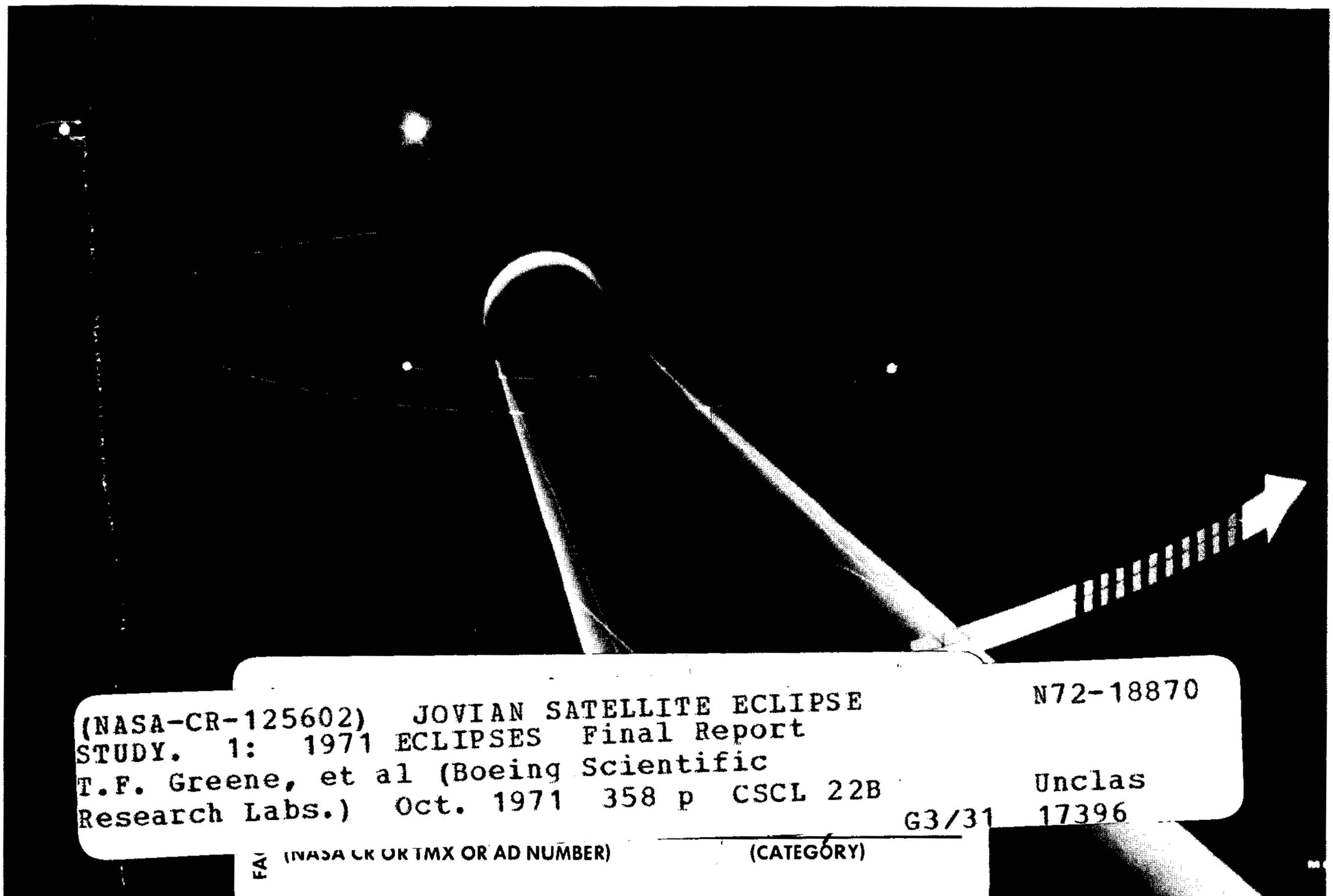
JOVIAN SATELLITE ECLIPSE STUDY I

1971 ECLIPSES

By T. F. Greene, R. W. Shorthill, and L. G. Despain



FINAL REPORT

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION - WASHINGTON, D. C.

OCTOBER 1971

362p

P A R T   T W O

GRAPHICAL ECLIPSE DATA

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This section contains the eclipse data in graphical form. On facing pages are a work sheet (left side) and the final eclipse light curve (right side). (Figures 2-1 and 2-2 illustrate.) These figures also contain a number of explanatory comments which pertain to all the figures in Part Two. Figure 2-1 illustrates the "curve-fit" technique of removing the sky background from the uncorrected object counts after opening the telescope to 200-inch aperture. Prior to opening the telescope aperture to 200-inches, the sky background was removed from the uncorrected object counts by subtracting the weighted sky count (as observed in the sky aperture of the spectrometer) from the object count (The "dual aperture" technique). The sky count was weighted by the balance factor appropriate to the particular channel. The balance factor was determined from the post disappearance data in the method discussed in Part One.

In the case of the February ingress and March egress data, the dual aperture technique was used to correct the data after opening to 200-inch aperture as well. The curves are ordered by date--February 8, March 10, April 6 and then by wavelength from blue to red.

Error bars are shown on the data from the time the telescope was first opened to 200-inch aperture until the 1σ level above zero counts. The data points are connected from the beginning until the data first falls below 1σ. A discussion of errors is found in Part One, Section VI.

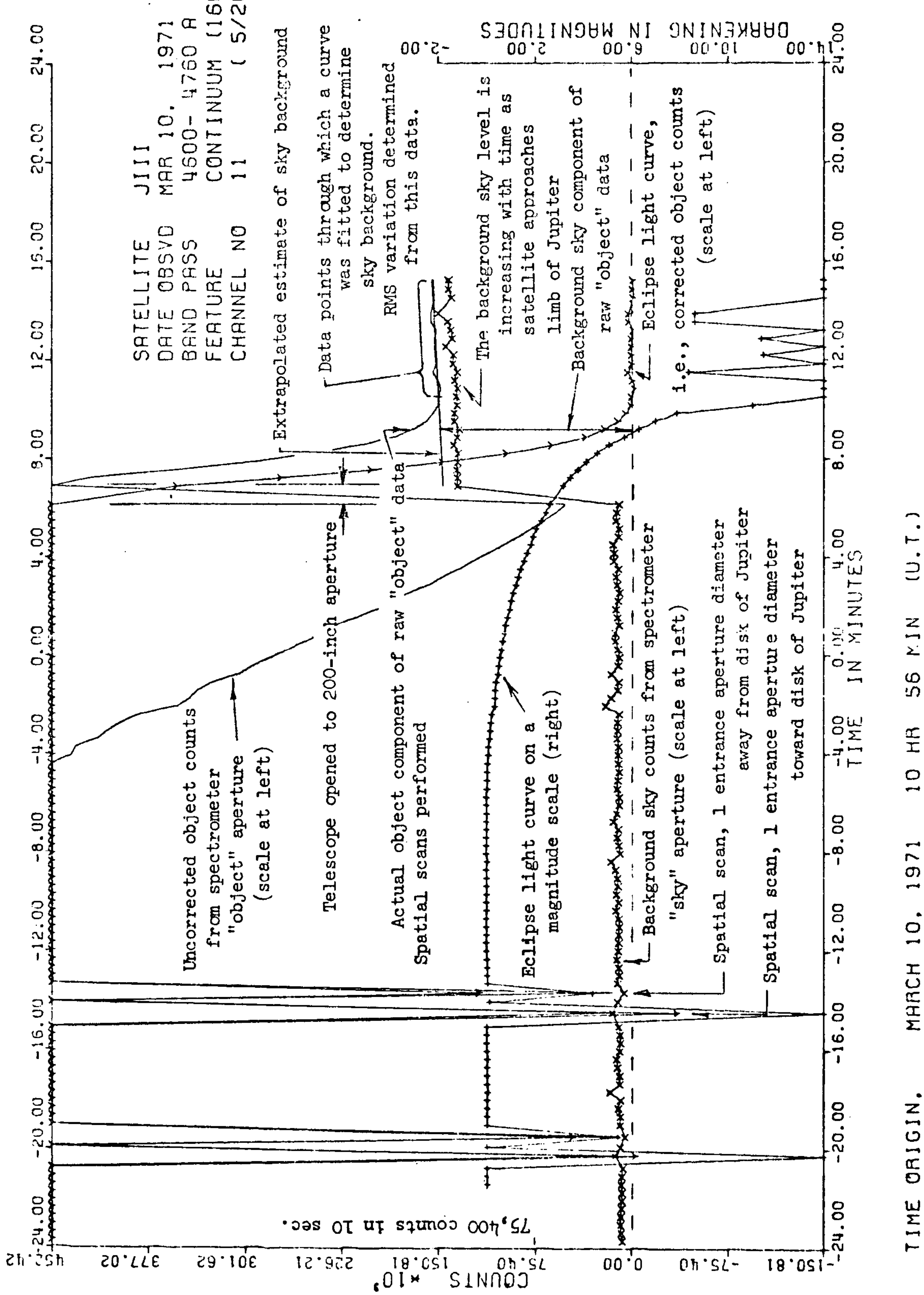


Figure 2-1 Annotated Work Sheet

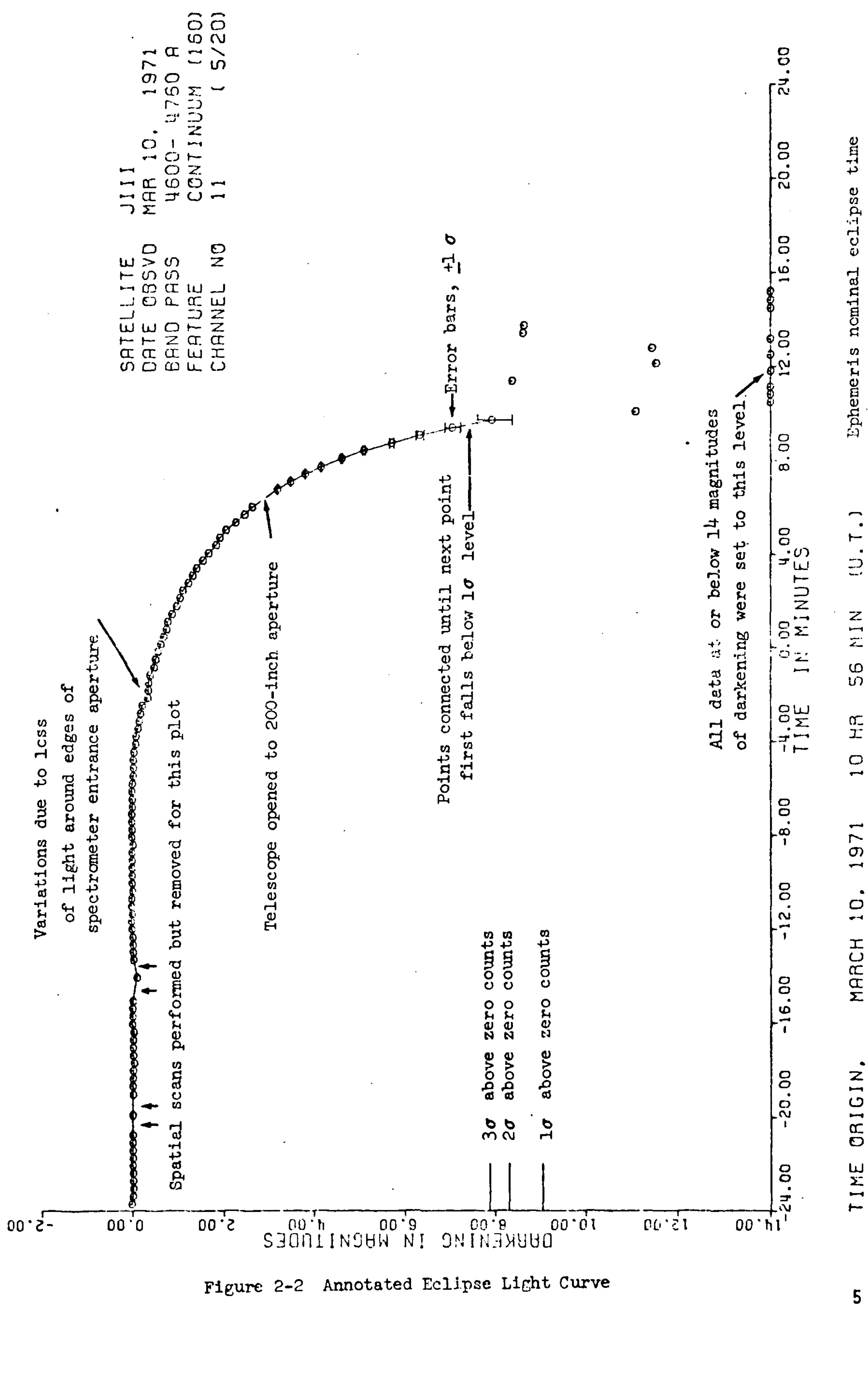
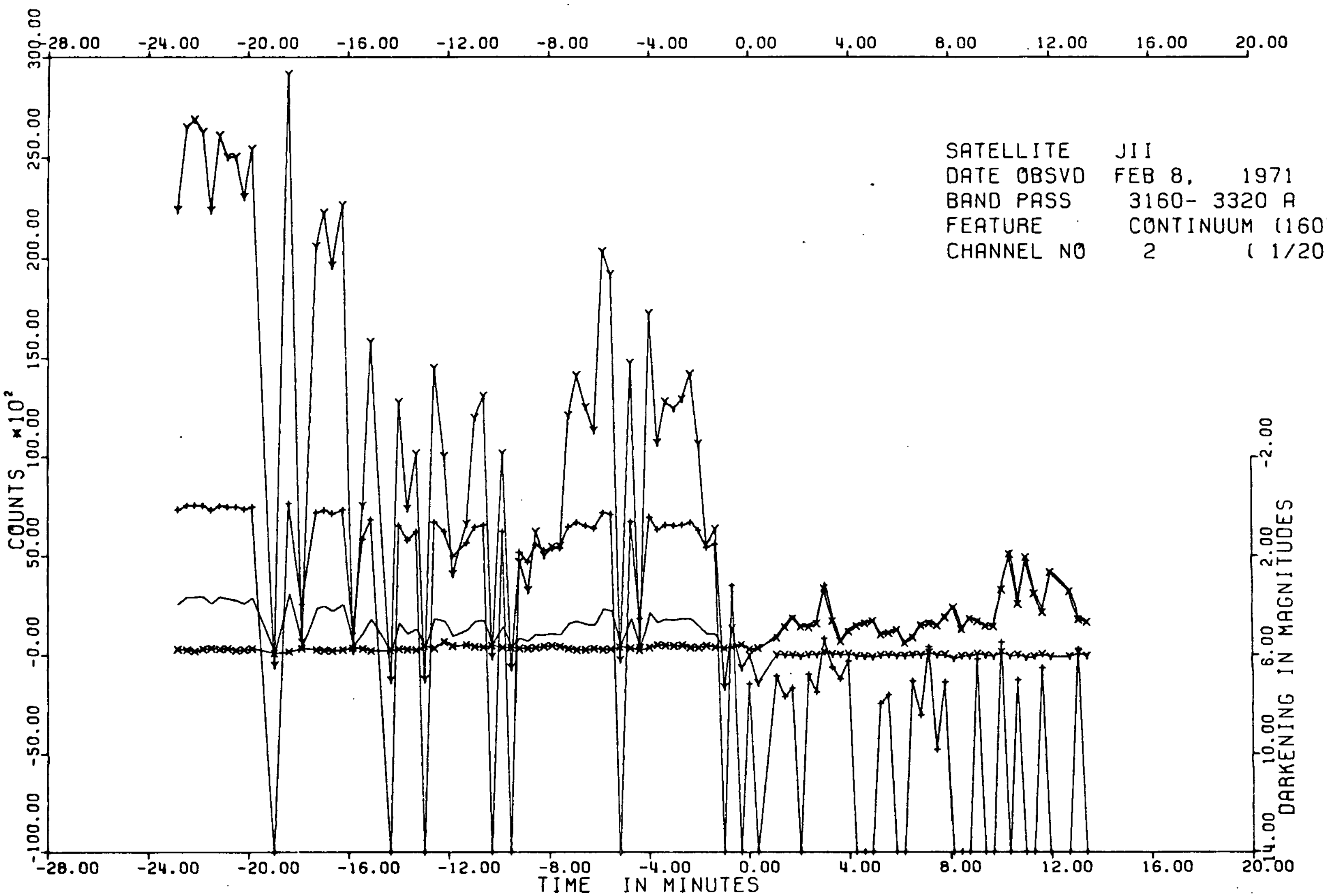


Figure 2-2 Annotated Eclipse Light Curve



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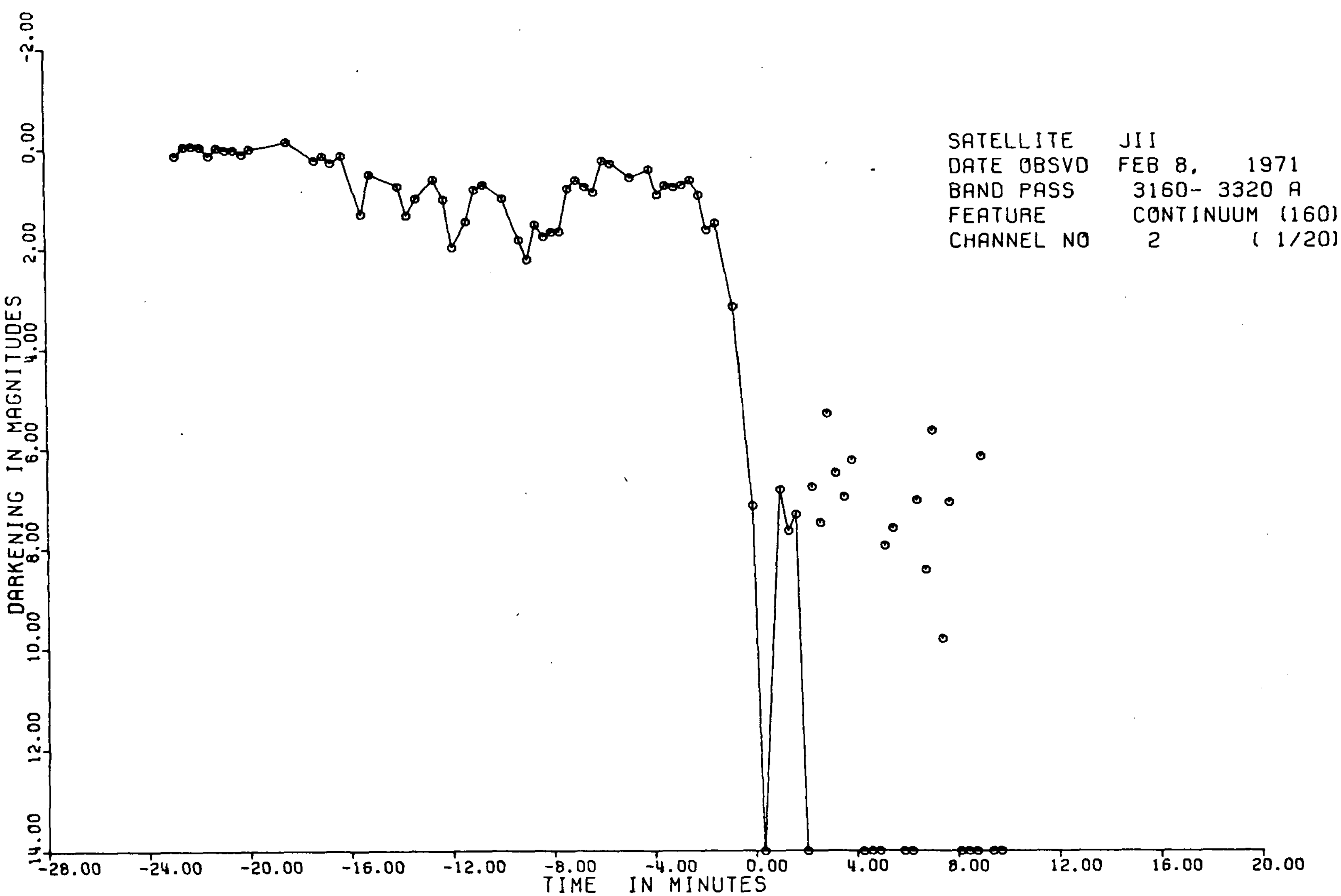

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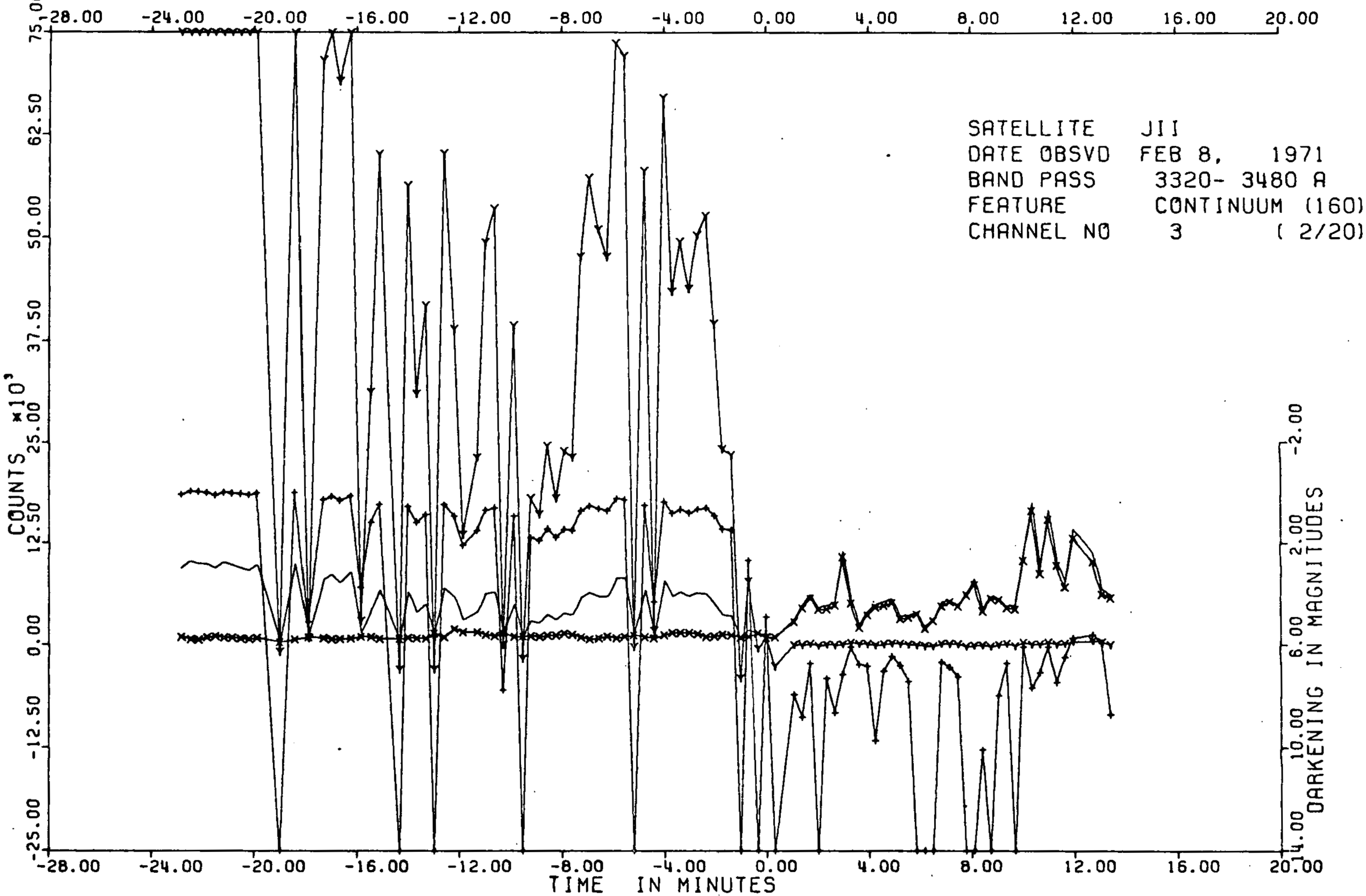

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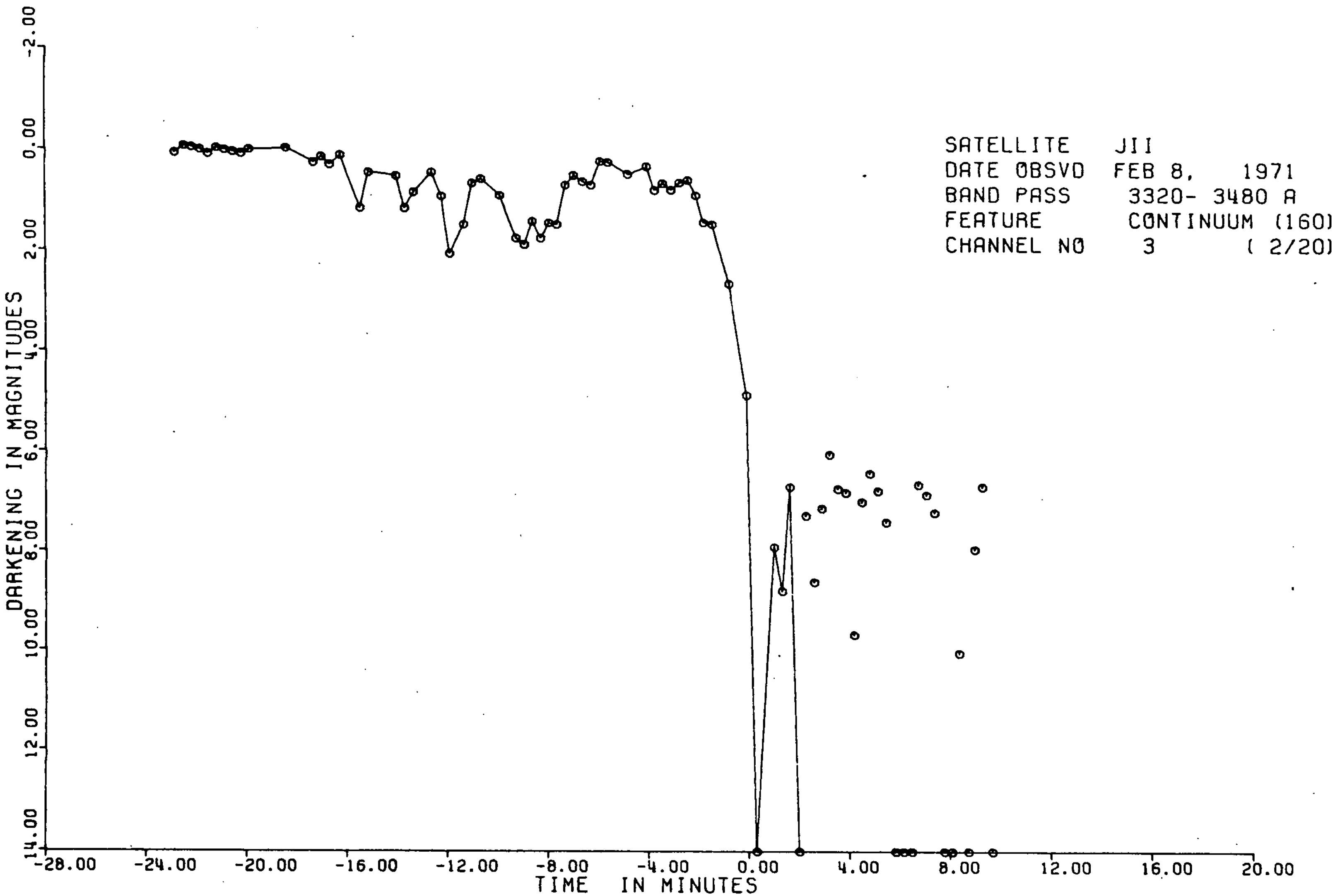

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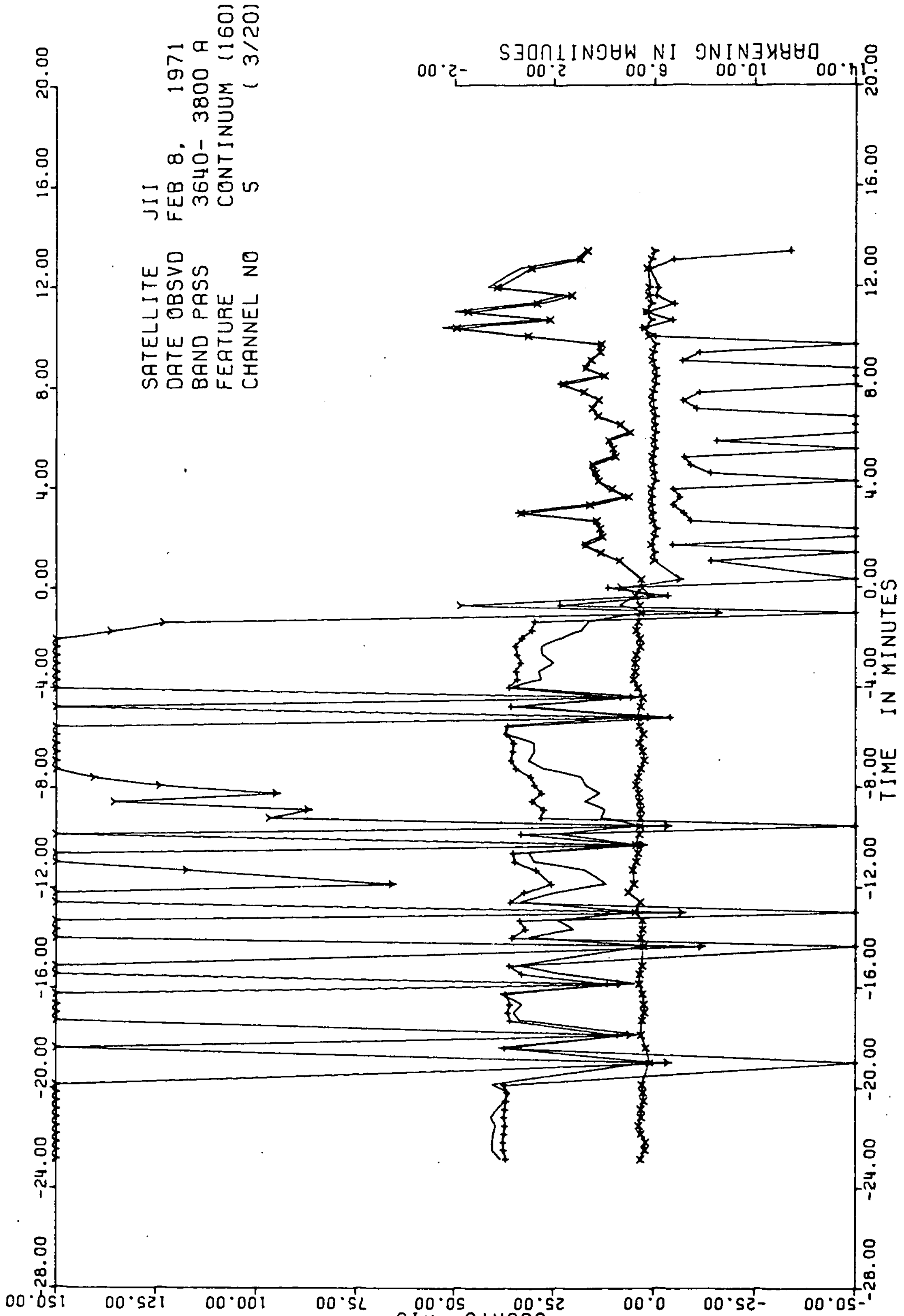

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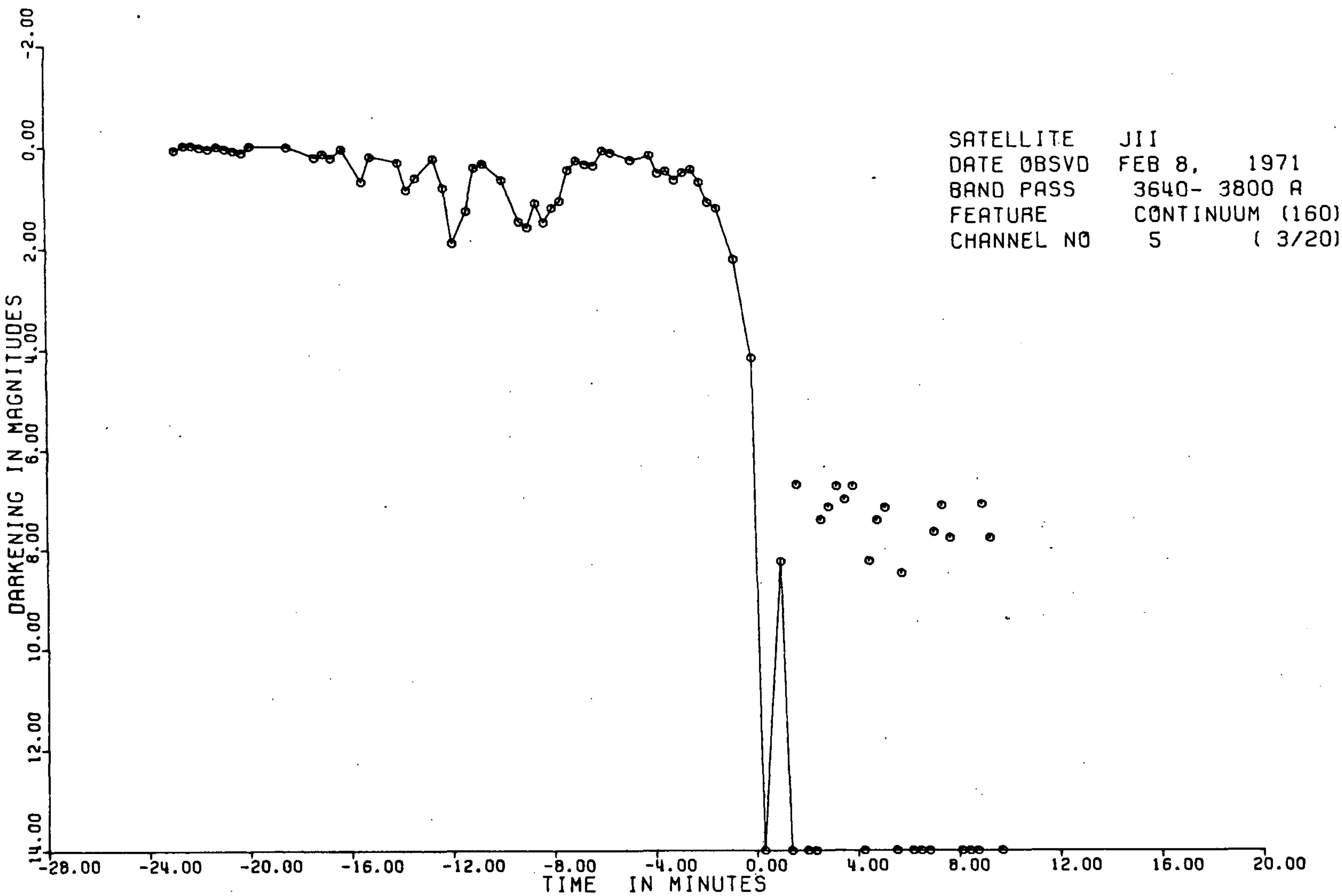

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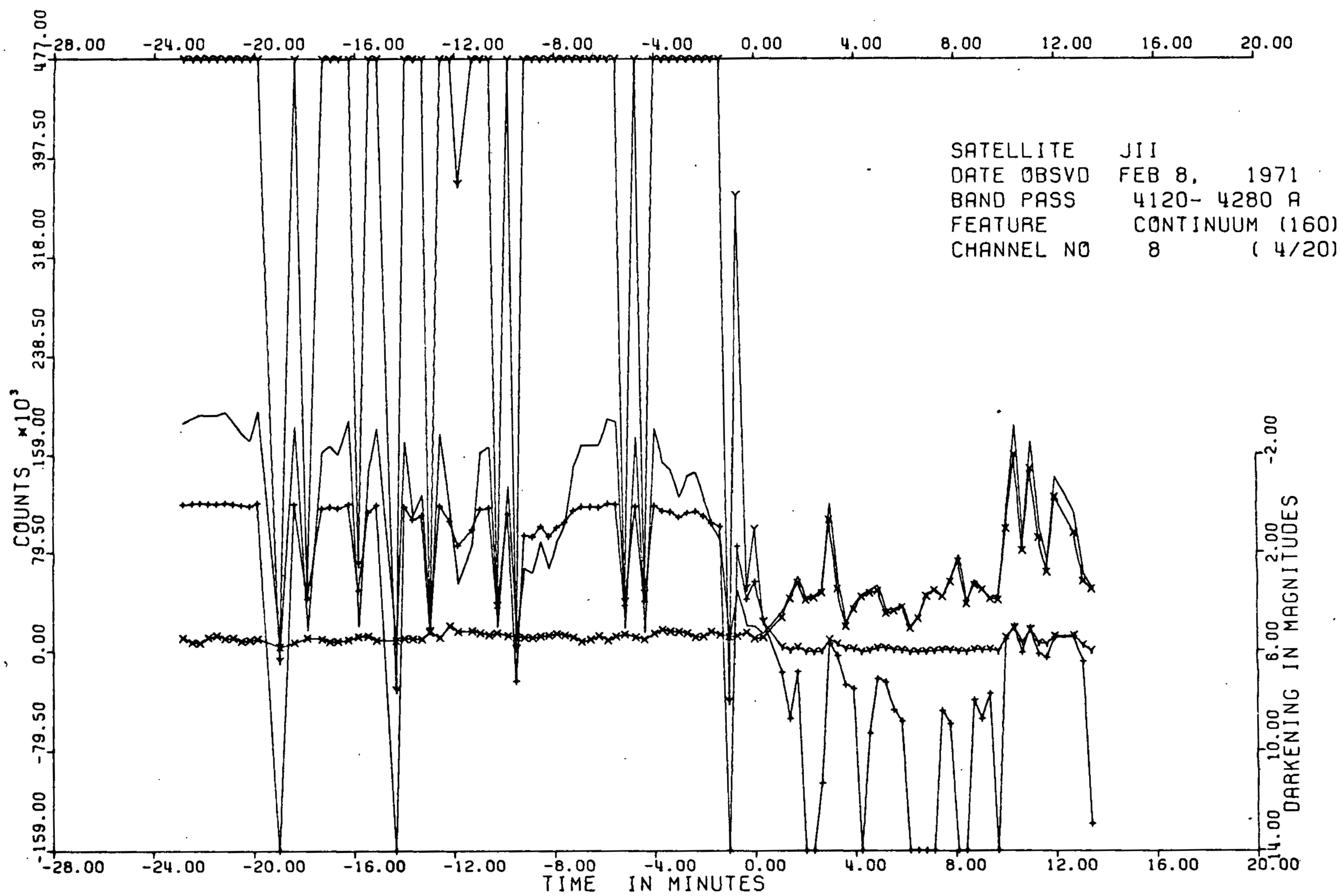

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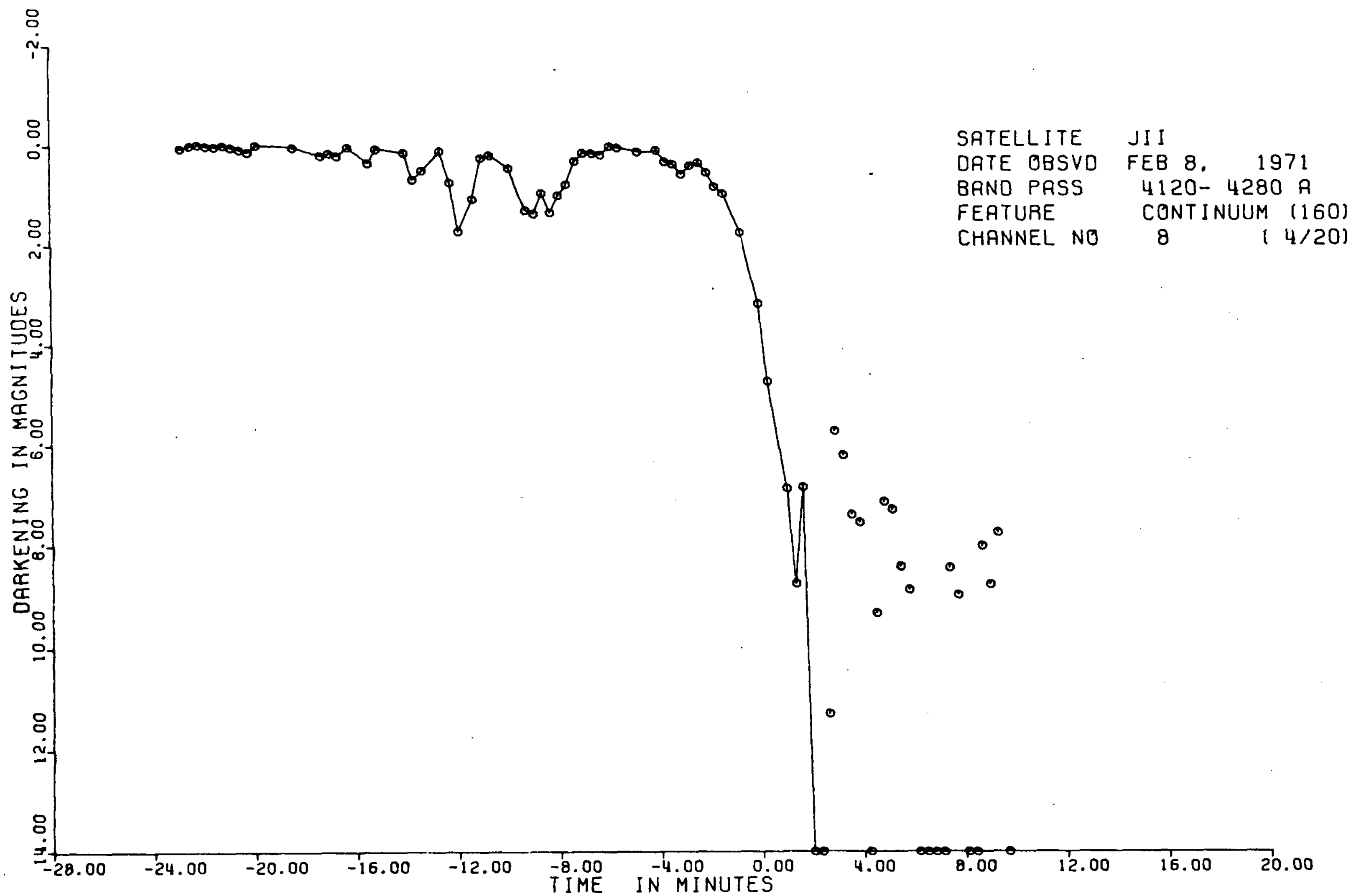

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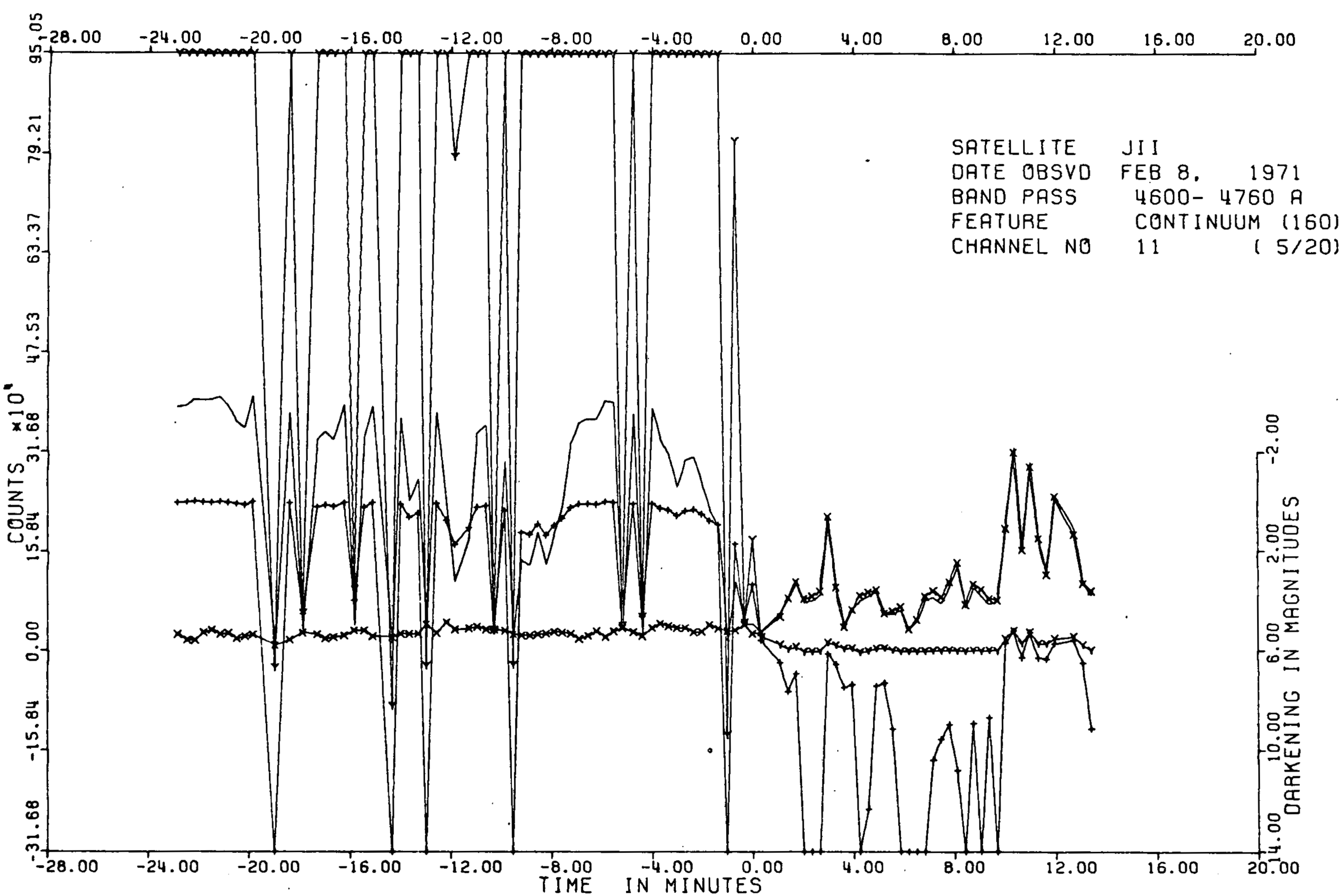

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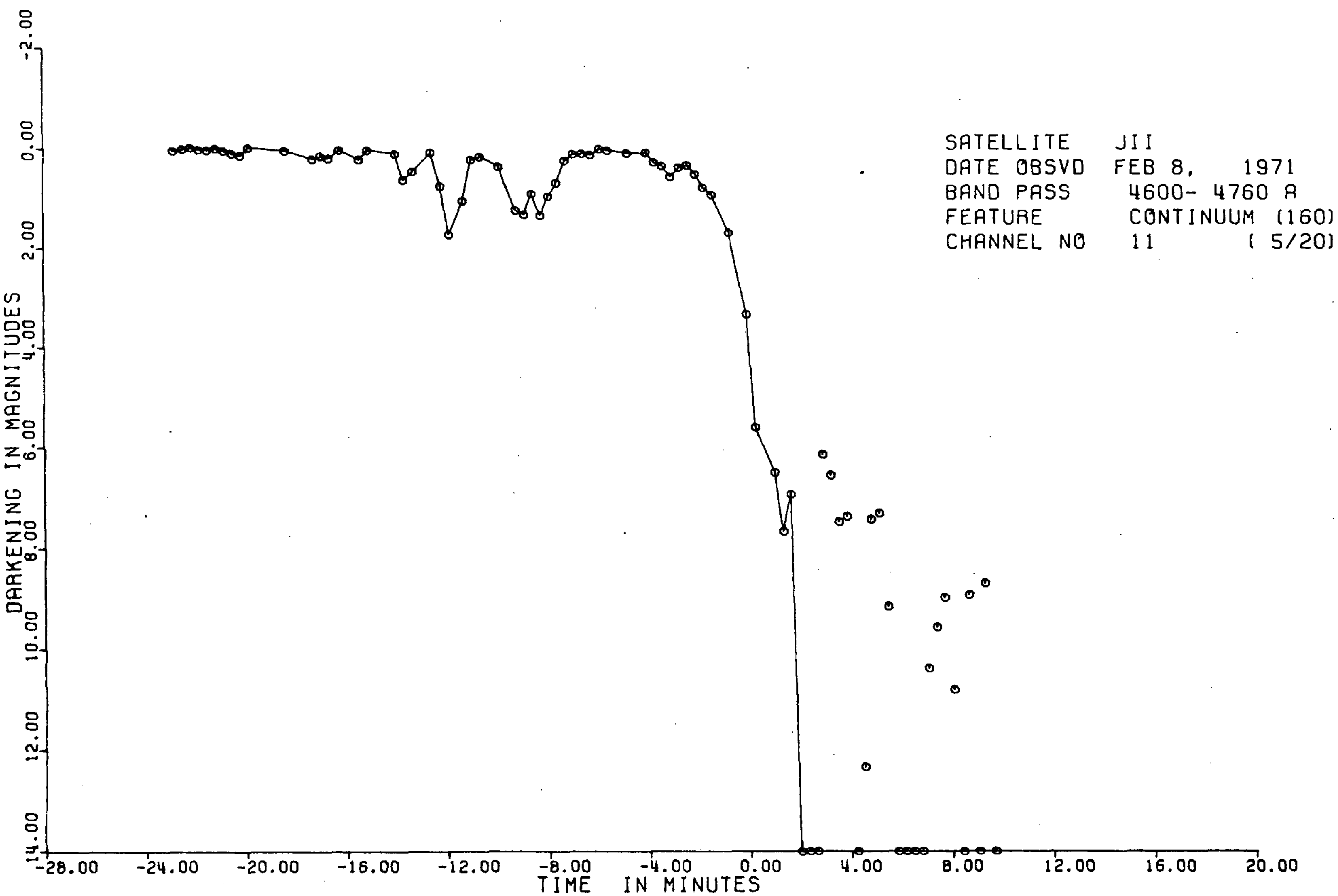

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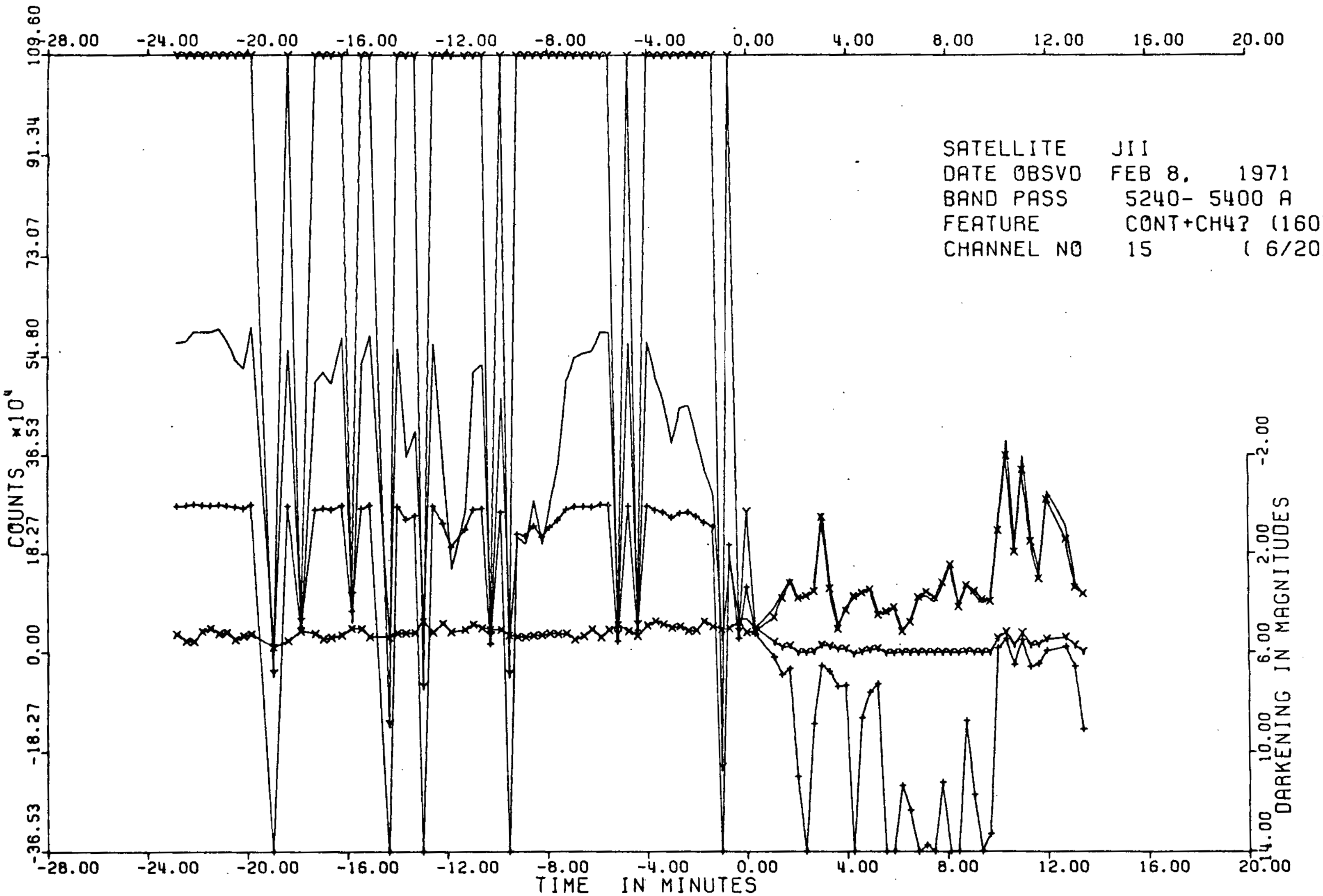

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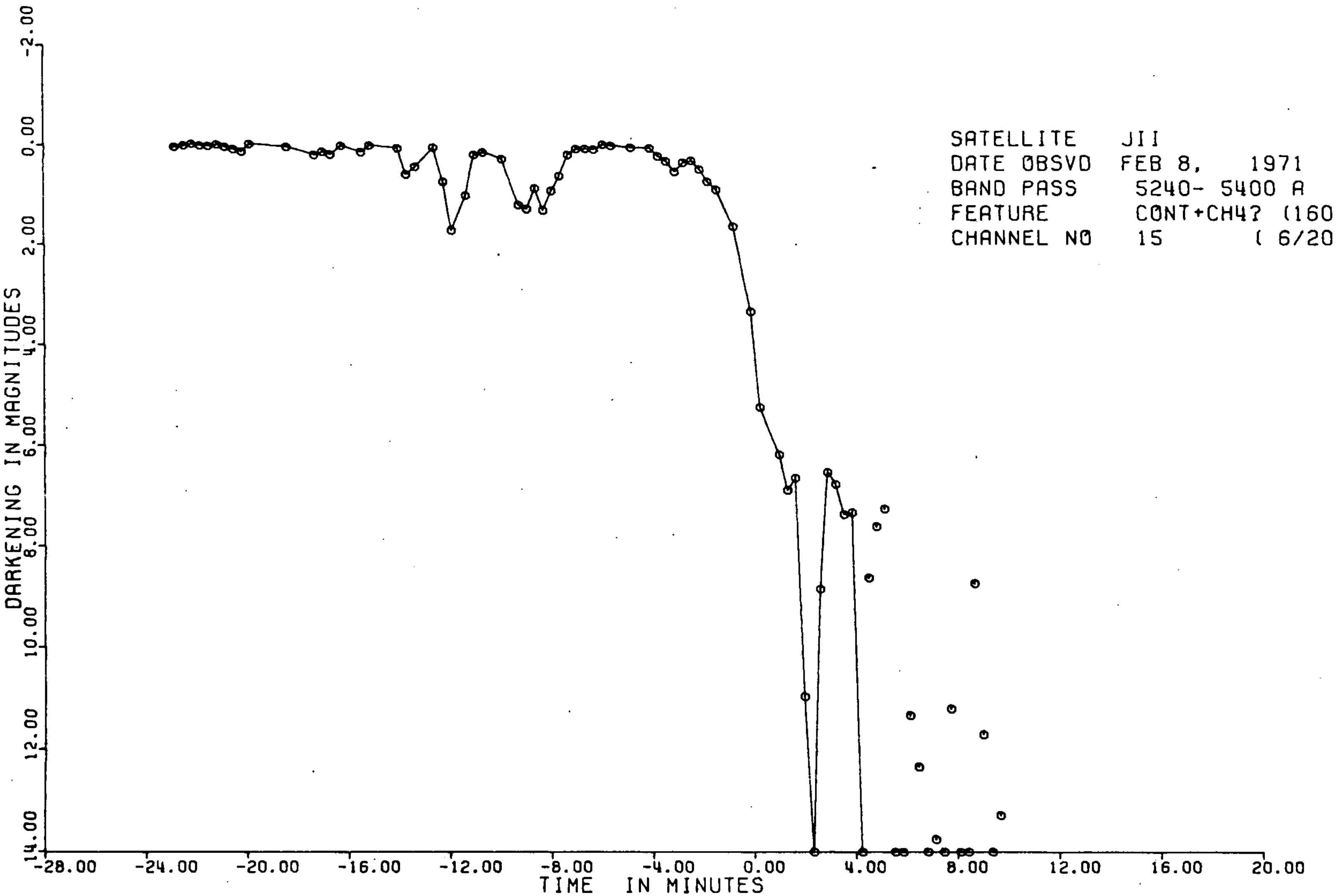

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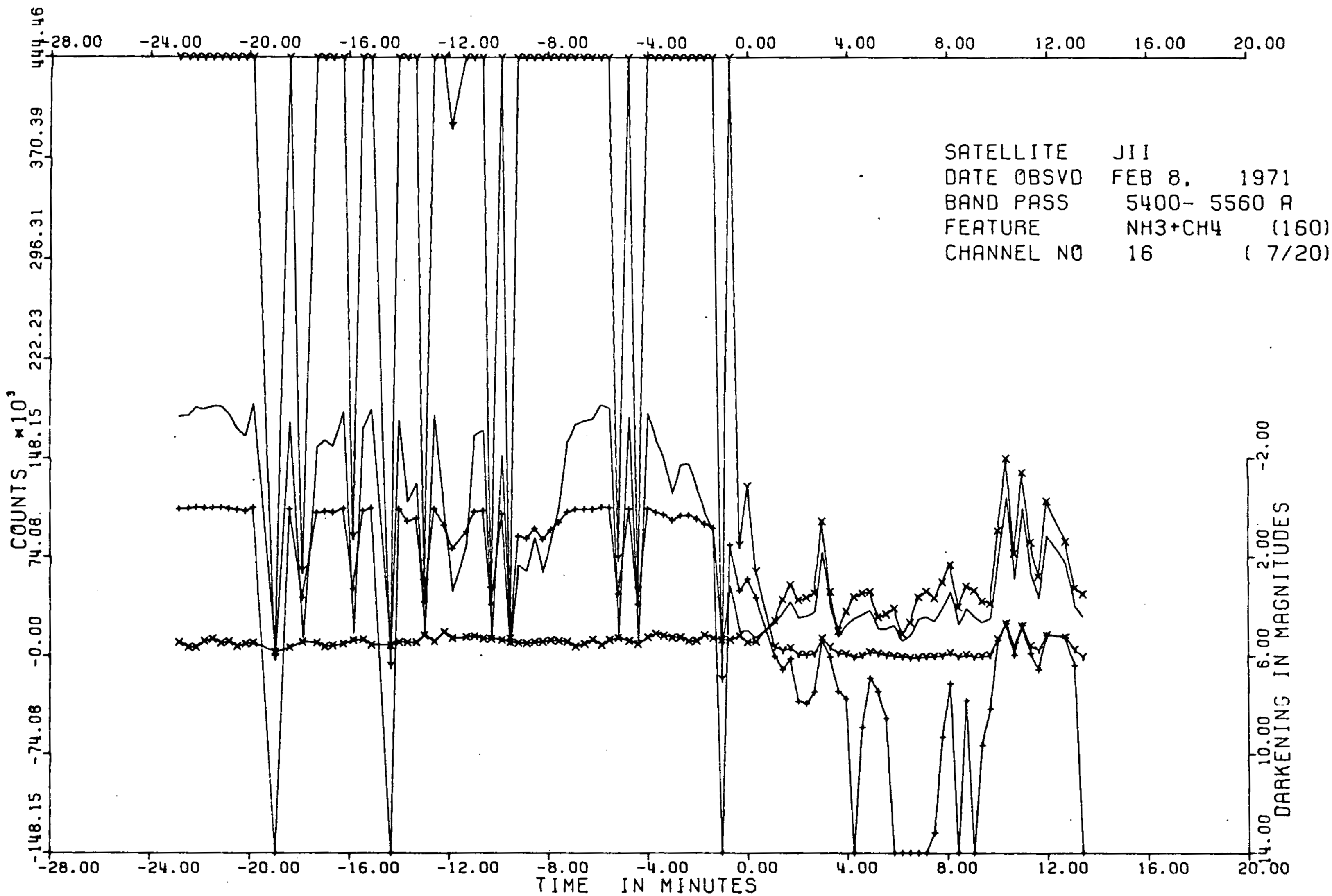

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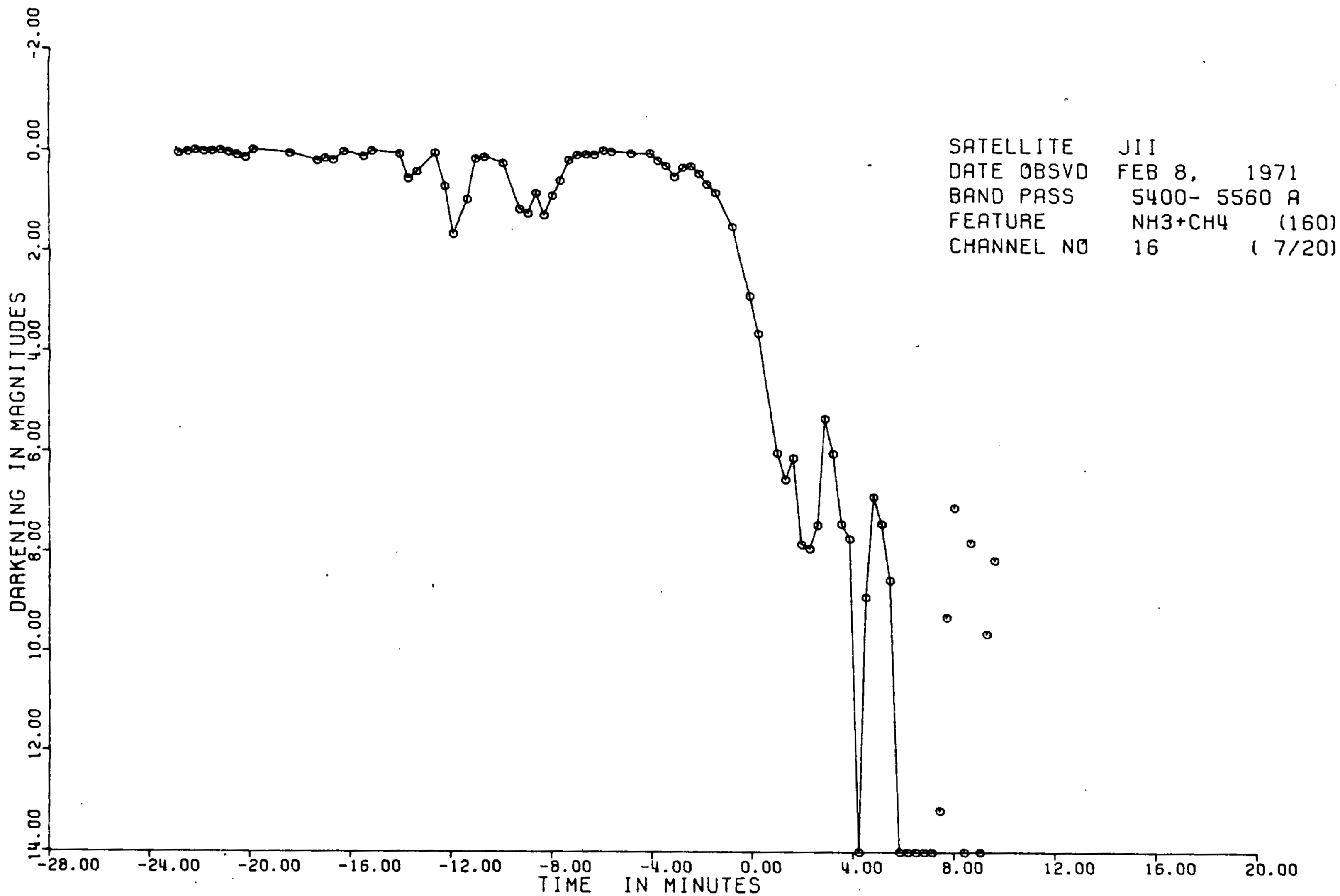

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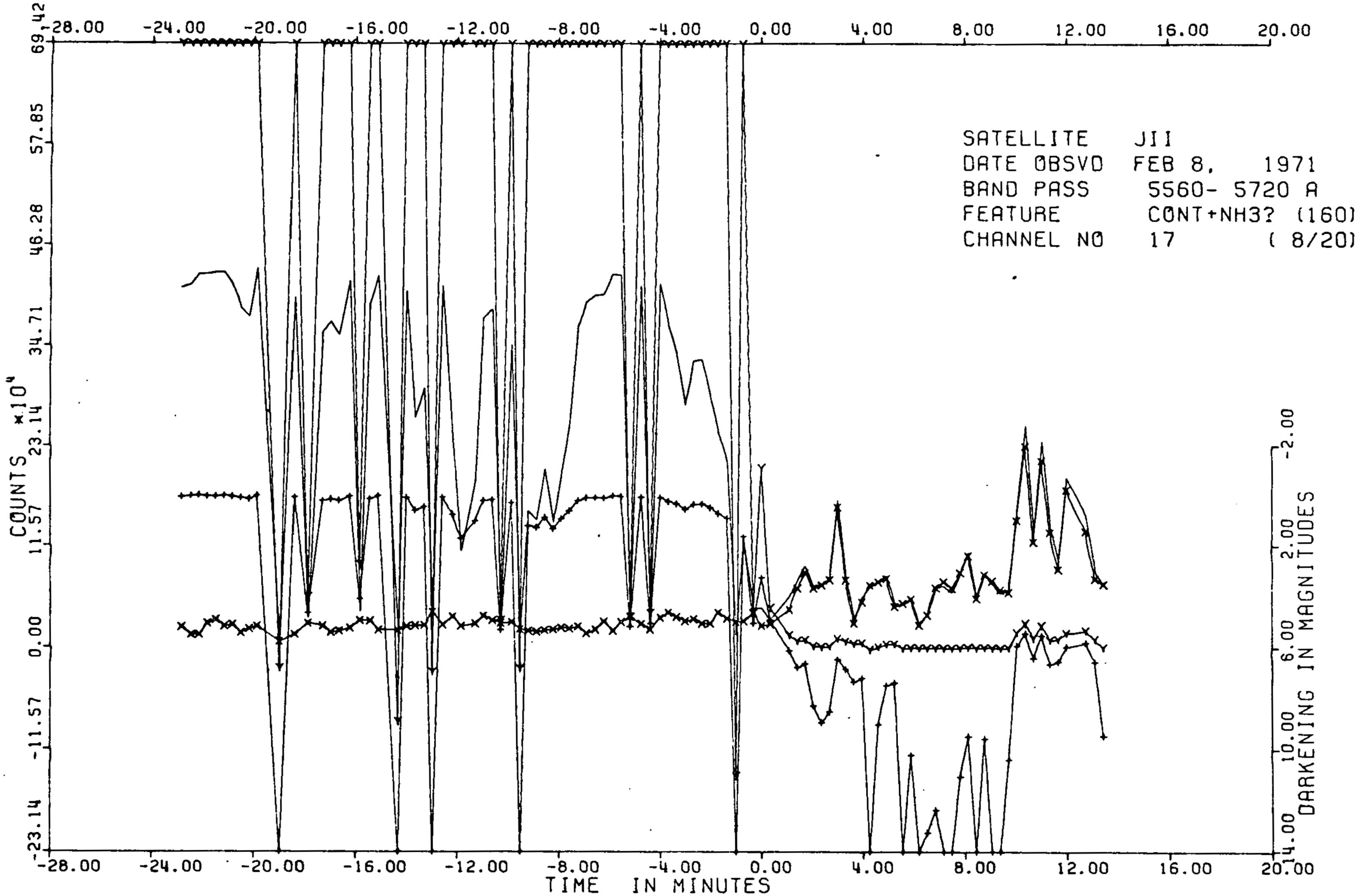

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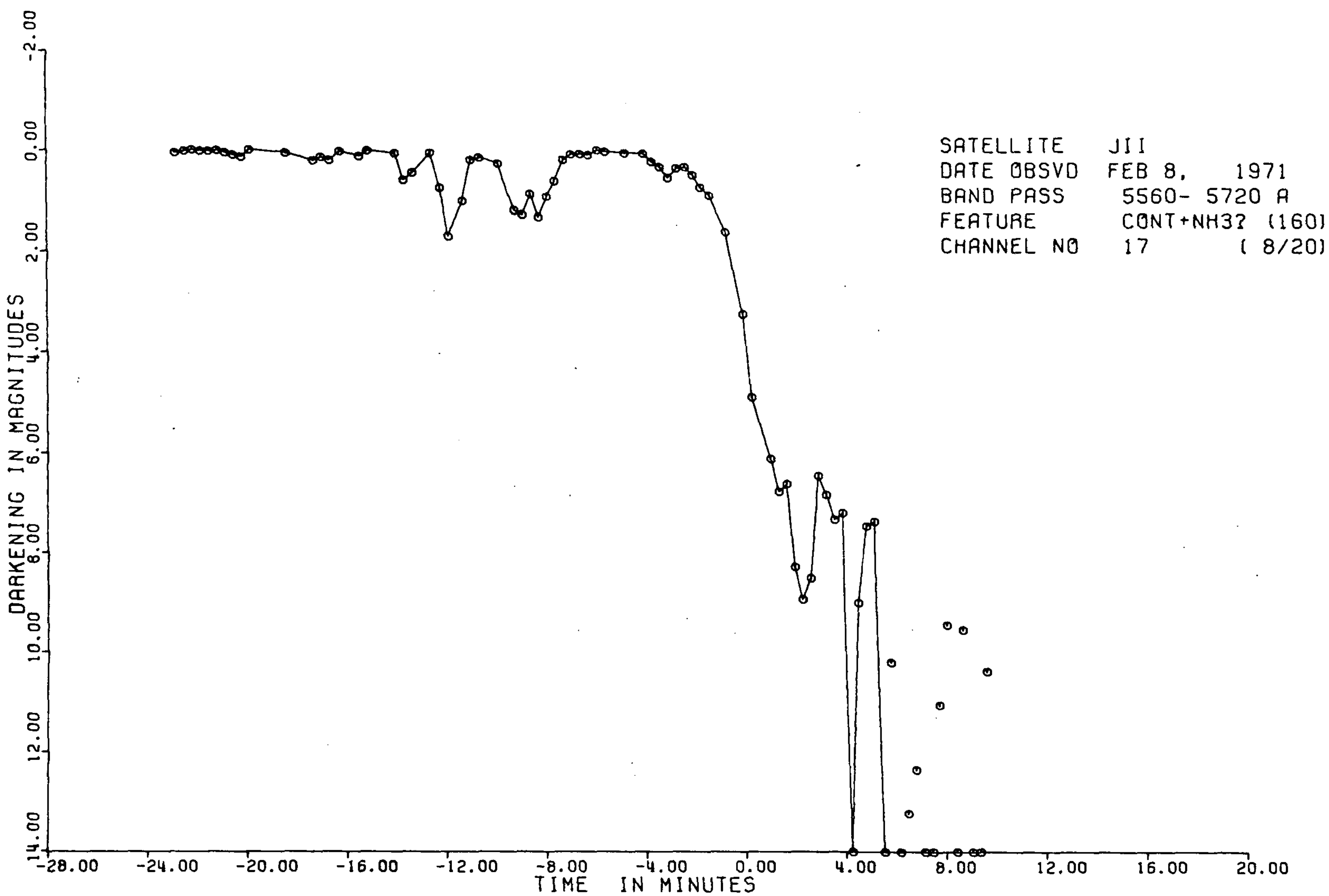

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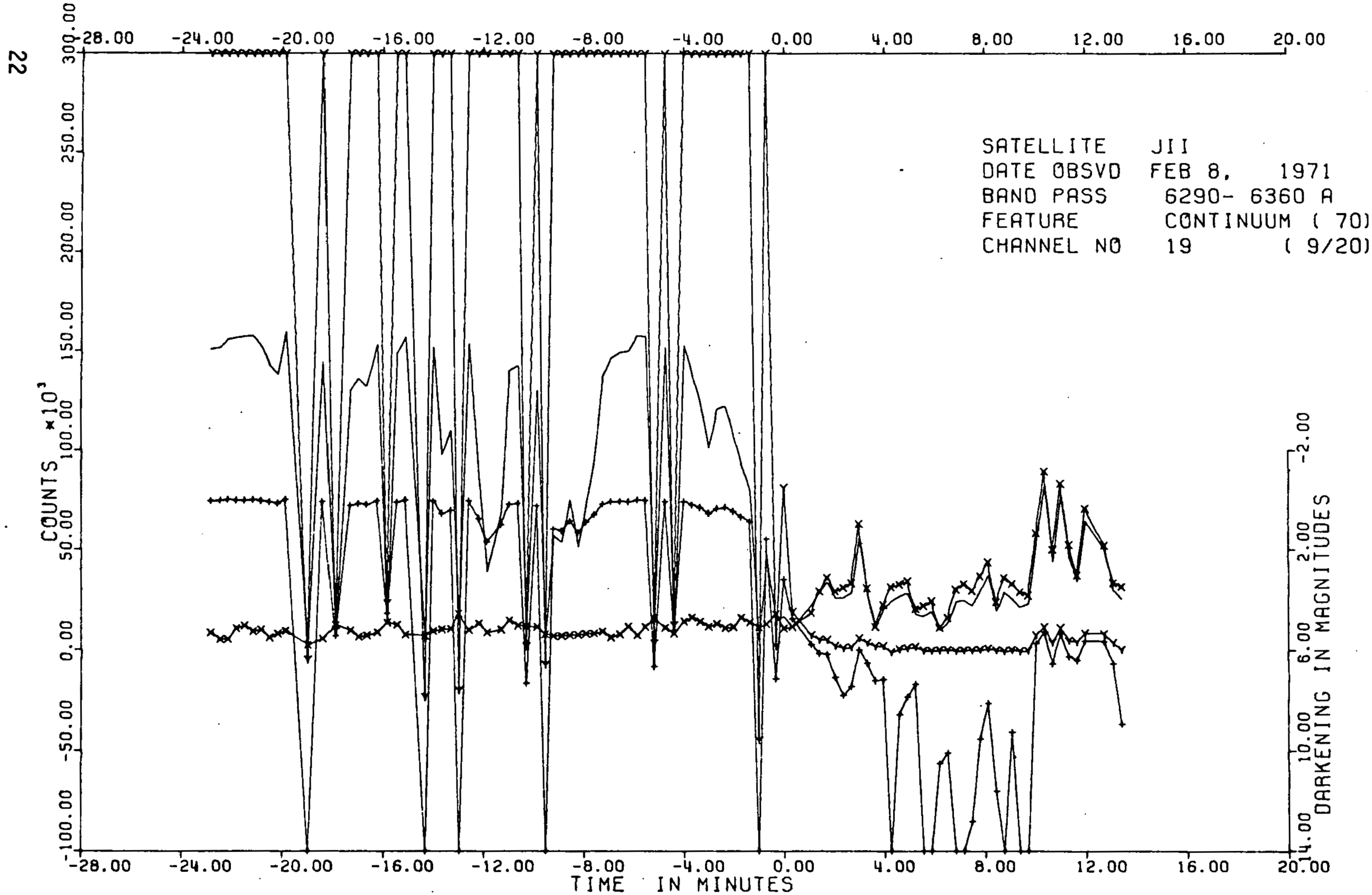

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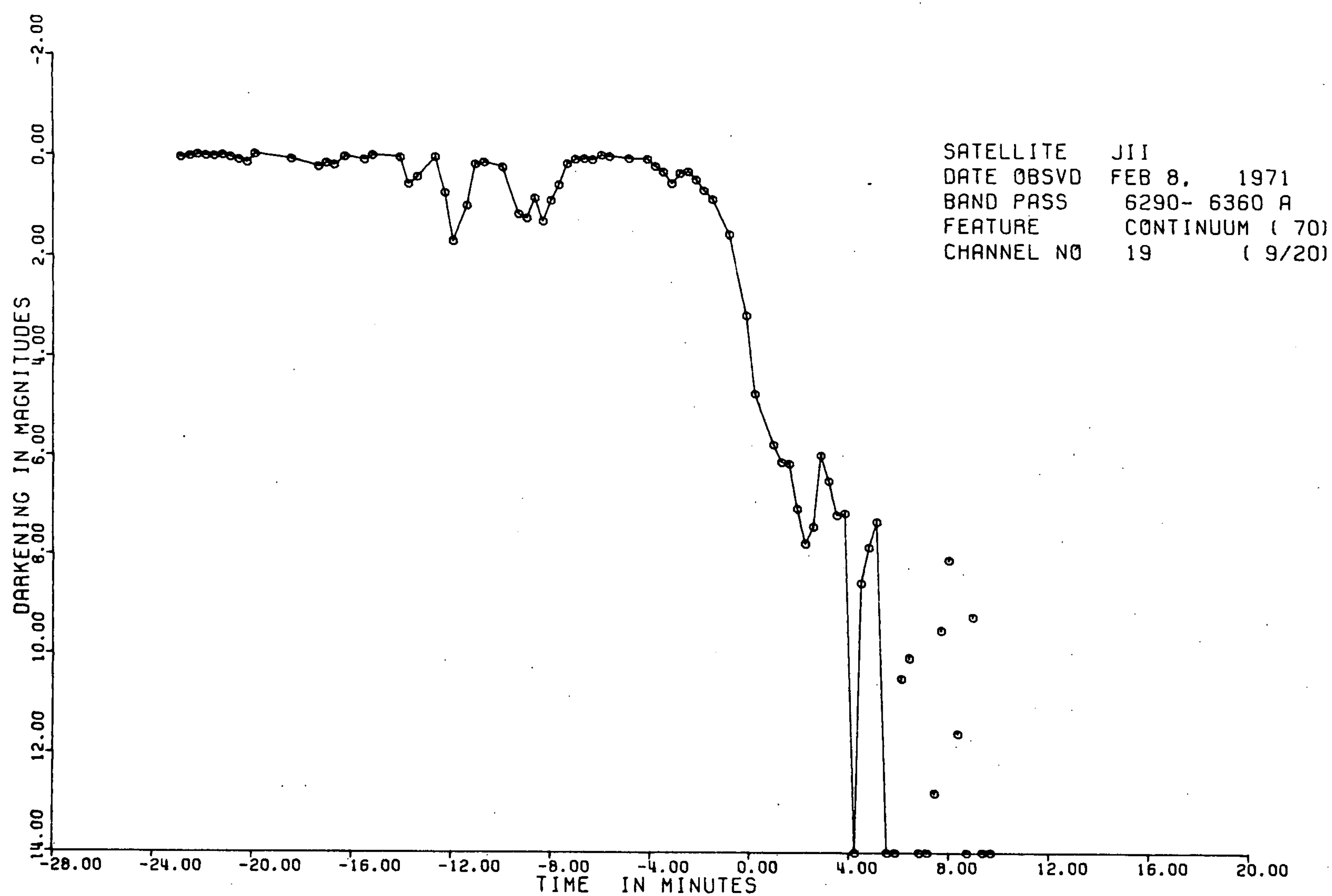

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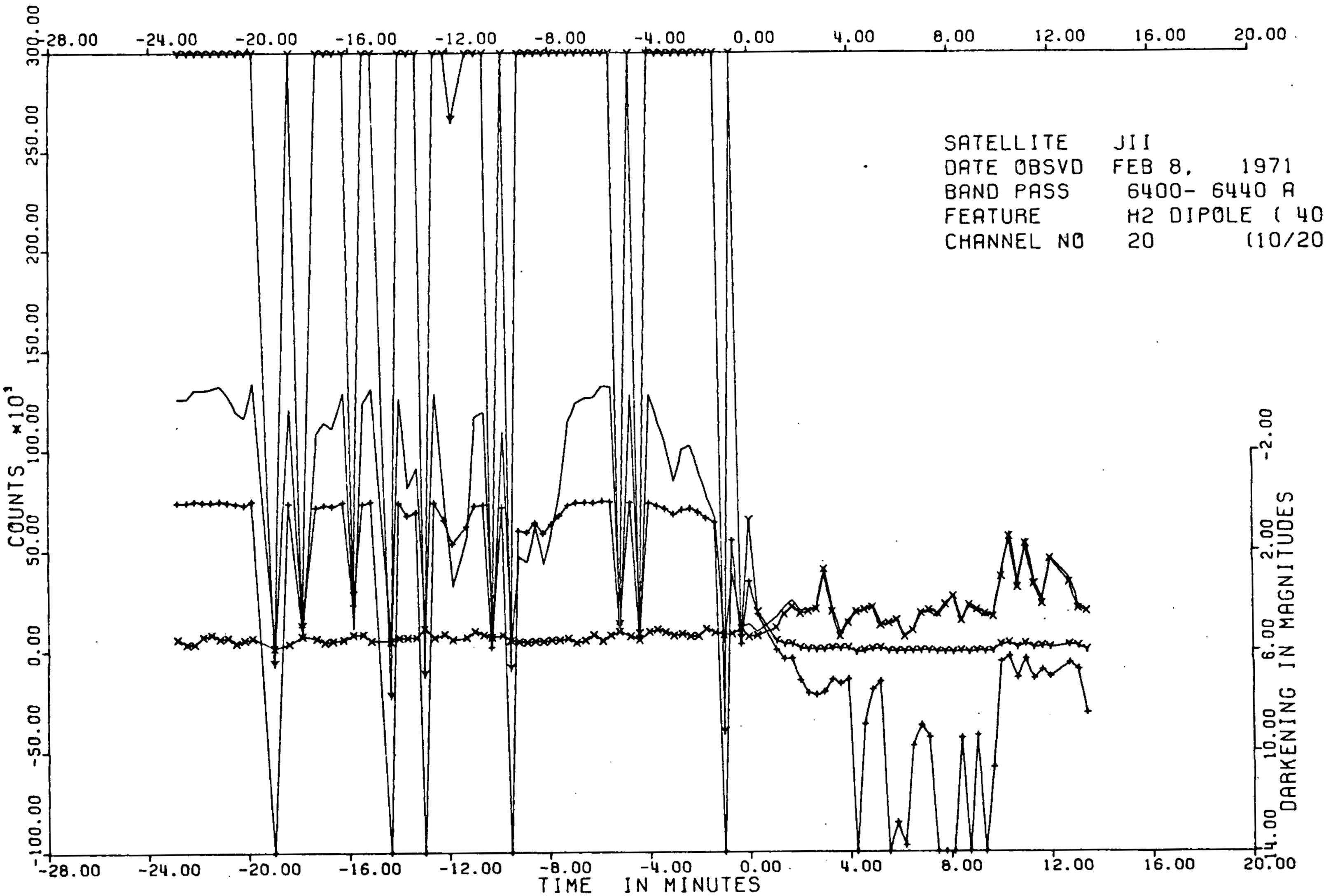

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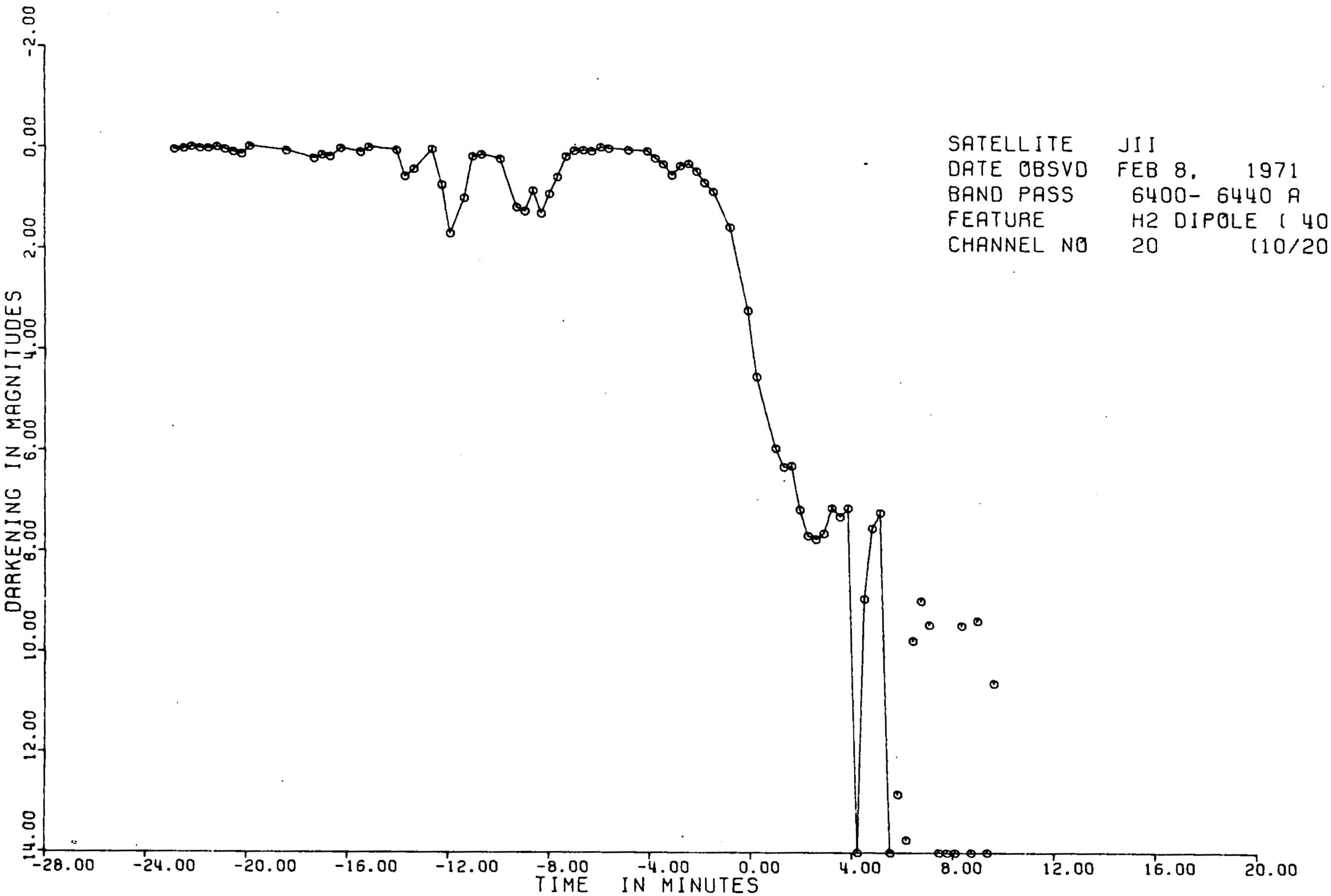

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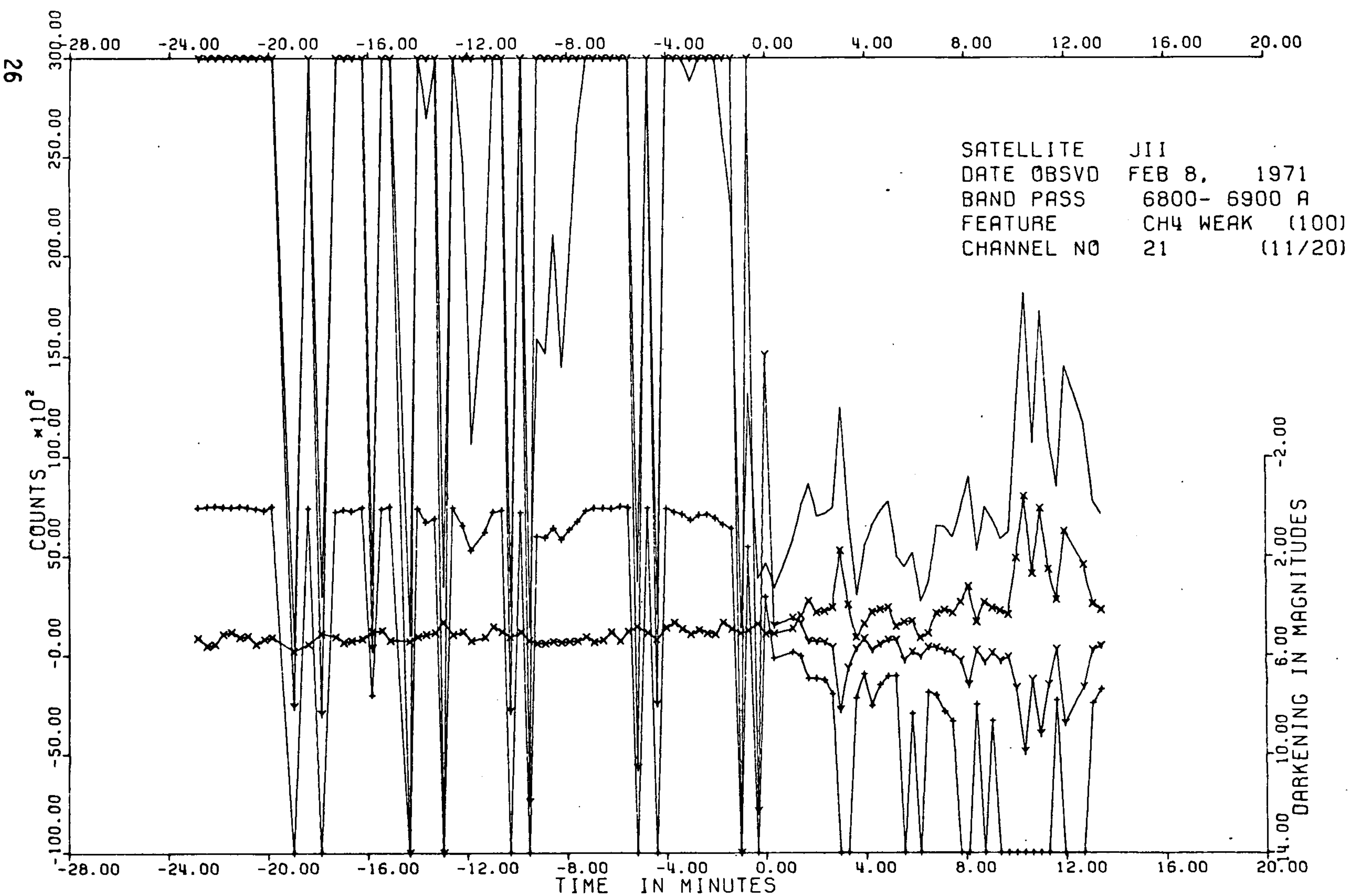

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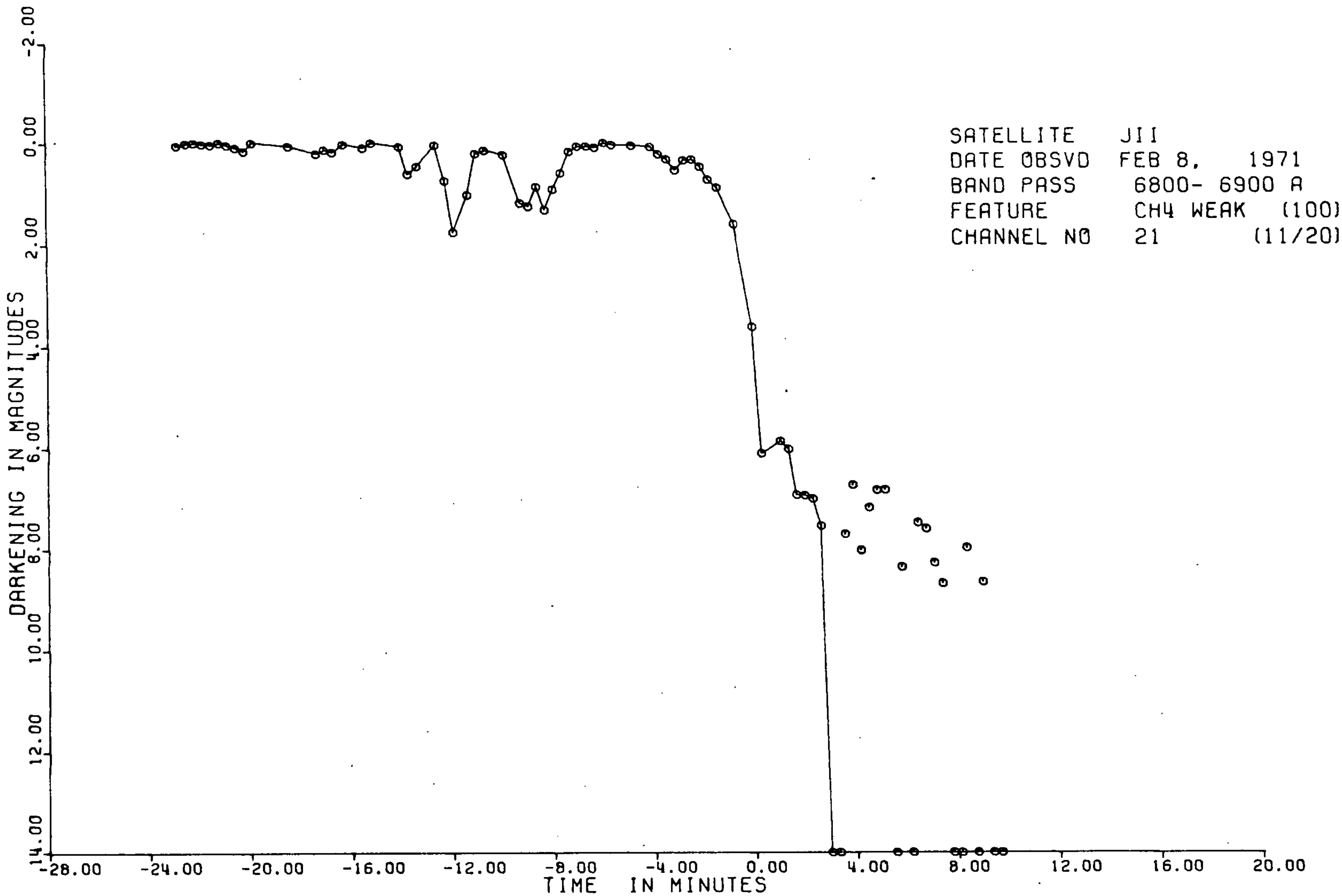

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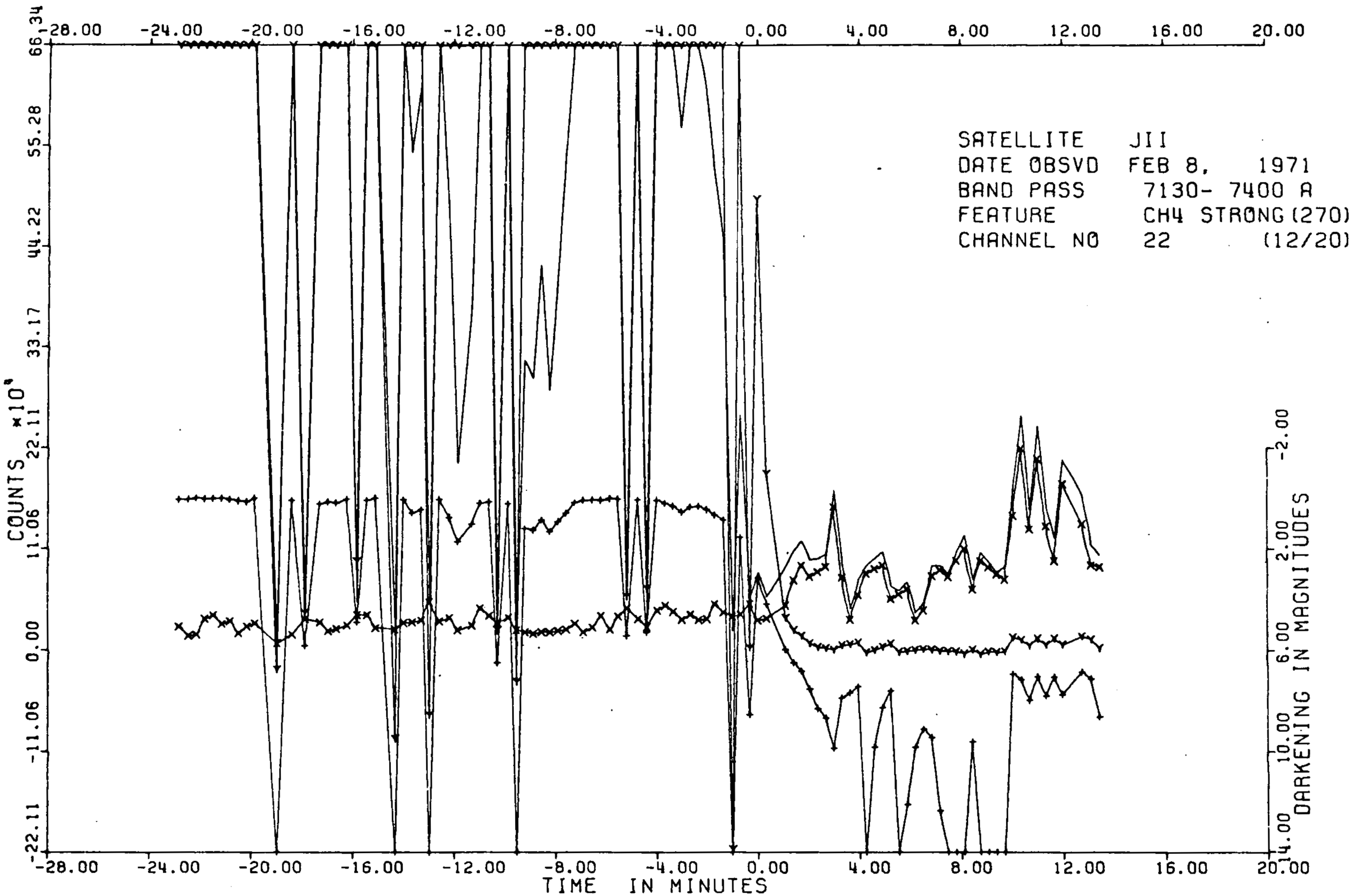

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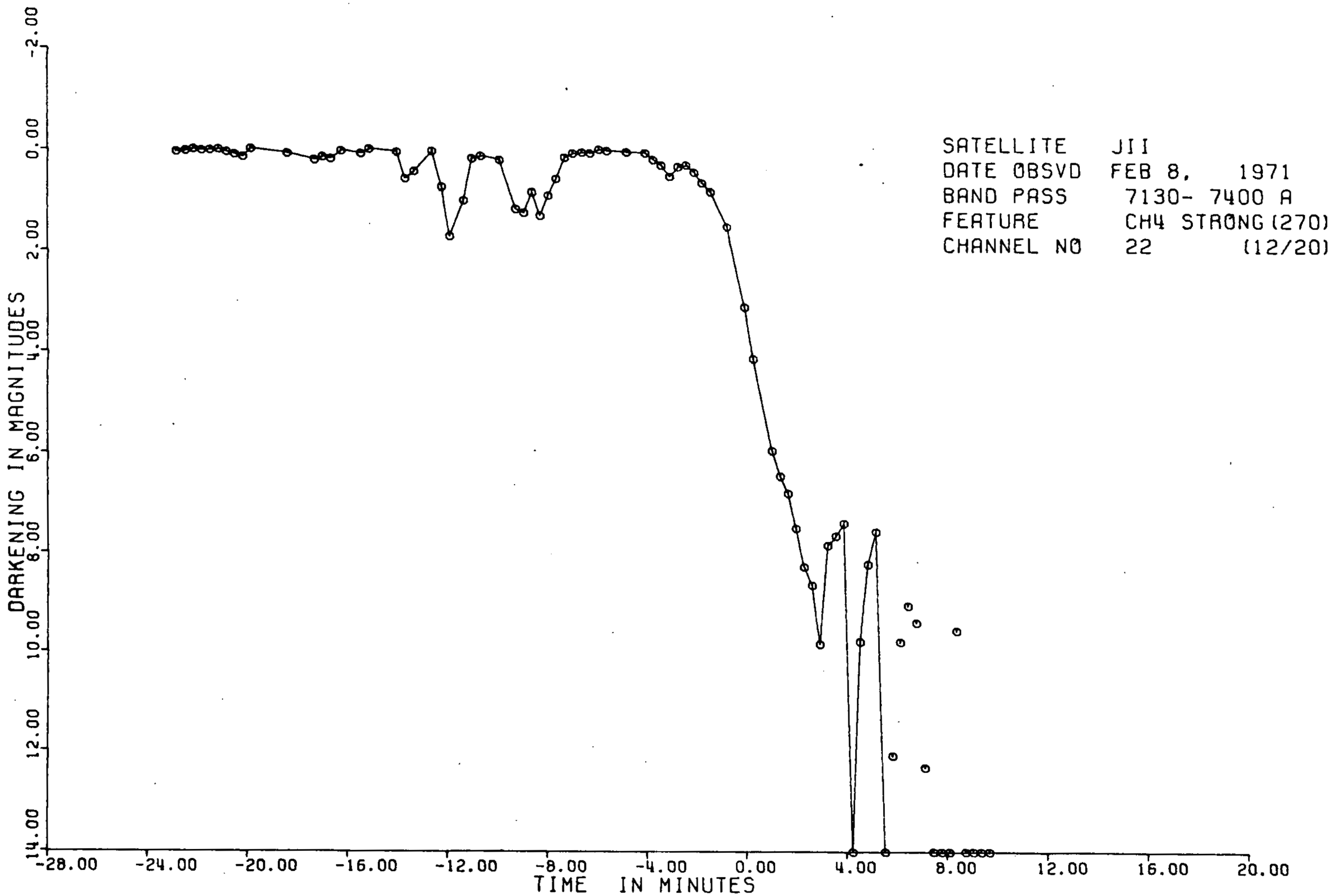

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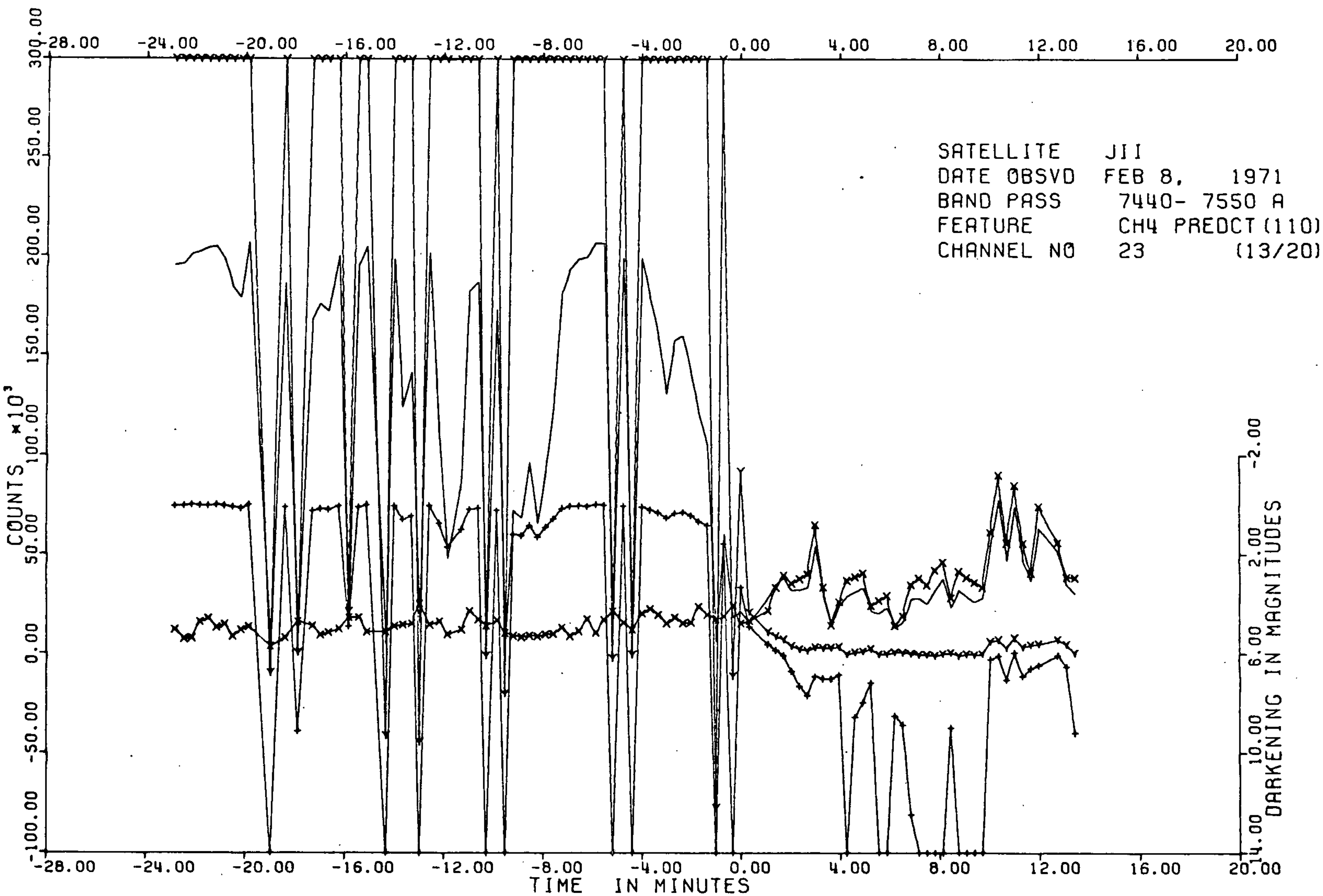

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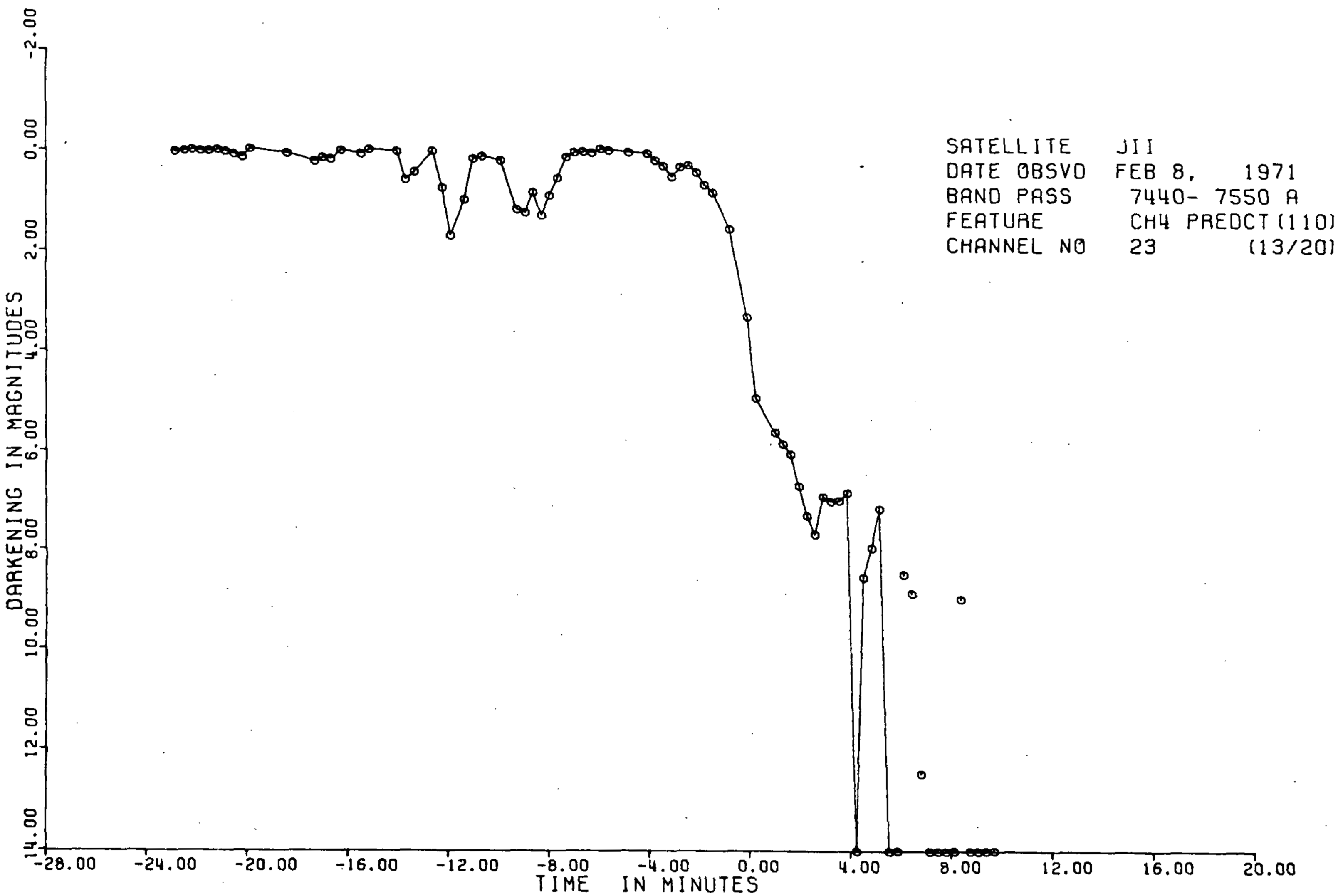

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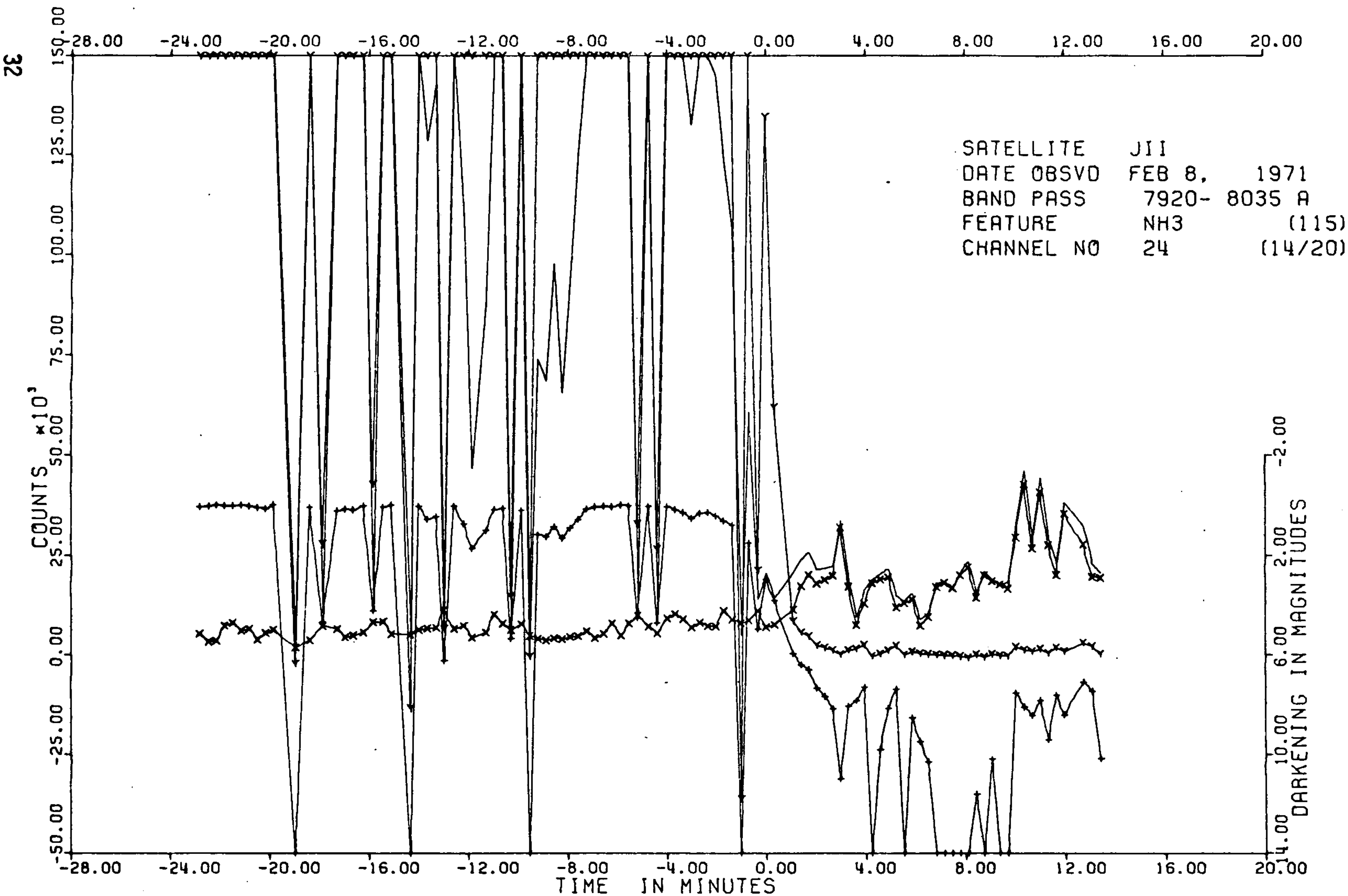

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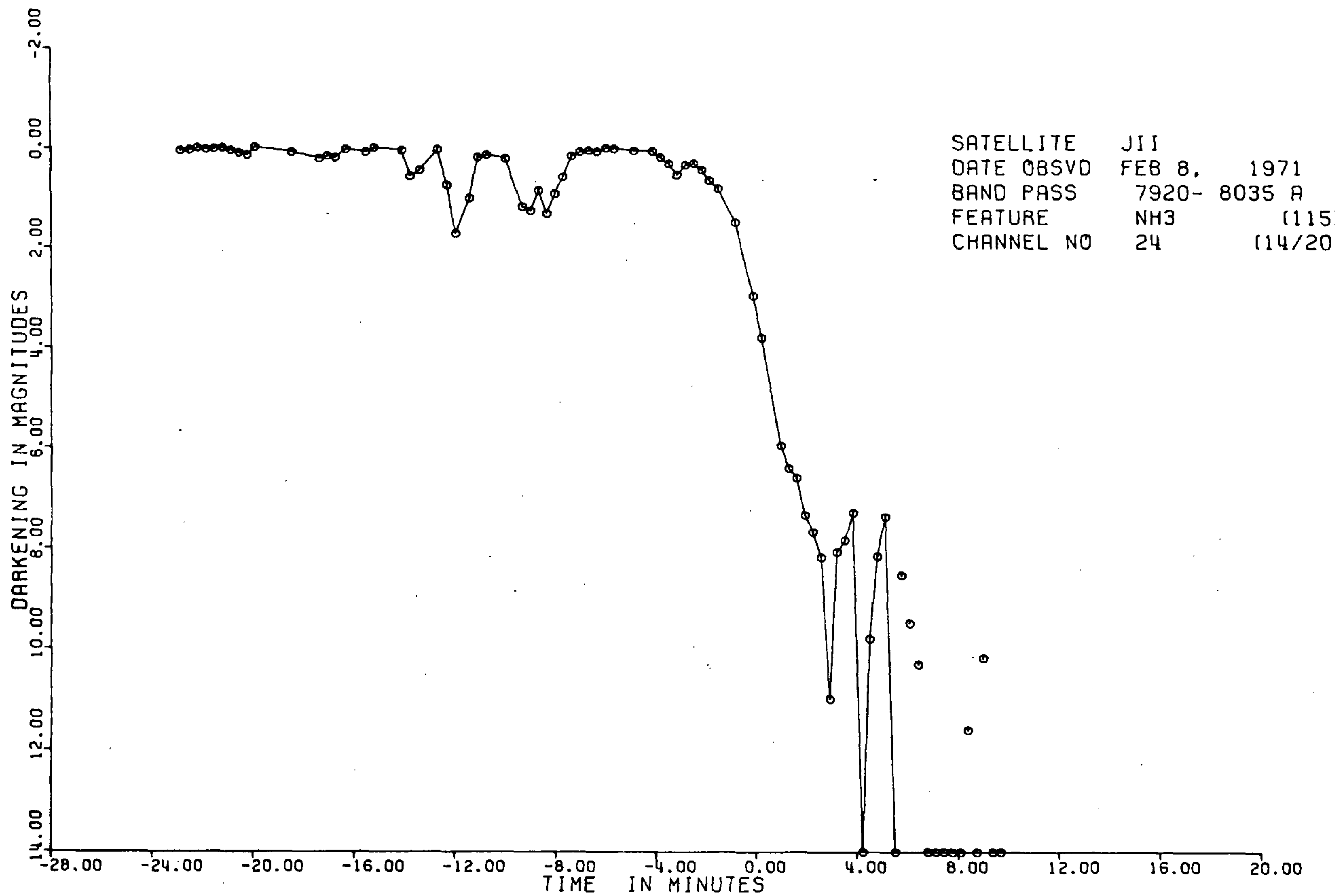

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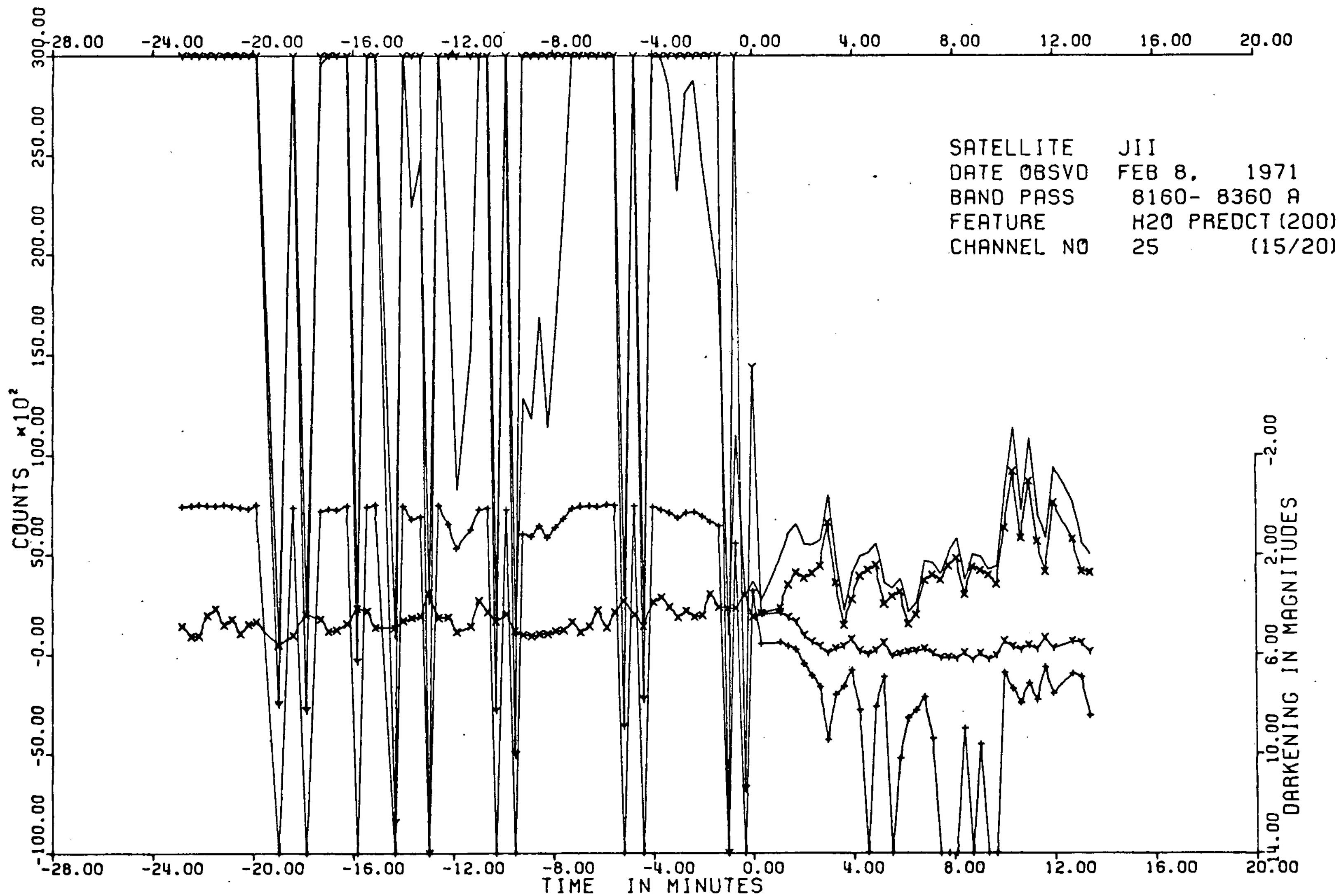

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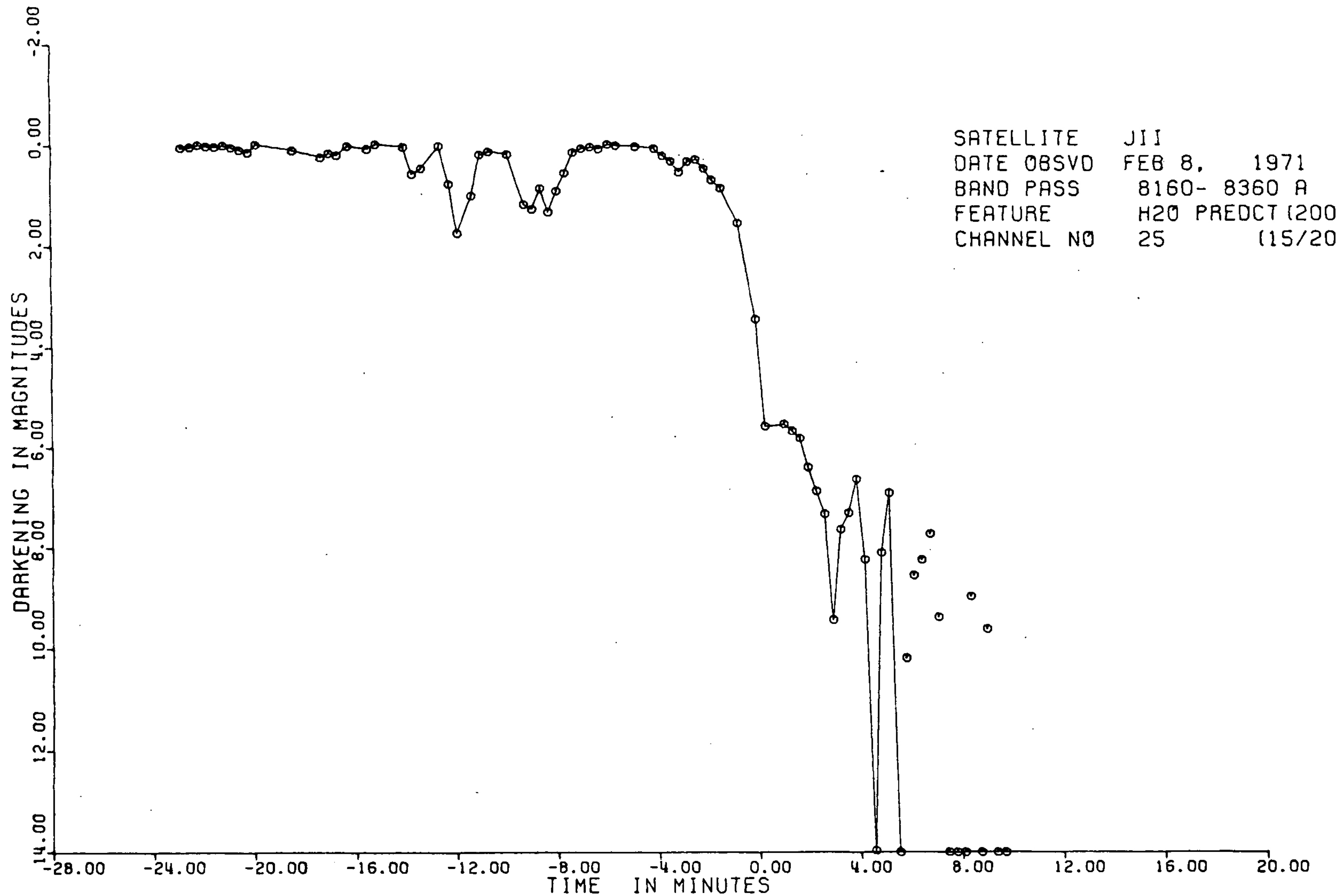

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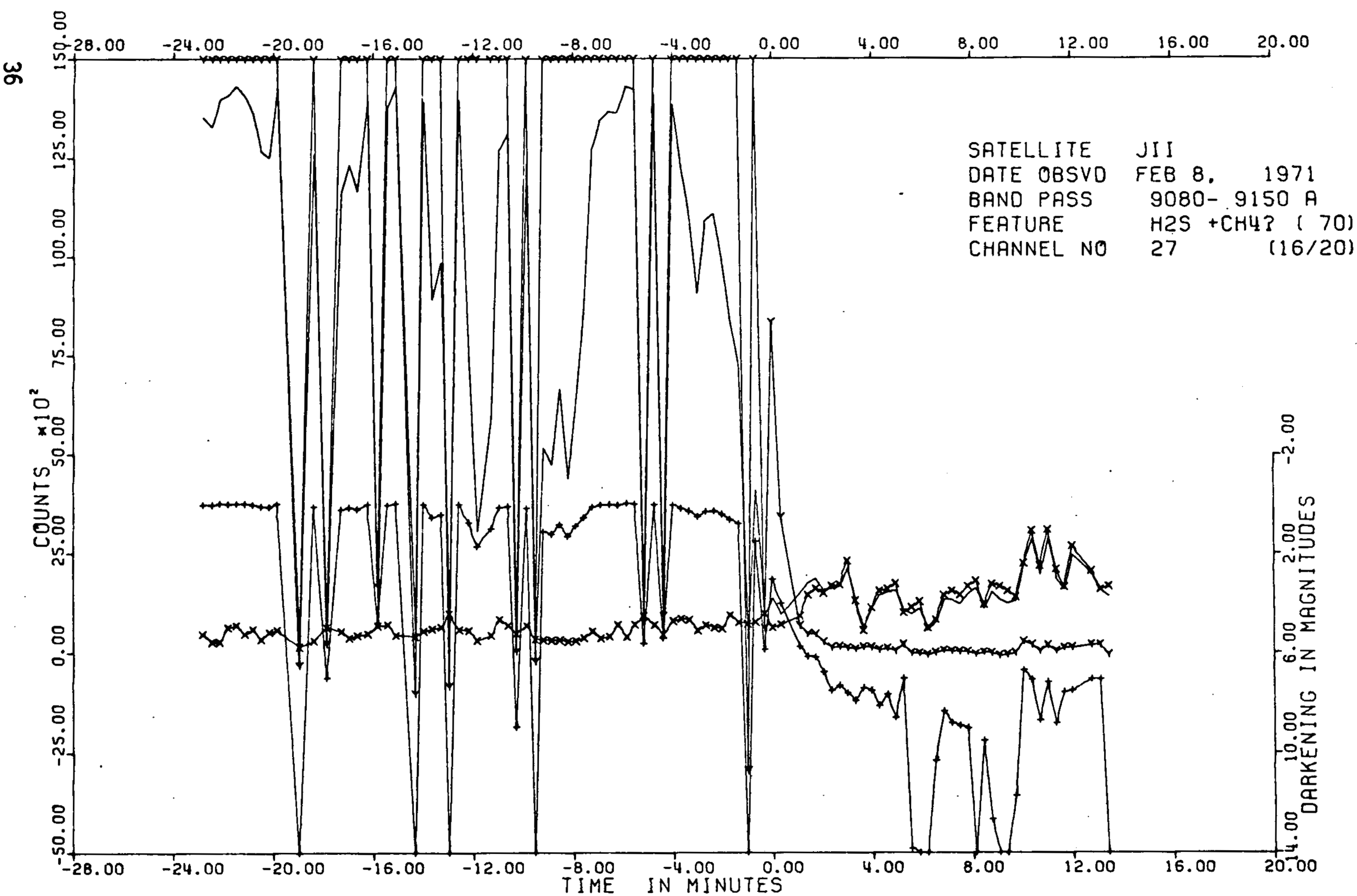

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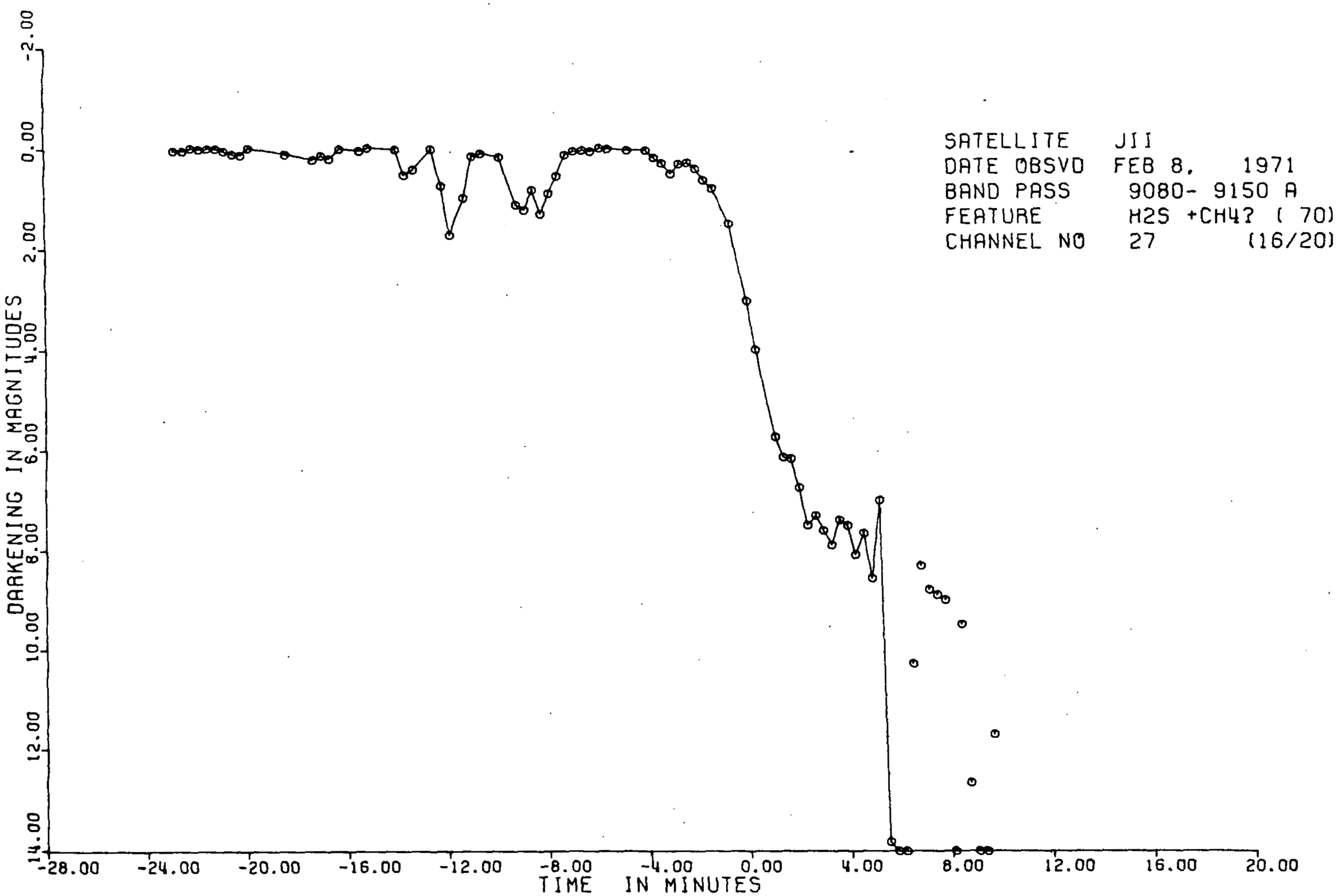

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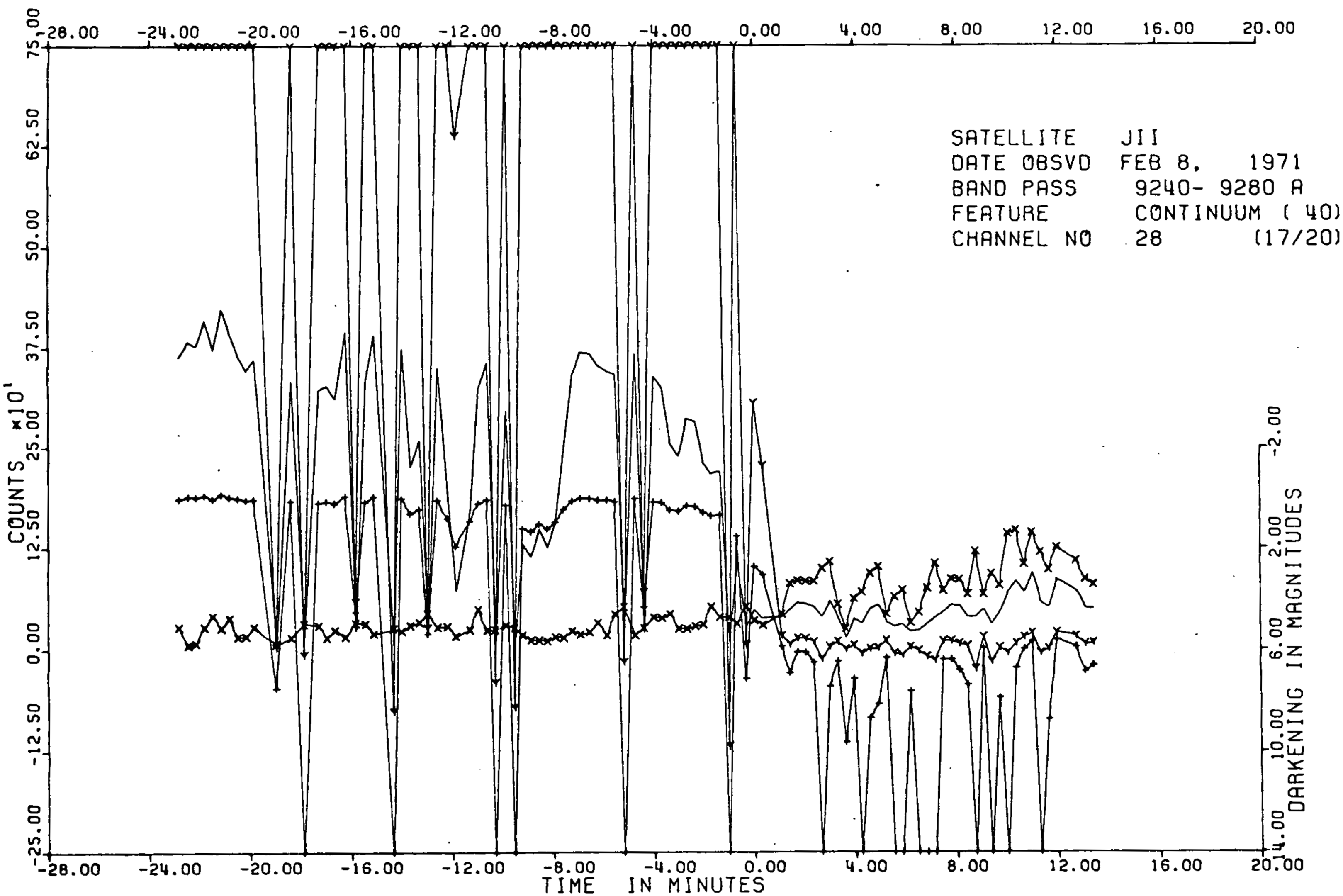

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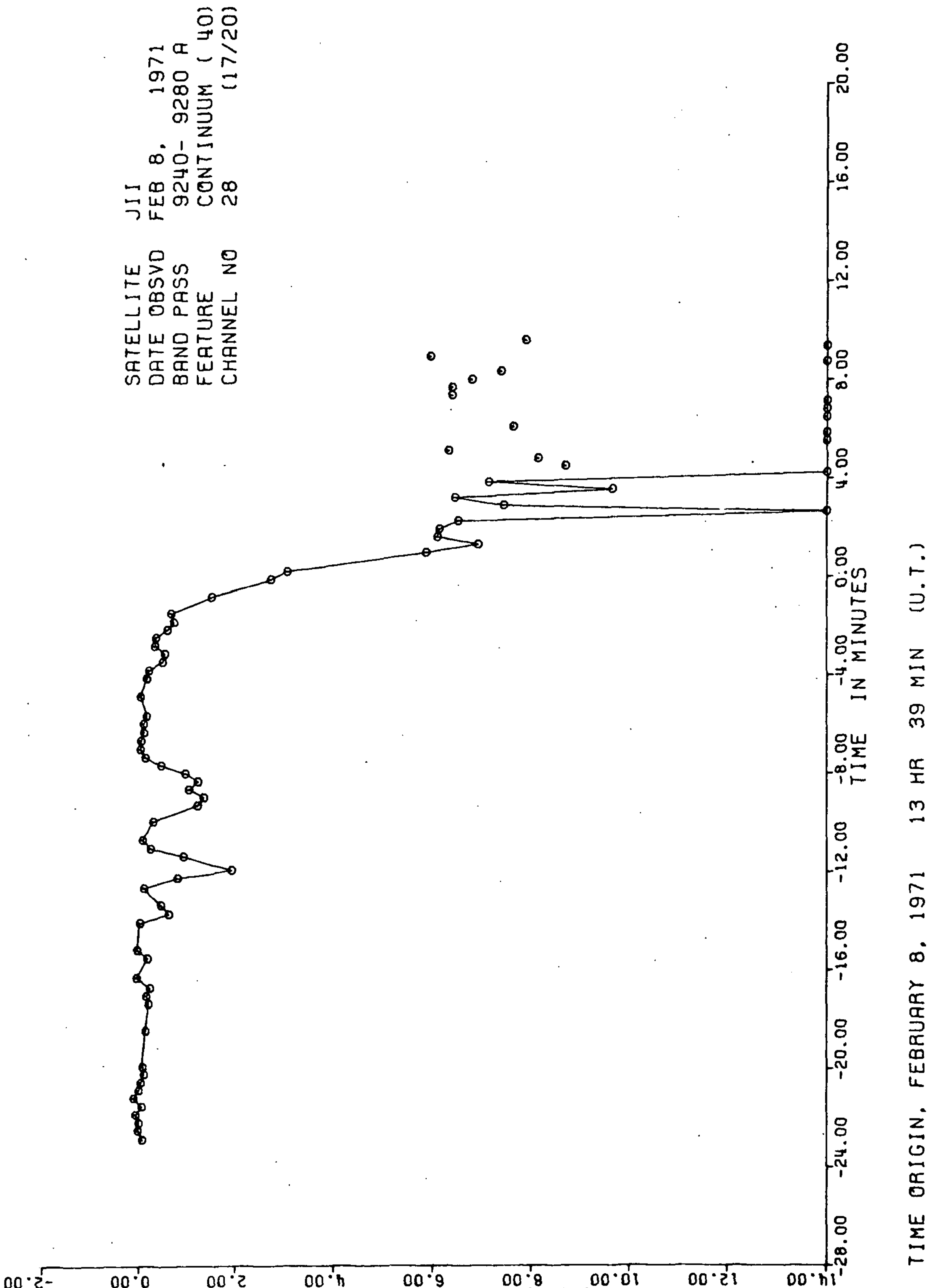
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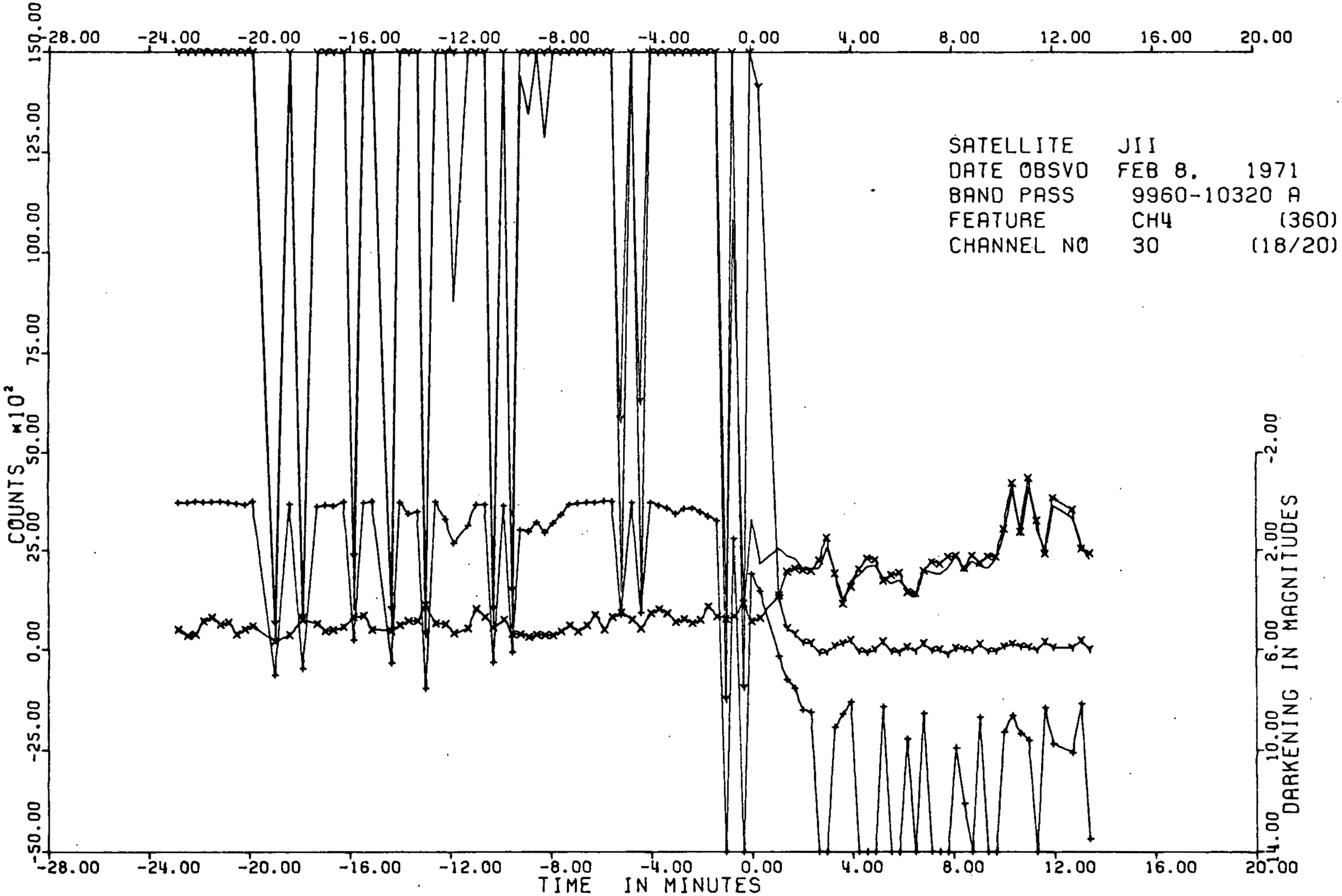

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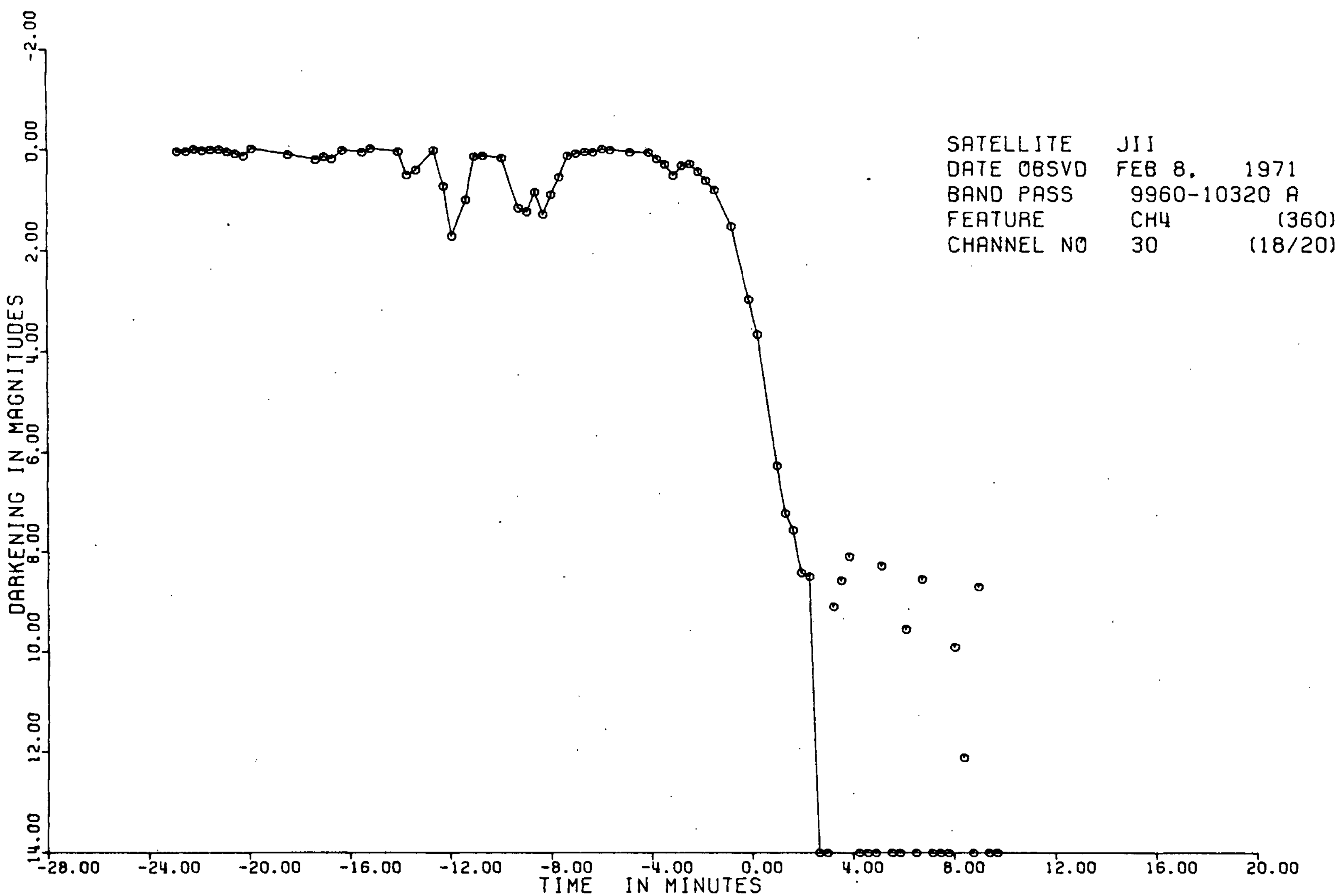

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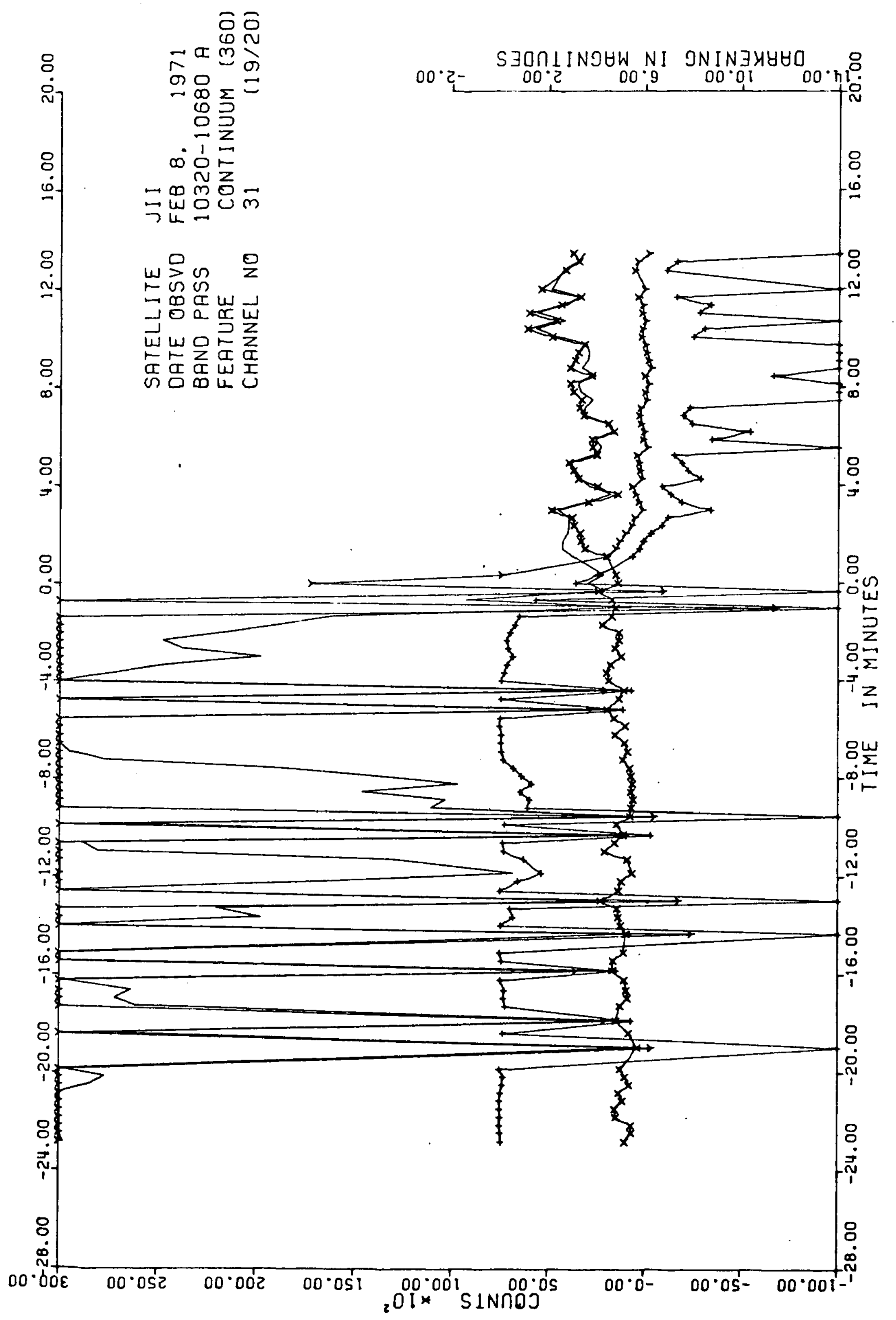

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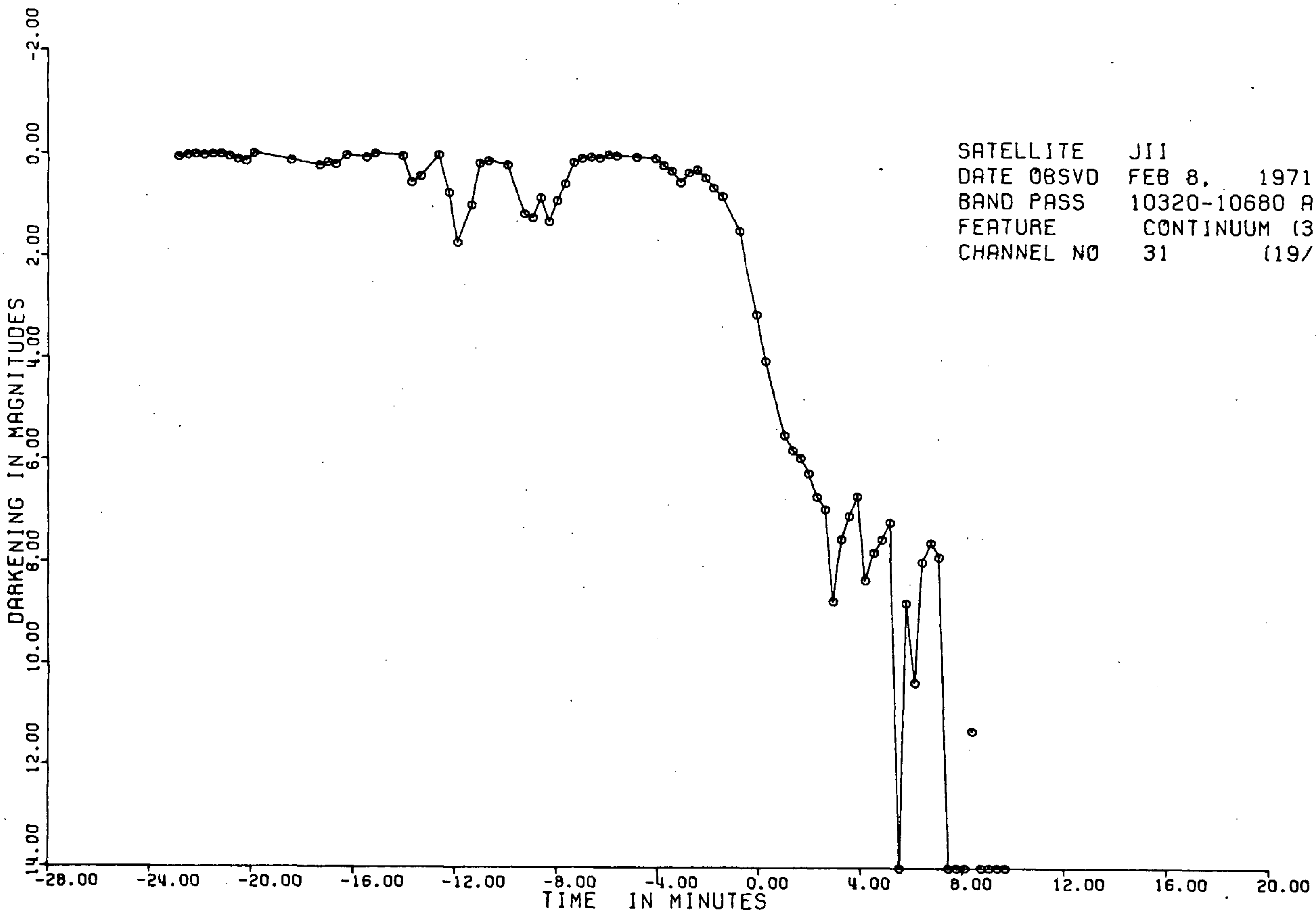

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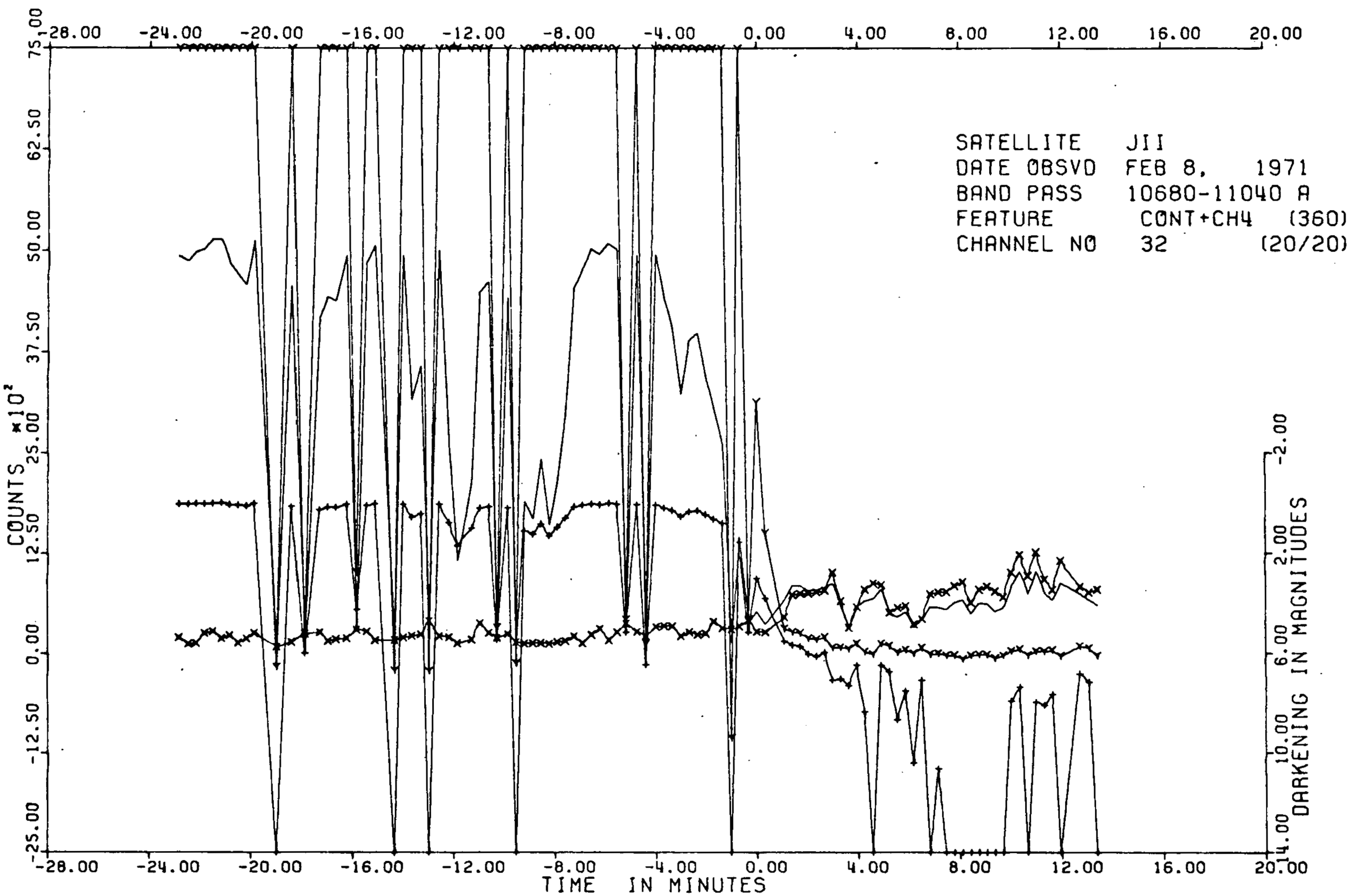

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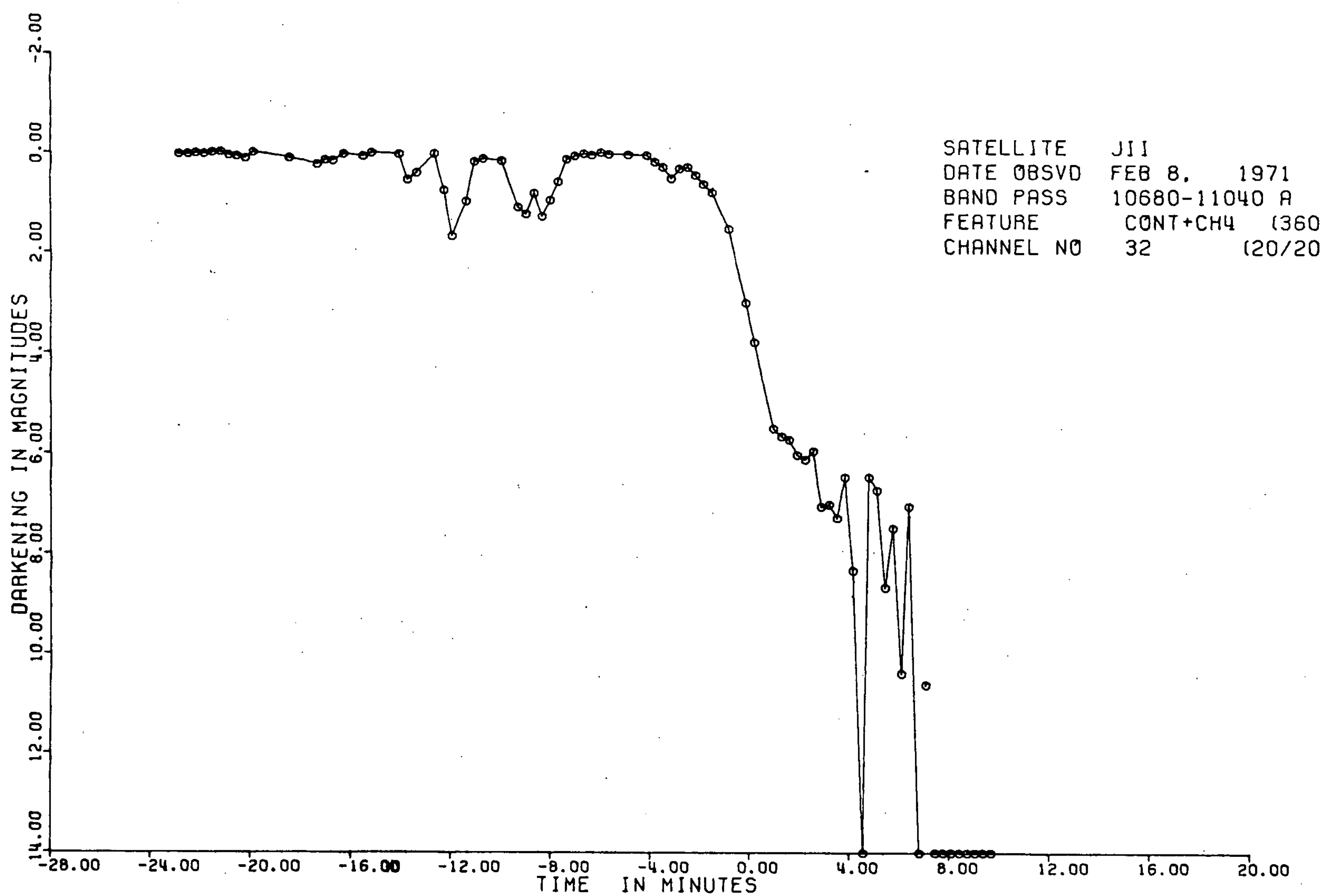

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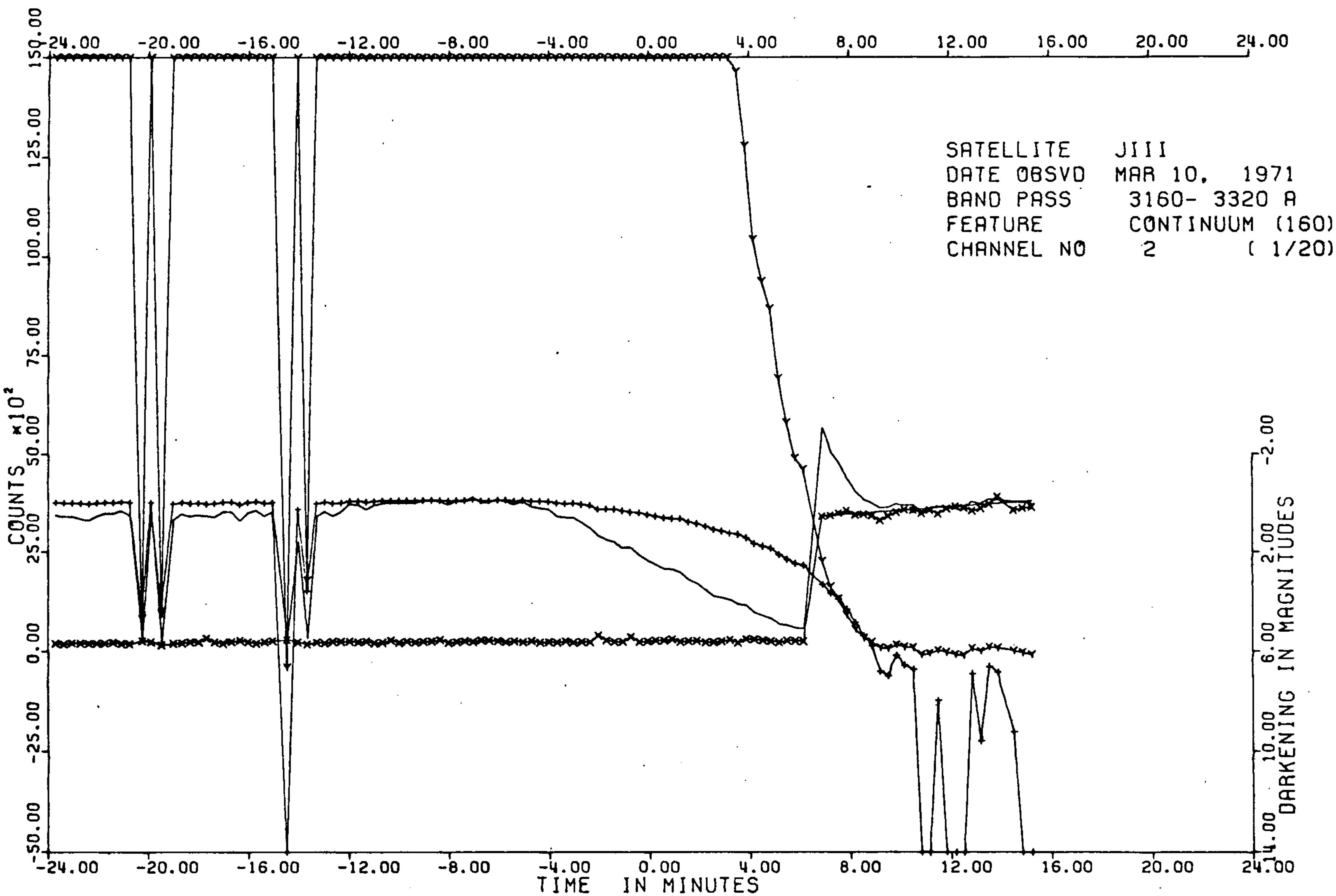

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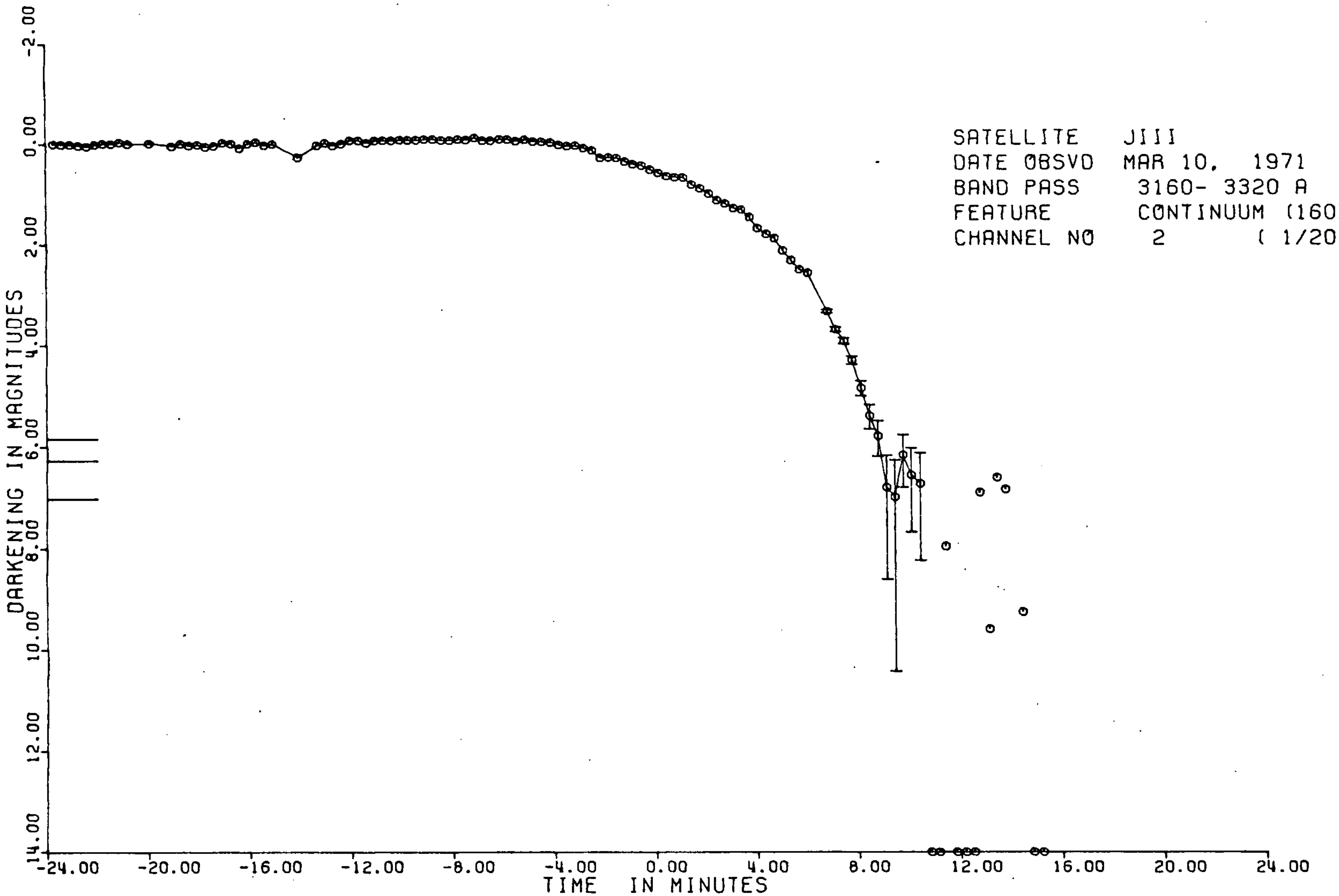

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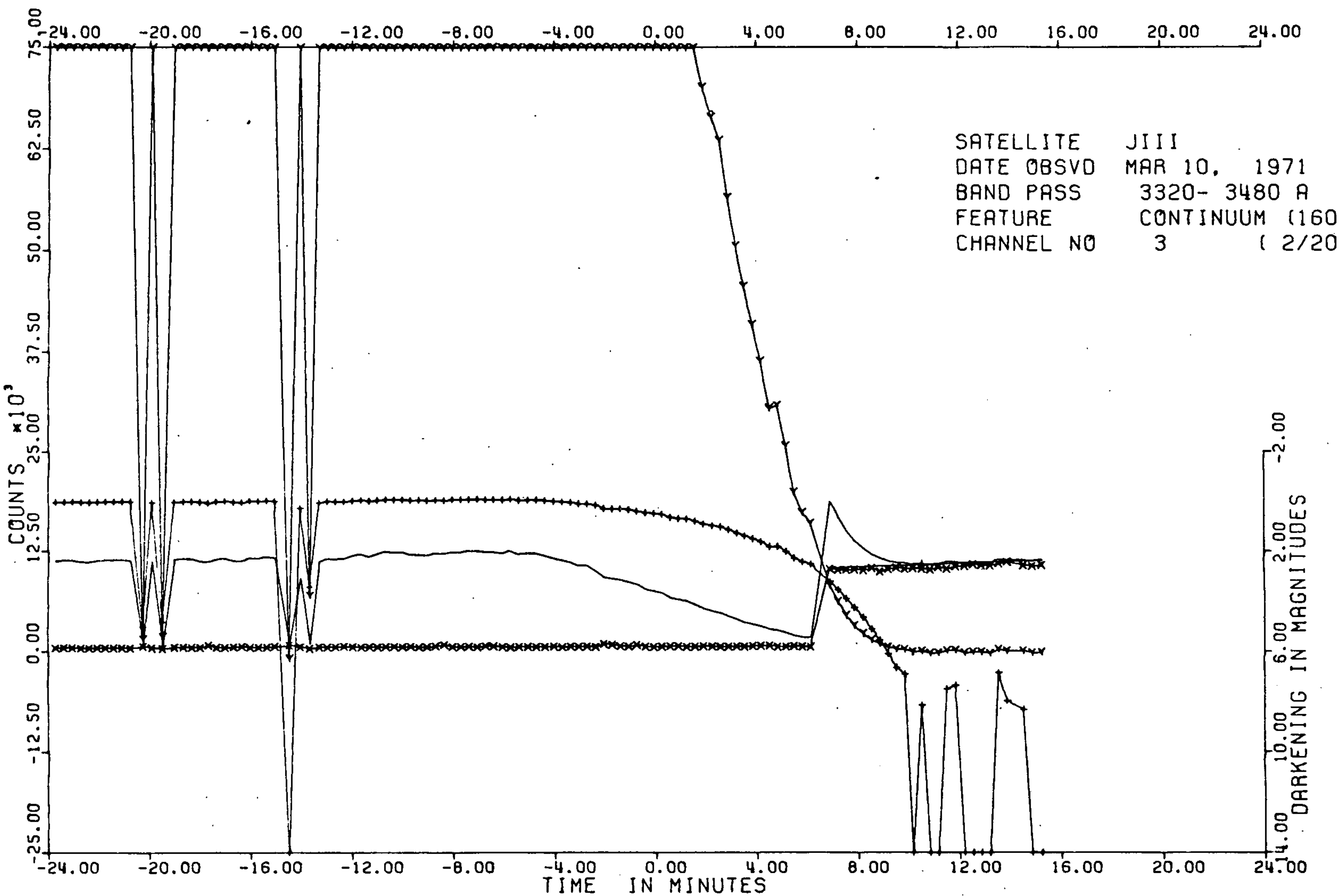

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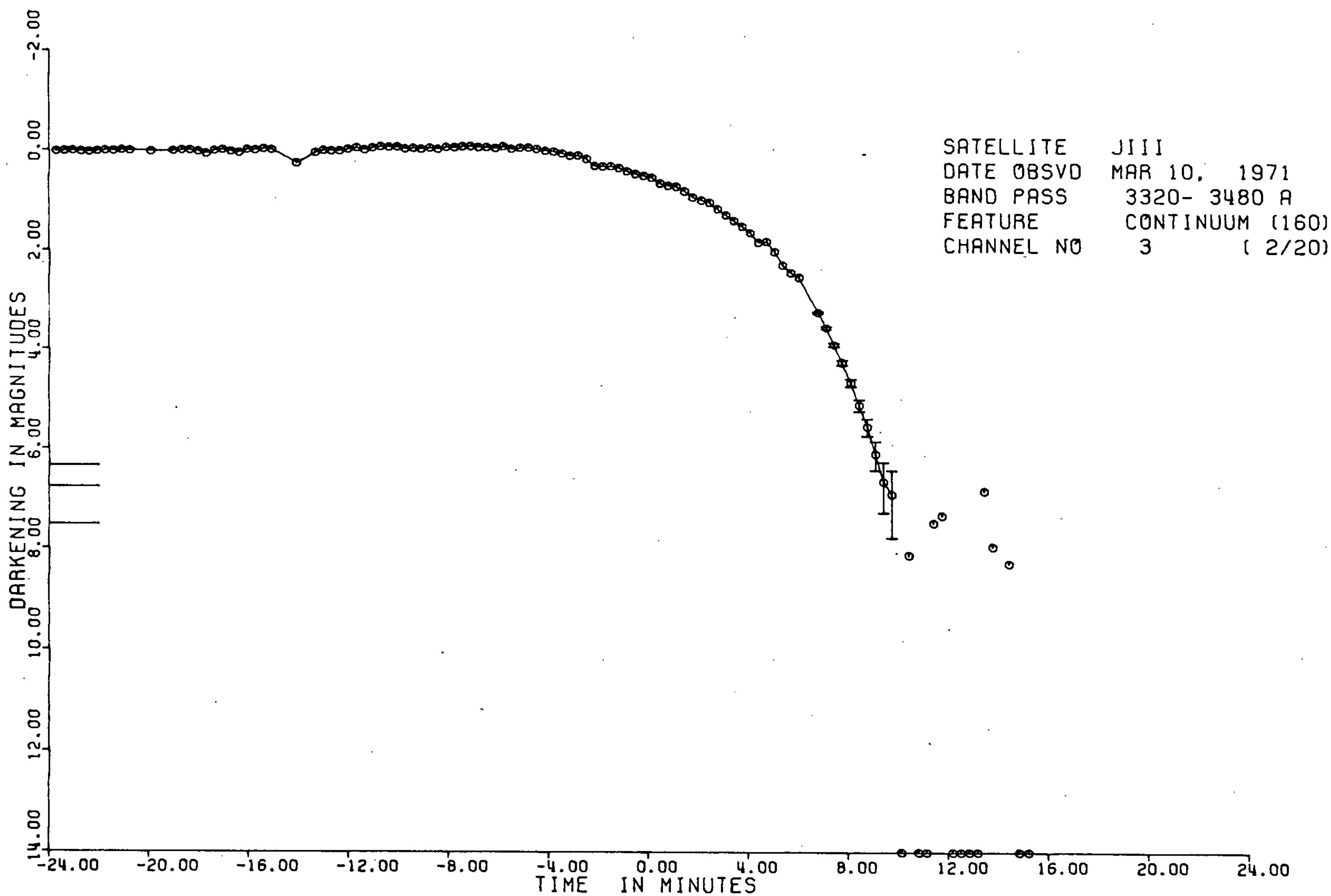

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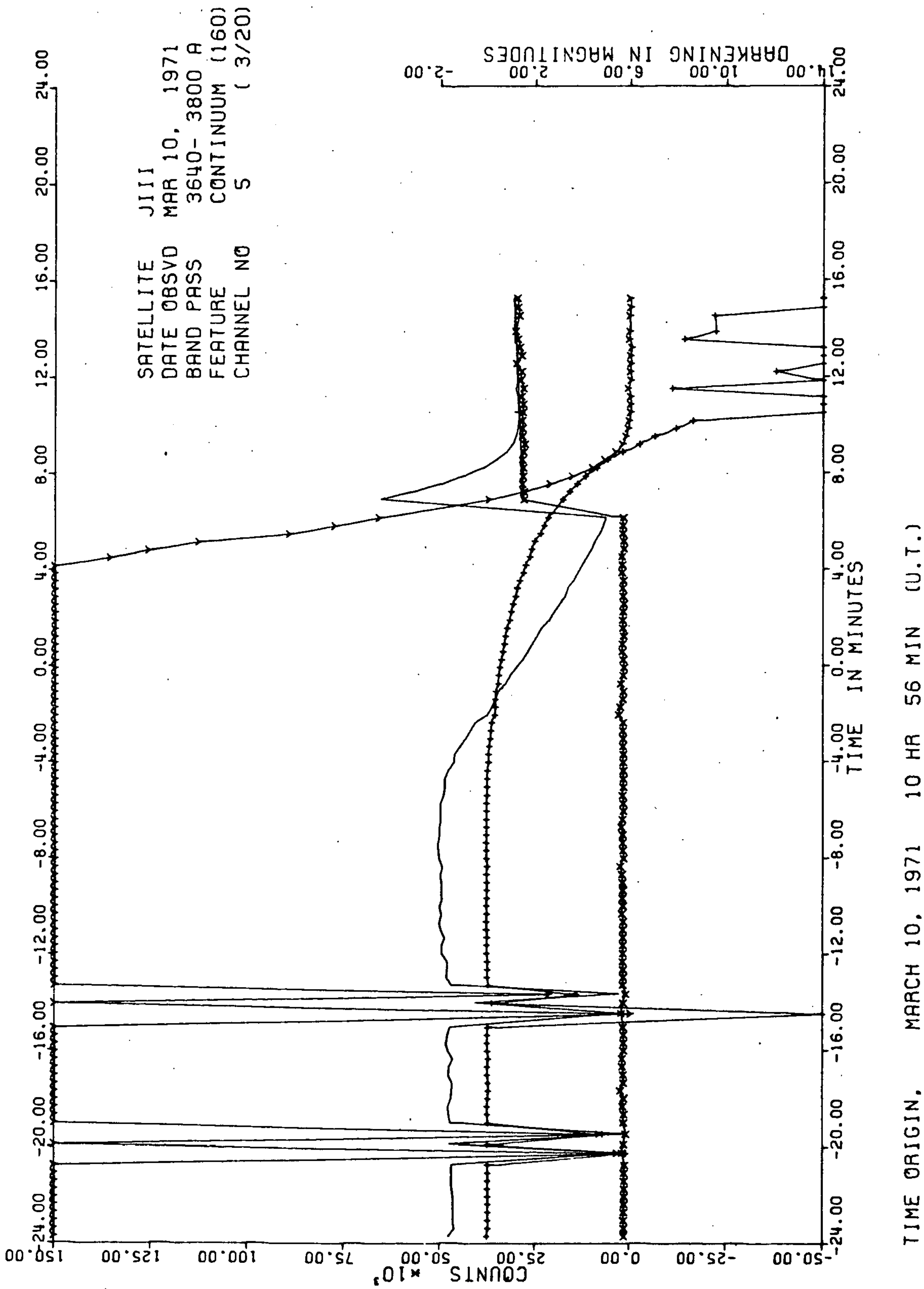
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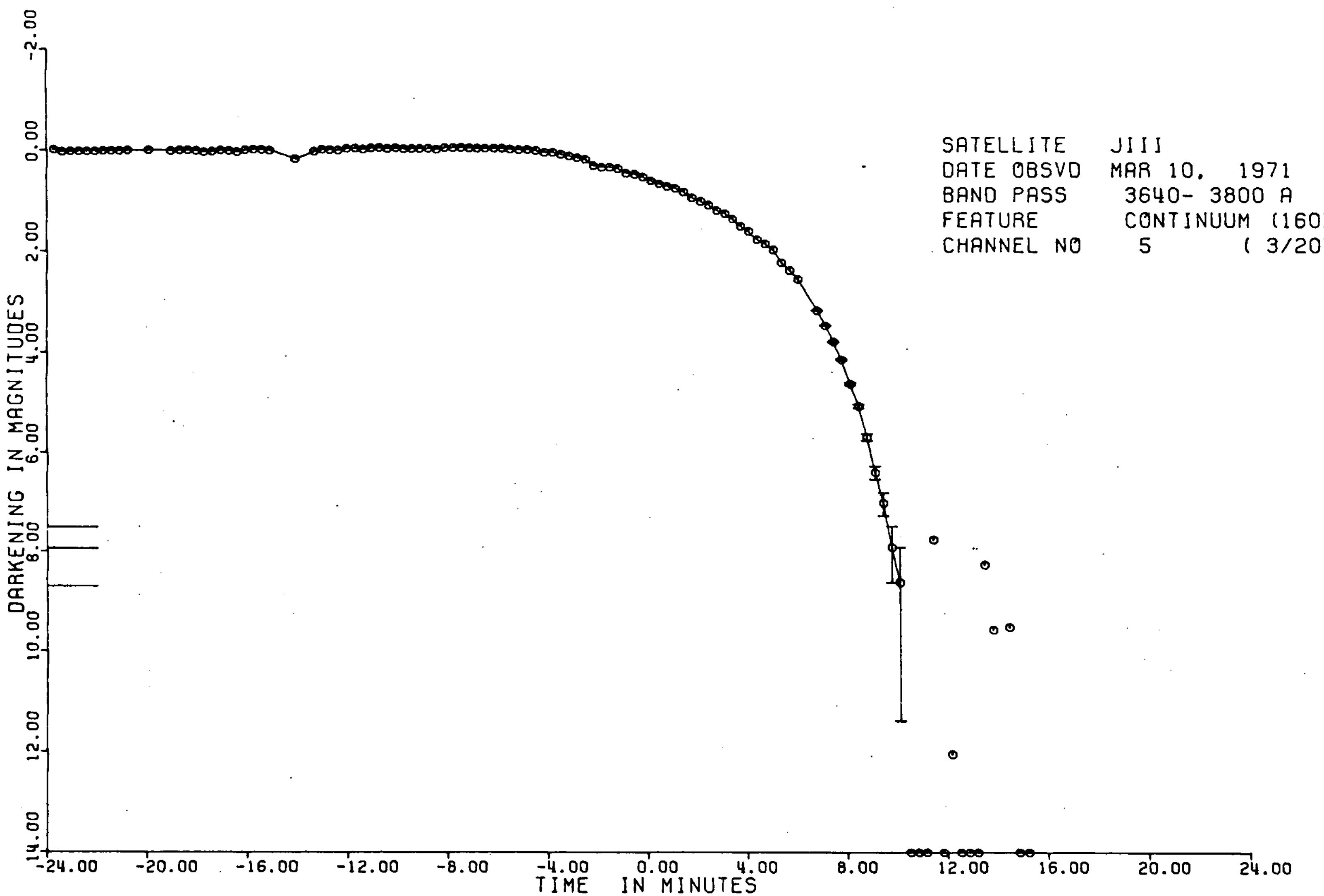

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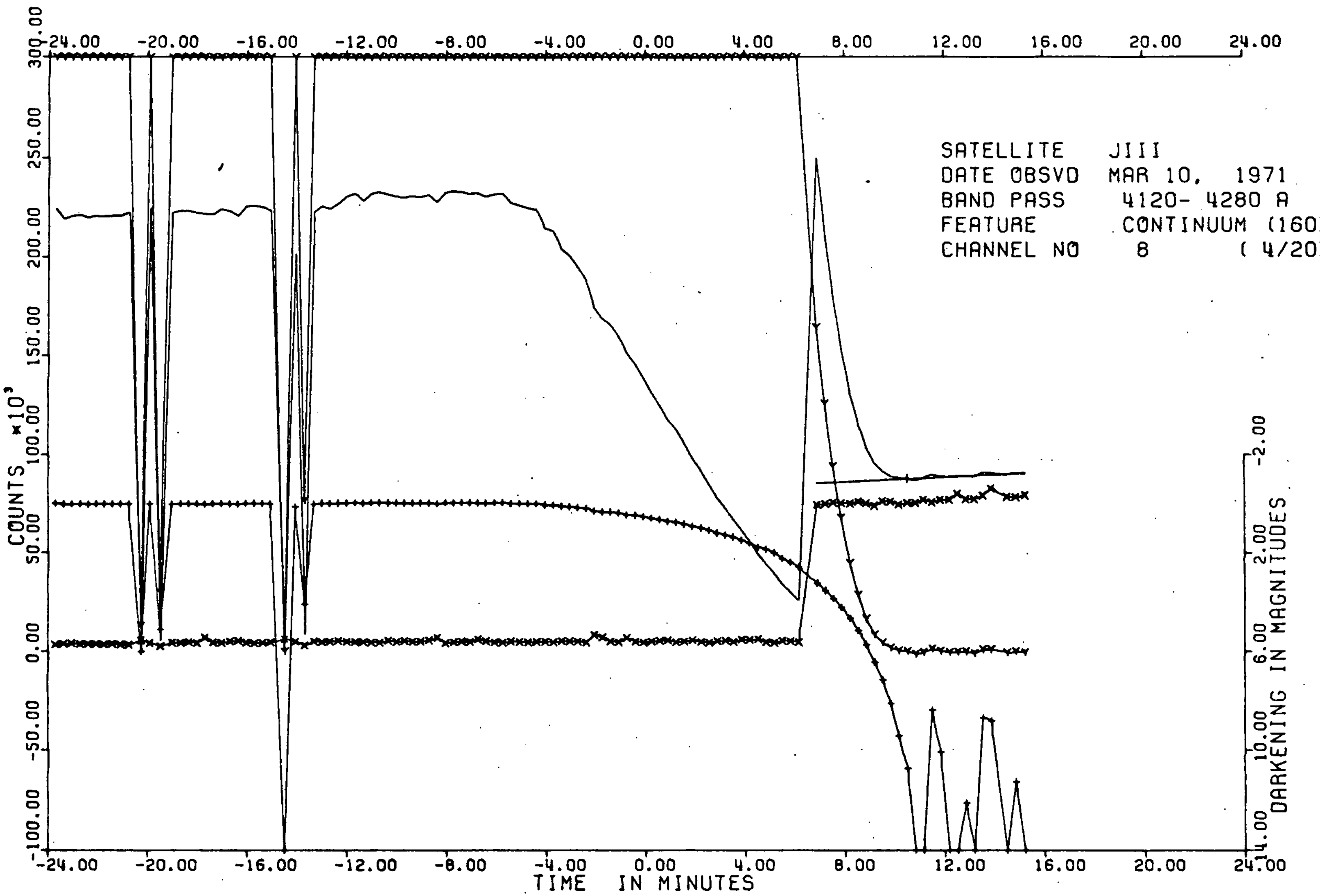

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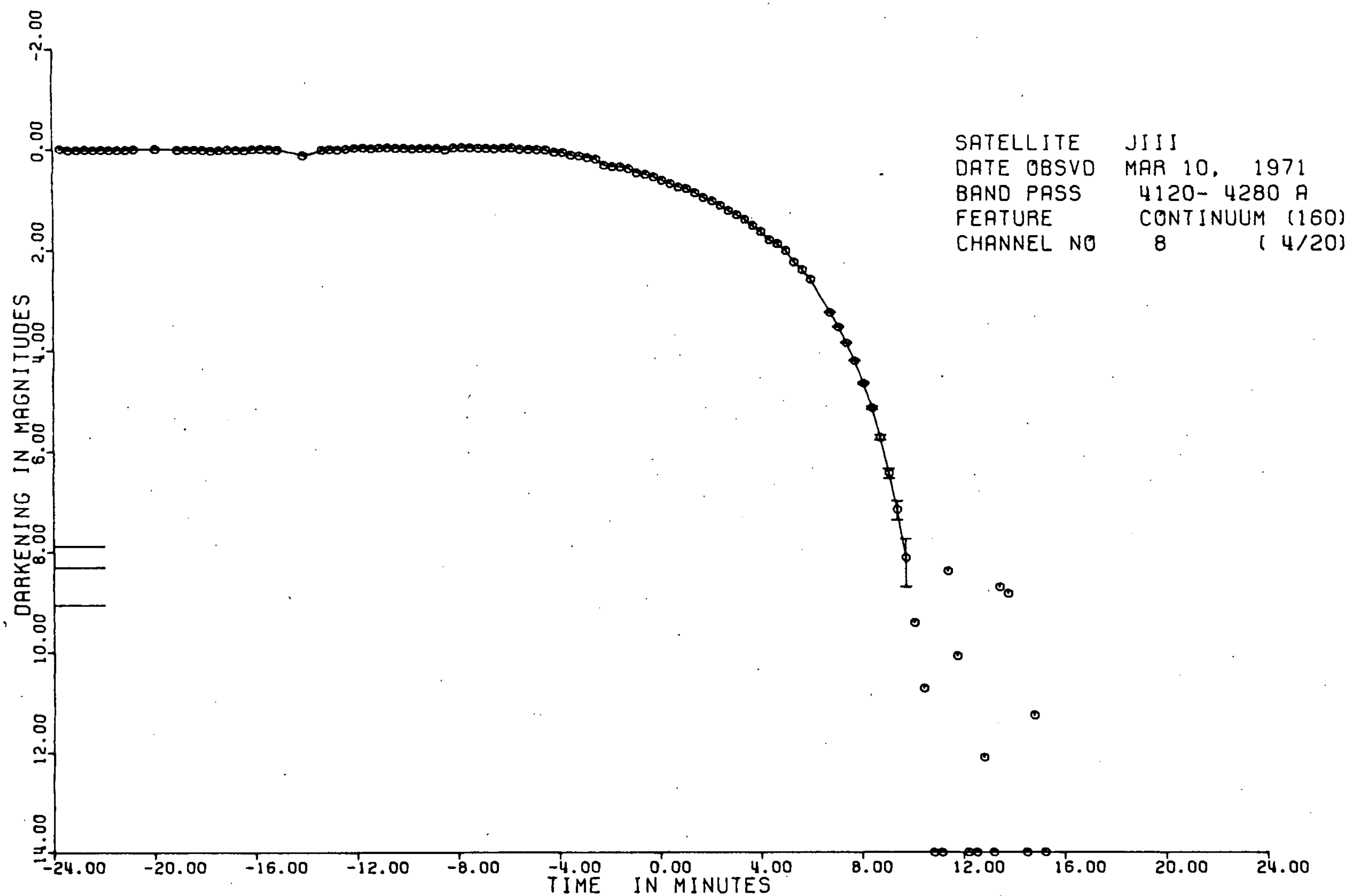

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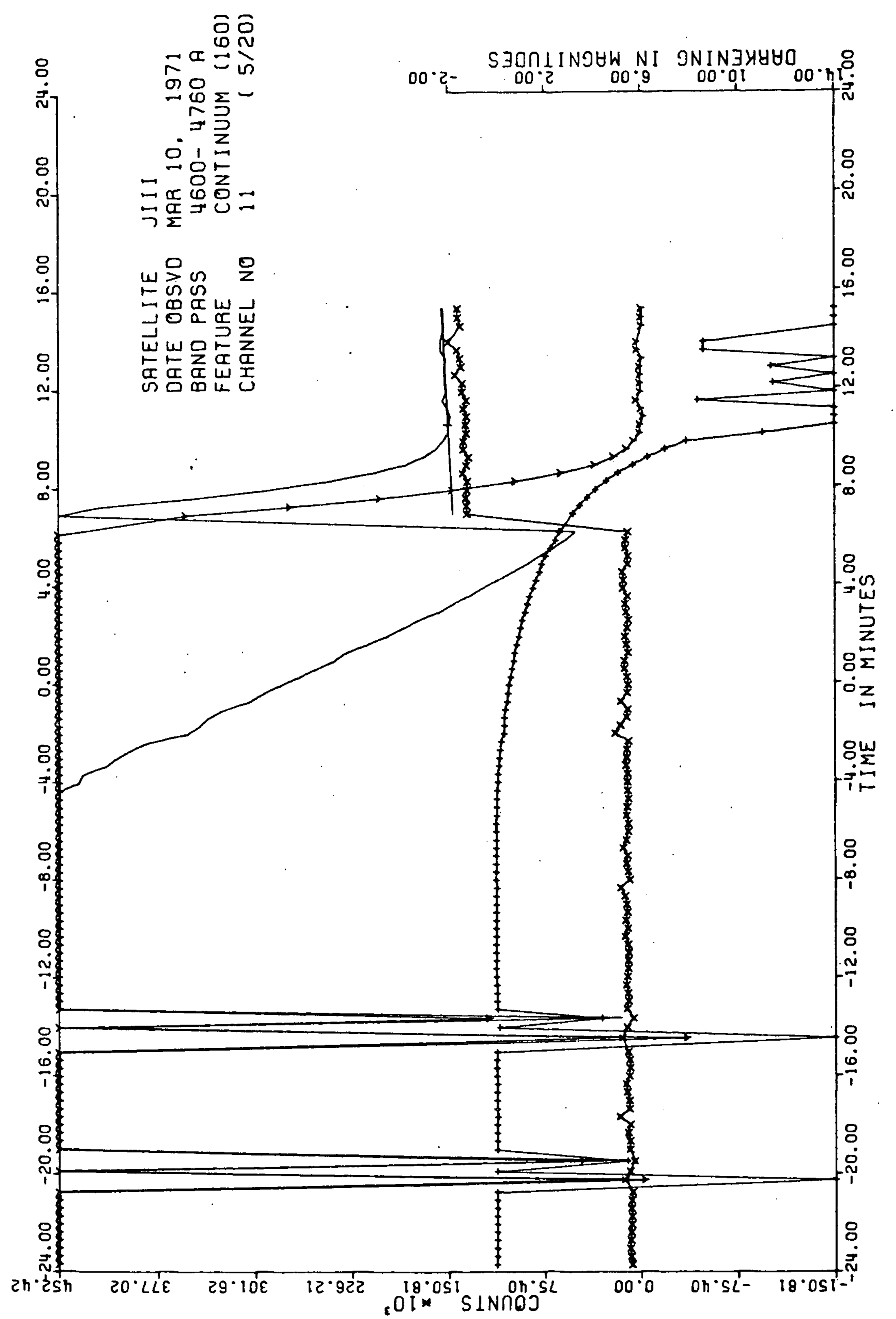

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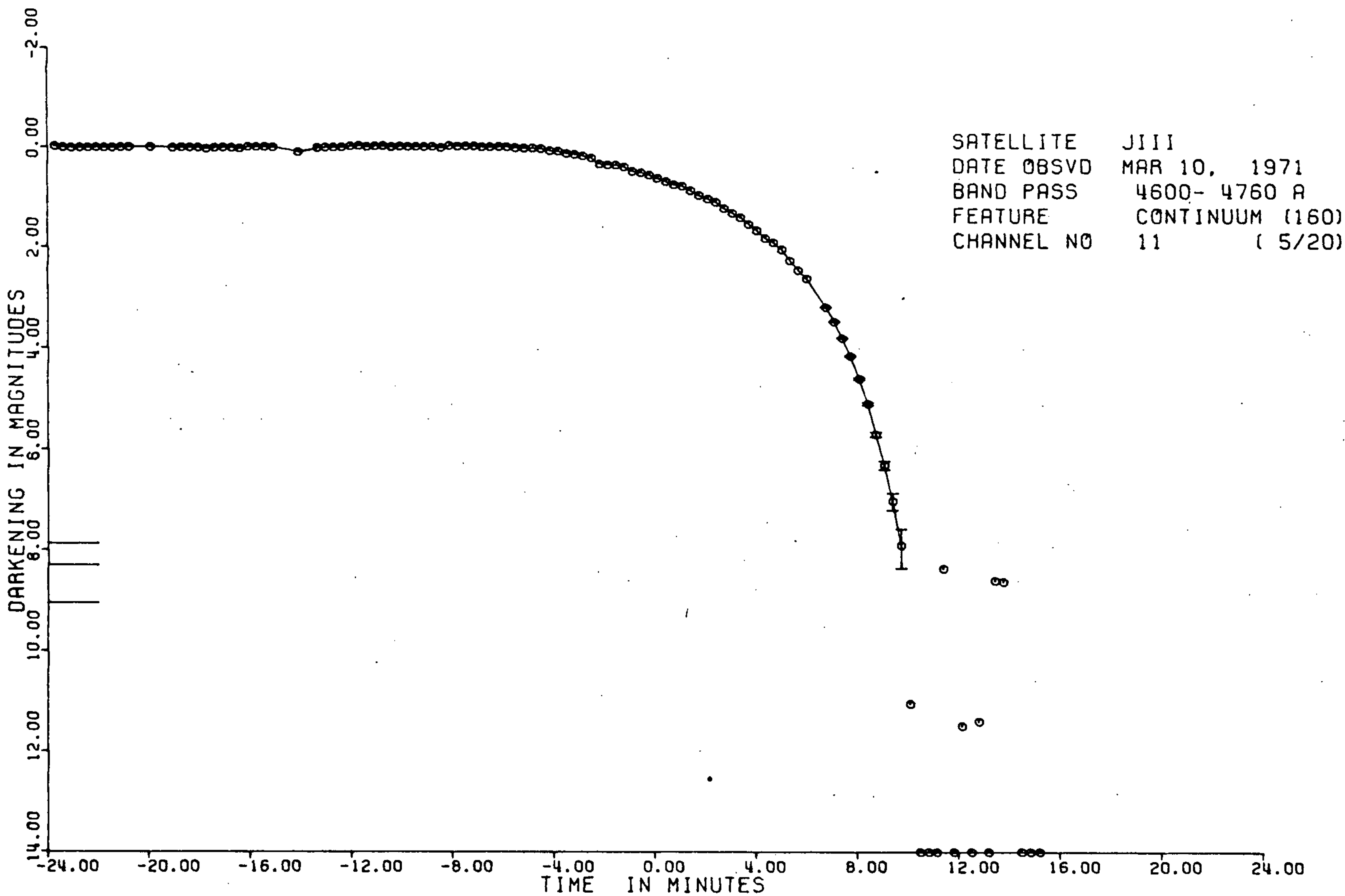

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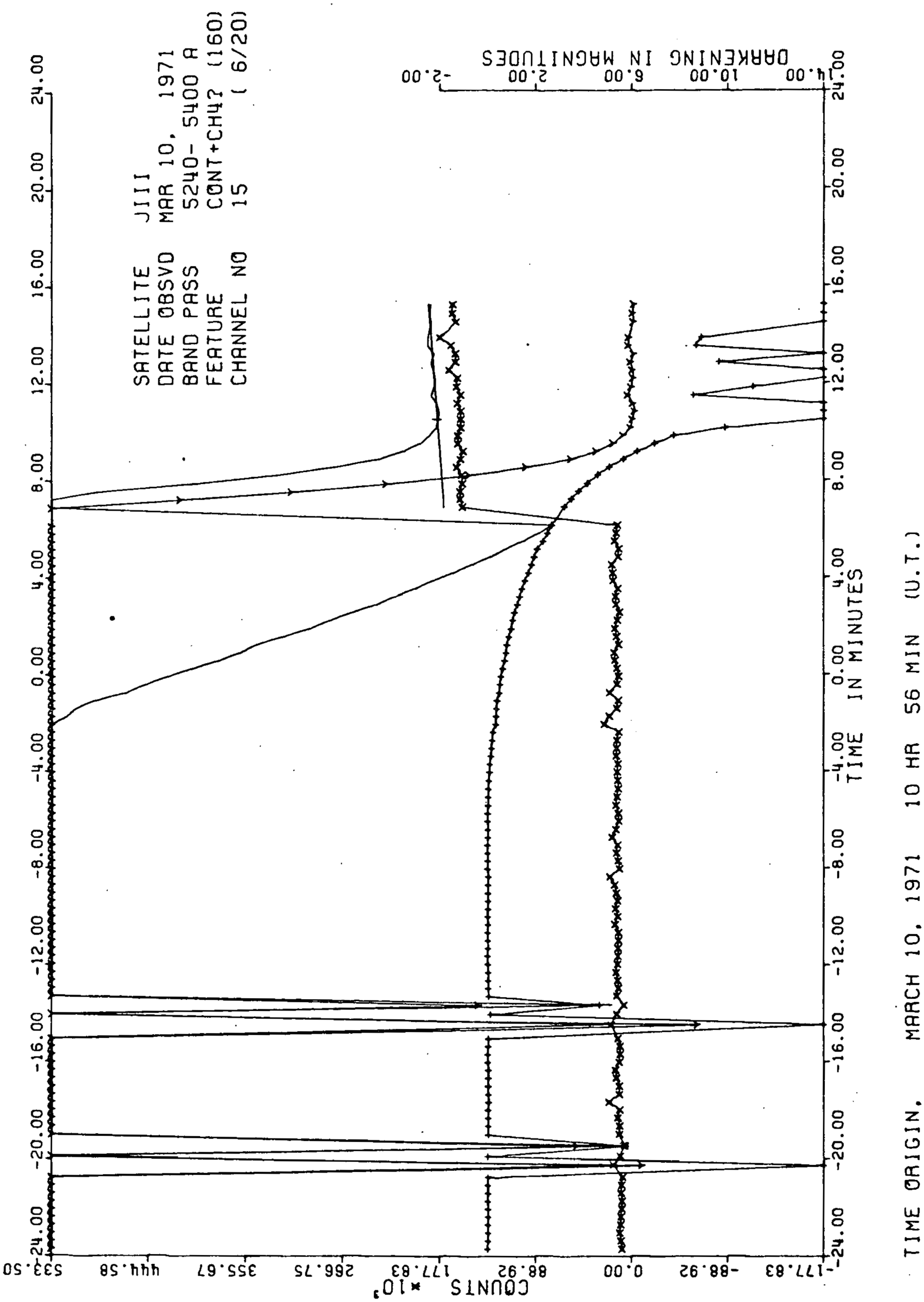
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355.67
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88.92
0.00
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-24.00
-20.00
-16.00
-12.00
-8.00
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TIME IN MINUTES
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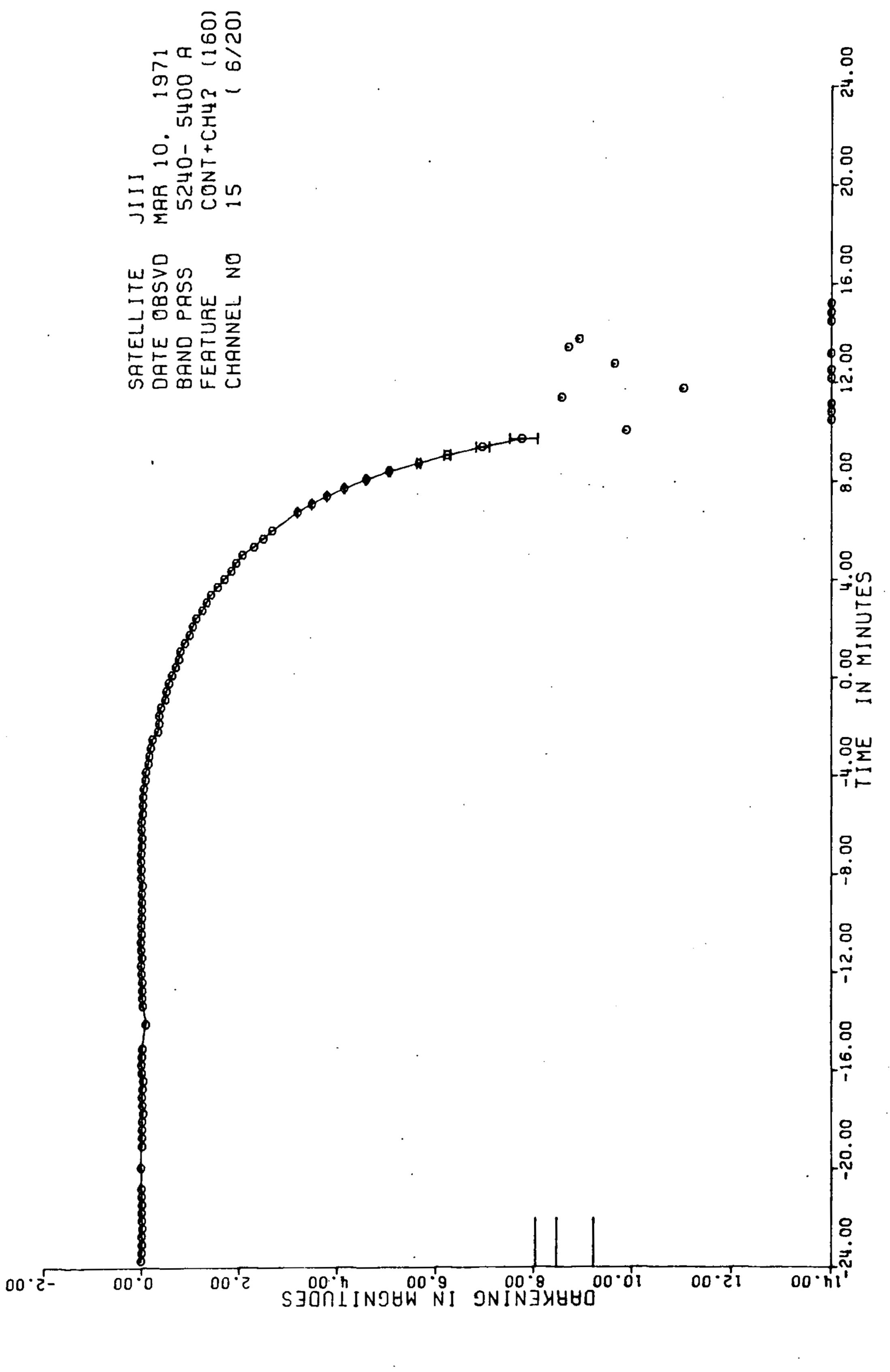

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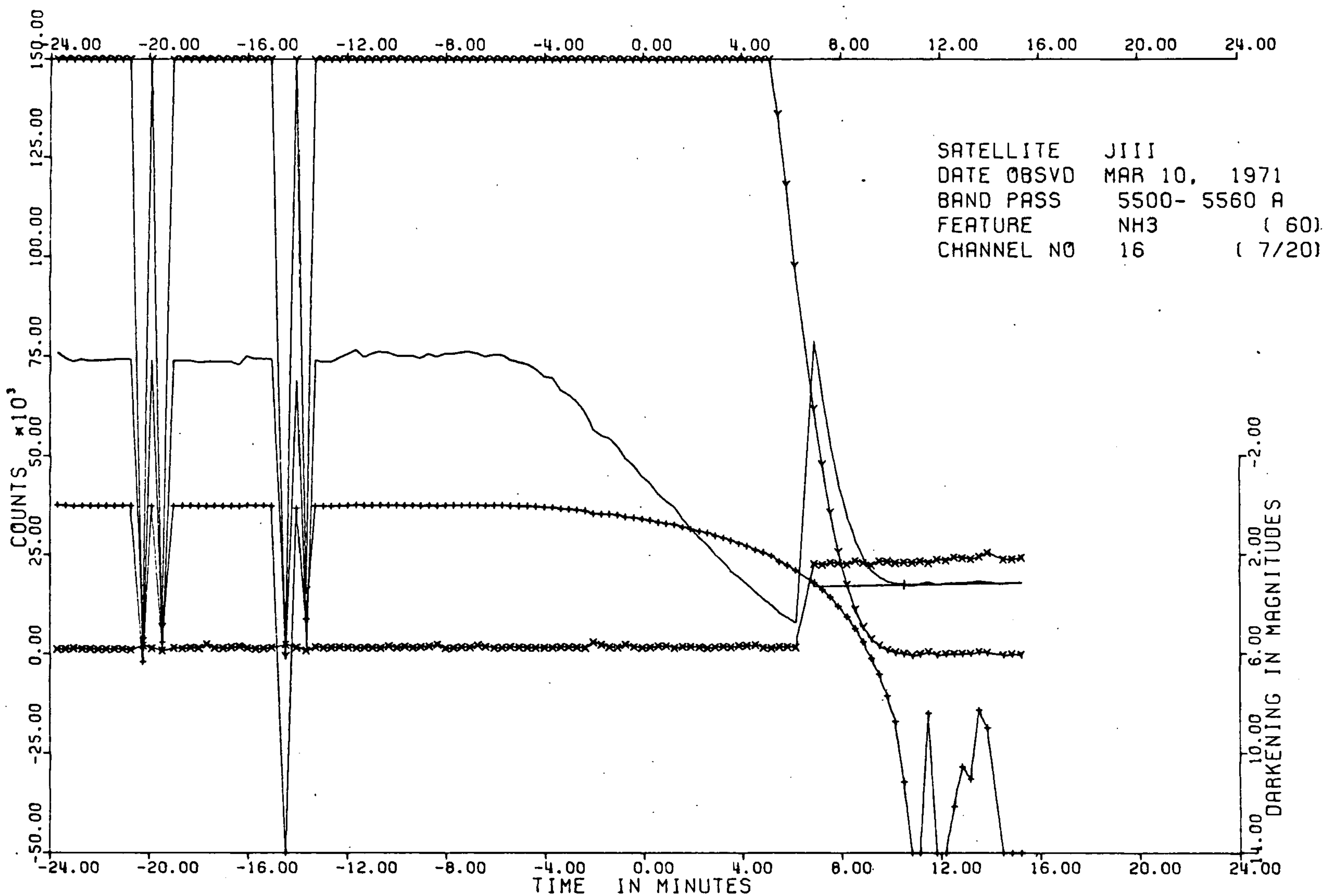

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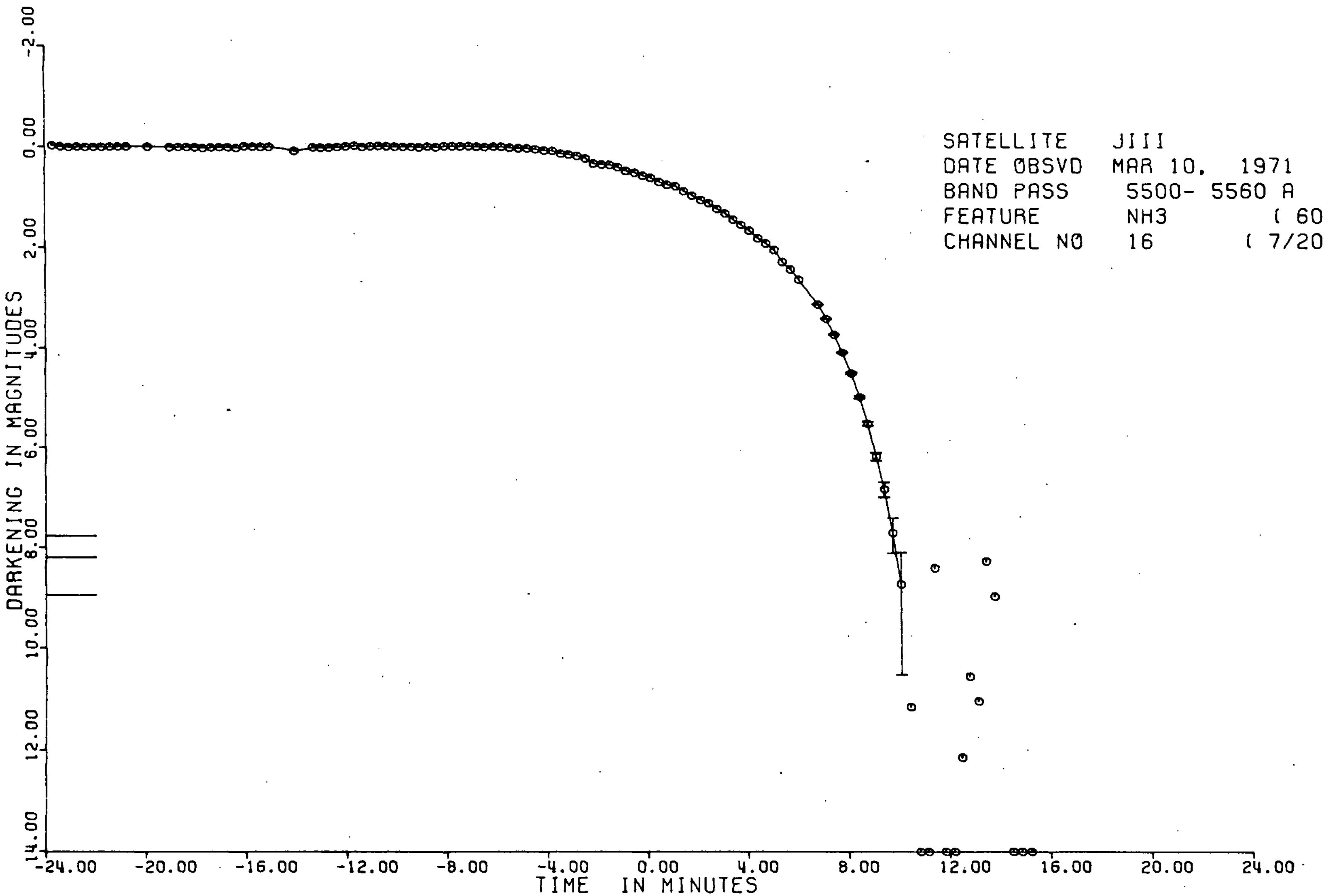

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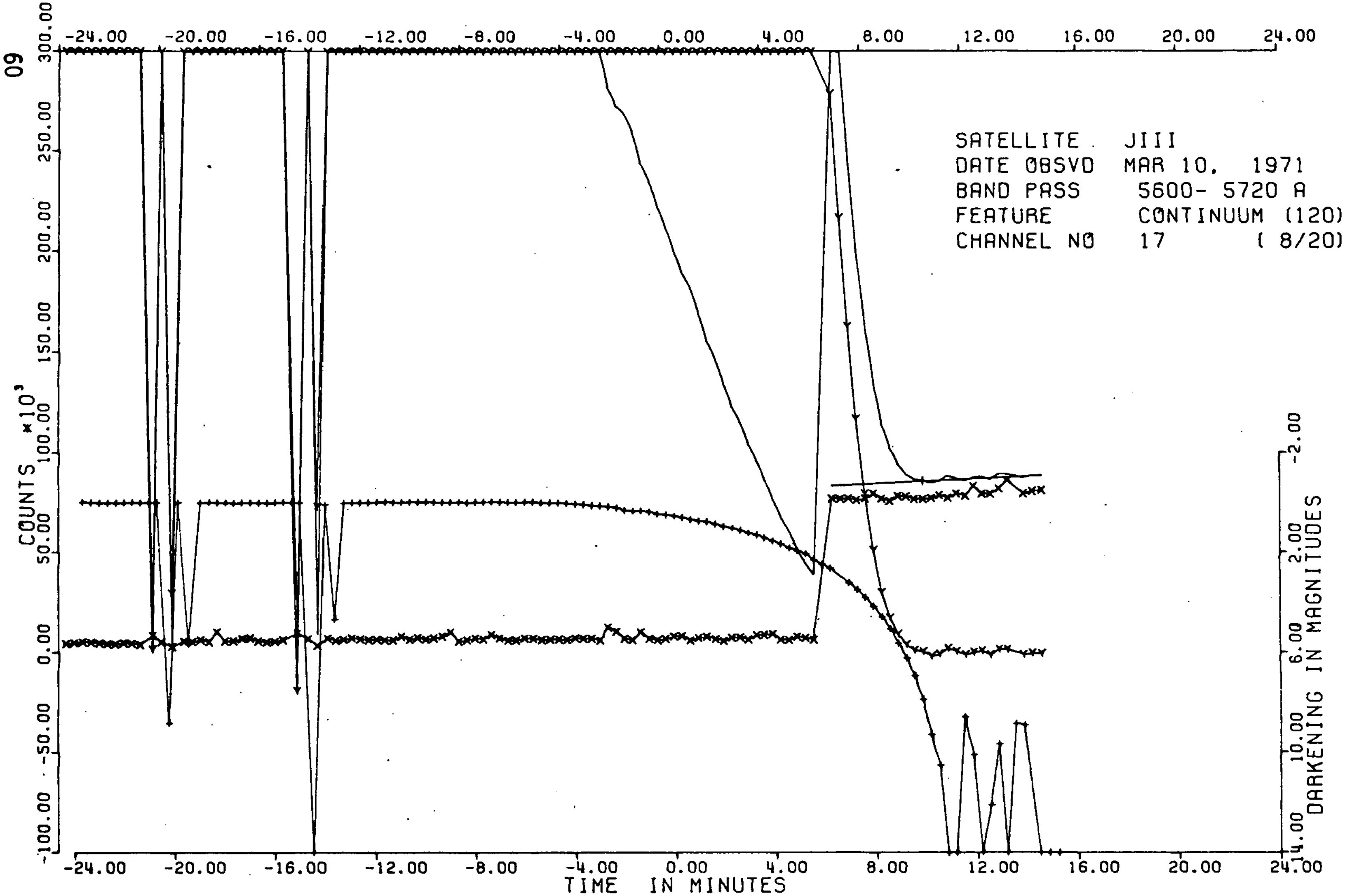

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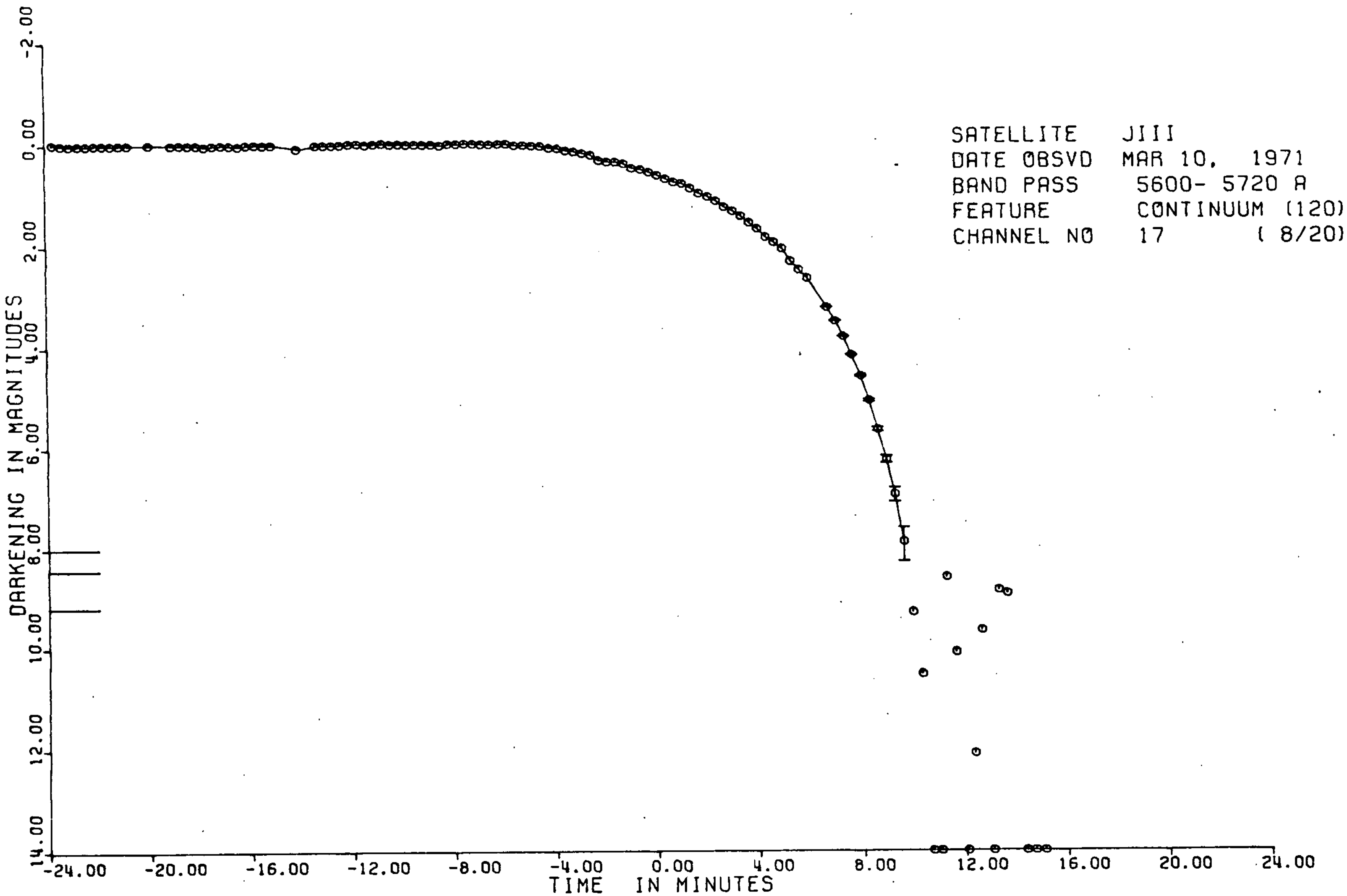

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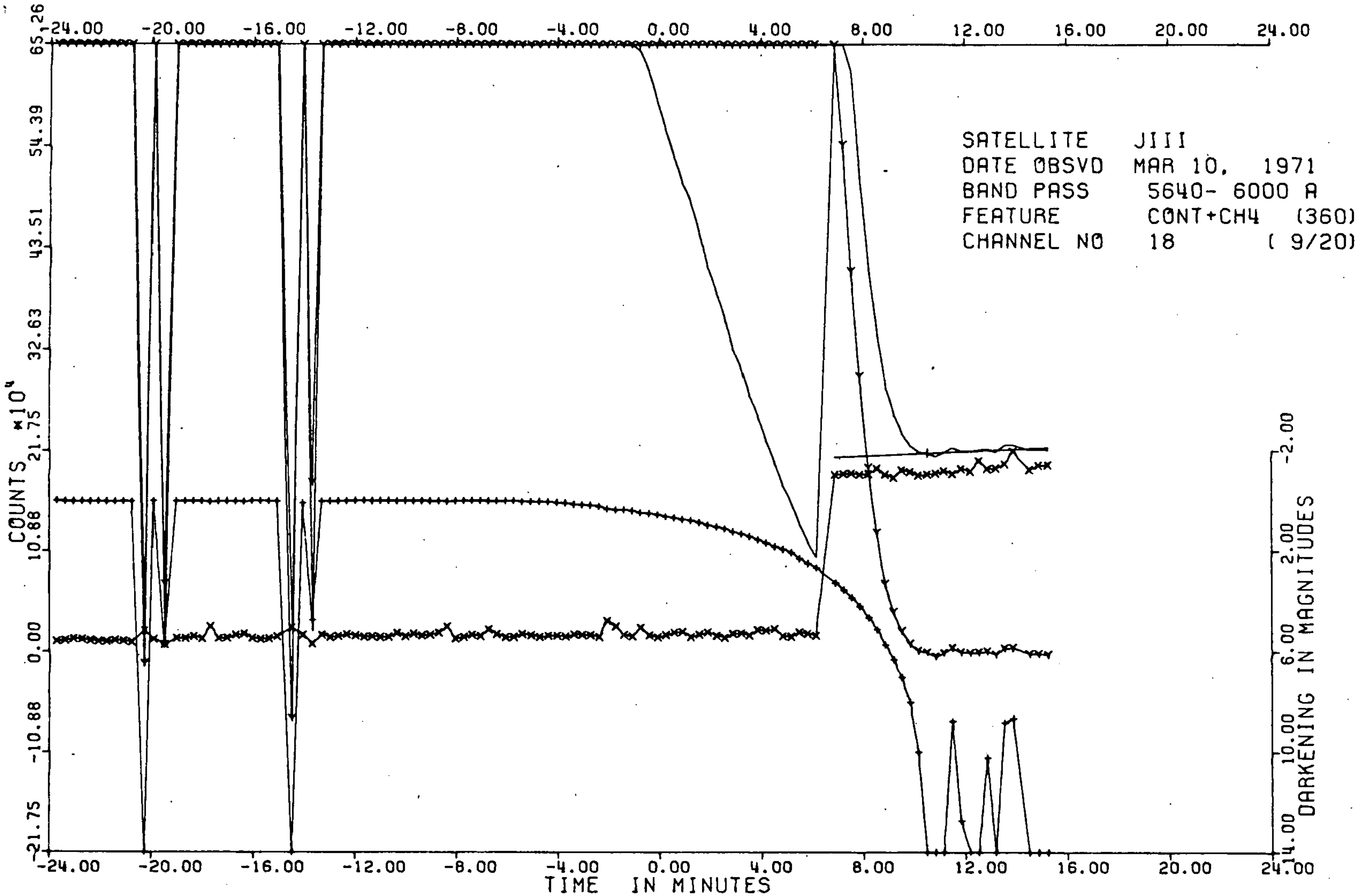

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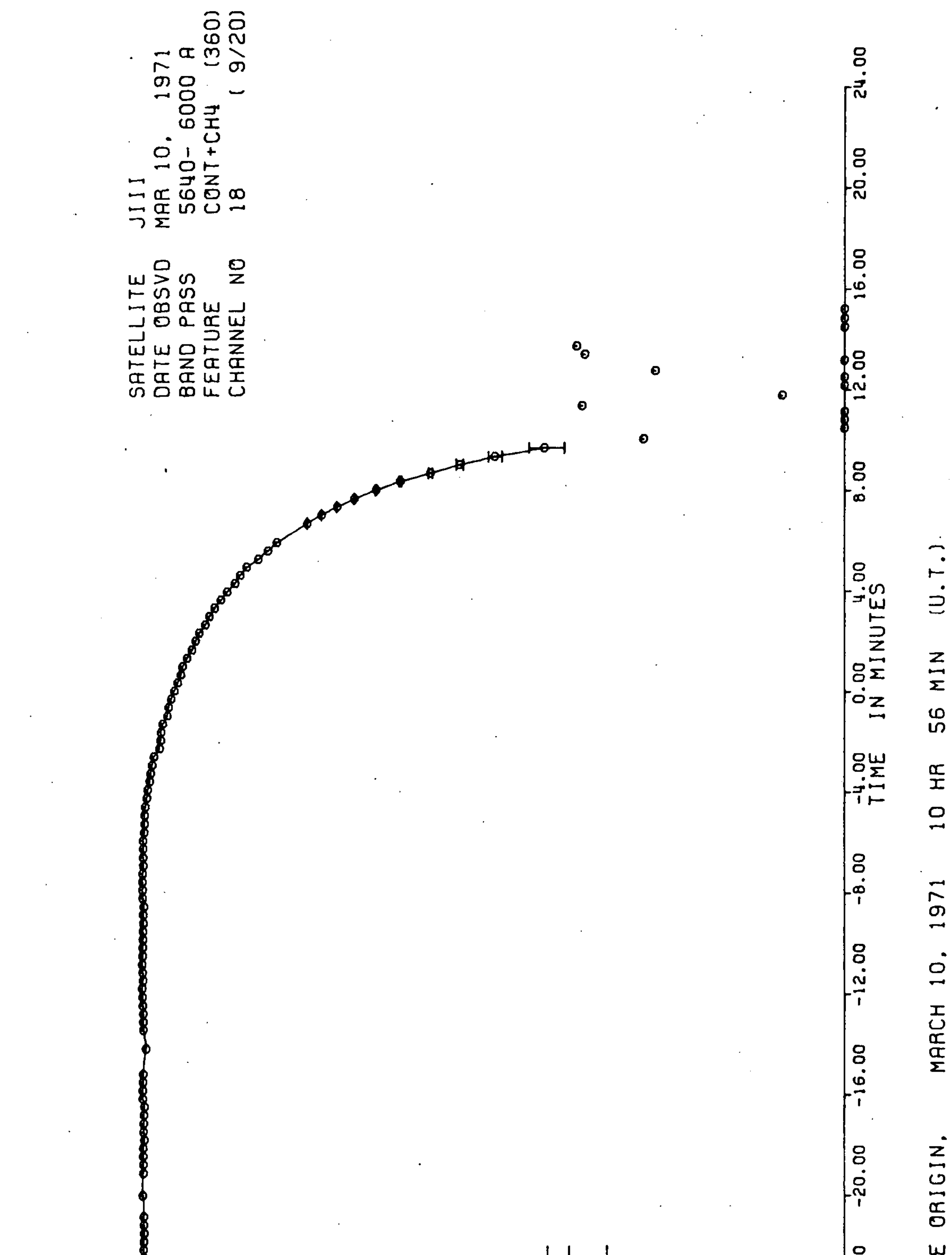
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FEATURE CØNT+CH4 (360)
CHANNEL NØ 18 (9/20)
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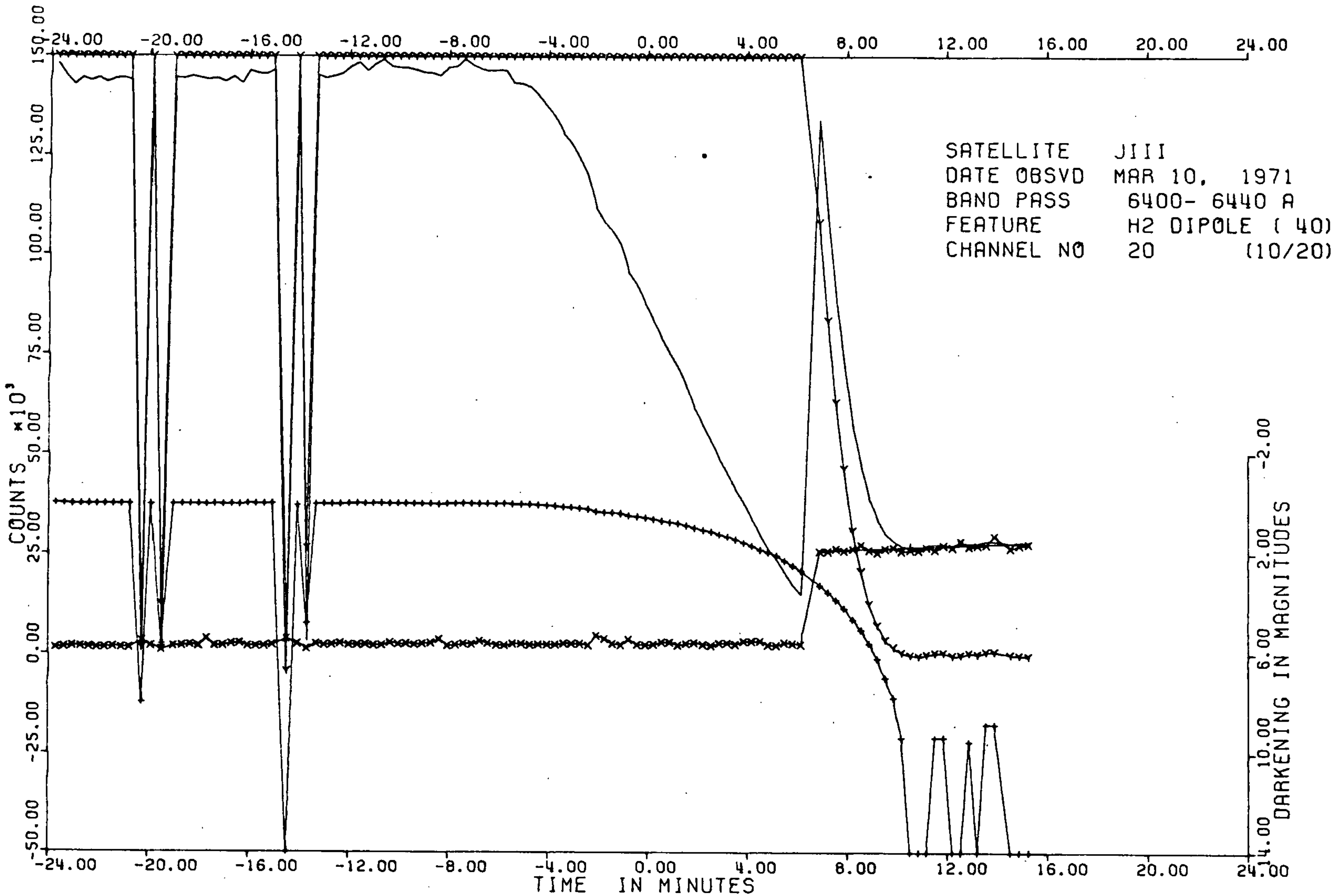
TIME IN MINUTES
-2.00 0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00
DARKENING IN MAGNITUDES
TIME ORIGIN, MARCH 10, 1971 10 HR 56 MIN (U.T.)



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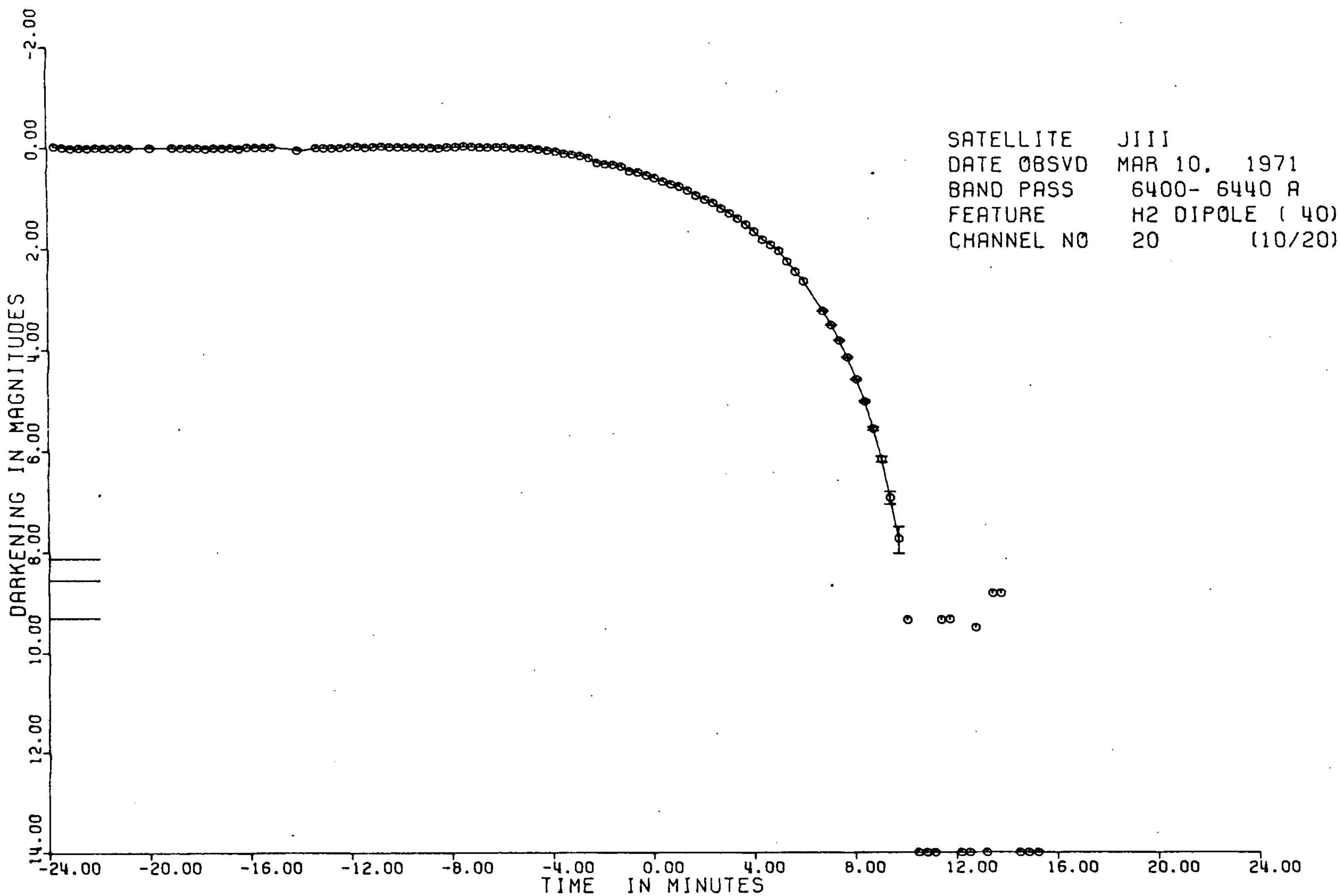

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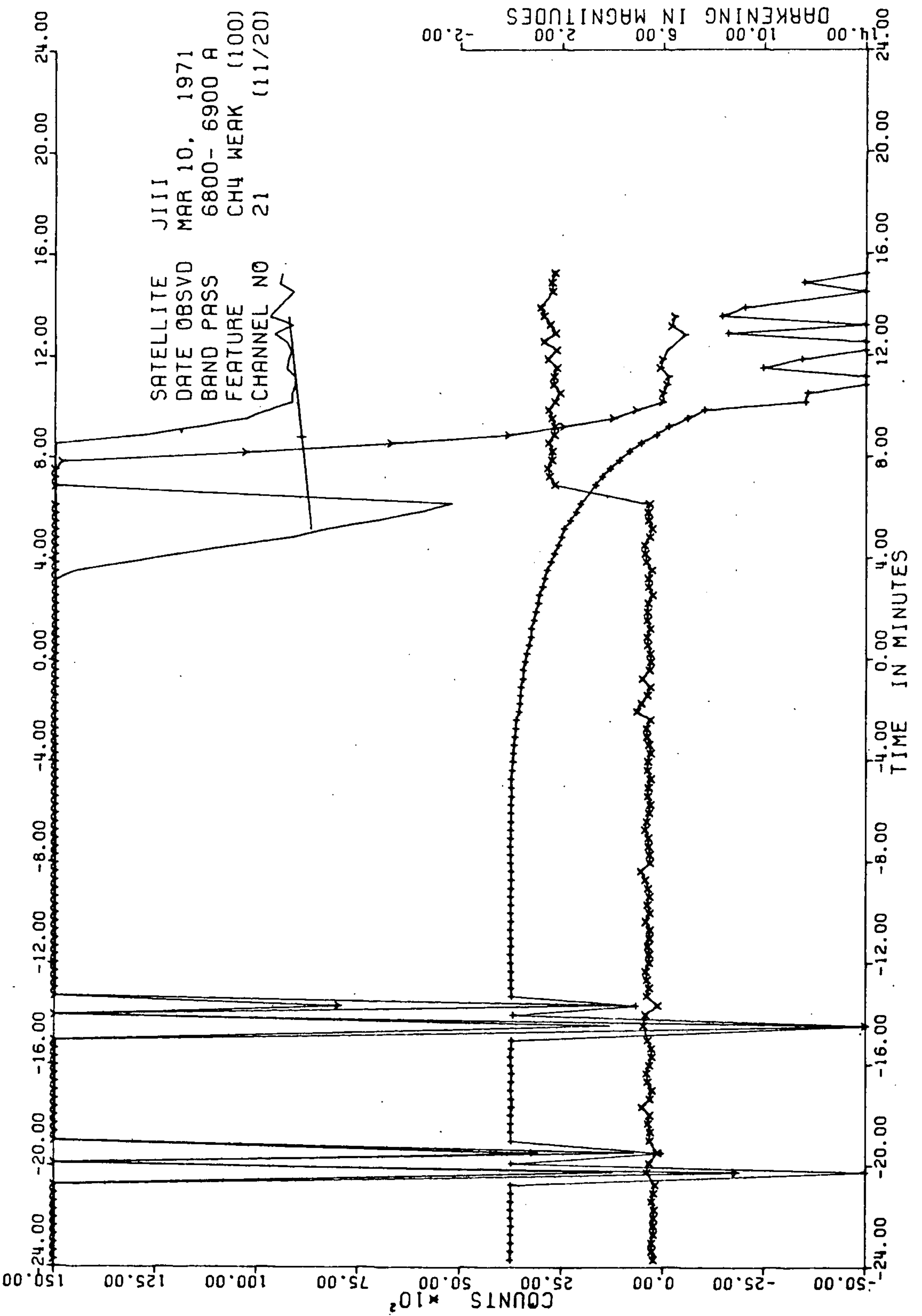

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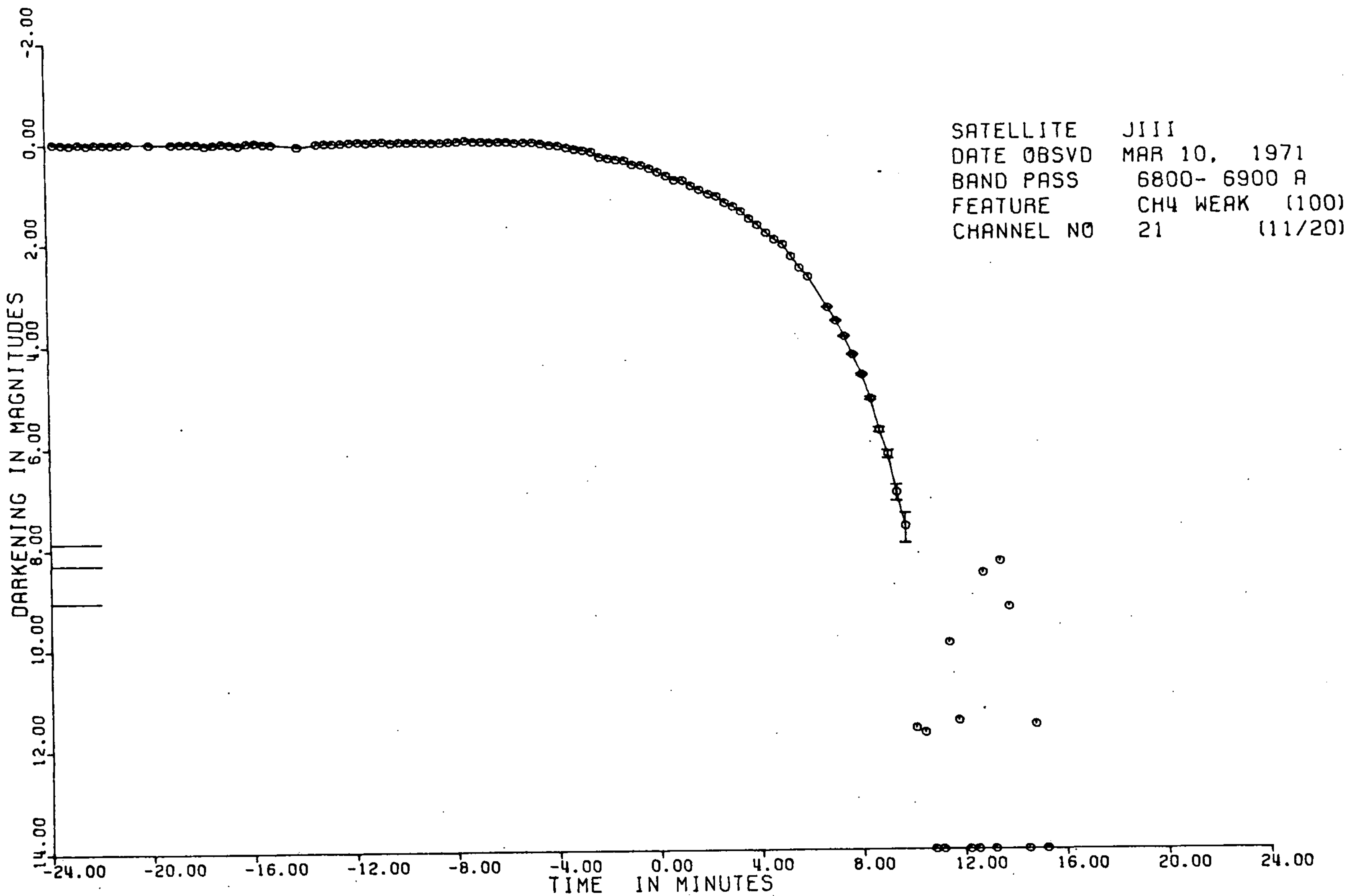

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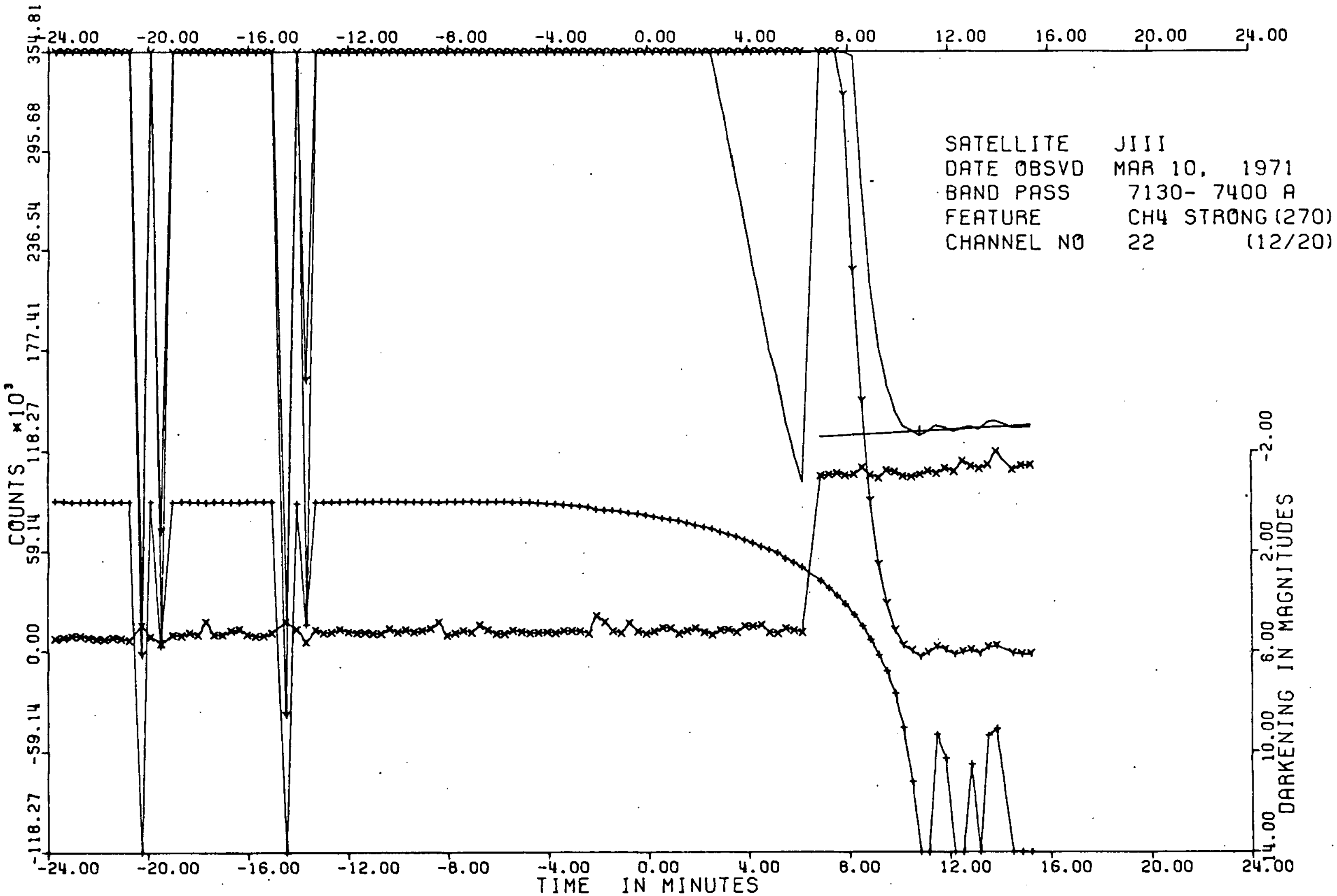

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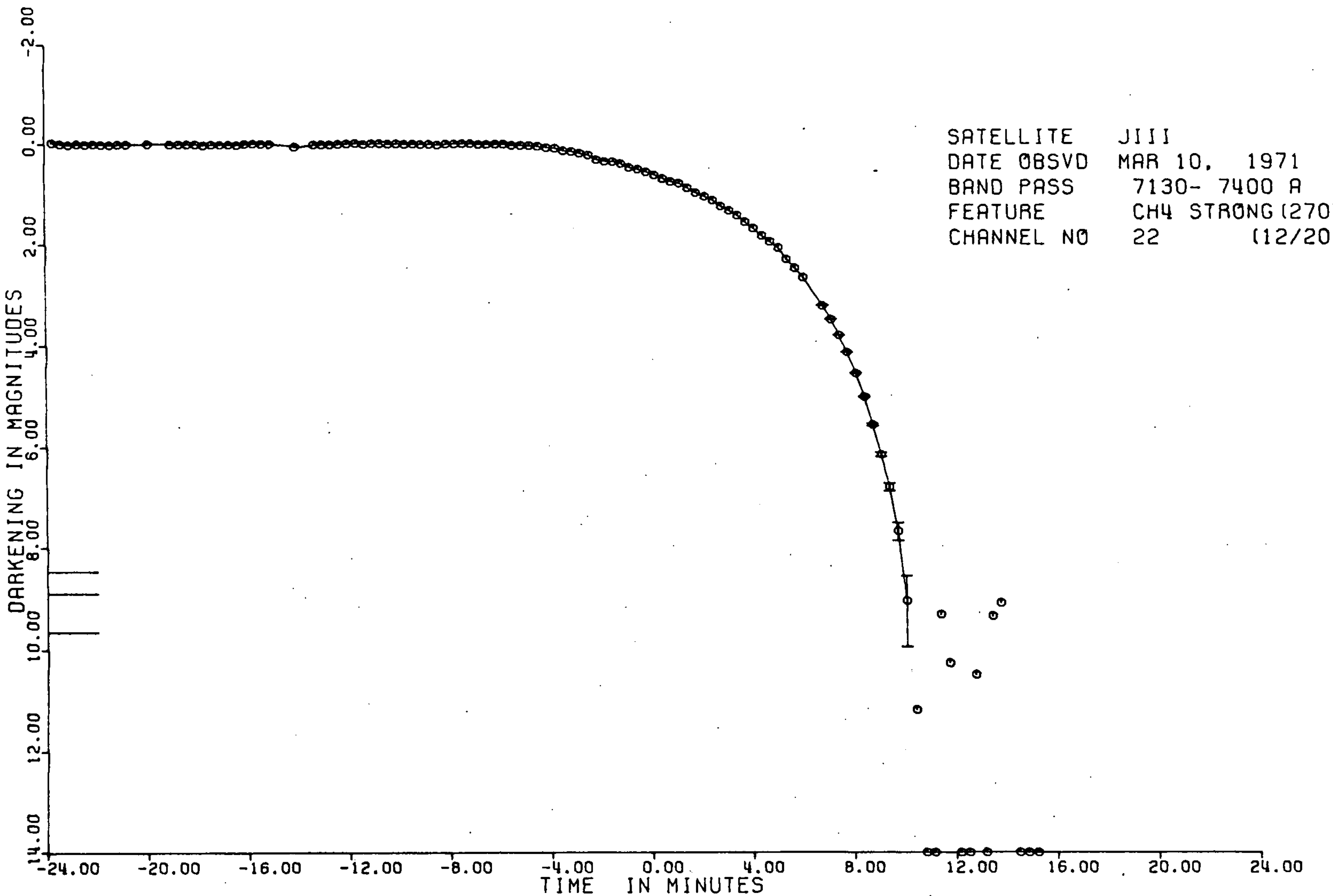

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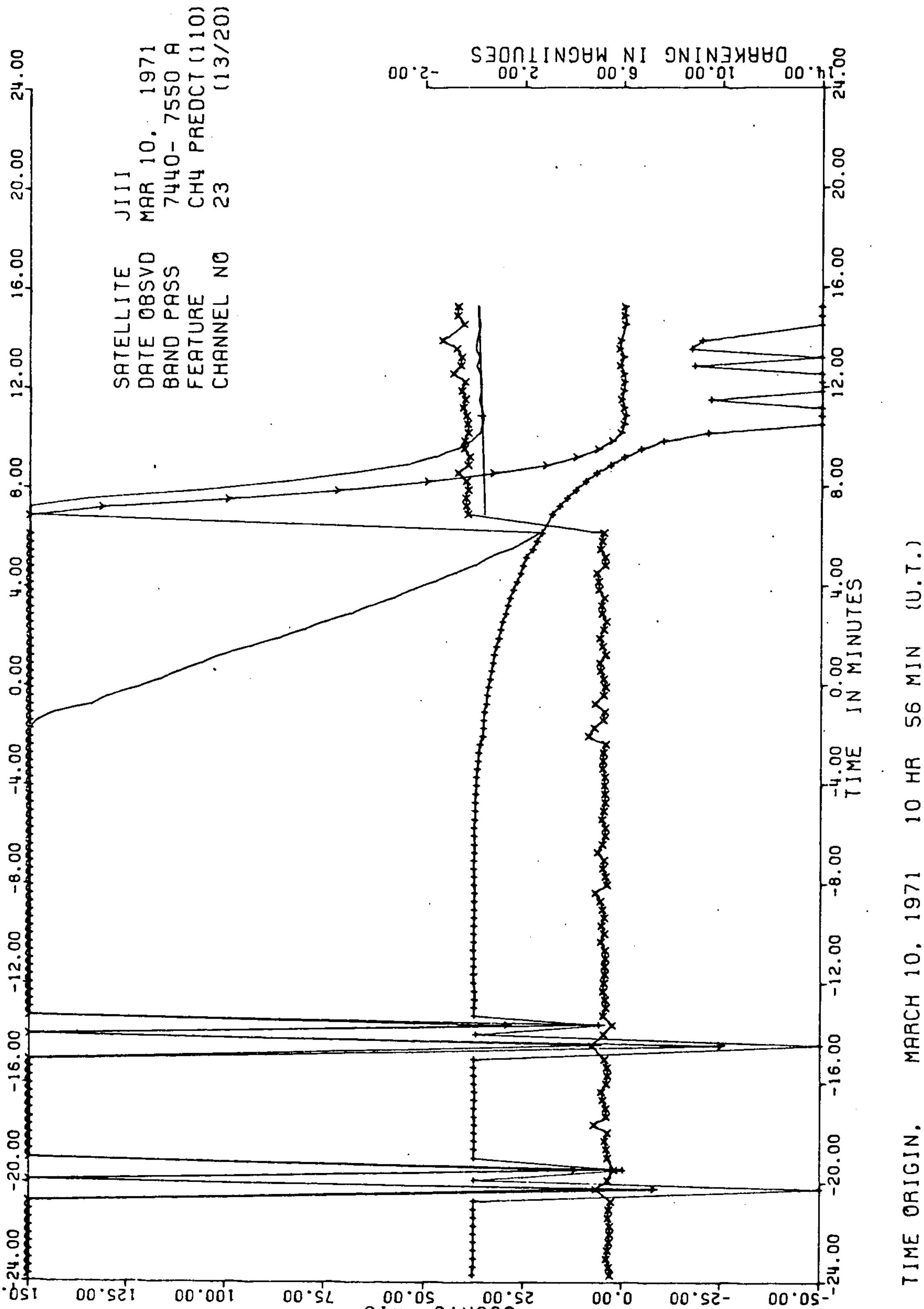
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COUNTS ×10³
TIME IN MINUTES (U.T.)
TIME ORIGIN, MARCH 10, 1971 10 HR 56 MIN
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-16.00
-12.00
-8.00
-4.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
150.00
125.00
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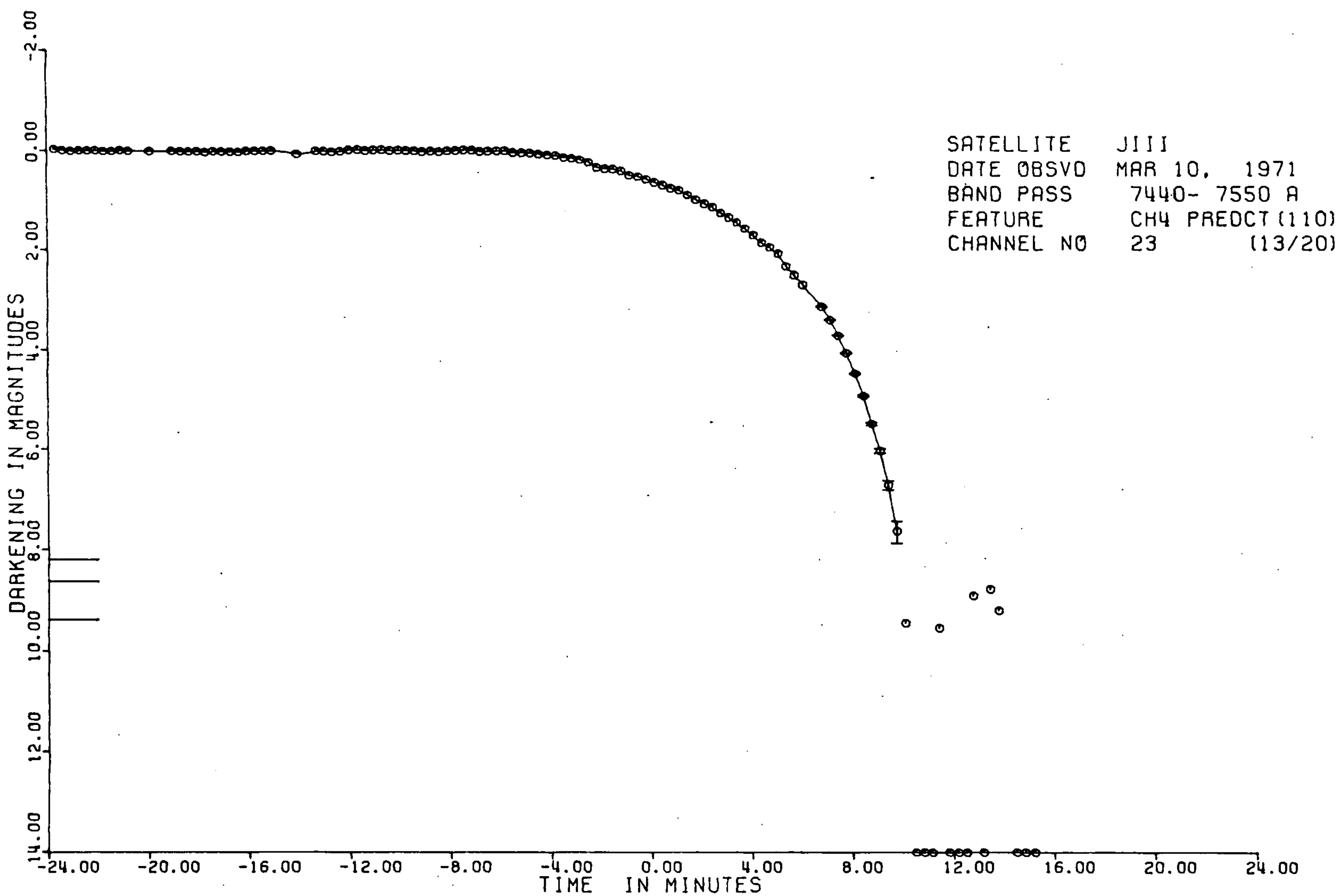

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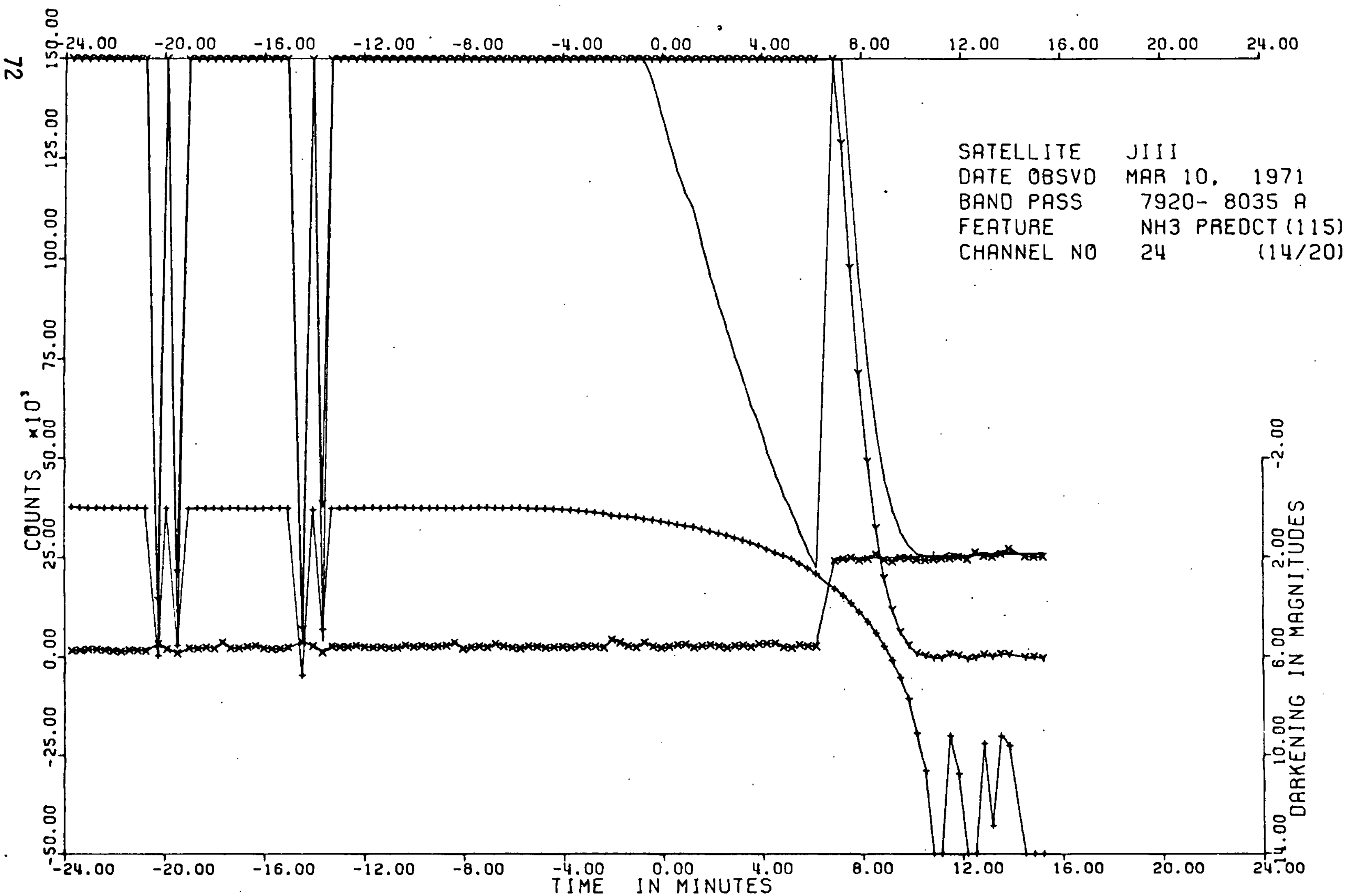

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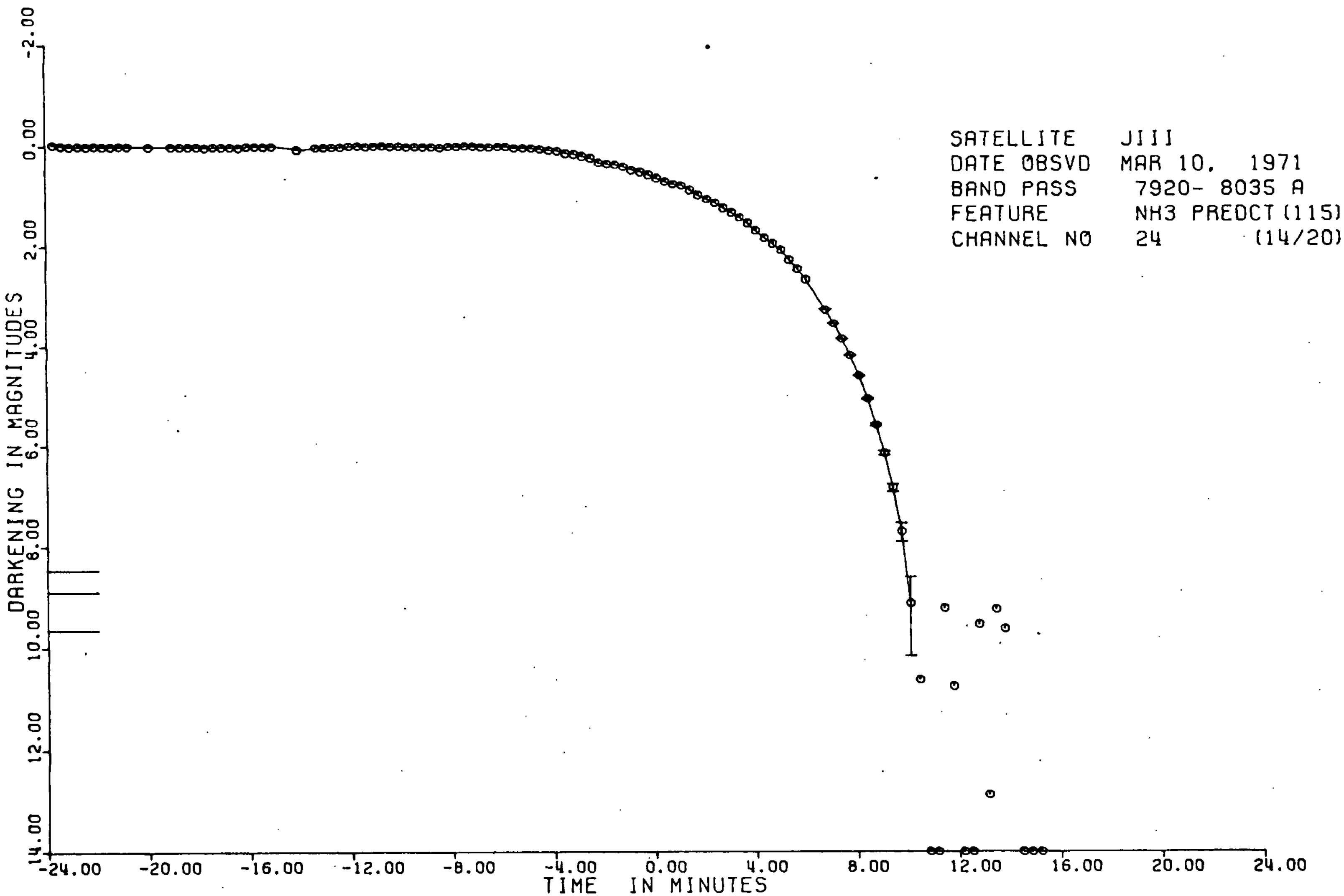

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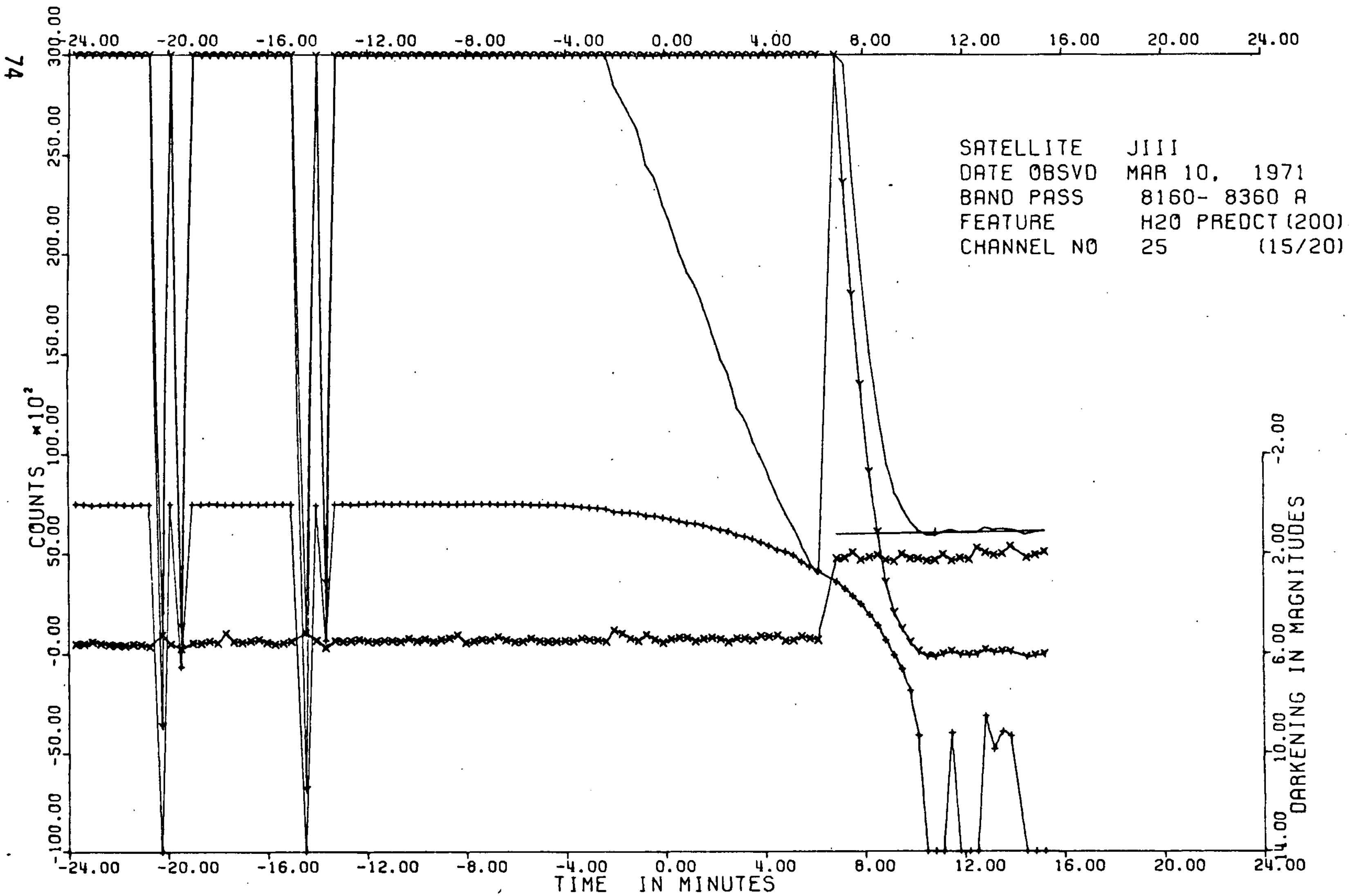

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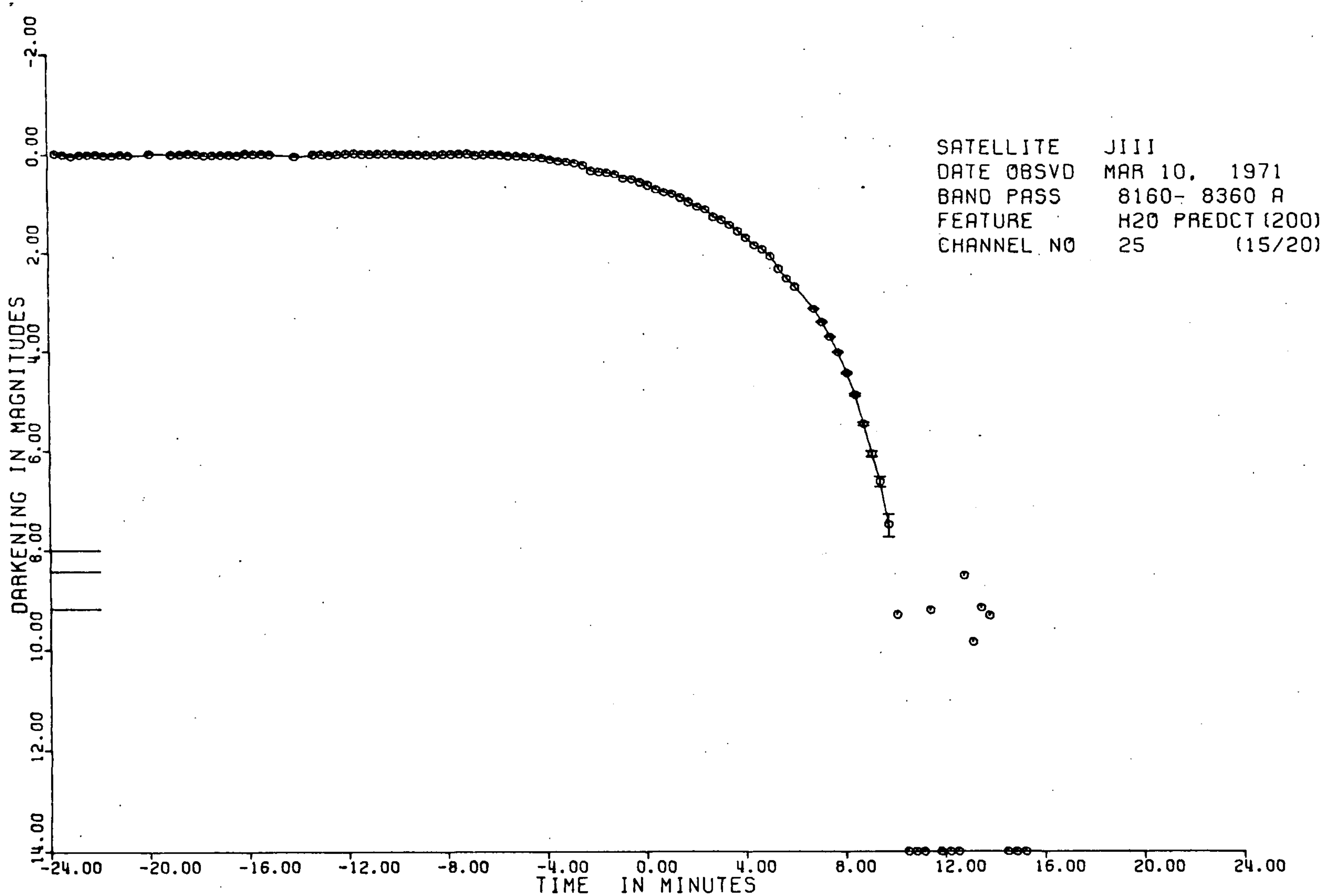

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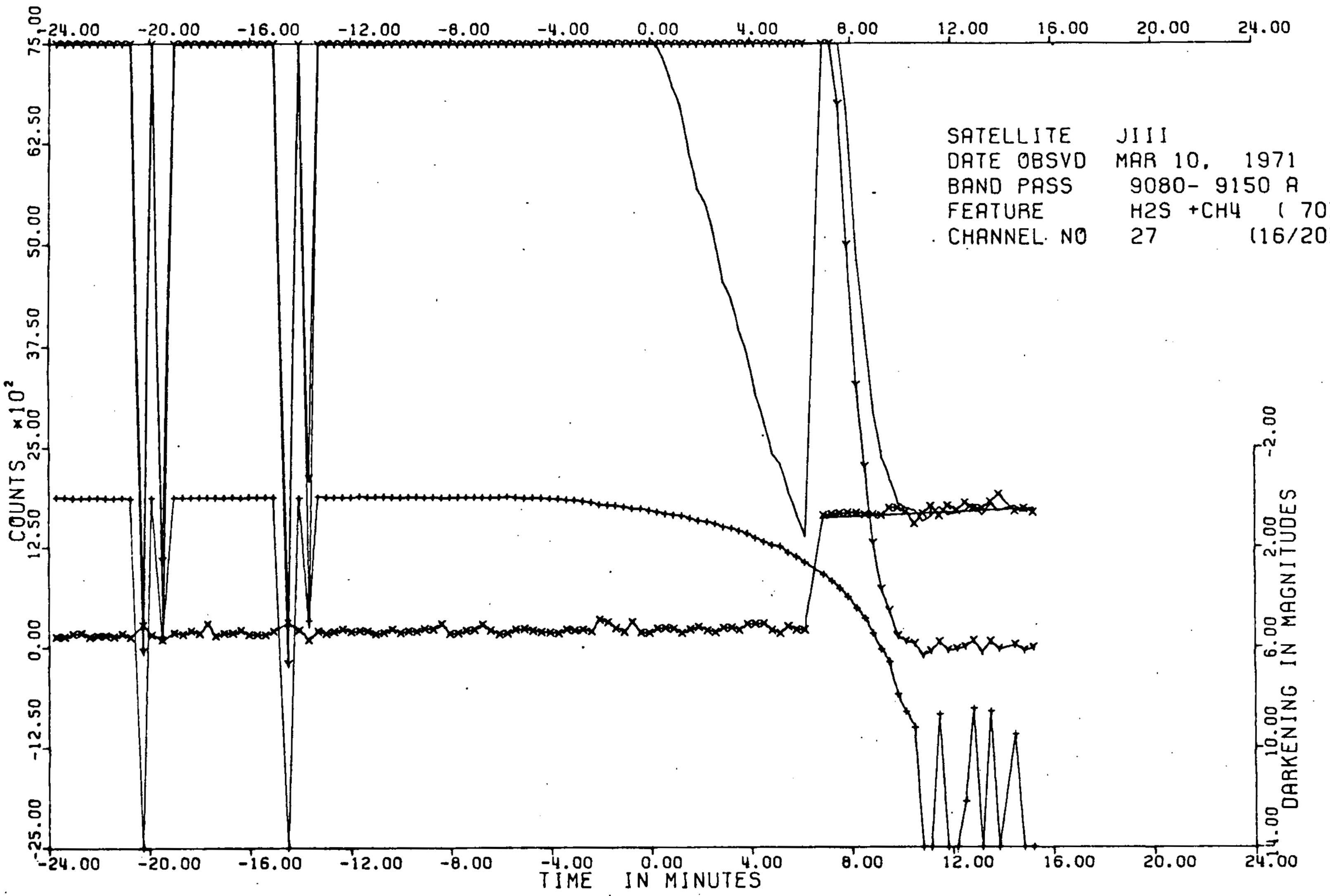

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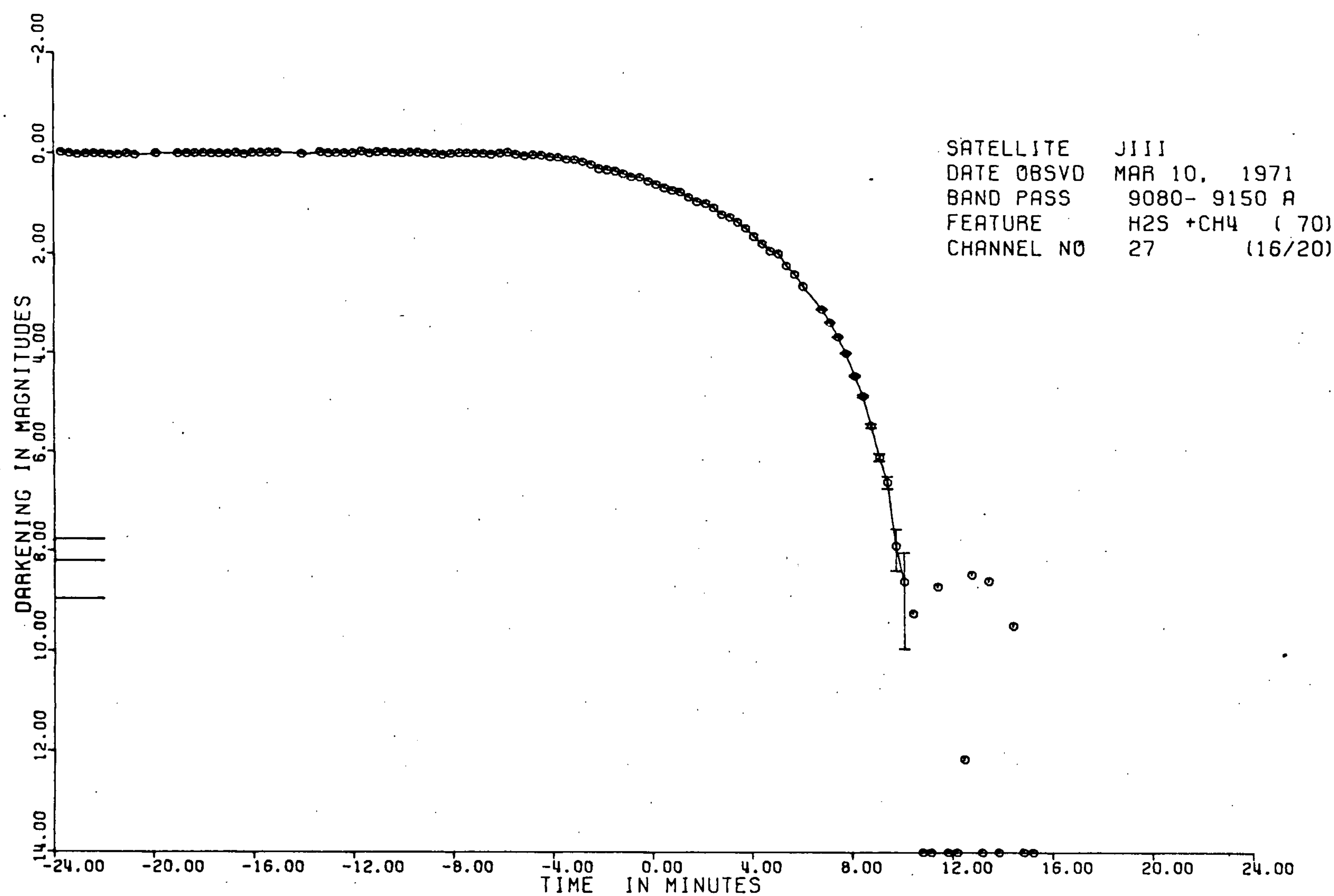

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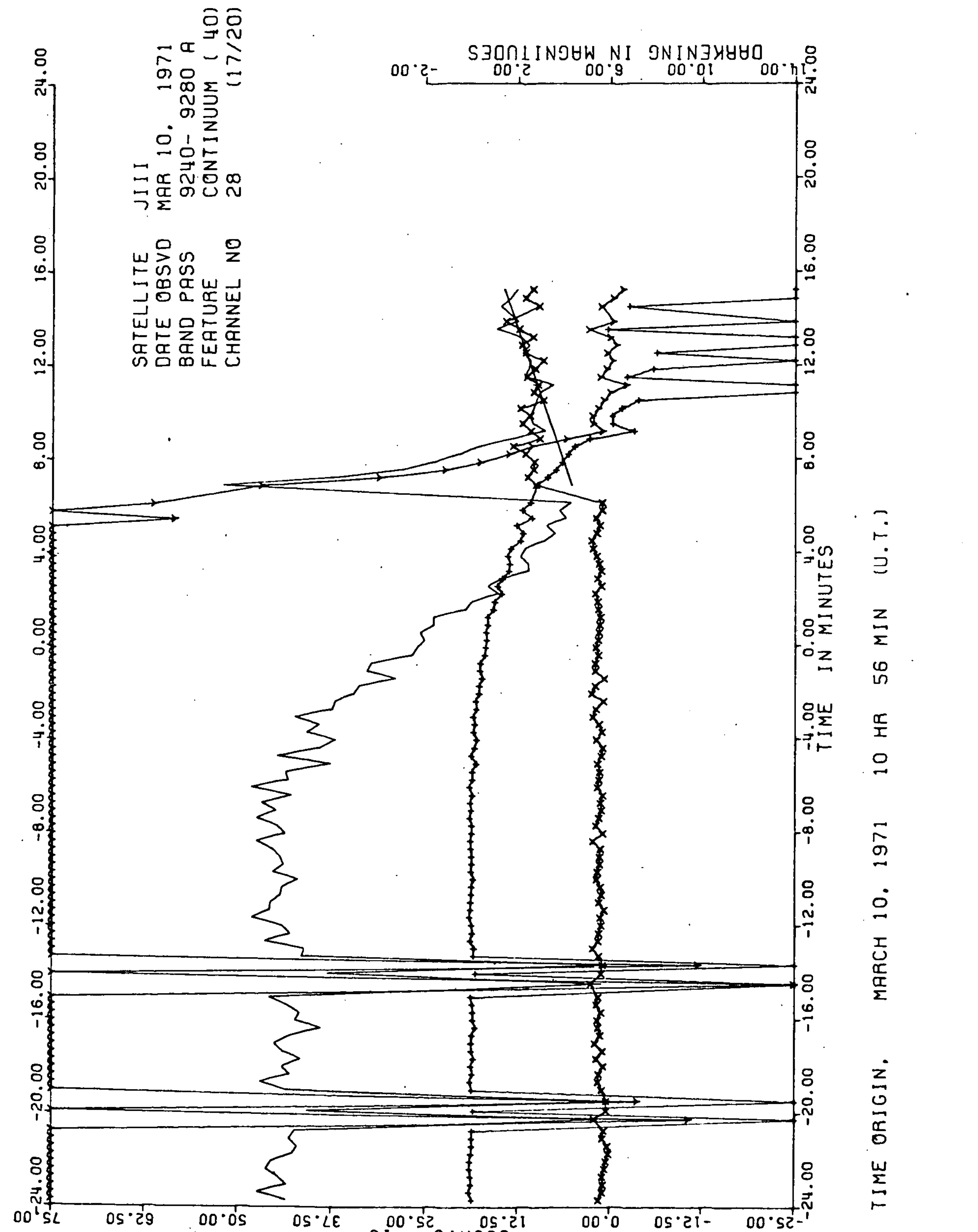
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FEATURE CONTINUUM (40)
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COUNTS ×10¹
TIME IN MINUTES
TIME ORIGIN, MARCH 10, 1971 10 HR 56 MIN (U.T.)
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-12.00
-8.00
-4.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
75.00
62.50
50.00
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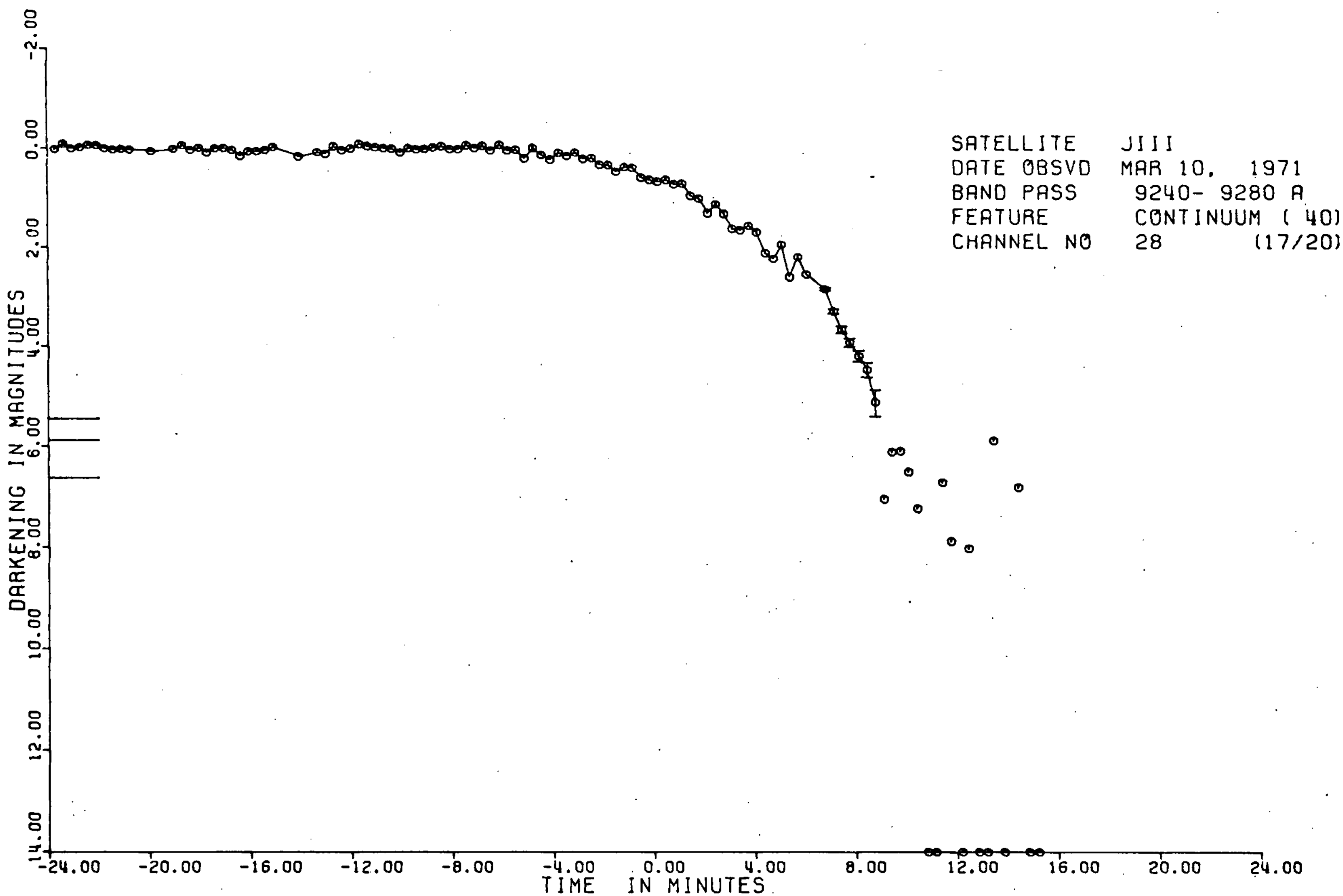
10.00
6.00
2.00
-2.00



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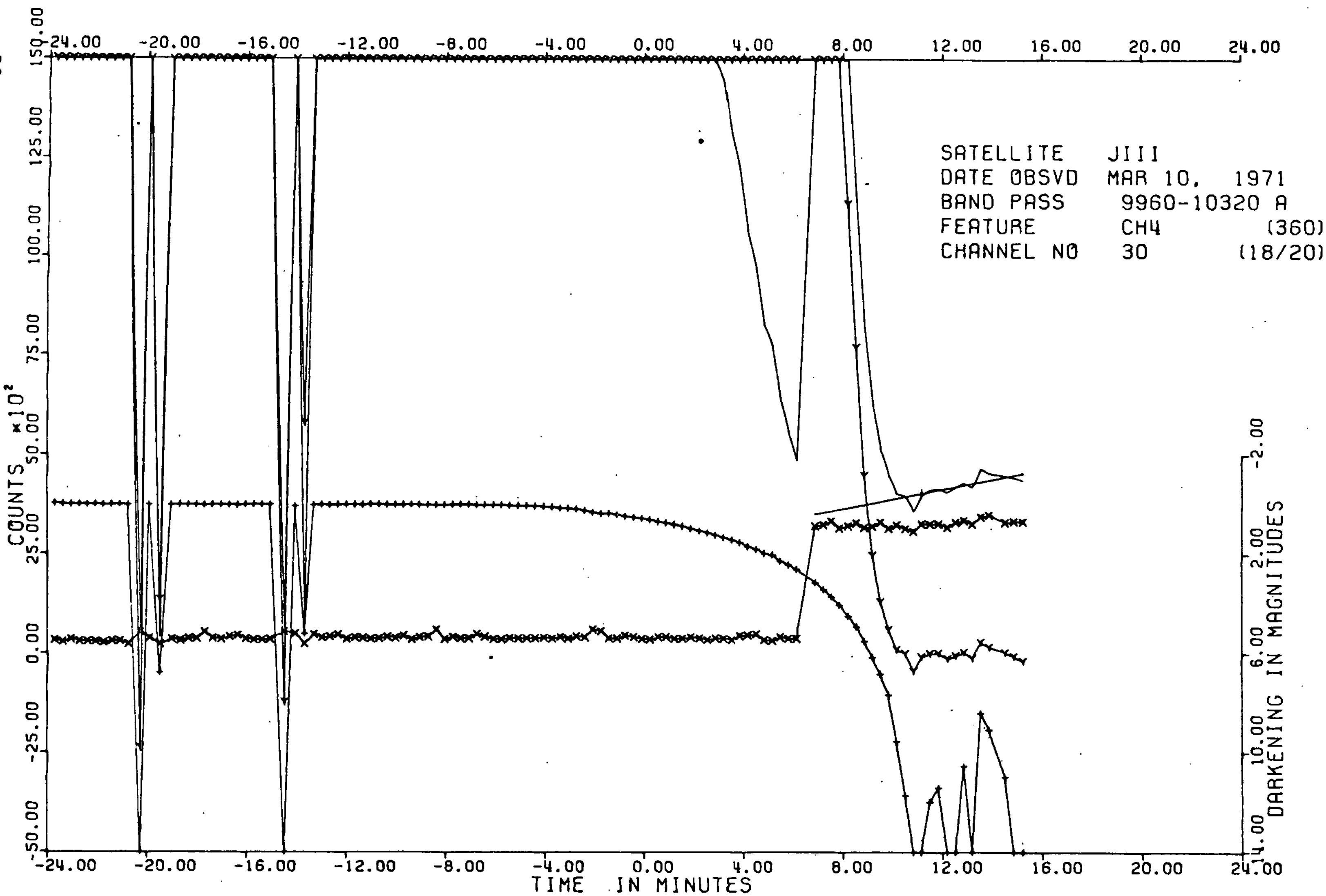

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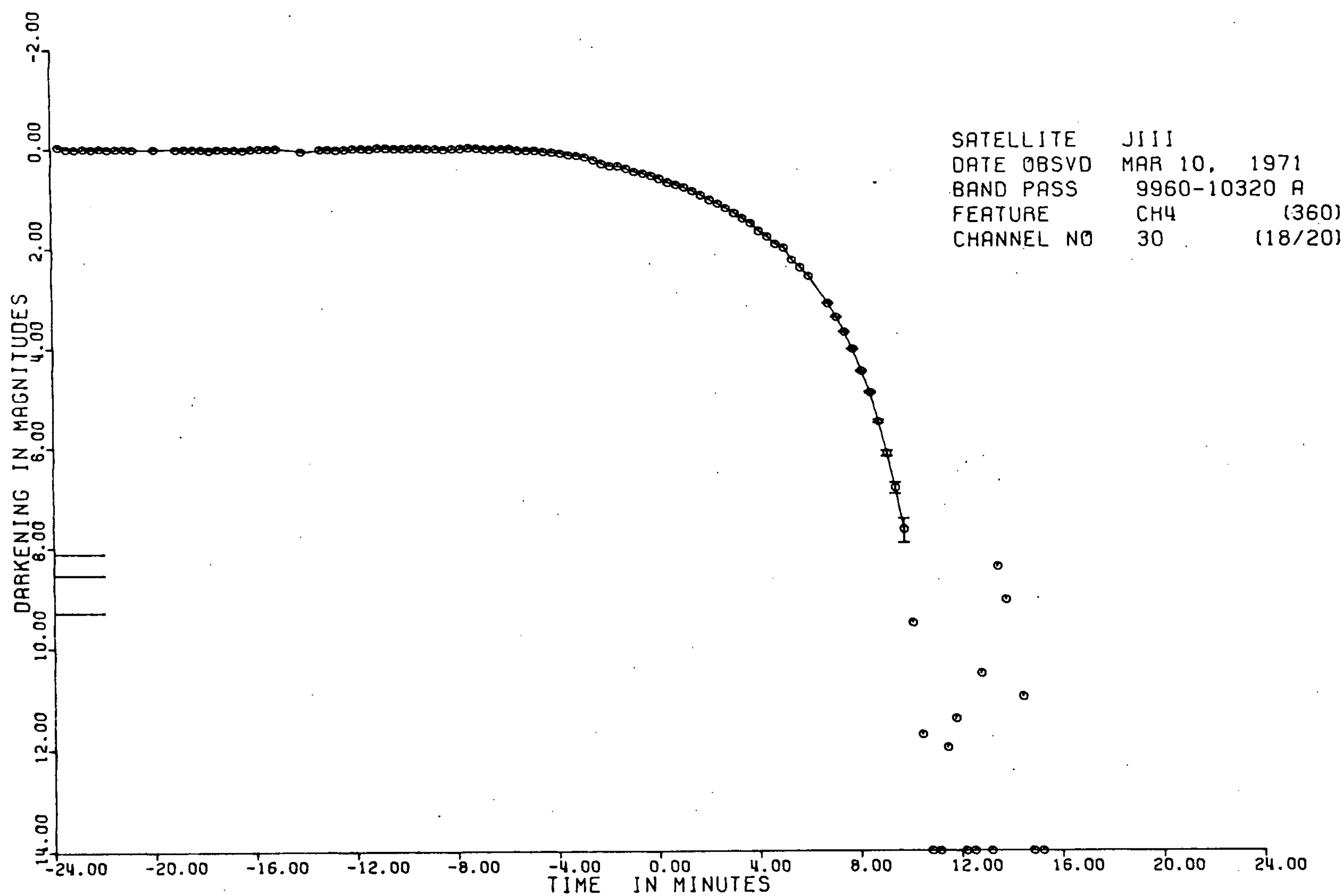

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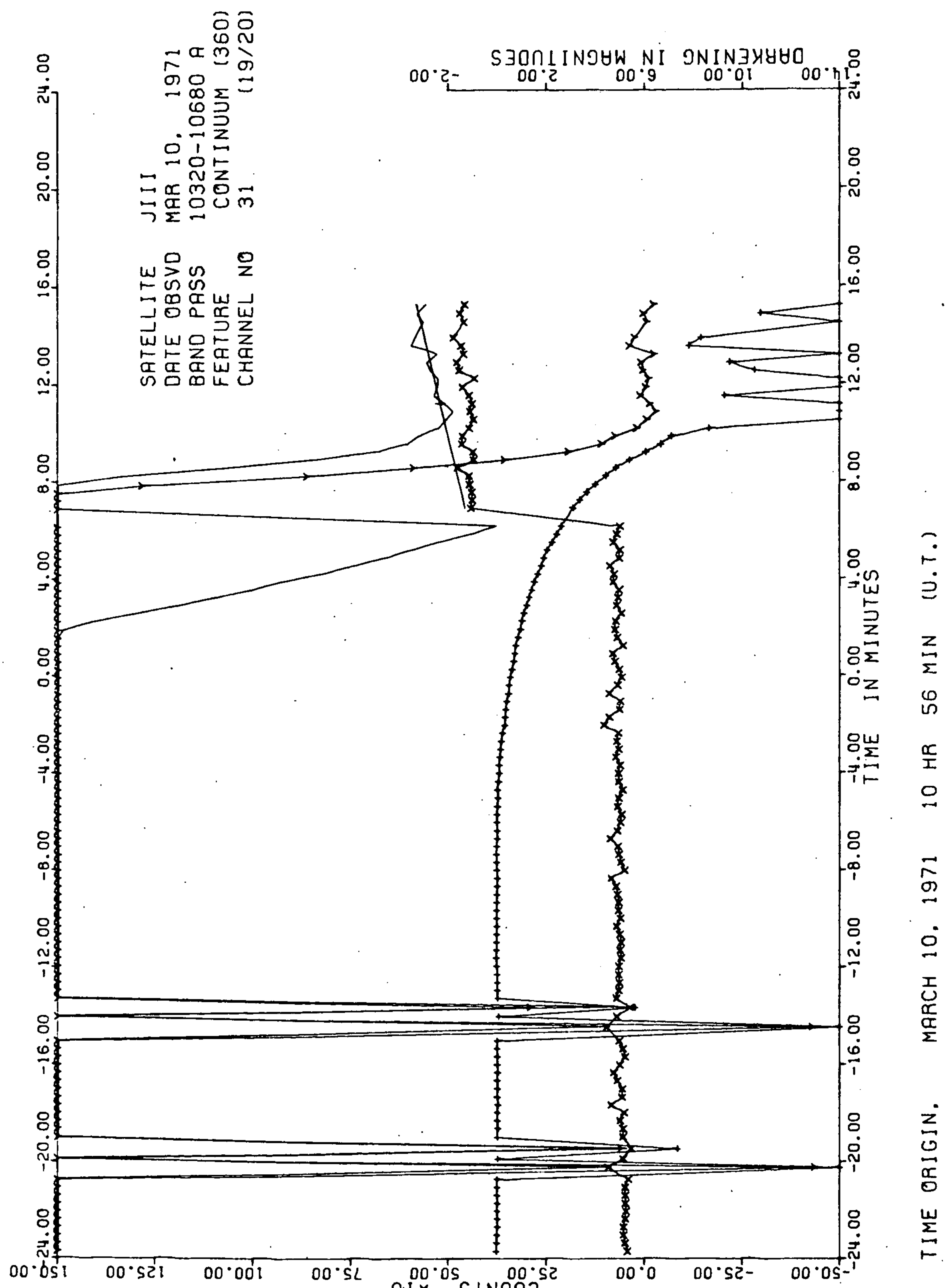
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COUNTS *10²
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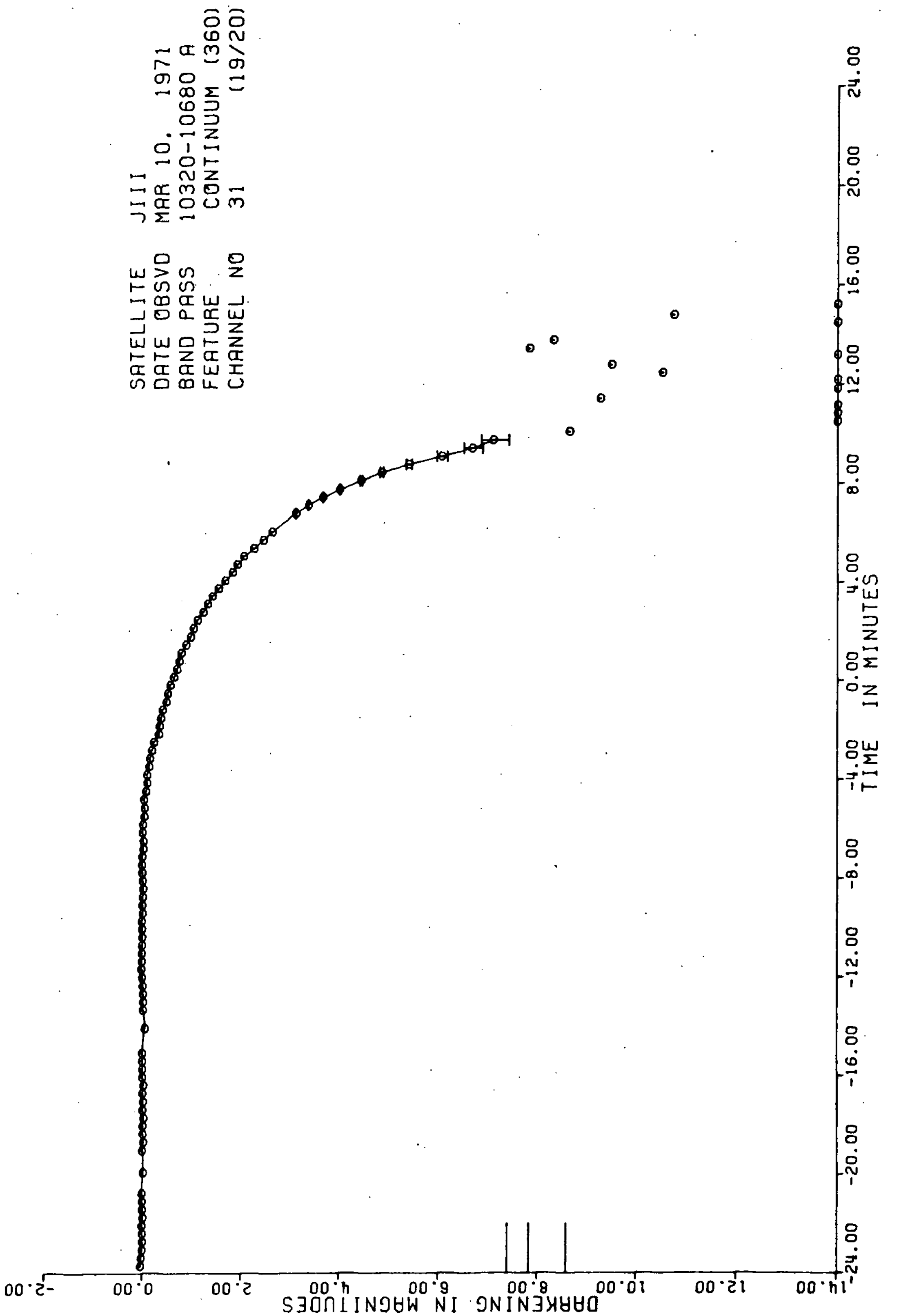
TIME ORIGIN. MARCH 10, 1971 10 HR 56 MIN (U.T.)



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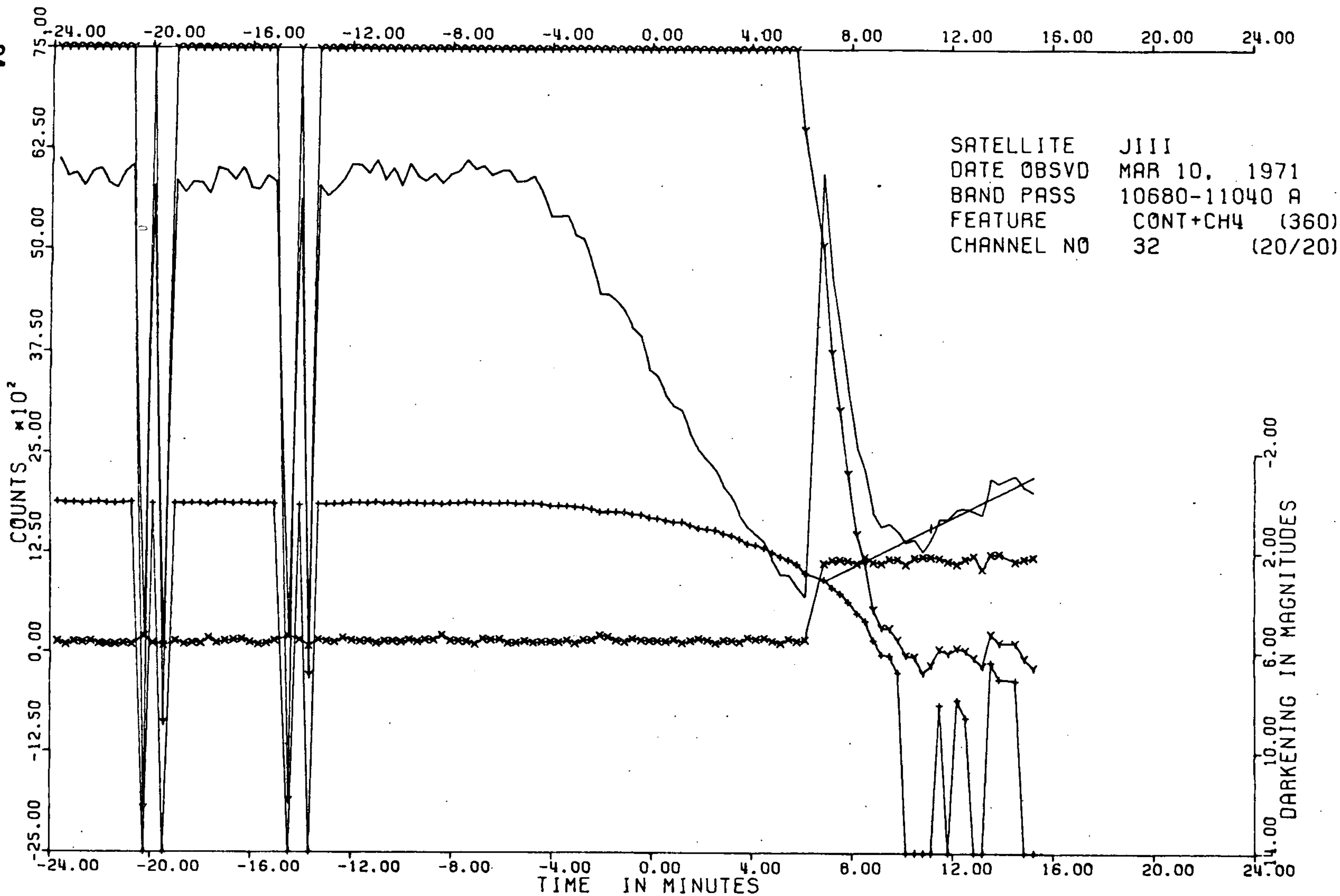

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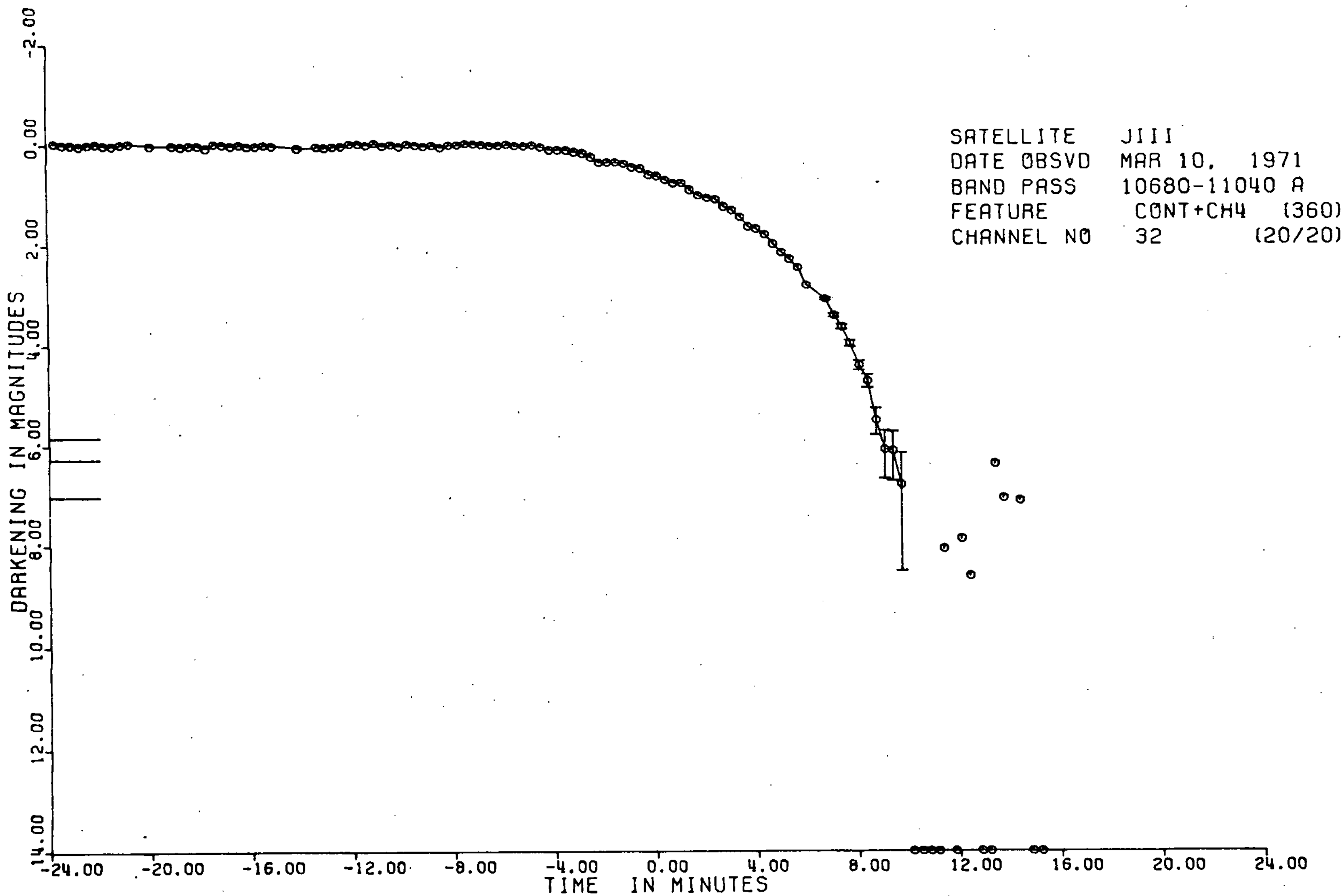

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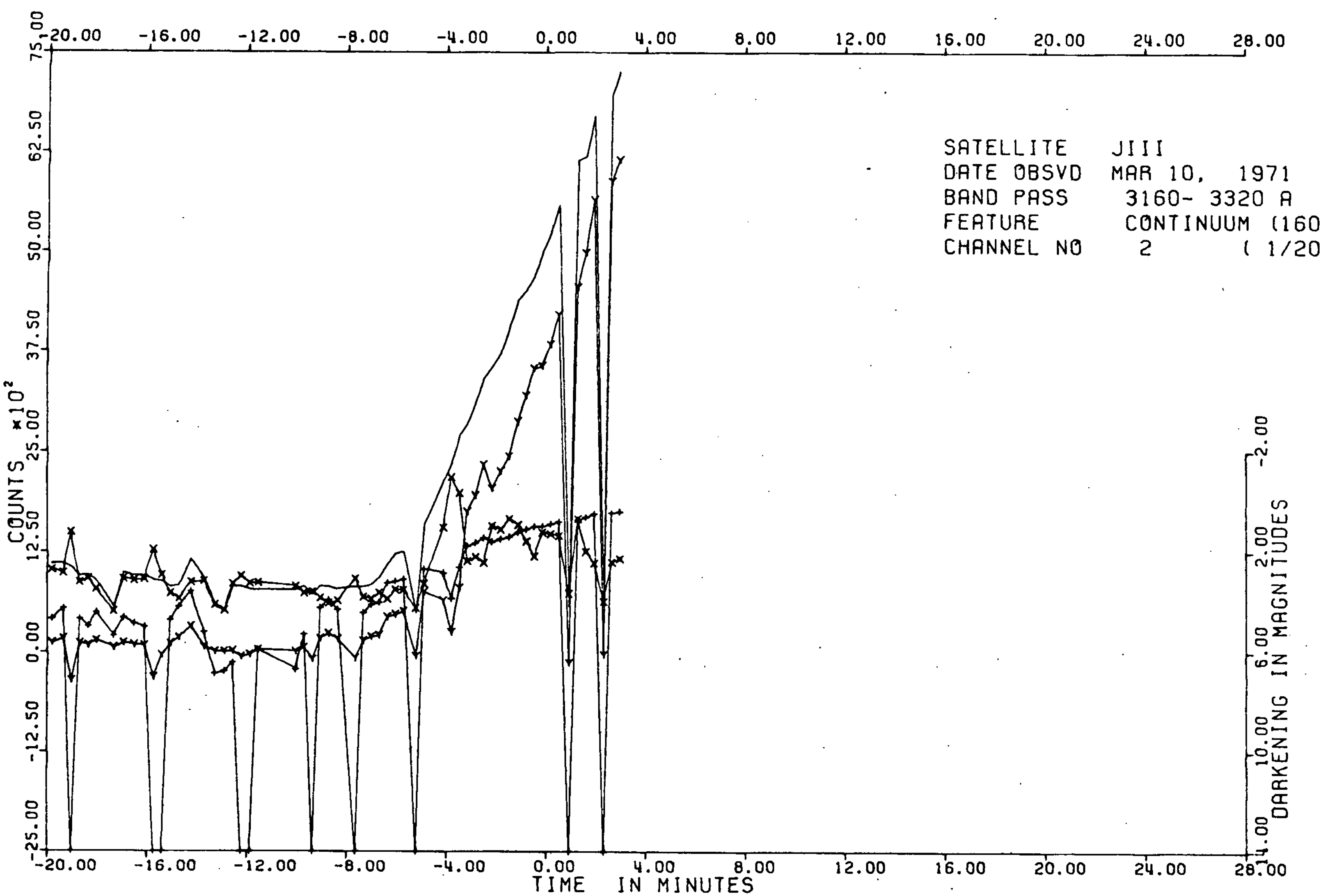

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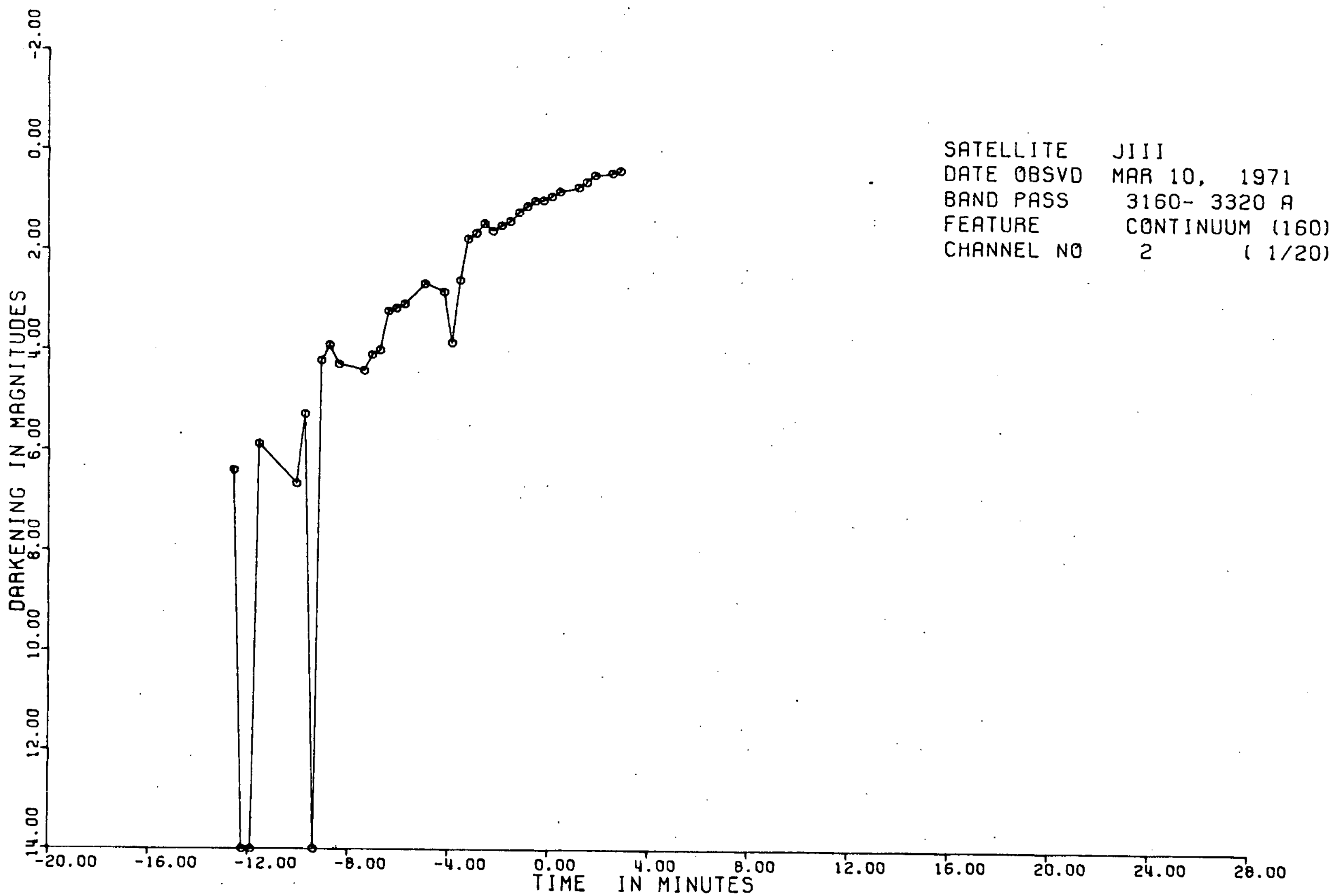

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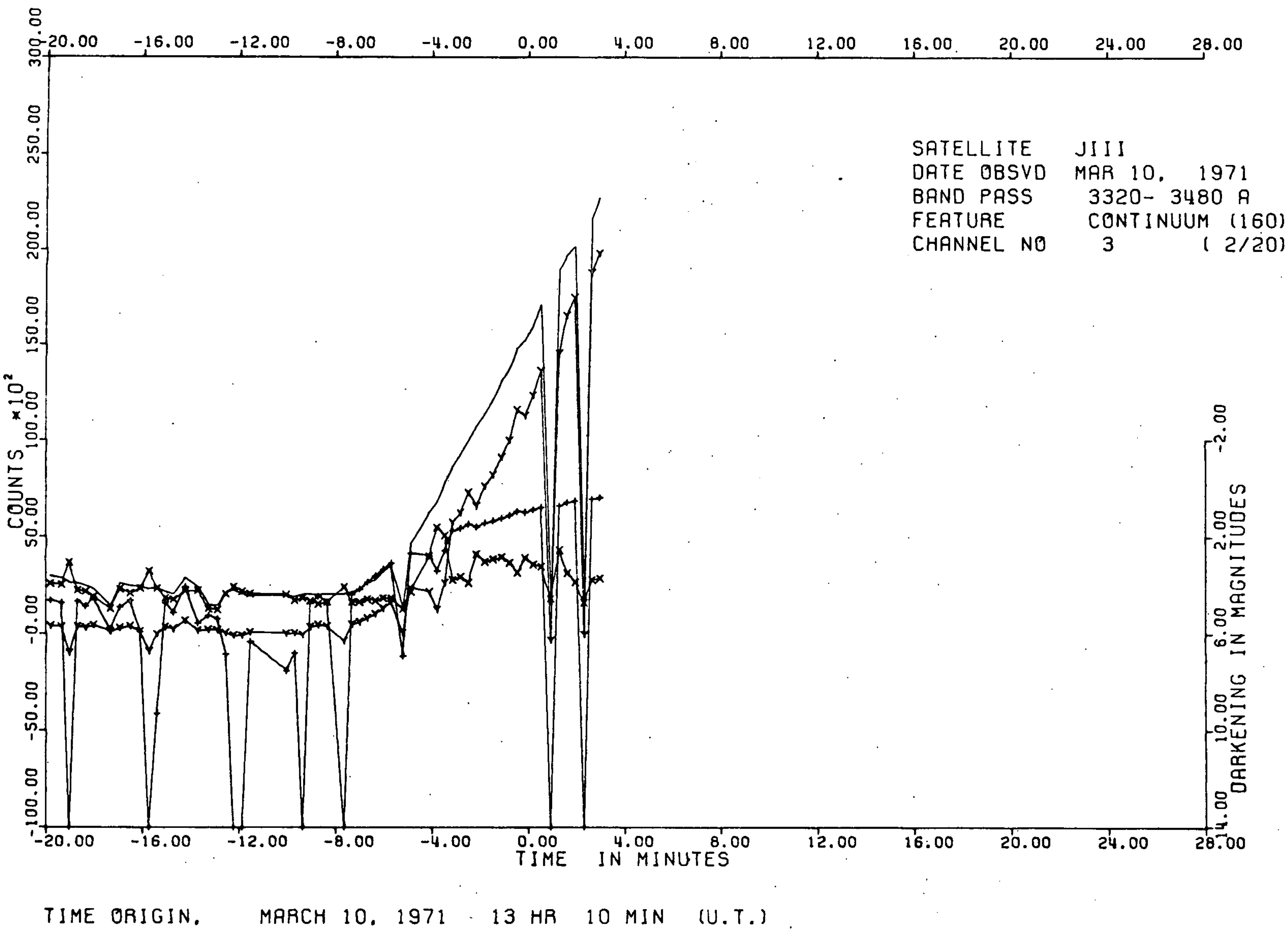
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DARKENING IN MAGNITUDES
TIME IN MINUTES
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-100.00 -50.00 -0.00 50.00 100.00 150.00 200.00 250.00 300.00
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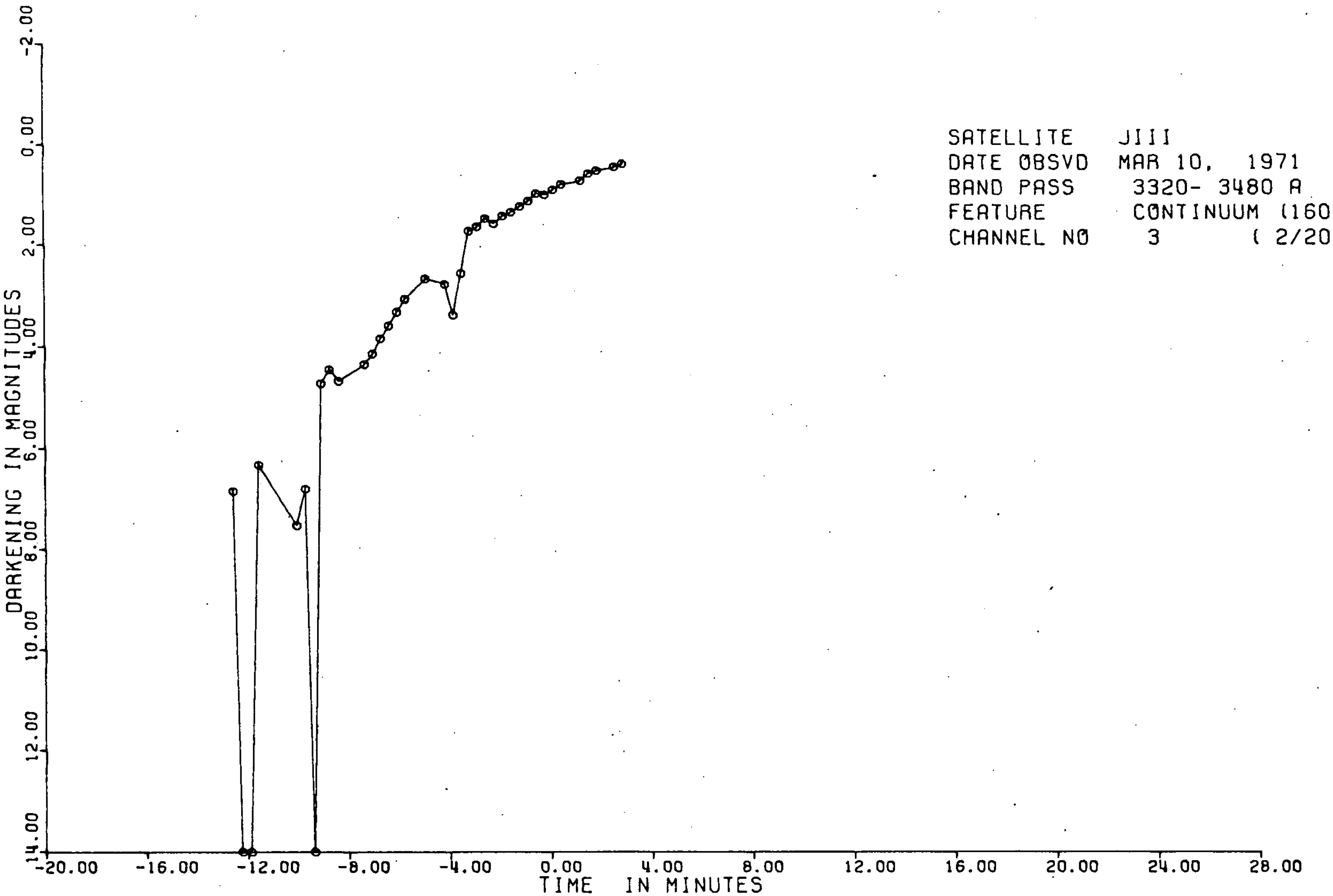

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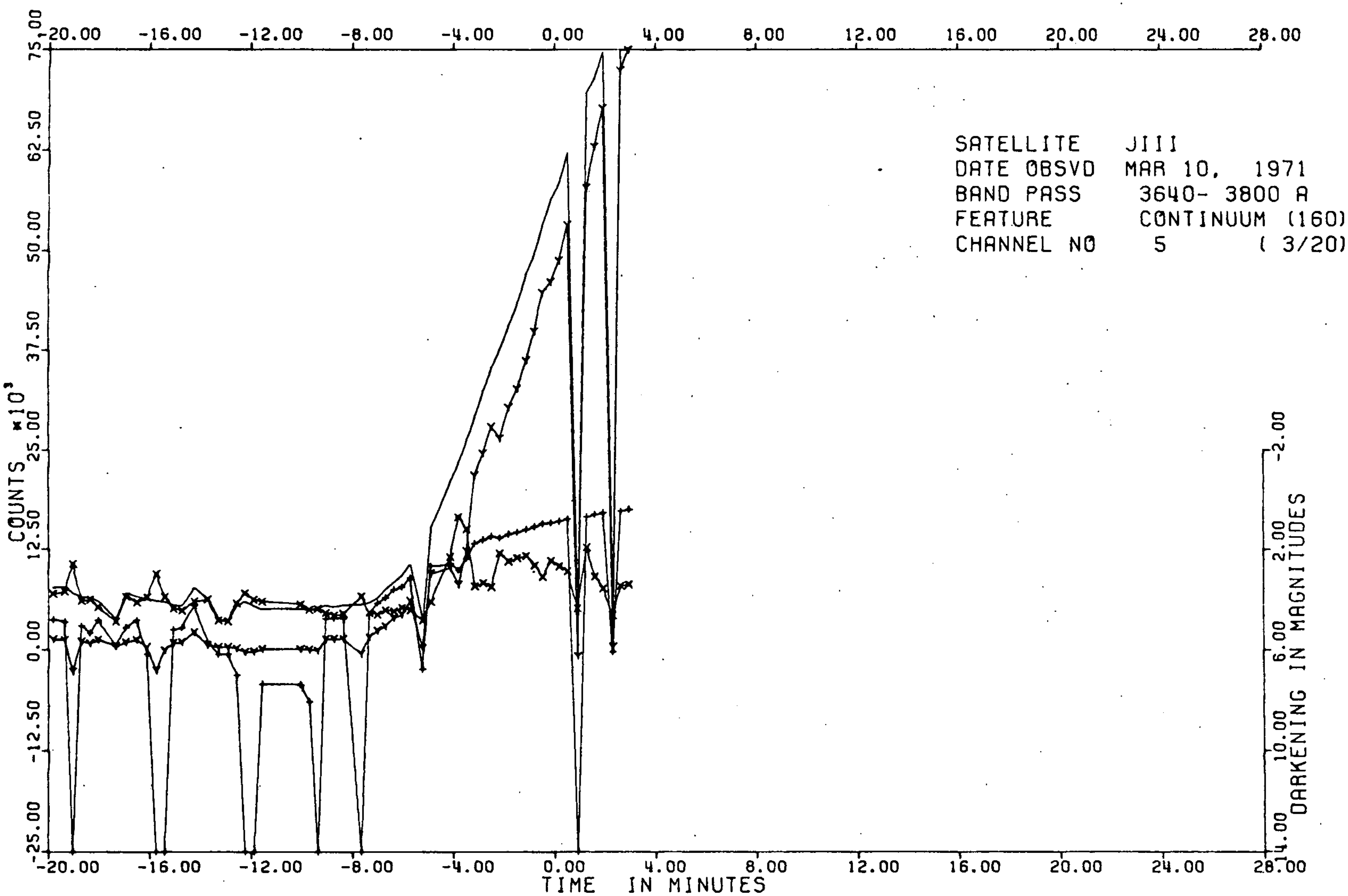

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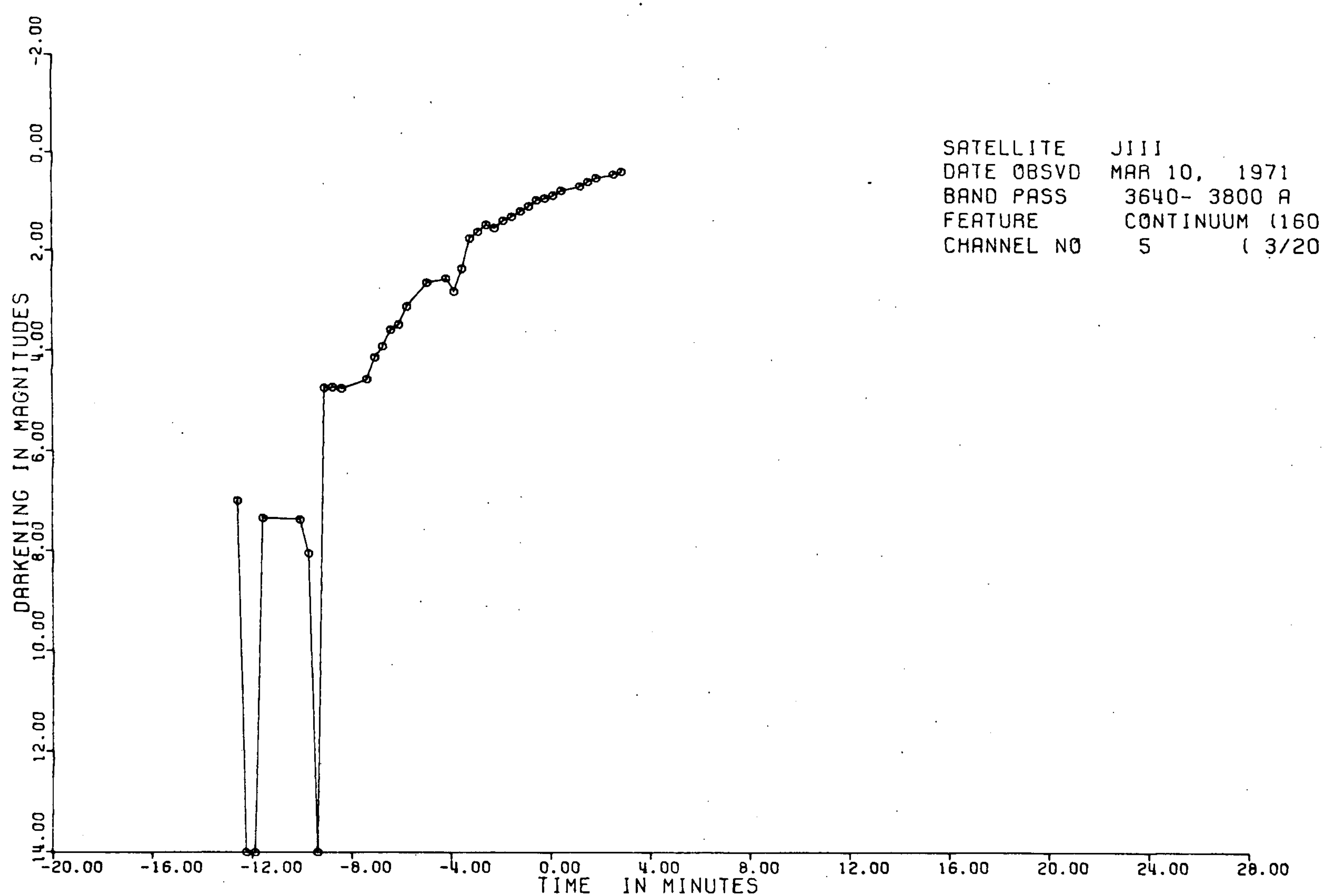

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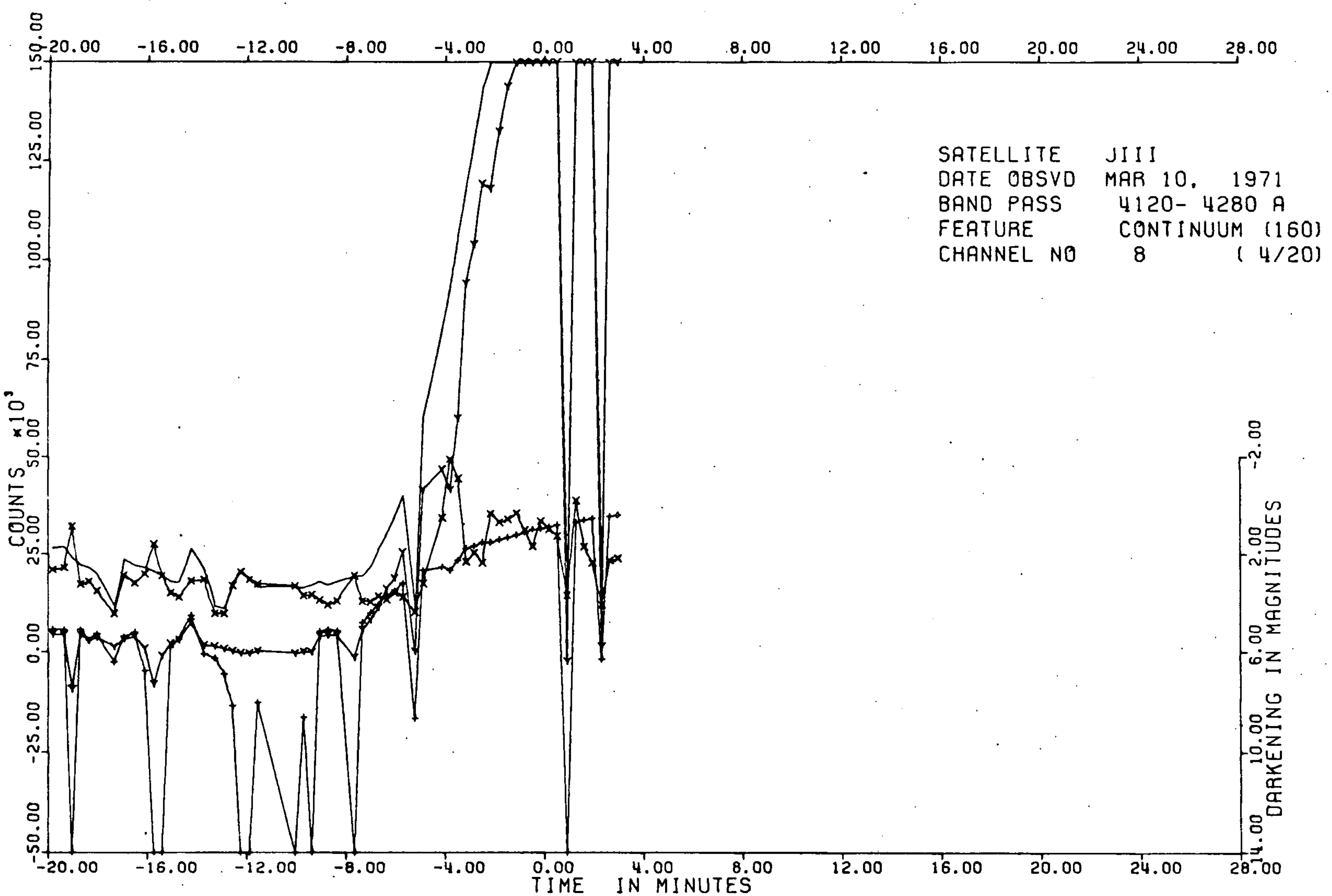

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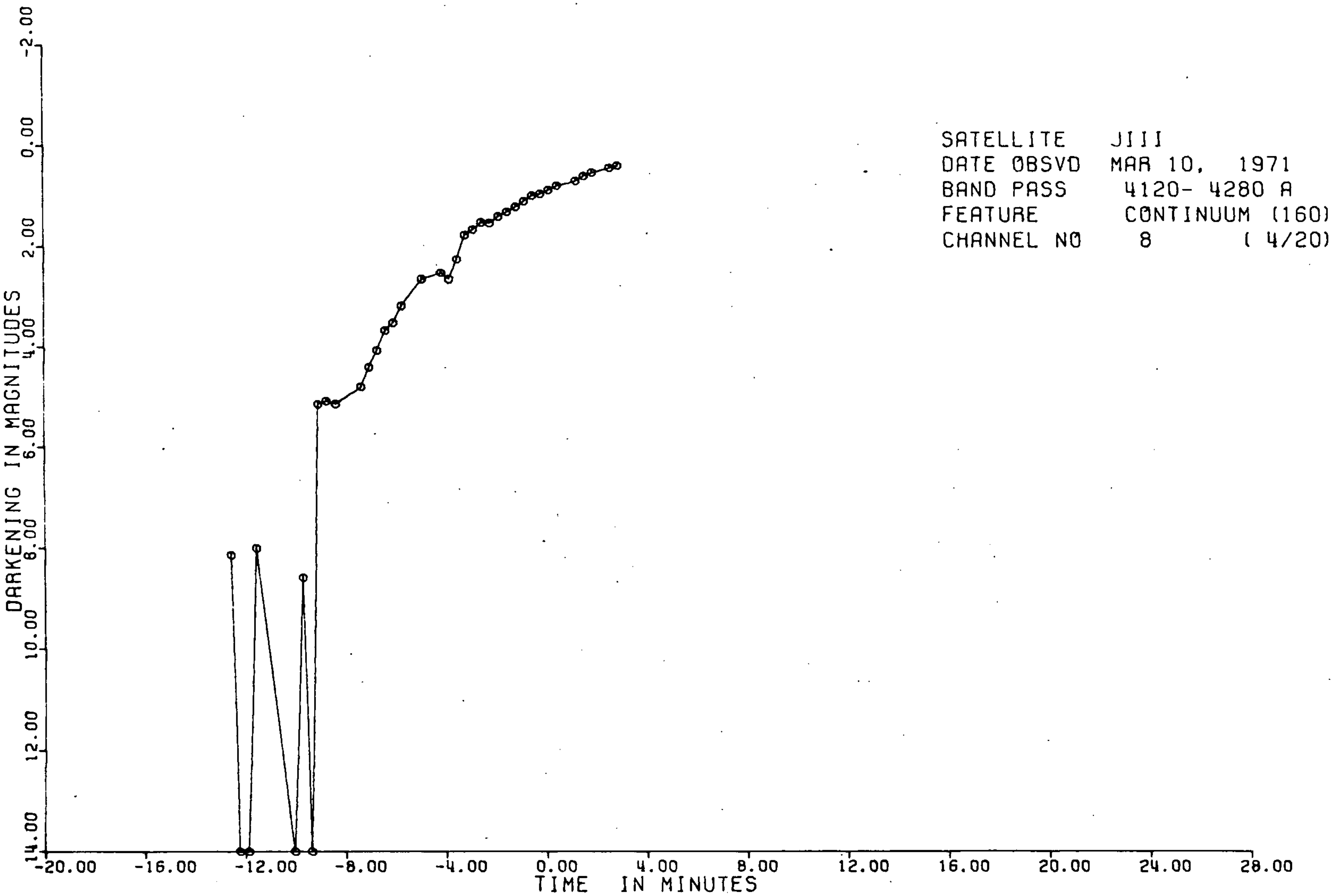

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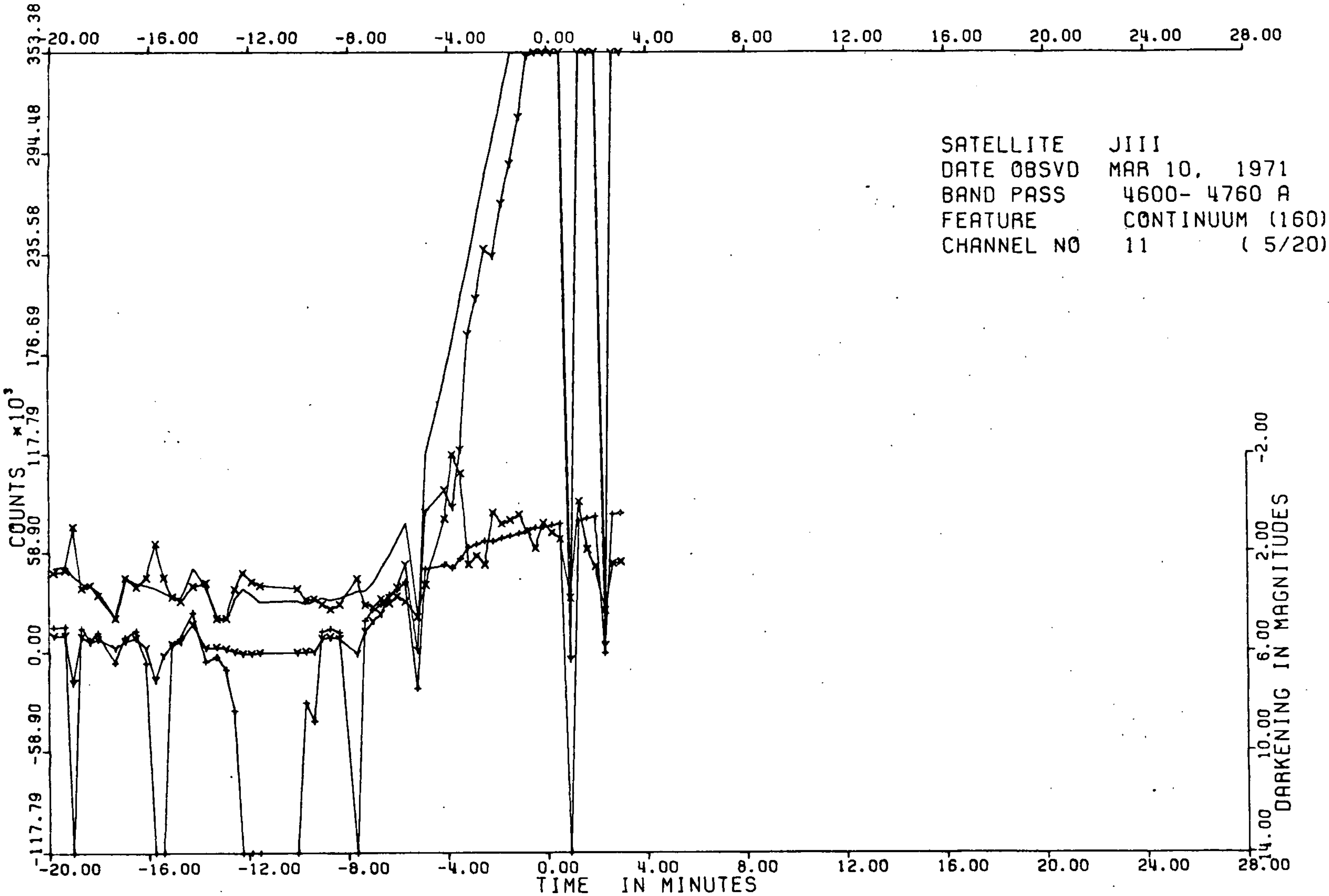

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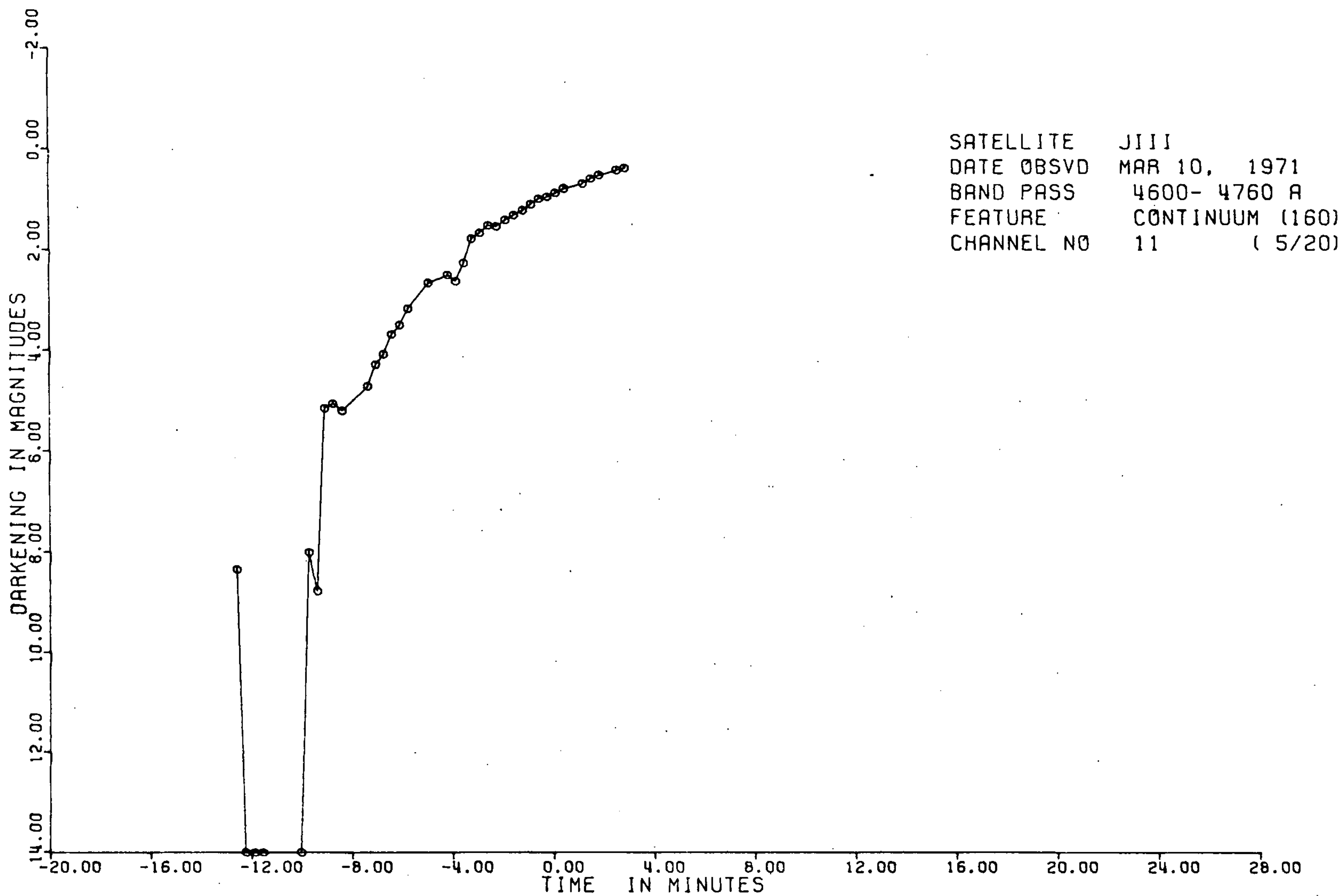

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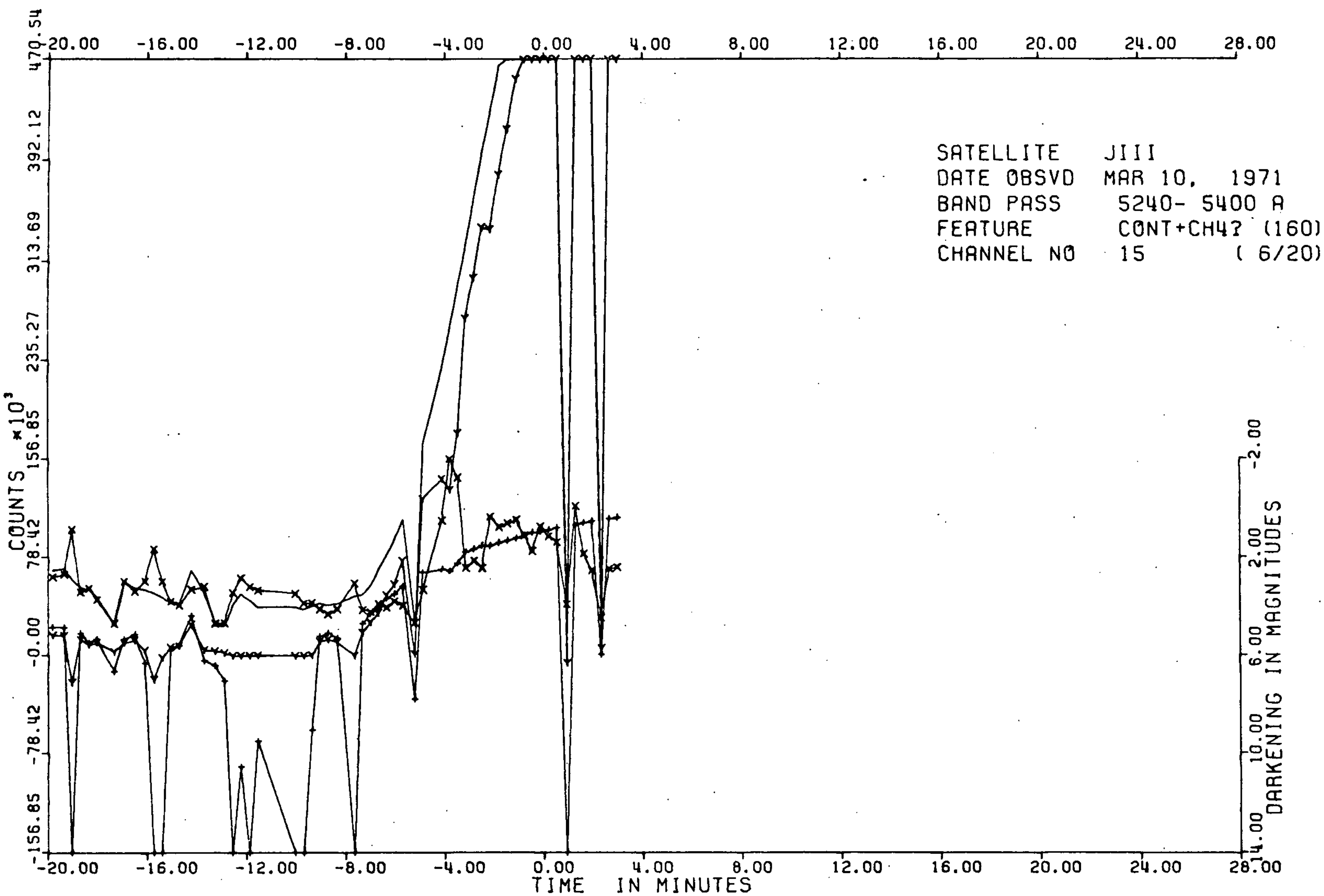

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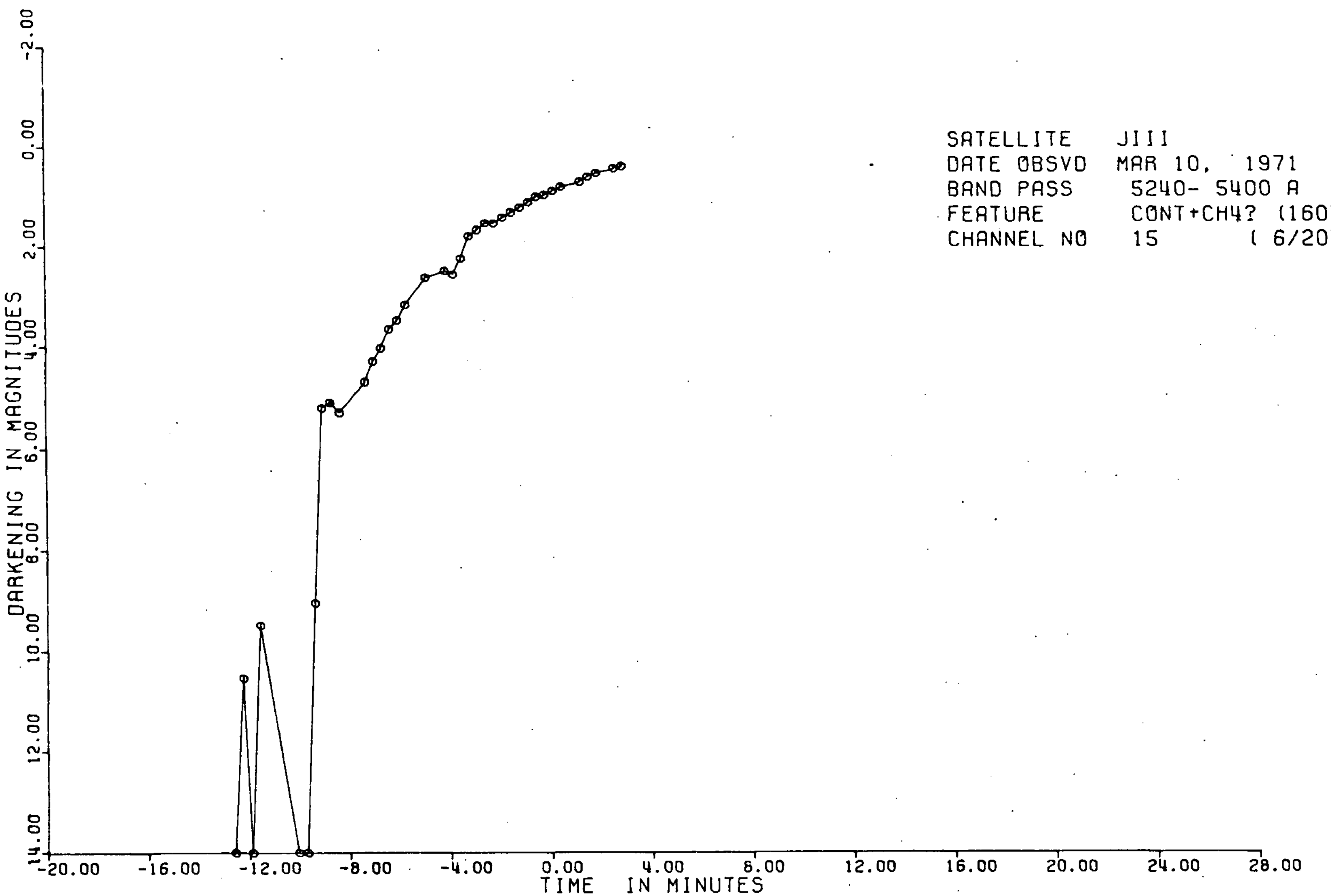

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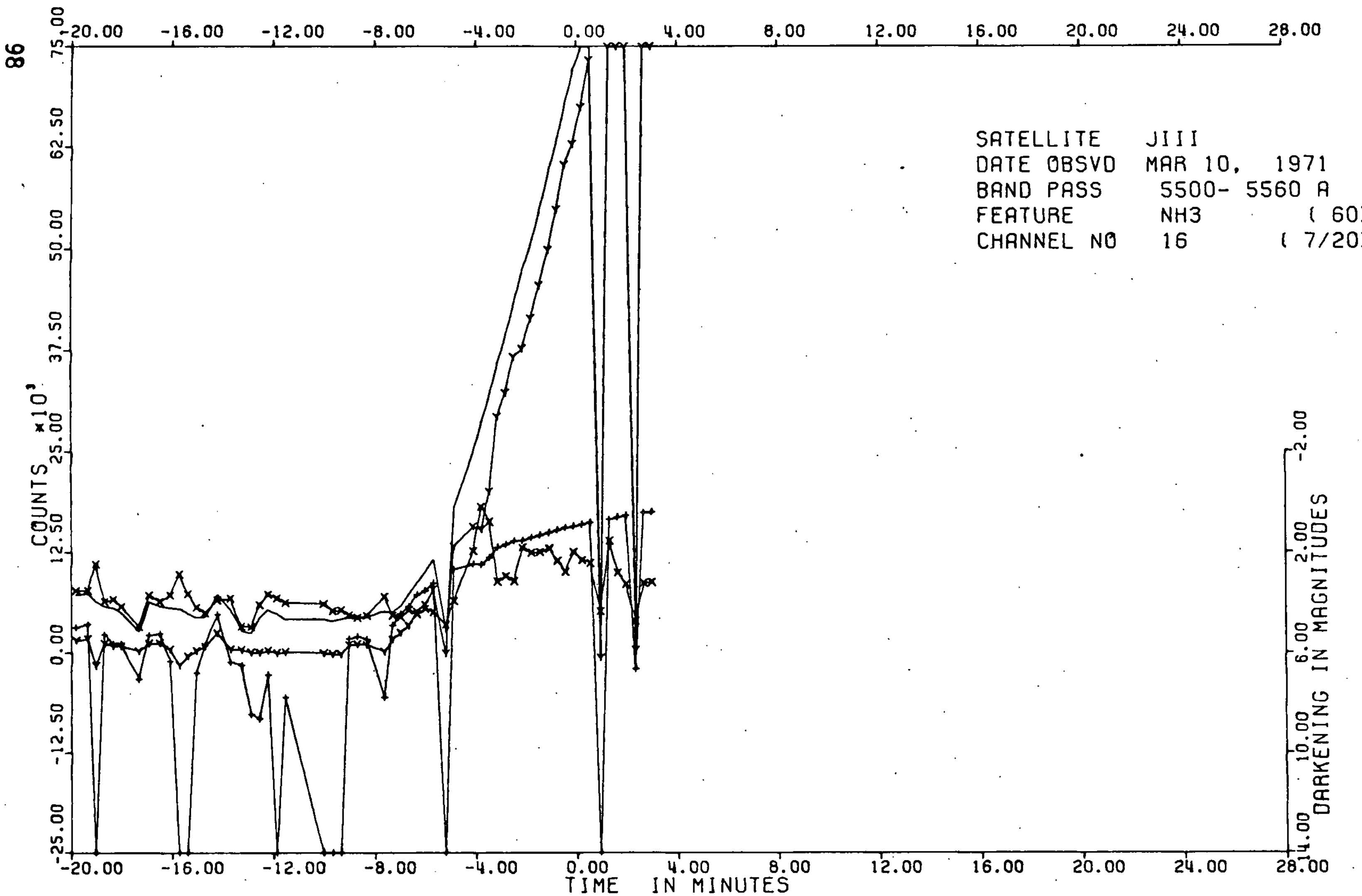

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JOVIAN SATELLITE ECLIPSE STUDY I

1971 ECLIPSES

By T. F. Greene, R. W. Shorthill, and L. G. Despain

FINAL REPORT

Prepared under Contract No. NASw-2205 by

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BOEING SCIENTIFIC RESEARCH LABORATORIES

Seattle, Washington 98124

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION - WASHINGTON, D.C.

ABSTRACT

Observations of five Jovian satellite eclipses were obtained during February, March, and April 1971 with the 200-inch Hale telescope and multichannel spectrometer. Eclipse light curves in 20 wavelength bandpasses were obtained for each eclipse. The higher counting rate channels were statisitically significant during 10 magnitudes of darkening. Well developed refractive tails were evident in the April 6 eclipse of Europa.

Preliminary analysis of these data has been performed. The eclipse radius of Europa was found to be 1200 ± 100 km. Employing a Jovian scale height of 10 km, extinction due to an aerosol component homogeneously mixed with the gas above the cloud tops, and total extinction due to cloud tops at the 7.58×10^{18} particle/cc level it was possible to theoretically duplicate the observed eclipse light curves in wavelength bandpasses not characterized by molecular band absorption. A wavelength variation in the aerosol extinction factor was found.

Observations in several channels also manifested the presence of molecular bands. Strong NH_3 and CH_4 absorption was noted in several channels. Evidence is presented supporting the tentative conclusion that the H_2, first-order-forbidden, pressure induced dipole line at λ 6420 Å has been observed. These data will enable new determinations of the abundances of several of the atmospheric constitutents.

KEY WORDS

Jupiter	Io
Eclipse	Europa
Refraction	Ganymede
Jovian Satellites	Scale Height
Satellite Eclipse	Extinction

Rayleigh Scattering

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COVER

The cover photograph shows Ganymede during an eclipse ingress. The trailing limb of the satellite is just crossing the penumbra-umbra boundary. After this configuration, the satellite is illuminated only by refracted light. Ganymede may also be observed during eclipse egress prior to occultation.

LIST OF FIGURES

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LIST OF TABLES

PART ONE

I. INTRODUCTION

Telescopic observations of the planet Jupiter at visual and near infrared wavelengths reveal a series of banded structures. These belts and zones vary in brightness with zenographic longitude and latitude, with time and with wavelength. In addition, they exhibit fine structure. At times the surface clouds show a pattern or regularity in their variations and multiple velocities have been observed indicating a shear velocity within the visible surface. These data point to a diversity of composition and structure within the visible layers.

Spectrographic observations of Jupiter have revealed the existence of minor amounts of Methane and Ammonia. In addition, the quadrupole rotation-vibrational lines of molecular hydrogen confirm the existence of H_2. Further species have not yet been detected spectroscopically even though there is strong reason to expect other gasses. The earth's atmosphere makes observations of these constituents difficult. Either they are hidden by telluric lines and bands or the features are too weak to be detected by normal incidence observations.

Other methods for determining the composition and physical structure of the atmosphere of Jupiter include observations of spacecraft and stellar occultations and observation of eclipses of the Galilean satellites. Flyby orbiter and direct entry probes could, of course, also be employed. The Pioneer and Outer Planet Exploration programs of NASA are pursuing these approaches. The σ-Arietis and the recent β-Scorpius occultations by Jupiter illustrate the occultation approach.

The more frequent phenomena are the Galilean Satellite Eclipses. While traditional spectroscopic measurements of the Jovian atmosphere at normal incidence reach to the cloud tops and occultations sample the very upper layers, eclipse measurements probe the atmosphere tangentially right at the cloud tops and thus enable observations with several times the integrated column density available in normal incidence observations. Thus the eclipse technique has the potential to reveal new details of the Jovian atmosphere. In order to obtain narrow band (40-360 Å) eclipse measurements, a large aperture telescope and a fast response photoelectric spectrometer are necessary. This is true because the most informative portion of the eclipse light curve is that between 10th and 15th magnitudes. In addition, this portion of the light curve is very short lived.

The primary purpose of the <u>Jovian Satellite Eclipse Study I</u> was to obtain and document observations of five Galilean satellite eclipses in 1971 and to perform reduction of this data. The results of this study are contained in the present volume.

Section II illustrates the effect of the various physical parameters on the eclipse light curve. In the next two sections the equipment and measurement procedures are detailed. The satellite absolute flux calibrations follow. Details on the techniques employed in reducing the raw data to eclipse light curves, and the method for calculating theoretical light curves are then presented. Finally the theoretical and observational studies are combined and a number of preliminary conclusions derived. A radius for Europa, and a Jovian atmosphere scale height are deduced. An aerosol extinction factor is derived from measurements at two wavelengths and the altitude of the cloud top is determined. The observed absorption features are tabulated and a number of additional data reduction tasks are outlined.

II. SATELLITE ECLIPSE DESCRIPTION

In this section the significant physical parameters determining the shape of a Jovian satellite eclipse light curve are briefly introduced. For a detailed description, see Price (1970). From geometrical considerations, the best configuration for observing a Galilean satellite eclipse is quadrature. The phase angle (planetocentric angle between the Sun and Earth) is at its maximum, approximately 11° and the satellites enter and exit the shadow cone at the greatest angular distance from the limb of Jupiter. Ingress eclipse light curves are experimentally easier to observe in that the satellite may be acquired before the onset of the eclipse. Egress eclipse light curves are of interest because they enable study of the sunrise terminator but are more difficult to obtain because the satellite is not visible initially and off-set finding procedures must be used for acquisition of the satellite. Hence eclipses at western quadrature (before opposition) have been observed more frequently. Table II-1 lists several physical data describing the satellites JI through JIV.

TABLE II-1 PHYSICAL DATA OF THE JOVIAN SATELLITES AND JUPITER*

Name	Magnitude At Opposition (m_v)	Distance From Primary (Jovian Radii)	Sidereal Period (days)	Radius (km)
Io (JI)	+5.52	5.92	1.769	1670
Europa (JII)	+5.67	9.40	3.551	1460
Ganymede (JIII)	+5.18	15.00	7.154	2550
Callisto (JIV)	+6.20	26.39	16.69	2360
Jupiter	-2.50	5.203 (Au)	11.862 (years)	71,350

*Allen (1962)

During an eclipse a satellite first passes into the penumbra. The shape of the eclipse light curve during this portion of the eclipse is determined almost totally by the geometry of the problem i.e., by the sun and satellite diameters and distances from Jupiter. In the umbra the satellite would be totally dark if Jupiter had no atmosphere. (See cover picture.) However, Jupiter has an atmosphere which refracts the light so that the satellite remains visible after passing totally into the umbra. The shape of this "refractive tail" on the eclipse light curve contains a great deal of information about the Jovian atmosphere. The remainder of this section is a qualitative description of the effect of each of the significant parameters on the light curves. Graphical data are employed. They were obtained in part from our own calculations performed in the manner described in Section VII and in part from Price (1970).

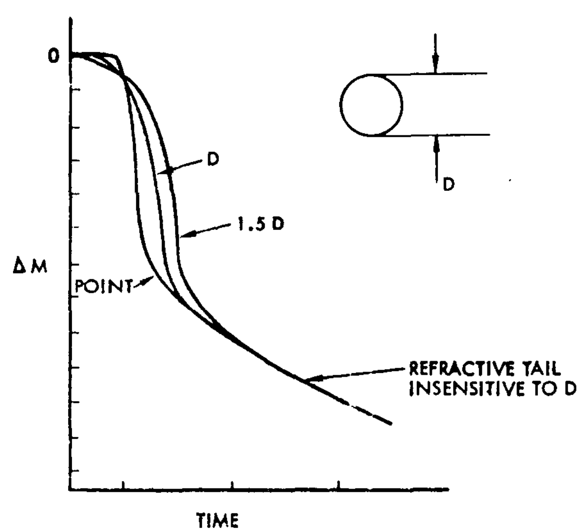

Figure II-1 Effect of Satellite Diameter on the Eclipse Light Curve (Price 1970)

1) Satellite Radius. Figure II-1 shows the effect of the satellite radius on the eclipse light curve. In the case of a point satellite,

the slope is steep but finite due to the finite diameter of the sun.

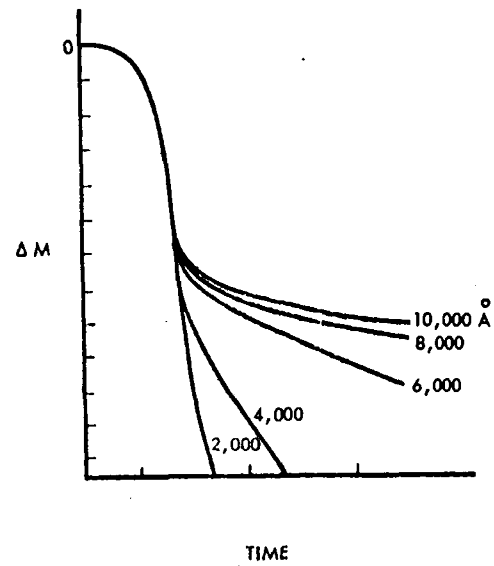

Figure II-2 Effect of Rayleigh Scattering for Various Wavelengths (Price 1970)

2) Rayleigh Scattering. One major extinction mechanism attenuating a ray as it passes tangentially through the Jovian atmosphere is Rayleigh scattering. Given the Hydrogen and Helium number densities versus altitude, the Rayleigh scattering cross sections, versus wavelength, are easily calculated. Figure II-2 shows the effect of different amounts of Rayleigh scattering stemming from variation of the wavelength of the light in which the satellite is viewed.

3) Scale Height. Figure II-3 shows the effect of the Jovian atmosphere scale height on the refractive tail. The angle of refraction through which a ray is bent depends inversely on the square root of the scale height, and on the closest approach elevation. Hence the shape of the refractive tail on the light curve is readily understood to be influenced by the scale height.

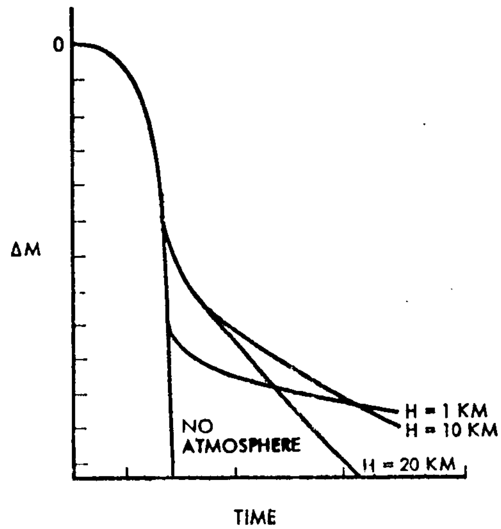

Figure II-3 Effect of Scale Height on the Eclipse Light Curves for a Fixed Wavelength (Price 1970)

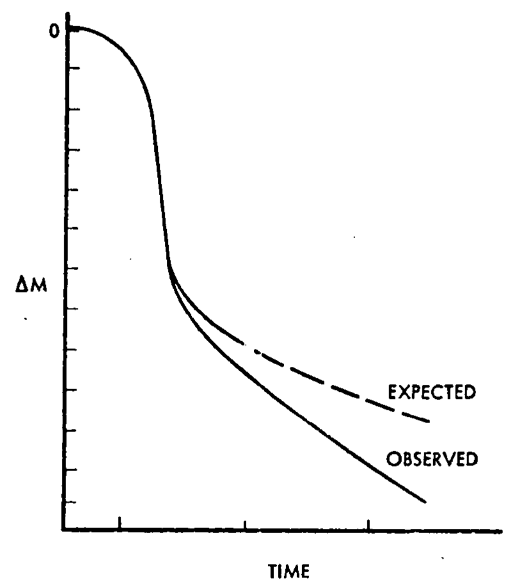

Figure II-4 Effect of Additional Aerosol Extinction on the Expected Refractive Tail

4) Additional Extinction Due to Aerosols. It has been found necessary to invoke an additional extinction component to match our observed eclipse light curves with theoretical curves. If the ratio of aerosol and gaseous particles is constant throughout the atmosphere the effect of aerosol extinction has exactly the same form as that of Rayleigh scattering. See Figure II-4. The wavelength variation of this additional extinction component will yield the size parameter (π x Particle diameter/λ) variation of the aerosol particle extinction efficiency factors.

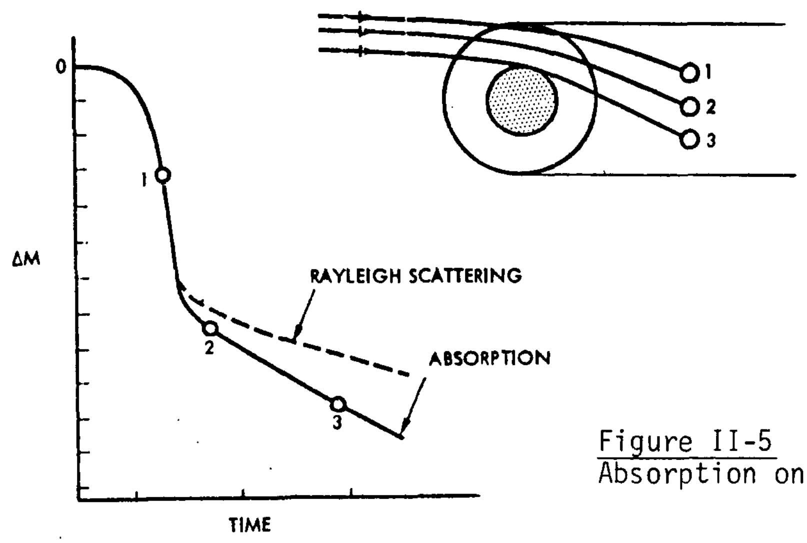

Figure II-5 Effect of Molecular Absorption on the Refractive Tail

5) Additional Extinction Due To Molecular Absorption Bands. In particular bands additional extinction occurs due to absorption. The difference between the Rayleigh-plus-aerosol-continuum and the actual eclipse light curve in an absorption band enables determination of the absorbing specie number density, presuming the curve-of-growth is known. Figure II-5 illustrates this effect.

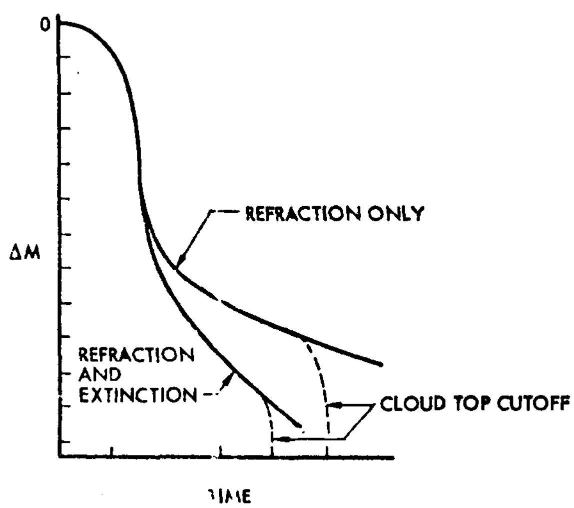

Figure II-6 Effect of Cloud Top Cutoff on the Refractive Tail

(6) Cloud Top Cutoff. A ray traversing tangentially through the atmosphere of Jupiter may get to a low enough altitude, at closest approach, to

be totally extinguished by the cloud tops. This terminates the refractive tail and is illustrated in Figure II-6.

In principal, the ray might also be terminated by critical refraction--the situation in which the ray is refracted with a smaller radius of curvature than the planet radius. The observational effect would be exactly the same as with cloud top cutoff.

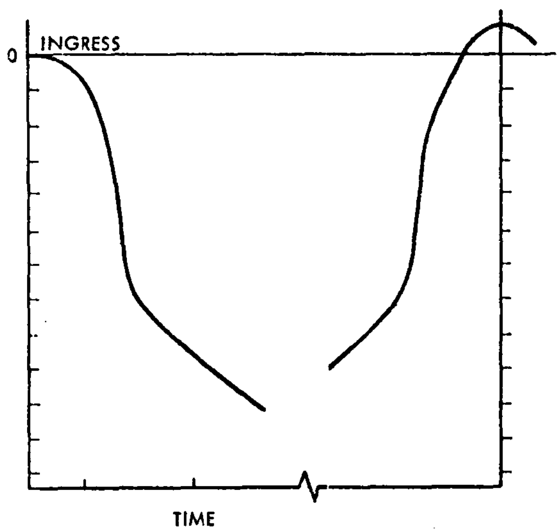

Figure II-7 Effect of the Albedo Change Producing Anomolous Post Reappearance Brighting

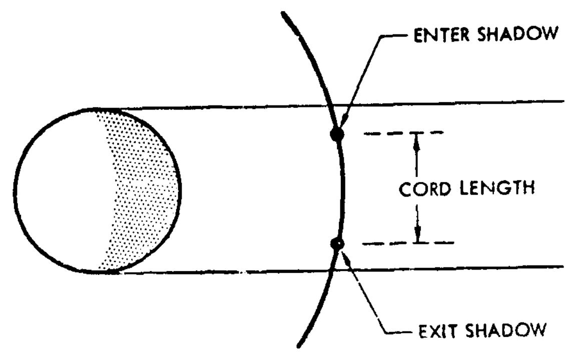

Figure II-8 The Shadow Chord Length Determined from Ingress/Egress Observations

7) Satellite Albedo and Anomalous Reappearance Brightening. If the satellite reflectivity should increase during immersion in the shadow the satellite might reappear with a greater brightness than prior to disappearance. In principal, detection of such brightening is possible from reappearance data. See Figure II-7.

8) Jovian Figure Determination. Figure II-8 illustrates how knowledge of the precise duration of a satellite eclipse may lead to a determination of the chord length of the shadow cone, and hence of the Jovian disk.

III. EQUIPMENT

The 200-inch Hale telescope and the 33-channel photoelectric spectrometer were used in this study to measure the eclipse light curves. The spectrometer optical system and associated electronic equipment are described by Oke (1969). The spectrometer is designed for operation at the Cassegrain focus. The data were recorded on punched cards and printed paper tape. Selected wavelength counters were also recorded on video tape. The punched card mode was used during the non time-critical portions of the measurements. The printed paper tape mode was employed at all times, and the video tape mode was employed only during the actual eclipses. An audio tape machine recorded voice remarks from the data room and from the observer in the Cassegrain cage on one channel and WWV on the other channel. Audio recordings were made at all times, including set-up and calibration periods.

A. Multichannel Photoelectric Spectrometer

Only a brief description of the spectrometer will be given here. The spectrometer operates in the wavelength region 3100 to 11,000 Å. Although there are 33 photomultiplier channels available, only 20 were used because only 20 sets of dual pulse counters were available. The wavelength interval is divided into two regions, 3100 to 5600 Å (reffered to as blue)and 5600 to 11,000 Å (referred to as red). In the blue region, the 17 photomultipliers have acceptance bands 160 Å wide; while in the red region, the 16 photomultipliers have acceptance bands 360 Å wide. In the focal plane of the spectrometer camera, a mask or decker can be inserted so that any restricted wavelength interval within each of the bands in the red or blue can be measured. Various standard "Oke-decker" patterns are available in the red and blue with 20, 40, 80, 160 and 360 Å slots. The grating can also be rotated so that a spectral scan is obtained. For the eclipse measurements, special red and blue "Boeing-deckers" were constructed. On February 8, the specially designed Boeing red decker was used but the blue decker could not be inserted into the spectrometer and the 160 Å band, blue Oke decker #4 was used during that eclipse. For the March and April eclipses the Boeing deckers were used in both the red and blue.

There are dual entrance apertures to the spectrometer separted by 40 arc seconds. A choice of entrance aperture diameters is available as shown in Table III-1. A chopper behind these entrance apertures alternately admits light from first one and then the other aperture at 30 Hz (see Figure VI-2), and the counts from each aperture are electronically separated. Various integration times may be selected. In addition to the counts, which are printed out for each aperture and the 20 selected channels, other information such as integration time, the grating position, entrance aperture number, decker number, right ascension, declination, date, sidereal time, civil time, and certain alphameric identifications can be selected for printing and/or punching.

Controls for the multichannel spectrometer and the data systems are located both in the data room and at the Cassegrain focus. Nixie tube displays are located in the data room for the 20 selected channels

TABLE III-1 SPECTROMETER INSTRUMENT ENTRANCE APERTURES

NO.	DIAMETER (Sec arc)	DIAMETER (mm)
0	--	--
1	2.03	0.79
2	3.58	1.39
3	5.04	1.96
4	6.94	2.70
5	9.92	3.86
6	14.05	5.46
7	20.00	7.77

Separation of holes = 40.00 sec arc = 15.57 mm

Except for No.1, apertures increase in area by very nearly factors of 2.0

along with time, telescope position, spectrometer and data system status. An abbreviated display is located at the Cassegrain focus.

B. Additional-Recording Systems

A two channel audio tape recorder was employed to keep a log of all checkout and calibration procedures which began about midnight for each eclipse. One channel recorded the output of the intercommunication system between the Cassegrain cage and the data room, plus all the activities in the data room. A second channel was used to record WWV received at 5 Mc. This system was found particularly useful in that a few deviations were made from the planned observing sequence of events during the experiment which were not written down at the time. In addition to audio recording, a TV camera and TV recording system was used. The most important channels in the red and blue, and civil and sideral time were displayed on Nixie tubes within the field of view of the TV system. During the actual eclipses, only the printed paper tape data recording mode was used because the card punch was slower, requiring $\sim$15 seconds to punch a series of observations after each 10 second integration period. The printed paper tape required only 8 seconds to print after each 10 second integration period. In the event of a printer system failure the video tape backup data system would have enabled data retrieval in several important channels. In addition, a standby printer was available. During the 3 nights of observation when the tape printer was in continual operation there was no failure of this or any other electronic system.

IV. MEASUREMENTS

Introduction

Four satellite ingress and one satellite egress eclipses were observed at 20 different wavelength bands making a total of 100 eclipse light curves. The 20 wavelength bands were slightly different for the three observation periods. The choice of continuum bands and expected features were, in general, determined from the literature (Kiess et al., 1960; Spinrad, 1963; Owen, 1967; Spinrad and Trafton, 1963; and Taylor, 1965).

After the discriminator curves of the photomultiplier tubes were checked for each channel, an alternate choice of channels was sometimes necessary because of a bad tube. Several spare wavelength band passes were built into the deckers in view of this possibility. Table IV-1 lists the satellite eclipses that were observed in 1971. Each observation included observations of the star HD 140283. This star was employed as a standard star (Oke, 1971). Typically a measurement sequence consisted of the following events: reduce the telescope aperture to nominally 100-inches, next observe the calibration star, then observe the eclipse until the light level reaches a predetermined value, then open the telescope to full aperture (200-inches) and observe the remainder of the eclipse. Finally the standard star was again observed at the 200 inch aperture.

The dust cover mechanism on the 200-inch telescope can be used to reduce the collecting area of the primary mirror. It was necessary to

TABLE IV-1 SATELLITE ECLIPSE OBSERVATIONS OF JI, JII, & JIII

DATE (1971)	SATELLITE	ECLIPSE TIME (PST)	R_x*	R_y*	AIR† MASS	SPECTROMETER ENTRANCE APERTURE (ARC SEC)
February 8	JII (Europa)	Ingress 5:39 am	-2.6	-0.5	1.8	6.94
March 10	JIII (Ganymede)	Ingress 2:56 am	-3.2	-0.8	2.0	14.05
		Egress 5:10 am	-2.0	-0.8	1.7	14.05
April 6	JII (Europa)	Ingress 2:22 am	-2.1	-0.5	1.8	5.04
	JI (Io)	Ingress 4:02 am	-1.8	-0.3	1.8	3.58

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* R_x = Distance in Jovian radii from disk center, Eastward (parallel to equator of Jupiter) to eclipse location

* R_y = Distance in Jovian radii from disk center, Northward (parallel to axis of Jupiter) to eclipse location

† Air Mass = Air mass of Jupiter from Palomar at eclipse time

reduce the telescope aperture to a value between 90 and 100 inches during the early stages of the eclipse ($m_V \sim 5$) to prevent saturation of the photomultiplier tubes in the multichannel spectrometer. When the brightness of the eclipsing satellite was sufficiently reduced, the dust cover was opened completely permitting measurements of the satellite to continue to much lower light levels ($m_V \sim 15$). The brightness of HD 140283 is $m_V = 7.3$ so that observation at full aperture presented no saturation problem.

Calibrations using the standard star were performed each night using the Oke red #2 and blue #1 deckers and the Boeing red and blue deckers. Spectral scans were made once each night in 10 Angstrom steps in the blue and 20 in the red. Subsequent calibrations during the night were then made with the grating fixed in the nominal position (500).

For each series of observations a judgment of the seeing conditions was made and the smallest usable spectrometer instrument aperture selected (see Table III-1). The instrument aperture setting was reduced when seeing conditions permitted.

In order to evaluate the sky background around the satellite, periodically during the eclipse, the object aperture was: 1) moved off the satellite toward Jupiter, 2) moved back on the satellite,

3) moved off on the side away from Jupiter, 4) then moved back on. Measurements were made at all four positions. Extrapolation between the two readings from the object-aperture adjacent to the satellite could then give the background sky at the satellite position. This procedure is referred to as a "spatial scan" in subsequent descriptions.

A. February 8, 1971 Observation of Europa

This was the first eclipse observation so that particular care was taken in calibration procedures and experimental techniques. Table IV-2 lists the sequence of events. Here a few explanations of the abbreviations are given: the *Oke decker Red #2* has 40 Angstrom slits for each channel. The *Oke decker Blue #4* has 160 Angstrom slits (wide open) for each channel. The term *N/S aperture #5* refers to the orientation of the two spectrometer instrument apertures. The number refers to one of the apertures listed in Table III-1. The object-aperture is the one in which the object is being observed. For example, in Table IV-2, at time 00:57, *Observe Uranus, grating (400,20,600) S Aperture #5,* means: with the telescope closed down to 100 inches and Oke decker Red #2 and Blue #1 in place, measurements at 10 second integration intervals were taken with *Uranus* in the south aperture. The instrument aperture diameter was 9.92 arc seconds. The grating was set at reading 400 (100 Angstroms below the nominal position) and a data count taken. The grating was then rotated to reading 420 and a data count taken.

TABLE IV-2 SEQUENCE OF EVENTS FOR FEBRUARY 8, 1971 OBSERVATIONS OF JII (EUROPA)

TIME (PST)	EVENT
00:00	Check out equipment, final selection of channels
	• Close telescope to 100-inch (1st setting)
	Set on Uranus, estimate seeing, determine spectrometer entrance aperture
	Obtain 16 mm movie sequence
00:57	Oke decker Red #2, Blue #1, integration time 10 sec
	Observe Uranus, grating (400,20,600)* S aperture #5
	Observe Uranus, grating (600,20,400), N aperture #5
01:25	Boeing decker Red #0, Oke decker Blue #4
	Observe Uranus, grating (480,10,520) N aperture #5
	Observe Uranus, grating (520,10,480) S aperture #5
01:36	Rehearse satellite eclipse sequence with printer only, video tape recorder, etc.
02:04	Oke decker Red #2, Blue #1
	Observe Uranus, grating (400,20,600) S aperture #5
	Observe Uranus, grating (600,20,400) N aperture #5
02:24	Boeing decker Red #0, Oke decker Blue #4
	Practice satellite eclipse sequence
02:54	Observe HD 140283, grating (480,10,520) N aperture #5
	Observe HD 140283, grating (520,10,480) S aperture #5
03:02	Oke decker Red #2, Blue #1

TIME (PST)	EVENTS
	Observe HD 140283, grating (400, 10,600) N aperture #5
	Observe HD 140283, grating (600, 10,400) S aperture #5
03:26	• Open telescope to 200-inch
	Boeing decker Red #0, Oke decker Blue #4
	Observe HD 140283, grating (500) N/S aperture #5
04:16	• Close telescope to 100-inch (2nd setting)**
	Observe HD 140283, grating (500) N aperture #5
	Observe HD 140283, grating (500) S aperture #5
04:19	Set on JII (Europa), estimate cage rotation, move to zenith rotate cage, 16 mm sequence, Boeing decker still in position, grating set at (500)
	Observe JII, practice eclipse routine, on JII; off JII, toward Jupiter; on JII; off JII away from Jupiter.
04:30	Observe HD 140283, grating (500) S aperture #4
	Observe HD 140283 grating (500) N aperture #4
04:40	Set on JII, practice eclipse sequence
05:01	Observer HD 140283, grating (500) S/N aperture #4
05:10	Set on JII, Boeing decker, grating (500), 100-inch (2nd setting)
	JII Eclipse Sequence 10 sec integration time, S aperture #4
	Repeat spatial scan-observe sequence:
	(a) $0^m\ 0^s$ start a single counting sequence

TIME (PST)	EVENT
	(b) $0^m\ 18^s$ move toward Jupiter one aperture diameter (14 arc second)
	(c) $0^m\ 28^s$ count
	(d) $0^m\ 46^s$ move back on JII
	(e) $0^m\ 56^s$ count
	(f) $1^m\ 14^s$ move off JII away from Jupiter one aperture diameter (14" arc second)
	(g) $1^m\ 24^s$ count
	(h) $1^m\ 42^s$ move back on JII
	(i) $1^m\ 52^s$ count
	(j) $2^m\ 10^s$ repeat count approximately every 18 seconds
	(k) $6^m\ 56^s$ repeat sequence (a) through (j)
05:30	Repeat above sequence until counts on channel 17 drop below 250,000 and then,
05:40	Open telescope to 200-inch aperture
	Continue to observe JII
05:53	End eclipse observation
05:54	Observe HD 140283 grating (500) S/N aperture #4
05:58	Conclude measurements

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* (grating 400,20,600) = Move grating in steps of 20 from 400 to 600. Some notation used for steps of 10 between other limits.

**For telescope apertures other than full (200-inch) it is not possible to set with precision. Calibrations must be performed for each aperture less than 200. The notation 1st, 2nd . . . setting is employed in all Tables.

FEBRUARY 8 1971 WAVELENGTH BANDS OBSERVED JII EUROPA

BAND PASS ANGSTROMS	FEATURE EXPECTED	BAND WIDTH	CHAN. NO.	SEQUE. NO.	DKER TYPE	PHOTO.TUBE TYPE(SURFACE)	DECKER USED FOR OBSERV.
3160- 3320 A	CONTINUUM	(160)	2	(1/20)	/BLUE	ASCOP 641A	1 OKE DKER
3320- 3480 A	CONTINUUM	(160)	3	(2/20)	/BLUE	ASCOP 641A	2 OKE DKER
3640- 3800 A	CONTINUUM	(160)	5	(3/20)	/BLUE	ASCOP 641A	3 OKE DKER
4120- 4280 A	CONTINUUM	(160)	8	(4/20)	/BLUE	ASCOP 641A	4 OKE DKER
4600- 4760 A	CONTINUUM	(160)	11	(5/20)	/BLUE	ASCOP 641A	5 OKE DKER
5240- 5400 A	CONT+CH4?	(160)	15	(6/20)	/BLUE	ASCOP 641A	6 OKE DKER
5400- 5560 A	NH3+CH4	(160)	16	(7/20)	/BLUE	ASCOP 641A	7 OKE DKER
5560- 5720 A	CONT+NH3?	(160)	17	(8/20)	/BLUE	ASCOP 641A	8 OKE DKER
6290- 6360 A	CONTINUUM	(70)	19	(9/20)	/ RED	FW130 (S20)	9 BOE DKER
6400- 6440 A	H2 DIPOLE	(40)	20	(10/20)	/ RED	FW130 (S20)	10 BOE DKER
6800- 6900 A	CH4 WEAK	(100)	21	(11/20)	/ RED	FW130 (S20)	11 BOE DKER
7130- 7400 A	CH4 STRONG	(270)	22	(12/20)	/ RED	FW130 (S20)	12 BOE DKER
7440- 7550 A	CH4 PREDCT	(110)	23	(13/20)	/ RED	FW130 (S20)	13 BOE DKER
7920- 8035 A	NH3	(115)	24	(14/20)	/ RED	FW130 (S20)	14 BOE DKER
8160- 8360 A	H2O PREDCT	(200)	25	(15/20)	/ RED	FW130 (S20)	15 BOE DKER
9080- 9150 A	H2S +CH4?	(70)	27	(16/20)	/ RED	FW118 (S1)	16 BOE DKER
9240- 9280 A	CONTINUUM	(40)	28	(17/20)	/ RED	FW118 (S1)	17 BOE DKER
9960-10320 A	CH4	(360)	30	(18/20)	/ RED	FW118 (S1)	18 BOE DKER
10320-10680 A	CONTINUUM	(360)	31	(19/20)	/ RED	FW118 (S1)	19 BOE DKER
10680-11040 A	CONT+CH4	(360)	32	(20/20)	/ RED	FW118 (S1)	20 BOE DKER

TABLE IV-3

This procedure was continued up to grating setting 600. For example, on Channel #5 at grating reading 460 the wavelength interval measured was $\lambda\lambda$ 3660 to 3680 Angstroms.

Spectral scans were made of Uranus using the two sets of deckers. The purpose was to observe the H_2 dipole line and check the wavelength position of the Boeing deckers.

The wavelength bands observed February 8 are listed in Table IV-3. Several column headings are explained:

CHAN. NO. is the photomultiplier channel sequence number from shortest wavelength (blue) to longest wavelength (red).

SEQUE. NO. is the sequence number assigned to the channel.

DECKER USED FOR OBSERV. is the decker type used for the observation. The number is the physical order in which the Nixie tube display was arranged in the data room and the order in which that data were printed out on the printed paper tape.

B. March 10, 1971 Observation of Ganymede

This was the second eclipse observation so that experience from the earlier observation resulted in some changes in experimental procedures. Table IV-4 lists the sequence of events. In addition to a spectral scan of Uranus, one of Neptune was also accomplished to further

TABLE IV-4 SEQUENCE OF EVENTS FOR MARCH 10, 1971 GALILLEAN SATELLITE ECLIPSE OBSERVATIONS JIII (GANYMEDE)

TIME (PST)	EVENT
00:00	Check equipment, ice spectrometer, rotate spectrometer, dark current readings
00:30	• Close telescope to 100-inch (1st setting)
	Oke decker Red #2, Blue #1, integration time 10 sec
00:43	Observe Uranus, grating (400,20,600) N/S aperture #6
00:55	Observe Sky 10 arc second N of Uranus, grating (500)
01:00	Boeing decker Red #0, Blue #0
	Observe Uranus, grating (460,20,500) N/S aperture #6
	Observe Sky, 10 arc second N of Uranus, grating (500)
01:28	Observe HD 140283, grating (500) N/S aperture #6
	Oke decker Red #2, Blue #1
	Observe HD 140283, grating (400,20,600) N/S aperture #6
	• Open telescope to 200-inch
01:51	Observe HD 140283, grating (500), N/S aperture #6
	Boeing decker Red #0, Blue #0
01:55	Observe HD 140283, grating (500), N/S aperture #6
	• Close telescope 100-inch (2nd setting)
02:00	Observe HD 140283, grating (500), N/S aperture #6
	Check rotation of spectrometer on JIII
02:11	Observe JIII grating (500), N/S aperture #6

TIME (PST)	EVENT
02:13	• Close telescope to 90-inch (1st setting)
	Observe JIII grating (500), N/S aperture #6
02:17	Observe HD 140283, grating (500), N/S aperture #6
02:24	Observe JIII, grating (500)
02:28	JIII Eclipse Sequence (background determination included)
	• Every 5 min move off JIII 14 arc second toward Jupiter, then count, move back to JIII, then count, move off JIII 14 arc second away from Jupiter, then count, move back to JIII, then count, continue to count
	Note when count down by a factor of 10 in channels 22 & 11
03:02	• Open telescope to 200-inch
	Continue counting well into umbra
	Repeat background determination
03:13	Oke decker Red #2, Blue #1
	Observe JIII (not now visible) grating (400,20,600) S aperture #6
03:35	Boeing decker Red #0, Blue #0
	Observe scattered light, grating (500) aperture #6
	Move 20 arc second from Jupiter's limb, count
	Move in 20 arc second steps away from Jupiter, count repeat 4 times
03:38	Observe HD 140283, grating (500), N/S aperture #6
03:41	Close telescope to 100-inch (3rd setting)

TIME (PST)	EVENT
	Observe HD 140283, grating (500), N/S aperture #6
03:50	Observe Neptune, grating (460,20,540), N/S aperture #6
	Oke decker Red #2, Blue #1
03:58	Observe Neptune, grating (460,20,540), N/S aperture #6
04:27	Observe HD 140283, grating (500), N/S aperture #6
	Boeing decker Red #0, Blue #0
04:33	Observe HD 140283, grating (500), N/S aperture #6
	• Open telescope to 200-inch
04:37	Observe HD 140283, grating (500), N/S aperture #6
04:39	• Close telescope to 100-inch (4th setting)
	Observe HD 140283, grating (500), N/S aperture #6
04:49	Observe JIII, grating (500), S aperture #6
	JIII Eclipse Egress Sequence
	Every 5 min (same as 02:30 sequence)
05:12	Observe JIII, grating (500), S aperture #5, count once
05:15	Observe HD 140283, grating (500), S/N aperture #6
	• Close telescope to 90-inch (2nd setting)
05:18	Observe HD 140283, grating (500), S aperture #5, count twice
05:21	Observe JIII, grating (500), S aperture #5
05:23	Conclude JIII Egress sequence
05:24	Observe Scattered light radially away from Jupiter
05:26	Take dark count, rerun discriminator curves
05:54	Conclude measurements

verify the location of the H_2 dipole band. Since Ganymede (JIII) was brighter than JII the telescope aperture had to be reduced to 90 inches for the initial portion of the eclipse. During the totality phase of the satellite eclipse a search was made for any extraneous emission from Jupiter's nighttime side by scanning JIII in wavelength. Several measurements were conducted to evaluate the effects of scattered light from Jupiter.

The telescope was set at the 100-inch aperture setting to observe the egress of Ganymede instead of starting at full aperture (200-inch). This was done to avoid loss of time in closing the telescope down to a smaller aperture when the satellite brightness reached a level that would saturate the photomultipliers. Also, because of twilight, a calibration of the standard star might have been difficult. An analysis of the data has shown observation well into twilight is possible so that subsequent observations can be made for longer periods.

Table IV-5 lists the wavelength band used for Ganymede. The Boeing decker Blue #0 was altered to fit the spectrometer. For this observation, channel number 16 was 60 Angstroms wide to observe the NH_3 band and channel number 17 was 120 Angstroms wide to better fit the continuum than the channel used in February. Channel number 18, which had not been functioning previously was used so that the continuum and CH_4 could be observed together in a 360 Angstrom band. This was the only night that channel number 18 was used. The order

TABLE IV-5

MARCH 10 1971 WAVELENGTH BANDS OBSERVED JIII GANYMEDE

BAND PASS ANGSTROMS	FEATURE EXPECTED	BAND WIDTH	CHAN. NO.	SEQUE. NO.	DKER TYPE	PHOTO.TUBE TYPE(SURFACE)	DECKER USED FOR OBSERV.
3160- 3320 A	CONTINUUM	(160)	2	(1/20)	/BLUE	ASCOP 641A	1BOE DKER
3320- 3480 A	CONTINUUM	(160)	3	(2/20)	/BLUE	ASCOP 641A	4BOE DKER
3640- 3800 A	CONTINUUM	(160)	5	(3/20)	/BLUE	ASCOP 641A	2BOE DKER
4120- 4280 A	CONTINUUM	(160)	8	(4/20)	/BLUE	ASCOP 641A	3BOE DKER
4600- 4760 A	CONTINUUM	(160)	11	(5/20)	/BLUE	ASCOP 641A	5BOE DKER
5240- 5400 A	CONT+CH4?	(160)	15	(6/20)	/BLUE	ASCOP 641A	10BOE DKER
5500- 5560 A	NH3	(60)	16	(7/20)	/BLUE	ASCOP 641A	11BOE DKER
5600- 5720 A	CONTINUUM	(120)	17	(8/20)	/BLUE	ASCOP 641A	12BOE DKER
5640- 6000 A	CONT+CH4	(360)	18	(9/20)	/ RED	FW130 (S20)	6BOE DKER
6400- 6440 A	H2 DIPOLE	(40)	20	(10/20)	/ RED	FW130 (S20)	7BOE DKER
6800- 6900 A	CH4 WEAK	(100)	21	(11/20)	/ RED	FW130 (S20)	13BOE DKER
7130- 7400 A	CH4 STRONG	(270)	22	(12/20)	/ RED	FW130 (S20)	8BOE DKER
7440- 7550 A	CH4 PREDCT	(110)	23	(13/20)	/ RED	FW130 (S20)	14BOE DKER
7920- 8035 A	NH3 PREDCT	(115)	24	(14/20)	/ RED	FW130 (S20)	15BOE DKER
8160- 8360 A	H2O PREDCT	(200)	25	(15/20)	/ RED	FW118 (S1)	16BOE DKER
9080- 9150 A	H2S +CH4	(70)	27	(16/20)	/ RED	FW118 (S1)	17BOE DKER
9240- 9280 A	CONTINUUM	(40)	28	(17/20)	/ RED	FW118 (S1)	18BOE DKER
9960-10320 A	CH4	(360)	30	(18/20)	/ RED	FW118 (S1)	19BOE DKER
10320-10680 A	CONTINUUM	(360)	31	(19/20)	/ RED	FW118 (S1)	9BOE DKER
10680-11040 A	CONT+CH4	(360)	32	(20/20)	/ RED	FW118 (S1)	20BOE DKER

of the physical display of channels was changed so that channels number 3, 8, 11, 18, 20, 22, 31 would be in the field of view of the TV recorder system. This was done so that in the event of a printer failure the most significant data could still be obtained.

C. April 6, 1971 Observation of Io and Europa

April 6 provided the unique opportunity to observe two eclipses, an ingress of JI and an ingress of JII. Table IV-6 lists the sequence of events for the two eclipses. Additional measurements were made to evaluate the scattered light effect from Jupiter and the effect of different spectrometer instrument apertures.

At the conclusion of the second eclipse observation, a series of twilight measurements were made at -23° declination. The purpose of these measurements was to determine the sky brightness under the same conditions that will prevail during an egress of JIV in 1972.

The wavelength bands used for the April 6 observation are listed in Table IV-7. Several changes were made from the February and March wavelength bands. Channel number 13, a continuum plus CH_4 region, was used and the bluest band, 3160 to 3320 Angstroms, was eliminated. Channel number 18, 5640 to 6000 Angstroms, was also eliminated.

In summary, all the planned observations were made. Seeing conditions were not always ideal and are discussed in Section VI, Data Reduction. There was no malfunction of any electronic equipment. During the twilight measurements the wind screen was found to be

TABLE IV-6 SEQUENCE OF EVENTS FOR APRIL 6, 1971

GALILLEAN SATELLITE ECLIPSE OBSERVATIONS JI (IO) AND JII (EUROPA)

TIME (PST)	EVENT
00:00	Check equipment, ice spectrometer, rotate spectrometer, dark current readings
00:12	• Open telescope to 200-inch
	Oke decker Red #2, Blue #1
	Observe HD 140283, grating (370,20,600) S/N aperture #3
01:10	Observe HD 156074, grating (370,390,420,500,550,570,580, 600) S/N aperture #3
01:32	Boeing decker Red #0, Blue #0
	Observe Sky near JII, between JI and JIV, aperture #3
	Check rotation
01:39	• Close telescope to 90-inches (1st setting)
	Observe JI, grating (460, 20, 540) S aperture #2, #3, #1
01:48	Observe JII, grating (500) S aperture #3
01:53	Observe HD 140283, grating (500) S/N aperture #3
01:59	JII Eclipse Sequence, grating (500) S aperture #3
	Every 5 min move off JII toward Jupiter, count
	move back on JII count
	move off JII away from Jupiter, count
	move back on JII, count
	continue count

TIME (PST)	EVENT
	Note when count down by a factor of 8 in channels 22 and 11
02:22	• Open telescope to 200-inch
	Continue counting into umbra
	Repeat background determination
02:43	Complete JII eclipse measurement
02:46	Observe HD 140283, grating (500) N/S aperture #3
03:02	Observe scattered light from Jupiter, grating (500)
	Set aperture #1 move to center Jupiter
	Move in RA one Jupiter radius off W limb, count
	Set aperture #2, count
	Move in RA two Jupiter radii off W limb, count
	Move in RA three Jupiter radii off W limb, count
	Set aperture #3, count
	Move in RA four Jupiter radii off W limb, count
	Set aperture #4, count
	Move in RA five Jupiter radii off W limb, count
	Move in RA six Jupiter radii off W limb, count
03:20	Move in RA three Jupiter radii off W limb
	aperture #1, count
	aperture #2, count
	aperture #3, count
	aperture #4, count
	aperture #5, count

TIME (PST)	EVENT
	Set aperture #6, count
	Set aperture #7, count
03:24	Dark count, 50 second integration time
03:27	Sky evalution
	Aperture #2, count
	Aperture #3, count
	Aperture #4, count
	Aperture #6, count
	Aperture #7, count
	Long Sky count near HD 140283, grating (500) aperture #3, 100 sec integration
03:36	• Close telescope to 90-inch (2nd setting)
	Observe HD 140283, grating (500) N/S aperture #3
03:45	JI Eclipse Sequence, grating (500) S aperture #2
	Every 5 min repeat off and back sequence (see 01:59 position for details)
	Note when count down by factor of 4 in channels 22 and 11, then
04:01	• Open telescope to 200-inch
	Continue counting into umbra
04:16	Complete JI eclipse measurements
	Evaluate Sky near HD 140283
	Sky, grating (500) aperture #7, 100 sec integration

TIME (PST)	EVENT
04:25	Observe HD 140283, grating (500) N/S aperture #2
04:31	Evaluate twilight background at -23° declination, grating (500) N/S aperture #7, continue to count
04:55	Continue count
04:58	Aperture #6, continue count
05:01	Aperture #5, continue count
05:04	Aperture #4, continue count
05:11	Aperture #2, continue count
05:12	Aperture #4, continue count
05:17	Aperture #1, continue count
05:25	Completed measurement, wind screen found to be in field of view at this time
06:36	Concluded measurements

APRIL 6 1971 WAVELENGTH BANDS OBSERVED JI IO, JII EUROPA

BAND PASS ANGSTROMS	FEATURE EXPECTED	BAND WIDTH	CHAN. NO.	SEQUE. NO.	DKER TYPE	PHOTO.TUBE TYPE(SURFACE)	DECKER USED FOR OBSERV.
3320- 3480 A	CONTINUUM	(160)	3	(1/20)/	BLUE	ASCOP 641A	4BOE DKER
3640- 3800 A	CONTINUUM	(160)	5	(2/20)/	BLUE	ASCOP 641A	2BOE DKER
4120- 4280 A	CONTINUUM	(160)	8	(3/20)/	BLUE	ASCOP 641A	3BOE DKER
4600- 4760 A	CONTINUUM	(160)	11	(4/20)/	BLUE	ASCOP 641A	5BOE DKER
4920- 5080 A	CONT+CH4?	(160)	13	(5/20)/	BLUE	ASCOP 641A	1BOE DKER
5240- 54CC A	CONT+CH4?	(160)	15	(6/20)/	BLUE	ASCOP 641A	10BOE DKER
5500- 5560 A	NH3	(60)	16	(7/20)/	BLUE	ASCOP 641A	11BOE DKER
5600- 5720 A	CONTINUUM	(120)	17	(8/20)/	BLUE	ASCOP 641A	12BOE DKER
6290- 6360 A	CONTINUUM	(70)	19	(9/20)/	RED	FW130 (S20)	6BOE DKER
6400- 644C A	H2 DIPOLE	(40)	20	(10/20)/	RED	FW130 (S20)	7BOE DKER
6800- 6900 A	CH4 WEAK	(100)	21	(11/20)/	RED	FW130 (S20)	13BOE DKER
7130- 7400 A	CH4 STRONG	(270)	22	(12/20)/	RED	FW130 (S20)	8BOE DKER
7440- 755C A	CH4 PREDCT	(110)	23	(13/20)/	RED	FW130 (S20)	14BOE DKER
7920- 8035 A	NH3 PREDCT	(115)	24	(14/20)/	RED	FW130 (S20)	15BOE DKER
8160- 8360 A	H2C PREDCT	(200)	25	(15/20)/	RED	FW118 (S1)	16BOE DKER
9C80- 915C A	H2S +CH4	(70)	27	(16/20)/	RED	FW118 (S1)	17BOE DKER
9240- 9280 A	CONTINUUM	(40)	28	(17/20)/	RED	FW118 (S1)	18BOE DKER
9960-10320 A	CH4	(360)	30	(18/20)/	RED	FW118 (S1)	19BOE DKER
10320-1C68C A	CONTINUUM	(360)	31	(19/20)/	RED	FW118 (S1)	9BOE DKER
10680-11040 A	CONT+CH4	(360)	32	(20/20)/	RED	FW118 (S1)	20BOE DKER

TABLE IV-7

partially blocking the field of view and the observation was concluded. However, the eclipse data sought were apparently obtained satisfactorily. So far, we have not been able to ascertain the precise time of wind screen malfunction from the audio tapes. It is felt that it failed after viewing the standard star at the conclusion of the Io observations.

V. CALIBRATIONS

The initial point on each of the light curves obtained during three eclipses has been reduced to an absolute monochromatic flux above the earth's atmosphere. The three eclipses so analyzed were those of Io, April 6, 1971; Europa, April 6, 1971; and the Ganymede ingress, March 10, 1971. The reductions were performed with a code kindly made available to the authors by Dr. J. B. Oke. The results are presented in Table V-1, 2, and 3. It is estimated that the standard deviation of the data in the Magnitude Column does not exceed $\pm$ 0.05 magnitude, except for the data marked with the colon (:), indicating more uncertainty.

TABLE V-1

ABSOLUTE FLUX ABOVE THE EARTH'S ATMOSPHERE

Io, April 6, 1971

BANDPASS CENTER (Å)	MONOCHROMATIC FLUX, MAGNITUDES ($-2.5 \log f_\nu - 48.60$)	LOG MONOCHROMATIC FLUX ($\log_{10} f_\nu$, erg $cm^{-2} sec^{-1} Hz^{-1}$)
3400	10.60 :	-23.68 :
3720	10.03 :	-23.45 :
4200	7.40	-22.40
4680	6.29	-21.96
5000	5.88 :	-21.79 :
5320	5.70	-21.72
5530	5.75	-21.74
5660	5.54	-21.65
6325	5.37	-21.59
6420	5.30	-21.56
6850	4.71	-21.32
7265	5.02	-21.45
7495	4.95 :	-21.42 :
7978	5.23 :	-21.53 :
8260	5.11	-21.48
9115	5.12	-21.49
9260	5.32	-21.57
10140	5.05	-21.46
10500	5.06	-21.46
10860	5.11	-21.48

TABLE V-2

ABSOLUTE FLUX ABOVE THE EARTH'S ATMOSPHERE

Europa, April 6, 1971

BANDPASS CENTER (Å)	MONOCHROMATIC FLUX MAGNITUDES ($-2.5 \log f_\nu - 48.60$)	LOG MONOCHROMATIC FLUX ($\log_{10} f_\nu$, erg cm^{-2}sec^{-1}Hz^{-1})
3400	8.65 :	-22.90 :
3720	7.77 :	-22.55 :
4200	6.53	-22.05
4680	6.05	-21.86
5000	5.83 :	-21.77 :
5320	5.71	-21.72
5530	5.76	-21.74
5660	5.55	-21.66
6325	5.49	-21.64
6420	5.43	-21.61
6850	4.96	-21.42
7265	5.21	-21.52
7495	5.43 :	-21.61 :
7978	5.15 :	-21.50 :
8260	5.29	-21.55
9115	5.31	-21.56
9260	5.51	-21.64
10140	5.24	-21.53
10500	5.30	-21.56
10860	5.33	-21.57

TABLE V-3

ABSOLUTE FLUX ABOVE THE EARTH'S ATMOSPHERE

Ganymede, March 10, 1971

BANDPASS CENTER (Å)	MONOCHROMATIC FLUX MAGNITUDES ($-2.5 \log f_\nu - 48.60$)	LOG MONOCHROMATIC FLUX ($\log_{10} f_\nu$, erg $cm^{-2} sec^{-1} Hz^{-1}$)
3240	7.84 :	-22.58 :
3400	7.52 :	-22.45 :
3720	6.98 :	-22.23 :
4200	5.94	-21.82
4680	5.51	-21.64
5320	5.16	-21.50
5530	5.22	-21.53
5660	5.02	-21.45
5820	5.00	-21.44
6420	4.91	-21.40
6850	4.42	-21.21
7265	4.71	-21.32
7495	4.93 :	-21.41 :
7978	4.65 :	-21.30 :
8260	4.79	-21.35
9115	4.85	-21.38
9260	5.11	-21.48
10140	4.76	-21.34
10500	4.81	-21.36
10860	4.88	-21.39

VI. DATA REDUCTION

Introduction

In this section the technique used to obtain the satellite eclipse light curves from the raw data is described. A detailed description of the measurement sequence was presented in Section IV. Briefly, the telescope was stopped down to nominally 100 inches and after observing the standard star, observation of the satellite was begun. Prior to initiation of the eclipse ingress, occasional sky data were obtained just east and just west of the satellite position. After eclipse ingress had proceeded to a predetermined count level the telescope was opened to the full 200-inch aperture. Observations were continued well after the satellite was indistinguishable against the background sky. The standard star was again observed. A series of measurements was obtained approximately every 18 seconds consisting of sky background counts and satellite plus background counts in 20 wavelength bands.

These data were then reduced to obtain the eclipse light curves. An eclipse light curve is a plot of the darkening, in magnitudes, relative to the pre-eclipse brightness, versus universal time (see Figure VI-1a). The first step in the reduction procedure was removal of the background sky brightness from the object (sky background plus satellite) data. Two methods have been employed. One is to determine a "balance factor", the relative sensitivity of the two spectrometer apertures. See Figure VI-2. Using this balance factor, the count obtained from the object aperture was adjusted by subtracting a corrected sky brightness. The residual is the corrected object count, i.e., satellite brightness.

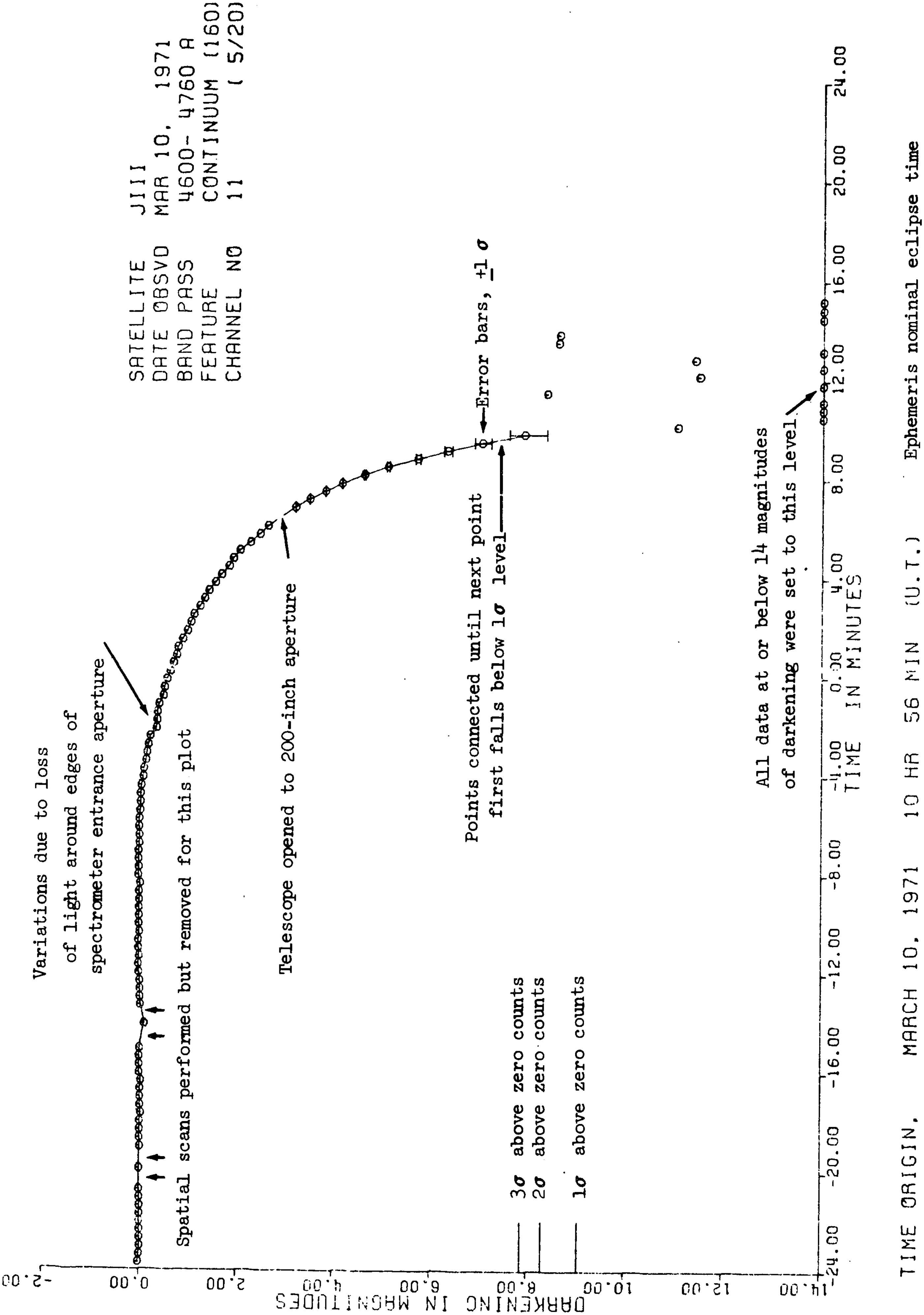


Figure VI-1a Annotated Eclipse Light Curve

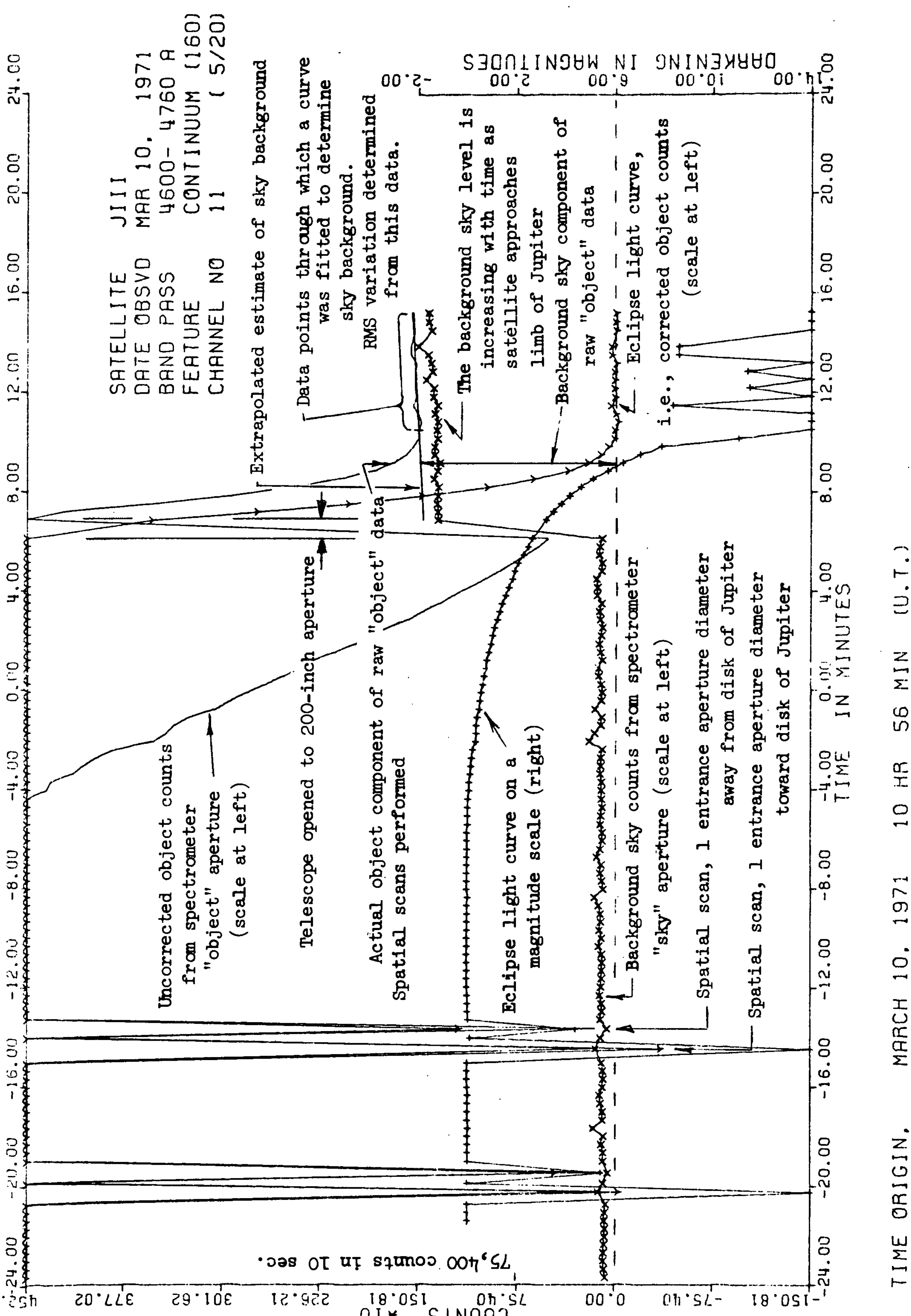


Figure VI-1b Annotated Work Sheet

The drawback to this dual aperture sky removal technique is that the residual true object count obtained suffers from the fluctuations in both the object and sky counts relative to their mean, and no advantage is taken of the possibility to average a number of sky counts and hence to obtain an improved corrected object brightness. The lack of these refinements is of no consequence during the brighter portions of the eclipse, but during the refractive tail portion it is desirable to utilize any refinement possible. Hence the other method employed, the curve fit sky removal technique, utilizes a curve, least squares fitted through the object counts observed after the satellite had become invisible to the spectrometer. This curve was then extrapolated to earlier times prior to satellite disappearance. By subtracting this extrapolated sky count from the object count the corrected object count was obtained as illustrated in Figure VI-1b. This method was employed to correct the important refractive tail portion of the light curves obtained during times of good sky stability.

The general subject of sky removal from the data has introduced the necessity of determining balance factors. Hence this subject is discussed below in more detail. There is also the necessity of determining the change in effective sensitivity of the system introduced by using different telescope collecting areas. This subject is discussed below. Next there is a summary of the time scale correction procedure. A discussion of errors follows. Finally, all the elements of the data reduction procedure are summarized.

1. Balance Factors

The primary advantage of a dual aperture spectrometer is that simultaneous observations may be made both of an object and of the adjacent sky background. The counts received in the object aperture also include counts from the sky background. In principle, the sky background may be removed by subtraction. However, there is always the possibility of an imbalance or difference in response when a signal of the same strength is observed first in one aperture and then in the other because of sensitivity variations over the photo tubes, geometrical effects, etc. In the case of the present experiment, there is an additional problem. There is a difference of sky background in the two apertures occasioned by the slight difference in scattered light which arises from the different distances, r_1 and r_2, or the two apertures from the nearby, very bright limb of Jupiter (see Figure VI-2). Initially, r_1 and r_2 were approximately the same, but they changed and at a different rate during the typically 40-minute observation sequence. Therefore, a balance factor is required that is unique not only to the spectrometer wavelength channel but also to the particular observation.

The procedures employed to obtain these balance factors and the corrected object counts were these. First an average was obtained for the object to sky ratio over 10 or more counts a little after the satellite was judged to be indistinguishable against the sky background -- "satellite-disappearance". Then the corrected sky count was subtracted from the object count to yield the true object count. The notation employed in these calculations is listed in Table VI-1.

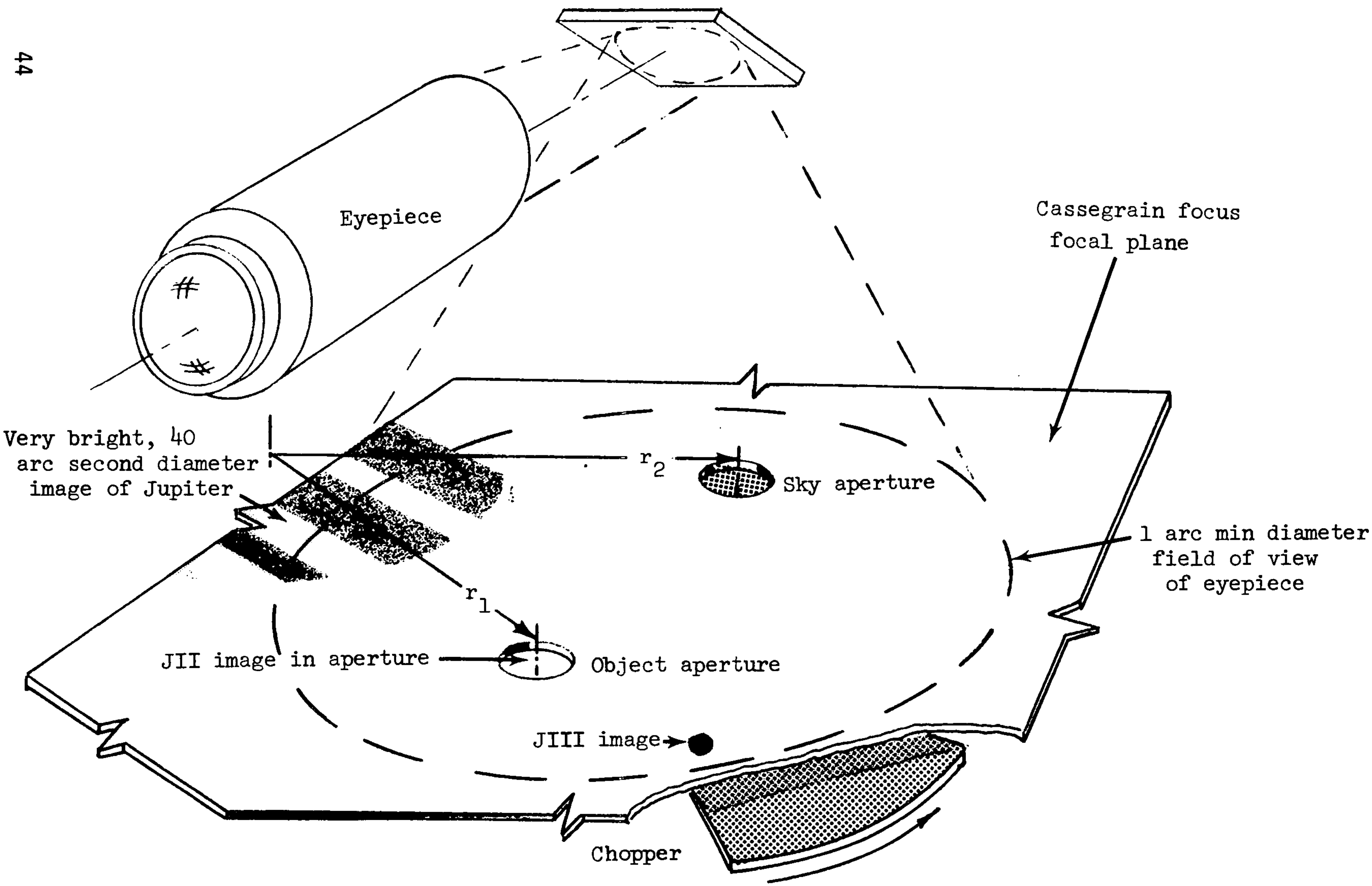


Figure VI-2 Schematic View of Spectrometer Top

Table IV-1 Notation Used for Balance Factor Calculations

Subscript i -	denotes the count, i=1,...,100+ depending on the number of integrations performed.
Subscript j -	denotes the wavelength band, j=1,...,20.
Superscript k -	denotes an iteration in calculating the corrected object count or balance factor.
O_{ij} -	denotes the number of counts observed in the object aperture on the ith observation in the jth wavelength channel
S_{ij} -	simarly denotes the number of counts in the sky aperture
C^k_{ij} -	denotes the corrected object counts on the kth iteration
BF^k_j -	denotes the balance factor for the jth wavelength channel obtained on the kth iteration.
CF^k_i -	a correction factor, discussed below, for all channels on the ith count and obtained on the kth iteration.
NL,NH -	first and last values of i in the interval in which the average balance factor is obtained.

Hence

$$C^k_{ij} = O_{ij} - S_{ij} \times BF^k_j \tag{VI-1}$$

where

$$BF^k_j = \sum_{i=NL}^{NH} \frac{O_{ij}-C^{k-1}_{ij}}{S_{ij}\ (NH-NL+1)} \tag{VI-2}$$

Note that, in principle, the guess as to "satellite-disappearance" may have been early. Effort was made to make the guess as soon as possible after disappearance so that the different rates of change of r_1 and r_2 would be insignificant. Hence, in determining the balance factor, two iterations were used. On the first, $C_{ij}^{k-1} = C_{ij}^{o}$ was set equal to 0. The first and second iteration balance factors differed by only a few parts in 10^5, typically.

An additional phenomenon was observed in reducing the data. The object/sky ratio in each channel varied systematically relative to the channel average, from one observation to the next after the satellite had disappeared. This suggested that a further improvement in the correction procedure might be employed in which the sky reading, on any given observation, would be corrected by an additional factor determined from <u>all</u> the wavelength channels. This correction factor, CF, essentially notes how the particular object/sky ratio on the ith observation and averaged over all 20 channels differed from the mean object/sky ratio obtained from averaging over all 20 channels and over the interval i=NL to NH. Quantitatively:

$$CF_i^k = \sum_{j=1}^{20} \frac{\left(O_{ij} - C_{ij}^{k-1}\right)\Big/ S_{ij}}{\displaystyle\sum_{i=NL}^{NH} \frac{O_{ij} - C_{ij}^{k-1}}{S_{ij}\ (NH-NL+1)}} \times \frac{S_{ij}}{\displaystyle\sum_{j=1}^{20} S_{ij}} \qquad \text{(VI-3)}$$

This last factor in VI-3 weights the individual channel O_{ij}/S_{ij} ratios according to the number of counts. The denominator in the first factor on the right side of equation VI-3 normalizes CF_i^k to unity, on the average. Equation VI-1, which gives the corrected object counts, then becomes

$$C^k_{ij} = O_{ij} - S_{ij} \times BF^k_j \times CF^k_i \qquad \text{(VI-4)}$$

To summarize, a two-step iteration procedure was employed. The C^k_{ij}'s were determined from equation VI-4 using balance factors obtained with equation VI-2 and correction factors obtained with equation VI-3.

2. Telescope Aperture Area Ratios

In order to relate the data obtained prior to opening the telescope to 200-inch to the data obtained after, it was necessary to determine the effective system sensitivity change. This can be done by comparing the corrected count rate obtained when observing a standard star before and after fully opening the dust cover. This procedure was used in reducing the February ingress data. However, an alternate procedure was employed with the March and April data. The ratio was adjusted until the eclipse light curves manifest a smooth continuous falloff. This alternate technique was employed because the first technique did not give rise to smooth light curves in all cases. It is suspected that the spectrometer responds differently to an extended source, the satellite image, than to a point source, a standard star. It was also noted that the effective collecting area ratio is slightly channel (wave length) dependent. Careful inspection of the curves in Part Two for the April ingress of Europa evidences this effect. However, because the magnitude of the effect is significantly less than the uncertainty in the data points in the refractive tail, further correction of the area ratio factor for each channel was not done for this report.

3. Time Scale Conversion

The time scale for the eclipse light curves was obtained in the following manner. Prior to beginning the data gathering sequence, a block of spectrometer and system configuration information was printed out (ID card). This data included both Pacific Standard Time and Sidereal Time. Each night, PST was set by WWV to 1/10 of a second. The sidereal time was also printed out with each set of count data. The time printed was the sidereal time at the conclusion of the 10.007 second integration period. These sidereal times were converted to UT using the UT equivalent of the initial PST and the UT interval equivalent of the sidereal time interval since the initial instrument configuration sidereal time. In this manner, the UT at the conclusion of each integration period was obtained. Hence the sidereal time printed out for each integration period was used as a time interval measure. The resulting UT's are therefore estimated to be accurate to ± 0.1 sec.

4. Errors

Errors in the corrected count data arise from at least three sources. (a) The light from the object may have partially missed the spectrometer entrance aperture due to seeing variations and guiding/setting errors. (b) The effective transmission and seeing of the atmosphere no doubt varied to some degree from integration period to integration period giving rise to variations in both the object and sky counts. And finally, (c) There are inherent variations in the count rate due to photon statistics.

An estimate of error (a) can be made by examining the first 10 or 15 minutes of the observations before any darkening occurred. See, for example, Part Two, page 141, JII, $\lambda\lambda$5600 to 5720 Angstroms, and the corresponding data in Part Three. The standard deviation of the magnitudes employed to obtain the zero magnitude count is 0.04 magnitudes. Since this error will always be a certain fraction of the total counts, on a magnitude scale the error will always be a constant. This error is immediately visible from an eclipse light curve, and is less than the error from sources (b) and (c) in the important refractive tail portion of the light curves. It has, therefore, not been included in the error bars on the finished eclipse light curves.

Error sources (b) and (c) may most easily be treated together. When the sky is very stable, the standard deviation of the post disappearance, uncorrected object count rate scatter about the mean is a good estimate of the significance of the uncertainty in the background sky removal. *It is this error which is shown as error bars on the eclipse light curves* between the time the telescope was first opened to 200 inches and the last point prior to when the curve first fell below 1σ above zero counts.

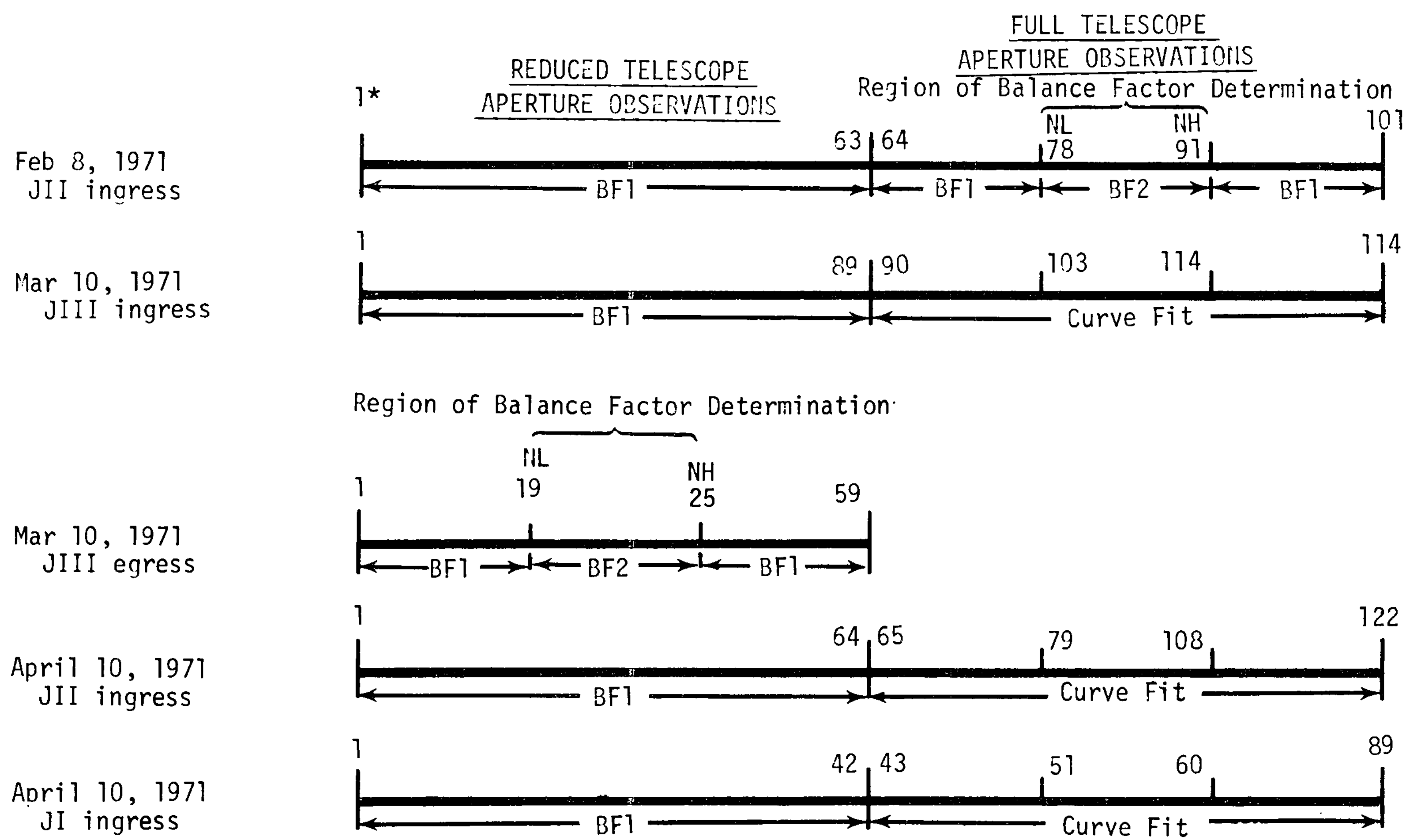
Quantitative detail on this error is presented in Part Three for the April 5, 1971 eclipse of Europa. During that particular eclipse the uncertainty in the background sky due to sources (b) and (c) was only $\sim$1.5 times the limiting photon statistical uncertainty.

5. Summary of Data Reduction Procedures

Table VI-2 summarizes the regions of application of the various data reduction procedures. On the first and third events, basically poor data prevented use of the preferred curve fit sky removal method. Additional numerical detail for the April eclipse of Europa is presented in Part Three.

Table VI-2

SUMMARY OF DATA REDUCTION METHODS



Legend

* The numbers indicate the integration period number i. Time between periods was not uniform.

BF1. The sky removal method of equation VI-1 was used, employing the balance factors obtained by equation VI-2 in the region indicated above.

BF2. The sky removal method of equation VI-4 was employed.

Curve Fit: The curve fit method of sky removal was employed.

VII. DATA ANALYSIS

Introduction

Although this report is primarily intended to document only observations and basic data reduction, some cursory analysis has been performed in this study. The real significance of the observations becomes evident when detailed interpretations are made which yield an insight into the composition, physical structure, and geometry of the Jovian atmosphere and satellites. Although the analysis of the results is preliminary, this section has been included as part of the report because it demonstrates the potentially significant interpretations that can be drawn from this data and from future observations of this type.

A. The Theory of Eclipse Light Curves

1. The Basic Relationships

A basic equation for the angle of refraction, Θ_r, experienced by a light ray which tangentially traverses the atmosphere of Jupiter in a grazing incidence path is derived by Baum and Code (1953) and is given by

$$\Theta_r = (2\pi r_0 a)^{\frac{1}{2}} (n_0-1)e^{-a(r_1 - r_0)} \quad . \qquad \text{(VII-1)}$$

(See Table VII-1 for notation.)

The assumptions implicit in this result are:

(a) that Jupiter is spherical

(b) that it is surrounded by an isothermal, homogeneous atmosphere

TABLE VII-1 NOTATION

a. . . . Reciprocal scale height, 1/H. [km^{-1}]

A. . . . A constant used in equation (VII-18) to consolidate other constants.

A(x,y) . Fractional beam strength reduction factor physically produced by scattering, absorption and cloud top cutoff. A function of the wavelength band under consideration and of (x,y) in that these define a unique path through the Jovian atmosphere. [dimensionless]

B. . . . A limb darkening constant (See Equation VII-18). Also the distance shown in Figure VII-1. [km]

C. . . . Same as B, 1st usage.

D_{JM}. . . Distance from Jupiter to the satellite under study. [km]

D_{SJ}. . . Distance from the sun to Jupiter. [km]

E. . . . Height above the reference radius, r_0, in Jupiter's atmosphere in scale height units. $E = (r_1 - r_0)/H$.

h. . . . Height above the reference altitude, r_0. [km]

H. . . . Scale height at r_0. [km]

H(h) . . Scale height as a function of h. [km]

I(x) . . Solar radiance (actually the radiance integrated over z from the upper to lower limb at x) per unit of x and per unit of solid angle, in the direction of Jupiter, and within the subject wavelength band. [watt/sr.km]

JI-JIV . The Galilean satellites of Jupiter.

K_1 . . . A consolidation of other constants (See Equation VII-6).

$L(x)$ . . The fractional solar illumination (relative to the total disk) per unit of x, per unit solid angle in the direction of Jupiter, and within the subject wavelength band. See Equation VII-5.

$n, n(h), n_\lambda(h)$. The index of refraction of elevation h and wavelength λ. [dimensionless]

n_0 . . . The index of refraction at the reference radius r_0. Implicitly this is due to H_2 and He and is not near an absorption line. [dimensionless]

$N_x(h)$. . The number density of specie x at altitude h. [#/unit vol]

$P(h)$ . . The pressure as a function of altitude h.

$P_x(h)$. . The partial pressure due to specie x as a function of altitude h.

r_0 . . . The reference radius at which $n = n_0$. [km]

r_1 . . . The distance of closest approach of a ray. See Figure VII-1. [km]

R_J . . . The nominal radius of Jupiter. We have taken $r_0 = R_J$. [km]

R_M . . . The radius of the satellite ("moon") under discussion. [km]

R_S . . . The radius of the sun. [km]

U. . . . A limb darkening constant, a function of wavelength. See discussion after Equation VII-16. [dimensionless]

V. . . . Similar to U.

7 (A)

x. . . . The length axis centered on the sun and shown in Figure VII-1. [km] Also a subscript denoting an atmospheric specie, H_2, NH_3, CH_4, He, . . .

y. . . . The length axis centered on the Jovian satellite orbit and shown in Figure VII-1. The satellite need not be centered on $y = 0$. [km]

z. . . . The length axis perpendicular to the plane of Figure VII-1. [km]

Θ_r . . . The angle of refraction experienced by a ray due to passage through the Jovian atmosphere; positive counterclockwise in Figure VII-1. [radians]

Θ_S . . . The angle at which a ray leaves the sun; positive counterclockwise. See Figure VII-1. [radians]

λ. . . . Wavelength

ρ_0 . . . The atmospheric density at r_0.

ϕ/ϕ_0 . . The fractional illumination per unit of y on the y axis and on the strip $2R_M$ thick in the z-direction in the subject wavelength band. [dimensionless] See Figure VII-1.

$\boldsymbol{\Phi}/\boldsymbol{\Phi}_0$ . . The fractional (i.e., relative to when no absorption, scattering, or refraction has occurred) integrated (over entire disk) satellite brightness in the subject wavelength band; a function of satellite position in its orbit about Jupiter. [dimensionless]

(c) that a constant effective gravity applies throughout, and

(d) that the effective depth of the atmosphere is much less than a Jovian radius. For these conditions the index of refraction is:

$$n \cong 1 + (n_o - 1)e^{-a(r_1 - r_o)} \tag{VII-2}$$

Then the further assumption, one well warranted in retrospect, is

(e) that Θ_r is small.

First, consider only the "diming" of the illumination at the satellite orbit due to the spreading of the light caused by differential refraction in the Jovian atmosphere. The illumination at y per unit of y (see Figure VII-1) and falling in a strip $2R_M$ thick in the z direction (z is perpendicular to the paper in Figure VII-1) is

$$\int_{-R_S}^{R_S} \frac{I(x)\left(\dfrac{2R_M}{D_{SJ} + D_{JM}}\right)}{\partial y/\partial \Theta_S} \, dx \tag{VII-3}$$

Here $I(x)$ is the illumination per unit solid angle and per unit of x (i.e., integrated over a strip of the solar disk from $z = -\sqrt{R_S{}^2 - x^2}$ to $z = +\sqrt{R_S{}^2 - x^2}$) including the effects of solar limb darkening. The factor $(2R_M)/(D_{SJ} + D_{JM})$ accounts for the spreading, in the z-direction, of the illumination from the sun. It is just the angle subtended by the satellite in the z-direction as seen from the sun. The effect of refraction enters through $\partial y/\partial \Theta_S$.

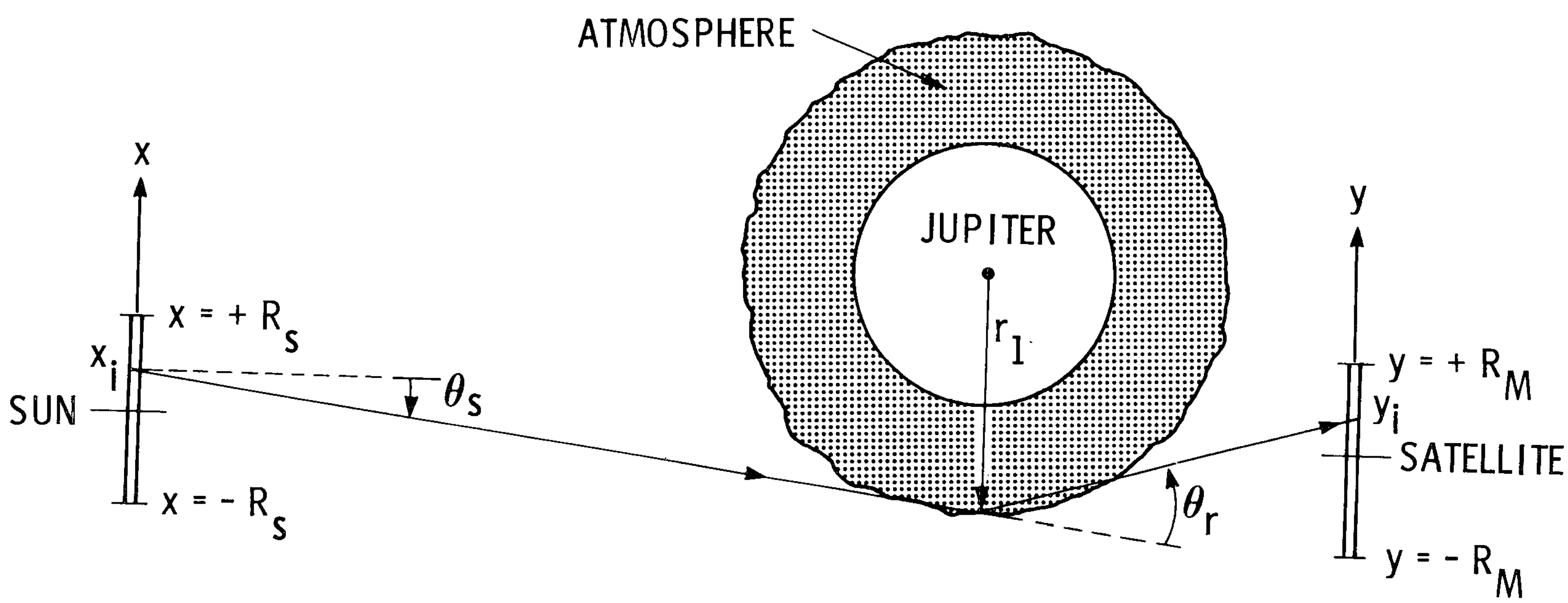


Figure VII-1 Typical Ray Path

A ray leaves the sun at x_i and θ_s. At the nearest approach distance, r_1, it is refracted through θ_r and falls on the satellite at y_i.

Parenthetically, meridian concentration in Jupiter's atmosphere is neglected and the projected limb of Jupiter on the satellite is assumed to be a straight line. The inaccuracy introduced by these assumptions is small.

Since only the fractional illumination is desired, equation VII-3 is next normalized by its equivalent value when no refraction occurs which yields the following relationship:

$$\left.\frac{\Phi}{\phi_o}\right|_y = \frac{1}{\int_{-R_S}^{R_S} I(x)dx} \int_{-R_S}^{R_S} \frac{I(x)}{\frac{\partial y}{\partial \Theta_S} \Big/ (D_{SJ} + D_{JM})} dx. \qquad \text{(VII-4)}$$

I(x), renormalized so as to give the fractional illumination per unit of x, is defined as the new function L(x) thus:

$$L(x) = I(x) \Big/ \int_{-R_S}^{R_S} I(x)dx \qquad \text{(VII-5)}$$

The analytical form of L(x), including limb darkening, is derived in Section 2 below. L(x) will be incorporated into equation VII-4, but it is first necessary to evaluate $\partial y/\partial \Theta_S$.

From figure VII-1 one sees that

$$r_1 \sim B - (x + D_{SJ}\,\Theta_S) \qquad \text{(VII-6)}$$

Hence, letting $K \equiv (2\pi r_0 a)^{\frac{1}{2}} (n_0 - 1)$, equation VII-1 becomes

$$\Theta_r(x,\Theta_S) = K_1 e^{-a(B - x - D_{SJ}\,\Theta_S - r_0)} \qquad \text{(VII-7)}$$

and

$$y(\Theta_S,\ x) = x + D_{SJ}\Theta_S + D_{JM}[\Theta_r(x,\Theta_S) + \Theta_S]. \qquad \text{(VII-8)}$$

Therefore

$$\left.\frac{\partial y}{\partial \Theta_S}\right|_x = D_{SJ} + a\ D_{SJ}\ D_{JM}\ \Theta_r + D_{JM} \qquad \text{(VII-9)}$$

then substitution of VII-5 and VII-9 into VII-4 gives

$$\left.\frac{\phi}{\phi_0}\right|_y = \int_{-R_S}^{R_S} \frac{L(x)}{1 + \dfrac{aD_{SJ}\ D_{JM}\ \Theta_r}{D_{SJ} + D_{JM}}}\ dx \qquad \text{(VII-10)}$$

Since $D_{SJ} = 7.78 \times 10^8$ km and, for JIV, $D_{JM} = 1.88 \times 10^6$, to a very good approximation

$$\left.\frac{\phi}{\phi_0}\right|_y = \int_{-R_S}^{R_S} \frac{L(x)\quad dx}{1 + aD_{JM}\ \Theta_r(x,y)} \qquad \text{(VII-11)}$$

The function $\Theta_r(x,y)$ is implicitly defined by equations VII-7 and VII-8 and in practice, given (x,y), Θ_r and Θ_S are found numerically by an iterative process.

Next, absorption, scattering, and cloud top cutoff must be taken into account. If their effects are known, incorporation into equation VII-11 is a straightforward process. A set of the variables (x,y) defines Θ_r and Θ_S through (VII-7) and (VII-8). Knowing Θ_S, r_1

can be calculated. Then knowing r_1 the grazing incidence path through the atmosphere is defined. If the structure of the density variation in the atmosphere is assumed, apart from an overall constant, the equivalent width expressing the amount of light removed from a grazing incidence beam can be pretabulated as a function of $E = (r_1 - r_0)/H$ and the overall number density of each of the atmospheric species. Introducing this extinction factor, $A_\lambda(E)$, into equation VII-11 gives

$$\left.\frac{\phi}{\phi_0}\right|_y = \int_{-R_S}^{R_S} \frac{L(x)A(x,y)dx}{1 + aD_{JM}\Theta_r(x,y)} \qquad \text{(VII-12)}$$

To obtain the fractional illumination of the entire satellite one merely integrates (VII-12) over the satellite disk obtaining

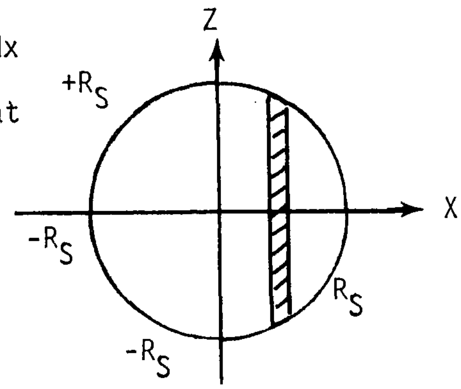
$$\frac{\Phi}{\Phi_0} = \int_{y=-R_M}^{y=+R_M} \frac{2\sqrt{R_M^2-y^2}}{\pi R_M^2} \int_{-R_S}^{R_S} \frac{L(x)A(x,y)}{1 + aD_{JM}\Theta_r(x,y)}\, dx\, dy. \qquad \text{(VII-13)}$$

This equation gives the fractional illumination in the sense that it is the brightness relative to that when no refraction or absorption occurs. *It is calculation of this integral for different times and different physical assumptions that yields theoretical eclipse light curves.*

The weighting factor in the y integral neglects any phase function perculiarities on the satellite. A special phase function would simply require a different weighting function.

2. Effects of Solar Limb Darkening

$L(x)$ is merely the integral of the surface brightness over the solar disk between the top limb and bottom limb in a strip dx wide at x. It is also defined so that



$$\int_{-R_S}^{R_S} L(x)\, dx = 1 \qquad \text{(VII-14)}$$

If the sun were of uniform brightness $L(x)$ would simply be

$$L(x) = \frac{2}{\pi R_S^2} \sqrt{R_S^2 - x^2} \,. \qquad \text{(VII-15)}$$

However, limb darkening must be taken into account. Allen (1962) gives the fractional brightness of any unit area on the solar disk relative to that at the center of the disk.

$$I'_\lambda(\Theta)/I'_\lambda(0) = 1 - U - V + U \cos\Theta + V \cos^2\Theta \qquad \text{(VII-16)}$$

Here the prime denotes the solar continuum, U and V are functions of wavelength tabulated by Allen and Θ is the angle between the solar radius vector and the line of sight. In terms of our variables, (x,z)

$$\cos\Theta = \sqrt{1 - \frac{x^2 + z^2}{R^2}} \qquad \text{(VII-17)}$$

Defining three new constants

$$A \equiv 1-U-V, \quad B \equiv U, \quad C \equiv V \tag{VII-18}$$

We may write

$$I'_\lambda(\Theta)/I'_\lambda(0) = A + B\cos\Theta + C\cos^2\Theta \tag{VII-19}$$

From the definition of $L(x)$ it is evident that

$$L(x) = \frac{\displaystyle\int_{-\sqrt{R_S^2 - x^2}}^{+\sqrt{R_S^2 - x^2}} I'_\lambda(\Theta)/I'_\lambda(0)\, dz}{\displaystyle\int_{-R_S}^{+R_S}\int_{-\sqrt{R_S^2 - x^2}}^{+\sqrt{R_S^2 - x^2}} I'_\lambda(\Theta)/I'_\lambda(0)\, dz\, dx} \tag{VII-20}$$

By substitution of (VII-17) and (VII-19) into (VII-20) one may show that:

$$L(x) = \frac{2AR_S\left(1 - \dfrac{x^2}{R_S^2}\right)^{\frac{1}{2}} + \dfrac{\pi BR_S}{2}\left(1 - \dfrac{x^2}{R_S^2}\right) + \dfrac{8CR_S}{3}\left(1 - \dfrac{x^2}{R_S^2}\right)^{3/2}}{\pi R_S^2\left(A + \dfrac{2B}{3} + C\right)} \,. \tag{VII-21}$$

It is immediately seen that (VII-21) has one correct limit. If there is no limb darkening, i.e., $A = 1$, $B = C = 0$, then (VII-21) becomes (VII-15).

In the calculations conducted in the course of the present study we have employed Allen's values of U and V interpolating linearily between tabulated values to obtain the values at other wavelengths.

B. Analysis of the Eclipse of Europa, March 10, 1971

The theory outlined in Part A has been employed and analysis begun of the Europa eclipse observations obtained on March 10, 1971. These data were analyzed because they are the best data in existence for study of the refractive tail of a Jovian satellite eclipse light curve. The analysis presented here is still to be regarded as preliminary. Attention is first directed to the continuum channels.

1. Analysis of Continuum Channels

Continuum channels are those wavelength bands in which the Jovian atmosphere has no absorption features significant at the spectral resolution and photometric precision employed. The only sources of extinction are Rayleigh and aerosol scattering. Differential refraction and cloud top cutoff, together with the physical properties of the atmosphere, and these extinction mechanisms, should enable an understanding of the continuum channels. There are enough continuum channels so that several may be used to define the parameters. The remaining ones may then be used for consistency checks.

Use of the eclipse light curve technique requires certain data describing the Sun-Jupiter-satellite system. Summarized here are both the parameter values which have been fixed and those which will be varied for this analysis.

Sun: A solar radius of 6.9598×10^5 km and the wavelength dependent solar limb darkening constants, U and V of Allen (1962) have been employed. Jupiter has been assumed to be at 7.7836×10^8 km from the solar center.

Jupiter: As noted previously, an exponential atmosphere is assumed in the present analysis. At a reference level in the atmosphere, 71,400 km (Newburn, 1969) from the center of Jupiter, we have adopted the particle number density 1.02×10^{20} particles/cc, employed by Price and Hall (1971). We have also adopted their H_2/He ratio of 5.1. These data uniquely determine the index of refraction and Rayleigh scattering cross section leaving only the scale height, aerosol scattering cross section, cloud top altitude and band absorption opacities to be determined.

Satellite: Europa being under study, we have adopted a Jupiter-satellite distance of 6.71×10^5 km (Newburn, 1969). No satellite phase function has been employed. Rather, the satellite has been assumed to be a uniformly reflecting disk. This assumption, particularly, needs further analysis and may account, in part, for the somewhat smaller satellite radii yielded by the eclipse technique than those customarily employed. In addition, no account of the approximately 11° phase angle at the satellite has been made.

Figure VII-2 shows how the satellite illumination distribution shifts markedly toward the trailing limb of the disk during the first five magnitudes of darkening and hence it is evident that the effect of the phase function and phase angle may be important in determining the satellite radius. During the refractive tail portion the illumination is more nearly uniform again.

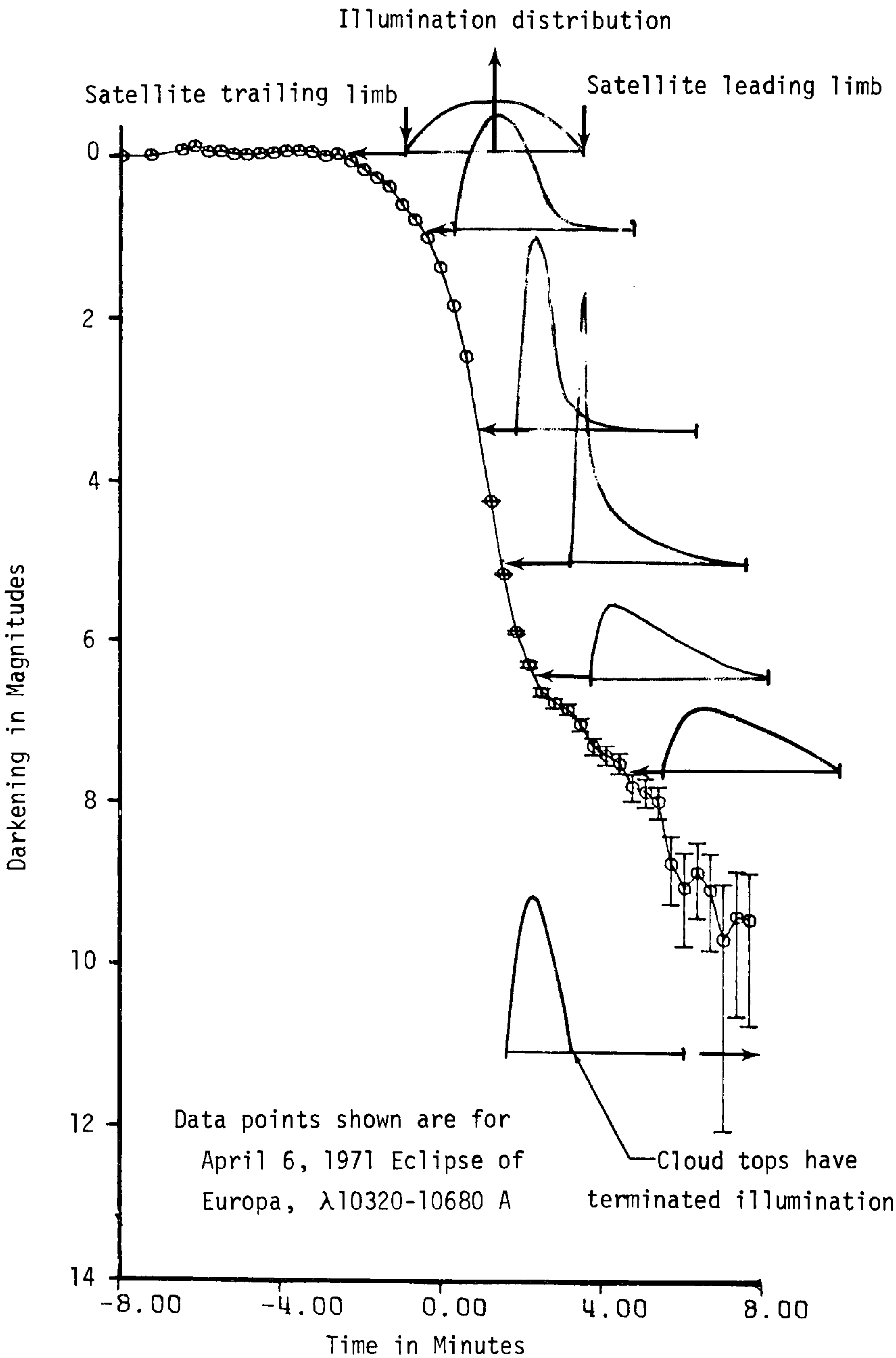


Figure VII-2 Satellite Illumination Distribution

In any case, the satellite radius is the only parameter to be determined from the brighter portions of the light curve, <u>but</u>, the value determined in this report, or by others using the satellite eclipse light curve method, has an inherent uncertainty if consideration of the phase function is not included.

a. Satellite Radius

We begin the analysis by examining the two continuum channels, $\lambda\lambda$10320-10680 and 6290-6260 Å. The data from these two channels are reproduced in Figure VII-3. The data are shown down to, but not including, the first data point falling below 1σ above zero counts. Only the portion of the eclipse light curve brighter than 4 magnitudes of darkening for the shorter wavelength channel is shown. The slight deviations from a smooth, monotonic decrease in the brightest part are felt to stem from the slight loss of light outside the spectrometer entrance aperture. The numerical data for the subject eclipse show that the sky was stable within $\sim$1.5 times the photon statistical limit (see Part Three of this report). The wavelength effect on the refractive tail is quite evident in the figure.

The satellite diameter is determined by the shape of the curves during the first 6 magnitudes of darkening. Figure VII-4 shows a superposition of 5 curves, corresponding to different satellite radii and λ = 10,500 Å. In the calculation of these 5 curves for Europa the scale height was taken to be 10 km and the extinction factor,

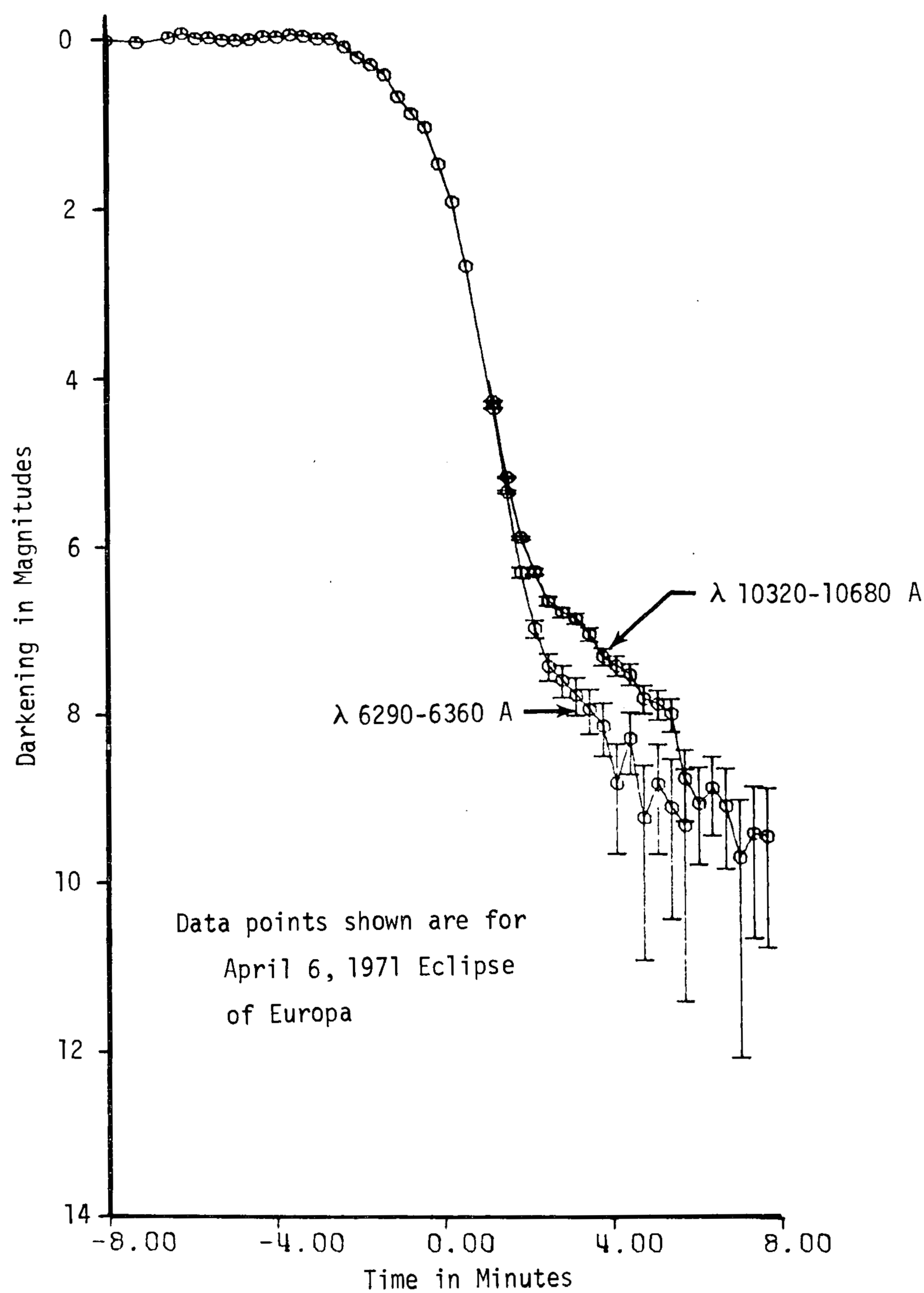


Figure VII-3 Effect of Wavelength on Refractive Tail

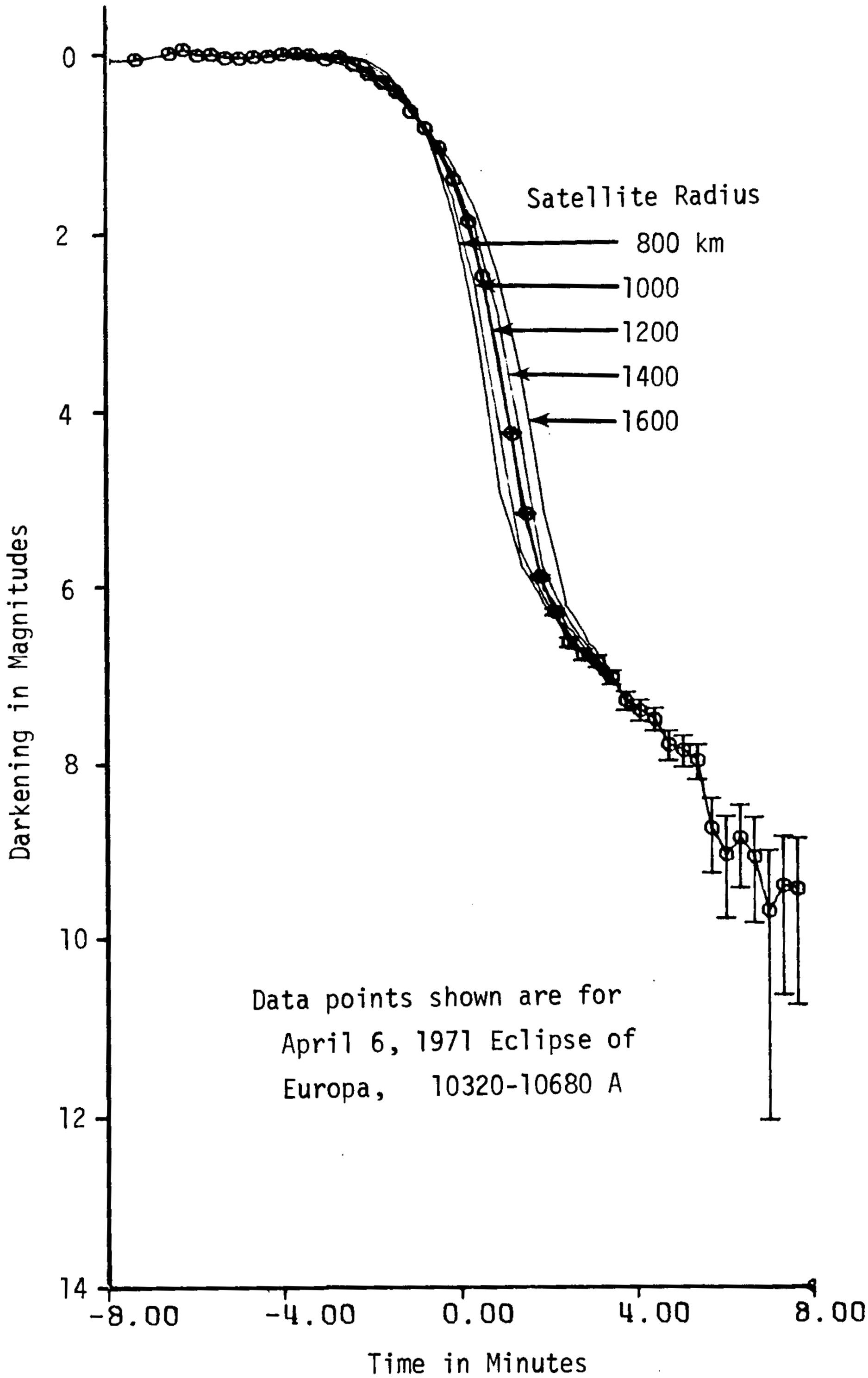


Figure VII-4 Effect of Radius on Theoretical
Eclipse Light Curve

f_{ext}, set equal to unity. However, the scale height and extinction do not effect the eclipse light curves until 6 magnitudes of darkening. It is concluded that the best eclipse radius for Europa is 1200 ± 100 km. This value is used throughout the subsequent discussion. It is less than the value of 1460 km cited in Newburn's (1969) review of planetary data.

b. Scale Height, Aerosol Extinction and Cloud Top Cutoff at λλ10320-10680 Å

A single wavelength, three values of the scale height and two values of aerosol extinction are used to predict the eclipse light curve tails. The values employed were: λ = 10500 Å; H = 5, 10, 20 km; f_{ext} = 0.5, 1; and no cloud top cutoff.

The extinction factor, f_{ext}, has the following meaning: An additional scattering cross section, over and above the Rayleigh scattering cross section is assumed. Thus, the total cross section is:

$$\sigma_{TOT}(\lambda,h) = \sigma_R(\lambda,h) + f_{ext} \times \sigma_R(5000\ \text{Å},h)$$

Here, $\sigma_{TOT}(\lambda,h)$ = the total scattering cross section, (cm^{-1}) encountered by radiation of wavelength λ at height h above the reference level in the Jovian atmosphere.

$\sigma_R(\lambda,h)$ = the Rayleigh scattering cross section (cm^{-1}) at altitude h and wavelength λ.

Implicitly, this formulation assumes that the ratio of aerosol particle number density and gas particle number density is a constant above the cloud tops. This assumption is not obviously true and may merit further attention.

The resulting curves, using these physical parameters are shown in Figure VII-5. It is concluded that a scale height of 10 $^{+0}_{-2}$ km and an extinction factor of 1.0 best fit the data in the $\lambda\lambda$10320-10680 Å channel for the location on the Jovian disk sampled by the subject eclipse.

The discrepancy during the latter portions of the refractive tail demands attention next. It is postulated that the downturn of the refractive tail is caused by cloud top cutoff. Theoretical curves with the following parameter were next generated: λ = 10,500 Å, H = 10 km, f_{ext} = 1.0, and cloud tops at 2.5, 2.75 and 3.0 scale heights above the atmosphere reference level. A superposition of these curves and the eclipse light curve are shown in Figure VII-6.

From these data we conclude that the cloud tops extend to 26 $\pm$ 1 km above the reference level.

c. Another Continuum Channel: $\lambda\lambda$6290-6360 Å

Next the observed data in the λ 6290-6360 wavelength channel is fitted. Now, however, only the extinction is varied. Figure VII-7 show theoretical curves generated with the following parameters: λ = 6225 Å; H = 10 km; cloud tops of 25 and 27.5 km; and f_{ext} = 0.5, 1.0, and 1.5. It is seen that these data are best fit with a value of extinction factor, f_{ext} = 1.5. It is now evident that the continuum

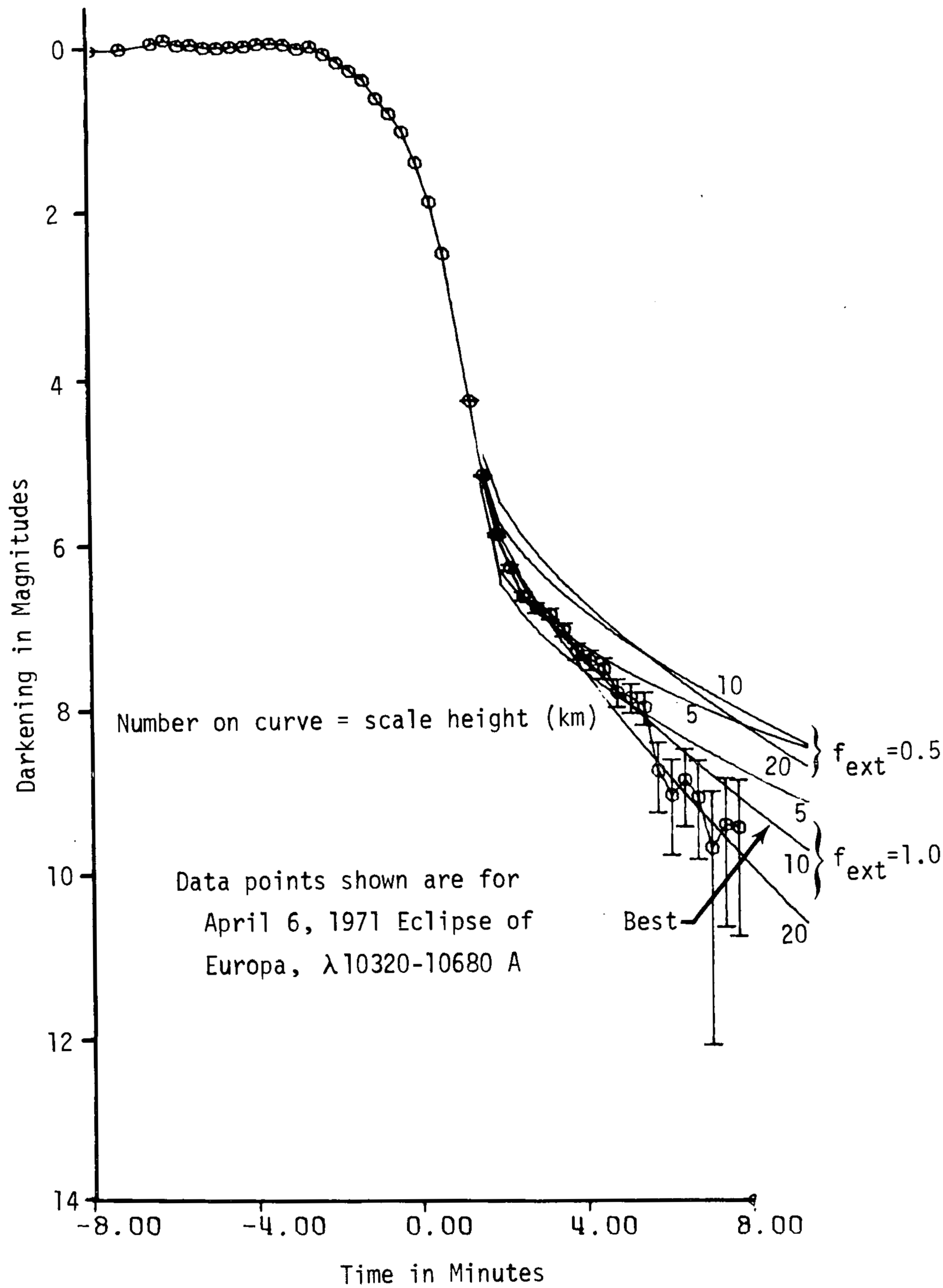


Figure VII-5 Effect of Scale Height and Aerosol Extinction on Theoretical Refractive Tails

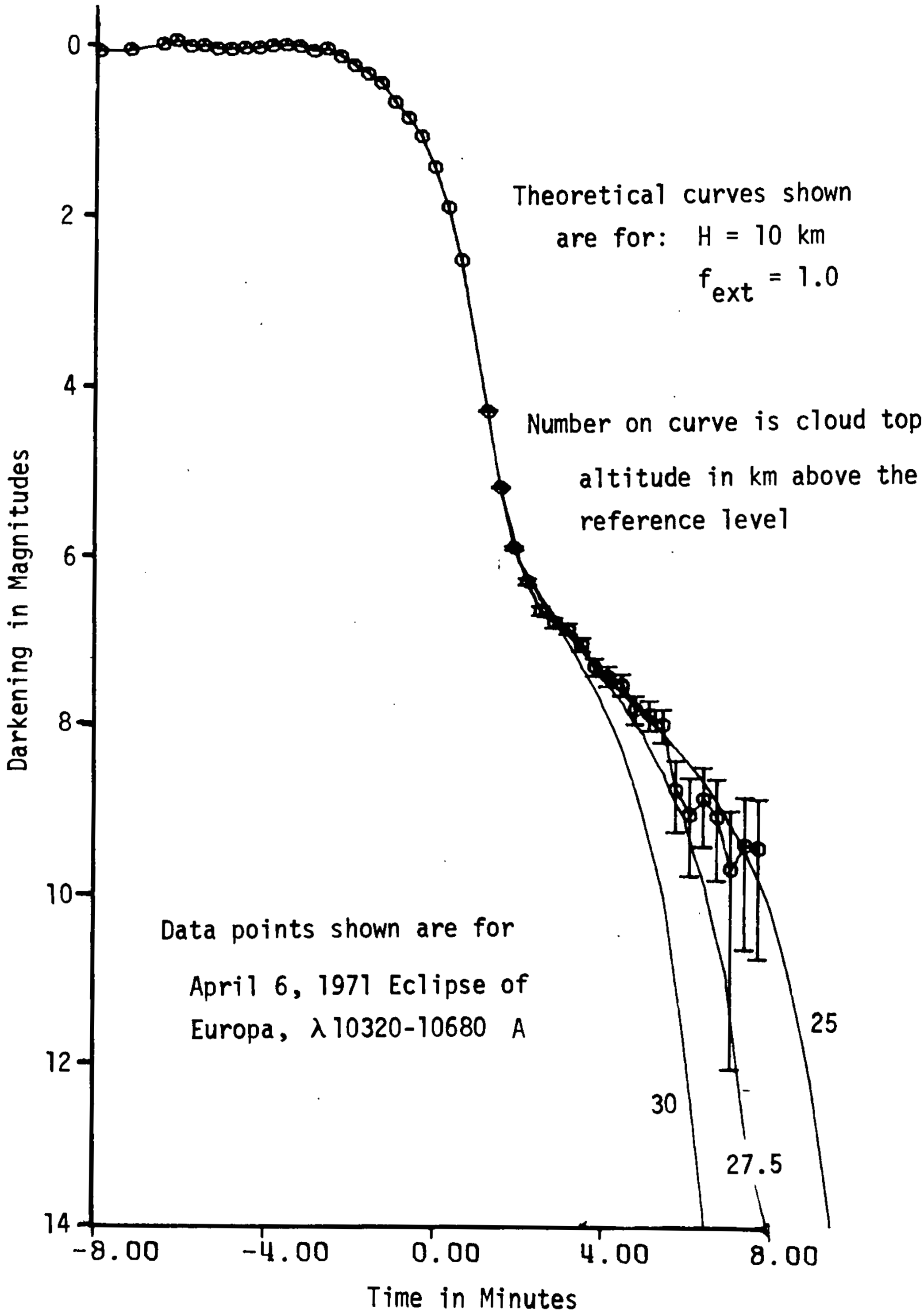


Figure VII-6 Effect of Cloud Top Cutoff

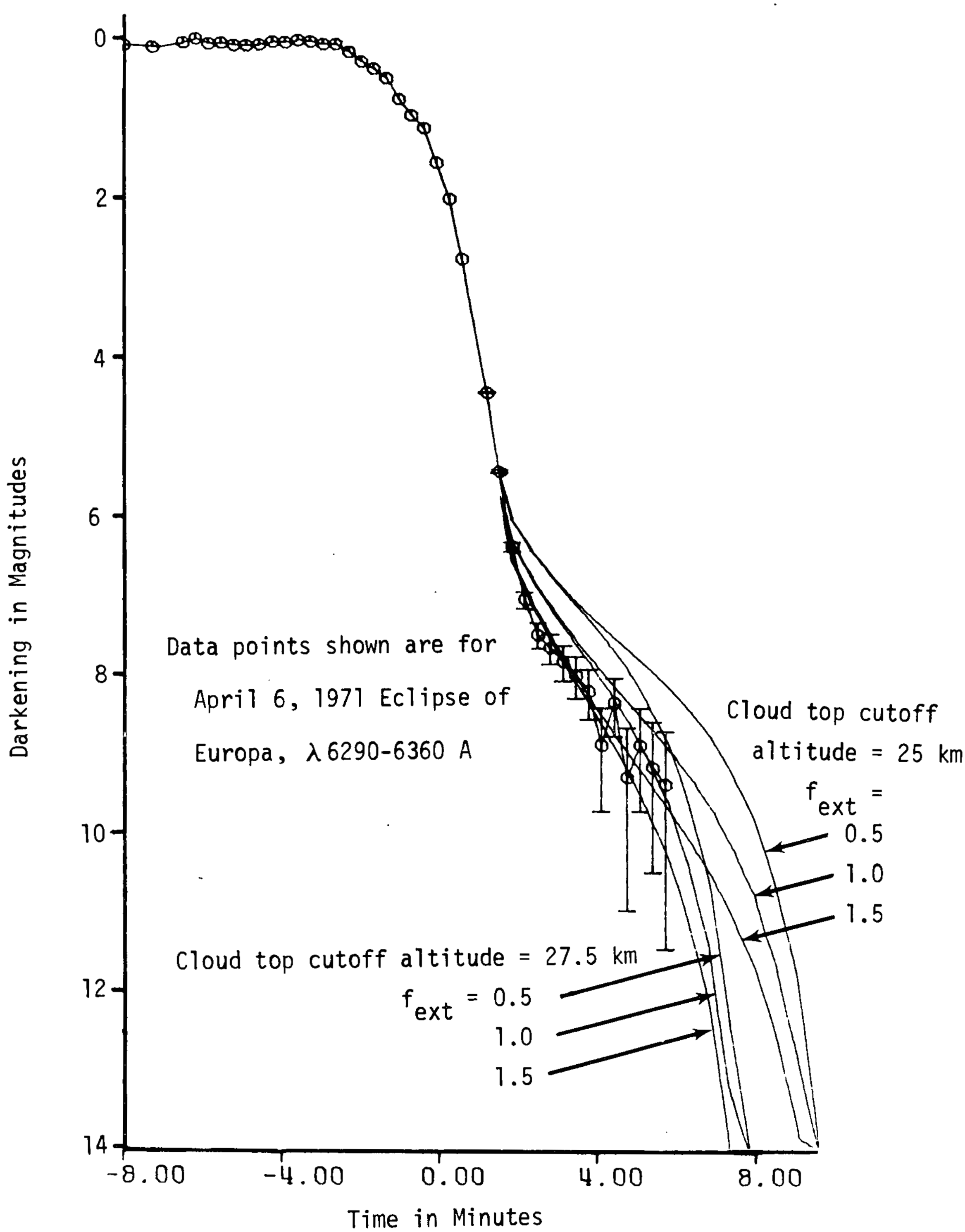


Figure VII-7 Determination of Aerosol Extinction Factor at λ6250 A channels will enable determination of the wavelength dependence of the aerosol extinction cross section.

In subsections a, b, and c., theoretical light curves have been fitted to the data in a step by step manner. A satellite radius, Jovian atmosphere scale height, aerosol extinction factors, and cloud top elevation have all been determined. Figure VII-8 summarizes the results. It shows the closest approach layer thickness, central elevation, and central ray number density versus time.

2. Analysis of the Absorption Channels

Absorption channels are those wavelength bands in which detectable CH_4, NH_3, ... absorption occurs. At the present time, study of these absorption data has only begun. However, a few comments are indicated.

An overview of the measurements is shown in Figure VII-9, a three-dimensional perspective plot of all the wavelength channels for the April eclipse of JII. Table VII-2 lists the wavelengths, anticipated features and whether or not observed, as deduced from the 3-d figure. Positive identification of a feature is indicated when one wavelength channel continually evidences more darkening than adjacent or nearest continuum wavelength channels. Shading between the continuum and an actual data point on the "cuts" in Figure VII-9 indicates absorption. The perspective shown does not immediately convey the significant variation, with wavelength, of the continuum height. It is evident that the data will yield significant abundance information when processed.

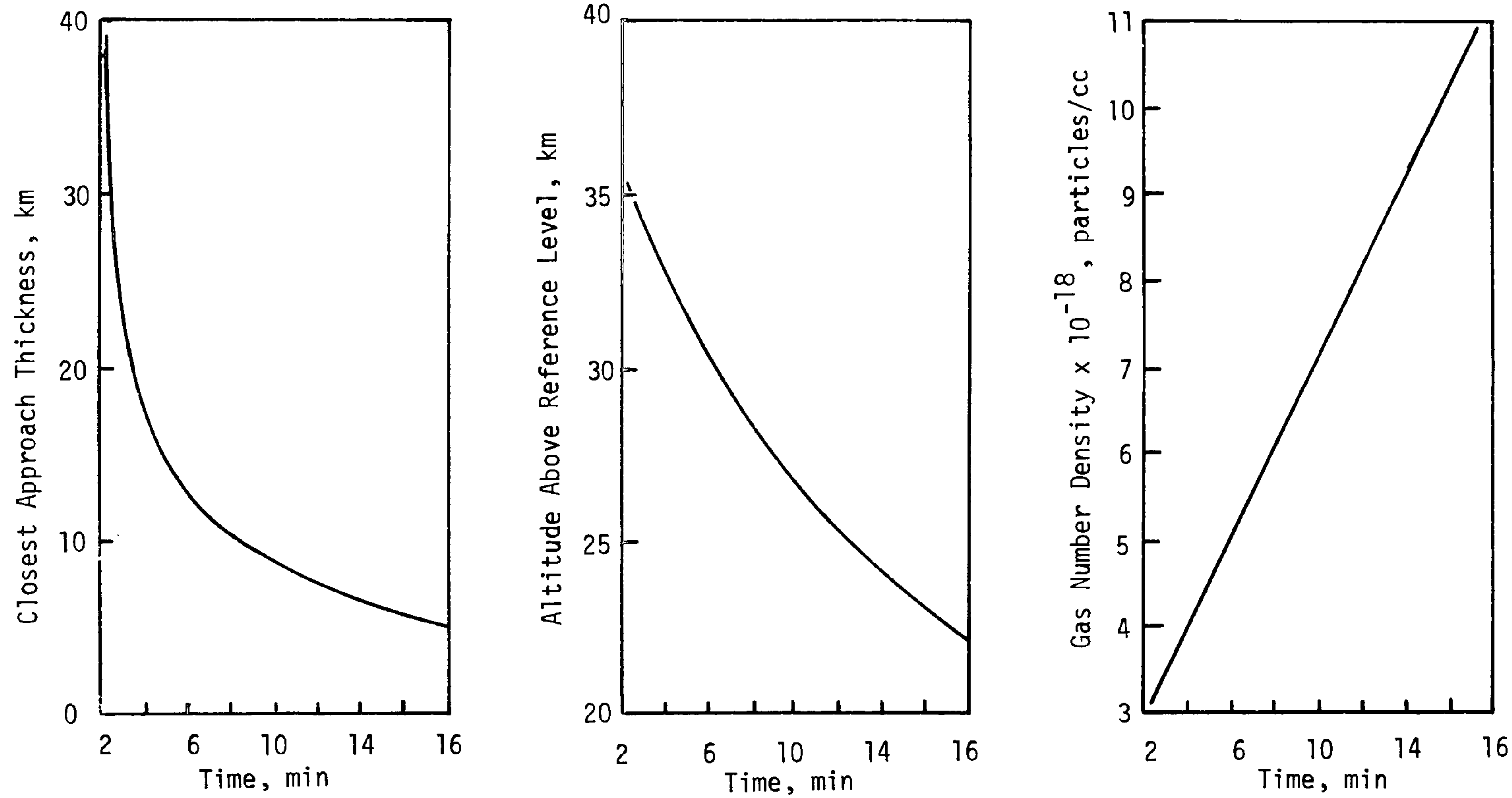


Figure VII-8 Refracting Layer Thickness, Altitude and Gas Particle Number Density

The curves show (left) the thickness of the envelope of rays illuminating Europa at closest approach to Jupiter; (center) the altitude of the envelope center above the reference level; and (right) the gas particle number density at this altitude. The data pertain to the April 6, 1971 eclipse of Europa.

TABLE VII-2 PRELIMINARY COMPARISON OF ANTICIPATED AND OBSERVED ABSORPTION FEATURES

BANDPASS (ANGSTROMS)	ANTICIPATED FEATURES	IS AN ABSORPTION FEATURE OBSERVED?
3320 - 3480	Continuum	No
3640 - 3800	Continuum	No
4120 - 4280	Continuum	No
4600 - 4760	Continuum	No
4920 - 5080	Continuum + CH_4	*
5240 - 5400	Continuum + CH_4	*
5500 - 5560	NH_3	Definitely
5600 - 5720	Continuum	No
6290 - 6360	Continuum	No
6400 - 6440	H_2 Dipole	Probably
6800 - 6900	CH_4 Weak	No
7130 - 7400	CH_4 Strong	Definitely
7440 - 7550	CH_4 Predicted	No
7920 - 8035	NH_3 Predicted	Definitely
8160 - 8360	H_2O Predicted	No
9080 - 9150	H_2S + CH_4	Definitely
9240 - 9280	Continuum	Statistics very bad due to narrow bandpass
9960 - 10320	CH_4	Very strong!
10320 - 10680	Continuum	Possible feature
10680 - 11040	Continuum + CH_4	No

* Continuum changing to fast, with wavelength, to tell using only the 3-d plot.

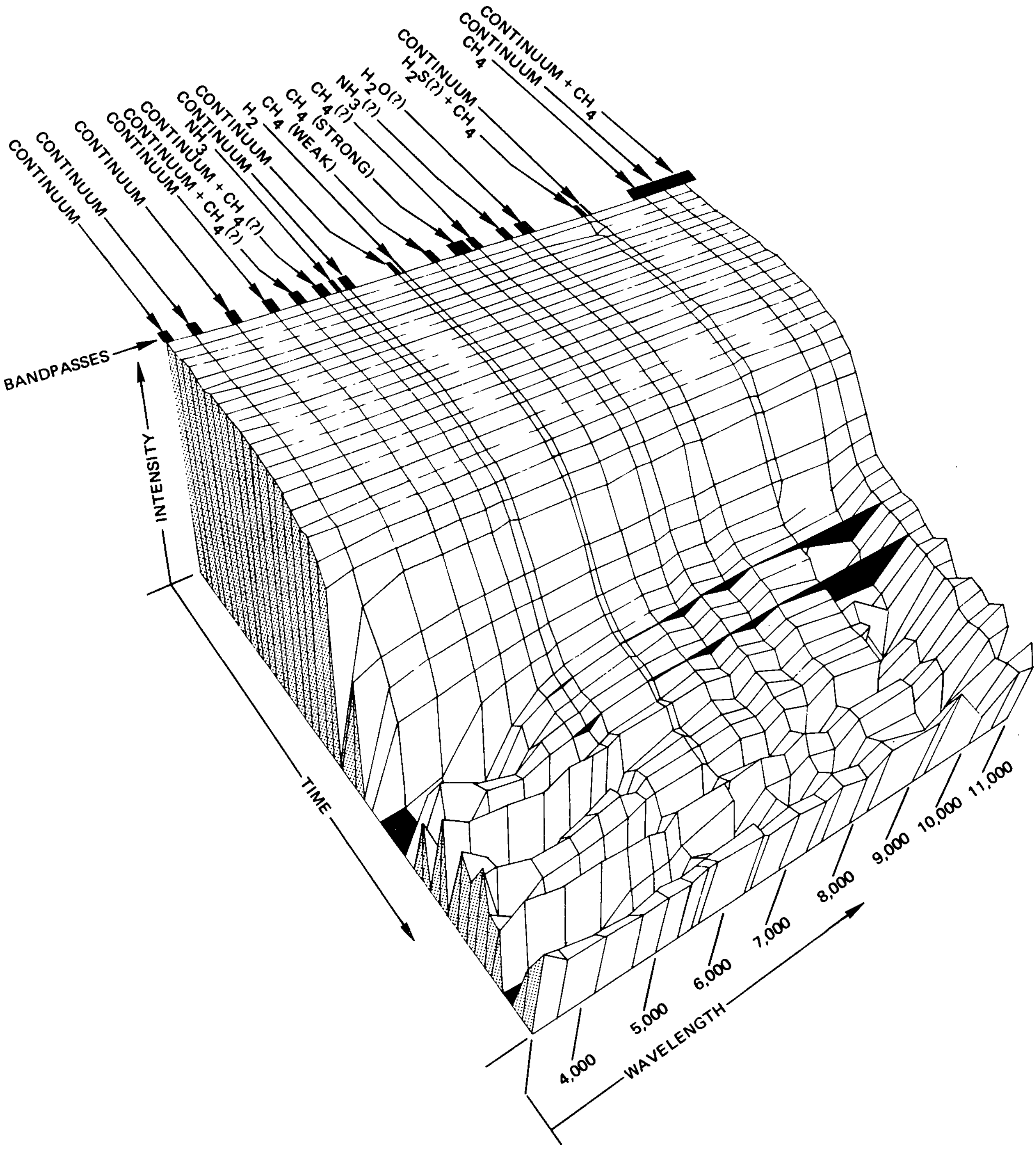


Figure VII-9: THREE-DIMENSIONAL ECLIPSE LIGHT CURVE OF APRIL 6, 1971 ECLIPSE OF EUROPA

VIII. CONCLUSIONS

Five Jovian satellite eclipses have been observed with the 200-inch Hale telescope and multichannel spectrometer in 20 colors. The data has been reduced to eclipse light curve form and statistically significant results obtained for up to 10 magnitudes of darkening. Markedly different degrees of development of the refractive tails were observed from one eclipse to another.

Analysis of the eclipse light curves obtained during the April 6, 1971 eclipse of Europa has been initiated. It was found that an eclipse radius for Europa of 1200 $\pm$ 100 km gave excellent agreement with the brighter portions of the eclipse light curves. A scale height of 10^{+0}_{-2} km, a wavelength dependent aerosol extinction component and cloud tops at 26 $\pm$ 1 km above the reference level in the atmosphere yielded excellent agreement between the theoretical and observed light curves. The reference level is that elevation at which the gas density equals 1.02×10^{20}/cc.

Ammonia and methane bands and probably the H_2, first-order-forbidden, pressure induced dipole line at $\lambda 6420 \pm 20$ Å were observed. Hence the data inherently contains information which will yield new NH_3 and CH_4 abundance measurements. By analysis of the H_2 data obtained, further insight into the H_2/He ratio may be gained.

The absolute time accuracy and the observation of both an eclipse ingress and egress of Ganymede make available new data on the figure of Jupiter.

IX. ACKNOWLEDGMENTS

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Dr. Zdenek Kopal is especially thanked for the suggestions and encouragement which led us to make these measurements. We express our gratitude to Dr. Spinrad, Dr. Louise Gray Young, Dr. Barney Farmer, and Dr. Jack Margolos for their stimulating discussions concerning the bands most appropriate to observe. A special note of appreciation is expressed to Dr. Toby Owen for his several communications concerning possible features which might be observed.

We would like to thank Dr. James Kenney, Head of Environmental Sciences Laboratory of the Boeing Scientific Research Laboratories for his cooperation and help during this series of measurements and subsequent data reduction. In addition, Arnie Rom, Tom Bray, and Dave Beste were helpful with the data reduction programming. Mr. Gil Bruce also helped compile some of the data. Three very patient wives deserve a special note of appreciation too.

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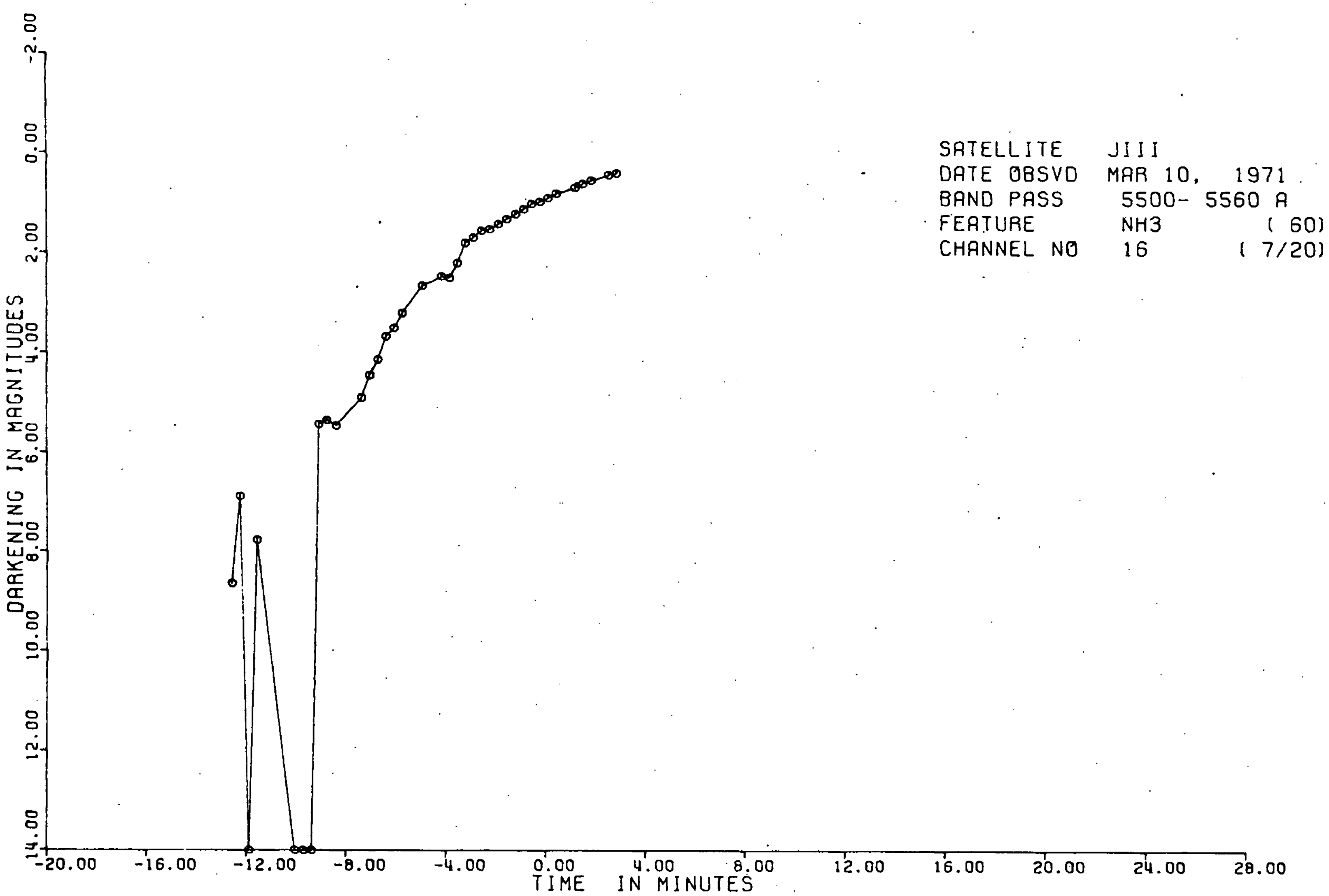

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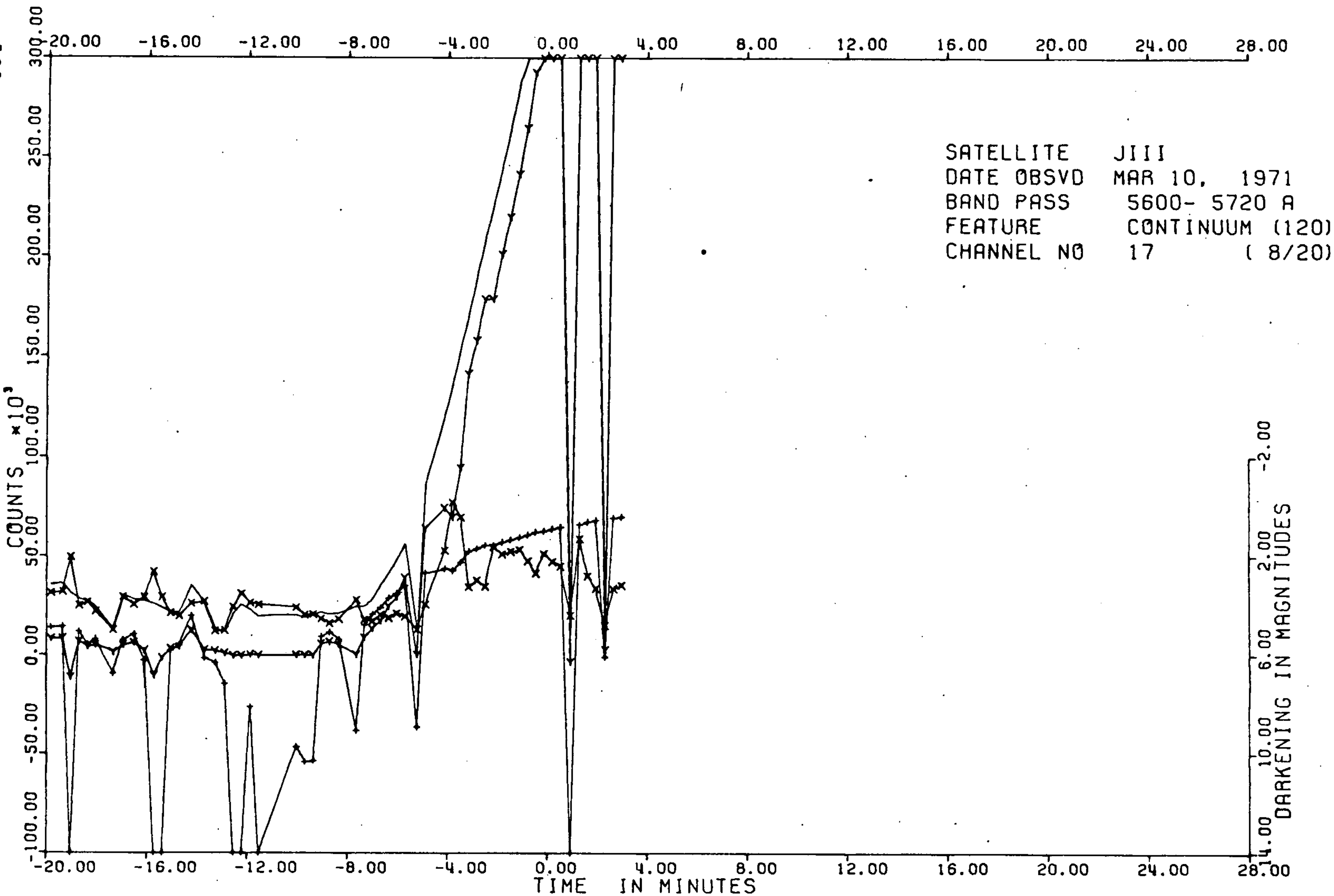
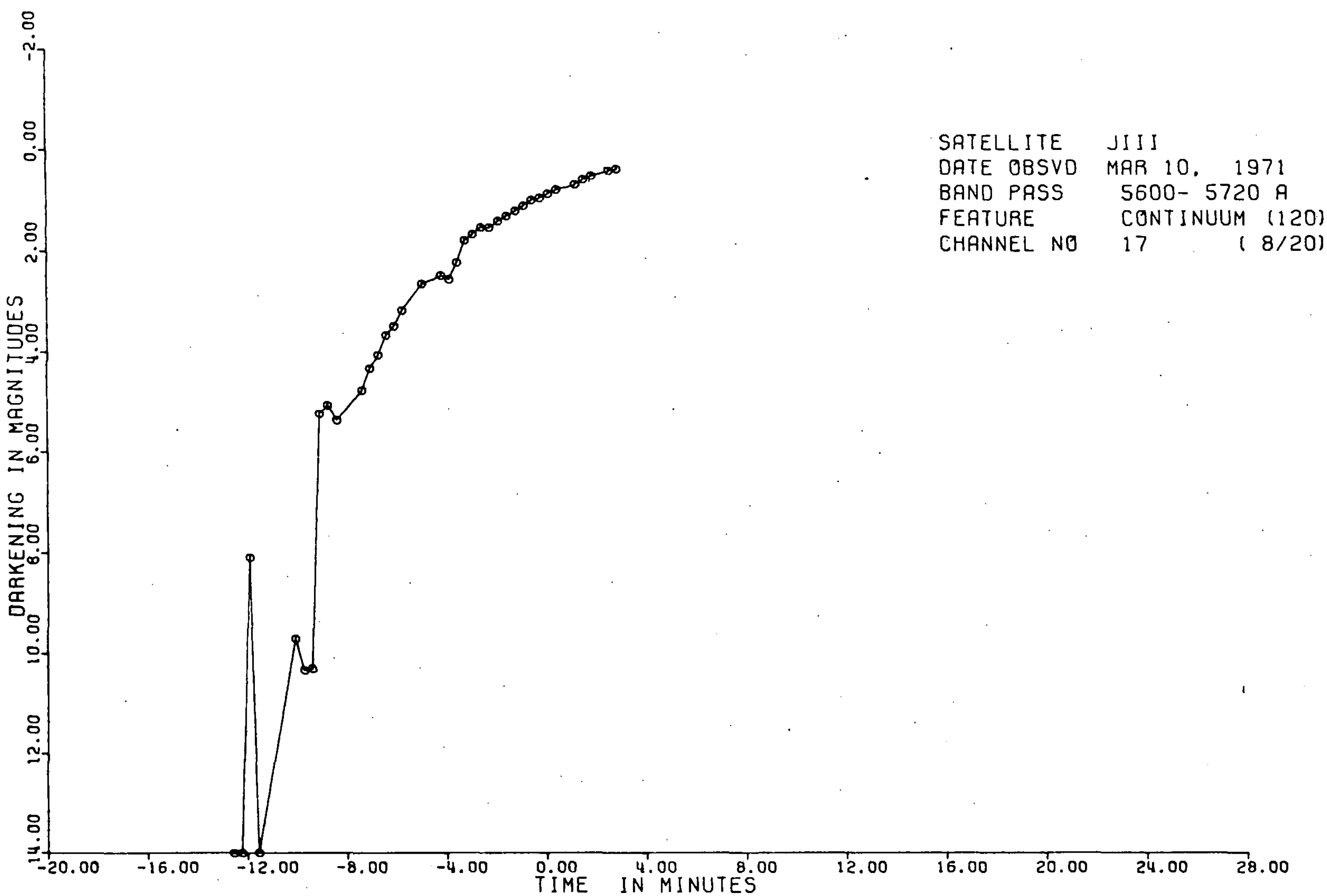


TIME ORIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)



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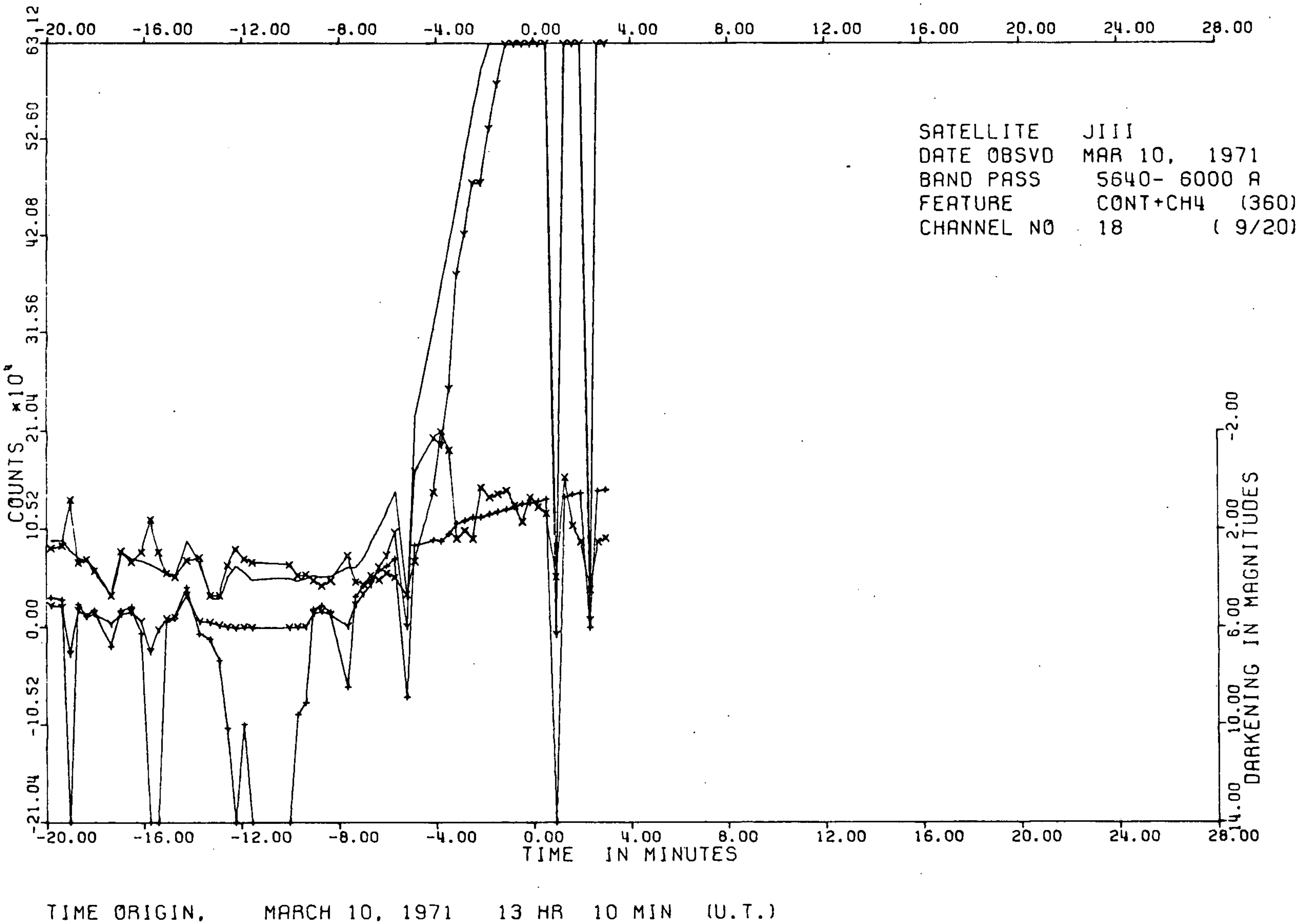
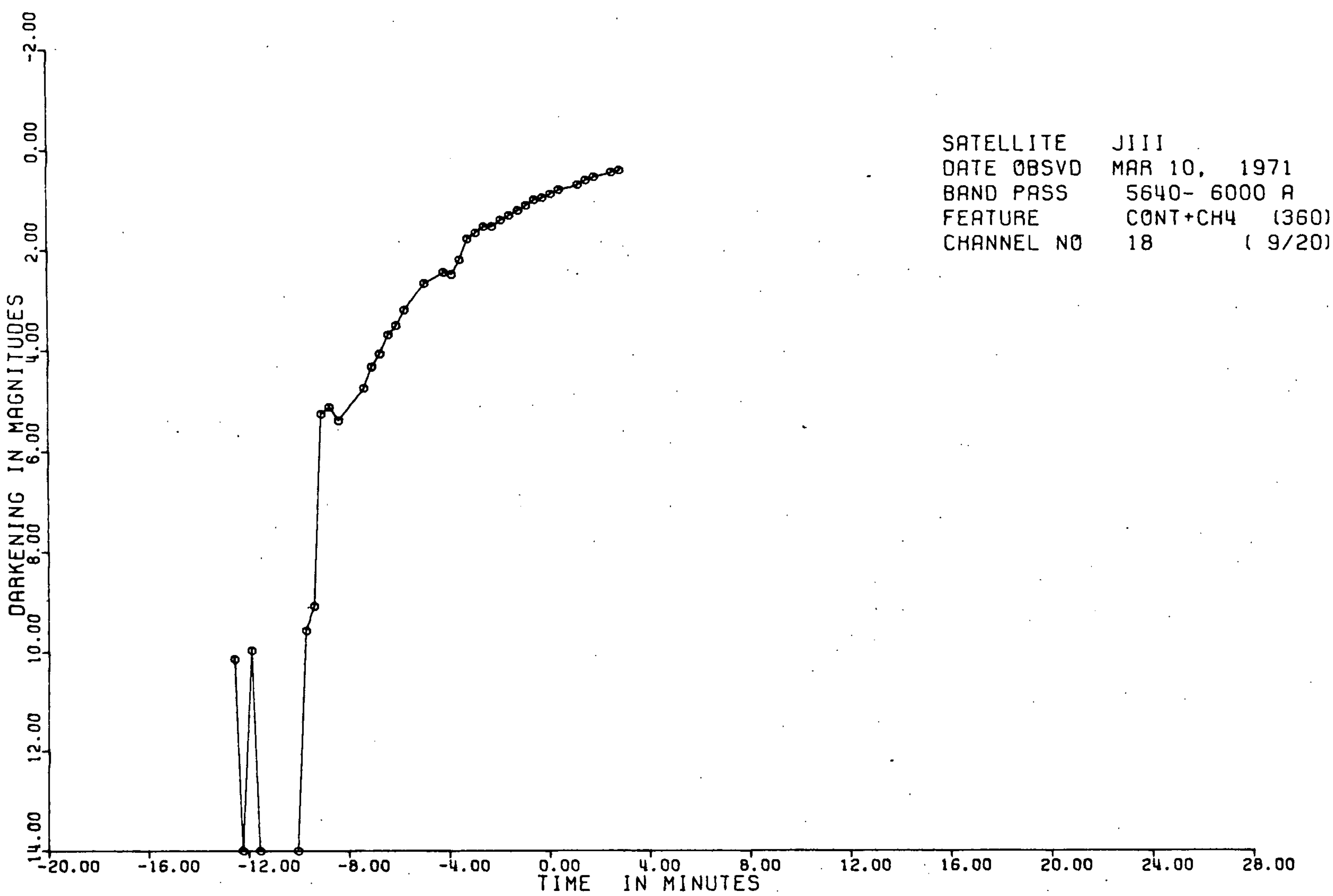


SATELLITE JIII
DATE OBSVD MAR 10, 1971
BAND PASS 5640- 6000 A
FEATURE CONT+CH4 (360)
CHANNEL NO 18 (9/20)
COUNTS ×10⁴
DARKENING IN MAGNITUDES
TIME IN MINUTES
TIME ORIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)



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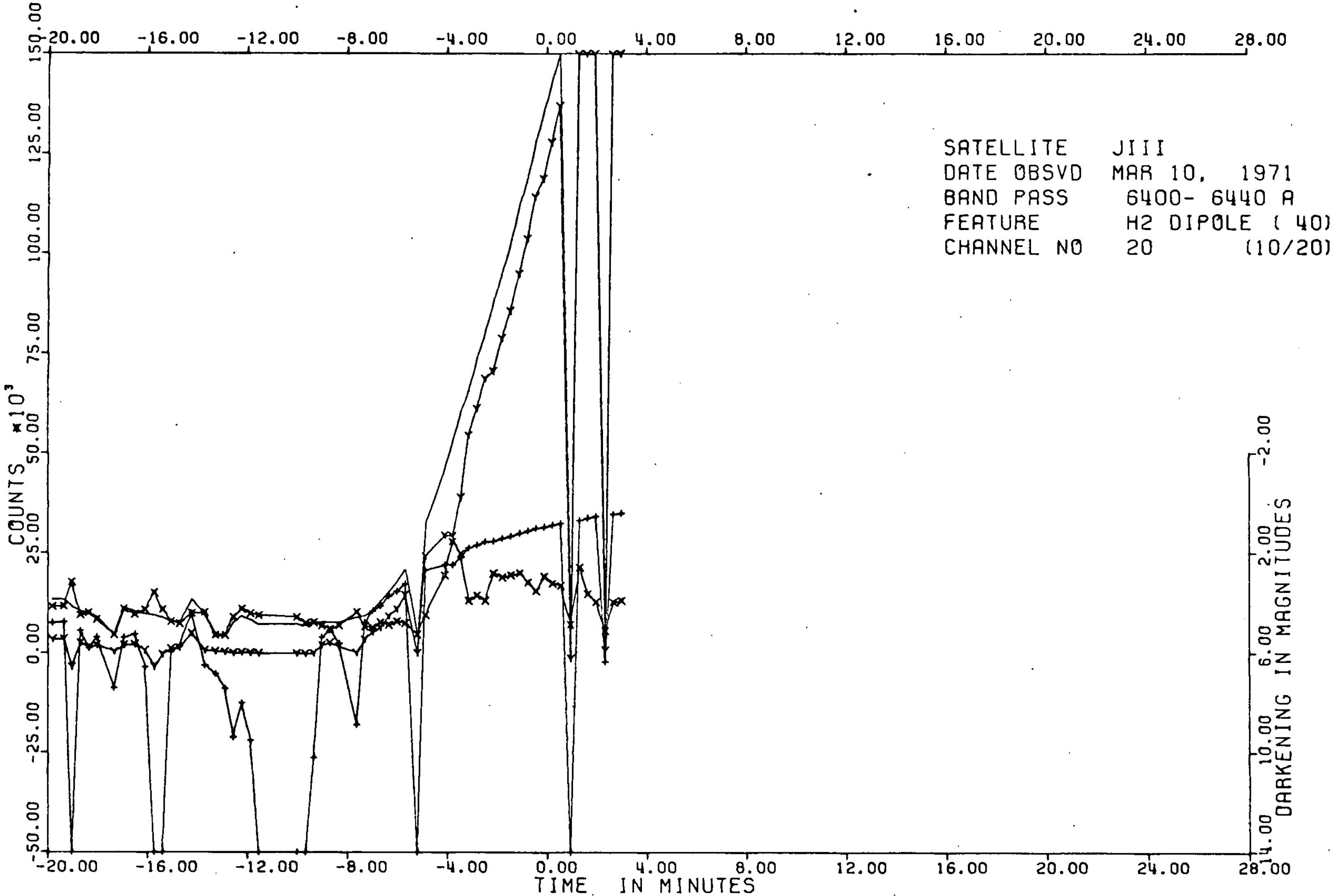

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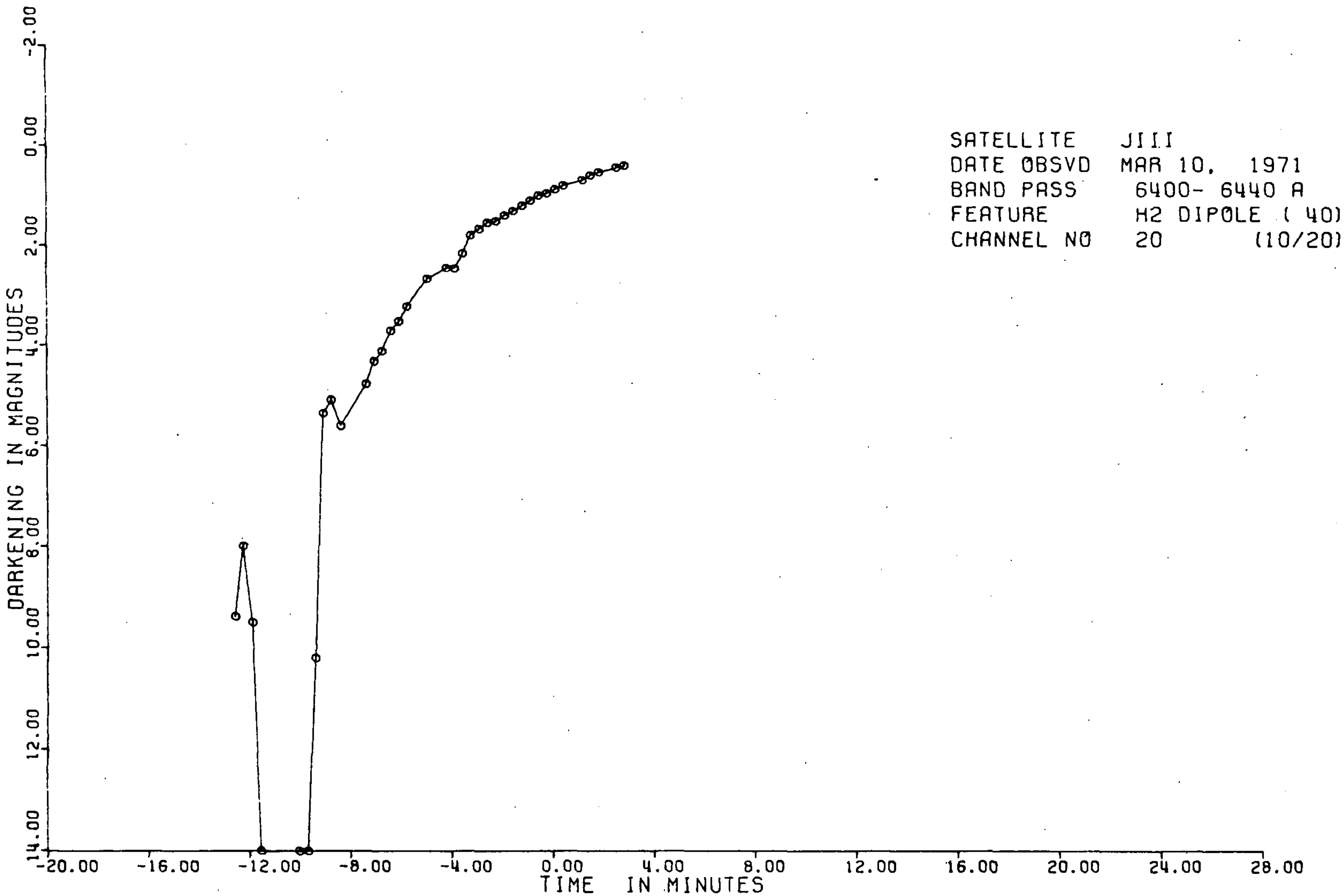
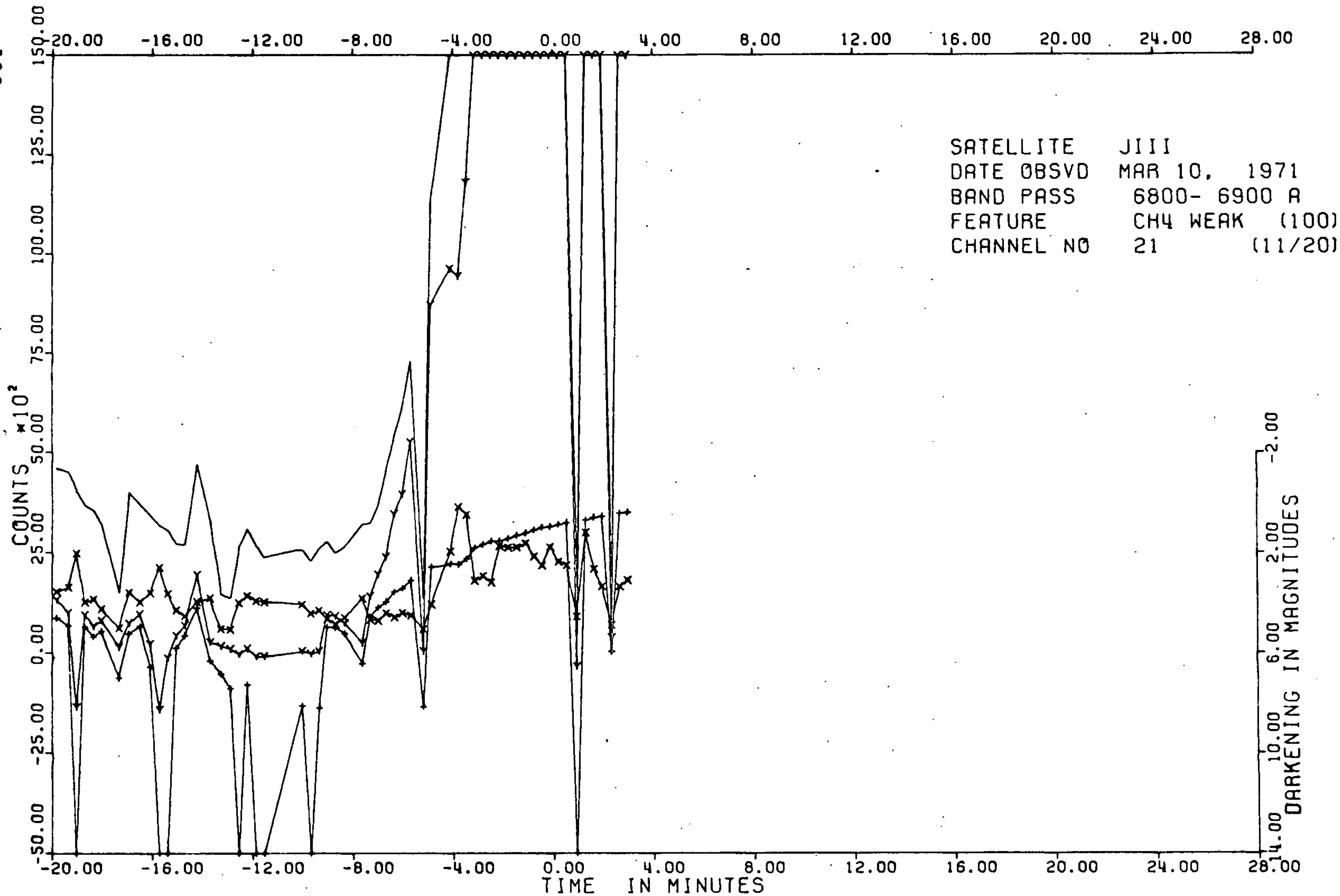


TIME ORIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)



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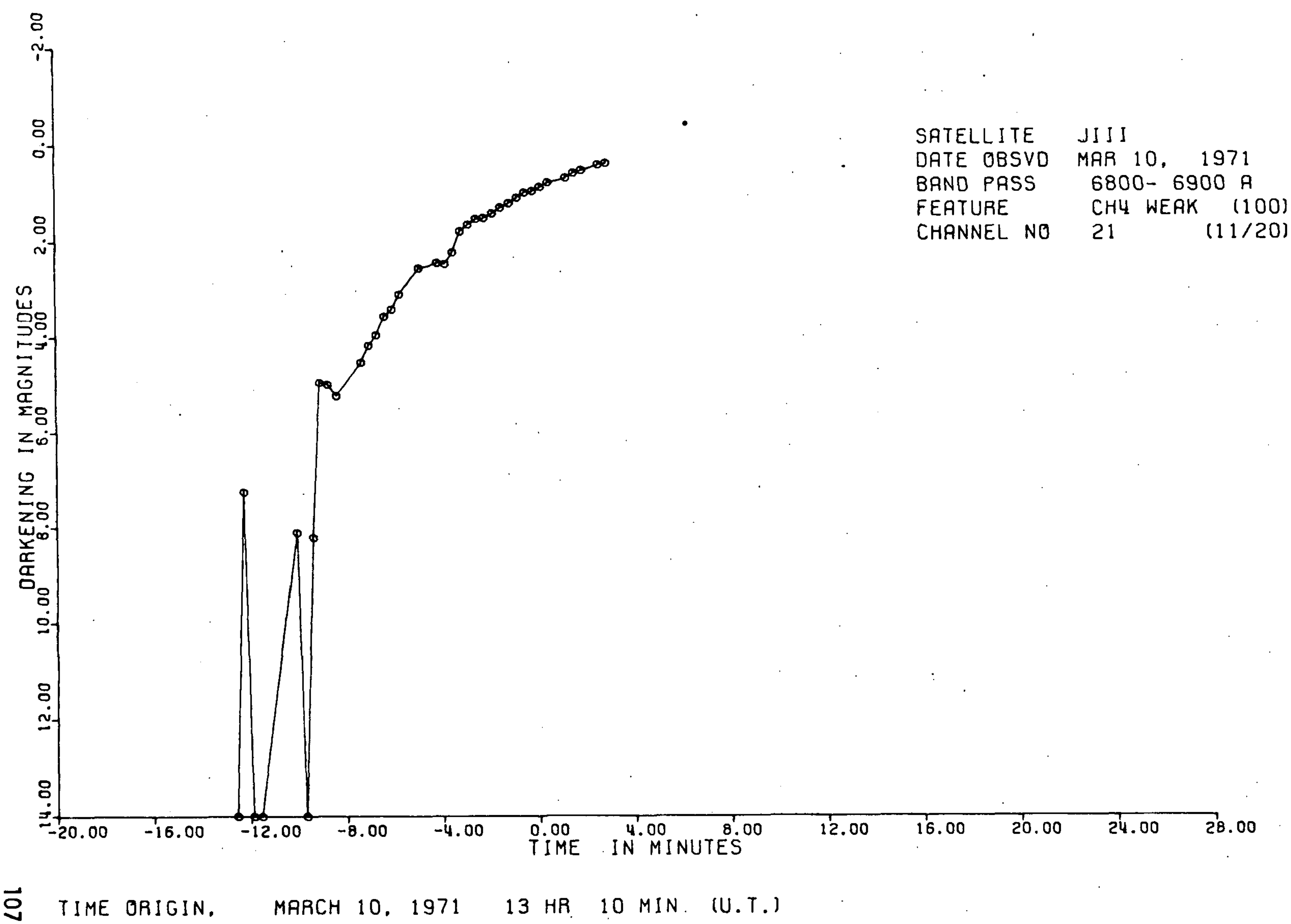
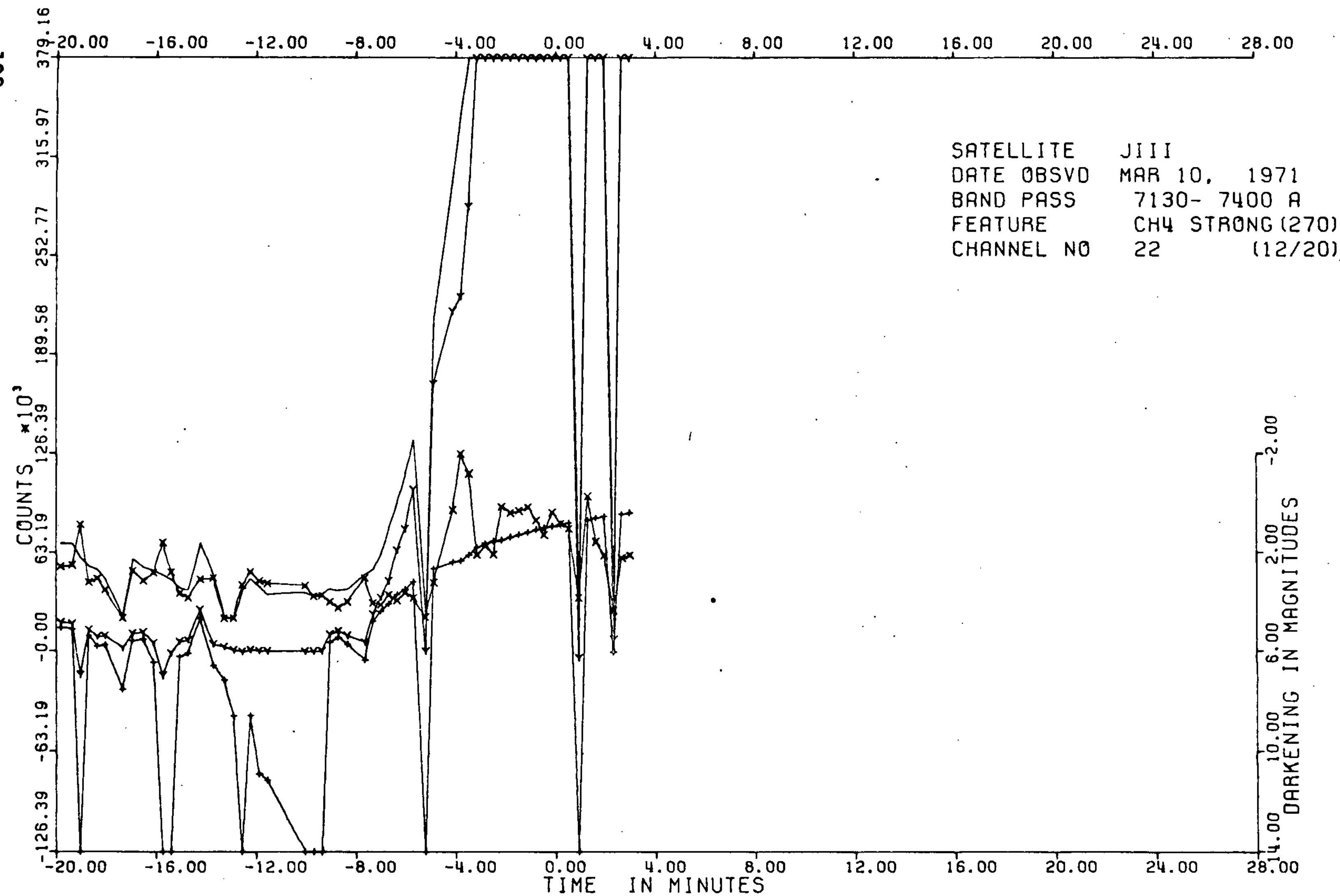
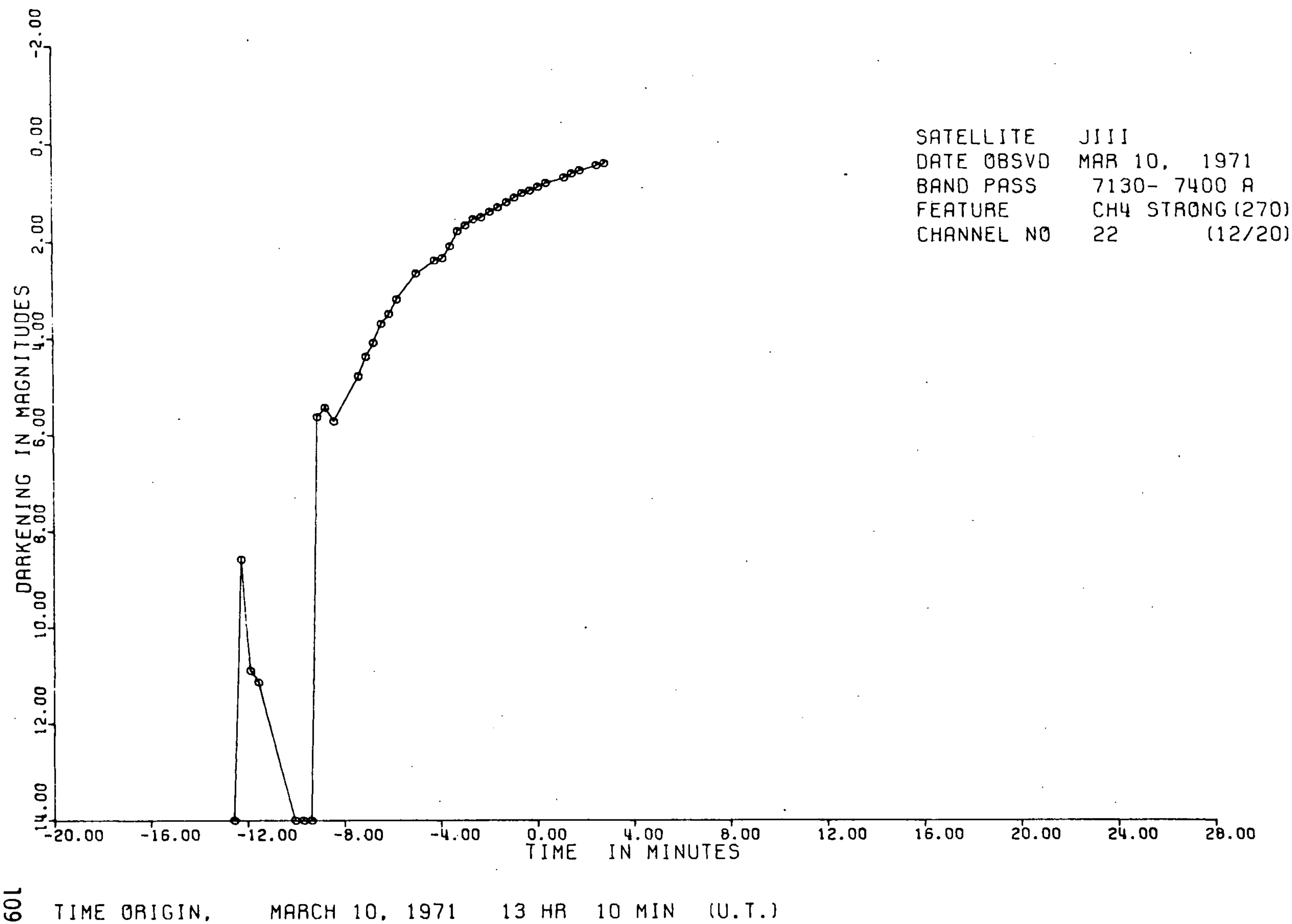
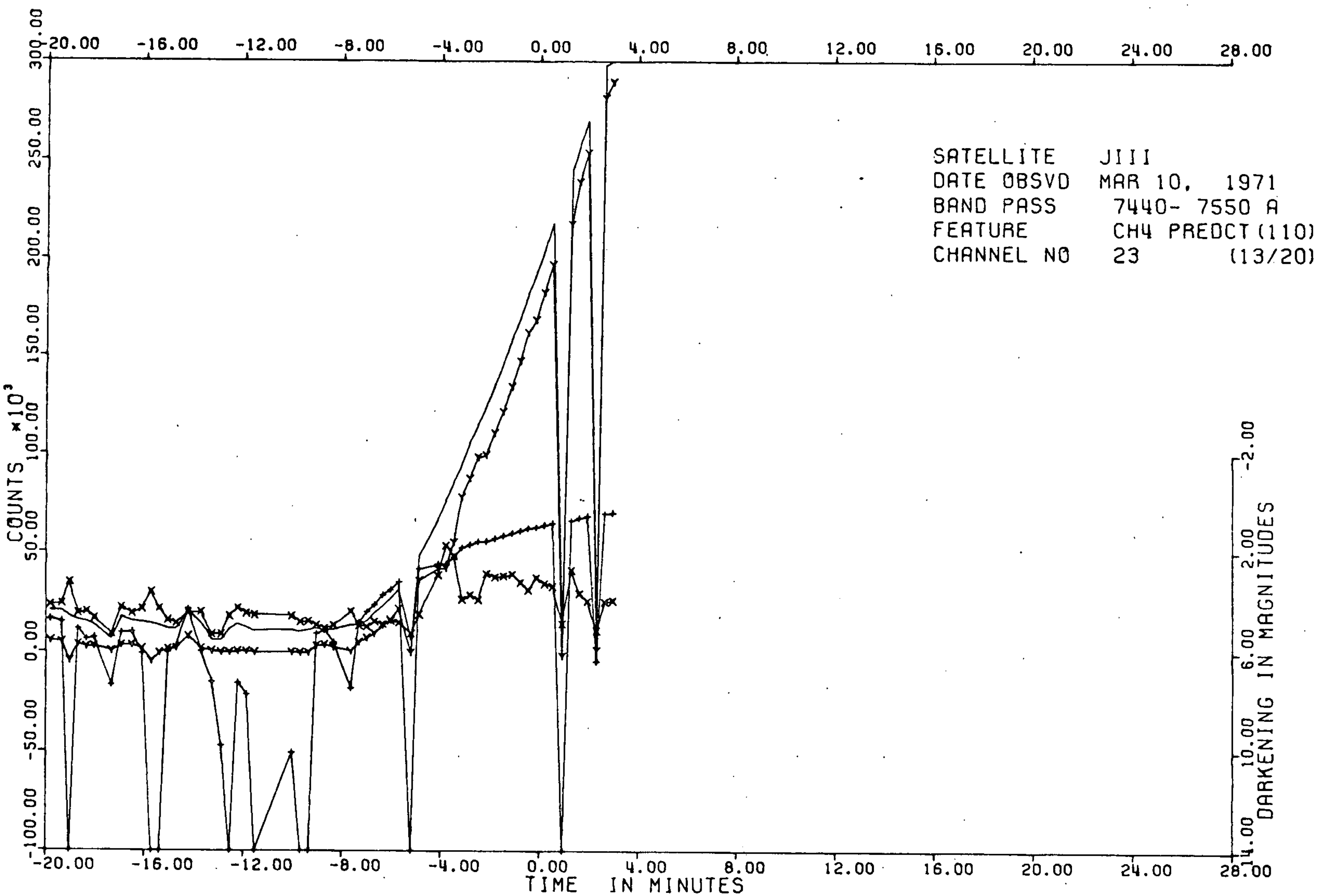

SATELLITE JIII
DATE OBSVD MAR 10, 1971
BAND PASS 6800- 6900 A
FEATURE CH4 WEAK (100)
CHANNEL NO 21 (11/20)
DARKENING IN MAGNITUDES
-2.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
-20.00
-16.00
-12.00
-8.00
-4.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
TIME IN MINUTES
TIME ORIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)



TIME ORIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)


SATELLITE JIII
DATE OBSVD MAR 10, 1971
BAND PASS 7130- 7400 A
FEATURE CH4 STRONG (270)
CHANNEL NO 22 (12/20)
DARKENING IN MAGNITUDES
-2.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
-20.00
-16.00
-12.00
-8.00
-4.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
TIME IN MINUTES
TIME ORIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)



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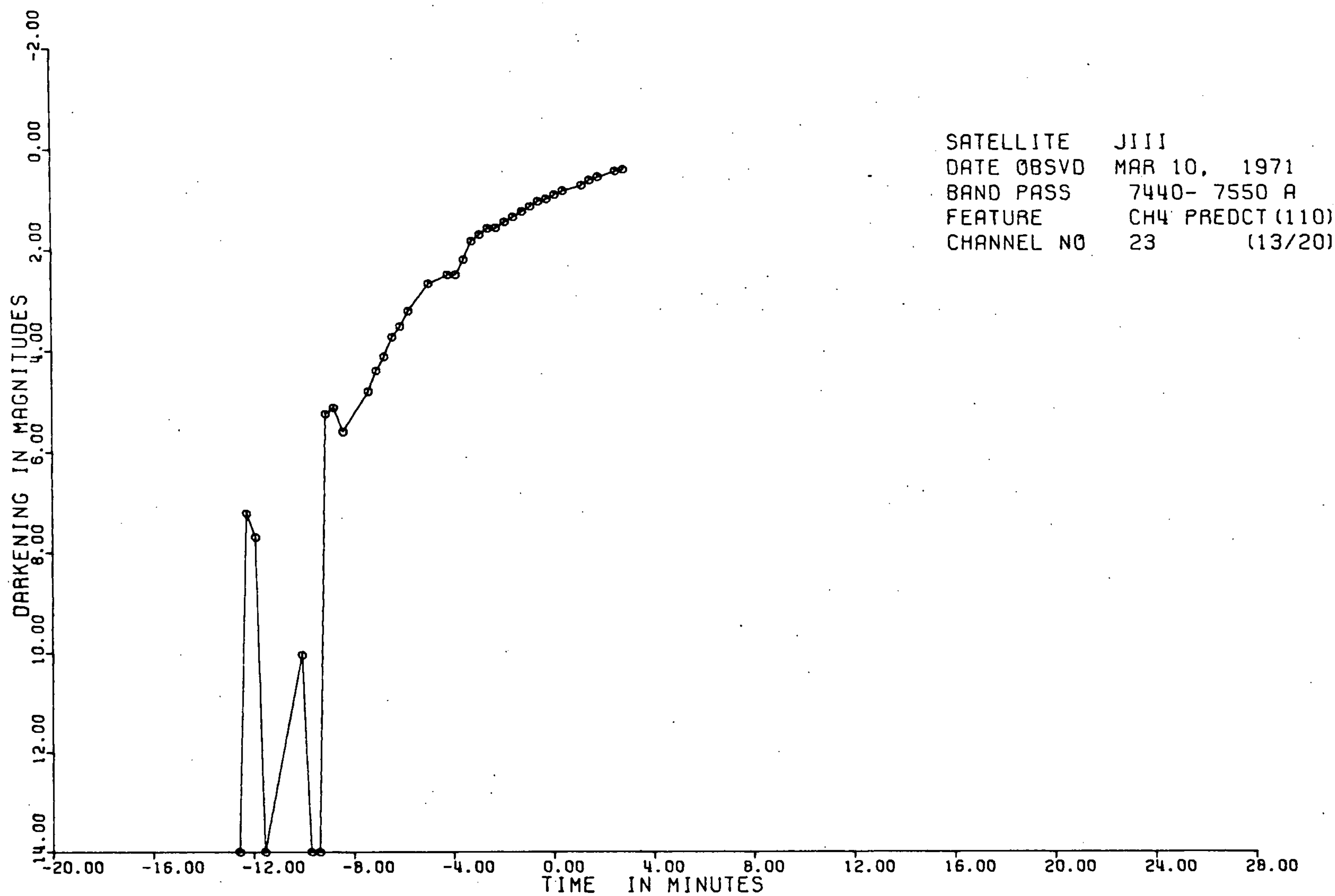
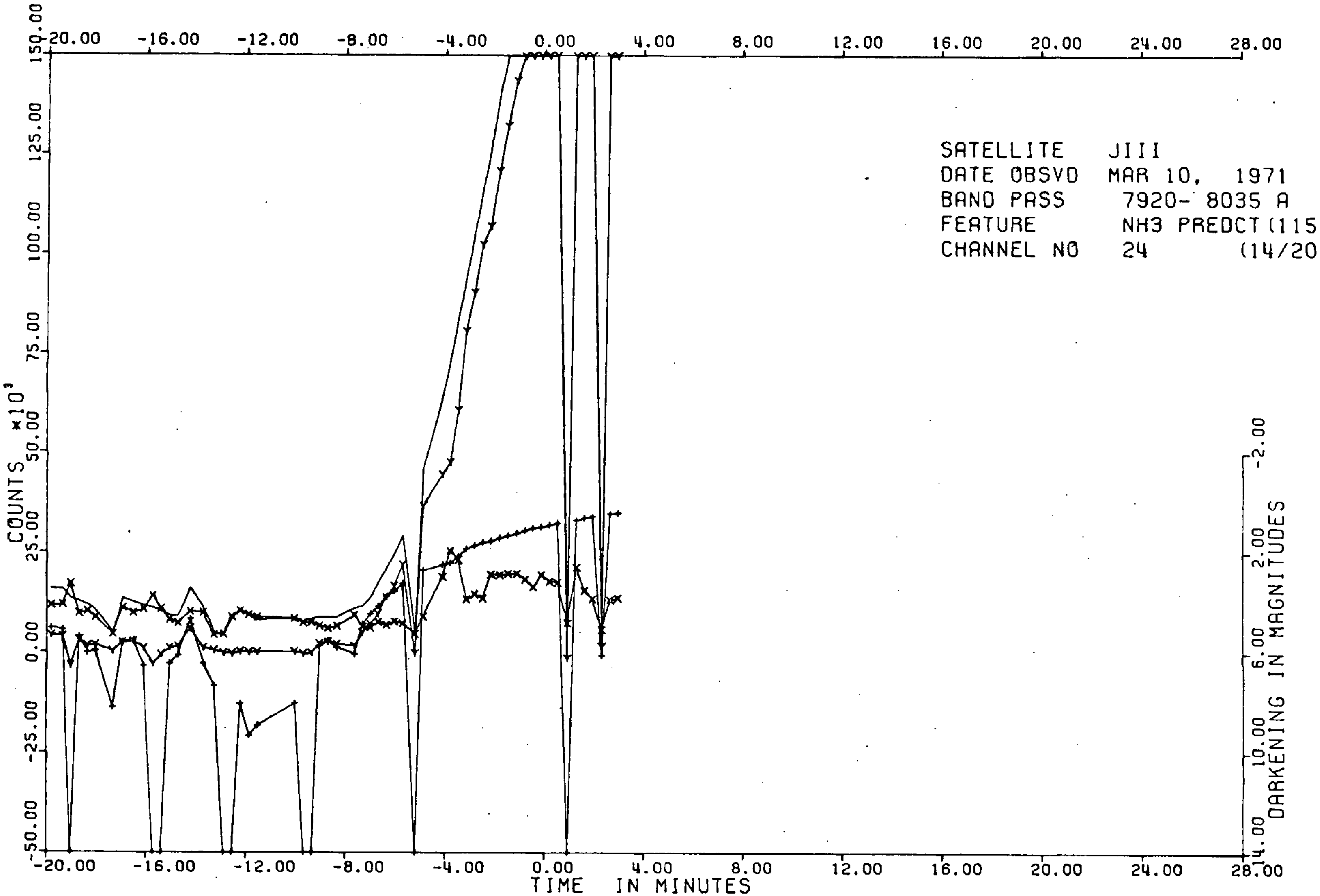


TIME ØRIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)



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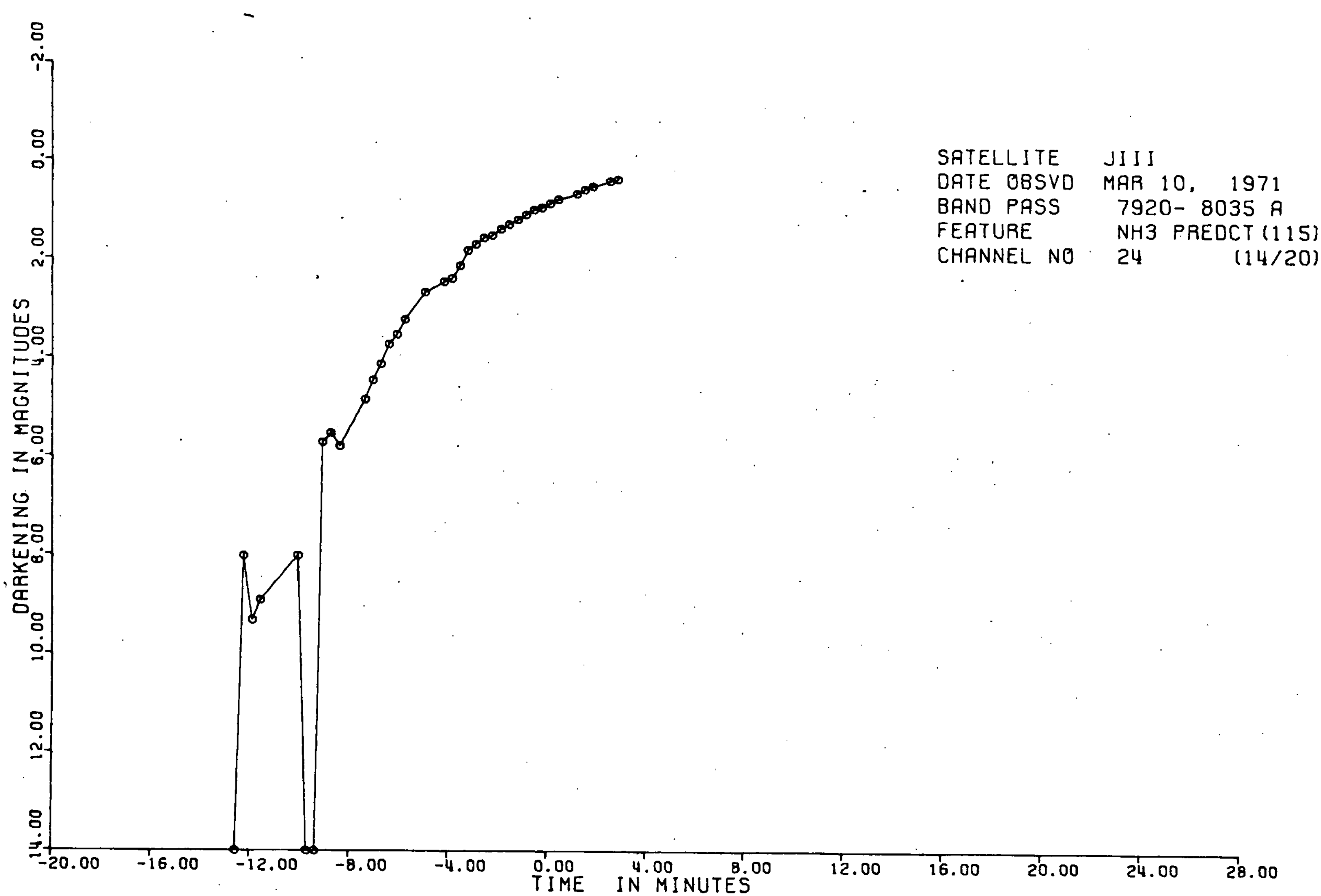

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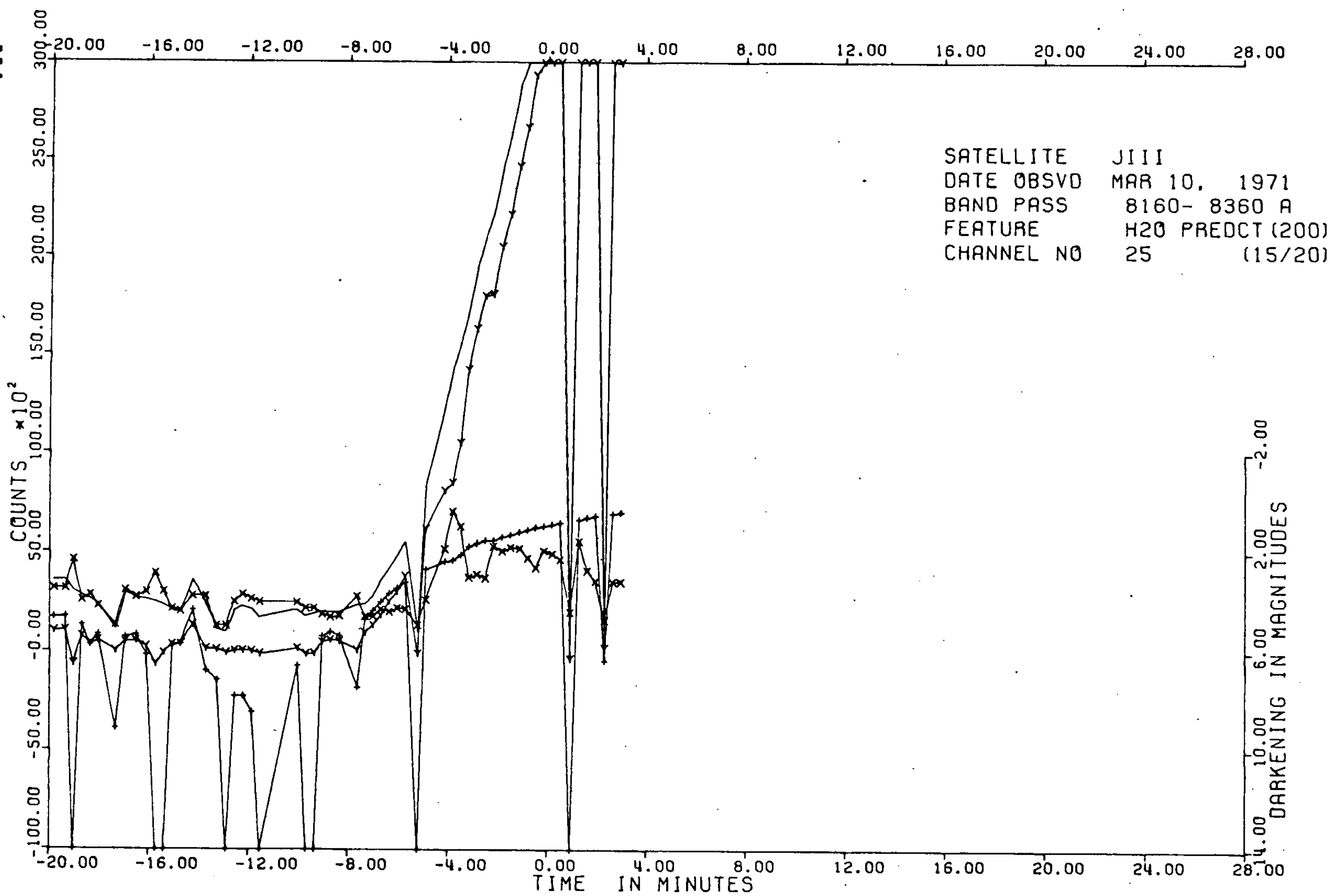

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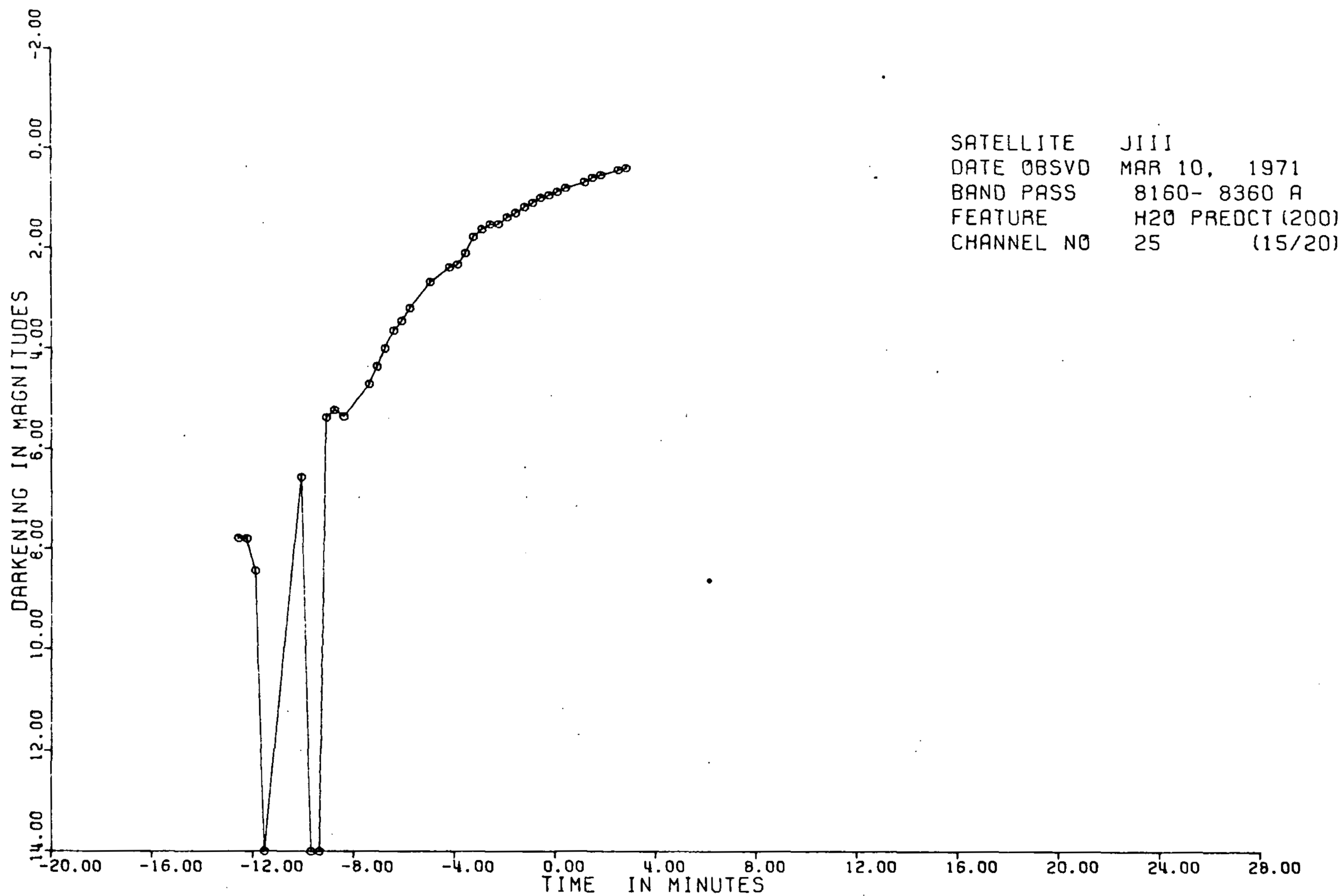

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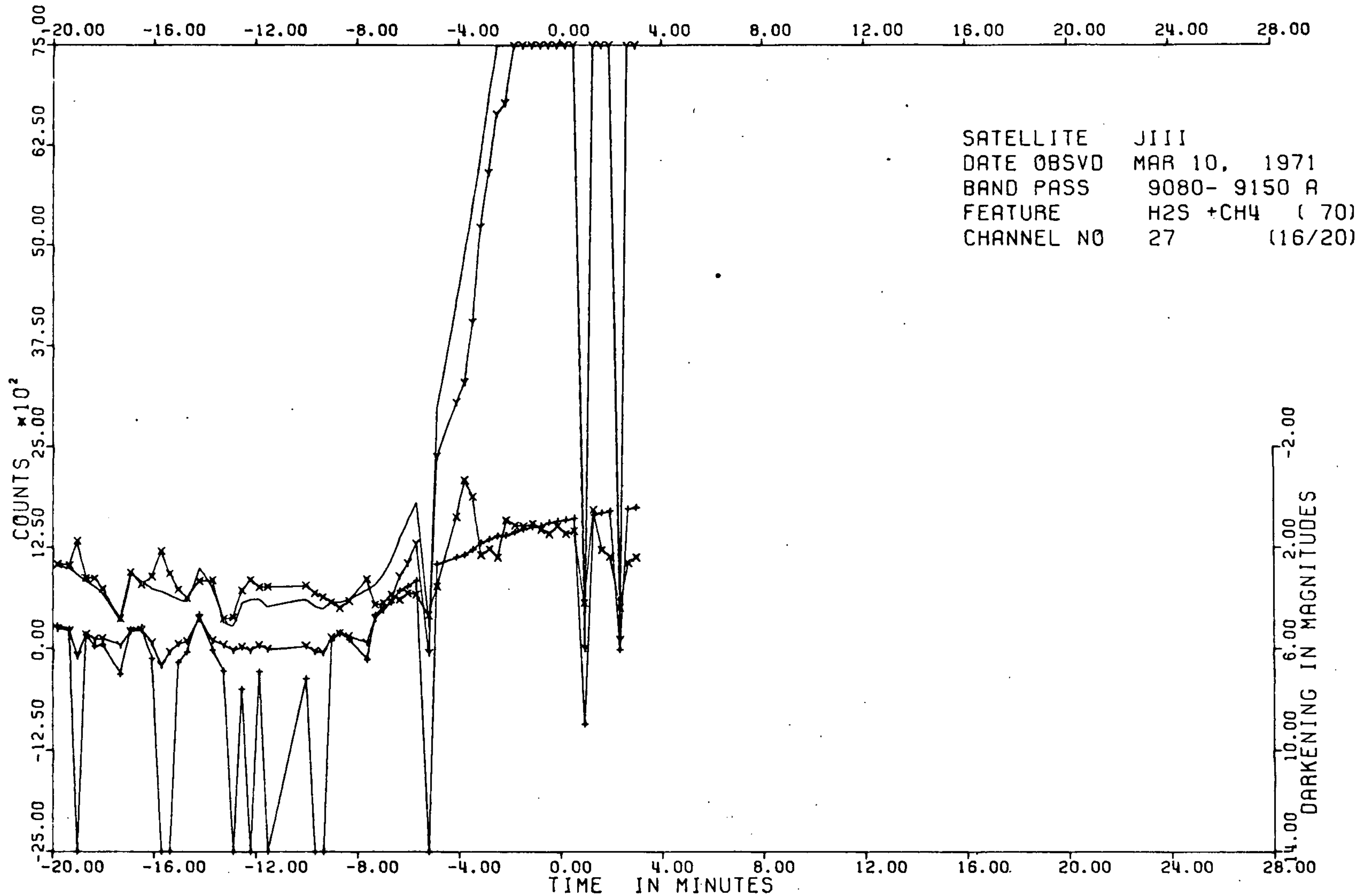

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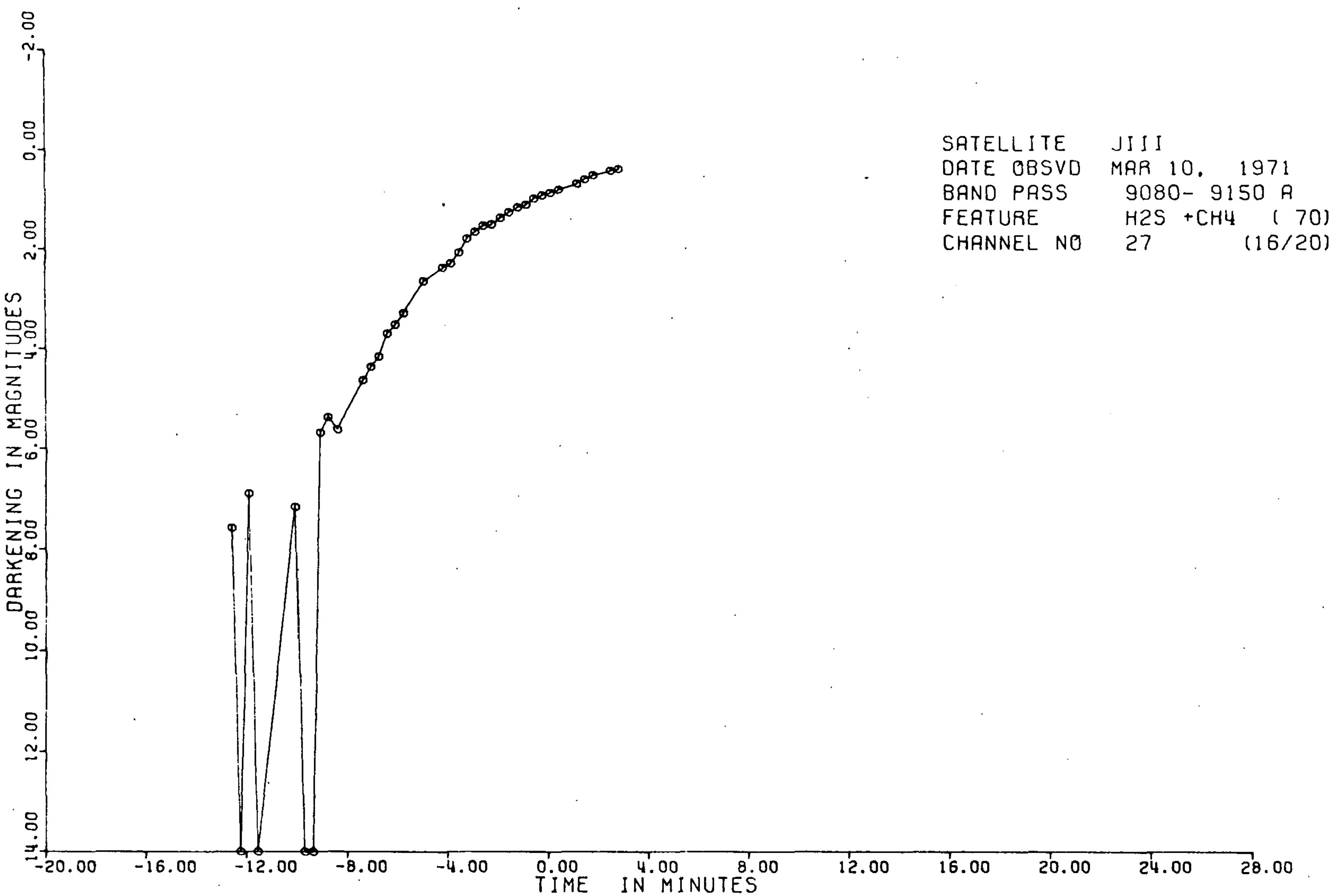

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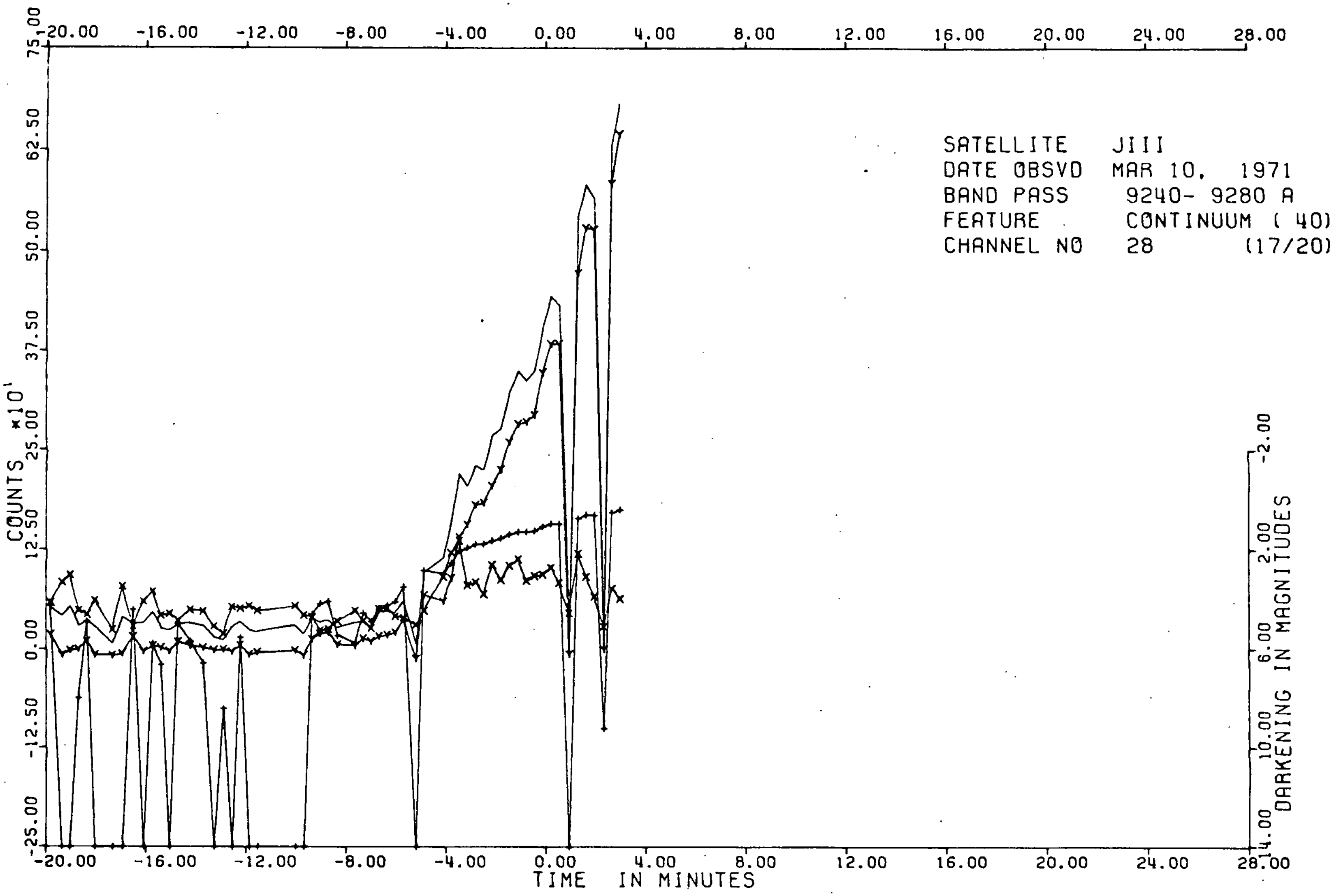

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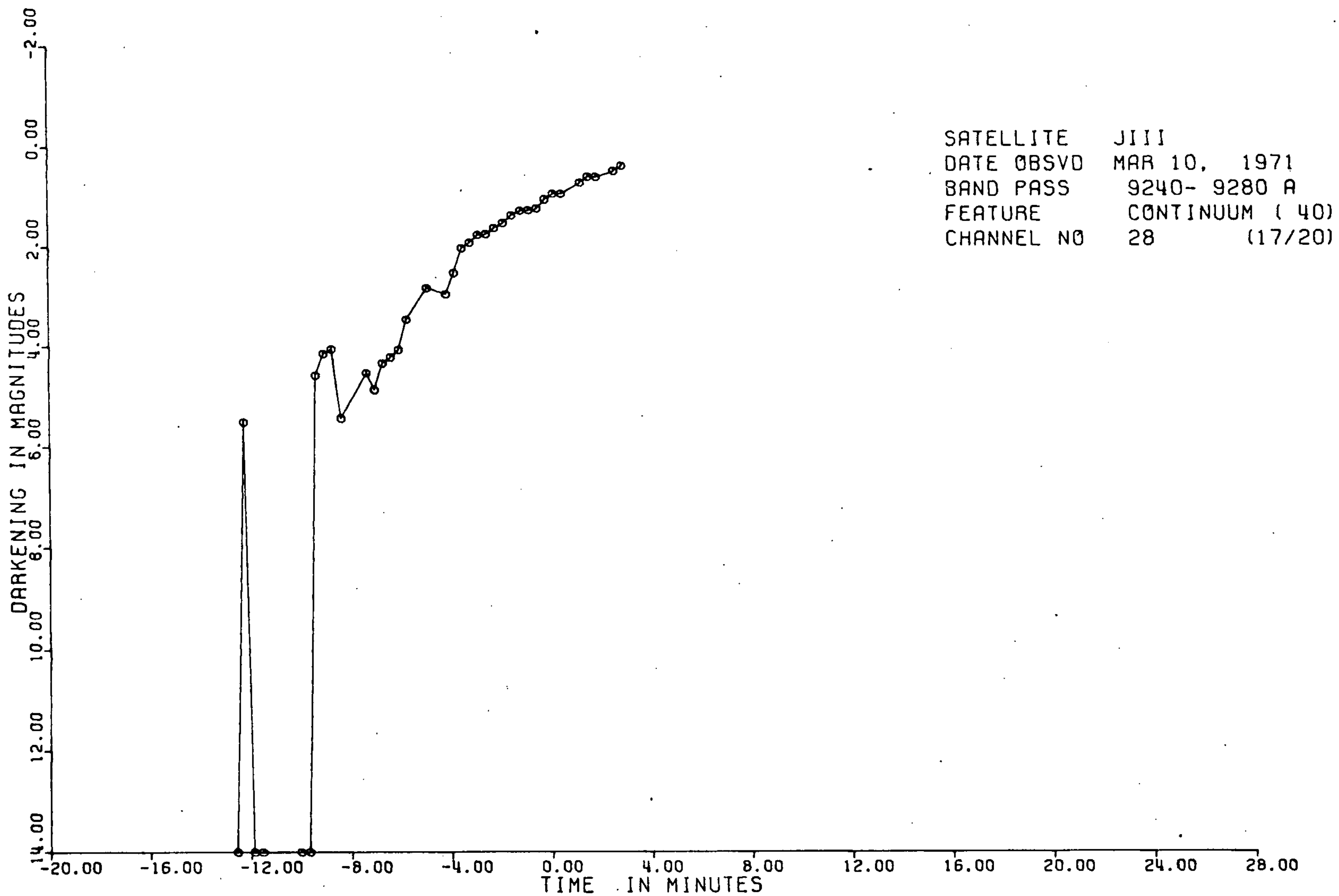

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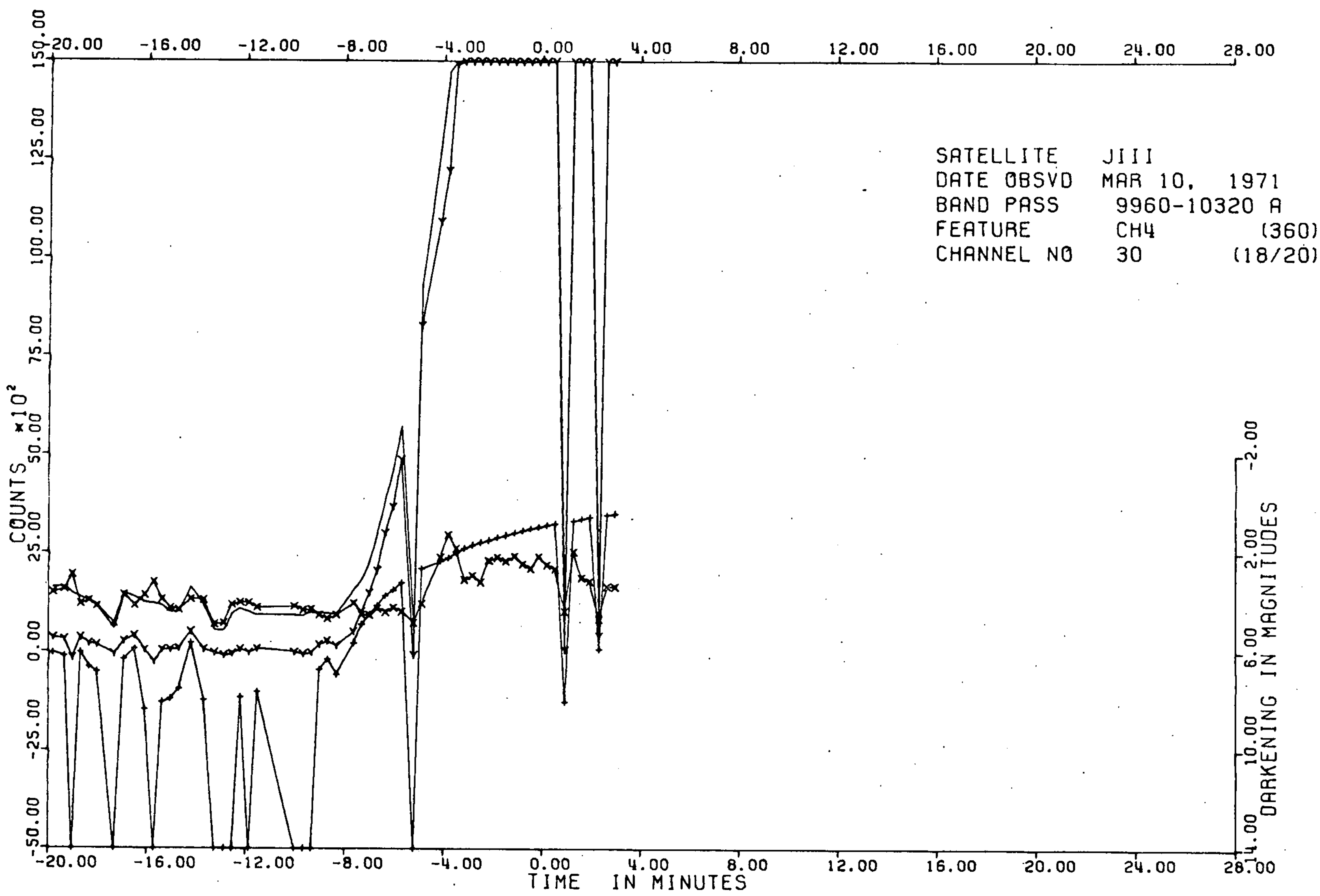
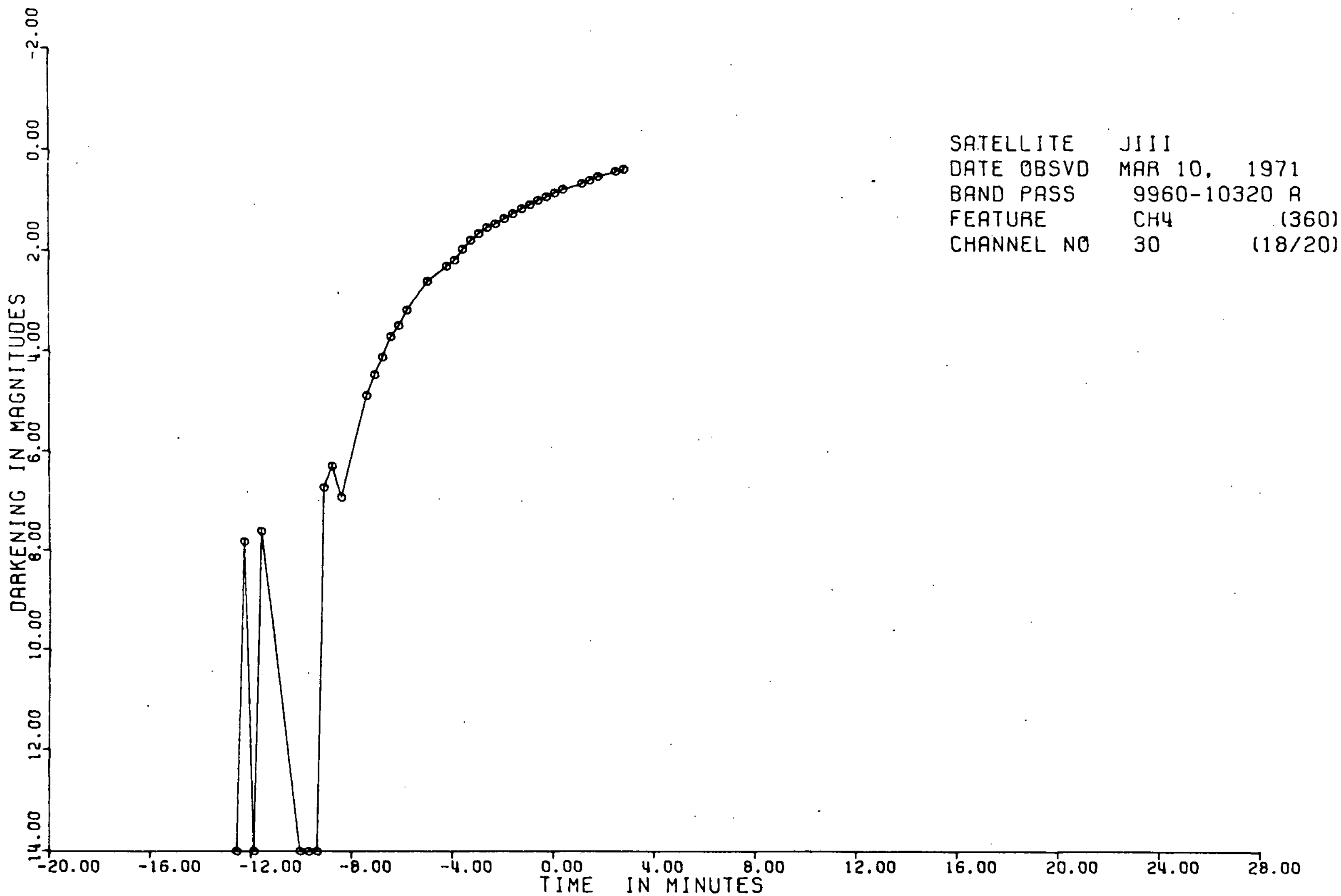
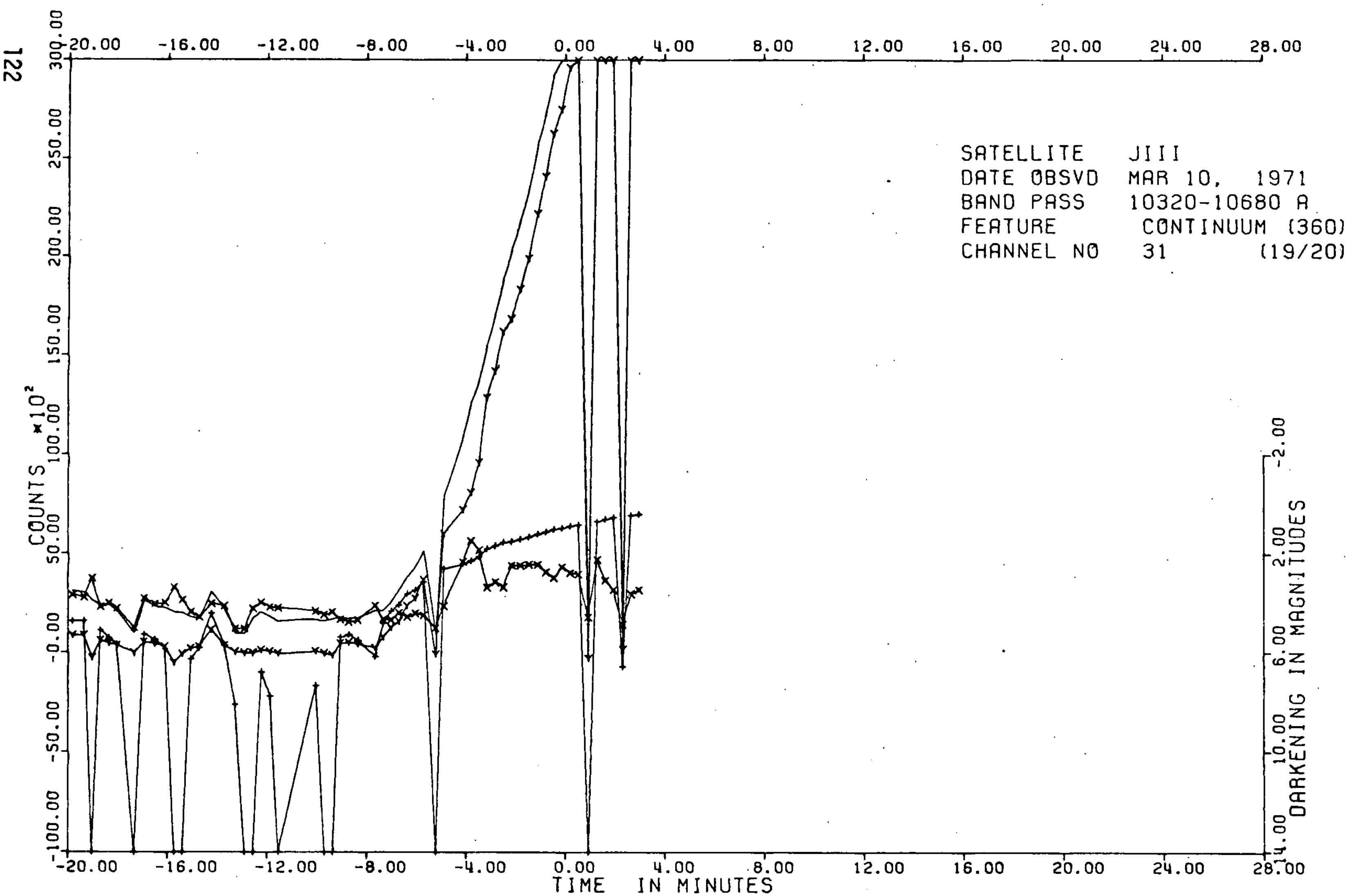


TIME ORIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)



TIME ORIGIN, MARCH 10, 1971 13 HR 10 MIN (U.T.)



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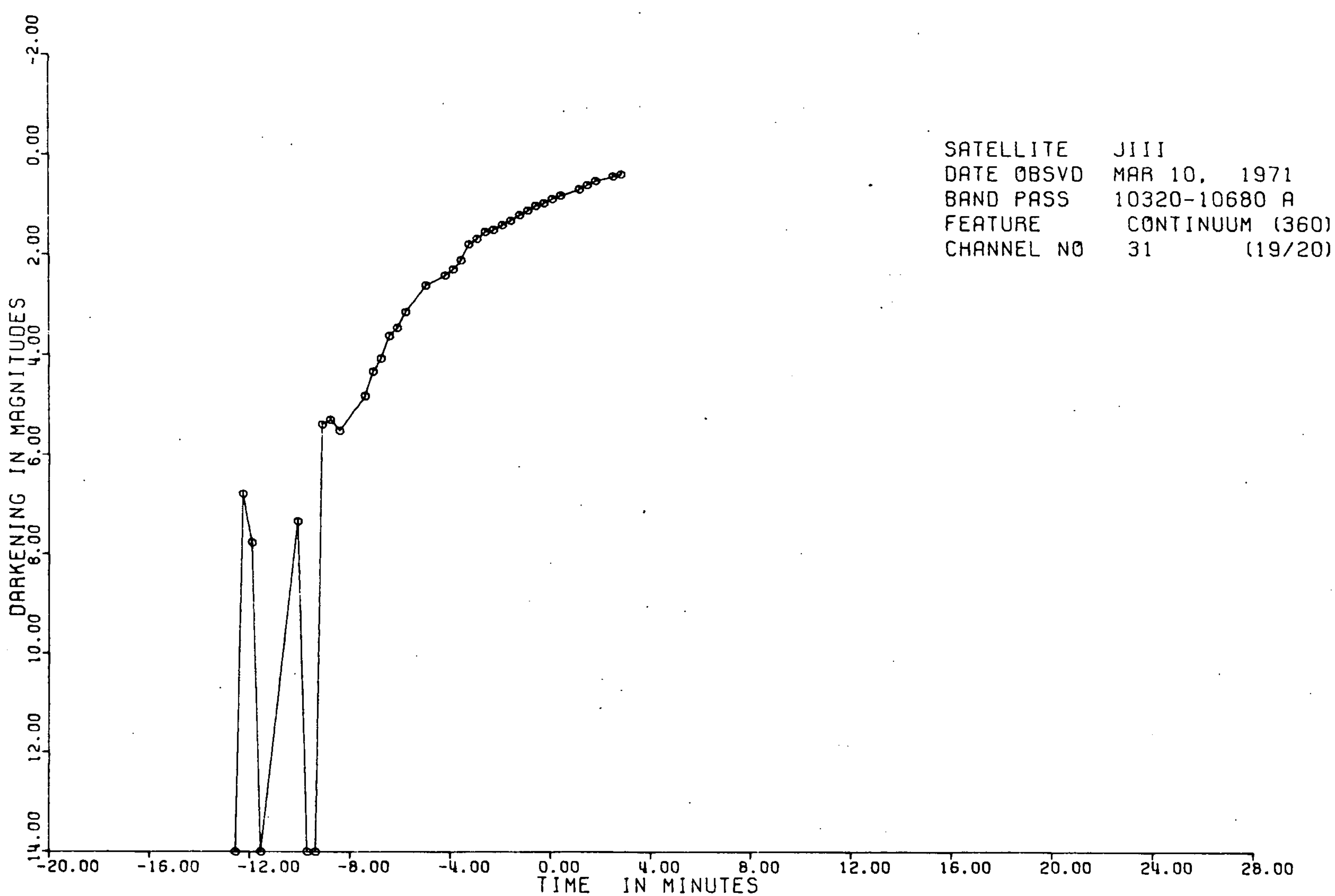

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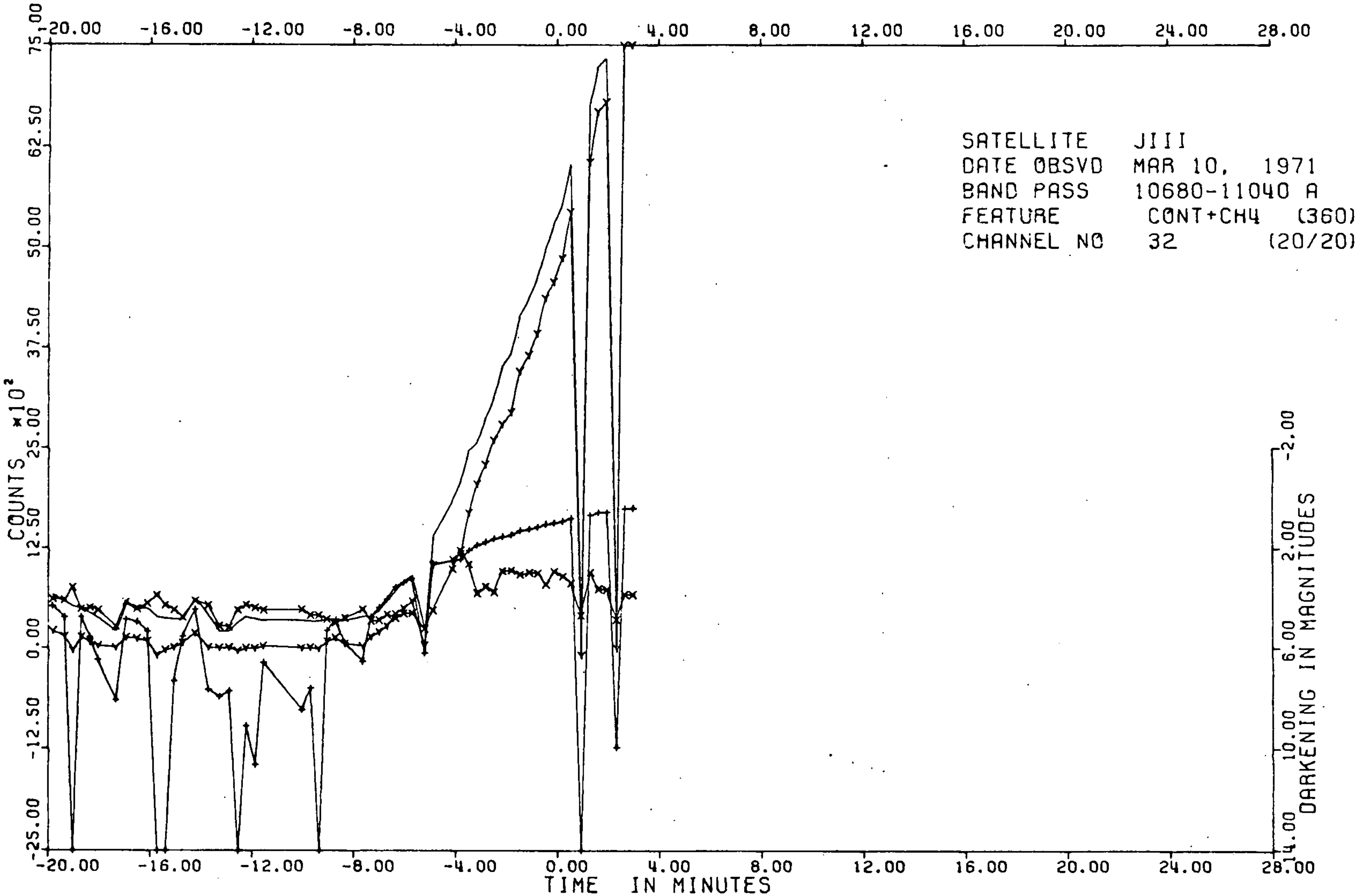

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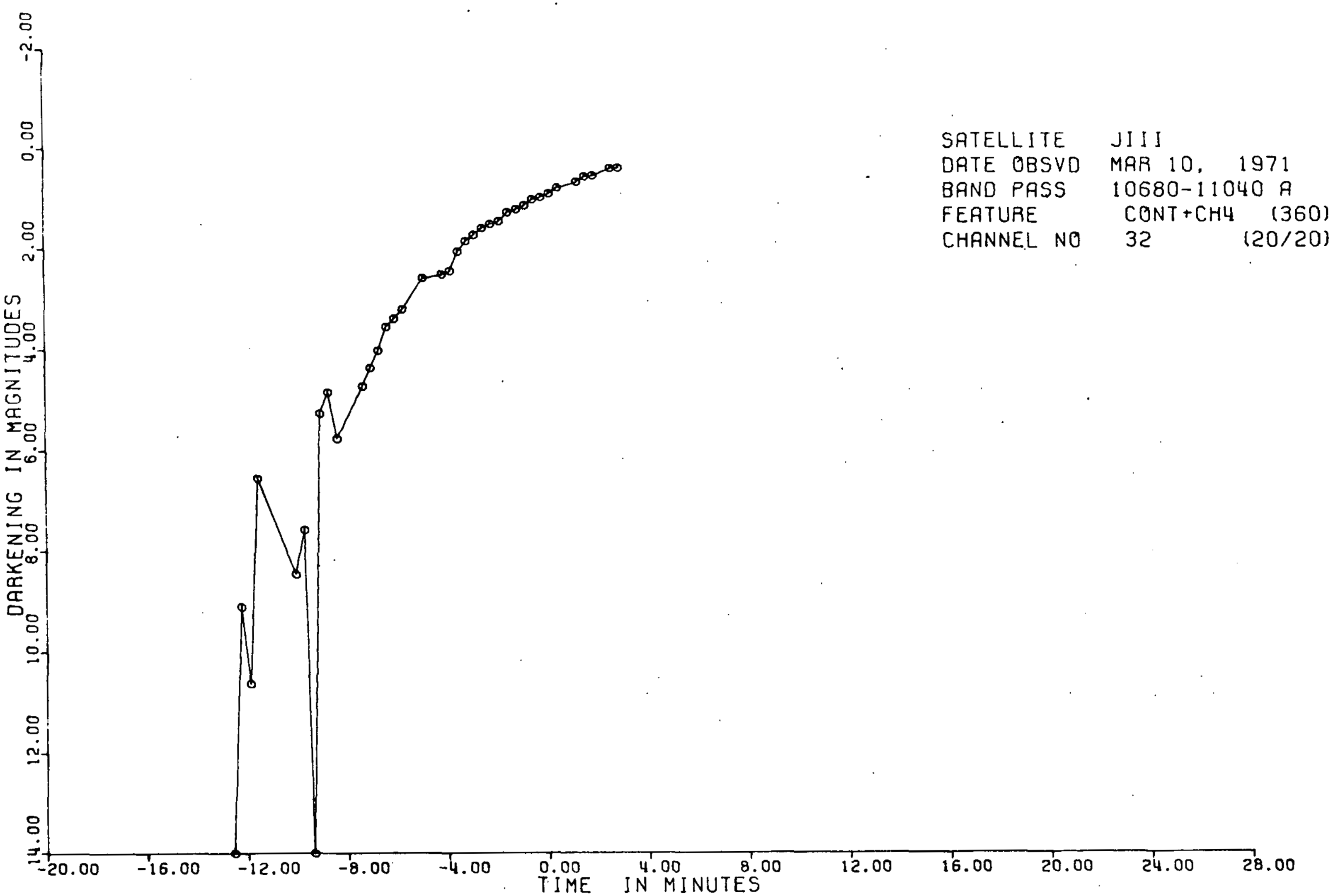

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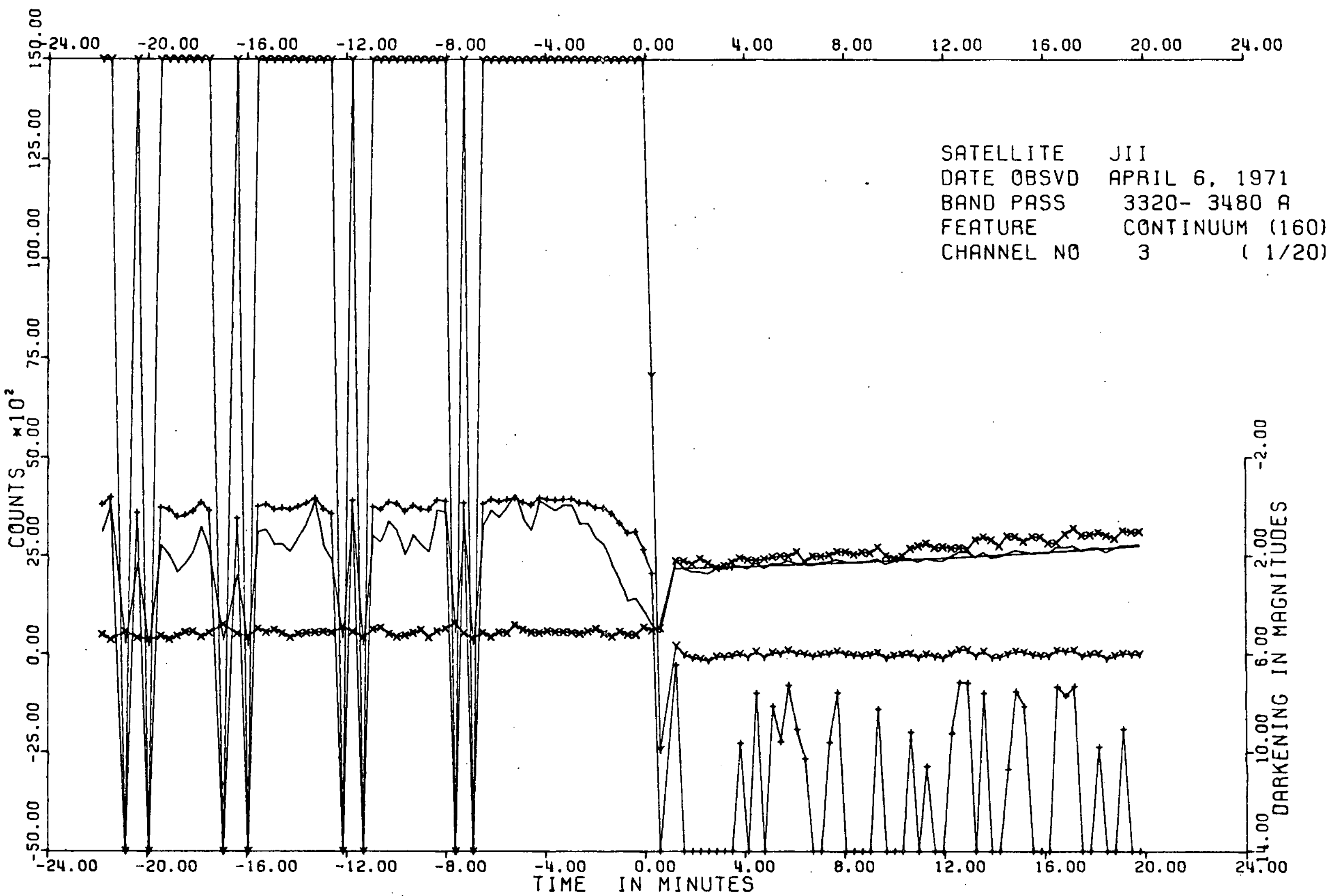
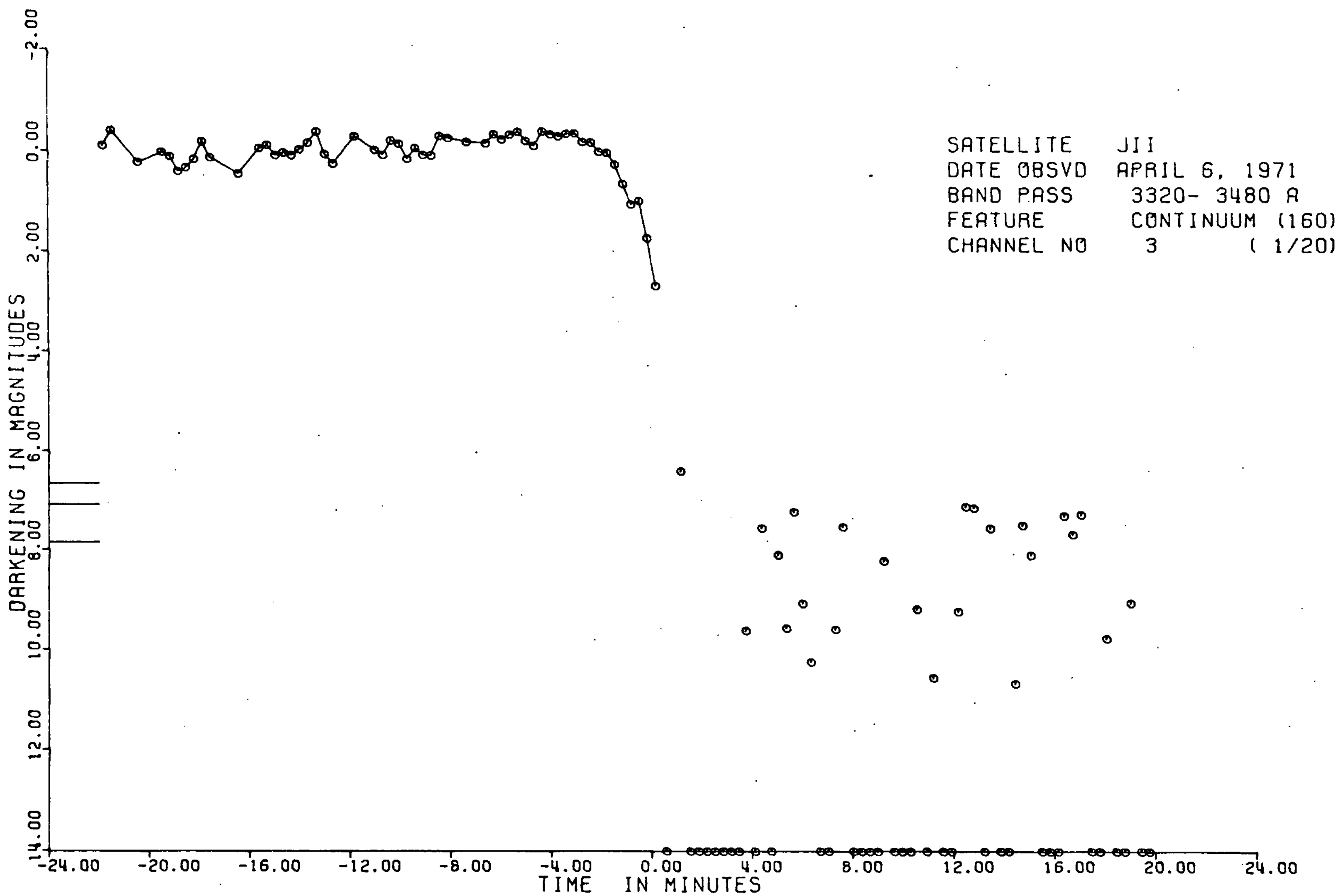


TIME ORIGIN, APRIL 6, 1971 10 HR 22 MIN (U.T.)



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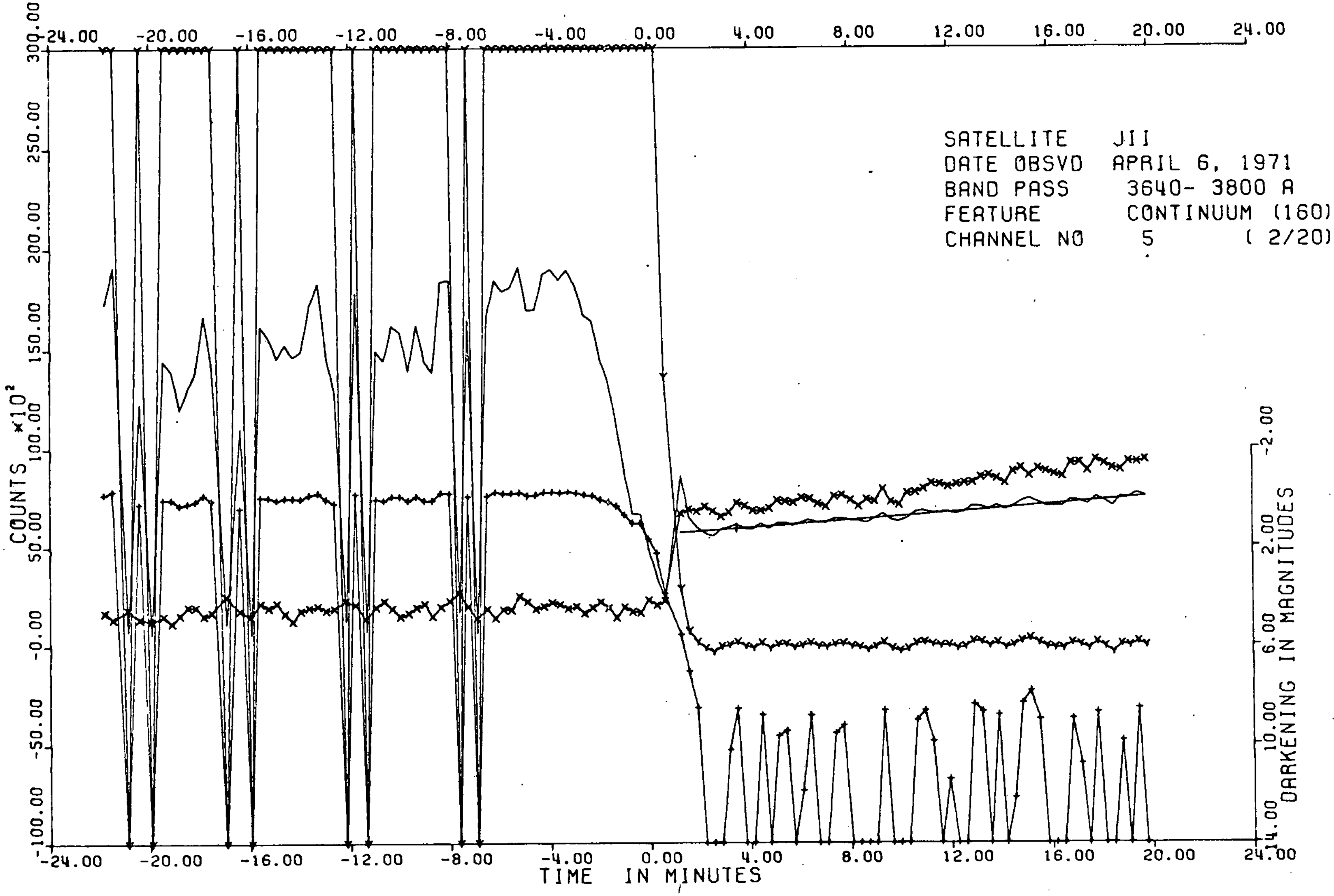

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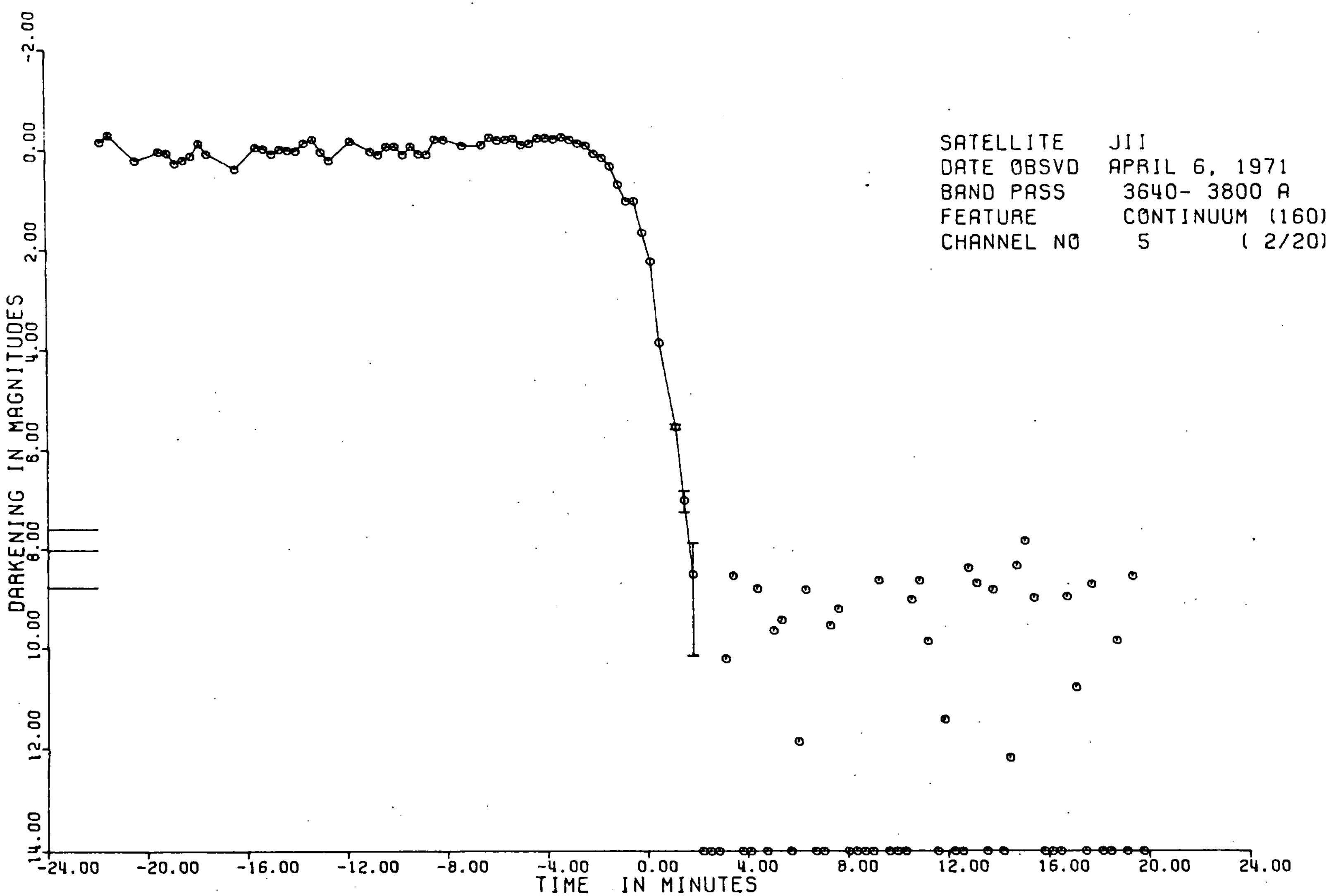

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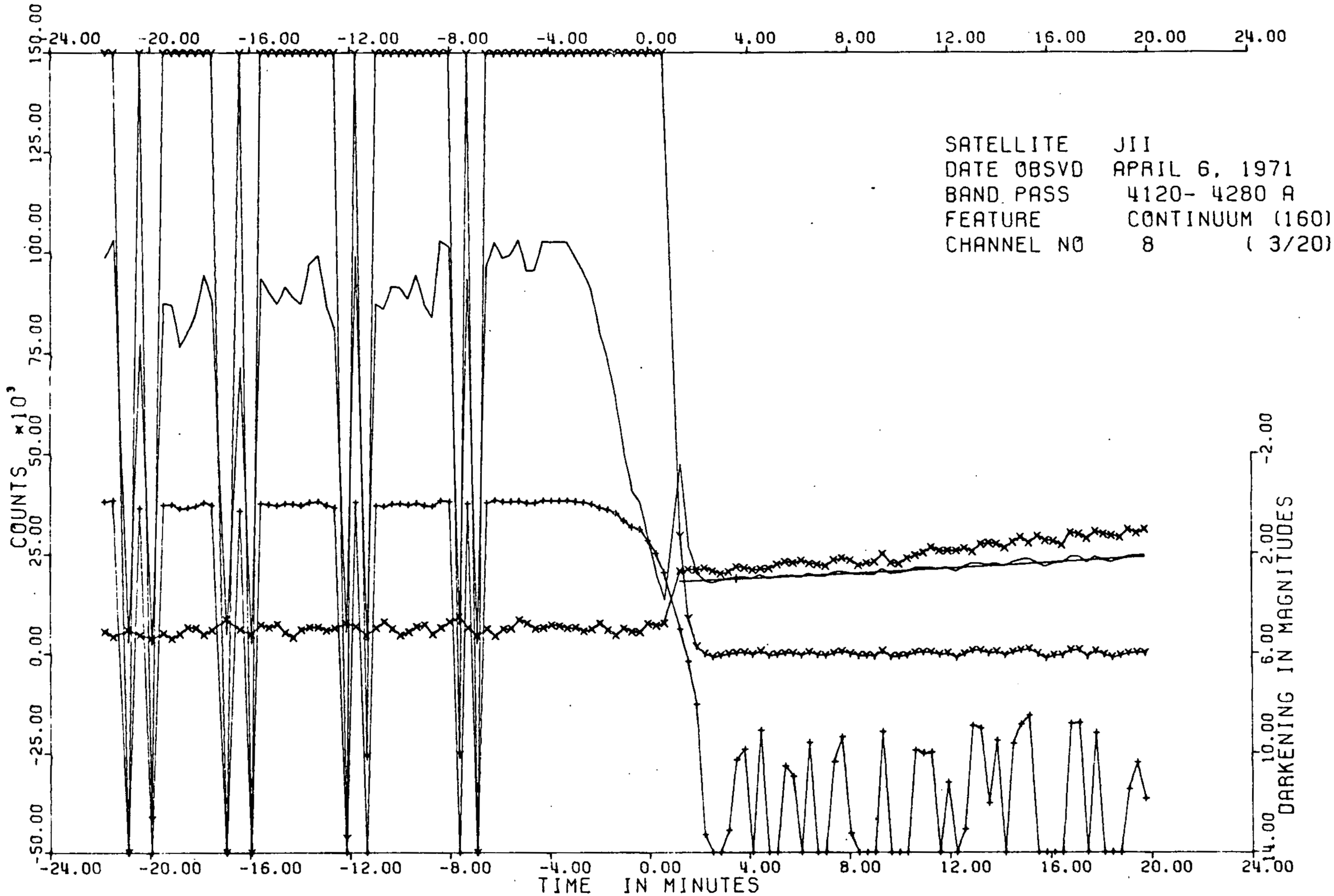

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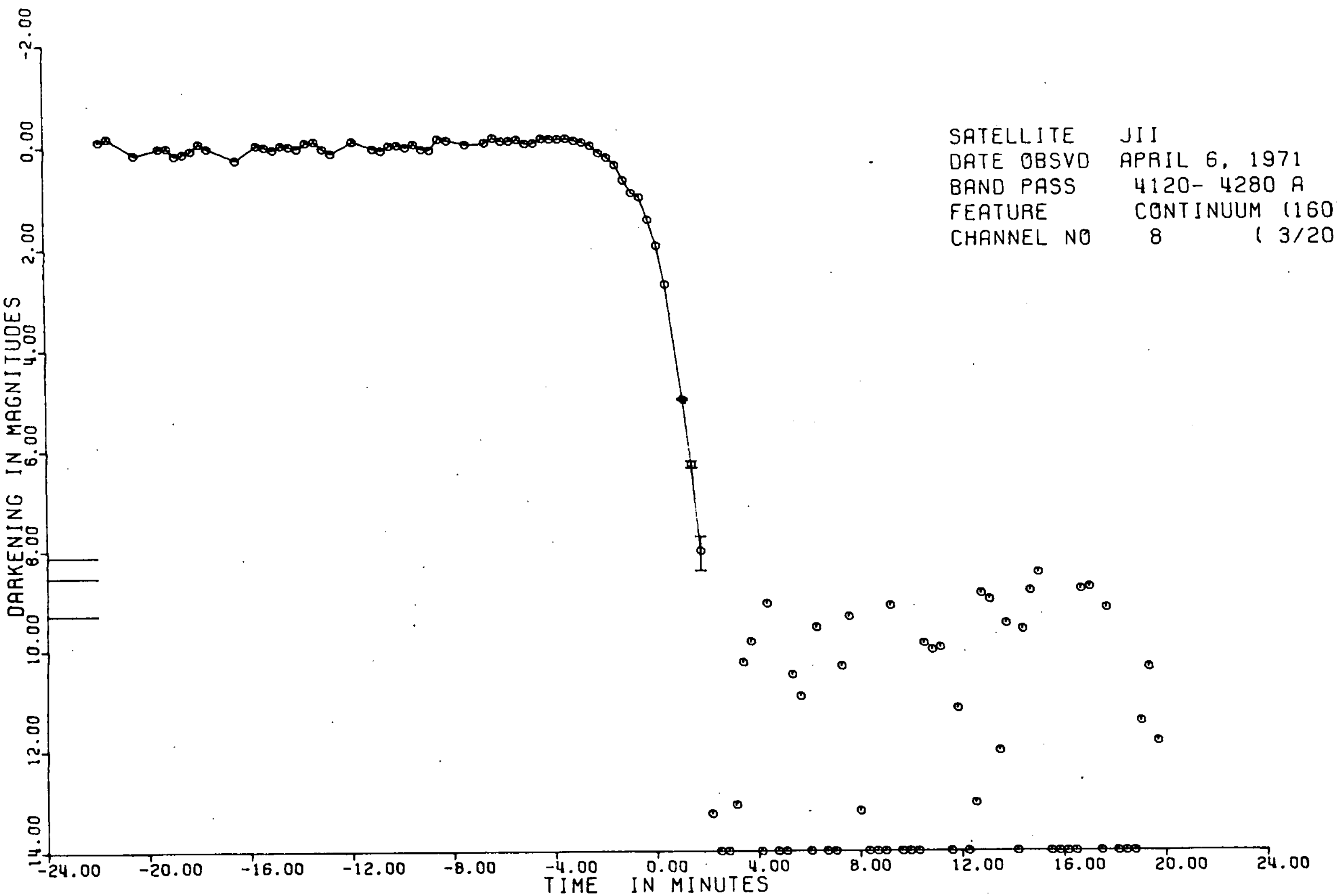

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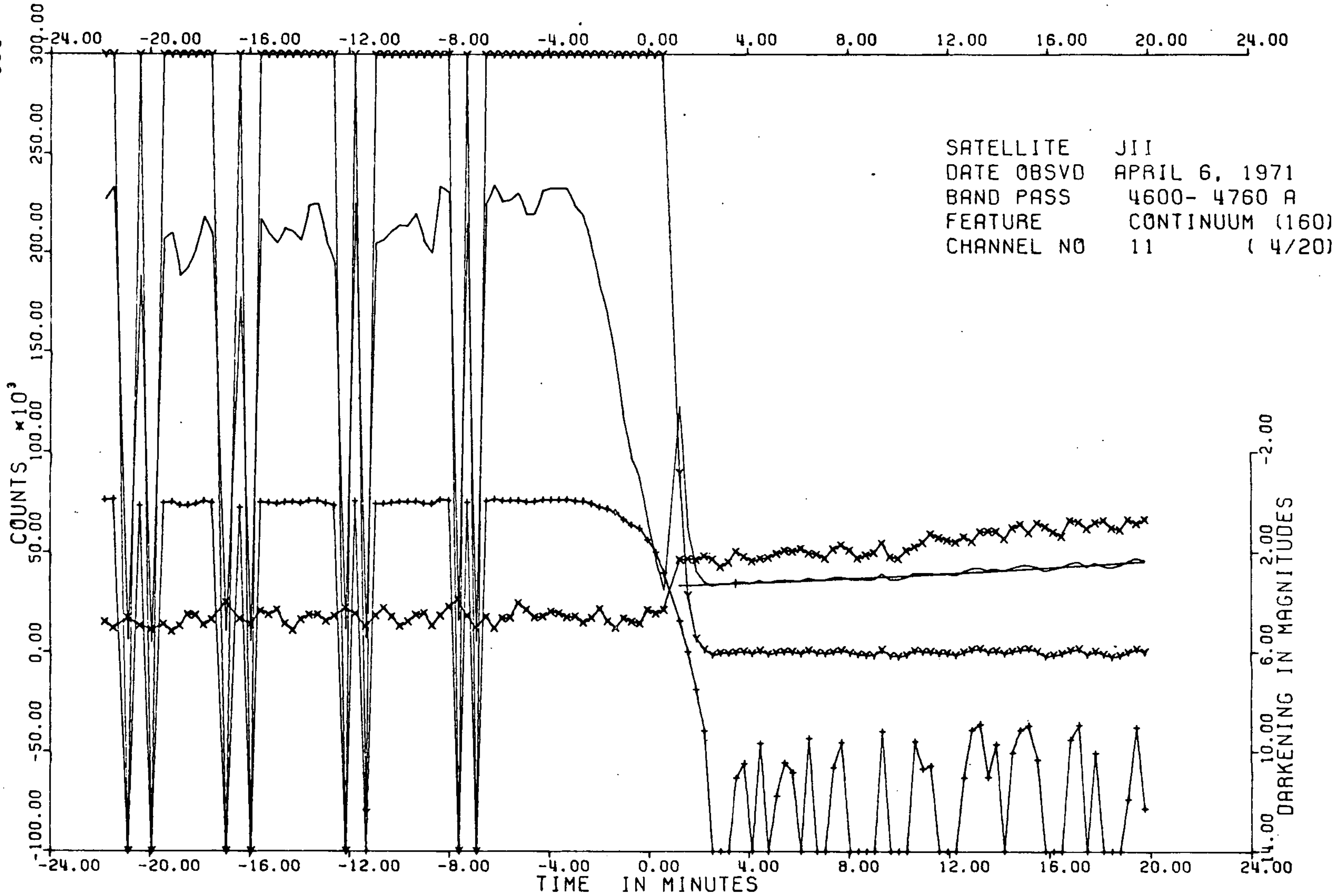

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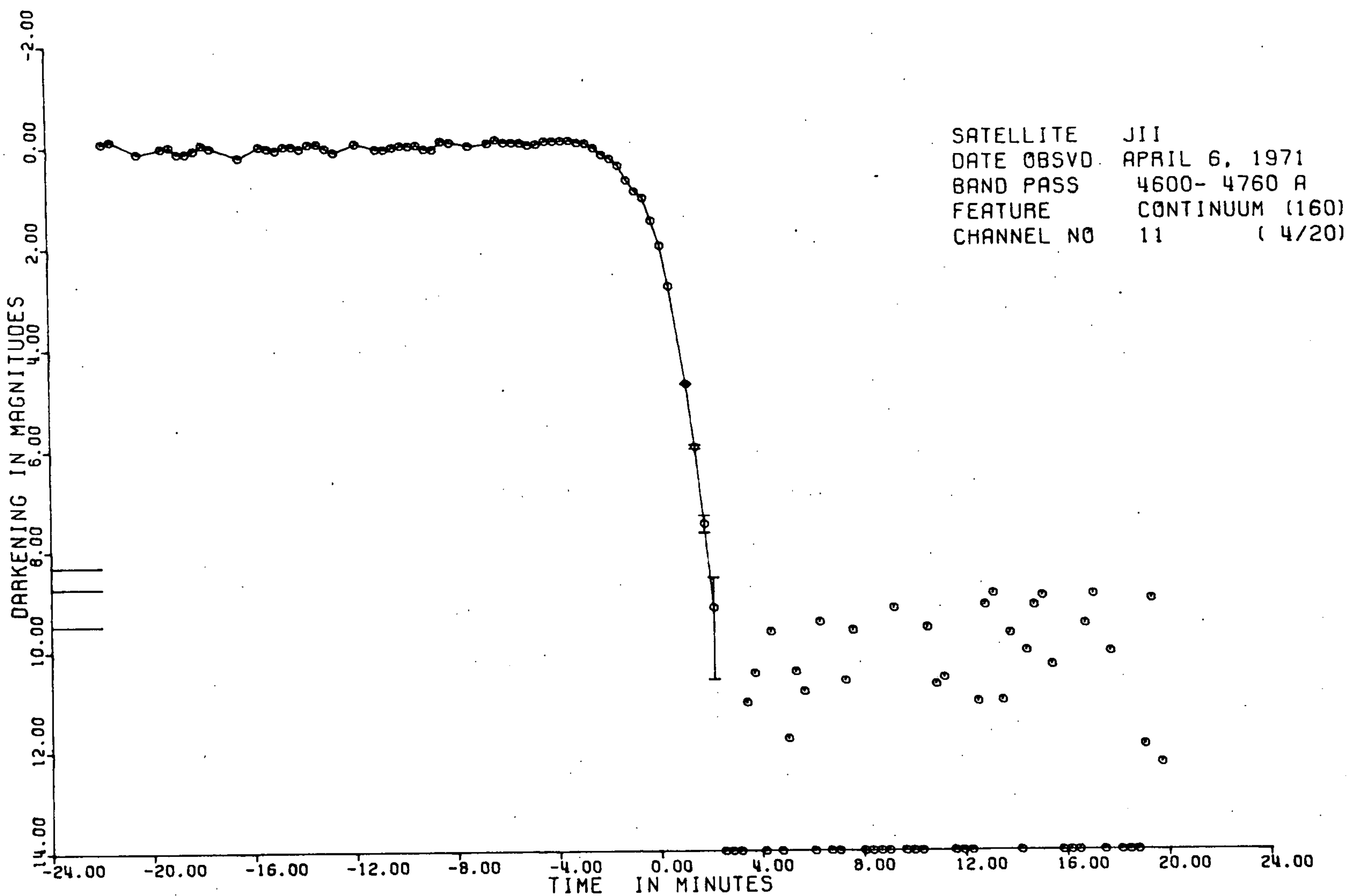

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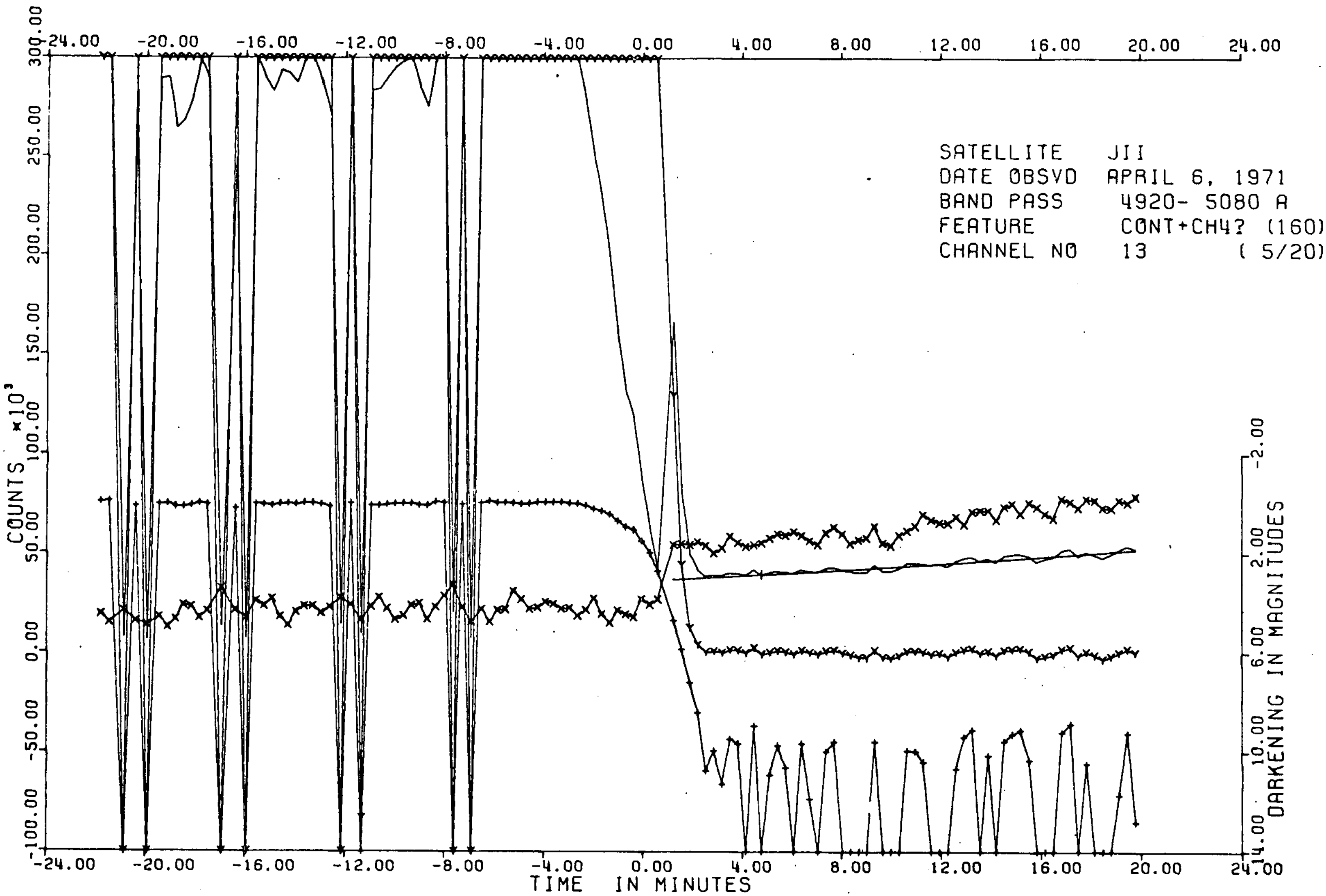

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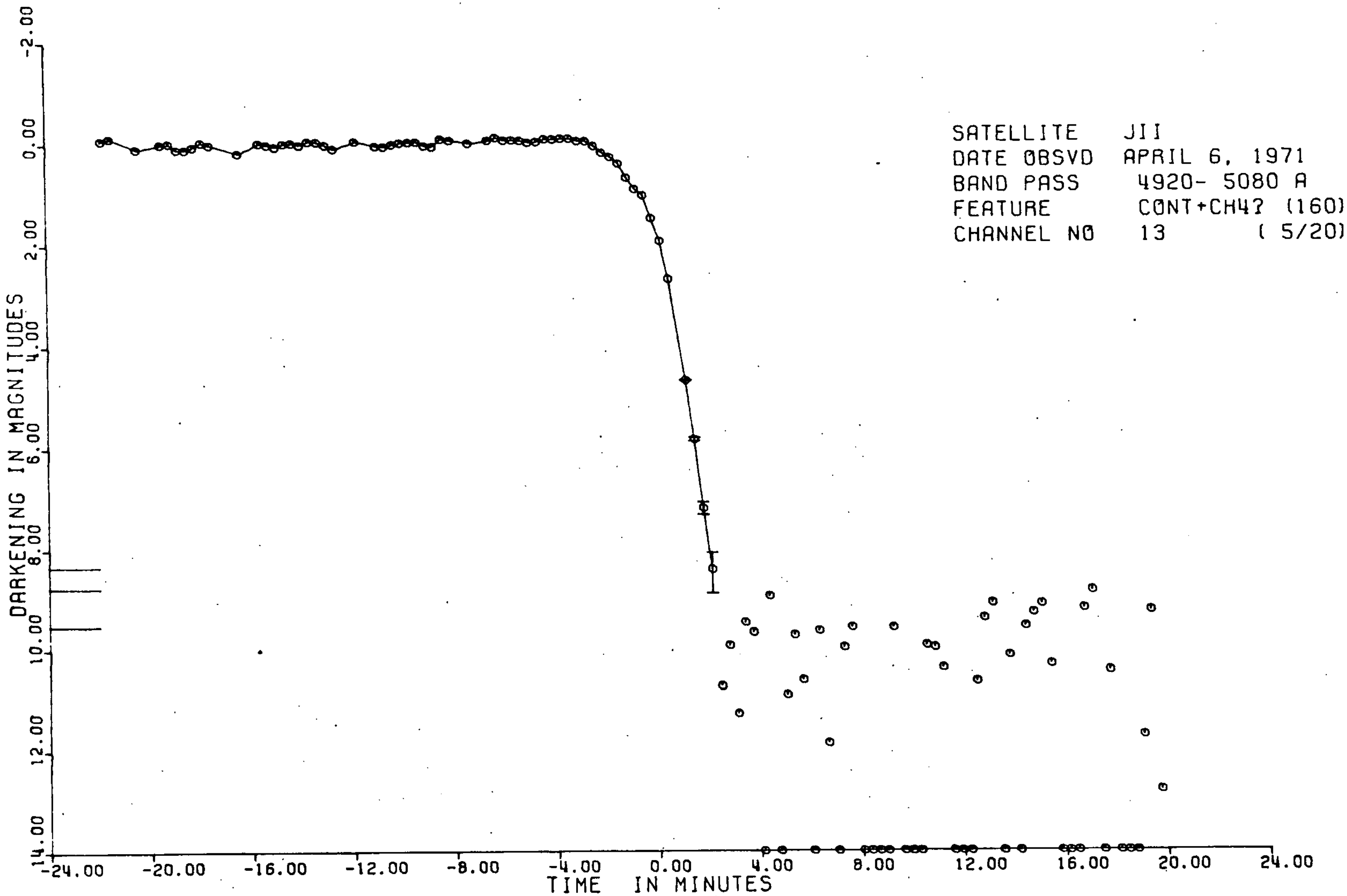

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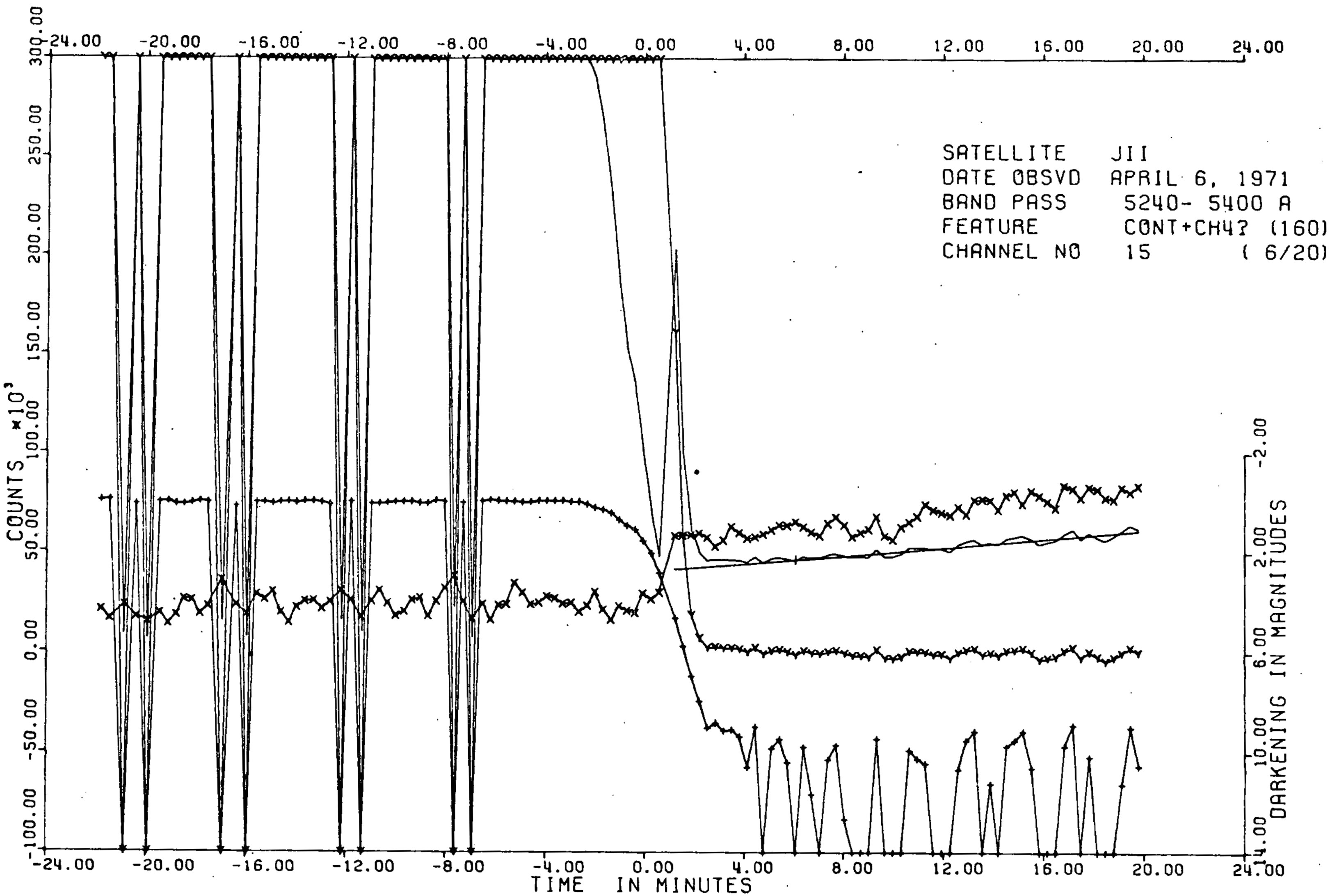

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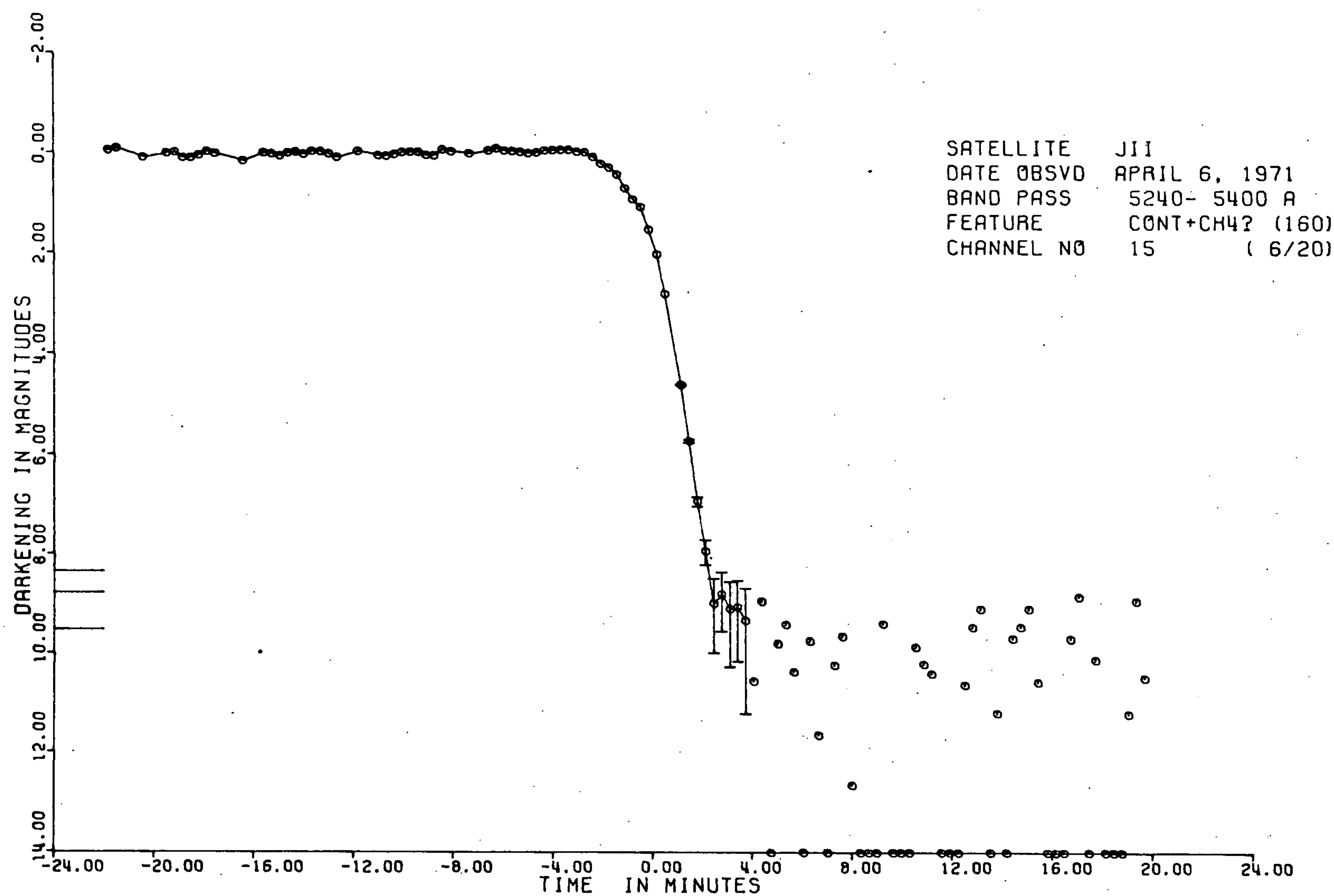

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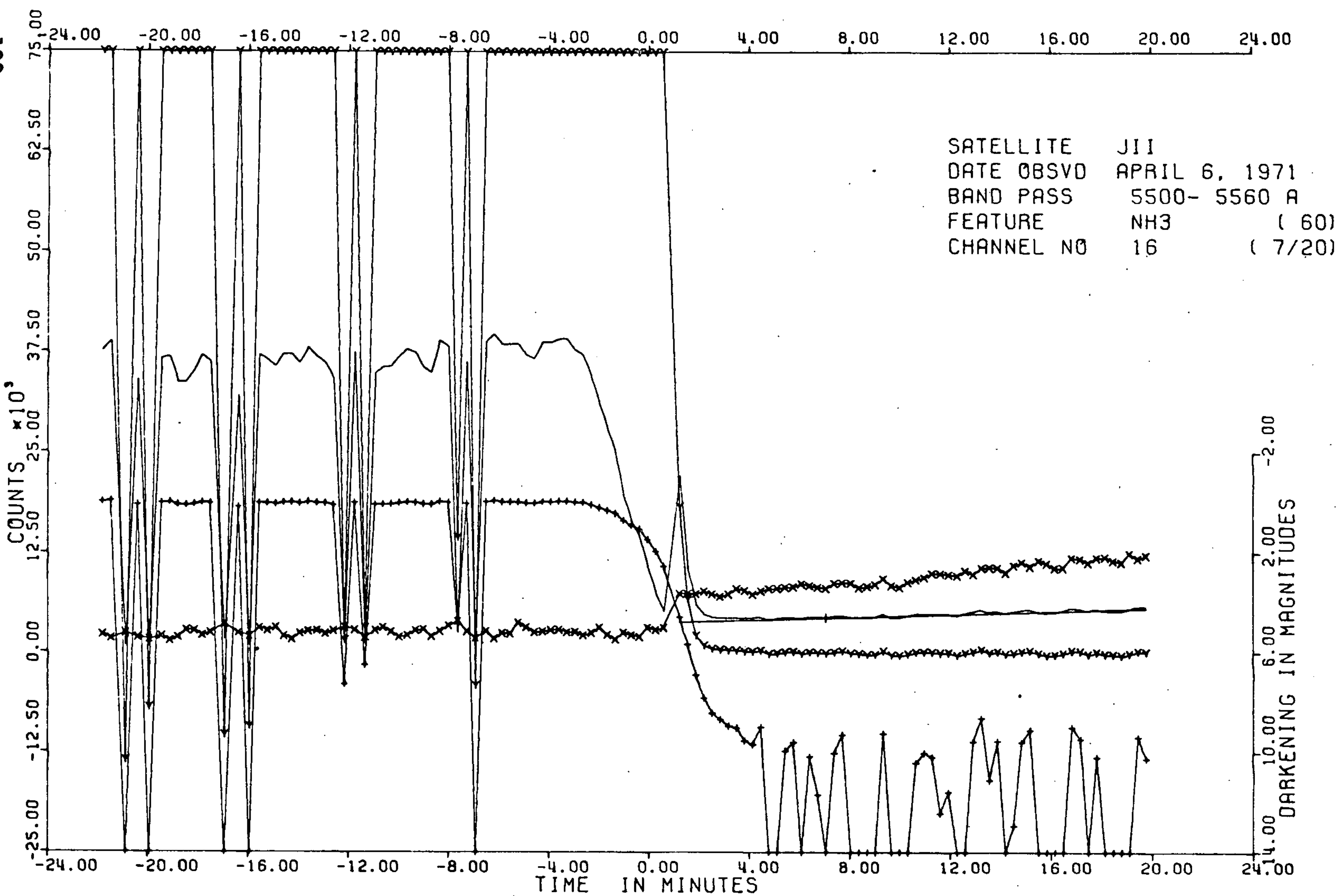

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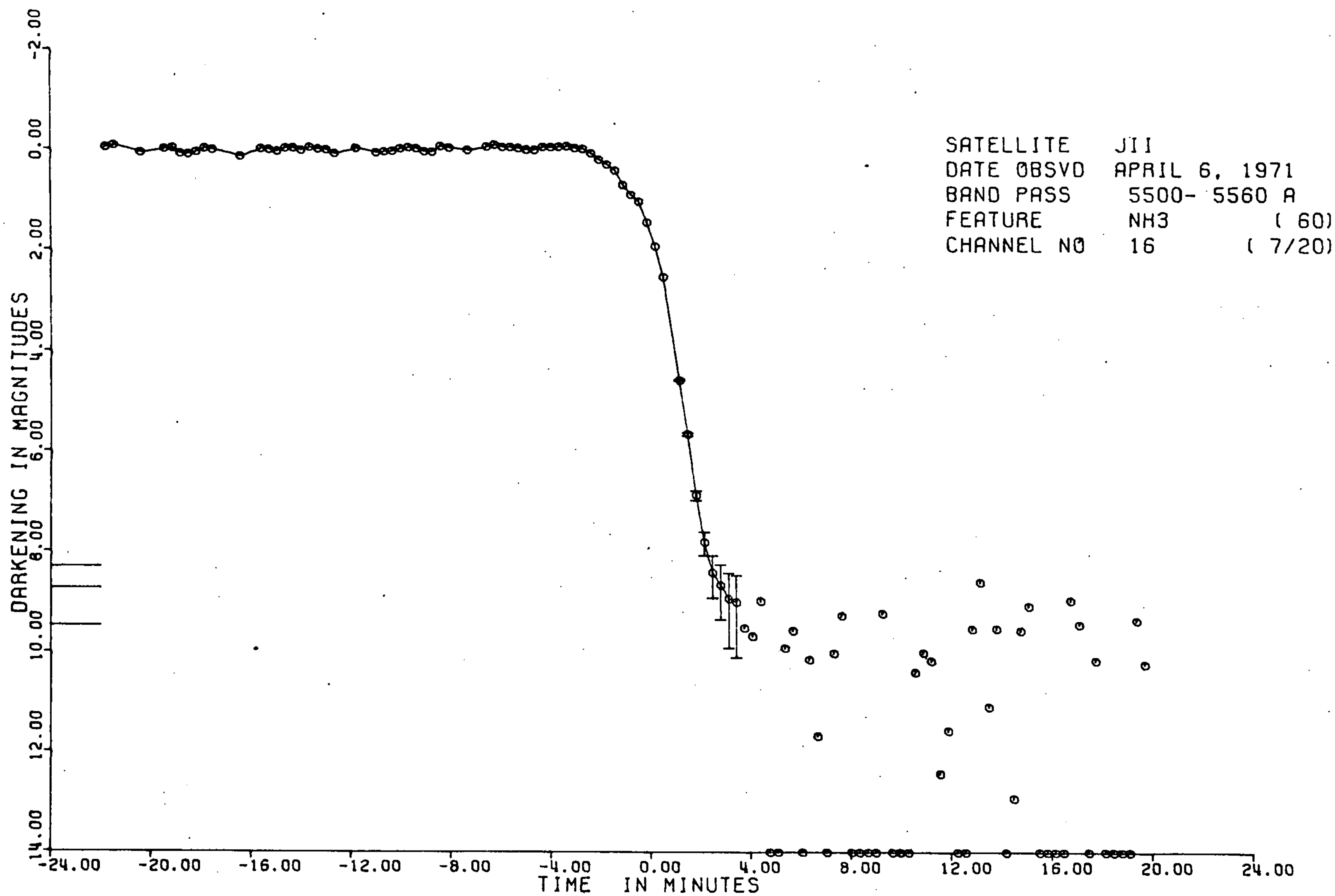

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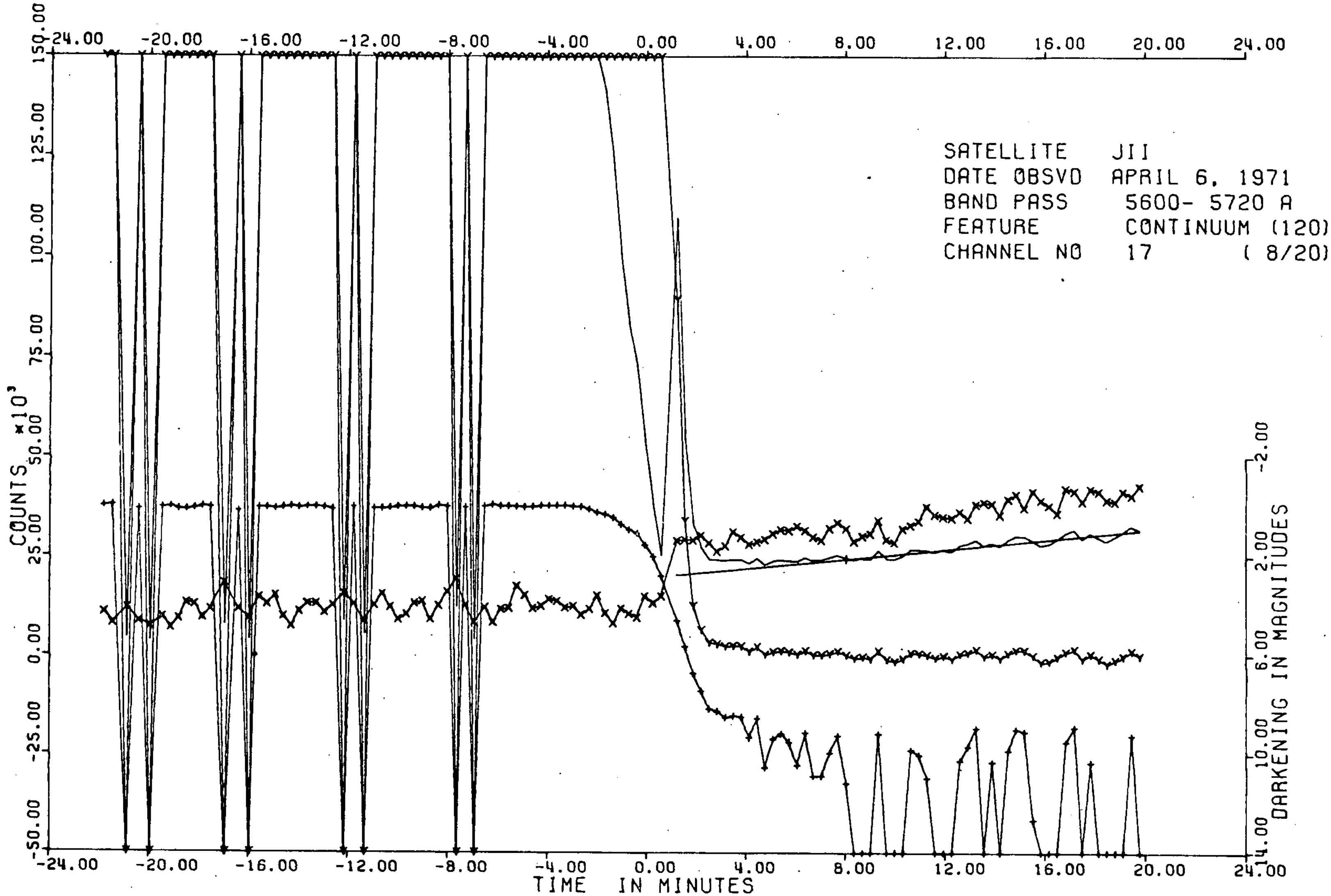

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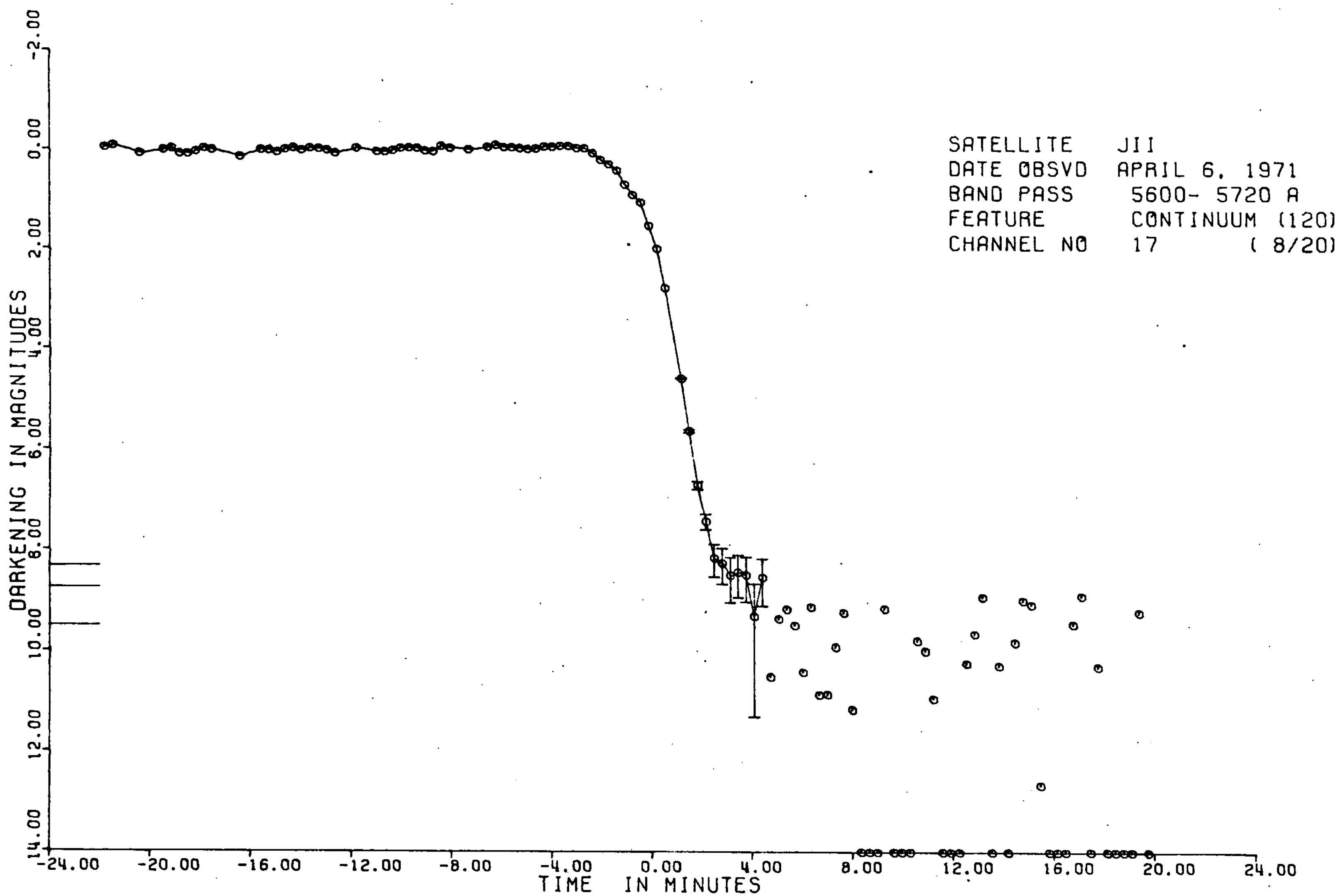

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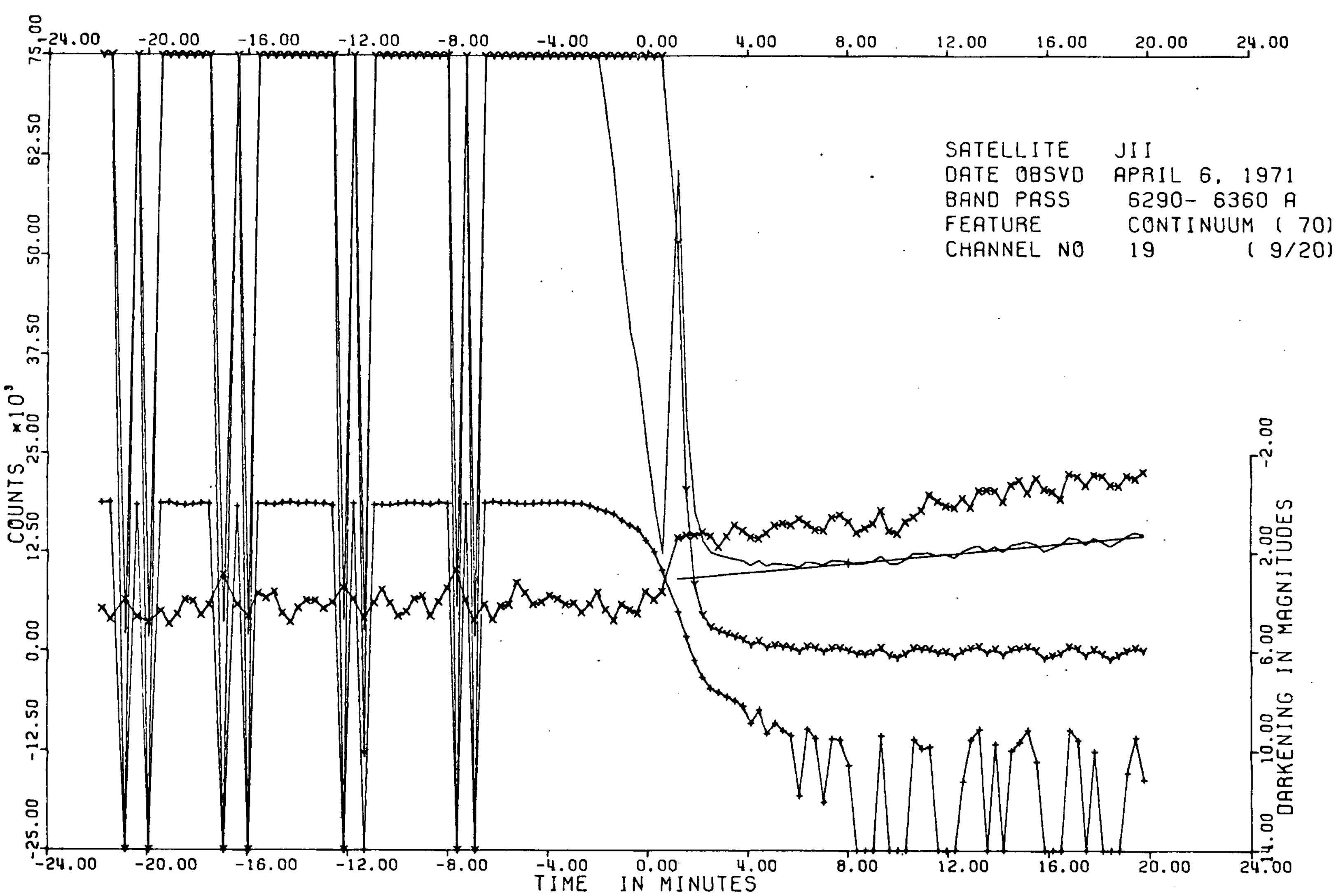

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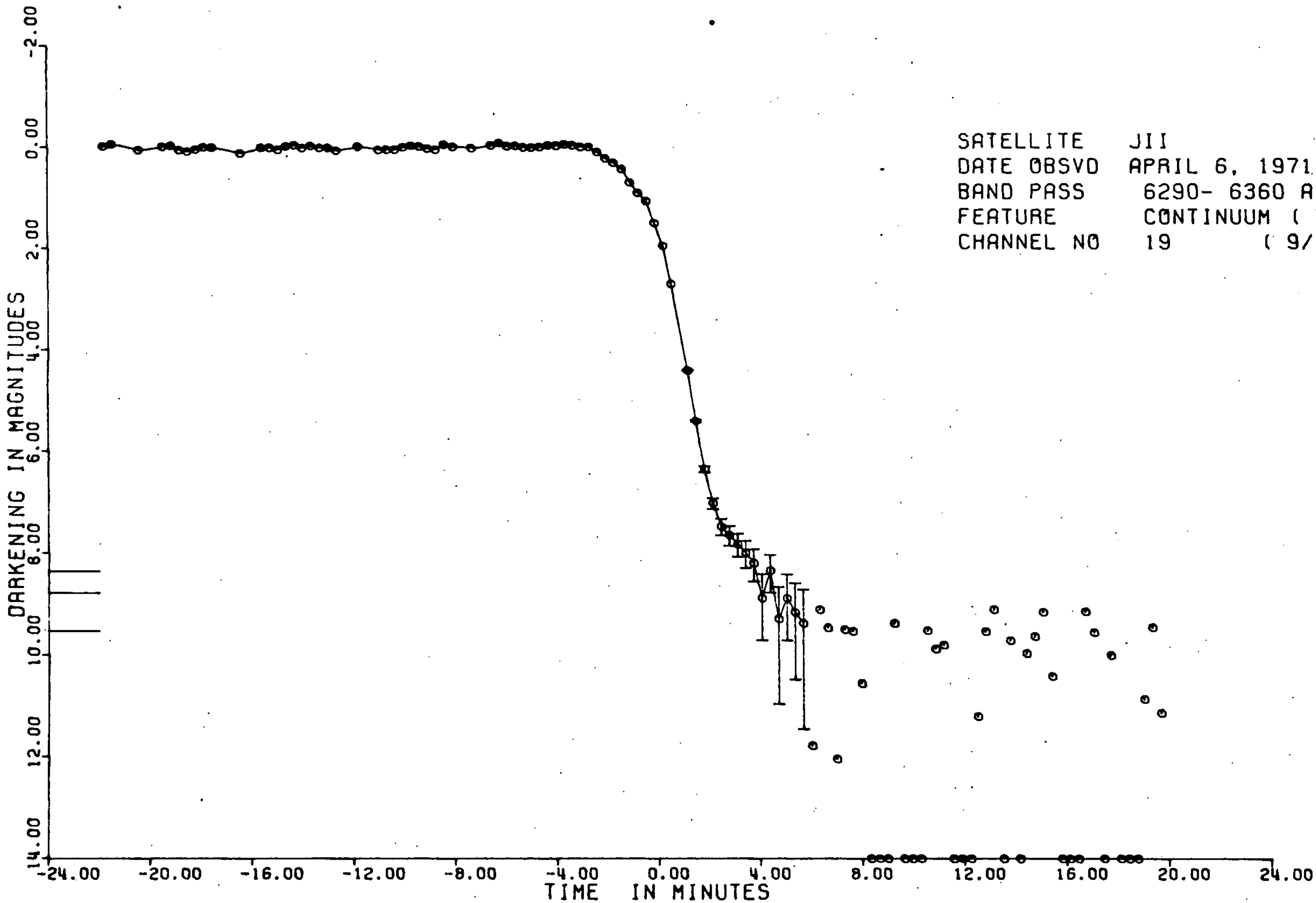

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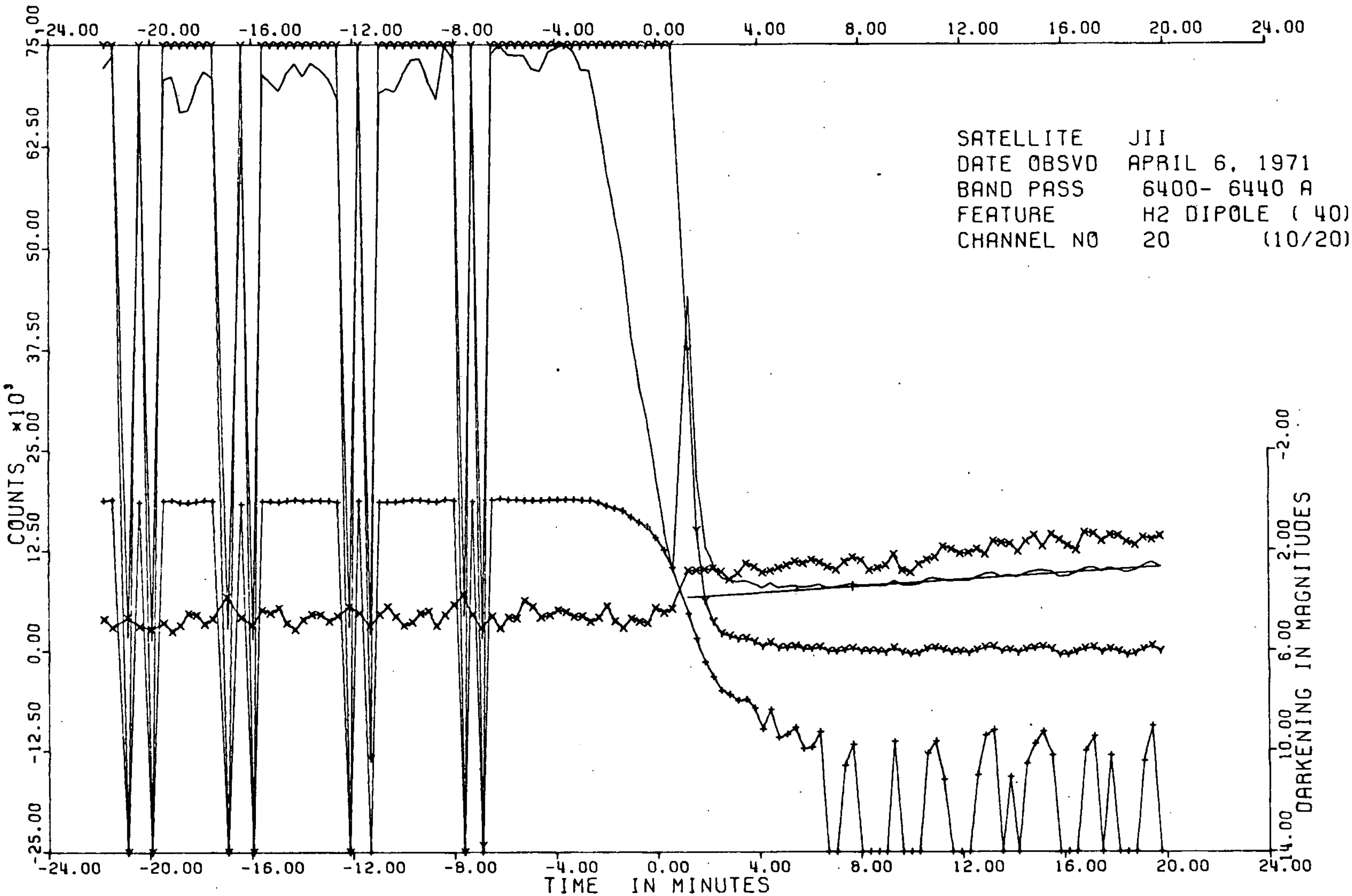

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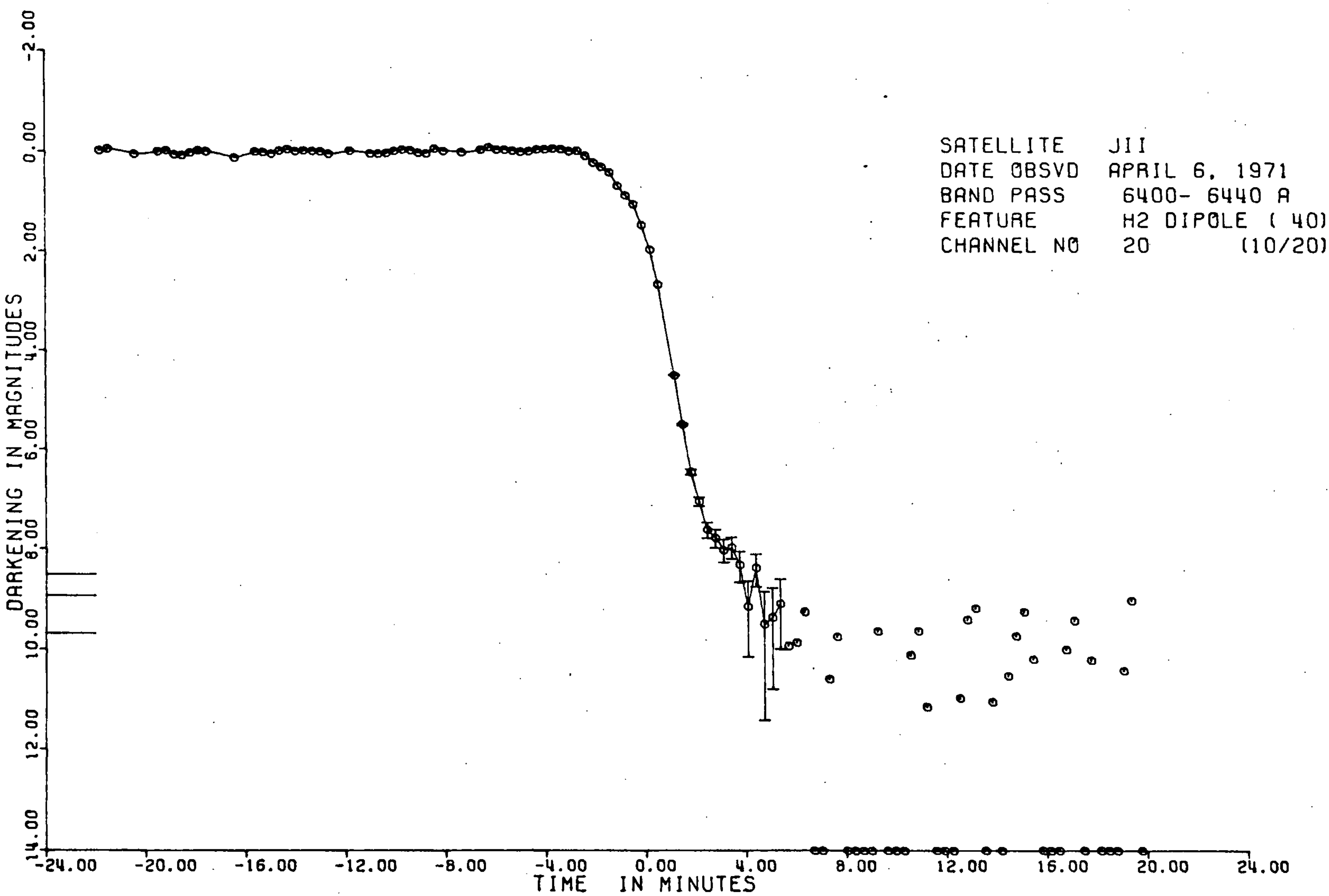

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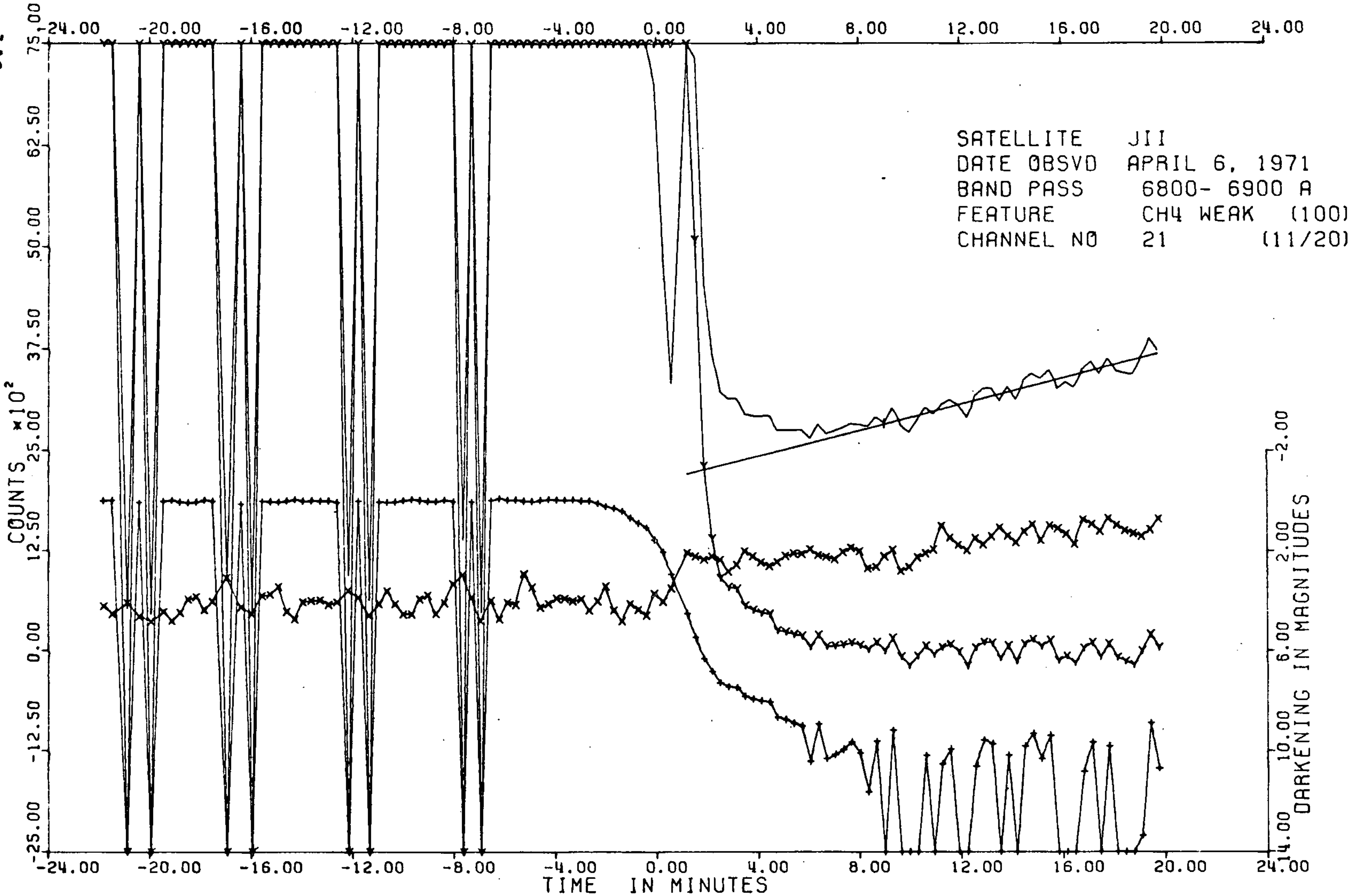

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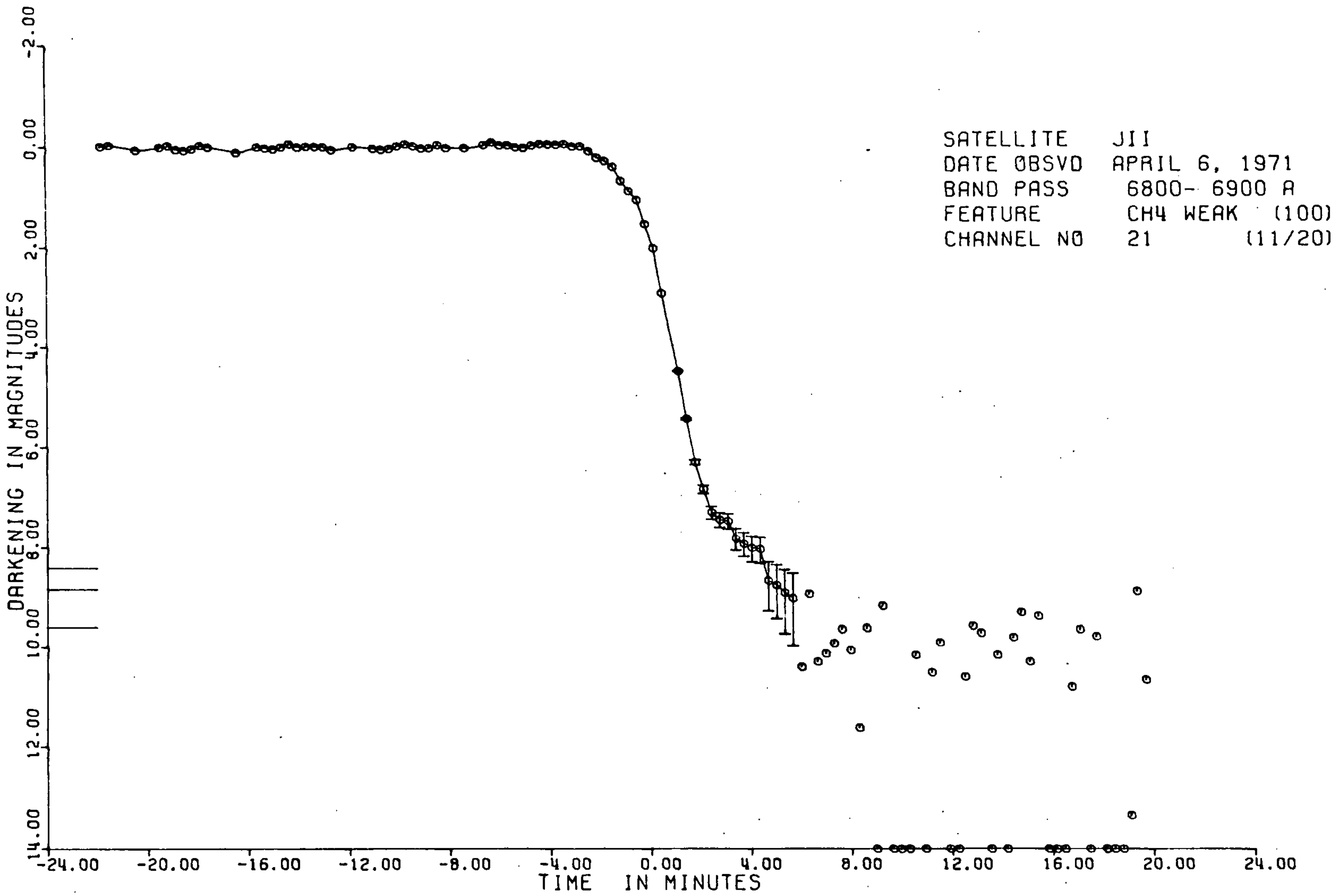

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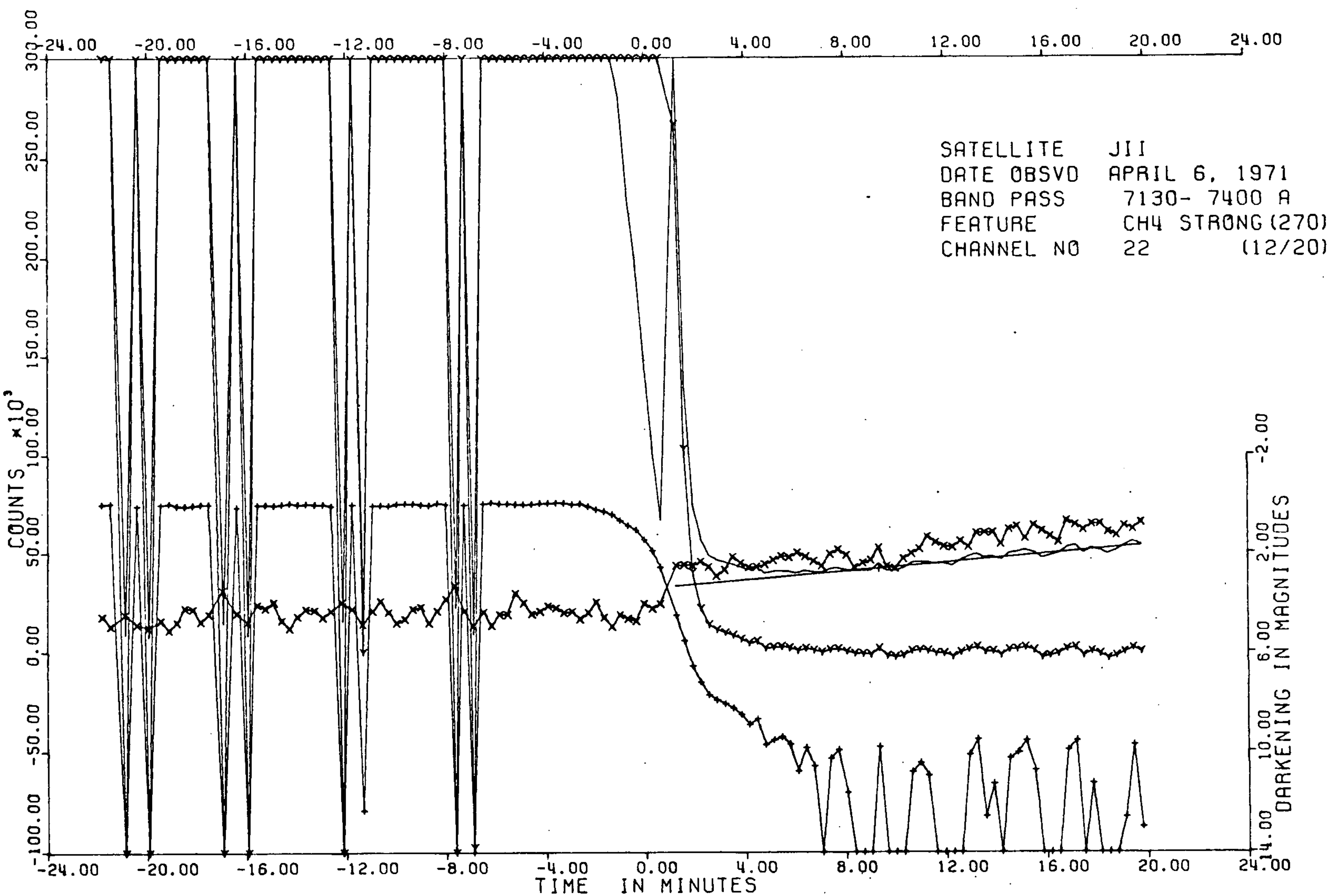

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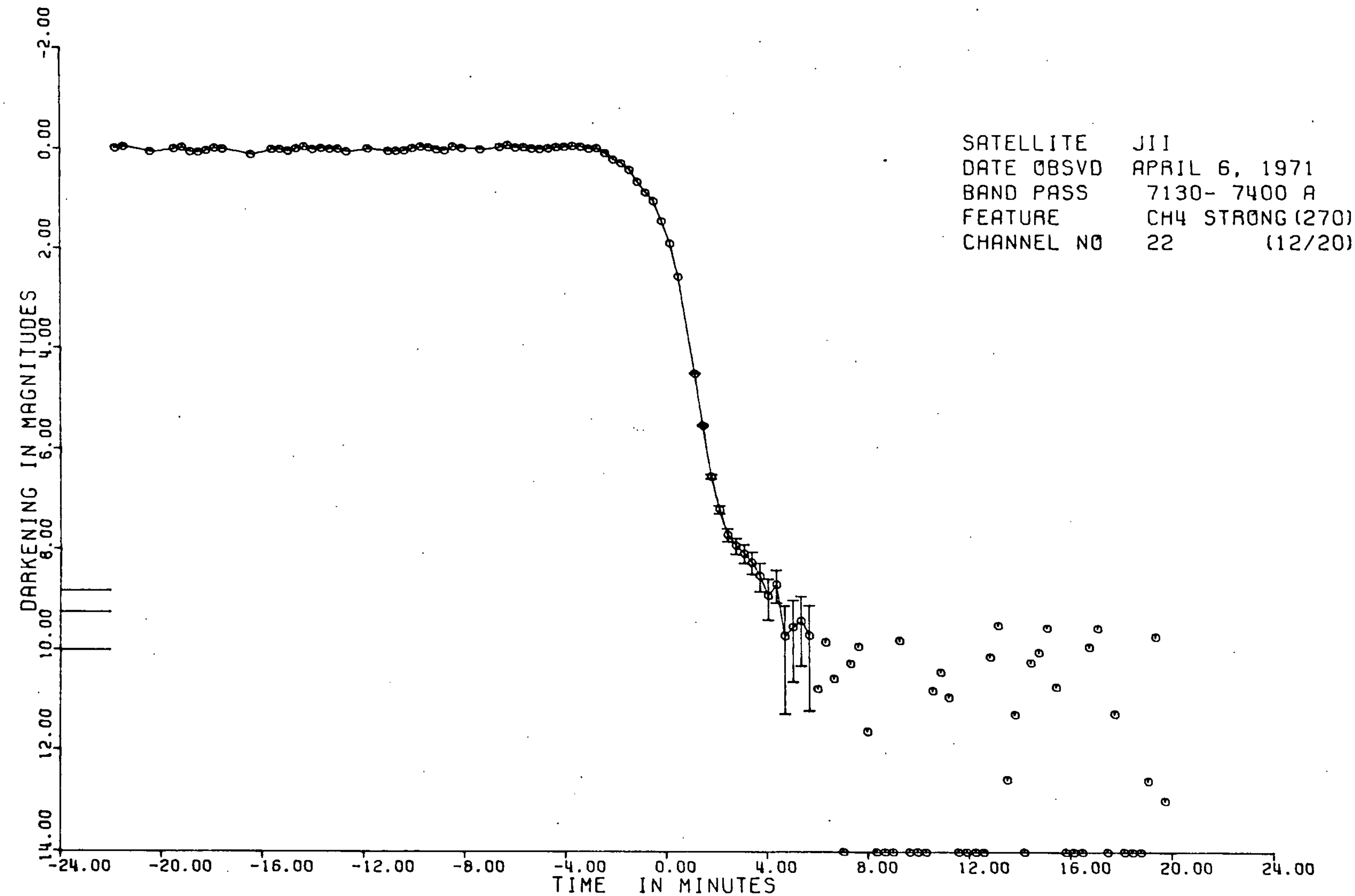
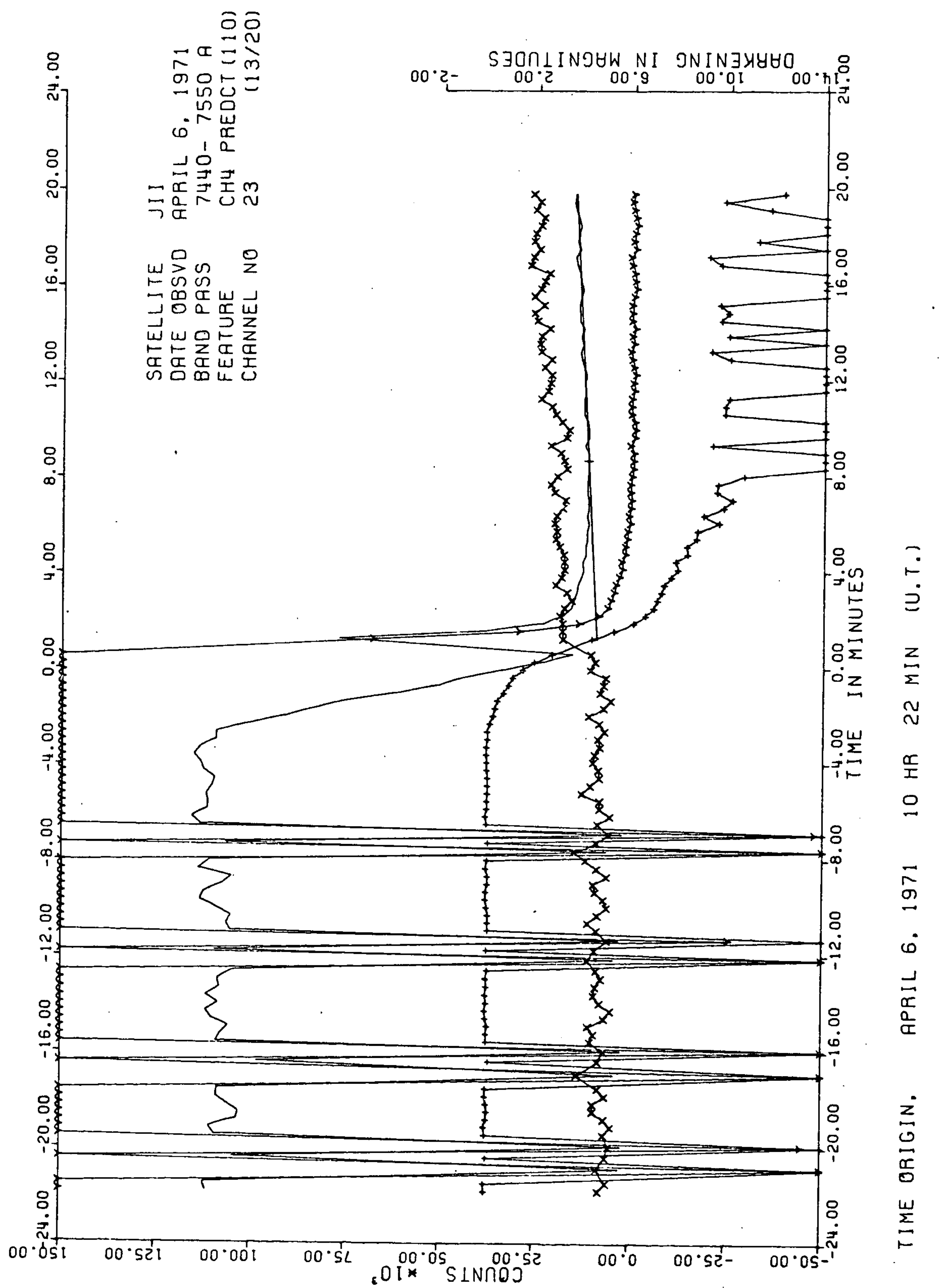


TIME ORIGIN, APRIL 6, 1971 10 HR 22 MIN (U.T.)


SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 7440- 7550 A
FEATURE CH4 PREDCT (110)
CHANNEL NO 23 (13/20)
DARKENING IN MAGNITUDES
COUNTS *10³
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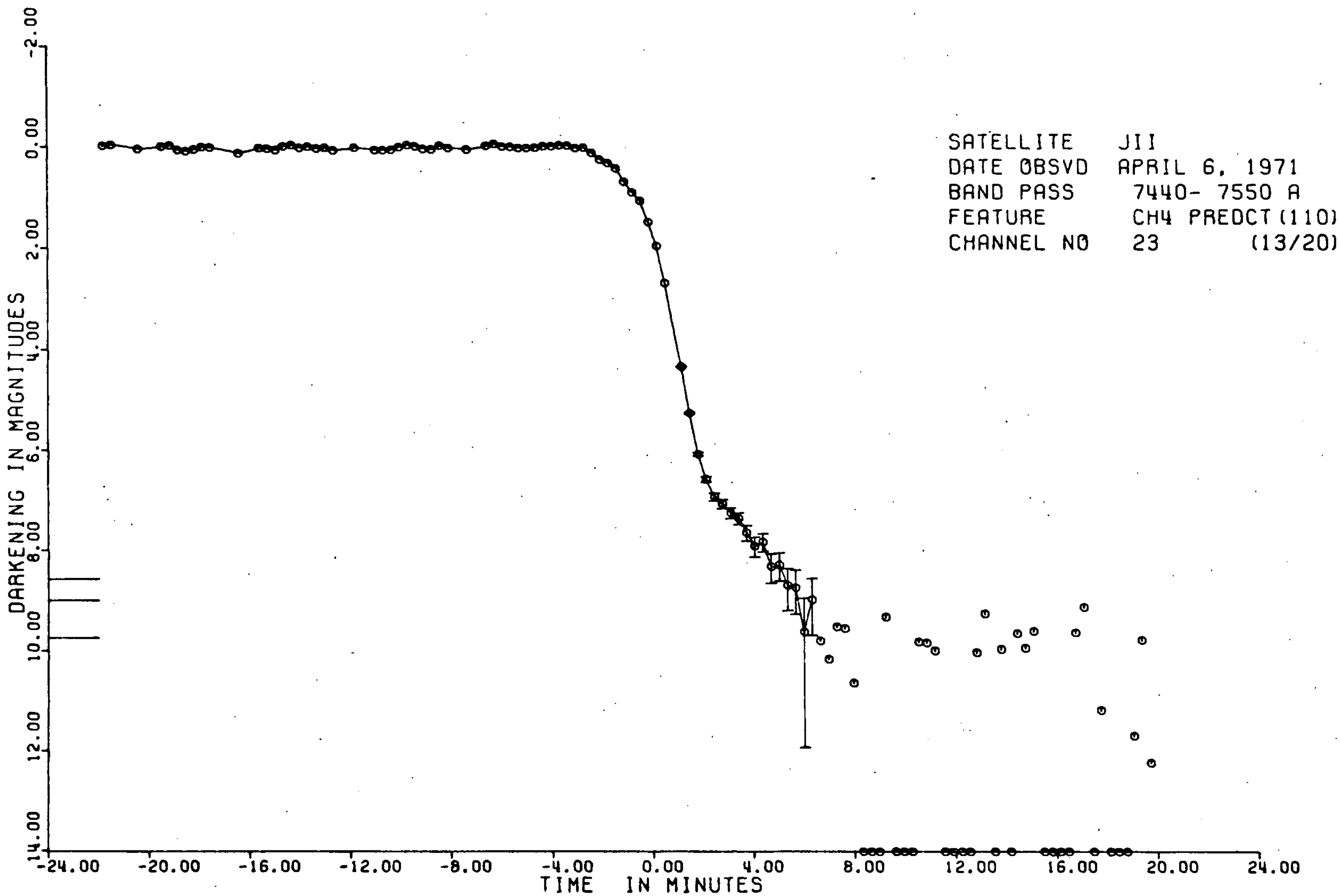
TIME ORIGIN, APRIL 6, 1971 10 HR 22 MIN (U.T.)



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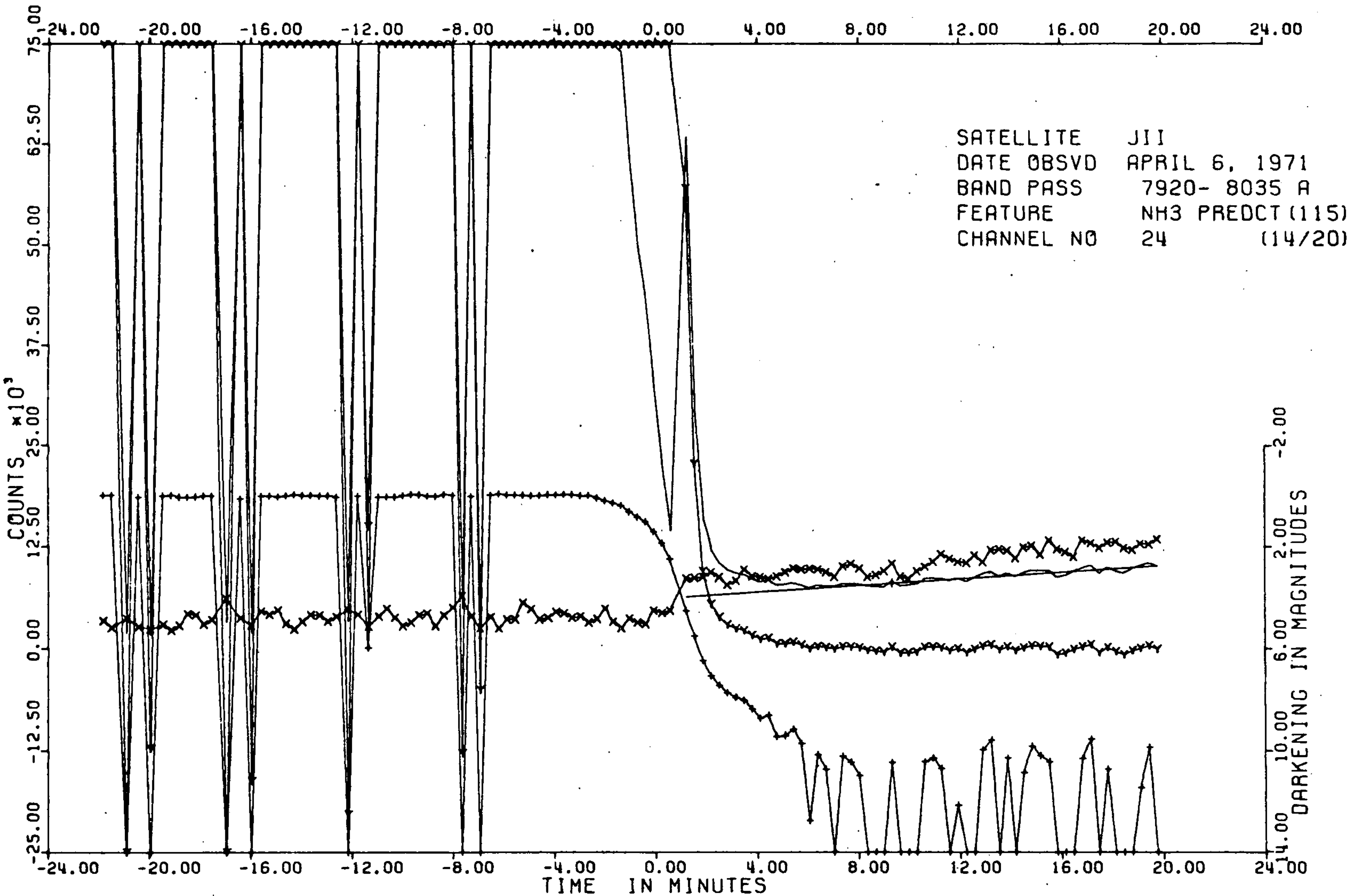

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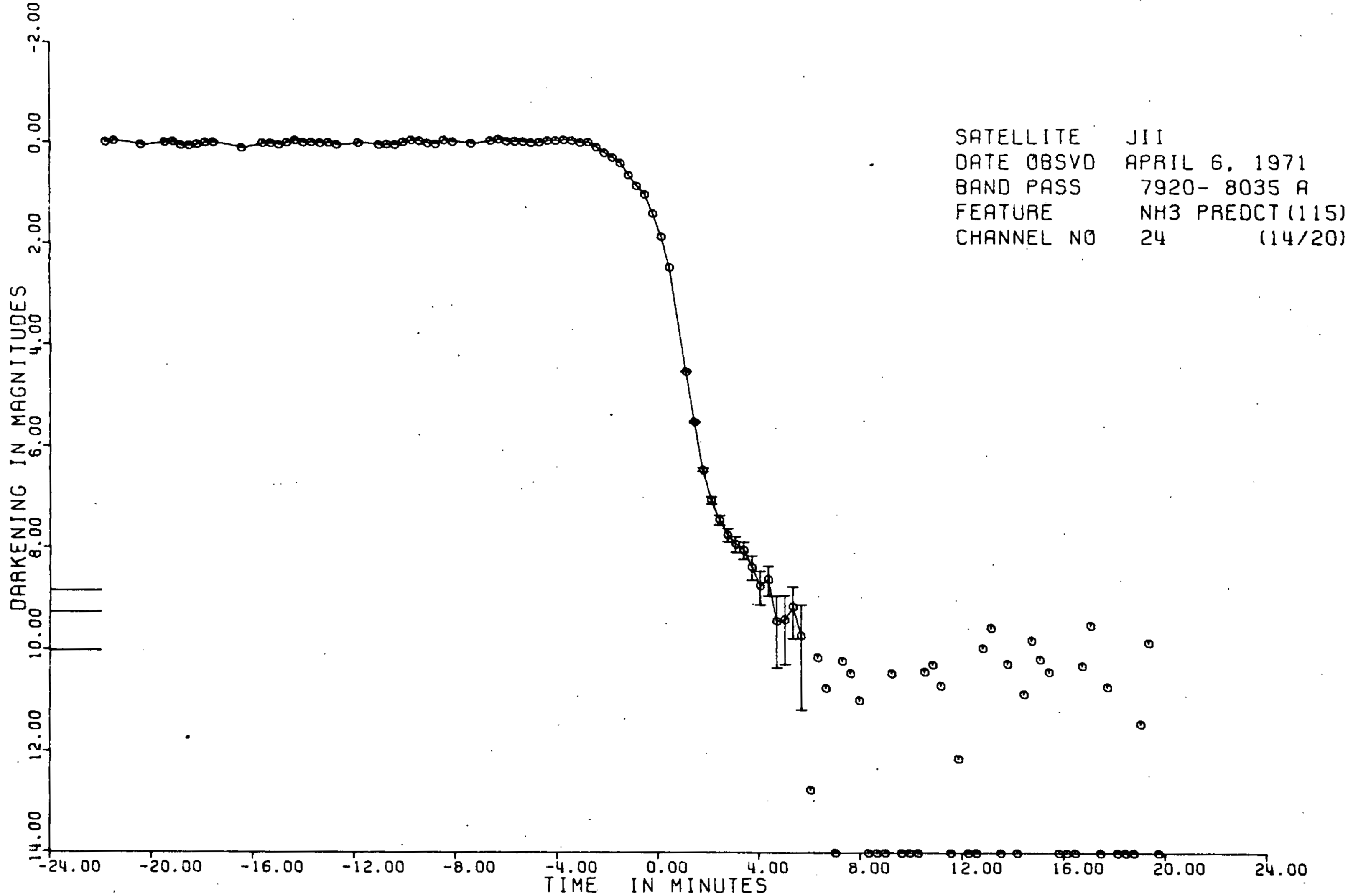

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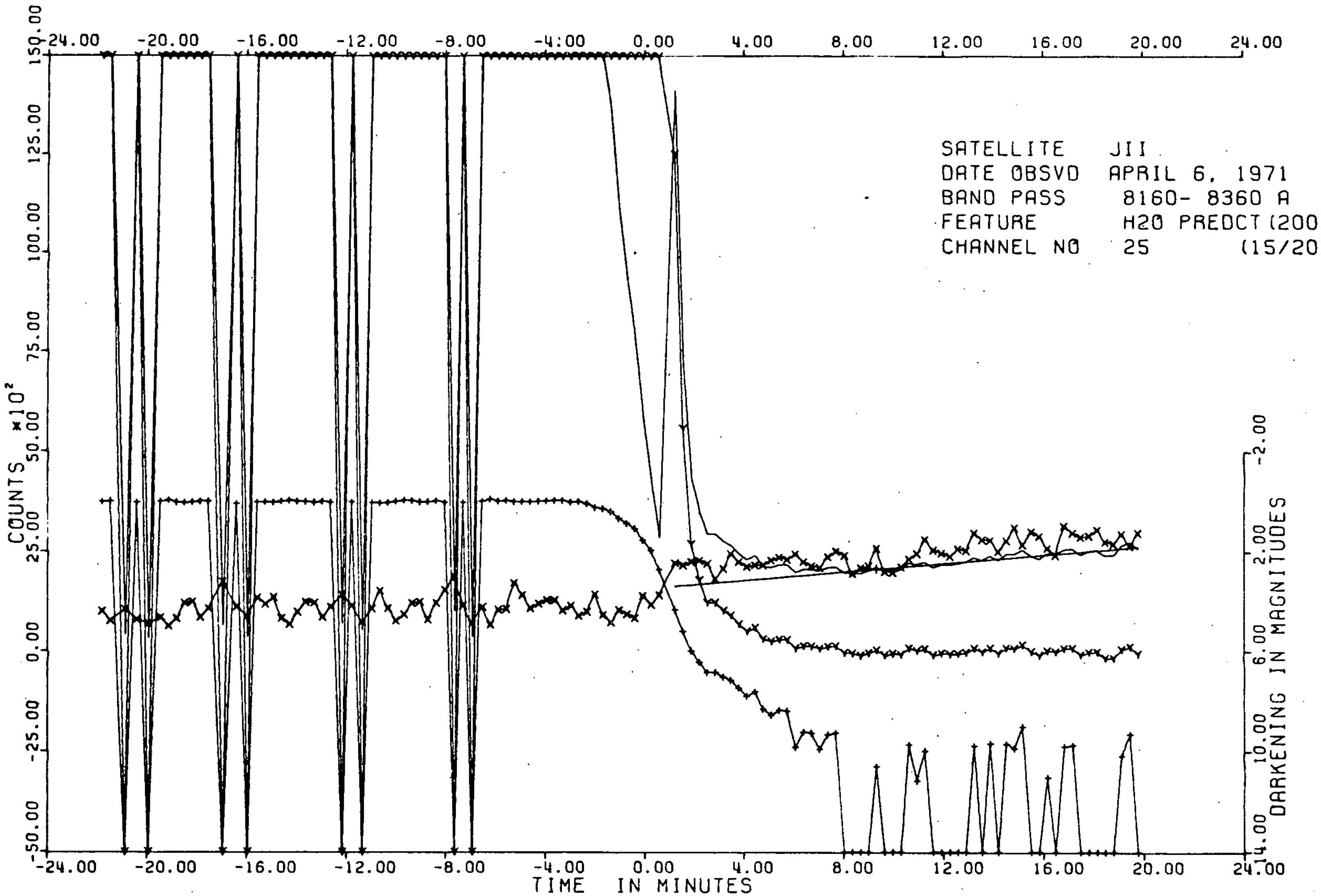

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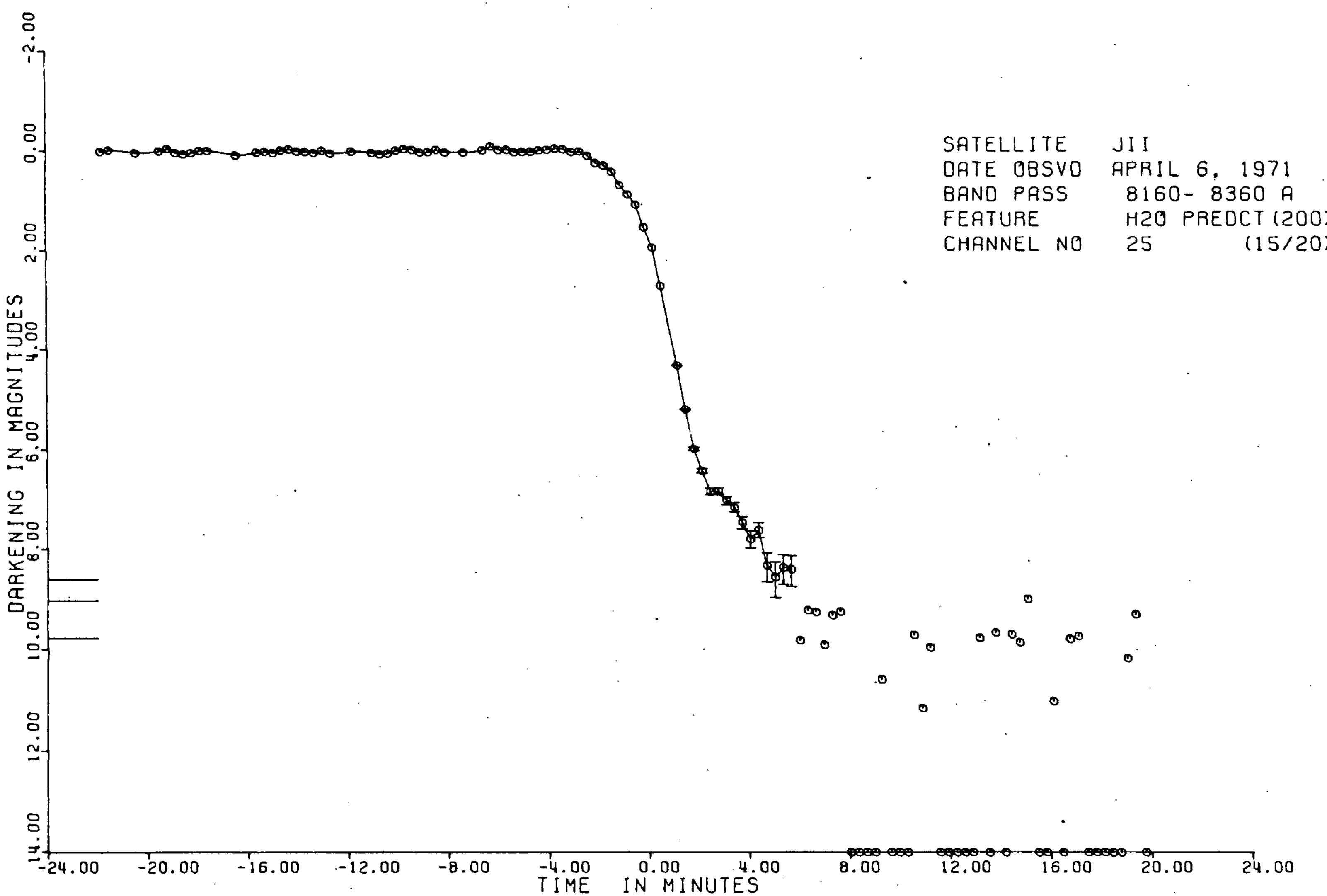

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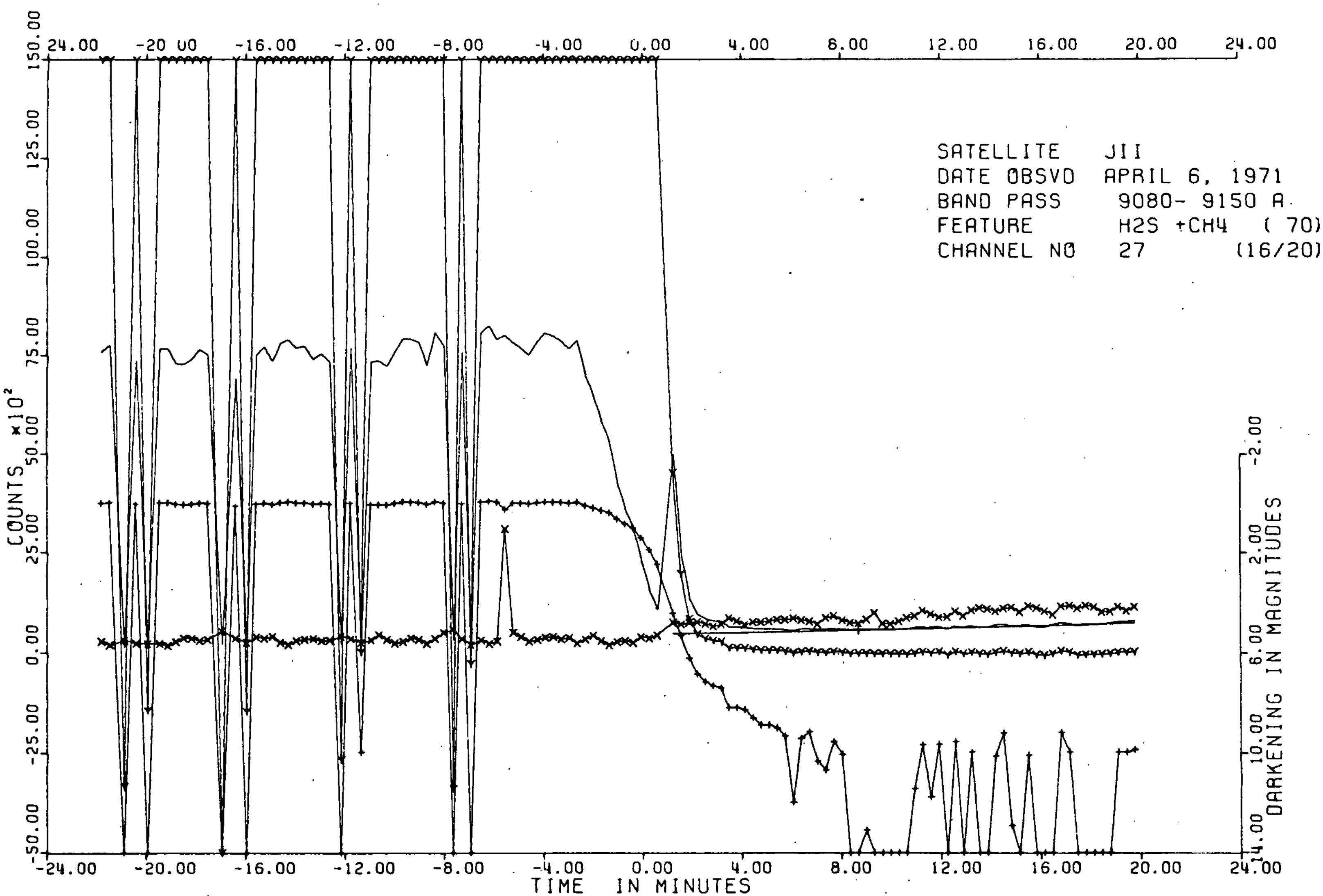

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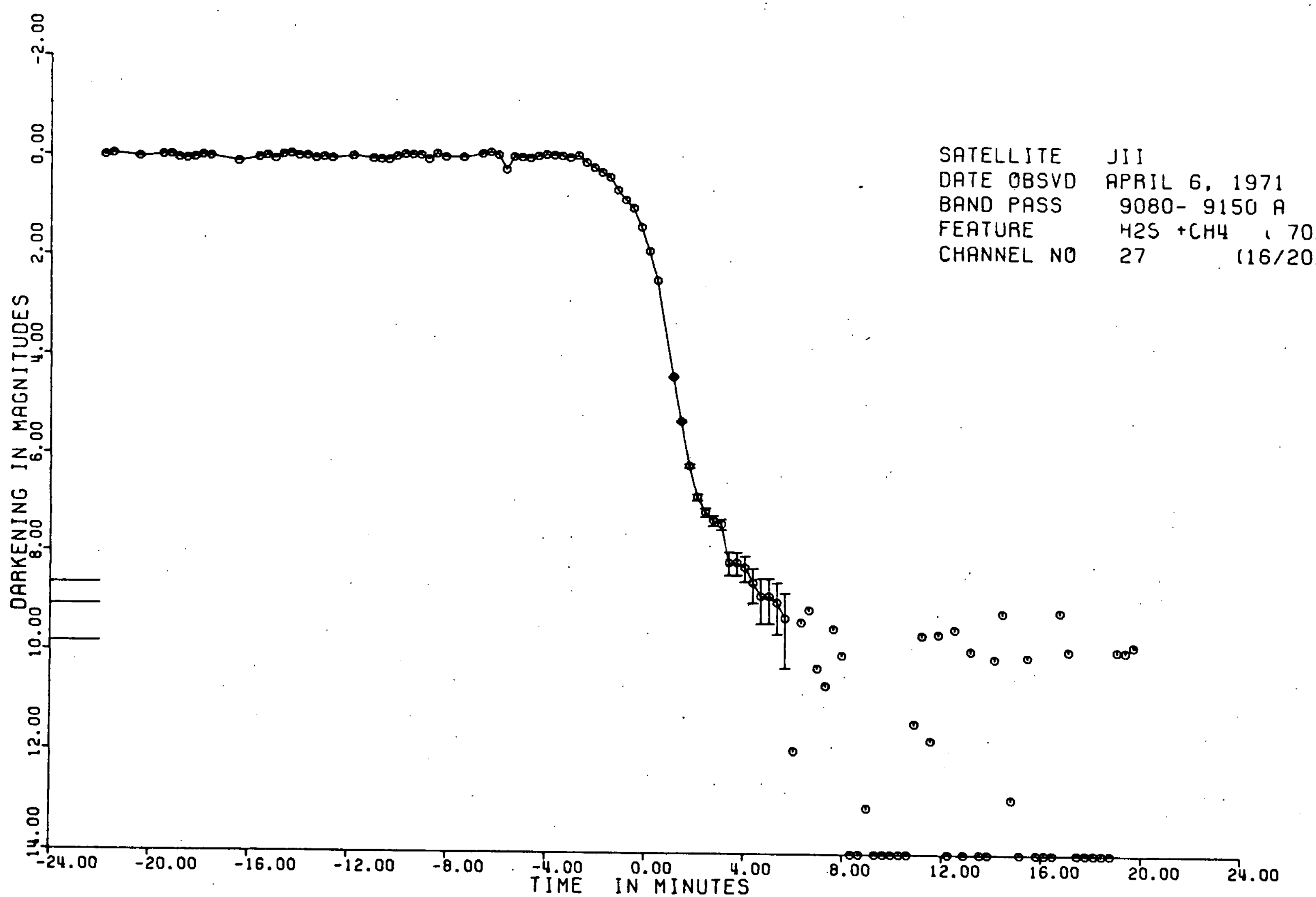

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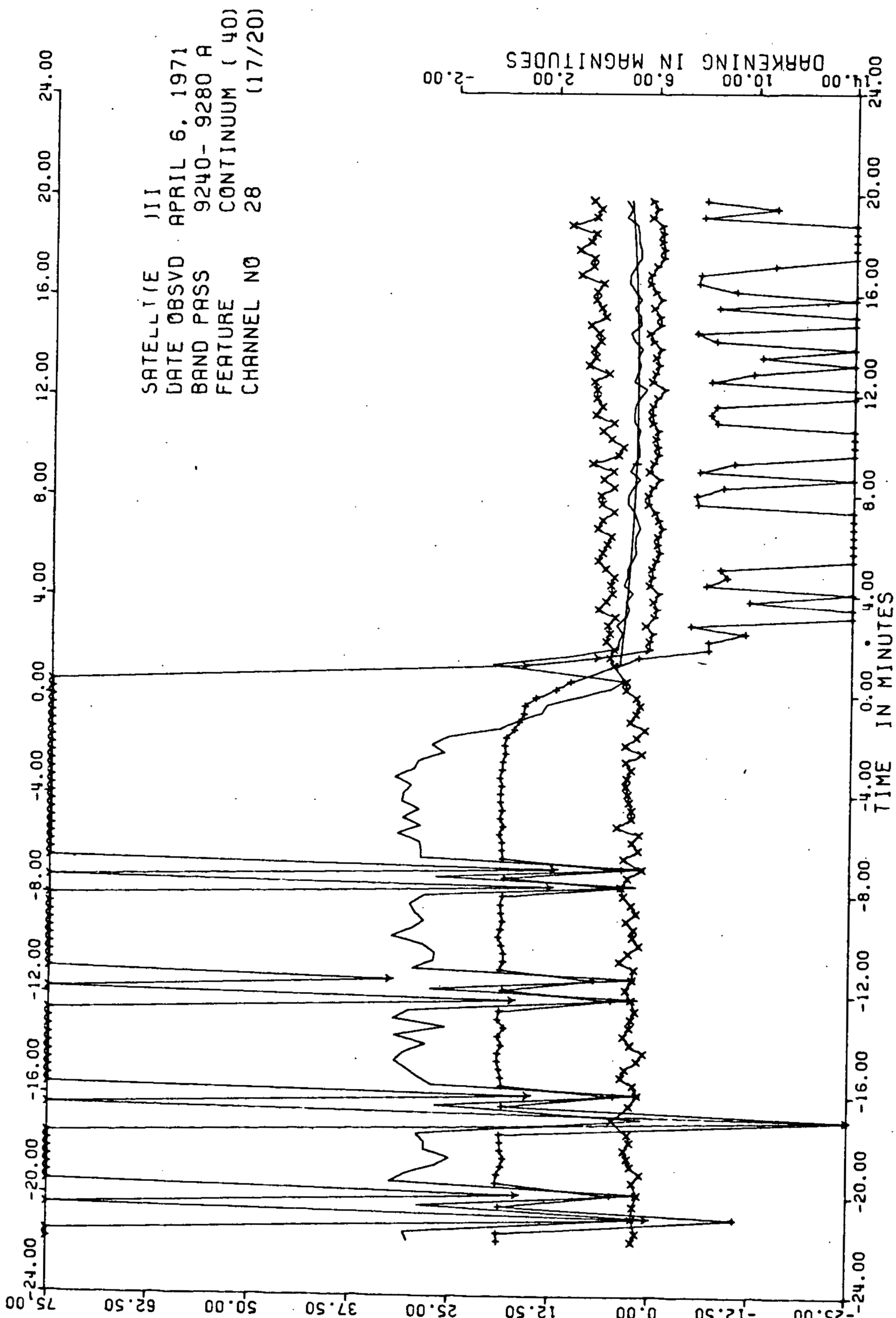

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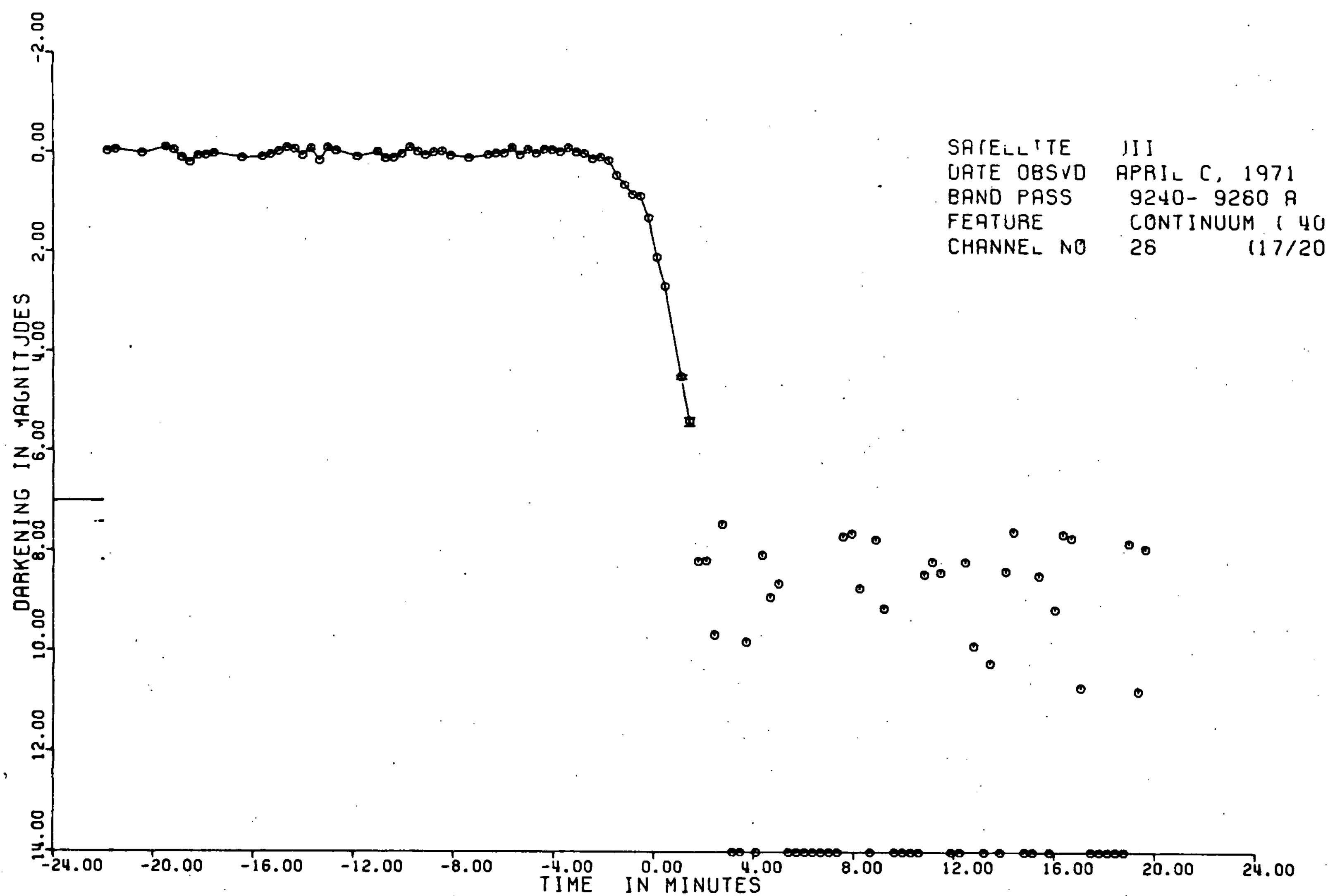
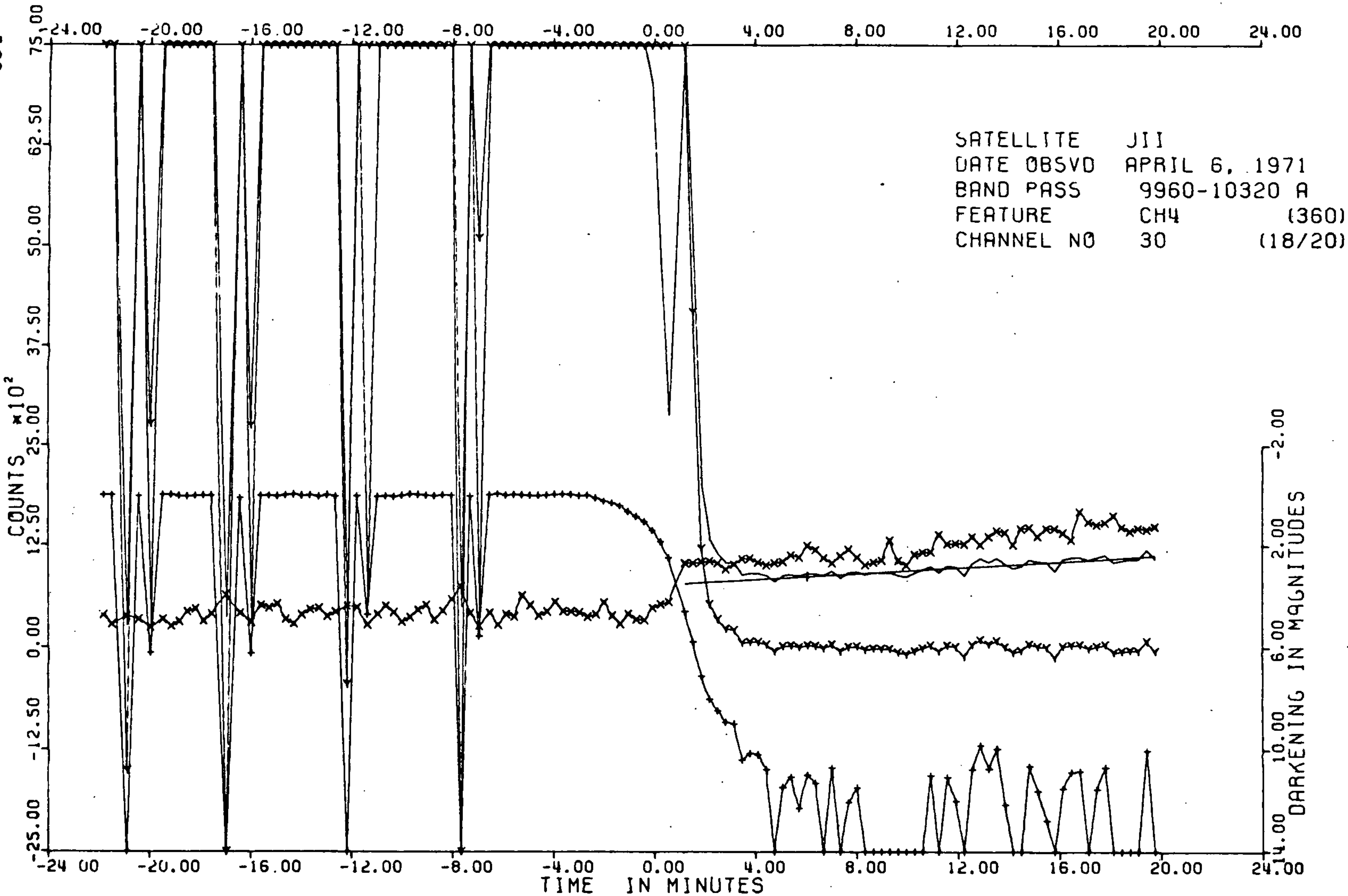


TIME ORIGIN. APRIL 6, 1971 10 HR 22 MIN (U.T.)



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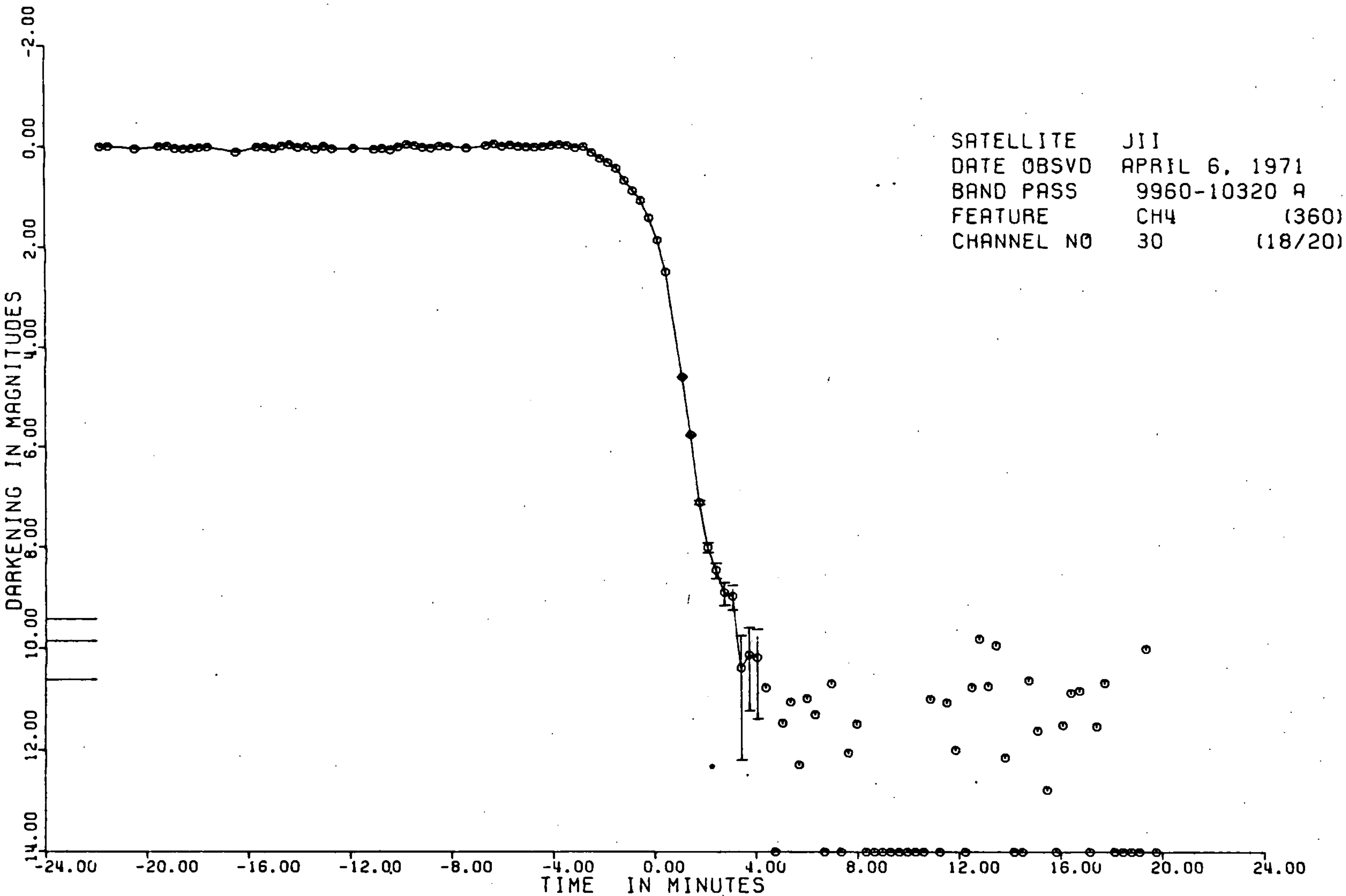

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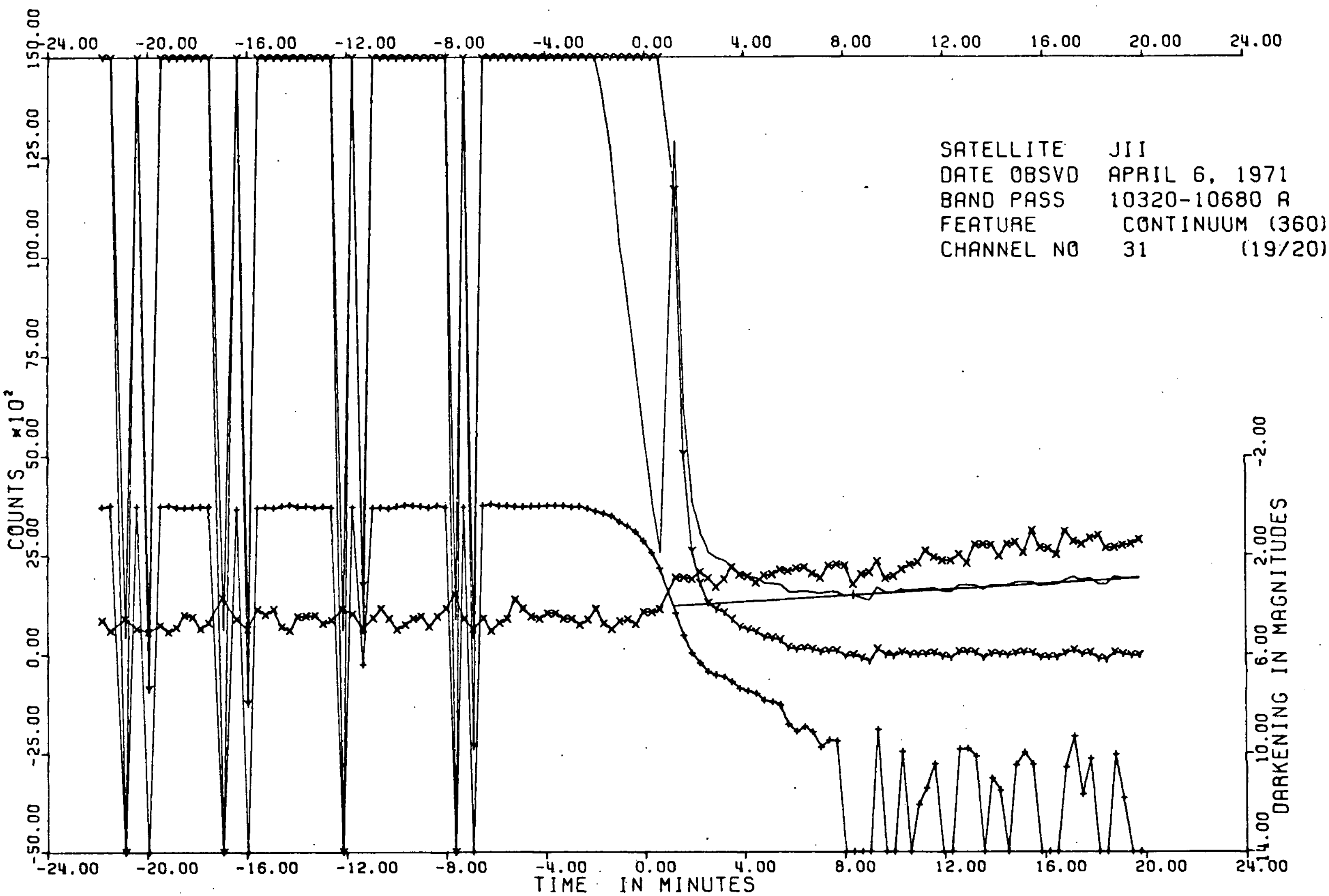

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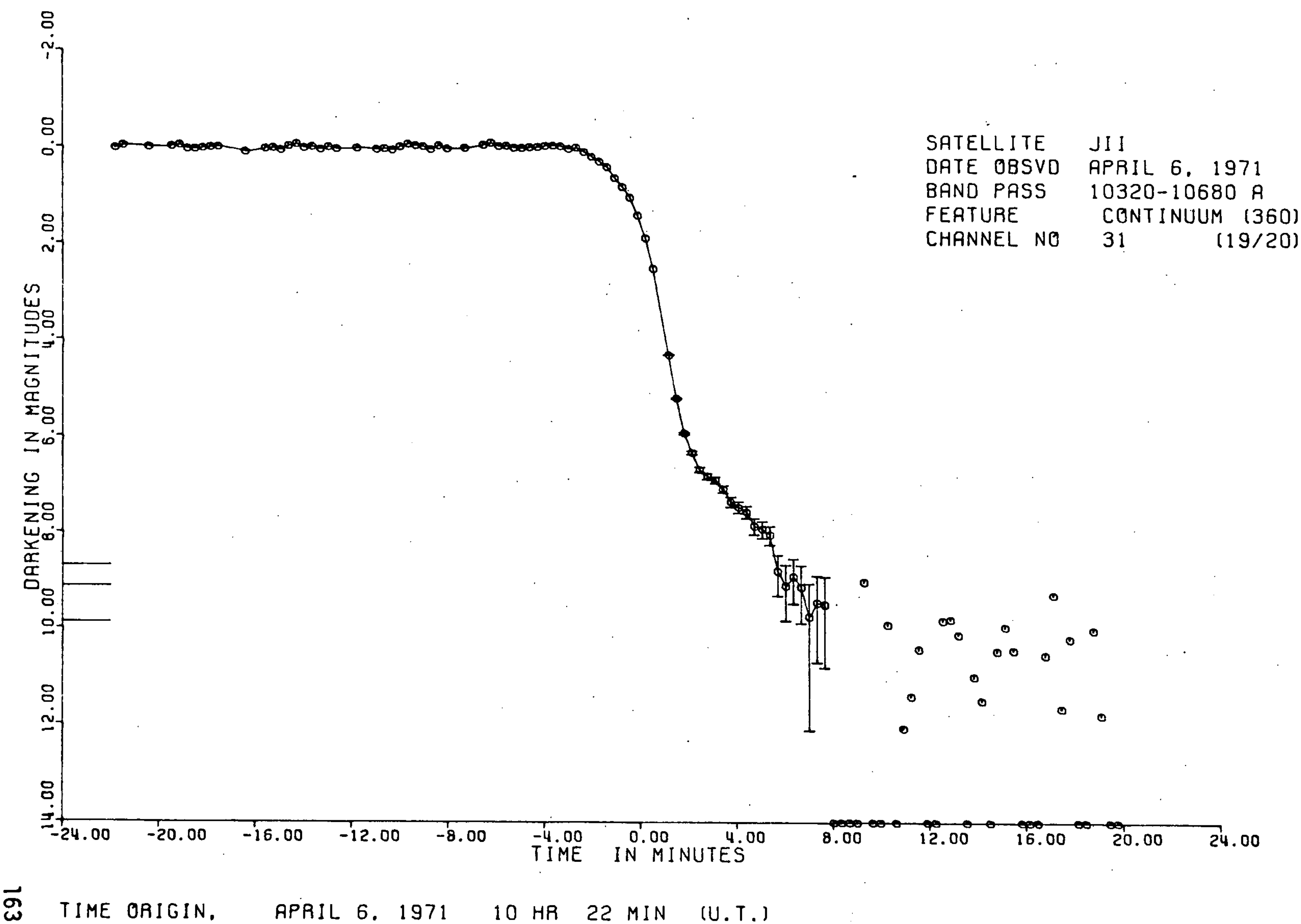
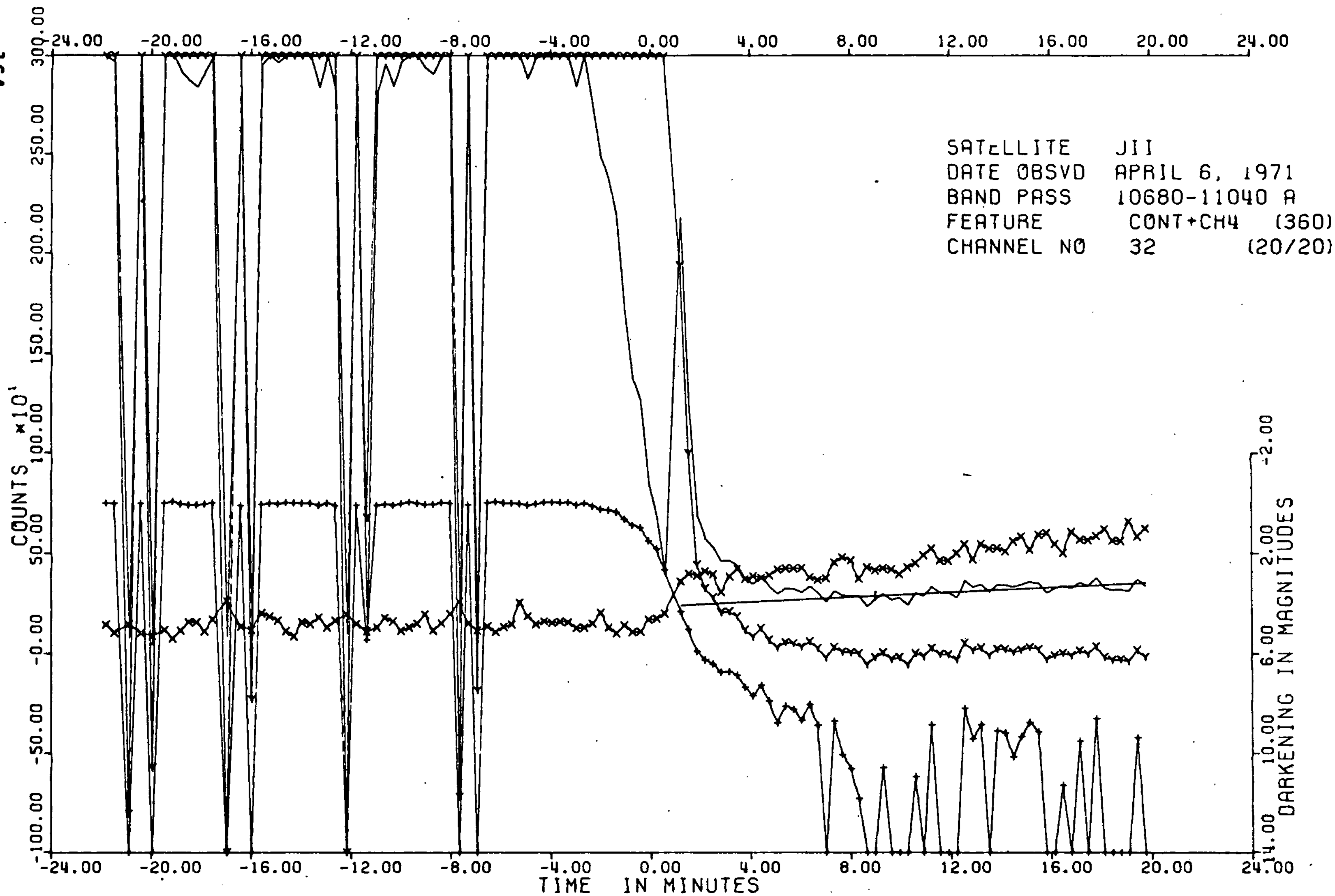

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 10320-10680 A
FEATURE CONTINUUM (360)
CHANNEL NO 31 (19/20)
DARKENING IN MAGNITUDES
-2.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
-24.00
-20.00
-16.00
-12.00
-8.00
-4.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
TIME IN MINUTES
TIME ORIGIN, APRIL 6, 1971 10 HR 22 MIN (U.T.)



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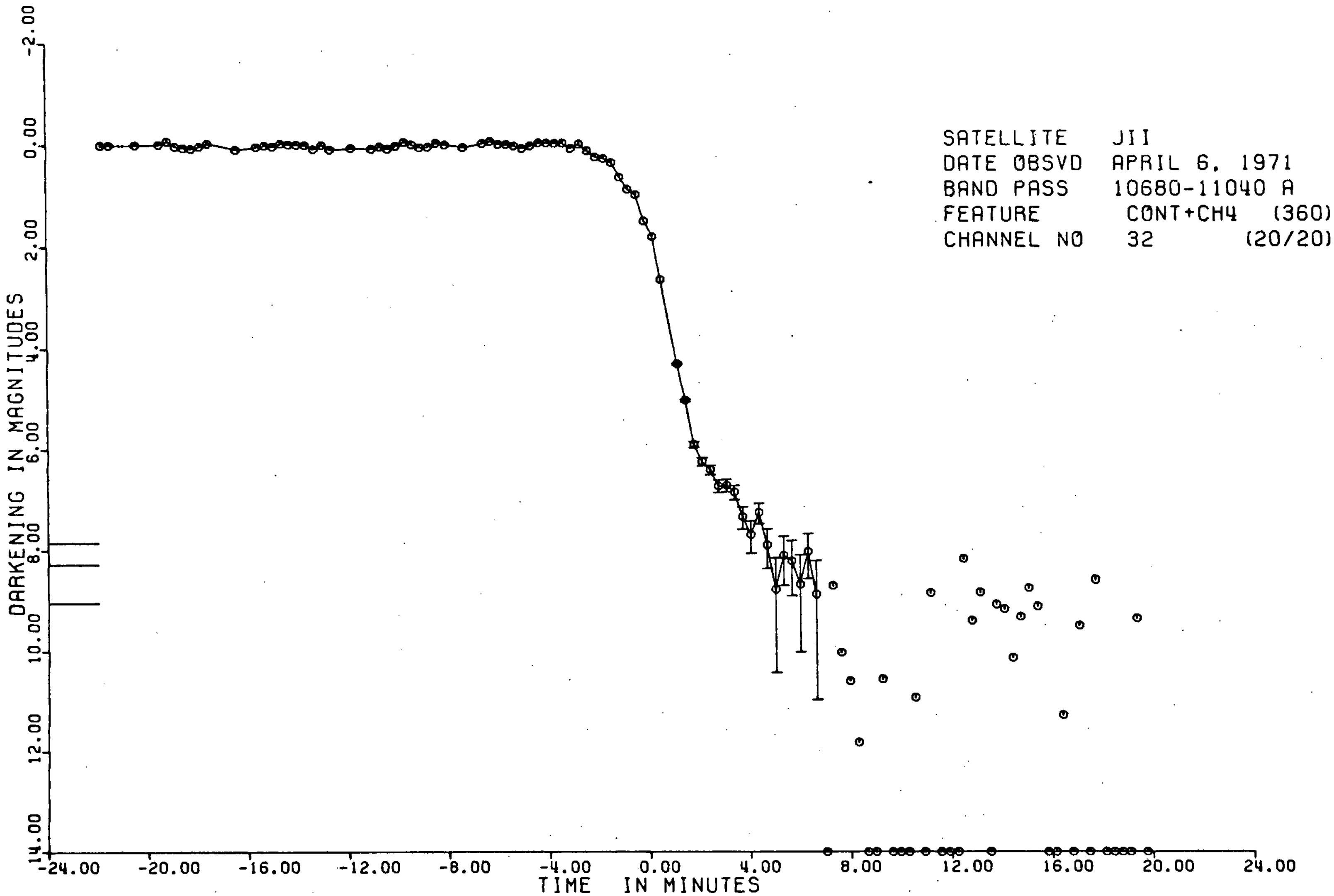

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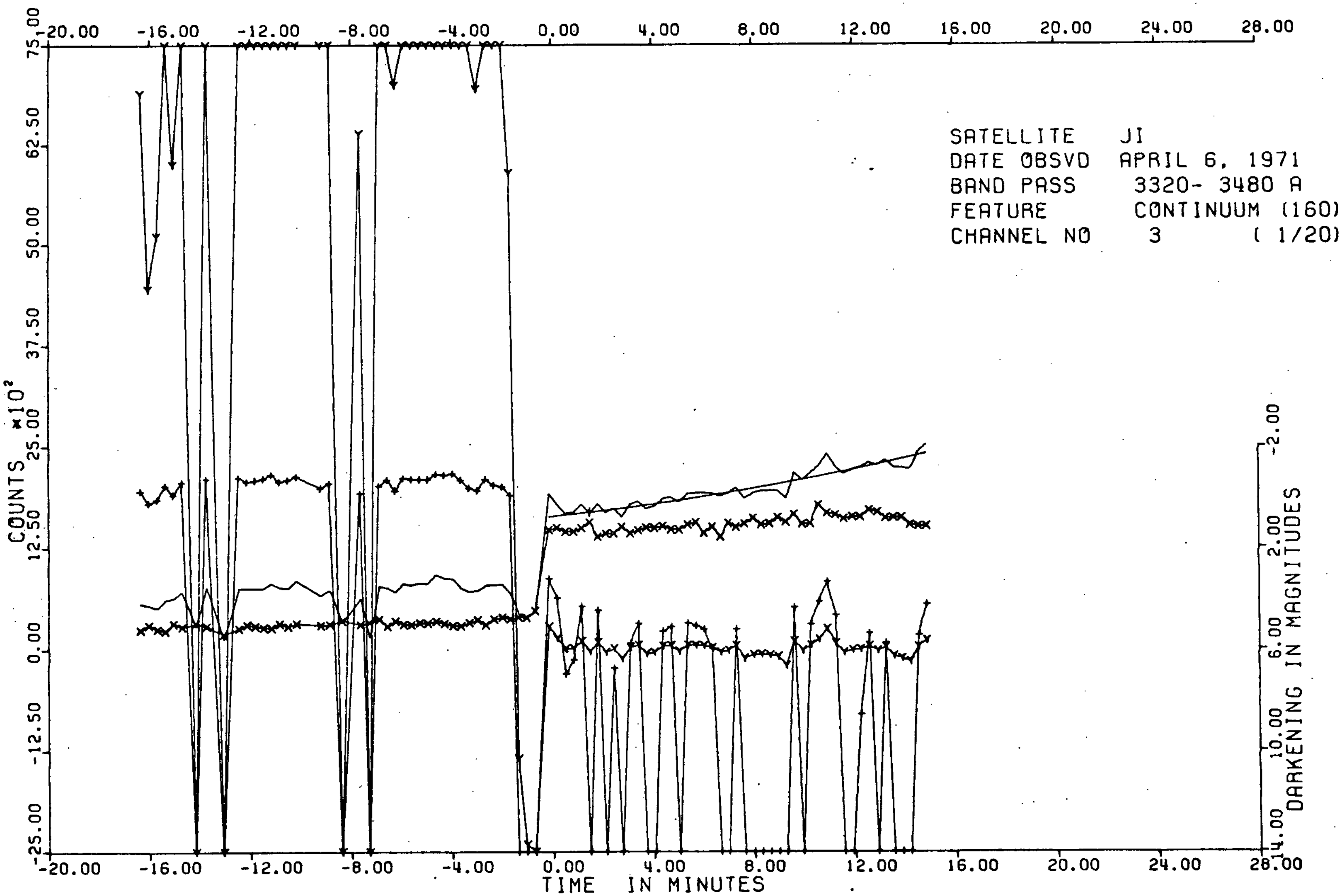

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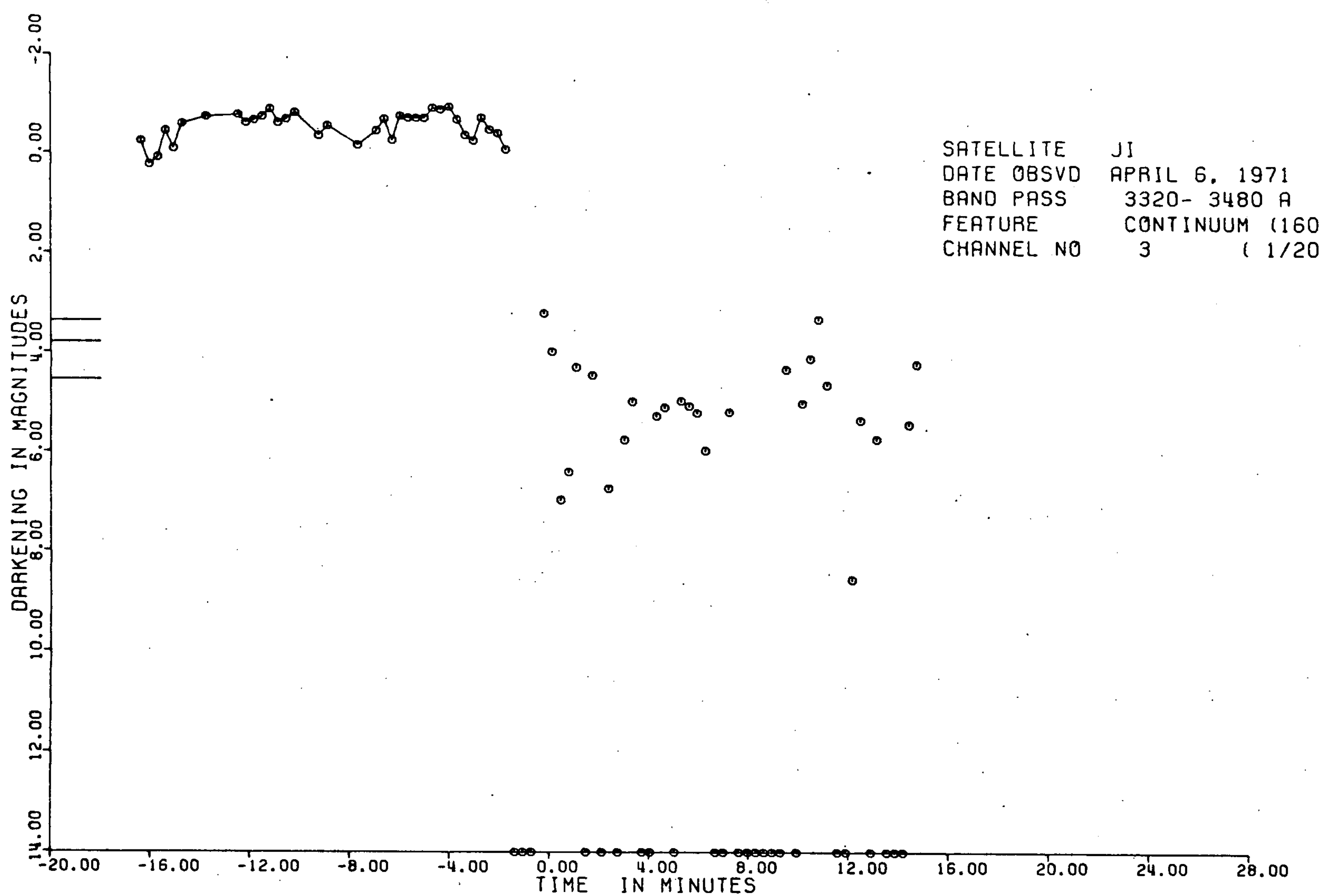

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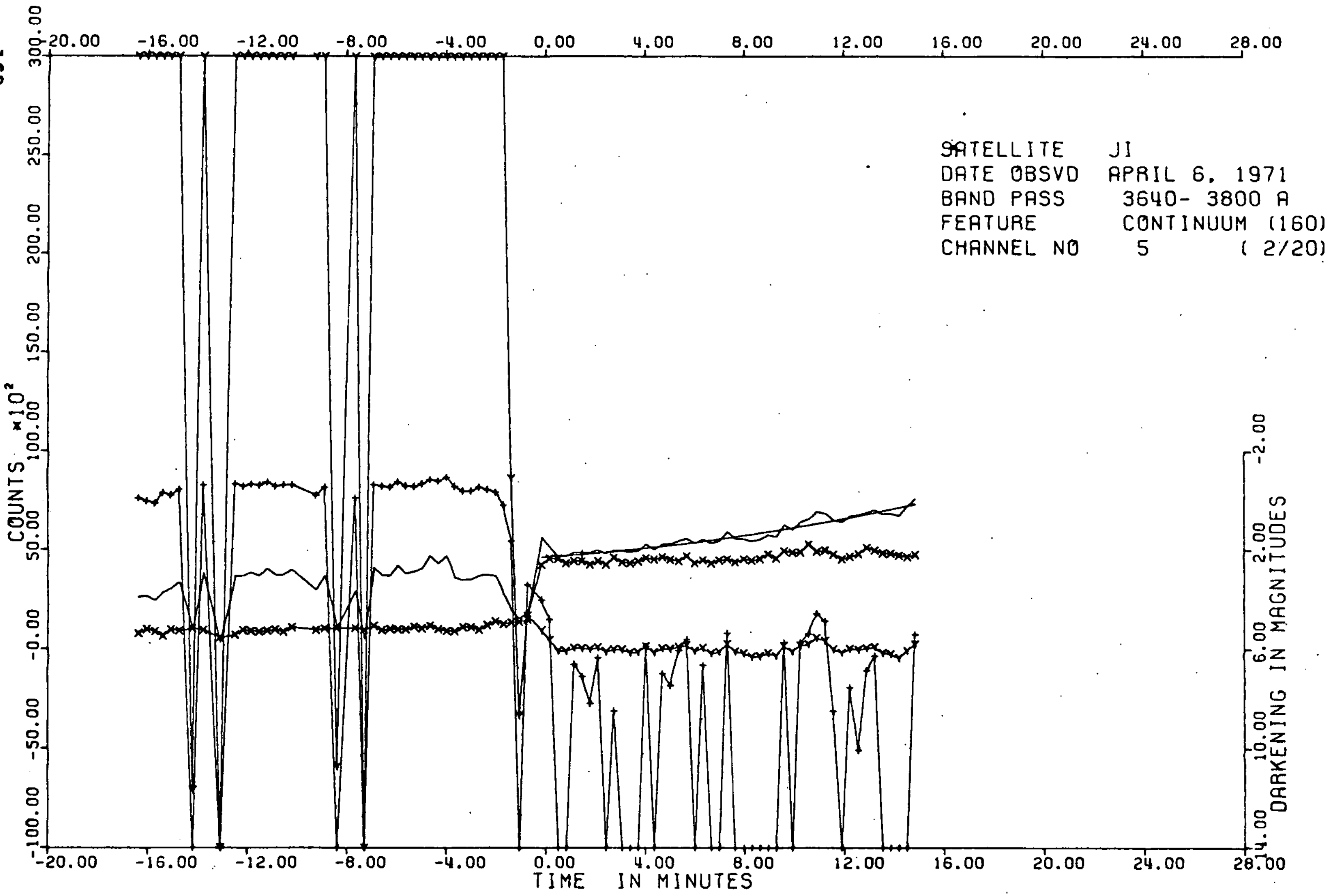

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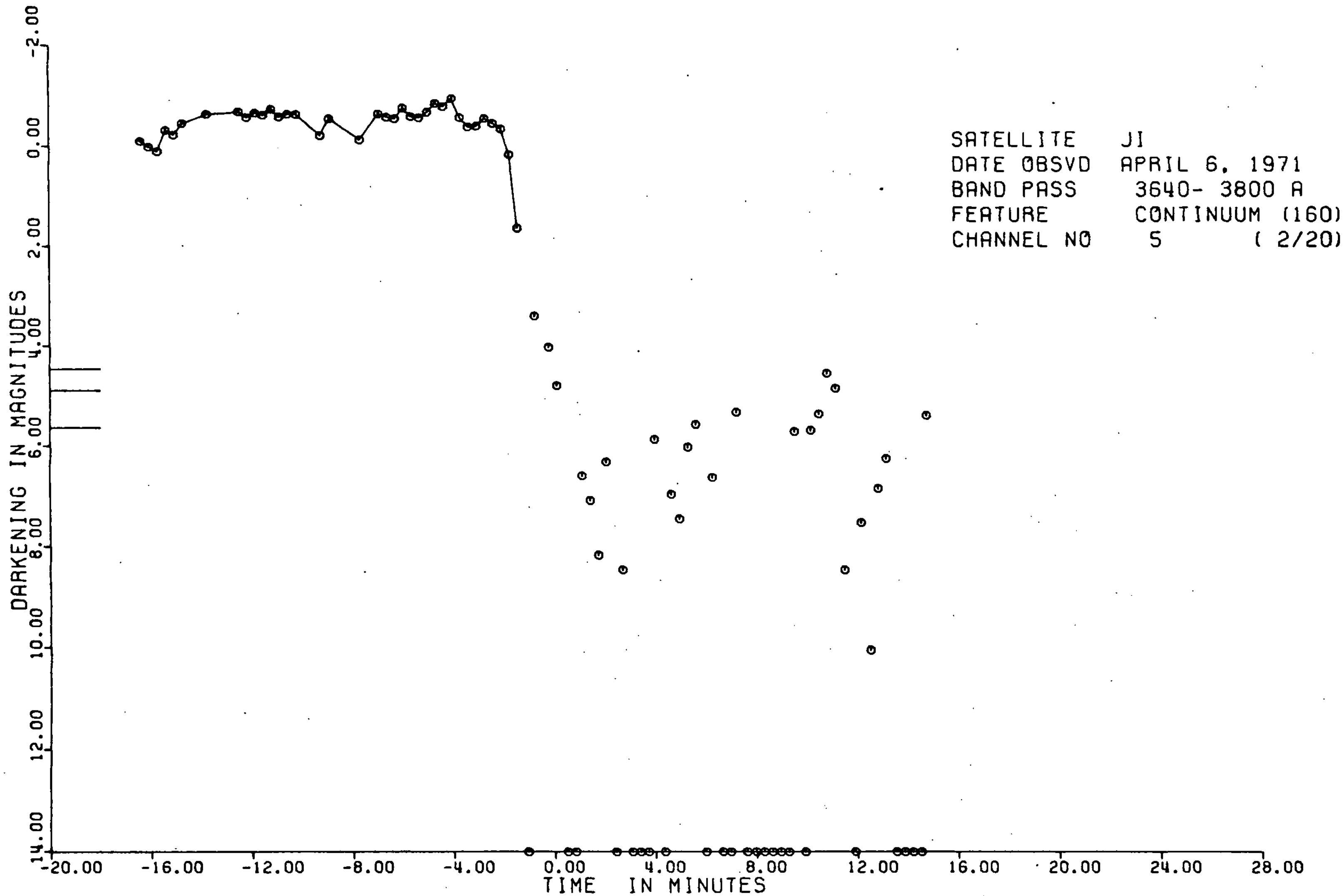

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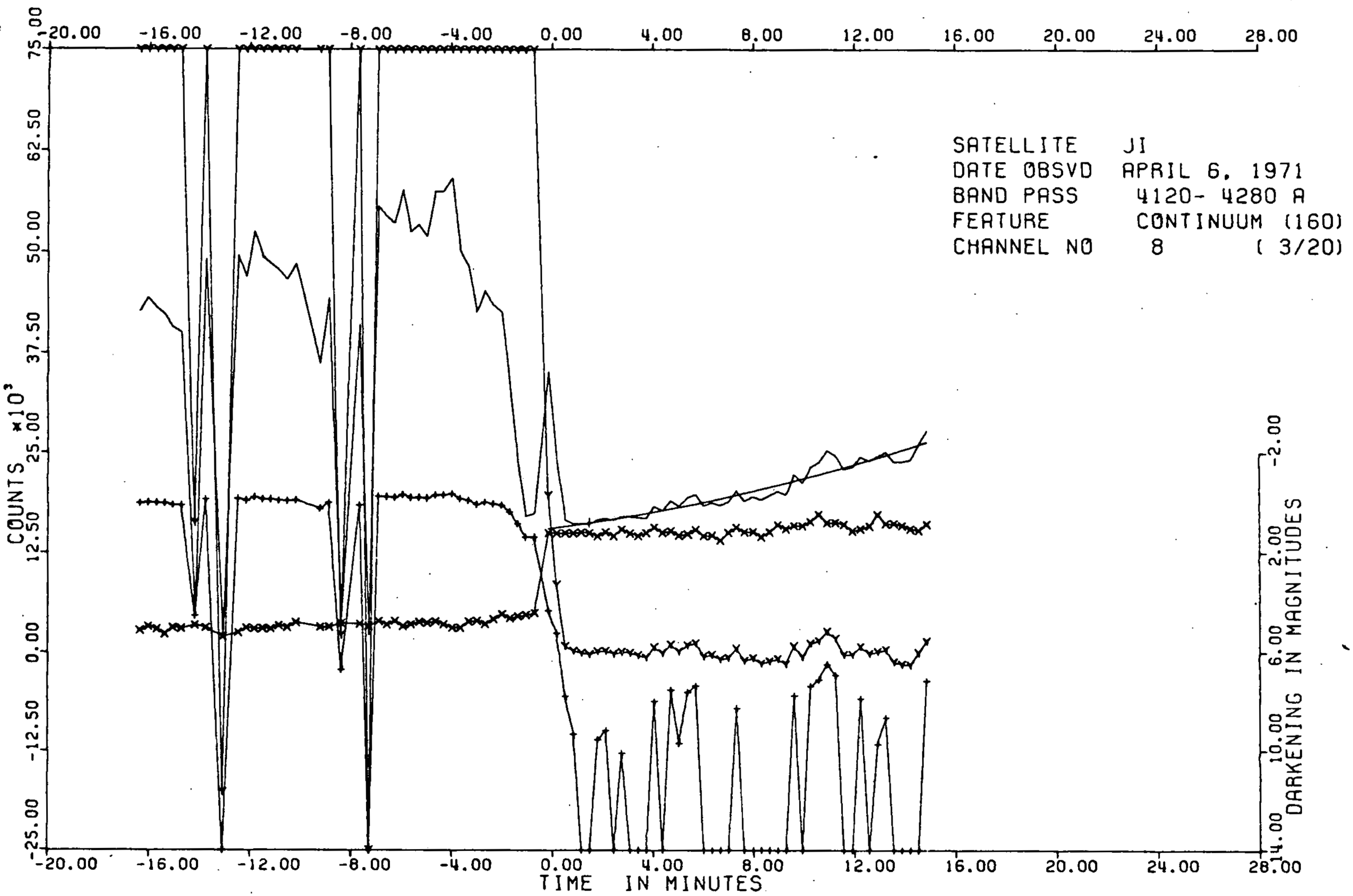

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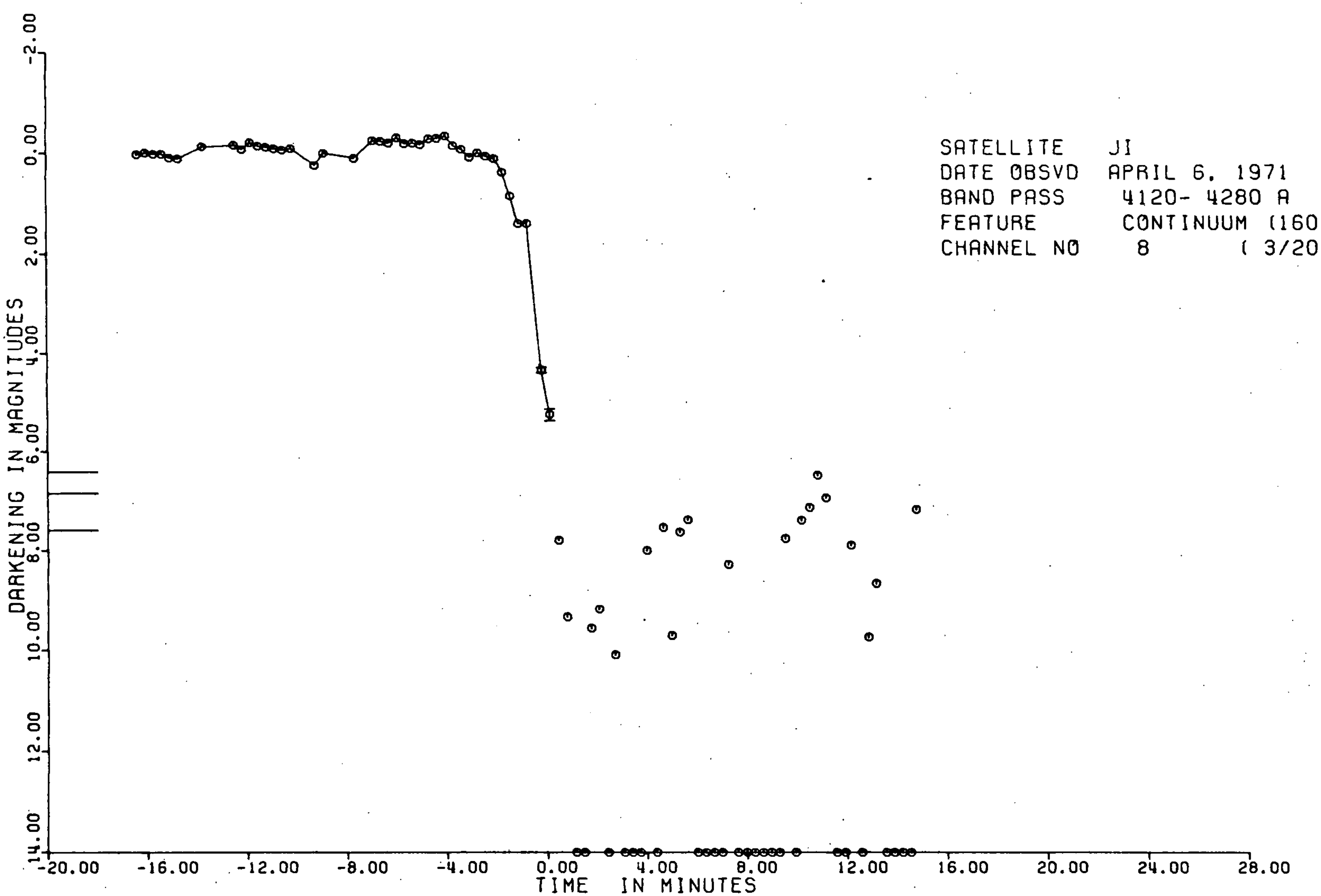

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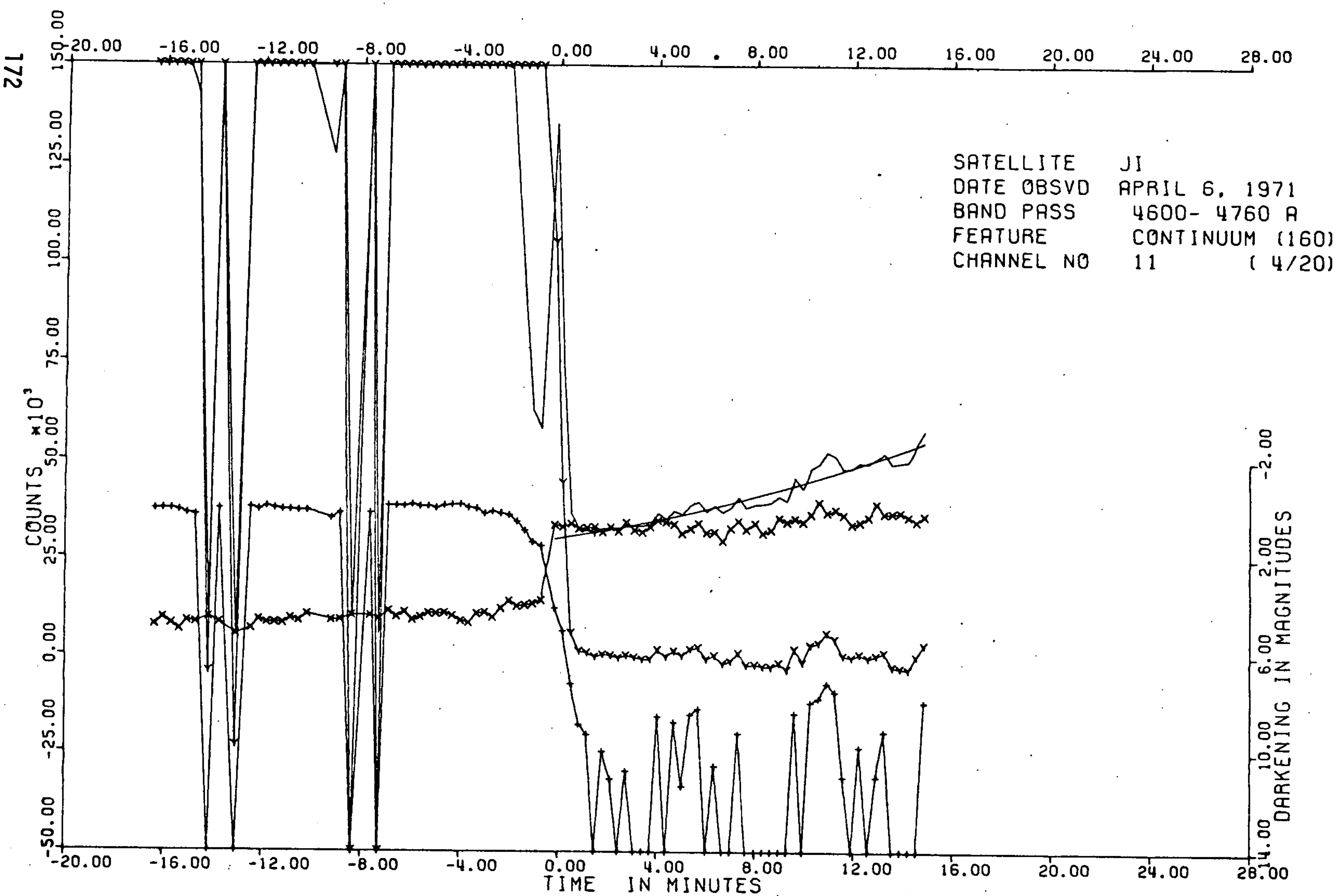

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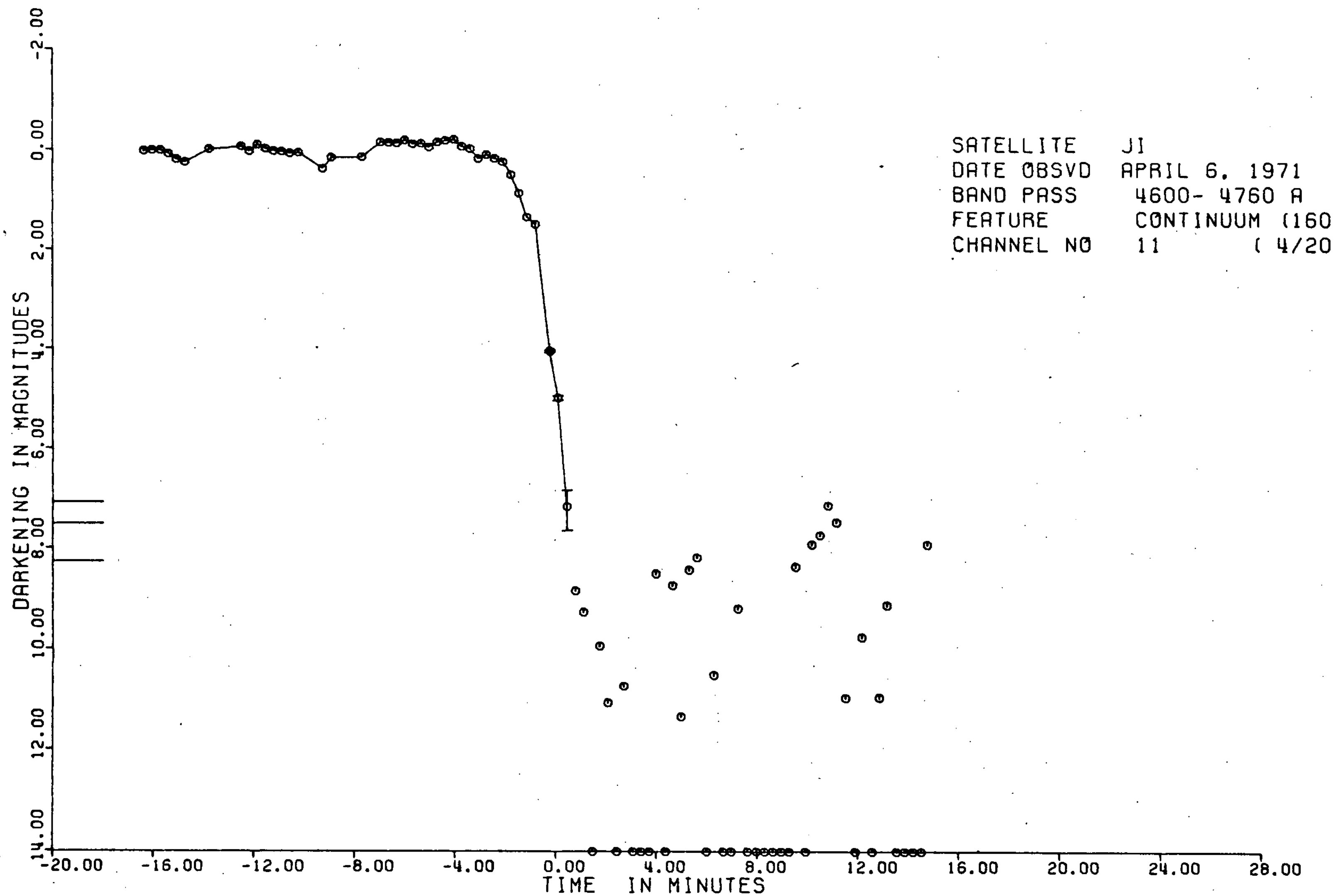

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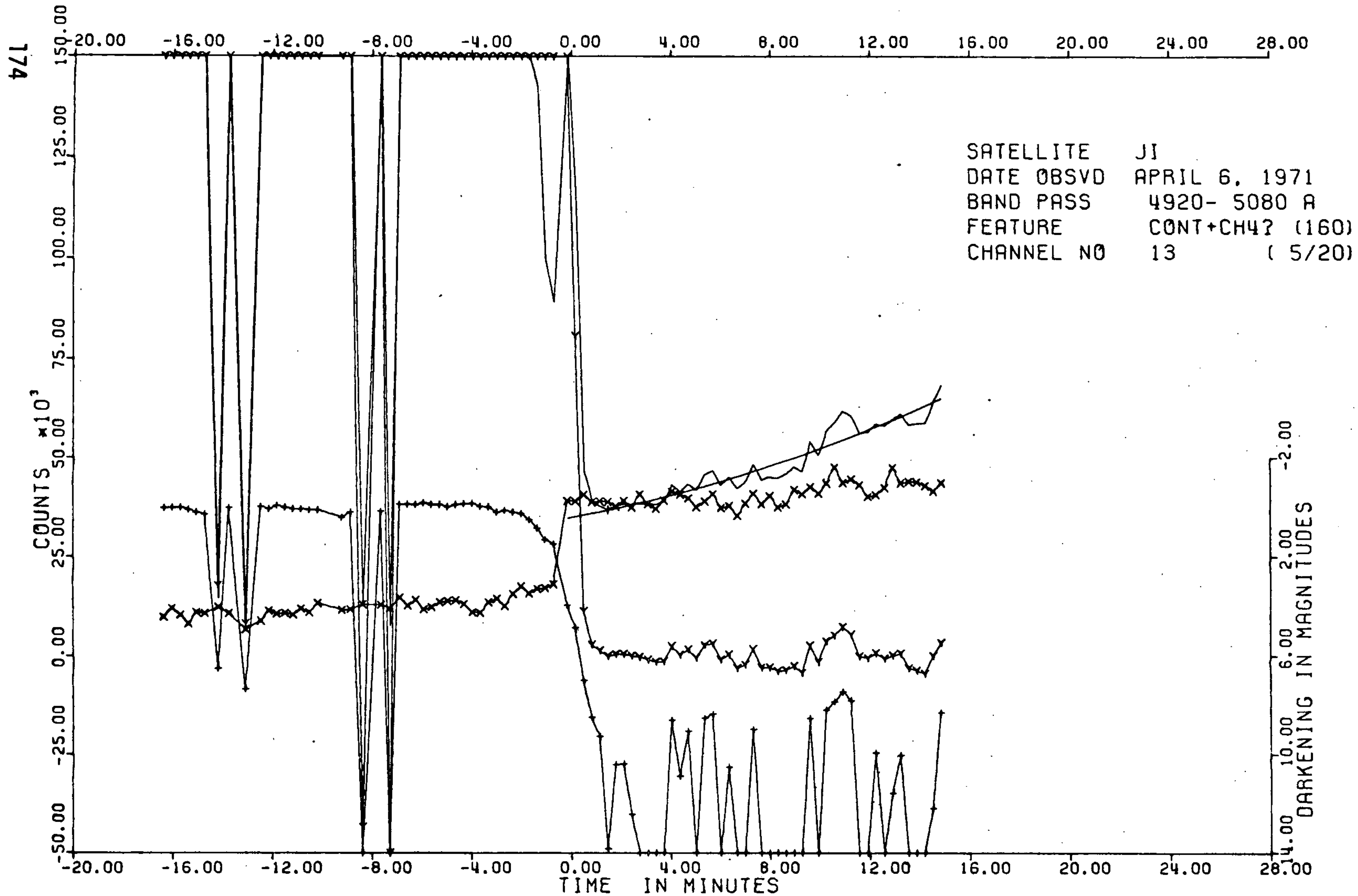

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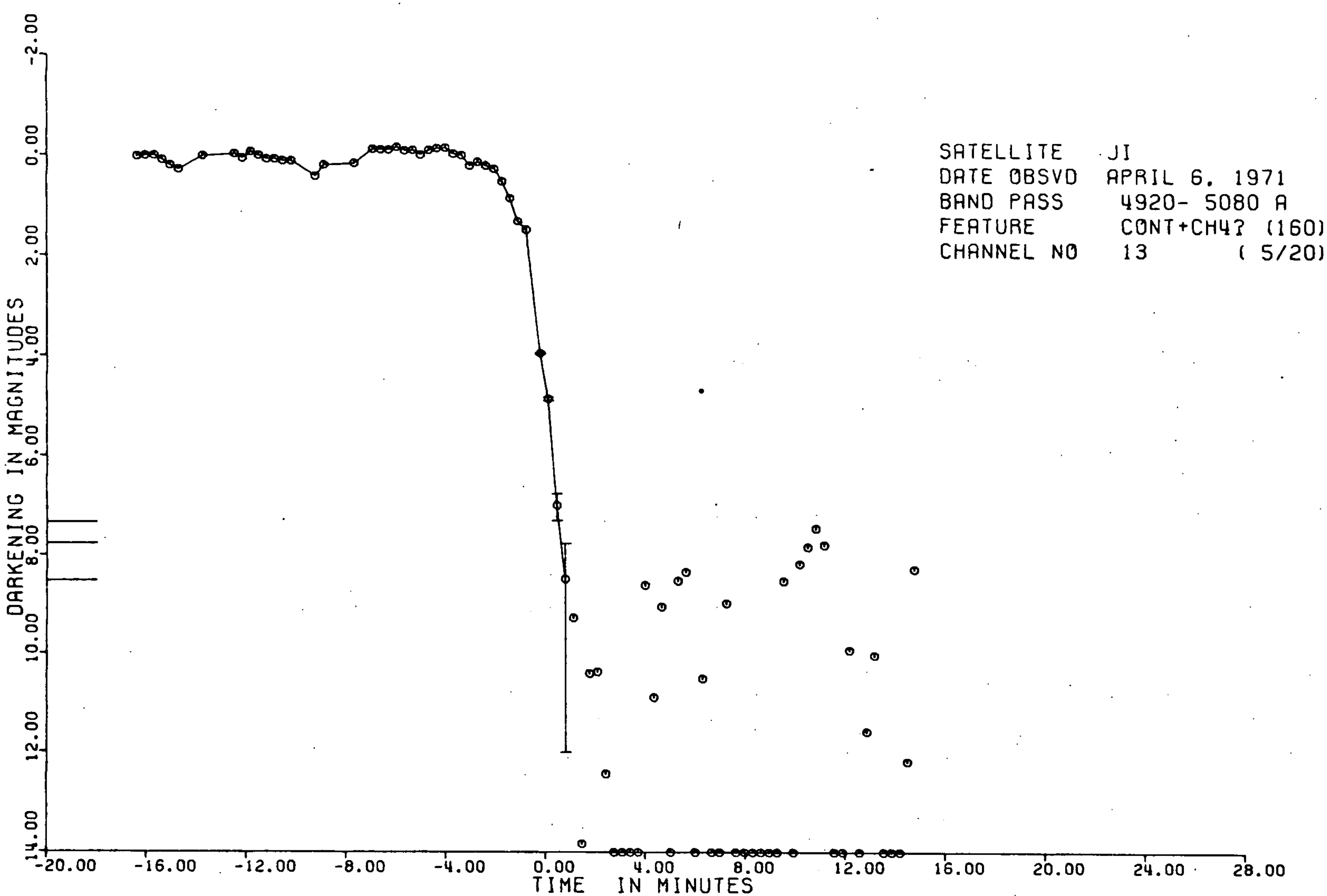

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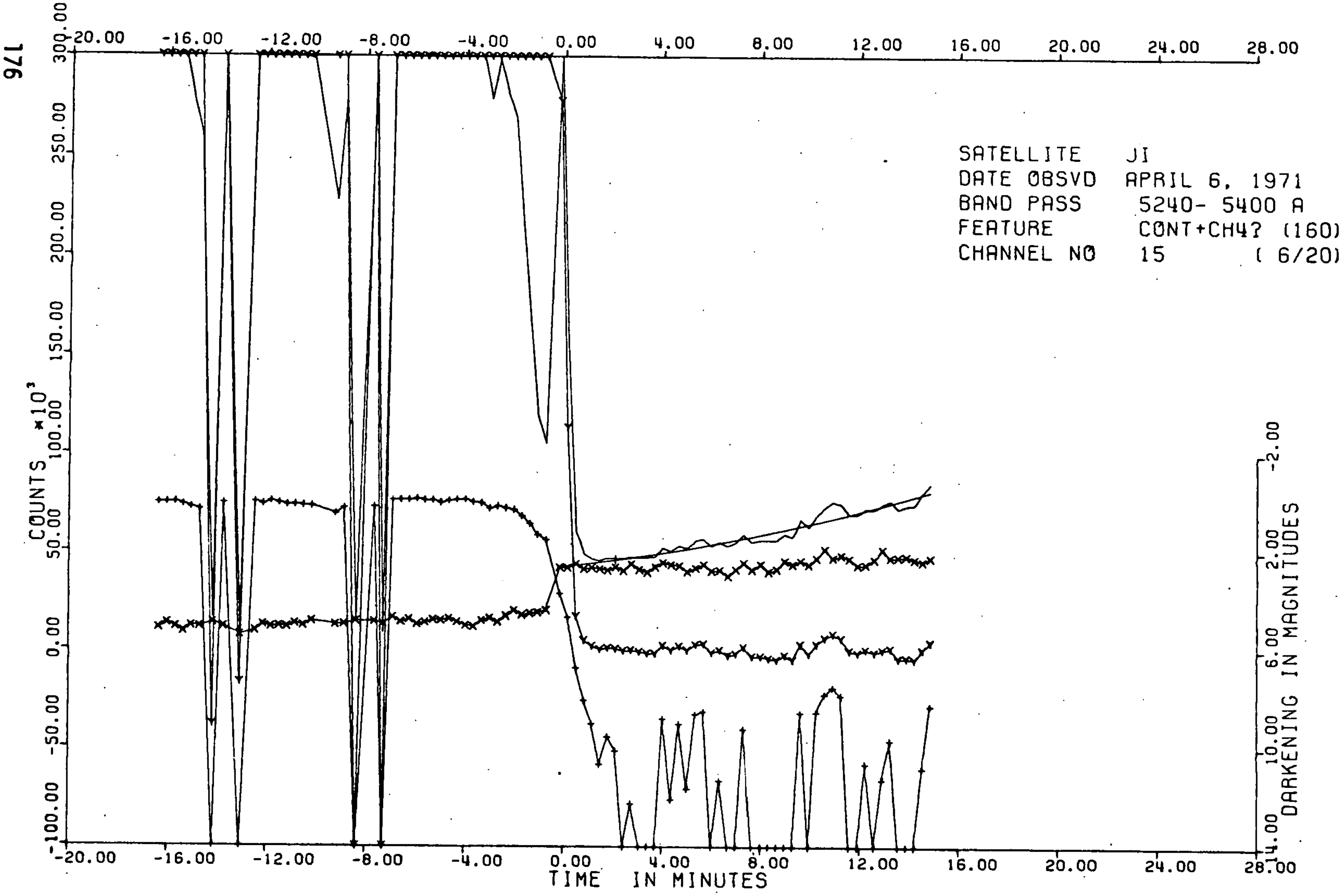

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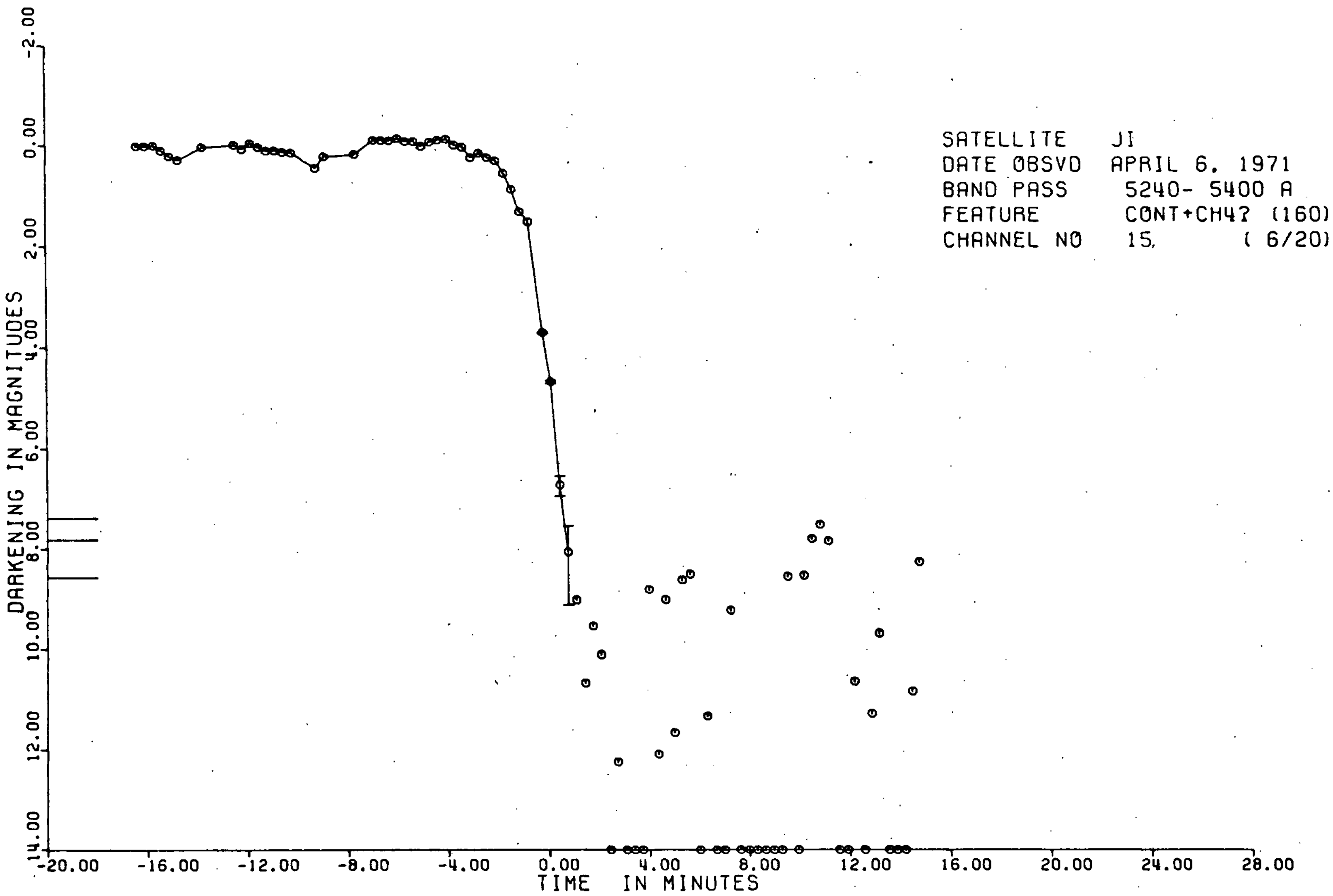

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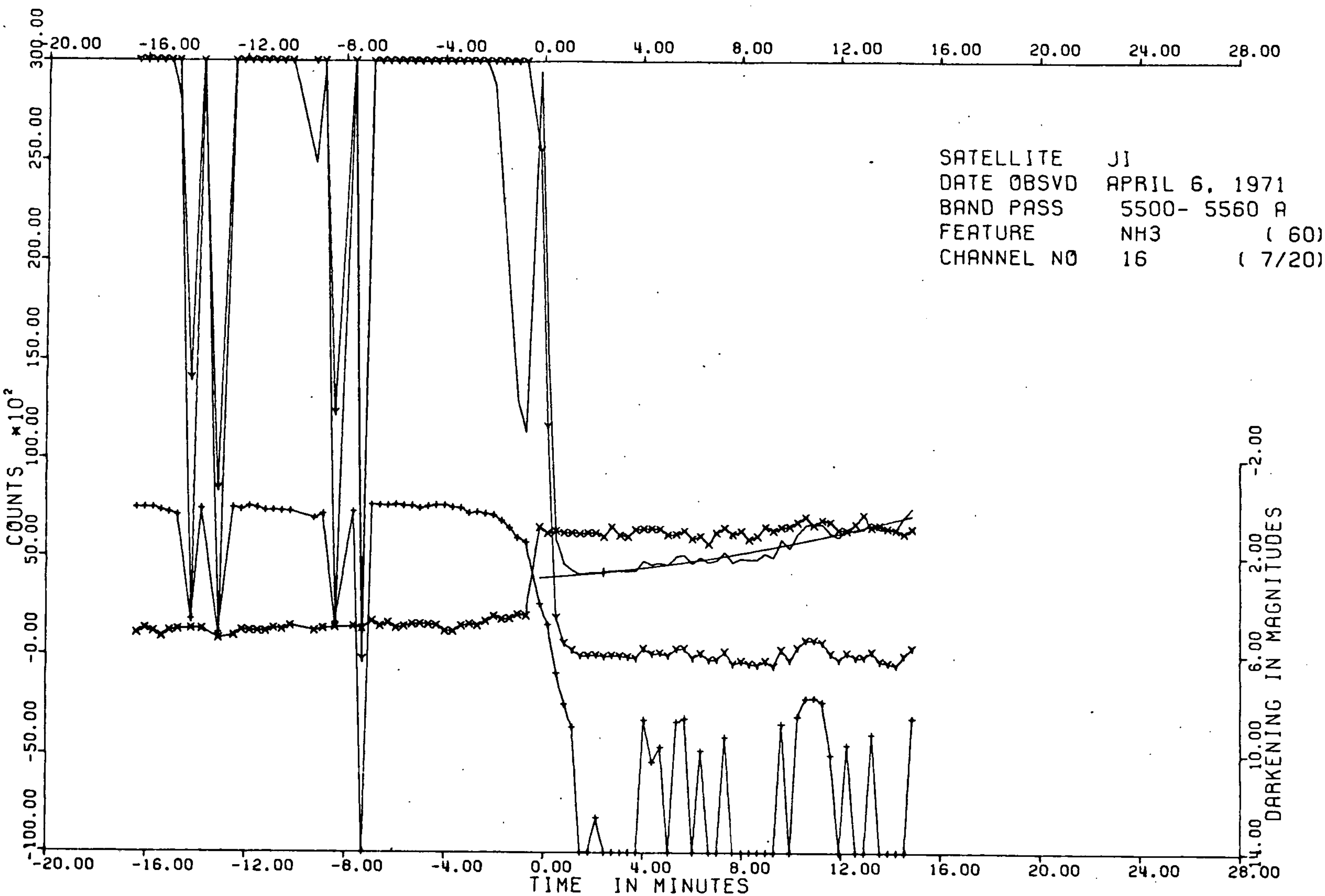

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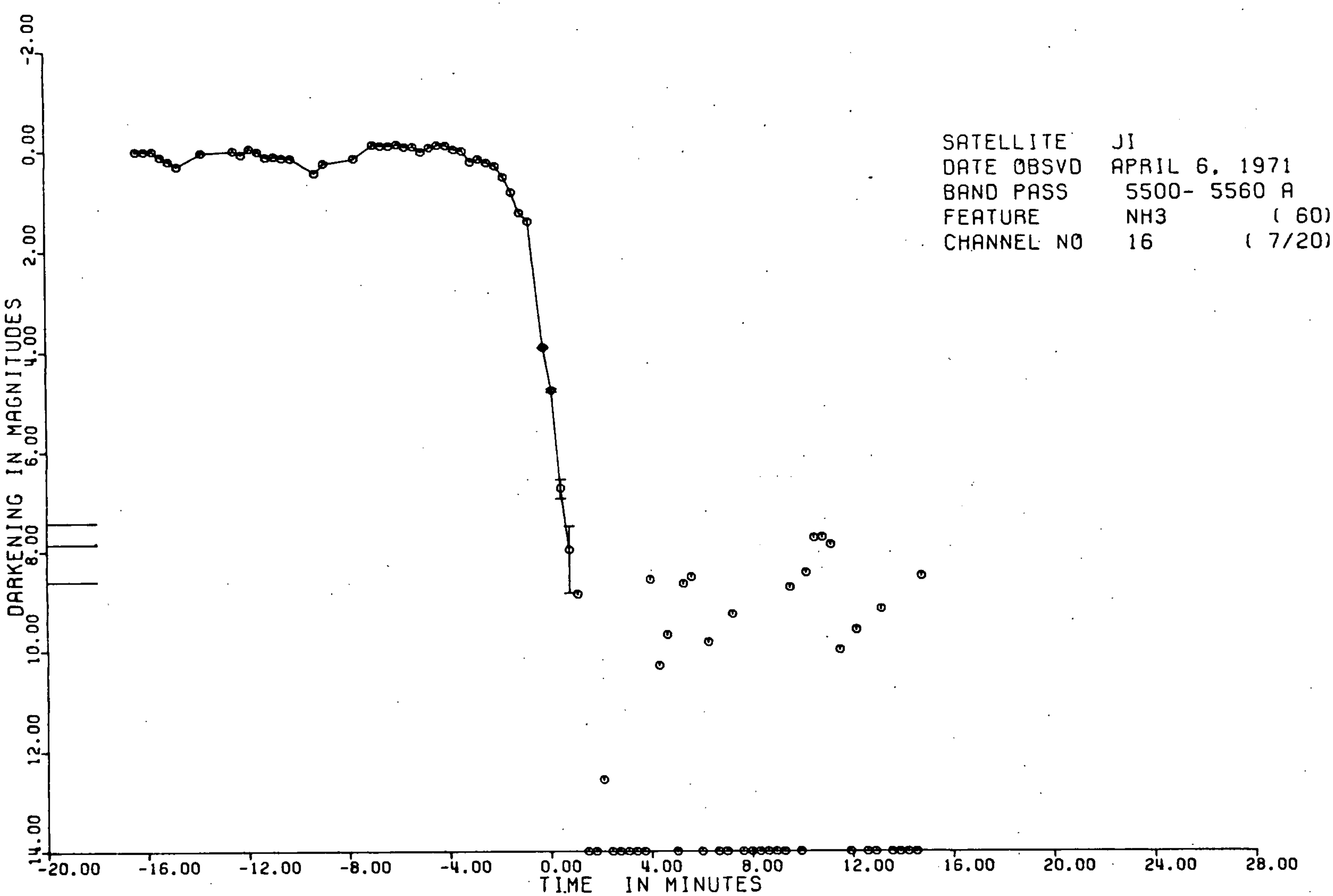

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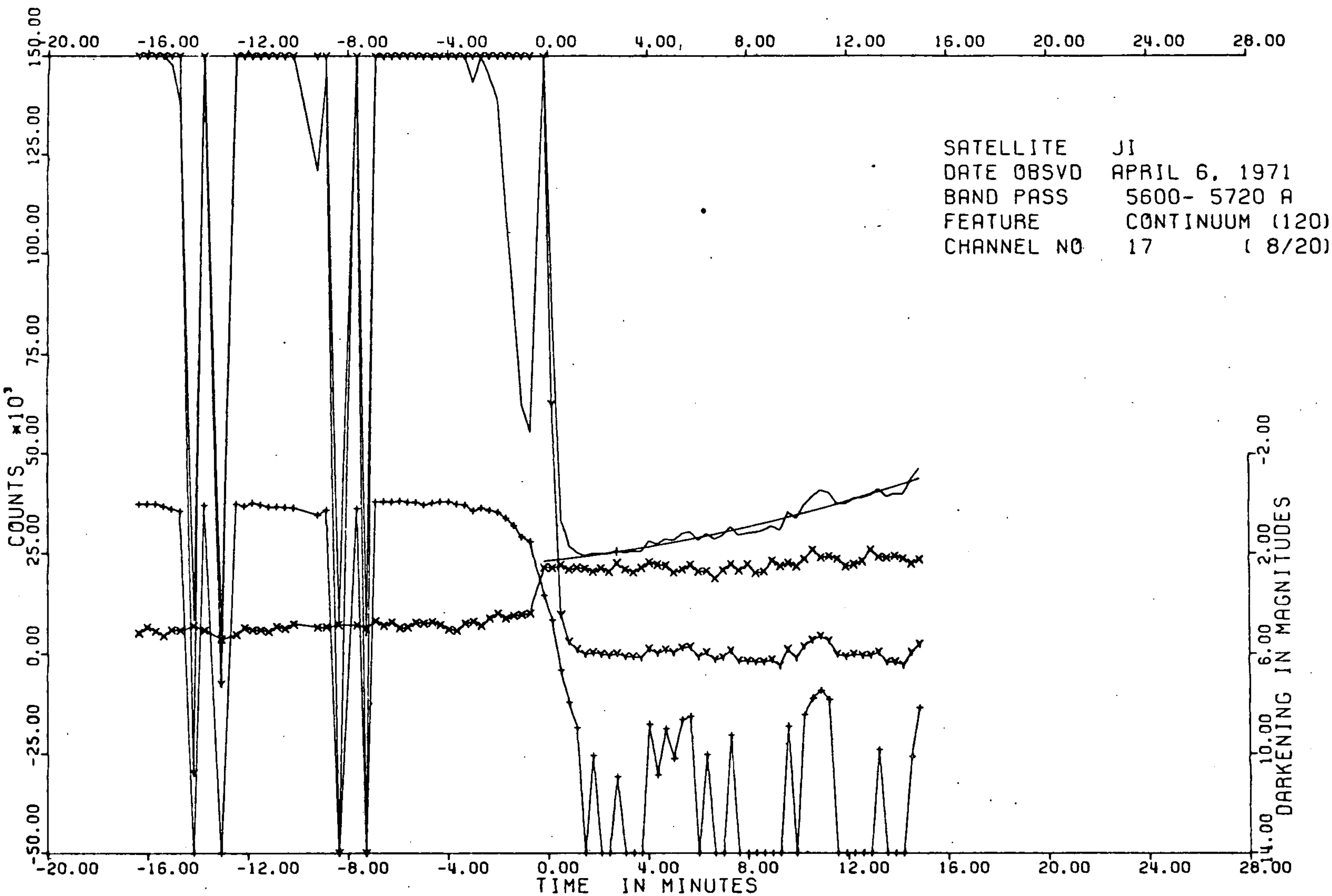

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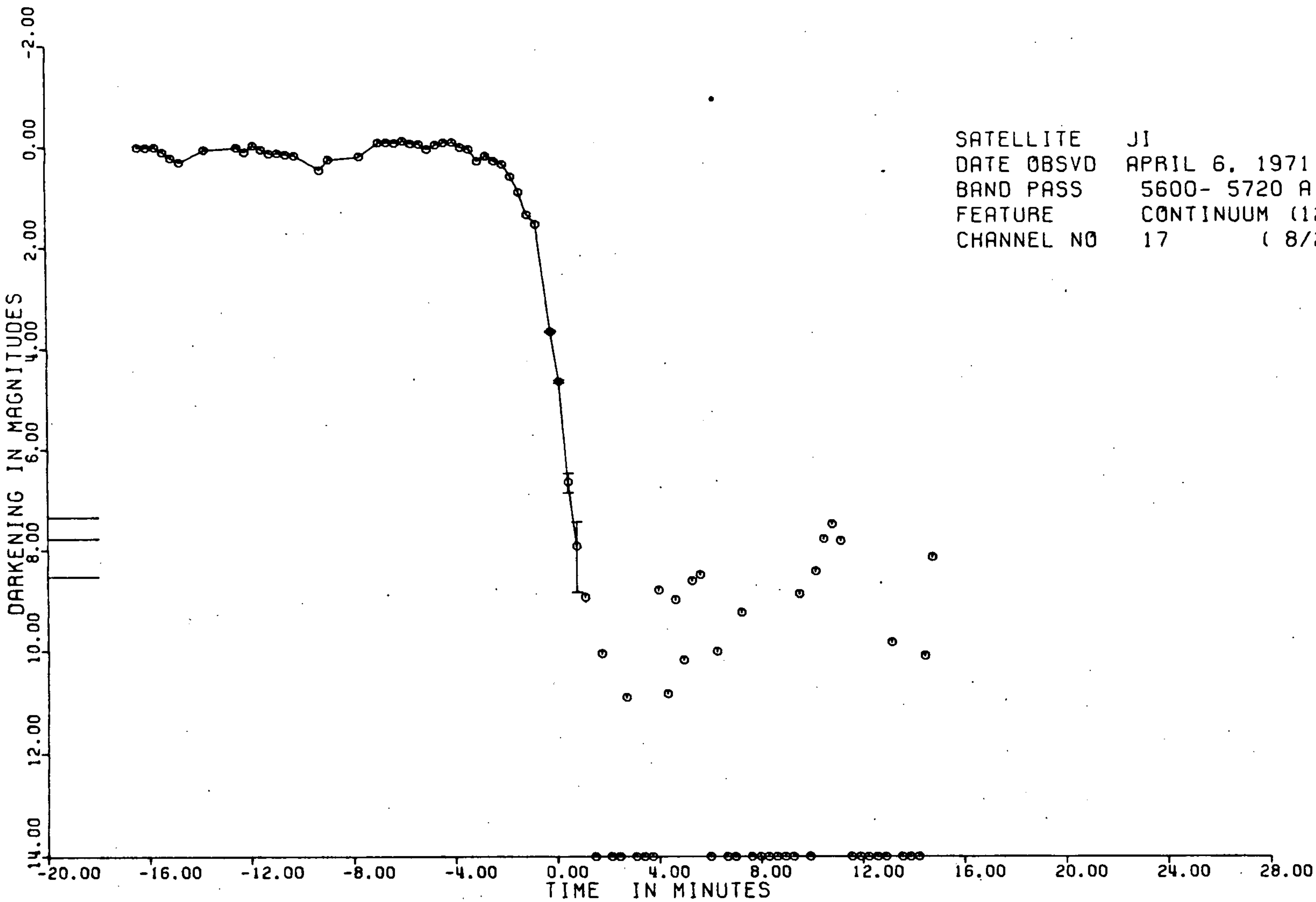

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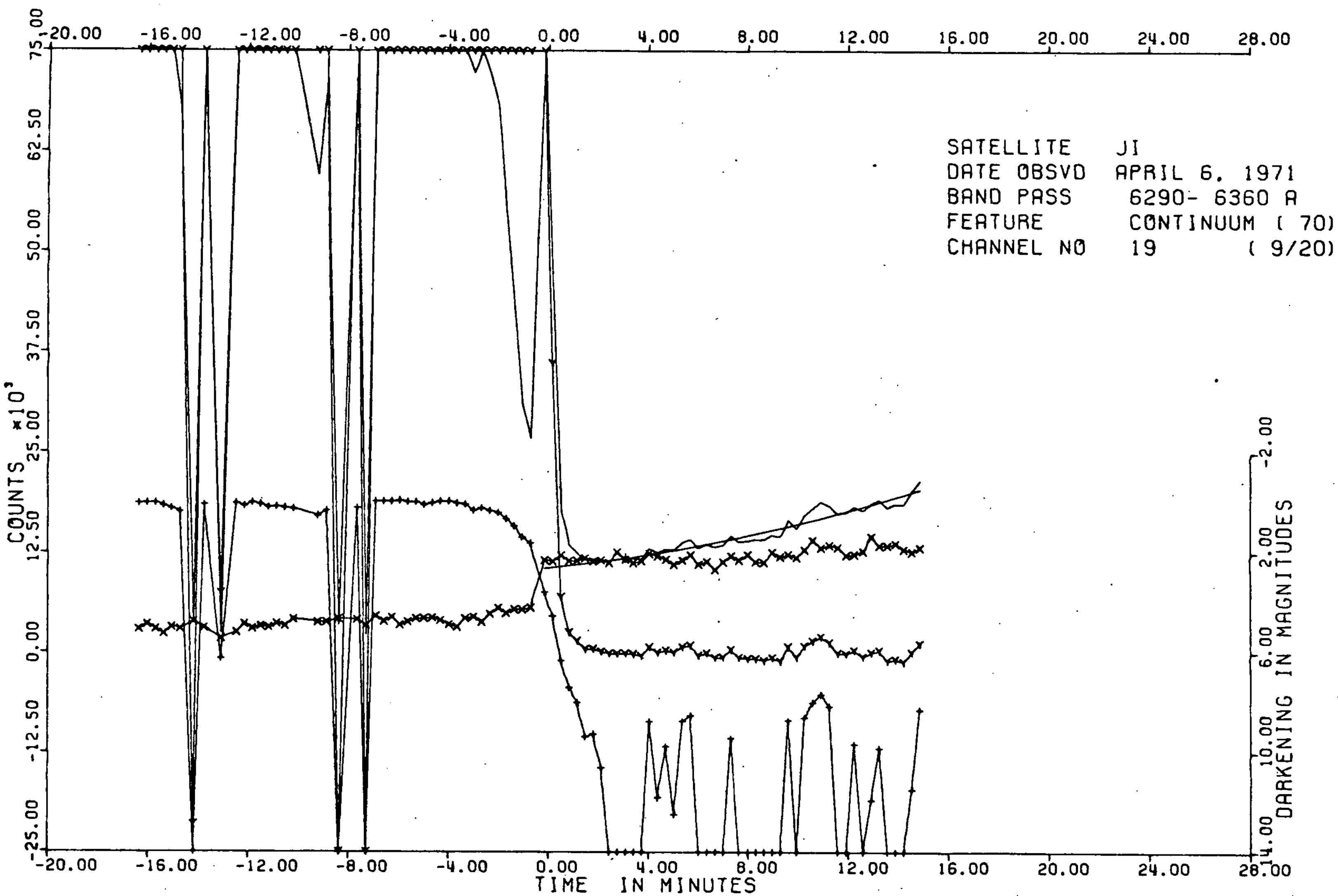

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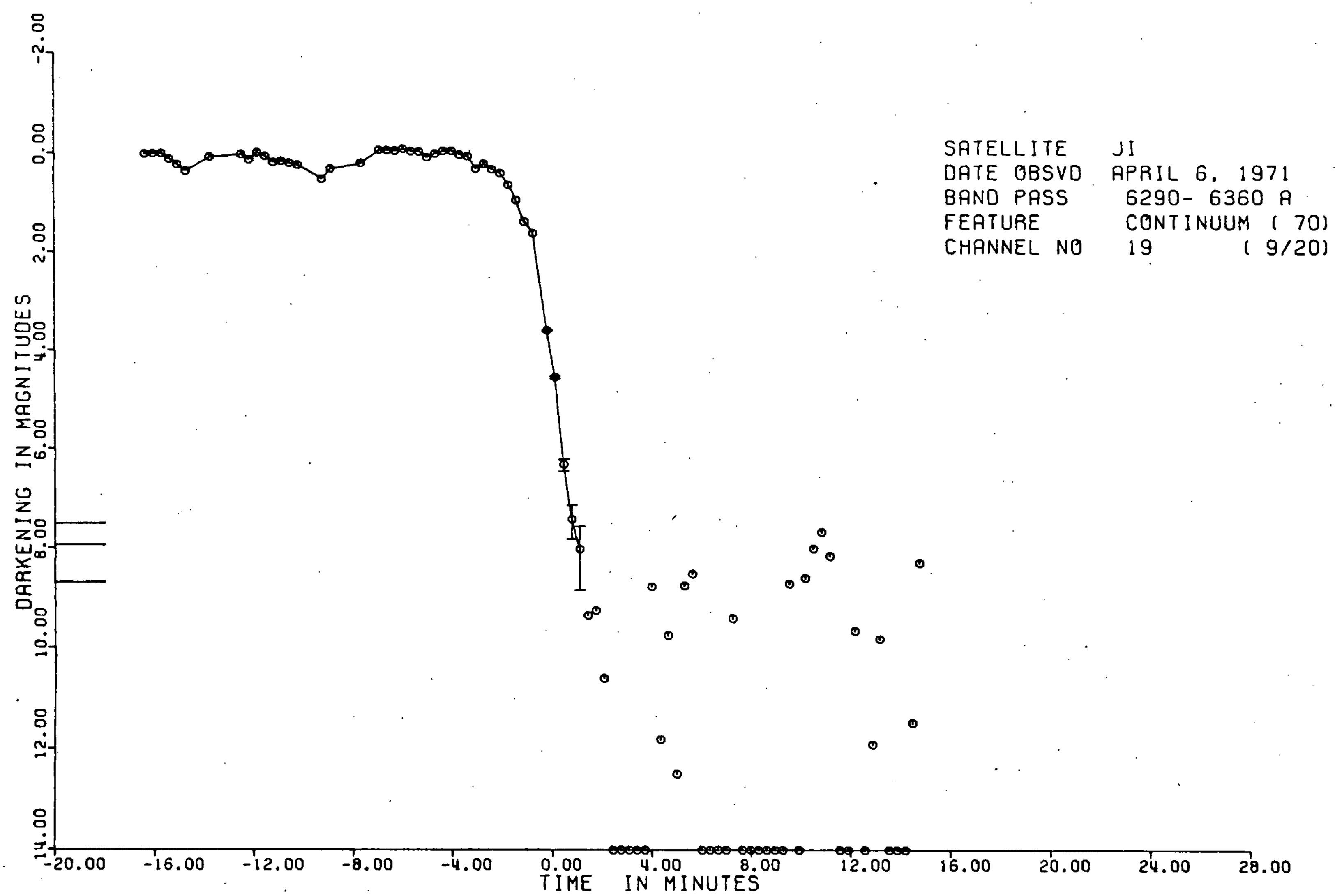

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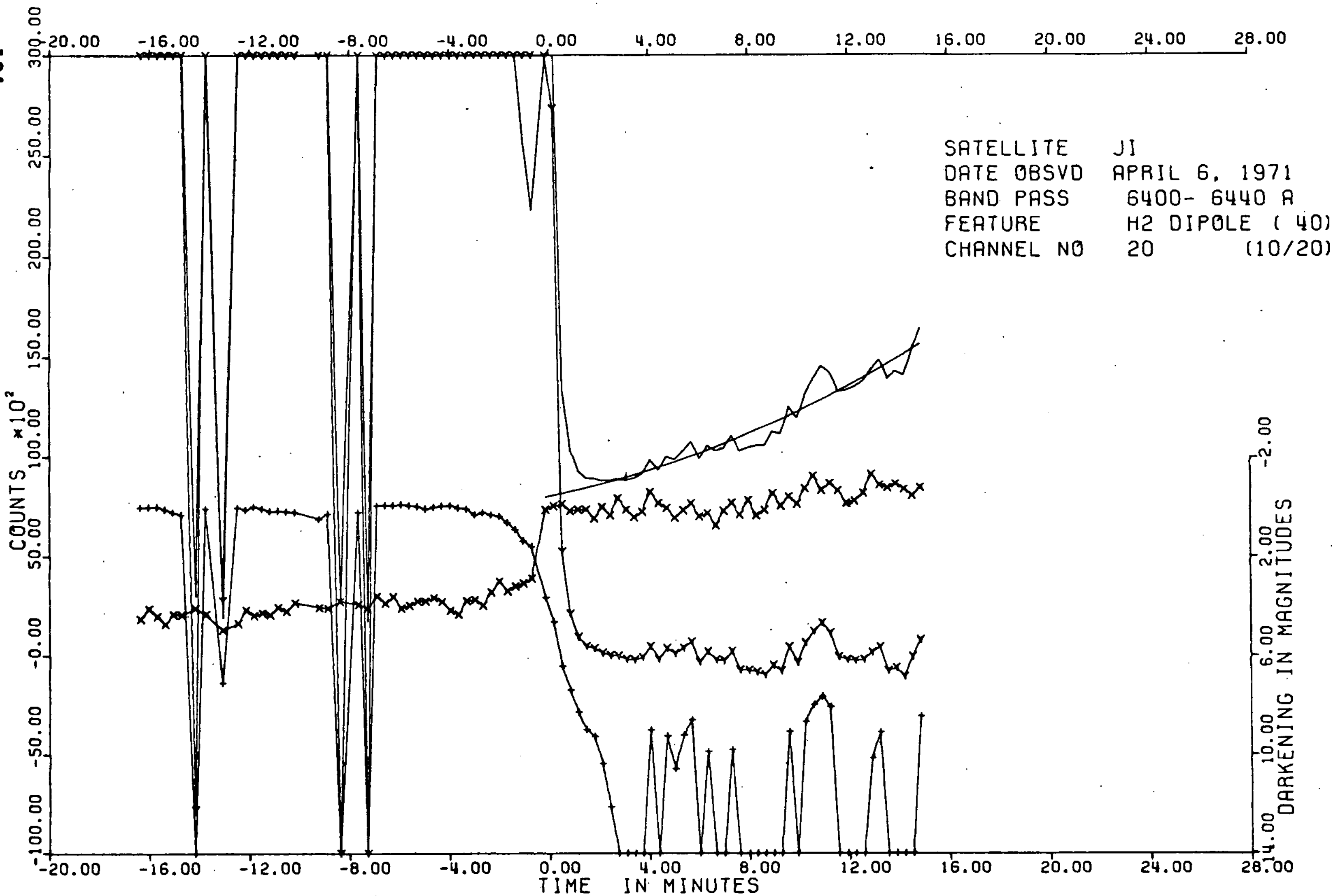

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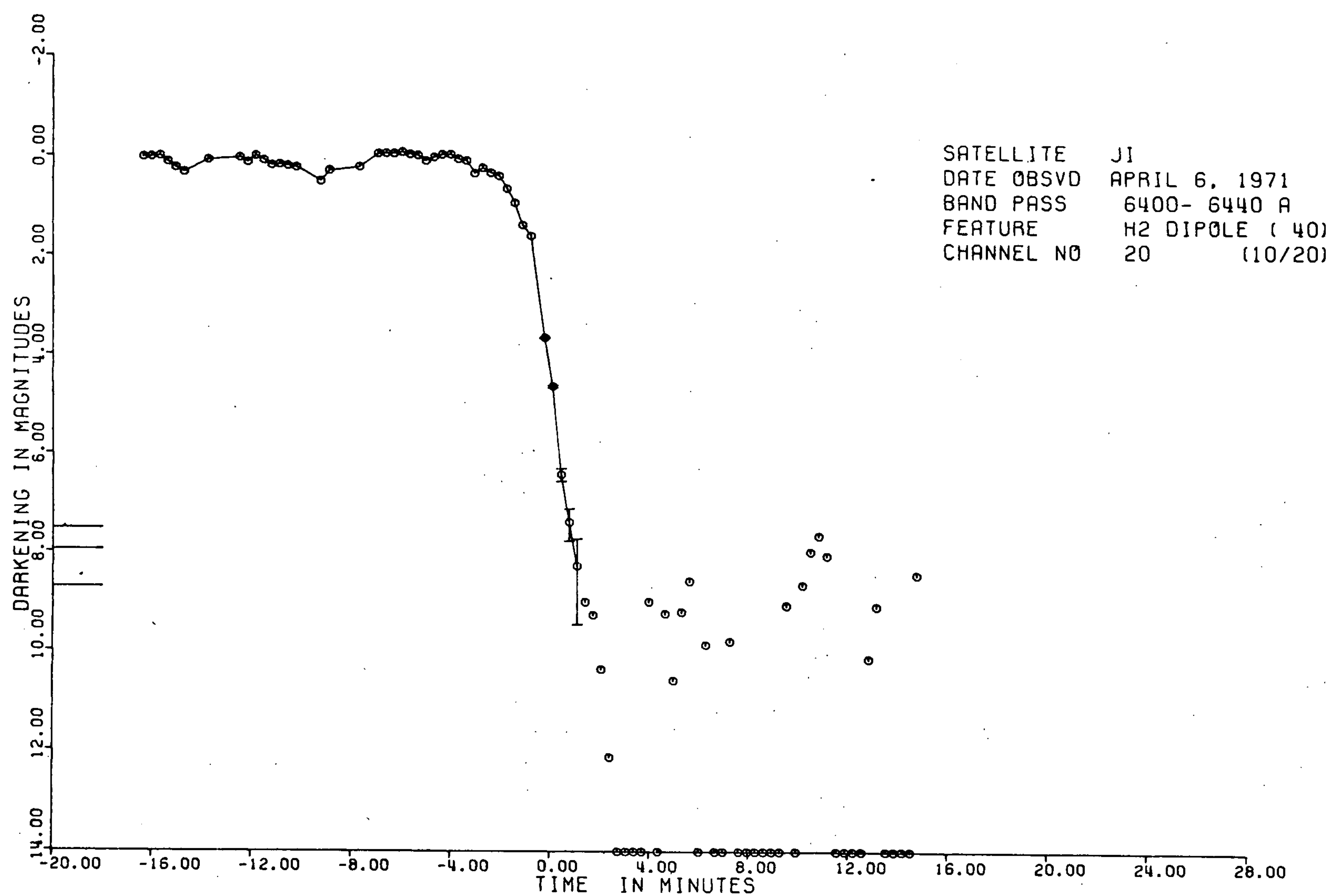

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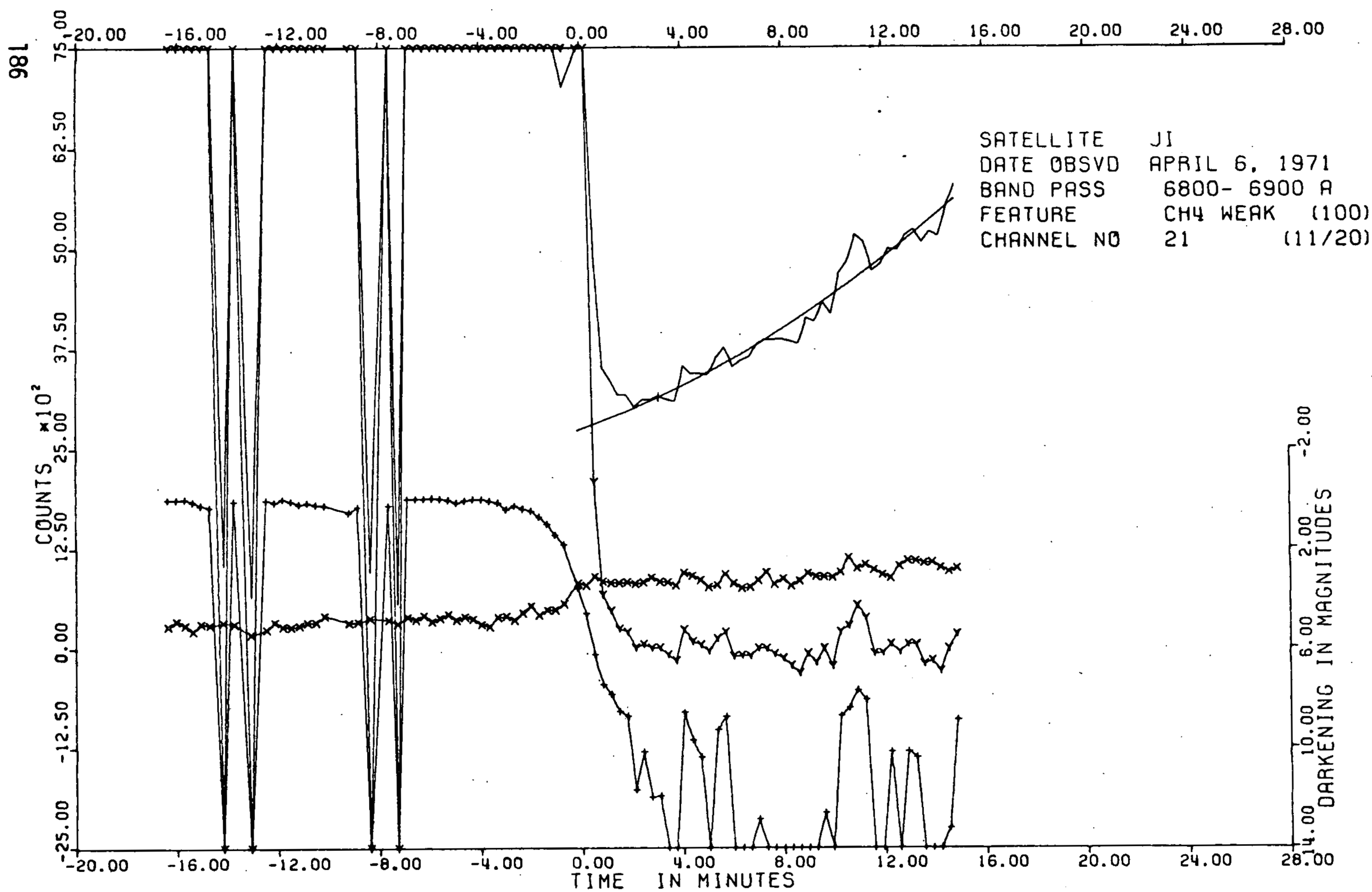

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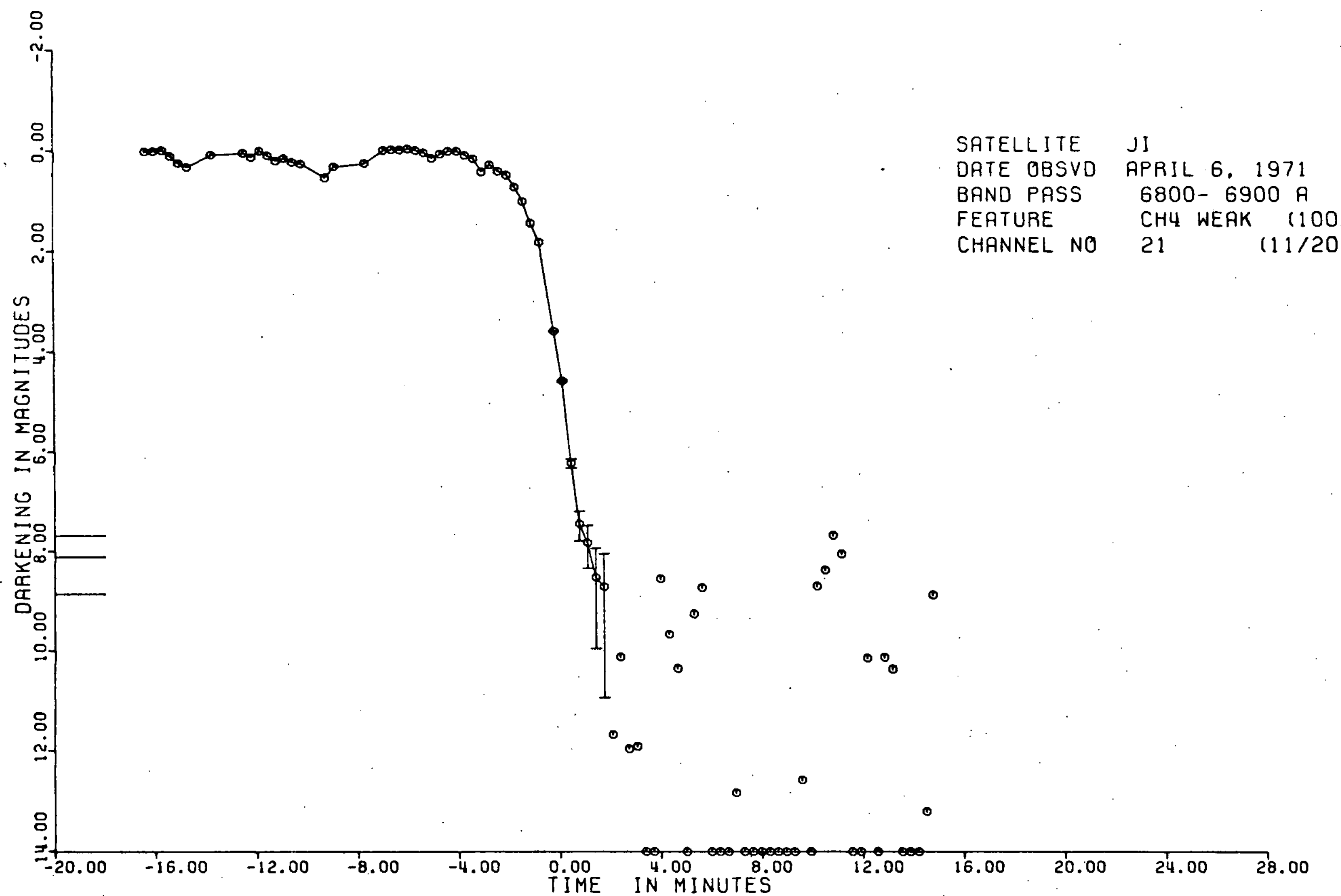

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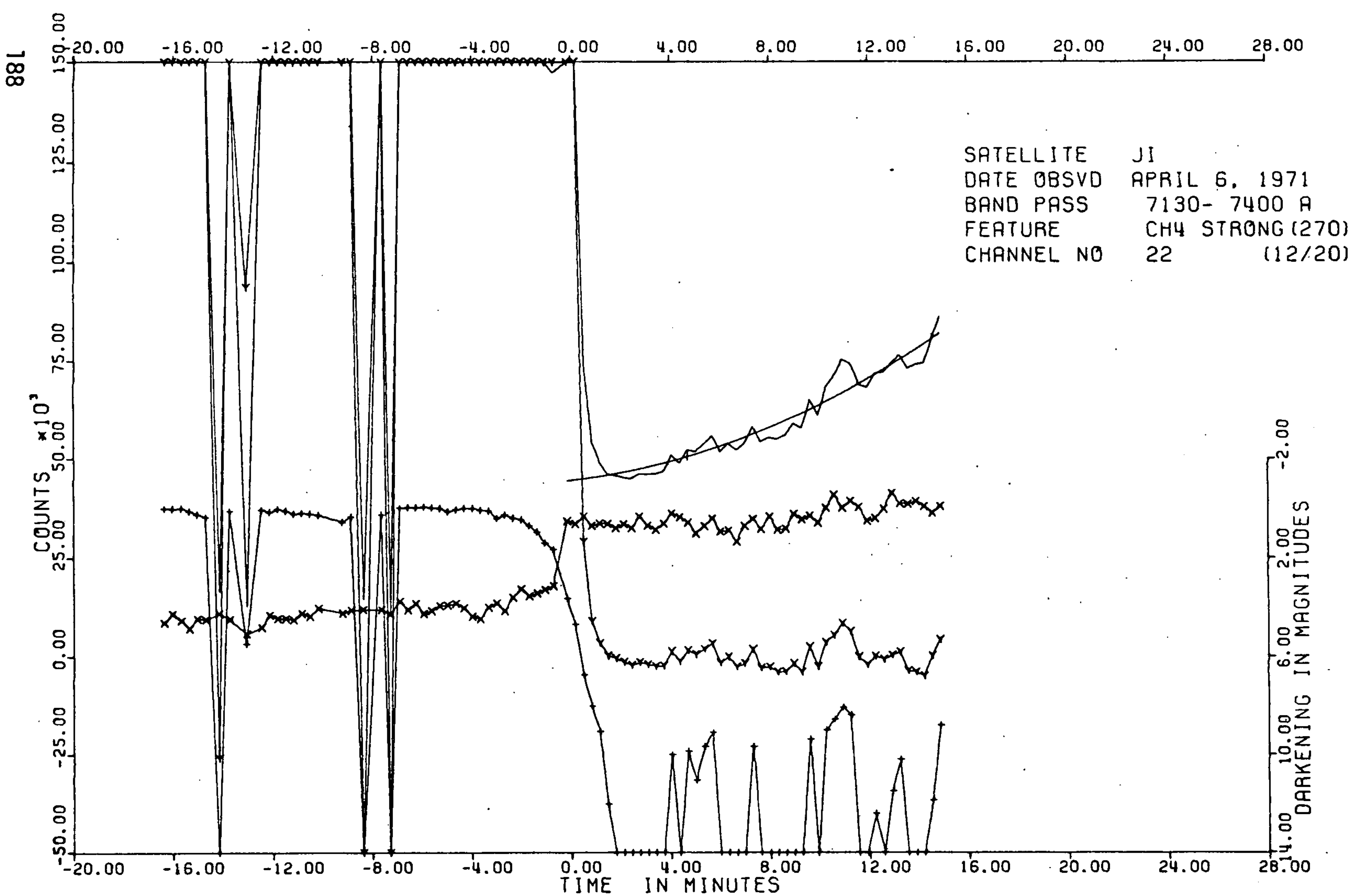

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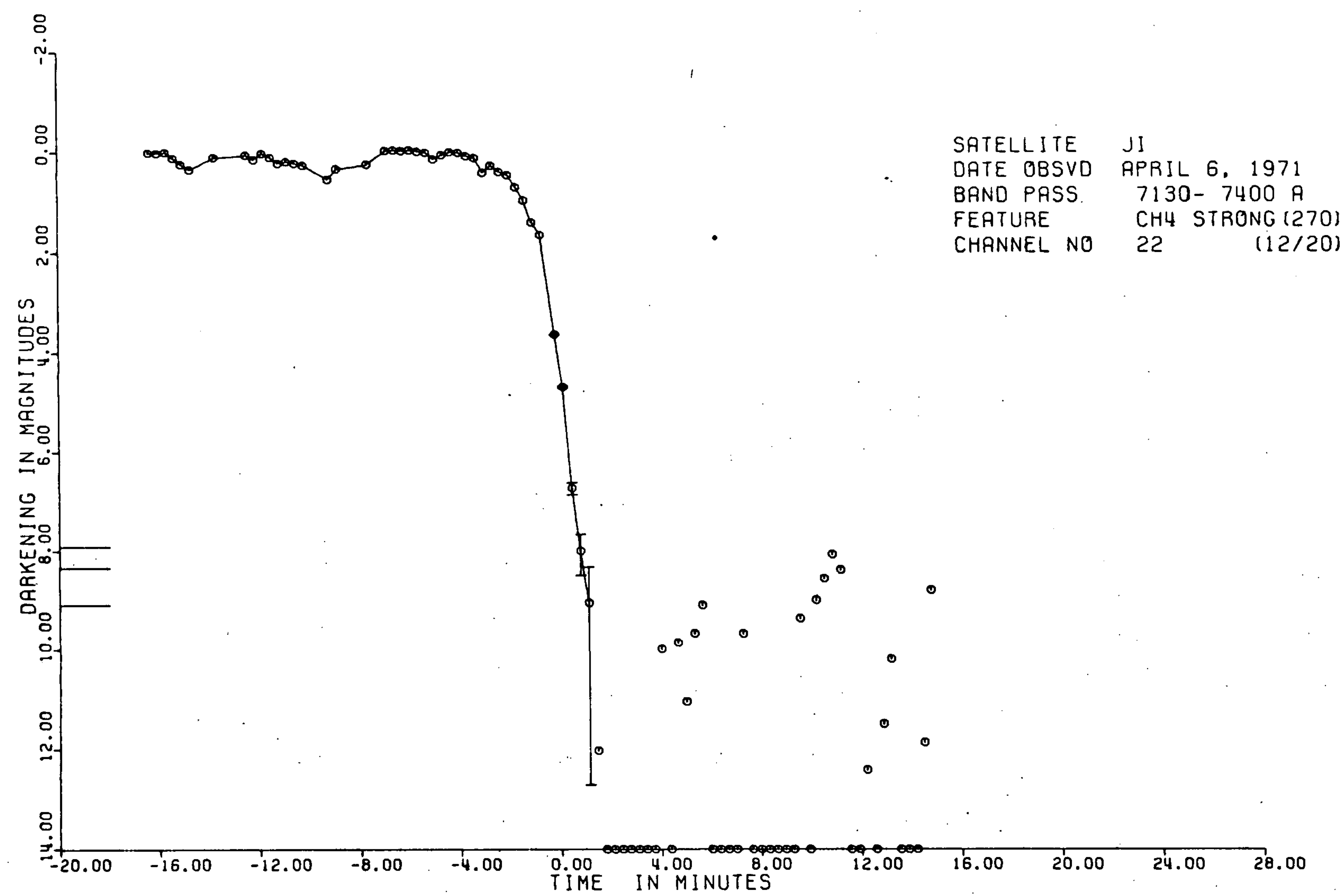

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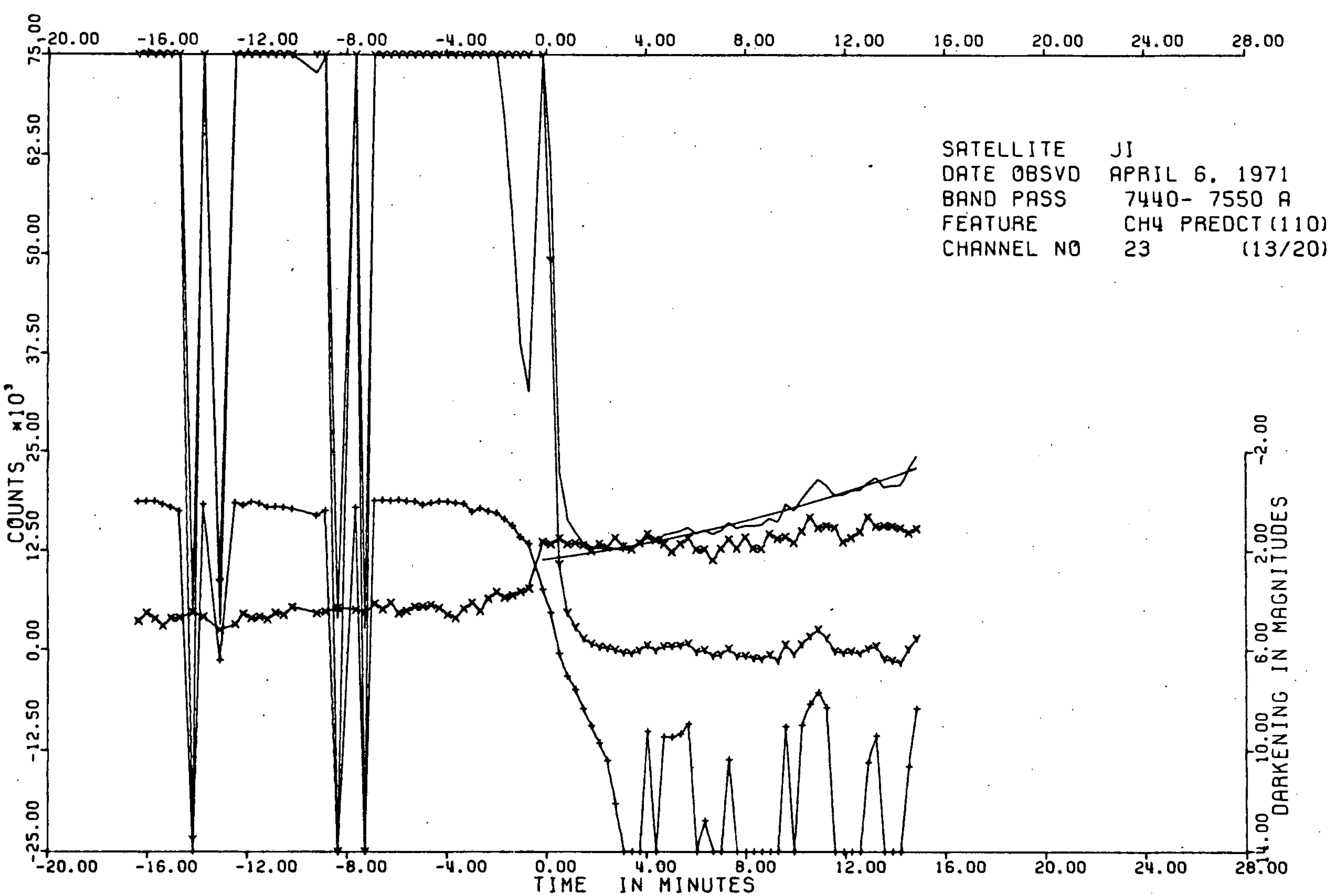

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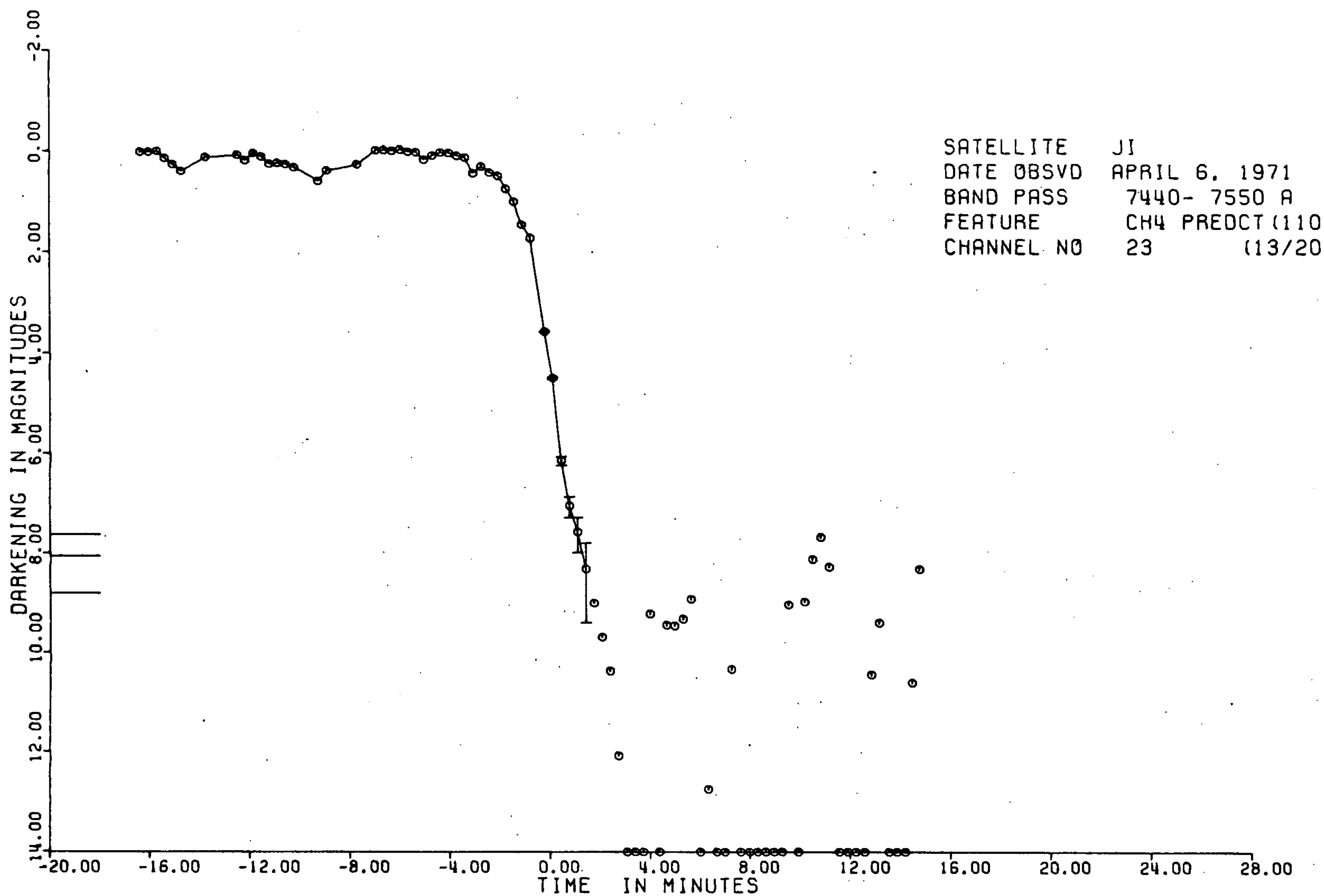

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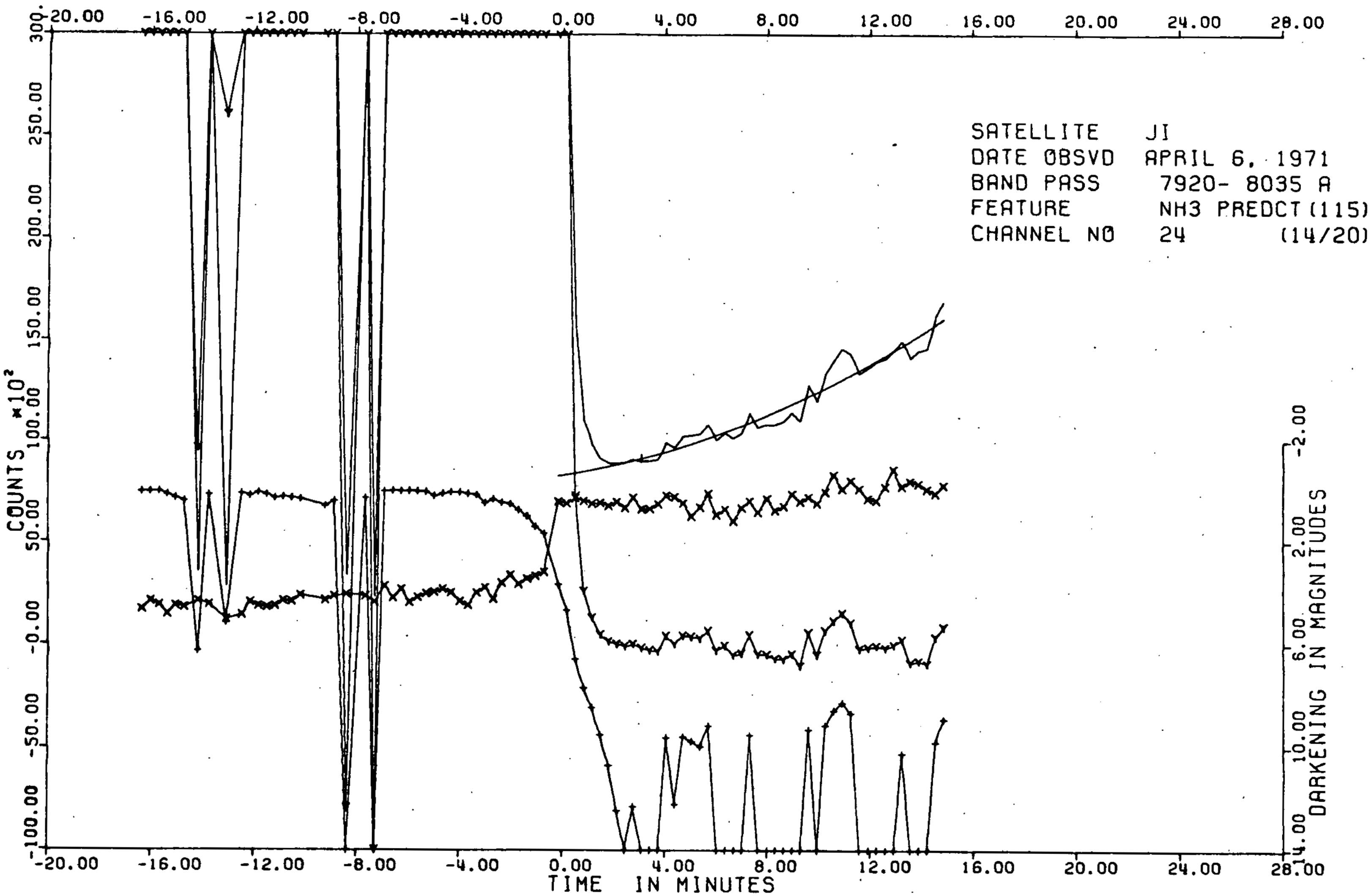

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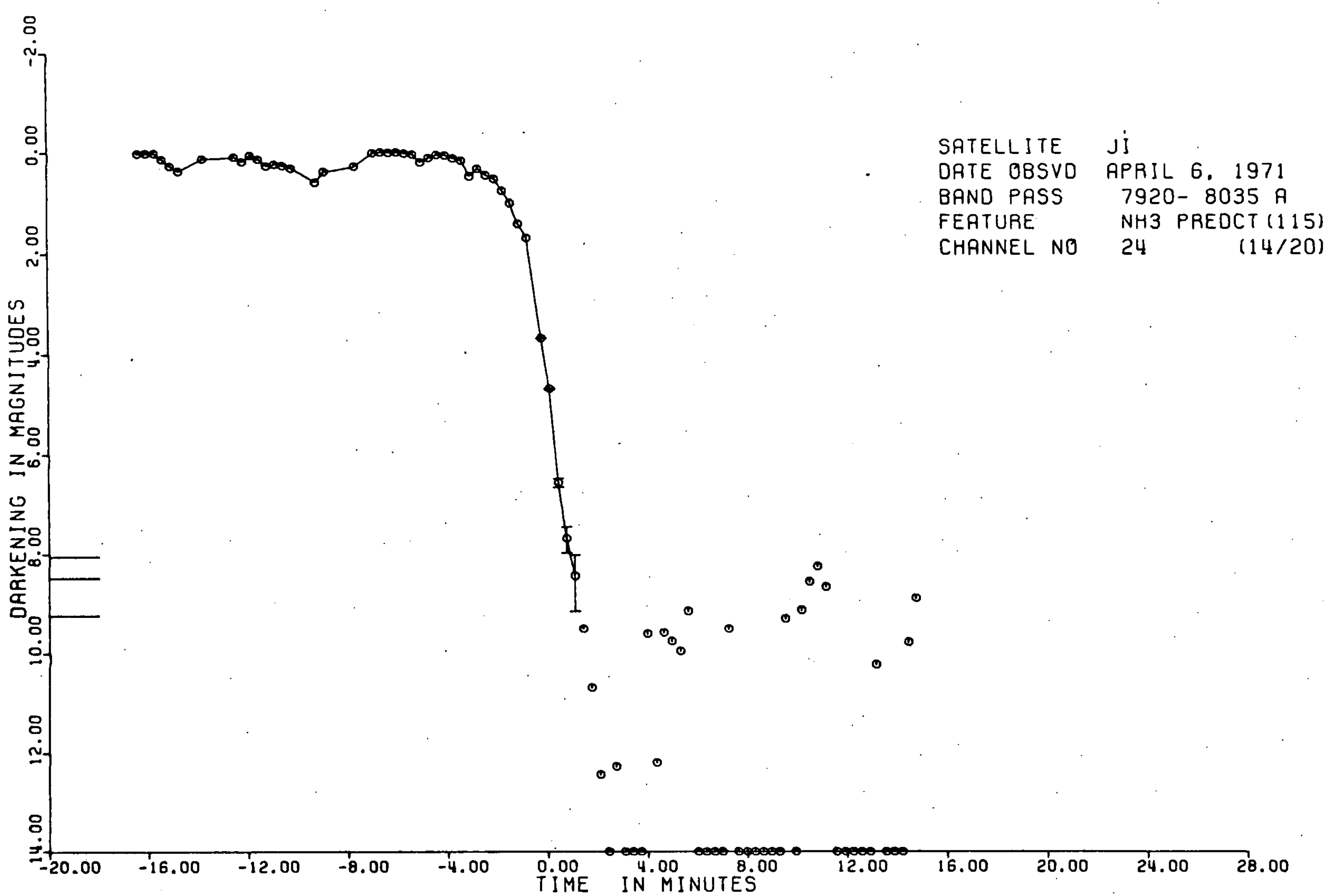

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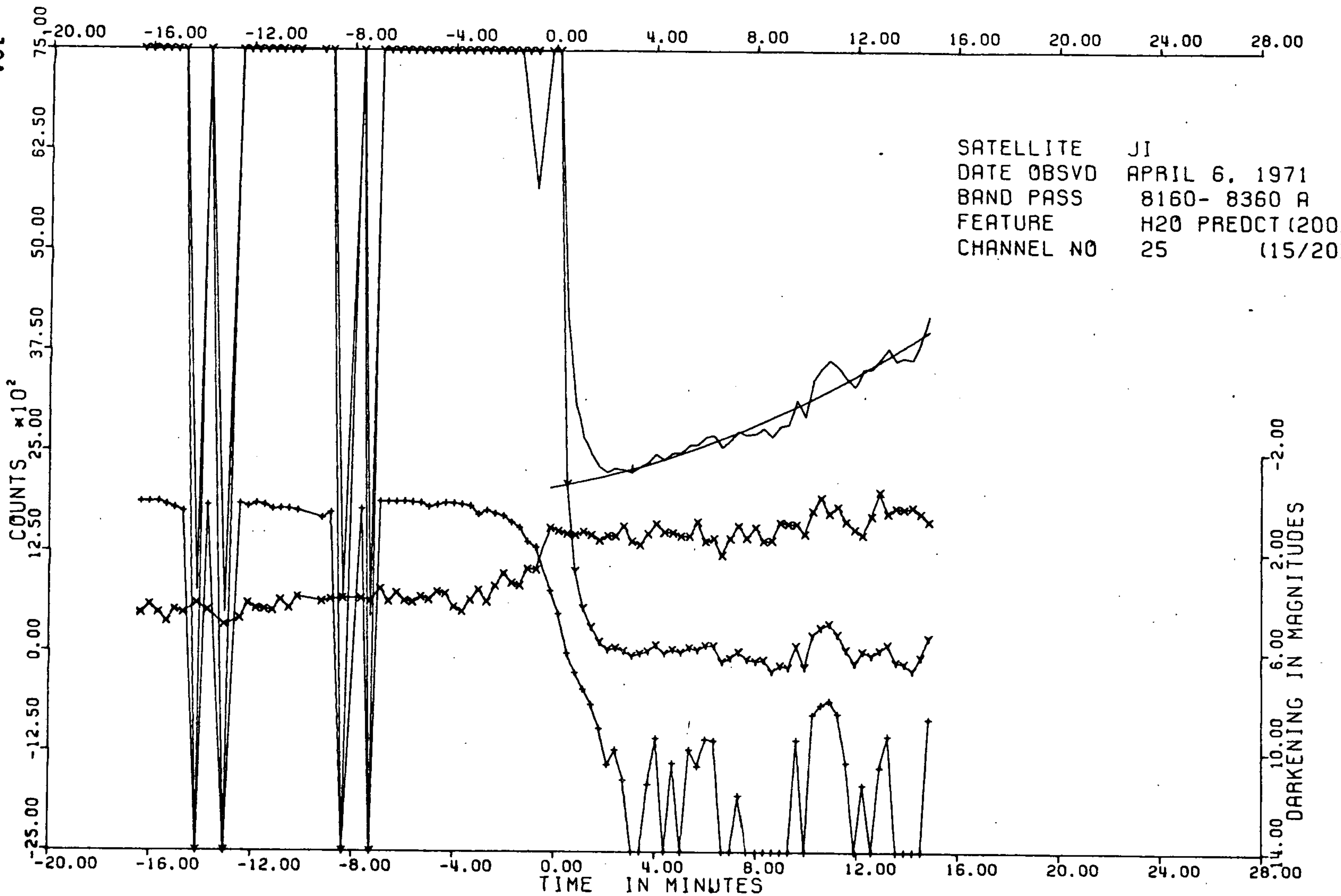

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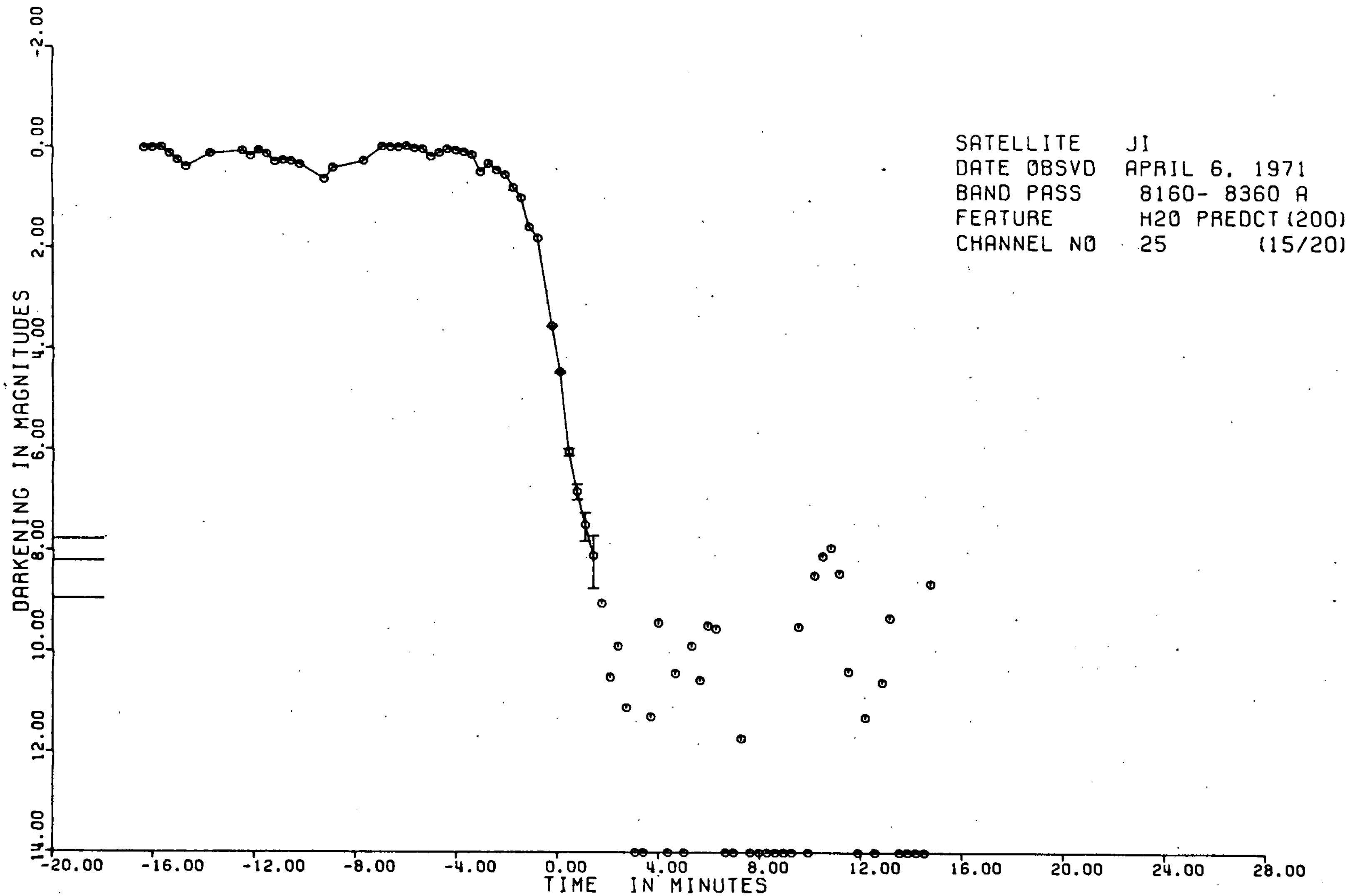

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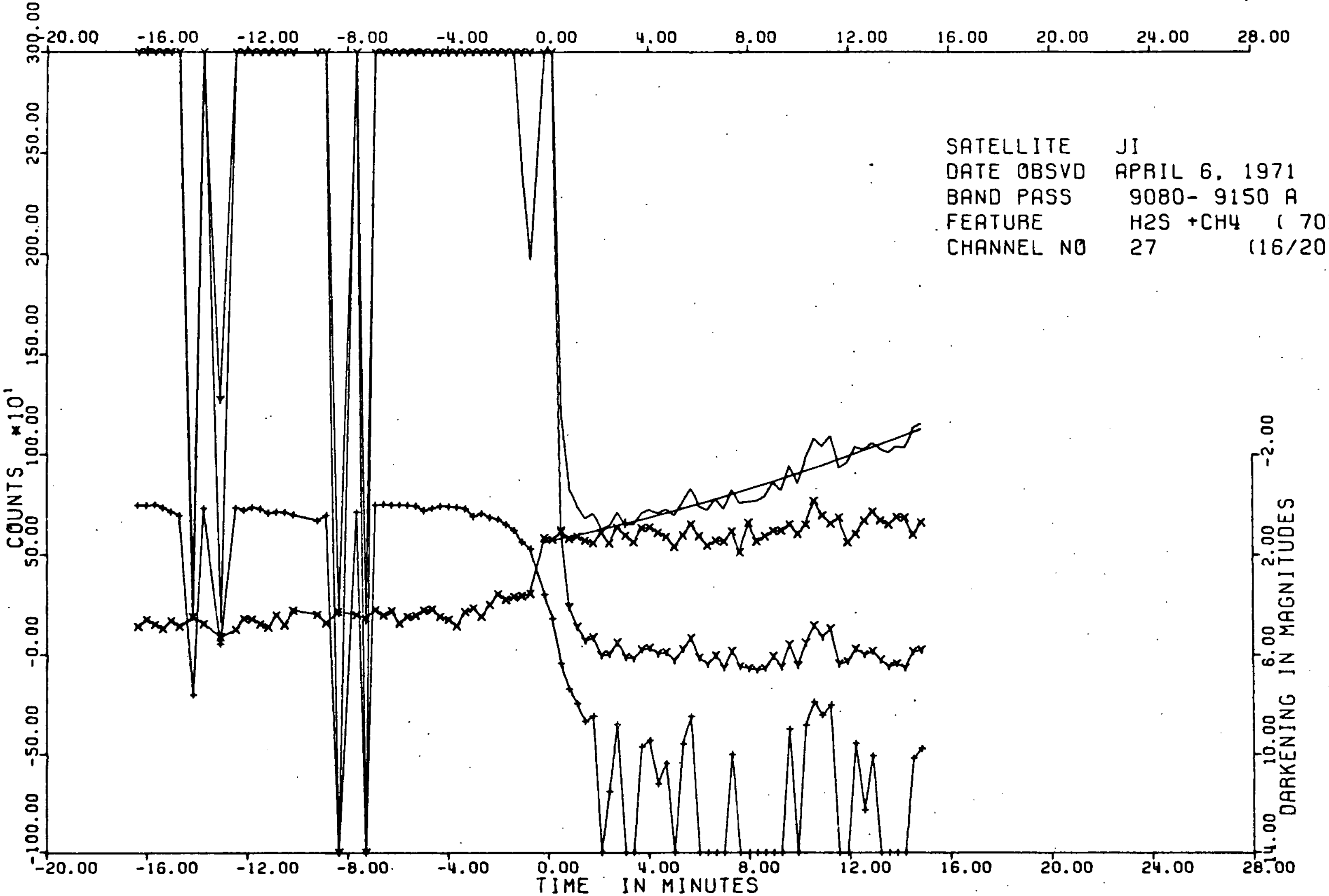

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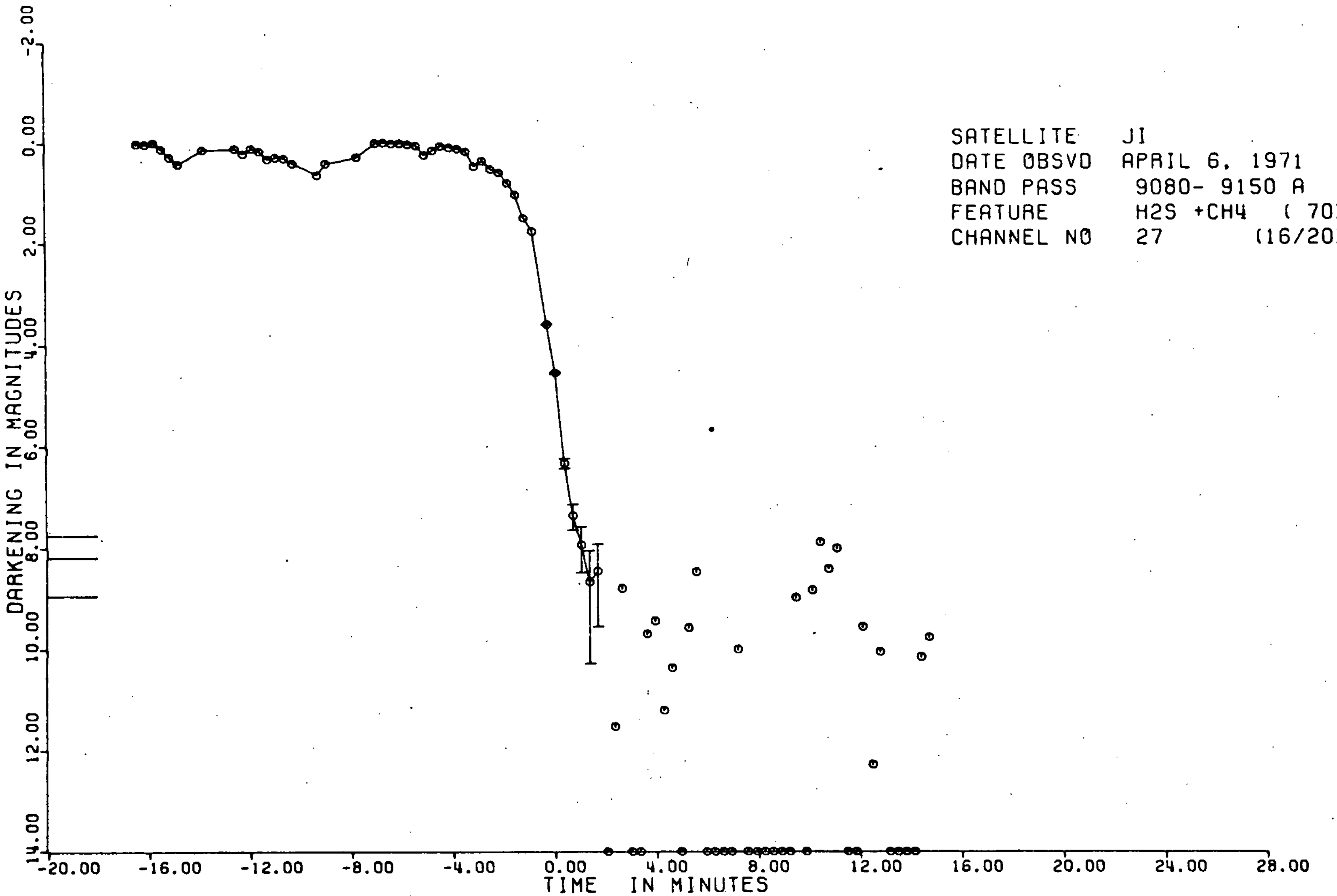

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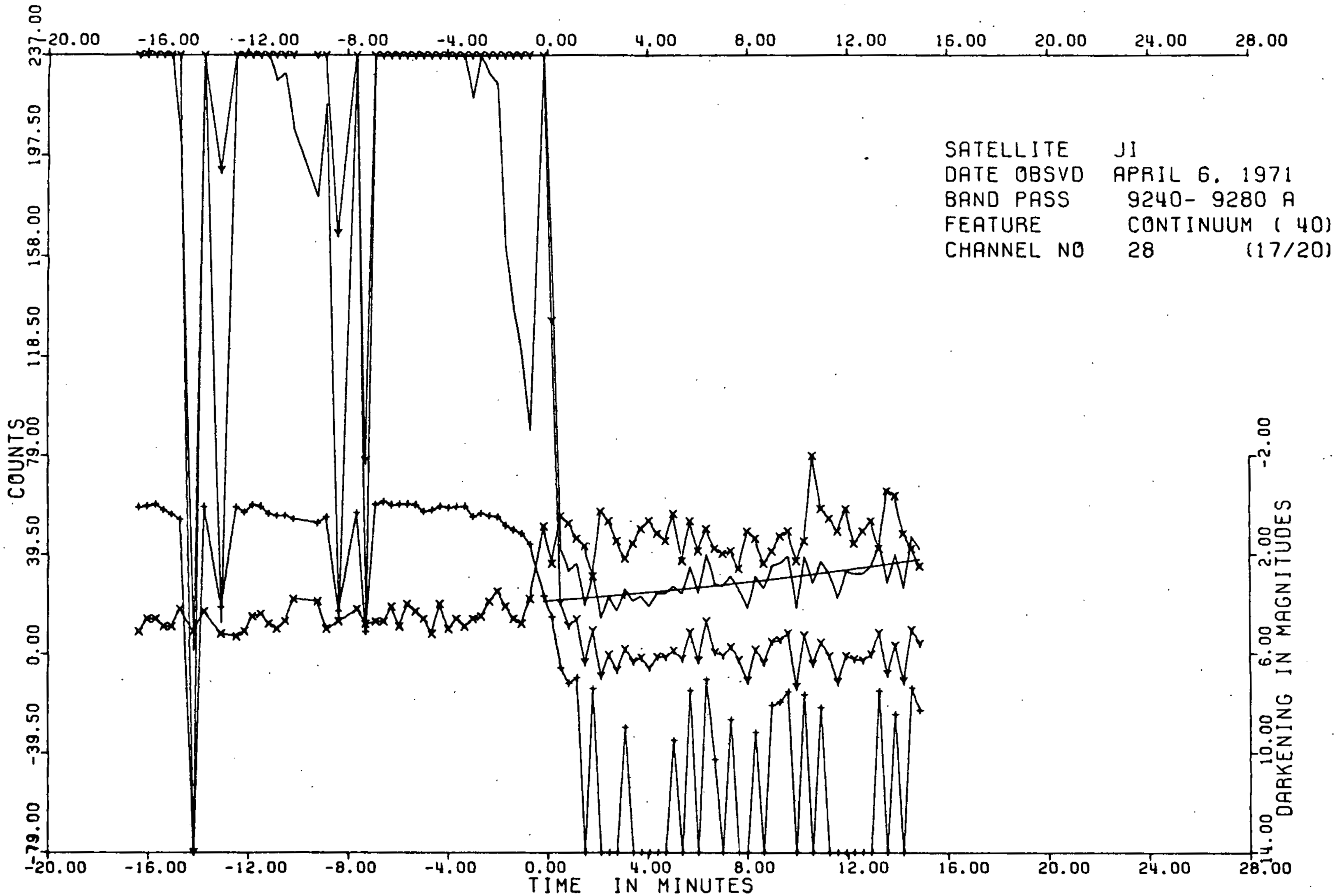

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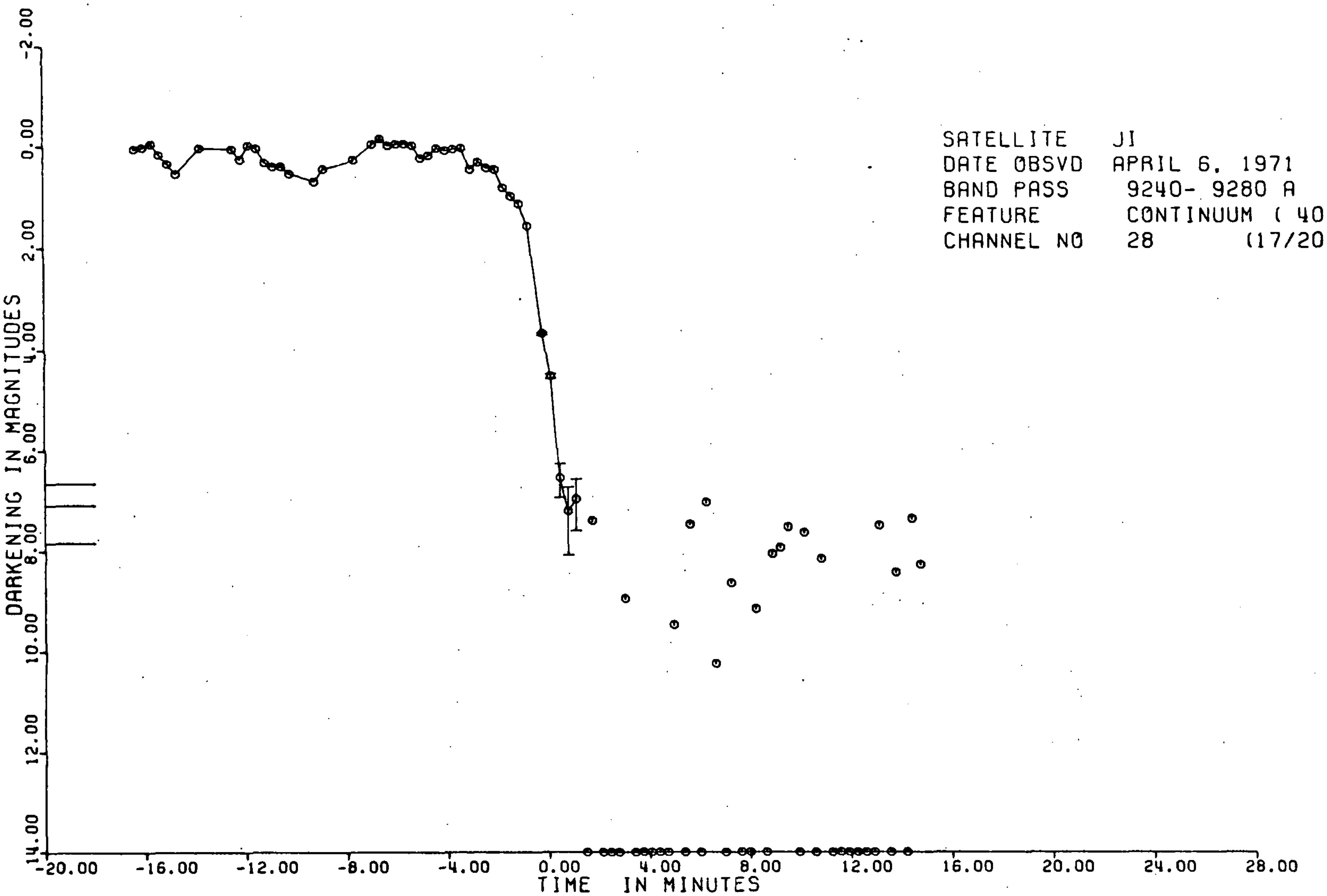

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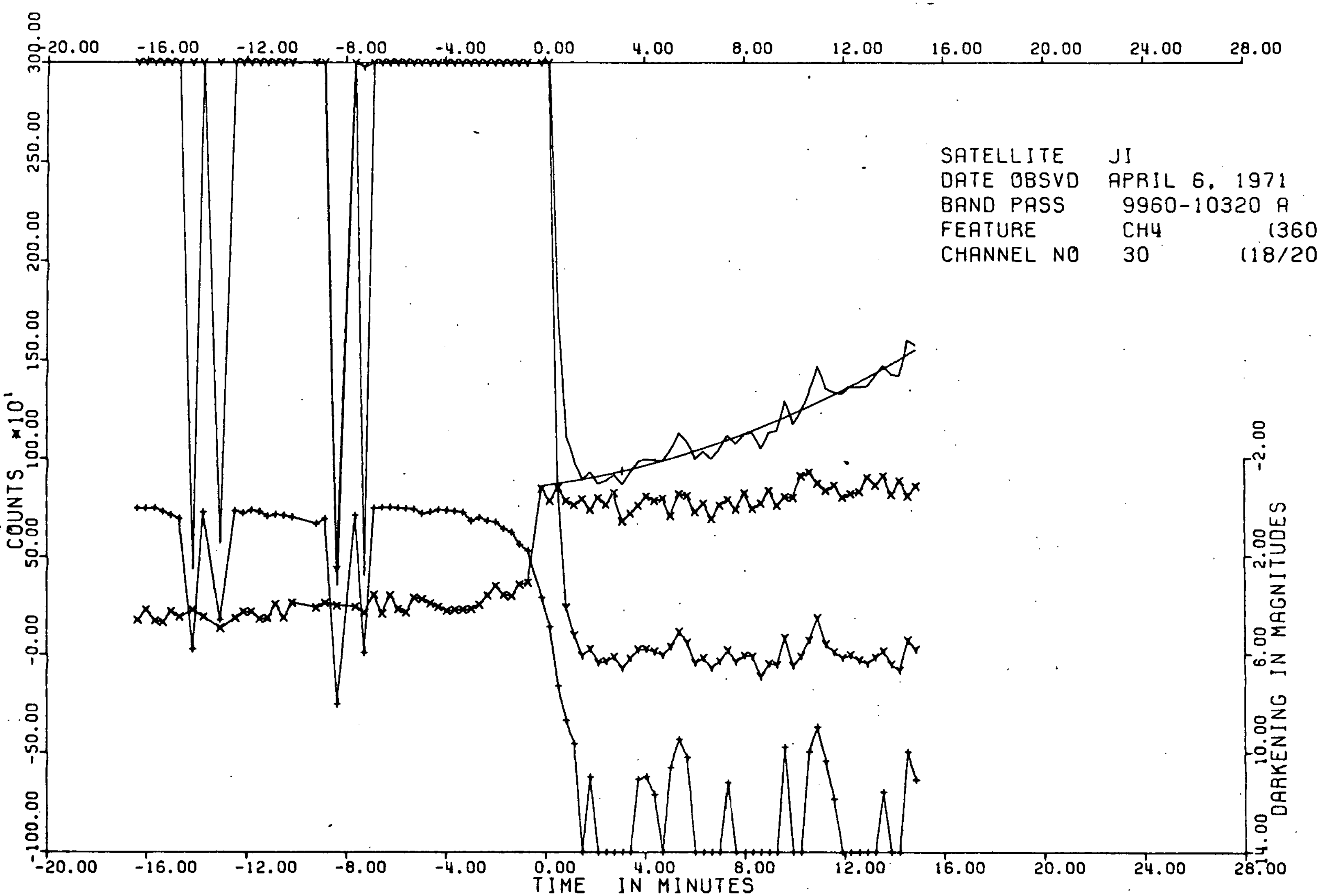

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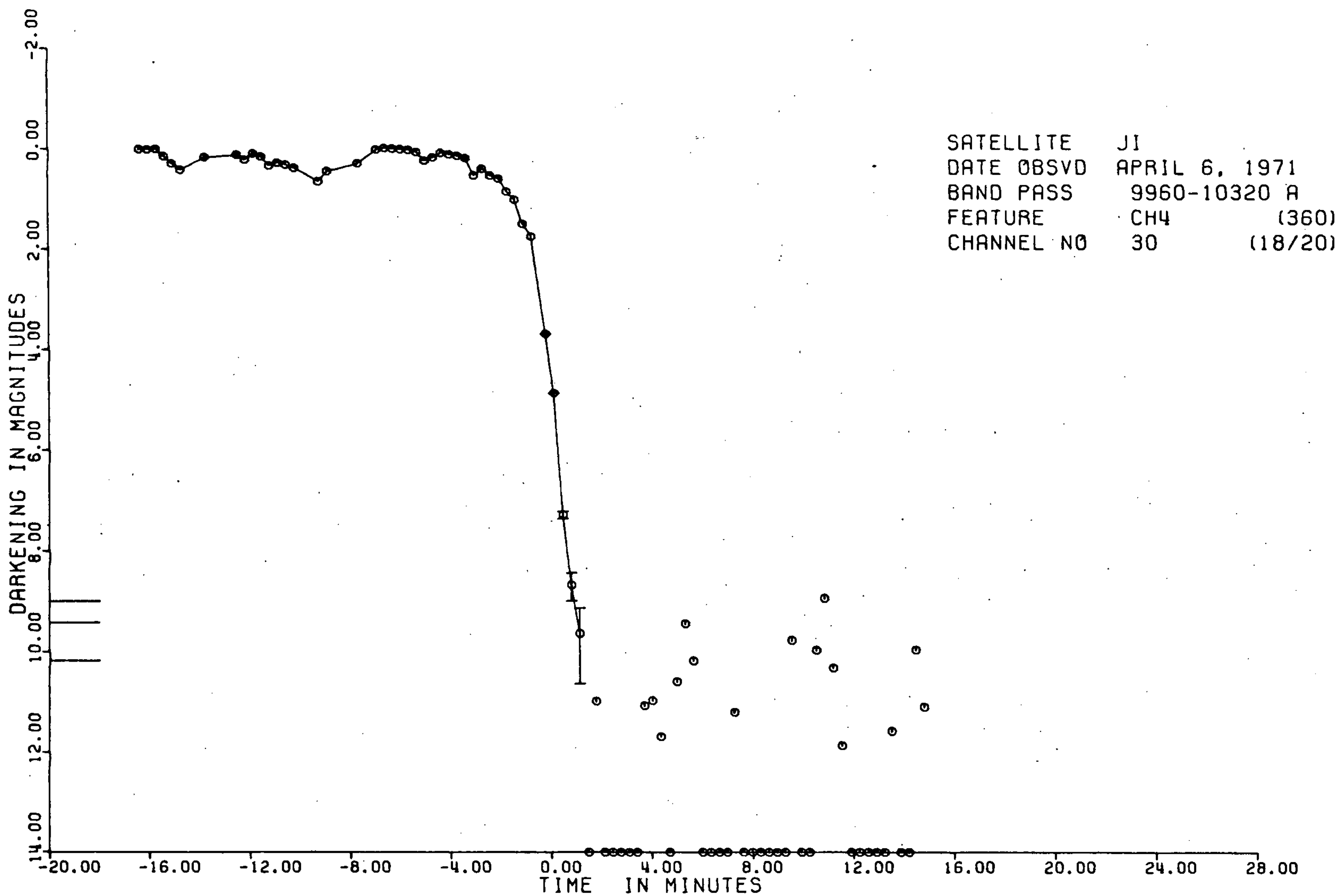

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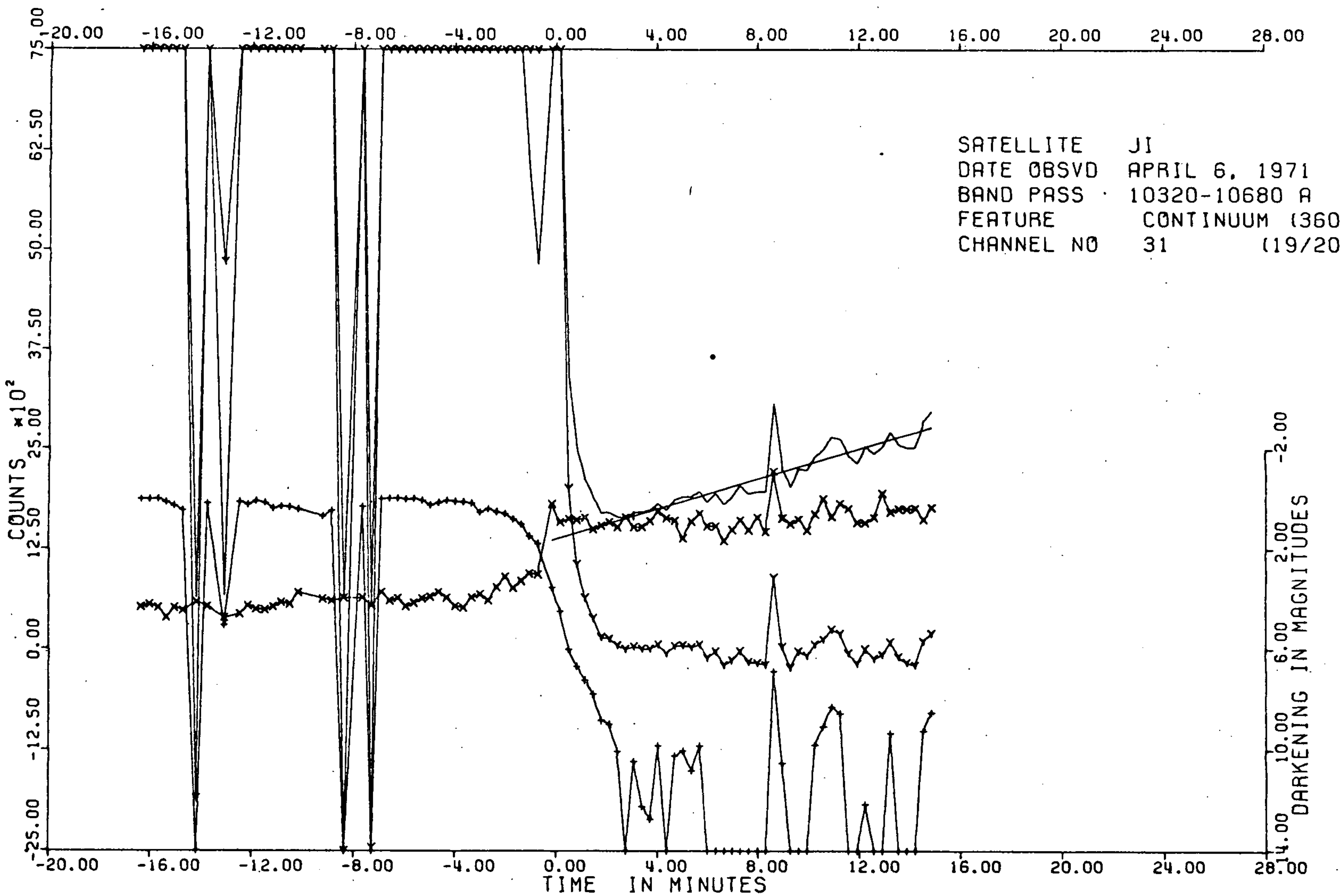

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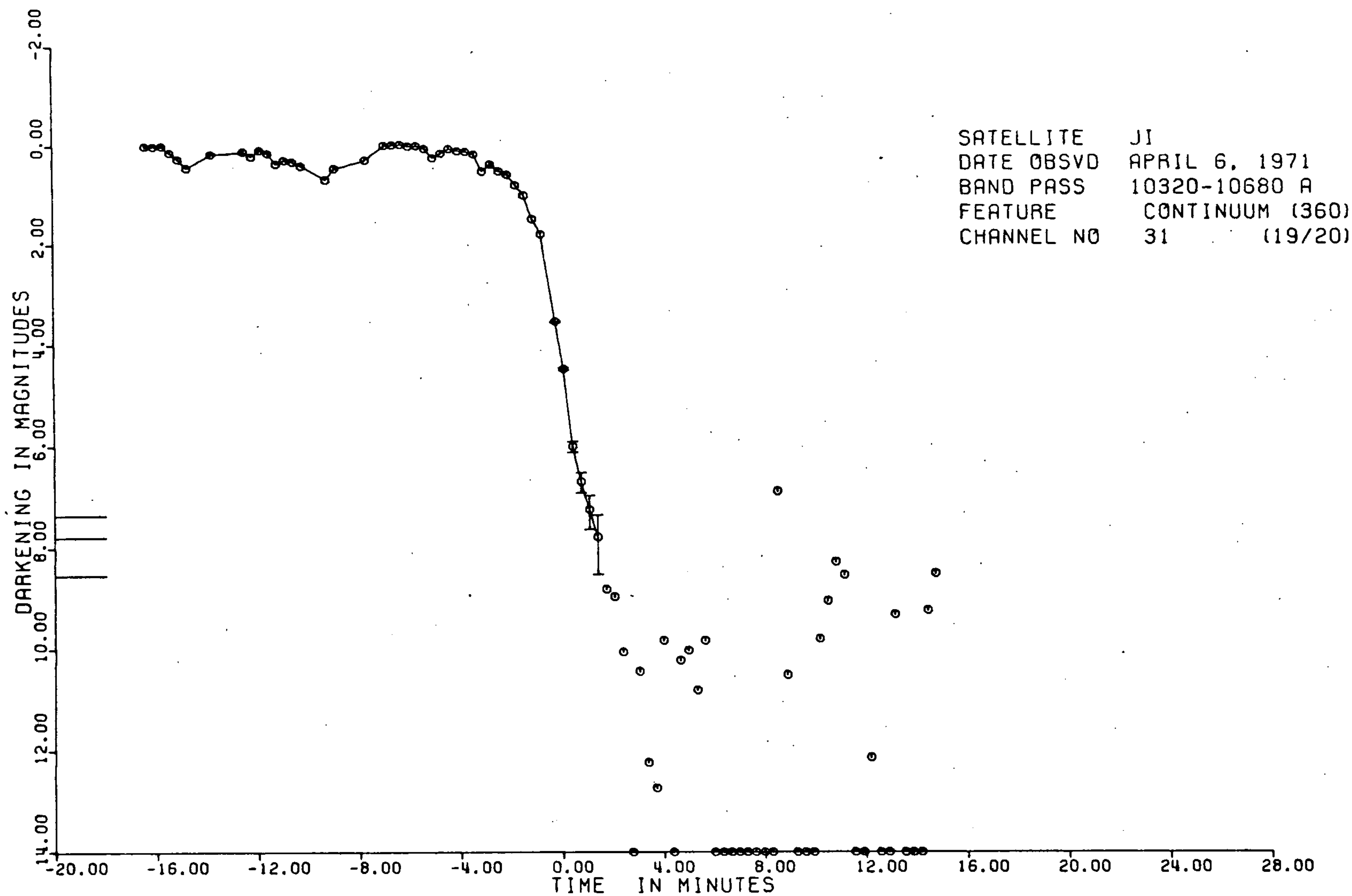

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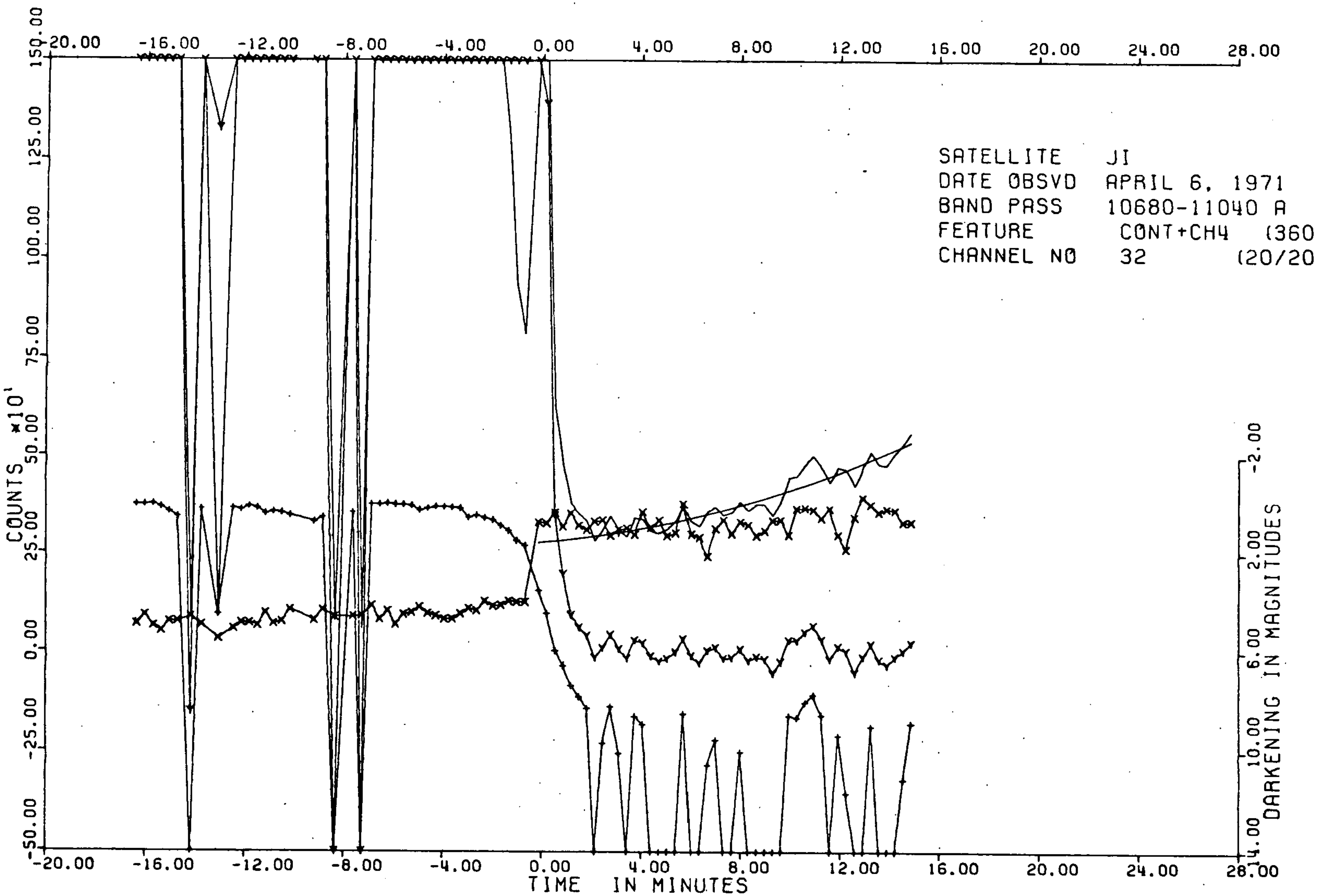

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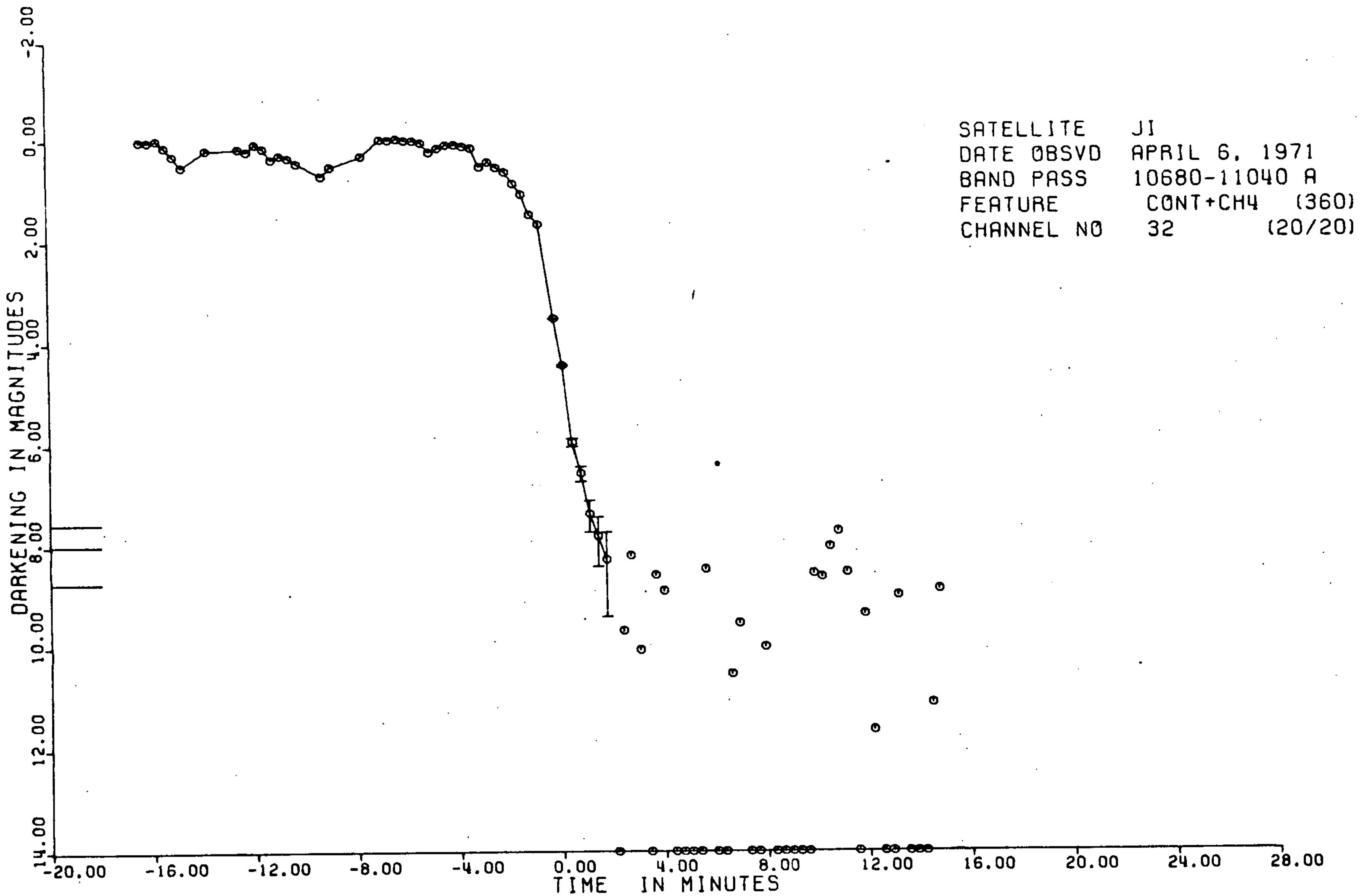

TIME ORIGIN, APRIL 6, 1971 12 HR 2 MIN (U.T.)

P A R T T H R E E

NUMERICAL ECLIPSE DATA, EUROPA, APRIL 6, 1971

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Introduction

Part Three contains a numerical listing of the data for the April 6, 1971 eclipse of Europa. The meaning of the various entries is explained below. The data for this eclipse is presented because it shows beautifully-developed refractive tails. Similar data for the other eclipses are available on a limited basis from the authors.

Explanation of Headings

(1)* TELESCOPE APERTURE RATIO

The ratio of collecting area after/before opening the telescope dust cover to 200-inches. This factor x (UNCORRECTED OBJECT COUNT - UNCORRECTED SKY COUNT x BALANCE FACTOR) yields the CORRECTED OBJECT COUNT prior to the first data point obtained at 200-inch aperture.

(2) ZERO MAGNITUDE

The count number used to determine the zero of the DARKENING IN MAGNITUDES scale. It is the average of the CORRECTED OBJECT COUNT marked in column 3 with a Z.

(3) FIRST DATA POINT ON 200-INCH

Indicates at what point in the subsequent data the telescope was opened to 200-inch aperture.

(4) EPHEMERIS ECLIPSE TIME & TIME ZERO

The date and Universal Time of the eclipse as given in the

American Ephemeris and Nautical Almanac (1971). The time is the zero for the times in the TIME column below.

(5) BALANCE FACTOR

The weighting factor relating the sky contribution in the object aperture and sky aperture. See Part One, Section VI.

(6) DOMAIN DETERMINING BALANCE FACTORS

The region of data analyzed to obtain the BALANCE FACTOR.

(7) OBJECT MINUS SKY UNCERTAINTY DUE TO PHOTON STATISTICS

An estimate of the uncertainty in the data due to the photon statistics of the sky contributions, i.e.,

$$\sqrt{\langle \sigma_o{}^2 \rangle + \langle \sigma_S{}^2 \rangle}$$

Here

$$\sigma_o = \sqrt{C_o} \quad , \quad \sigma_S = \sqrt{C_S} \quad .$$

C_O = average count in the object aperture just after disappearance of the satellite. C_S = average count in the sky aperture at the same TIME. The same region analyzed to obtain the BALANCE FACTOR was analyzed to obtain these averages.

(8) OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT METHOD

The rms deviation of the actual UNCORRECTED OBJECT COUNT from the curve least squares fitted through them in the region bounded by and inclusive of the second and third CURVE FIT POINTS numbers.

This count number is also expressed as a magnitude. Hence any magnitude fainter than this differs from zero counts by less than 1σ. The 2σ and 3σ levels above zero counts are 0.75 and 1.19 magntidues brighter than the 1σ value.

(9) SKY REMOVAL METHOD

Either, CURVE FIT or DUAL APERTURE. See Part One, Section VI. This information applied only to the data obtained after opening the telescope to 200-inches. The dual aperture method, exclusively, was used prior to opening the telescope to 200-inches.

(10) CURVE FIT POINTS

When using the CURVE FIT method of sky removal the sky in the object aperture was approximated by a curve, least-squares-fitted to the UNCORRECTED OBJECT COUNT data bounded by the second and third CURVE FIT POINTS (e.g., in the first data sheet, points 72 to 122). This curve was extrapolated back in time through the first point at 200-inch aperture (e.g., in first data sheet, point 65).

(11) POLYNOMIAL COEFFICIENTS

The constants in the expression SKY BY CURVE FIT = $C_1 + C_2T + C_3T^2$ where T = TIME. If the quadratic curve was found to be concave downward, a physically unrealistic occurrence, a straight line was least squares fitted through the data and no C_3 (SECOND ORDER) shows in the printout.

(12) NUMBER PLOT, 0 MAG (Columns 1, 2, 3)

Column 1 gives the data point number, sequentially. Column 2, P (or blank) means the data was plotted on the DARKENING IN MAGNITUDES versus TIME plots in Part Two. The only points omitted (a blank in column 2) were those corresponding to a spatial scan or those obtained well after disappearance. Column 3, Z (or blank) means the data in column 9 were employed in the averaging to obtain the ZERO MAGNITUDE counts.

(13) TIME (MIN) (Column 4)

Time interval in mean solar minutes relative to the Ephemeris Eclipse Universal Time of disappearance.

(14) DARKENING IN MAGNITUDES (Column 5)

The CORRECTED COUNTS relative to the ZERO MAGNITUDE counts, on a magnitude scale.

(15) UNCORRECTED OBJECT COUNT (Column 6)

The actual count data observed in the object aperture during the 10-sec integration period.

(16) UNCORRECTED SKY COUNT (Column 7)

The actual count data observed in the sky aperture during the 10-sec integration period.

(17) SKY BY CURVE FIT (Column 8)

In those rows containing an entry this represents the estimate of the sky count in the object aperture obtained by the SKY REMOVAL METHOD, CURVE FIT.

(18) CORRECTED OBJECT COUNTS (Column 9)

The final number of counts due to the Galilean Satellite with the telescope aperture ratio change and background sky corrected out.

(19) CORRECTION FACTOR (Column 10)

The correction factor used in determining the BALANCE FACTOR. See Part One, Section VI.

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* Refer to first data sheet for clarification of definitions of keyed (i.e., (1), (2),....) entries.

(1 A)

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 3320- 3480 A
FEATURE CONTINUUM (160)
CHANNEL NO 3 (1/20)

(1) TELESCOPE APERTURE RATIO = 35.00
(2) ZERO MAGNITUDE = 83641.3 COUNTS
(3) FIRST DATA POINT ON 200-INCH = 65
(4) EPHEMERIS ECLIPSE TIME & TIME ZERO, APRIL 6, 10 HR 22 MIN (UT)

(5) BALANCE FACTOR = 0.90346
(6) DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
(7) OBJECT MINUS SKY UNCERTAINTY DUE TO PHOTON STATISTICS = 71. COUNTS
(8) OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT METHOD = 61. COUNTS = 7.8 MAGNITUDES

(9) SKY REMOVAL METHOD, CURVE FIT
(10) CURVE FIT POINTS= 65, 72,122
(11) POLYNOMIAL COEFFICIENTS =

2.16884E 03	1.56761E 01	7.47751E-01
CONSTANT	FIRST ORDER	SECOND ORDER

(12) NUMBER PLOT, 0 MAG	(13) TIME (MIN)	(14) DARKENING IN MAGNITUDES	(15) UNCORRECTED OBJECT COUNT	(16) UNCORRECTED SKY COUNT	(17) SKY BY CURVE FIT	(18) CORRECTED OBJECT COUNTS	(19) CORRECTION FACTOR
1 P Z	-21.808	-0.11	3099.	505.		92496.	
2 P Z	-21.483	-0.41	3818.	374.		121804.	
3	-20.888	14.00	244.	582.		-9864.	
4 P Z	-20.406	0.22	2335.	421.		68412.	
5	-19.952	14.00	170.	373.		-5845.	
6 P Z	-19.457	0.01	2779.	464.		82593.	
7 P Z	-19.134	0.10	2519.	384.		76022.	
8 P Z	-18.812	0.40	2077.	470.		57833.	
9 P Z	-18.491	0.33	2281.	565.		61969.	
10 P Z	-18.172	0.16	2587.	579.		72236.	
11 P Z	-17.848	-0.19	3256.	452.		99667.	
12 P Z	-17.527	0.13	2617.	548.		74267.	
13	-16.963	14.00	323.	762.		-12790.	
14 P	-16.401	0.45	2046.	524.		55040.	
15	-15.968	14.00	187.	445.		-7526.	
16 P Z	-15.567	-0.05	3101.	655.		87823.	
17 P Z	-15.248	-0.12	3175.	561.		93385.	
18 P Z	-14.922	0.09	2776.	628.		77302.	
19 P Z	-14.603	0.03	2807.	536.		81296.	
20 P Z	-14.277	0.09	2600.	432.		77340.	
21 P Z	-13.958	-0.03	2939.	527.		86201.	
22 P Z	-13.627	-0.17	3285.	550.		97583.	
23 P Z	-13.285	-0.38	3912.	561.		119180.	
24 P Z	-12.951	0.06	2783.	579.		79096.	
25 P Z	-12.618	0.25	2400.	559.		66324.	
26	-12.175	14.00	380.	707.		-9056.	
27 P	-11.771	-0.29	3640.	574.		109249.	
28	-11.360	14.00	207.	433.		-6447.	
29 P	-10.951	-0.03	3024.	638.		85666.	
30 P	-10.627	0.08	2844.	684.		77911.	
31 P	-10.306	-0.22	3392.	525.		102119.	
32 P	-9.986	-0.15	3146.	452.		95817.	
33 P	-9.661	0.16	2512.	488.		72489.	
34 P	-9.341	-0.07	3043.	557.		88892.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 3320- 3480 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.07	2793.	622.		78087.	
36 P	-8.696	0.09	2601.	436.		77248.	
37 P	-8.368	-0.30	3681.	593.		110084.	
38 P	-8.021	-0.26	3630.	654.		106370.	
39	-7.654	14.00	519.	808.		-7385.	
40 P	-7.295	-0.19	3324.	541.		99233.	
41	-6.944	14.00	202.	405.		-5737.	
42 P	-6.519	-0.16	3278.	559.		97054.	
43 P	-6.199	-0.34	3672.	448.		114354.	
44 P	-5.880	-0.24	3480.	567.		103871.	
45 P	-5.559	-0.33	3739.	551.		113442.	
46 P	-5.240	-0.38	4079.	749.		119081.	
47 P	-4.918	-0.21	3456.	629.		101070.	
48 P	-4.592	-0.10	3139.	561.		92125.	
49 P	-4.260	-0.39	3919.	552.		119710.	
50 P	-3.939	-0.33	3786.	592.		113790.	
51 P	-3.618	-0.30	3650.	568.		109789.	
52 P	-3.297	-0.34	3789.	567.		114686.	
53 P	-2.973	-0.35	3809.	558.		115670.	
54 P	-2.646	-0.18	3311.	530.		99126.	
55 P	-2.325	-0.17	3338.	590.		98173.	
56 P	-2.002	0.01	2962.	652.		83053.	
57 P	-1.683	0.03	2800.	532.		81177.	
58 P	-1.363	0.26	2288.	448.		65914.	
59 P	-1.040	0.64	1847.	583.		46210.	
60 P	-0.718	1.05	1358.	498.		31783.	
61 P	-0.397	0.98	1424.	503.		33935.	
62 P	-0.076	1.72	1109.	687.		17091.	
63 P	0.250	2.69	748.	605.		7049.	
64 P	0.569	14.00	533.	667.		-2436.	
65 P	1.212	6.41	2417.	2394.	2188.9	228.	
66 P	1.533	14.00	2181.	2379.	2194.6	-14.	
67 P	1.857	14.00	2106.	2302.	2200.5	-95.	
68 P	2.179	14.00	2097.	2443.	2206.6	-110.	
69 P	2.502	14.00	2043.	2325.	2212.7	-170.	
70 P	2.824	14.00	2168.	2206.	2219.1	-51.	
71 P	3.147	14.00	2162.	2264.	2225.6	-64.	
72 P	3.469	14.00	2210.	2356.	2232.2	-22.	
73 P	3.793	9.61	2251.	2464.	2239.1	12.	
74 P	4.114	14.00	2174.	2411.	2246.0	-72.	
75 P	4.437	7.56	2332.	2399.	2253.1	79.	
76 P	4.764	14.00	2178.	2435.	2260.5	-82.	
77 P	5.086	8.10	2316.	2485.	2267.9	48.	
78 P	5.409	9.56	2288.	2512.	2275.5	12.	
79 P	5.733	7.24	2390.	2499.	2283.3	107.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 3320- 3480 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	9.07	2311.	2617.	2291.3	20.	0.937233
81 P	6.381	10.25	2306.	2364.	2299.3	7.	1.019332
82 P	6.702	14.00	2250.	2509.	2307.5	-57.	1.035761
83 P	7.028	14.00	2314.	2497.	2315.9	-2.	1.065564
84 P	7.364	9.59	2337.	2532.	2324.8	12.	0.994524
85 P	7.683	7.54	2414.	2622.	2333.4	81.	0.974208
86 P	8.020	14.00	2342.	2612.	2342.7	-1.	0.999707
87 P	8.344	14.00	2326.	2552.	2351.7	-26.	1.084400
88 P	8.668	14.00	2324.	2604.	2360.9	-37.	1.042114
89 P	8.991	14.00	2356.	2586.	2370.2	-14.	1.015523
90 P	9.315	8.22	2423.	2733.	2379.7	43.	0.996534
91 P	9.637	14.00	2289.	2520.	2389.4	-100.	1.075159
92 P	9.963	14.00	2365.	2444.	2399.3	-34.	1.098599
93 P	10.286	14.00	2406.	2509.	2409.2	-3.	1.028554
94 P	10.606	9.18	2437.	2697.	2419.2	18.	1.048194
95 P	10.929	14.00	2340.	2764.	2429.5	-89.	1.011329
96 P	11.254	10.55	2445.	2833.	2440.0	5.	0.925800
97 P	11.579	14.00	2392.	2719.	2450.6	-59.	0.945601
98 P	11.913	14.00	2361.	2736.	2461.7	-101.	0.984208
99 P	12.245	9.22	2490.	2707.	2472.9	17.	0.961412
100 P	12.568	7.13	2602.	2719.	2484.0	118.	0.967106
101 P	12.890	7.16	2610.	2681.	2495.2	115.	1.052082
102 P	13.216	14.00	2465.	2920.	2506.6	-42.	0.971486
103 P	13.537	7.56	2597.	2995.	2518.1	79.	0.923142
104 P	13.859	14.00	2443.	2915.	2529.7	-87.	0.952737
105 P	14.180	14.00	2474.	2764.	2541.5	-67.	0.989722
106 P	14.504	10.68	2558.	3015.	2553.5	4.	0.943021
107 P	14.825	7.50	2649.	3003.	2565.6	83.	0.936075
108 P	15.154	8.11	2626.	2875.	2578.1	48.	1.028826
109 P	15.498	14.00	2577.	2995.	2591.4	-14.	
110 P	15.822	14.00	2563.	2990.	2604.1	-41.	
111 P	16.145	14.00	2569.	2824.	2616.8	-48.	
112 P	16.472	7.32	2729.	2844.	2629.9	99.	
113 P	16.811	7.69	2714.	3058.	2643.7	70.	
114 P	17.145	7.29	2759.	3209.	2657.4	102.	
115 P	17.469	14.00	2623.	3026.	2670.9	-48.	
116 P	17.802	14.00	2685.	3043.	2684.9	0.	
117 P	18.126	9.77	2709.	3098.	2698.7	10.	
118 P	18.455	14.00	2595.	3016.	2712.8	-118.	
119 P	18.776	14.00	2692.	2943.	2726.8	-35.	
120 P	19.101	9.06	2761.	3143.	2741.1	20.	
121 P	19.437	14.00	2751.	3106.	2756.0	-5.	
122 P	19.758	14.00	2766.	3119.	2770.5	-4.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 3640- 3800 A
FEATURE CONTINUUM (160)
CHANNEL NO 5 (2/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE = 474748.5 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.84444
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 120. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 146. COUNTS = 8.8 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 72,122
POLYNOMIAL COEFFICIENTS =
5.63646E 03, 8.91606E 01, 3.70355E-01
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.17	17249.	1717.		552968.	
2 P Z	-21.483	-0.31	19145.	1382.		629229.	
3	-20.888	14.00	718.	1846.		-29429.	
4 P Z	-20.406	0.21	12333.	1392.		390514.	
5	-19.952	14.00	552.	1290.		-18807.	
6 P Z	-19.457	0.03	14458.	1521.		461076.	
7 P Z	-19.134	0.05	13906.	1186.		451657.	
8 P Z	-18.812	0.27	11964.	1591.		371717.	
9 P Z	-18.491	0.20	12991.	1998.		395633.	
10 P Z	-18.172	0.11	13883.	1987.		427178.	
11 P Z	-17.848	-0.14	16714.	1555.		539031.	
12 P Z	-17.527	0.08	14089.	1707.		442664.	
13	-16.963	14.00	1093.	2526.		-36402.	
14 P	-16.401	0.38	11062.	1791.		334236.	
15	-15.968	14.00	555.	1491.		-24642.	
16 P Z	-15.567	-0.06	16149.	2170.		501080.	
17 P Z	-15.248	-0.03	15571.	1933.		487854.	
18 P Z	-14.922	0.07	14512.	2181.		443459.	
19 P Z	-14.603	-0.02	15241.	1652.		484609.	
20 P Z	-14.277	0.00	14615.	1260.		474285.	
21 P Z	-13.958	0.02	14862.	1793.		467177.	
22 P Z	-13.627	-0.14	17125.	1940.		542037.	
23 P Z	-13.285	-0.22	18300.	2023.		580709.	
24 P Z	-12.951	0.04	14637.	1807.		458888.	
25 P Z	-12.618	0.20	12839.	1900.		393209.	
26	-12.175	14.00	1242.	2302.		-24567.	
27 P	-11.771	-0.19	17863.	2105.		562991.	
28	-11.360	14.00	723.	1403.		-16161.	
29 P	-10.951	0.02	14941.	1977.		464504.	
30 P	-10.627	0.09	14400.	2292.		436259.	
31 P	-10.306	-0.08	16180.	1912.		509790.	
32 P	-9.986	-0.08	15886.	1517.		511174.	
33 P	-9.661	0.09	13889.	1680.		436462.	
34 P	-9.341	-0.08	16241.	1966.		510329.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 3640- 3800 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.08	14455.	2155.		442233.	
36 P	-8.696	0.08	13839.	1520.		439441.	
37 P	-8.368	-0.22	18338.	1983.		583221.	
38 P	-8.021	-0.21	18452.	2300.		577842.	
39	-7.654	14.00	1662.	2708.		-21866.	
40 P	-7.295	-0.10	16504.	2006.		518352.	
41	-6.944	14.00	615.	1418.		-20385.	
42 P	-6.519	-0.11	16620.	1873.		526342.	
43 P	-6.199	-0.26	18422.	1420.		602801.	
44 P	-5.880	-0.20	17879.	1844.		571265.	
45 P	-5.559	-0.21	18065.	1836.		578011.	
46 P	-5.240	-0.24	19097.	2546.		593147.	
47 P	-4.918	-0.11	16948.	2256.		526503.	
48 P	-4.592	-0.14	16955.	1879.		537890.	
49 P	-4.260	-0.25	18715.	2018.		595382.	
50 P	-3.939	-0.25	18959.	2199.		598572.	
51 P	-3.618	-0.22	18421.	2097.		582757.	
52 P	-3.297	-0.27	18923.	1891.		606415.	
53 P	-2.973	-0.21	18148.	1994.		576246.	
54 P	-2.646	-0.13	16732.	1653.		536765.	
55 P	-2.325	-0.10	16441.	1932.		518334.	
56 P	-2.002	0.07	14541.	2226.		443144.	
57 P	-1.683	0.16	13375.	1926.		411201.	
58 P	-1.363	0.32	11281.	1442.		352216.	
59 P	-1.040	0.69	8804.	1951.		250477.	
60 P	-0.718	1.03	6701.	1719.		183729.	
61 P	-0.397	1.02	6693.	1672.		184838.	
62 P	-0.076	1.66	4875.	2298.		102706.	
63 P	0.250	2.23	3467.	2055.		60608.	
64 P	0.569	3.86	2305.	2269.		13614.	
65 P	1.212	5.54	8634.	6721.	5745.1	2889.	
66 P	1.533	7.02	6511.	6918.	5774.0	737.	
67 P	1.857	8.51	5991.	6814.	5803.3	188.	
68 P	2.179	14.00	5711.	7049.	5832.5	-122.	
69 P	2.502	14.00	5527.	6818.	5861.8	-335.	
70 P	2.824	14.00	5860.	6533.	5891.3	-31.	
71 P	3.147	10.21	5960.	6768.	5920.7	39.	
72 P	3.469	8.54	6132.	7225.	5950.2	182.	
73 P	3.793	14.00	5951.	7076.	5980.0	-29.	
74 P	4.114	14.00	5880.	6840.	6009.5	-130.	
75 P	4.437	8.80	6183.	6835.	6039.3	144.	
76 P	4.764	14.00	5914.	6965.	6069.6	-156.	
77 P	5.086	9.63	6166.	7355.	6099.6	66.	
78 P	5.409	9.43	6210.	7299.	6129.6	80.	
79 P	5.733	14.00	6061.	7241.	6159.8	-99.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 3640- 3800 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	11.86	6199.	7488.	6190.4	9.	0.937233
81 P	6.381	8.82	6361.	7431.	6220.5	140.	1.019332
82 P	6.702	14.00	6218.	7180.	6250.6	-33.	1.035761
83 P	7.028	14.00	6201.	7035.	6281.3	-80.	1.065564
84 P	7.364	9.53	6386.	7551.	6313.1	73.	0.994524
85 P	7.683	9.21	6442.	7616.	6343.3	99.	0.974208
86 P	8.020	14.00	6344.	7345.	6375.4	-31.	0.999707
87 P	8.344	14.00	6322.	7048.	6406.2	-84.	1.084400
88 P	8.668	14.00	6199.	7384.	6437.2	-238.	1.042114
89 P	8.991	14.00	6411.	7298.	6468.0	-57.	1.015523
90 P	9.315	8.63	6667.	7906.	6499.1	168.	0.996534
91 P	9.637	14.00	6371.	7264.	6530.1	-159.	1.075159
92 P	9.963	14.00	6268.	7120.	6561.5	-294.	1.098599
93 P	10.286	14.00	6422.	7714.	6592.7	-171.	1.028554
94 P	10.606	9.02	6741.	7748.	6623.8	117.	1.048194
95 P	10.929	8.64	6822.	7931.	6655.1	167.	1.011329
96 P	11.254	9.86	6741.	8216.	6686.8	54.	0.925800
97 P	11.579	14.00	6689.	8165.	6718.5	-29.	0.945601
98 P	11.913	11.42	6764.	8021.	6751.2	13.	0.984208
99 P	12.245	14.00	6634.	8151.	6783.8	-150.	0.961412
100 P	12.568	14.00	6745.	8228.	6815.5	-70.	0.967106
101 P	12.890	8.39	7057.	8244.	6847.3	210.	1.052082
102 P	13.216	8.69	7038.	8529.	6879.5	159.	0.971486
103 P	13.537	14.00	6868.	8611.	6911.3	-43.	0.923142
104 P	13.859	8.82	7084.	8451.	6943.3	141.	0.952737
105 P	14.180	14.00	6844.	8211.	6975.2	-131.	0.989722
106 P	14.504	12.17	7014.	8796.	7007.6	6.	0.943021
107 P	14.825	8.33	7260.	8975.	7039.6	220.	0.936075
108 P	15.154	7.84	7419.	8594.	7072.6	346.	1.028826
109 P	15.498	8.99	7228.	8952.	7107.2	121.	
110 P	15.822	14.00	7059.	8807.	7139.9	-81.	
111 P	16.145	14.00	7030.	8665.	7172.4	-142.	
112 P	16.472	14.00	7045.	8552.	7205.6	-161.	
113 P	16.811	8.96	7364.	9226.	7240.0	124.	
114 P	17.145	10.79	7297.	9242.	7274.0	23.	
115 P	17.469	14.00	7130.	8837.	7307.0	-177.	
116 P	17.802	8.71	7497.	9386.	7341.0	156.	
117 P	18.126	14.00	7305.	9181.	7374.2	-69.	
118 P	18.455	14.00	7027.	8951.	7408.0	-381.	
119 P	18.776	9.84	7496.	8881.	7441.1	55.	
120 P	19.101	14.00	7438.	9290.	7474.7	-37.	
121 P	19.437	8.55	7690.	9266.	7509.4	181.	
122 P	19.758	14.00	7522.	9374.	7542.7	-21.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 4120- 4280 A
FEATURE CONTINUUM (160)
CHANNEL NO 8 (3/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =2940816.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.84695
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 214. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 561. COUNTS = 9.3 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 72,122
POLYNOMIAL COEFFICIENTS =
1.78703E 04, 2.55119E 02, 3.81593E 00
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.12	98689.	5694.		3285325.	
2 P Z	-21.483	-0.18	103311.	4453.		3483882.	
3	-20.888	14.00	2894.	6136.		-80602.	
4 P Z	-20.406	0.14	77686.	4809.		2576452.	
5	-19.952	14.00	2176.	3974.		-41643.	
6 P Z	-19.457	0.01	87443.	5230.		2905468.	
7 P Z	-19.134	0.00	87066.	4025.		2927995.	
8 P Z	-18.812	0.17	76484.	5137.		2524661.	
9 P Z	-18.491	0.13	80216.	6829.		2605124.	
10 P Z	-18.172	0.06	84834.	6627.		2772741.	
11 P Z	-17.848	-0.08	94615.	5027.		3162505.	
12 P Z	-17.527	0.02	87752.	6097.		2890582.	
13	-16.963	14.00	4815.	8798.		-92278.	
14 P	-16.401	0.25	71825.	6219.		2329521.	
15	-15.968	14.00	2463.	5003.		-62101.	
16 P Z	-15.567	-0.04	93624.	7402.		3057418.	
17 P Z	-15.248	-0.01	90213.	6772.		2956708.	
18 P Z	-14.922	0.04	87074.	7561.		2823454.	
19 P Z	-14.603	-0.04	91489.	5462.		3040200.	
20 P Z	-14.277	-0.02	88906.	4240.		2986020.	
21 P Z	-13.958	0.03	87074.	6159.		2865014.	
22 P Z	-13.627	-0.09	96958.	6807.		3191746.	
23 P Z	-13.285	-0.12	99336.	6841.		3273967.	
24 P Z	-12.951	0.03	86823.	5988.		2861300.	
25 P Z	-12.618	0.12	80566.	6542.		2625881.	
26	-12.175	14.00	5286.	7805.		-46357.	
27 P	-11.771	-0.11	99277.	6985.		3267635.	
28	-11.360	14.00	3315.	4782.		-25730.	
29 P	-10.951	0.03	87222.	6655.		2855492.	
30 P	-10.627	0.07	85832.	8212.		2760686.	
31 P	-10.306	-0.03	91588.	6424.		3015149.	
32 P	-9.986	-0.04	91438.	4812.		3057685.	
33 P	-9.661	0.01	88337.	5600.		2925790.	
34 P	-9.341	-0.06	94469.	6916.		3101400.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 4120- 4280 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.04	87283.	7408.		2835306.	
36 P	-8.696	0.06	83667.	5088.		2777519.	
37 P	-8.368	-0.16	102972.	6691.		3405675.	
38 P	-8.021	-0.13	101610.	8177.		3313955.	
39	-7.654	14.00	7211.	9365.		-25226.	
40 P	-7.295	-0.05	93635.	6617.		3081074.	
41	-6.944	14.00	2452.	4616.		-51014.	
42 P	-6.519	-0.08	96260.	6370.		3180270.	
43 P	-6.199	-0.18	102606.	4585.		3455294.	
44 P	-5.880	-0.11	98588.	6290.		3264121.	
45 P	-5.559	-0.12	99257.	6524.		3280600.	
46 P	-5.240	-0.14	103224.	8602.		3357845.	
47 P	-4.918	-0.06	95589.	7723.		3116677.	
48 P	-4.592	-0.07	95405.	6378.		3150109.	
49 P	-4.260	-0.16	102855.	6633.		3403299.	
50 P	-3.939	-0.15	102607.	7341.		3373632.	
51 P	-3.618	-0.15	102571.	7045.		3381146.	
52 P	-3.297	-0.16	102677.	6476.		3401724.	
53 P	-2.973	-0.11	99009.	6658.		3267947.	
54 P	-2.646	-0.08	95366.	5761.		3167034.	
55 P	-2.325	-0.01	90430.	6255.		2979628.	
56 P	-2.002	0.14	80775.	7781.		2596468.	
57 P	-1.683	0.22	73413.	5983.		2392096.	
58 P	-1.363	0.37	63630.	4685.		2088170.	
59 P	-1.040	0.67	50779.	6409.		1587280.	
60 P	-0.718	0.92	40784.	5572.		1262266.	
61 P	-0.397	1.01	37870.	5435.		1164338.	
62 P	-0.076	1.45	28627.	7644.		775351.	
63 P	0.250	1.96	19869.	7138.		483820.	
64 P	0.569	2.73	13342.	7706.		238538.	
65 P	1.212	5.00	47715.	20814.	18185.2	29530.	
66 P	1.533	6.30	27139.	21197.	18270.3	8869.	
67 P	1.857	8.02	20175.	21064.	18357.2	1818.	
68 P	2.179	13.26	18459.	21495.	18444.4	15.	
69 P	2.502	14.00	17713.	20754.	18532.4	-819.	
70 P	2.824	14.00	18222.	20049.	18621.3	-399.	
71 P	3.147	13.09	18728.	20538.	18710.9	17.	
72 P	3.469	10.25	19034.	21786.	18801.2	233.	
73 P	3.793	9.83	19236.	21526.	18893.0	343.	
74 P	4.114	14.00	18791.	20995.	18984.4	-193.	
75 P	4.437	9.08	19762.	21308.	19077.3	685.	
76 P	4.764	14.00	18724.	21432.	19172.3	-448.	
77 P	5.086	14.00	19139.	22416.	19266.7	-128.	
78 P	5.409	10.50	19547.	23085.	19361.9	185.	
79 P	5.733	10.93	19583.	22834.	19458.3	125.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 4120- 4280 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	14.00	19154.	23387.	19556.5	-403.	0.937233
81 P	6.381	9.56	20095.	22635.	19653.7	441.	1.019332
82 P	6.702	14.00	19468.	22367.	19751.5	-283.	1.035761
83 P	7.028	14.00	19389.	21960.	19851.6	-463.	1.065564
84 P	7.364	10.33	20173.	23489.	19955.8	217.	0.994524
85 P	7.683	9.34	20594.	23990.	20055.5	538.	0.974208
86 P	8.020	13.22	20177.	23447.	20161.8	15.	0.999707
87 P	8.344	14.00	19763.	22123.	20264.8	-502.	1.084400
88 P	8.668	14.00	19932.	22744.	20368.4	-436.	1.042114
89 P	8.991	14.00	19805.	23091.	20472.5	-667.	1.015523
90 P	9.315	9.13	21235.	25003.	20577.8	657.	0.996534
91 P	9.637	14.00	19861.	22763.	20683.3	-822.	1.075159
92 P	9.963	14.00	20141.	22529.	20790.9	-650.	1.098599
93 P	10.286	14.00	20477.	23944.	20898.1	-421.	1.028554
94 P	10.606	9.87	21337.	24705.	21005.4	332.	1.048194
95 P	10.929	10.00	21407.	25298.	21114.2	293.	1.011329
96 P	11.254	9.95	21532.	26655.	21224.8	307.	0.925800
97 P	11.579	14.00	21073.	25723.	21335.8	-263.	0.945601
98 P	11.913	11.17	21551.	25825.	21451.0	100.	0.984208
99 P	12.245	14.00	20564.	25806.	21566.4	-1002.	0.961412
100 P	12.568	13.05	21697.	26380.	21679.2	18.	0.967106
101 P	12.890	8.89	22613.	25543.	21792.9	820.	1.052082
102 P	13.216	9.00	22645.	27460.	21908.4	737.	0.971486
103 P	13.537	12.01	22069.	27776.	22023.0	46.	0.923142
104 P	13.859	9.48	22612.	27467.	22139.0	473.	0.952737
105 P	14.180	14.00	21839.	26444.	22255.1	-416.	0.989722
106 P	14.504	9.60	22798.	27964.	22373.3	425.	0.943021
107 P	14.825	8.83	23352.	29128.	22491.0	861.	0.936075
108 P	15.154	8.47	23816.	27727.	22612.6	1203.	1.028826
109 P	15.498	14.00	22701.	29361.	22740.6	-40.	
110 P	15.822	14.00	21660.	28297.	22862.1	-1202.	
111 P	16.145	14.00	22524.	28114.	22983.7	-460.	
112 P	16.472	14.00	22602.	27159.	23108.0	-506.	
113 P	16.811	8.80	24122.	30195.	23237.5	884.	
114 P	17.145	8.77	24283.	29896.	23366.0	917.	
115 P	17.469	14.00	22770.	28831.	23491.5	-721.	
116 P	17.802	9.18	24248.	30477.	23621.1	627.	
117 P	18.126	14.00	23433.	29863.	23748.2	-315.	
118 P	18.455	14.00	22880.	29508.	23878.1	-998.	
119 P	18.776	14.00	23521.	29076.	24005.5	-485.	
120 P	19.101	11.44	24214.	30993.	24135.7	78.	
121 P	19.437	10.36	24481.	30153.	24270.7	210.	
122 P	19.758	11.83	24455.	31006.	24400.6	54.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 4600- 4760 A
FEATURE CONTINUUM (160)
CHANNEL NO 11 (4/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =6916198.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.71885
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 305. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 1114. COUNTS = 9.5 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 72,122
POLYNCMIAL COEFFICIENTS =
3.29099E 04, 4.55969E 02, 9.97216E 00
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.10	226795.	15320.		7552376.	
2 P Z	-21.483	-0.14	233406.	12230.		7861505.	
3	-20.888	14.00	5740.	17437.		-237810.	
4 P Z	-20.406	0.11	188536.	13330.		6263381.	
5	-19.952	14.00	4456.	11507.		-133552.	
6 P Z	-19.457	0.01	2C6692.	14253.		6875618.	
7 P Z	-19.134	-0.03	210140.	10576.		7088810.	
8 P Z	-18.812	0.11	187895.	13556.		6235258.	
9 P Z	-18.491	0.11	192066.	18959.		6245305.	
10 P Z	-18.172	0.05	202056.	18698.		66C1522.	
11 P Z	-17.848	-0.06	218430.	13847.		7296662.	
12 P Z	-17.527	0.00	2C9268.	16586.		6907079.	
13	-16.963	14.00	10066.	25392.		-286545.	
14 P	-16.401	0.19	177611.	16932.		5790380.	
15	-15.968	14.00	5084.	14153.		-178145.	
16 P Z	-15.567	-0.02	216945.	20855.		7068368.	
17 P Z	-15.248	0.01	2C9716.	18999.		6862049.	
18 P Z	-14.922	0.05	204356.	21497.		66116CC.	
19 P Z	-14.603	-0.02	212548.	14411.		7076601.	
20 P Z	-14.277	-0.03	210588.	11150.		7090048.	
21 P Z	-13.958	0.02	205856.	16672.		6785495.	
22 P Z	-13.627	-0.07	223674.	18901.		7353045.	
23 P Z	-13.285	-0.07	225018.	18943.		7399028.	
24 P Z	-12.951	0.02	206058.	15742.		6815965.	
25 P Z	-12.618	0.10	194108.	18260.		6334363.	
26	-12.175	14.00	10940.	22306.		-178312.	
27 P	-11.771	-0.C7	225234.	19383.		7395519.	
28	-11.360	14.00	7030.	12993.		-80850.	
29 P	-10.951	0.04	204424.	18468.		6690188.	
30 P	-10.627	0.04	206103.	22263.		6653473.	
31 P	-10.306	-0.00	210633.	17980.		6919782.	
32 P	-9.986	-0.04	213785.	13272.		7148555.	
33 P	-9.661	-0.03	213457.	15558.		7079559.	
34 P	-9.341	-0.05	219618.	18836.		7212721.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 4600- 4760 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.03	205737.	19751.		67C3865.	
36 P	-8.696	0.05	199284.	13550.		6634024.	
37 P	-8.368	-0.12	233669.	18504.		7712858.	
38 P	-8.021	-0.09	230766.	22925.		7500023.	
39	-7.654	14.00	15478.	26679.		-129505.	
40 P	-7.295	-0.02	215248.	18394.		7070892.	
41	-6.944	14.00	5084.	12462.		-135600.	
42 P	-6.519	-0.C7	224373.	17817.		7404783.	
43 P	-6.199	-0.14	234338.	12286.		7892716.	
44 P	-5.880	-0.C8	225747.	17229.		7467667.	
45 P	-5.559	-0.09	226686.	17495.		7493841.	
46 P	-5.240	-0.08	230315.	24842.		7436005.	
47 P	-4.918	-0.03	219541.	21513.		7142673.	
48 P	-4.592	-0.05	219226.	17574.		7230752.	
49 P	-4.260	-0.11	231207.	18154.		7635495.	
50 P	-3.939	-0.11	232554.	20538.		7622658.	
51 P	-3.618	-0.11	232787.	19796.		7649481.	
52 P	-3.297	-0.12	232733.	17778.		7698365.	
53 P	-2.973	-0.07	223696.	18146.		7372811.	
54 P	-2.646	-0.06	219154.	15017.		7292565.	
55 P	-2.325	0.04	203601.	17541.		6684706.	
56 P	-2.002	0.17	184350.	21868.		5902056.	
57 P	-1.683	0.25	168689.	15810.		5506340.	
58 P	-1.363	0.39	146788.	12472.		4823787.	
59 P	-1.040	0.68	118049.	17120.		3700980.	
60 P	-0.718	0.90	97308.	15540.		3014797.	
61 P	-0.397	1.03	87219.	14649.		2684099.	
62 P	-0.076	1.48	65829.	21343.		1767031.	
63 P	0.250	1.97	46186.	19613.		1123052.	
64 P	0.569	2.79	30669.	21527.		531802.	
65 P	1.212	4.72	123243.	46676.	33477.2	89766.	
66 P	1.533	5.96	62309.	46983.	33632.2	28677.	
67 P	1.857	7.48	40809.	46487.	33790.9	7018.	
68 P	2.179	9.15	35467.	48437.	33951.0	1516.	
69 P	2.502	14.00	32972.	46784.	34113.0	-1141.	
70 P	2.824	14.00	34142.	42964.	34277.3	-135.	
71 P	3.147	14.00	34028.	45346.	34443.4	-415.	
72 P	3.469	11.04	34876.	50617.	34611.6	264.	
73 P	3.793	10.46	35236.	48051.	34783.1	453.	
74 P	4.114	14.00	34408.	45905.	34954.5	-547.	
75 P	4.437	9.64	36095.	47110.	35129.2	966.	
76 P	4.764	14.00	34590.	47673.	35308.4	-718.	
77 P	5.086	11.76	35624.	49658.	35487.1	137.	
78 P	5.409	10.43	36133.	51079.	35667.9	465.	
79 P	5.733	10.83	36173.	50782.	35851.6	321.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 4600- 4760 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	14.00	35544.	52184.	36039.4	-495.	0.937233
81 P	6.381	9.45	37378.	49802.	36225.6	1152.	1.019332
82 P	6.702	14.00	36230.	49200.	36413.6	-184.	1.035761
83 P	7.028	14.00	36169.	47245.	36606.7	-438.	1.065564
84 P	7.364	10.62	37200.	51905.	36808.1	392.	0.994524
85 P	7.683	9.61	37988.	53935.	37001.5	987.	0.974208
86 P	8.020	14.00	36929.	51288.	37208.2	-279.	0.999707
87 P	8.344	14.00	36402.	47244.	37408.9	-1007.	1.084400
88 P	8.668	14.00	36313.	48899.	37611.6	-1299.	1.042114
89 P	8.991	14.00	36338.	50099.	37815.4	-1477.	1.015523
90 P	9.315	9.17	39510.	54739.	38022.4	1488.	0.996534
91 P	9.637	14.00	36546.	47883.	38230.3	-1684.	1.075159
92 P	9.963	14.00	36406.	47067.	38442.6	-2037.	1.098599
93 P	10.286	14.00	37504.	51154.	38654.8	-1151.	1.028554
94 P	10.606	9.57	39898.	53061.	38867.7	1030.	1.048194
95 P	10.929	10.69	39449.	55170.	39084.1	365.	1.011329
96 P	11.254	10.56	39719.	59416.	39304.6	414.	0.925800
97 P	11.579	14.00	39098.	57502.	39526.3	-428.	0.945601
98 P	11.913	14.00	39569.	56197.	39757.0	-188.	0.984208
99 P	12.245	14.00	38648.	55263.	39988.5	-1341.	0.961412
100 P	12.568	11.03	40482.	57861.	40215.4	267.	0.967106
101 P	12.890	9.12	42005.	55608.	40444.3	1561.	1.052082
102 P	13.216	8.89	42596.	60546.	40677.6	1918.	0.971486
103 P	13.537	11.02	41180.	60865.	40909.4	271.	0.923142
104 P	13.859	9.68	42073.	60619.	41144.6	928.	0.952737
105 P	14.180	14.00	40927.	57016.	41380.4	-453.	0.989722
106 P	14.504	10.03	42295.	62428.	41621.2	674.	0.943021
107 P	14.825	9.13	43407.	64146.	41861.1	1546.	0.936075
108 P	15.154	8.94	43944.	59952.	42109.5	1834.	1.028826
109 P	15.498	10.32	42888.	64758.	42371.5	516.	
110 P	15.822	14.00	40582.	62822.	42620.6	-2039.	
111 P	16.145	14.00	41652.	60292.	42870.5	-1218.	
112 P	16.472	14.00	42599.	58107.	43126.2	-527.	
113 P	16.811	9.50	44492.	66142.	43393.4	1099.	
114 P	17.145	8.91	45549.	65302.	43658.8	1890.	
115 P	17.469	14.00	42749.	61995.	43918.3	-1169.	
116 P	17.802	10.05	44847.	65041.	44187.1	660.	
117 P	18.126	14.00	43393.	66013.	44450.9	-1058.	
118 P	18.455	14.00	42415.	62308.	44721.0	-2306.	
119 P	18.776	14.00	43505.	61420.	44986.4	-1481.	
120 P	19.101	11.90	45378.	66350.	45257.9	120.	
121 P	19.437	9.01	47261.	64491.	45540.0	1721.	
122 P	19.758	12.27	45897.	66531.	45811.9	85.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 4920- 5080 A
FEATURE CONT+CH4? (160)
CHANNEL NO 13 (5/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =9646892.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.69687
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 328. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 1510. COUNTS = 9.5 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 76,122
POLYNOMIAL COEFFICIENTS =
3.62536E 04, 6.53842E 02, 8.26950E 00
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.08	309853.	19436.		10370799.	
2 P Z	-21.483	-0.12	319345.	15120.		10808288.	
3	-20.888	14.00	7301.	21301.		-264008.	
4 P Z	-20.406	0.08	266210.	16043.		8926052.	
5	-19.952	14.00	6120.	14105.		-129829.	
6 P Z	-19.457	-0.00	289117.	18036.		9679186.	
7 P Z	-19.134	-0.02	290404.	12855.		9850599.	
8 P Z	-18.812	0.10	264212.	16814.		8837316.	
9 P Z	-18.491	0.10	268153.	23925.		8801810.	
10 P Z	-18.172	0.05	280273.	23154.		9244814.	
11 P Z	-17.848	-0.04	299102.	17626.		10038660.	
12 P Z	-17.527	0.00	289500.	21034.		9619467.	
13	-16.963	14.00	12920.	32503.		-340566.	
14 P	-16.401	0.17	249533.	21403.		8211623.	
15	-15.968	14.00	6707.	17532.		-192870.	
16 P Z	-15.567	-0.03	300535.	26250.		9878472.	
17 P Z	-15.248	0.01	290287.	23611.		9584159.	
18 P Z	-14.922	0.05	282885.	27241.		9236550.	
19 P Z	-14.603	-0.02	293856.	18145.		9842391.	
20 P Z	-14.277	-0.03	292489.	13841.		9899524.	
21 P Z	-13.958	0.01	287309.	20612.		9553075.	
22 P Z	-13.627	-0.06	306996.	23379.		10174631.	
23 P Z	-13.285	-0.05	305097.	23535.		10104362.	
24 P Z	-12.951	0.01	287294.	19994.		9567624.	
25 P Z	-12.618	0.09	270924.	23047.		8920209.	
26	-12.175	14.00	14177.	27649.		-178179.	
27 P	-11.771	-0.06	307770.	24156.		10182770.	
28	-11.360	14.00	9131.	16516.		-83249.	
29 P	-10.951	0.03	283417.	23290.		9351538.	
30 P	-10.627	0.04	284367.	27863.		9273250.	
31 P	-10.306	0.00	290169.	22269.		9612760.	
32 P	-9.986	-0.03	295298.	16701.		9928082.	
33 P	-9.661	-0.04	298481.	18782.		9988730.	
34 P	-9.341	-0.04	303367.	23885.		10035276.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 4920- 5080 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.03	285370.	24903.		9380551.	
36 P	-8.696	0.05	275301.	16845.		9224674.	
37 P	-8.368	-0.10	318716.	23179.		10589709.	
38 P	-8.021	-0.07	313469.	28660.		10272379.	
39	-7.654	14.00	20017.	34192.		-133367.	
40 P	-7.295	-0.01	295013.	22694.		9771934.	
41	-6.944	14.00	6725.	15652.		-146386.	
42 P	-6.519	-0.07	309384.	22034.		10291017.	
43 P	-6.199	-0.13	320469.	15578.		10836457.	
44 P	-5.880	-0.07	308383.	21544.		10267934.	
45 P	-5.559	-0.08	310743.	21844.		10343217.	
46 P	-5.240	-0.06	313740.	31114.		10222010.	
47 P	-4.918	-0.02	300410.	26842.		9859657.	
48 P	-4.592	-0.04	300512.	22112.		9978594.	
49 P	-4.260	-0.09	315293.	22698.		10481638.	
50 P	-3.939	-0.09	316187.	25684.		10440097.	
51 P	-3.618	-0.10	318793.	24620.		10557257.	
52 P	-3.297	-0.10	318294.	22280.		10596866.	
53 P	-2.973	-0.05	304827.	22575.		10118327.	
54 P	-2.646	-0.04	299720.	18764.		10032535.	
55 P	-2.325	0.05	278039.	21589.		9204796.	
56 P	-2.002	0.18	252041.	27374.		8153766.	
57 P	-1.683	0.27	228954.	19488.		7538065.	
58 P	-1.363	0.41	200229.	15178.		6637813.	
59 P	-1.040	0.68	161855.	21418.		5142528.	
60 P	-0.718	0.91	132795.	19424.		4174062.	
61 P	-0.397	1.03	118954.	17988.		3724651.	
62 P	-0.076	1.49	88794.	27155.		2445463.	
63 P	0.250	1.94	63156.	24355.		1616428.	
64 P	0.569	2.69	42026.	27024.		811780.	
65 P	1.212	4.68	166948.	54615.	37058.3	129890.	
66 P	1.533	5.84	81819.	55005.	37275.1	44544.	
67 P	1.857	7.19	50273.	54527.	37496.2	12777.	
68 P	2.179	8.40	41931.	55971.	37717.9	4213.	
69 P	2.502	10.73	38435.	54115.	37941.0	494.	
70 P	2.824	9.91	39216.	50407.	38166.3	1050.	
71 P	3.147	11.27	38692.	52905.	38392.9	299.	
72 P	3.469	9.46	40212.	58906.	38621.3	1591.	
73 P	3.793	9.65	40179.	55475.	38852.9	1326.	
74 P	4.114	14.00	39039.	53606.	39083.4	-44.	
75 P	4.437	8.93	41906.	54445.	39317.3	2589.	
76 P	4.764	14.00	38963.	55342.	39556.1	-593.	
77 P	5.086	10.90	40216.	57844.	39793.2	423.	
78 P	5.409	9.71	41292.	60036.	40032.1	1260.	
79 P	5.733	10.61	40823.	59405.	40273.8	549.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 4920- 5080 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	14.00	39849.	61152.	40519.8	-671.	0.937233
81 P	6.381	9.63	42117.	59201.	40762.7	1354.	1.019332
82 P	6.702	11.86	41181.	56494.	41007.0	174.	1.035761
83 P	7.028	14.00	40628.	54568.	41256.9	-629.	1.065564
84 P	7.364	9.96	42520.	60518.	41516.5	1003.	0.994524
85 P	7.683	9.56	43212.	63367.	41764.9	1447.	0.974208
86 P	8.020	14.00	42046.	59999.	42029.3	17.	0.999707
87 P	8.344	14.00	41309.	55069.	42285.1	-976.	1.084400
88 P	8.668	14.00	40343.	56940.	42542.6	-2200.	1.042114
89 P	8.991	14.00	40533.	58025.	42800.5	-2268.	1.015523
90 P	9.315	9.56	44502.	63899.	43061.6	1440.	0.996534
91 P	9.637	14.00	41203.	55336.	43322.8	-2120.	1.075159
92 P	9.963	14.00	41008.	54174.	43588.7	-2581.	1.098599
93 P	10.286	14.00	42518.	59397.	43853.6	-1336.	1.028554
94 P	10.606	9.92	45161.	61595.	44118.6	1042.	1.048194
95 P	10.929	9.96	45388.	63945.	44386.9	1001.	1.011329
96 P	11.254	10.38	45341.	69859.	44659.6	681.	0.925800
97 P	11.579	14.00	44263.	67170.	44932.8	-670.	0.945601
98 P	11.913	14.00	45202.	65625.	45216.3	-14.	0.984208
99 P	12.245	14.00	43611.	65434.	45499.9	-1889.	0.961412
100 P	12.568	10.65	46309.	68675.	45776.9	532.	0.967106
101 P	12.890	9.38	47764.	64833.	46055.7	1708.	1.052082
102 P	13.216	9.09	48578.	71305.	46339.0	2239.	0.971486
103 P	13.537	14.00	46531.	71937.	46619.7	-89.	0.923142
104 P	13.859	10.12	47766.	71853.	46903.6	862.	0.952737
105 P	14.180	14.00	45947.	67182.	47187.5	-1241.	0.989722
106 P	14.504	9.54	48945.	73930.	47476.6	1468.	0.943021
107 P	14.825	9.27	49651.	75418.	47764.0	1887.	0.936075
108 P	15.154	9.10	50272.	70197.	48060.7	2211.	1.028826
109 P	15.498	10.31	49101.	75896.	48372.9	728.	
110 P	15.822	14.00	46049.	73590.	48668.8	-2620.	
111 P	16.145	14.00	47358.	70239.	48964.9	-1607.	
112 P	16.472	14.00	48331.	67871.	49267.3	-936.	
113 P	16.811	9.19	51614.	77958.	49582.4	2032.	
114 P	17.145	8.84	52710.	76385.	49894.5	2815.	
115 P	17.469	14.00	48787.	73221.	50199.1	-1412.	
116 P	17.802	10.44	51159.	77709.	50513.7	645.	
117 P	18.126	14.00	49694.	77131.	50821.8	-1128.	
118 P	18.455	14.00	47989.	73282.	51136.5	-3148.	
119 P	18.776	14.00	49820.	72813.	51445.1	-1625.	
120 P	19.101	11.71	51960.	77162.	51760.0	200.	
121 P	19.437	9.23	54042.	75827.	52086.5	1956.	
122 P	19.758	12.81	52473.	78960.	52400.5	73.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 5240- 5400 A
FEATURE CONT+CH4? (160)
CHANNEL NO 15 (6/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =********* COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.76282
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 346. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 1726. COUNTS = 9.5 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 80,122
POLYNOMIAL COEFFICIENTS =
4.06411E 04, 9.85937E 02, 3.87534E 00
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.06	353952.	21236.		11821341.	
2 P Z	-21.483	-0.10	363143.	16786.		12261836.	
3	-20.888	14.00	8440.	23739.		-338404.	
4 P Z	-20.406	0.08	310227.	17614.		10387669.	
5	-19.952	14.00	6553.	15317.		-179591.	
6 P Z	-19.457	-0.01	336646.	19626.		11258618.	
7 P Z	-19.134	-0.03	338829.	14251.		11478530.	
8 P Z	-18.812	0.08	311005.	18774.		10383929.	
9 P Z	-18.491	0.09	315755.	26606.		10341073.	
10 P Z	-18.172	0.03	330340.	26073.		10865780.	
11 P Z	-17.848	-0.04	346555.	19259.		11615231.	
12 P Z	-17.527	-0.00	338493.	23154.		11229069.	
13	-16.963	14.00	14856.	36161.		-445497.	
14 P	-16.401	0.15	296930.	23778.		9757704.	
15	-15.968	14.00	7298.	18946.		-250406.	
16 P Z	-15.567	-0.01	346615.	29060.		11355655.	
17 P Z	-15.248	0.00	338929.	26554.		11153552.	
18 P Z	-14.922	0.05	330140.	30437.		10742265.	
19 P Z	-14.603	-0.01	339534.	20011.		11349419.	
20 P Z	-14.277	-0.04	342778.	14945.		11598214.	
21 P Z	-13.958	0.01	334968.	22644.		11119309.	
22 P Z	-13.627	-0.05	355229.	25750.		11745518.	
23 P Z	-13.285	-0.05	354079.	25966.		11699502.	
24 P Z	-12.951	0.00	336466.	22045.		11187732.	
25 P Z	-12.618	0.07	319443.	25352.		10503635.	
26	-12.175	14.00	15855.	30870.		-269268.	
27 P	-11.771	-0.05	355076.	26375.		11723477.	
28	-11.360	14.00	9887.	17812.		-129515.	
29 P	-10.951	0.03	330644.	25714.		10886006.	
30 P	-10.627	0.04	332378.	31022.		10804976.	
31 P	-10.306	0.00	338011.	24690.		11171190.	
32 P	-9.986	-0.03	344598.	18323.		11571726.	
33 P	-9.661	-0.04	348400.	20595.		11644136.	
34 P	-9.341	-0.04	352720.	26344.		11641844.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 5240- 5400 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.02	334098.	27525.		10958543.	
36 P	-8.696	0.03	324324.	18302.		10862696.	
37 P	-8.368	-0.09	365966.	25780.		12120513.	
38 P	-8.021	-0.05	359999.	32274.		11738286.	
39	-7.654	14.00	22448.	38219.		-234723.	
40 P	-7.295	-0.01	342535.	25579.		11305794.	
41	-6.944	14.00	7168.	16833.		-198541.	
42 P	-6.519	-0.07	359880.	24387.		11944695.	
43 P	-6.199	-0.12	369069.	16559.		12475308.	
44 P	-5.880	-0.07	358973.	23839.		11927580.	
45 P	-5.559	-0.06	357541.	24193.		11868010.	
46 P	-5.240	-0.05	361024.	34903.		11703969.	
47 P	-4.918	-0.02	349700.	30015.		11438133.	
48 P	-4.592	-0.03	348443.	24256.		11547897.	
49 P	-4.260	-0.08	362391.	25064.		12014504.	
50 P	-3.939	-0.08	365913.	28302.		12051322.	
51 P	-3.618	-0.08	366310.	27235.		12093705.	
52 P	-3.297	-0.09	365533.	24596.		12136969.	
53 P	-2.973	-0.04	352167.	25118.		11655223.	
54 P	-2.646	-0.04	346846.	20519.		11591774.	
55 P	-2.325	0.06	320418.	23665.		10582801.	
56 P	-2.002	0.20	289249.	30531.		9308571.	
57 P	-1.683	0.28	264624.	21594.		8685304.	
58 P	-1.363	0.41	231392.	16471.		7658962.	
59 P	-1.040	0.69	187571.	23548.		5936280.	
60 P	-0.718	0.92	153724.	21178.		4814910.	
61 P	-0.397	1.07	134824.	19960.		4185930.	
62 P	-0.076	1.52	101779.	29767.		2767520.	
63 P	0.250	2.01	70878.	26909.		1762291.	
64 P	0.569	2.79	47564.	30227.		857714.	
65 P	1.212	4.60	203498.	58659.	41841.9	161656.	
66 P	1.533	5.72	100039.	58816.	42161.4	57878.	
67 P	1.857	6.92	61672.	58987.	42485.3	19187.	
68 P	2.179	7.92	50394.	59871.	42808.3	7586.	
69 P	2.502	8.98	45996.	57663.	43131.9	2864.	
70 P	2.824	8.79	46867.	53265.	43456.8	3410.	
71 P	3.147	9.09	46382.	56390.	43782.0	2600.	
72 P	3.469	9.05	46799.	63154.	44108.0	2691.	
73 P	3.793	9.32	46525.	60099.	44437.0	2088.	
74 P	4.114	10.56	45433.	57401.	44762.9	670.	
75 P	4.437	8.93	48086.	58088.	45091.8	2994.	
76 P	4.764	14.00	45161.	59550.	45426.0	-265.	
77 P	5.086	9.79	47113.	61628.	45756.3	1357.	
78 P	5.409	9.41	48024.	63944.	46087.4	1937.	
79 P	5.733	10.36	47222.	63858.	46420.8	801.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 5240- 5400 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	14.00	46068.	65596.	46758.6	-691.	0.937233
81 P	6.381	9.73	48522.	63094.	47090.6	1431.	1.019332
82 P	6.702	11.65	47668.	60505.	47422.9	245.	1.035761
83 P	7.028	14.00	47663.	58723.	47761.3	-98.	1.065564
84 P	7.364	10.23	49016.	64906.	48111.2	905.	0.994524
85 P	7.683	9.65	49997.	67951.	48444.5	1553.	0.974208
86 P	8.020	12.65	48895.	64002.	48797.6	97.	0.999707
87 P	8.344	14.00	48161.	58276.	49137.9	-977.	1.084400
88 P	8.668	14.00	48369.	60389.	49478.6	-1110.	1.042114
89 P	8.991	14.00	48104.	62055.	49818.7	-1715.	1.015523
90 P	9.315	9.39	52131.	68274.	50161.3	1970.	0.996534
91 P	9.637	14.00	48302.	58730.	50502.8	-2201.	1.075159
92 P	9.963	14.00	48289.	56735.	50848.8	-2560.	1.098599
93 P	10.286	14.00	49615.	63100.	51192.1	-1577.	1.028554
94 P	10.606	9.86	52806.	65645.	51534.1	1272.	1.048194
95 P	10.929	10.21	52801.	68530.	51879.0	922.	1.011329
96 P	11.254	10.40	53000.	74516.	52228.1	772.	0.925800
97 P	11.579	14.00	52052.	71675.	52576.5	-524.	0.945601
98 P	11.913	14.00	52671.	70272.	52936.4	-265.	0.984208
99 P	12.245	14.00	50917.	69171.	53295.1	-2378.	0.961412
100 P	12.568	10.63	54272.	73103.	53644.1	628.	0.967106
101 P	12.890	9.46	55836.	69571.	53993.9	1842.	1.052082
102 P	13.216	9.09	56947.	76809.	54348.0	2599.	0.971486
103 P	13.537	14.00	54241.	77067.	54697.5	-457.	0.923142
104 P	13.859	11.20	55420.	76670.	55049.7	370.	0.952737
105 P	14.180	14.00	54546.	72030.	55400.6	-855.	0.989722
106 P	14.504	9.69	57246.	78946.	55756.6	1489.	0.943021
107 P	14.825	9.46	57960.	80936.	56109.1	1851.	0.936075
108 P	15.154	9.09	59073.	74881.	56471.8	2601.	1.028826
109 P	15.498	10.57	57512.	81436.	56851.8	660.	
110 P	15.822	14.00	54324.	78897.	57210.8	-2887.	
111 P	16.145	14.00	55457.	75992.	57568.7	-2112.	
112 P	16.472	14.00	56379.	72746.	57932.9	-1554.	
113 P	16.811	9.69	59797.	84113.	58311.0	1486.	
114 P	17.145	8.84	61952.	82520.	58684.2	3268.	
115 P	17.469	14.00	57104.	77972.	59047.1	-1943.	
116 P	17.802	10.11	60430.	83233.	59420.7	1009.	
117 P	18.126	14.00	58276.	82256.	59785.2	-1509.	
118 P	18.455	14.00	56348.	77900.	60156.3	-3808.	
119 P	18.776	14.00	58675.	76944.	60518.9	-1844.	
120 P	19.101	11.22	61253.	82941.	60887.8	365.	
121 P	19.437	8.93	64284.	80765.	61268.9	3015.	
122 P	19.758	10.49	62347.	83911.	61634.2	713.	

SATELLITE J11
DATE OBSVD APRIL 6, 1971
BAND PASS 5500- 5560 A
FEATURE NH3 (60)
CHANNEL NO 16 (7/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =1227891.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.50908
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 119. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 198. COUNTS = 9.5 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 83,122
POLYNOMIAL COEFFICIENTS =
3.74550E 03, 9.59817E 01,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.04	37663.	2241.		1278274.	
2 P Z	-21.483	-0.09	38876.	1791.		1328748.	
3	-20.888	14.00	840.	2408.		-13506.	
4 P Z	-20.406	0.06	34202.	1900.		1163215.	
5	-19.952	14.00	648.	1660.		-6898.	
6 P Z	-19.457	-0.02	36666.	2058.		1246640.	
7 P Z	-19.134	-0.03	36924.	1490.		1265791.	
8 P Z	-18.812	0.07	33725.	1929.		1146004.	
9 P Z	-18.491	0.09	33707.	2827.		1129373.	
10 P Z	-18.172	0.04	35133.	2754.		1180584.	
11 P Z	-17.848	-0.03	37097.	2178.		1259587.	
12 P Z	-17.527	0.00	36357.	2536.		1227308.	
13	-16.963	14.00	1526.	3576.		-10307.	
14 P	-16.401	0.14	32169.	2471.		1081886.	
15	-15.968	14.00	779.	2051.		-9280.	
16 P Z	-15.567	-0.02	37231.	3087.		1248080.	
17 P Z	-15.248	-0.00	36605.	2780.		1231641.	
18 P Z	-14.922	0.03	35672.	3147.		1192446.	
19 P Z	-14.603	-0.03	37253.	2061.		1267132.	
20 P Z	-14.277	-0.04	37254.	1690.		1273777.	
21 P Z	-13.958	0.01	36051.	2447.		1218184.	
22 P Z	-13.627	-0.05	38063.	2682.		1284417.	
23 P Z	-13.285	-0.01	36951.	2774.		1243858.	
24 P Z	-12.951	0.00	36212.	2360.		1225369.	
25 P Z	-12.618	0.07	34191.	2764.		1147436.	
26	-12.175	7.26	1664.	3183.		1526.	
27 P	-11.771	-0.03	37492.	2853.		1261385.	
28	-11.360	6.50	1046.	1881.		3094.	
29 P	-10.951	0.05	34806.	2807.		1168195.	
30 P	-10.627	0.04	35558.	3166.		1188118.	
31 P	-10.306	0.02	35642.	2635.		1200519.	
32 P	-9.986	-0.02	36837.	1968.		1254229.	
33 P	-9.661	-0.05	37879.	2173.		1287046.	
34 P	-9.341	-0.03	37477.	2822.		1261412.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 5500- 5560 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
35 P	-9.020	0.03	35658.	2940.		1195645.	
36 P	-8.696	0.04	34911.	2019.		1185910.	
37 P	-8.368	-0.07	38979.	2729.		1315639.	
38 P	-8.021	-0.04	38239.	3400.		1277783.	
39	-7.654	4.82	2426.	3954.		14458.	
40 P	-7.295	0.00	36410.	2690.		1226419.	
41	-6.944	14.00	819.	1838.		-4084.	
42 P	-6.519	-0.07	38759.	2709.		1308296.	
43 P	-6.199	-0.11	39744.	1785.		1359234.	
44 P	-5.880	-0.06	38455.	2458.		1302128.	
45 P	-5.559	-0.06	38429.	2407.		1302127.	
46 P	-5.240	-0.05	38536.	3741.		1282103.	
47 P	-4.918	-0.01	37197.	3227.		1244396.	
48 P	-4.592	-0.01	36702.	2593.		1238368.	
49 P	-4.260	-0.07	38772.	2683.		1309214.	
50 P	-3.939	-0.06	38648.	2872.		1301506.	
51 P	-3.618	-0.08	39078.	2892.		1316200.	
52 P	-3.297	-0.08	39223.	2587.		1326710.	
53 P	-2.973	-0.04	37851.	2627.		1277977.	
54 P	-2.646	-0.03	37211.	2206.		1263078.	
55 P	-2.325	0.06	34497.	2515.		1162582.	
56 P	-2.002	0.18	31220.	3155.		1036484.	
57 P	-1.683	0.28	28152.	2242.		945372.	
58 P	-1.363	0.40	25070.	1691.		847320.	
59 P	-1.040	0.69	19790.	2527.		647624.	
60 P	-0.718	0.89	16570.	2217.		540448.	
61 P	-0.397	1.03	14653.	2003.		477166.	
62 P	-0.076	1.44	10930.	3154.		326352.	
63 P	0.250	1.91	7525.	2893.		211828.	
64 P	0.569	2.51	5083.	3143.		121903.	
65 P	1.212	4.56	22214.	7501.	3861.8	18352.	
66 P	1.533	5.65	10662.	7466.	3892.6	6769.	
67 P	1.857	6.87	6124.	7475.	3923.7	2200.	
68 P	2.179	7.81	4880.	7756.	3954.7	925.	
69 P	2.502	8.41	4516.	7414.	3985.6	530.	
70 P	2.824	8.66	4438.	7097.	4016.6	421.	
71 P	3.147	8.93	4378.	7395.	4047.5	330.	
72 P	3.469	9.00	4388.	8060.	4078.5	310.	
73 P	3.793	9.52	4301.	7825.	4109.6	191.	
74 P	4.114	9.68	4305.	7352.	4140.4	165.	
75 P	4.437	8.97	4487.	7766.	4171.3	316.	
76 P	4.764	14.00	4090.	8069.	4202.8	-113.	
77 P	5.086	14.00	4211.	8137.	4233.7	-23.	
78 P	5.409	9.91	4398.	8252.	4264.7	133.	
79 P	5.733	9.57	4478.	8299.	4295.8	182.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 5500- 5560 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
80 P	6.060	14.00	4260.	8698.	4327.2	-67.	0.937233
81 P	6.381	10.14	4466.	8454.	4358.0	108.	1.019332
82 P	6.702	11.68	4415.	8243.	4388.8	26.	1.035761
83 P	7.028	14.00	4395.	8111.	4420.C	-25.	1.065564
84 P	7.364	10.01	4574.	8755.	4452.3	122.	0.994524
85 P	7.683	9.26	4726.	8846.	4482.9	243.	0.974208
86 P	8.020	14.00	4479.	8767.	4515.3	-36.	0.9997C7
87 P	8.344	14.00	4446.	8189.	4546.4	-100.	1.C844C0
88 P	8.668	14.00	4359.	8384.	4577.5	-218.	1.042114
89 P	8.991	14.C0	4432.	8613.	4608.4	-176.	1.015523
90 P	9.315	9.21	4893.	9330.	4639.6	253.	0.996534
91 P	9.637	14.00	4395.	8477.	4670.5	-275.	1.075159
92 P	9.963	14.00	4380.	8238.	4701.8	-322.	1.C98599
93 P	10.286	14.00	4611.	8905.	4732.7	-122.	1.028554
94 P	10.606	10.39	4849.	9226.	4763.5	85.	1.048194
95 P	10.929	10.00	4917.	9502.	4794.5	123.	1.011329
96 P	11.254	10.17	4931.	10024.	4825.7	105.	0.925800
97 P	11.579	12.42	4870.	10000.	4856.8	13.	0.945601
98 P	11.913	11.56	4918.	9833.	4888.9	29.	0.9842C8
99 P	12.245	14.00	4628.	9715.	4920.8	-293.	0.961412
100 P	12.568	14.00	4943.	10346.	4951.8	-9.	0.967106
101 P	12.890	9.54	5171.	9891.	4982.7	188.	1.052082
102 P	13.216	8.60	5461.	10719.	5014.0	447.	0.971486
103 P	13.537	11.C8	5090.	10791.	5044.8	45.	0.923142
104 P	13.859	9.52	5266.	10723.	5075.7	190.	0.952737
105 P	14.180	14.00	4967.	10103.	5106.5	-139.	0.989722
106 P	14.504	12.92	5146.	11028.	5137.6	8.	0.943021
107 P	14.825	9.56	5352.	11419.	5168.4	184.	0.936075
108 P	15.154	9.07	5489.	10867.	5200.0	289.	1.028826
109 P	15.498	14.00	5195.	11606.	5233.0	-38.	
110 P	15.822	14.00	4991.	11258.	5264.1	-273.	
111 P	16.145	14.00	5064.	10682.	5295.1	-231.	
112 P	16.472	14.C0	5295.	10723.	5326.5	-32.	
113 P	16.811	8.96	5679.	11963.	5359.1	320.	
114 P	17.145	9.44	5596.	11808.	5391.1	205.	
115 P	17.469	14.00	5257.	11358.	5422.2	-165.	
116 P	17.802	10.16	5560.	11956.	5454.1	106.	
117 P	18.126	14.00	5328.	12048.	5485.2	-157.	
118 P	18.455	14.00	5307.	11604.	5516.8	-210.	
119 P	18.776	14.00	5198.	11366.	5547.6	-350.	
120 P	19.101	14.00	5475.	12508.	5578.9	-104.	
121 P	19.437	9.36	5832.	11864.	5611.1	221.	
122 P	19.758	10.23	5741.	12258.	5641.9	99.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 5600- 5720 A
FEATURE CONTINUUM (120)
CHANNEL NO 17 (8/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =6045276.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.77888
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 246. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 954. COUNTS = 9.5 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 86,122
POLYNOMIAL COEFFICIENTS =
1.96428E 04, 6.15569E 02,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.05	188736.	10908.		6308397.	
2 P Z	-21.483	-0.09	193217.	8209.		6538809.	
3	-20.888	14.00	4340.	12061.		-176892.	
4 P Z	-20.406	0.07	168708.	8680.		5668155.	
5	-19.952	14.00	3469.	7529.		-83831.	
6 P Z	-19.457	0.00	180152.	9720.		6040343.	
7 P Z	-19.134	-0.03	182741.	7068.		6203255.	
8 P Z	-18.812	0.07	168573.	9400.		5643802.	
9 P Z	-18.491	0.08	171131.	13286.		5627396.	
10 P Z	-18.172	0.03	177786.	12911.		5870545.	
11 P Z	-17.848	-0.04	186210.	9688.		6253246.	
12 P Z	-17.527	-0.01	182761.	11773.		6075693.	
13	-16.963	14.00	7601.	18466.		-237363.	
14 P	-16.401	0.13	161740.	11787.		5339575.	
15	-15.968	14.00	3823.	9498.		-125118.	
16 P Z	-15.567	-0.01	185242.	14744.		6081536.	
17 P Z	-15.248	0.00	182536.	13073.		6032379.	
18 P Z	-14.922	0.04	178178.	15219.		5821346.	
19 P Z	-14.603	-0.01	182787.	9913.		6127307.	
20 P Z	-14.277	-0.05	185951.	7555.		6302329.	
21 P Z	-13.958	-0.00	181589.	11248.		6048984.	
22 P Z	-13.627	-0.04	189525.	13181.		6274049.	
23 P Z	-13.285	-0.03	188054.	13180.		6222590.	
24 P Z	-12.951	-0.00	181585.	10909.		6058086.	
25 P Z	-12.618	0.06	172980.	12725.		5707406.	
26	-12.175	14.00	8489.	15594.		-127990.	
27 P	-11.771	-0.04	189223.	13152.		6264269.	
28	-11.360	14.00	5299.	8889.		-56856.	
29 P	-10.951	0.03	177925.	12814.		5878055.	
30 P	-10.627	0.04	179308.	15588.		5850838.	
31 P	-10.306	0.01	181047.	12282.		6001826.	
32 P	-9.986	-0.04	185970.	9171.		6258940.	
33 P	-9.661	-0.05	188356.	10487.		6306575.	
34 P	-9.341	-0.04	189186.	13256.		6260139.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 5600- 5720 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.02	180776.	13748.		5952377.	
36 P	-8.696	0.03	174974.	9270.		5871381.	
37 P	-8.368	-0.08	196216.	12699.		6521375.	
38 P	-8.021	-0.04	191905.	16121.		6277201.	
39	-7.654	14.00	12079.	19428.		-106857.	
40 P	-7.295	-0.01	184091.	12725.		6096291.	
41	-6.944	14.00	3896.	8446.		-93884.	
42 P	-6.519	-0.06	191678.	12273.		6374158.	
43 P	-6.199	-0.11	197100.	8442.		6668364.	
44 P	-5.880	-0.06	191495.	11825.		6379966.	
45 P	-5.559	-0.06	191184.	12053.		6362864.	
46 P	-5.240	-0.04	193032.	17614.		6275948.	
47 P	-4.918	-0.02	187578.	15253.		6149421.	
48 P	-4.592	-0.03	187307.	12023.		6227987.	
49 P	-4.260	-0.07	193656.	12532.		6436327.	
50 P	-3.939	-0.07	194836.	14270.		6430248.	
51 P	-3.618	-0.08	196848.	13838.		6512443.	
52 P	-3.297	-0.08	195172.	12181.		6498955.	
53 P	-2.973	-0.04	188146.	12516.		6243912.	
54 P	-2.646	-0.03	186392.	10397.		6240287.	
55 P	-2.325	0.07	171611.	11898.		5682035.	
56 P	-2.002	0.20	155232.	15217.		5018291.	
57 P	-1.683	0.29	141042.	10756.		4643253.	
58 P	-1.363	0.42	124000.	8211.		4116159.	
59 P	-1.040	0.70	100005.	11952.		3174353.	
60 P	-0.718	C.91	83218.	10610.		2623392.	
61 P	-0.397	1.05	72927.	9703.		2287933.	
62 P	-0.076	1.52	54340.	14975.		1493669.	
63 P	0.250	1.98	38133.	13286.		972468.	
64 P	0.569	2.77	25144.	15062.		469438.	
65 P	1.212	4.57	109886.	29163.	20389.0	89497.	
66 P	1.533	5.62	54646.	29402.	20586.3	34060.	
67 P	1.857	6.70	33383.	29260.	20785.9	12597.	
68 P	2.179	7.42	27465.	30399.	20984.4	6481.	
69 P	2.502	8.16	24467.	28515.	21182.8	3284.	
70 P	2.824	8.26	24383.	26365.	21381.5	3002.	
71 P	3.147	8.50	23990.	27807.	21579.9	2410.	
72 P	3.469	8.44	24329.	31310.	21778.2	2551.	
73 P	3.793	8.49	24402.	29934.	21978.0	2424.	
74 P	4.114	9.32	23310.	28215.	22175.3	1135.	
75 P	4.437	8.54	24696.	28828.	22374.0	2322.	
76 P	4.764	10.52	22951.	29466.	22575.4	376.	
77 P	5.086	9.36	23865.	30849.	22773.9	1091.	
78 P	5.409	9.17	24268.	31861.	22972.4	1296.	
79 P	5.733	9.49	24137.	31679.	23171.8	965.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 5600- 5720 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	10.42	23784.	32763.	23373.4	411.	0.937233
81 P	6.381	9.12	24925.	31686.	23571.0	1354.	1.019332
82 P	6.702	10.87	24040.	30025.	23768.3	272.	1.035761
83 P	7.028	10.86	24243.	29228.	23968.8	274.	1.065564
84 P	7.364	9.92	24828.	32204.	24175.6	652.	0.994524
85 P	7.683	9.24	25588.	33700.	24372.0	1216.	0.974208
86 P	8.020	11.16	24787.	32097.	24579.7	207.	0.999707
87 P	8.344	14.00	24232.	28893.	24779.3	-547.	1.084400
88 P	8.668	14.00	24721.	30277.	24978.7	-258.	1.042114
89 P	8.991	14.00	24418.	30848.	25177.2	-759.	1.015523
90 P	9.315	9.16	26685.	34272.	25376.8	1308.	0.996534
91 P	9.637	14.00	24663.	29396.	25575.2	-912.	1.075159
92 P	9.963	14.00	24422.	28658.	25775.8	-1354.	1.098599
93 P	10.286	14.00	25311.	32104.	25974.4	-663.	1.028554
94 P	10.606	9.79	26903.	33001.	26171.7	731.	1.048194
95 P	10.929	10.00	26977.	34032.	26370.2	607.	1.011329
96 P	11.254	10.94	26824.	37784.	26570.7	253.	0.925800
97 P	11.579	14.00	26274.	35692.	26770.3	-496.	0.945601
98 P	11.913	14.00	26946.	35106.	26976.0	-30.	0.984208
99 P	12.245	14.00	26393.	34890.	27180.6	-788.	0.961412
100 P	12.568	10.23	27866.	36398.	27379.1	487.	0.967106
101 P	12.890	9.66	28406.	34761.	27577.6	828.	1.052082
102 P	13.216	8.93	29403.	38334.	27778.1	1625.	0.971486
103 P	13.537	14.00	27837.	38806.	27975.6	-139.	0.923142
104 P	13.859	10.29	28638.	38484.	28174.1	464.	0.952737
105 P	14.180	14.00	27739.	35633.	28371.4	-632.	0.989722
106 P	14.504	9.82	29283.	39712.	28571.1	712.	0.943021
107 P	14.825	8.99	30296.	40814.	28768.5	1528.	0.936075
108 P	15.154	9.08	30380.	37414.	28971.1	1409.	1.028826
109 P	15.498	12.66	29235.	41552.	29182.8	52.	
110 P	15.822	14.00	27845.	39310.	29382.4	-1537.	
111 P	16.145	14.00	28228.	38010.	29580.9	-1353.	
112 P	16.472	14.00	29510.	36046.	29782.4	-272.	
113 P	16.811	9.47	30979.	42293.	29991.2	988.	
114 P	17.145	8.90	31855.	41638.	30196.8	1658.	
115 P	17.469	14.00	29585.	39080.	30396.2	-811.	
116 P	17.802	10.30	31058.	42146.	30601.1	457.	
117 P	18.126	14.00	30027.	41506.	30800.5	-773.	
118 P	18.455	14.00	29006.	39373.	31003.1	-1997.	
119 P	18.776	14.00	30133.	38989.	31200.5	-1068.	
120 P	19.101	14.00	31247.	41486.	31401.0	-154.	
121 P	19.437	9.23	32832.	40531.	31607.7	1224.	
122 P	19.758	14.00	31811.	42891.	31805.3	6.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 6290- 6360 A
FEATURE CONTINUUM (70)
CHANNEL NO 19 (9/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =2950747.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.68048
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 173. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 453. COUNTS = 9.5 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 86,122
POLYNOMIAL COEFFICIENTS =
8.82936E 03, 2.98045E 02,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.03	89975.	5316.		3022514.	
2 P Z	-21.483	-0.07	92288.	3955.		3135884.	
3	-20.888	14.00	1979.	6446.		-84258.	
4 P Z	-20.406	0.05	83286.	4245.		2813905.	
5	-19.952	14.00	1579.	3552.		-29332.	
6 P Z	-19.457	-0.02	89094.	4963.		3000086.	
7 P Z	-19.134	-0.04	89967.	3409.		3067653.	
8 P Z	-18.812	0.05	83828.	4592.		2824611.	
9 P Z	-18.491	0.07	83096.	6435.		2755097.	
10 P Z	-18.172	0.03	85902.	6258.		2857524.	
11 P Z	-17.848	-0.01	88257.	4520.		2981341.	
12 P Z	-17.527	-0.00	88496.	5796.		2959317.	
13	-16.963	14.00	3518.	9722.		-108416.	
14 P	-16.401	0.11	79805.	5822.		2654513.	
15	-15.968	14.00	1853.	4352.		-38796.	
16 P Z	-15.567	-0.00	89369.	7324.		2953479.	
17 P Z	-15.248	0.00	88805.	6701.		2948577.	
18 P Z	-14.922	0.04	86350.	7472.		2844290.	
19 P Z	-14.603	-0.03	89783.	4775.		3028679.	
20 P Z	-14.277	-0.06	91305.	3651.		3108719.	
21 P Z	-13.958	0.00	87947.	5445.		2948461.	
22 P Z	-13.627	-0.04	91651.	6369.		3056095.	
23 P Z	-13.285	-0.00	88756.	6365.		2954866.	
24 P Z	-12.951	0.00	87904.	5329.		2949719.	
25 P Z	-12.618	0.06	84283.	6116.		2804241.	
26	-12.175	14.00	3771.	8054.		-59835.	
27 P	-11.771	-0.03	90845.	6582.		3022812.	
28	-11.360	14.00	2485.	4193.		-12889.	
29 P	-10.951	0.04	85258.	6109.		2838532.	
30 P	-10.627	0.04	86766.	7743.		2852395.	
31 P	-10.306	0.04	85657.	6027.		2854451.	
32 P	-9.986	-0.01	88400.	4437.		2988324.	
33 P	-9.661	-0.04	91104.	4956.		3070602.	
34 P	-9.341	-0.03	91065.	6576.		3030654.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 6290- 6360 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.01	88131.	6981.		2918319.	
36 P	-8.696	0.03	84667.	4448.		2857406.	
37 P	-8.368	-0.06	93635.	6234.		3128750.	
38 P	-8.021	-0.02	91496.	7978.		3012349.	
39	-7.654	14.00	5446.	10373.		-56441.	
40 P	-7.295	0.00	88445.	6423.		2942598.	
41	-6.944	14.00	1814.	3908.		-29586.	
42 P	-6.519	-0.05	92457.	5911.		3095214.	
43 P	-6.199	-0.10	95119.	4010.		3233658.	
44 P	-5.880	-0.04	90955.	5694.		3047810.	
45 P	-5.559	-0.05	92009.	5890.		3080032.	
46 P	-5.240	-0.01	91213.	8680.		2985725.	
47 P	-4.918	-0.01	89996.	7349.		2974829.	
48 P	-4.592	-0.02	90053.	5923.		3010787.	
49 P	-4.260	-0.06	93093.	6207.		3110423.	
50 P	-3.939	-0.04	92545.	7018.		3071928.	
51 P	-3.618	-0.07	94656.	6631.		3155029.	
52 P	-3.297	-0.05	92640.	5944.		3100831.	
53 P	-2.973	-0.02	89887.	6058.		3001761.	
54 P	-2.646	-0.02	89265.	4897.		3007644.	
55 P	-2.325	0.08	82550.	5969.		2747086.	
56 P	-2.002	0.21	74789.	7443.		2440346.	
57 P	-1.683	0.30	67795.	5249.		2247810.	
58 P	-1.363	0.42	60129.	3895.		2011748.	
59 P	-1.040	0.68	49192.	5927.		1580558.	
60 P	-0.718	0.89	40802.	5224.		1303651.	
61 P	-0.397	1.04	35469.	4796.		1127189.	
62 P	-0.076	1.49	26586.	7535.		751051.	
63 P	0.250	1.94	18602.	6534.		495451.	
64 P	0.569	2.69	12214.	7576.		247054.	
65 P	1.212	4.39	60752.	14484.	9190.6	51561.	
66 P	1.533	5.39	29827.	14768.	9286.2	20541.	
67 P	1.857	6.35	17874.	14707.	9382.8	8491.	
68 P	2.179	7.02	14061.	15136.	9478.9	4582.	
69 P	2.502	7.47	12596.	14638.	9575.0	3021.	
70 P	2.824	7.64	12259.	13276.	9671.2	2588.	
71 P	3.147	7.81	11977.	14594.	9767.2	2210.	
72 P	3.469	7.98	11751.	15992.	9863.3	1888.	
73 P	3.793	8.18	11533.	15308.	9960.0	1573.	
74 P	4.114	8.87	10894.	14486.	10055.5	838.	
75 P	4.437	8.33	11526.	14337.	10151.7	1374.	
76 P	4.764	9.28	10823.	15004.	10249.2	574.	
77 P	5.086	8.87	11181.	16010.	10345.3	836.	
78 P	5.409	9.16	11083.	16267.	10441.5	642.	
79 P	5.733	9.36	11068.	16067.	10538.0	530.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 6290- 6360 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	11.78	10693.	16857.	10635.6	57.	0.937233
81 P	6.381	9.09	11411.	16169.	10731.3	680.	1.019332
82 P	6.702	9.46	11314.	15479.	10826.8	487.	1.035761
83 P	7.028	12.04	10969.	15360.	10923.9	45.	1.065564
84 P	7.364	9.49	11497.	17050.	11024.0	473.	0.994524
85 P	7.683	9.53	11576.	17338.	11119.1	457.	0.974208
86 P	8.020	10.55	11397.	16470.	11219.7	177.	0.999707
87 P	8.344	14.00	11077.	15071.	11316.3	-239.	1.084400
88 P	8.668	14.00	11111.	15696.	11412.9	-302.	1.042114
89 P	8.991	14.00	11405.	16258.	11509.0	-104.	1.015523
90 P	9.315	9.37	12135.	17950.	11605.6	529.	0.996534
91 P	9.637	14.00	11228.	15298.	11701.7	-474.	1.075159
92 P	9.963	14.00	11060.	14978.	11798.8	-739.	1.098599
93 P	10.286	14.00	11636.	16471.	11894.9	-259.	1.028554
94 P	10.606	9.51	12454.	17105.	11990.5	464.	1.048194
95 P	10.929	9.88	12417.	17974.	12086.6	330.	1.011329
96 P	11.254	9.80	12539.	19928.	12183.7	355.	0.925800
97 P	11.579	14.00	12119.	19120.	12280.3	-161.	0.945601
98 P	11.913	14.00	12386.	18542.	12379.9	6.	0.984208
99 P	12.245	14.00	11863.	18318.	12479.0	-616.	0.961412
100 P	12.568	11.20	12673.	19496.	12575.1	98.	0.967106
101 P	12.890	9.53	13128.	18330.	12671.2	457.	1.052082
102 P	13.216	9.10	13447.	20474.	12768.3	679.	0.971486
103 P	13.537	14.00	12732.	20572.	12863.9	-132.	0.923142
104 P	13.859	9.70	13348.	20448.	12960.0	388.	0.952737
105 P	14.180	14.00	12658.	19053.	13055.5	-398.	0.989722
106 P	14.504	9.96	13458.	21195.	13152.2	306.	0.943021
107 P	14.825	9.62	13665.	21754.	13247.8	417.	0.936075
108 P	15.154	9.14	13995.	20228.	13345.9	649.	1.028826
109 P	15.498	10.41	13651.	22011.	13448.4	203.	
110 P	15.822	14.00	12698.	20620.	13545.0	-847.	
111 P	16.145	14.00	13129.	20335.	13641.2	-512.	
112 P	16.472	14.00	13518.	19418.	13738.7	-221.	
113 P	16.811	9.14	14493.	22622.	13839.8	653.	
114 P	17.145	9.55	14387.	22240.	13939.3	448.	
115 P	17.469	14.00	13553.	21149.	14035.9	-483.	
116 P	17.802	9.99	14432.	22464.	14135.1	297.	
117 P	18.126	14.00	13956.	22318.	14231.6	-276.	
118 P	18.455	14.00	13355.	21150.	14329.7	-975.	
119 P	18.776	14.00	13976.	21071.	14425.3	-449.	
120 P	19.101	10.86	14656.	22316.	14522.4	134.	
121 P	19.437	9.44	15115.	21972.	14622.5	493.	
122 P	19.758	11.13	14822.	22834.	14718.1	104.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 6400- 6440 A
FEATURE H2 DIPOLE (40)
CHANNEL NO 20 (10/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =2367224.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.73870
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 143. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 313. COUNTS = 9.7 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 85,122
POLYNOMIAL COEFFICIENTS =
6.42363E 03, 2.05338E 02,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.02	72136.	4026.		2420670.	
2 P Z	-21.483	-0.06	73647.	3006.		2499925.	
3	-20.888	14.00	1599.	4265.		-54304.	
4 P Z	-20.406	0.05	67134.	3140.		2268507.	
5	-19.952	14.00	1238.	2768.		-28235.	
6 P Z	-19.457	-0.01	70646.	3578.		2380102.	
7 P Z	-19.134	-0.03	71130.	2476.		2425532.	
8 P Z	-18.812	0.06	66703.	3266.		2250164.	
9 P Z	-18.491	0.07	66870.	4762.		2217331.	
10 P Z	-18.172	0.02	69879.	4558.		2327920.	
11 P Z	-17.848	-0.03	71753.	3437.		2422492.	
12 P Z	-17.527	-0.01	71005.	4094.		2379326.	
13	-16.963	14.00	2724.	6807.		-80651.	
14 P	-16.401	0.12	63711.	4261.		2119719.	
15	-15.968	14.00	1366.	3283.		-37070.	
16 P Z	-15.567	-0.00	71447.	5158.		2367286.	
17 P Z	-15.248	0.01	70424.	4772.		2341460.	
18 P Z	-14.922	0.04	69290.	5393.		2285717.	
19 P Z	-14.603	-0.02	71468.	3533.		2410034.	
20 P Z	-14.277	-0.05	72703.	2733.		2473944.	
21 P Z	-13.958	-0.01	71079.	3976.		2384967.	
22 P Z	-13.627	-0.03	72794.	4650.		2427565.	
23 P Z	-13.285	-0.02	72001.	4602.		2401052.	
24 P Z	-12.951	-0.01	70887.	3785.		2383185.	
25 P Z	-12.618	0.04	68352.	4444.		2277422.	
26	-12.175	14.00	2963.	5566.		-40201.	
27 P	-11.771	-0.02	72421.	4801.		2410607.	
28	-11.360	14.00	1948.	3158.		-13468.	
29 P	-10.951	0.03	68987.	4633.		2294759.	
30 P	-10.627	0.03	69655.	5569.		2293941.	
31 P	-10.306	0.03	69204.	4349.		2309698.	
32 P	-9.986	-0.02	71396.	3234.		2415245.	
33 P	-9.661	-0.04	73081.	3648.		2463516.	
34 P	-9.341	-0.03	73317.	4739.		2443570.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 6400- 6440 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.01	70470.	5001.		2337151.	
36 P	-8.696	0.03	68236.	3196.		2305629.	
37 P	-8.368	-0.06	75167.	4556.		2513050.	
38 P	-8.021	-0.02	73252.	5819.		2413372.	
39	-7.654	14.00	4319.	7065.		-31496.	
40 P	-7.295	0.01	70641.	4548.		2354848.	
41	-6.944	14.00	1444.	2892.		-24231.	
42 P	-6.519	-0.05	73830.	4371.		2471039.	
43 P	-6.199	-0.10	76070.	2919.		2586979.	
44 P	-5.880	-0.05	73834.	4245.		2474436.	
45 P	-5.559	-0.05	73696.	4120.		2472839.	
46 P	-5.240	-0.02	73763.	6354.		2417425.	
47 P	-4.918	-0.01	72098.	5563.		2379601.	
48 P	-4.592	-0.02	71738.	4268.		2400481.	
49 P	-4.260	-0.05	74098.	4489.		2477367.	
50 P	-3.939	-0.05	74617.	5138.		2478754.	
51 P	-3.618	-0.06	75418.	4913.		2512606.	
52 P	-3.297	-0.05	74328.	4324.		2489683.	
53 P	-2.973	-0.02	71948.	4386.		2404782.	
54 P	-2.646	-0.02	71914.	3692.		2421534.	
55 P	-2.325	0.07	66246.	4219.		2209530.	
56 P	-2.002	0.21	59751.	5601.		1946474.	
57 P	-1.683	0.30	54262.	3747.		1802293.	
58 P	-1.363	0.40	48733.	2915.		1630289.	
59 P	-1.040	0.67	39334.	4054.		1271876.	
60 P	-0.718	0.87	33095.	3700.		1062663.	
61 P	-0.397	1.05	28304.	3502.		900098.	
62 P	-0.076	1.47	21517.	5390.		613740.	
63 P	0.250	1.96	14713.	4822.		390285.	
64 P	0.569	2.66	9740.	5278.		204440.	
65 P	1.212	4.50	44191.	10025.	6672.5	37518.	
66 P	1.533	5.50	21727.	10020.	6738.4	14989.	
67 P	1.857	6.45	13028.	10130.	6804.9	6223.	
68 P	2.179	7.04	10492.	10291.	6871.2	3621.	
69 P	2.502	7.61	9079.	9887.	6937.3	2142.	
70 P	2.824	7.77	8848.	8875.	7003.6	1844.	
71 P	3.147	8.01	8544.	9645.	7069.8	1474.	
72 P	3.469	7.96	8689.	10876.	7135.9	1553.	
73 P	3.793	8.31	8322.	10425.	7202.6	1119.	
74 P	4.114	9.15	7788.	9752.	7268.4	520.	
75 P	4.437	8.37	8393.	9977.	7334.7	1058.	
76 P	4.764	9.49	7779.	10311.	7401.8	377.	
77 P	5.086	9.36	7894.	10667.	7468.1	426.	
78 P	5.409	9.08	8085.	11121.	7534.3	551.	
79 P	5.733	9.92	7855.	10911.	7600.8	254.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 6400- 6440 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	9.86	7937.	11339.	7668.0	269.	0.937233
81 P	6.381	9.25	8208.	11005.	7734.0	474.	1.019332
82 P	6.702	14.00	7744.	10453.	7799.8	-56.	1.035761
83 P	7.028	14.00	7819.	10053.	7866.7	-48.	1.065564
84 P	7.364	10.59	8073.	11073.	7935.6	137.	0.994524
85 P	7.683	9.75	8300.	11639.	8001.2	299.	0.974208
86 P	8.020	14.00	8005.	11247.	8070.4	-65.	0.999707
87 P	8.344	14.00	8119.	9987.	8137.0	-18.	1.084400
88 P	8.668	14.00	8123.	10274.	8203.5	-81.	1.042114
89 P	8.991	14.00	8008.	10613.	8269.8	-262.	1.015523
90 P	9.315	9.63	8668.	11993.	8336.3	332.	0.996534
91 P	9.637	14.00	8182.	9969.	8402.5	-221.	1.075159
92 P	9.963	14.00	8047.	9703.	8469.4	-422.	1.098599
93 P	10.286	14.00	8195.	10752.	8535.7	-341.	1.028554
94 P	10.606	10.11	8816.	11314.	8601.5	215.	1.048194
95 P	10.929	9.63	9000.	11611.	8667.7	332.	1.011329
96 P	11.254	11.15	8817.	12939.	8734.6	82.	0.925800
97 P	11.579	14.00	8596.	12644.	8801.2	-205.	0.945601
98 P	11.913	14.00	8742.	12109.	8869.8	-128.	0.984208
99 P	12.245	14.00	8633.	12174.	8938.0	-305.	0.961412
100 P	12.568	10.97	9101.	12653.	9004.2	97.	0.967106
101 P	12.890	9.40	9480.	12008.	9070.5	410.	1.052082
102 P	13.216	9.18	9640.	13636.	9137.3	503.	0.971486
103 P	13.537	14.00	9124.	13430.	9203.2	-79.	0.923142
104 P	13.859	11.04	9360.	13307.	9269.4	91.	0.952737
105 P	14.180	14.00	9093.	12351.	9335.3	-242.	0.989722
106 P	14.504	10.52	9548.	13616.	9401.9	146.	0.943021
107 P	14.825	9.73	9770.	14343.	9467.7	302.	0.936075
108 P	15.154	9.25	10008.	12988.	9535.3	473.	1.028826
109 P	15.498	10.19	9805.	14428.	9605.9	199.	
110 P	15.822	14.00	9109.	13790.	9672.5	-563.	
111 P	16.145	14.00	9177.	13064.	9738.7	-562.	
112 P	16.472	14.00	9628.	12510.	9805.9	-178.	
113 P	16.811	10.00	10112.	14701.	9875.6	236.	
114 P	17.145	9.43	10346.	14544.	9944.1	402.	
115 P	17.469	14.00	9816.	13645.	10010.7	-195.	
116 P	17.802	10.20	10275.	14388.	10079.0	196.	
117 P	18.126	14.00	9998.	14283.	10145.5	-148.	
118 P	18.455	14.00	9656.	13529.	10213.1	-557.	
119 P	18.776	14.00	9910.	13136.	10279.0	-369.	
120 P	19.101	10.42	10507.	14048.	10345.9	161.	
121 P	19.437	9.02	10997.	13803.	10414.8	582.	
122 P	19.758	14.00	10364.	14237.	10480.7	-117.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 6800- 6900 A
FEATURE CH4 WEAK (100)
CHANNEL NO 21 (11/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE = 764602.6 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 2.34046
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 65. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 111. COUNTS = 9.6 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 89,122
POLYNOMIAL COEFFICIENTS =
2.11316E 03, 8.04819E 01,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.02	23605.	564.		779974.	
2 P Z	-21.483	-0.04	23838.	465.		796239.	
3	-20.888	14.00	523.	602.		-31009.	
4 P Z	-20.406	0.05	21813.	435.		727821.	
5	-19.952	14.00	447.	371.		-14746.	
6 P Z	-19.457	-0.00	23003.	486.		765294.	
7 P Z	-19.134	-0.03	23416.	379.		788514.	
8 P Z	-18.812	0.04	22185.	482.		736991.	
9 P Z	-18.491	0.06	22198.	646.		724012.	
10 P Z	-18.172	0.03	22808.	679.		742659.	
11 P Z	-17.848	-0.04	23845.	511.		792716.	
12 P Z	-17.527	-0.00	23349.	618.		766591.	
13	-16.963	14.00	869.	918.		-44784.	
14 P	-16.401	0.11	21111.	547.		694077.	
15	-15.968	14.00	451.	461.		-21978.	
16 P Z	-15.567	-0.00	23515.	691.		766421.	
17 P Z	-15.248	0.02	23182.	710.		753209.	
18 P Z	-14.922	0.03	23072.	805.		741577.	
19 P Z	-14.603	-0.01	23148.	494.		769713.	
20 P Z	-14.277	-0.07	24234.	399.		815505.	
21 P Z	-13.958	-0.00	23351.	612.		767152.	
22 P Z	-13.627	-0.02	23774.	631.		780401.	
23 P Z	-13.285	-0.01	23619.	638.		774402.	
24 P Z	-12.951	-0.01	23421.	582.		772060.	
25 P Z	-12.618	0.05	22315.	613.		730810.	
26	-12.175	14.00	932.	755.		-29227.	
27 P	-11.771	-0.01	23584.	673.		770310.	
28	-11.360	14.00	624.	448.		-14858.	
29 P	-10.951	0.02	22859.	592.		751571.	
30 P	-10.627	0.04	22851.	749.		738430.	
31 P	-10.306	0.02	22767.	591.		748432.	
32 P	-9.986	-0.03	23547.	466.		785972.	
33 P	-9.661	-0.07	24443.	466.		817332.	
34 P	-9.341	-0.03	24013.	653.		786964.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 6800- 6900 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT CCUNTS	CORRECTION FACTOR
35 P	-9.020	0.01	23195.	699.		754566.	
36 P	-8.696	0.01	22717.	468.		756758.	
37 P	-8.368	-0.05	24330.	605.		8C1991.	
38 P	-8.021	0.C1	23589.	840.		756805.	
39	-7.654	14.00	1377.	956.		-30117.	
40 P	-7.295	0.01	23207.	672.		757197.	
41	-6.944	14.00	465.	381.		-14935.	
42 P	-6.519	-0.05	24364.	634.		800805.	
43 P	-6.199	-0.11	25031.	402.		843155.	
44 P	-5.880	-0.05	24195.	608.		797020.	
45 P	-5.559	-0.05	24208.	582.		799605.	
46 P	-5.240	-0.01	24253.	968.		769560.	
47 P	-4.918	0.01	23567.	798.		759476.	
48 P	-4.592	-0.04	23927.	546.		792719.	
49 P	-4.260	-0.07	24666.	591.		814897.	
50 P	-3.939	-0.06	24604.	660.		807075.	
51 P	-3.618	-0.05	24420.	655.		801045.	
52 P	-3.297	-0.06	24625.	628.		810432.	
53 P	-2.973	-0.02	23713.	649.		776791.	
54 P	-2.646	-0.02	23475.	513.		779602.	
55 P	-2.325	0.08	21760.	625.		710402.	
56 P	-2.002	0.21	19873.	811.		629121.	
57 P	-1.683	0.28	18133.	508.		593042.	
58 P	-1.363	0.40	16058.	379.		530984.	
59 P	-1.040	0.67	13133.	593.		411079.	
60 P	-0.718	0.88	10967.	519.		341331.	
61 P	-0.397	1.06	9301.	447.		288918.	
62 P	-0.076	1.54	6978.	720.		185250.	
63 P	0.250	2.02	4850.	620.		118962.	
64 P	0.569	2.92	3323.	788.		51755.	
65 P	1.212	4.49	14424.	1235.	2210.7	12213.	
66 P	1.533	5.44	7329.	1186.	2236.5	5092.	
67 P	1.857	6.30	4573.	1147.	2262.6	2310.	
68 P	2.179	6.84	3698.	1186.	2288.6	1409.	
69 P	2.502	7.30	3230.	1145.	2314.5	915.	
70 P	2.824	7.45	3141.	996.	2340.5	801.	
71 P	3.147	7.48	3147.	1081.	2366.4	781.	
72 P	3.469	7.82	2960.	1250.	2392.4	568.	
73 P	3.793	7.93	2934.	1188.	2418.5	516.	
74 P	4.114	8.01	2921.	1112.	2444.3	477.	
75 P	4.437	8.04	2937.	1067.	2470.2	467.	
76 P	4.764	8.67	2756.	1117.	2496.6	259.	
77 P	5.086	8.76	2762.	1193.	2522.5	239.	
78 P	5.409	8.91	2757.	1224.	2548.5	209.	
79 P	5.733	9.01	2764.	1219.	2574.6	189.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 6800- 6900 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
80 P	6.060	10.40	2654.	1275.	2600.9	53.	0.937233
81 P	6.381	8.93	2832.	1203.	2626.7	205.	1.019332
82 P	6.702	10.29	2711.	1182.	2652.5	58.	1.035761
83 P	7.028	10.12	2747.	1149.	2678.8	68.	1.065564
84 P	7.364	9.92	2788.	1242.	2705.8	82.	0.994524
85 P	7.683	9.64	2838.	1295.	2731.5	107.	0.974208
86 P	8.020	10.06	2831.	1251.	2758.6	72.	0.999707
87 P	8.344	11.61	2802.	1034.	2784.7	17.	1.084400
88 P	8.668	9.61	2920.	1054.	2810.8	109.	1.042114
89 P	8.991	14.00	2838.	1187.	2836.8	1.	1.015523
90 P	9.315	9.17	3027.	1270.	2862.8	164.	0.996534
91 P	9.637	14.00	2816.	1003.	2888.8	-73.	1.075159
92 P	9.963	14.00	2729.	1050.	2915.0	-186.	1.098599
93 P	10.286	14.00	2880.	1174.	2941.0	-61.	1.028554
94 P	10.606	10.16	3033.	1226.	2966.8	66.	1.048194
95 P	10.929	14.00	2952.	1272.	2992.7	-41.	1.011329
96 P	11.254	10.50	3067.	1565.	3018.9	48.	0.925800
97 P	11.579	9.91	3128.	1420.	3045.0	83.	0.945601
98 P	11.913	14.00	3063.	1327.	3071.9	-9.	0.984208
99 P	12.245	14.00	2904.	1263.	3098.7	-195.	0.961412
100 P	12.568	10.59	3169.	1408.	3124.6	44.	0.967106
101 P	12.890	9.57	3264.	1335.	3150.6	113.	1.052082
102 P	13.216	9.72	3276.	1435.	3176.8	99.	0.971486
103 P	13.537	14.00	3110.	1543.	3202.6	-93.	0.923142
104 P	13.859	10.15	3295.	1442.	3228.6	66.	0.952737
105 P	14.180	14.00	3123.	1358.	3254.4	-131.	0.989722
106 P	14.504	9.80	3372.	1490.	3280.5	92.	0.943021
107 P	14.825	9.30	3452.	1582.	3306.3	146.	0.936075
108 P	15.154	10.30	3391.	1390.	3332.8	58.	1.028826
109 P	15.498	9.38	3496.	1570.	3360.5	136.	
110 P	15.822	14.00	3261.	1531.	3386.5	-126.	
111 P	16.145	14.00	3348.	1464.	3412.5	-65.	
112 P	16.472	14.00	3282.	1341.	3438.9	-157.	
113 P	16.811	10.79	3503.	1646.	3466.1	37.	
114 P	17.145	9.65	3599.	1586.	3493.0	106.	
115 P	17.469	14.00	3445.	1501.	3519.1	-74.	
116 P	17.802	9.79	3639.	1660.	3545.9	93.	
117 P	18.126	14.00	3487.	1574.	3572.0	-85.	
118 P	18.455	14.00	3464.	1506.	3598.4	-134.	
119 P	18.776	14.00	3442.	1472.	3624.3	-182.	
120 P	19.101	13.34	3654.	1438.	3650.5	4.	
121 P	19.437	8.89	3890.	1520.	3677.5	213.	
122 P	19.758	10.66	3745.	1653.	3703.3	42.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 7130- 7400 A
FEATURE CH4 STRONG(270)
CHANNEL NO 22 (12/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =********* COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.85655
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 310. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 1668. COUNTS = 10.0 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 90,122
POLYNOMIAL COEFFICIENTS =
3.22904E 04, 1.10105E 03,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
1 P Z	-21.808	-0.02	504646.	18169.		17117904.	
2 P Z	-21.483	-0.05	513560.	13294.		17576C48.	
3	-20.888	14.C0	8534.	19164.		-275835.	
4 P Z	-20.406	0.05	470982.	14103.		16061570.	
5	-19.952	14.00	7172.	12559.		-125491.	
6 P Z	-19.457	-0.01	498195.	16094.		16954320.	
7 P Z	-19.134	-0.04	507486.	11362.		17421376.	
8 P Z	-18.812	0.05	471151.	15276.		16032318.	
9 P Z	-18.491	0.06	473997.	22472.		15916197.	
10 P Z	-18.172	0.02	488142.	21925.		16427670.	
11 P Z	-17.848	-0.02	5C3950.	15685.		17168016.	
12 P Z	-17.527	-0.01	499675.	19415.		16906560.	
13	-16.963	14.00	14159.	31529.		-449656.	
14 P	-16.401	0.10	453769.	19745.		15289970.	
15	-15.968	14.C0	8271.	15187.		-165812.	
16 P Z	-15.567	0.00	500021.	24159.		16776460.	
17 P Z	-15.248	0.C0	498629.	22330.		16782560.	
18 P Z	-14.922	0.C3	487648.	25517.		16302693.	
19 P Z	-14.603	-0.02	501358.	16134.		17063840.	
20 P Z	-14.277	-0.05	514856.	12311.		17650880.	
21 P Z	-13.958	-0.00	496153.	18127.		16821904.	
22 P Z	-13.627	-0.03	510608.	21892.		17214960.	
23 P Z	-13.285	-0.01	501094.	21337.		16898608.	
24 P Z	-12.951	-0.01	500635.	17731.		16990656.	
25 P Z	-12.618	0.05	478046.	20874.		161C5818.	
26	-12.175	14.00	15213.	25434.		-230C41.	
27 P	-11.771	-0.01	505449.	22046.		17029776.	
28	-11.360	12.32	12233.	14275.		199.	
29 P	-10.951	0.03	483953.	21045.		16307436.	
30 P	-10.627	0.03	490279.	26011.		16379969.	
31 P	-10.306	0.03	486593.	20403.		16419084.	
32 P	-9.986	-0.03	505058.	14813.		17232928.	
33 P	-9.661	-0.05	519637.	16876.		17681360.	
34 P	-9.341	-0.04	518302.	22044.		17479696.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 7130- 7400 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	-0.00	500117.	23069.		16812496.	
36 P	-8.696	0.02	483696.	14924.		16481946.	
37 P	-8.368	-0.06	524961.	21055.		17742416.	
38 P	-8.021	-0.02	513699.	27027.		17169200.	
39	-7.654	14.00	22285.	33872.		-235488.	
40 P	-7.295	-0.00	498478.	20769.		16824080.	
41	-6.944	14.00	8661.	13363.		-97480.	
42 P	-6.519	-0.05	520670.	20326.		17614080.	
43 P	-6.199	-0.09	533323.	13668.		18256544.	
44 P	-5.880	-0.04	515619.	19306.		17467872.	
45 P	-5.559	-0.04	516004.	19226.		17483744.	
46 P	-5.240	-0.02	515203.	29954.		17134096.	
47 P	-4.918	-0.01	505517.	25066.		16941616.	
48 P	-4.592	-0.02	507971.	19367.		17198368.	
49 P	-4.260	-0.05	520208.	20796.		17583824.	
50 P	-3.939	-0.06	526153.	23532.		17709872.	
51 P	-3.618	-0.07	531053.	22507.		17912096.	
52 P	-3.297	-0.06	522411.	20039.		17683616.	
53 P	-2.973	-0.01	504520.	20613.		17040224.	
54 P	-2.646	-0.03	506687.	16698.		17233440.	
55 P	-2.325	0.08	464578.	19976.		15661360.	
56 P	-2.002	0.20	420204.	25436.		13944581.	
57 P	-1.683	0.28	385328.	17450.		12963337.	
58 P	-1.363	0.41	340979.	13042.		11543273.	
59 P	-1.040	0.65	279558.	18933.		9216928.	
60 P	-0.718	0.86	231393.	16837.		7593991.	
61 P	-0.397	1.04	197460.	15702.		6440363.	
62 P	-0.076	1.44	148724.	24607.		4467636.	
63 P	0.250	1.89	103071.	22029.		2947067.	
64 P	0.569	2.56	66319.	24505.		1586519.	
65 P	1.212	4.50	300648.	43855.	33625.0	267023.	
66 P	1.533	5.53	137258.	44134.	33978.0	103280.	
67 P	1.857	6.54	74850.	43729.	34335.0	40515.	
68 P	2.179	7.20	56887.	45743.	34690.1	22197.	
69 P	2.502	7.71	48946.	42999.	35044.9	13901.	
70 P	2.824	7.92	46807.	38490.	35400.3	11407.	
71 P	3.147	8.07	45668.	41679.	35755.1	9913.	
72 P	3.469	8.25	44554.	48110.	36109.9	8444.	
73 P	3.793	8.51	43082.	44930.	36467.2	6615.	
74 P	4.114	8.91	41418.	42824.	36820.1	4598.	
75 P	4.437	8.68	42856.	43027.	37175.5	5681.	
76 P	4.764	9.72	39721.	44429.	37535.7	2185.	
77 P	5.086	9.53	40491.	46484.	37890.8	2600.	
78 P	5.409	9.40	41164.	48511.	38245.9	2918.	
79 P	5.733	9.70	40820.	47908.	38602.6	2217.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 7130- 7400 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	10.78	39786.	50213.	38963.1	823.	0.937233
81 P	6.381	9.83	41281.	48264.	39316.6	1964.	1.019332
82 P	6.702	10.57	40665.	45919.	39669.5	995.	1.035761
83 P	7.028	14.00	40006.	43523.	40028.1	-22.	1.065564
84 P	7.364	10.26	41717.	49524.	40398.0	1319.	0.994524
85 P	7.683	9.92	42559.	51720.	40749.3	1810.	0.974208
86 P	8.020	11.62	41498.	48851.	41120.8	377.	0.9997C7
87 P	8.344	14.00	40853.	42751.	41477.8	-625.	1.084400
88 P	8.668	14.00	41083.	45038.	41834.5	-752.	1.042114
89 P	8.991	14.0C	41001.	46491.	42189.6	-1189.	1.015523
90 P	9.315	9.80	44571.	52624.	42546.6	2024.	0.996534
91 P	9.637	14.00	40992.	43283.	42901.4	-1909.	1.075159
92 P	9.963	14.00	40907.	42226.	43260.3	-2353.	1.098599
93 P	10.286	14.00	42114.	47171.	43615.4	-1501.	1.028554
94 P	10.606	10.81	44765.	49779.	43968.3	797.	1.048194
95 P	10.929	10.44	45446.	52126.	44323.4	1123.	1.011329
96 P	11.254	10.95	45385.	58365.	44682.0	703.	0.925800
97 P	11.579	14.00	44530.	55431.	45039.0	-509.	0.945601
98 P	11.913	14.00	44834.	53292.	45407.0	-573.	0.984208
99 P	12.245	14.00	43467.	52823.	45772.9	-2306.	0.961412
100 P	12.568	14.00	46170.	56019.	46128.0	42.	0.967106
101 P	12.890	10.12	47982.	53013.	46483.1	1499.	1.052082
102 P	13.216	9.50	49514.	60201.	46841.6	2672.	0.971486
103 P	13.537	12.57	47352.	60395.	47194.9	157.	0.923142
104 P	13.859	11.28	48066.	60539.	47550.0	516.	0.952737
105 P	14.180	14.C0	46376.	54457.	47902.9	-1527.	0.989722
106 P	14.504	10.25	49599.	62407.	48260.2	1339.	0.943021
107 P	14.825	10.03	50241.	63671.	48613.1	1628.	0.936075
108 P	15.154	9.54	51533.	57497.	48975.5	2558.	1.028826
109 P	15.498	10.74	50206.	64205.	49354.2	852.	
110 P	15.822	14.00	47235.	61353.	49711.2	-2476.	
111 P	16.145	14.00	48393.	58558.	50066.3	-1673.	
112 P	16.472	14.00	49681.	55458.	50426.8	-746.	
113 P	16.811	9.92	52602.	66634.	50800.2	1802.	
114 P	17.145	9.55	53703.	64504.	51167.9	2535.	
115 P	17.469	14.00	49830.	61914.	51524.6	-1695.	
116 P	17.802	11.26	52416.	64895.	51891.0	525.	
117 P	18.126	14.C0	51366.	64966.	52247.7	-882.	
118 P	18.455	14.00	49425.	60811.	52610.1	-3185.	
119 P	18.776	14.00	51100.	59060.	52963.3	-1863.	
120 P	19.101	12.59	53476.	63976.	53321.9	154.	
121 P	19.437	9.72	55858.	62249.	53691.5	2167.	
122 P	19.758	12.99	54152.	65756.	54045.0	107.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 7440- 7550 A
FEATURE CH4 PREDCT(110)
CHANNEL NO 23 (13/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =3631983.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.59749
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 183. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 458. COUNTS = 9.7 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 88,122
POLYNOMIAL COEFFICIENTS =
8.87741E 03, 3.29837E 02,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.03	111567.	7847.		3740745.	
2 P Z	-21.483	-0.05	112442.	5936.		3811333.	
3	-20.888	14.00	2315.	8354.		-93676.	
4 P Z	-20.406	0.03	104805.	6102.		3540567.	
5	-19.952	14.00	1871.	5282.		-44974.	
6 P Z	-19.457	-0.02	109473.	6634.		3692821.	
7 P Z	-19.134	-0.05	111083.	4799.		3787546.	
8 P Z	-18.812	0.04	103594.	6555.		3488708.	
9 P Z	-18.491	0.07	103086.	9527.		3408776.	
10 P Z	-18.172	0.03	106322.	9417.		3524338.	
11 P Z	-17.848	-0.02	109080.	6421.		3683520.	
12 P Z	-17.527	-0.00	108914.	8178.		3640969.	
13	-16.963	14.00	3950.	13769.		-149691.	
14 P	-16.401	0.11	98632.	8258.		3279425.	
15	-15.968	14.00	2198.	6712.		-63433.	
16 P Z	-15.567	0.01	109342.	10368.		3610151.	
17 P Z	-15.248	0.01	108113.	9448.		3586375.	
18 P Z	-14.922	0.05	106017.	10952.		3481563.	
19 P Z	-14.603	-0.03	110481.	6716.		3726386.	
20 P Z	-14.277	-0.05	112031.	5130.		3813803.	
21 P Z	-13.958	-0.00	108706.	7896.		3639586.	
22 P Z	-13.627	-0.03	111955.	9468.		3720425.	
23 P Z	-13.285	0.01	108322.	9018.		3602681.	
24 P Z	-12.951	-0.01	108895.	7536.		3653728.	
25 P Z	-12.618	0.04	104867.	8828.		3485730.	
26	-12.175	14.00	4181.	11140.		-86628.	
27 P	-11.771	-0.00	109785.	9303.		3647927.	
28	-11.360	14.00	2932.	6132.		-25614.	
29 P	-10.951	0.04	105498.	8799.		3508421.	
30 P	-10.627	0.04	106698.	11149.		3501277.	
31 P	-10.306	0.04	105493.	8608.		3512241.	
32 P	-9.986	-0.02	109356.	6279.		3696150.	
33 P	-9.661	-0.06	113703.	7103.		3831065.	
34 P	-9.341	-0.04	112891.	9274.		3757243.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 7440- 7550 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.02	108096.	9688.		3580760.	
36 P	-8.696	0.02	105342.	6321.		3554781.	
37 P	-8.368	-0.05	114167.	8866.		3810436.	
38 P	-8.021	-0.00	111244.	11830.		3646146.	
39	-7.654	14.00	6213.	14768.		-91377.	
40 P	-7.295	0.02	106952.	8917.		3556844.	
41	-6.944	14.00	2110.	5830.		-48069.	
42 P	-6.519	-0.05	113654.	8679.		3796390.	
43 P	-6.199	-0.09	116016.	5547.		3944559.	
44 P	-5.880	-0.03	111926.	8255.		3744779.	
45 P	-5.559	-0.03	111708.	8244.		3737378.	
46 P	-5.240	-0.01	112154.	12911.		3655391.	
47 P	-4.918	-0.01	110669.	10695.		3649756.	
48 P	-4.592	-0.01	109907.	8368.		3671749.	
49 P	-4.260	-0.04	112745.	8630.		3765601.	
50 P	-3.939	-0.04	113539.	10022.		3764280.	
51 P	-3.618	-0.06	115336.	9482.		3838469.	
52 P	-3.297	-0.05	113889.	8277.		3813022.	
53 P	-2.973	-0.01	109558.	8701.		3652571.	
54 P	-2.646	-0.02	109544.	7086.		3685854.	
55 P	-2.325	0.09	100724.	8433.		3348985.	
56 P	-2.002	0.22	91272.	11149.		2961367.	
57 P	-1.683	0.29	83834.	7276.		2782031.	
58 P	-1.363	0.40	75365.	5427.		2524283.	
59 P	-1.040	0.66	61346.	8194.		1975754.	
60 P	-0.718	0.87	50797.	7314.		1624942.	
61 P	-0.397	1.04	43845.	6723.		1393981.	
62 P	-0.076	1.46	33380.	10796.		942531.	
63 P	0.250	1.93	23258.	9538.		614569.	
64 P	0.569	2.66	15317.	10683.		312689.	
65 P	1.212	4.32	77308.	18101.	9277.2	68031.	
66 P	1.533	5.24	38555.	18183.	9383.0	29172.	
67 P	1.857	6.06	23200.	18209.	9489.9	13710.	
68 P	2.179	6.56	18207.	18884.	9596.3	8611.	
69 P	2.502	6.91	15961.	17685.	9702.6	6258.	
70 P	2.824	7.05	15302.	15885.	9809.0	5493.	
71 P	3.147	7.23	14554.	17055.	9915.3	4639.	
72 P	3.469	7.34	14235.	19992.	10021.6	4213.	
73 P	3.793	7.63	13355.	18520.	10128.6	3226.	
74 P	4.114	7.90	12757.	17723.	10234.4	2523.	
75 P	4.437	7.81	13073.	17842.	10340.8	2732.	
76 P	4.764	8.30	12180.	18008.	10448.7	1731.	
77 P	5.086	8.27	12341.	19058.	10555.1	1786.	
78 P	5.409	8.68	11890.	20021.	10661.5	1229.	
79 P	5.733	8.72	11944.	19788.	10768.3	1176.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 7440- 7550 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	9.61	11397.	20375.	10876.3	521.	0.937233
81 P	6.381	8.96	11927.	19873.	10982.2	945.	1.019332
82 P	6.702	9.79	11528.	18335.	11087.9	440.	1.035761
83 P	7.028	10.15	11511.	17612.	11195.4	316.	1.065564
84 P	7.364	9.50	11880.	20430.	11306.2	574.	0.994524
85 P	7.683	9.54	11966.	21445.	11411.4	555.	0.974208
86 P	8.020	10.64	11725.	19746.	11522.7	202.	0.9997C7
87 P	8.344	14.00	11522.	17319.	11629.6	-108.	1.084400
88 P	8.668	14.00	11550.	18023.	11736.5	-187.	1.042114
89 P	8.991	14.00	11584.	18907.	11842.9	-259.	1.015523
90 P	9.315	9.31	12634.	21522.	11949.8	684.	0.996534
91 P	9.637	14.00	11552.	17433.	12056.1	-504.	1.075159
92 P	9.963	14.00	11569.	16813.	12163.6	-595.	1.098599
93 P	10.286	14.00	11841.	18710.	12270.0	-429.	1.028554
94 P	10.606	9.81	12808.	20336.	12375.7	432.	1.048194
95 P	10.929	9.83	12907.	21364.	12482.1	425.	1.011329
96 P	11.254	9.98	12958.	24107.	12589.5	368.	0.925800
97 P	11.579	14.00	12416.	22403.	12696.5	-280.	0.945601
98 P	11.913	14.00	12790.	21780.	12806.7	-17.	0.984208
99 P	12.245	14.00	12298.	21499.	12916.3	-618.	0.961412
100 P	12.568	14.00	12964.	23318.	13022.7	-59.	0.967106
101 P	12.890	10.02	13486.	21538.	13129.0	357.	1.052082
102 P	13.216	9.24	13965.	24205.	13236.5	729.	0.971486
103 P	13.537	14.00	13203.	24571.	13342.3	-139.	0.923142
104 P	13.859	9.96	13827.	24126.	13448.7	378.	0.952737
105 P	14.180	14.00	13043.	22080.	13554.4	-511.	0.989722
106 P	14.504	9.64	14168.	25229.	13661.4	507.	0.943021
107 P	14.825	9.94	14152.	25992.	13767.1	385.	0.936075
108 P	15.154	9.59	14404.	23641.	13875.7	528.	1.028826
109 P	15.498	14.00	13942.	26037.	13989.2	-47.	
110 P	15.822	14.00	13397.	24320.	14096.1	-699.	
111 P	16.145	14.00	13962.	23411.	14202.5	-240.	
112 P	16.472	14.00	14178.	22194.	14310.5	-132.	
113 P	16.811	9.62	14936.	27055.	14422.3	514.	
114 P	17.145	9.12	15352.	26293.	14532.5	82C.	
115 P	17.469	14.00	14110.	24779.	14639.3	-529.	
116 P	17.802	11.18	14872.	26192.	14749.1	123.	
117 P	18.126	14.00	14609.	25804.	14855.9	-247.	
118 P	18.455	14.00	14076.	24395.	14964.5	-888.	
119 P	18.776	14.00	14631.	23708.	15070.3	-439.	
120 P	19.101	11.68	15255.	25724.	15177.7	77.	
121 P	19.437	9.77	15736.	24601.	15288.4	448.	
122 P	19.758	12.23	15441.	26405.	15394.3	47.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 7920- 8035 A
FEATURE NH3 PREDCT(115)
CHANNEL NO 24 (14/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE =3618424.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.80196
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 137. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 354. COUNTS = 10.0 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 90,122
POLYNOMIAL COEFFICIENTS =
6.15125E 03, 2.03774E 02,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, 0 MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.02	108197.	3434.		3690507.	
2 P Z	-21.483	-0.04	109690.	2587.		3766535.	
3	-20.888	14.00	1823.	3734.		-41003.	
4 P Z	-20.406	0.04	102204.	2688.		3501690.	
5	-19.952	14.00	1585.	2411.		-12199.	
6 P Z	-19.457	-0.01	106975.	2970.		3660759.	
7 P Z	-19.134	-0.03	108213.	2247.		3724382.	
8 P Z	-18.812	0.05	101447.	2847.		3470733.	
9 P Z	-18.491	0.05	102286.	4292.		3459537.	
10 P Z	-18.172	0.03	104334.	4124.		3535934.	
11 P Z	-17.848	-0.01	106566.	2991.		3645855.	
12 P Z	-17.527	-0.01	107114.	3570.		3648782.	
13	-16.963	14.00	3122.	6145.		-63212.	
14 P	-16.401	0.10	97498.	3760.		3306889.	
15	-15.968	14.00	1829.	2858.		-16205.	
16 P Z	-15.567	0.00	106668.	4630.		3603420.	
17 P Z	-15.248	0.00	106339.	4191.		3604227.	
18 P Z	-14.922	0.03	103937.	4708.		3505645.	
19 P Z	-14.603	-0.01	107000.	3066.		3658939.	
20 P Z	-14.277	-0.05	110447.	2361.		3799374.	
21 P Z	-13.958	-0.01	106986.	3316.		3651434.	
22 P Z	-13.627	-0.02	108355.	4171.		3675350.	
23 P Z	-13.285	0.00	106566.	4089.		3615036.	
24 P Z	-12.951	-0.01	106913.	3340.		3648205.	
25 P Z	-12.618	0.04	103189.	3894.		3502314.	
26	-12.175	14.00	3290.	4826.		-20309.	
27 P	-11.771	-0.01	107393.	4186.		3641257.	
28	-11.360	5.95	2628.	2742.		15016.	
29 P	-10.951	0.03	103336.	3959.		3505635.	
30 P	-10.627	0.03	104992.	4948.		3535835.	
31 P	-10.306	0.04	103149.	3816.		3503104.	
32 P	-9.986	-0.02	107370.	2781.		3679889.	
33 P	-9.661	-0.06	111672.	3211.		3818390.	
34 P	-9.341	-0.05	111295.	4115.		3779820.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 7920- 8035 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.00	106757.	4346.		3614506.	
36 P	-8.696	0.02	103828.	2767.		3556312.	
37 P	-8.368	-0.06	112344.	4082.		3817463.	
38 P	-8.021	-0.03	109878.	5049.		3704010.	
39	-7.654	14.00	4832.	6481.		-12793.	
40 P	-7.295	0.01	106061.	3946.		3601375.	
41	-6.944	14.00	1876.	2517.		-4989.	
42 P	-6.519	-0.05	111415.	3871.		3790869.	
43 P	-6.199	-0.08	113195.	2492.		3891877.	
44 P	-5.880	-0.04	110181.	3601.		3755259.	
45 P	-5.559	-0.04	109994.	3604.		3748629.	
46 P	-5.240	-0.03	110829.	5661.		3720117.	
47 P	-4.918	-0.01	108438.	4882.		3658298.	
48 P	-4.592	-0.02	108420.	3601.		3693624.	
49 P	-4.260	-0.05	111500.	3825.		3795135.	
50 P	-3.939	-0.05	111947.	4518.		3791329.	
51 P	-3.618	-0.06	113045.	4358.		3834250.	
52 P	-3.297	-0.05	111525.	3807.		3796515.	
53 P	-2.973	-0.01	107571.	3981.		3653243.	
54 P	-2.646	-0.02	108002.	3220.		3689686.	
55 P	-2.325	0.08	99086.	3665.		3365136.	
56 P	-2.002	0.19	90915.	4907.		3044291.	
57 P	-1.683	0.28	82576.	3316.		2797084.	
58 P	-1.363	0.39	74140.	2539.		2523633.	
59 P	-1.040	0.63	60807.	3682.		2024896.	
60 P	-0.718	0.84	50067.	3221.		1661935.	
61 P	-0.397	1.02	42957.	3020.		1418727.	
62 P	-0.076	1.40	32330.	4685.		1000048.	
63 P	0.250	1.85	22255.	4366.		656377.	
64 P	0.569	2.47	14414.	4667.		373493.	
65 P	1.212	4.50	63483.	8611.	6398.3	57085.	
66 P	1.533	5.50	29243.	8702.	6463.6	22779.	
67 P	1.857	6.45	16042.	8813.	6529.6	9512.	
68 P	2.179	7.05	12067.	9347.	6595.4	5472.	
69 P	2.502	7.43	10508.	8751.	6661.0	3847.	
70 P	2.824	7.73	9658.	7812.	6726.8	2931.	
71 P	3.147	7.91	9270.	8306.	6792.5	2478.	
72 P	3.469	8.03	9086.	9696.	6858.1	2228.	
73 P	3.793	8.36	8566.	8867.	6924.3	1642.	
74 P	4.114	8.72	8168.	8795.	6989.6	1178.	
75 P	4.437	8.60	8374.	8549.	7055.3	1319.	
76 P	4.764	9.42	7740.	8888.	7122.0	618.	
77 P	5.086	9.39	7823.	9388.	7187.7	635.	
78 P	5.409	9.14	8055.	9831.	7253.4	802.	
79 P	5.733	9.70	7797.	9722.	7319.5	478.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 7920- 8035 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
80 P	6.060	12.75	7415.	9821.	7386.2	29.	0.937233
81 P	6.381	10.14	7771.	9715.	7451.6	319.	1.019332
82 P	6.702	10.73	7701.	9381.	7516.9	184.	1.035761
83 P	7.028	14.00	7569.	8798.	7583.3	-14.	1.065564
84 P	7.364	10.20	7953.	10125.	7651.7	301.	0.994524
85 P	7.683	10.44	7957.	10396.	7716.8	240.	0.974208
86 P	8.020	10.97	7933.	9851.	7785.5	147.	0.999707
87 P	8.344	14.00	7705.	8809.	7851.6	-147.	1.084400
88 P	8.668	14.00	7656.	9044.	7917.6	-262.	1.042114
89 P	8.991	14.00	7578.	9516.	7983.3	-405.	1.015523
90 P	9.315	10.44	8290.	10434.	8049.4	241.	0.996534
91 P	9.637	14.00	7648.	8837.	8115.1	-467.	1.075159
92 P	9.963	14.00	7745.	8559.	8181.5	-436.	1.098599
93 P	10.286	14.00	7896.	9515.	8247.2	-351.	1.028554
94 P	10.606	10.41	8561.	10052.	8312.5	248.	1.048194
95 P	10.929	10.27	8660.	10673.	8378.2	282.	1.011329
96 P	11.254	10.69	8637.	11635.	8444.6	192.	0.925800
97 P	11.579	14.00	8334.	11069.	8510.7	-177.	0.945601
98 P	11.913	12.12	8630.	10659.	8578.8	51.	0.984208
99 P	12.245	14.00	8216.	10516.	8646.5	-430.	0.961412
100 P	12.568	14.00	8708.	11463.	8712.2	-4.	0.967106
101 P	12.890	9.94	9159.	10650.	8777.9	381.	1.052082
102 P	13.216	9.55	9391.	12097.	8844.3	547.	0.971486
103 P	13.537	14.00	8848.	12247.	8909.7	-62.	0.923142
104 P	13.859	10.26	9261.	12065.	8975.4	286.	0.952737
105 P	14.180	14.00	8849.	11122.	9040.7	-192.	0.989722
106 P	14.504	10.85	9272.	12452.	9106.8	165.	0.943021
107 P	14.825	9.80	9609.	12653.	9172.1	437.	0.936075
108 P	15.154	10.17	9549.	11608.	9239.2	310.	1.028826
109 P	15.498	10.42	9556.	13268.	9309.3	247.	
110 P	15.822	14.00	8709.	12257.	9375.4	-666.	
111 P	16.145	14.00	8962.	11873.	9441.1	-479.	
112 P	16.472	14.00	9477.	11269.	9507.8	-31.	
113 P	16.811	10.29	9853.	13321.	9576.9	276.	
114 P	17.145	9.51	10215.	12953.	9645.0	570.	
115 P	17.469	14.00	9260.	12380.	9711.0	-451.	
116 P	17.802	10.71	9967.	13024.	9778.8	188.	
117 P	18.126	14.00	9521.	13136.	9844.8	-324.	
118 P	18.455	14.00	9237.	12331.	9911.9	-675.	
119 P	18.776	14.00	9802.	12163.	9977.2	-175.	
120 P	19.101	11.44	10140.	12866.	10043.6	96.	
121 P	19.437	9.84	10532.	12817.	10112.0	420.	
122 P	19.758	14.00	10161.	13446.	10177.4	-16.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 8160- 8360 A
FEATURE H2O PREDCT(200)
CHANNEL NO 25 (15/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE = 660203.8 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.89393
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 68. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 81. COUNTS = 9.8 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 90,122
PCLYNCMIAL COEFFICIENTS =
1.57786E 03, 5.38285E 01,
CCNSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, 0 MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
1 P Z	-21.808	0.00	19762.	1010.		660070.	
2 P Z	-21.483	-0.03	20095.	775.		679C77.	
3	-20.888	14.00	406.	1064.		-1908C.	
4 P Z	-20.406	0.03	19042.	799.		641471.	
5	-19.952	14.00	313.	703.		-11040.	
6 P Z	-19.457	-0.01	19790.	849.		666087.	
7 P Z	-19.134	-0.06	20475.	640.		696601.	
8 P Z	-18.812	0.03	19170.	830.		644981.	
9 P Z	-18.491	0.05	19103.	1217.		630528.	
10 P Z	-18.172	0.02	19560.	1241.		645772.	
11 P Z	-17.848	-0.02	19980.	861.		672361.	
12 P Z	-17.527	-0.02	20133.	1083.		670771.	
13	-16.963	14.00	643.	1747.		-32154.	
14 P	-16.401	0.08	18574.	1120.		615048.	
15	-15.968	14.00	352.	880.		-15213.	
16 P Z	-15.567	0.02	19731.	1350.		648347.	
17 P Z	-15.248	0.00	19903.	1190.		659373.	
18 P Z	-14.922	0.03	19550.	1361.		641668.	
19 P Z	-14.603	-0.02	20015.	840.		674244.	
20 P Z	-14.277	-0.05	20350.	682.		690912.	
21 P Z	-13.958	-0.01	19856.	1001.		663641.	
22 P Z	-13.627	-0.00	19994.	1242.		660931.	
23 P Z	-13.285	0.03	19519.	1222.		644932.	
24 P Z	-12.951	-0.02	19997.	871.		672644.	
25 P Z	-12.618	0.03	19283.	1126.		639675.	
26	-12.175	14.C0	680.	1429.		-20910.	
27 P	-11.771	-0.00	19944.	1151.		662028.	
28	-11.360	14.00	524.	751.		-5157.	
29 P	-10.951	0.03	19364.	1081.		643918.	
30 P	-10.627	0.05	19415.	1530.		631655.	
31 P	-10.306	0.03	19264.	1089.		640168.	
32 P	-9.986	-0.03	20036.	775.		677012.	
33 P	-9.661	-0.06	20773.	940.		697645.	
34 P	-9.341	-0.04	20618.	1216.		683584.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 8160- 8360 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.01	19725.	1253.		651172.	
36 P	-8.696	0.00	19498.	804.		657275.	
37 P	-8.368	-0.04	20678.	1226.		685372.	
38 P	-8.021	0.02	19980.	1545.		650961.	
39	-7.654	14.00	999.	1888.		-24106.	
40 P	-7.295	0.02	19616.	1157.		650360.	
41	-6.944	14.00	350.	700.		-9651.	
42 P	-6.519	-0.03	20378.	1116.		678313.	
43 P	-6.199	-0.11	21462.	676.		730020.	
44 P	-5.880	-0.03	20407.	1057.		681174.	
45 P	-5.559	-0.05	20626.	1077.		688213.	
46 P	-5.240	0.00	20342.	1728.		657905.	
47 P	-4.918	-0.00	20146.	1419.		660713.	
48 P	-4.592	-0.00	19865.	1091.		661140.	
49 P	-4.260	-0.03	20462.	1206.		678437.	
50 P	-3.939	-0.04	20746.	1291.		685718.	
51 P	-3.618	-0.06	21152.	1286.		700084.	
52 P	-3.297	-0.05	20710.	1039.		692342.	
53 P	-2.973	0.01	19775.	1148.		656207.	
54 P	-2.646	-0.01	19779.	897.		664200.	
55 P	-2.325	0.08	18372.	998.		611795.	
56 P	-2.002	0.23	16564.	1439.		534717.	
57 P	-1.683	0.28	15364.	916.		509081.	
58 P	-1.363	0.40	13648.	731.		454809.	
59 P	-1.040	0.66	11172.	1038.		358544.	
60 P	-0.718	0.86	9404.	938.		299792.	
61 P	-0.397	1.06	7866.	836.		249154.	
62 P	-0.076	1.52	5920.	1398.		163460.	
63 P	0.250	1.92	4259.	1178.		112208.	
64 P	0.569	2.70	2838.	1418.		54964.	
65 P	1.212	4.31	14149.	2225.	1643.1	12506.	
66 P	1.533	5.18	7248.	2170.	1660.4	5588.	
67 P	1.857	5.97	4377.	2257.	1677.8	2699.	
68 P	2.179	6.42	3487.	2287.	1695.2	1792.	
69 P	2.502	6.83	2938.	2206.	1712.5	1225.	
70 P	2.824	6.83	2959.	1828.	1729.9	1229.	
71 P	3.147	7.02	2777.	2082.	1747.2	1030.	
72 P	3.469	7.15	2676.	2464.	1764.6	911.	
73 P	3.793	7.45	2471.	2257.	1782.1	689.	
74 P	4.114	7.79	2307.	2130.	1799.3	508.	
75 P	4.437	7.60	2419.	2176.	1816.7	602.	
76 P	4.764	8.31	2146.	2176.	1834.3	312.	
77 P	5.086	8.54	2105.	2302.	1851.7	253.	
78 P	5.409	8.35	2171.	2378.	1869.0	302.	
79 P	5.733	8.38	2179.	2317.	1886.5	293.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 8160- 8360 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	9.81	1983.	2457.	1904.1	79.	0.937233
81 P	6.381	9.20	2059.	2254.	1921.4	138.	1.019332
82 P	6.702	9.24	2072.	2151.	1938.6	133.	1.035761
83 P	7.028	9.89	2029.	2115.	1956.1	73.	1.065564
84 P	7.364	9.30	2100.	2379.	1974.2	126.	0.994524
85 P	7.683	9.23	2126.	2523.	1991.4	135.	0.974208
86 P	8.020	14.00	1981.	2421.	2009.6	-29.	0.999707
87 P	8.344	14.00	1984.	1960.	2027.0	-43.	1.084400
88 P	8.668	14.00	1947.	2104.	2044.5	-97.	1.042114
89 P	8.991	14.00	2032.	2152.	2061.8	-30.	1.015523
90 P	9.315	10.58	2118.	2597.	2079.3	39.	0.996534
91 P	9.637	14.00	2012.	2015.	2096.6	-85.	1.075159
92 P	9.963	14.00	2071.	1990.	2114.2	-43.	1.098599
93 P	10.286	14.00	2056.	2129.	2131.5	-76.	1.028554
94 P	10.606	9.70	2236.	2332.	2148.8	87.	1.048194
95 P	10.929	11.15	2189.	2470.	2166.1	23.	1.011329
96 P	11.254	9.95	2253.	2817.	2183.7	69.	0.925800
97 P	11.579	14.00	2111.	2555.	2201.1	-90.	0.945601
98 P	11.913	14.00	2174.	2482.	2219.1	-45.	0.984208
99 P	12.245	14.00	2172.	2403.	2237.0	-65.	0.961412
100 P	12.568	14.00	2204.	2585.	2254.4	-50.	0.967106
101 P	12.890	14.00	2253.	2541.	2271.7	-19.	1.052082
102 P	13.216	9.75	2372.	2983.	2289.2	83.	0.971486
103 P	13.537	14.00	2301.	2817.	2306.5	-6.	0.923142
104 P	13.859	9.65	2415.	2803.	2323.9	91.	0.952737
105 P	14.180	14.00	2300.	2519.	2341.1	-41.	0.989722
106 P	14.504	9.68	2447.	2791.	2358.6	88.	0.943021
107 P	14.825	9.85	2452.	3110.	2375.9	76.	0.936075
108 P	15.154	8.98	2563.	2692.	2393.6	169.	1.028826
109 P	15.498	14.00	2411.	3013.	2412.1	-1.	
110 P	15.822	14.00	2333.	2901.	2429.5	-97.	
111 P	16.145	11.01	2473.	2603.	2446.9	26.	
112 P	16.472	14.00	2456.	2424.	2464.5	-9.	
113 P	16.811	9.77	2564.	3160.	2482.8	81.	
114 P	17.145	9.72	2586.	2988.	2500.8	85.	
115 P	17.469	14.00	2436.	2884.	2518.2	-82.	
116 P	17.802	14.00	2526.	2921.	2536.1	-10.	
117 P	18.126	14.00	2548.	3061.	2553.5	-6.	
118 P	18.455	14.00	2410.	2760.	2571.3	-161.	
119 P	18.776	14.00	2426.	2710.	2588.5	-163.	
120 P	19.101	10.16	2663.	2957.	2606.1	57.	
121 P	19.437	9.28	2752.	2665.	2624.1	128.	
122 P	19.758	14.00	2585.	2990.	2641.4	-56.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 9080- 9150 A
FEATURE H2S +CH4 (70)
CHANNEL NO 27 (16/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE = 257547.1 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.68246
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 39. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 30. COUNTS = 9.8 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 88,122
POLYNCMIAL COEFFICIENTS =
4.78995E 02, 1.01326E 01, 2.27536E-01
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.00	7586.	294.		258487.	
2 P Z	-21.483	-0.04	7778.	205.		267333.	
3	-20.888	14.00	128.	327.		-3331.	
4 P Z	-20.406	0.02	7391.	245.		252833.	
5	-19.952	14.00	120.	236.		-1437.	
6 P Z	-19.457	-0.02	7662.	236.		262533.	
7 P Z	-19.134	-0.03	7679.	190.		264227.	
8 P Z	-18.812	0.04	7321.	290.		249308.	
9 P Z	-18.491	0.05	7283.	380.		245828.	
10 P Z	-18.172	0.03	7409.	369.		250501.	
11 P Z	-17.848	-0.01	7658.	310.		260625.	
12 P Z	-17.527	0.01	7546.	342.		255941.	
13	-16.963	14.00	203.	559.		-6247.	
14 P	-16.401	C.10	6952.	377.		234315.	
15	-15.968	14.00	140.	266.		-1454.	
16 P Z	-15.567	0.02	7514.	407.		253268.	
17 P Z	-15.248	-0.02	7734.	377.		261685.	
18 P Z	-14.922	0.04	7354.	418.		247406.	
19 P Z	-14.603	-0.04	7810.	269.		266925.	
20 P Z	-14.277	-0.C6	7915.	214.		271913.	
21 P Z	-13.958	-0.02	7690.	312.		261697.	
22 P Z	-13.627	-0.02	7742.	350.		262610.	
23 P Z	-13.285	0.03	7413.	364.		250761.	
24 P Z	-12.951	0.00	7551.	310.		25688C.	
25 P Z	-12.618	0.03	7368.	322.		250189.	
26	-12.175	14.00	212.	422.		-2660.	
27 P	-11.771	-0.02	7715.	362.		261378.	
28	-11.360	9.93	183.	267.		27.	
29 P	-10.951	0.04	7340.	330.		249018.	
30 P	-10.627	0.05	7372.	463.		246961.	
31 P	-10.306	0.05	7238.	346.		245065.	
32 P	-9.986	-0.01	7595.	259.		259638.	
33 P	-9.661	-0.06	7943.	296.		270935.	
34 P	-9.341	-0.05	7938.	379.		268777.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 9C80- 9150 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	-0.04	7854.	344.		266673.	
36 P	-8.696	0.04	7242.	244.		247642.	
37 P	-8.368	-0.07	8105.	371.		274813.	
38 P	-8.021	-0.01	7759.	518.		259192.	
39	-7.654	14.00	314.	602.		-3389.	
40 P	-7.295	-0.00	7619.	363.		257994.	
41	-6.944	14.00	139.	215.		-270.	
42 P	-6.519	-0.07	8082.	322.		275179.	
43 P	-6.199	-0.10	8266.	238.		283625.	
44 P	-5.880	-0.05	7911.	300.		269719.	
45 P	-5.559	0.24	8022.	3100.		206723.	
46 P	-5.240	-0.02	7843.	518.		262132.	
47 P	-4.918	-0.01	7706.	412.		259869.	
48 P	-4.592	0.01	7510.	294.		255827.	
49 P	-4.260	-0.04	7836.	337.		266210.	
50 P	-3.939	-0.07	8085.	396.		273516.	
51 P	-3.618	-0.05	8015.	410.		270732.	
52 P	-3.297	-0.04	7882.	348.		267558.	
53 P	-2.973	-0.01	7674.	388.		259322.	
54 P	-2.646	-0.05	7891.	248.		270261.	
55 P	-2.325	0.09	7018.	353.		237198.	
56 P	-2.002	0.19	6492.	442.		216662.	
57 P	-1.683	0.29	5858.	305.		197745.	
58 P	-1.363	0.38	5333.	200.		181878.	
59 P	-1.040	0.64	4275.	285.		142818.	
60 P	-0.718	0.84	3603.	308.		118748.	
61 P	-0.397	1.00	3100.	263.		102218.	
62 P	-0.076	1.39	2324.	409.		71571.	
63 P	0.250	1.87	1575.	376.		46144.	
64 P	0.569	2.45	1076.	452.		26864.	
65 P	1.212	4.39	5023.	769.	491.6	4531.	
66 P	1.533	5.29	2467.	723.	495.1	1972.	
67 P	1.857	6.19	1361.	766.	498.6	862.	
68 P	2.179	6.82	982.	779.	502.2	48C.	
69 P	2.502	7.13	868.	730.	505.8	362.	
70 P	2.824	7.30	819.	673.	509.4	310.	
71 P	3.147	7.38	802.	726.	513.1	289.	
72 P	3.469	8.17	656.	883.	516.9	139.	
73 P	3.793	8.17	660.	807.	520.7	139.	
74 P	4.114	8.26	652.	716.	524.5	127.	
75 P	4.437	8.58	624.	780.	528.4	96.	
76 P	4.764	8.85	607.	779.	532.4	75.	
77 P	5.086	8.85	611.	807.	536.4	75.	
78 P	5.409	8.97	607.	841.	540.5	67.	
79 P	5.733	9.29	594.	845.	544.6	49.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 9080- 9150 A -- CONTINUED

NUMBER PLOT, 0 MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
80 P	6.060	11.96	553.	874.	548.8	4.	0.937233
81 P	6.381	9.37	599.	832.	552.9	46.	1.019332
82 P	6.702	9.12	615.	795.	557.1	58.	1.035761
83 P	7.028	10.30	581.	725.	561.4	20.	1.065564
84 P	7.364	10.66	580.	886.	565.9	14.	0.994524
85 P	7.683	9.50	611.	931.	570.3	41.	0.974208
86 P	8.020	10.03	600.	824.	574.9	25.	0.999707
87 P	8.344	14.00	575.	762.	579.4	-4.	1.084400
88 P	8.668	14.00	584.	748.	583.9	0.	1.042114
89 P	8.991	13.08	590.	844.	588.5	2.	1.015523
90 P	9.315	14.00	581.	1006.	593.1	-12.	0.996534
91 P	9.637	14.00	593.	746.	597.8	-5.	1.075159
92 P	9.963	14.00	589.	729.	602.5	-14.	1.098599
93 P	10.286	14.00	597.	801.	607.3	-10.	1.028554
94 P	10.606	14.00	587.	890.	612.1	-25.	1.048194
95 P	10.929	11.40	624.	931.	616.9	7.	1.011329
96 P	11.254	9.63	658.	1070.	621.9	36.	0.925800
97 P	11.579	11.74	632.	977.	626.8	5.	0.945601
98 P	11.913	9.61	669.	903.	632.0	37.	0.984208
99 P	12.245	14.00	593.	906.	637.2	-44.	0.961412
100 P	12.568	9.50	683.	1051.	642.3	41.	0.967106
101 P	12.890	14.00	637.	930.	647.4	-10.	1.052082
102 P	13.216	9.93	680.	1078.	652.6	27.	0.971486
103 P	13.537	14.00	647.	1138.	657.9	-11.	0.923142
104 P	13.859	14.00	639.	1107.	663.1	-24.	0.952737
105 P	14.180	10.10	692.	1053.	668.4	24.	0.989722
106 P	14.504	9.17	729.	1126.	673.8	55.	0.943021
107 P	14.825	12.90	681.	1151.	679.2	2.	0.936075
108 P	15.154	14.00	674.	1031.	684.8	-11.	1.028826
109 P	15.498	10.06	715.	1188.	690.7	24.	
110 P	15.822	14.00	654.	1133.	696.3	-42.	
111 P	16.145	14.00	643.	1049.	701.9	-59.	
112 P	16.472	14.00	697.	960.	707.6	-11.	
113 P	16.811	9.15	770.	1175.	713.6	56.	
114 P	17.145	9.93	747.	1193.	719.6	27.	
115 P	17.469	14.00	674.	1125.	725.4	-51.	
116 P	17.802	14.00	694.	1191.	731.5	-37.	
117 P	18.126	14.00	707.	1154.	737.4	-30.	
118 P	18.455	14.00	721.	1031.	743.5	-22.	
119 P	18.776	14.00	741.	1042.	749.5	-8.	
120 P	19.101	9.93	783.	1169.	755.6	27.	
121 P	19.437	9.94	789.	1064.	761.9	27.	
122 P	19.758	9.84	798.	1164.	768.0	30.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 9240- 9280 A
FEATURE CONTINUUM (40)
CHANNEL NO 28 (17/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE = 9955.0 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.37865
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 10. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 5. COUNTS = 8.2 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 90,122
POLYNCMIAL COEFFICIENTS =
4.67139E 01,-4.04805E 00, 1.70684E-01
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.03	301.	21.		10257.	
2 P Z	-21.483	-0.06	306.	16.		10498.	
3	-20.888	9.43	8.	21.		2.	
4 P Z	-20.406	0.01	289.	19.		9863.	
5	-19.952	4.45	10.	14.		164.	
6 P Z	-19.457	-0.11	323.	20.		11040.	
7 P Z	-19.134	-0.06	304.	11.		10494.	
8 P Z	-18.812	0.10	268.	23.		9075.	
9 P Z	-18.491	0.19	248.	27.		8322.	
10 P Z	-18.172	0.06	281.	31.		9424.	
11 P Z	-17.848	0.05	281.	24.		9517.	
12 P Z	-17.527	0.01	291.	27.		9827.	
13	-16.963	14.00	8.	47.		-343.	
14 P	-16.401	0.10	268.	25.		9049.	
15	-15.968	4.55	10.	15.		151.	
16 P Z	-15.567	0.08	272.	21.		9242.	
17 P Z	-15.248	0.04	289.	36.		9638.	
18 P Z	-14.922	-0.03	304.	31.		10229.	
19 P Z	-14.603	-0.10	319.	16.		10953.	
20 P Z	-14.277	-0.08	308.	8.		10674.	
21 P Z	-13.958	0.05	280.	25.		9469.	
22 P Z	-13.627	-0.08	320.	33.		10763.	
23 P Z	-13.285	0.16	255.	26.		8580.	
24 P Z	-12.951	-0.10	321.	24.		10917.	
25 P Z	-12.618	-0.04	302.	19.		10318.	
26	-12.175	4.41	14.	24.		172.	
27 P	-11.771	0.08	276.	31.		9249.	
28	-11.360	3.71	18.	23.		325.	
29 P	-10.951	-0.02	298.	21.		10152.	
30 P	-10.627	0.11	272.	39.		9003.	
31 P	-10.306	0.10	270.	28.		9079.	
32 P	-9.986	0.02	284.	15.		9741.	
33 P	-9.661	-0.11	324.	23.		11035.	
34 P	-9.341	-0.02	299.	22.		10173.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 9240- 9280 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.05	284.	31.		9529.	
36 P	-8.696	-0.01	295.	19.		10073.	
37 P	-8.368	-0.03	302.	25.		10239.	
38 P	-8.021	0.05	284.	35.		9476.	
39	-7.654	4.74	18.	38.		126.	
40 P	-7.295	0.10	270.	30.		9052.	
41	-6.944	4.79	8.	12.		121.	
42 P	-6.519	0.04	288.	35.		9616.	
43 P	-6.199	0.01	288.	17.		9855.	
44 P	-5.880	0.01	290.	25.		9819.	
45 P	-5.559	-0.10	318.	16.		10918.	
46 P	-5.240	0.05	289.	44.		9532.	
47 P	-4.918	-0.07	312.	26.		10575.	
48 P	-4.592	0.01	291.	26.		9840.	
49 P	-4.260	-0.07	313.	29.		10571.	
50 P	-3.939	-0.06	311.	31.		10474.	
51 P	-3.618	-0.02	301.	33.		10098.	
52 P	-3.297	-0.09	322.	32.		10846.	
53 P	-2.973	-0.01	298.	27.		10072.	
54 P	-2.646	0.02	293.	33.		9818.	
55 P	-2.325	0.12	260.	13.		8928.	
56 P	-2.002	0.08	276.	34.		9209.	
57 P	-1.683	0.15	255.	20.		8660.	
58 P	-1.363	0.45	192.	10.		6587.	
59 P	-1.040	0.64	168.	28.		5509.	
60 P	-0.718	0.84	139.	21.		4587.	
61 P	-0.397	0.88	133.	16.		4443.	
62 P	-0.076	1.31	93.	21.		2977.	
63 P	0.250	2.10	54.	34.		1439.	
64 P	0.569	2.68	37.	34.		844.	
65 P	1.212	4.49	201.	50.	42.1	159.	
66 P	1.533	5.40	110.	55.	40.9	69.	
67 P	1.857	8.20	45.	50.	39.8	5.	
68 P	2.179	8.18	44.	60.	38.7	5.	
69 P	2.502	9.67	39.	56.	37.7	1.	
70 P	2.824	7.46	47.	58.	36.6	10.	
71 P	3.147	14.00	35.	49.	35.7	-1.	
72 P	3.469	14.00	31.	70.	34.7	-4.	
73 P	3.793	9.81	35.	61.	33.8	1.	
74 P	4.114	14.00	27.	53.	32.9	-6.	
75 P	4.437	8.07	38.	55.	32.1	6.	
76 P	4.764	8.92	34.	51.	31.3	3.	
77 P	5.086	8.65	34.	62.	30.5	3.	
78 P	5.409	14.00	28.	71.	29.8	-2.	
79 P	5.733	14.00	23.	66.	29.1	-6.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 9240- 9280 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
80 P	6.060	14.00	25.	60.	28.5	-3.	0.937233
81 P	6.381	14.00	24.	55.	27.8	-4.	1.019332
82 P	6.702	14.00	18.	72.	27.3	-9.	1.035761
83 P	7.028	14.00	22.	66.	26.7	-5.	1.065564
84 P	7.364	14.00	26.	52.	26.2	-0.	0.994524
85 P	7.683	7.70	34.	67.	25.7	8.	0.974208
86 P	8.020	7.64	34.	68.	25.2	9.	0.999707
87 P	8.344	8.74	28.	52.	24.8	3.	1.084400
88 P	8.668	14.00	19.	65.	24.4	-5.	1.042114
89 P	8.991	7.75	32.	53.	24.1	8.	1.015523
90 P	9.315	9.15	26.	79.	23.8	2.	0.996534
91 P	9.637	14.00	20.	47.	23.6	-4.	1.075159
92 P	9.963	14.00	21.	41.	23.3	-2.	1.098599
93 P	10.286	14.00	23.	56.	23.1	-0.	1.028554
94 P	10.606	14.00	20.	67.	23.0	-3.	1.048194
95 P	10.929	8.45	27.	53.	22.9	4.	1.011329
96 P	11.254	8.20	28.	76.	22.8	5.	0.925800
97 P	11.579	8.42	27.	68.	22.7	4.	0.945601
98 P	11.913	14.00	21.	75.	22.7	-2.	0.984208
99 P	12.245	14.00	12.	75.	22.7	-11.	0.961412
100 P	12.568	8.20	28.	78.	22.8	5.	0.967106
101 P	12.890	9.89	24.	60.	22.9	1.	1.052082
102 P	13.216	14.00	20.	85.	23.0	-3.	0.971486
103 P	13.537	10.23	24.	77.	23.2	1.	0.923142
104 P	13.859	14.00	18.	79.	23.4	-5.	0.952737
105 P	14.180	8.39	28.	71.	23.6	4.	0.989722
106 P	14.504	7.60	33.	73.	23.9	9.	0.943021
107 P	14.825	14.00	20.	83.	24.2	-4.	0.936075
108 P	15.154	14.00	21.	65.	24.6	-4.	1.028826
109 P	15.498	8.48	29.	70.	25.0	4.	
110 P	15.822	14.00	20.	77.	25.4	-5.	
111 P	16.145	9.16	28.	76.	25.8	2.	
112 P	16.472	7.65	35.	68.	26.3	9.	
113 P	16.811	7.72	35.	96.	26.9	8.	
114 P	17.145	10.71	28.	81.	27.5	1.	
115 P	17.469	14.00	21.	80.	28.1	-7.	
116 P	17.802	14.00	21.	98.	28.7	-8.	
117 P	18.126	14.00	24.	84.	29.4	-5.	
118 P	18.455	14.00	24.	78.	30.1	-6.	
119 P	18.776	14.00	26.	108.	30.9	-5.	
120 P	19.101	7.83	39.	77.	31.7	7.	
121 P	19.437	10.78	33.	72.	32.5	0.	
122 P	19.758	7.94	40.	81.	33.4	7.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 9960-10320 A
FEATURE CH4 (360)
CHANNEL NO 30 (18/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE = 838307.3 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.77997
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 47. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 48. COUNTS = 10.6 MAGNITUDES

SKY REMOVAL METHOD,. CURVE FIT
CURVE FIT POINTS= 65, 80,122
POLYNOMIAL COEFFICIENTS =
7.57718E 02, 1.74935E 01, 5.27975E-02
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.01	24399.	397.		843127.	
2 P Z	-21.483	-0.01	24463.	284.		848452.	
3	-20.888	14.00	254.	381.		-1511.	
4 P Z	-20.406	0.03	23535.	345.		814307.	
5	-19.952	6.20	271.	246.		2769.	
6 P Z	-19.457	-0.02	24577.	344.		850804.	
7 P Z	-19.134	-0.02	24697.	261.		857270.	
8 P Z	-18.812	0.03	23618.	319.		817922.	
9 P Z	-18.491	0.04	23505.	437.		810745.	
10 P Z	-18.172	0.02	23783.	472.		819520.	
11 P Z	-17.848	0.01	24023.	327.		831878.	
12 P Z	-17.527	0.00	24259.	414.		837763.	
13	-16.963	14.00	353.	640.		-5116.	
14 P	-16.401	0.09	22283.	423.		768357.	
15	-15.968	6.21	322.	312.		2753.	
16 P Z	-15.567	-0.00	24446.	519.		841442.	
17 P Z	-15.248	-0.01	24539.	488.		845543.	
18 P Z	-14.922	0.02	23853.	535.		820250.	
19 P Z	-14.603	-0.03	24892.	347.		861747.	
20 P Z	-14.277	-0.05	25377.	294.		880169.	
21 P Z	-13.958	-0.00	24296.	402.		839386.	
22 P Z	-13.627	-0.02	24727.	470.		852614.	
23 P Z	-13.285	0.03	23604.	484.		812927.	
24 P Z	-12.951	-0.03	24862.	383.		859714.	
25 P Z	-12.618	0.02	23785.	436.		820573.	
26	-12.175	14.00	385.	510.		-447.	
27 P	-11.771	0.01	24041.	492.		828004.	
28	-11.360	4.70	535.	282.		11027.	
29 P	-10.951	0.03	23549.	408.		813077.	
30 P	-10.627	0.01	24032.	512.		827143.	
31 P	-10.306	0.04	23347.	431.		805379.	
32 P	-9.986	-0.01	24487.	320.		848309.	
33 P	-9.661	-0.06	25700.	376.		889236.	
34 P	-9.341	-0.04	25154.	462.		867778.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 9960-10320 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	-0.01	24503.	521.		843382.	
36 P	-8.696	0.01	24003.	345.		830687.	
37 P	-8.368	-0.03	25009.	449.		863058.	
38 P	-8.021	-0.02	24809.	593.		852127.	
39	-7.654	14.00	481.	746.		-3530.	
40 P	-7.295	0.01	24092.	422.		831700.	
41	-6.944	5.54	354.	267.		5101.	
42 P	-6.519	-0.04	25205.	427.		870518.	
43 P	-6.199	-0.08	25889.	281.		898444.	
44 P	-5.880	-0.02	24828.	410.		857787.	
45 P	-5.559	-0.05	25457.	382.		880567.	
46 P	-5.240	-0.03	25022.	636.		858408.	
47 P	-4.918	-0.01	24683.	519.		849737.	
48 P	-4.592	-0.01	24459.	395.		845282.	
49 P	-4.260	-0.02	24763.	442.		854639.	
50 P	-3.939	-0.05	25431.	555.		874934.	
51 P	-3.618	-0.06	25650.	446.		885575.	
52 P	-3.297	-0.04	25214.	444.		870369.	
53 P	-2.973	0.00	24220.	432.		835907.	
54 P	-2.646	-0.02	24681.	378.		853516.	
55 P	-2.325	0.10	22199.	410.		765772.	
56 P	-2.002	0.22	20061.	552.		687066.	
57 P	-1.683	0.30	18457.	392.		635294.	
58 P	-1.363	0.41	16666.	290.		575393.	
59 P	-1.040	0.65	13465.	413.		460000.	
60 P	-0.718	0.85	11177.	344.		381804.	
61 P	-0.397	1.05	9362.	339.		318416.	
62 P	-0.076	1.40	7003.	489.		231756.	
63 P	0.250	1.84	4820.	532.		154177.	
64 P	0.569	2.48	2875.	558.		85392.	
65 P	1.212	4.58	13072.	1034.	779.0	12293.	
66 P	1.533	5.76	4965.	1034.	784.7	4180.	
67 P	1.857	7.10	2004.	1046.	790.4	1214.	
68 P	2.179	8.00	1326.	1058.	796.1	530.	
69 P	2.502	8.46	1149.	1031.	801.8	347.	
70 P	2.824	8.90	1039.	955.	807.5	231.	
71 P	3.147	8.97	1030.	1018.	813.3	217.	
72 P	3.469	10.38	878.	1086.	819.0	59.	
73 P	3.793	10.12	900.	1093.	824.8	75.	
74 P	4.114	10.17	902.	1045.	830.6	71.	
75 P	4.437	10.76	878.	1010.	836.4	42.	
76 P	4.764	14.00	800.	1037.	842.3	-42.	
77 P	5.086	11.46	870.	1054.	848.1	22.	
78 P	5.409	11.04	886.	1134.	853.9	32.	
79 P	5.733	12.28	870.	1107.	859.7	10.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 9960-10320 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
80 P	6.060	10.97	900.	1252.	865.7	34.	0.937233
81 P	6.381	11.29	897.	1201.	871.5	26.	1.019332
82 P	6.702	14.00	874.	1101.	877.3	-3.	1.035761
83 P	7.028	10.68	928.	1034.	883.3	45.	1.065564
84 P	7.364	14.00	845.	1125.	889.4	-44.	0.994524
85 P	7.683	12.04	908.	1205.	895.2	13.	0.974208
86 P	8.020	11.47	923.	1105.	901.4	22.	0.9997C7
87 P	8.344	14.C0	884.	1013.	907.4	-23.	1.084400
88 P	8.668	14.00	908.	1044.	913.3	-5.	1.042114
89 P	8.991	14.00	909.	1071.	919.3	-10.	1.015523
90 P	9.315	14.00	912.	1318.	925.2	-13.	0.996534
91 P	9.637	14.00	878.	1062.	931.2	-53.	1.075159
92 P	9.963	14.00	859.	1006.	937.2	-78.	1.C98599
93 P	10.286	14.00	906.	1140.	943.2	-37.	1.028554
94 P	10.606	14.00	945.	1168.	949.2	-4.	1.048194
95 P	10.929	10.99	989.	1174.	955.2	34.	1.011329
96 P	11.254	14.00	917.	1387.	961.3	-44.	0.925800
97 P	11.579	11.06	999.	1274.	967.3	32.	0.945601
98 P	11.913	11.99	987.	1281.	973.6	13.	0.984208
99 P	12.245	14.00	874.	1271.	979.8	-106.	0.961412
100 P	12.568	10.75	1028.	1358.	985.9	42.	0.967106
101 P	12.890	9.81	1092.	1264.	992.0	100.	1.052082
102 P	13.216	10.73	1041.	1364.	998.1	43.	0.971486
103 P	13.537	9.94	1093.	1433.	1004.2	89.	0.923142
104 P	13.859	12.14	1022.	1413.	1010.3	12.	0.952737
105 P	14.180	14.00	963.	1265.	1016.4	-53.	0.989722
106 P	14.504	14.00	990.	1462.	1022.6	-33.	0.943021
107 P	14.825	10.62	1076.	1474.	1028.7	47.	0.936075
108 P	15.154	11.61	1054.	1370.	1034.9	19.	1.028826
109 P	15.498	12.78	1048.	1462.	1041.5	6.	
110 P	15.822	14.00	929.	1461.	1047.7	-119.	
111 P	16.145	11.50	1075.	1410.	1053.9	21.	
112 P	16.472	10.86	1098.	1324.	1060.2	38.	
113 P	16.811	10.82	1106.	1675.	1066.7	39.	
114 P	17.145	14.00	1068.	1545.	1073.2	-5.	
115 P	17.469	11.53	1100.	1510.	1079.4	21.	
116 P	17.802	10.67	1131.	1538.	1085.9	45.	
117 P	18.126	14.00	1040.	1625.	1092.1	-52.	
118 P	18.455	14.00	1060.	1482.	1098.5	-39.	
119 P	18.776	14.00	1078.	1427.	1104.8	-27.	
120 P	19.101	14.00	1078.	1465.	1111.1	-33.	
121 P	19.437	10.01	1201.	1451.	1117.7	83.	
122 P	19.758	14.00	1084.	1486.	1124.0	-40.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 10320-10680 A
FEATURE CONTINUUM (360)
CHANNEL NO 31 (19/20)

TELESCOPE APERTURE RATIO = 35.0C
ZERO MAGNITUDE = 615380.4 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.70342
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 63. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 69. COUNTS = 9.9 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 87,122
POLYNOMIAL COEFFICIENTS =
1.18541E 03, 3.77380E 01,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, 0 MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	0.02	17938.	882.		606115.	
2 P Z	-21.483	-0.04	18656.	620.		637696.	
3	-20.888	14.00	423.	927.		-8017.	
4 P Z	-20.406	-0.01	18172.	672.		619476.	
5	-19.952	14.00	387.	585.		-857.	
6 P Z	-19.457	-0.02	18460.	765.		627266.	
7 P Z	-19.134	-0.C5	18845.	596.		644902.	
8 P Z	-18.812	0.03	17611.	705.		599028.	
9 P Z	-18.491	0.04	17713.	1011.		595C65.	
10 P Z	-18.172	0.01	18046.	970.		607729.	
11 P Z	-17.848	-0.00	18101.	676.		616892.	
12 P Z	-17.527	-0.01	18352.	833.		621812.	
13	-16.963	14.00	611.	1448.		-14264.	
14 P	-16.401	0.09	16779.	919.		564640.	
15	-15.968	14.00	427.	657.		-1230.	
16 P Z	-15.567	0.03	17976.	1154.		600749.	
17 P Z	-15.248	0.01	18148.	1032.		6C9772.	
18 P Z	-14.922	0.05	17548.	1164.		585523.	
19 P Z	-14.603	-0.03	18554.	721.		631639.	
20 P Z	-14.277	-0.07	19173.	625.		655668.	
21 P Z	-13.958	0.01	18146.	984.		610884.	
22 P Z	-13.627	-0.02	18528.	996.		623959.	
23 P Z	-13.285	0.04	17673.	1009.		593714.	
24 P Z	-12.951	-0.01	18294.	805.		620471.	
25 P Z	-12.618	0.03	17752.	896.		599261.	
26	-12.175	14.00	594.	1165.		-7892.	
27 P	-11.771	0.01	18110.	1045.		608122.	
28	-11.360	6.37	529.	681.		1749.	
29 P	-10.951	0.04	17590.	946.		59236C.	
30 P	-10.627	0.03	17977.	1176.		600242.	
31 P	-10.306	0.06	17342.	926.		584172.	
32 P	-9.986	-0.01	18251.	652.		622733.	
33 P	-9.661	-0.07	19273.	776.		655450.	
34 P	-9.341	-0.04	18900.	932.		638554.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 10320-10680 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	-0.02	18605.	990.		626801.	
36 P	-8.696	0.04	17492.	724.		594395.	
37 P	-8.368	-0.04	18947.	975.		639141.	
38 P	-8.021	0.02	18052.	1184.		602670.	
39	-7.654	14.00	871.	1544.		-7528.	
40 P	-7.295	0.01	18098.	921.		610755.	
41	-6.944	14.00	399.	661.		-2309.	
42 P	-6.519	-0.06	19192.	929.		648848.	
43 P	-6.199	-0.10	19721.	611.		675192.	
44 P	-5.880	-0.03	18671.	819.		633321.	
45 P	-5.559	-0.04	18868.	923.		637656.	
46 P	-5.240	-0.00	18573.	1403.		615514.	
47 P	-4.918	0.00	18356.	1177.		613483.	
48 P	-4.592	-0.01	18418.	975.		620626.	
49 P	-4.260	-0.02	18481.	920.		624185.	
50 P	-3.939	-0.04	18999.	1056.		638967.	
51 P	-3.618	-0.04	19052.	1050.		640969.	
52 P	-3.297	-0.03	18703.	917.		632029.	
53 P	-2.973	0.02	17834.	918.		601589.	
54 P	-2.646	-0.00	18188.	761.		617844.	
55 P	-2.325	0.09	16849.	901.		567533.	
56 P	-2.002	0.20	15492.	1158.		513710.	
57 P	-1.683	0.29	13963.	791.		469231.	
58 P	-1.363	0.40	12586.	653.		424433.	
59 P	-1.040	0.63	10423.	858.		343681.	
60 P	-0.718	0.81	8942.	897.		290886.	
61 P	-0.397	1.04	7308.	774.		236724.	
62 P	-0.076	1.41	5580.	1089.		168489.	
63 P	0.250	1.88	3868.	1081.		108766.	
64 P	0.569	2.51	2549.	1151.		60878.	
65 P	1.212	4.30	12925.	1946.	1231.2	11694.	
66 P	1.533	5.21	6304.	1934.	1243.3	5061.	
67 P	1.857	5.93	3866.	1902.	1255.5	2611.	
68 P	2.179	6.33	3068.	2074.	1267.7	1800.	
69 P	2.502	6.69	2581.	1917.	1279.8	1301.	
70 P	2.824	6.82	2441.	1697.	1292.0	1149.	
71 P	3.147	6.90	2374.	1896.	1304.2	1070.	
72 P	3.469	7.09	2215.	2199.	1316.3	899.	
73 P	3.793	7.36	2029.	2002.	1328.6	700.	
74 P	4.114	7.47	1974.	1961.	1340.7	633.	
75 P	4.437	7.57	1931.	1809.	1352.8	578.	
76 P	4.764	7.86	1806.	1988.	1365.2	441.	
77 P	5.086	7.92	1794.	2020.	1377.4	417.	
78 P	5.409	8.04	1763.	2129.	1389.5	373.	
79 P	5.733	8.82	1585.	2096.	1401.8	183.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 10320-10680 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
80 P	6.060	9.11	1554.	2170.	1414.1	140.	0.937233
81 P	6.381	8.92	1593.	2192.	1426.2	167.	1.019332
82 P	6.702	9.13	1575.	2030.	1438.3	137.	1.035761
83 P	7.028	9.75	1528.	1917.	1450.6	77.	1.065564
84 P	7.364	9.47	1564.	2230.	1463.3	1C1.	0.994524
85 P	7.683	9.5C	1573.	2265.	1475.3	98.	0.974208
86 P	8.020	14.00	1455.	2237.	1488.1	-33.	0.999707
87 P	8.344	14.00	1493.	1765.	1500.3	-7.	1.C84400
88 P	8.668	14.00	1426.	2010.	1512.5	-87.	1.042114
89 P	8.991	14.00	1354.	2062.	1524.7	-171.	1.015523
90 P	9.315	9.02	1688.	2343.	1536.9	151.	0.996534
91 P	9.637	14.00	1550.	1905.	1549.1	1.	1.075159
92 P	9.963	14.00	1538.	1964.	1561.4	-23.	1.098599
93 P	10.286	9.92	1640.	2136.	1573.6	66.	1.028554
94 P	10.606	14.00	1586.	2255.	1585.7	0.	1.048194
95 P	10.929	12.07	1607.	2310.	1597.8	9.	1.011329
96 P	11.254	11.41	1627.	2614.	1610.1	17.	0.925800
97 P	11.579	10.42	1664.	2446.	1622.4	42.	0.945601
98 P	11.913	14.00	1594.	2363.	1635.0	-41.	0.984208
99 P	12.245	14.00	1563.	2355.	1647.5	-85.	0.961412
100 P	12.568	9.82	1732.	2520.	1659.7	72.	0.967106
101 P	12.890	9.80	1746.	2293.	1671.9	74.	1.052082
102 P	13.216	10.12	1739.	2771.	1684.2	55.	0.971486
103 P	13.537	14.00	1618.	2770.	1696.3	-78.	0.923142
104 P	13.859	11.00	1733.	2756.	1708.4	25.	0.952737
105 P	14.180	11.50	1736.	2472.	1720.5	15.	0.989722
106 P	14.504	14.C0	1717.	2780.	1732.8	-16.	0.943021
107 P	14.825	10.46	1785.	2823.	1744.9	40.	0.936075
108 P	15.154	9.96	1821.	2563.	1757.3	64.	1.028826
109 P	15.498	10.45	1811.	3125.	1770.3	41.	
110 P	15.822	14.00	1713.	2693.	1782.5	-70.	
111 P	16.145	14.00	1735.	2675.	1794.7	-60.	
112 P	16.472	14.00	1741.	2510.	1807.0	-66.	
113 P	16.811	10.55	1857.	3106.	1819.8	37.	
114 P	17.145	9.30	1950.	2847.	1832.4	118.	
115 P	17.469	11.66	1858.	2773.	1844.7	13.	
116 P	17.802	10.21	1908.	2931.	1857.2	51.	
117 P	18.126	14.00	1767.	3001.	1869.4	-102.	
118 P	18.455	14.00	1755.	2687.	1881.9	-127.	
119 P	18.776	10.03	1954.	2700.	1894.C	60.	
120 P	19.101	11.80	1918.	2751.	1906.3	12.	
121 P	19.437	14.00	1902.	2786.	1918.9	-17.	
122 P	19.758	14.00	1917.	2896.	1931.0	-14.	

SATELLITE JII
DATE OBSVD APRIL 6, 1971
BAND PASS 10680-11040 A
FEATURE CONT+CH4 (360)
CHANNEL NO 32 (20/20)

TELESCOPE APERTURE RATIO = 35.00
ZERO MAGNITUDE = 100982.4 COUNTS
FIRST DATA POINT ON 200-INCH = 65
EPHEMERIS ECLIPSE TIME & TIME ZERO,
APRIL 6, 10 HR 22 MIN (UT)

BALANCE FACTOR = 0.65989
DOMAIN DETERMINING BALANCE FACTORS, 79 TO 108
OBJECT MINUS SKY UNCERTAINTY DUE TO
PHOTON STATISTICS = 28. COUNTS
OBJECT MINUS SKY UNCERTAINTY USING CURVE FIT
METHOD = 25. COUNTS = 9.0 MAGNITUDES

SKY REMOVAL METHOD, CURVE FIT
CURVE FIT POINTS= 65, 89,122
POLYNCMIAL COEFFICIENTS =
2.35055E 02, 5.99903E 00,
CONSTANT ,FIRST ORDER ,SECOND ORDER

NUMBER PLOT, 0 MAG	TIME (MIN)	DARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
1 P Z	-21.808	-0.01	2996.	145.		101511.	
2 P Z	-21.483	-0.01	2969.	105.		1C1490.	
3	-20.888	14.00	74.	147.		-805.	
4 P Z	-20.406	-0.01	2984.	104.		102C38.	
5	-19.952	14.00	43.	90.		-574.	
6 P Z	-19.457	-0.02	3023.	119.		103057.	
7 P Z	-19.134	-0.08	3164.	76.		1C8985.	
8 P Z	-18.812	0.02	2917.	116.		99416.	
9 P Z	-18.491	0.05	2872.	159.		96848.	
10 P Z	-18.172	0.06	2839.	158.		95716.	
11 P Z	-17.848	0.02	2915.	112.		99438.	
12 P Z	-17.527	-0.04	3116.	172.		105C87.	
13	-16.963	14.00	83.	265.		-3215.	
14 P	-16.401	0.07	2785.	137.		94311.	
15	-15.968	14.00	72.	119.		-228.	
16 P Z	-15.567	0.03	2951.	203.		98596.	
17 P Z	-15.248	-0.01	3028.	188.		101638.	
18 P Z	-14.922	0.01	2961.	166.		99801.	
19 P Z	-14.603	-0.04	3076.	112.		105073.	
20 P Z	-14.277	-0.03	3016.	87.		103551.	
21 P Z	-13.958	-0.02	3046.	158.		102961.	
22 P Z	-13.627	-0.01	3017.	149.		102154.	
23 P Z	-13.285	0.07	2834.	181.		95C10.	
24 P Z	-12.951	-0.02	3016.	133.		102488.	
25 P Z	-12.618	0.07	2818.	166.		94796.	
26	-12.175	14.00	95.	198.		-1248.	
27 P	-11.771	0.05	2866.	150.		96846.	
28	-11.360	5.43	94.	113.		680.	
29 P	-10.951	0.06	2811.	132.		95336.	
30 P	-10.627	0.02	2959.	180.		99408.	
31 P	-10.306	0.06	2841.	162.		95693.	
32 P	-9.986	-0.00	2968.	116.		101201.	
33 P	-9.661	-0.07	3175.	133.		108053.	
34 P	-9.341	-0.02	3049.	153.		103181.	

JII ECLIPSE, APRIL 6, 1971 BAND PASS 10680-11040 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTION FACTOR
35 P	-9.020	0.03	2937.	197.		98245.	
36 P	-8.696	0.02	2905.	117.		98973.	
37 P	-8.368	-0.05	3131.	154.		106028.	
38 P	-8.021	-0.02	3065.	201.		102633.	
39	-7.654	14.00	153.	263.		-719.	
40 P	-7.295	0.03	2909.	154.		98258.	
41	-6.944	14.00	72.	117.		-182.	
42 P	-6.519	-0.05	3118.	138.		105943.	
43 P	-6.199	-0.09	3214.	111.		109926.	
44 P	-5.880	-0.03	3054.	136.		103749.	
45 P	-5.559	-0.03	3061.	149.		103694.	
46 P	-5.240	-0.00	3059.	258.		101106.	
47 P	-4.918	0.05	2880.	190.		96412.	
48 P	-4.592	-0.00	2986.	150.		101046.	
49 P	-4.260	-0.06	3152.	164.		106532.	
50 P	-3.939	-0.06	3144.	156.		106437.	
51 P	-3.618	-0.05	3134.	162.		105948.	
52 P	-3.297	-0.06	3145.	157.		106449.	
53 P	-2.973	0.05	2839.	129.		96386.	
54 P	-2.646	-0.03	3064.	131.		104214.	
55 P	-2.325	0.09	2746.	152.		92599.	
56 P	-2.002	0.22	2490.	206.		82392.	
57 P	-1.683	0.25	2376.	131.		80134.	
58 P	-1.363	0.33	2193.	104.		74353.	
59 P	-1.040	0.62	1728.	143.		57177.	
60 P	-0.718	0.86	1383.	110.		45864.	
61 P	-0.397	0.96	1266.	113.		41700.	
62 P	-0.076	1.48	851.	173.		25789.	
63 P	0.250	1.79	674.	178.		19479.	
64 P	0.569	2.63	390.	203.		8961.	
65 P	1.212	4.29	2184.	363.	242.3	1942.	
66 P	1.533	5.01	1244.	401.	244.3	1000.	
67 P	1.857	5.89	691.	391.	246.2	445.	
68 P	2.179	6.23	574.	412.	248.1	326.	
69 P	2.502	6.39	531.	397.	250.1	281.	
70 P	2.824	6.72	460.	309.	252.0	208.	
71 P	3.147	6.70	465.	387.	253.9	211.	
72 P	3.469	6.84	442.	425.	255.9	186.	
73 P	3.793	7.33	376.	374.	257.8	118.	
74 P	4.114	7.68	345.	388.	259.7	85.	
75 P	4.437	7.24	390.	380.	261.7	128.	
76 P	4.764	7.89	334.	393.	263.6	70.	
77 P	5.086	8.77	297.	423.	265.6	31.	
78 P	5.409	8.09	326.	429.	267.5	58.	
79 P	5.733	8.21	322.	428.	269.4	53.	0.992028

JII ECLIPSE, APRIL 6, 1971 BAND PASS 10680-11040 A -- CONTINUED

NUMBER PLOT, O MAG	TIME (MIN)	CARKENING IN MAGNITUDES	UNCORRECTED OBJECT COUNT	UNCORRECTED SKY COUNT	SKY BY CURVE FIT	CORRECTED OBJECT COUNTS	CORRECTICN FACTOR
80 P	6.060	8.66	306.	430.	271.4	35.	0.937233
81 P	6.381	8.02	336.	383.	273.3	63.	1.019332
82 P	6.702	8.86	304.	369.	275.3	29.	1.035761
83 P	7.028	14.C0	258.	378.	277.2	-19.	1.065564
84 P	7.364	8.69	313.	458.	279.2	34.	0.994524
85 P	7.683	10.03	291.	483.	281.1	10.	0.9742C8
86 P	8.020	10.60	289.	466.	283.2	6.	0.9997C7
87 P	8.344	11.82	287.	375.	285.1	2.	1.C844C0
88 P	8.668	14.00	235.	432.	287.1	-52.	1.C42114
89 P	8.991	14.00	271.	417.	289.0	-18.	1.015523
90 P	9.315	10.55	297.	428.	290.9	6.	0.996534
91 P	9.637	14.00	267.	423.	292.9	-26.	1.075159
92 P	9.963	14.00	279.	398.	294.8	-16.	1.098599
93 P	10.286	14.00	243.	433.	296.8	-54.	1.028554
94 P	10.606	10.92	303.	454.	298.7	4.	1.048194
95 P	10.929	14.00	288.	492.	300.6	-13.	1.011329
96 P	11.254	8.84	332.	526.	302.6	29.	0.9258C0
97 P	11.579	14.00	302.	466.	304.5	-3.	0.945601
98 P	11.913	14.00	303.	465.	306.5	-4.	0.984208
99 P	12.245	14.0C	279.	503.	308.5	-30.	0.961412
100 P	12.568	8.17	365.	546.	310.4	55.	0.967106
101 P	12.890	9.40	330.	473.	312.4	18.	1.052082
102 P	13.216	8.83	344.	548.	314.3	30.	0.971486
103 P	13.537	14.00	308.	526.	316.3	-8.	0.923142
104 P	13.859	9.07	342.	527.	318.2	24.	0.952737
105 P	14.180	9.16	342.	511.	320.1	22.	0.989722
106 P	14.504	10.13	331.	561.	322.1	9.	0.943021
107 P	14.825	9.31	343.	585.	324.0	19.	0.936075
108 P	15.154	8.75	358.	520.	326.0	32.	1.028826
109 P	15.498	9.11	351.	595.	328.C	23.	
110 P	15.822	14.00	302.	602.	330.0	-28.	
111 P	16.145	14.00	324.	547.	331.9	-8.	
112 P	16.472	11.27	337.	503.	333.9	3.	
113 P	16.811	14.00	327.	609.	335.9	-9.	
114 P	17.145	9.49	354.	570.	337.9	16.	
115 P	17.469	14.00	338.	567.	339.9	-2.	
116 P	17.802	8.59	379.	587.	341.8	37.	
117 P	18.126	14.00	327.	621.	343.8	-17.	
118 P	18.455	14.00	316.	565.	345.8	-30.	
119 P	18.776	14.00	320.	563.	347.7	-28.	
120 P	19.101	14.00	312.	660.	349.6	-38.	
121 P	19.437	9.35	370.	585.	351.7	18.	
122 P	19.758	14.00	337.	625.	353.6	-17.	