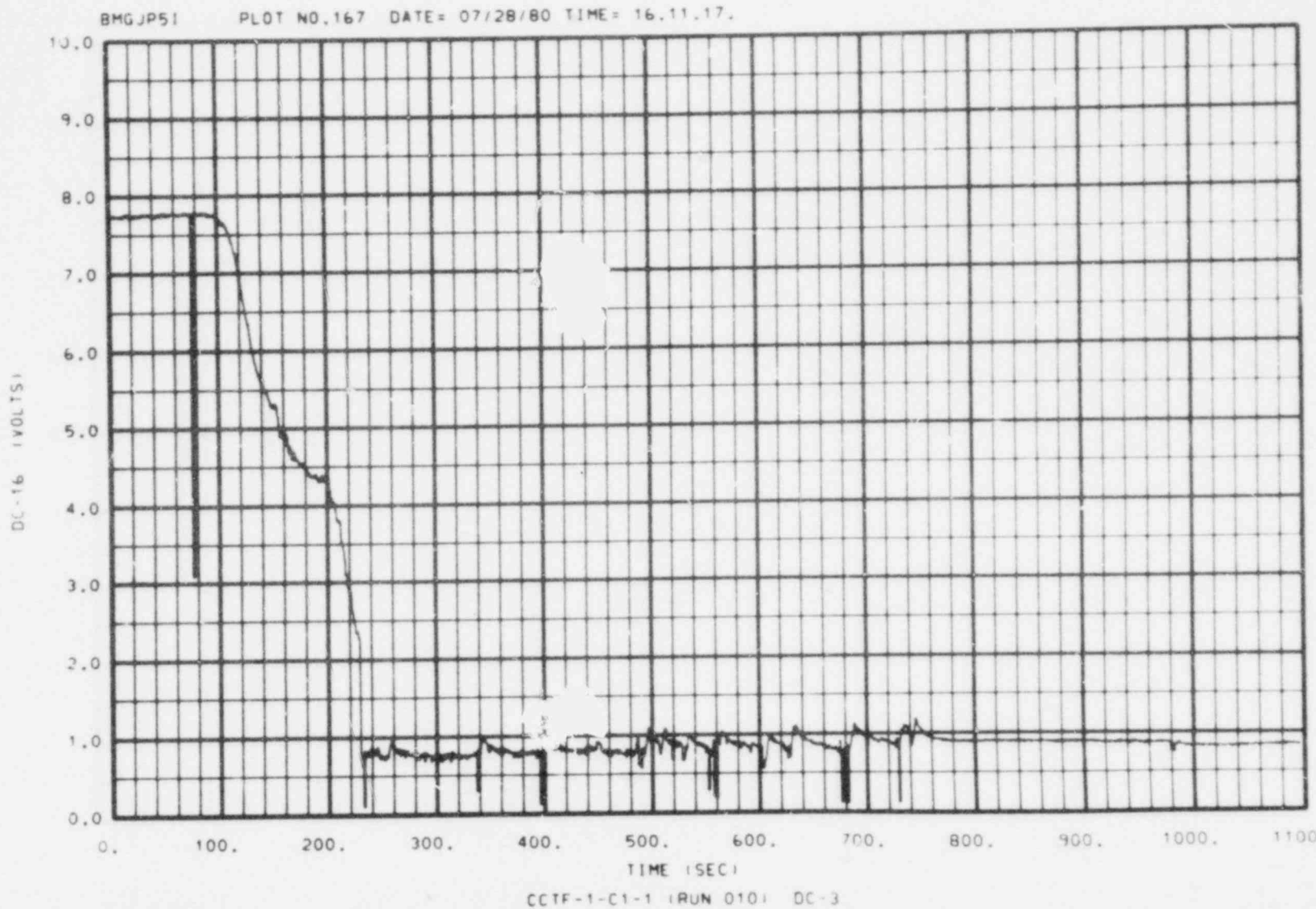

BMGJP5I PLOT NO.172 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-11 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

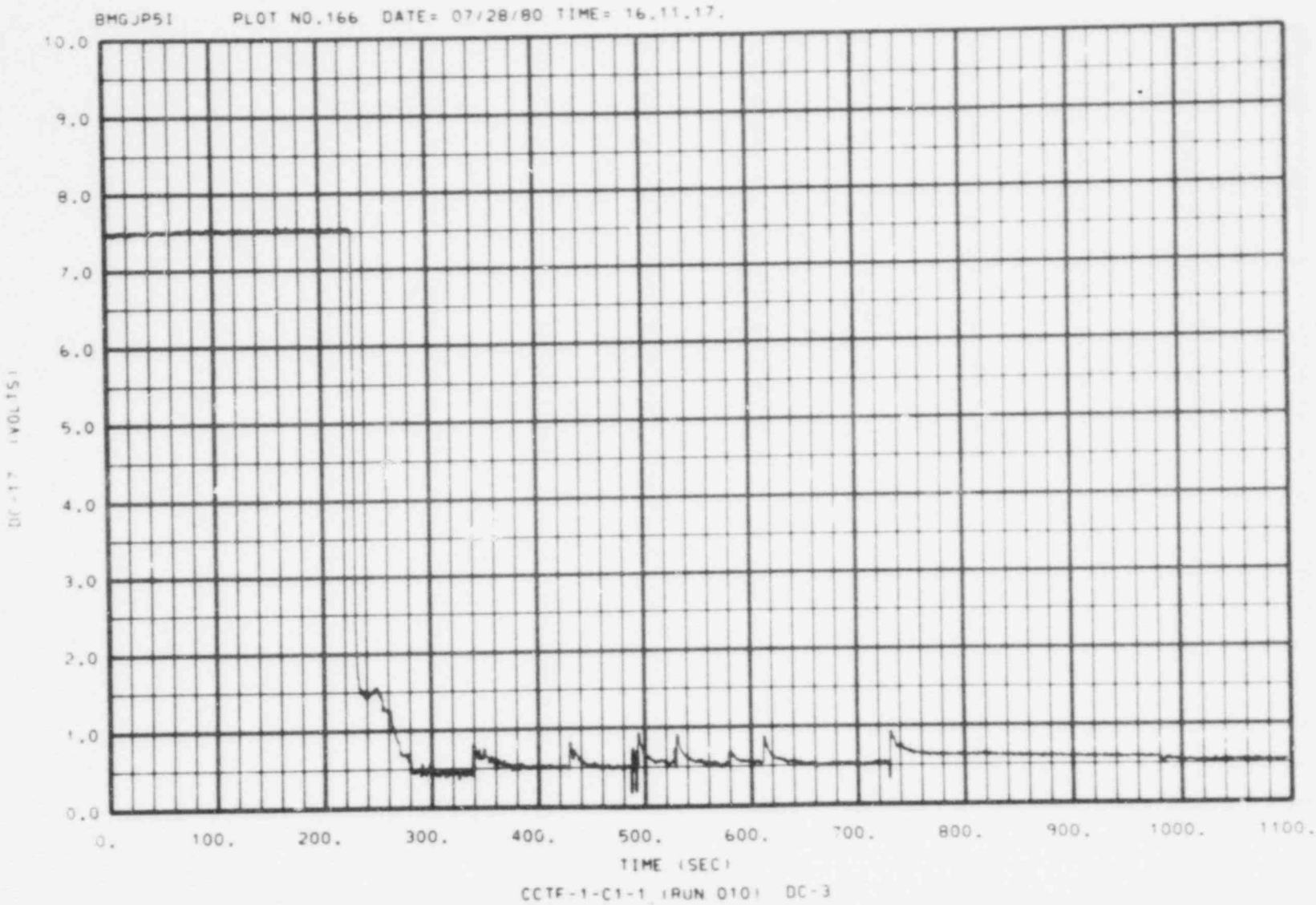

BMGJP5I PLOT NO.171 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-12 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

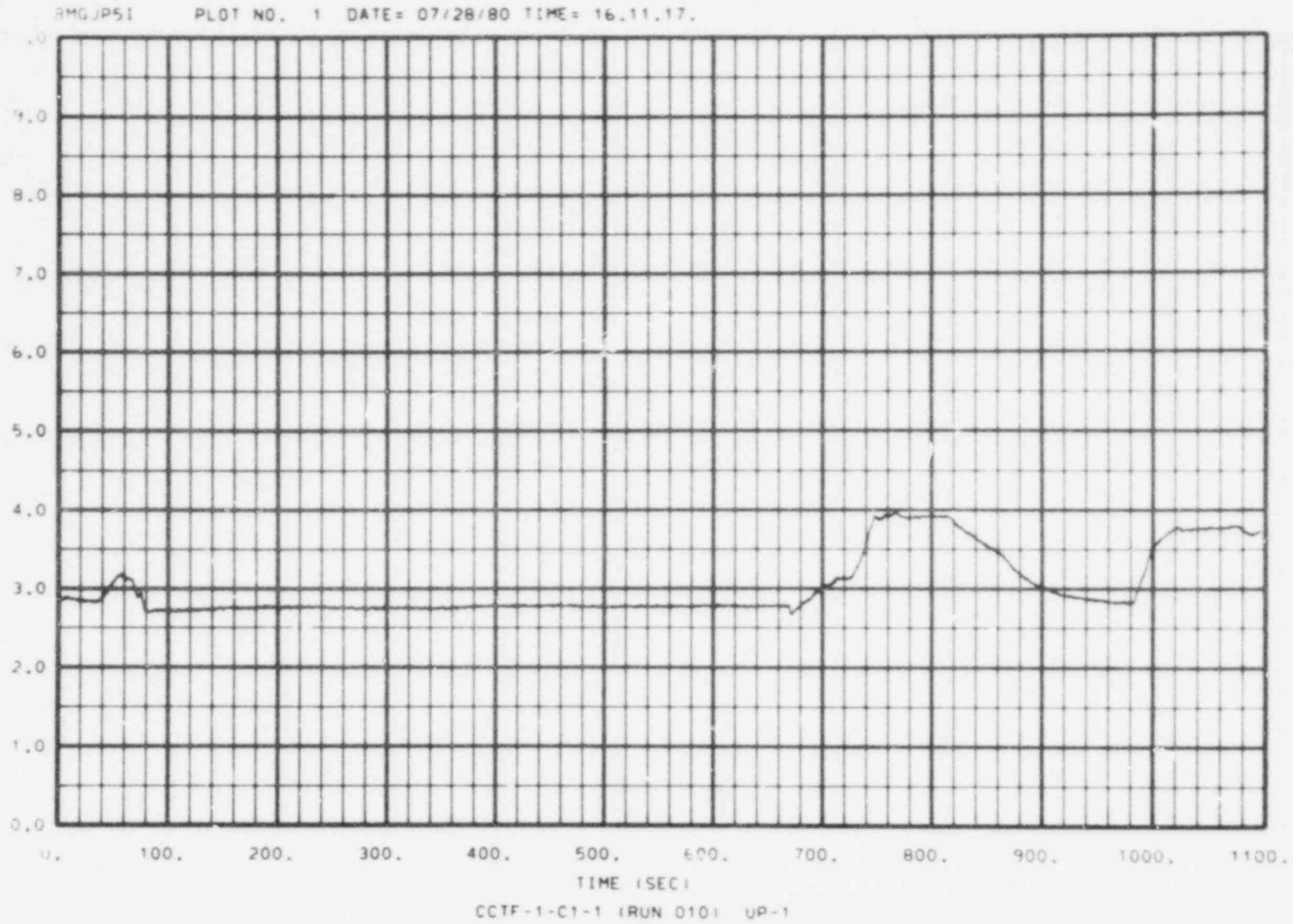

BMGJP51 PLOT NO.170 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-13 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

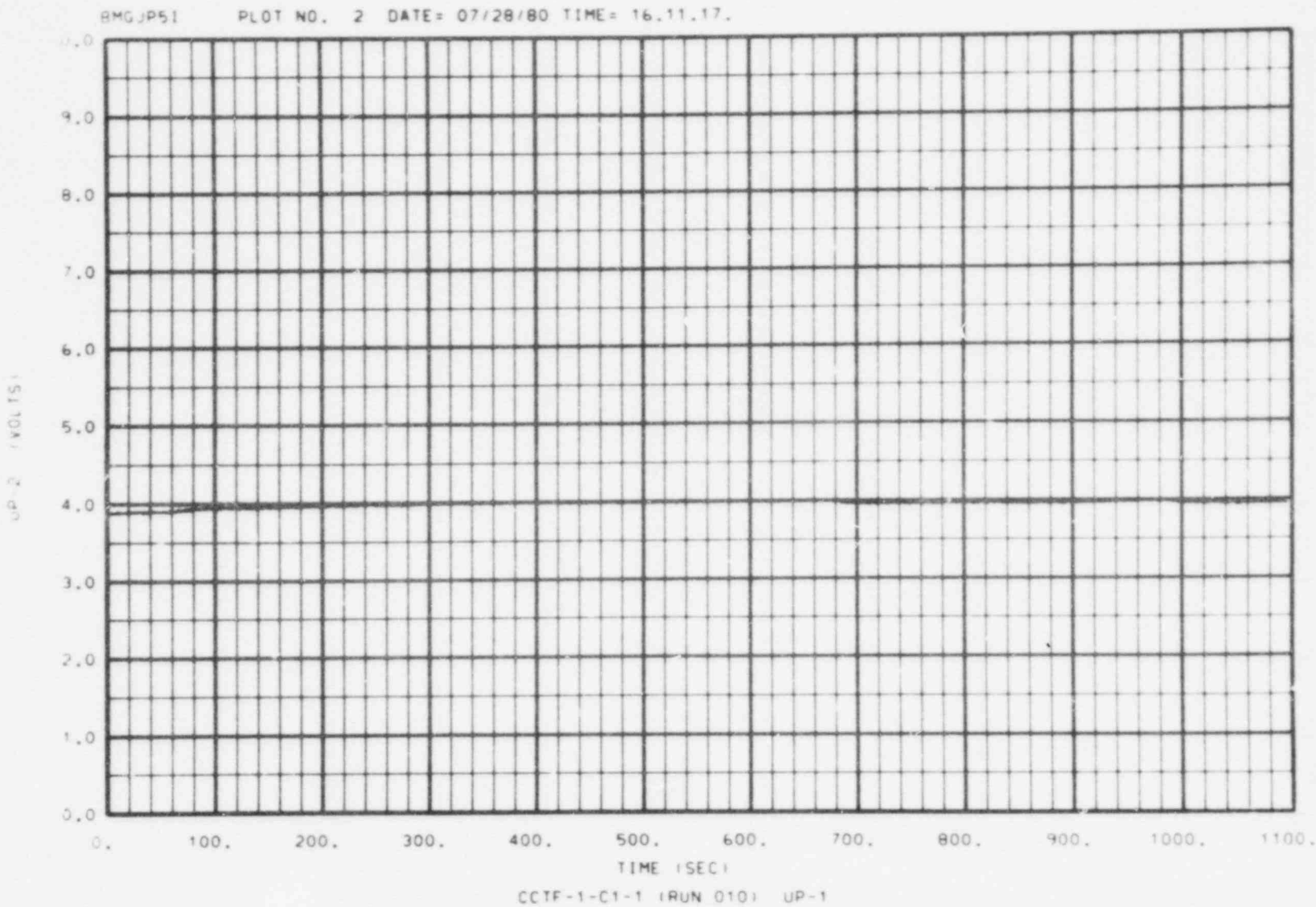

BMGJP51 PLOT NO.169 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-14 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

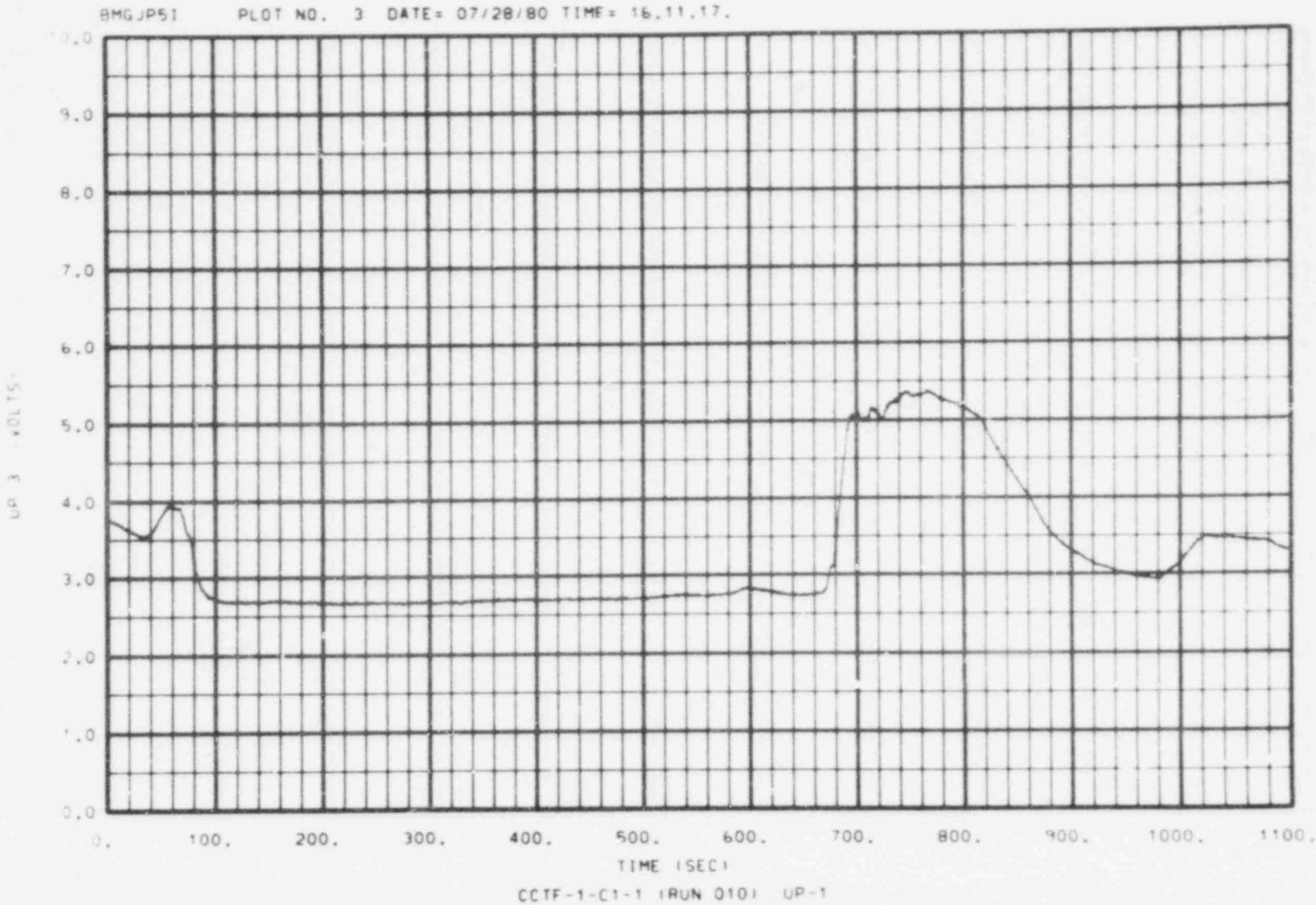

BMGJP51 PLOT NO.168 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-15 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

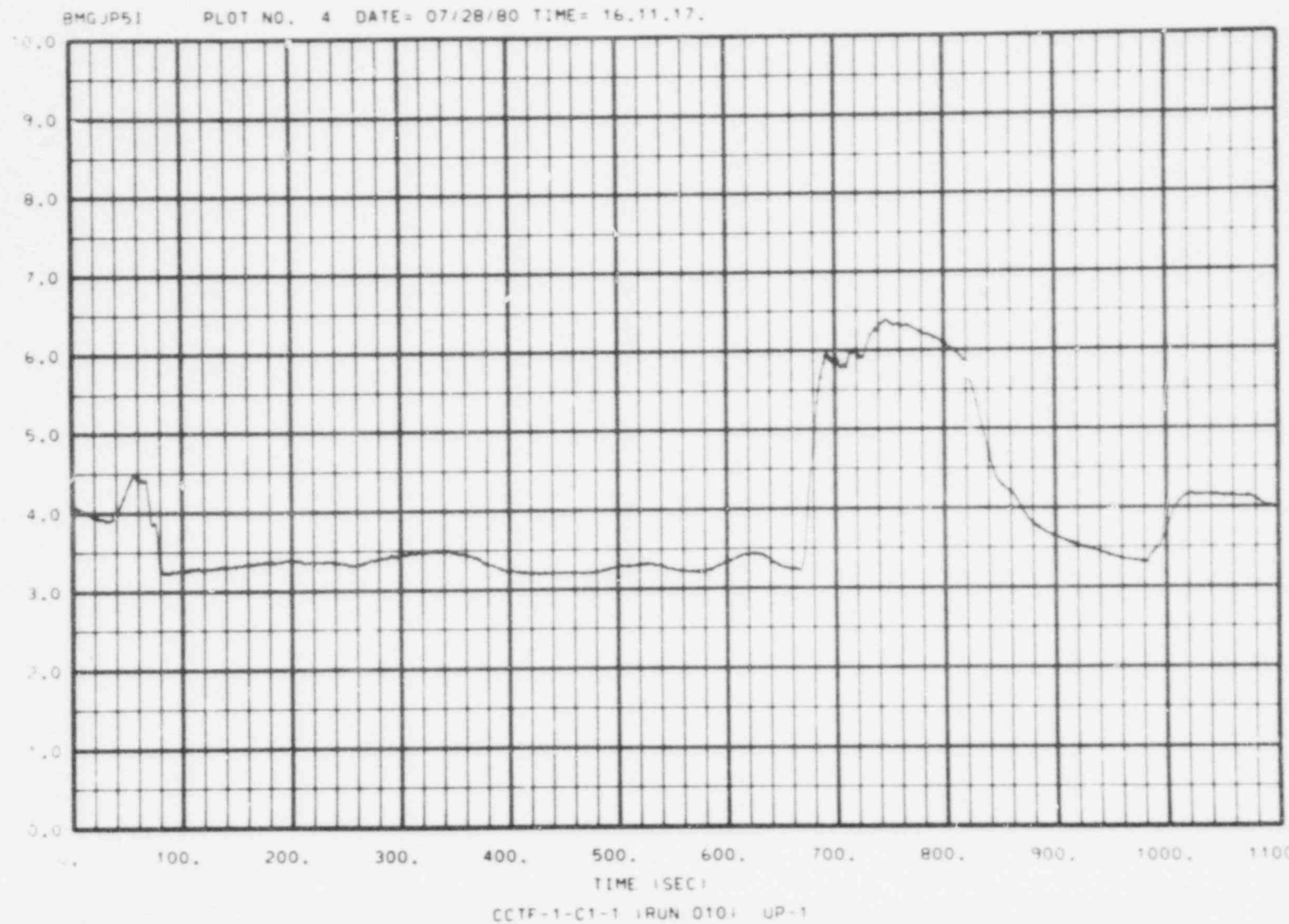

BMGJP51 PLOT NO.167 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DC-19 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

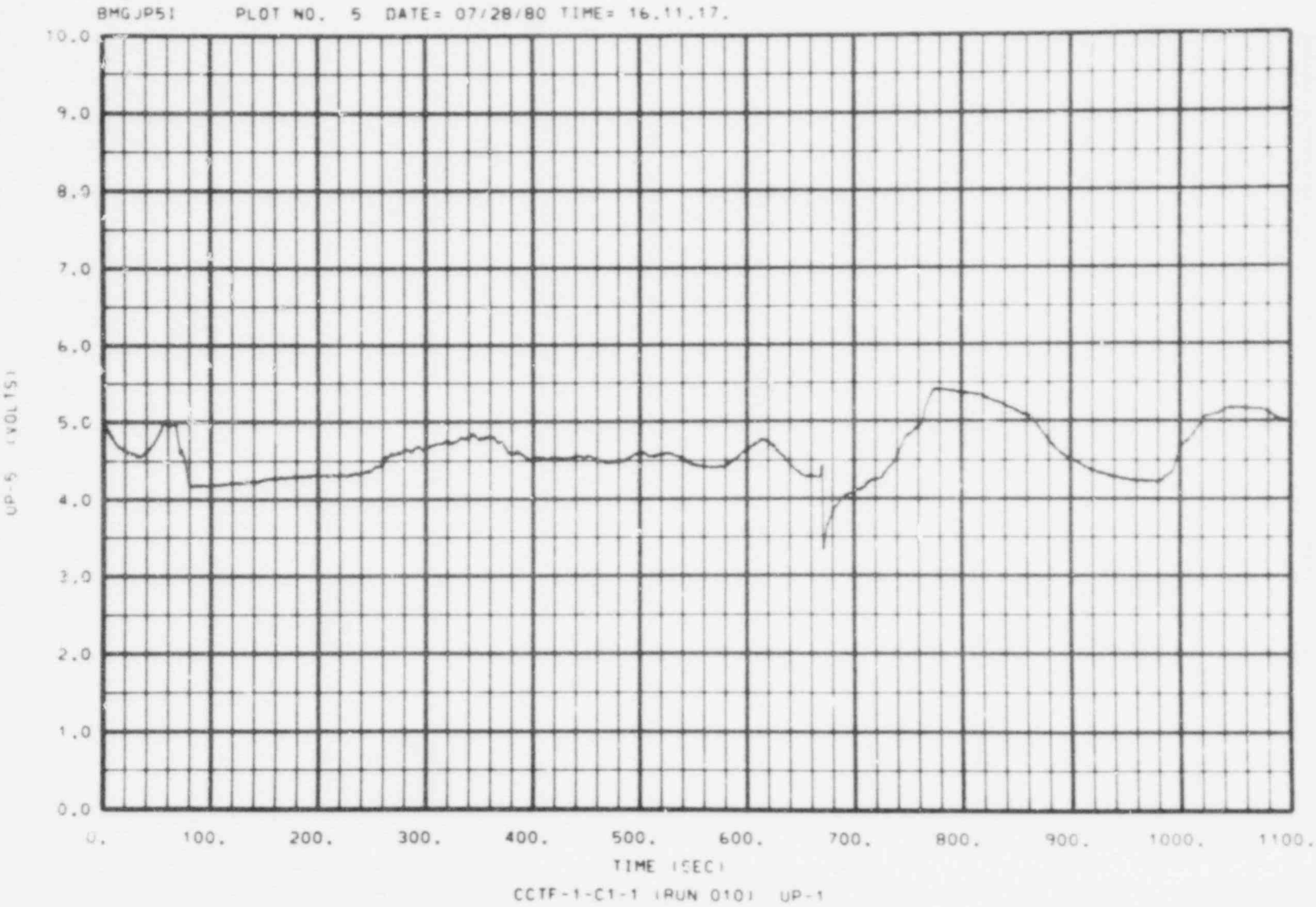

BMGJP5I PLOT NO.166 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) DC-3

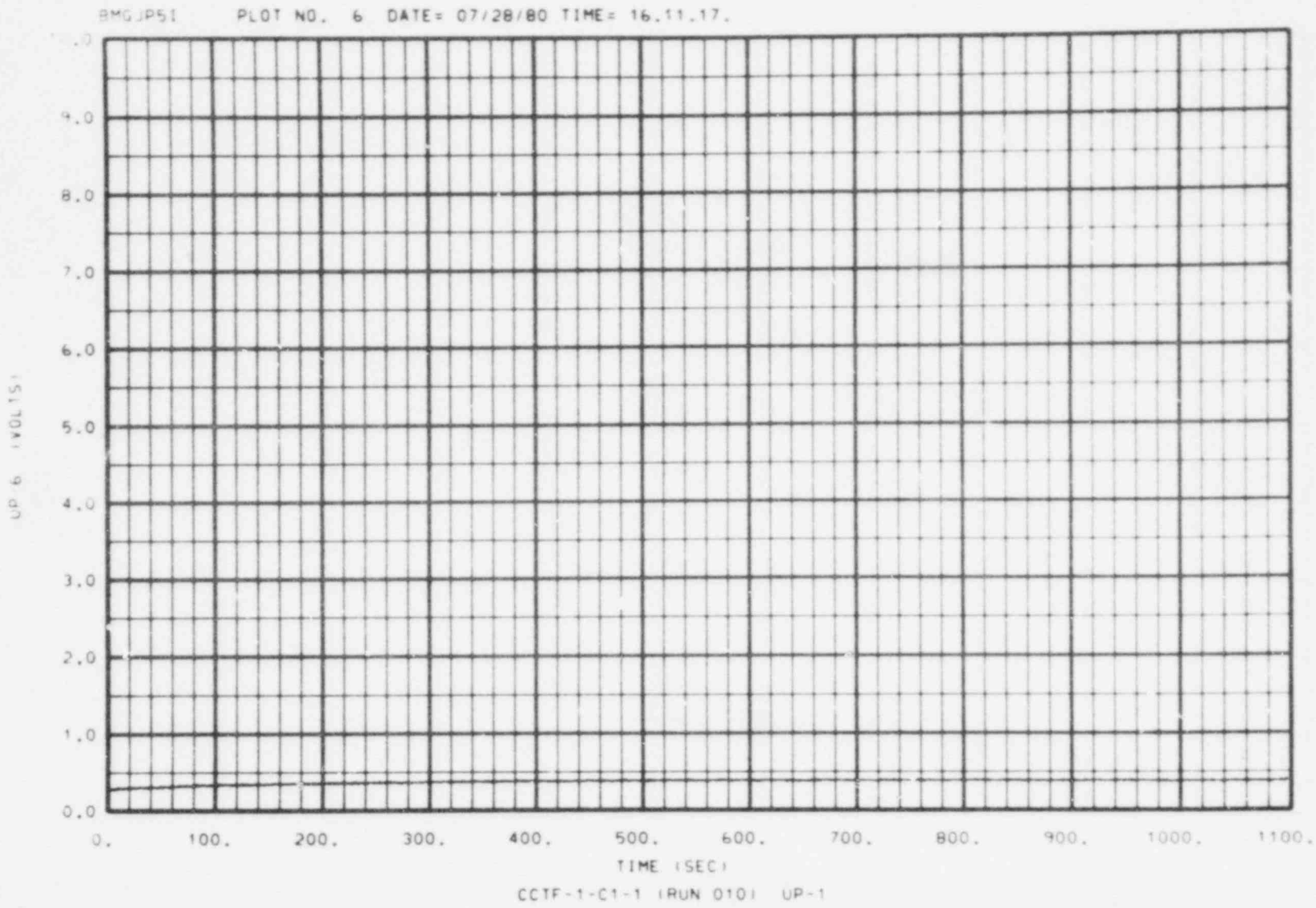

BMGJP5I PLOT NO. 1 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1

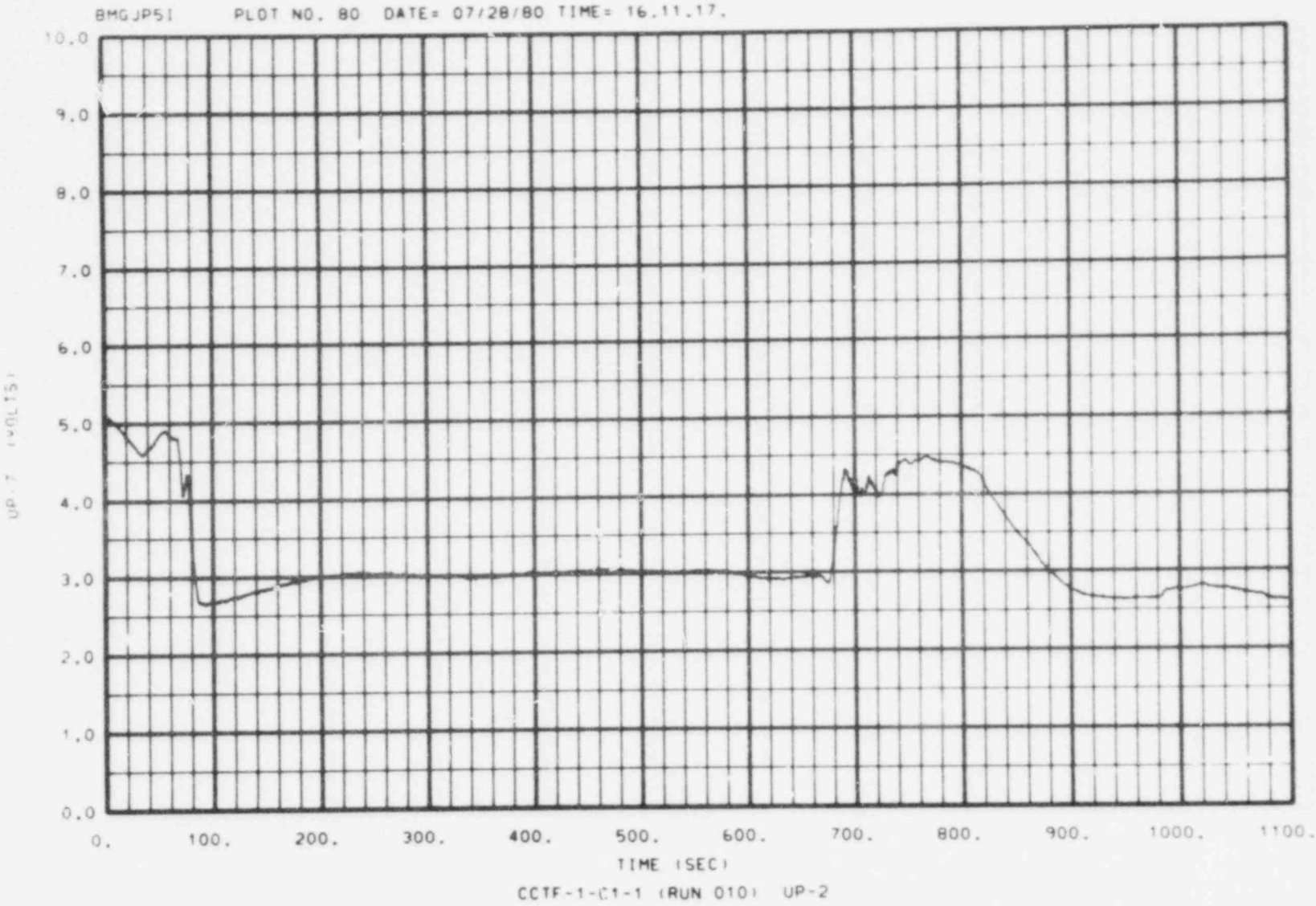

BMGJP51 PLOT NO. 2 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1

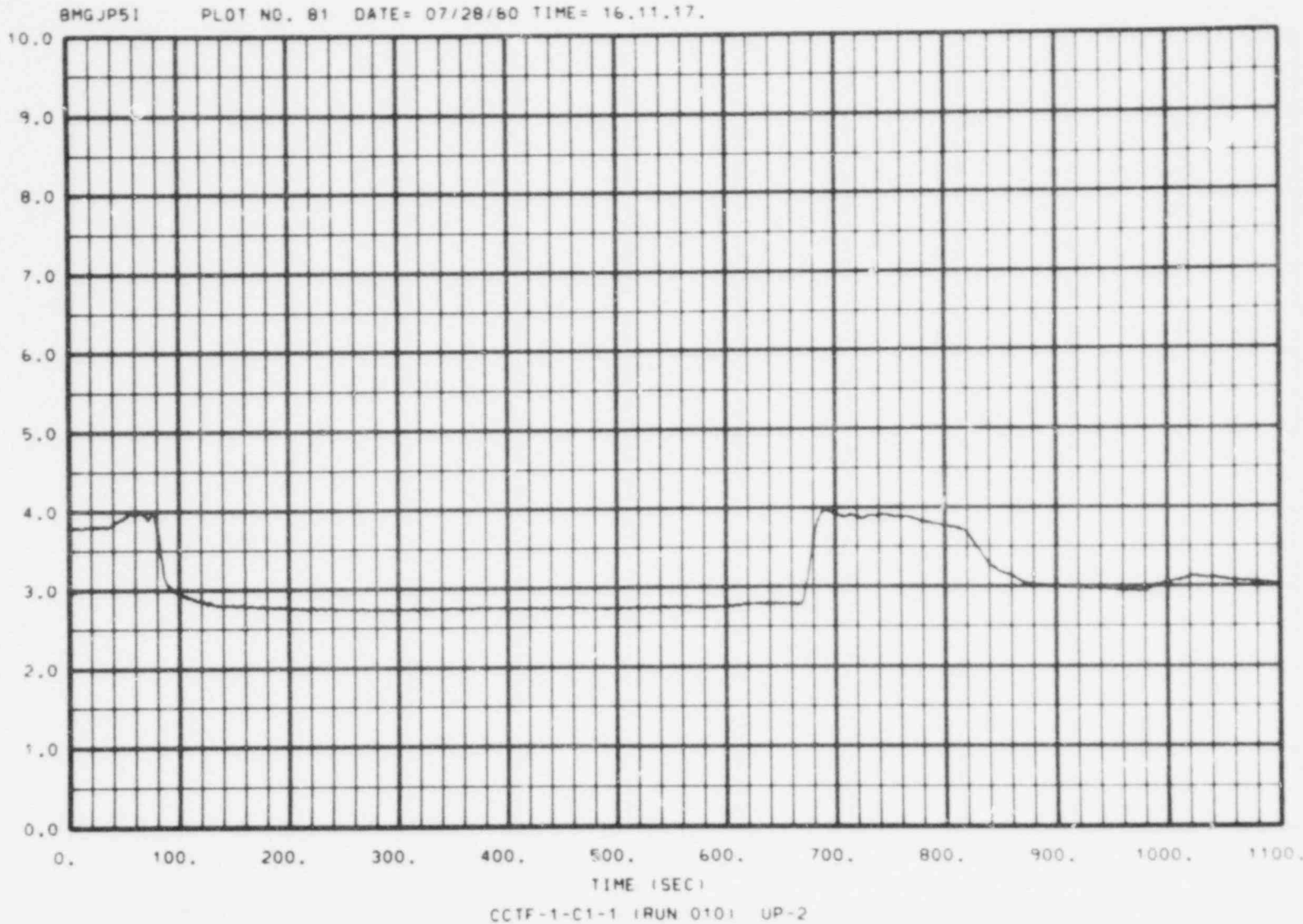

BMGJP51 PLOT NO. 3 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
UP 3 VOLTS
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1

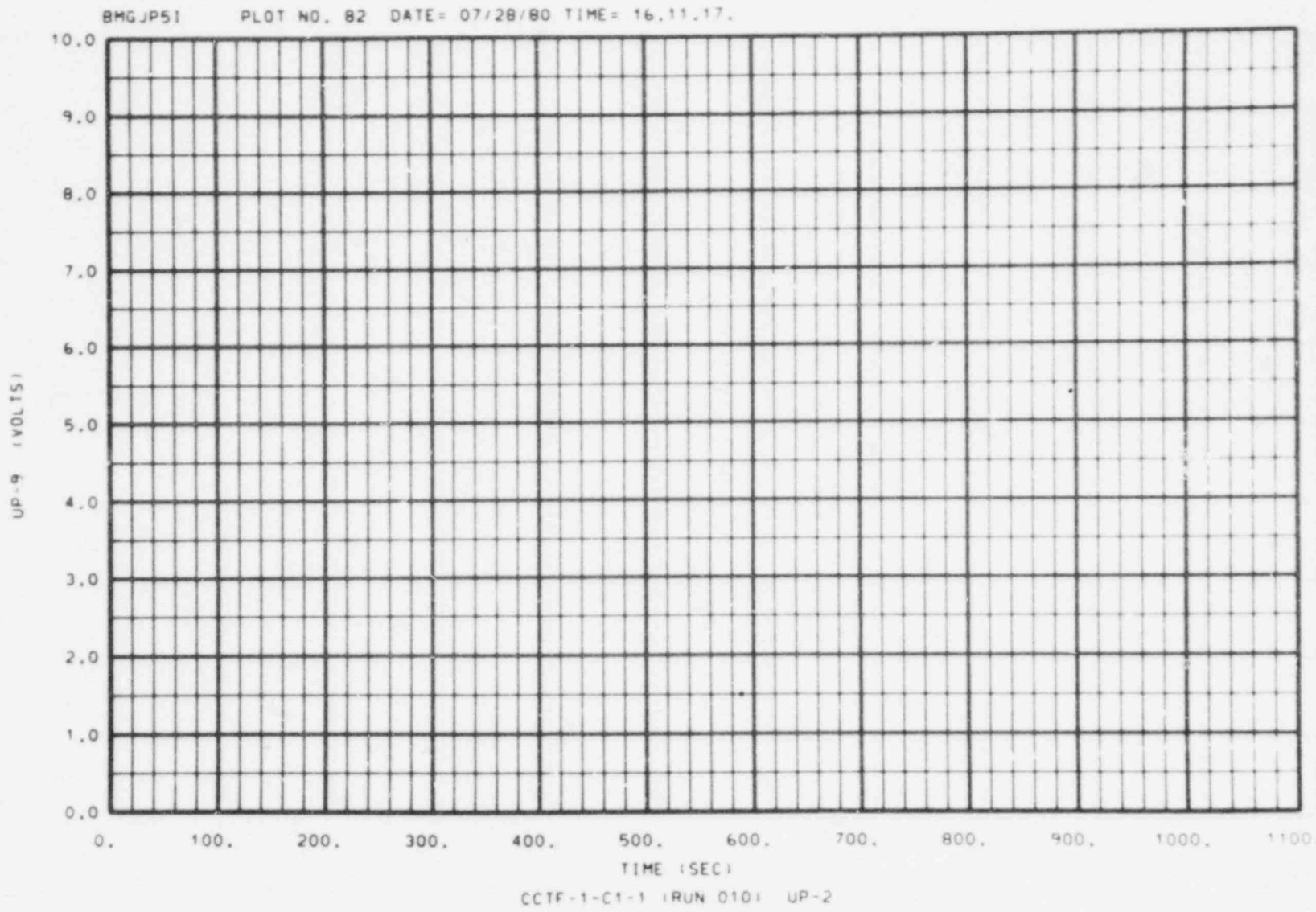

BMGJP51 PLOT NO. 4 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1

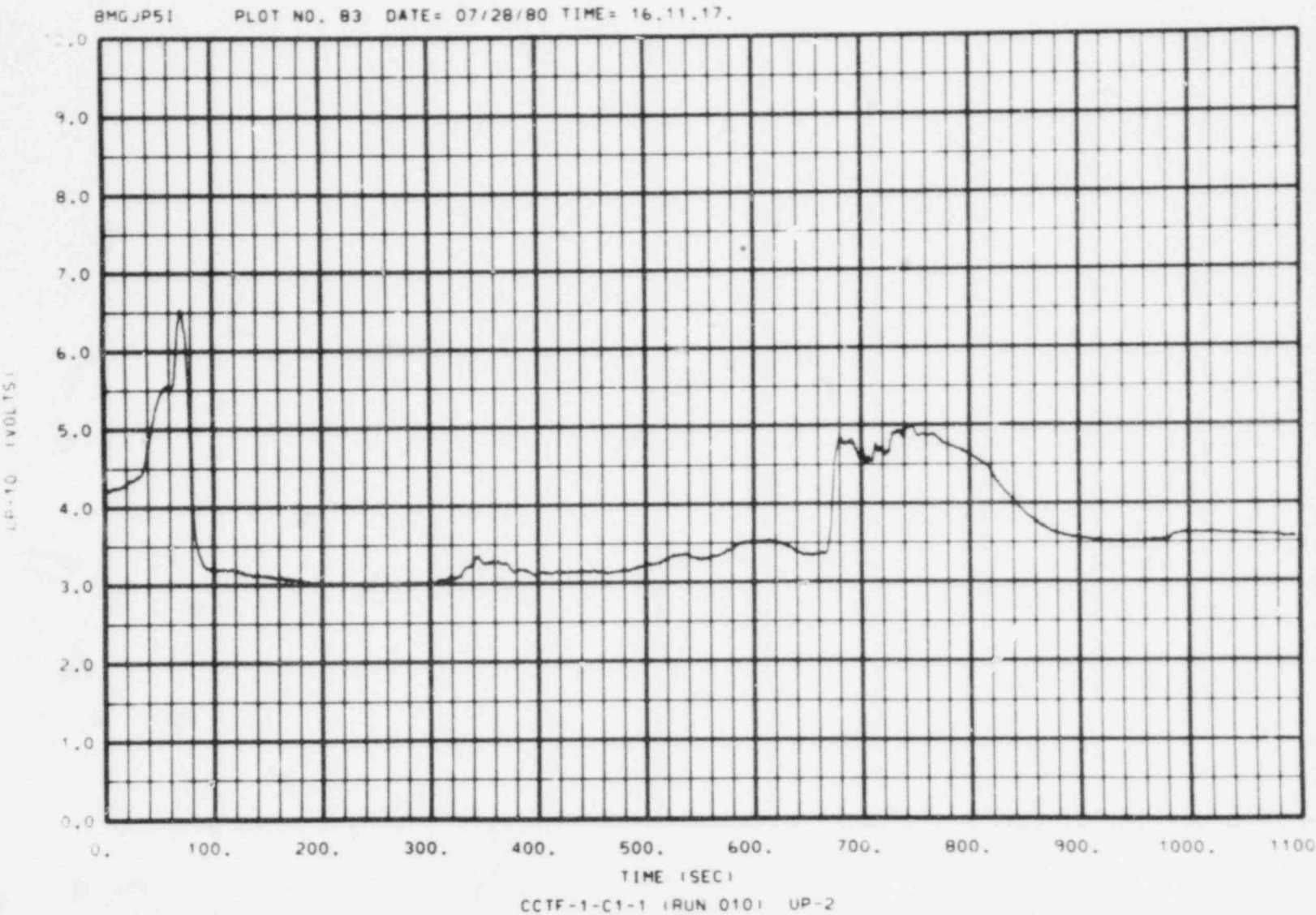

BMGJP5I PLOT NO. 5 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
UP-5 (X0.1 PSI)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1

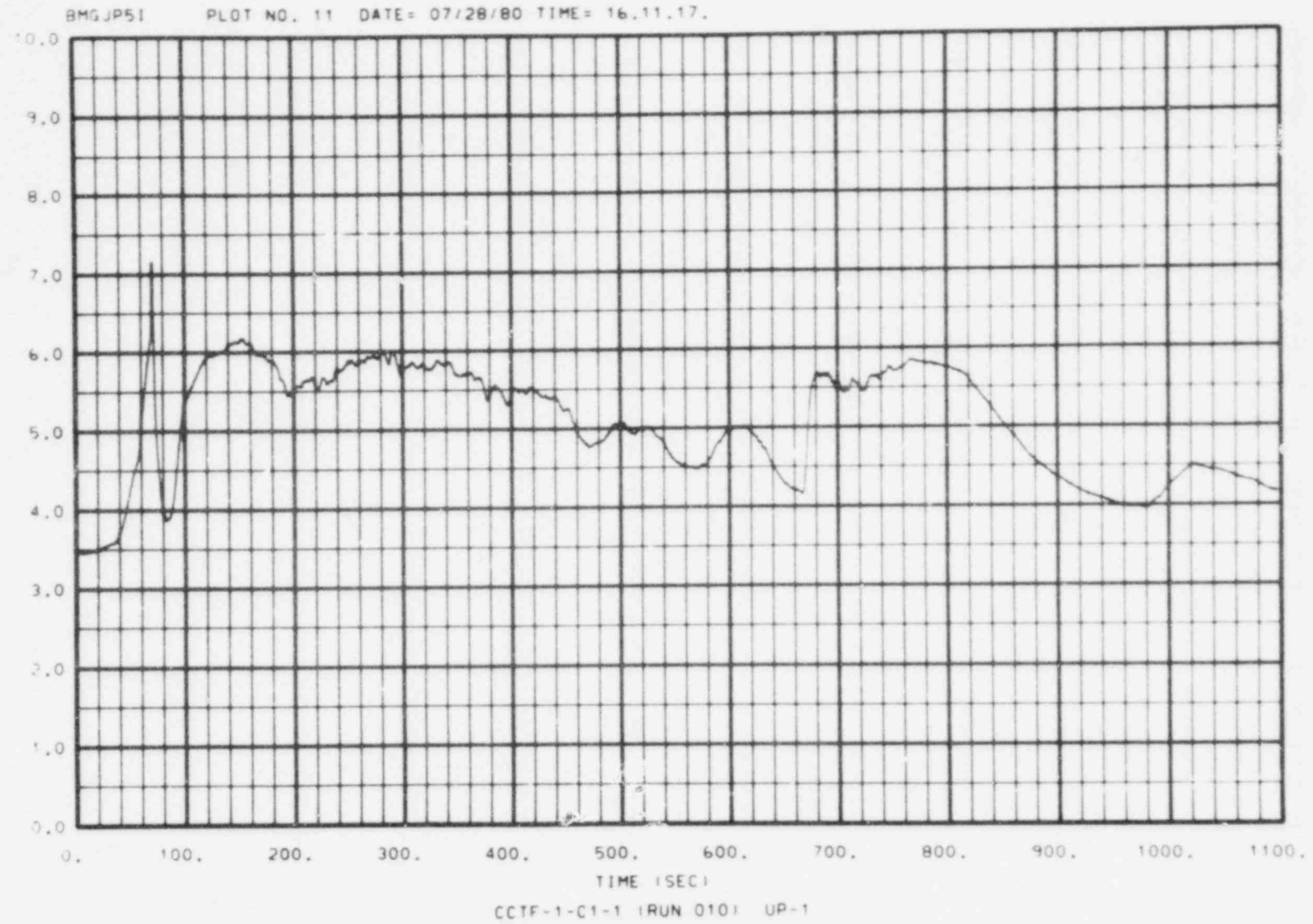

BMGJP51 PLOT NO. 6 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1

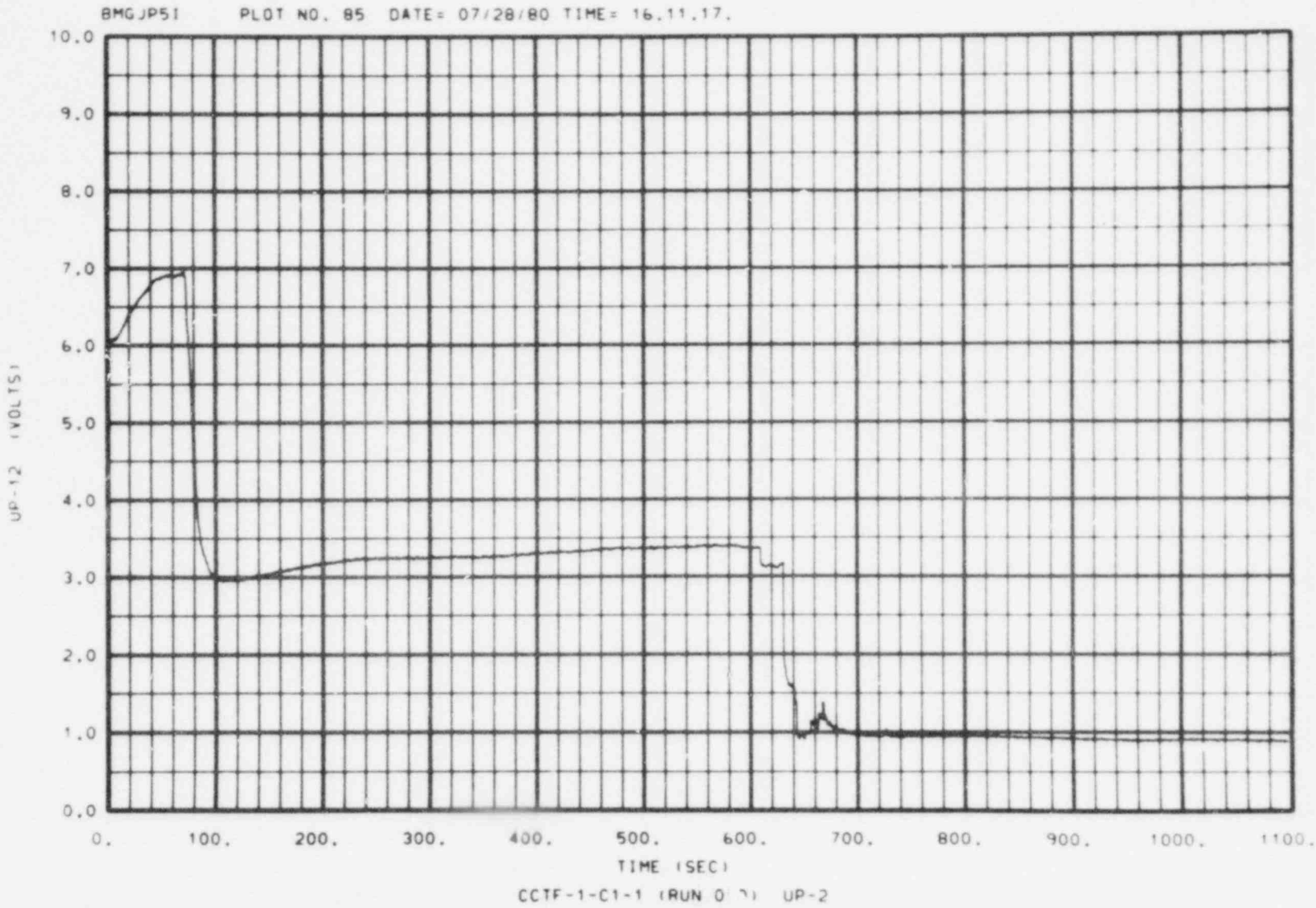

BMGJP51 PLOT NO. 80 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-2

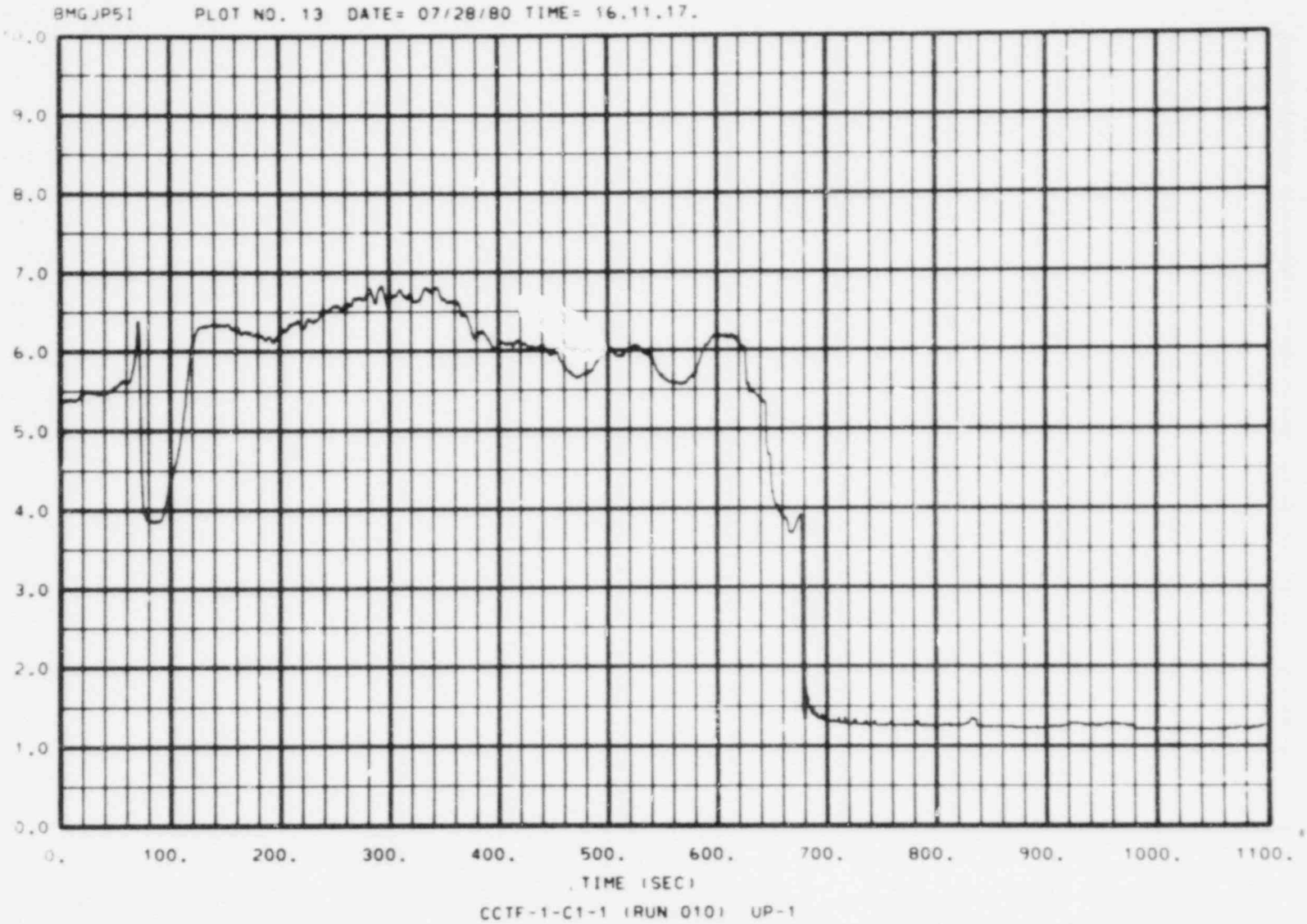

BMGJP51 PLOT NO. 81 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-2

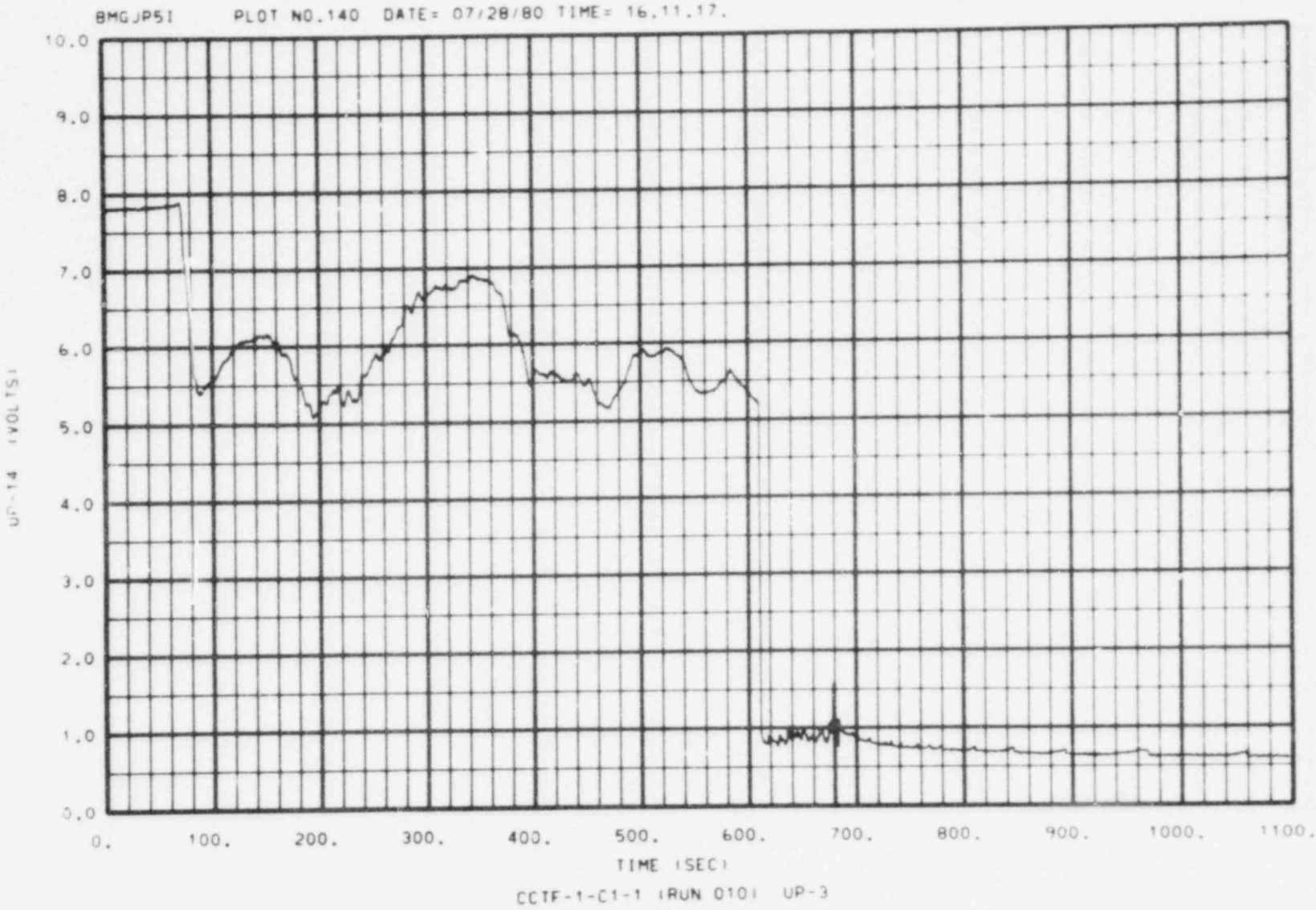

BMGJP51 PLOT NO. 82 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-2

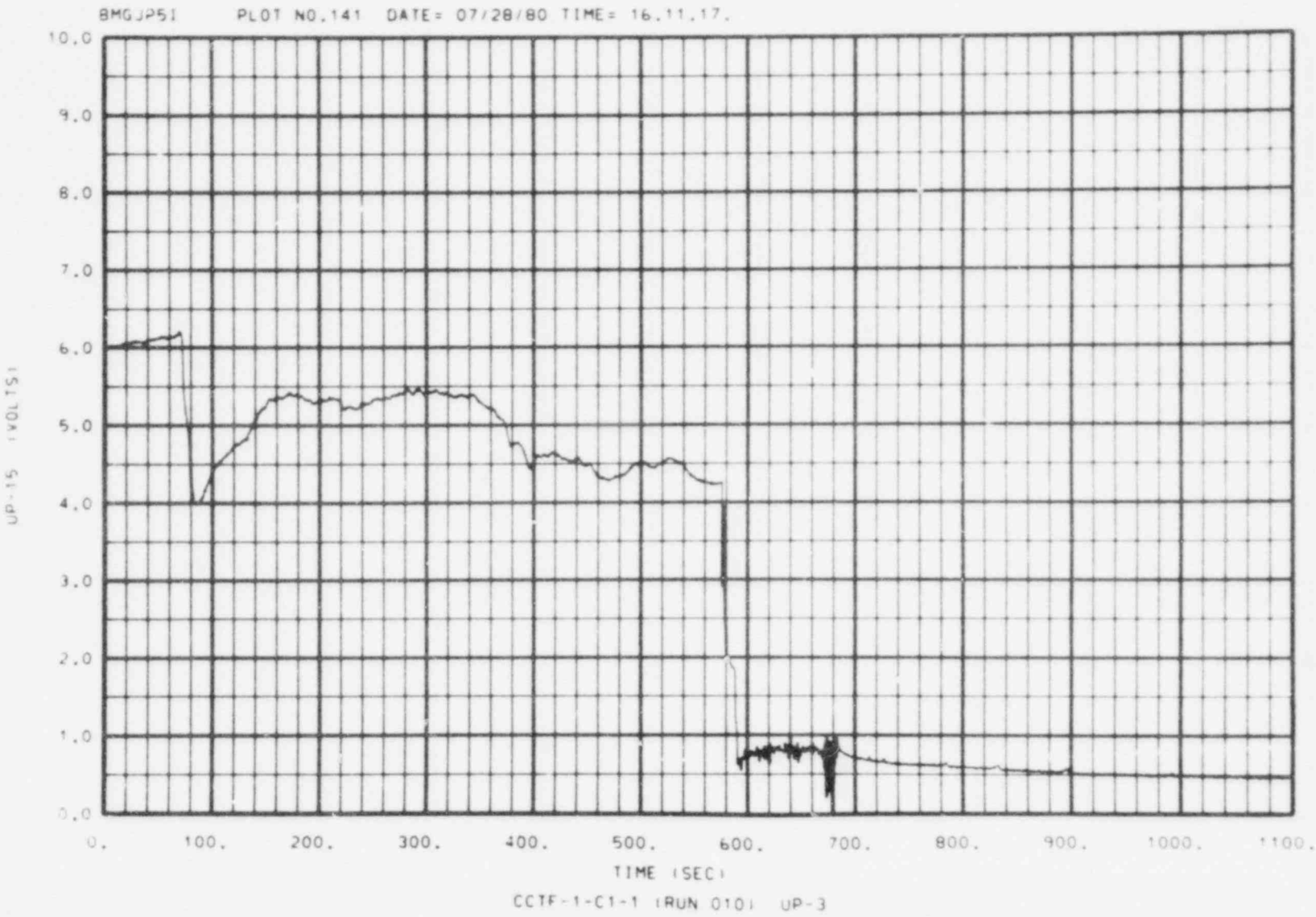

BMGJP51 PLOT NO. 83 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-2

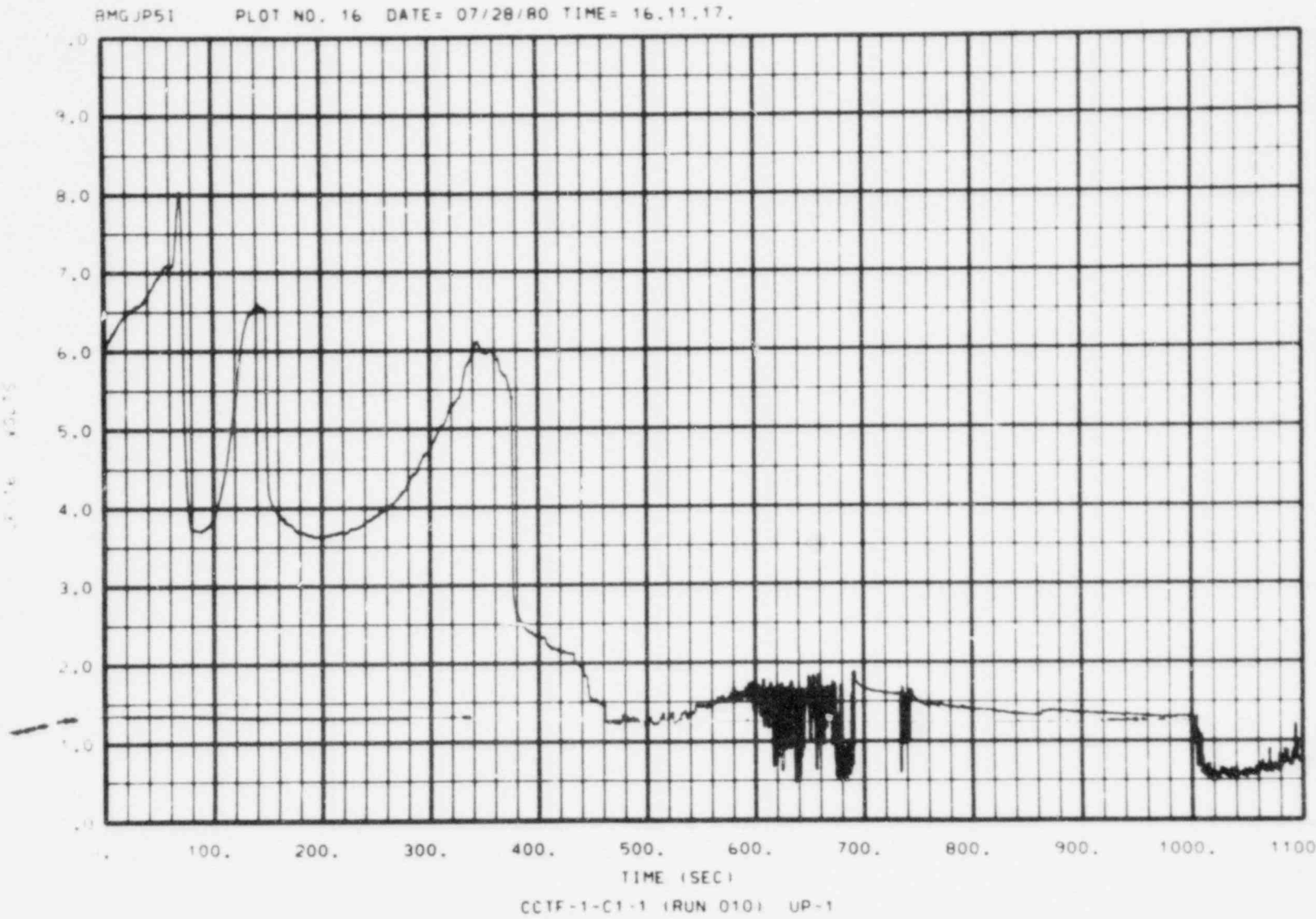

BMGJP5I PLOT NO. 11 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1

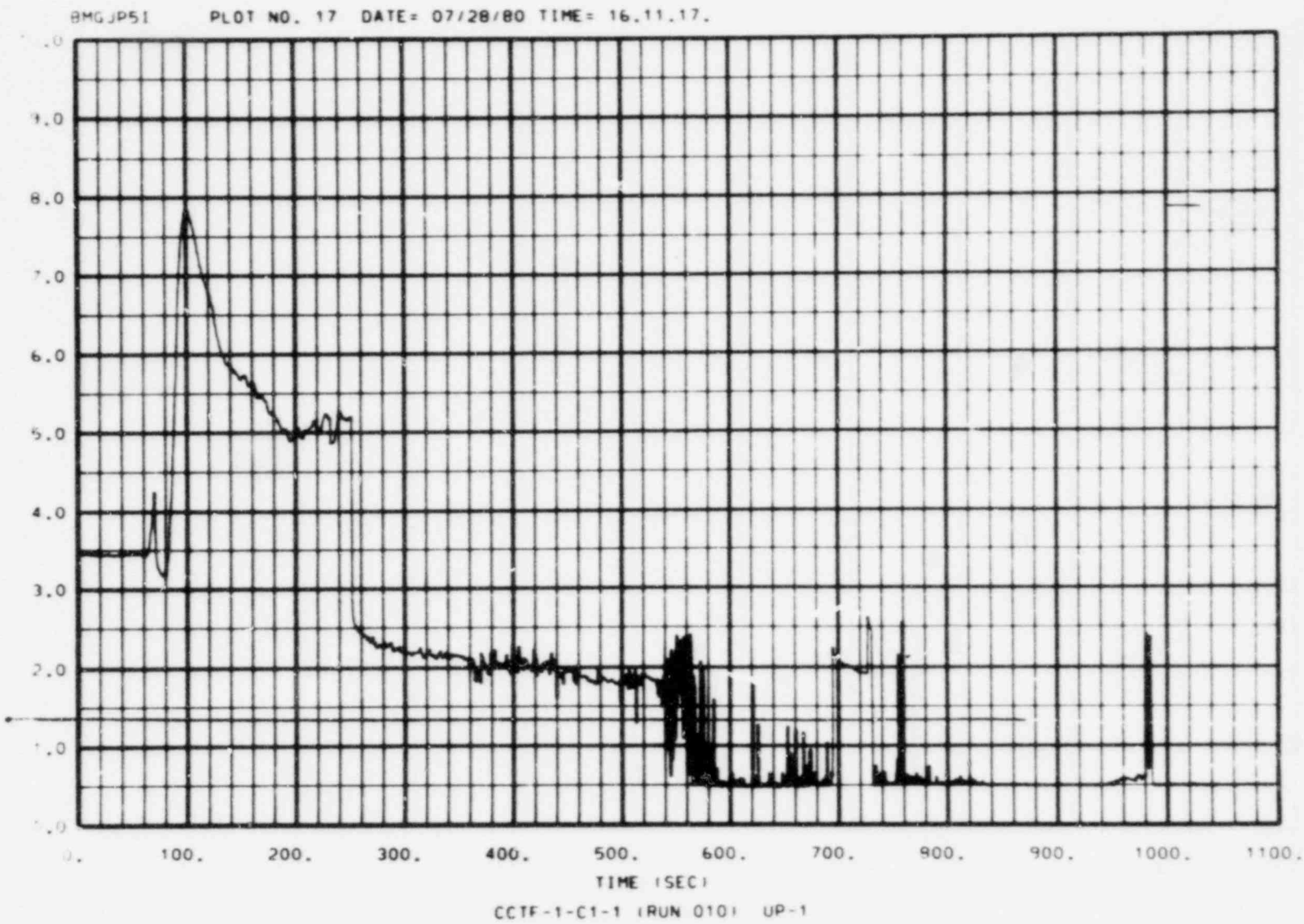

BMGJP5I PLOT NO. 85 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
UP-12 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 0)) UP-2


BMGJP5I PLOT NO. 13 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1


BMGJP5I PLOT NO.140 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
UP-14 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-3


BMGJP51 PLOT NO.141 DATE= 07/28/80 TIME= 16.11.17.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
UP-15 (VOLTS)
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-3


BMGJP51 PLOT NO. 16 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1


BMGJP5I PLOT NO. 17 DATE= 07/28/80 TIME= 16.11.17.
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
TIME (SEC)
CCTF-1-C1-1 (RUN 010) UP-1

APPENDIX B

BUBBLE PLOTS

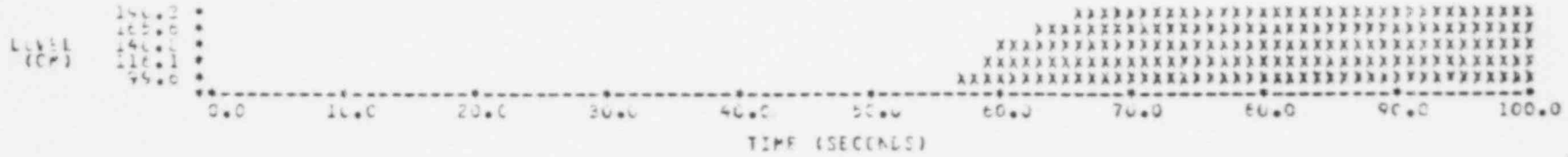


Figure B-1. Lower plenum assembly 1 (0 to 100 s).

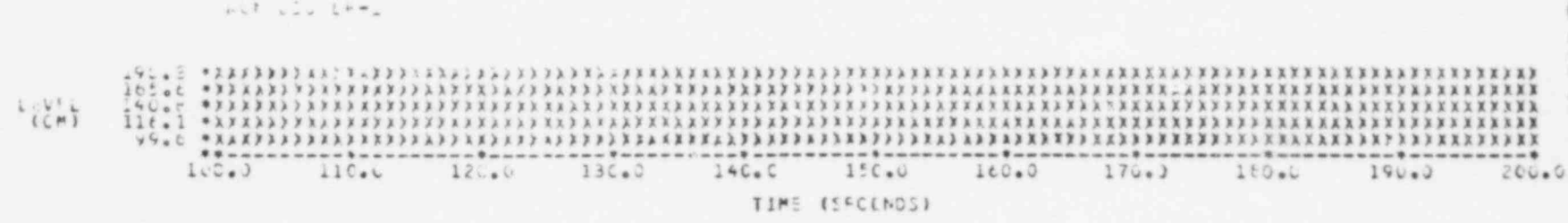


Figure B-2. Lower plenum assembly 1 (100 to 200 s).

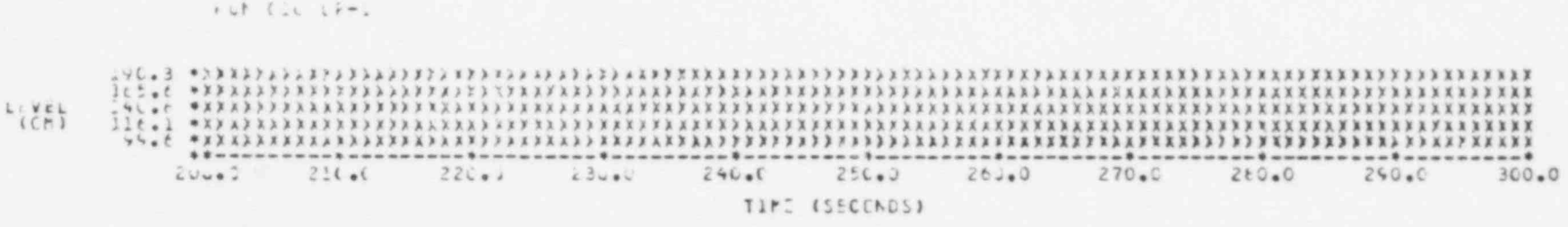


Figure B-3. Lower plenum assembly 1 (200 to 300 s).

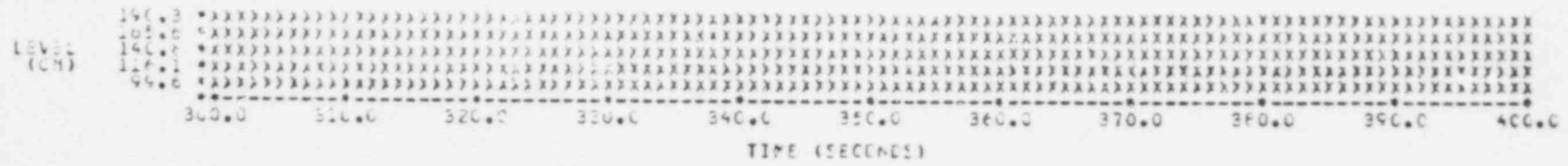


Figure B-4. Lower plenum assembly 1 (300 to 400 s).

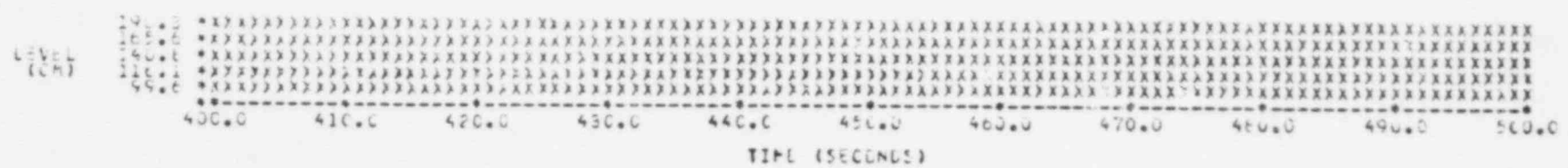


Figure B-5. Lower plenum assembly 1 (400 to 500 s).

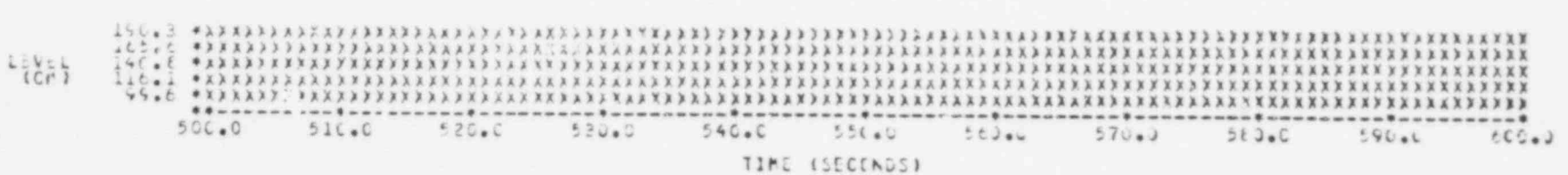


Figure B-6. Lower plenum assembly 1 (500 to 600 s).

Figure B-7. Lower plenum assembly 1 (600 to 700 s).

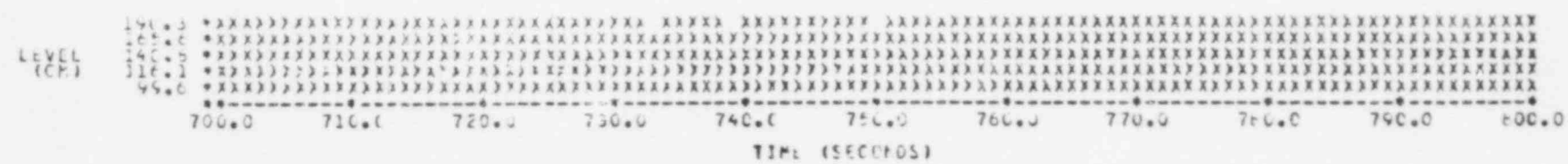


Figure B-8. Lower plenum assembly 1 (700 to 800 s).

Figure B-9. Lower plenum assembly 1 (800 to 900 s).

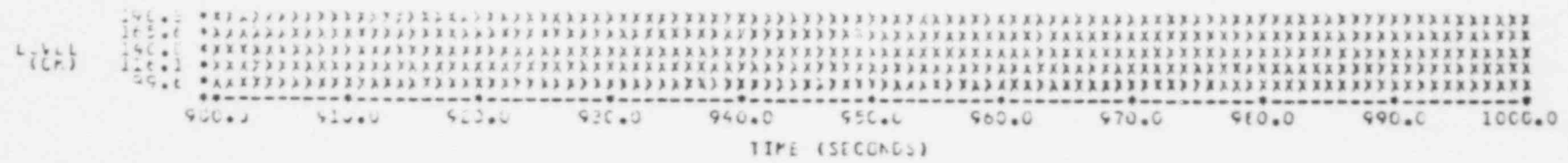


Figure B-10. Lower plenum assembly 1 (900 to 1000 s).

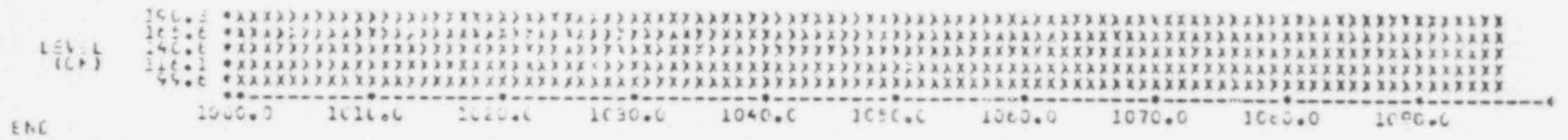


Figure B-11. Lower plenum assembly 1 (1000 to 1096 s).

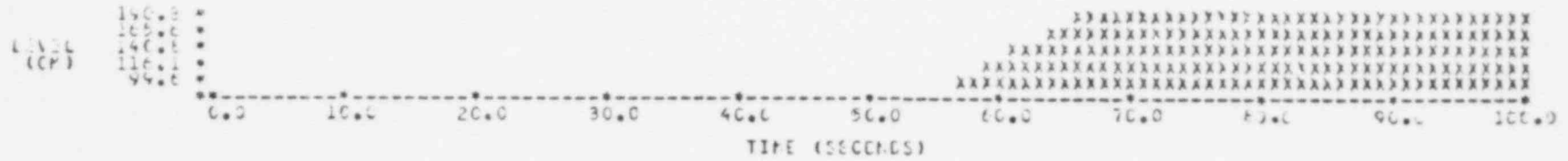


Figure B-12. Lower plenum assembly 2 (0 to 100 s).

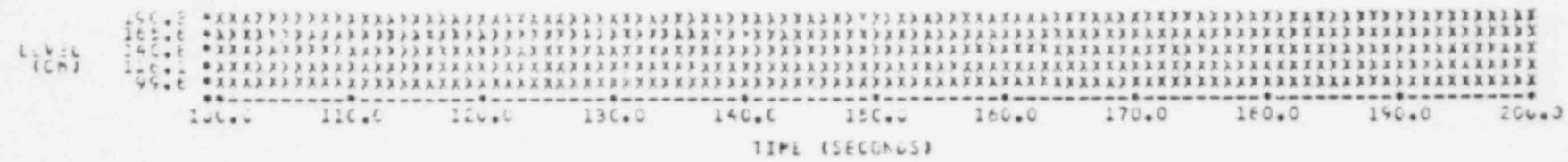


Figure B-13. Lower plenum assembly 2 (100 to 200 s).

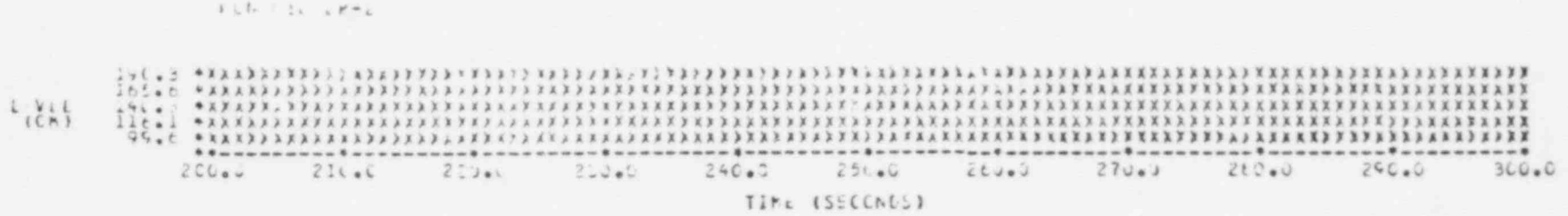


Figure B-14. Lower plenum assembly 2 (200 to 300 s).

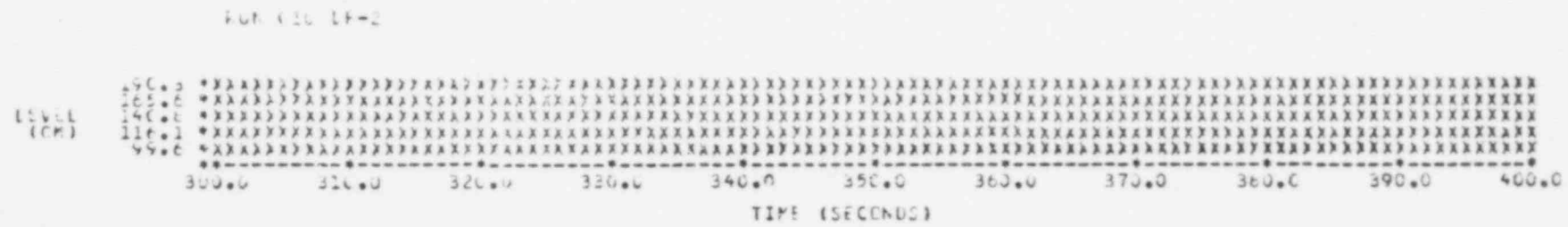


Figure B-15. Lower plenum assembly 2 (300 to 400 s).

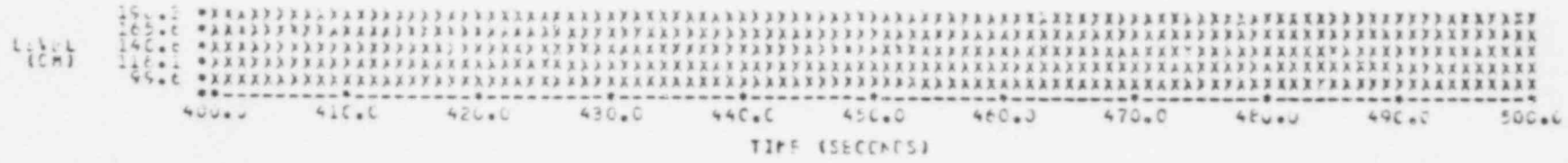


Figure B-16. Lower plenum assembly 2 (400 to 500 s).

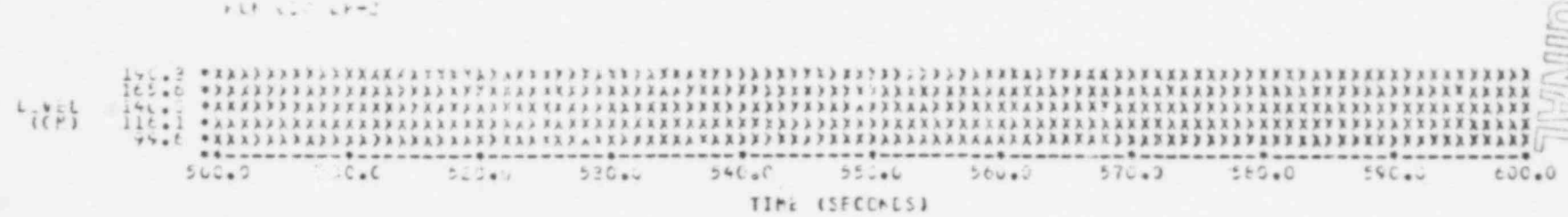


Figure B-17. Lower plenum assembly 2 (500 to 600 s).

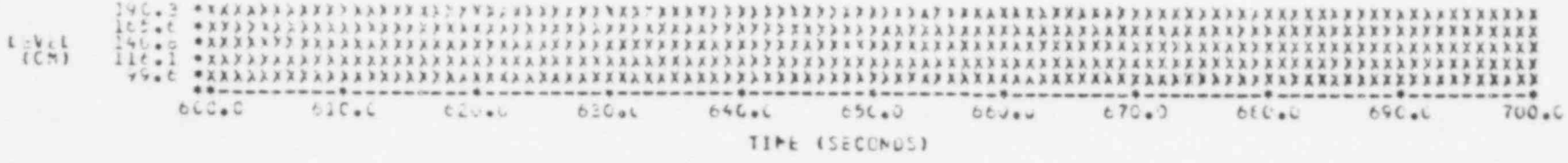


Figure B-18. Lower plenum assembly 2 (600 to 700 s).

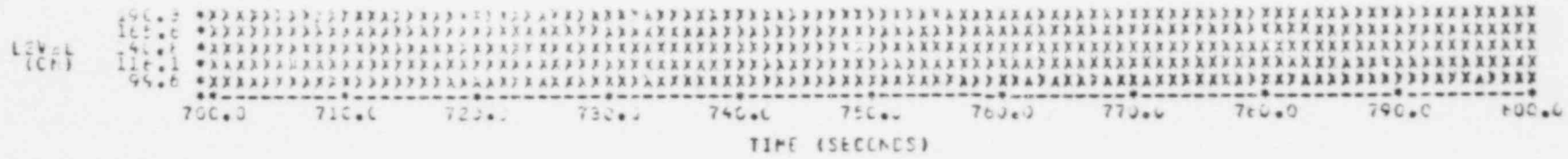


Figure B-19. Lower plenum assembly 2 (700 to 800 s).

Figure B-20. Lower plenum assembly 2 (800 to 900 s).

Figure B-21. Lower plenum assembly 2 (900 to 1000 s).

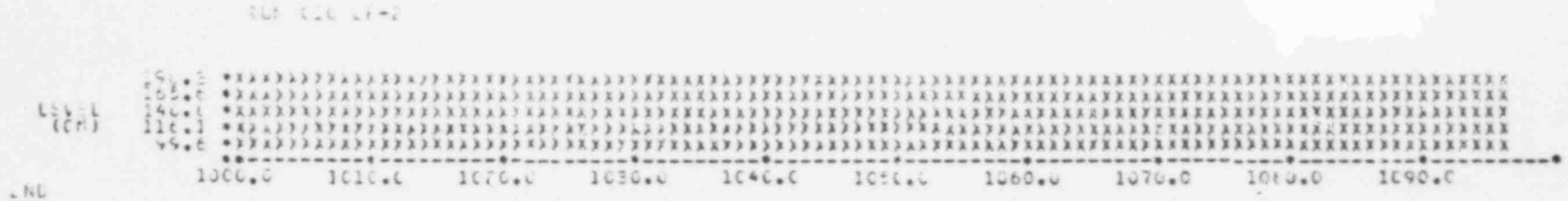


Figure B-22. Lower plenum assembly 2 (1000 to 1096 s).

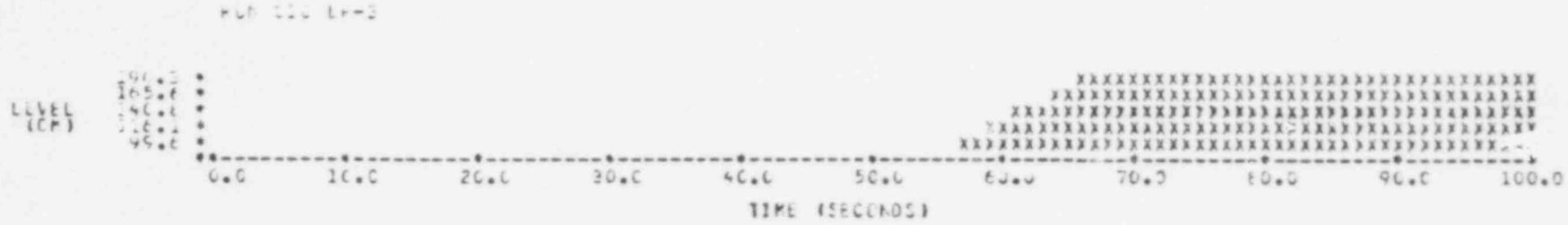


Figure B-23. Lower plenum assembly 3 (0 to 100 s).

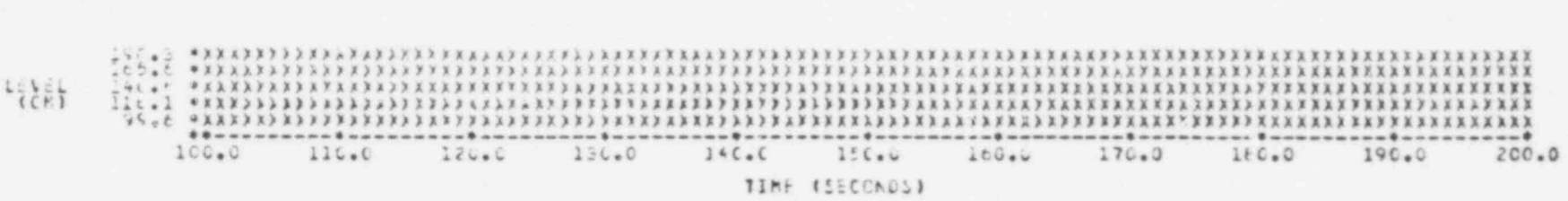


Figure B-24. Lower plenum assembly 3 (100 to 200 s).

Figure B-25. Lower plenum assembly 3 (200 to 300 s).

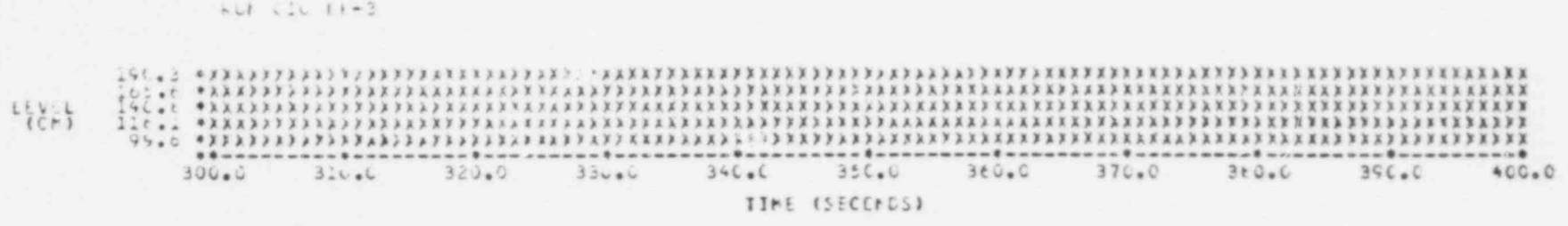


Figure B-26. Lower plenum assembly 3 (300 to 400 s).

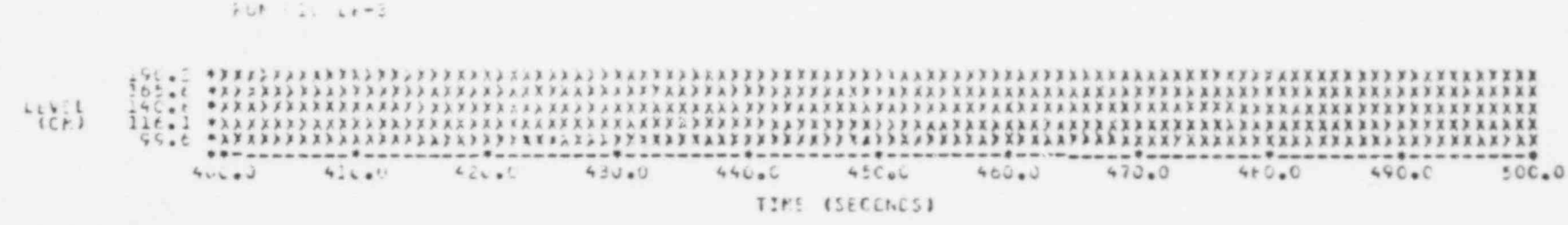


Figure B-27. Lower plenum assembly 3 (400 to 500 s).

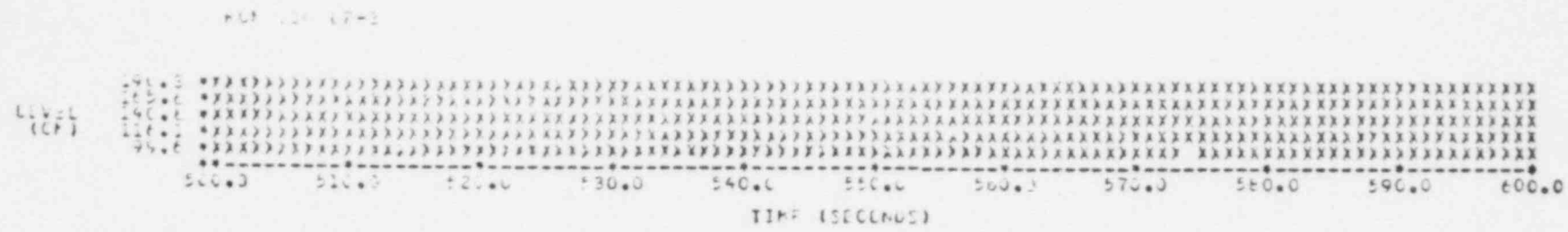


Figure B-28. Lower plenum assembly 3 (500 to 600 s).

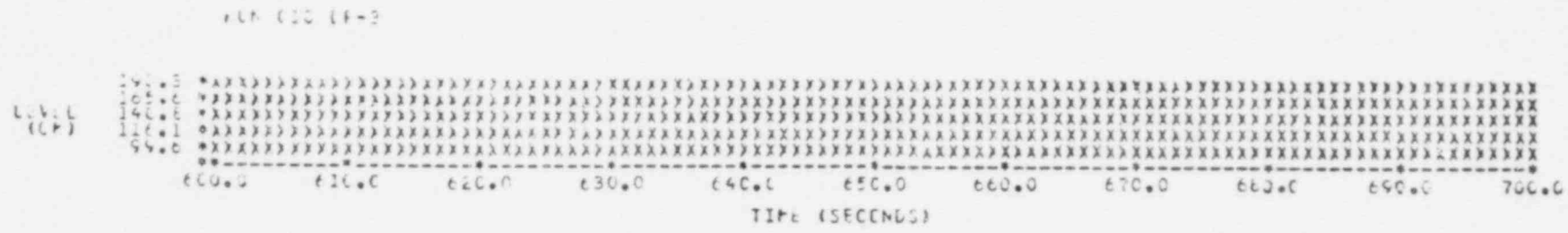


Figure B-29. Lower plenum assembly 3 (600 to 700 s).

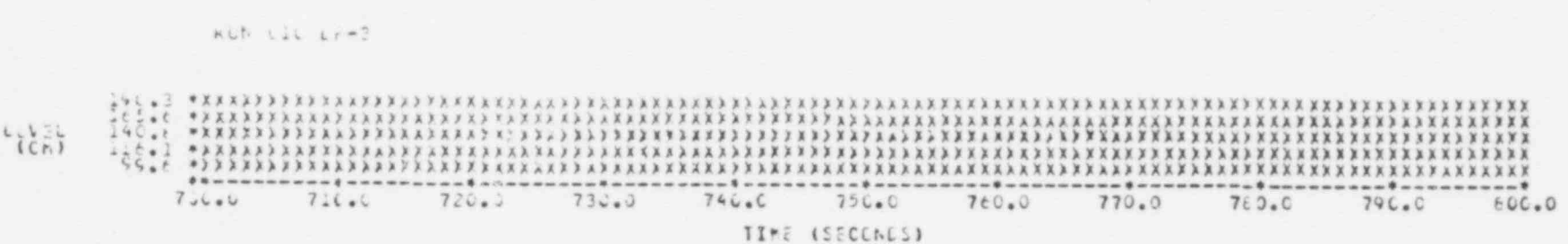


Figure B-30. Lower plenum assembly 3 (700 to 800 s).

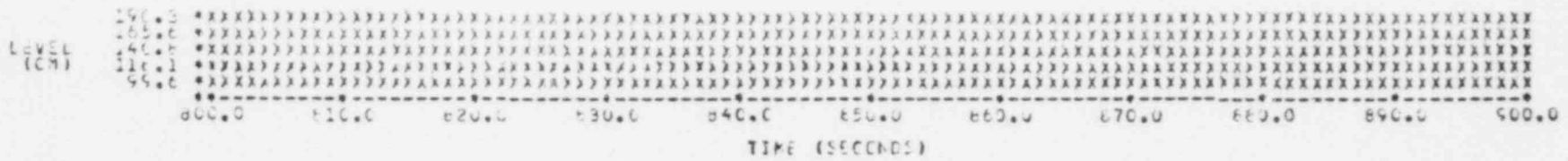


Figure B-31. Lower plenum assembly 3 (800 to 900 s).

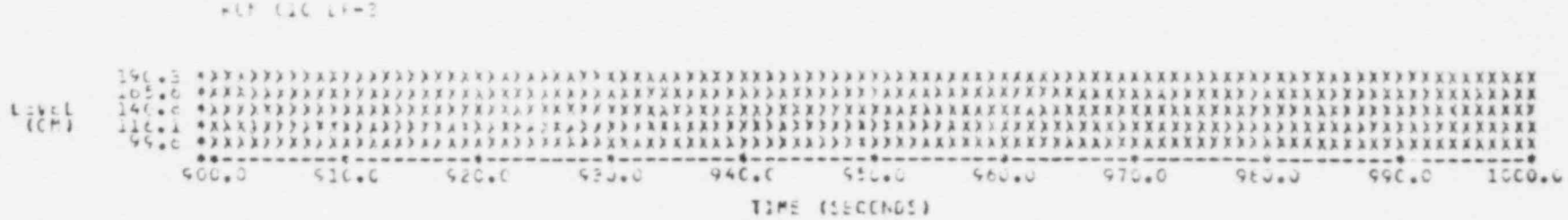


Figure B-32. Lower plenum assembly 3 (900 to 1000 s).

Figure B-33. Lower plenum assembly 3 (1000 to 1096 s).

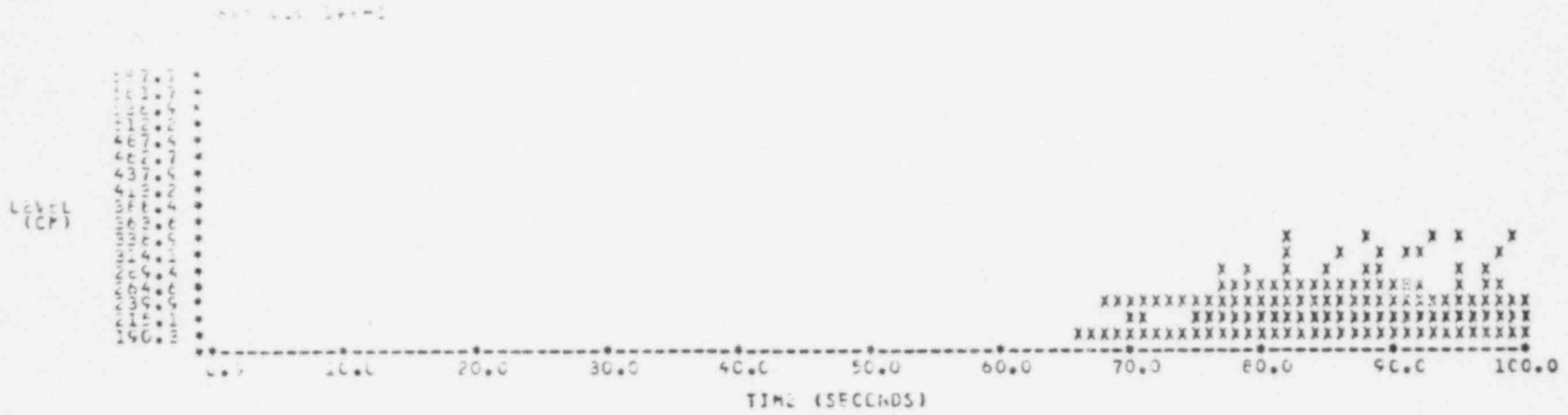


Figure B-34. Core wide range 1 (0 to 100 s).

Figure B-35. Core wide range 1 (100 to 200 s).

Figure B-36. Core wide range 1 (200 to 300 s).

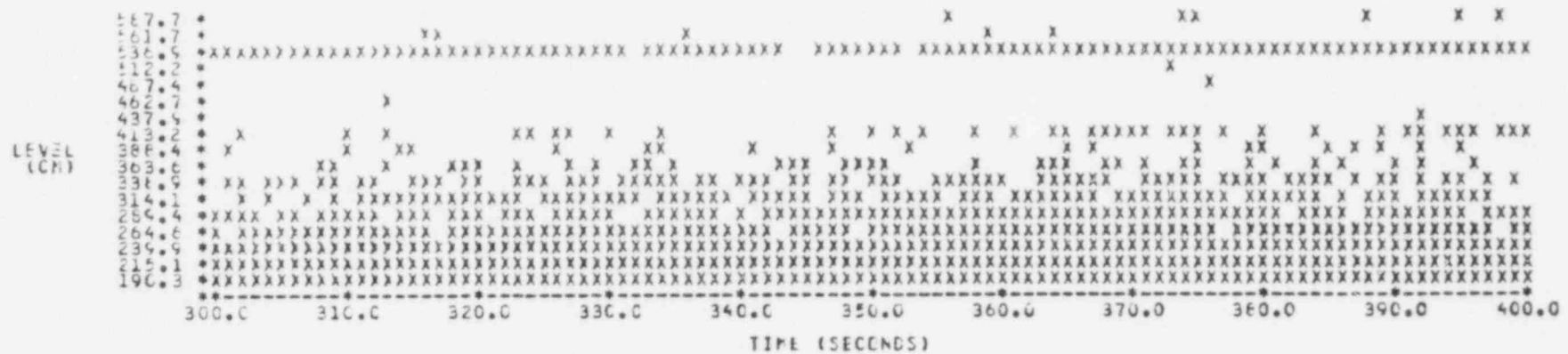


Figure B-37. Core wide range 1 (300 to 400 s).

Figure B-38. Core wide range 1 (400 to 500 s).

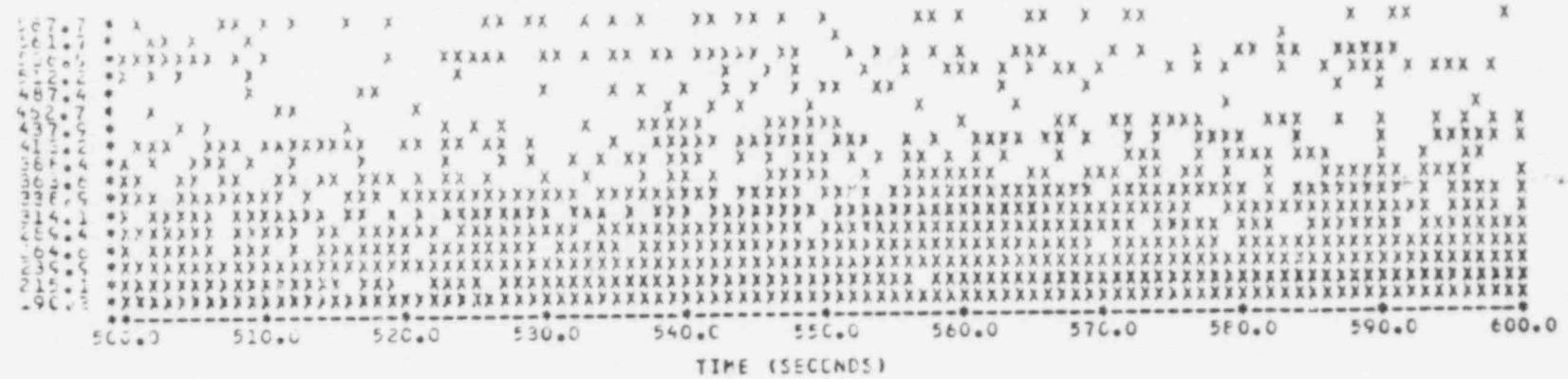


Figure B-39. Core wide range 1 (500 to 600 s).

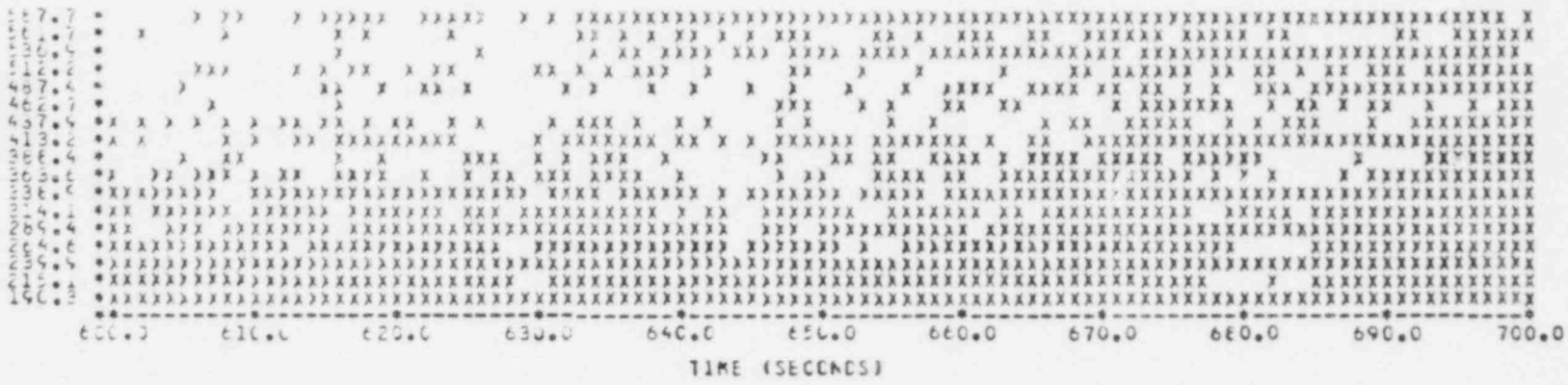


Figure B-40. Core wide range 1 (600 to 700 s).

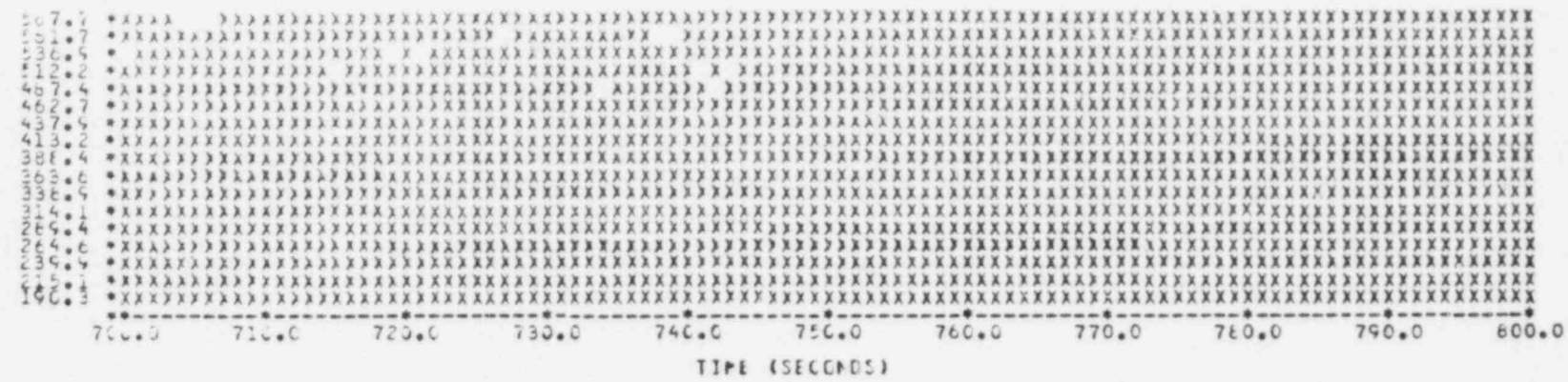


Figure B-41. Core wide range 1 (700 to 800 s).

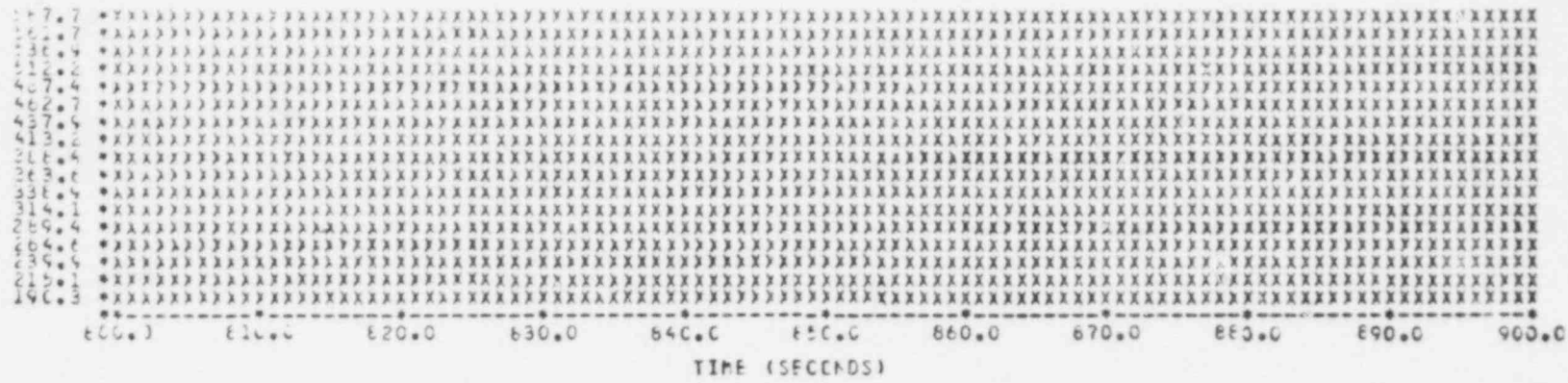


Figure B-42. Core wide range 1 (800 to 900 s).

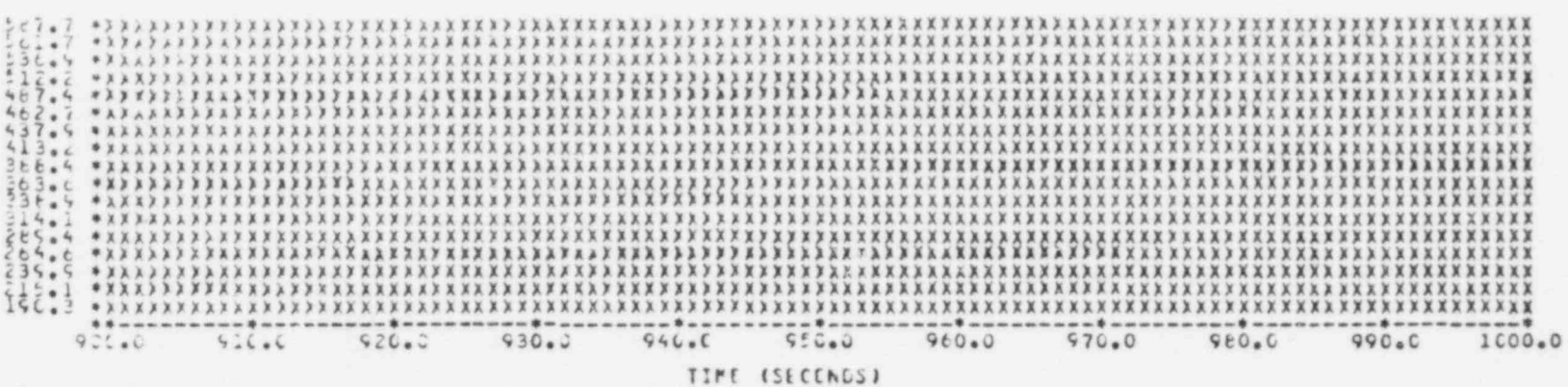


Figure B-43. Core wide range 1 (900 to 1000 s).

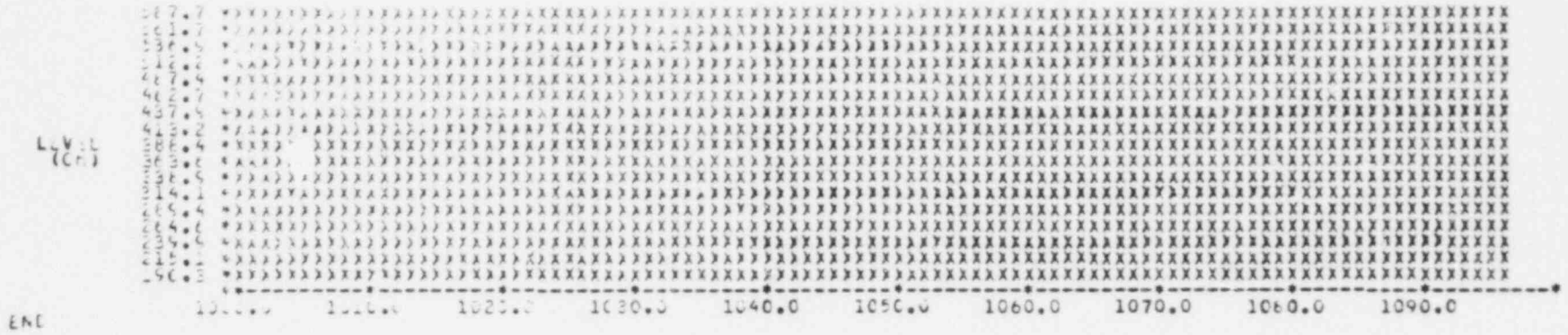


Figure B-44. Core wide range 1 (1000 to 1096 s).

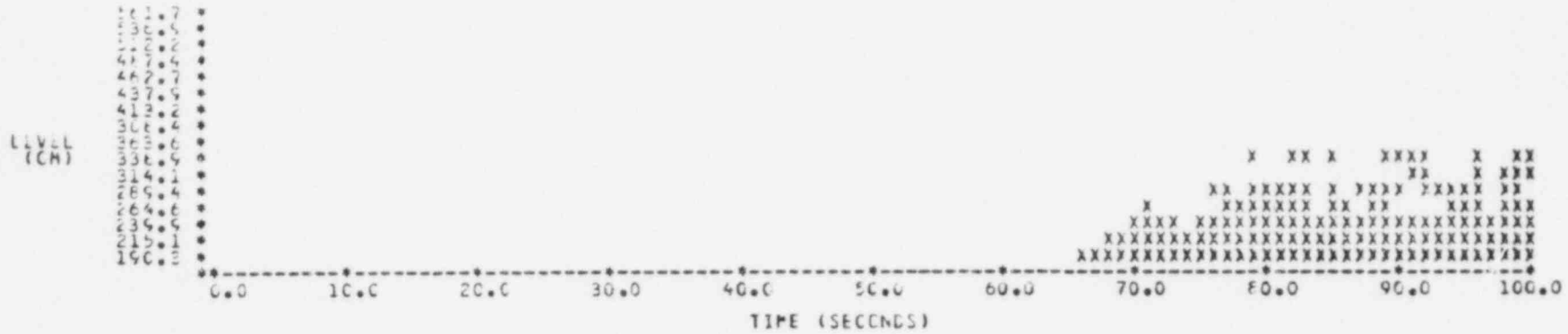


Figure B-45. Core wide range 2 (0 to 100 s).

Figure B-46. Core wide range 2 (100 to 200 s).

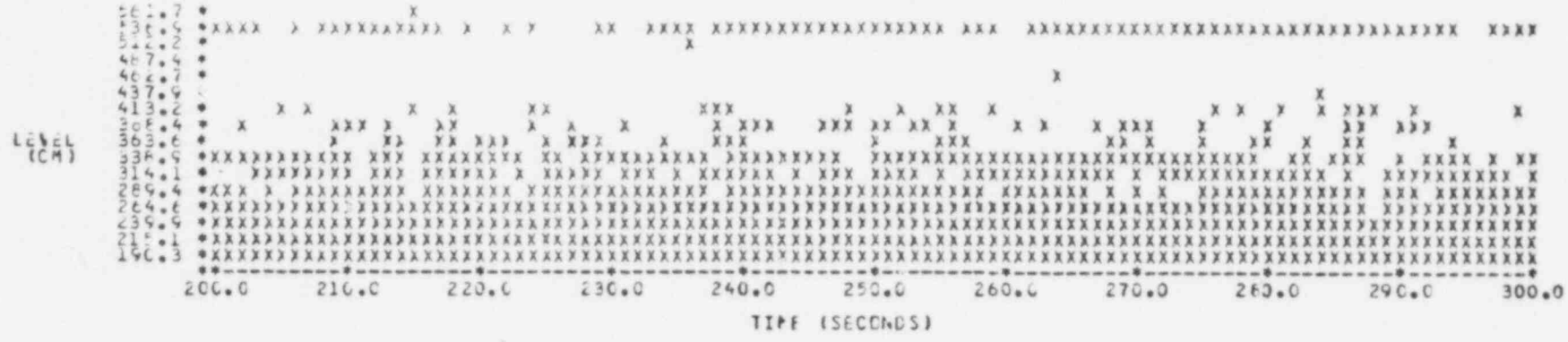


Figure B-47. Core wide range 2 (200 to 300 s).

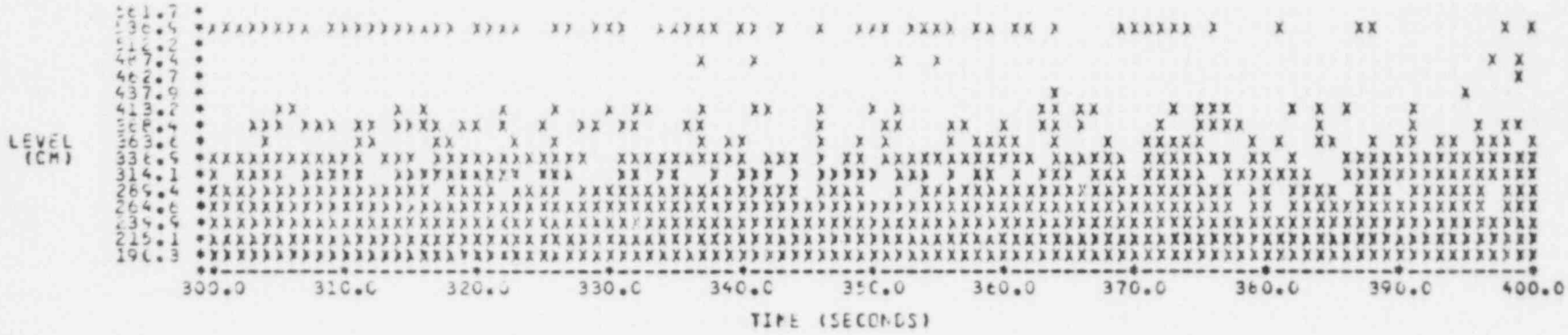


Figure B-48. Core wide range 2 (300 to 400 s).

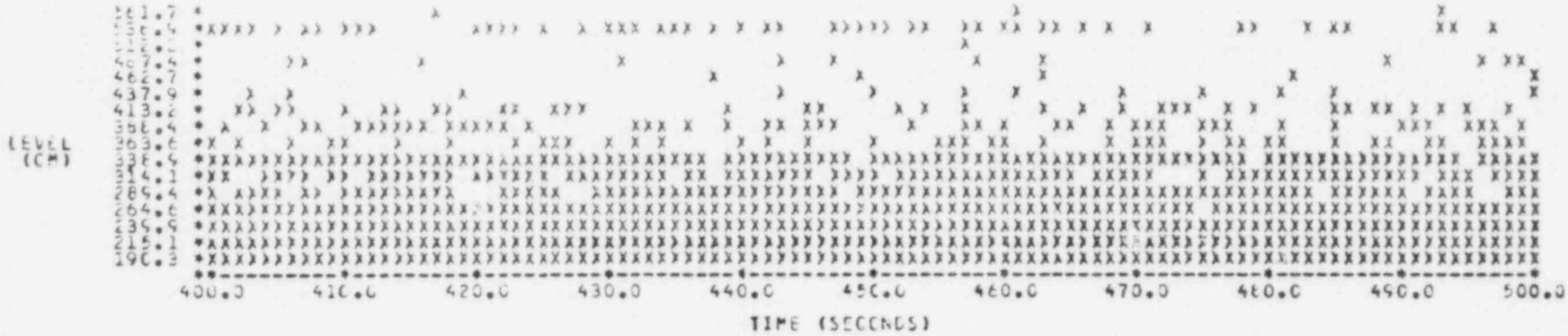


Figure B-49. Core wide range 2 (400 to 500 s).

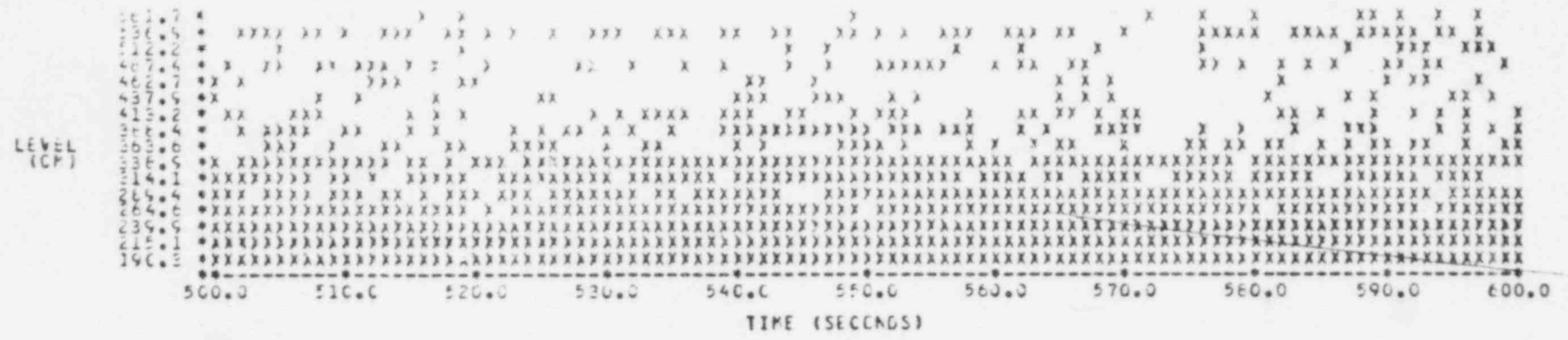


Figure B-50. Core wide range 2 (500 to 600 s).

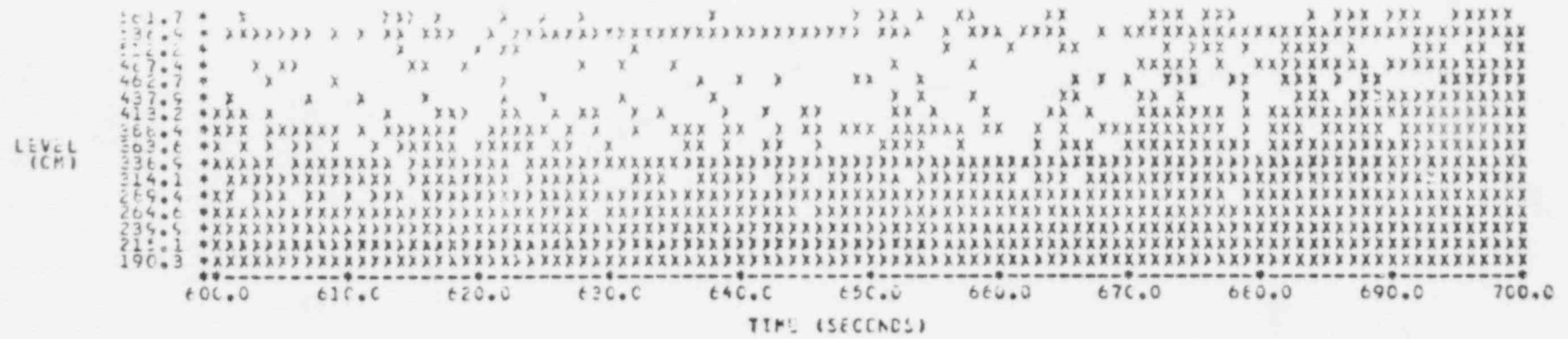


Figure B-51. Core wide range 2 (600 to 700 s).

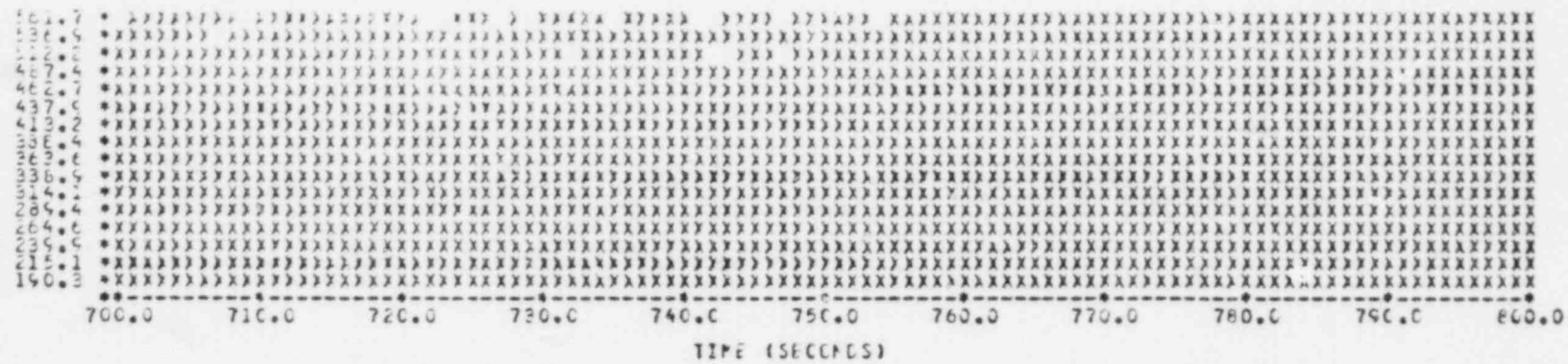


Figure B-52. Core wide range 2 (700 to 800 s).

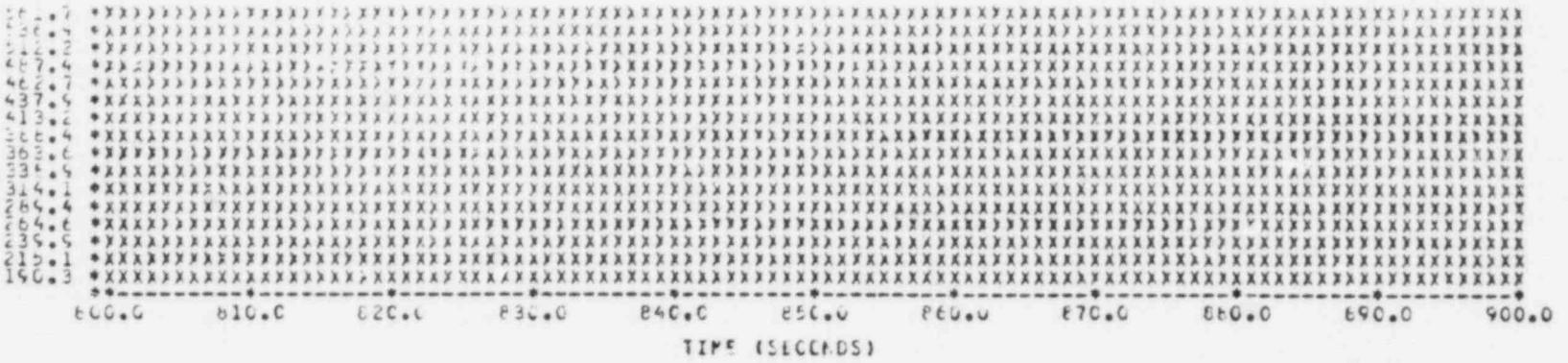


Figure B-53. Core wide range 2 (800 to 900 s).

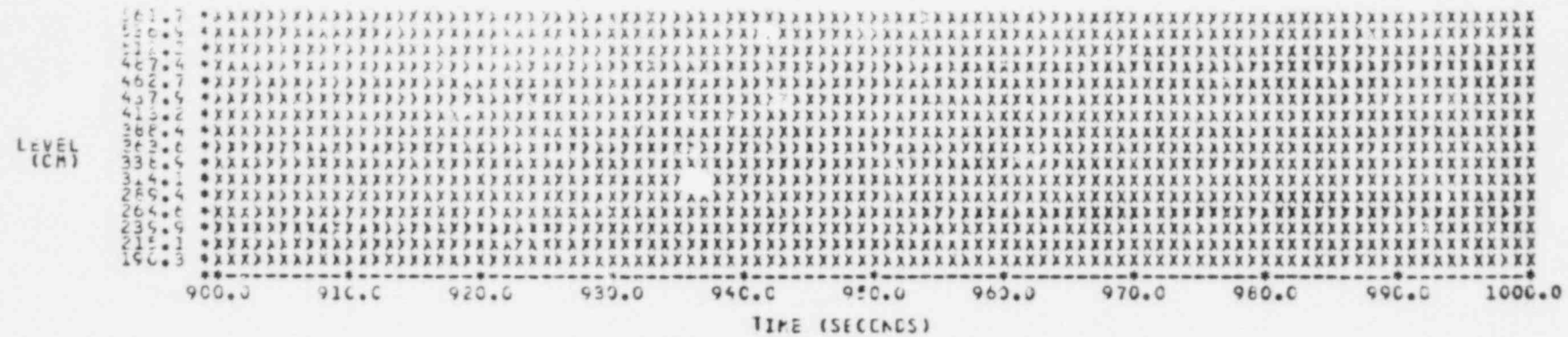


Figure B-54. Core wide range 2 (900 to 1000 s).

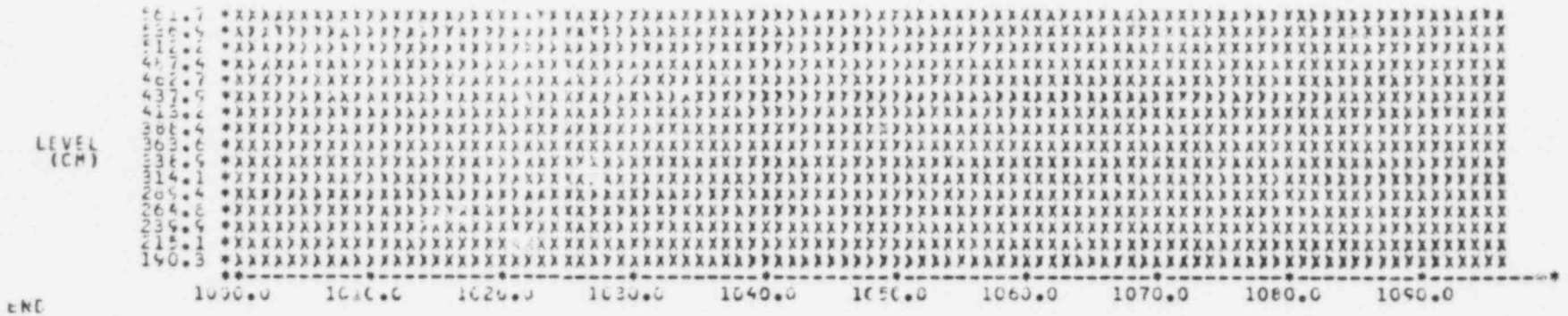


Figure B-55. Core wide range 2 (1000 to 1096 s).

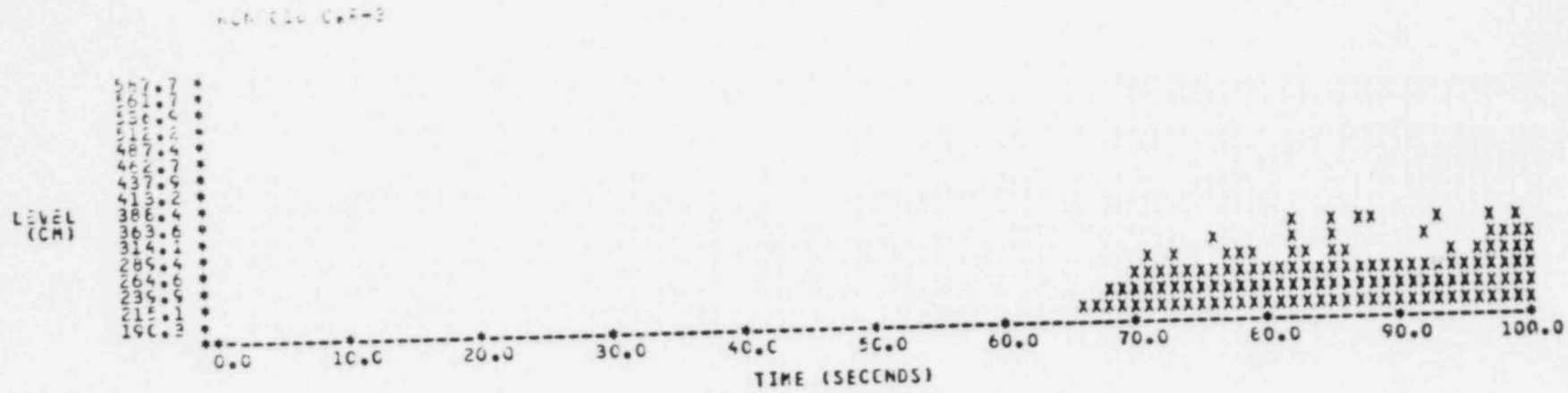


Figure B-56. Core wide range 3 (0 to 100 s).

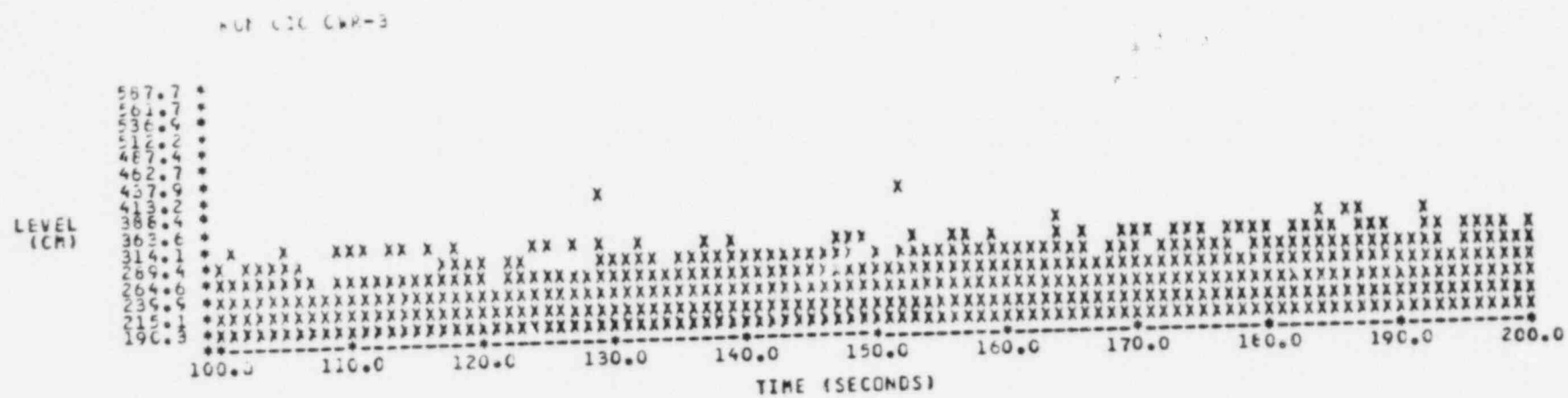


Figure B-57. Core wide range 3 (100 to 200 s).

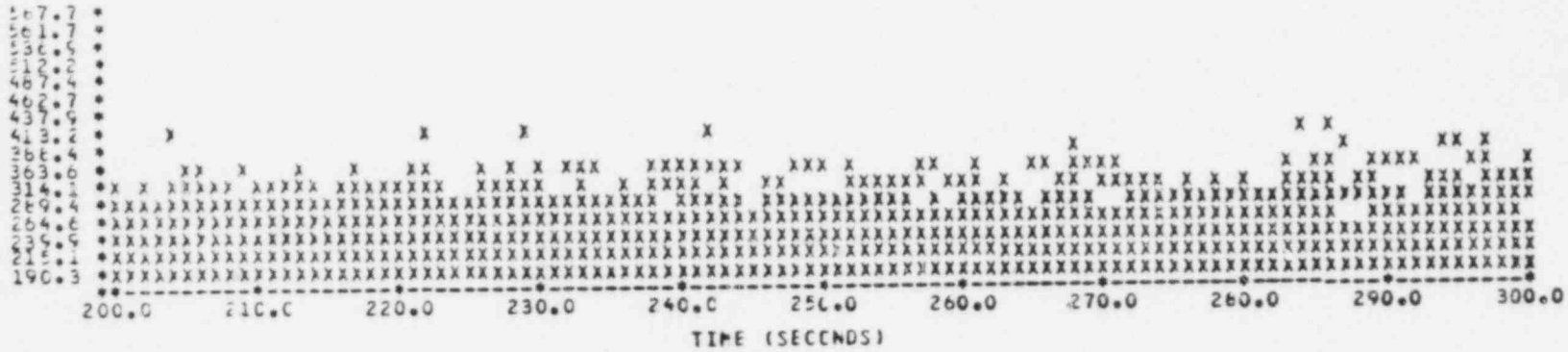


Figure B-58. Core wide range 3 (200 to 300 s).

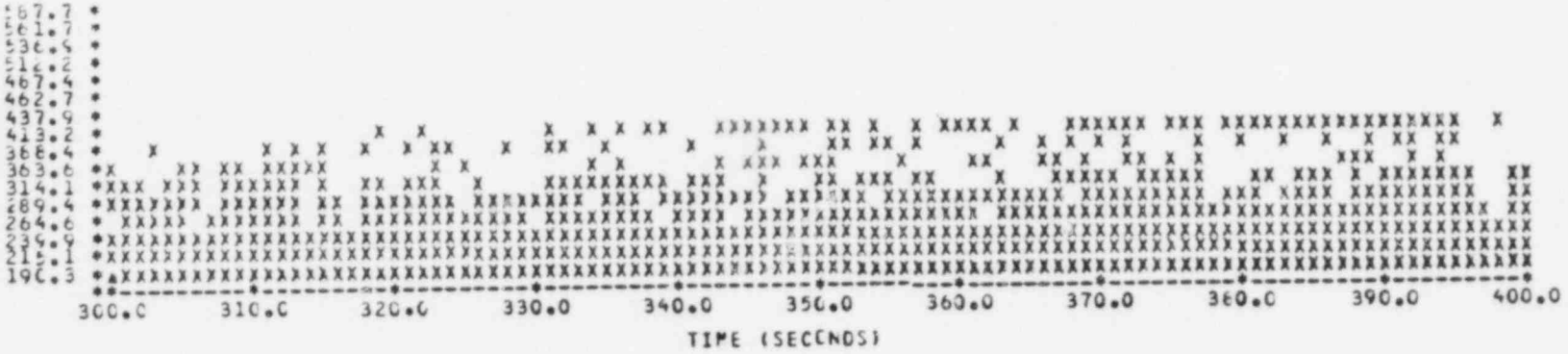


Figure B-59. Core wide range 3 (300 to 400 s).

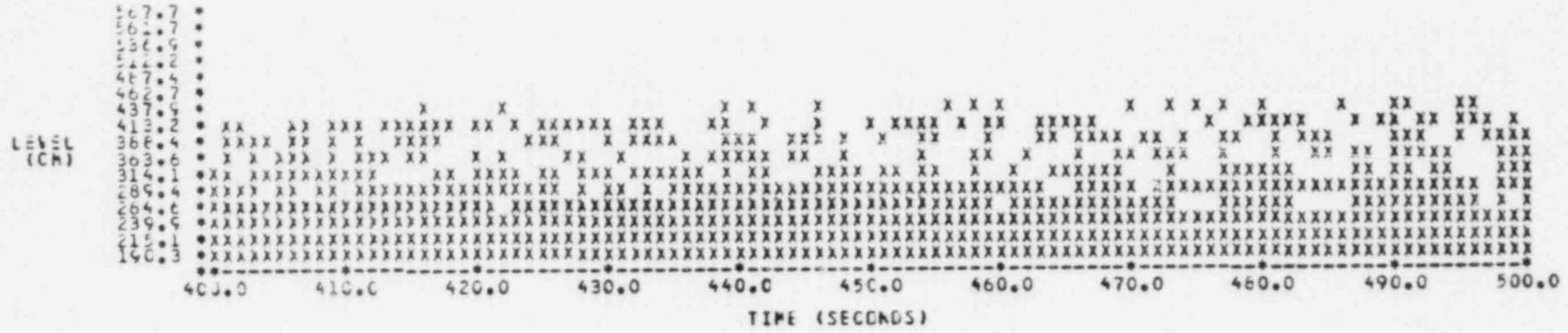


Figure B-60. Core wide range 3 (400 to 500 s).

Figure B-61. Core wide range 3 (500 to 600 s).

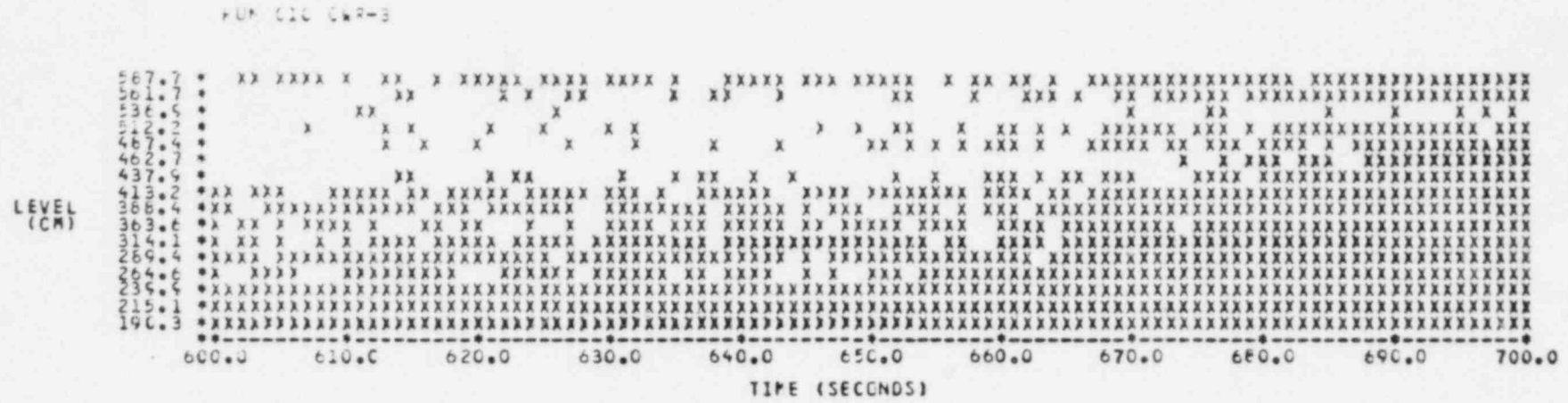


Figure B-62. Core wide range 3 (600 to 700 s).

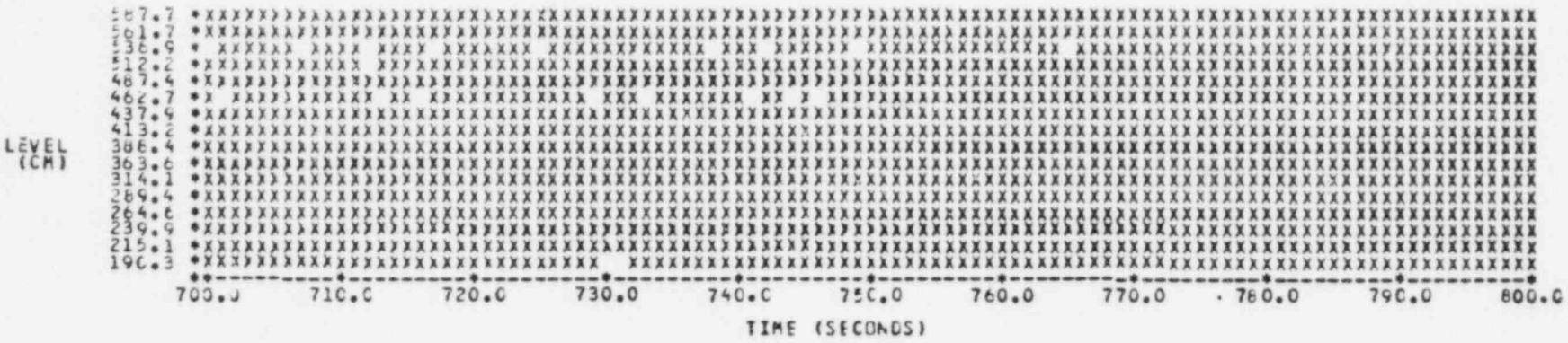


Figure B-63. Core wide range 3 (700 to 800 s).

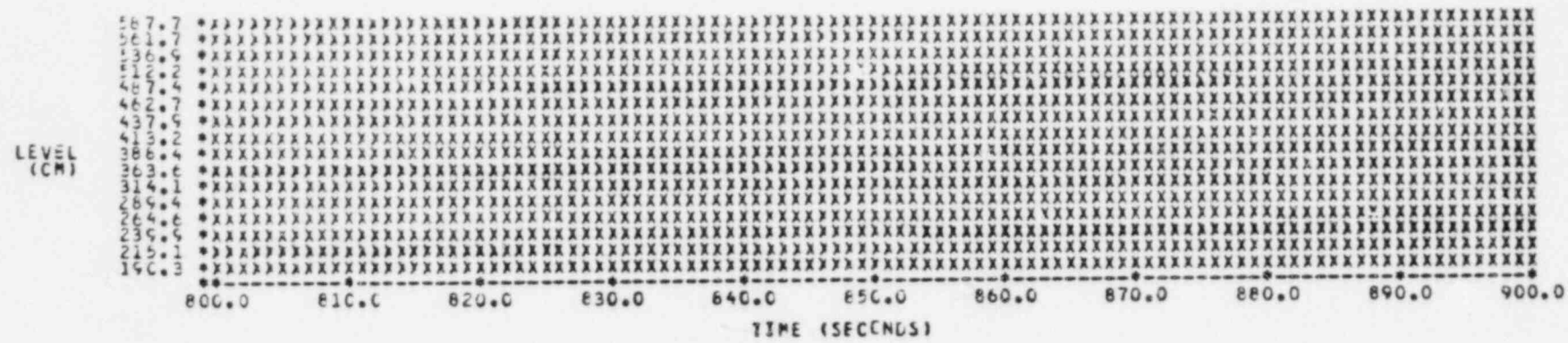


Figure B-64. Core wide range 3 (800 to 900 s).

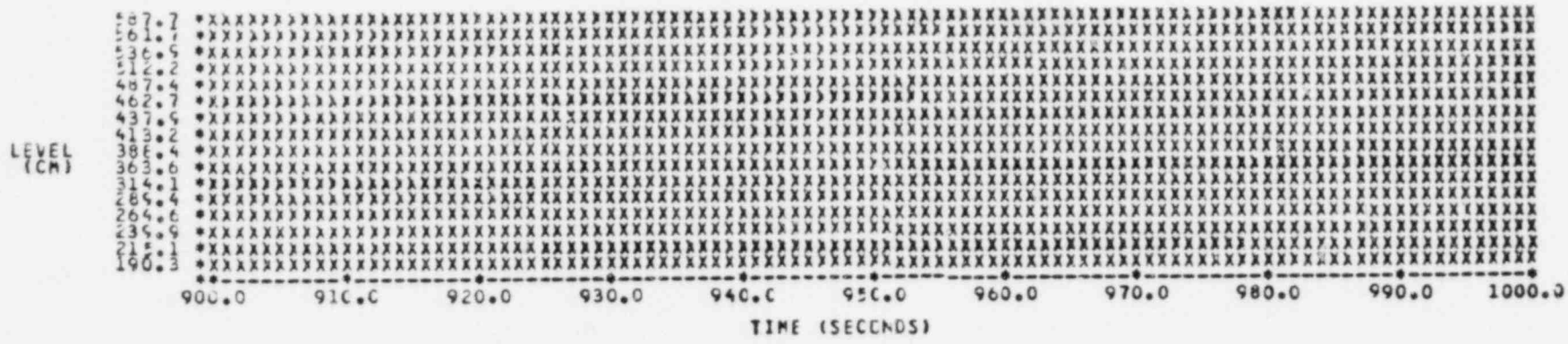


Figure B-65. Core wide range 3 (900 to 1000 s).

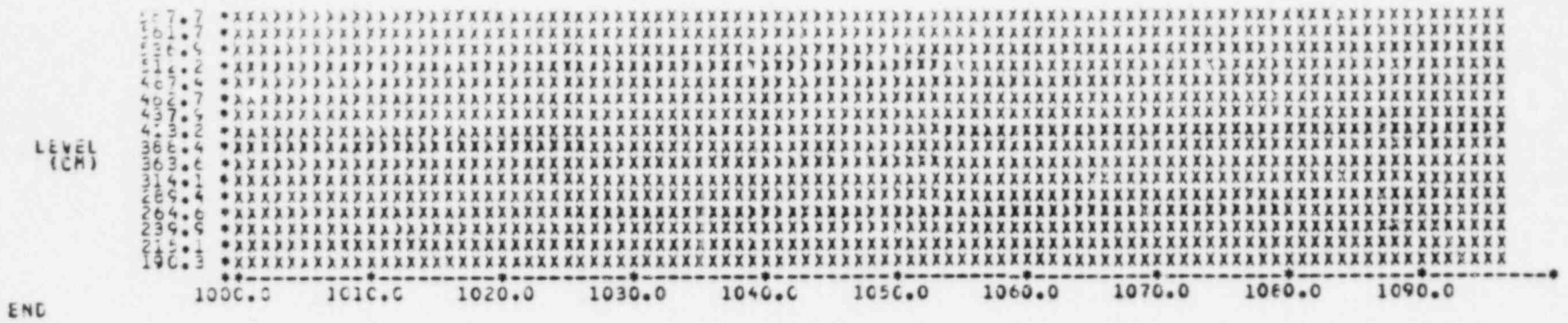


Figure B-66. Core wide range 3 (1000 to 1096 s).

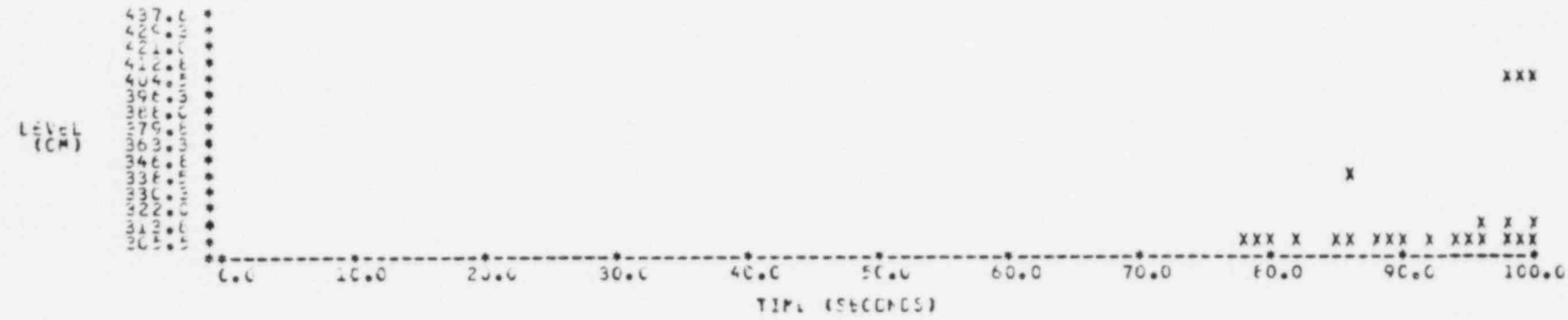


Figure B-67. Core narrow range 1 (0 to 100 s).

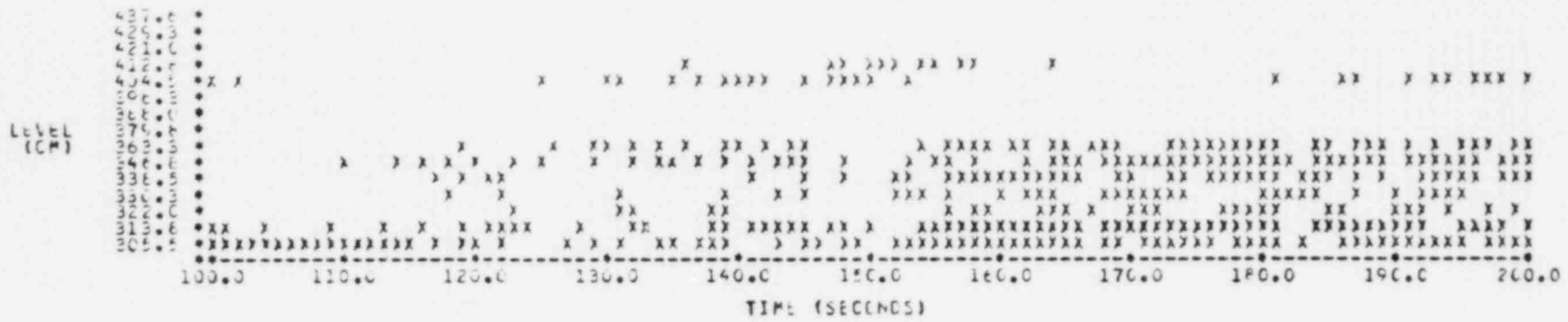


Figure B-68. Core narrow range 1 (100 to 200 s).

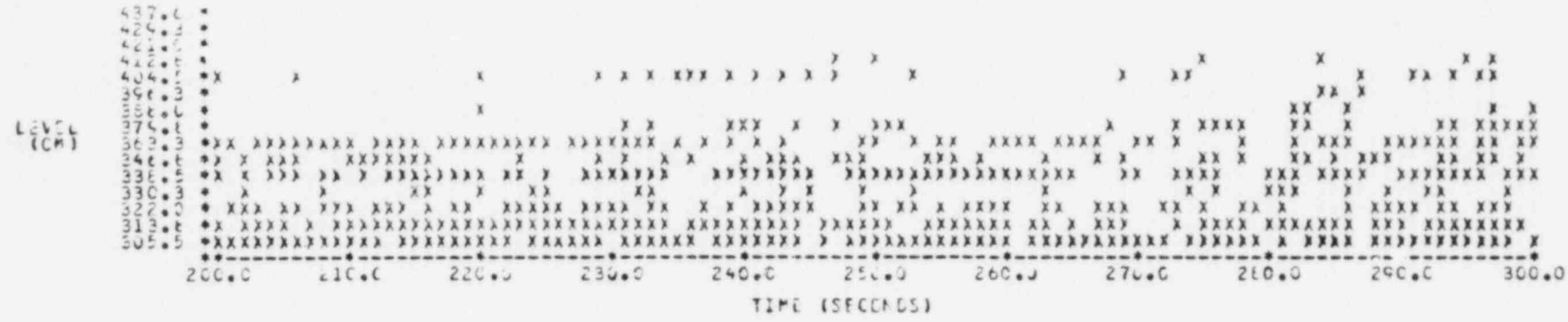


Figure B-69. Core narrow range 1 (200 to 300 s).

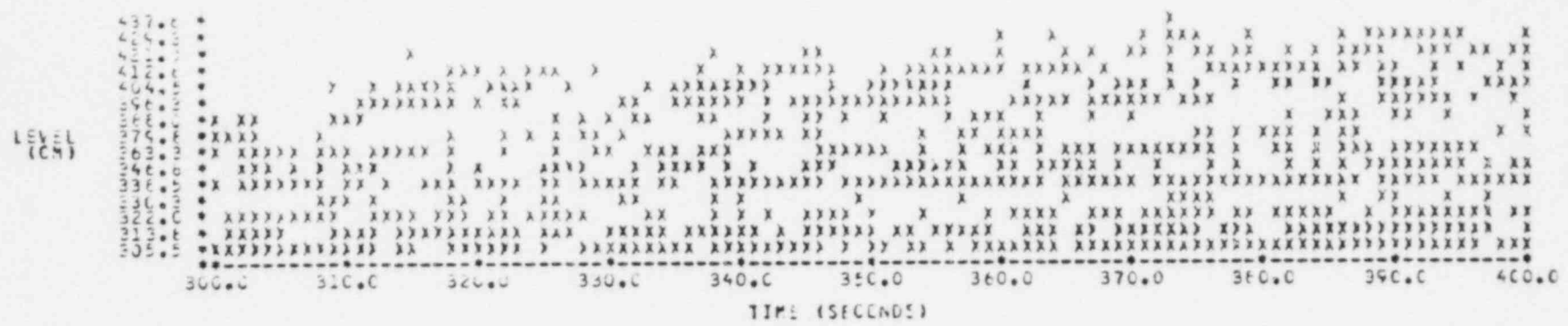


Figure B-70. Core narrow range 1 (300 to 400 s).

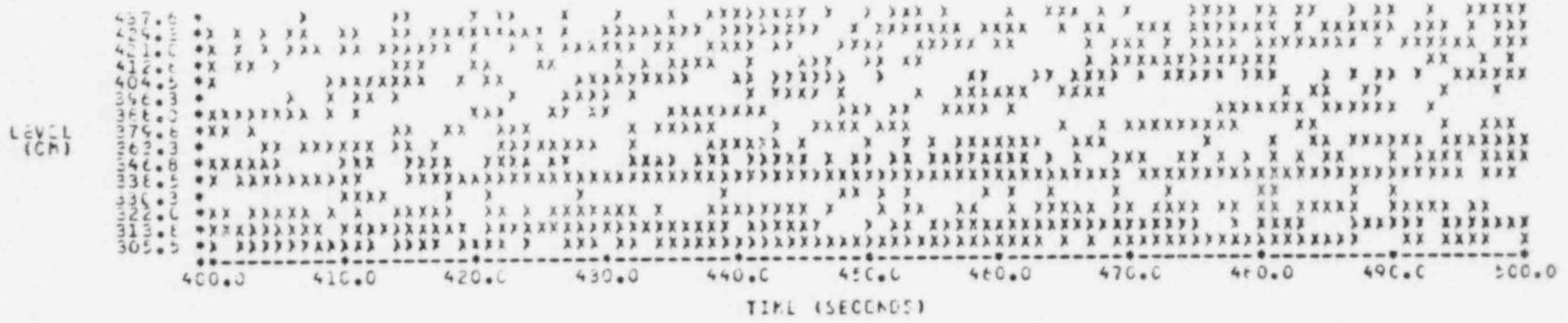


Figure B-71. Core narrow range 1 (400 to 500 s).

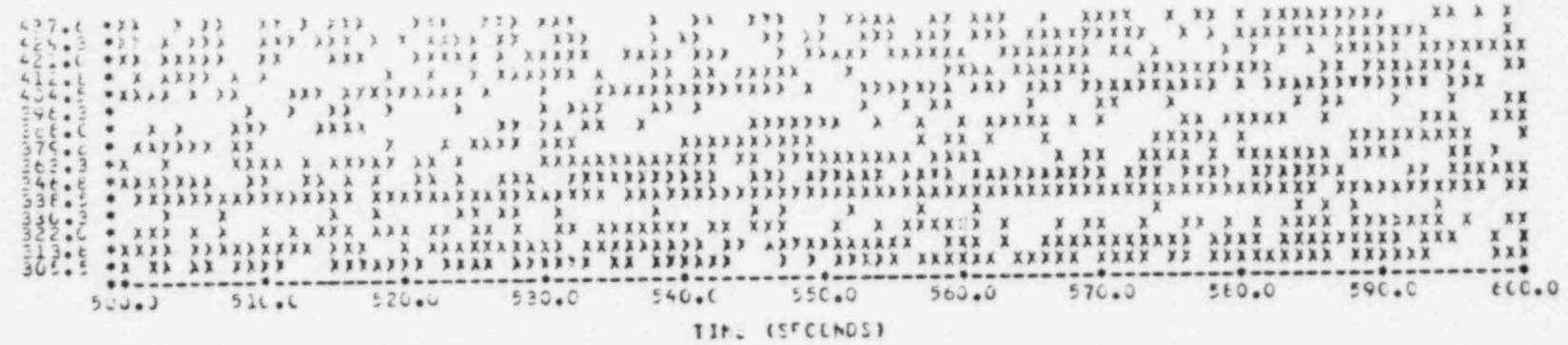


Figure B-72. Core narrow range 1 (500 to 600 s).

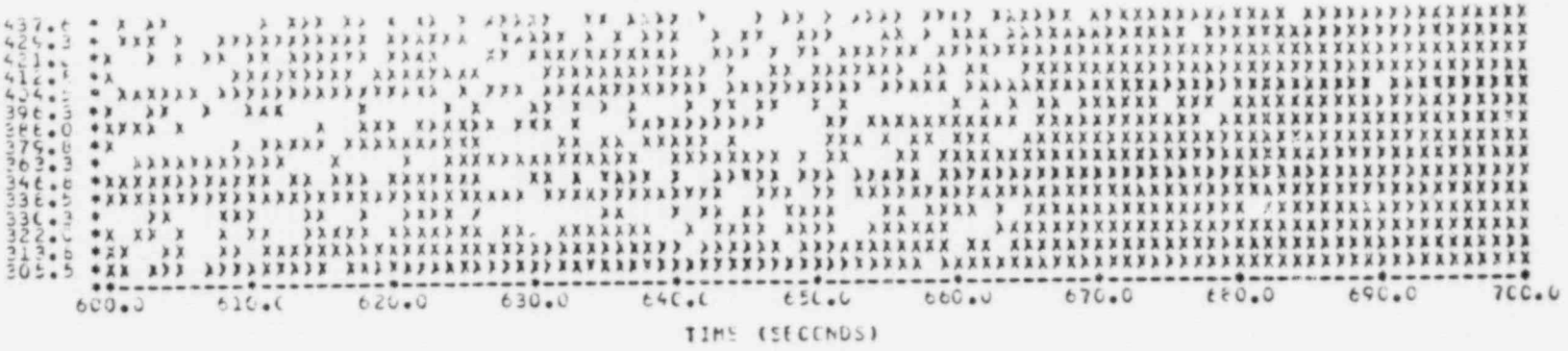


Figure B-73. Core narrow range 1 (600 to 700 s).

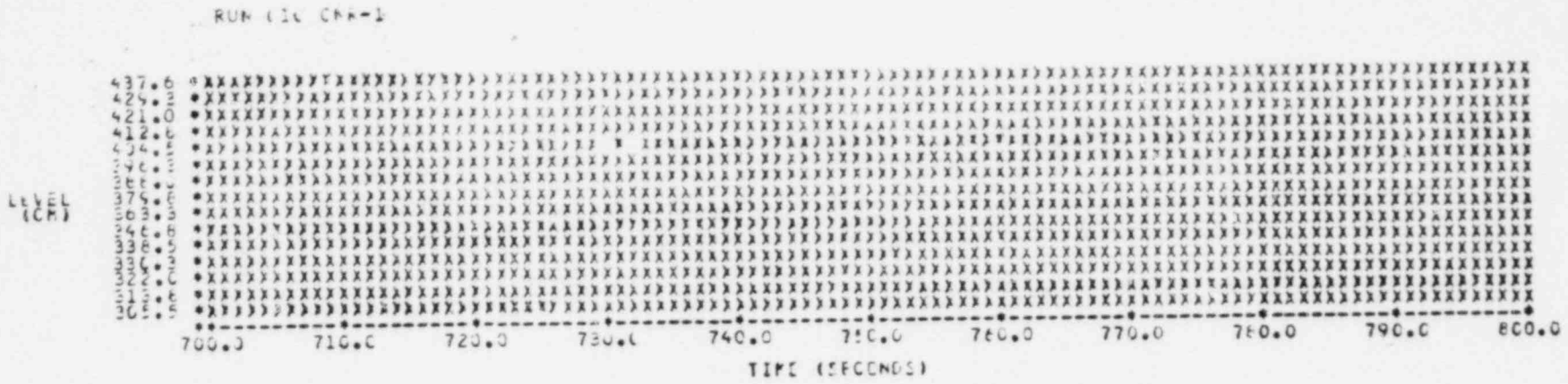


Figure B-74. Core narrow range 1 (700 to 800 s).

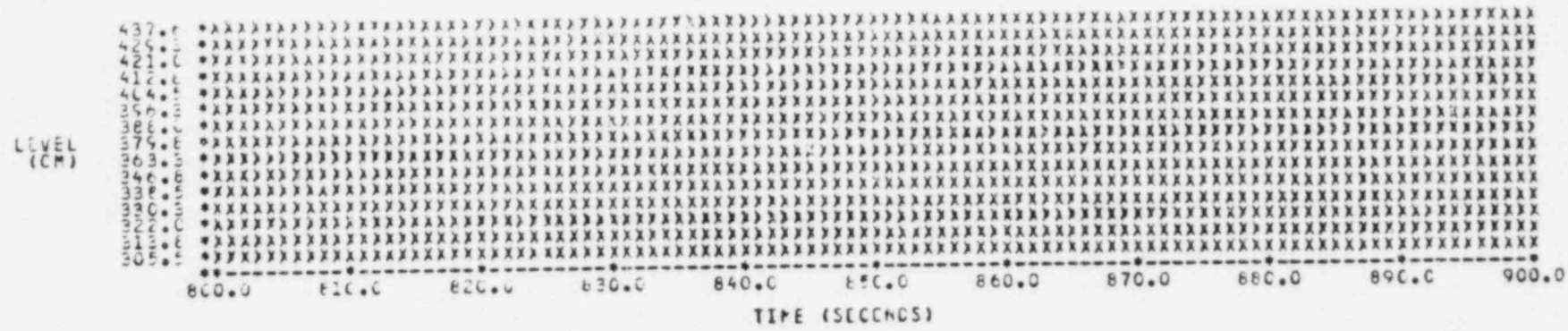


Figure B-75. Core narrow range 1 (800 to 900 s).

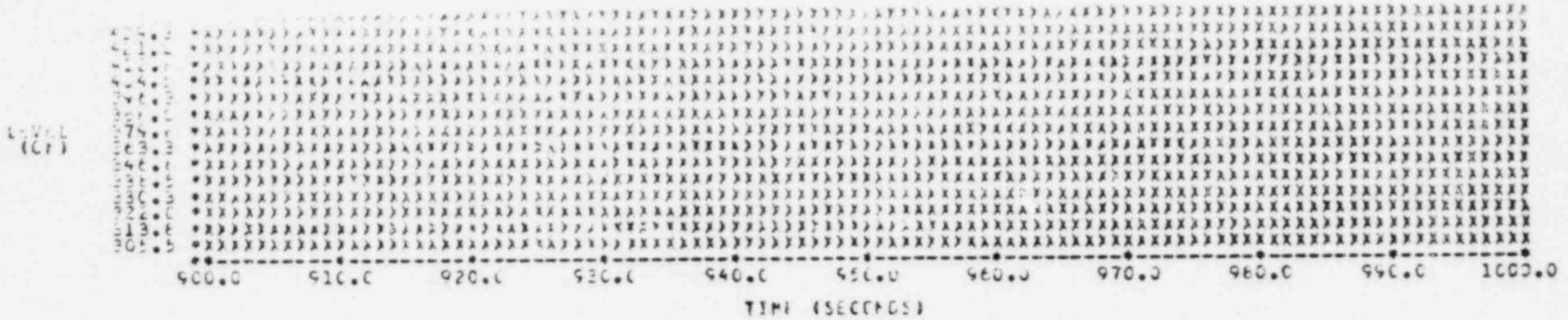


Figure B-76. Core narrow range 1 (900 to 1000 s).

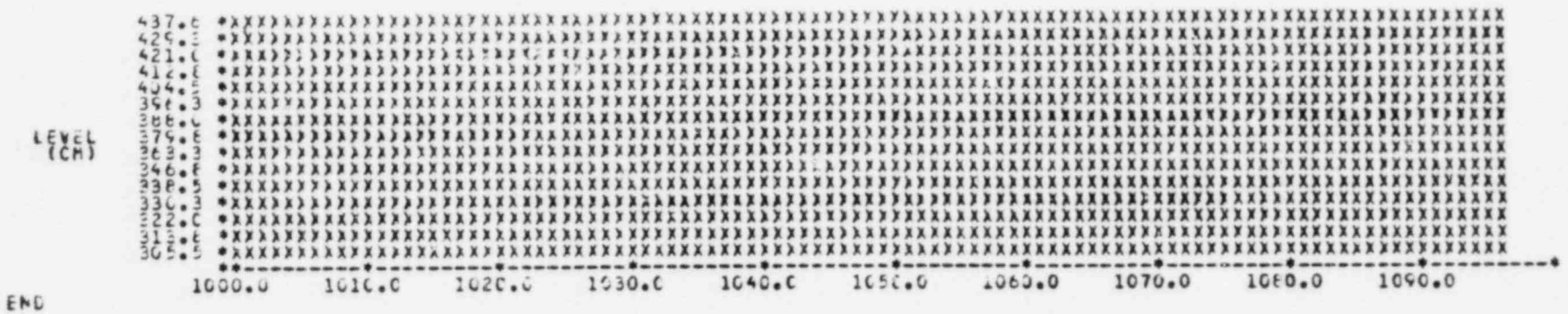


Figure B-77. Core narrow range 1 (1000 to 1096 s).

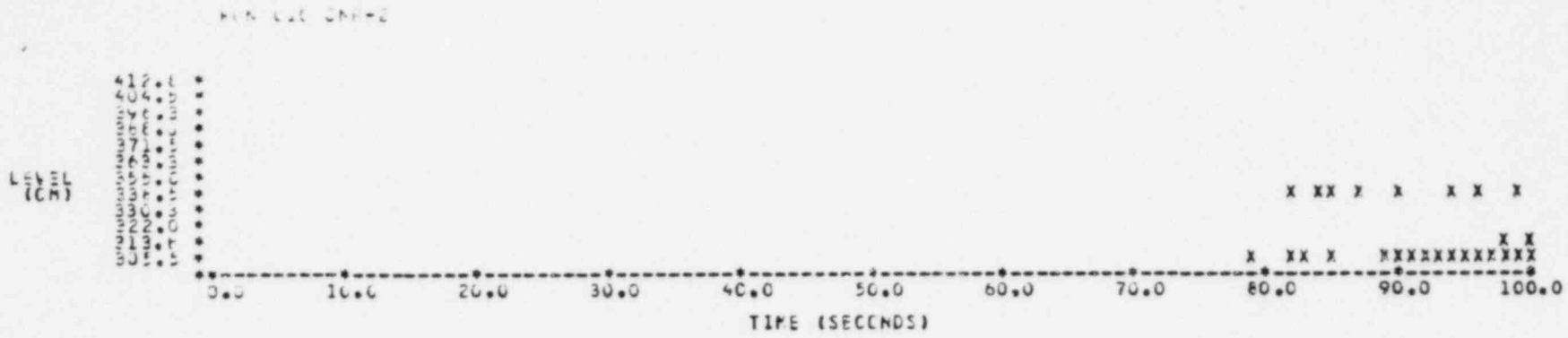


Figure B-78. Core narrow range 2 (0 to 100 s).

Figure B-79. Core narrow range 2 (100 to 200 s).

Figure B-80. Core narrow range 2 (200 to 300 s).

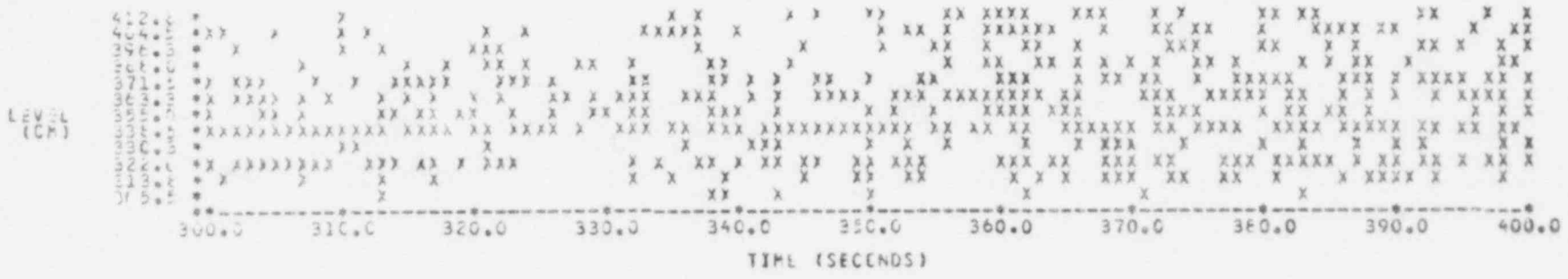
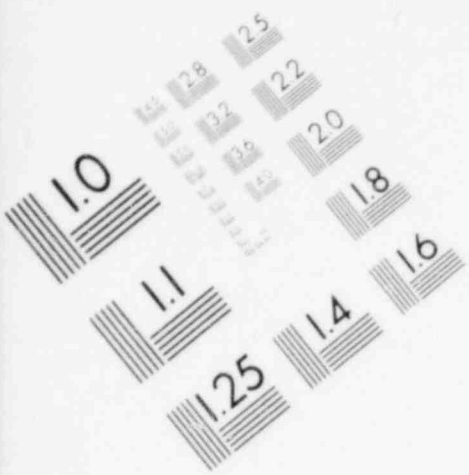


Figure B-81. Core narrow range 2 (300 to 400 s).



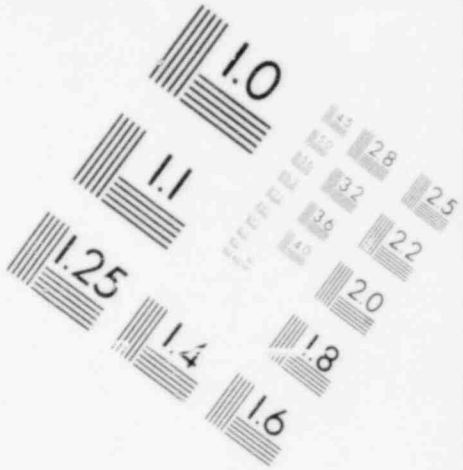
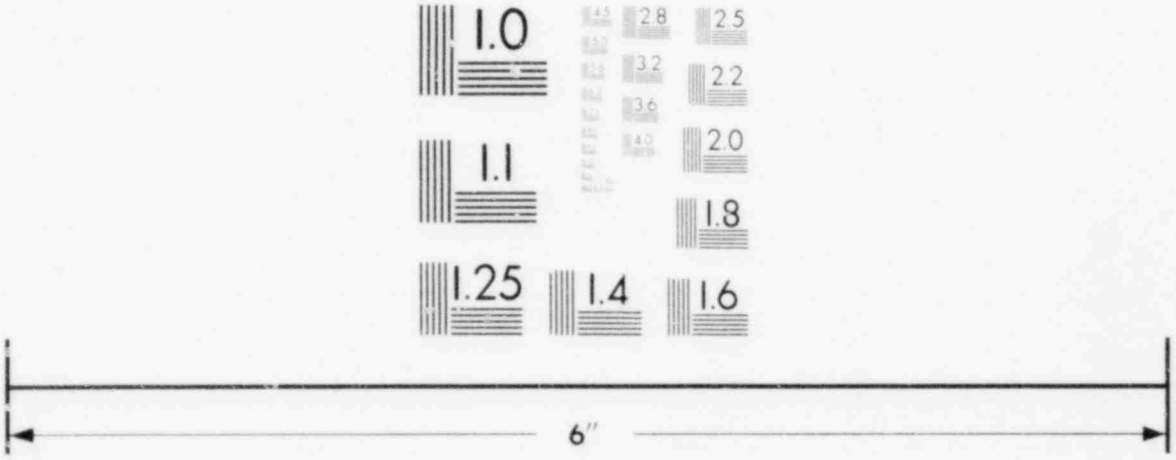
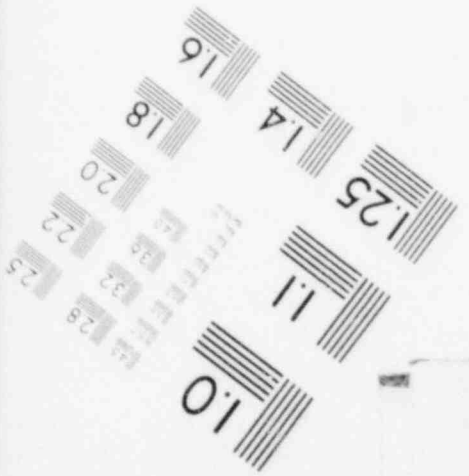
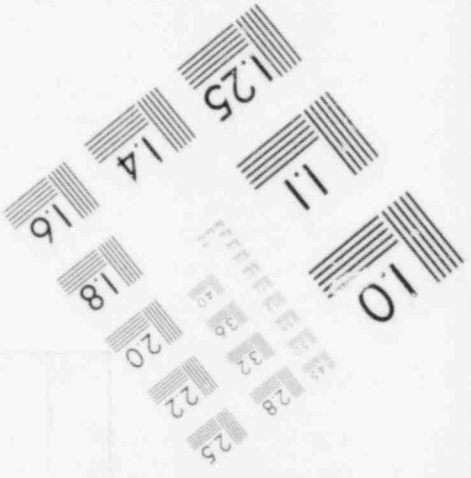


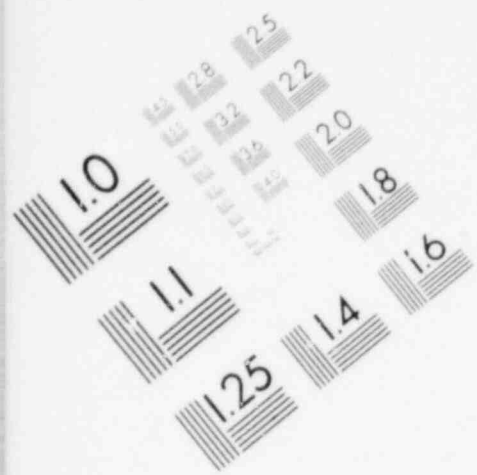
IMAGE EVALUATION
TEST TARGET (MT-3)



MICROCOPY RESOLUTION TEST CHART







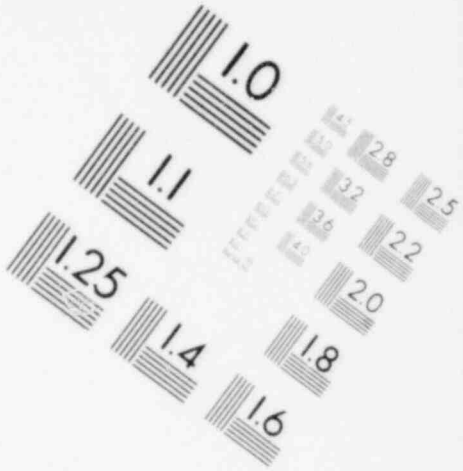
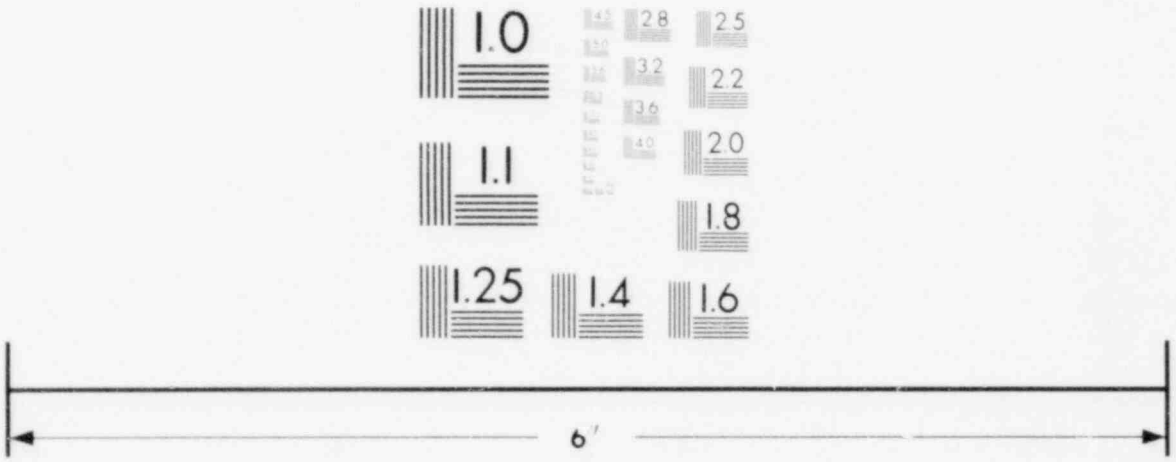
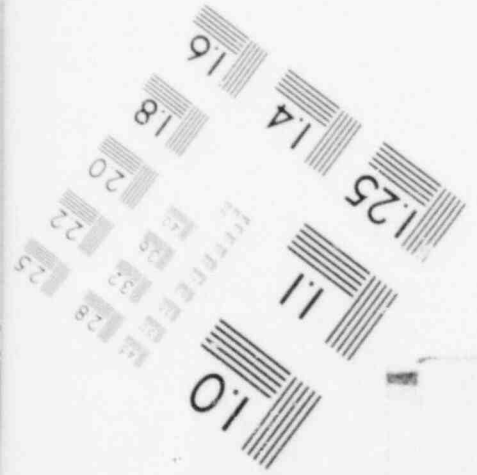
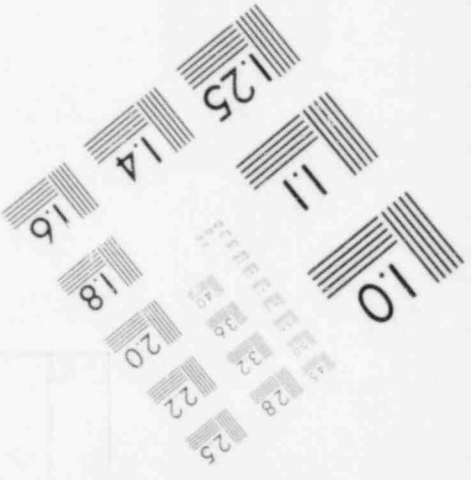


IMAGE EVALUATION
TEST TARGET (MT-3)



MICROCOPY RESOLUTION TEST CHART





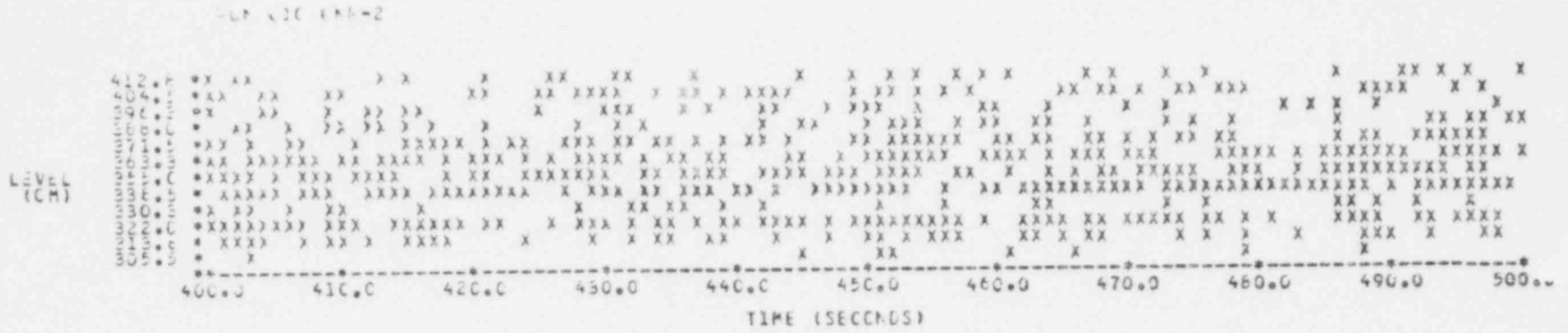


Figure B-82. Core narrow range 2 (400 to 500 s).

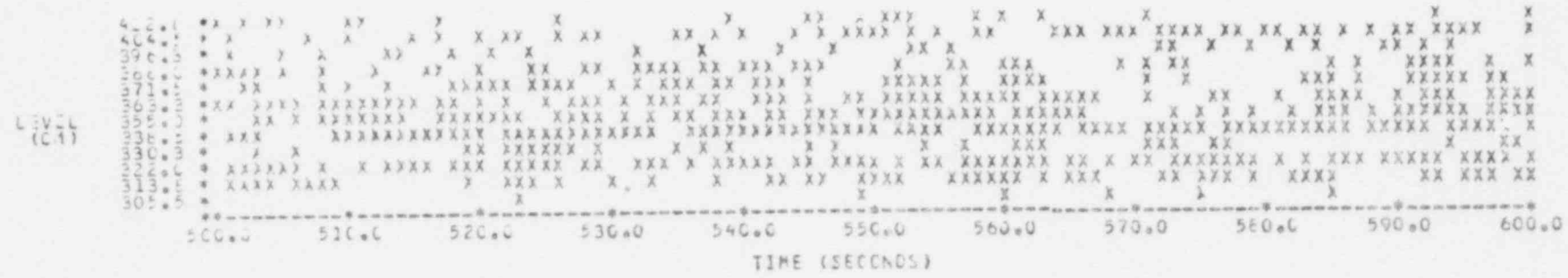


Figure B-83. Core narrow range 2 (500 to 600 s).

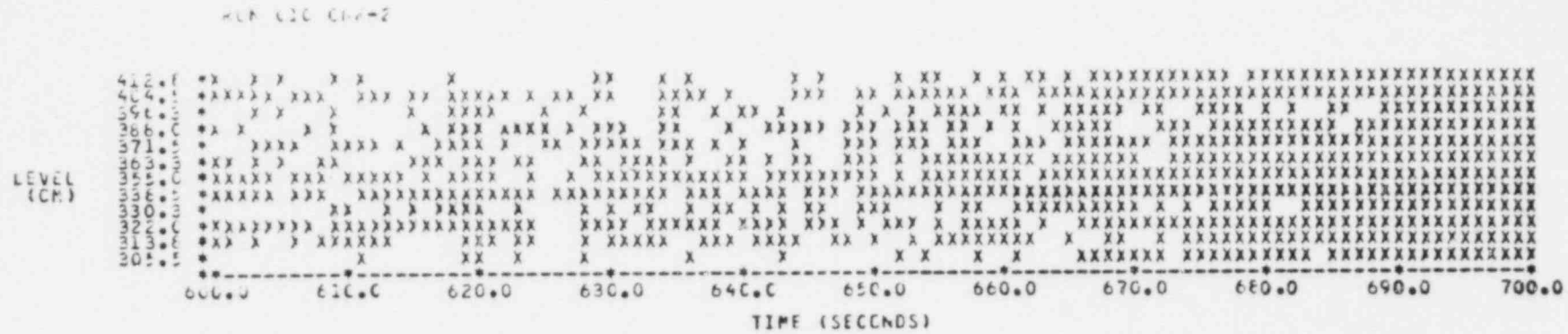


Figure B-84. Core narrow range 2 (600 to 700 s).

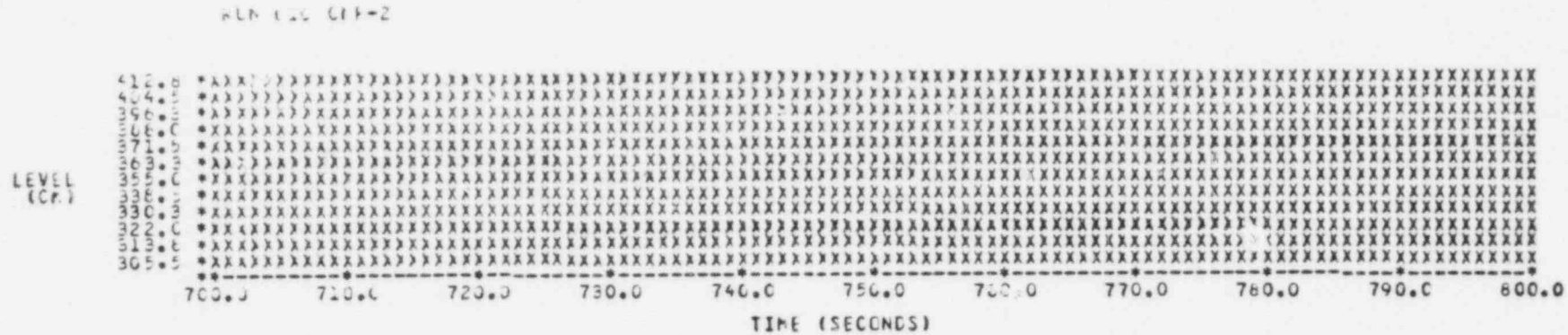


Figure B-85. Core narrow range 2 (700 to 800 s).

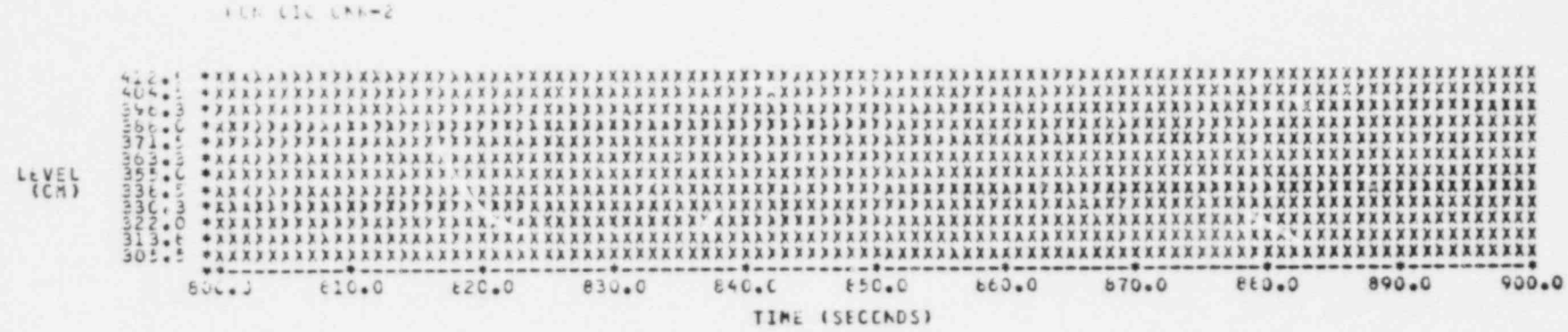


Figure B-86. Core narrow range 2 (800 to 900 s).

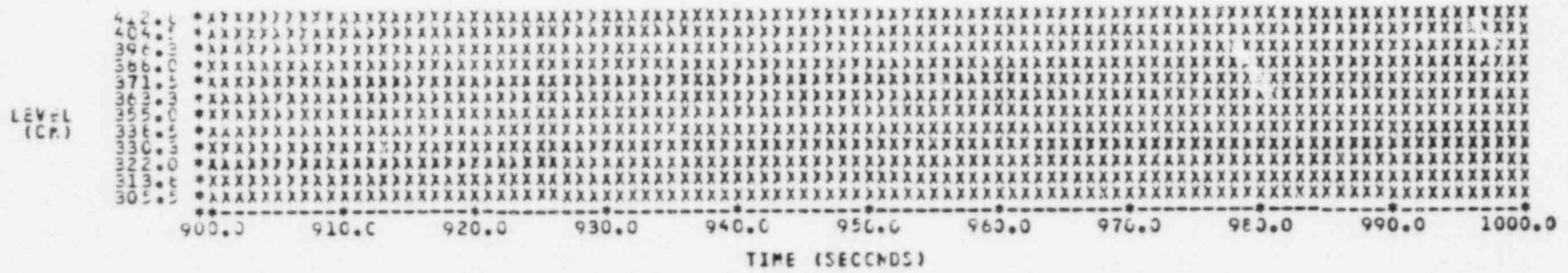


Figure B-87. Core narrow range 2 (900 to 1000 s).

Figure B-88. Core narrow range 2 (1000 to 1096 s).

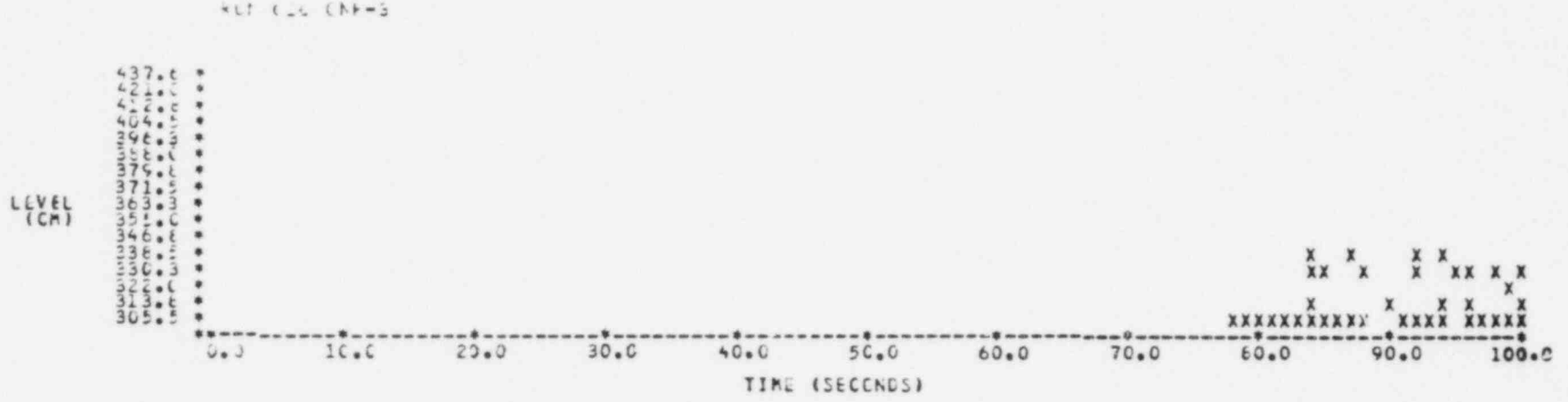


Figure B-89. Core narrow range 3 (0 to 100 s).

Figure B-90. Core narrow range 3 (100 to 200 s).

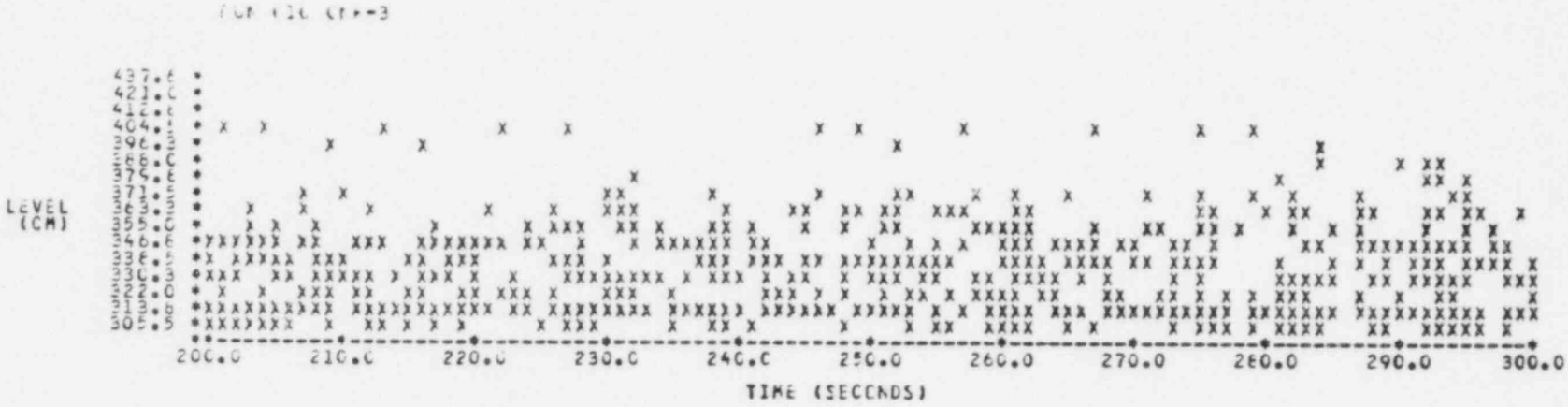


Figure B-91. Core narrow range 3 (200 to 300 s).

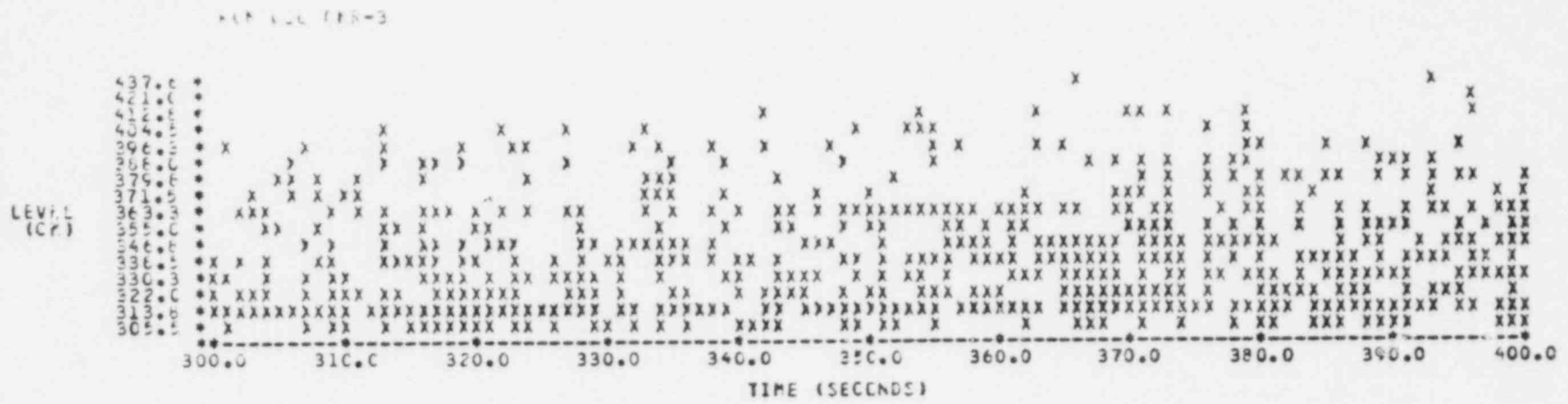


Figure B-92. Core narrow range 3 (300 to 400 s).

Figure B-93. Core narrow range 3 (400 to 500 s).

Figure B-94. Core narrow range 3 (500 to 600 s).

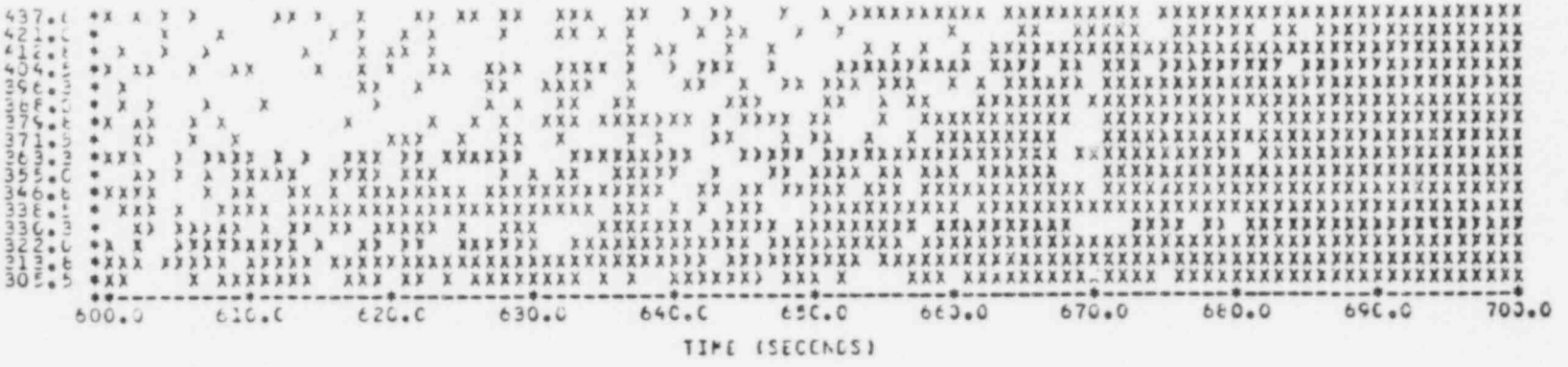


Figure B-95. Core narrow range 3 (600 to 700 s).

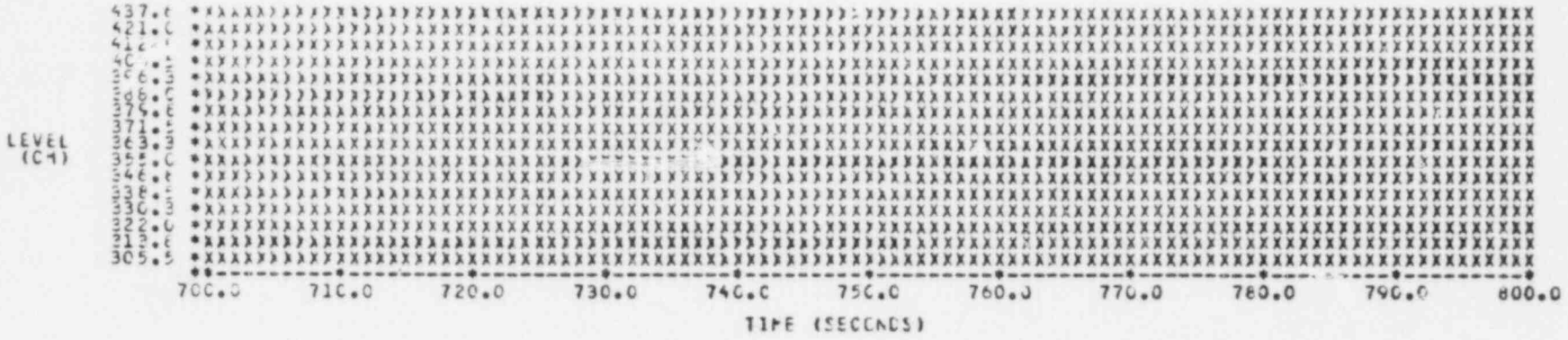


Figure B-96. Core narrow range 3 (700 to 800 s).

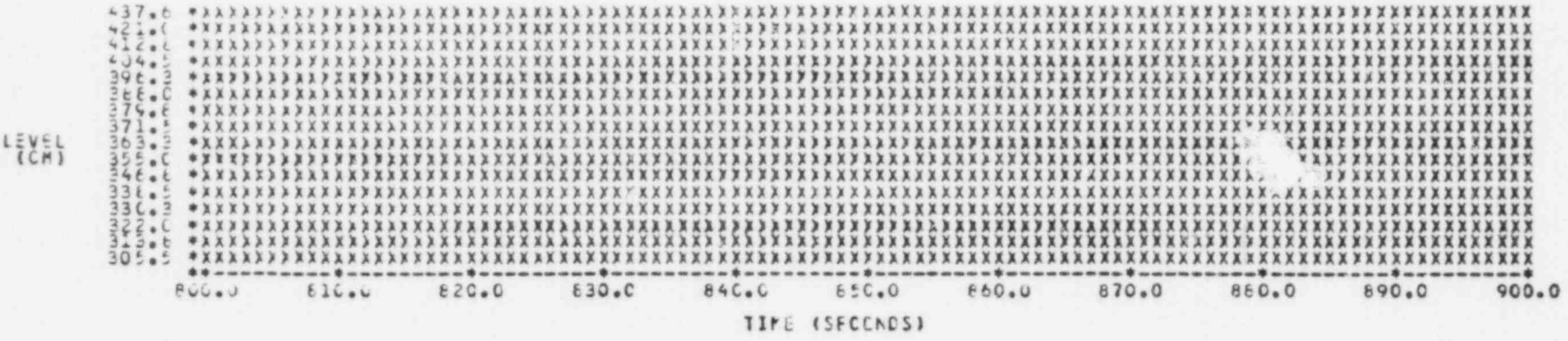


Figure B-97. Core narrow range 3 (800 to 900 s).

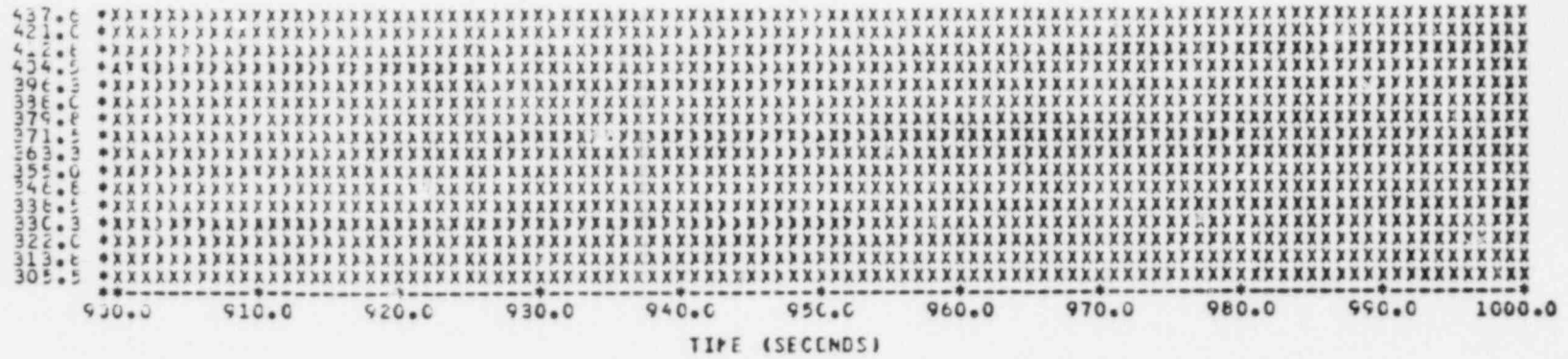


Figure B-98. Core narrow range 3 (900 to 1000 s).

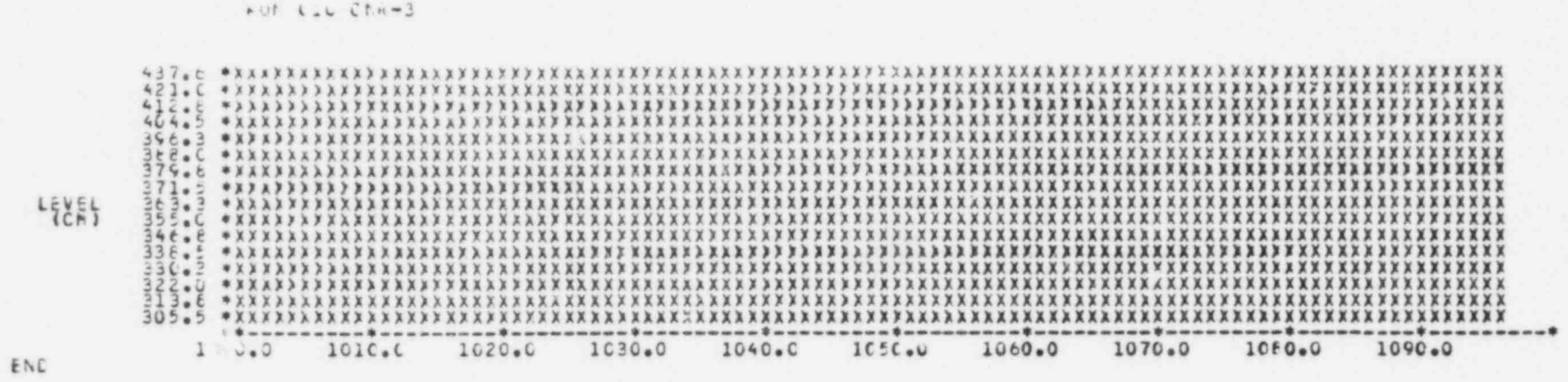


Figure B-99. Core narrow range 3 (1000 to 1096 s).

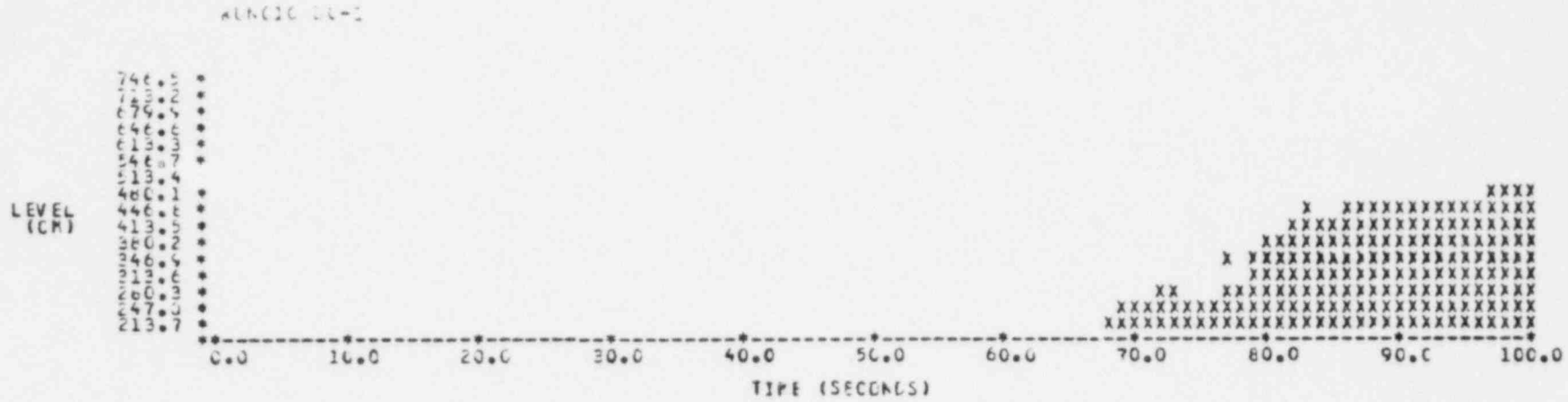


Figure B-100. Downcomer 1 (0 to 100 s).

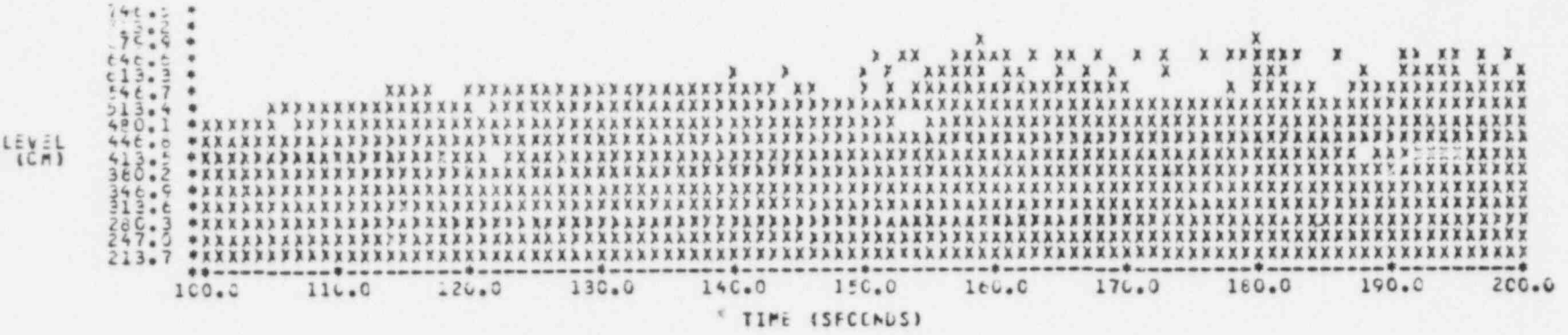


Figure B-101. Downcomer 1 (100 to 200 s).

Figure B-102. Downcomer 1 (200 to 300 s).

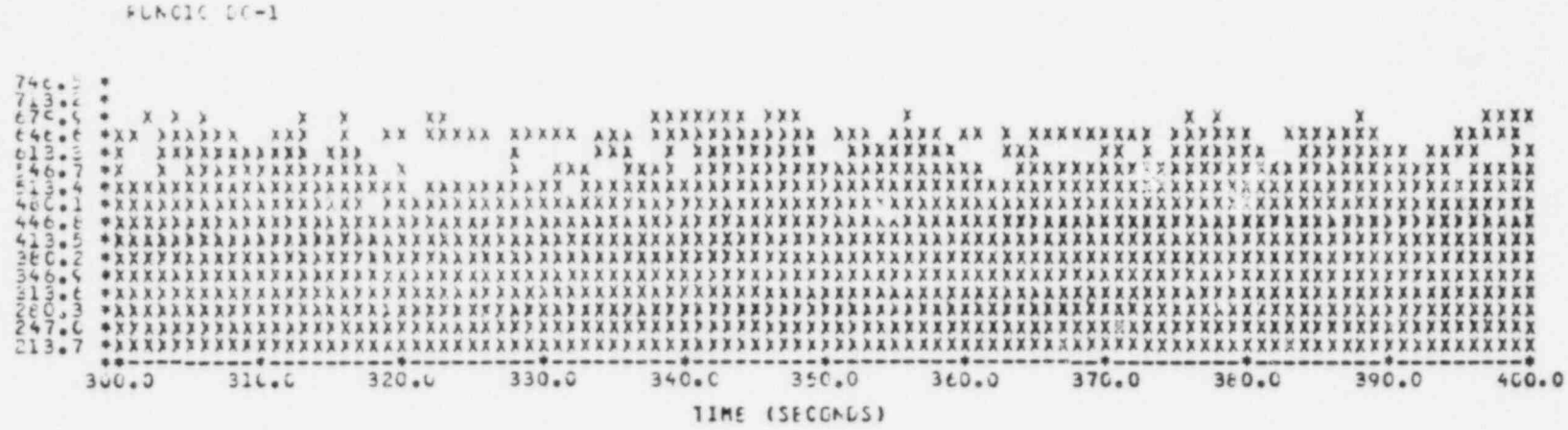


Figure B-103. Downcomer 1 (300 to 400 s).

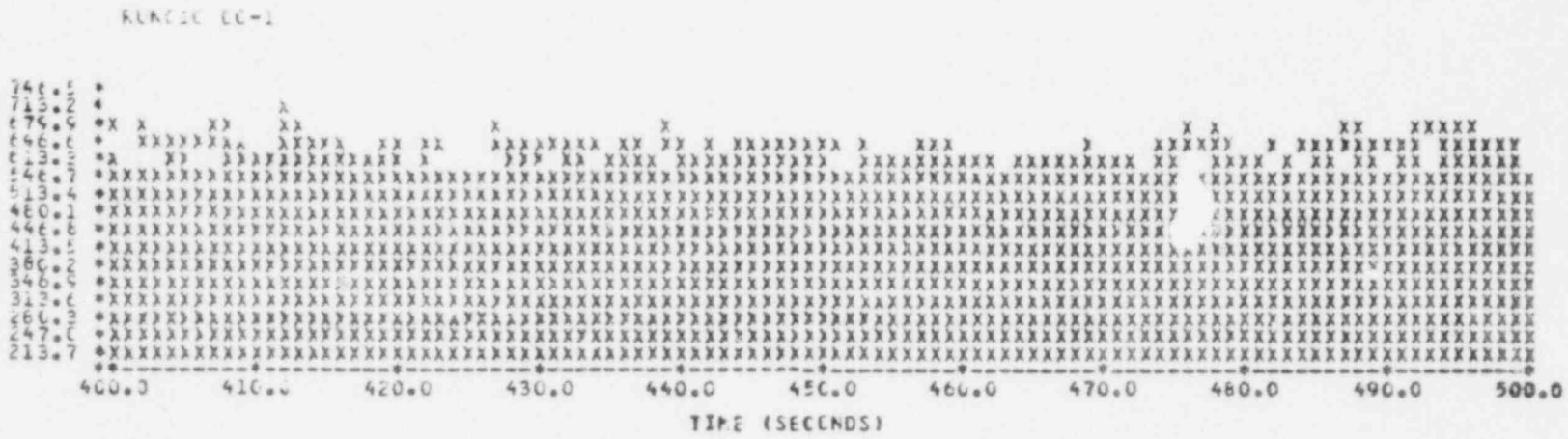


Figure B-104. Downcomer 1 (400 to 500 s).

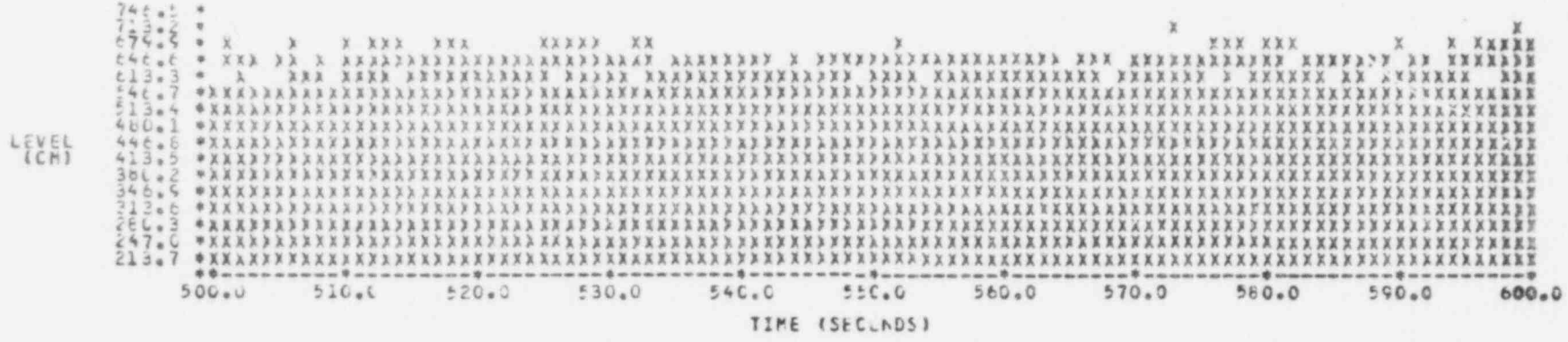


Figure B-105. Downcomer 1 (500 to 600 s).

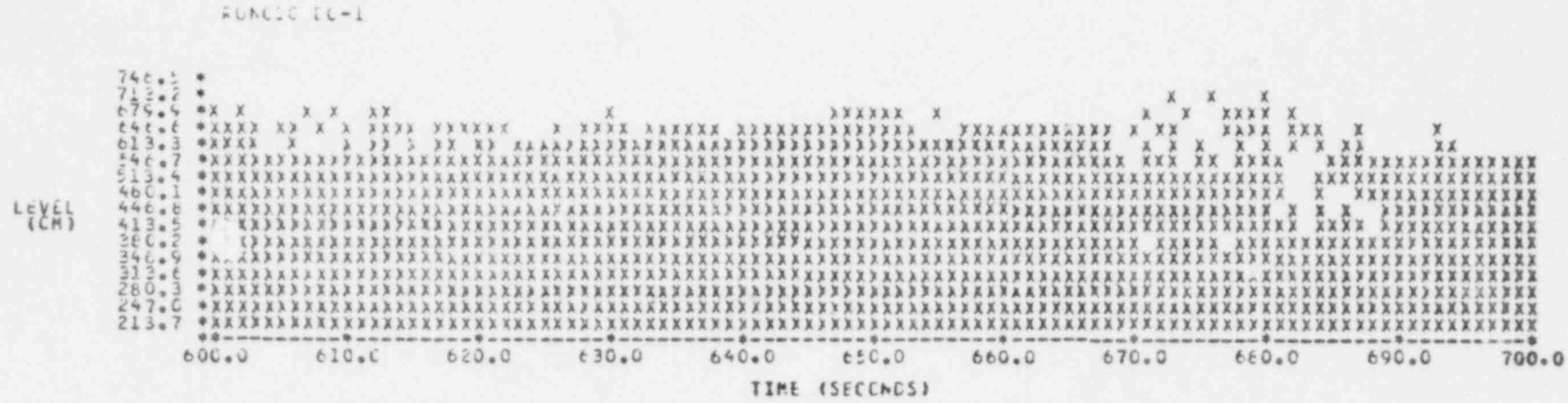


Figure B-106. Downcomer 1 (600 to 700 s).

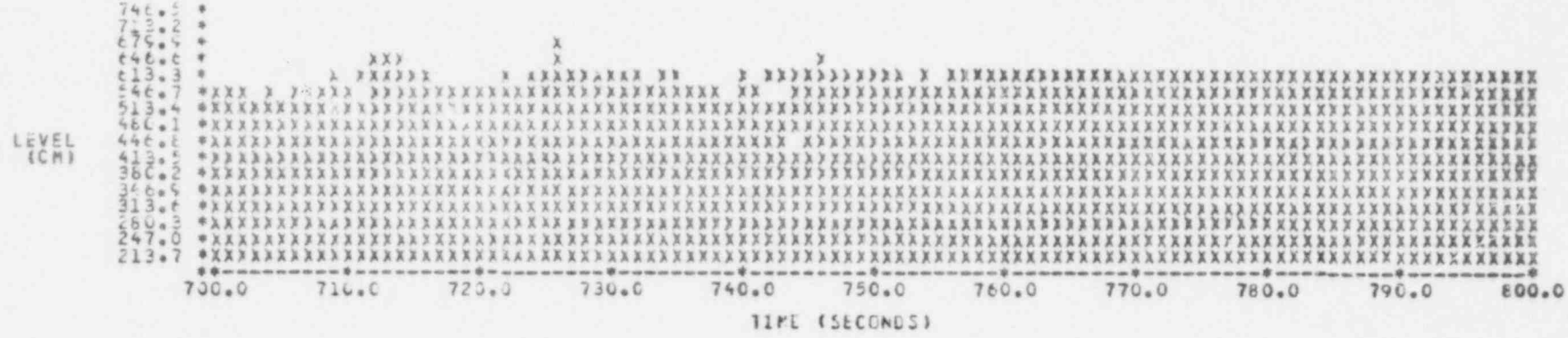


Figure B-107. Downcomer 1 (700 to 800 s).

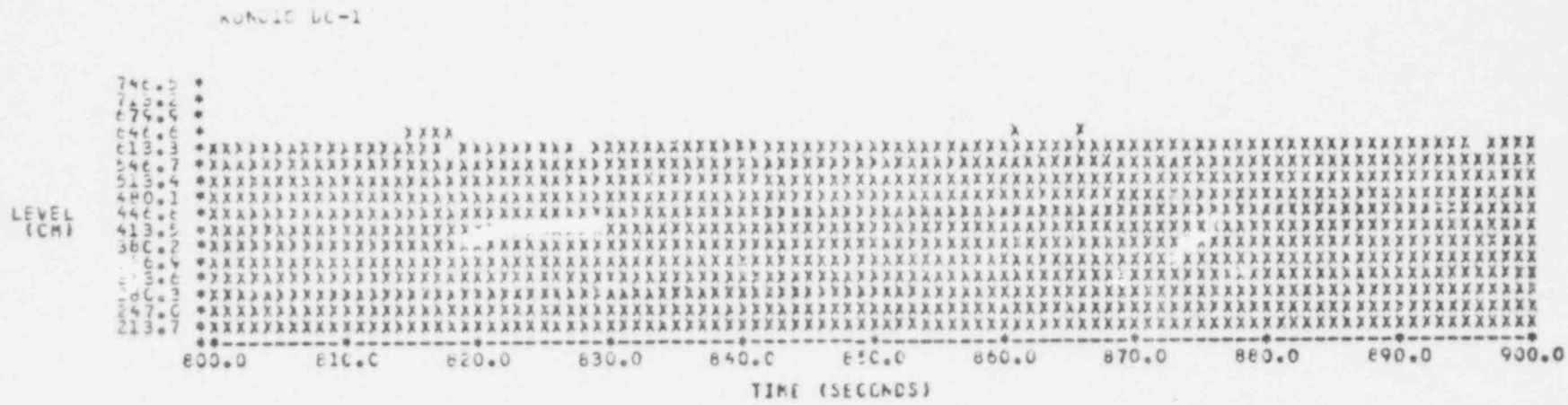


Figure B-108. Downcomer 1 (800 to 900 s).

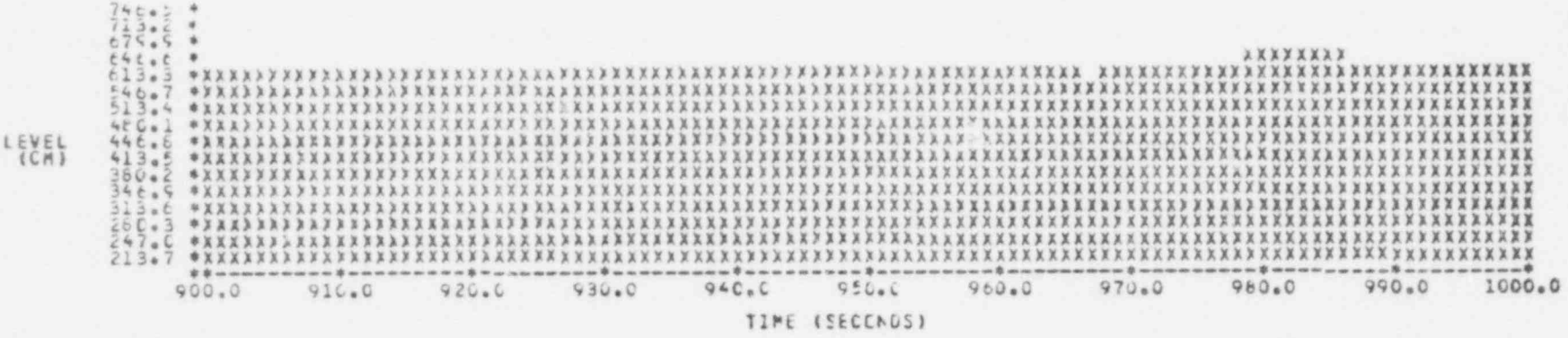


Figure B-109. Downcomer 1 (900 to 1000 s).

Figure B-110. Downcomer 1 (1000 to 1096 s).

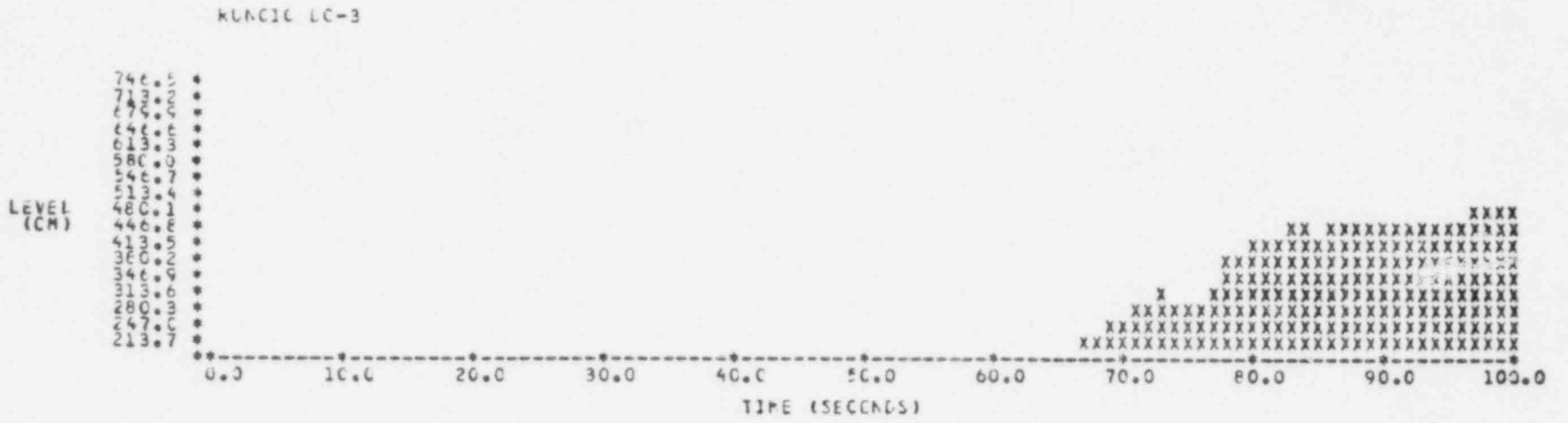


Figure B-111. Downcomer 3 (0 to 100 s).

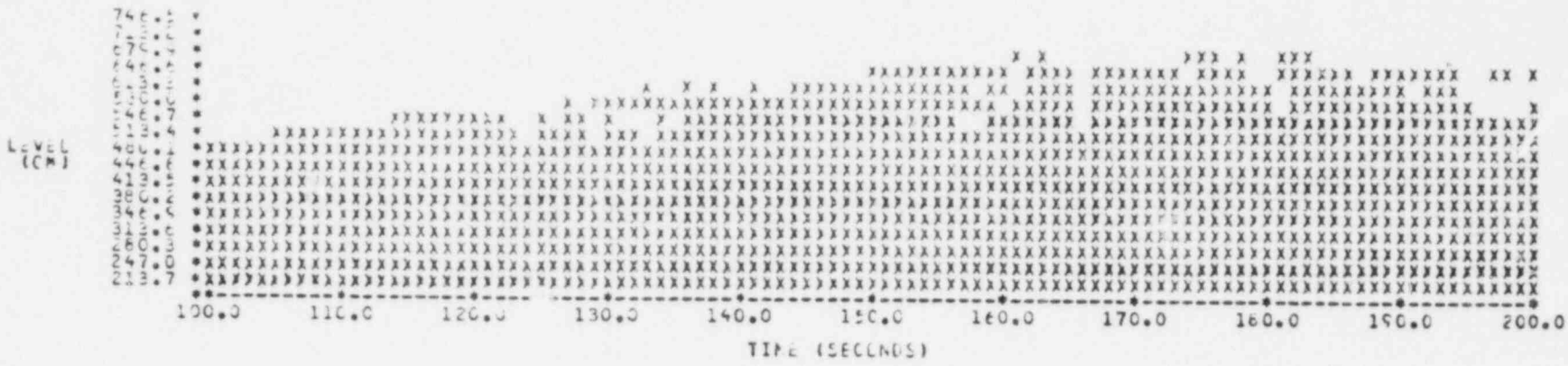


Figure B-112. Downcomer 3 (100 to 200 s).

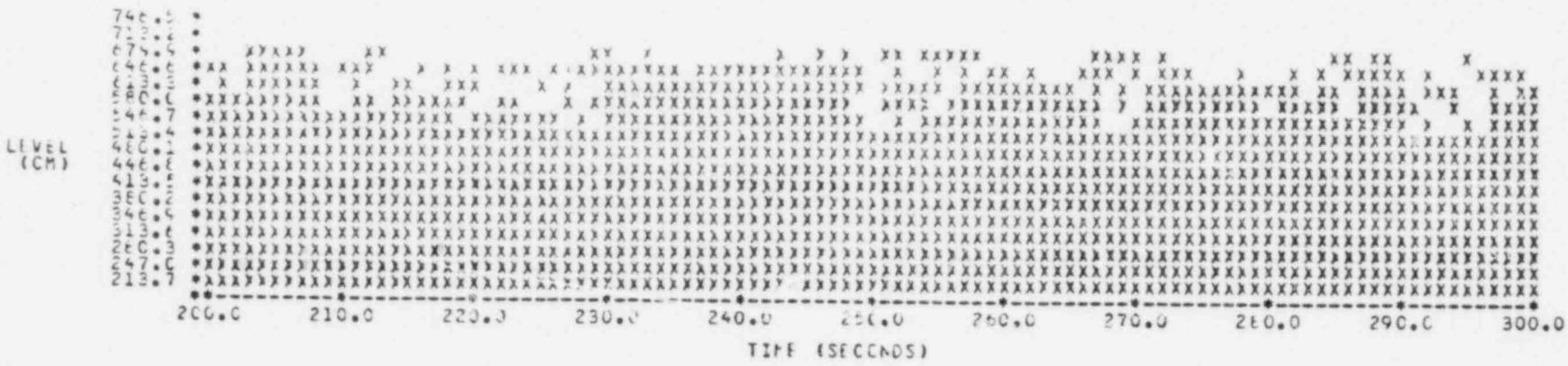


Figure B-113. Downcomer 3 (200 to 300 s).

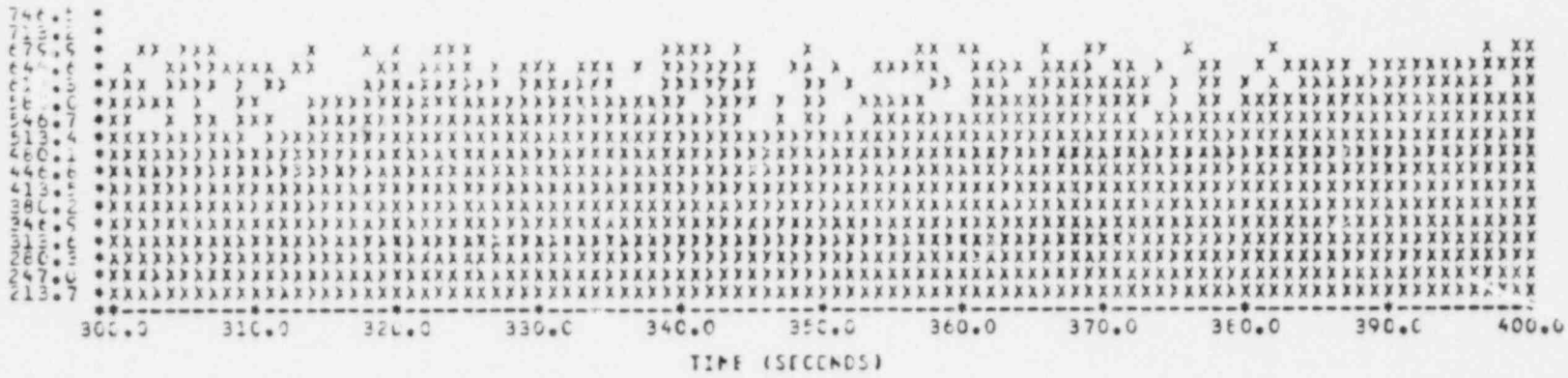


Figure B-114. Downcomer 3 (300 to 400 s).

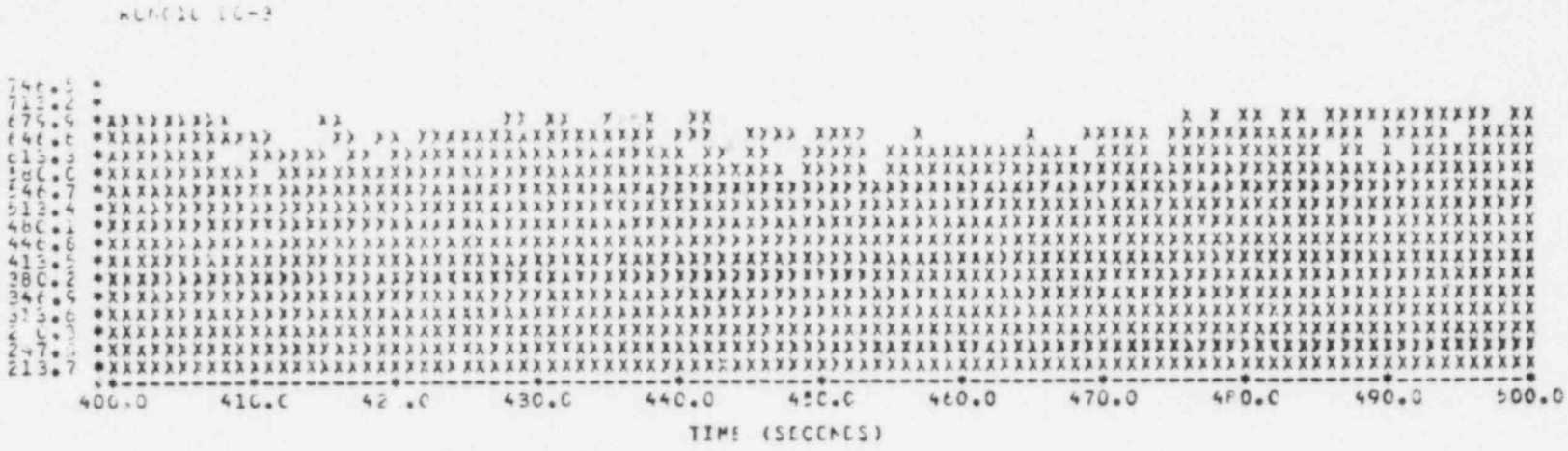


Figure B-115. Downcomer 3 (400 to 500 s).

Figure B-116. Downcomer 3 (500 to 600 s).

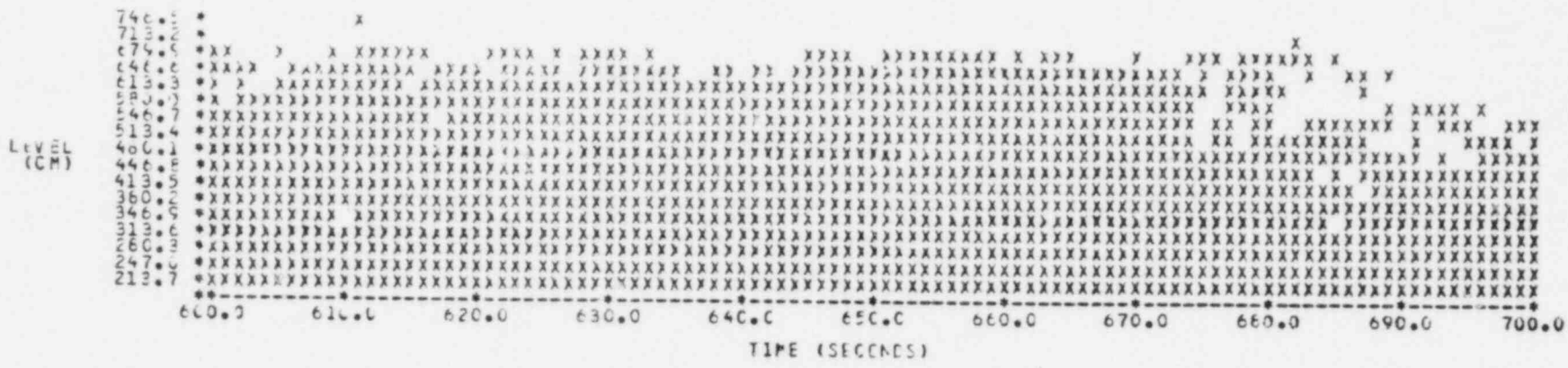


Figure B-117. Downcomer 3 (600 to 700 s).

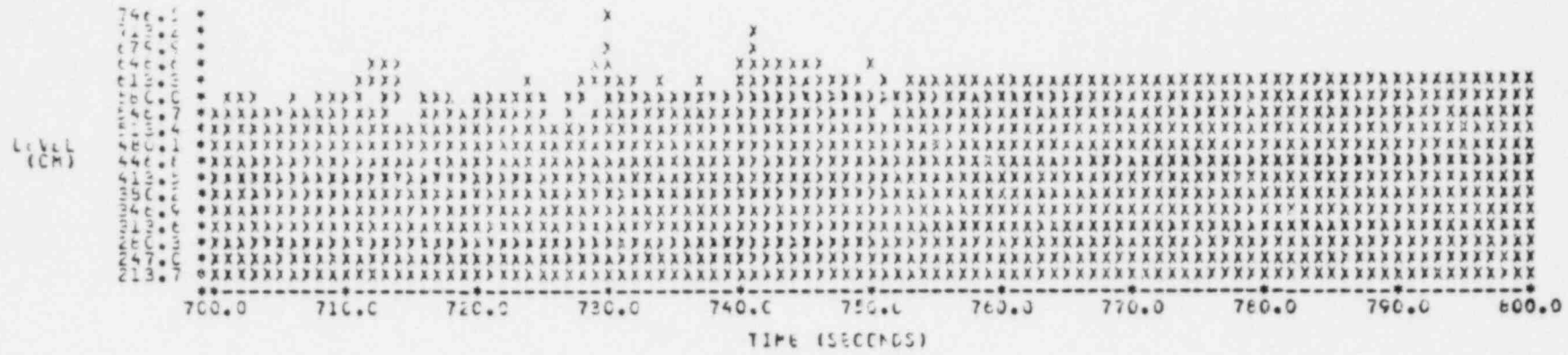


Figure B-118. Downcomer 3 (700 to 800 s).

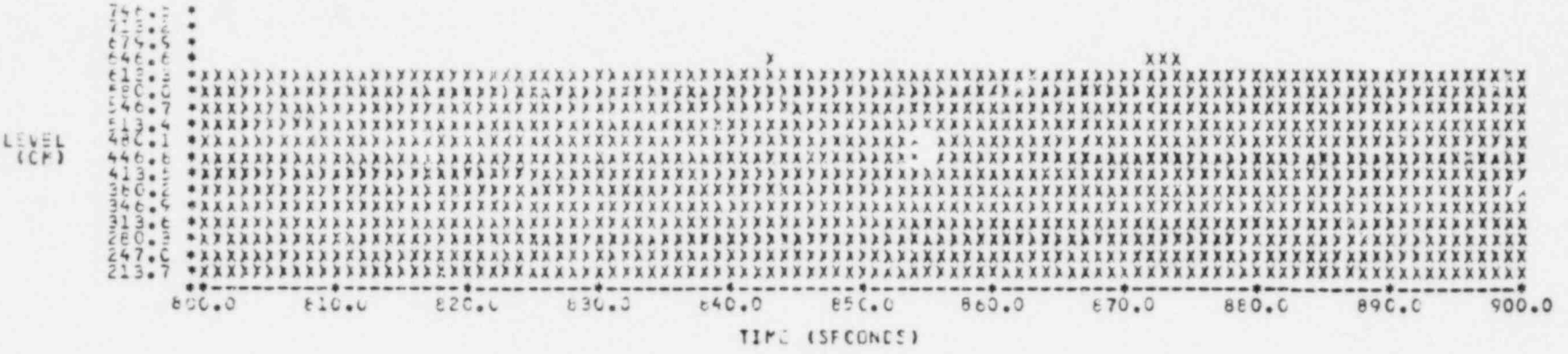


Figure B-119. Downcomer 3 (800 to 900 s).

Figure B-120. Downcomer 3 (900 to 1000 s).

Figure B-121. Downcomer 3 (1000 to 1096 s).

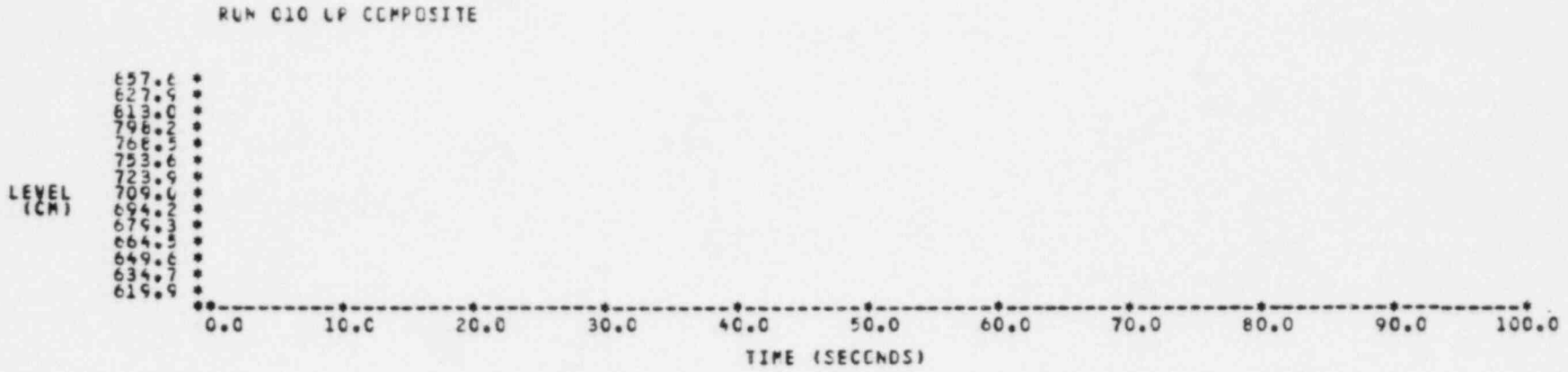


Figure B-122. Upper plenum composite (0 to 100 s).

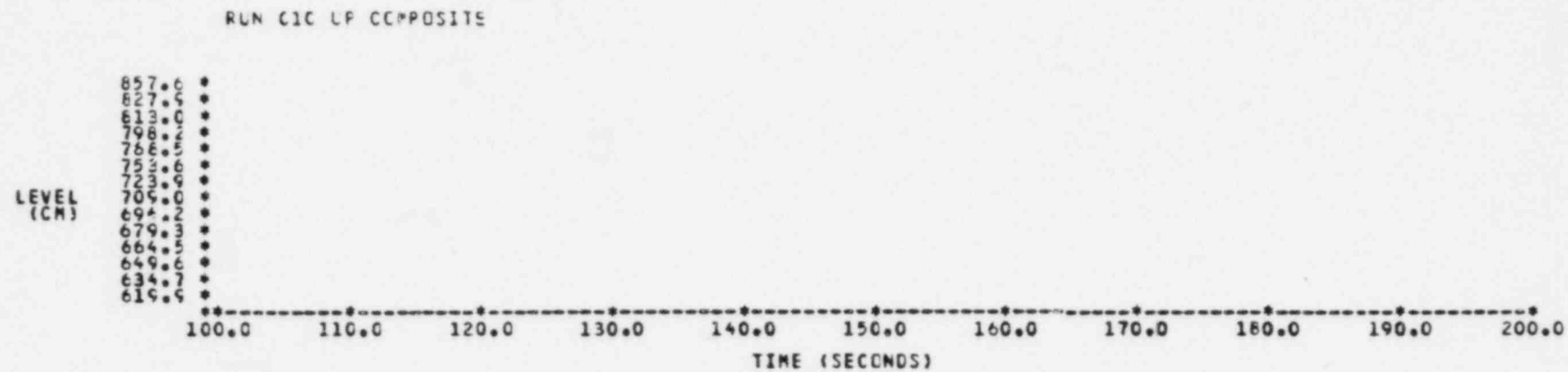


Figure B-123. Upper plenum composite (100 to 200 s).

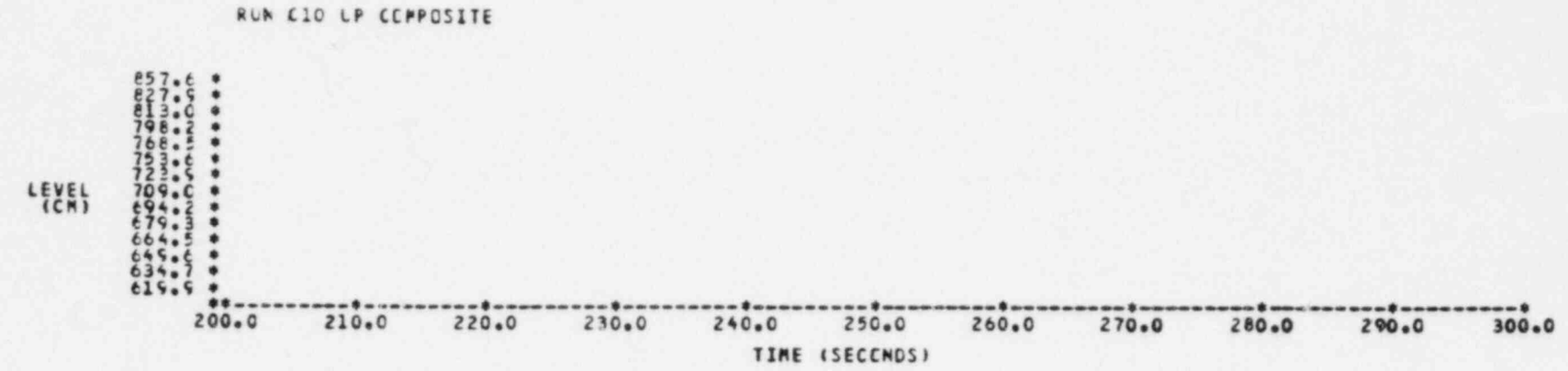


Figure B-124. Upper plenum composite (200 to 300 s).

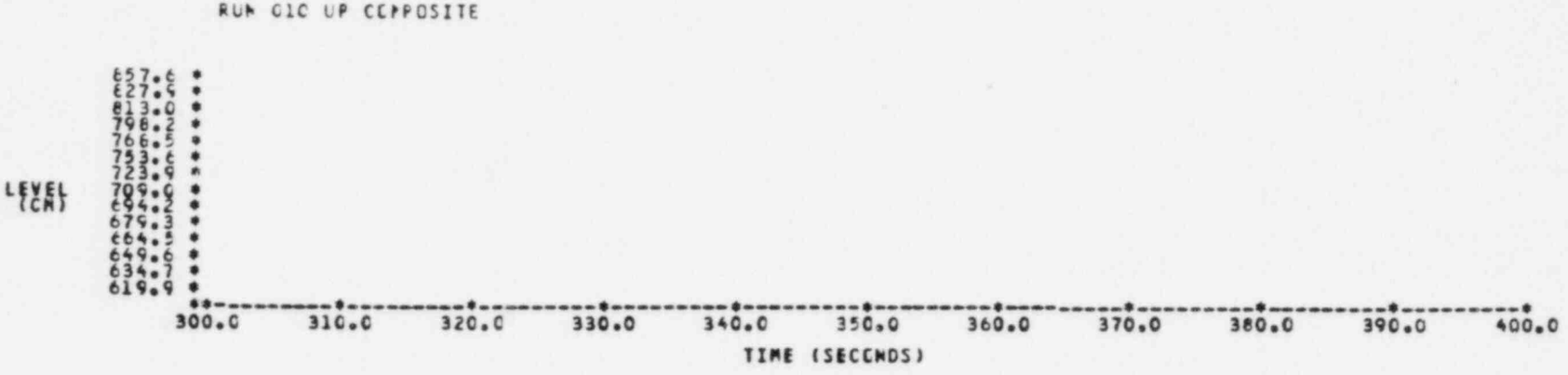


Figure B-125. Upper plenum composite (300 to 400 s).

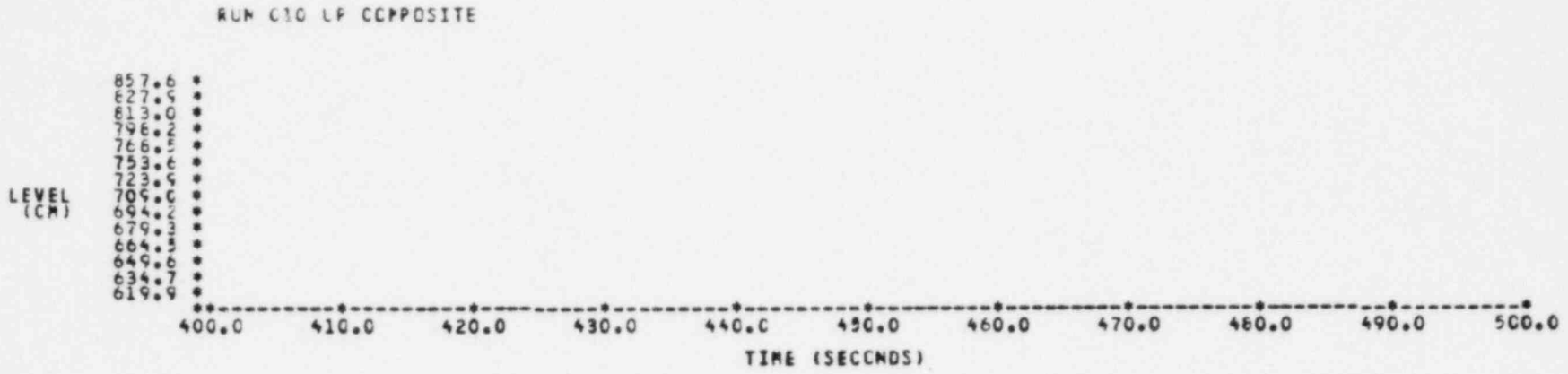


Figure B-126. Upper plenum composite (400 to 500 s).

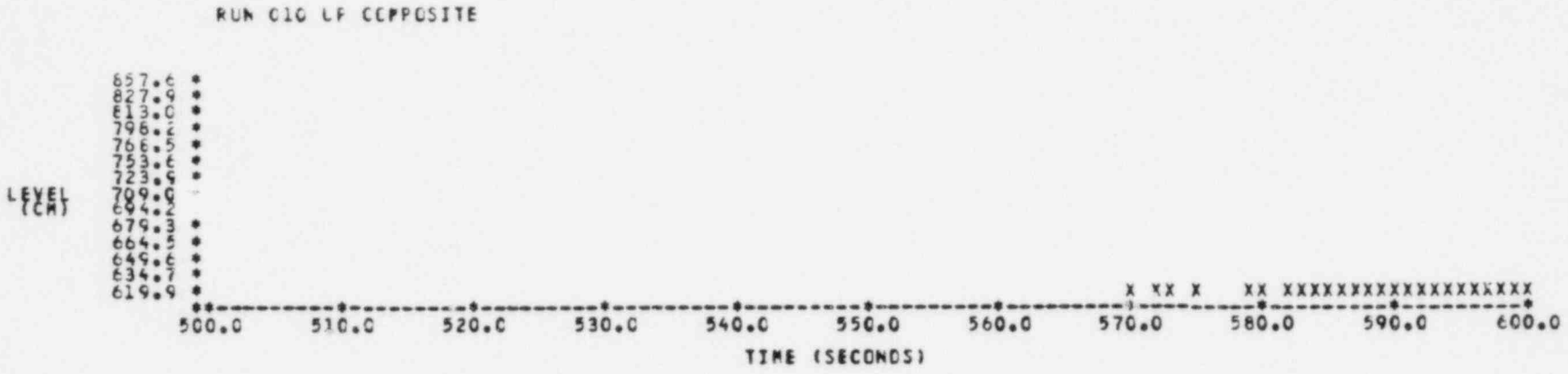


Figure B-127. Upper plenum composite (500 to 600 s).

Figure B-128. Upper plenum composite (600 to 700 s).

Figure B-129. Upper plenum composite (700 to 800 s).

Figure B-130. Upper plenum composite (800 to 900 s).

Figure B-131. Upper plenum composite (900 to 1000 s).

Figure B-132. Upper plenum composite (1000 to 1096 s).