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7. Abstract

This report documents the available summaries of recorded maximum surface levels and maximum waste temperatures of the existing single- and double-shell waste tanks, excluding the 50,000-gal single-shell tanks, and references other sources for more specific data. The purpose of this report is to aid in the structural sensitivity studies performed for the Accelerated Safety Analyses-Phase I effort and in future analyses of the single- and double-shell tanks by compiling a quantitative summary of some of the operating conditions the tanks have experienced.

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MAXIMUM SURFACE-LEVEL AND TEMPERATURE HISTORIES FOR HANFORD WASTE TANKS

August 1994

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MAXIMUM SURFACE-LEVEL AND TEMPERATURE HISTORIES FOR HANFORD WASTE TANKS

1.0 INTRODUCTION

Radioactive defense waste resulting from the chemical processing of spent nuclear fuel has been accumulating at the Hanford Site since 1944. This waste is stored in underground waste-storage tanks. The *Hanford Site Tank Farm Facilities Interim Safety Basis* (ISB) (Leach 1993) provides a ready reference to the safety envelope for applicable tank farm facilities and installations. The ISB is intended to facilitate understanding of the safety envelope and its corresponding justification until formal safety analysis report upgrades can be completed.

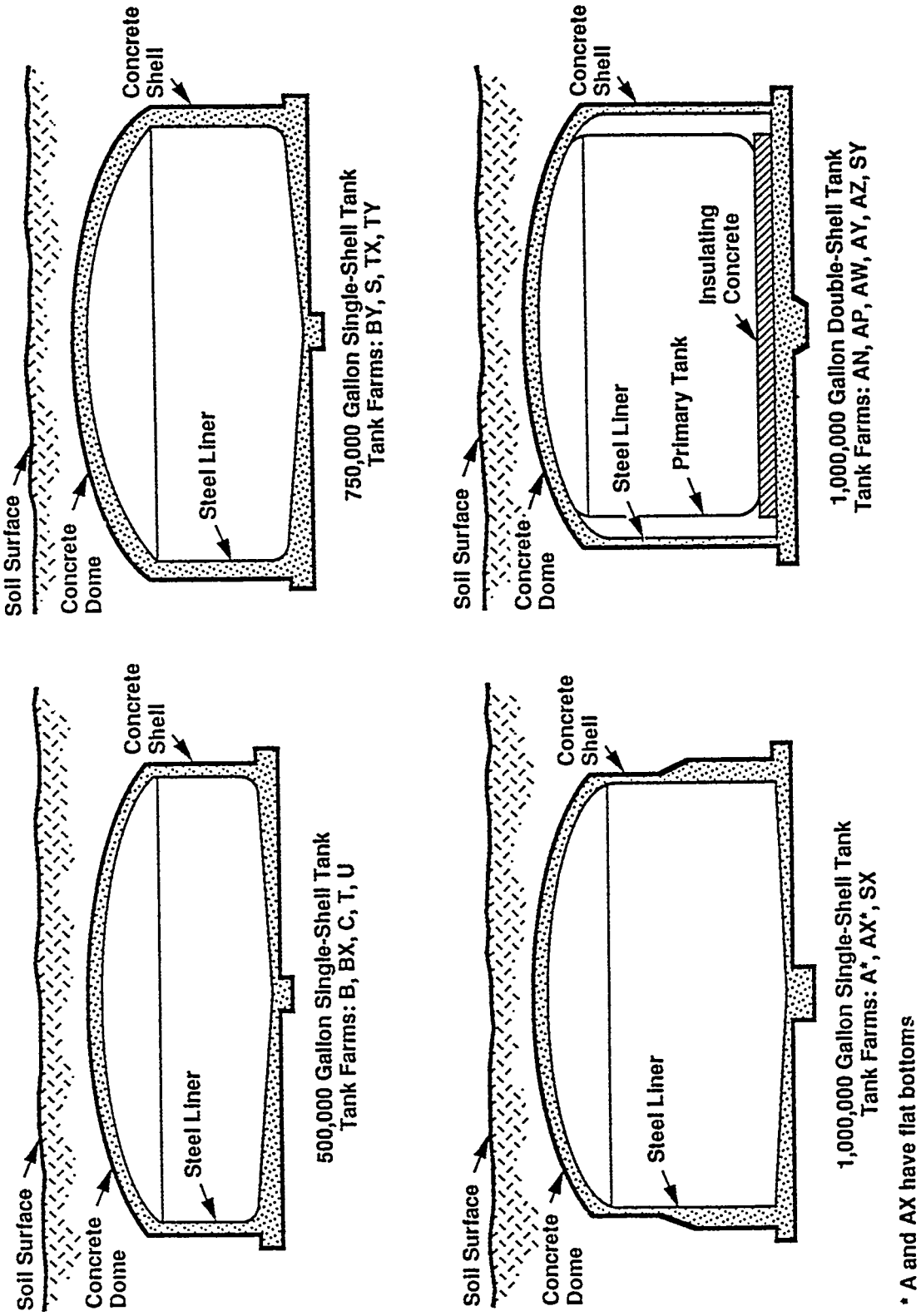
During preparation of the ISB, tank structural integrity concerns were identified as a key element in defining the safety envelope. These concerns, along with several deficiencies in the technical bases associated with the structural integrity issues and the corresponding operational limits/controls specified for conduct of normal tank farm operations are documented in the ISB. Consequently, a plan was initiated to upgrade the safety envelope technical bases by conducting Accelerated Safety Analyses-Phase I (ASA-Phase I) sensitivity studies (Becker et al. 1994) and additional structural evaluations. The purpose of this report is to facilitate the ASA-Phase I studies and future analyses of the single-shell tanks (SSTs) and double-shell tanks (DSTs) by compiling a quantitative summary of some of the past operating conditions the tanks have experienced during their existence. This report documents the available summaries of recorded maximum surface levels and maximum waste temperatures and references other sources for more specific data.

1.2 DESCRIPTION OF TANKS

Five basic tank design configurations have been used in the waste storage program. Four of these are SST designs, which represent the oldest designs and systems of buried waste storage tanks at the Hanford Site. The fifth configuration, which represents the latest tank design and system configuration, consists of a DST design concept. Typical tank configurations are shown in Figure 1-1.

The tanks are located in seventeen separate groupings referred to as tank farms. These SST and DST farms, located on the Hanford Site in the 200 East and West Areas, are operated by the Westinghouse Hanford Company (WHC) for the U.S. Department of Energy Field Office, Richland, Washington.

Figure 1-1. Typical High-Level Waste Tank Configurations At the Hanford Site.



1.3 SINGLE-SHELL TANKS

A total of 149 SSTs were constructed between 1943 and 1964. These are located in twelve separate tank farms. One hundred thirty-three of the tanks have an internal diameter of 75 ft and nominal storage capacities of either 500,000-, 750,000- or 1,000,000-gal of radioactive waste. The tanks are constructed of reinforced concrete with a single internal steel liner that extends across the tank basemat and up the cylindrical sides to the dome shaped roofs. Structurally, the basemat reinforcing steel is extended into the cylindrical concrete tank wall. The height of the dome above the basemat varies from approximately 30 to 43 ft according to the capacity of the tanks. The tanks are buried and the minimum soil depth at the dome crown is 5 ft. The welded carbon steel liner is independent of the reinforced concrete tank and was designed to provide containment of the stored liquid waste. Surface live loads, static and dynamic soil loads, dead loads, and hydrostatic and hydrodynamic loads are carried by the reinforced concrete tank and dome. The remaining 16 SSTs differ in configuration. They have a capacity of 55,000-gal and have been interim stabilized and interim isolated (Hanlon 1994).

1.4 DOUBLE-SHELL TANKS

The twenty-eight DSTs, also buried, were constructed between 1968 and 1986. They are located in six separate tank farms. Four of these tanks, two each in the 241-AY and -AZ tank farms, have a designed capacity of 1,000,000-gal. The twenty-four remaining tanks have a nominal design capacity of 1,144,000-gal. Geometrically, all of the DSTs are similar. Structurally, they are identical within any single tank farm grouping. Between tank farms, the tank designs are structurally similar with some variations in concrete and rebar strength and in rebar arrangement in the haunch region. The DSTs are 83 ft in external diameter and constructed of reinforced concrete with an internal primary tank and secondary steel liner. They are cylindrical in shape with a dome roof. The height of the dome is approximately 47 ft above the basemat and the minimum soil overburden is 6½ ft at the crown. The welded primary carbon steel tank consists of a base that rests on an 8-in. layer of refractory insulating grout. The secondary welded carbon steel liner is structurally integral with the inner surface of the cylindrical reinforced concrete tank wall and rests on the concrete basemat. The primary tank bottom is separated from the secondary liner by an 8-in. layer of insulating refractory grout.

The primary steel tank provides containment for the stored liquid waste; the secondary steel liner/reinforced concrete tank establishes a redundant leakage barrier. There is a nominal 30-in. annulus between the primary tank cylindrical wall and steel lined reinforced concrete tank cylindrical wall. The reinforced concrete tank and dome carry the surface live loads, the static and dynamic soil loads, and the dead loads. The primary steel tank resists the hydrostatic and hydrodynamic liquid waste loads and the internal pressure.

2.0 SUMMARY

This document provides a summary of the currently available recorded historical waste surface-level and waste temperature data. These data have been summarized to assist in the structural analyses of the principal structural elements of the existing SSTs and DSTs, excluding the 50,000-gal SSTs. This document presents in tabular and graphical form the historical data located and reviewed to date and is a "living" document in that it is to be updated as more data become available. The document also notes reported sources where additional or more detailed information might be found.

Table 2-1 provides a brief orientation and overview of the tanks in each tank farm. Section 3.0 of this report describes the measurement techniques and methods used for monitoring waste tank surface levels and temperatures. Section 4.0 discusses the different sources from which the data summarized in this report were obtained and lists alternative sources that also may contain archived data. Section 5.0 discusses the summarized data. Section 6.0 and 7.0 discuss anomalies in some of the data and conclusions/recommendations, respectively. The appendices contain summaries of surface-level and temperature data.

3.0 MEASUREMENT TECHNIQUES

3.1 SURFACE-LEVEL MEASUREMENT

The surface levels in all of the waste storage tanks are monitored and recorded. The techniques for measurement utilize manual equipment in some tanks and automatic in others; the current ratio of the two methods is roughly fifty-fifty. In each case, the principle of operation is electrical conductivity. The depth of the waste is recorded by monitoring an electrical signal as electrodes contact the liquid surface.

A new system is being tested because the electrical conductivity method tends to fail in tanks that contain small quantities of liquids. The new system involves a pressure-sensitive "donut" that works in both liquid and solid conditions to help reduce data anomalies.

3.1.1 Manual Measurement

Manual measurements are taken by lowering a reel-mounted tape (manual tape) or calibrated insulated wire (zip cord), with attached electrodes, to a point at which they contact the liquid surface. Measurements are visually read from the tape and recorded to the nearest 0.25 in.

Table 2-1. Tank Details Per Tank Farm.

Tank Farm	Tanks per Farm	Capacity, m^3 (gal)	Year(s) Constructed
A (1)	6	4,546 (1,000,000)	1954-1955
AN (2)	7	5,270 (1,160,000)	1980-1981
AP (2)	8	5,270 (1,160,000)	1984-1986
AW (2)	6	5,270 (1,160,000)	1978-1980
AX (1)	4	4,546 (1,000,000)	1963-1964
AY (2)	2	4,546 (1,000,000)	1968-1970
AZ (2)	2	4,546 (1,000,000)	1971-1977
B (1)	4	250 (55,000)	1943-1944
	12	2,400 (530,000)	1943-1944
BX (1)	12	2,400 (530,000)	1946-1947
BY (1)	12	3,450 (758,000)	1948-1949
C (1)	4	250 (55,000)	1943-1944
	12	2,400 (530,000)	1943-1944
S (1)	12	3,450 (758,000)	1950-1951
SX (1)	15	4,546 (1,000,000)	1953-1954
SY (2)	3	5,270 (1,160,000)	1974-1977
T (1)	4	250 (55,000)	1943-1944
	12	2,400 (530,000)	1943-1944
TX (1)	18	3,450 (758,000)	1947-1948
TY (1)	6	3,450 (758,000)	1951-1952
U (1)	4	250 (55,000)	1943-1944
	12	2,400 (530,000)	1943-1944

(1) Single-Shell Tank.
(2) Double-Shell Tank.

3.1.2 Automatic Measurement

Each automatic gauge used to measure surface levels is an instrument provided by the Food Instrument Corporation (FIC). An FIC instrument consists of an electrically driven plummet connected to a calibrated steel tape, a steel tape reel housing, and a controller that automatically raises and lowers the plummet until it contacts the surface of the waste and obtains a reading. The controller can display the data digitally and also transmit the reading to the Computer Automated Surveillance System (CASS). Some tanks have gauges connected to the CASS; others are read manually. A counter is provided for readout of liquid level to the nearest 0.1 in.

Some automatic FIC gauges in several of the tanks containing solids have been modified to indicate intrusions, i.e., an infiltration of liquid into a waste tank beyond a specified level. In intrusion mode, the FIC typically is positioned one to two inches above the surface level of the waste so that it will alarm to the CASS if the surface level rises to a point at which it contacts the plummet. (This system eliminates the need for Tank Farm Operations to measure the surface level on a regular basis and may account for gaps in data.)

3.2 TEMPERATURE MEASUREMENT

Temperature data are recorded via thermocouples placed in the tanks; in the case of AX farm and DSTs, some thermocouples have also been placed in insulating concrete, the lower primary tank knuckle, the secondary tank concrete foundation, or the outer structural concrete. Thermocouples located inside the tanks may be installed through a riser or lowered through a riser in an existing liquid observation well. Multiple thermocouples are attached to a single probe called a thermocouple tree. In SSTs, some tanks do not have any functioning thermocouple trees, while others have one or more functioning thermocouple trees. Each DST has at least one functioning thermocouple tree.

4.0 DATA RETRIEVAL

The search for data documenting temperatures and surface levels for the contents of the waste storage tanks centered on the resources available in the Surveillance and Data Acquisition (S&DA) group. The group is located in the C-wing of the 2750E Building in The 200 East Area of the Hanford Site.

Before the autumn of 1973, the surveillance system depended on manual data collection, transport, manual review and plotting of the data and temporary archiving of the data and plots. The location of data recorded before 1973 is not known, but is presumed to be archived in the Federal Records Center (FRC) in Seattle, Washington. In the autumn of 1973, an upgraded surveillance system was established to collect, log, maintain, and evaluate waste surveillance data (surface-level and temperature readings). That system is managed by the S&DA group, and all information received from the tanks, except the AY and AZ tank farms, goes to the S&DA group for review. Efforts are now underway to incorporate data from the AY and AZ farms into the upgraded surveillance system.

The fact that waste tanks have been present onsite since 1943 means that voluminous quantities of data have been produced and handled by various contractors over the past 50 years. Accounting for and attempting to recover such records inevitably poses challenges to those interested. Retrieval of the data focused on three areas, each of which is discussed below:

- Log books / Raw data
- CASS / SACS
- Other sources.

4.1 LOG BOOKS / RAW DATA

4.1.1 Surface-Level Data

Surveillance surface-level data for SSTs have always been recorded and compiled in log books. As the number of log books increased with the passage of time, the older ones were archived. The specific location of the surface-level data taken before 1973 is unknown, however it is presumed to be archived in Seattle in the FRC. At present, all SST surface-level data gathered from 1973 to 1980 are archived. According to S&DA personnel, the first five boxes listed in Table 3-1 contain the surface-level data sheets as first compiled from the field data as part of the surveillance system. The last two boxes listed in Table 3-1 are referred to as "process engineering data", and contain much of the same data found in the first five boxes, except that the data these boxes contain were prepared by Process Engineering personnel who reassembled it into tabular and graphical form.

Table 4-1. Surface-Level Data Archived at the Federal Records Center, Seattle, Washington.

Type of Data	Tank Farm	Box Number
Surveillance data from 1973 to 1980	A, AX, AY, AZ, B	111504
	BX, BY, C (through C-112)	111505
	C (C-112 through C-204), S	111506
	SX, SY, T	111507
	TX, TY, U	111508
Process engineering data from 6/1/76 to 12/31/84	All	111509 111510

Although detailed surface-level records may not be immediately retrievable, representative quarterly values can be estimated by using accepted formulas relating surface level to total volume (Appendix F). The quarterly data on the volume of total tank contents can be obtained from the waste status summaries of the 156 tanks in use through 1980. These historical summaries appear in *A History of the 200 Area Tank Farms* (Anderson 1990).

Surface-level records after 1980 are currently available in log books in Room C101 of Building 2750E.

4.1.2 Temperature Data

As in the case of surface-level measurements, before the autumn of 1973, temperature readings were taken and recorded, then manualy processed. It is not known where the temperature data taken before 1973 is stored, but it is presumed to be archived in the FRC, Seattle, Washington.

Since the upgraded surveillance program began in 1973, temperature data are entered in log books stored in room C102 of the 2750E Building. These temperature data from 1974 to 1987 are being entered in the Surveillance Analysis Computer System (SACS) database as time permits. From 1987 to present, the SACS database is complete regarding located data. Weekly, monthly and daily temperature data are entered as received. Table 4-2 lists temperature data reported by the S&DA group as archived; however, the precise location of the data is unknown. These data are presumed to be archived in the FRC in Seattle. Time limitations prevented the retrieval of archived data under this scope of work; additional data retrieval searches will be conducted as time and funding become available.

4.2 SURVEILLANCE ANALYSIS COMPUTER SYSTEM AND COMPUTER AUTOMATED SURVEILLANCE SYSTEM

A primary source of data for this document is the Surveillance Analysis Computer System (SACS) database. The SACS was started in 1989; its main function is to bring data from CASS in a way that allows the information to be gathered quickly and organized as needed, e.g., graphs, time blocks. Surface-level data is transferred automatically from CASS to SACS; however, the temperature data must be transferred manually to SACS. Although SACS did not start until 1989, information from as long ago as 1974, or even earlier, can be retrieved because of the availability of CASS and manually transferred data. Backlogged data is currently being entered to the system as time permits.

The CASS was started in 1977. It acts as an alarm system for all the waste tanks. The CASS monitors for undesirable conditions as information from each tank is entered, either manually or automatically, depending on the tank.

In general, surface-level data has been verified from the SACS database since July 1989. To date, most anomalies noted in surface-level data recorded in the database have been reconciled and corrected by S&DA personnel.

Table 4-2. Reported Archived Tank Surveillance Data Sources (Precise Location[s] Unknown).

Surveillance Data Description	Box No.
Thermocouple Temp. Data Sheets 01/87-05/90	100478
Thermocouple Temp. Data Sheets 10/88-03/90	100479
Thermocouple Temp. Data Sheets 07/88-12/90	100480
Thermocouple Temp. Data Sheets 10/89-01/90	100481
Thermocouple Temp. Data Sheets 02/84-12/89	100482
Thermocouple Temp. Data Sheets 11/88-11/90	100483
SSTs and SY-101 for '91 and '92	117438
Double- and Single-Shell	100444
Single-Shell	107350
Double-Shell '89 and '90	100442
Aging Waste Tanks AY and AZ	93685
AX-101	93683
Concrete Temperatures, Double-Shell	81298
C Farm	84882
TX Farm	84701
TX Farm Temperatures and Heat Trace	84703
Unknown	68690
Unknown	68689
Unknown	61317
Unknown	61280
Thermocouple Reports	61284
Thermocouple Reports	61288
TX Farm Temperature and Exhauster Data	58097
ITS-2 Profile Temperatures in Tank Bottoms	58099

Recently, the method of retrieving data from SACS changed from script files to PCSACS. This change occurred as a result of an upgrade of the computer system. Therefore some of the data presented in the appendices was gathered with script files and some with PCSACS. The information in the database has not changed, only the retrieval process has changed.

PCSACS is a Microsoft EXCEL[1] based program that is much easier to use than the script files. The PCSACS user searches the database for specific information and/or records by selecting the desired subjects and items from a user-friendly interactive menu. Areas to choose from include the tank identifier, data type, data quality (good, transcribed, or suspect), average/maximum, and time frame. Once the data has been gathered, EXCEL allows the user to arrange the information as needed.

4.3 OTHER SOURCES

Table 4-3 lists the documents reviewed for additional data not contained in previous sources. Many documents were found containing surface-level and temperature data. In most cases the data duplicated measurements already gathered in SACS or in the raw-data readings. Reports containing matching information of the documents already listed have not been included as references.

5.0 DATA PRESENTED

The data presented in Appendices C through F focus on manual tape, automatic FIC measurements, and thermocouple data that have been transmitted or entered to the SACS database from the CASS or the log books.

Appendices G and H are profiles of the surface-level and temperature record envelopes for each tank. These profiles contain the sources from which the data for each tank was gathered and the time period each source covers. Appendices A and B contain data on the highest surface-levels and temperatures located for each tank along with the source from which these data were retrieved. Appendix I lists all documents reviewed while searching for both surface-level and temperature data. Unretrieved records may show higher surface-level and temperature levels than listed in the appendices.

5.1 SURFACE-LEVEL DATA

Appendix A gives the overall maximum surface level for each tank, as determined from data recorded to date. These values may not reflect the actual maximum; however, it is the maximum determined from the references listed and the time span shown in Appendix G.

---

[1]EXCEL is a trademark of Microsoft, Inc., Bellevue, Washington.

Table 4-3. Additional Data Not Contained in Previous Sources.

Document	Subject	Tanks	Dates
RHO-CD-1172 (Mercier, Wonacott, Defigh-Price, 1981)	Temperature	S A AX SX U	1952-60 56-71 66-71 56-69 56-57
HW-83906 A (Bayless, 1964)	Temperature	S,U	1953-55
WHC-MR-00132 (Anderson, 1990)	Total Volume	All SST's AY, AZ, SY	1944-80
HW-56357 (Roberts, 1958)	Surface Level & Temp	A, SX	5/1/58-5/31/58
ARH-780 (McCullugh, Cartmell)	Temperature	S, TX	1952, 54
ICF Kaiser (Preliminary, 1994)	Surface Level & Temp	A, AX, B, BX, BY, C	- -
RHO-CD-02213 Vol.1-4 (Stalos, Walker)	Surface Level	200 East 200 West	- -
WHC-SD-WM-TI-543 (WHC, 1993)	Surface Level	All DSTs	1981-93

Appendix C lists the quarterly history plots of maximum surface levels taken from the SACS database. Of all the references cited, either in the table above or listed in Section 8.0 below, the SACS records are the most complete. Surface-level data in SACS date from the late 1970's to the early 1980's, depending on the tank being investigated.

Appendix D presents the waste-volume history plots for the double shell tanks from WHC-SD-WM-TI-543 (WHC, 1993). The appendix and WHC-MR-0132 (Anderson, 1990) list the data in the form of waste volume. The equivalent surface-level was determined by means of the waste volume/liquid level formulas of Appendix F.

Appendix G provides a profile of the surface-level record envelope. The profile identifies the references from which the data were retrieved and the time period each reference covers. This profile is especially useful in helping analysts determine which reference to use to establish the time span for a particular surface level in a particular tank.

5.2 TEMPERATURE DATA

Appendix B contains the highest maximum temperature that has been found (from the records reviewed to date) for each tank. The values given in Appendix B may not be the actual maximum temperatures, but it is the maximum value obtained from the references listed and the time span shown in Appendix H.

Appendix E provides a historical record of the maximum temperatures as obtained from the SACS database. The plots consist of graphs from both script files and PCSACS. The temperature data in SACS cover the time period from the early 1970's to early 1990's depending on the tank being investigated. Missing from Appendix E are the 55,000-gal tanks, SX-115, TX-114, TX-116, TX-117, and all tanks in the AY and AZ tank farms because they are non existent in PCSACS.

Appendix H shows the profile of the temperature-record envelope. This profile shows the correlation between the various data sources and the time periods covered and is a convenient tool for determining which document to use when investigating a particular time span.

6.0 DATA ANOMALIES

Inspection of the plots in Appendices C, E, and H may raise questions about certain irregularities that appear to exist in the data. These unusual characteristics may take the form of "spikes" (sudden deviations from an apparent trend in the plotted value), gaps in data (implying that no readings were taken for a prolonged period of time, or records were not found), or perhaps fewer data points plotted than would be expected considering the length of time the tank has been in use. These anomalies may or may not represent erroneous data.

As mentioned earlier, the SACS database does not contain every surface-level and temperature reading ever taken in the tanks. Records of nearly all of the surface-level data for SSTs that have been retrieved begin in the late 1970's or early 1980's. The first readings of the temperature data recorded in the SACS for SSTs generally begin in either the mid-1970s or in the latter 1980's, with some not beginning until 1991.

In general, for DSTs, records of surface level begin with their first receipt of waste or within four years after construction, except for tanks in the AY and AZ farms. For the AY and AZ tanks, the first records of surface level located date from 1989, more than ten years after they were built.

Records located on DST temperature data begin anywhere from three to fifteen years after construction, except for the tanks in AY and AZ farms. Raw temperature data for the AY and AZ tanks prior to 1991 have not been located by this effort.

Not all data in the SACS have been verified by S&DA. Only questionable data that has been brought to S&DA personnel for verification may be considered verified. To verify such data S&DA personnel review it for logical possibilities on a case-by-case basis. Therefore, the potential exists for errors in the database.

What appears to be errors or "bad data" in the database for surface-level measurements may result from instrument malfunction, surface irregularities of the crust, data incorrectly entered into the database (i.e., typographical errors, wrong data descriptors, wrong tank, wrong data field), backlogged data not yet entered to the database, difficulties encountered during the measurement process, or perhaps a misunderstanding of the ways that data were recorded and entered into the database. Once data are determined to be bad, they are flagged as such and will not be read by the files unless the software is instructed to read them.

Some confusion may arise from plotted surface-level data that suddenly rises to a new level and/or are plotted at higher and relatively constant levels than those actually existing in the tank. Either of these phenomena may occur because the tank began operating in intrusion mode. In intrusion mode, the FIC is typically positioned approximately one to two inches above the surface level of the waste such that it will alarm to CASS if the surface level rises to contact the plummet. (Intrusion mode eliminates the need for measuring the surface level on a regular basis and may account for gaps in data.) The height of the plummet also is recorded in the SACS under a data field other than that for automatic FIC measurements. However, because a separate data field has not been established specifically for the intrusion mode, intrusion level data are entered in the data field reserved for radar measurements. This practice results in a variation in the plotted data when the file is executed because, if the intrusion FIC level is higher than the actual surface level during a given quarter, the intrusion FIC reading, rather than the actual surface-level reading, is written to the file.

The nature and sources of the anomalies for the temperature plots are similar to those for the surface-level plots. In addition, the gaps in data that often appear from 1984 through 1988 are the result of administrative controls that minimized the number of temperature readings in an effort to monitor the tanks more efficiently.

7.0 CONCLUSIONS AND RECOMMENDATIONS

A complete history of waste surface level and waste temperature for all waste tanks is not possible at this time. Neither complete data entry nor verification of all tank data can be accomplished by the resources currently available in S&DA. Maximum surface-level and maximum temperature data as taken from the SACS database for each tank are presented herein for the time spans over which it is available. The appendices present these data in both graphical and tabular form. Additional or more detailed waste temperature and waste surface level information may be found in the referenced documents, or data sources provided herein, or possibly from data archived in the FIC.

As funding permits, this review effort should continue, and this report and the summaries in the appendices should be updated and supplemented.

8.0 REFERENCES

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A P P E N D I X A

OVERALL MAXIMUM SURFACE-LEVEL HISTORY

History of Surface Level Data
1,000,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
A	101	360	1/82	345	81-93	359	2/84	344	80-93	360	1/69	338.5	56-80
	102	240*	1/93	15	81-93	N/A	N/A	N/A	N/A	369.1	3/62	32.4	56-80
	103	195	2/93	140	81-93	N/A	N/A	N/A	N/A	354.2	1/76	187.6	56-79
	104	199*	2/93	7	78-93	N/A	N/A	N/A	N/A	357.5	4/68	10.2	57-80
	105	19	1/84	16	80-93	N/A	N/A	N/A	N/A	322.5	4/67	6.9	57-80
	106	46	2/84	46	81-88	N/A	N/A	N/A	N/A	358.9	3/74	46.5	57-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max: Maximum liquid level (in.); **Date:** Quarter/Year
Final: Last reading data of the reference; **Recd:** Period during which data were recorded

Prepared by : N. D. HA Date : 6-8-94

Checked by : B. D. FLANAGAN Date : 6-5-94

History of Surface Level Data
1,000,000 Gallons Double-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
AN	101	390	2/88	240	81-93								
	102	410	3/84	400	81-93								
	103	410	4/84	350	81-93								
	104	410	4/82	390	81-93								
	105	410	4/87	406	81-93								
	106	385	4/83	10	81-93								
	107	410	4/83	390	81-93								

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max: Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-8-94

Checked by : B. D. FLANAGAN BDF Date : 6-8-94

History of Surface Level Data
1,000,000 Gallons Double-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
AP	101	390	4/89	390	86-93								
	102	400	4/92	400	86-93								
	103	410	2/91	410	86-93								
	104	390	2/88	8	86-93								
	105	300	3/93	300	86-93								
	106	410	4/89	405	86-93								
	107	410	1/90	405	89-93								
	108	330	2/92	328	89-93								

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max: Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-8-94

Checked by : B. D. FLANAGAN BDF Date : 6-8-94

History of Surface Level Data
1,000,000 Gallons Double-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
AW	101	420	2/93	420	80-93					3.27	4/80	3.27	80-80
	102	420	2/93	320	80-93					10.9	4/80	10.9	80-80
	103	415	2/82	230	80-93					348.7	4/80	348.7	80-80
	104	410	4/92	408	80-93					3.27	4/81	0.0	80-80
	105	410	1/84	370	80-93					344	3/80	341.5	80-80
	106	395	3/93	395	80-93					195.6	4/80	195.6	80-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max: Maximum liquid level (in.); **Date**: Quarter/Year
Final: Last reading data of the reference; **Recd**: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-8-94

Checked by : B. D. FLANAGAN BDF Date : 6-8-94

History of Surface Level Data
1,000,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
AX	101	280	3/83	275	81-84	279.3	1/81	278.2	81-93	360	4/71	277.1	65-80
	102	130*	1/91	10	81-93	15	3/92	15	90-92	350.5	2/68	19.6	65-80
	103	45	1/81	42	81-93	43.9	1/81	39.3	81-93	363.6	2/69	44	65-80
	104	41*	1/91	3	81-93	3.5	3/93	3.5	80-93	364	2/71	2.2	65-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max: Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA Date : 6-8-94

Checked by : B. D. FLANAGAN Date : 6-8-94

History of Surface Level Data
1,000,000 Gallons Double-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
AY	101	350	1/81	325	89-93	N/A	N/A	N/A	N/A	354.9	3/76	296.7	71-80
	102	350	1/91	310	89-93	N/A	N/A	N/A	N/A	258.9	3/80	82.5	71-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); **Date**: Quarter/Year
Final: Last reading data of the reference; **Recd**: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-8-94

Checked by : B. D. FLANAGAN BDF Date : 6-8-94

History of Surface Level Data
1,000,000 Gallons Double-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
AZ	101	350	3/91	345	91-93	N/A	N/A	N/A	N/A	354.2	1/78	289.1	76-80
	102	350	4/89	350	89-93	N/A	N/A	N/A	N/A	353.1	2/77	334.9	76-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-8-94

Checked by : B. D. FLANAGAN BDF Date : 6-8-94

History of Surface Level Data
500,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
B	101	36	2/81	35	81-84	66.7	1/93	0.0*	80-93	192.2	2/57	32.9	45-80
	102	40	4/82	7	81-93	16.1	1/82	0.0*	80-93	192.5	2/64	14	45-80
	103	33	1/85	16	81-90	33	2/82	27.4	80-93	199.1	4/68	28.9	45-80
	104	148	1/85	130	79-93	144.5	1/80	131.8	78-93	194	4/63	144.2	46-80
	105	49	3/82	42	81-93	46.8	1/80	42	80-93	188.2	2/52	102	47-80
	106	69	2/93	69	79-93	46.4	3/78	0.0	78-93	196.2	3/57	46	47-80
	107	57	1/81	55	81-93	57	1/80	54.8	80-93	195	3/65	66	45-80
	108	34	4/81	27	81-90	60.3	1/93	0.0	80-93	193.6	4/71	32.9	45-80
	109	42	3/81	41	81-93	42	1/82	41.3	80-93	200.9	1/69	42	46-80
	110	88	2/91	88	81-91	85.5	3/92	0.0	80-93	194	3/68	98	45-80
	111	85	1/81	83	81-90	85.7	1/80	0.0	80-93	196.9	4/67	86	45-80
	112	11.7	4/83	7.5	81-93	10.7	2/82	0.0	80-93	198.4	4/70	11.1	46-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-8-94

Checked by : B.D. Flanagan BDF Date : 6-8-94

History of Surface Level Data
500,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
BX	101	15	1/81	12	81-93	12	3/93	12	80-93	200.9	3/67	12.2	48-80
	102	31	3/88	27	81-93	30.5	4/80	28.0	80-93	195.1	4/64	10	48-80
	103	21	3/93	21	81-93	20.4	3/93	20.4	80-93	192.5	3/63	23.1	48-80
	104	121*	4/90	32	81-93	38.6	1/83	31.9	80-93	203.1	3/67	35.5	49-80
	105	75*	4/91	25	81-93	26.3	3/85	25.8	80-93	194	2/69	25.3	49-80
	106	150*	3/93	150*	79-93	13	4/92	12.7	79-93	196.2	2/69	11.1	49-80
	107	130	3/81	120	81-93	130.2	3/82	0.0	81-93	202	2/68	132.2	48-80
	108	6.2	3/92	4.2	81-93	6.3	3/92	4.3	81-93	202	3/57	4.9	49-80
	109	70	1/81	65	81-93	65.3	1/93	65.3	92-93	198	3/68	71.1	50-80
	110	70	3/85	68	81-93	71.3	4/82	68.5	81-93	196.9	3/68	68.9	49-80
	111	81	3/84	80	81-93	81	3/82	75.5	80-93	202	3/57	80.2	50-80
	112	62	4/81	55	81-93	57.8	2/83	55.1	80-93	196.9	2/68	56.9	52-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-8-94

Checked by : B. D. FLANAGAN BDF Date : 6-8-94

History of Surface Level Data
750,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
BY	101	170	1/81	140	81-93	165.5	2/79	0.0	79-93	283	4/53	168.5	50-80
	102	170	3/88	80	79-93	80.5	2/79	80.0	79-93	281.3	4/53	159	50-80
	103	180	1/87	150	81-93	181.3	1/84	148.0	80-93	278.4	4/52	175	50-80
	104	240	2/83	130	81-93	239.3	4/80	0.0	80-92	283	1/54	238	51-80
	105	195	1/81	175	81-93	193.5	4/80	177.0	80-92	278.4	1/70	235	51-80
	106	245	3/93	245	81-93	244.3	1/93	243.8	80-93	283	3/53	235	53-80
	107	110	1/81	105	81-93	104.0	4/93	104.0	79-93	287.8	4/61	126	50-80
	108	100	1/81	90	81-93	100.3	4/81	88.0	80-93	281.3	1/53	138	51-80
	109	200*	1/90	140	79-93	139.9	4/91	100.8	78-93	277.6	1/68	176.9	53-80
	110	190	1/81	149	81-93	191.8	1/82	98.3	80-92	276.2	4/60	192.2	52-80
	111	245	1/81	165	81-93	165.3	1/90	163.0	89-93	283.5	1/53	233.6	52-80
	112	119	3/83	115	81-93	114.3	1/92	113.5	89-93	282.4	4/67	120.2	52-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : B. D. FLANAGAN BDF Date : 6-10-94

Checked by : N. D. HA NHA Date : 6-10-94

History of Surface Level Data
500,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
C	101	65*	2/92	25	81-93	64.5	1/92	25.5	85-93	203.1	2/66	22	46-80
	102	152	2/84	30	81-93	152	4/81	0.0	80-93	188.2	4/56	152.2	46-80
	103	69	4/80	66	79-83	67	2/91	65.9	91-93	200.2	4/61	68.2	46-80
	104	112	2/81	90	81-93	88.2	1/92	0.0	91-93	199.1	1/66	110	46-80
	105	65	1/81	48	81-93	54.7	2/87	46.4	87-93	194	4/55	58	47-80
	106	81	2/85	78	81-93	78.7	1/89	75.1	87-89	195.8	4/51	75.1	47-80
	107	108	3/90	93	81-93	105.3	2/91	0.0	88-93	194.4	4/52	118	46-80
	108	22	1/84	17	81-93	20	1/93	0.0	89-93	202	1/65	19.1	47-80
	109	24	3/86	18	81-93	19.5	1/92	18	89-93	200.9	3/66	20.2	48-80
	110	105	3/93	105	81-93	68.8	4/91	65.3	91-93	191.1	4/55	72.9	46-80
	111	17	4/90	16	81-93	20	1/92	16.5	89-93	195.1	3/57	18	46-80
	112	66	2/93	66	81-93	34	2/91	0.0	91-92	194.4	4/64	35.1	46-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA Date : 6-10-94

Checked by : B. D. FLANAGAN Date : 6-10-94

History of Surface Level Data
750,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
S	101	170	3/93	590*	81-93	162.3	3/93	162.3	88-93	288.2	3/65	162.7	53-80
	102	205	3/93	205	81-93	204.6	1/92	204.1	89-93	286	4/53	209.3	53-80
	103	105	3/93	105	81-93	104.8	3/92	104.8	88-93	288.5	3/73	97.6	53-80
	104	220*	2/93	115	81-93	113.8	3/92	112.8	91-93	300.9	4/65	116.2	53-80
	105	1000*	4/90	180	81-93	163	1/92	158	91-93	286.4	3/73	184.9	53-80
	106	390*	1/93	390	81-93	177.5	3/93	177.5	91-93	286	3/73	230	52-80
	107	145	3/93	145	81-93	144.9	3/93	144.9	88-93	284.9	3/53	133.3	52-80
	108	590*	1/93	180	81-93	172.8	3/93	172.8	91-93	285.6	1/57	230	52-80
	109	190	1/81	175	81-93	173.8	1/93	172.6	91-93	287.8	4/73	214	52-80
	110	450*	4/92	150	81-93	156.9	1/89	149.3	88-93	291.5	2/57	259.1	52-80
	111	205	1/92	205	81-93	203.4	4/91	203	91-93	286	4/73	234	52-80
	112	210	4/81	195	81-93	239.7	3/91	196.4	91-93	295.5	4/73	251.8	52-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); **Date**: Quarter/Year
Final: Last reading data of the reference; **Recd**: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-10-94

Checked by : B. D. FLANAGAN BDF Date : 6-10-94

History of Surface Level Data
1,000,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
SX	101	175	1/81	165	81-93	172	4/93	172	89-93	368.9	3/54	176.5	54-80
	102	320	1/80	195	80-93	205	4/93	205	90-93	368.9	1/55	200.9	54-80
	103	305	1/80	240	80-93	242.7	3/91	242.6	90-93	362	1/77	247.5	54-80
	104	350	1/80	225	80-90	237	4/93	237	89-93	366.7	2/55	282.7	54-80
	105	330	1/80	250	80-91	257	4/93	257	89-93	360.9	1/77	255.5	55-80
	106	215	2/91	200	81-93	209.8	2/91	0.0	90-93	358	2/76	178.7	54-80
	107	42	1/81	40	81-93	N/A	N/A	N/A	N/A	264.9	3/58	44.9	56-80
	108	48	1/81	37	81-93	N/A	NA	N/A	N/A	290.7	4/58	36.9	55-80
	109	95	1/81	95	81-93	N/A	N/A	N/A	N/A	362	4/56	98.7	55-80
	110	35	4/87	27	81-93	N/A	N/A	N/A	N/A	357.6	4/73	27.8	59-80
	111	58	2/83	50	81-93	N/A	N/A	N/A	N/A	353.3	4/70	50.7	56-80
	112	38	1/81	33	81-93	N/A	N/A	N/A	N/A	360.5	4/56	43.8	56-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-10-94

Checked by : B. D. FLANAGAN BDF Date : 6-10-94

History of Surface Level Data
1,000,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
SX	113	15	3/88	15	81-93	N/A	N/A	N/A	N/A	122	2/58	6	58-73
	114	70	1/90	65	81-93	N/A	N/A	N/A	N/A	350.7	4/70	78	57-80
	115	7.2	1/81	7	81-93	7	3/93	6.5	91-93	260.5	4/63	8.9	58-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max: Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-10-94

Checked by : B. D. FLANAGAN BDF Date : 6-10-94

History of Surface Level Data
1,000,000 Gallons Double-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
SY	101	425	4/91	400	77-93	N/A	N/A	N/A	N/A	411.3	4/80	441.3	77-80
	102	405	1/82	280	81-93	N/A	N/A	N/A	N/A	353.1	4/79	239.6	77-80
	103	280	2/93	275	81-93	N/A	N/A	N/A	N/A	350.2	4/78	197.5	77-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA Date : 6-10-94

Checked by : B. D. FLANAGAN Date : 6-10-94

History of Surface Level Data
500,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
T	101	44	3/91	42	81-93	44.4	4/90	0.0	80-93	191.5	1/69	43.1	45-80
	102	21	2/92	21	81-92	7.2	3/86	0.0	80-92	191.1	2/69	.9	45-80
	103	17*	1/93	17	81-93	5.7	1/81	0.0	80-93	197.6	3/65	8.2	45-80
	104	155	1/80	155	80-93	156.8	3/80	154.8	78-93	194	1/57	171.1	46-80
	105	80	4/90	60	81-93	60.2	3/93	60.2	80-93	192.9	2/64	31.5	46-80
	106	3.2	1/93	3.2	93-93	8.4	3/92	8.4	80-93	188.9	4/68	4.9	47-80
	107	61	4/92	61	84-93	61.8	4/92	61.1	83-93	190.4	2/53	60.2	46-80
	108	23*	3/93	23	84-93	13	3/92	13	83-92	199.1	1/76	12.2	45-80
	109	49	2/92	16	92-93	17.1	3/80	16.7	80-92	196.2	4/67	48.9	45-80
	110	150	1/81	145	81-93	147.7	3/89	147.6	80-93	190.4	2/73	164.9	45-80
	111	325*	4/90	160	84-93	162.6	1/92	0.0	83-93	199.1	1/57	172.9	45-80
	112	21	3/93	21	81-93	20.6	1/88	20.6	80-93	202.4	4/55	20.2	46-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA NDH Date : 6-10-94

Checked by : B. D. FRANAGAN BDF Date : 6-10-94

History of Surface Level Data
750,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
TX	101	51	4/83	39	81-93	40	4/91	39.2	91-93	283.1	2/66	46.4	49-80
	102	205*	2/92	80	84-93	82.5	3/93	82.5	91-93	283.1	4/55	128.9	52-80
	103	59	2/93	59	84-93	69.7	1/93	58.6	91-93	283.1	4/55	81.6	52-80
	104	34	1/84	33	84-92	33	3/93	33	91-93	284.2	1/66	32.2	50-80
	105	230	4/81	215	81-93	224.8	1/84	213.5	84-93	286	1/53	228.9	52-80
	106	170	1/81	135	81-93	133.5	3/93	133.5	91-93	283.1	1/52	172.2	52-80
	107	24	4/83	17	79-93	16.8	3/92	0	91-93	286	1/53	22	52-80
	108	58	1/82	53	81-93	57.1	3/93	57.1	91-93	283.1	3/56	55.1	52-80
	109	147	1/84	147	84-88	148.6	3/93	148.6	91-93	283.1	2/54	171.1	49-80
	110	190	1/81	145	81-93	152	1/93	144.3	91-93	283.5	1/69	200.2	49-80
	111	145	1/84	138	84-93	137	3/93	137	91-93	280.9	1/70	154	50-80
	112	255	4/81	240	81-93	237.5	3/93	237.5	91-93	284.2	1/57	252.2	50-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA Date : 6-10-94

Checked by : B. D. FLANAGAN Date : 6-10-94

History of Surface Level Data
750,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
TX	113	225	1/84	215	84-93	215.5	3/93	215.3	91-93	283	1/54	255	52-80
	114	220*	1/89	200	84-93	201.3	3/93	201.3	91-93	288.9	3/66	242	52-80
	115	230	1/81	200	81-93	201.5	1/93	201.3	91-93	283.5	4/52	240.2	52-80
	116	220	1/81	215	81-93	212.3	3/93	212.3	91-93	287	4/64	236.9	52-80
	117	190	2/82	185	81-93	183	3/93	183	91-93	282.4	4/52	235	52-80
	118	142	3/81	110	81-93	118.5	1/93	117.7	89-93	274.7	3/52	138.4	52-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA MH Date : 6-10-94

Checked by : B. D. FLANAGAN BDF Date : 6-10-94

History of Surface Level Data
750,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
TY	101	52	3/82	49	81-93	51.4	4/93	0.0	89-93	283.1	2/54	68.9	53-80
	102	36	1/82	32	81-93	31.9	4/92	31.7	89-93	288.2	3/59	34	53-80
	103	75	2/81	63	81-93	67.5	4/93	67.5	89-93	283.5	2/55	70	53-80
	104	24	4/83	24	81-93	23.8	4/93	23.8	91-93	287.5	4/54	24.2	53-80
	105	92	2/84	85	84-93	N/A	N/A	N/A	N/A	283.1	4/56	111.1	53-80
	106	15	4/87	13	81-93	14	3/93	14.0	91-93	283.1	4/56	15.1	53-80

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA Date : 6-10-94

Checked by : B. D. FLANAGAN Date : 6-10-94

History of Surface Level Data
500,000 Gallons Single-Shell Tanks

Tank		Reference(1)				Reference(2)				Reference(3)			
		Max	Date	Final	Recd	Max	Date	Final	Recd	Max	Date	Final	Recd
U	101	4.2	2/81	4	81-93	3.8	1/93	3.8	92-93	194	1/54	4.9	46-80
	102	130	2/93	130	81-93	131.6	3/93	131.6	91-93	194	1/54	132.9	46-80
	103	170	3/93	170	81-93	166.7	4/93	166.5	91-93	191.5	3/60	160.2	47-80
	104	40	1/81	32	81-93	32.8	3/93	32.8	92-93	188.2	4/55	40.9	47-80
	105	150	3/93	150	81-93	150.2	3/93	0.0	87-93	188.2	1/53	143.1	47-80
	106	79	3/93	79	79-93	78.1	4/93	78.1	90-93	188.2	1/53	78	48-80
	107	145	4/92	143	81-93	144.4	4/93	144.4	90-93	195.1	2/68	137.6	48-80
	108	165	1/93	165	81-93	168.8	4/93	168.8	91-93	196.2	3/55	163.1	49-80
	109	160	3/93	160	78-93	164.8	3/92	164.7	91-93	187.5	1/51	160.9	49-80
	110	65	2/84	62	81-93	61.8	3/93	61.8	91-93	188.2	1/54	54	46-80
	111	118	2/84	112	84-93	118	4/93	118	93-93	188.5	1/69	108.5	47-80
	112	13	4/89	12	81-93	12.5	1/93	12.3	91-93	N/A	N/A	N/A	N/A

NOTE : (1) WHC-SD-WM-TI-591 Appendix C (SACS)
(2) SST TEMPERATURE & LIQUID LEVEL REPORTS & GRAPHS
(3) WHC-MR-0132
* SUSPECTED DATA
Max : Maximum liquid level (in.); Date: Quarter/Year
Final: Last reading data of the reference; Recd: Period during which data were recorded

Prepared by : N. D. HA Date : 6-10-94

Checked by : B. D. FLANAGAN Date : 6-10-94

A P P E N D I X B

OVERALL MAXIMUM TEMPERATURE HISTORY

Maximum Recorded Temperature Data
1,000,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	>200		
A	101										399	(4)	5/61
	102										420	(4)	8/61
	103										300	(4)	6/60
	104										430	(4)	2/63
	105										325	(4)	3/63
	106										583	(4)	5/63

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(*) SUSPECT DATA

Prepared by : N. D. HA NHA Date : 4/11/94

Checked by : B. D. FLANAGAN BDF Date : 4/11/94

Maximum Recorded Temperature Data
1,000,000 Gallons Double-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
AN	101	76										(1)	11/30/92
	102			113								(1)	8/24/92
	103				121							(1)	3/14/93
	104				124							(1)	3/1/93
	105			113								(1)	5/3/93
	106	92										(1)	2/19/90
	107		103									(1)	5/3/93

NOTE : (1) DOUBLE SHELL TANK RAW TEMPERATURE DATA 1990-1993
(*) SUSPECT DATA

Prepared by : B. D. FLANAGAN BDF Date : 4/11/94

Checked by : N. D. HA NDH Date : 4/11/94

Maximum Recorded Temperature Data
1,000,000 Gallons Double-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
AP	101	69										(1)	10/8/90
	102	86										(1)	4/26/93
	103	72										(1)	11/5/90
	104	69										(1)	8/13/90
	105	87										(1)	8/23/92
	106	82										(1)	6/25/90
	107	70										(1)	12/3/90
	108	74										(1)	10/14/91

NOTE : (1) DOUBLE SHELL TANK RAW TEMPERATURE DATA 1990-1993
(*) SUSPECT DATA

Prepared by : B. D. FLANAGAN BDF Date : 4/11/94

Checked by : N. D. HA NDH Date : 4/11/94

Maximum Recorded Temperature Data
1,000,000 Gallons Double-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
AW	101		108									(1)	1/15/90
	102		103									(1)	9/10/90
	103	87										(1)	7/2/90
	104		100									(1)	8/6/90
	105	85										(1)	5/18/92
	106		100									(1)	12/24/90

NOTE : (1) DOUBLE SHELL TANK RAW TEMPERATURE DATA 1990-1993
(*) SUSPECT DATA

Prepared by : B. D. FLANAGAN BDF Date : 4/11/94

Checked by : N. D. HA NDH Date : 4/11/94

Maximum Recorded Temperature Data
1,000,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	>200		
AX	101										260	(4)	6/71
	102										250	(4)	12/70
	103										330	(4)	5/66
	104										320	(4)	5/70

NOTE : (1) WHC-SD-WM-TI-591 Appendix E(SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(*) SUSPECT DATA

Prepared by : N. D. HA Date : 4/11/94

Checked by : B. D. FLANAGAN Date : 4/11/94

Maximum Recorded Temperature Data
1,000,000 Gallons Double-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<300		
AY	101	106										(1)	9/91
	102	87										(2)	1/94
AZ	101										215	(5)	10/85
	102										240	(5)	8/86

NOTE : (1) TO-040-660 (TANK FARM PLANT OPERATING PROCEDURE)
(2) TF-OR-EF-AYAZ-D (TANK FARM OPERATOR ROUND)
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(5) WHC-SD-WM-TI-394 (SOLIDS ACCUMULATION IN AGING WASTE TANK 241-AZ-102)
(*) SUSPECT DATA

Prepared by : N. D. HA Date : 4/8/94

Checked by : B. D. FLANAGAN Date : 4/8/94

Maximum Recorded Temperature Data
500,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										Ref.	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
B	101					137						(2)	1977
	102		108									(1)	1989
	103	83										(2)	1976
	104				122							(1)	1989
	105		107									(2)	1989
	106	86										(1)	1982
	107				124							(2)	1989
	108		105									(1)	1989
	109		105									(1)	1989
	110				121							(2)	1989
	111	98										(1)	1979
	112		101									(2)	1989

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
* SUSPECTED DATA

Prepared by : N. D. HA Date : 4/8/94

Checked by : B. D. FLANAGAN Date : 4/8/94

Maximum Recorded Temperature Data
500,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										Ref.	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
BX	101	86										(2)	1977
	102	83										(2)	1977
	103	99										(3)	1979
	104				124							(3)	1977
	105				126							(2)	1977
	106			115								(2)	1974
	107	88										(3)	1977
	108	90										(3)	1980
	109	77										(2)	1993
	110		104									(2)	1974
	111		111									(3)	1977
	112	90										(3)	1980

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORY)
* SUSPECTED DATA

Prepared by : N. D. HA NDHA Date : 4/8/94

Checked by : B. D. FLANAGAN BDF Date : 4/8/94

Maximum Recorded Temperature Data
750,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	>200		
BY	101			115								(2)	11/16/74
	102							155				(3)	11/16/74
	103					137						(2)	7/7/79
	104										237	(2)	1/21/75
	105								180			(2)	1/21/75
	106									199		(2)	1/21/75
	107				125							(3)	1/21/75
	108							154				(2)	12/9/76
	109					138						(3)	6/9/76
	110										205	(2)	4/8/75
	111				124							(3)	11/21/75
	112								163			(3)	11/21/75

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(*) SUSPECT DATA

Prepared by : N. D. HA Date : 4/8/94

Checked by : B. D. FLANAGAN Date : 4/8/94

Maximum Recorded Temperature Data
500,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F											Ref.	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200	>200		
C	101		111										(3)	1980
	102		106										(3)	1978
	103								168				(3)	1977
	104				129								(3)	1978
	105						149						(3)	1976
	106										198		(1)	1992
	107								170				(1)	1988
	108	96											(3)	1977
	109								160				(4)	1963
	110		110										(3)	1981
	111										190		(4)	1964
	112								160				(4)	1961

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORY)
* SUSPECTED DATA

Prepared by : N. D. HA Date : 4/8/94

Checked by : B. D. FLANAGAN Date : 4/8/94

Maximum Recorded Temperature Data
750,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	>200		
S	101										300	(4)	11/53
	102						140					(3)	9/6/79
	103					130						(3)	9/6/79
	104										300	(4)	7/53
	105				125							(3)	1/23/80
	106						144					(3)	2/4/76
	107										240	(4)	11/52
	108									195		(3)	1/13/82
	109							150				(3)	10/20/74
	110										240	(4)	10/52
	111									169		(3)	2/4/76
	112						141					(3)	1/8/78

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(*) SUSPECT DATA

Prepared by : N. D. HA NDH Date : 4/8/94

Checked by : B. D. FLANAGAN BDF Date : 4/8/94

Maximum Recorded Temperature Data
1,000,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	>200		
SX	101										320	(4)	11/57
	102										212	(3)	8/6/85
	103										225	(3)	8/13/85
	104										300	(4)	12/56
	105										330	(3)	11/75
	106									195		(4)	10/63
	107										390	(4)	2/5/58
	108										320	(4)	9/58
	109										295	(4)	9/62
	110										310	(4)	5/66
	111										320	(4)	11/65
	112										315	(4)	3/62

NOTE : (1) WHC-SD-WM-TI-591 Appendix E(SACS)(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA (4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(*) SUSPECT DATA

Prepared by : N. D. HA NHA Date : 4-8-94

Checked by : B. D. FLANAGAN BDF Date : _____

Maximum Recorded Temperature Data
1,000,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	>200		
SX	113										255	(4)	7/58
	114										335	(4)	8/58
	115										260	(4)	9/60

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(*) SUSPECT DATA

Prepared by : N. D. HA NDH Date : 4-13-94

Checked by : B. D. FLANAGAN BDF Date : 4-8-94

Maximum Recorded Temperature Data
1,000,000 Gallons Double-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
SY	101										260	(2)	1/91
	102	91										(1)	4/8/91
	103				128							(1)	1/7/91

NOTE : (1) DOUBLE SHELL TANK RAW TEMPERATURE DATA 1990-1993
(2) WHC-SD-WM-TI-591 Appendix E (SACS)
(*) SUSPECT DATA

Prepared by : B. D. FLANAGAN BDF Date : 4/11/94

Checked by : N. D. HA NHA Date : 4/11/94

Maximum Recorded Temperature Data
500,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										Ref.	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
T	101		103									(3)	1988
	102	94										(3)	1976
	103	96										(3)	1976
	104	90										(2)	1978
	105	93										(1)	1985
	106	93										(3)	1979
	107			114								(3)	1981
	108	90										(2)	1978
	109	91										(2)	1978
	110	91										(2)	1976
	111	98										(2)	1981
	112	87										(2)	1978

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
* SUSPECTED DATA

Prepared by : N. D. HA NDHa Date : 4/8/94

Checked by : B. D. FLANAGAN BDF Date : 4/8/94

Maximum Recorded Temperature Data
750,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
TX	101				128							(3)	8/15/82
	102					136						(3)	4/7/76
	103			112								(3)	12/3/76
	104				128							(3)	1/29/77
	105										238	(5)	1/52
	106					138						(3)	11/5/75
	107			110								(3)	12/3/76
	108			116								(3)	3/13/77
	109								168			(3)	11/5/75
	110							153				(3)	11/22/77
	111						147					(3)	11/5/75
	112				126							(3)	

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(5) ARH-780 (CHRONOLOGICAL RECORD OF SIGNIFICANT EVENTS IN SEPARATIONS OPERATIONS)
(*) SUSPECT DATA

Prepared by : N. D. HA Date : 4/8/94

Chec' by : B. D. FLANAGAN Date : 4/8/94

Maximum Recorded Temperature Data
750,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
TX	113				120							(3)	3/13/77
	114		102									(3)	12/3/76
	115				123							(3)	8/31/76
	116			117								(3)	11/5/75
	117										191*	(3)	No valid data found
	118						145					(3)	2/1/77

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(*) SUSPECT DATA

Prepared by : N. D. HA Date : 4/8/94

Checked by : B. D. FLANAGAN Date : 4/8/94

Maximum Recorded Temperature Data
750,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										References	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
TY	101	83										(3)	12/3/76
	102	82										(3)	8/11/77
	103	86										(3)	8/11/77
	104			114								(3)	8/31/76
	105			112								(3)	8/31/76
	106		106									(3)	12/3/76

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
(*) SUSPECT DATA

Prepared by : N. D. HA NDH Date : 4/8/94

Checked by : B. D. FLANAGAN BDF Date : 4/8/94

Maximum Recorded Temperature Data
500,000 Gallons Single-Shell Tanks

Tank		Maximum Temperature - °F										Ref.	Remarks
		<100	<110	<120	<130	<140	<150	<160	<180	<190	<200		
U	101	92										(3)	1977
	102					134						(3)	1978
	103	93				132						(2),(3)	1991,1977
	104	78										(3)	1976
	105						146					(3)	1988,1977
	106				122							(3)	1976
	107				122							(3)	1976
	108					130						(3)	1980
	109				120							(3)	1977
	110						140					(4)	1956
	111					130						(4)	1956
	112	79							160*			(3),(4)	1977, 1956

NOTE : (1) WHC-SD-WM-TI-591 Appendix E (SACS)
(2) SST TEMPERATURE REPORTS & GRAPHS
(3) RAW TEMPERATURE DATA
(4) RHO-CD-1172 (SURVEY OF SINGLE SHELL TANK THERMAL HISTORIES)
* SUSPECTED DATA

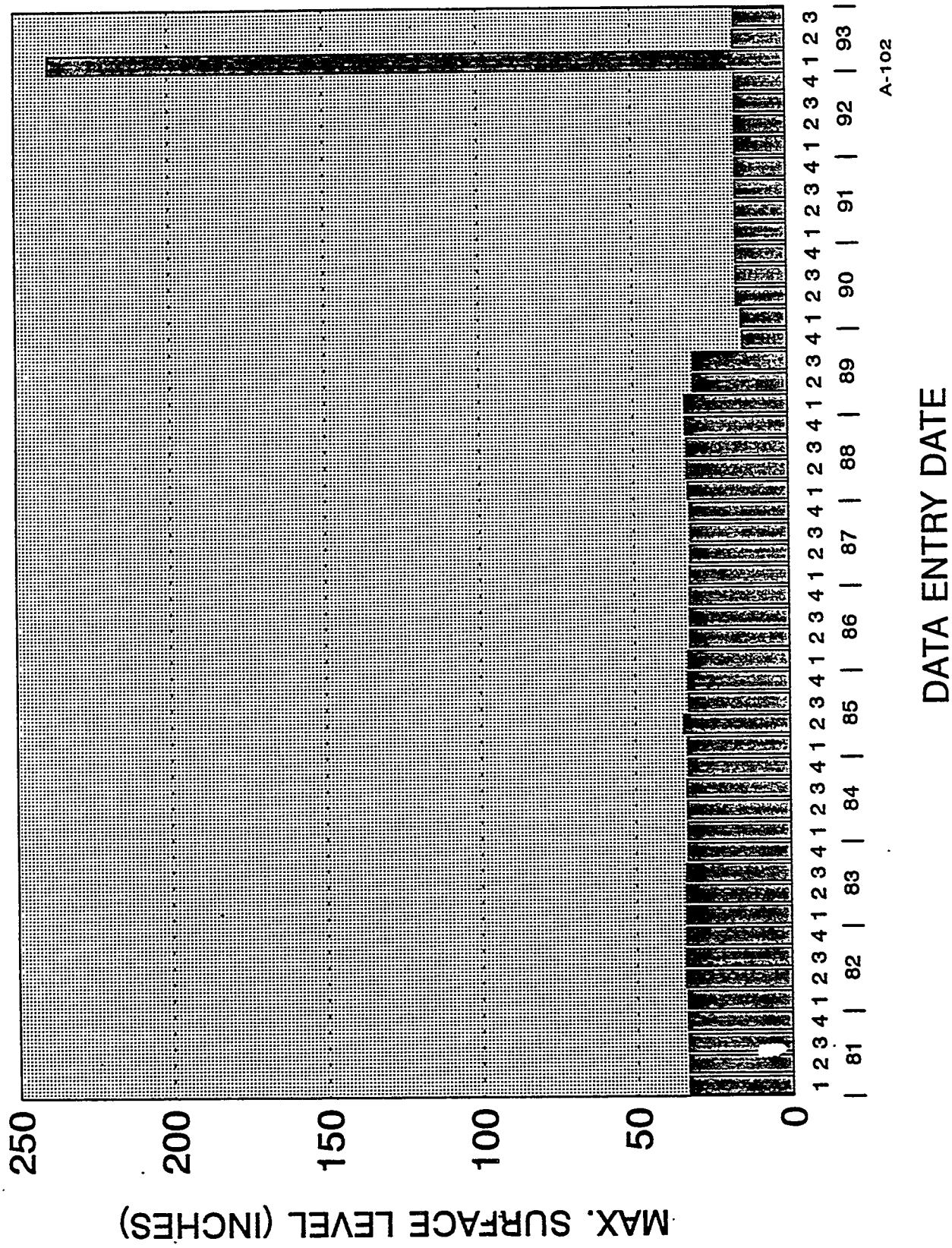
Prepared by : N. D. HA NHA Date : 4-8-94

Checked by : B. D. FLANAGAN BDF Date : 4-8-94

A P P E N D I X C

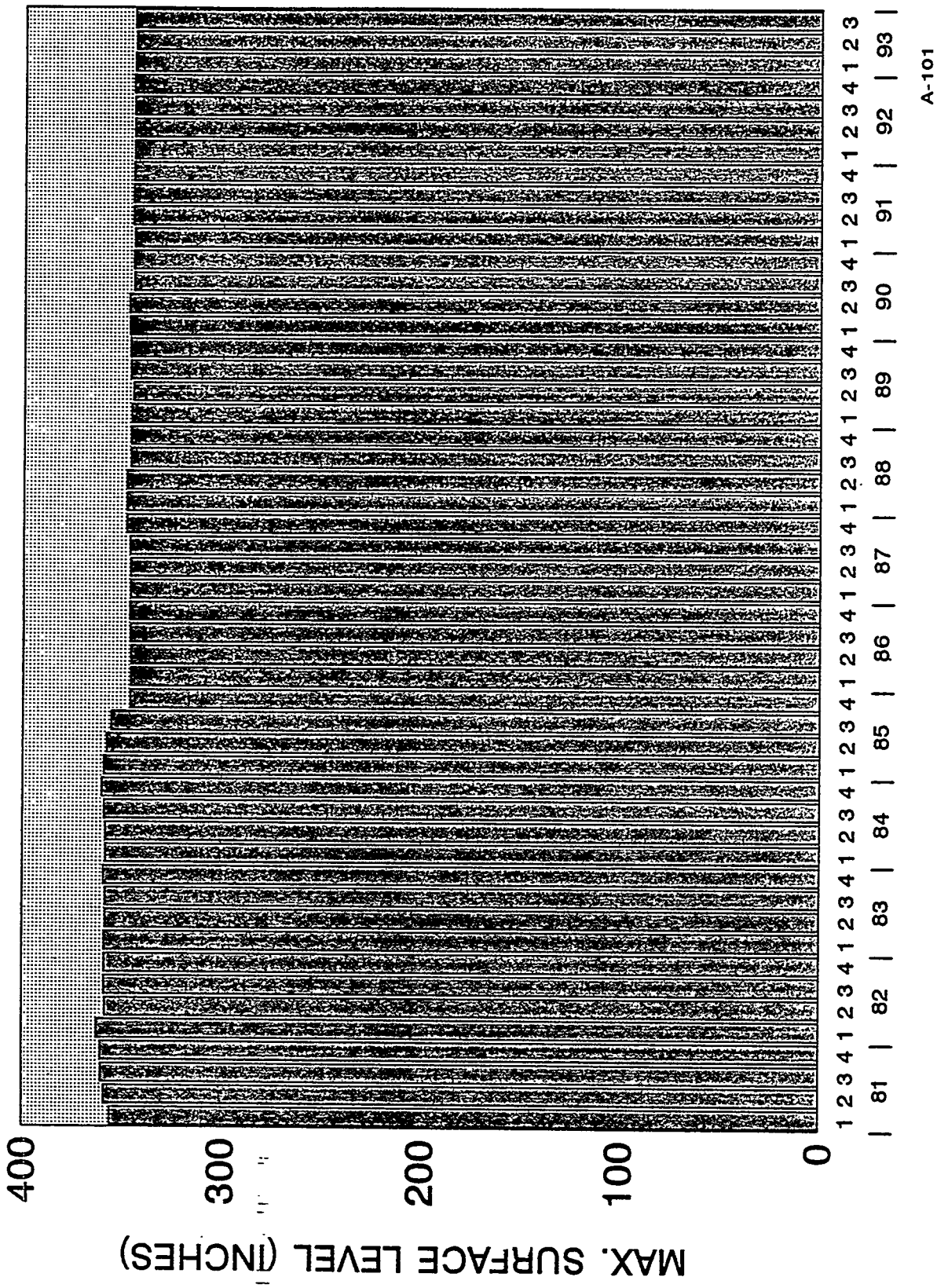
QUARTERLY MAXIMUM SURFACE-LEVEL HISTORY PLOTS FROM SACS DATABASE VIA SCRIPT FILES

Quarterly Maximum Surface-Level History Plot



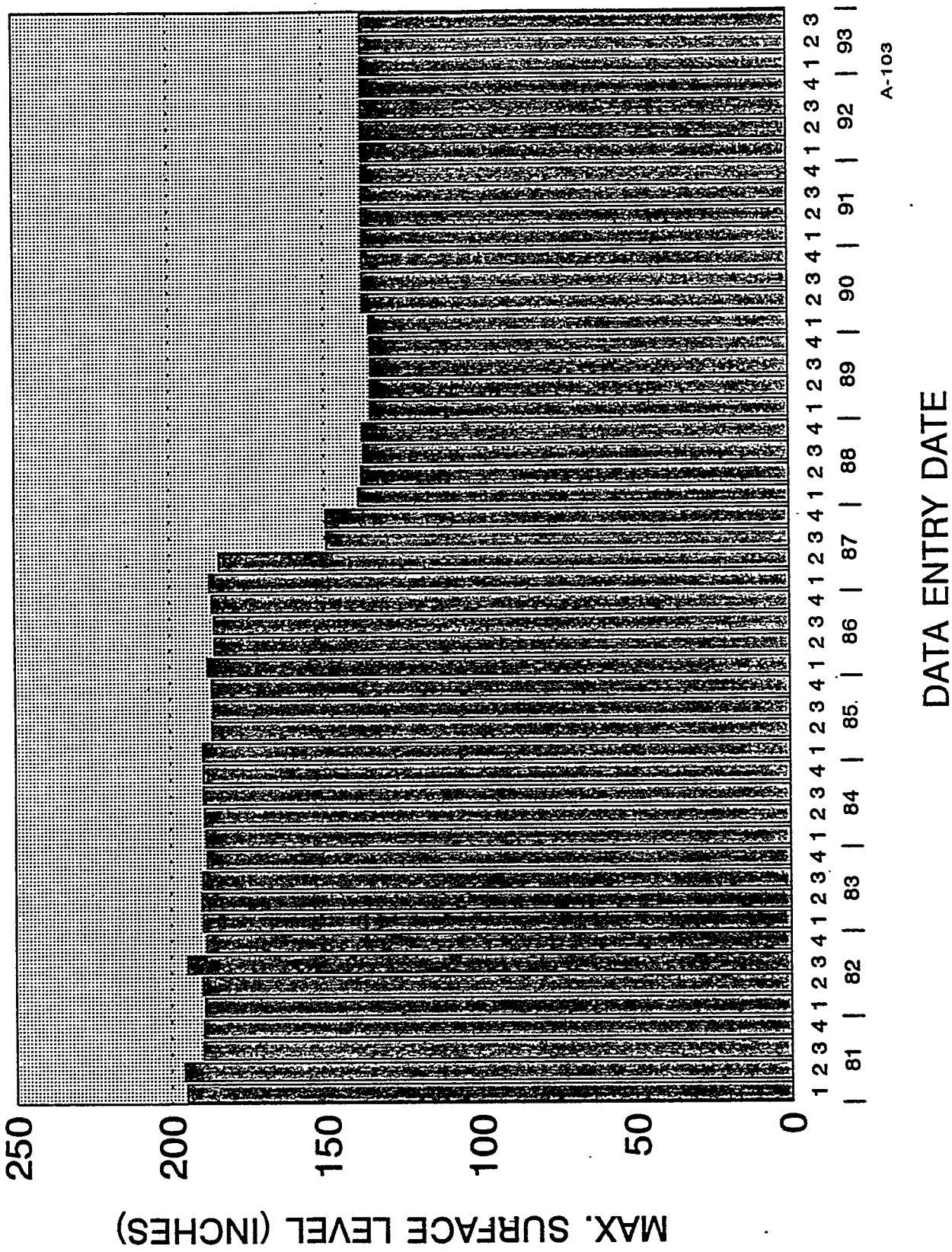
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



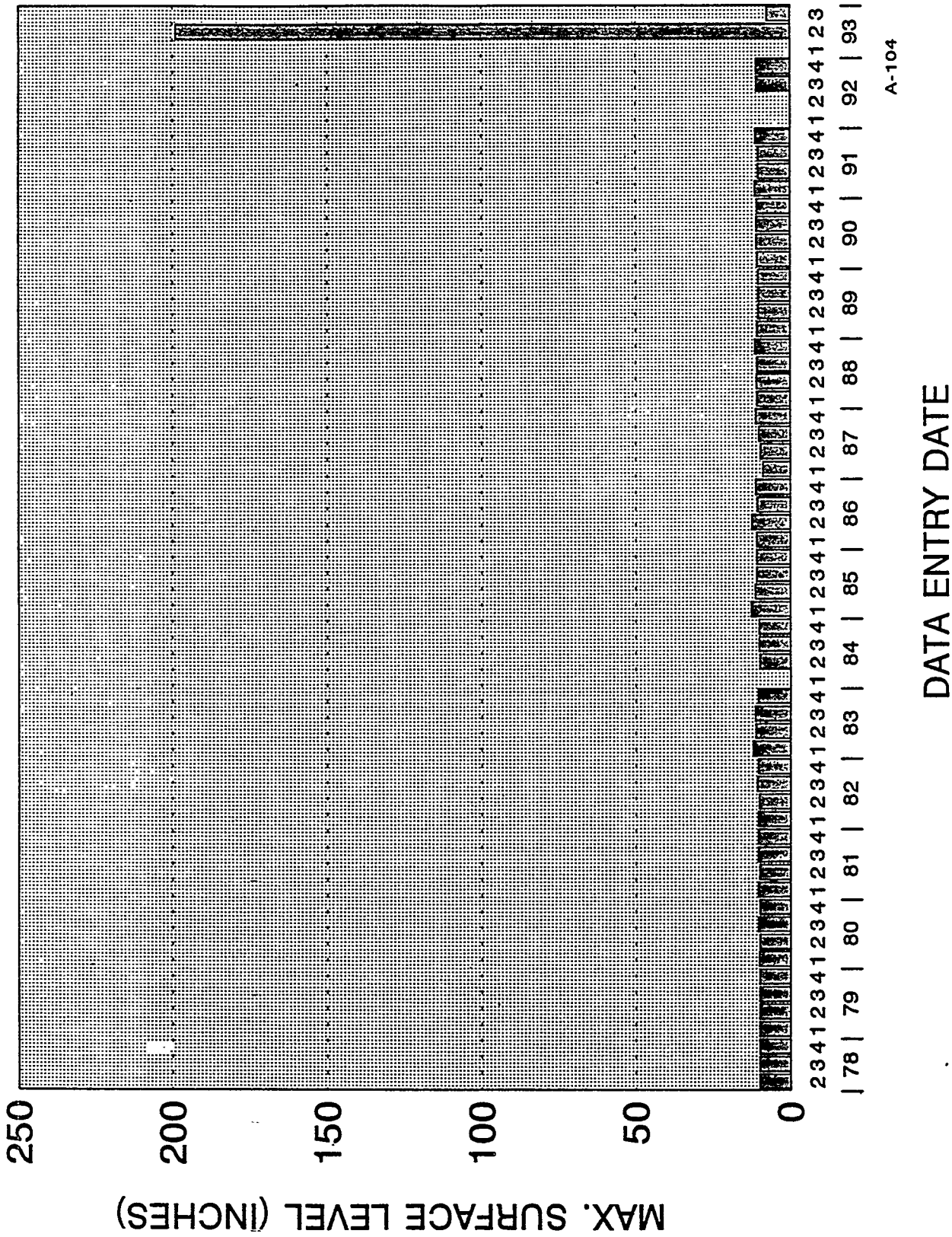
ZERO TRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



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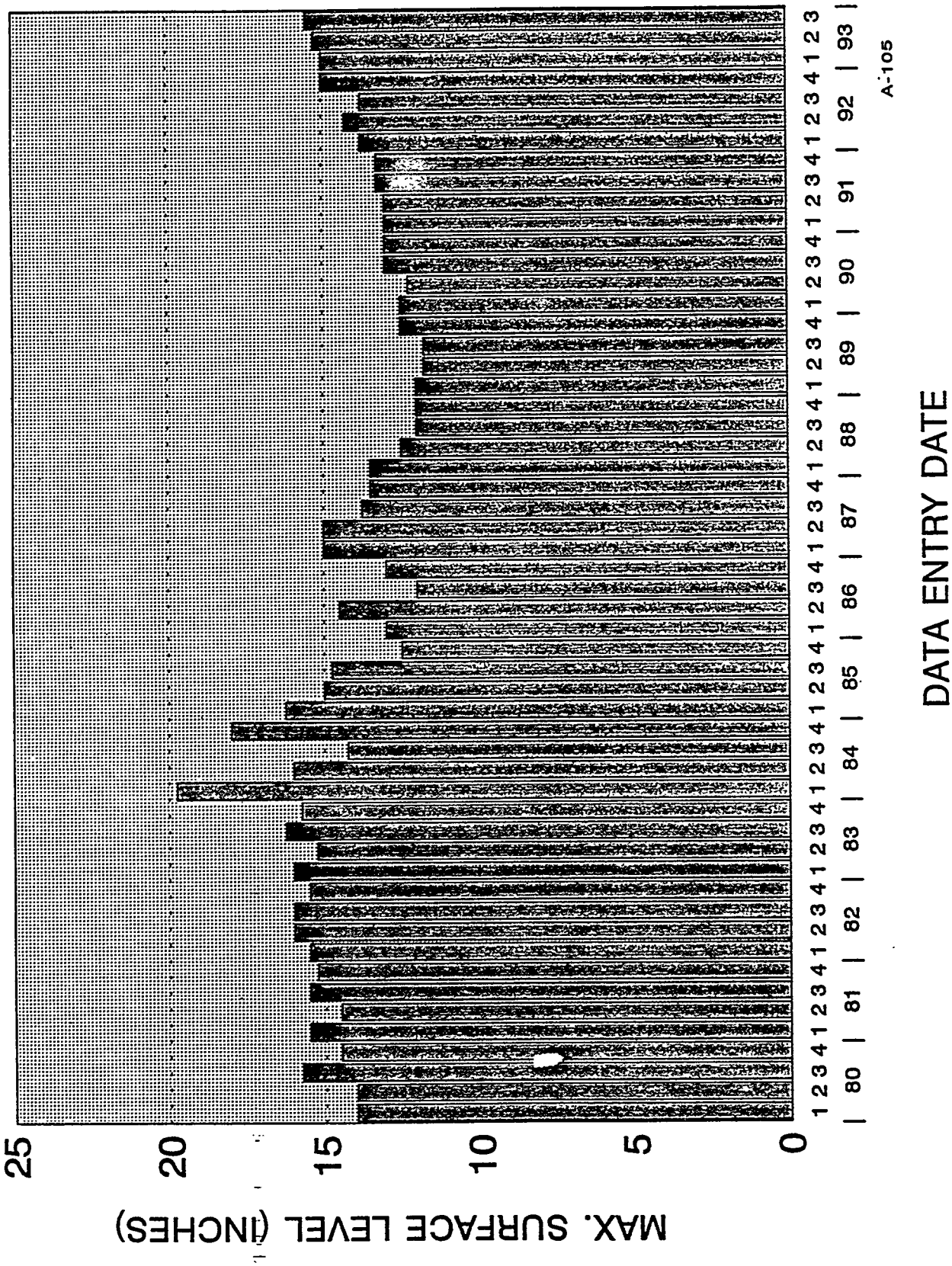
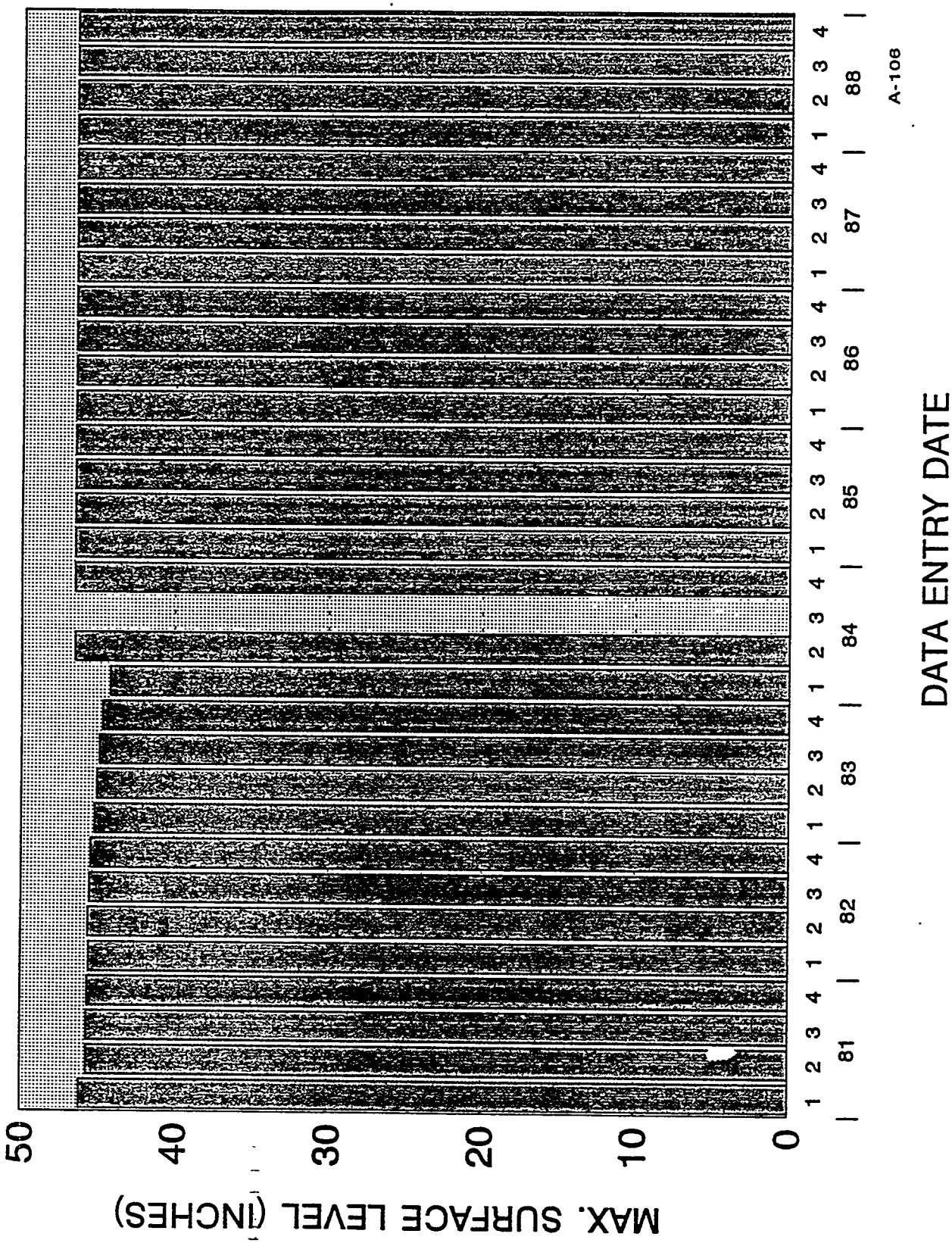


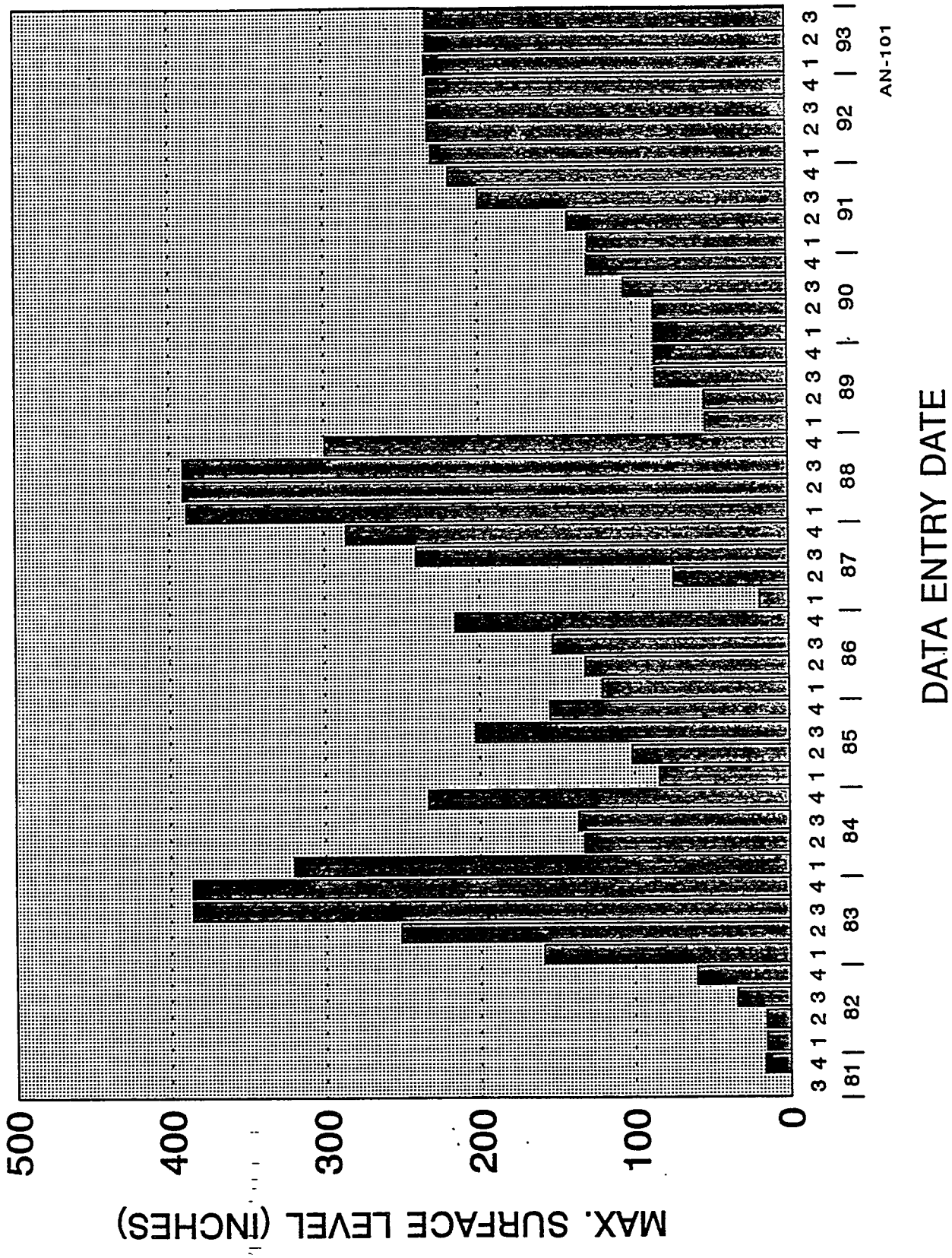
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



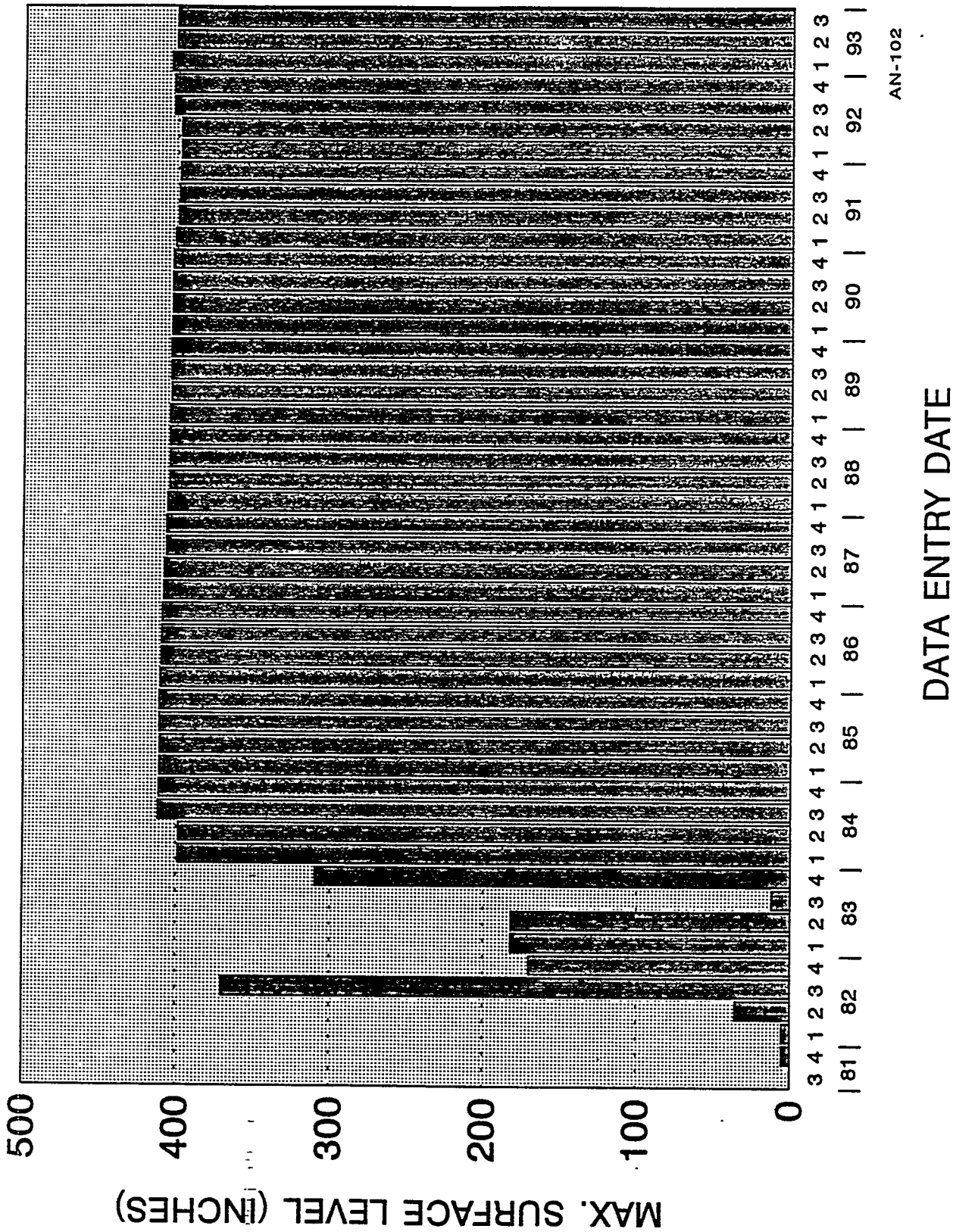
ZER 'TRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



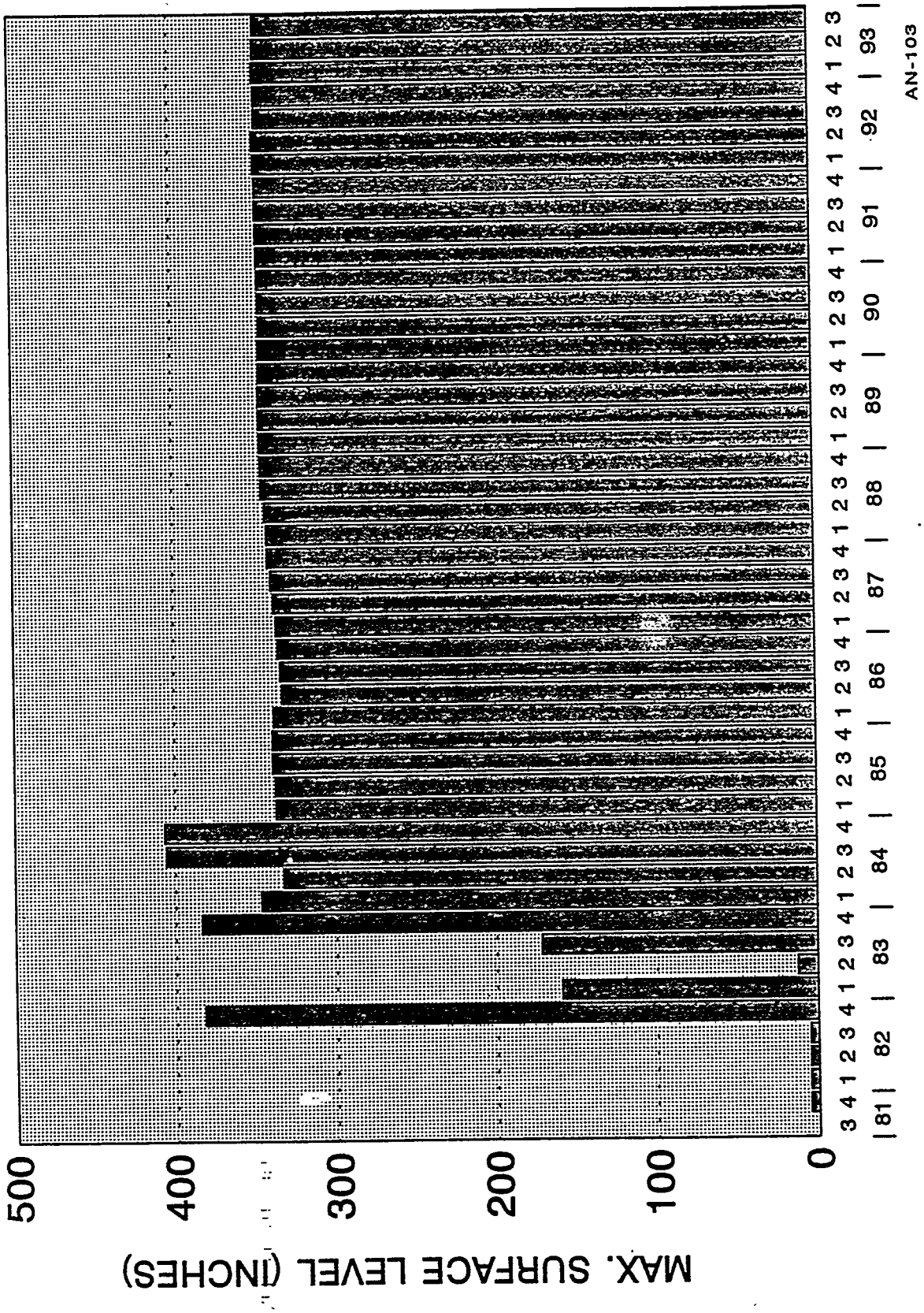
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



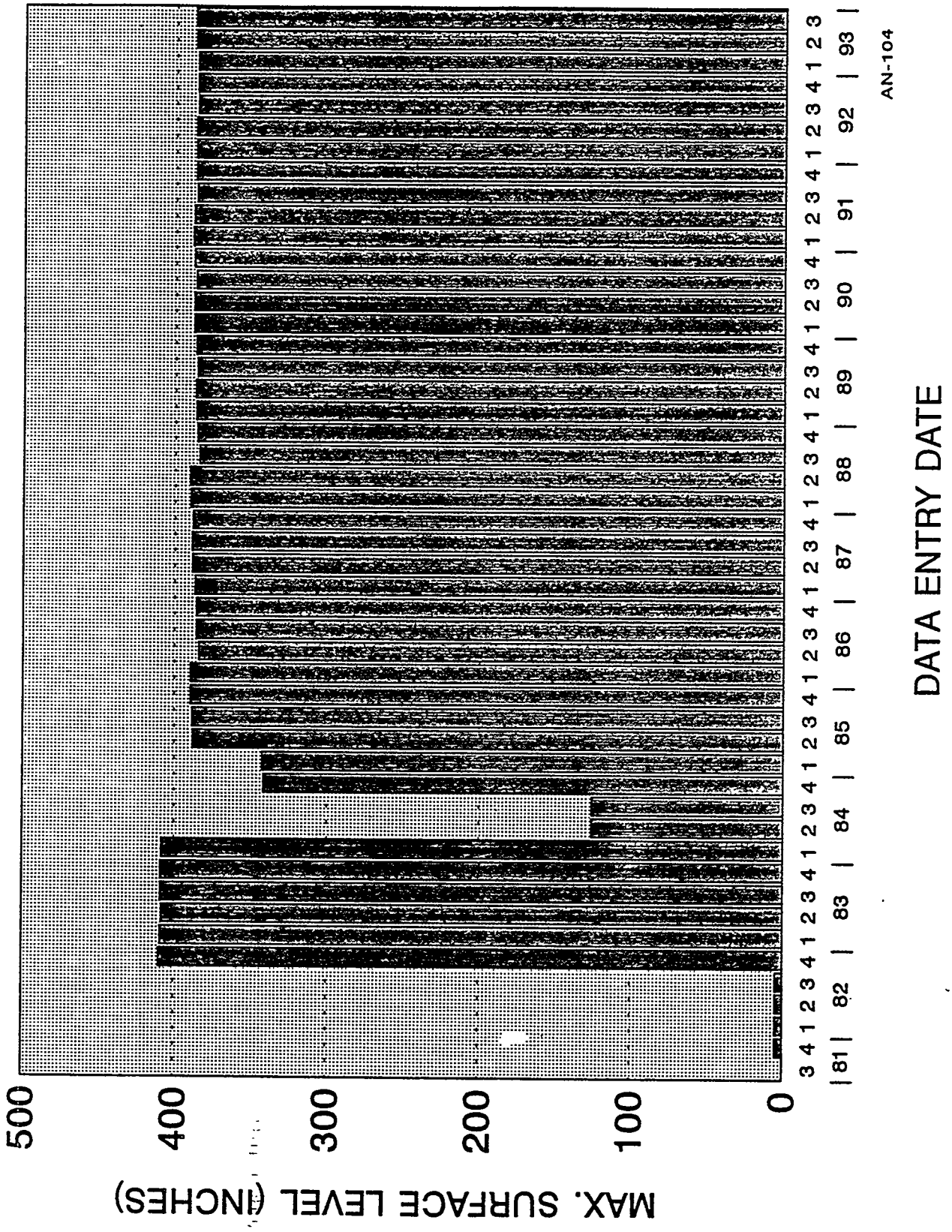
ZE NTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



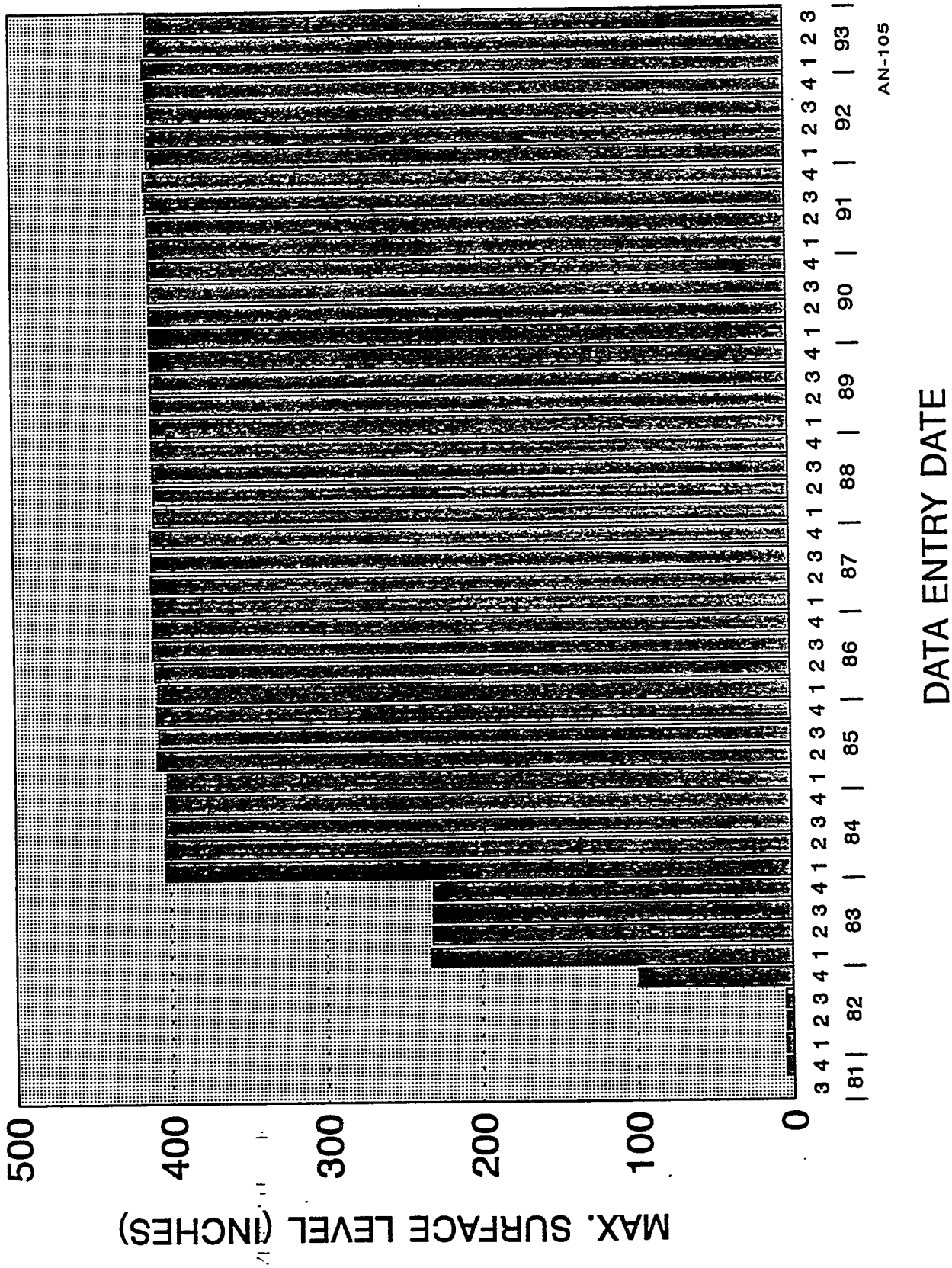
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



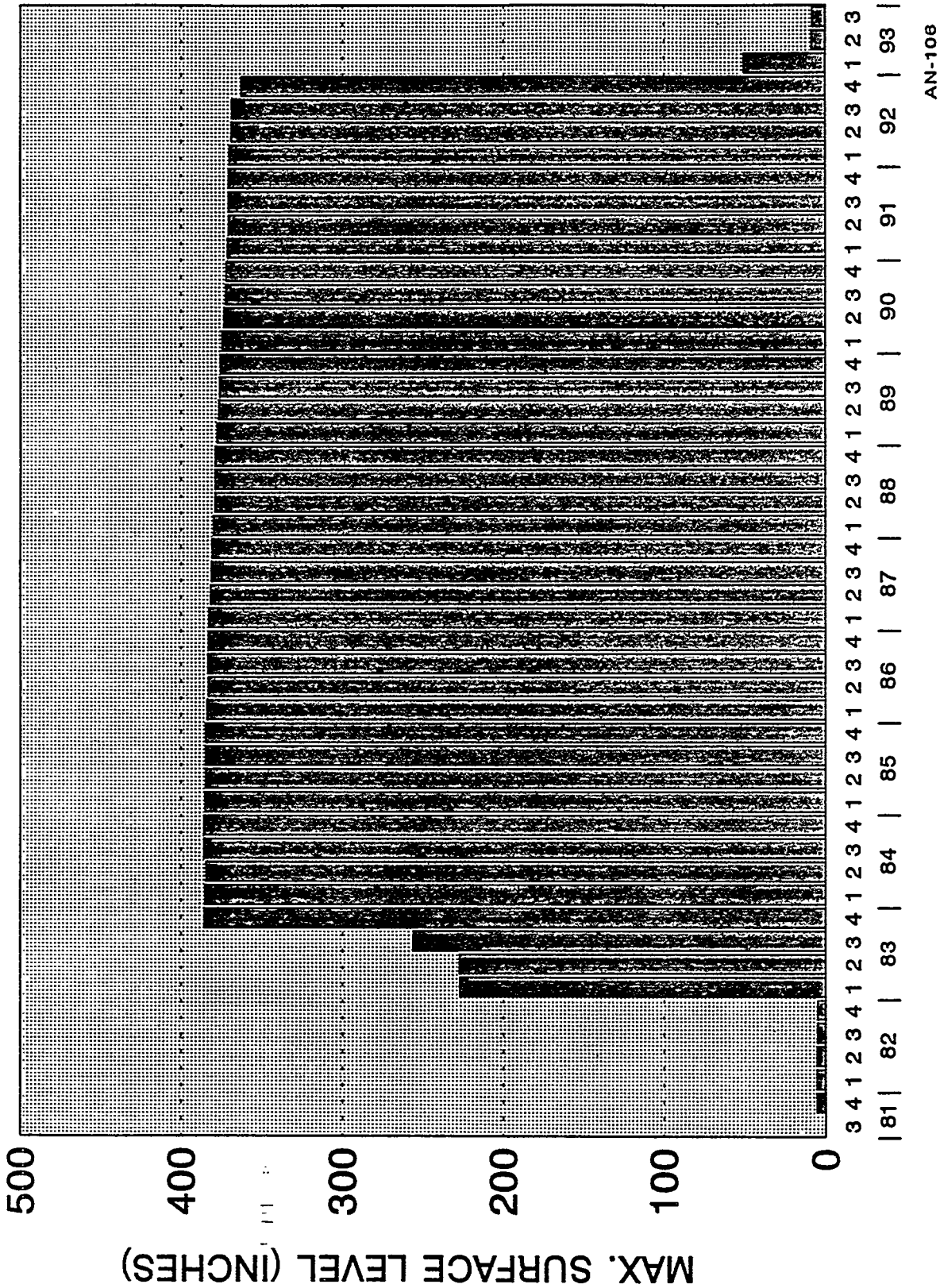
ZER ITRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



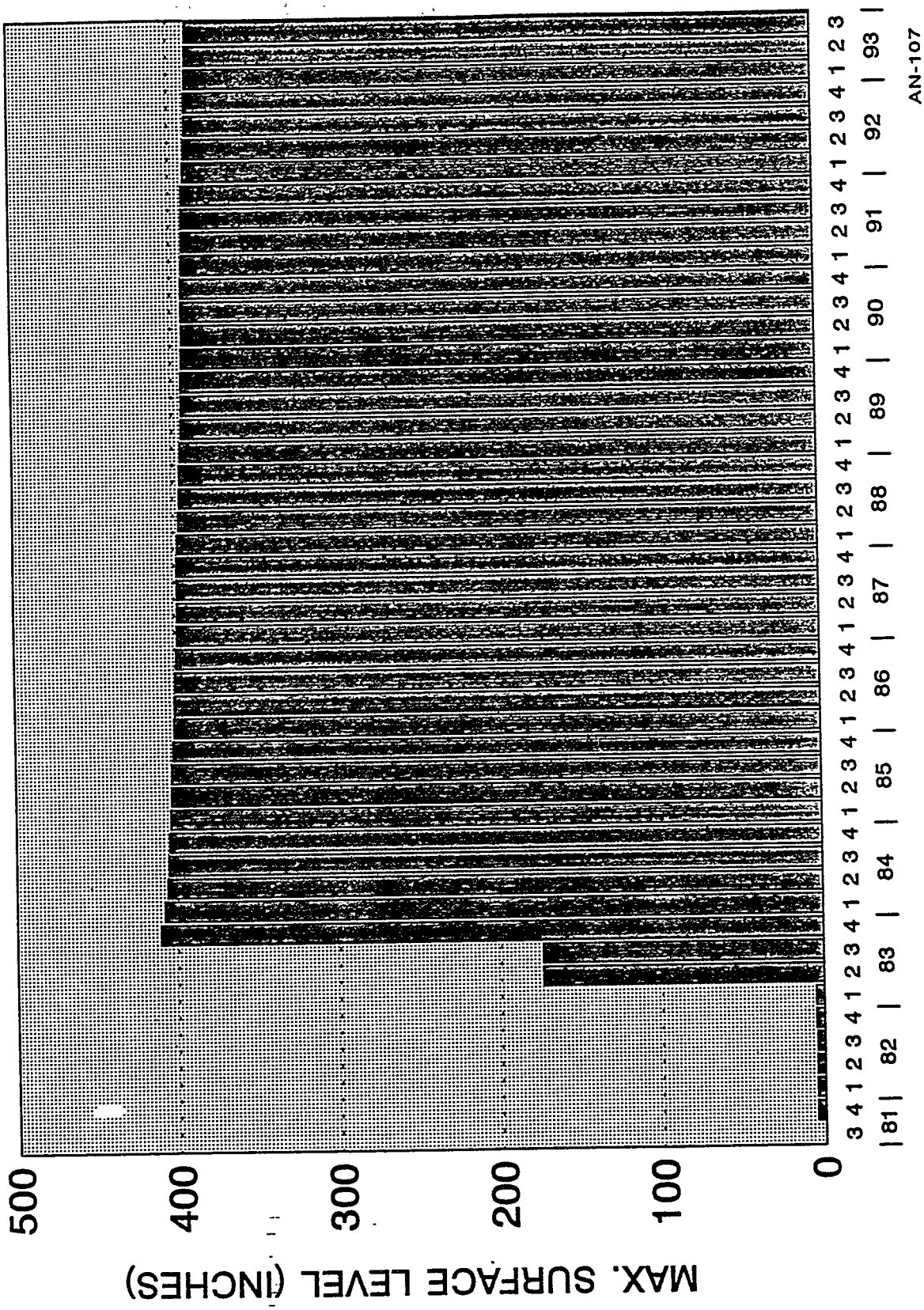
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



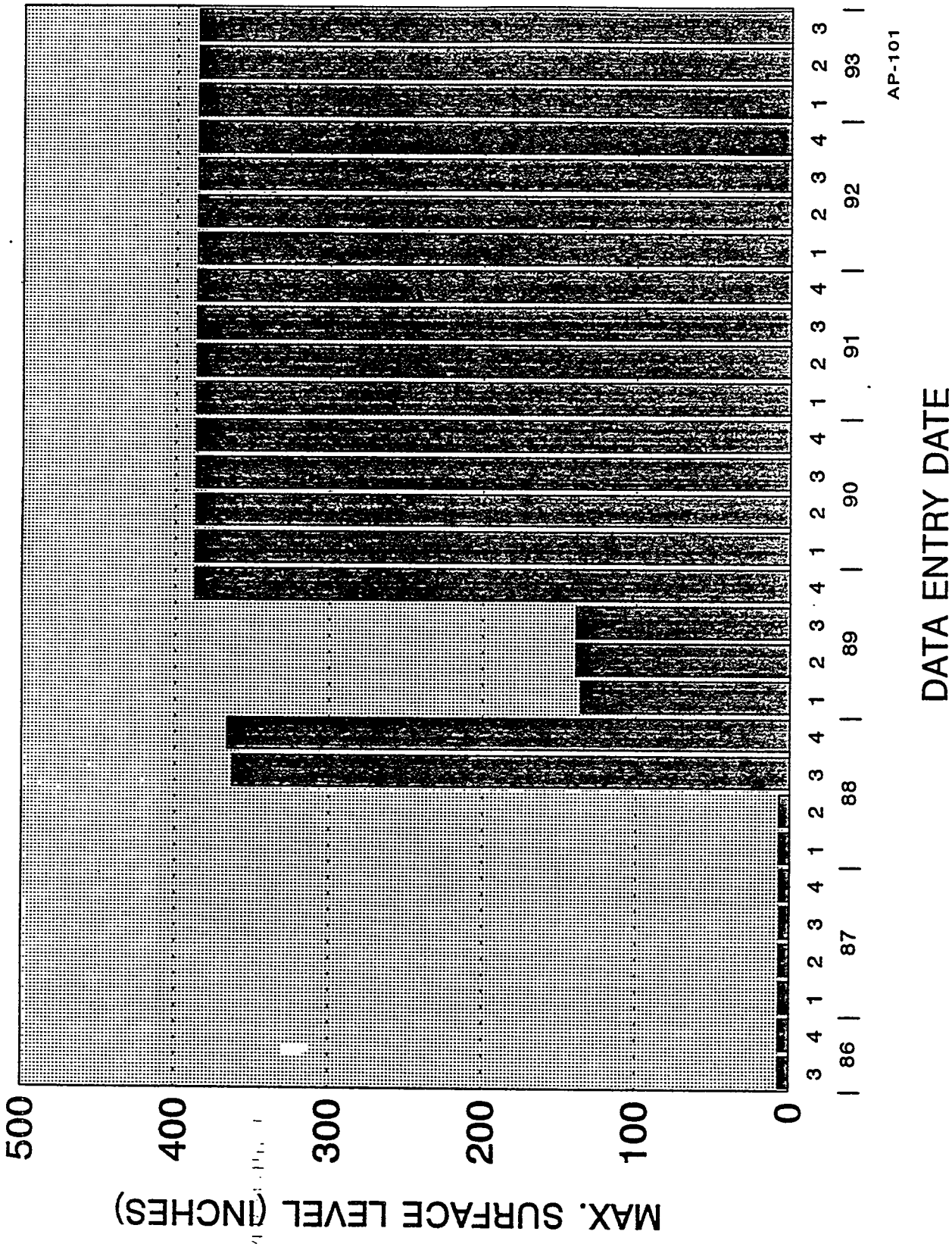
ZEF JTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



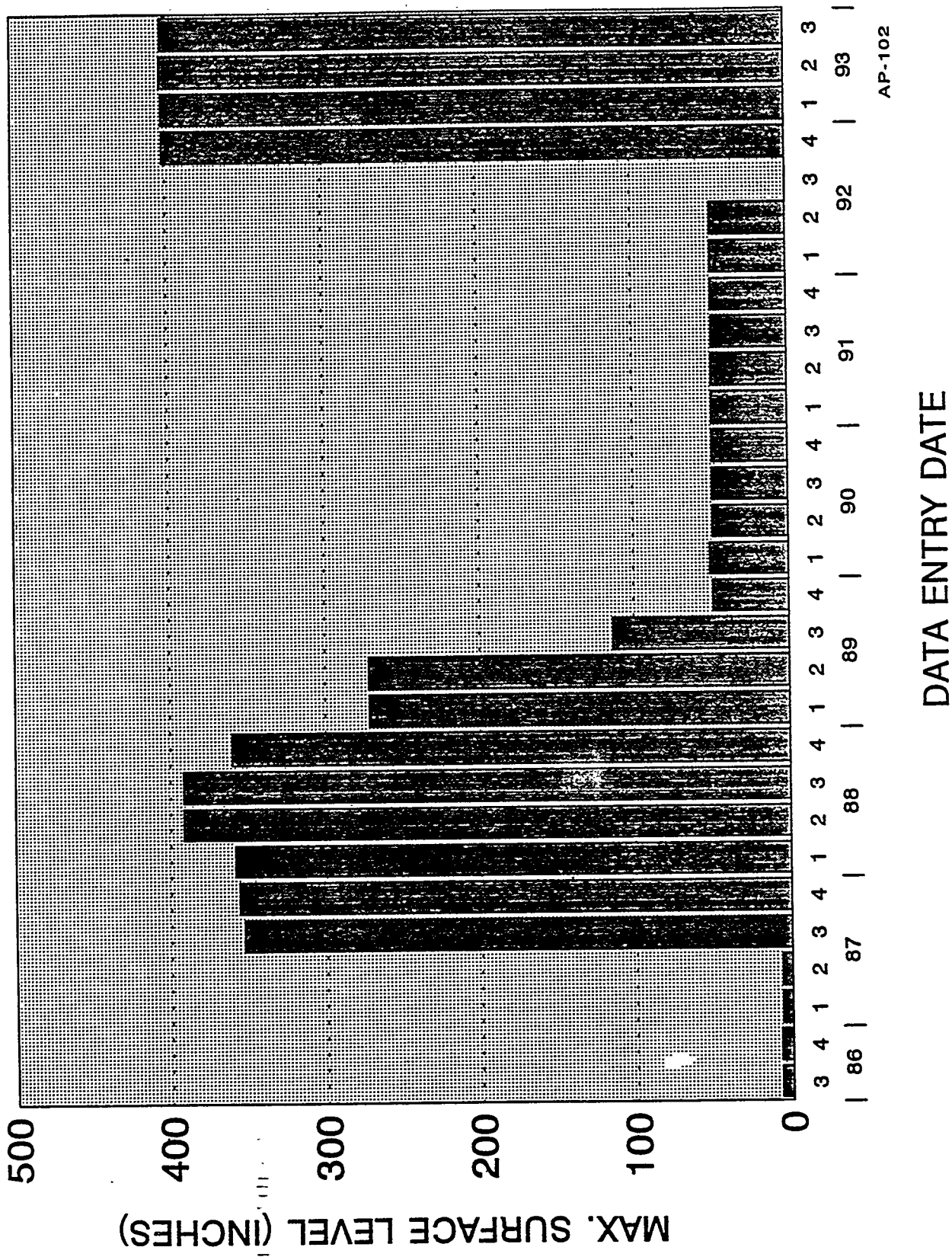
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



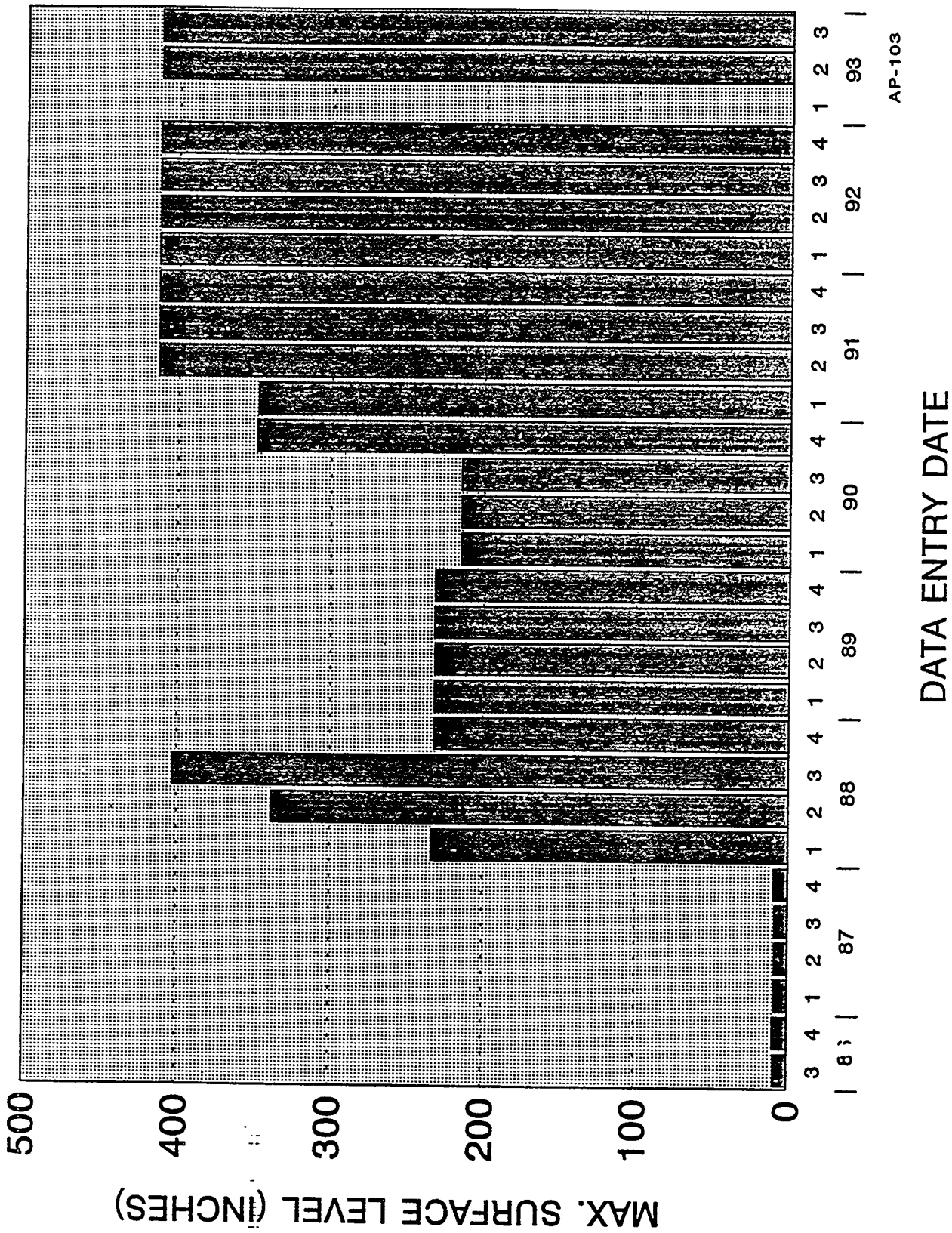
ZE ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



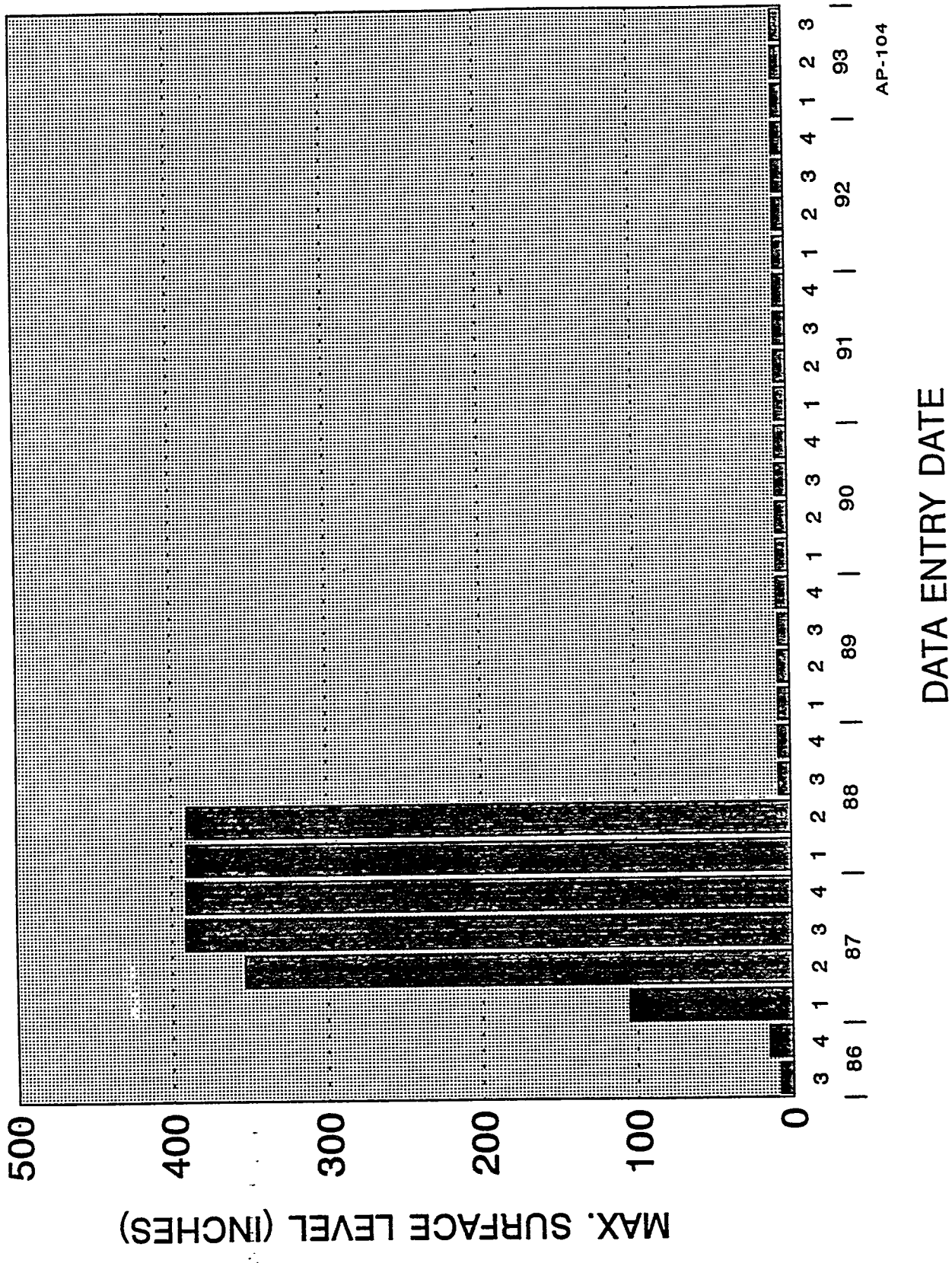
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



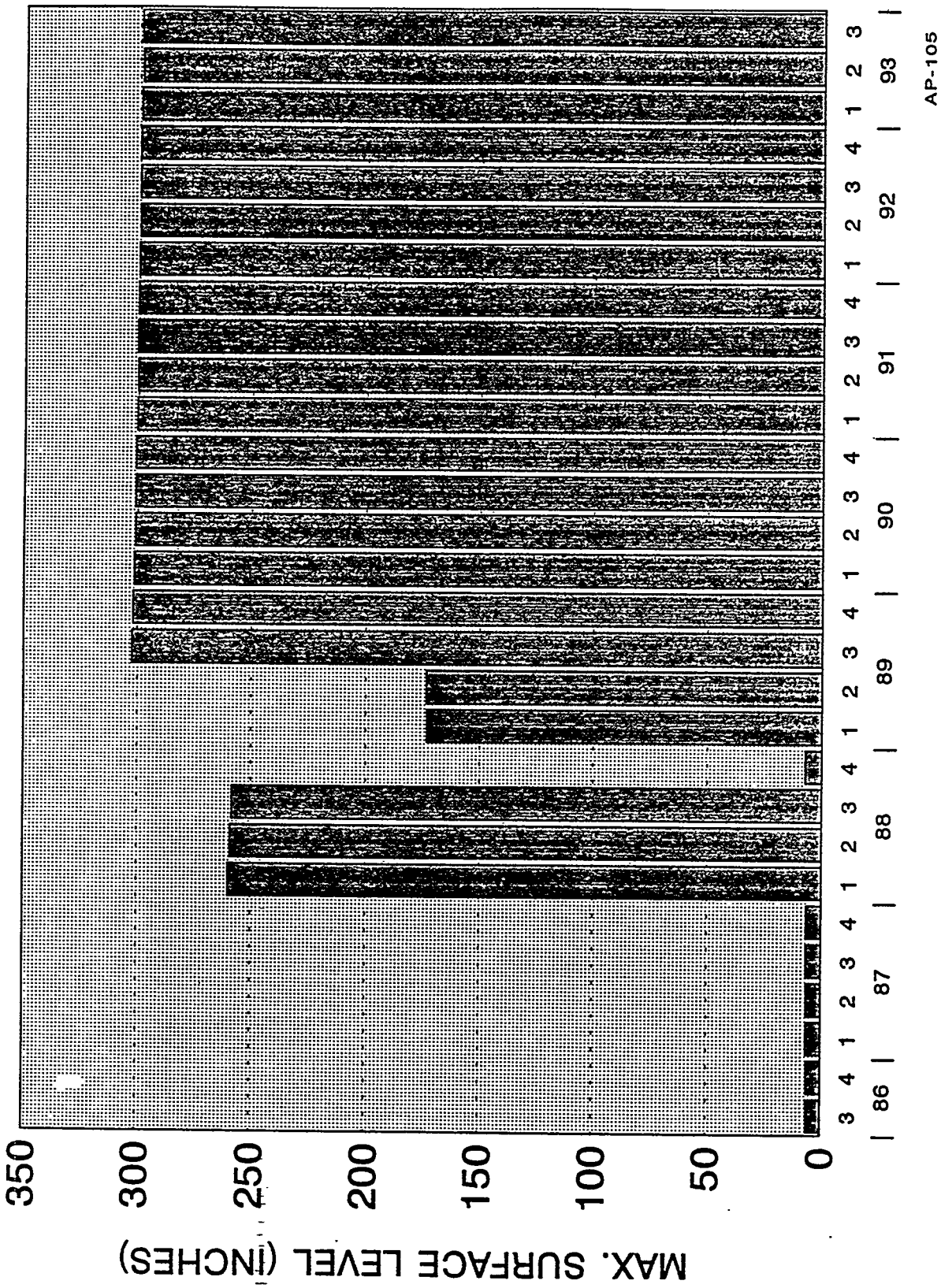
ZEF JTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



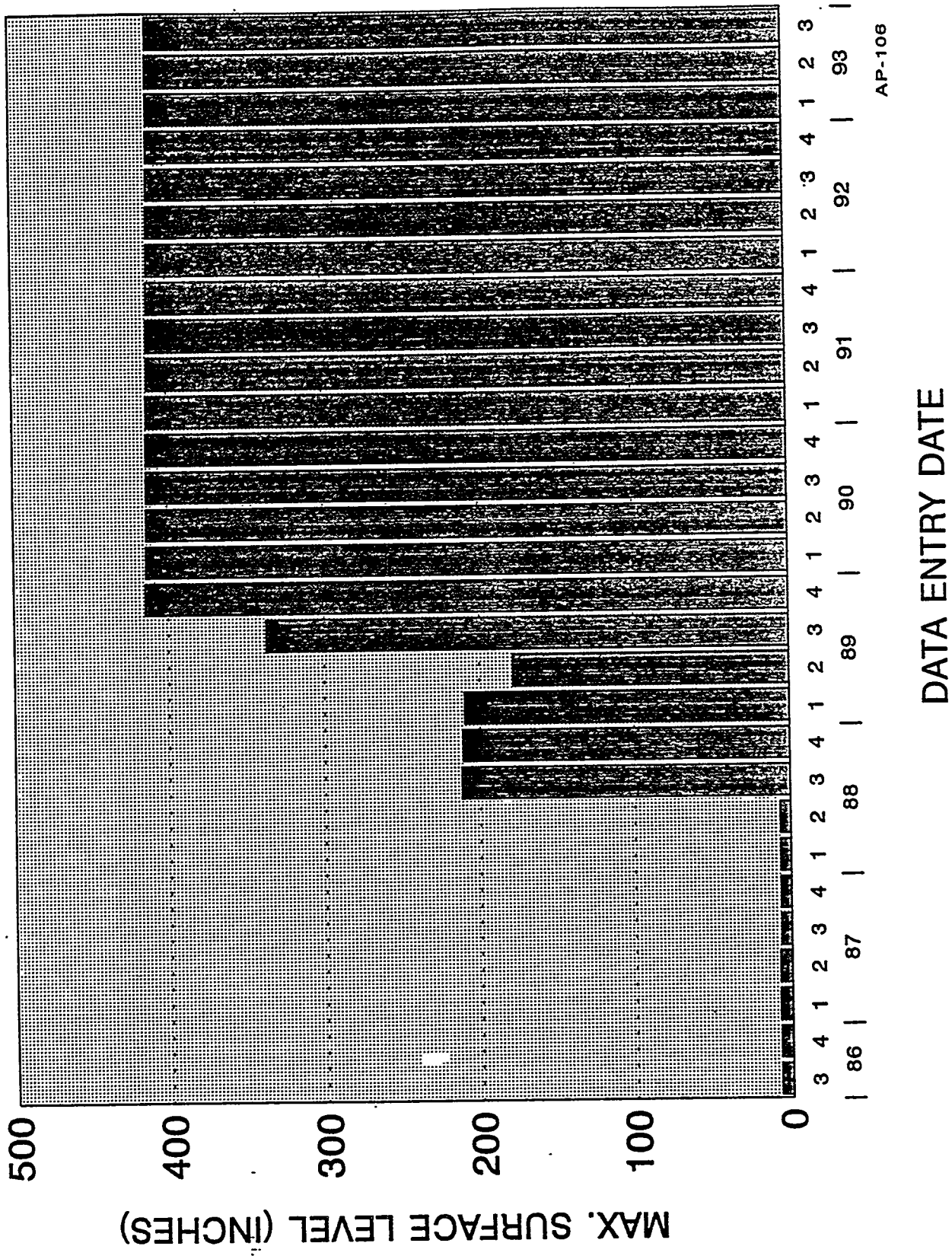
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



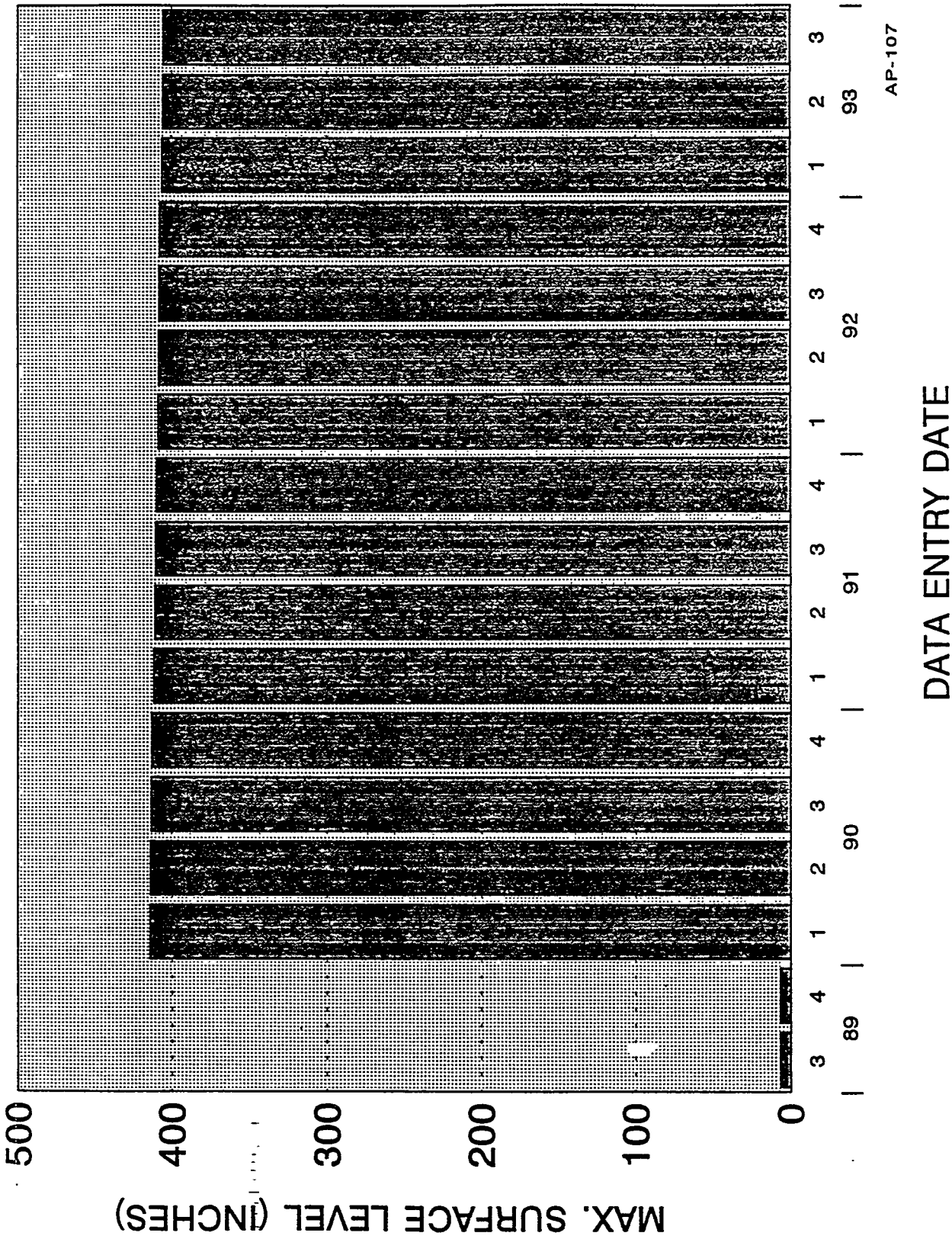
ZEI NTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



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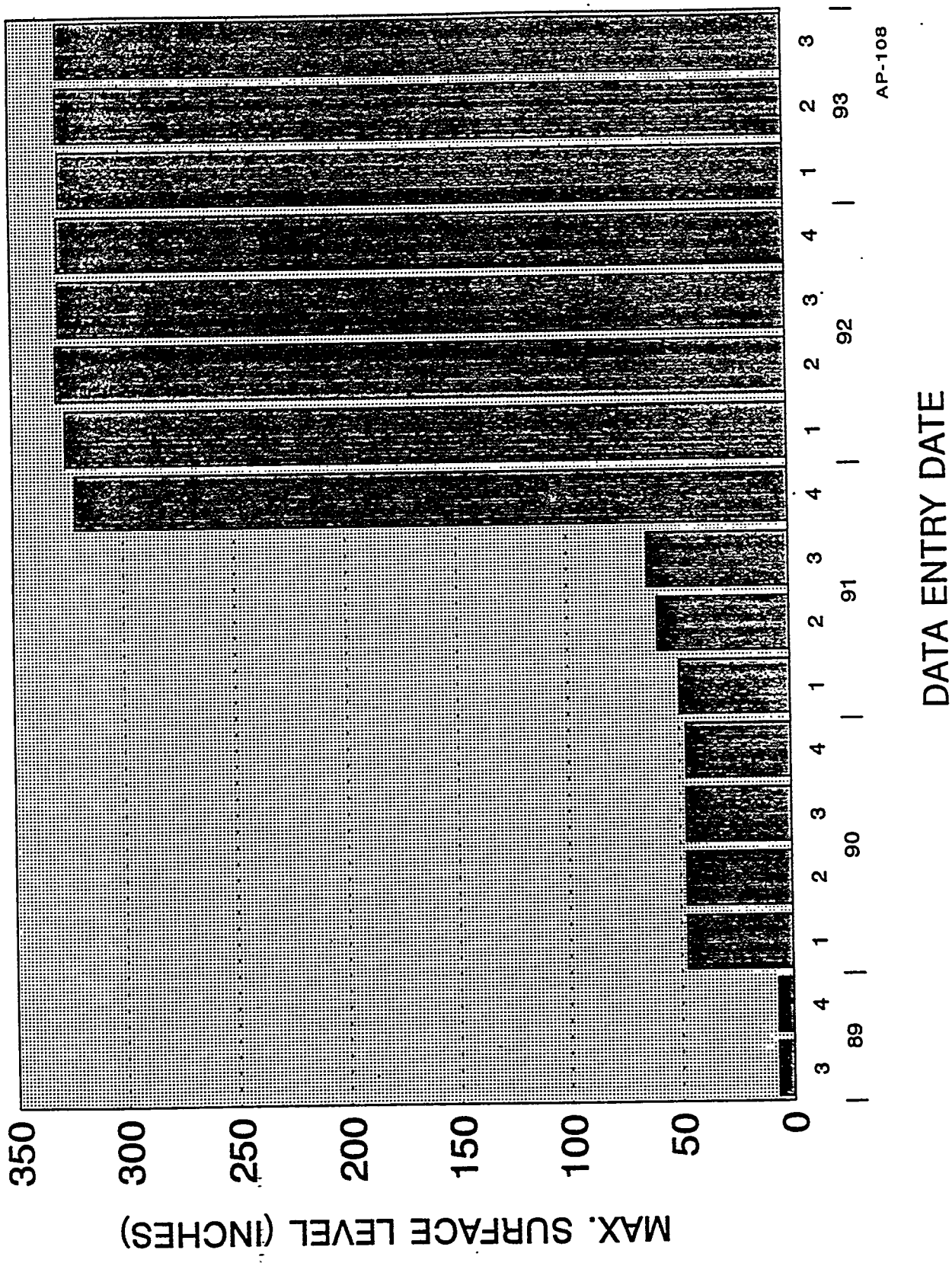
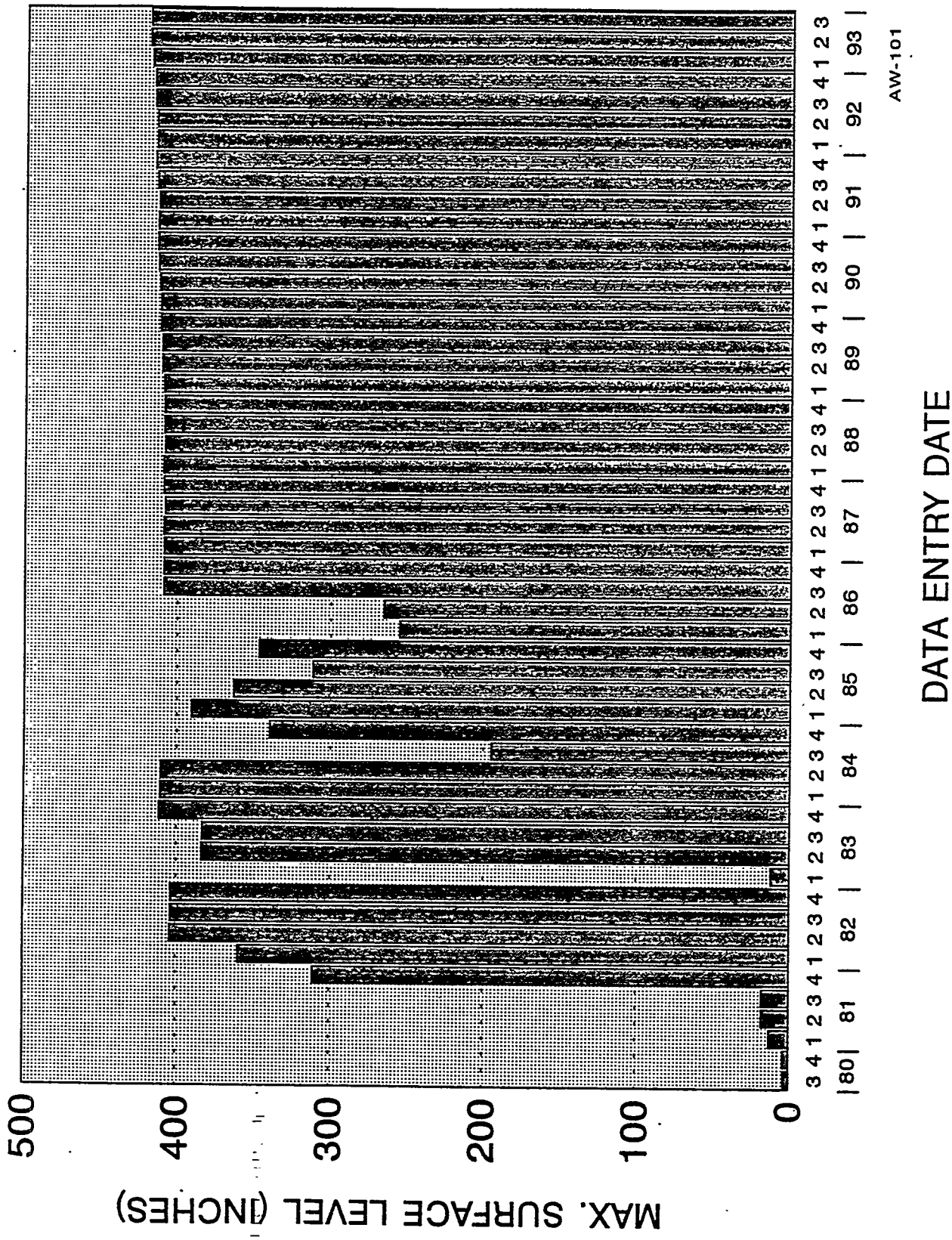
Quarterly Maximum Surface-Level History Plot



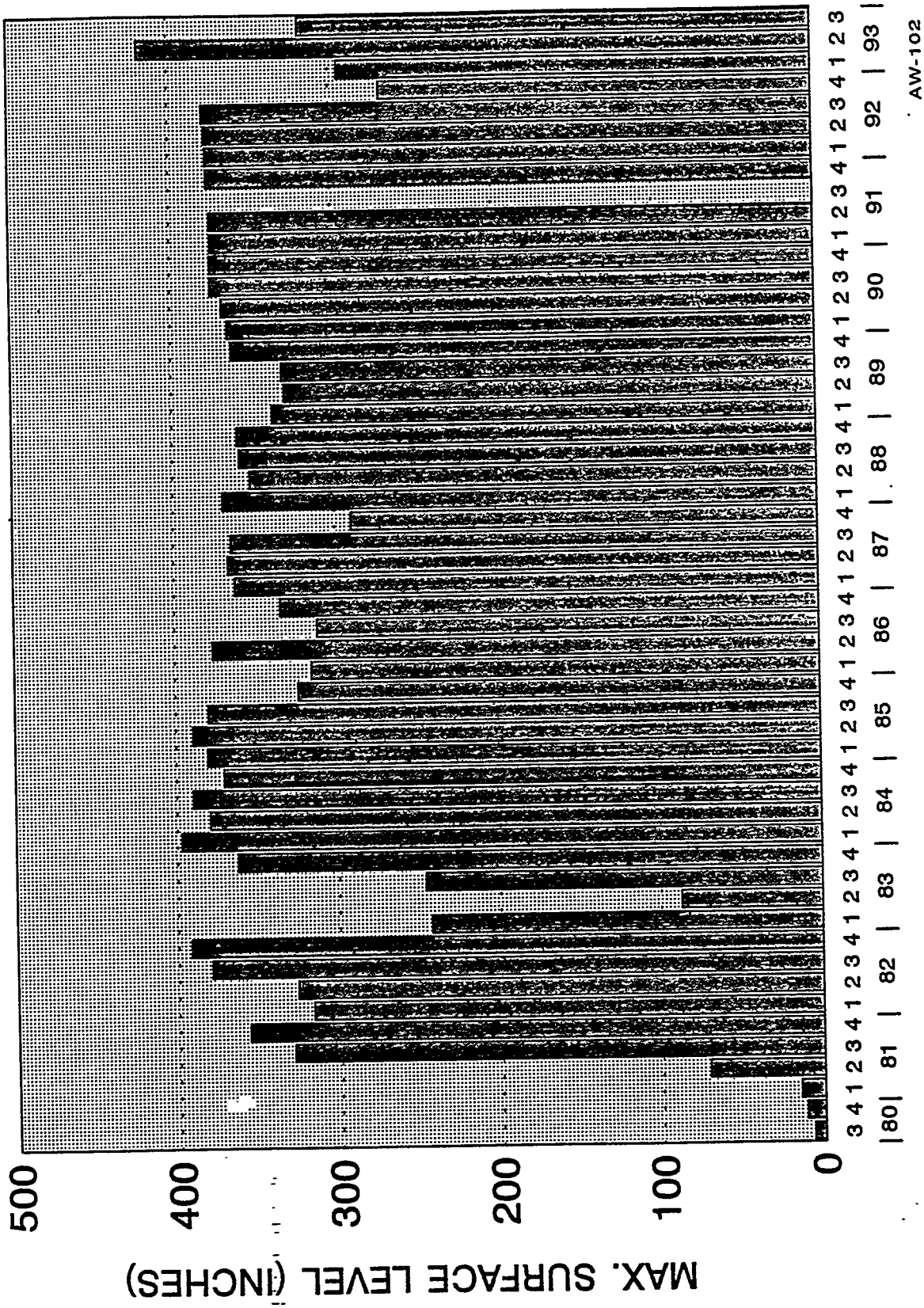
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



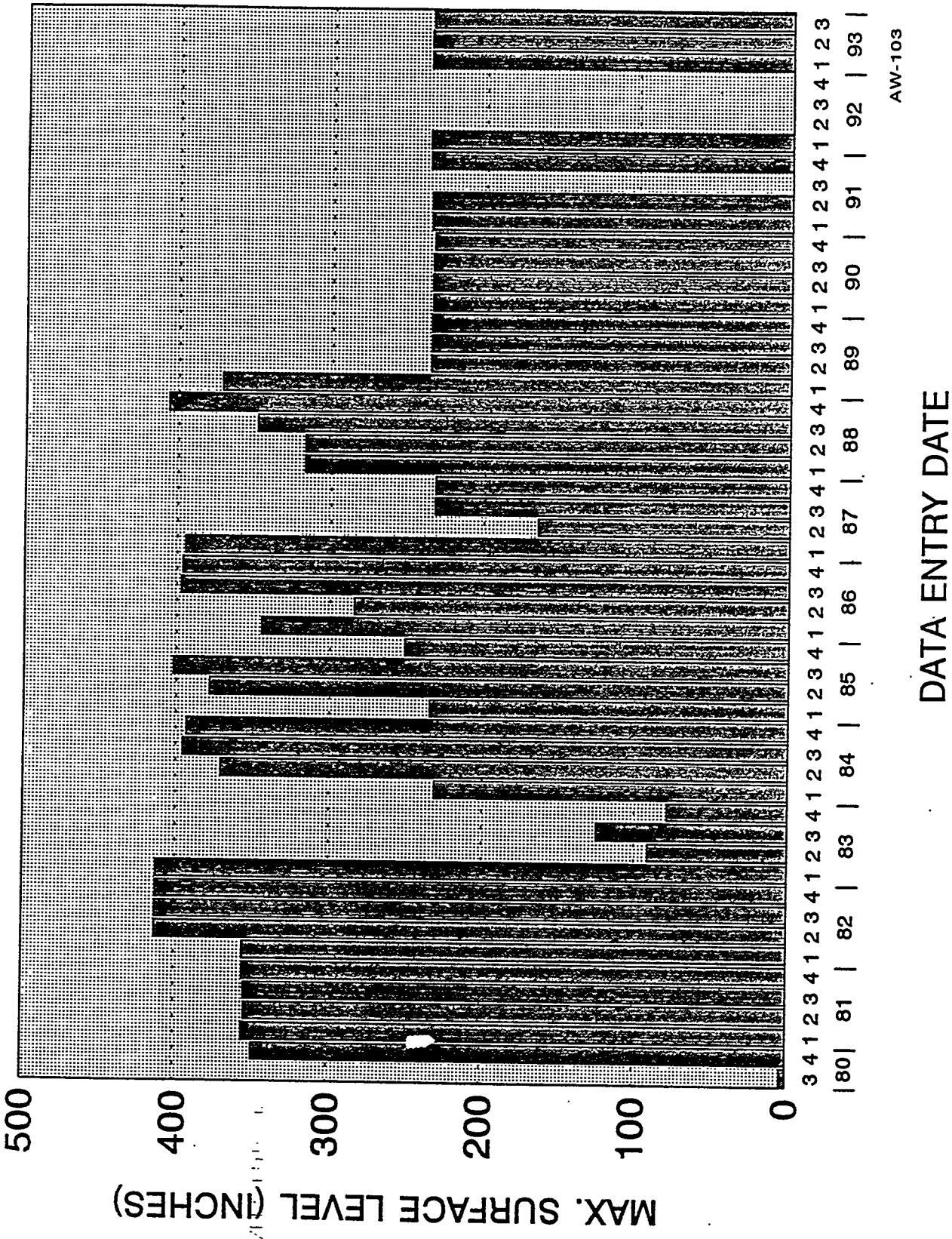
ZE NTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



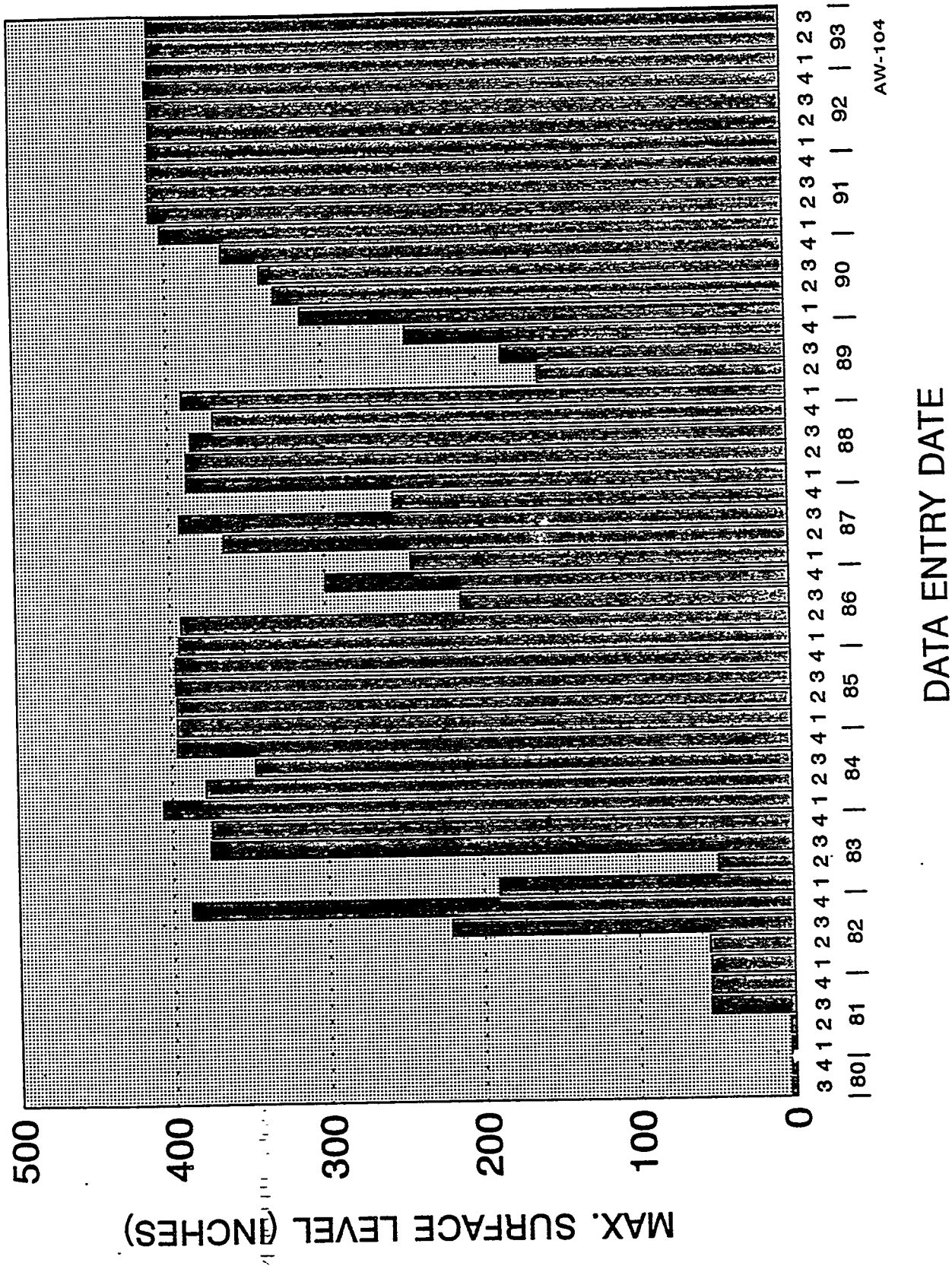
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



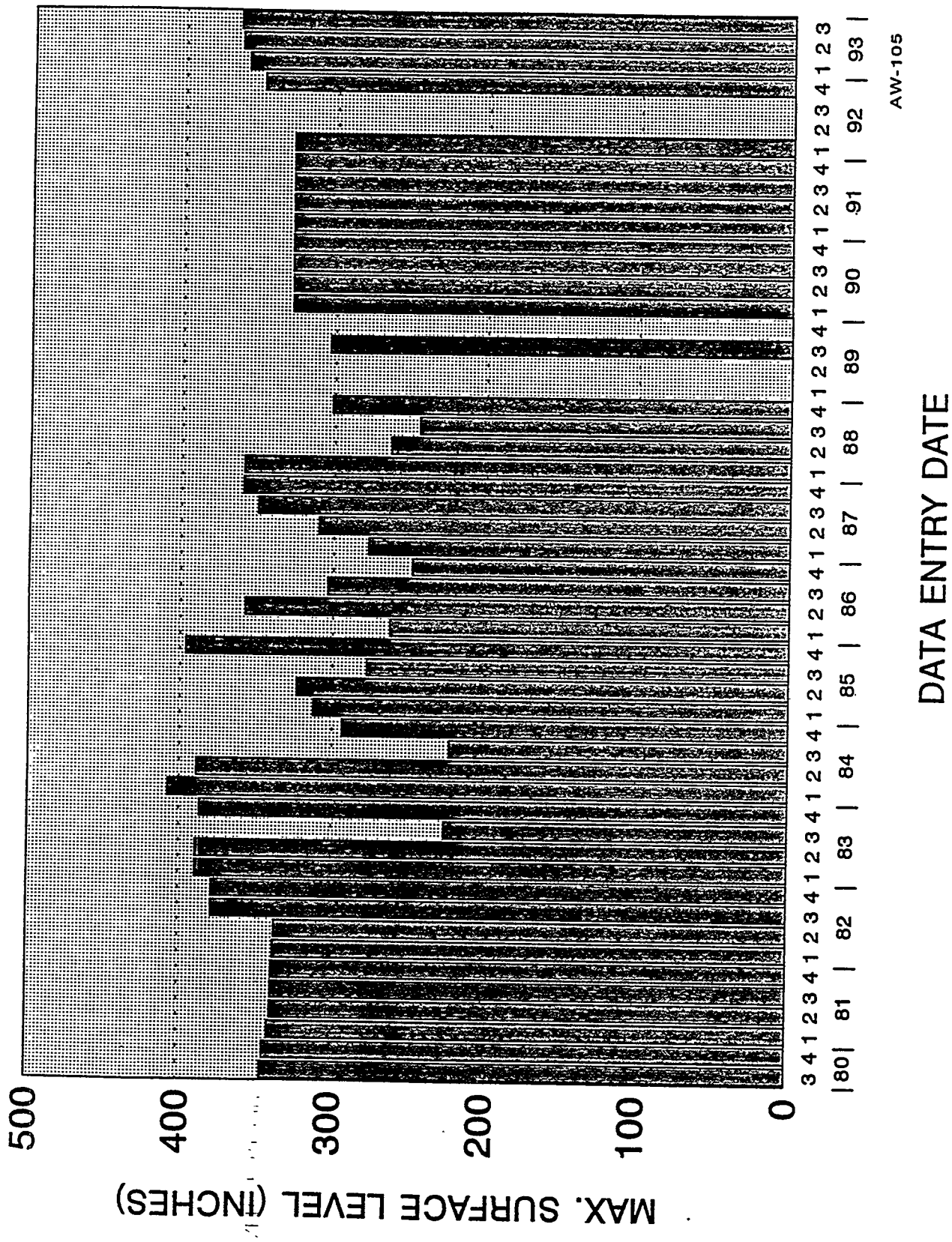
ZE ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



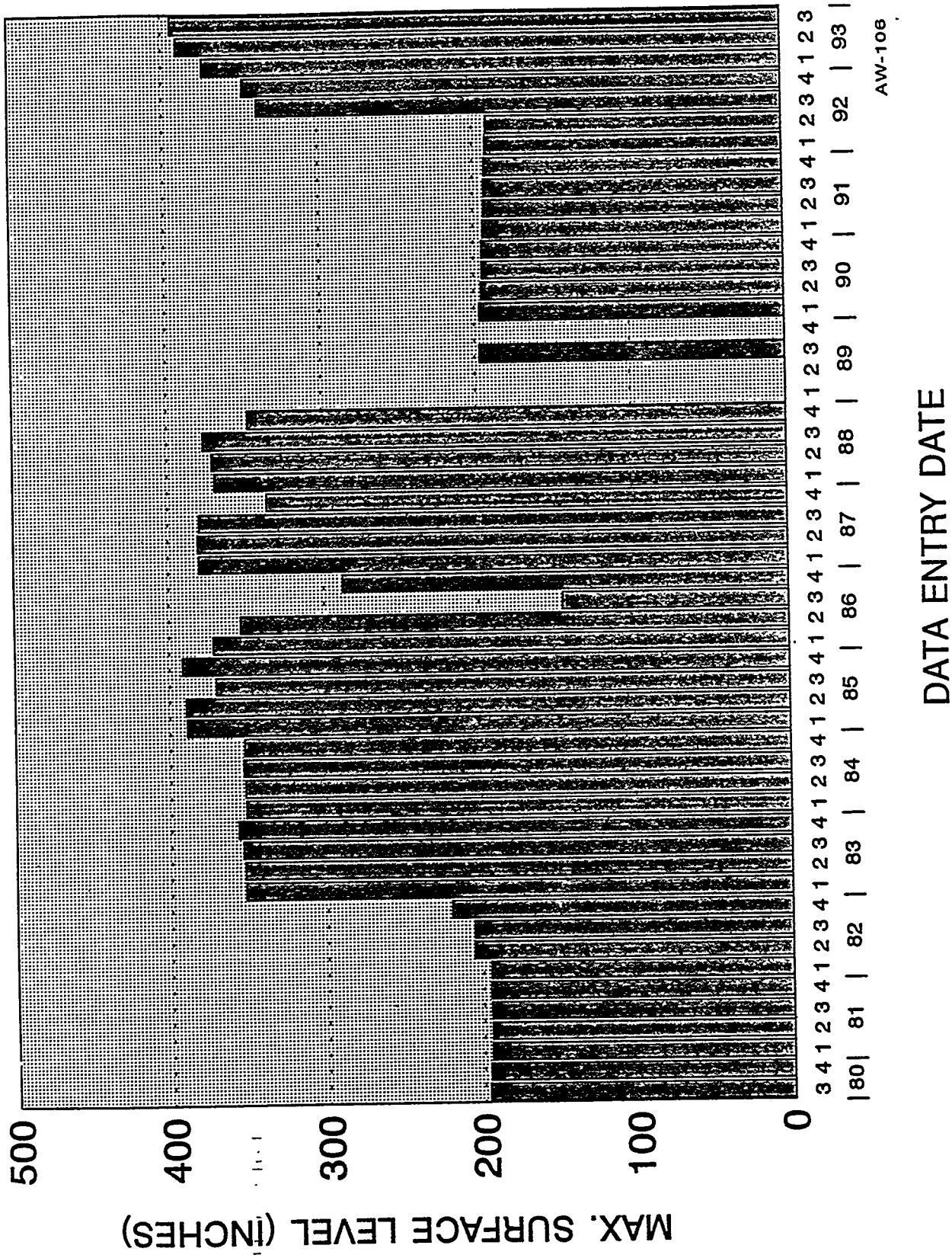
ZERO ENTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



ZE NTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



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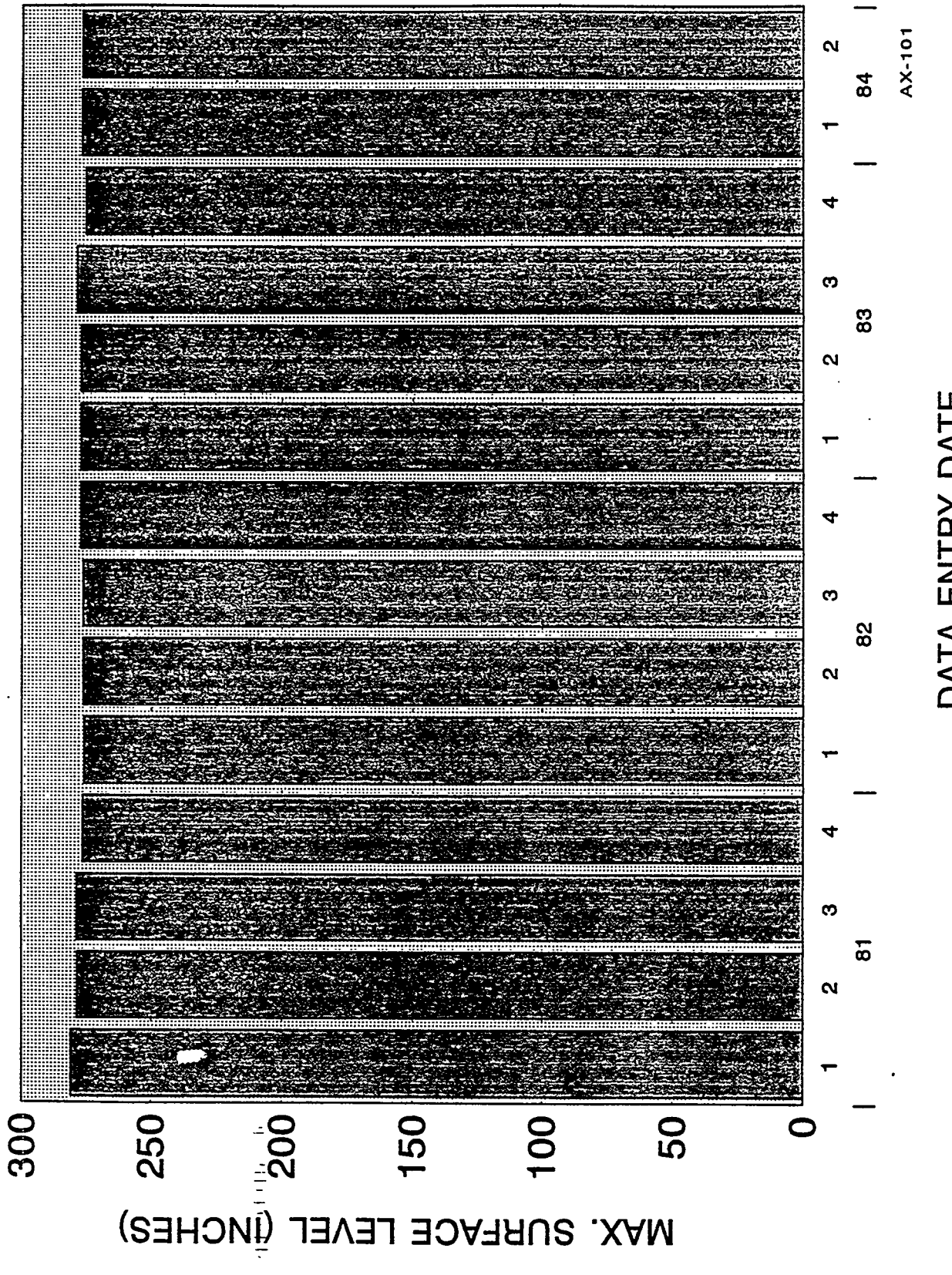
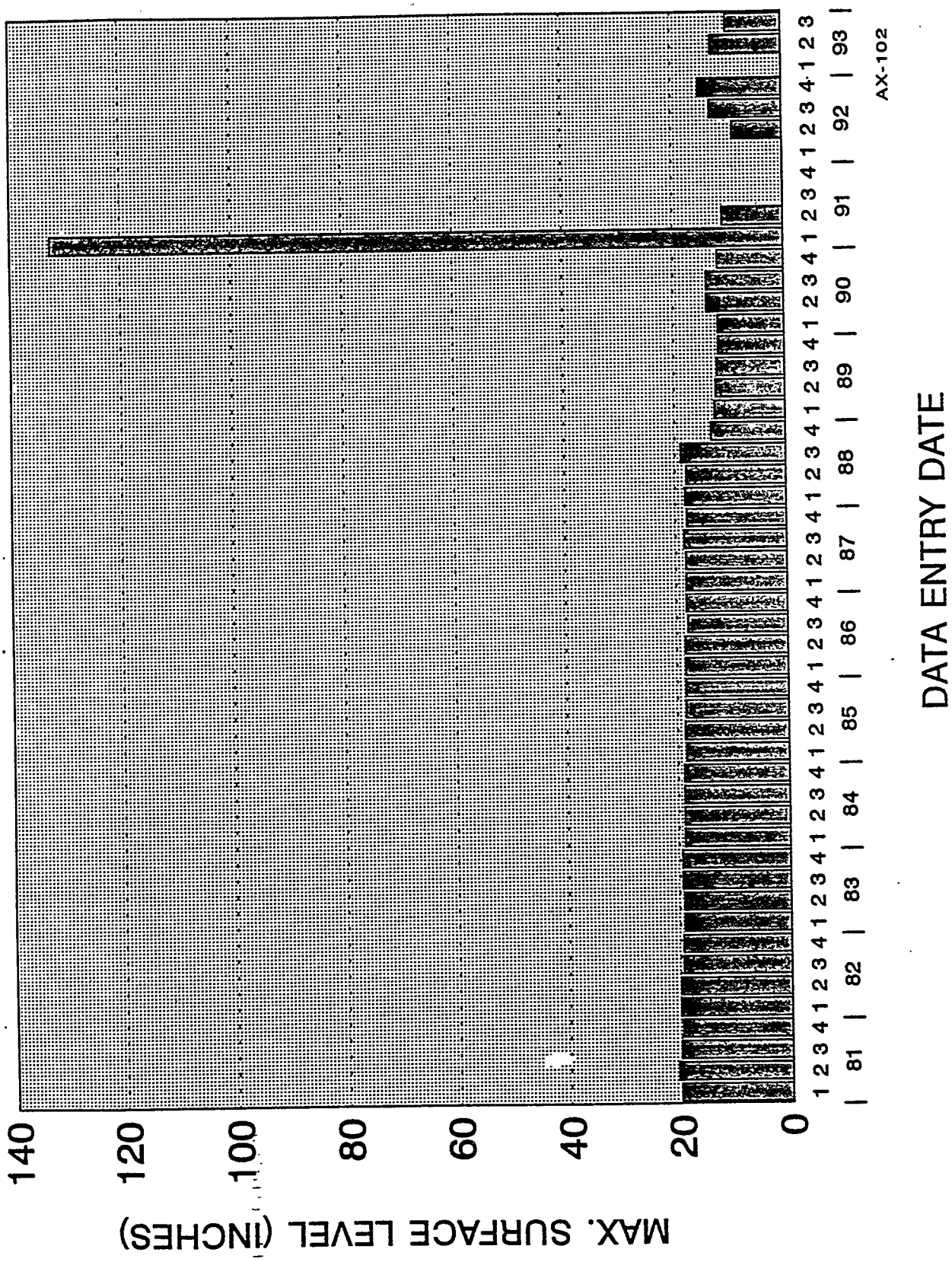
Quarterly Maximum Surface-Level History Plot



ZEI NTRY INDICATES NO DATA WAS RECORDED

Quarterly Maximum Surface-Level History Plot



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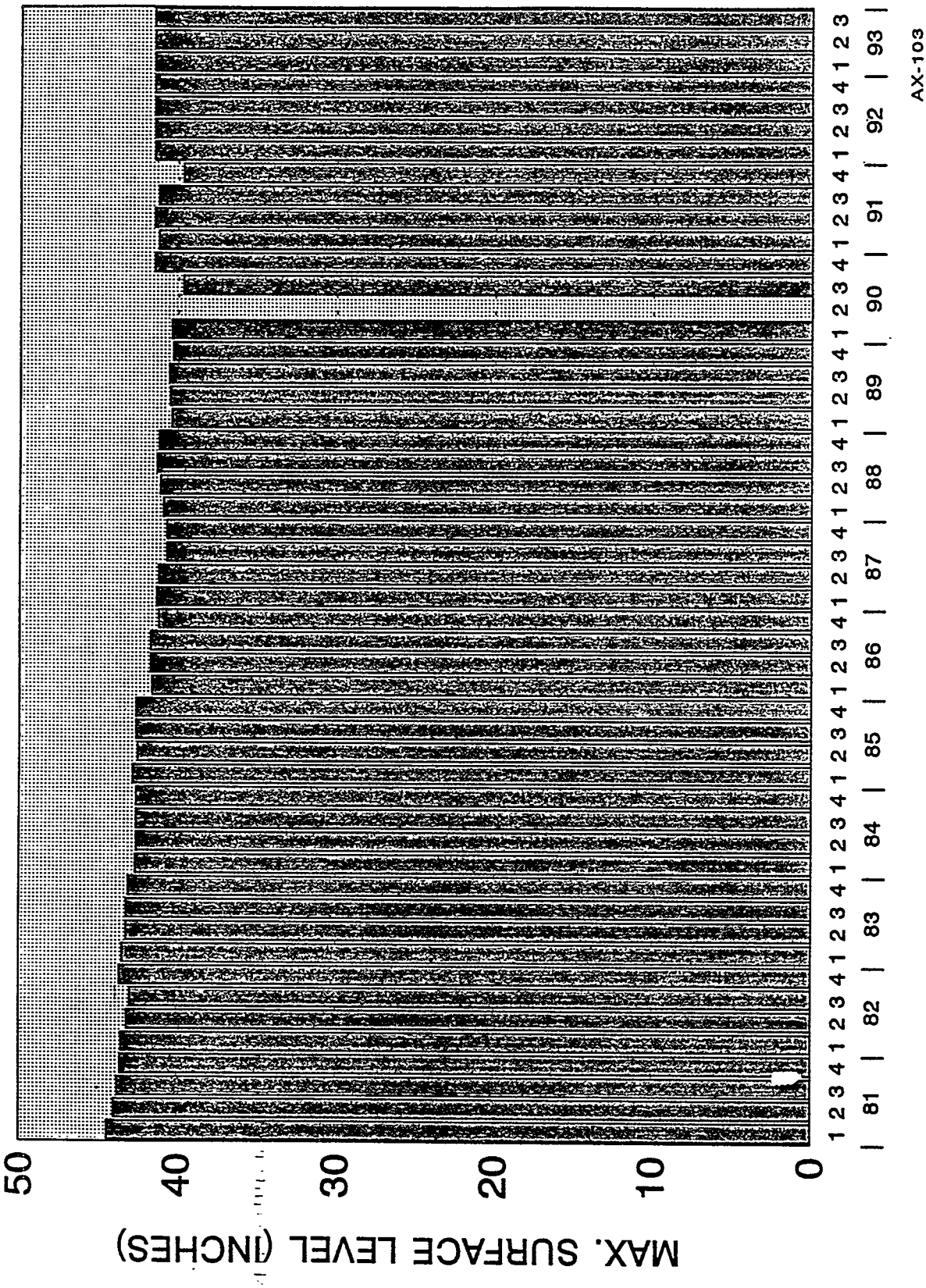

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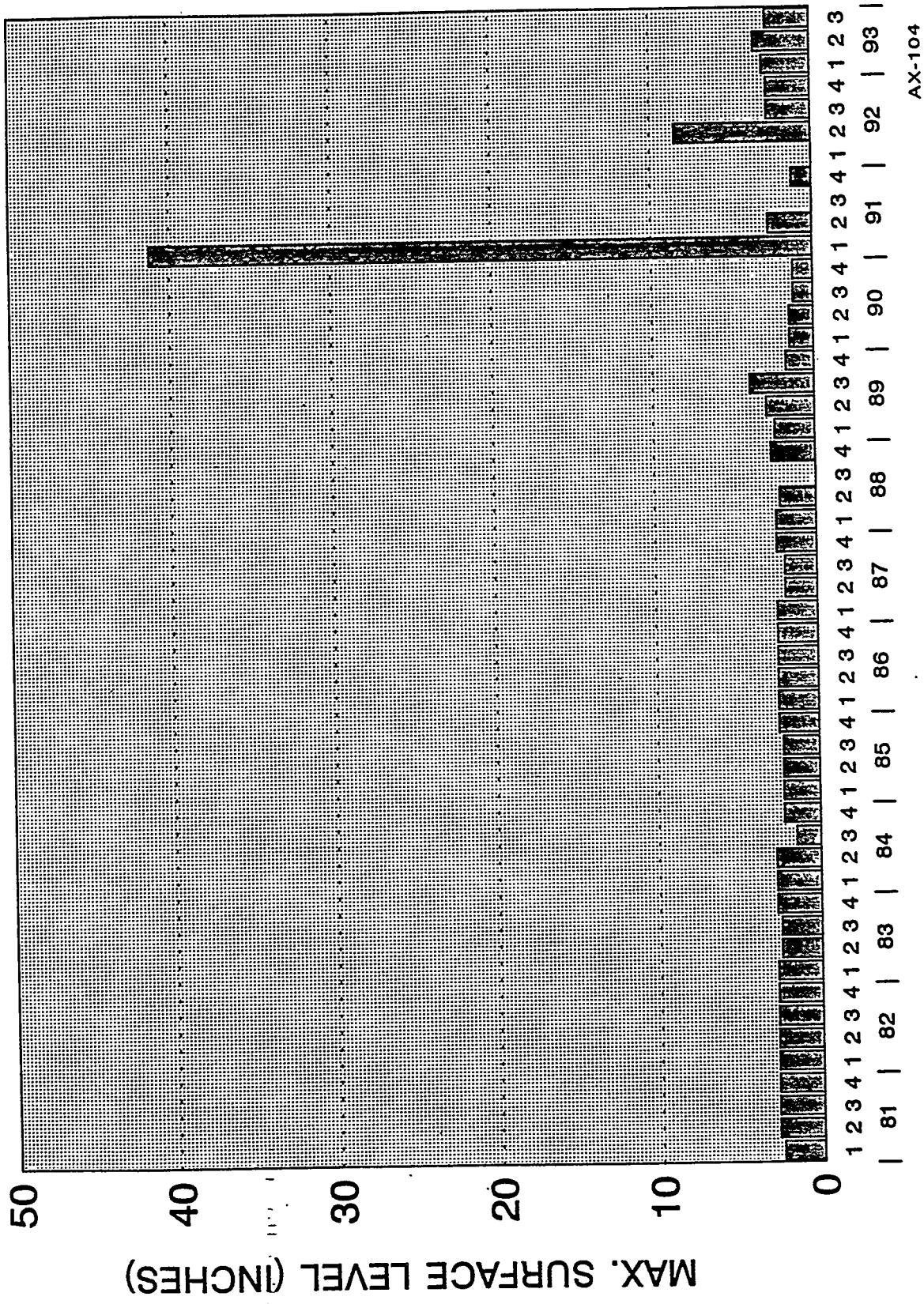

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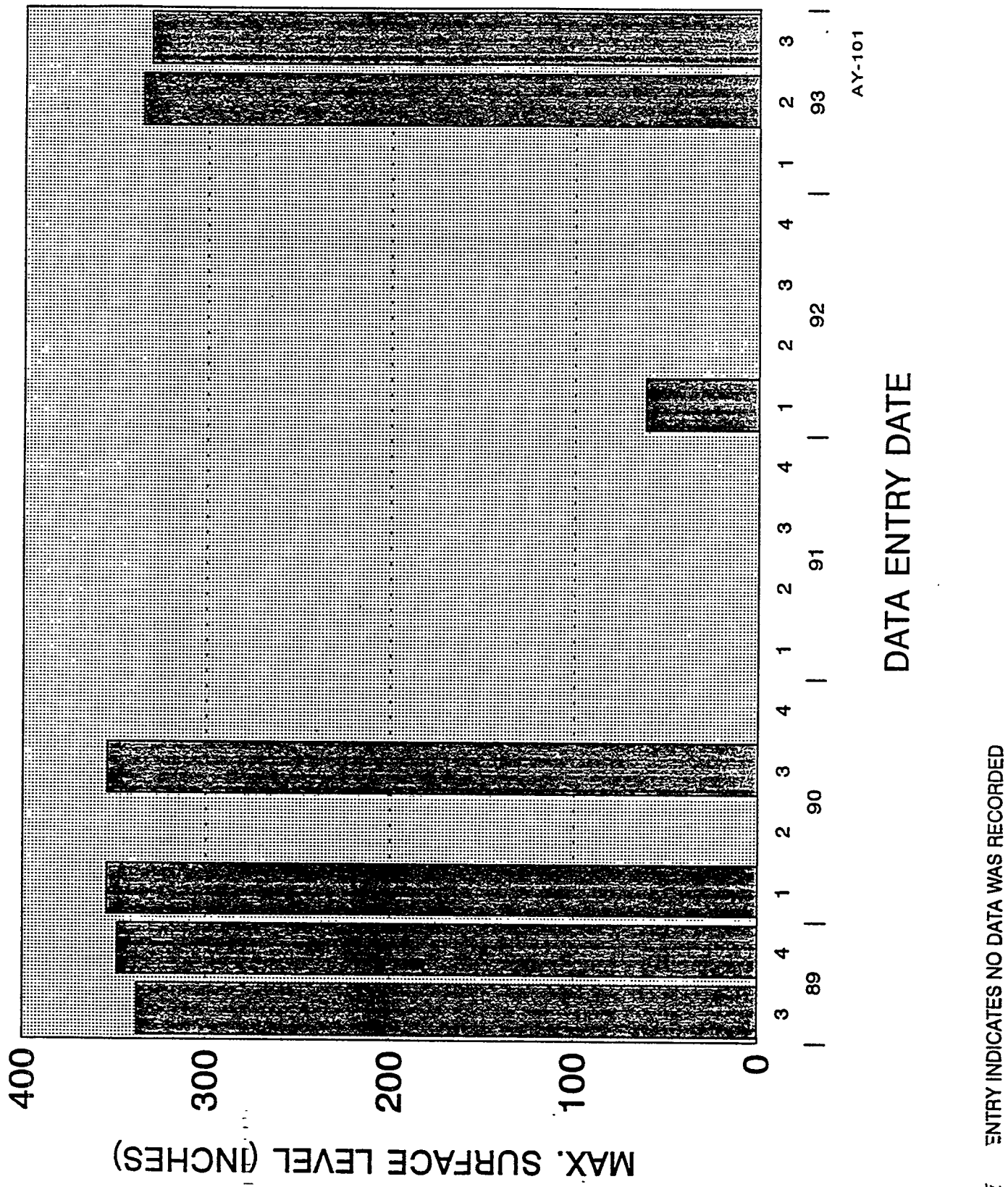

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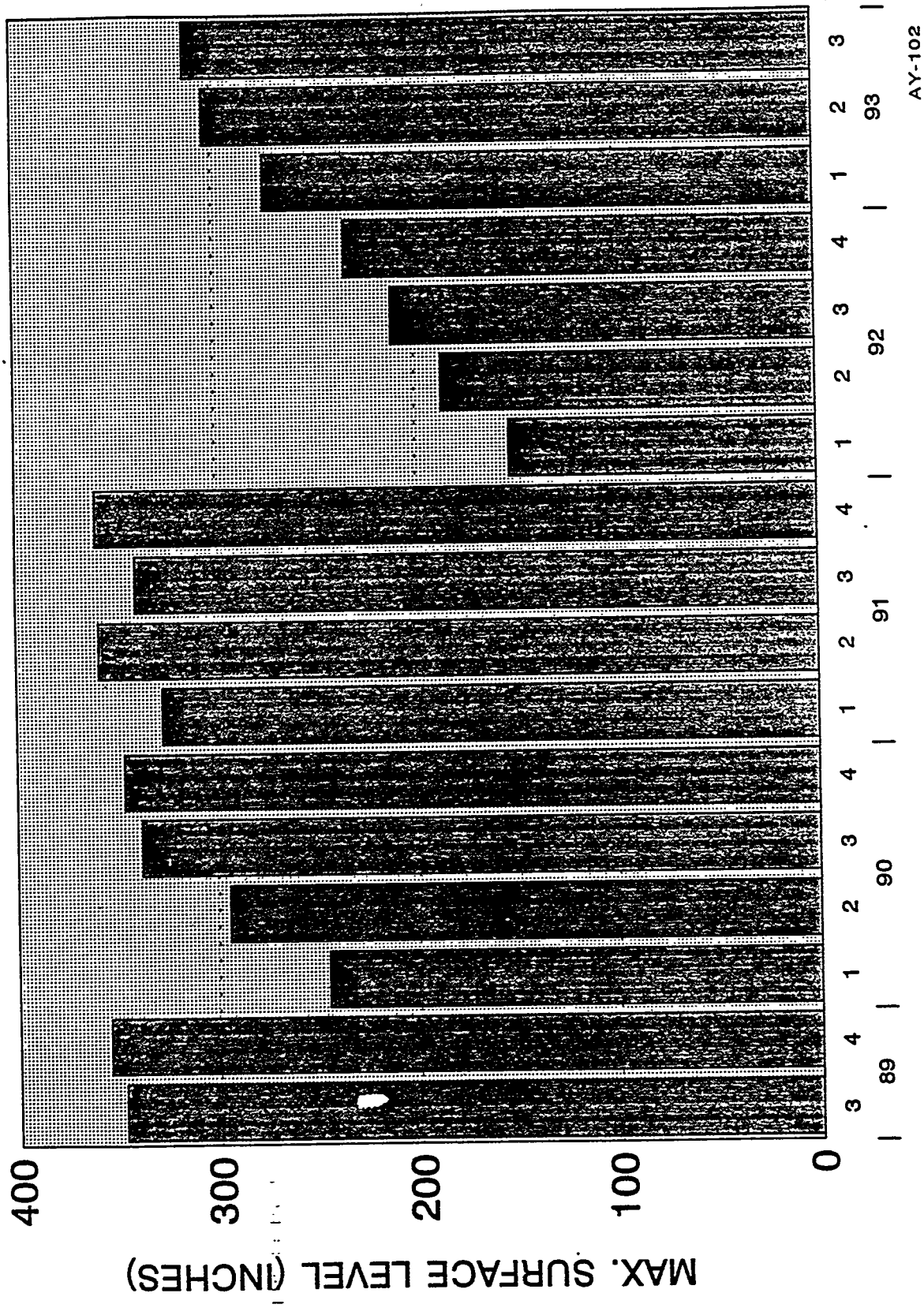

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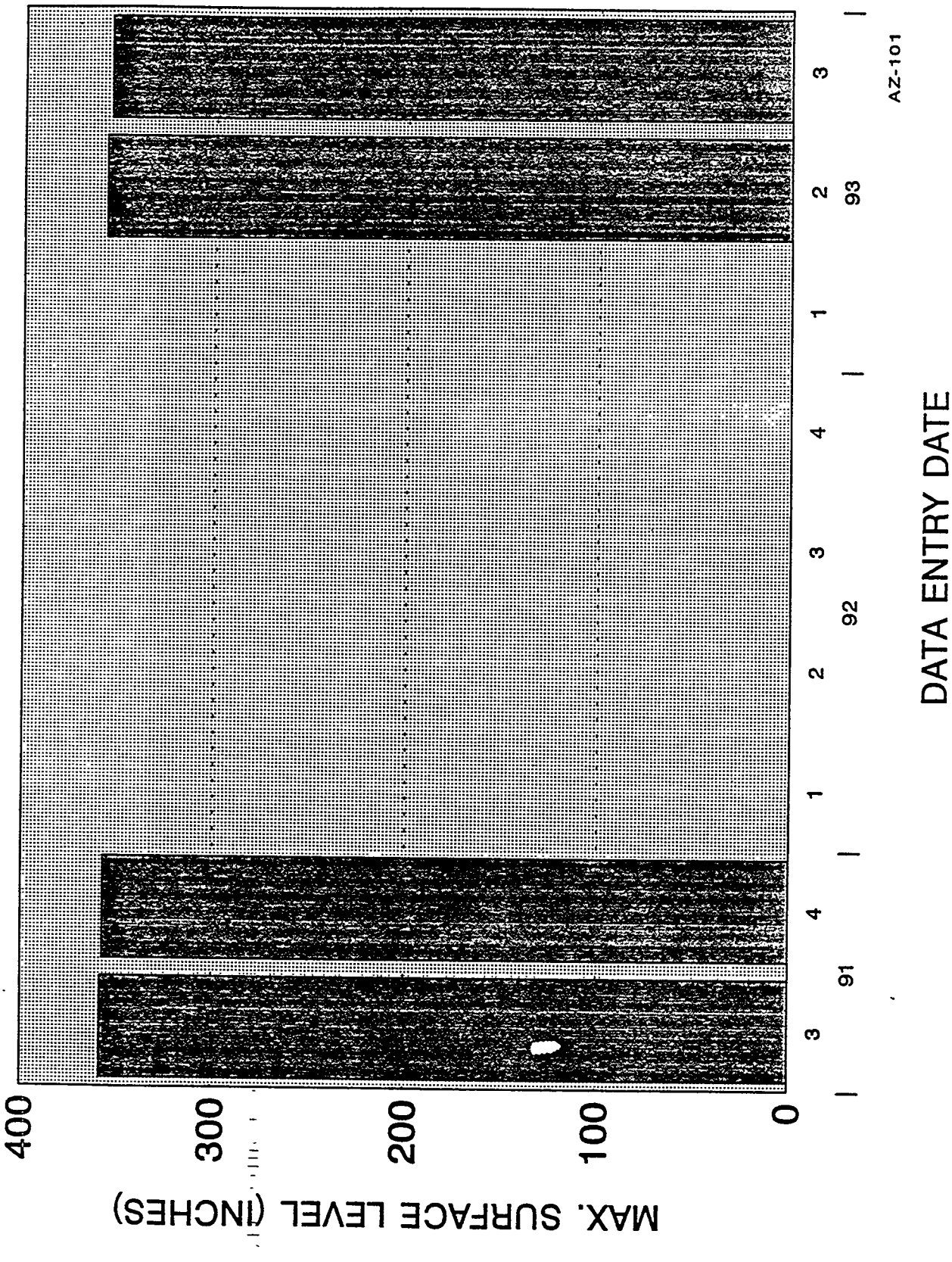

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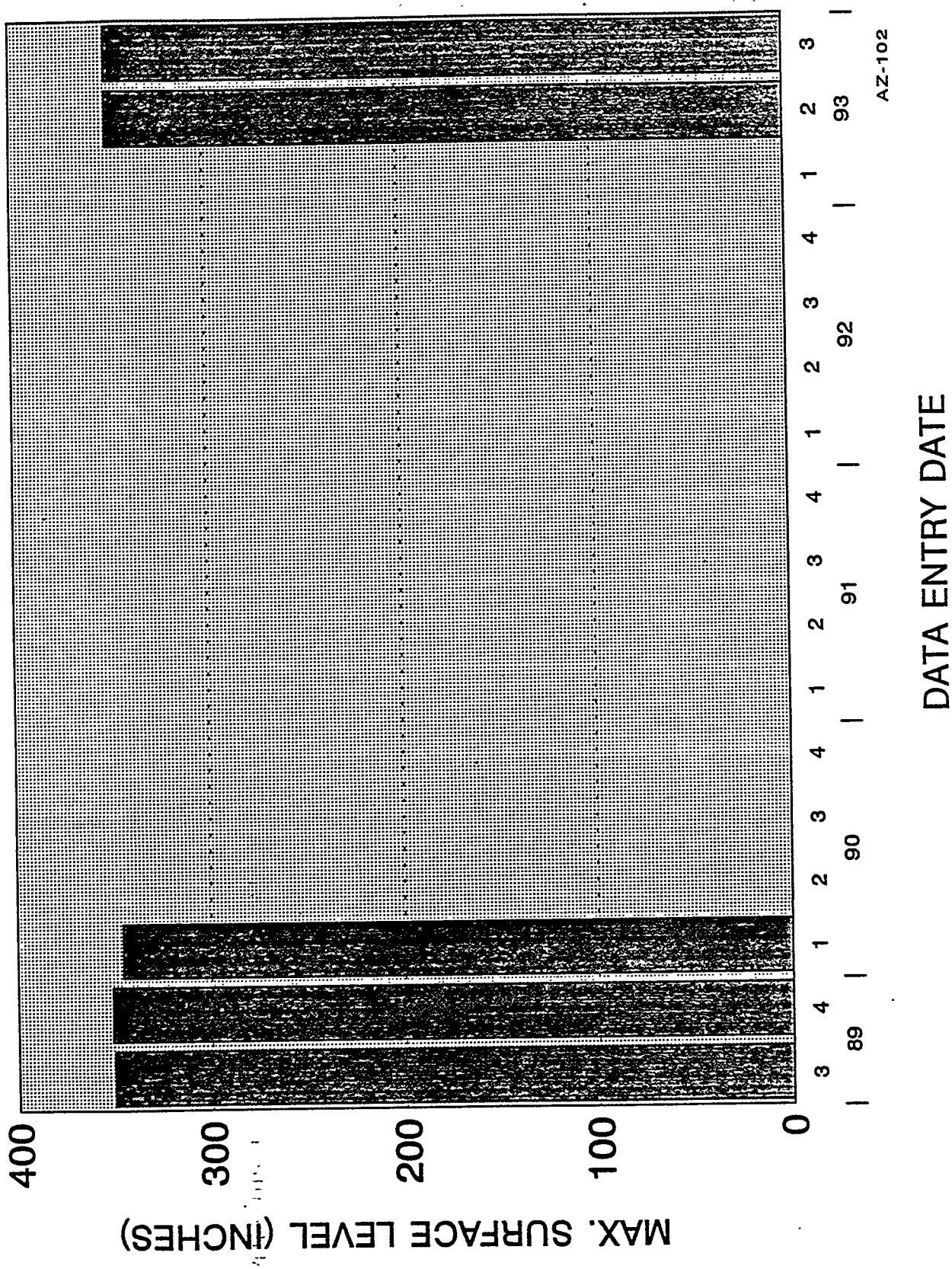

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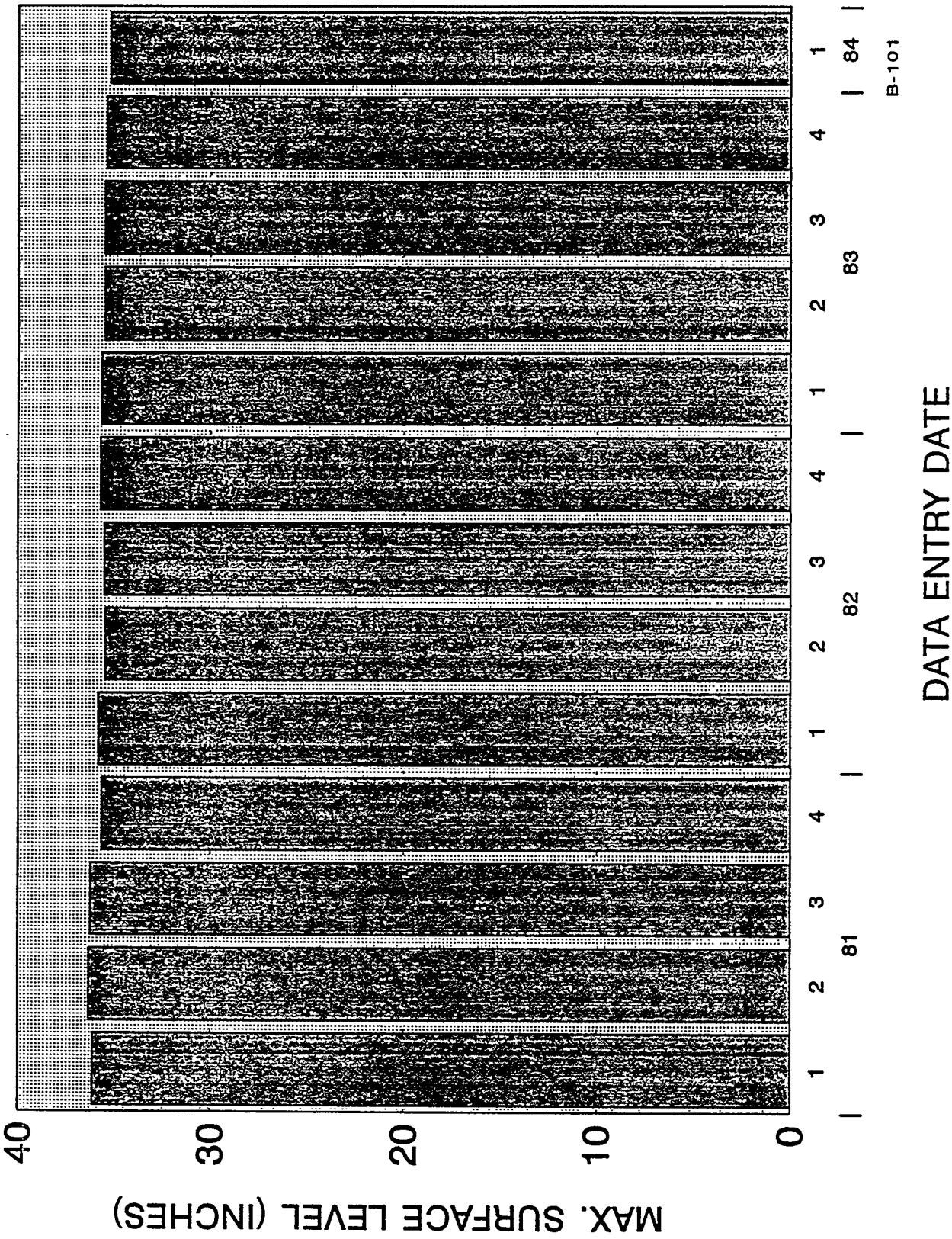

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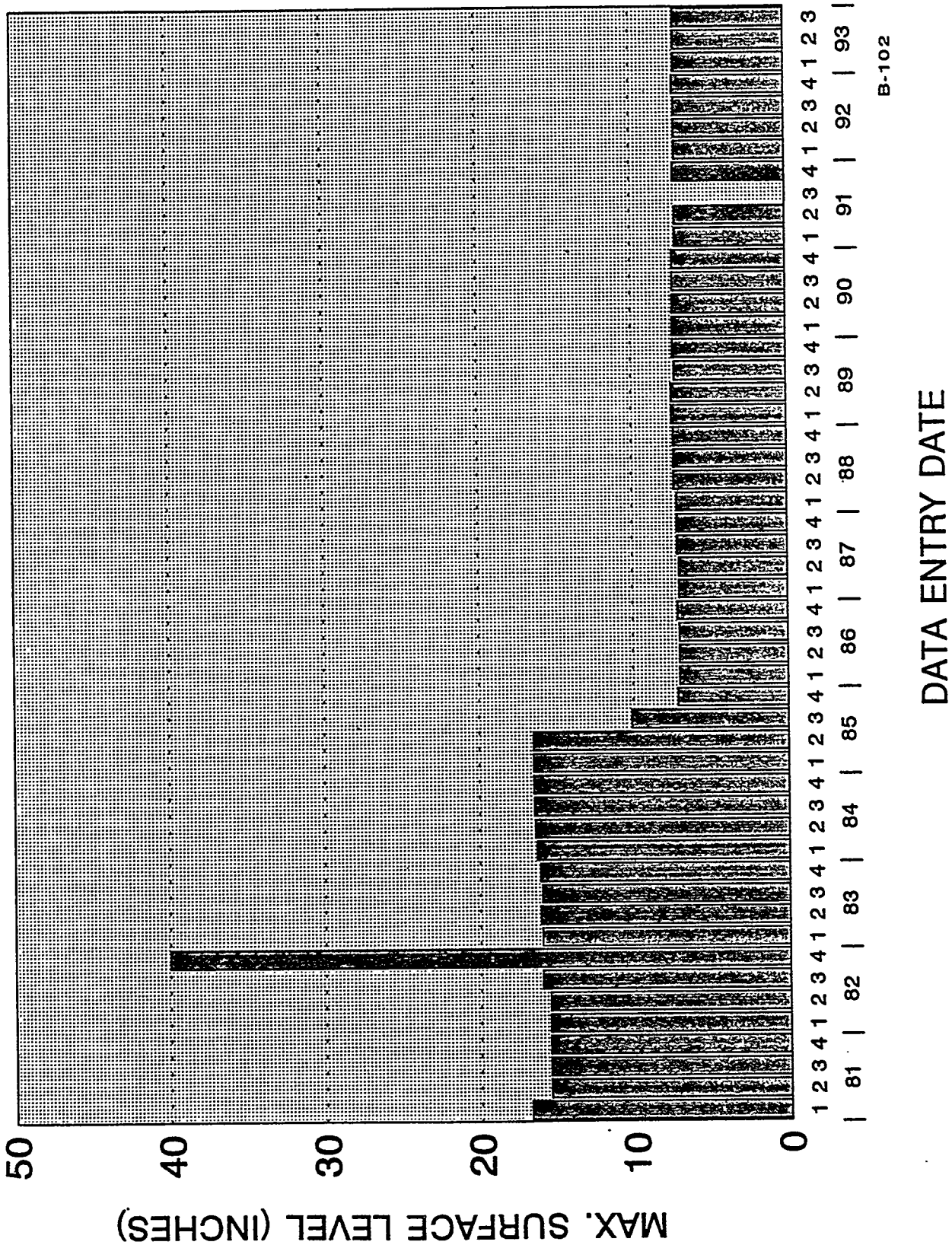

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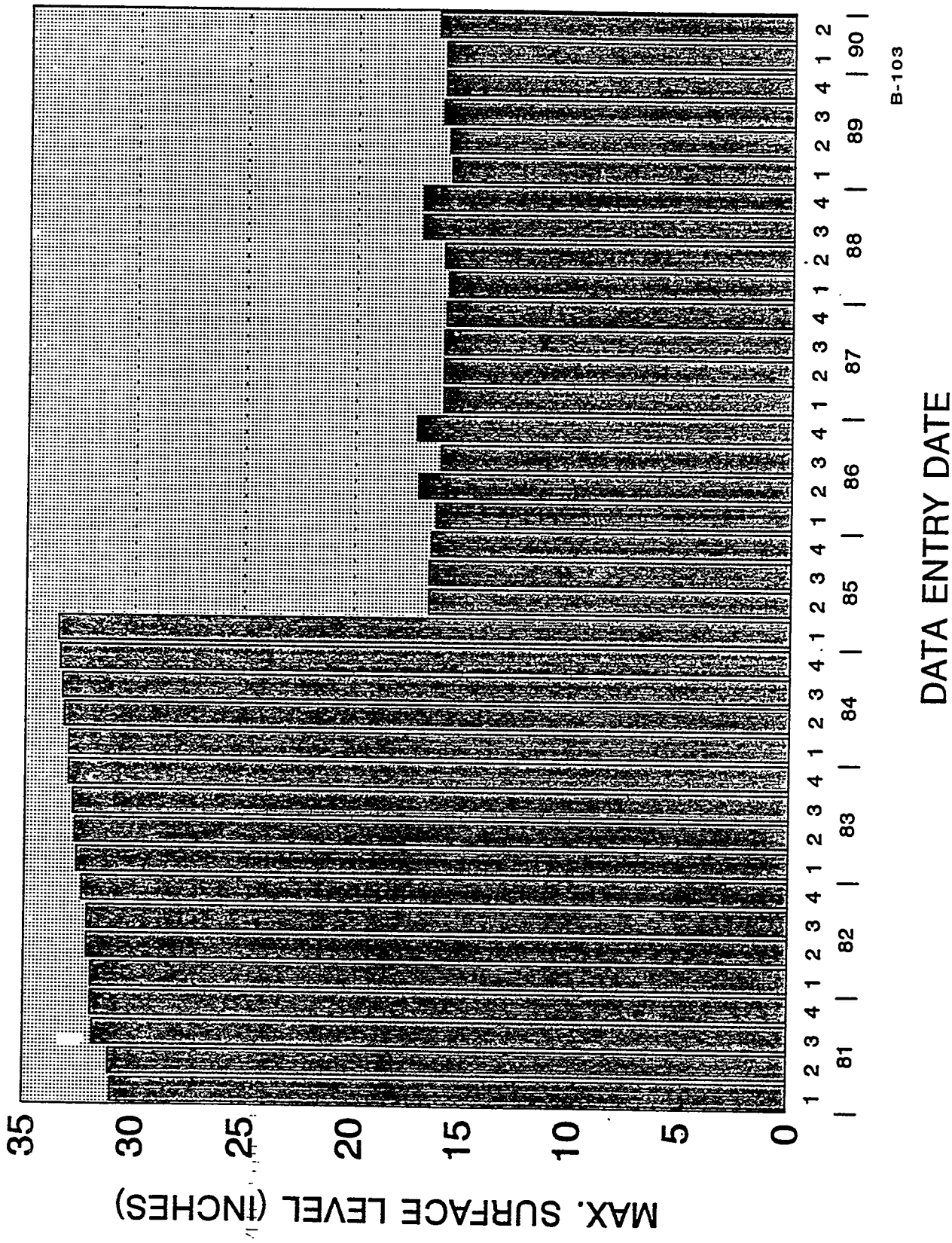

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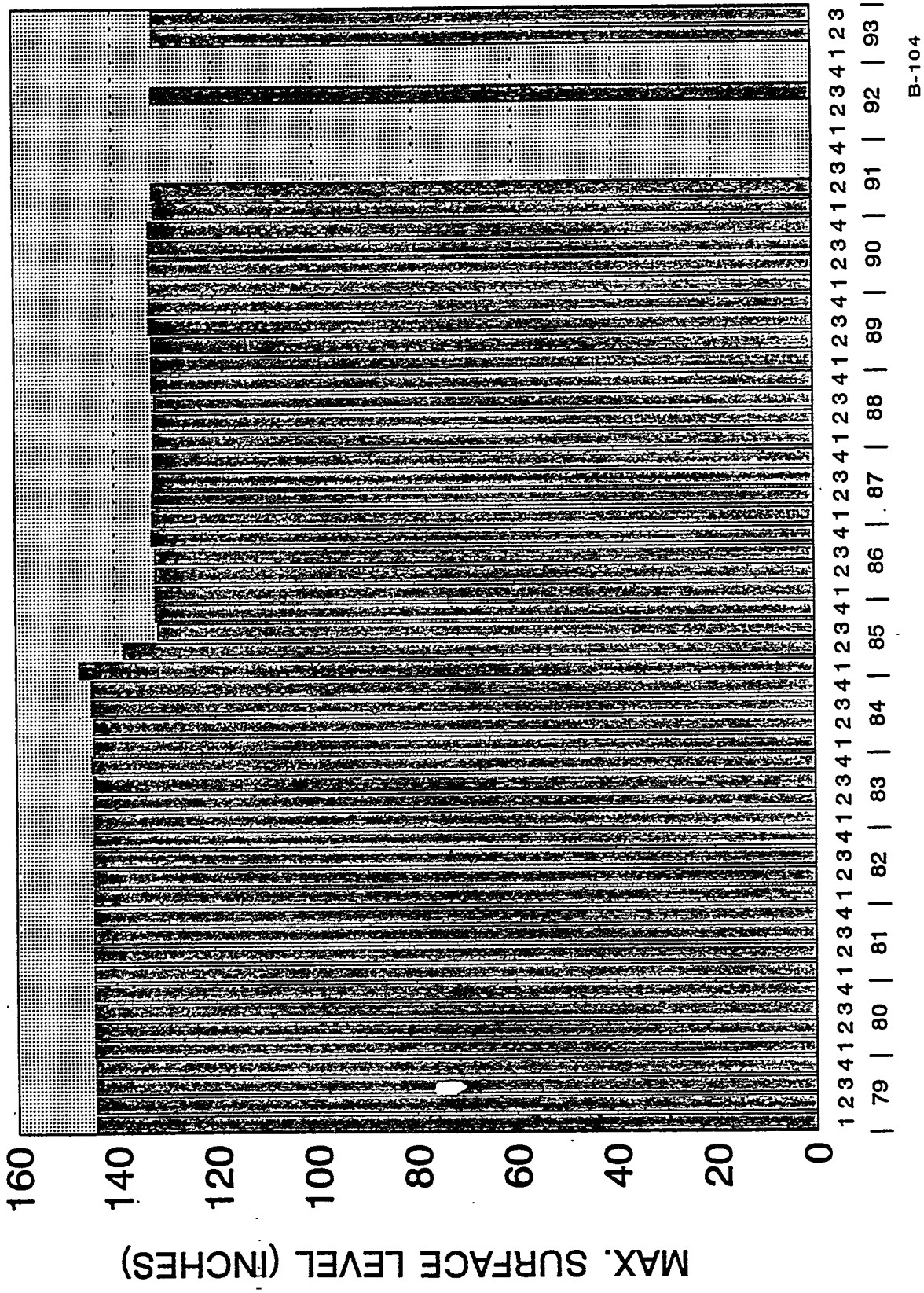

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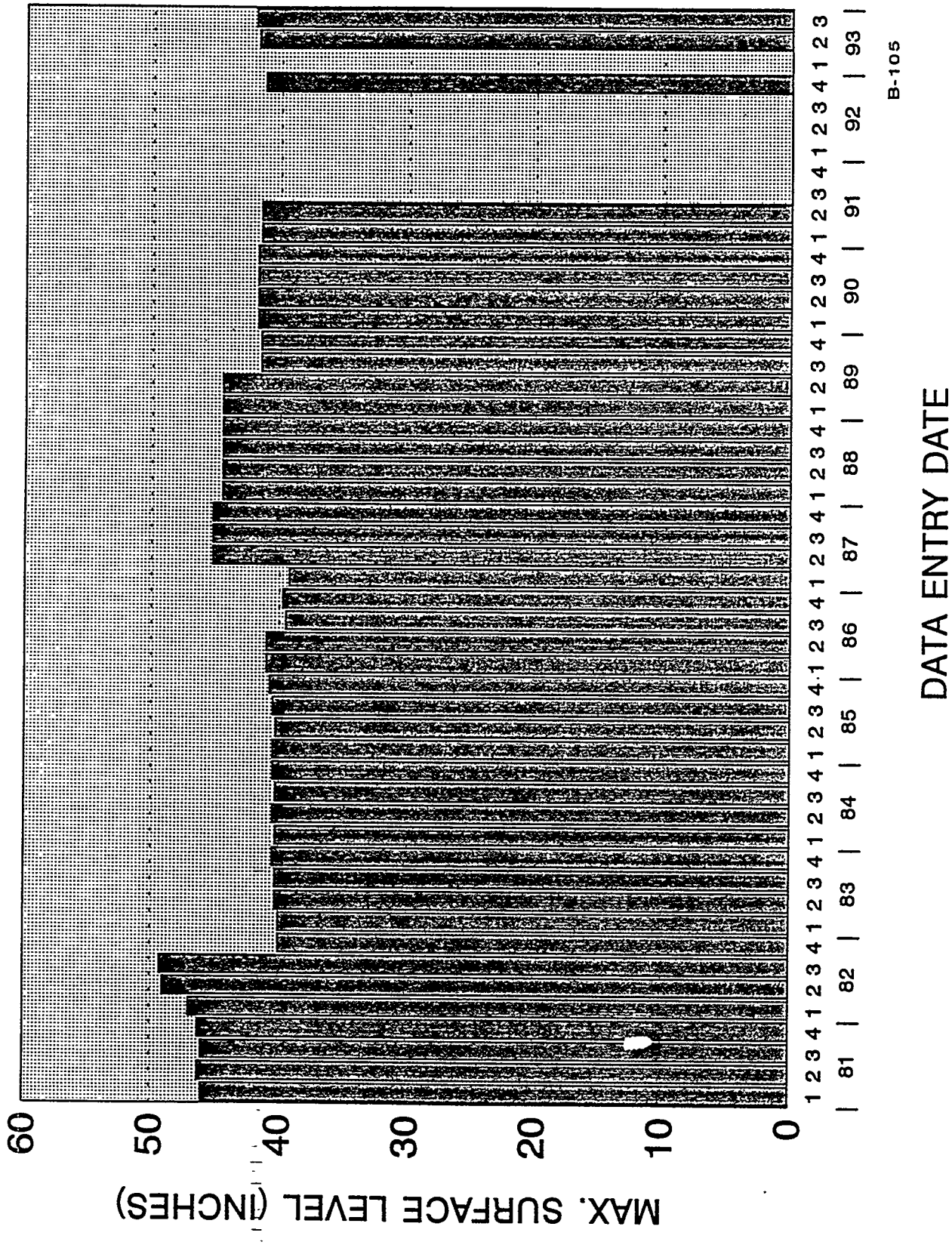

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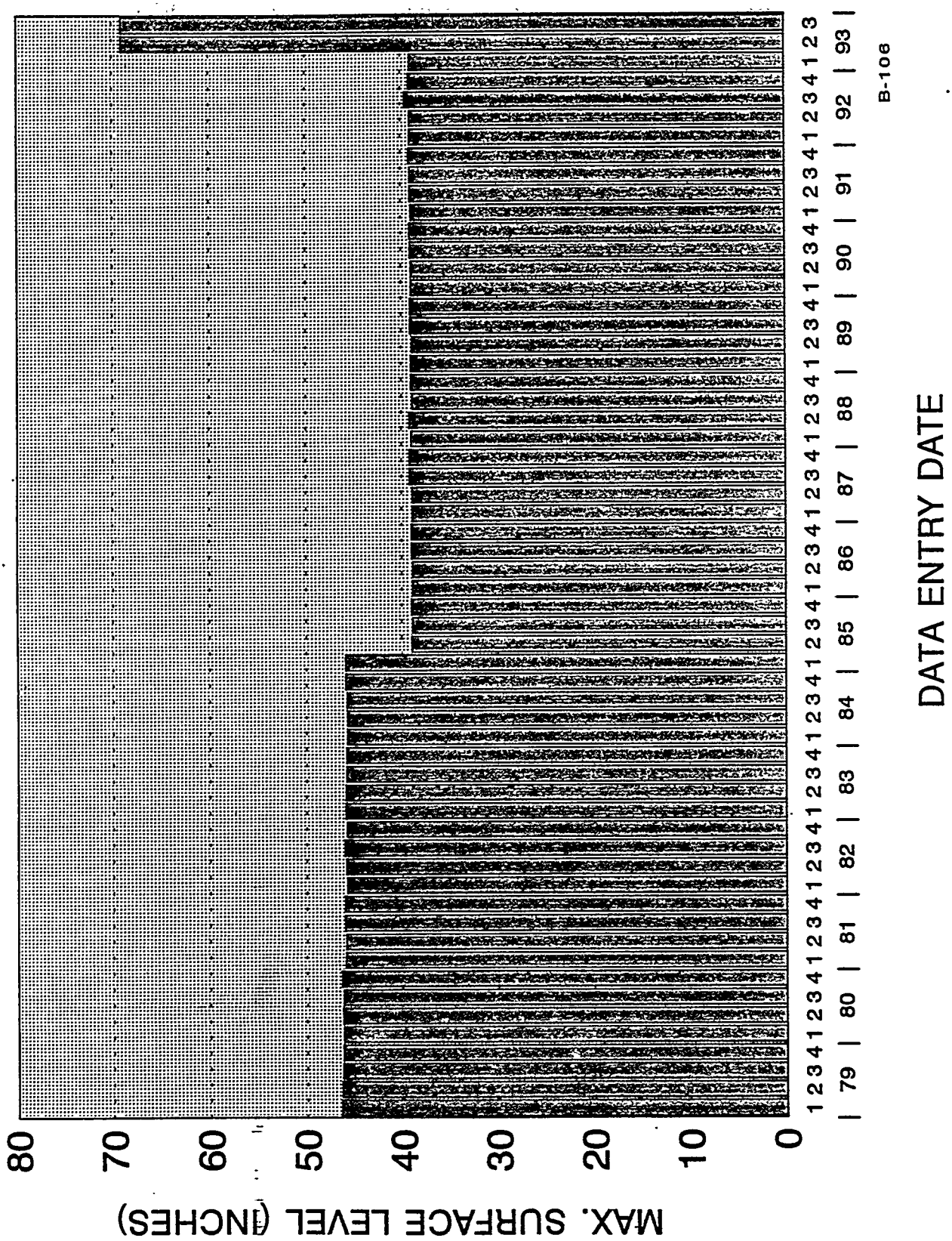

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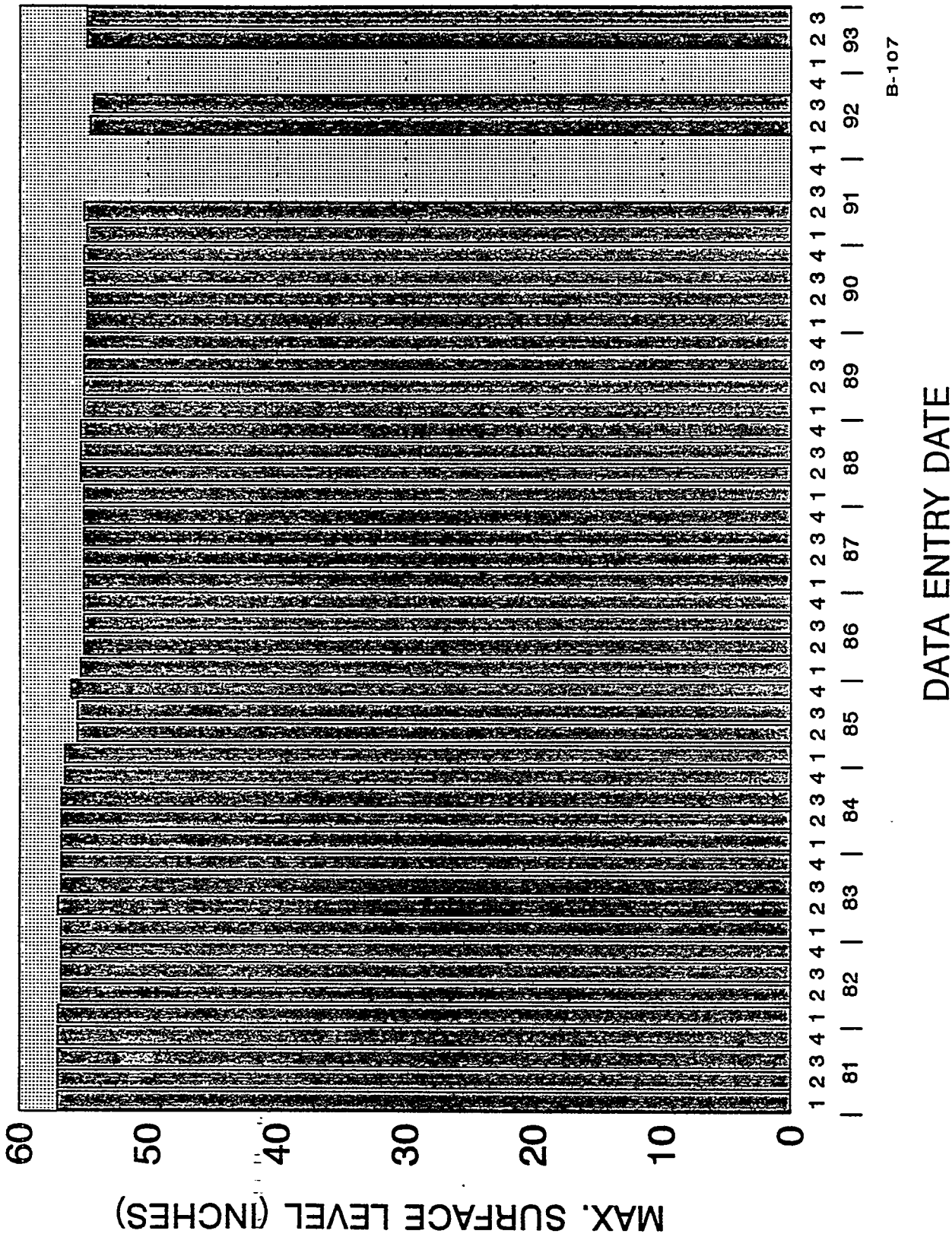

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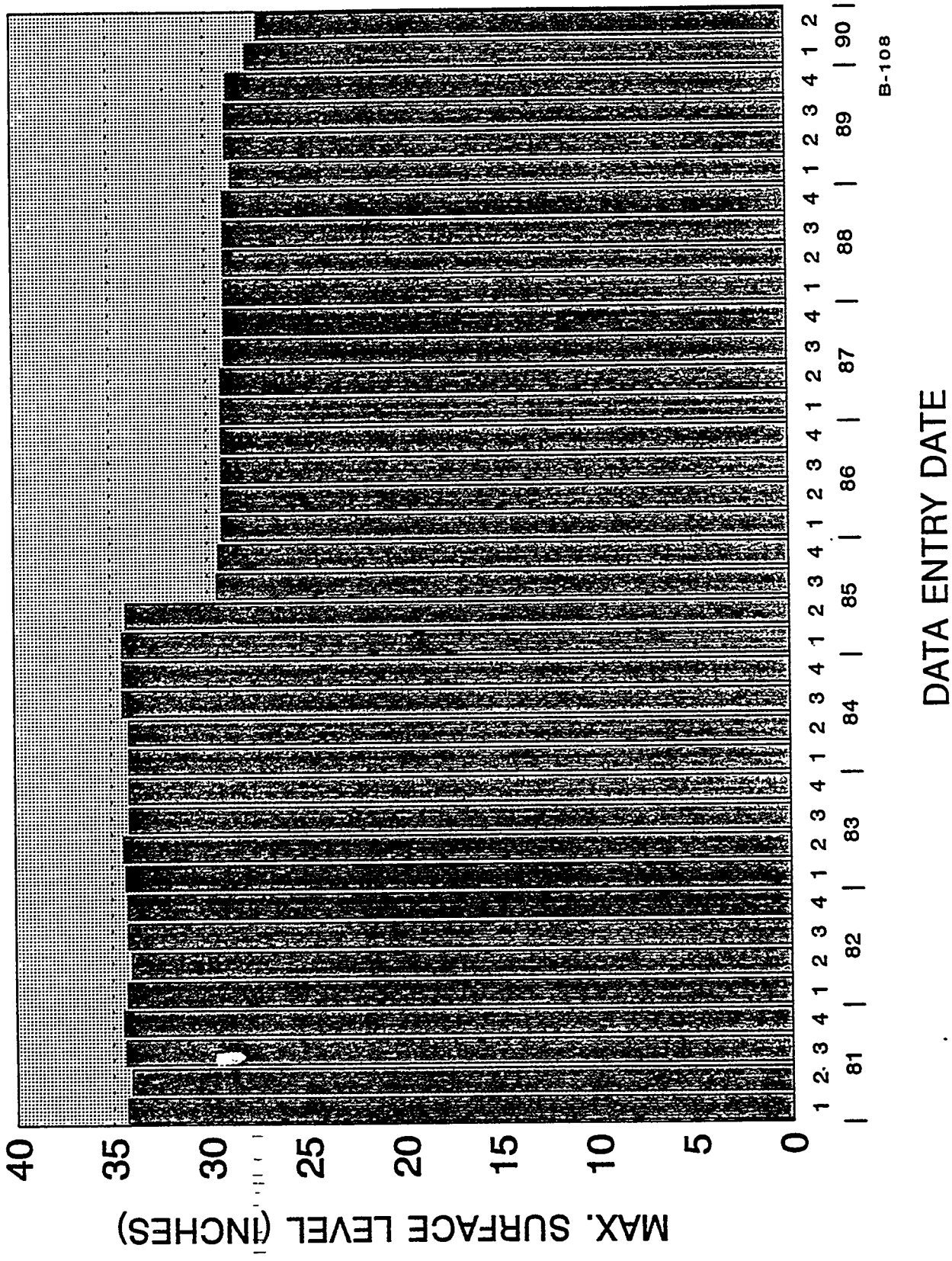

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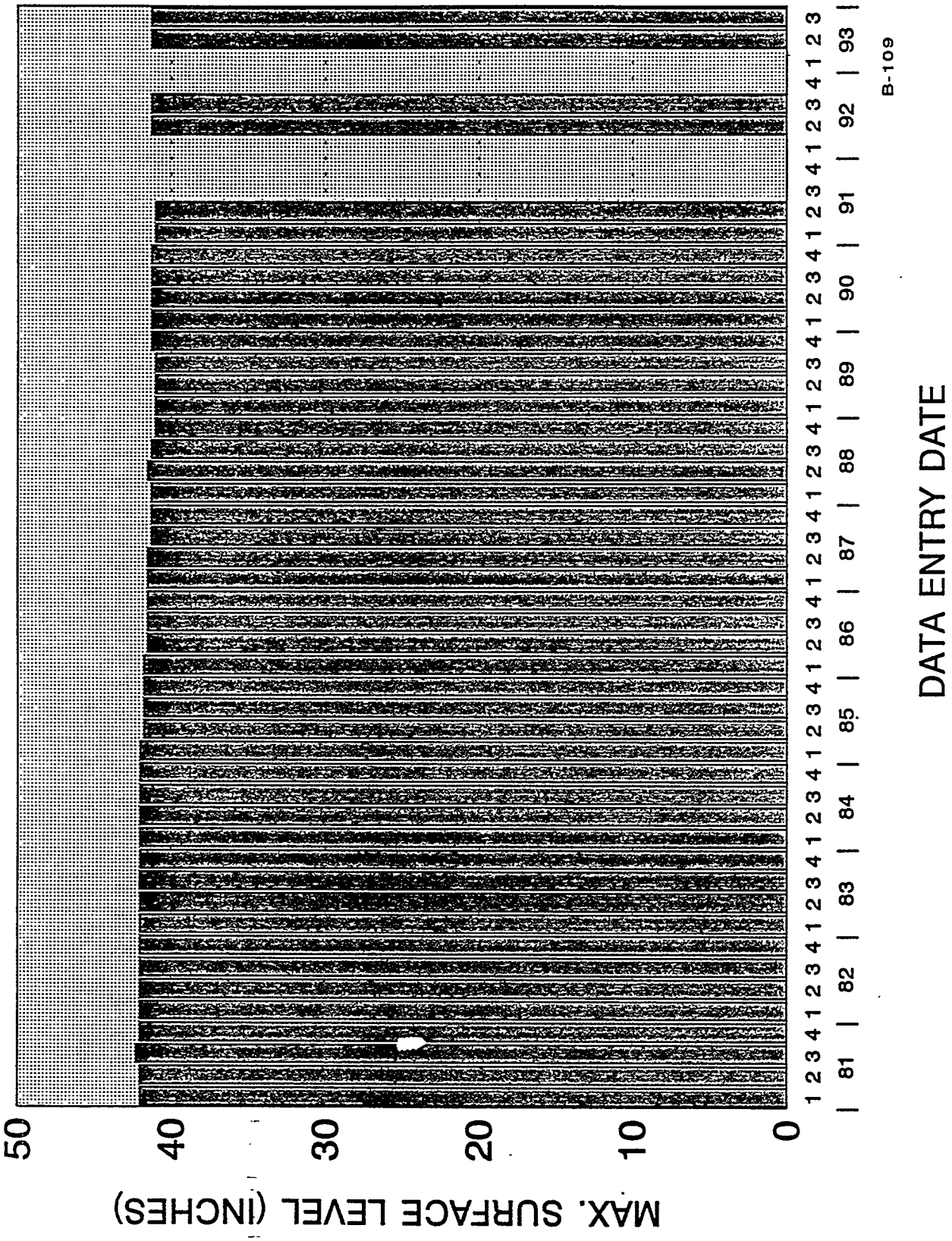

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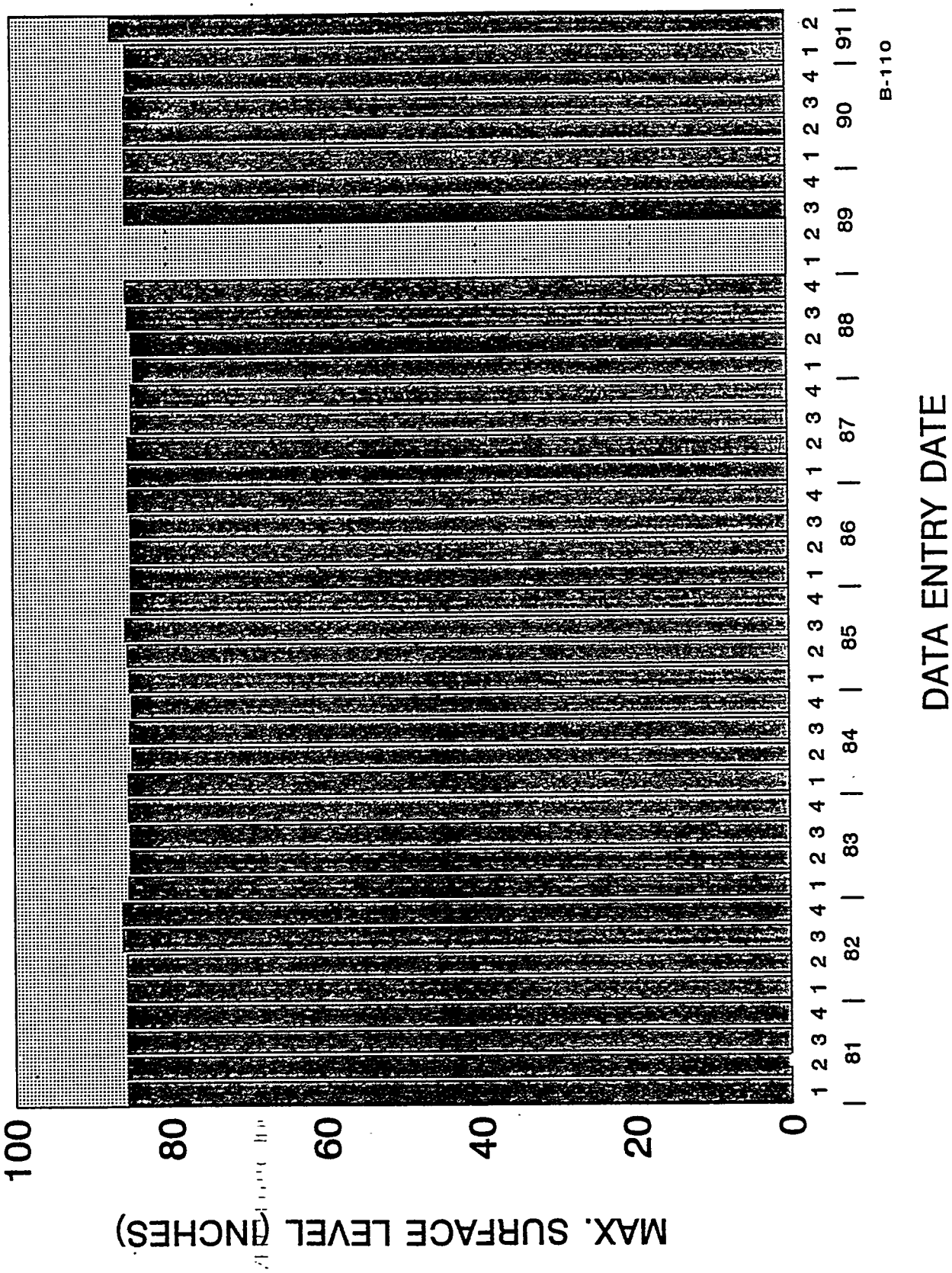

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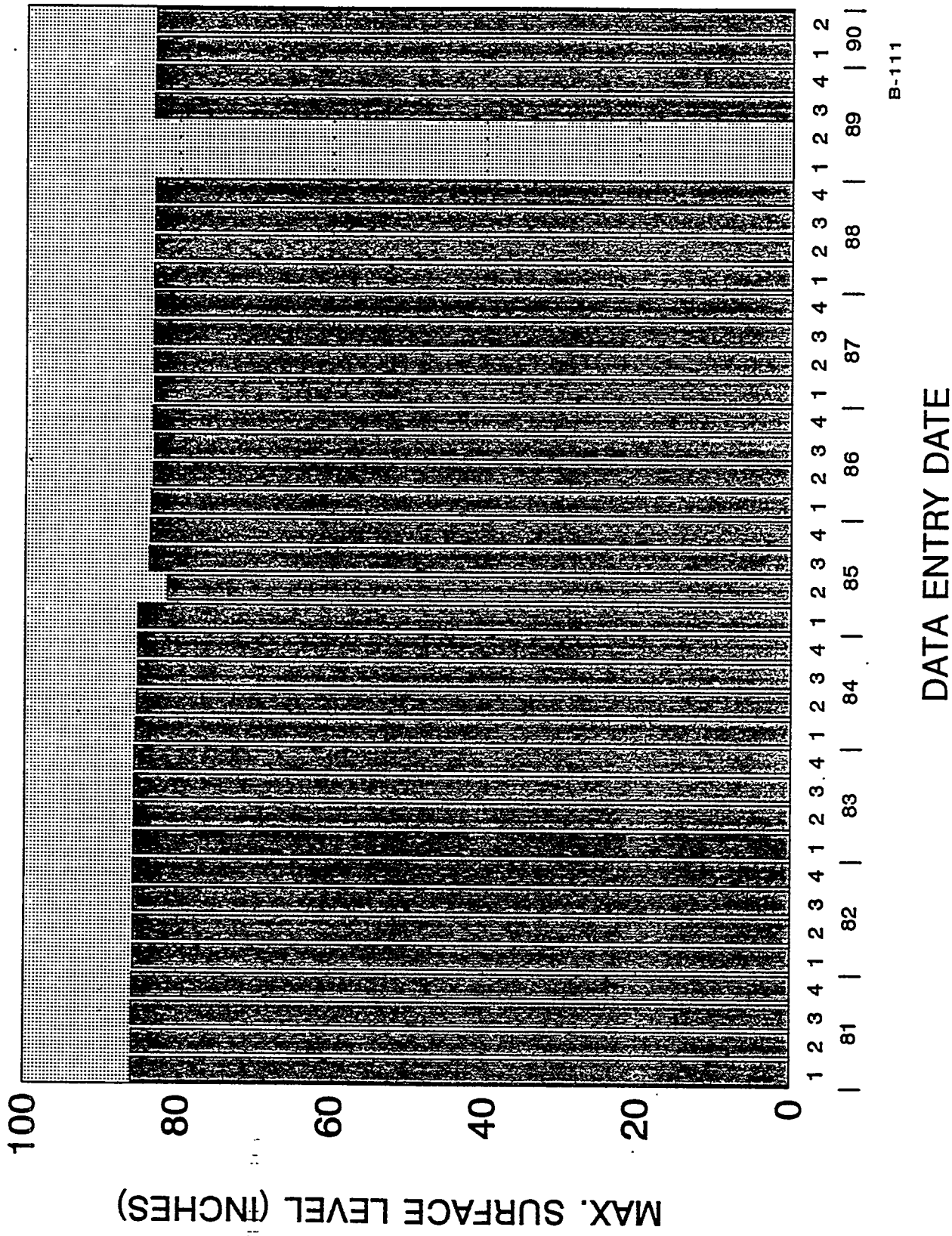

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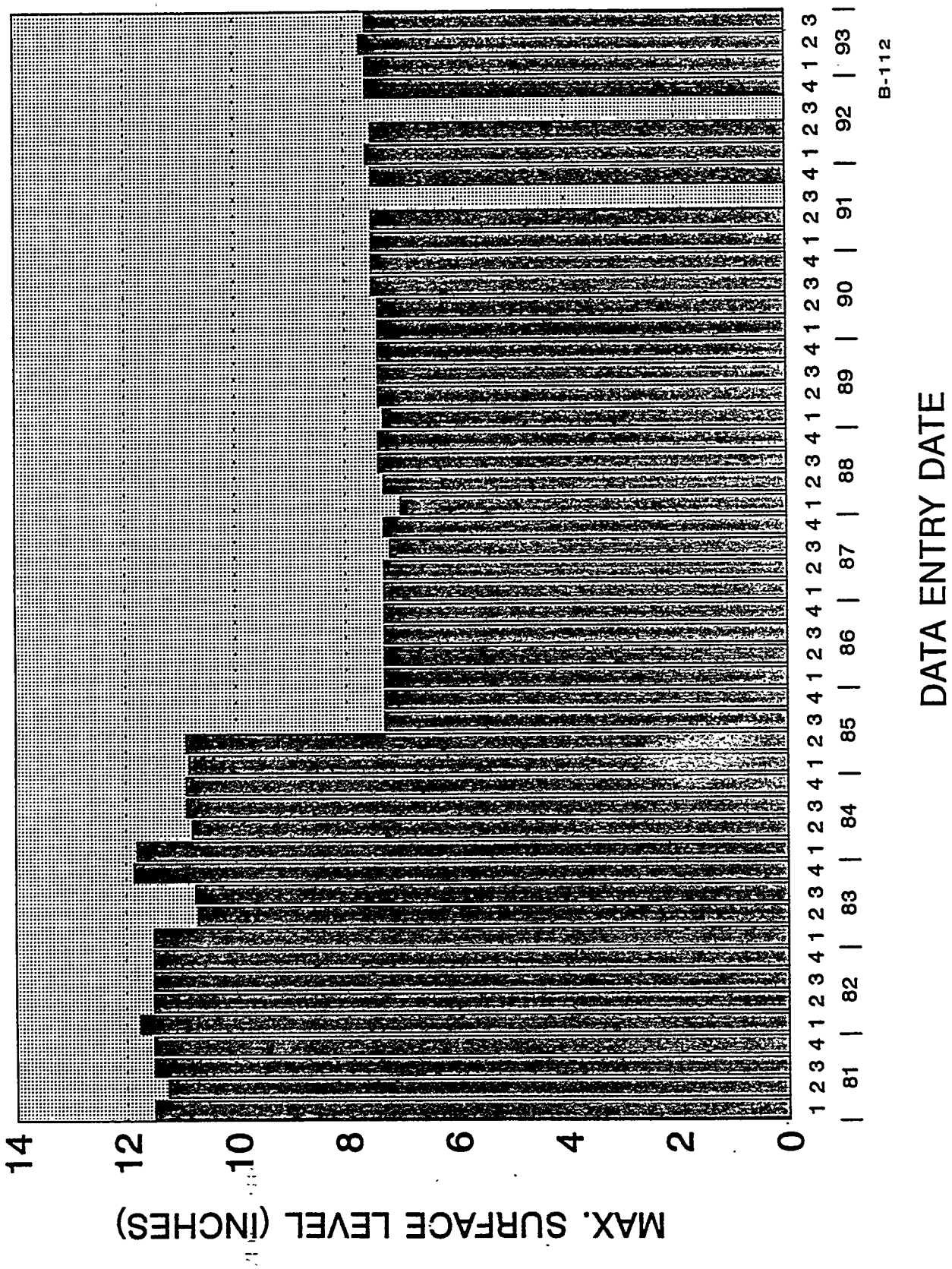

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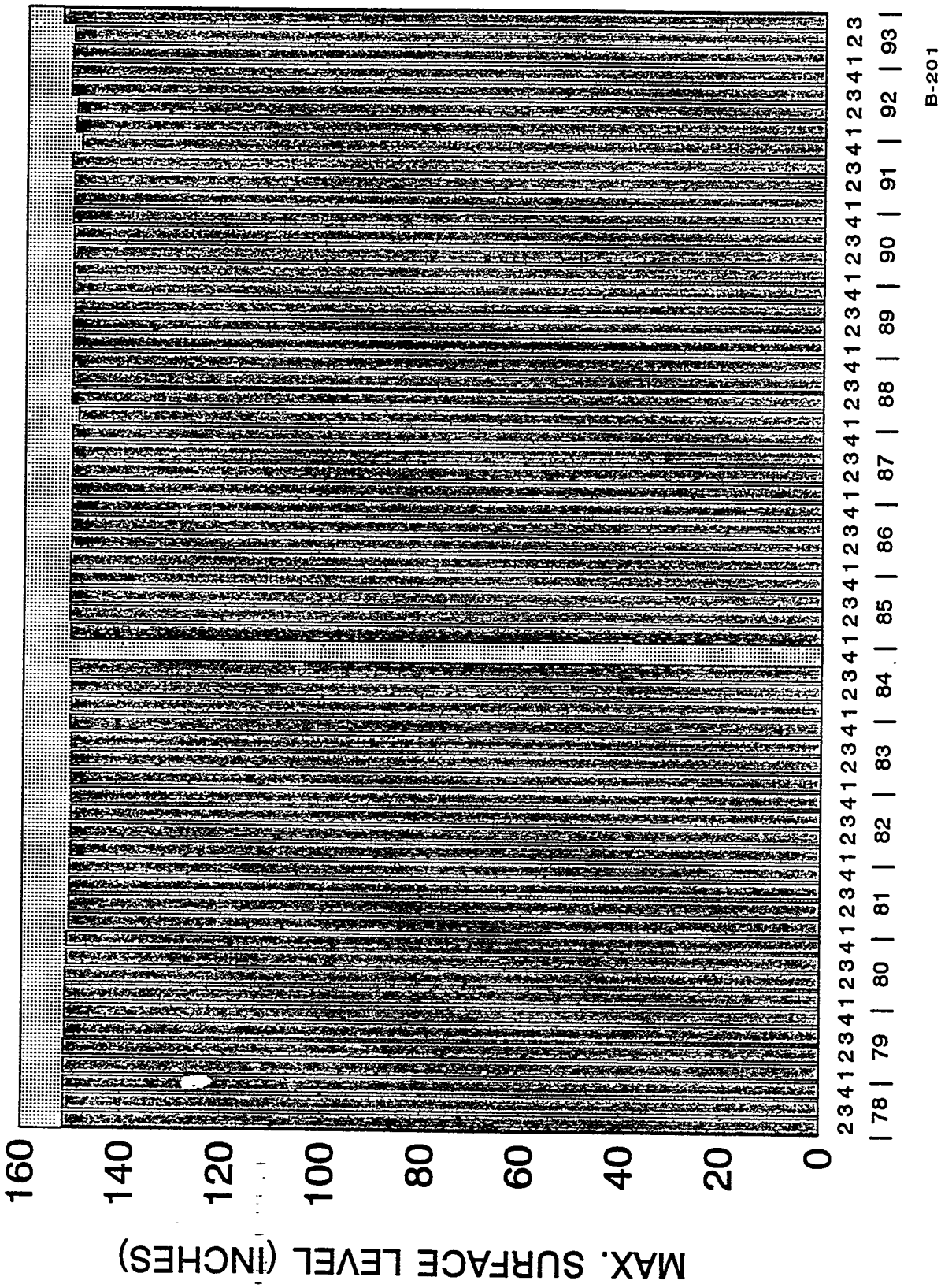

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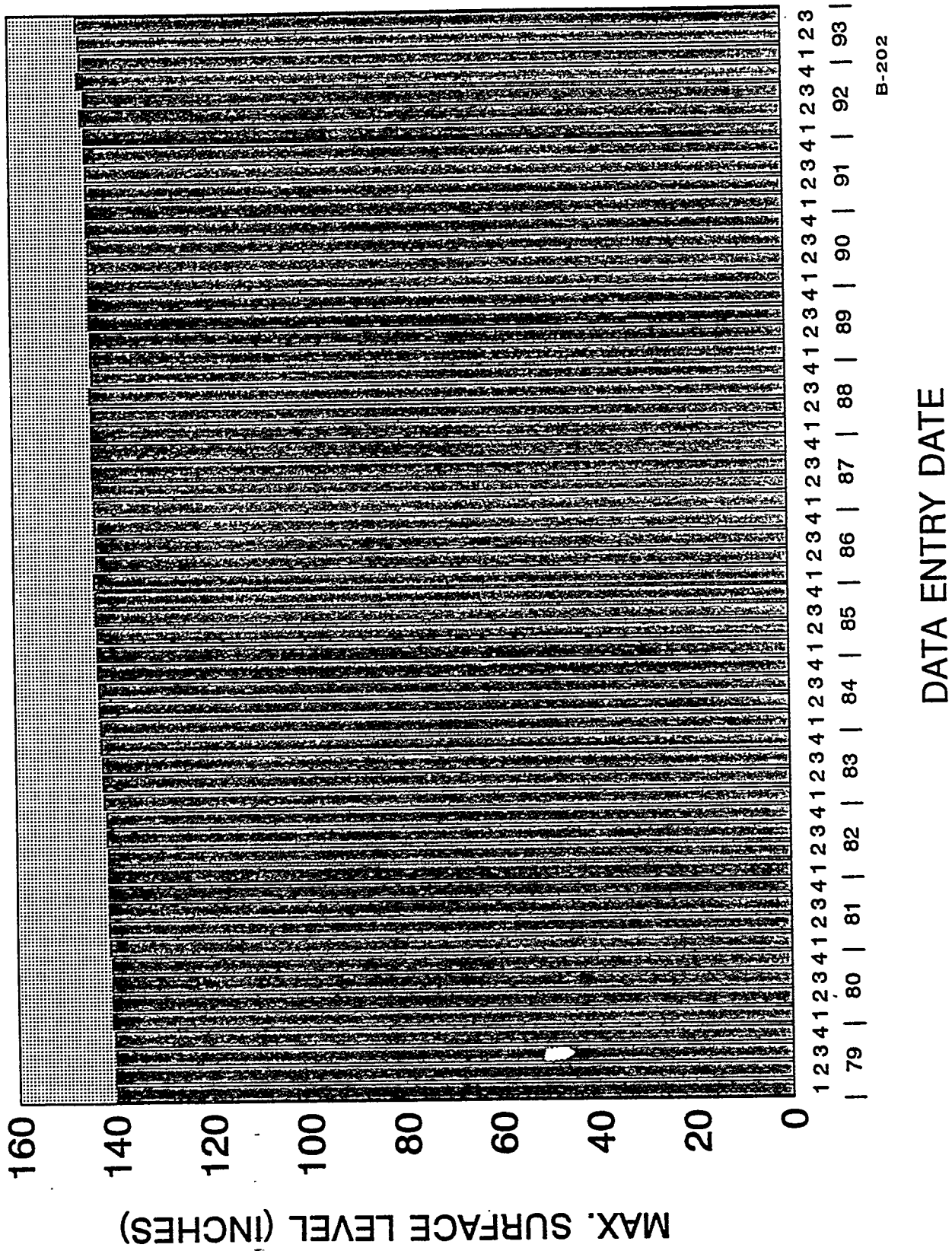

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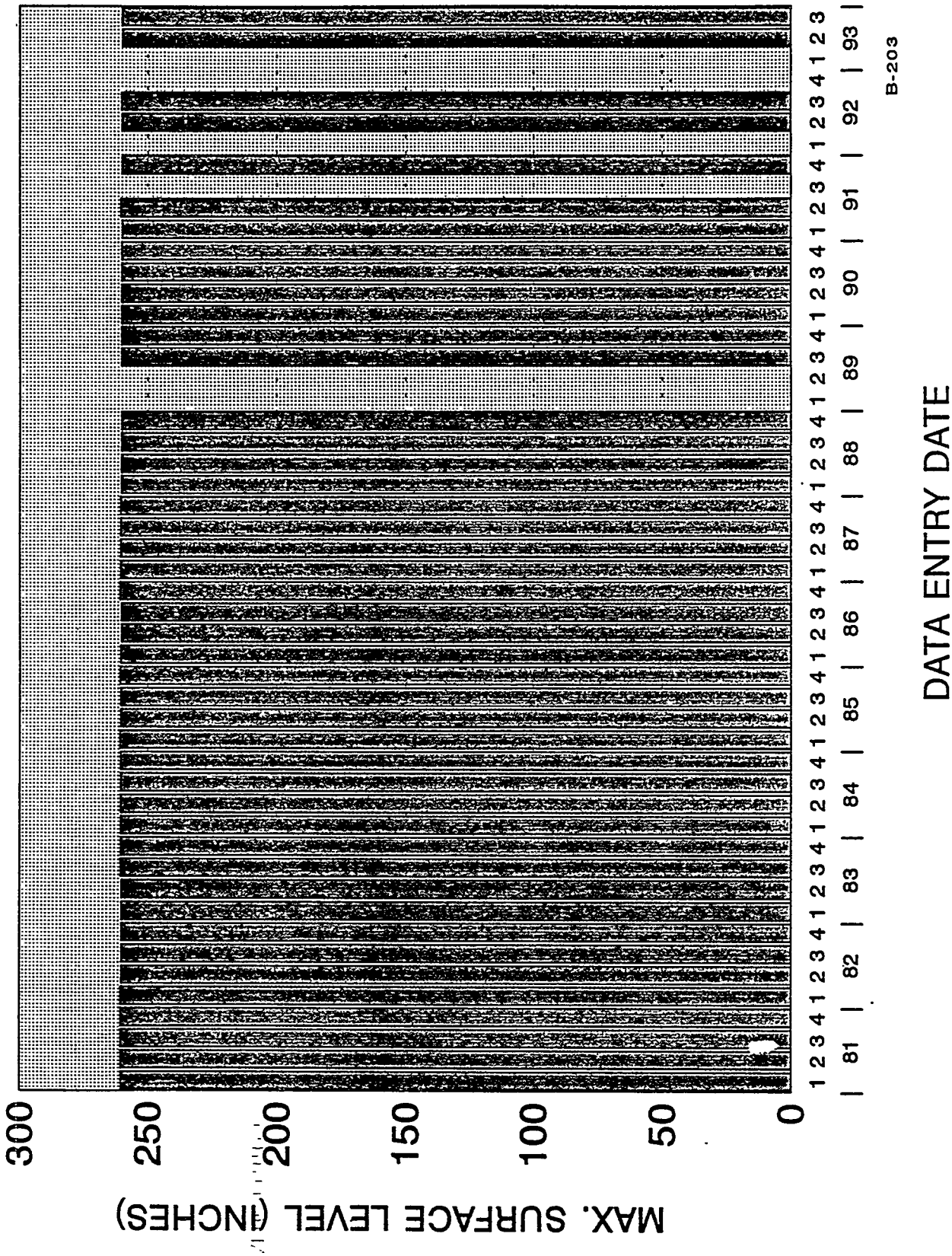

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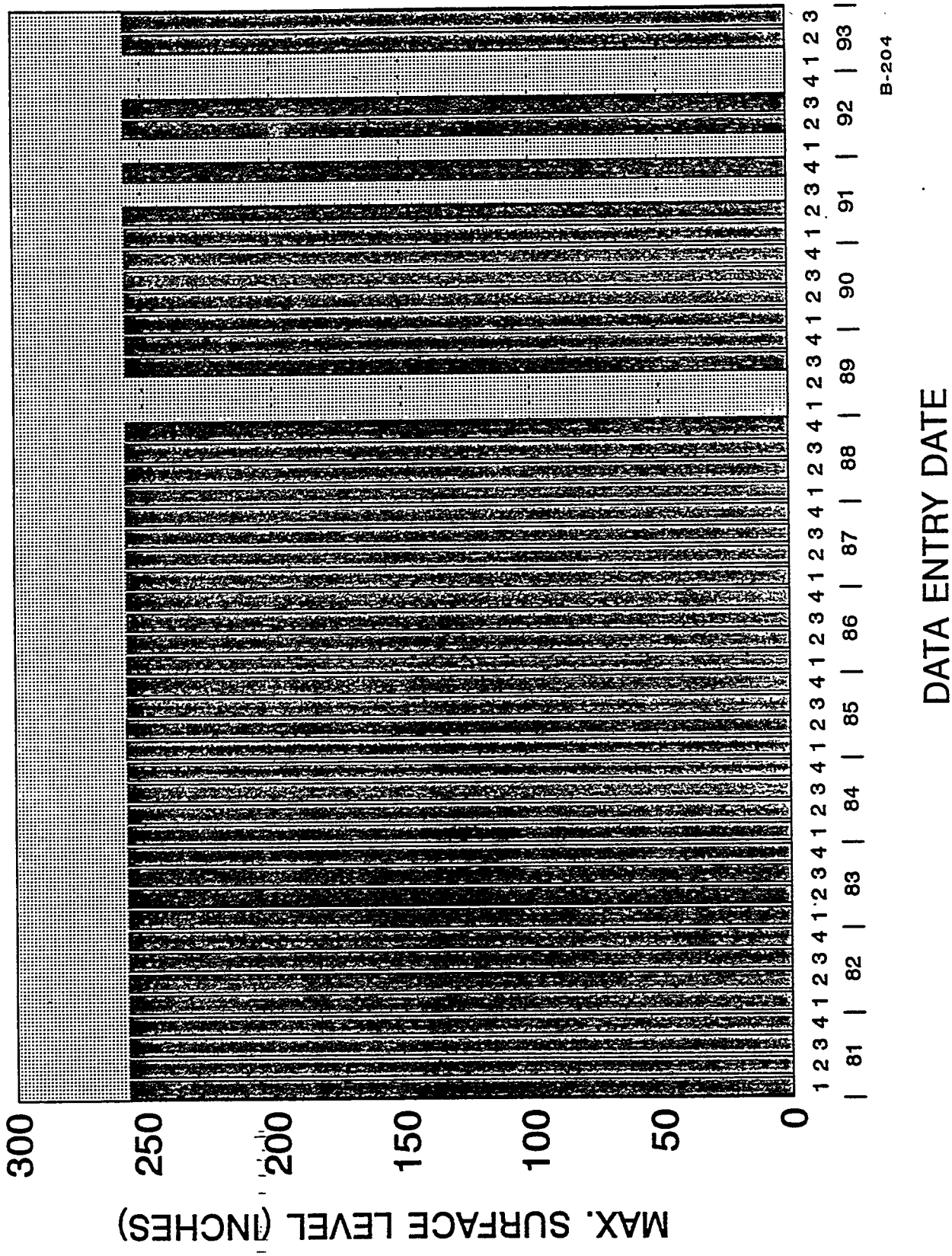

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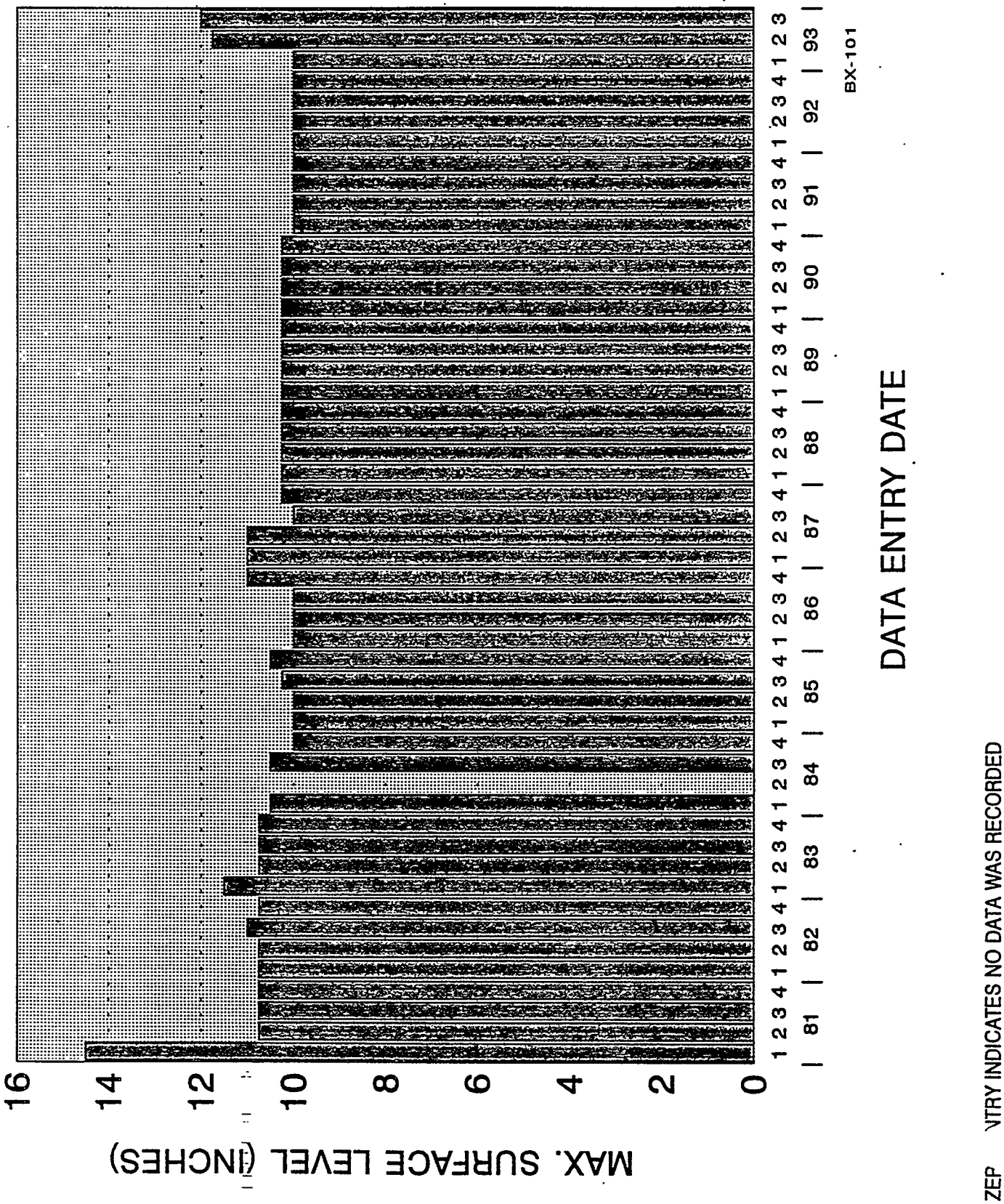

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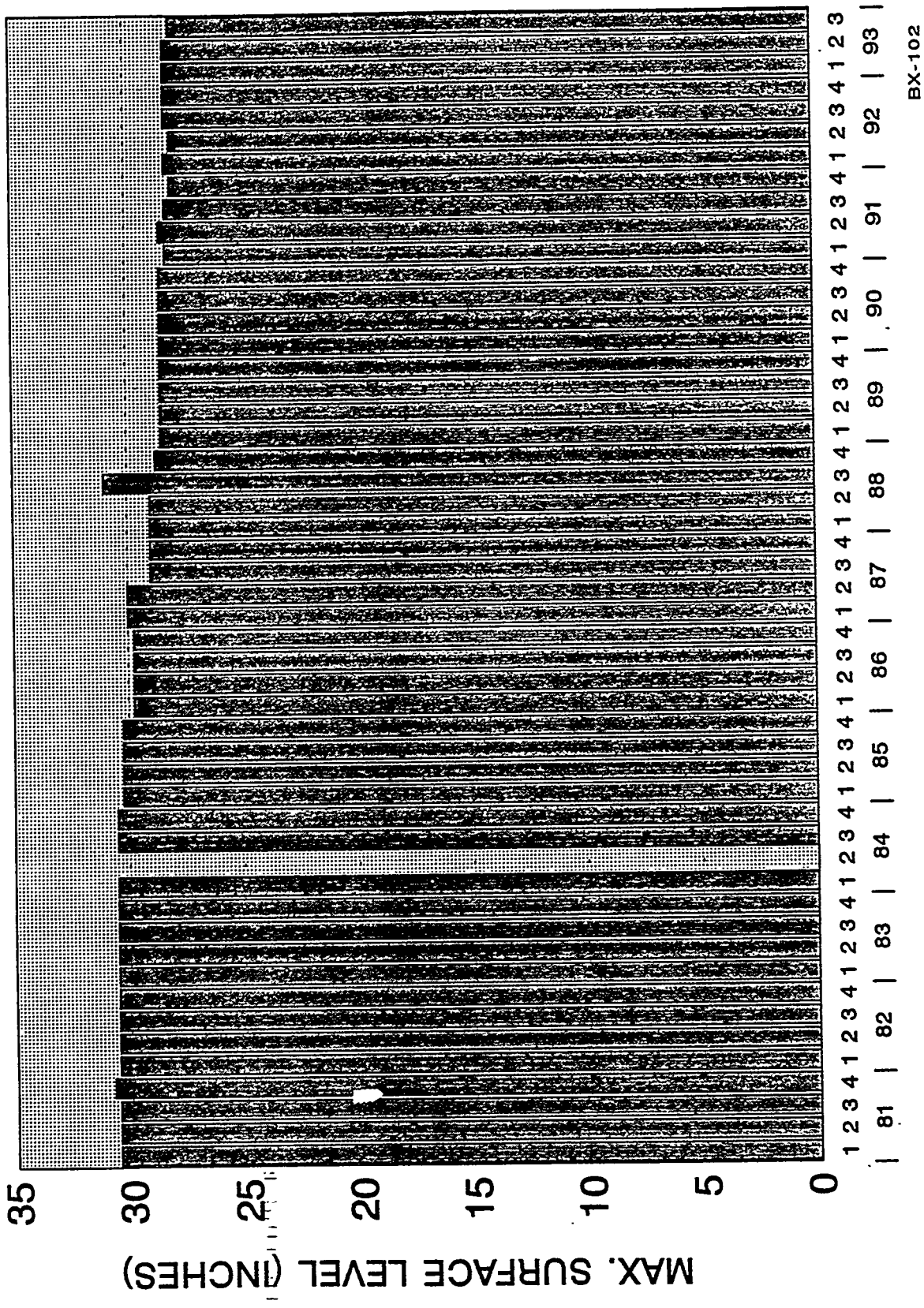

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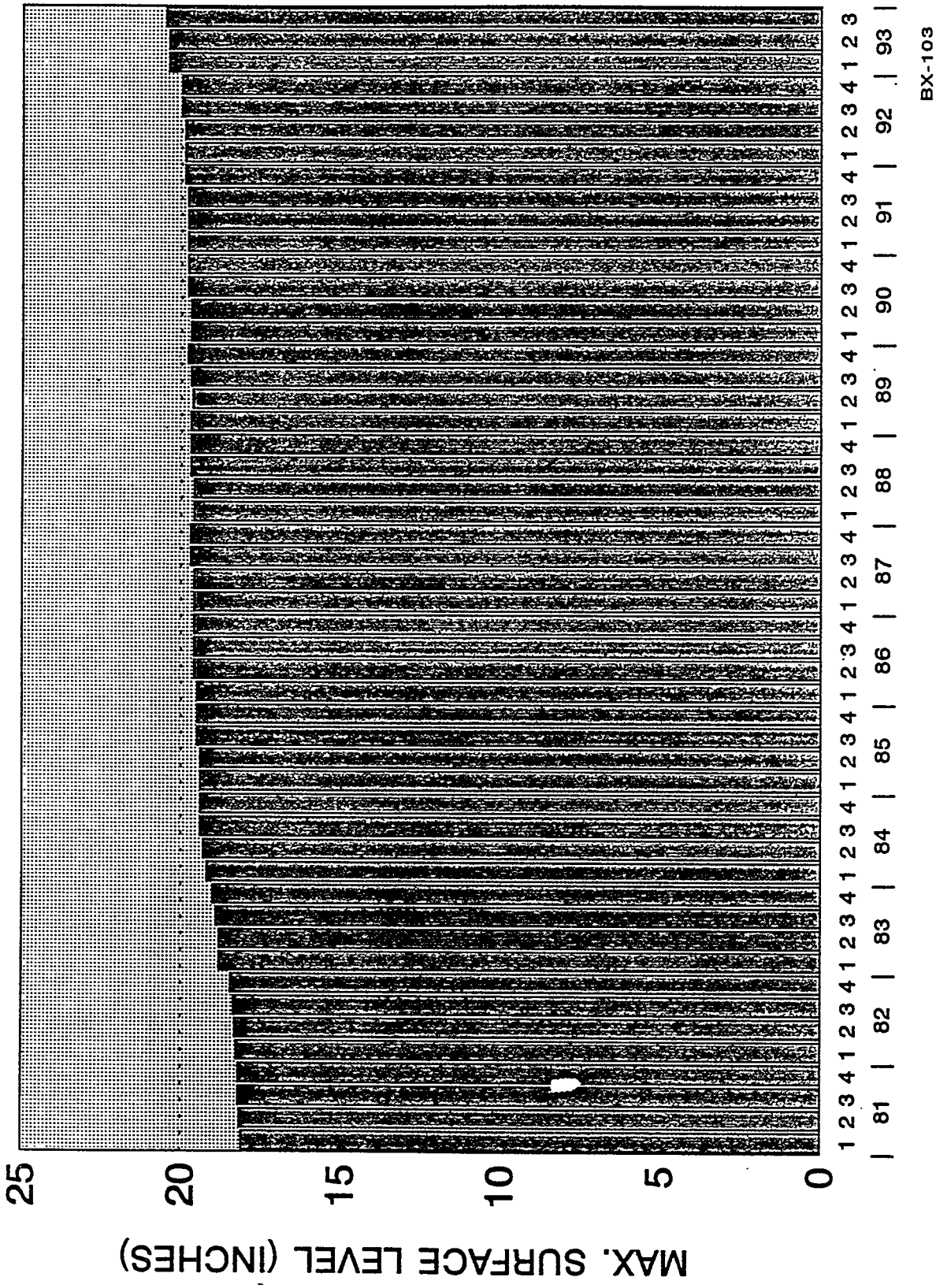

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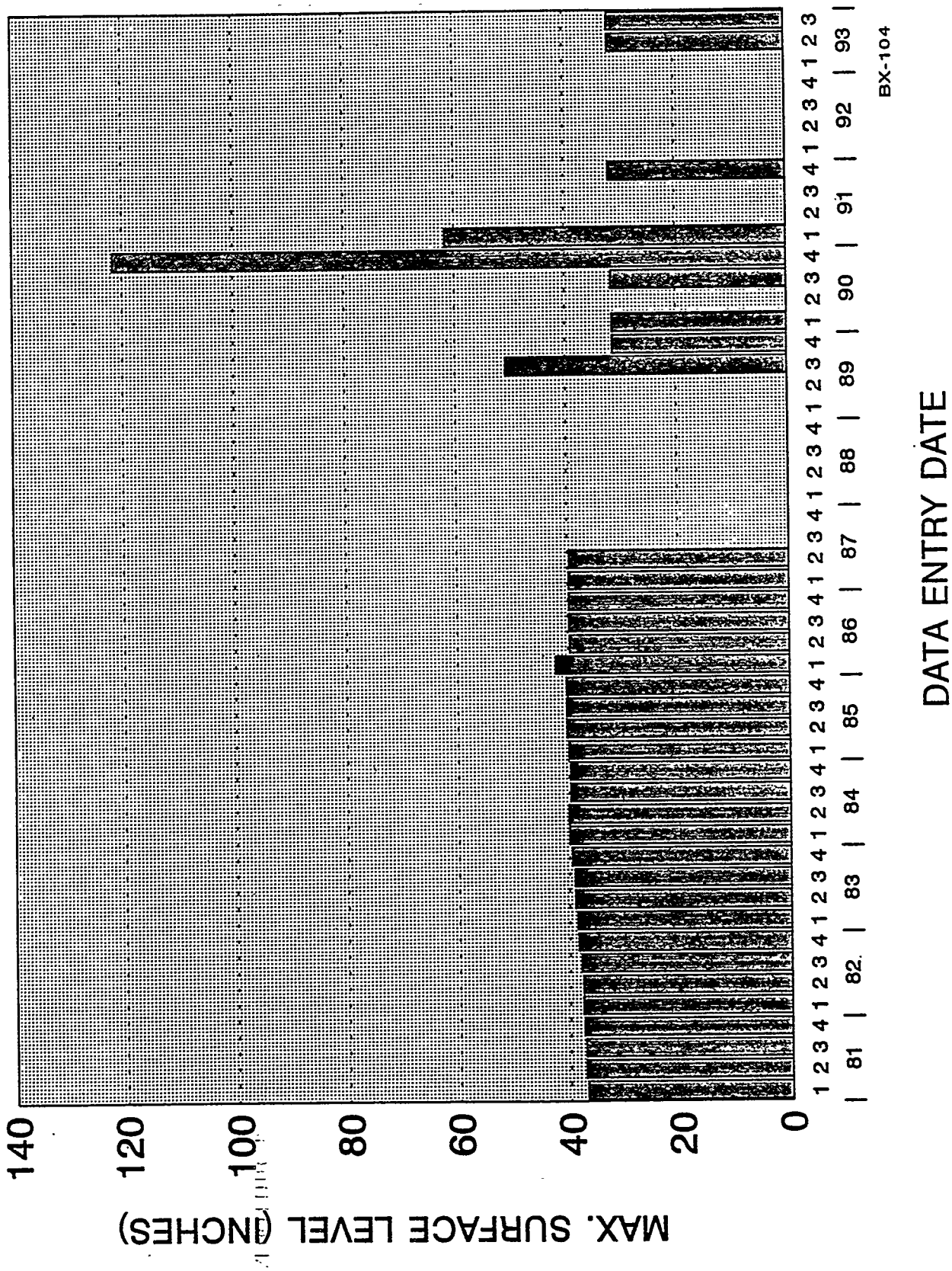

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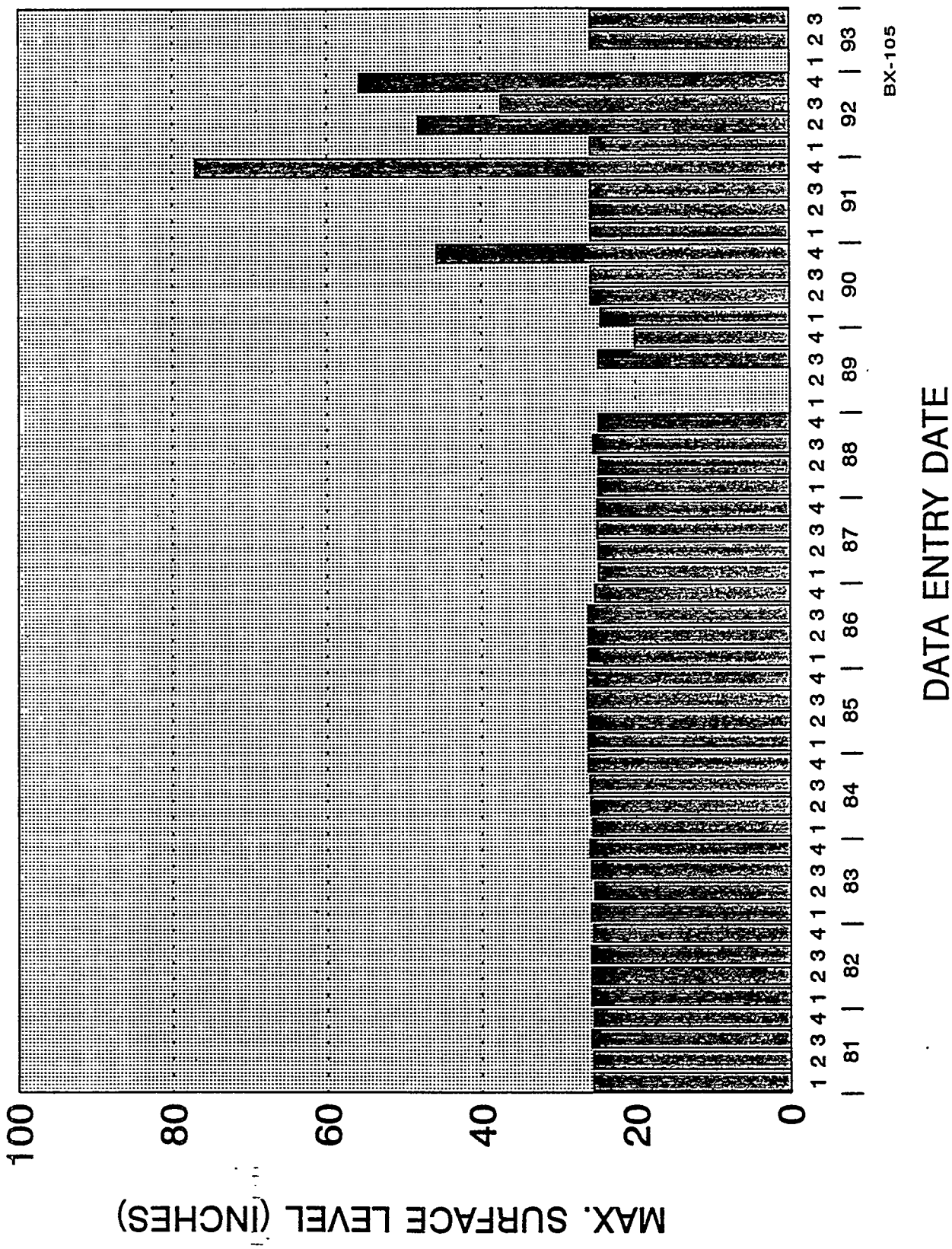

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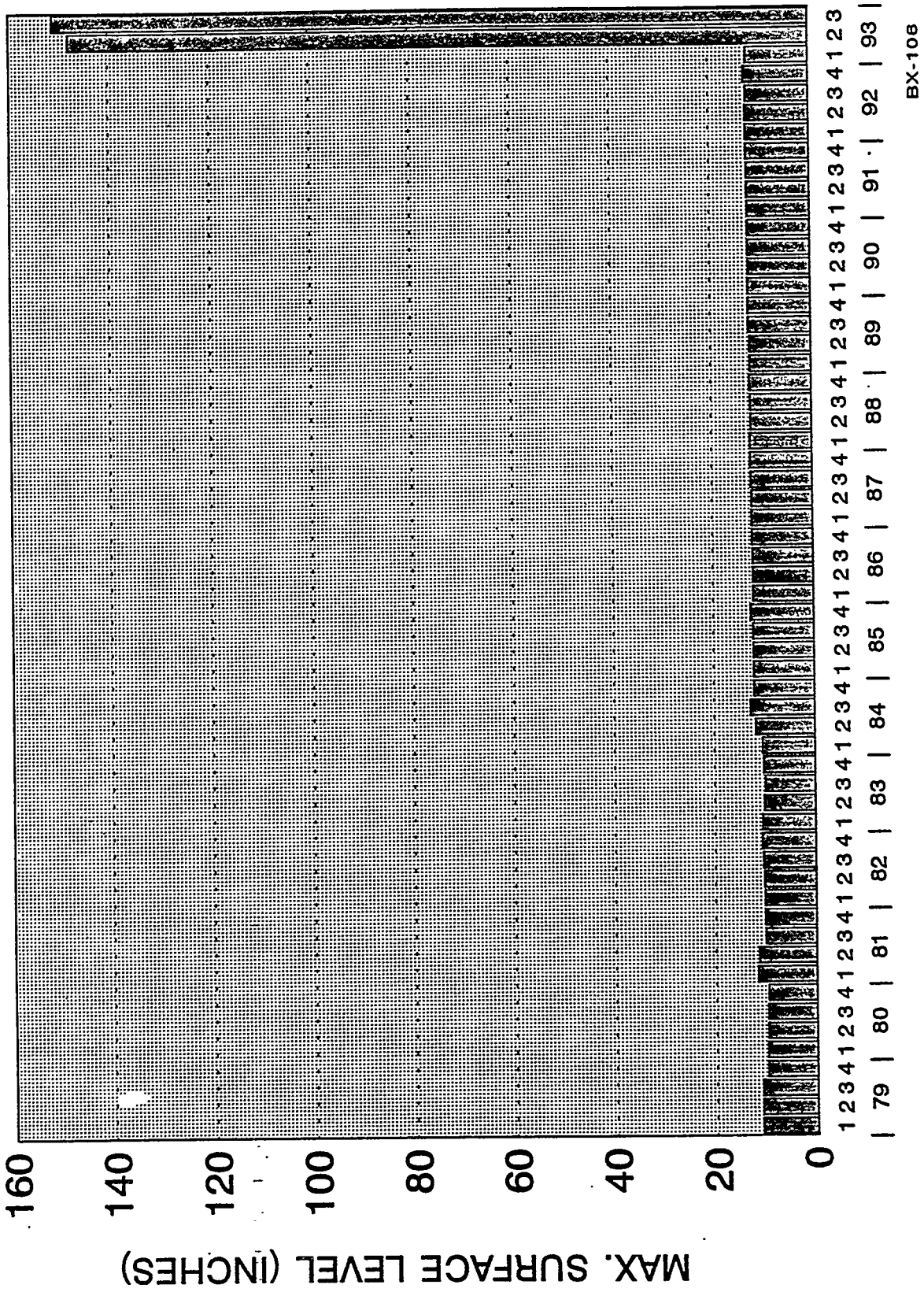

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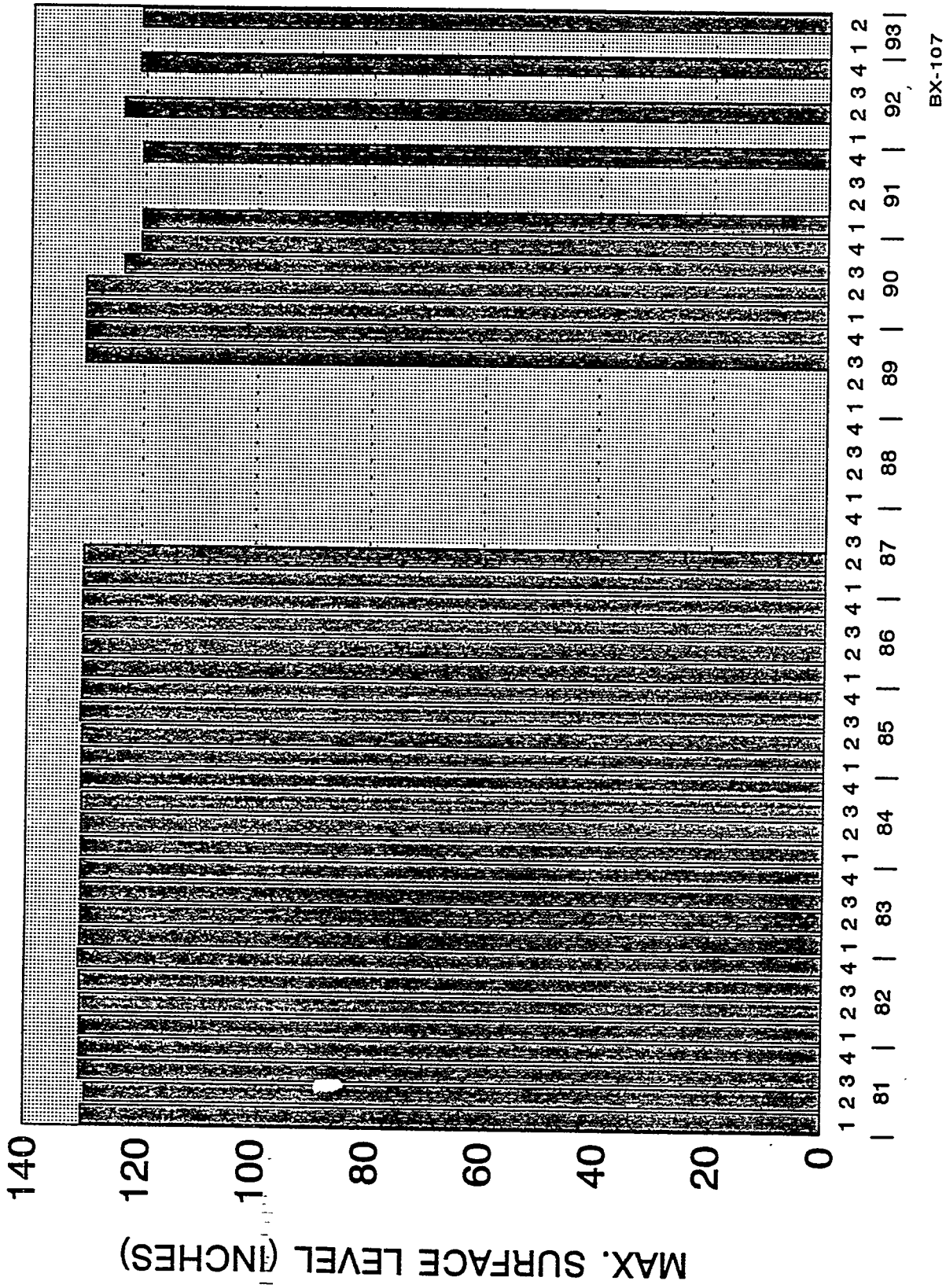

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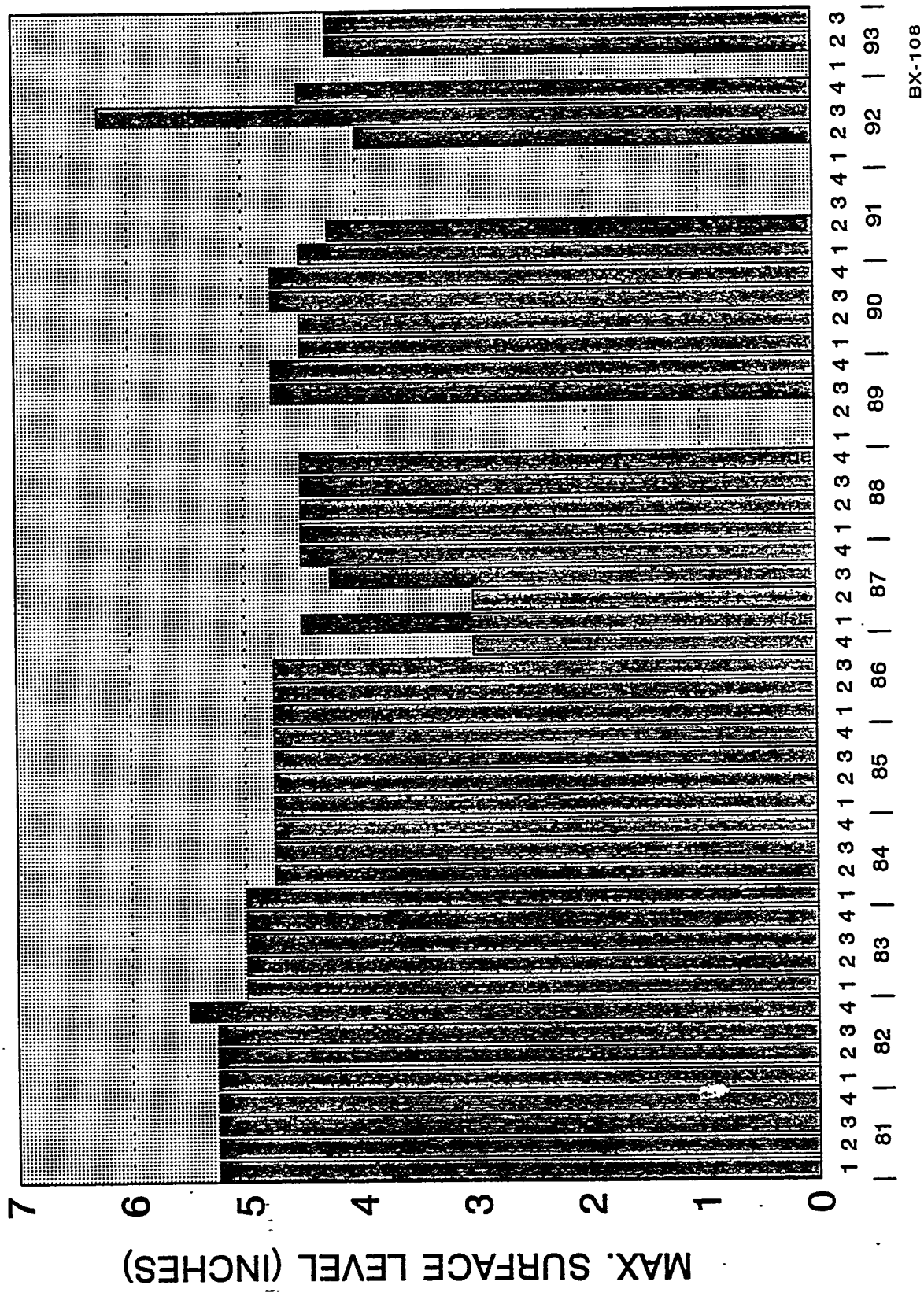

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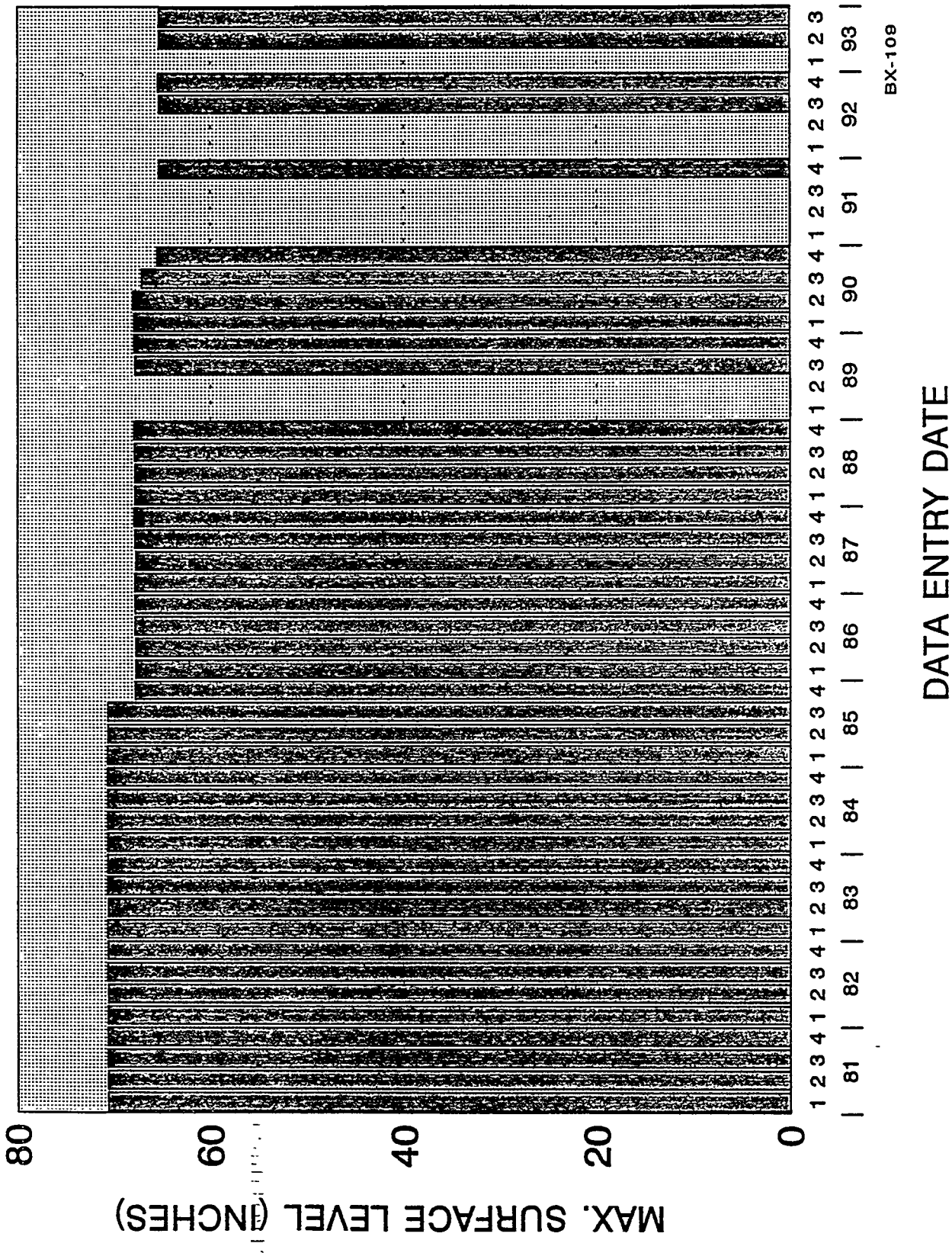

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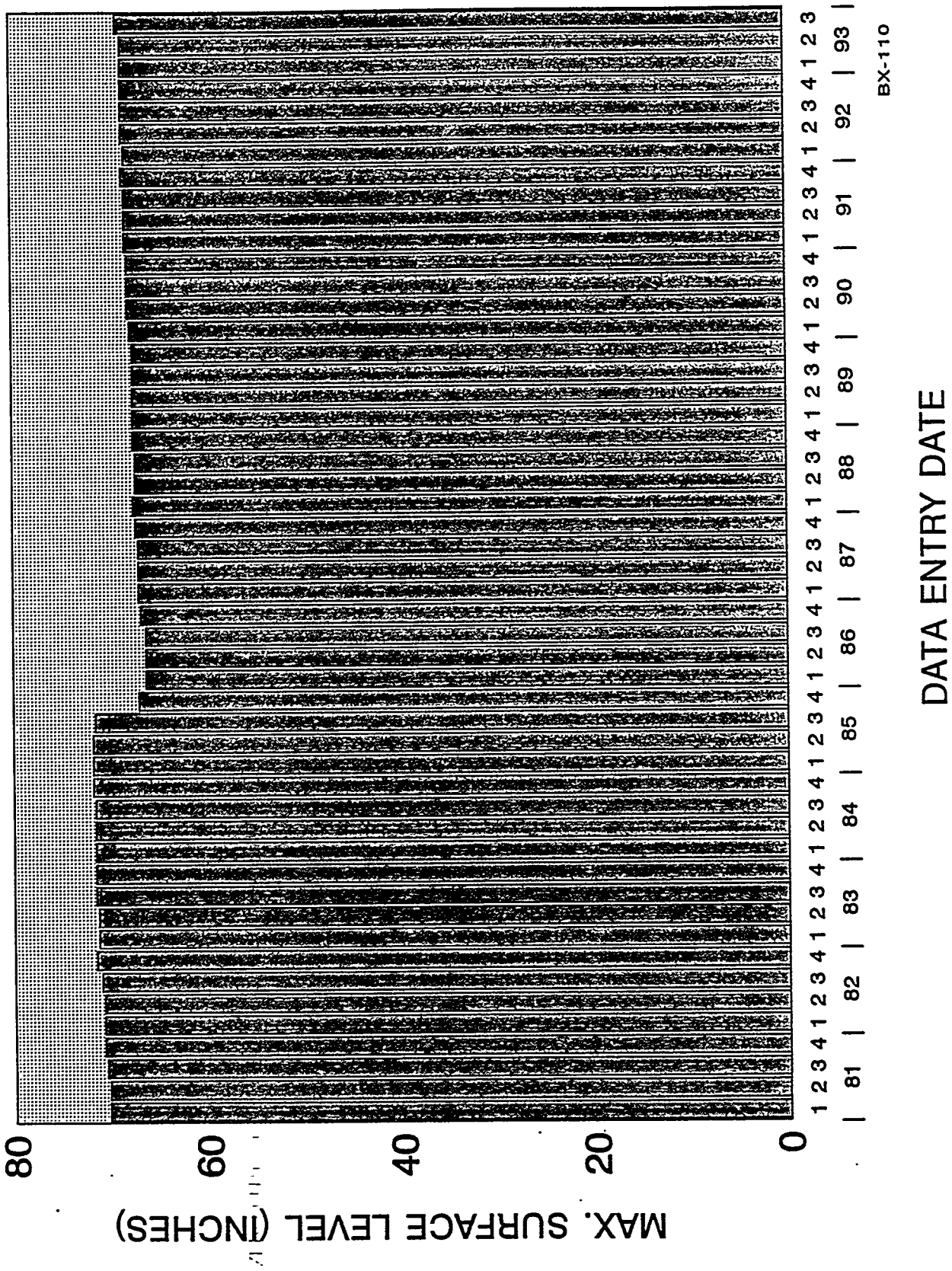

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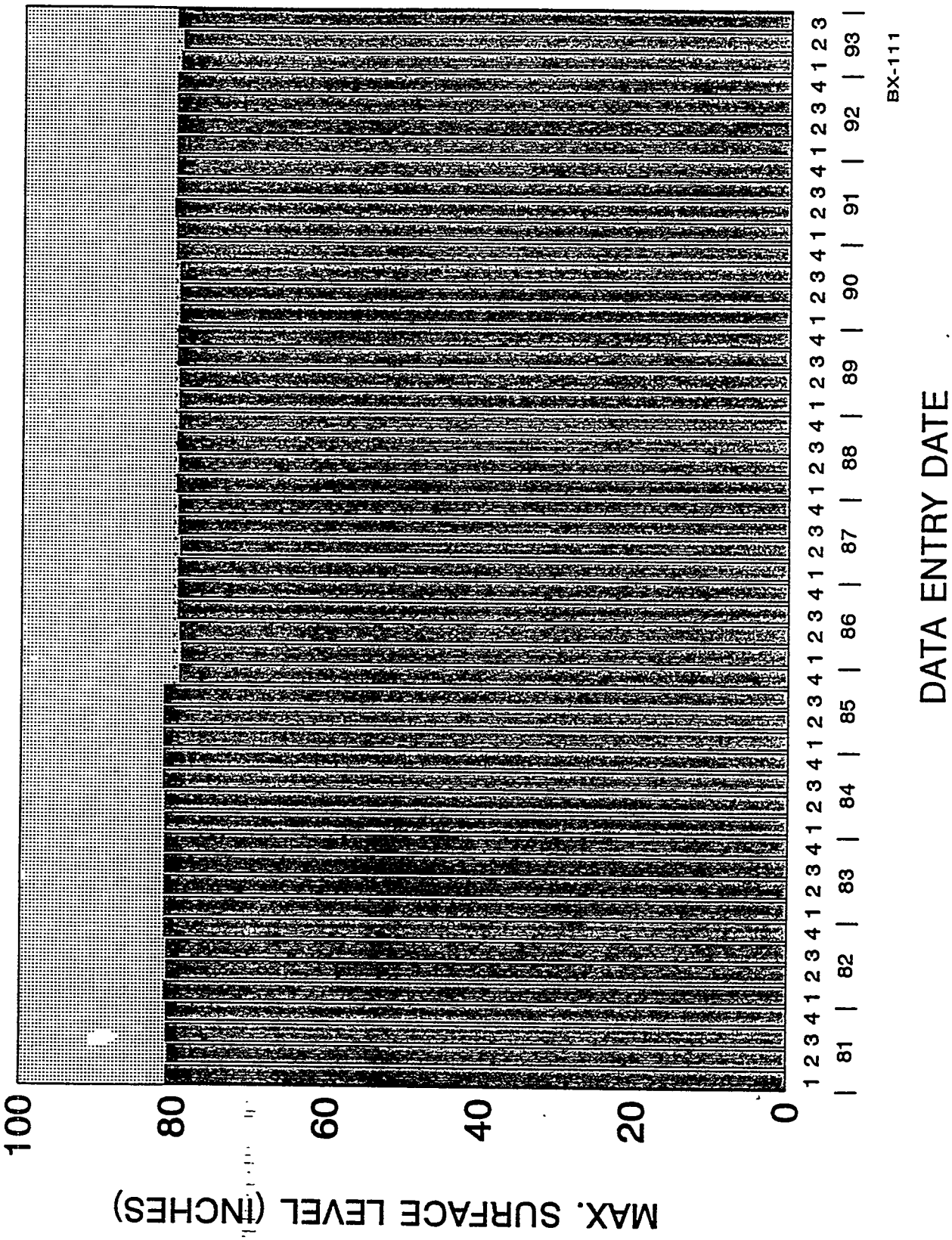

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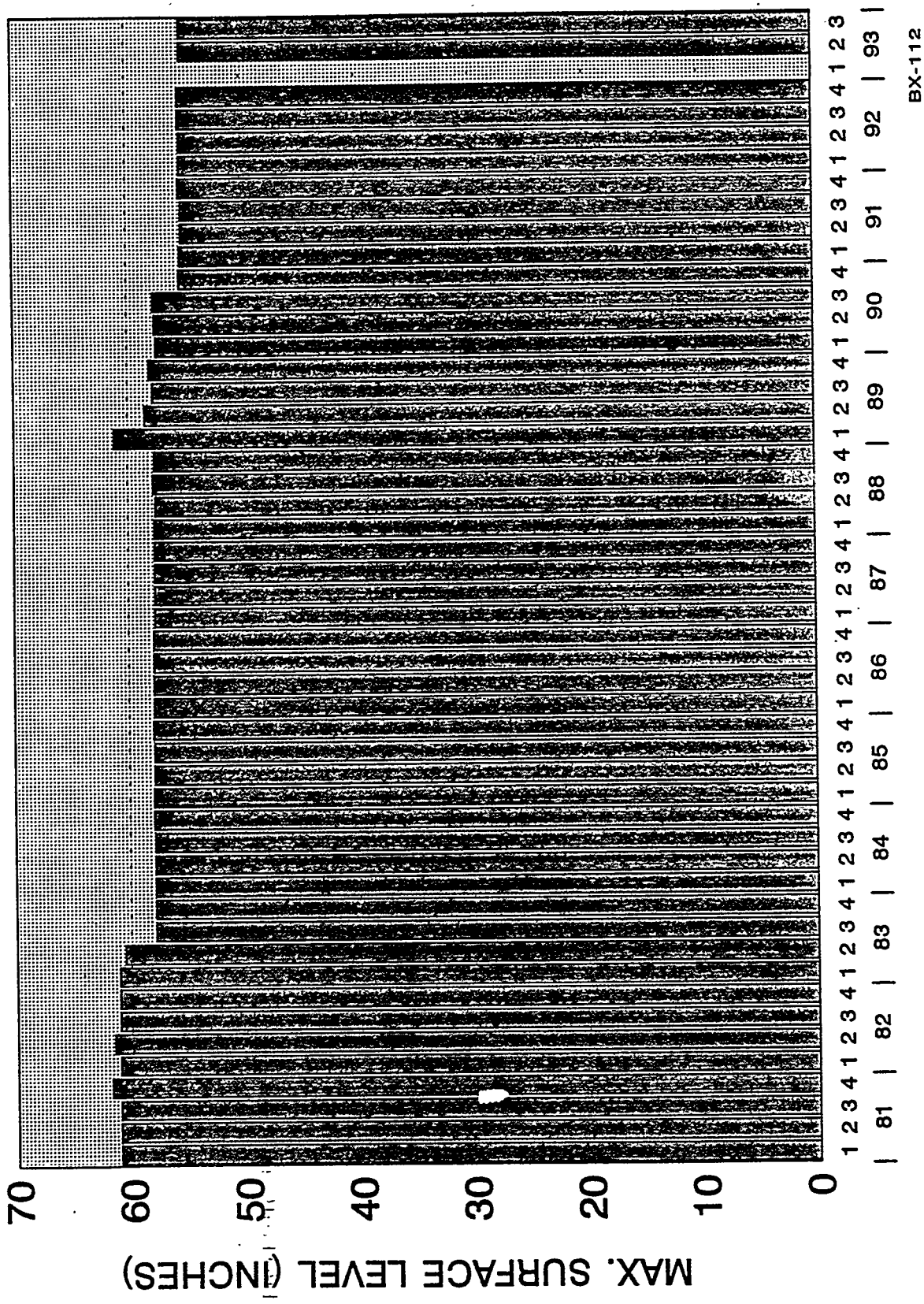

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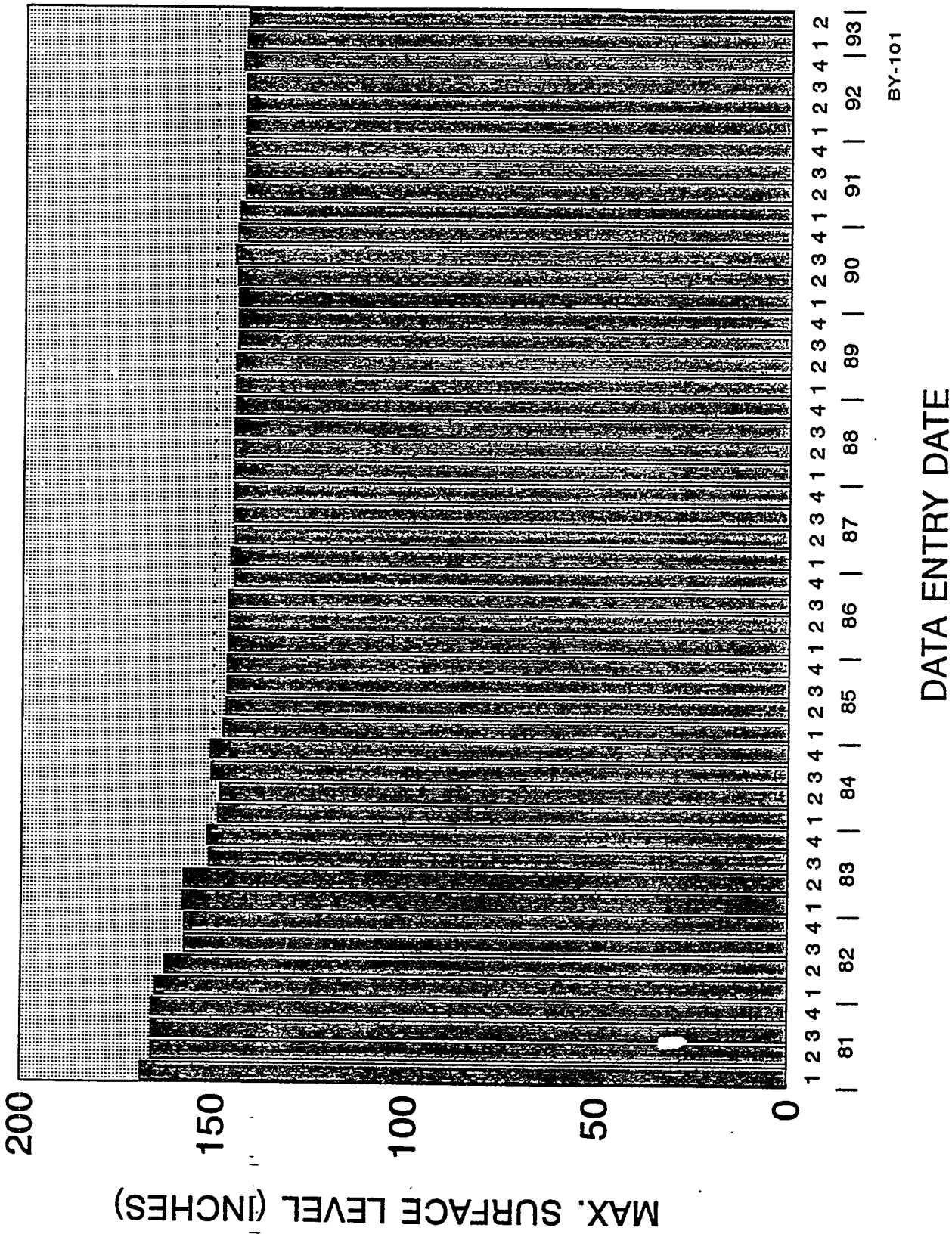

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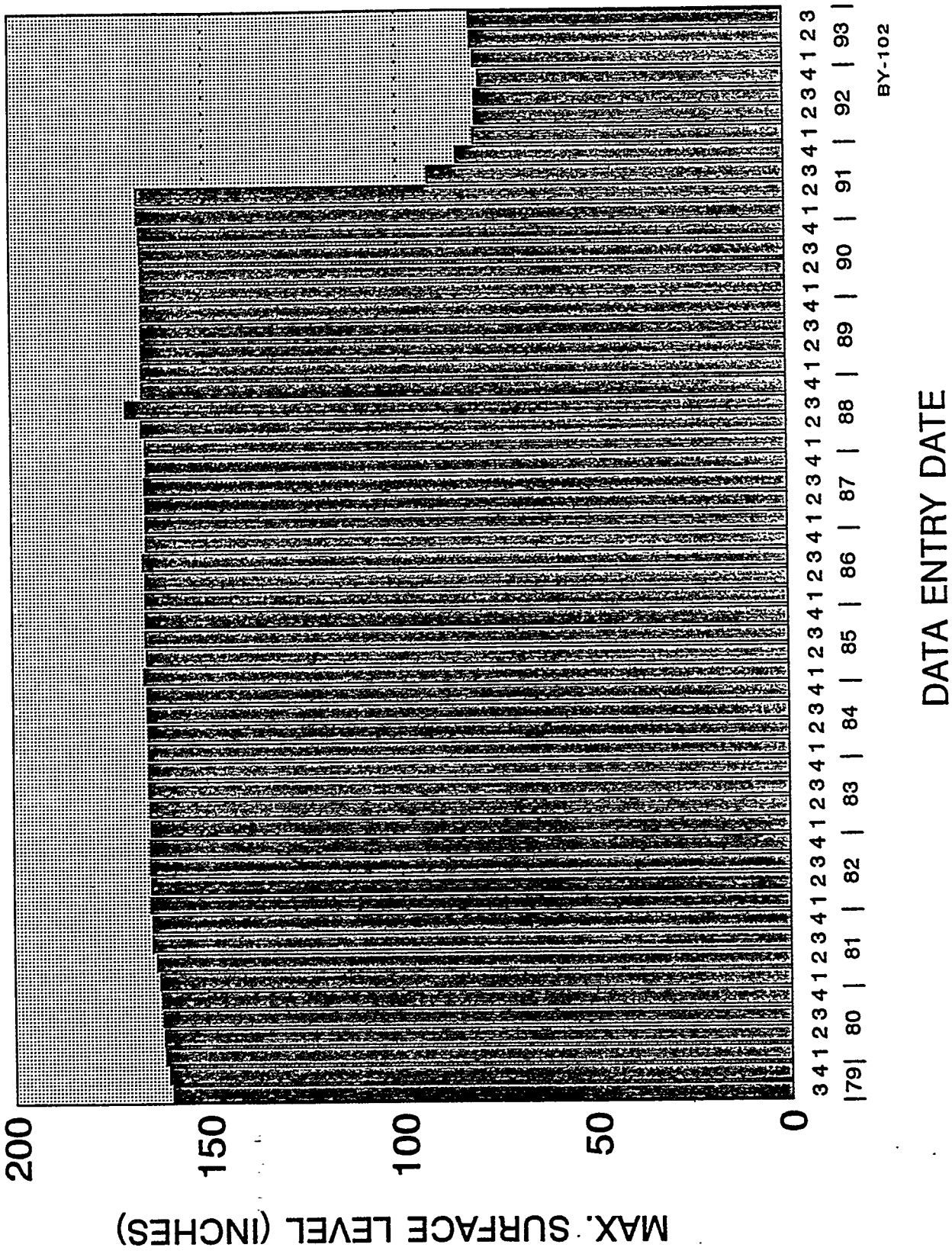

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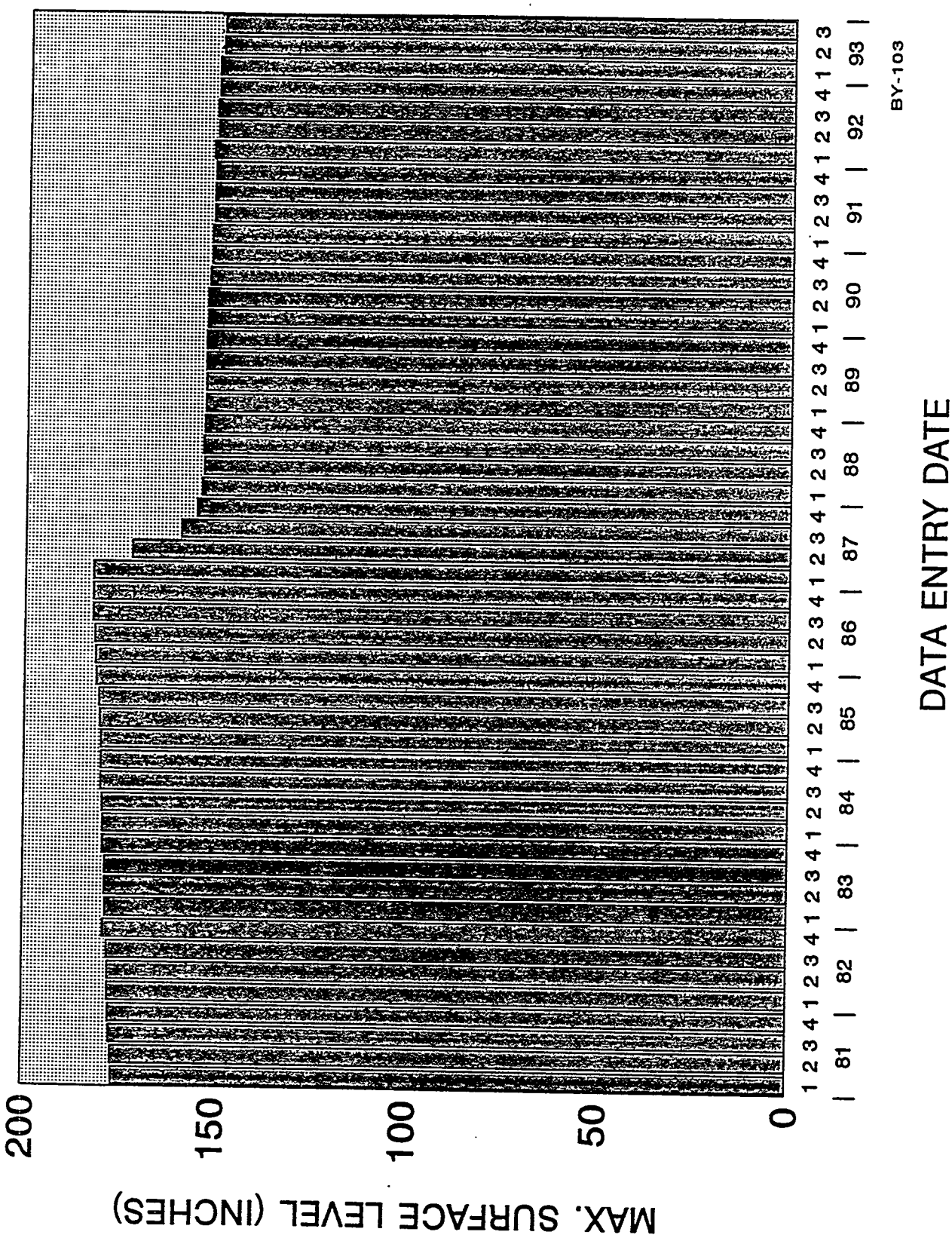

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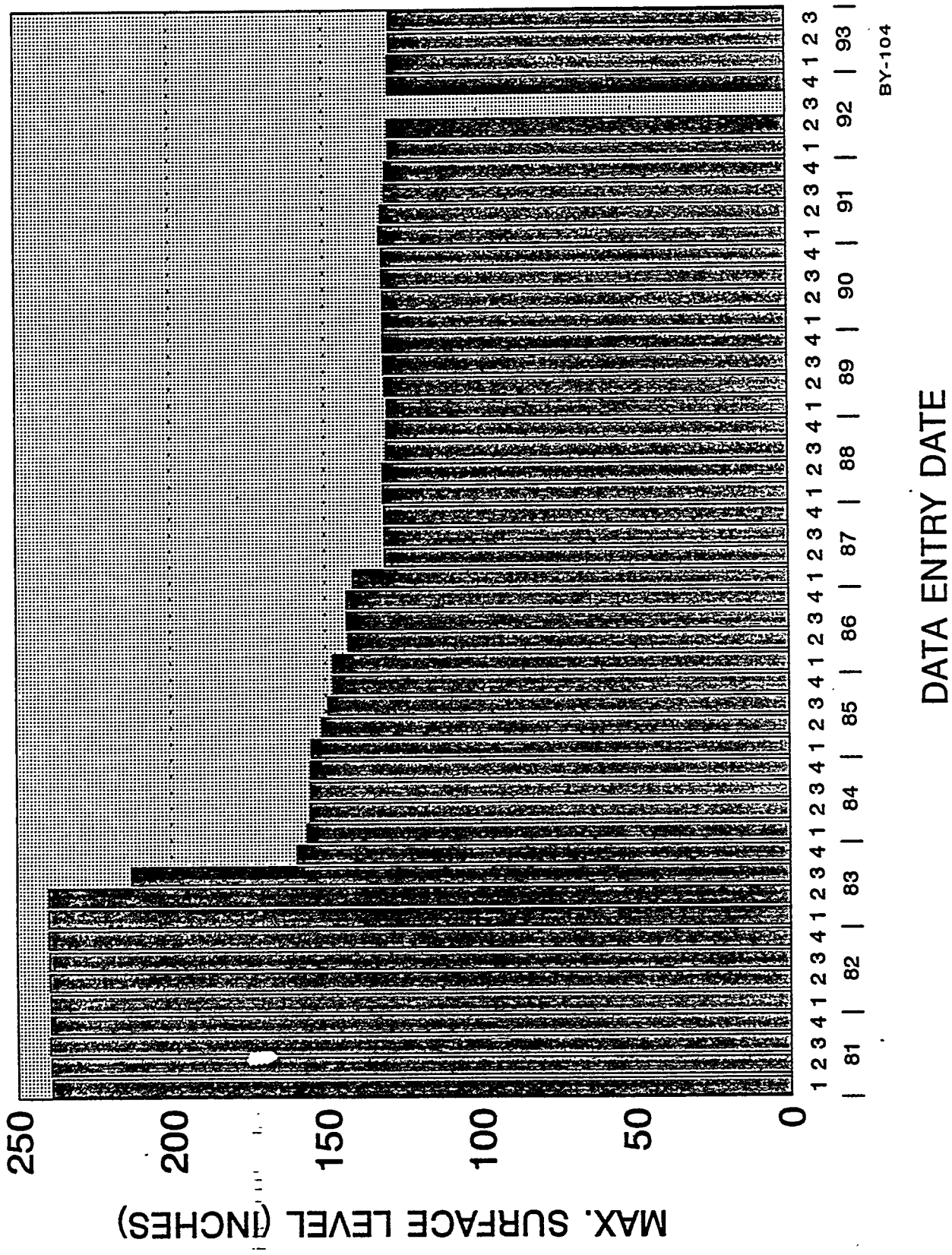

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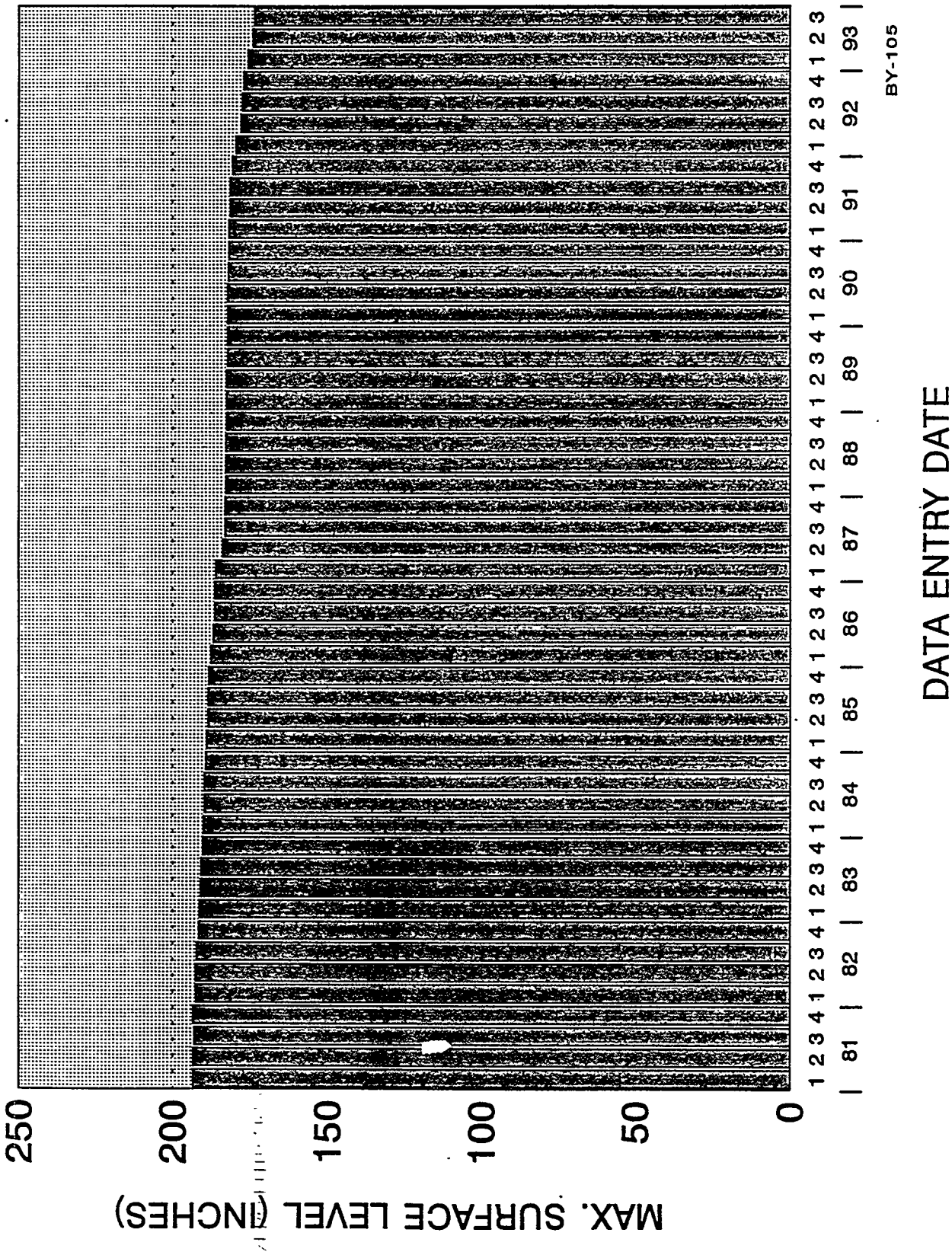

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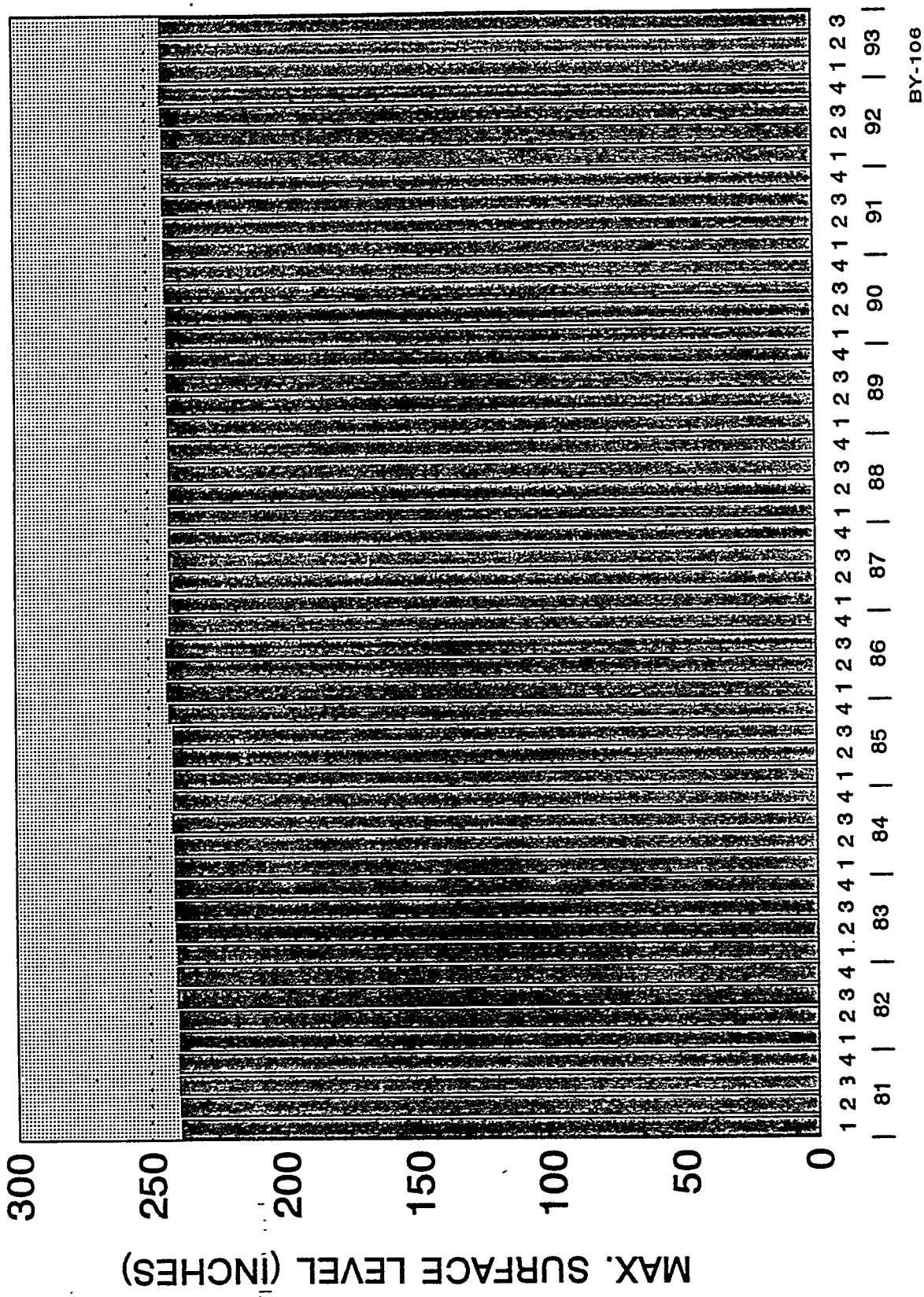

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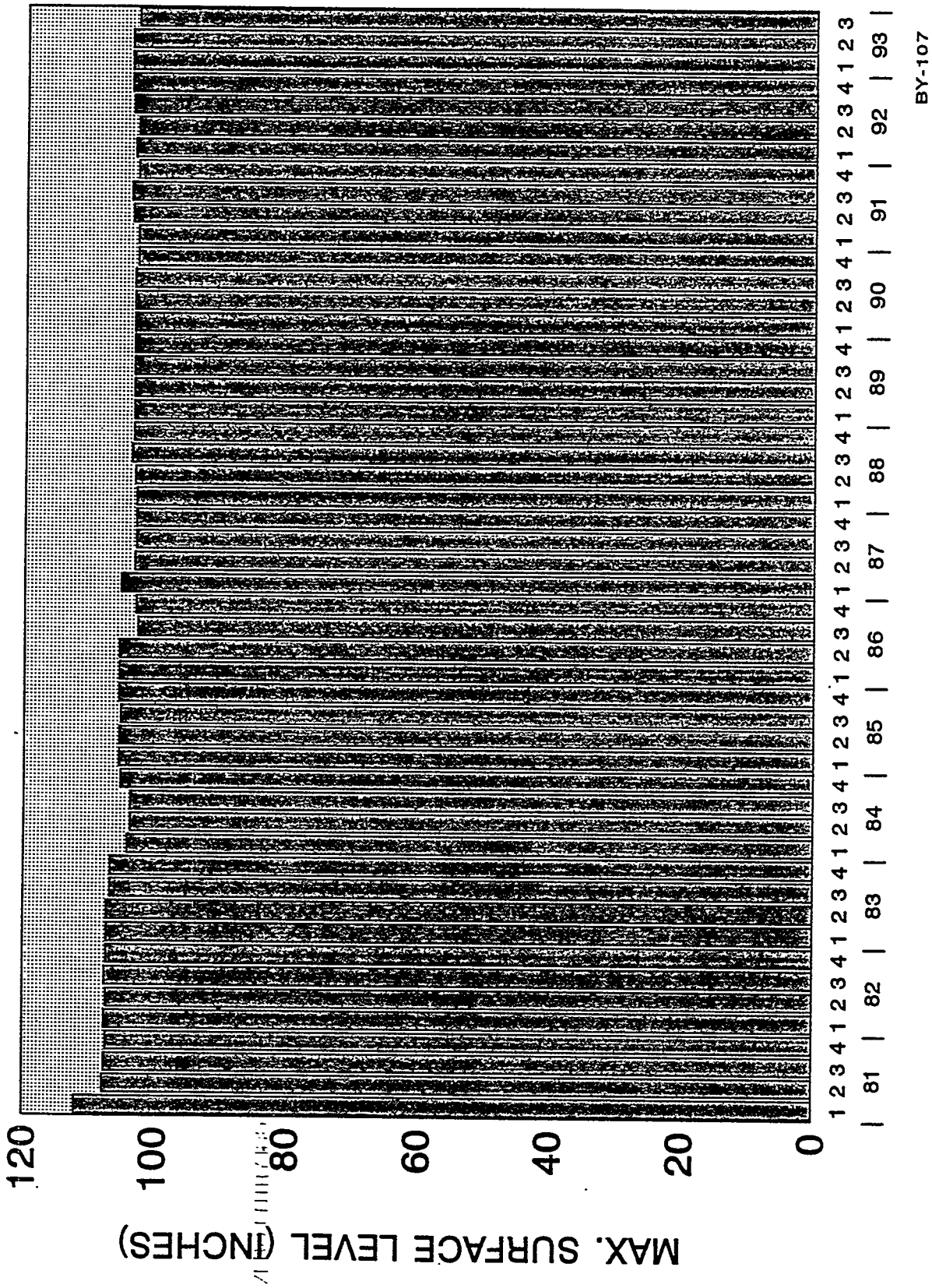

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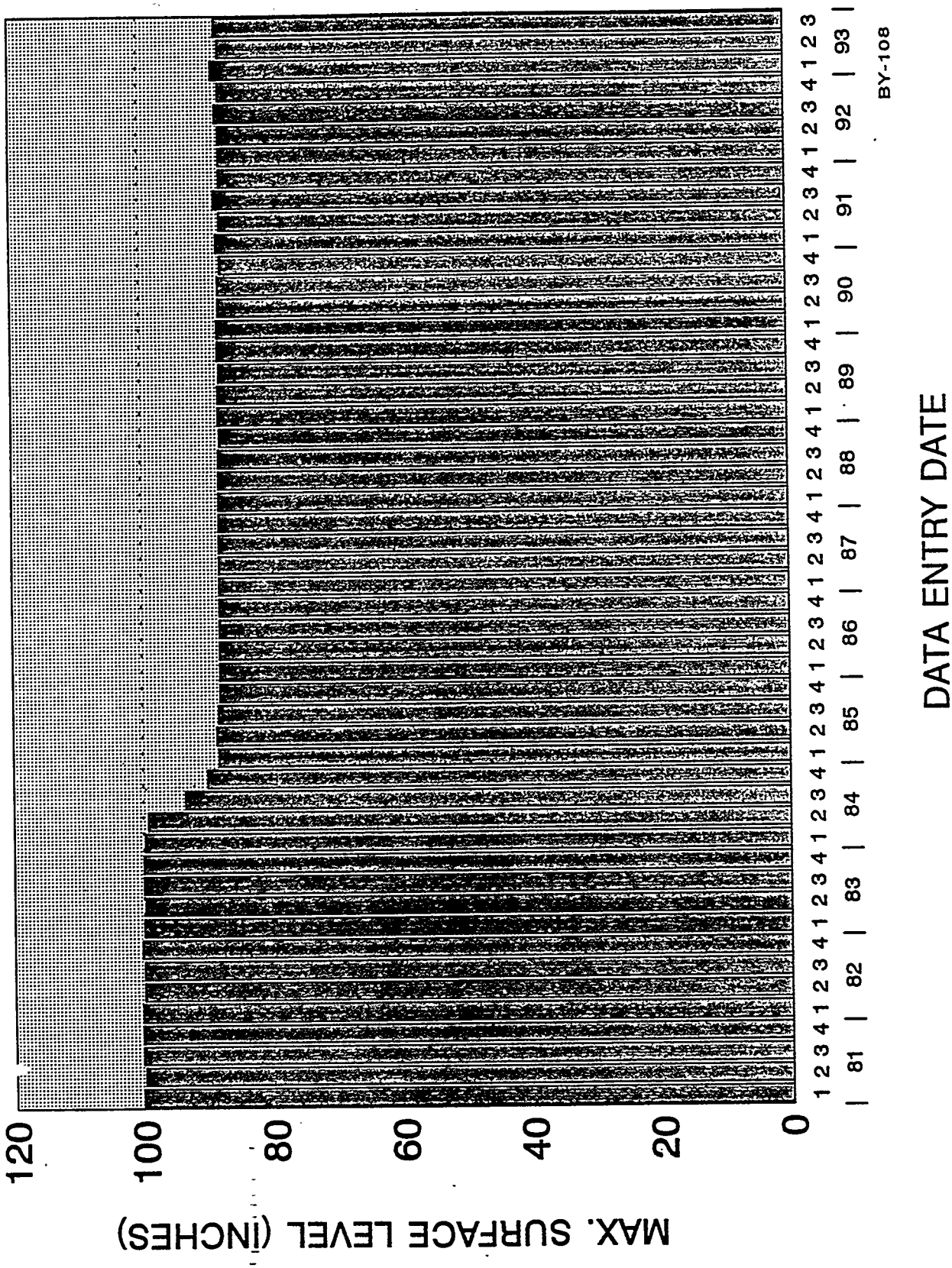

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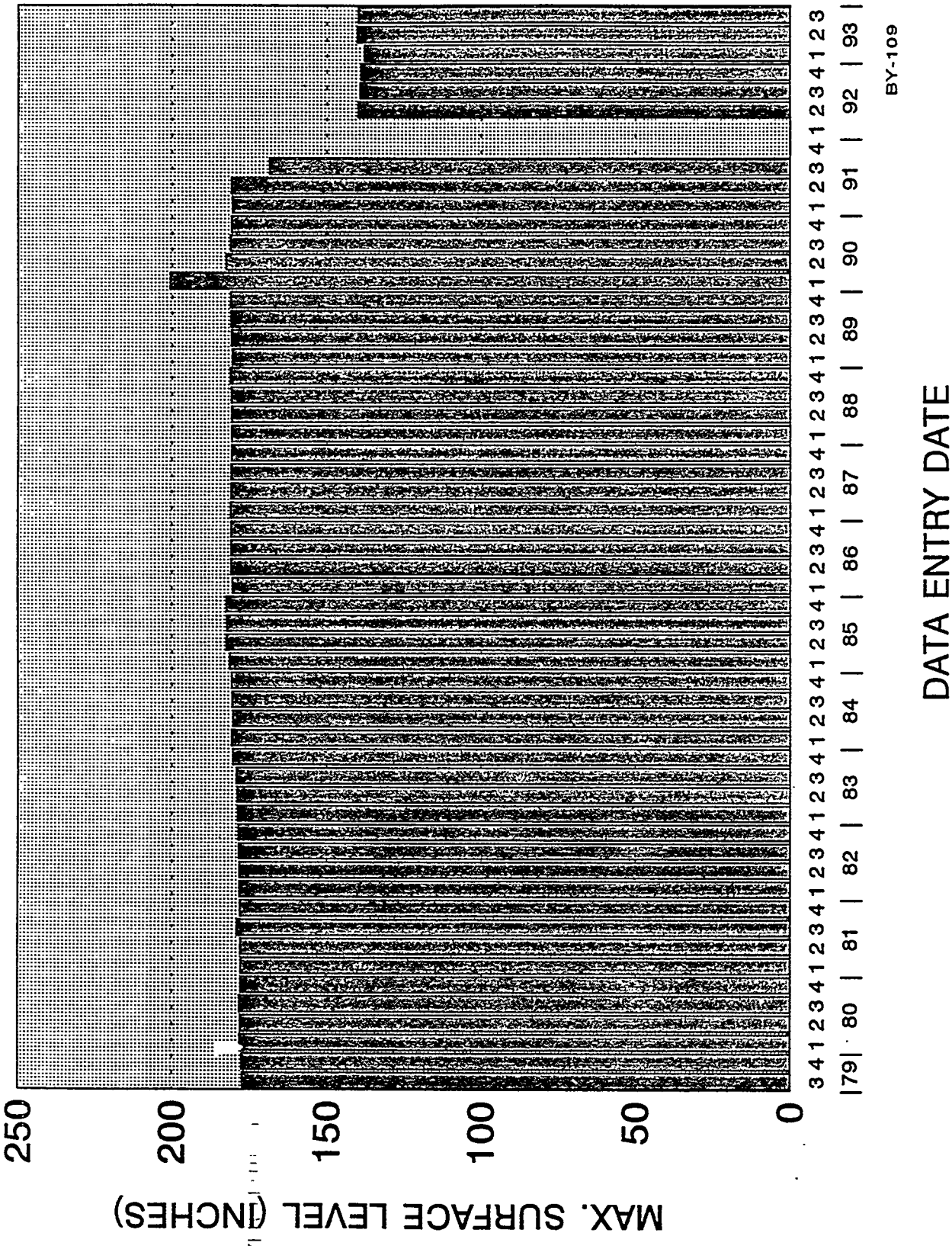

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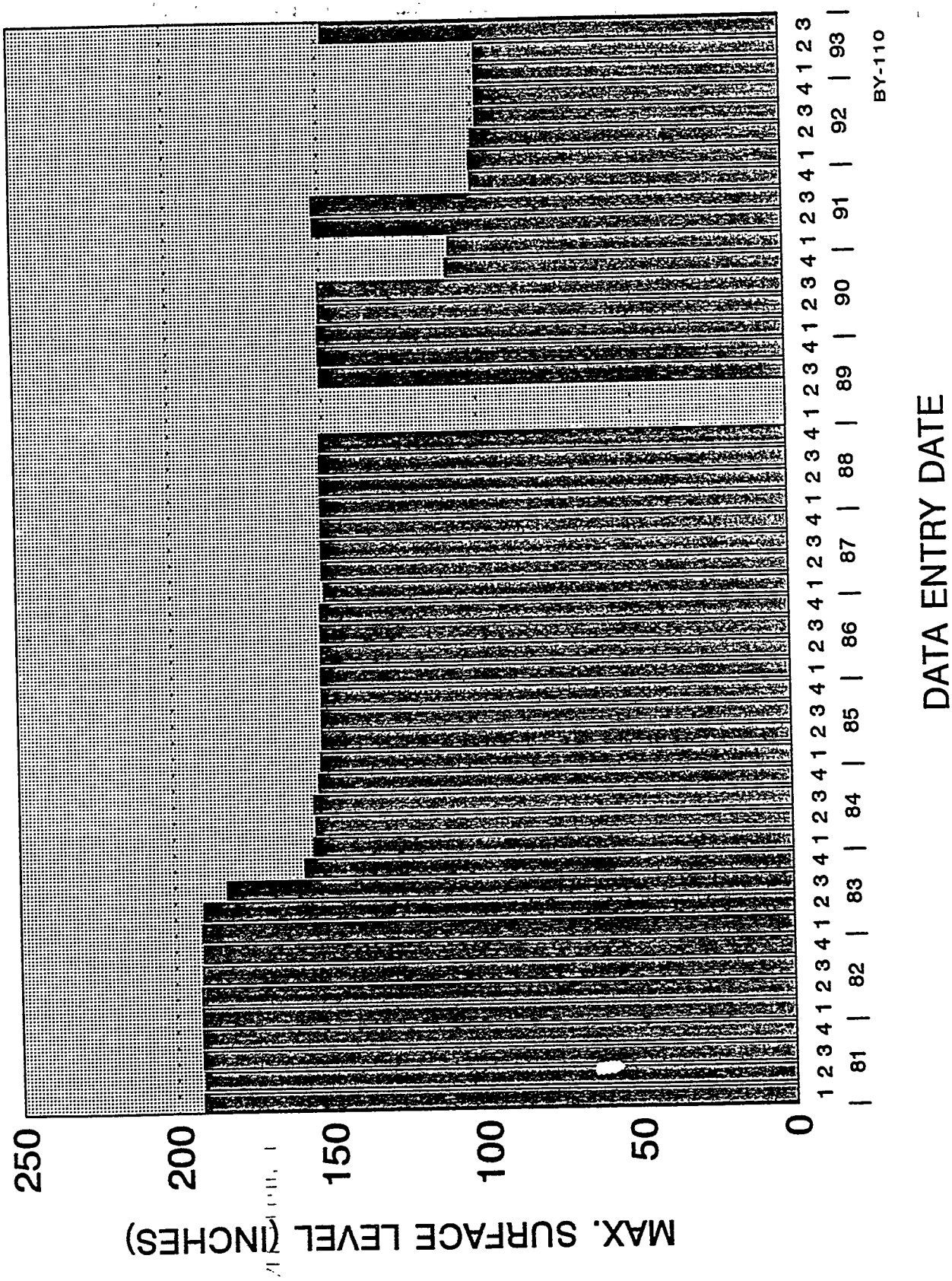

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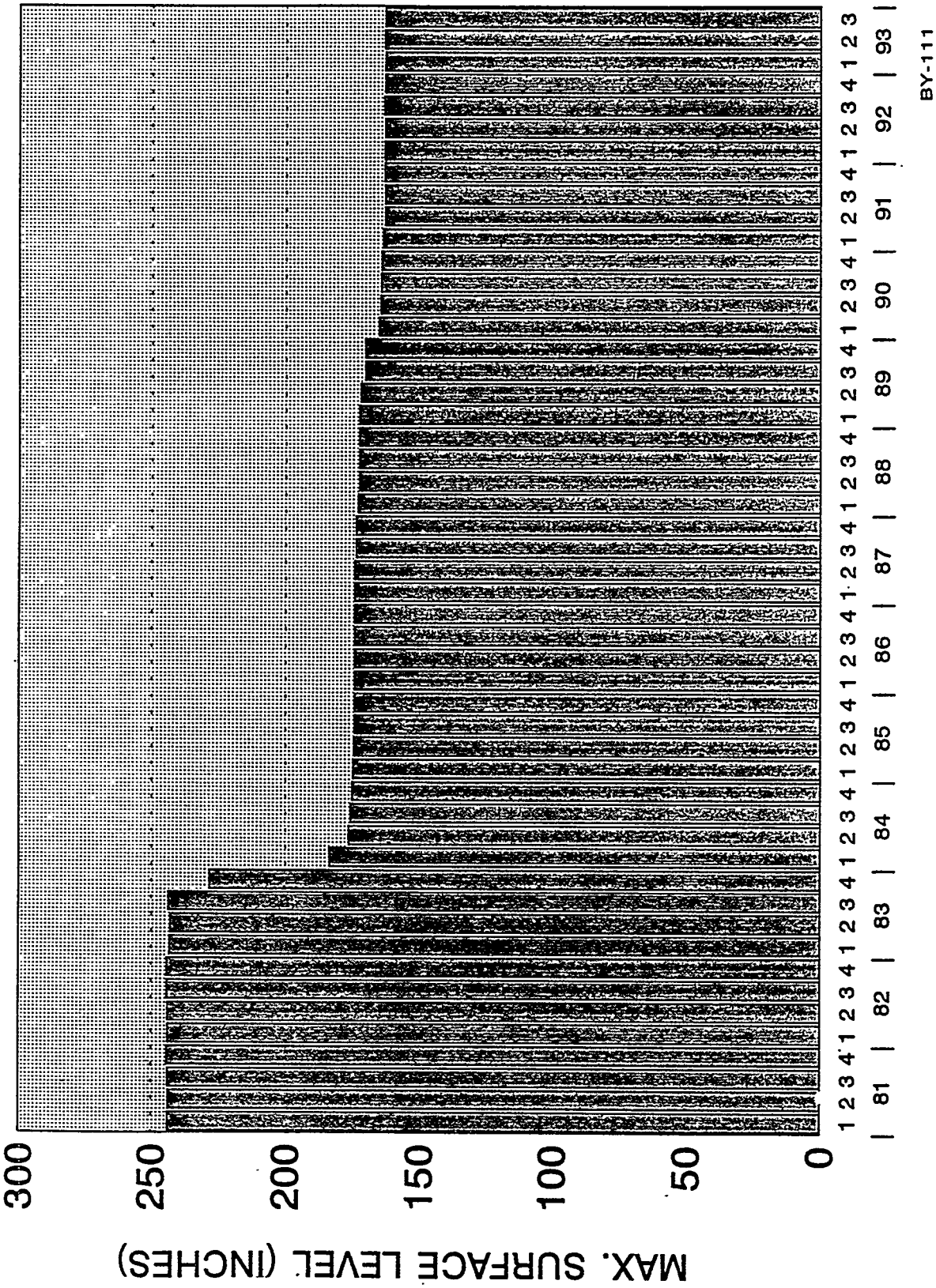

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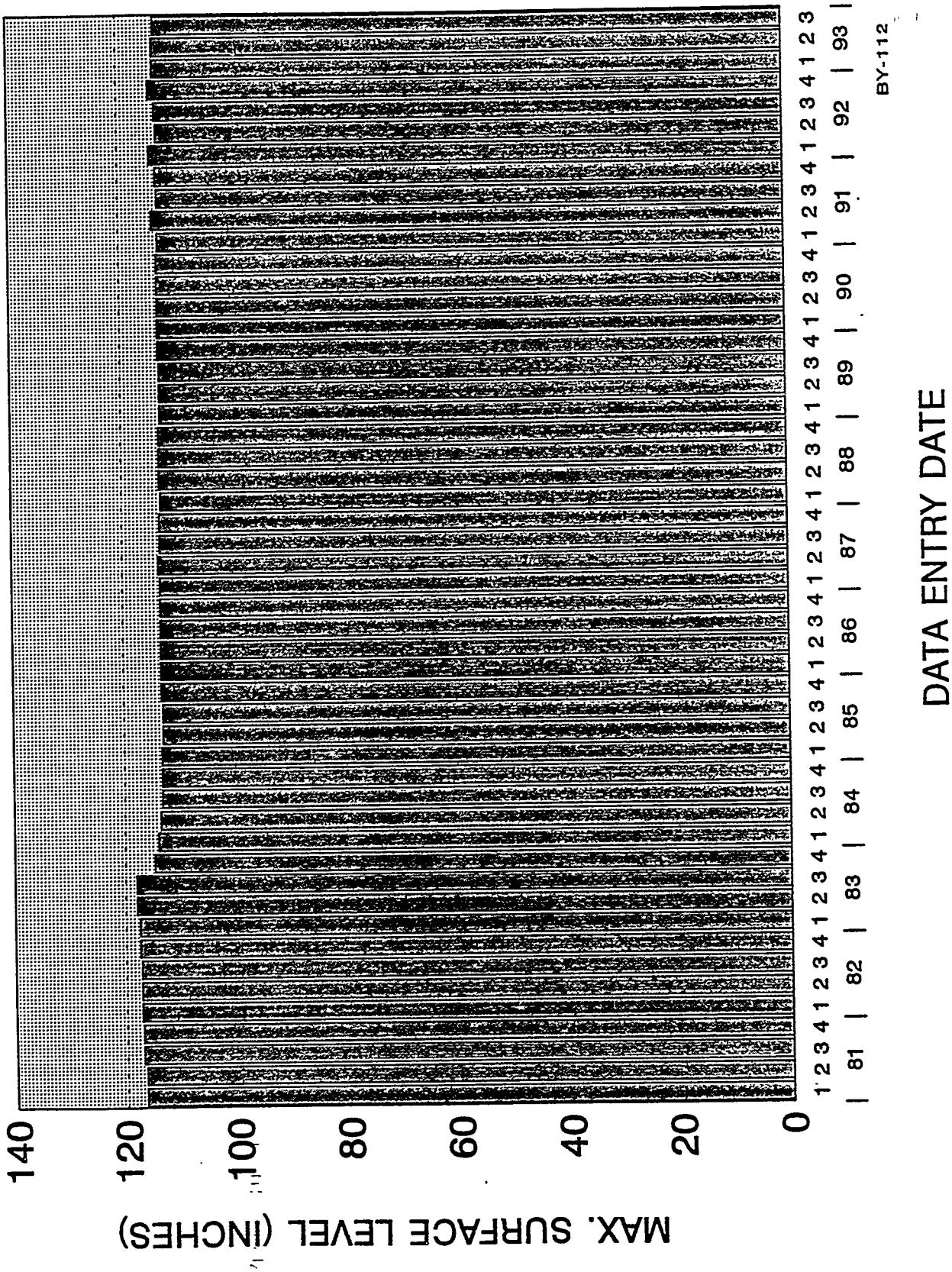

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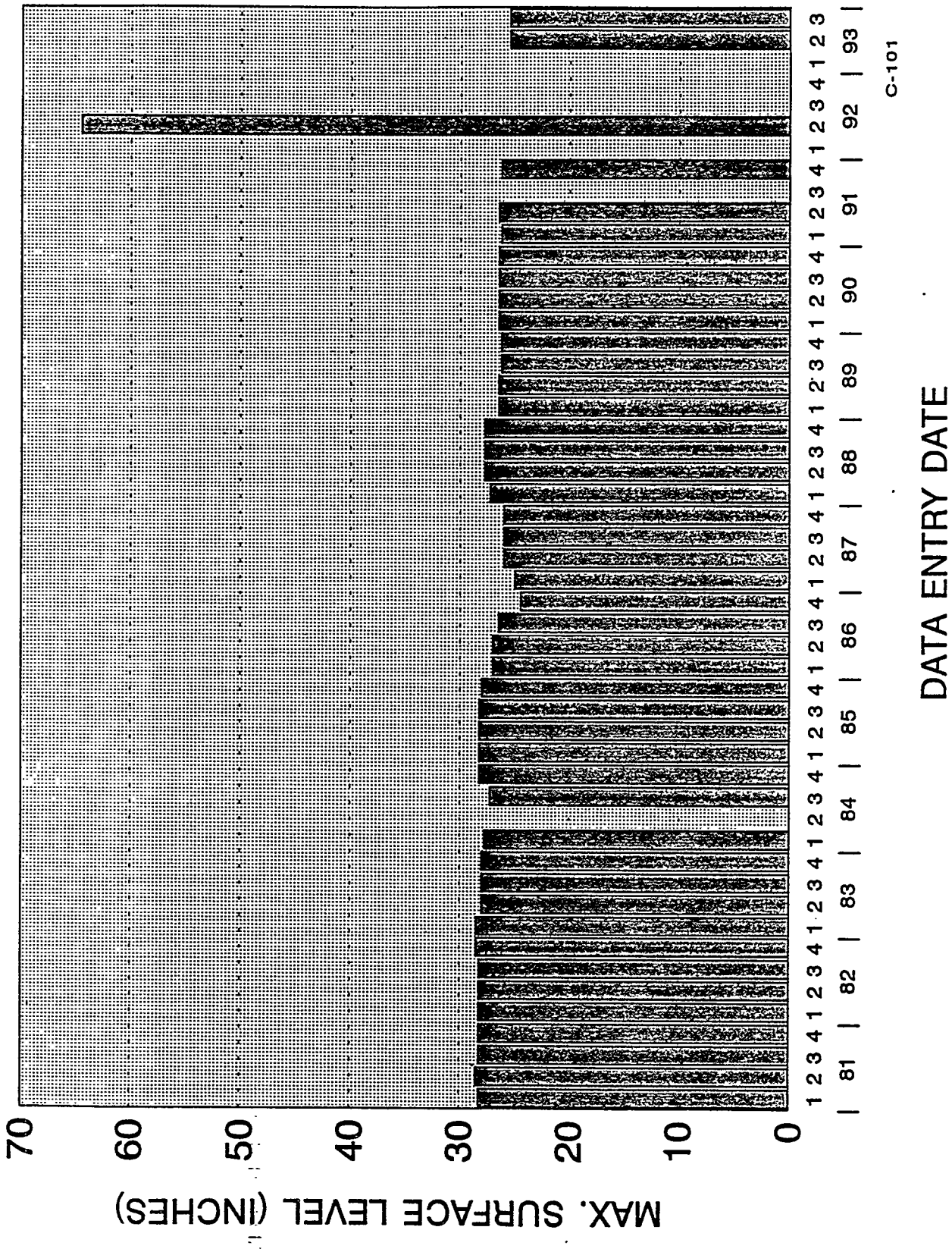

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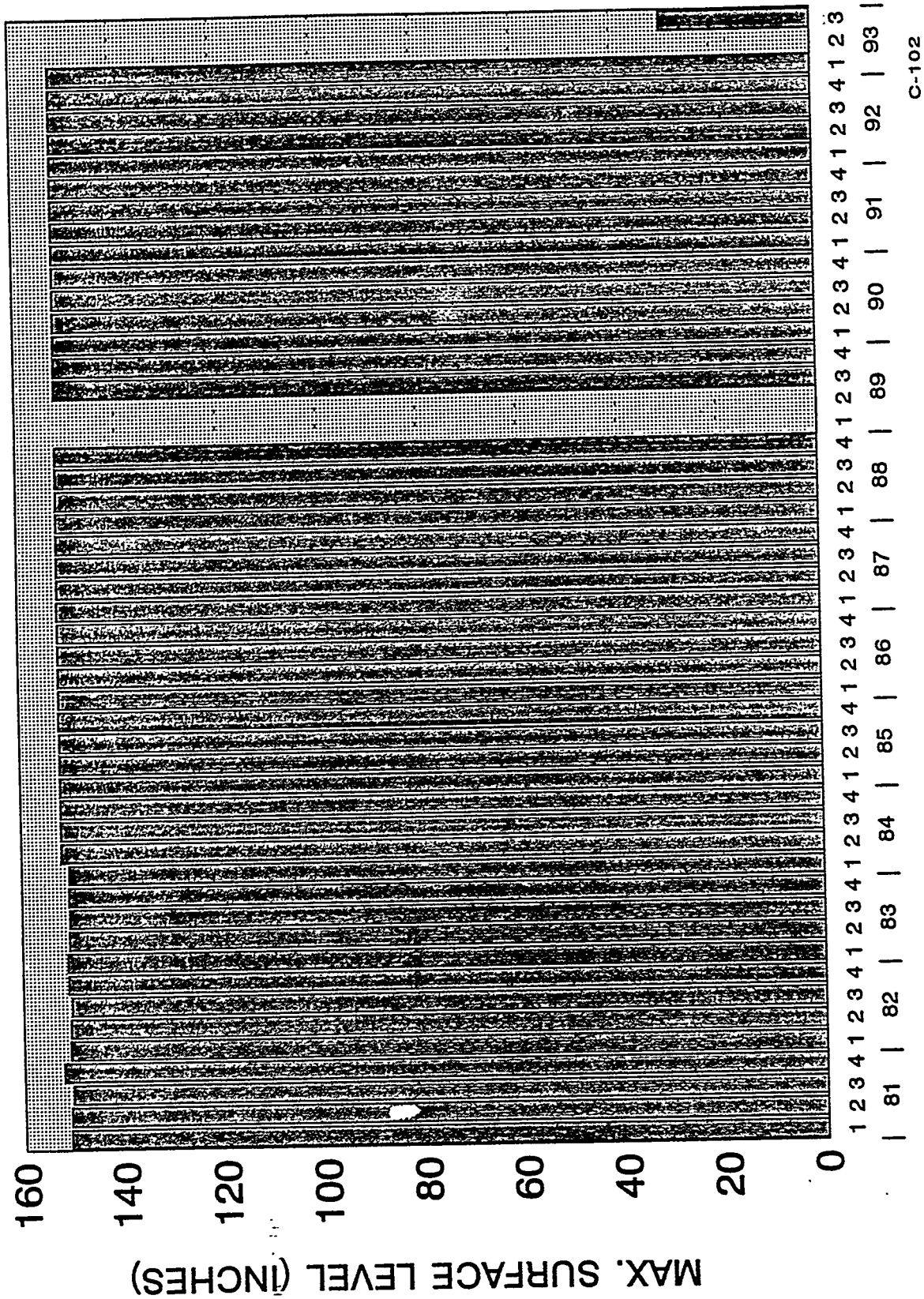

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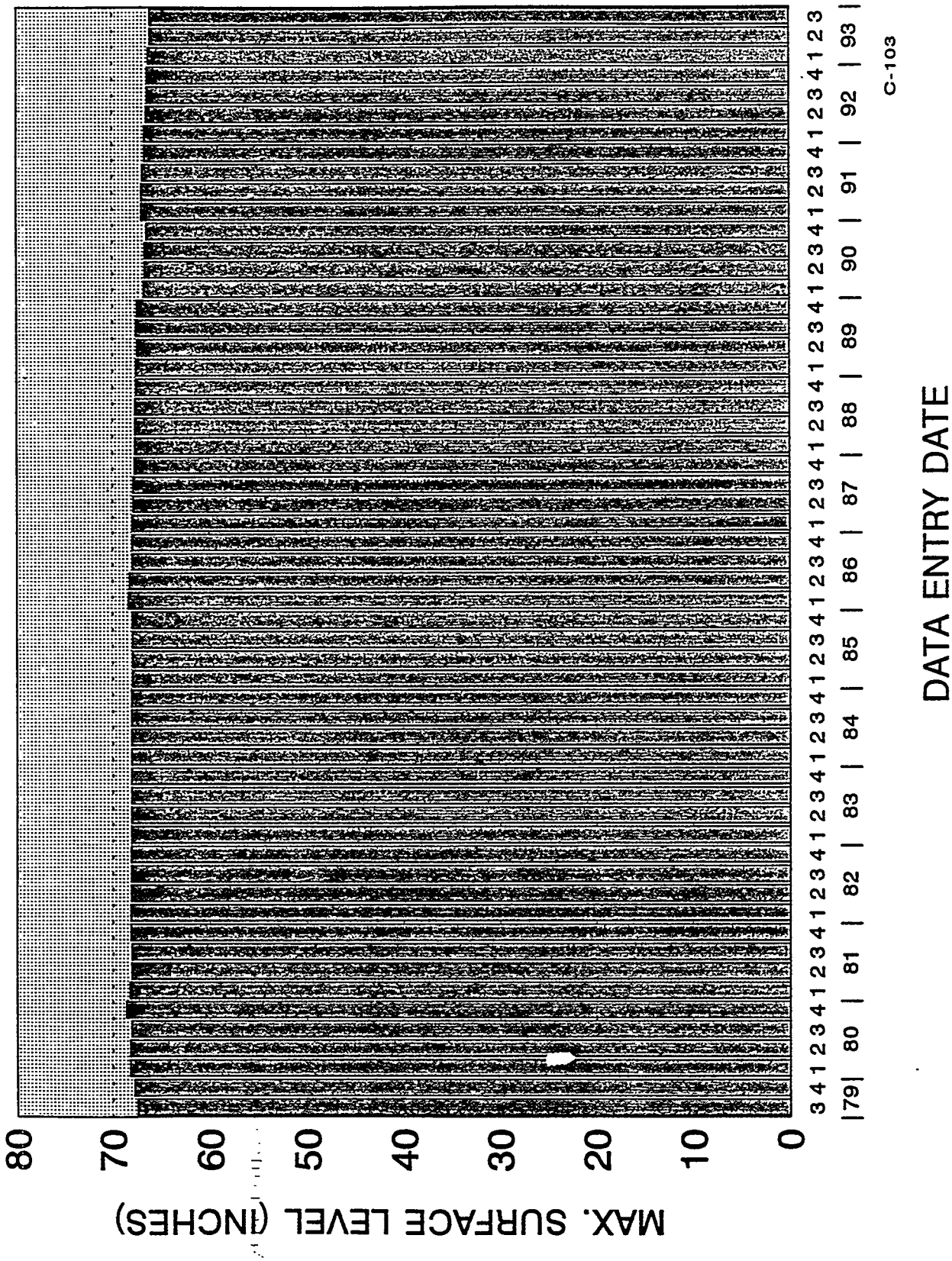

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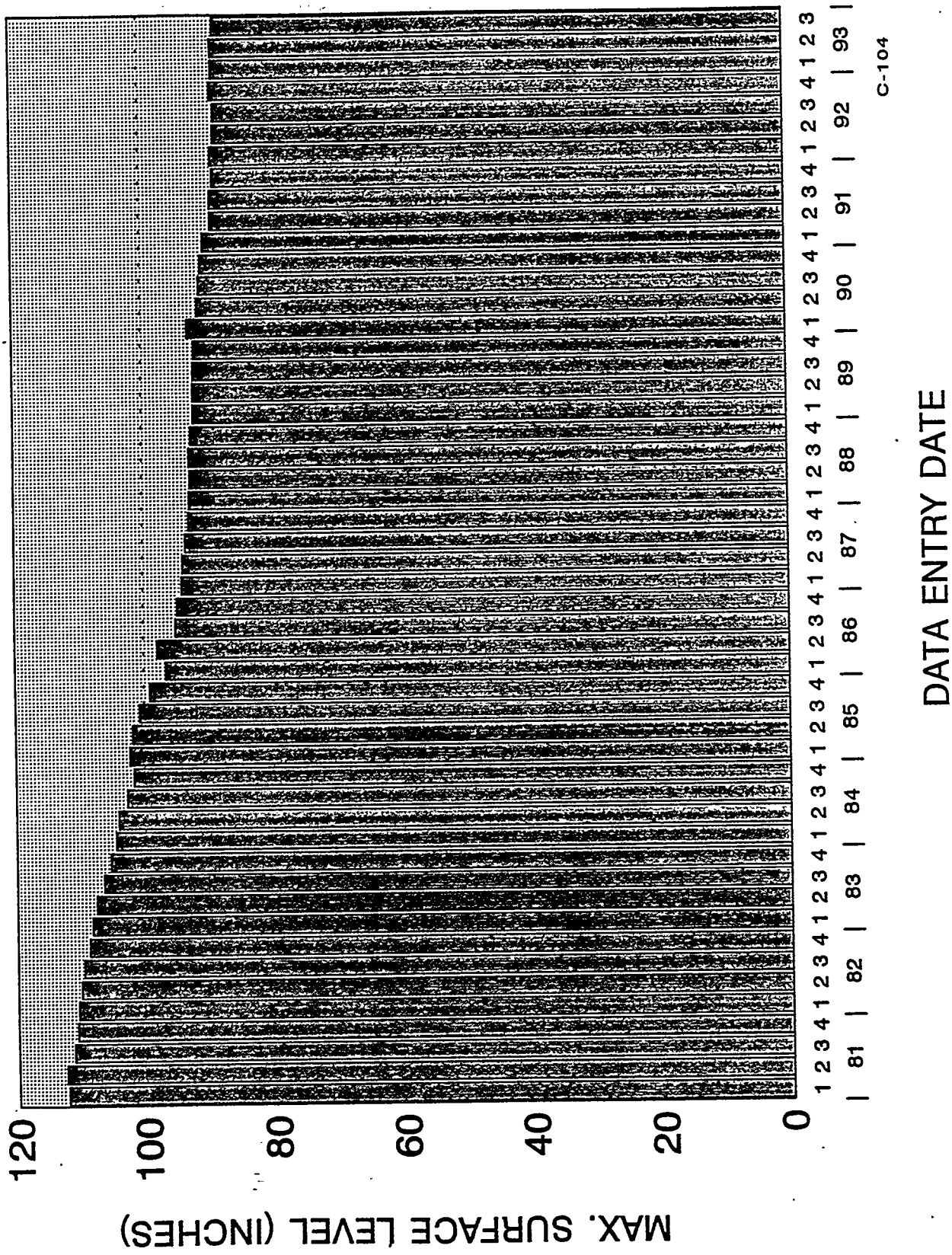

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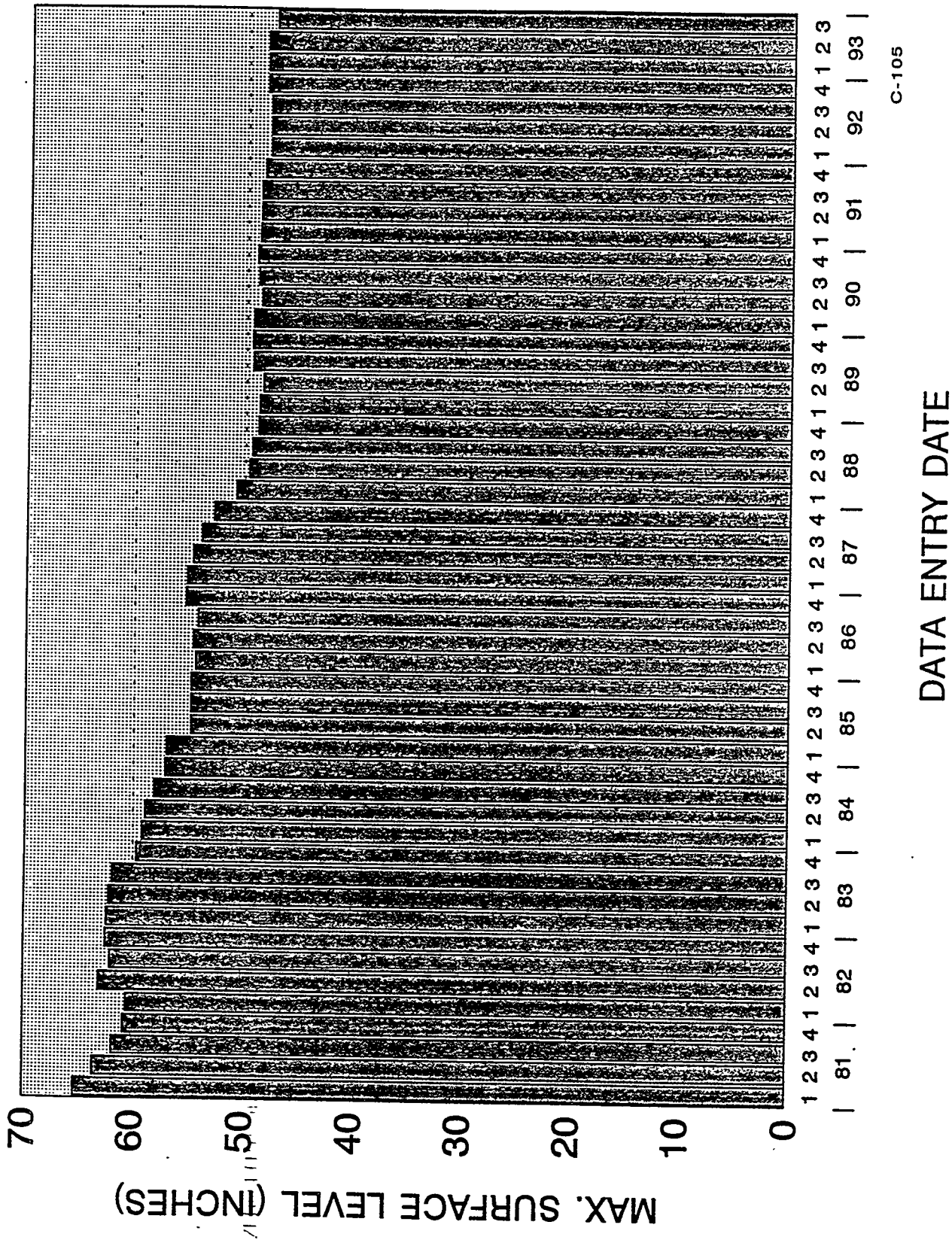

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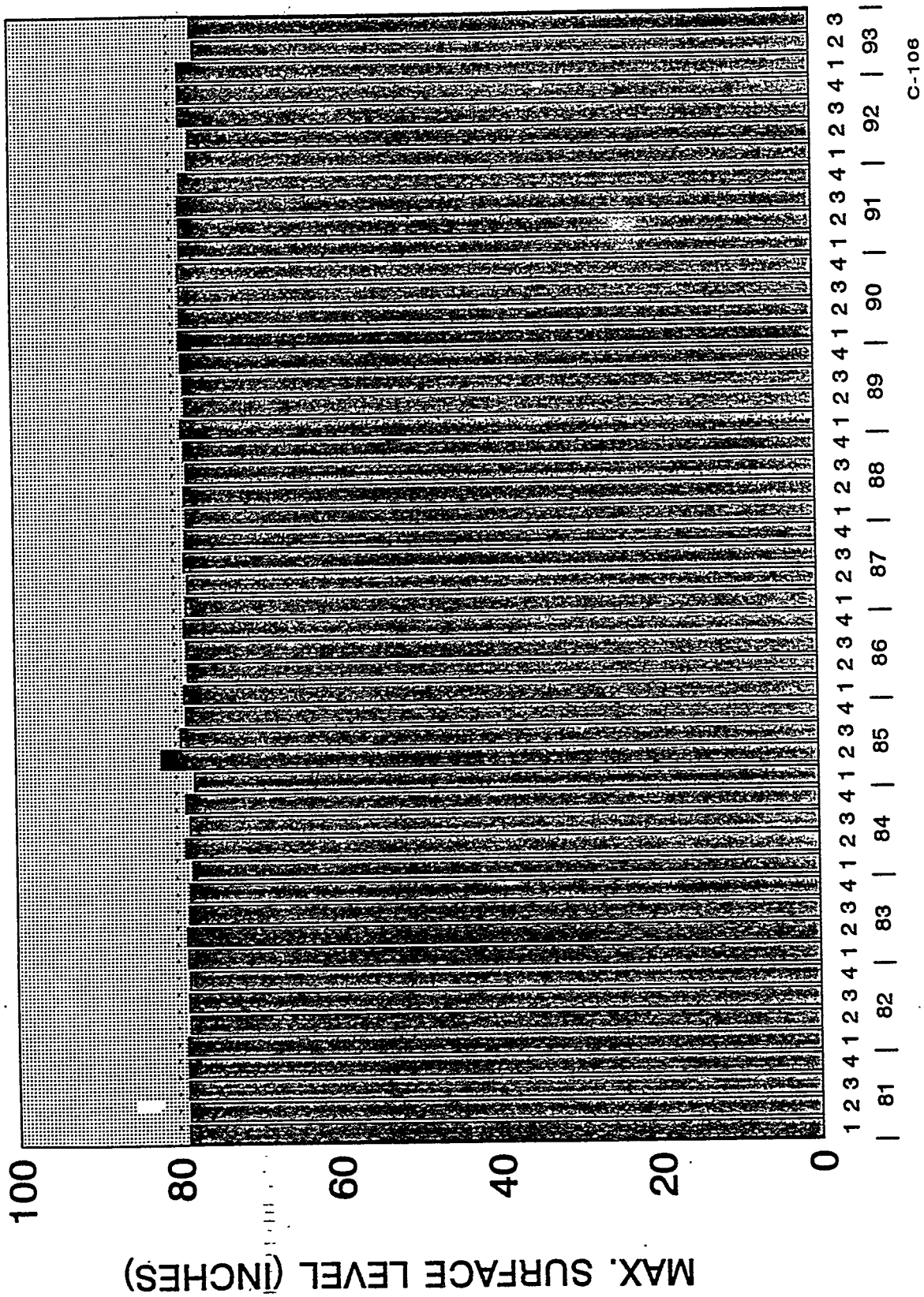

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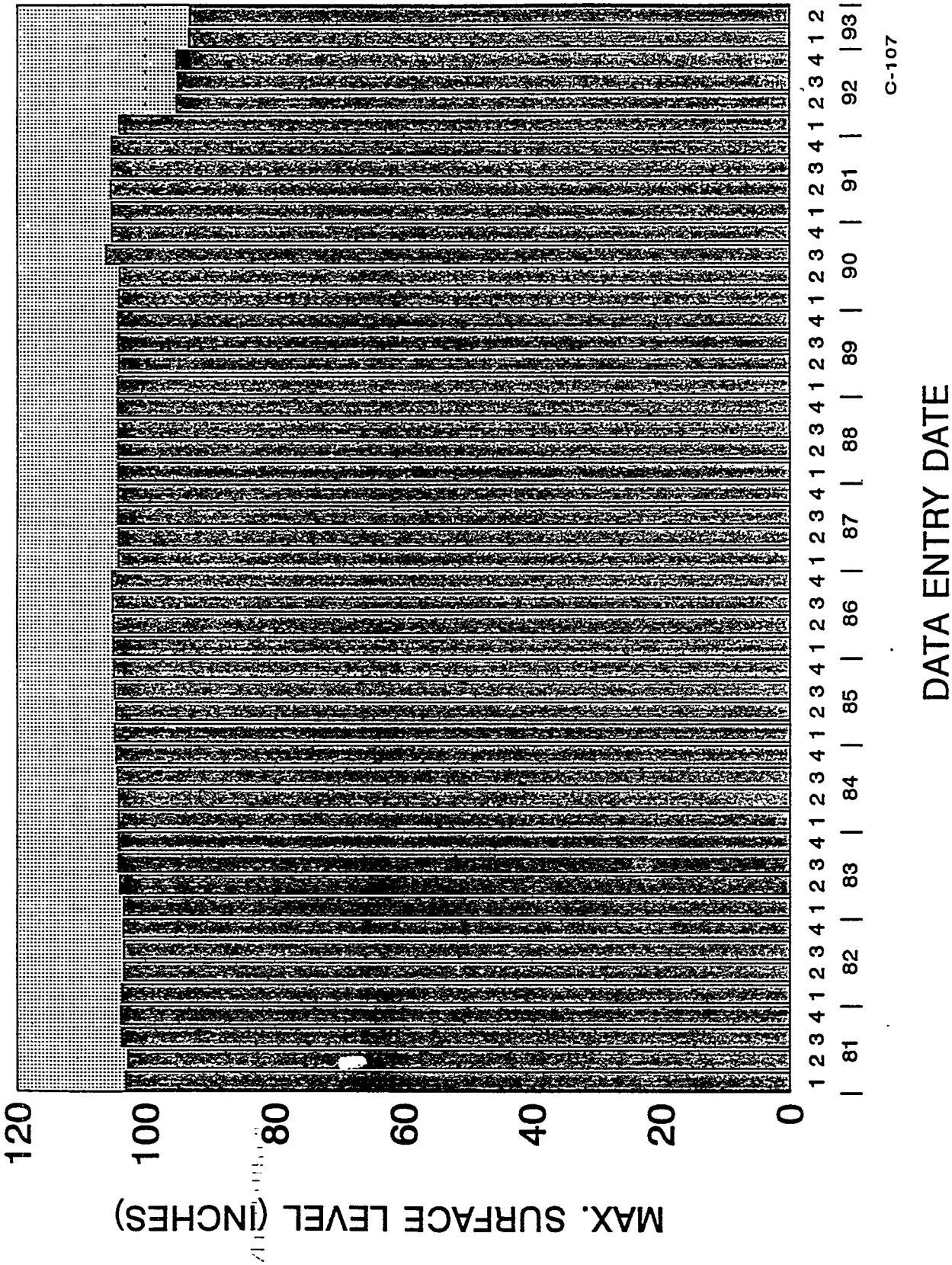
Quarterly Maximum Surface-Level History Plot



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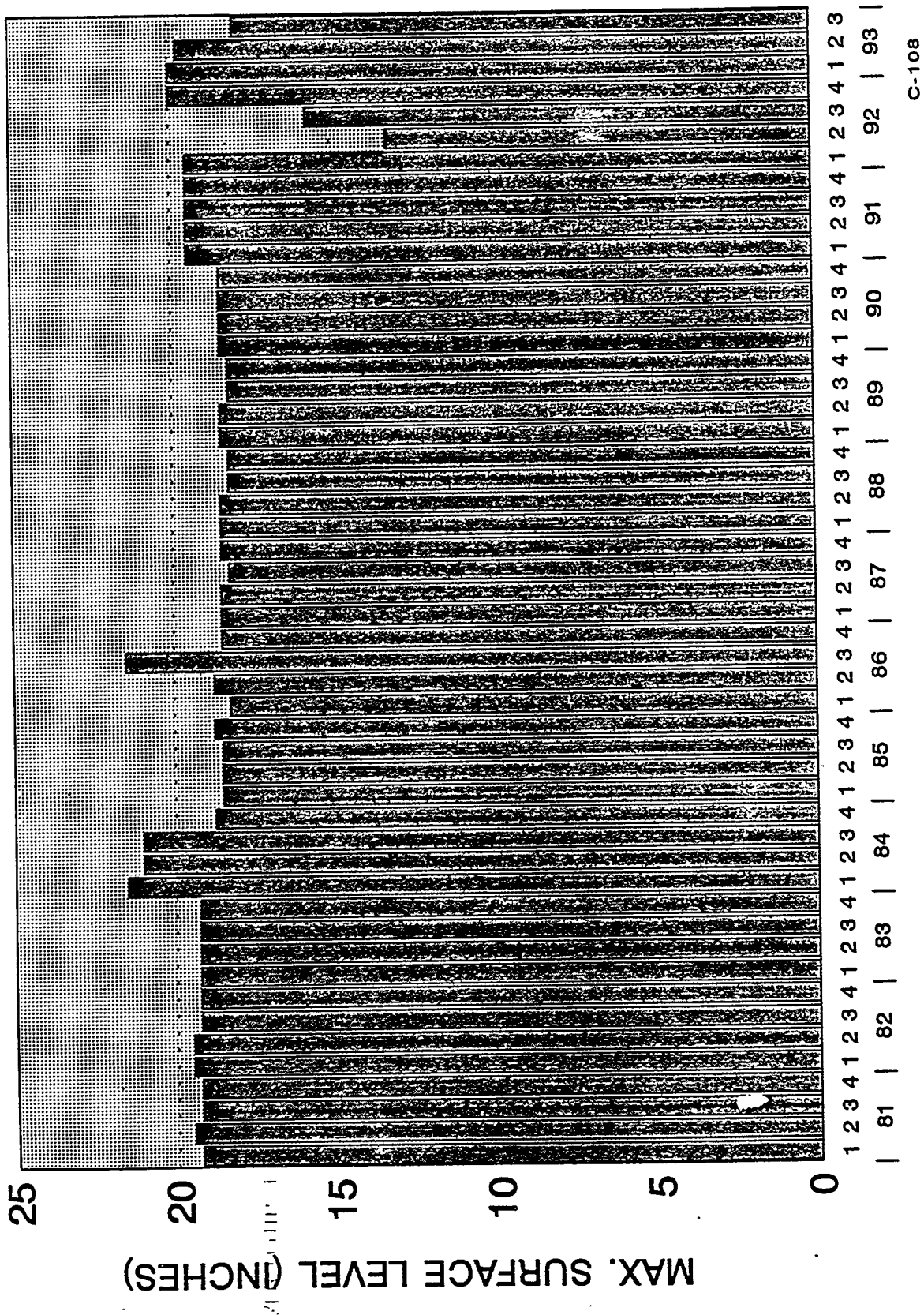

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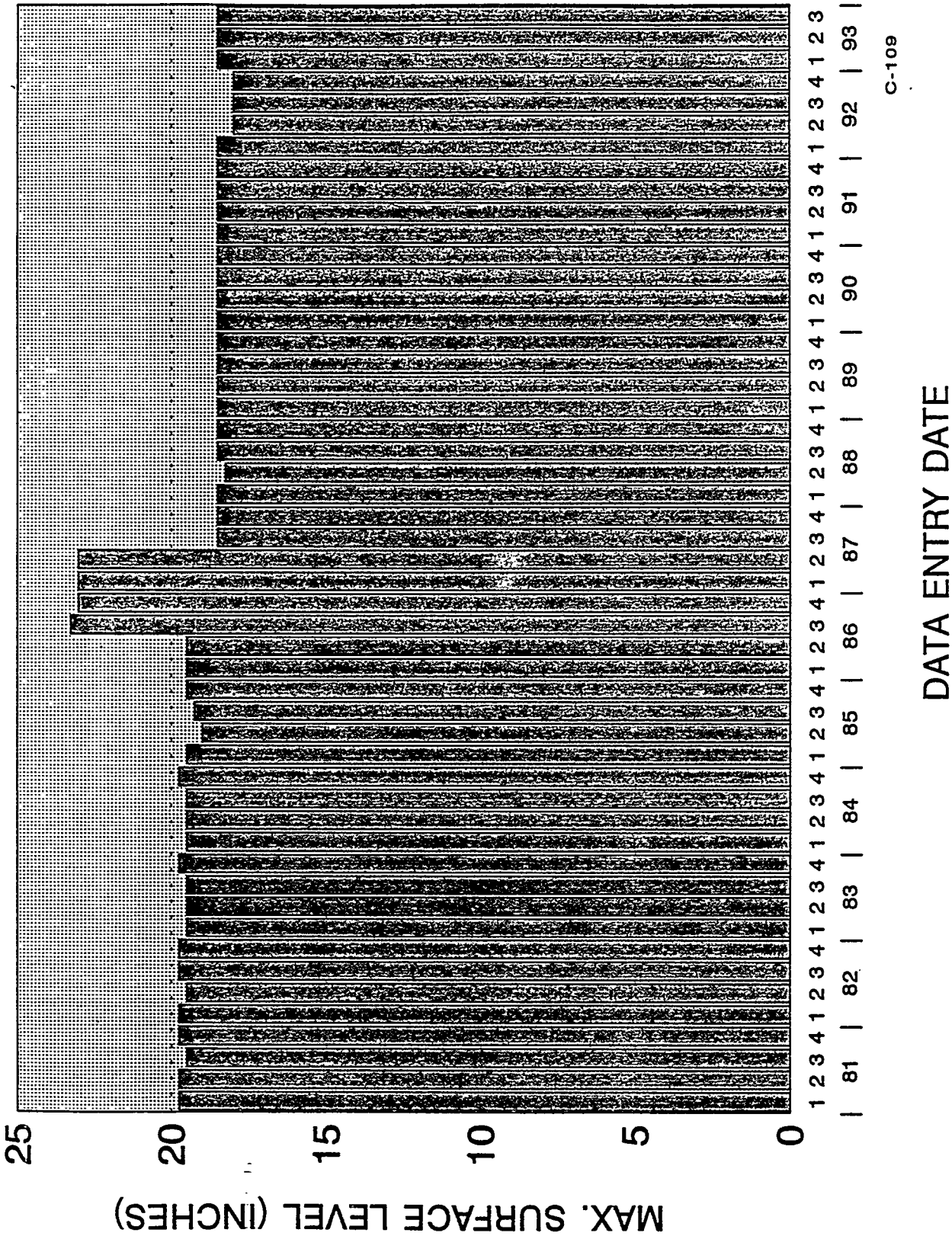

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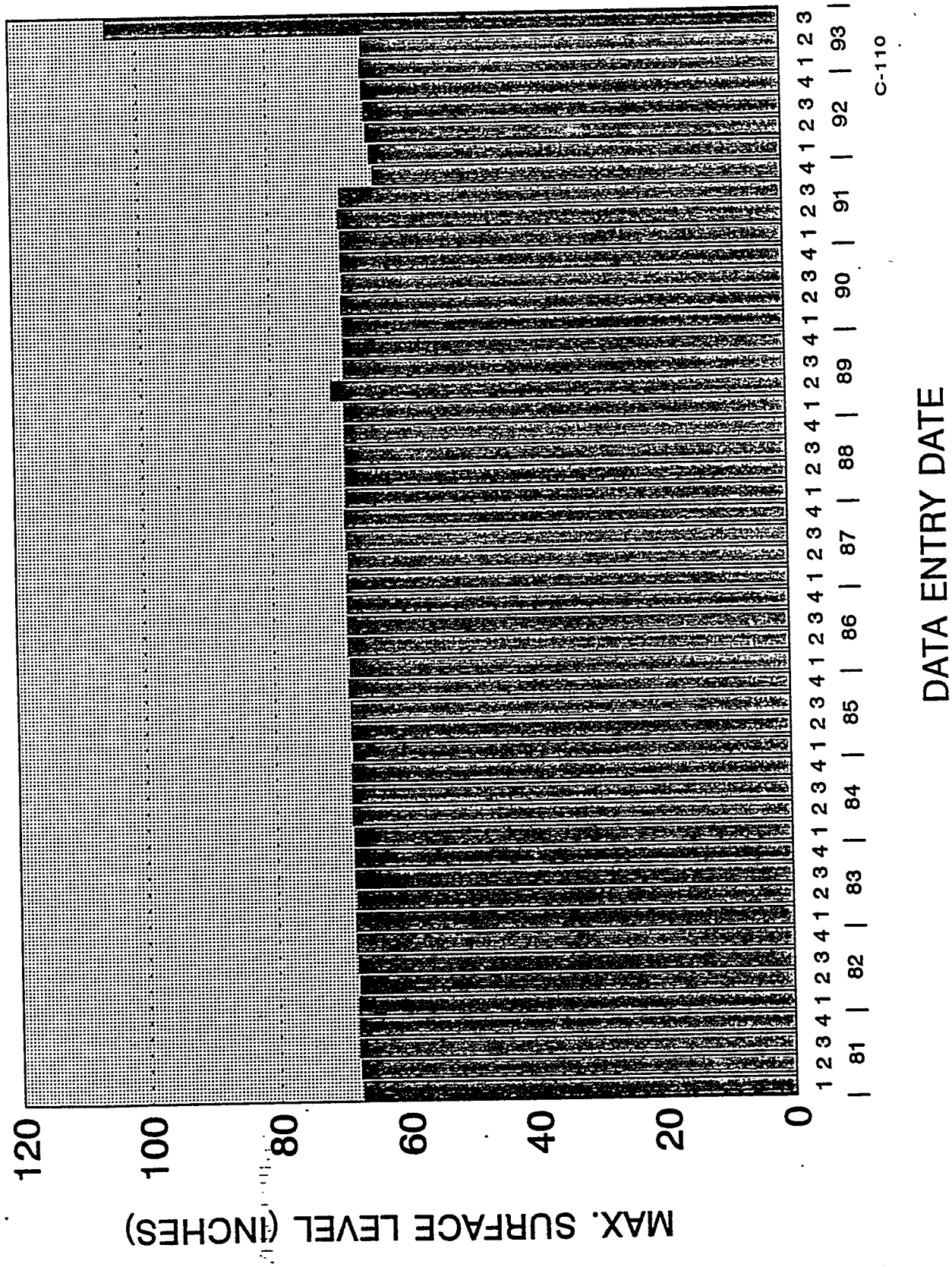

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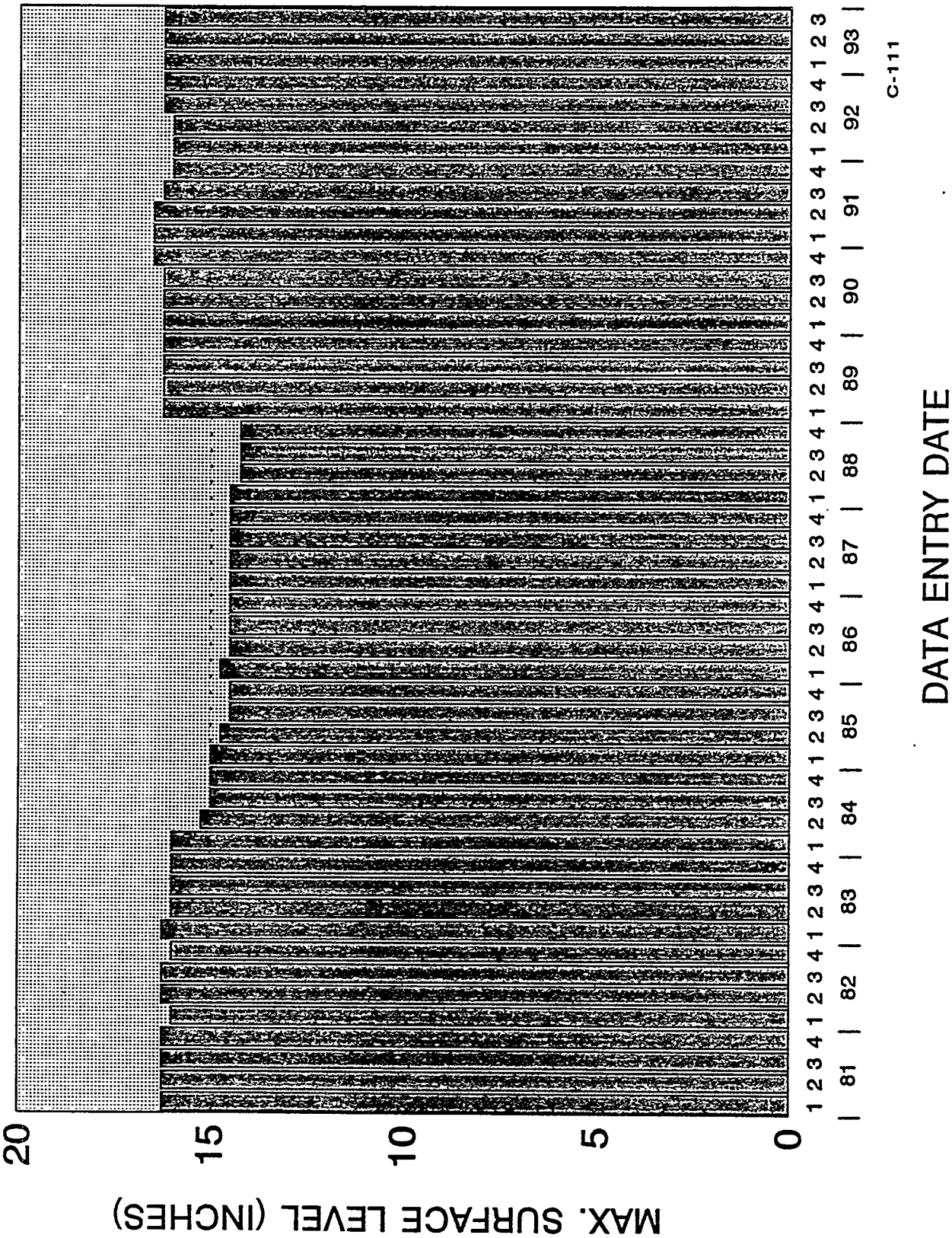

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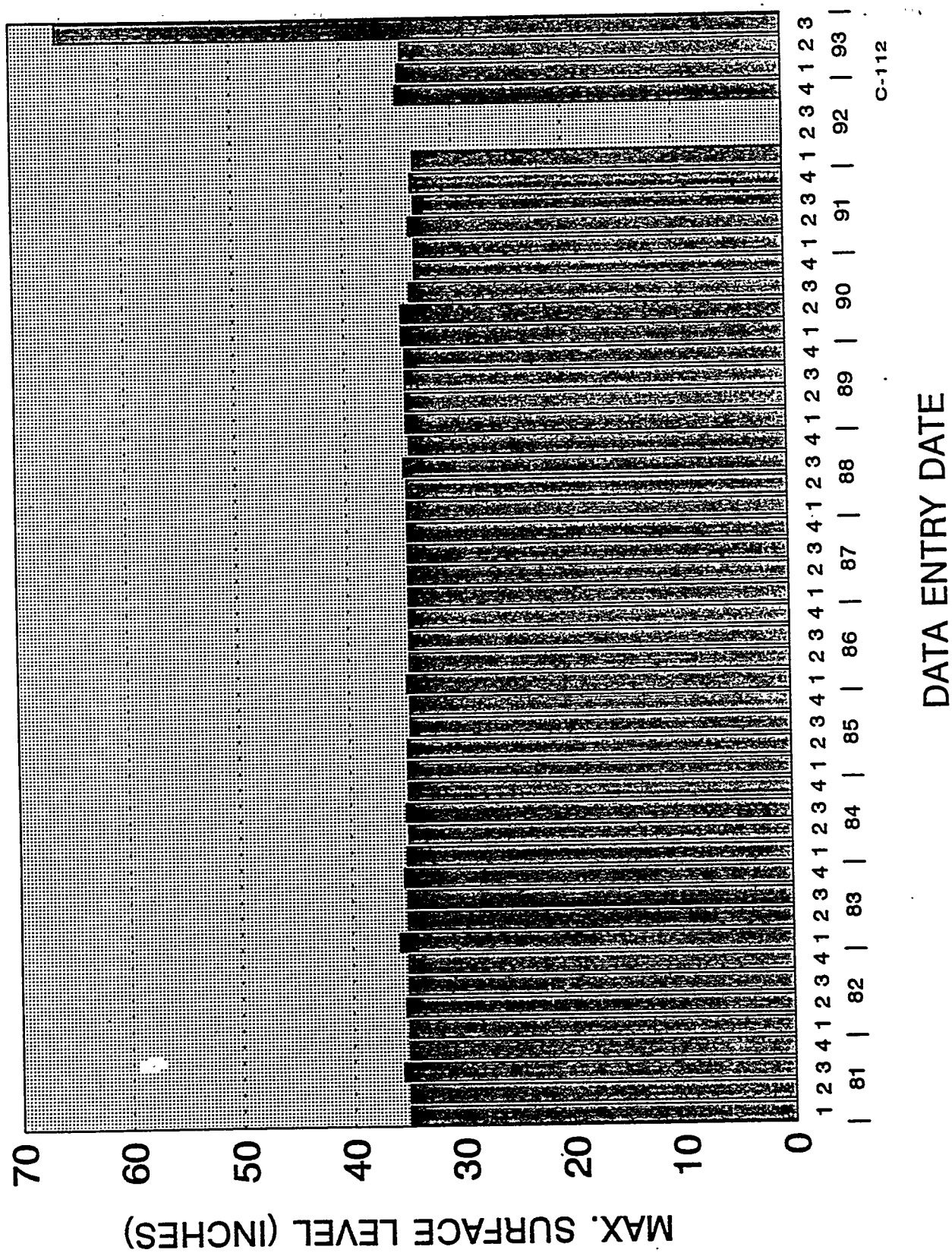

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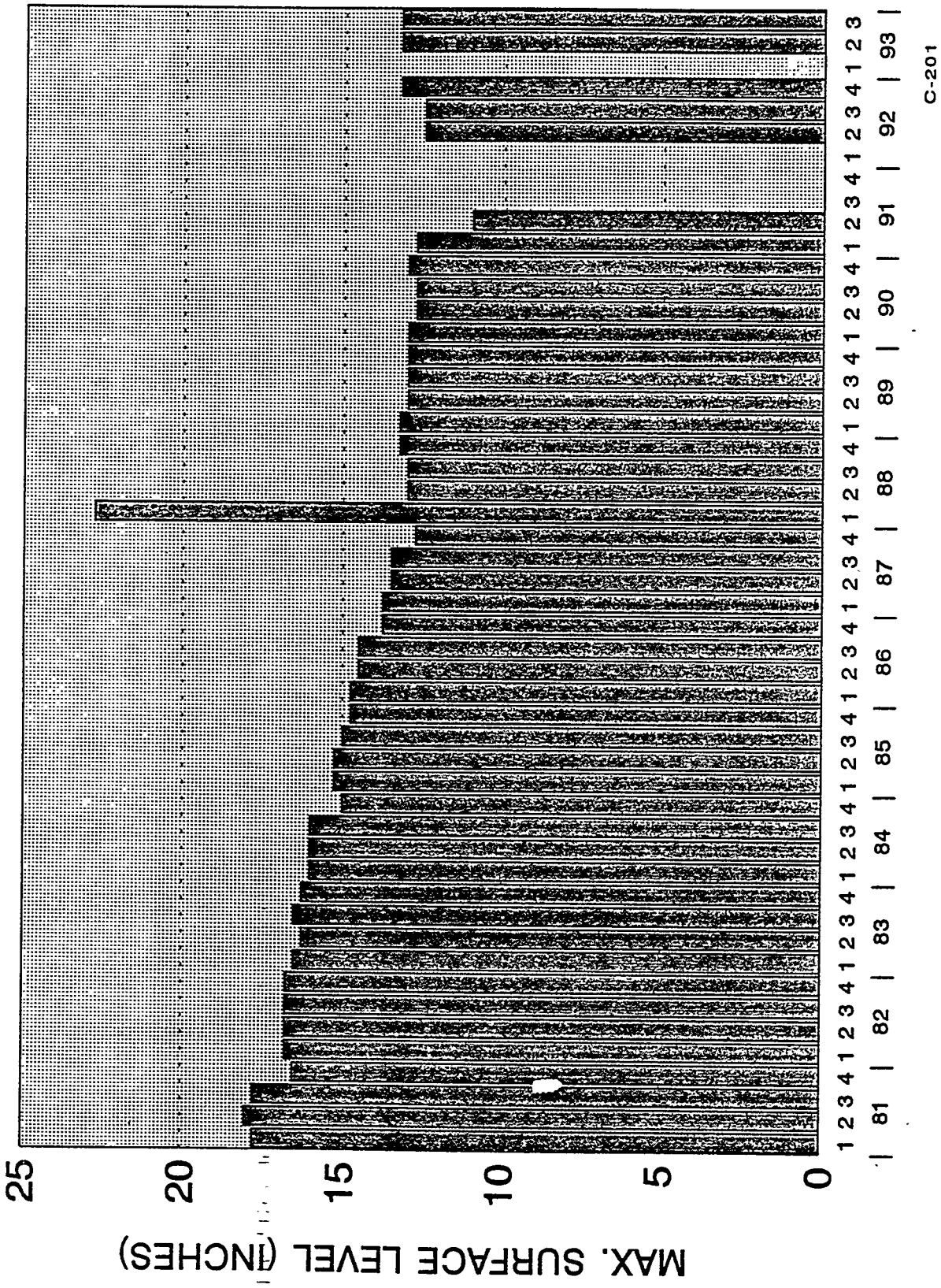

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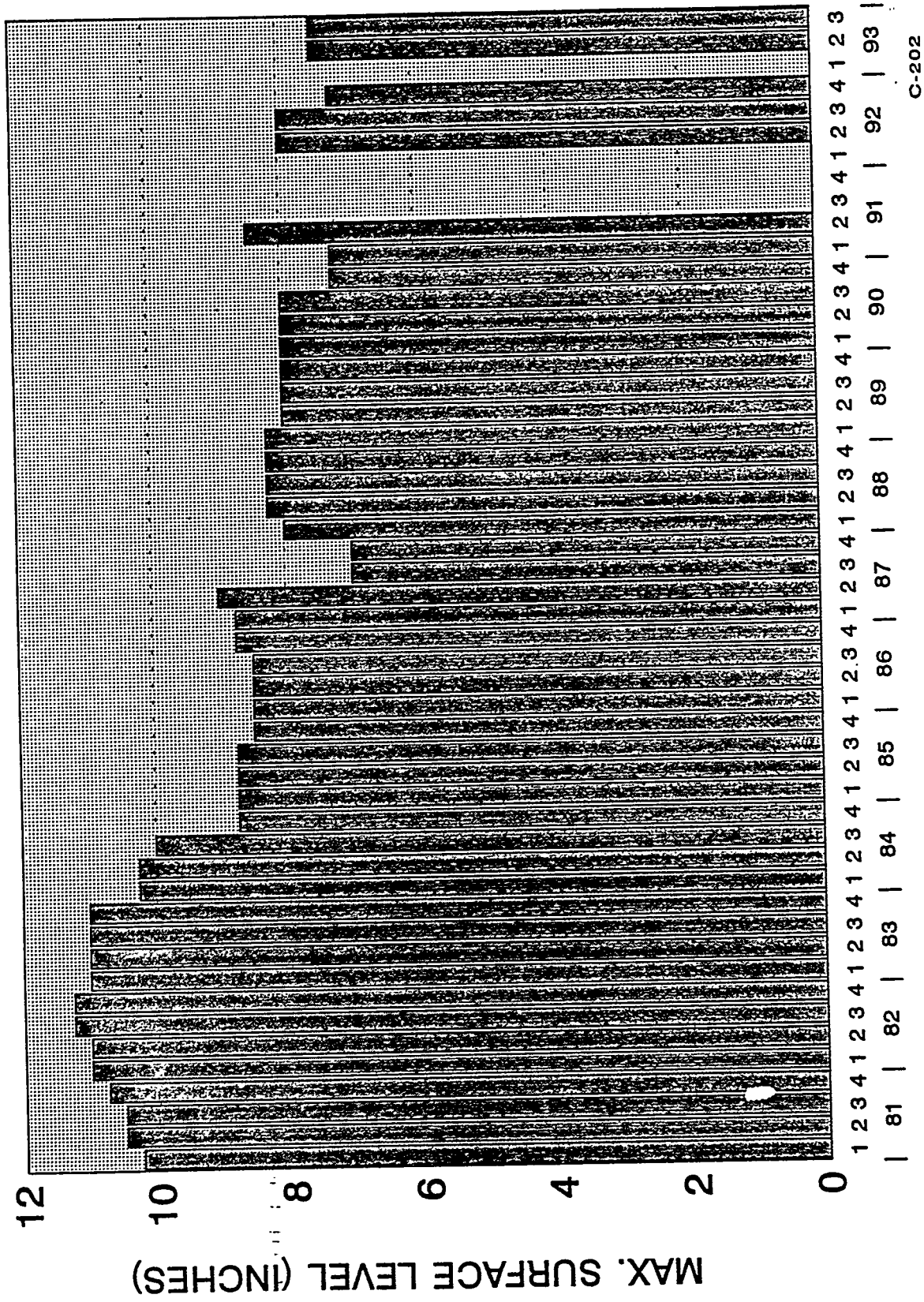

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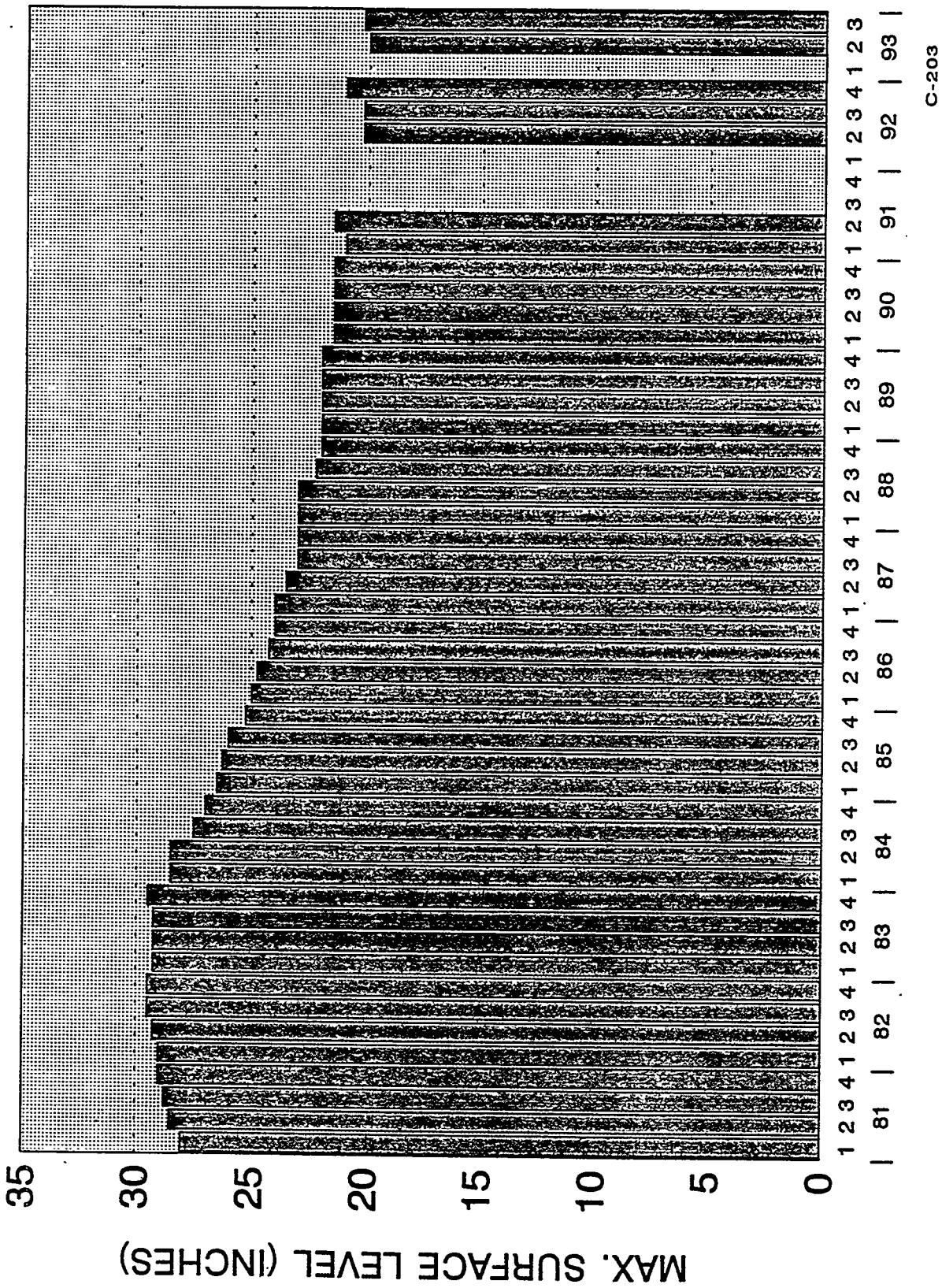

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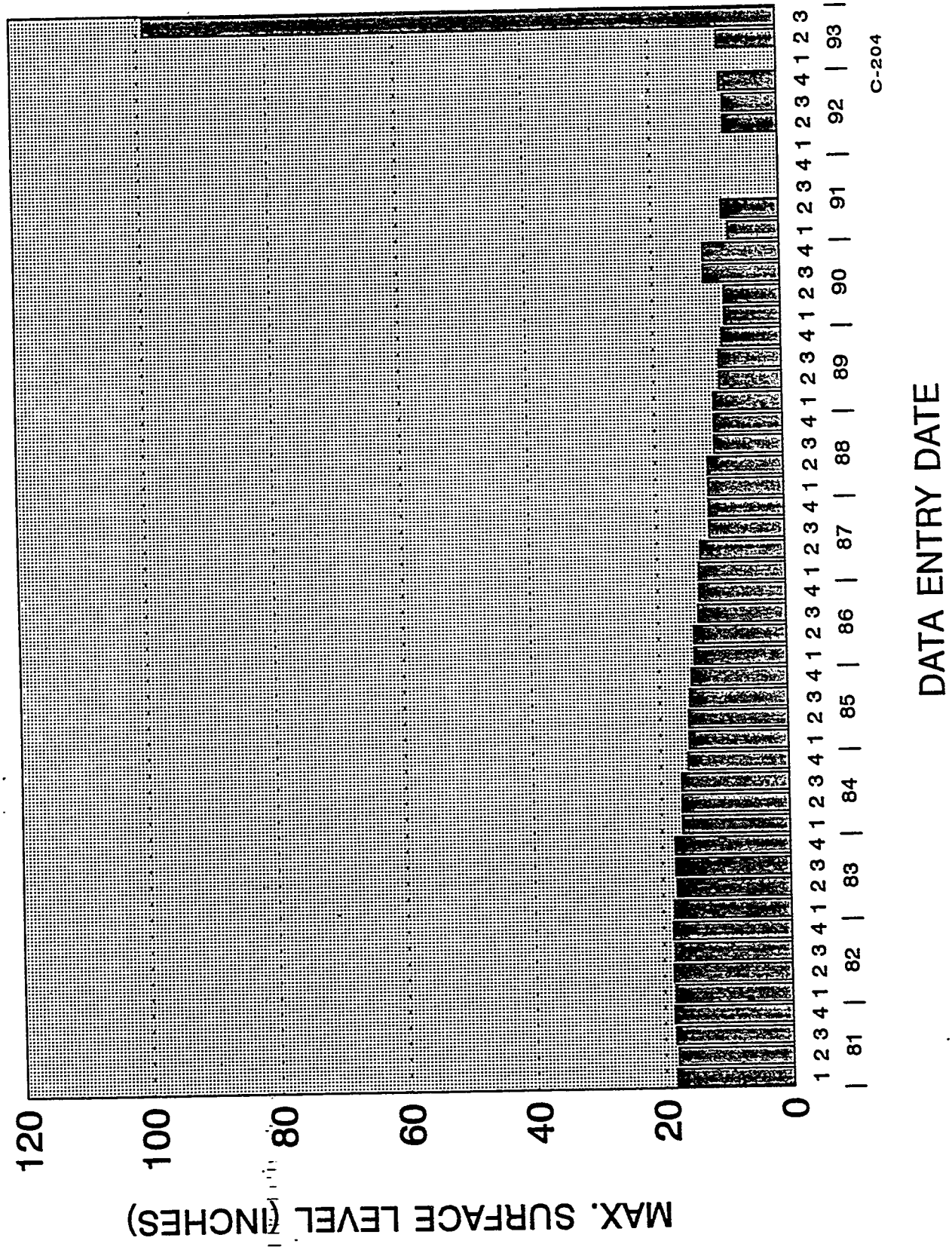

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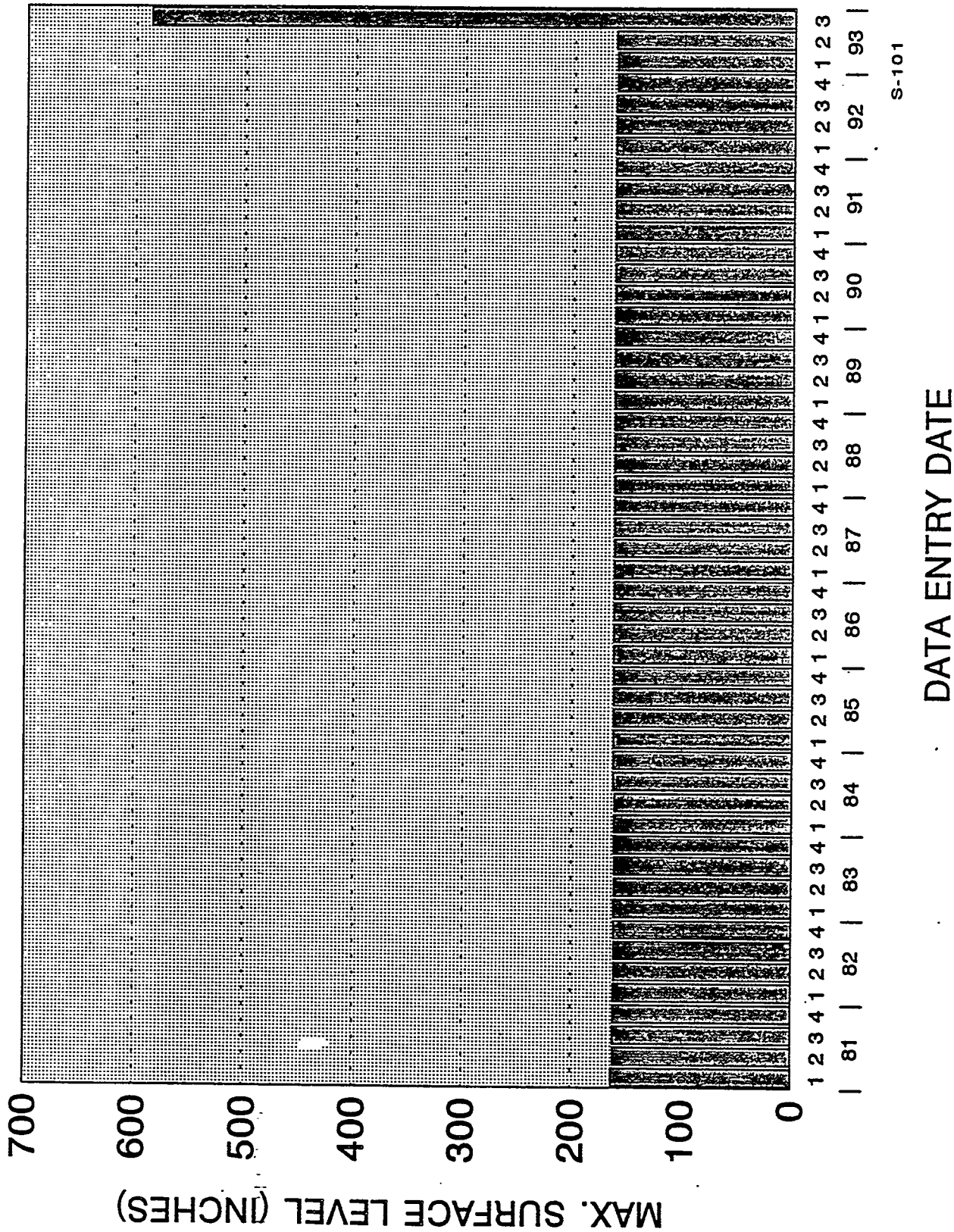

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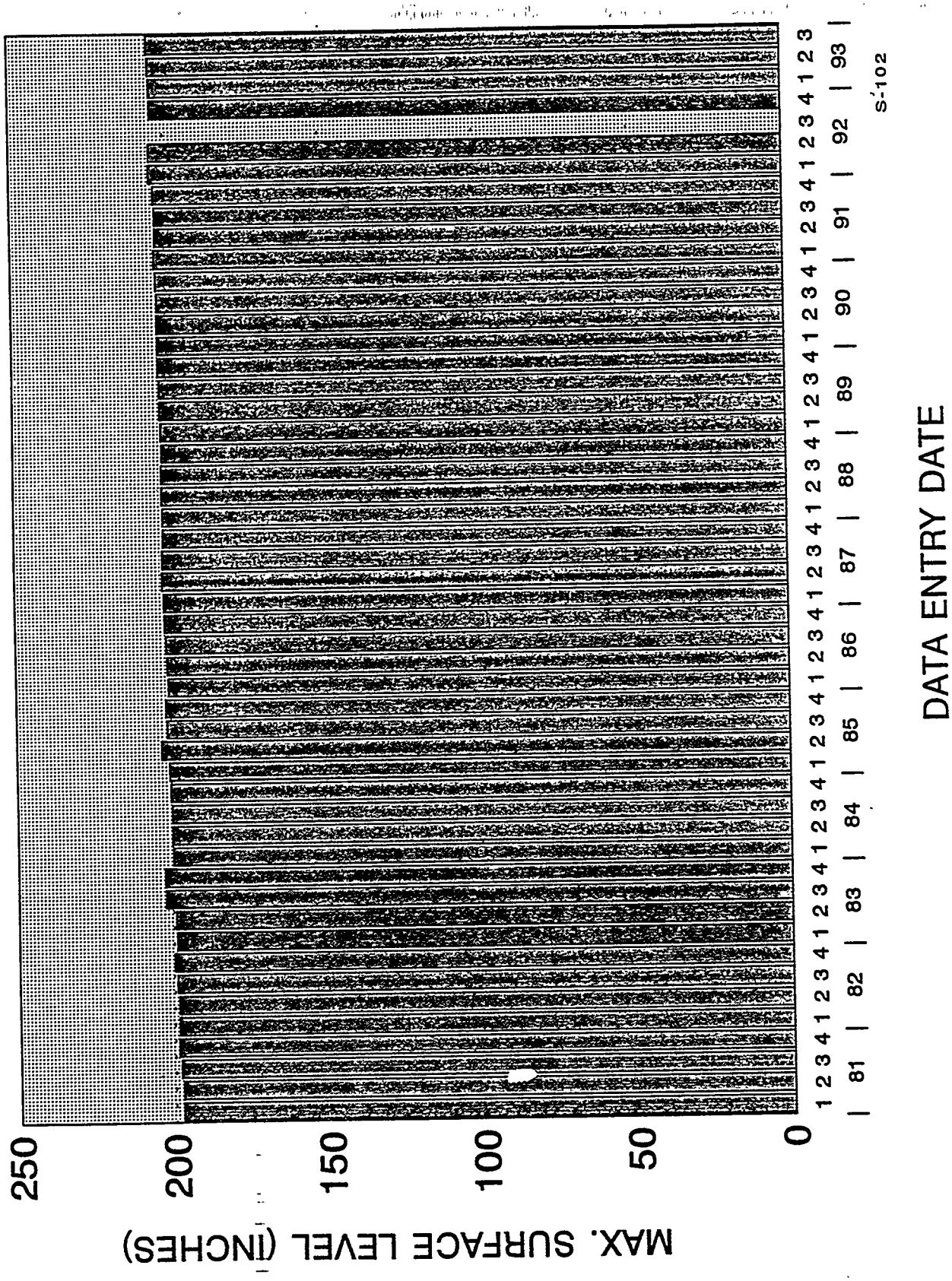

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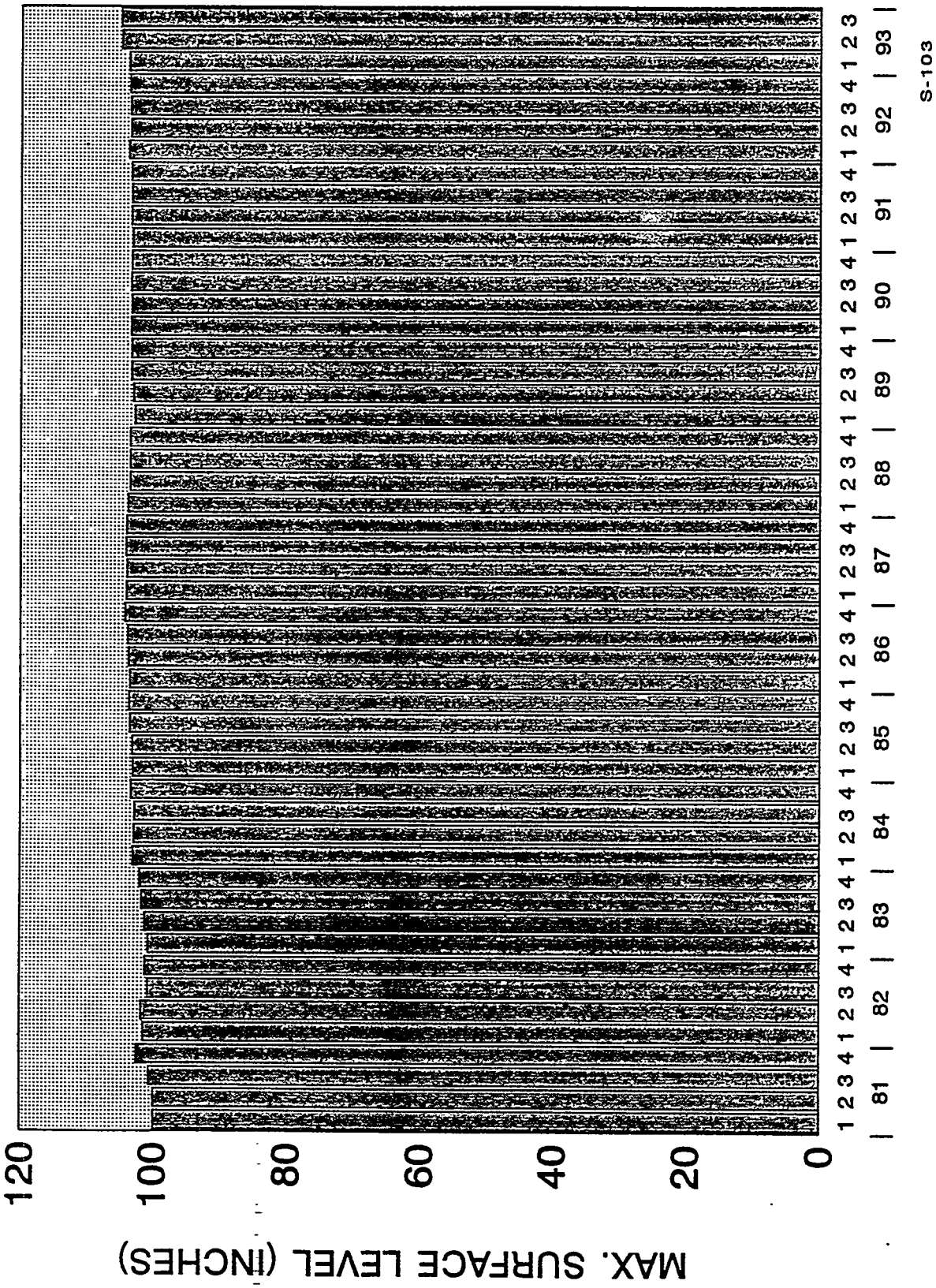

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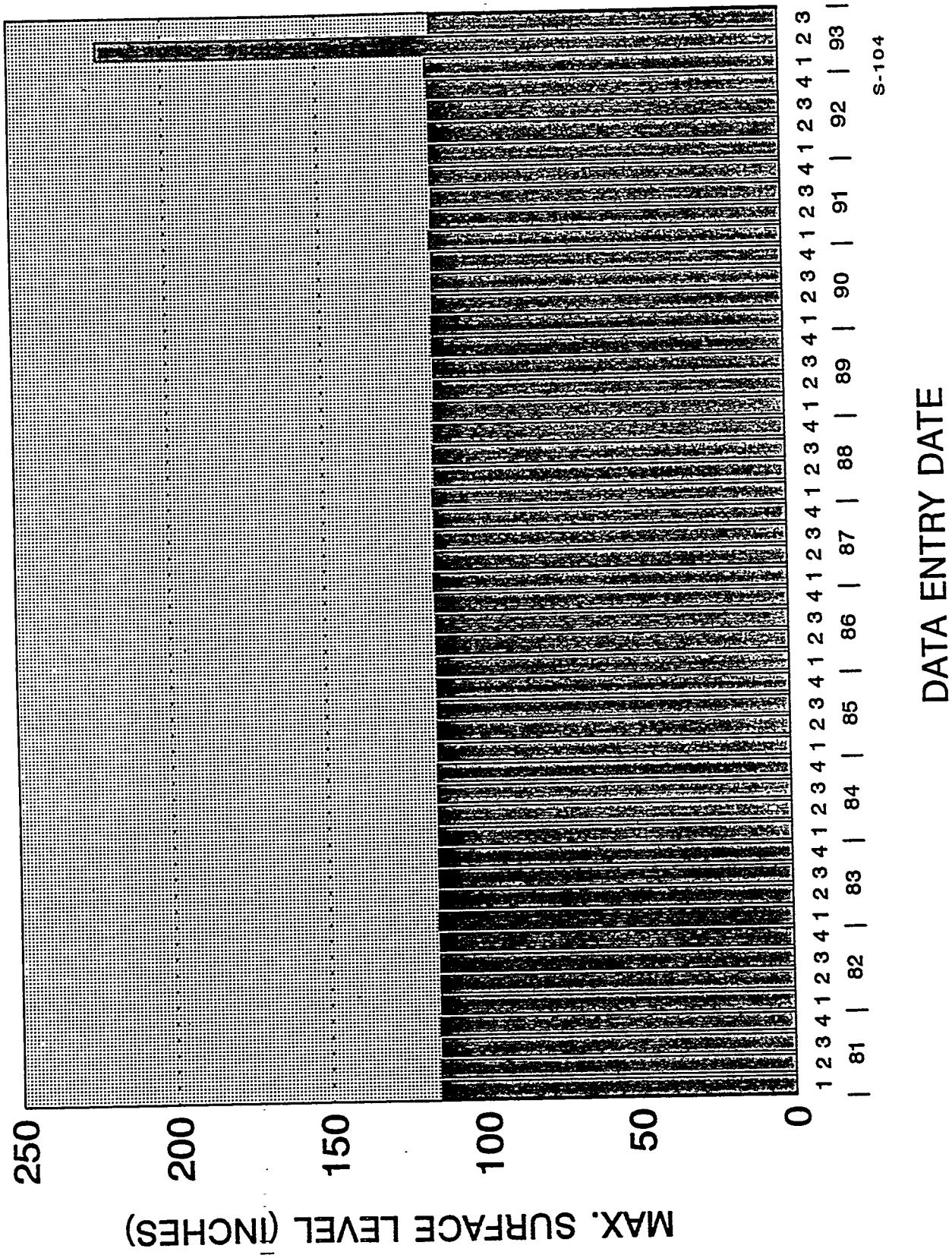

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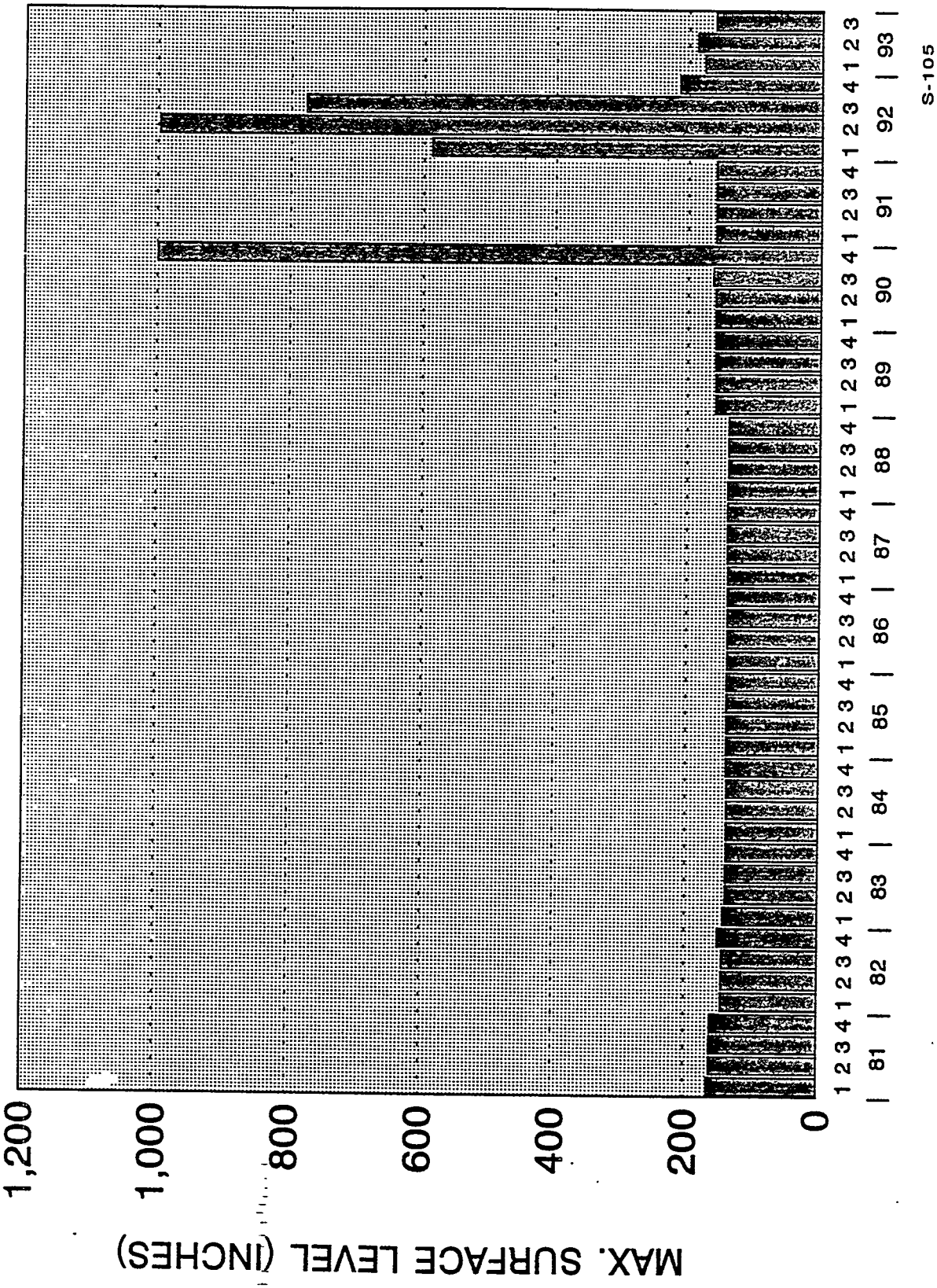

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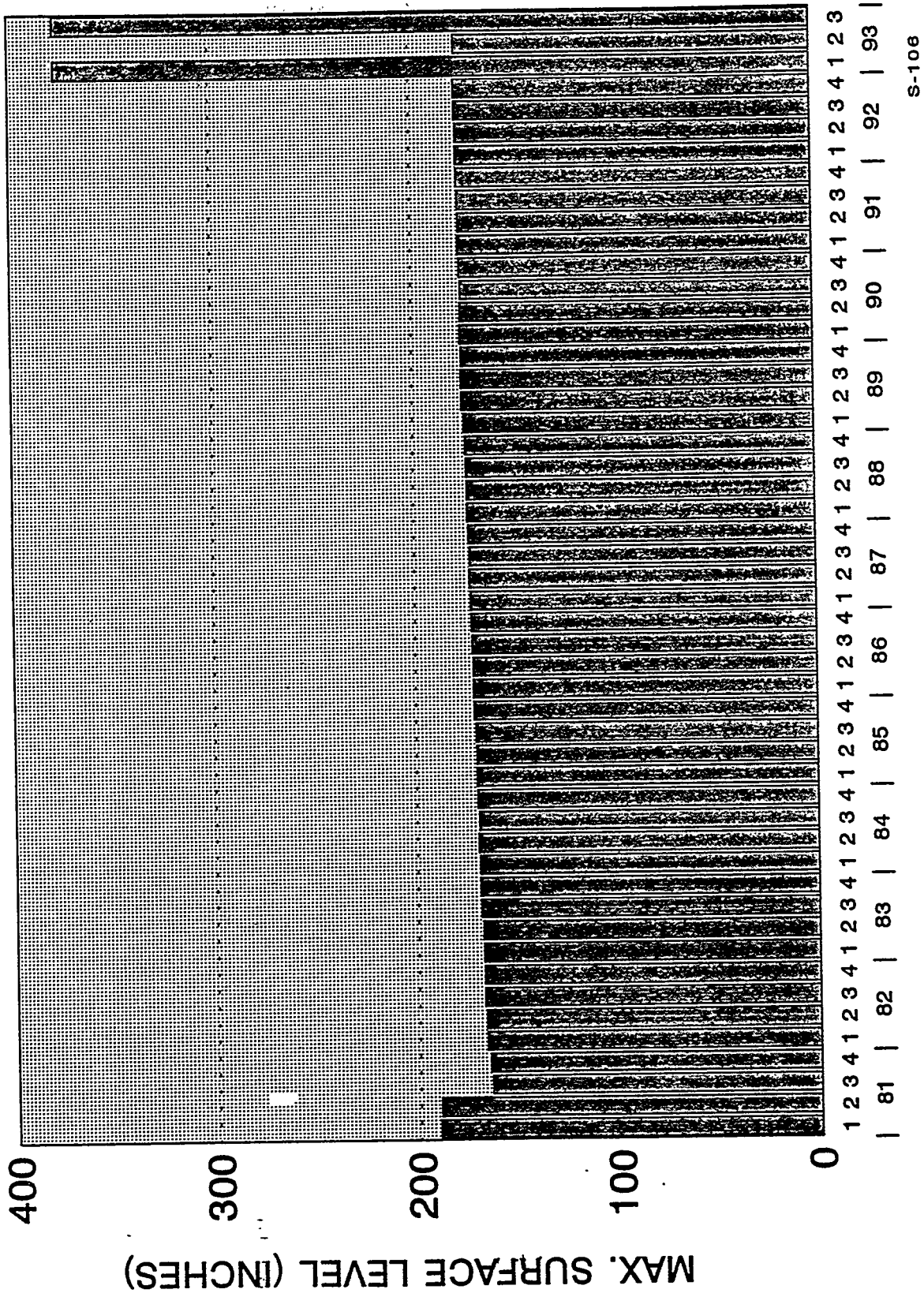

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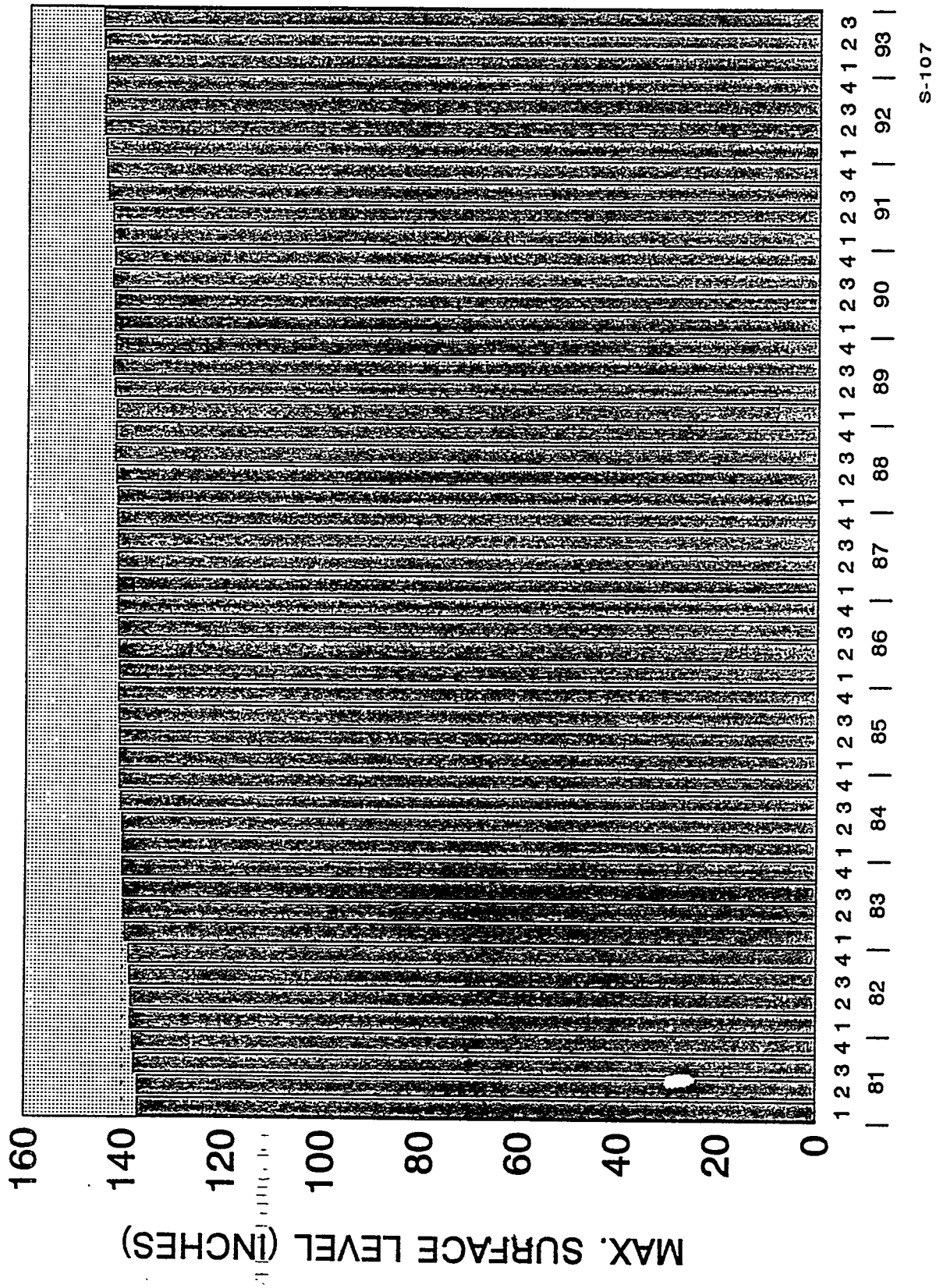

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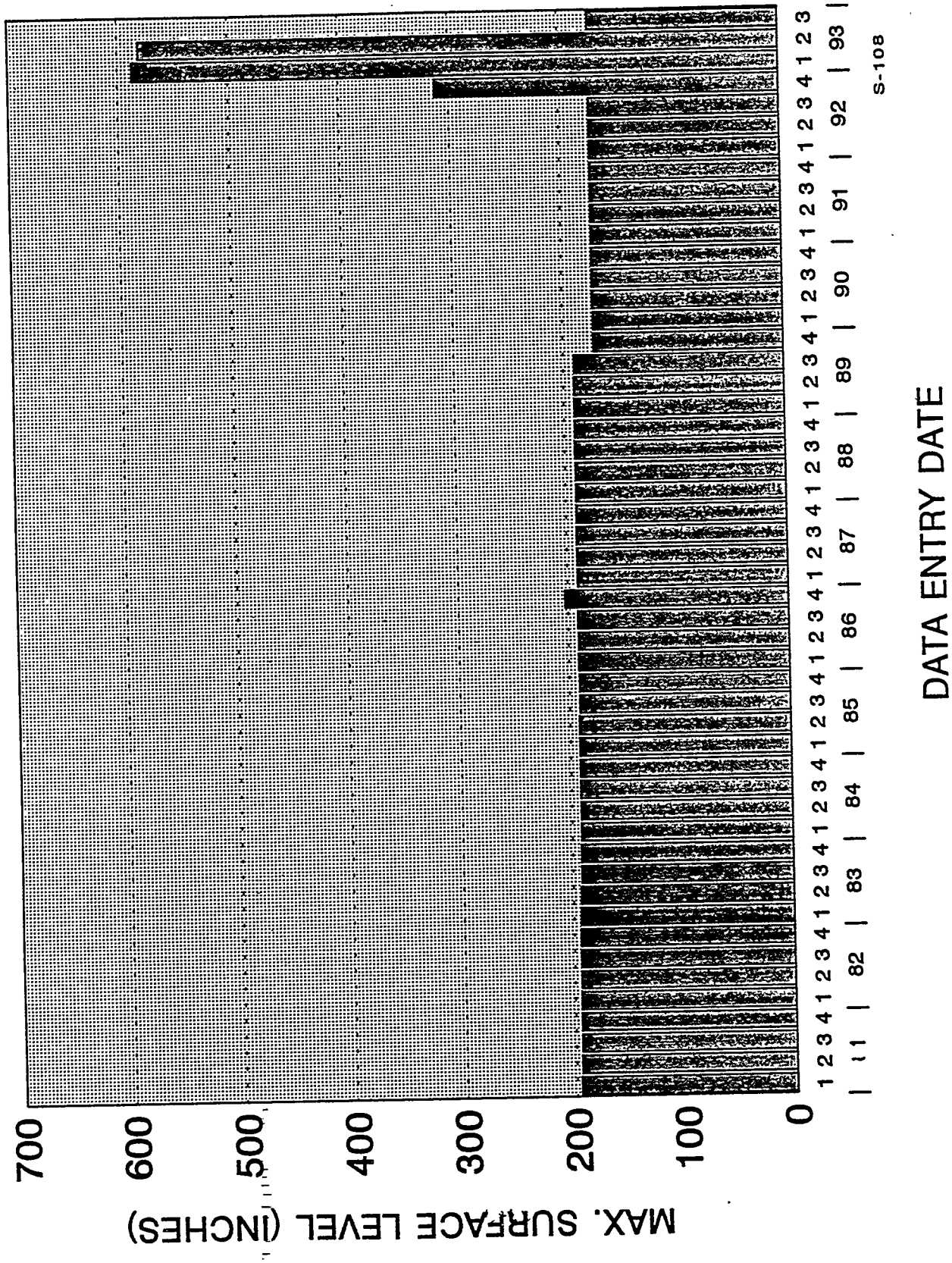

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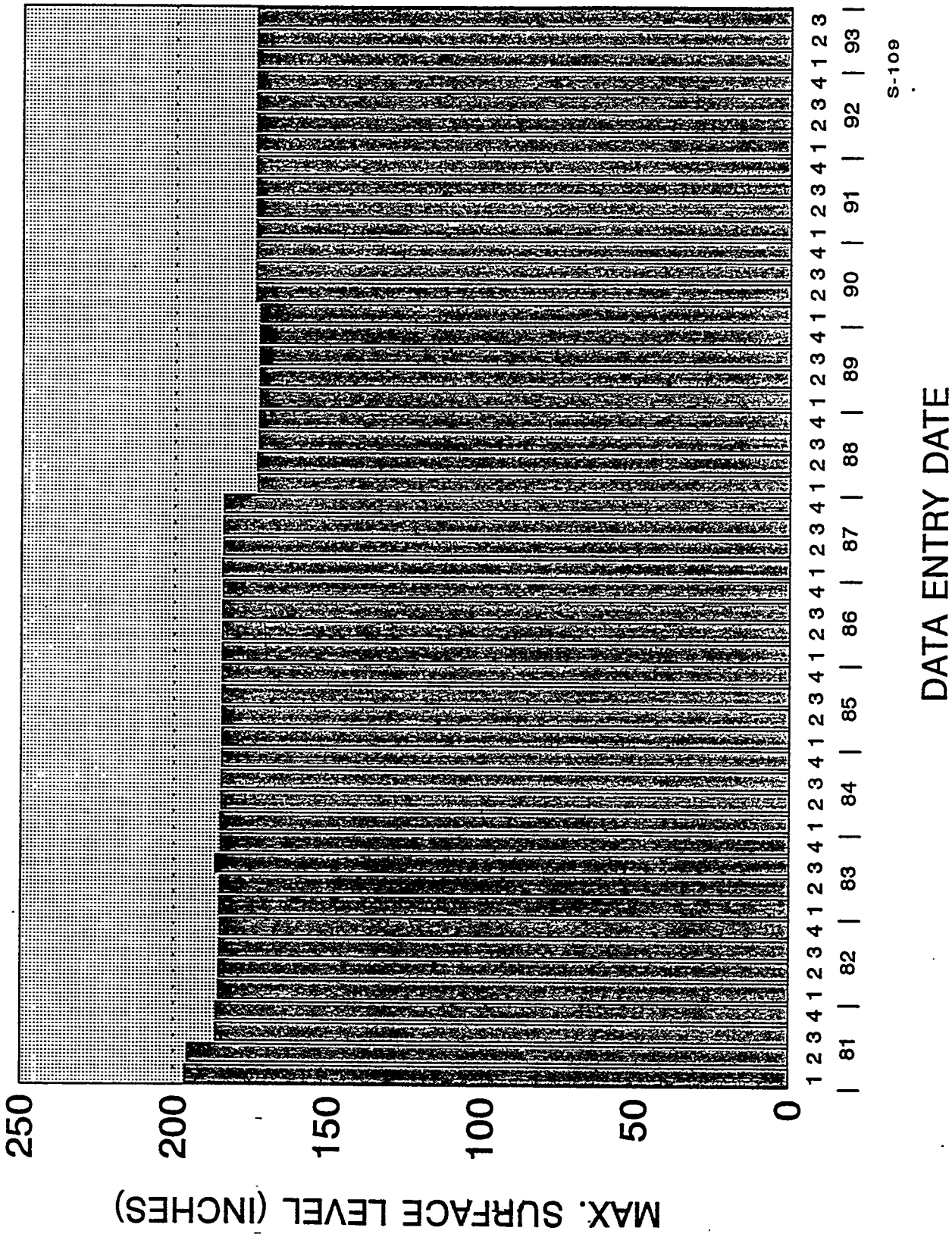

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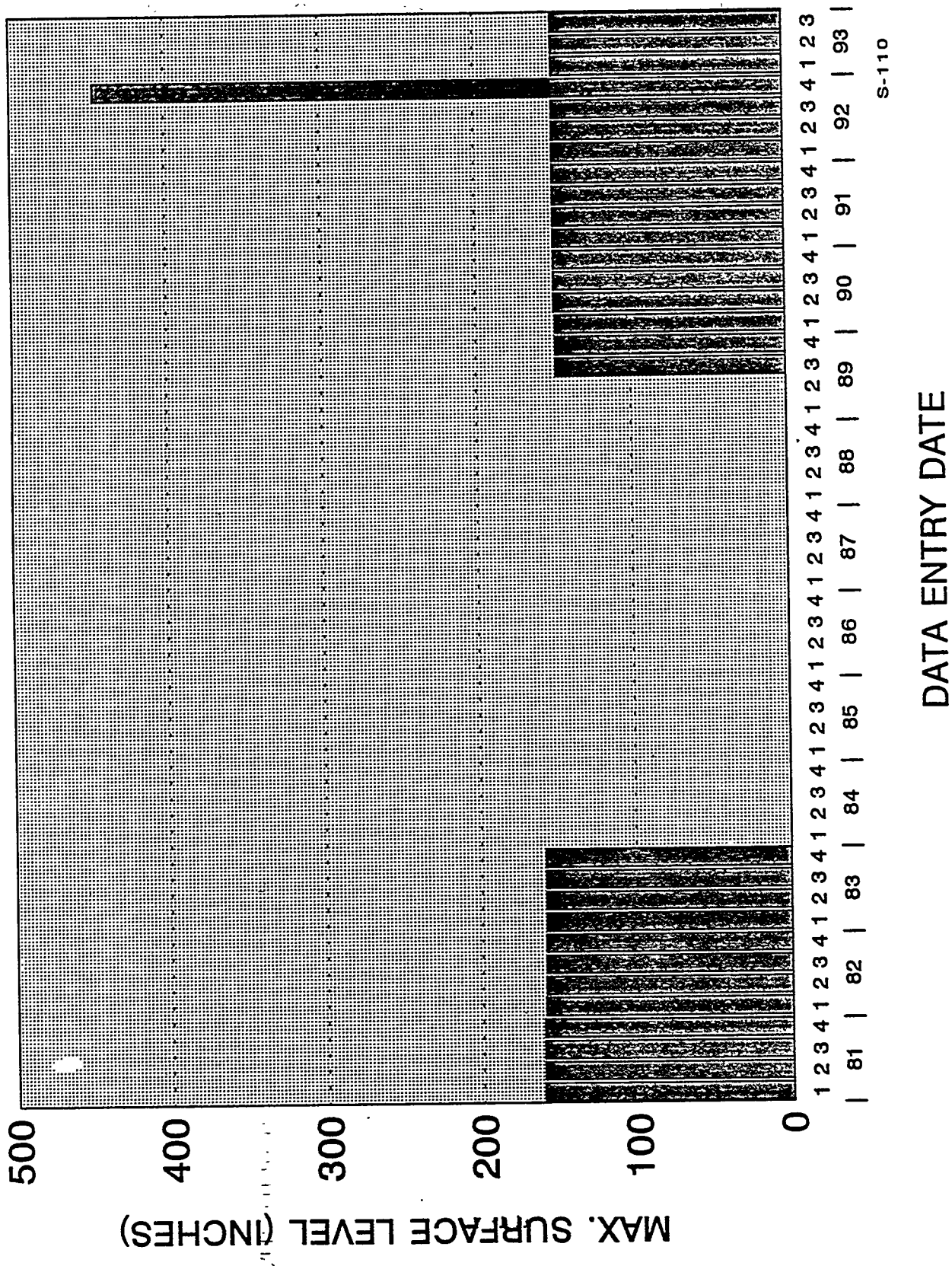

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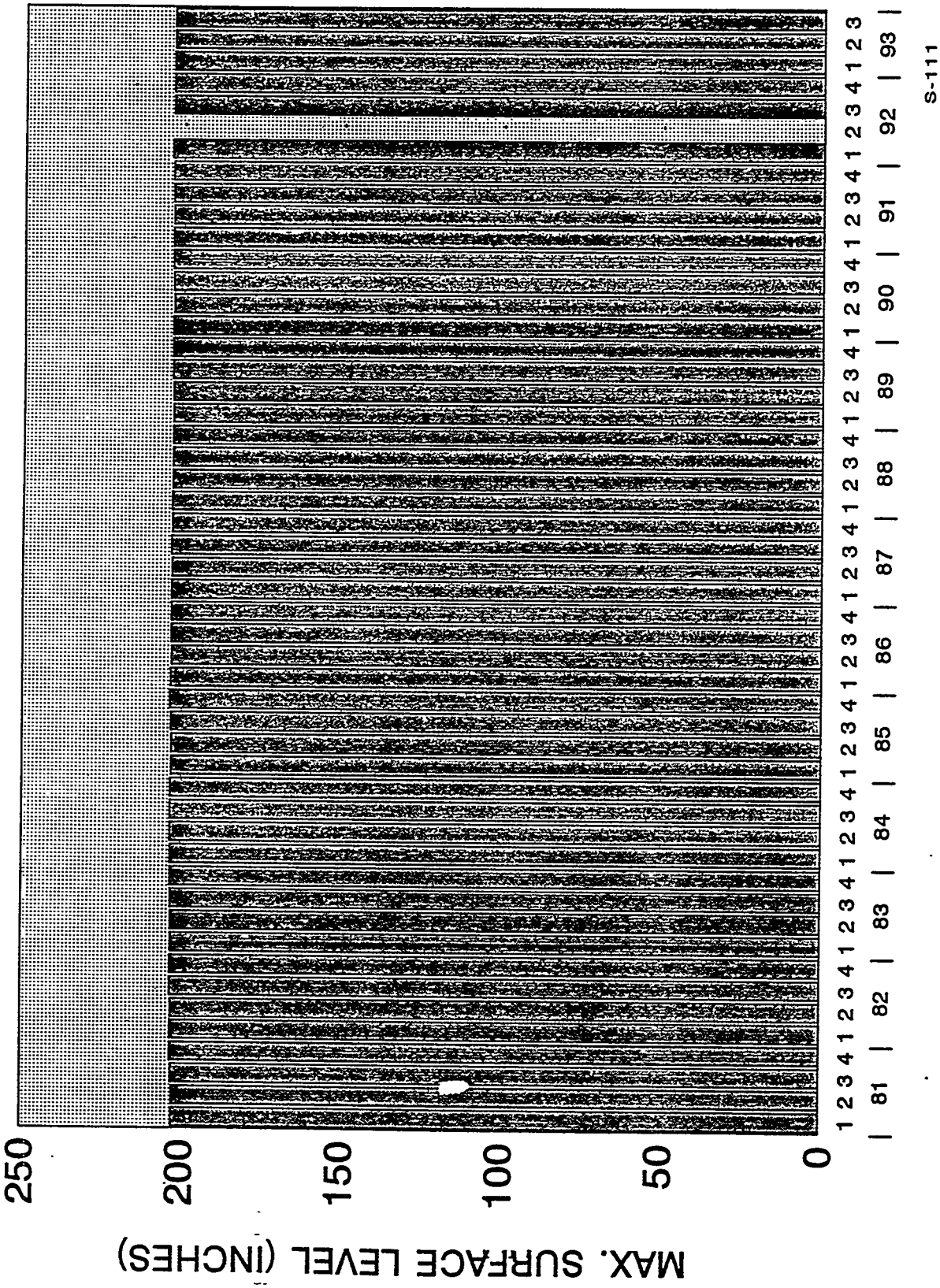

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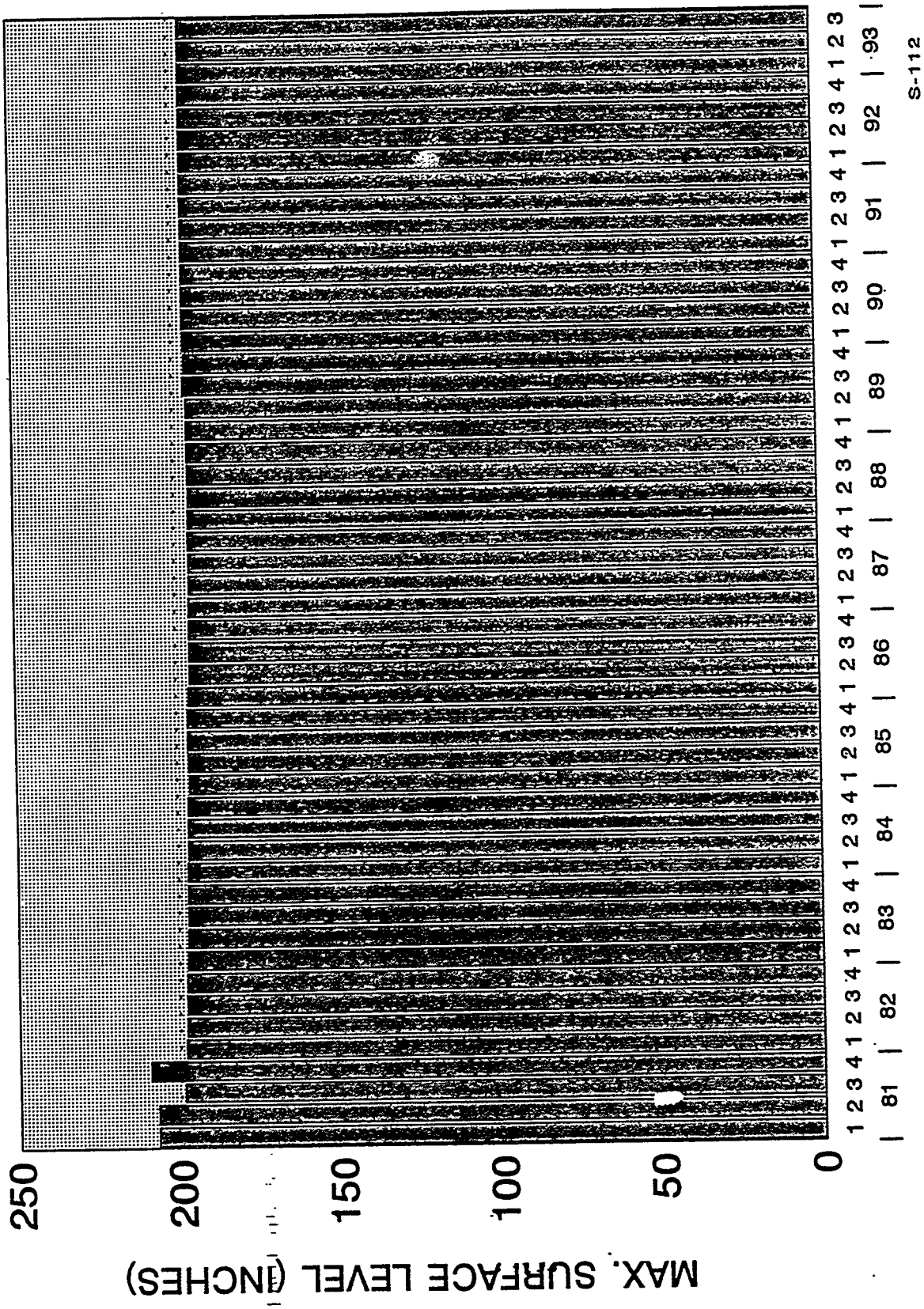

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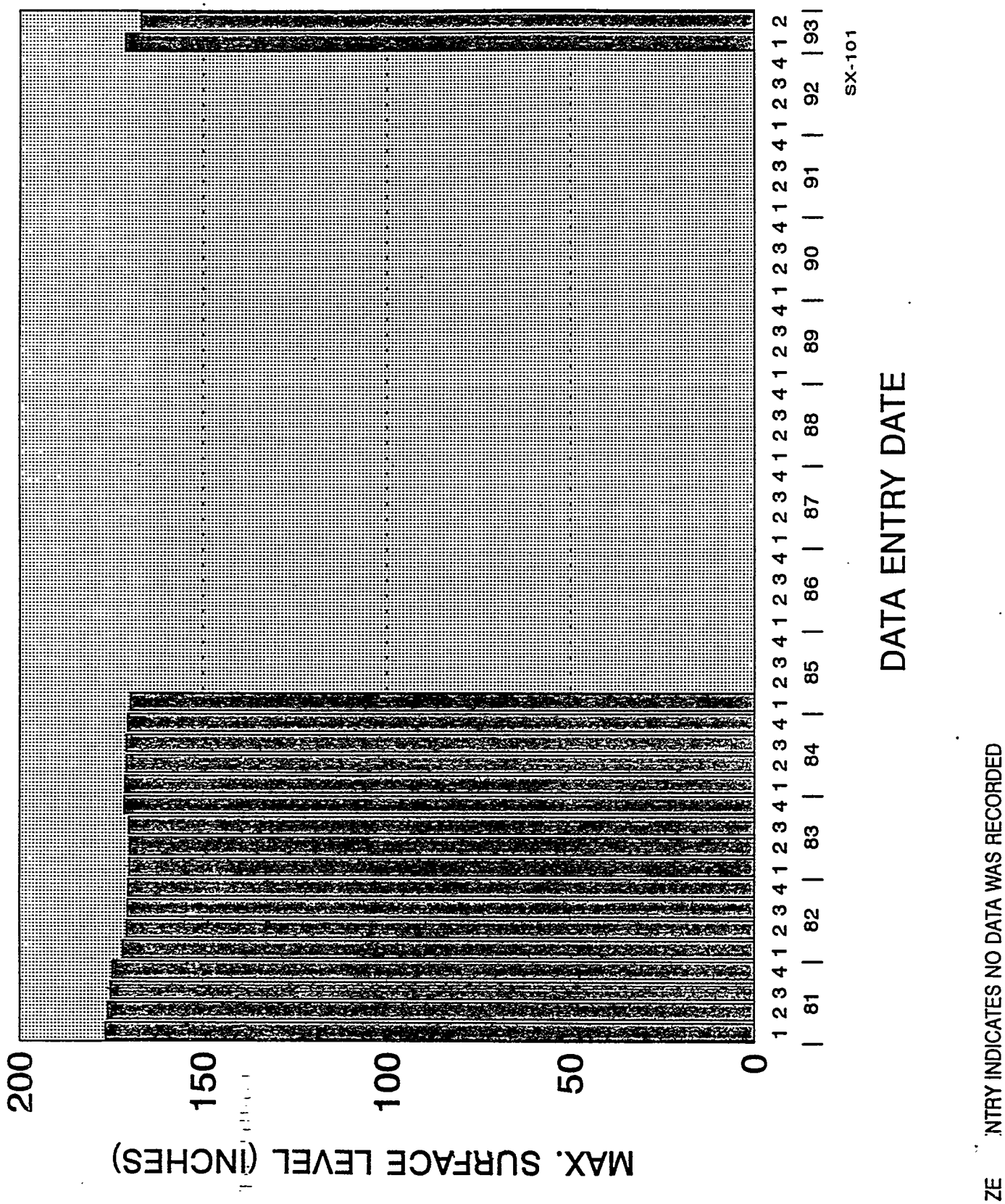

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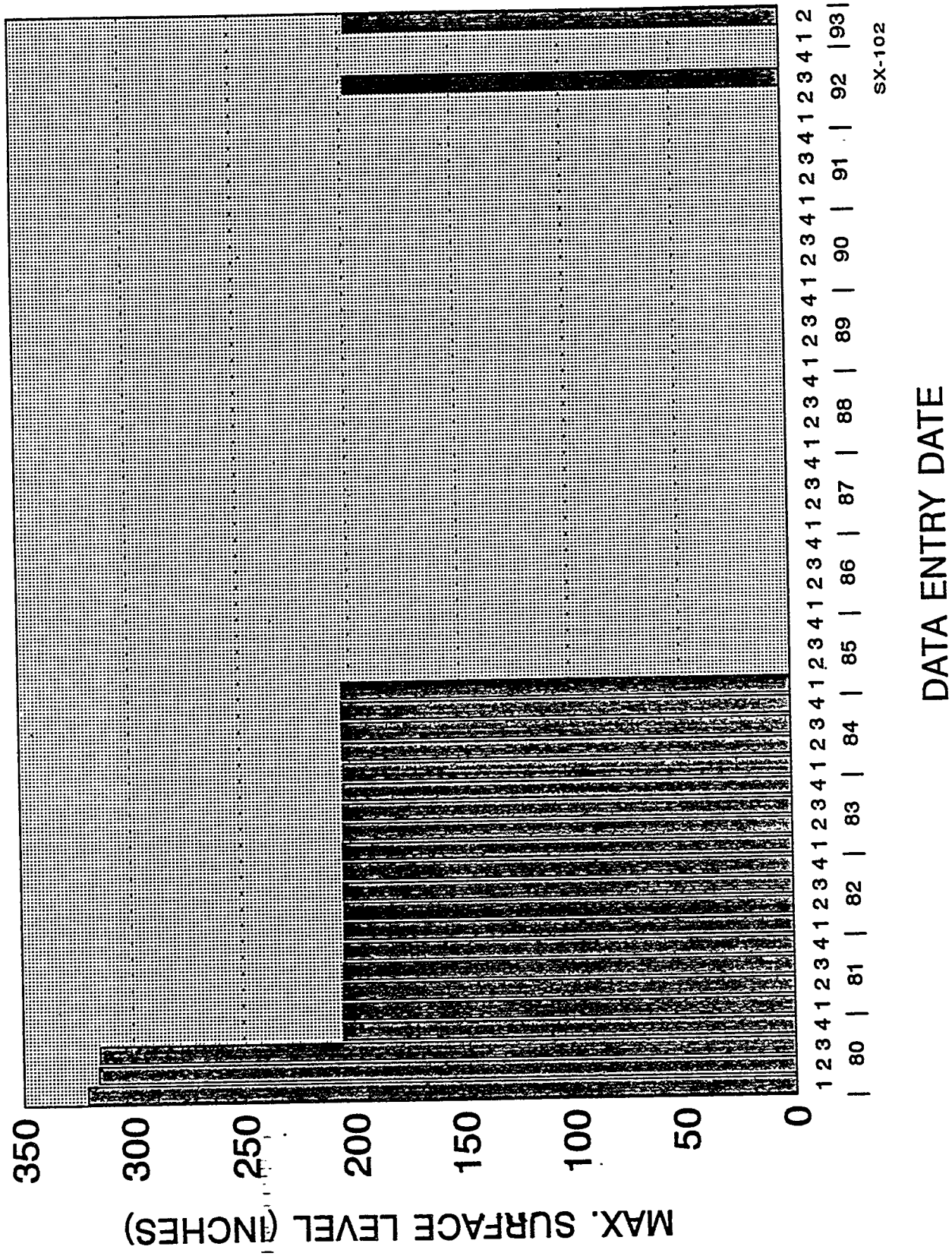

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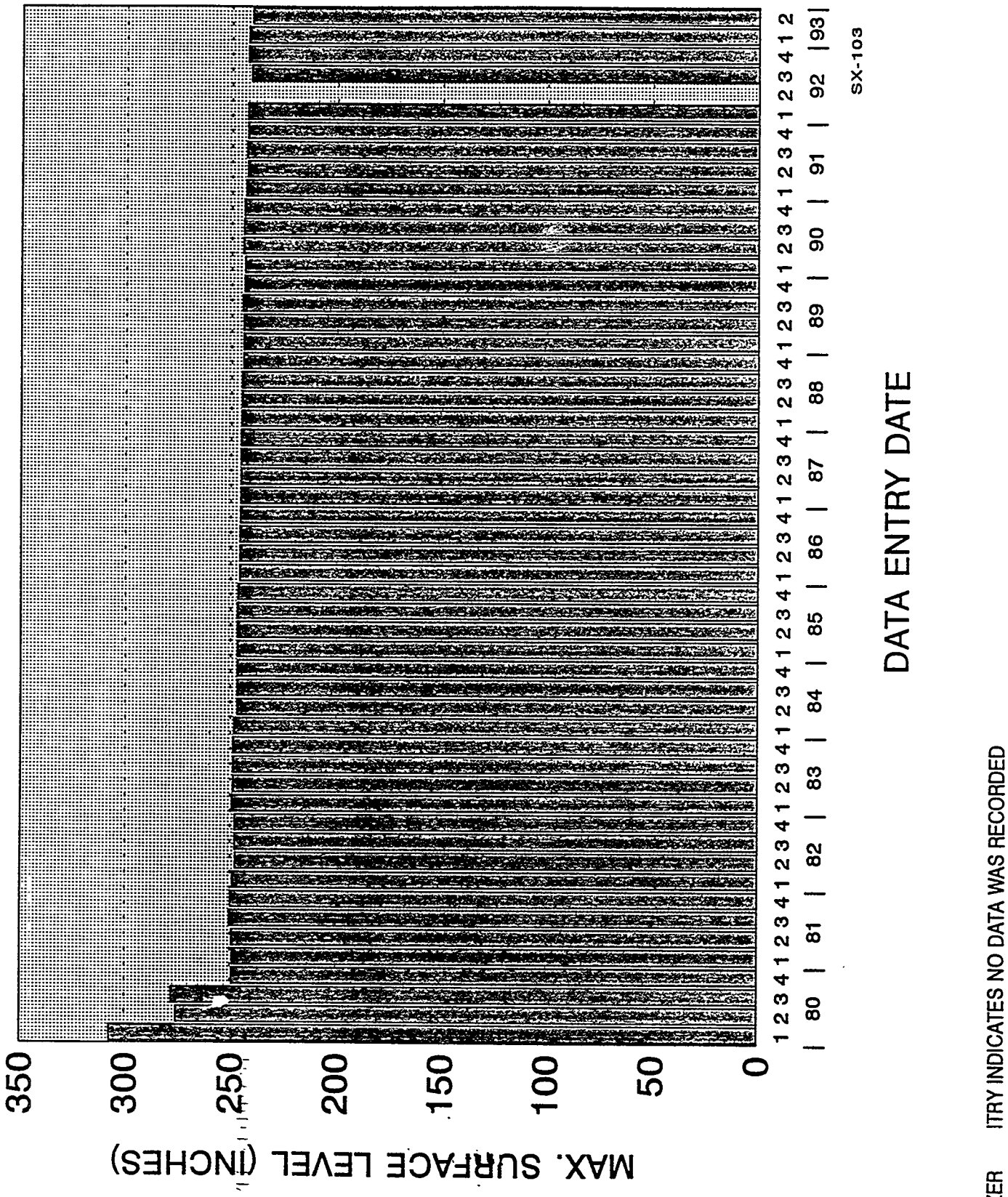

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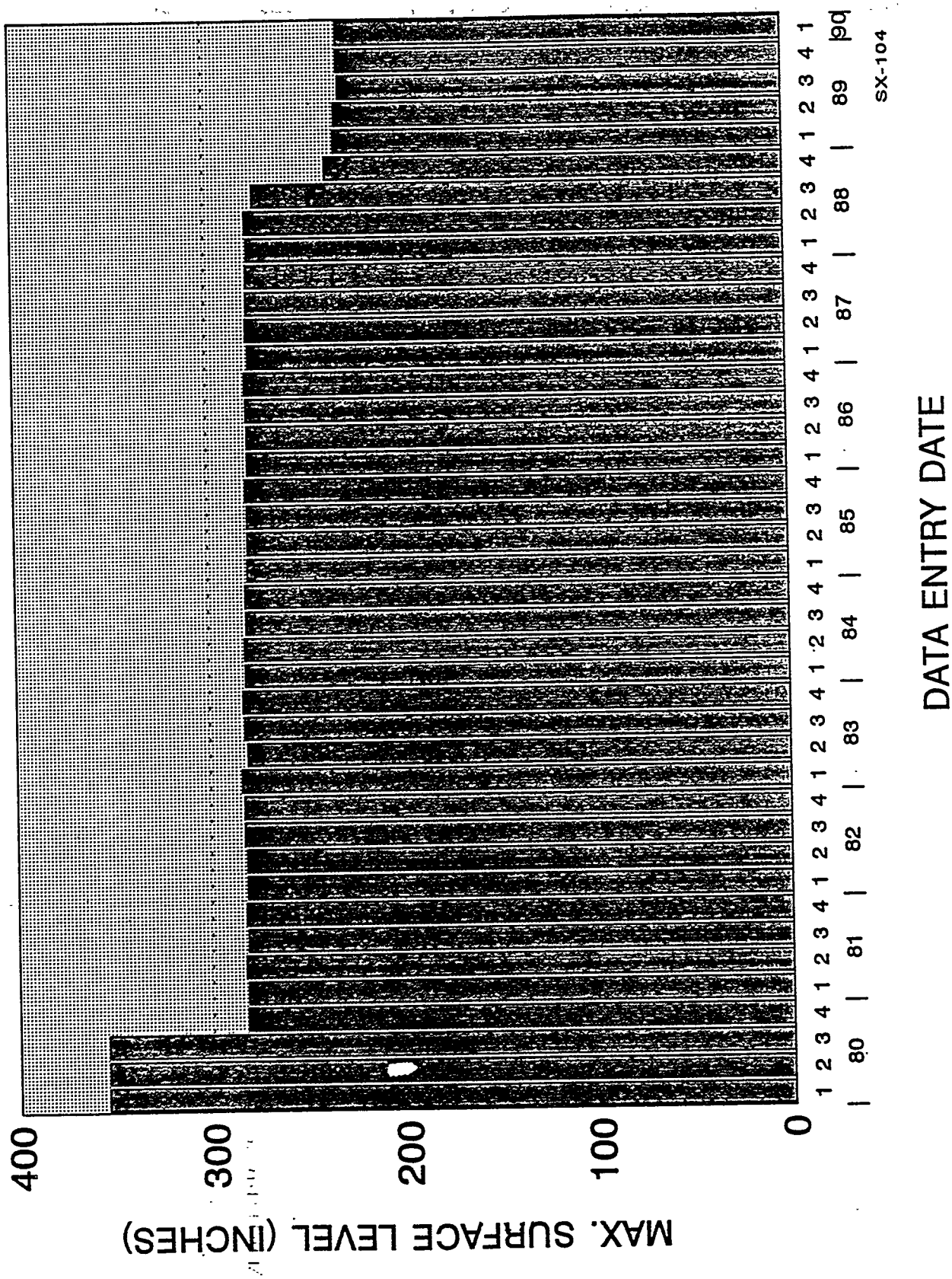

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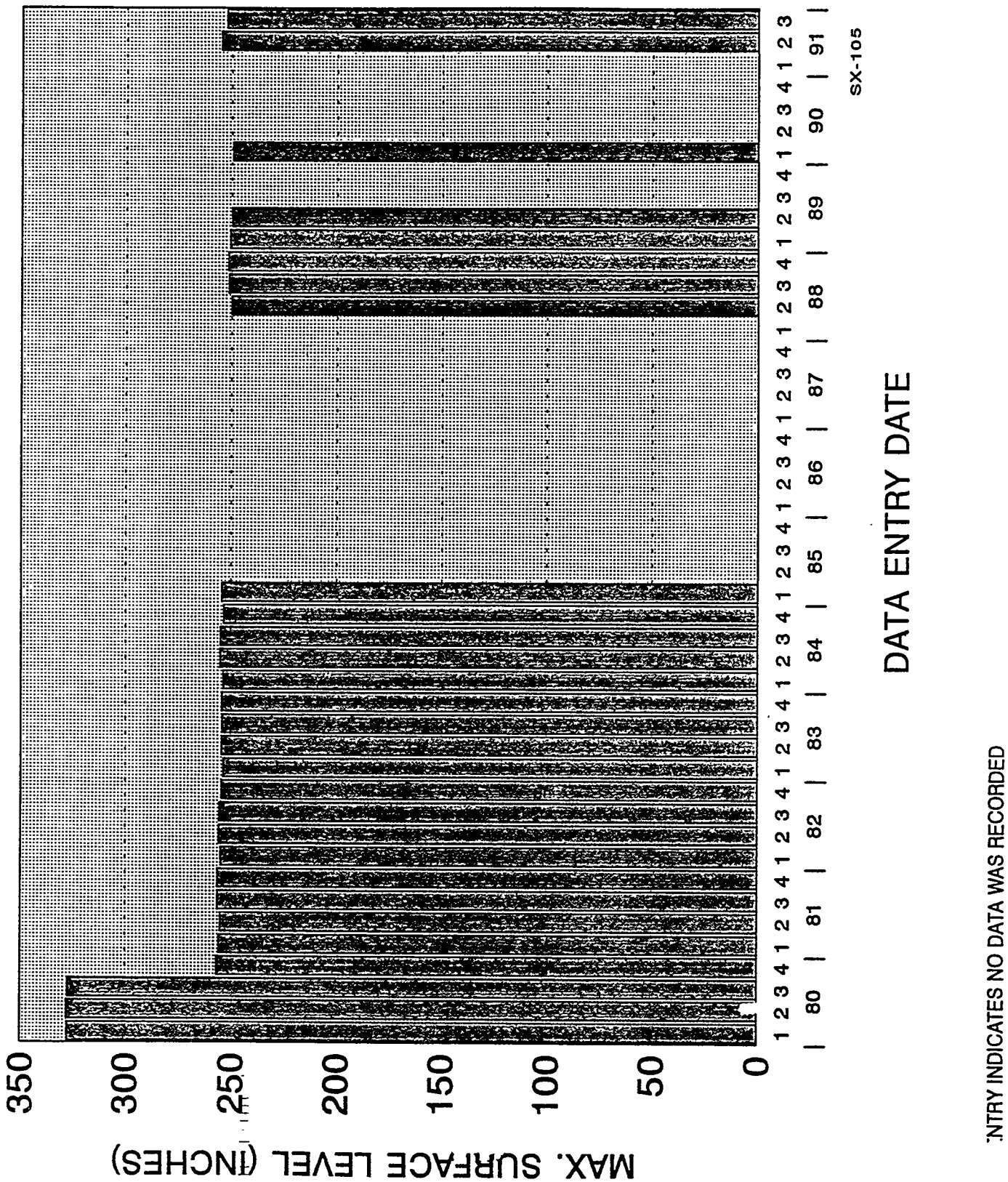

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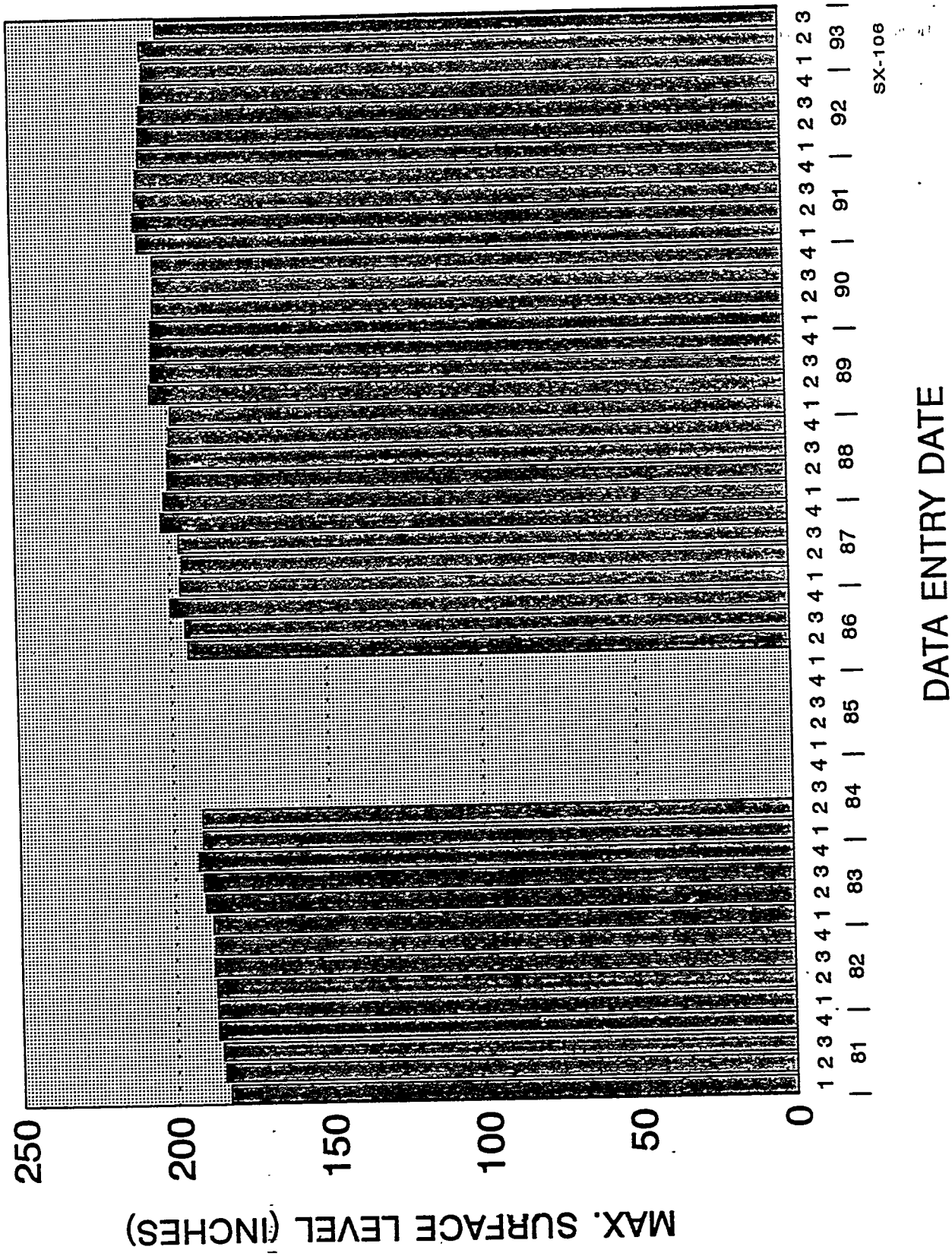

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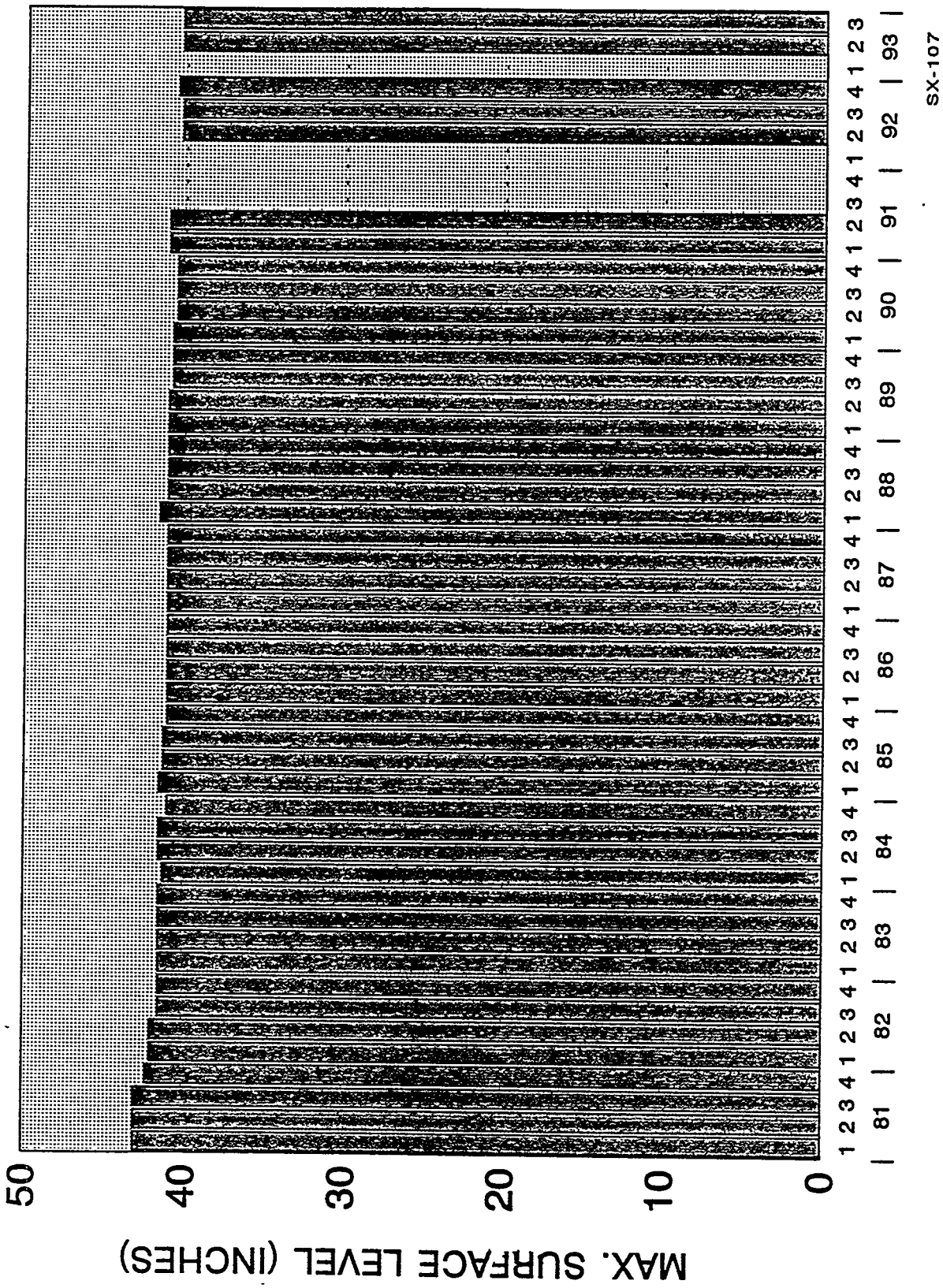

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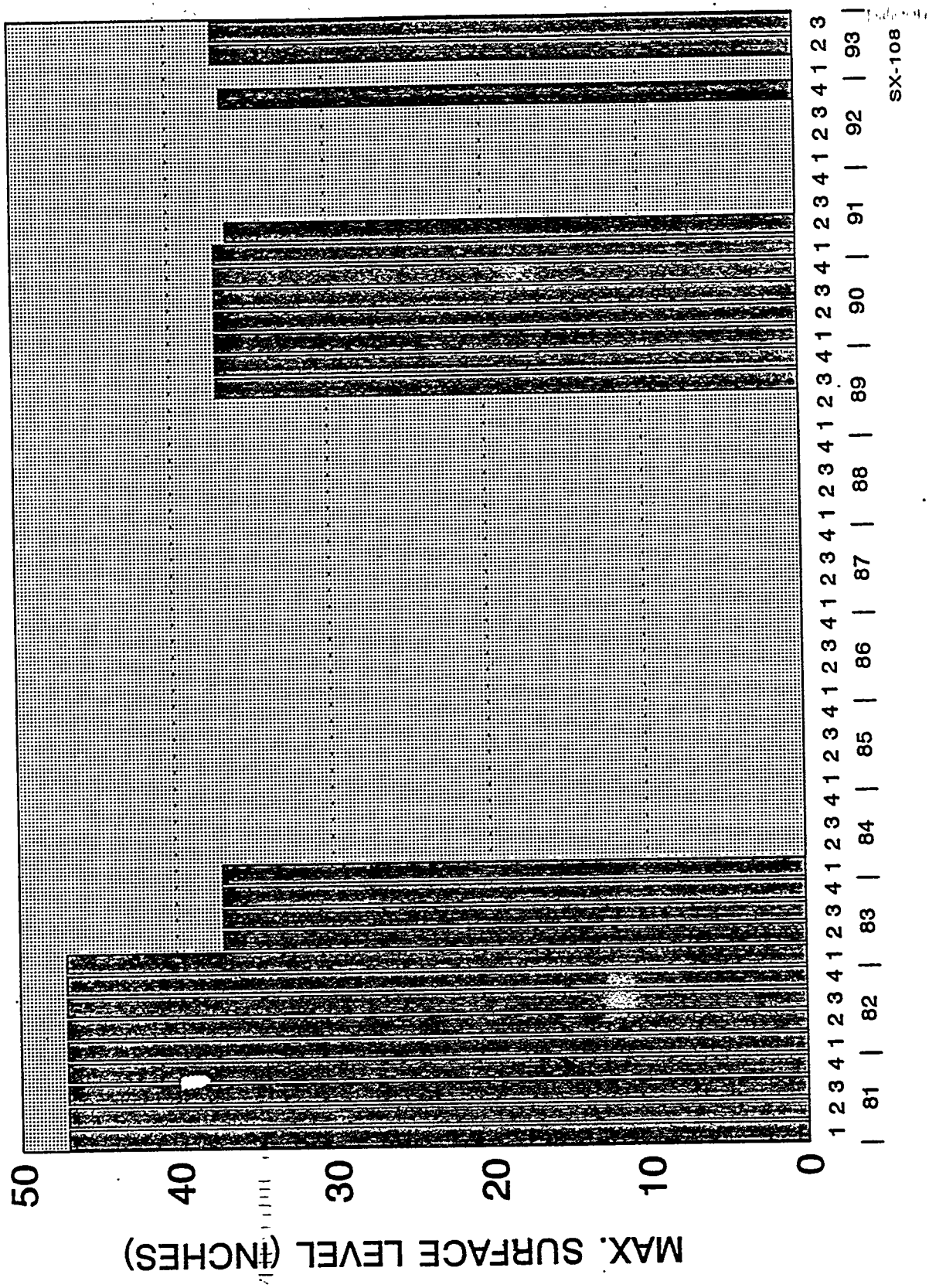

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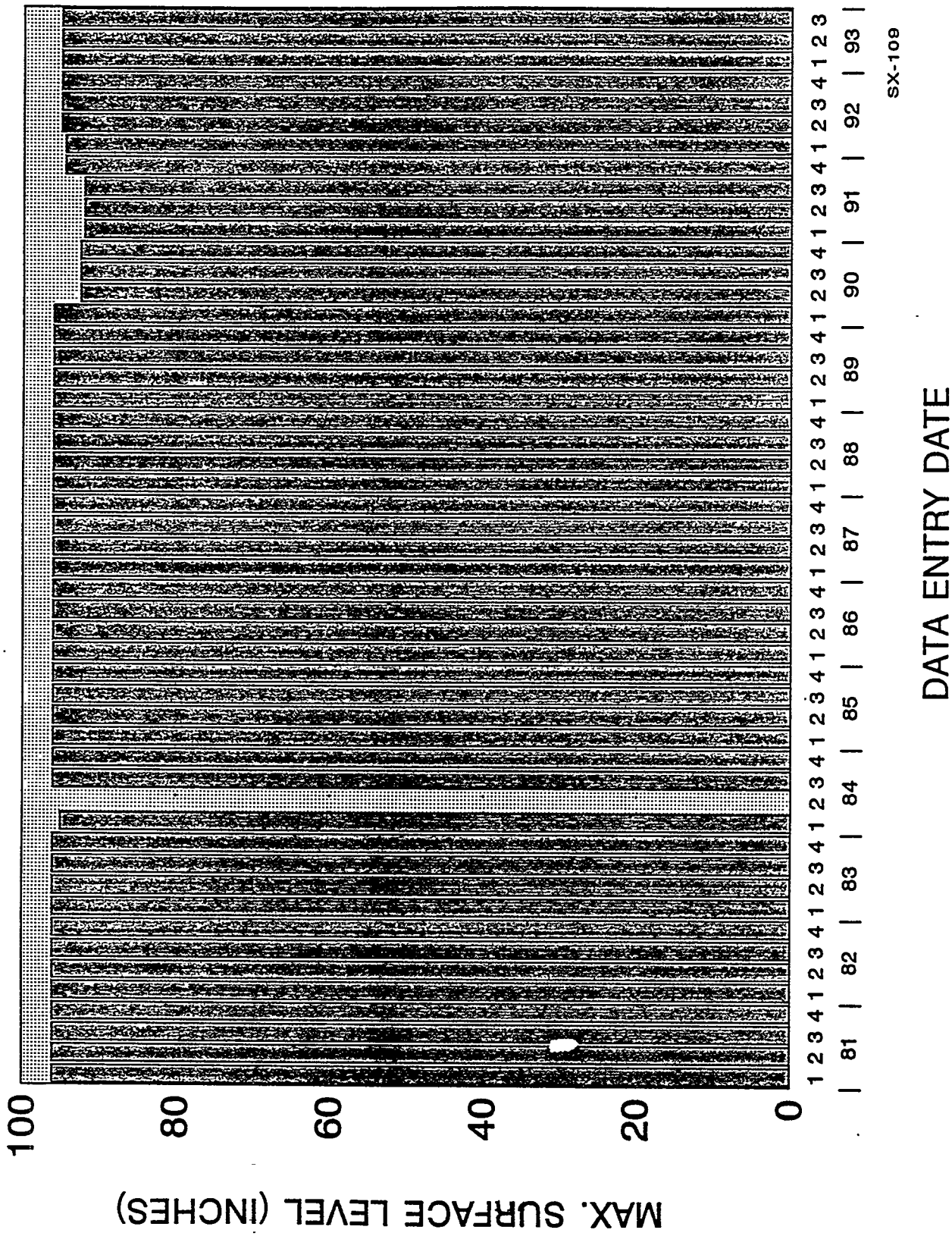

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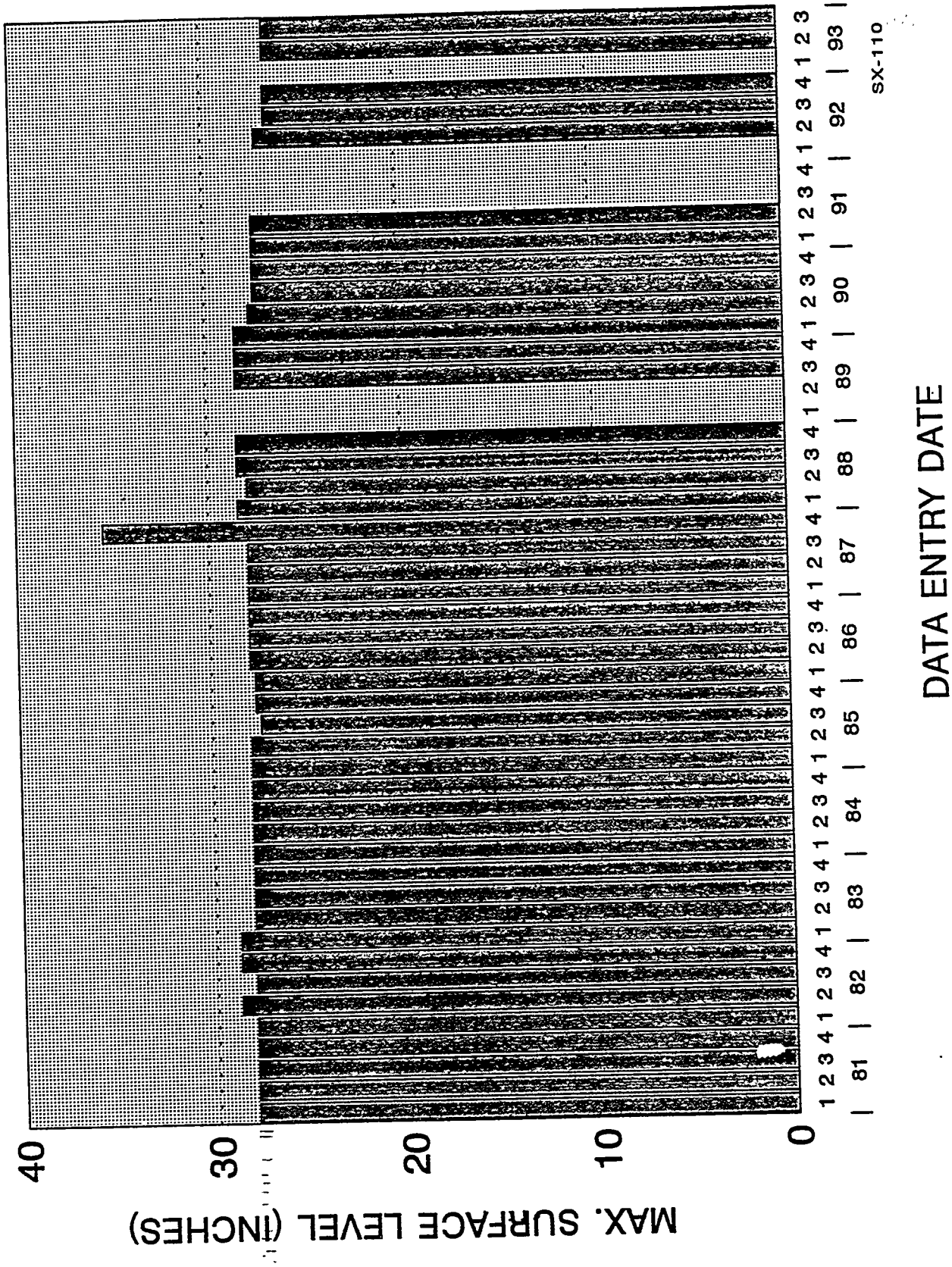

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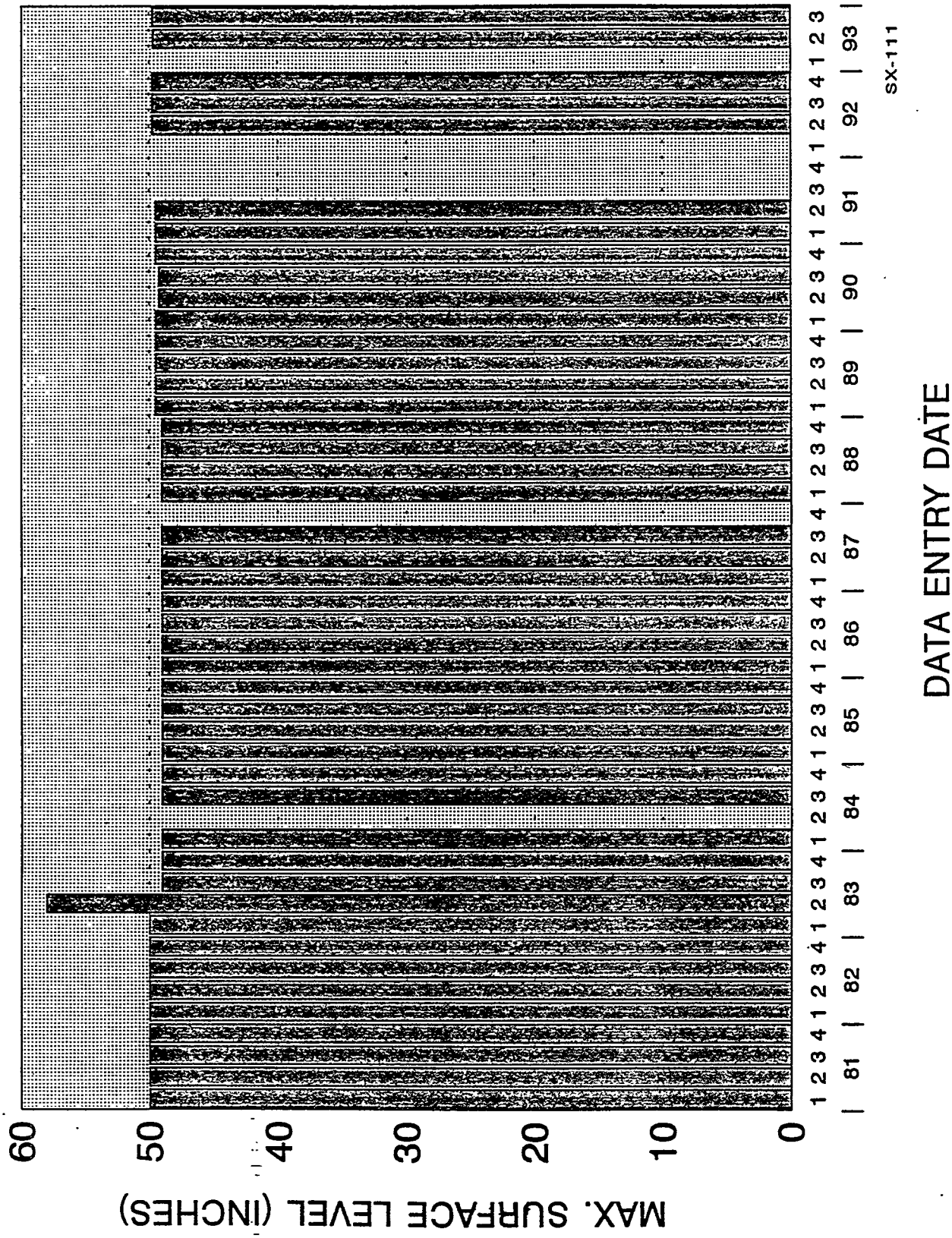

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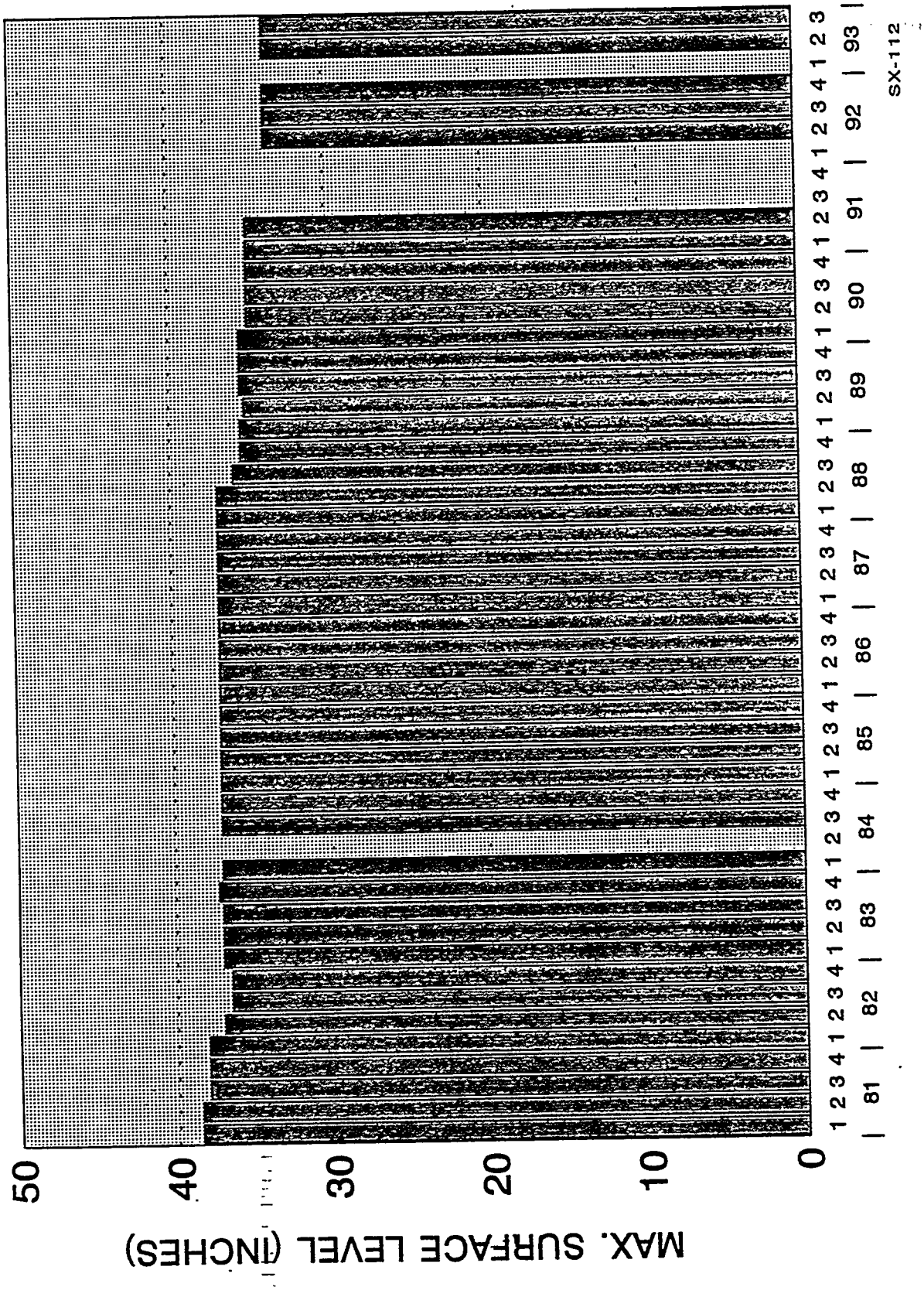

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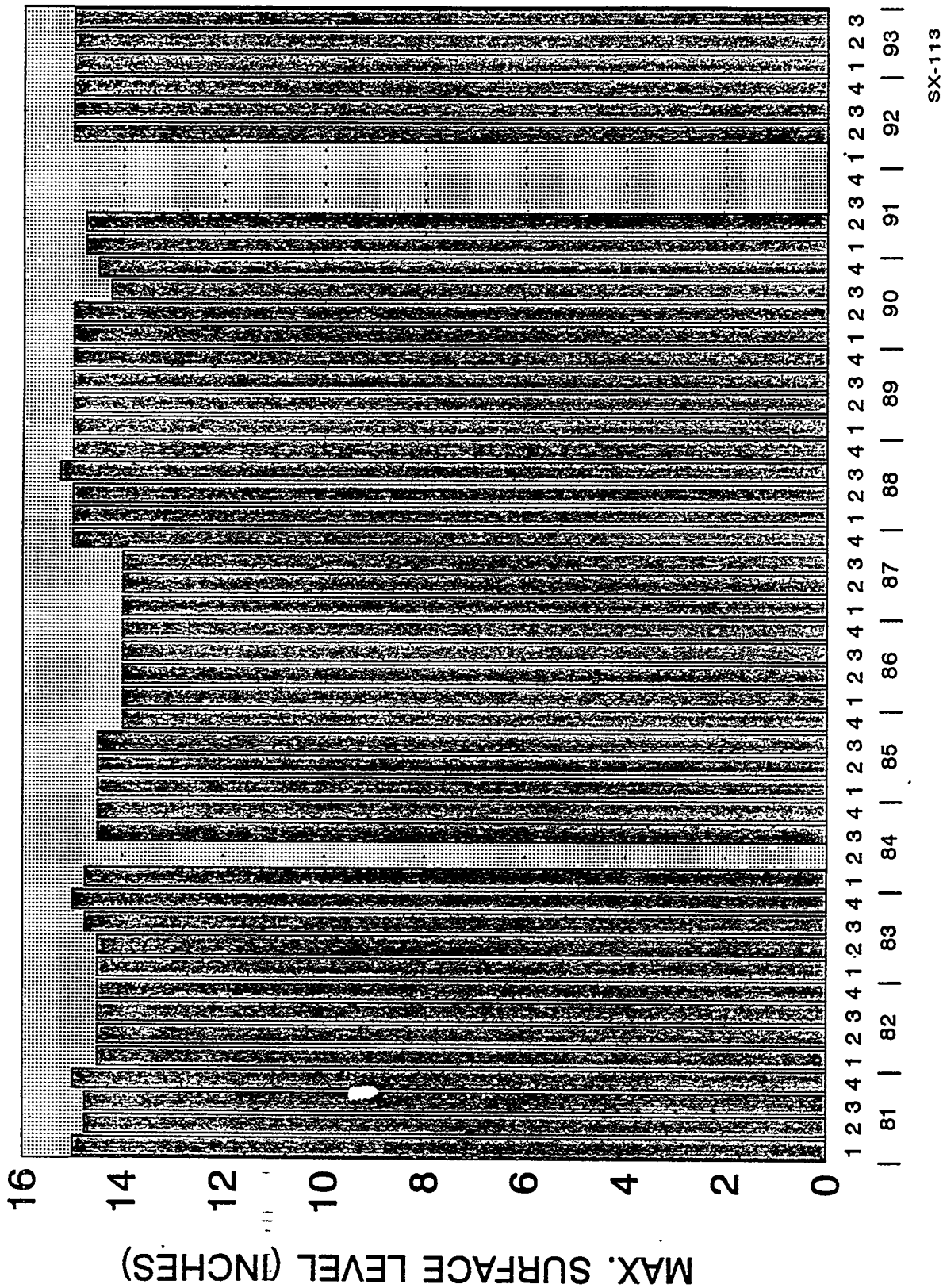

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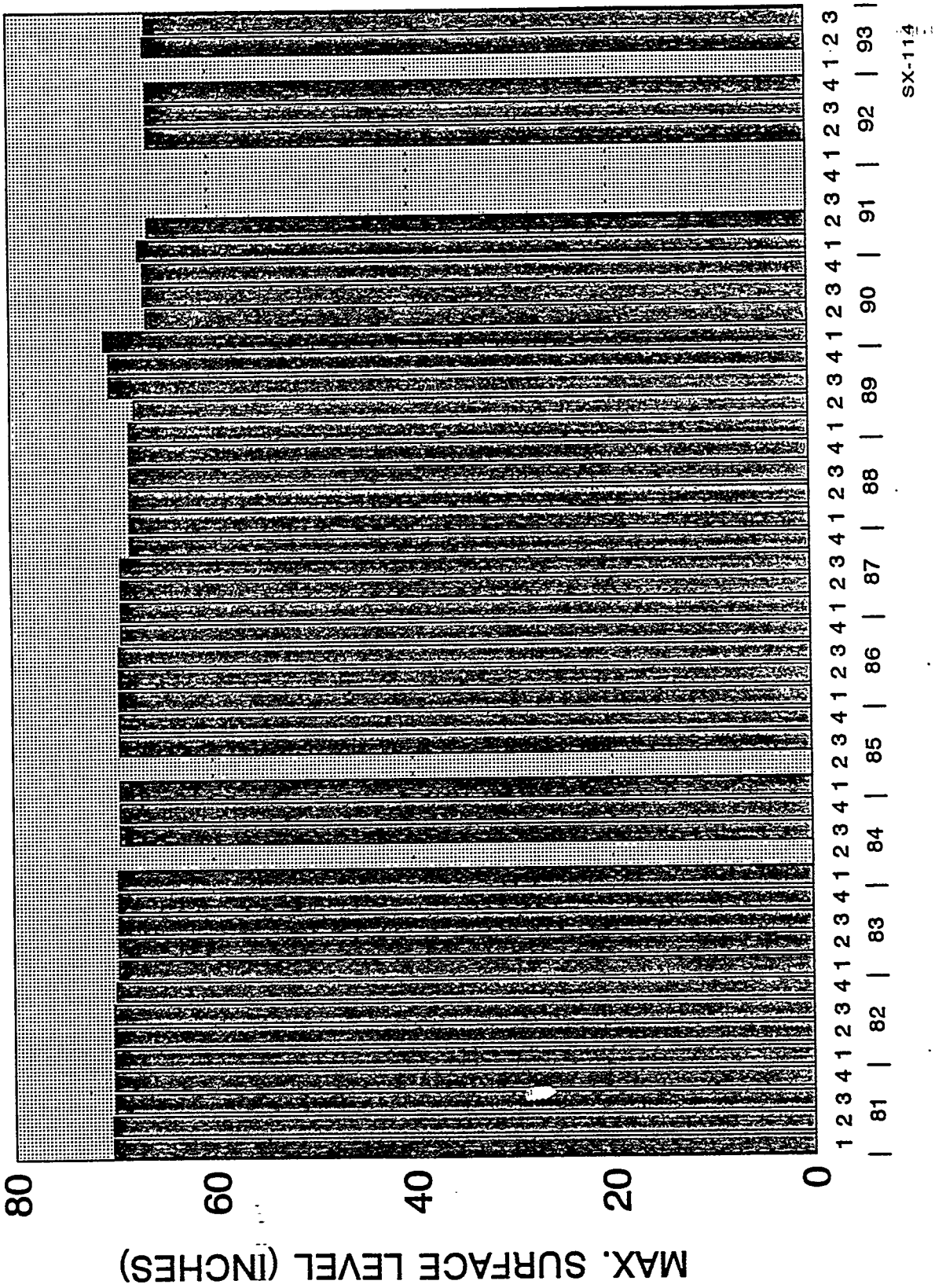

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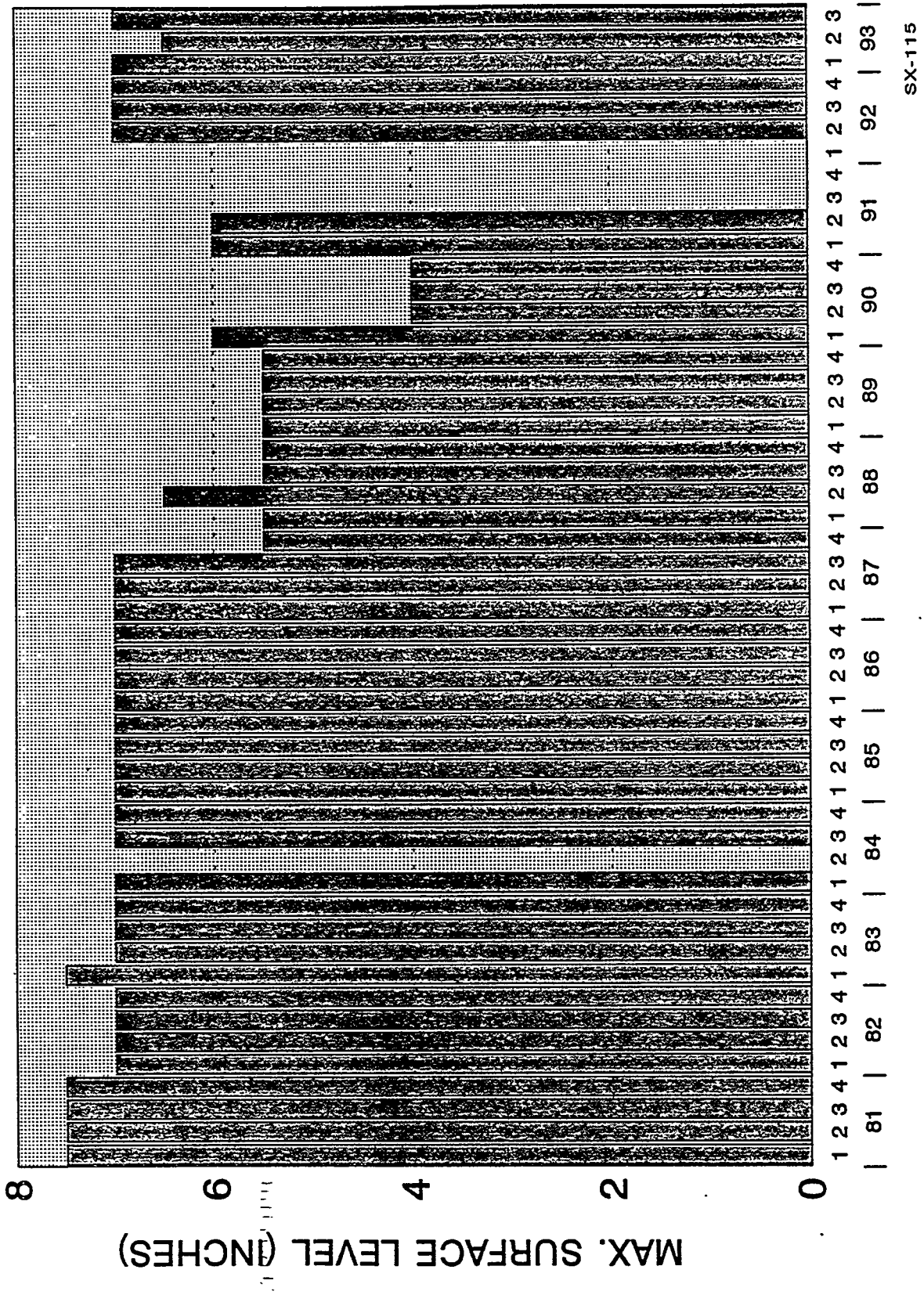

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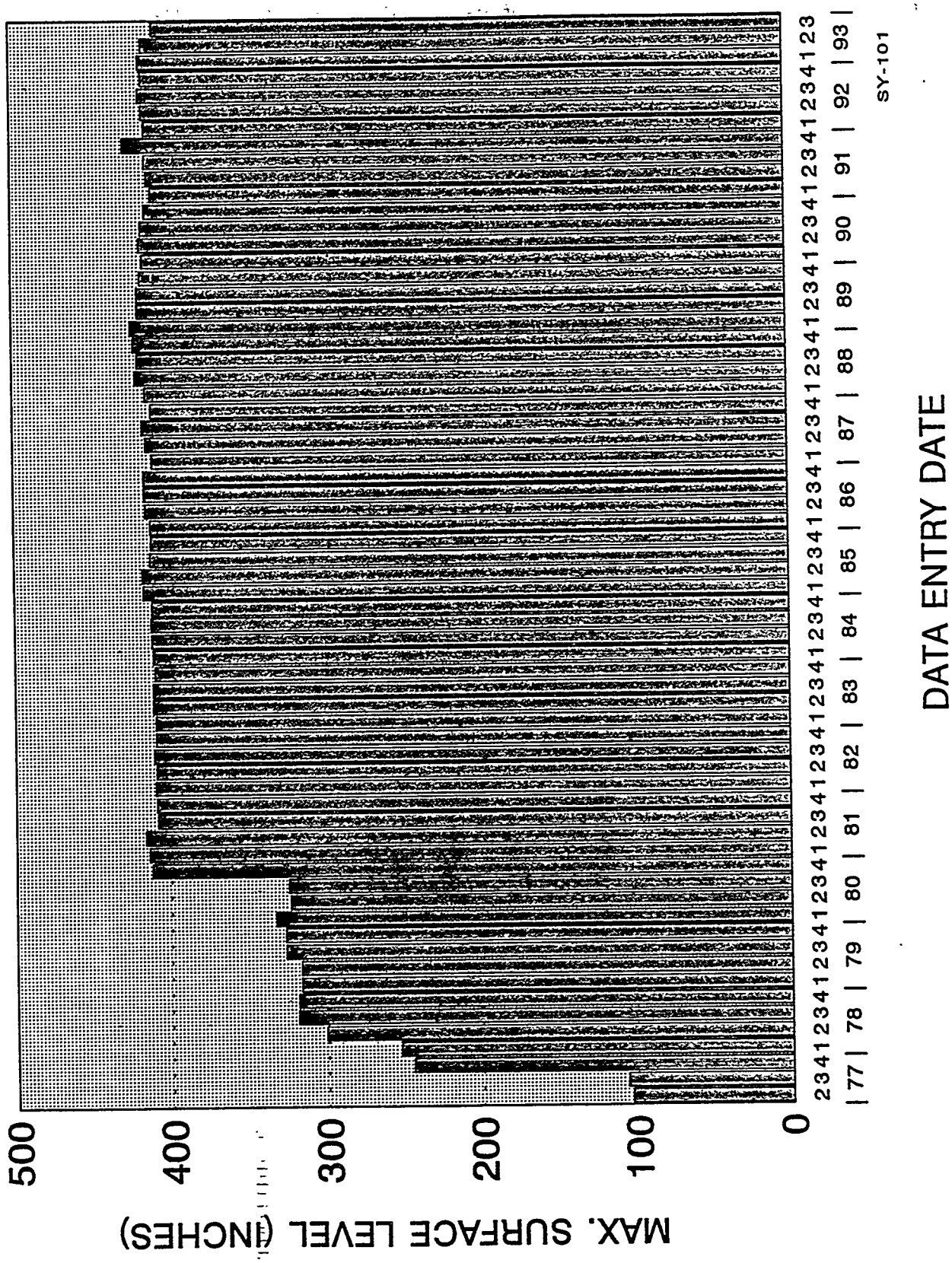

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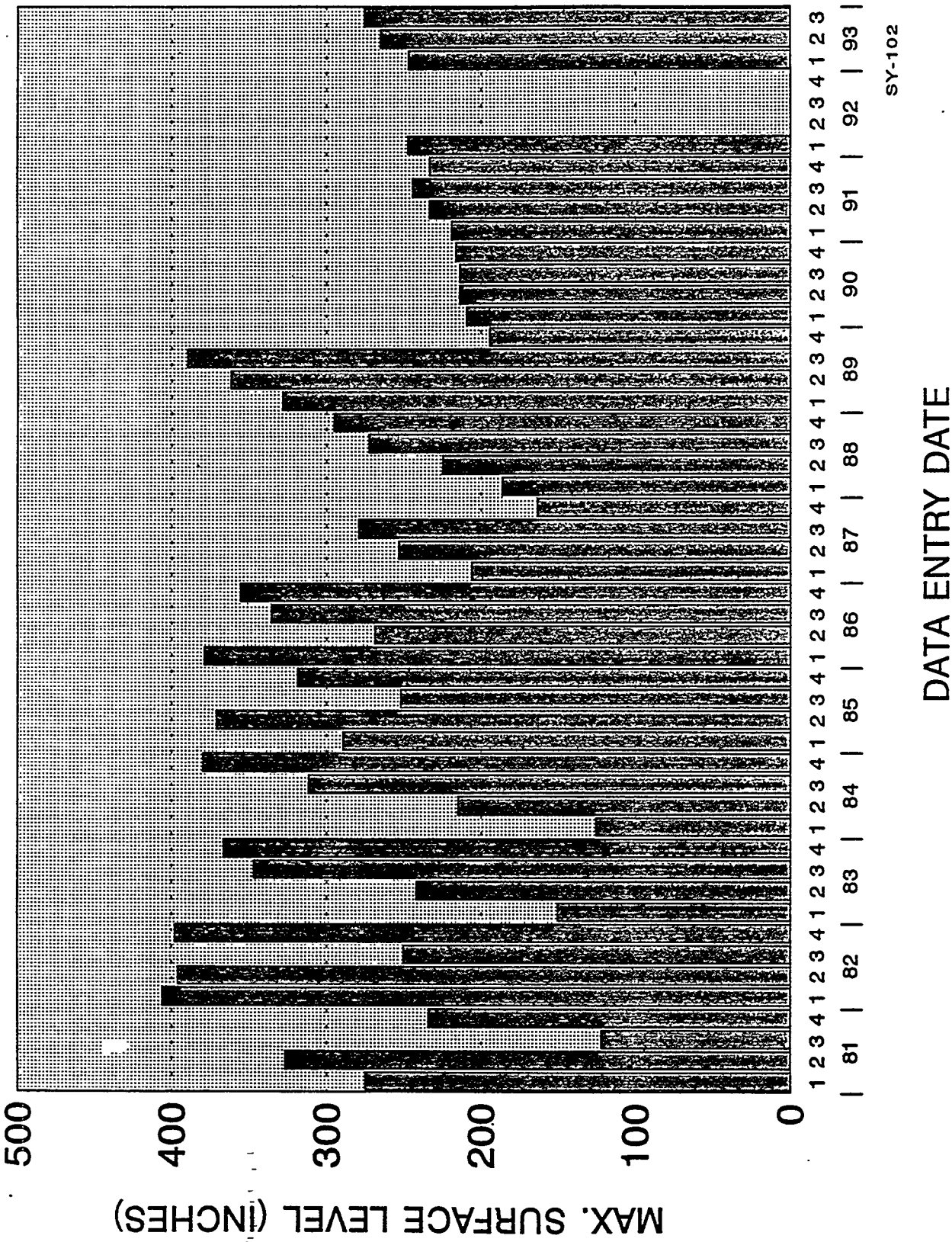

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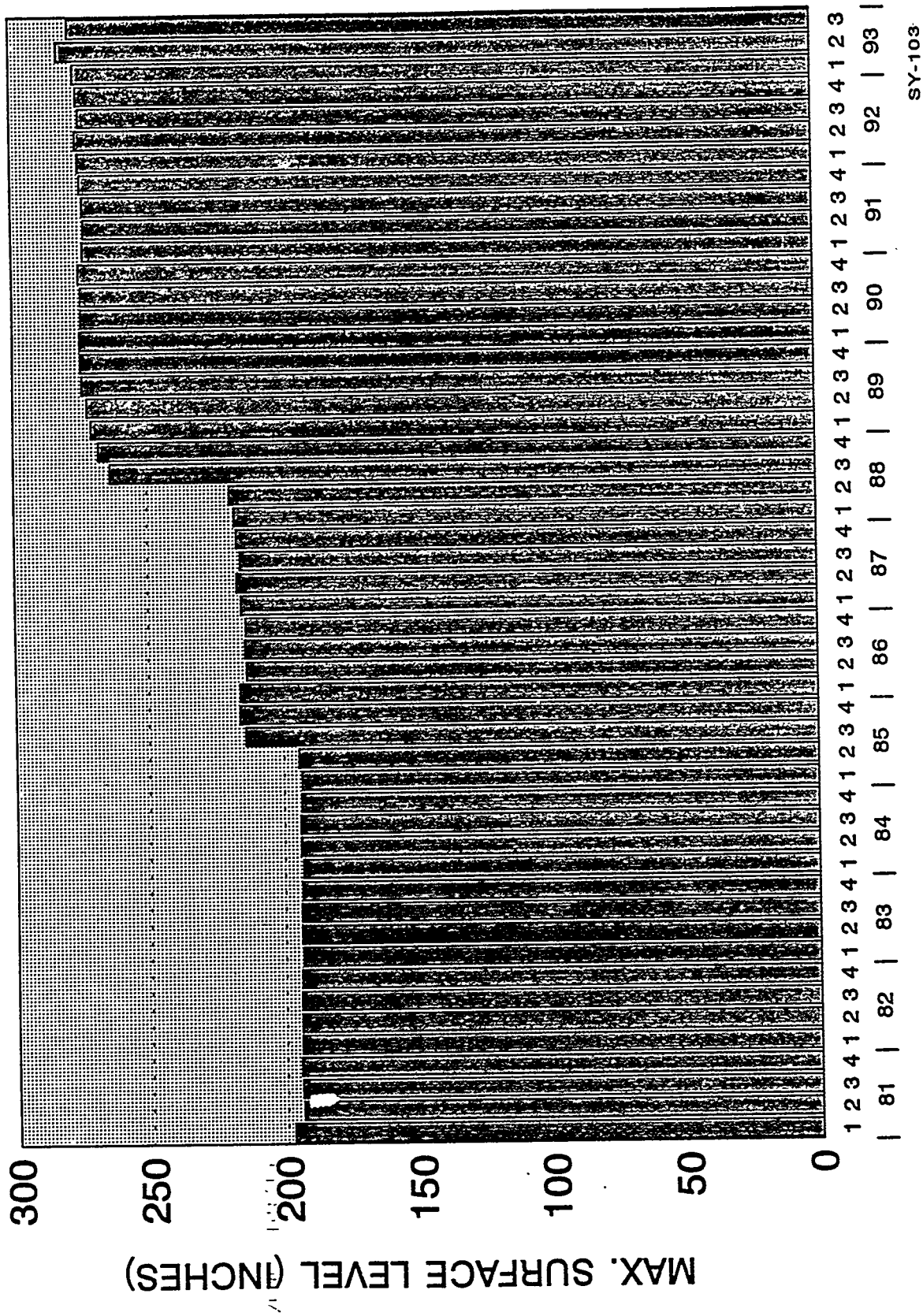

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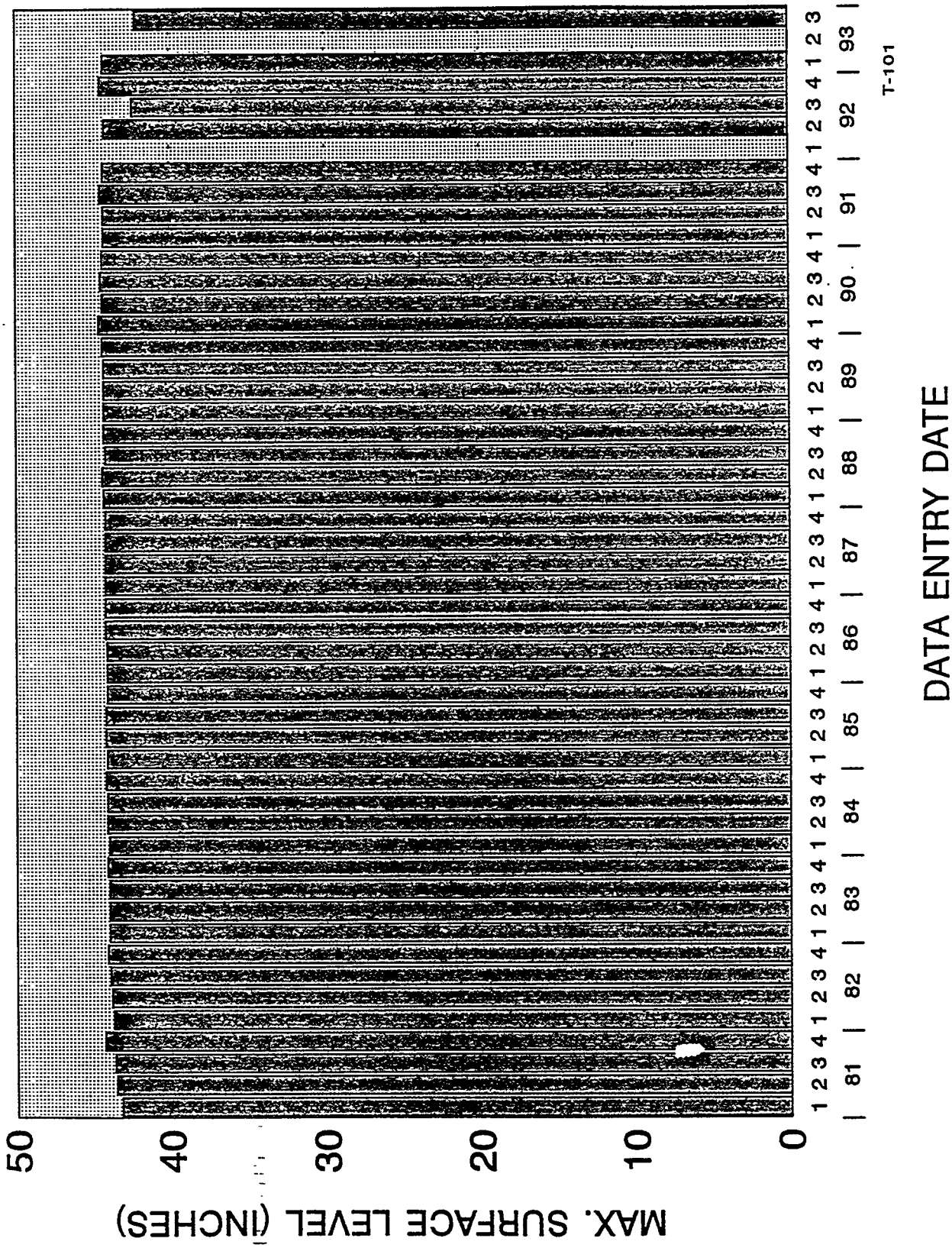

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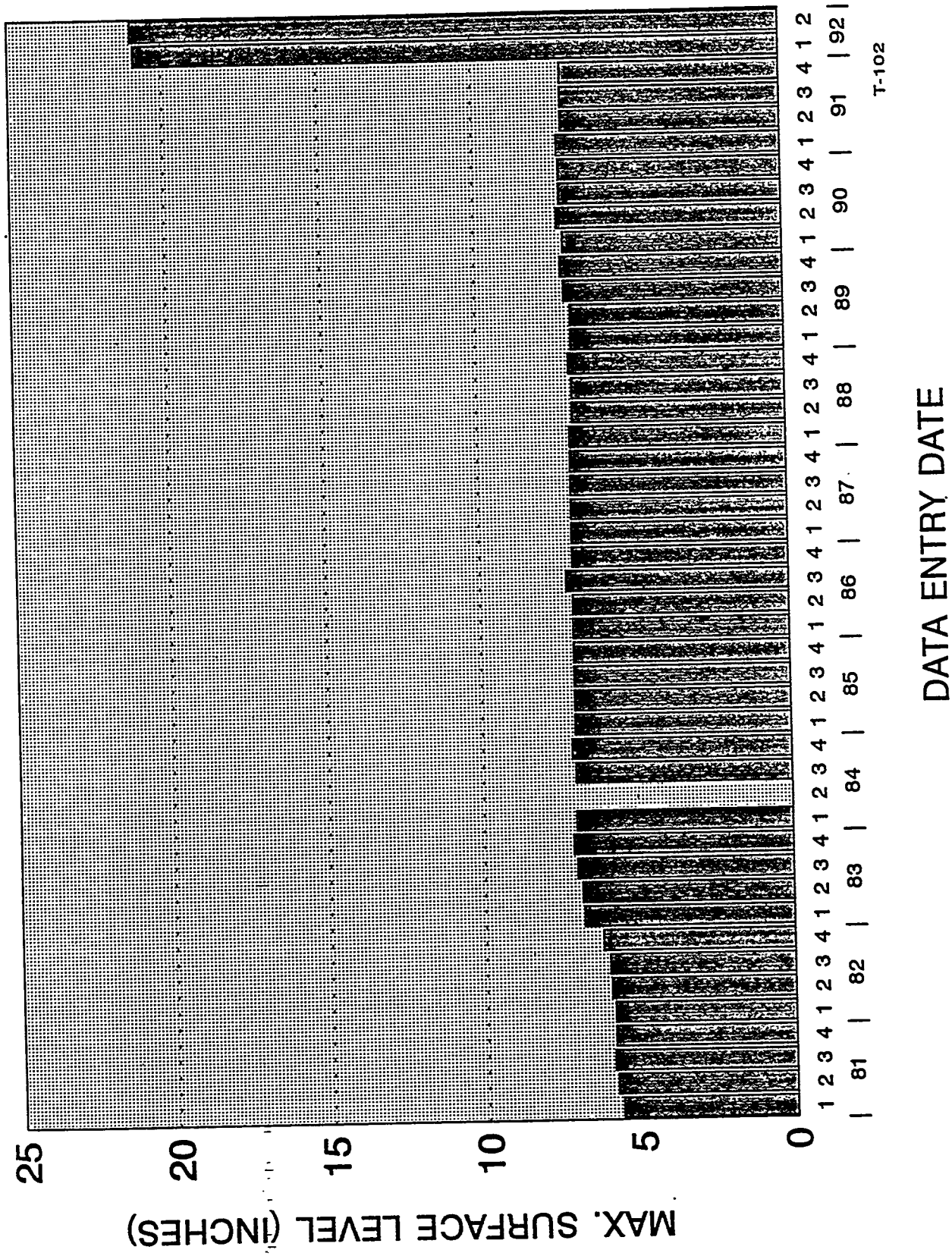

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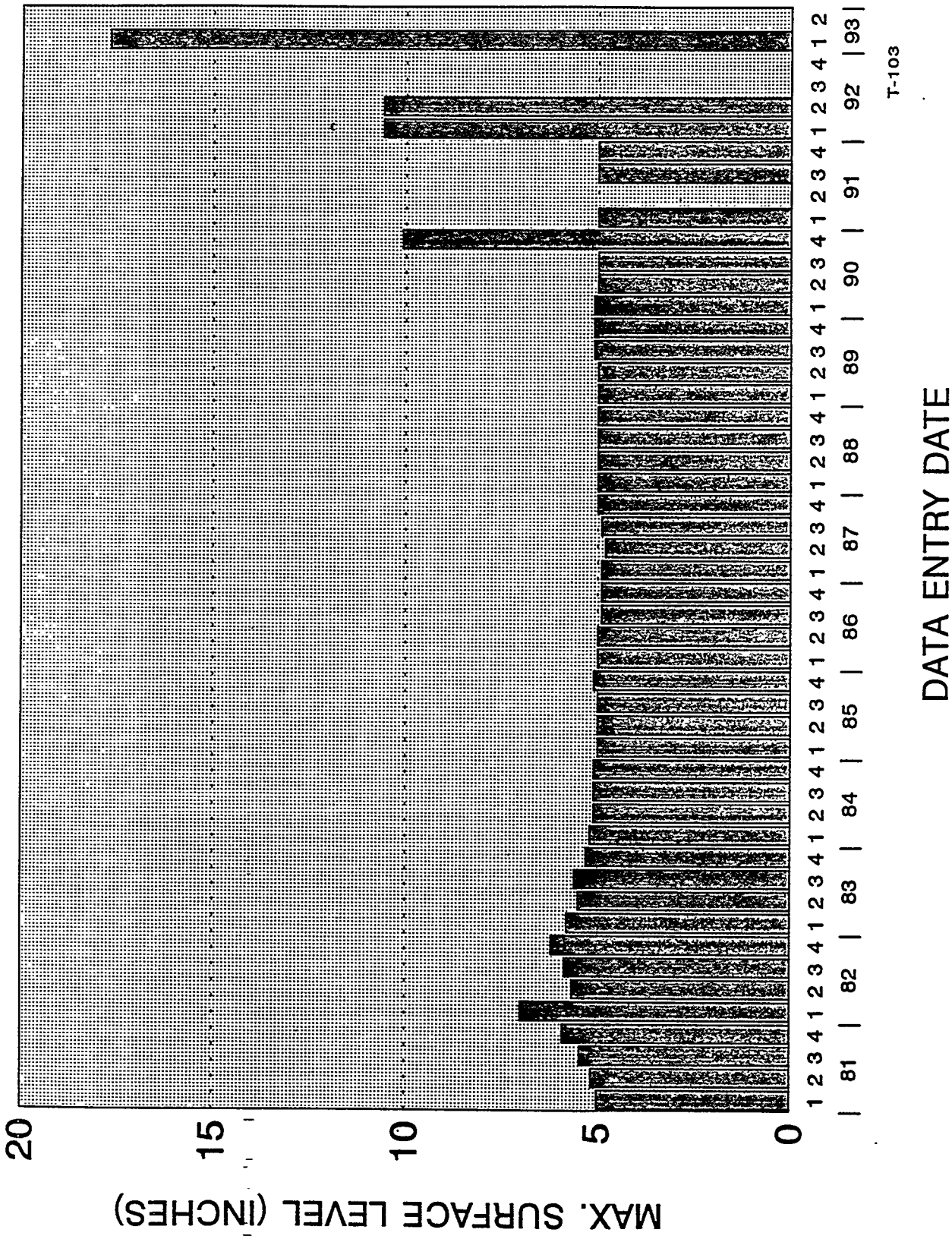

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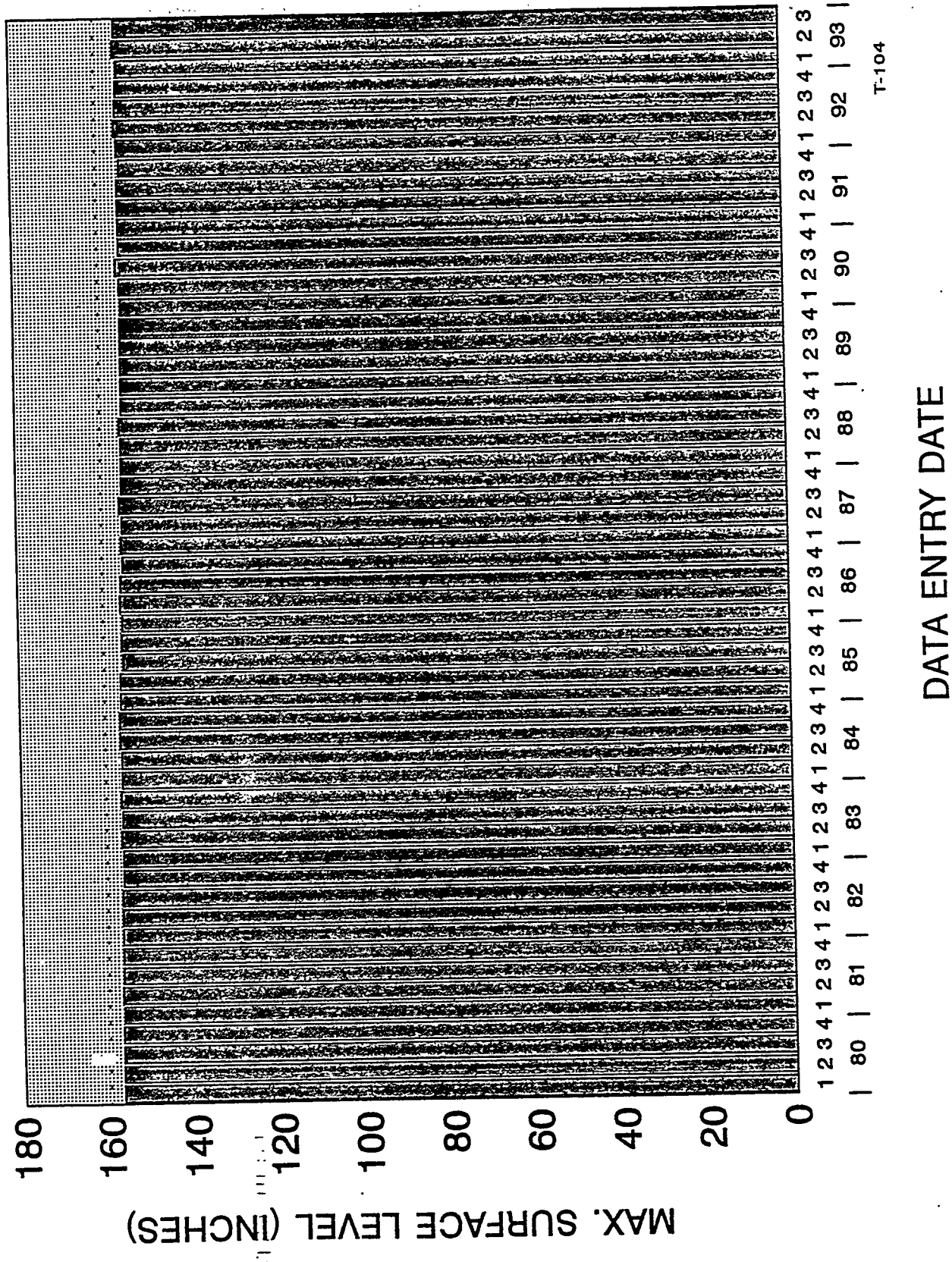

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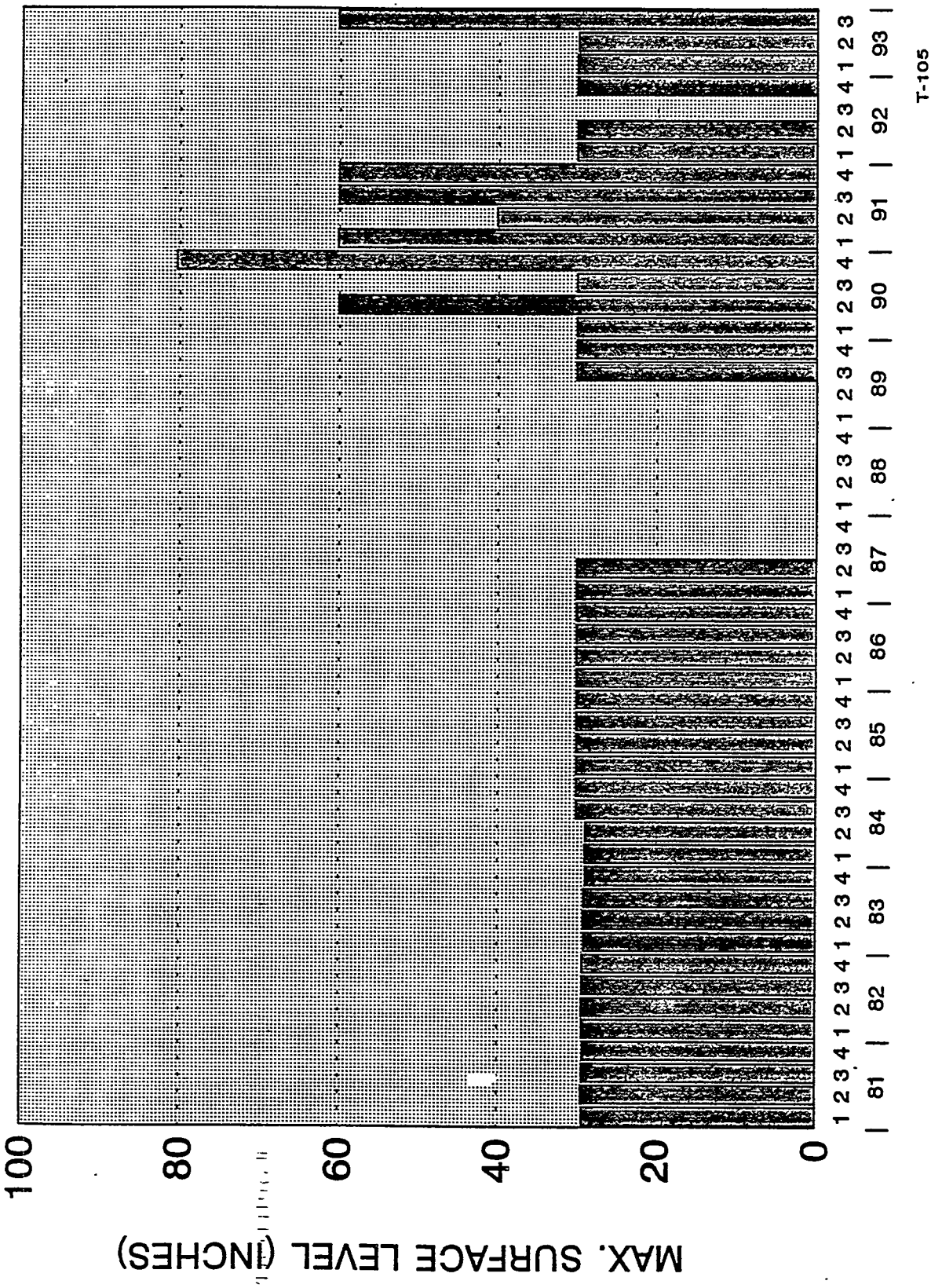

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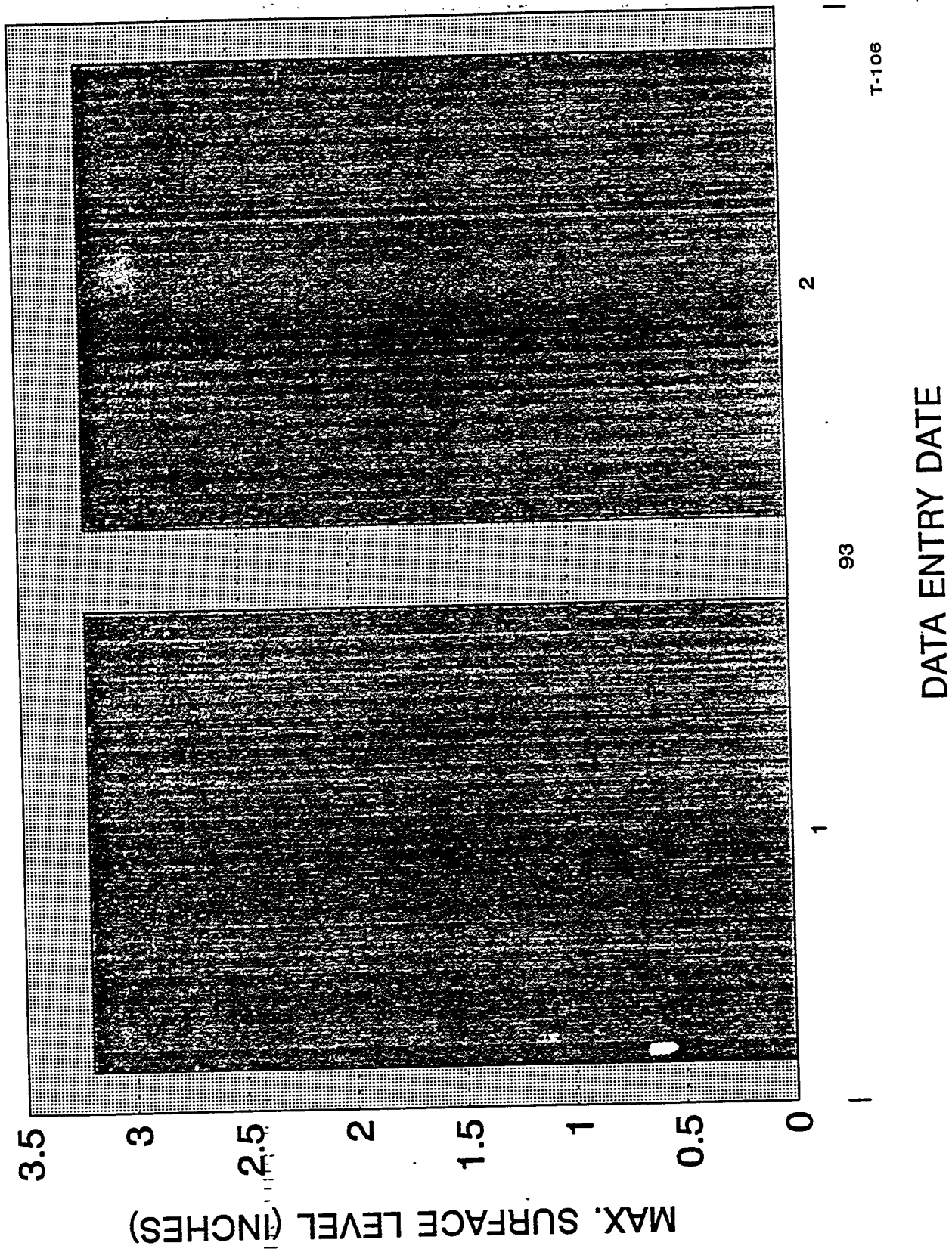

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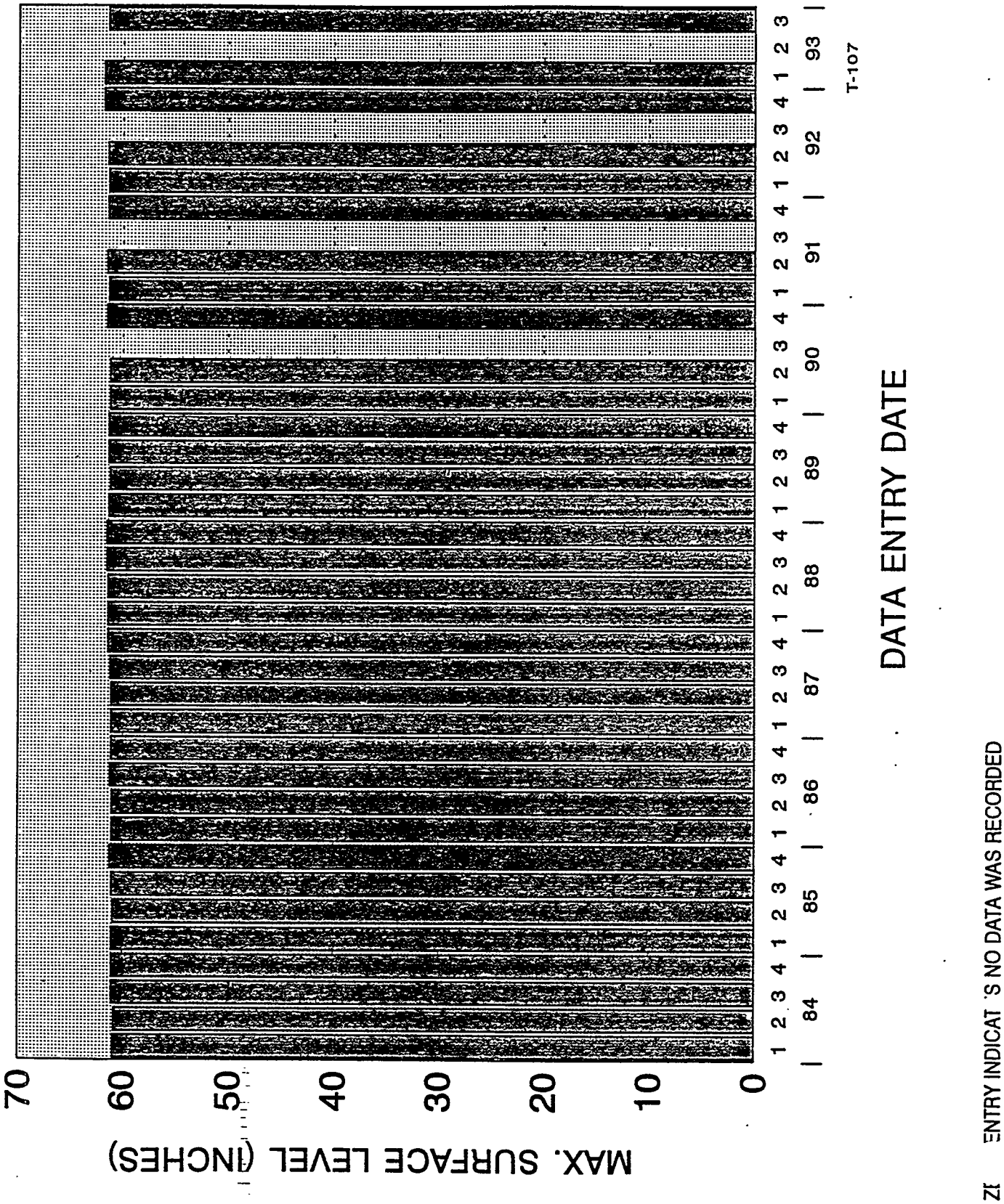

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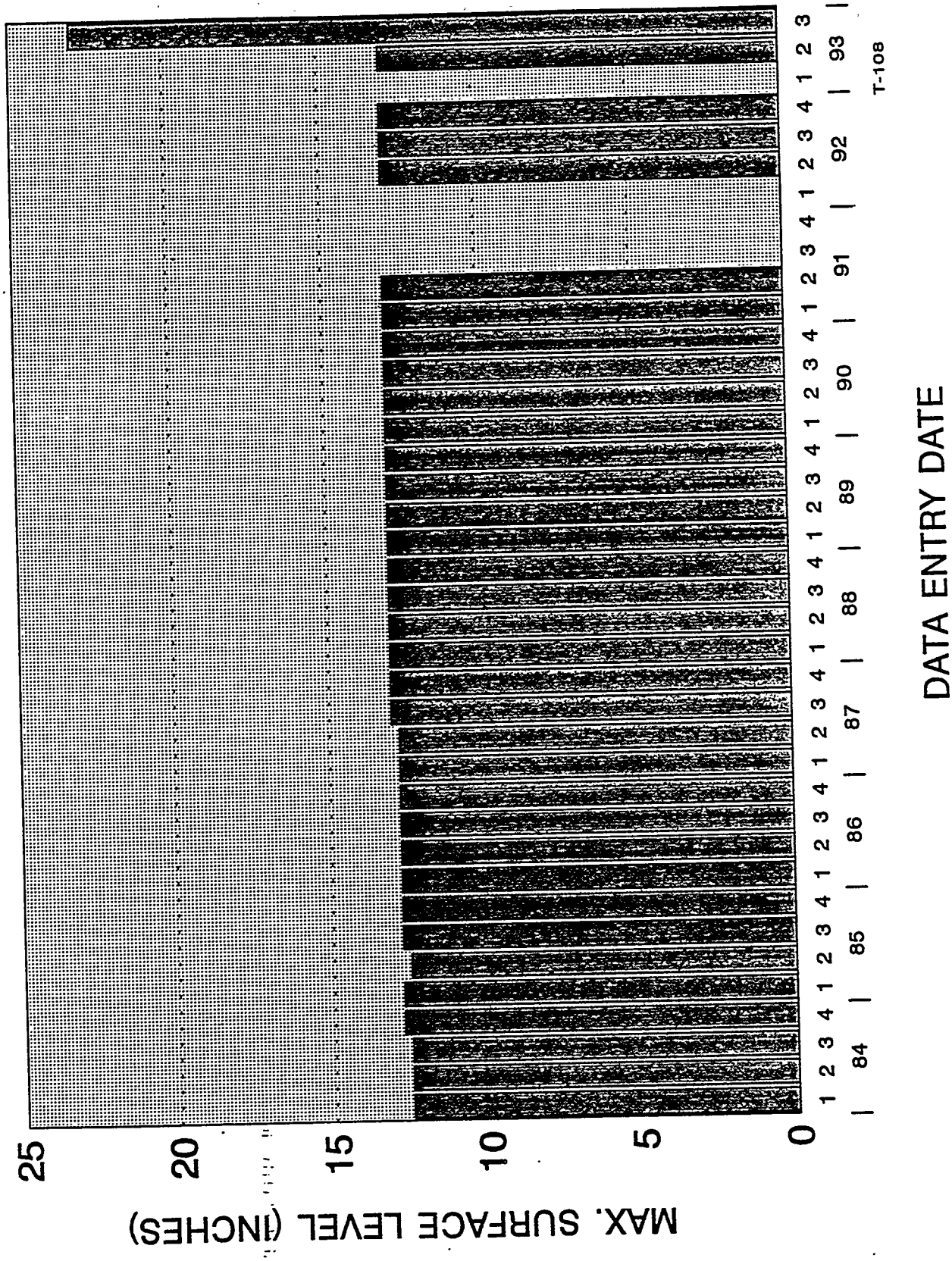

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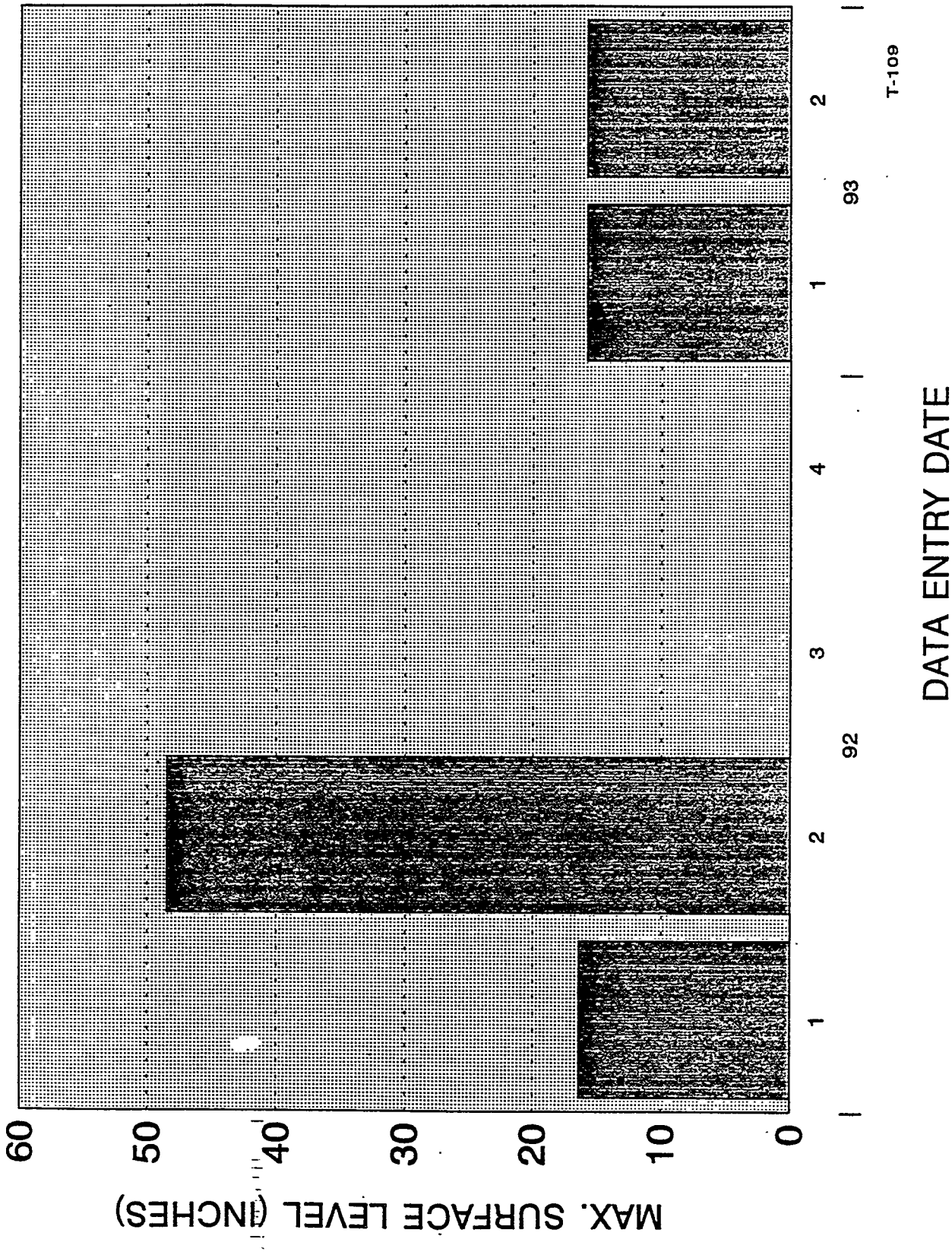

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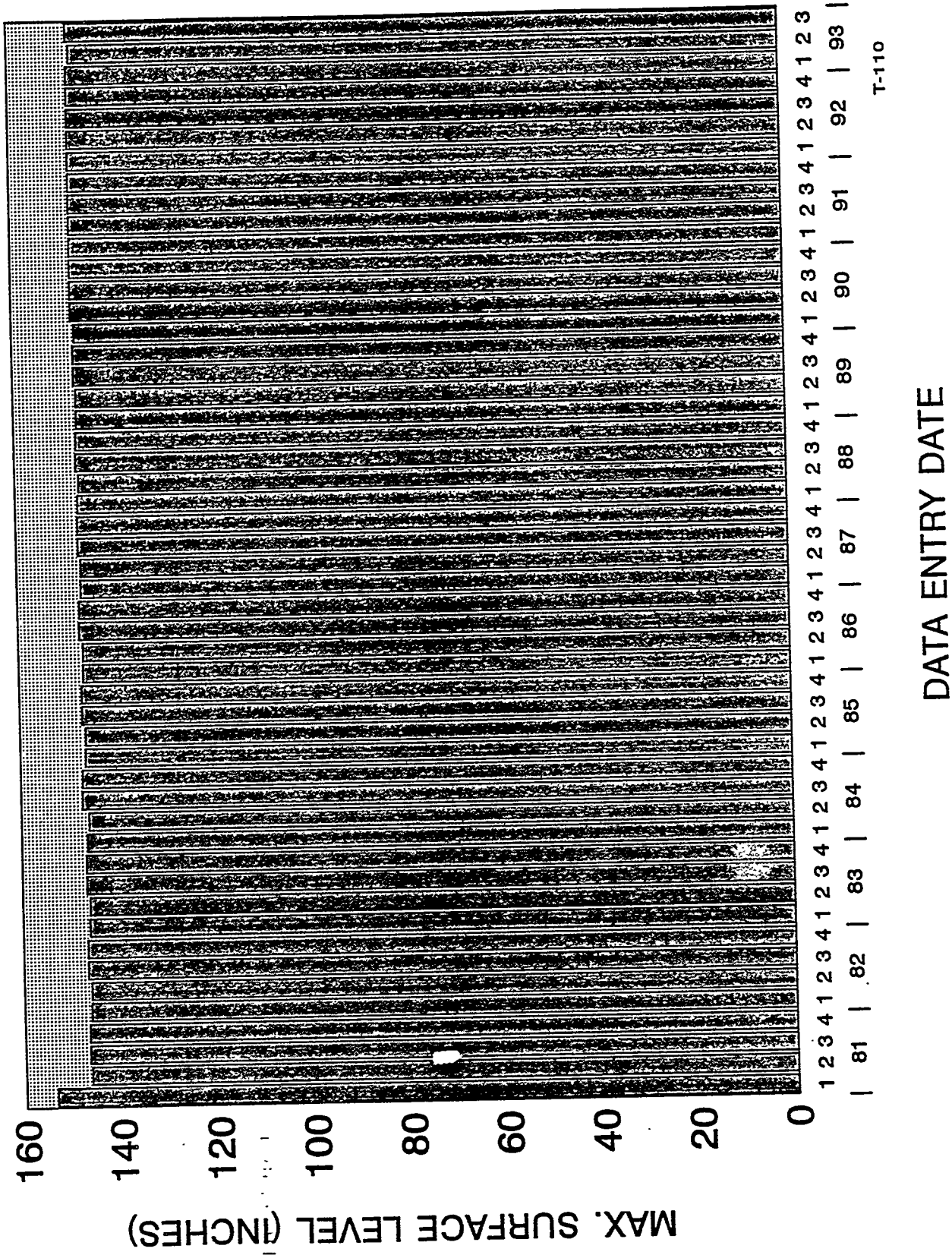

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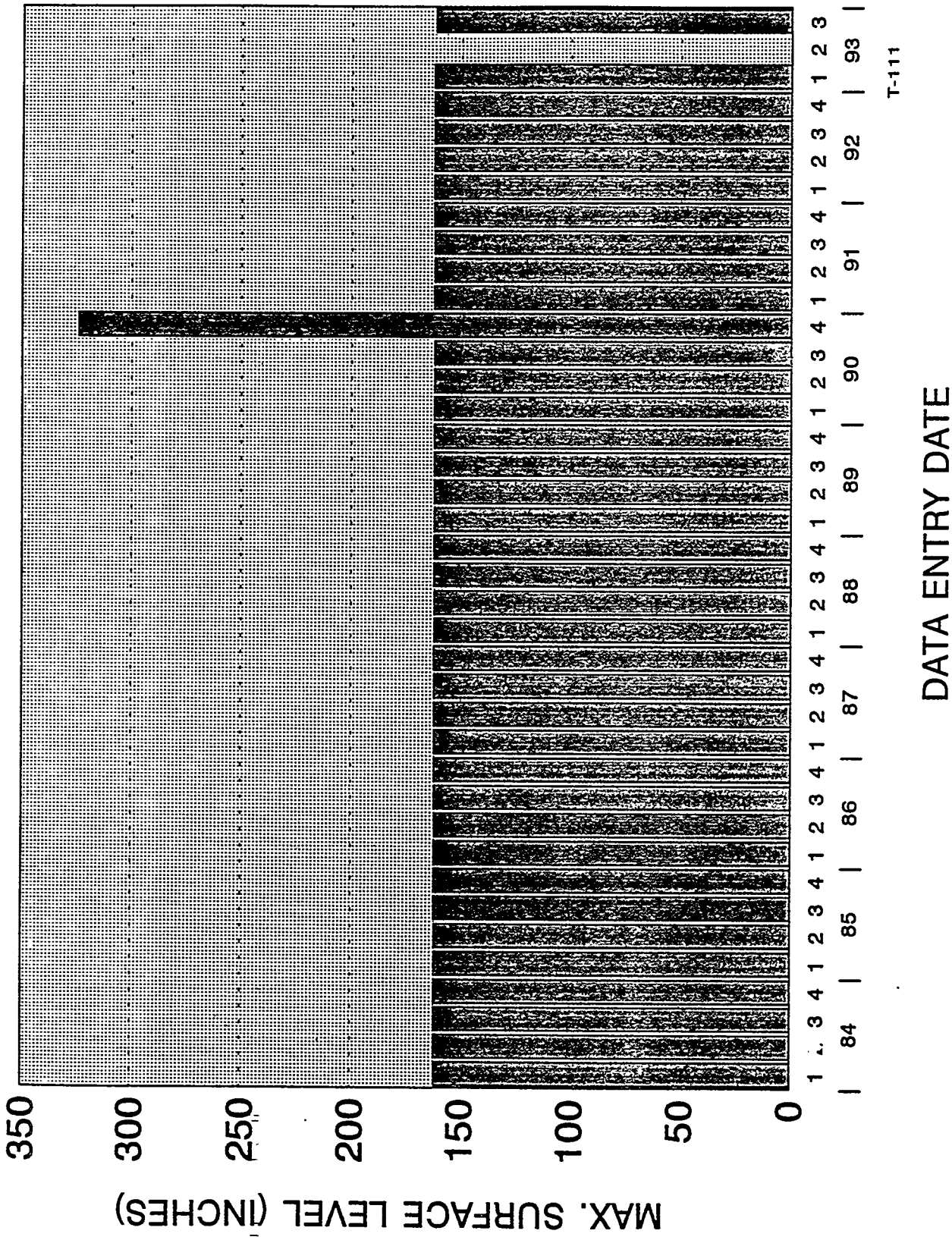

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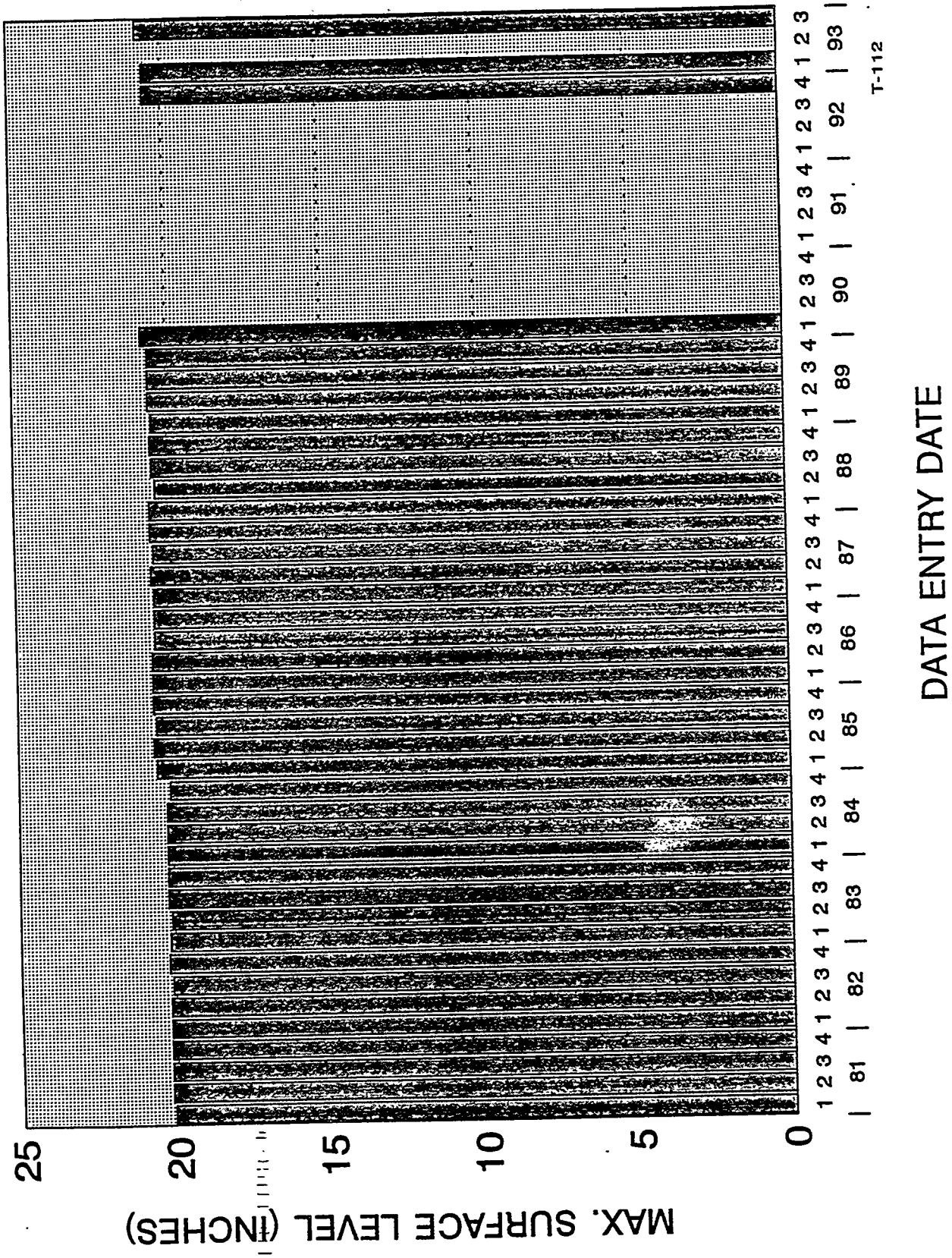

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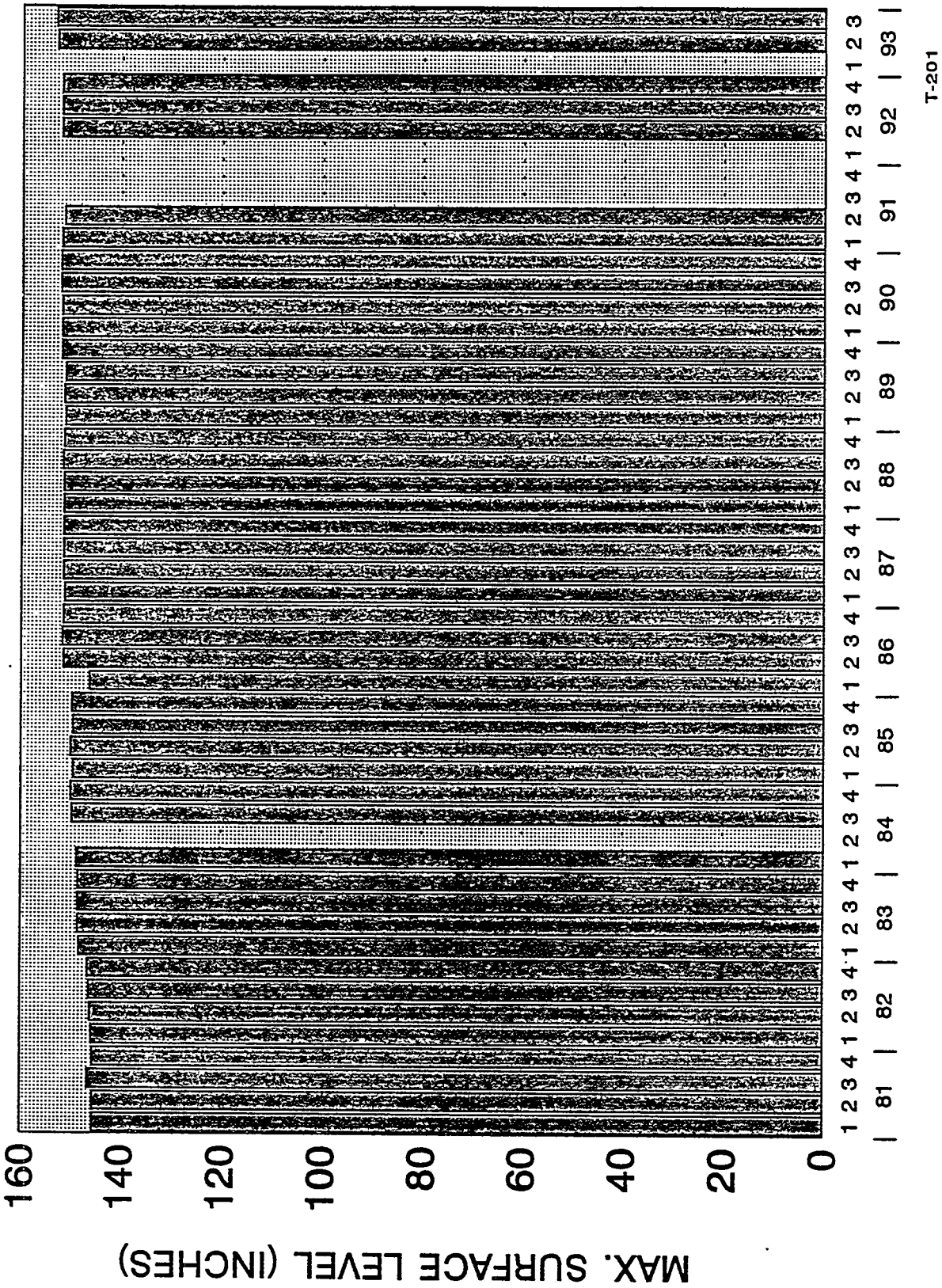

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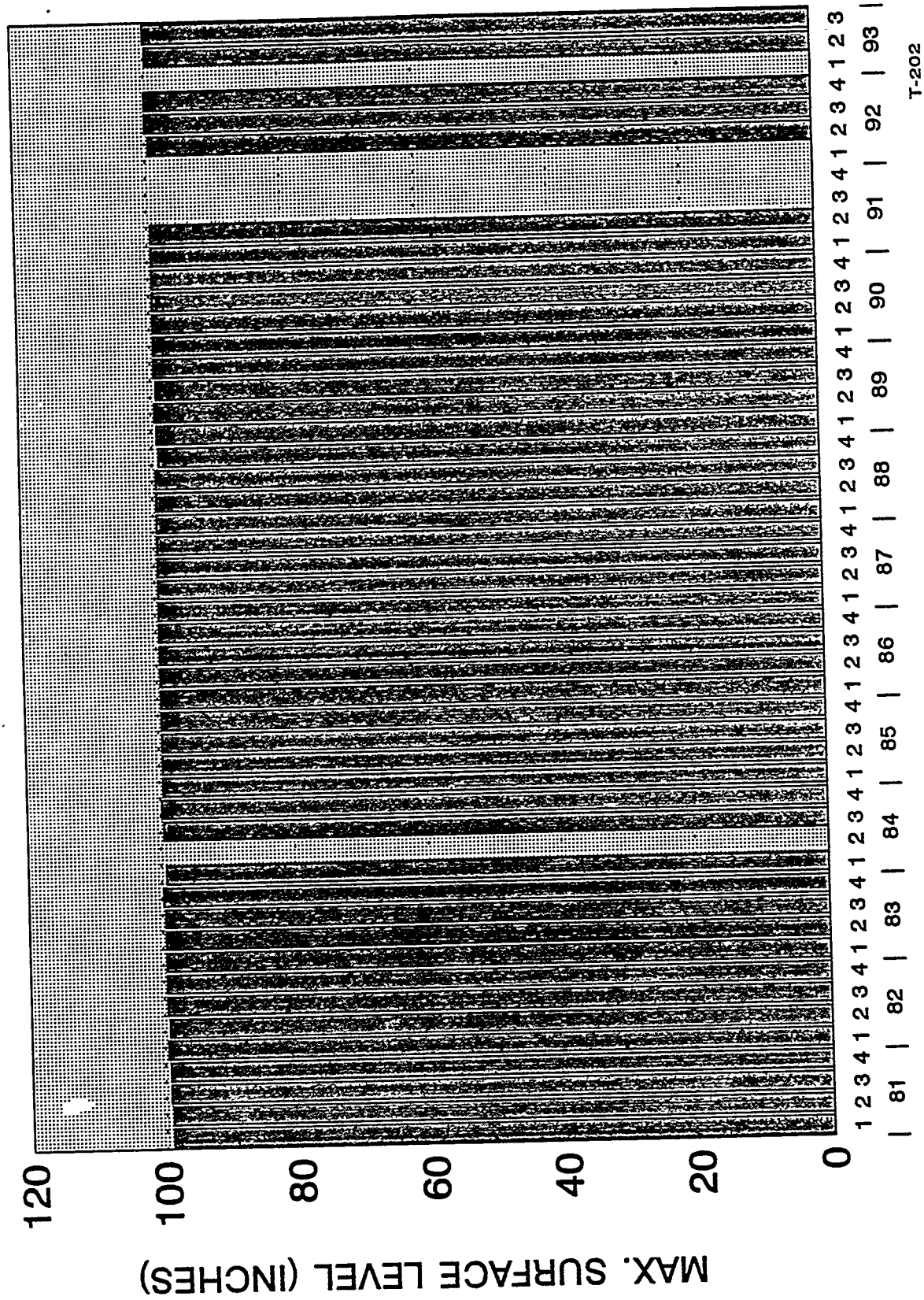
Quarterly Maximum Surface-Level History Plot



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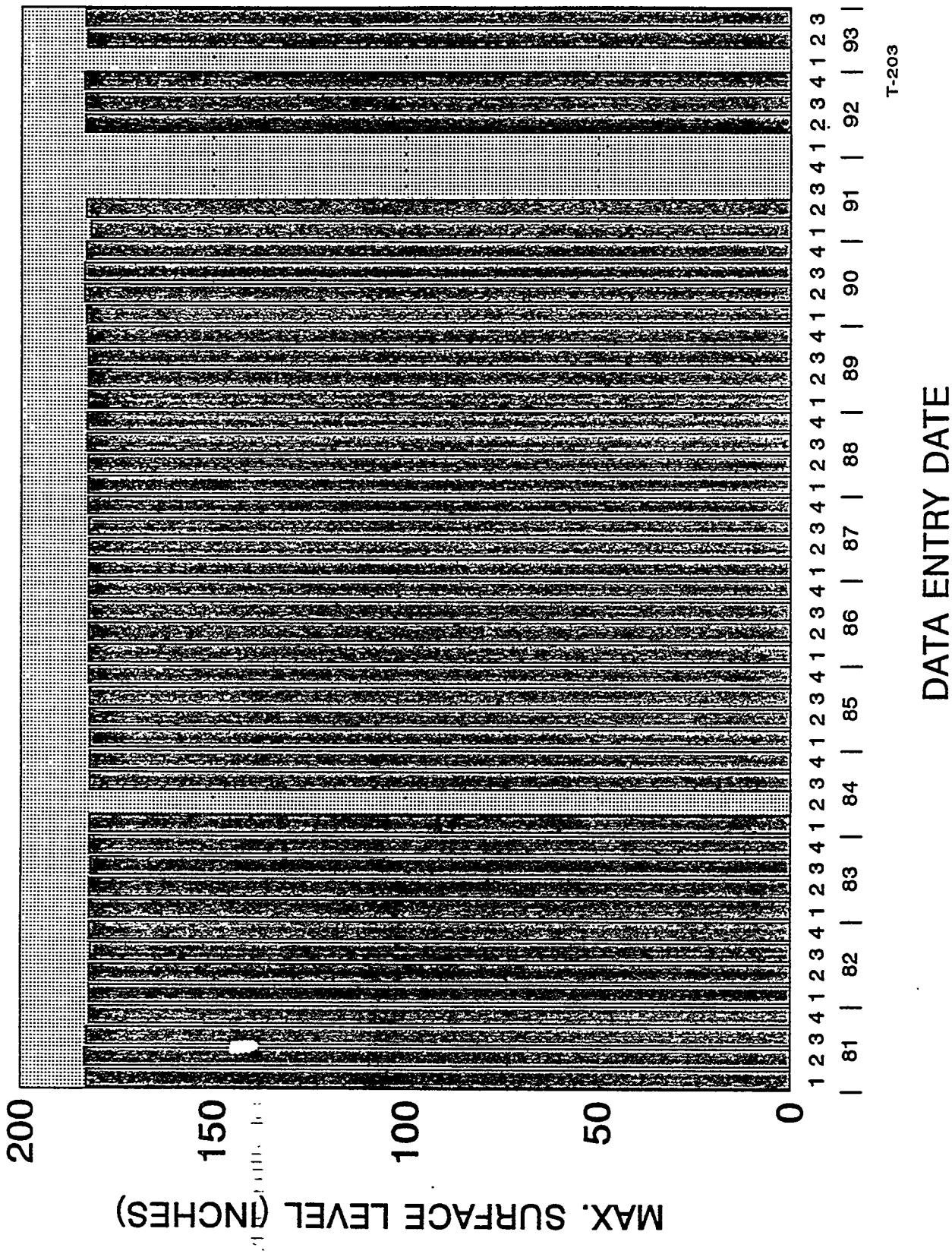

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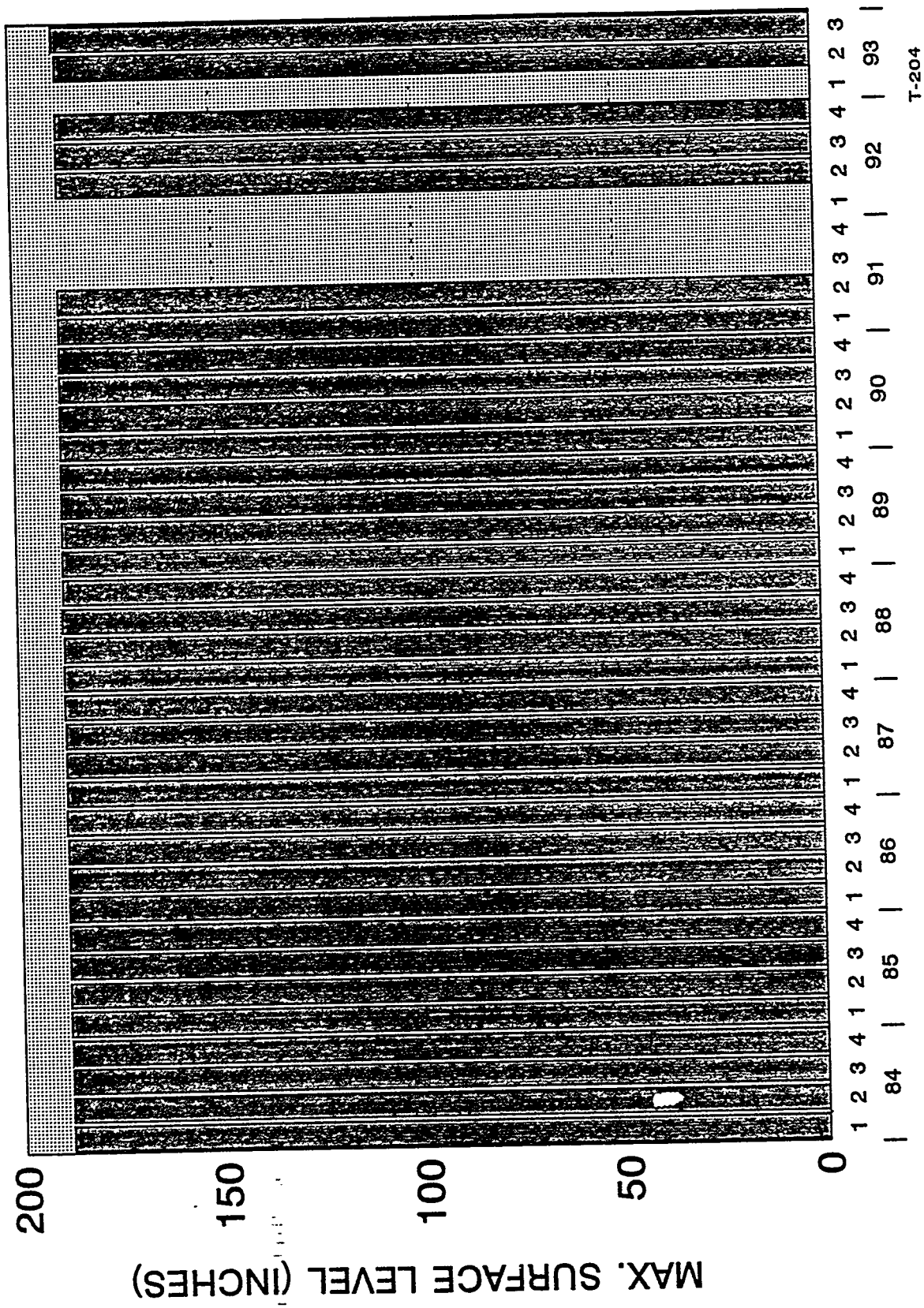

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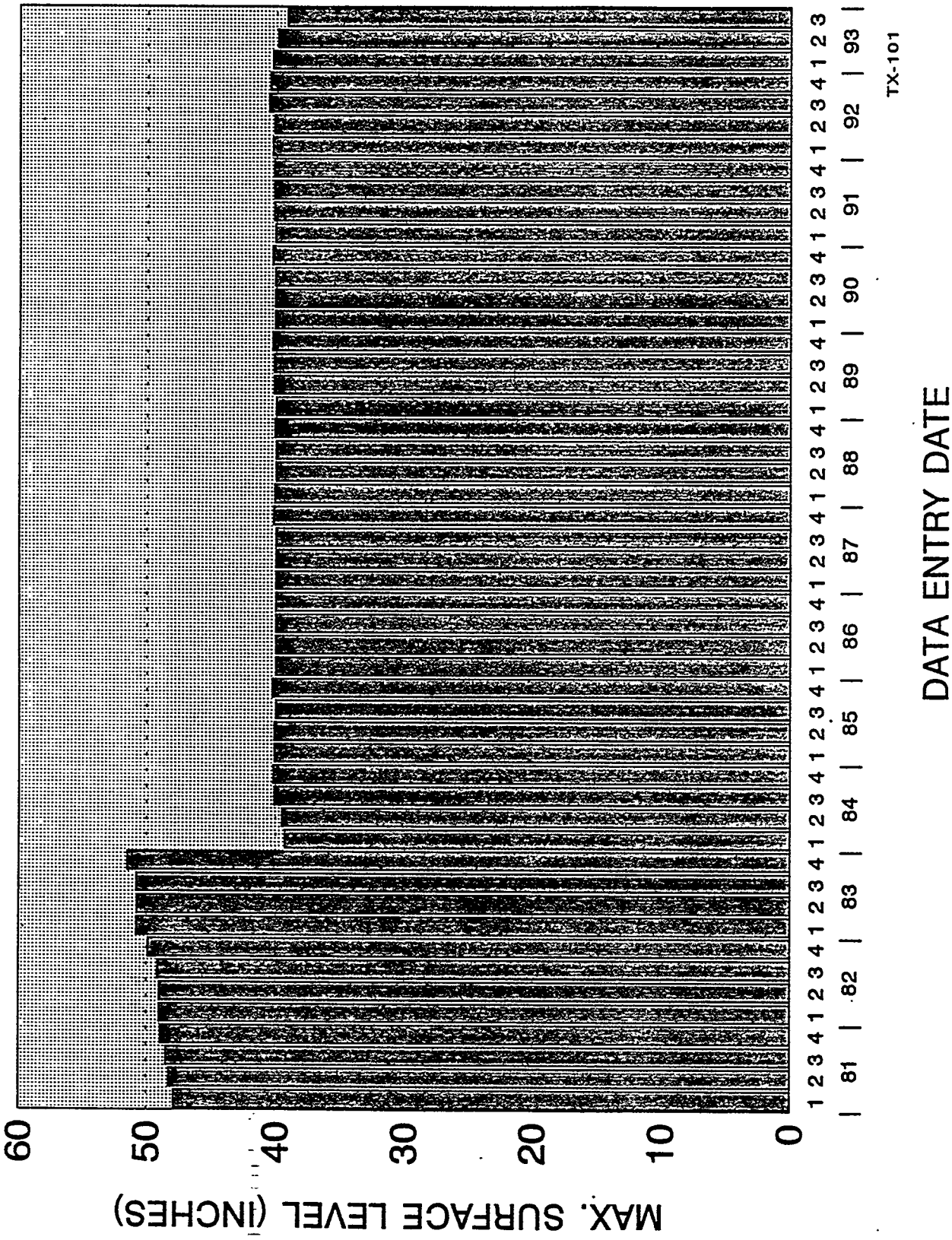

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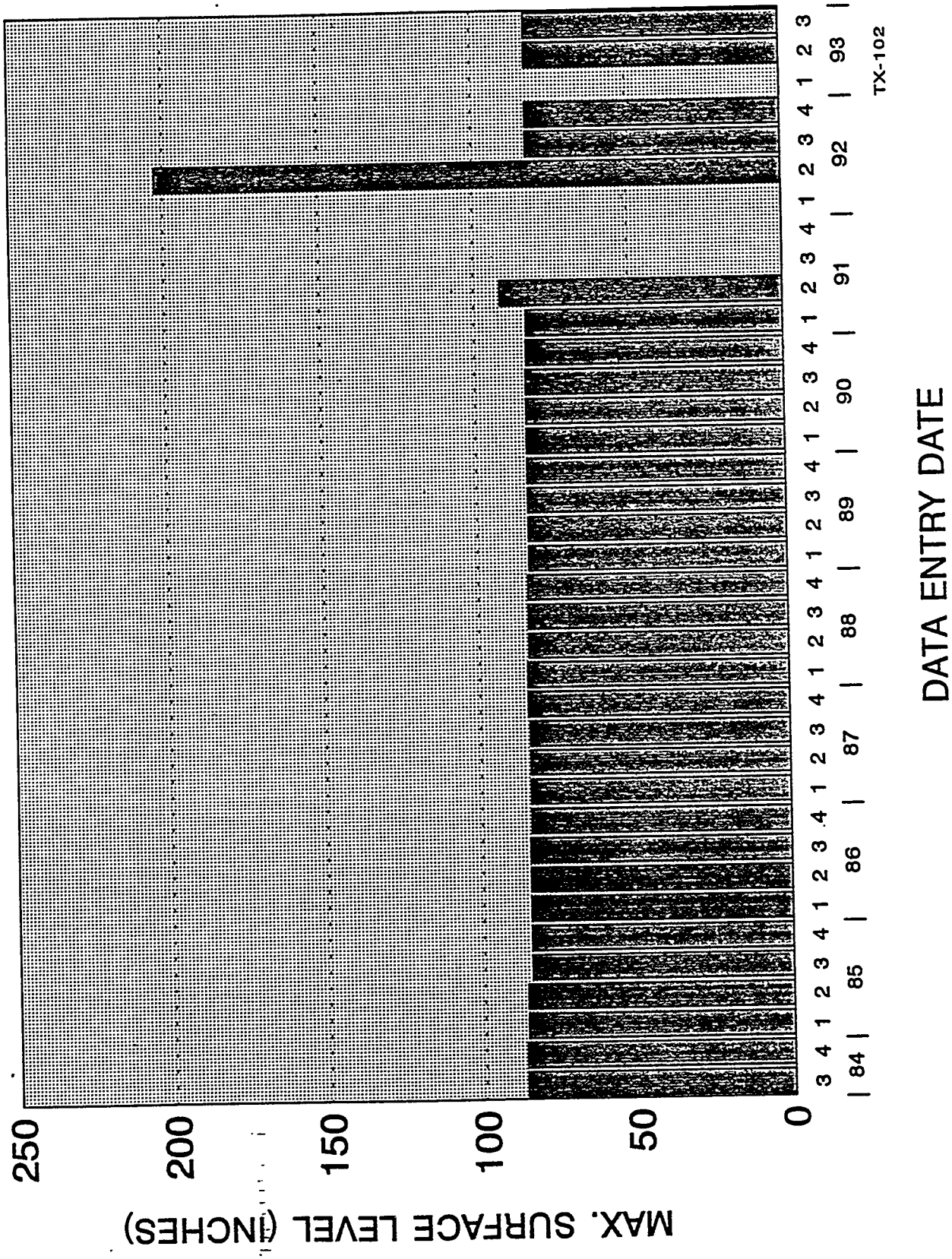

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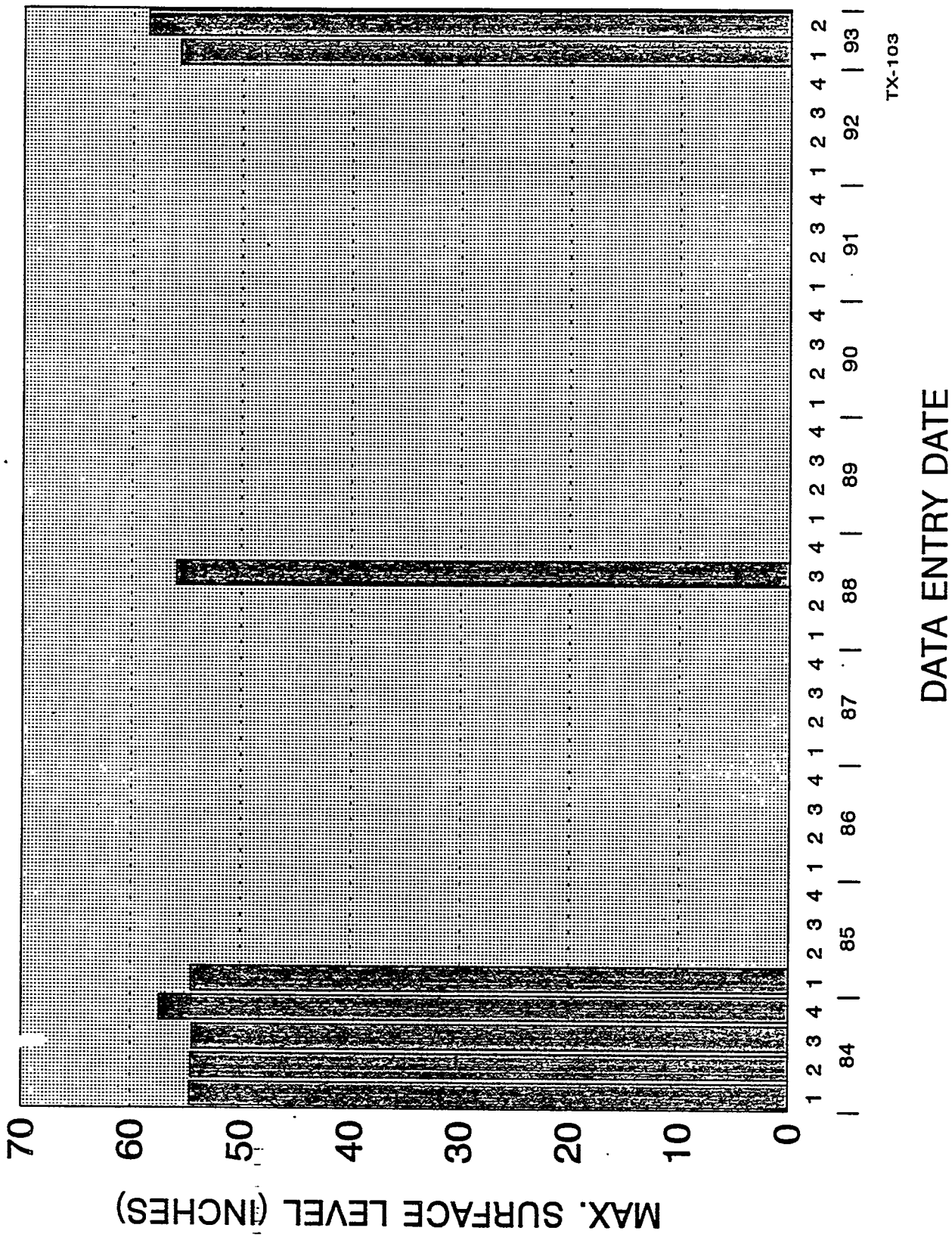

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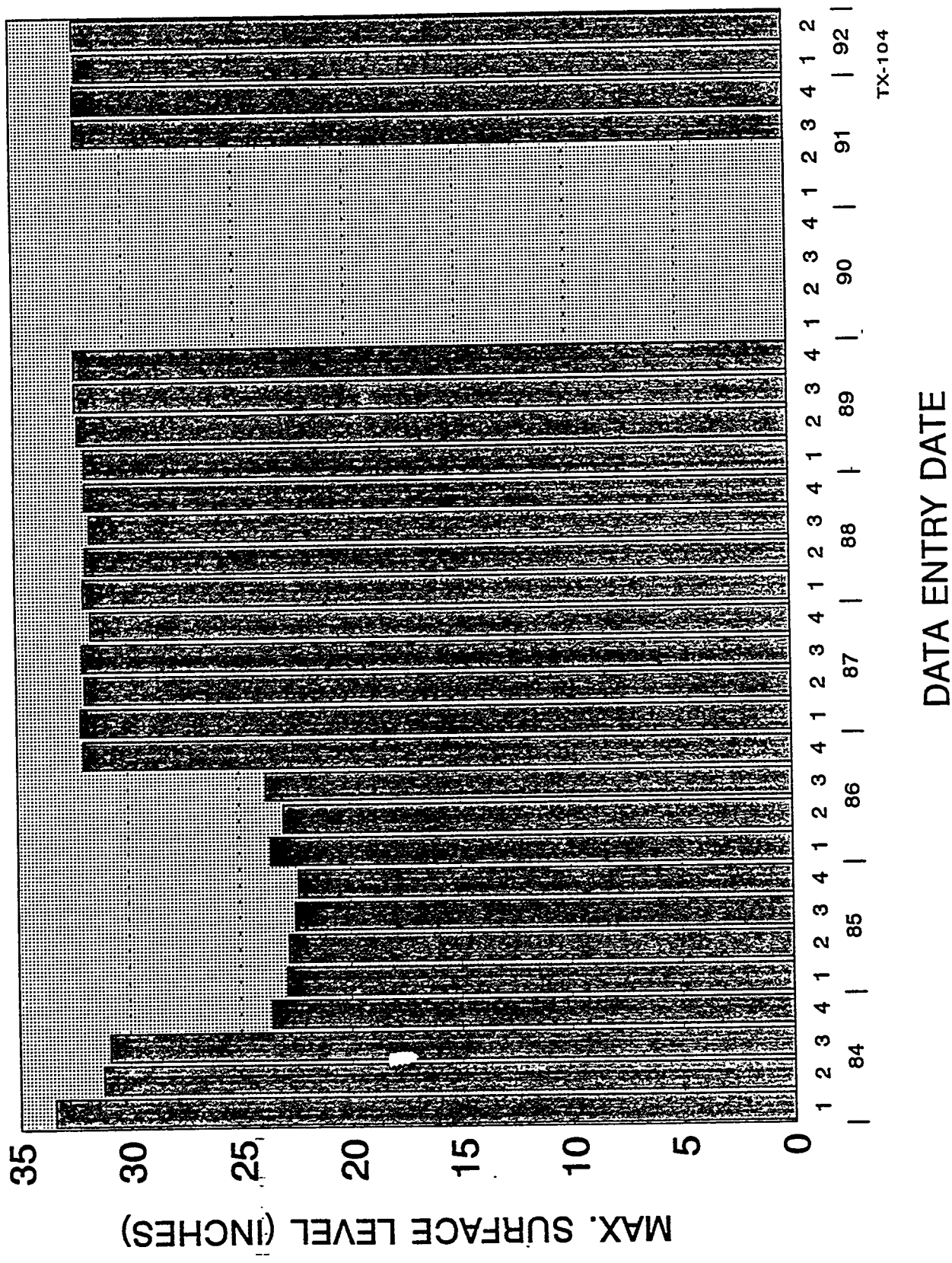

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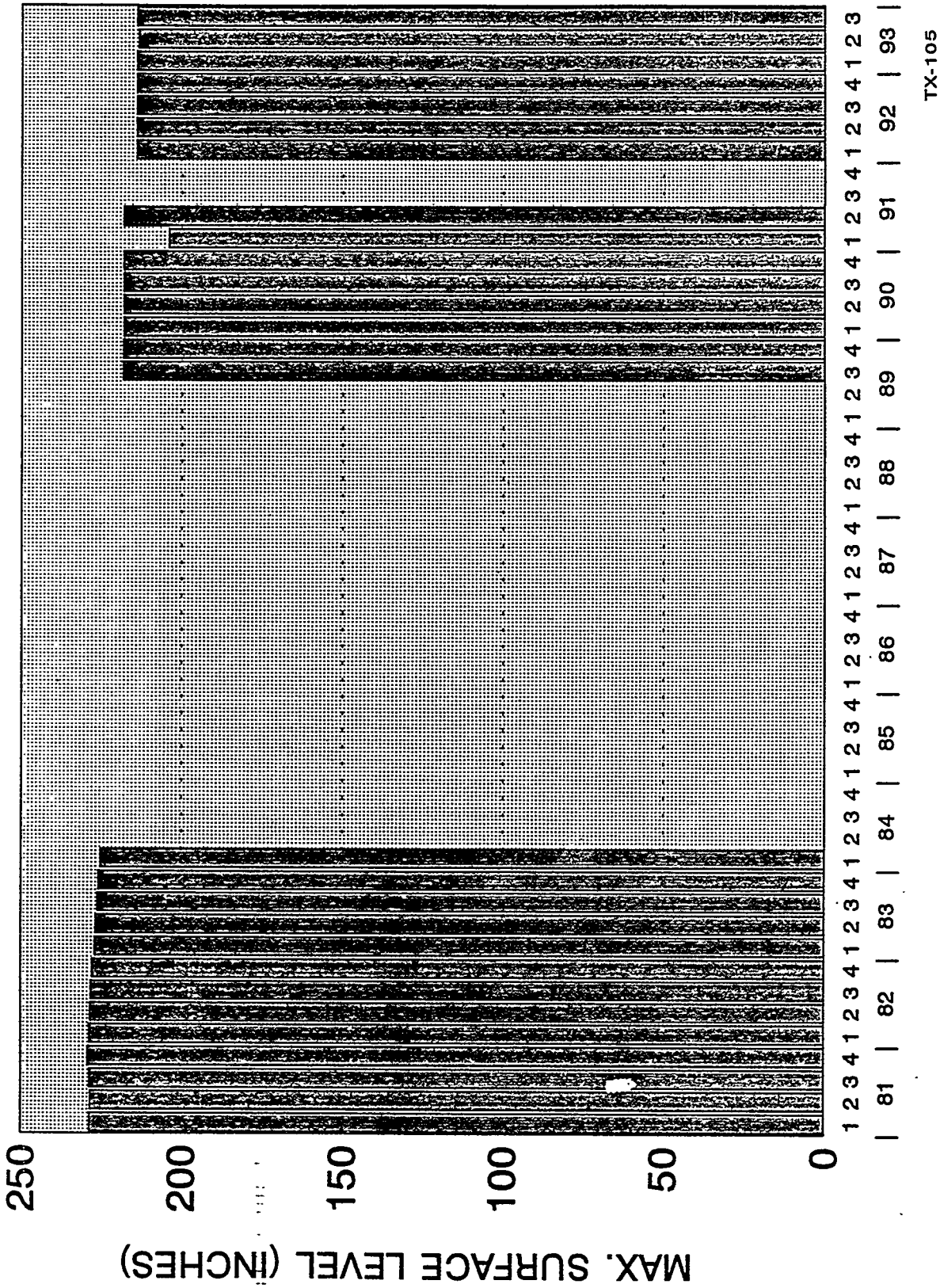

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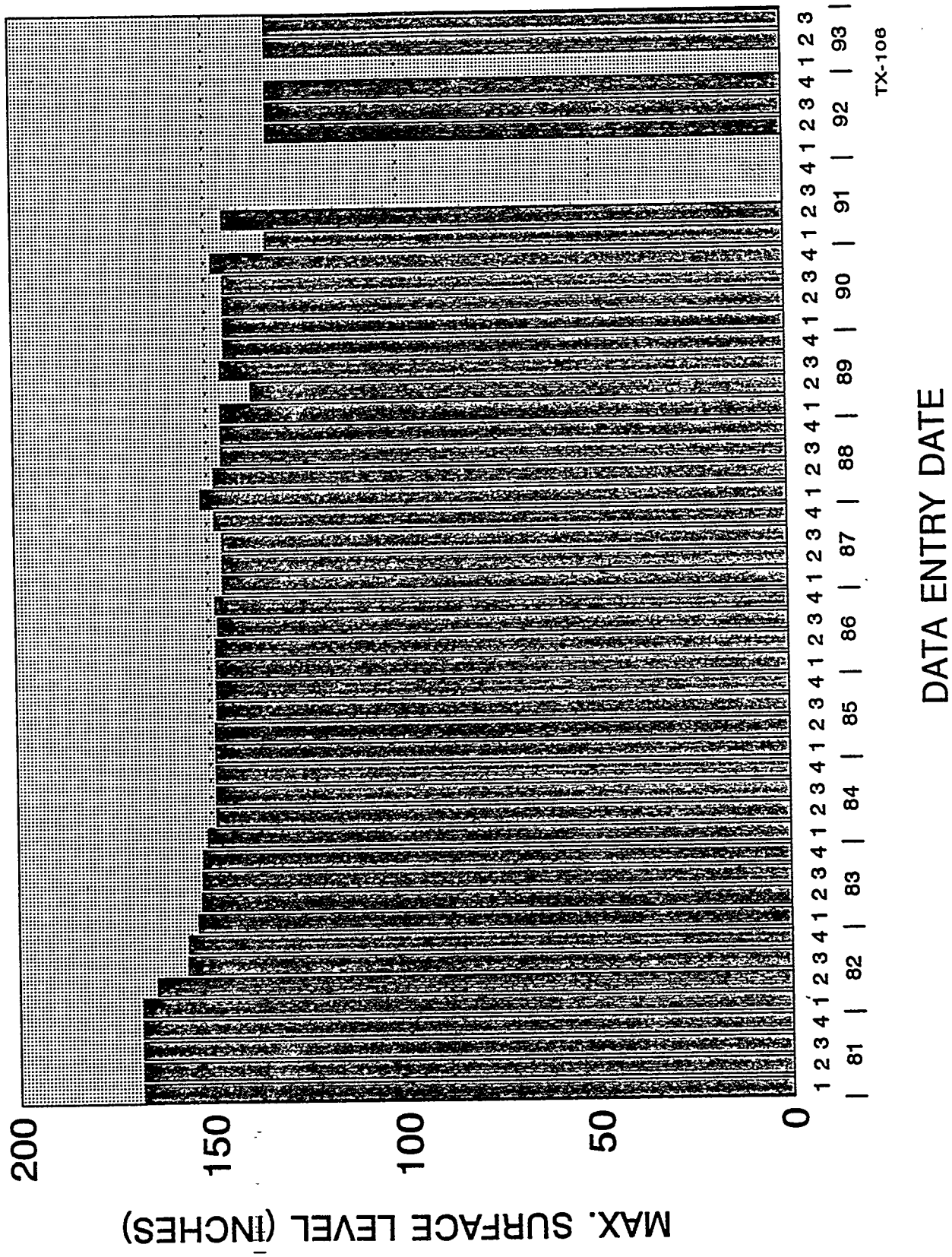

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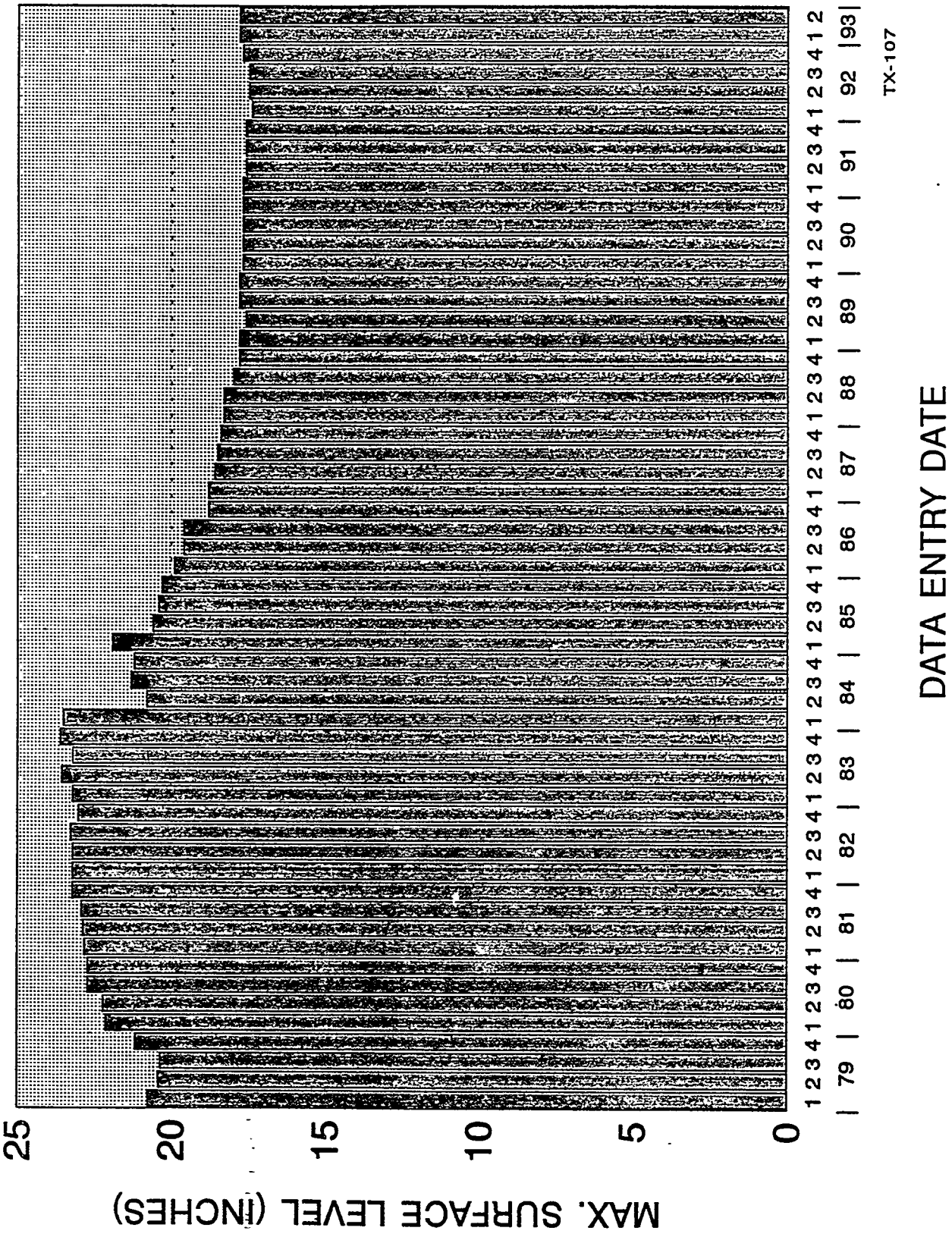

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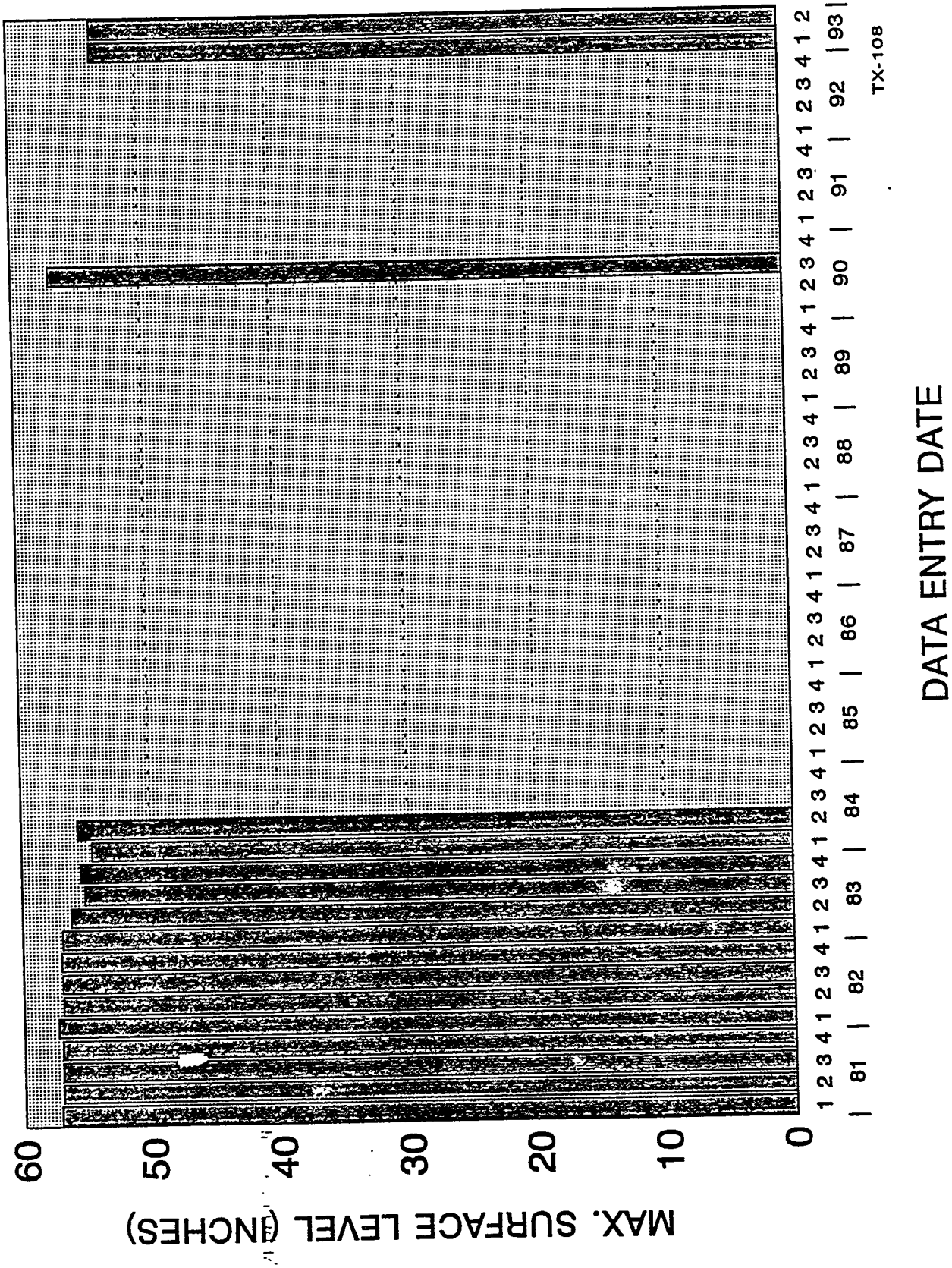

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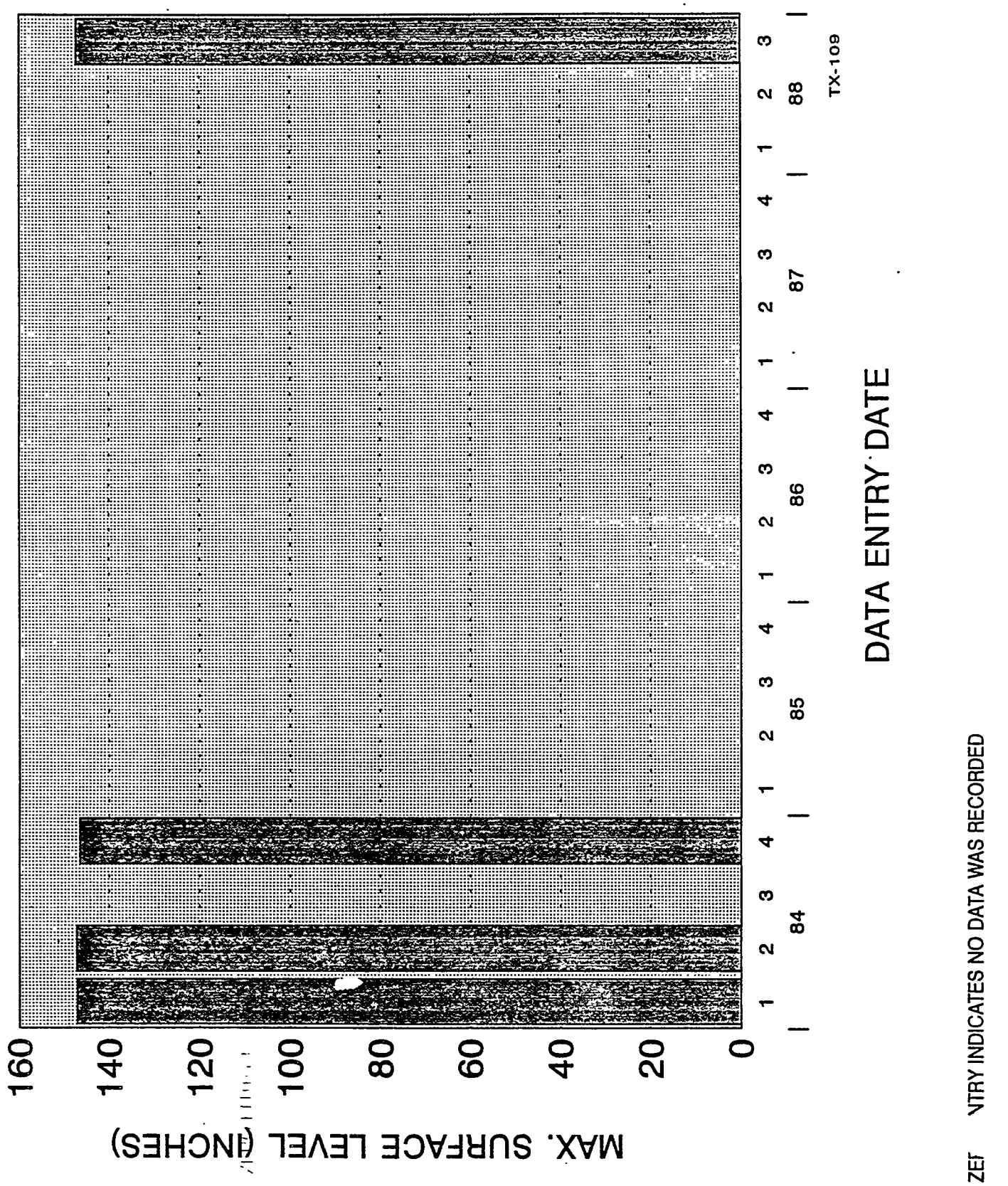

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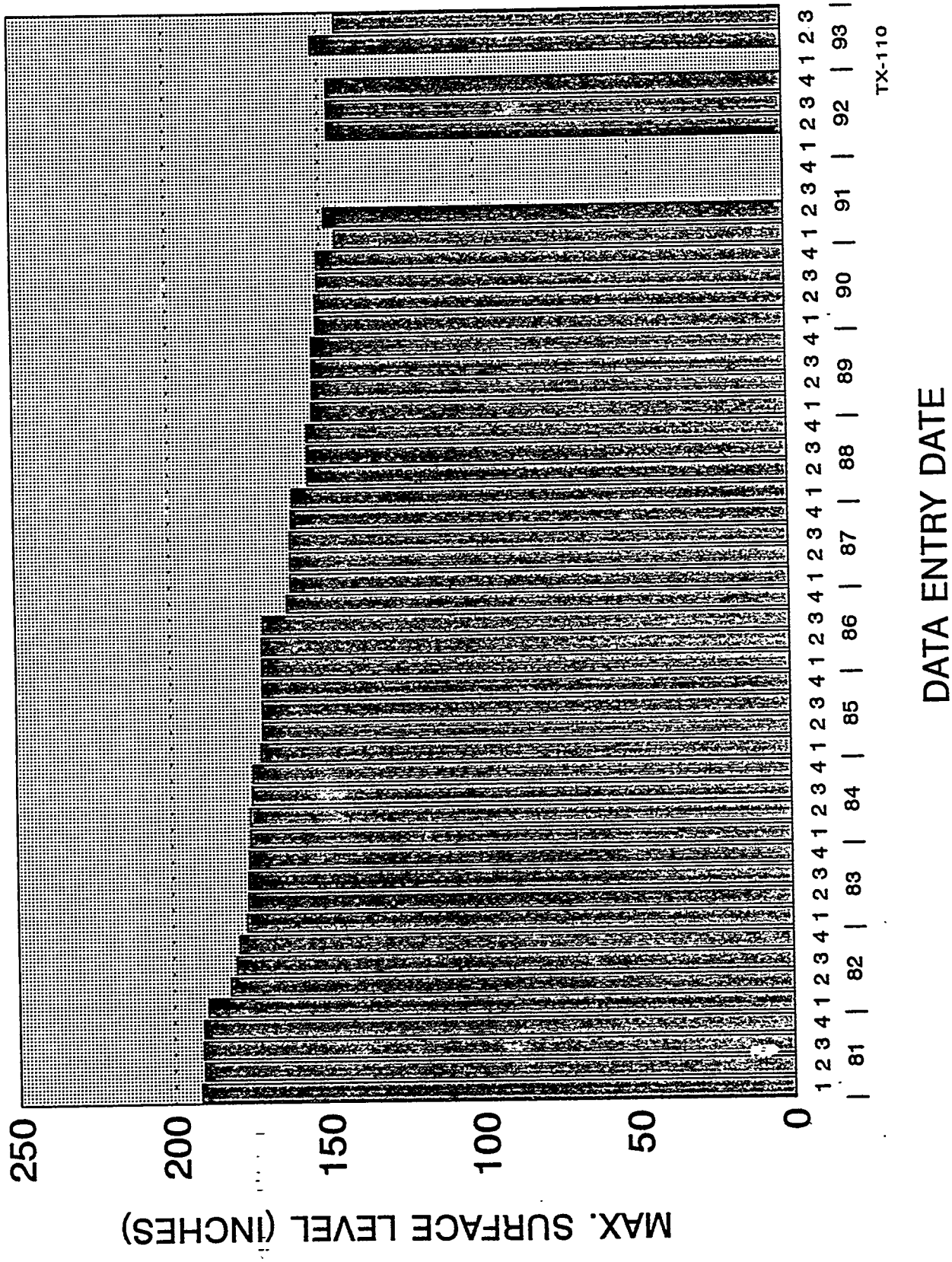

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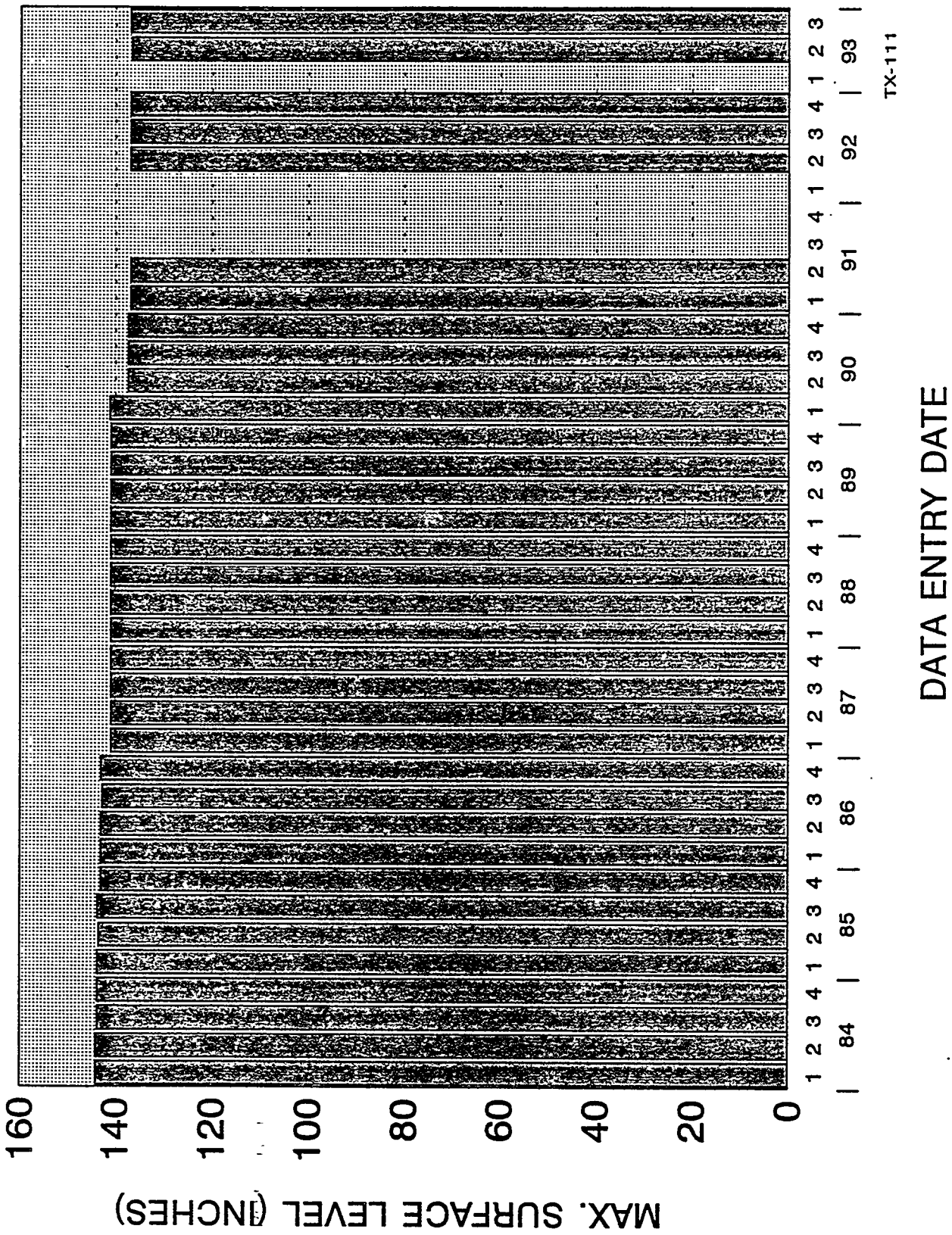

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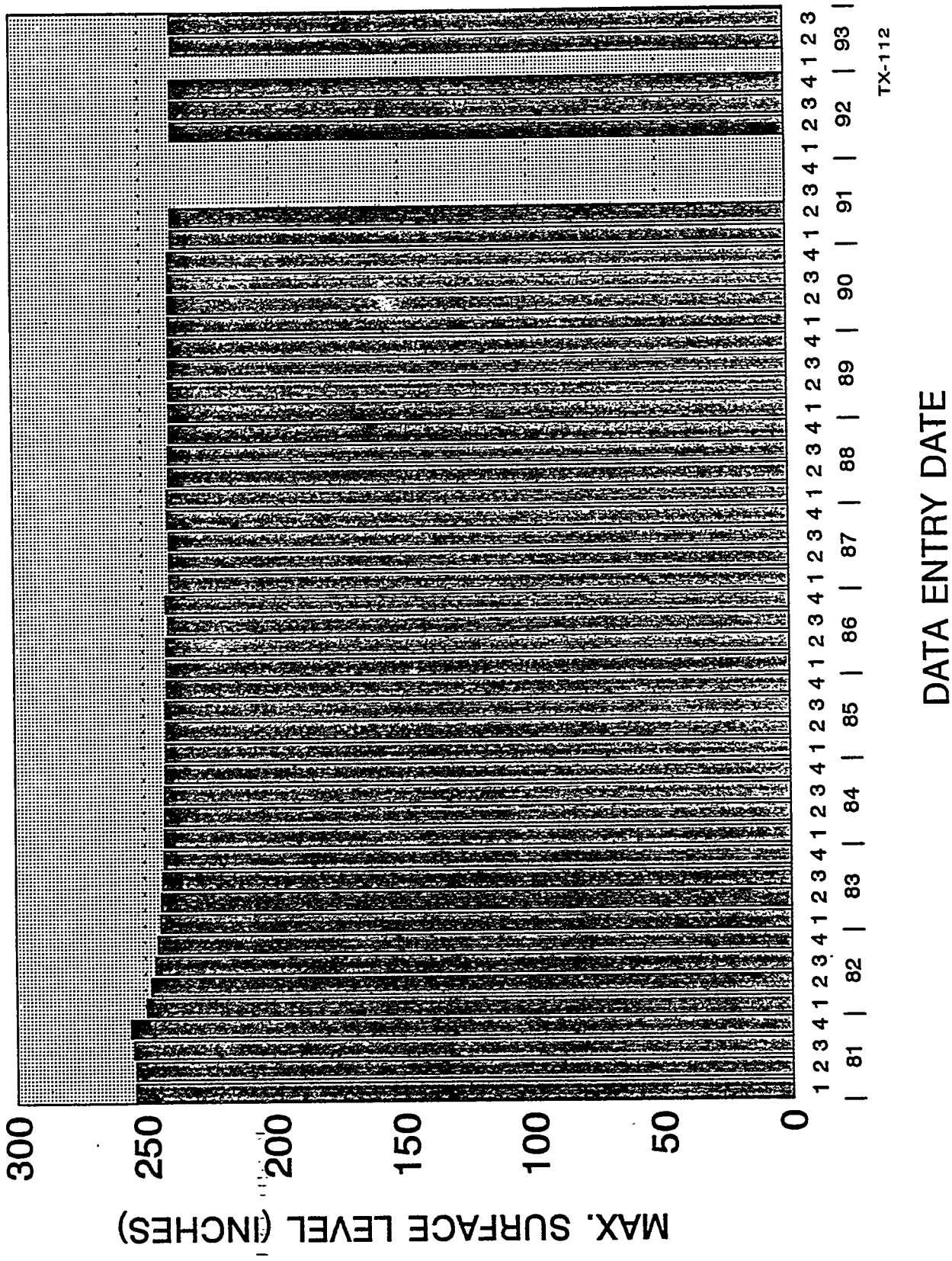

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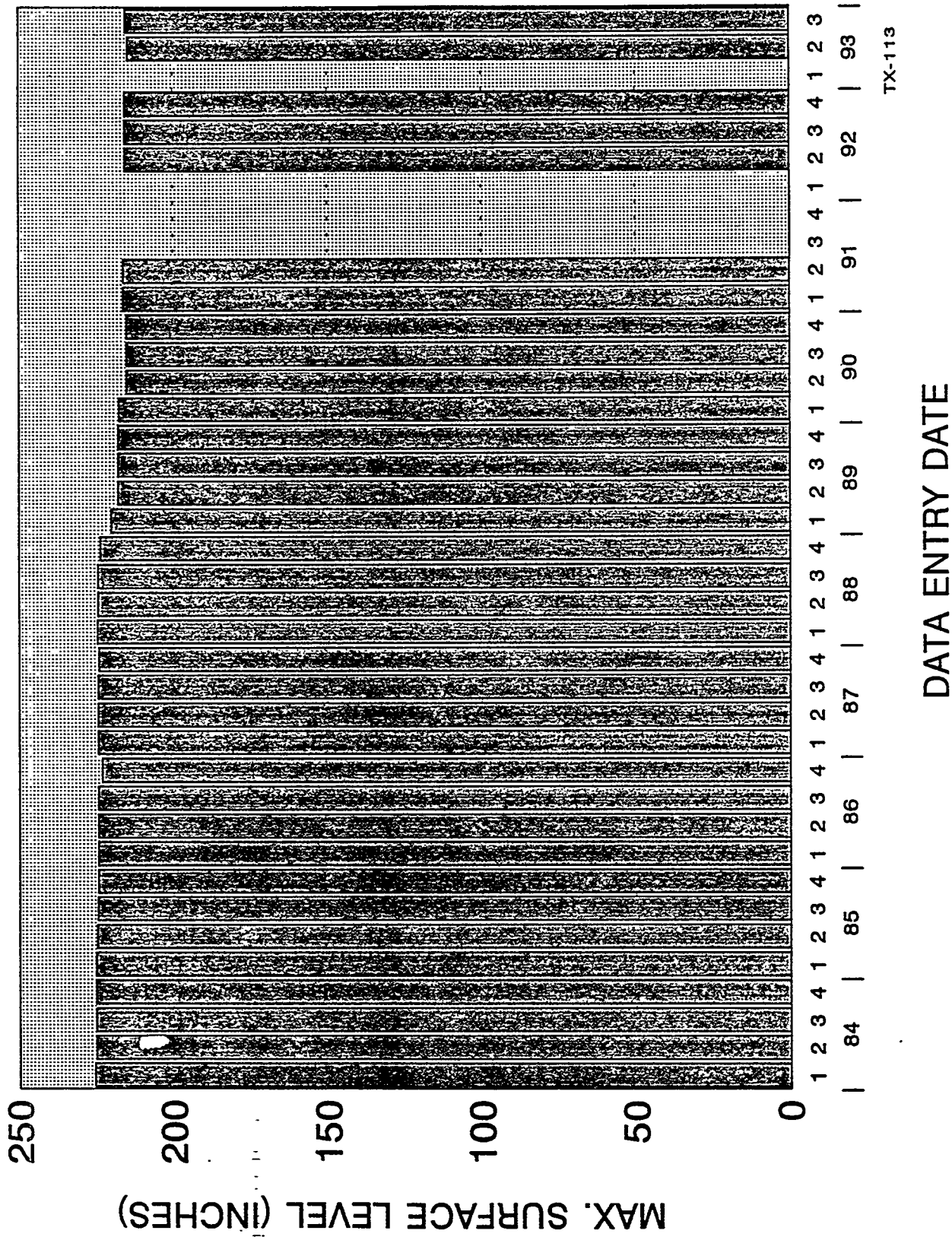

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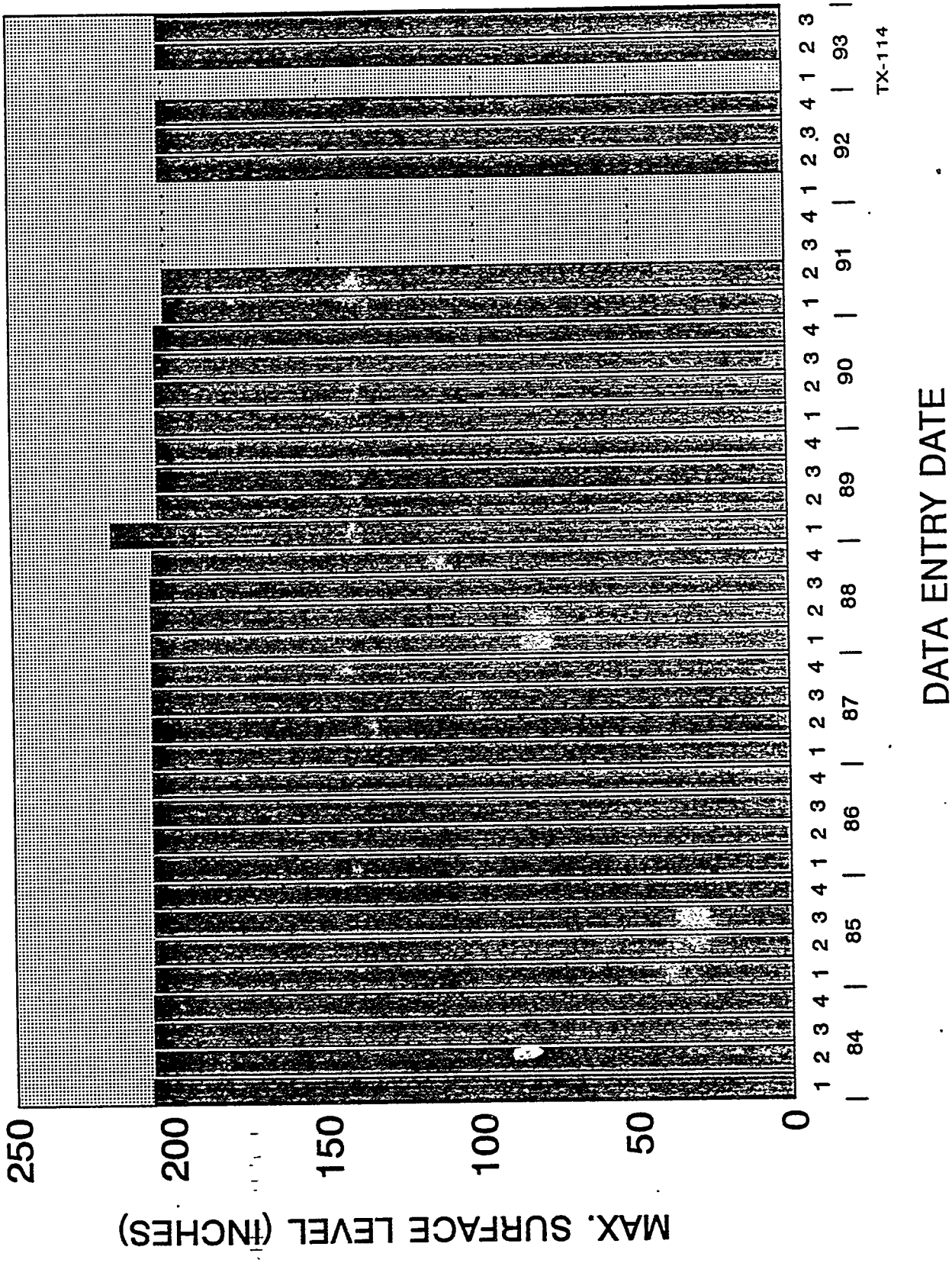

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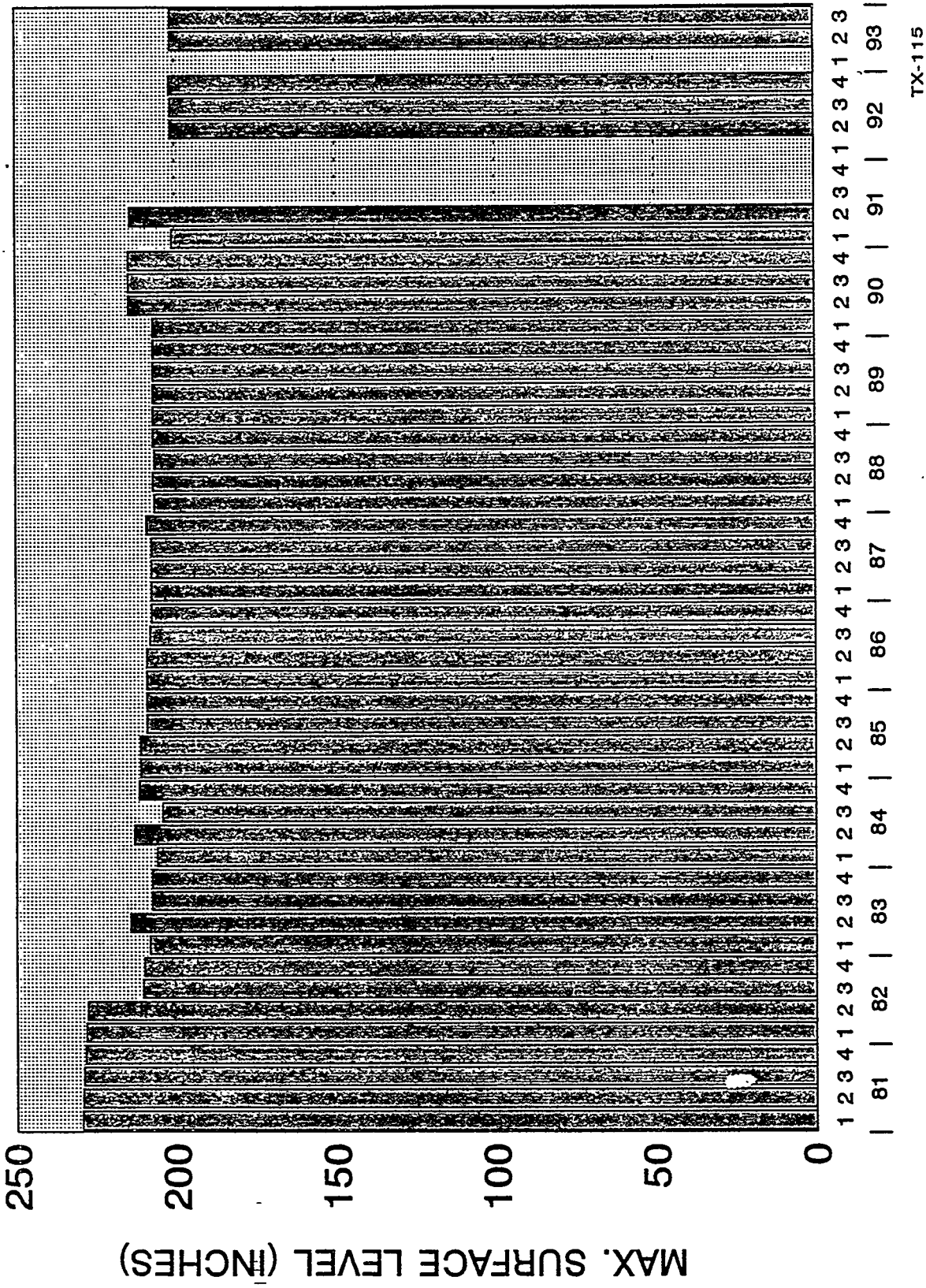

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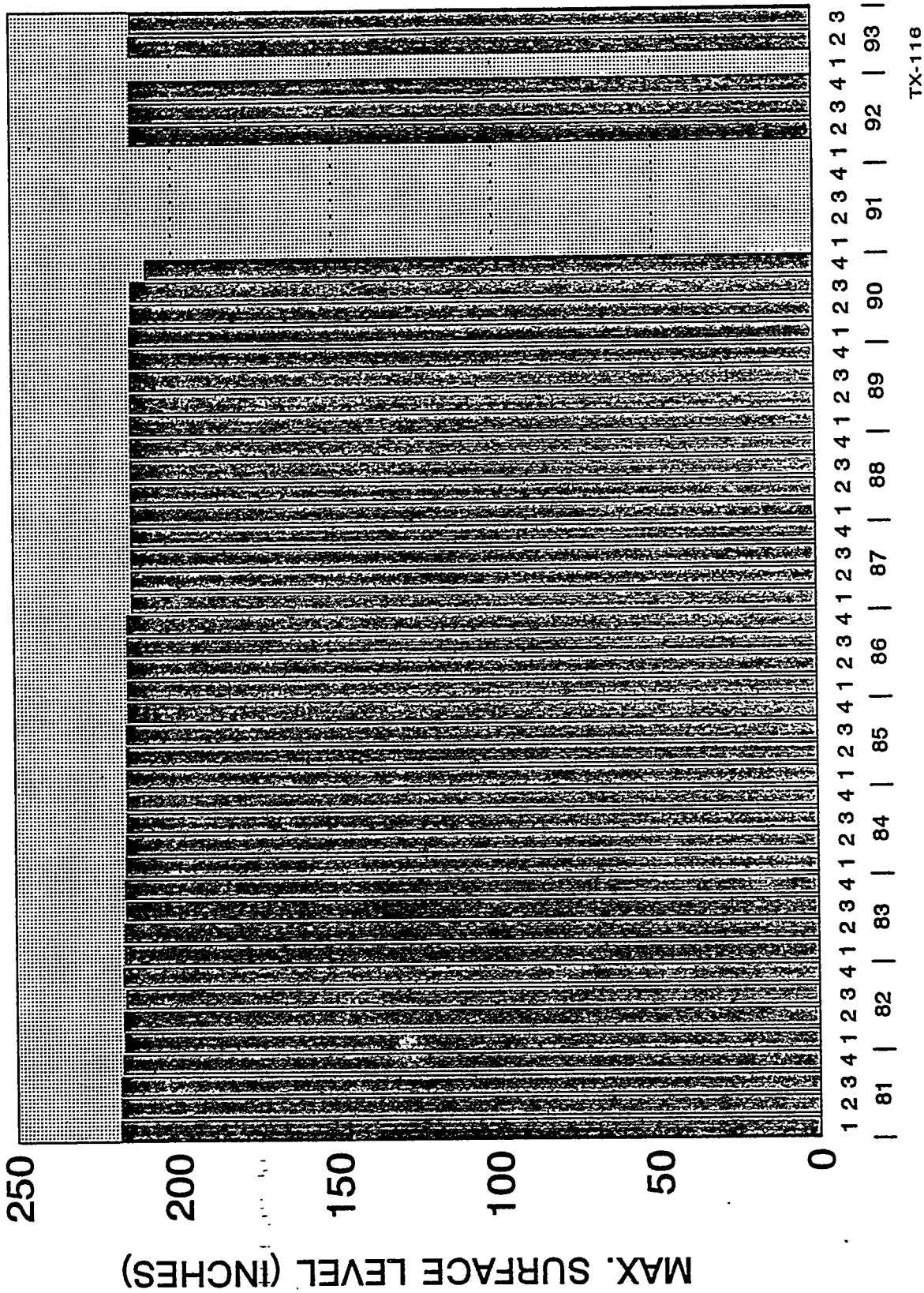

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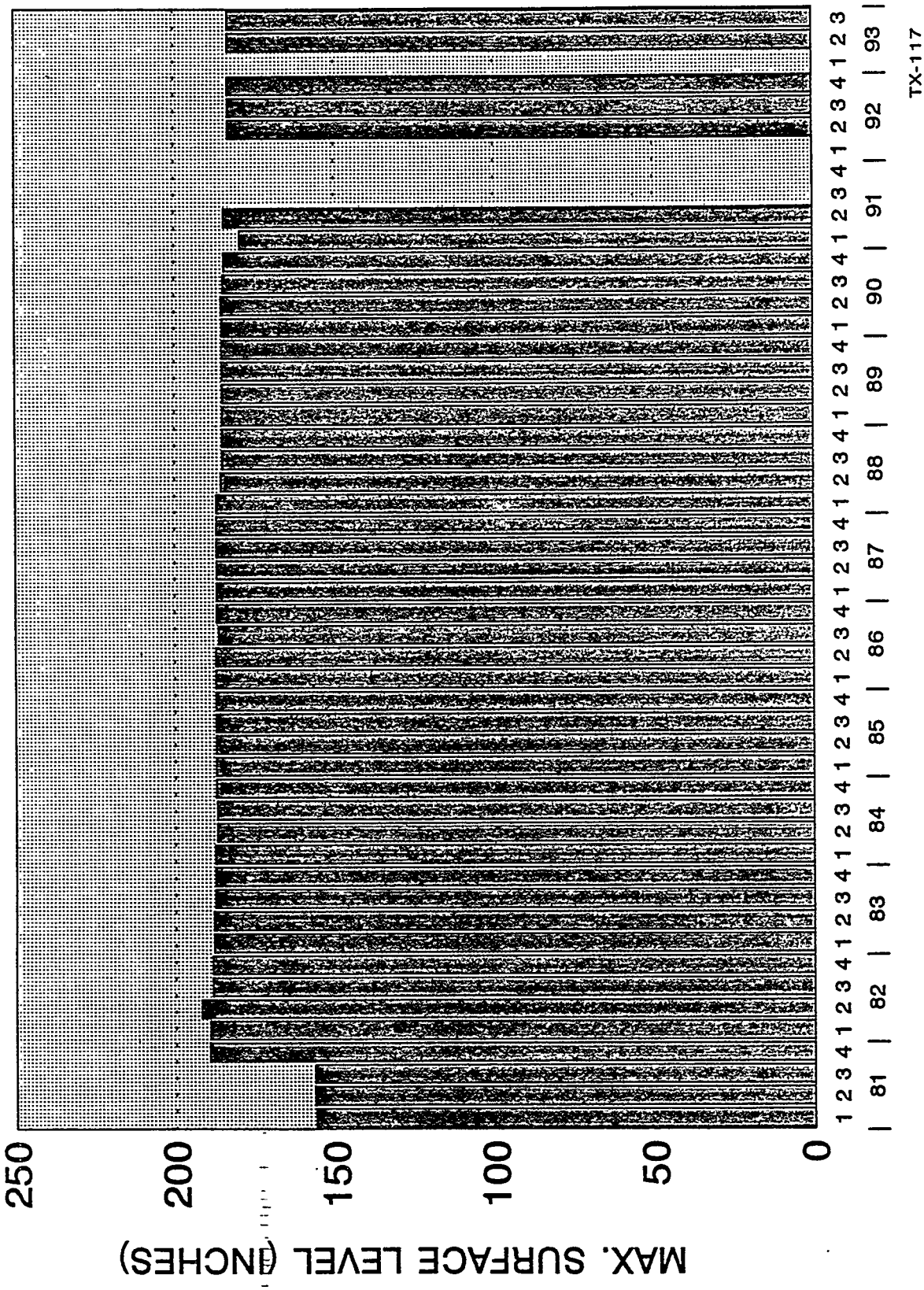

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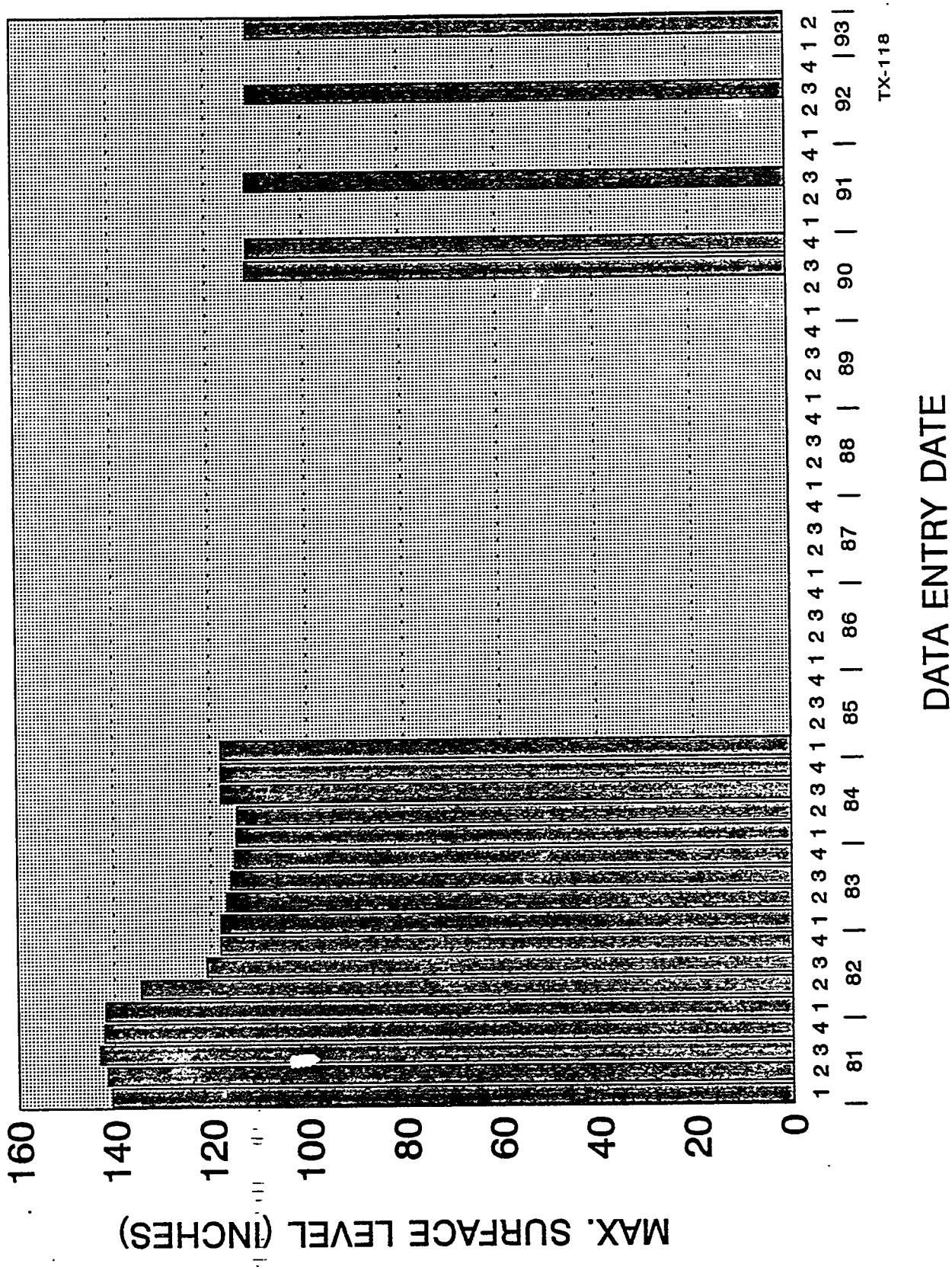

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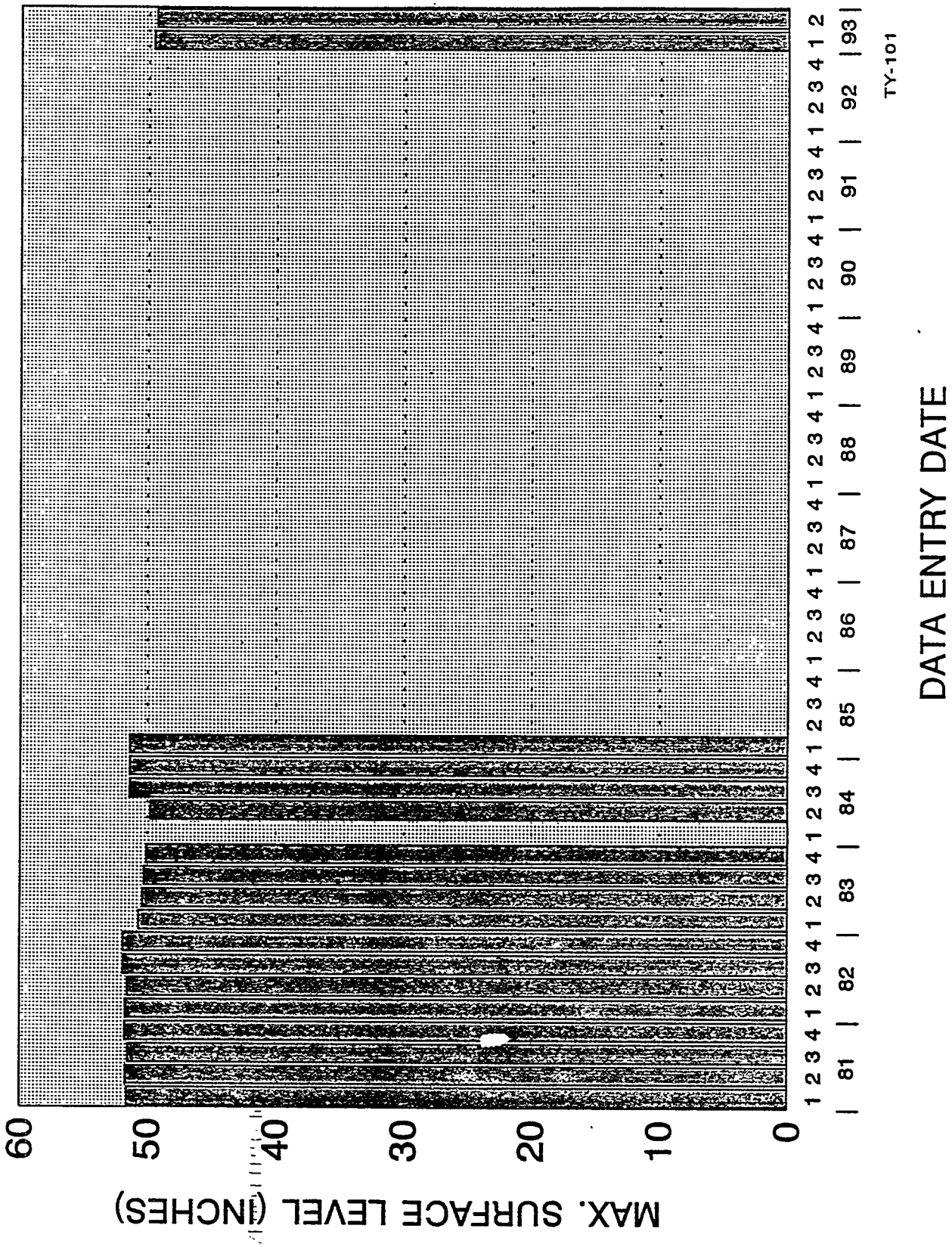

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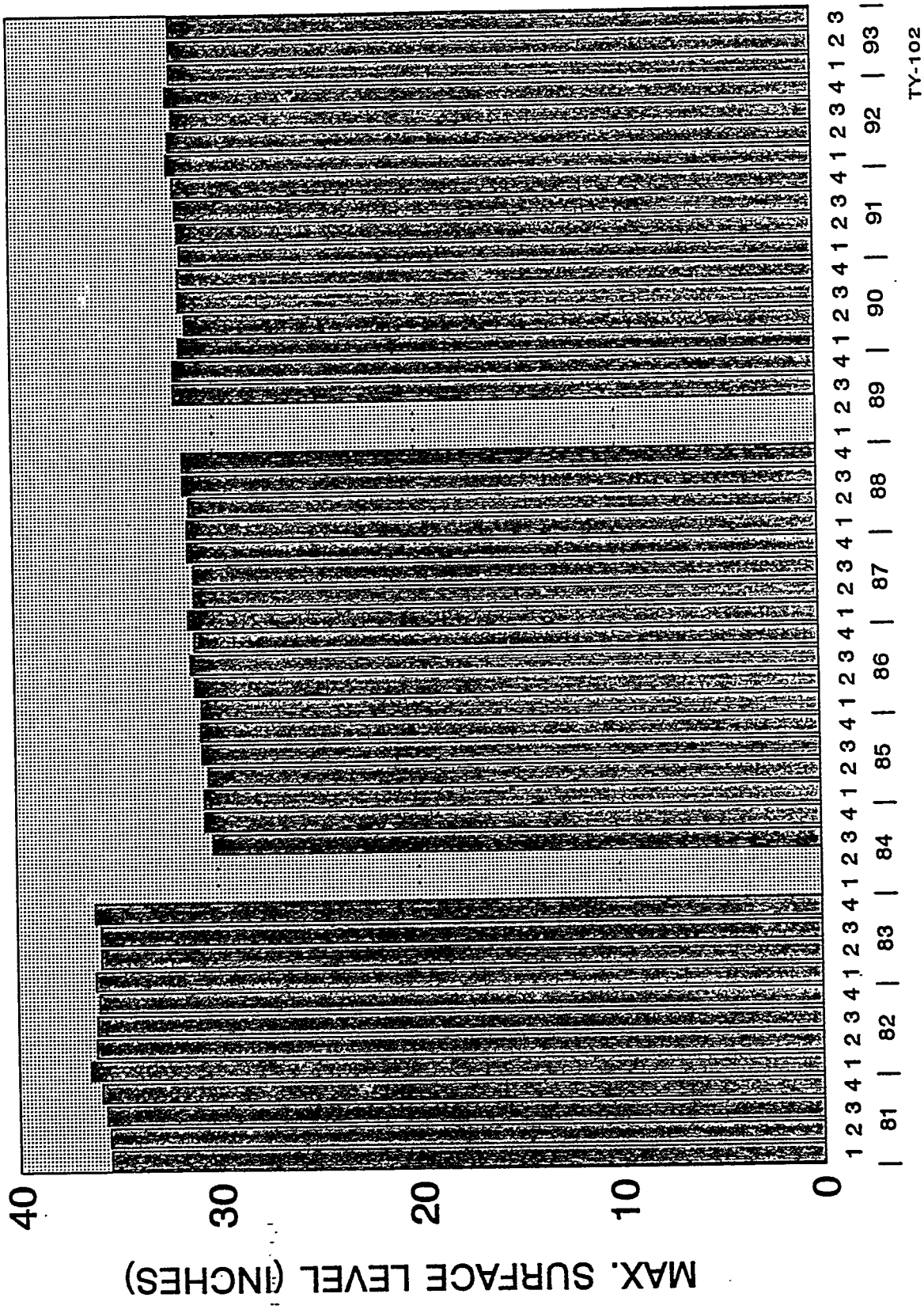

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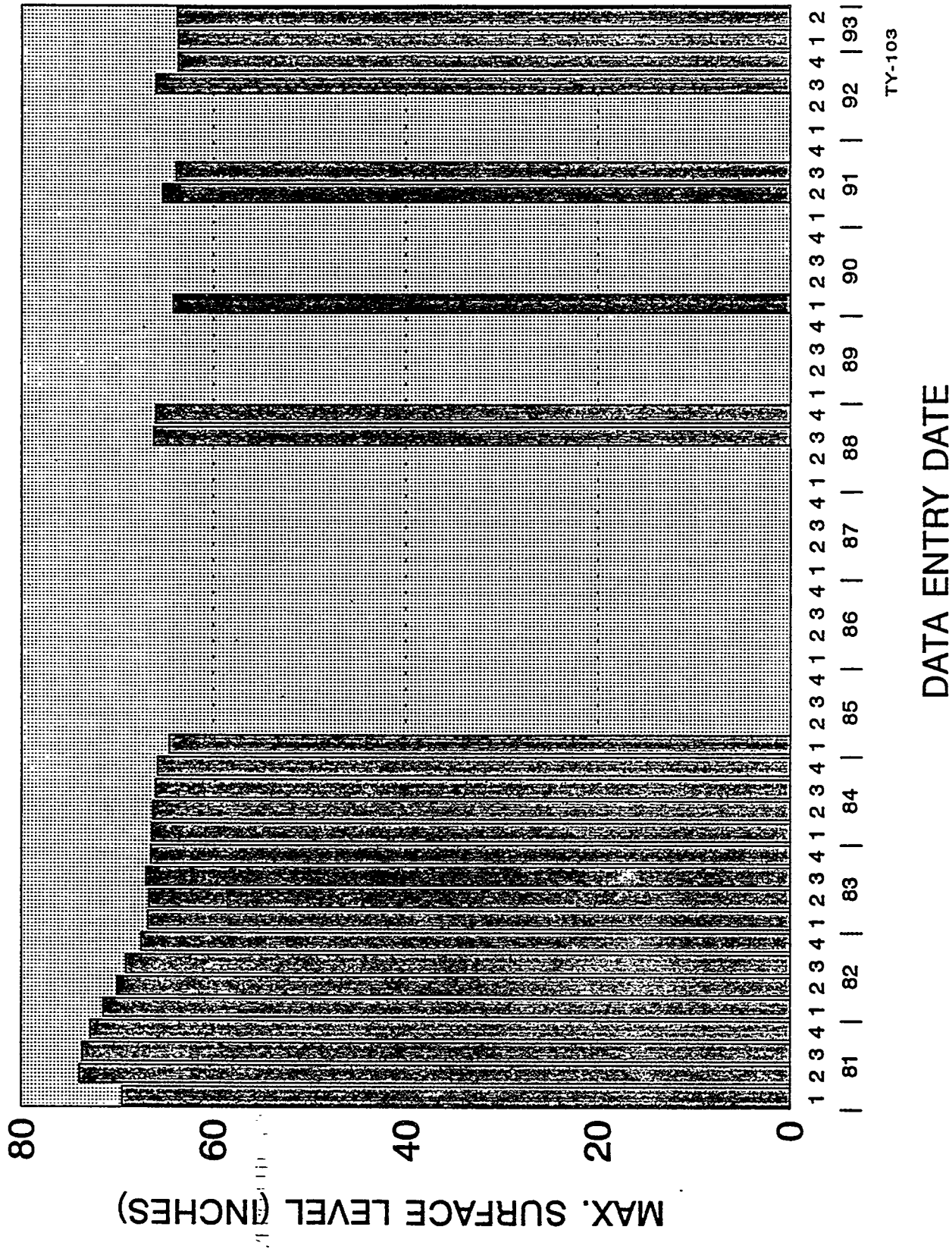

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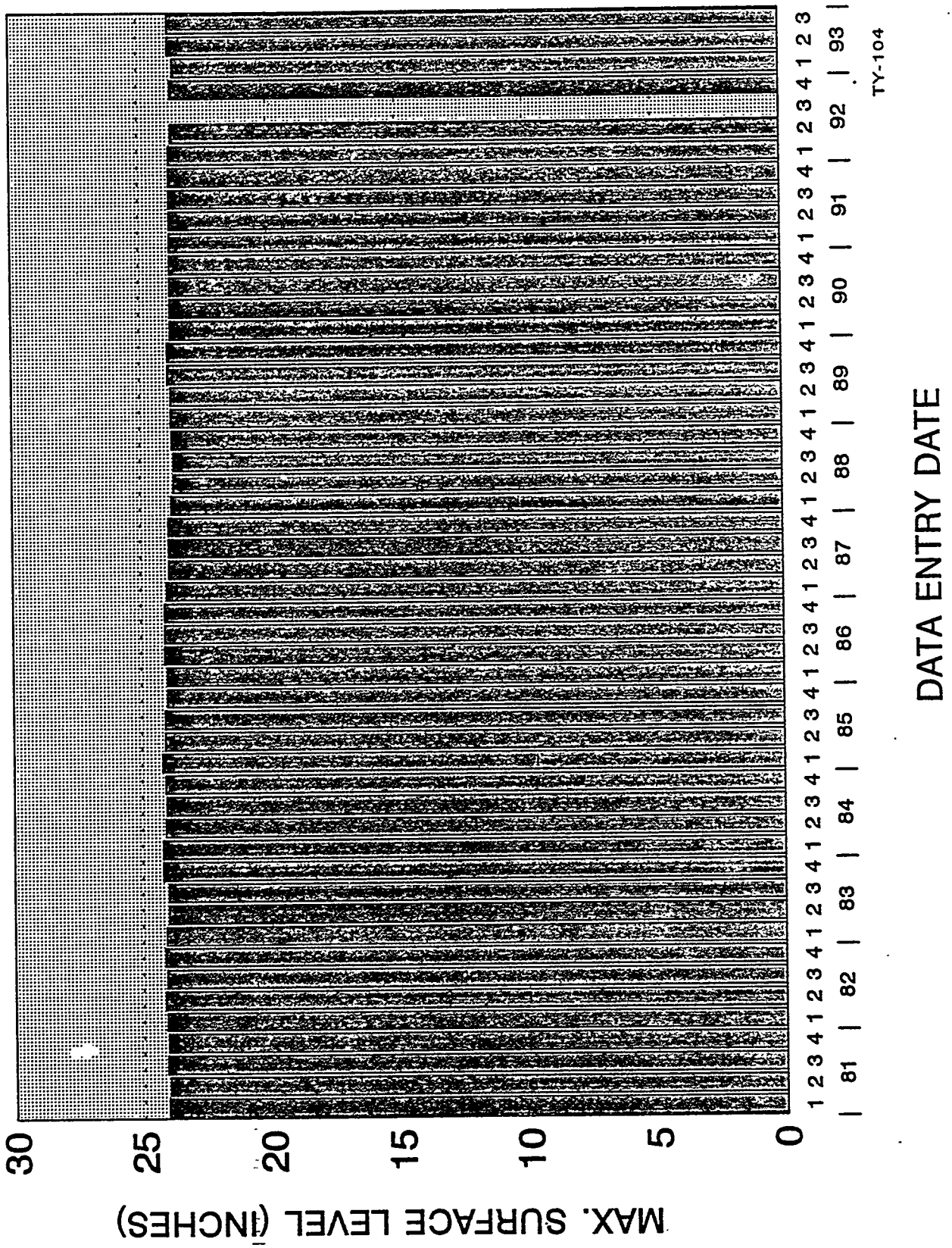

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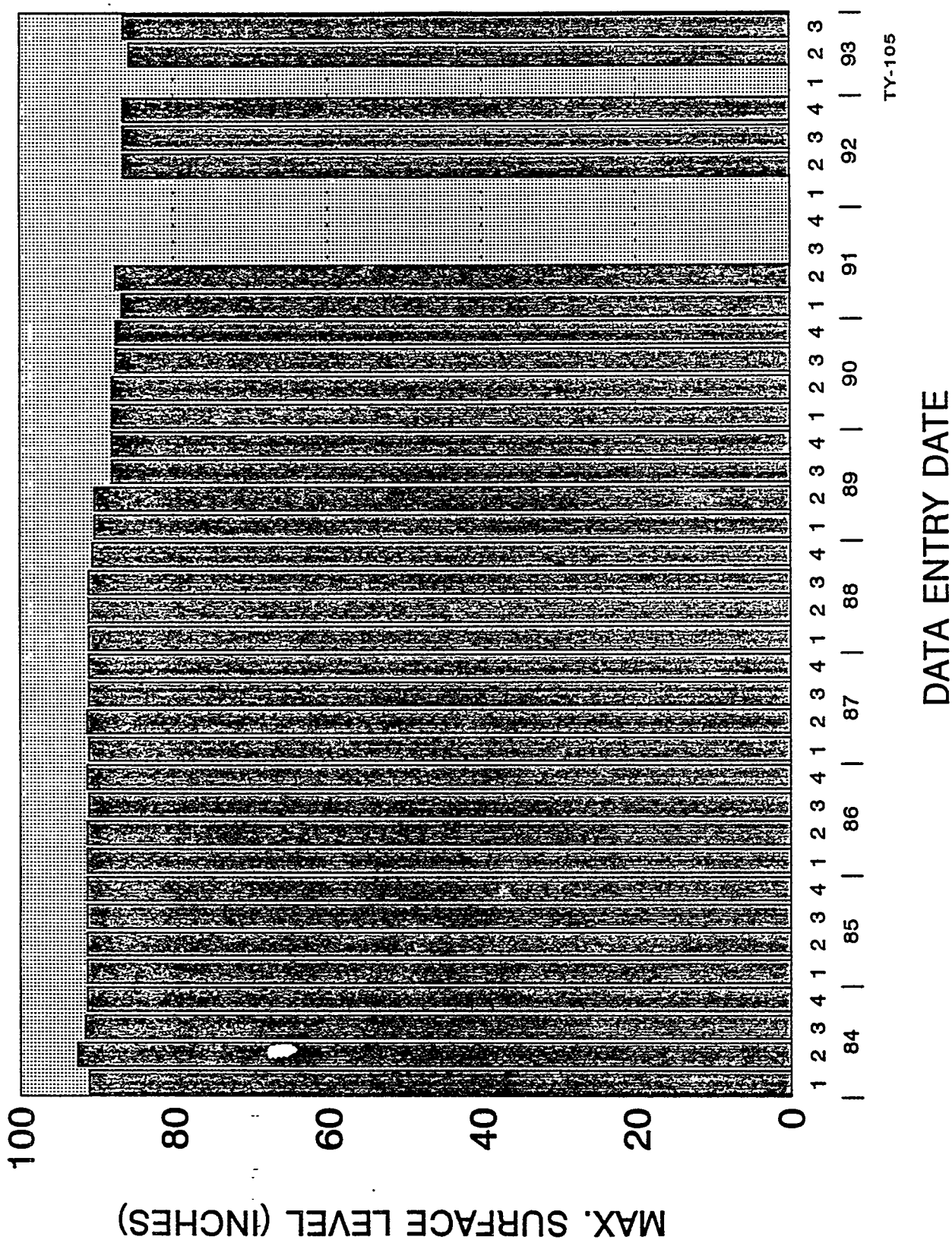

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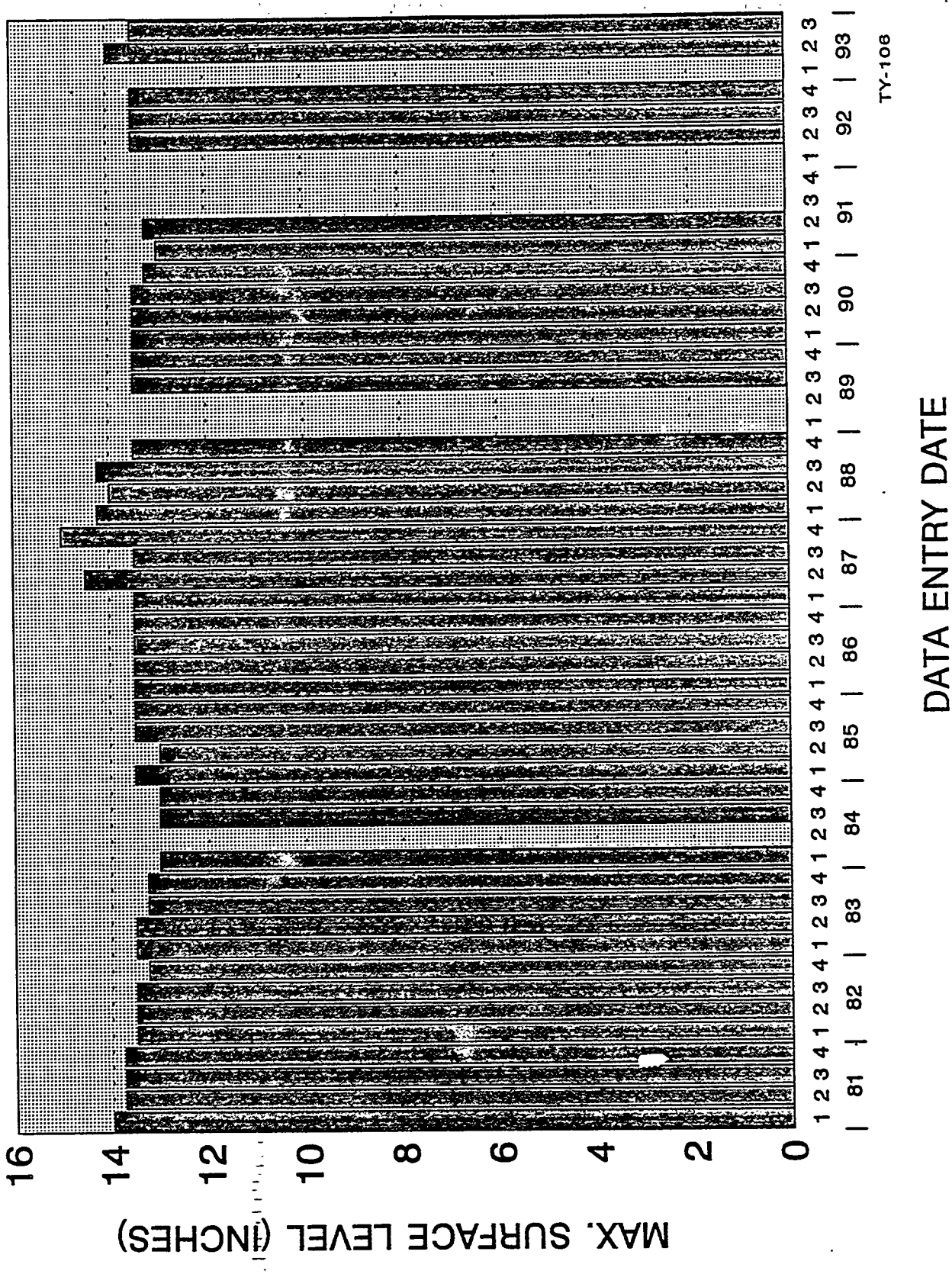

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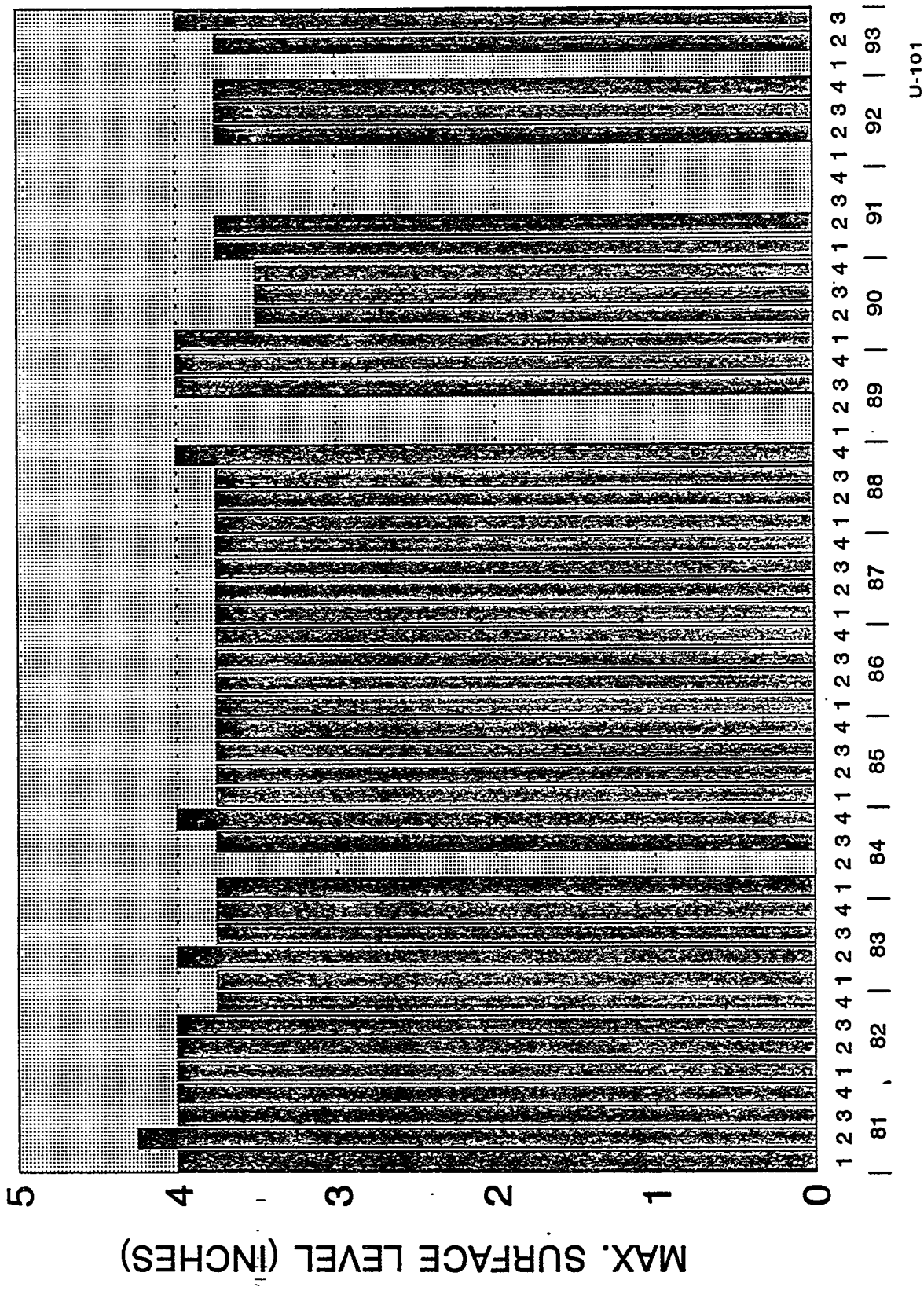

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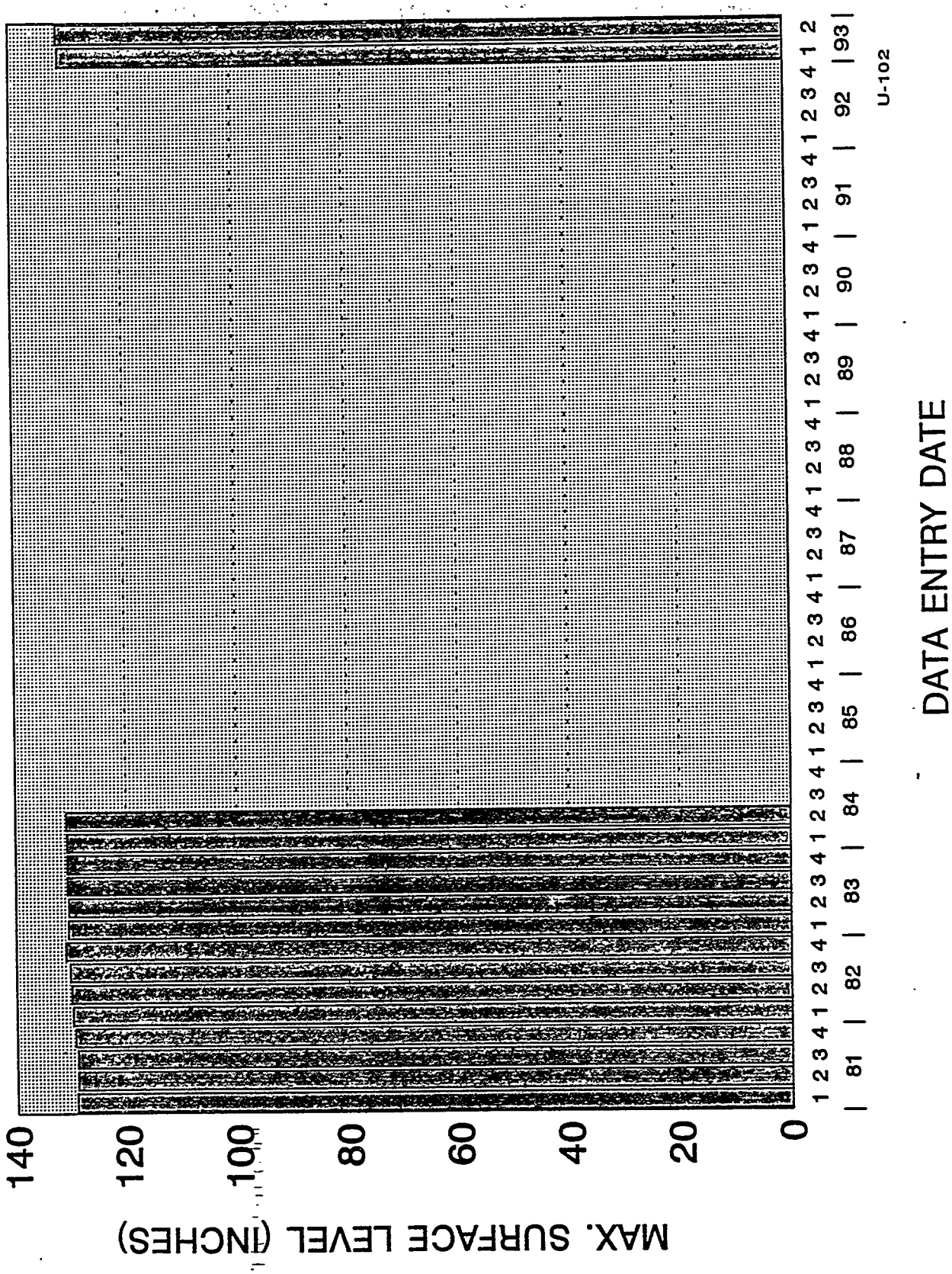

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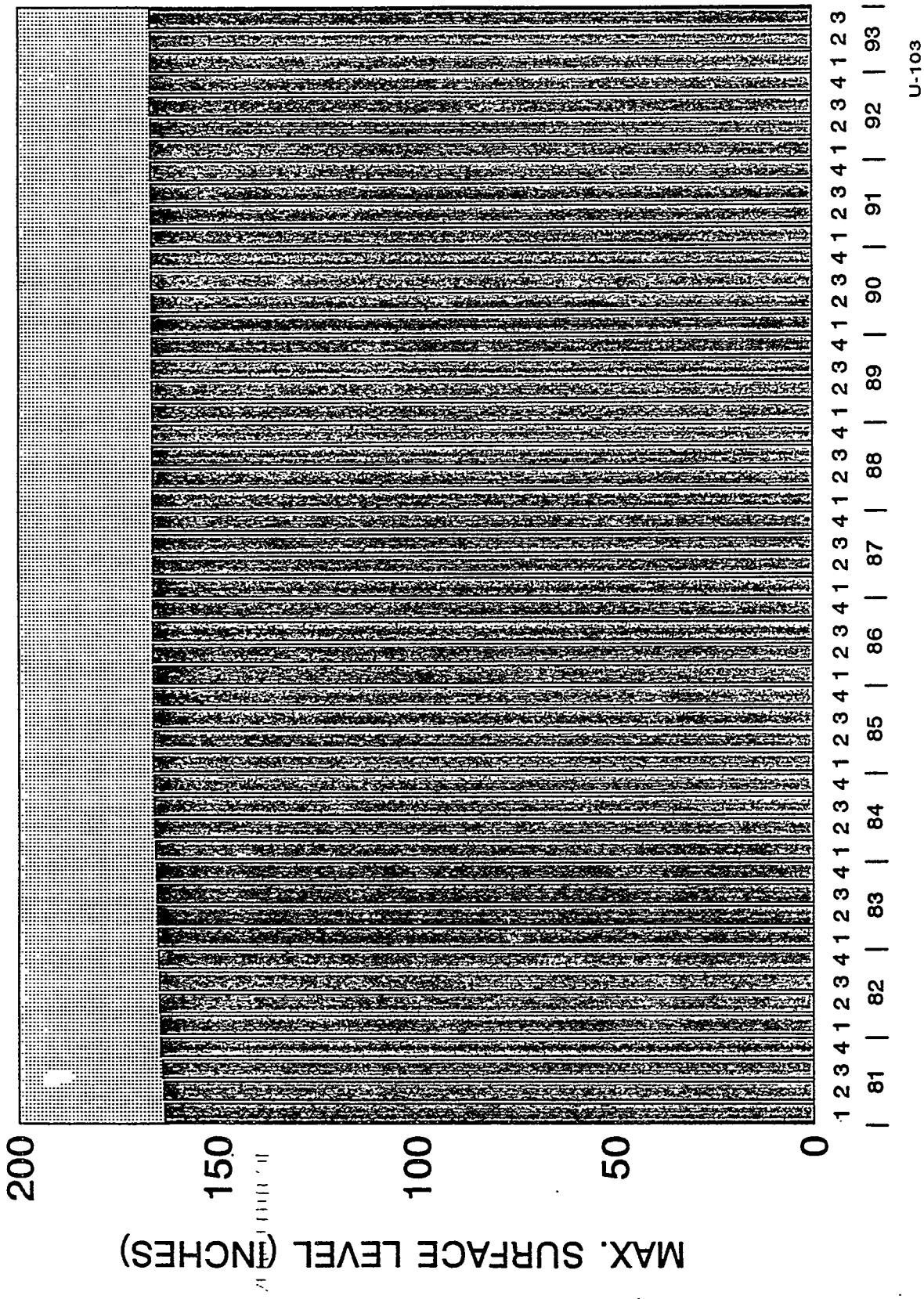

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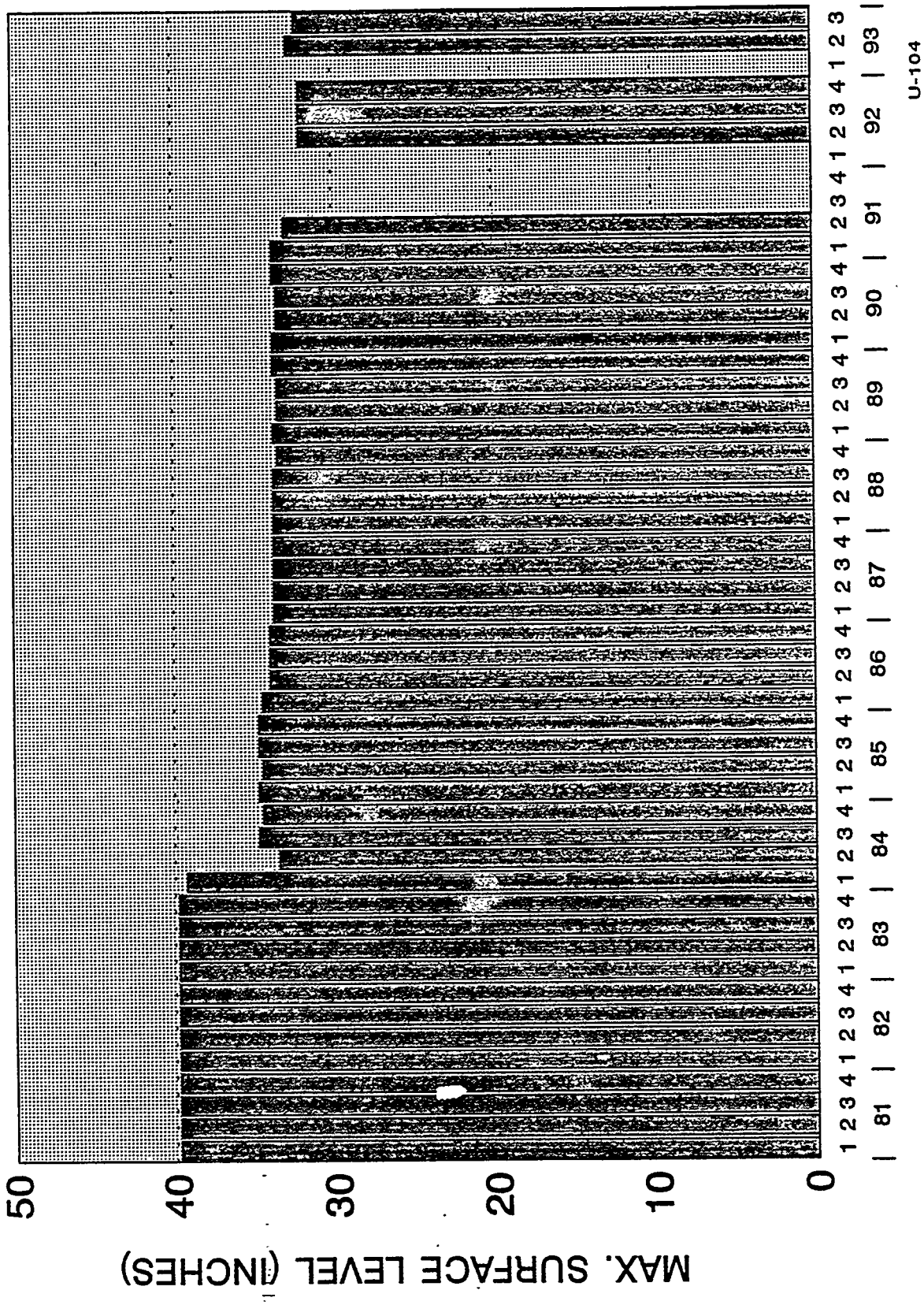

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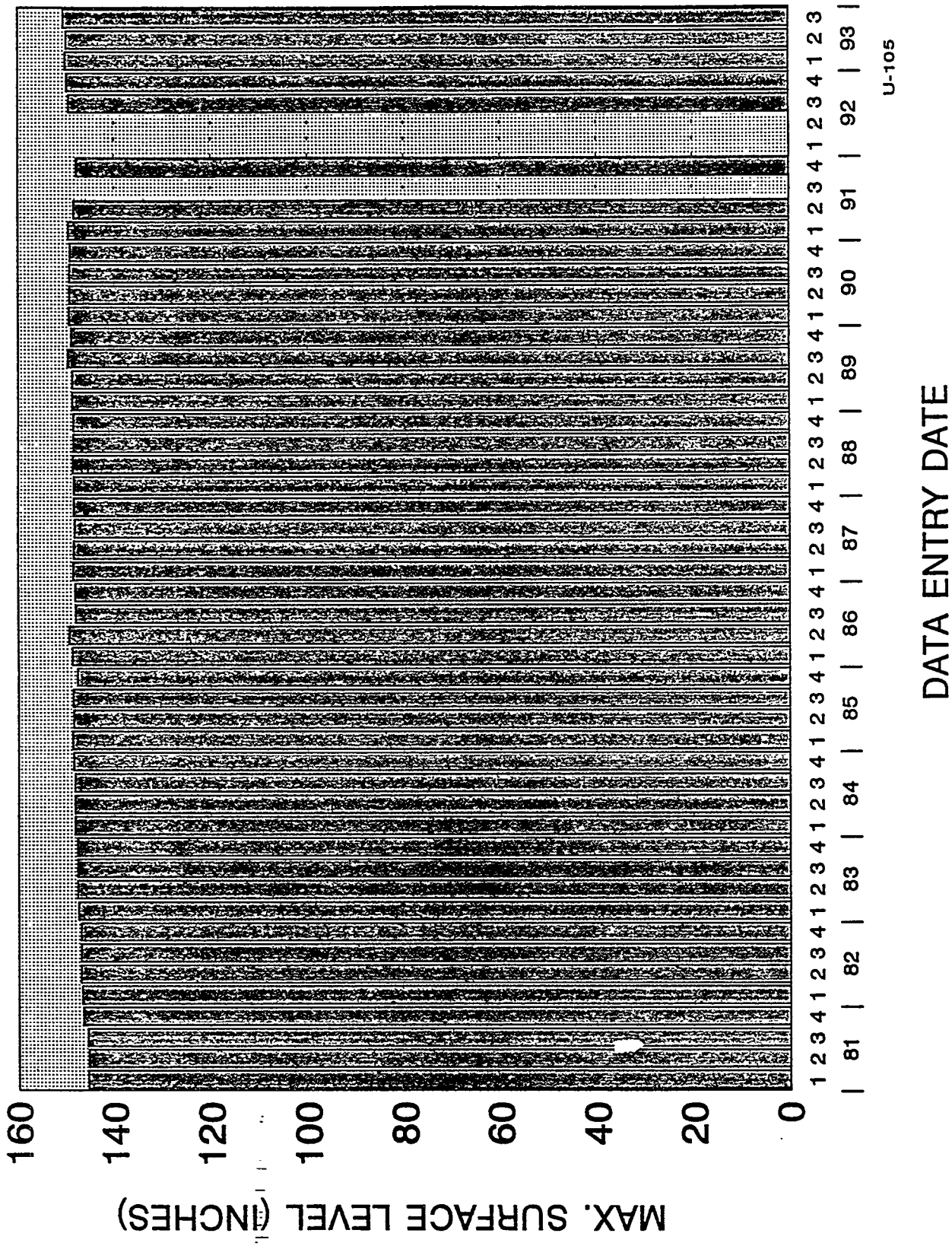

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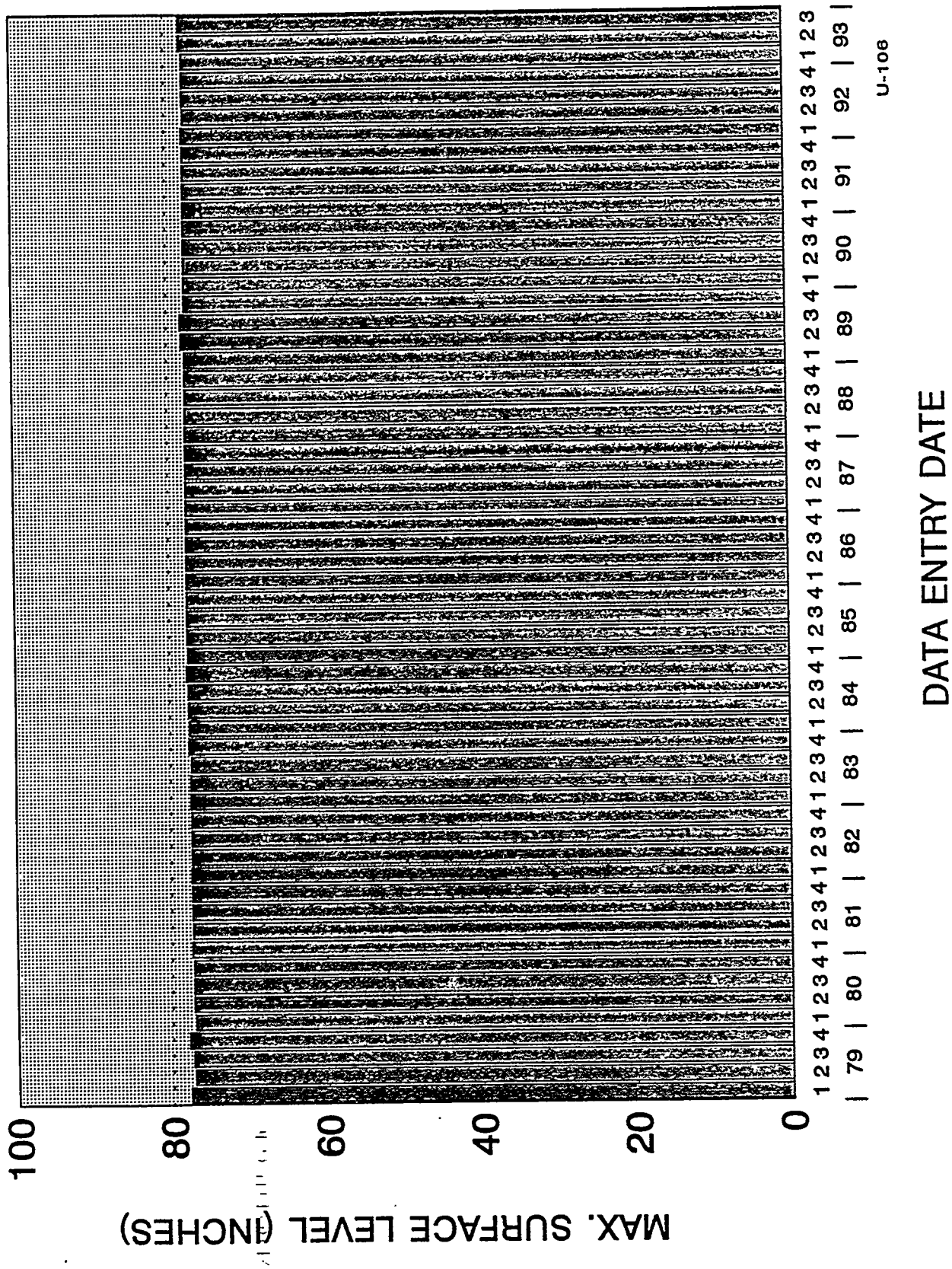

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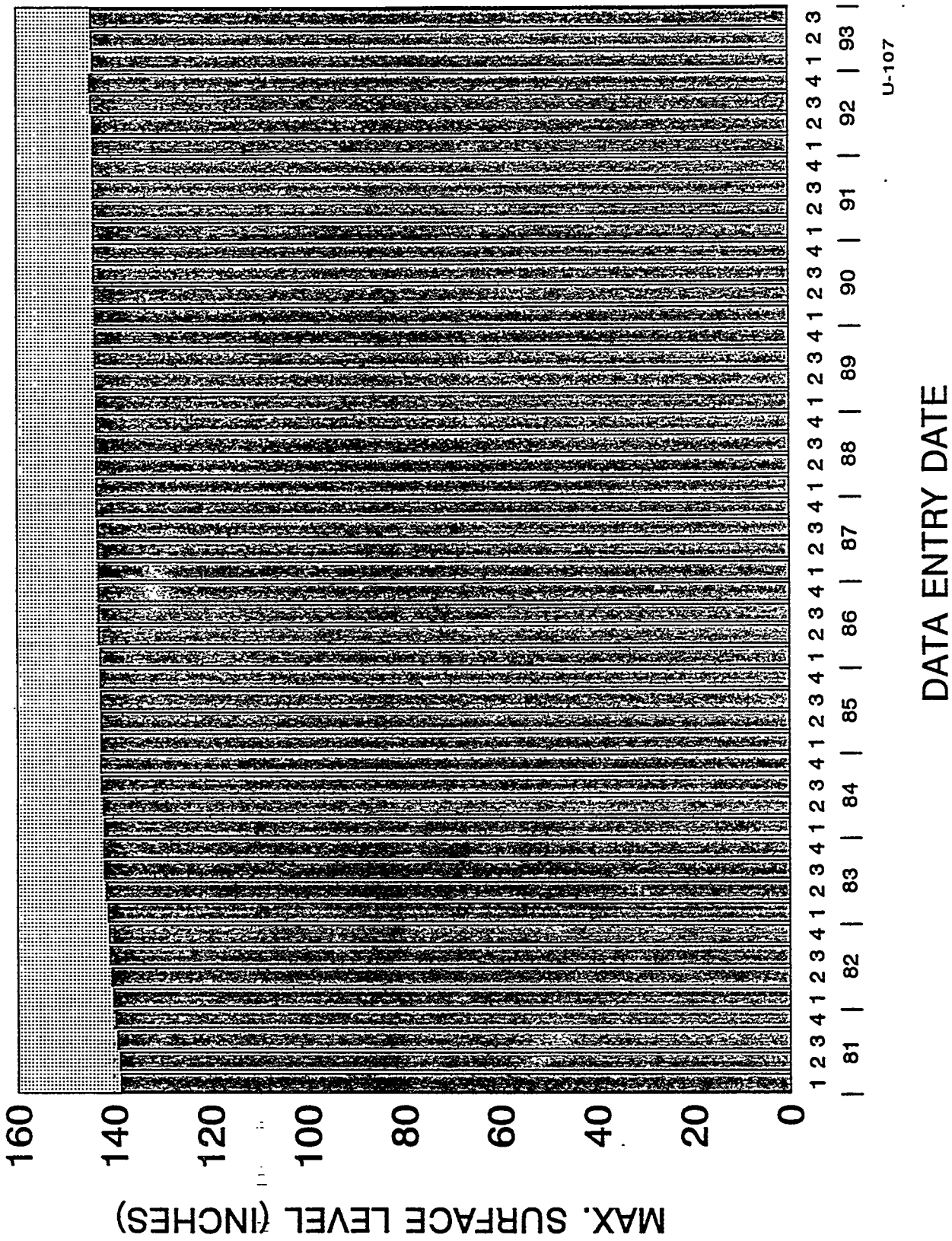

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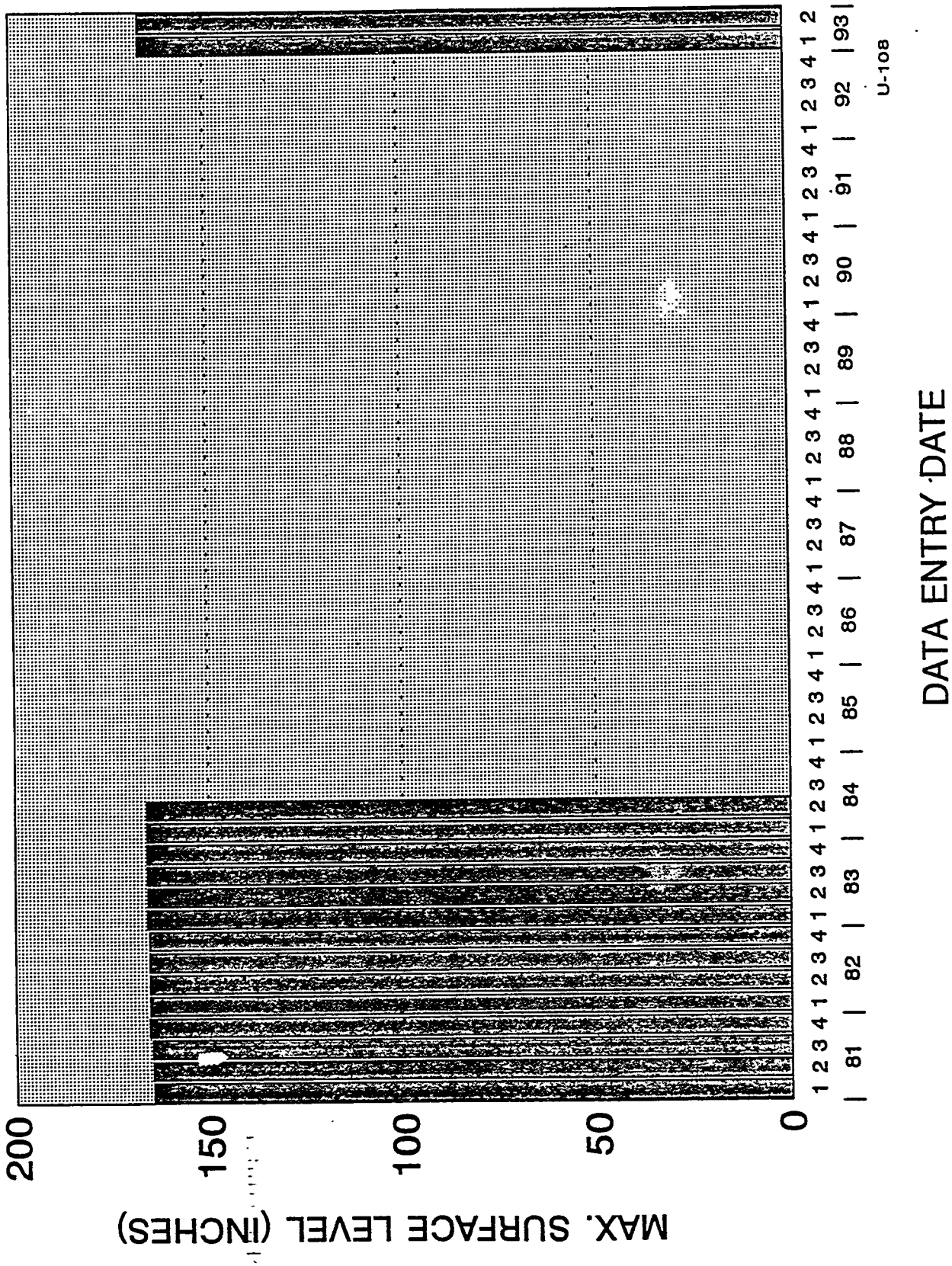

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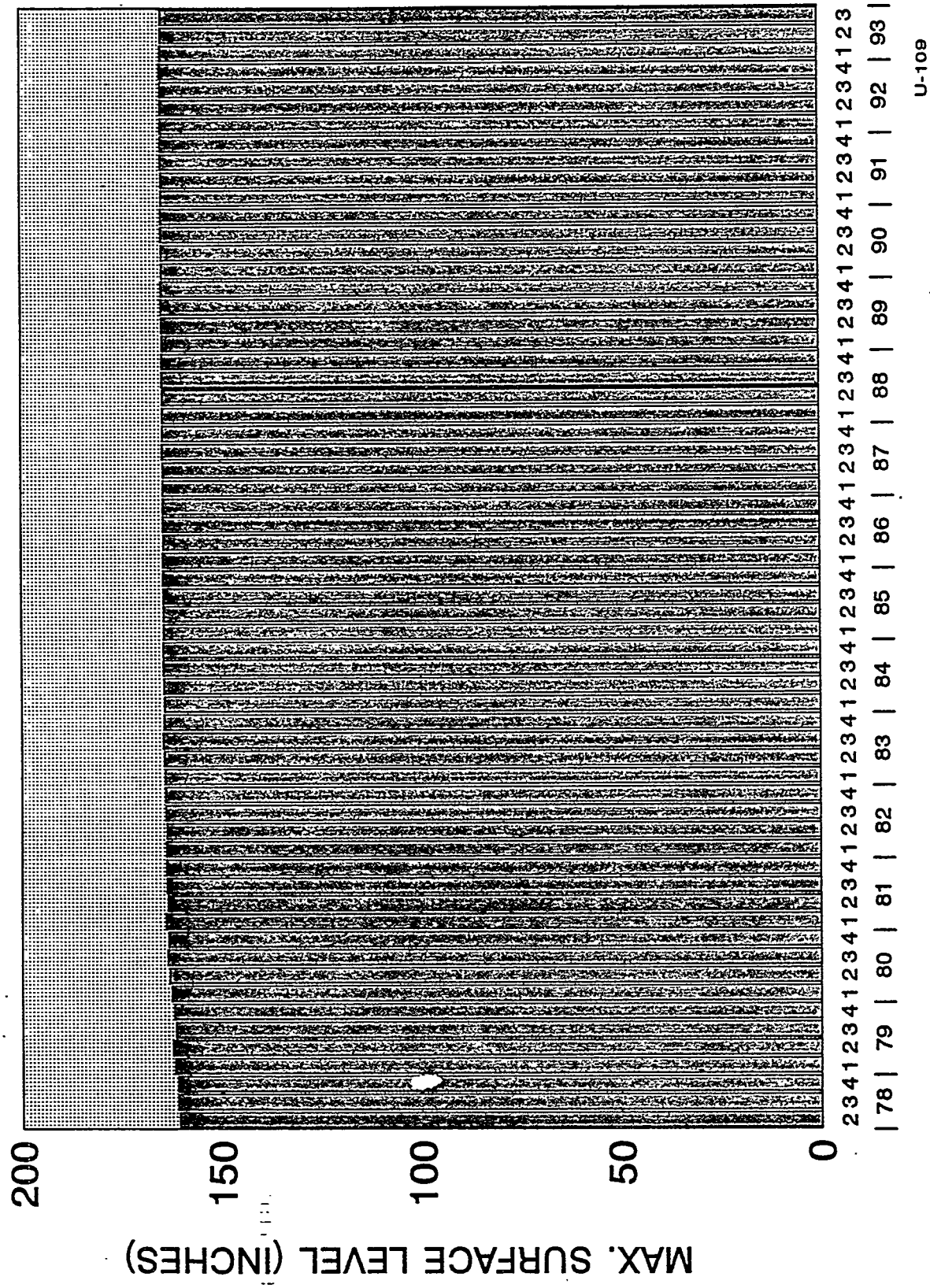

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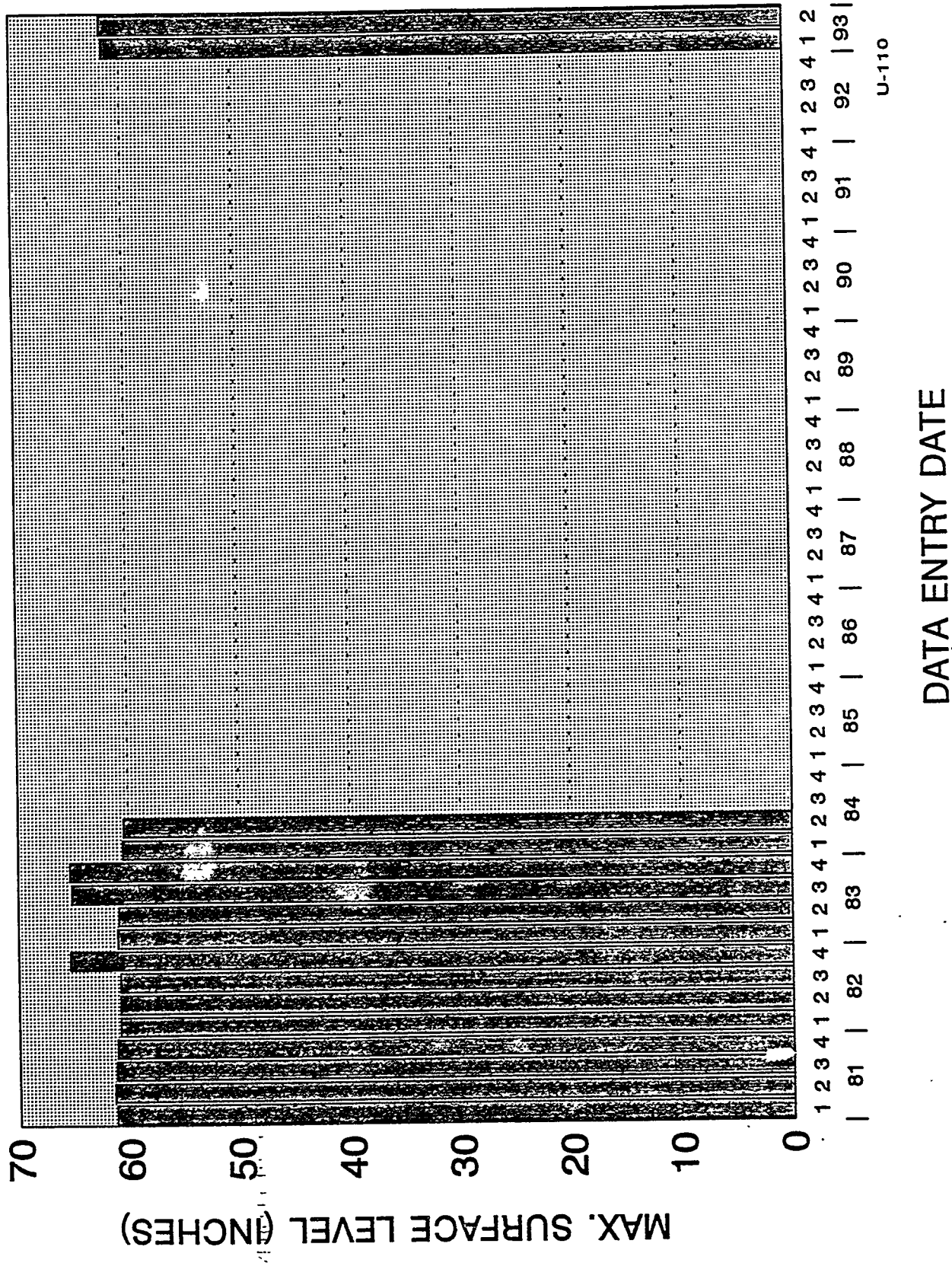

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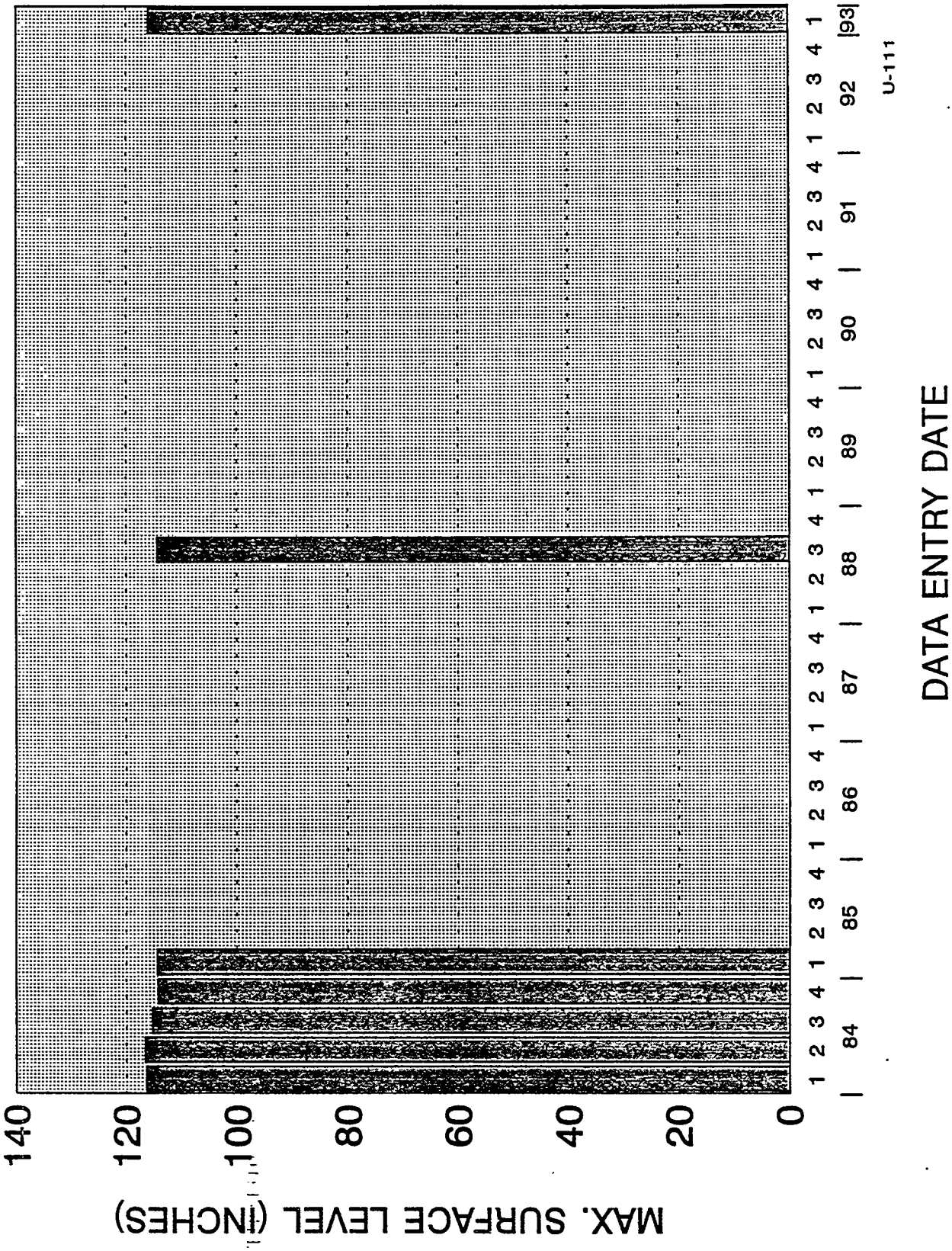

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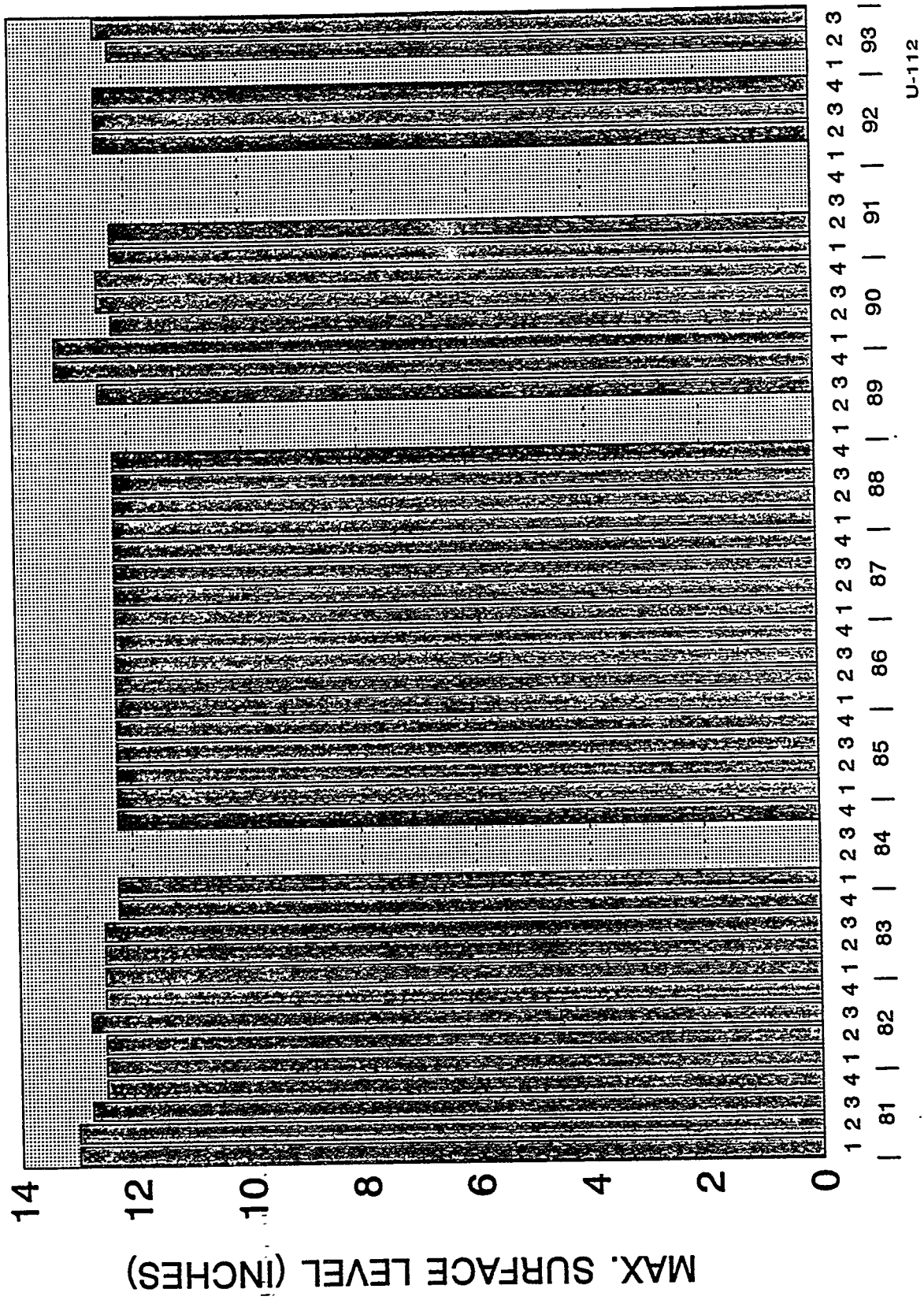

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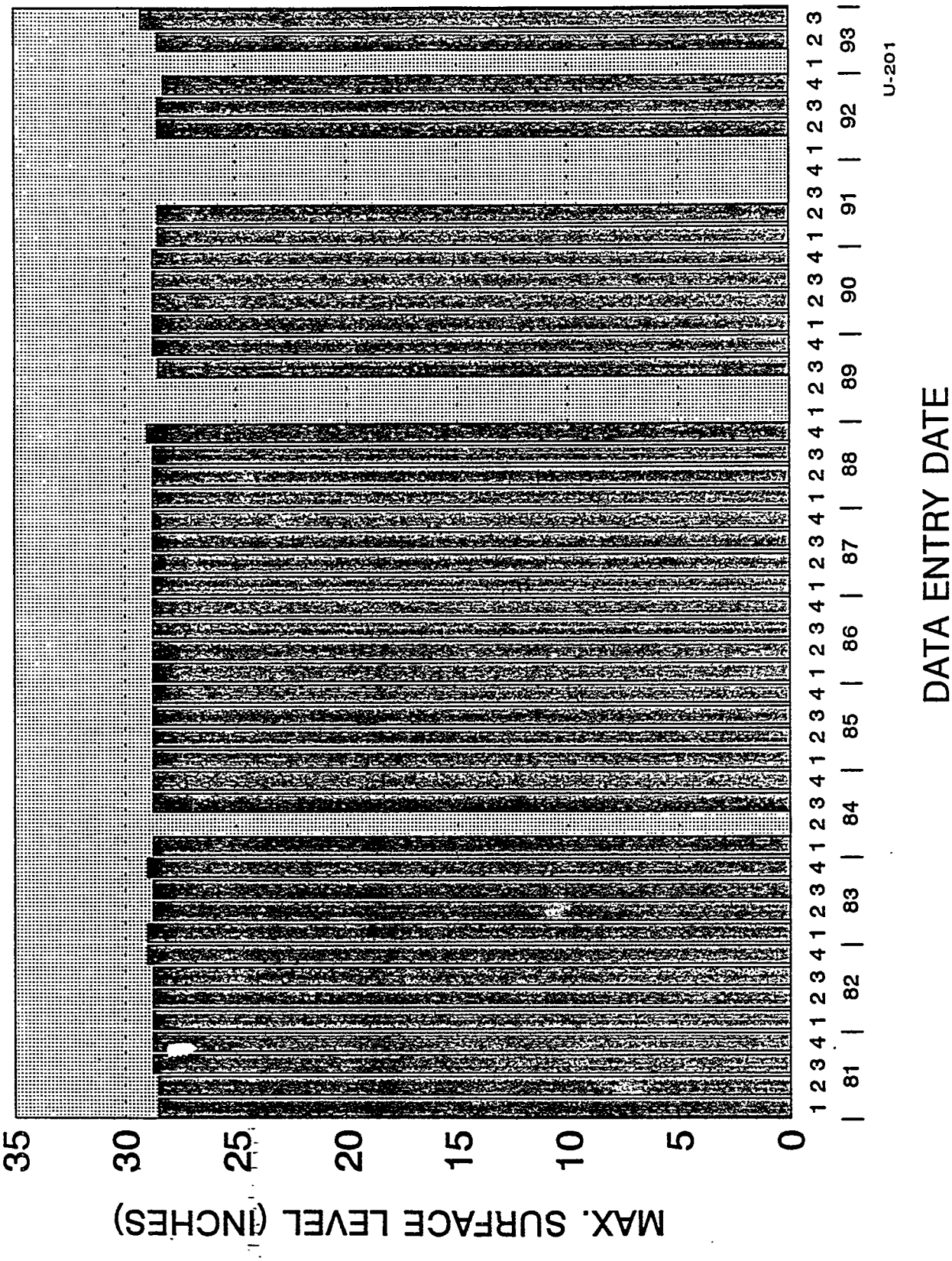

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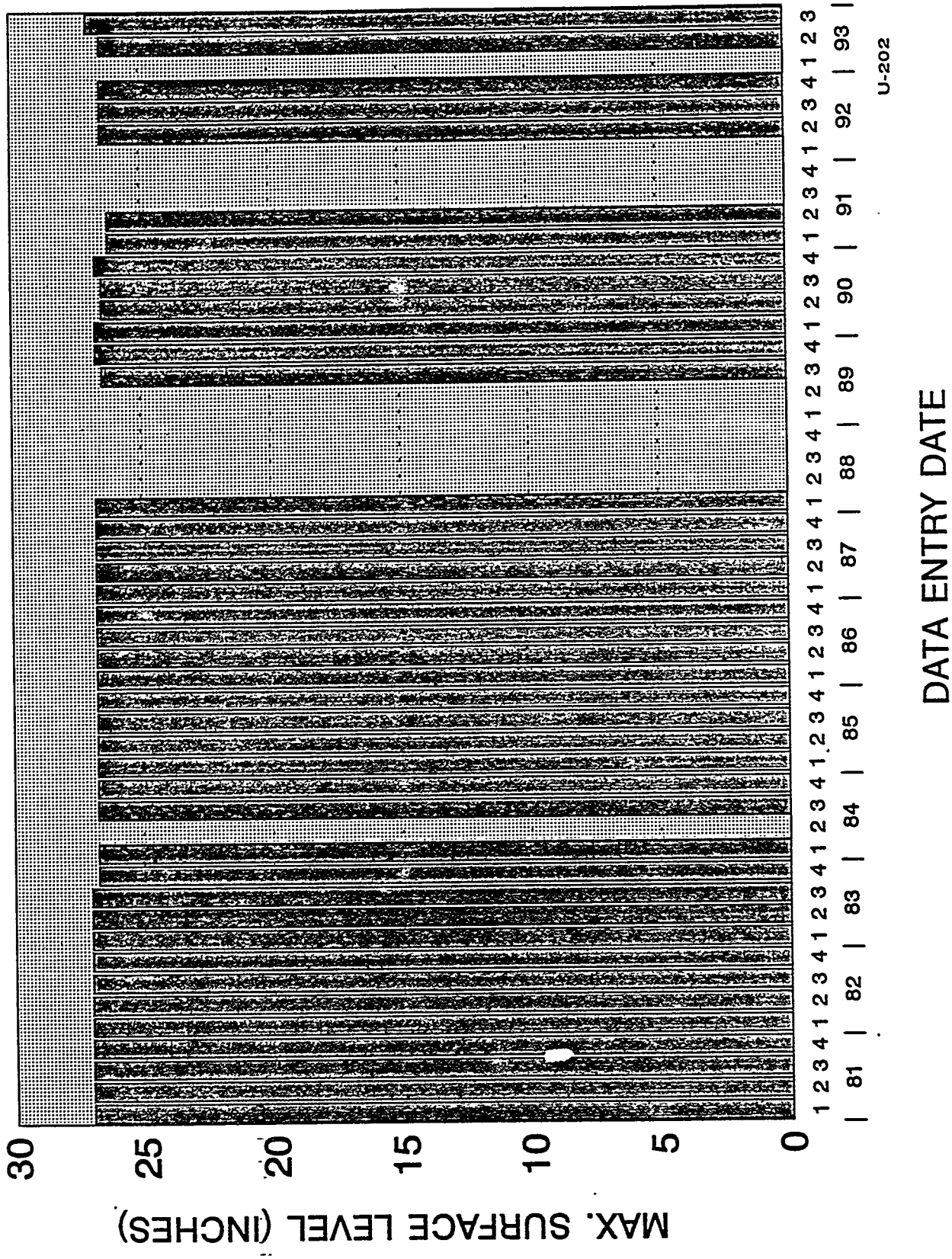

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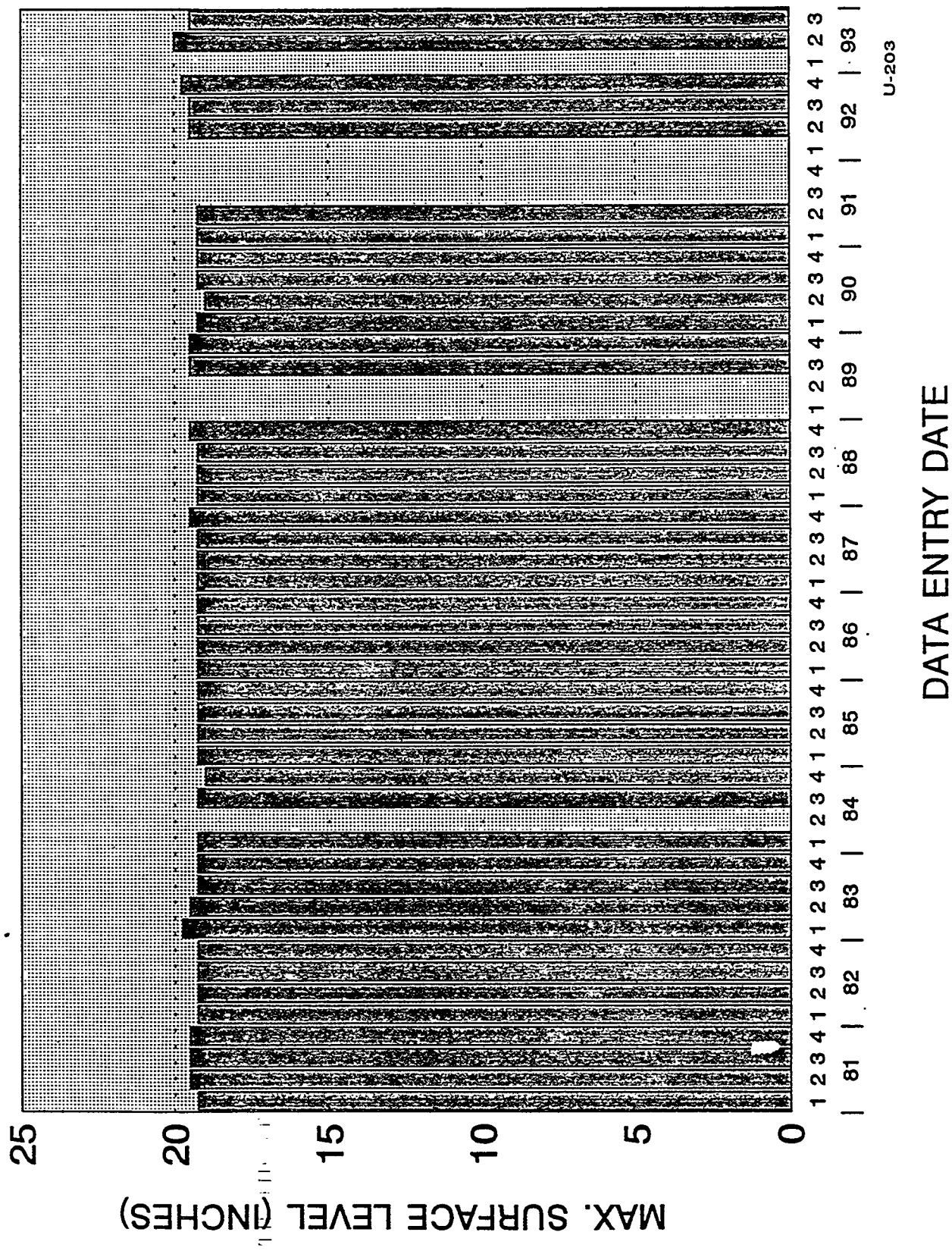

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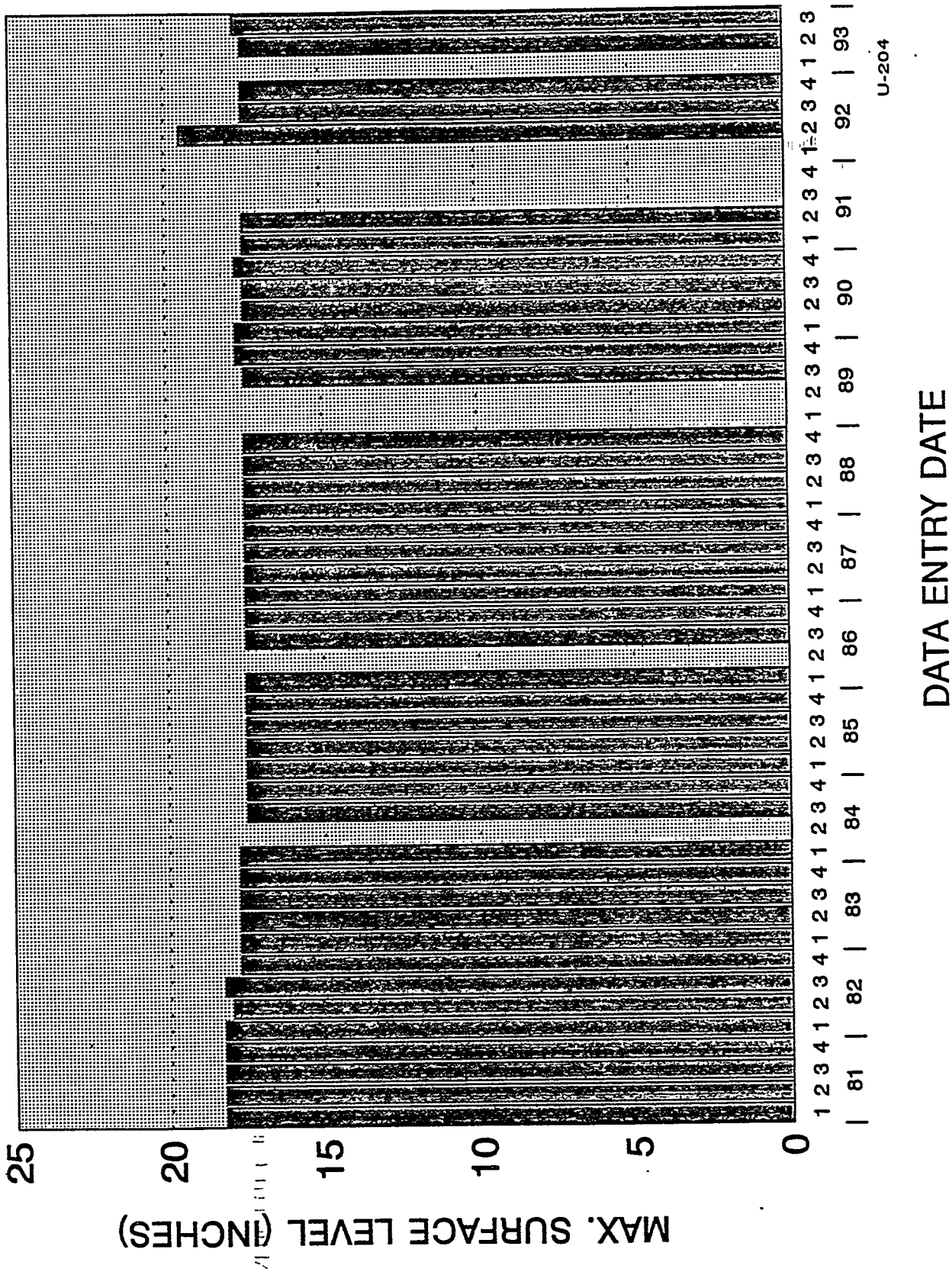

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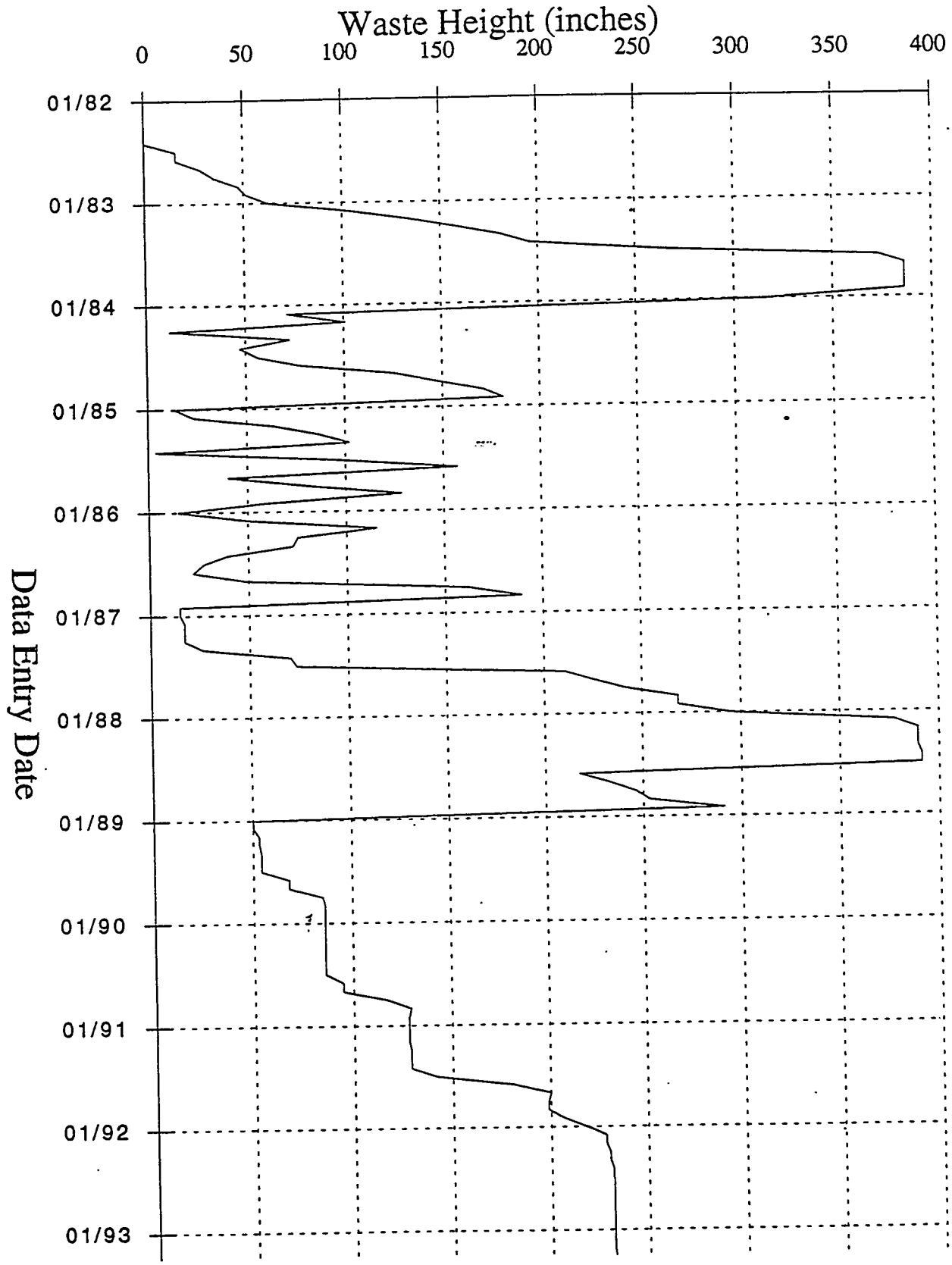
A P P E N D I X D

MAXIMUM SURFACE-LEVEL HISTORY PLOTS FOR DOUBLE-SHELL TANKS AS DEVELOPED FROM WORK PERFORMED BY WHC (WHC 1993)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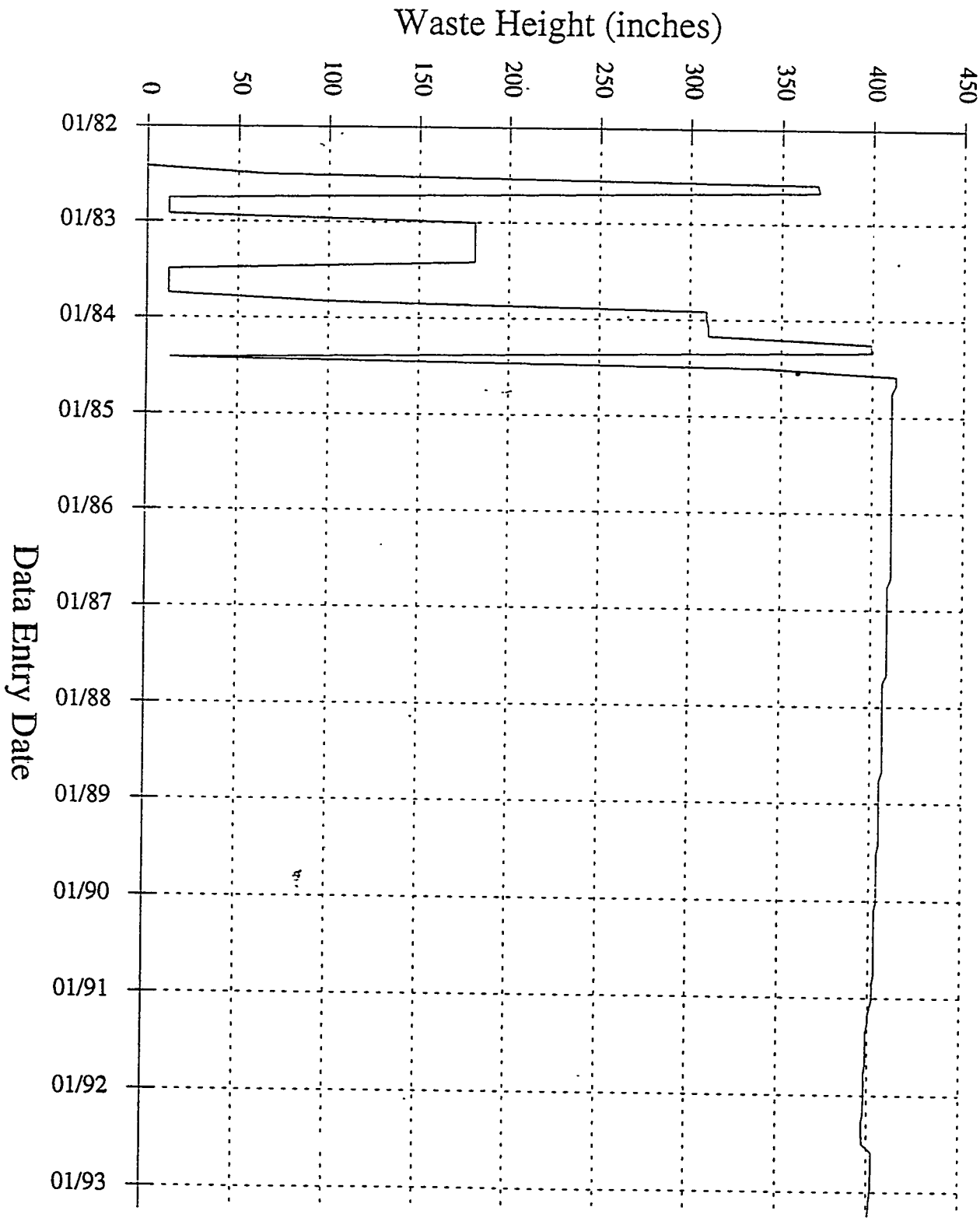
AN-101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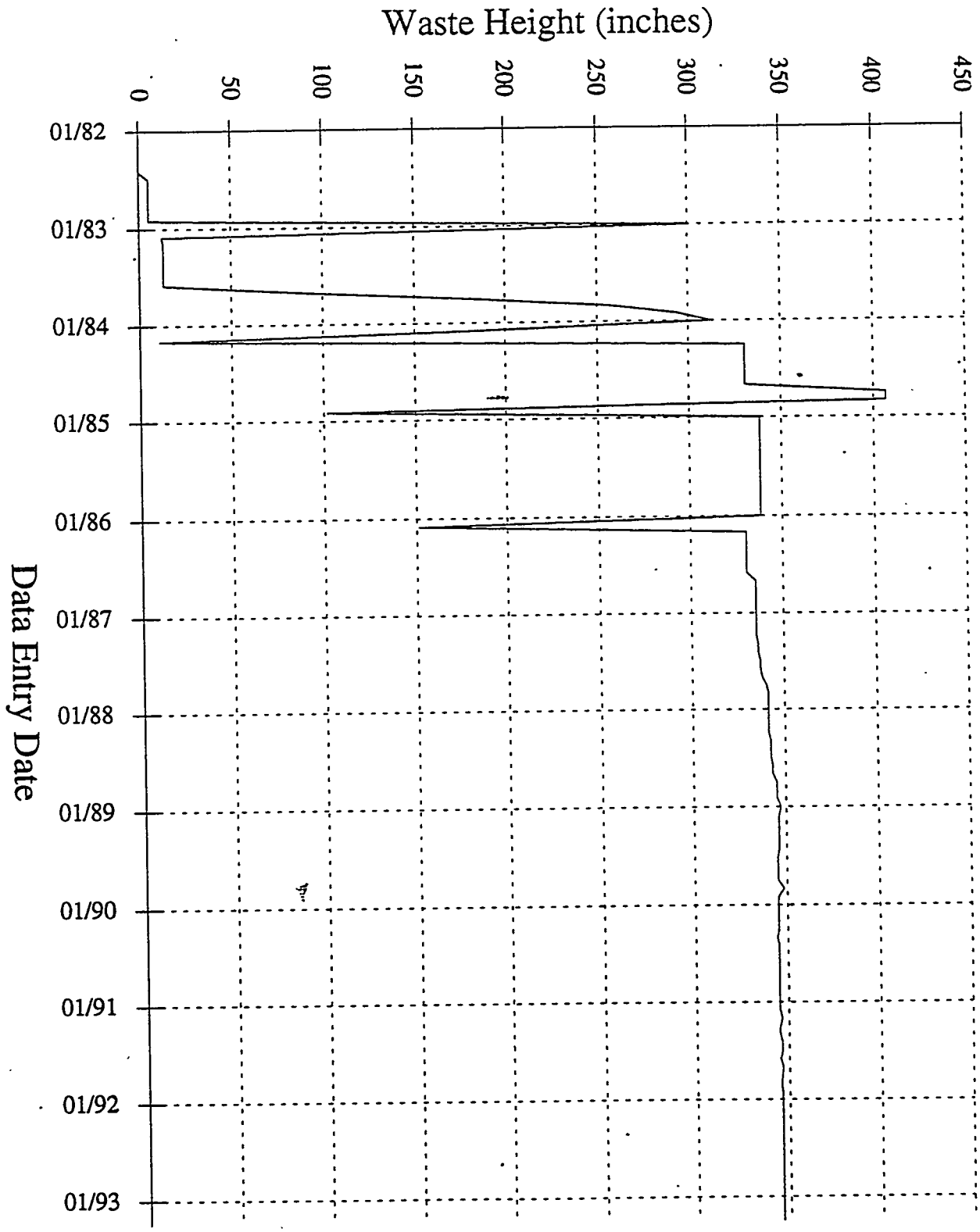
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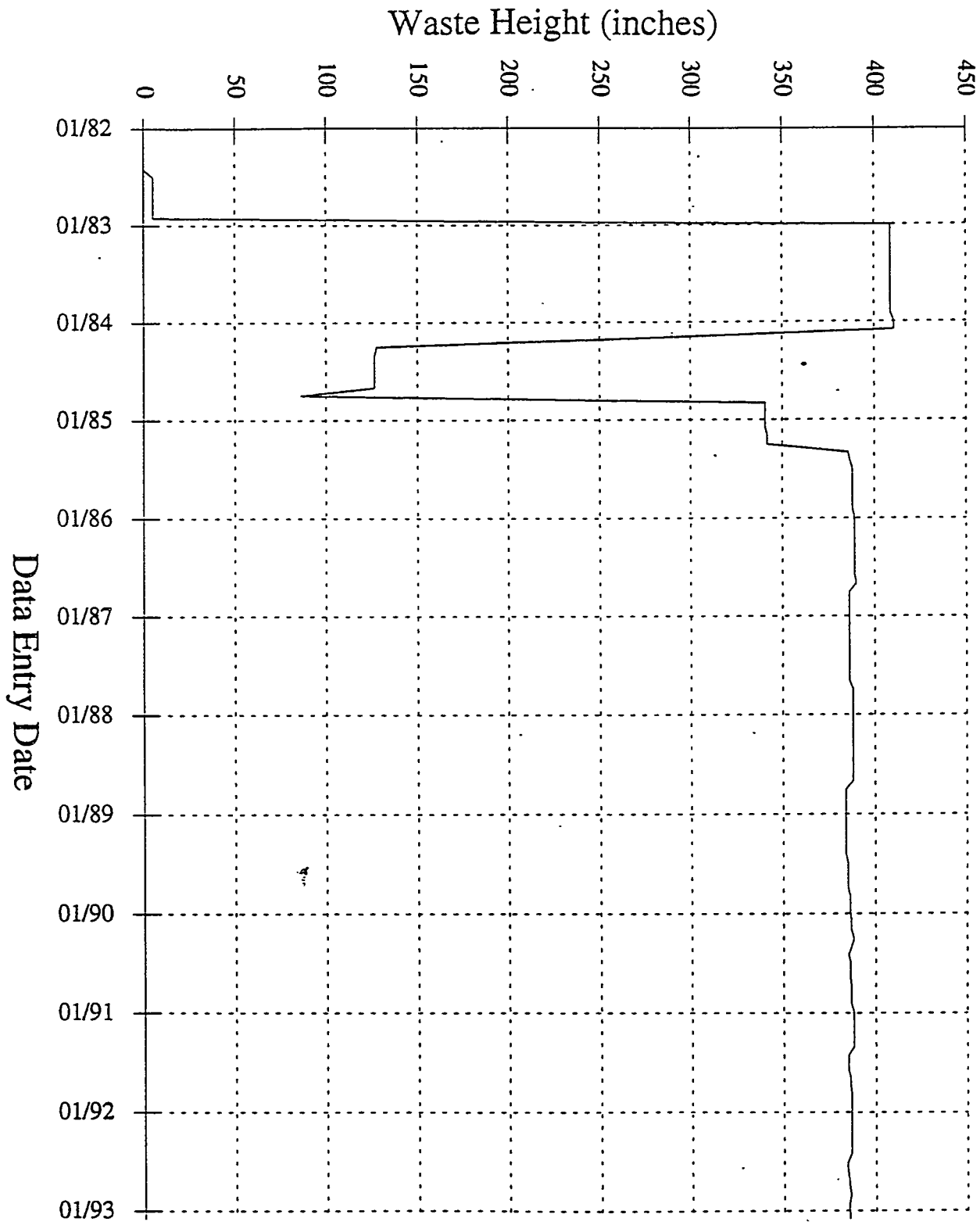
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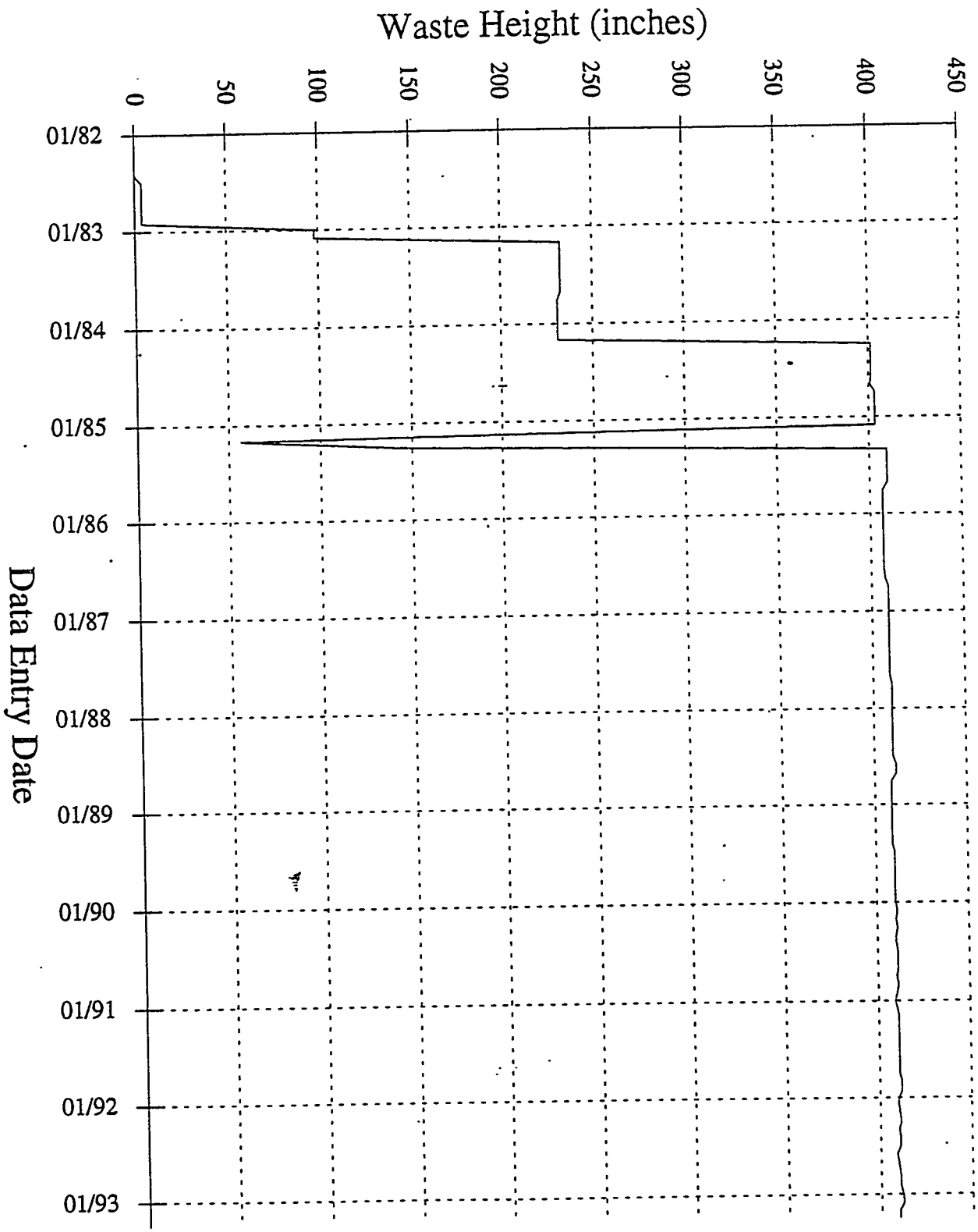
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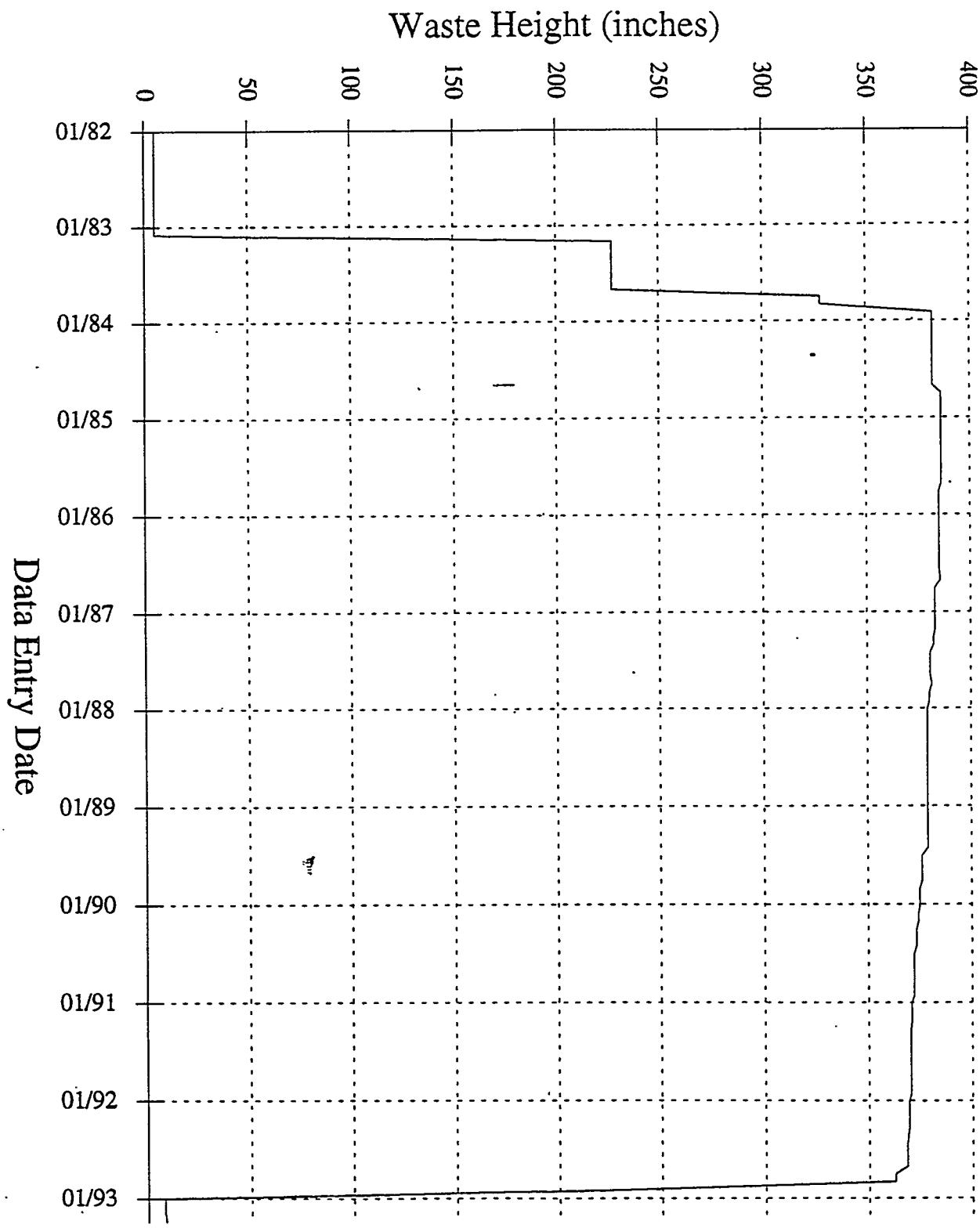
AN-105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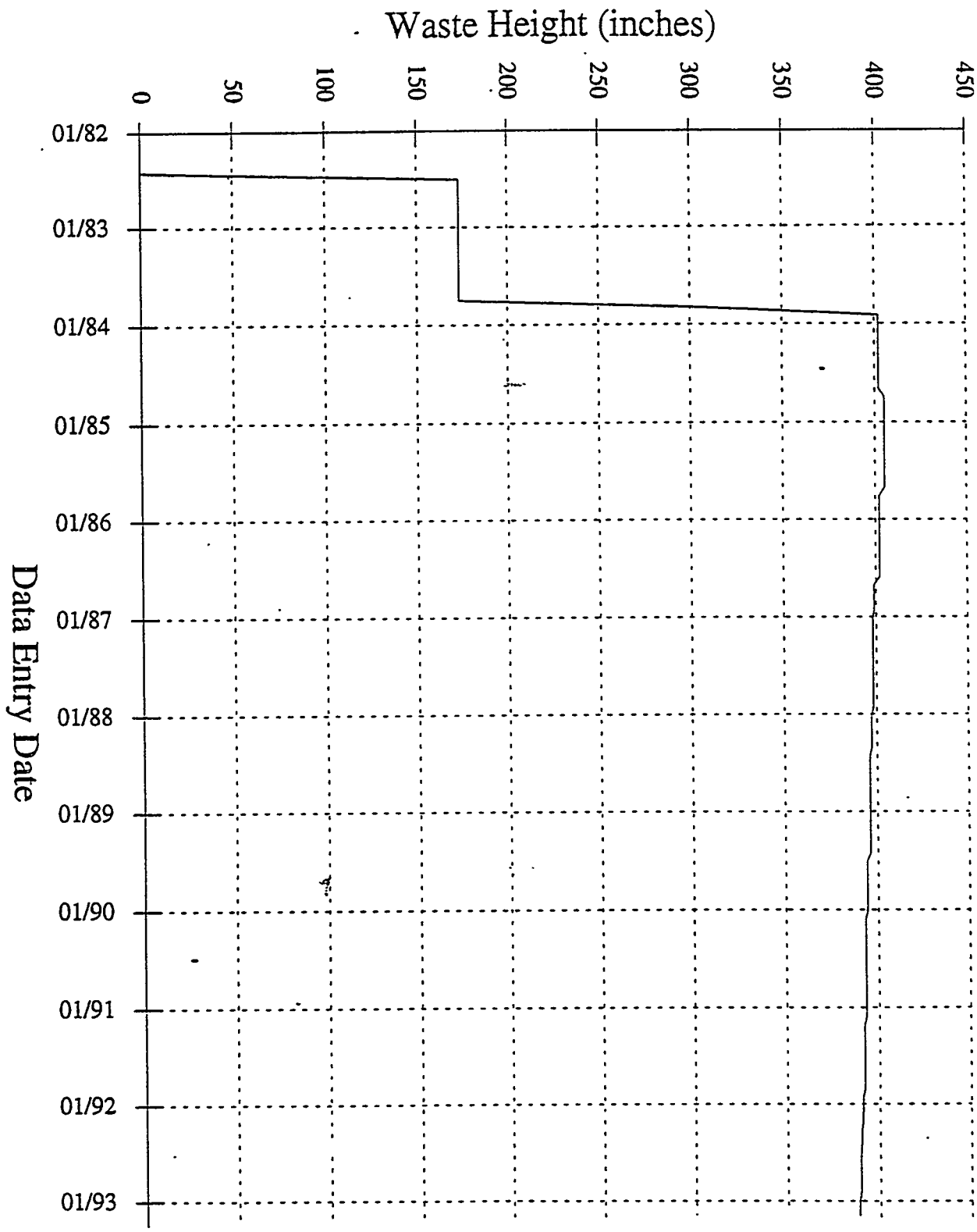
AN-106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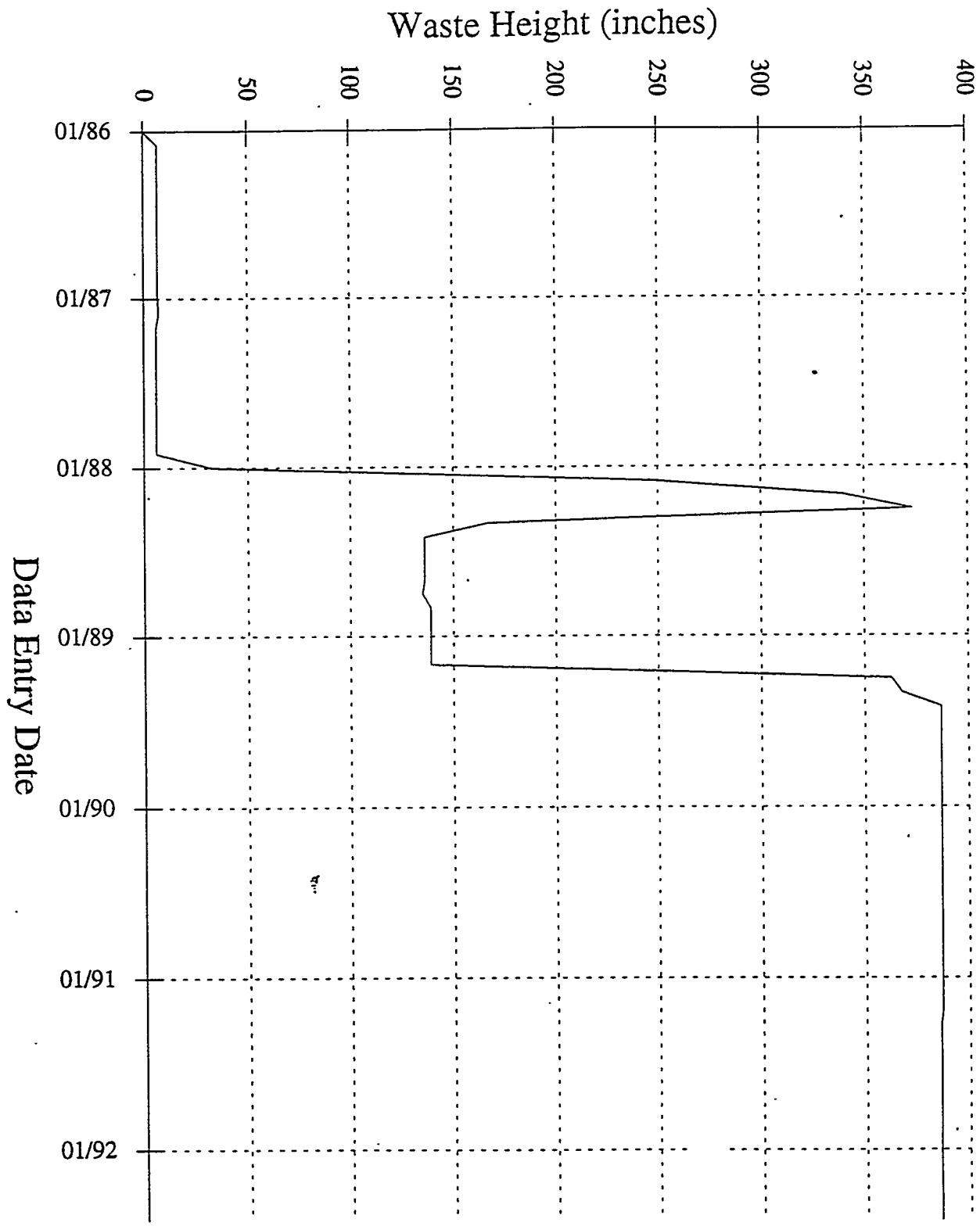
AN-107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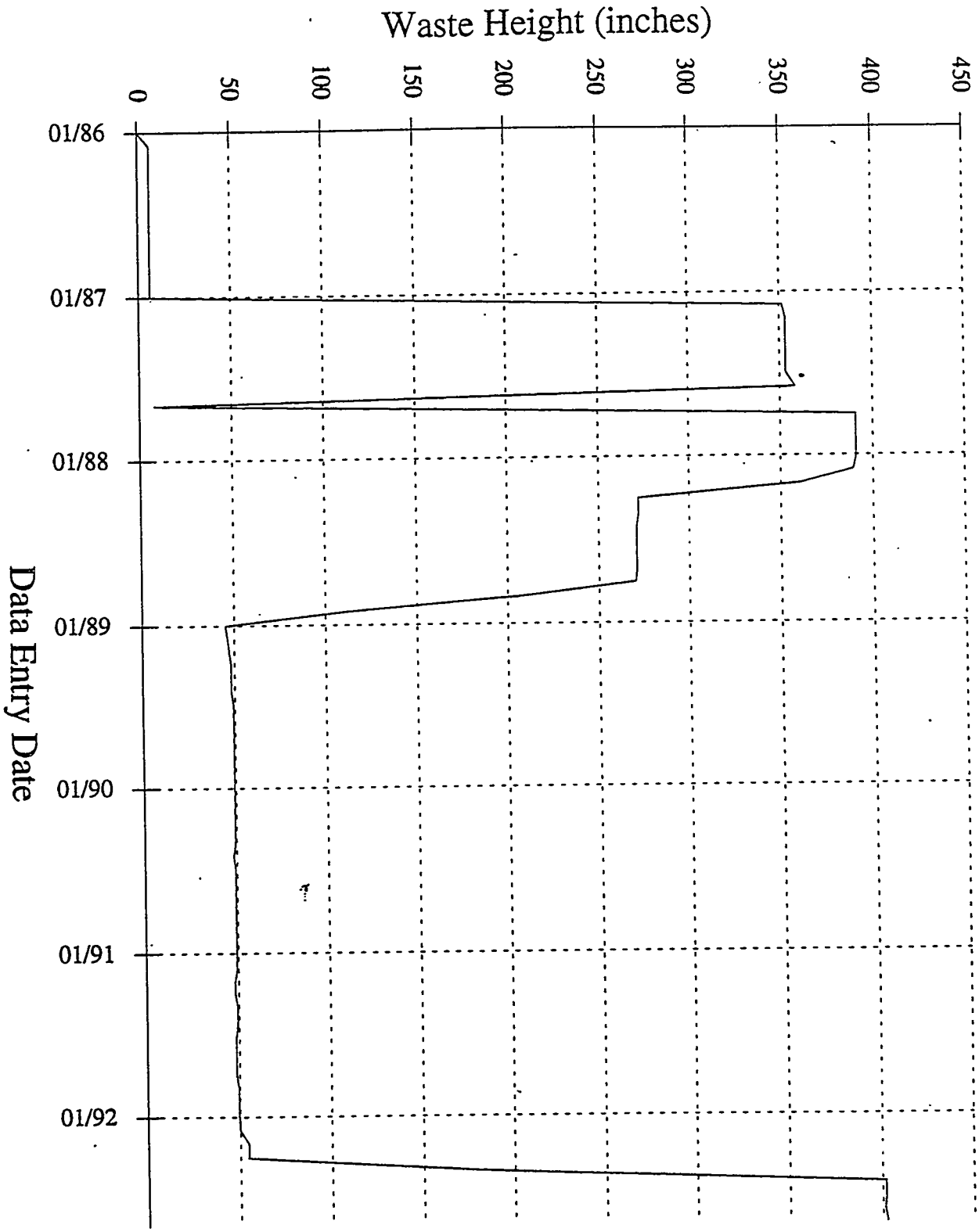
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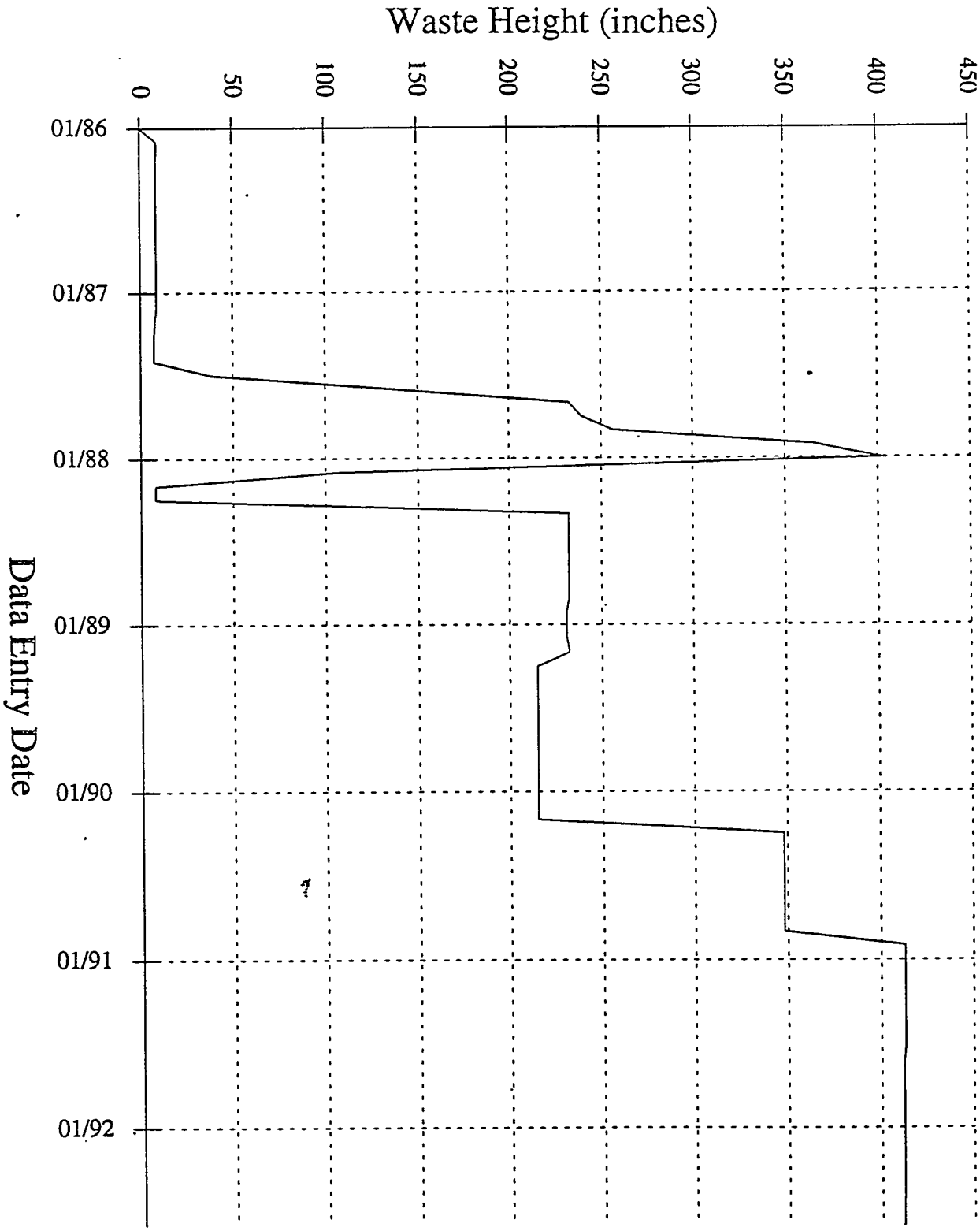
Data Entry Date

AP-102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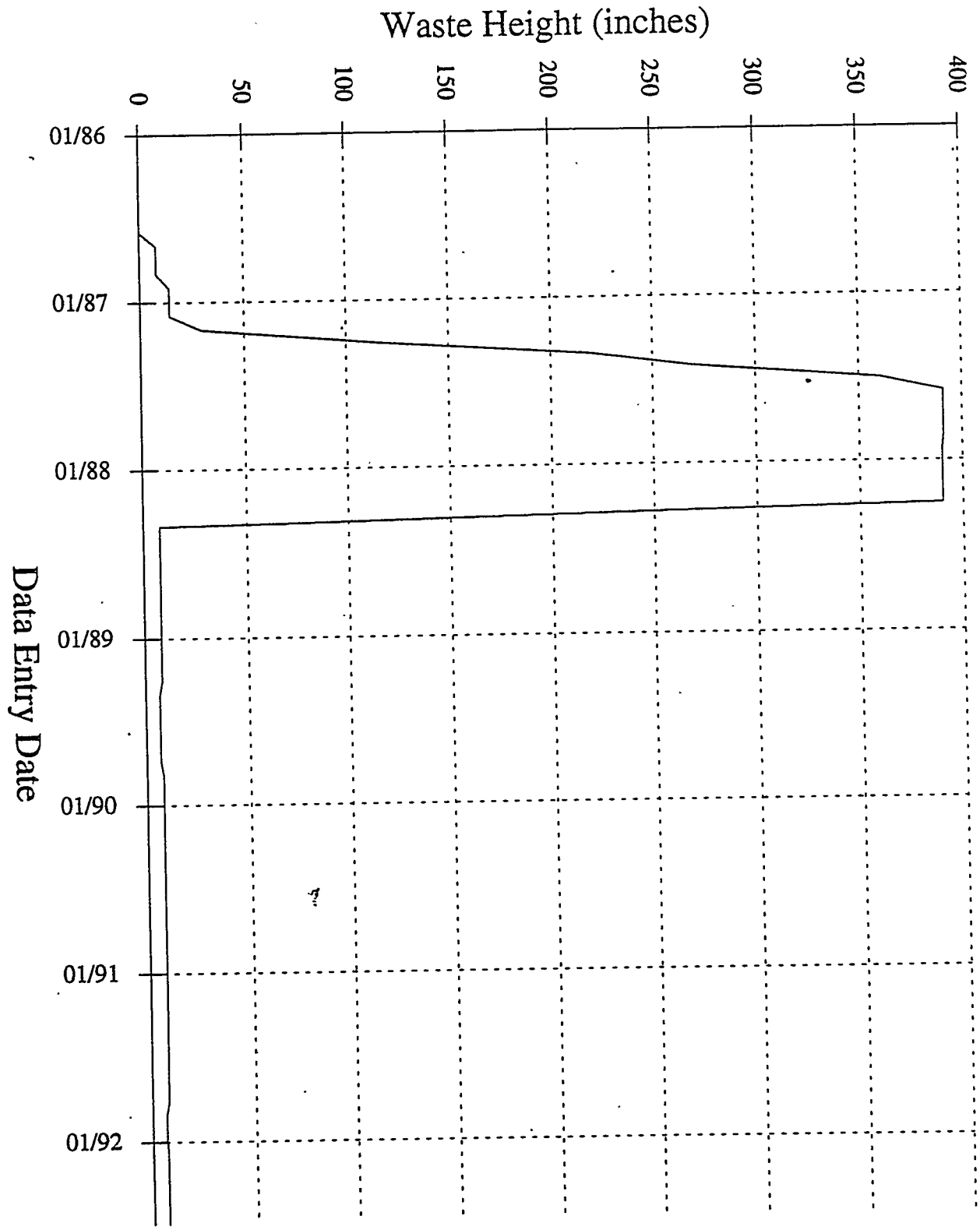
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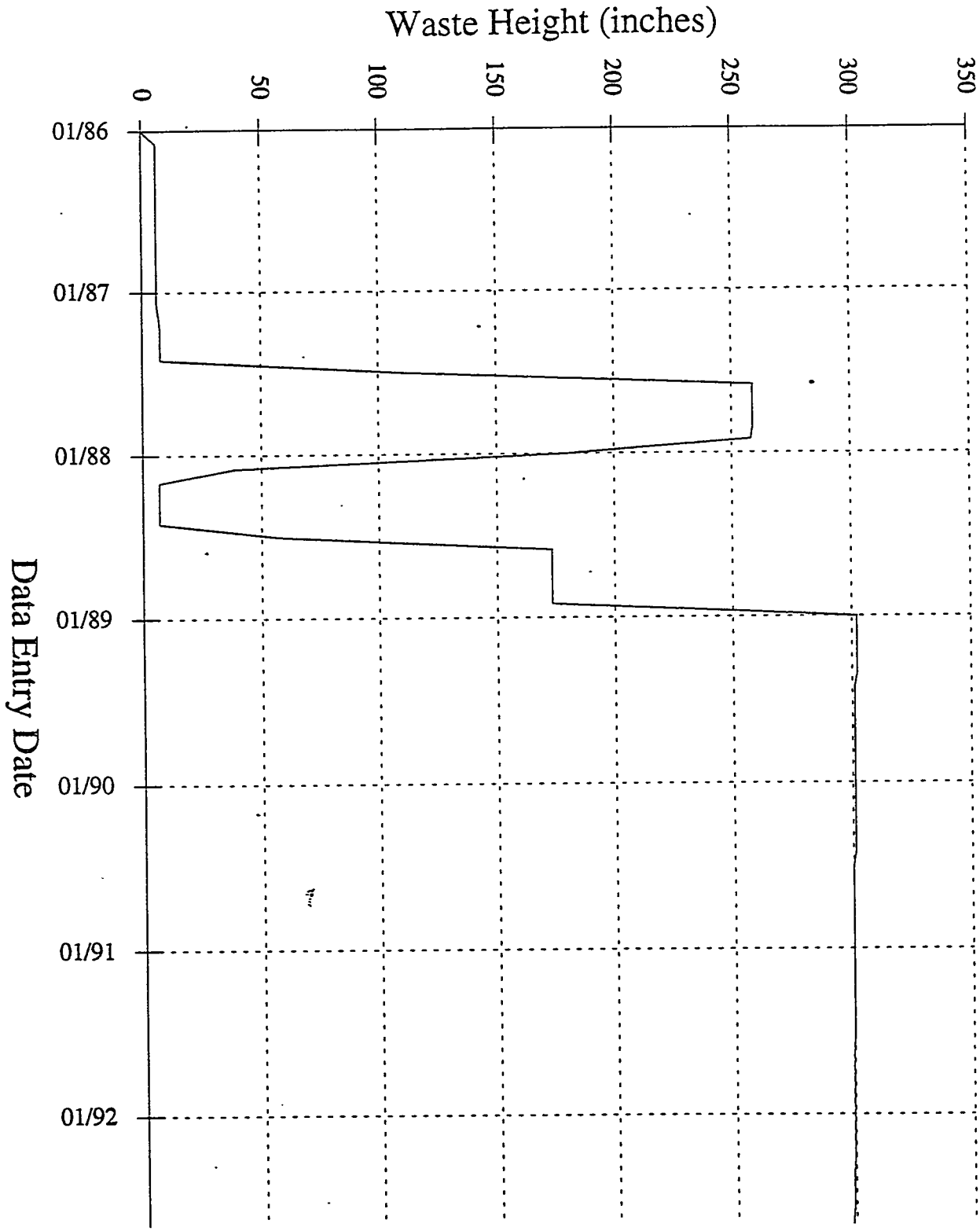
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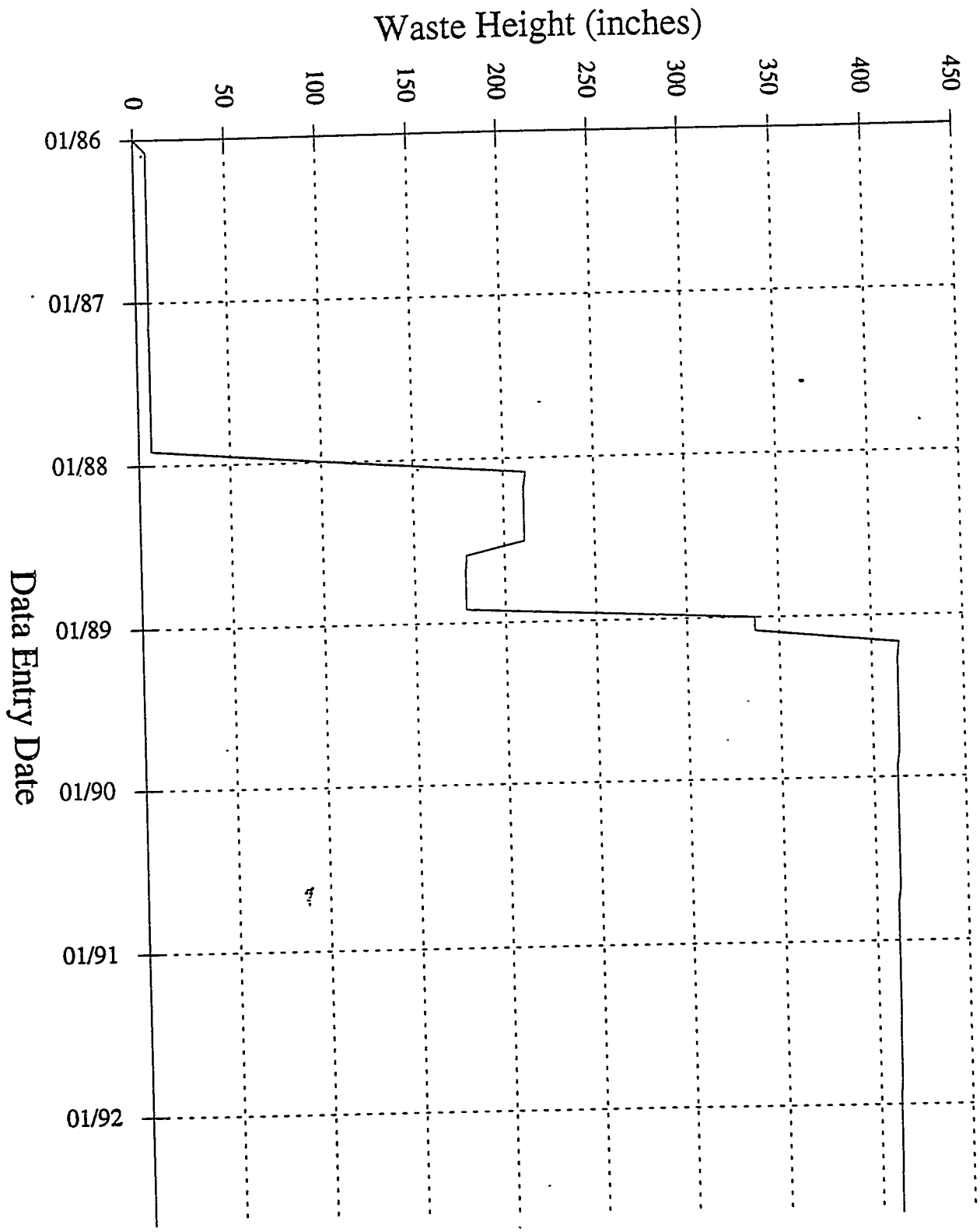
Data Entry Date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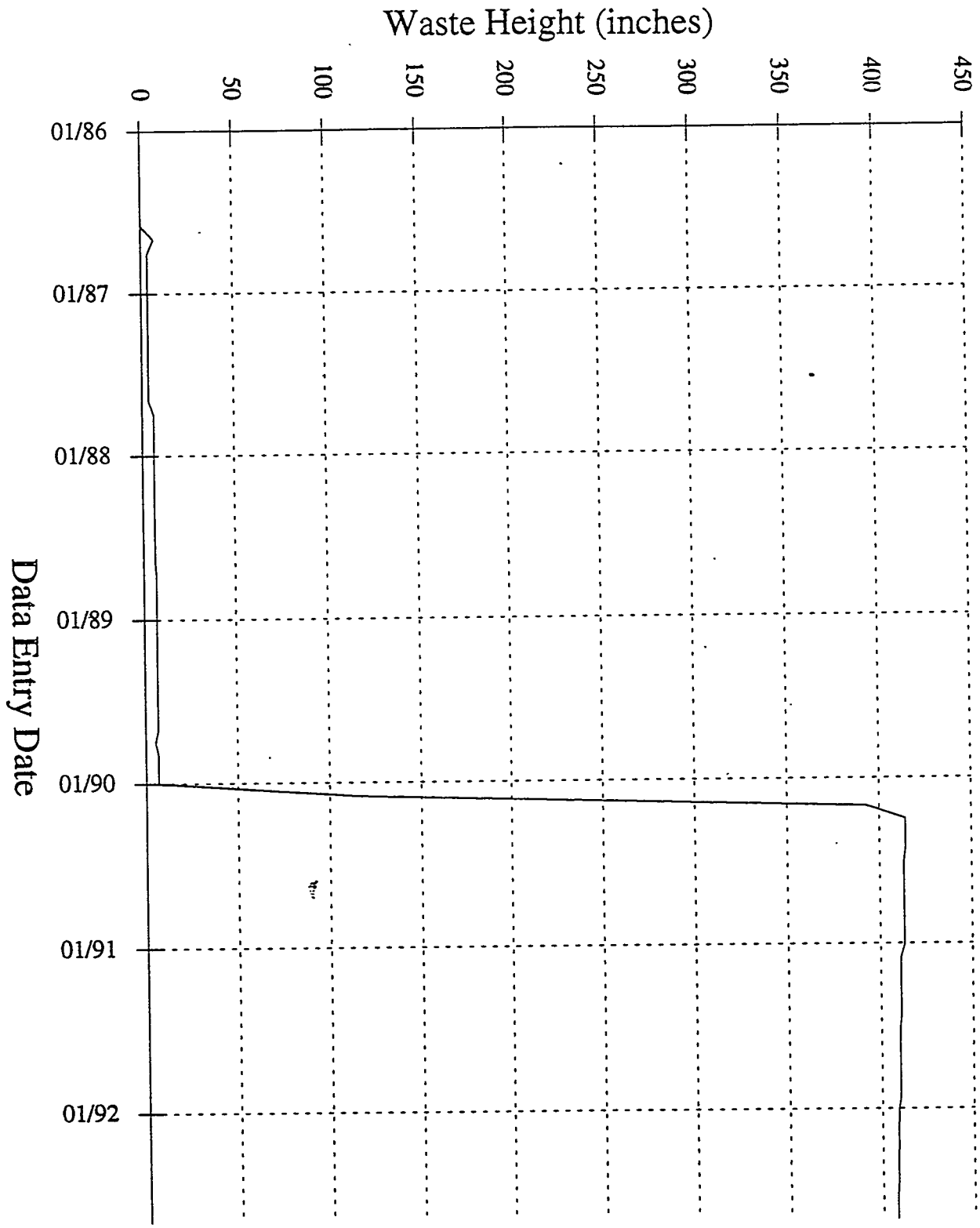
AP-106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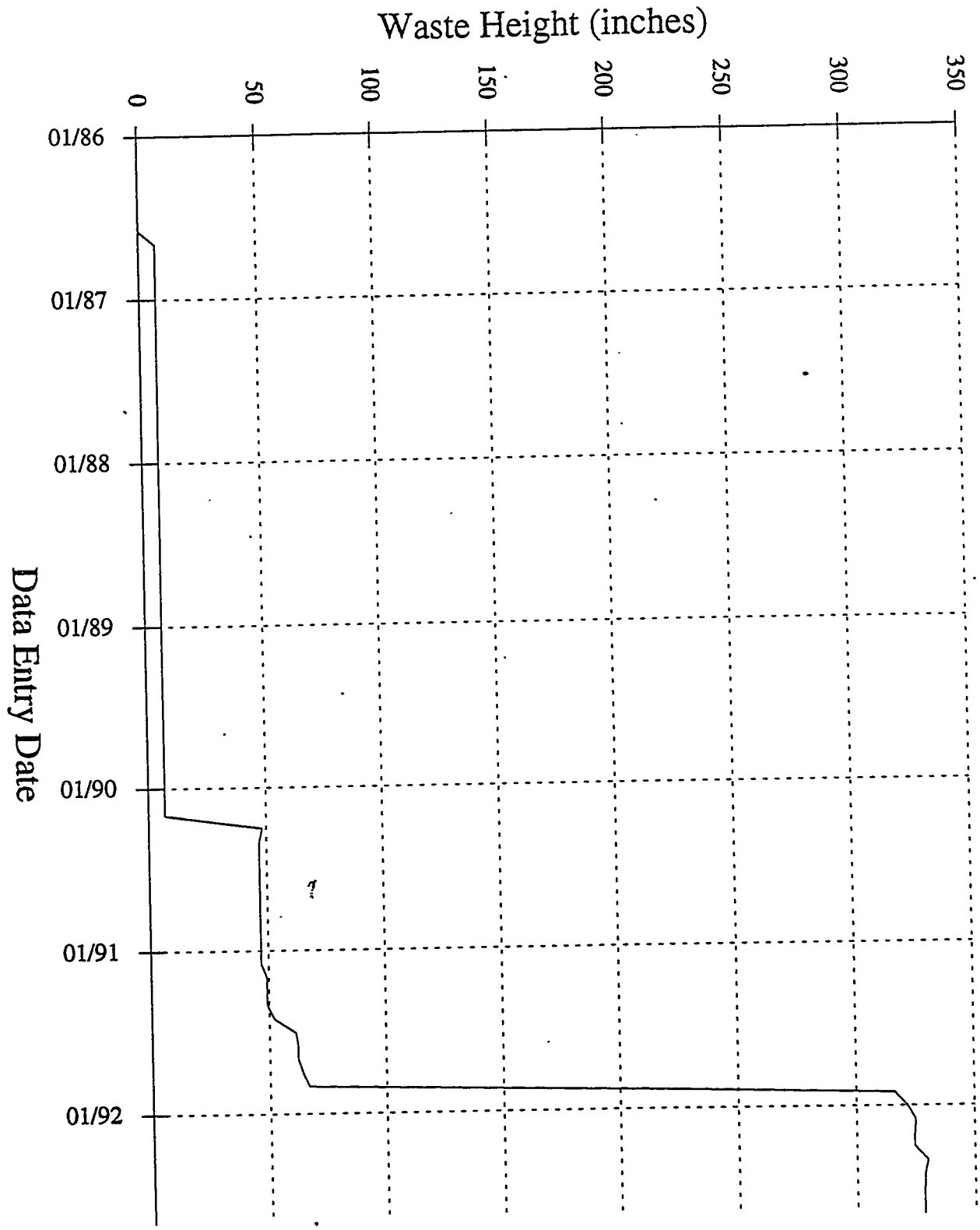
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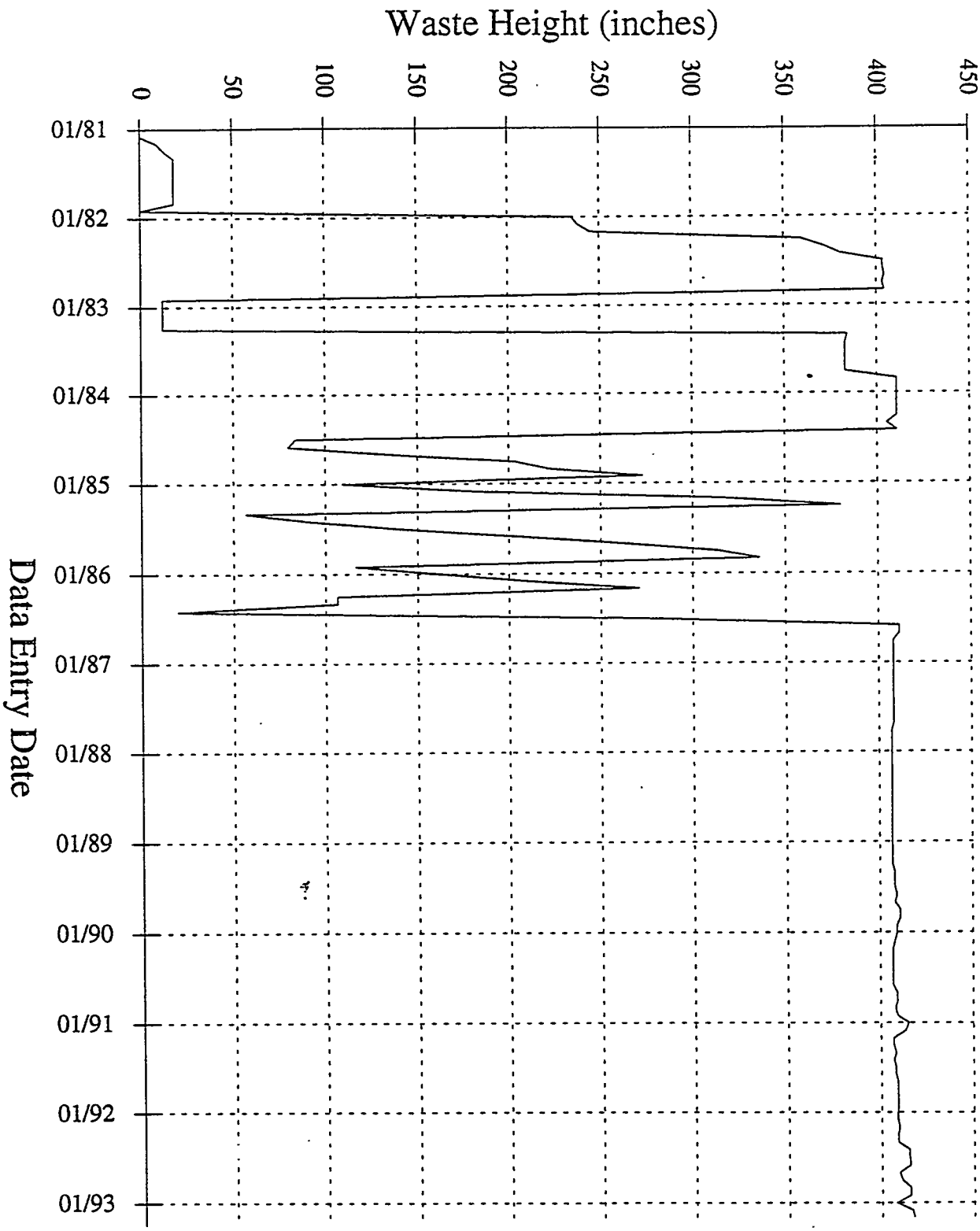
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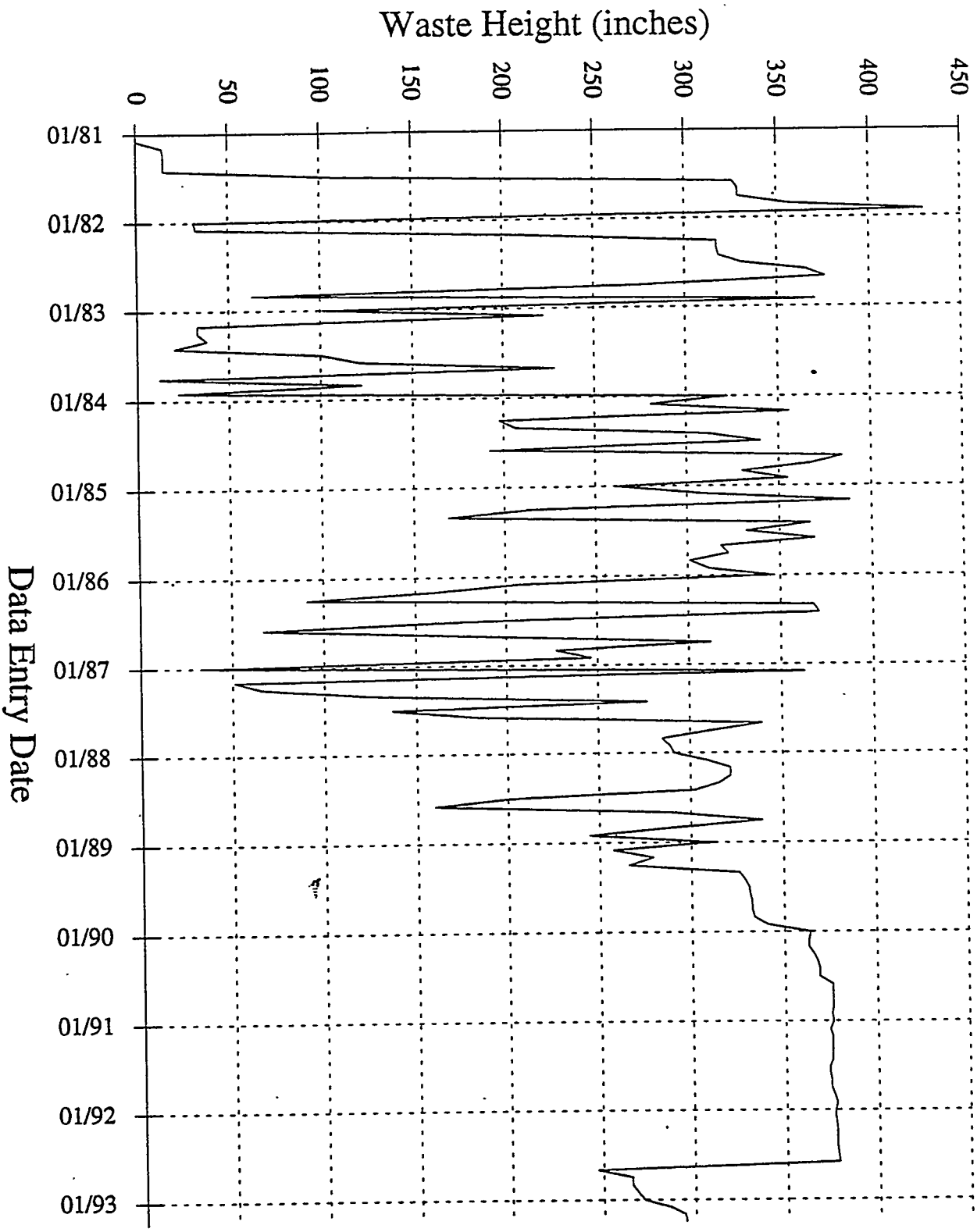
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Data Entry Date

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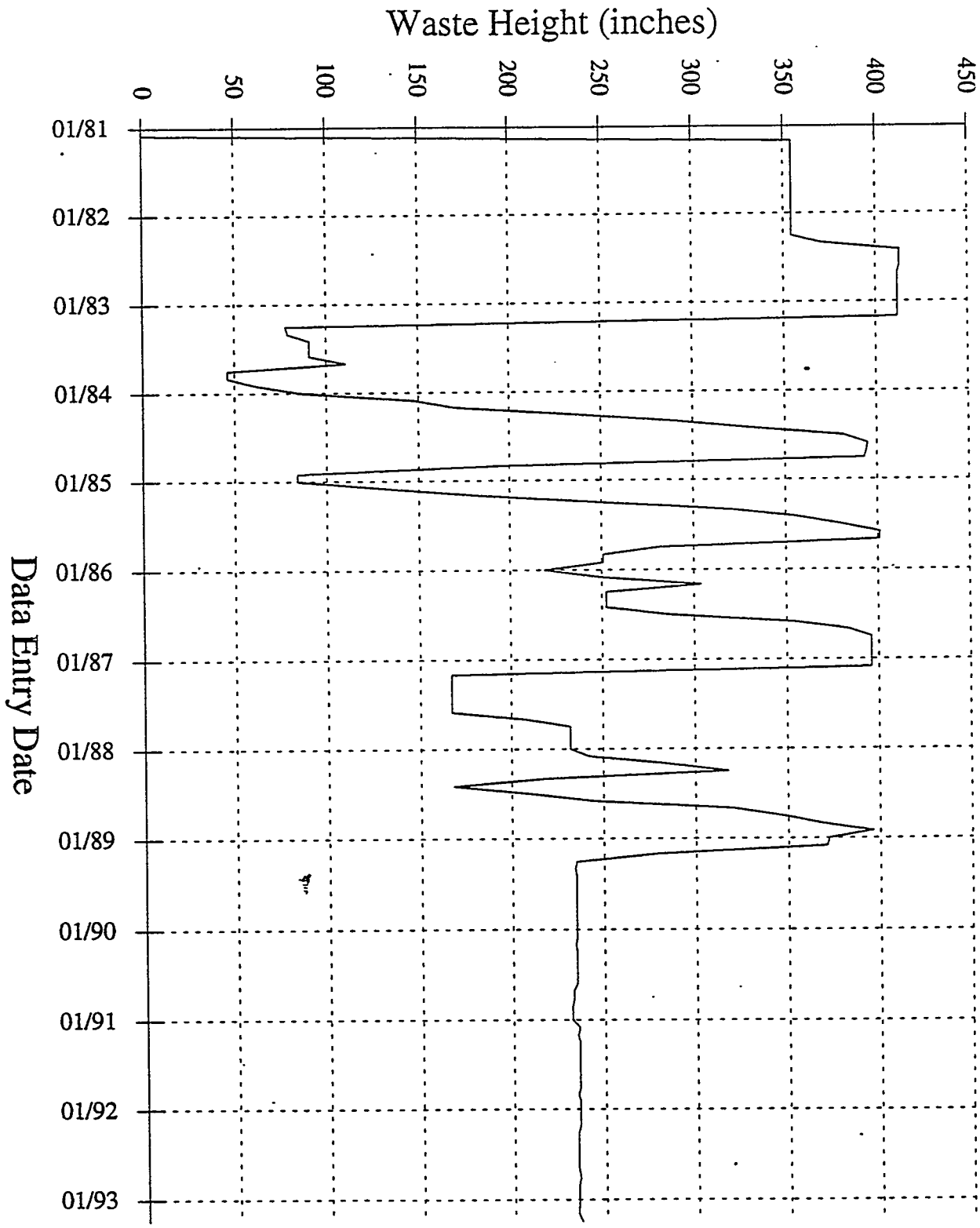
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Data Entry Date

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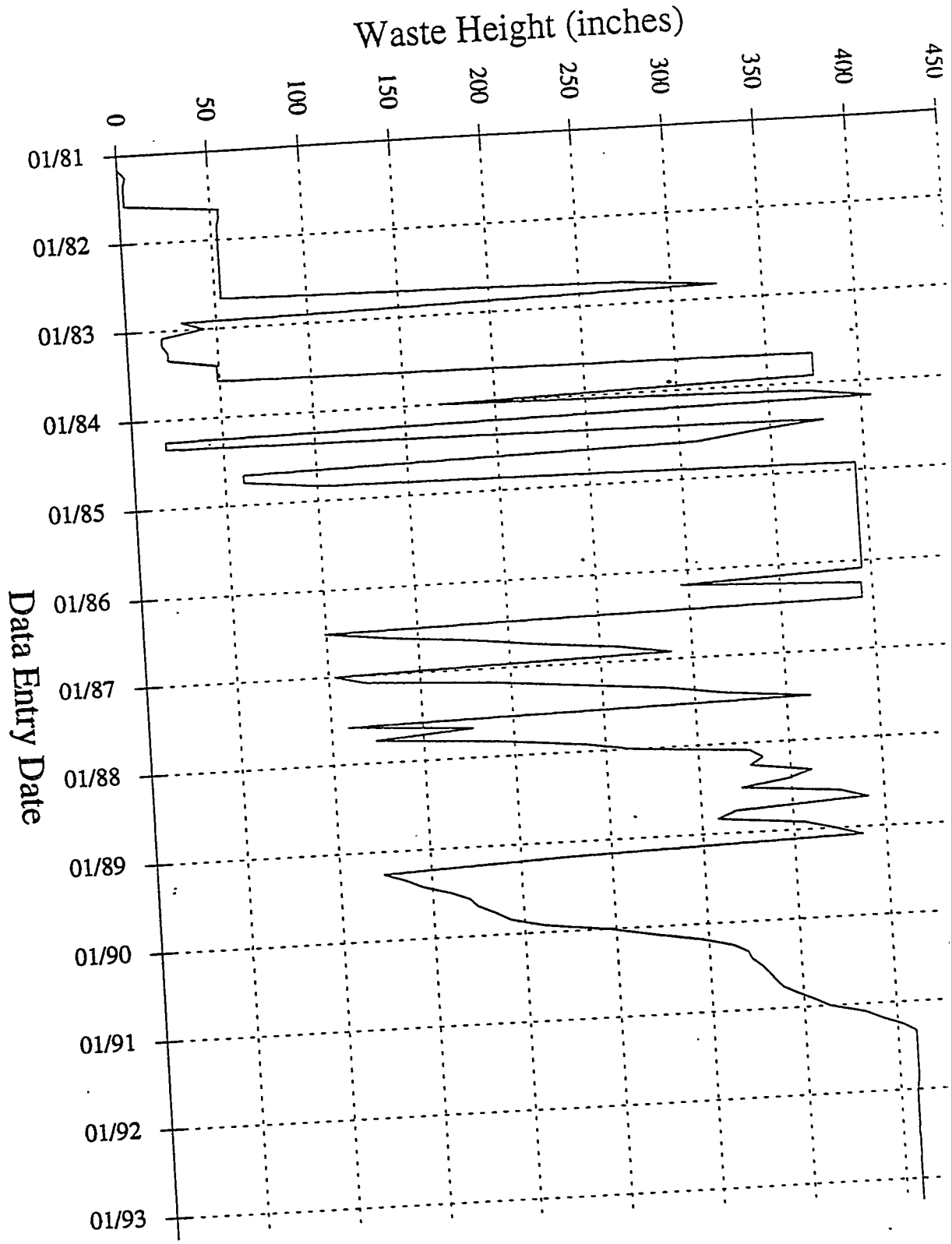
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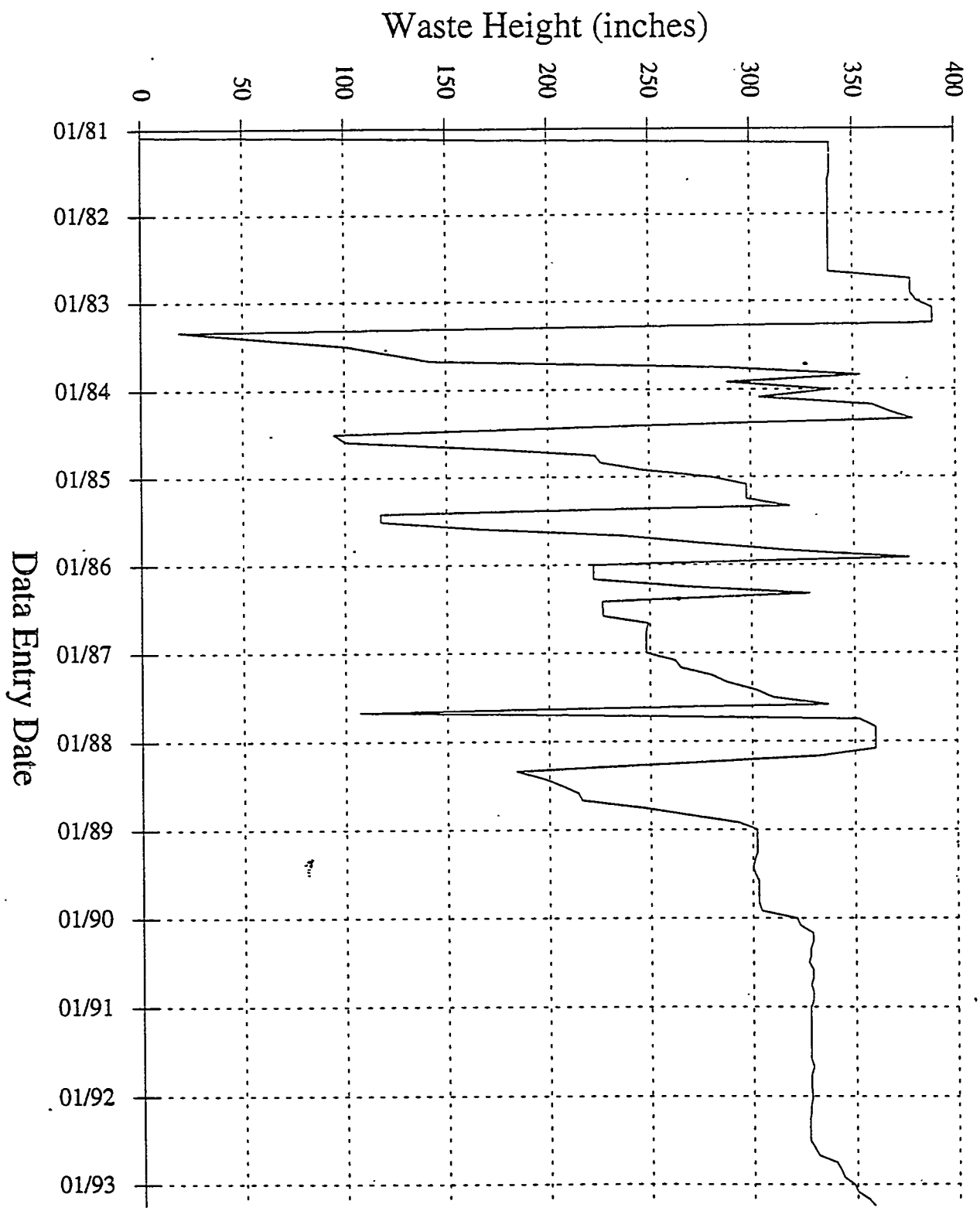
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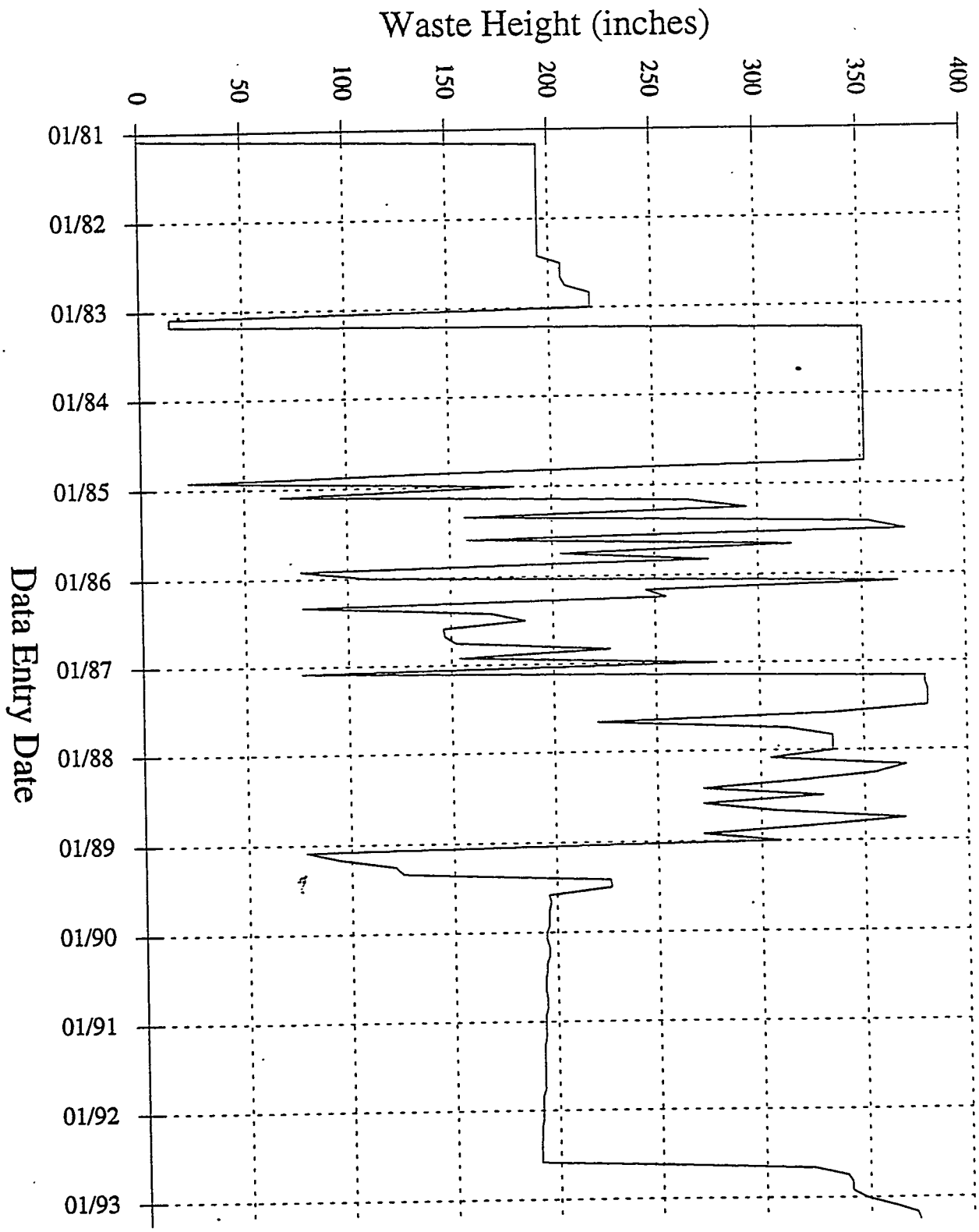
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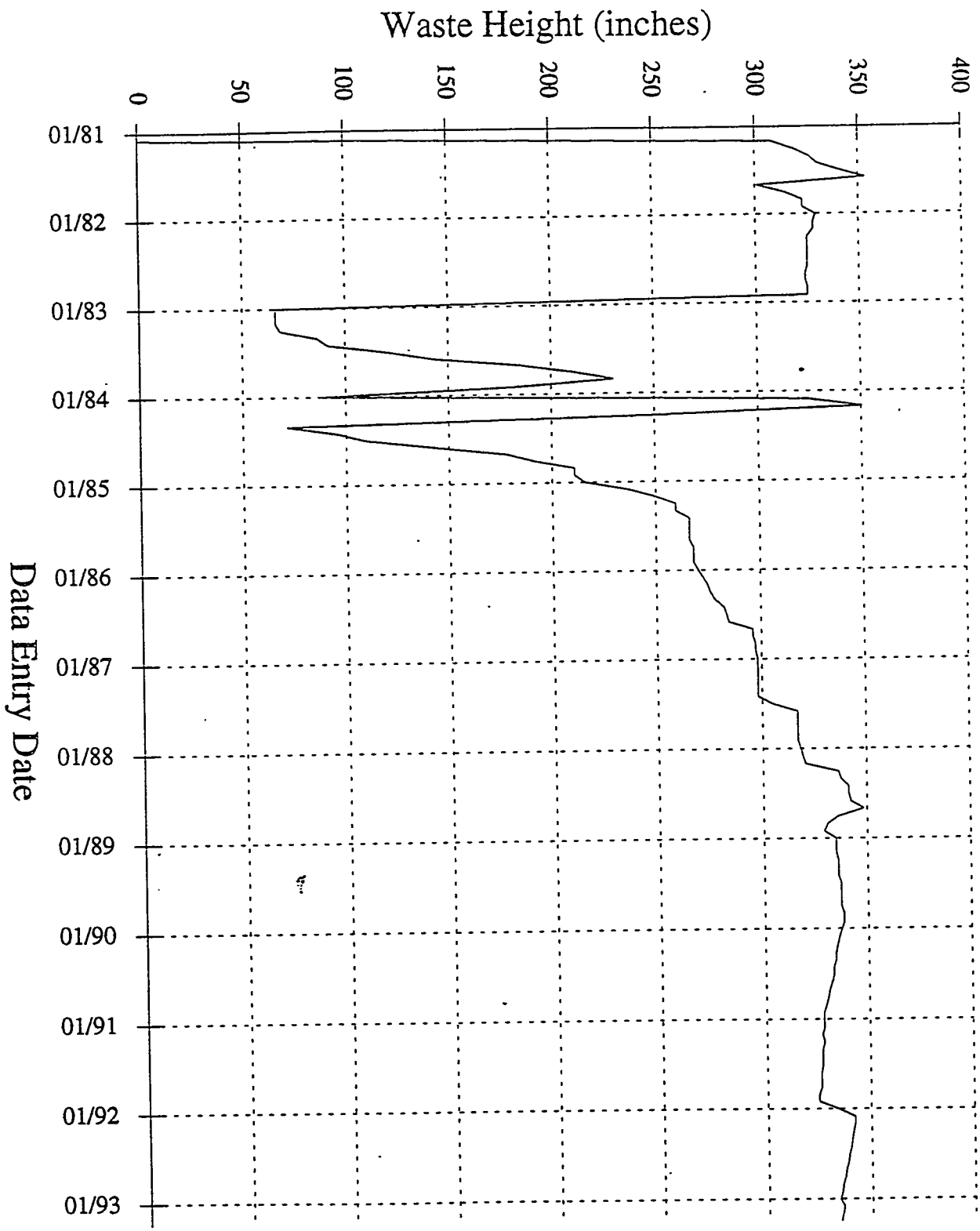
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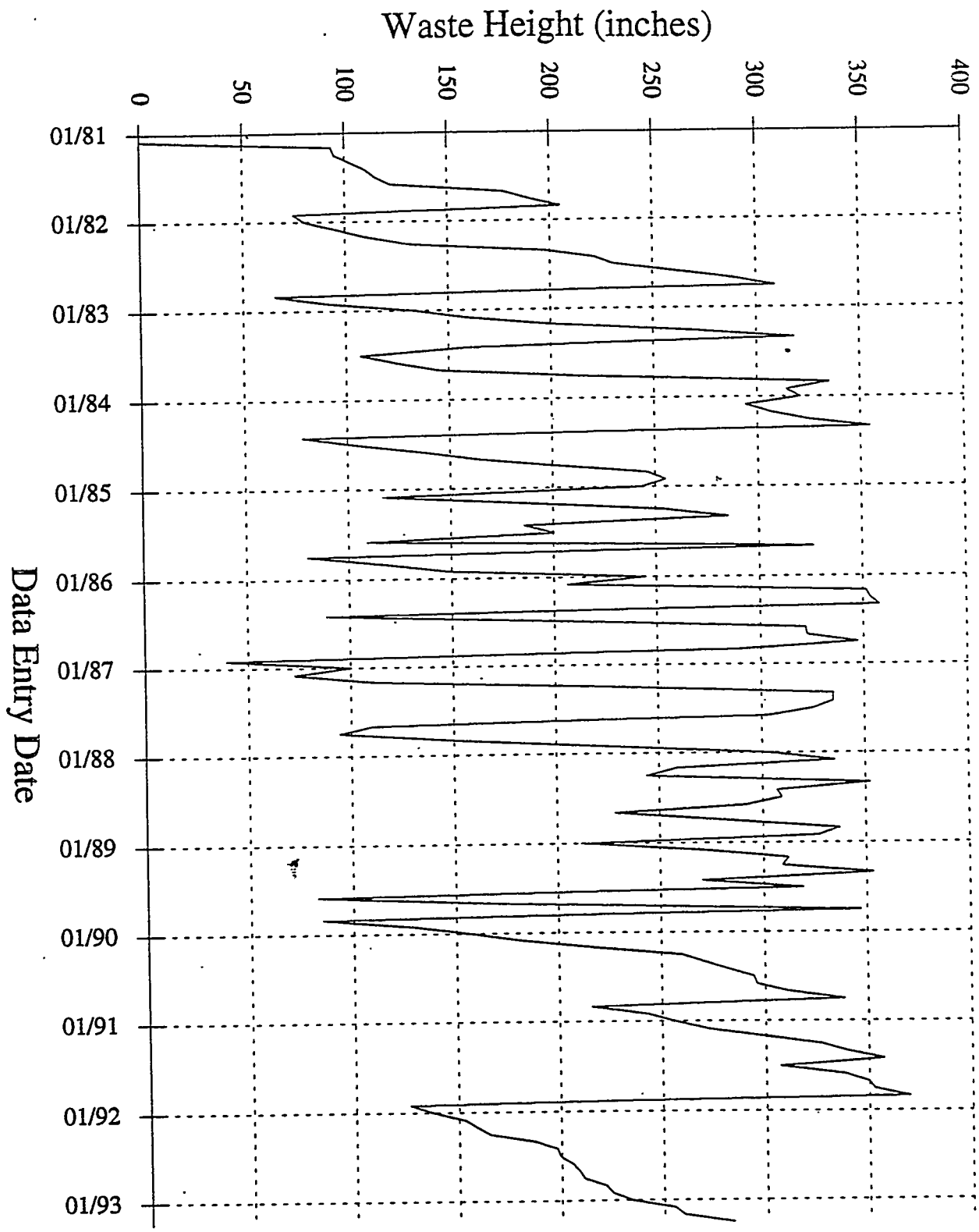
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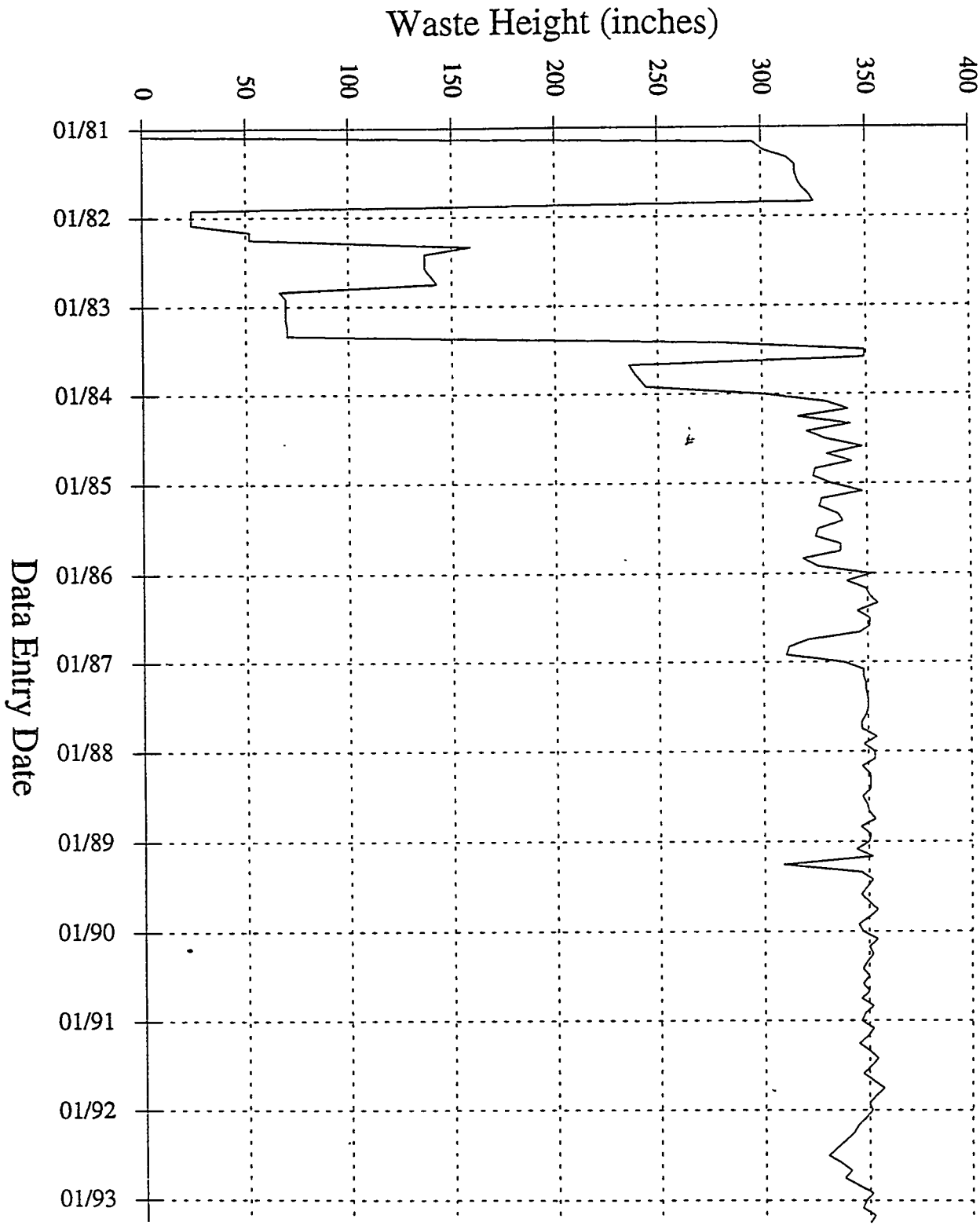
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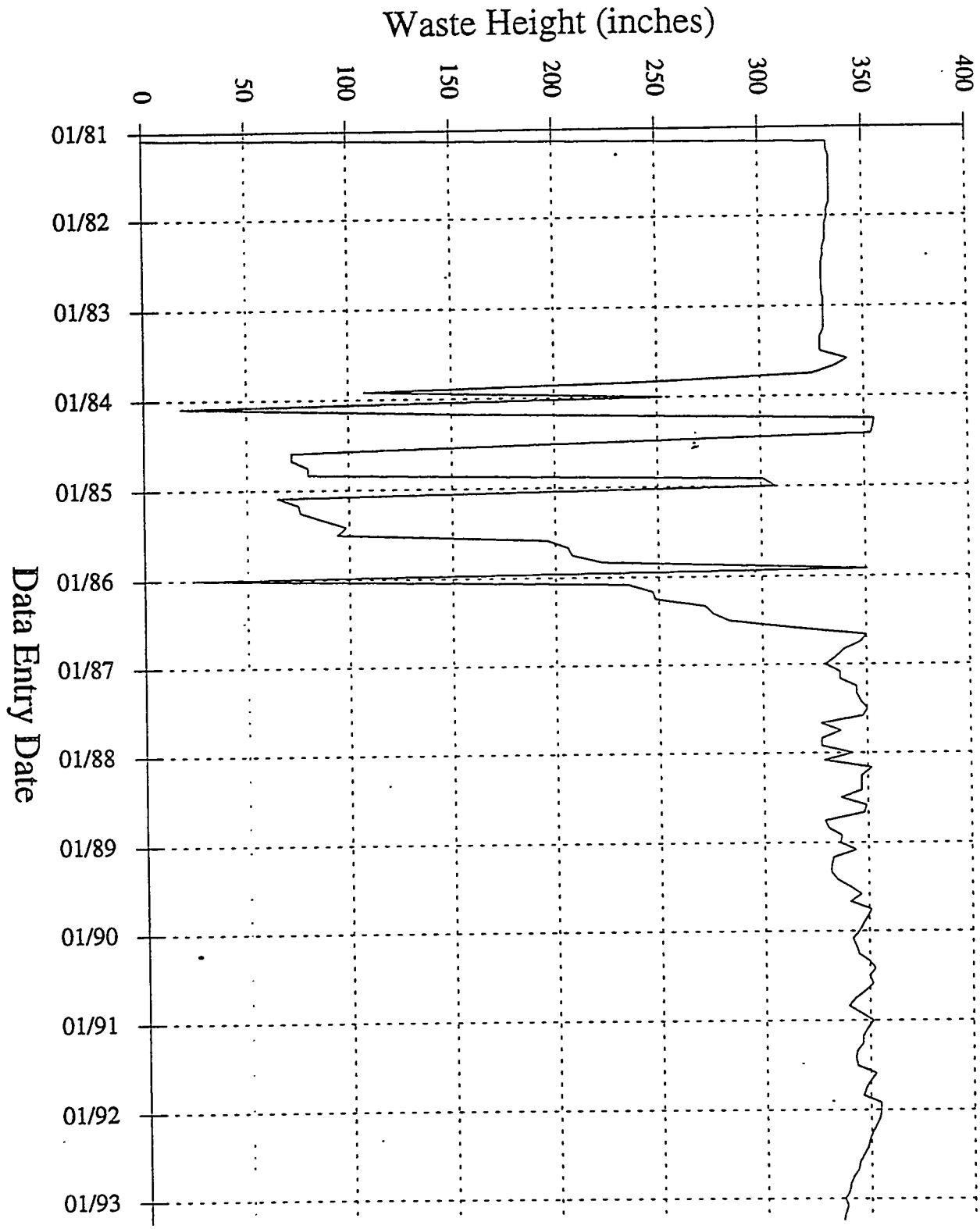
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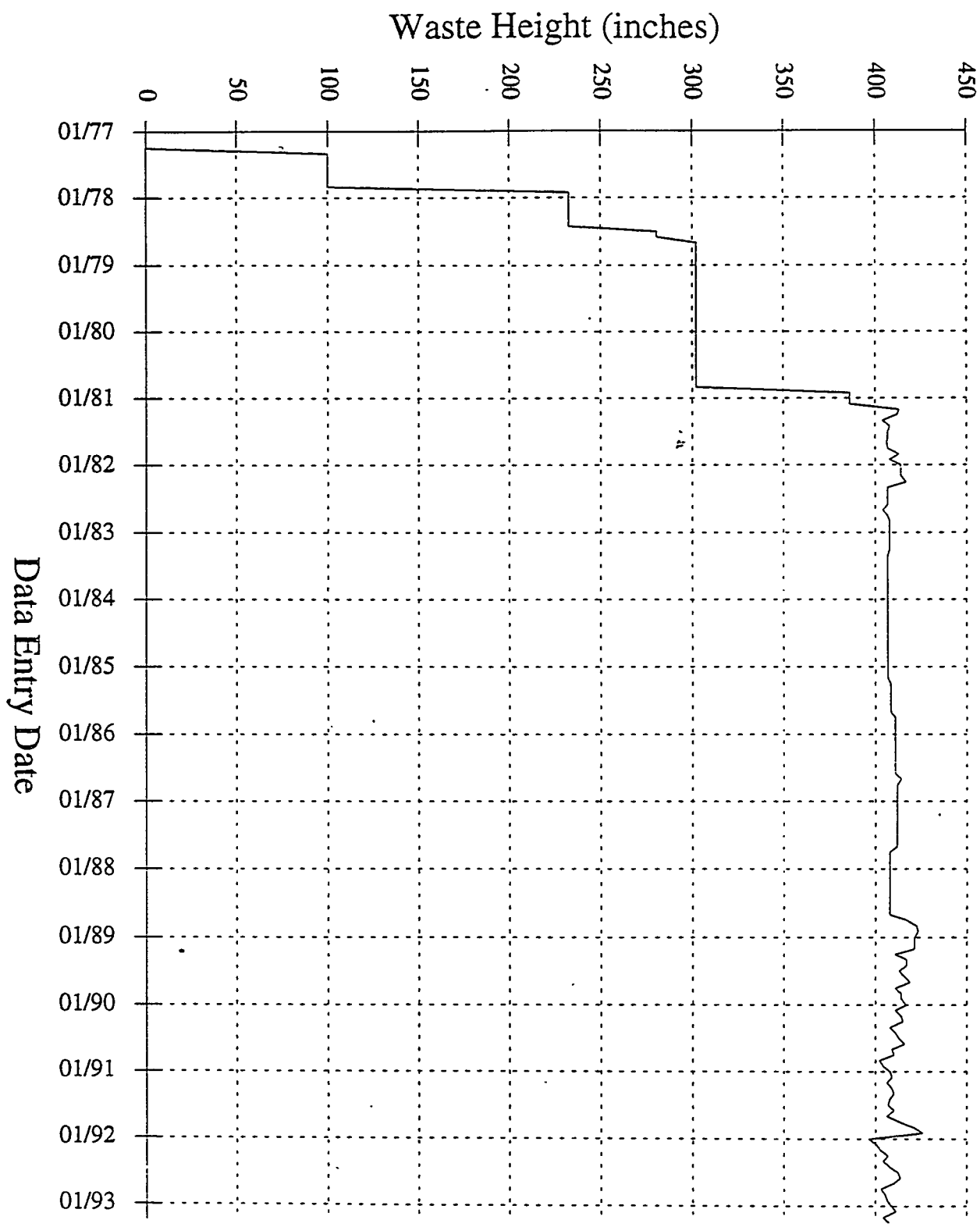
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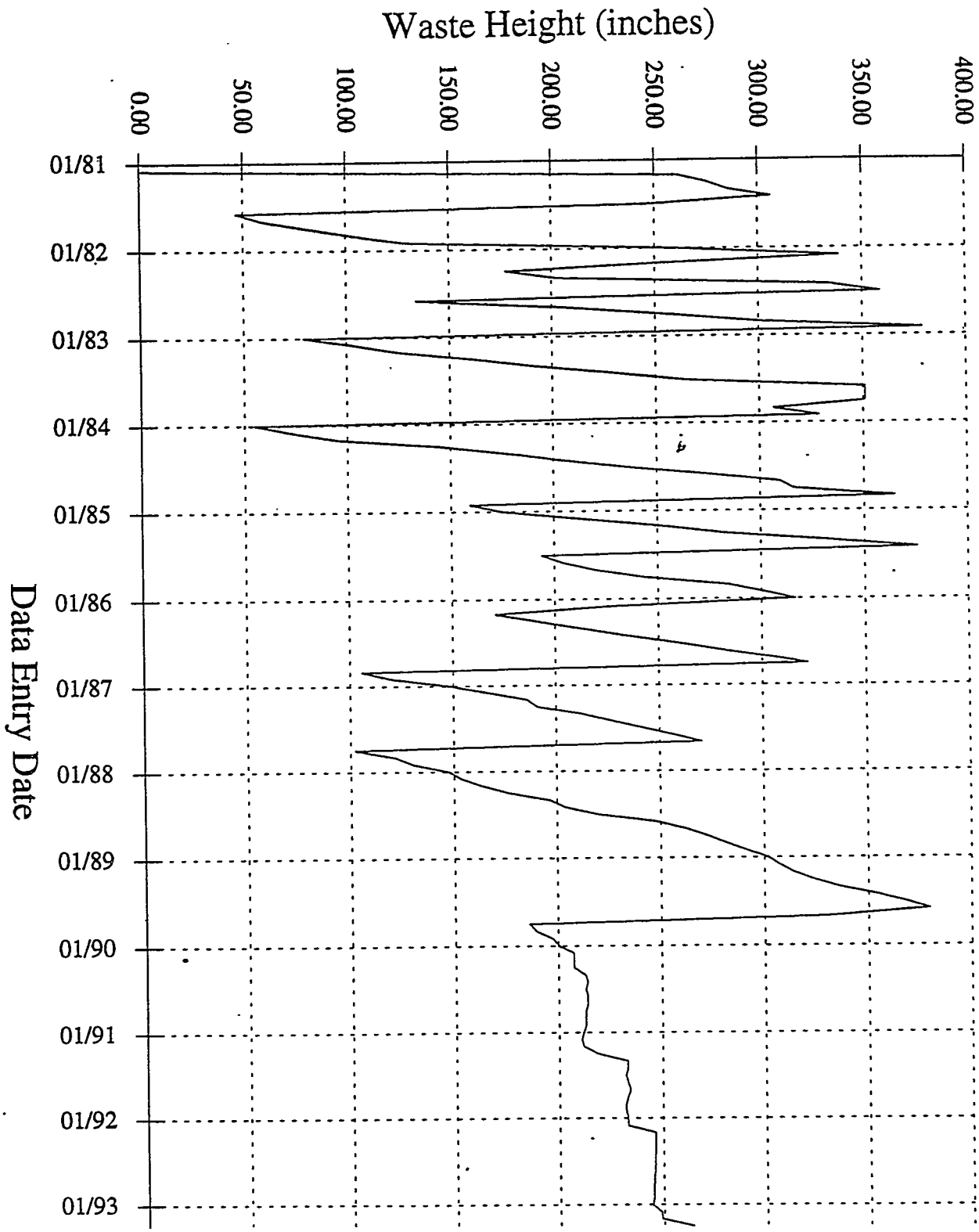
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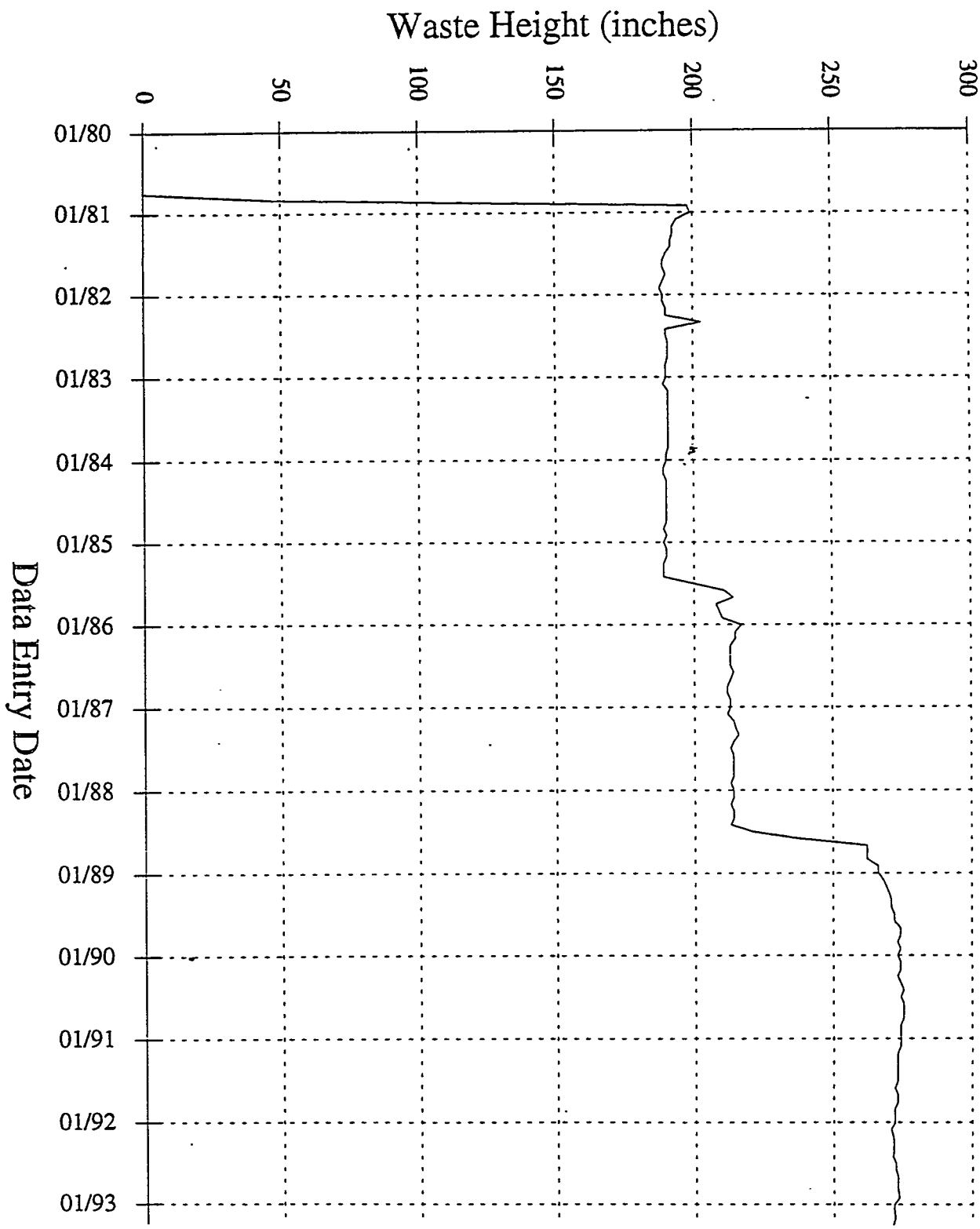
SY-102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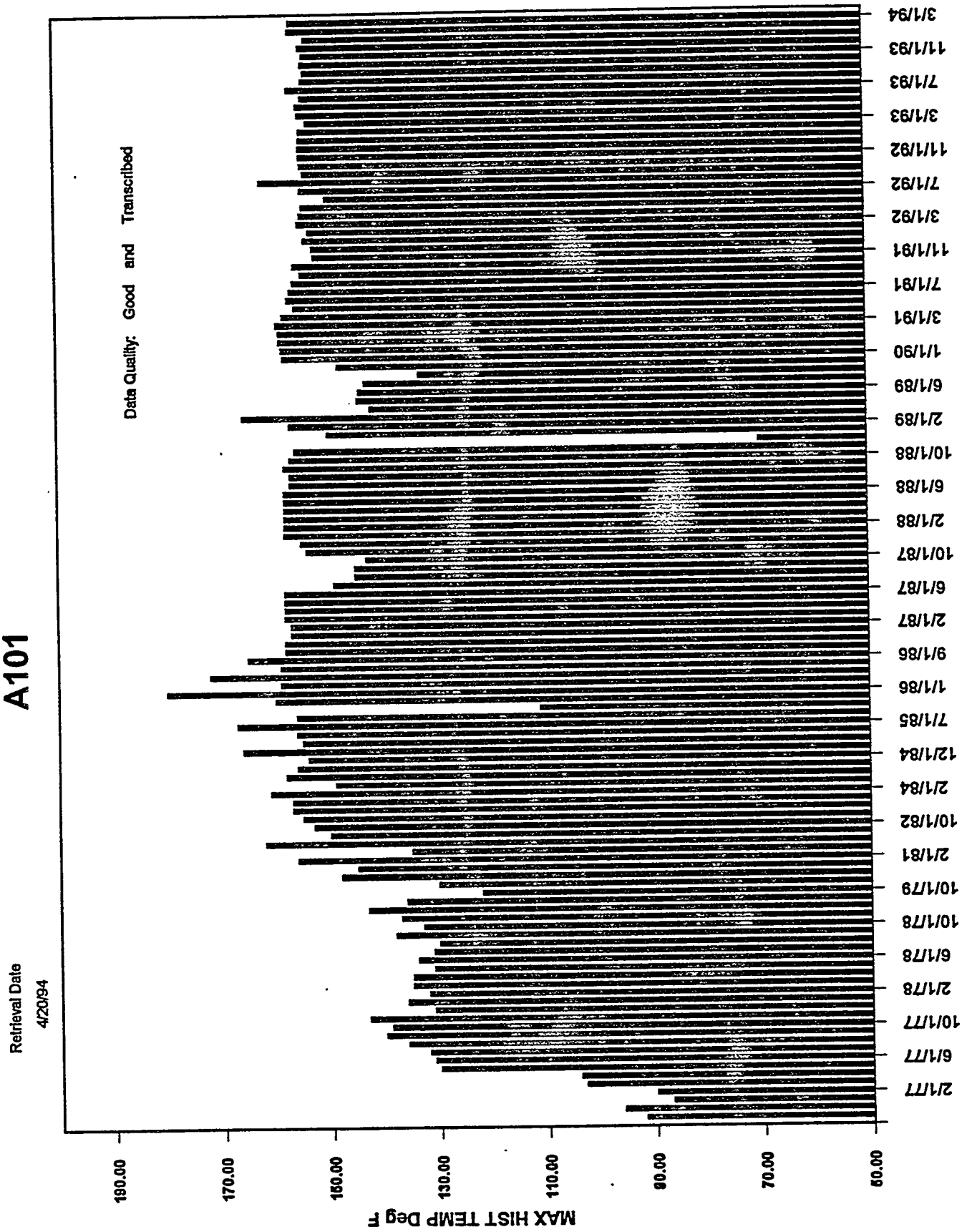
SY-103

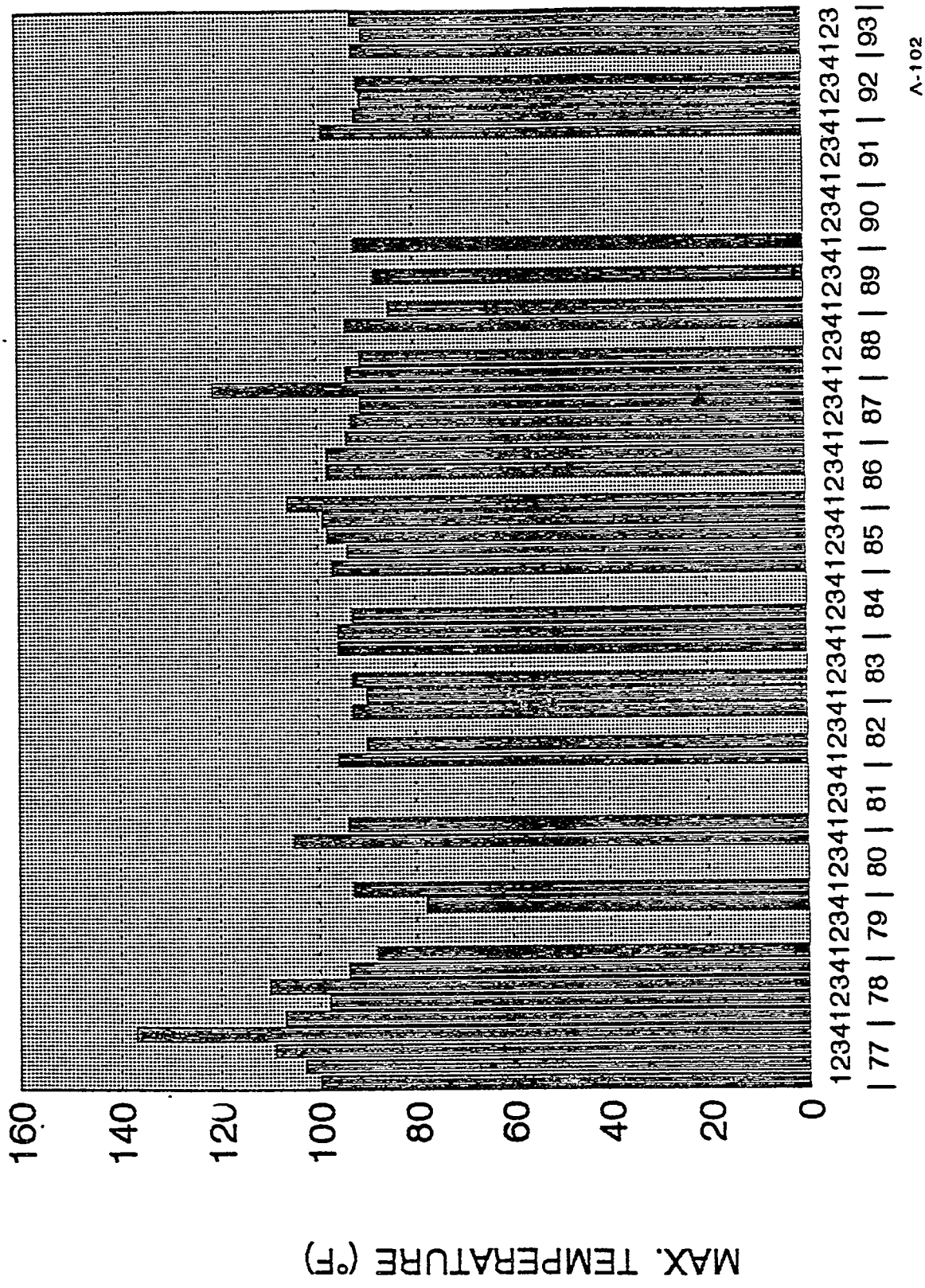
A P P E N D I X E

MAXIMUM TEMPERATURE HISTORY PLOTS FROM SACS DATABASE VIA SCRIPT FILES AND PCSACS

Quarterly Maximum Temperature History Plot



Quarterly Maximum Temperature History Plot



A-102

O ENTRY INDICATES NO DATA WAS RECORDED

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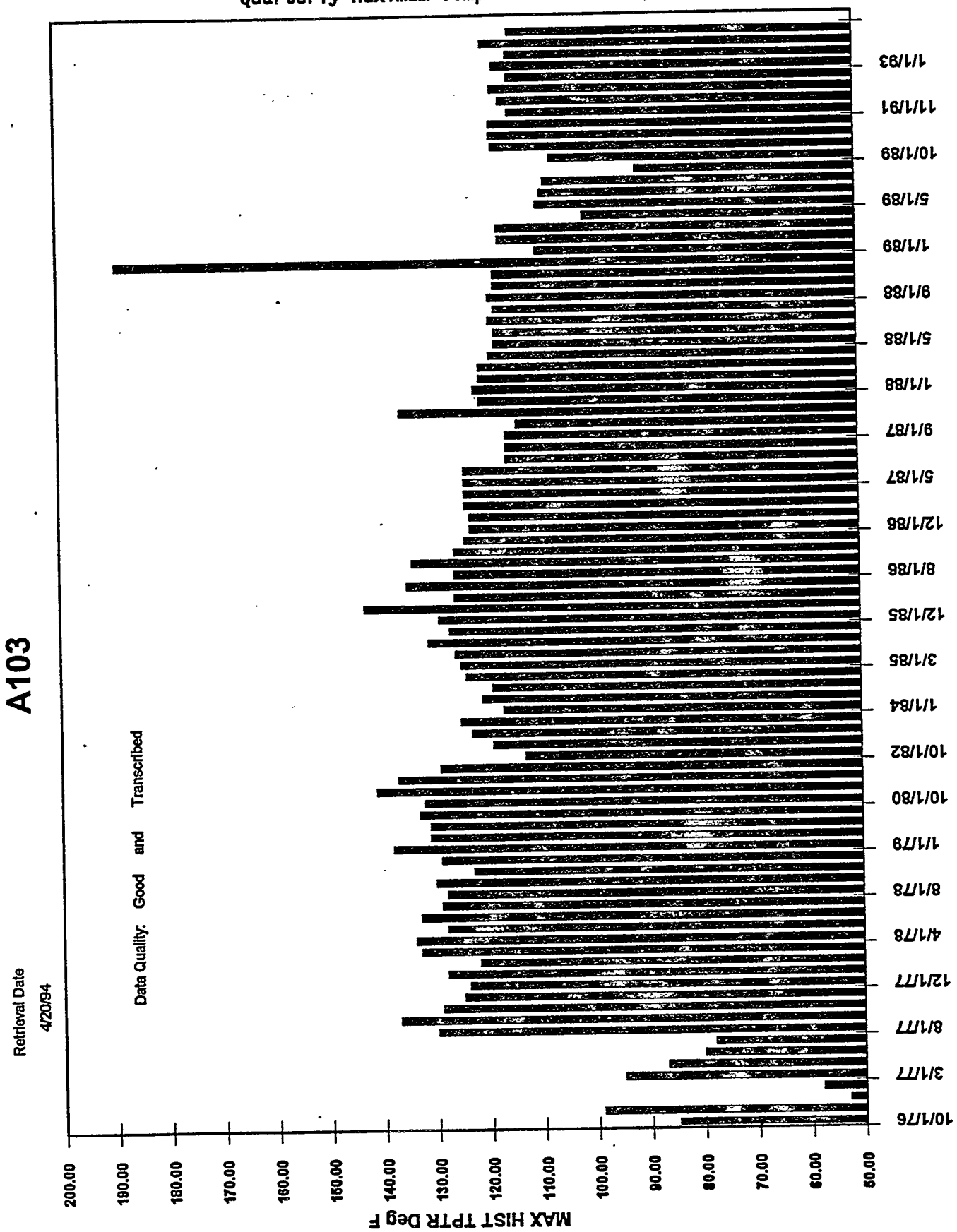

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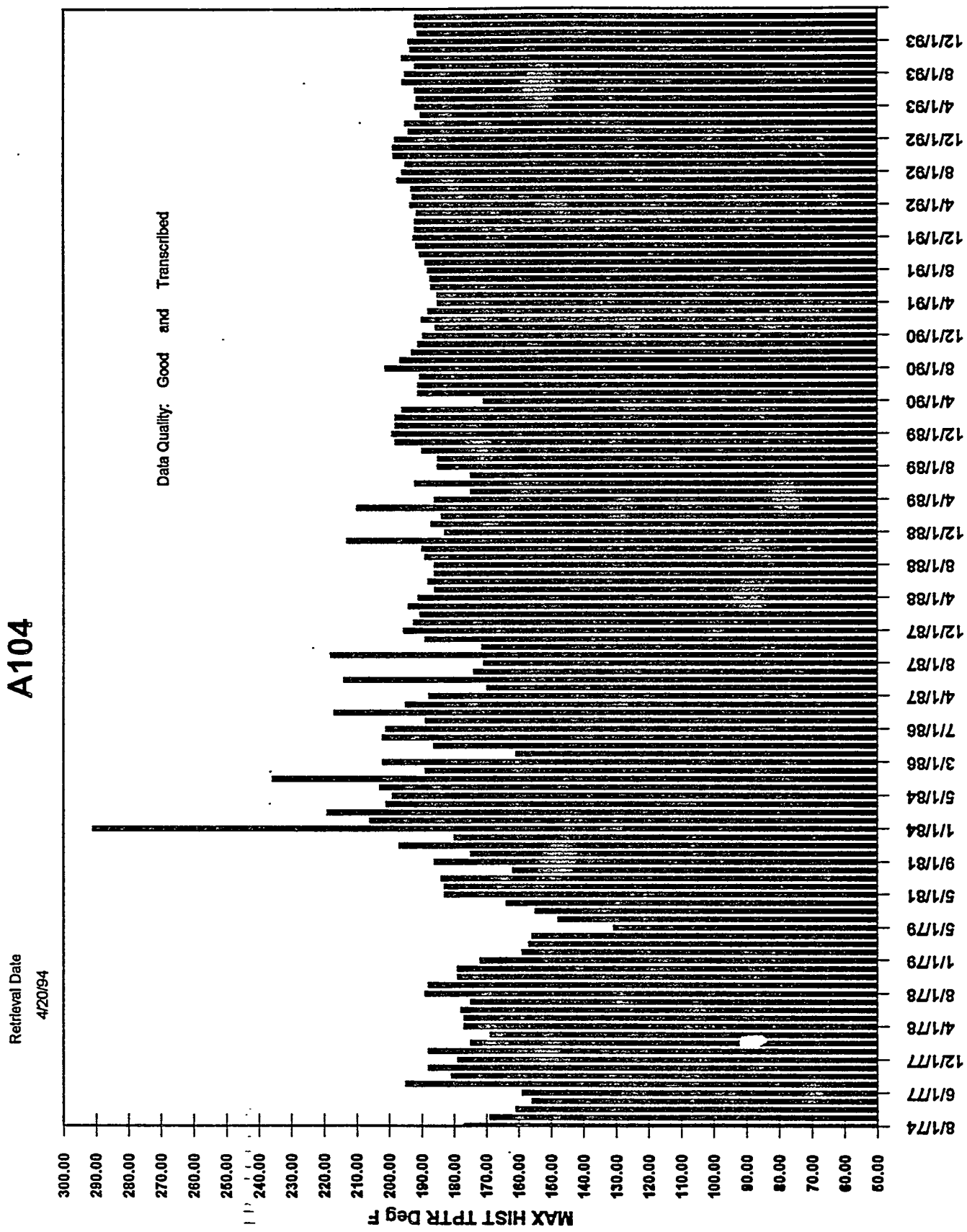

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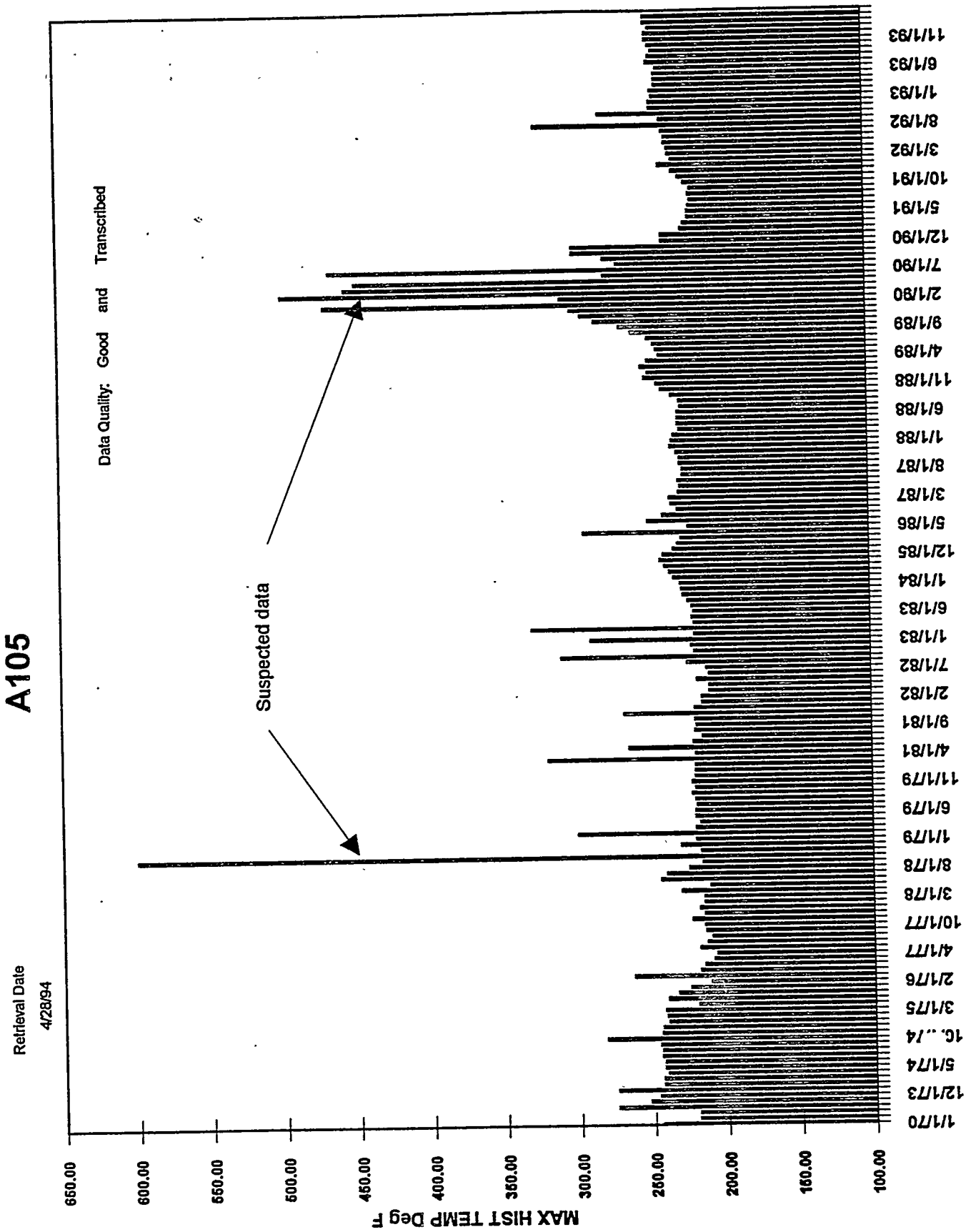

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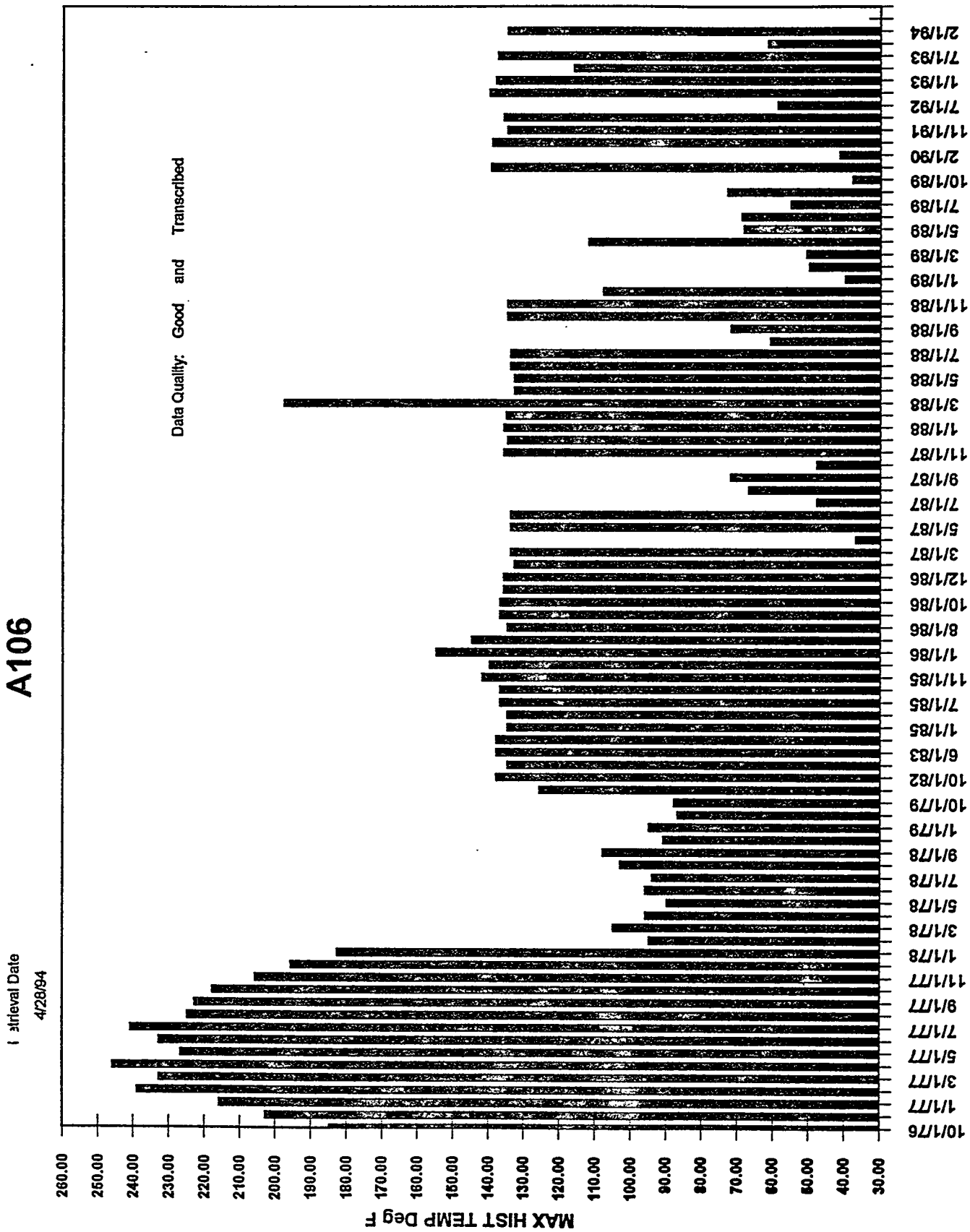

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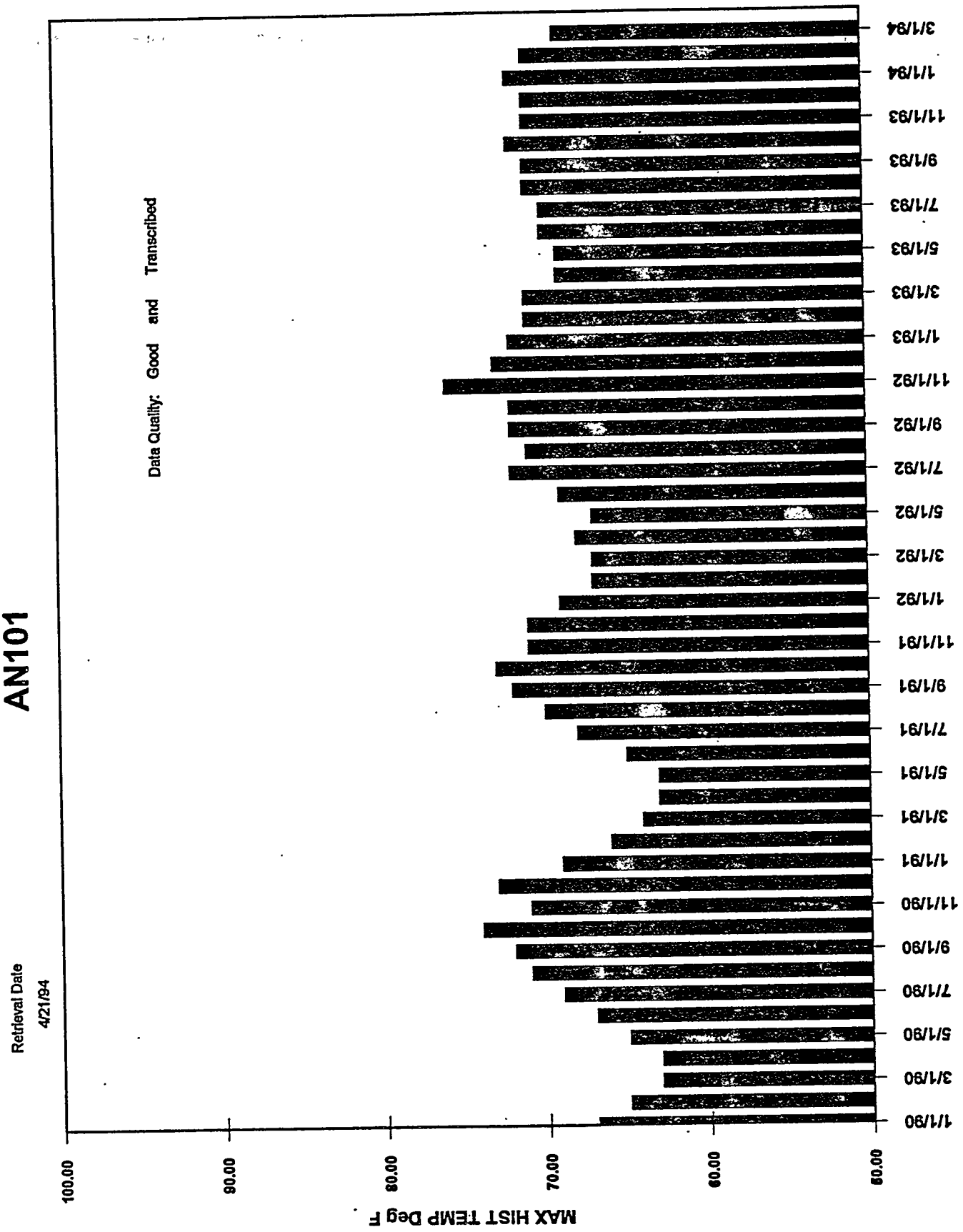

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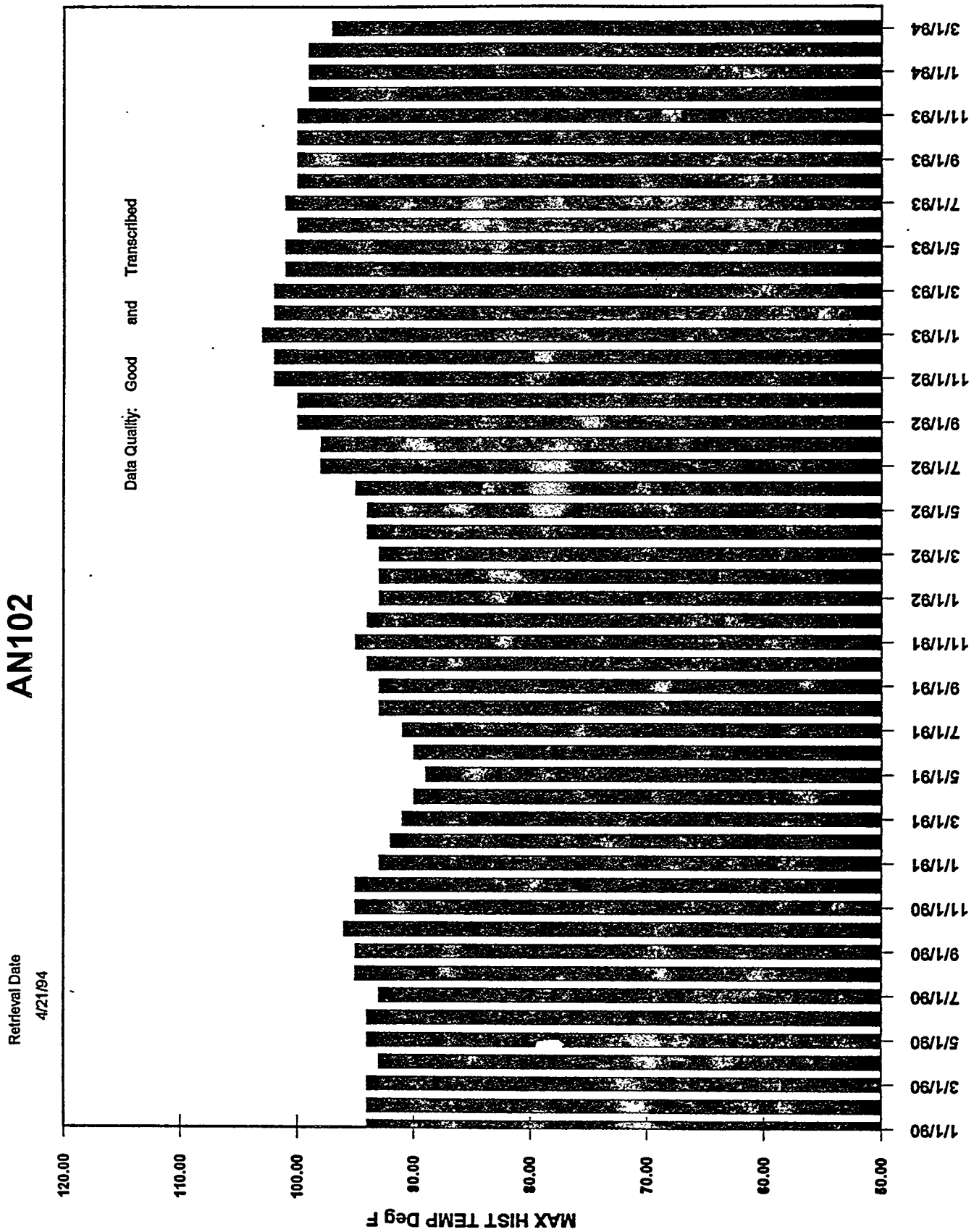

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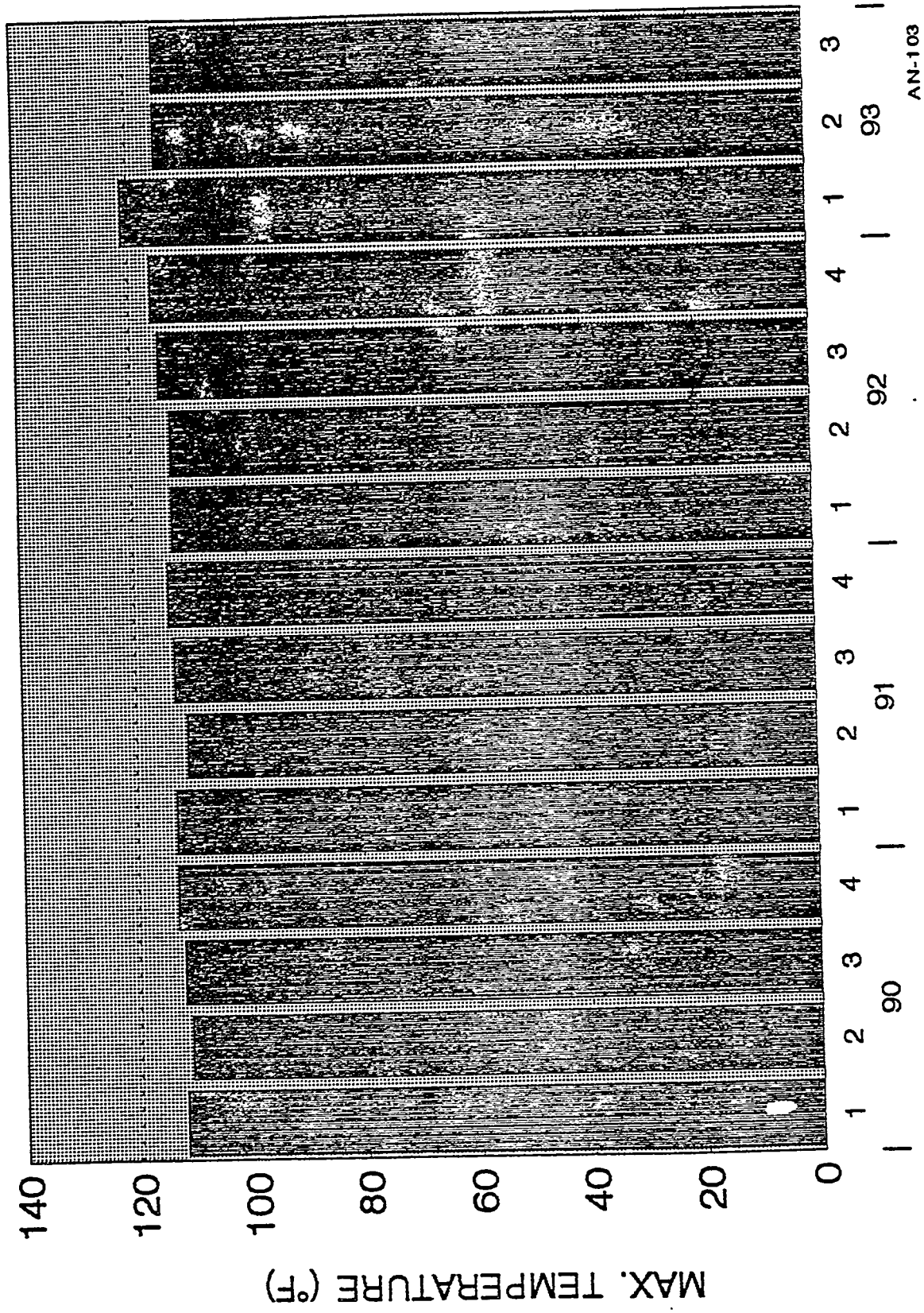

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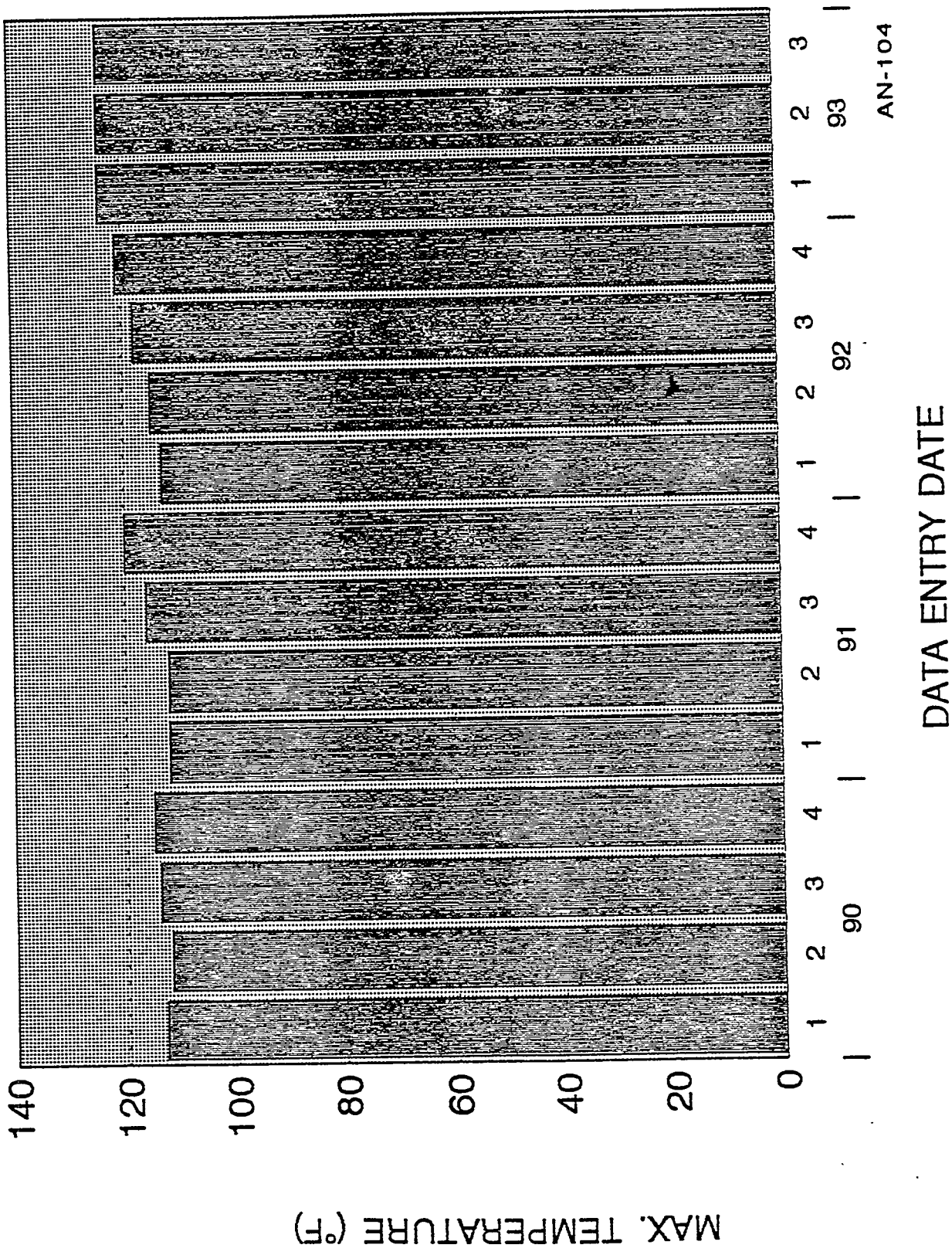

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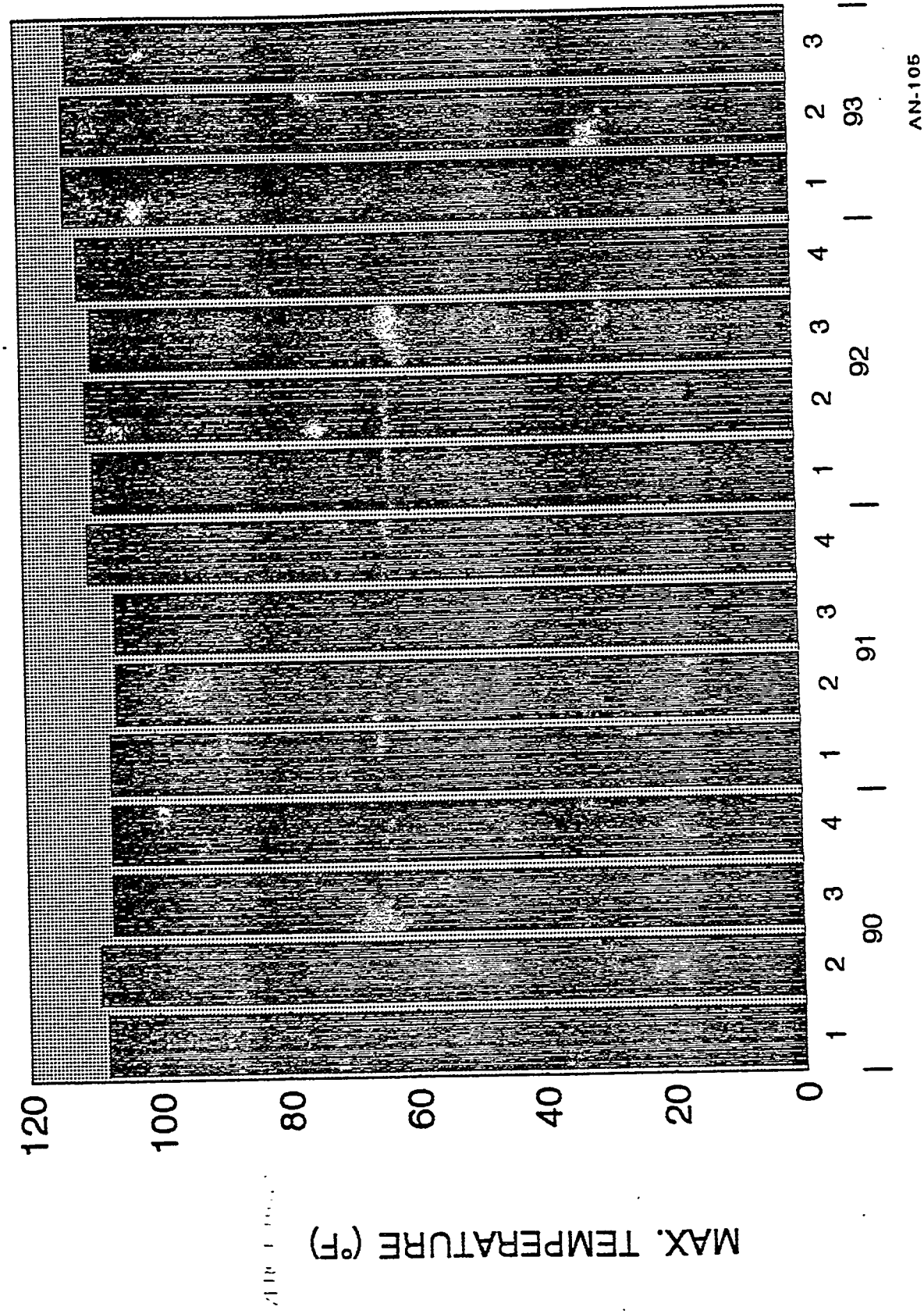

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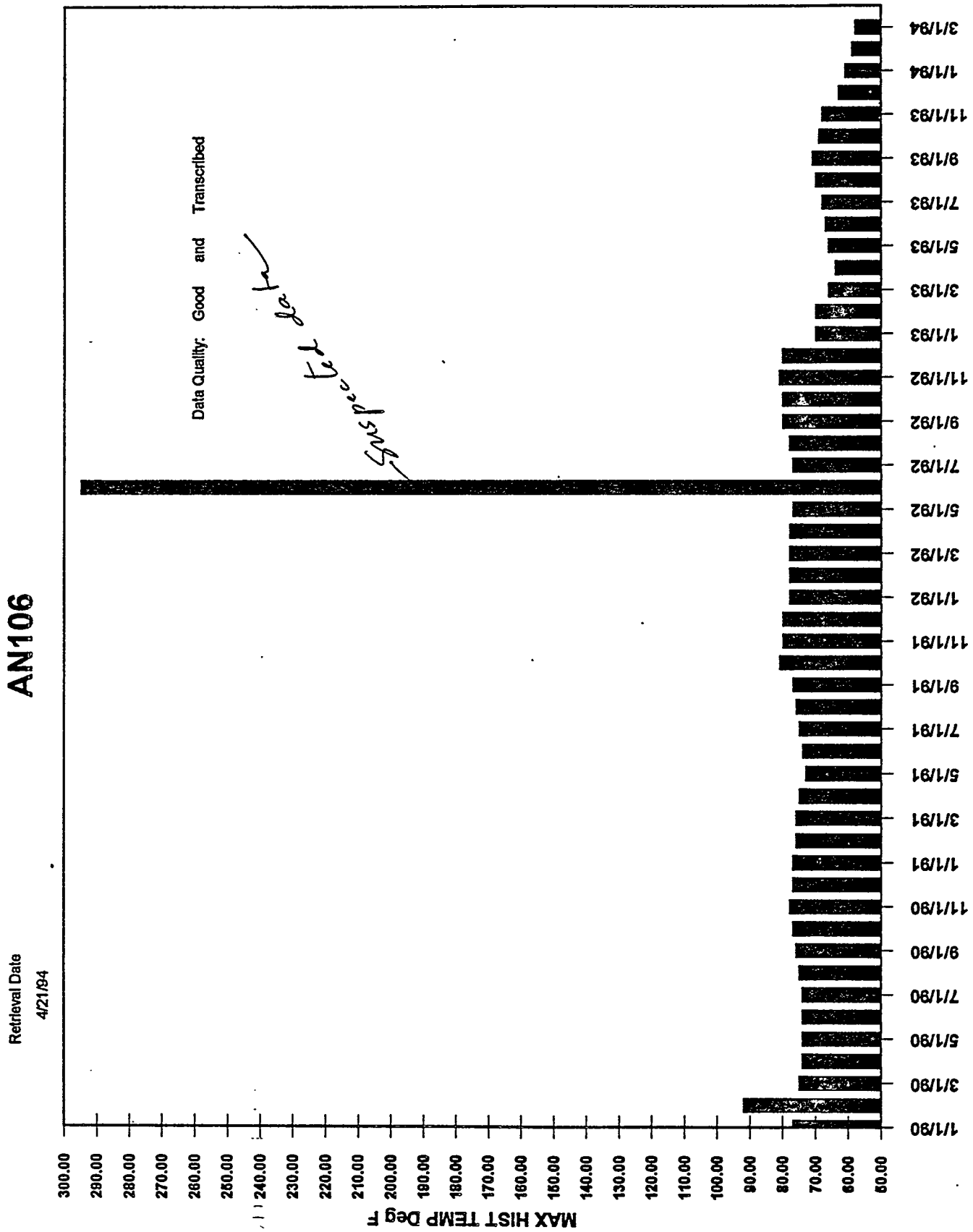

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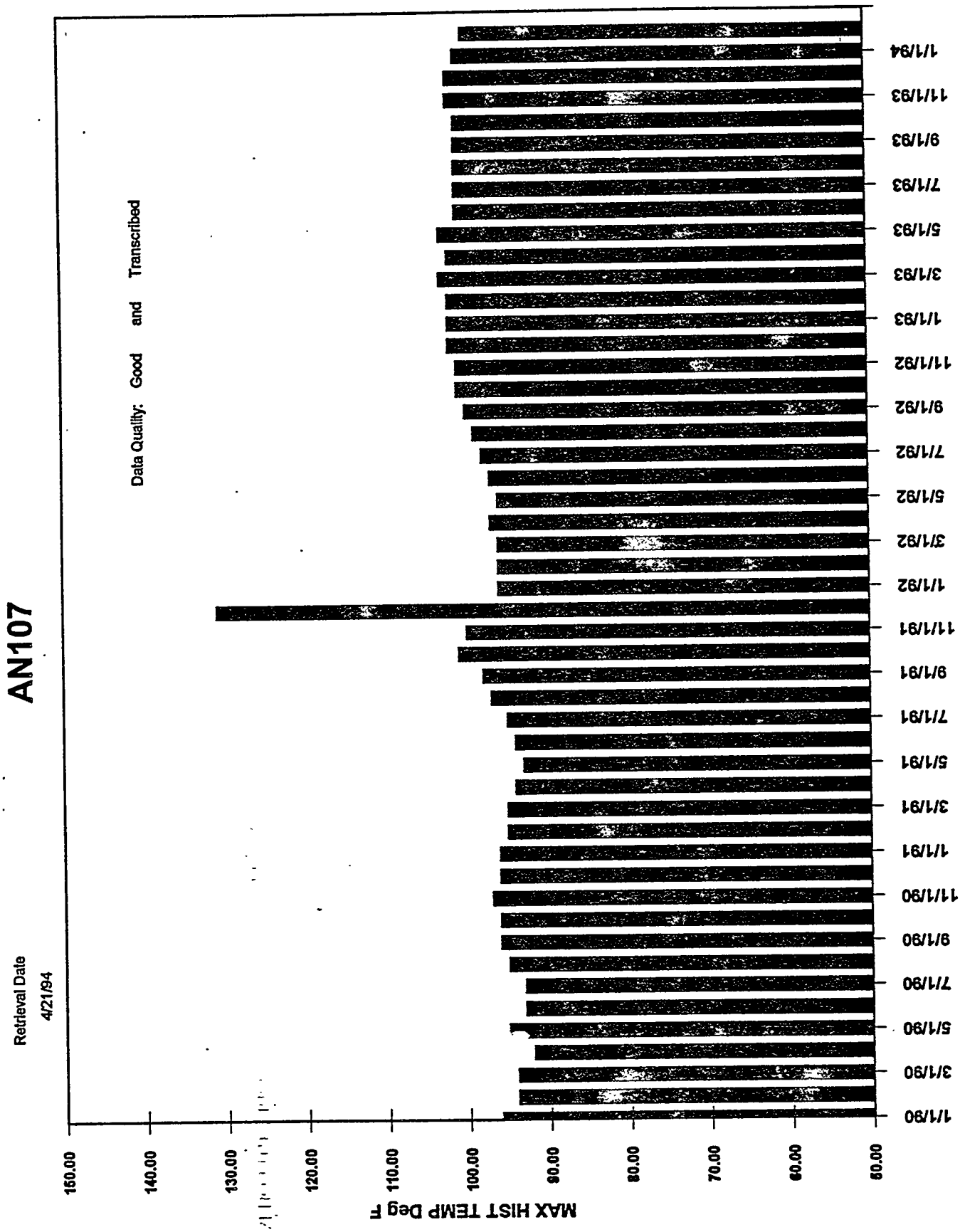

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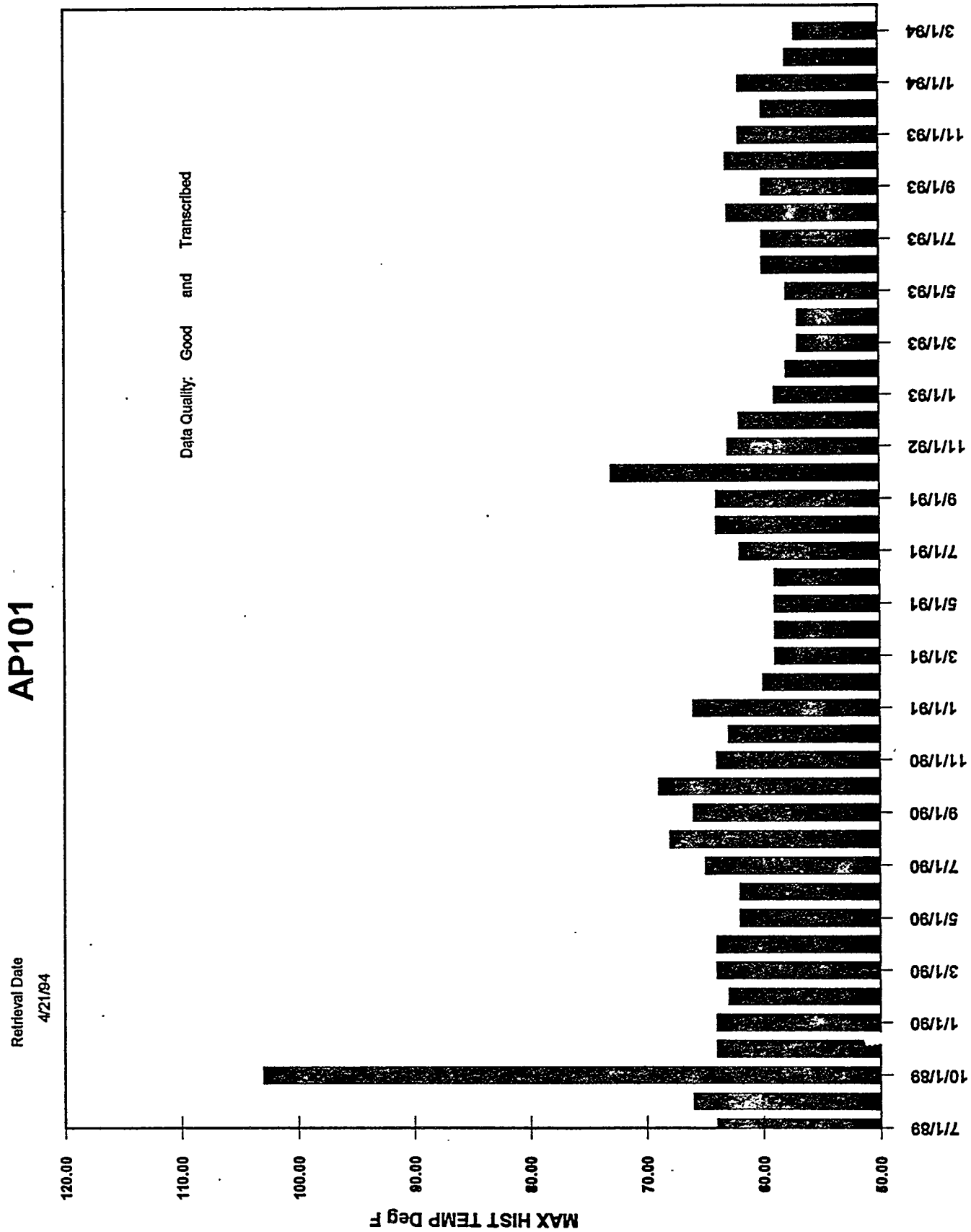

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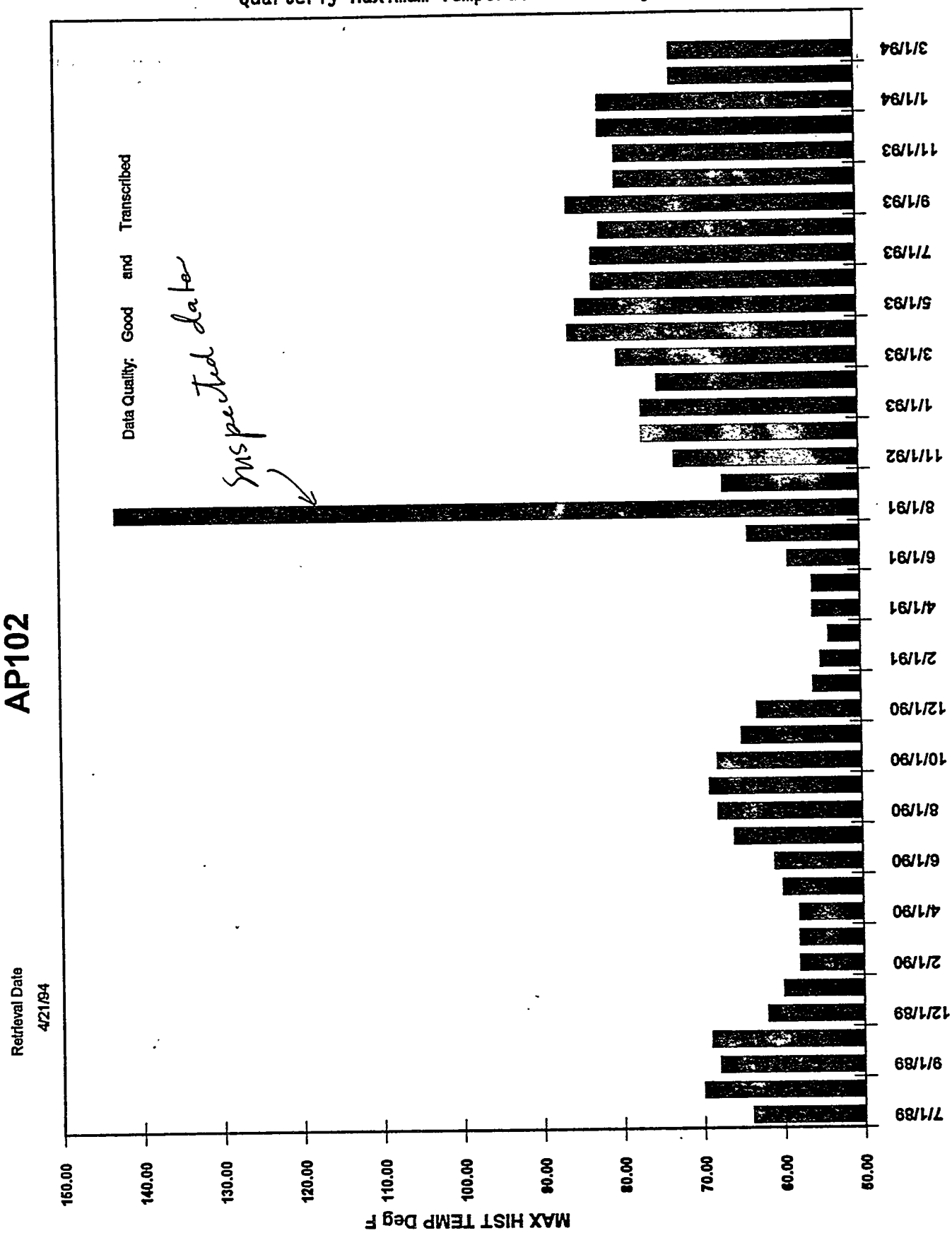

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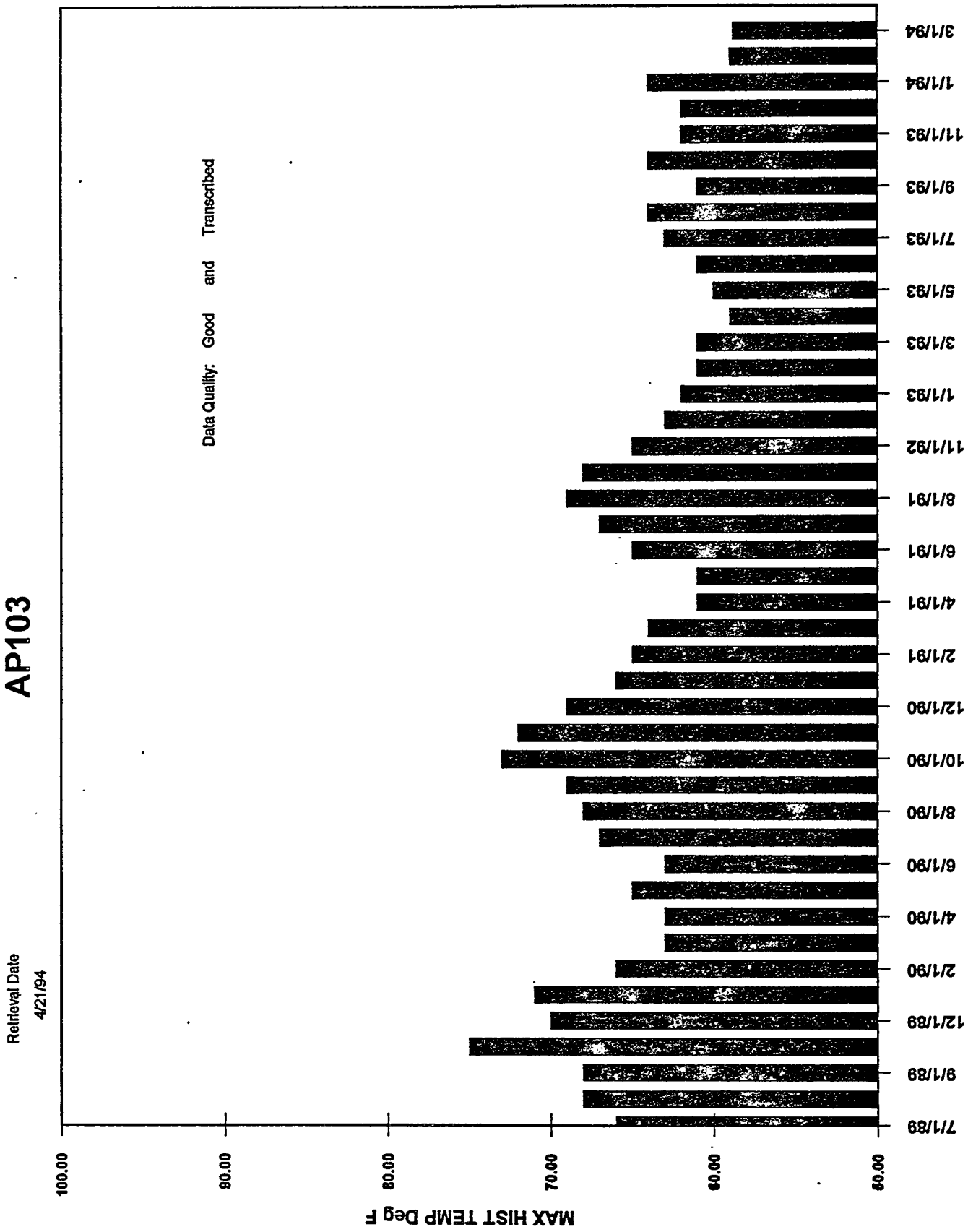

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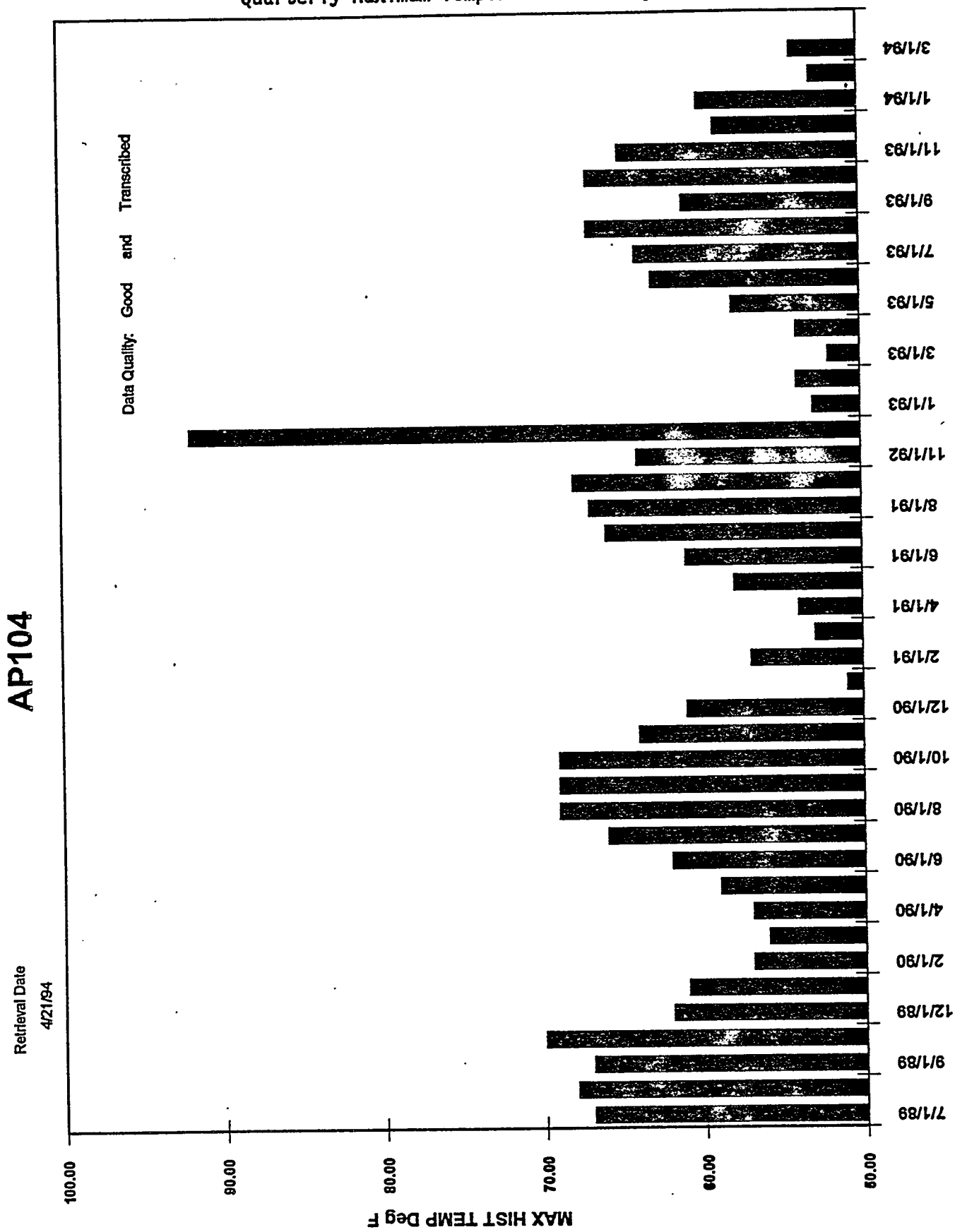

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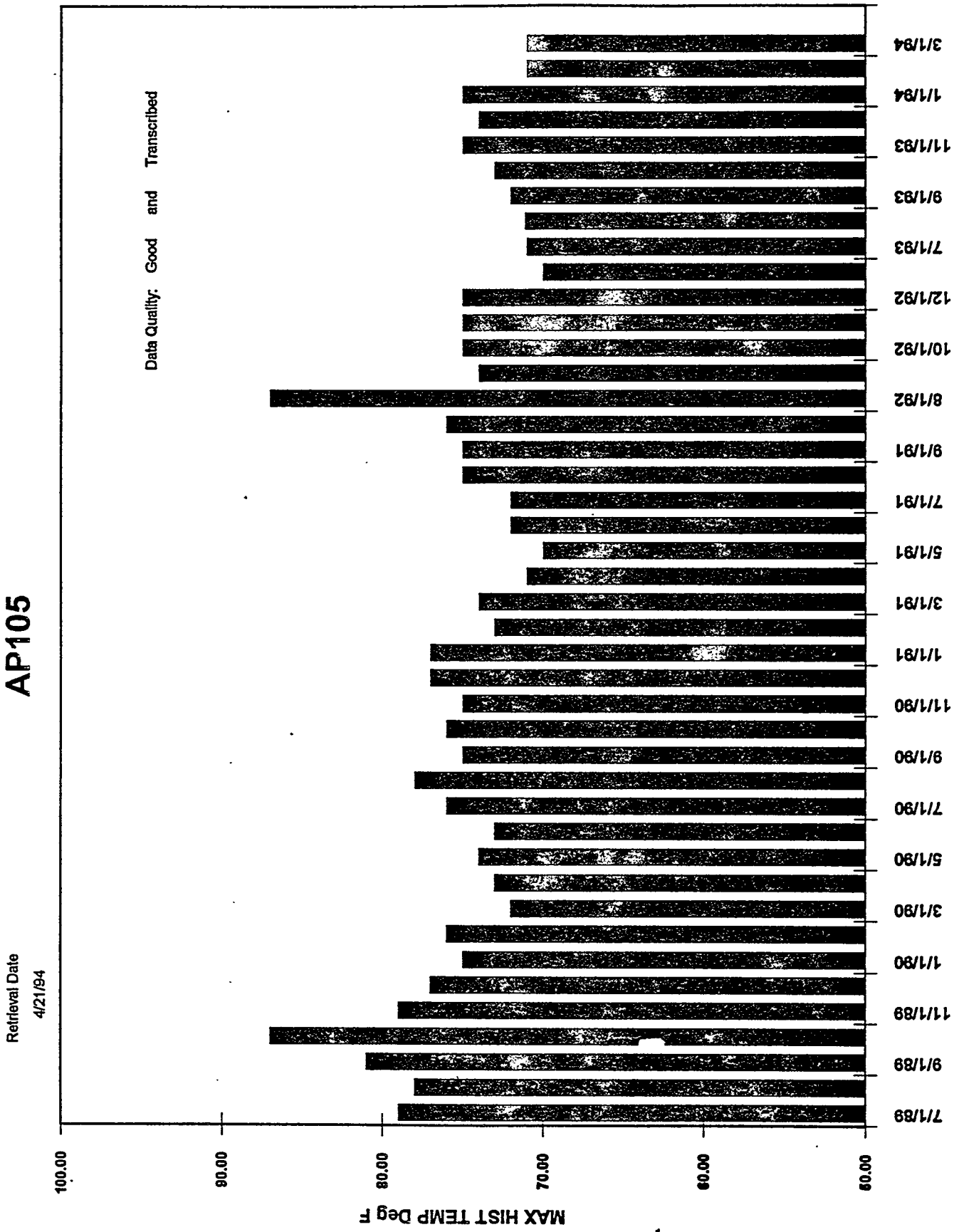

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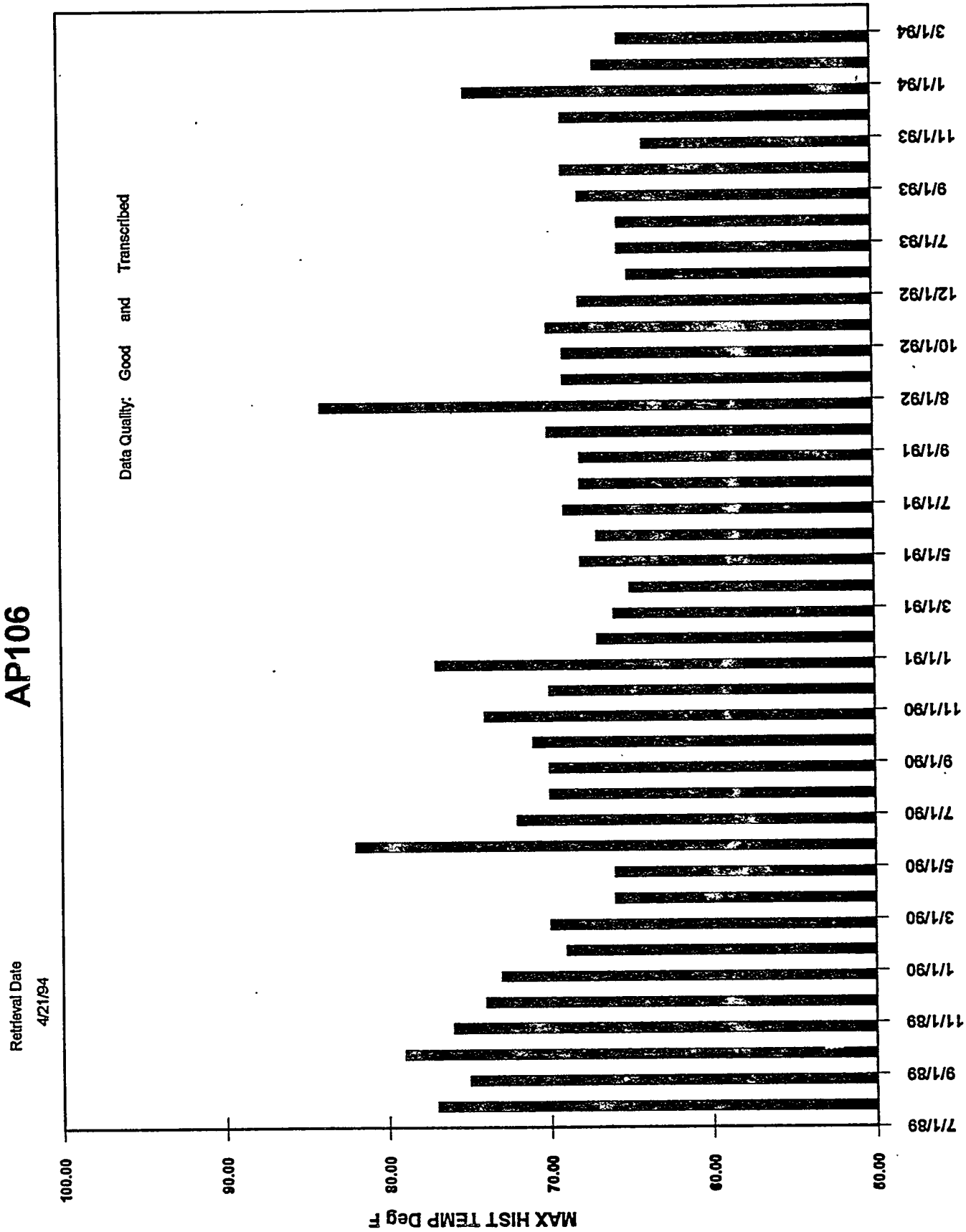

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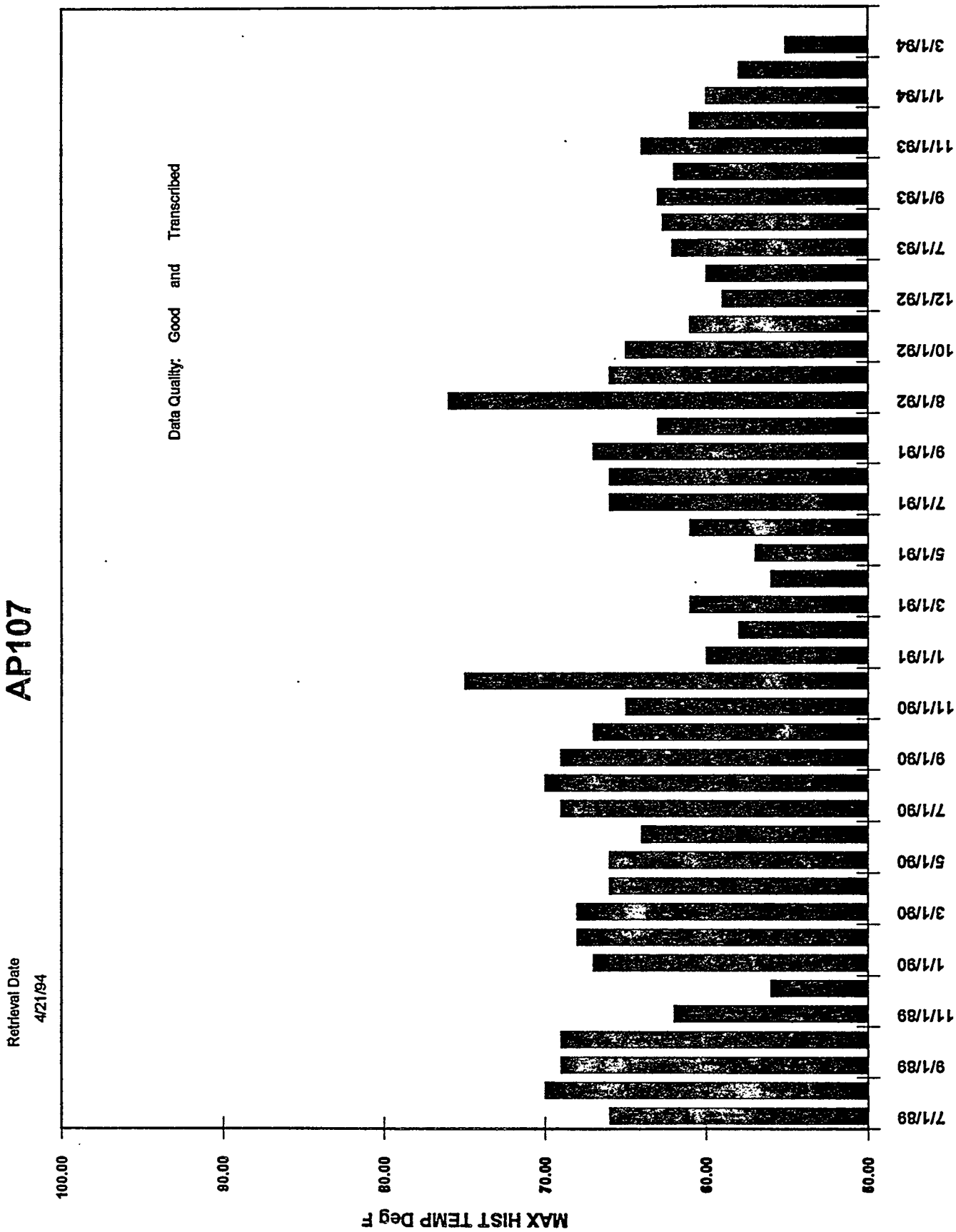
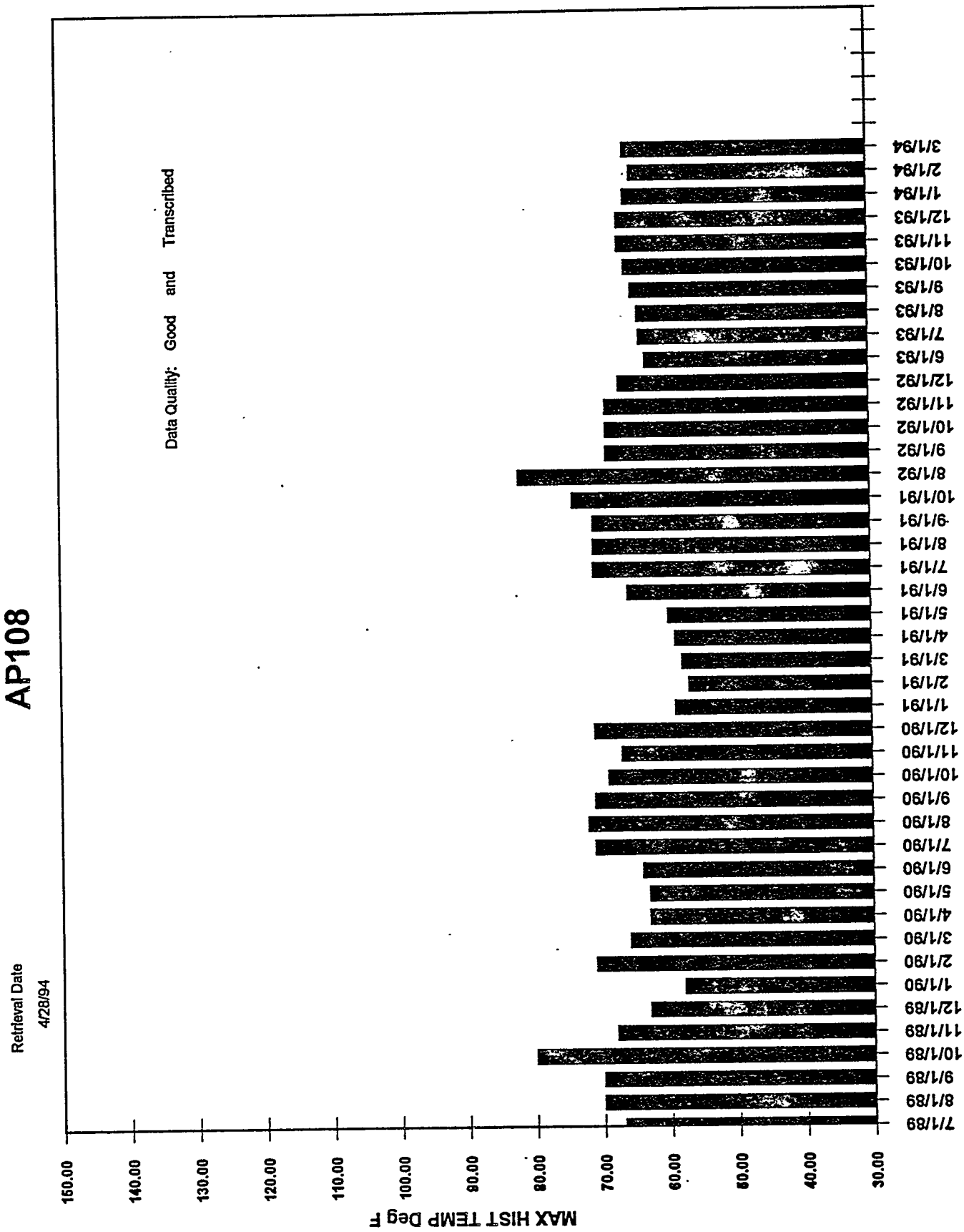
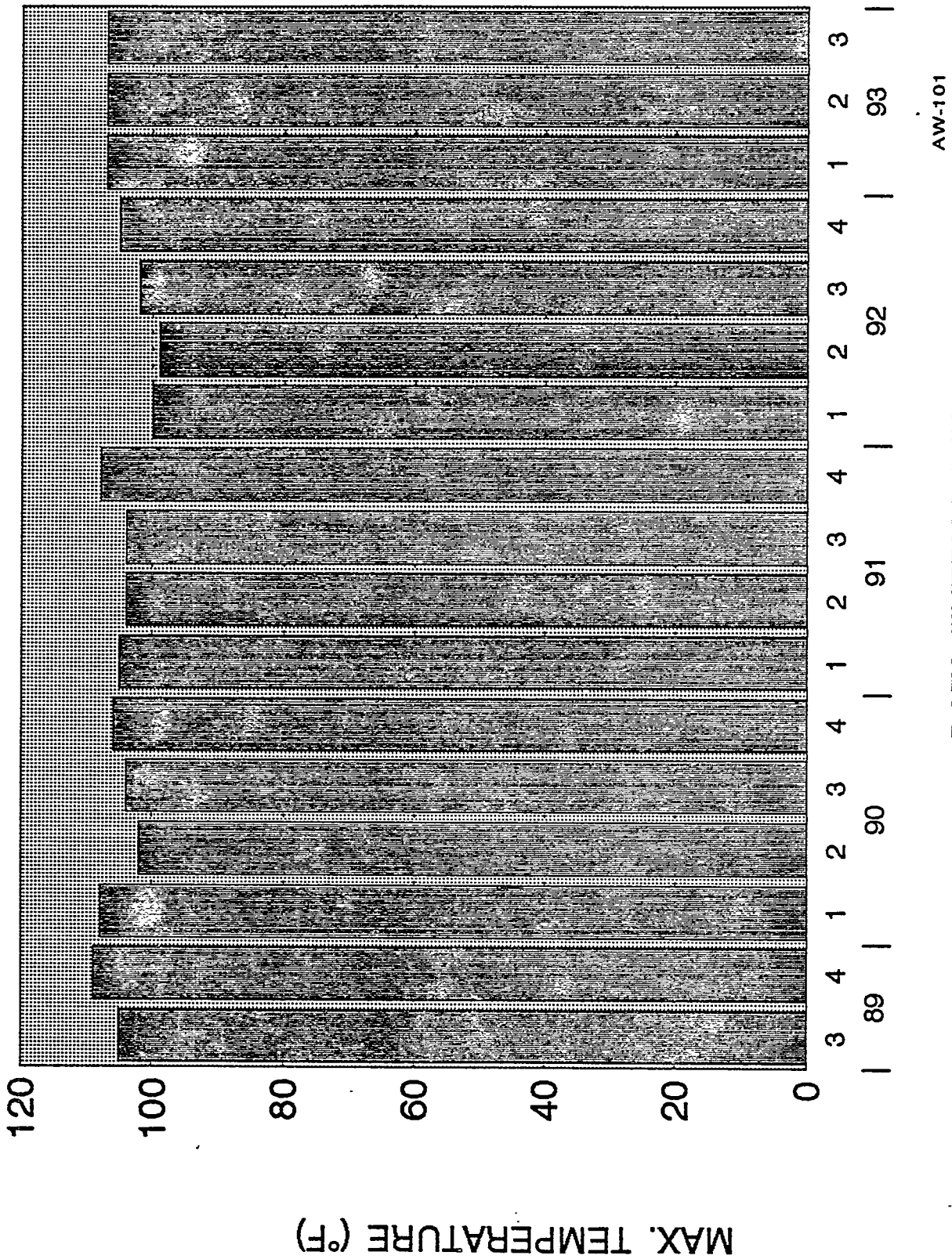


Maximum Temperature History Plot



Maximum Temperature History Plot



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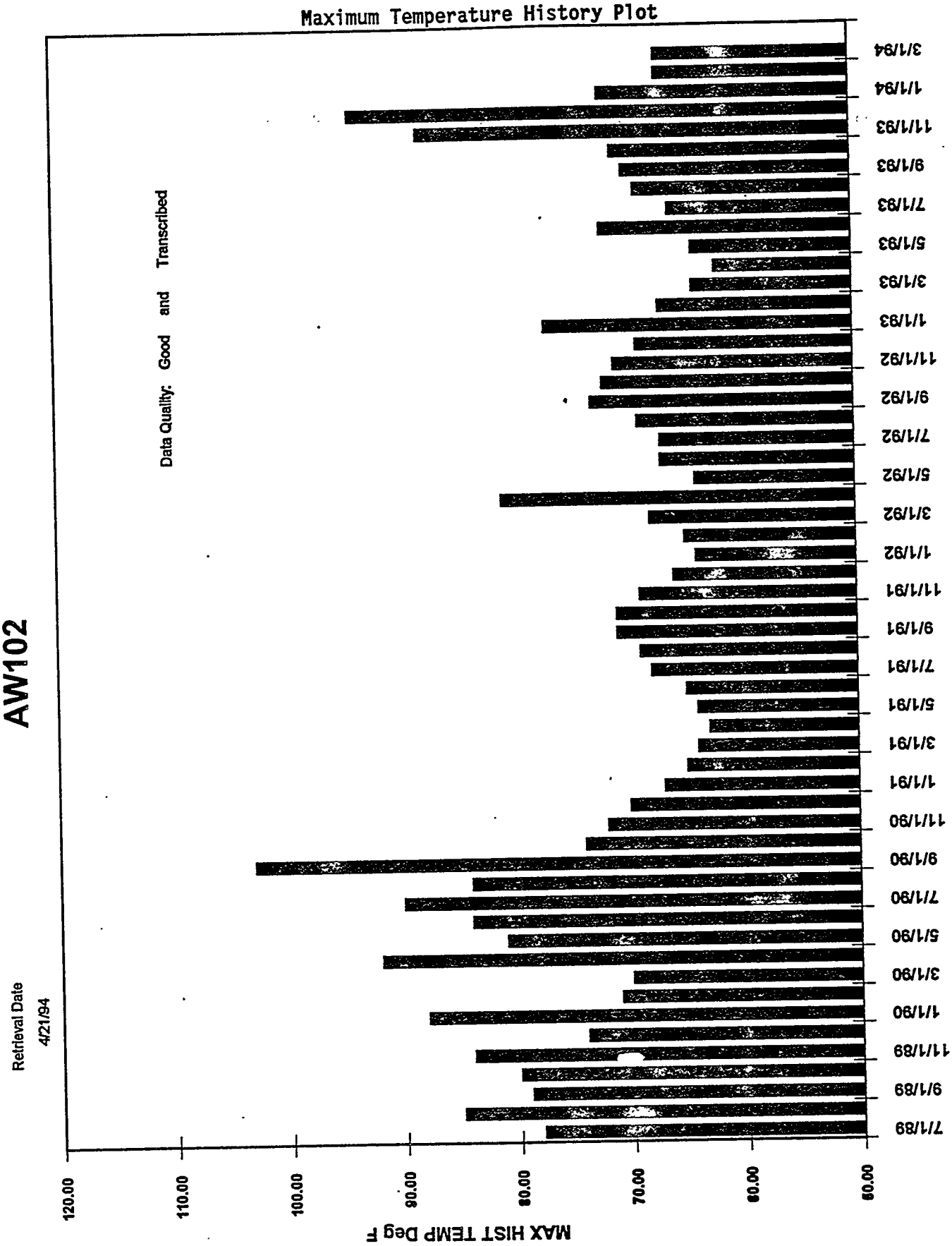

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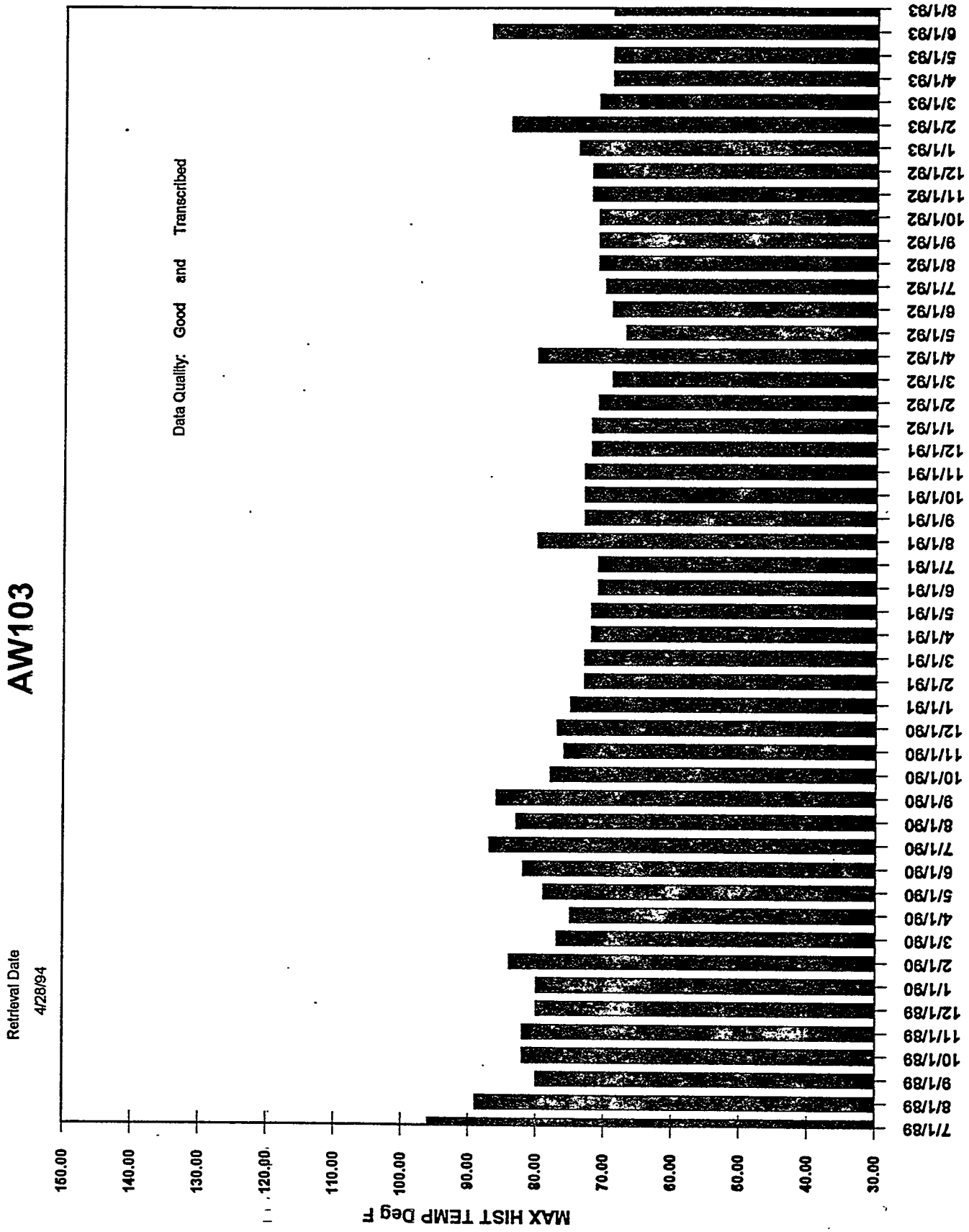

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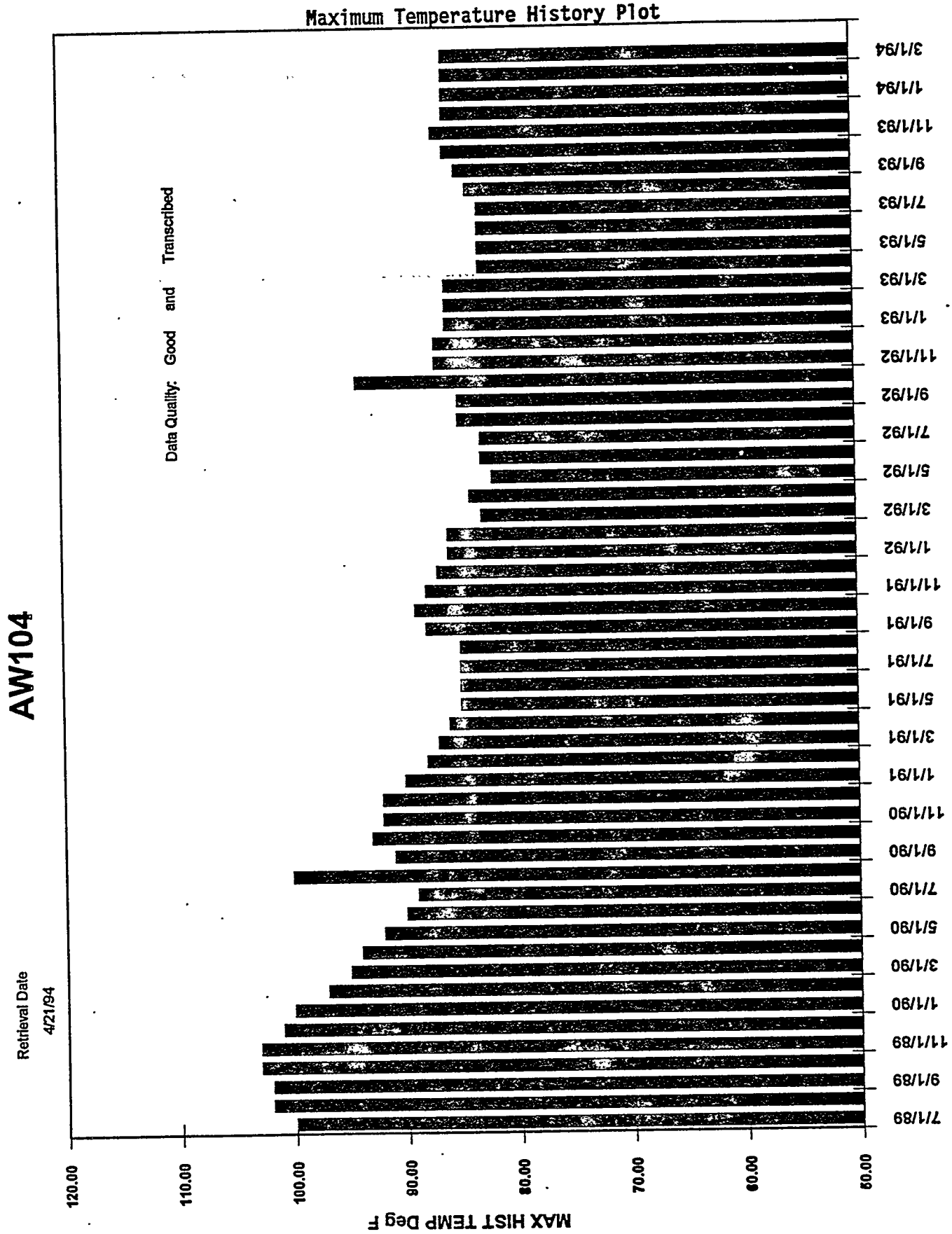

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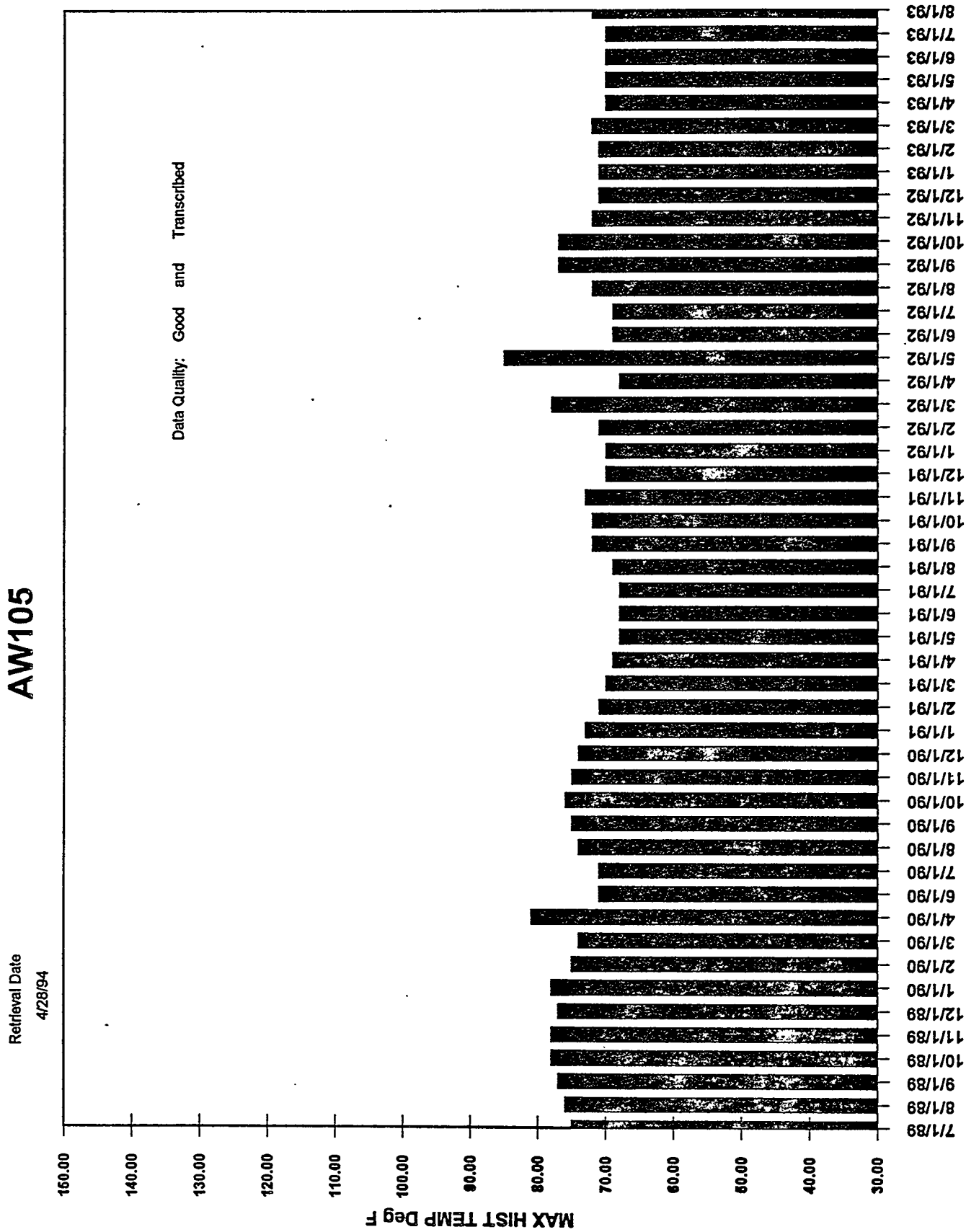

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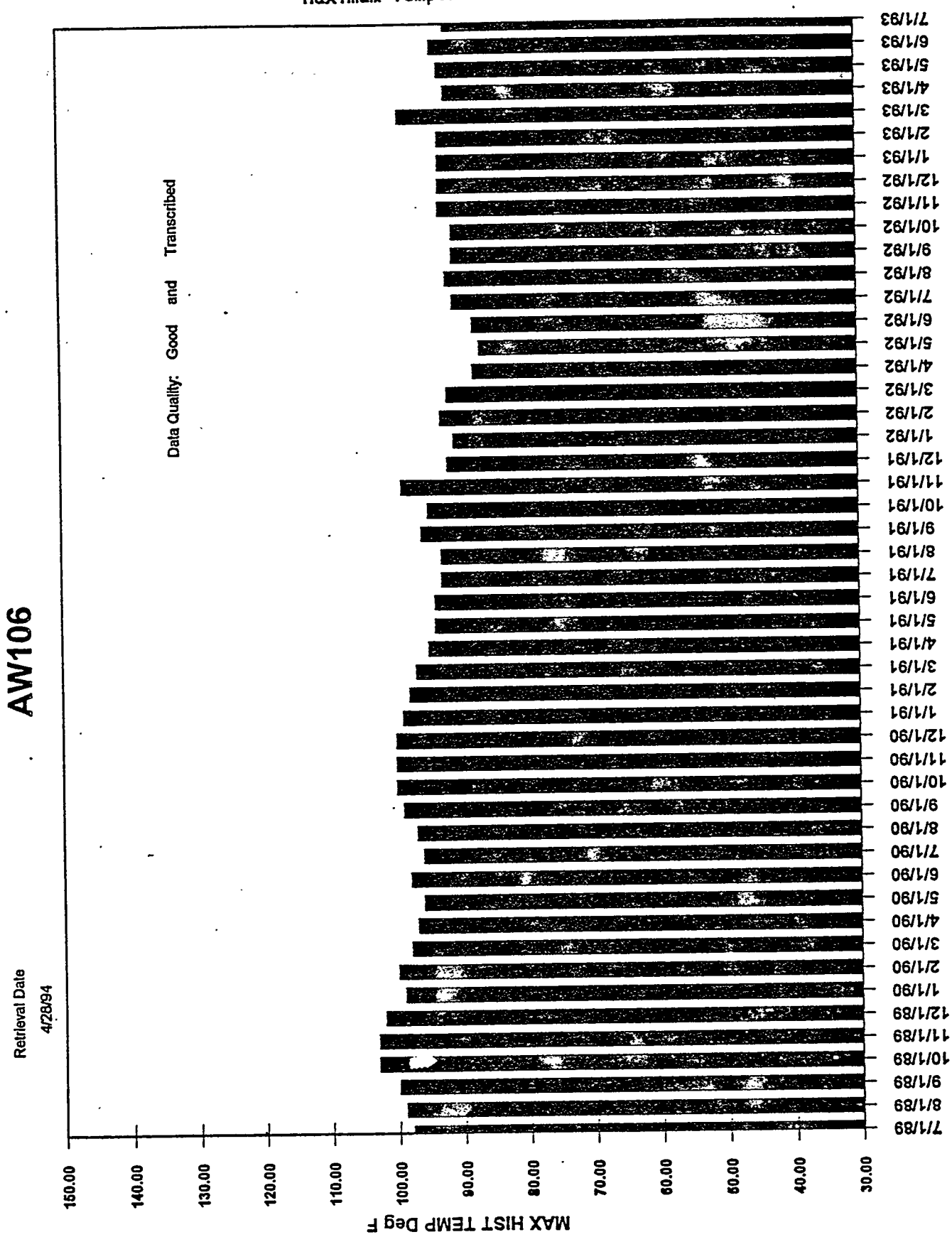

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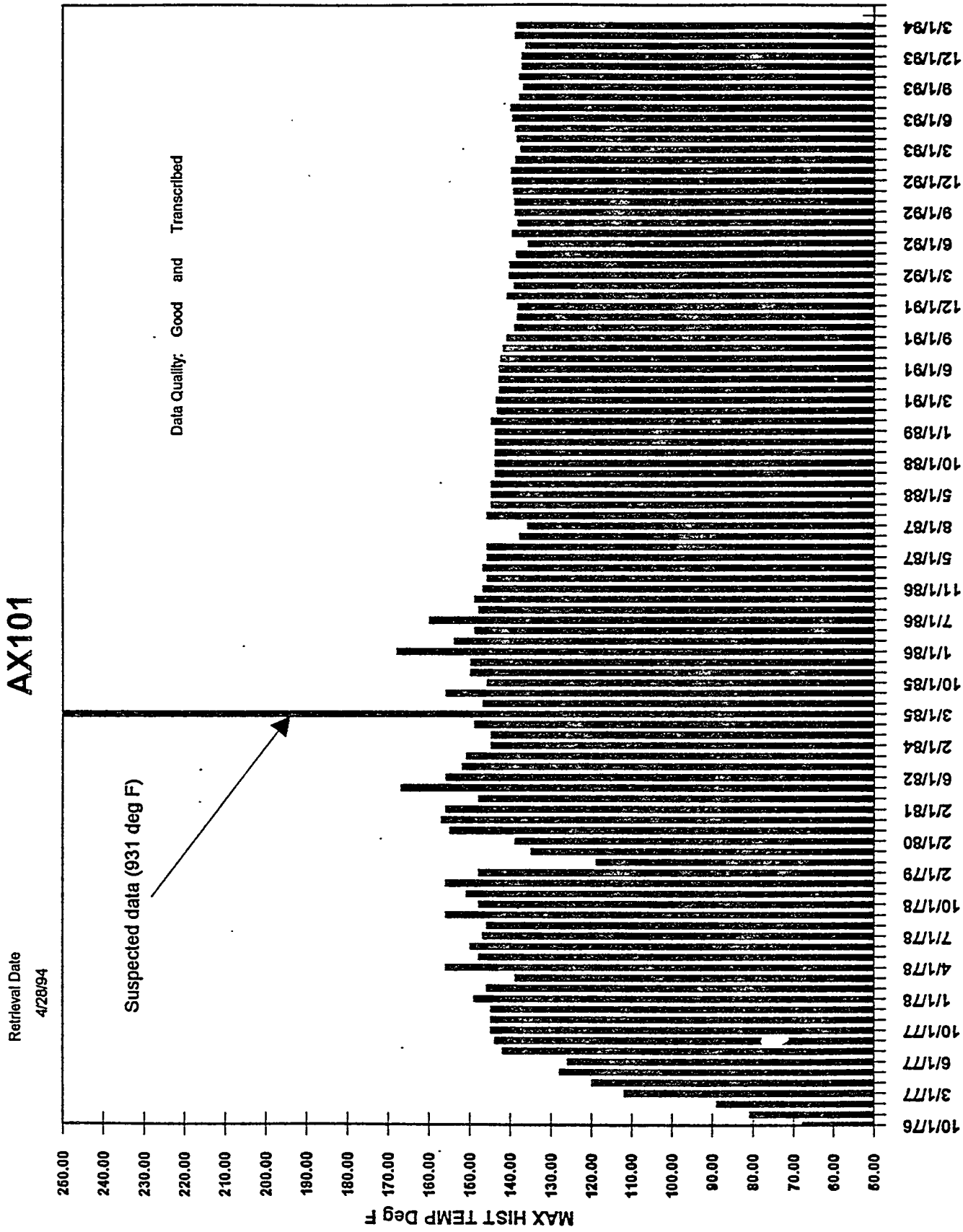

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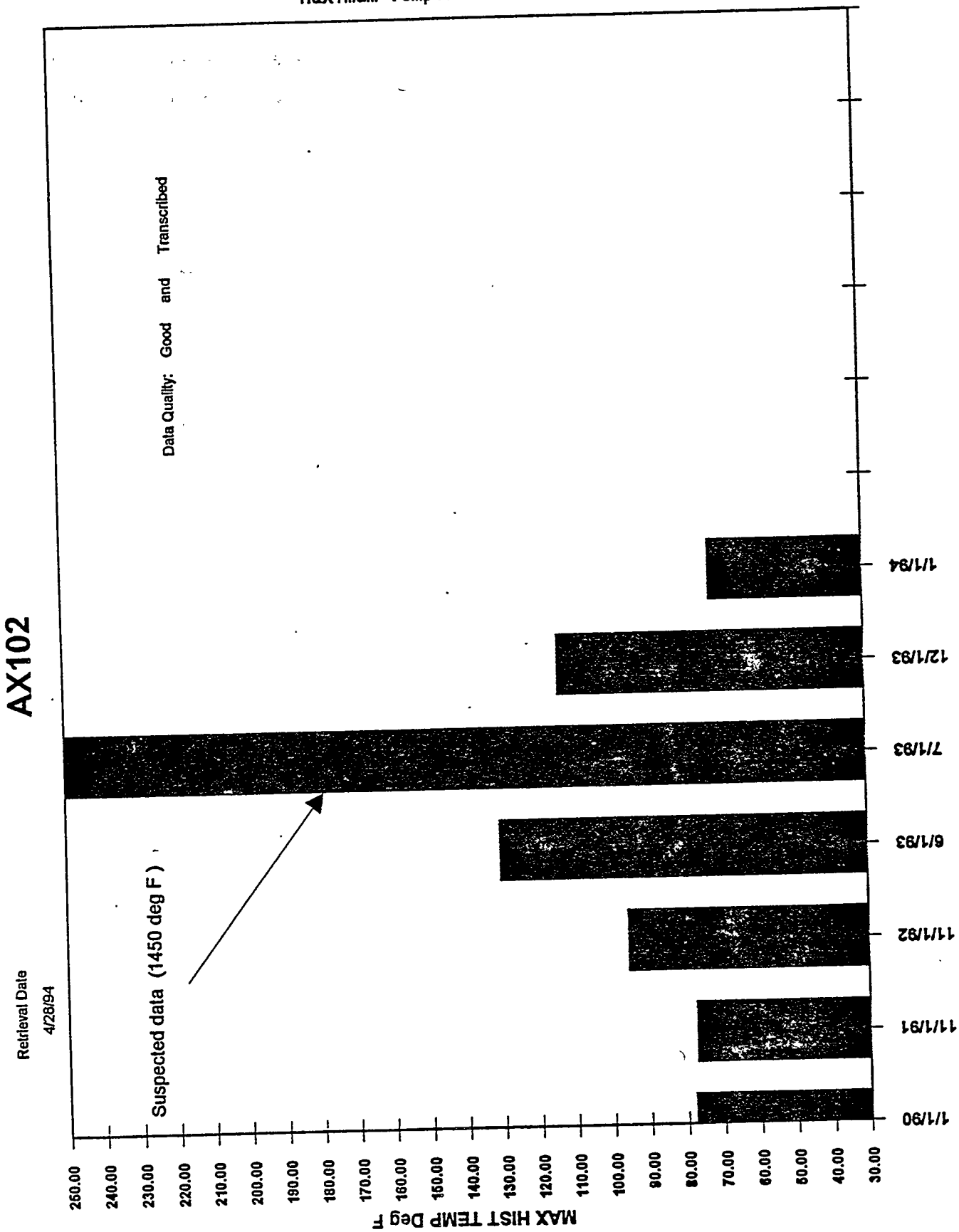

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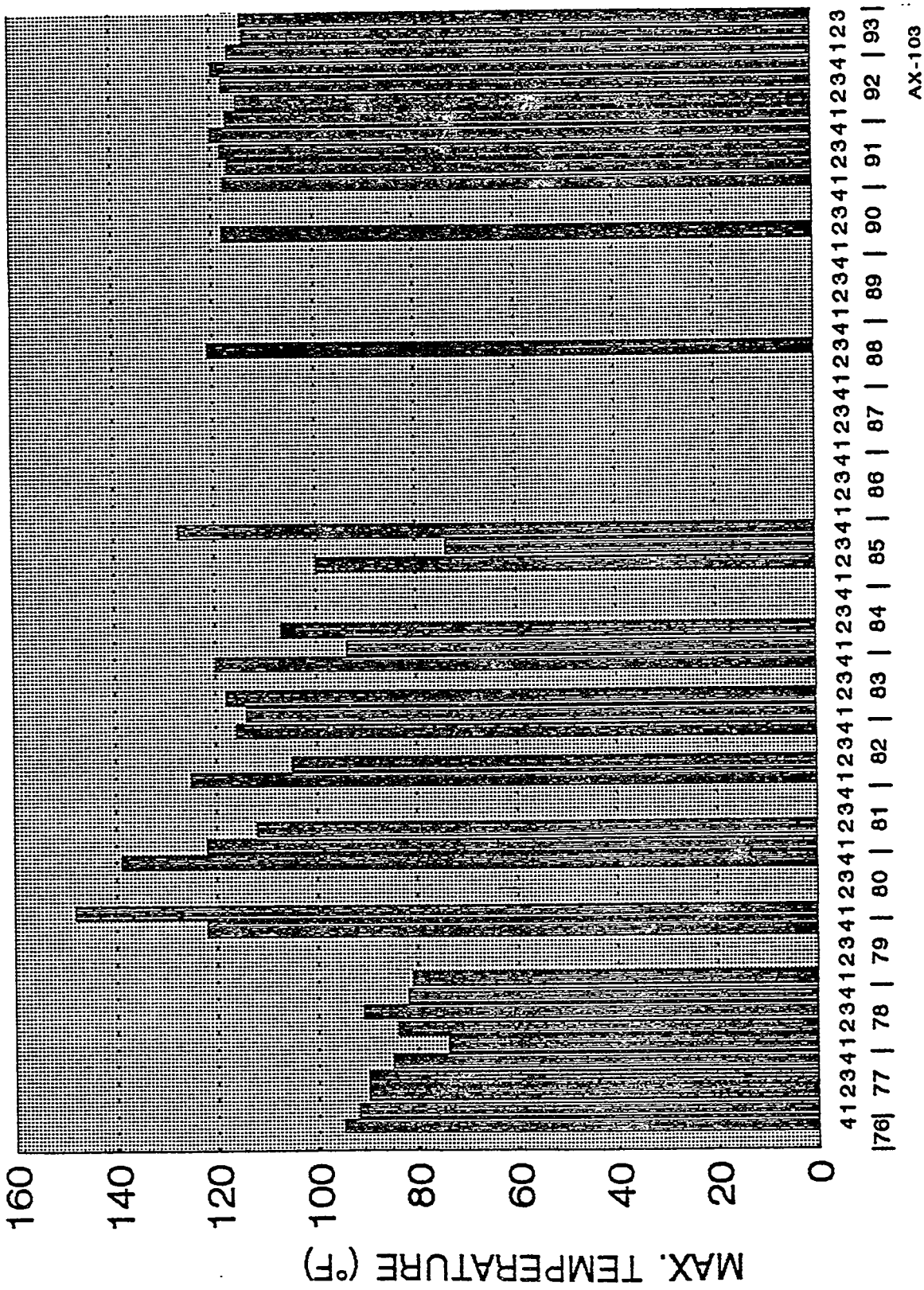

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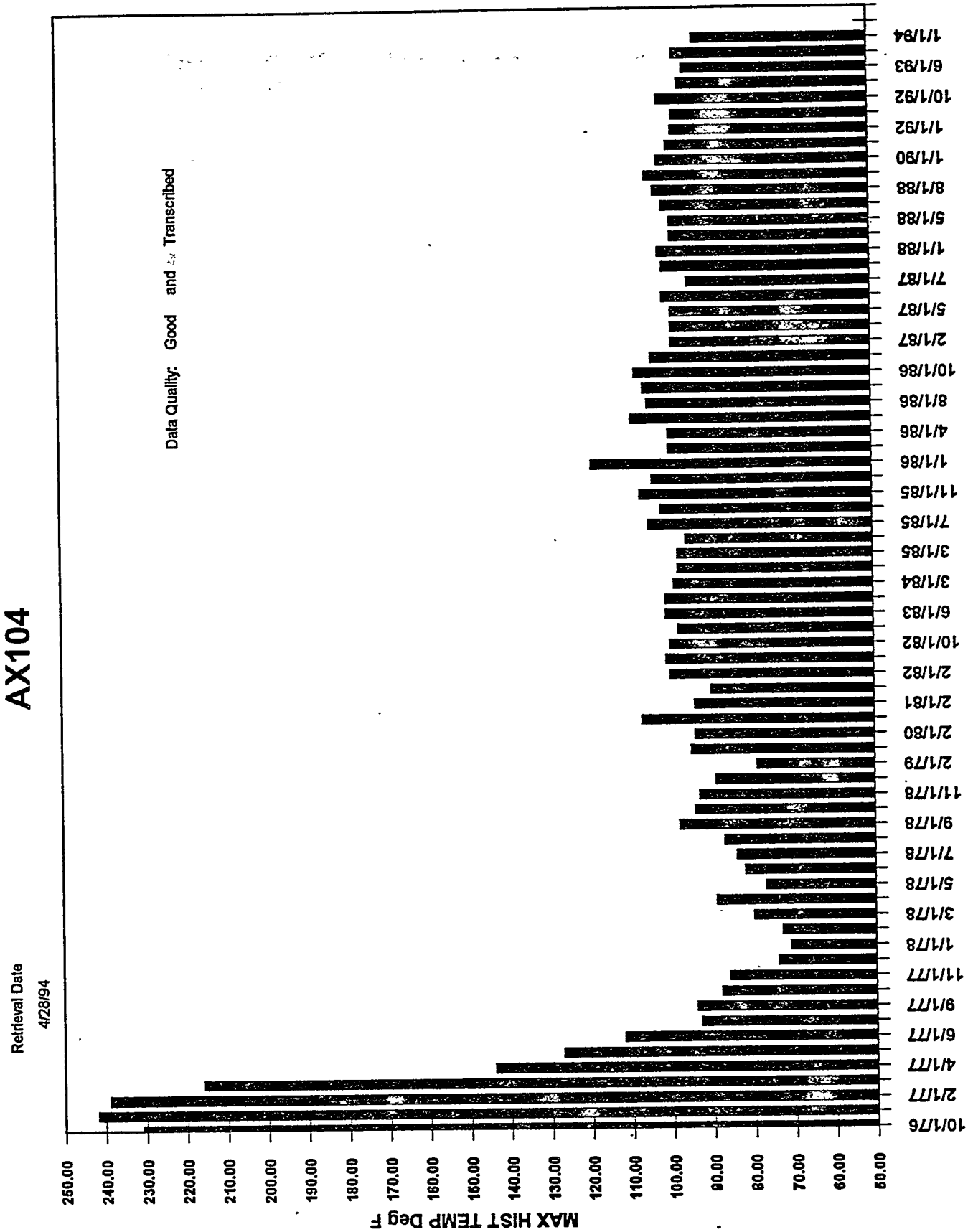

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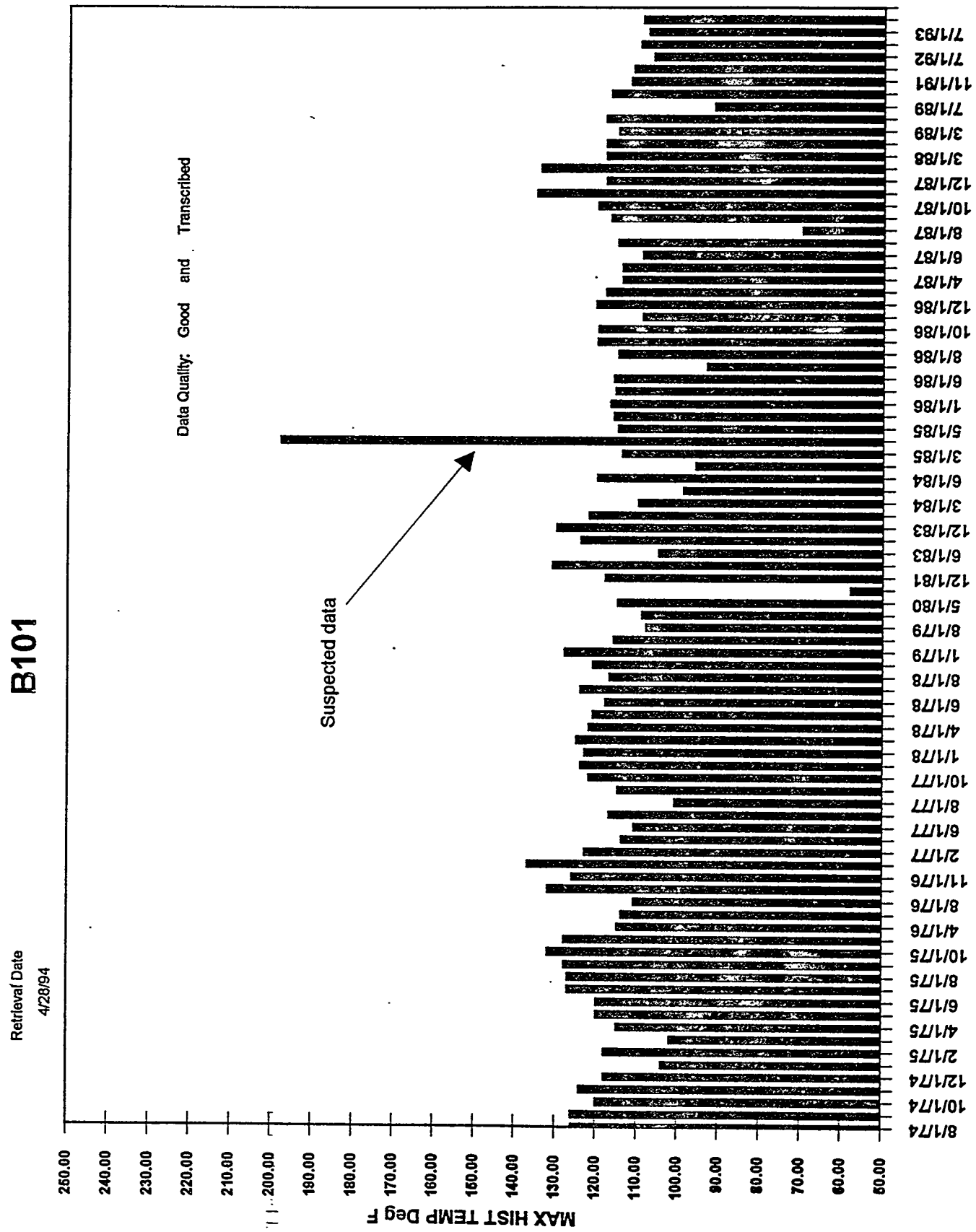

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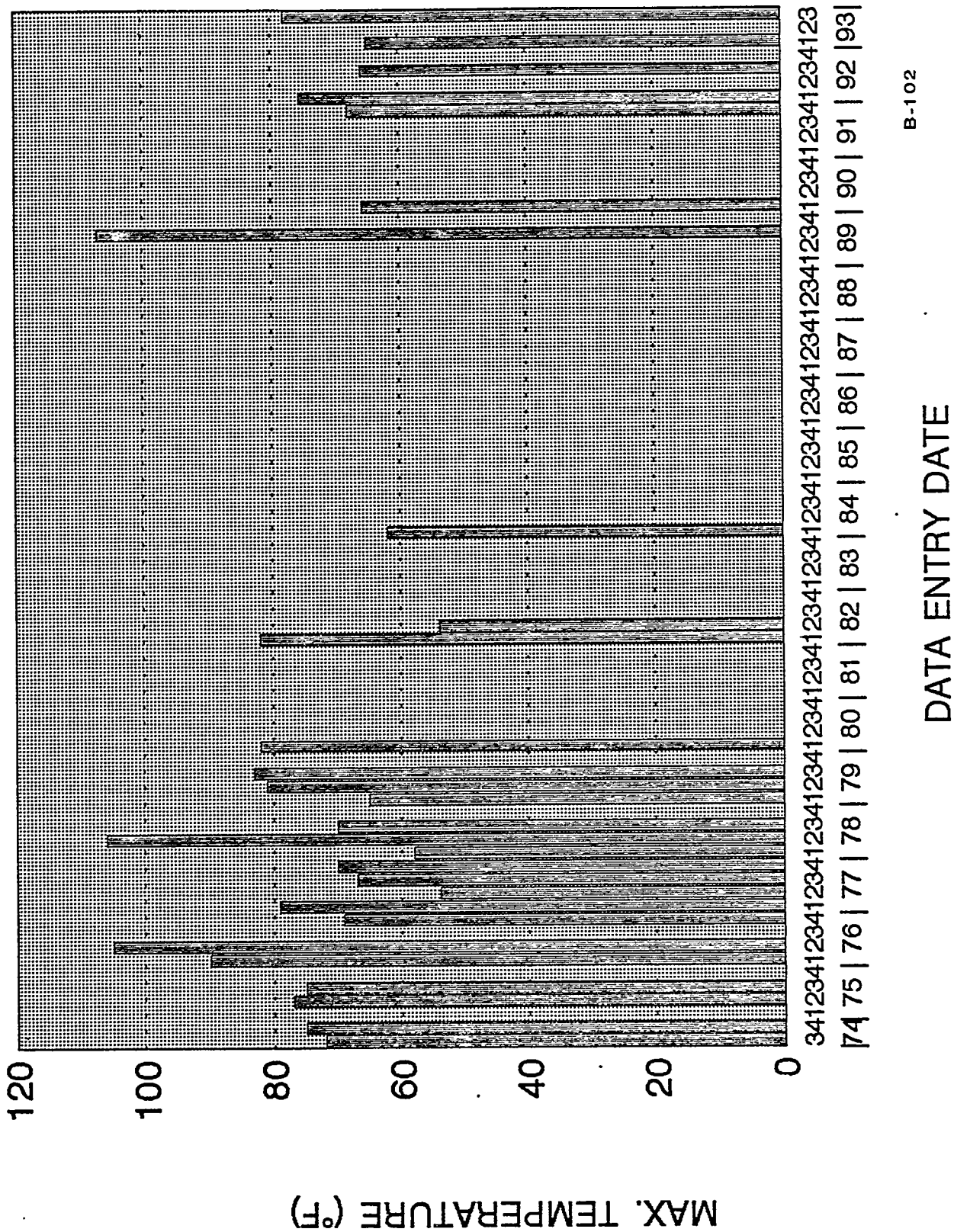

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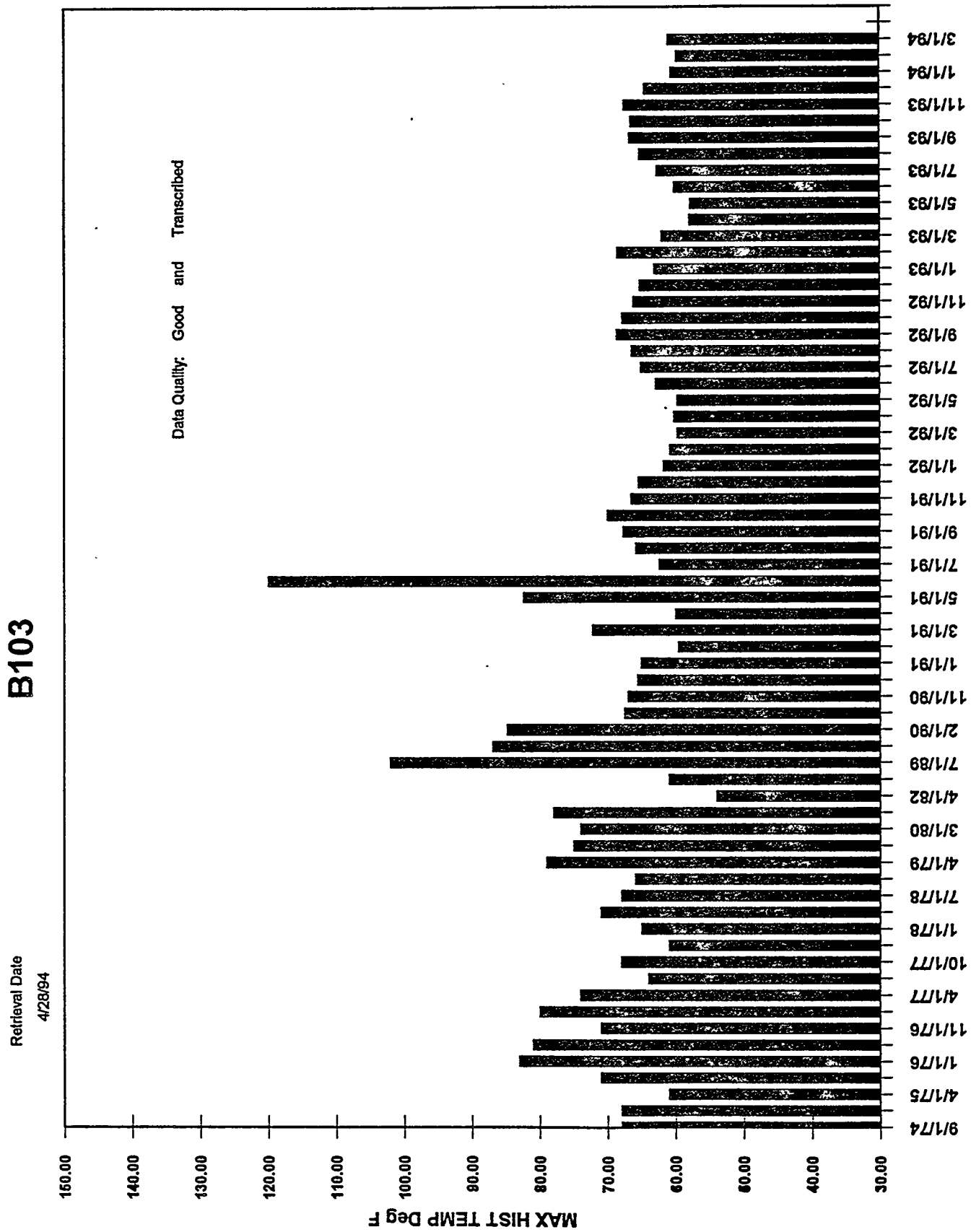

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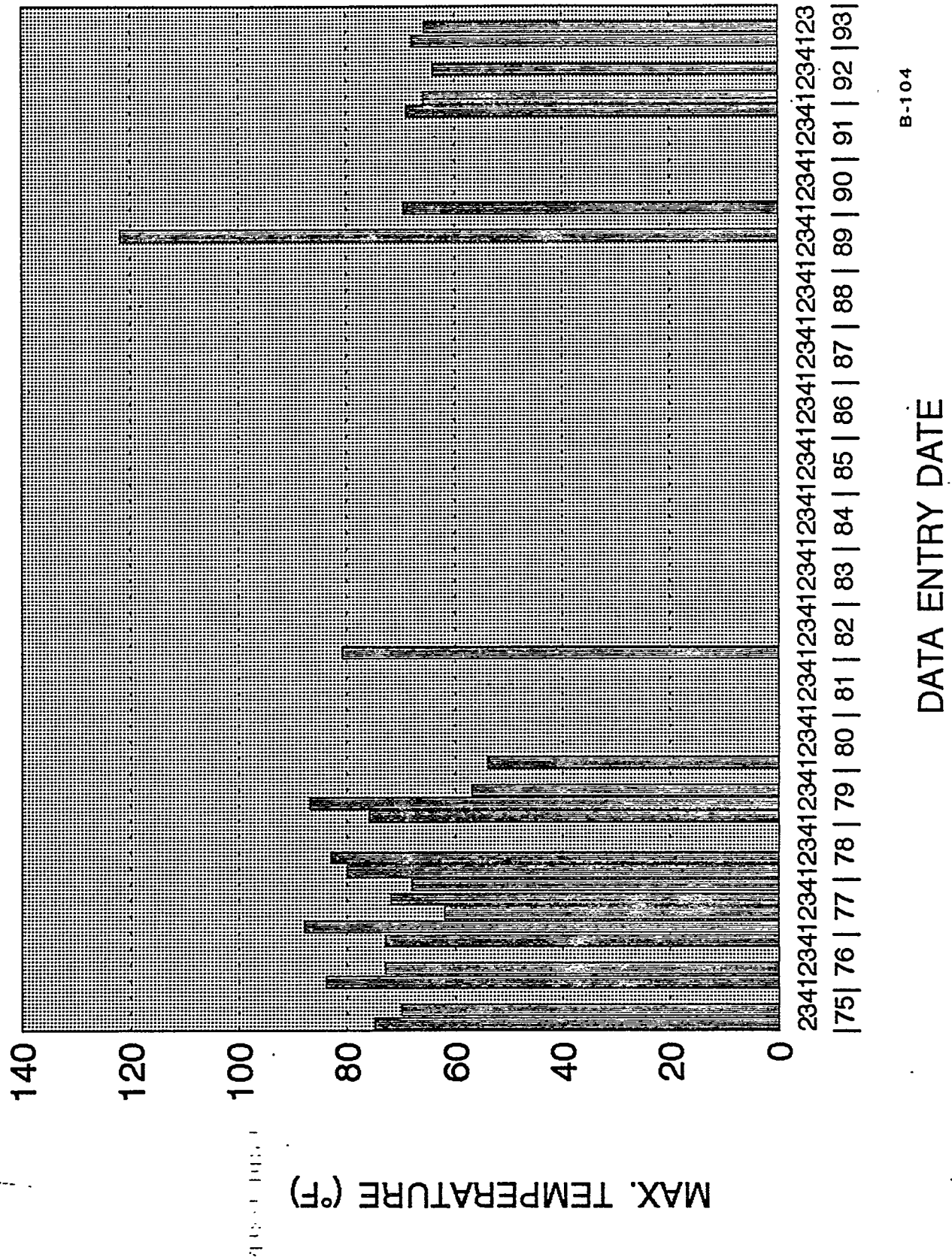

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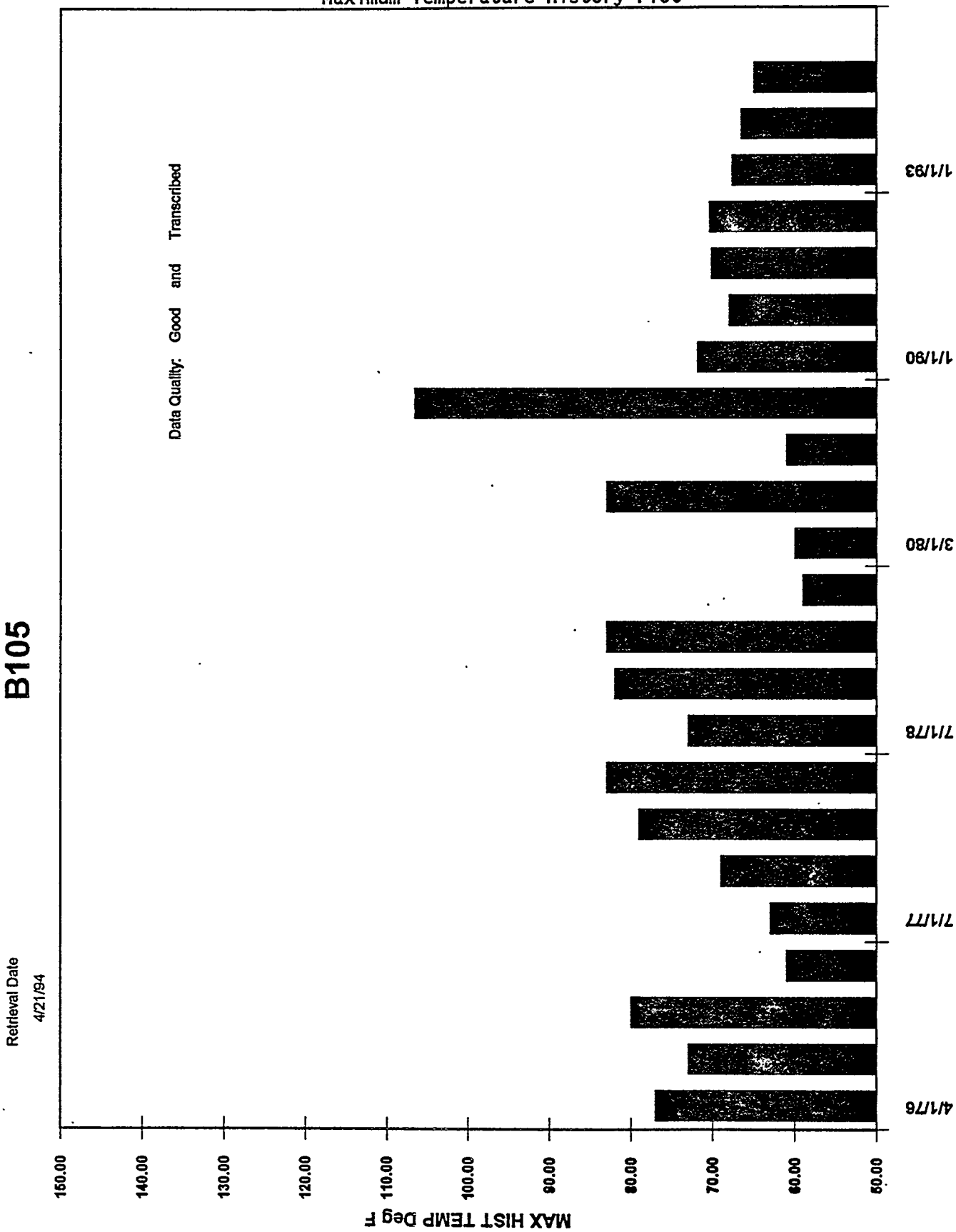

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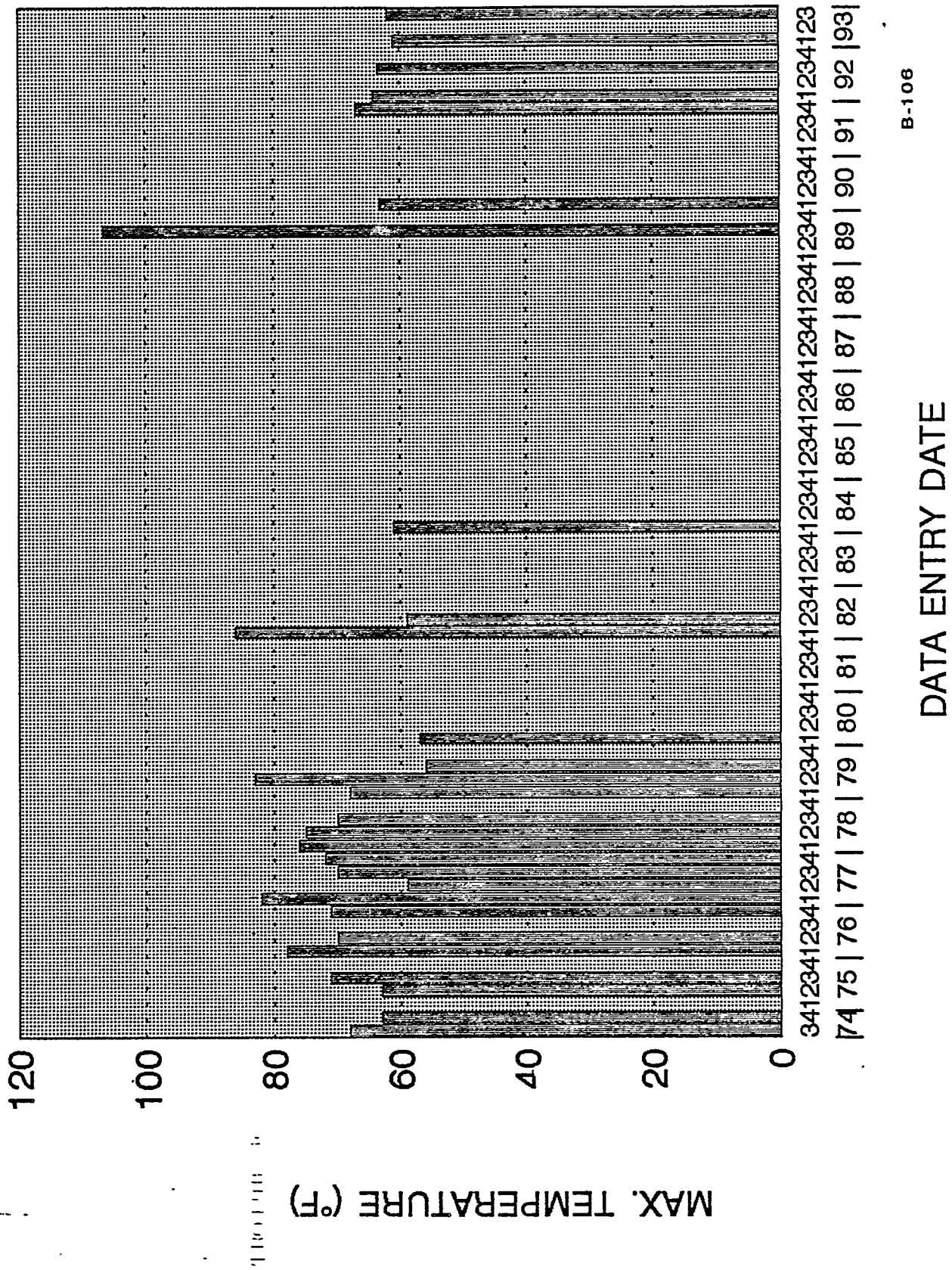

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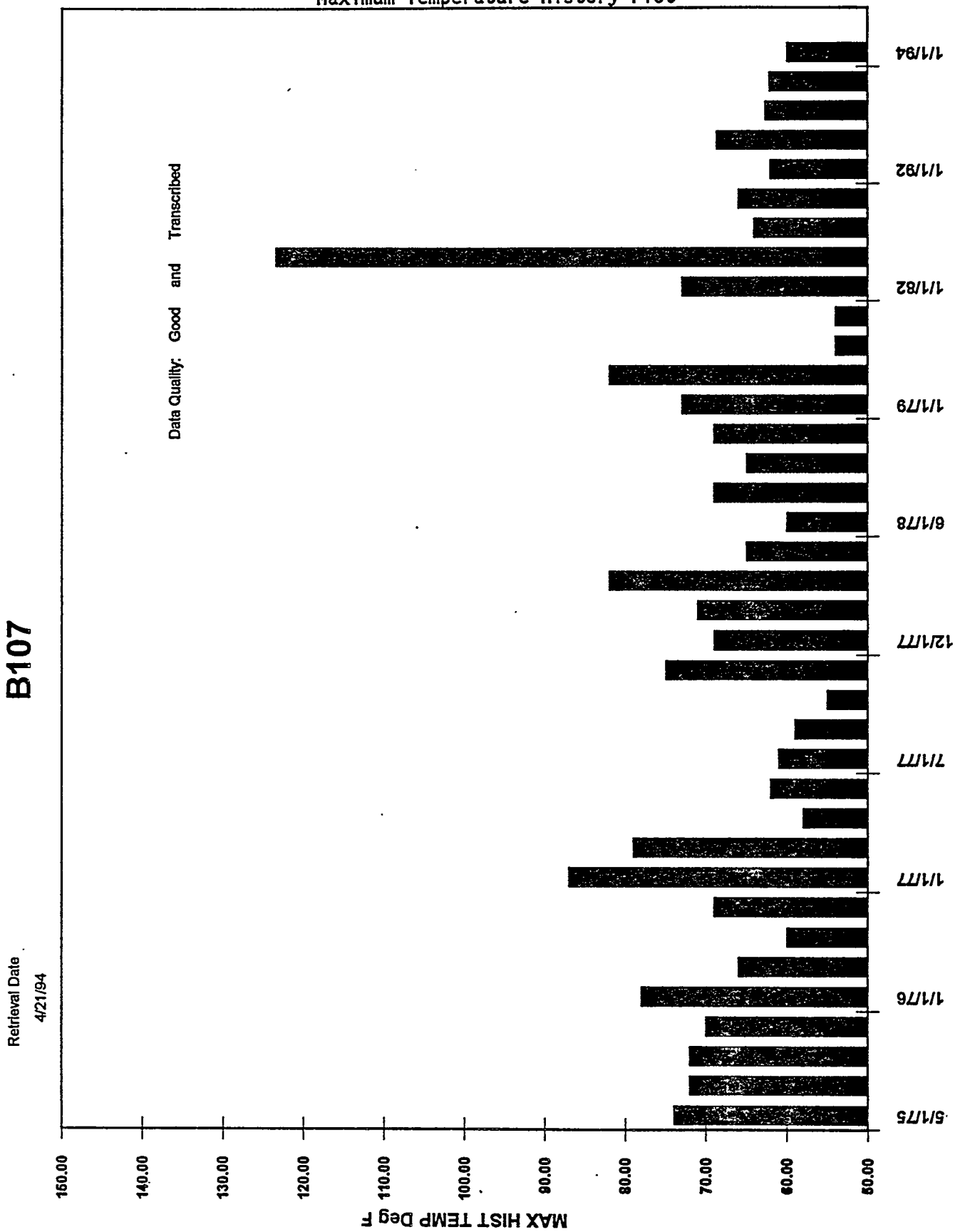

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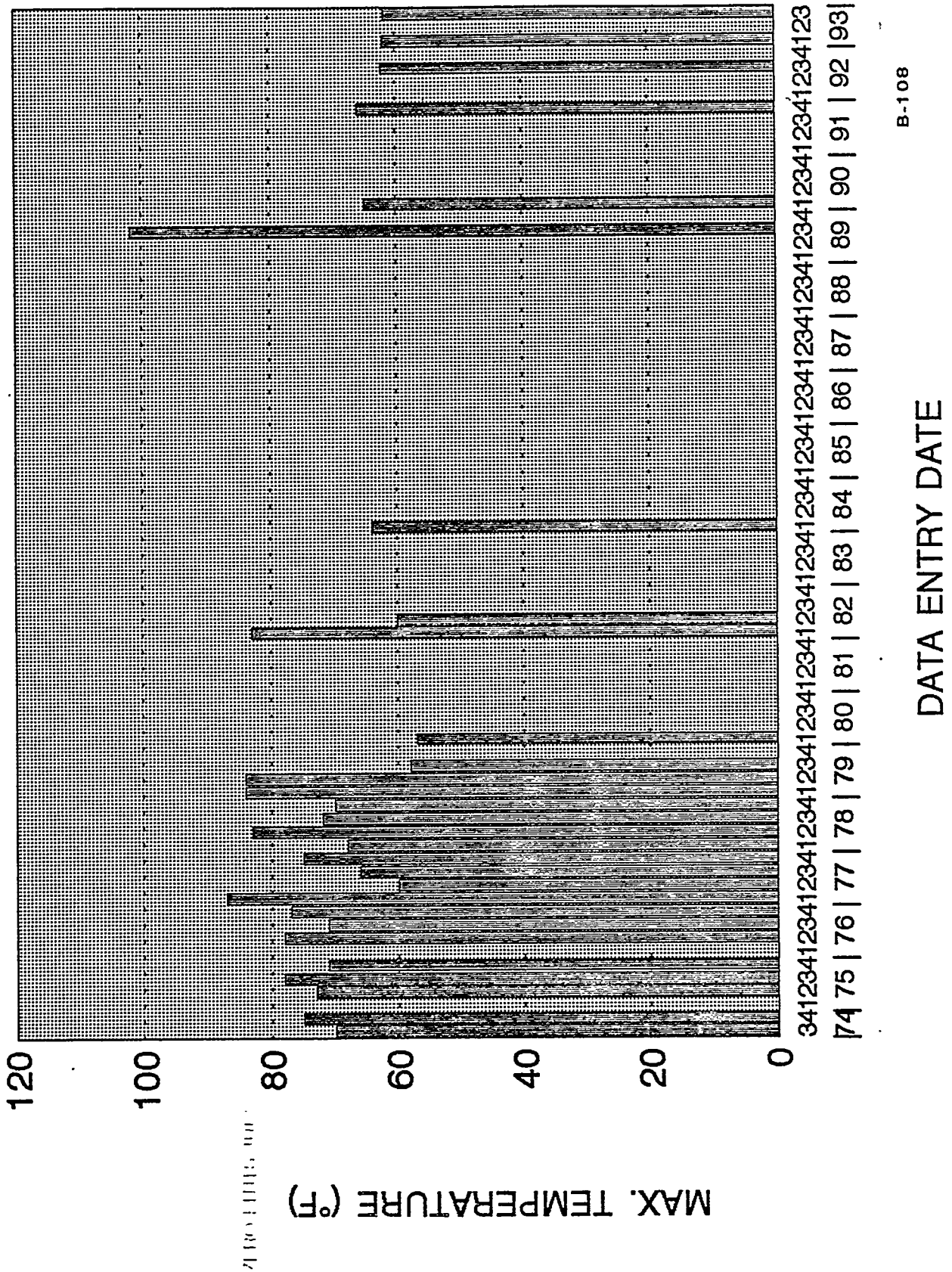

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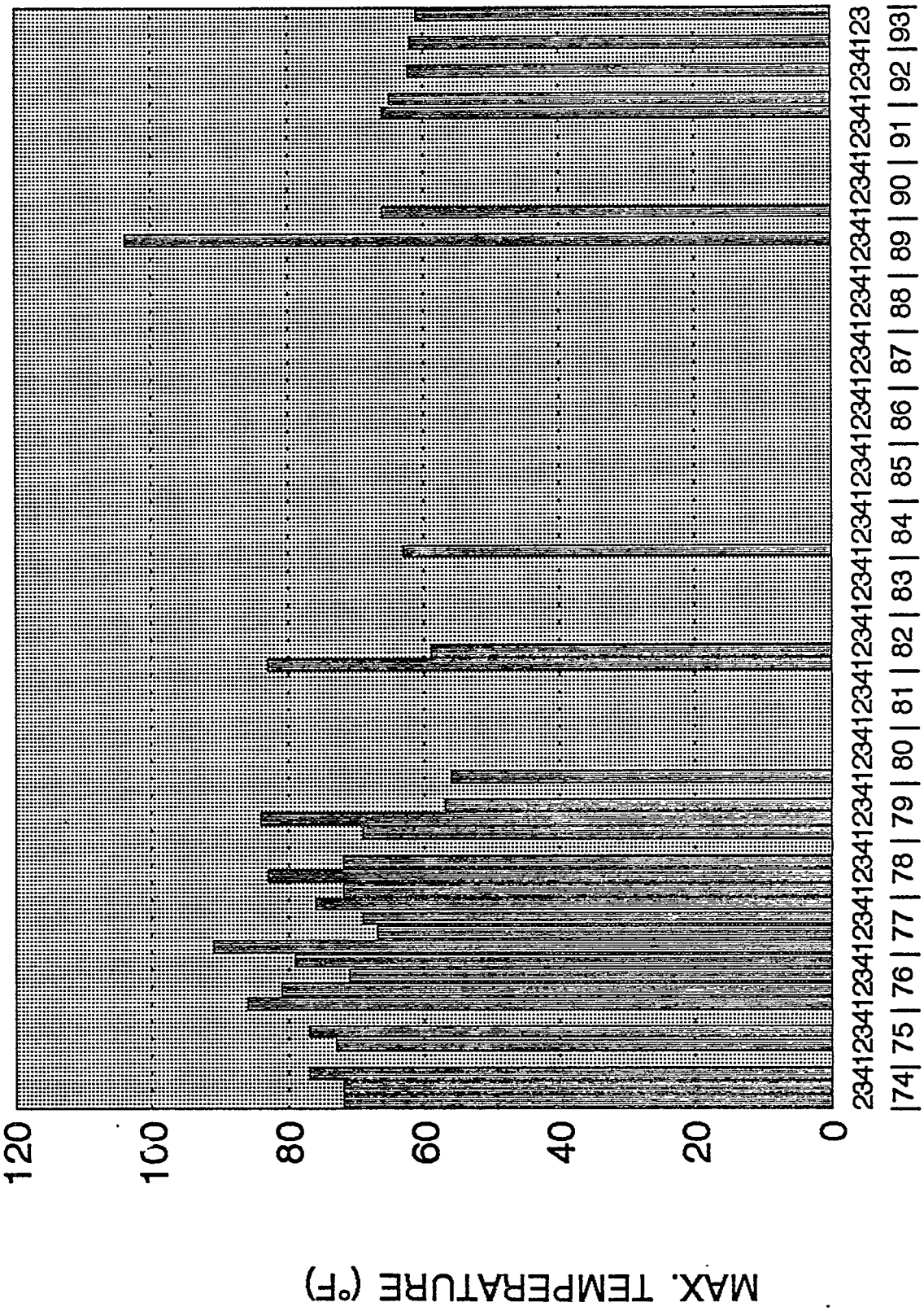

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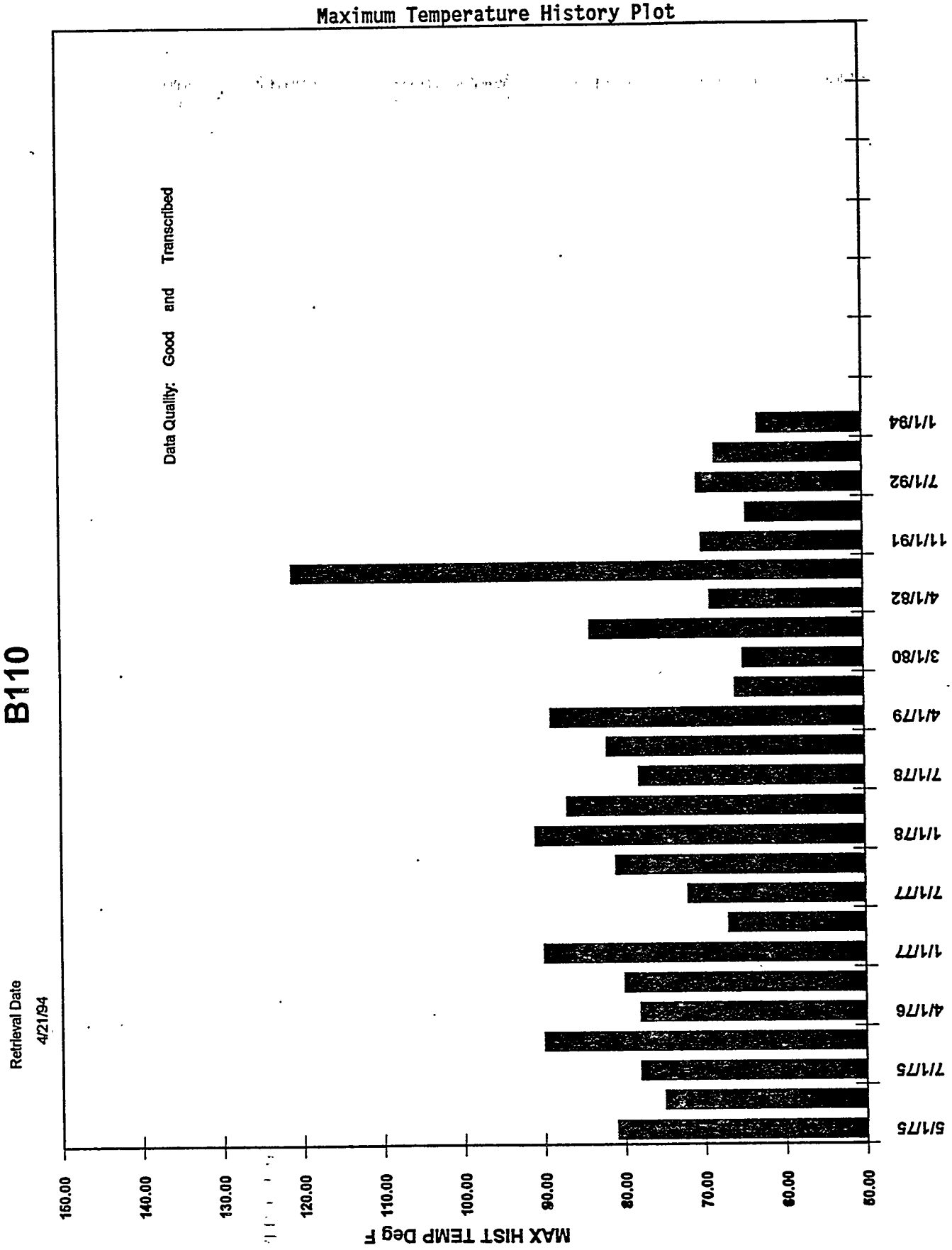

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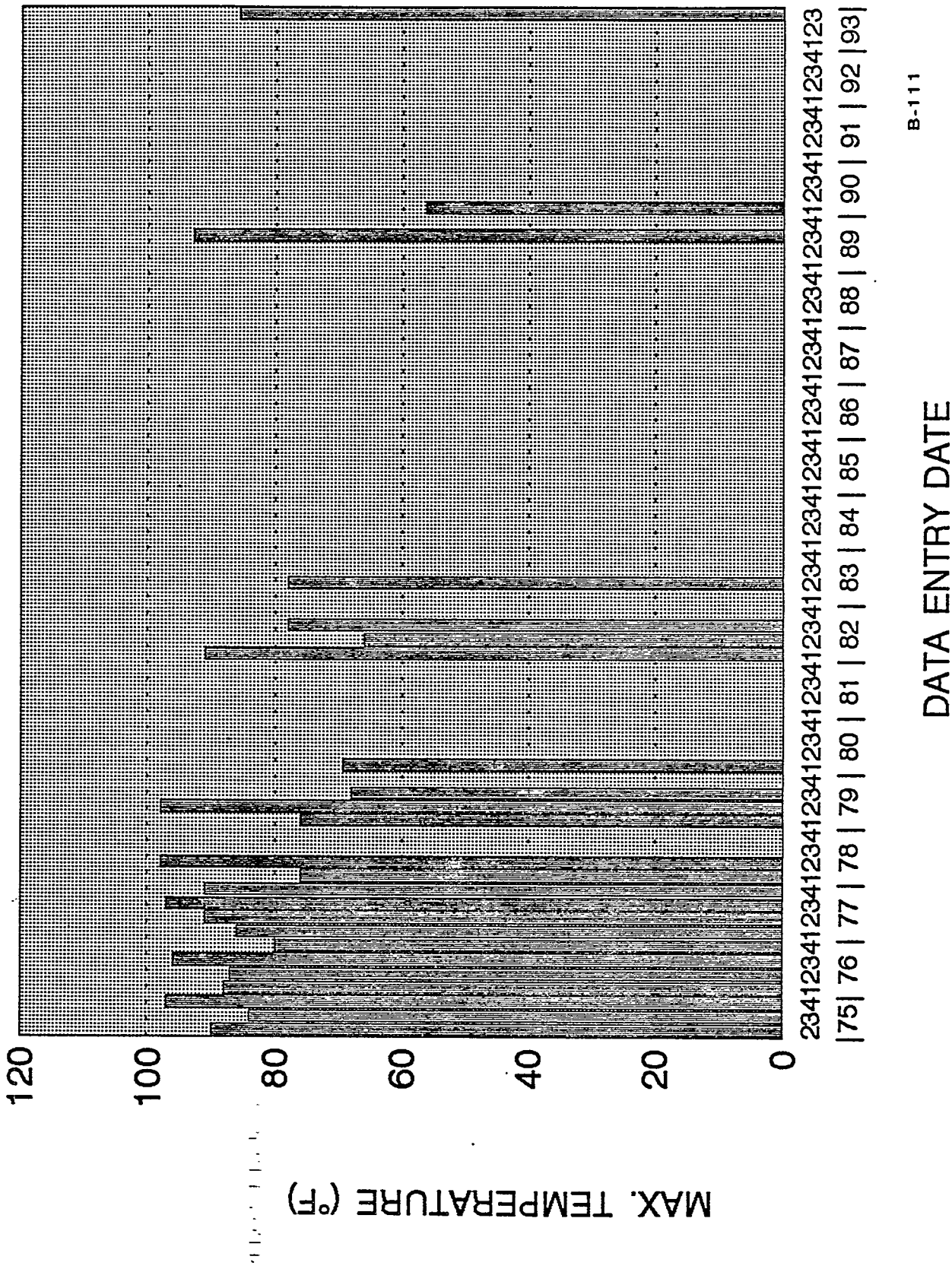

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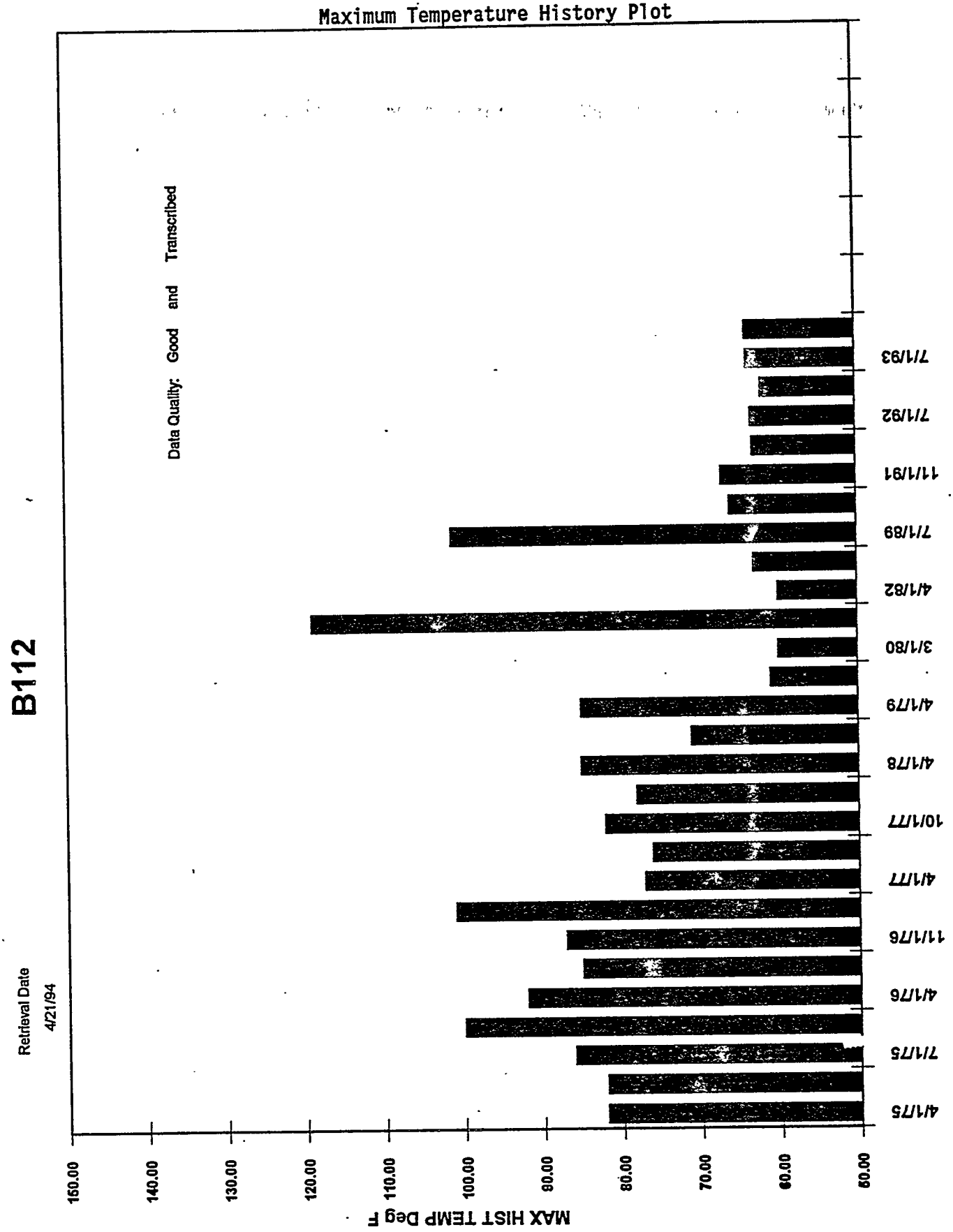

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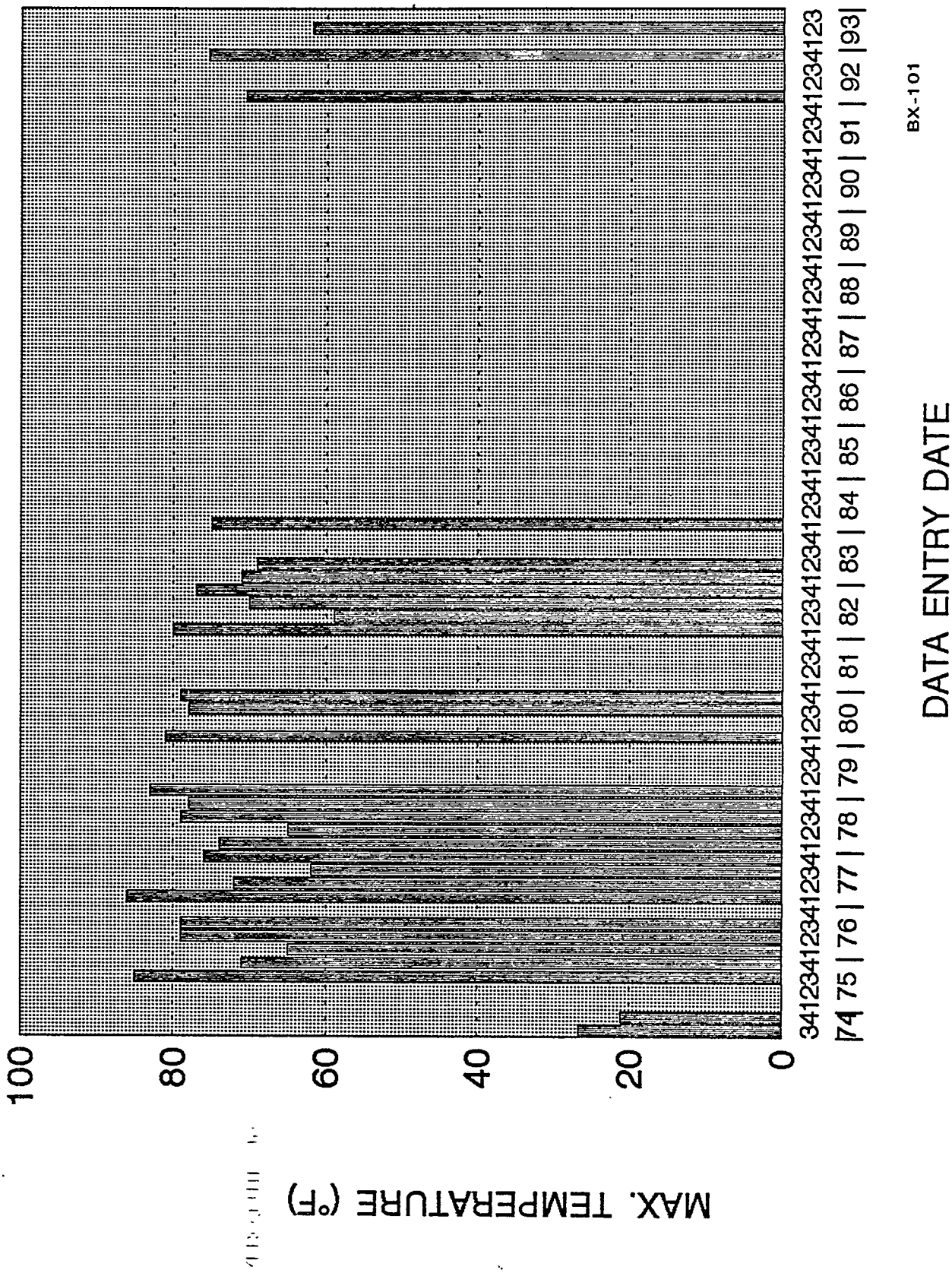

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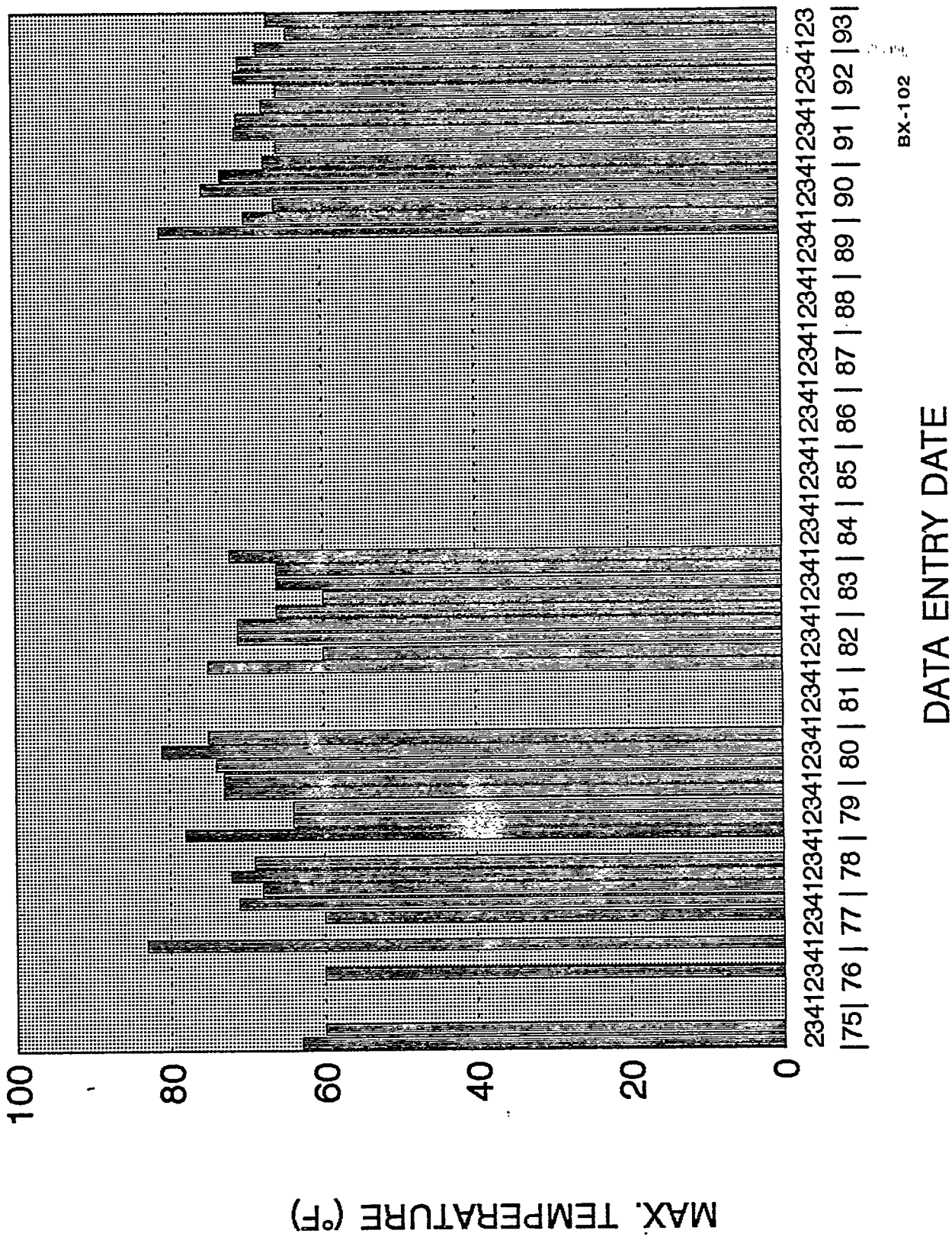

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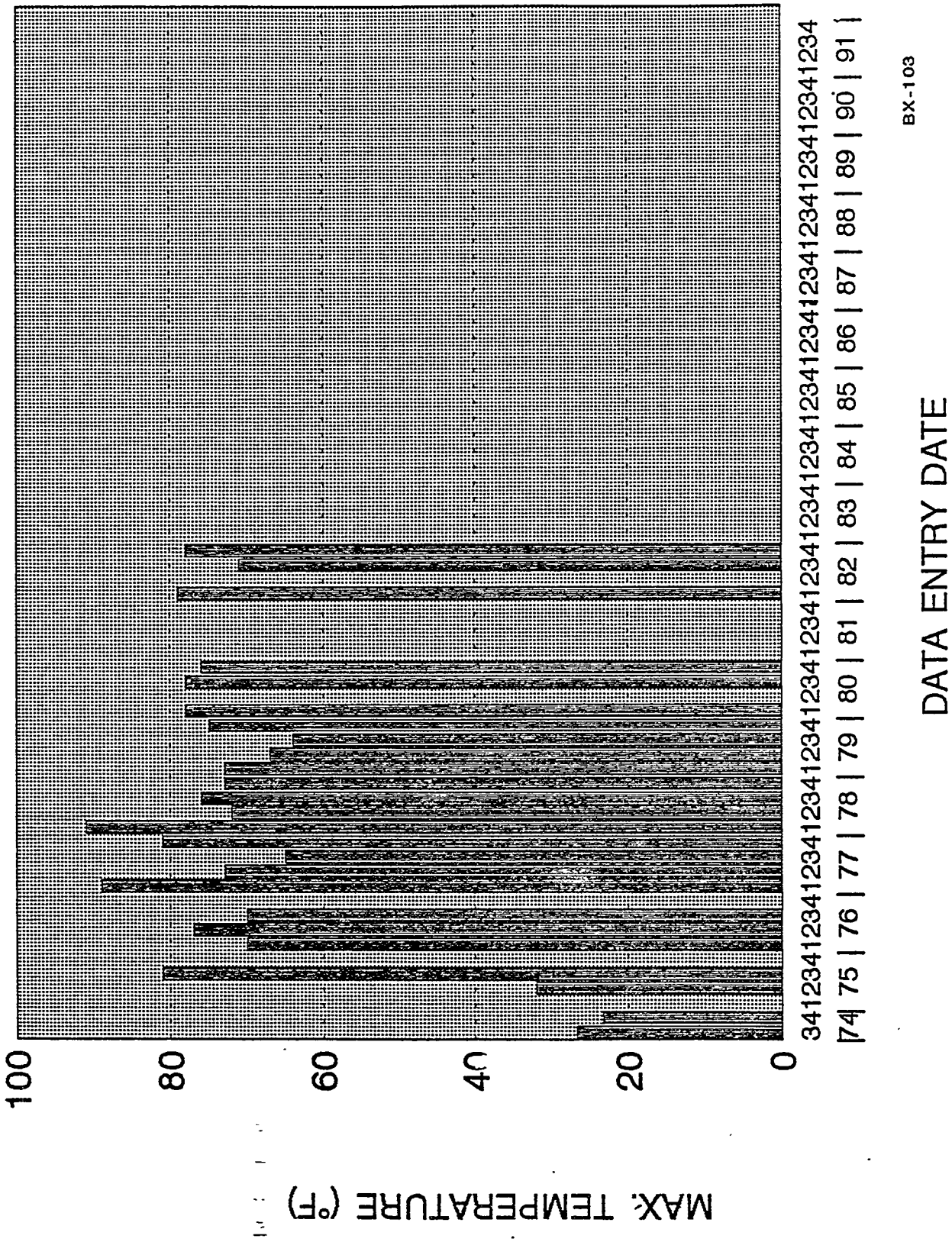

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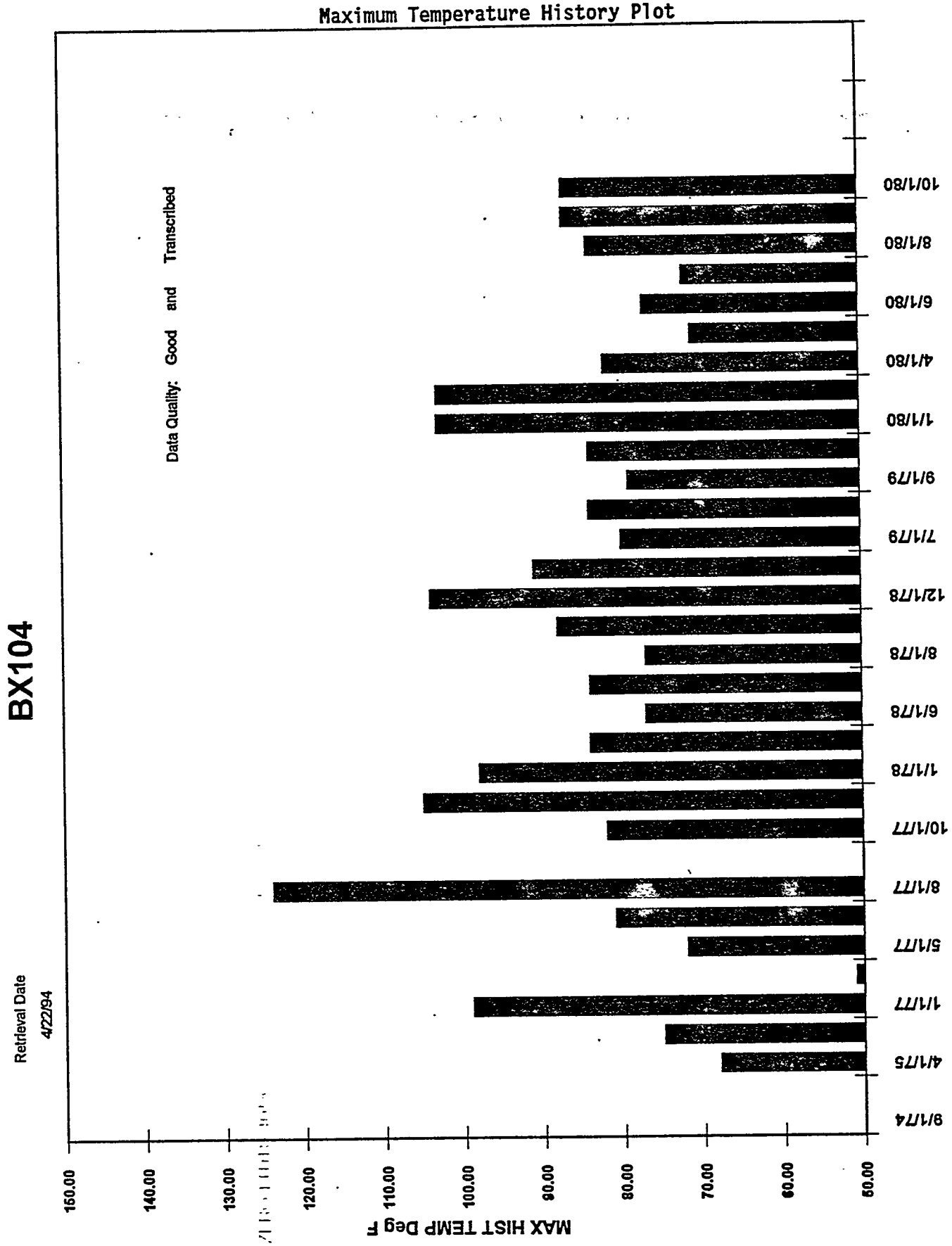

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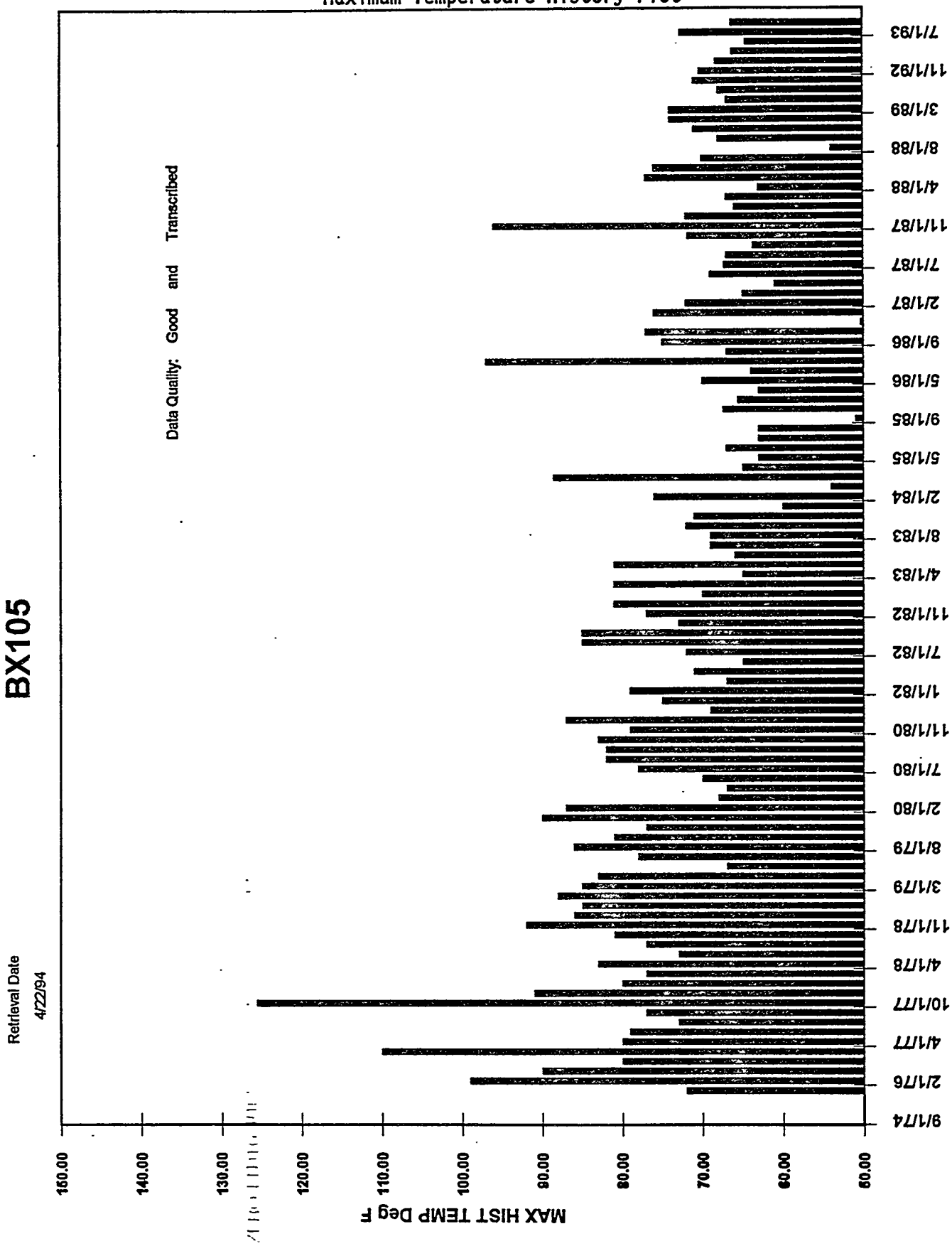

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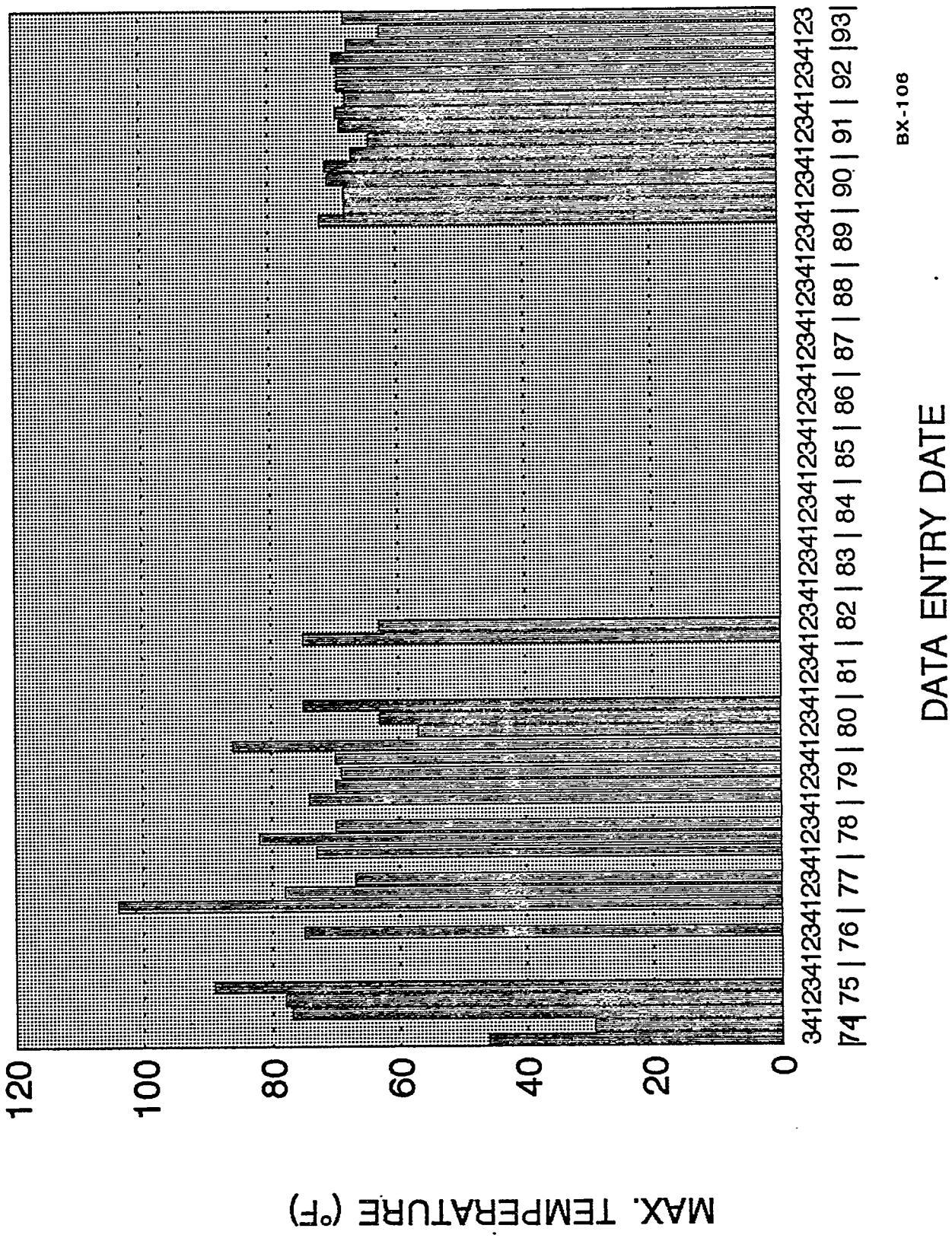

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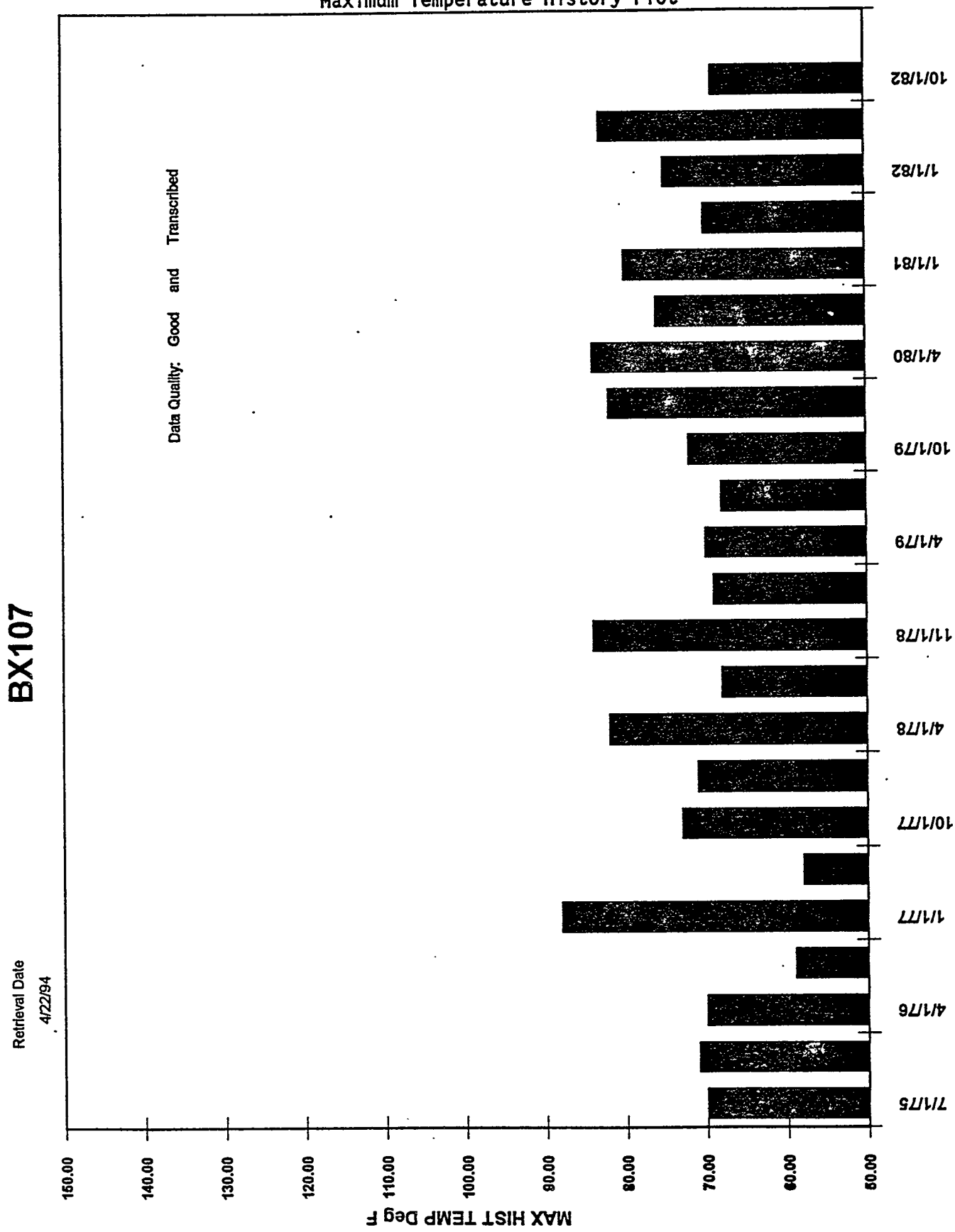

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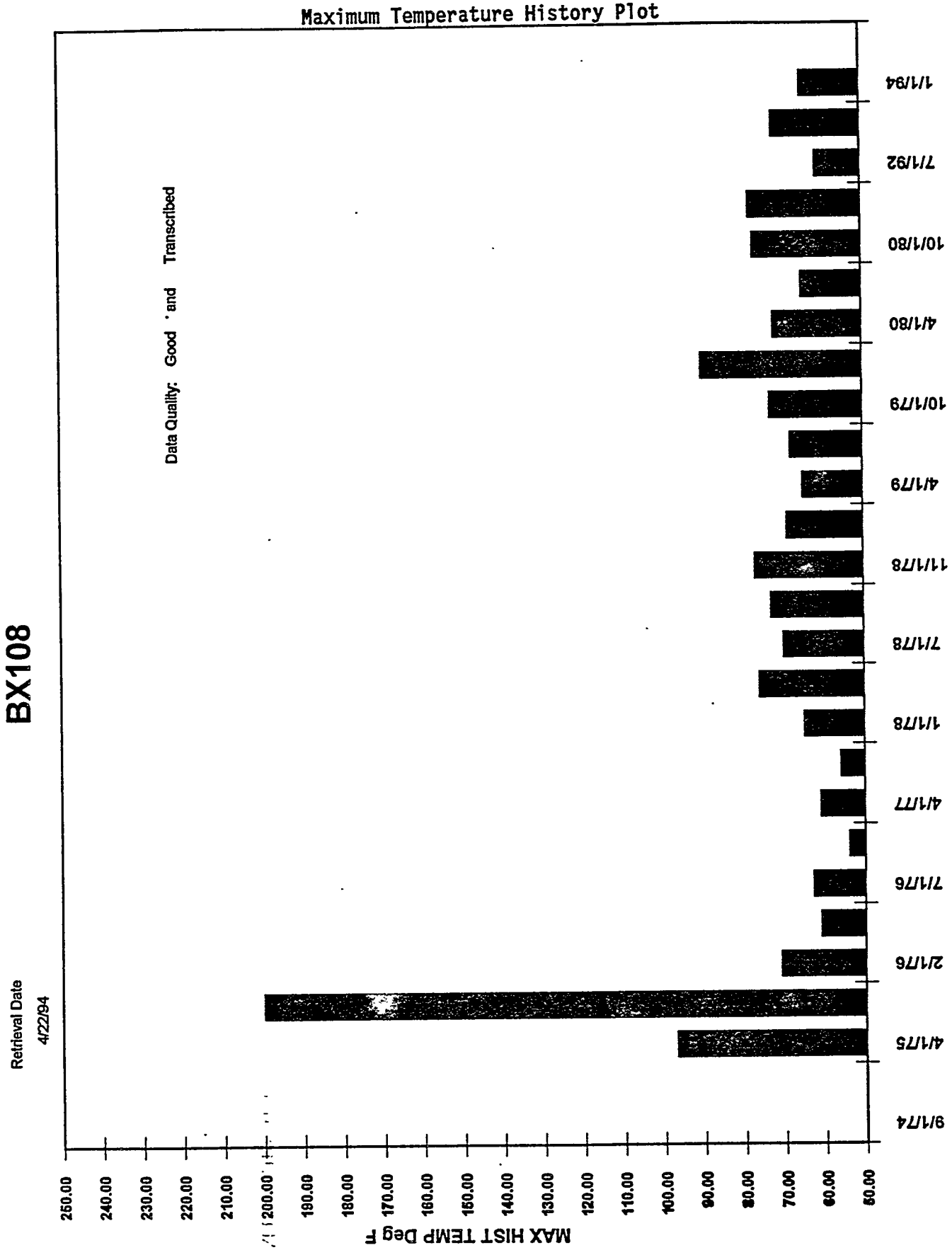

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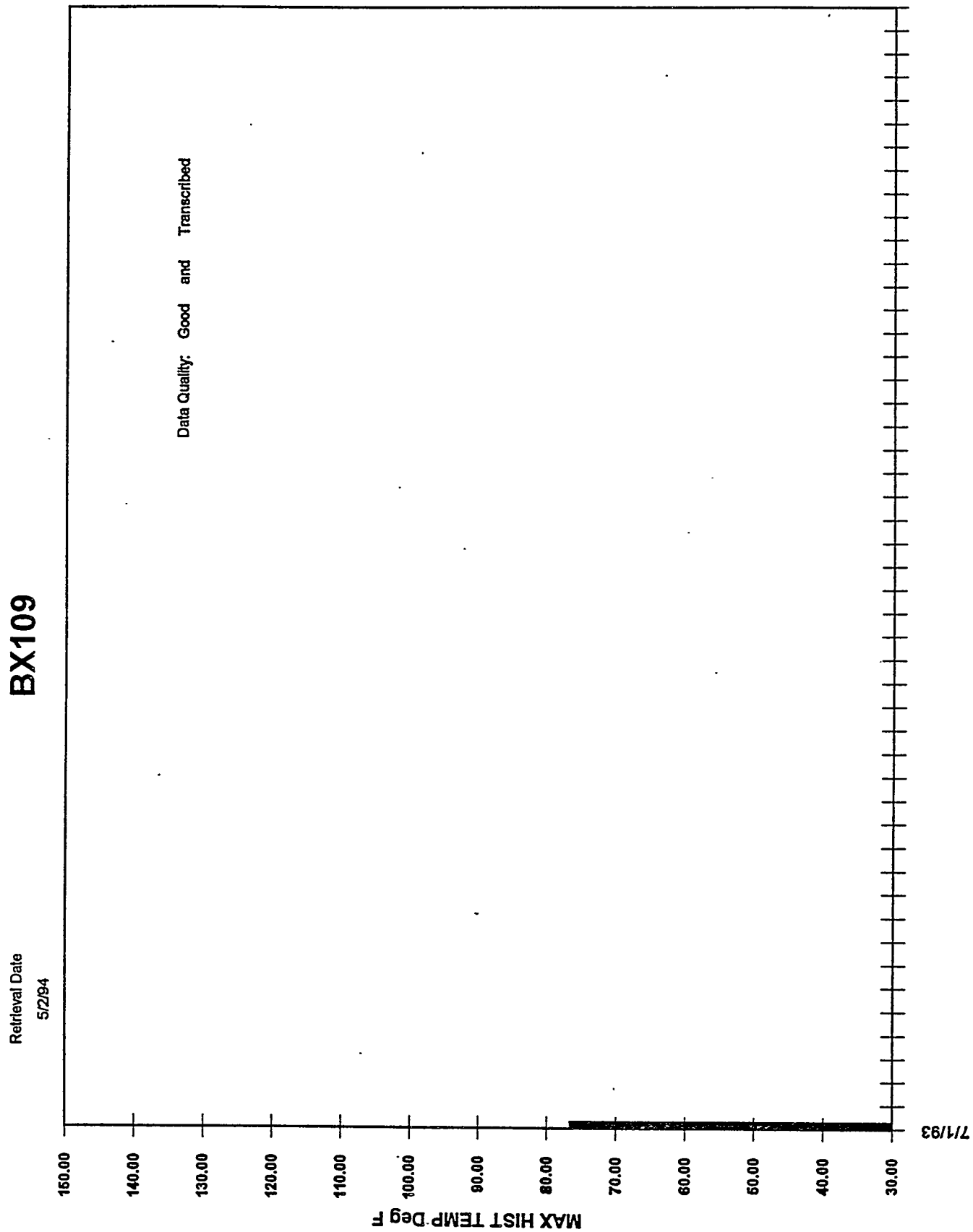

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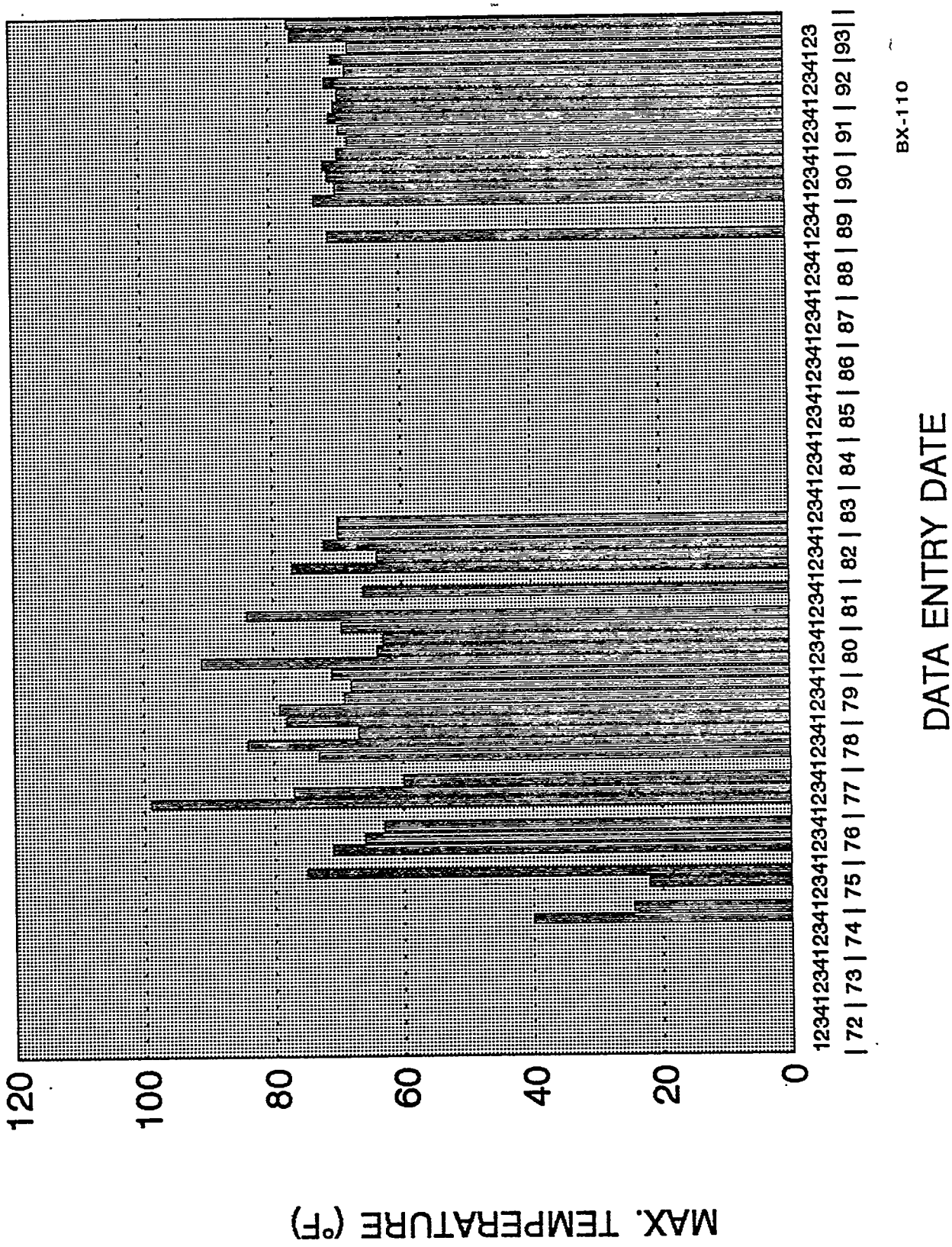

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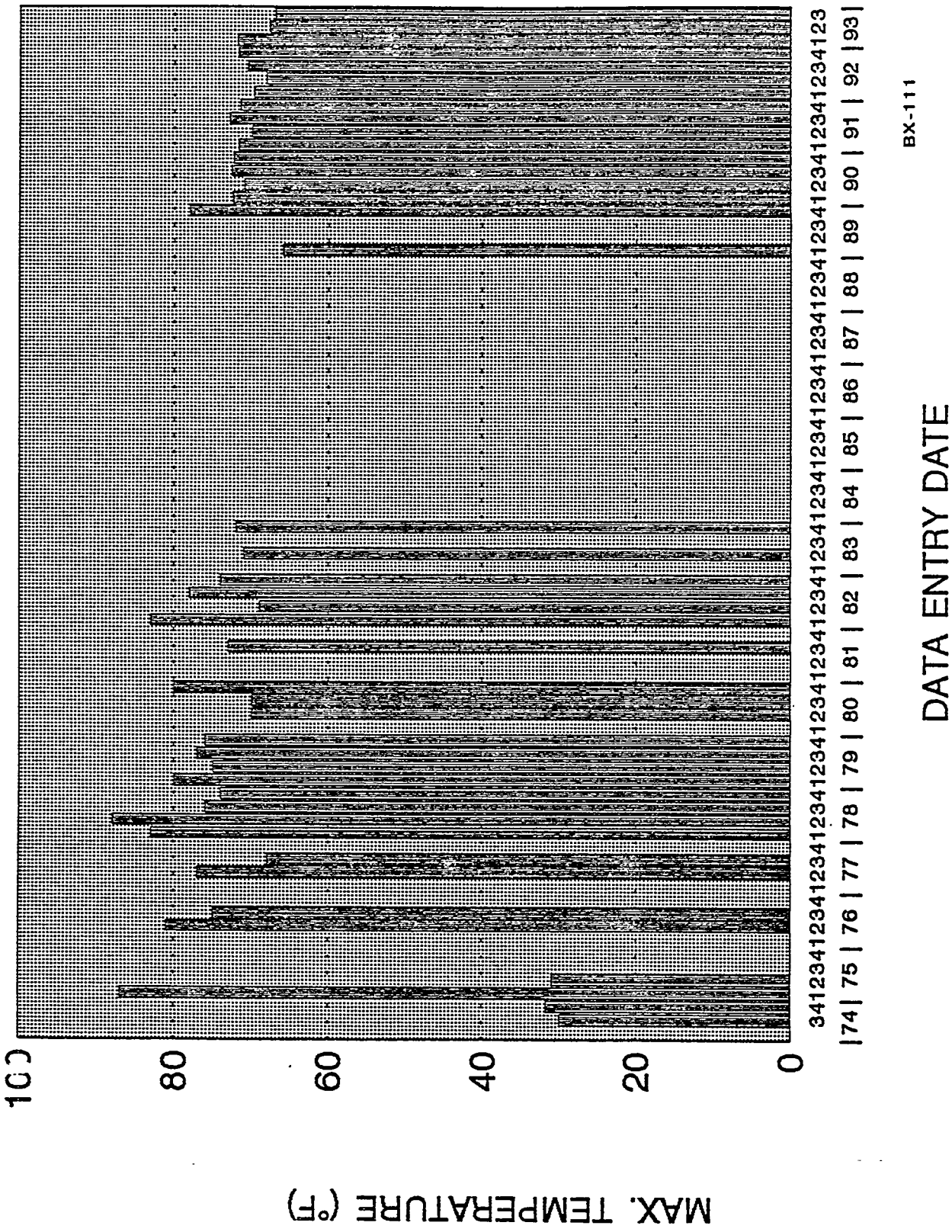

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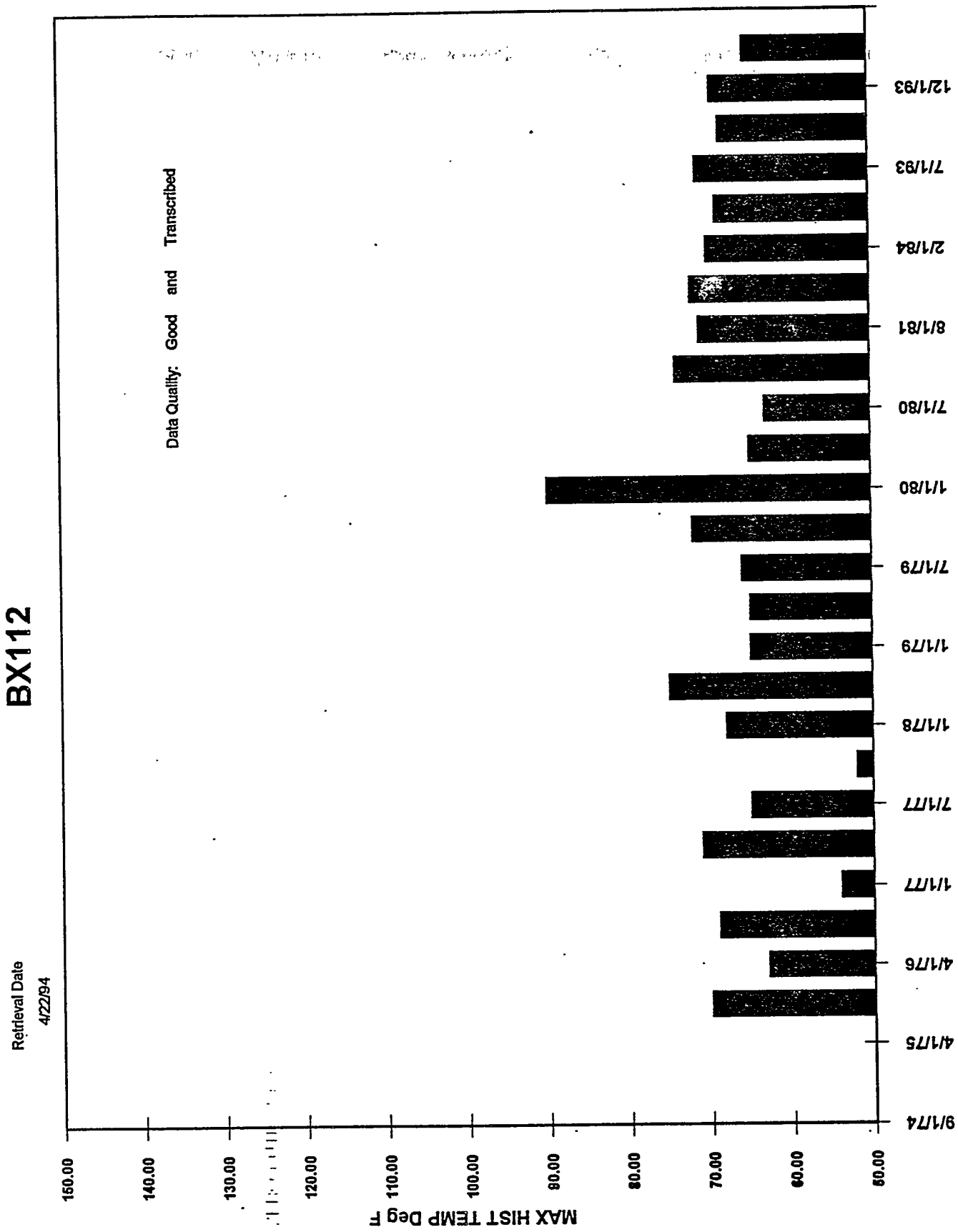

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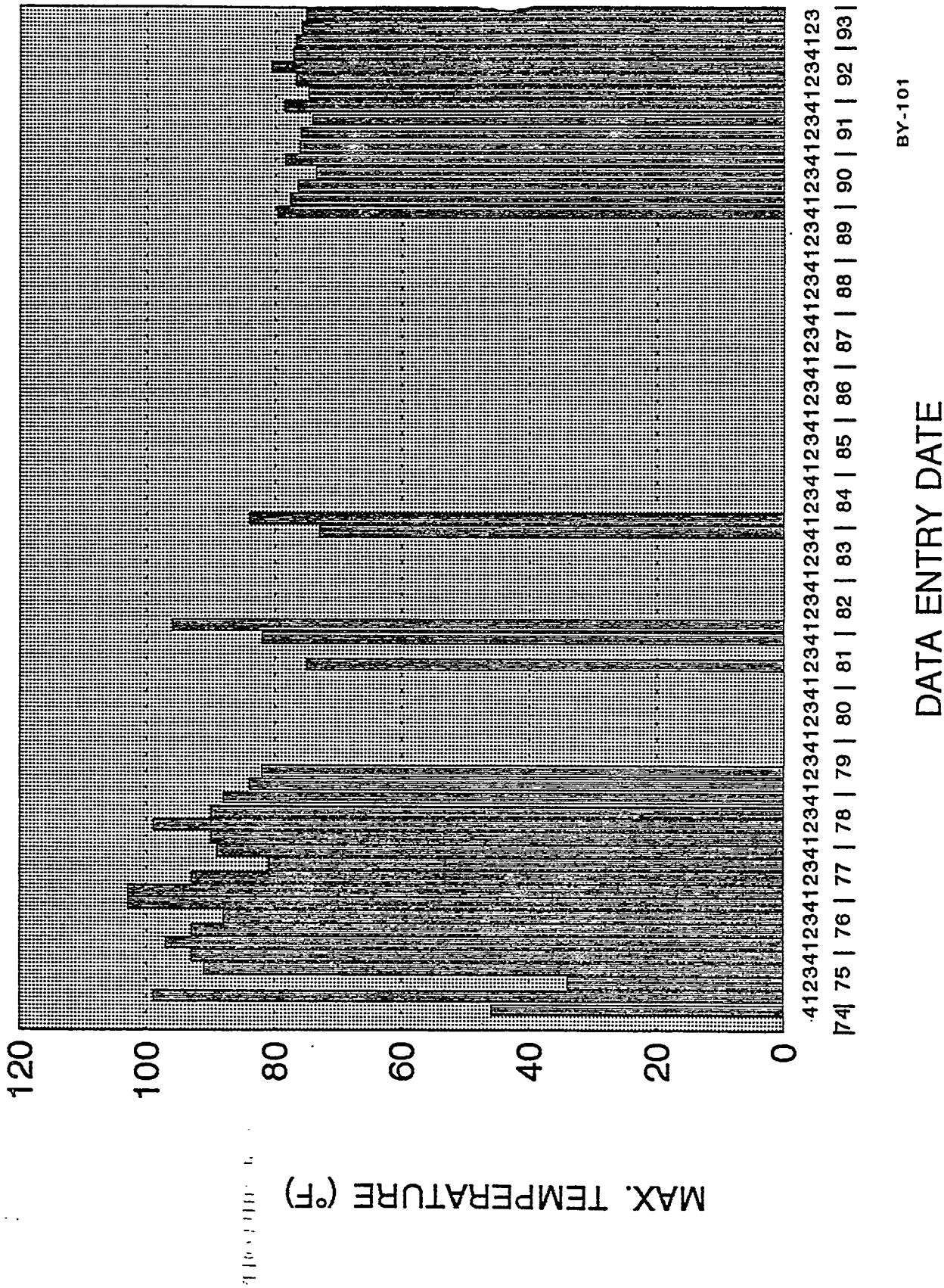

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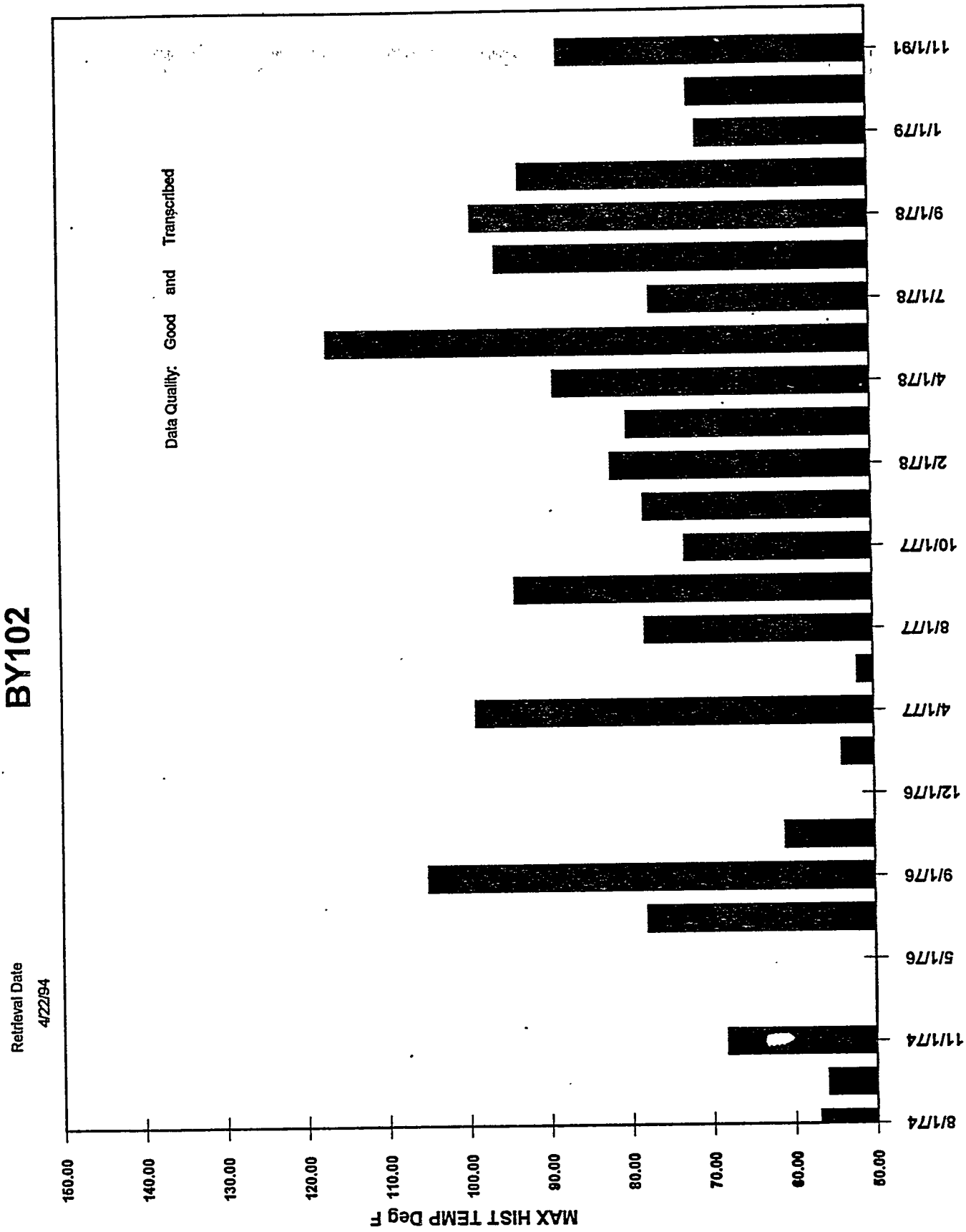

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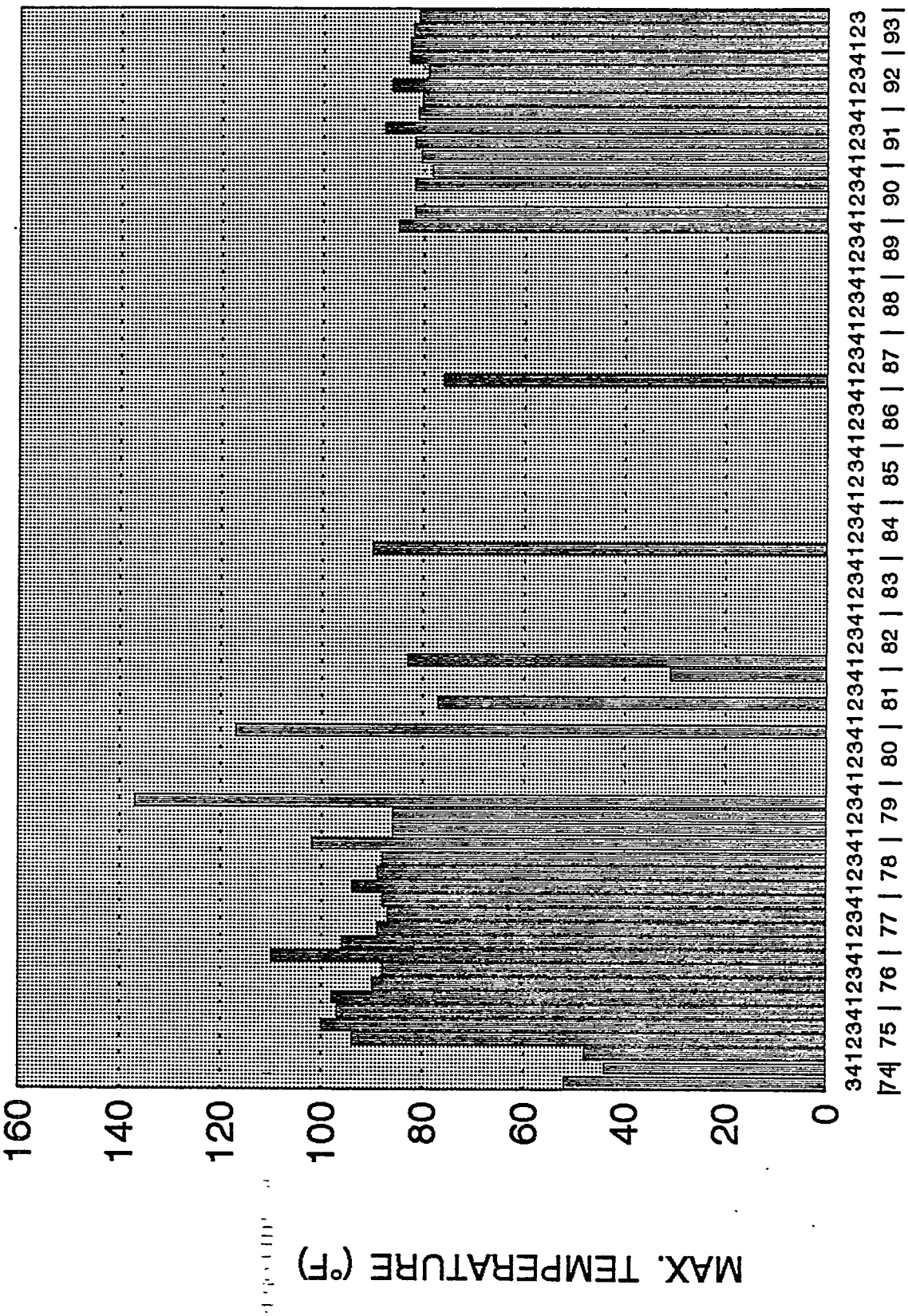

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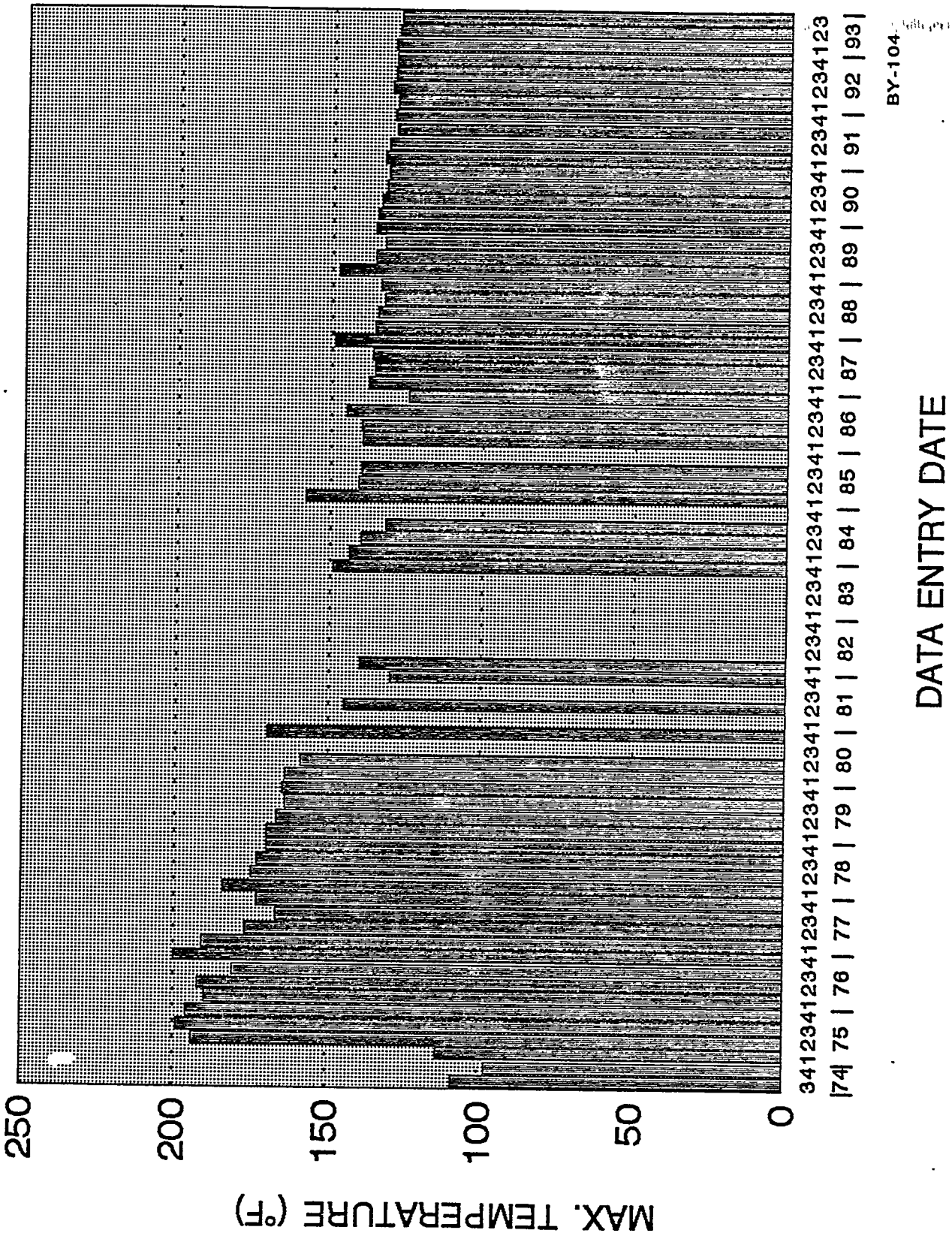

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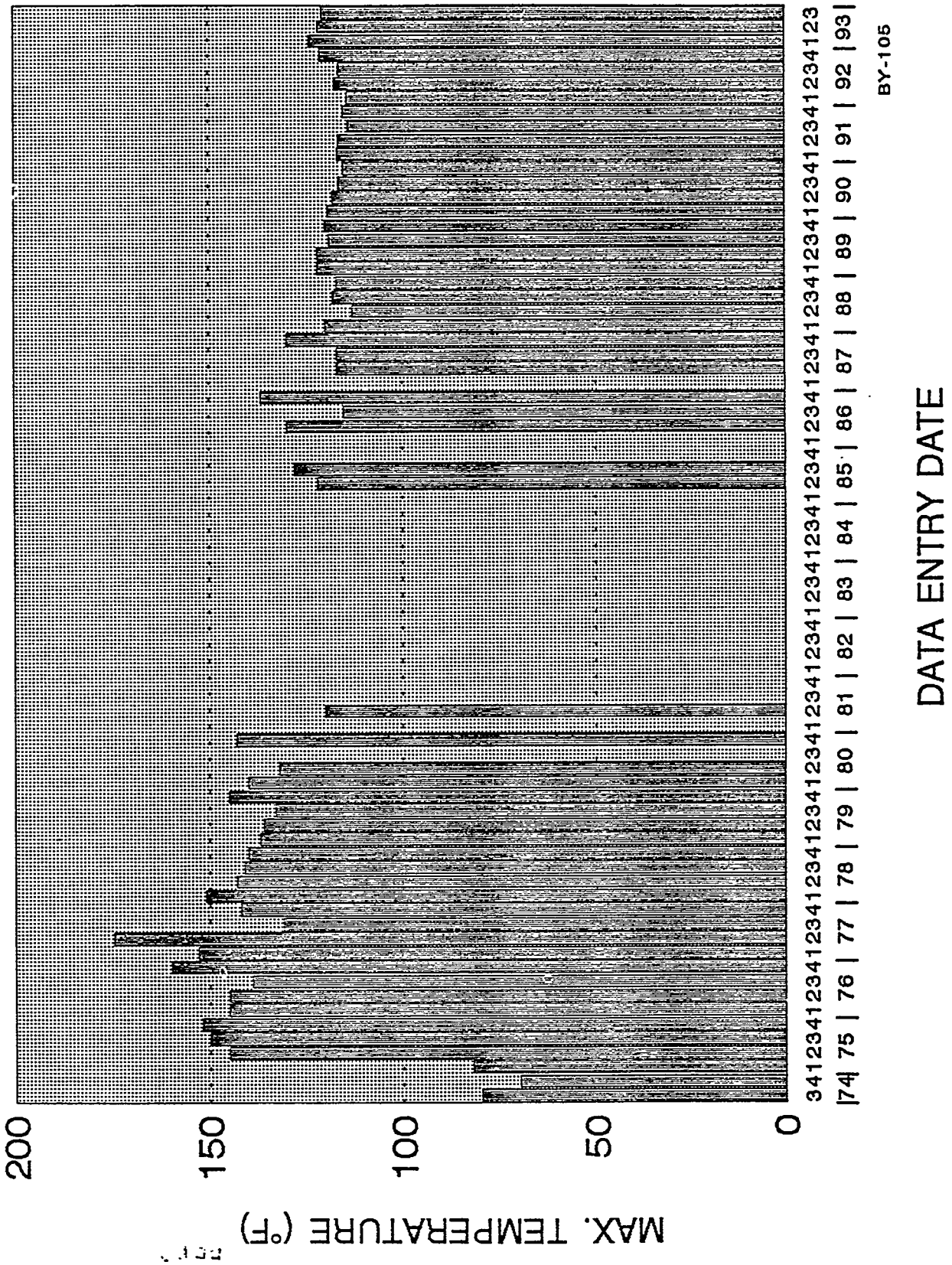

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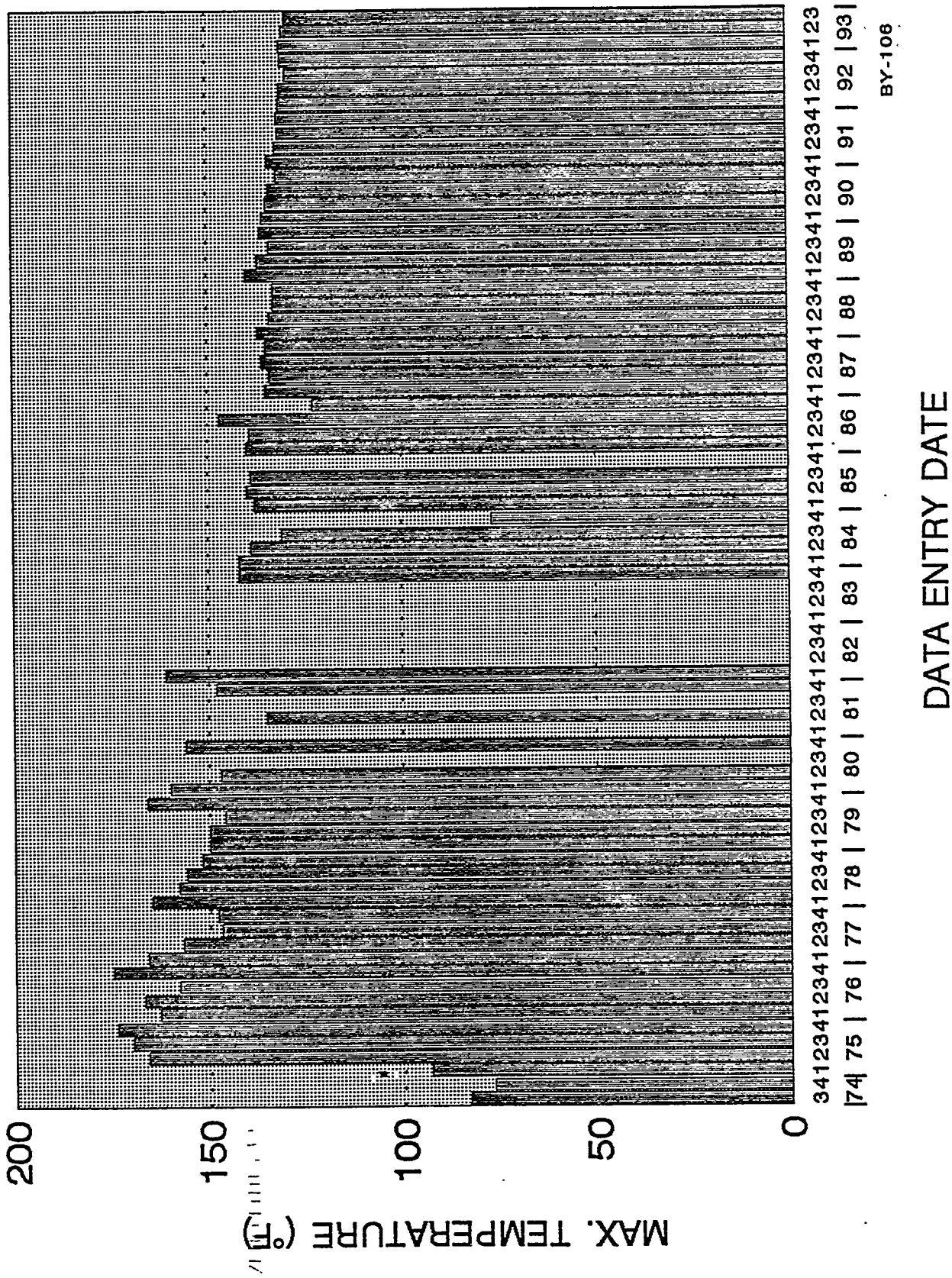

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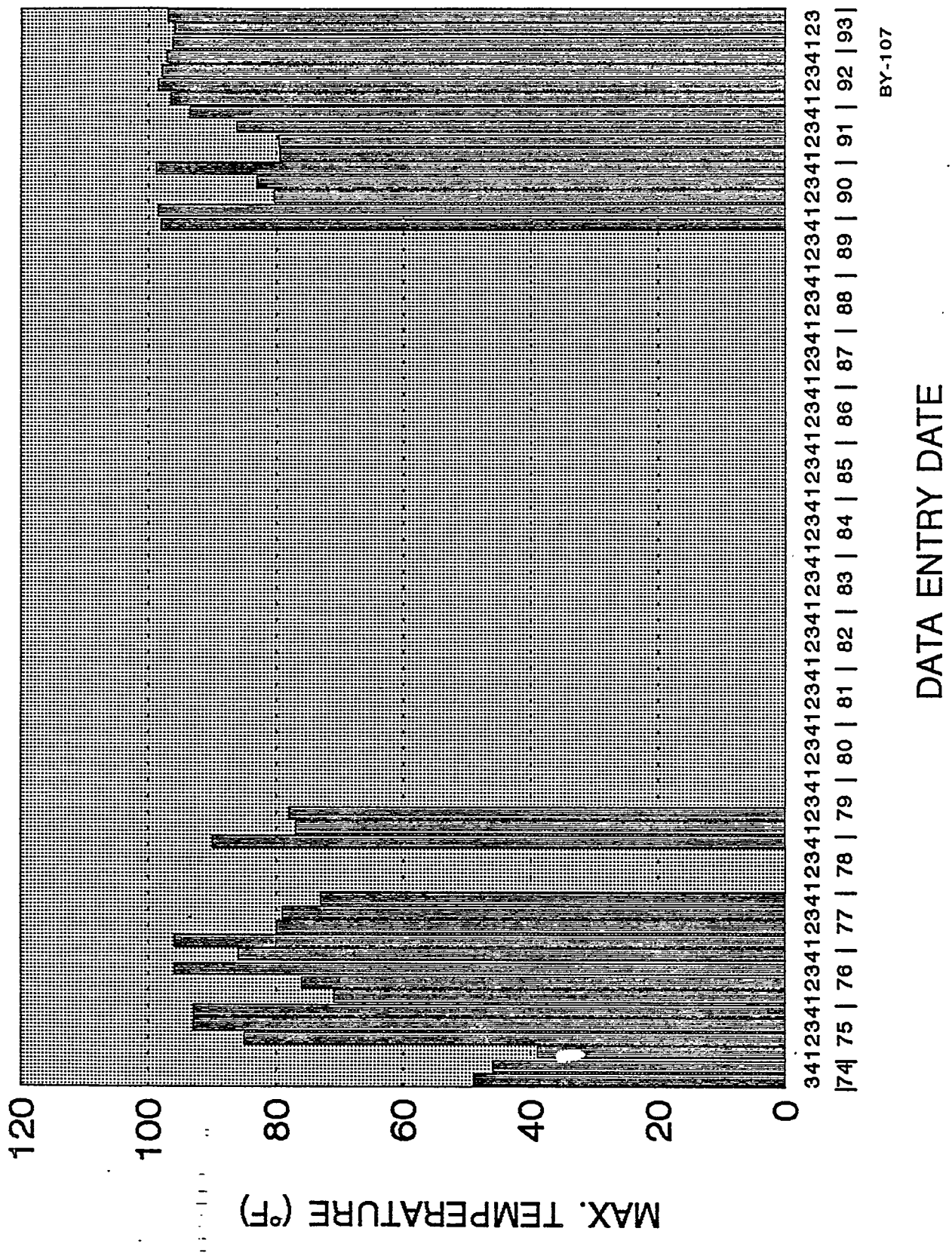

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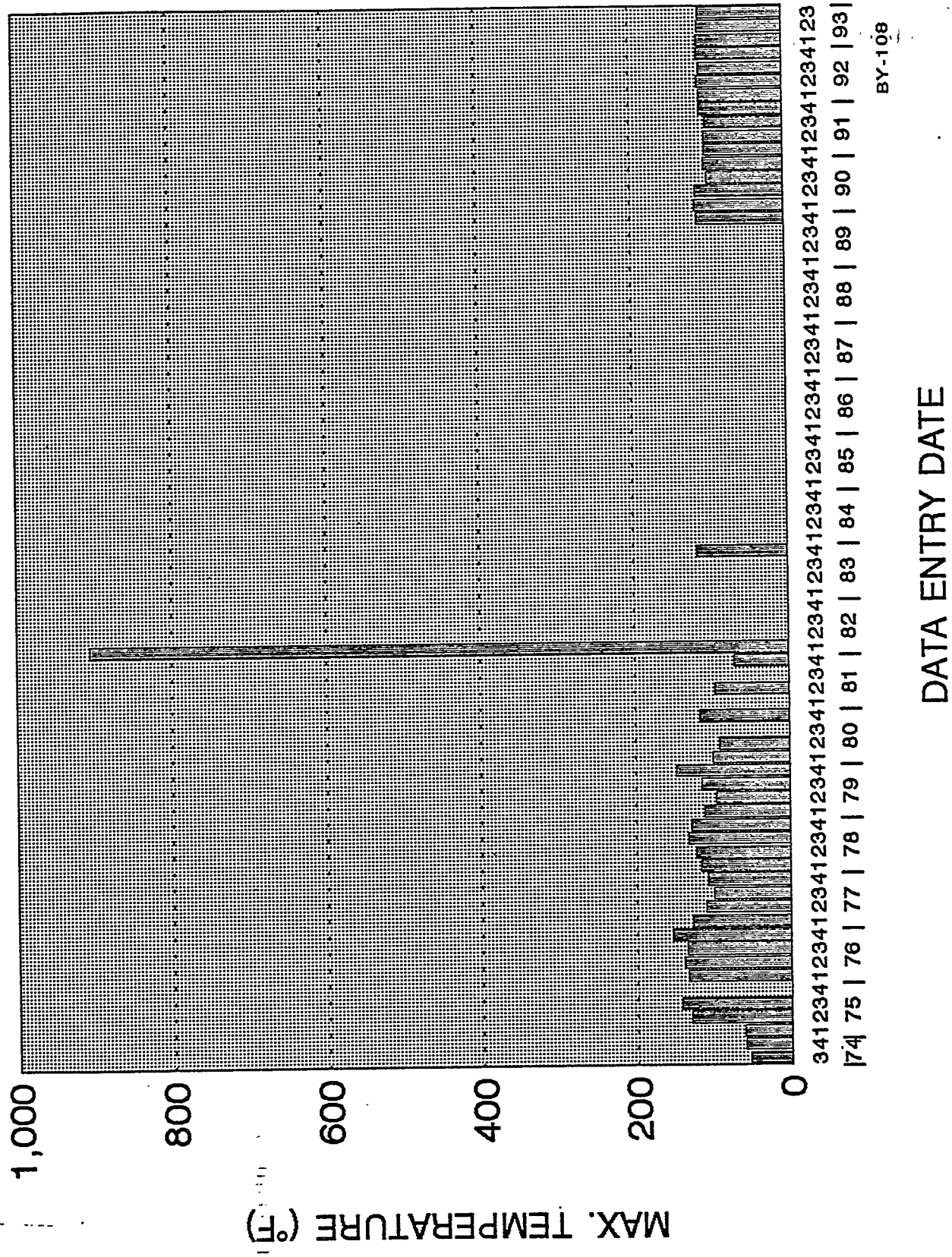

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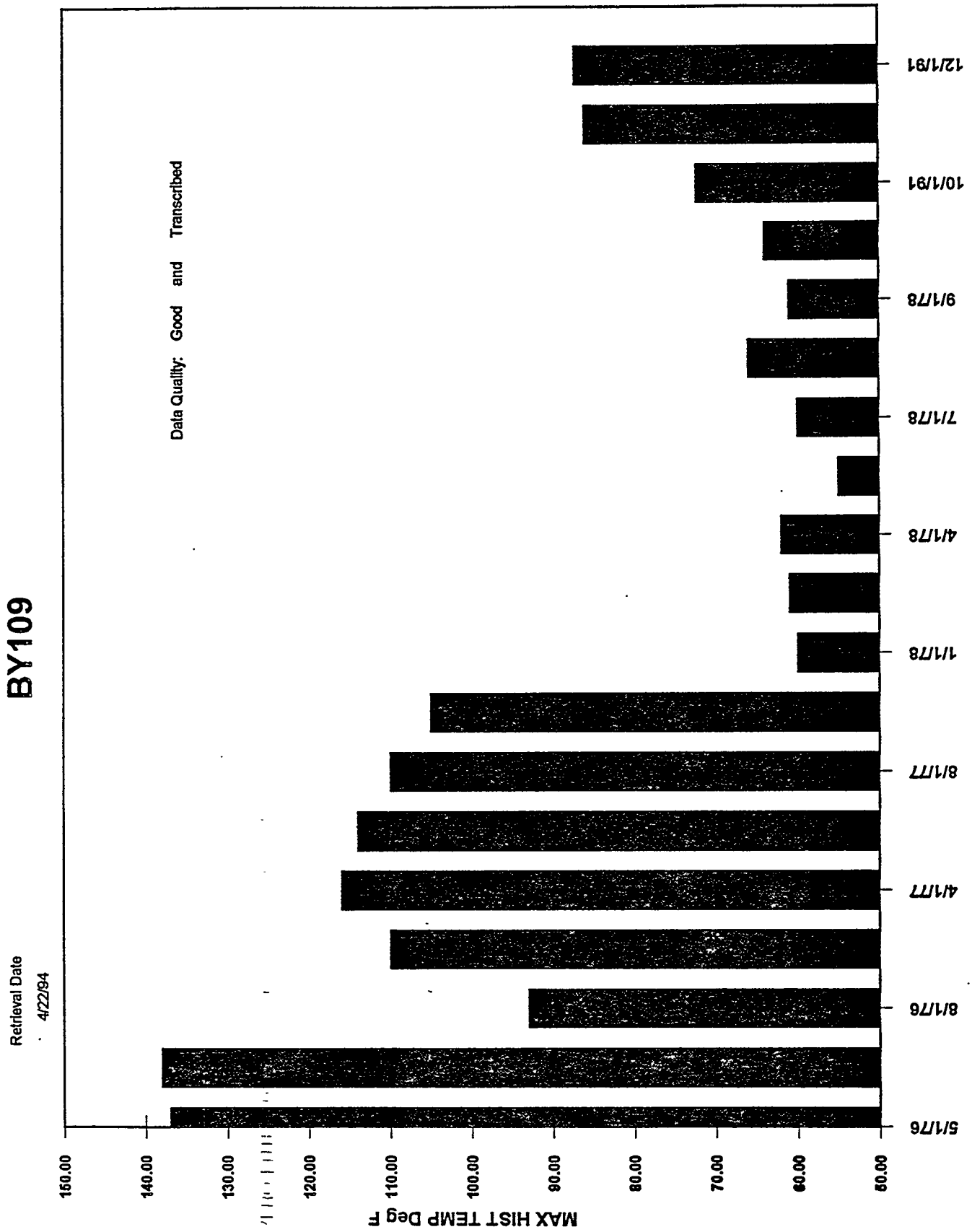

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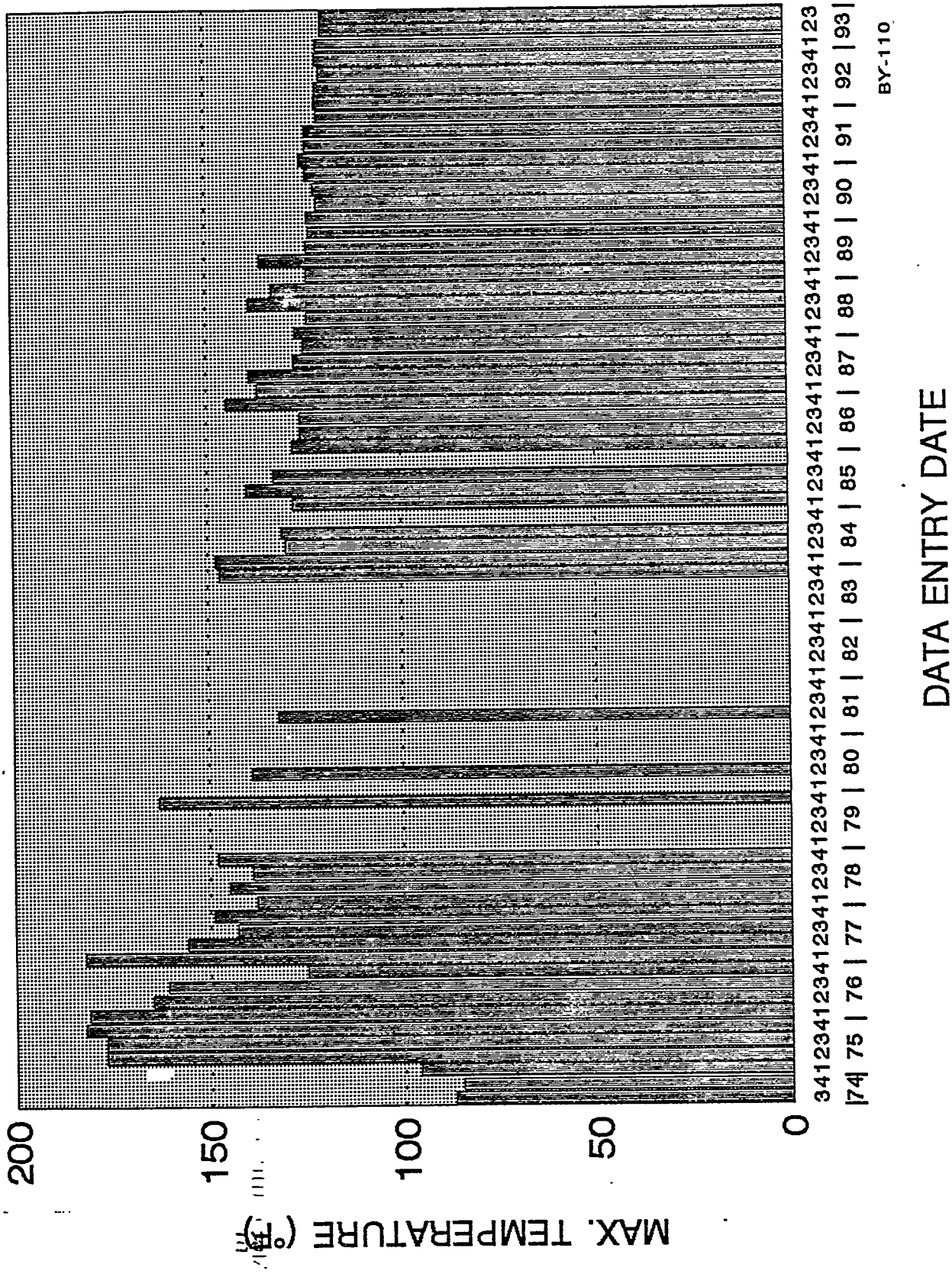

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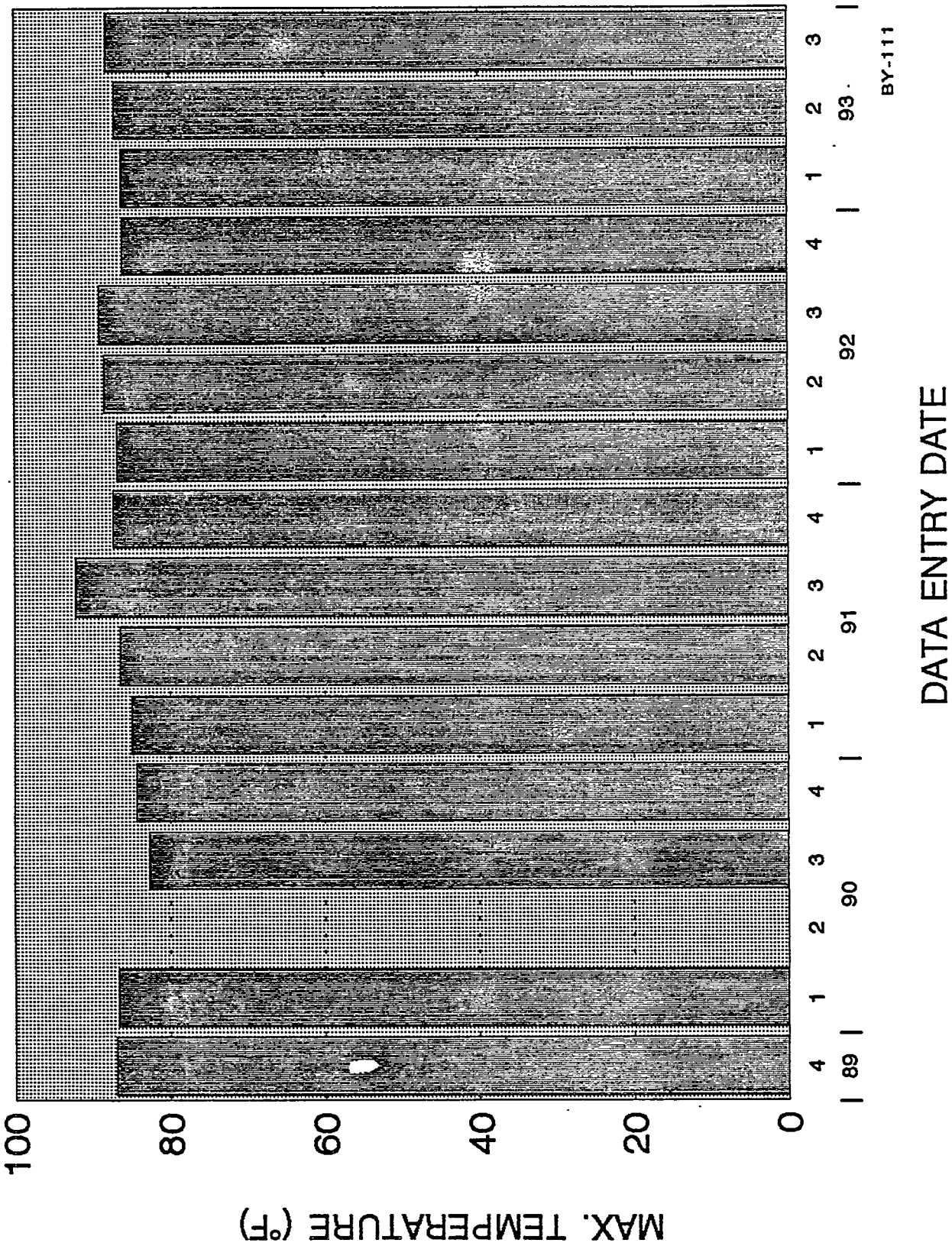

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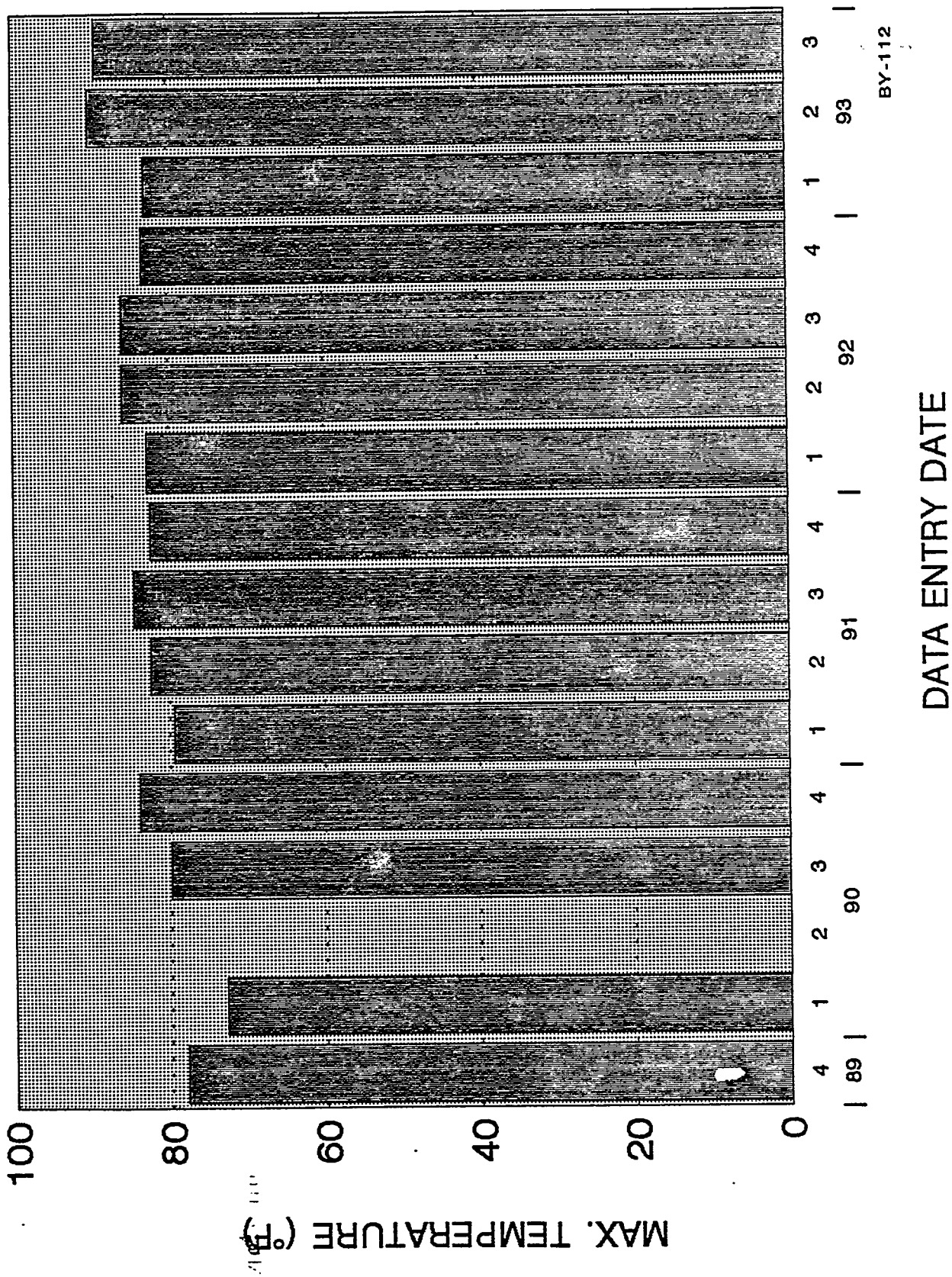

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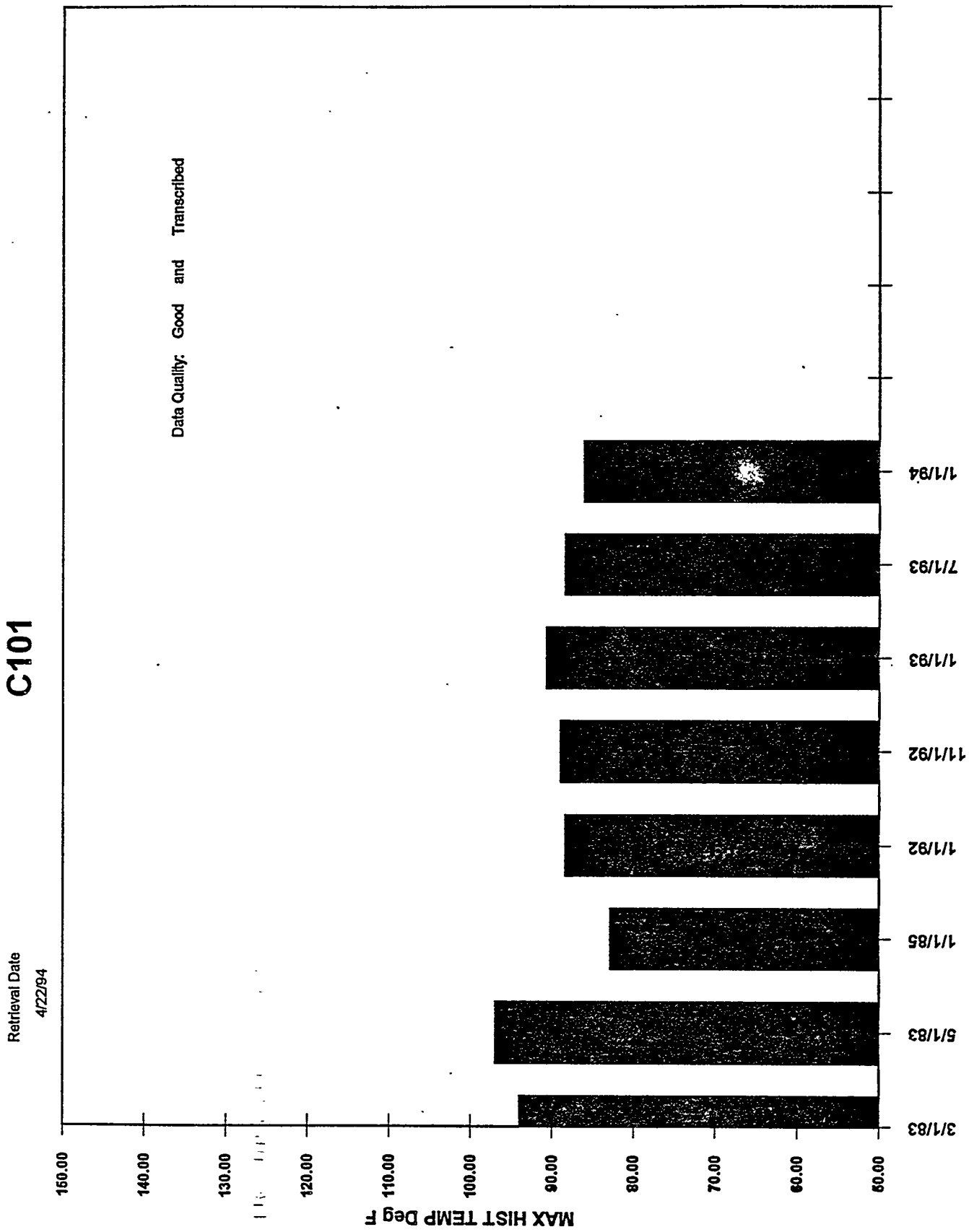

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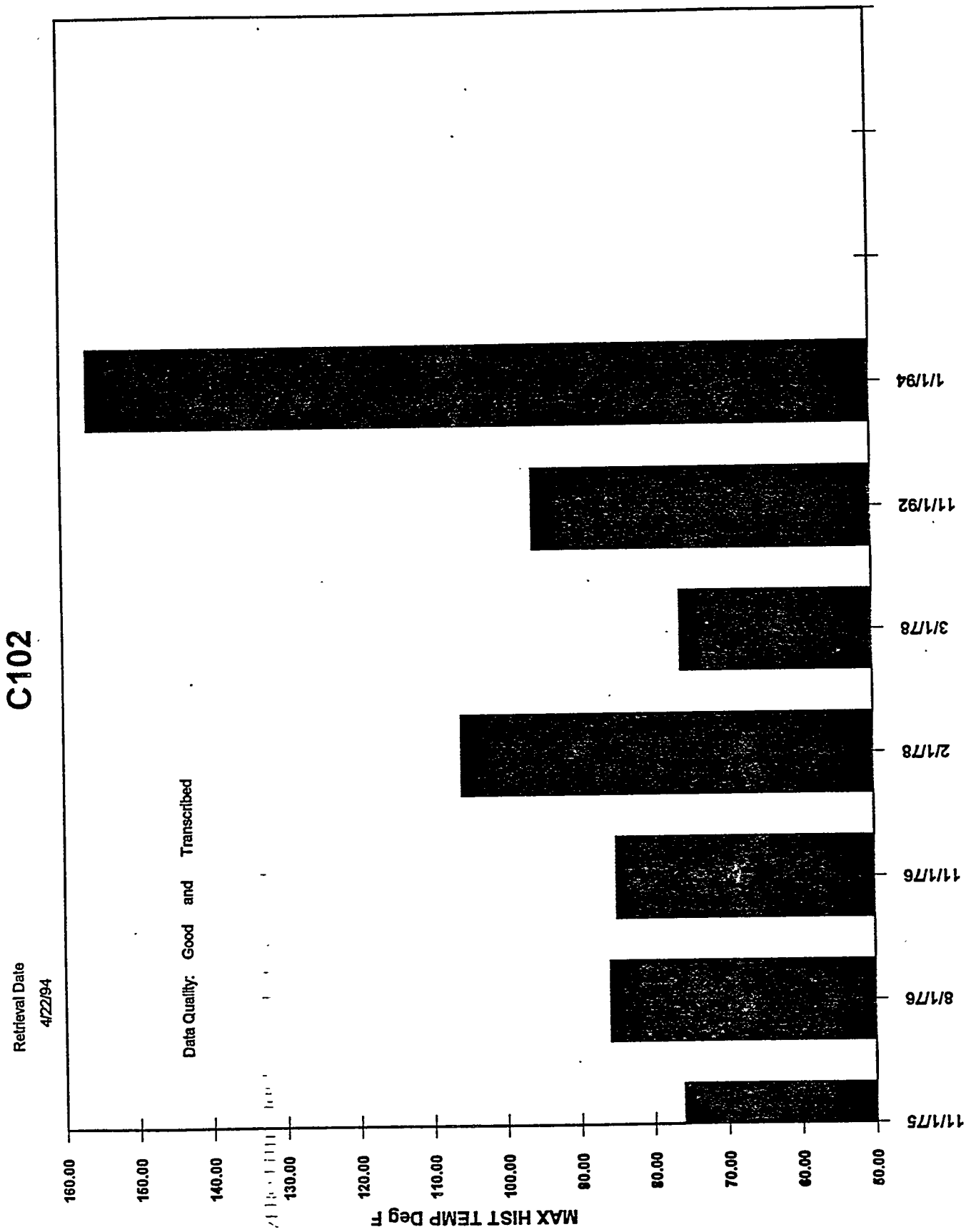

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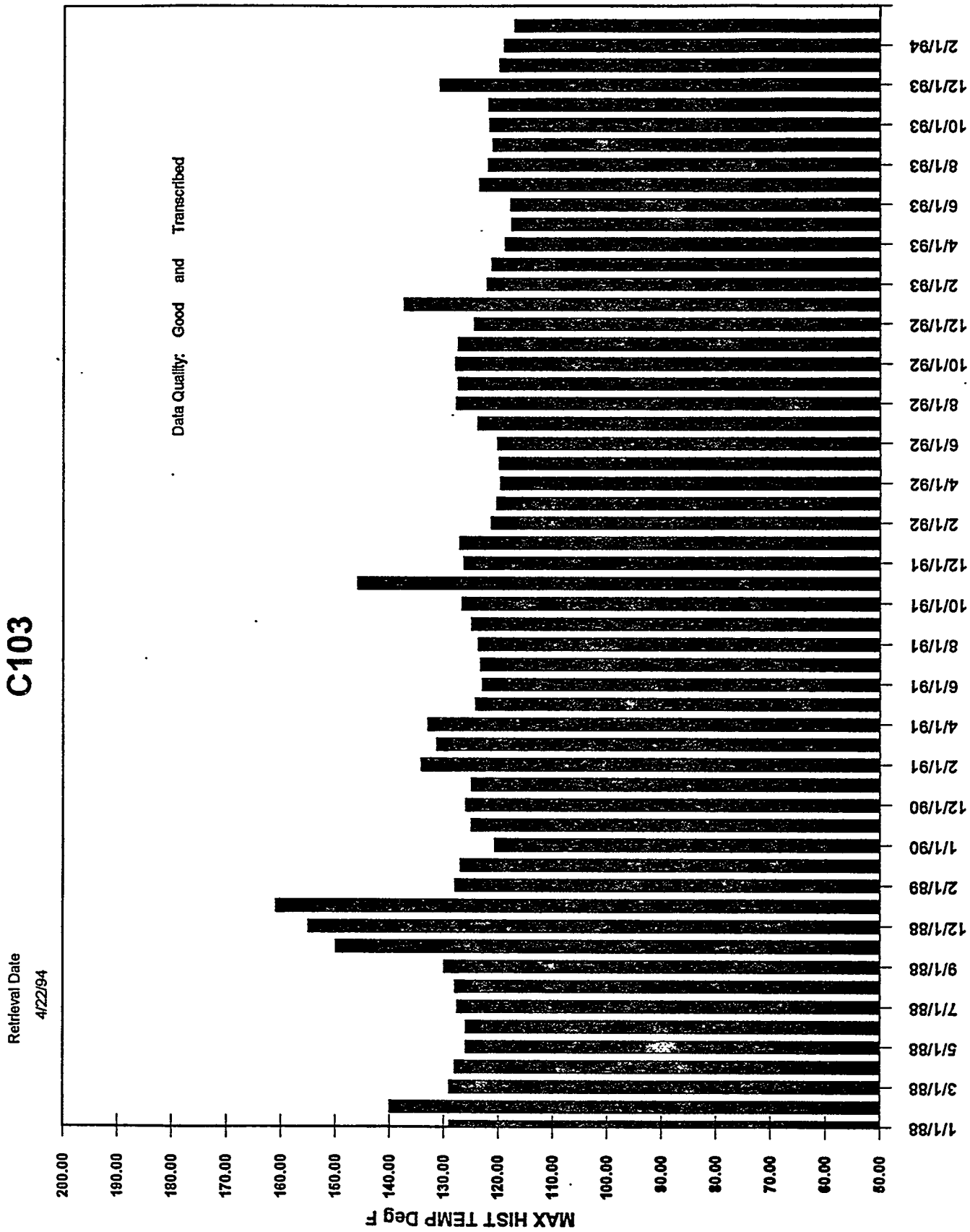

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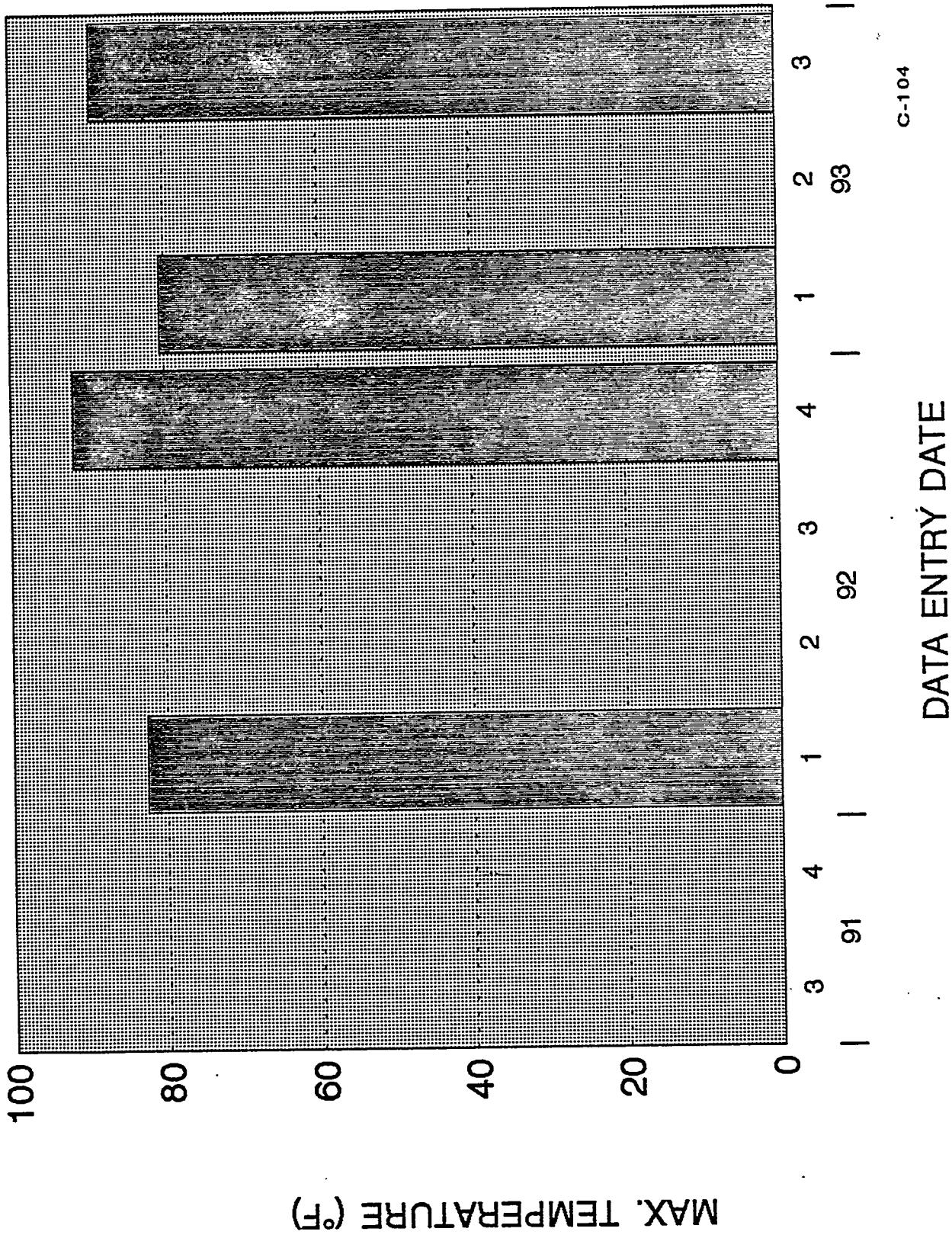

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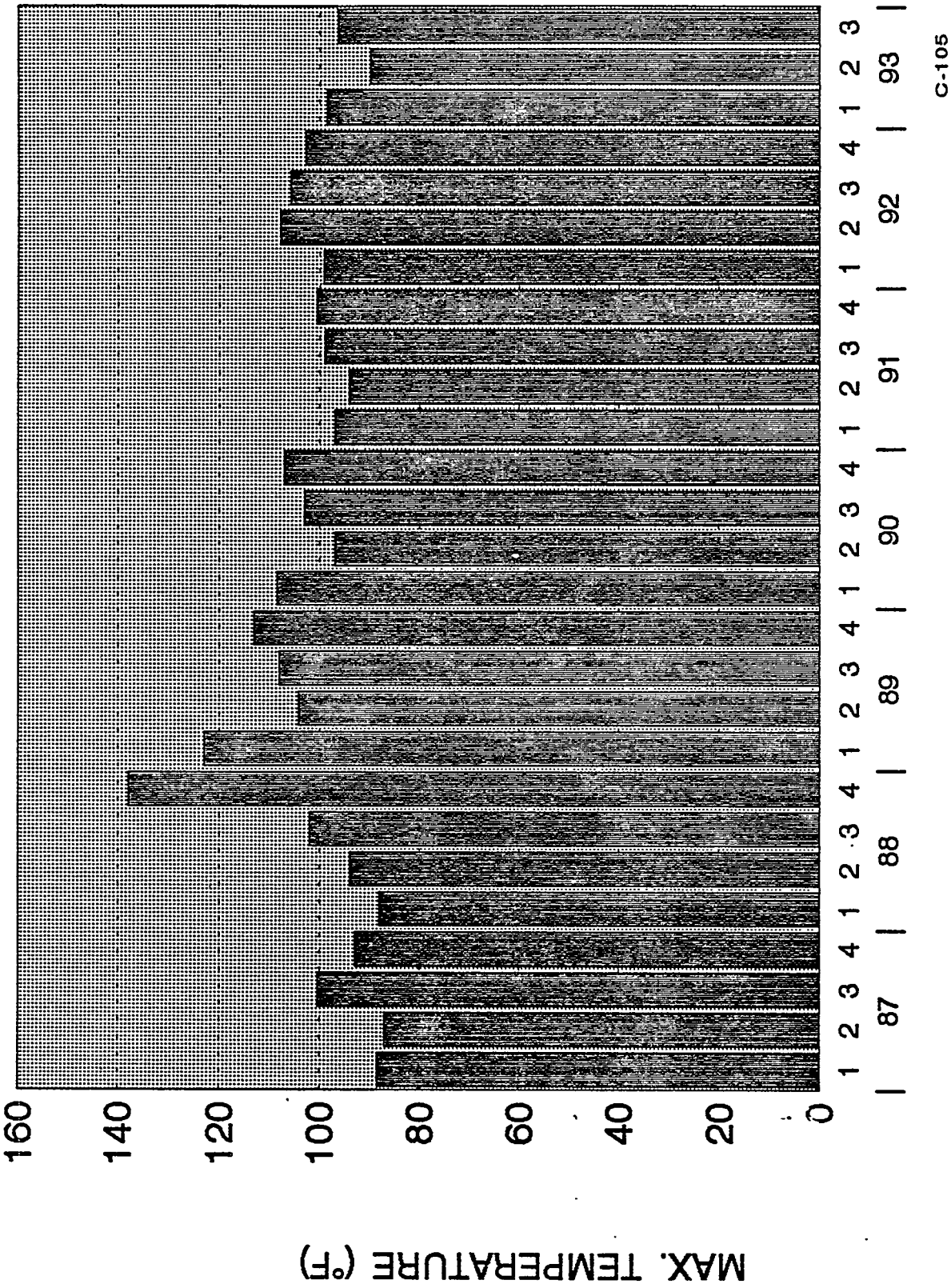

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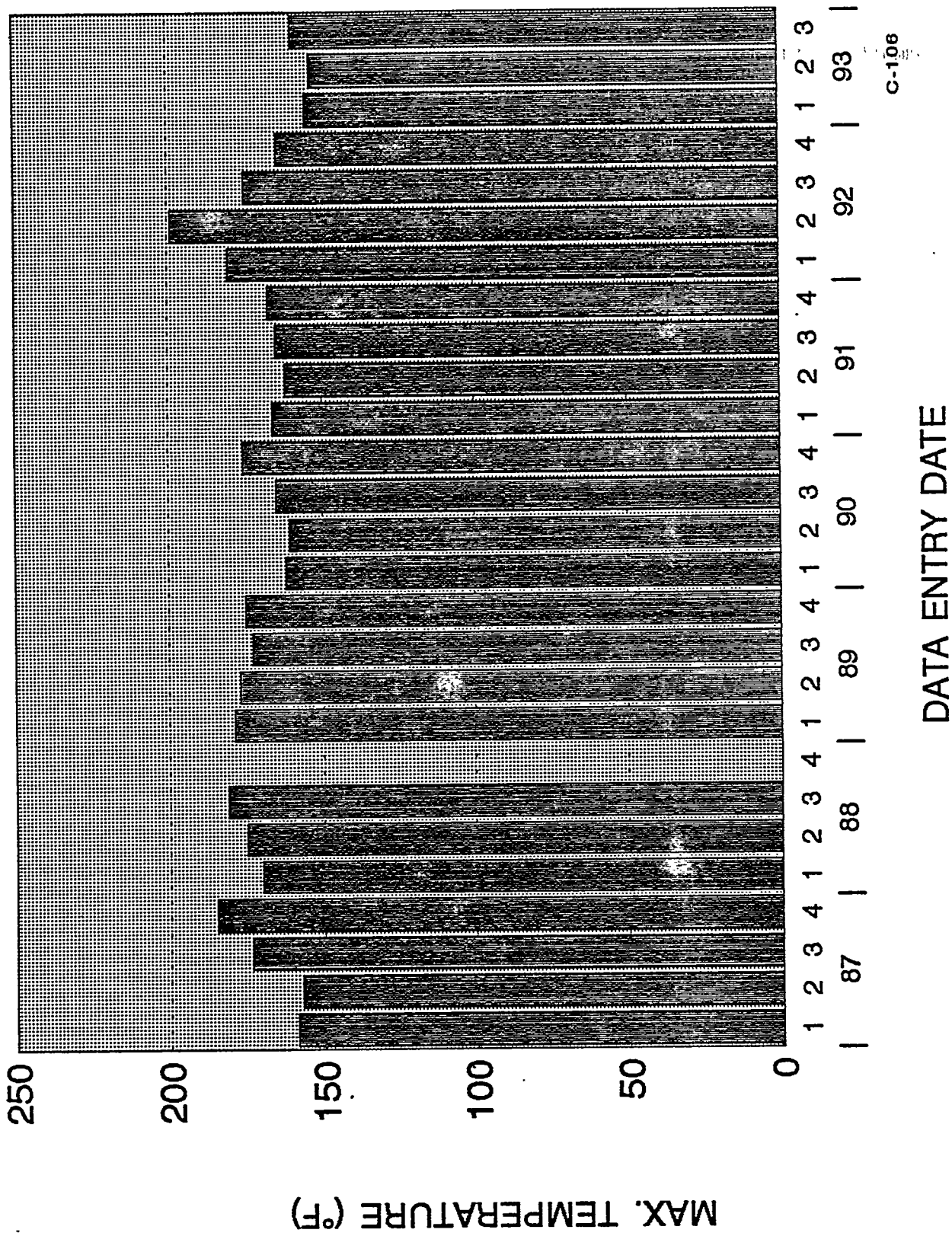

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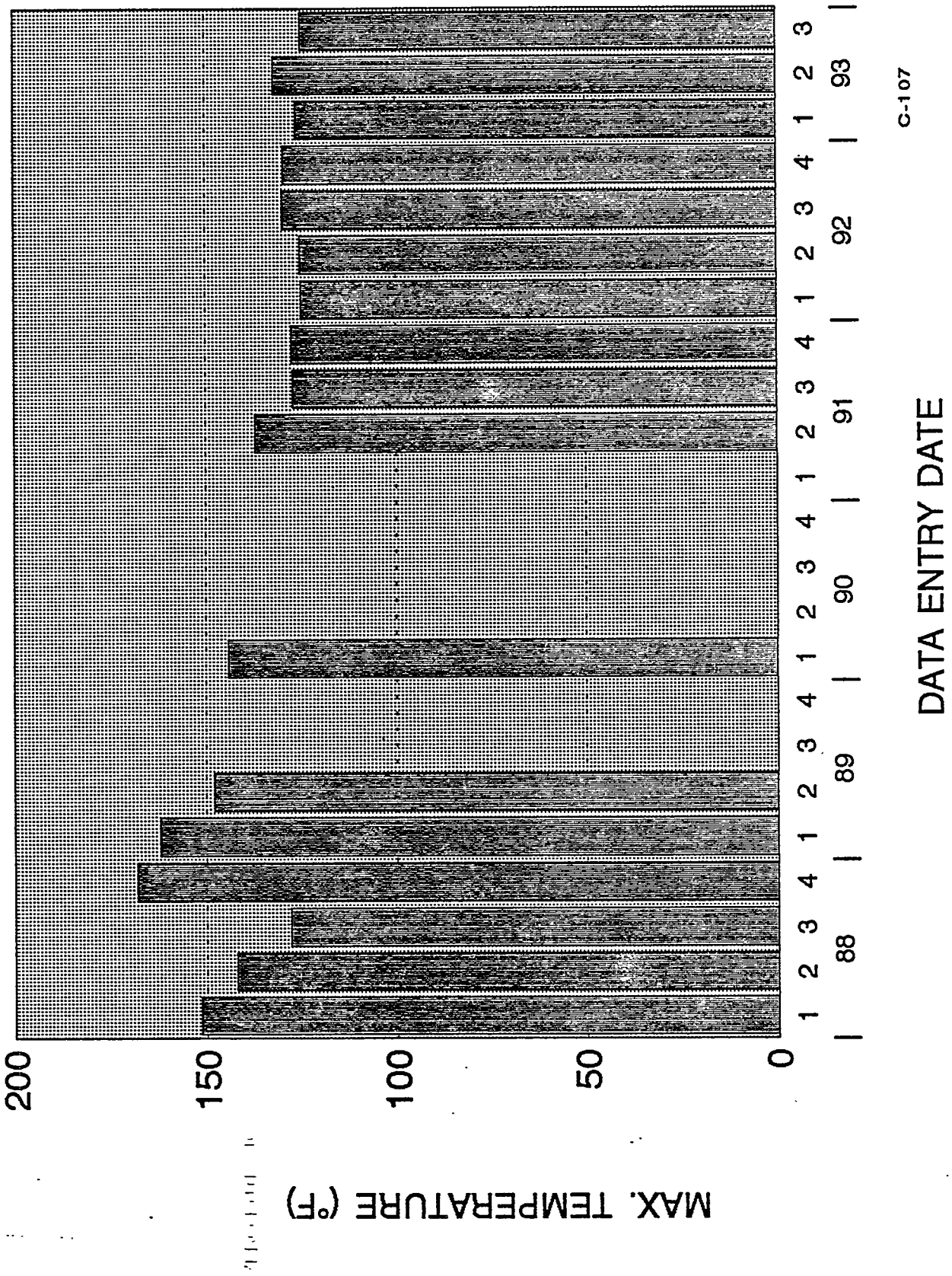

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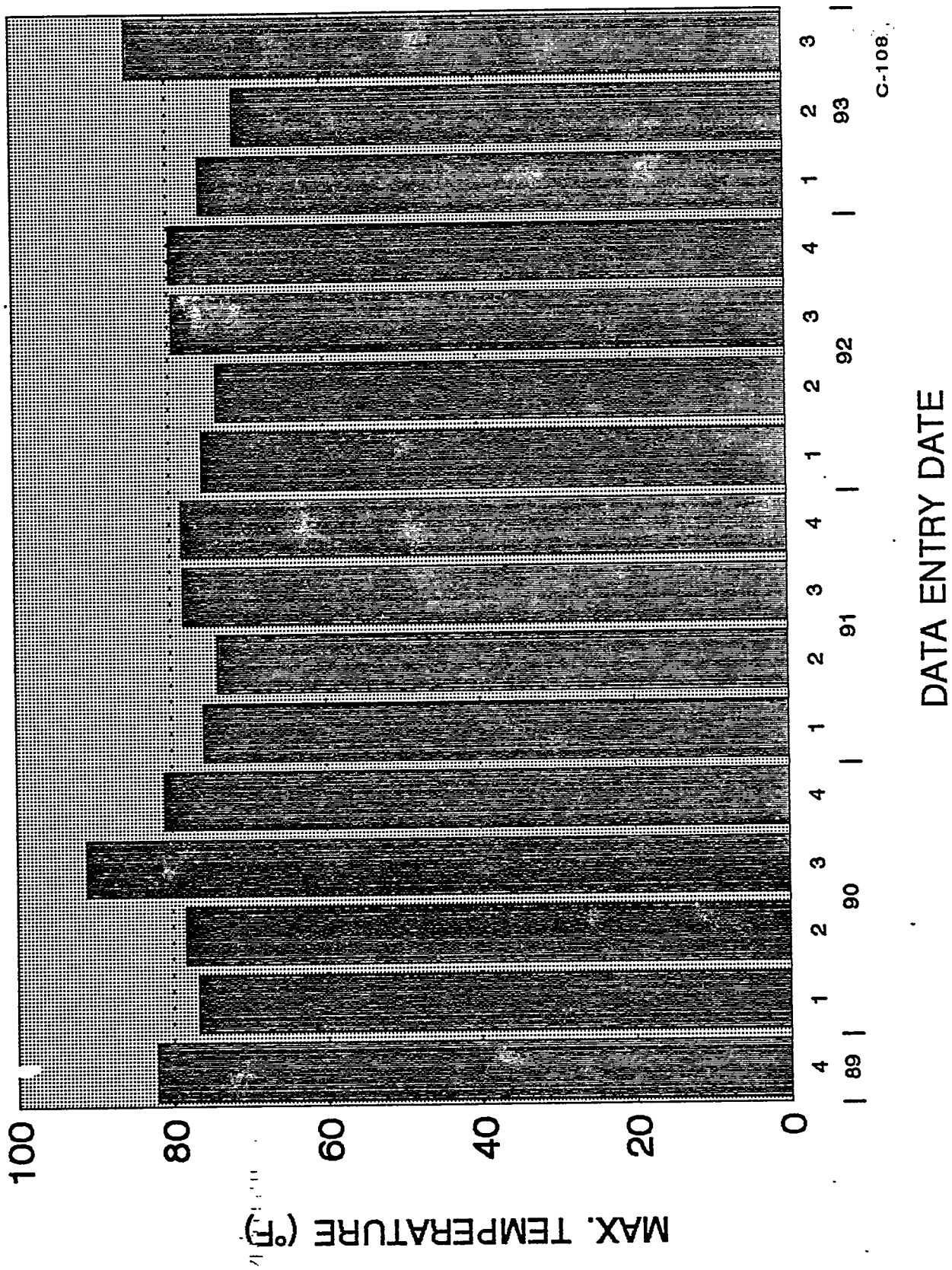

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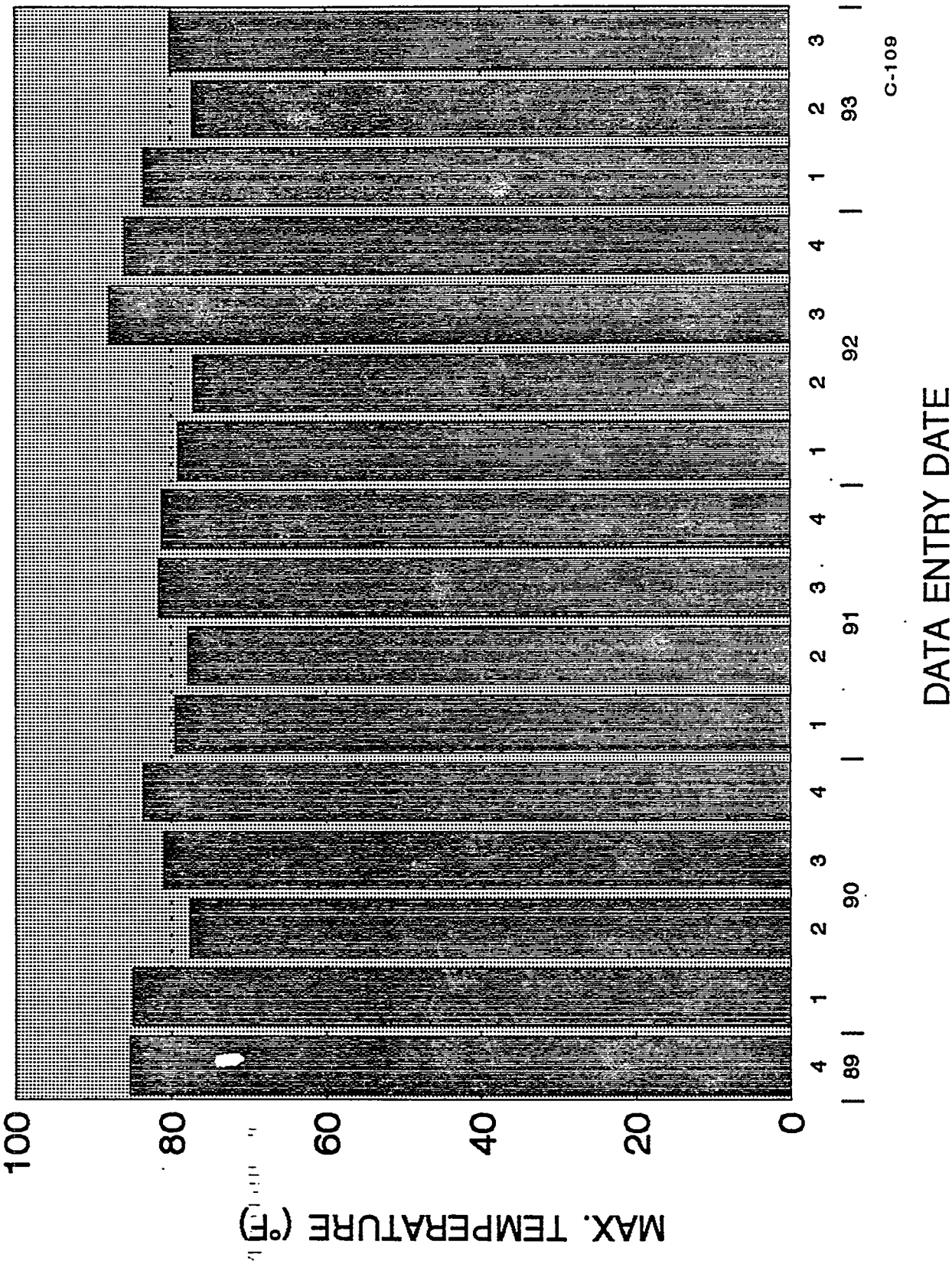

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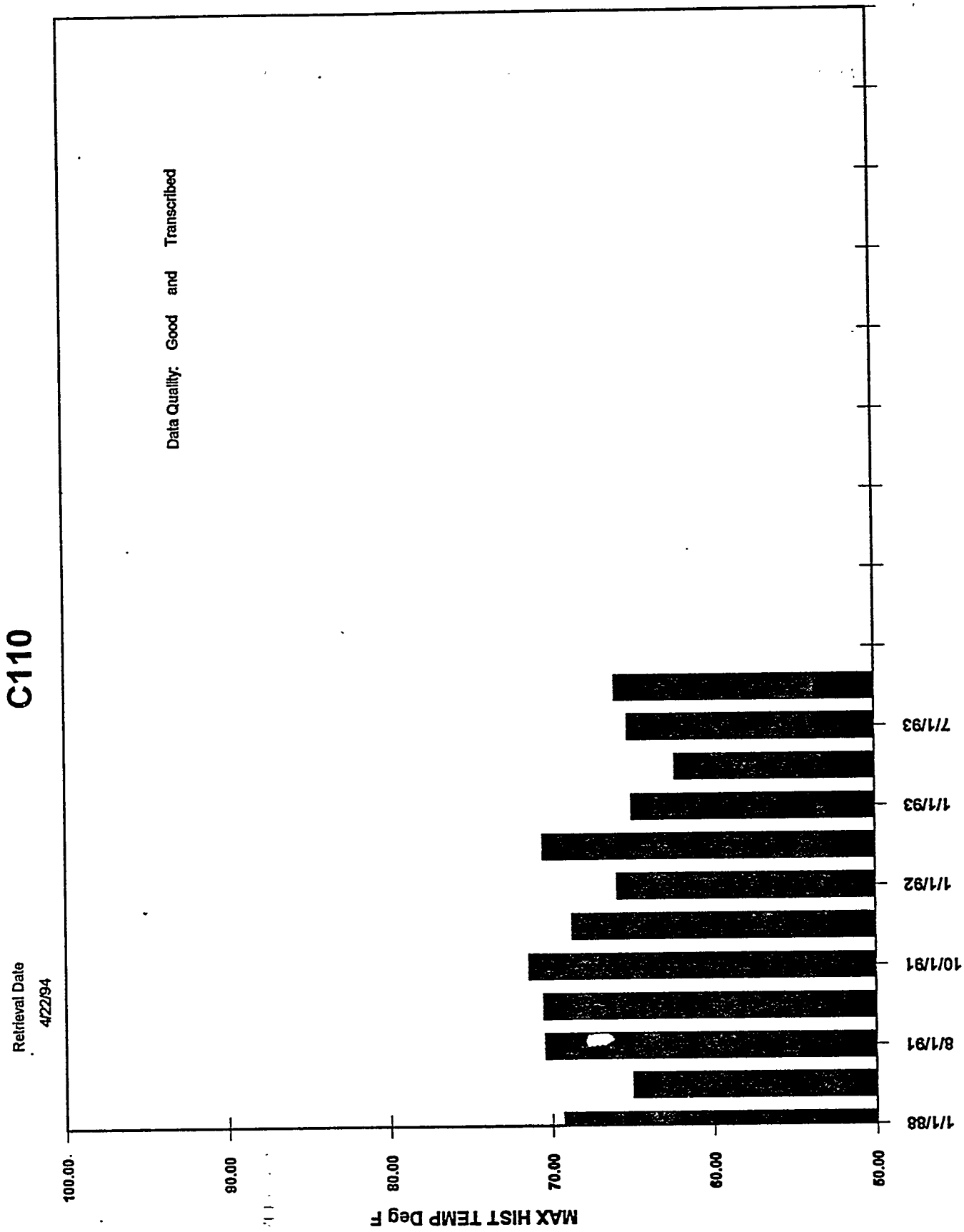
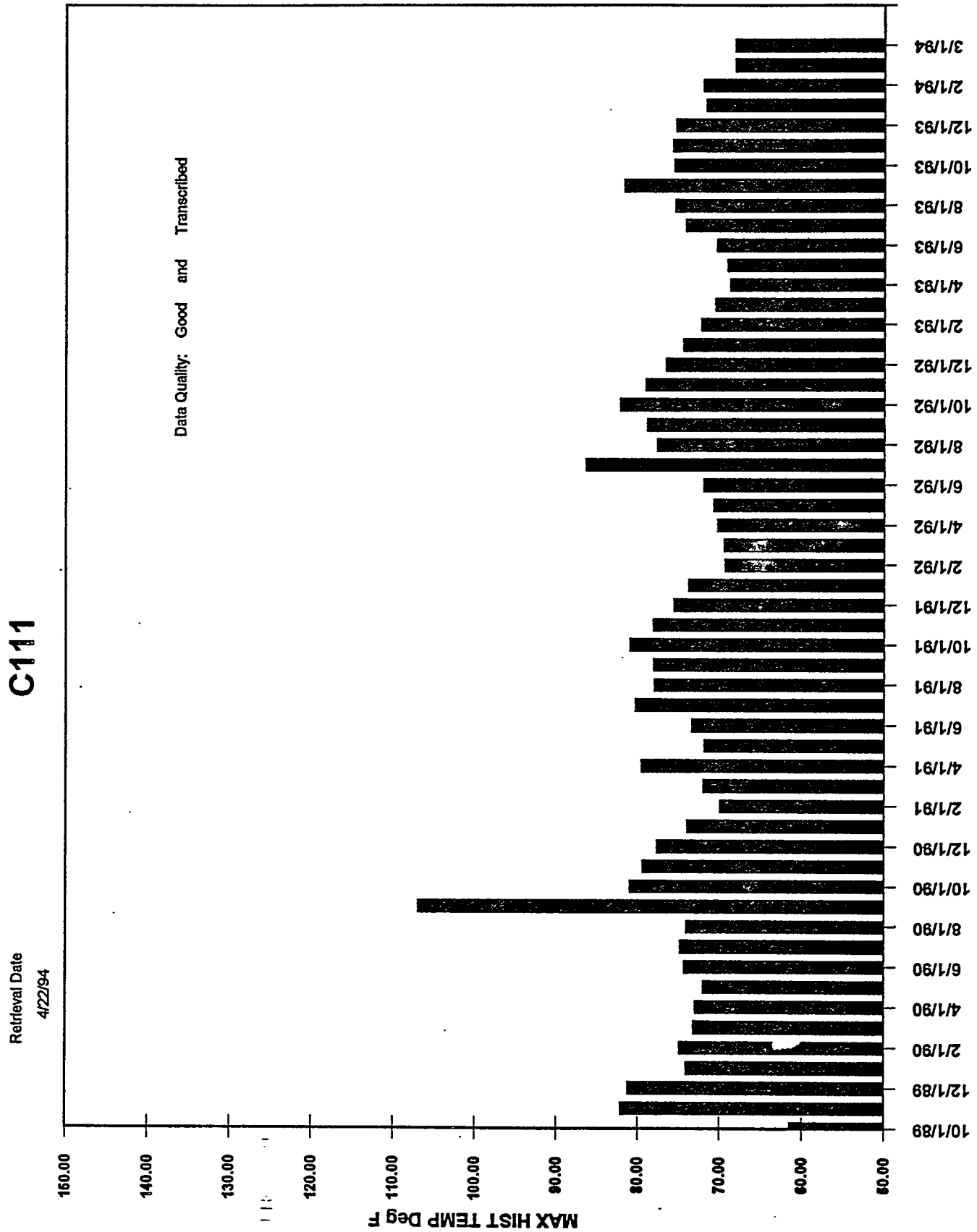


Maximum Temperature History Plot



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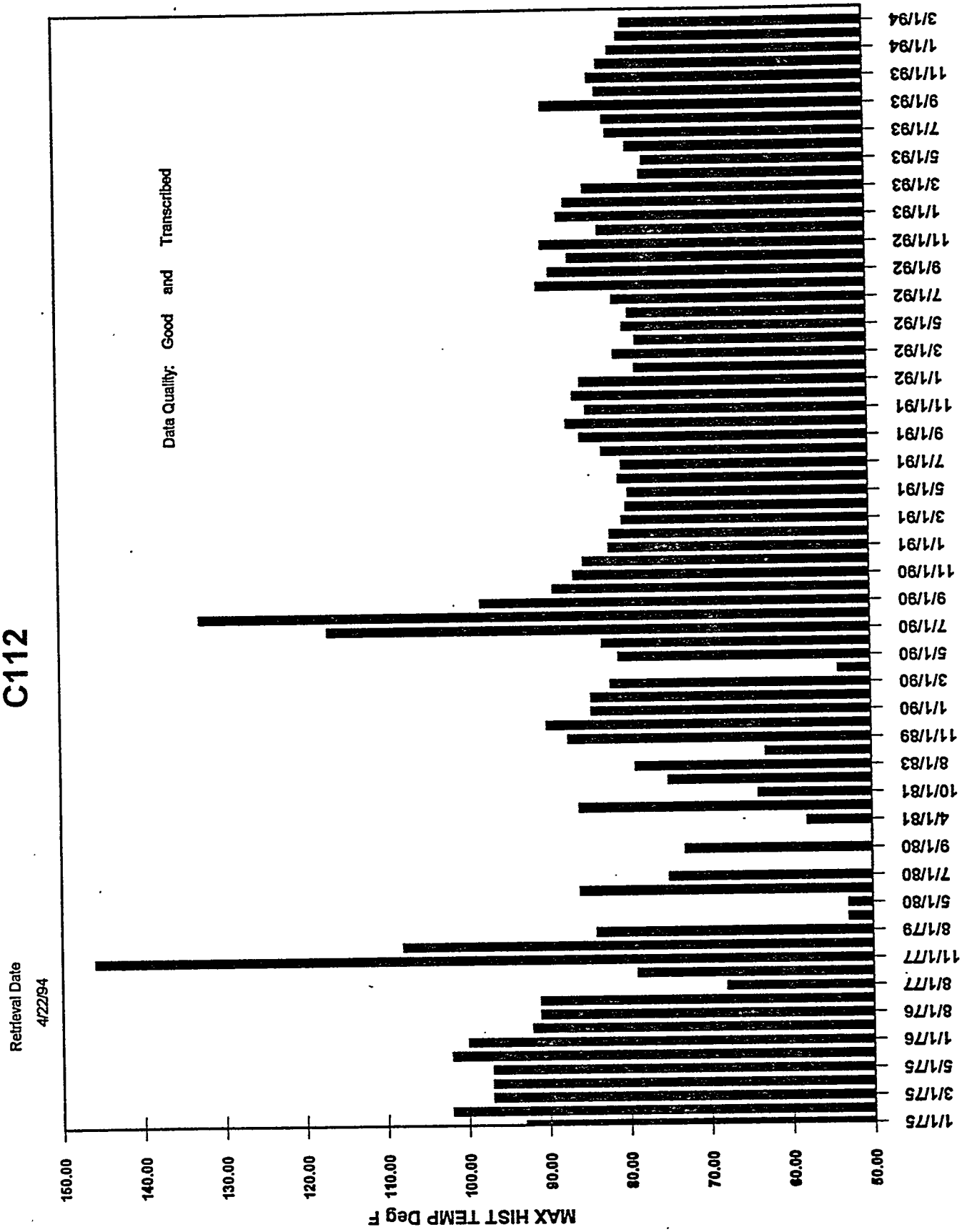

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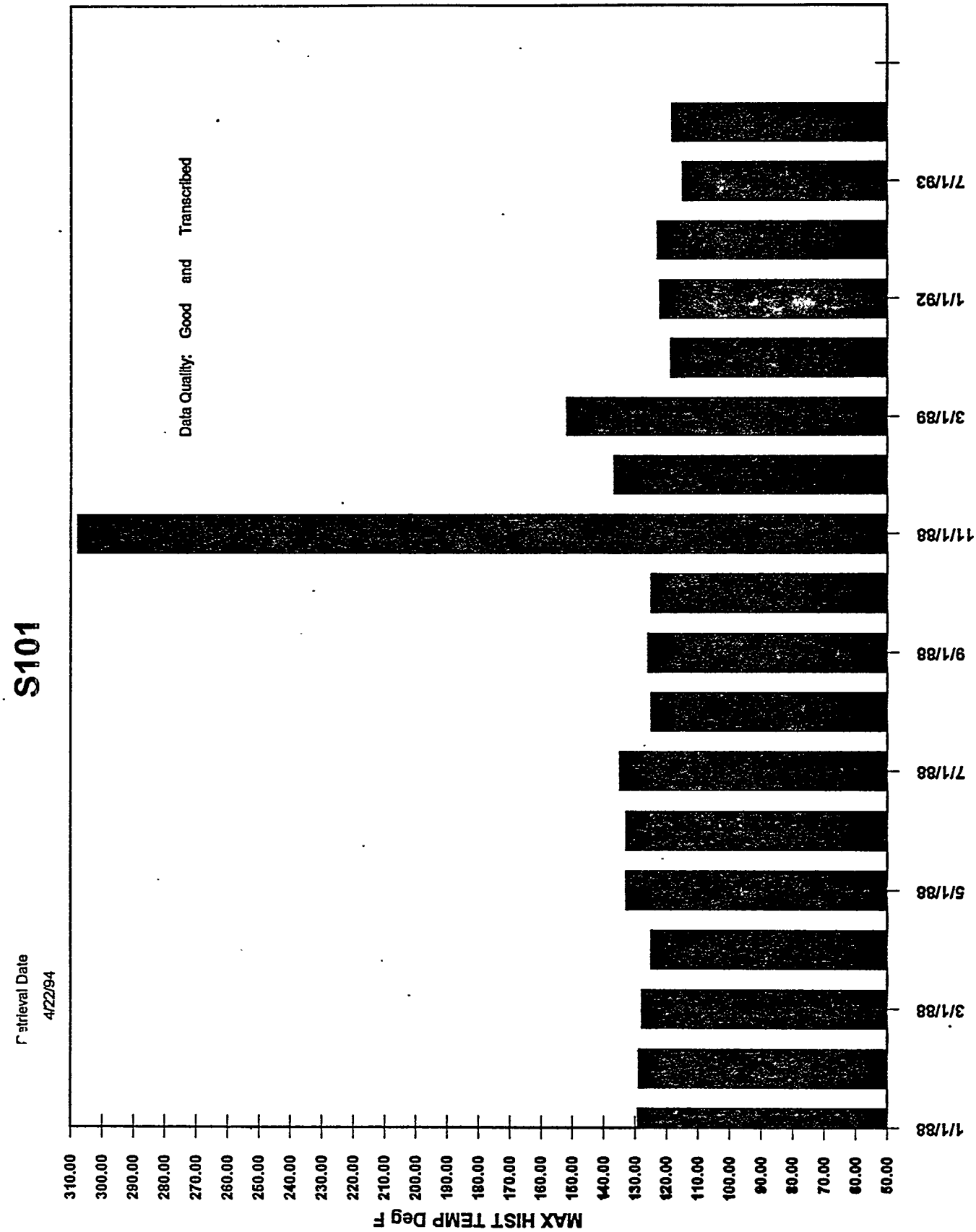

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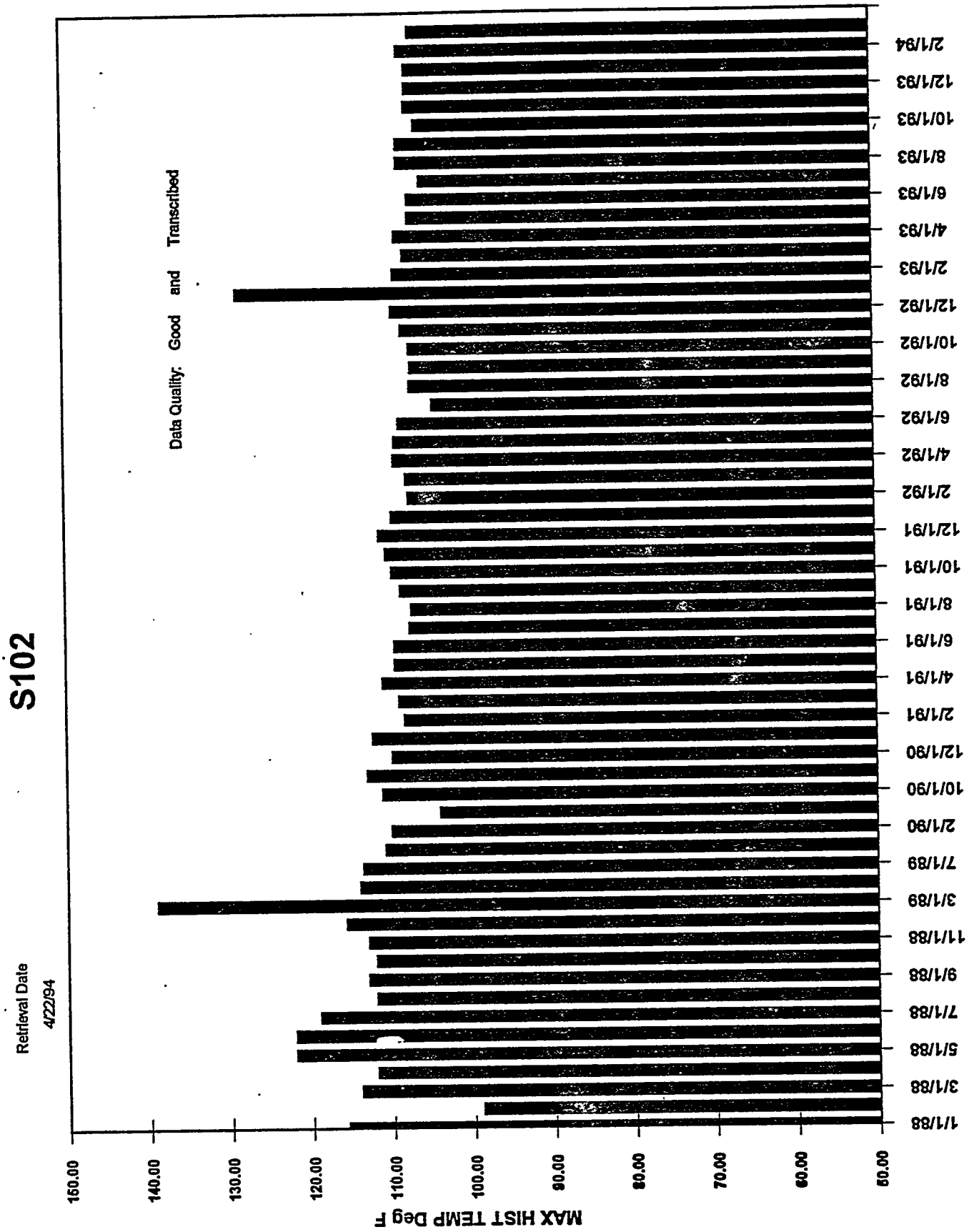

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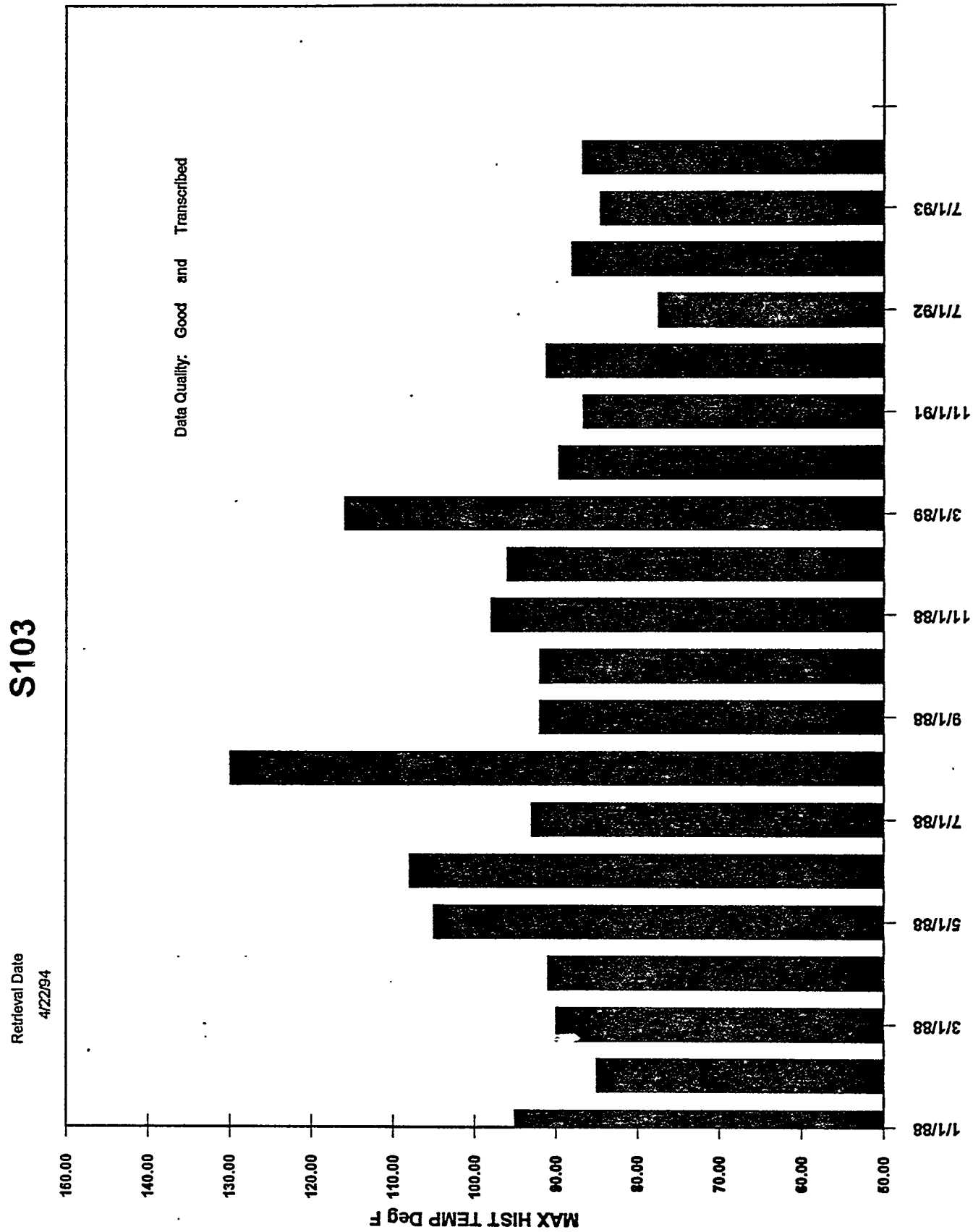

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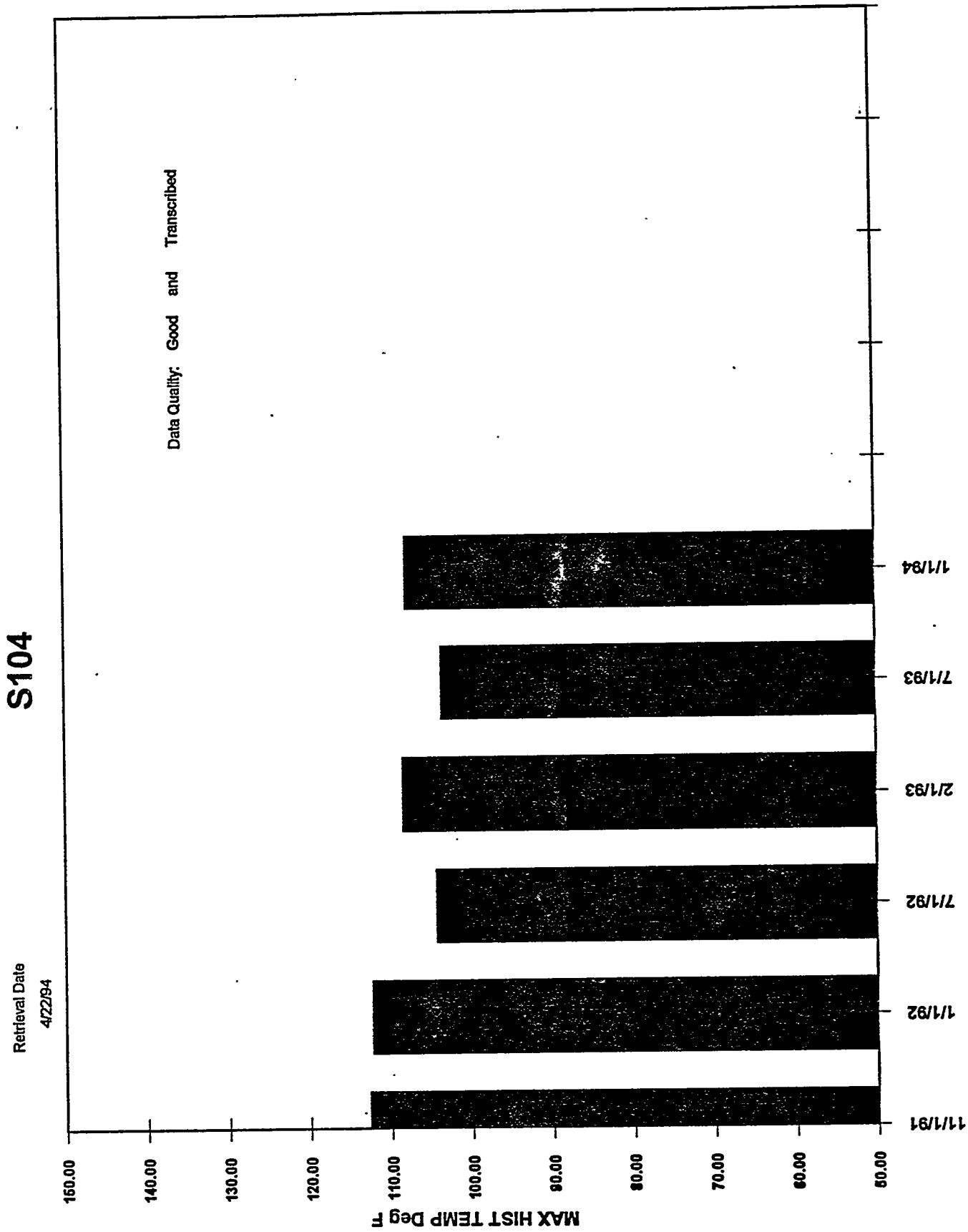

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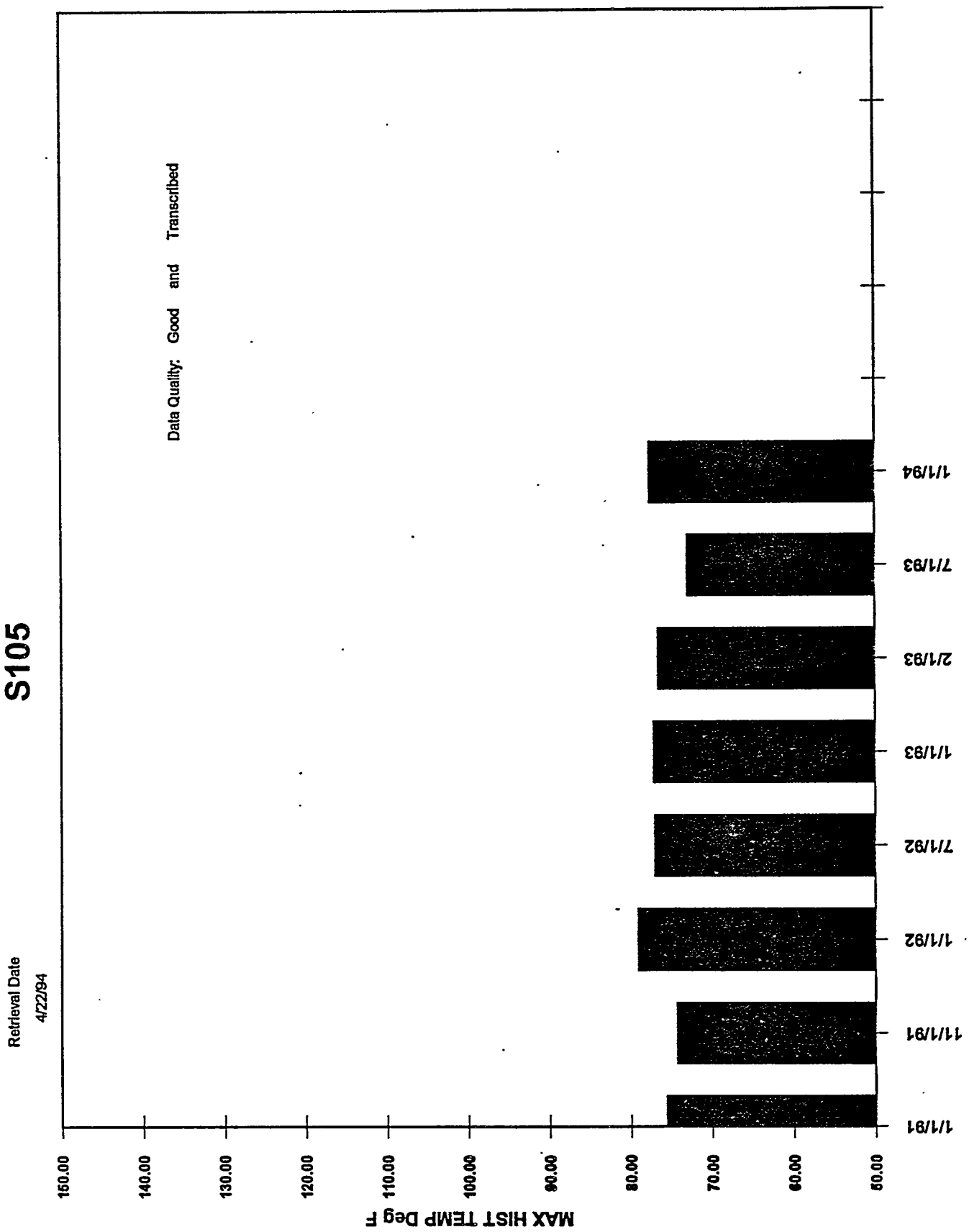

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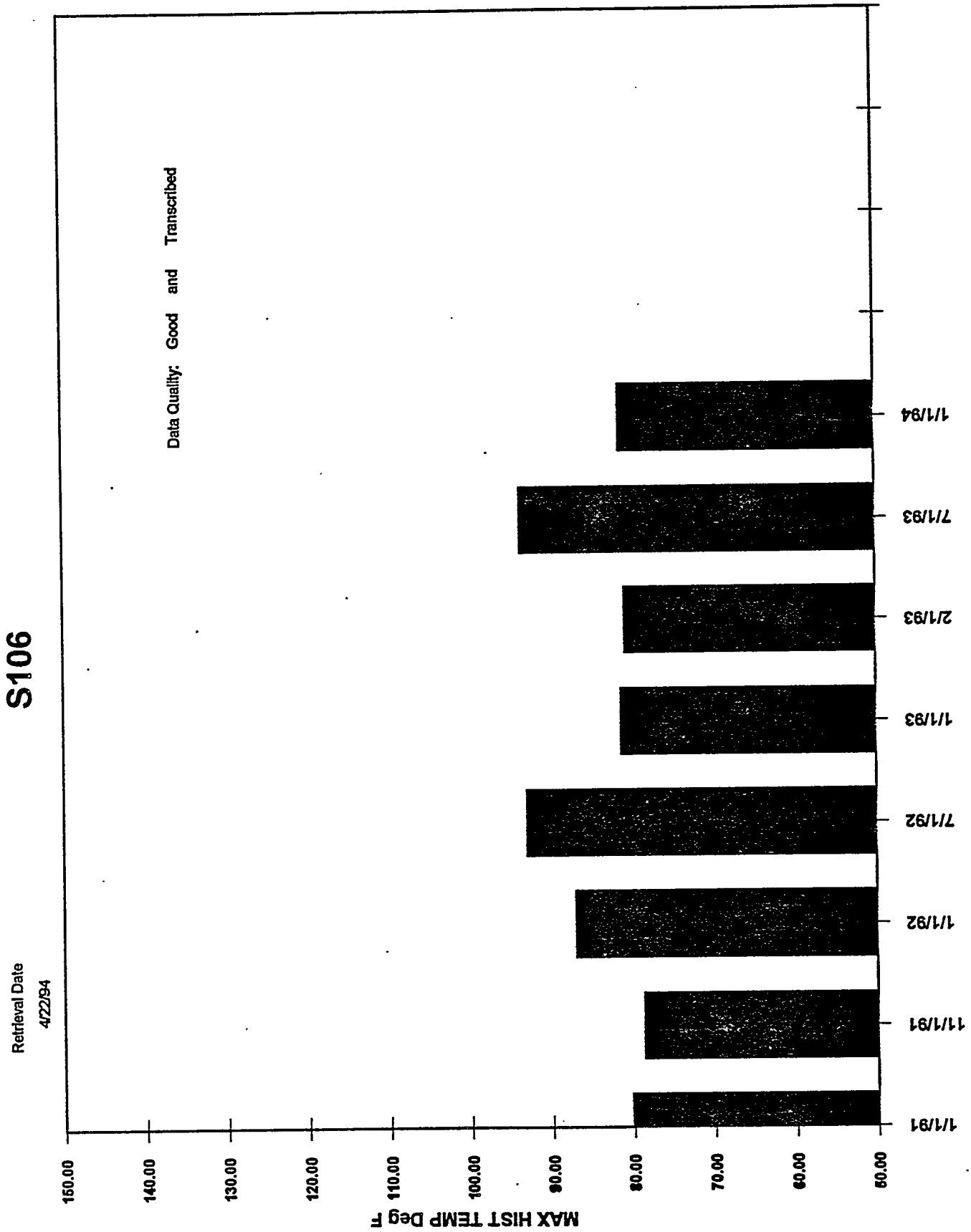

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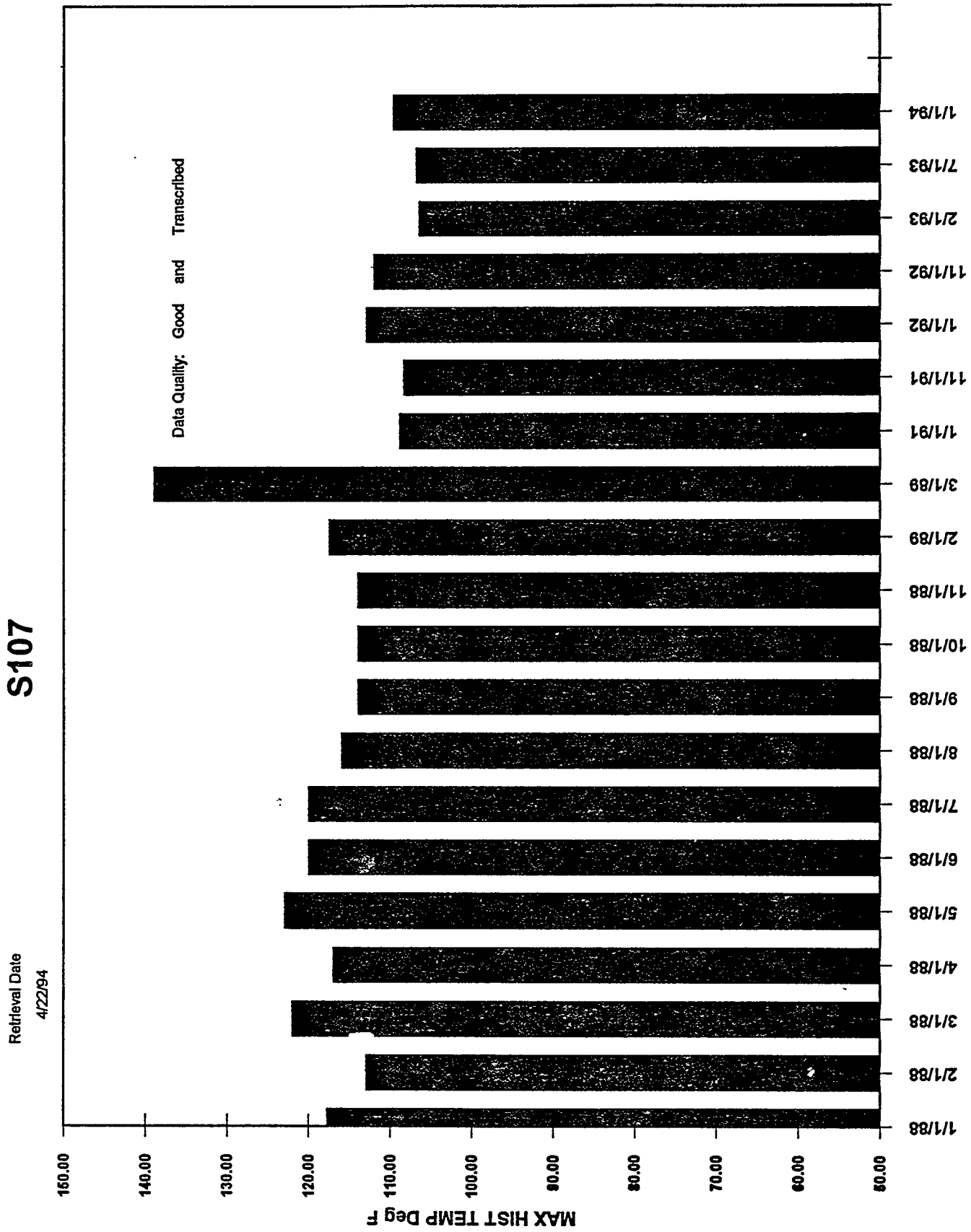

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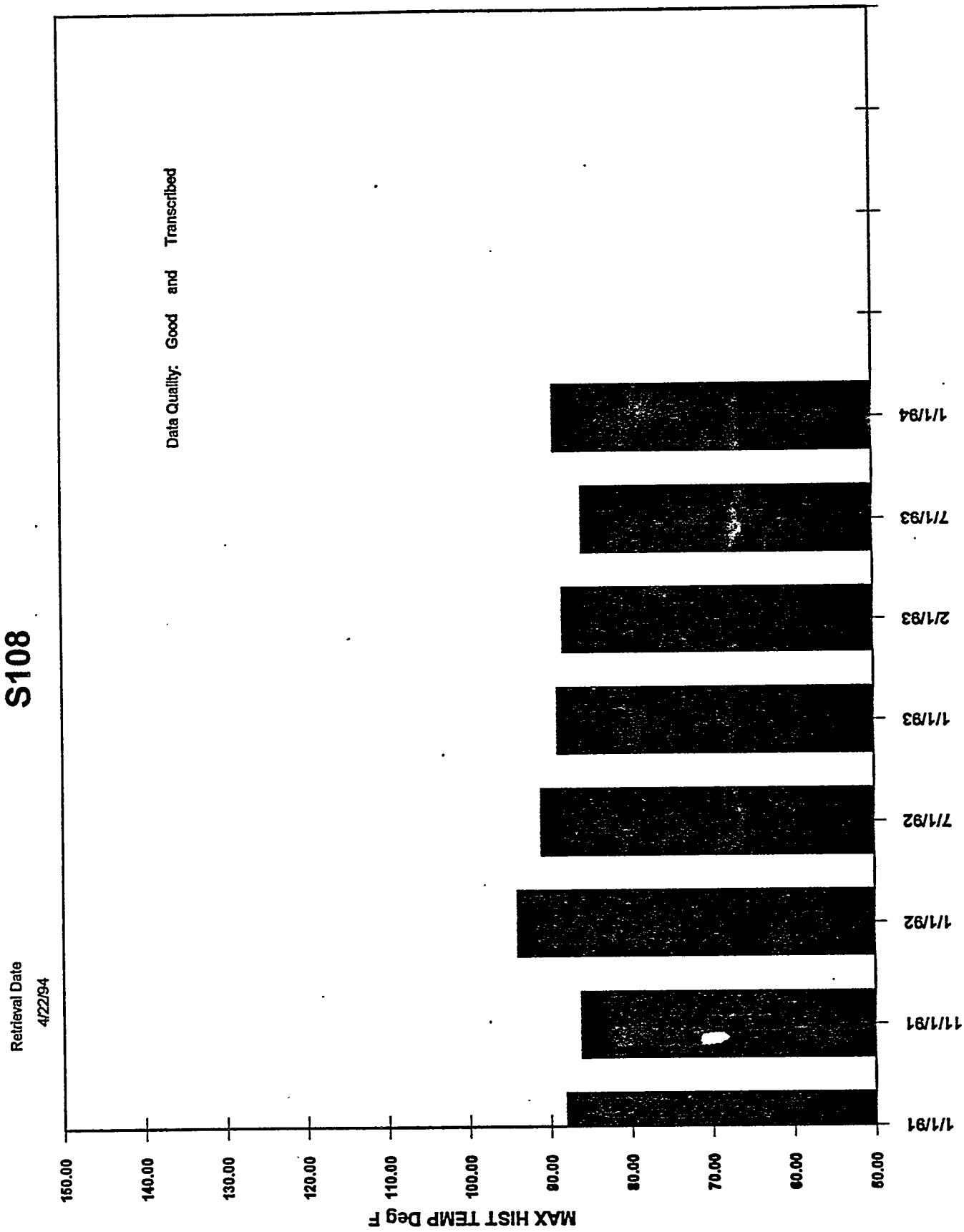

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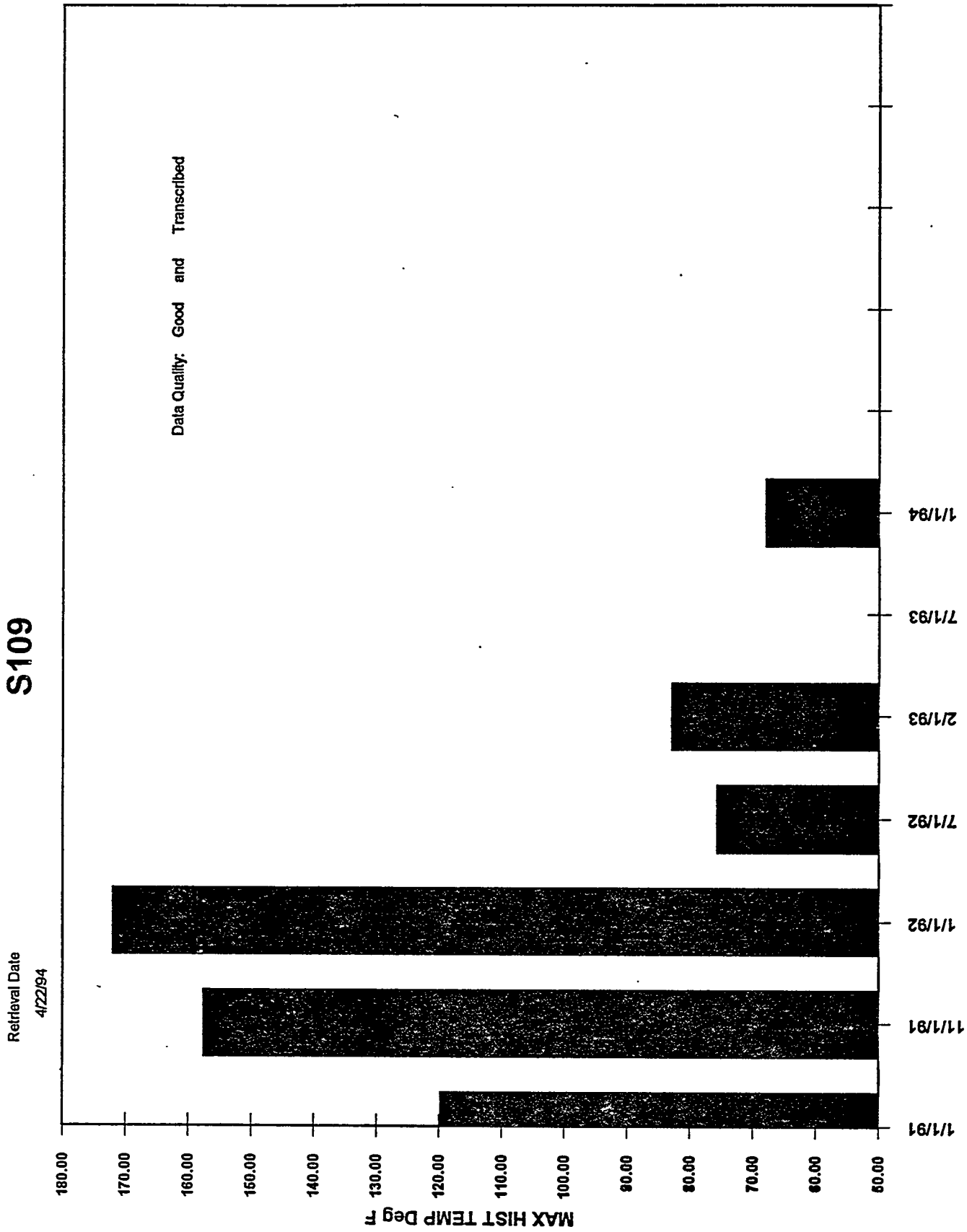

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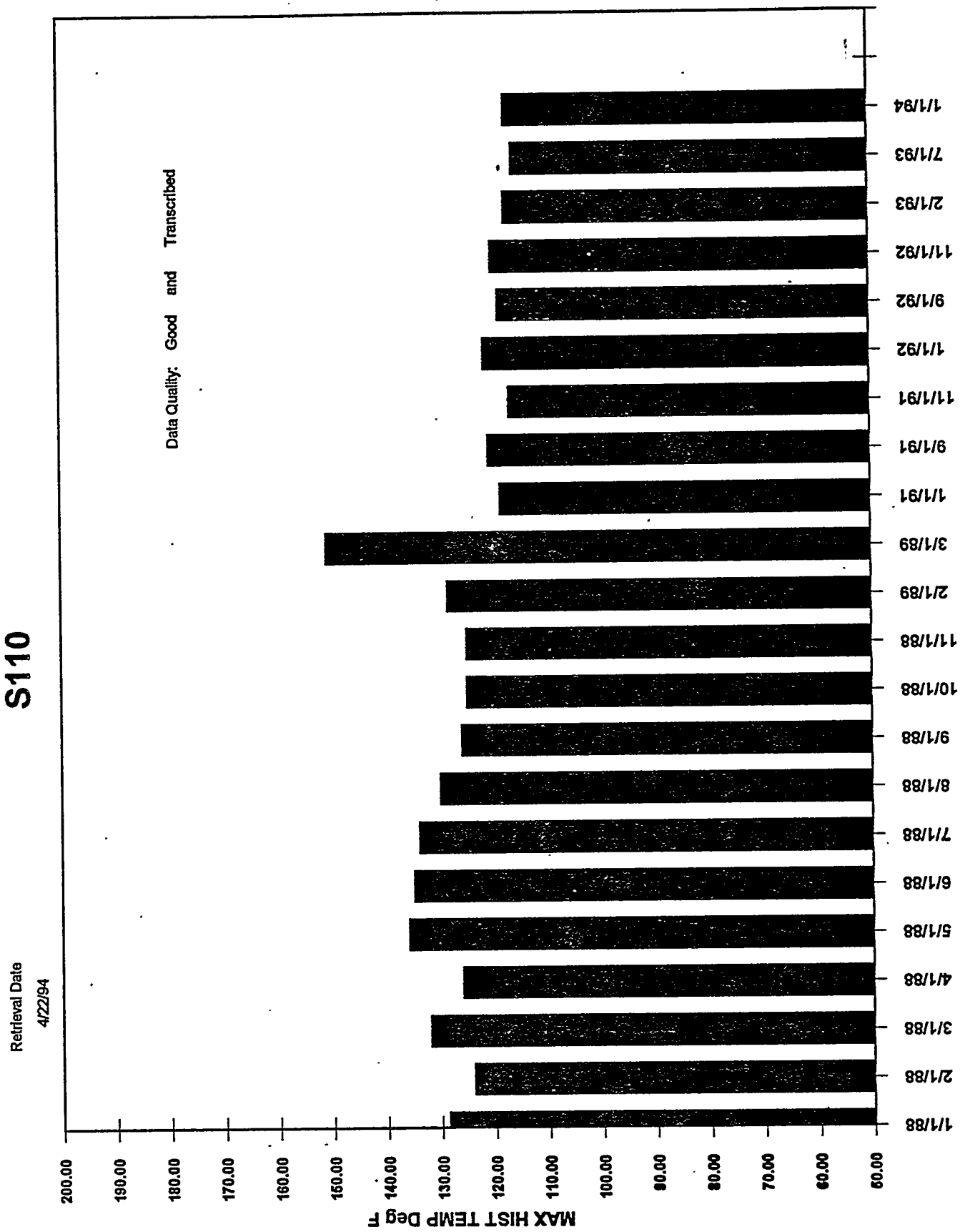

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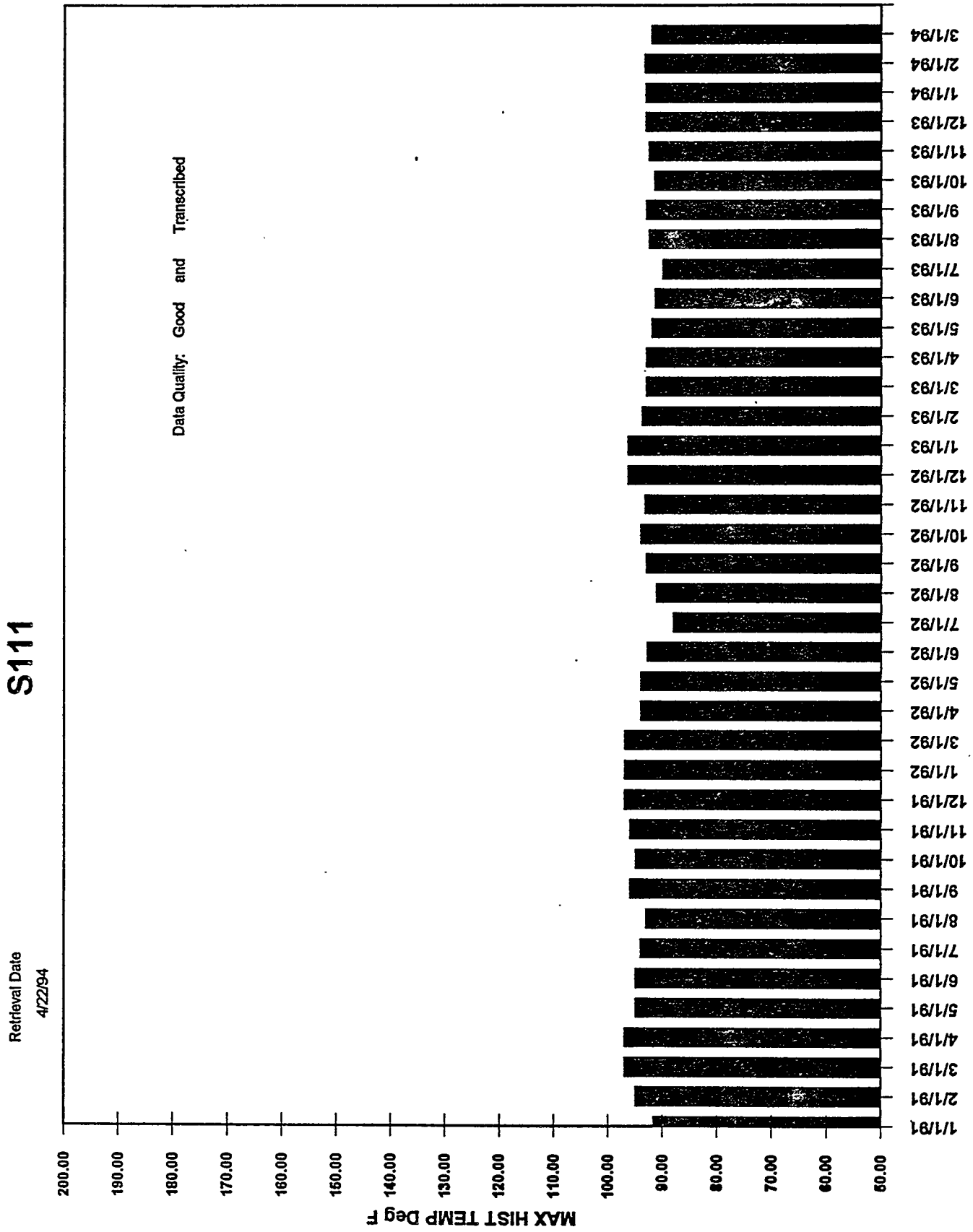

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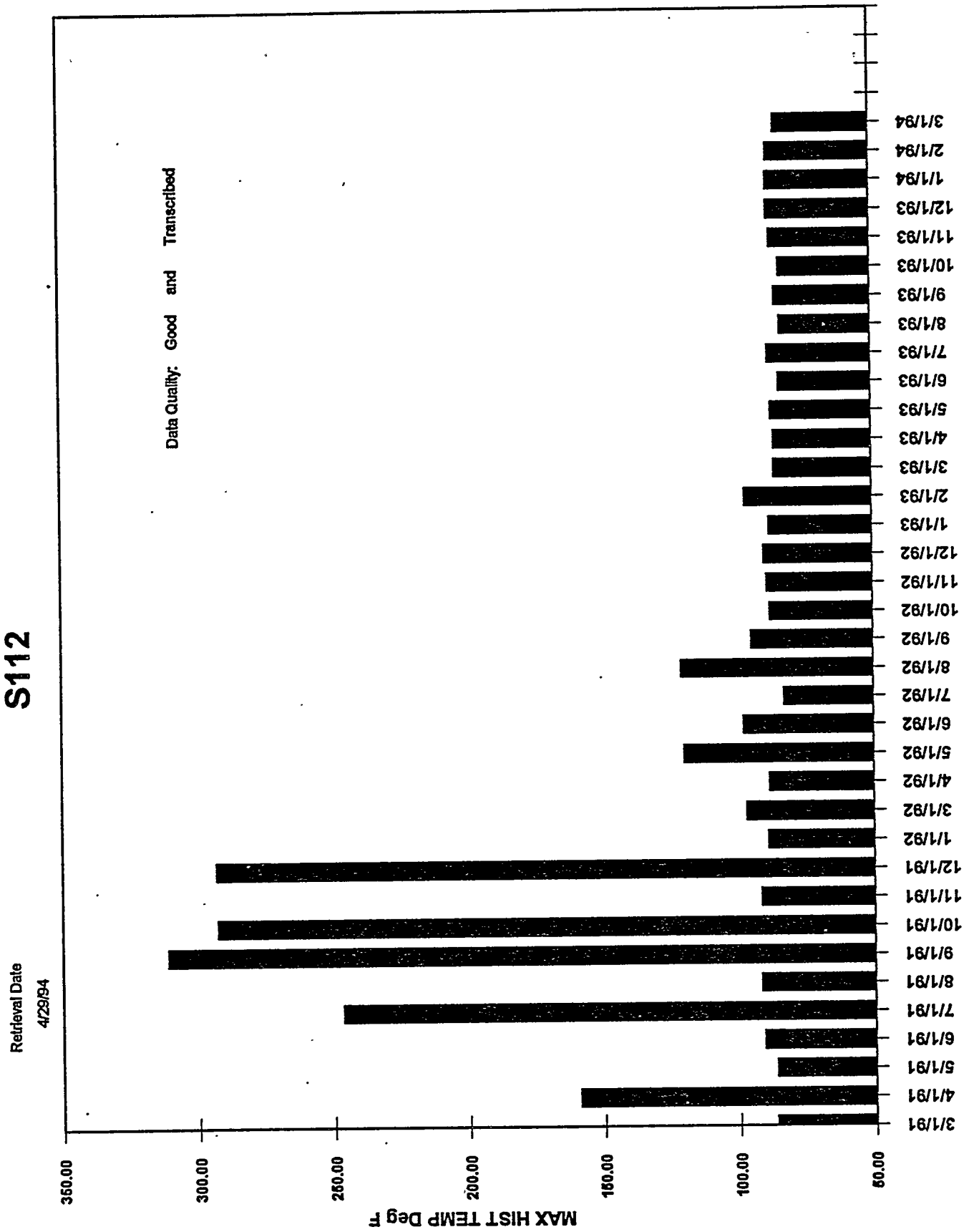

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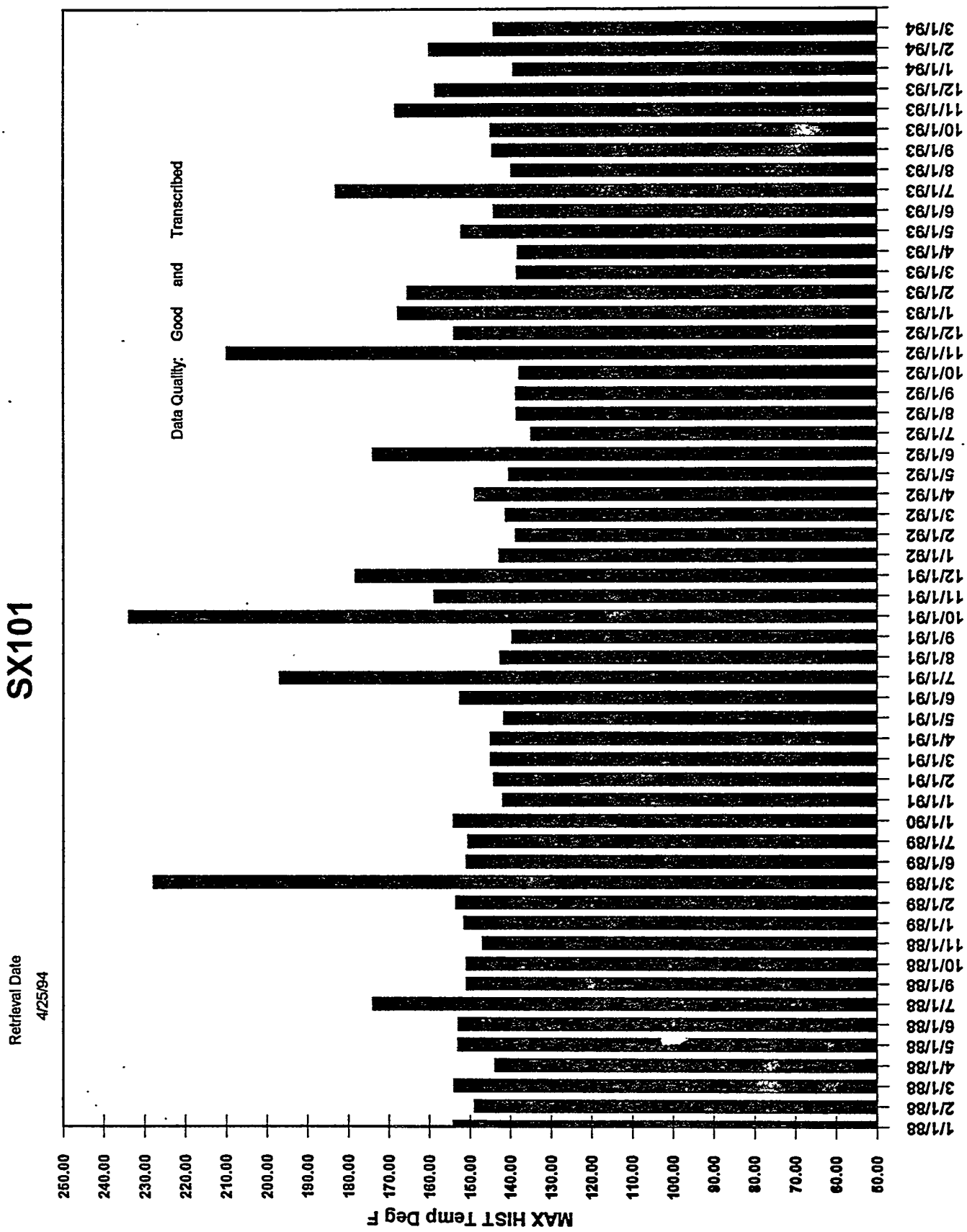

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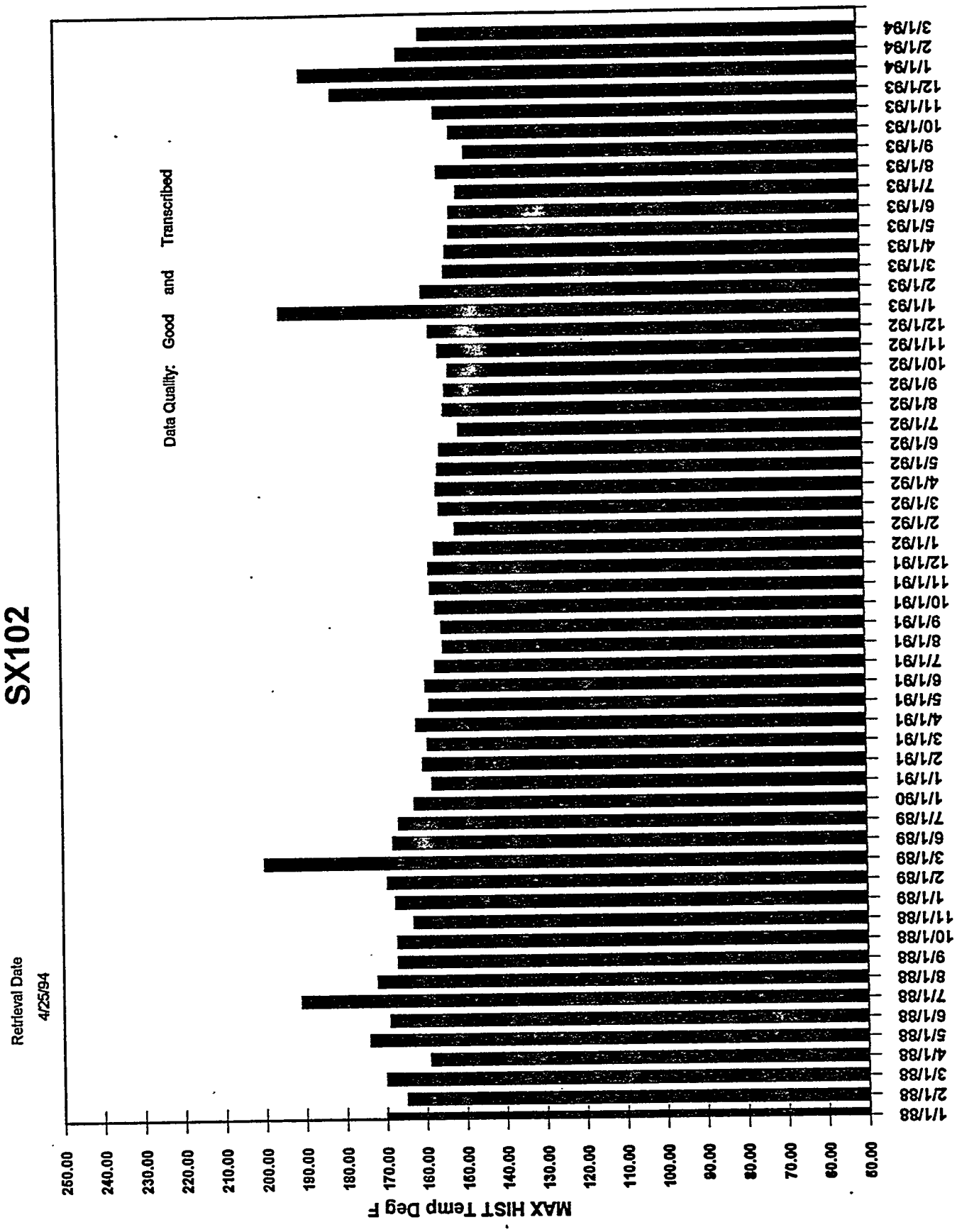

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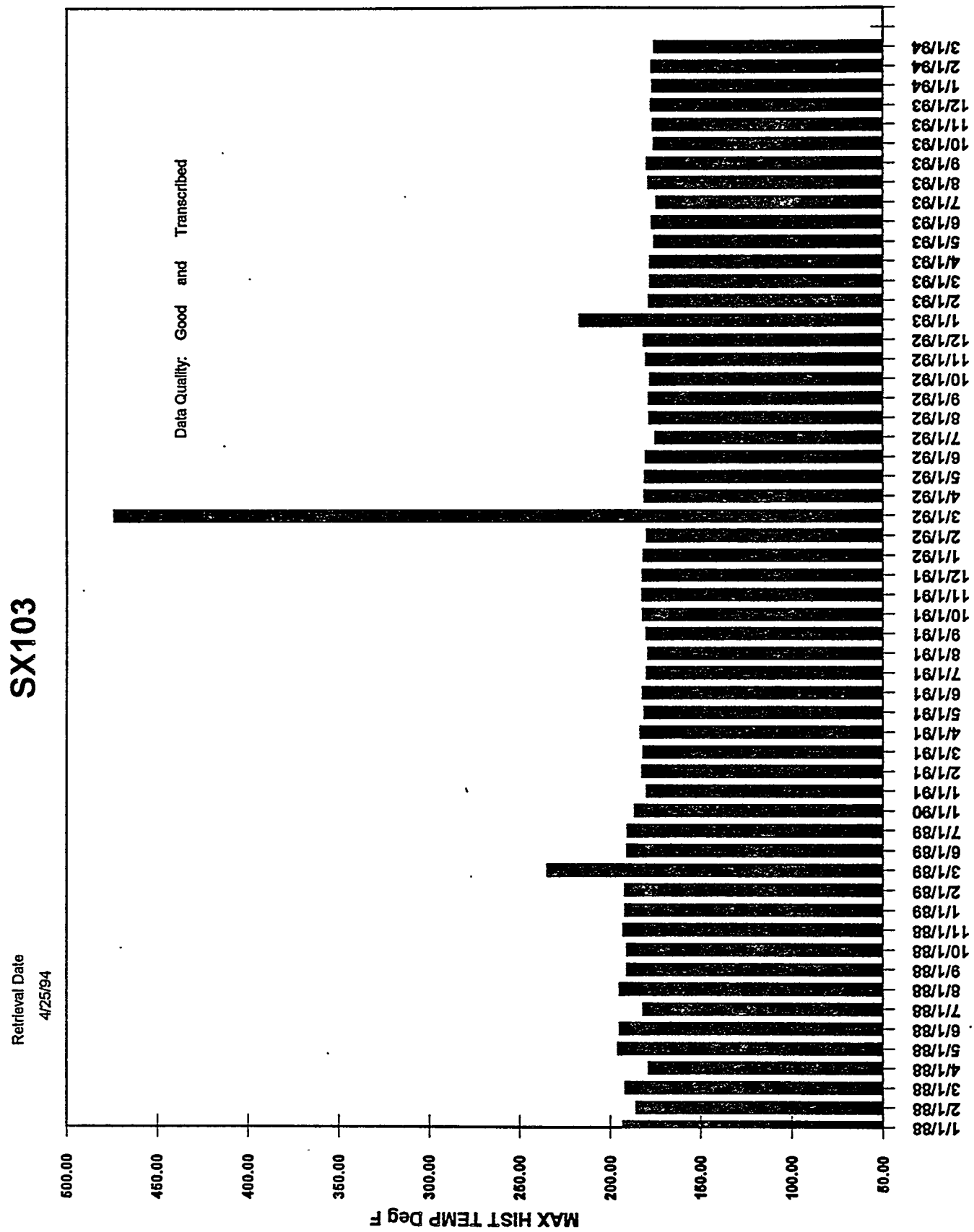

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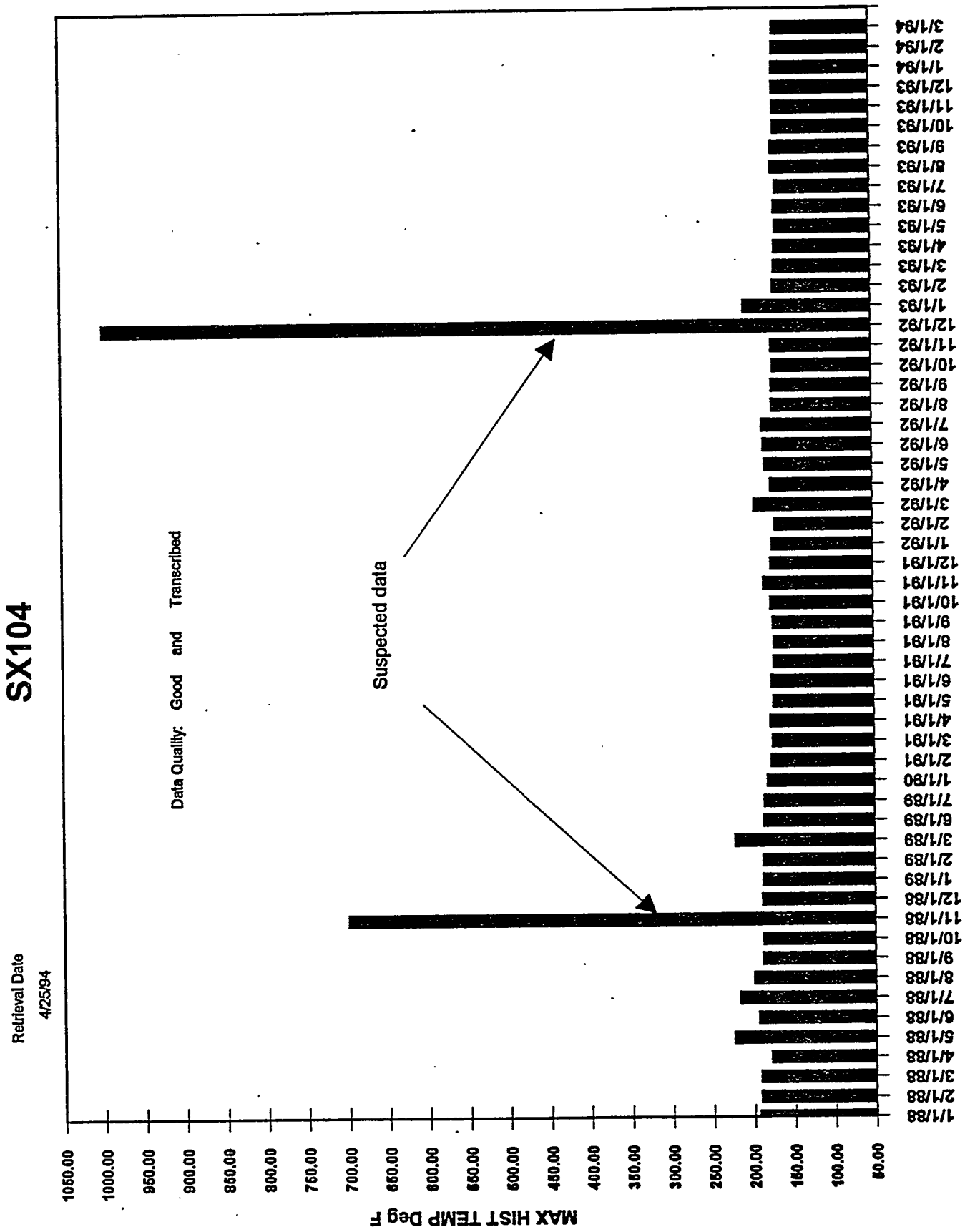

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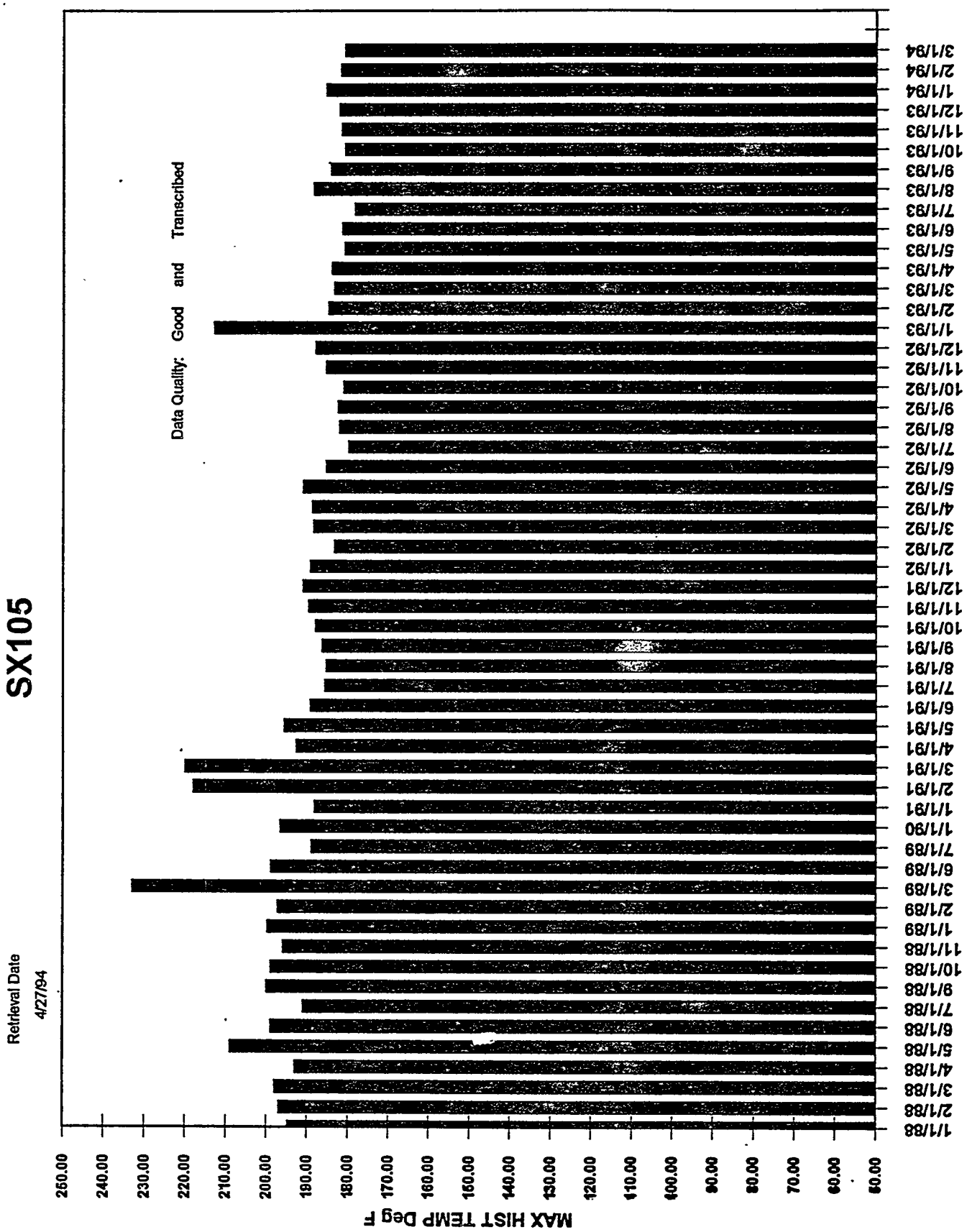

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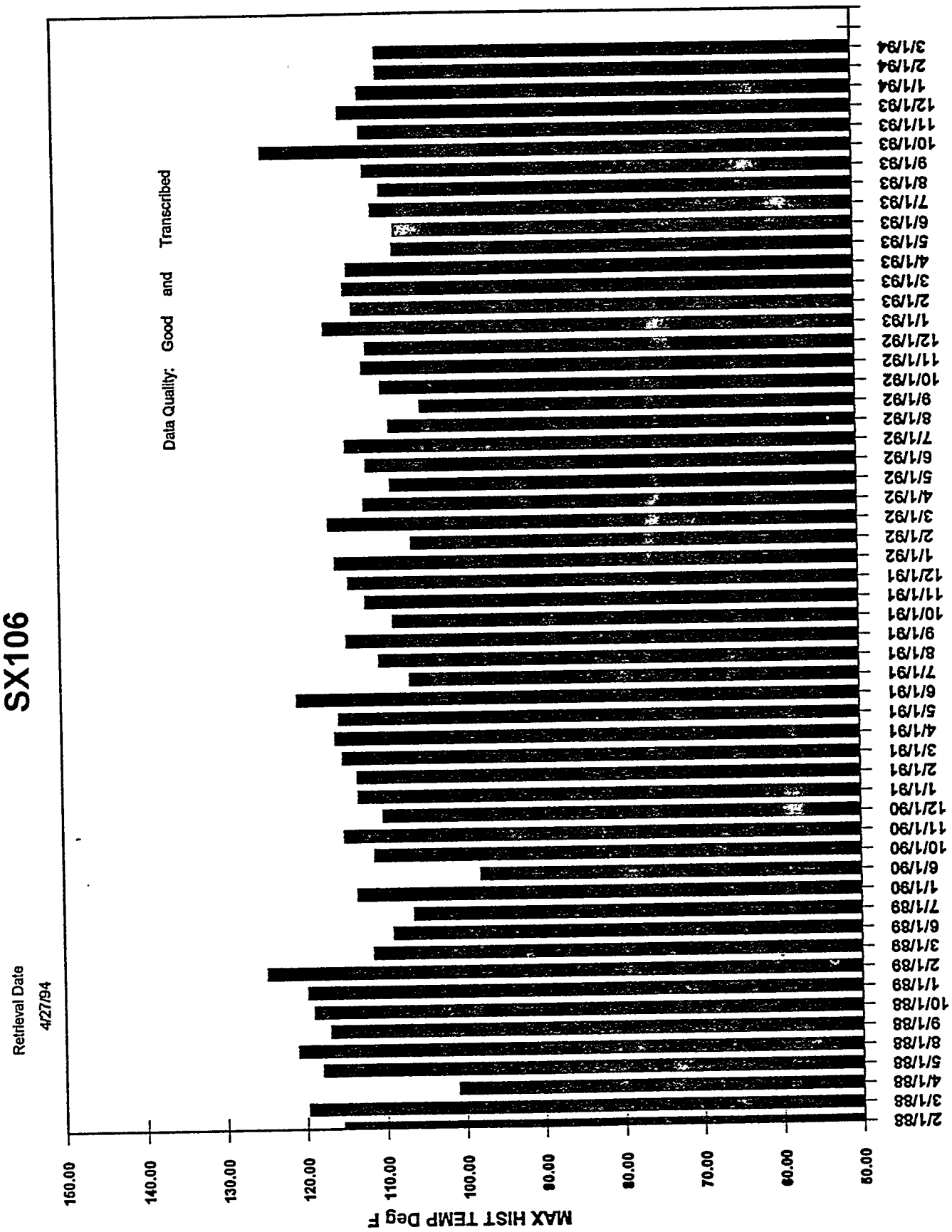

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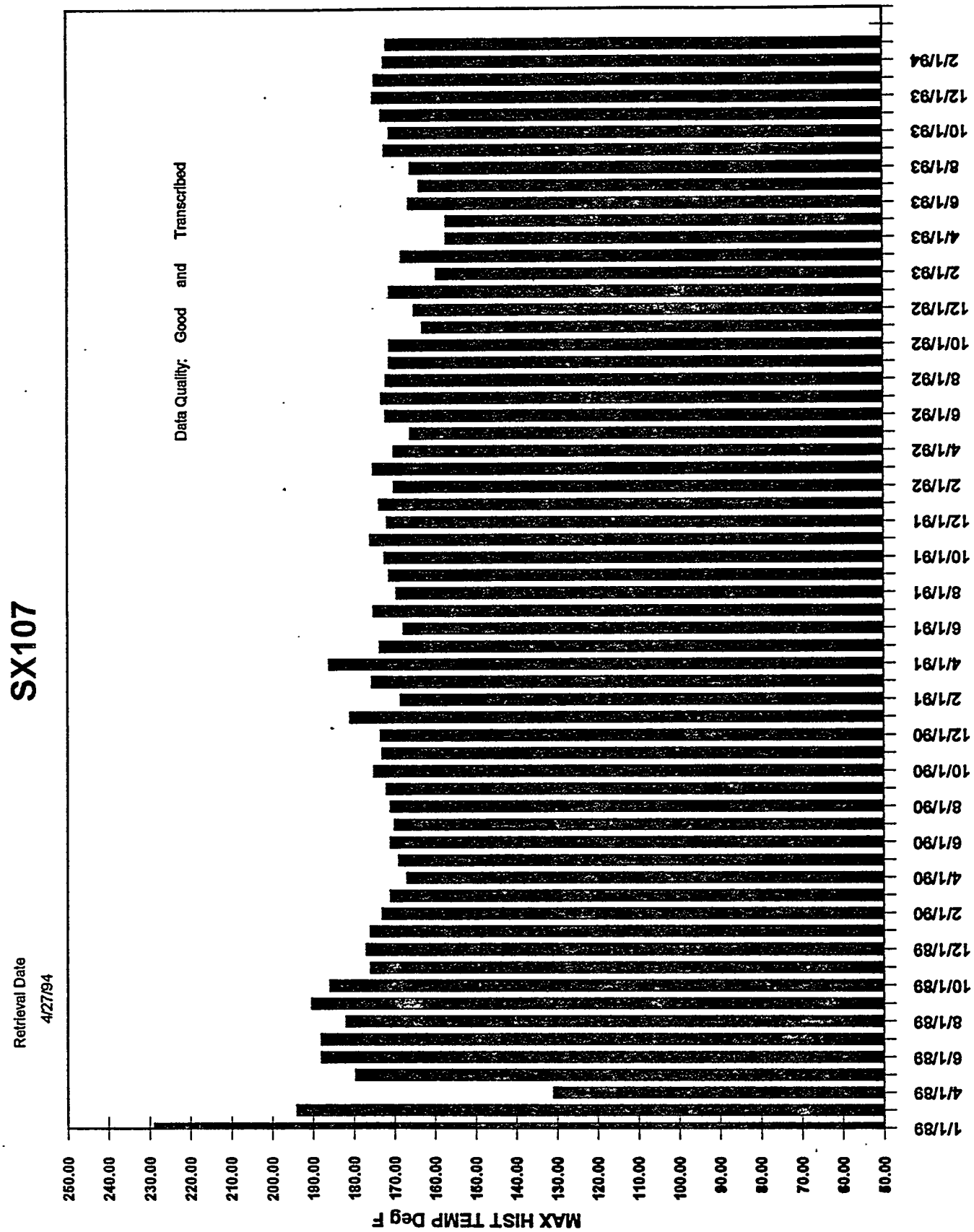

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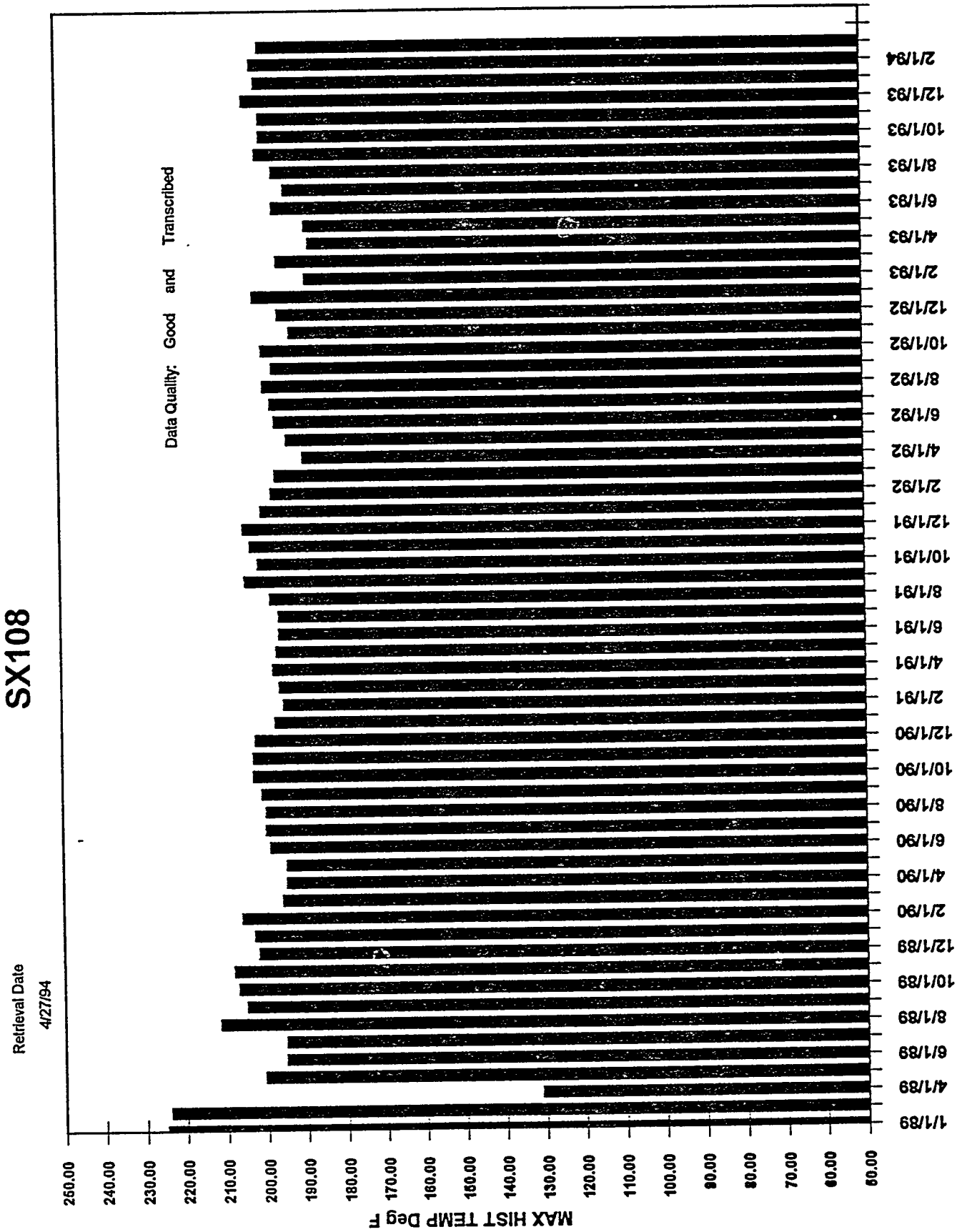

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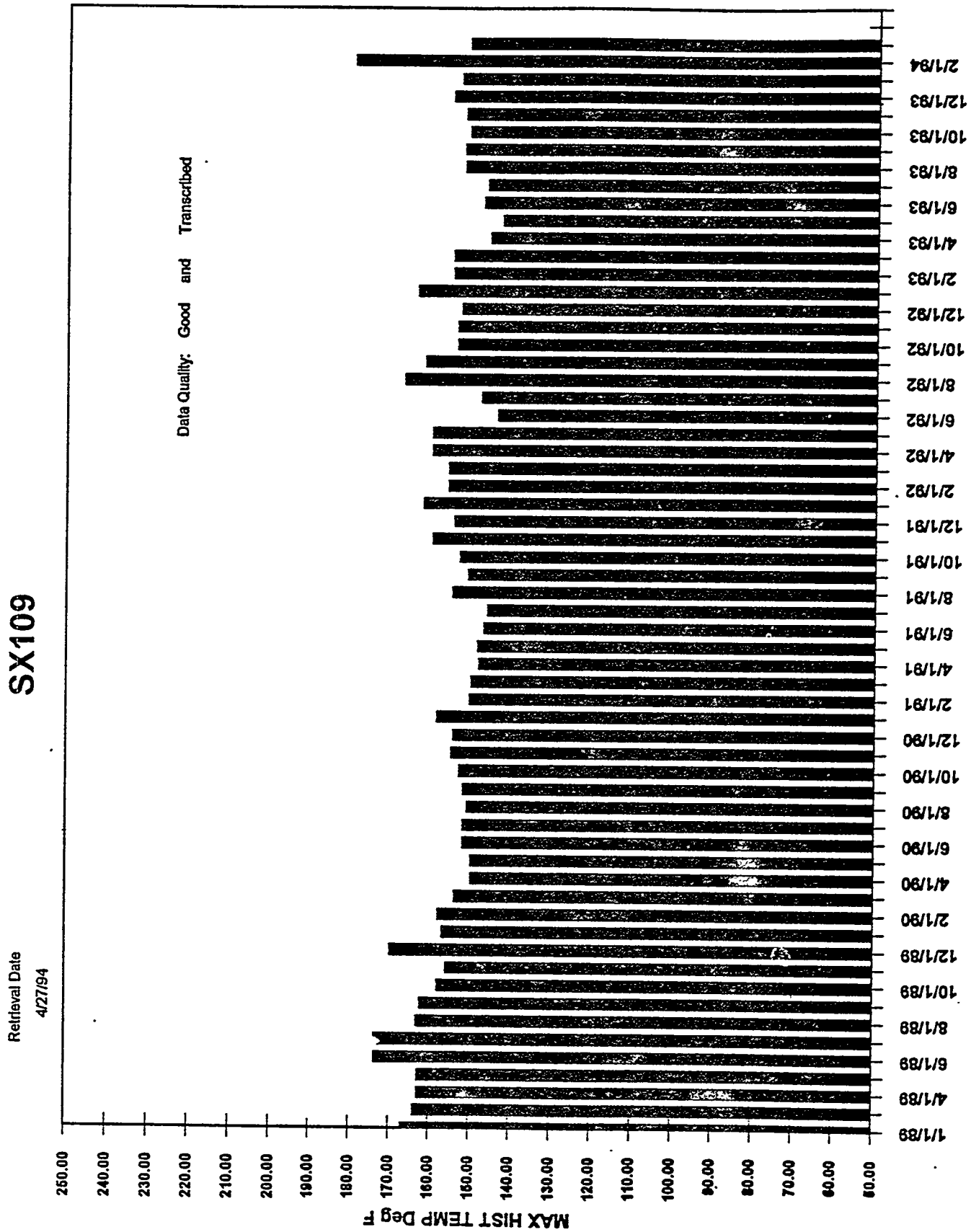

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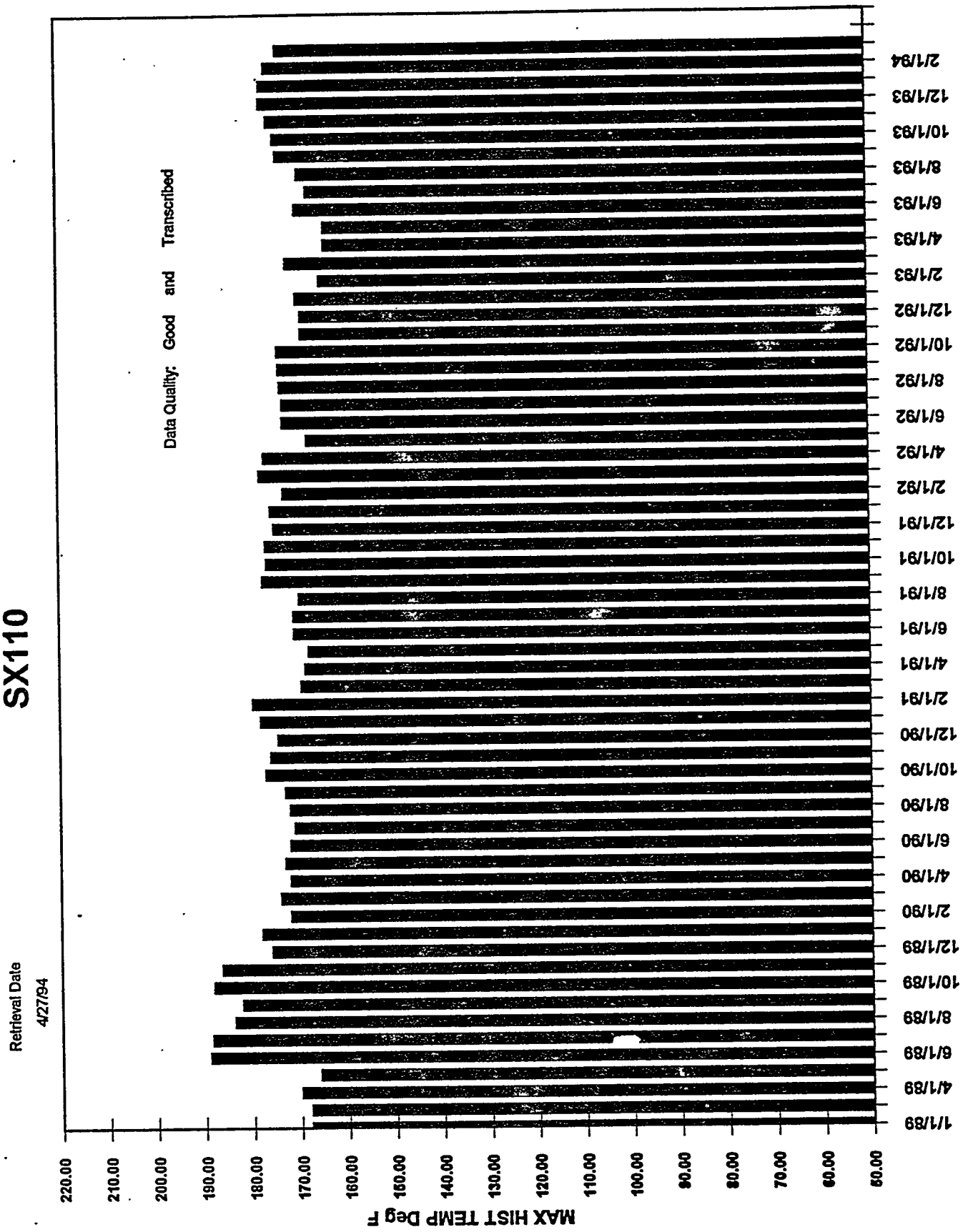

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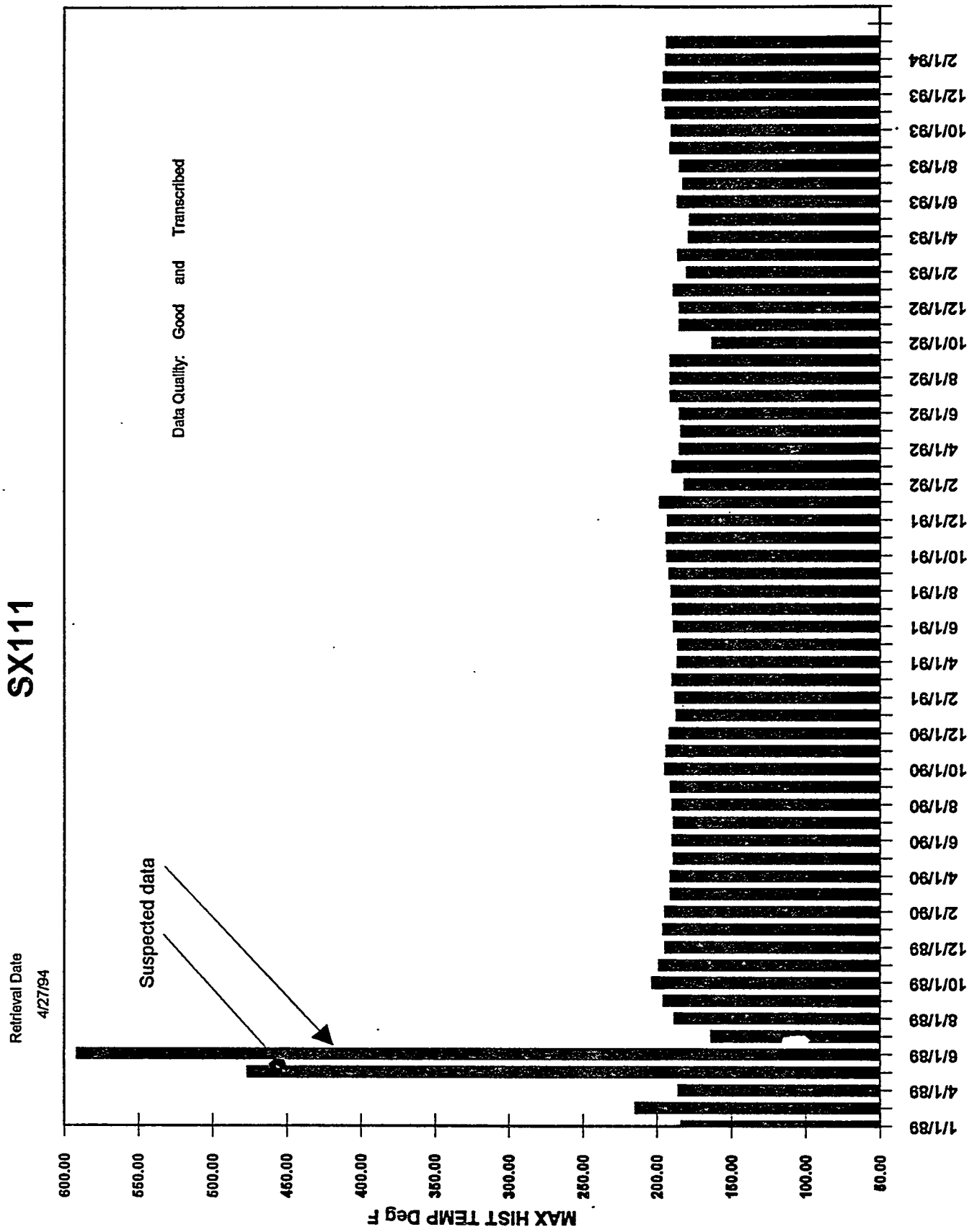

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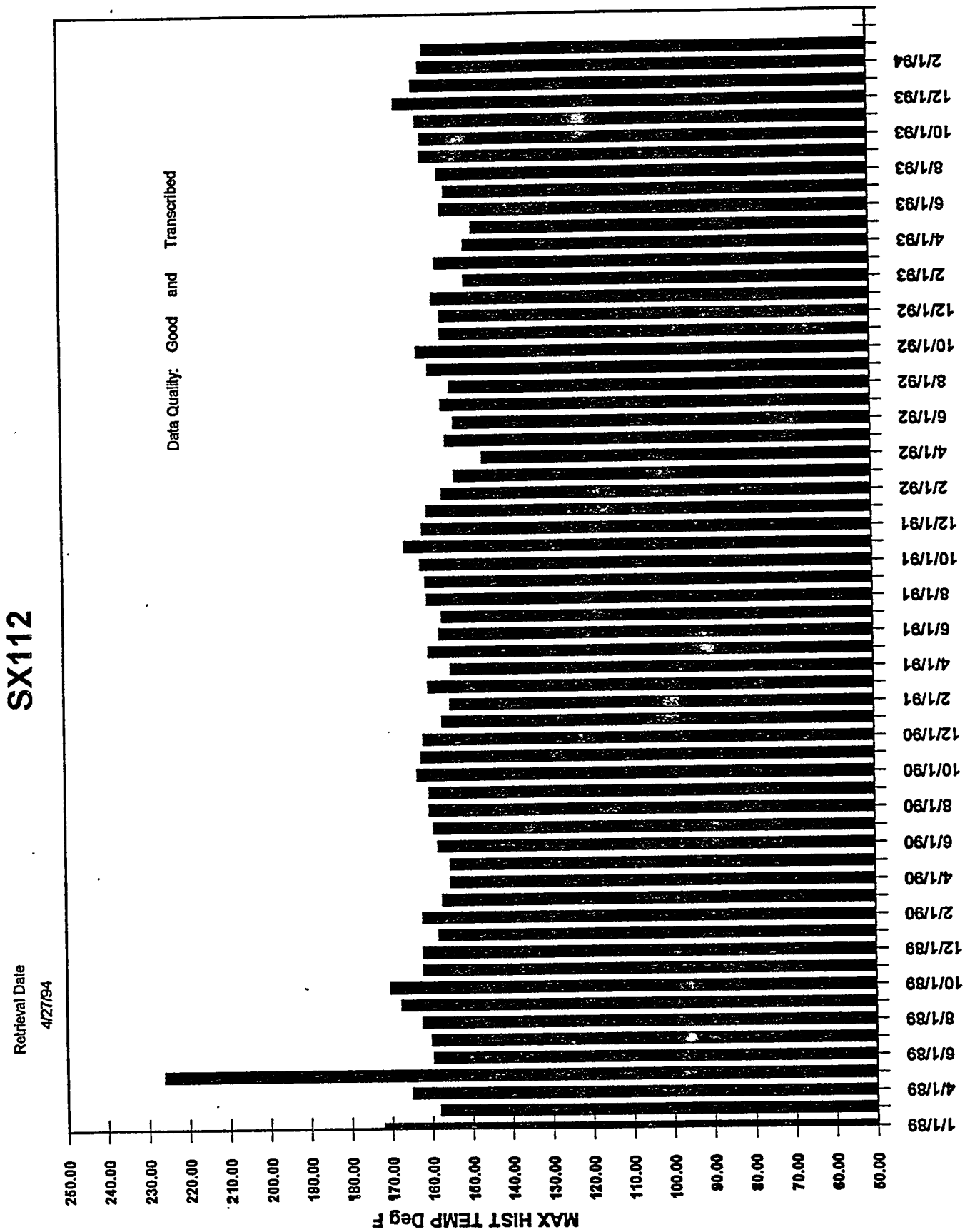

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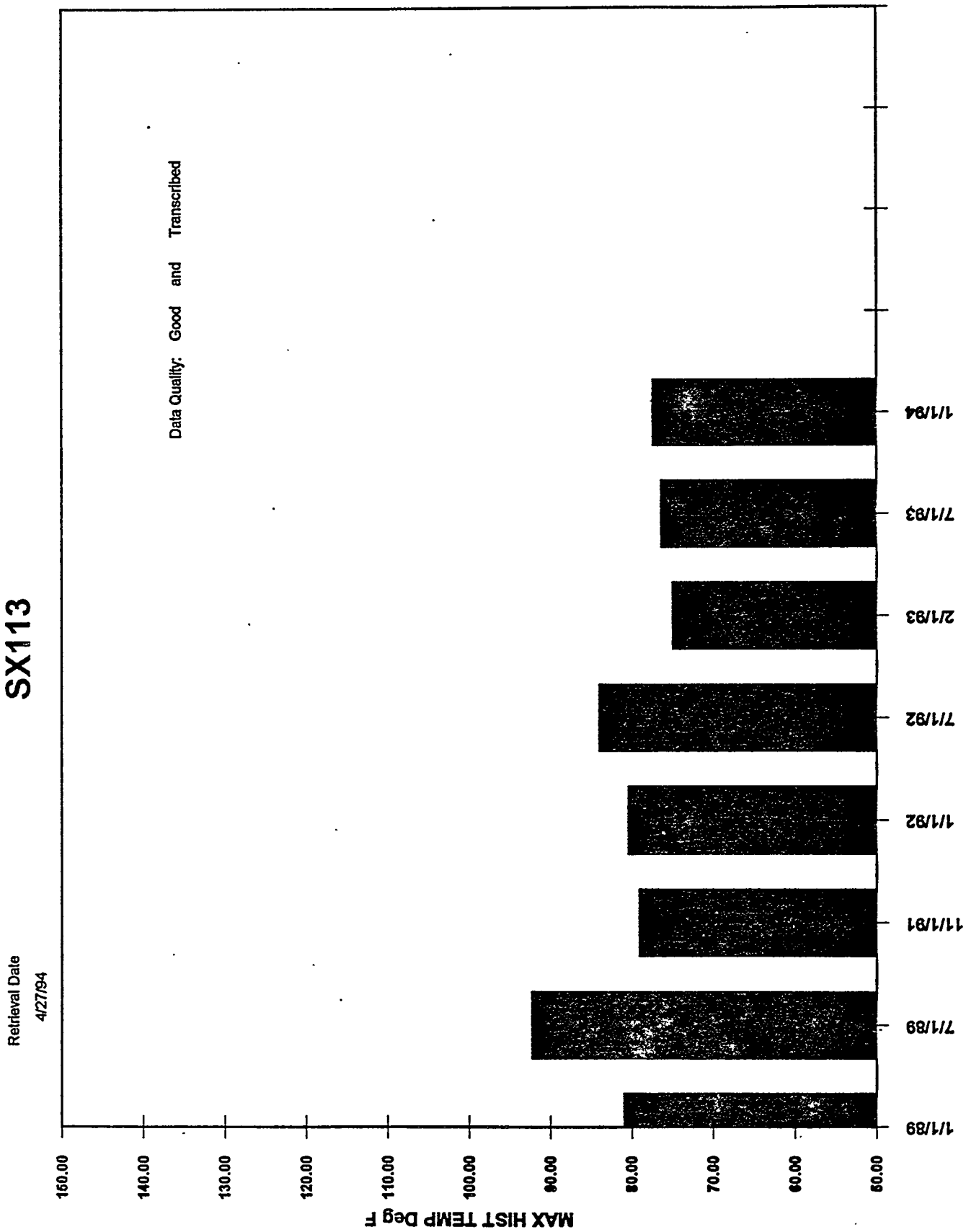

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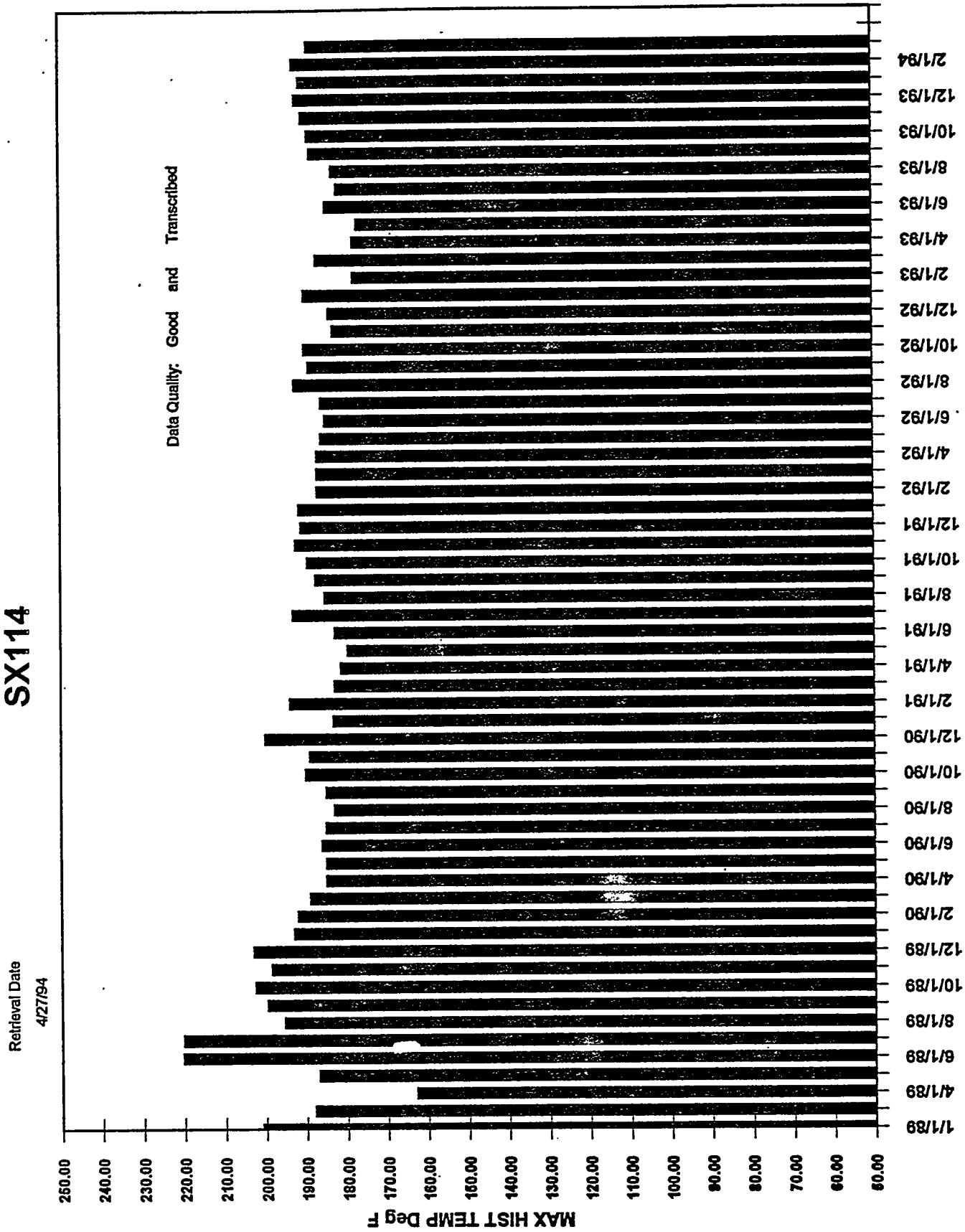

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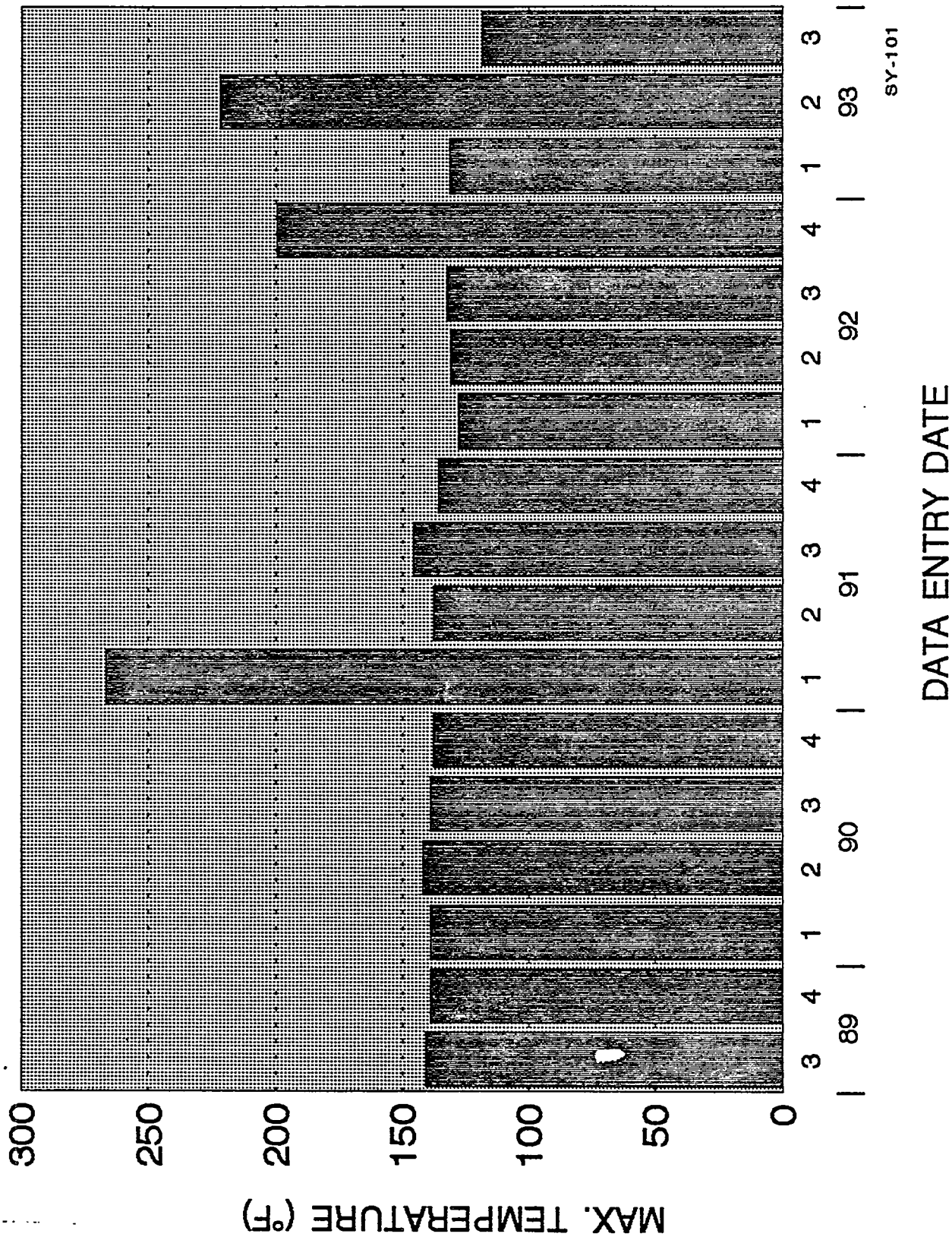

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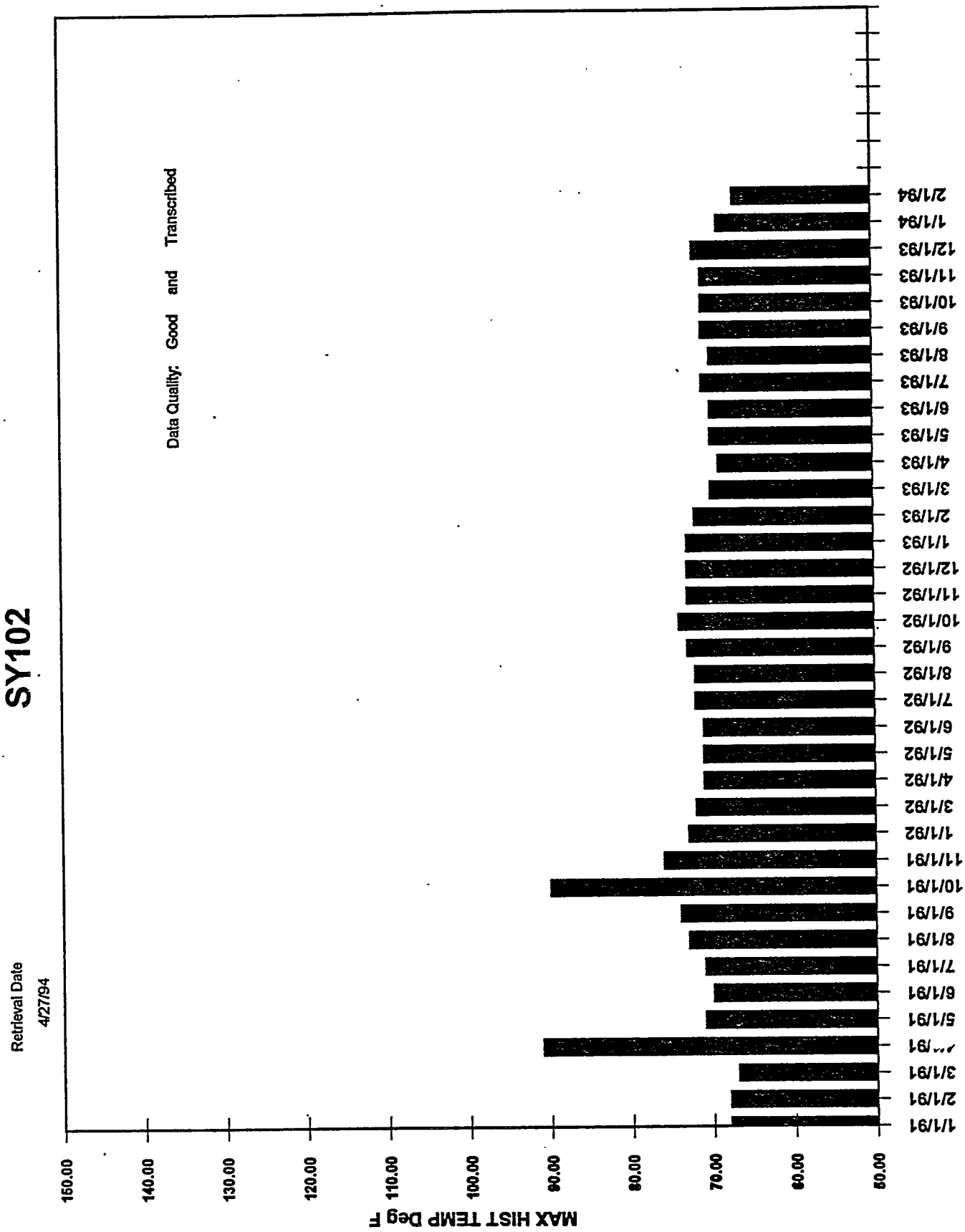

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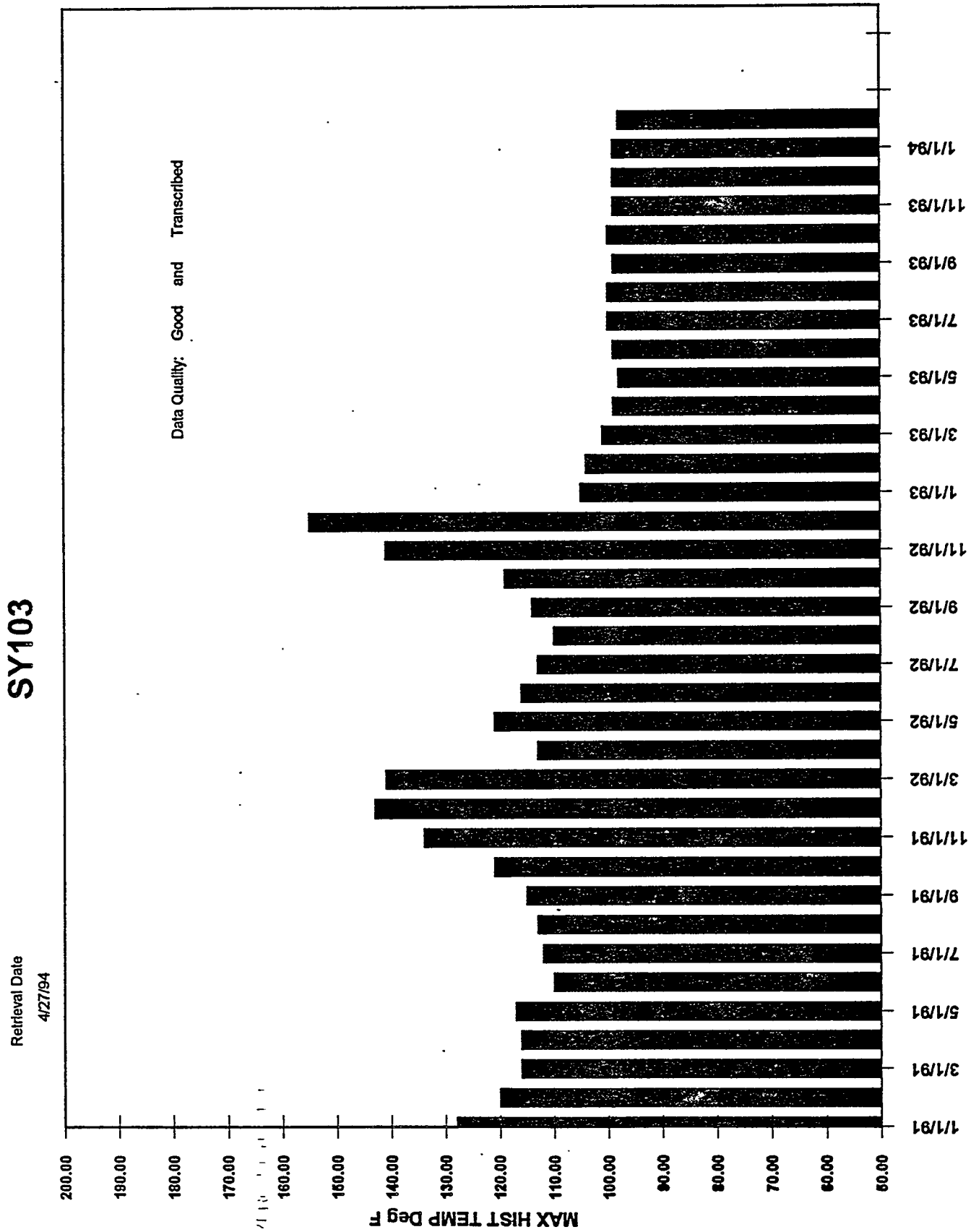

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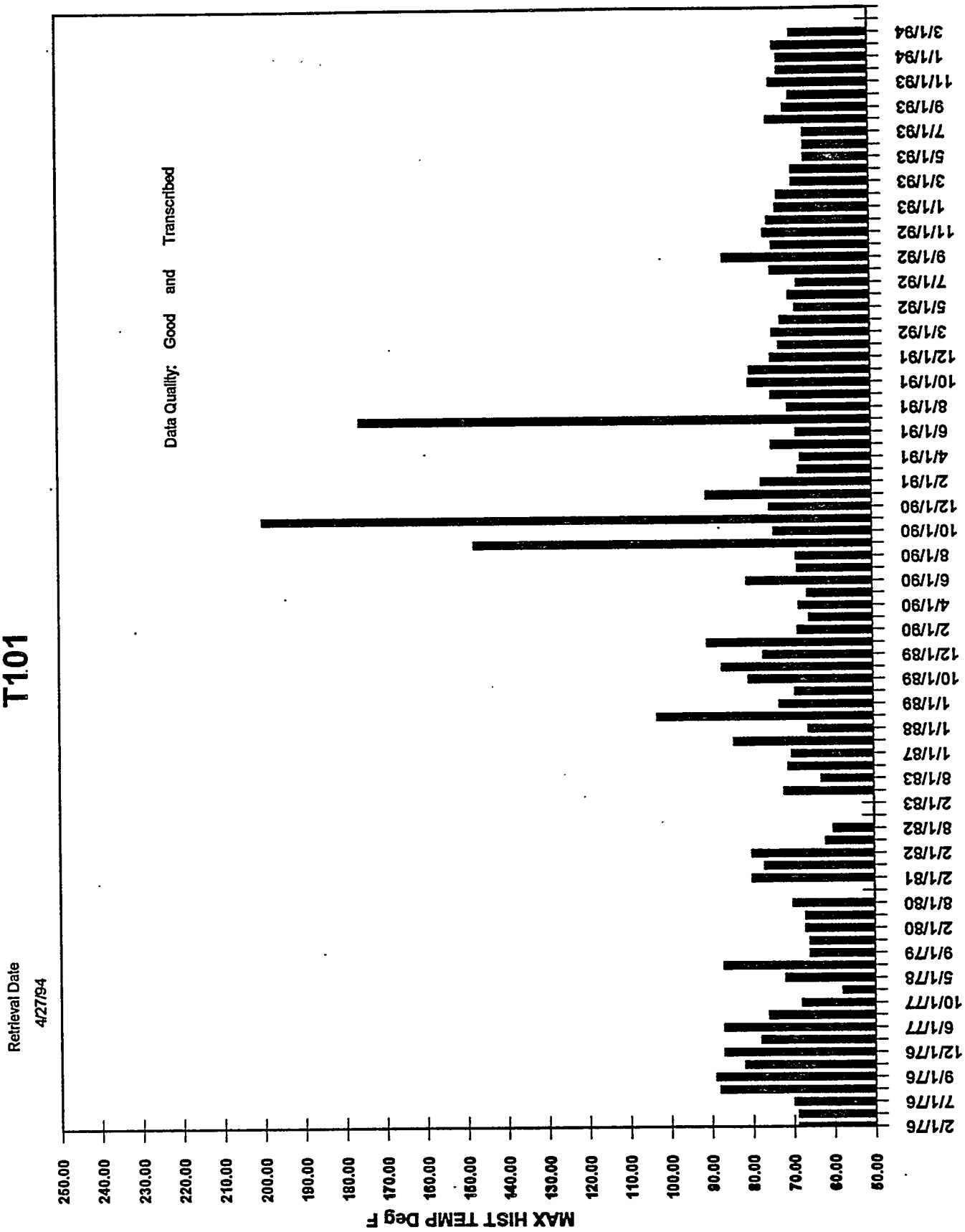

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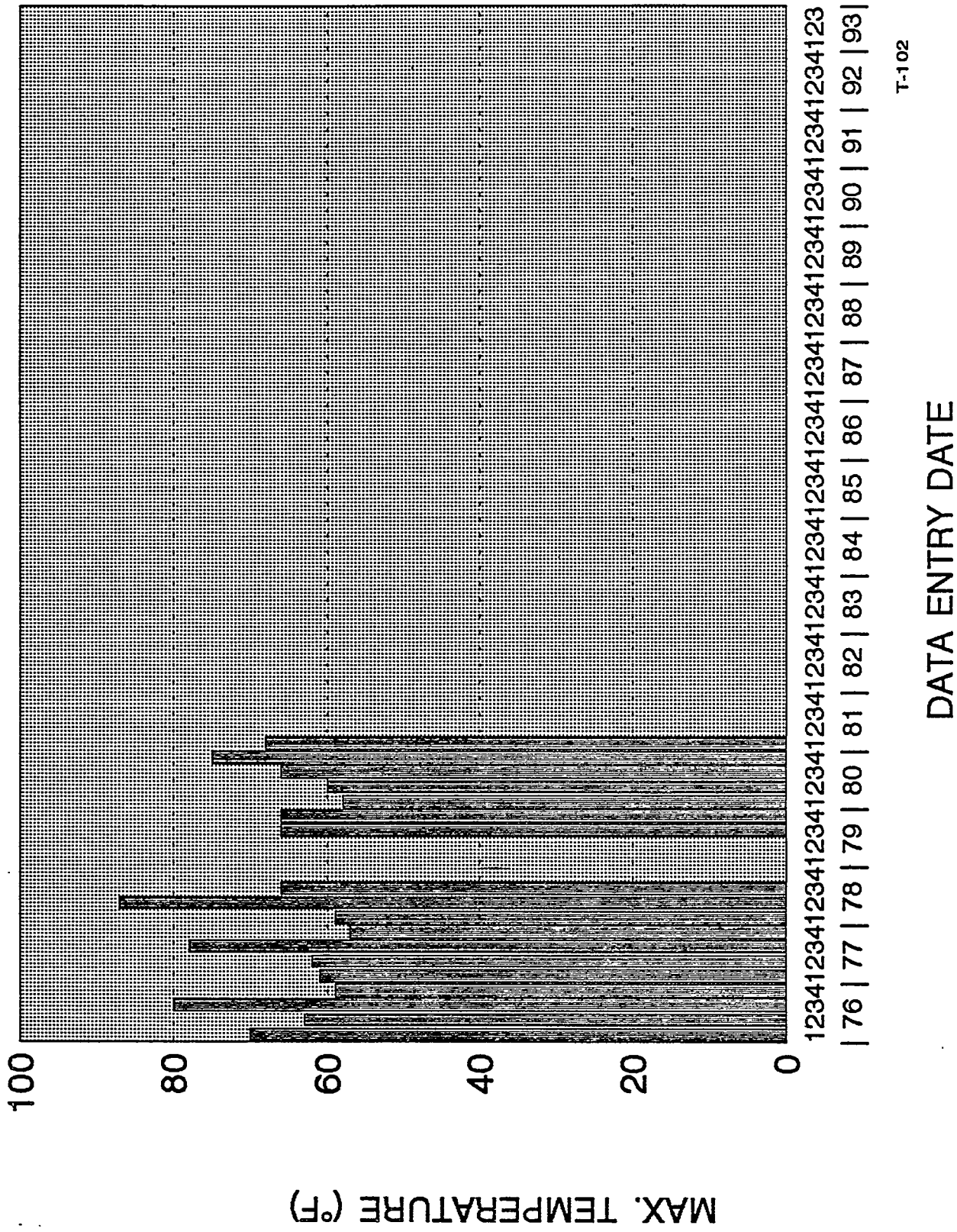

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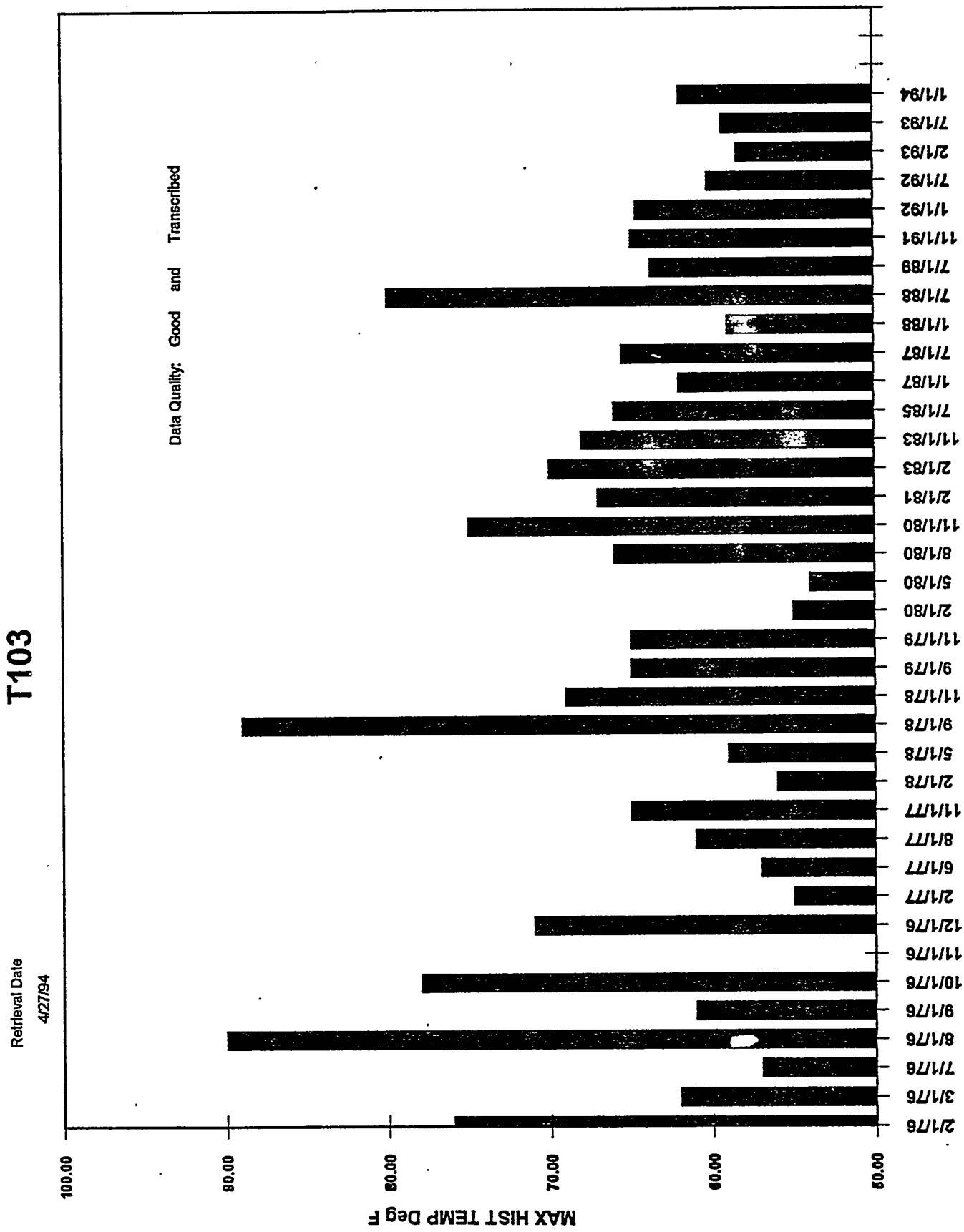

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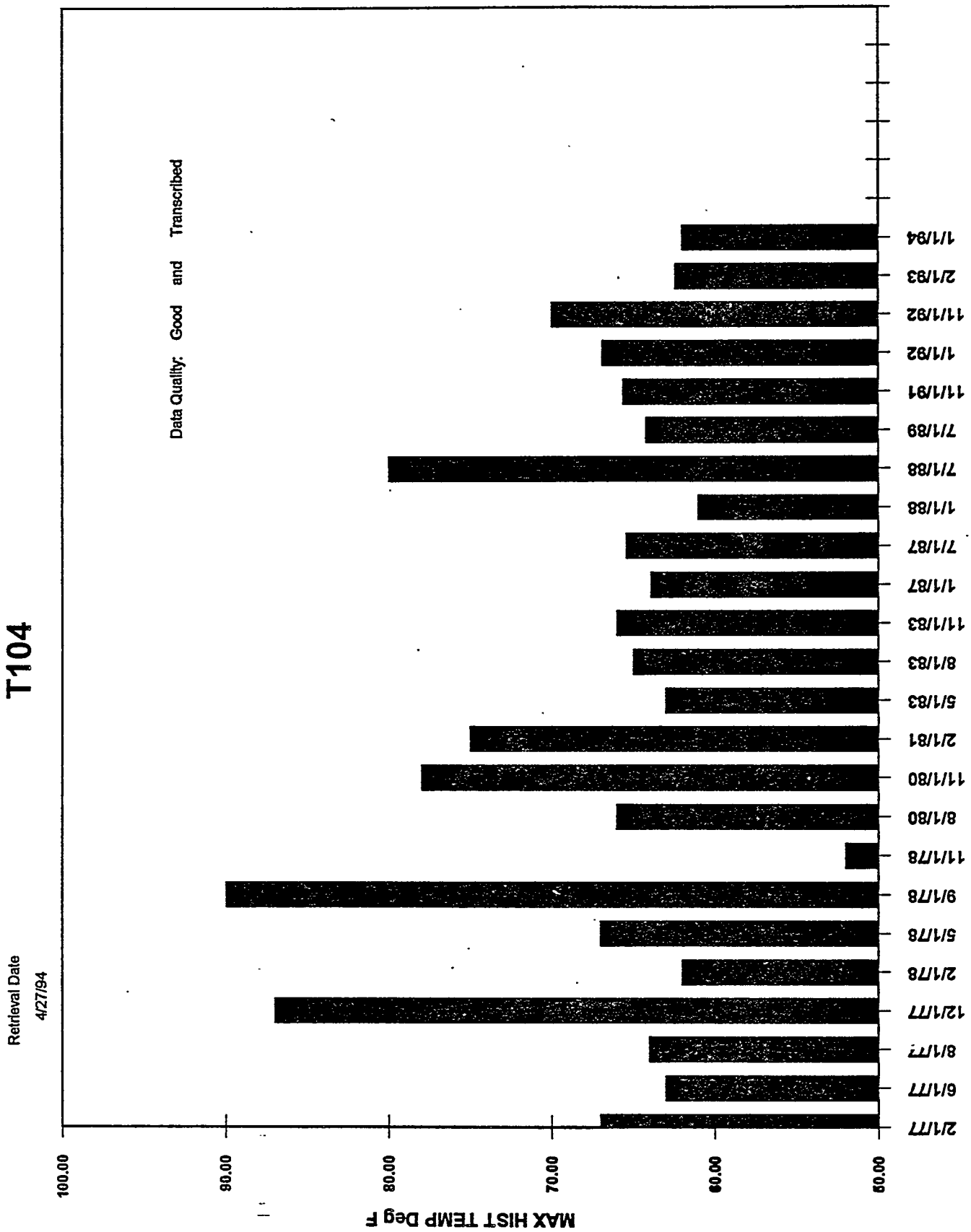

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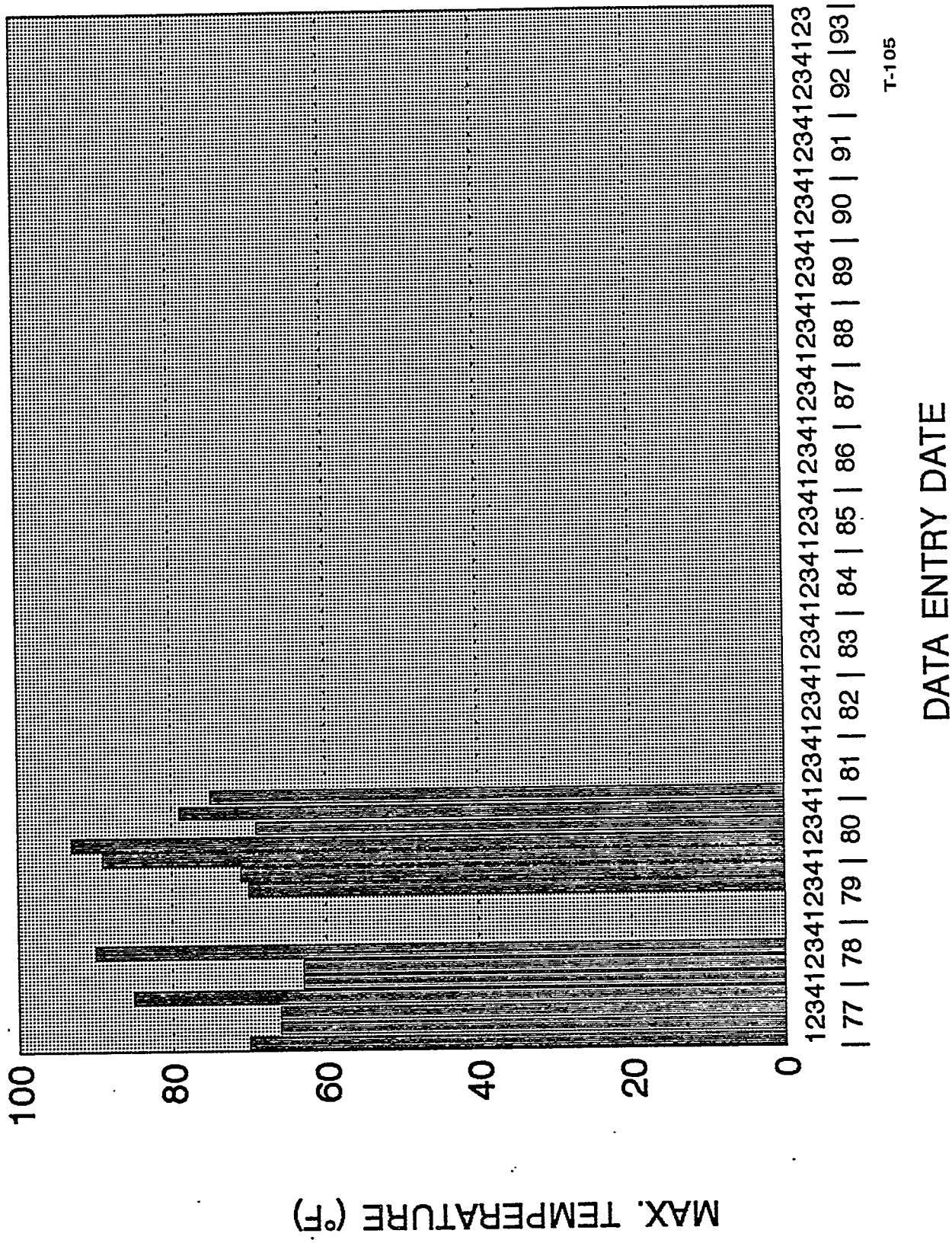

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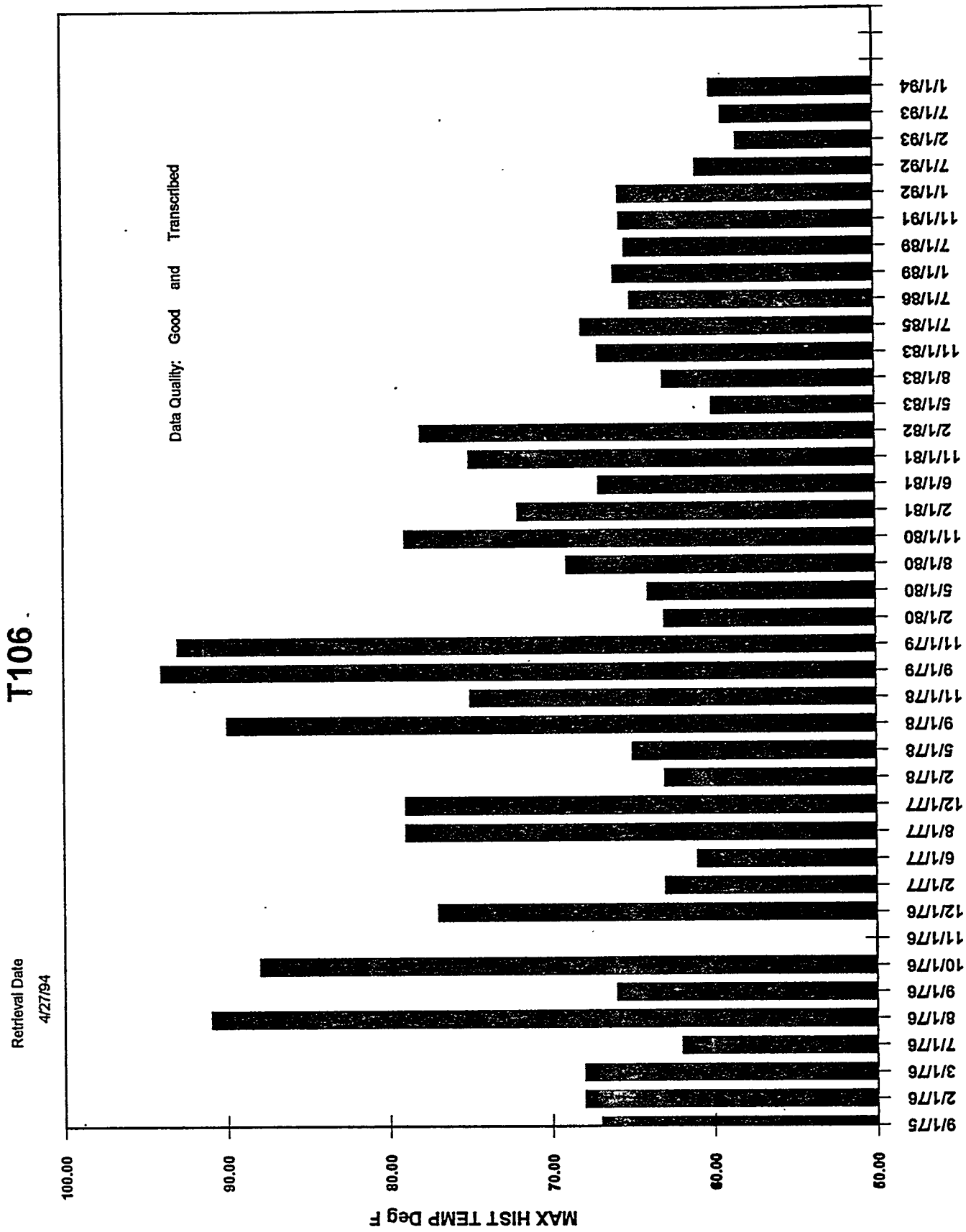

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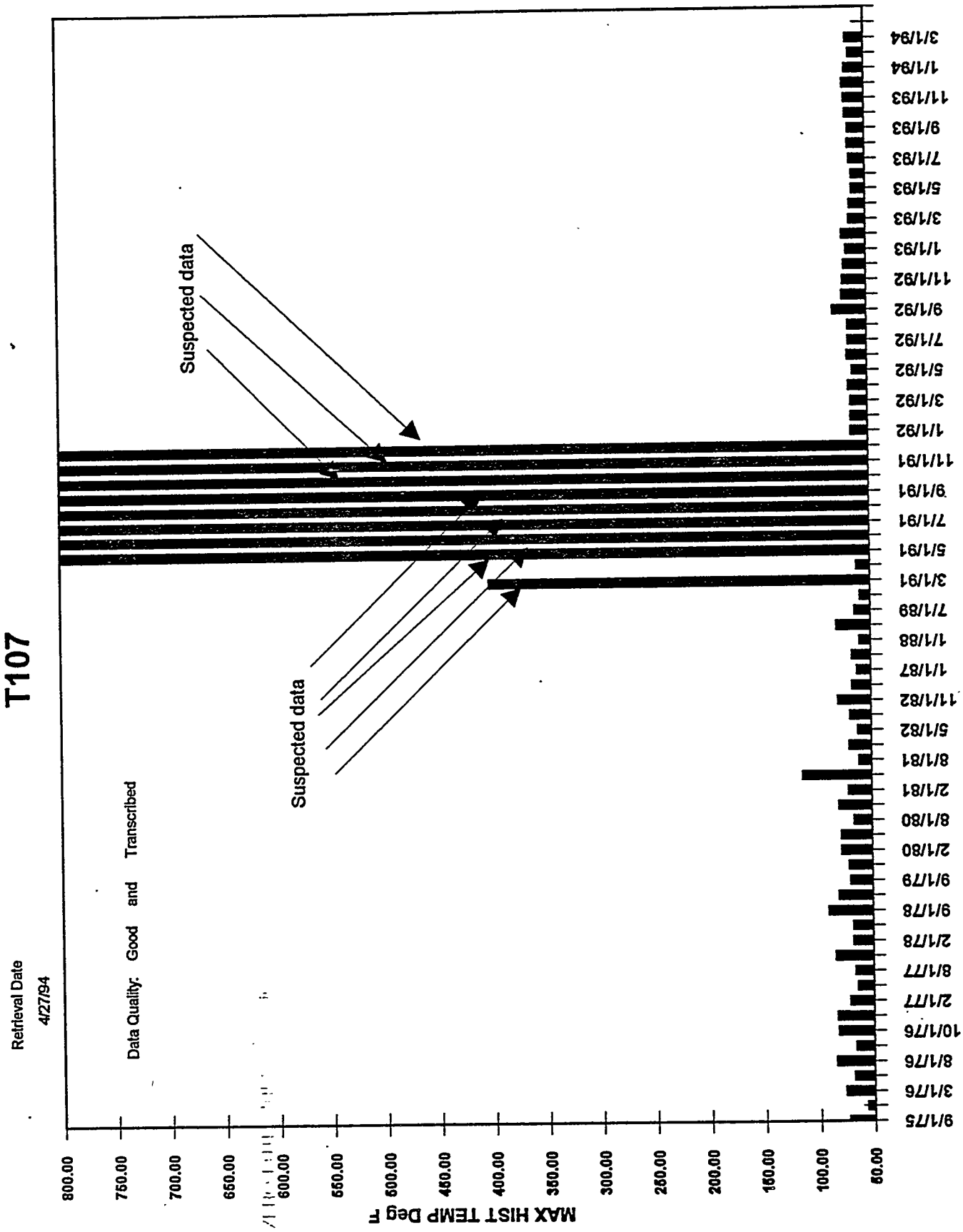

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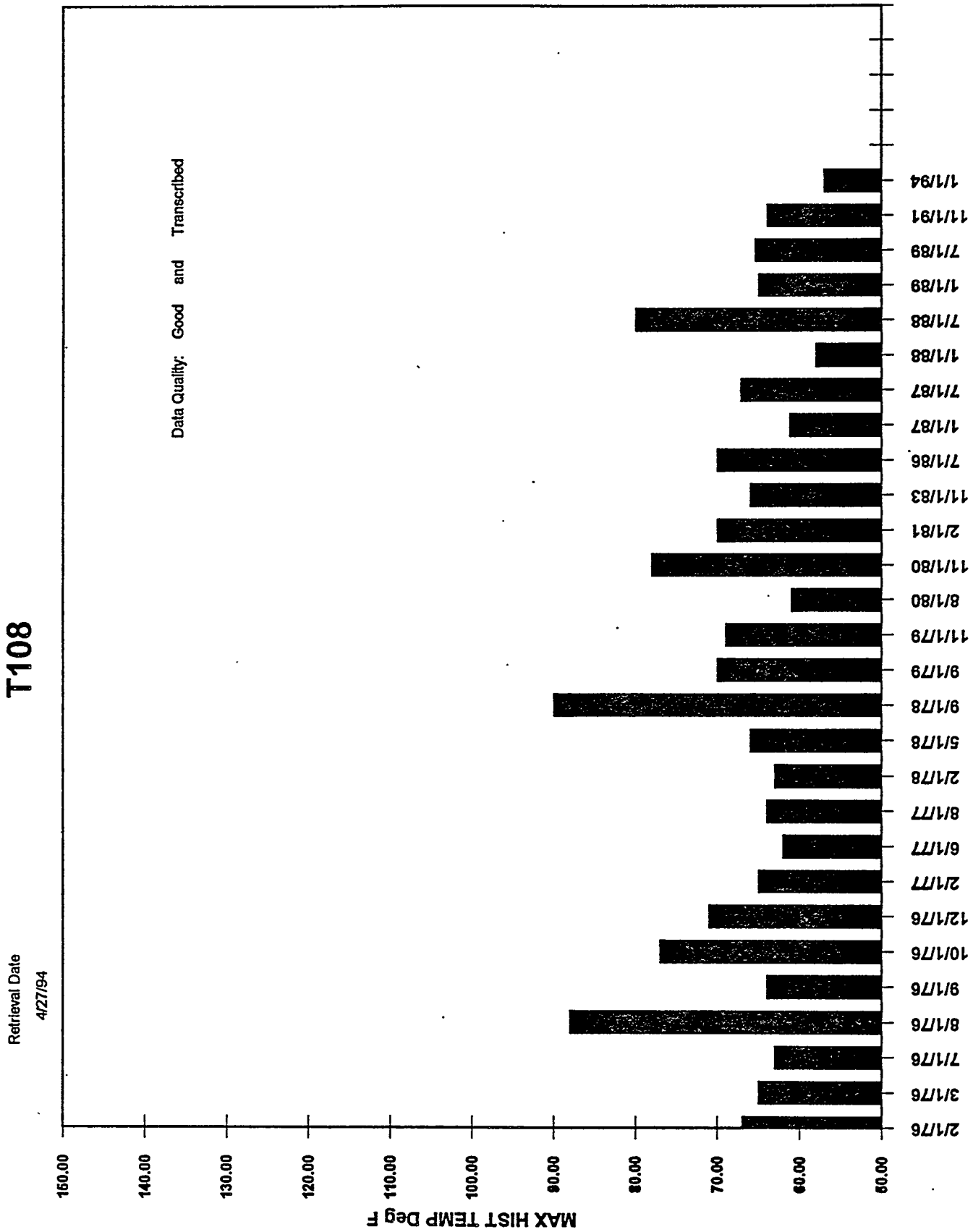

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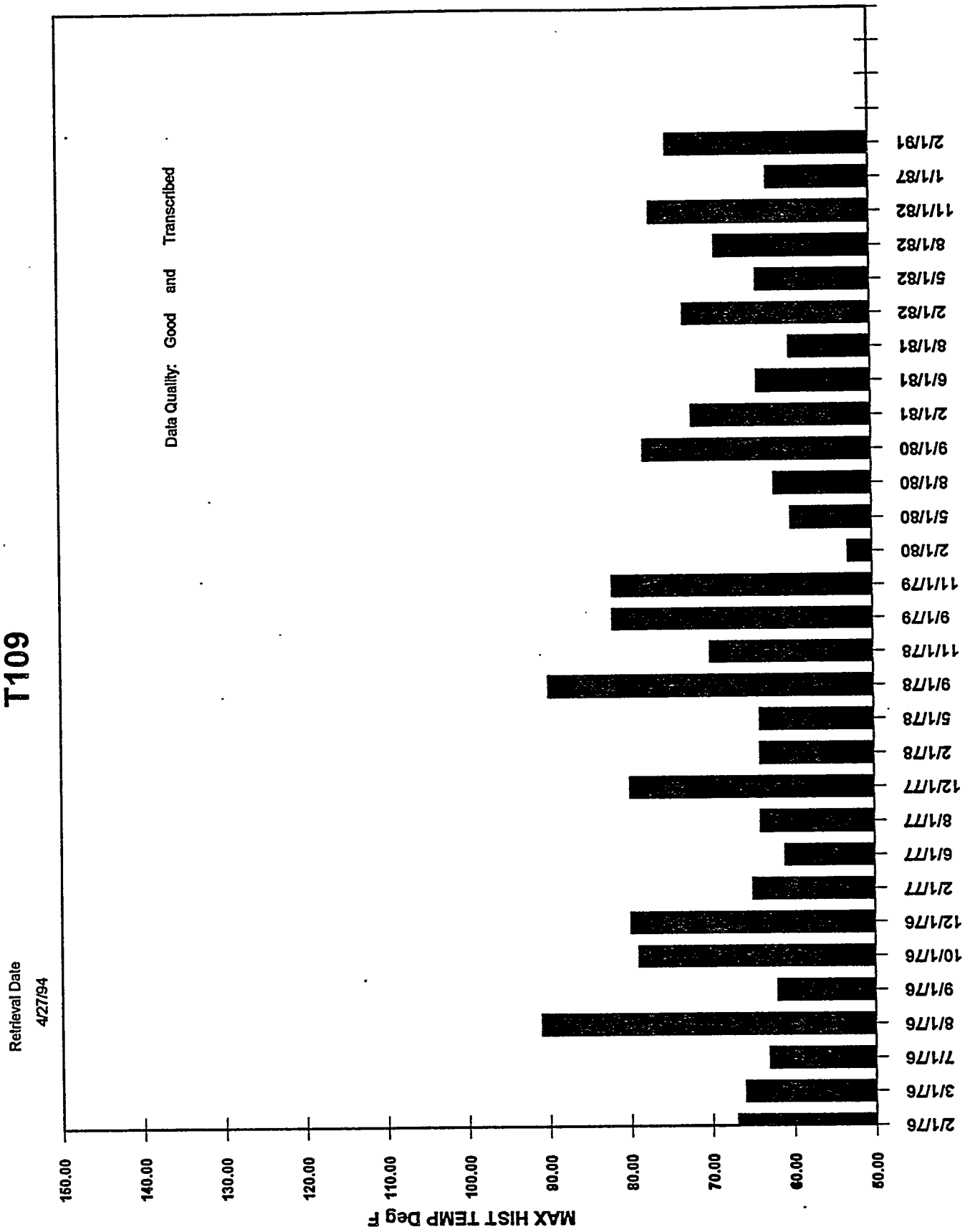

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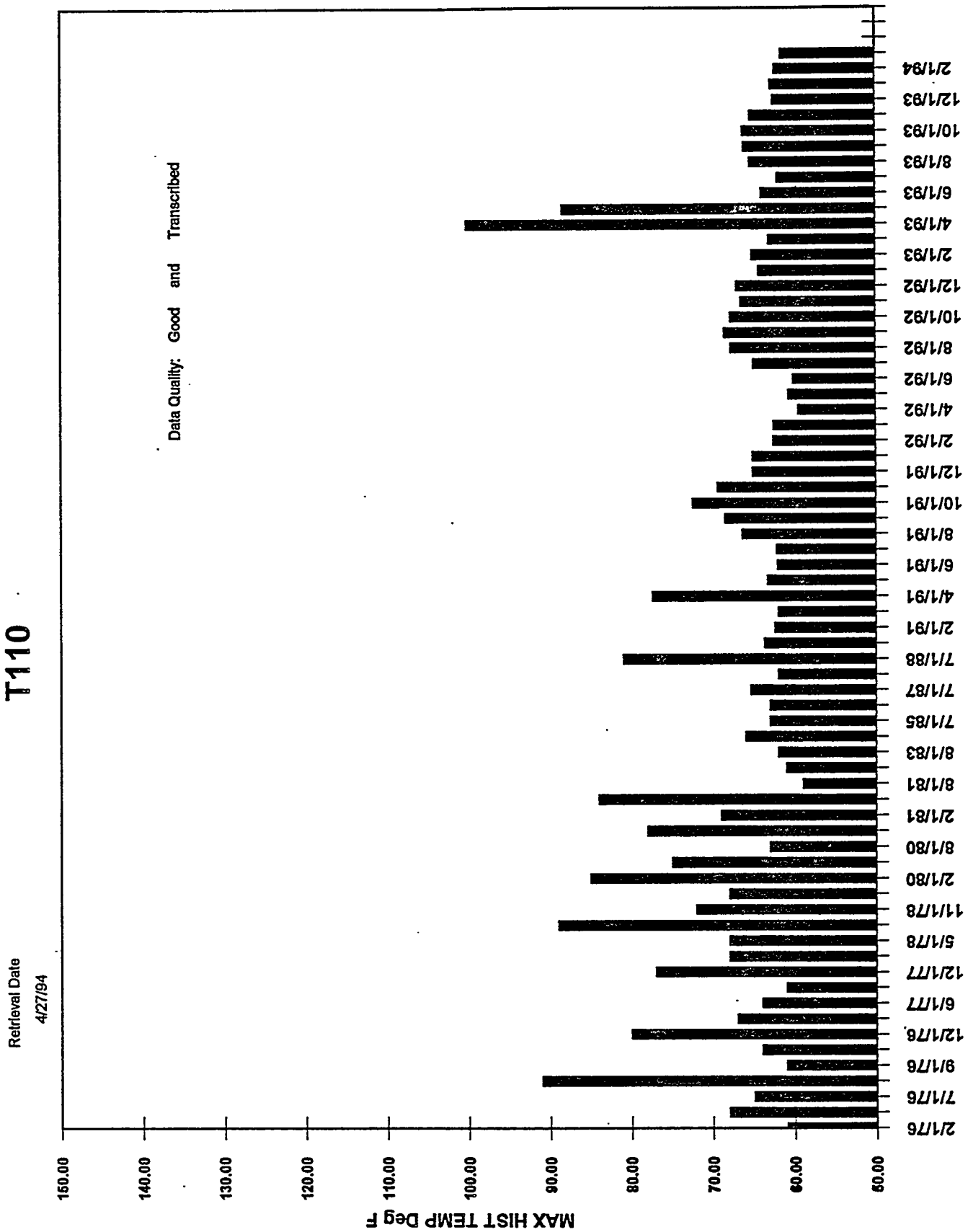

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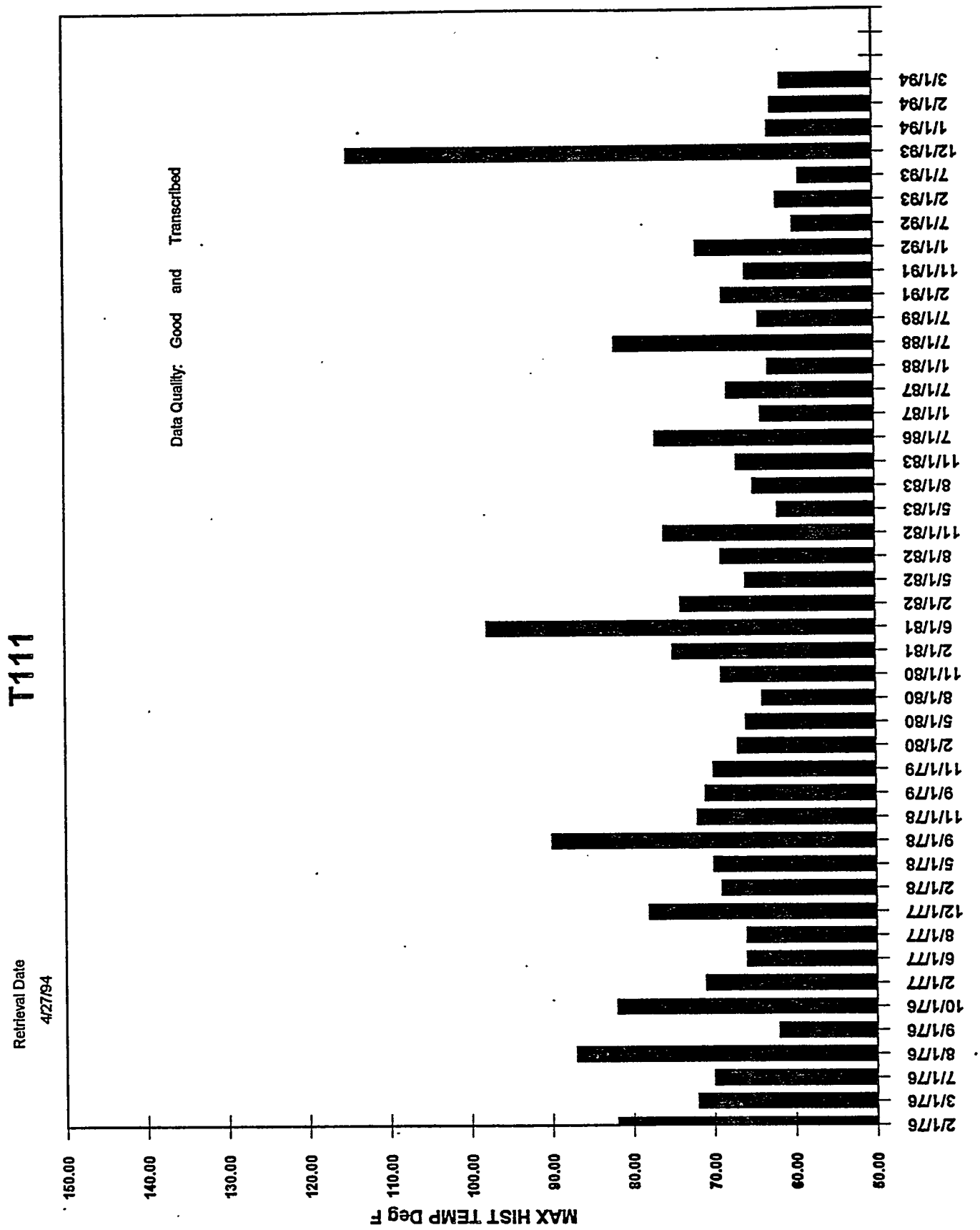

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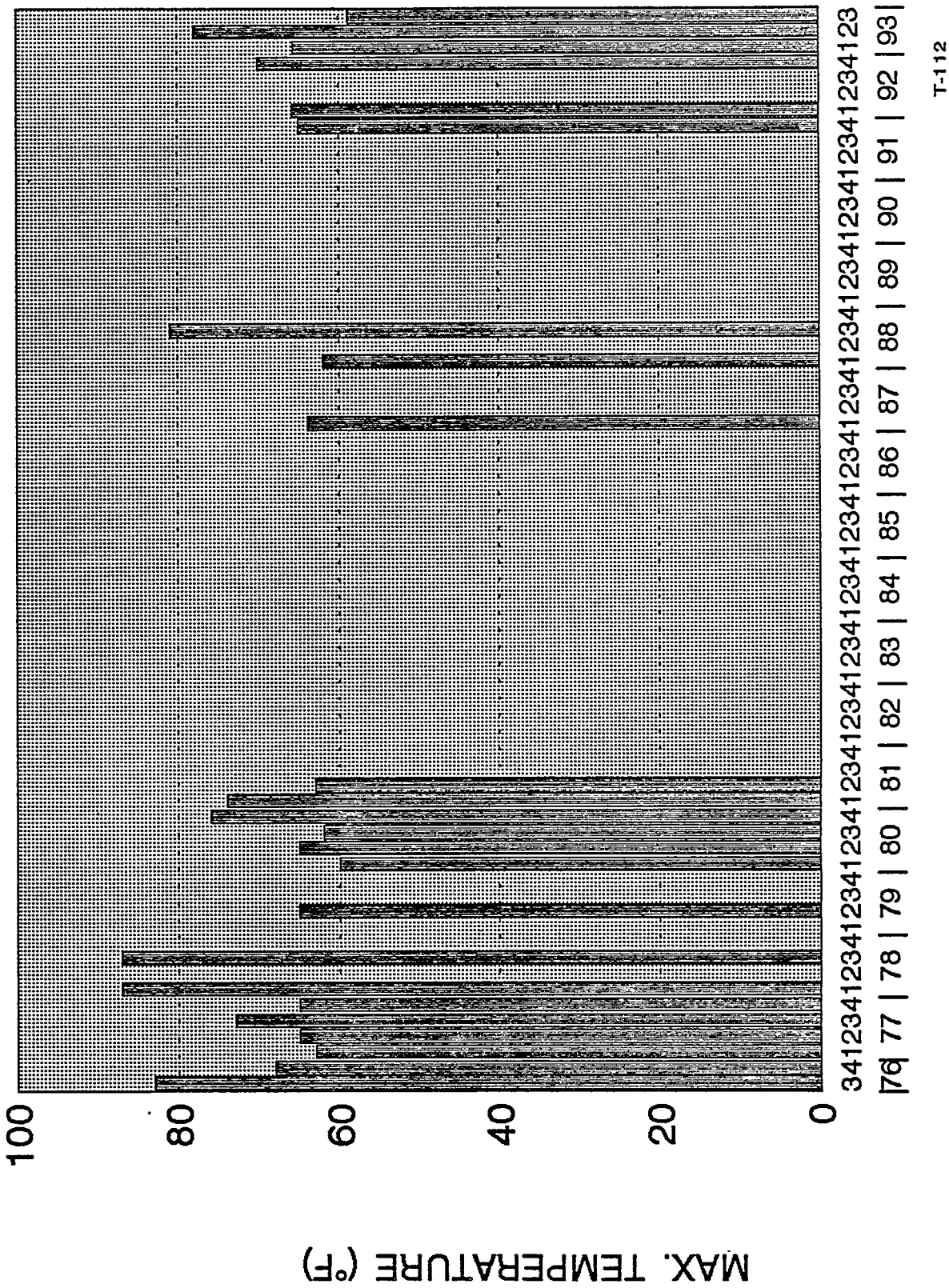

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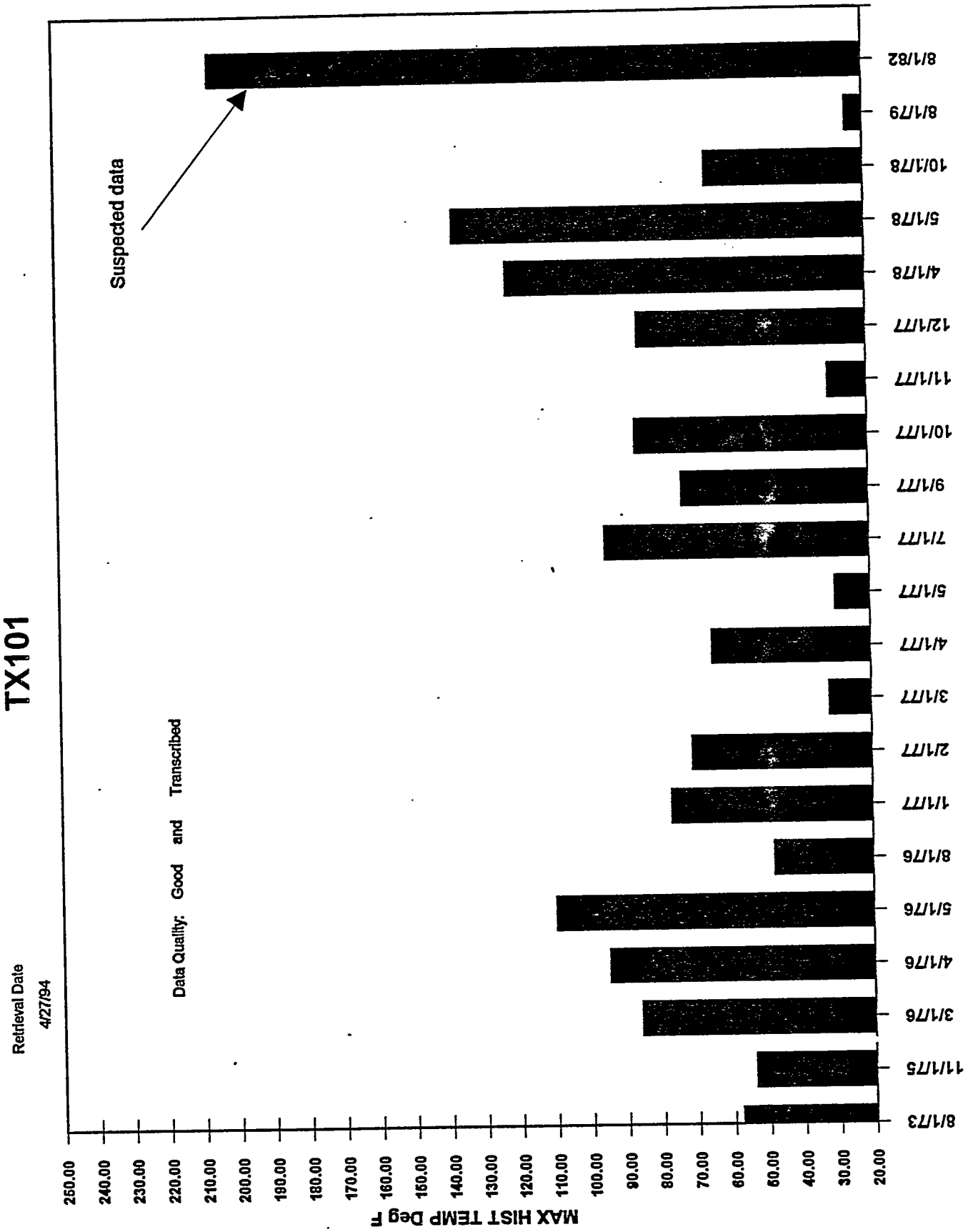

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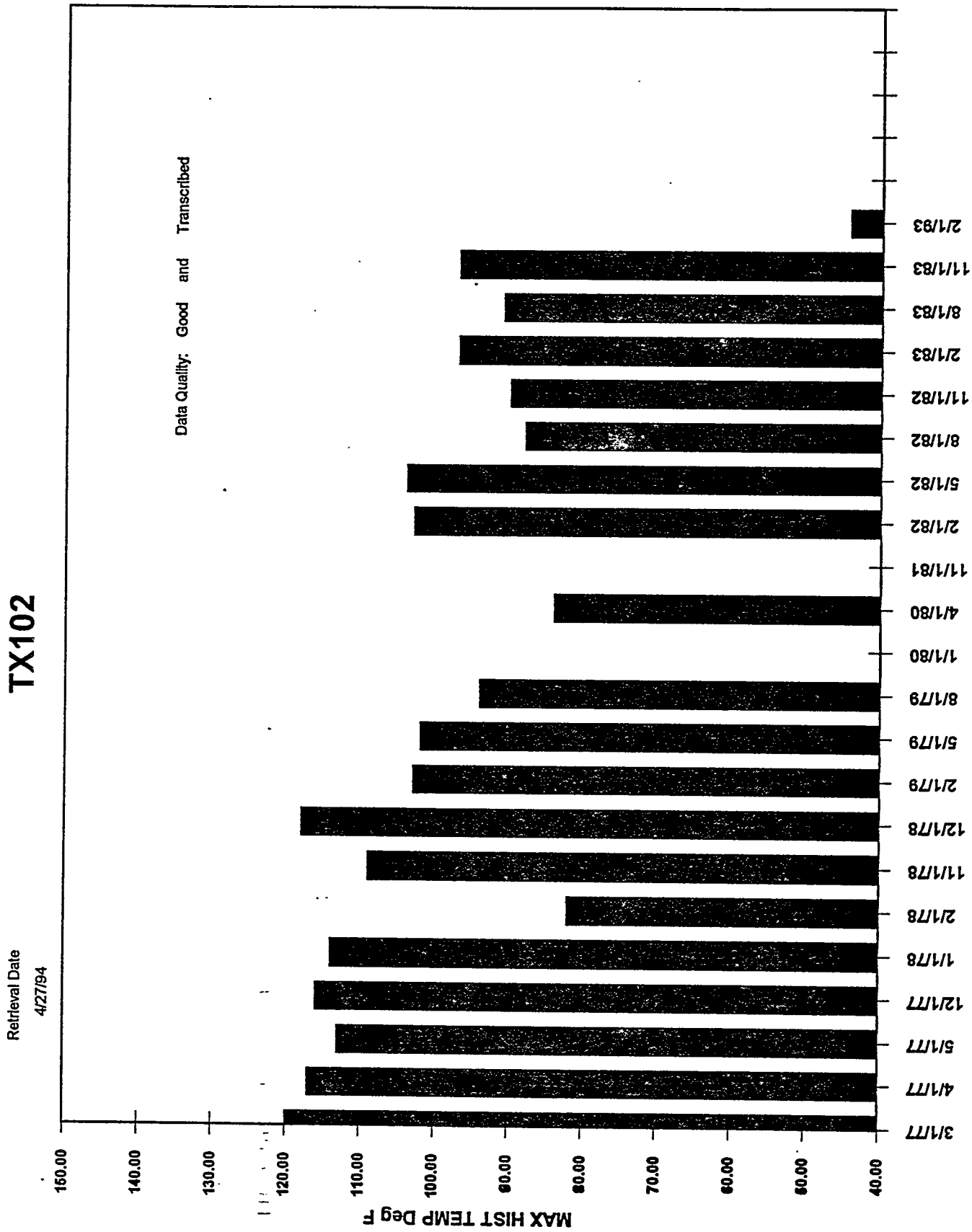

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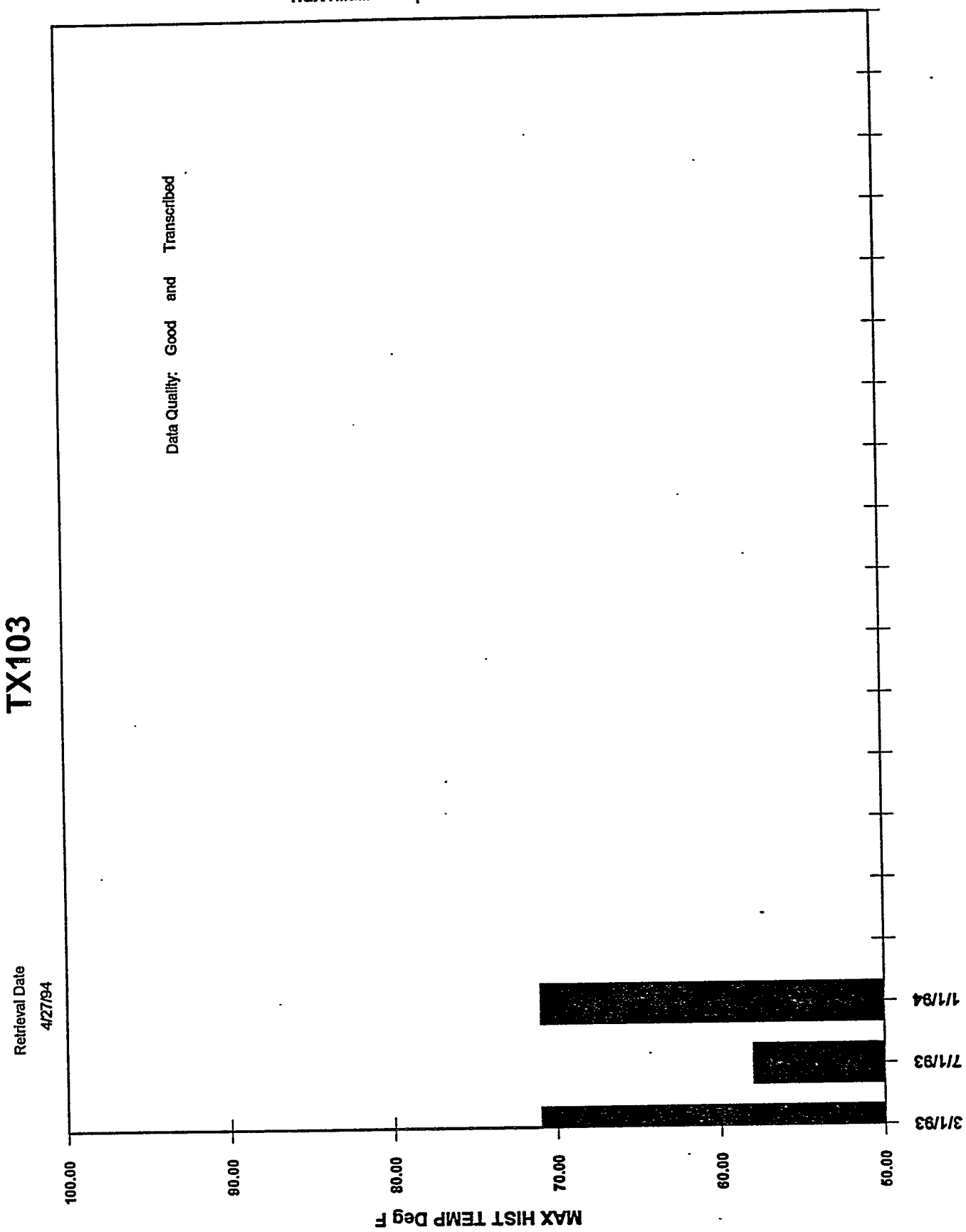

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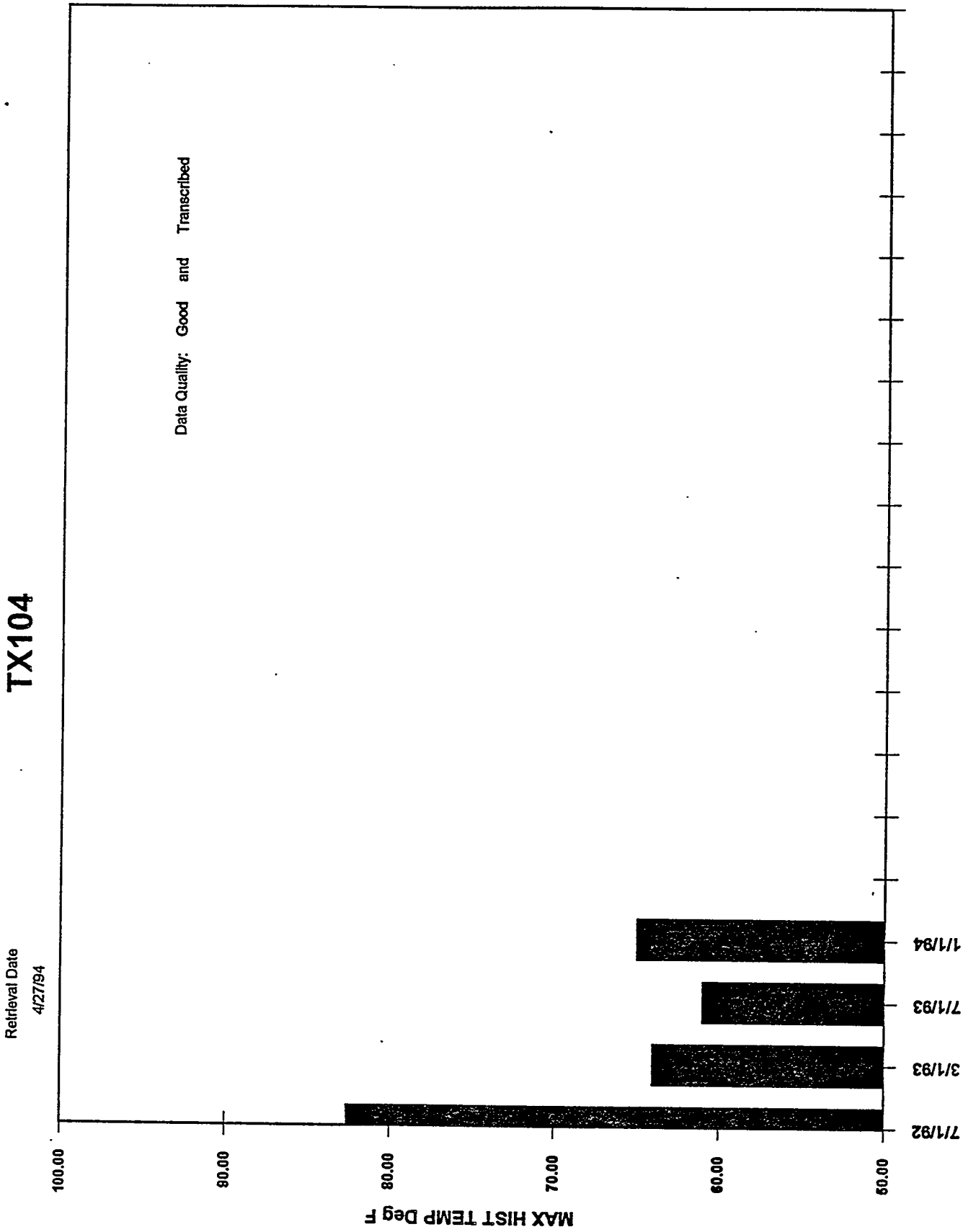

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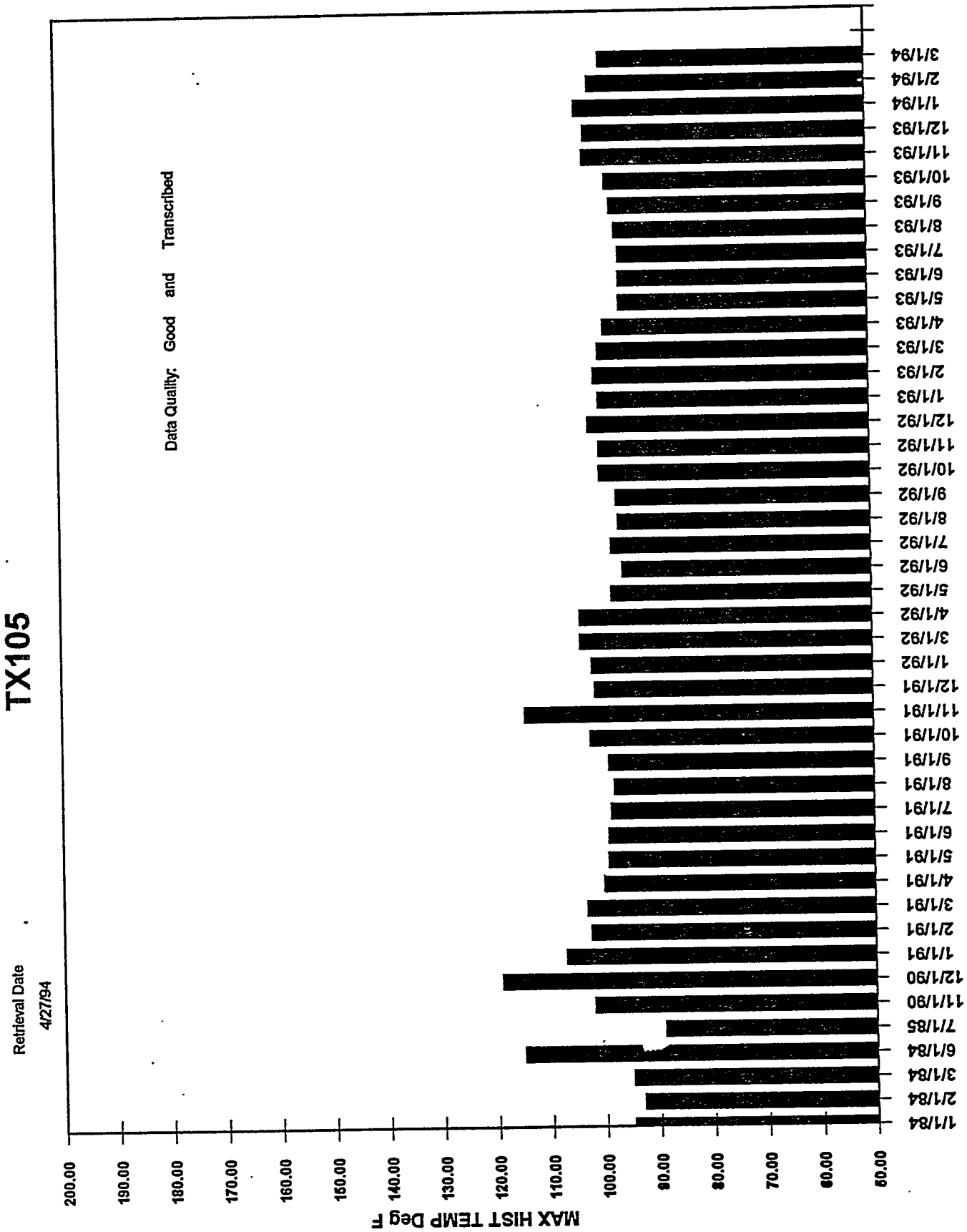

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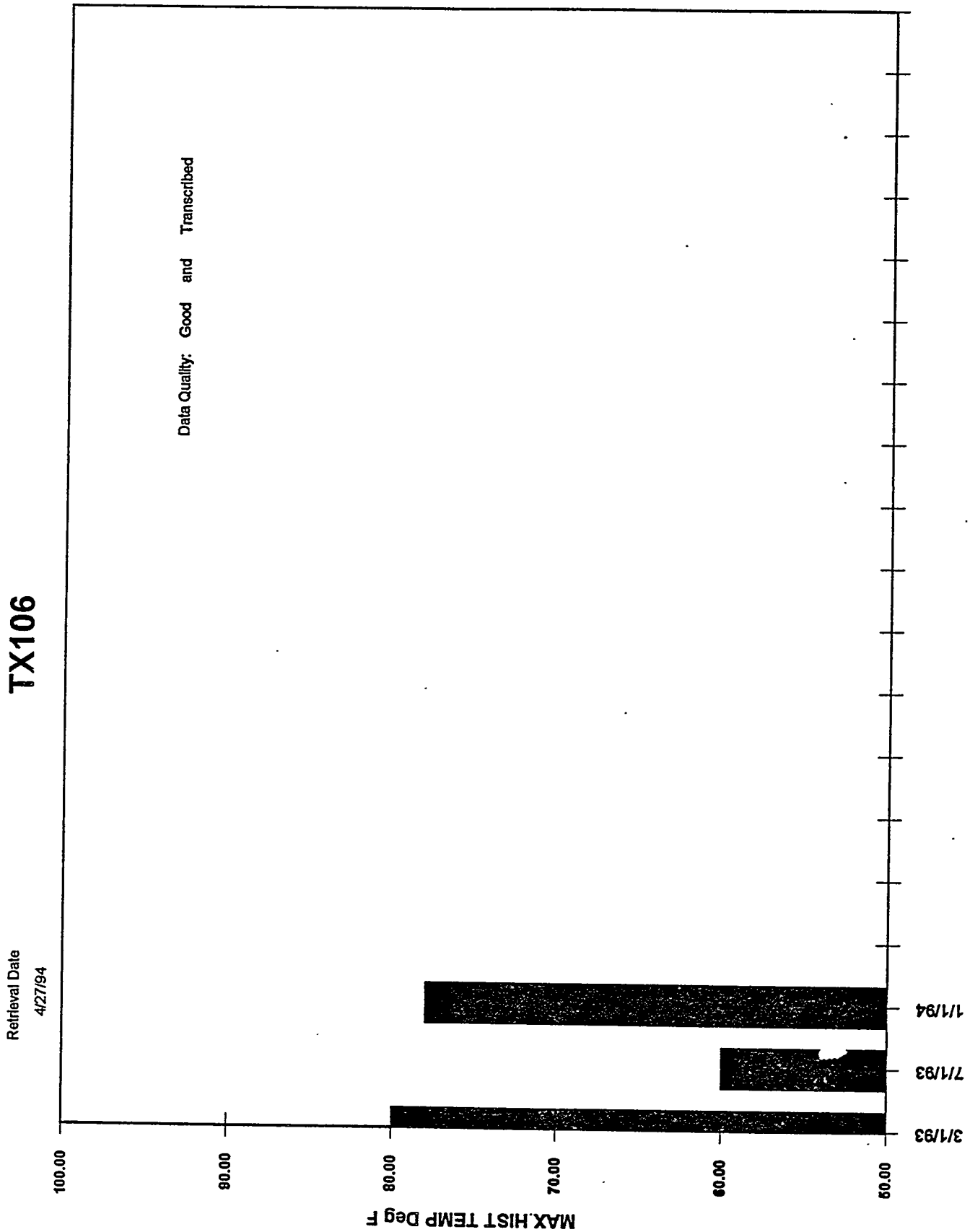

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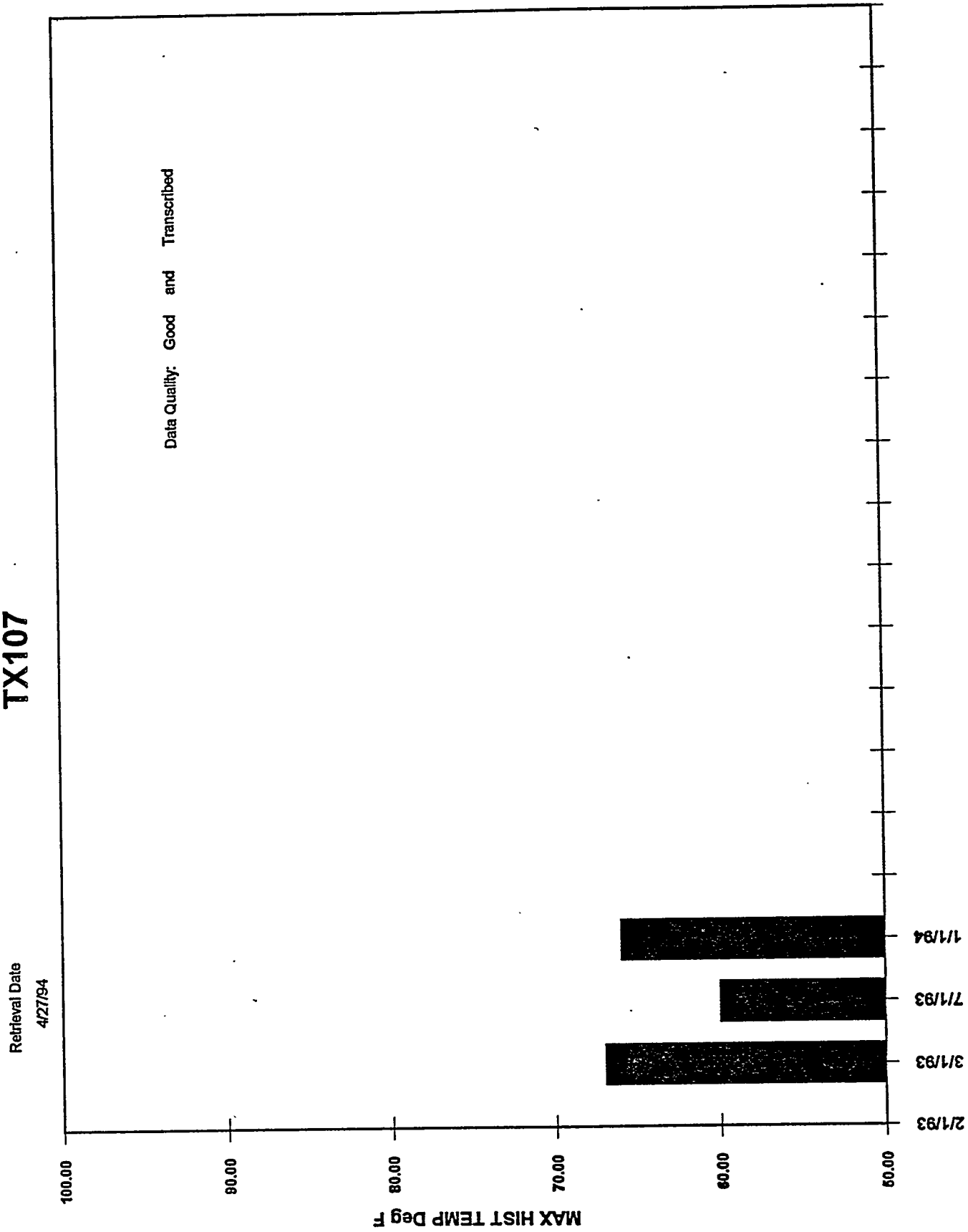

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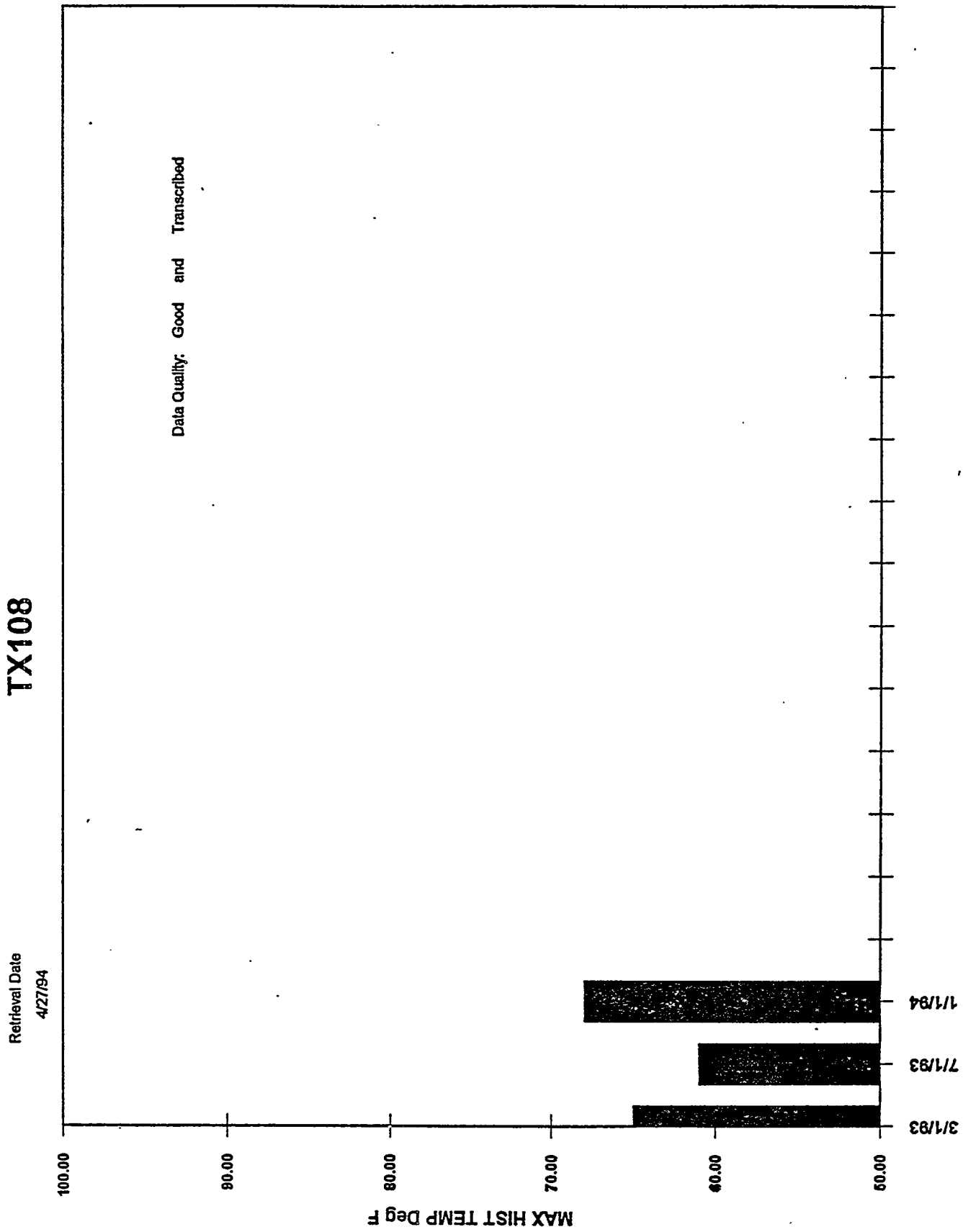

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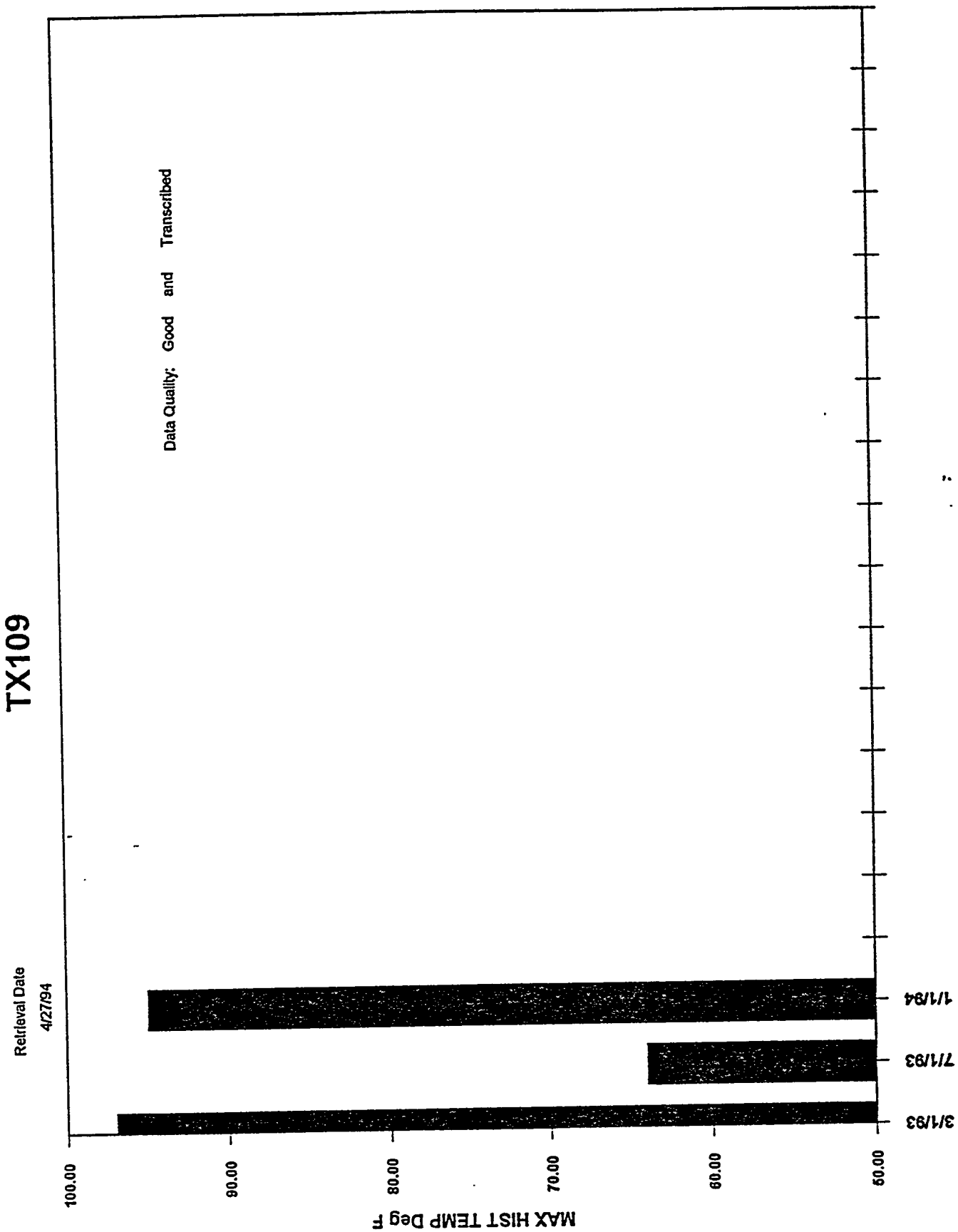

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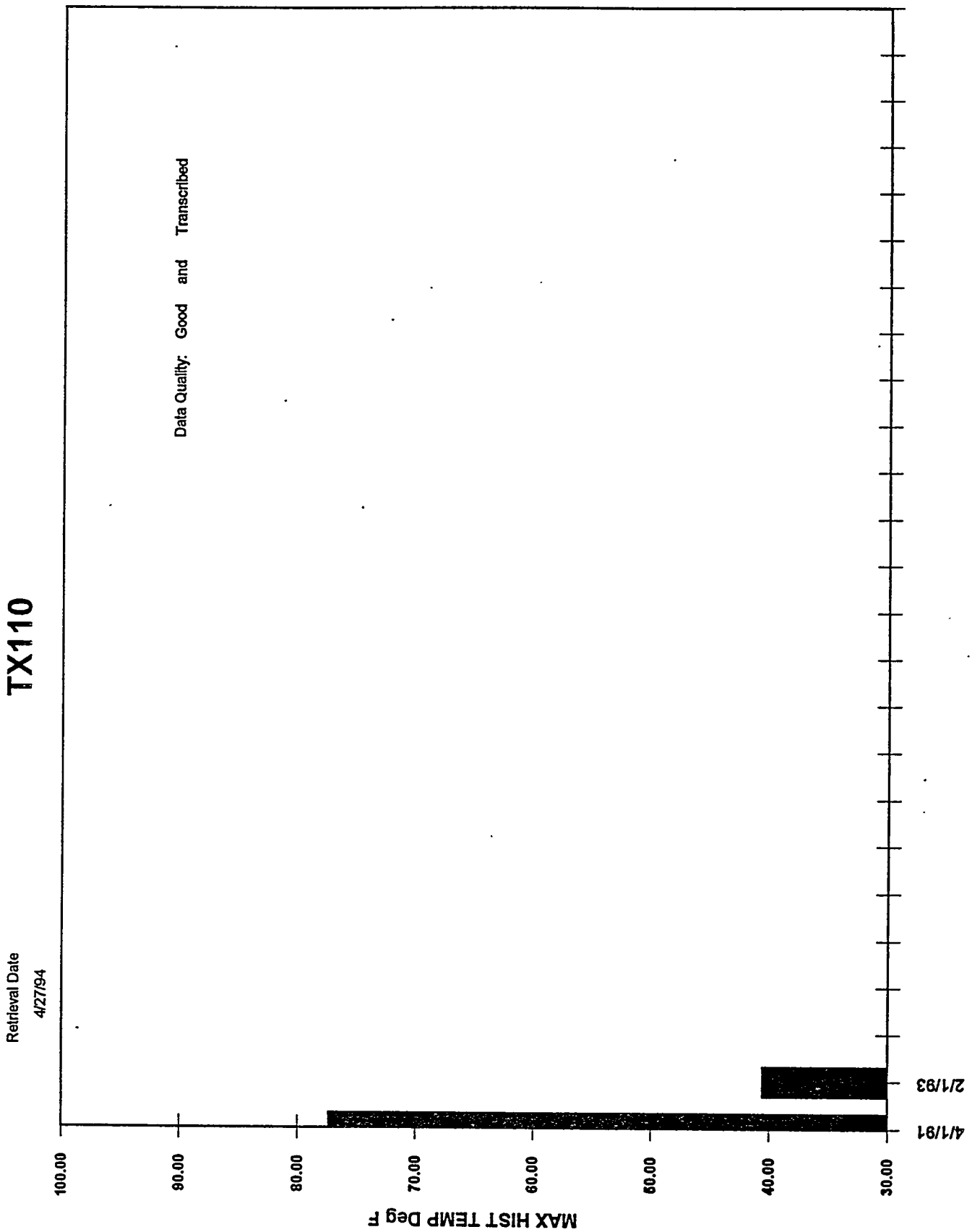

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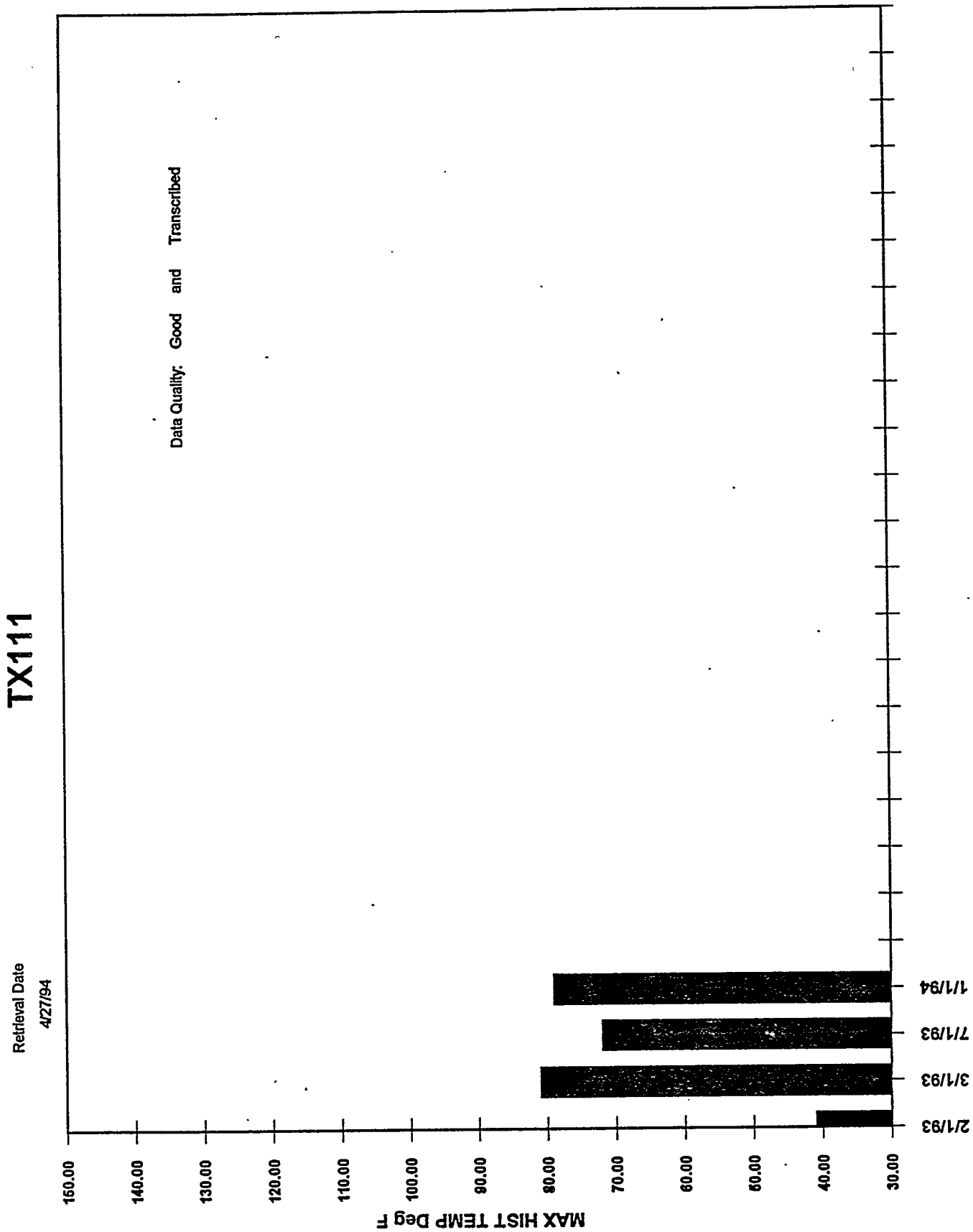

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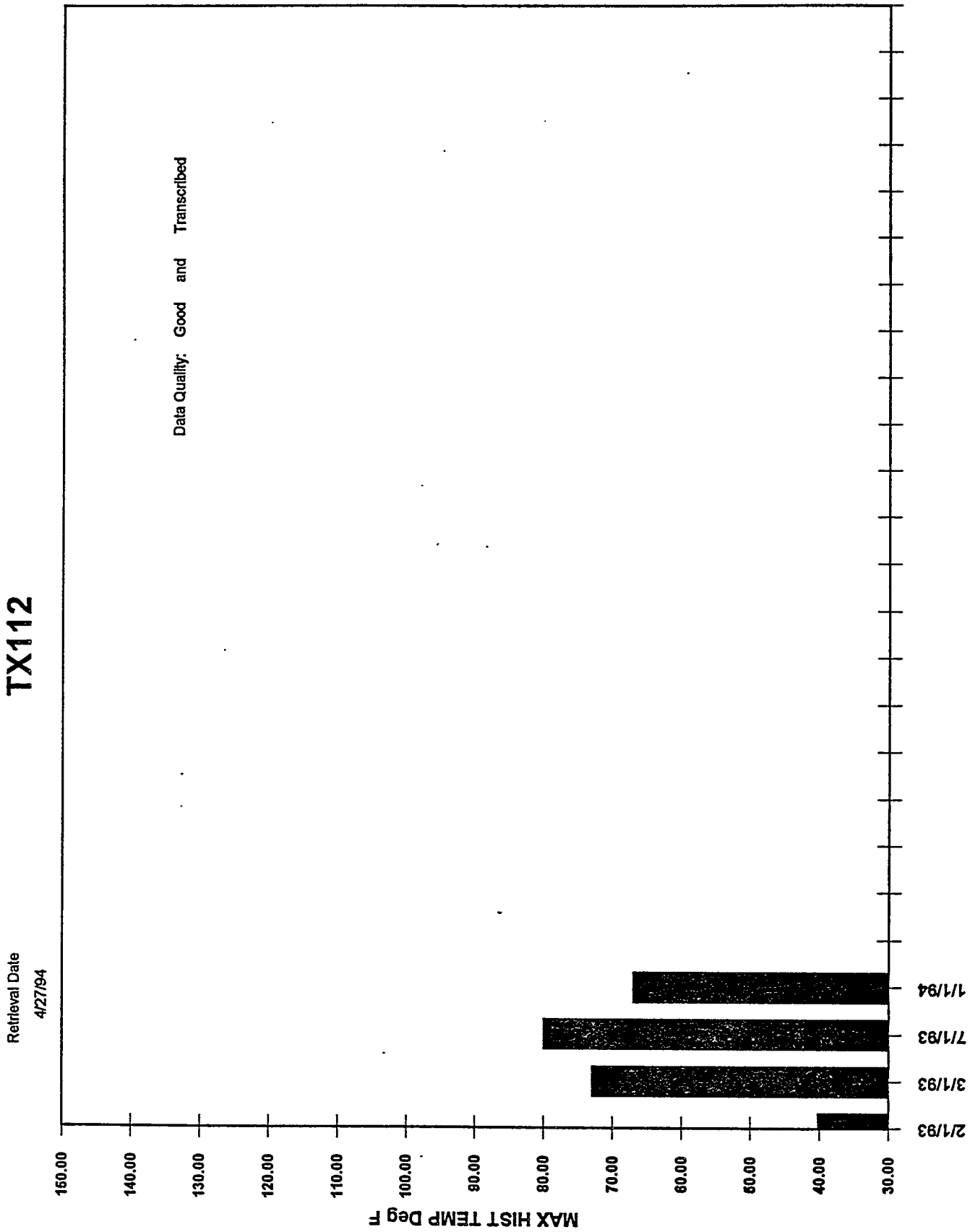

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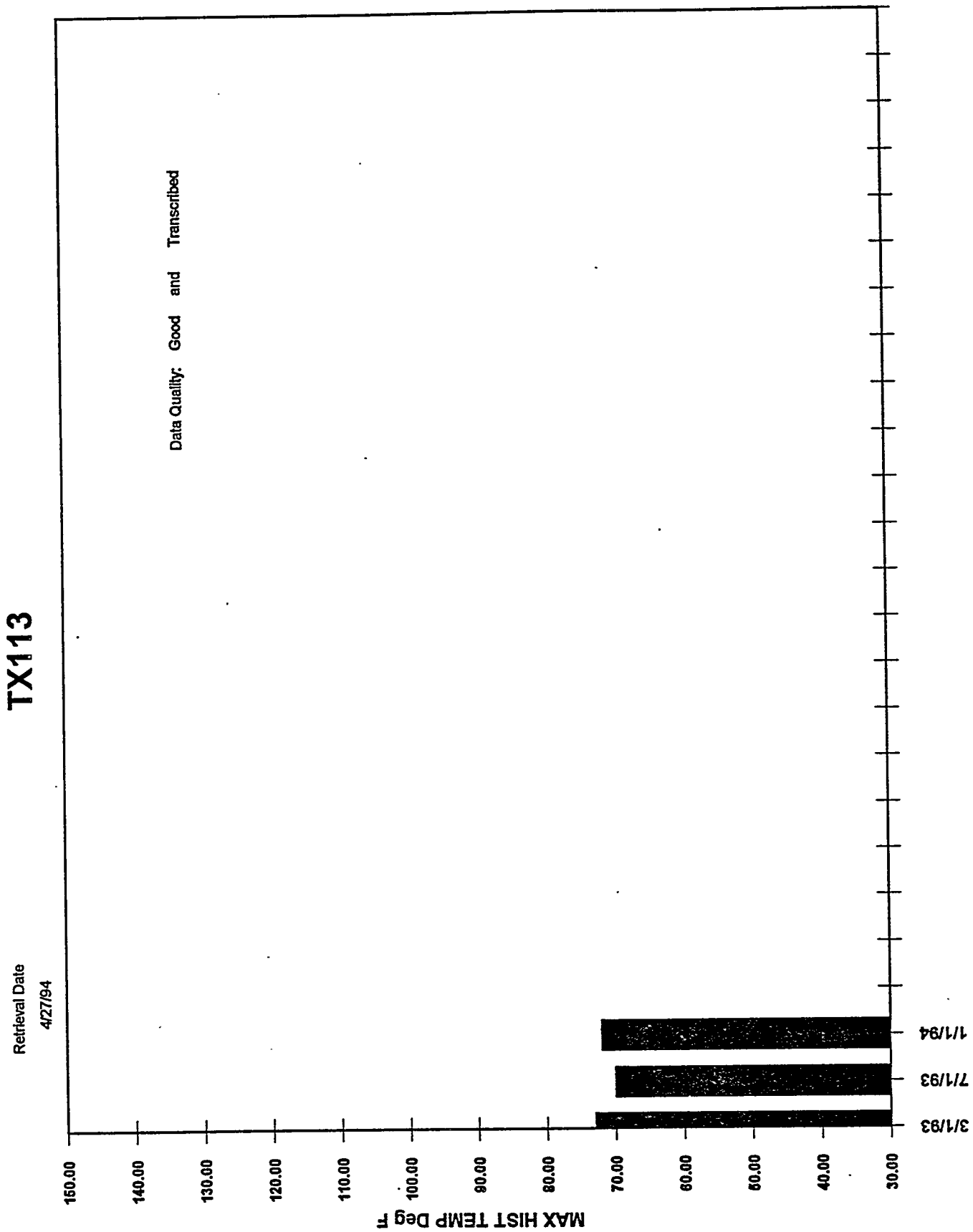

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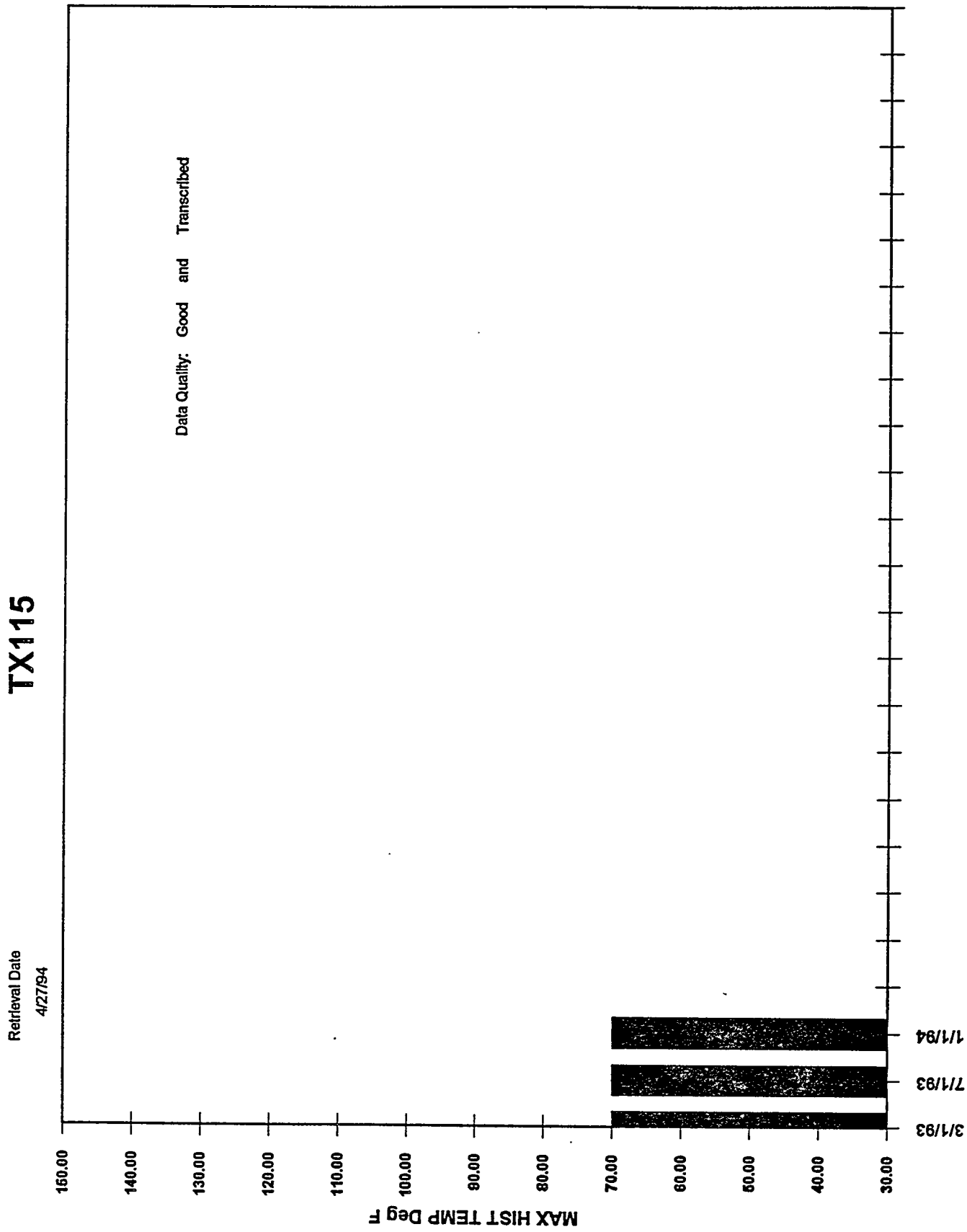

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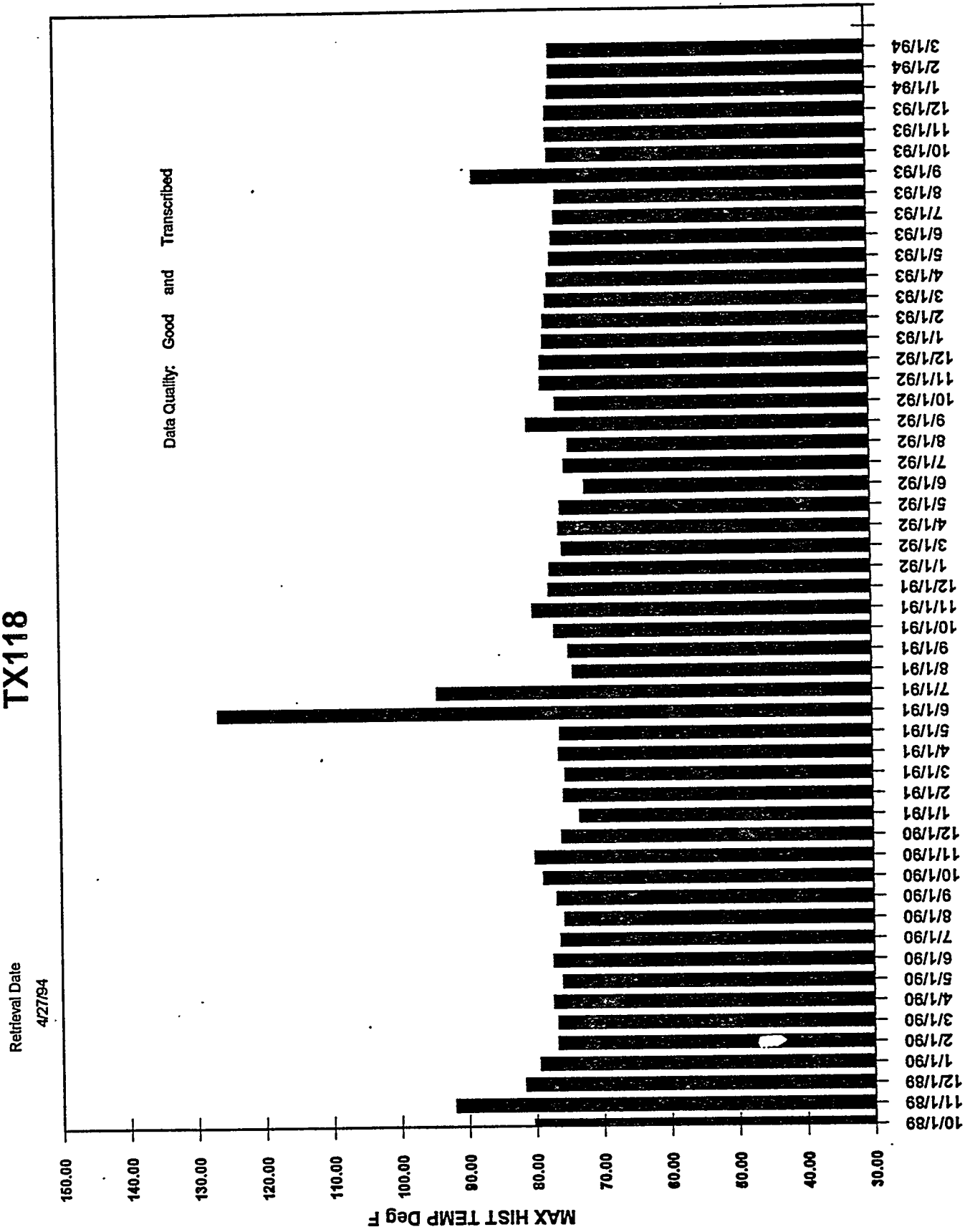

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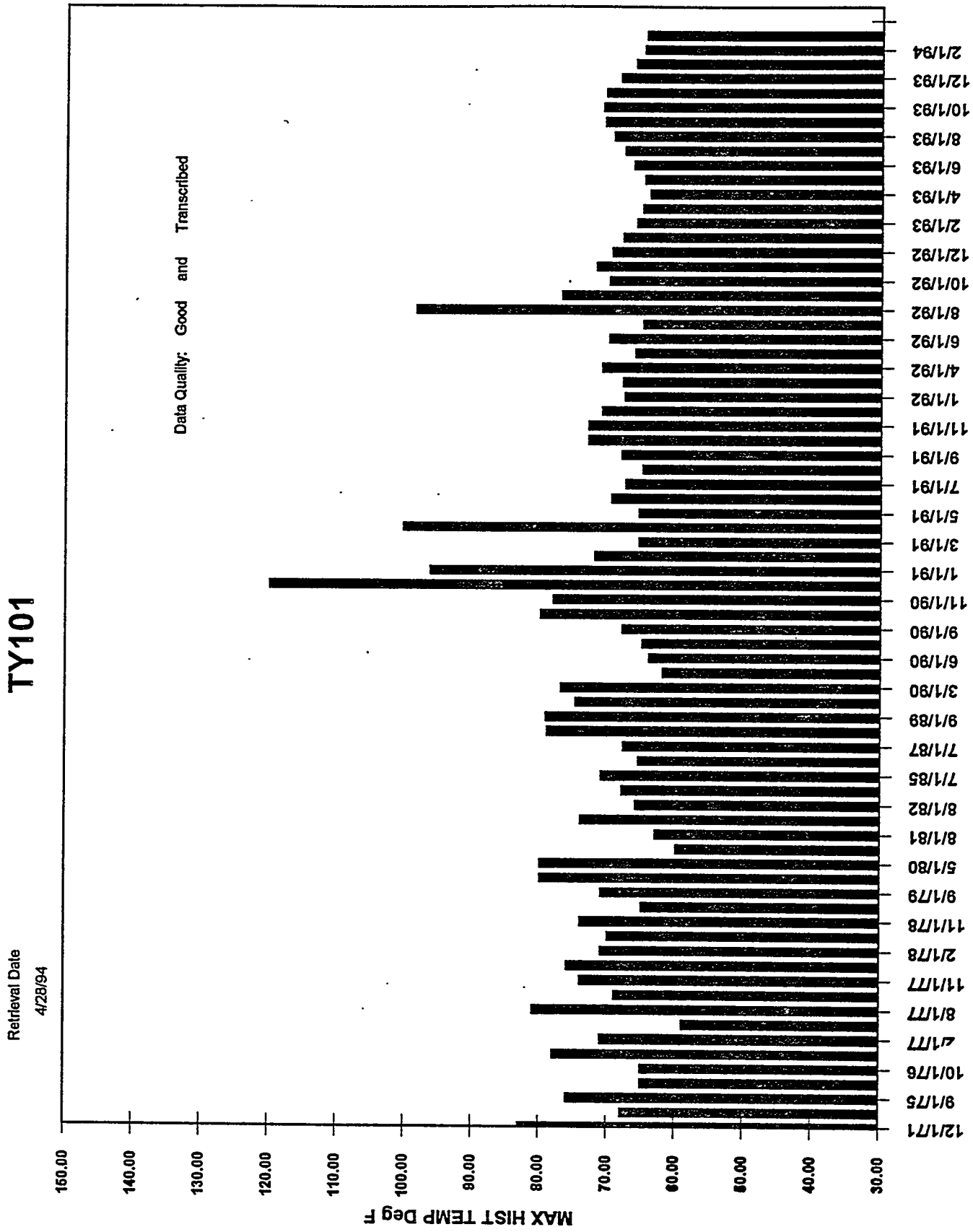
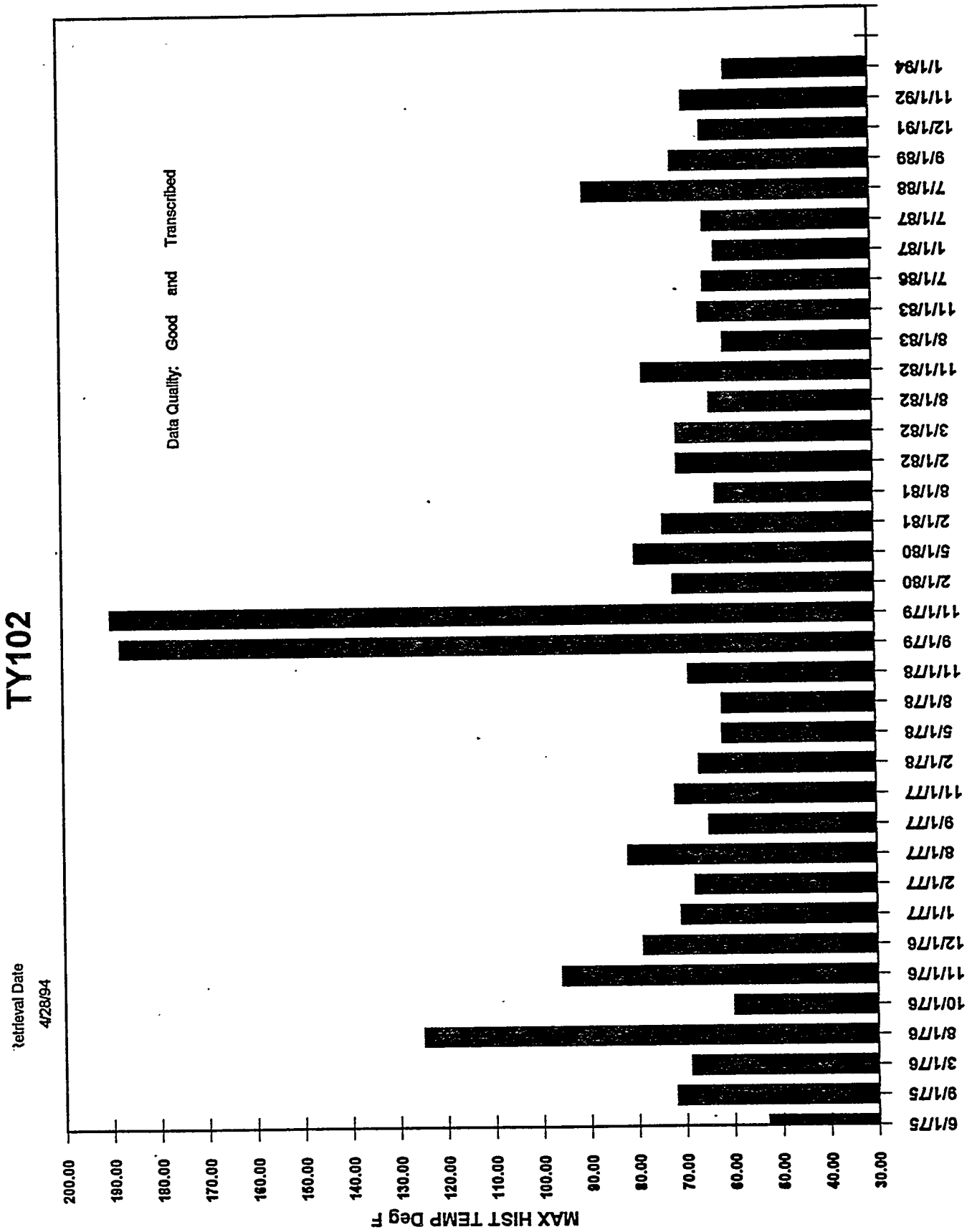
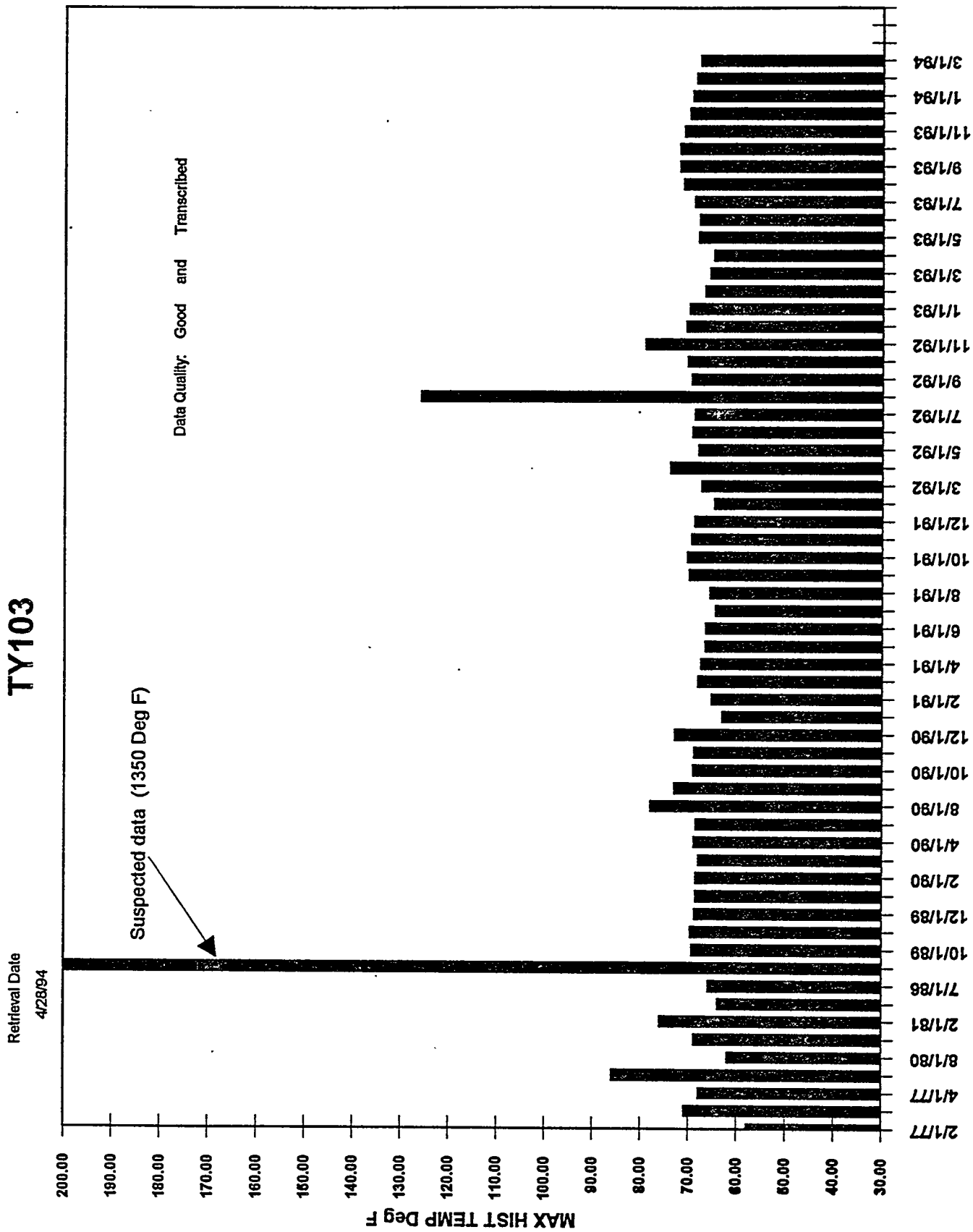


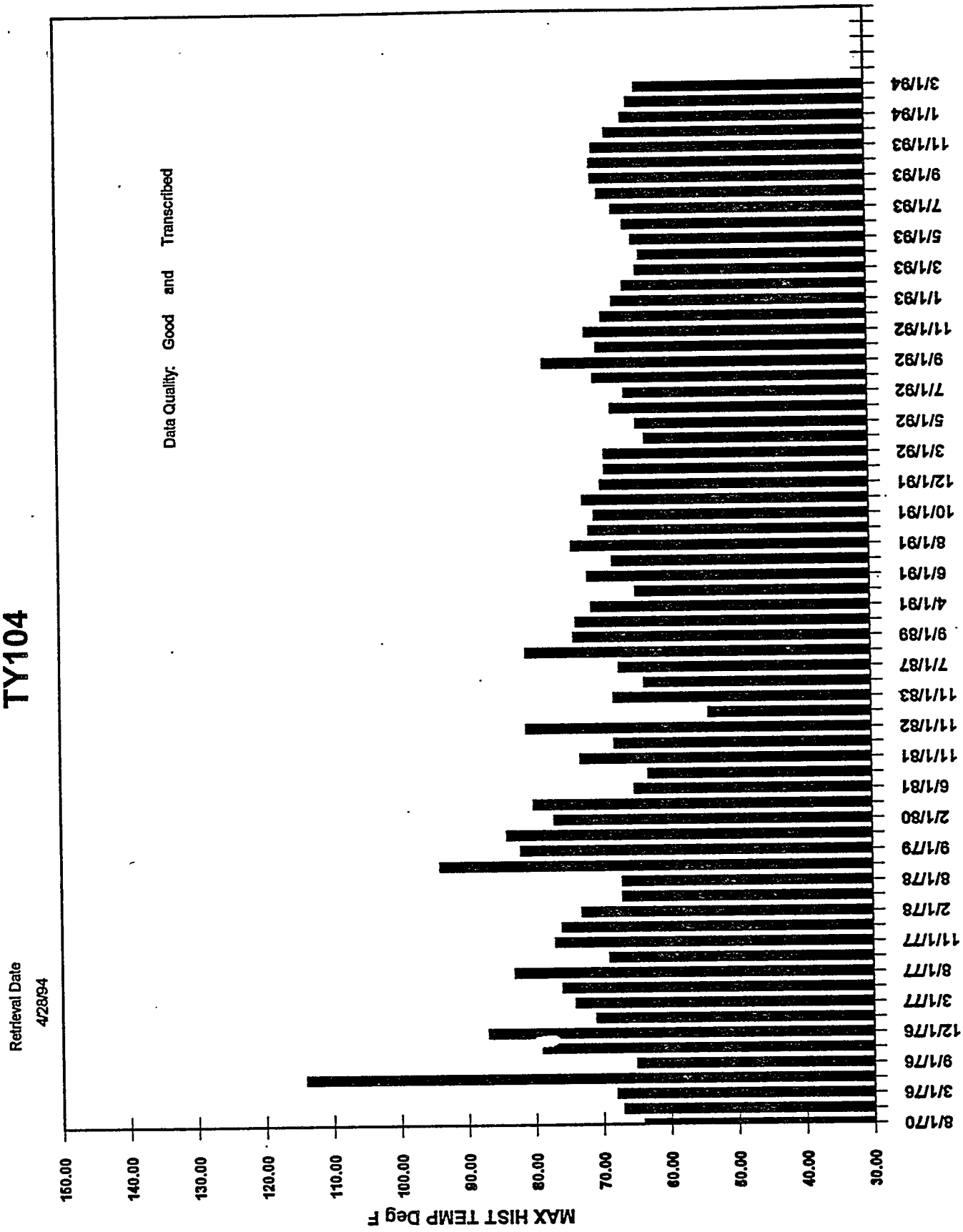
Maximum Temperature History Plot



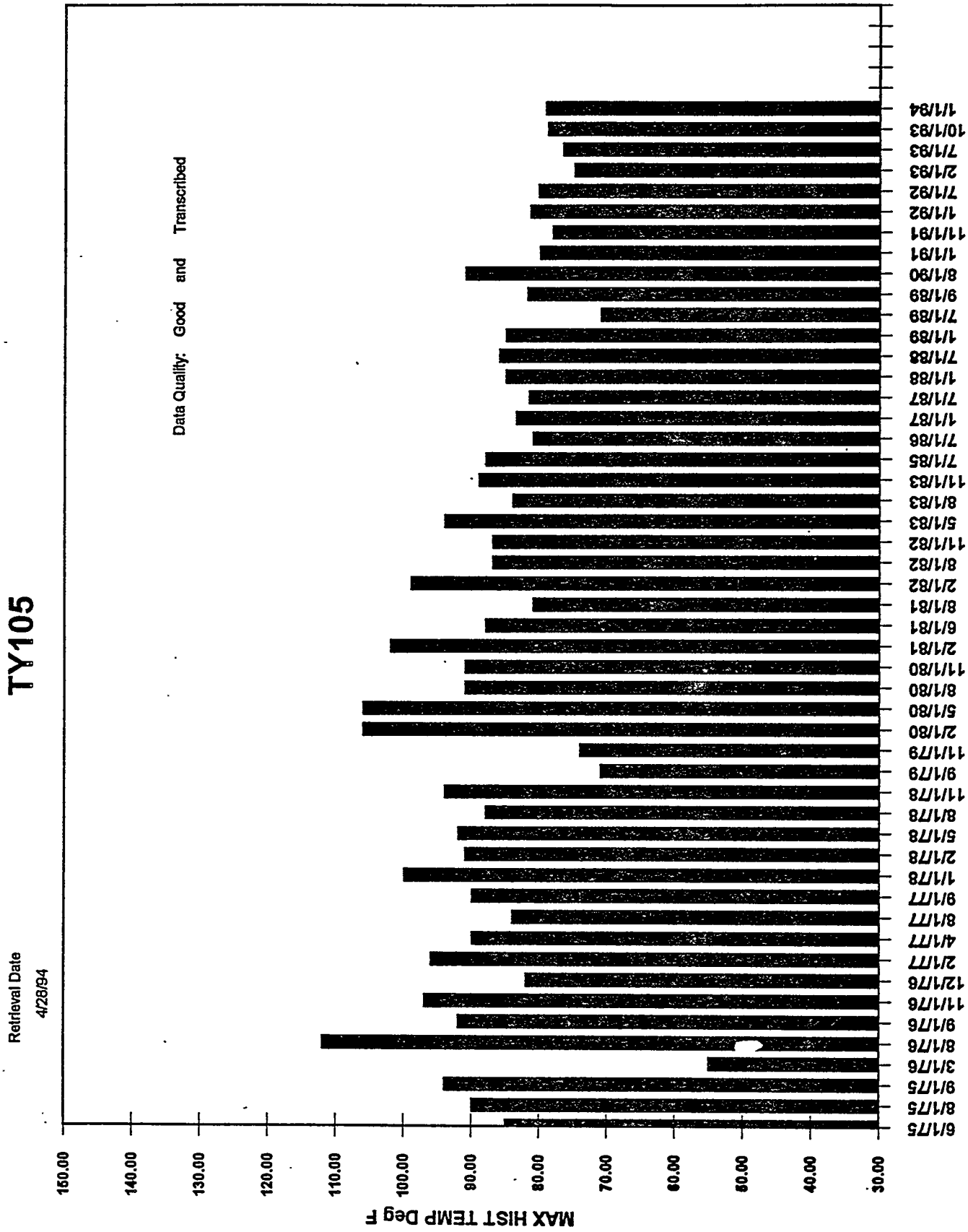
Maximum Temperature History Plot



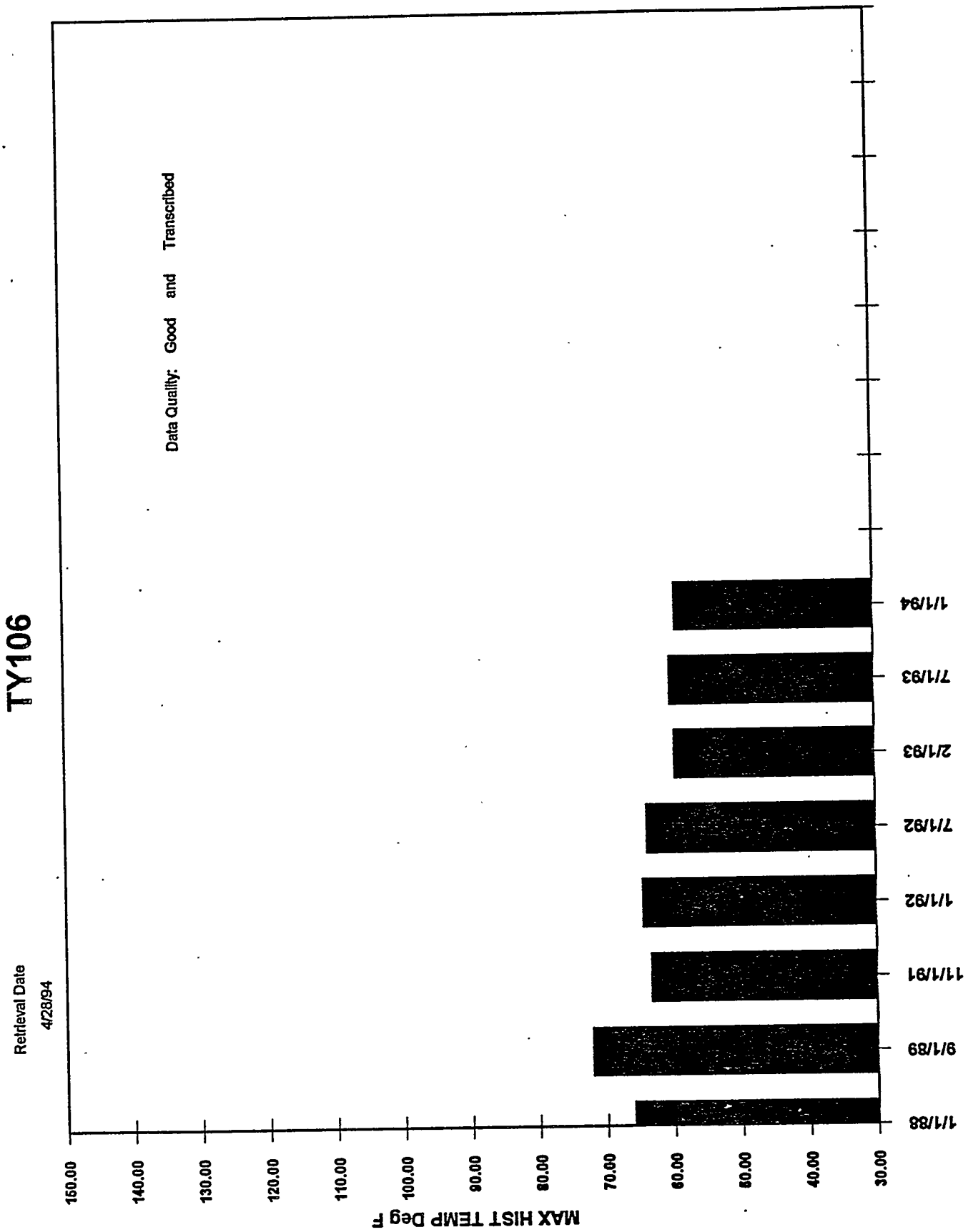
Maximum Temperature History Plot



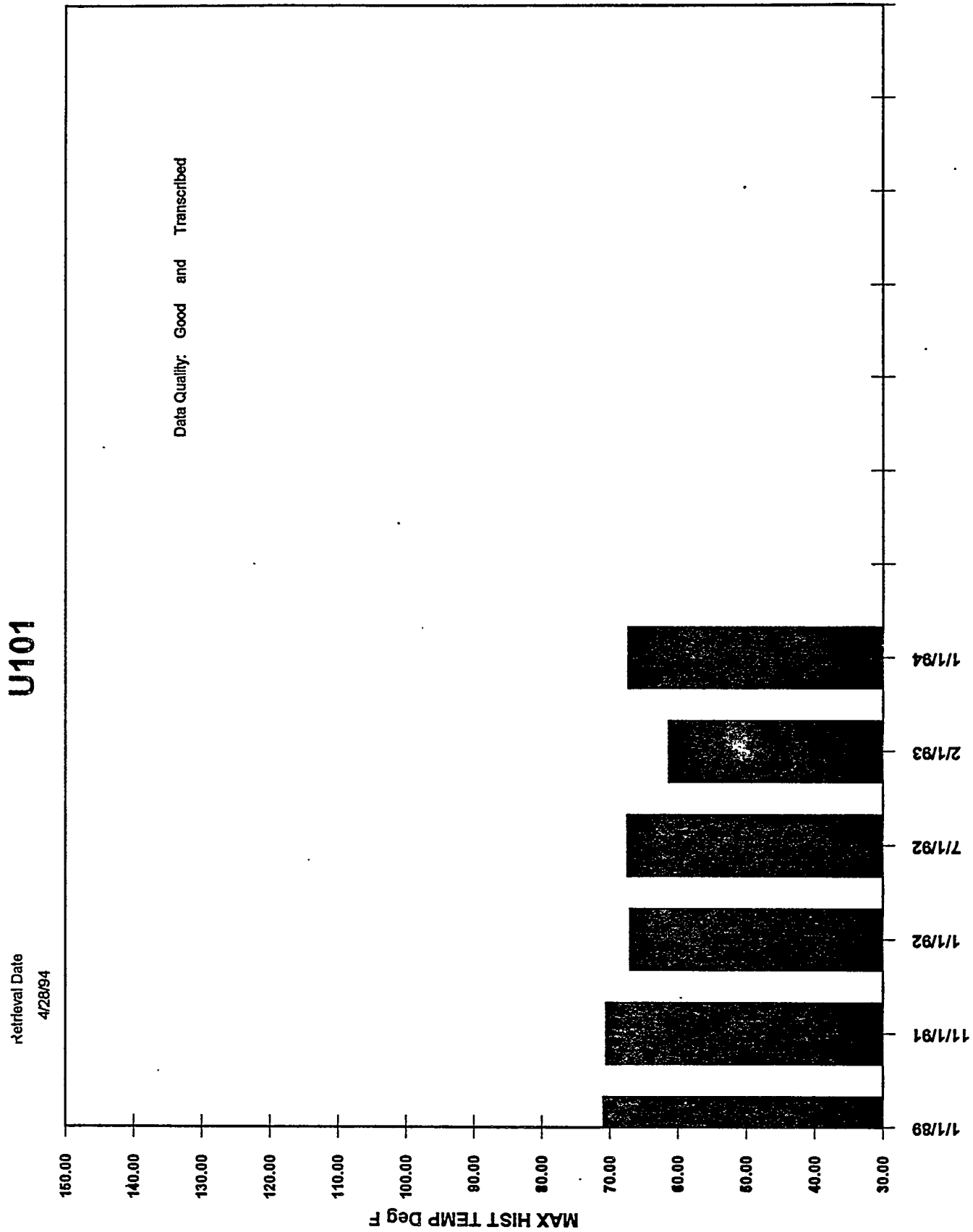
Maximum Temperature History Plot



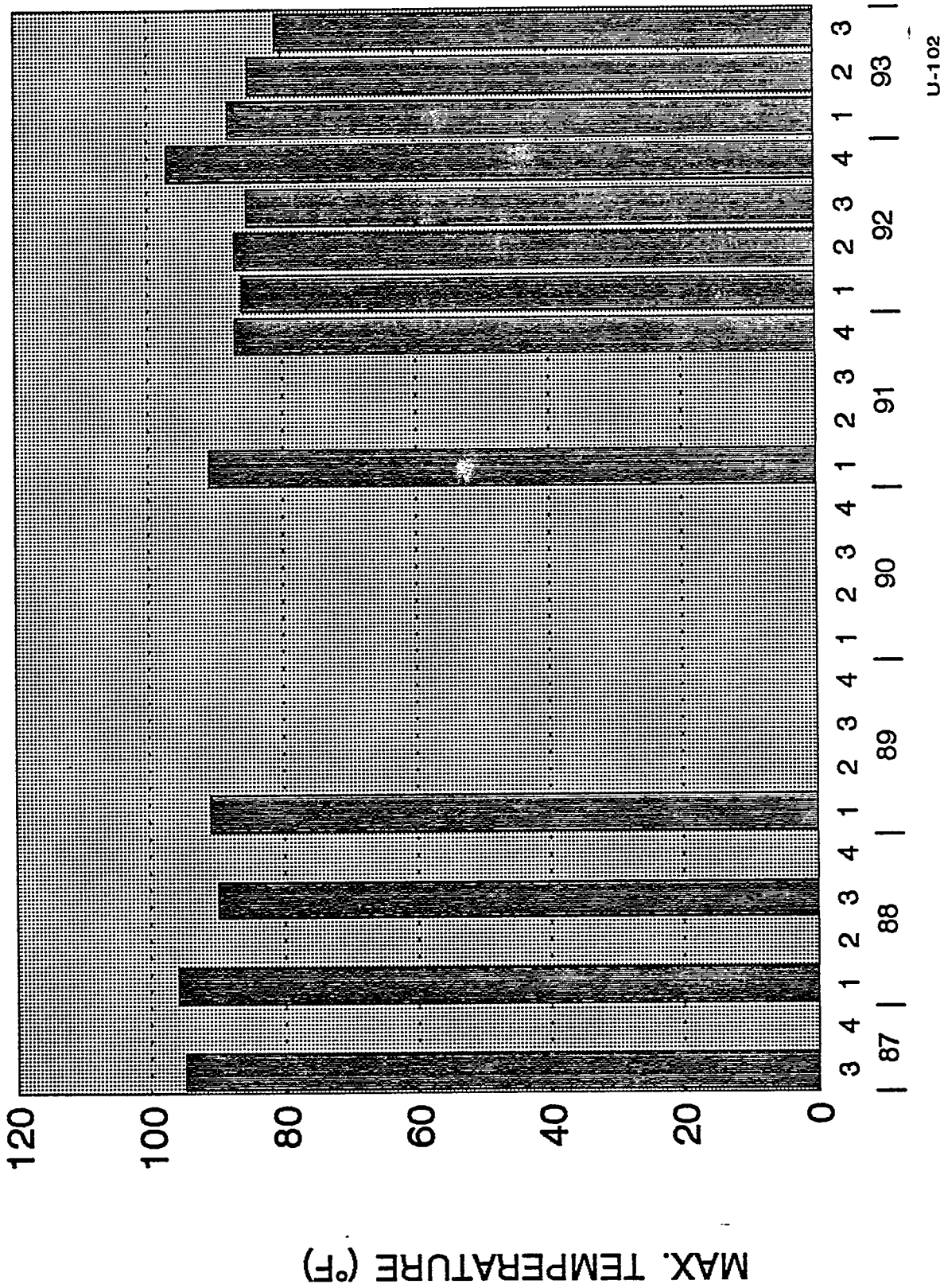
Maximum Temperature History Plot



Maximum Temperature History Plot

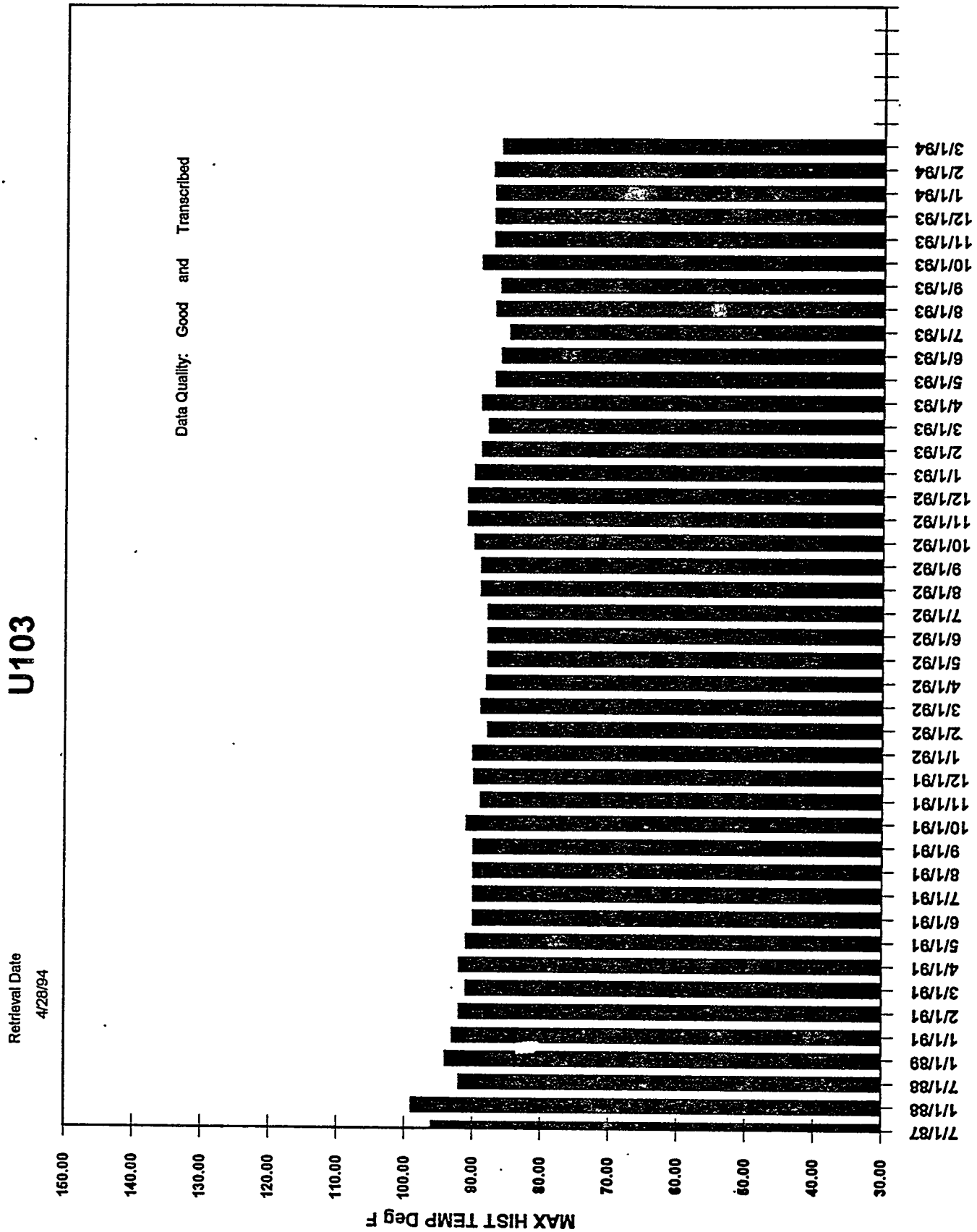


Maximum Temperature History Plot



ZERO ENTRY INDICATES NO DATA WAS RECORDED

Maximum Temperature History Plot



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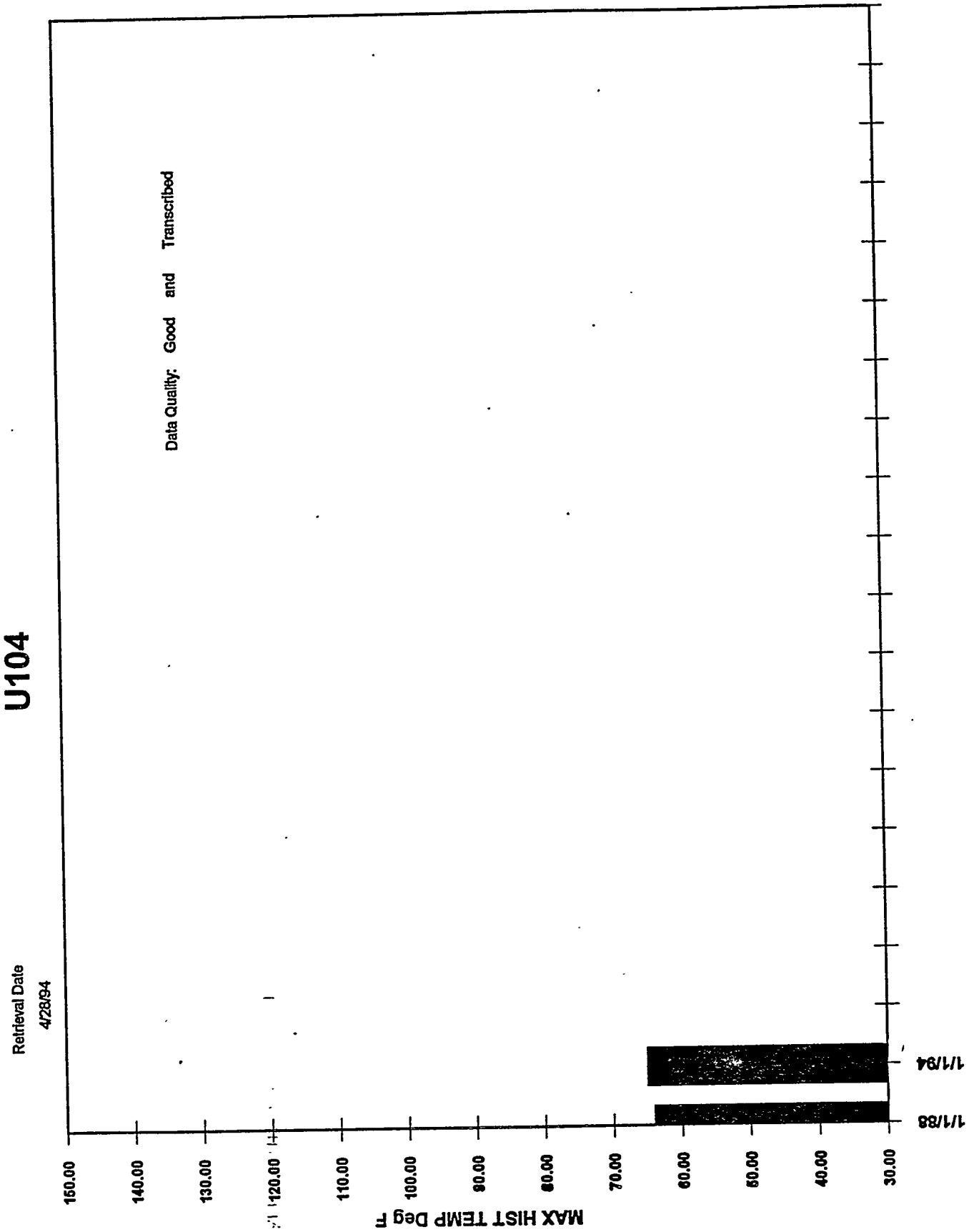
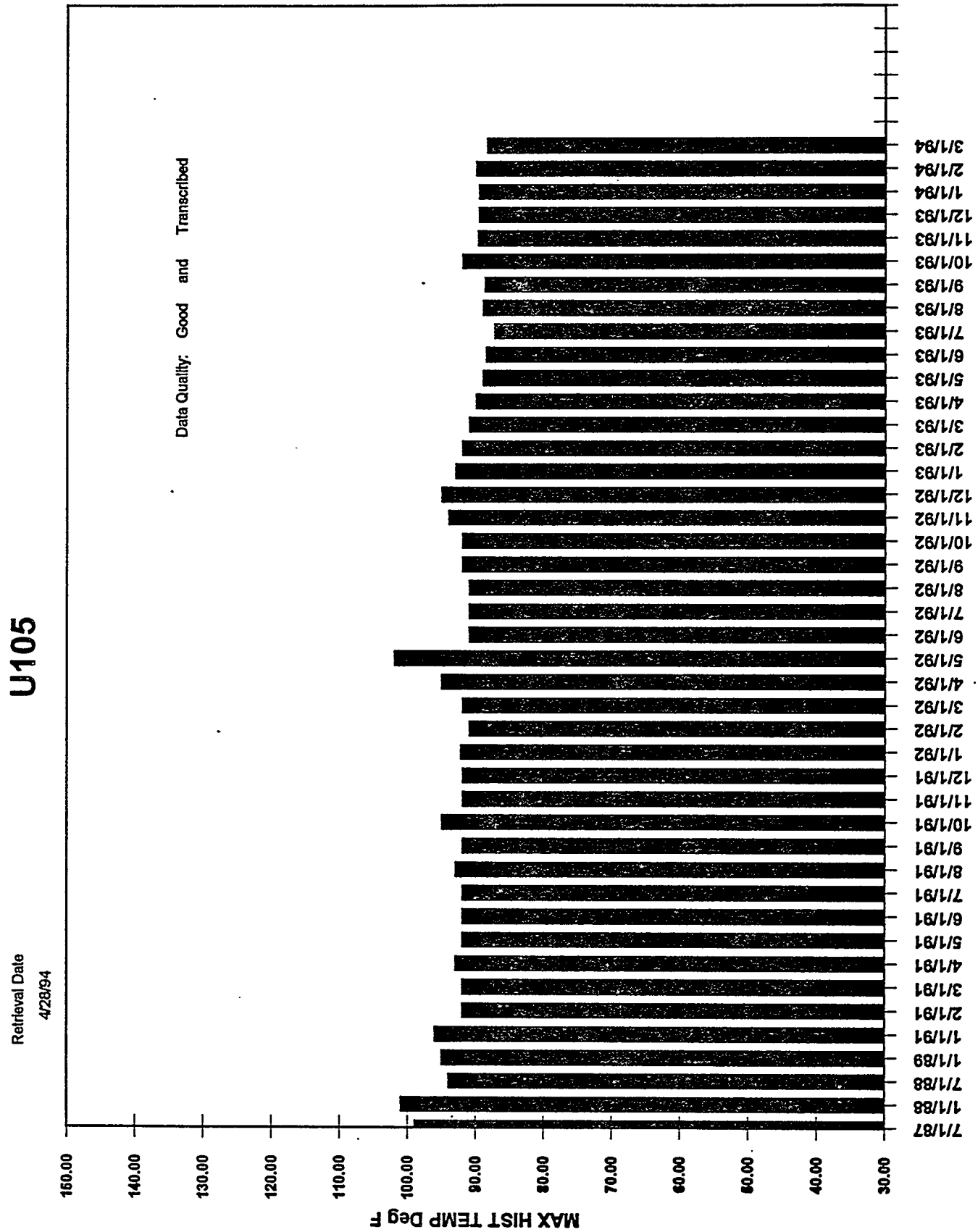
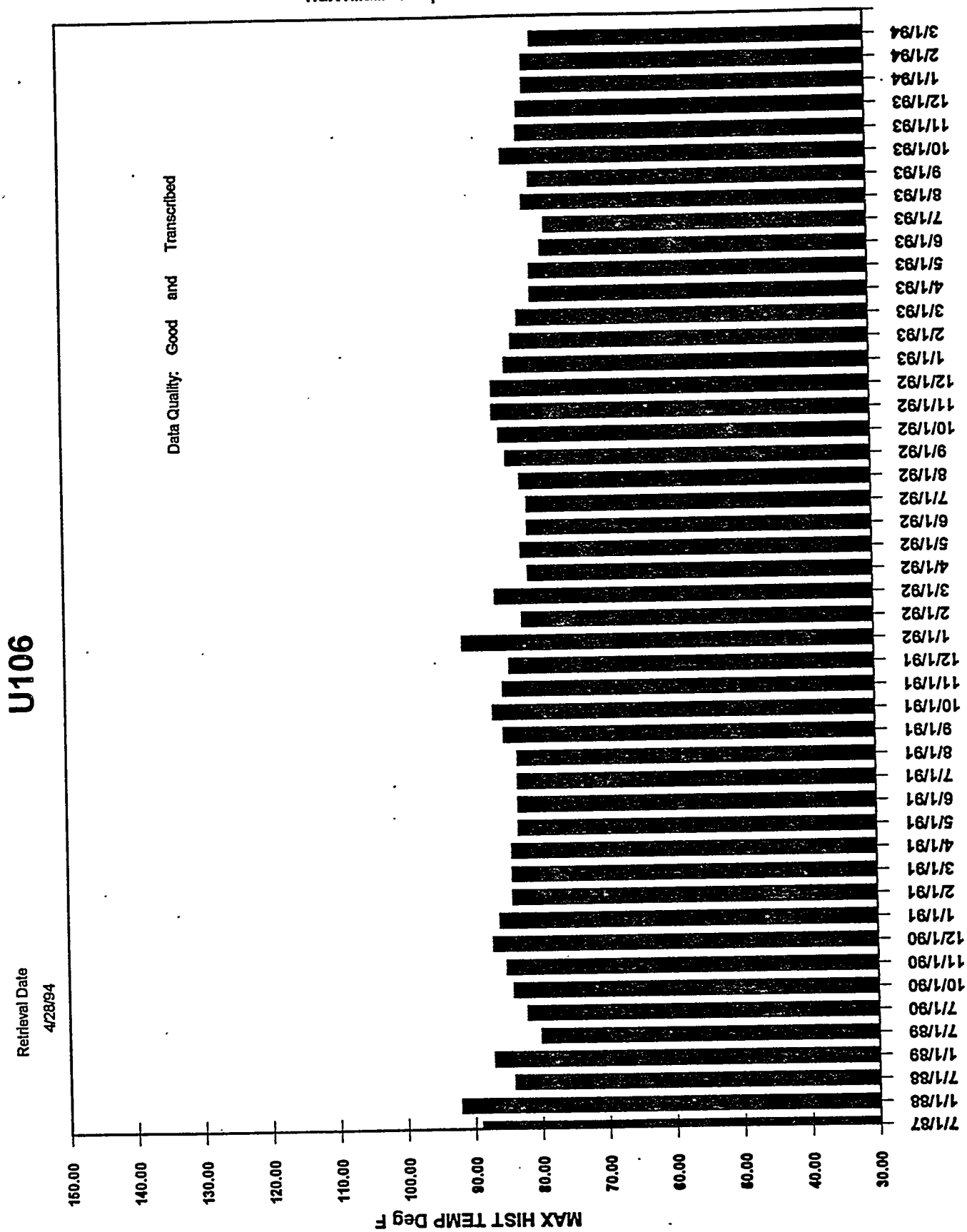


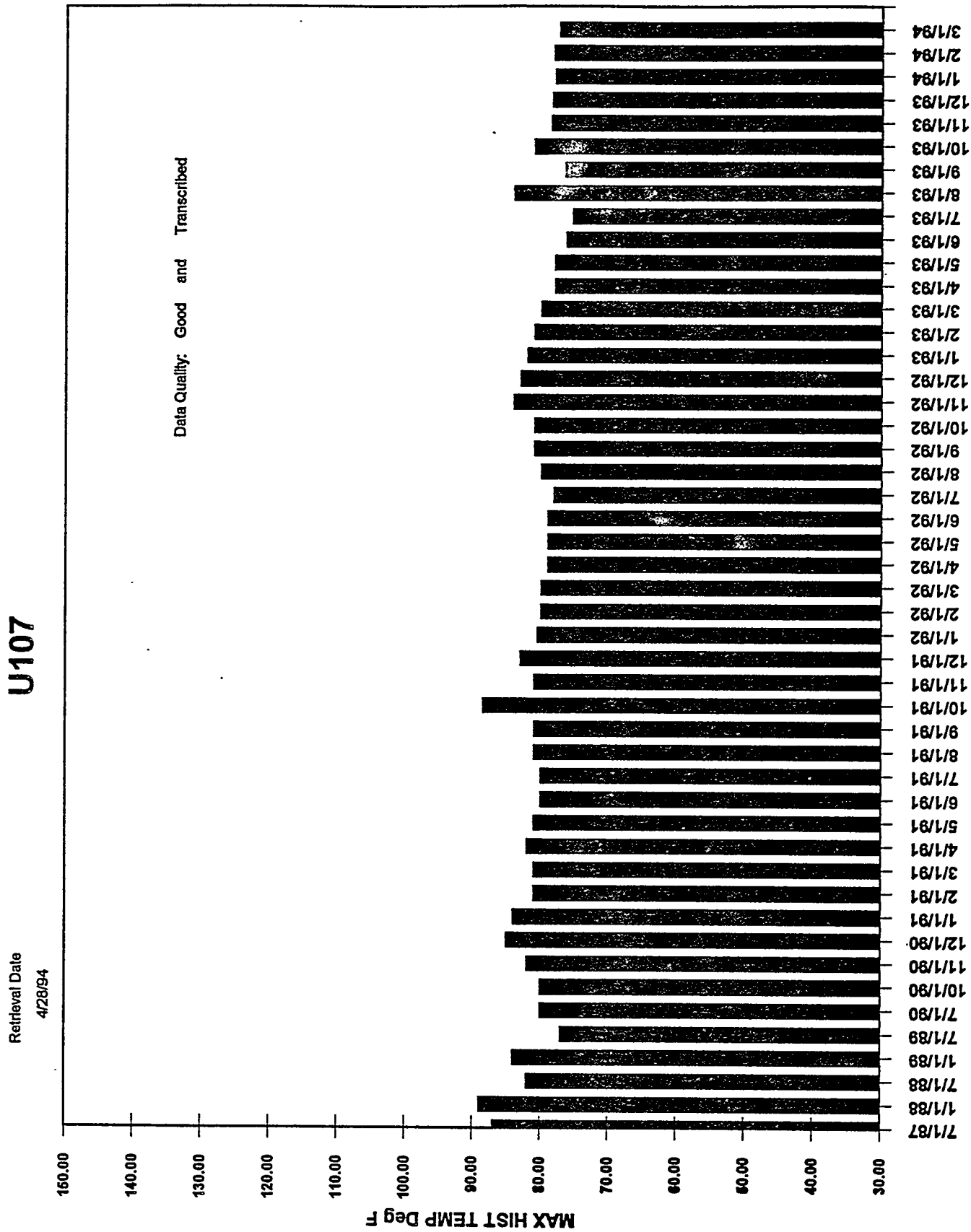
Maximum Temperature History Plot



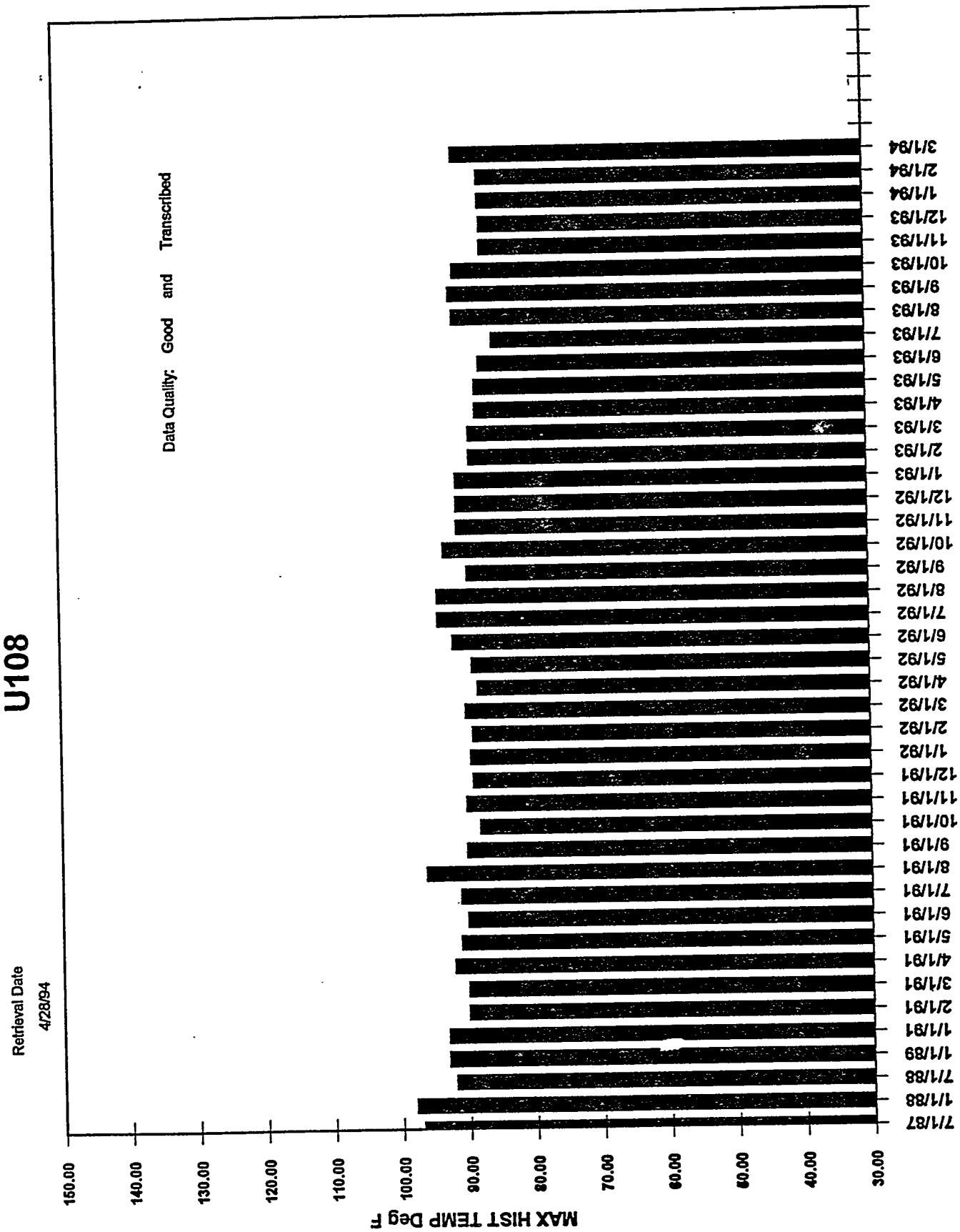
Maximum Temperature History Plot



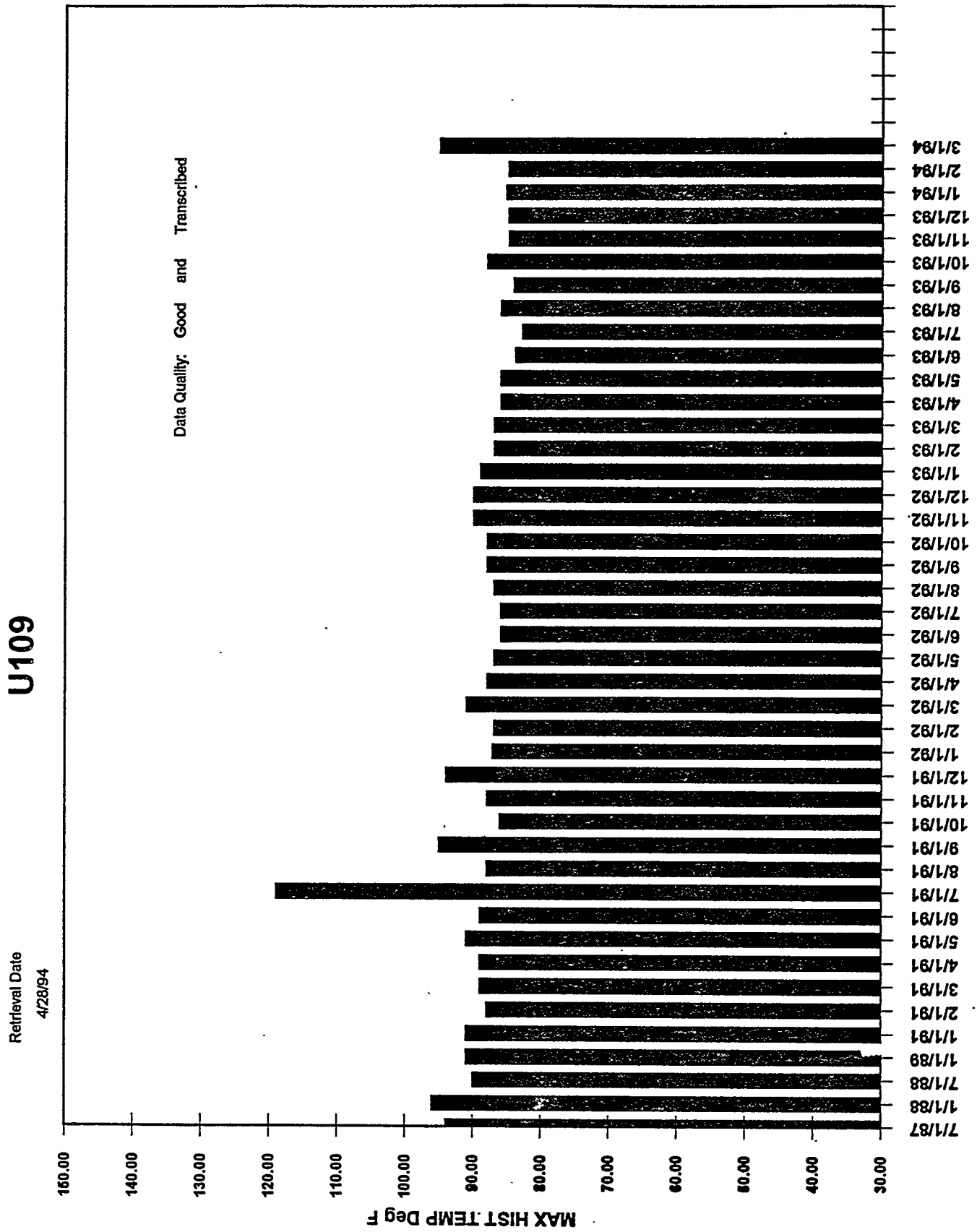
Maximum Temperature History Plot



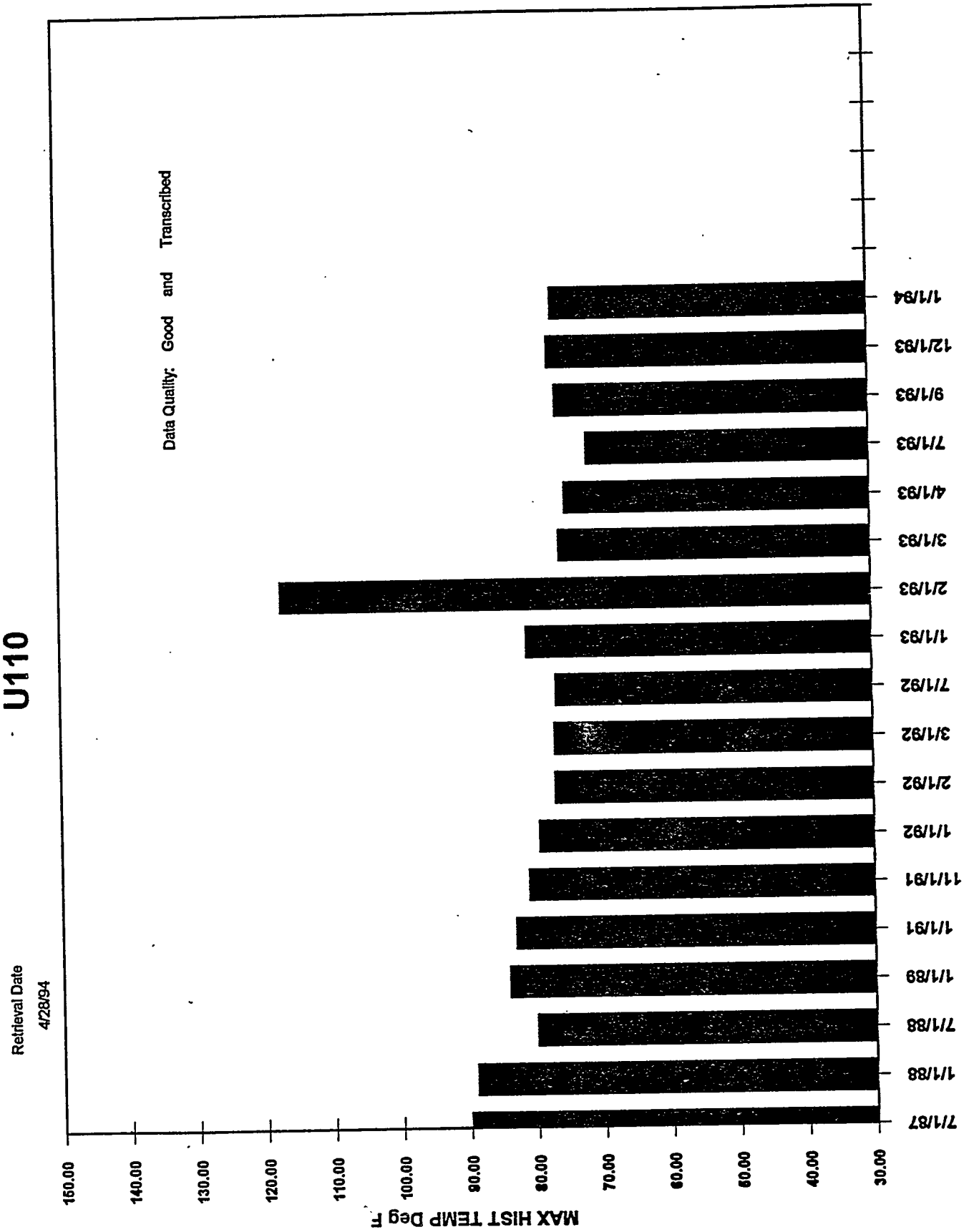
Maximum Temperature History Plot



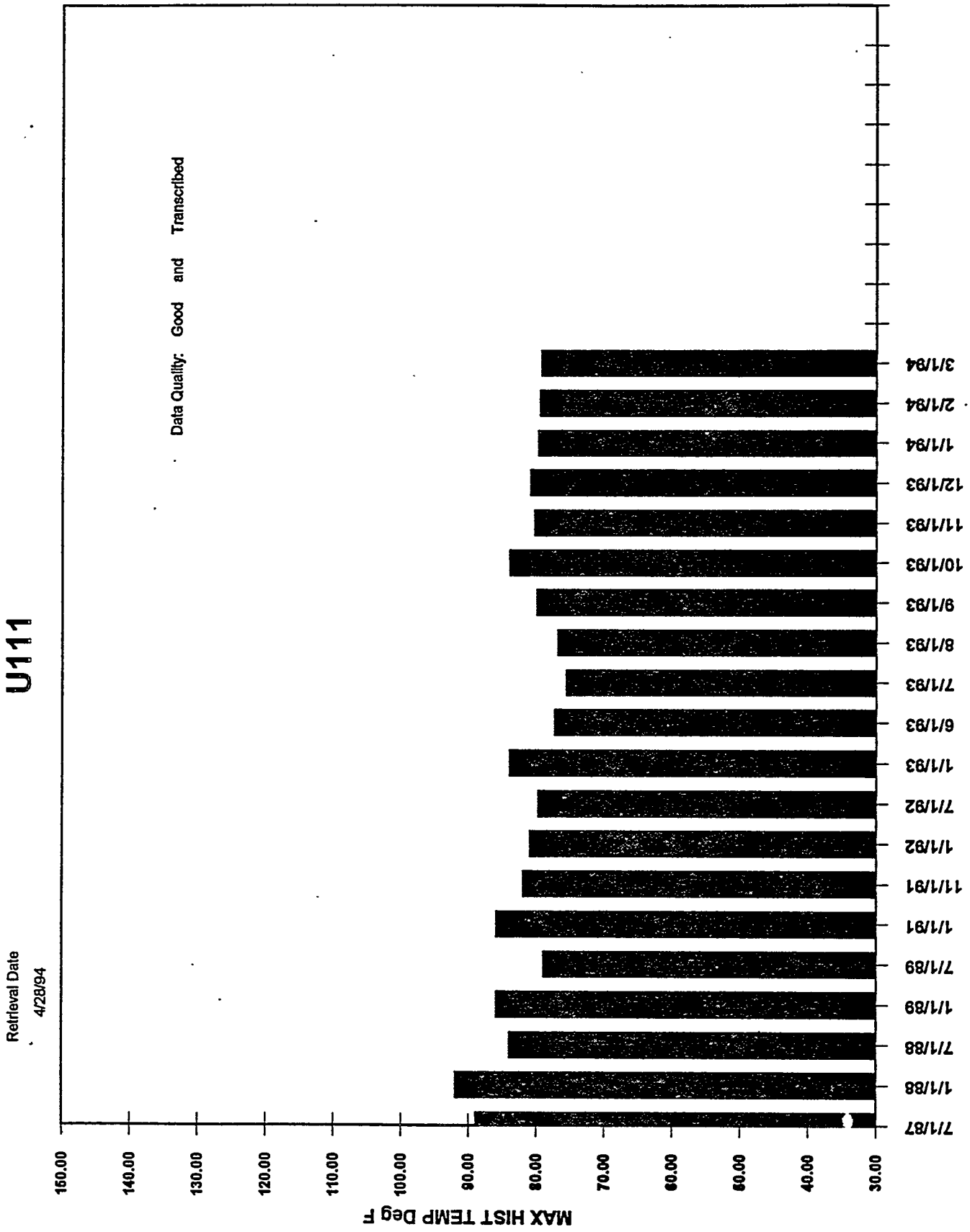
Maximum Temperature History Plot



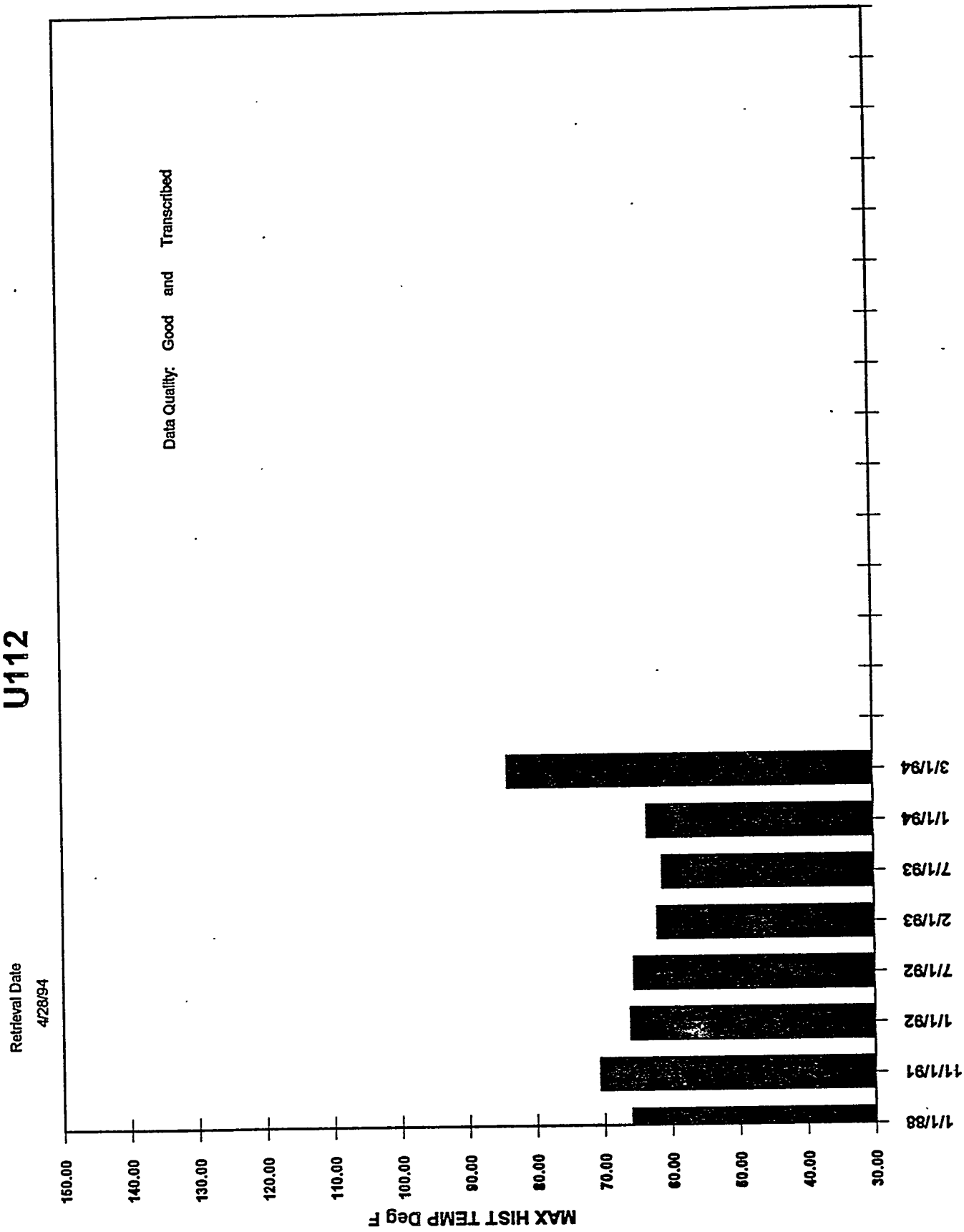
Maximum Temperature History Plot



Maximum Temperature History Plot



Maximum Temperature History Plot



A P P E N D I X F

ACCEPTED WASTE VOLUME/SURFACE-LEVEL FORMULAS

Accepted Waste Volume/Liquid Level Formulas[2]

SST Farms:A, AX, B, BX, BY, C, S, SX, T, TX, TY, U
DST Farms:AN, AP, AW, AY, AZ, SY

"Vol" volume is in gallons. "LL" is liquid level in inches as determined by FIC or manual tape (MT).

When calculating "LL" note that the values obtained are referenced from the bottom center-line on all tanks. On dish bottom tanks the calculated "LL" may be off by 6 or 12 in. from the FIC or MT measurements.

(1) For 55,000-gal SST, Type I (B, C, T, and U): (dish bottom)

Vol = (LL - 6 in.) x 196 + 590
LL = (Vol - 590)/196 + 6

(2) For 530,000-gal SST, Type II (B, BX, C, T, and U) where FICs are on side of tank: (dish bottom)

Vol = (LL - 12 in.) x 2750 + 12,500
LL = (Vol - 12,500)/2750 + 12

(3) For 758,000-gal SSTs, Type III (BY, S, TX, and TY) (dish bottom)

Vol = (LL - 12 in.) x 2750 + 12,500
LL = (Vol - 12,500)/2750 + 12

(4) For 1,000,000 gal SST, Type IV (SX): (dish bottom)

Vol = (LL - 12 in.) x 2750 + 18,500
LL = (Vol - 18,500)/2750 + 12

(5) For 1,000,000-gal SST, Type IV (A, AX): (flat bottom)

Vol = LL x 2750
LL = Vol/2750

(6) For 1,000,000-gal and 1,160,000-gal DSTs, Type V (AN, AP, AW, and SY are 1,160,000-gal, while AY and AZ are 1,000,000-gal): (flat bottom)

Vol = LL x 2750
LL = Vol/2750

Prepared by: Bryan Flanagan _____ Date: 8/2/94

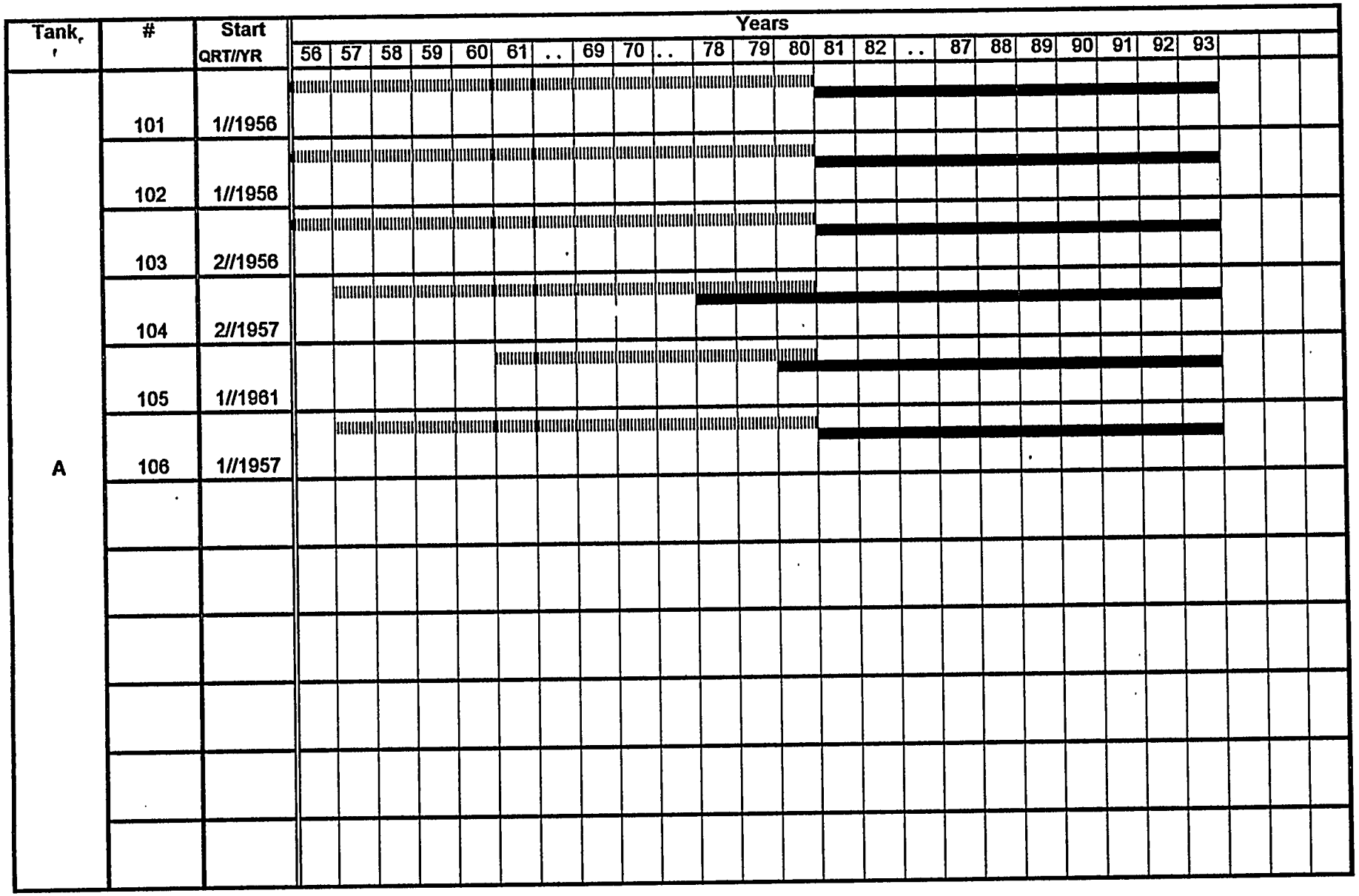
Checked by: Nguyen Ha _____ Date: 8/2/94

[2]Joncus, S. J., 1982, Change Control Procedure & Reference for Document RHO-RE-SR-14, SD-RE-CMP-001, Rev. 0

A P P E N D I X G

SURFACE-LEVEL RECORD ENVELOPE PROFILE

SURFACE LEVEL RECORD ENVELOPE PROFILE
1,000,000 GALS SINGLE SHELL TANKS



SURFACE LEVEL RECORD ENVELOPE PROFILE
1,000,000 GALS DOUBLE SHELL TANKS

Tank	#	Start QRT//YR	Years																									
			56	57	58	59	60	61	..	69	70	71	..	76	77	..	81	..	87	88	89	90	91	92	93			
AN	101	1981																										
	102	1981																										
	103	1981																										
	104	1981																										
	105	1981																										
	106	1981																										
	107	1981																										

SACS DATA

SURFACE LEVEL RECORD ENVELOPE PROFILE
1,000,000 GALS DOUBLE SHELL TANKS

Tank	#	Start QRT//YR	Years																									
			56	57	58	59	60	61	..	69	70	71	..	76	77	..	85	86	87	88	89	90	91	92	93			
AP	101	1986																■	■	■	■	■	■	■	■			
	102	1986																■	■	■	■	■	■	■	■			
	103	1986																■	■	■	■	■	■	■	■			
	104	1986																■	■	■	■	■	■	■	■			
	105	1986																■	■	■	■	■	■	■	■			
	106	1986																■	■	■	■	■	■	■	■			
	107	1989																			■	■	■	■	■			
	108	1989																			■	■	■	■	■			

■ SACS DATA

SURFACE LEVEL RECORD ENVELOPE PROFILE
1,000,000 GALS DOUBLE SHELL TANKS

Tank	#	Start QRT//YR	Years																									
			56	57	58	59	60	61	..	69	70	71	..	80	81	82	83	..	87	88	89	90	91	92	93			
AW	101	3//1980																										
	102	3//1980																										
	103	3//1980																										
	104	3//1980																										
	105	3//1980																										
	106	3//1980																										

SACS DATA

WHC-MR-0132 (ANDERSON) DATA

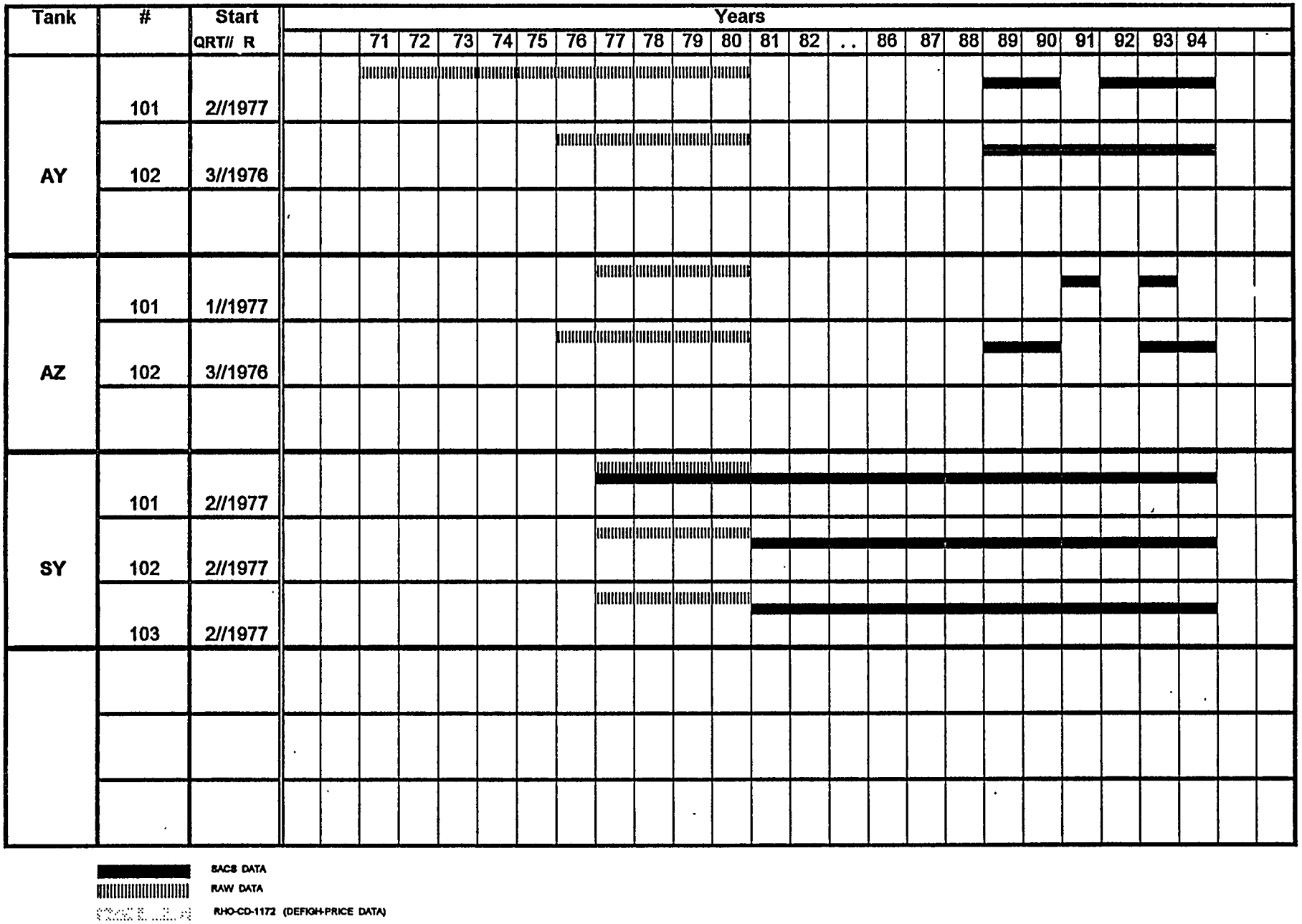
SURFACE LEVEL RECORD ENVELOPE PROFILE
1,000,000 GALS SINGLE SHELL TANKS

Tank	#	Start QRT//YR	Years																									
				64	65	66	..	69	70	71	..	74	75	76	..	80	81	..	87	88	89	90	91	92	93			
AX	101	1//1965																										
	102	2//1966																										
	103	1//1965																										
	104	1//1966																										

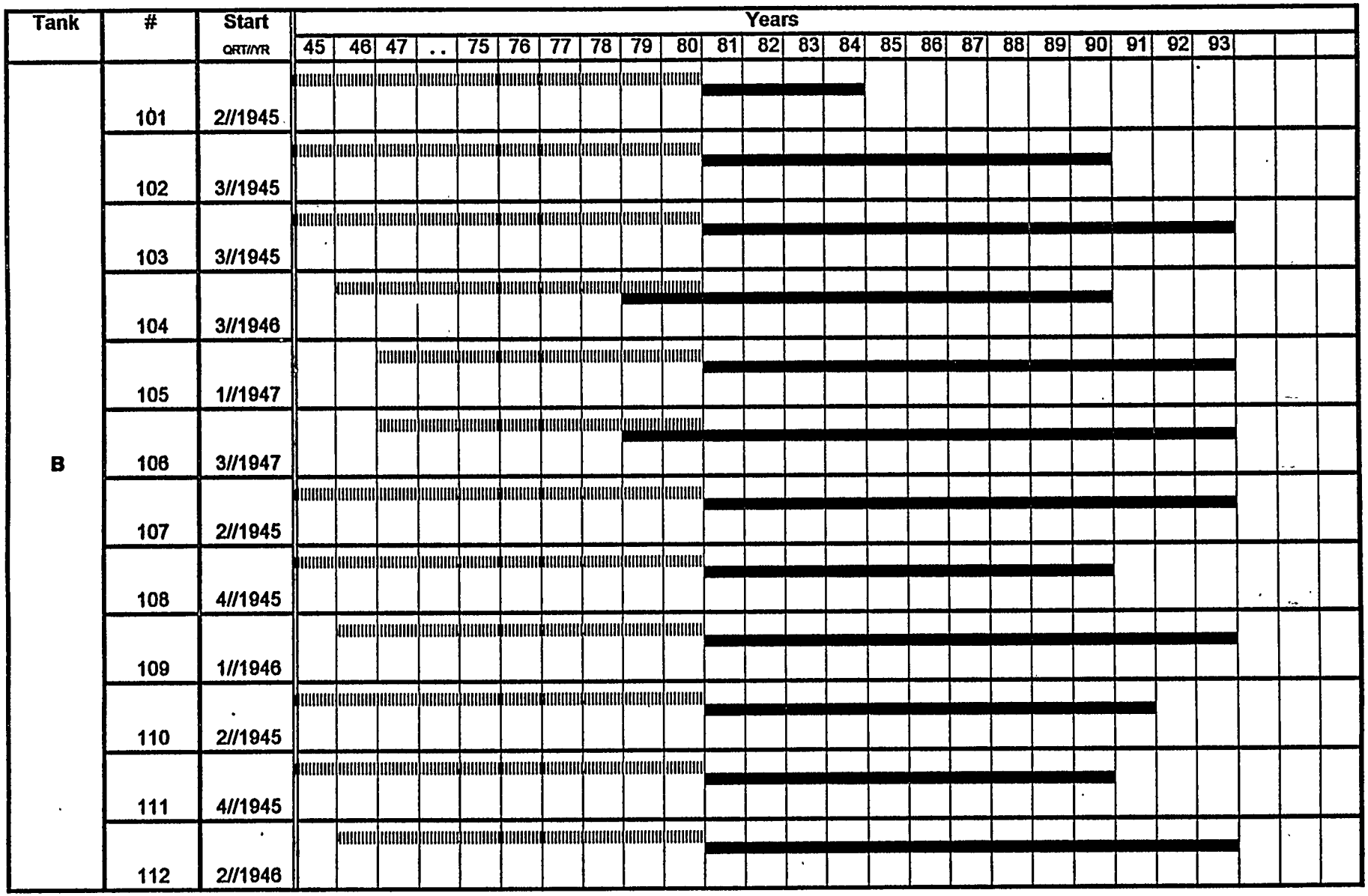
SACS DATA

WHC-MR-0132 (ANDERSON) DATA

SURFACE LEVEL RECORD ENVELOPE PROFILE
1,000,000 GALS DOUBLE SHELL TANKS



SURFACE LEVEL RECORD ENVELOPE PROFILE
500,000 GALS SINGLE SHELL TANKS



SURFACE LEVEL RECORD ENVELOPE PROFILE
500,000 GALS SINGLE SHELL TANKS

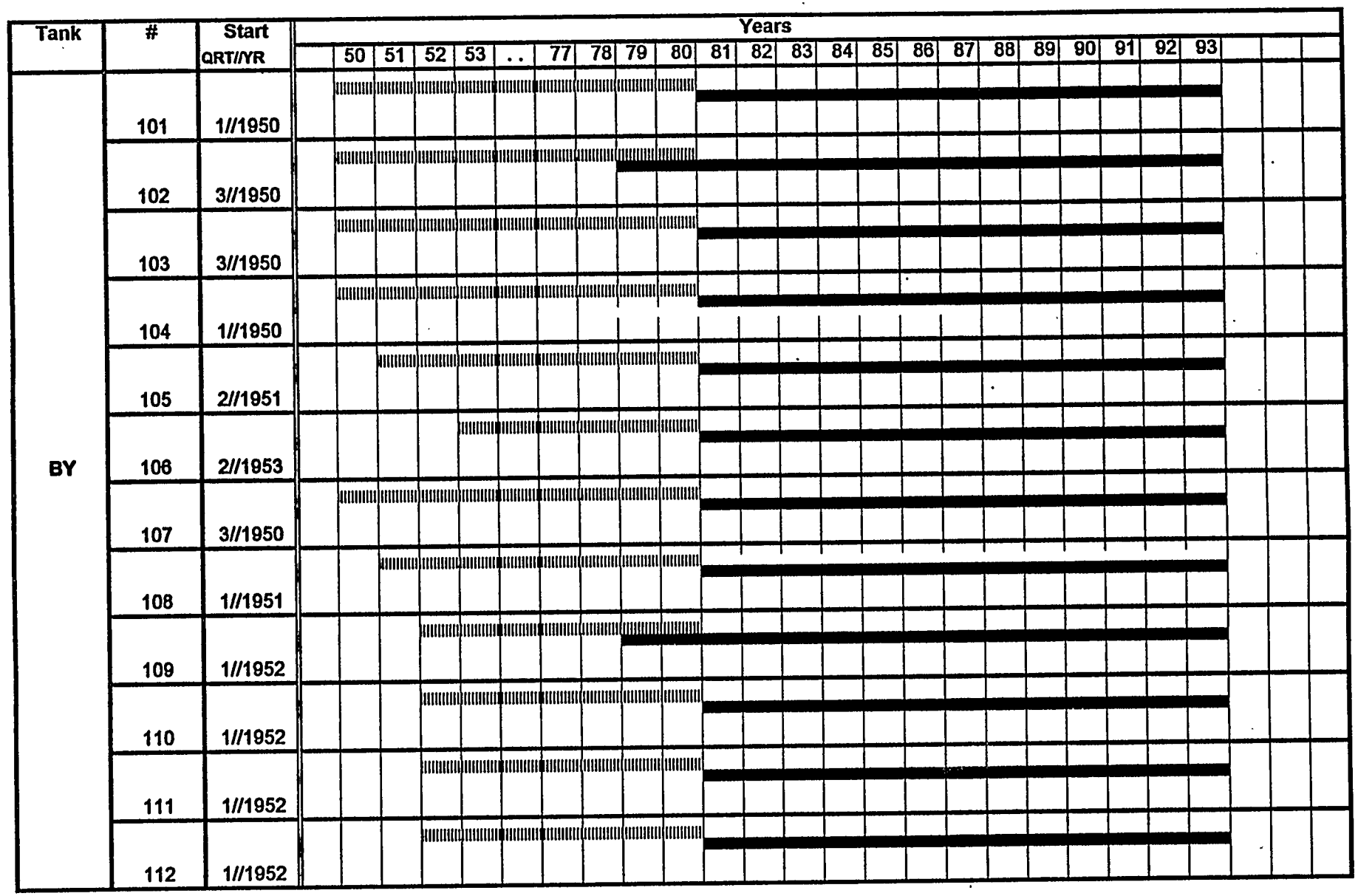
Tank	#	Start qrt//yr	Years																								
			45	46	47	48	49	50	51	52	..	79	80	81	..	84	85	86	87	88	89	90	91	92	93			
BX	101	1//1948																										
	102	2//1948																										
	103	3//1948																										
	104	1//1949																										
	105	2//1949																										
	106	3//1949																										
	107	3//1948																										
	108	1//1949																										
	109	4//1950																										
	110	3//1949																										
	111	1//1950																										
	112	2//1952																										

SACS DATA

WHC-MR-0132 (ANDERSON) DATA

SURFACE LEVEL RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS

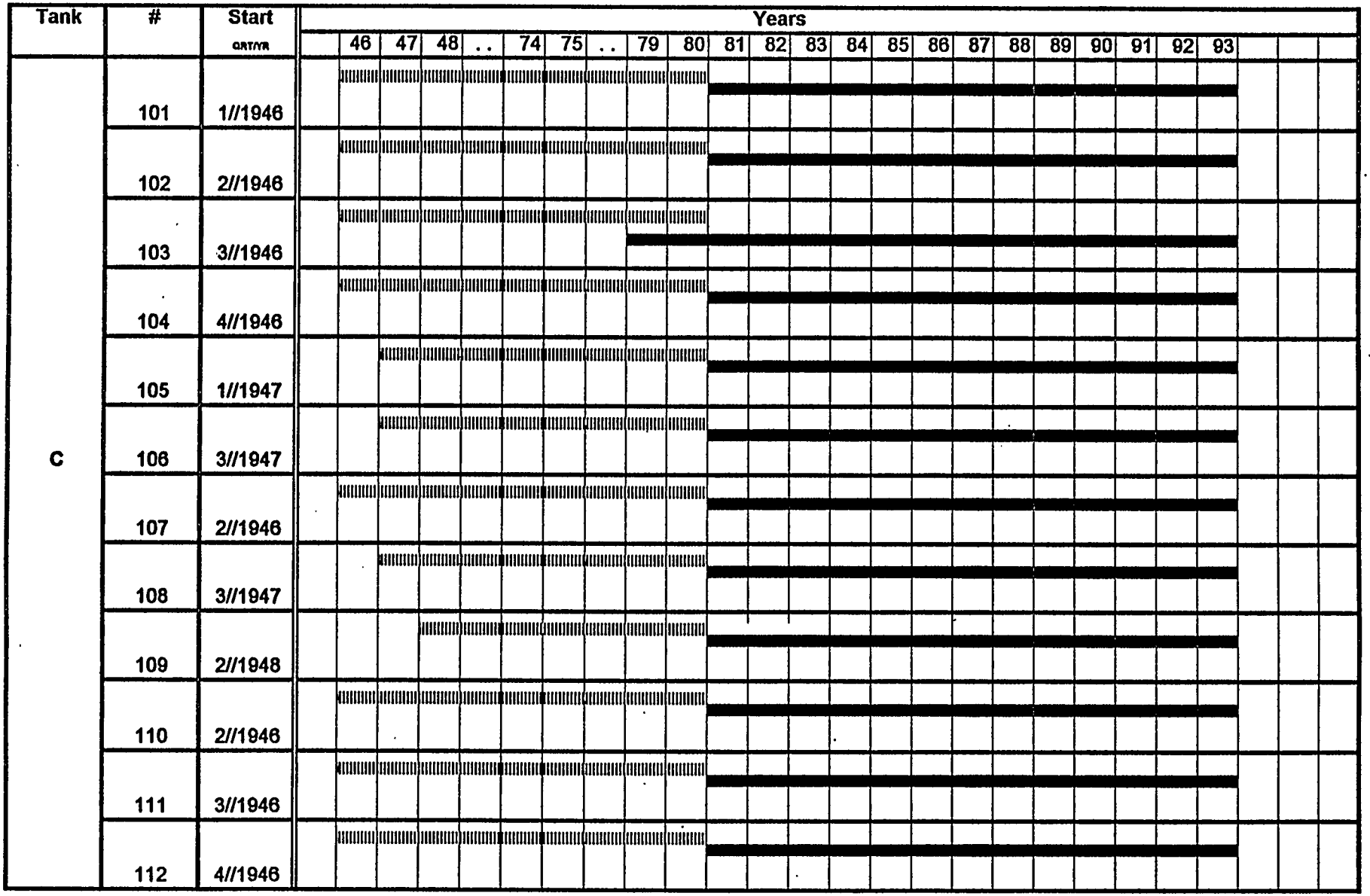
Tank	#	Start QRT/YR
BY	101	1//1950
	102	3//1950
	103	3//1950
	104	1//1950
	105	2//1951
	106	2//1953
	107	3//1950
	108	1//1951
	109	1//1952
	110	1//1952
	111	1//1952
	112	1//1952



SACS DATA

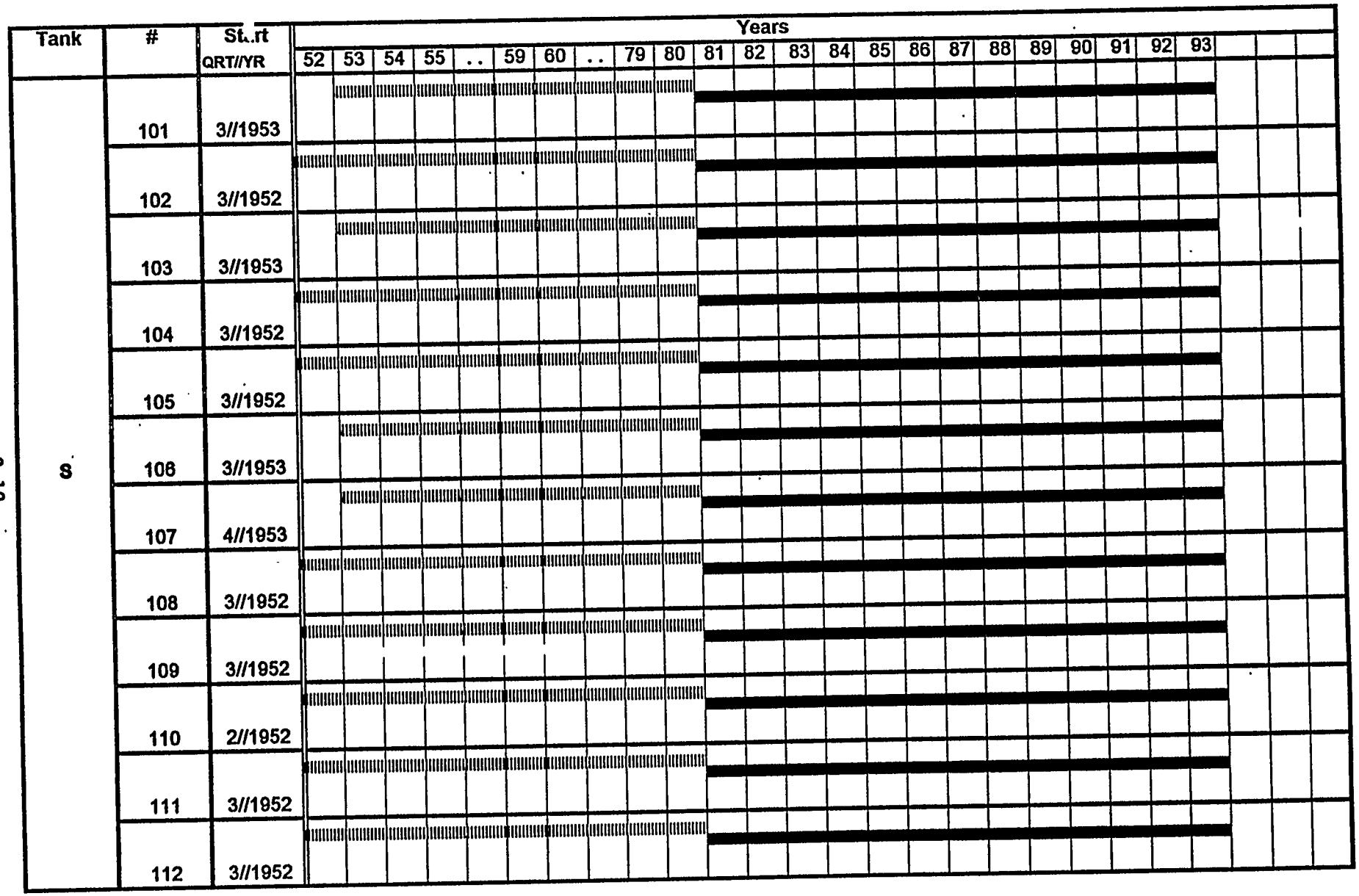
WHC-MR-0132 (ANDERSON) DATA

SURFACE LEVEL RECORD ENVELOPE PROFILE
500,000 GALS SINGLE SHELL TANKS



SURFACE LEVEL RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS

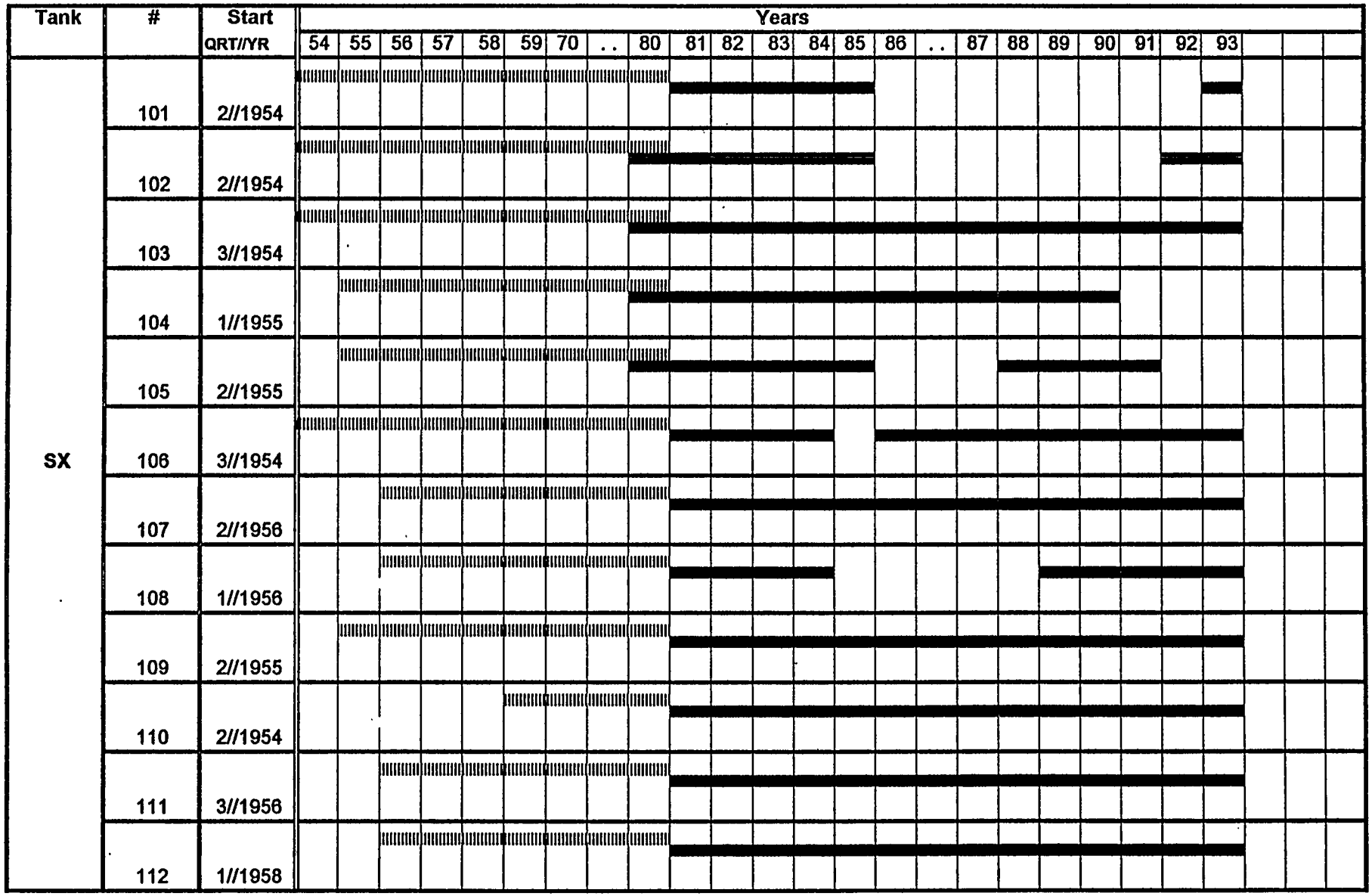
Tank	#	Start QRT//YR
S	101	3//1953
	102	3//1952
	103	3//1953
	104	3//1952
	105	3//1952
	106	3//1953
	107	4//1953
	108	3//1952
	109	3//1952
	110	2//1952
	111	3//1952
	112	3//1952



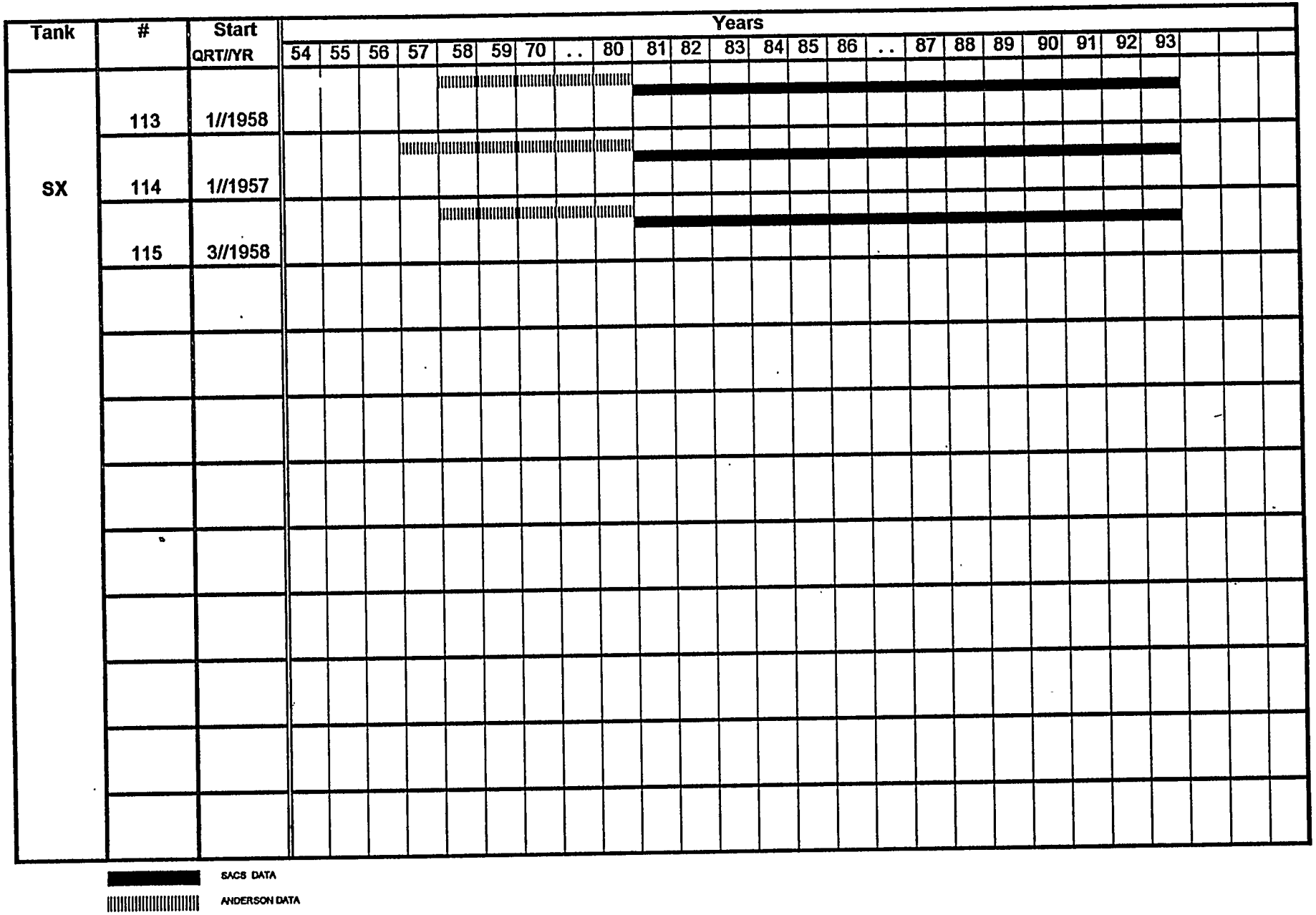
SACS DATA

WHC-MR-0132 (ANDERSON) DATA

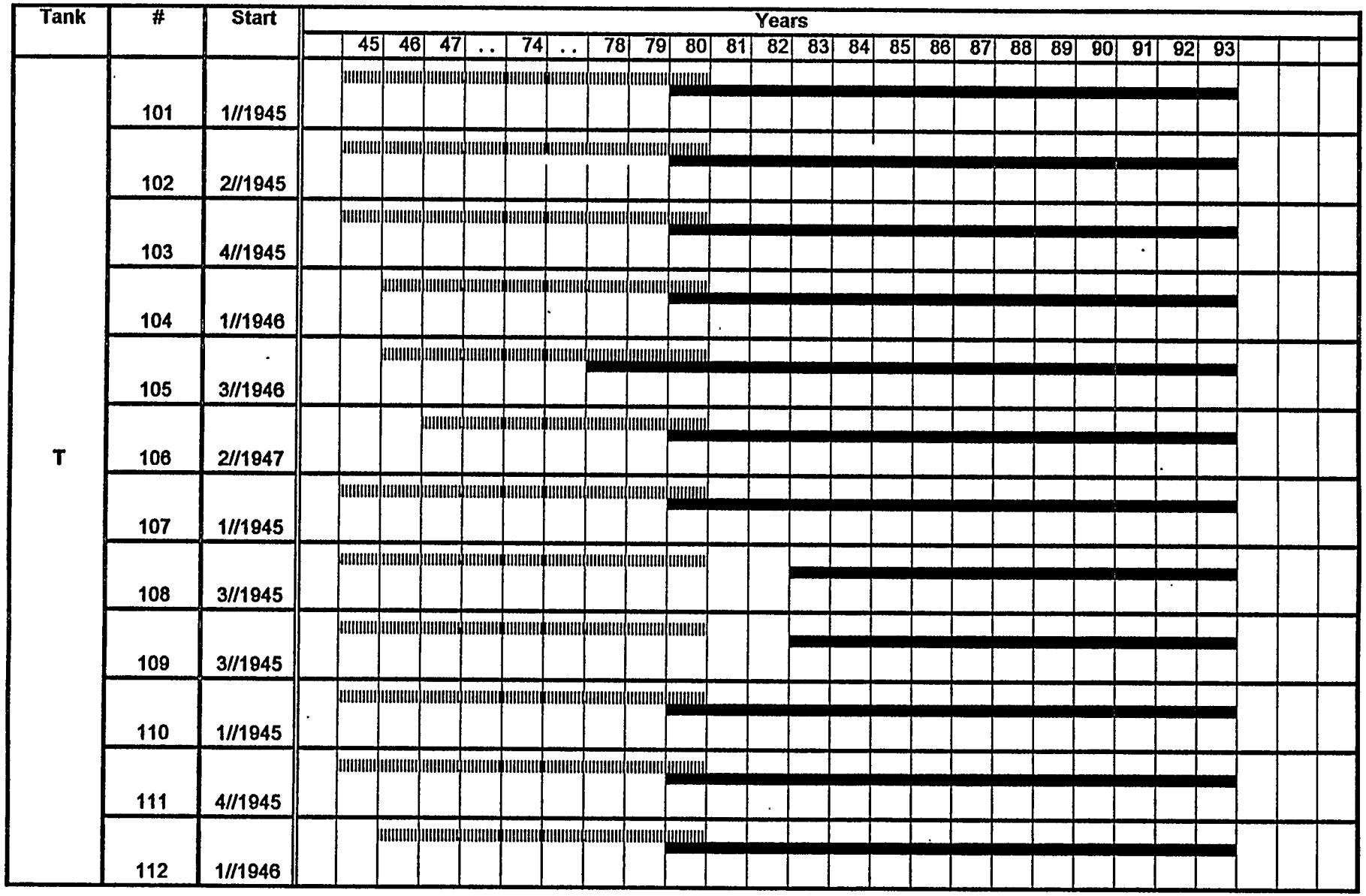
SURFACE LEVEL RECORD ENVELOPE PROFILE
1,000,000 GALS SINGLE SHELL TANKS



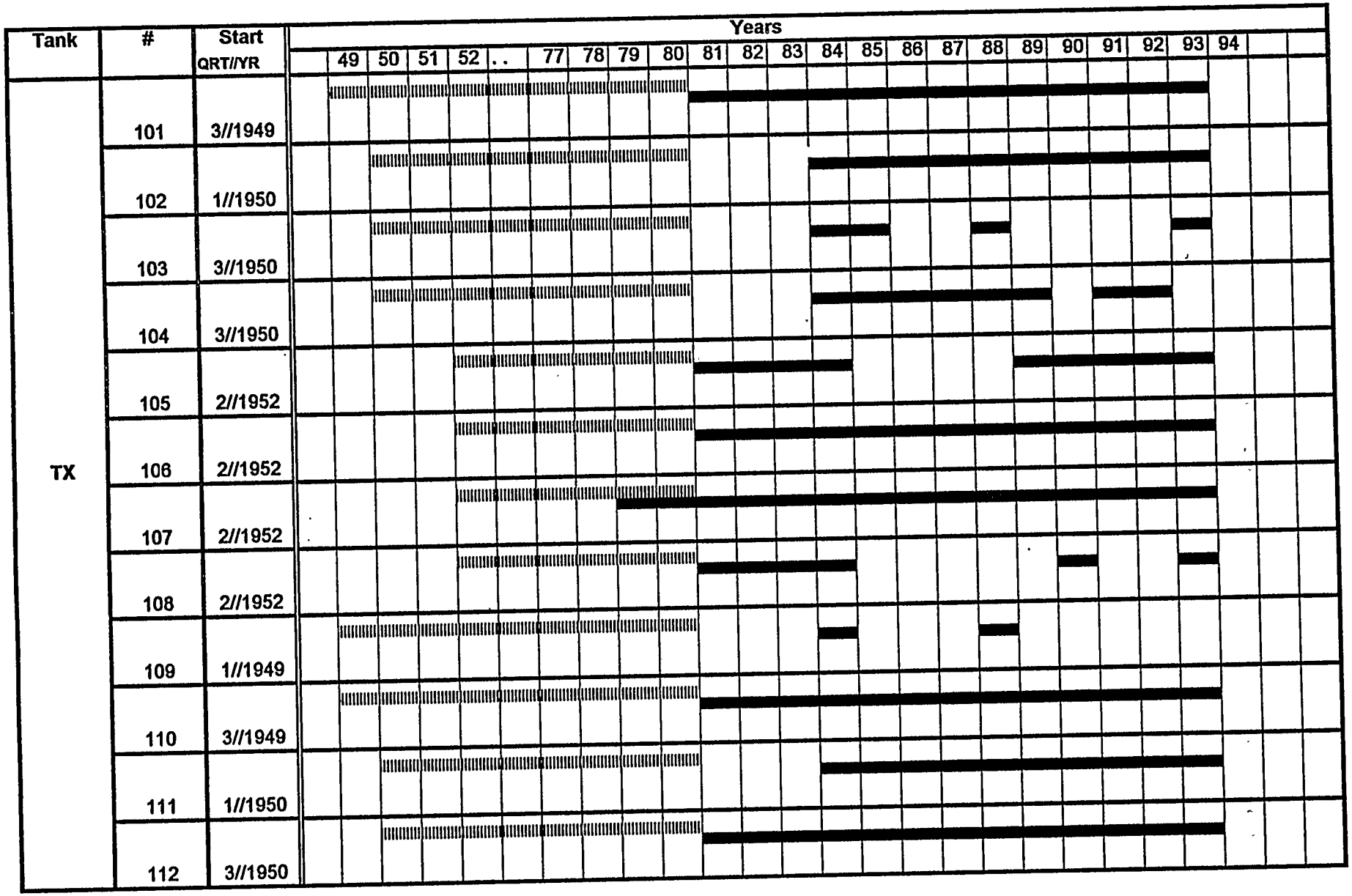
SURFACE LEVEL RECORD ENVELOPE PROFILE
1,000,000 GALS SINGLE SHELL TANKS



SURFACE LEVEL RECORD ENVELOPE PROFILE
500,000 GALS SINGLE SHELL TANKS

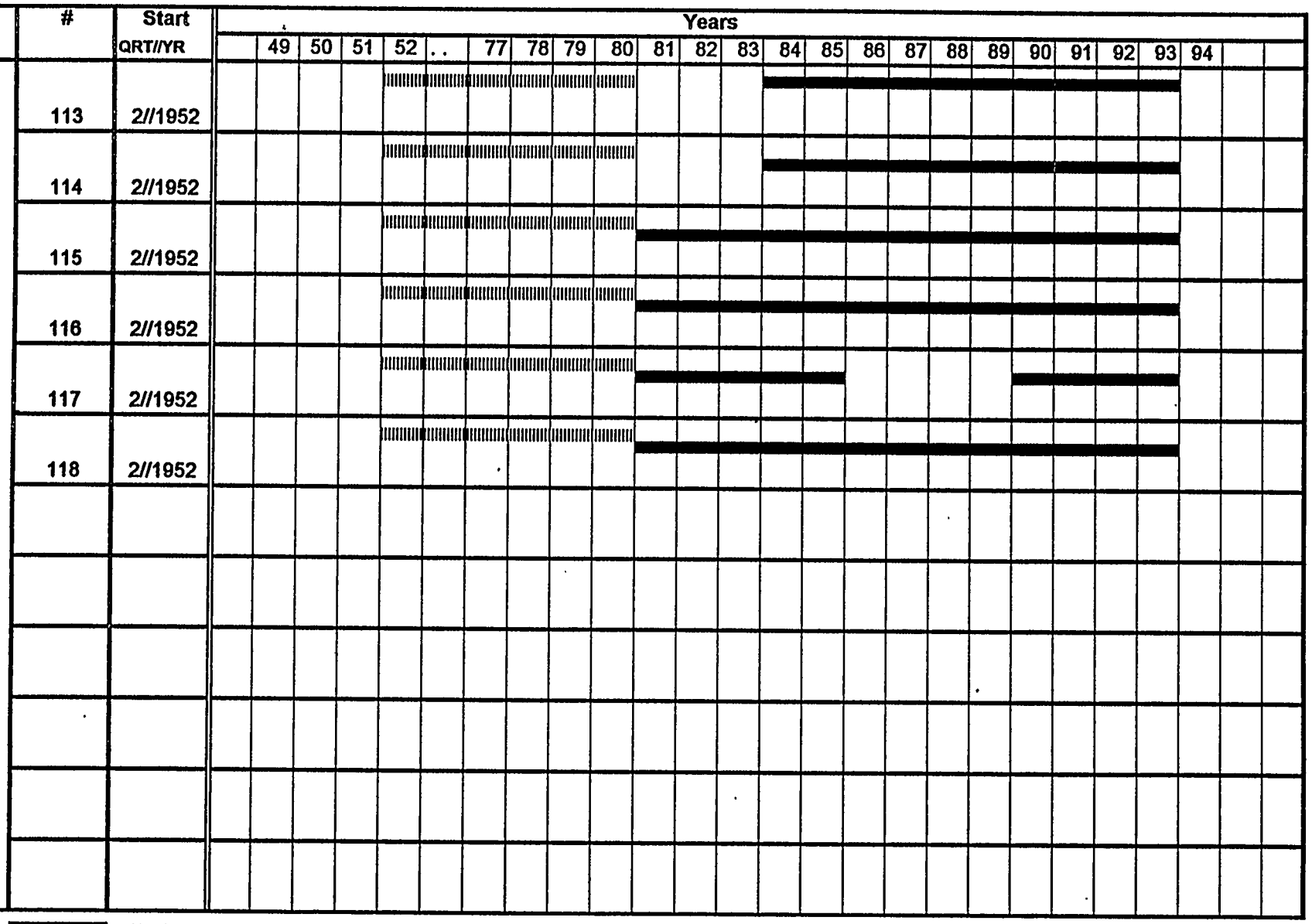


SURFACE LEVEL RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS



SURFACE LEVEL RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS

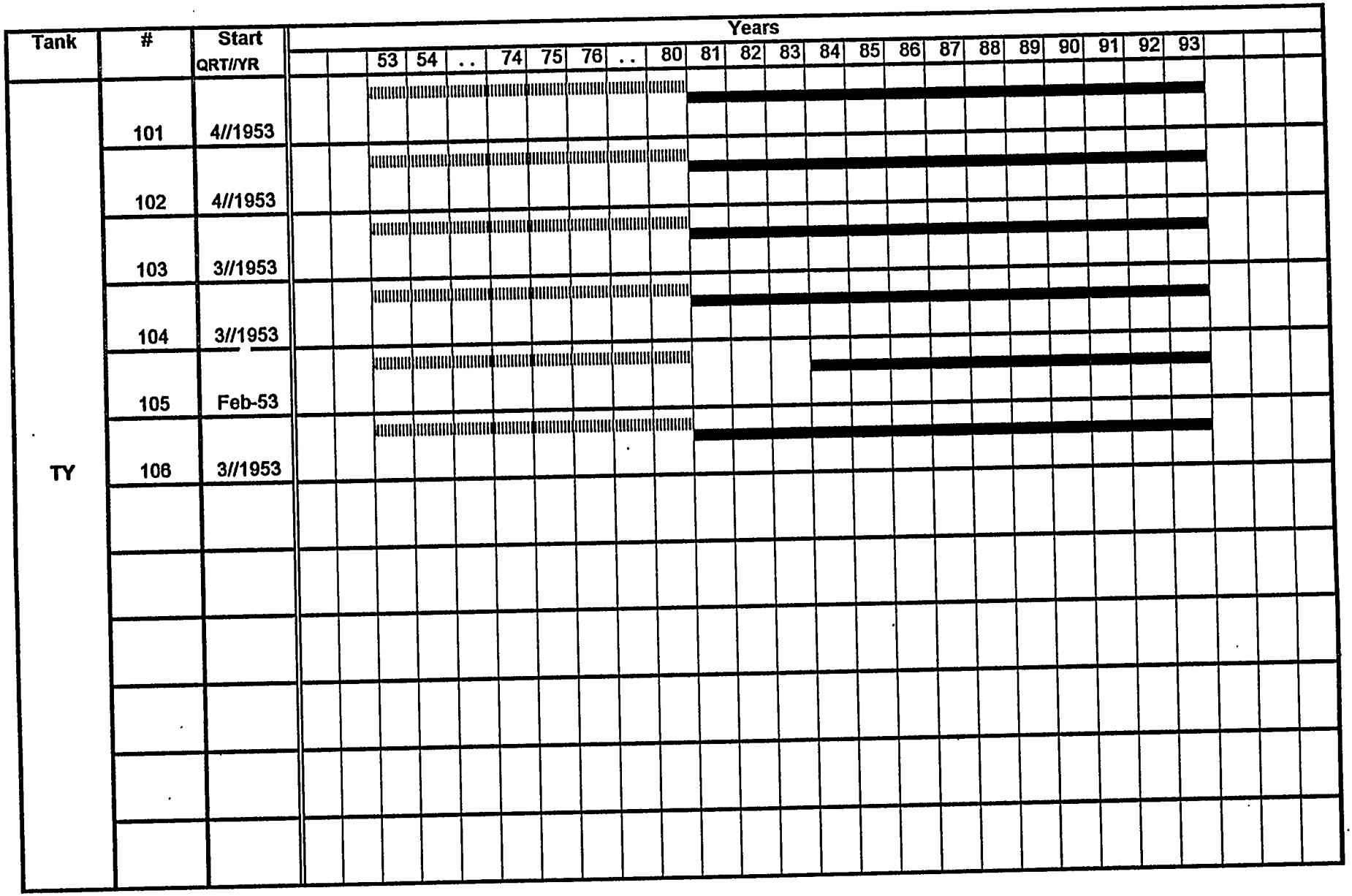
Tank	#	Start QRT//YR
TX	113	2//1952
	114	2//1952
	115	2//1952
	116	2//1952
	117	2//1952
	118	2//1952



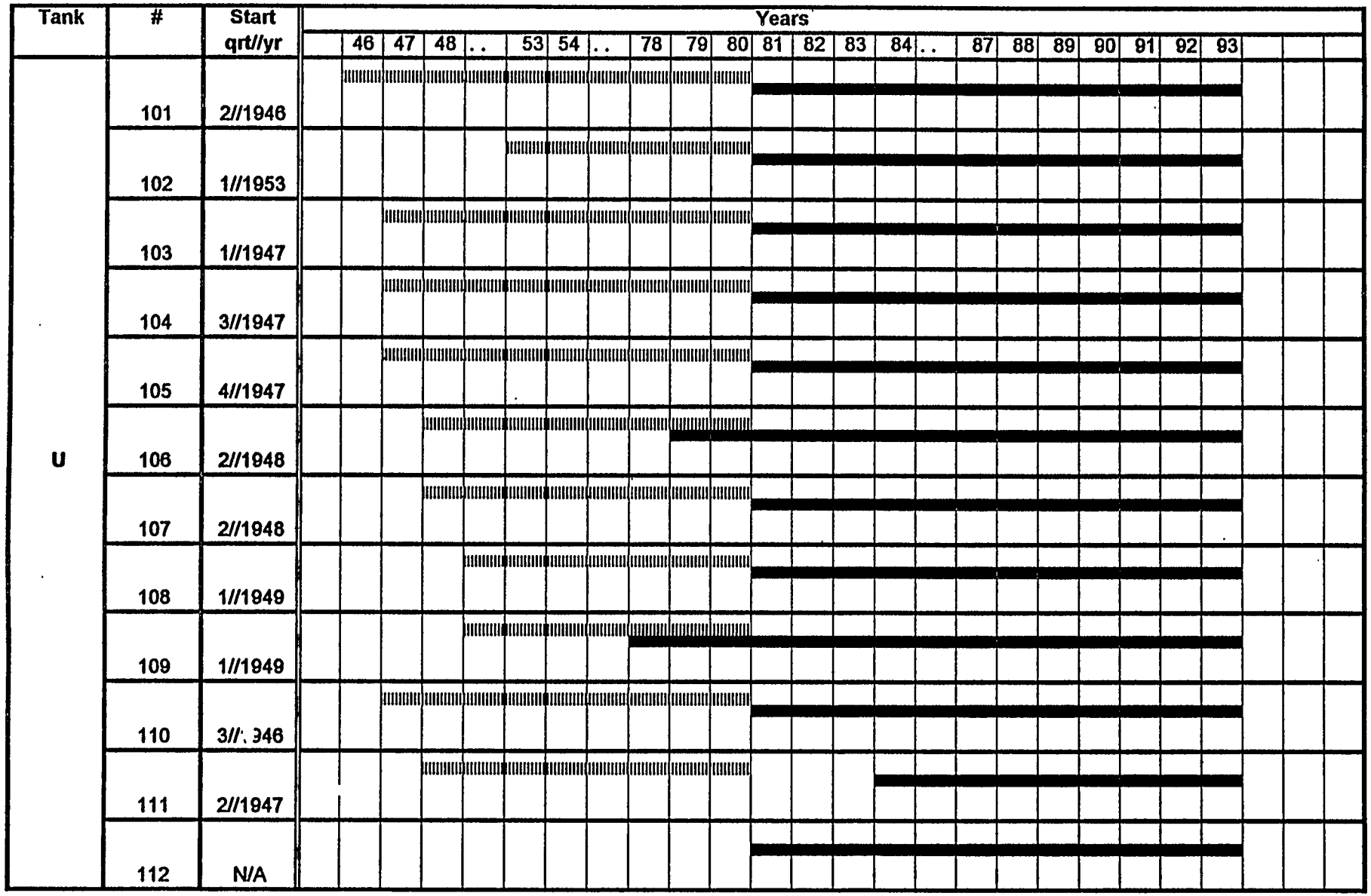
SACS DATA

WHC-MR-0132 (ANDERSON) DATA

SURFACE LEVEL RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS



SURFACE LEVEL RECORD ENVELOPE PROFILE
500,000 GALS SINGLE SHELL TANKS



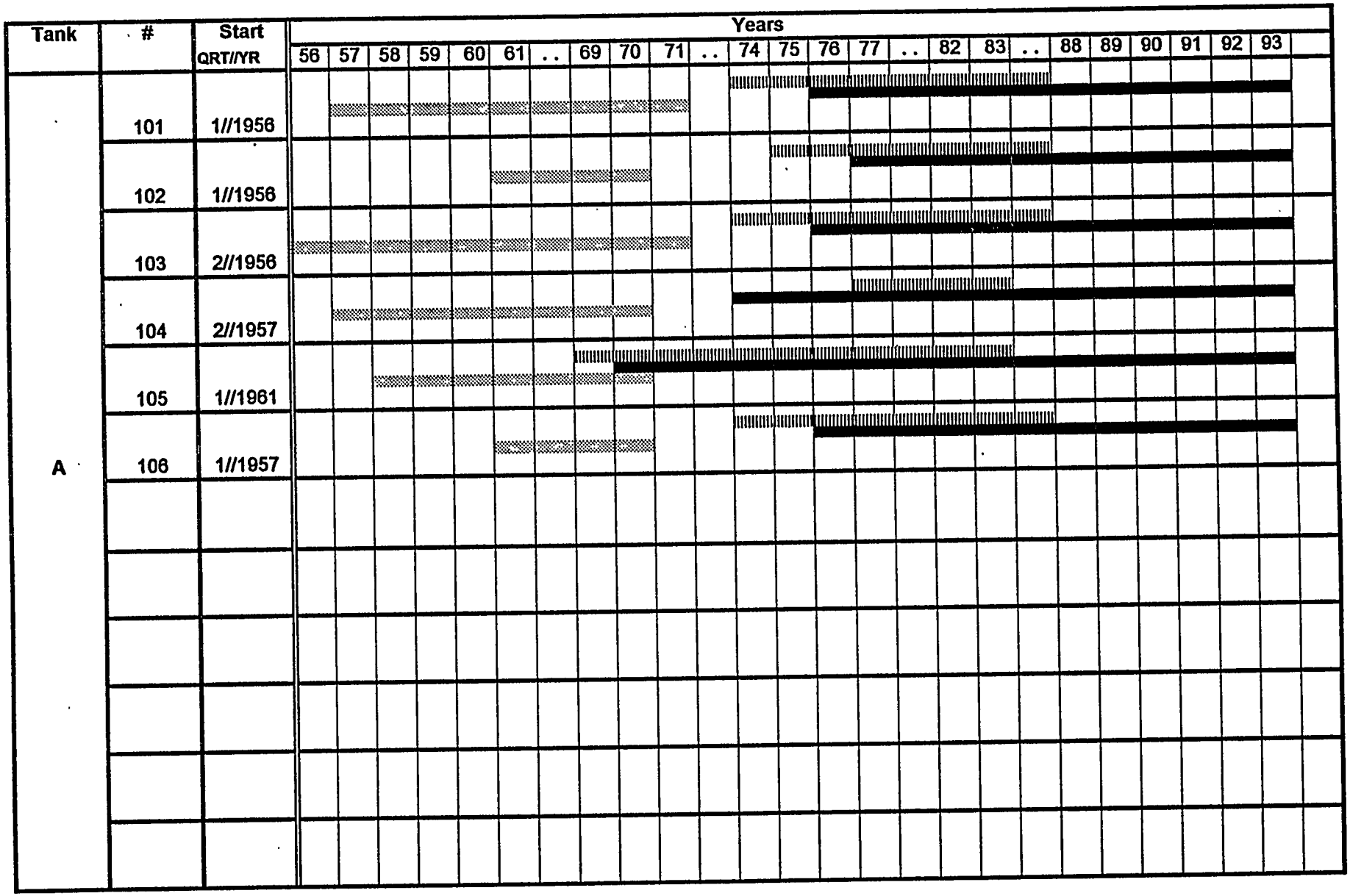
SACS DATA

WHC-MR-0132 (ANDERSON) DATA

APPENDIX H

TEMPERATURE RECORD ENVELOPE PROFILE

TEMPERATURE RECORD ENVELOPE PROFILE
1,000,000 GALS SINGLE SHELL TANKS



SACS DATA
RAI DATA
RHO-CD-1172 (DEFIGH-PRICE DATA)

TEMPERATURE RECORD ENVELOPE PROFILE
1,000,000 GALS DOUBLE SHELL TANKS

Tank	#	Start QRT/YR	Years																									
			56	57	58	59	60	61	..	69	70	71	..	76	77	..	82	..	87	88	89	90	91	92	93			
AN	101	1981																										
	102	1981																										
	103	1981																										
	104	1981																										
	105	1981																										
	106	1981																										
	107	1981																										

SACS DATA
RAW DATA
RHO-CD-1172 (DEFIGH-PRICE DATA)

TEMPERATURE RECORD ENVELOPE PROFILE
1,000,000 GALS DOUBLE SHELL TANKS

Tank	#	Start QRT//YR	Years																										
			56	57	58	59	60	61	..	69	70	71	..	76	77	..	82	..	87	88	89	90	91	92	93				
AP	101	1986																											
	102	1986																											
	103	1986																											
	104	1986																											
	105	1986																											
	106	1986																											
	107	1989																											
	108	1989																											

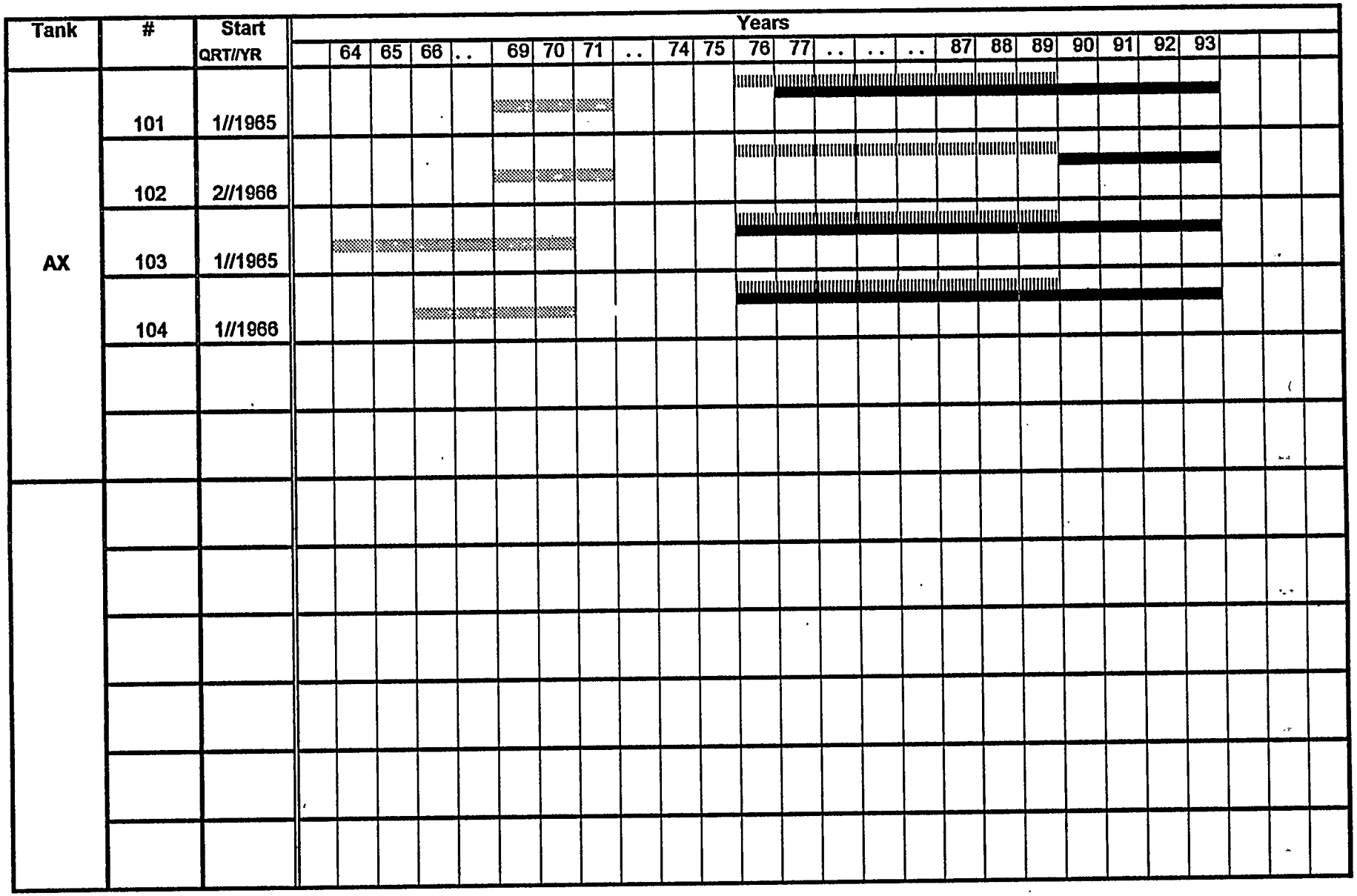
SACS DATA
RAW DATA
RHO-CD-1172 (DEFIGH-PRICE DATA)

TEMPERATURE RECORD ENVELOPE PROFILE
1,000,000 GALS DOUBLE SHELL TANKS

Tank	#	Start QRT//YR	Years																									
			56	57	58	59	60	61	..	69	70	71	..	76	77	..	82	..	87	88	89	90	91	92	93			
AW	101	3//1980																										
	102	3//1980																										
	103	3//1980																										
	104	3//1980																										
	105	3//1980																										
	106	3//1980																										

SACS DATA
RAW DATA
RHO-CD-1172 (DEFIGH-PRICE DATA)

TEMPERATURE RECORD ENVELOPE PROFILE
1,000,000 GALS SINGLE SHELL TANKS



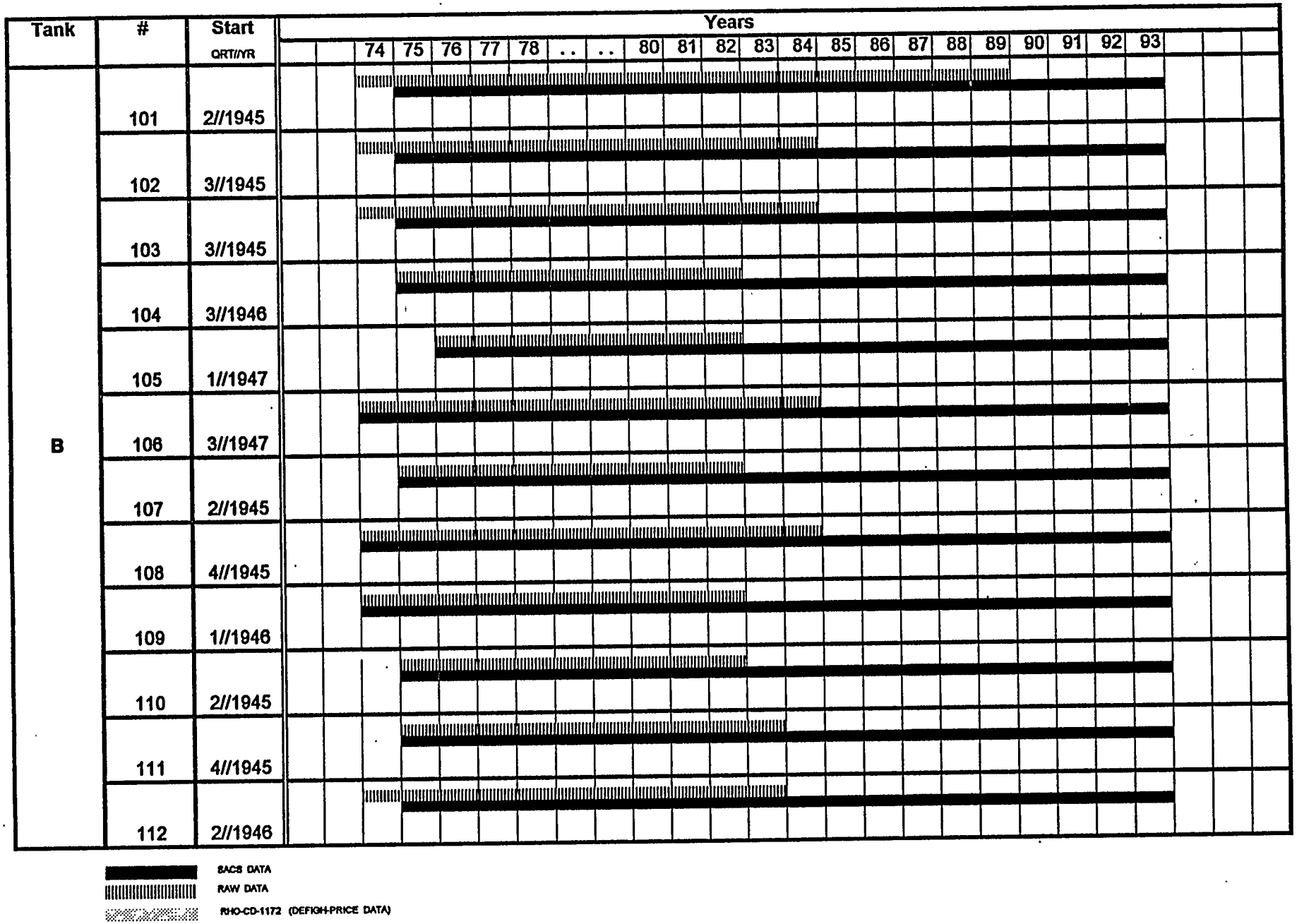
SACS DATA
RAW DATA
RHO-CD-1172 (DEFIGH-PRICE DATA)

TEMPERATURE RECORD ENVELOPE PROFILE
1,000,000 GALS DOUBLE SHELL TANKS

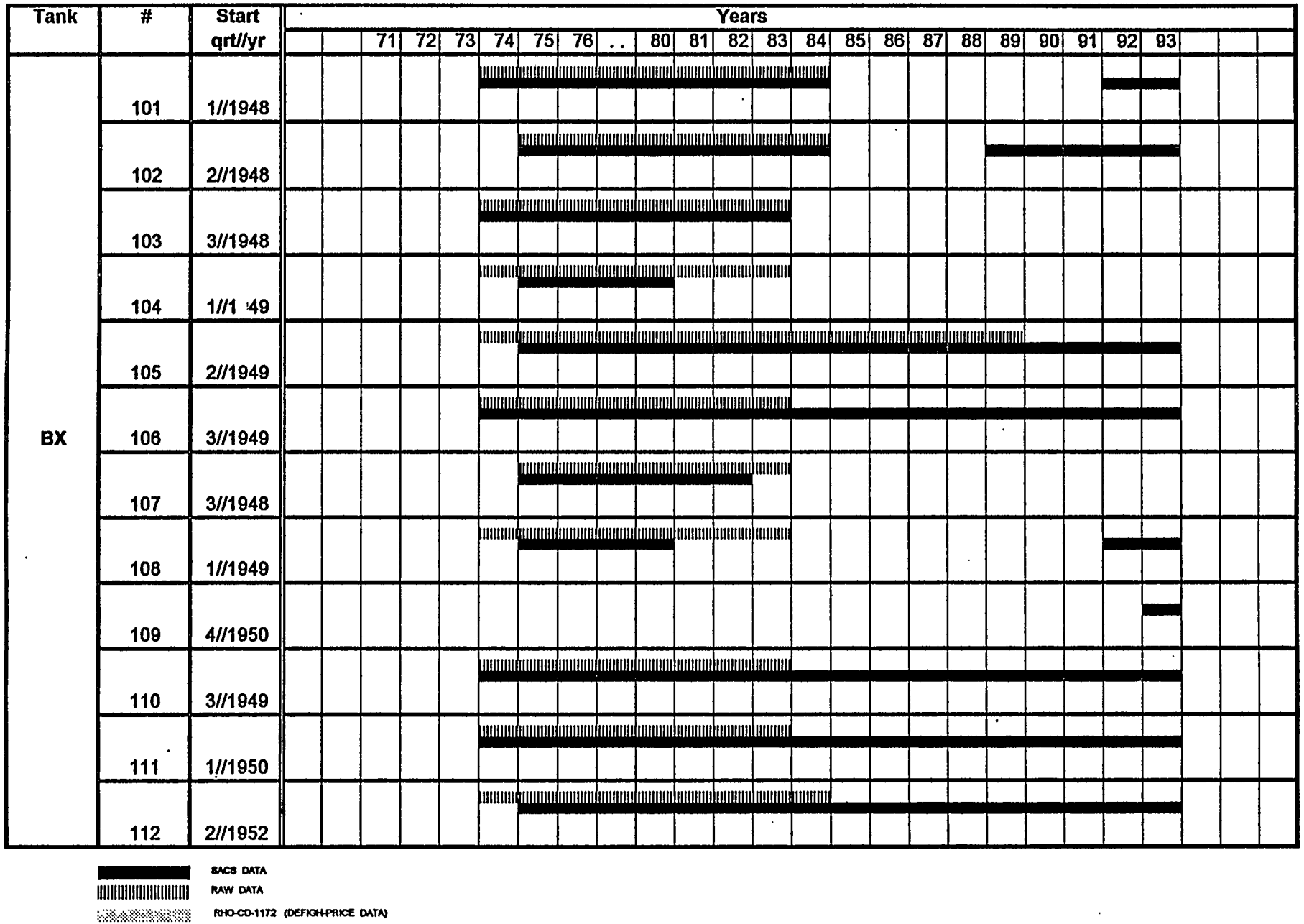
Tank	#	Start QRT//YR	Years																								
			56	57	58	59	60	61	..	69	70	71	..	76	..	84	85	86	87	88	89	90	91	92	93	94	
AY	101	2//1977																									
	102	3//1976																									
AZ	101	1//1977																									
	102	3//1976																									
SY	101	2//1977																									
	102	2//1977																									
	103	2//1977																									

SACS DATA
RAW DATA
WHC-SD-WM-TI-394 REV. 0

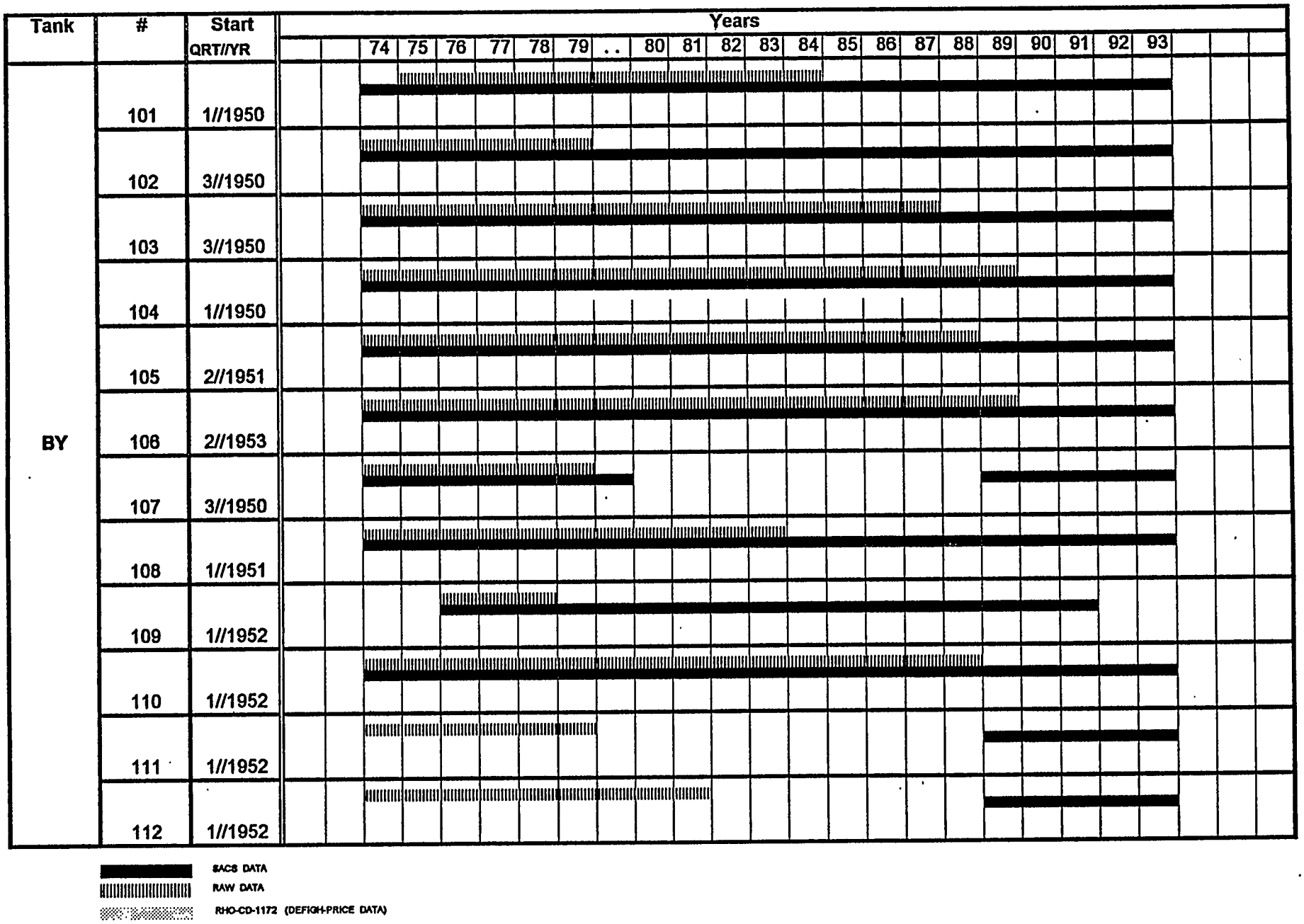
TEMPERATURE RECORD ENVELOPE PROFILE
500,000 GALS SINGLE SHELL TANKS



TEMPERATURE RECORD ENVELOPE PROFILE
500,000 GALS SINGLE SHELL TANKS



TEMPERATURE RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS



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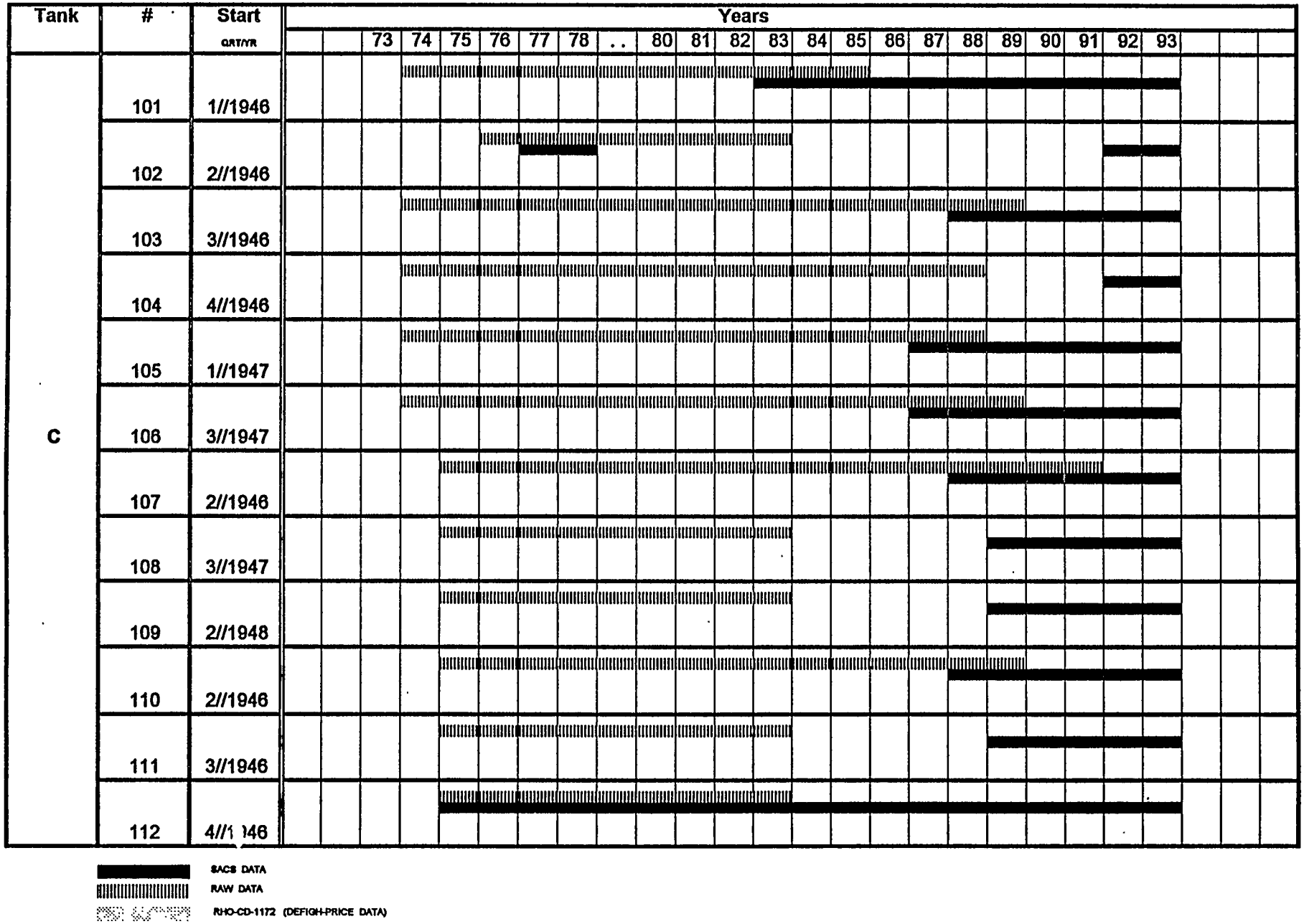
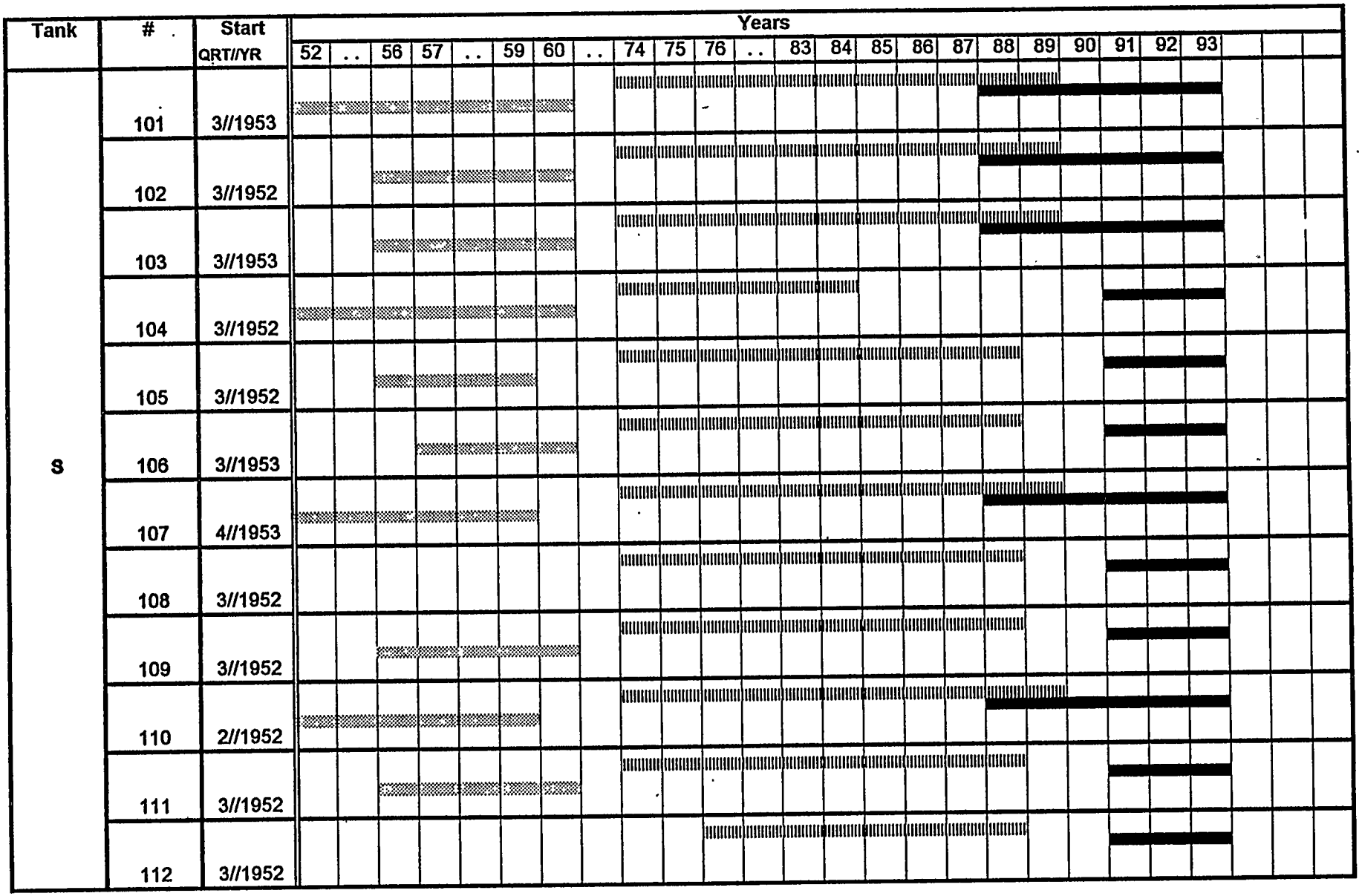
500,000 GALS SINGLE SHELL TANKS



TEMPERATURE RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS



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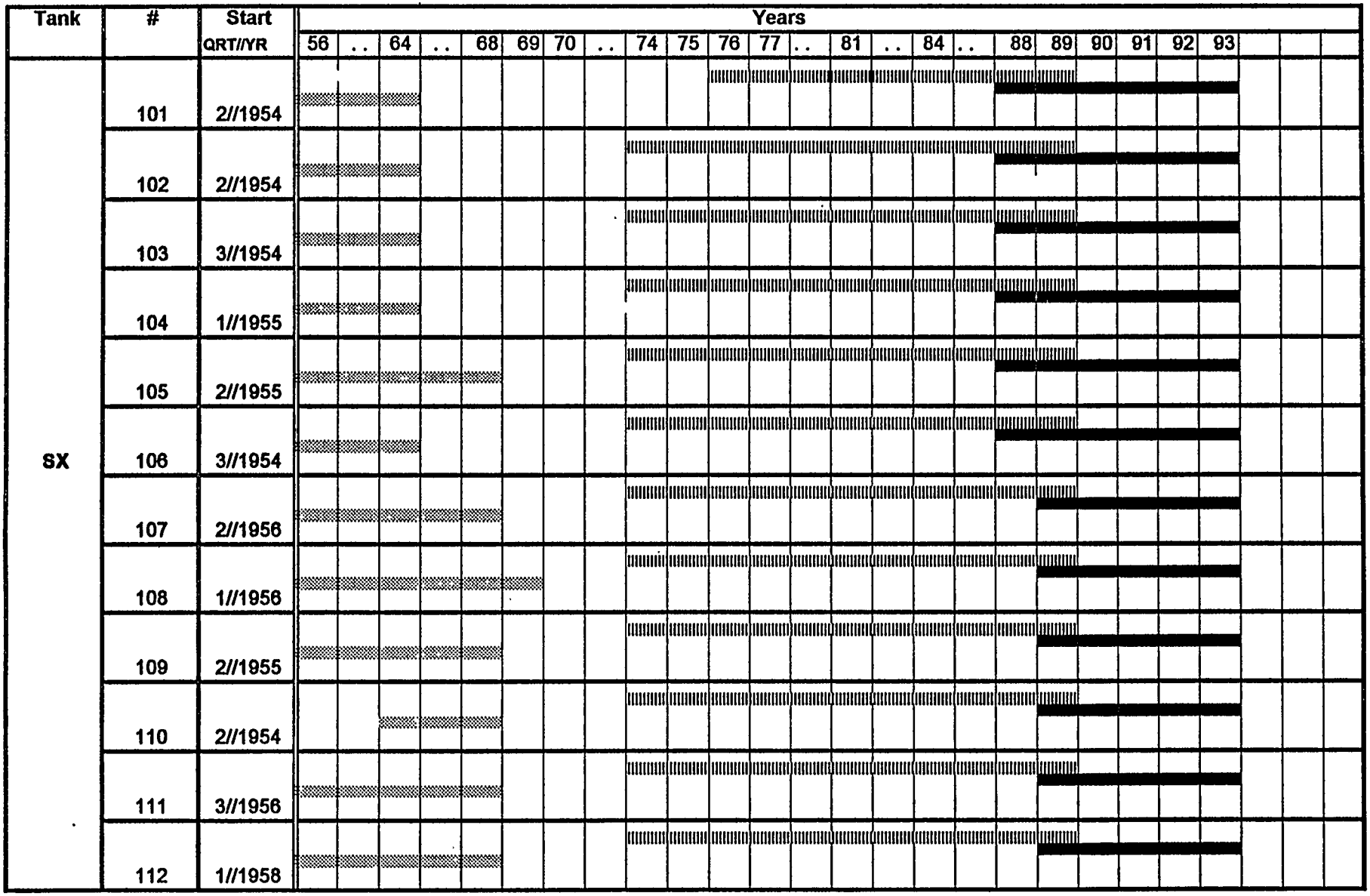
1,000,000 GALS SINGLE SHELL TANKS



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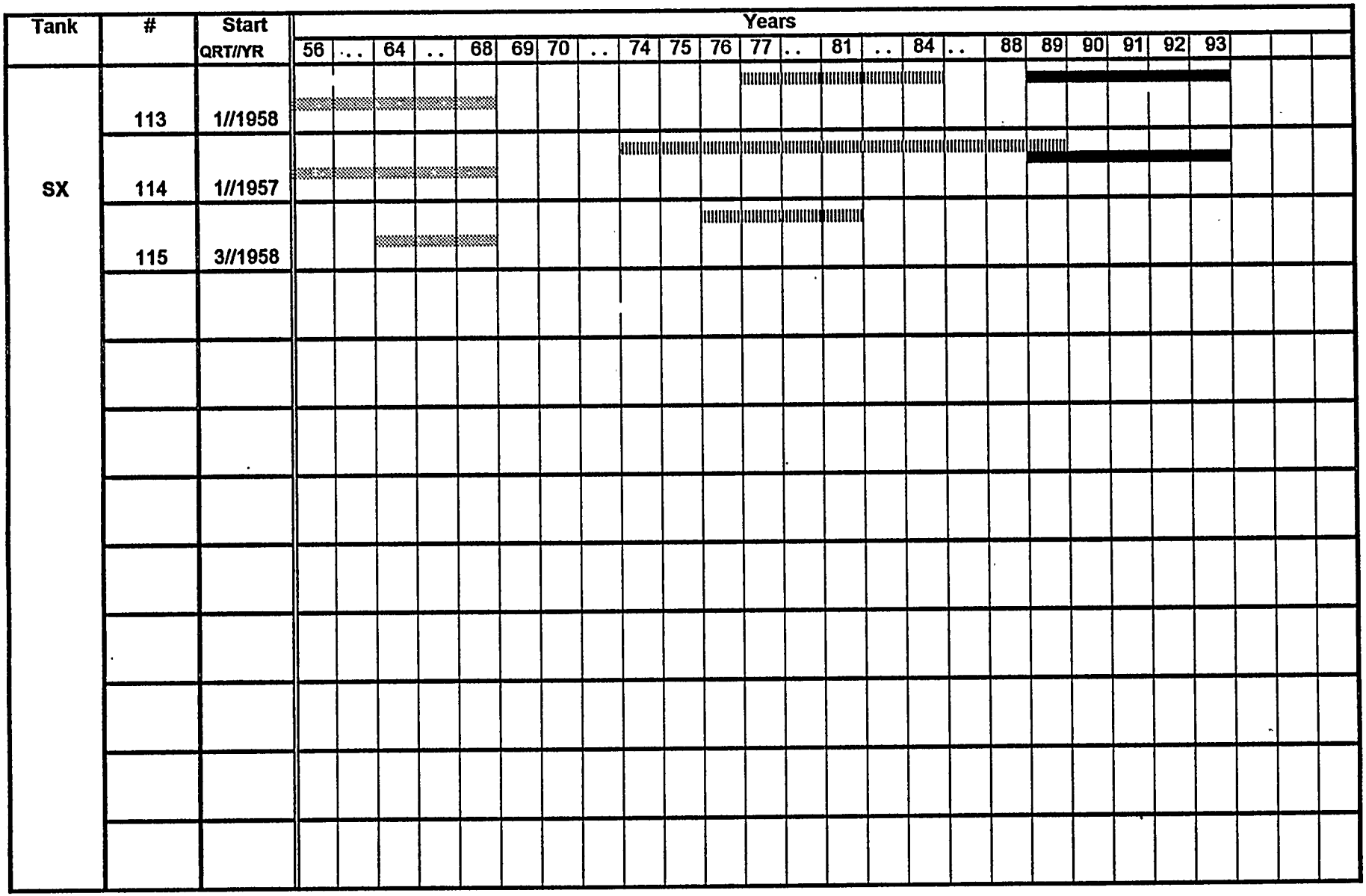

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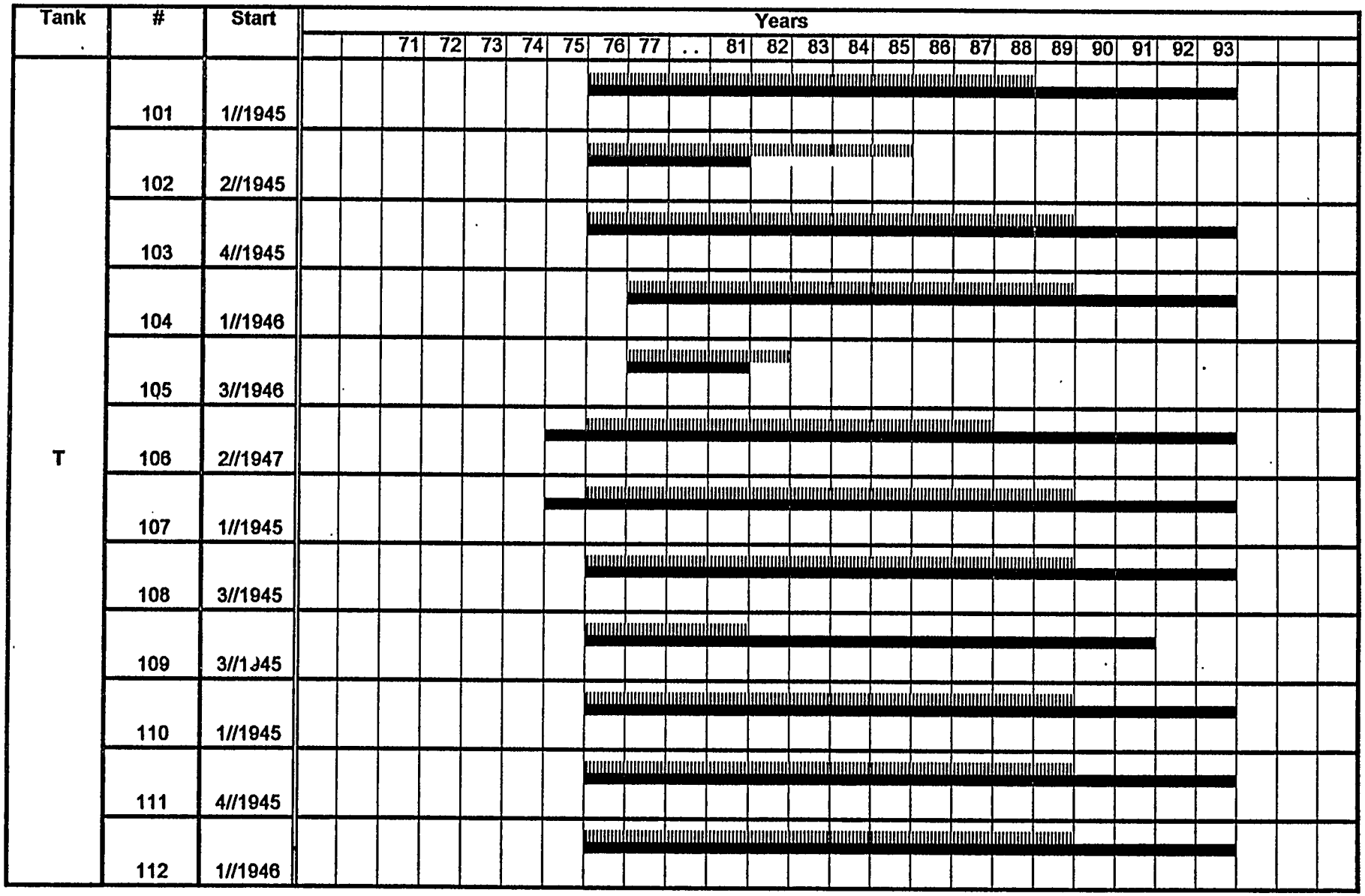
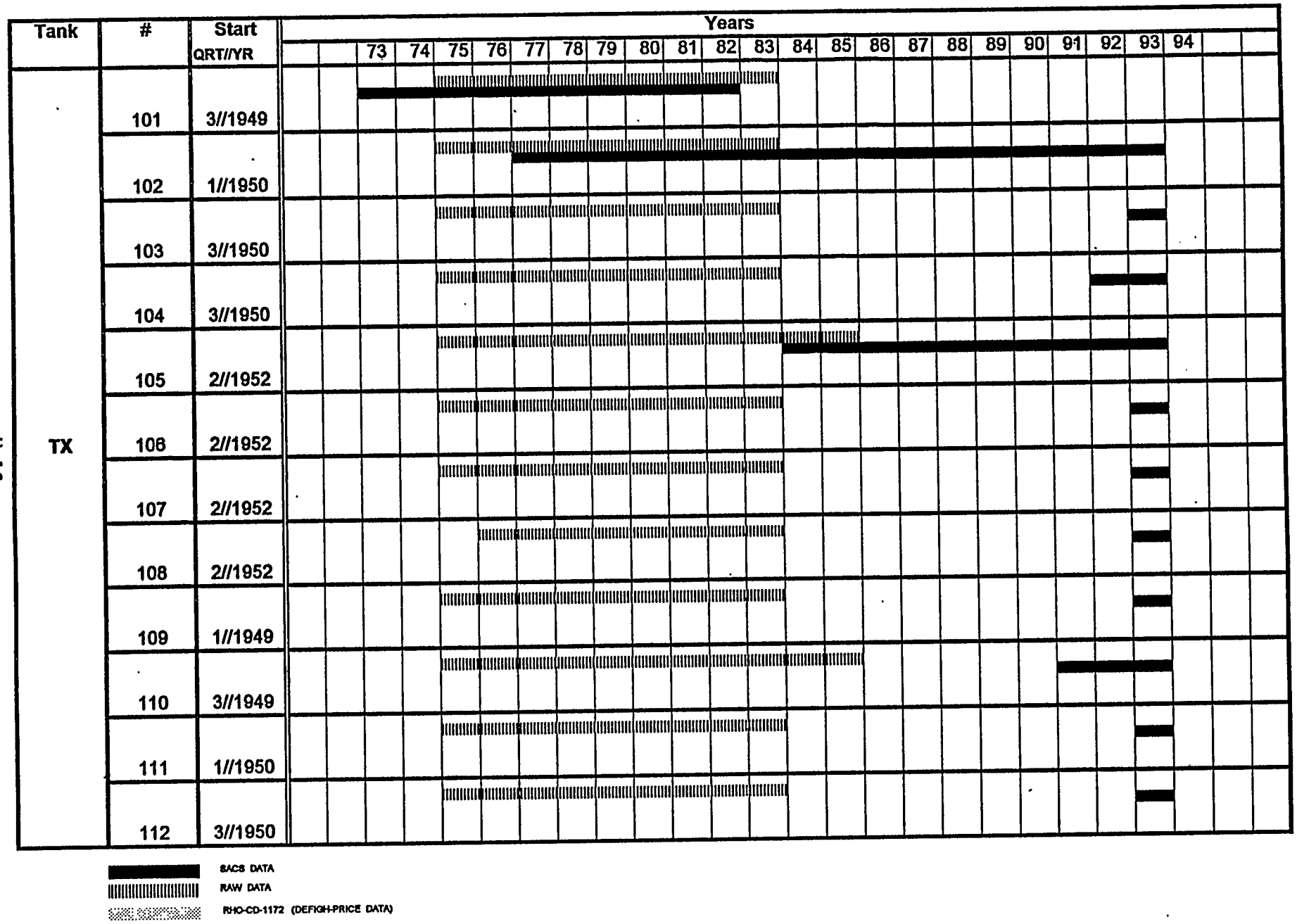


SACS DATA
RAW DATA
RHO-CD-1172 (DEFIGH-PRICE DATA)

TEMPERATURE RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS



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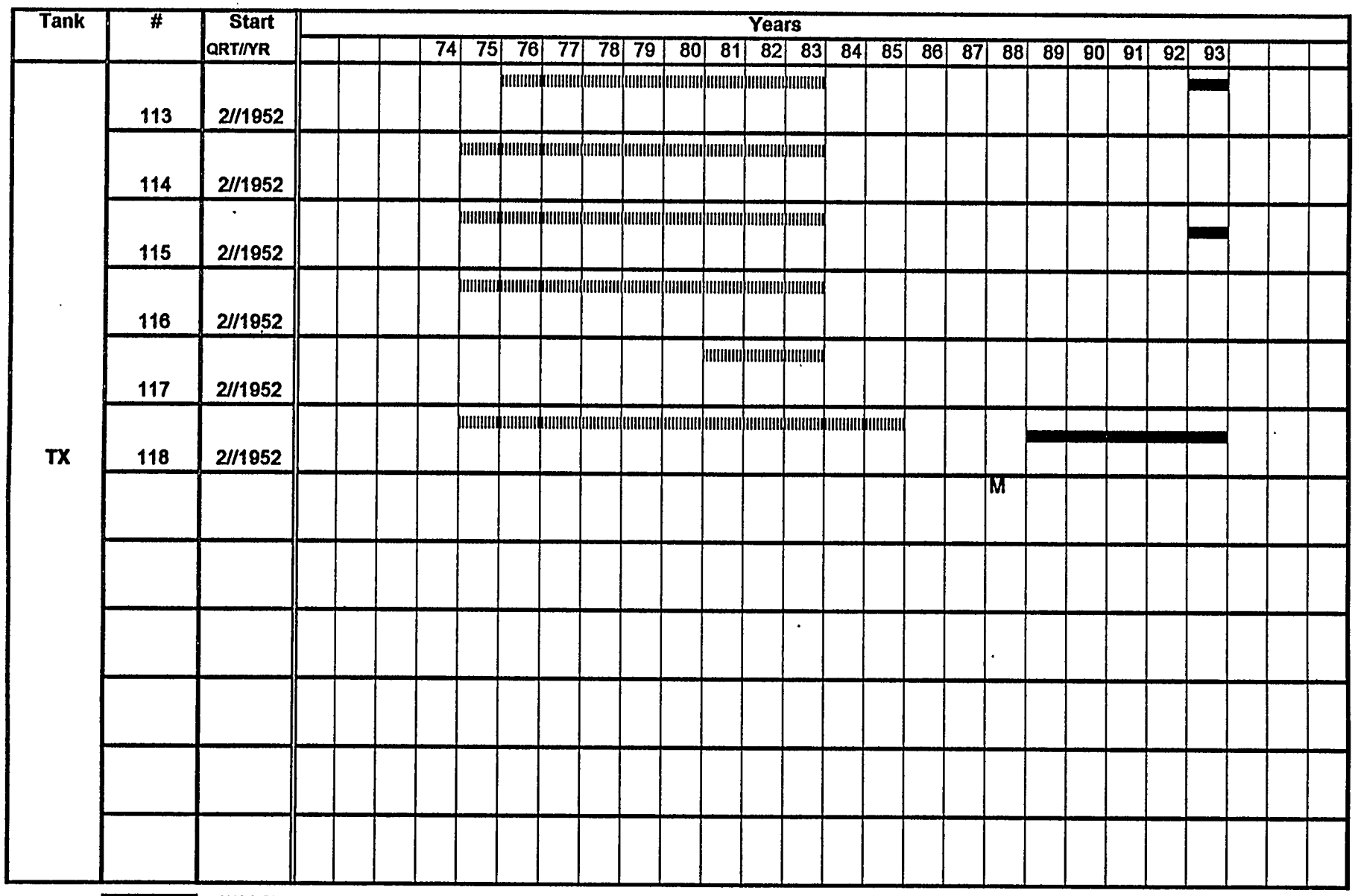
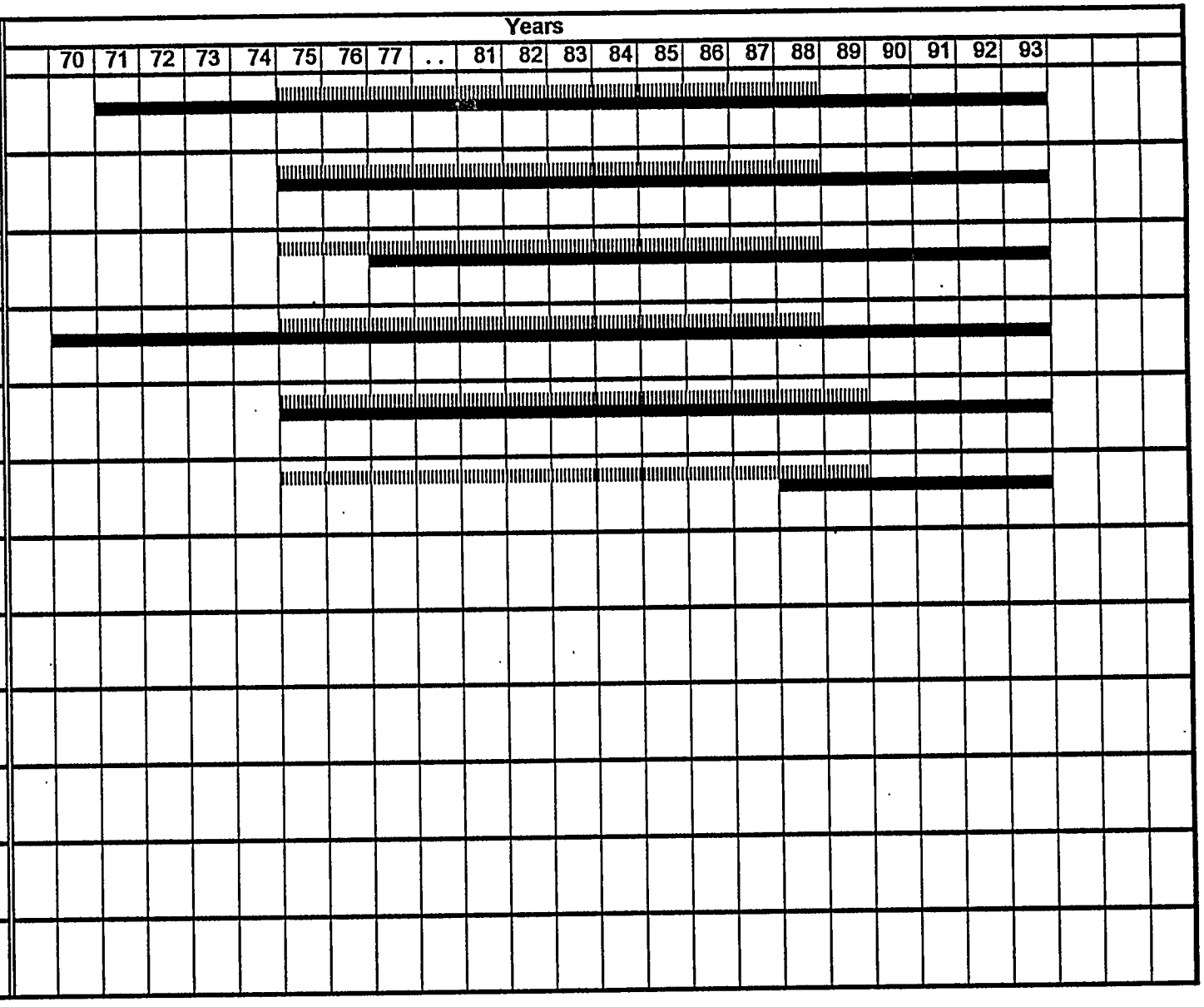
750,000 GALS SINGLE SHELL TANKS



TEMPERATURE RECORD ENVELOPE PROFILE
750,000 GALS SINGLE SHELL TANKS

Tank	#	Start QRT//YR
TY	101	4//1953
	102	4//1953
	103	3//1953
	104	3//1953
	105	Feb-53
	106	3//1953



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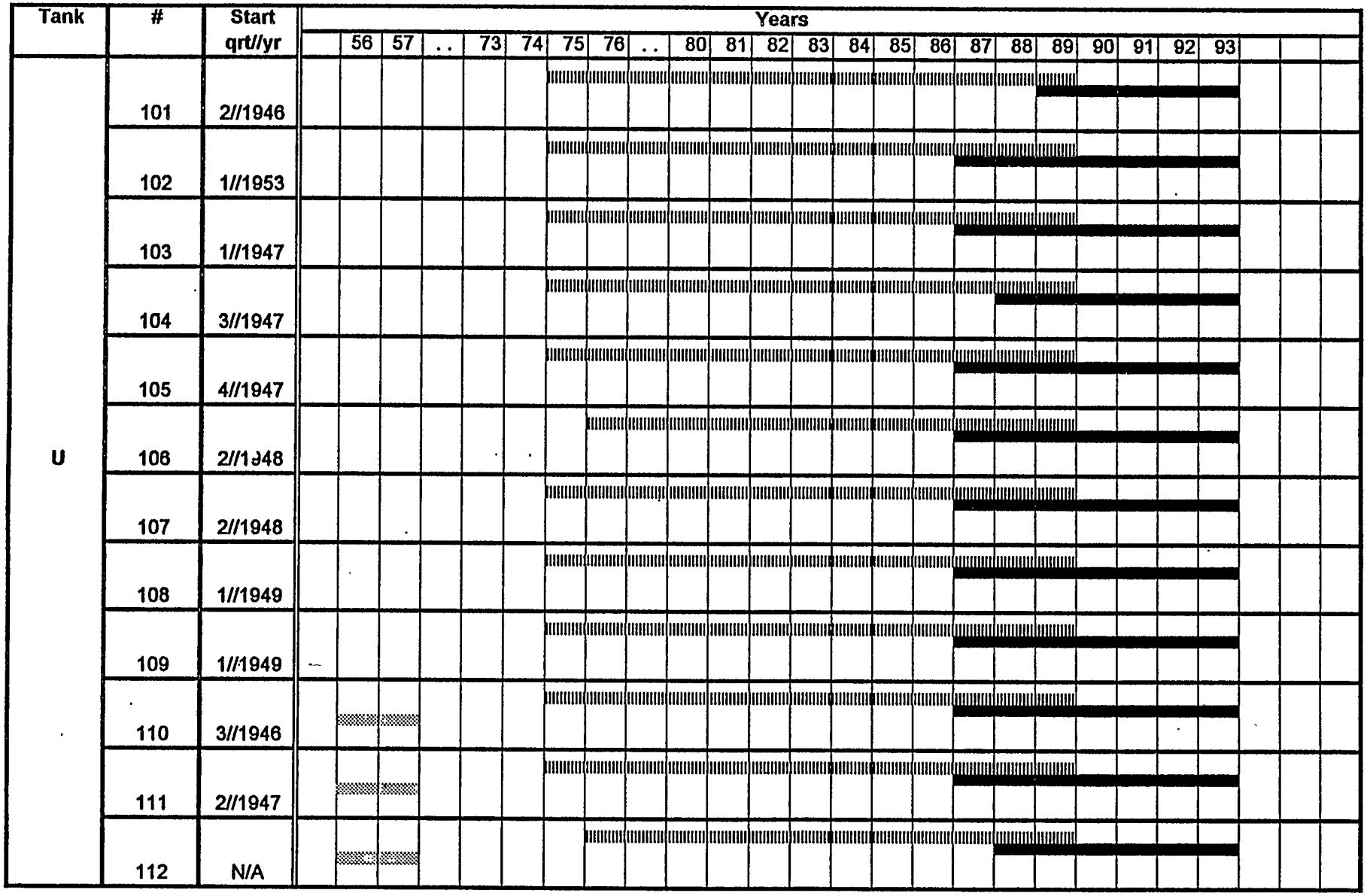
RHO-CD-1172 (DEFIGH-PRICE DATA)

TEMPERATURE RECORD ENVELOPE PROFILE
500,000 GALS SINGLE SHELL TANKS



A P P E N D I X I

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