

1985 STEAM GENERATOR INSPECTION RESULTS

SAN ONOFRE UNIT 1

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Southern California Edison Company

Rosemead, California

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## I. Introduction

On November 21, 1985, following 13.5 effective full power months (EFPM) of operation from the start of Cycle 8 operation, San Onofre Unit 1 began the Cycle 9 refueling outage. As part of this refueling outage, the steam generator tubes were inspected in accordance with the San Onofre Unit 1 Technical Specification 4.16, Inservice Inspection of Steam Generator Tubing. The purpose of this report is to provide detailed results of the steam generator inspections performed during the outage. This report provides the information necessary to facilitate the NRC review of the inspection results and approval of the corrective action taken at San Onofre Unit 1 as it relates to the inspection of steam generators. The report also includes the description of the secondary side wrapper support bar inspection.

Consistent with the provisions of Technical Specification 4.16 an inspection was performed addressing requirements on random surveillance of the steam generator tubes and on special surveillances of anti-vibration bar (AVB) wear, progression of denting and previously detected tube degradation. The last such inspection was conducted in May 1984. Further, in accordance with Reference 2, a secondary side inspection was conducted to visually inspect the intact wrapper support bars. The purpose of the inspection was to verify the bars had remained intact following 9.2 EFPM of operation since return to service in November 1984 and did not require removal.

Section II of this report contains the Technical Specification Inspection program description, results, corrective actions and conclusions. Section III of this report contains the Wrapper Support Bar Inspection program description, results and conclusions. Section IV contains the steam generator operating history of San Onofre Unit 1 over the period since 1980. Section V summarizes the overall conclusions derived from the inspection program. Finally, Section VI provides a listing of the references used in this report.

## II. Technical Specification Inspection

### A. Introduction

The San Onofre Unit 1 Steam Generator Tube Technical Specification Inspection was performed during the December 8, 1985 through December 31, 1985 time period. The previous Steam Generator Tube Technical Specification Inspection was performed in May 1984. The May 1984 inspection results and earlier inspection results indicated the pattern of denting in steam generators "A" and "C" is unchanged and in all other respects the steam generators "A", "B" and "C" (SG-A, SG-B and SG-C) are behaving in a like manner. Based on Technical Specification 4.16.A.3, which allows the inspection of steam generators on a rotating schedule if they are performing in a like manner, SG-B was selected for the general inspection and special inspection of AVB wear. SG-C was selected for the special inspection for denting. The inspection plans, results and conclusions are discussed below.

### B. Denting Inspection

#### 1. Description

As a result of previous steam generator inspections, 192 tubes in SG-C hot and cold legs were identified as having restrictions due to steam generator tube denting. These tubes were gauged through the fourth support plate using eddy current probes. Figures A.1 and A.2 show the SG-C gauging program for the hot leg and cold leg respectively. Each tube was gauged using the probe size which was previously recorded as having passed through the tube. In the event of an increased restriction, the tube was gauged with successively smaller probes until a probe passed the restriction. Restriction sizes observed this outage were compared to previous inspection results to assess the progression of steam generator tube denting.

#### 2. Results

The results of the tube gauging were compared with the corresponding data from previous inspections for the 192 tubes. The comparison identified six tubes which restricted a probe size that previously passed and four tubes which passed a probe size that was previously restricted. The remaining 182 tubes gauged remained unchanged, passing the probe size which was previously passed. The data for the SG-C tube gauging is summarized in Table A.1 of Appendix A.

#### 3. Conclusion

Out of 192 tubes gauged, only six tubes were more restricted than in previous inspections. These results are within the expected variability of the gauging process and are not attributable to a significant progression of the denting process. Therefore, it is concluded that steam generator tube denting, as compared to previous inspection results, is not progressing at San Onofre Unit 1.

## C. AVB Inspection

### 1. Description

As required by Technical Specification 4.16.C the 131 tubes in SG-B having previous indications of AVB wear were inspected. These tubes were inspected from the cold leg due to accessibility limitations from restricted or sleeved tubes. The best available technology in multi-frequency eddy current techniques was employed using the MIZ-18 to collect the eddy current data and the DDA-4 to analyze the data.

### 2. Results

The results of the SG-B AVB inspection indicated that 3 tubes required plugging. These tubes had indications at the AVBs of greater than or equal to 50% through-wall degradation and were plugged per the criteria of Technical Specification 4.16.E.1.c. The AVB inspection program was expanded to include 191 more tubes in SG-B and 166 tubes in SG-C for a total of 488 tubes to evaluate whether any other previously detected AVB indications required plugging. The expanded AVB inspection resulted in an additional 20 tubes in SG-C which required plugging. In total, 23 tubes were plugged out of 488 tubes inspected for AVB wear. All of the 488 tubes had previously been inspected either in 1980 (SG-B) or 1982 (SG-C) and were documented at that time as having less than 50% through-wall degradation (not pluggable). An investigation was conducted to evaluate the apparent increase in AVB indications. The investigation, as discussed below, concluded that the changes in AVB indications are due to improved inspection techniques.

Since the previous 1980 and 1982 inspections, improvements have been made in the methods used to inspect steam generator tubes in the vicinity of the AVBs and interpret the data obtained. The use of an AVB wear scar standard for data acquisition and the 340 KHZ/100 KHZ mixed signals (differential or absolute) for data interpretation are now standard industry practice. Further, the percentage of wall loss is based on signal amplitude rather than signal phase angle. These techniques provide a more accurate assessment of the tubing condition in the vicinity of the AVBs.

A comparison of the AVB inspection data with previous inspection data was conducted for 37 tubes. This comparison indicated that data taken at the same frequency showed no change in the signal in any of the tubes. Hence, there was no real AVB degradation in the steam generator tubes. The comparison results are summarized in Table B.1 and the comparison data is contained in Appendix B.

An AVB inspection program was conducted on SG-A in May 1984. The inspection utilized the improved techniques of the AVB standard

and the data was evaluated using the 340KHZ/100KHZ differential mix. As a result of that inspection, no tubes were plugged. Since the SG-A tubes had previously been inspected with the improved techniques, a reinspection of SG-A for AVB wear was not conducted.

### 3. Conclusion

Based on the comparison results, it is concluded that the indications at the AVBs have not changed and the apparent growth of the indications is due to the change in data acquisition and analysis techniques rather than increased degradation between inspections.

## D. General Inspection

### 1. Description

The general inspection program consisted of inspecting the unsleeved length of 312 steam generator tubes (at least 3% of the total number of tubes in service) in SG-B. In addition, the sleeved portion of 272 tubes (approximately 4% of the total sleeved tubes) was inspected. Multi-frequency eddy current techniques were employed using the MIZ-18 to collect the data and the DDA-4 to analyze the data. The conventional bobbin coil probe was used to provide the best possible assessment of the general condition of the unsleeved steam generator tubes. The 8x1 probe was used to supplement the bobbin probe when necessary. The magnetically biased bobbin probe and the crosswound probe were employed to assess the condition of the sleeves inspected.

### 2. Results

As discussed in our letter of February 11, 1986, (Reference 1), pluggable defects were identified in only 3 areas of the steam generators. Further, no progression of degradation was detected in any other region of the steam generator, including the sleeves. In addition, the sleeved tubes inspected showed no sign of imperfections and no detectable structural changes were observed in the sleeves and sleeve-to-tube joints. As also stated in Reference 1, the three areas with pluggable defects are (1) near the top of the cold leg tubesheet, (2) near the top of the hot leg tubesheet and (3) at the AVB's. The AVB inspection results were discussed in Section II.C of this report. The remaining two areas are addressed below.

#### a. Top of the Hot Leg Tubesheet

One tube, R20C94, inspected due to a previous 44% through-wall indication near the top of the tubesheet, had exhibited an increase in the indication to 64%. Based on the 64% through-wall indication, the tube was plugged per Technical Specifications. Reviewing the history of this tube, the previous indication (1982) of 44% was only 0.1 inch

above the top of the tubesheet. In 1982 the indication was measured using the prime frequency, but due to the location near the tubesheet the indication should have been measured using the 340 KHZ/100 KHZ differential mix. If the differential mix had been used in 1982, the indication would also have been approximately 64% and the tube would have been plugged. It is concluded that based on the comparison of the 1982 and 1985 data, there has been no real growth in the indication for this tube. A comparison of the data is shown in Appendix C.

b. Top of the Cold Leg Tubesheet

A total of 400 tubes were inspected on the cold leg side of SG-B. The results were compared to previous inspection results and 39 indications exhibited apparent growth. This growth was confirmed when the 1985 DDA-4 output was compared to the corresponding DDA-4 output from 1980. This comparison of 39 indications showed that: 1) 3 previous greater than 20% through-wall indications near the top of the cold leg tubesheet had grown more than 10%, and 2) there were 9 new indications greater than 20% through-wall near the top of the cold leg tubesheet. The calculated mean growth of the 39 indications from 1980 to 1985 (13.5 EFPM) was 4.5% through-wall. Although none of these indications required plugging, one tube was preventively plugged due to a distorted ECT signal near the top of the cold leg tubesheet.

This confirmation of active growth of indications in SG-B necessitated an expansion of the inspection program into one of the uninspected steam generators as required by Technical Specification 4.16.B.1. A total of 546 tubes were inspected in the cold leg of SG-C. The results indicated there was further evidence of growth in indications near the top of the cold leg tubesheet. The inspection results were compared to previous inspection results and 59 indications exhibited apparent growth. Consequently, the DDA-4 output was compared to corresponding DDA-4 outputs from the 1980 inspection. This comparison of 59 indications showed that: 1) 3 previous greater than 20% through-wall indications near the top of the cold leg tubesheet had grown more than 10%, and 2) there were 12 new indications greater than 20% through-wall near the top of the cold leg tubesheet. The calculated mean growth of the 59 indications from 1980 to 1985 (13.5 EFPM) was 2.3%. One of the indications was identified as pluggable (greater than or equal to 50% through-wall degradation). In addition, two tubes with distorted ECT signals near the top of the cold leg tubesheet were preventively plugged. At least two tube pitches (24 tubes) surrounding the plugged tubes were inspected and verified that no other pluggable tubes existed in that area.

The pluggable tube in SG-C required an expansion into SG-A as required by Technical Specification 4.16.B.1. A total of

1,118 tubes were inspected on the cold leg side and compared to previous results. There were 198 indications which exhibited apparent growth and consequently the DDA-4 output was compared to the corresponding DDA-4 output from the 1980 inspection. This comparison of 198 indications showed that: 1) 8 previous greater than 20% through-wall indications near the top of the cold leg tubesheet had grown more than 10%, and 2) there were 26 new indications greater than 20% through-wall near the top of the cold leg tubesheet. The calculated mean growth of the 198 indications from 1980 to 1985 (13.5 EFPM) was 0.4%.

The indications in SG-A were located within 5 inches above the cold leg tube sheet rather than at the top of the cold leg tubesheet as in SG-C. A total of 19 tubes had indications which required plugging and 16 additional tubes with distorted ECT signals were preventively plugged. All tubes within two tube pitches of each tube plugged were inspected to bound the problem area.

The results of the top of the cold leg tubesheet indication comparisons are shown in Table C.1 and the actual comparisons are shown in Appendix C.

### 3. Conclusion

The single tube which was plugged due to a defect near the top of the hot leg tubesheet does not indicate an active problem that requires further action. The indications at or near the top of the cold leg tubesheet that indicate growth, do represent a potentially active region. However, the calculated growth rate is well within that assumed in the safety analysis which defines the basis for the Technical Specification 4.16. Therefore, existing requirements to inspect previously identified problem regions during future inspections will ensure corrective actions are performed as necessary to prevent potential failures.

### E. Summary/Conclusion

A total of 2336 tubes (22 percent of the tubes in service) were inspected and 63 tubes were removed from service by mechanical plugging. The tubesheet maps showing the tubes inspected in SG-A, SG-B and SG-C are shown in Appendix D. The SG-B inlet examination tubesheet map also shows tubes inspected as part of the 3.E License Condition inspection (Reference 5). The 63 tubes which required plugging had 39 defects located near the top of the cold leg tubesheet, 1 near the top of the hot leg tubesheet and 23 at the AVB's. However, more than half of these showed no real growth since previous inspections and were plugged as a result of improved inspection and analysis techniques. The inspection demonstrated that there has been no detectable progression of intergranular attack (IGA), denting, AVB wear or sleeve degradation. Further, only limited degradation has occurred since 1980 and only in the cold leg near the top of the tubesheet. Accordingly, it is concluded that the remedial action taken (plugging) is appropriate to resolve steam generator tube degradation identified during this inspection and no further action is required.



### III. Wrapper Support Bar Inspection

#### A. Introduction

The original wrapper support design for the Westinghouse Series 27 steam generator, including San Onofre Unit 1, included six symmetrically located and vertically positioned bars welded to the base of the wrapper on the ID and threaded into the tubesheet. The wrapper rested on these bars and the bars were intended to accept the vertical wrapper loads specified in the steam generator equipment specification.

Subsequent modifications to Series 27 steam generators involved installing two brackets (Type I) in each steam generator, one end of the bracket welded to the transition section of the upper portion of the wrapper assembly with the other end attached to the feedwater ring bracket close to the steam generator shell. These brackets were designed to prevent vertical displacement of the wrapper assembly even if all of the existing wrapper support bars were not in place. In order to provide further support to the wrapper, these two support brackets were supplemented by a third bracket (Type II) welded to the wrapper and attached to the feedwater ring nozzle support.

During the secondary side visual inspections conducted in 1982 all but three of the wrapper support bars were found to be either broken or missing. The subsequent investigation required the loose support bars to be removed but allowed the three intact support bars to remain.

In Reference 2, a commitment was made to visually inspect the intact wrapper support bars in SG-A and B during the next refueling cycle.

#### B. Results

A visual inspection of the intact wrapper support bars was conducted during the Cycle 9 refueling outage. The three remaining intact wrapper bars in SG-A and B are shown in Figure E.1 and E.2, respectively. The results of the inspection showed that the support bars are still intact and have not moved.

#### C. Conclusion

Based on the results of the wrapper support bar investigation documented in Reference 2 and the fact that the wrapper support bars in SG-A and B remain intact, the wrapper support bars can be left in place without affecting tube integrity.

#### IV. Steam Generator Operating History

The purpose of this section is to provide a discussion of the steam generator water chemistry, both prior to and during the most recent operating cycle and to provide a discussion of the unit operating history during the most recent operating cycle. This information will provide a basis to correlate previous and current inspection results.

Since SONGS 1 return to service on November 27, 1984, there have been three scheduled and five forced outages. However, none of these outages were due to condenser leaks or extraordinary steam generator water chemistry conditions.

An overview of the steam generator water chemistry from 1980 to return to service on November 27, 1984 was previously provided to you in Reference 3. As also stated in Reference 3, since return to service on November 27, 1984, the steam generator water chemistry has been controlled and condenser problems corrected using a program that is consistent, to the extent practical, with the Steam Generator Owners Group Secondary Water Chemistry Guidelines (4). Consistent with these guidelines, when condenser leaks were discovered in December 1984, February 1985 and October 1985, they were promptly corrected. Consequently, the steam generator water chemistry has been consistently stable over the period of operation since return to service.

## V. Steam Generator Inspection Summary and Conclusions

### A. Summary of Results

As part of the Inservice Inspection of steam generator tubes required by Technical Specification 4.16, a total of 2,336 tubes were inspected. The inspection results indicate there is no detectable progression of IGA, denting, or AVB wear. Further, there was no detectable sleeve degradation. Although 63 tubes required plugging, more than half of these showed no real growth since previous inspections and required plugging due to improved inspection and analysis techniques. The results indicate that limited degradation is occurring, but only in the cold leg near the top of the tubesheet. All plugging repairs required have been completed as summarized in Table F.1 and F.2 of Appendix F.

The wrapper support bar visual inspection results demonstrate that the three remaining wrapper support bars in SG-A and B are intact.

### B. Conclusions

The information provided in Section II of this report establishes the basis for concluding the remedial action taken to resolve the steam generator tube degradation identified during this inspection is appropriate. Accordingly, no further action is required and power operation can be safely resumed.

In regards to the wrapper support bars, the information provided in Section III of this report and Reference 2 provide adequate basis for leaving the intact bars in SG-A and B. To ensure these support bars remain intact, an inspection will be conducted during the next refueling outage.

In summary, the information presented in this report provides adequate basis for the approval of the corrective action taken at San Onofre Unit 1 as it relates to technical specification inspection of steam generator tubing.

6459F:8037u:8112u

VI. References

1. Letter, H. E. Morgan (SCE) to J. B. Martin (NRC Region V), "Docket No. 50-206, Special Report San Onofre Nuclear Generating Station, Unit 1," dated February 11, 1986
  
2. Letter, K. P. Baskin (SCE) to D. M. Crutchfield (NRC), "Steam Generator Inspection Report," dated September 21, 1982
  
3. Letter, M. O. Medford (SCE) to J. A. Zwolinski (NRC), "Steam Generator Inspections," dated March 18, 1985, Enclosure - 1985 Re-evaluation of Steam Generator Inspection Interval.
  
4. EPRI, Special Report No. NP-2704-SR, "PWR Secondary Water Chemistry Guidelines," October 1982.
  
5. Letter, M. O. Medford (SCE) to G. E. Lear (NRC), "License Condition 3.E Steam Generator Inspection Report," dated March 10, 1986

Appendix A

Tube Gauging Data

SAN ONOFRE UNIT 1 S/G C

HOT LEG

12/85 DENT GAUGING

REPORT DATE: 1/15/86

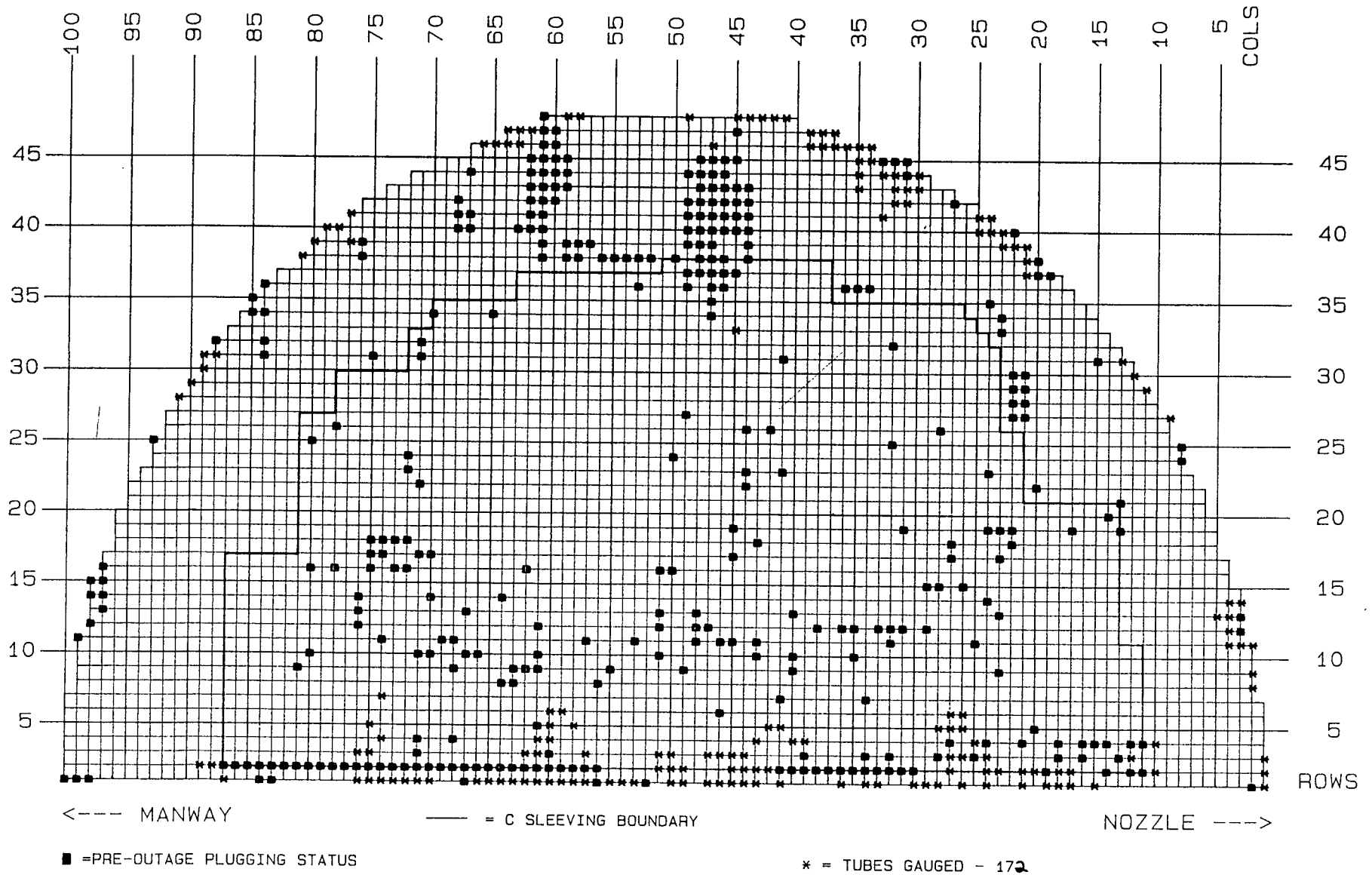


FIGURE A.1 - HOT LEG GAUGING PROGRAM

SAN ONOFRE UNIT 1 S/G C

COLD LEG

12/85 DENT GAUGING

REPORT DATE: 1/15/86

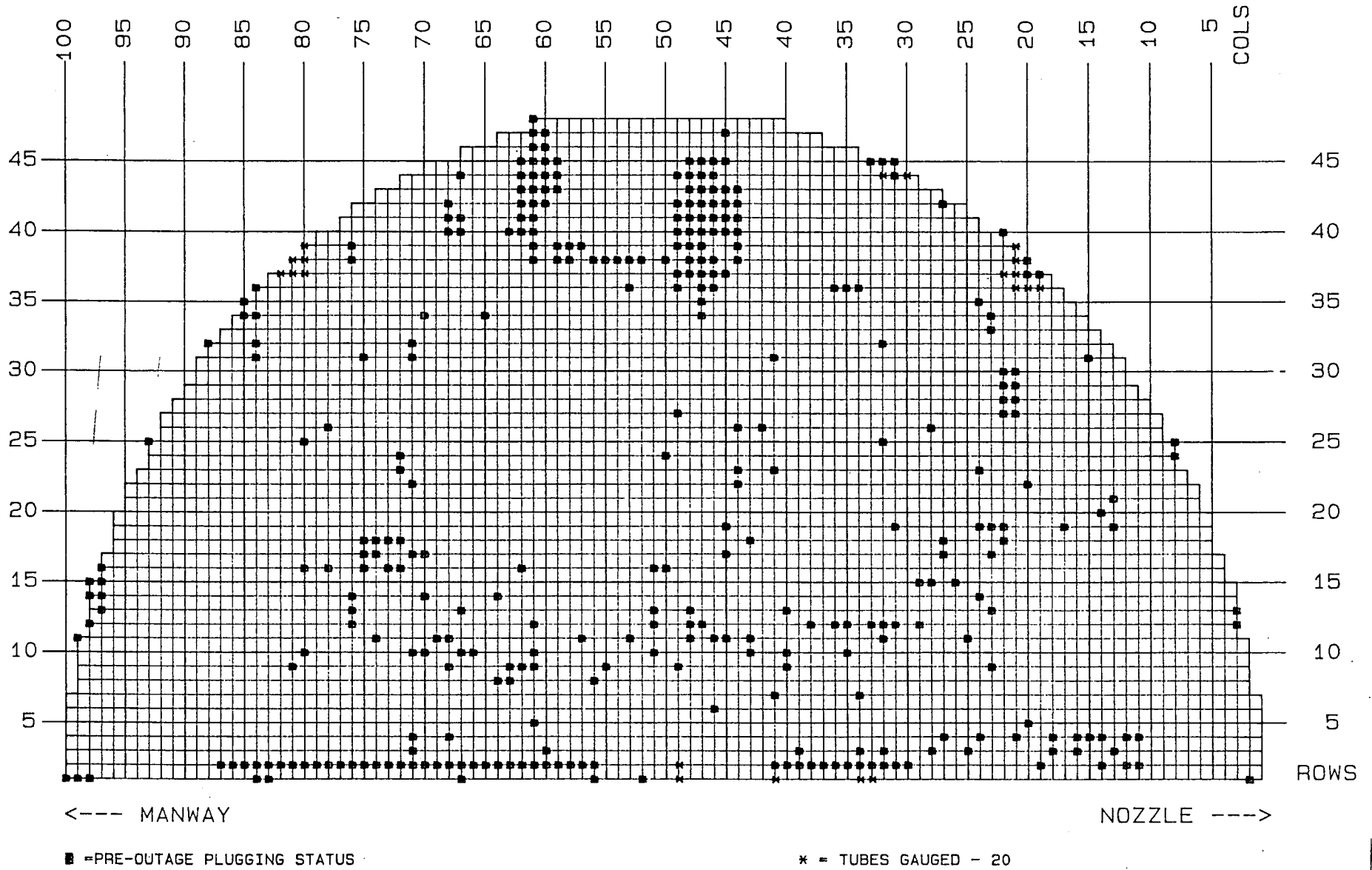


FIGURE A.2 - COLD LEG GAUGING PROGRAM

TABLE A.1

## 1985 "C" Steam Generator Gauging Results

	<u>Hot Leg</u>	<u>Cold Leg</u>
• Number of Tubes Gauged	172	20
• Probe Sizes		
• .400	0	0
• .400 - .460	0	0
• .460 - .500	7	2
• .500 - .560	93	10
• .560 - .580	72	8



Appendix B

Comparison of AVB Data

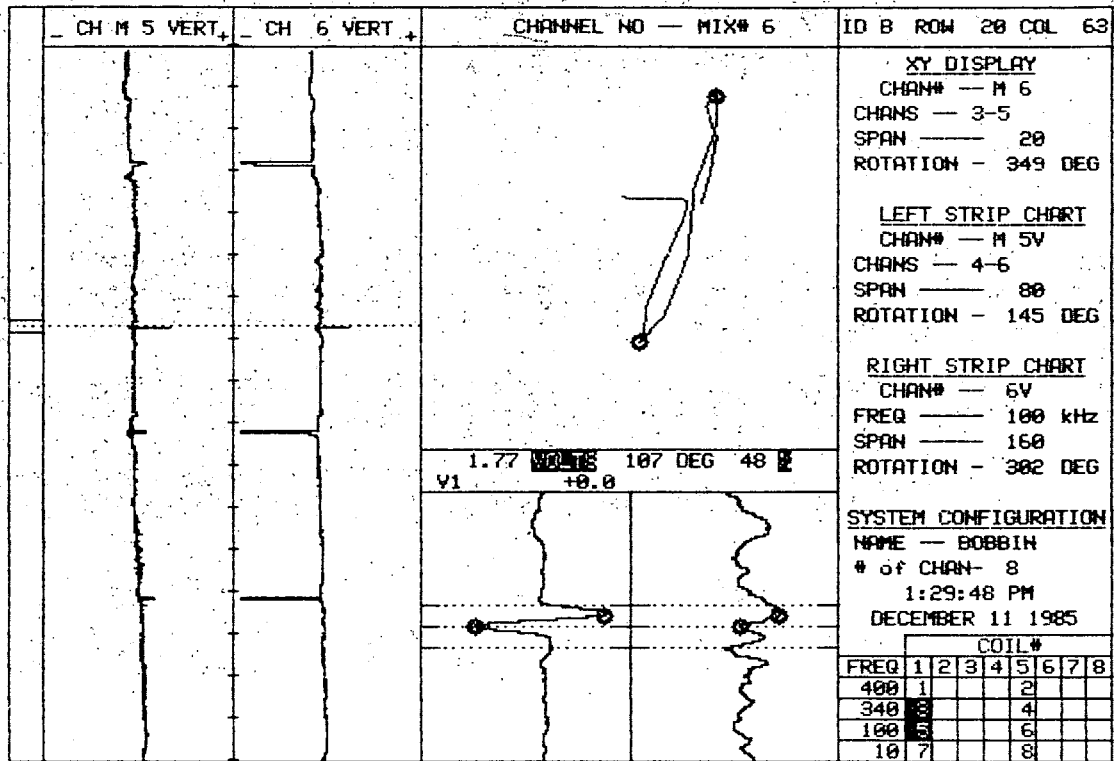
Table B.1

Steam Generator "B" and "C" AVB Data Comparison Results

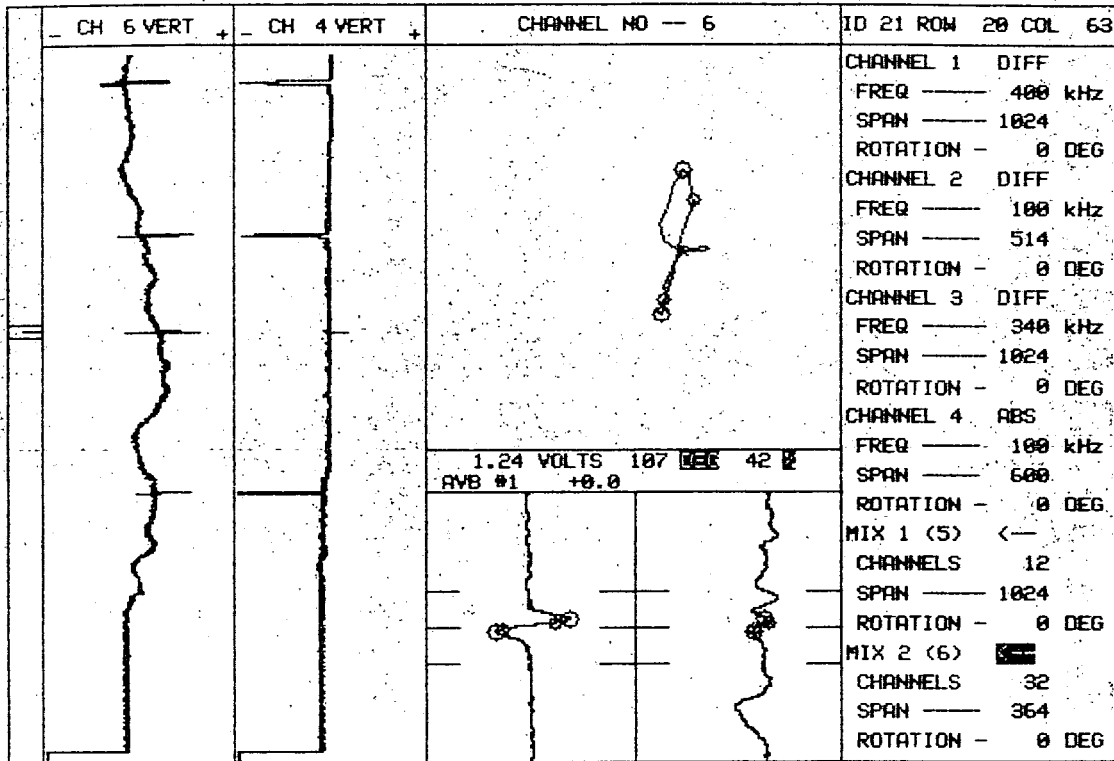
San Onofre Unit 1

	<u>Steam Generator</u>	
	<u>B</u>	<u>C</u>
· Number of Tubes Tested	322	166
· Number of AVB Indications Compared Between Previous Inspection and 1985	26	11
· Number of Tubes with Real Growth	0	0
· Number of Tubes Plugged ( $\geq$ 50% Indications)	3	20

STEAM GENERATOR "B" AVB INDICATION COMPARISONS

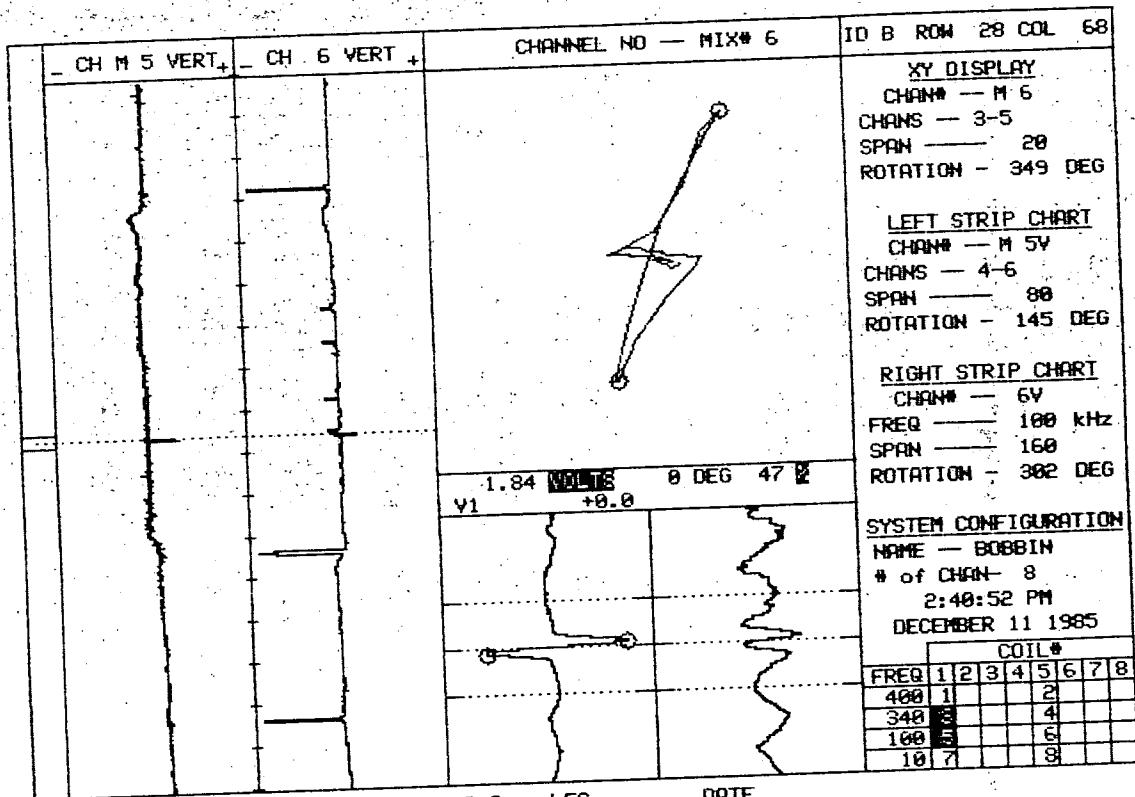


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 SONGS REEL C06    1    B    OUTLET    12/11/85

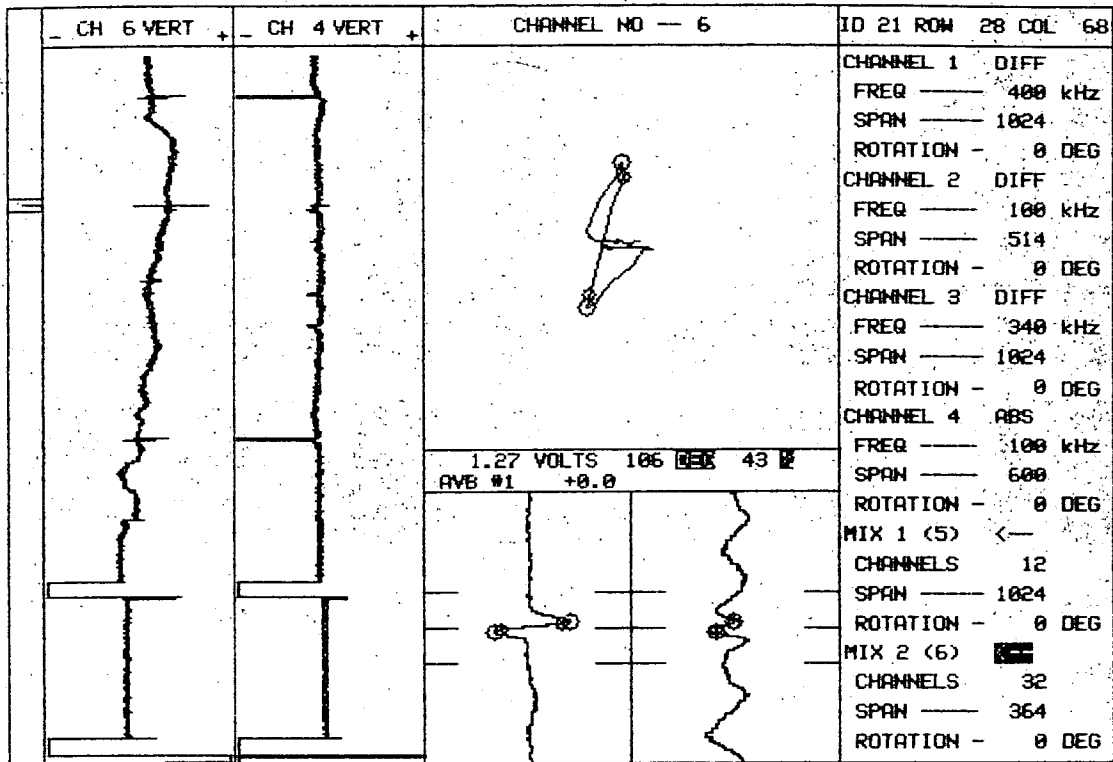


1.24 VOLTS 107 DEG 42 2  
AVB #1 +0.0

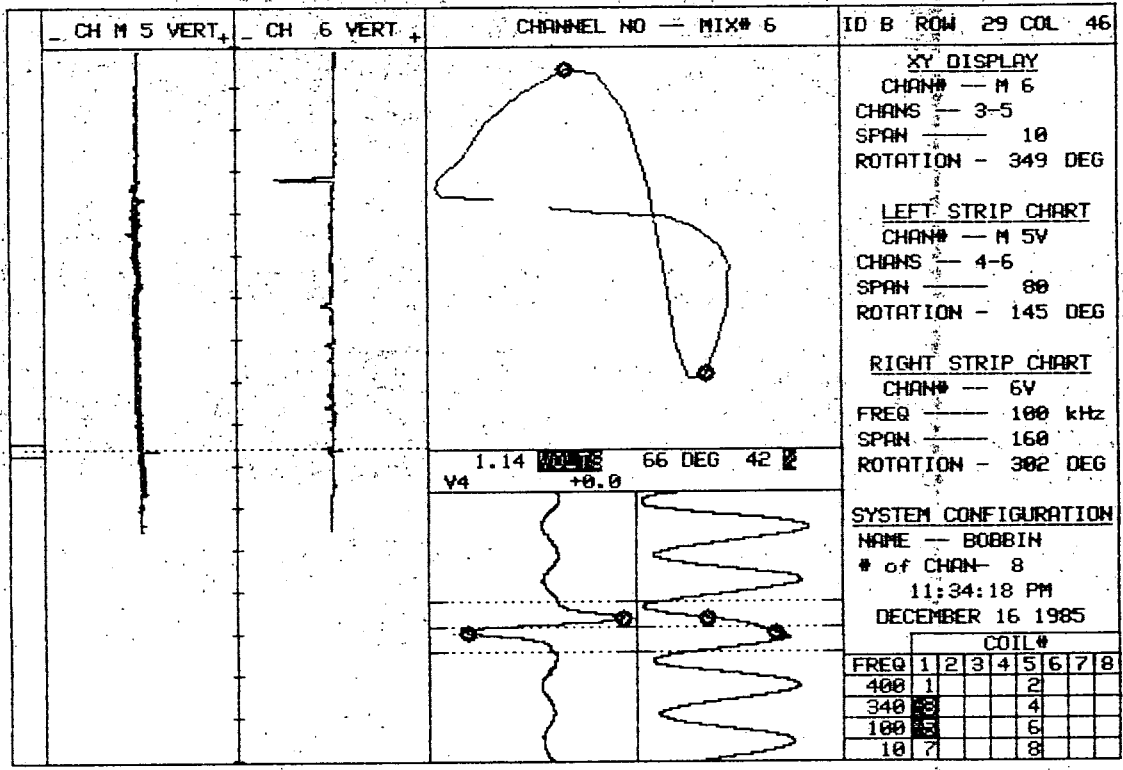
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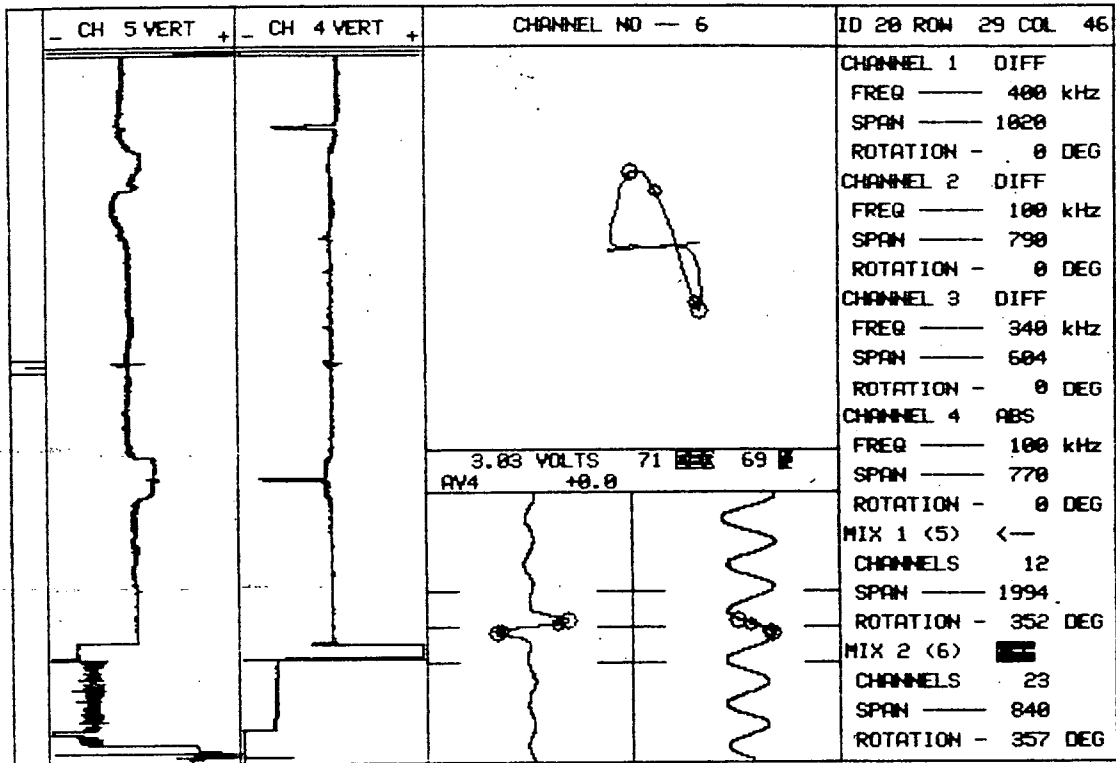


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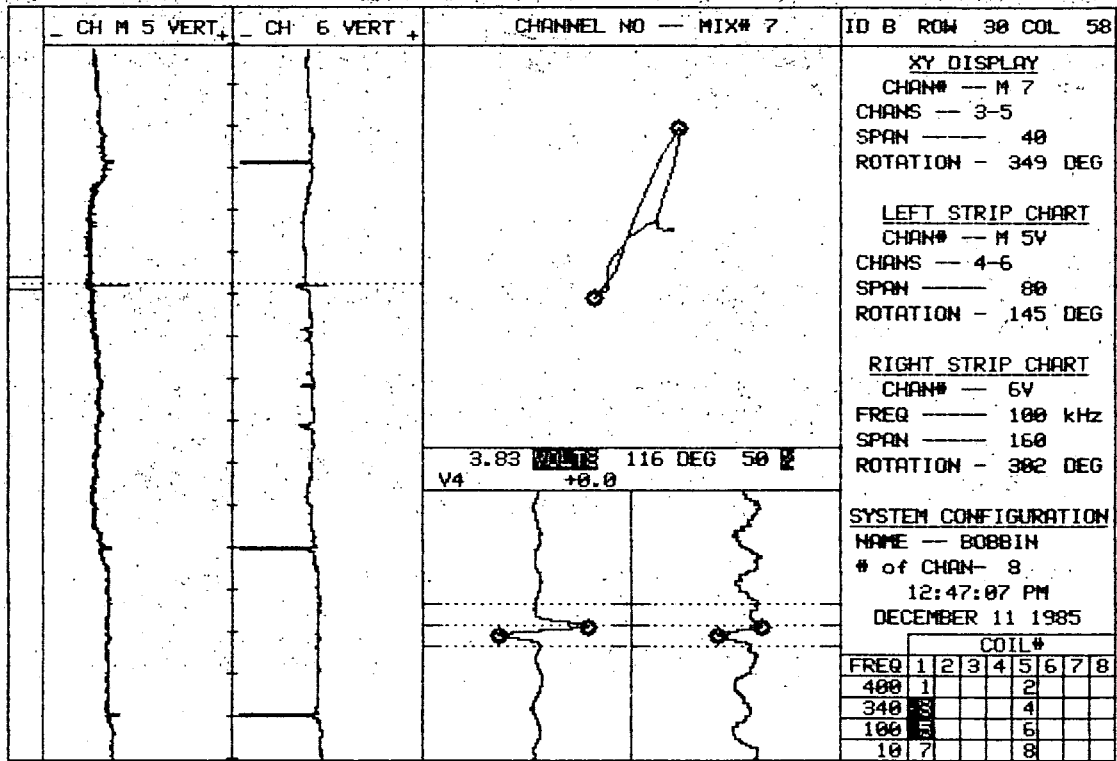


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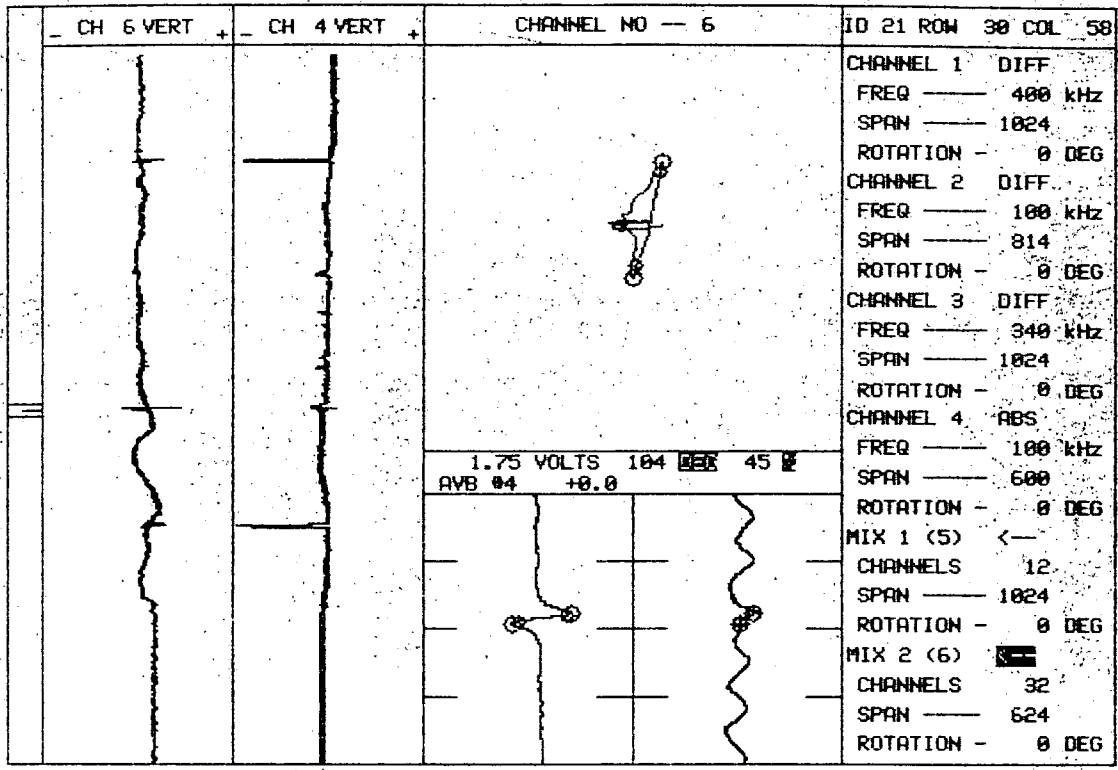




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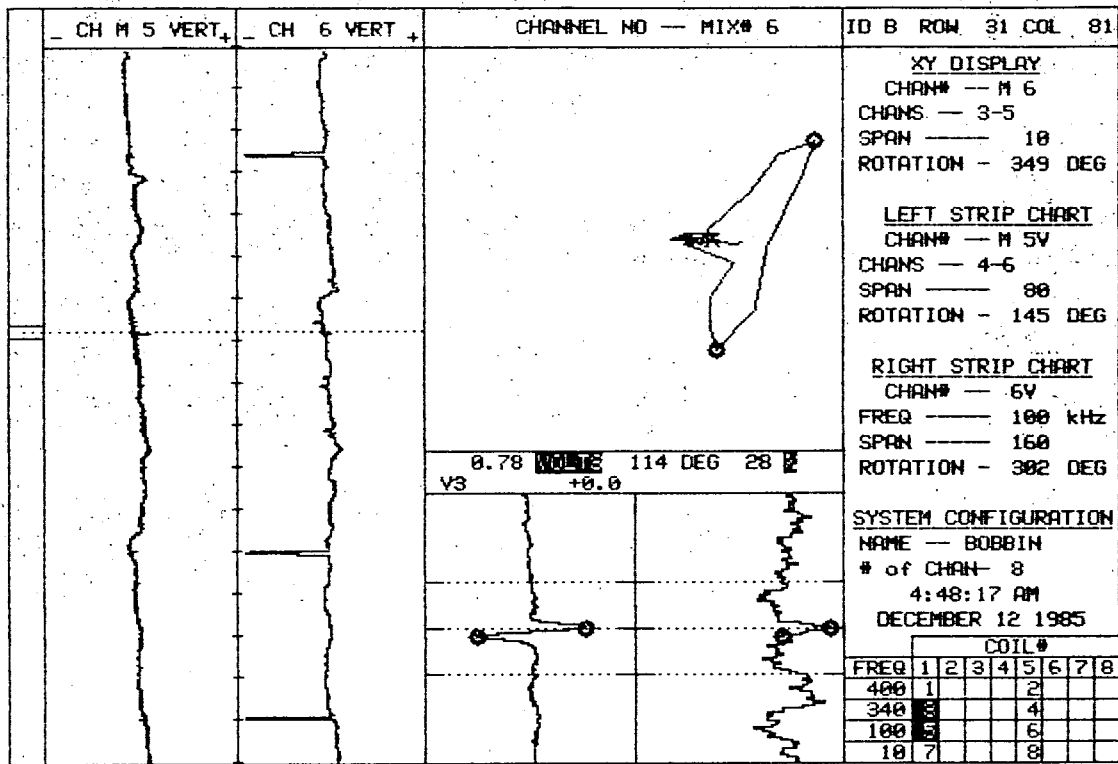


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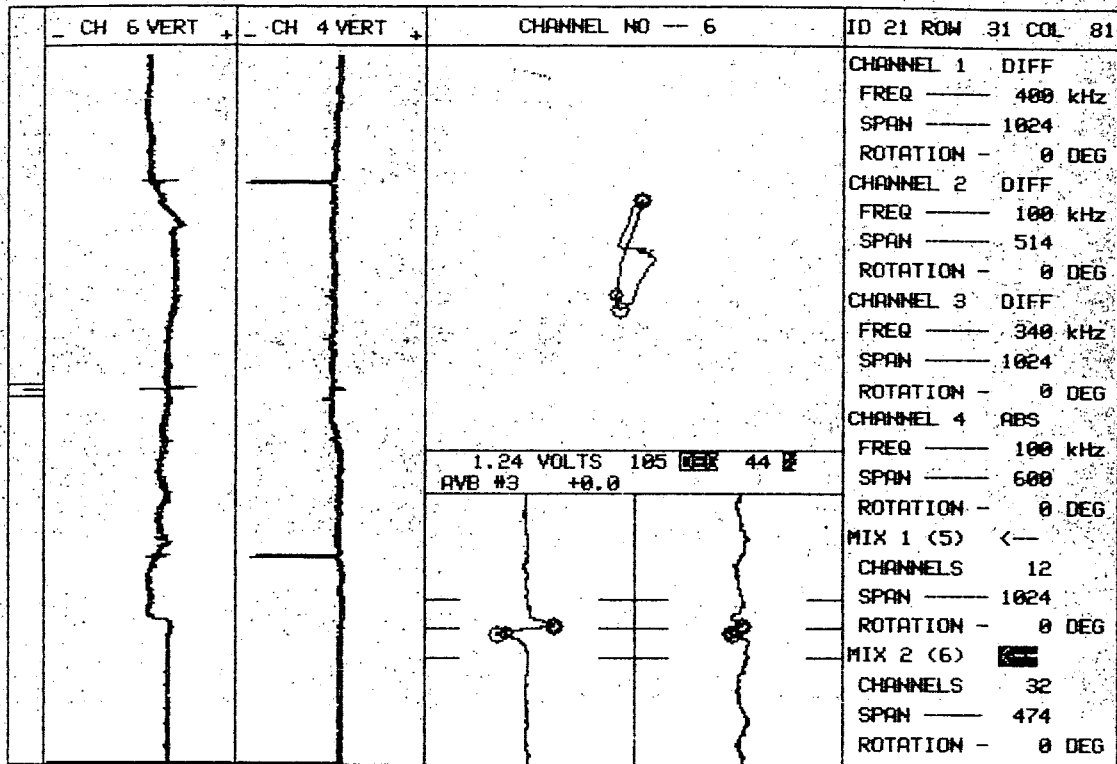


1.75 VOLTS 104 DEG 45 W  
AVB #4 +0.0

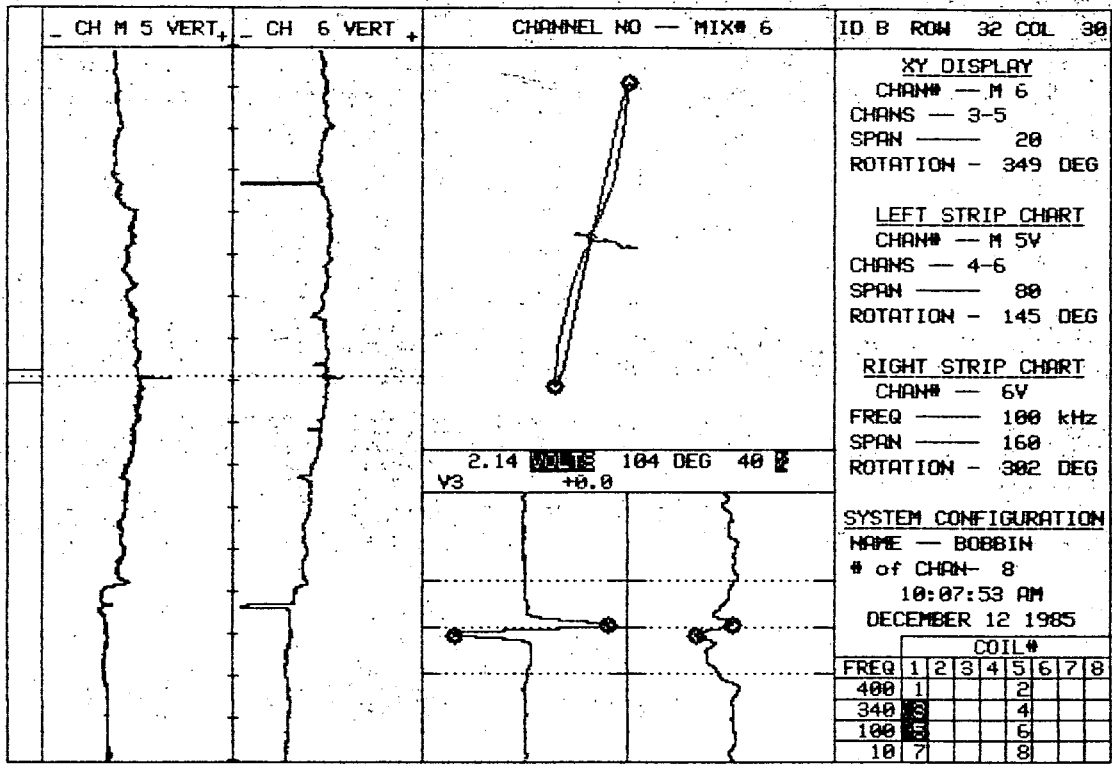
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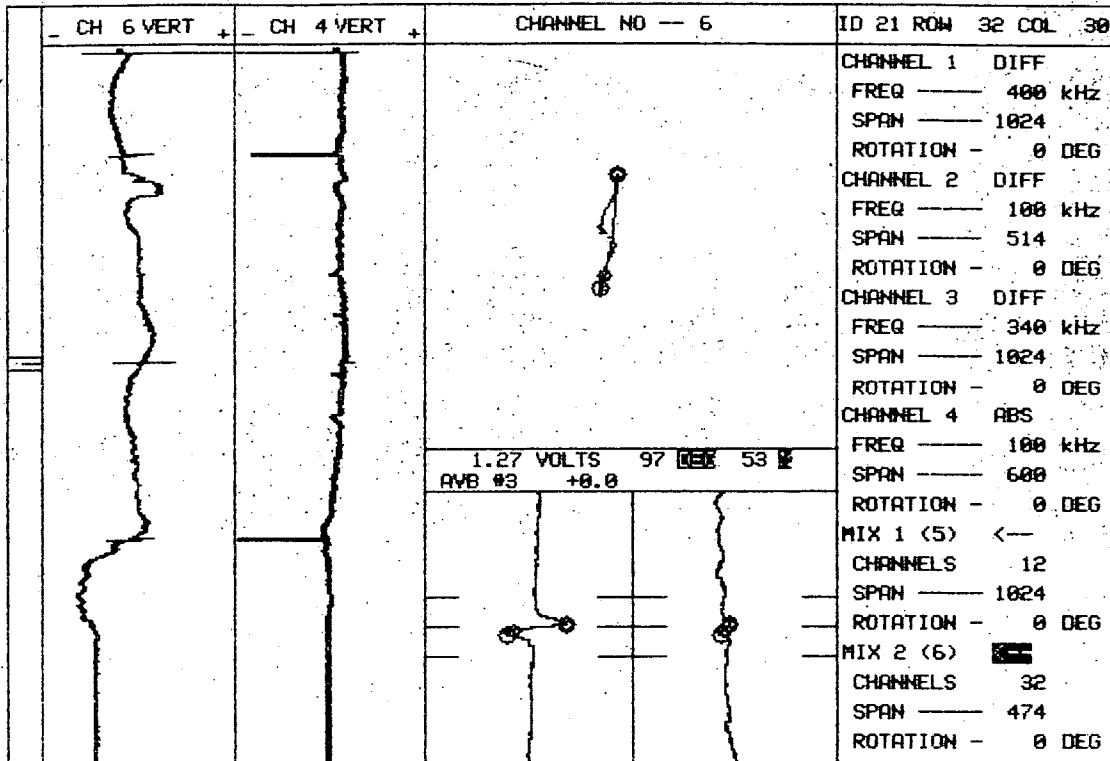
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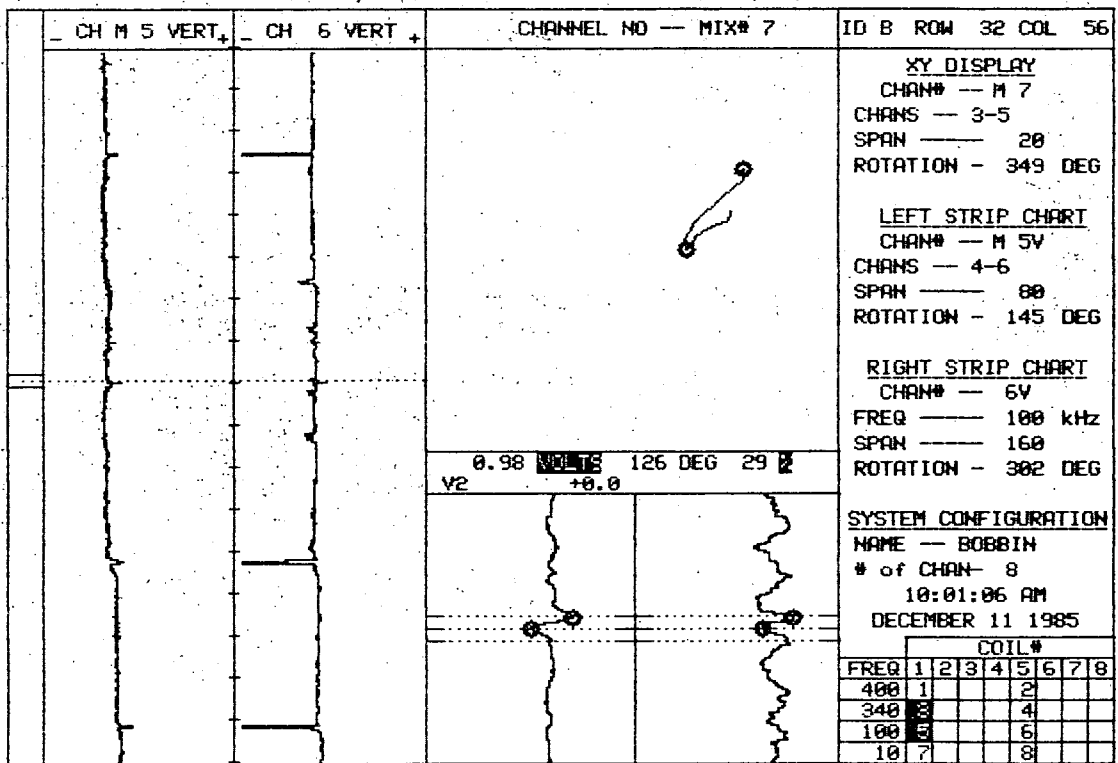
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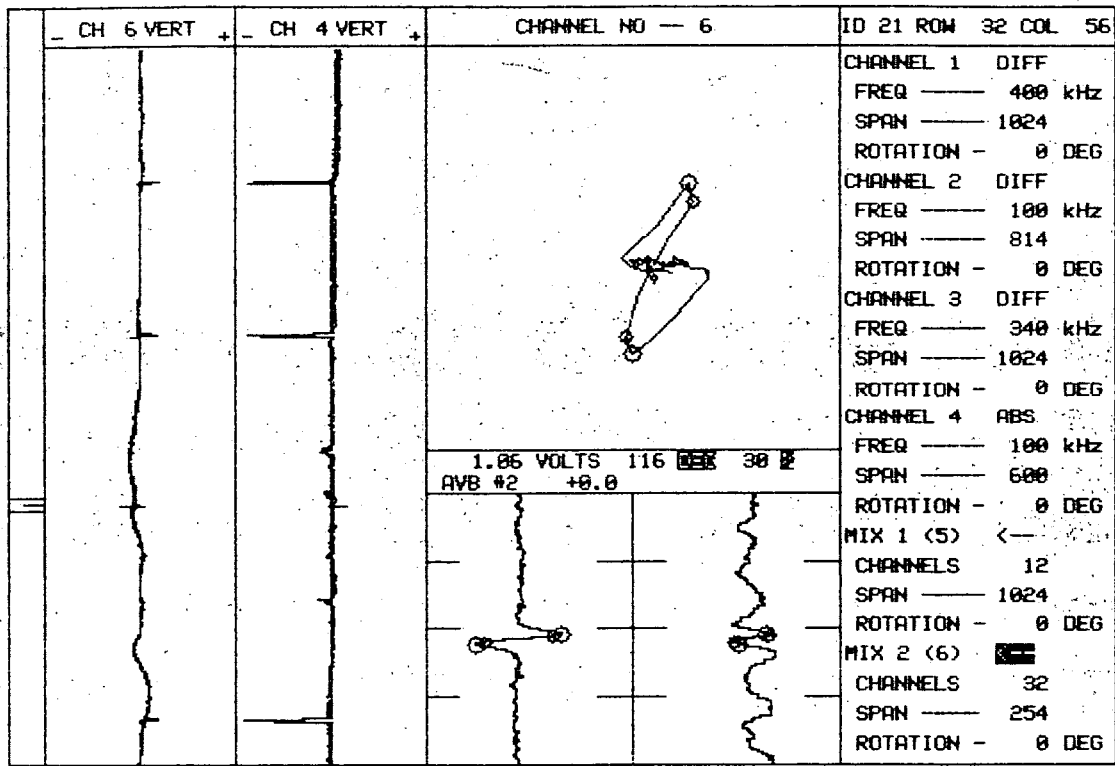


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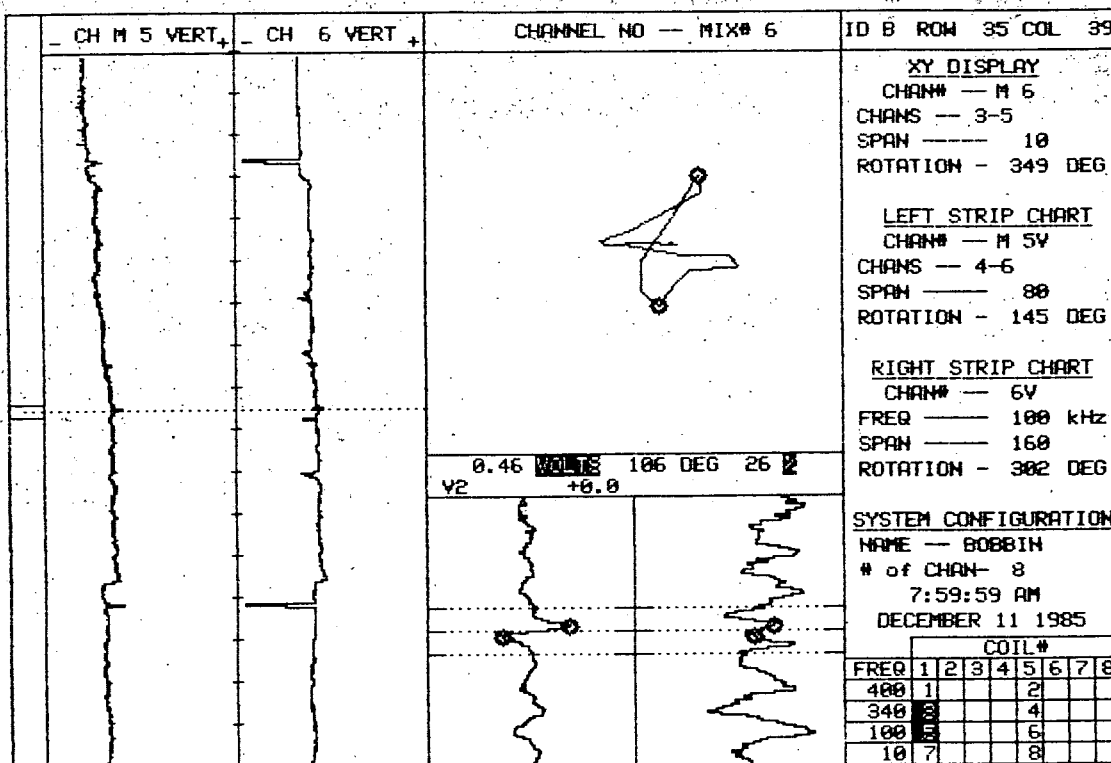
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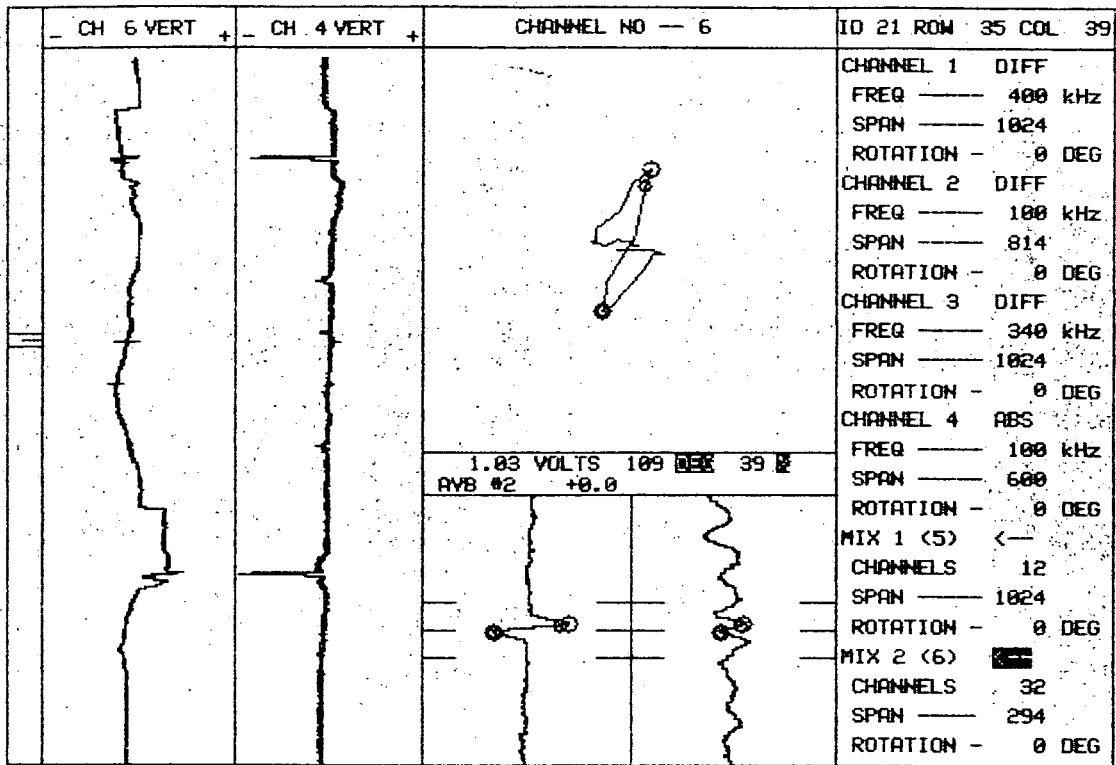


1.05 VOLTS 116 DEG 30 E  
 AVB #2 +0.0

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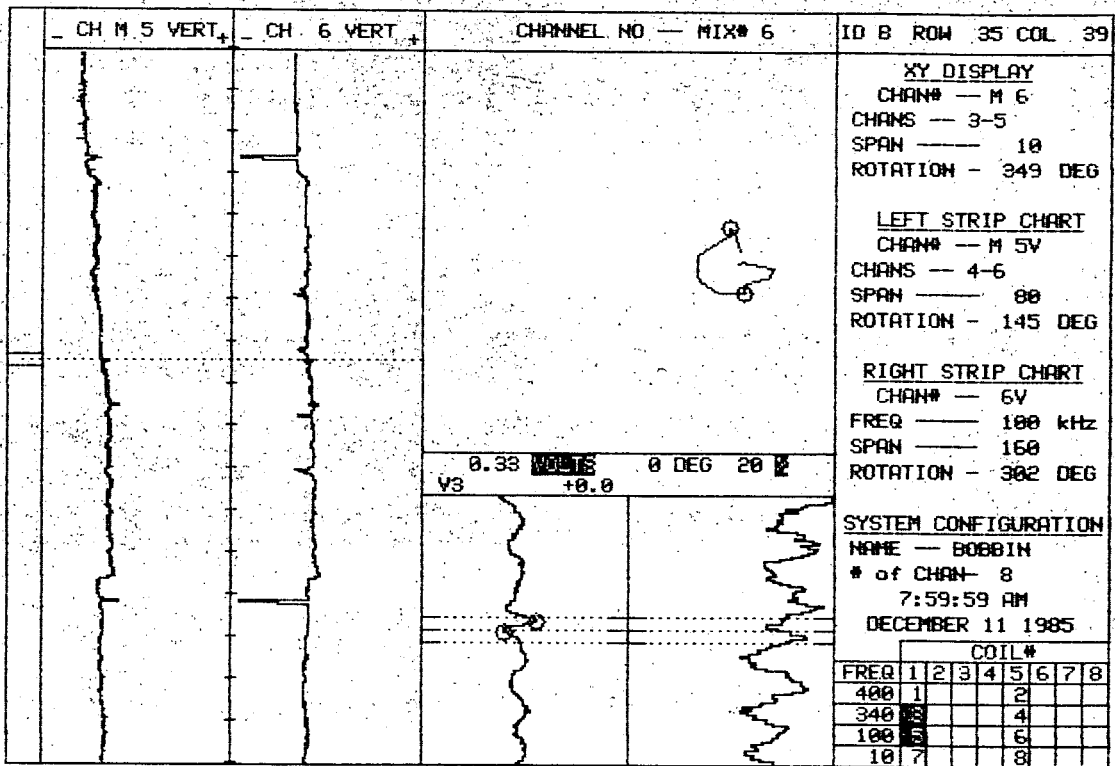


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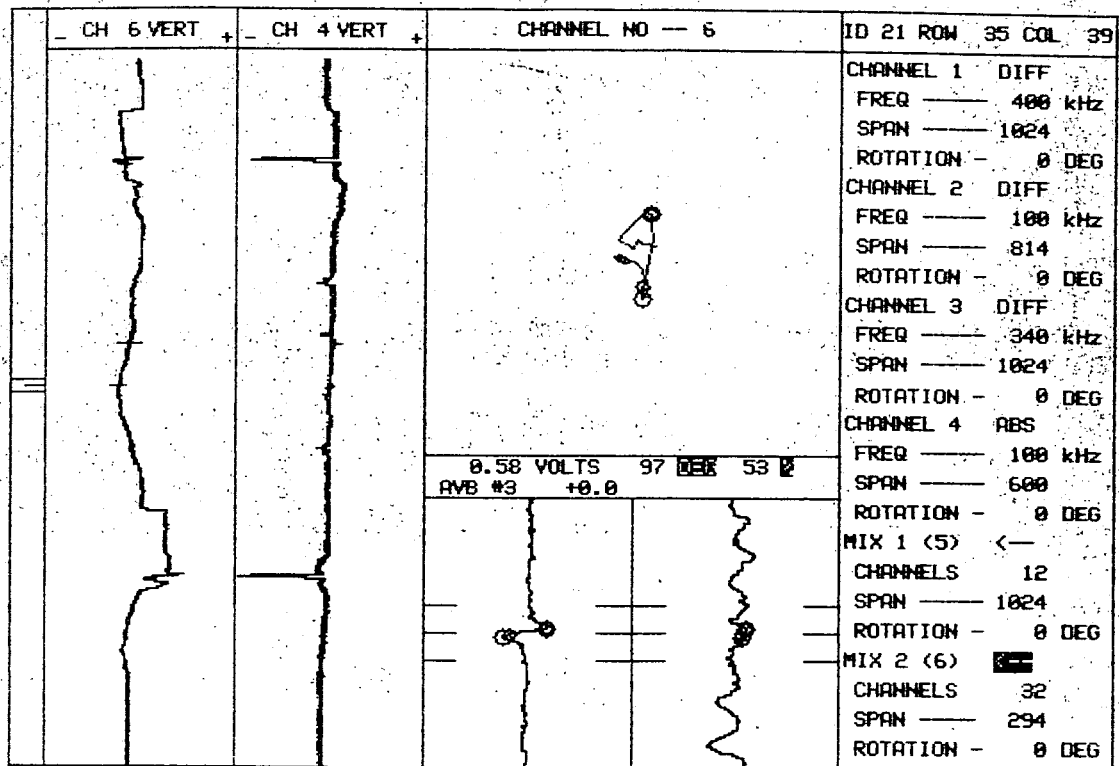


1.03 VOLTS 109 DEG 39 M  
AVB #2 +0.0

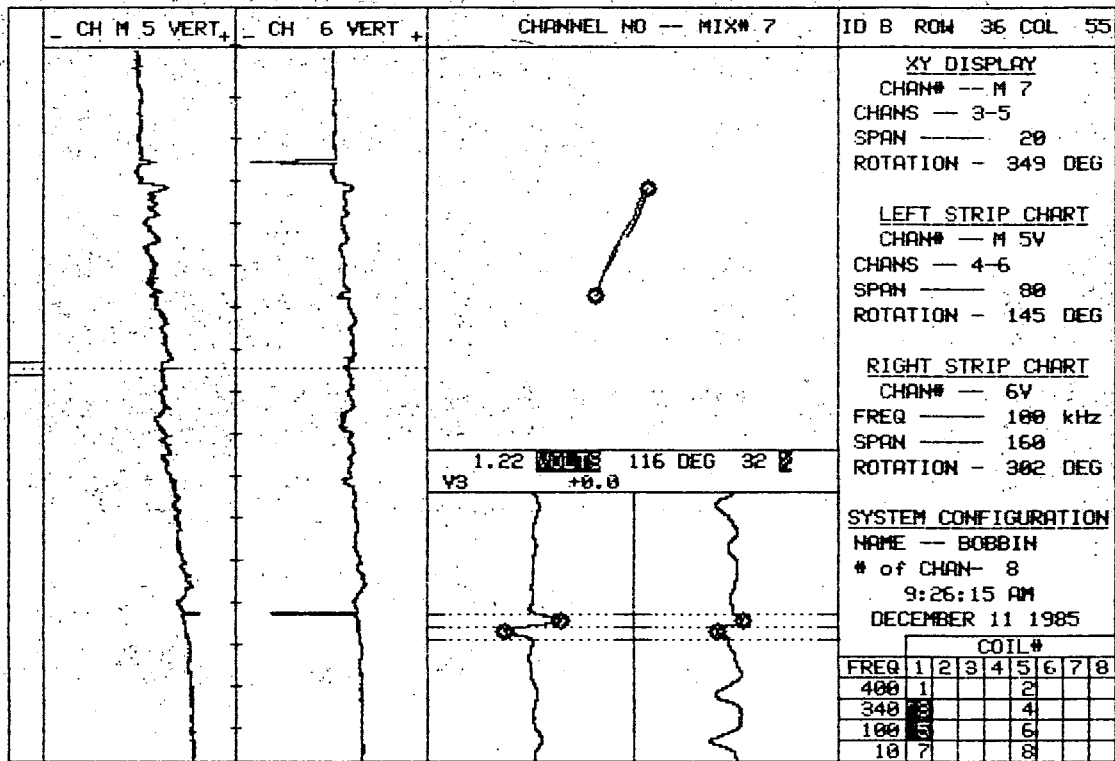
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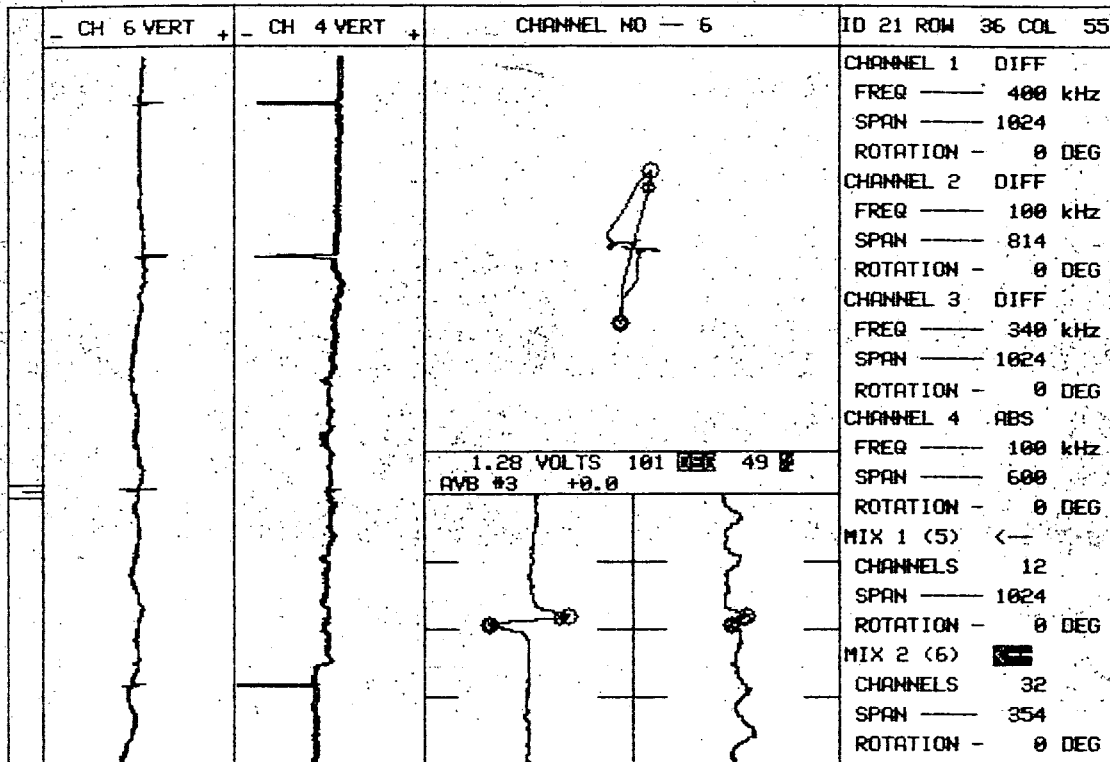
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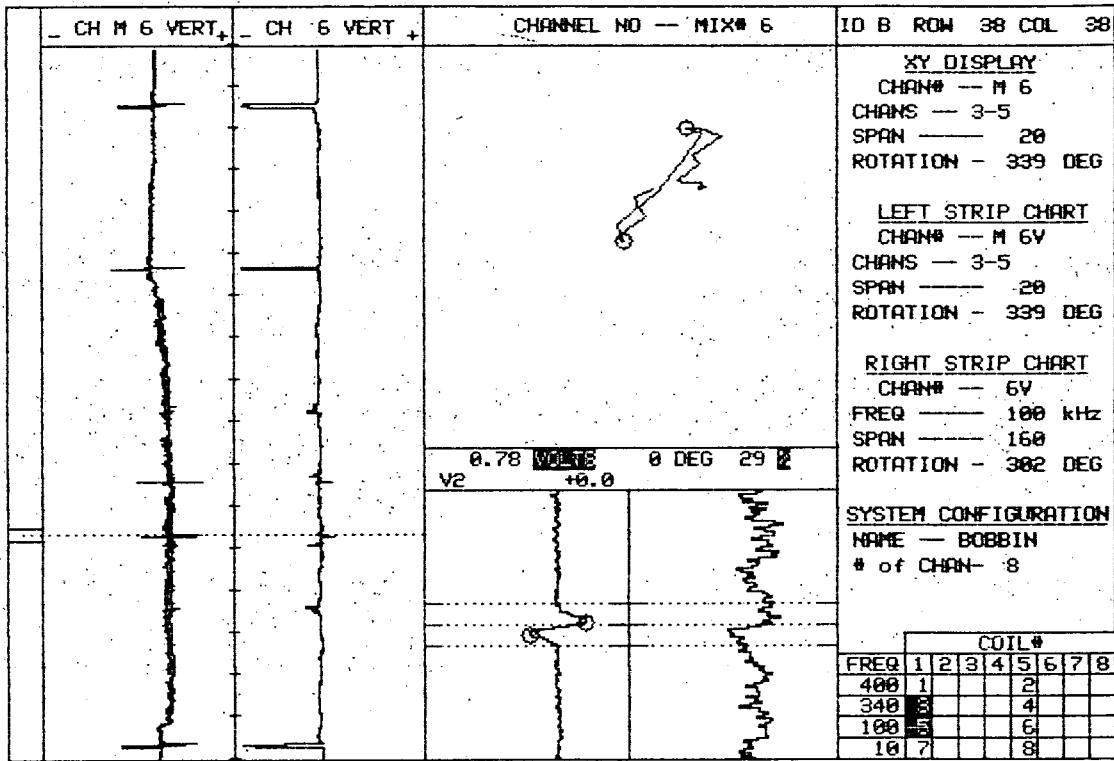
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1.28 VOLTS 101 DEG 49  
AVB #3 +0.0

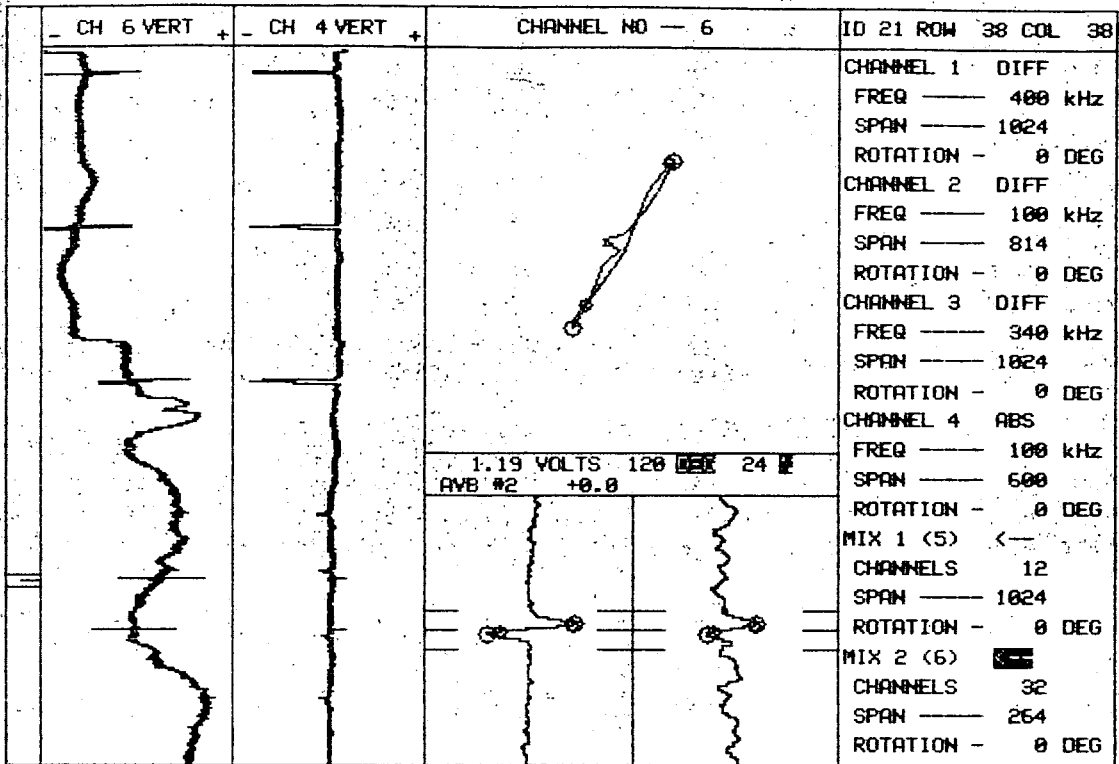
20 PLANT SONGS UNIT# I S/G B LEG INLET DATE 06/04/80

ZETEC Inc. - 1983  
Edition 12.0 Rev 1



PLANT	UNIT#	S/G	LEG	DATE
SONGS REEL C03	1	B	OUTLET	12/10/85





20 PLANT  
SONGS

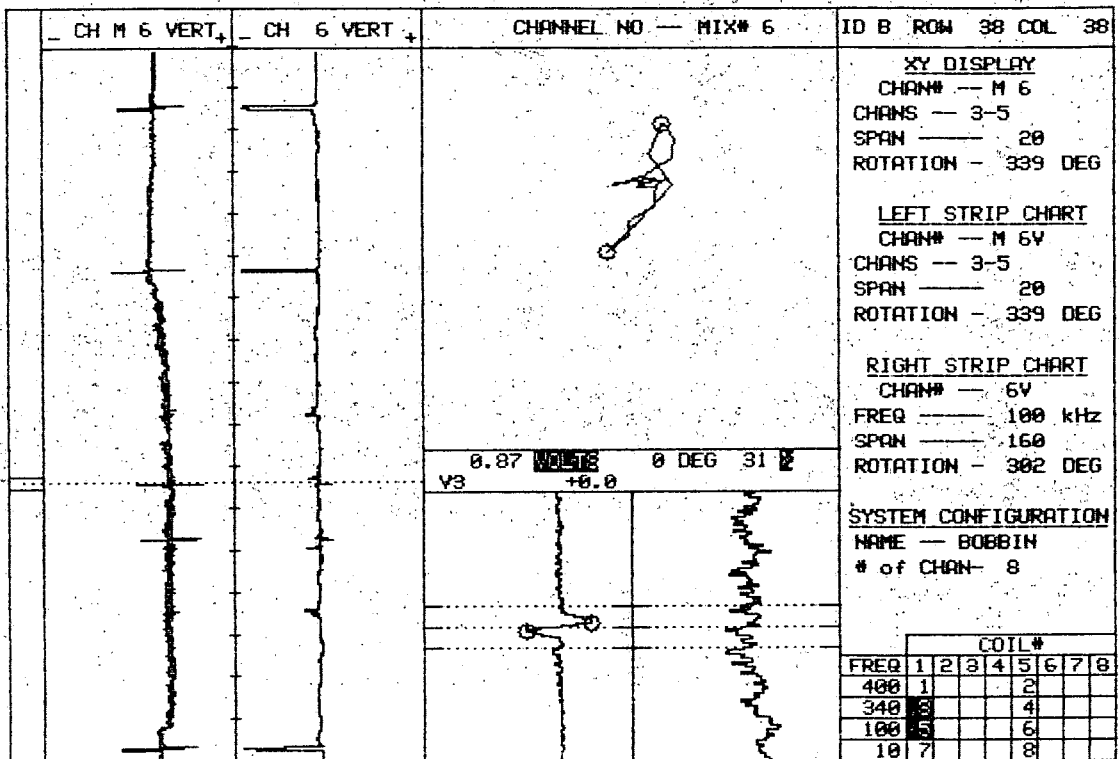
UNIT#  
I

S/G  
B

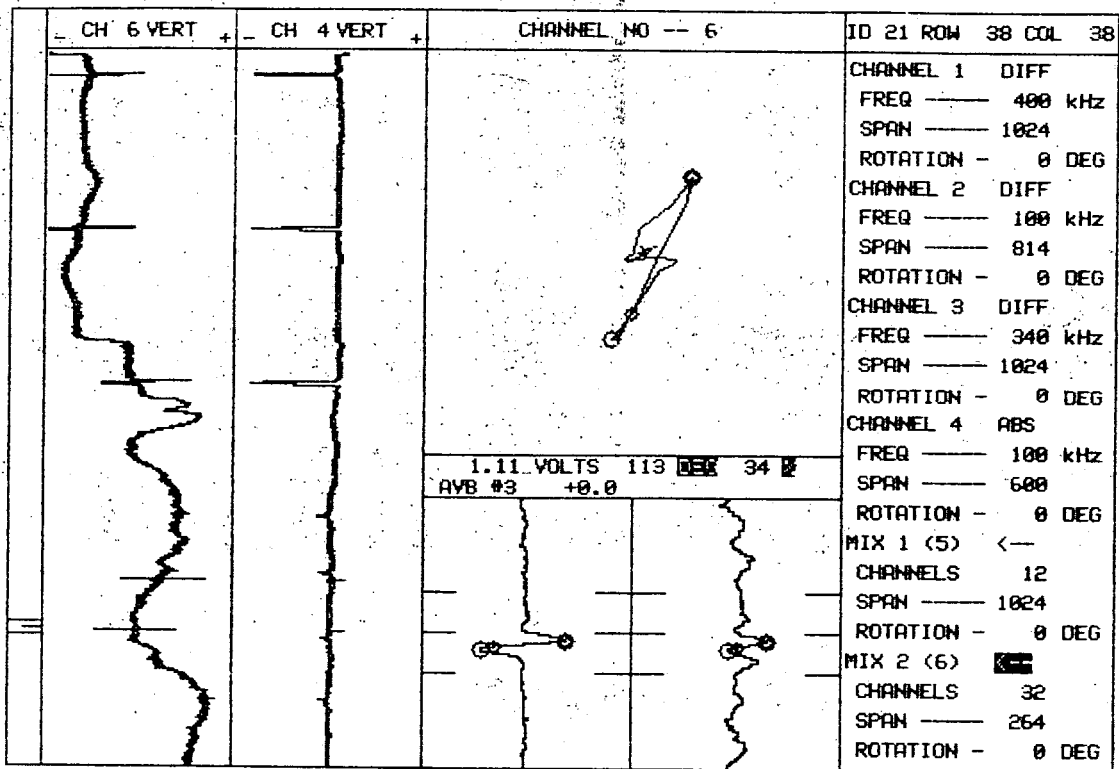
LEG  
INLET

DATE  
06/04/80

ZETEC Inc. - 1983  
Edition 12.0 Rev 1

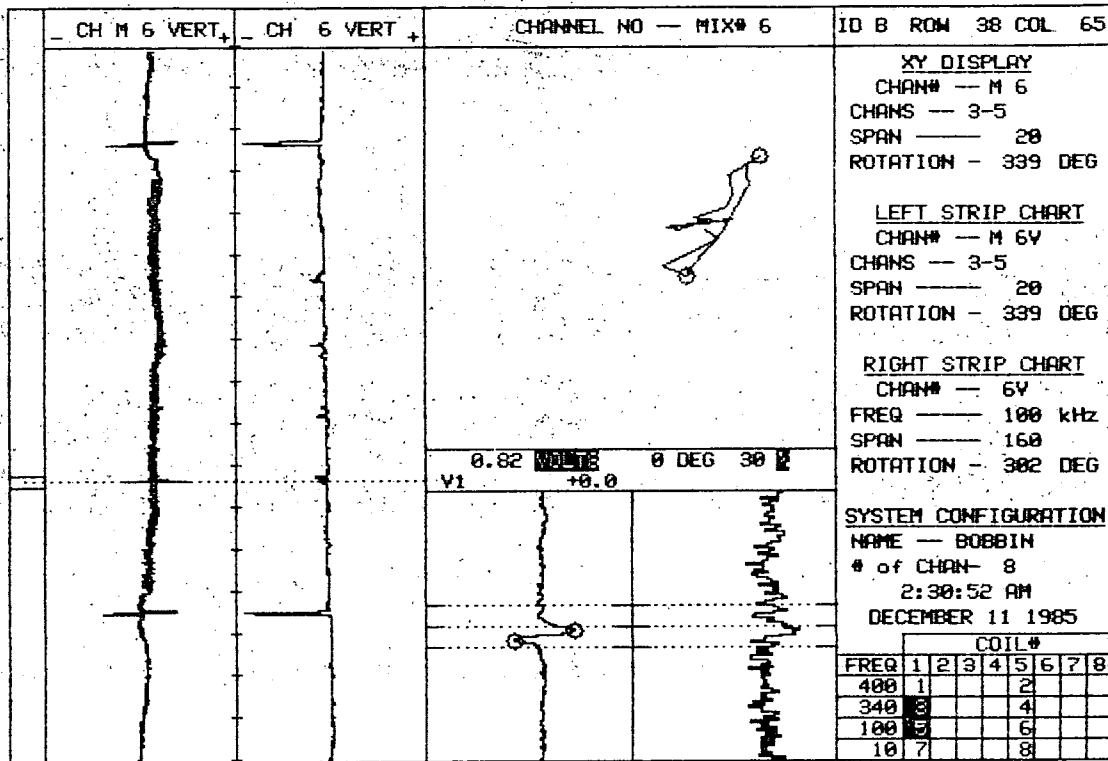


20 PLANT SONGS REEL C03 UNIT# 1 S/G B LEG B DATE 12/10/85

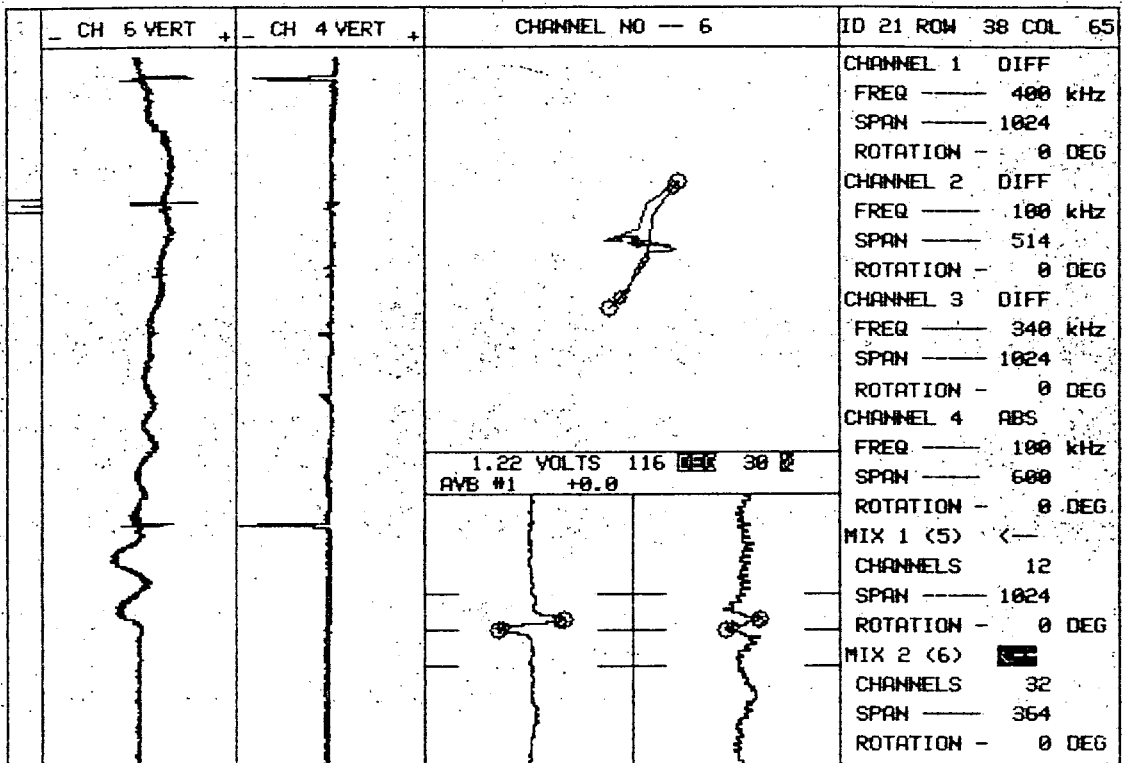


1.11 VOLTS 113 DEG 34  
AVB #3 +0.0

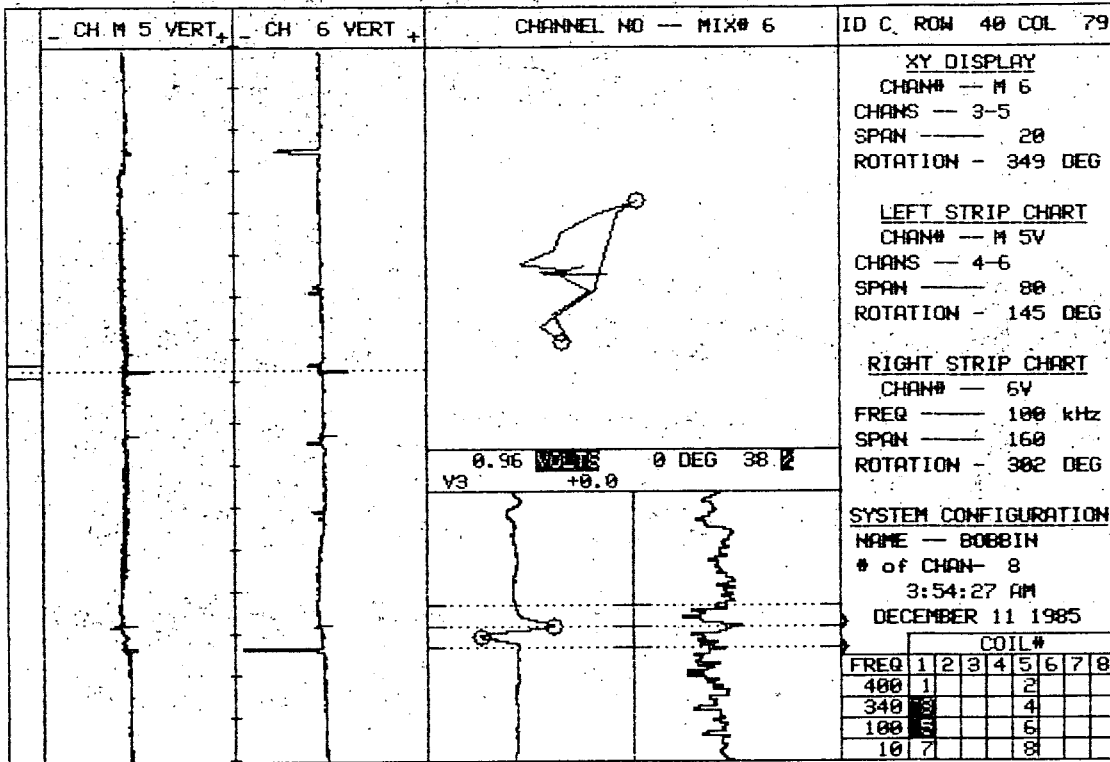
20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/80	Edition 12.0 Rev 1



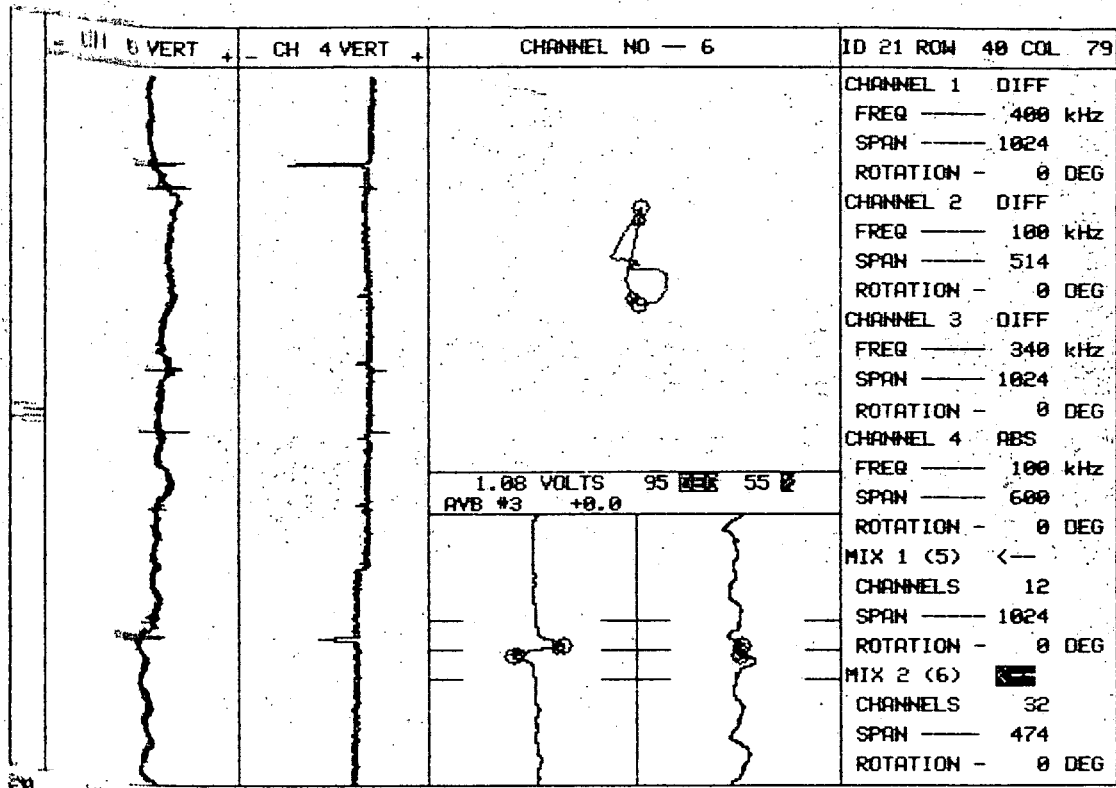
20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS REEL C03    1    B    OUTLET    12/10/85



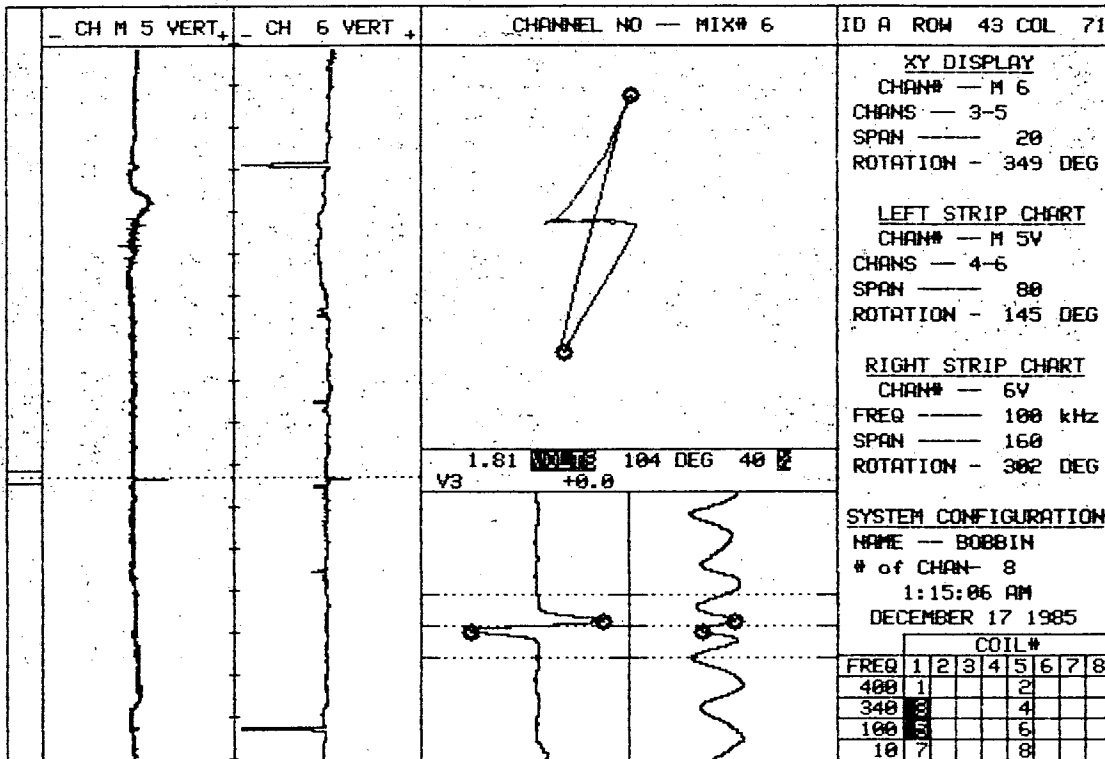
20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	05/04/80	Edition 12.0 Rev 1



20 PLANT SONGS REEL C03 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85

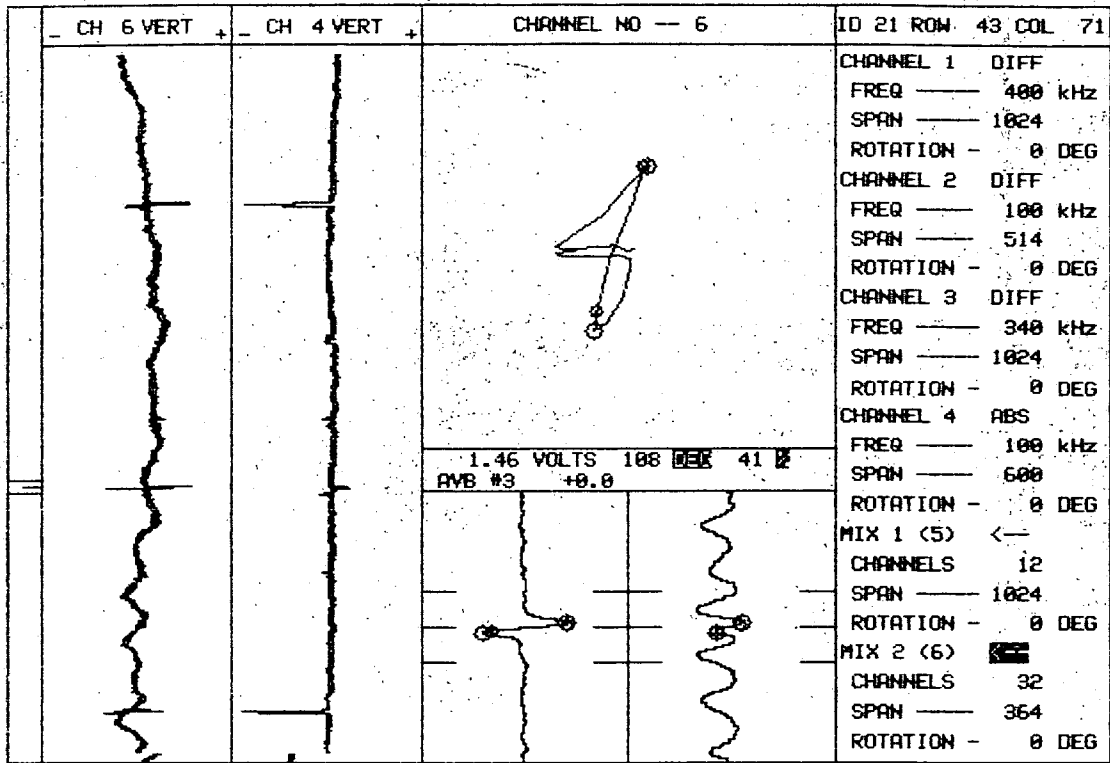


PLANT      UNIT#      S/G      LEG      DATE      ZETEC Inc. - 1983  
 BUNDS      I      B      INLET      06/04/80      Edition 12.0 Rev 1



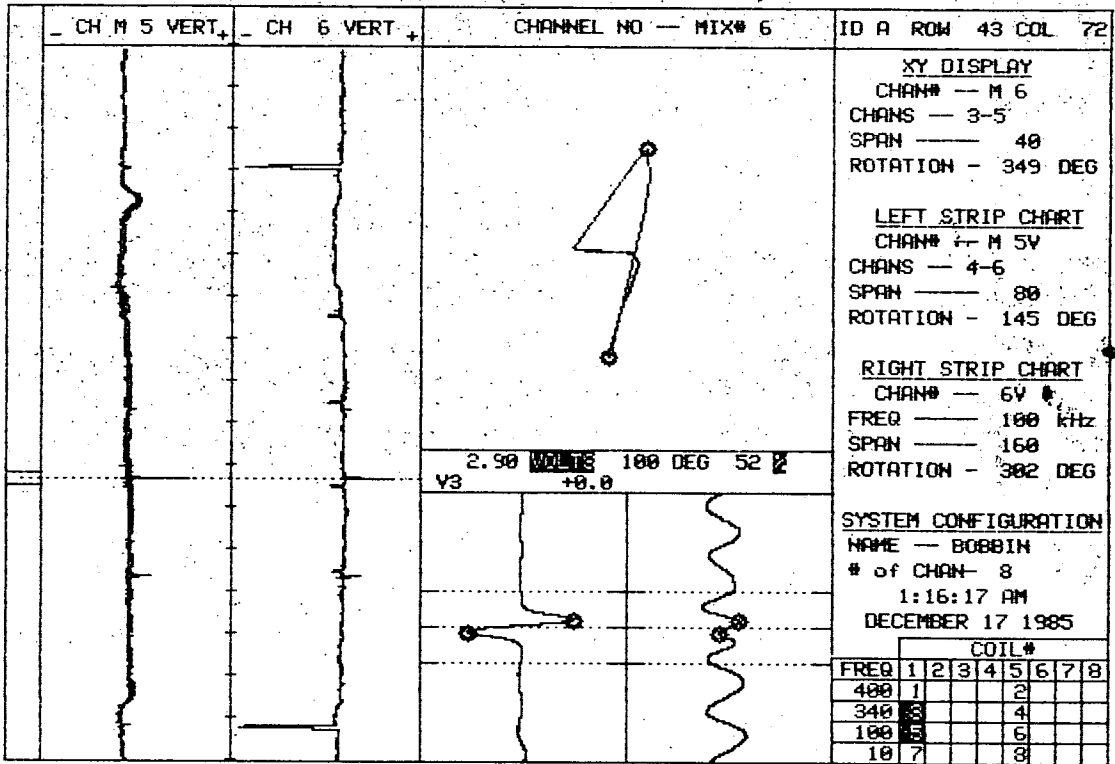
20 PLANT SONGS REEL H13 UNIT# 1 S/G B LEG INLET DATE 12/16/85



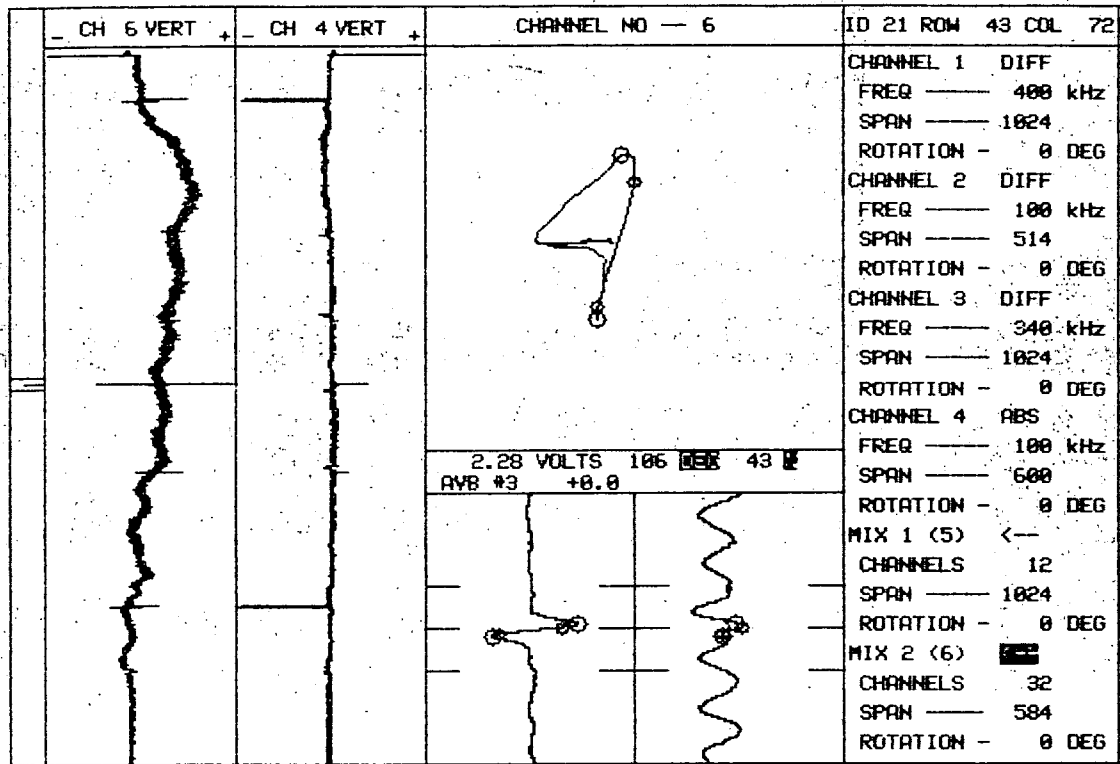


1.46 VOLTS 108 41 2  
AVB #3 +0.0

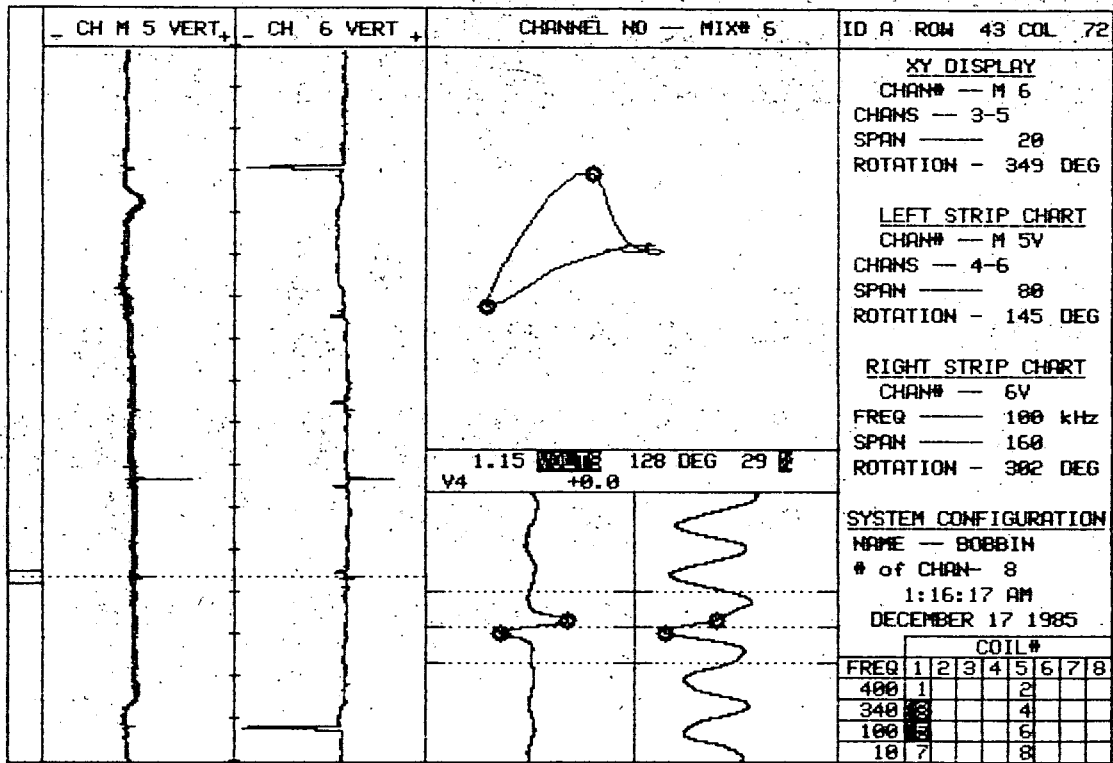
20 PLANT SONGS UNIT# I S/G B LEG INLET DATE 06/04/80 ZETEC Inc. - 1983 Edition 12.0 Rev 1



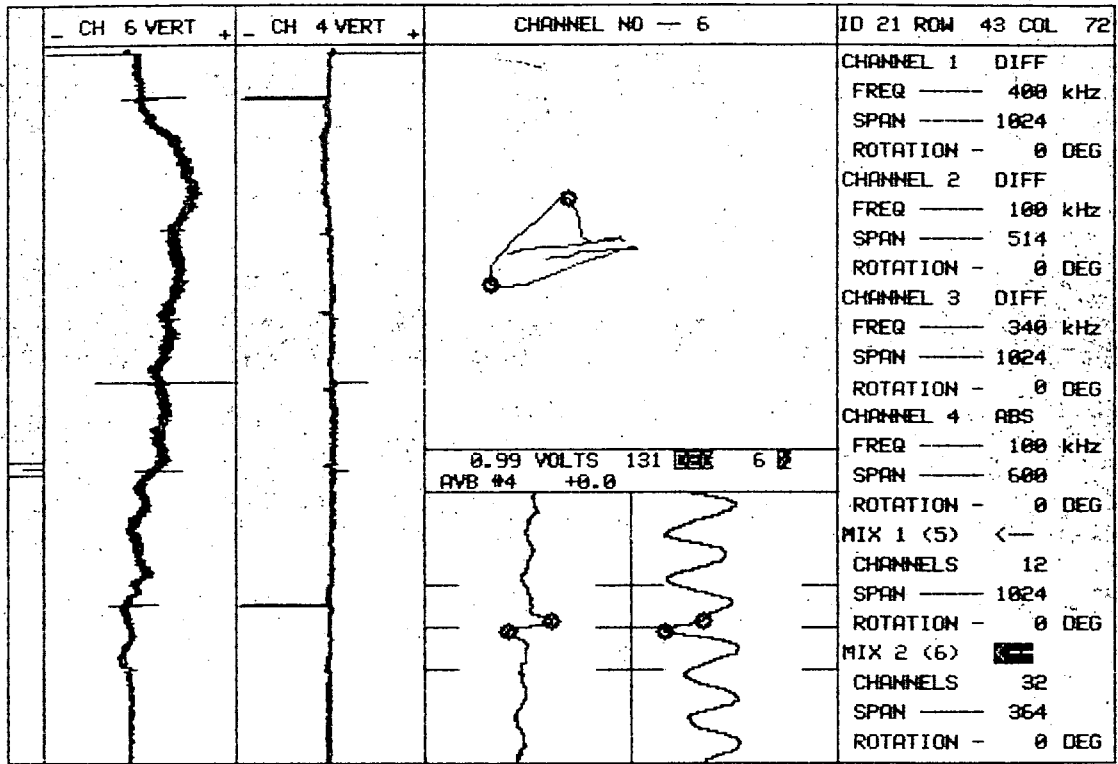
20 PLANT SONGS REEL H13 UNIT# 1 S/G B LEG INLET DATE 12/16/85



20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/88	Edition 12.0 Rev 1

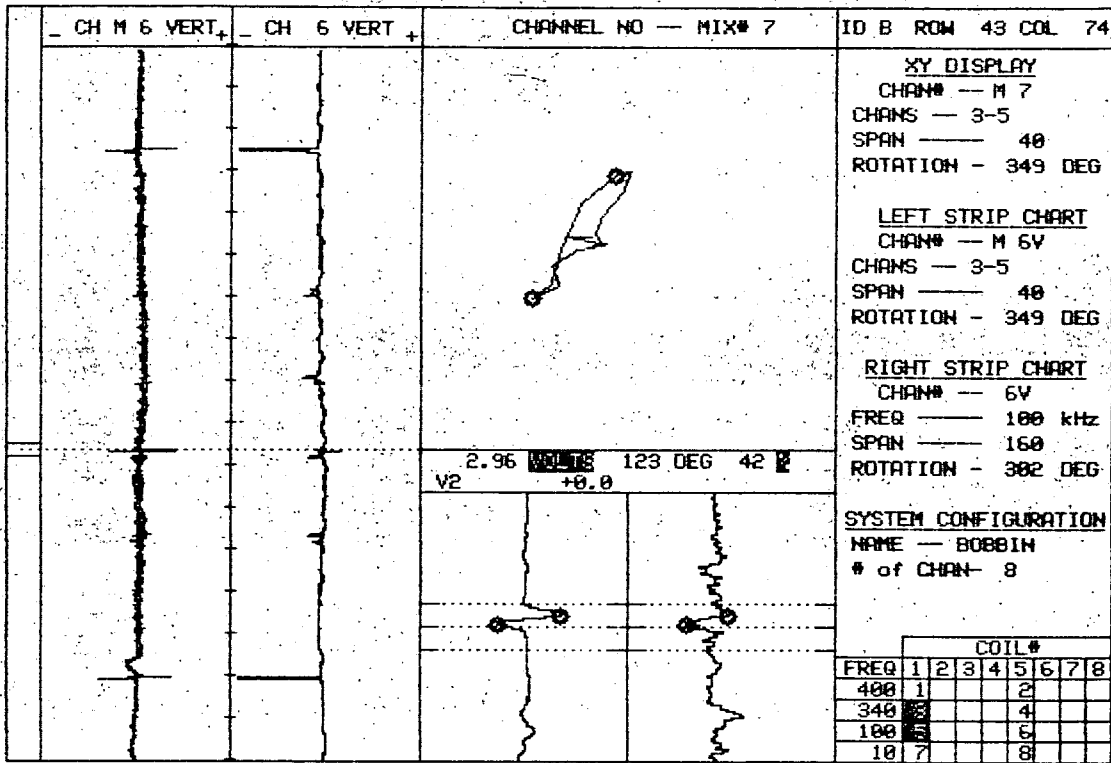


20 PLANT SONGS REEL H13 UNIT# 1 S/G B LEG INLET DATE 12/16/85

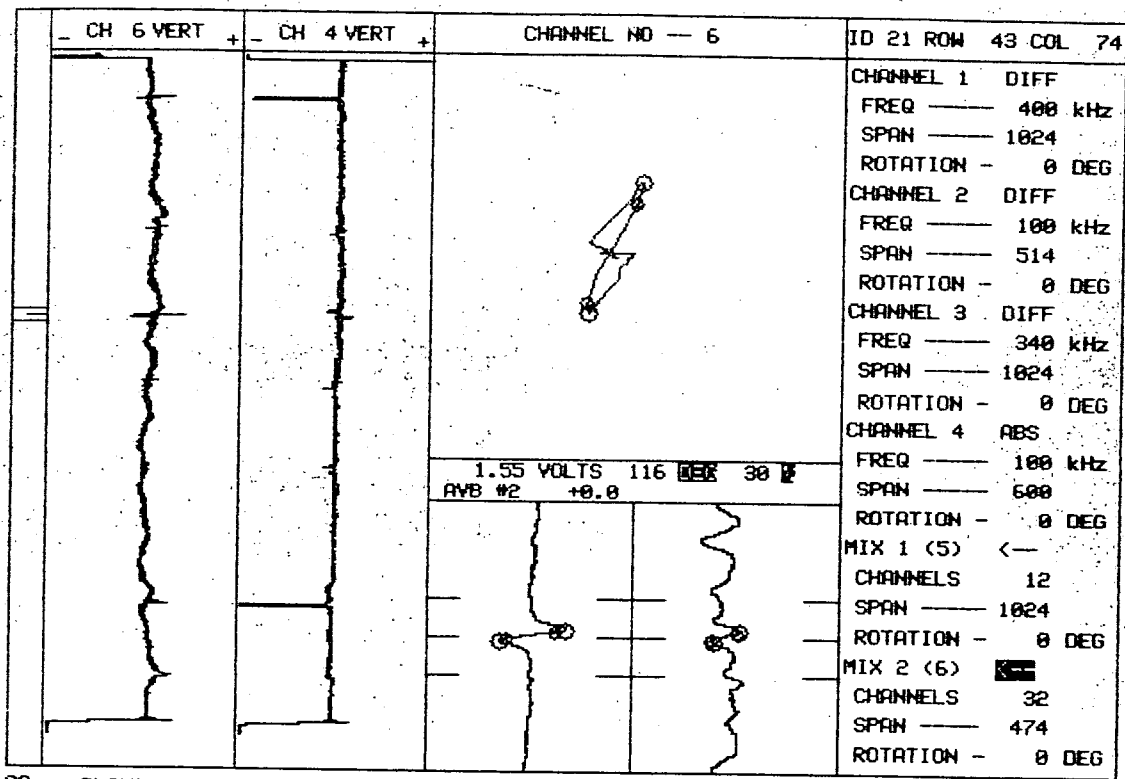


20	PLANT	UNIT*	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/80	Edition 12.0 Rev 1

ID 21	ROW 43	COL 72
CHANNEL 1	DIFF	
FREQ	400 kHz	
SPAN	1024	
ROTATION	0 DEG	
CHANNEL 2	DIFF	
FREQ	100 kHz	
SPAN	514	
ROTATION	0 DEG	
CHANNEL 3	DIFF	
FREQ	340 kHz	
SPAN	1024	
ROTATION	0 DEG	
CHANNEL 4	ABS	
FREQ	100 kHz	
SPAN	600	
ROTATION	0 DEG	
MIX 1 (5)	<	
CHANNELS	12	
SPAN	1024	
ROTATION	0 DEG	
MIX 2 (6)	█	
CHANNELS	32	
SPAN	364	
ROTATION	0 DEG	

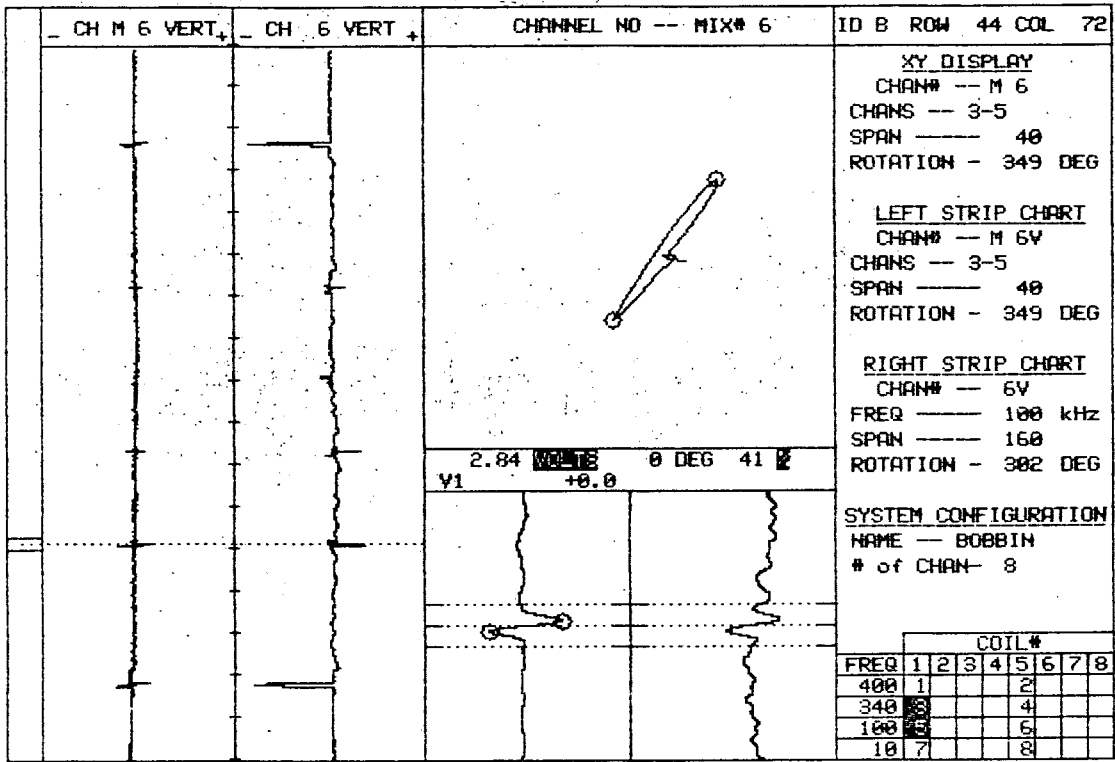


20 PLANT SONGS REEL C03 UNIT# 1 S/G B LEG B DATE 12/10/85



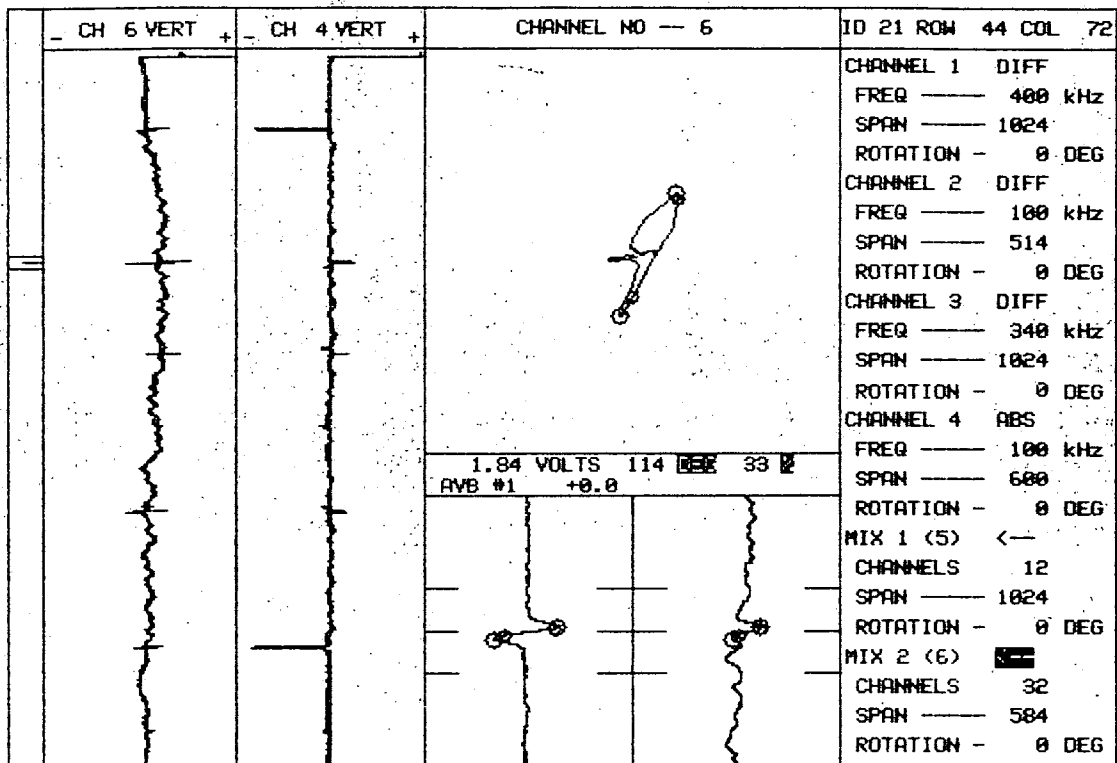
1.55 VOLTS 116 ~~DEG~~ 30 ~~DEG~~  
 AVB #2 +0.0

20 PLANT SONGS UNIT# I S/G B LEG INLET DATE 06/04/80 ZETEC Inc. - 1983 Edition 12.0 Rev 1



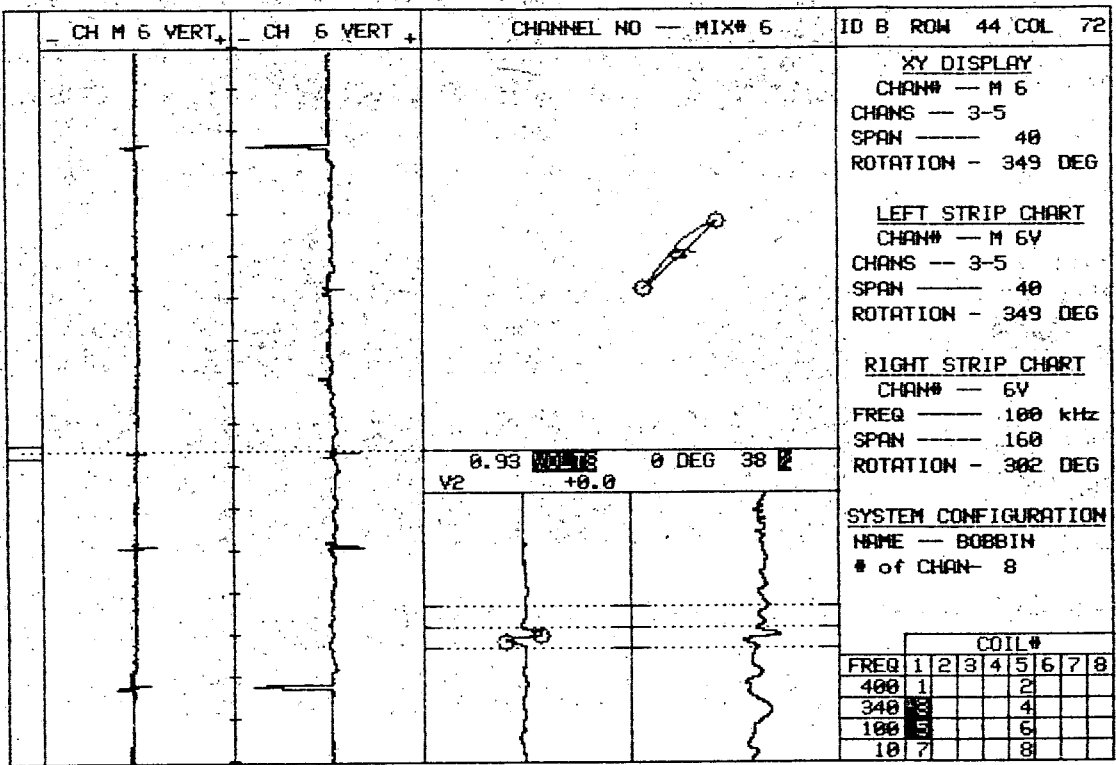
20 PLANT SONGS REEL C03 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85



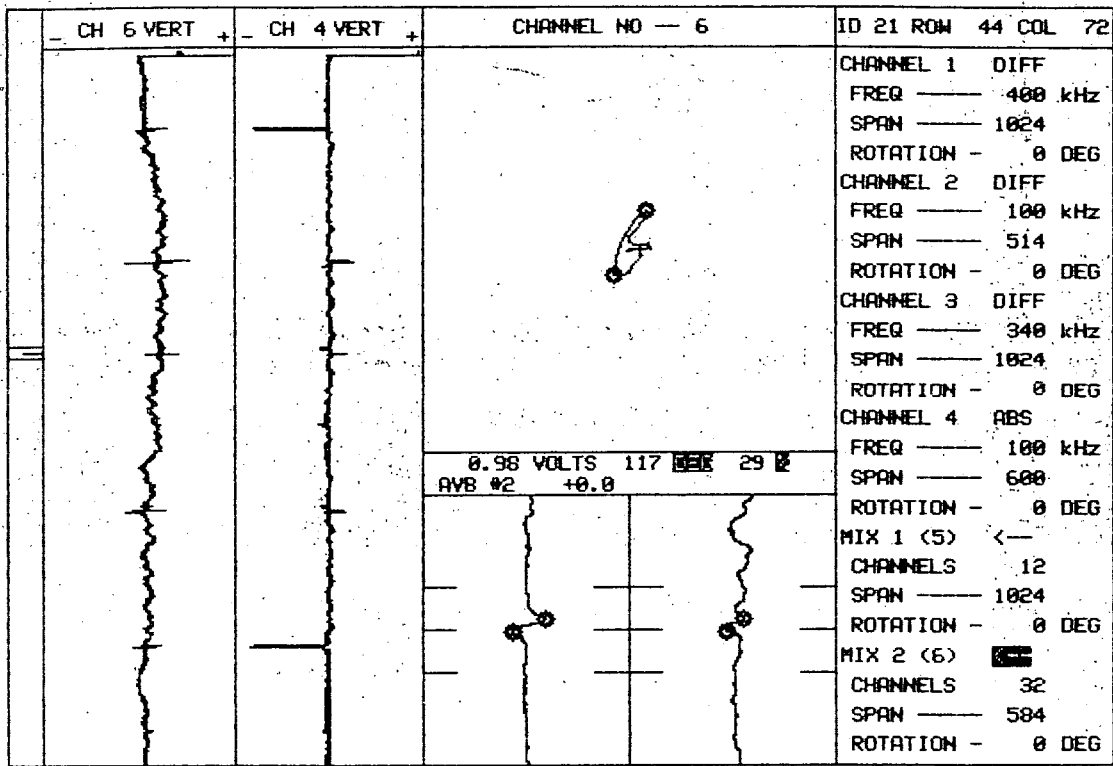


1.84 VOLTS 114  33   
 AVB #1 +0.0

20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/88	Edition 12.0 Rev 1

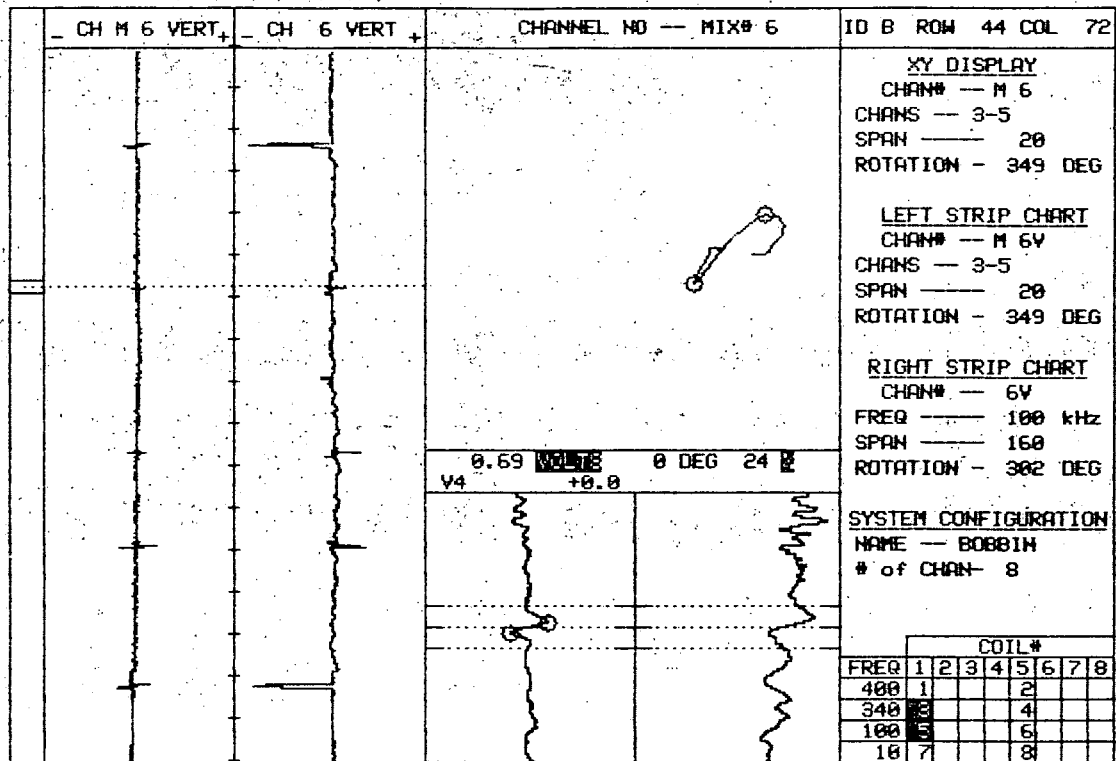


PLANT SONGS REEL C03 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85

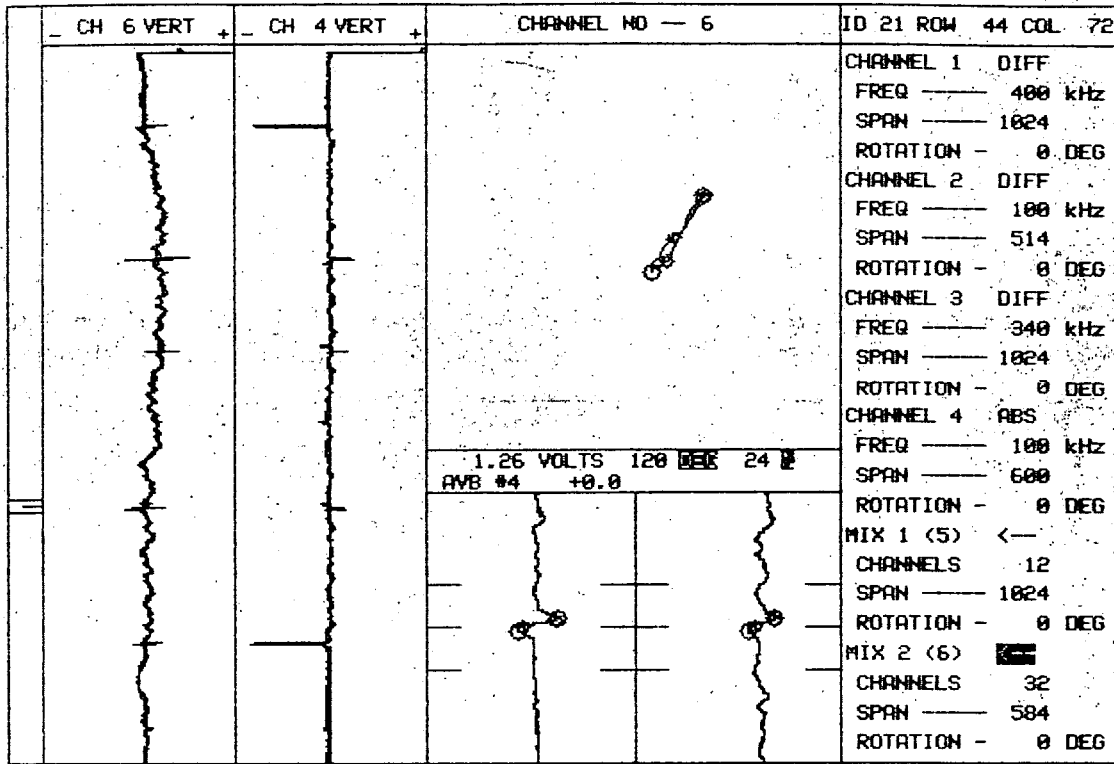


0.98 VOLTS 117 ~~100~~ 29 ~~2~~  
 AVB #2 +0.0

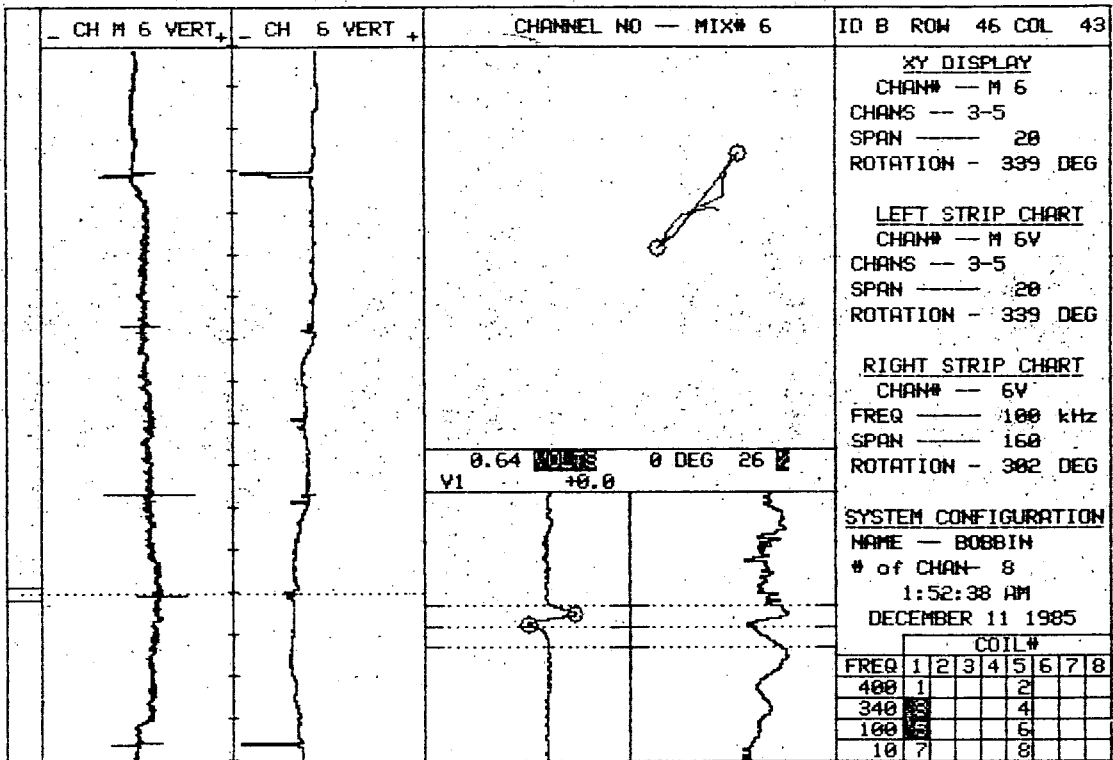
20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/80	Edition 12.0 Rev 1



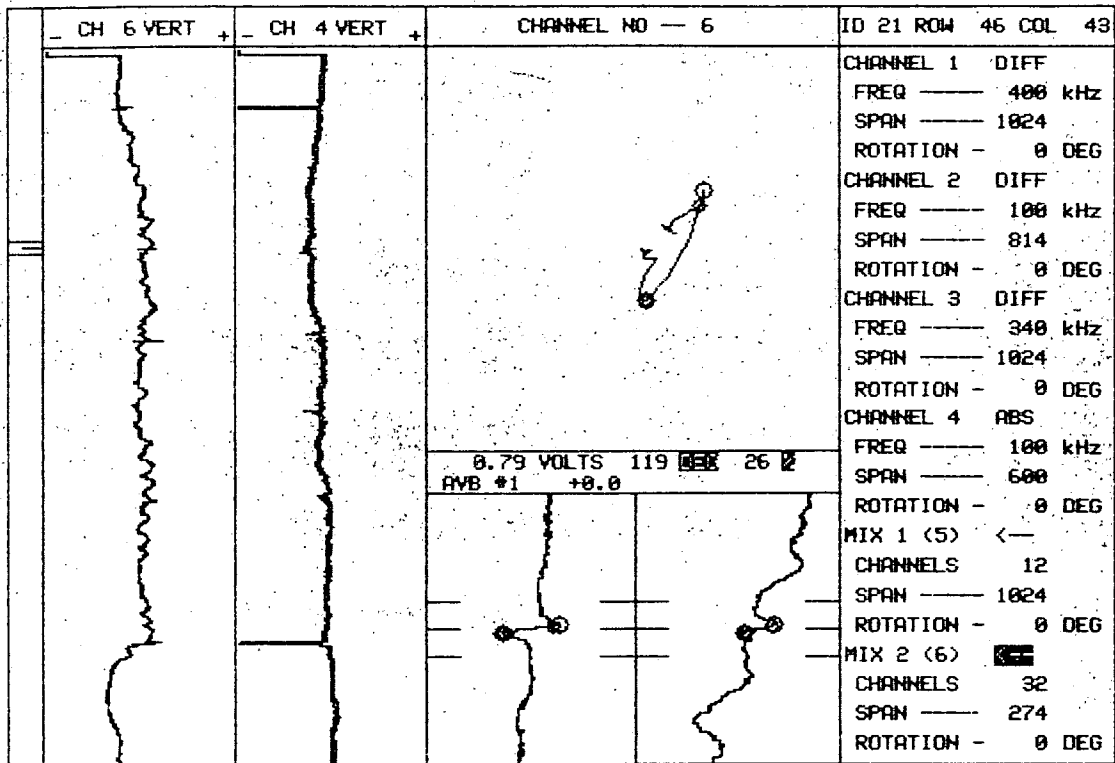
20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS REEL C03    1    B    OUTLET    12/10/85



20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/80	Edition 12.0 Rev 1

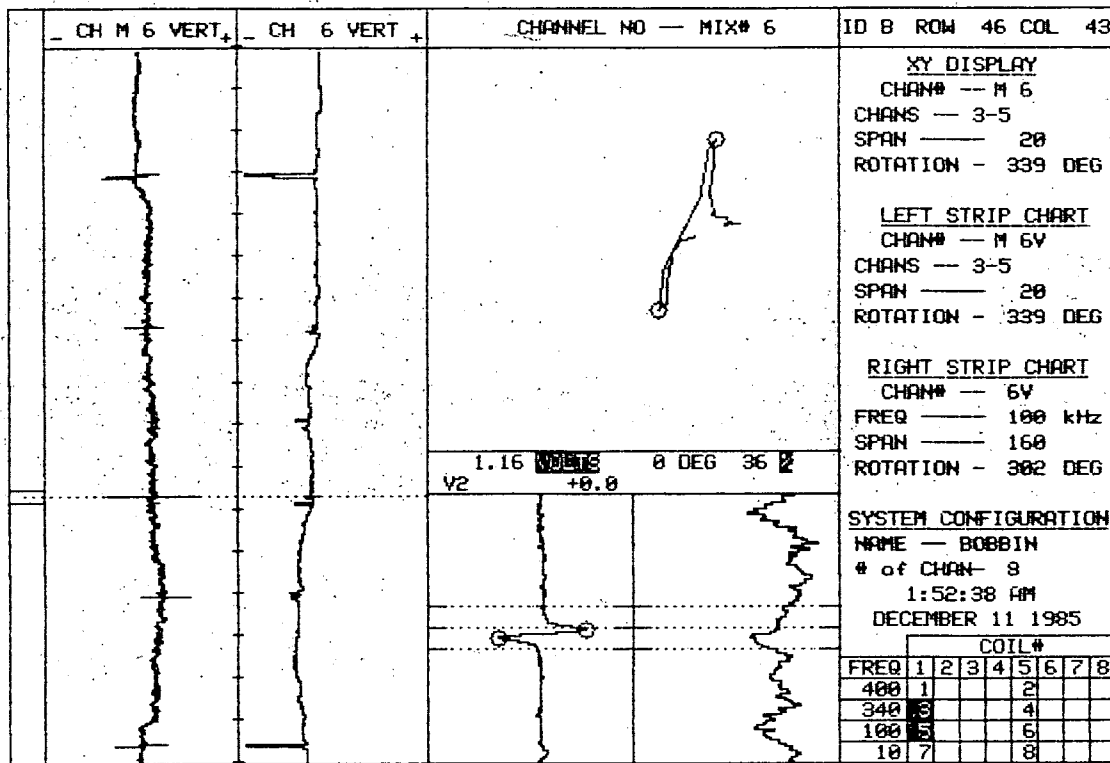


20 PLANT SONGS REEL C03 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85



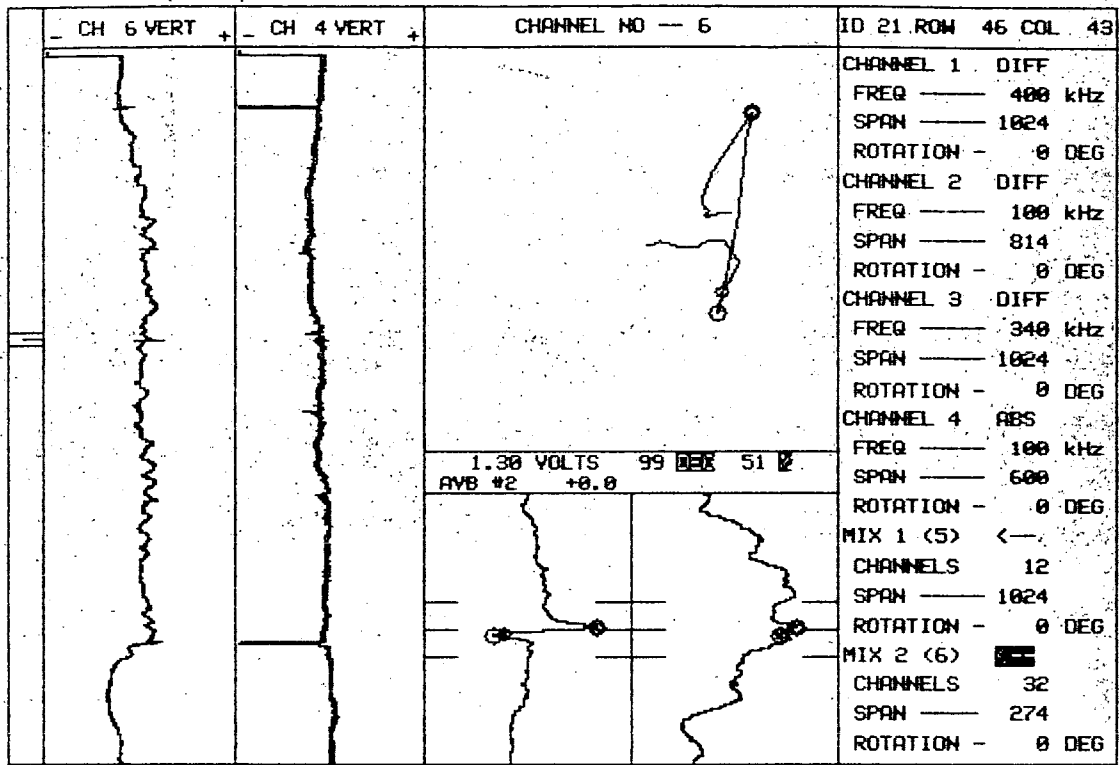
0.79 VOLTS 119 ~~0.0~~ 26 ~~0~~  
 AVB #1 +0.0

20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/80	Edition 12.0 Rev 1



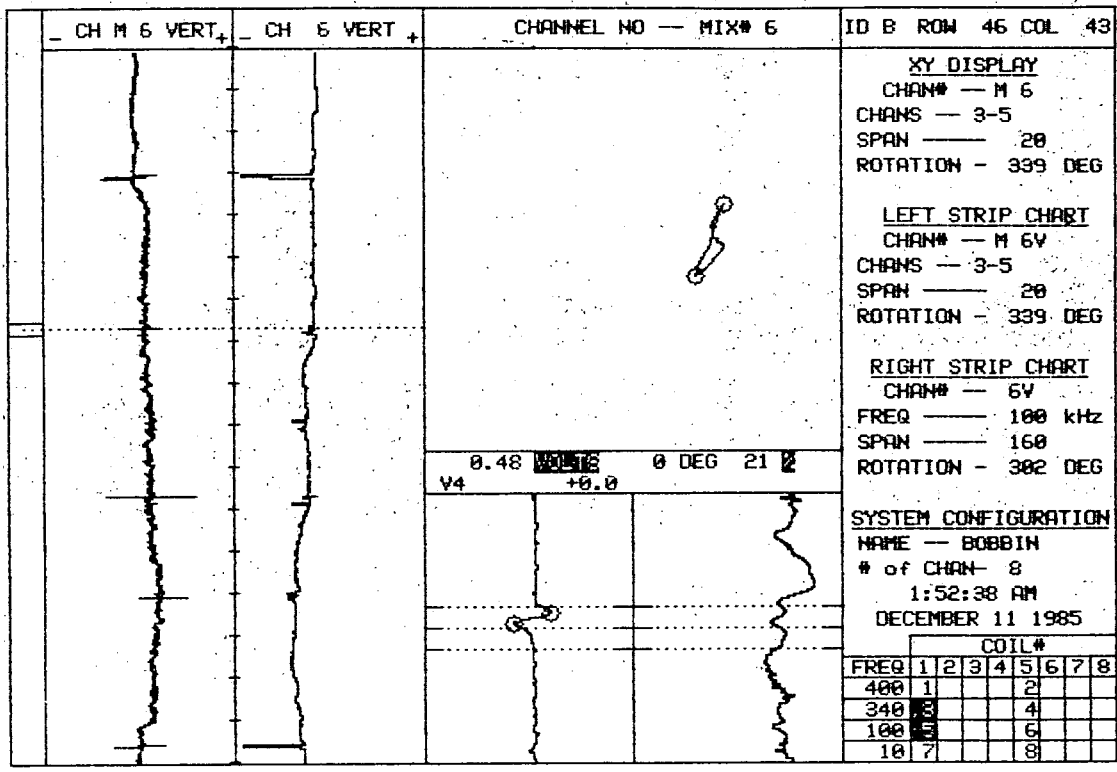
20 PLANT SONGS REEL C03 UNIT# 1 S/G B LEG B DATE 12/10/85

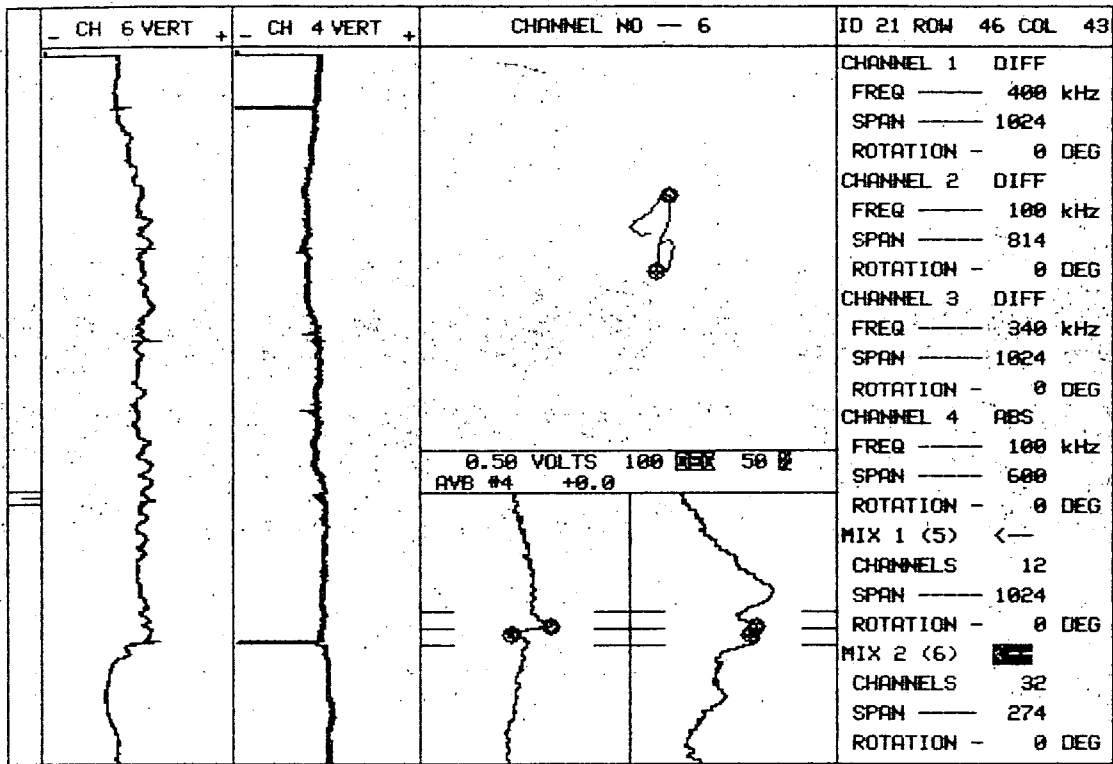




1.30 VOLTS 99 DEG 51 V  
AVB #2 +0.0

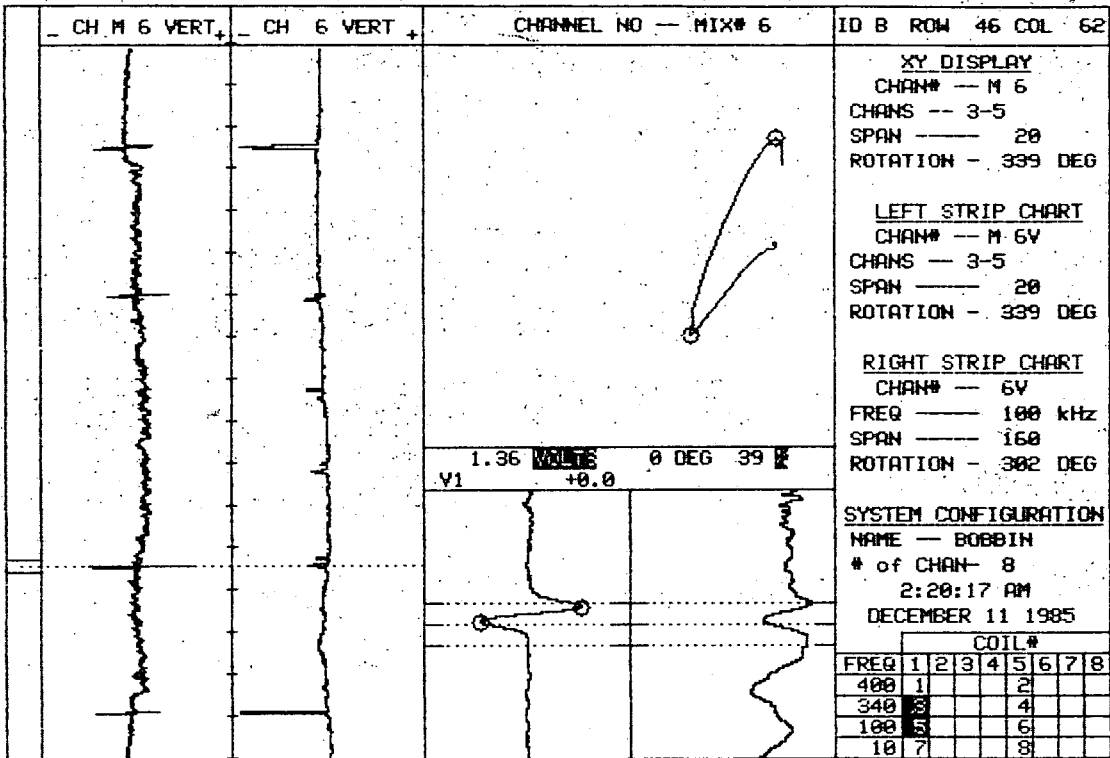
20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/80	Edition 12.0 Rev 1



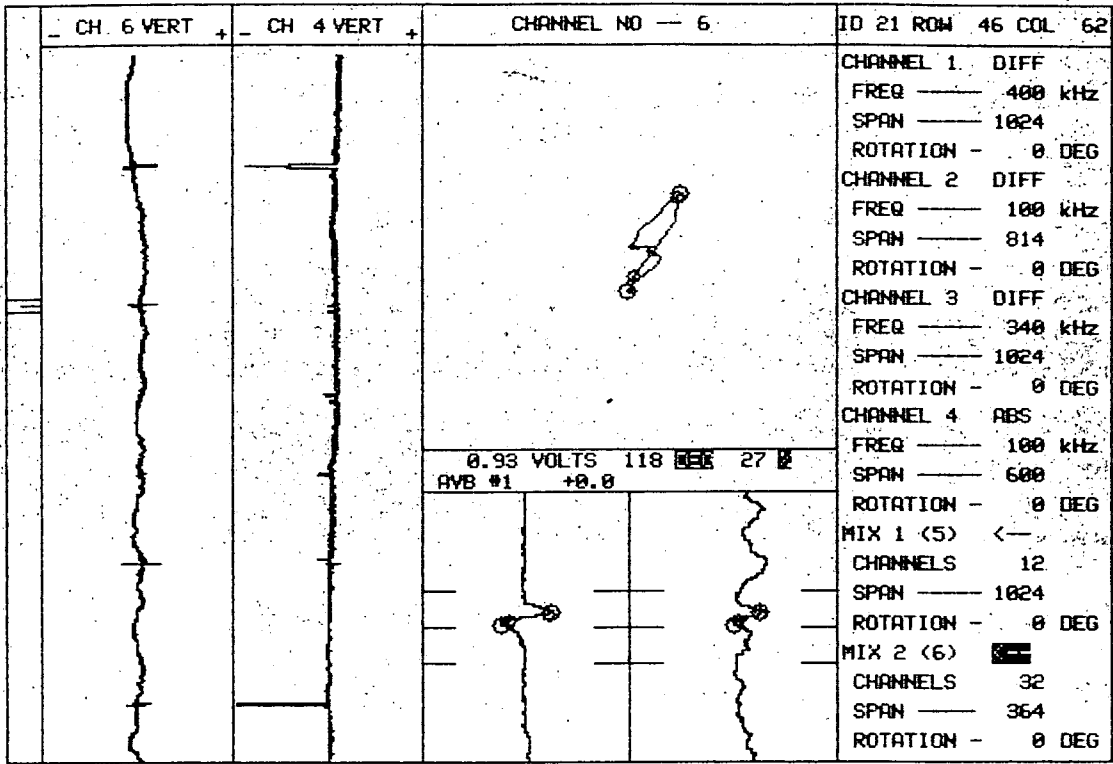


0.50 VOLTS 100 DEG 50 Hz  
AVG #4 +0.0

20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/80	Edition 12.0 Rev 1

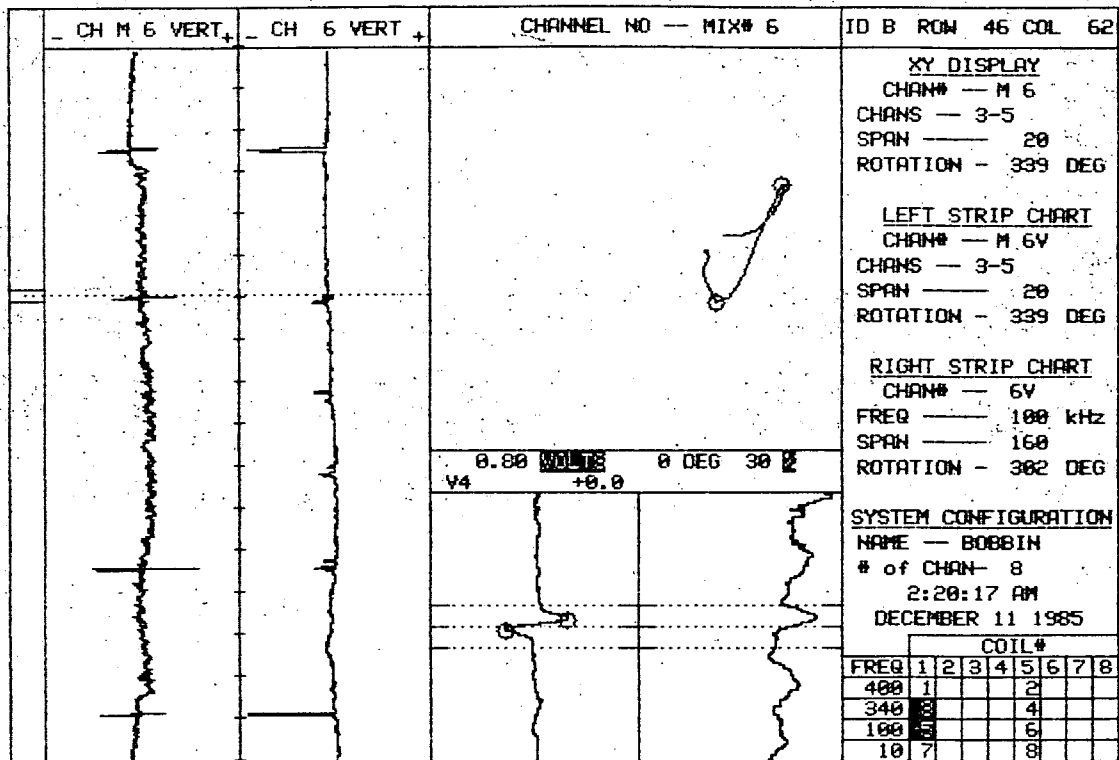


20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS REEL C03    1    B    OUTLET    12/10/85

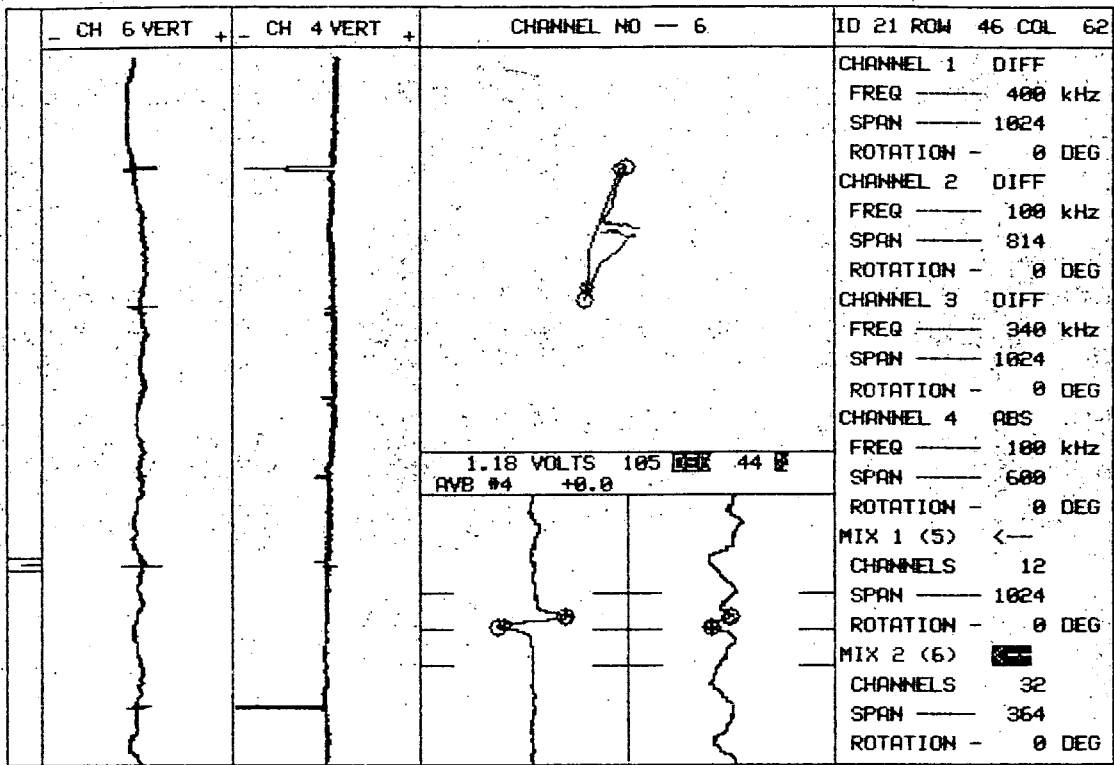


0.93 VOLTS 118 DEG 27  
AVB #1 +0.0

20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	05/04/80	Edition 12.0 Rev 1



20    PLANT    SONGS REEL C03    UNIT#    1    S/G    B    LEG    OUTLET    DATE    12/10/85

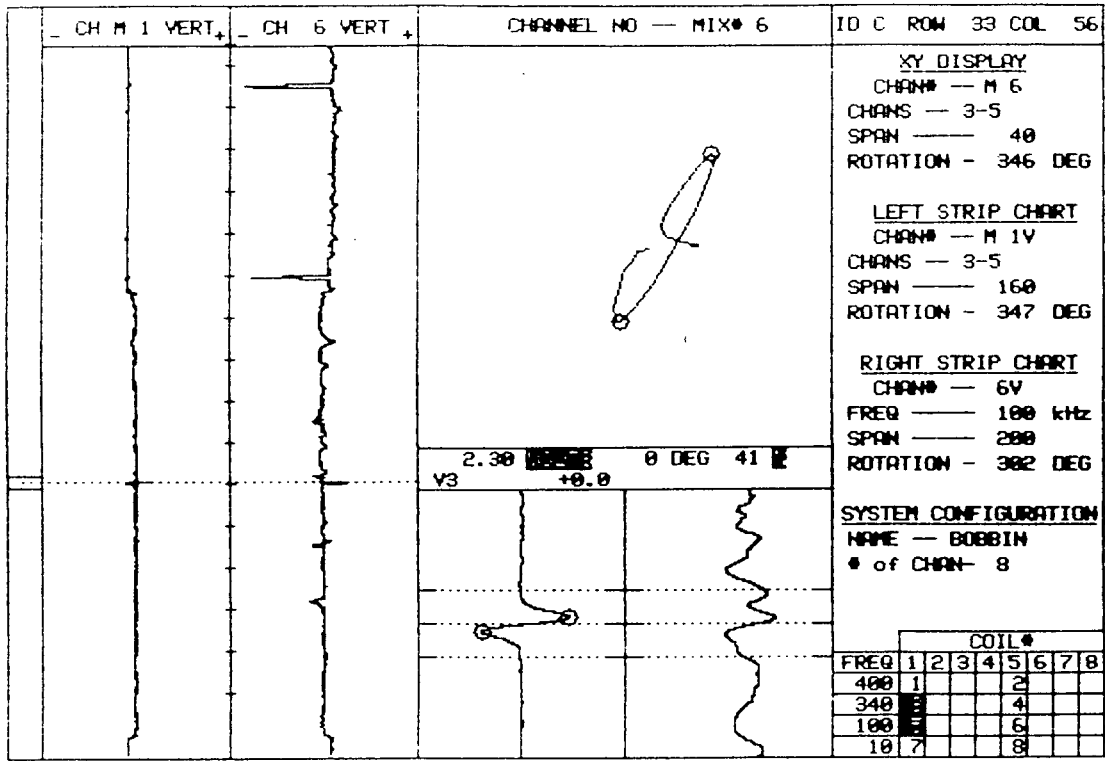


1.18 VOLTS 105 ~~100~~ 44 ~~4~~  
 AVE #4 +0.0

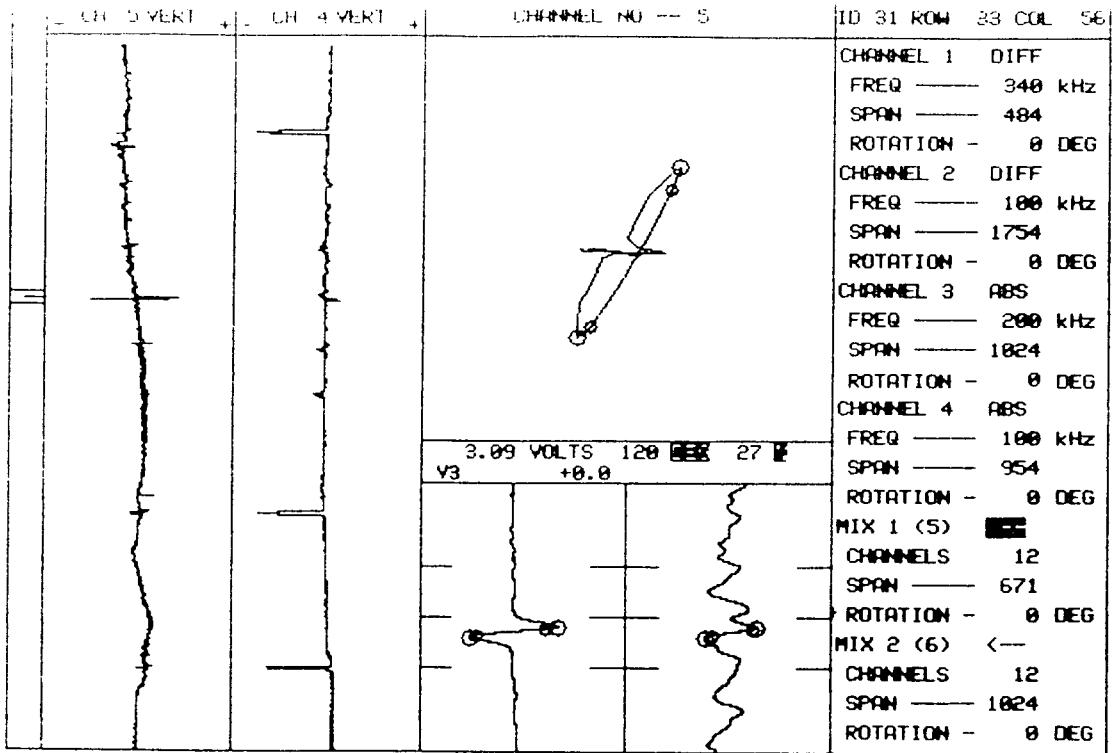
20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS	I	B	INLET	06/04/80	Edition 12.0 Rev 1

STEAM GENERATOR "C" AVB INDICATION COMPARISONS

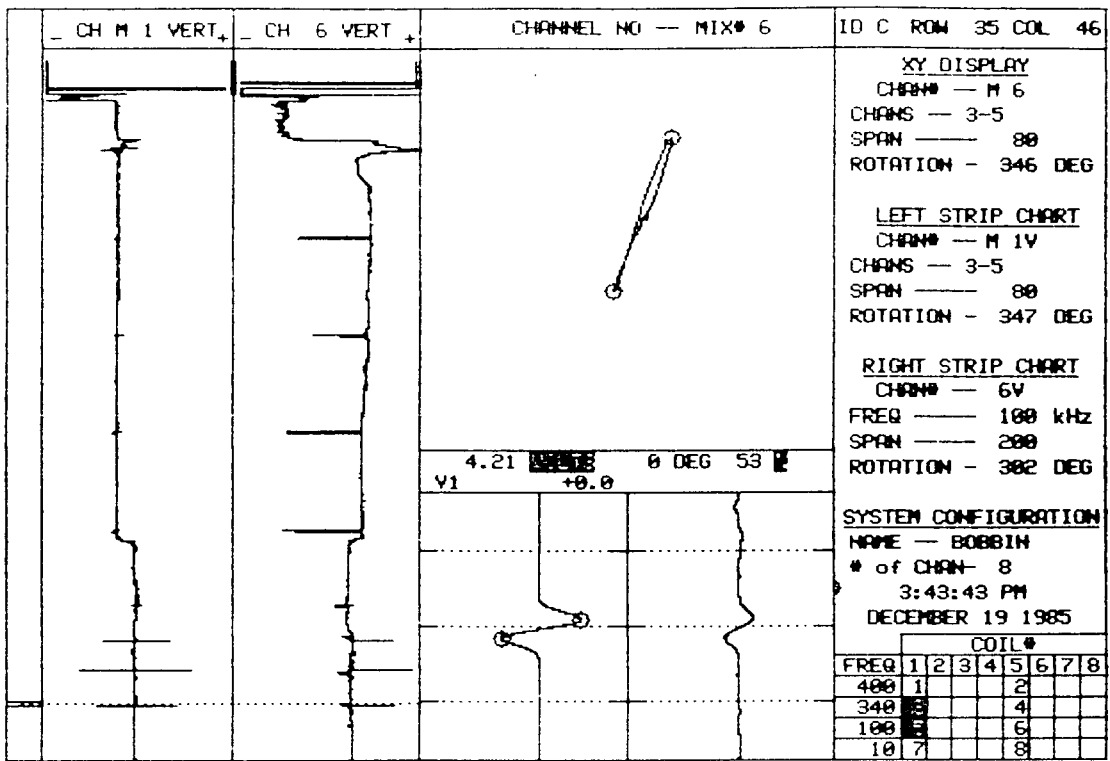




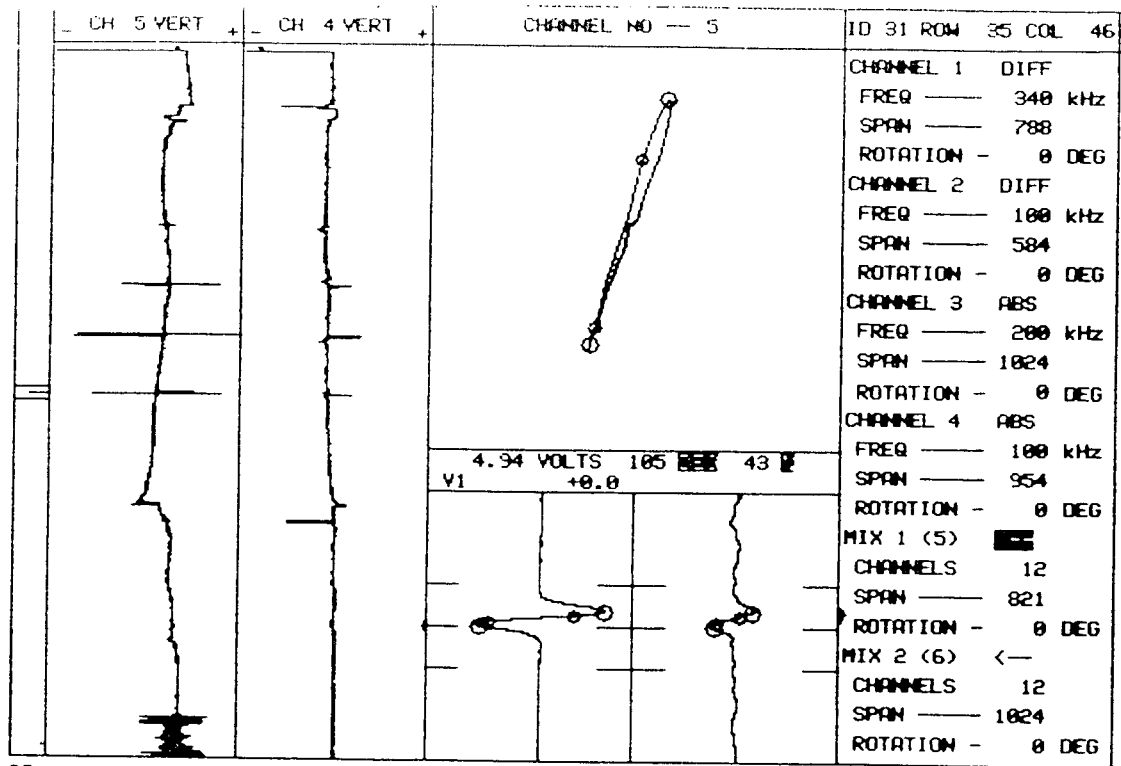
20 PLANT SONGS DISK C16- UNIT# 1 S/G C LEG OUTLET DATE 12/19/85



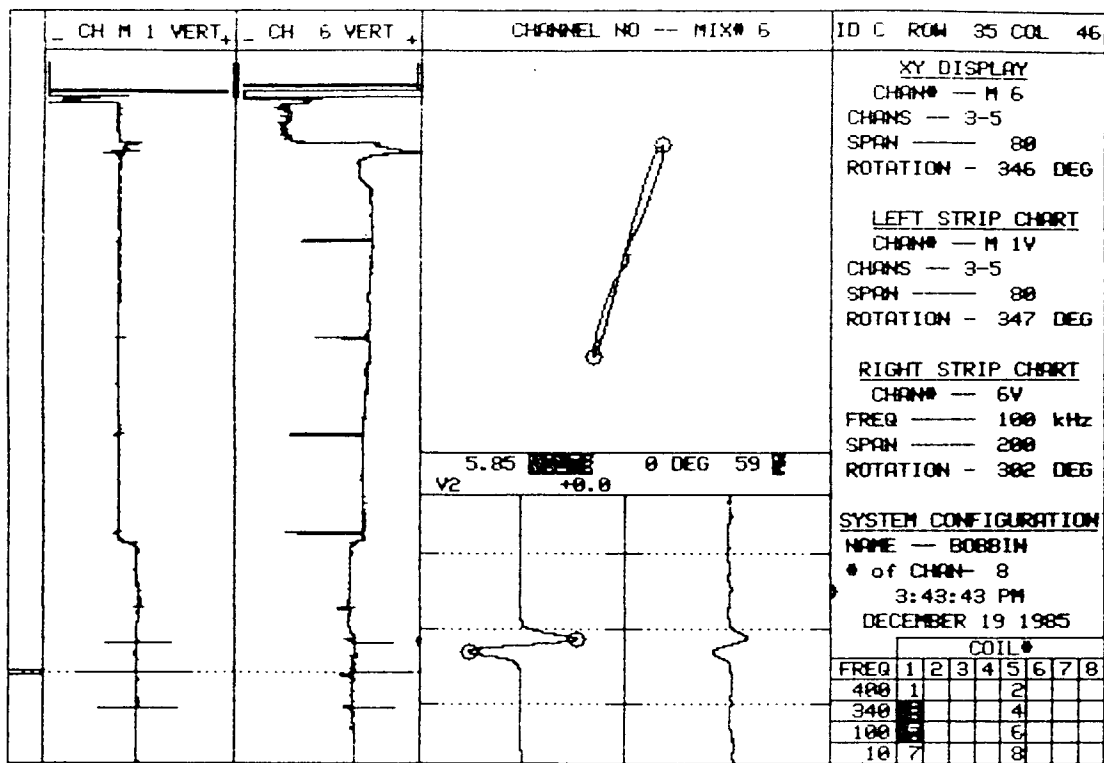
20 PLANT SONGS I DISK #1    UNIT# I    S/G 'C'    LEG COLD    DATE 03/19/82    ZETEC Inc. - 1983 Edition 12.0 Rev 1



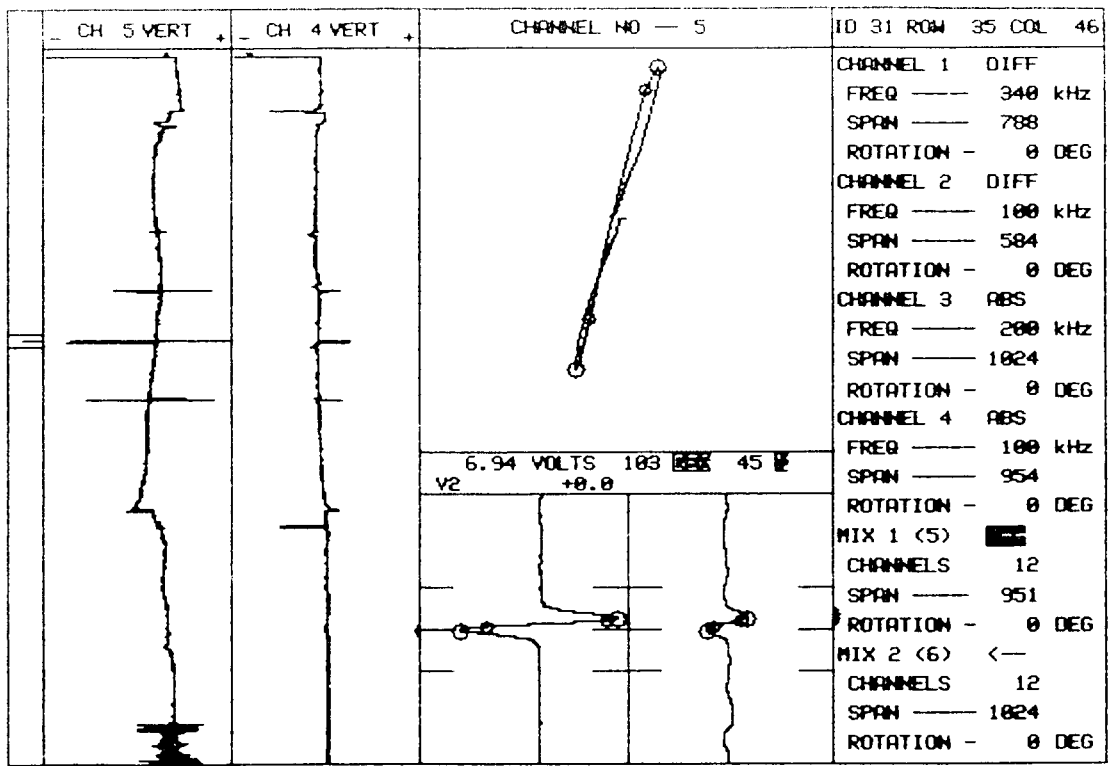
40 PLANT SONGS DISK C16- UNIT# 1 S/G C LEG OUTLET DATE 12/19/85



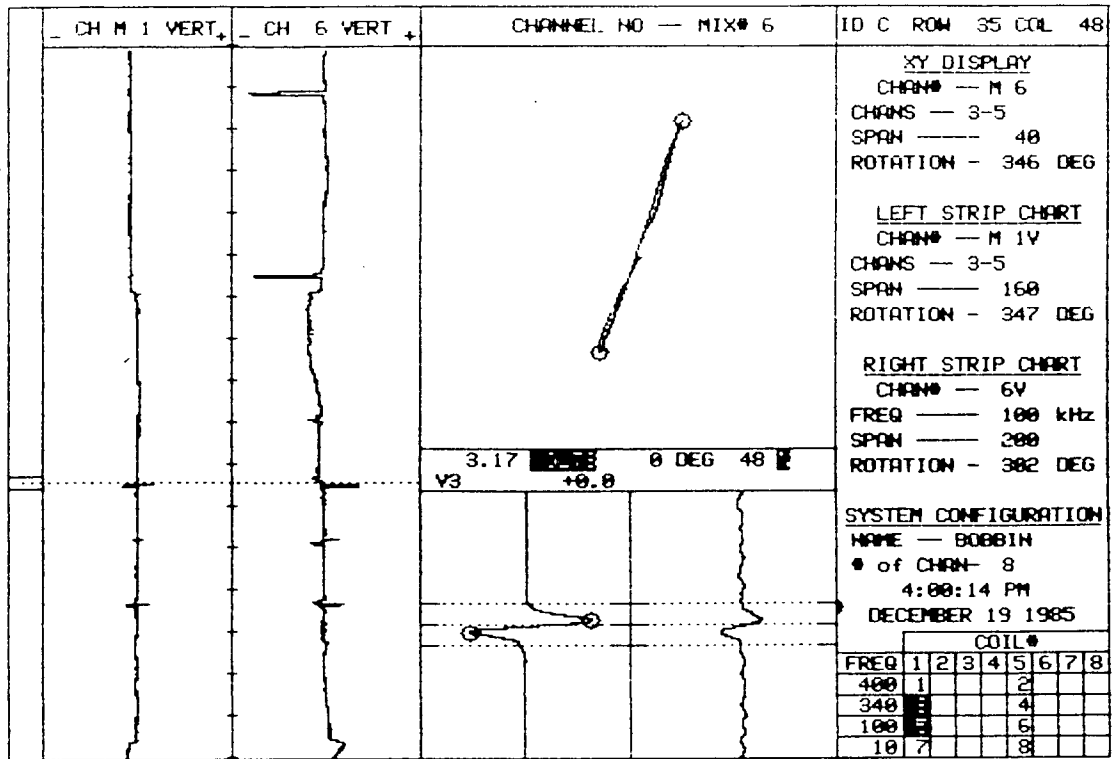
20    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SONGS 1 DISK #1    I    'C'    COLD    03/19/82    Edition 12.0 Rev 1



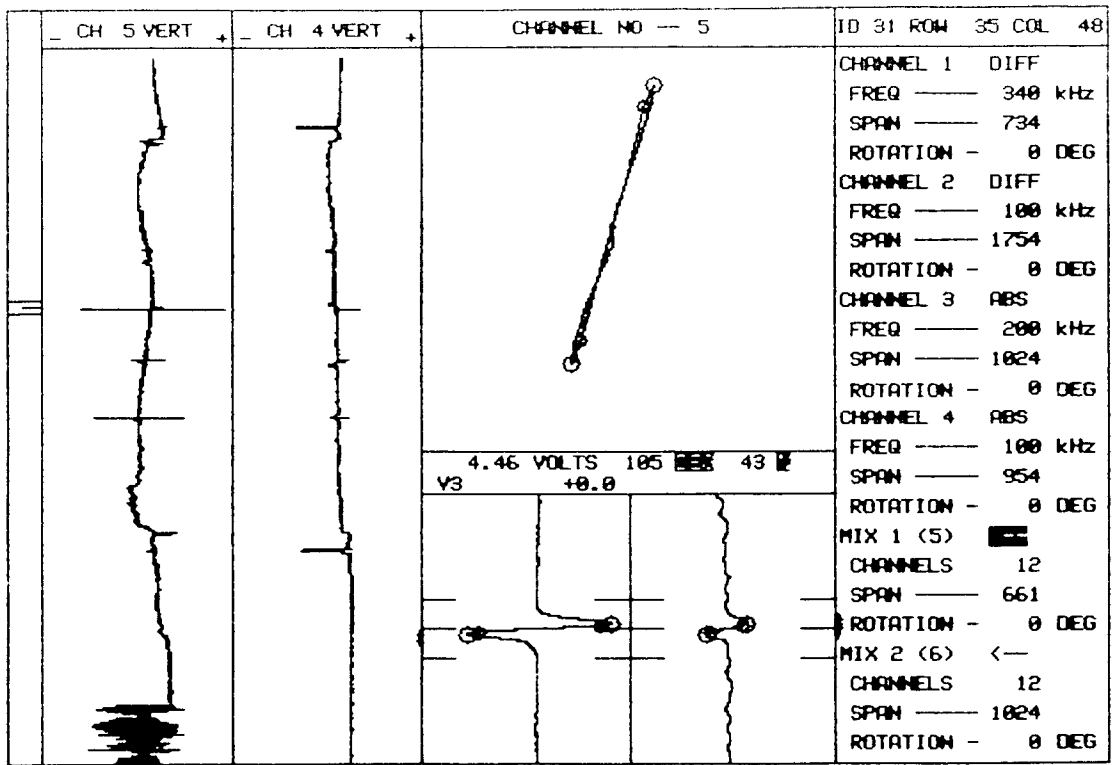
48 PLANT SONGS DISK C16- UNIT# 1 S/G C LEG C DATE 12/19/85



20    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SONGS I DISK #1    I    'C'    COLD    03/19/82    Edition 12.0 Rev 1

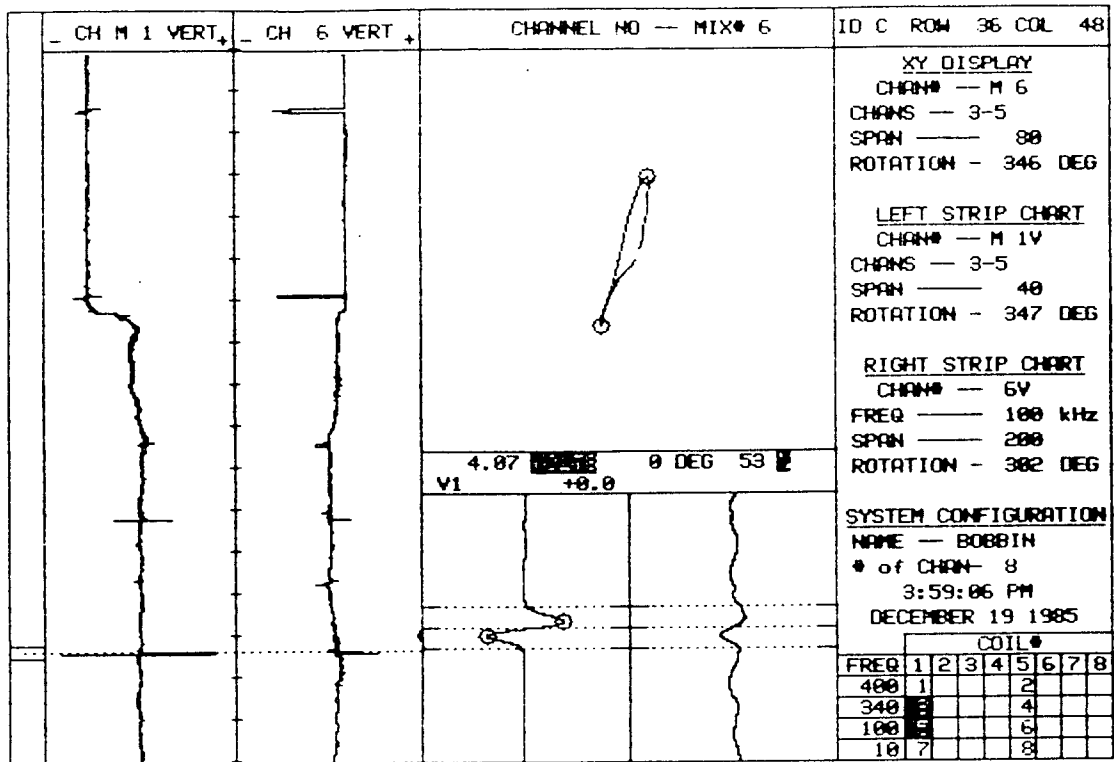


20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C16-    1    C    OUTLET    12/19/85

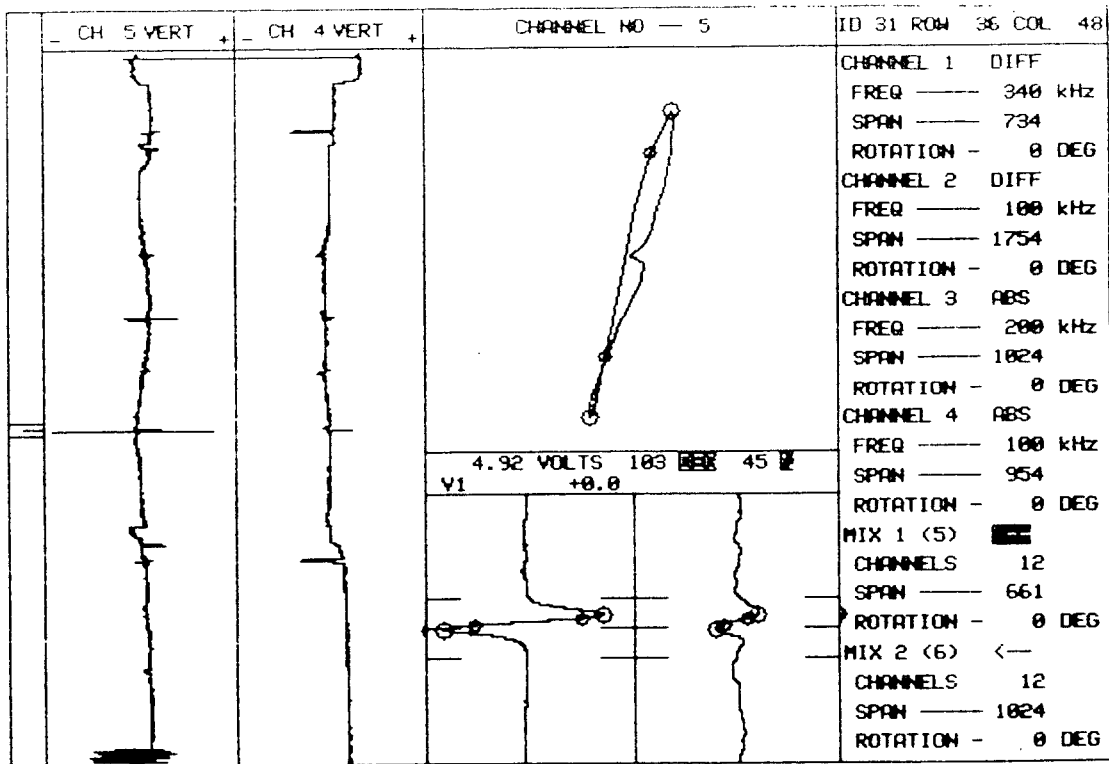


20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS I DISK #1	I	'C'	COLD	03/19/82	Edition 12.0 Rev 1

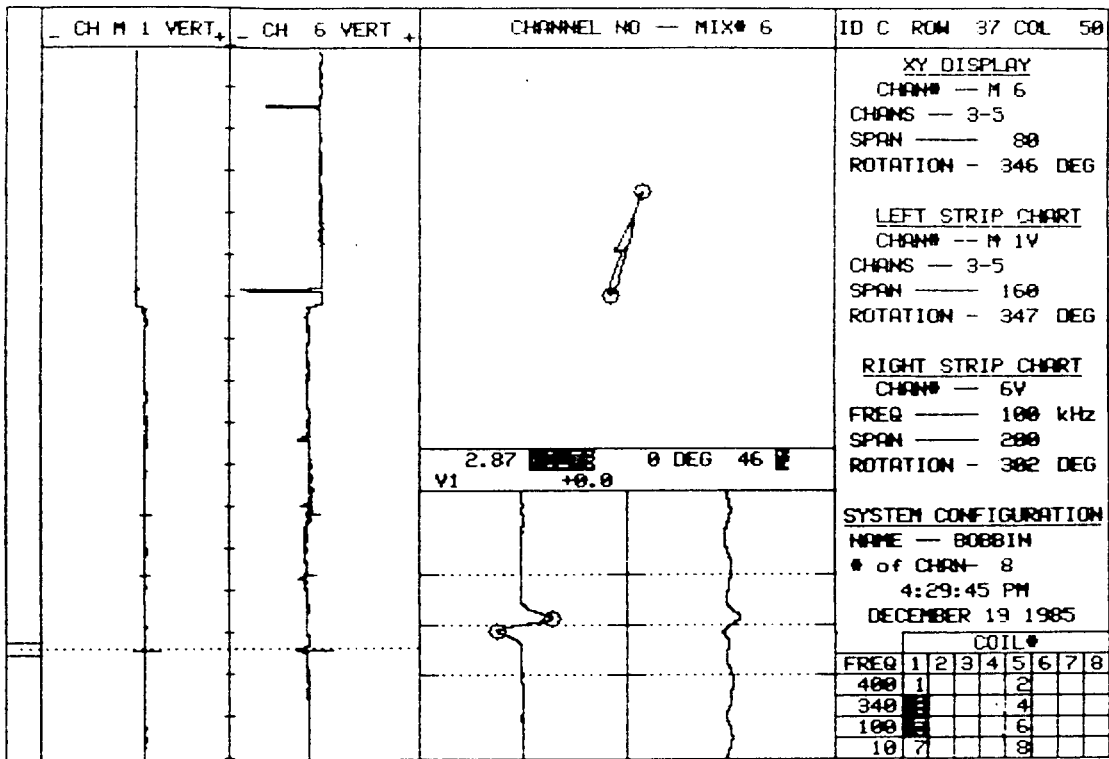




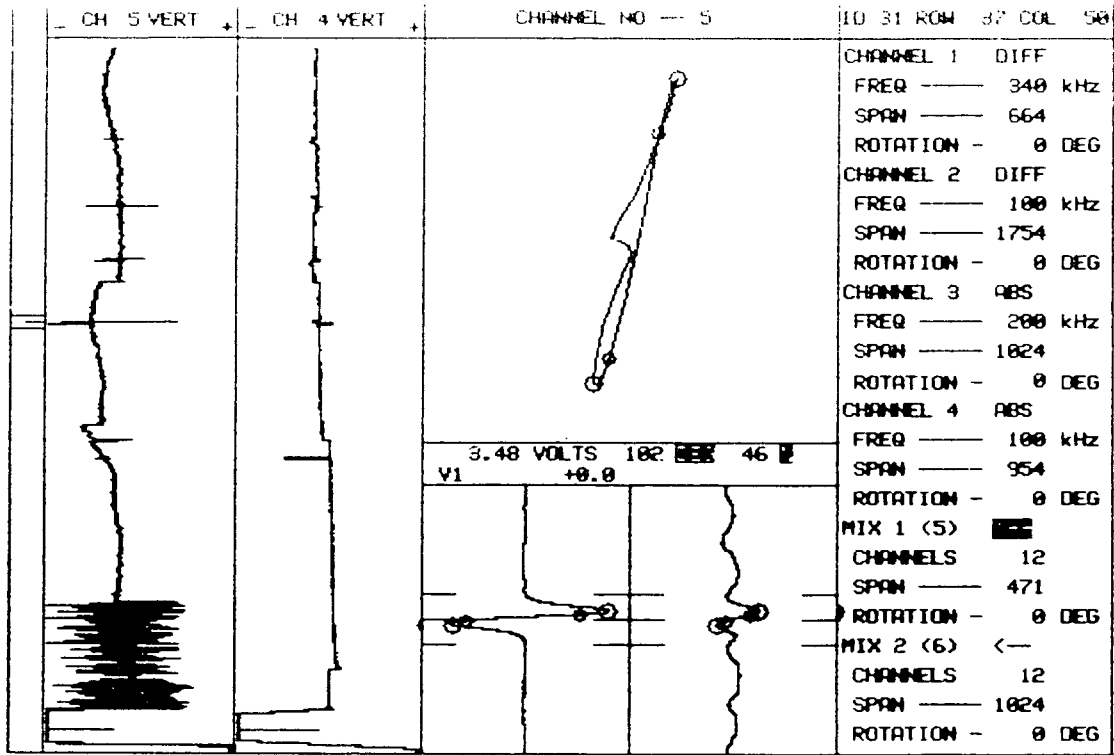
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 SONGS DISK C16-    1    C    OUTLET    12/19/85



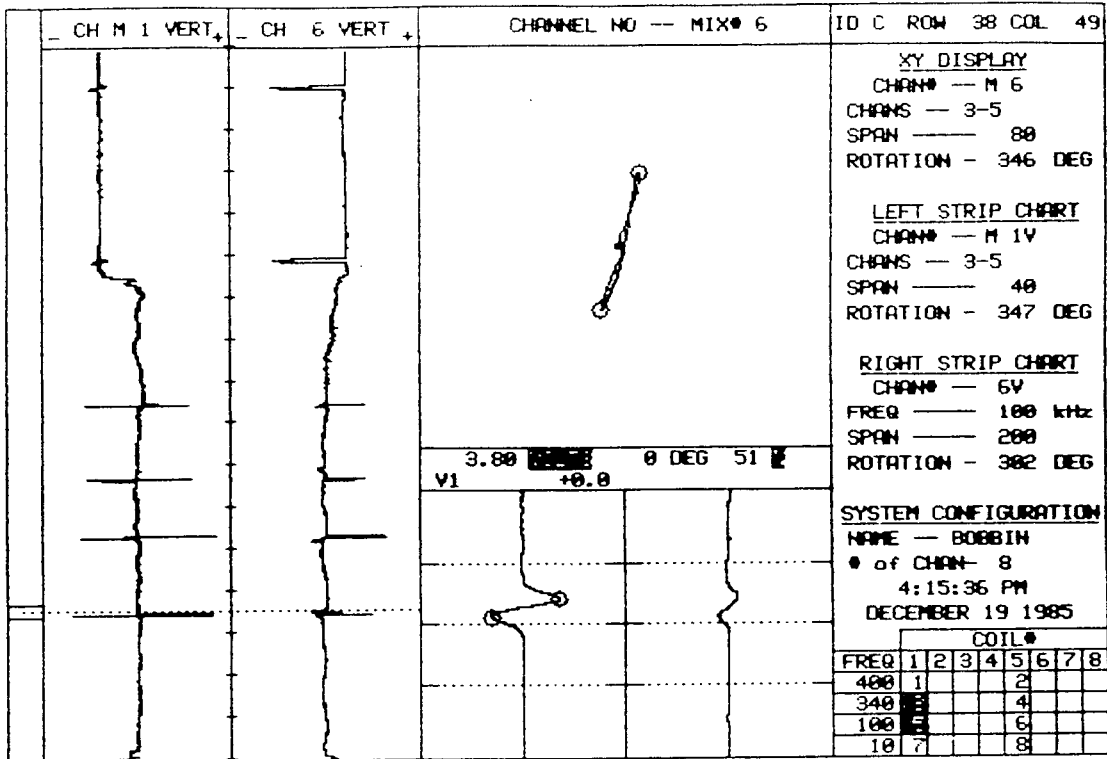
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 SONGS I DISK #1    I    'C'    COLD    03/19/82    Edition 12.0 Rev 1



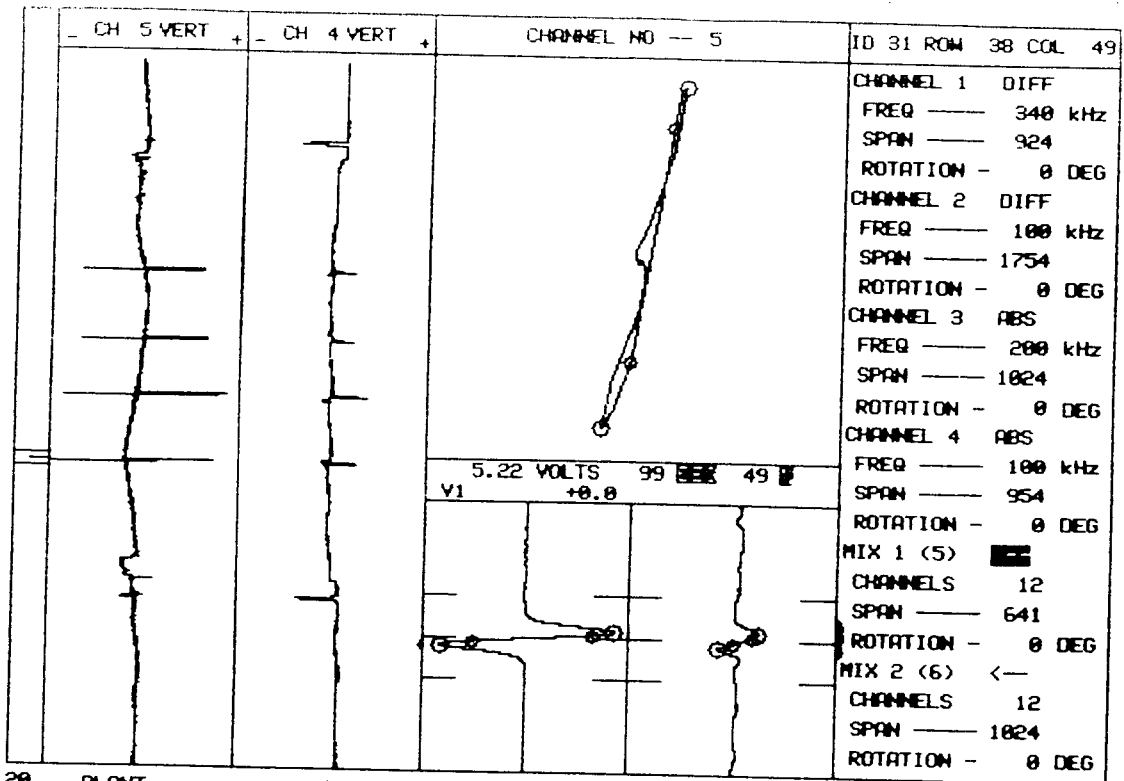
20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C16-    1    C    OUTLET    12/19/85



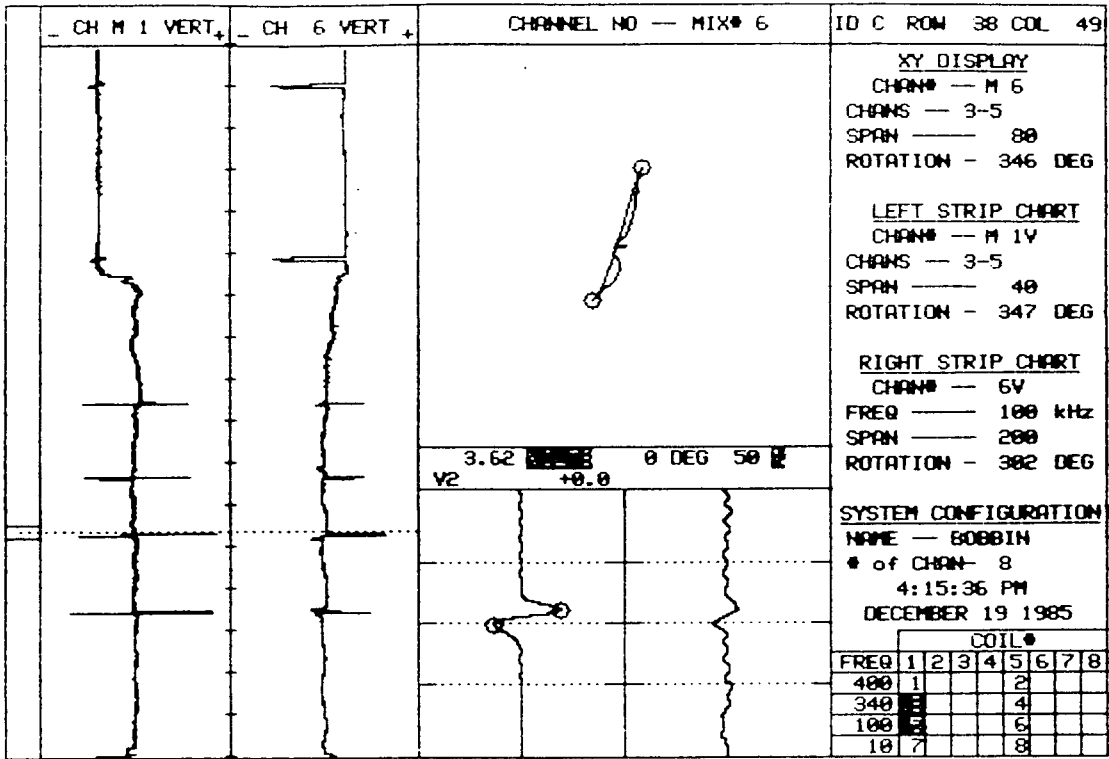
20 PLANT                      UNIT#    S/G    LEG            DATE                      ZETEC Inc. - 1983  
 SONGS I DISK #1            I       'C'    COLD            03/19/82                      Edition 12.0 Rev 1



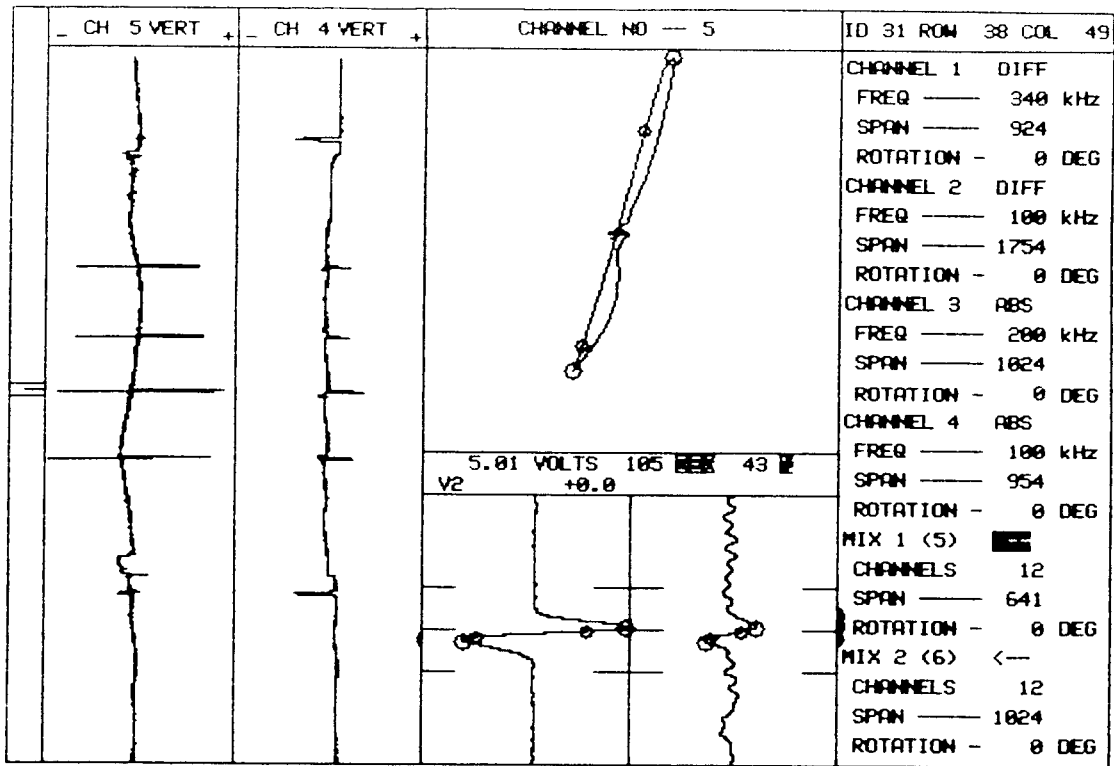
20 PLANT SONGS DISK C16- UNIT# 1 S/G C LEG OUTLET DATE 12/19/85



28 PLANT SONGS I DISK #1 UNIT# I S/G 'C' LEG COLD DATE 03/19/82 ZETEC Inc. - 1983 Edition 12.0 Rev 1

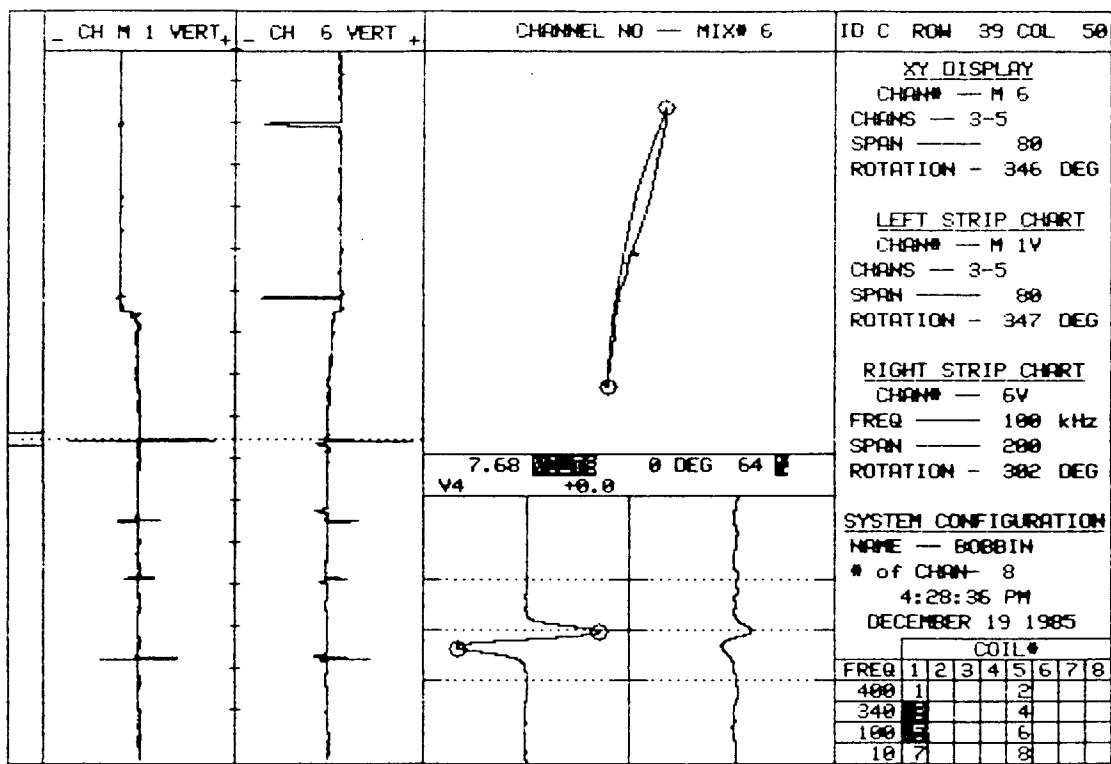


20	PLANT	UNIT#	S/G	LEG	DATE
	SONGS DISK C16-	1	C	OUTLET	12/19/85

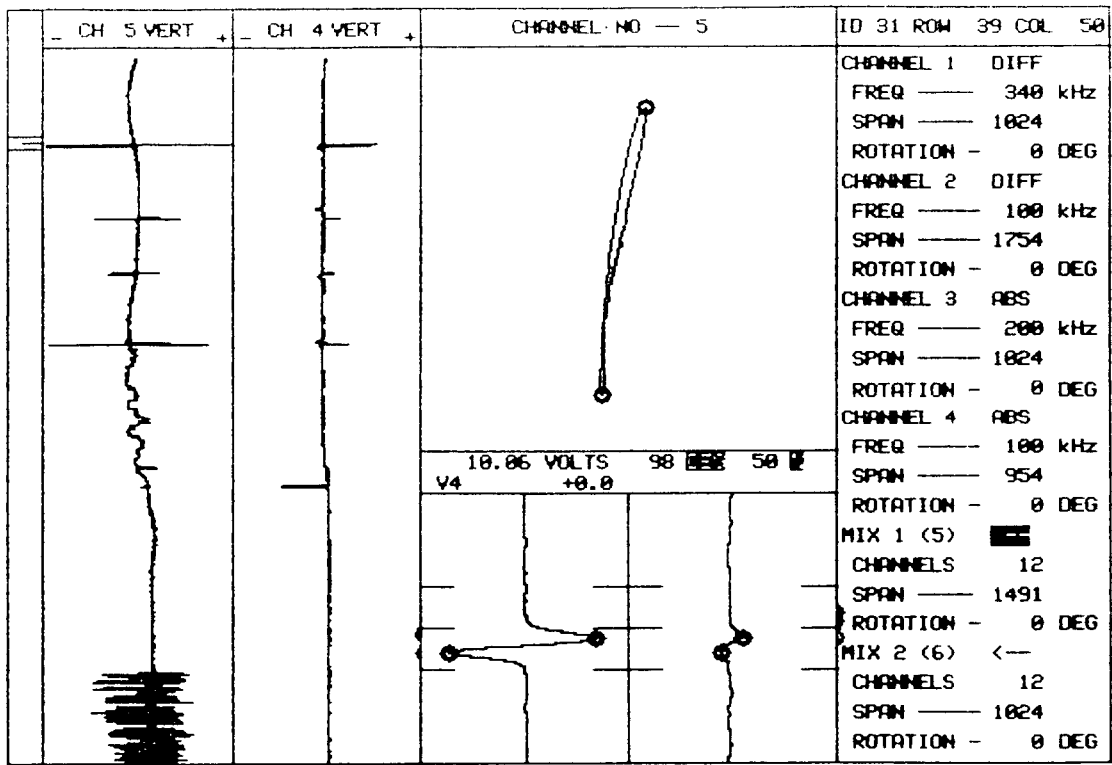


20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SONGS I DISK #1	I	'C'	COLD	03/19/82	Edition 12.0 Rev 1

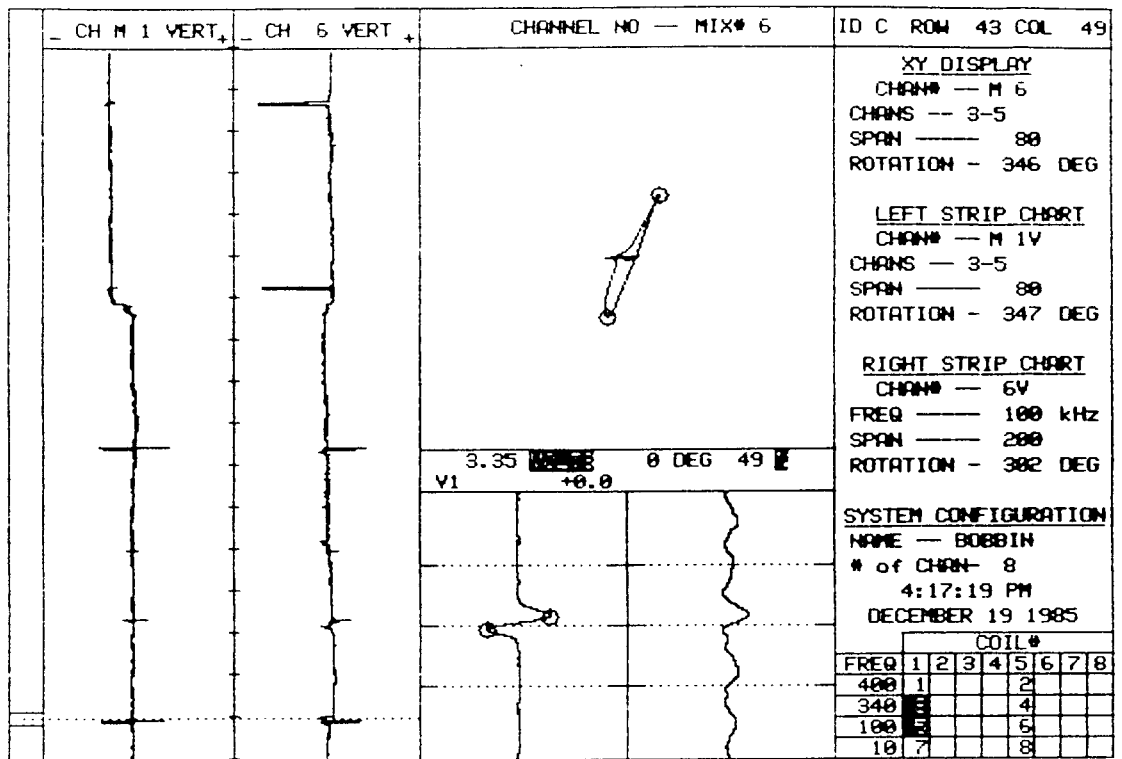




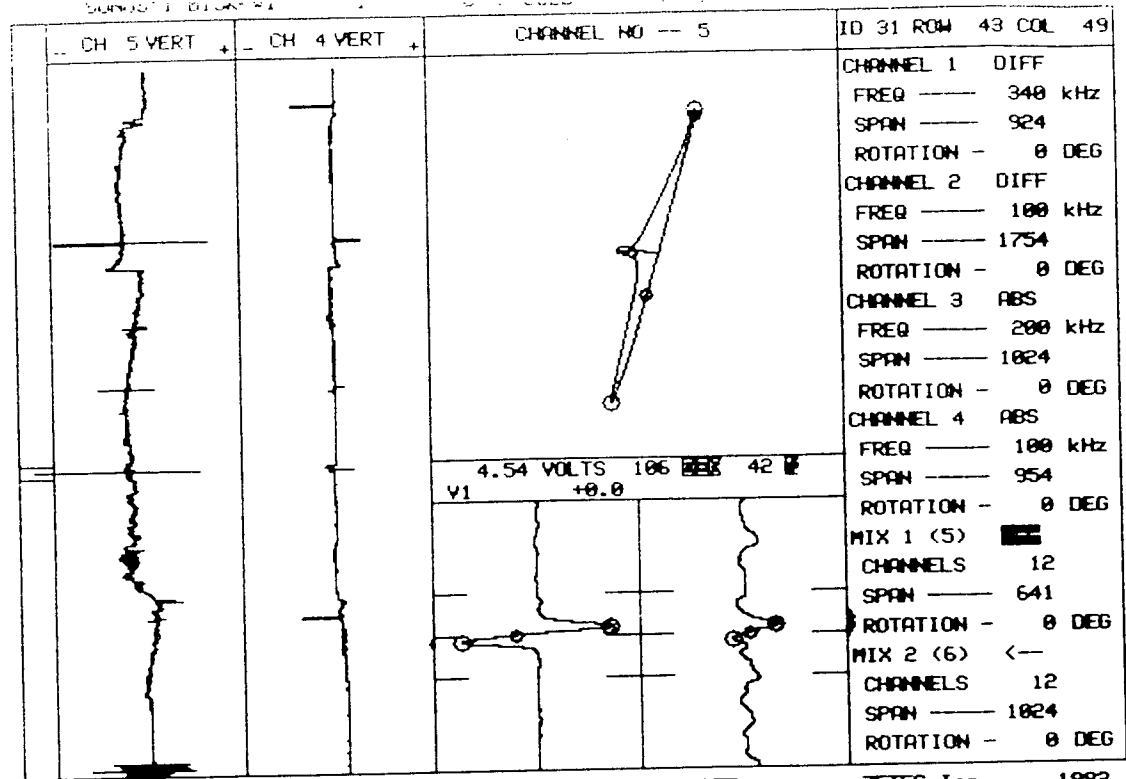
20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C16-    1    C    OUTLET    12/19/85



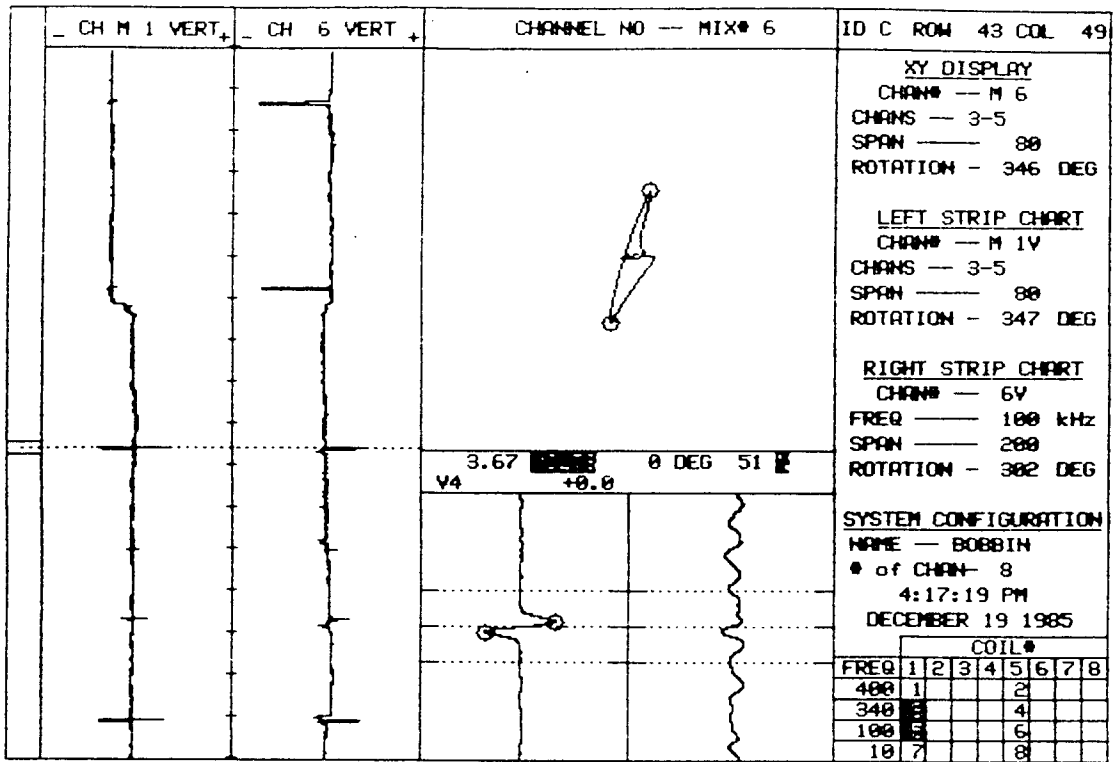
20 PLANT SONGS I DISK #1 UNIT# I S/G 'C' LEG COLD DATE 03/19/82 ZETEC Inc. - 1983 Edition 12.0 Rev 1



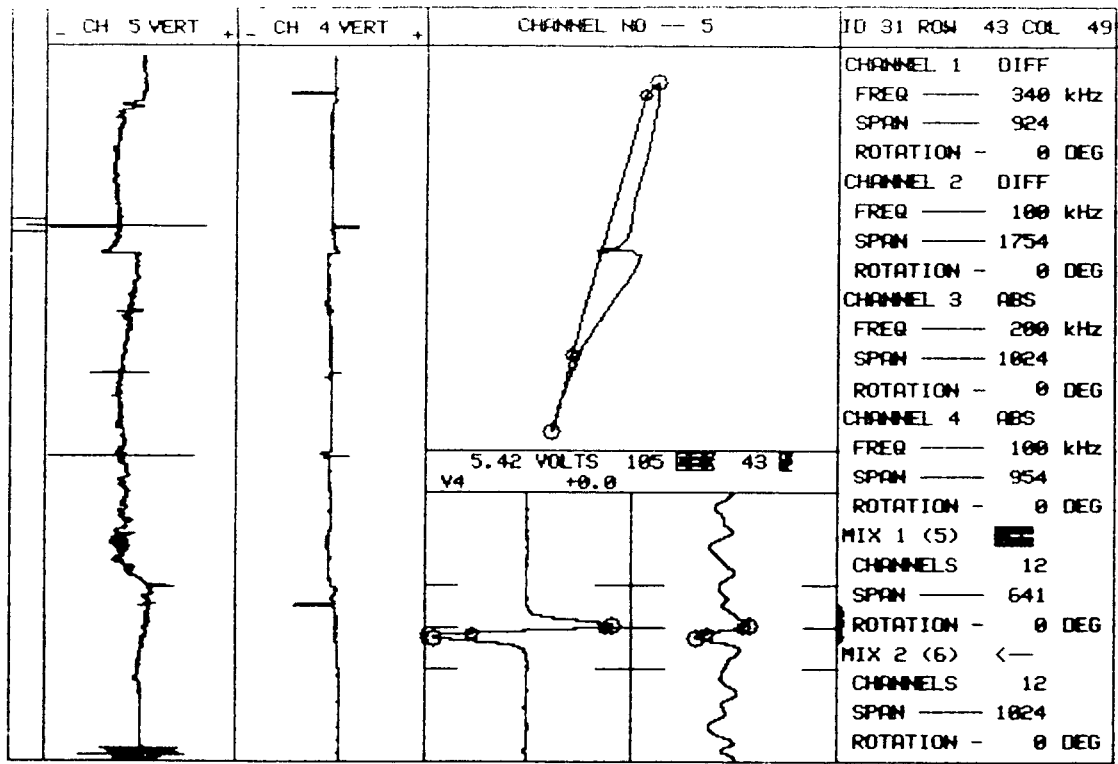
20 PLANT SONGS DISK C16 UNIT# 1 S/G C LEG OUTLET DATE 12/19/85



20	PLANT SONGS I DISK #1	UNIT# I	S/G 'C'	LEG COLD	DATE 03/19/82	ZETEC Inc. - 1983 Edition 12.0 Rev 1
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20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C16-    1    C    OUTLET    12/19/85



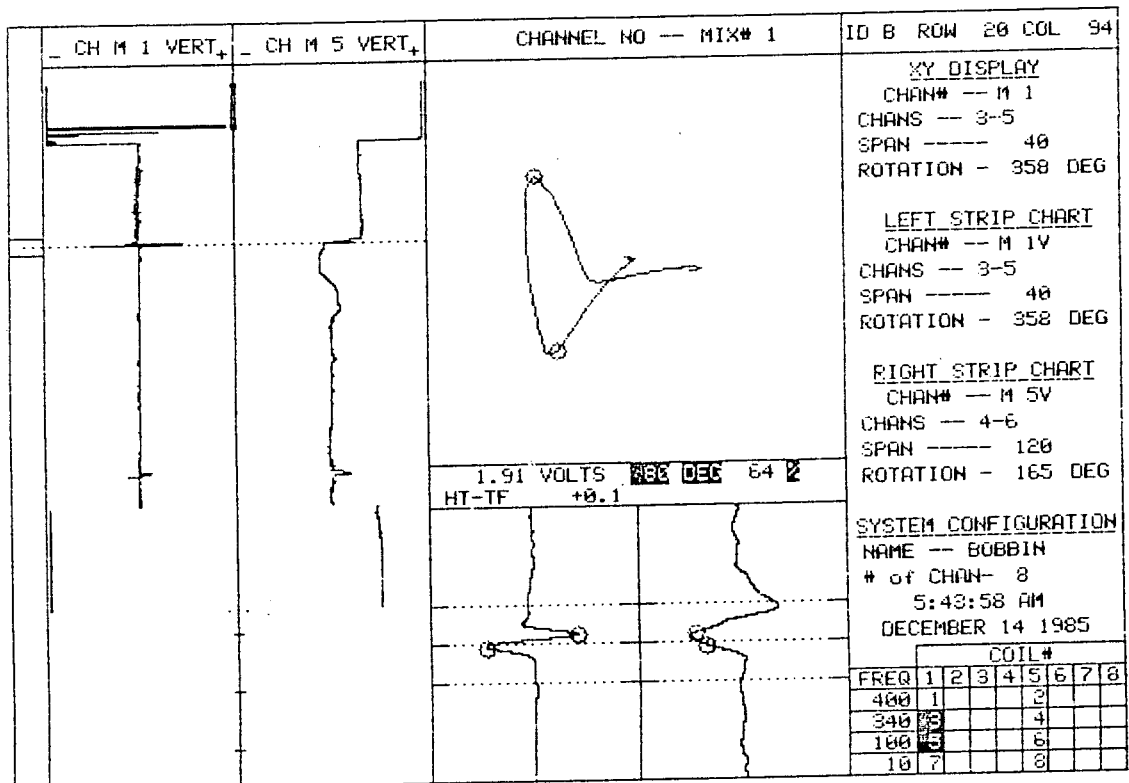
20 PLANT SONGS I DISK #1 UNIT# I S/G 'C' LEG COLD DATE 03/19/82 ZETEC Inc. - 1983 Edition 12.0 Rev 1

Appendix C

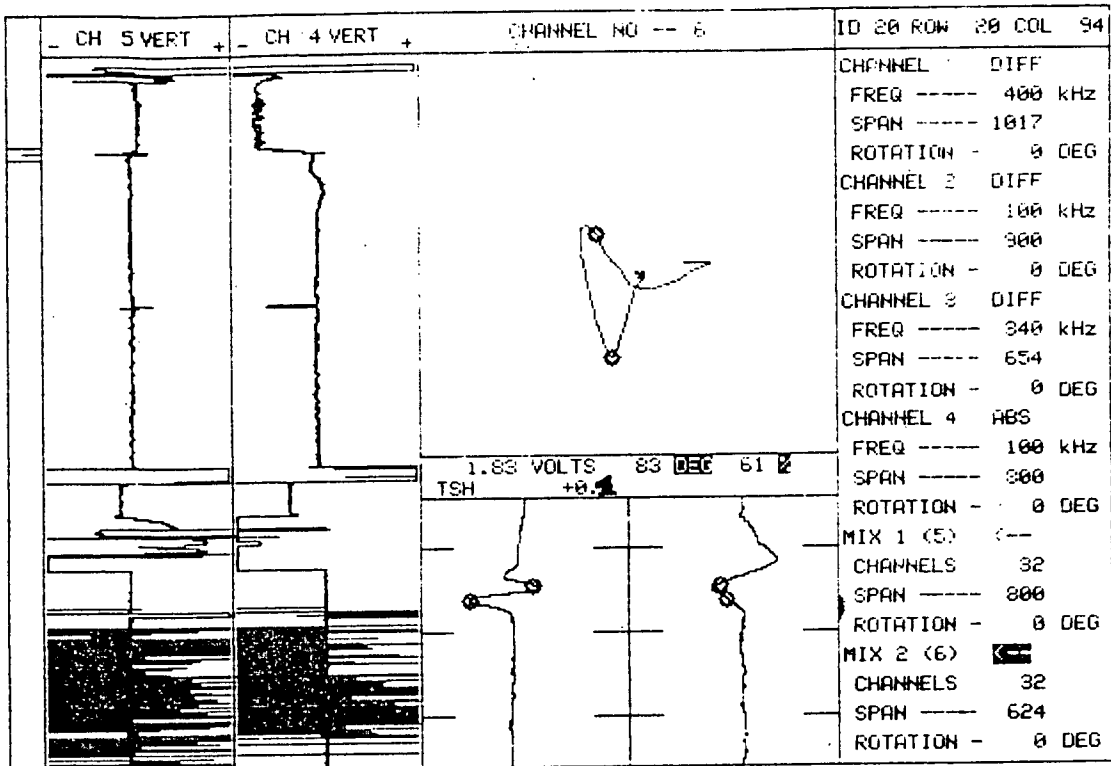
General Inspection Data Comparison Results

Steam Generator "B" R20C94 Hot Leg Comparison





15 PLANT SONGS DISK H03 UNIT# 1 S/G B LEG HOT DATE 12/13/85



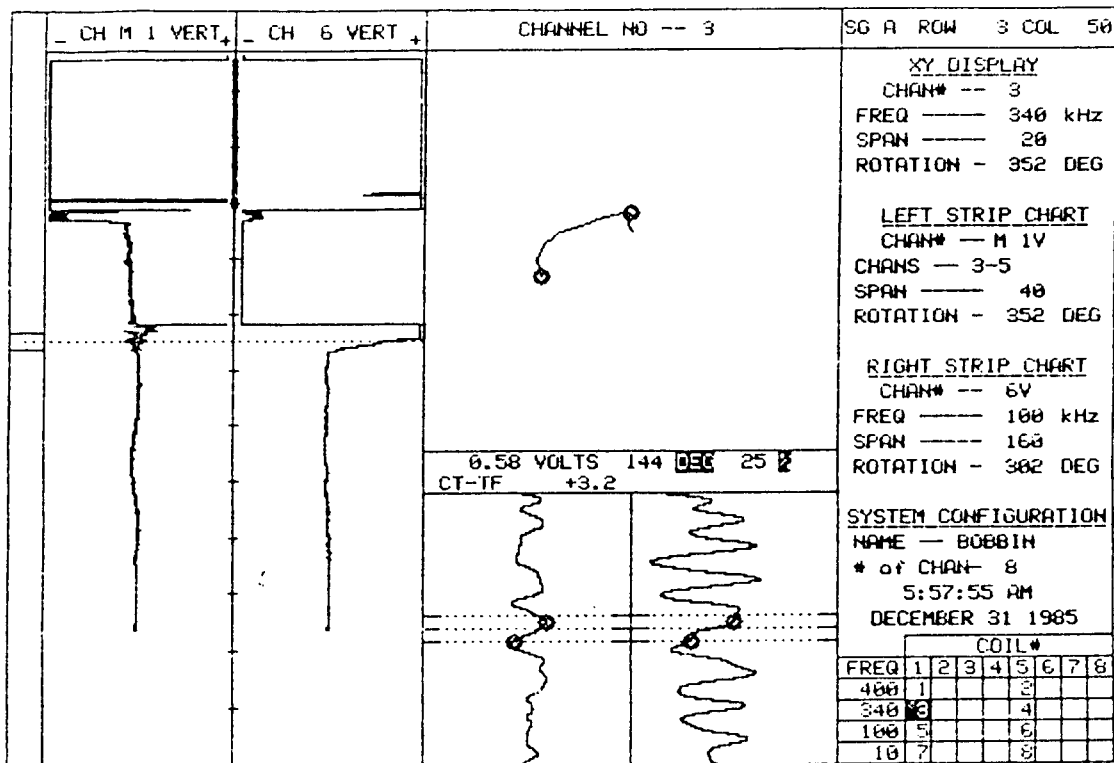
20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS DISK#1	I	B	INLET	1980	Edition 12.0 Rev 1

Table C.1

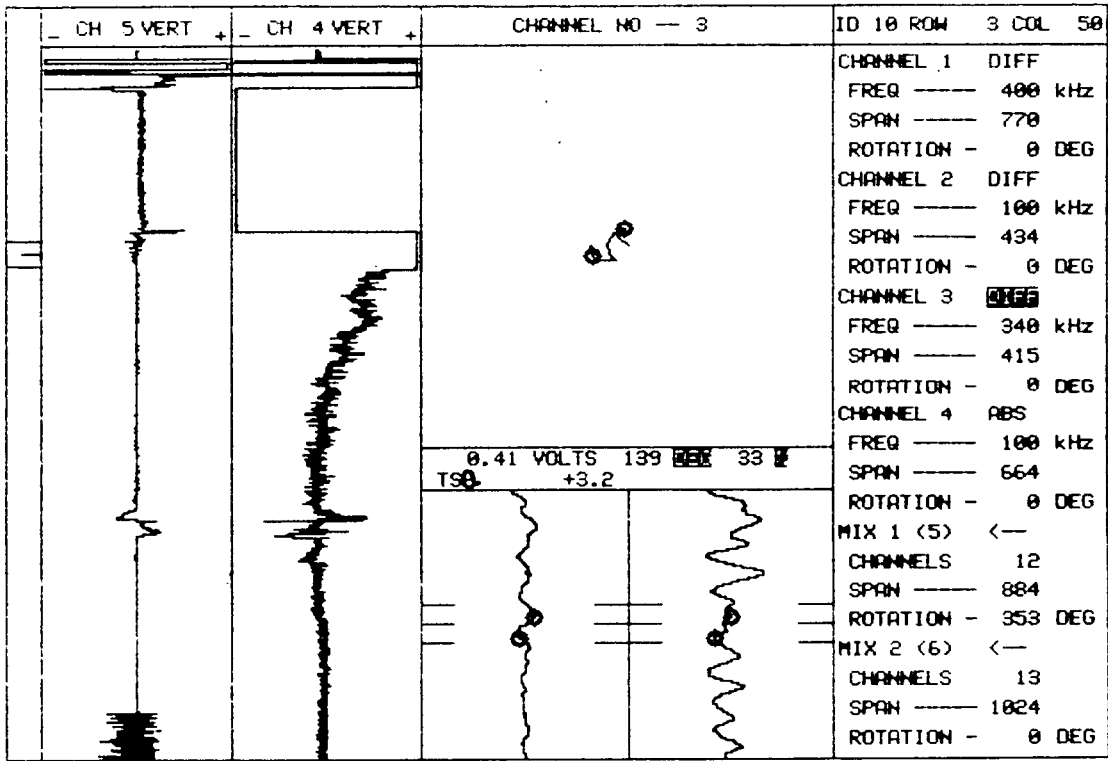
## COLD LEG DATA COMPARISONS

o COLD LEG INDICATIONS	STEAM GENERATOR		
	<u>A</u>	<u>B</u>	<u>C</u>
o NUMBER OF TUBES TESTED	1118	400	546
o NUMBER OF INDICATIONS COMPARED BETWEEN 1980 AND 1985 (13.5 EFPM)	198	39	59
o MEAN CHANGE	-0.4%	+4.5%	+2.3%
o NUMBER OF TUBE WITH <u>NEW</u> $\geq 20\%$ INDICATIONS	26	9	12
o NUMBER OF TUBES WITH <u>ACTUAL</u> $\geq 10\%$ GROWTH	8	3	3
o NUMBER OF TUBES PLUGGED ( $\geq 50\%$ INDICATIONS)	19	0	1
o NUMBER OF TUBES PLUGGED (DISTORTED SIGNALS)	16	1	2

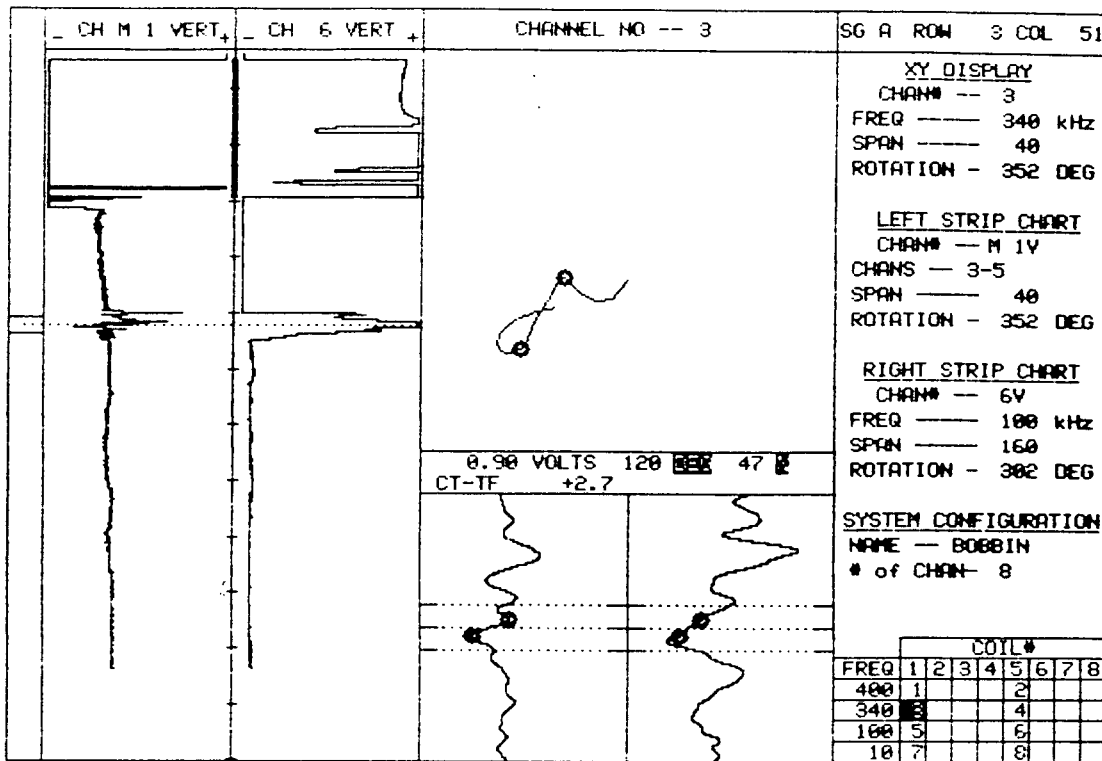
Steam Generator "A" Cold Leg Data Comparisons



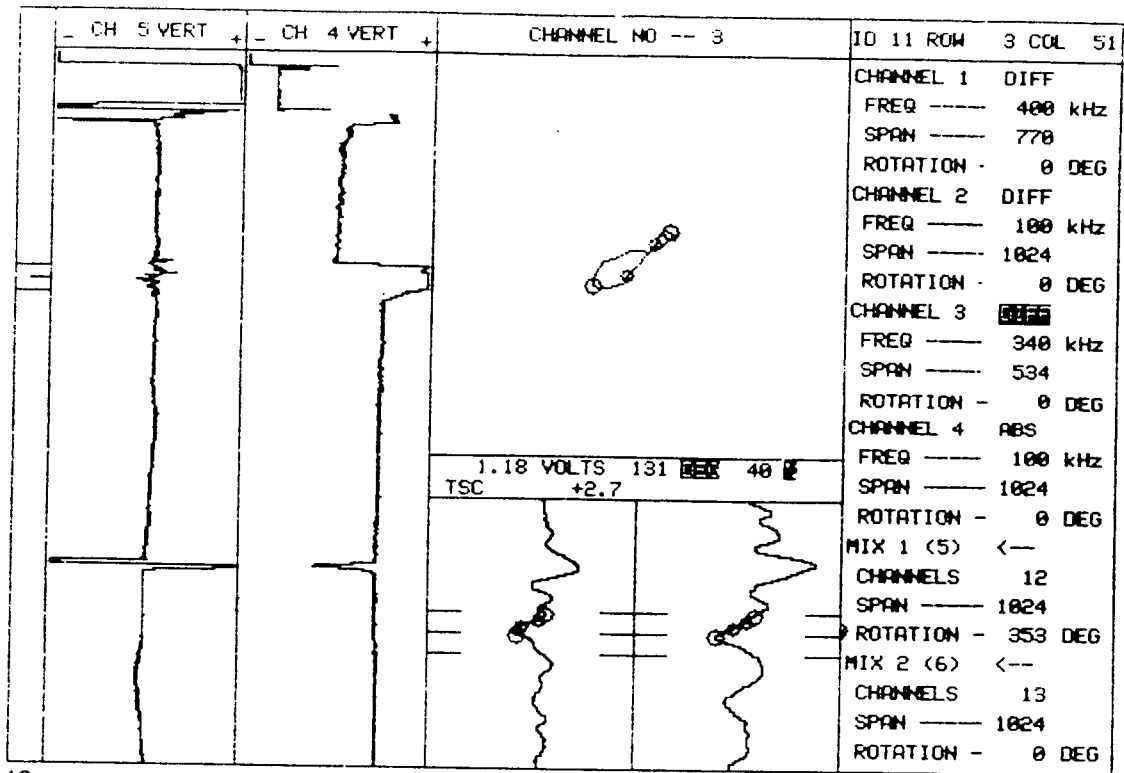
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C46    1    A    OUTLE    12/31/85



10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



15 PLANT SONGS DISK C46 UNIT# 1 S/G A LEG OUTLE DATE 12/31/85



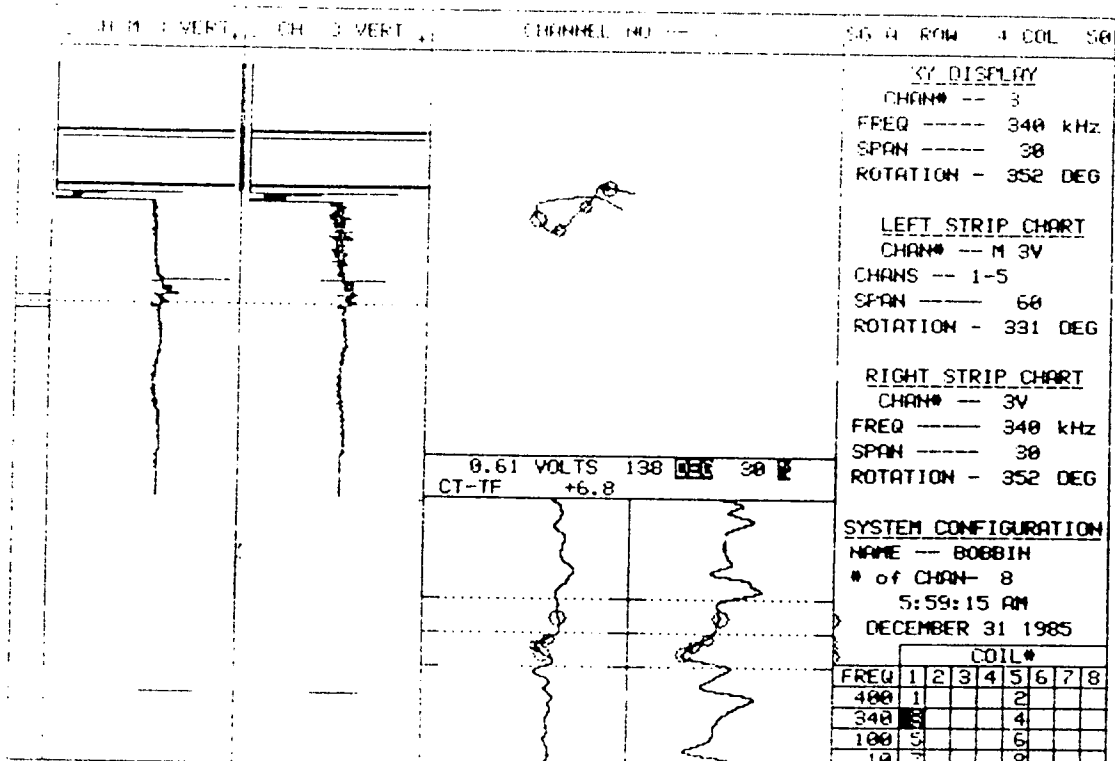
1.18 VOLTS 131 **DEG** 40 **μ**  
TSC +2.7

10

ZETEC Inc. - 1983  
Edition 12.0 Rev 1

S/G A 1980





XY\_DISPLAY  
 CHAN# -- 3  
 FREQ ---- 340 kHz  
 SPAN ---- 30  
 ROTATION - 352 DEG

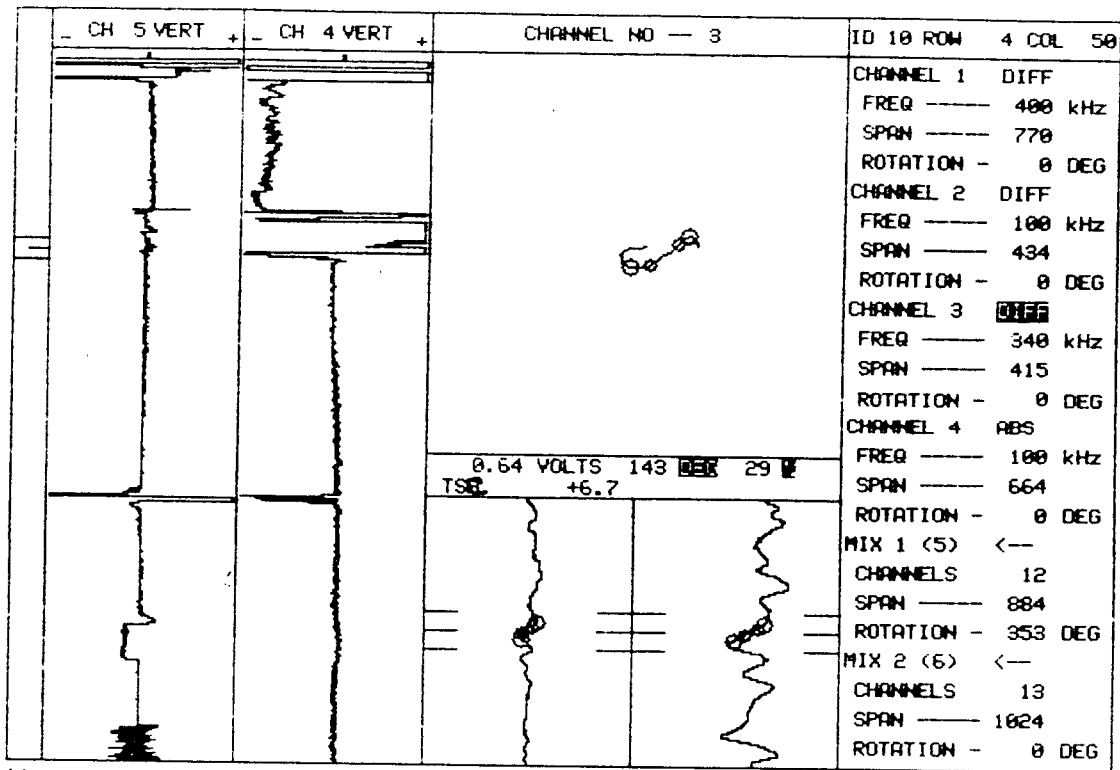
LEFT STRIP CHART  
 CHAN# -- M 3V  
 CHANS -- 1-5  
 SPAN ---- 60  
 ROTATION - 331 DEG

RIGHT STRIP CHART  
 CHAN# -- 3V  
 FREQ ---- 340 kHz  
 SPAN ---- 30  
 ROTATION - 352 DEG

SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 5:59:15 AM  
 DECEMBER 31 1985

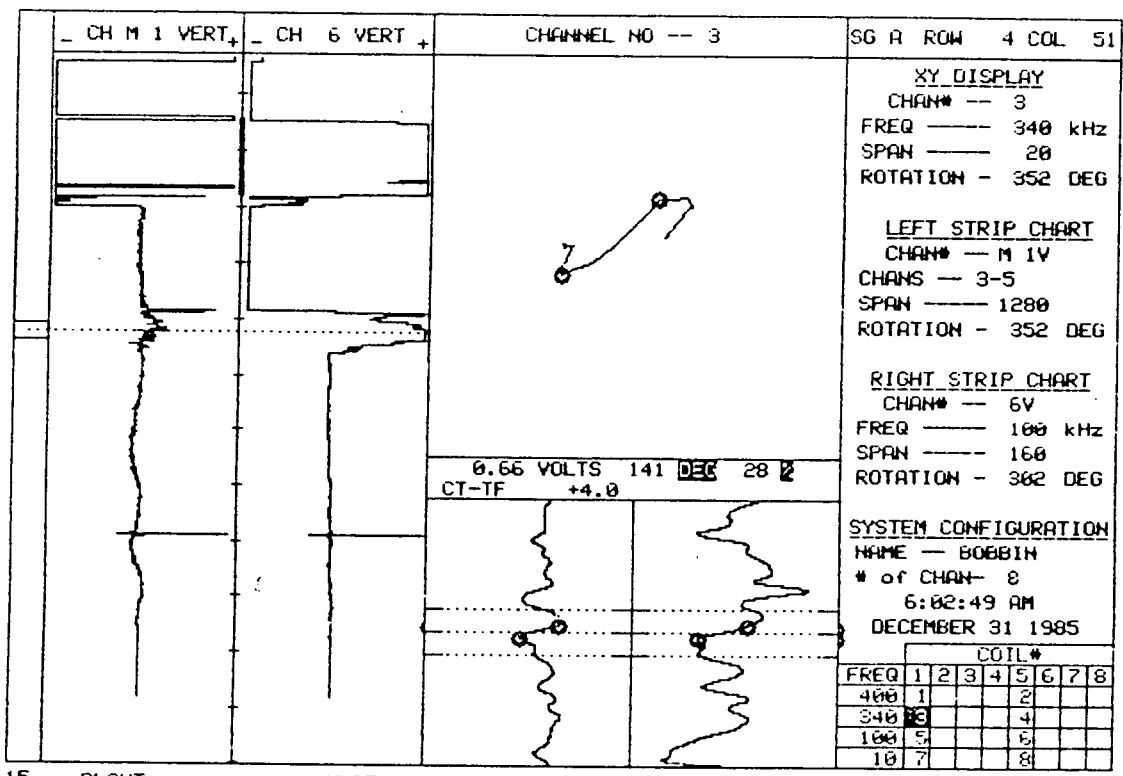
		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	3					4			
100	5					6			
10	7					8			

20 PLANT SONGS C46 UNIT# 1 S/G A LEG OUTLET DATE 12/31/85

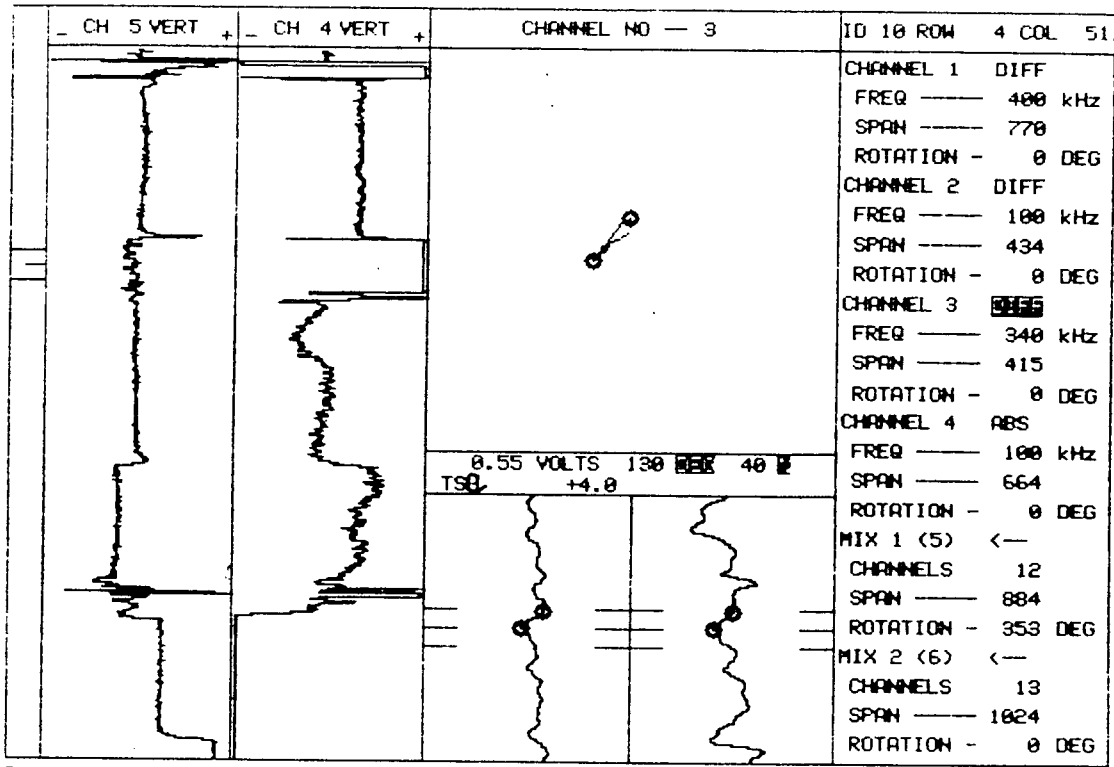


0.54 VOLTS 143 DEG 29 W  
TSP +6.7

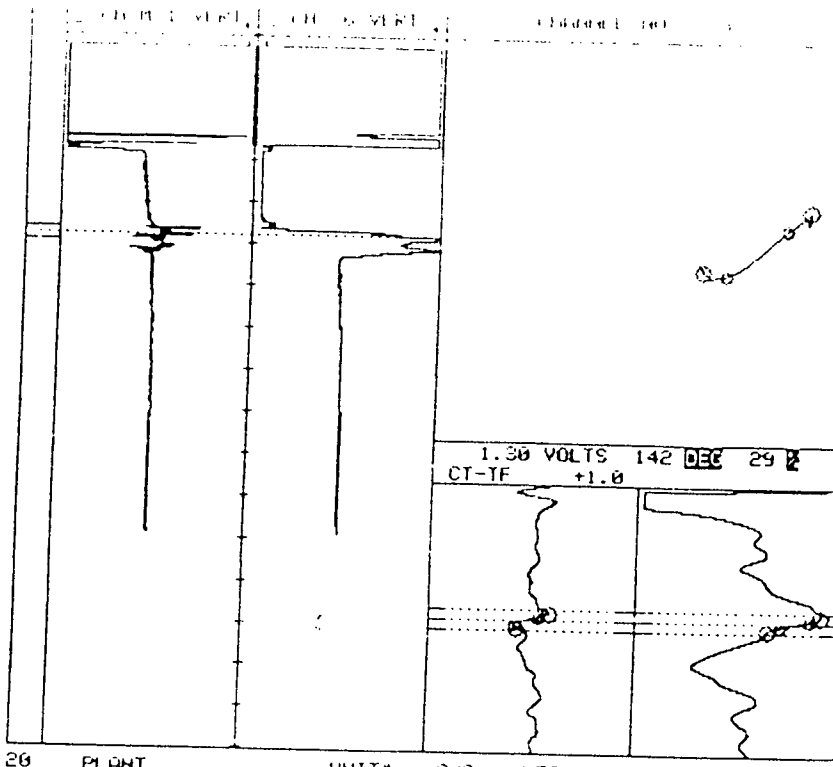
11	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	R	OUTLET	1980	Edition 12.0 Rev 1



15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C46    1    A    OUTLE    12/31/85



9 PLANT SCE SONGS UNIT# I S/G A LEG R DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



SY DISPLAY  
 CHAN# -- 3  
 FREQ ----- 340 kHz  
 SPAN ----- 40  
 ROTATION - 352 DEG

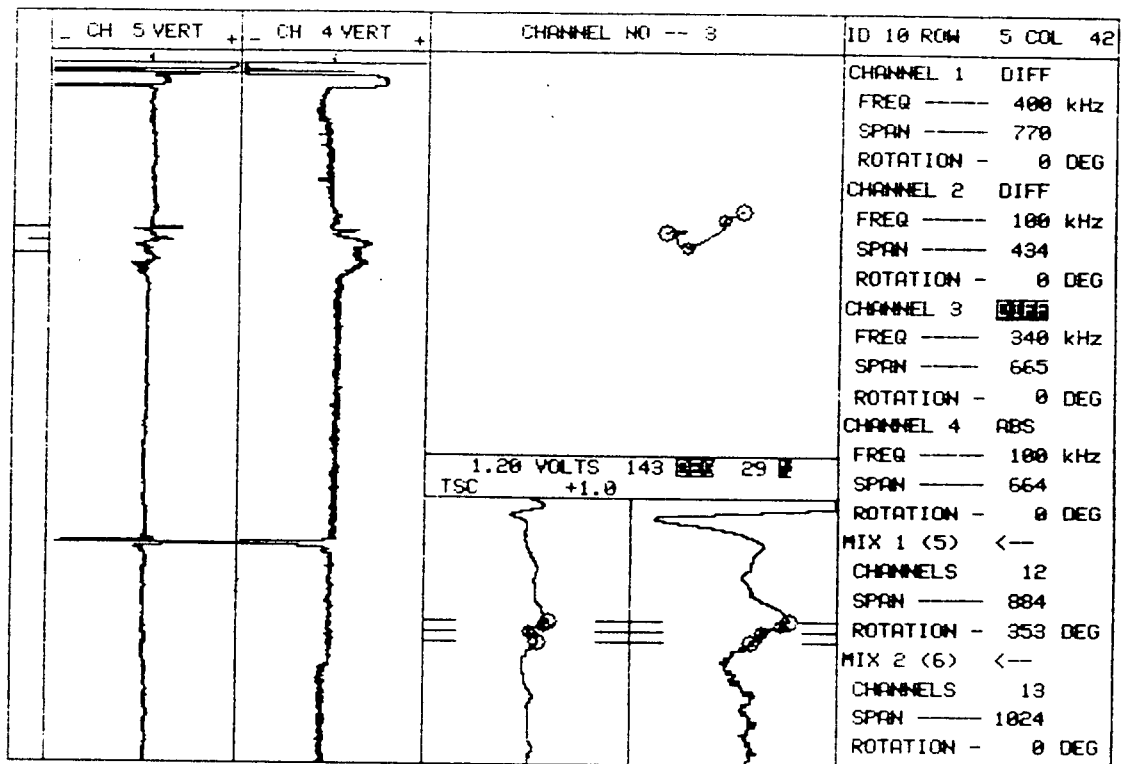
LEFT STRIP CHART  
 CHAN# -- M IV  
 CHANS -- 3-5  
 SPAN ----- 40  
 ROTATION - 351 DEG

RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ ----- 100 kHz  
 SPAN ----- 220  
 ROTATION - 302 DEG

SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 10:13:56 PM  
 DECEMBER 29 1985

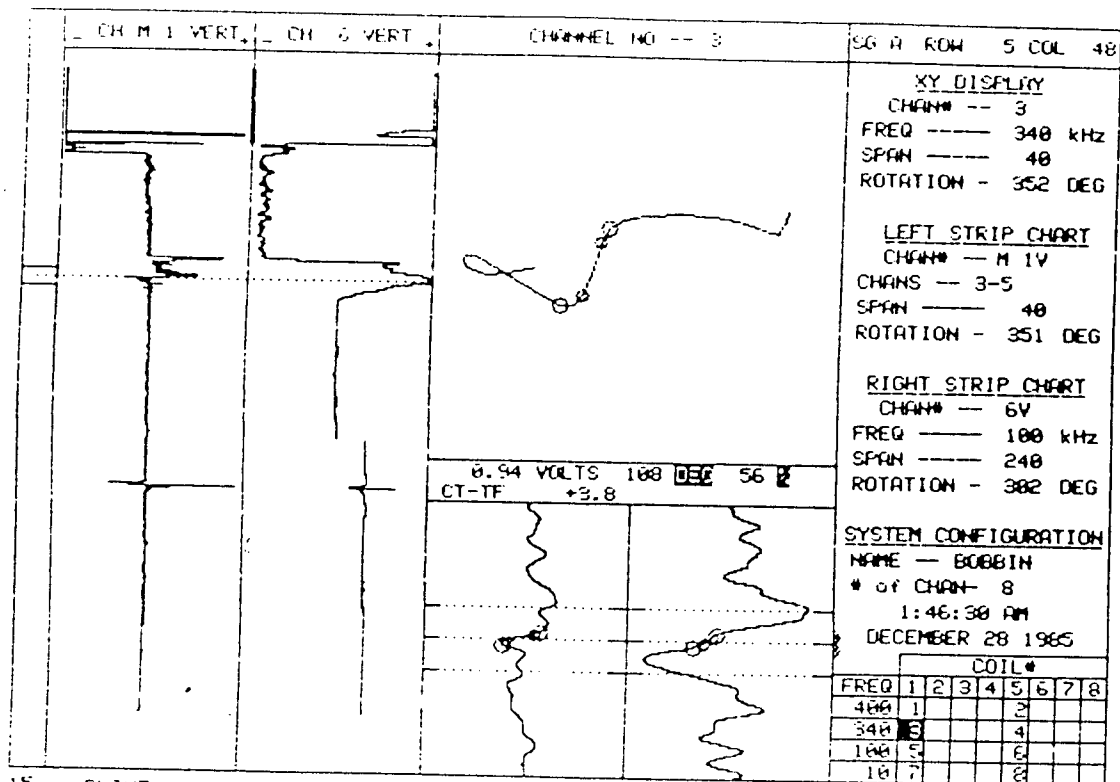
		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	3					4			
100	5					6			
10	7					8			

20 PLANT SONGS DISK C41 UNIT# 1 S/G A LEG OUTLET DATE 12/29/85

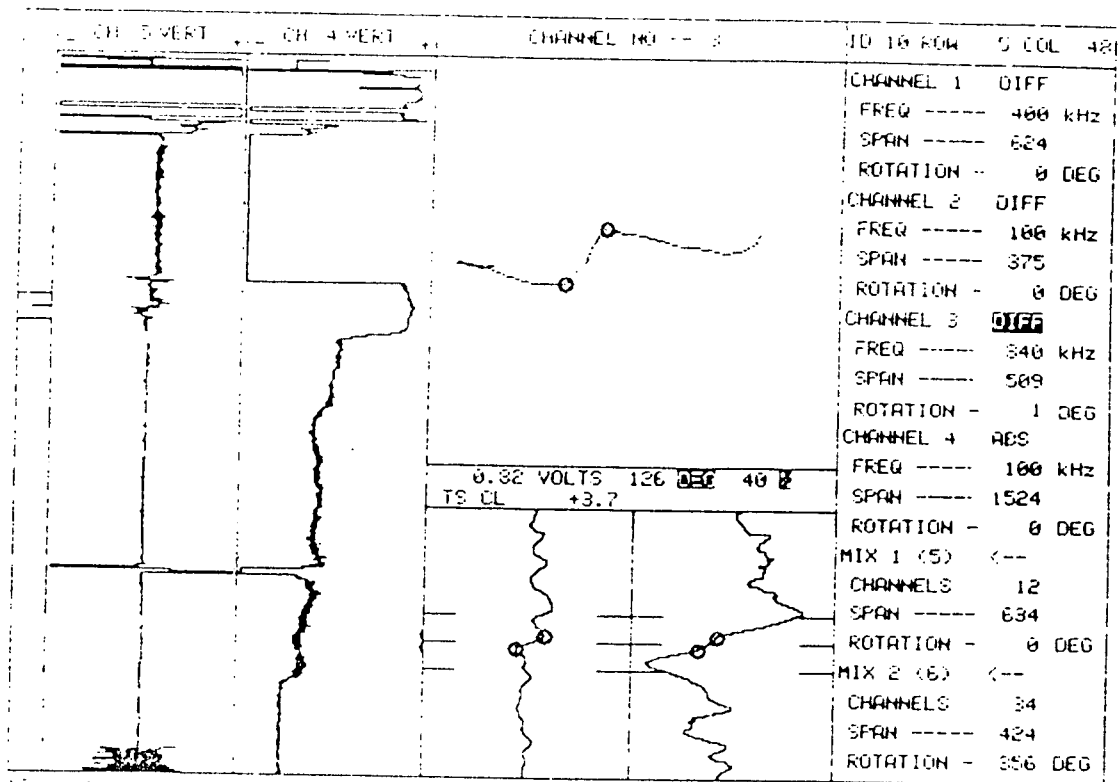


1.20 VOLTS 143 ~~222~~ 29 ~~12~~  
TSC +1.0

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

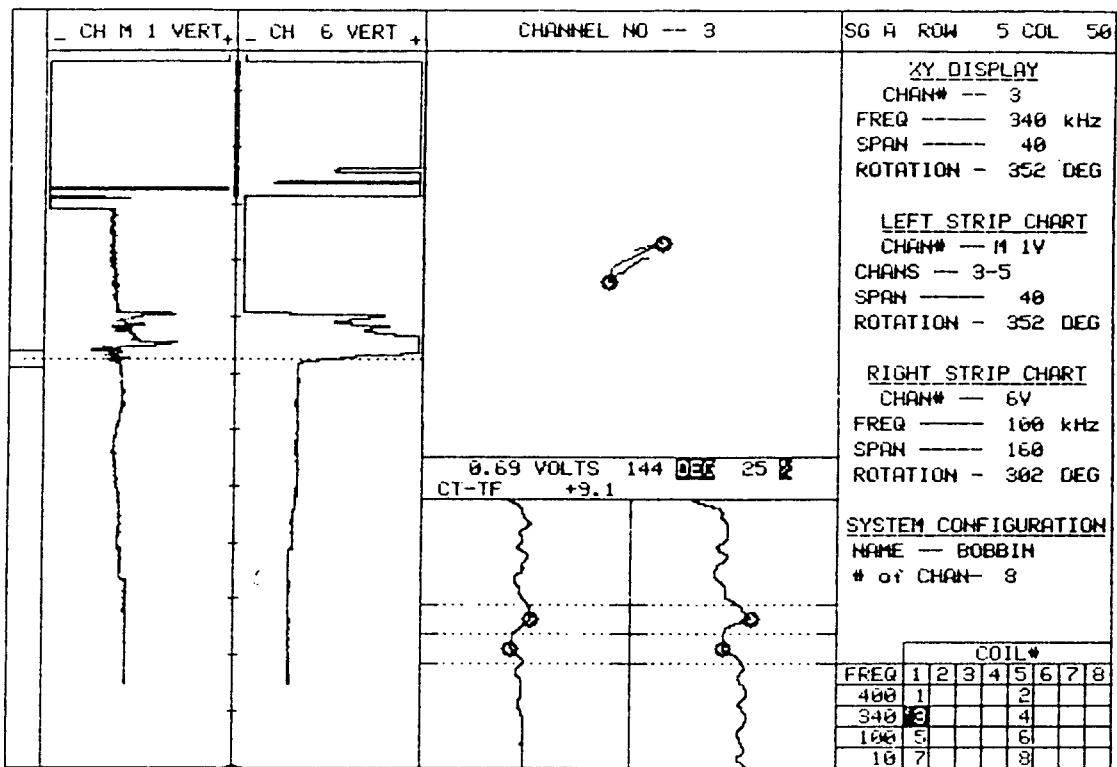


15 PLANT SONGS DISK C37 UNIT# 1 S/G R LEG OUTLET DATE 12/27/85

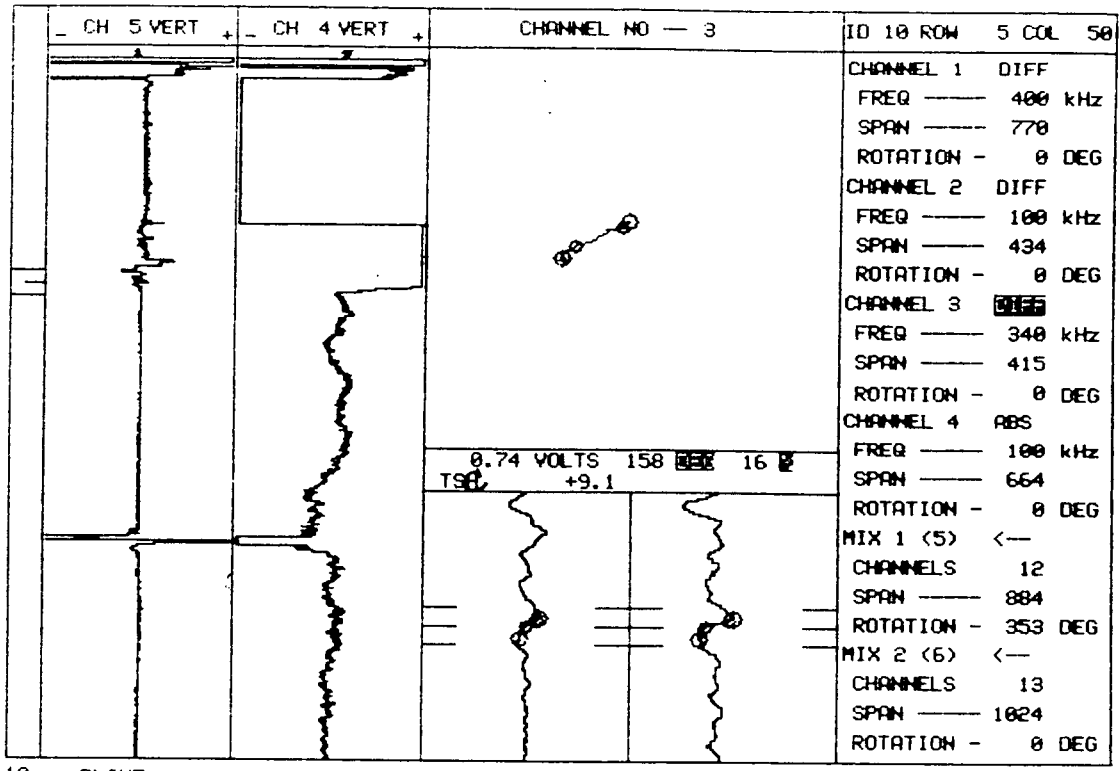


10 PLANT UNIT# SAG LEG DATE DETEC Inc. - 1983  
SCE 50405 1 "A" COLD 06/03/88 Edition 12.0 Rev 1



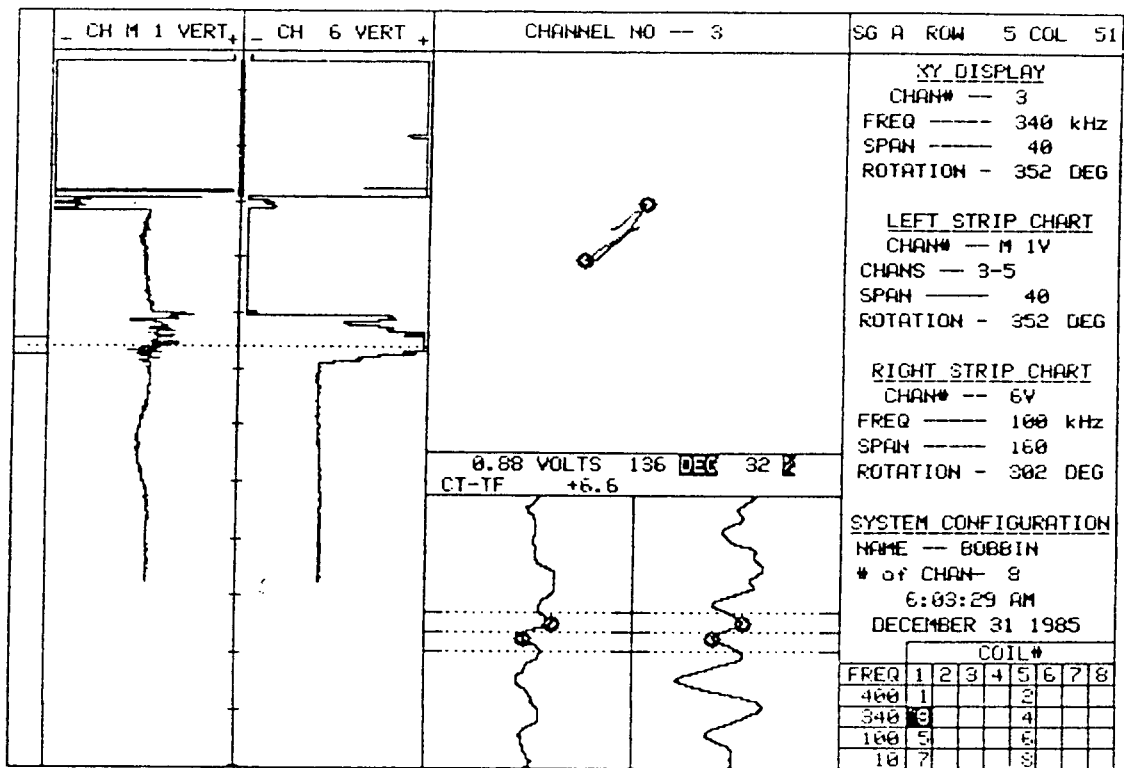


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C46    1    A    OUTLE    12/31/85

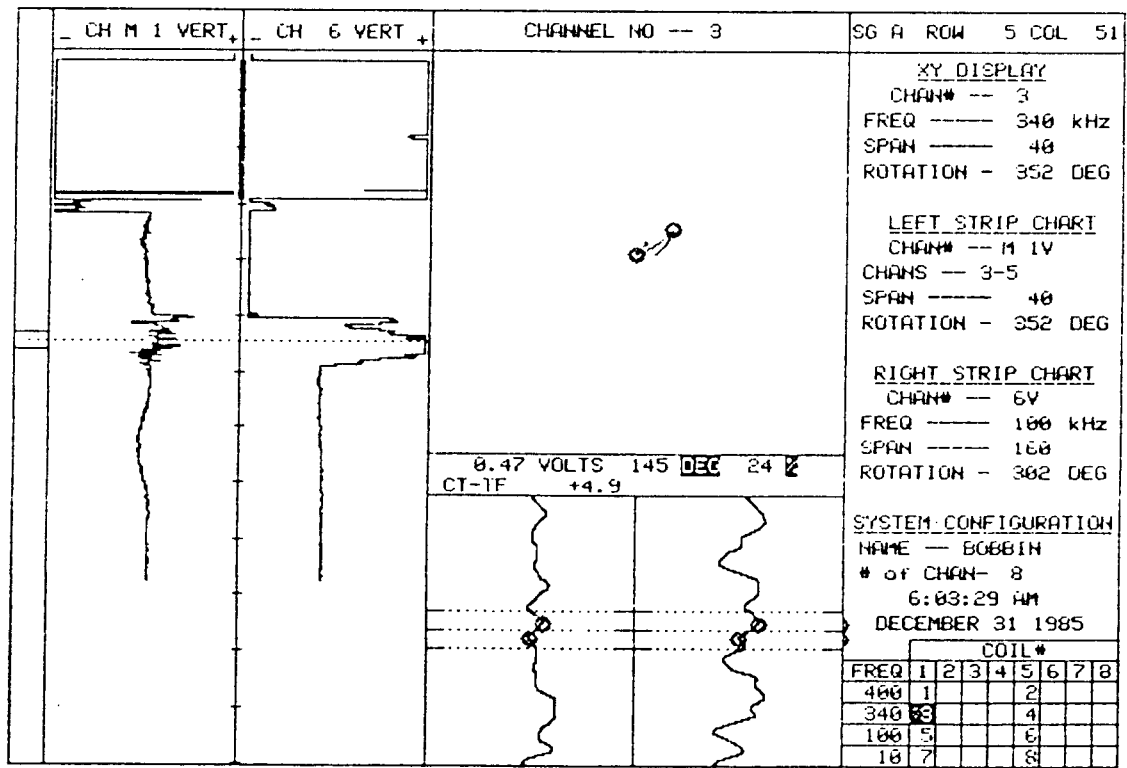


10    PLANT    UNIT#    S/G    LEG    DATE  
 SCE SONGS    I    A    OUTLET    1980

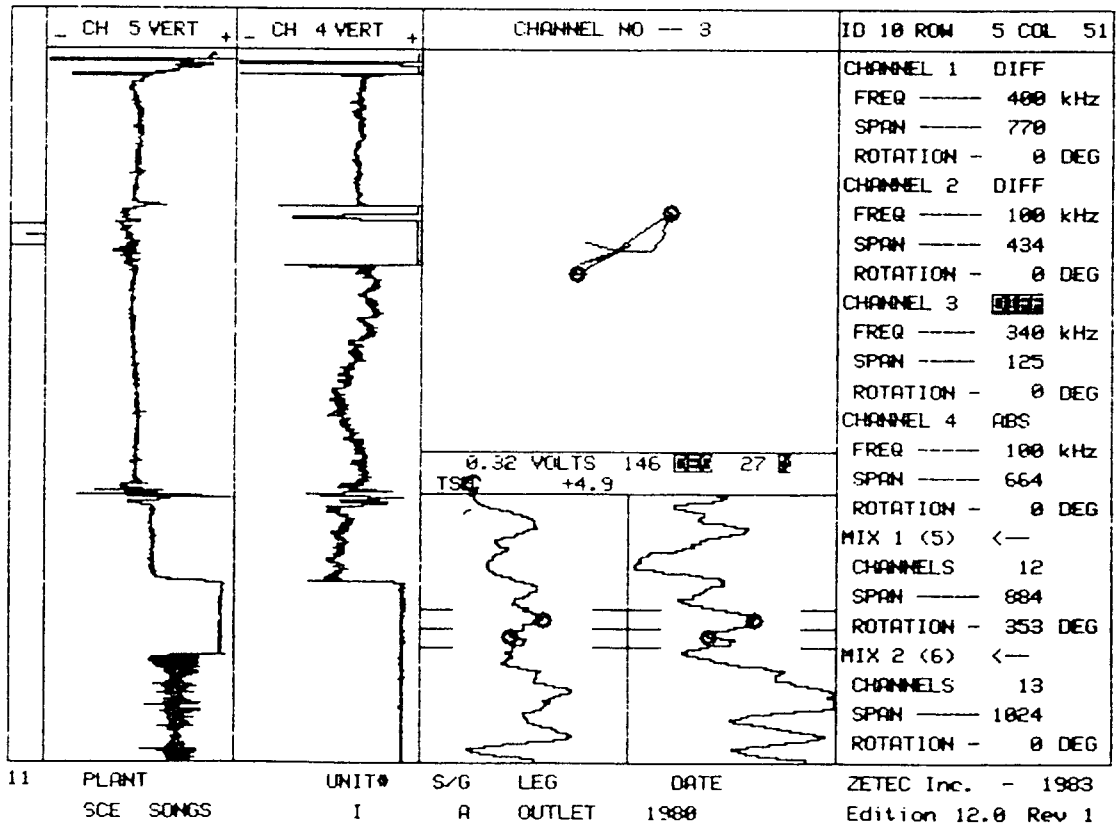
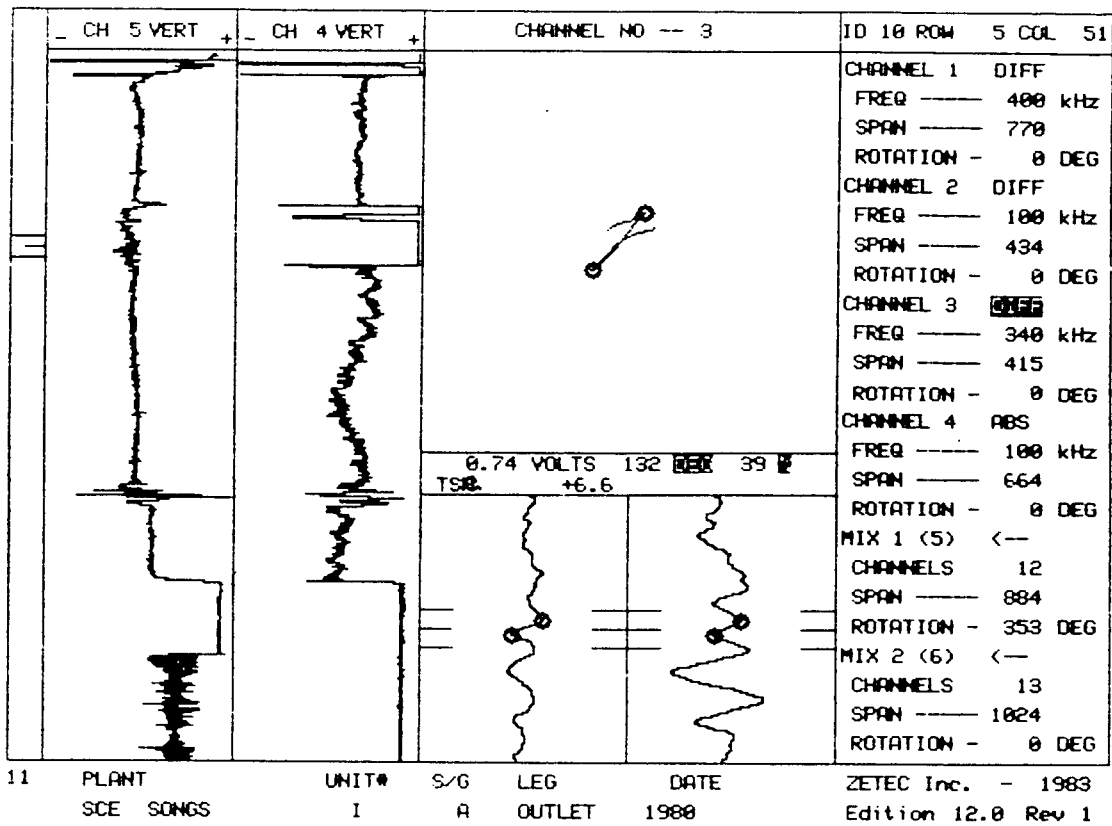
ZETEC Inc. - 1983  
 Edition 12.0 Rev 1

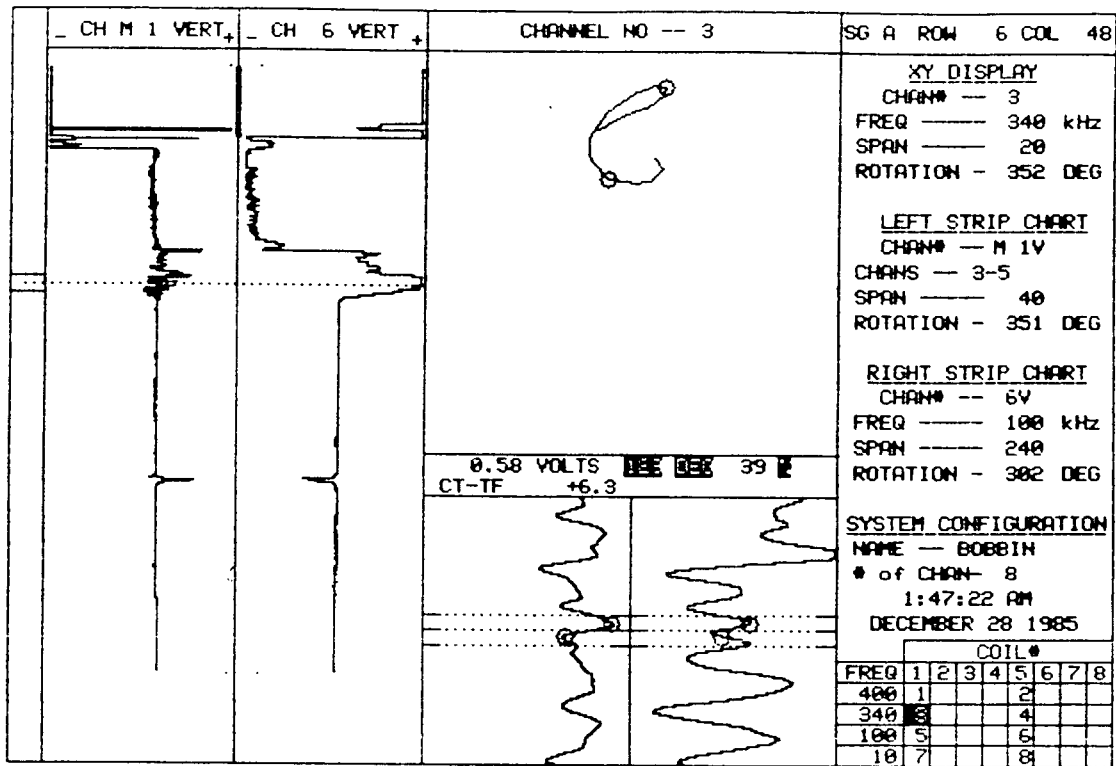


15 PLANT SONGS DISK C46 UNIT# 1 S/G A LEG OUTLE DATE 12/31/85

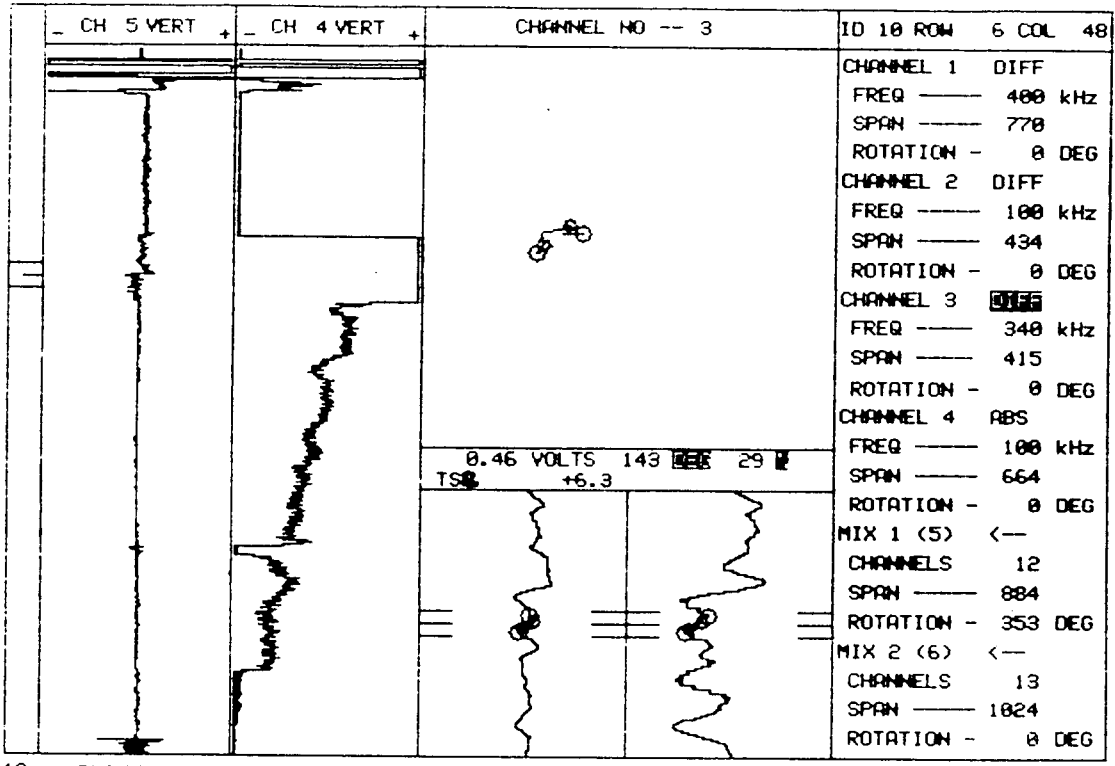


15 PLANT SONGS DISK C46 UNIT# 1 S/G A LEG OUTLE DATE 12/31/85



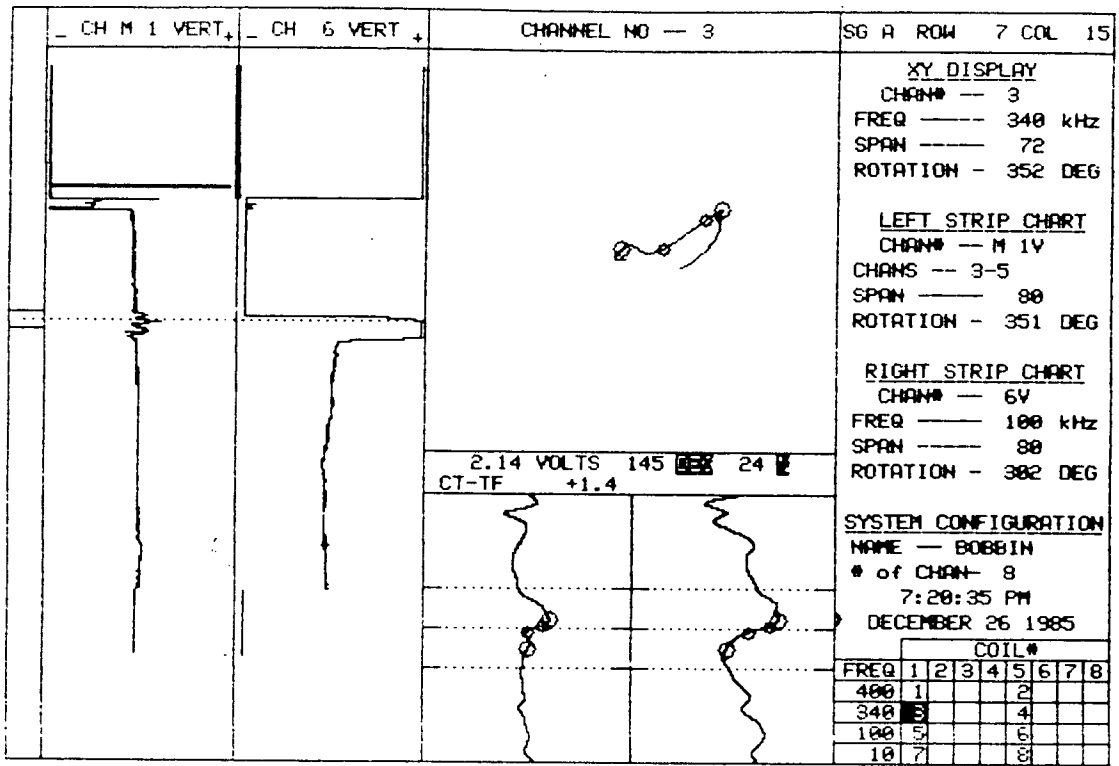


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C37    1    A    OUTLET    12/27/85

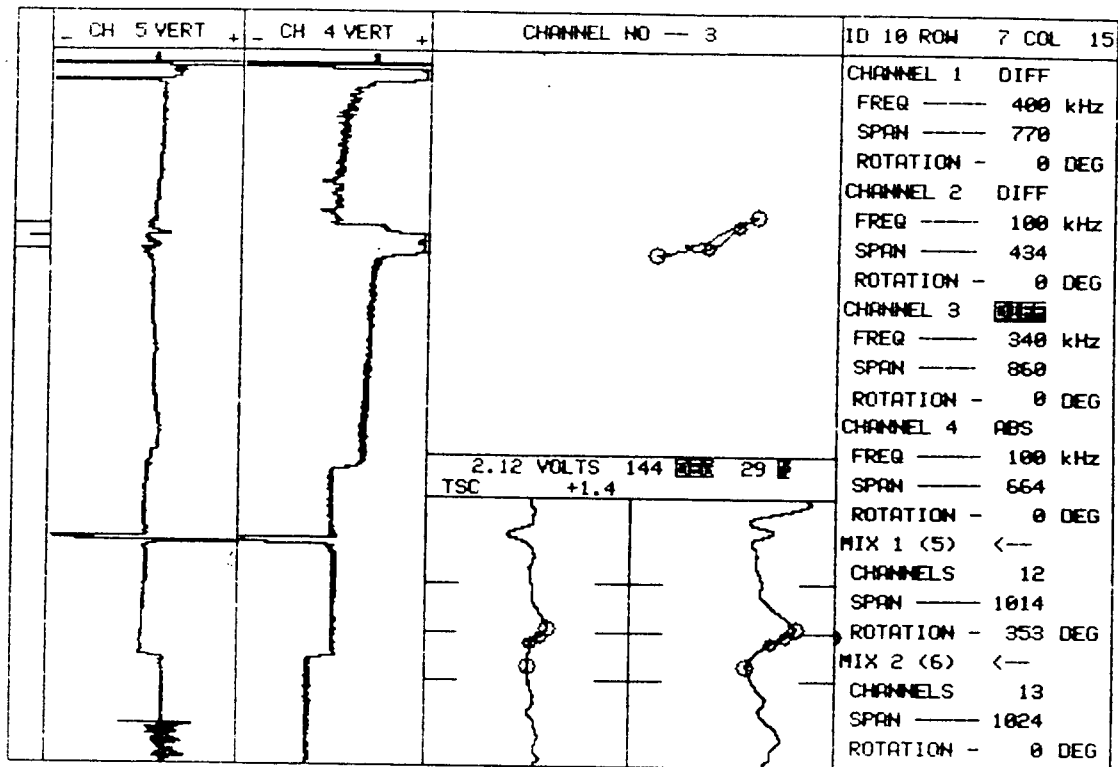


10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980

ZETEC Inc. - 1983  
Edition 12.0 Rev 1



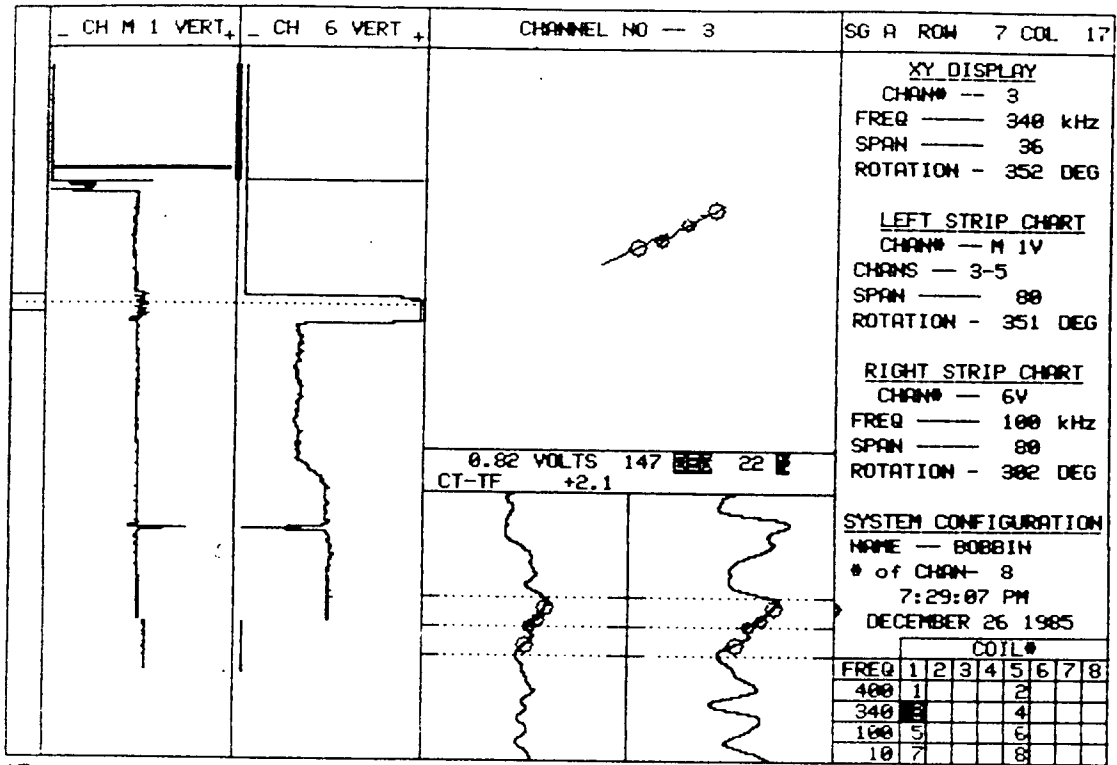
15 PLANT SONGS DISK C33 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



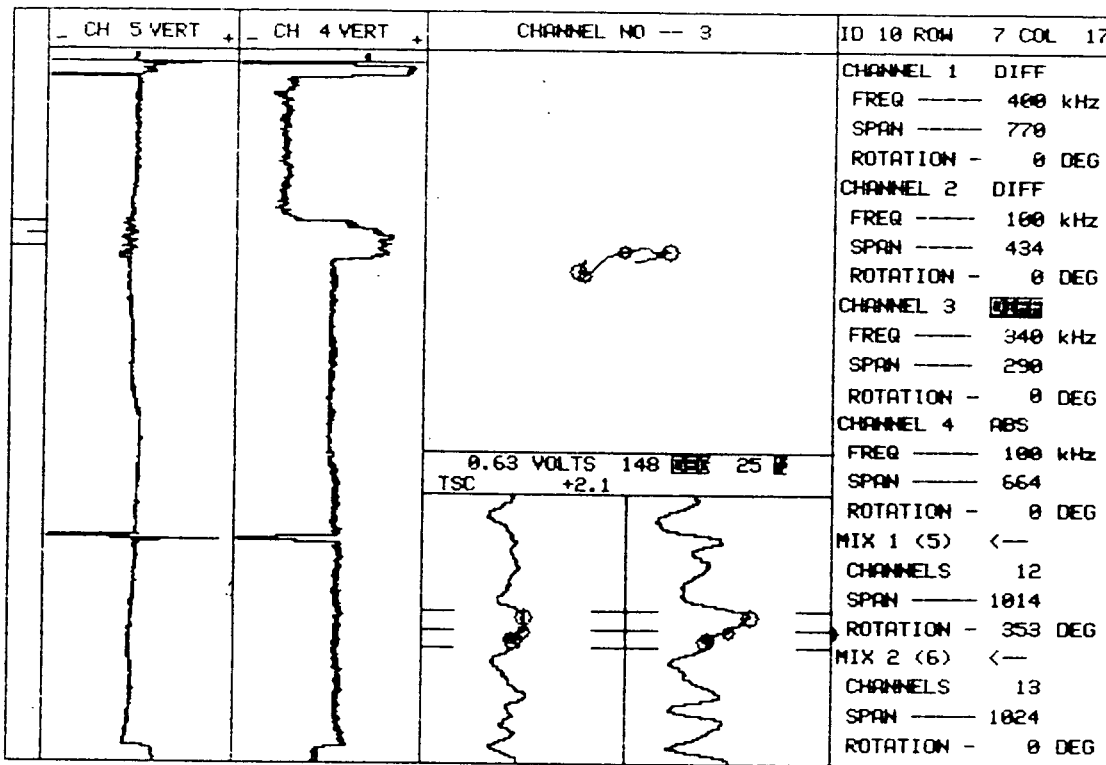
10 PLANT UNIT# S/G LEG DATE  
 SCE SONGS I A OUTLET 1980

ZETEC Inc. - 1983  
 Edition 12.0 Rev 1



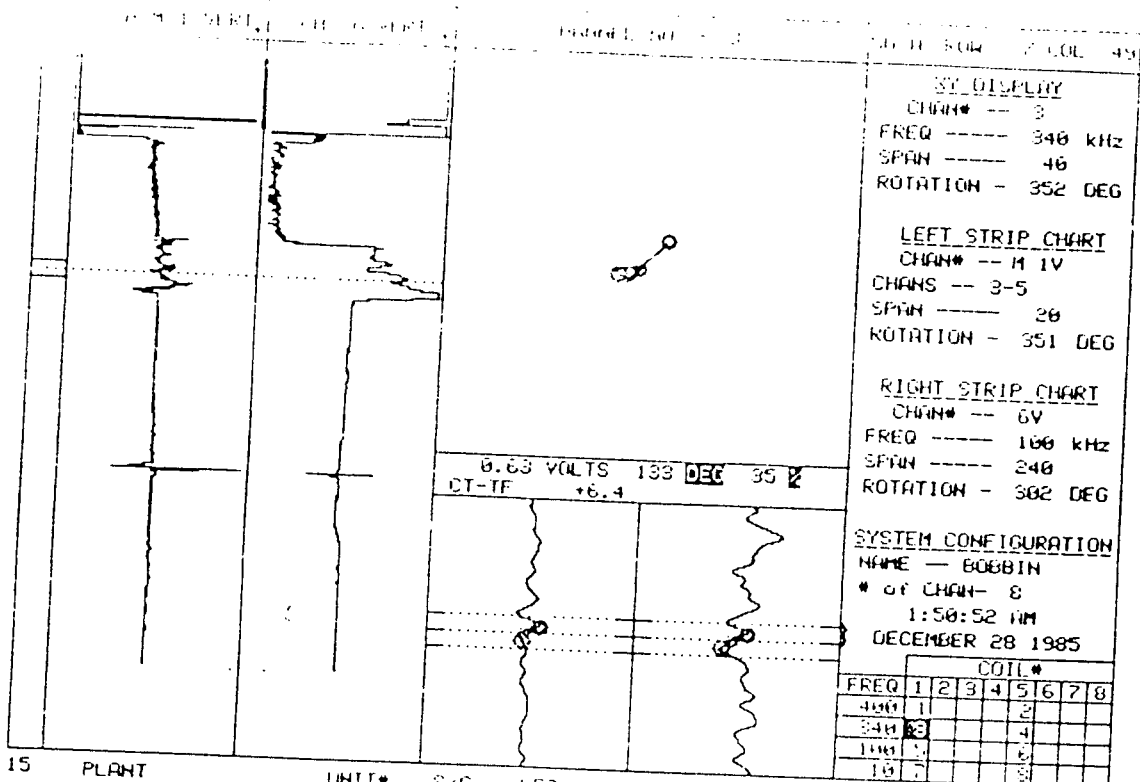


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C33    1    A    OUTLET    12/26/85



10    PLANT    UNIT#    S/G    LEG    DATE  
 SCE SONGS    I    A    OUTLET    1980

ZETEC Inc. - 1983  
 Edition 12.0 Rev 1



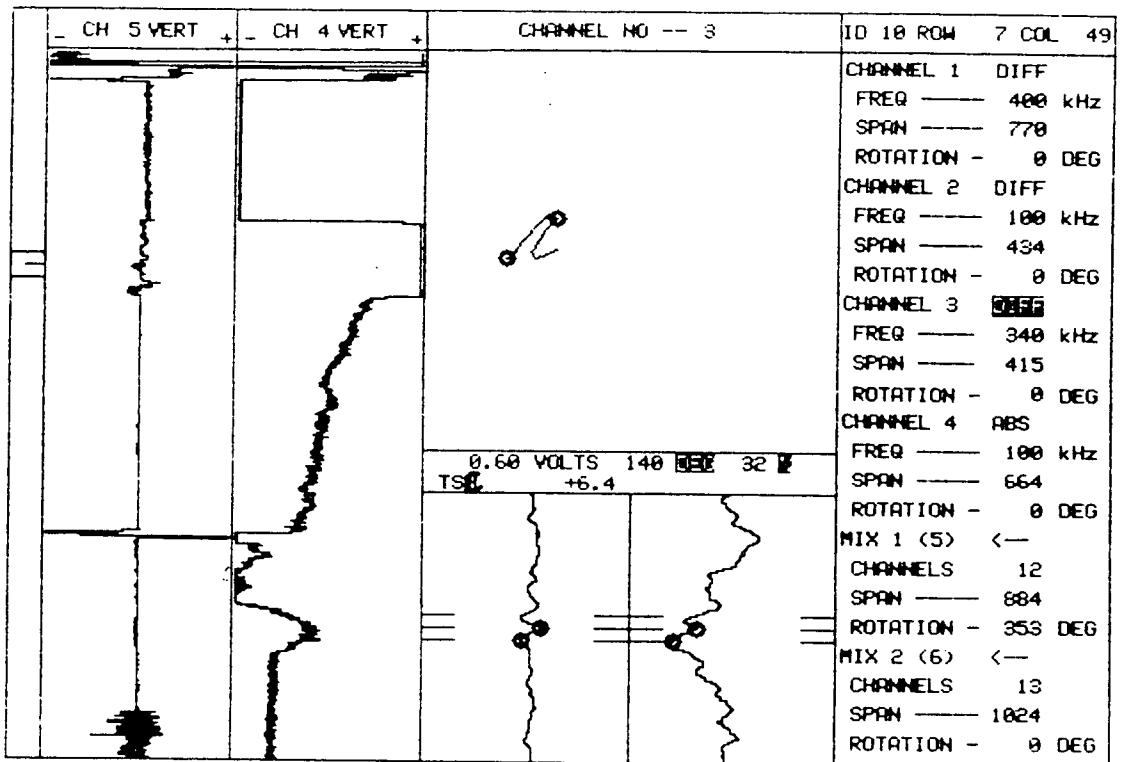
SY DISPLAY  
 CHAN# -- 3  
 FREQ ---- 340 kHz  
 SPAN ---- 40  
 ROTATION - 352 DEG

LEFT STRIP CHART  
 CHAN# -- M IV  
 CHANS -- 3-5  
 SPAN ---- 20  
 ROTATION - 351 DEG

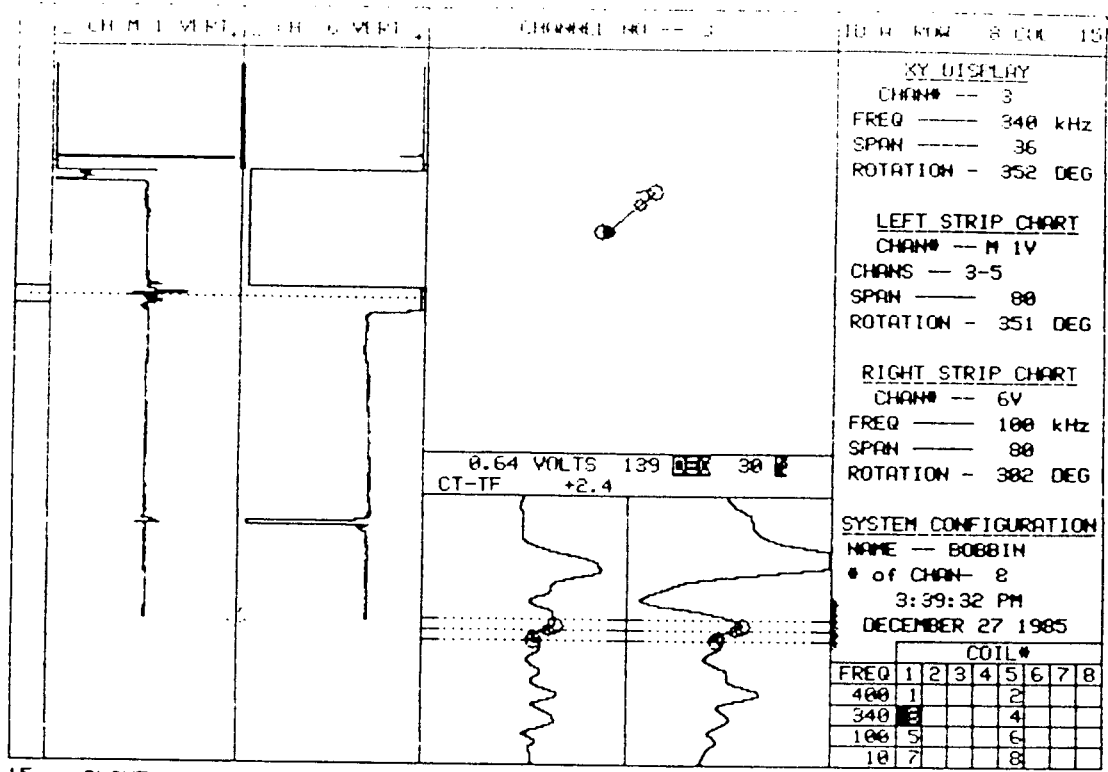
RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ ---- 100 kHz  
 SPAN ---- 240  
 ROTATION - 302 DEG

SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 1:50:52 AM  
 DECEMBER 28 1985

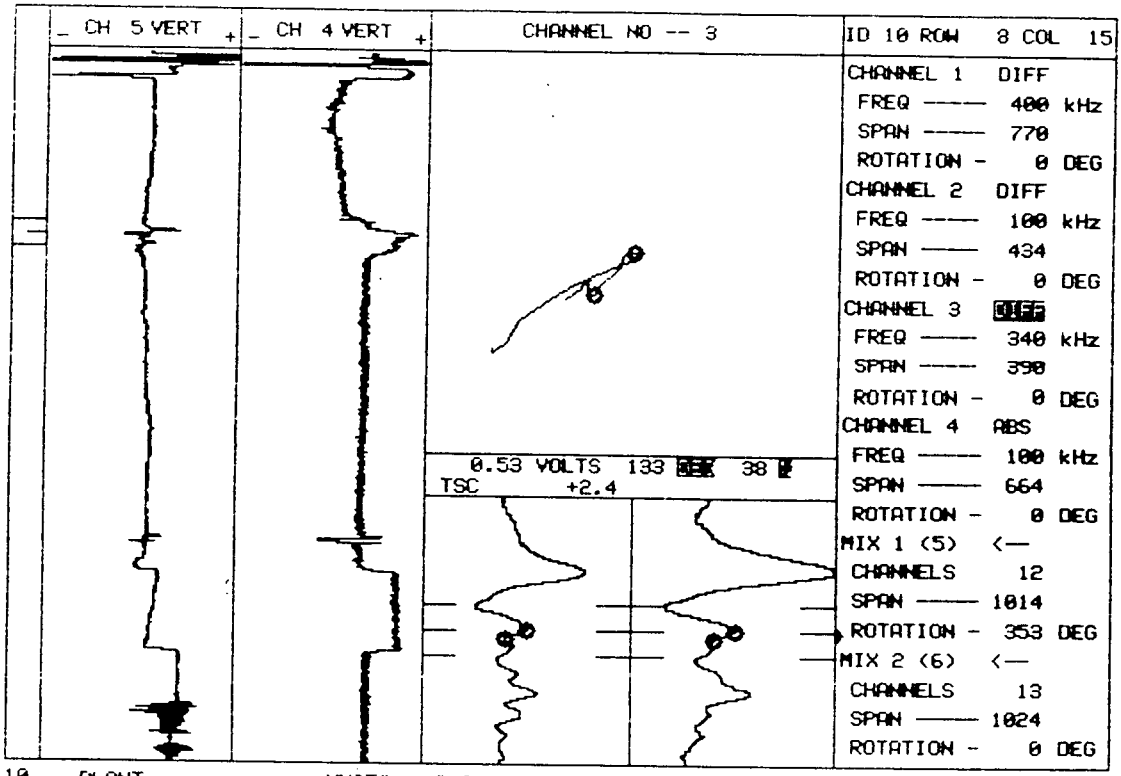
15 PLANT SONGS DISK C37 UNIT# 1 S/G H LEG A OUTLET DATE 12/27/85



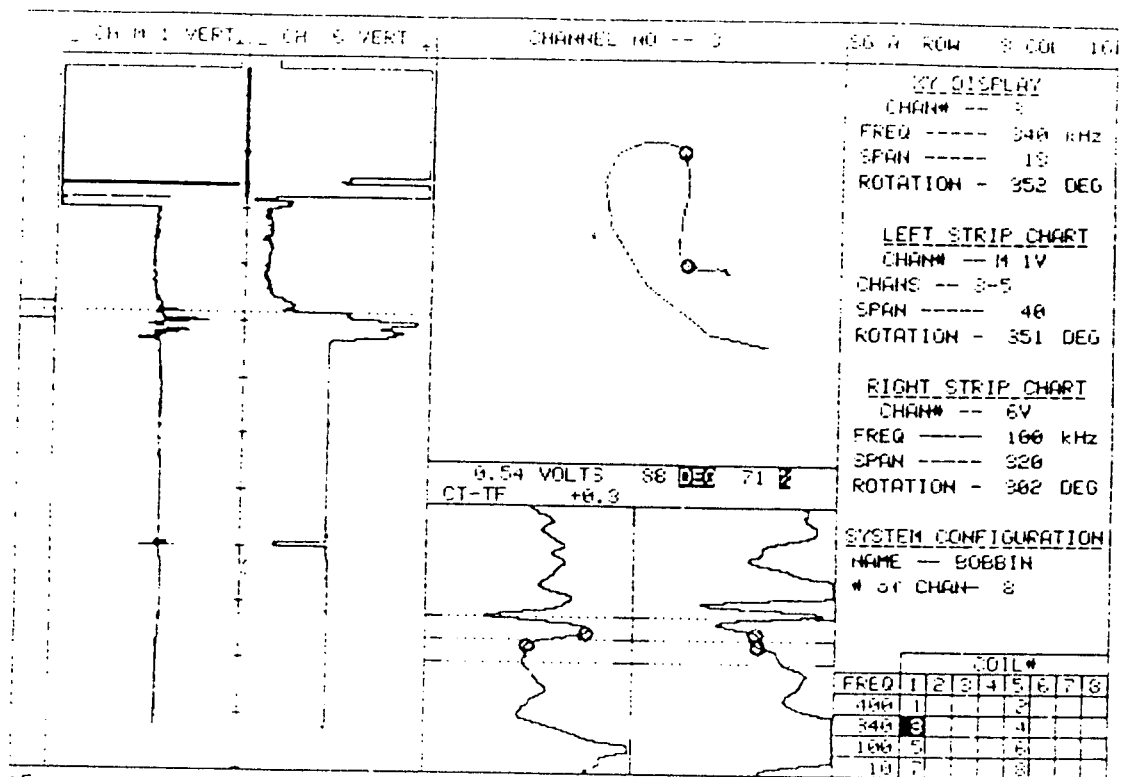
10 PLANT SCE SONGS UNIT# I S/G A LEG A OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



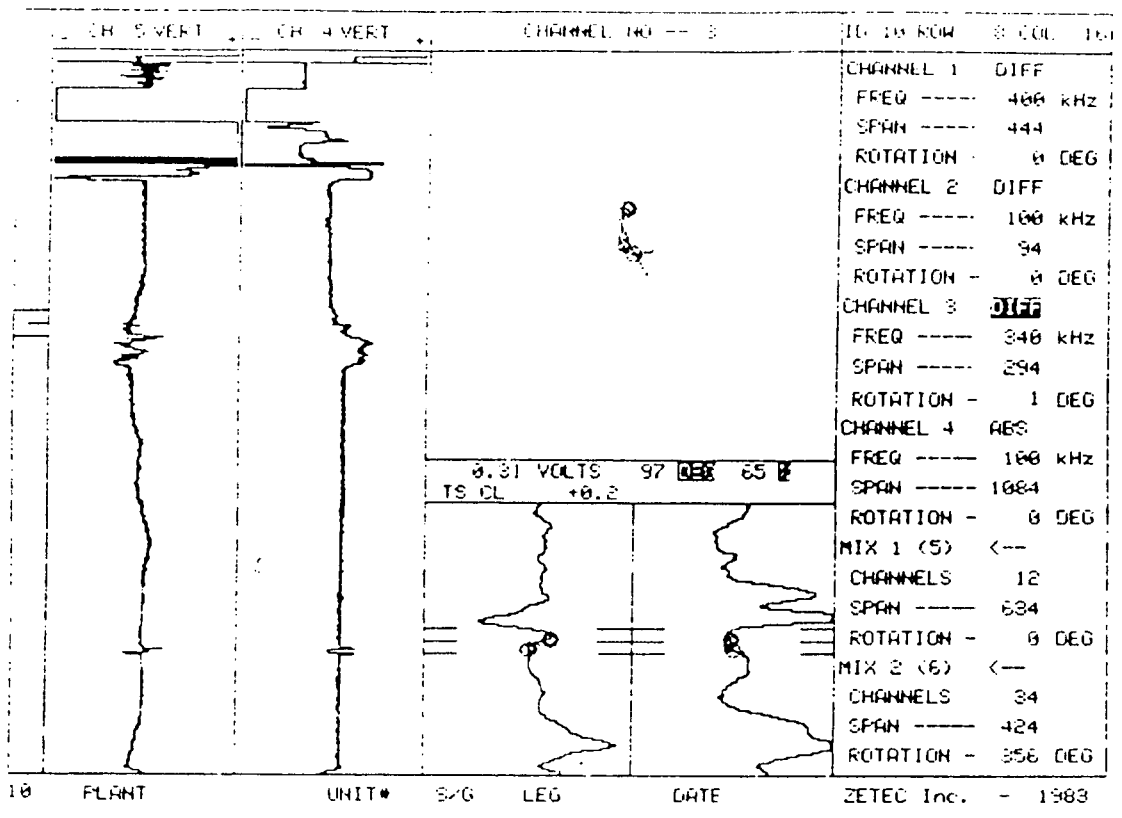
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



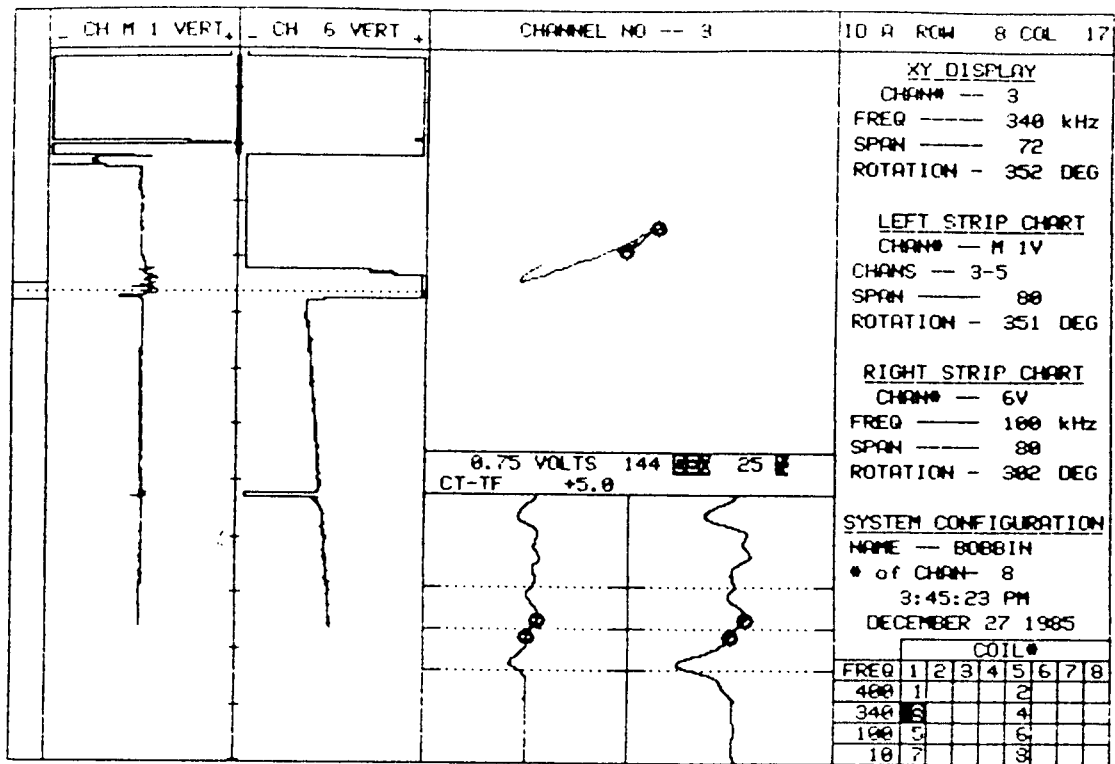
10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



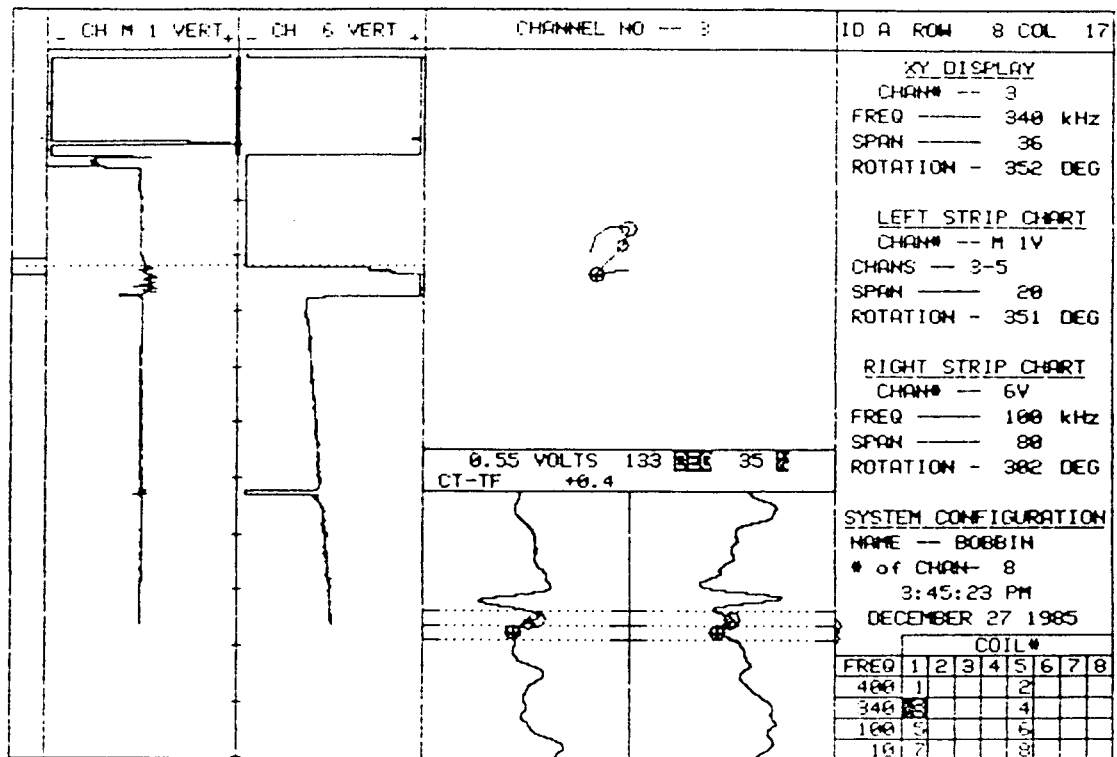
15 PLANT SONGS DISK C33 UNIT# 1 SFG R LEG A DATE 12/26/85



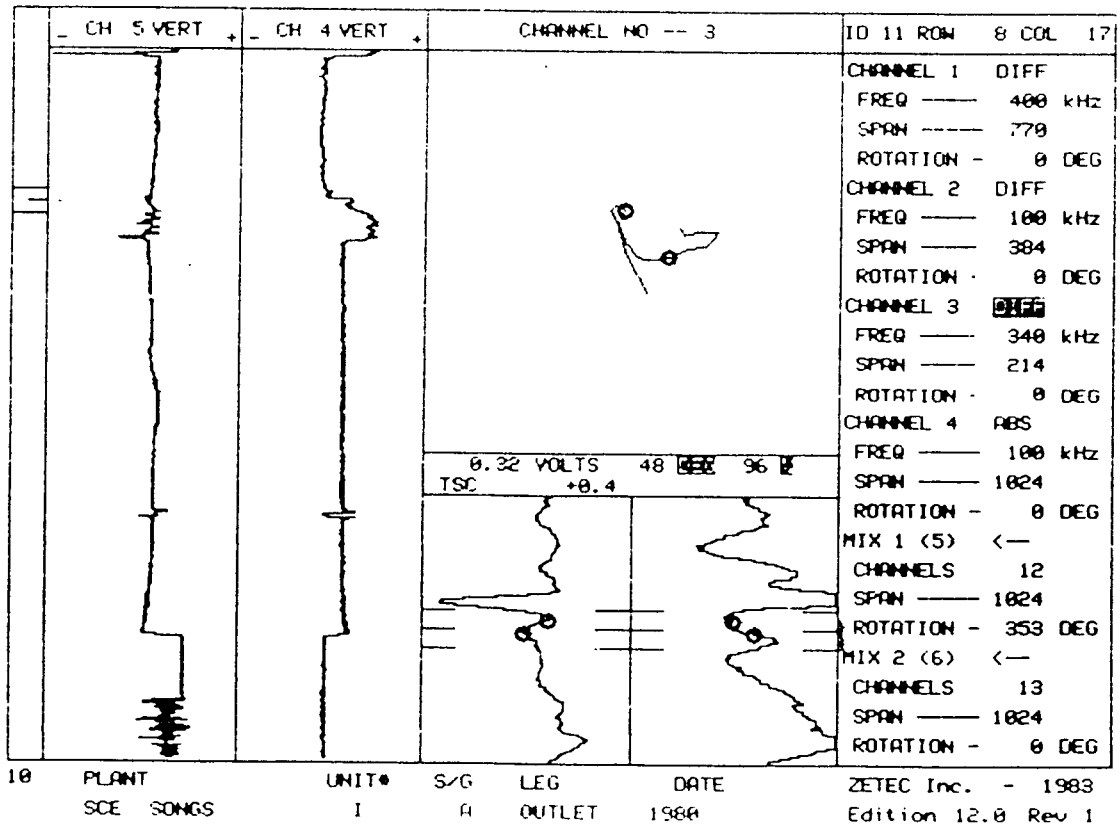
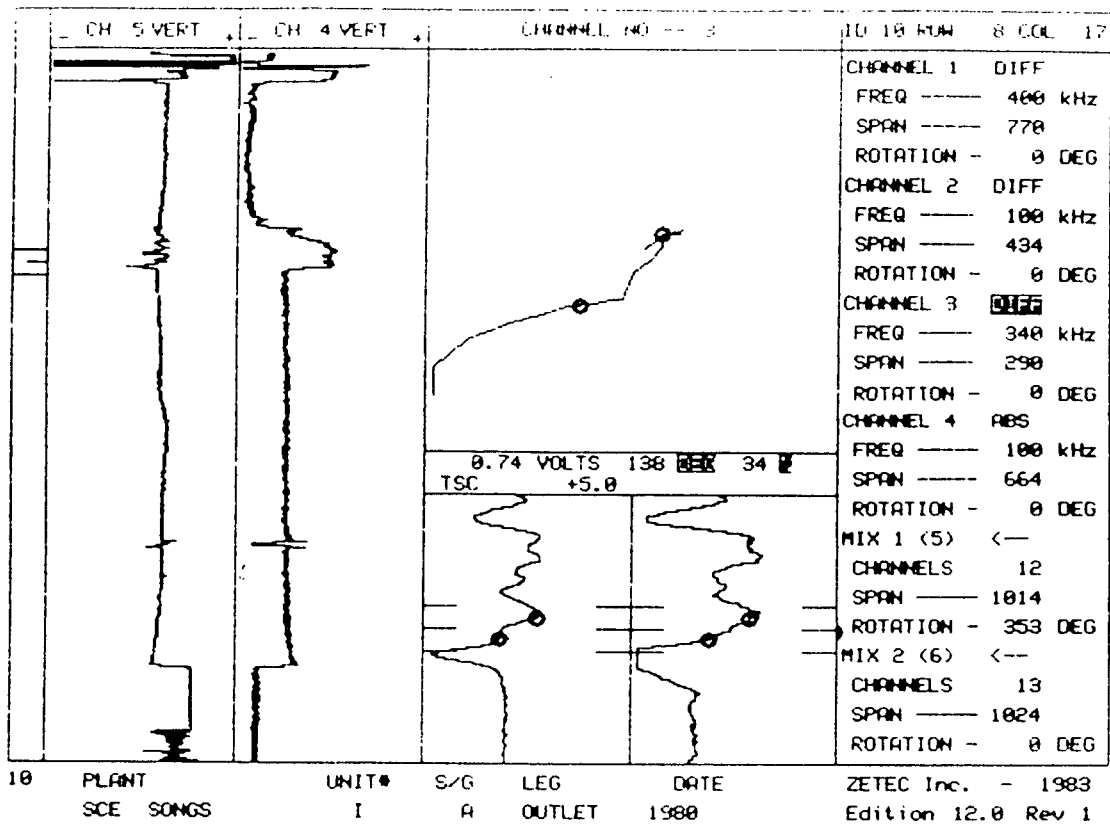


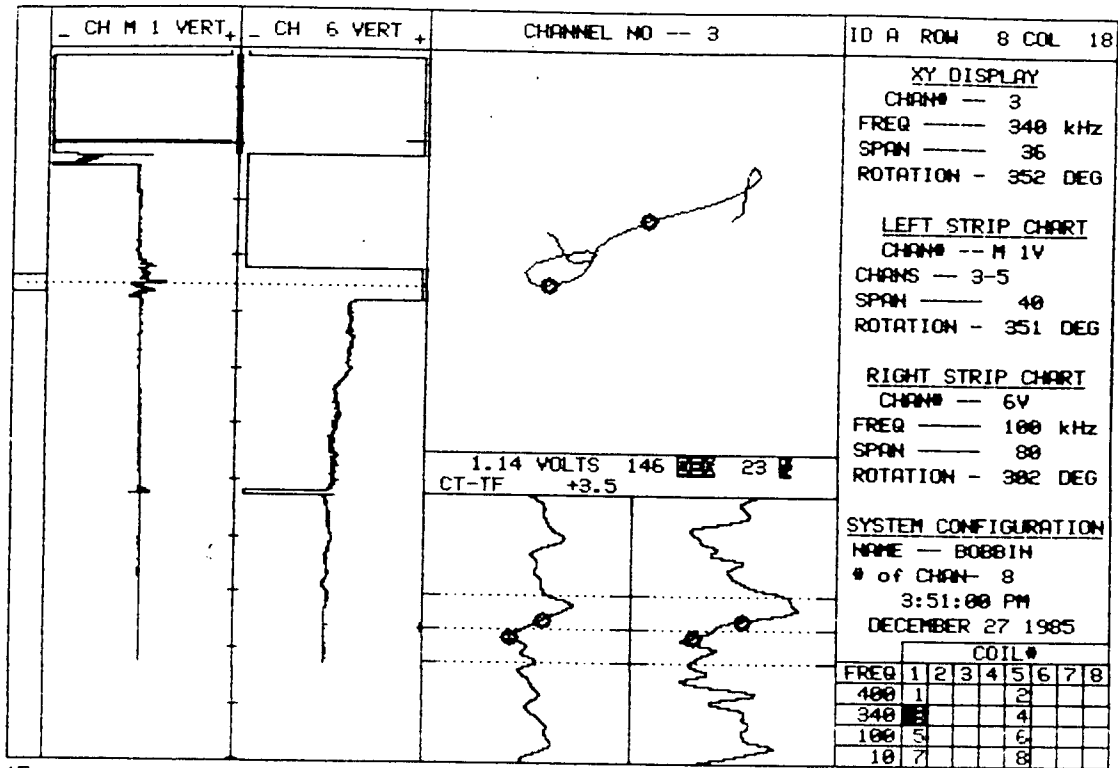


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

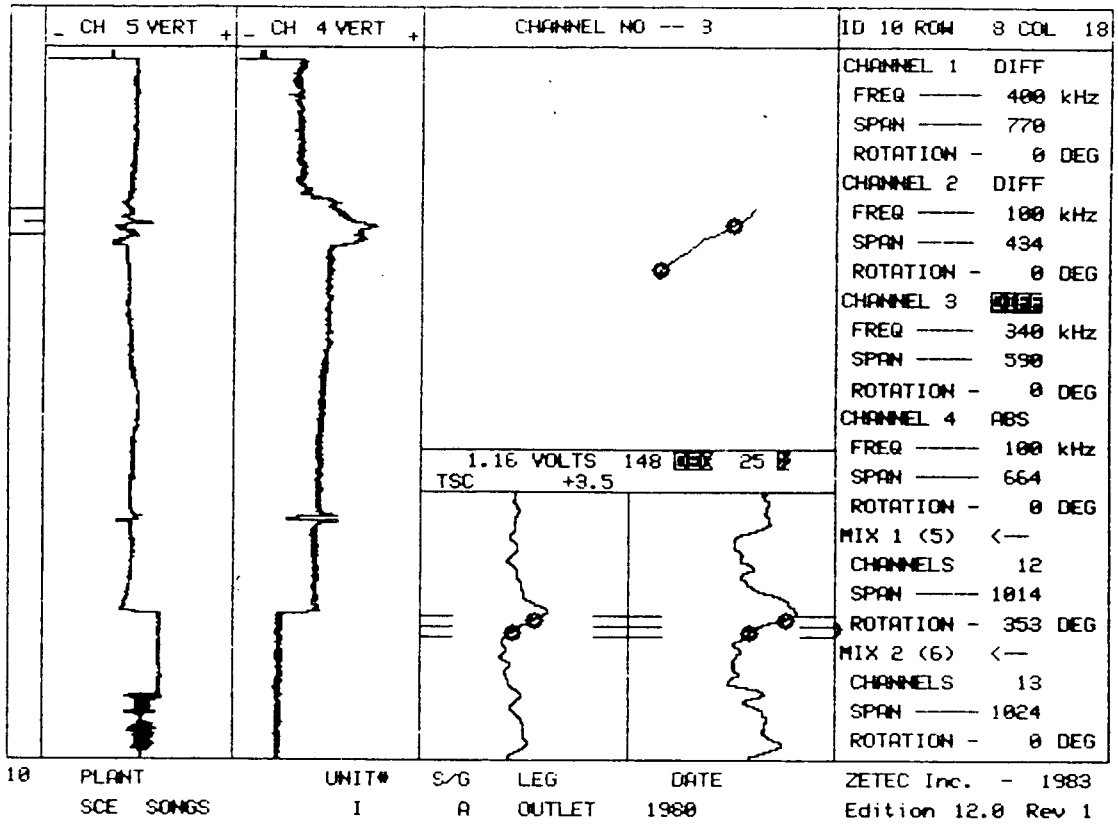


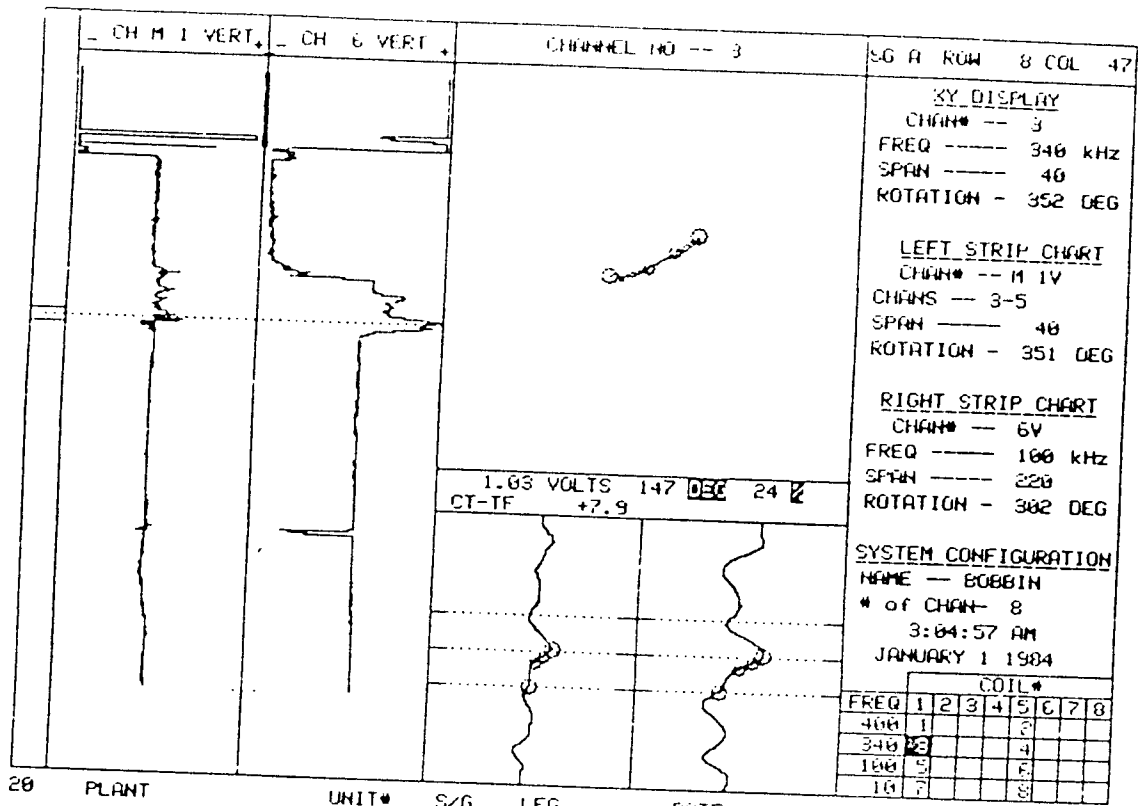
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



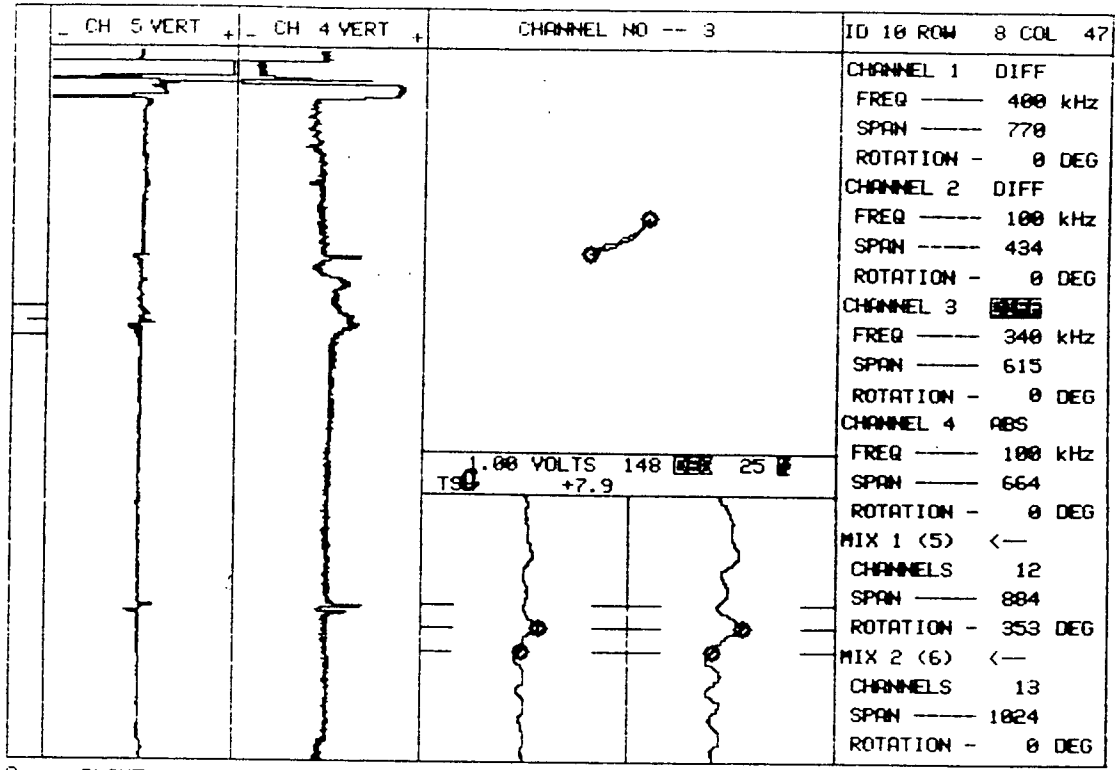


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

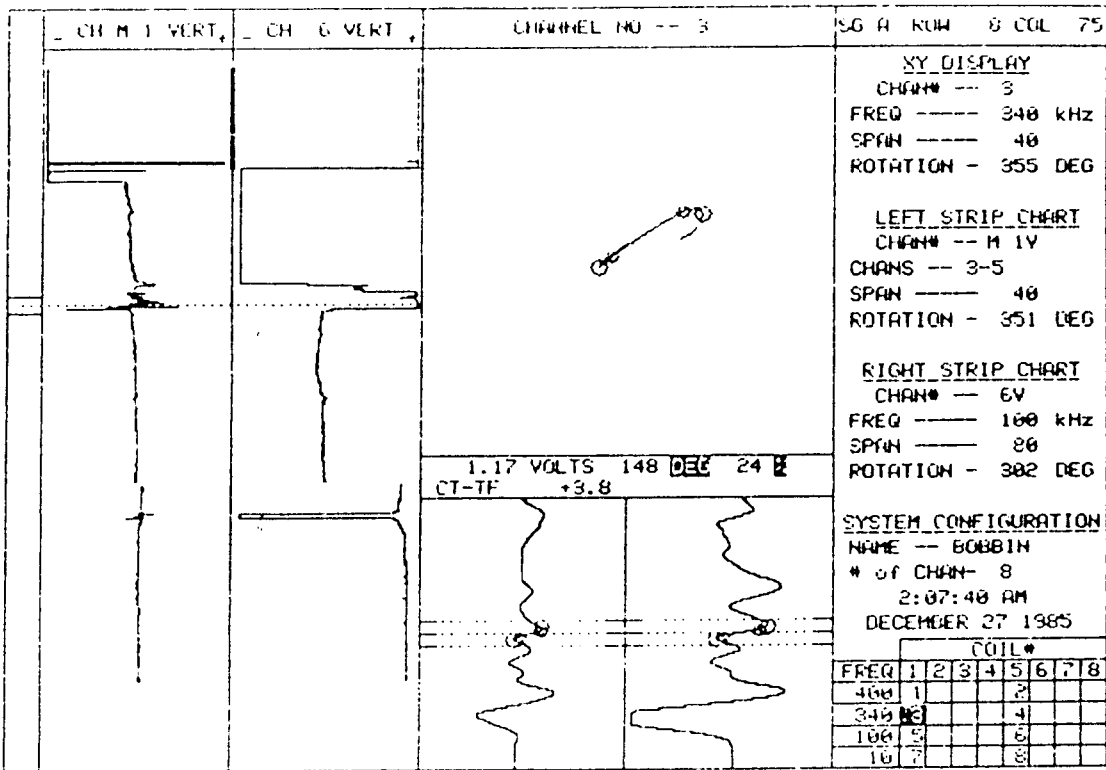




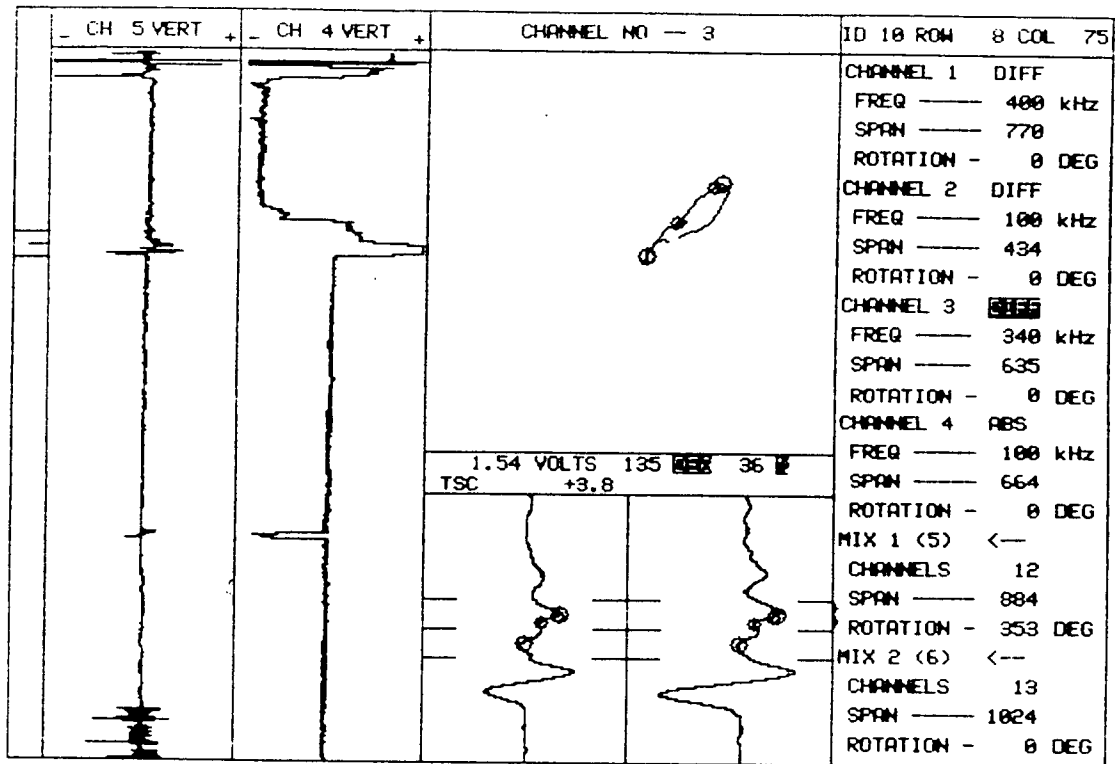
20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C40    1    A    OUTLET    12/29/85



9 PLANT SCE SONGS    UNIT# I    S/G A    LEG OUTLET    DATE 1980    ZETEC Inc. - 1983 Edition 12.0 Rev 1

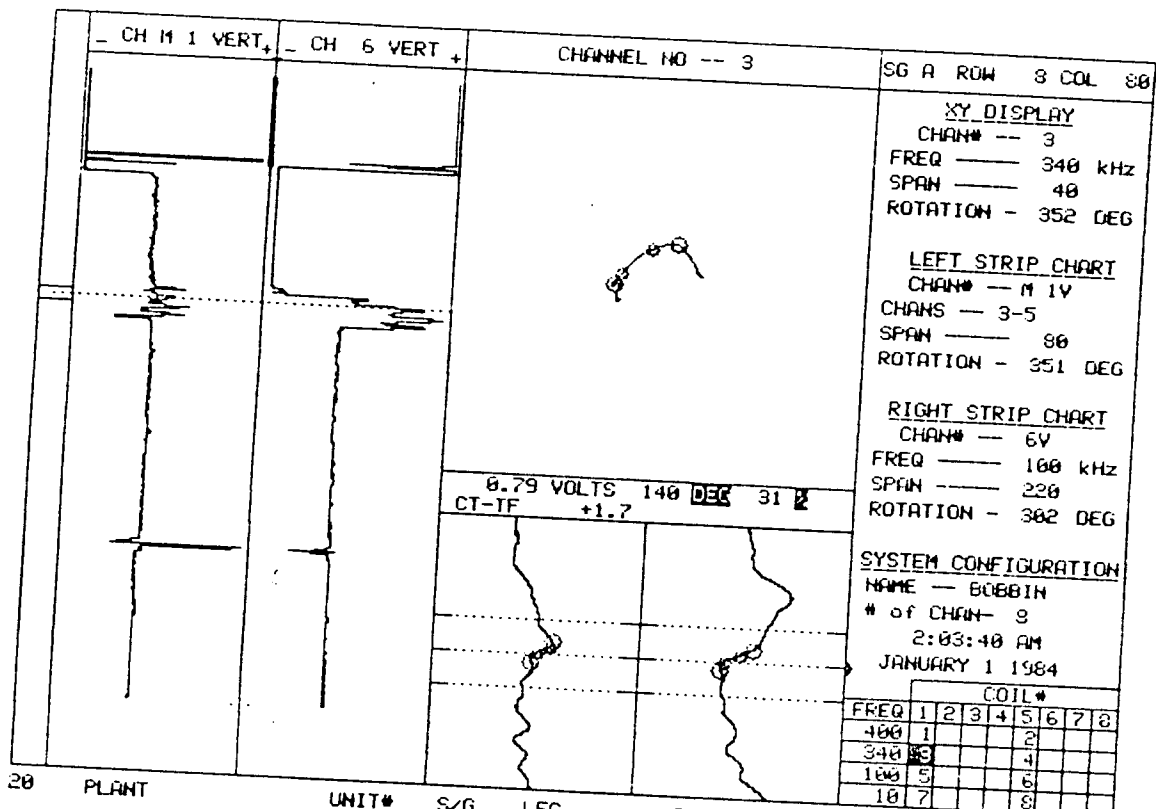


15    PLANT                    UNIT#    S/G    LEG            DATE  
      SONGS DISK C34        1        A        OUTLET        12/26/85

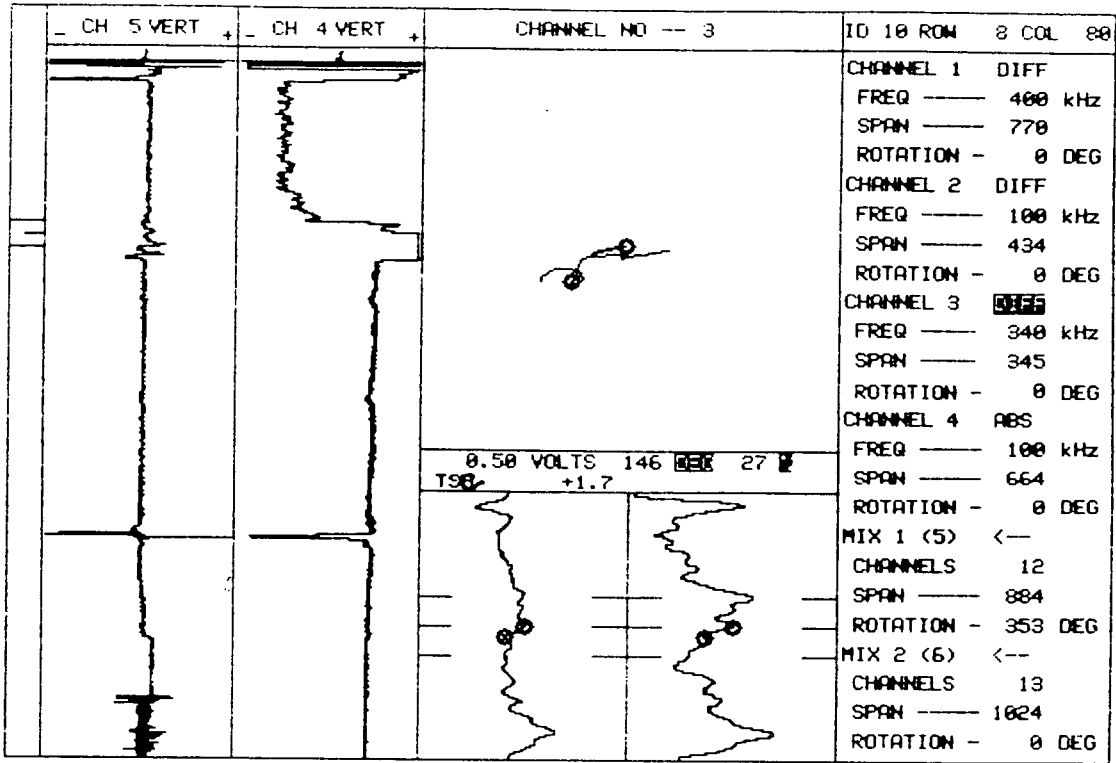


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

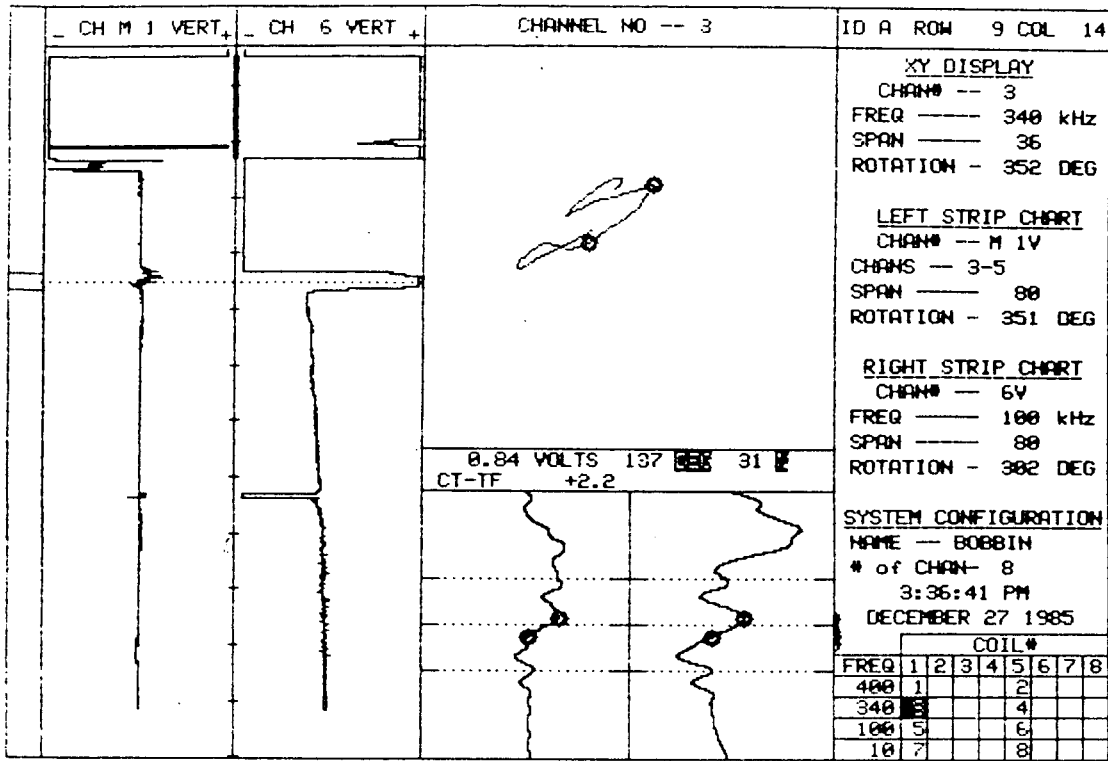




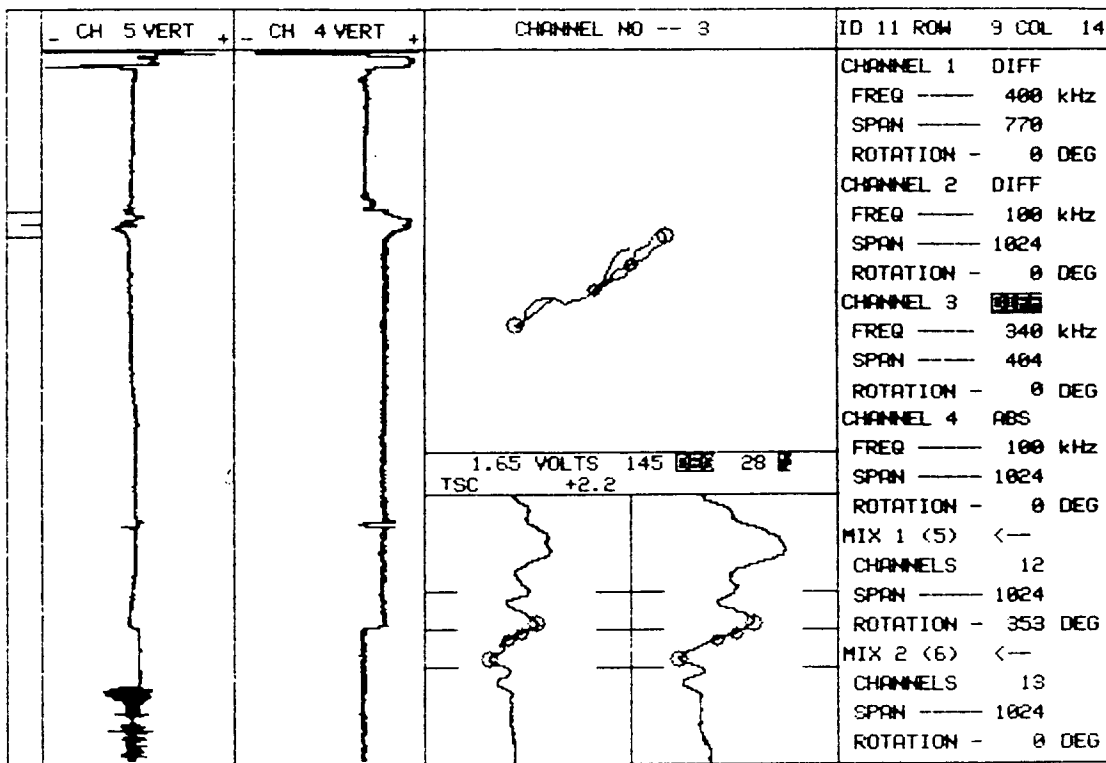
20 PLANT SONGS DISK C40    UNIT# 1    S/G A    LEG OUTLET    DATE 12/29/85



10 PLANT SCE SONGS    UNIT# I    S/G A    LEG OUTLET    DATE 1980    ZETEC Inc. - 1983    Edition 12.0 Rev 1



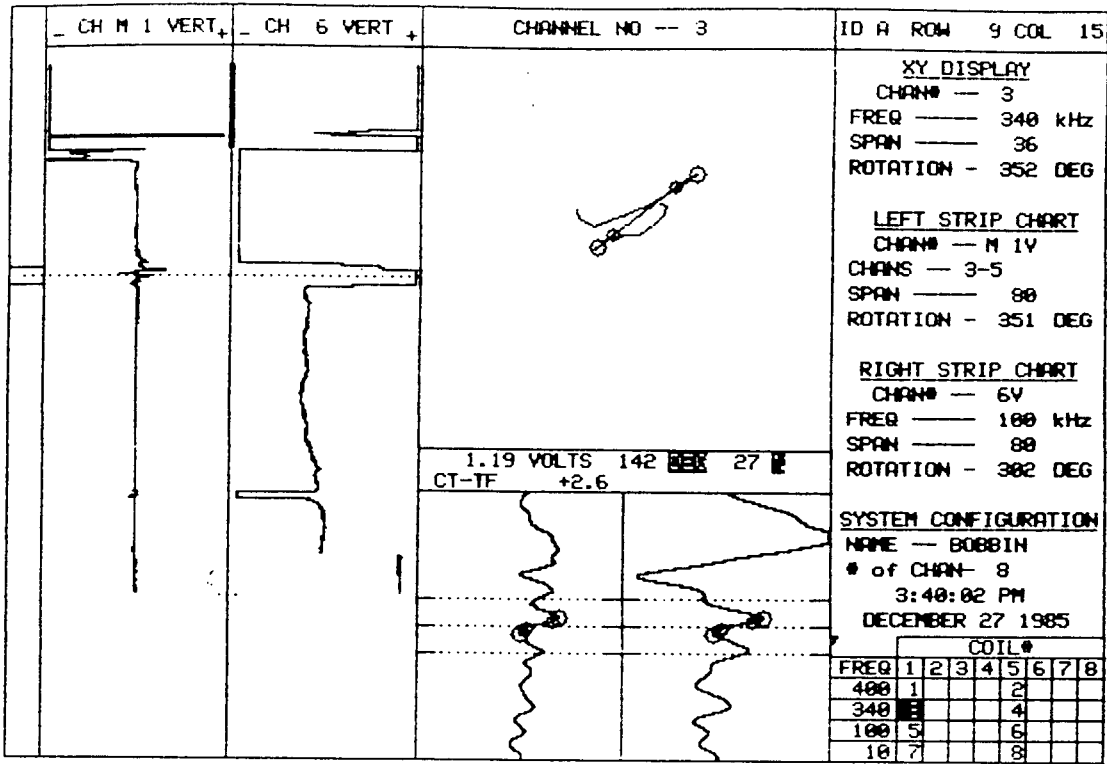
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



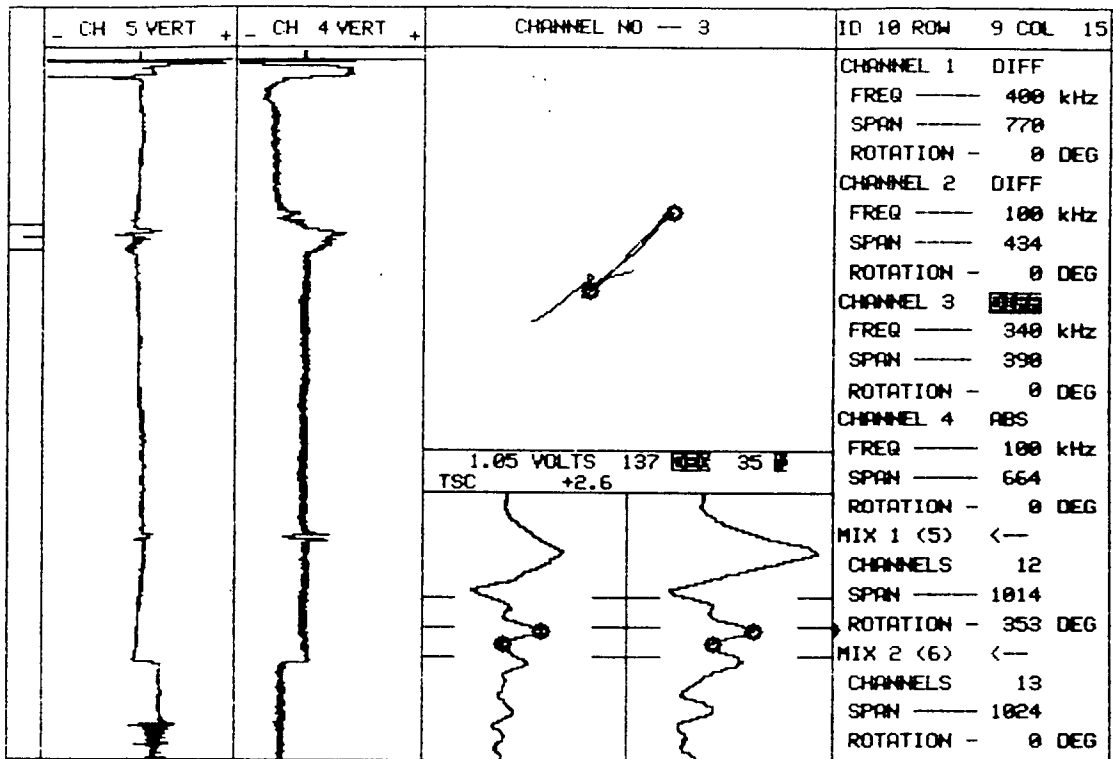
1.65 VOLTS 145 ~~DEG~~ 28 ~~DEG~~  
TSC +2.2

10 S/G A outlet 1980

ZETEC Inc. - 1983

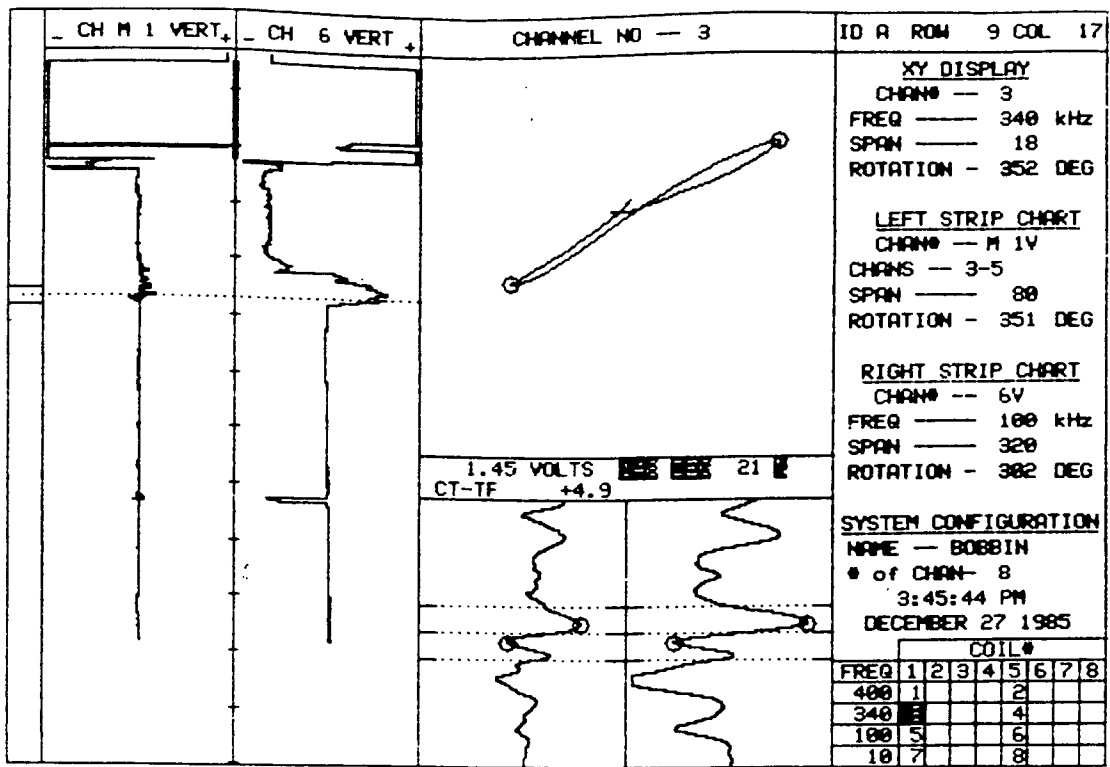


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

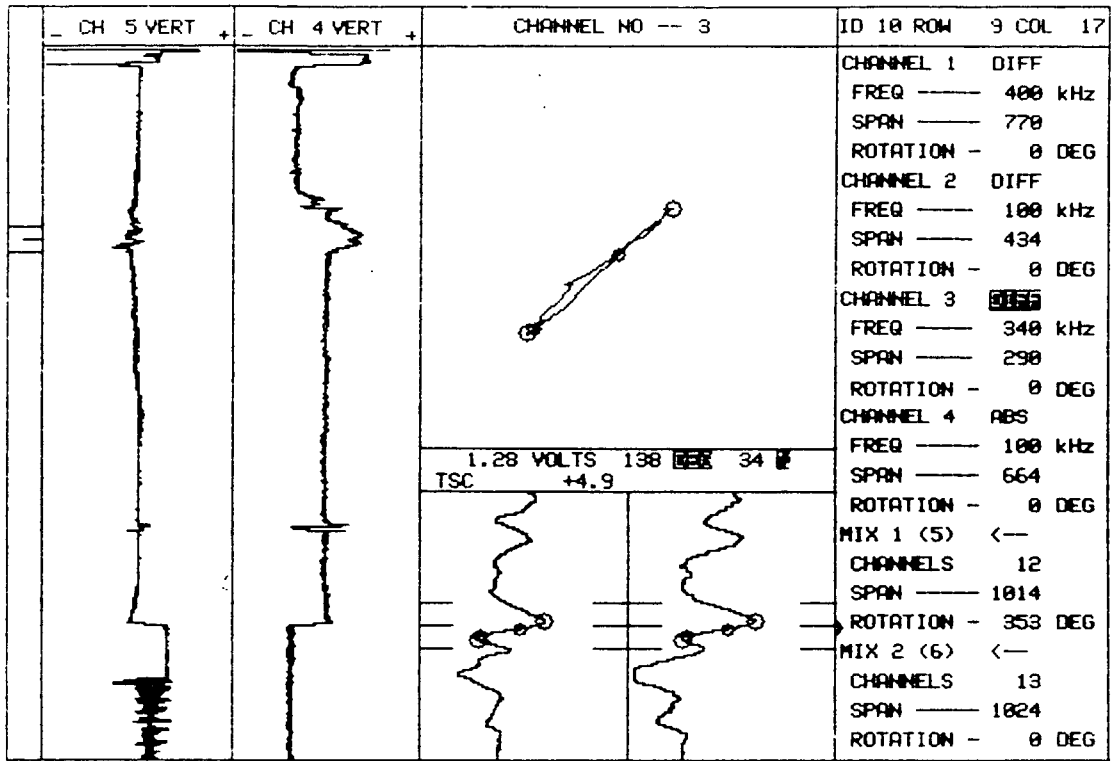


1.05 VOLTS 137 ~~100~~ 35 ~~10~~  
TSC +2.6

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



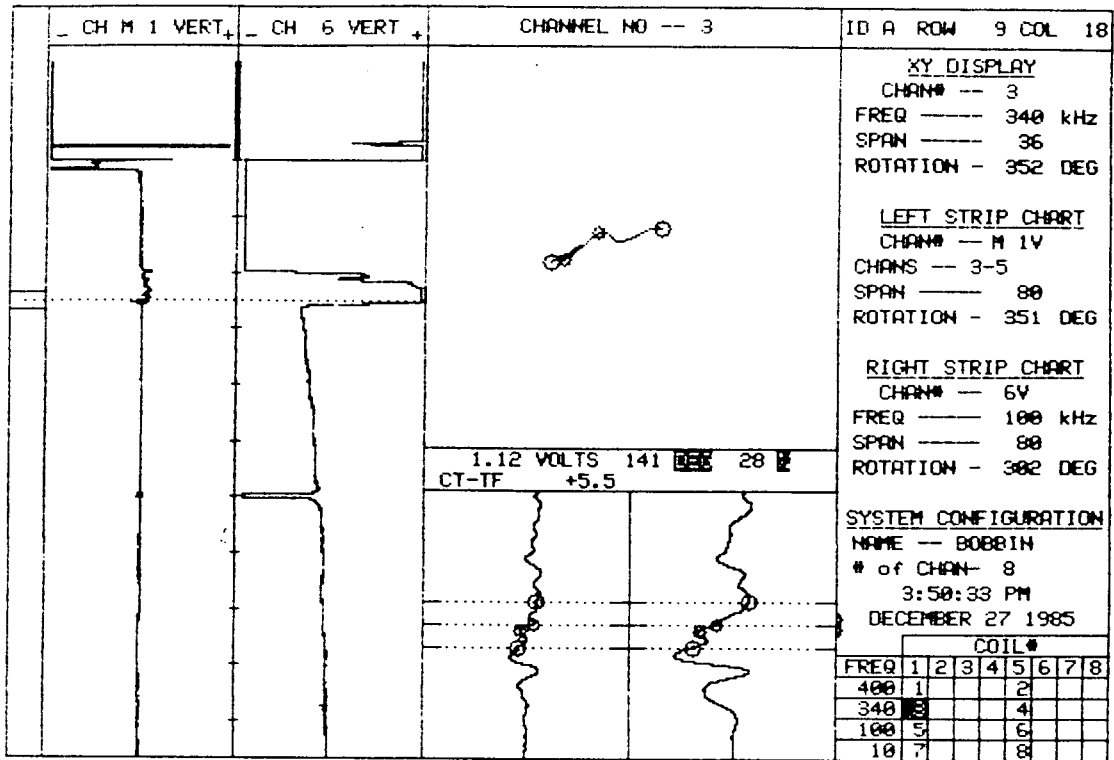
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



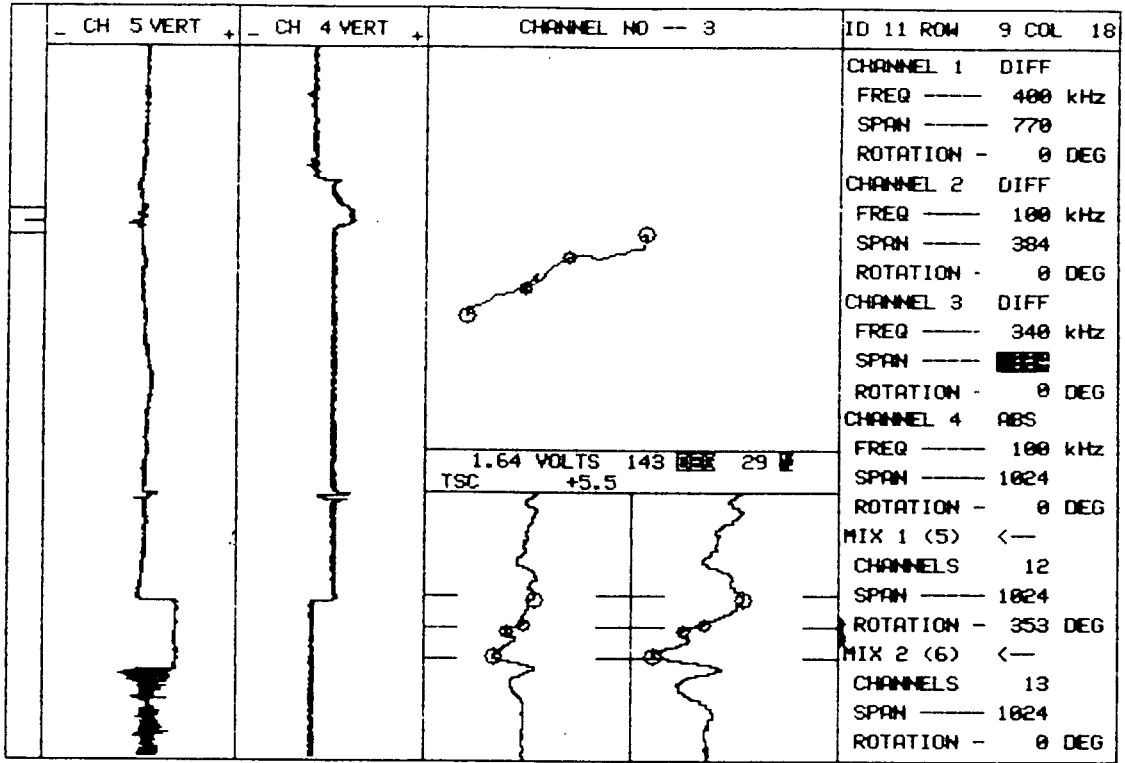
1.28 VOLTS 138 **DEG** 34 **DEG**  
TSC +4.9

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



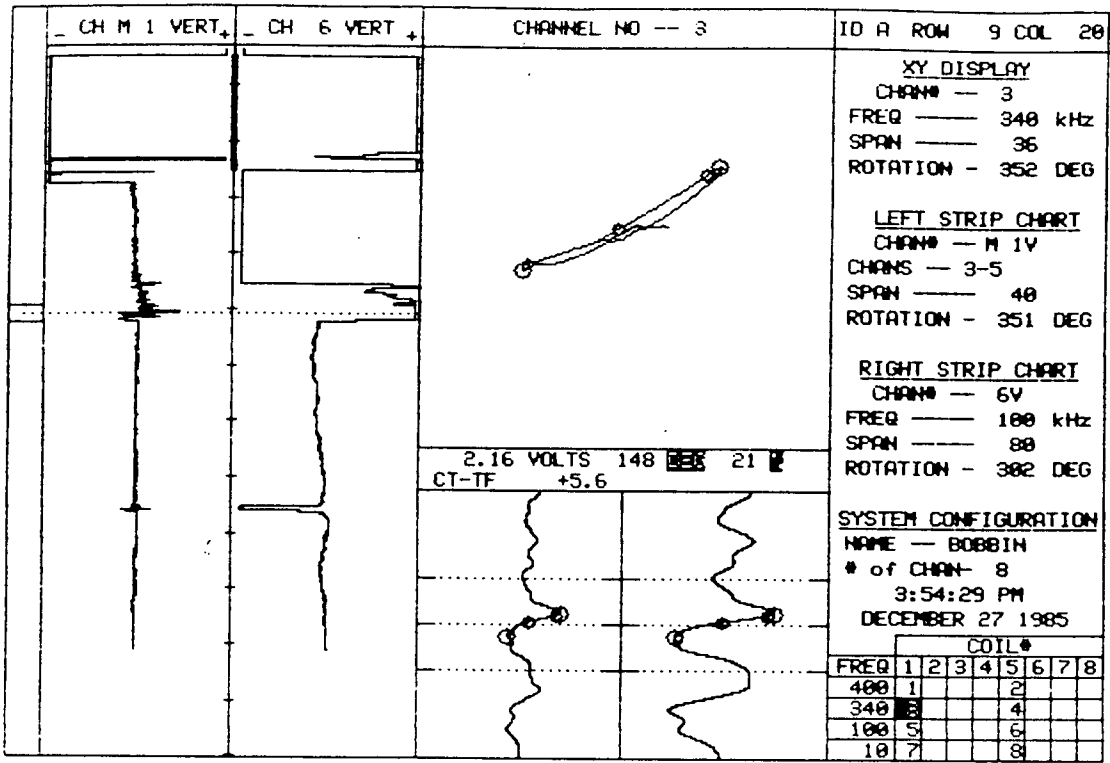


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

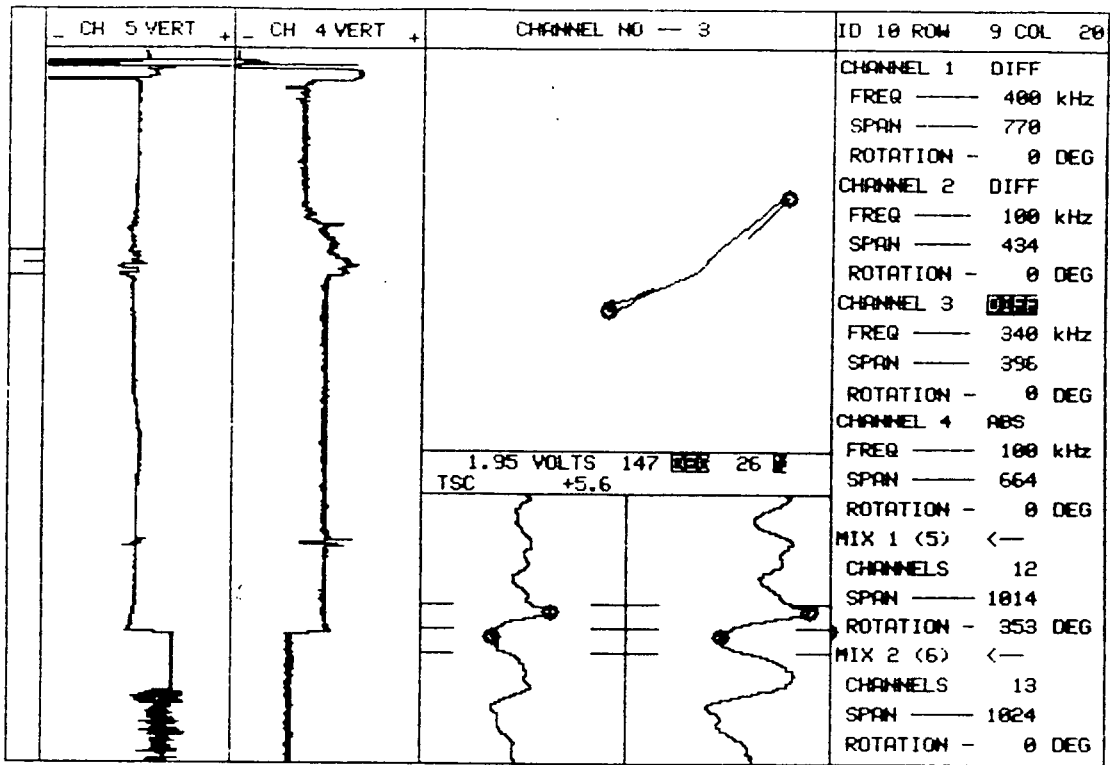


1.64 VOLTS 143 ~~000~~ 29 ~~00~~  
TSC +5.5

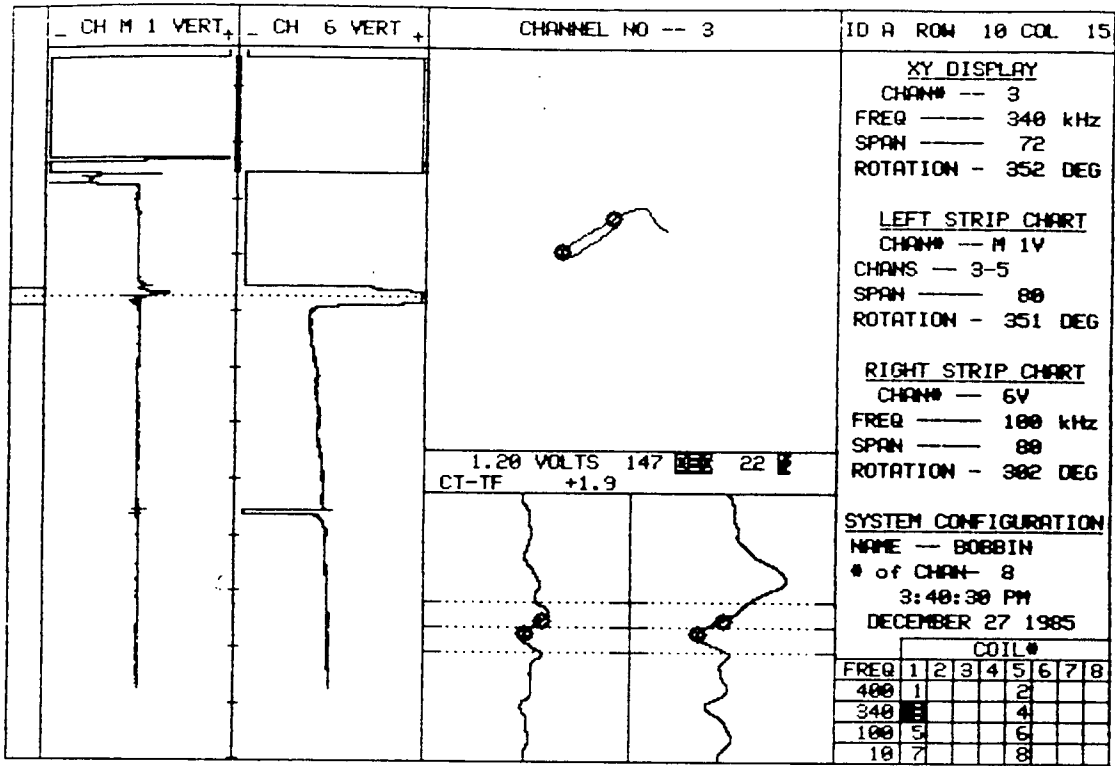
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



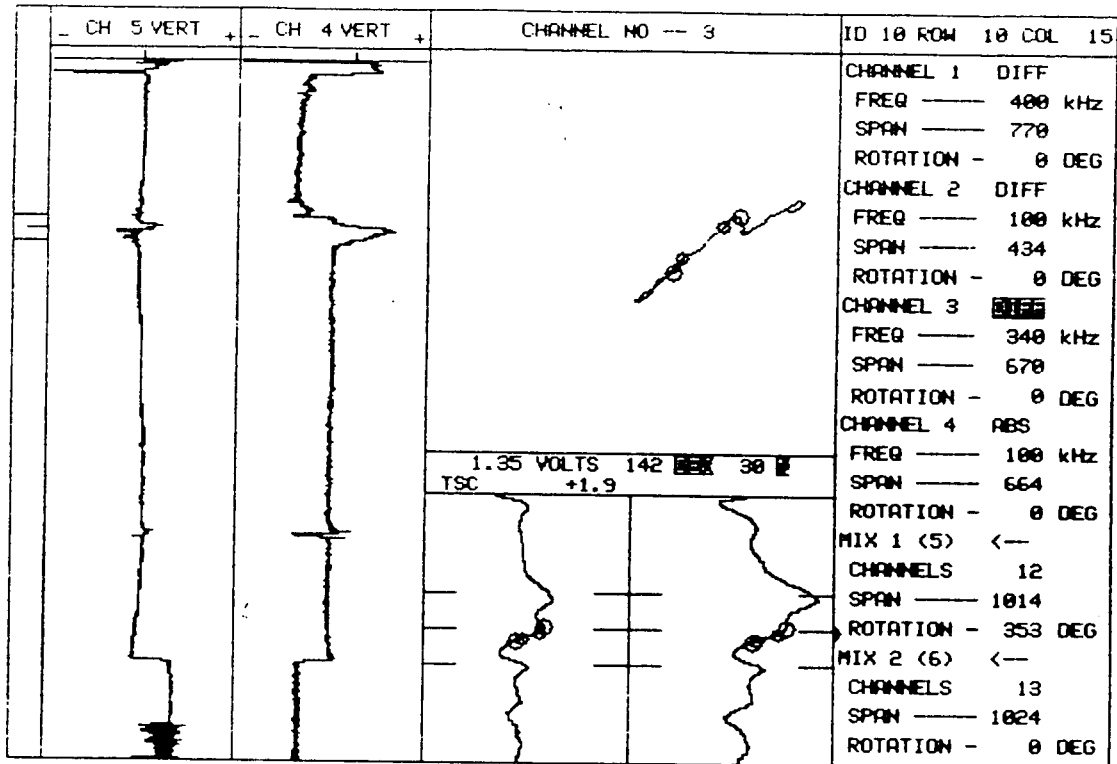
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

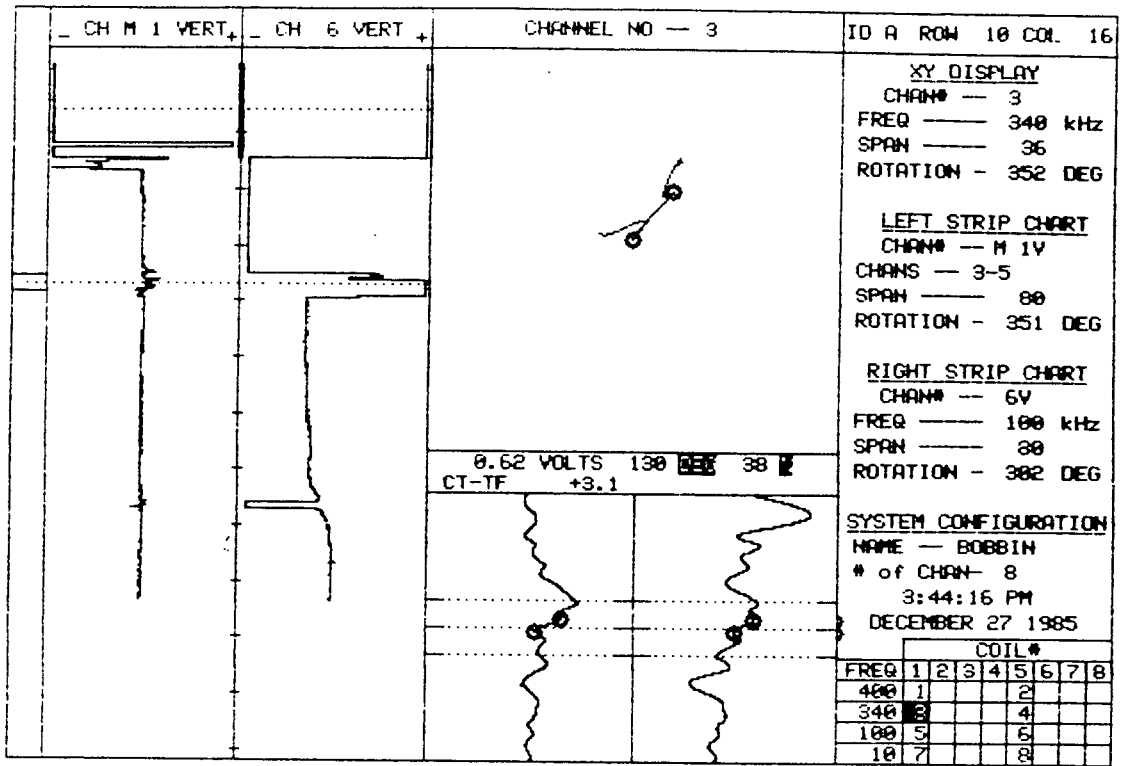


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85

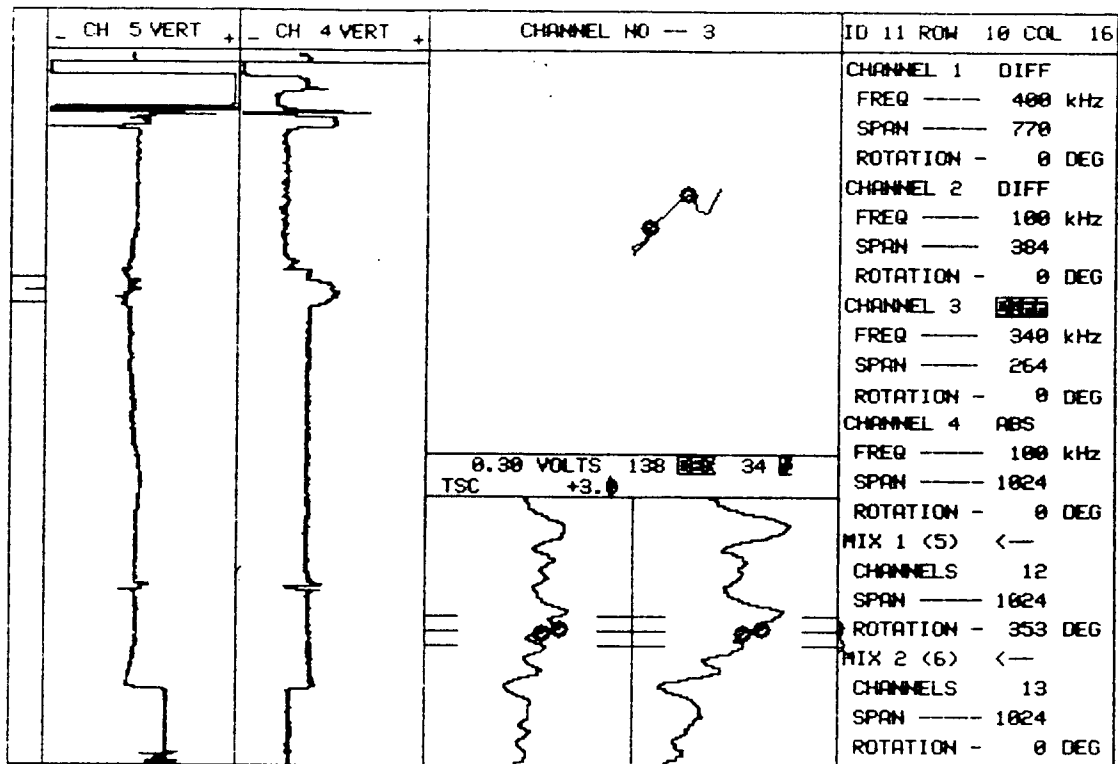


1.35 VOLTS 142 ~~EX~~ 30 ~~EX~~  
TSC +1.9

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

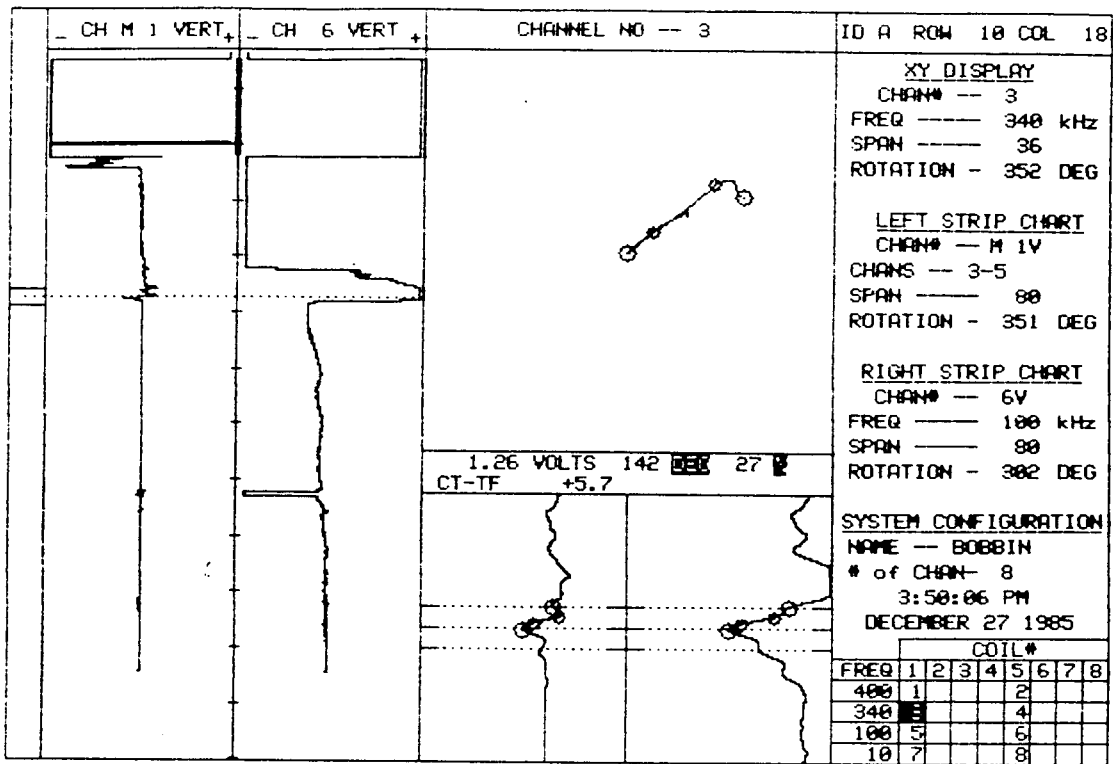


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG A DATE 12/27/85

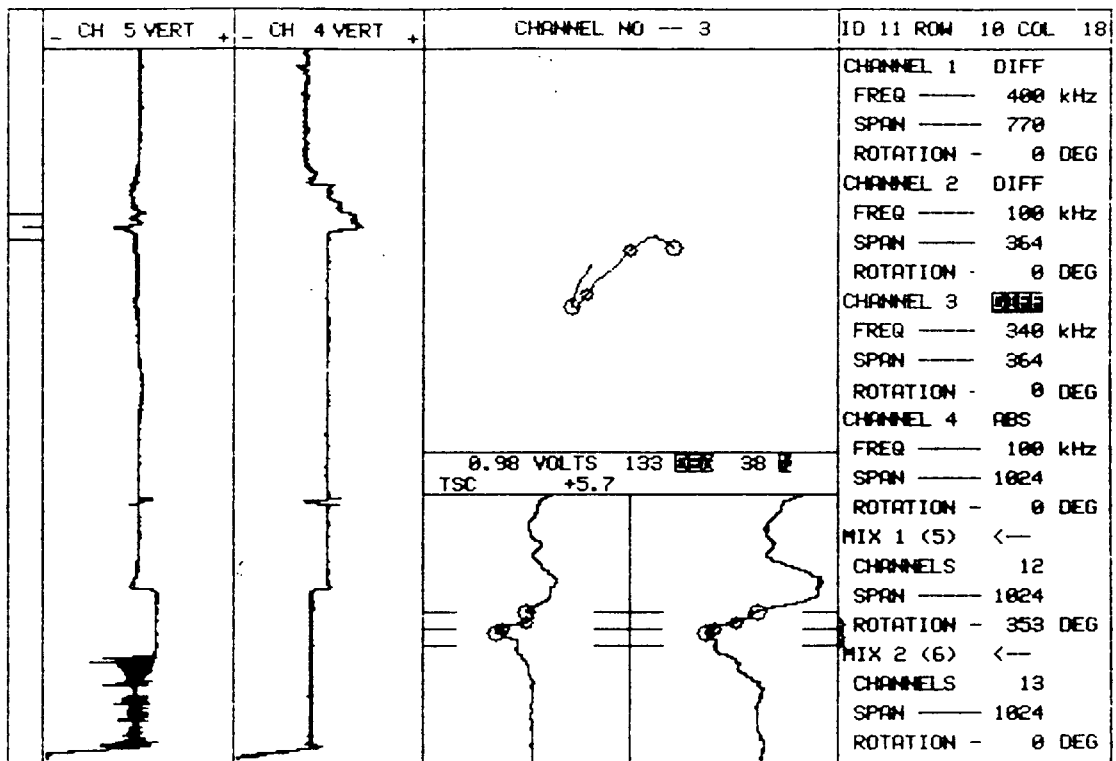


10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

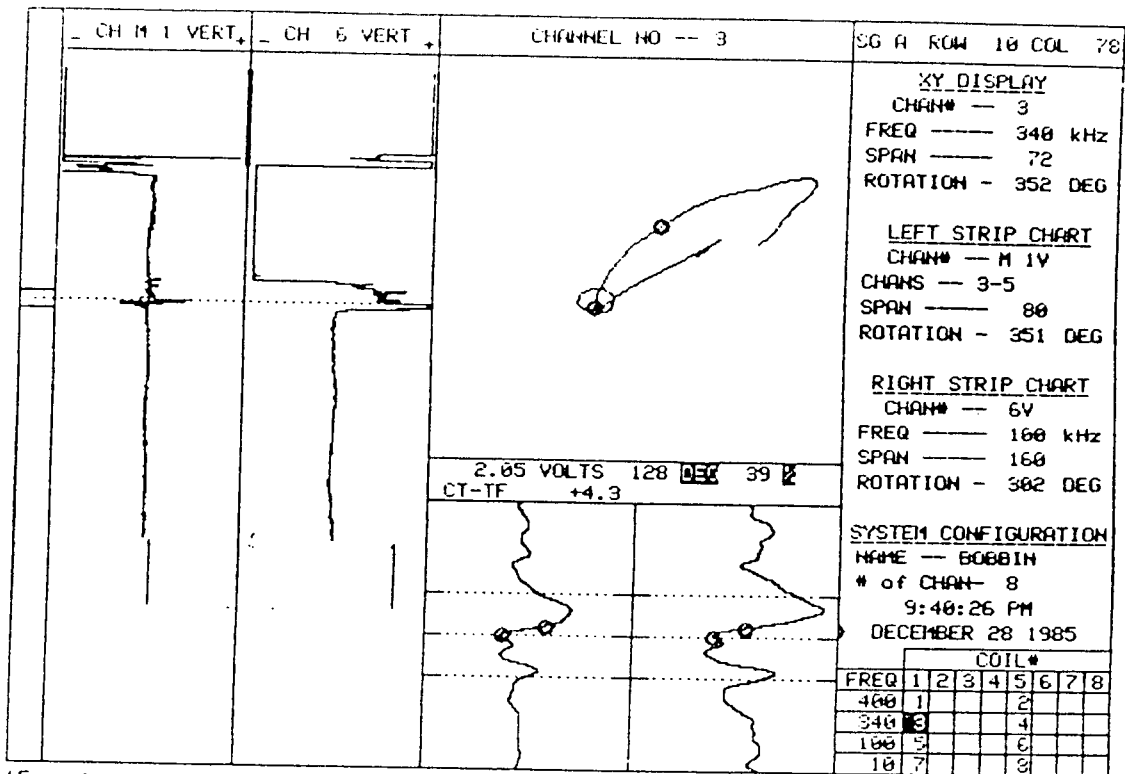




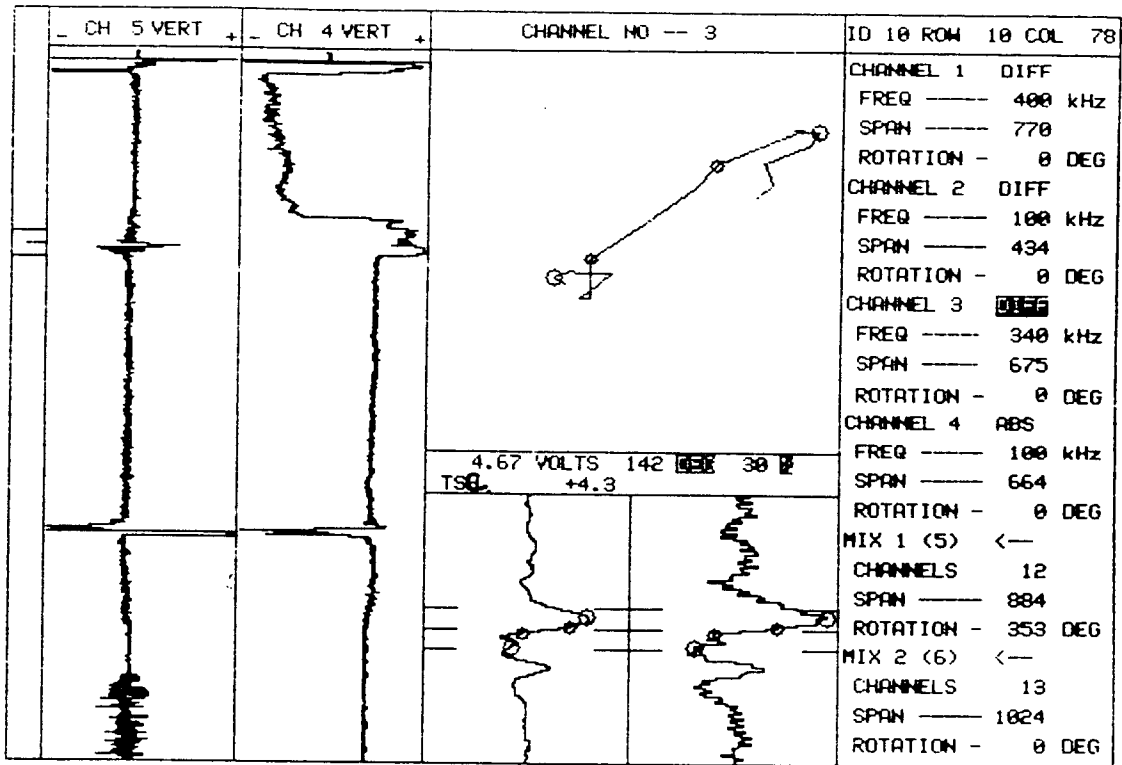
15    PLANT                    UNIT#    S/G    LEG                    DATE  
       SONGS DISK C35        1        A        OUTLET                12/27/85



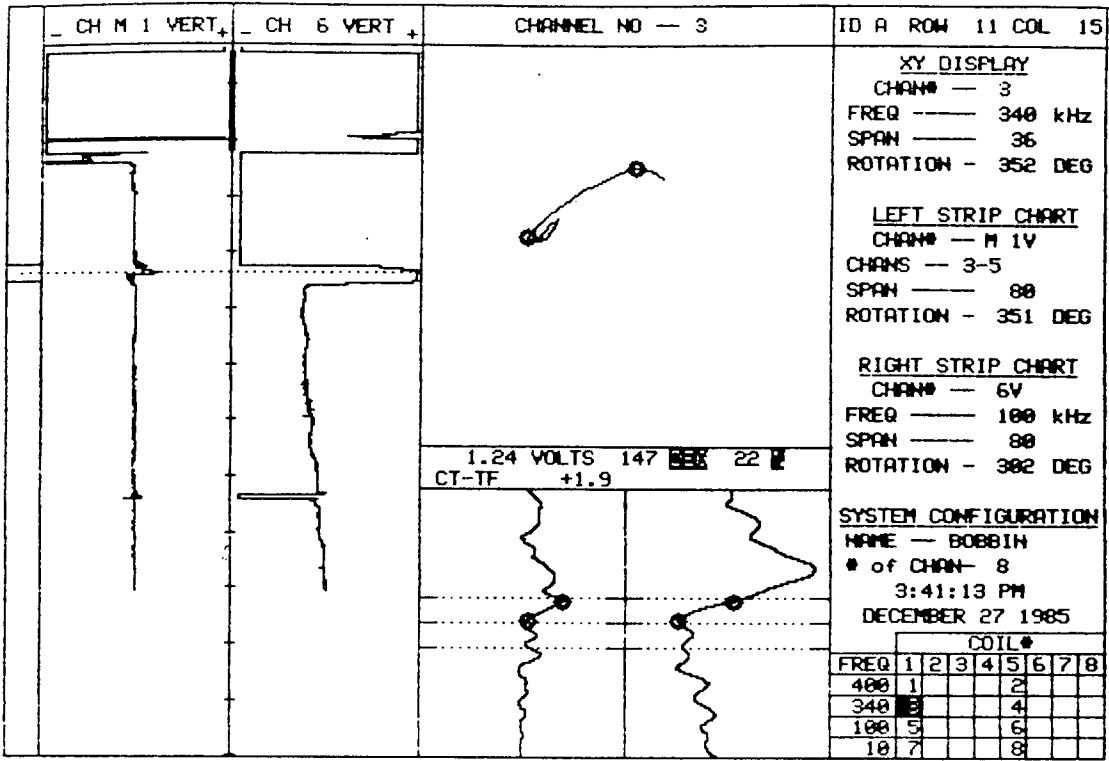
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



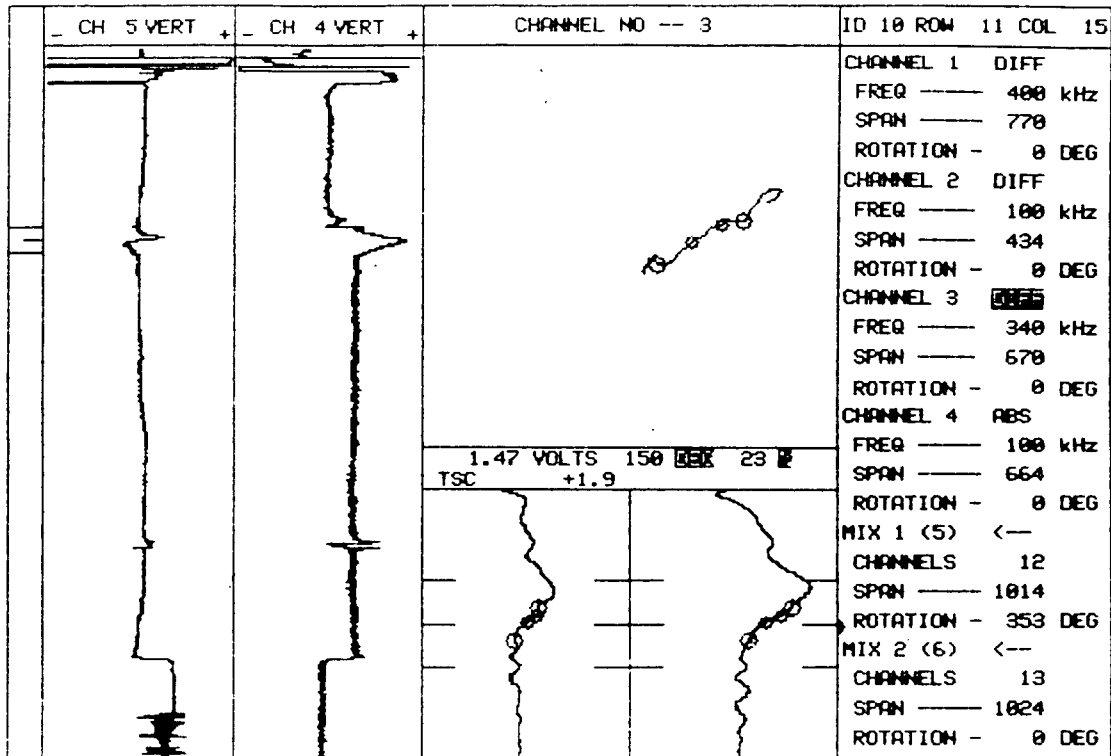
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C38    1    A    OUTLET    12/27/85



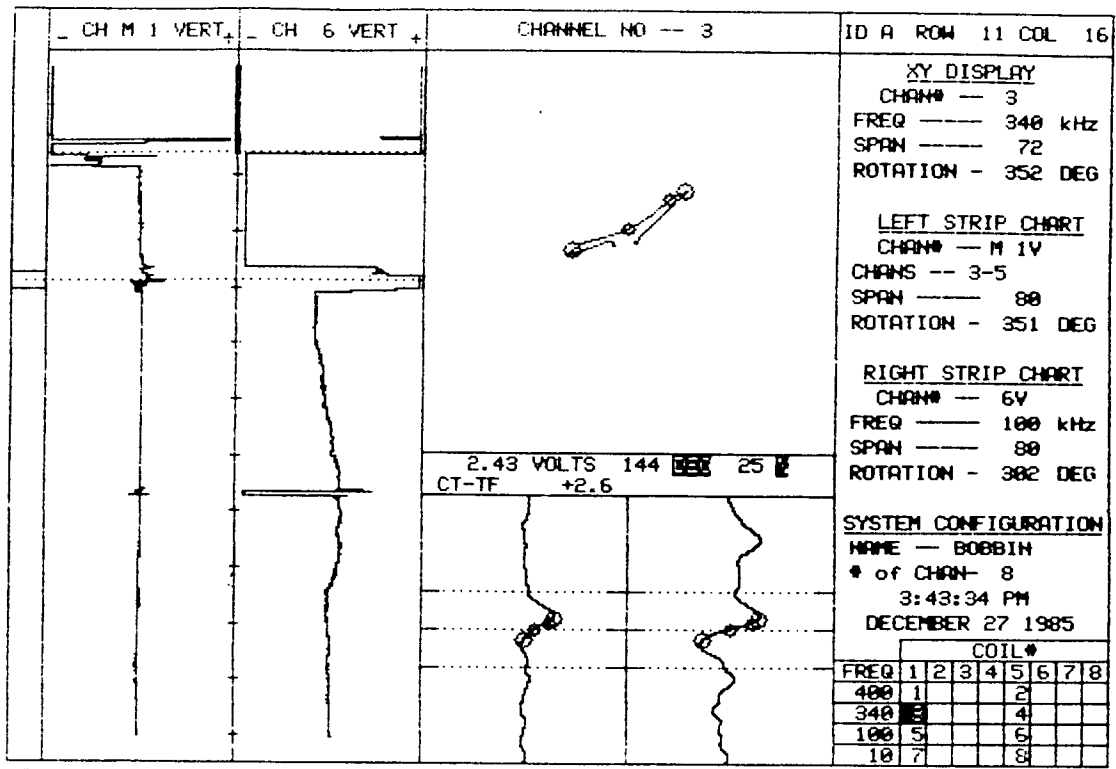
10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



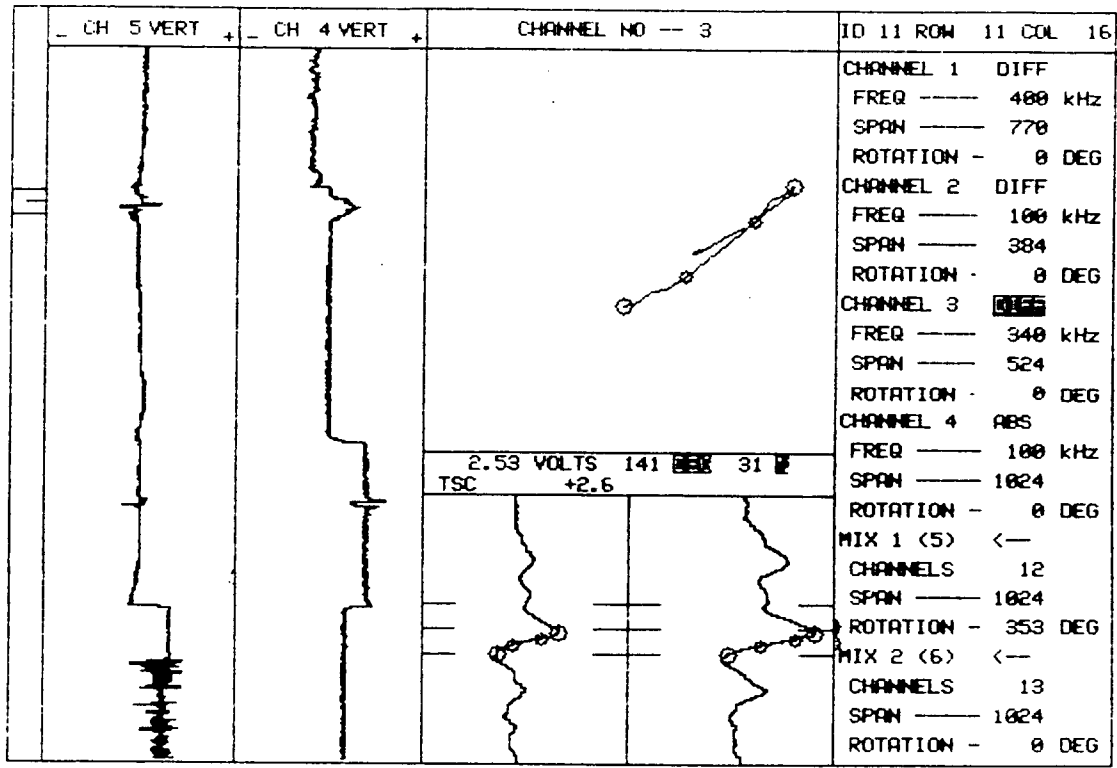
15    PLANT                    UNIT#    S/G    LEG            DATE  
       SONGS DISK C35        1        A        OUTLET        12/27/85



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

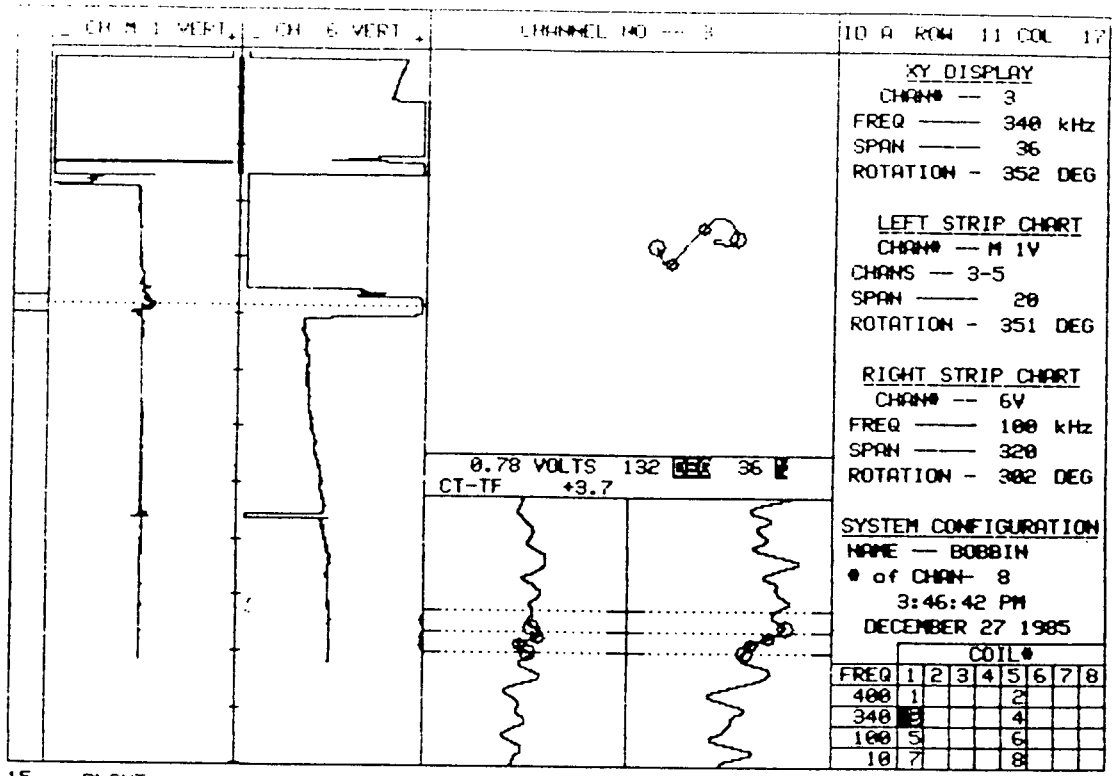


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85

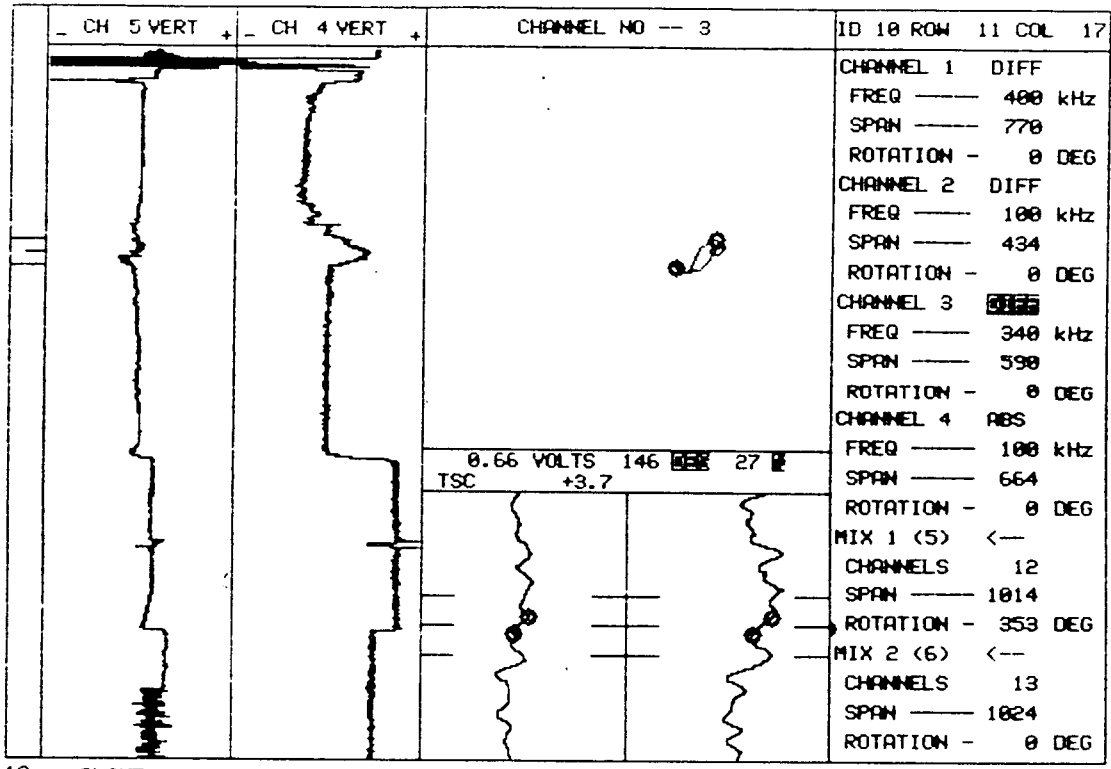


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1





15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

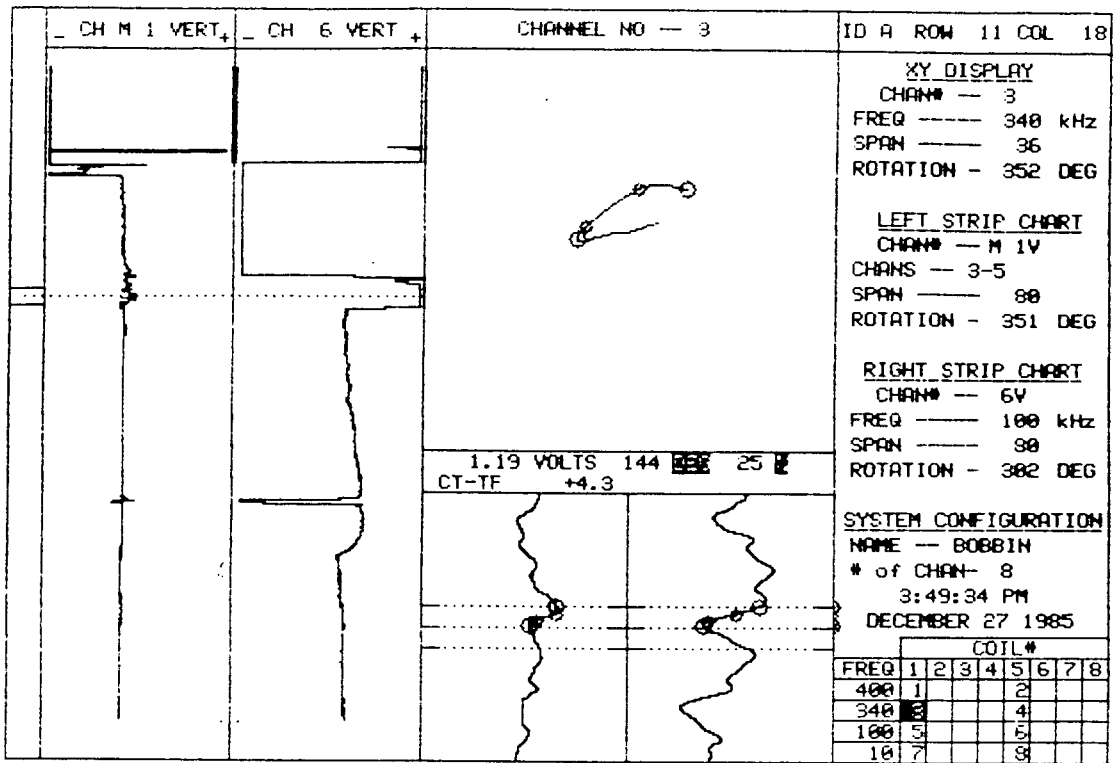


ID 10 ROW 11 COL 17  
 CHANNEL 1 DIFF  
 FREQ — 400 kHz  
 SPAN — 770  
 ROTATION - 0 DEG  
 CHANNEL 2 DIFF  
 FREQ — 100 kHz  
 SPAN — 434  
 ROTATION - 0 DEG  
 CHANNEL 3 ~~DIFF~~  
 FREQ — 340 kHz  
 SPAN — 590  
 ROTATION - 0 DEG  
 CHANNEL 4 ABS  
 FREQ — 100 kHz  
 SPAN — 664  
 ROTATION - 0 DEG  
 MIX 1 (5) <—  
 CHANNELS 12  
 SPAN — 1014  
 ROTATION - 353 DEG  
 MIX 2 (6) <—  
 CHANNELS 13  
 SPAN — 1024  
 ROTATION - 0 DEG

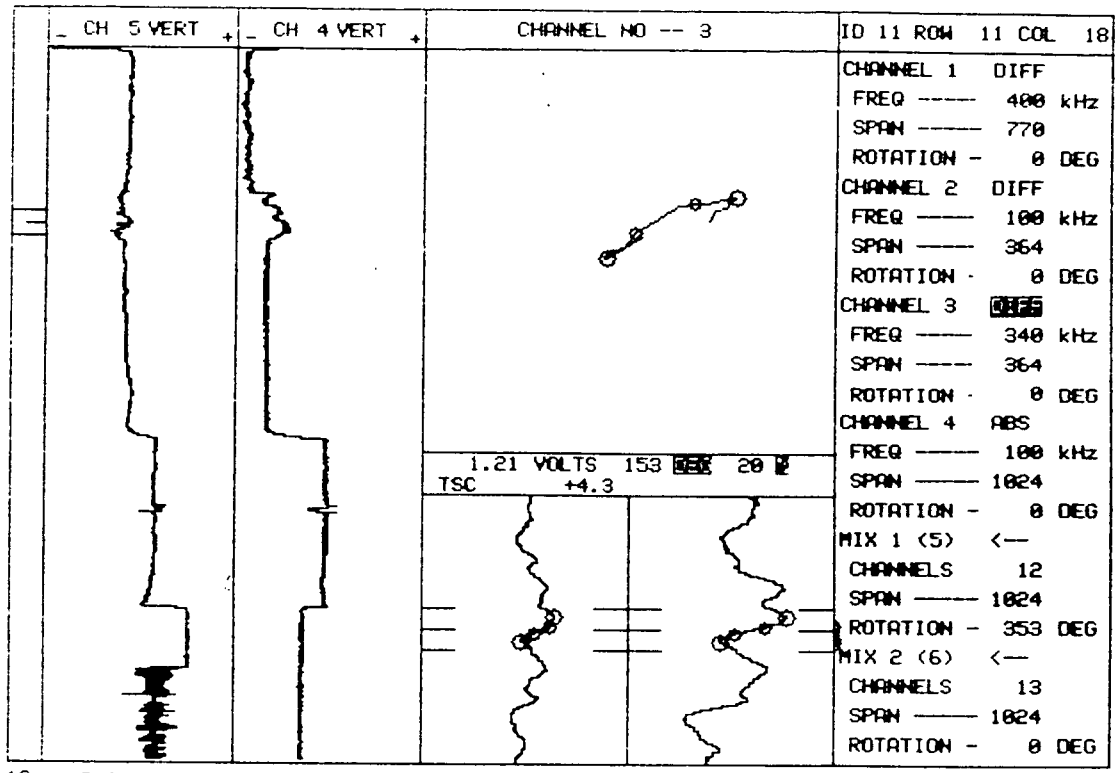
0.66 VOLTS 146 DEG 27  
 TSC +3.7

10 PLANT SCE SONGS UNIT\* I S/G A LEG OUTLET DATE 1980

ZETEC Inc. - 1983  
 Edition 12.0 Rev 1



15	PLANT	UNIT#	S/G	LEG	DATE
	SONGS DISK C35	1	A	OUTLET	12/27/85



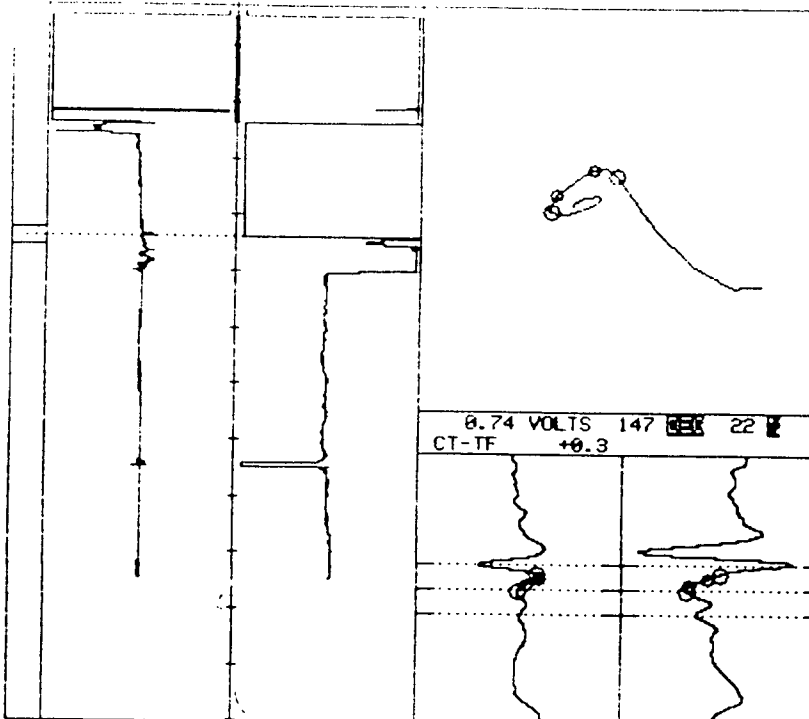
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

ED M 1 VERT

CR 5 VERT

CHANNEL NO -- 3

ID A ROW 11 COL 12



KY\_DISPLAY  
 CHAN# -- 3  
 FREQ ---- 340 kHz  
 SPAN ---- 36  
 ROTATION - 352 DEG

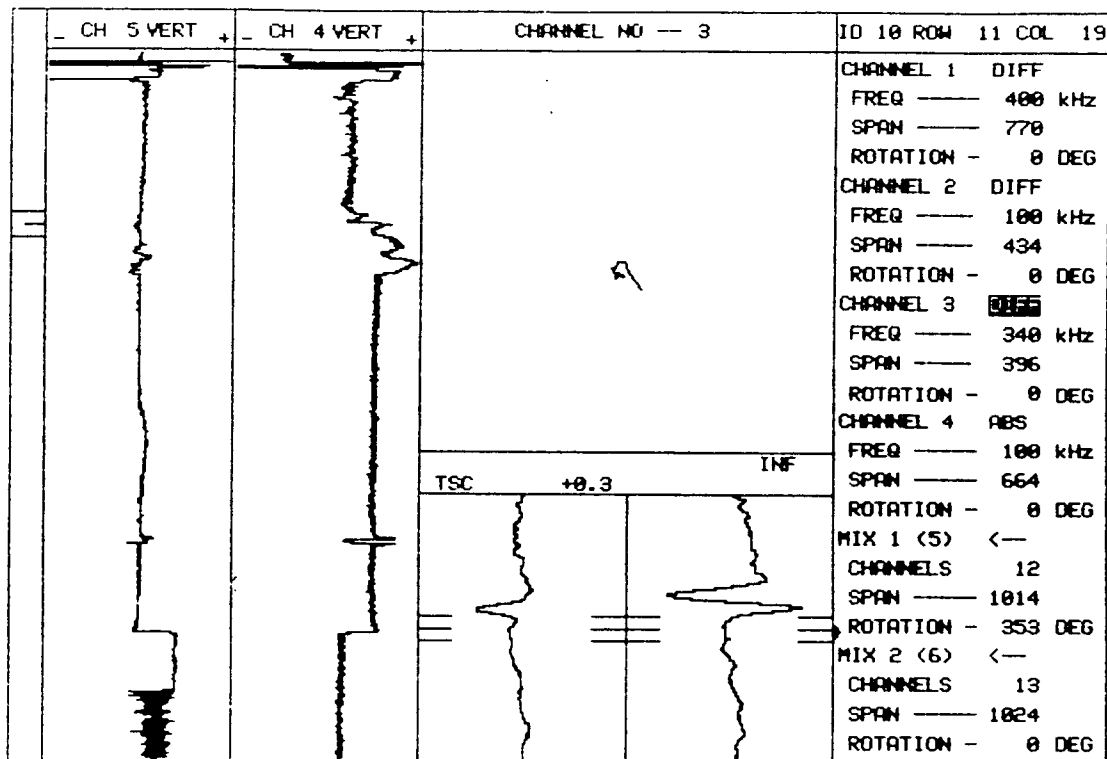
LEFT STRIP CHART  
 CHAN# -- M IV  
 CHANS -- 3-5  
 SPAN ---- 80  
 ROTATION - 351 DEG

RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ ---- 100 kHz  
 SPAN ---- 80  
 ROTATION - 302 DEG

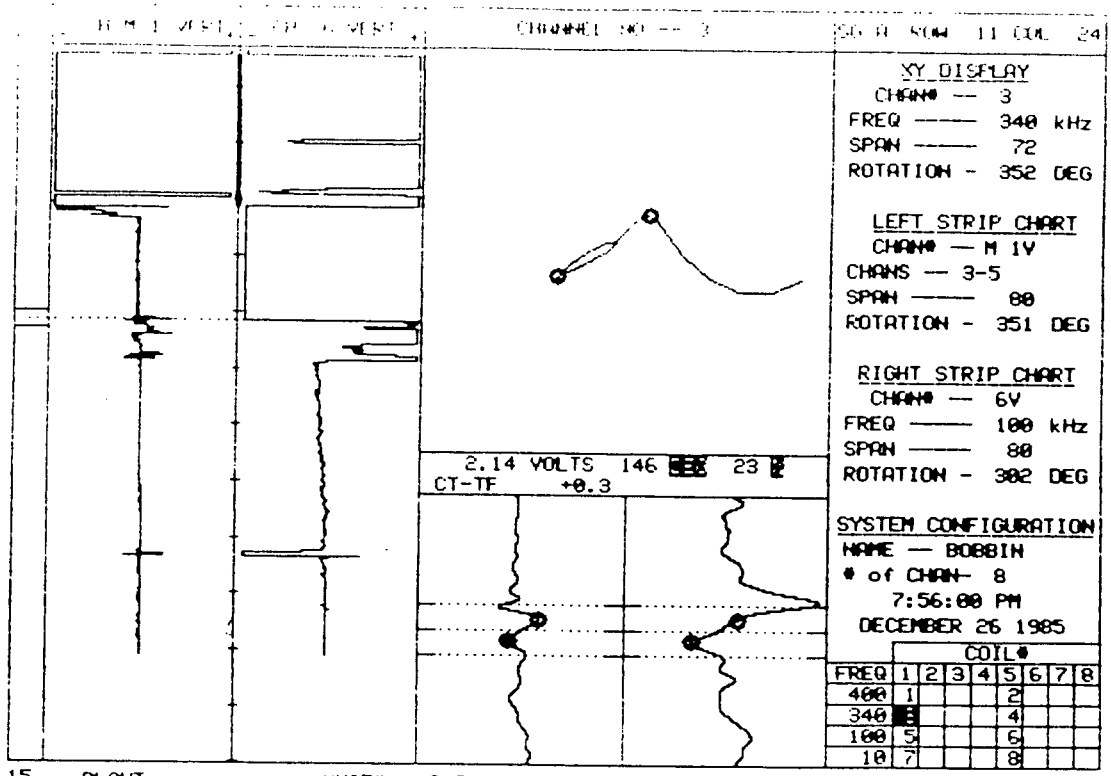
SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 3:52:54 PM  
 DECEMBER 27 1985

		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	3					4			
100	5					6			
10	7					8			

15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG A DATE 12/27/85



10 PLANT SCE SONGS UNIT# 1 S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



XY DISPLAY  
 CHAN# -- 3  
 FREQ --- 340 kHz  
 SPAN --- 72  
 ROTATION - 352 DEG

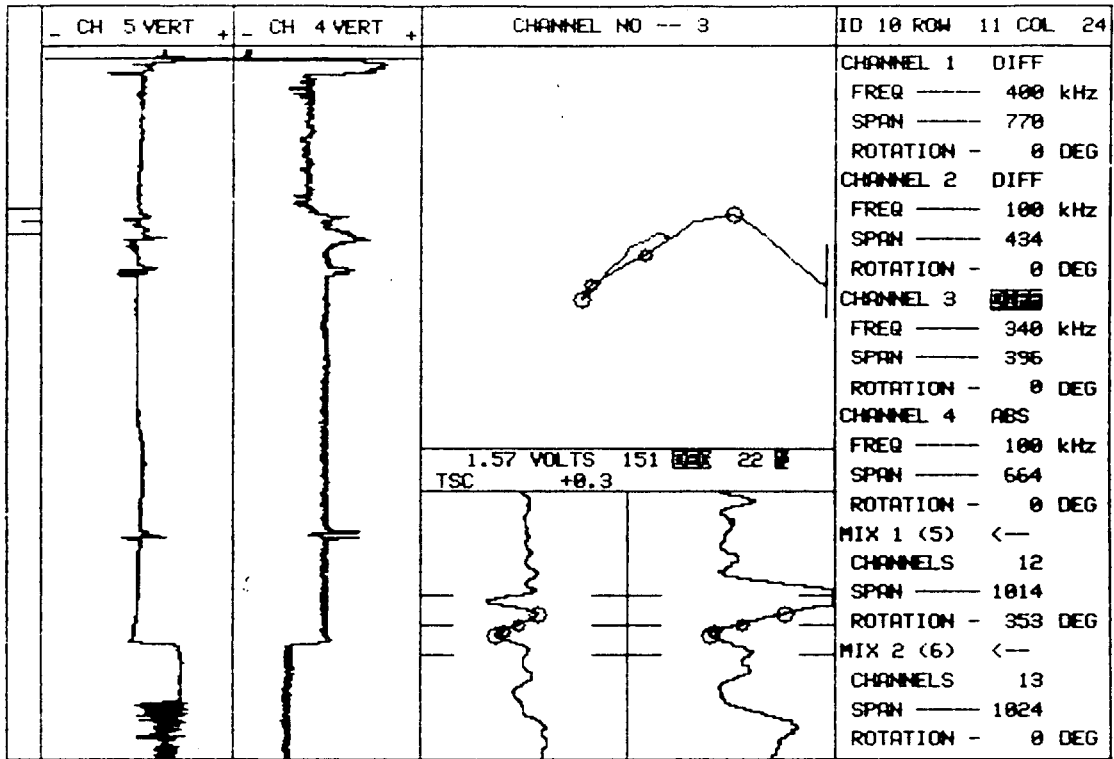
LEFT STRIP CHART  
 CHAN# -- M IV  
 CHANS -- 3-5  
 SPAN --- 80  
 ROTATION - 351 DEG

RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ --- 100 kHz  
 SPAN --- 80  
 ROTATION - 302 DEG

SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 7:56:00 PM  
 DECEMBER 26 1985

		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	3				4				
100	5					6			
10	7						8		

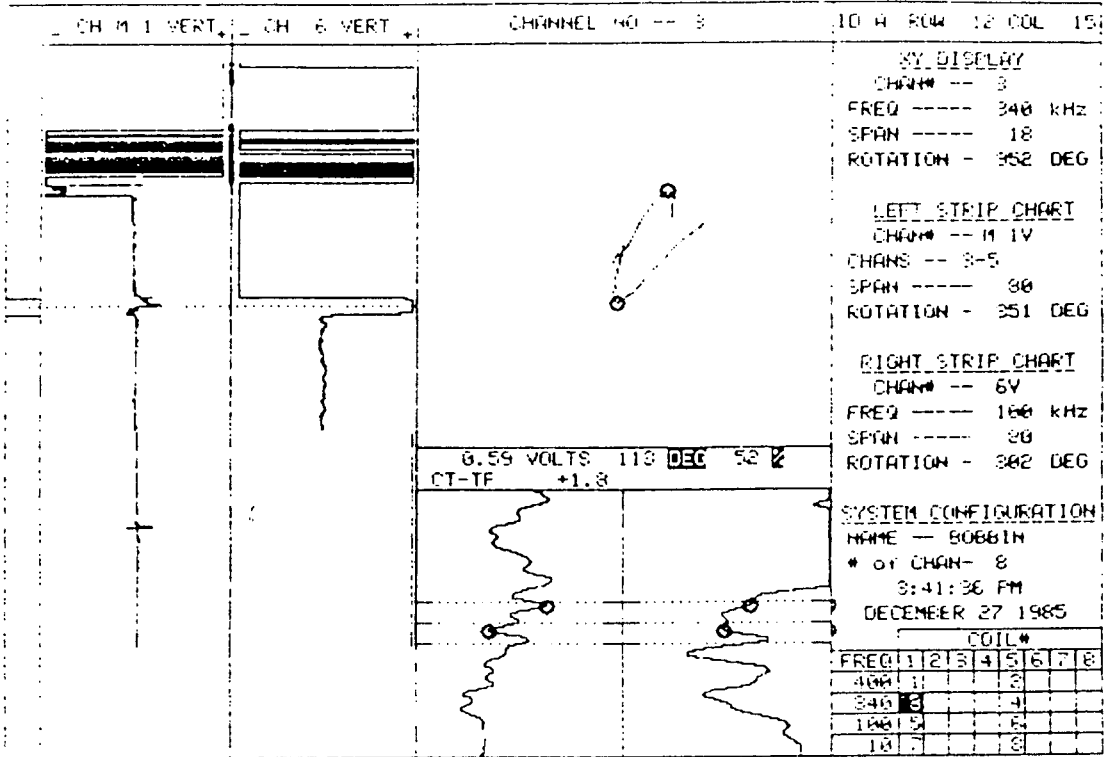
15 PLANT SONGS DISK C33 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



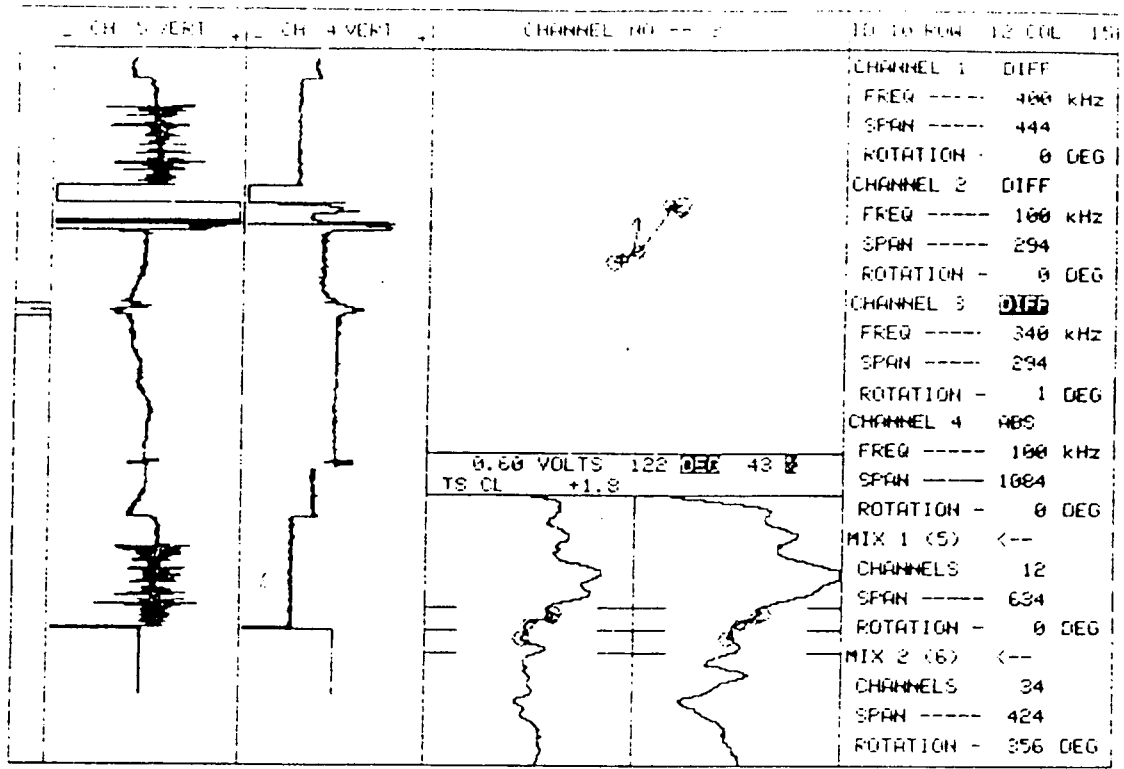
1.57 VOLTS 151 ~~DEG~~ 22 ~~DEG~~  
TSC +0.3

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

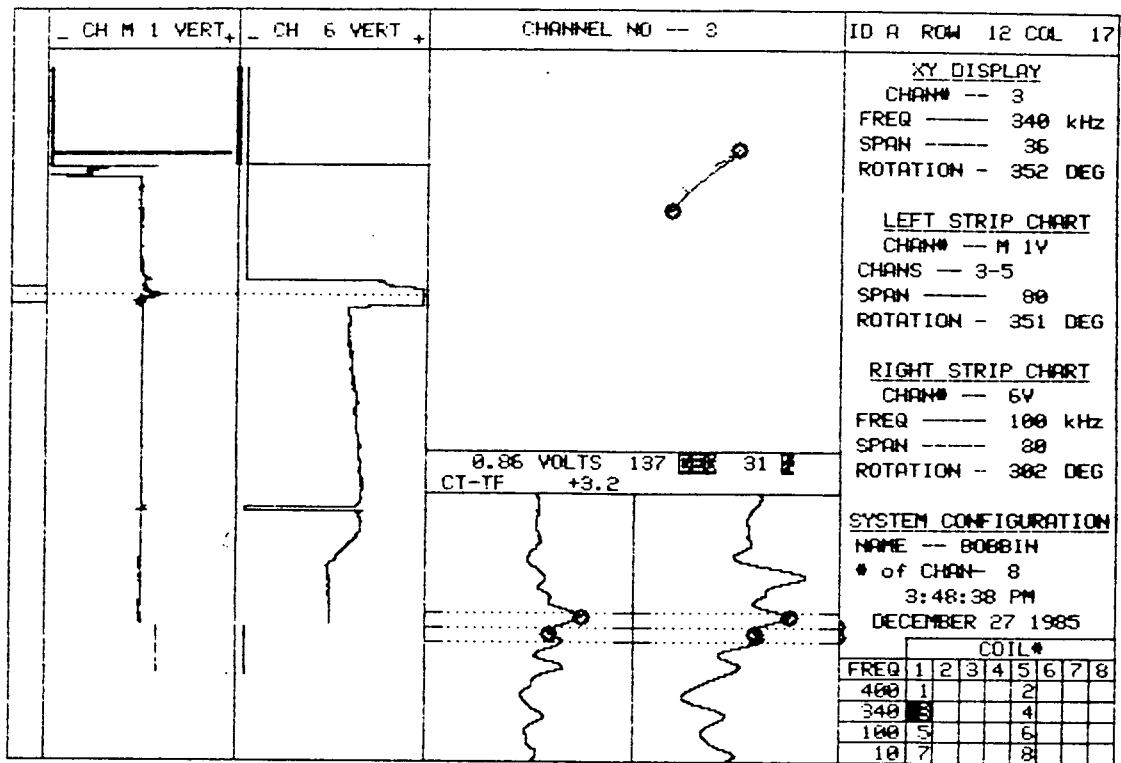




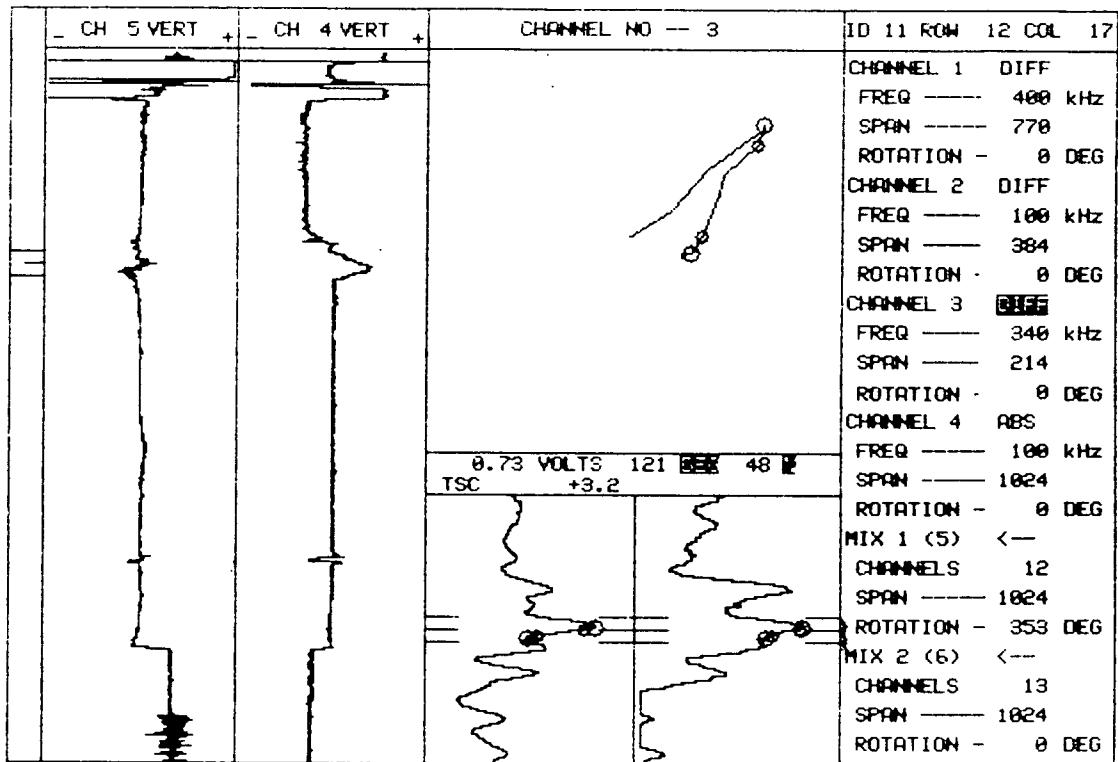
15 PLANT SONGS DISK C35 UNIT# 1 S/G R LEG OUTLET DATE 12/27/85



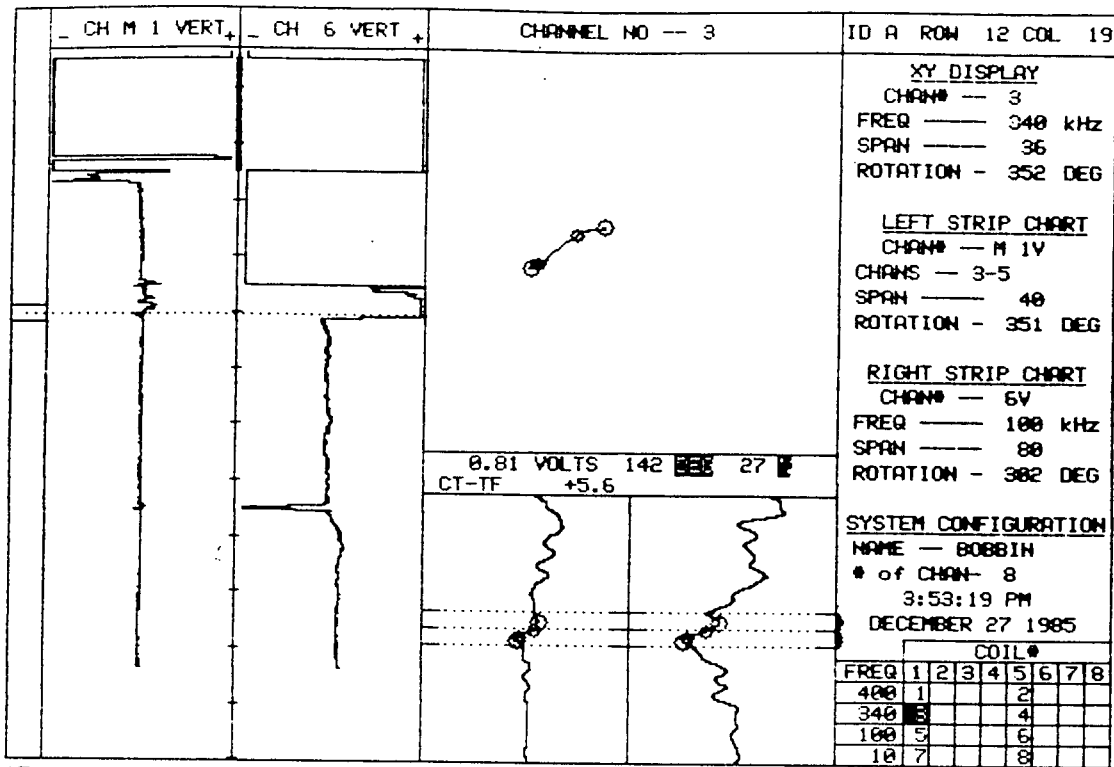
20 PLANT SCE SONGS    UNIT# I    S/G "A"    LEG COLD    DATE 06/03/88    ZETEC Inc. - 1983    Edition 12.0 Rev 1



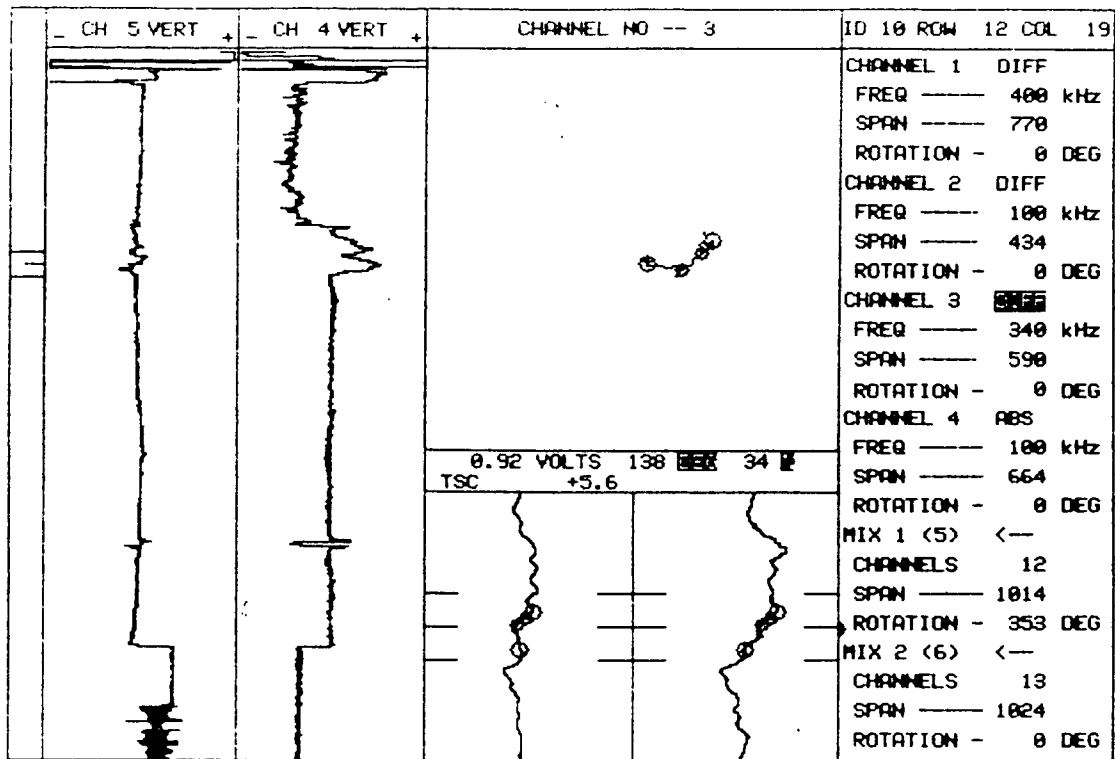
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



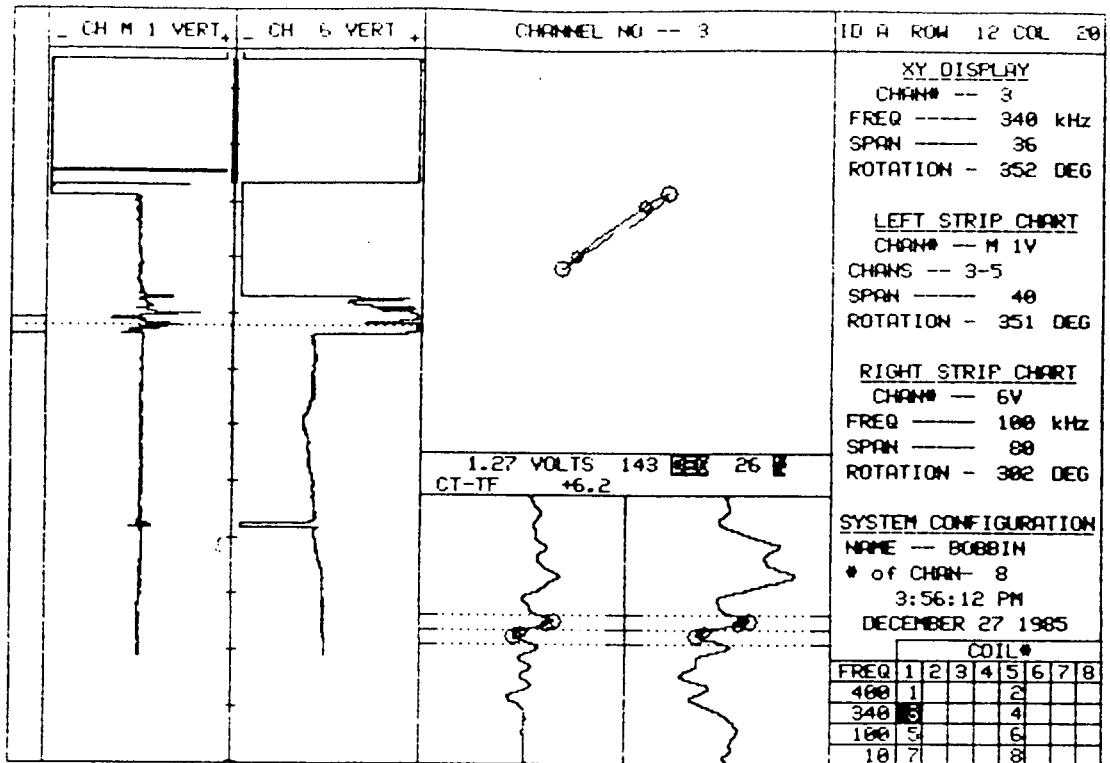
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



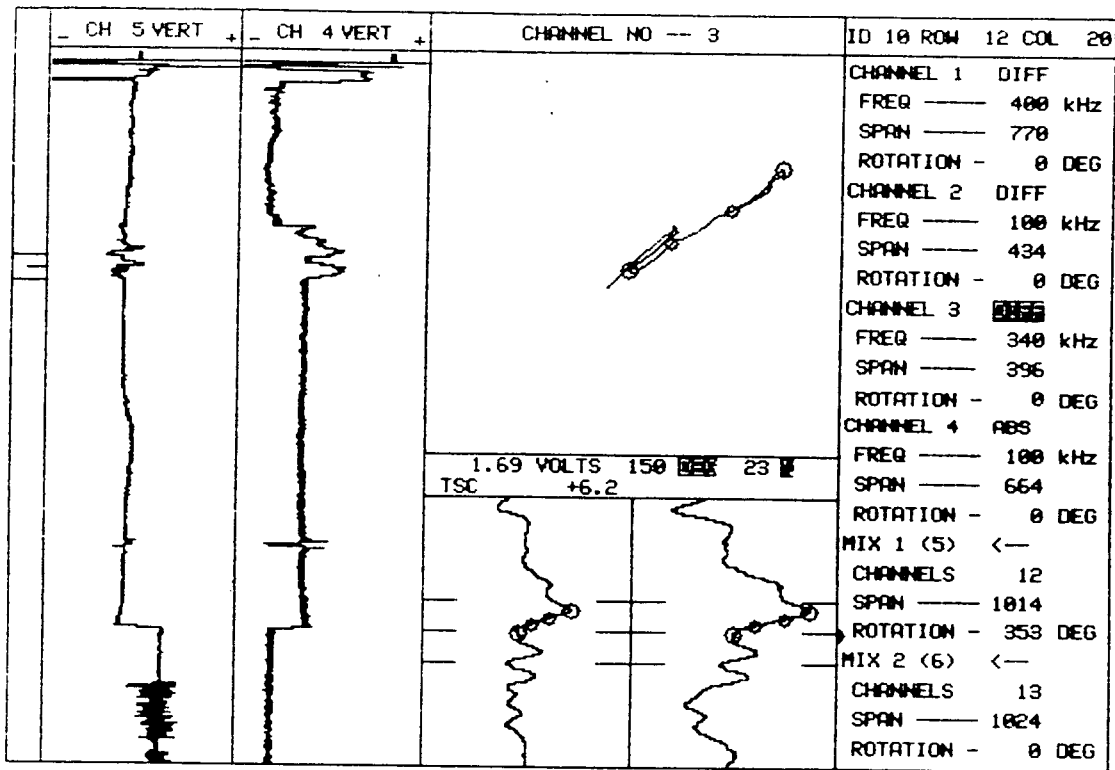
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



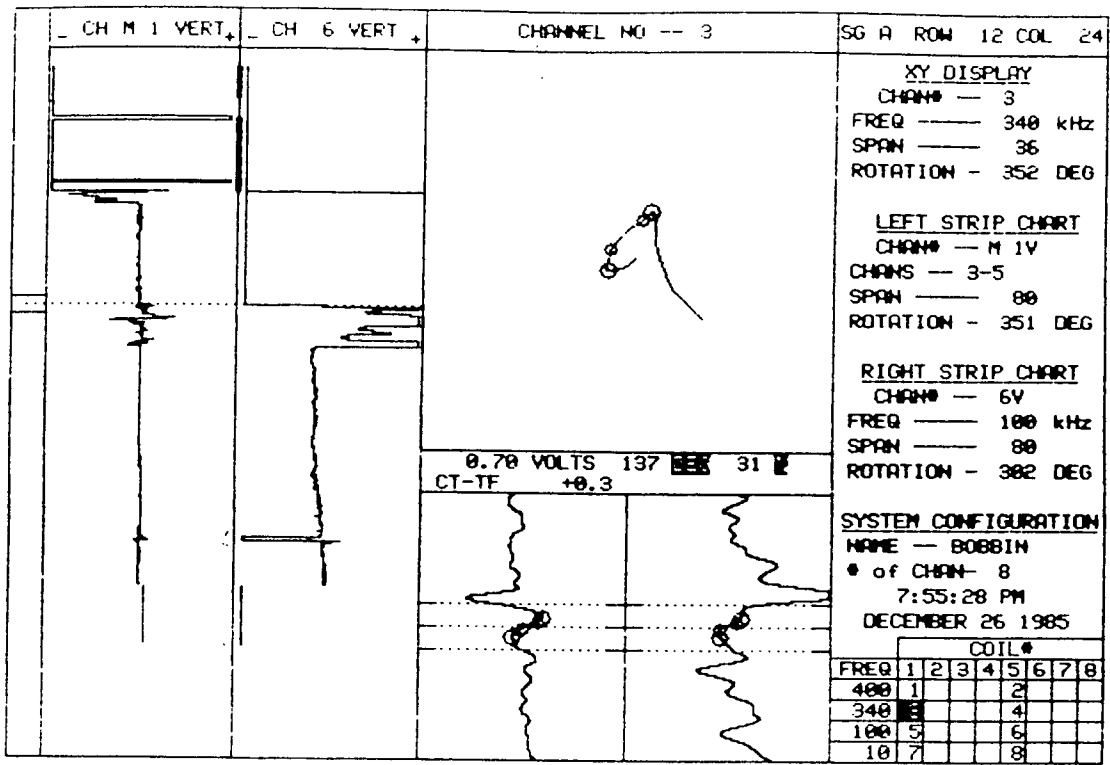
15 PLANT SONGS DISK C35 UNIT# 1 S/G R LEG A DATE 12/27/85



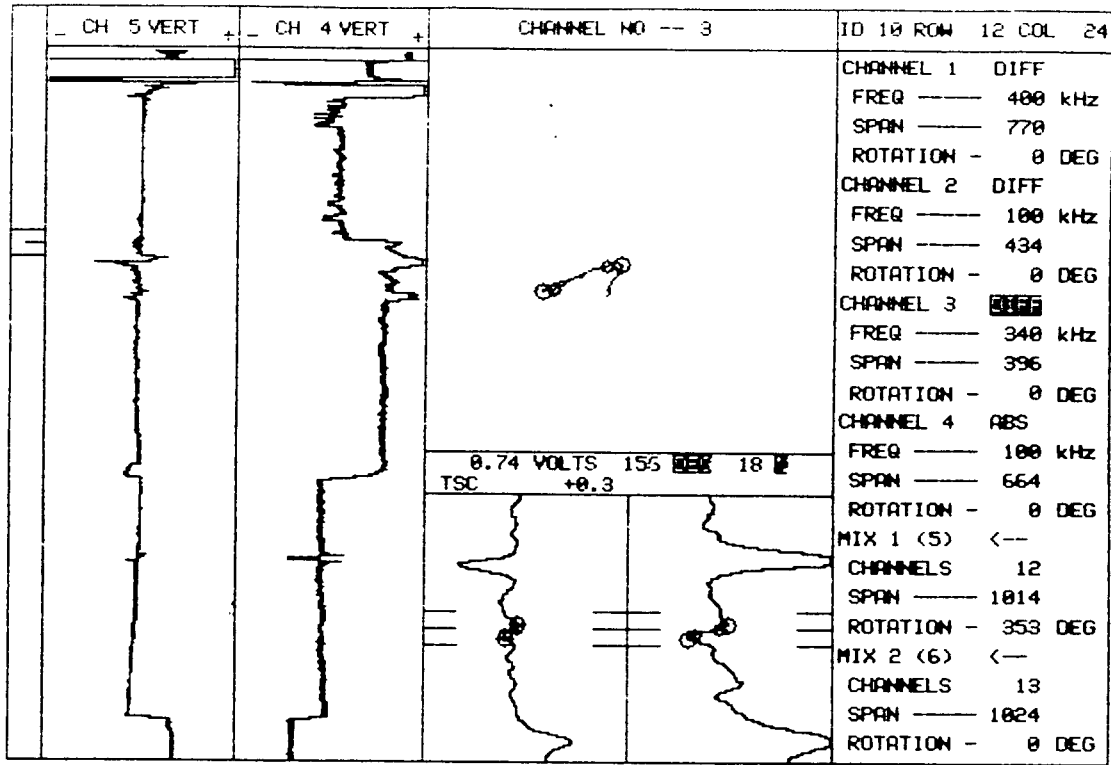
10 PLANT UNIT# S/G LEG DATE  
 SCE SONGS I A OUTLET 1980

ZETEC Inc. - 1983  
 Edition 12.0 Rev 1

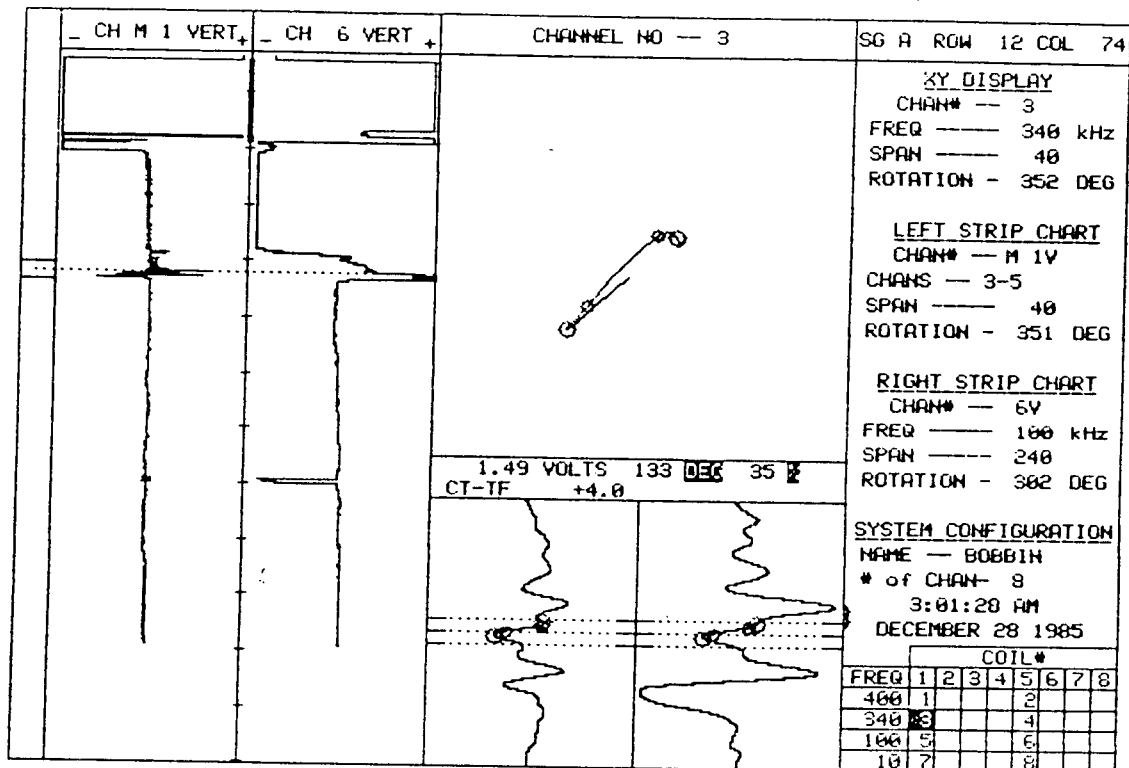




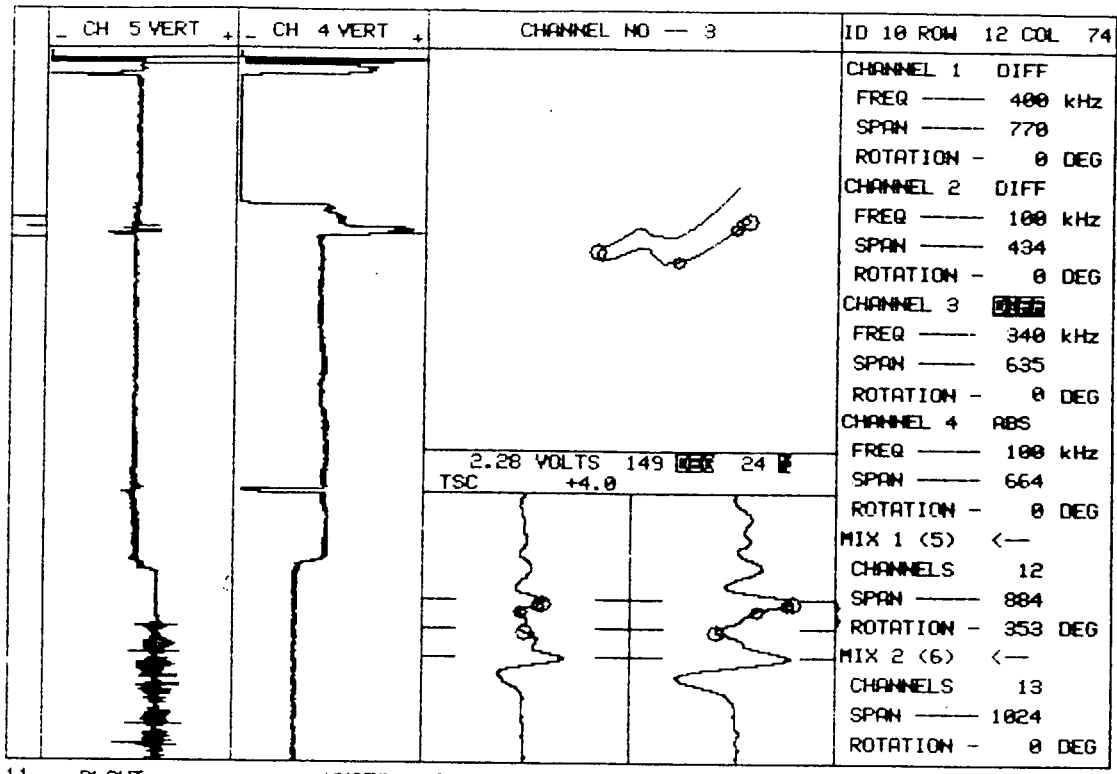
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C33    1    A    OUTLET    12/26/85



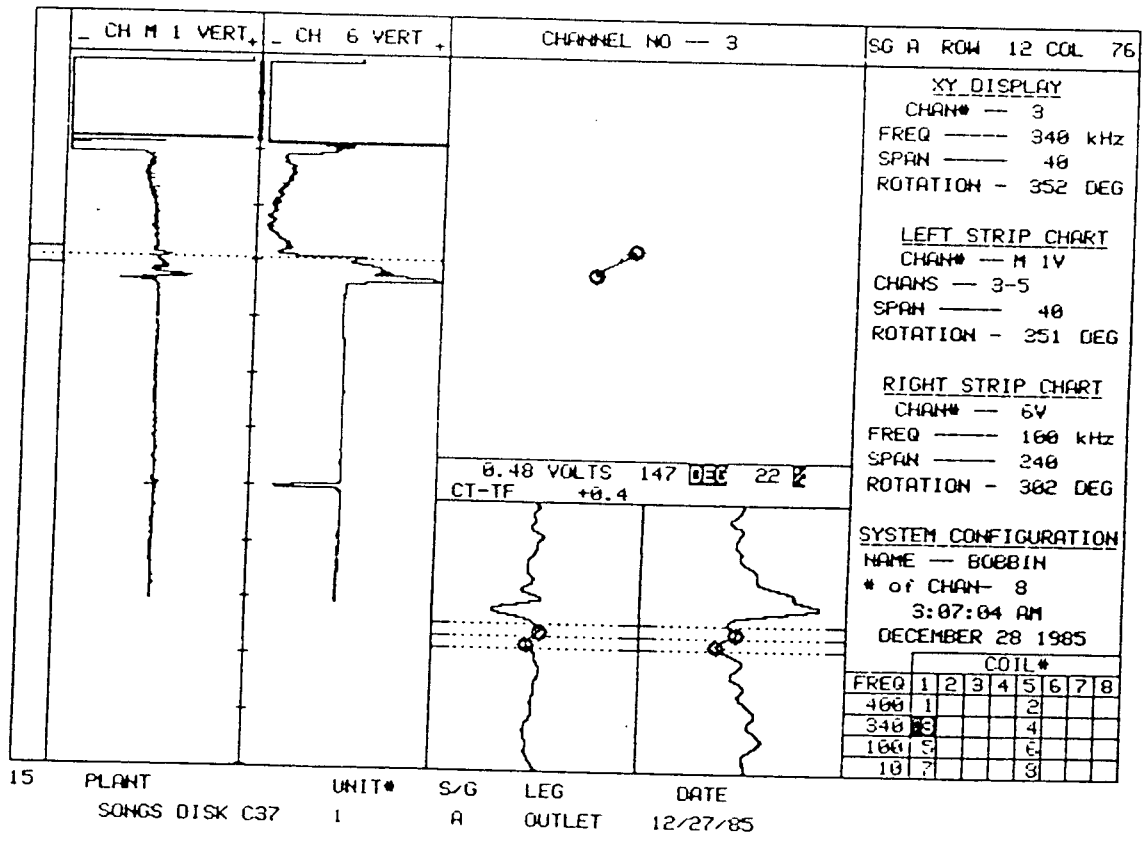
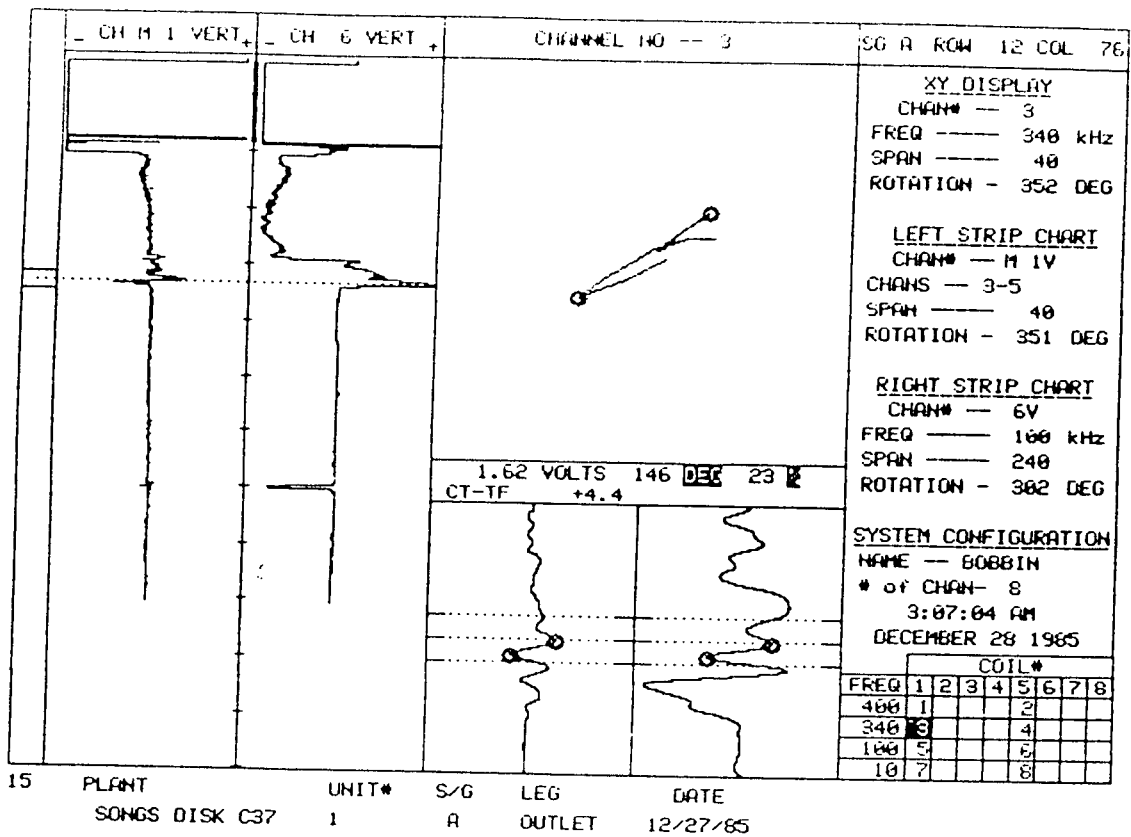
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

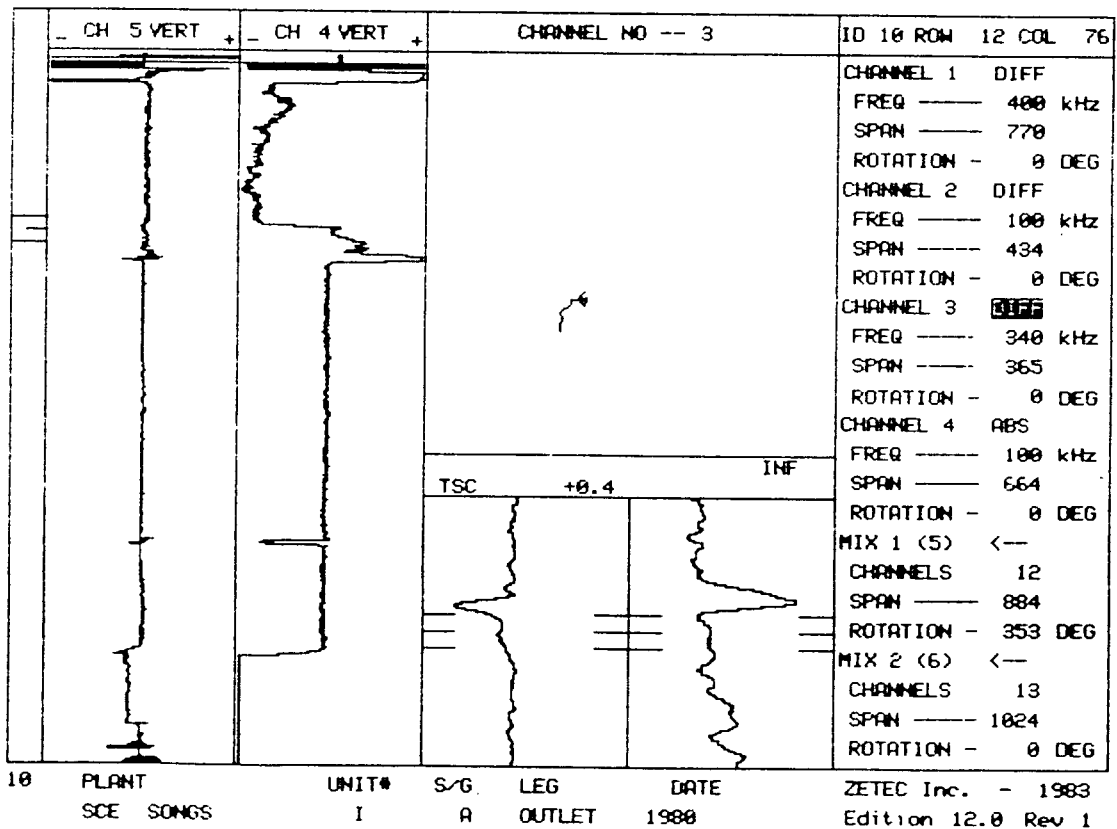
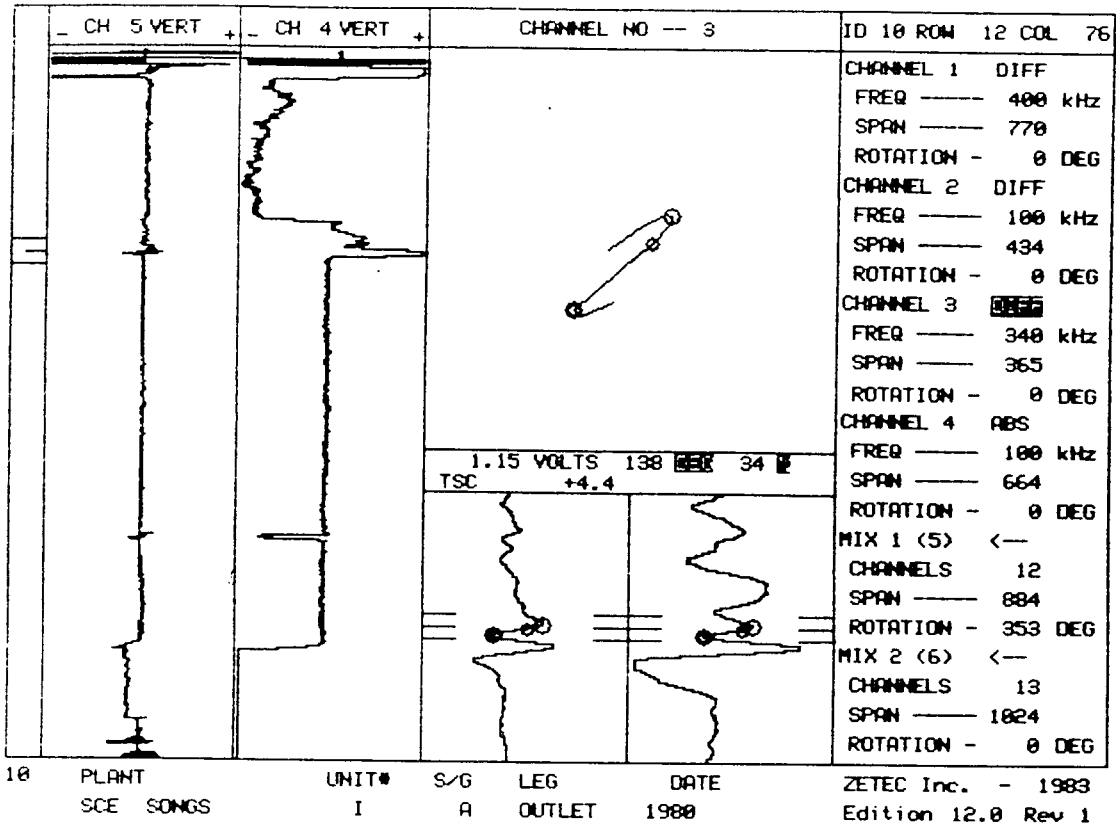


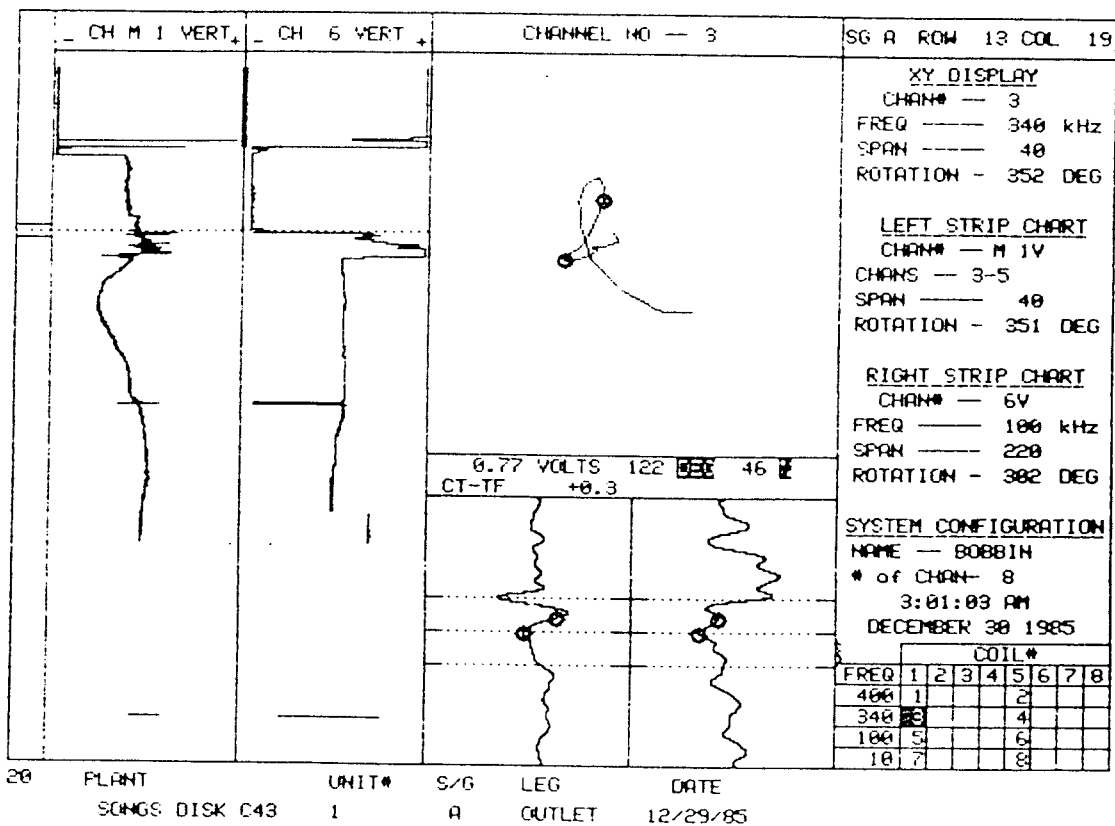
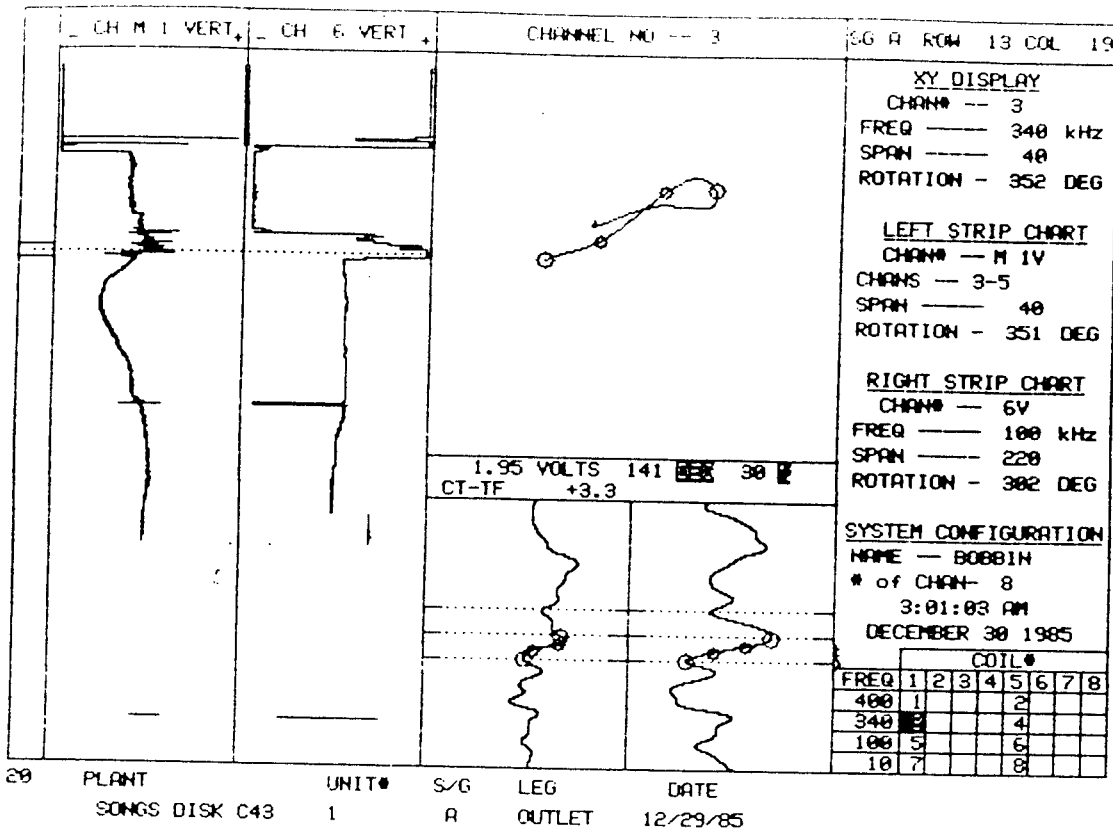
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C37    1    A    OUTLET    12/27/85

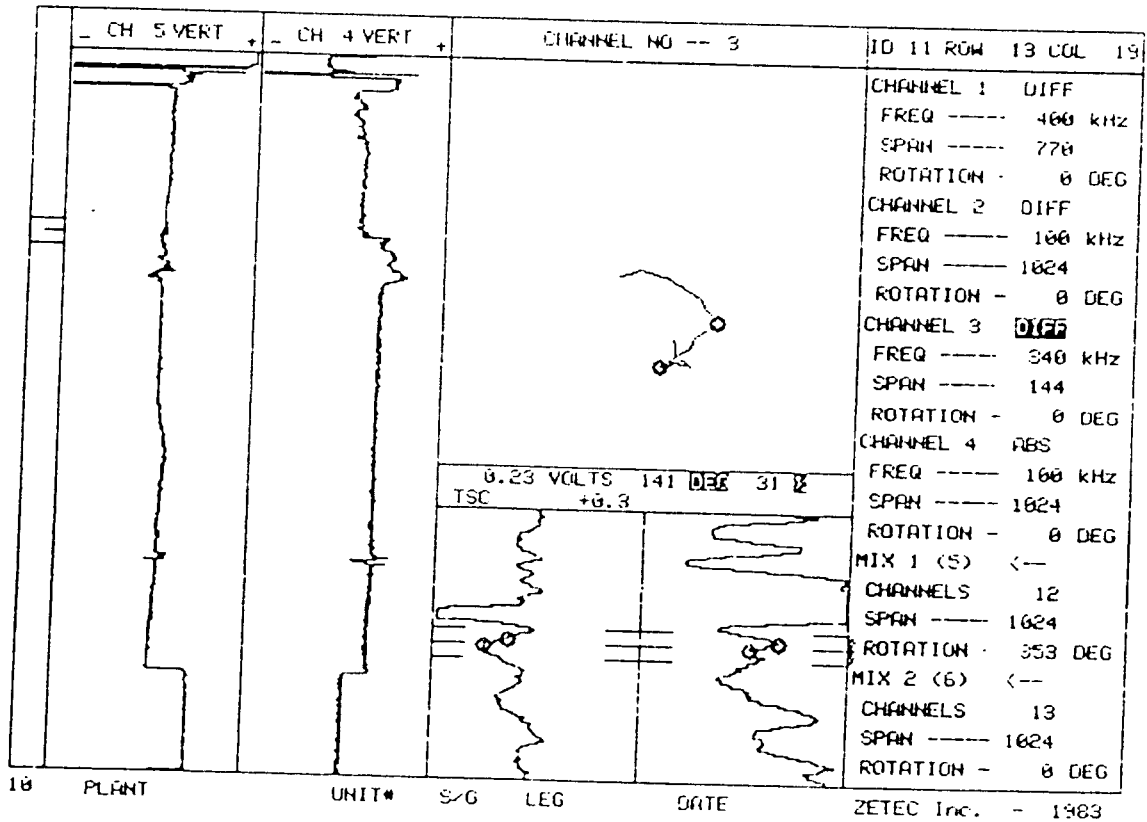
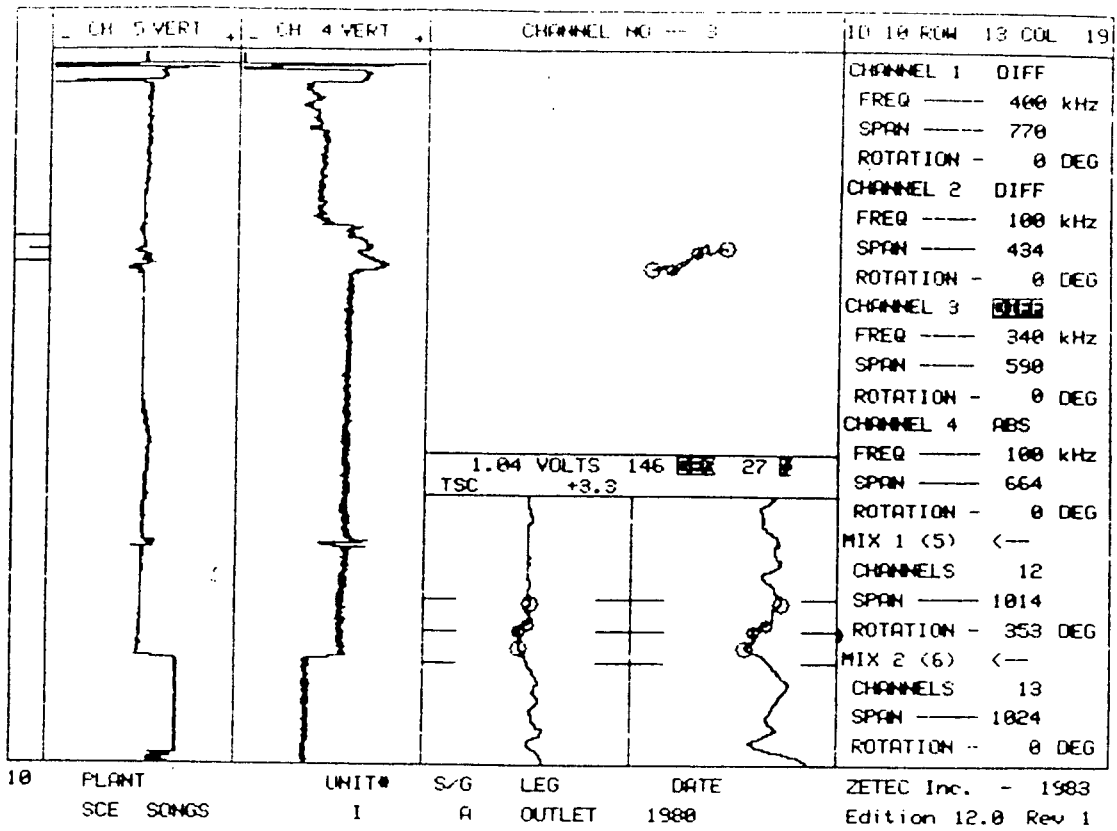


11    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1

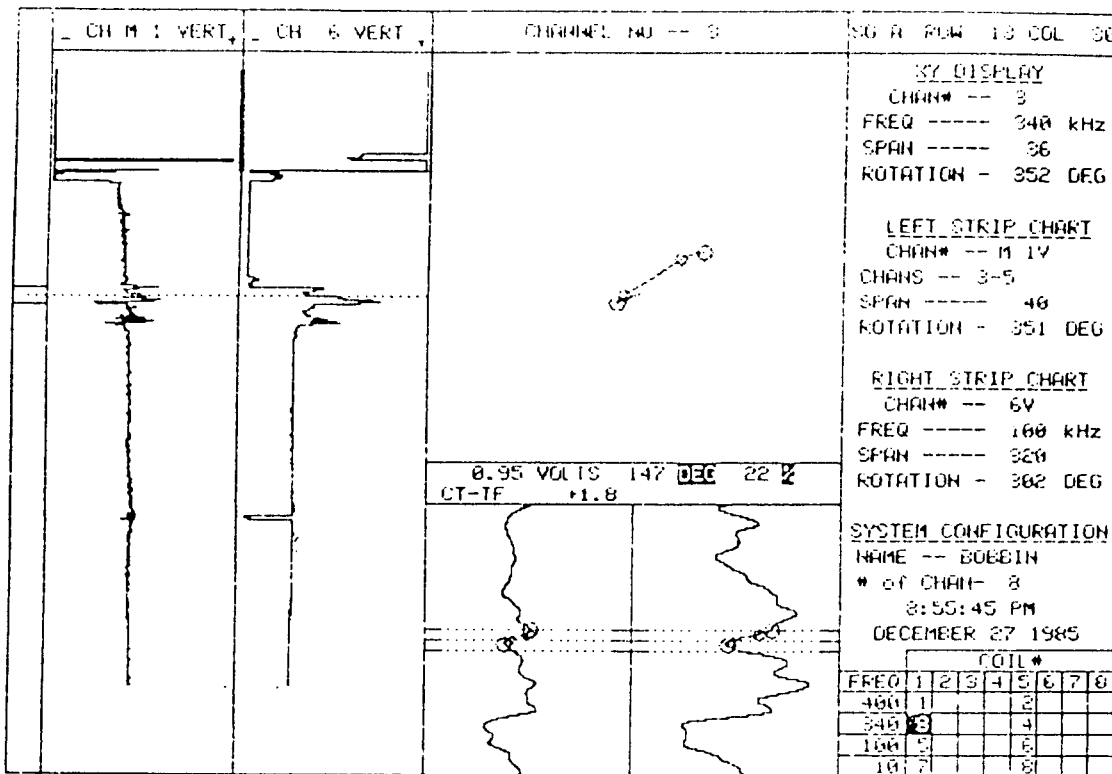




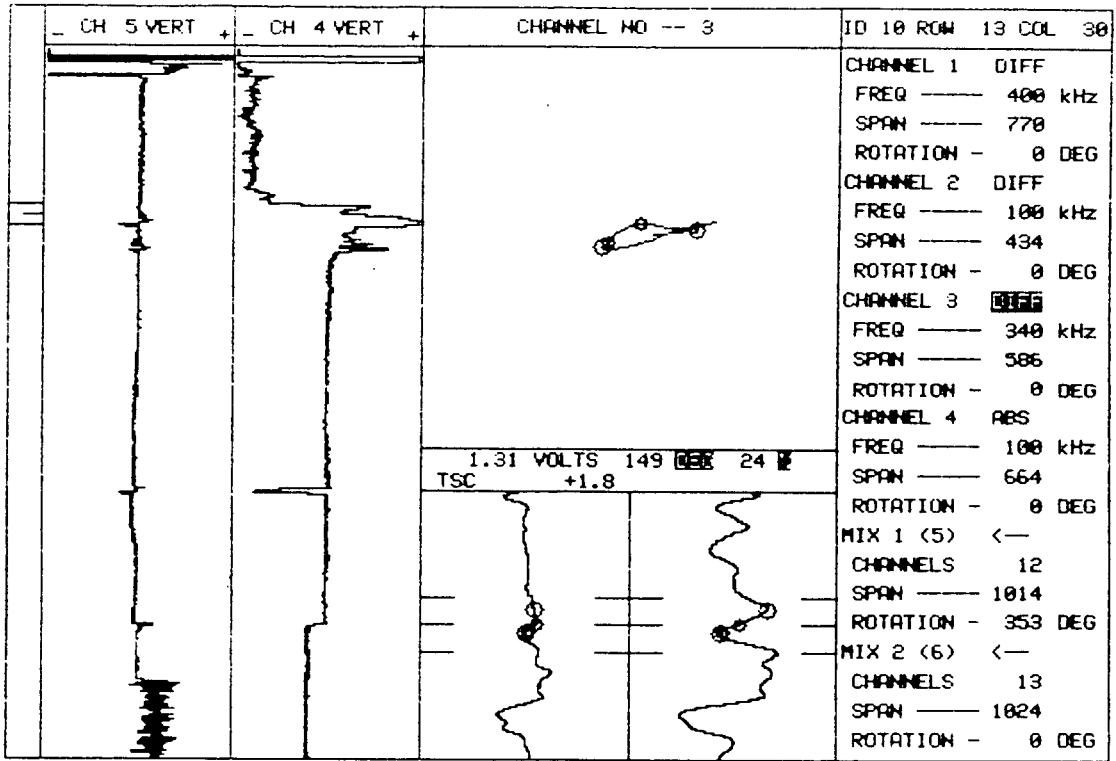




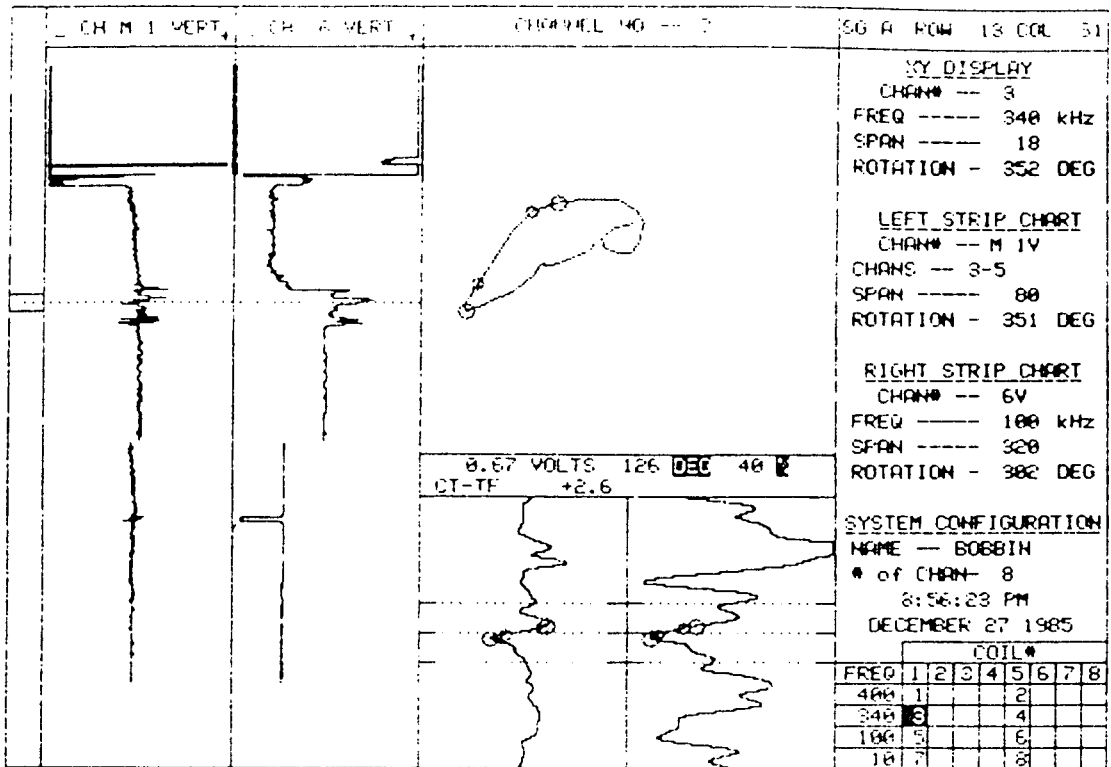




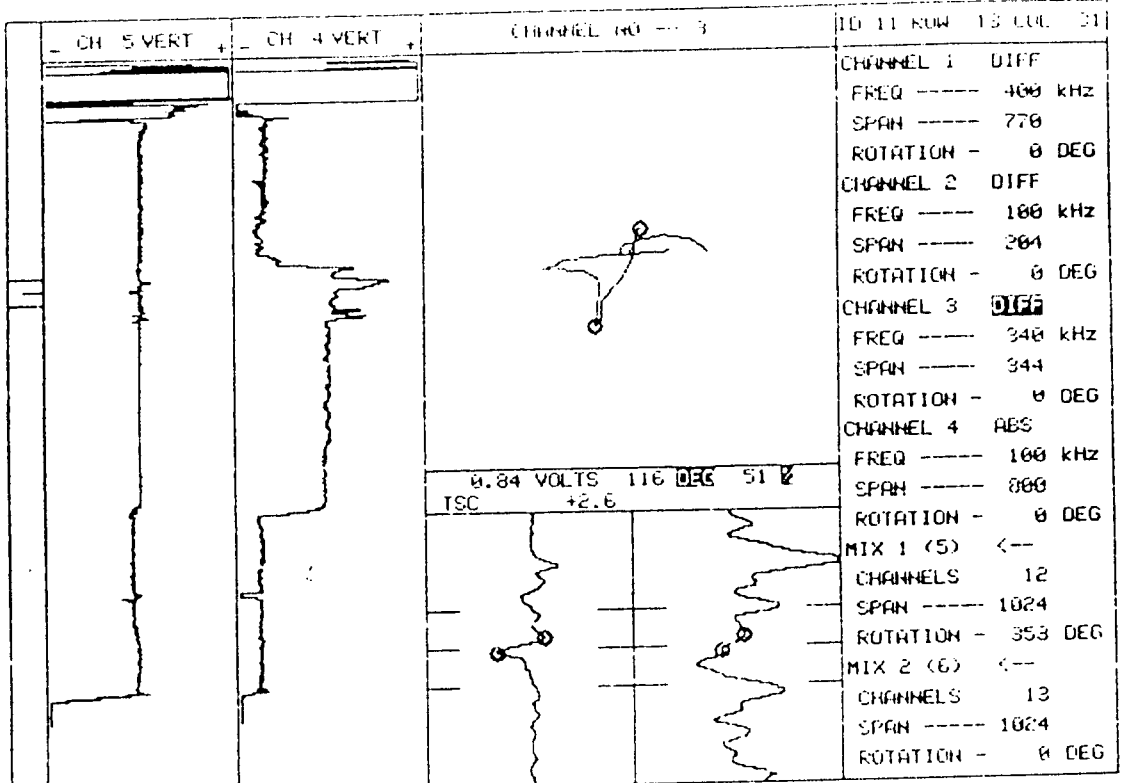
15    PLANT                    UNIT#    S/G    LEG                    DATE  
 SONGS DISK C36            1        A        OUTLET                12/27/85



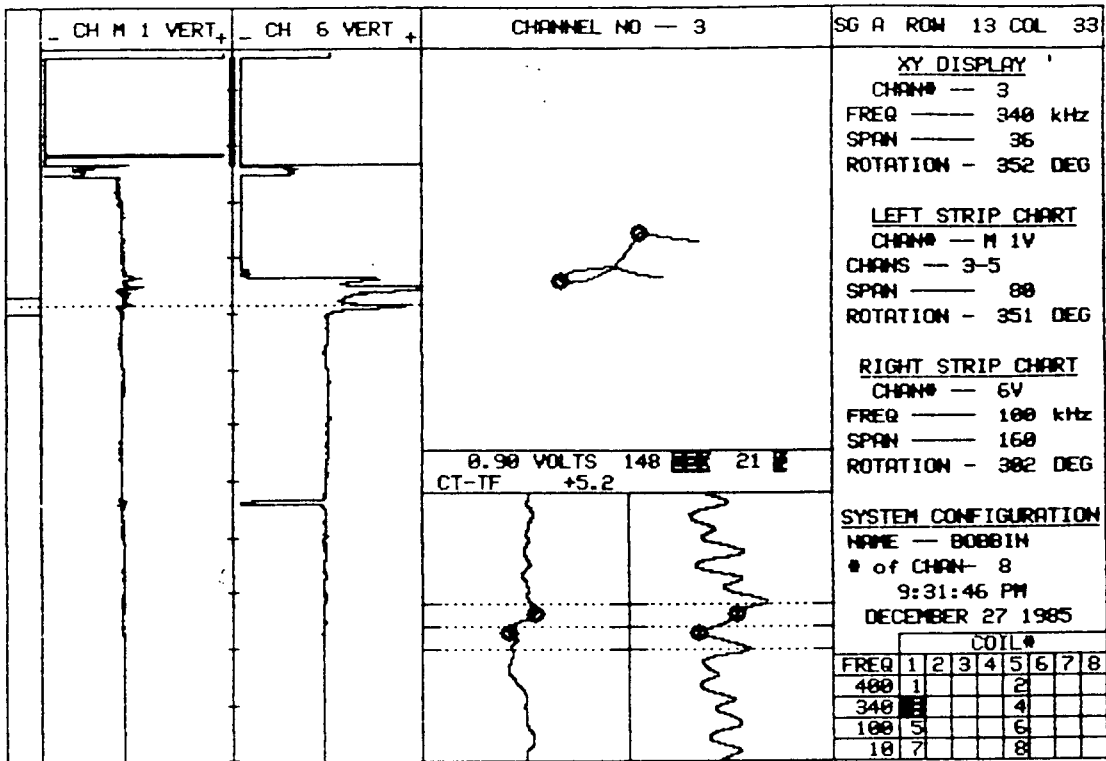
11    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1



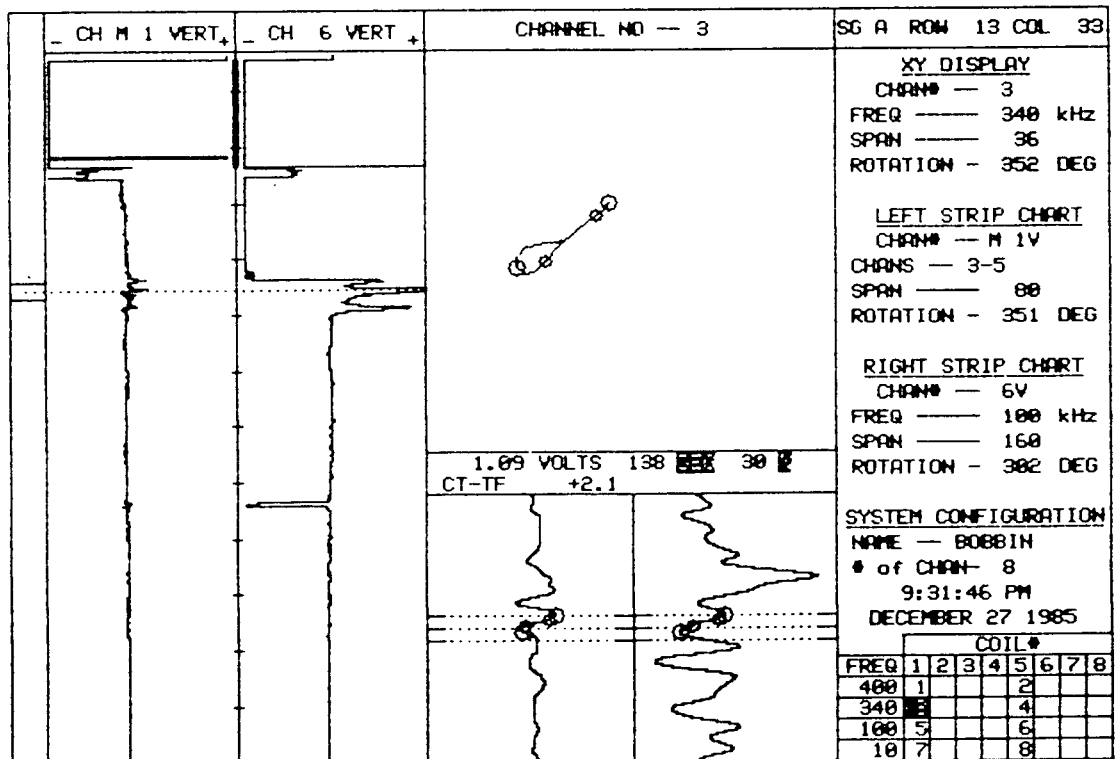
15 PLANT SONGS DISK C36 UNIT# 1 S/G R LEG OUTLET DATE 12/27/85



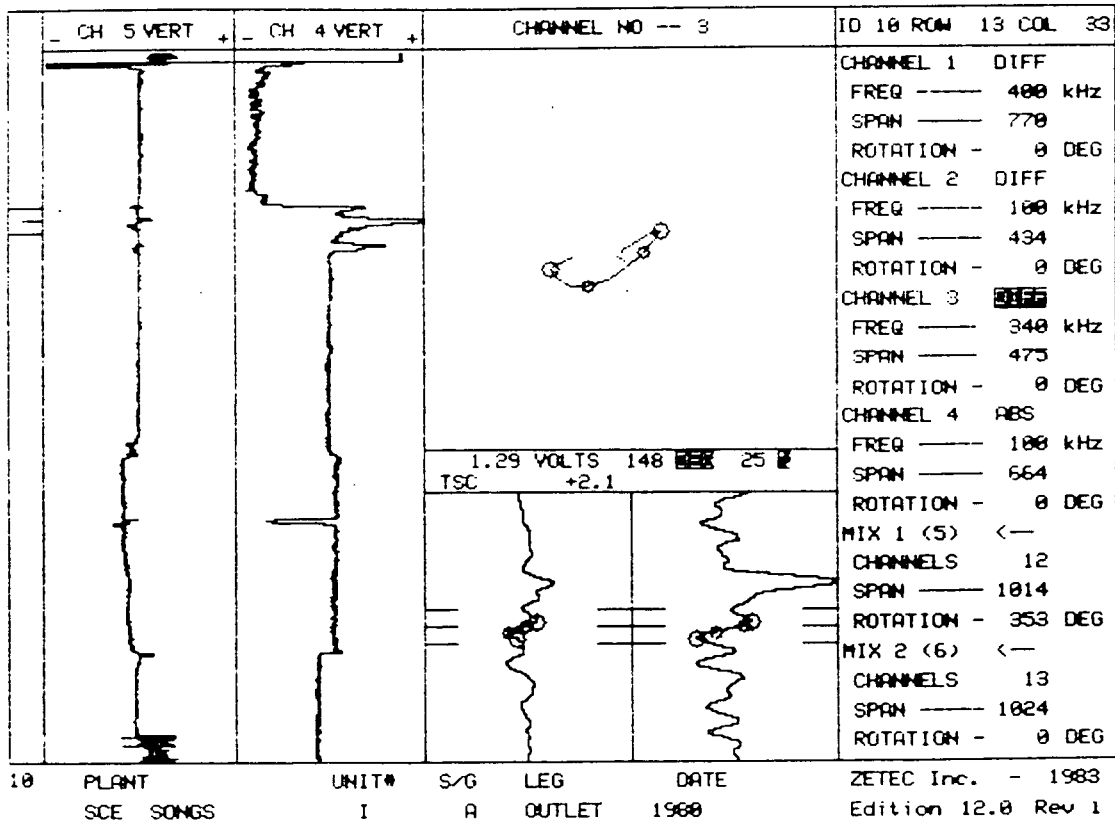
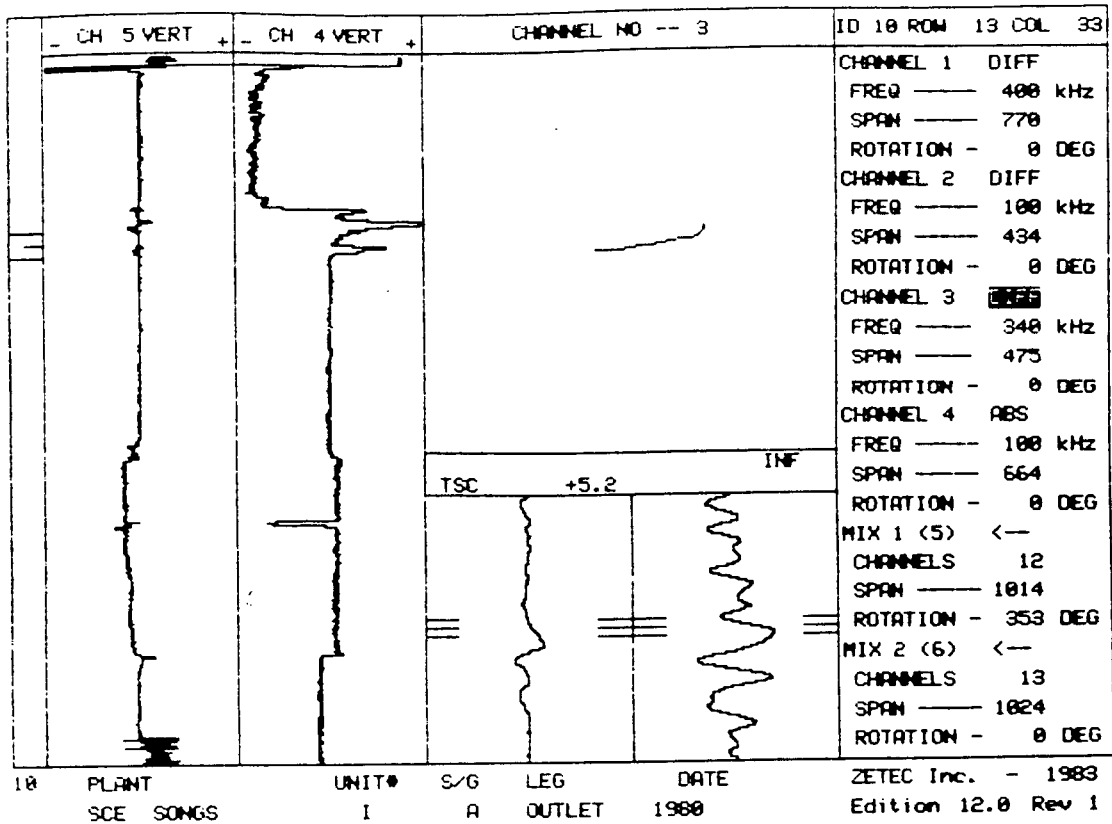
10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    1    A    OUTLET    1980    Edition 12.0 Rev 1

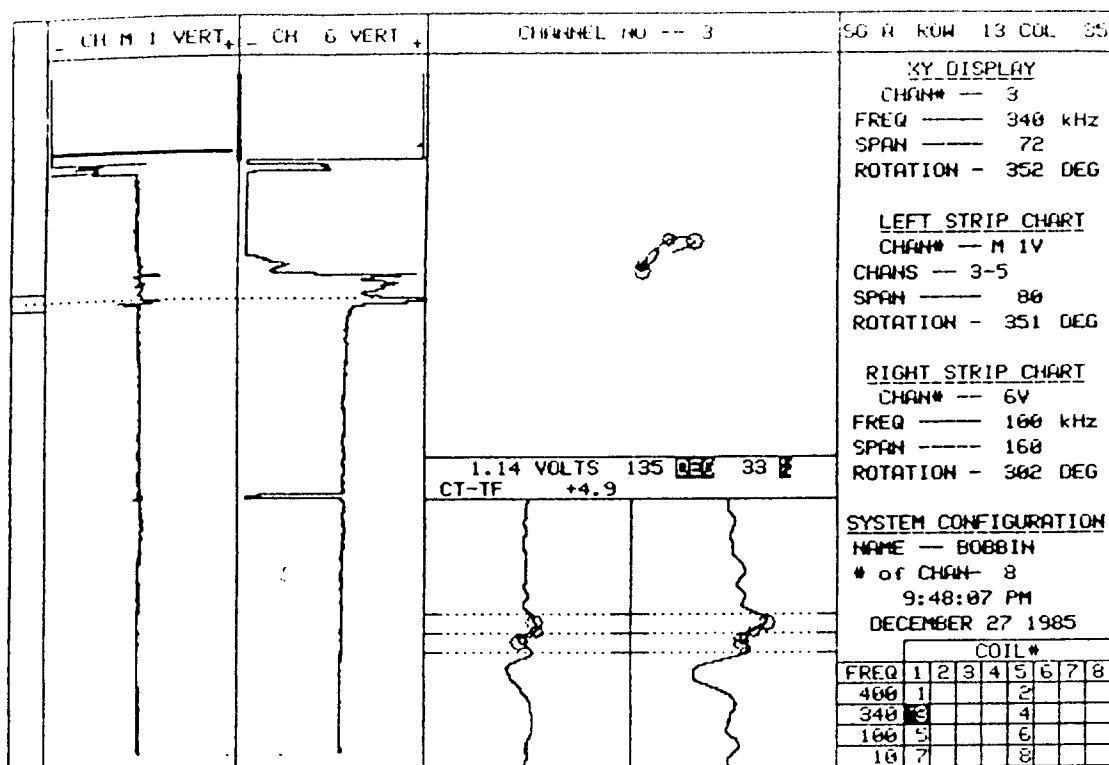


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85

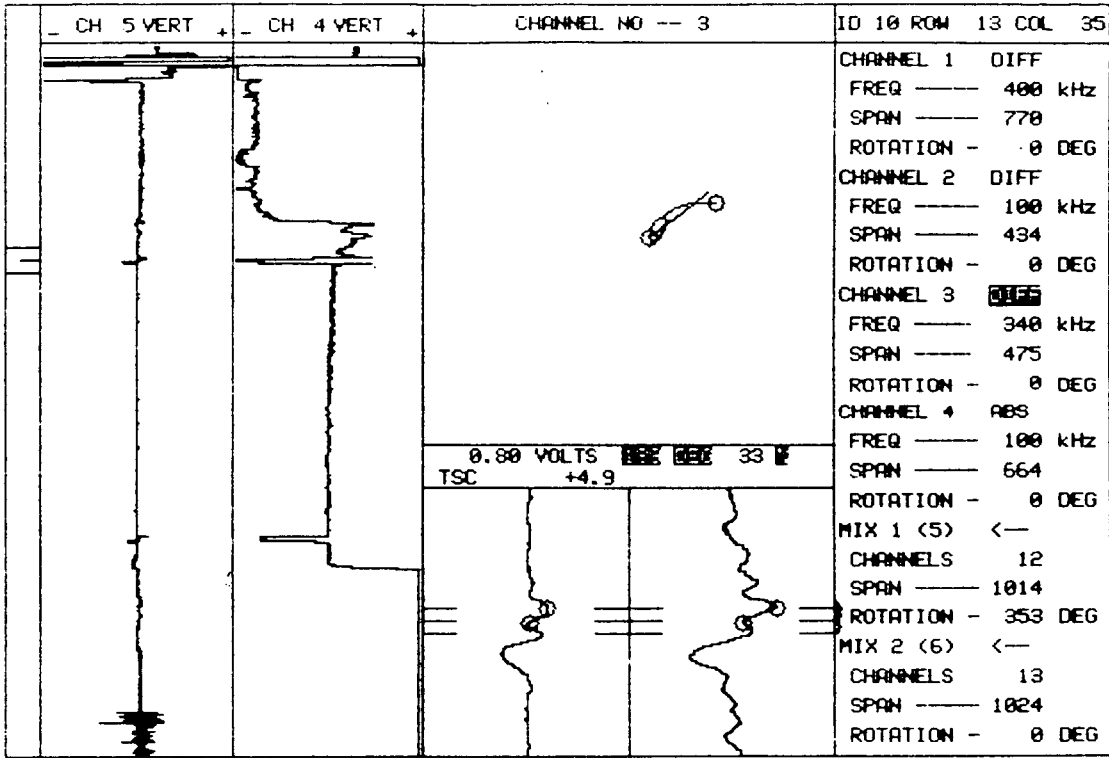


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85



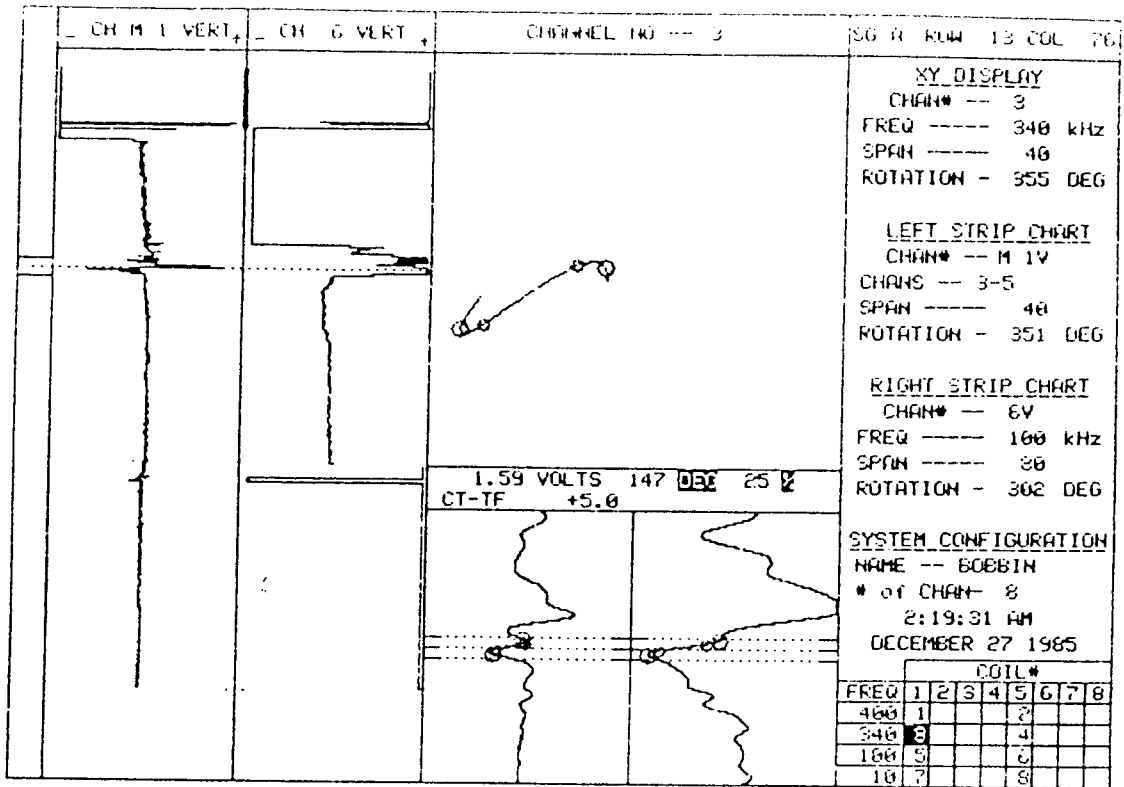


15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

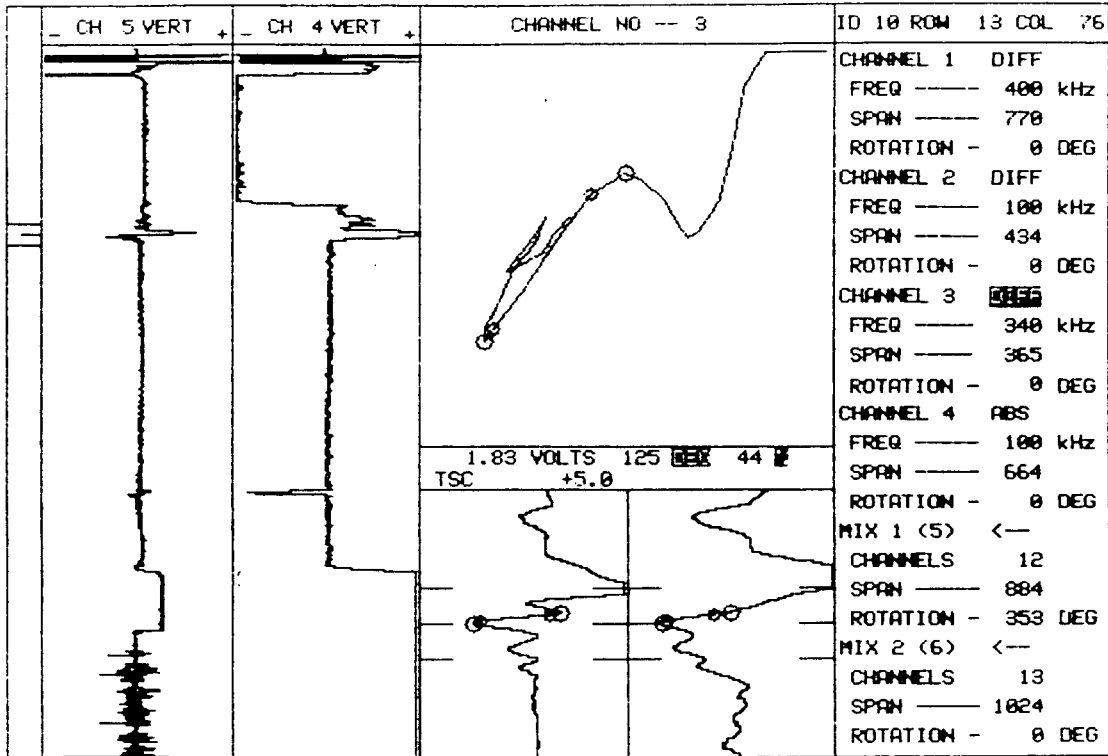


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1





15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C34    1    A    OUTLET    12/26/85



ID 10 ROW 13 COL 76

CHANNEL 1 DIFF  
 FREQ ----- 400 kHz  
 SPAN ----- 770  
 ROTATION - 0 DEG

CHANNEL 2 DIFF  
 FREQ ----- 100 kHz  
 SPAN ----- 434  
 ROTATION - 0 DEG

CHANNEL 3 ~~DIFF~~  
 FREQ ----- 340 kHz  
 SPAN ----- 365  
 ROTATION - 0 DEG

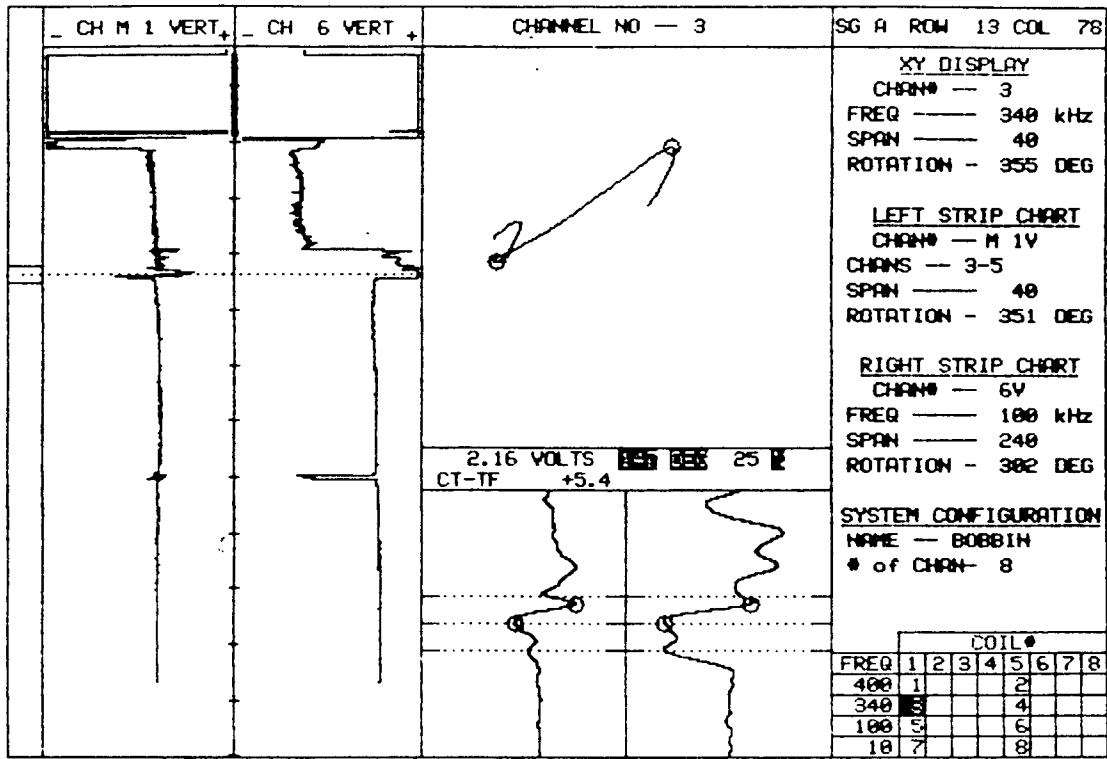
CHANNEL 4 ABS  
 FREQ ----- 100 kHz  
 SPAN ----- 664  
 ROTATION - 0 DEG

MIX 1 (5) <--  
 CHANNELS 12  
 SPAN ----- 884  
 ROTATION - 353 DEG

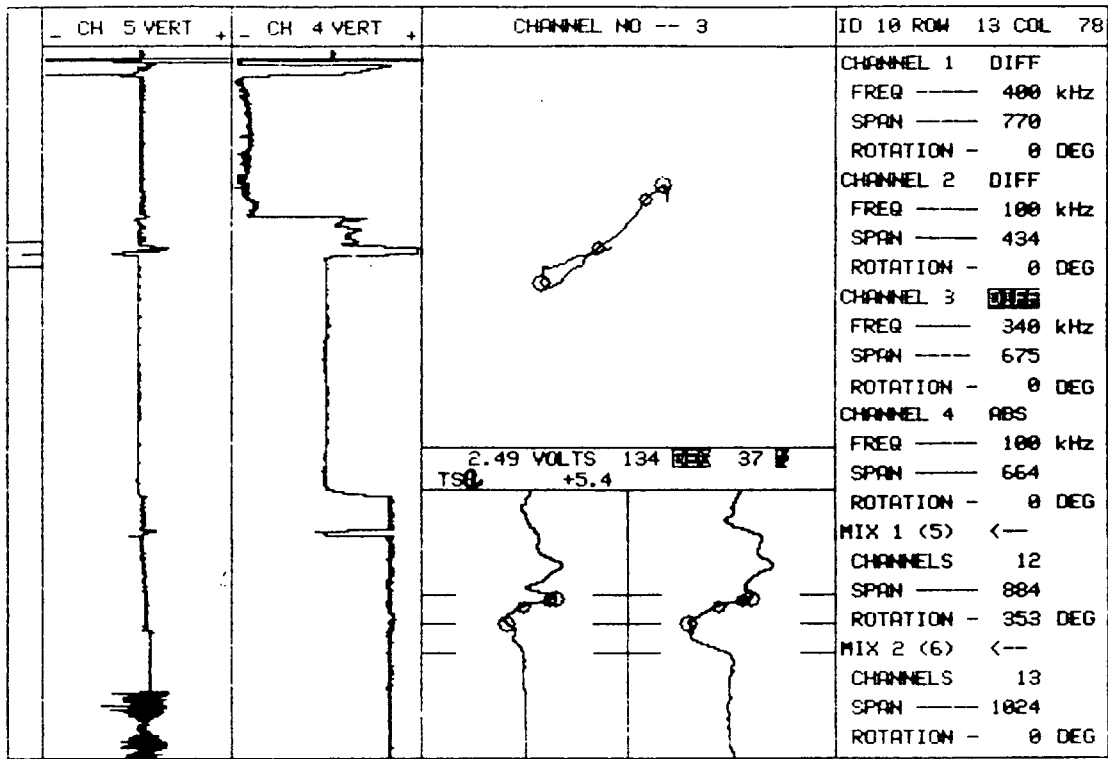
MIX 2 (6) <--  
 CHANNELS 13  
 SPAN ----- 1024  
 ROTATION - 0 DEG

11 PLANT UNIT# S/G LEG DATE  
 SCE SONGS I A OUTLET 1980

ZETEC Inc. - 1983  
 Edition 12.0 Rev 1

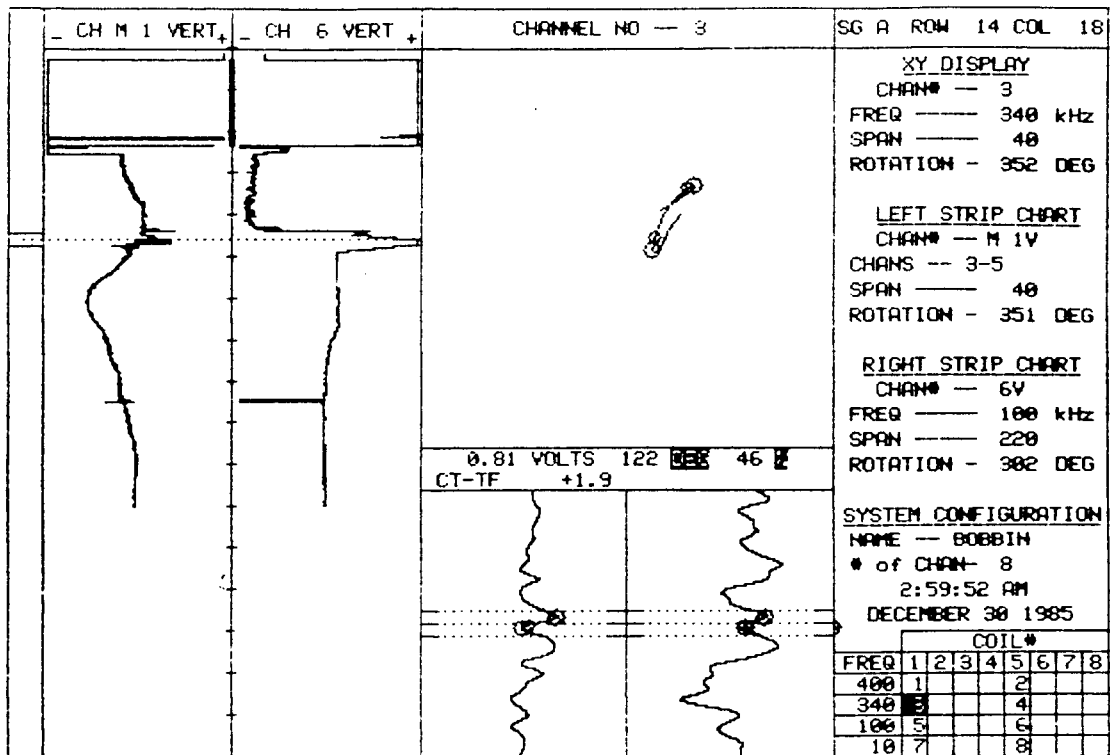


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C34    1    A    OUTLET    12/26/85

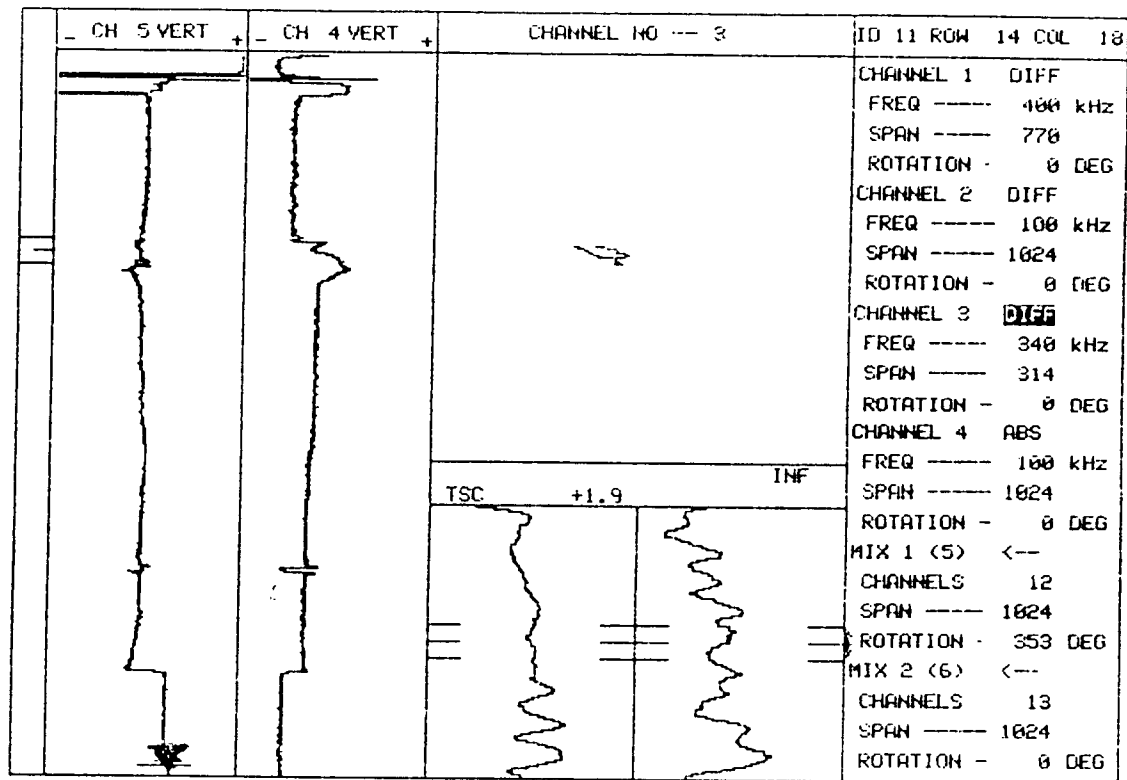


2.49 VOLTS 134 ~~888~~ 37 ~~1~~  
 TSO +5.4

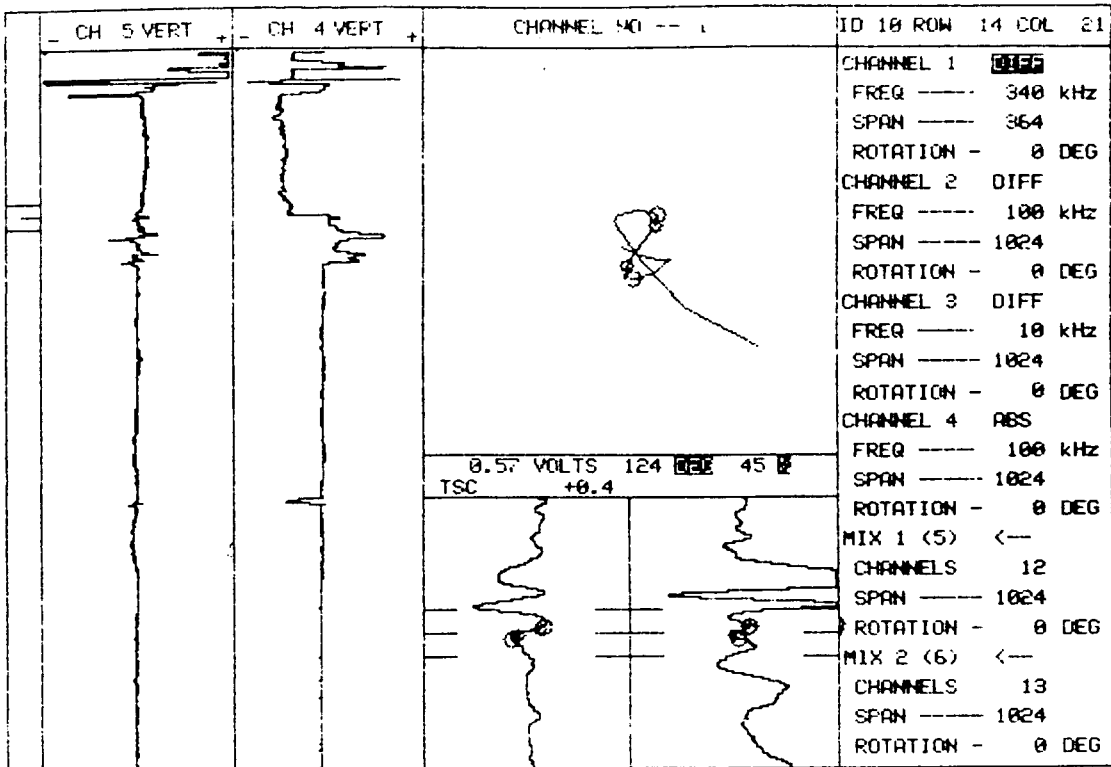
10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



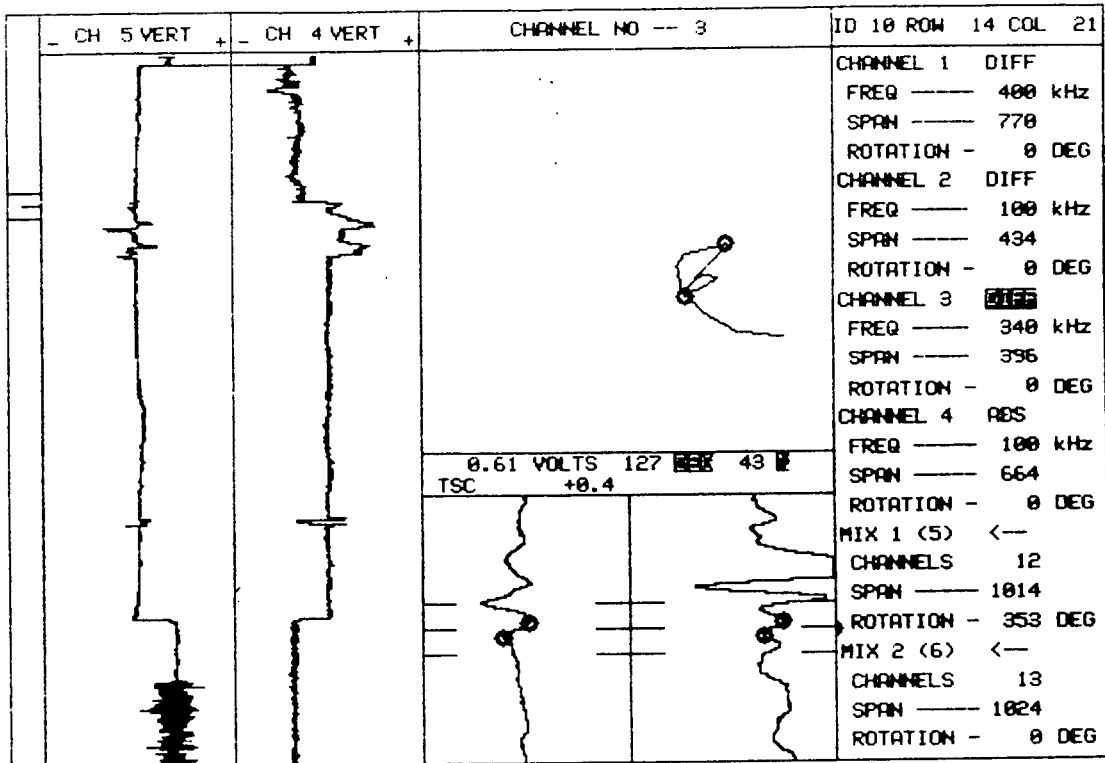
20    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C43    1    A    OUTLET    12/29/85



18    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1

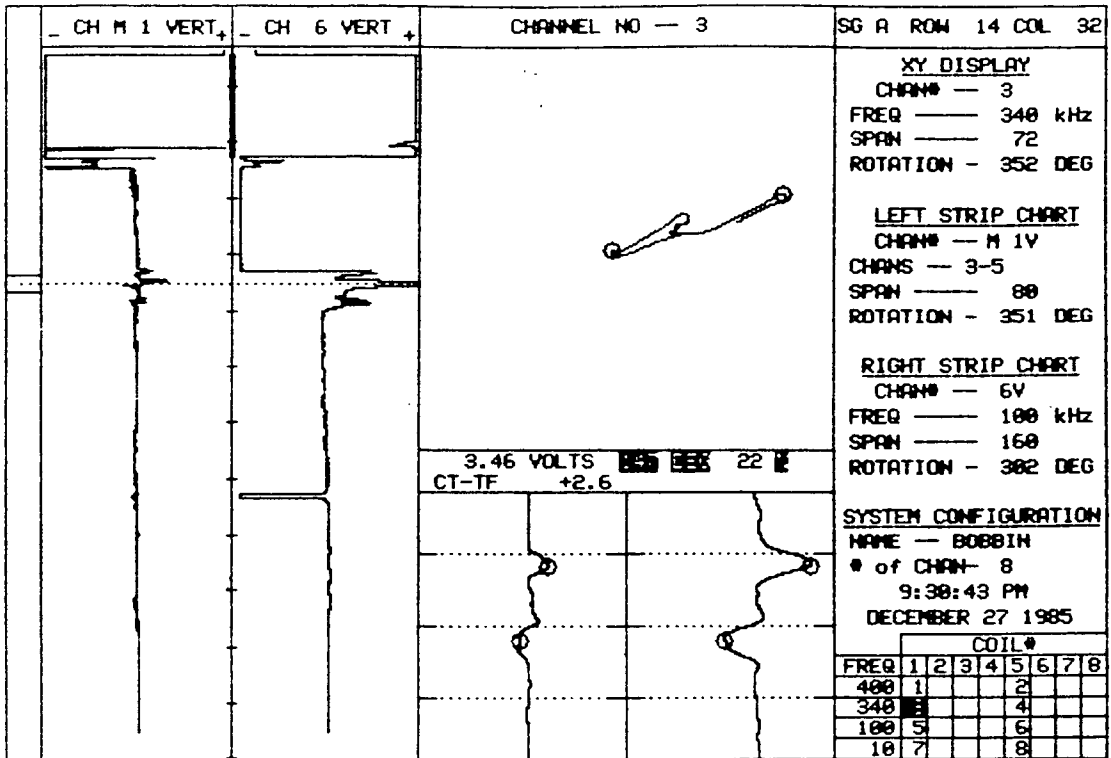


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1984	Edition 12.0 Rev 1

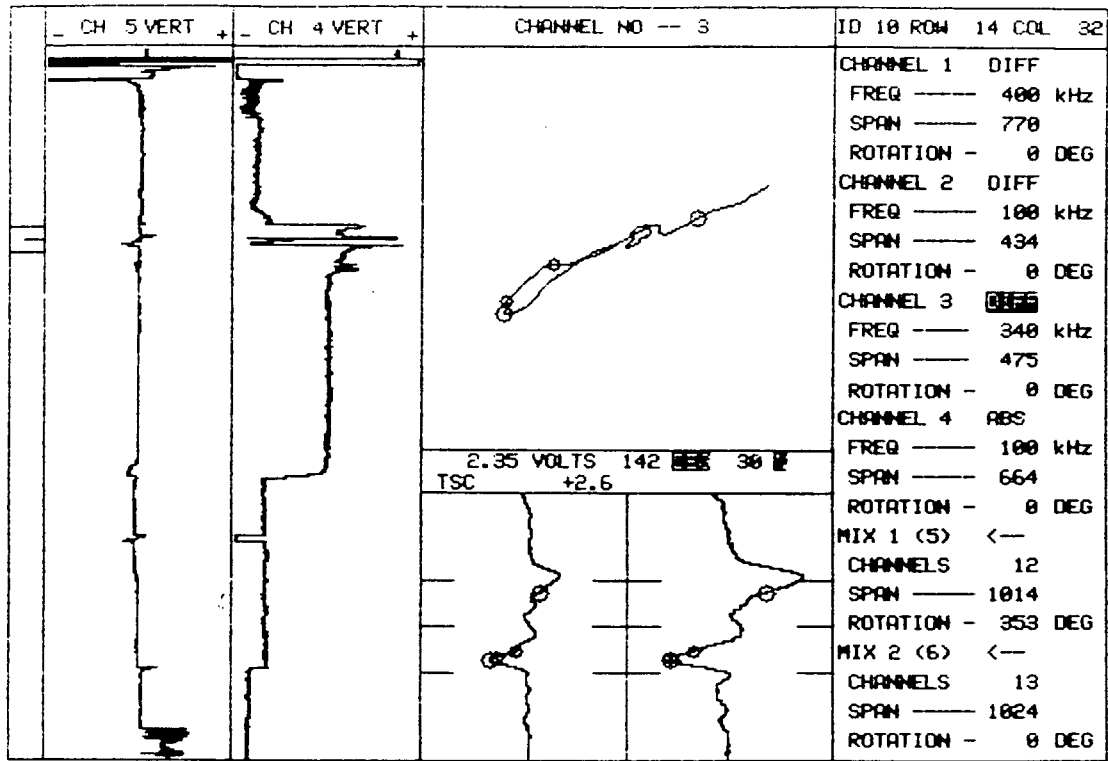


10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1



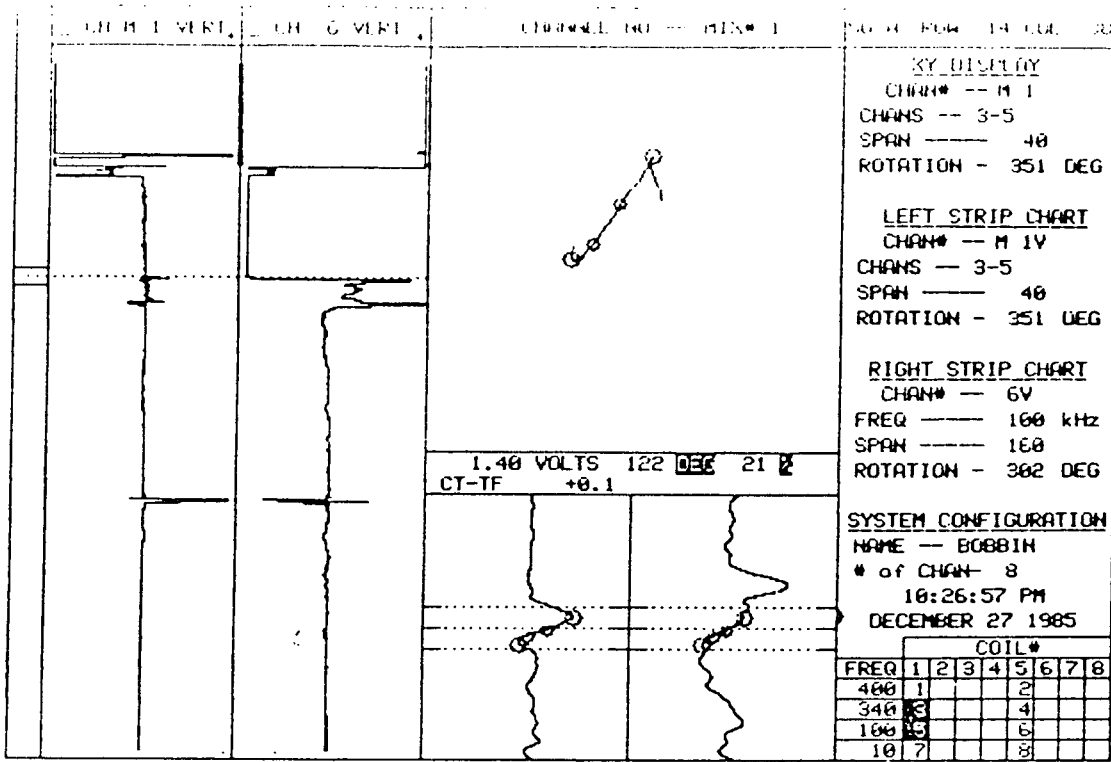


15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

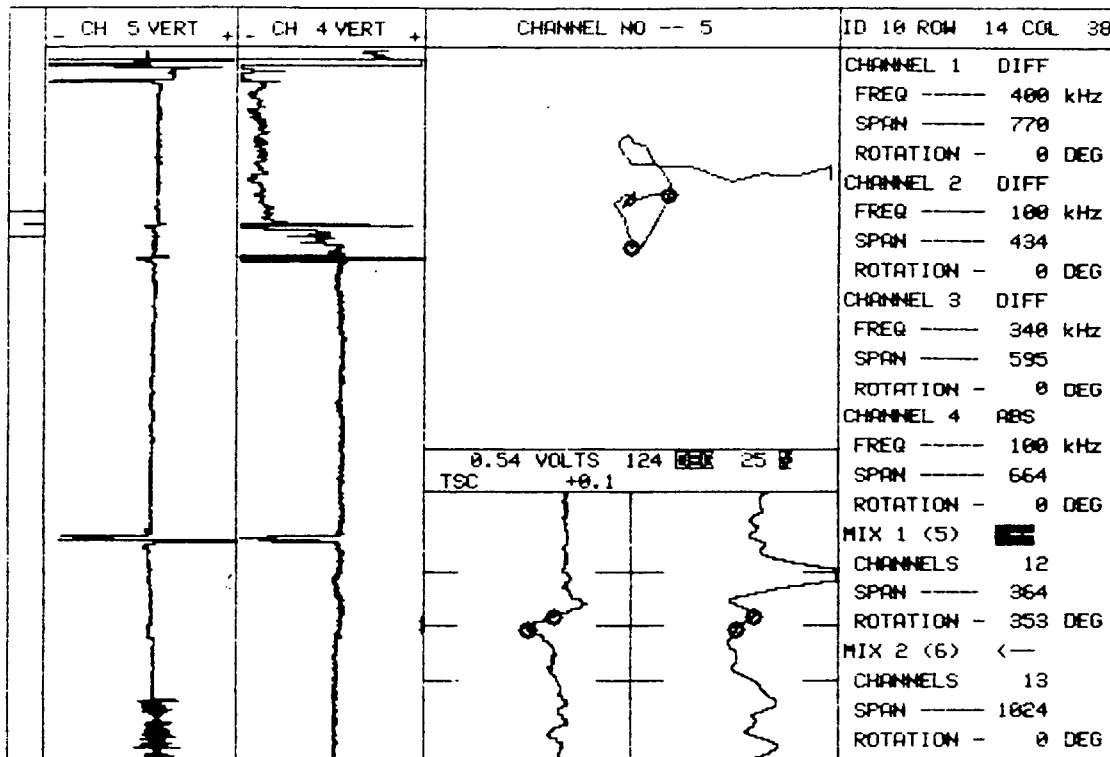


2.35 VOLTS 142 **DES** 30 **W**  
TSC +2.6

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

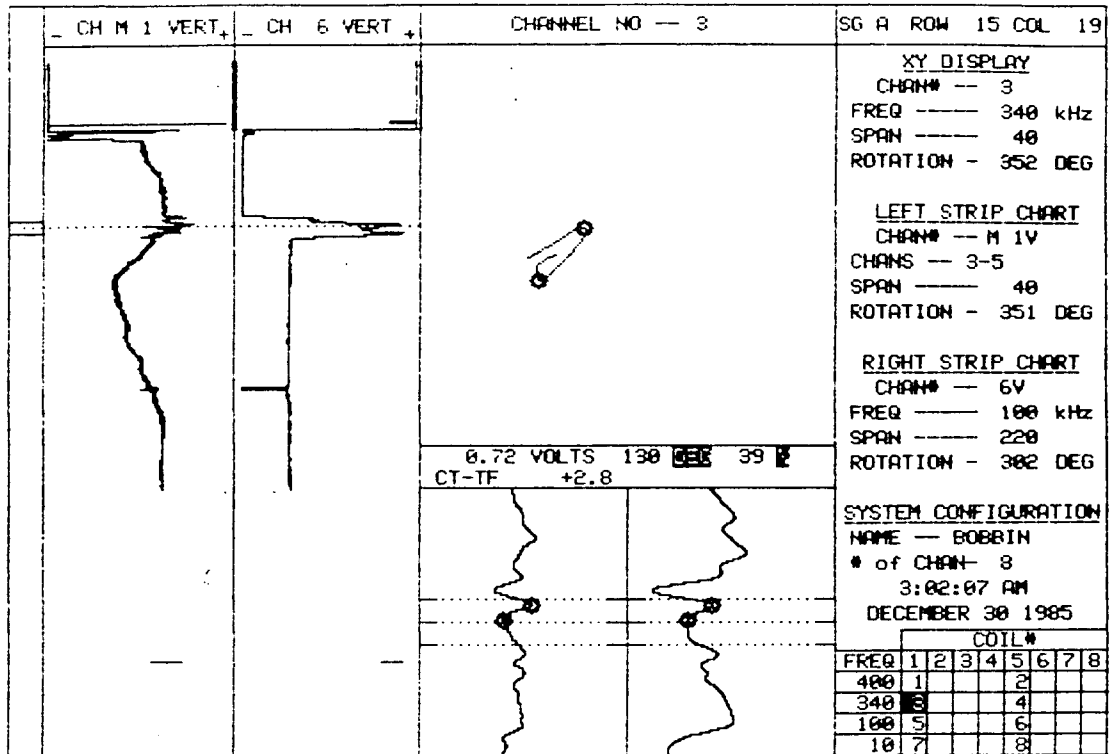


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85

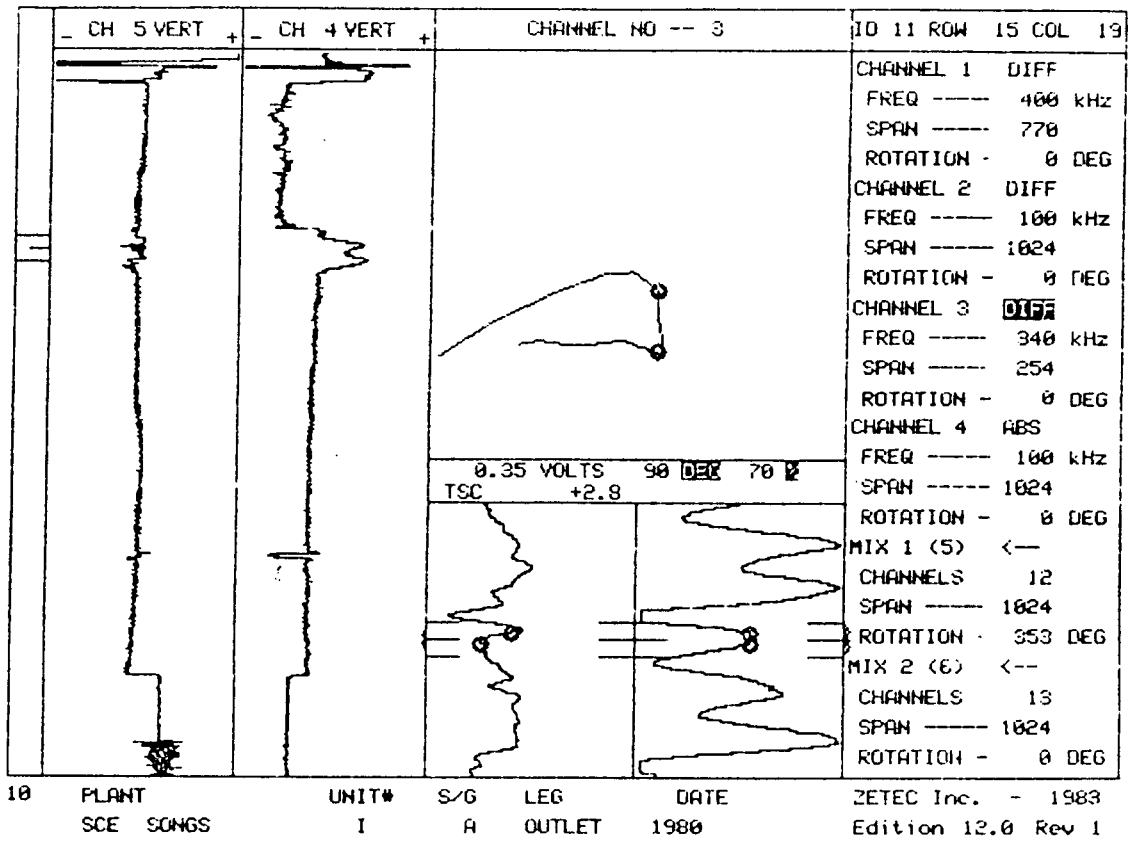


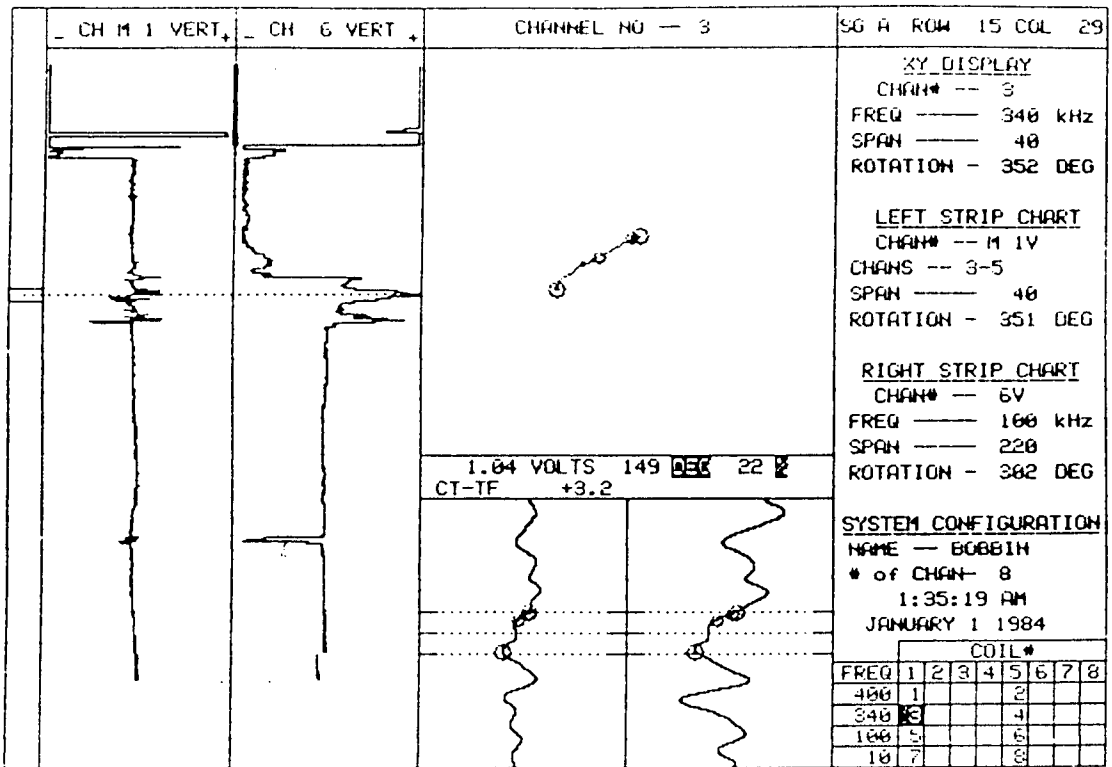
0.54 VOLTS 124 25   
TSC +0.1

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

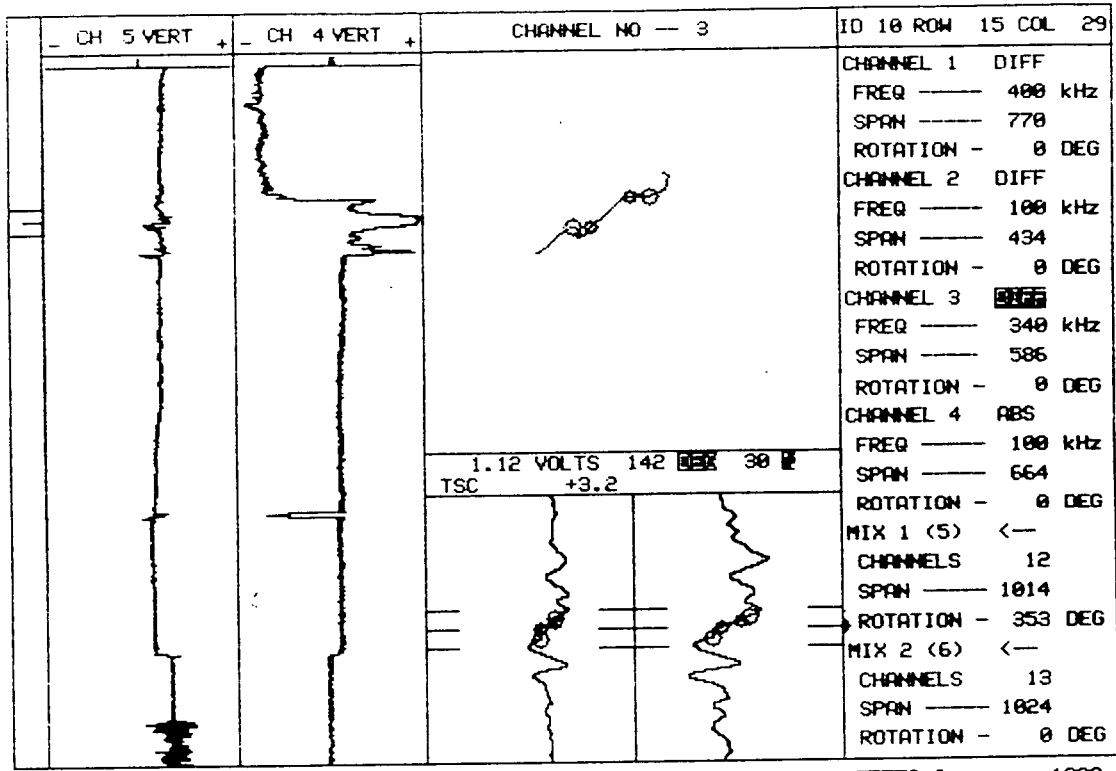


20    PLANT                    UNIT#    S/G    LEG                    DATE  
       SONGS DISK C43        1        A        OUTLET                12/29/85



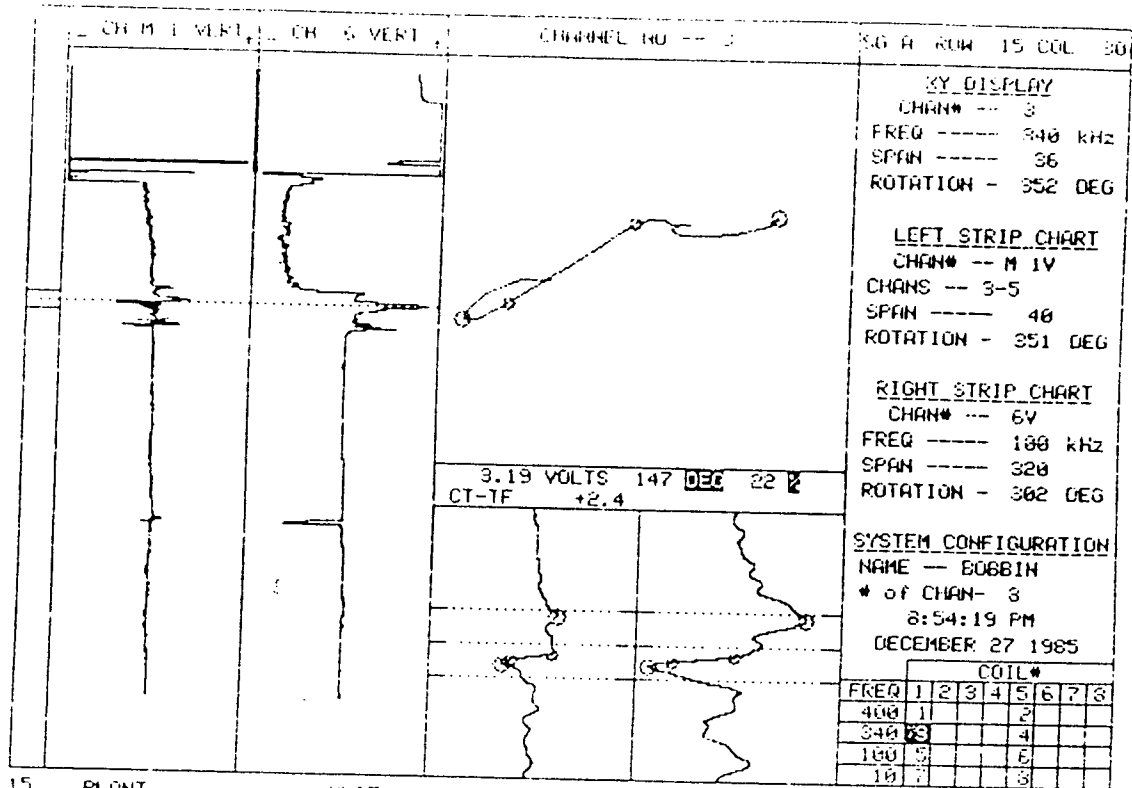


28    PLANT                    UNIT#    S/G    LEG                    DATE  
      SONGS DISK C40        1        A        OUTLET                12/29/85

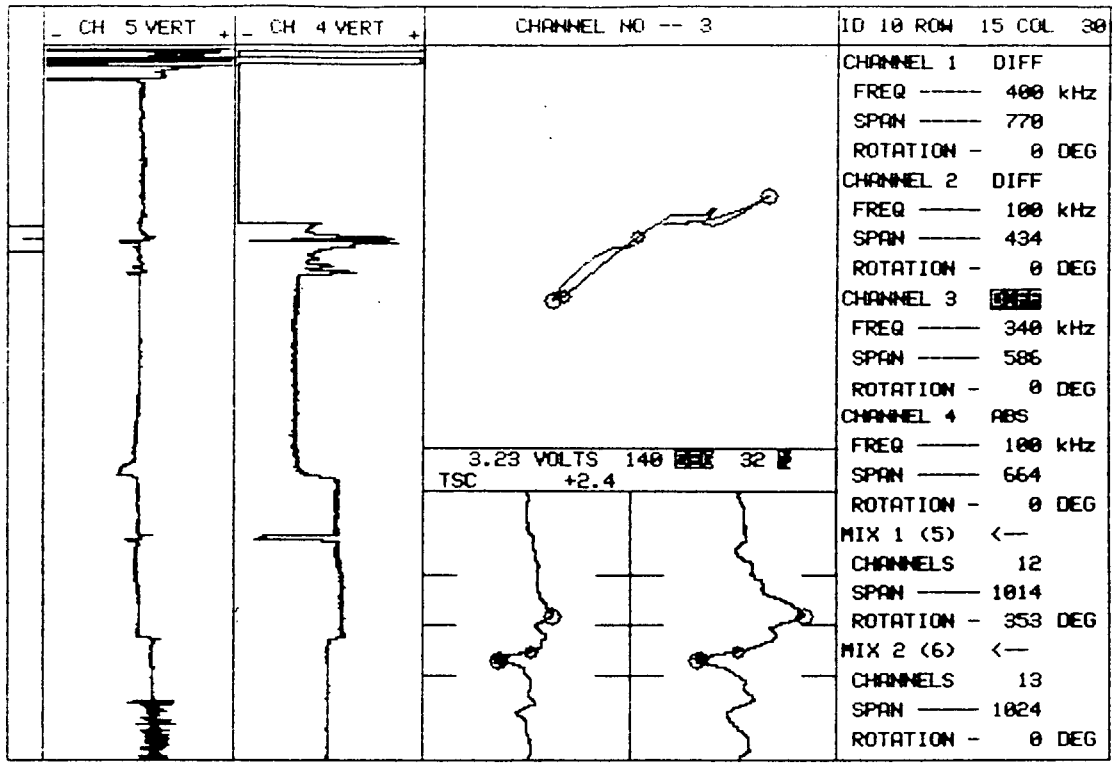


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

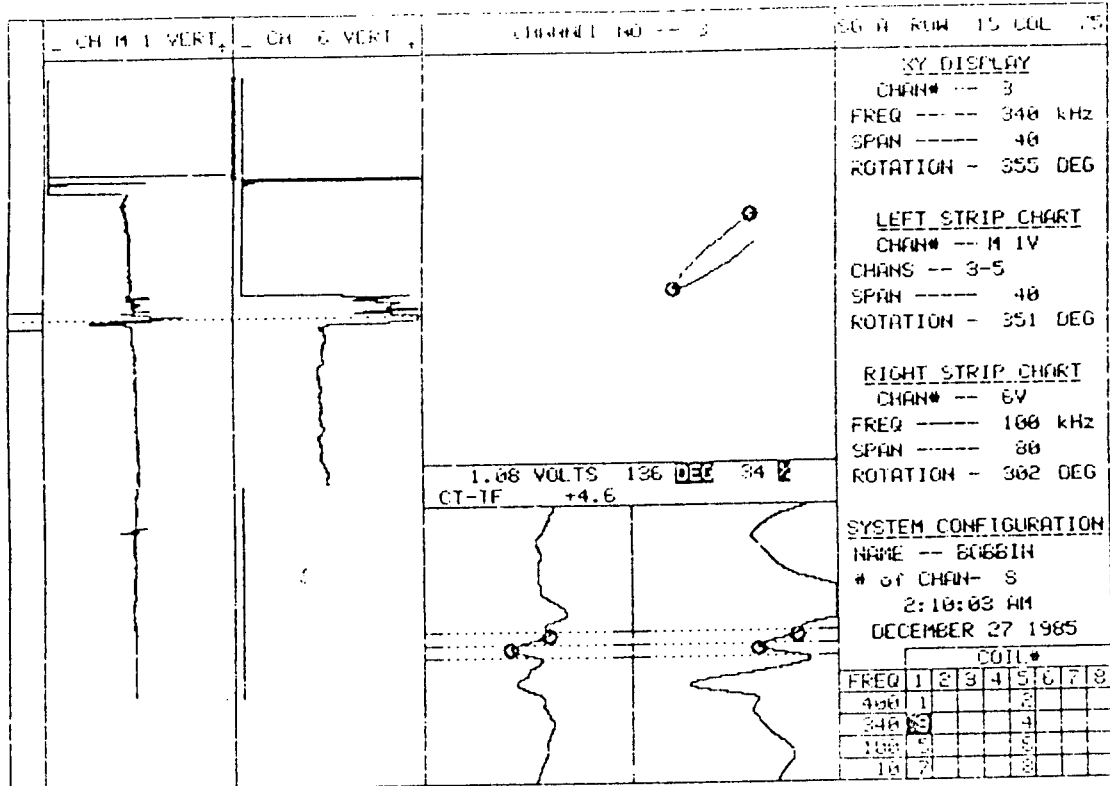




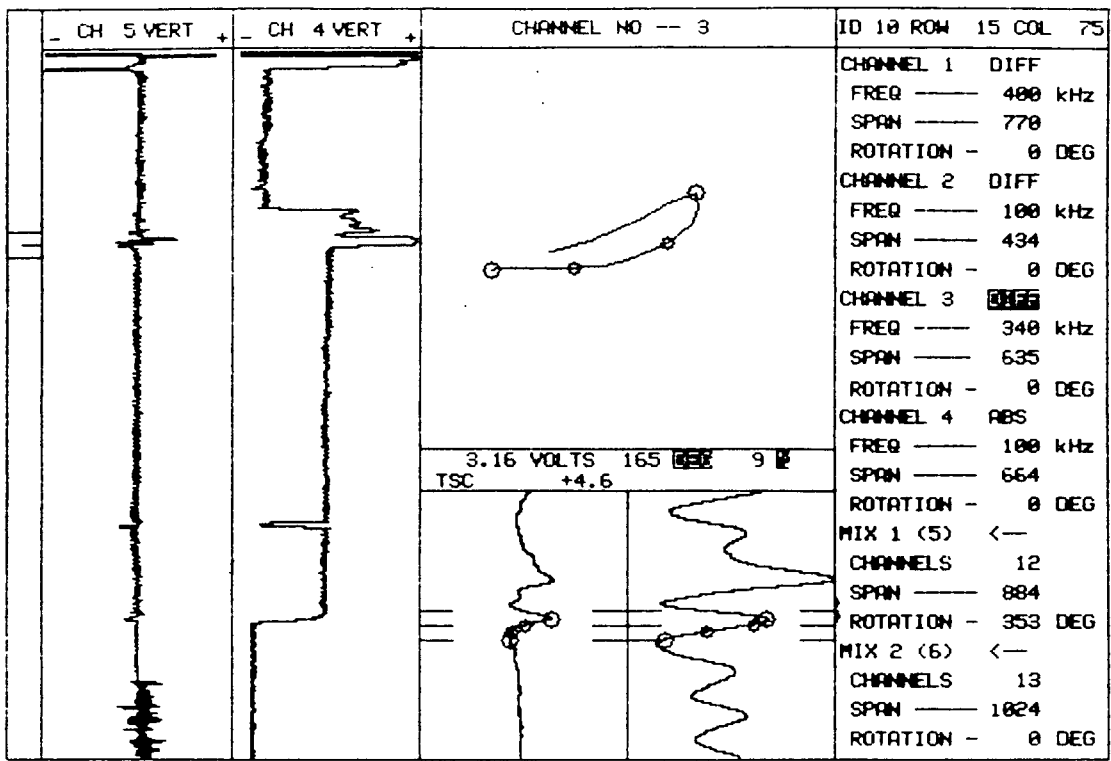
15 PLANT UNIT# S/G LEG DATE  
 SCMS DISK 036 1 A OUTLET 12/27/85



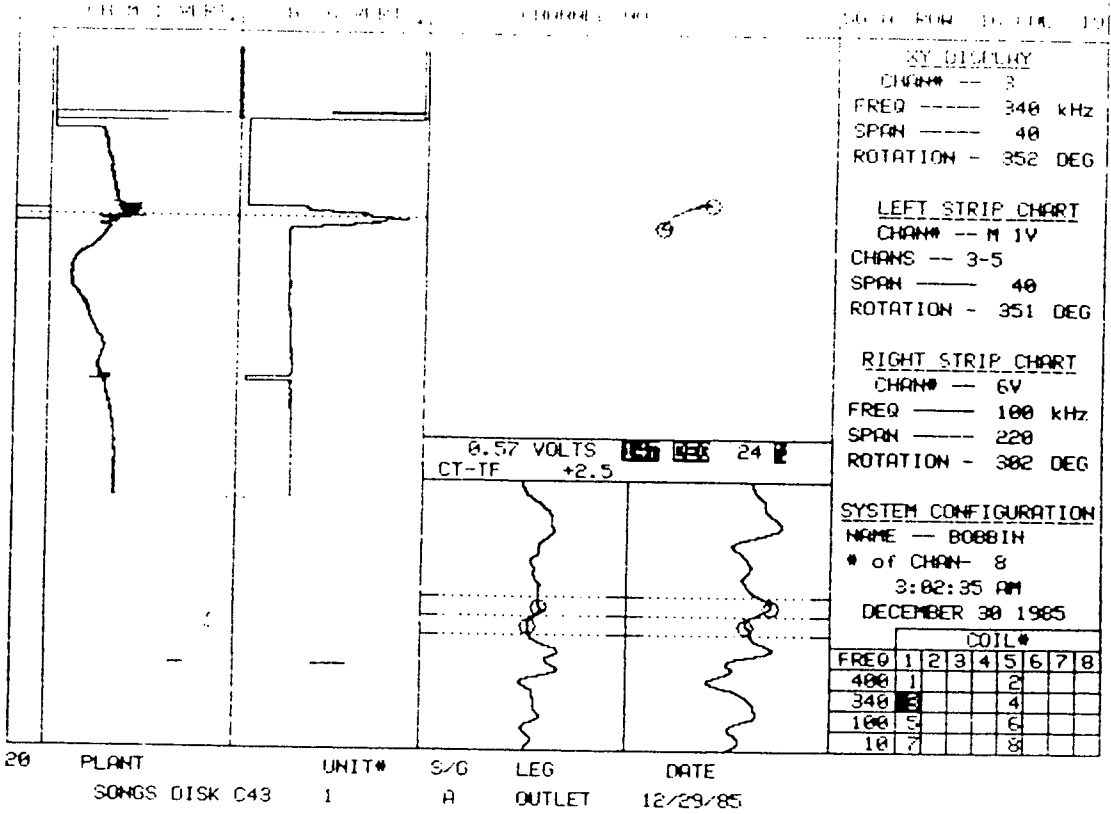
10 PLANT SCE SONGS UNIT# I S/G A LEG A OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

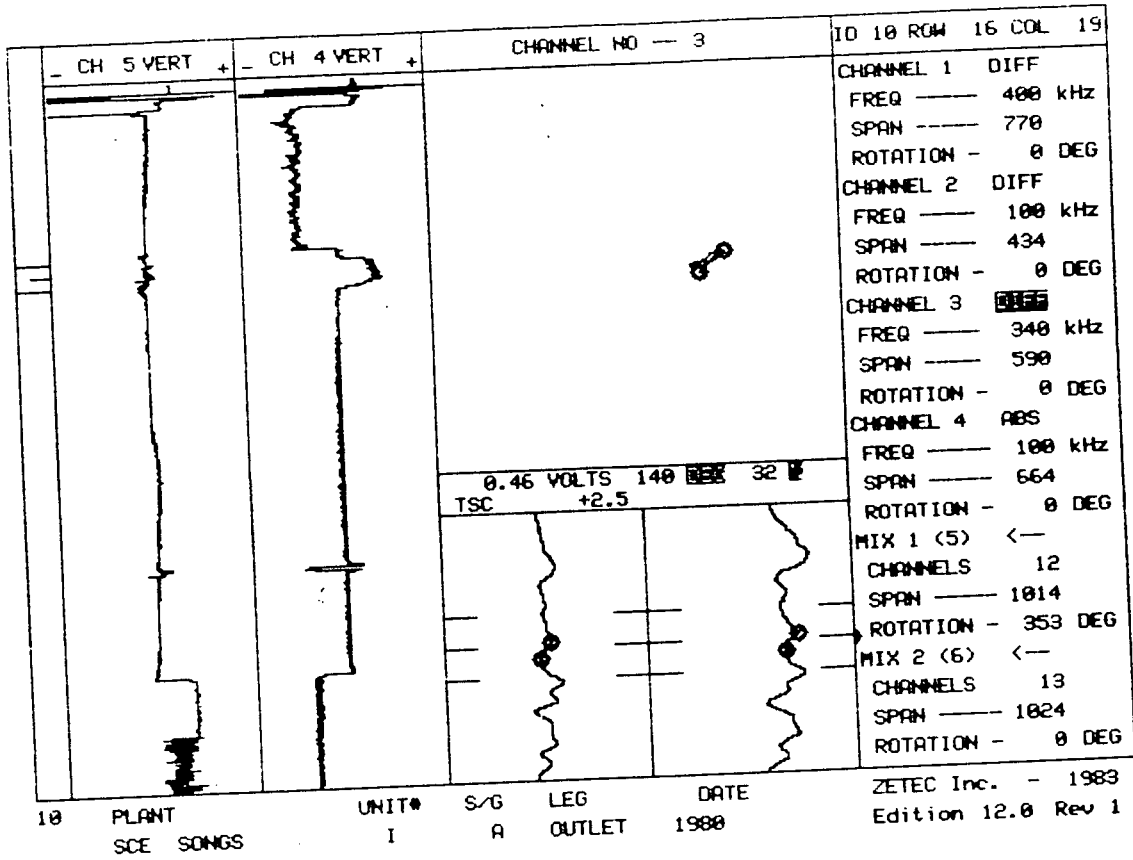


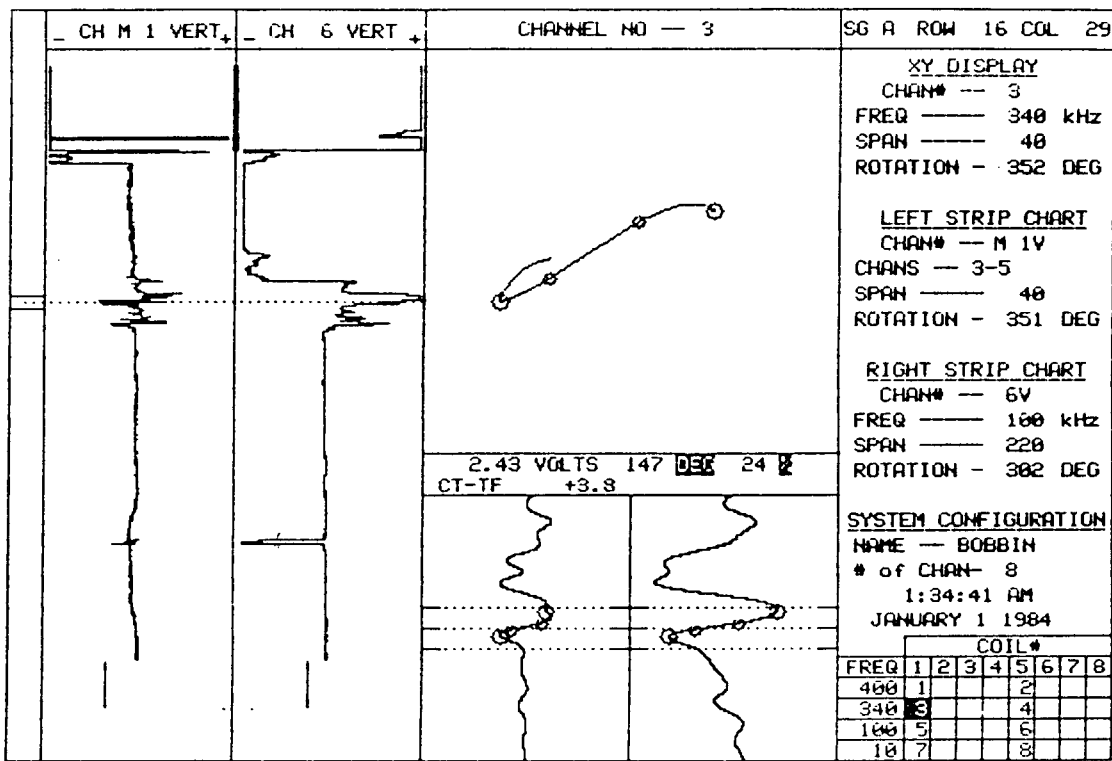
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C34    1    A    OUTLET    12/26/85



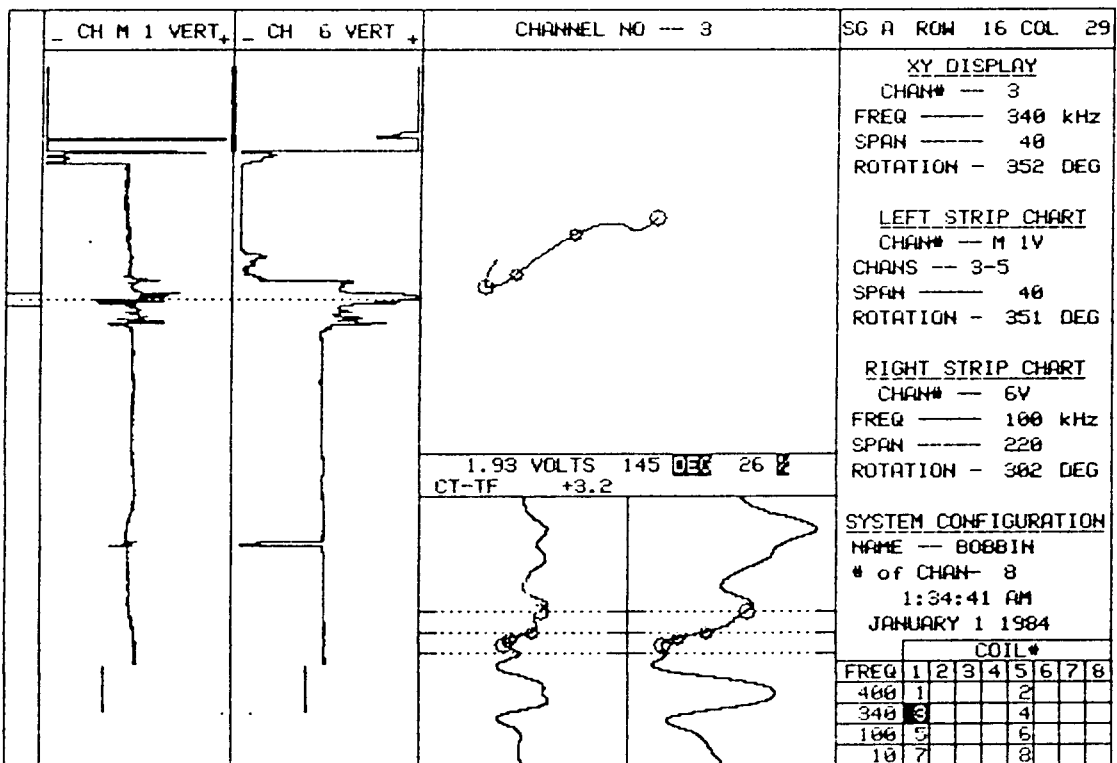
10 PLANT UNIT# S/G LEG DATE ZETEC Inc. - 1983  
 SCE SONGS I A OUTLET 1980 Edition 12.0 Rev 1



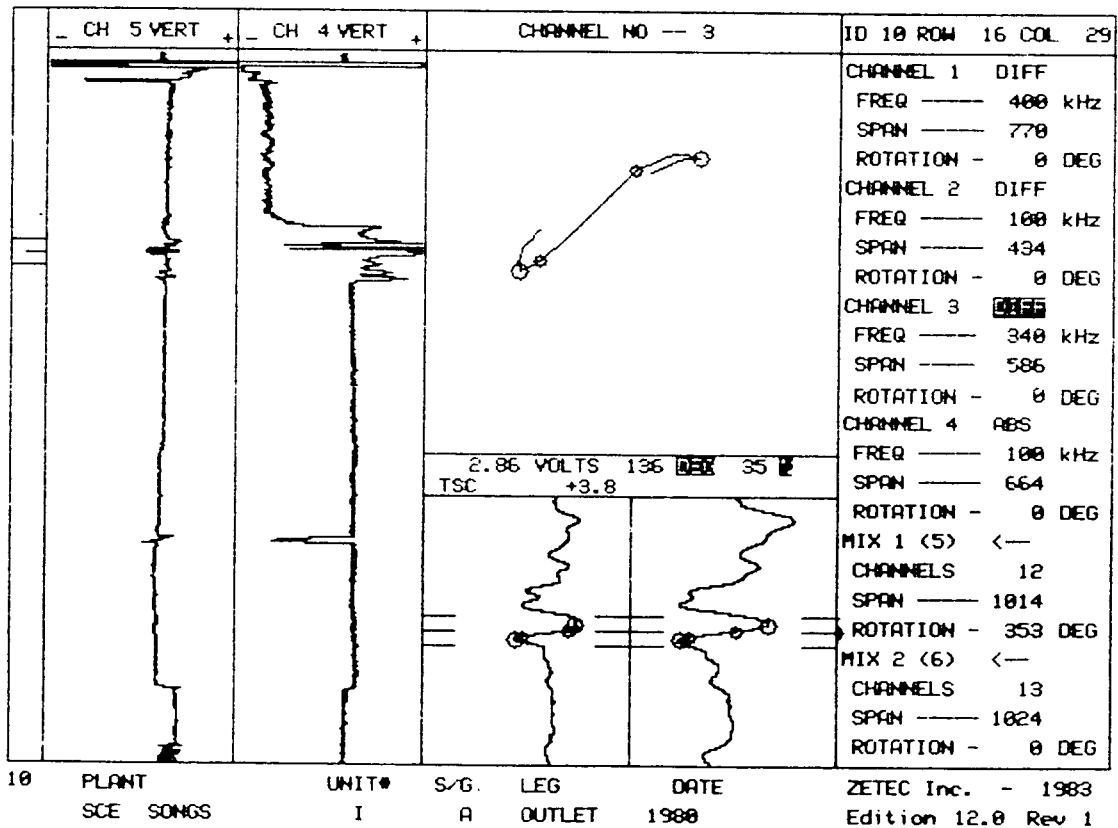
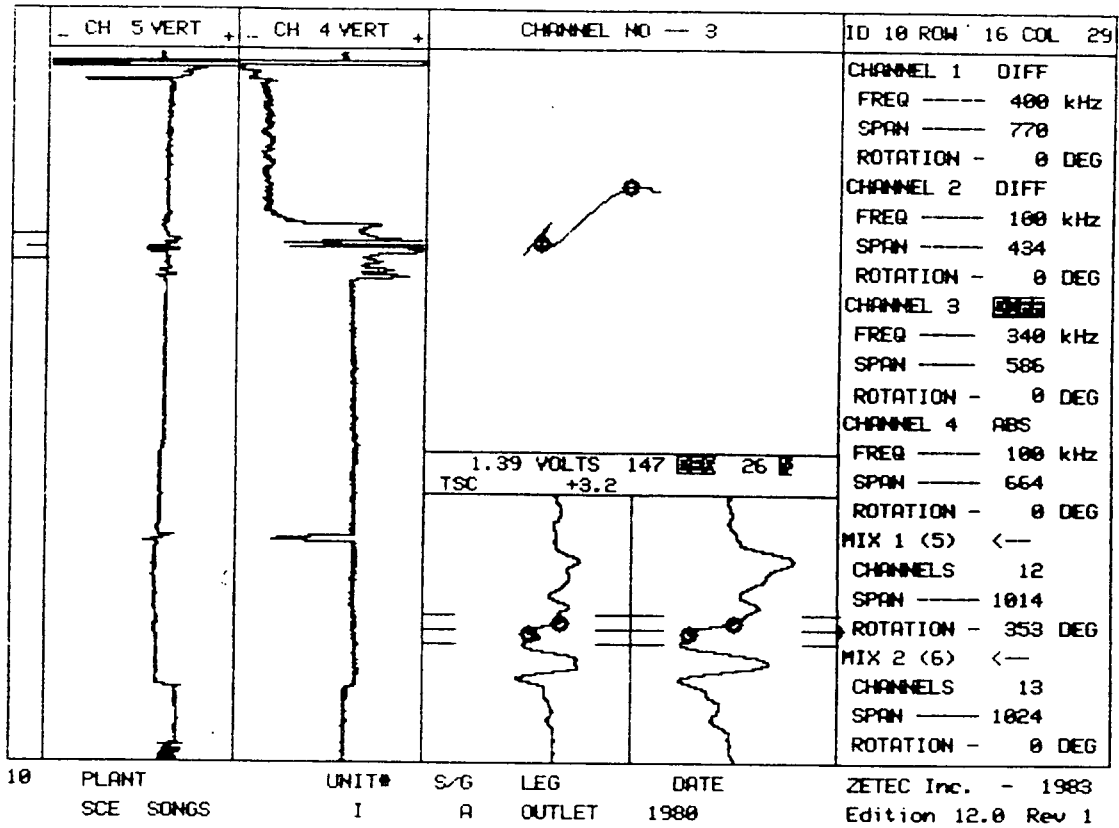




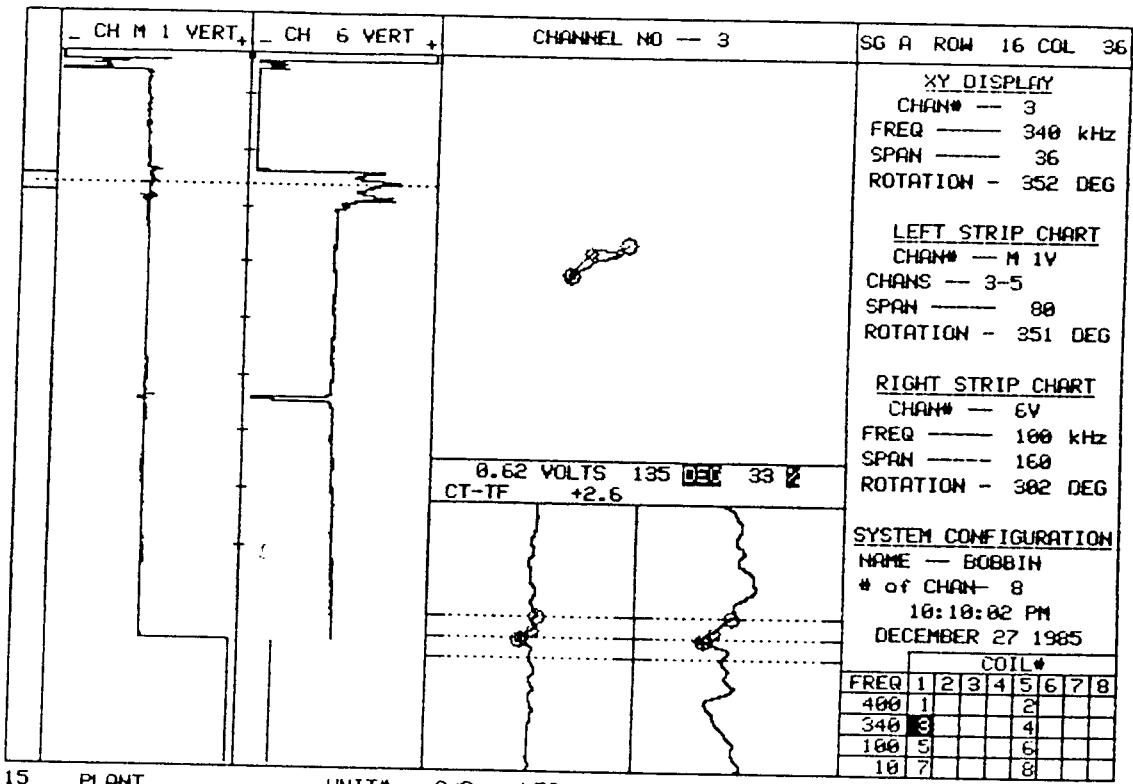
20 PLANT SONGS DISK C40 UNIT# 1 S/G A LEG OUTLET DATE 12/29/85



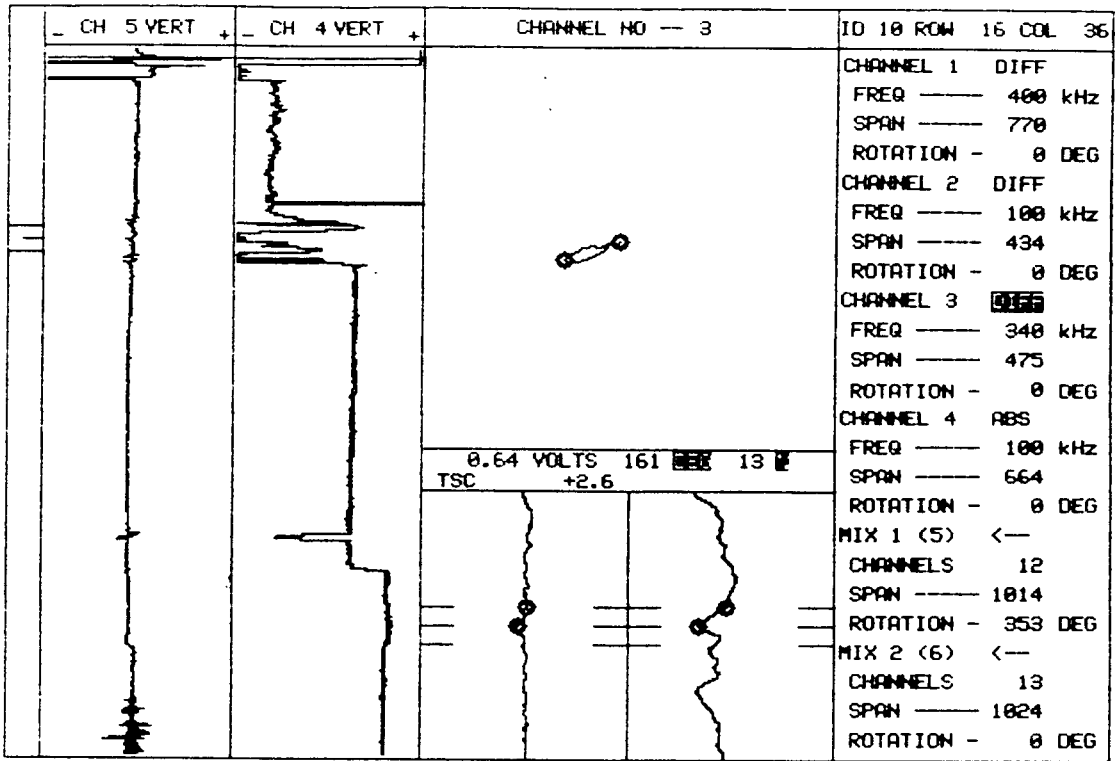
20 PLANT SONGS DISK C40 UNIT# 1 S/G A LEG OUTLET DATE 12/29/85



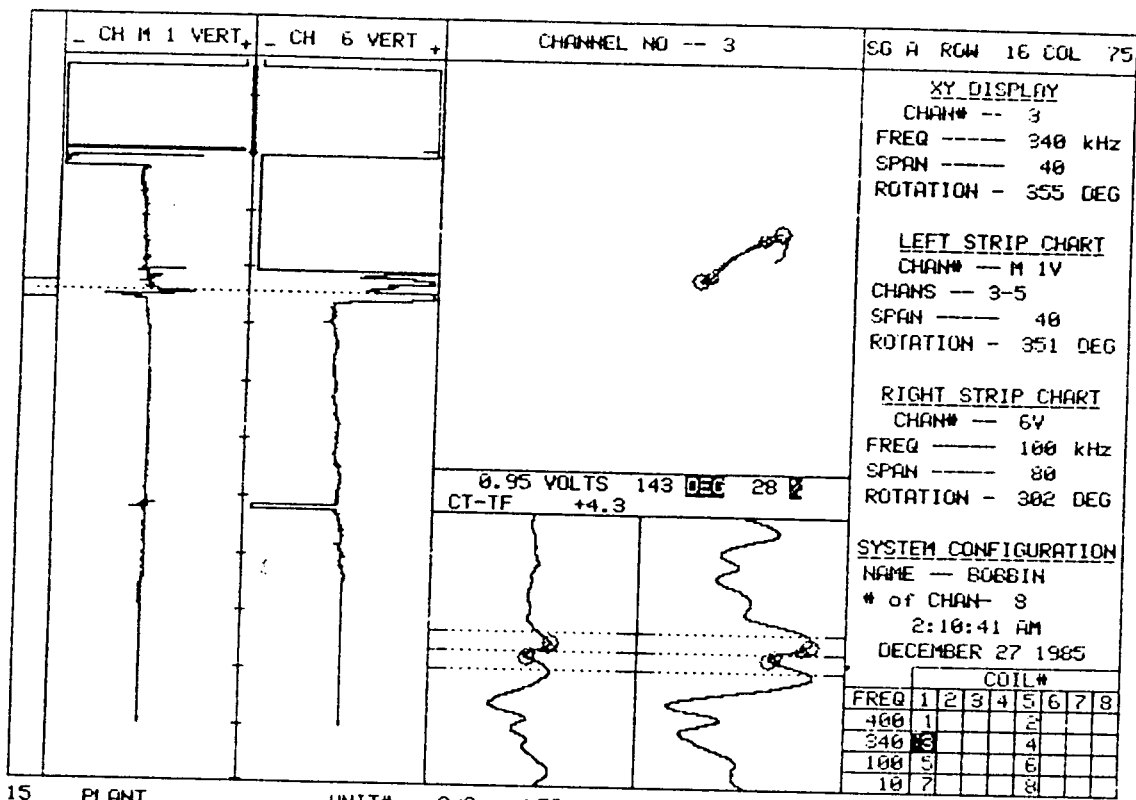




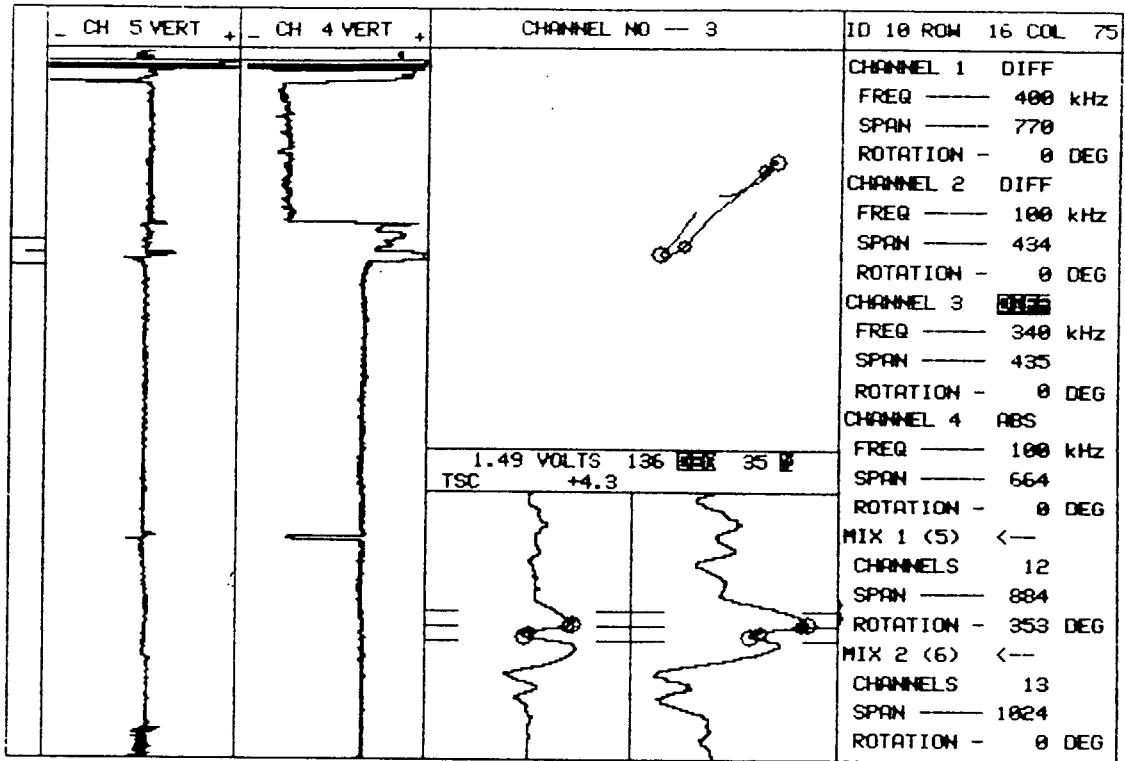
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

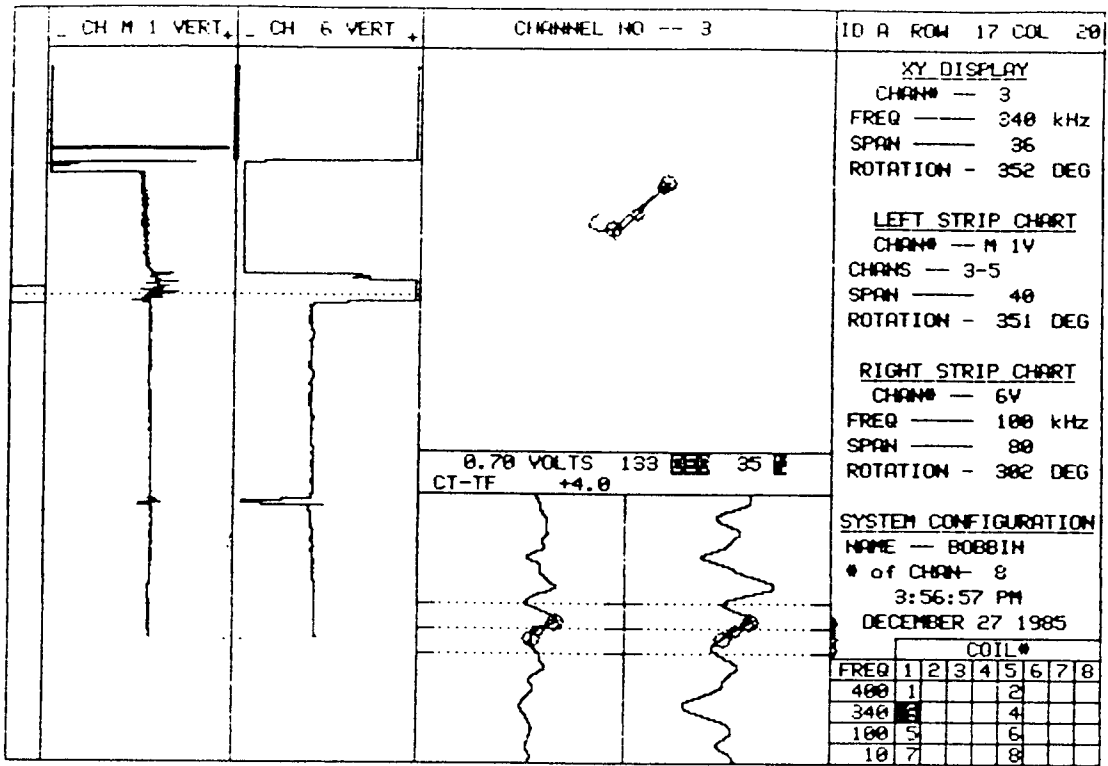


15    PLANT                      UNIT#    S/G    LEG                      DATE  
      SONGS DISK C34            1        R        OUTLET                  12/26/85

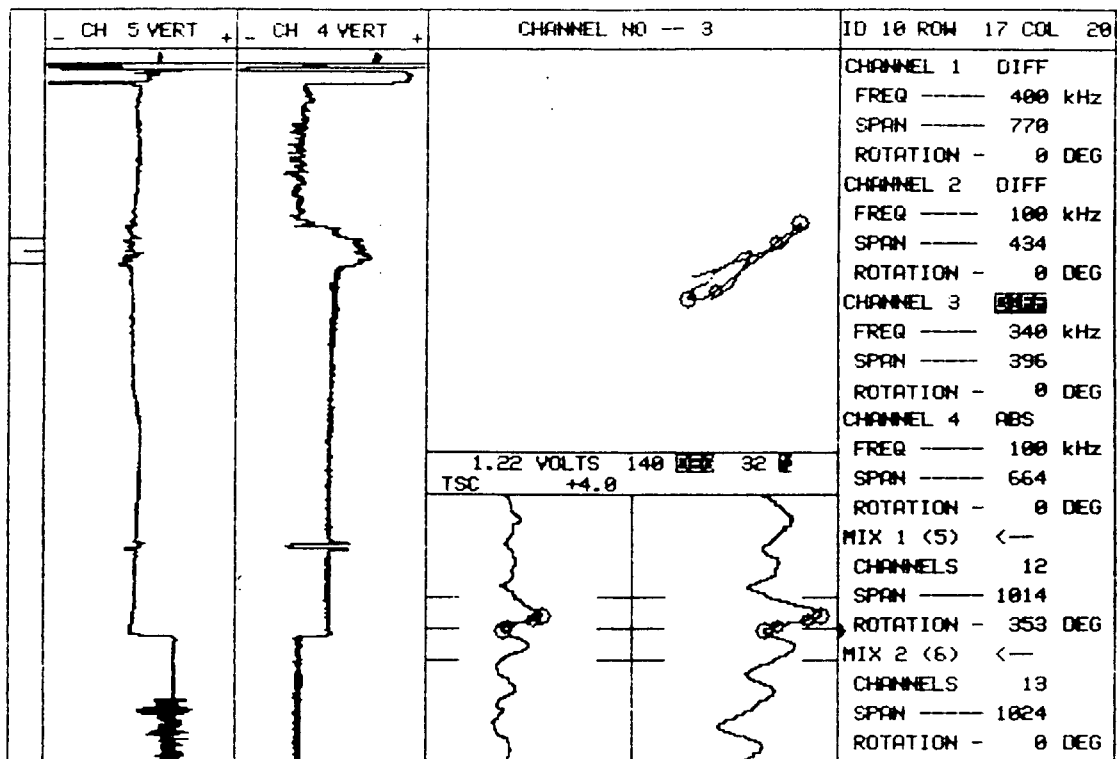


18 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980

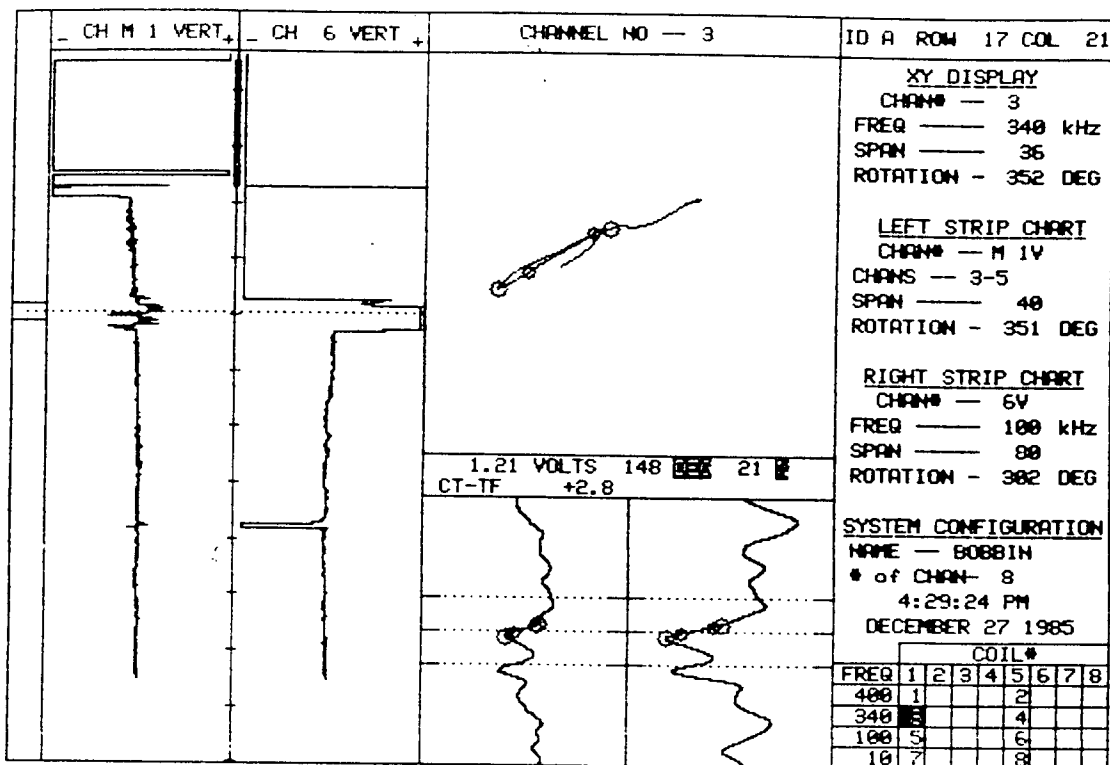
ZETEC Inc. - 1983  
Edition 12.0 Rev 1



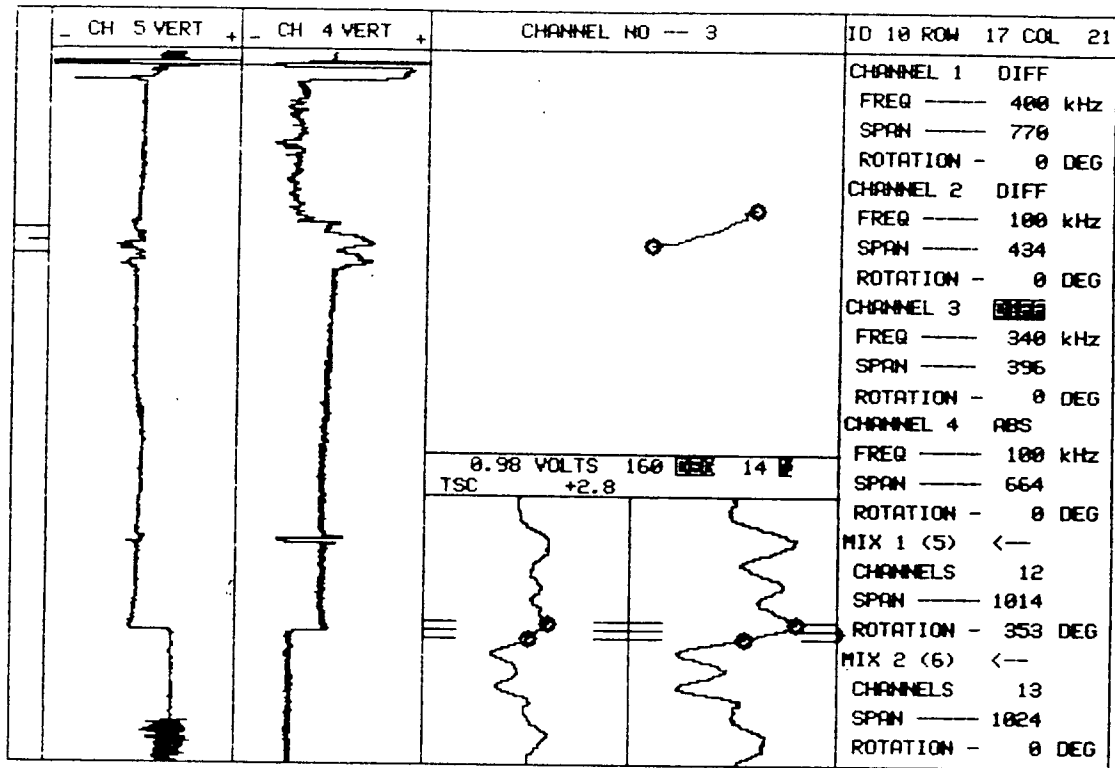
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG A DATE 12/27/85



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



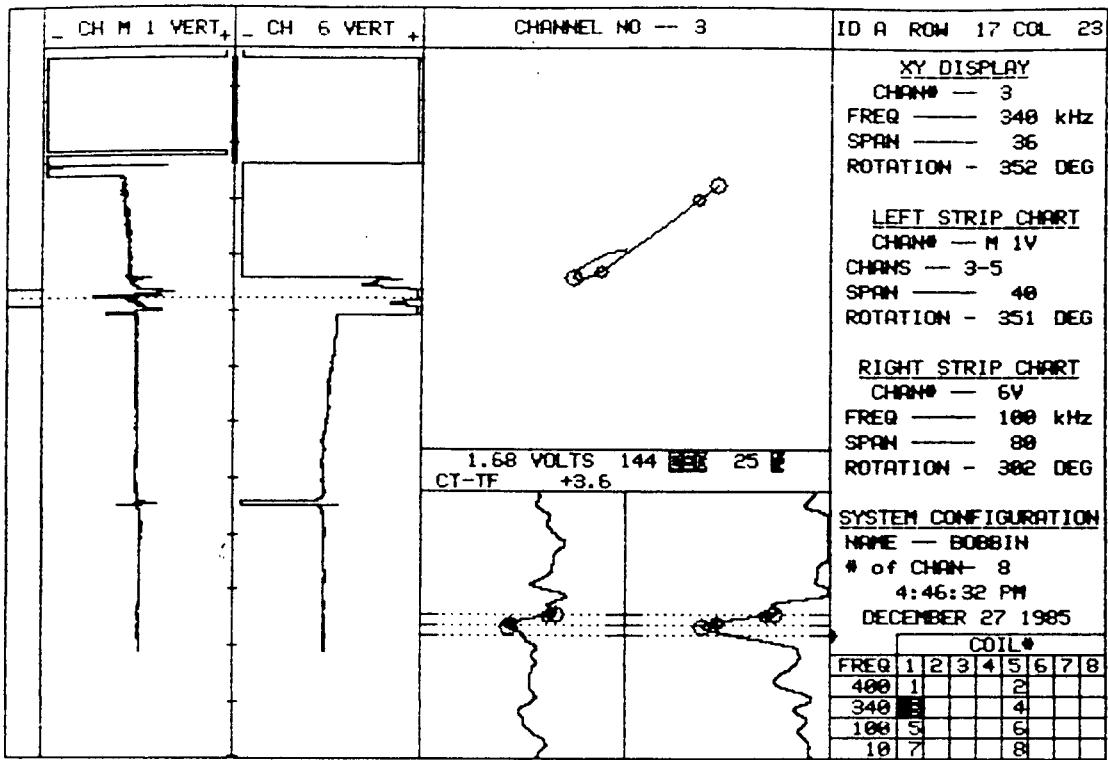
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



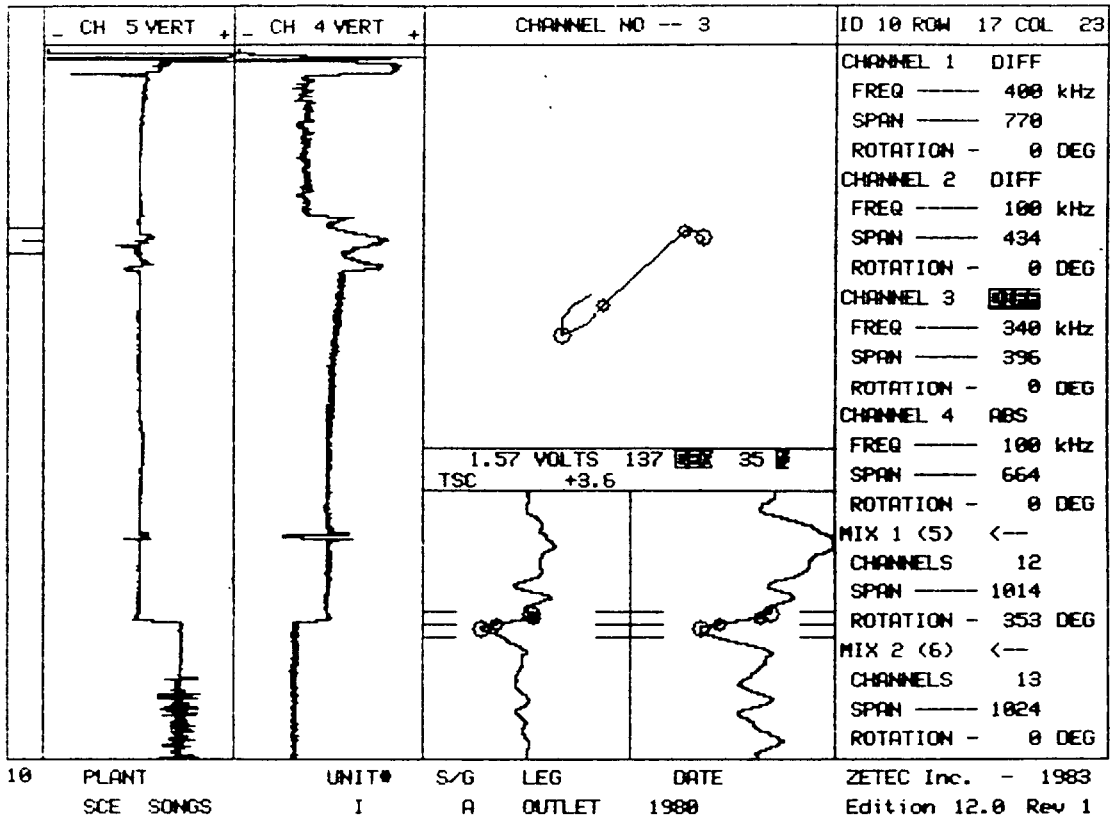
10    PLANT    UNIT#    S/G    LEG    DATE  
 SCE SONGS    I    A    OUTLET    1980

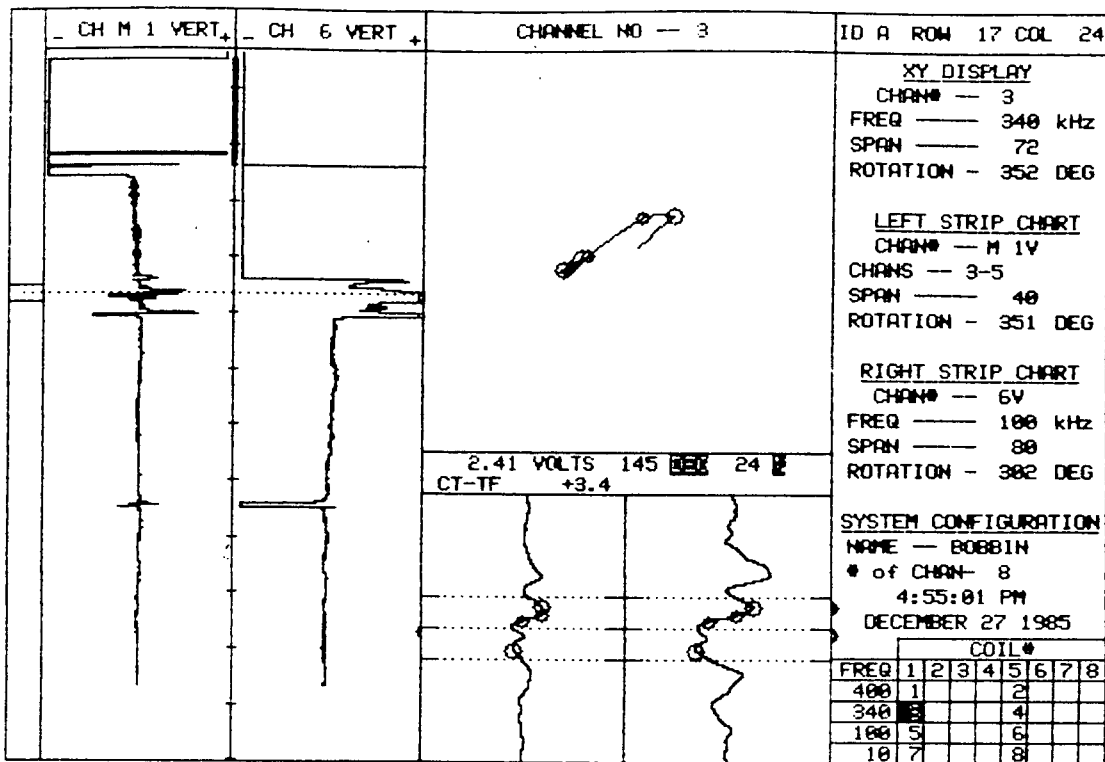
ZETEC Inc. - 1983  
 Edition 12.0 Rev 1



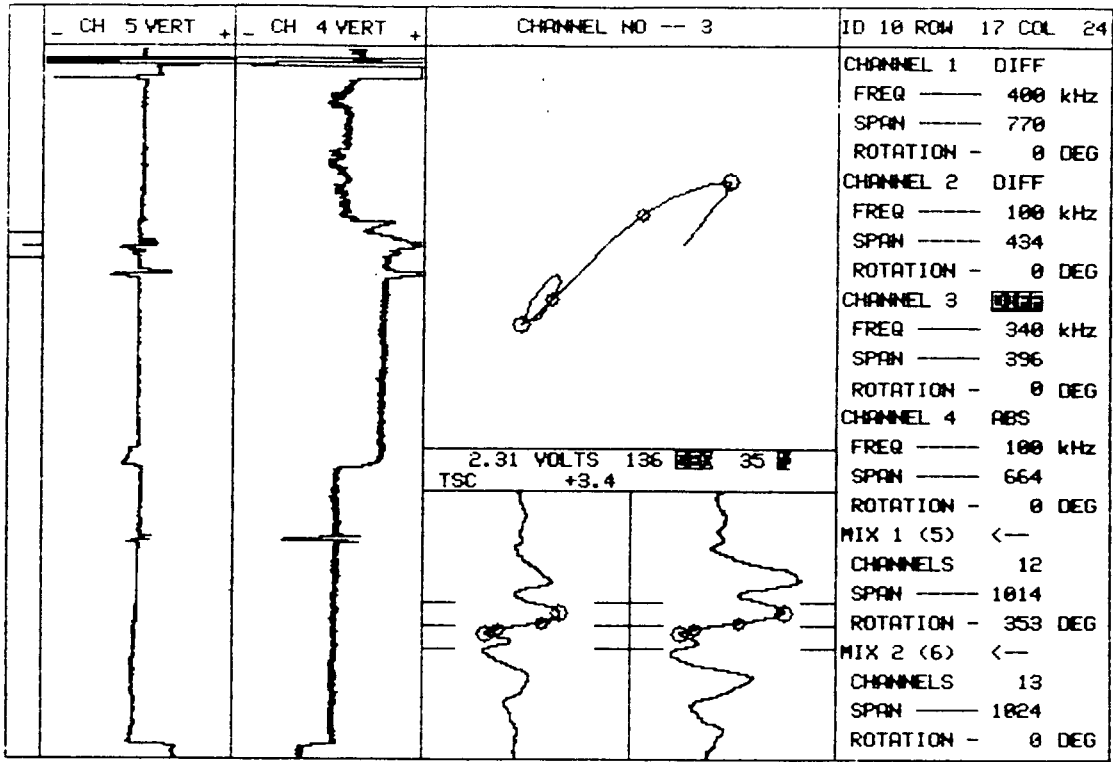


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

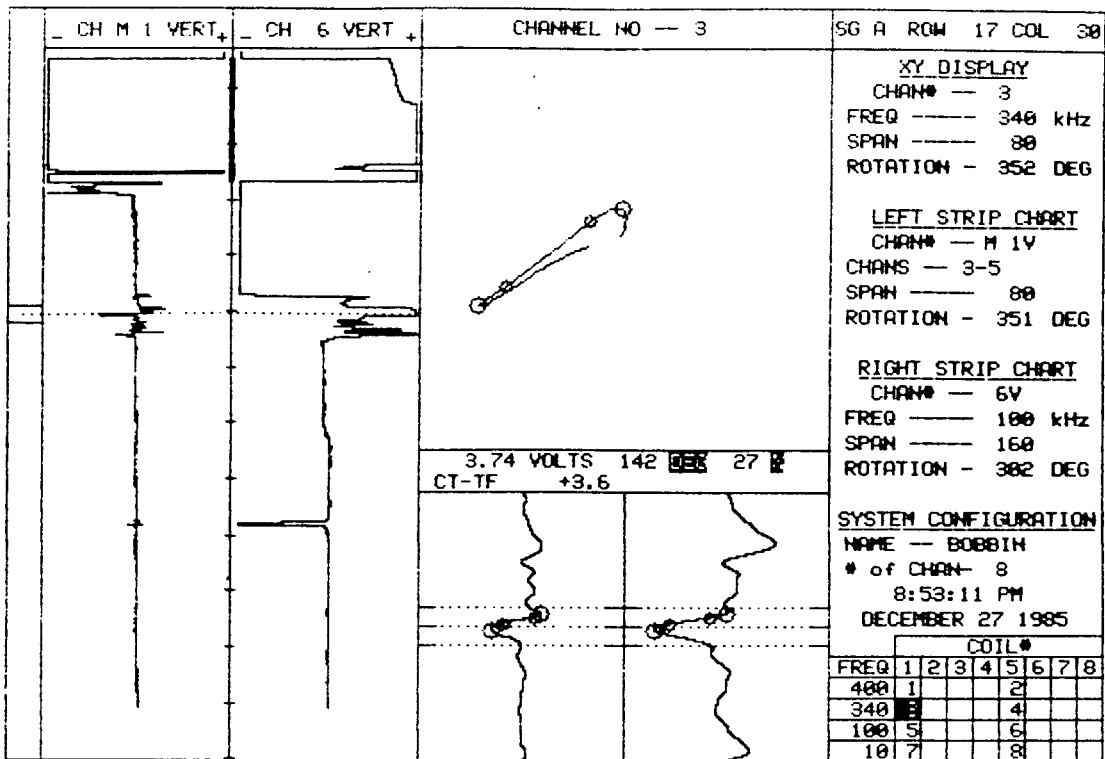




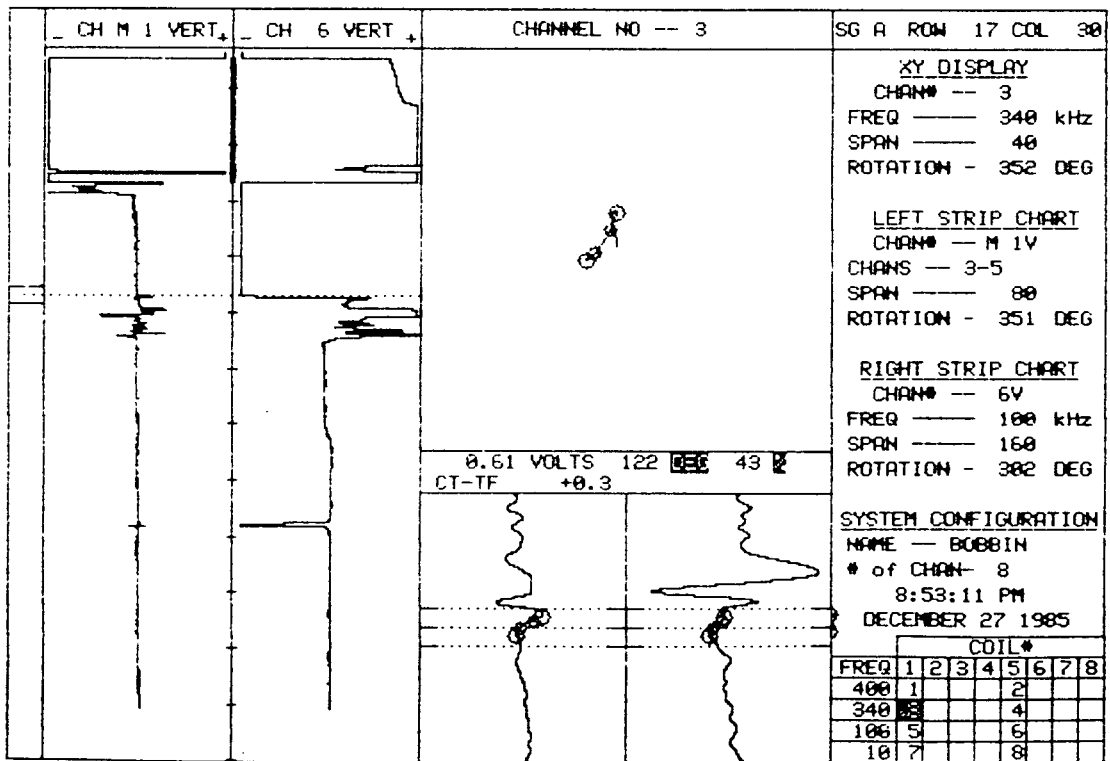
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



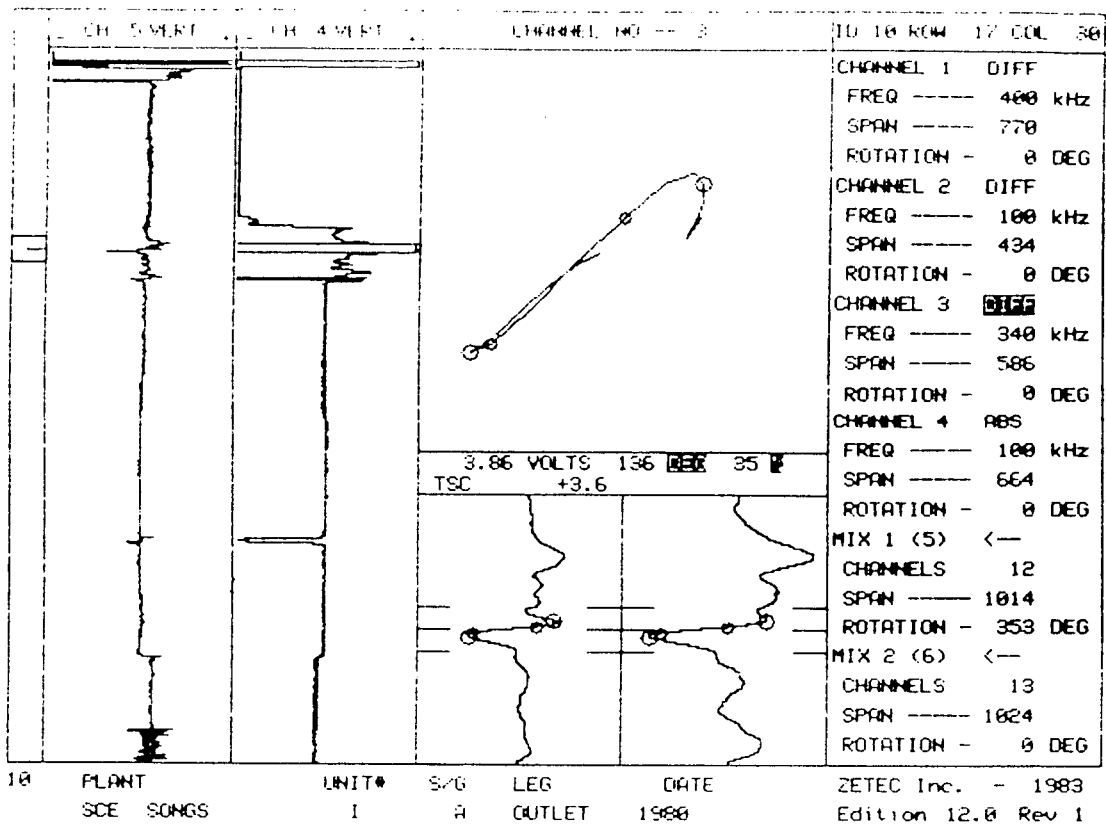
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



CHANNEL 1 DIFF  
FREQ ---- 400 kHz  
SPAN ---- 770  
ROTATION - 0 DEG

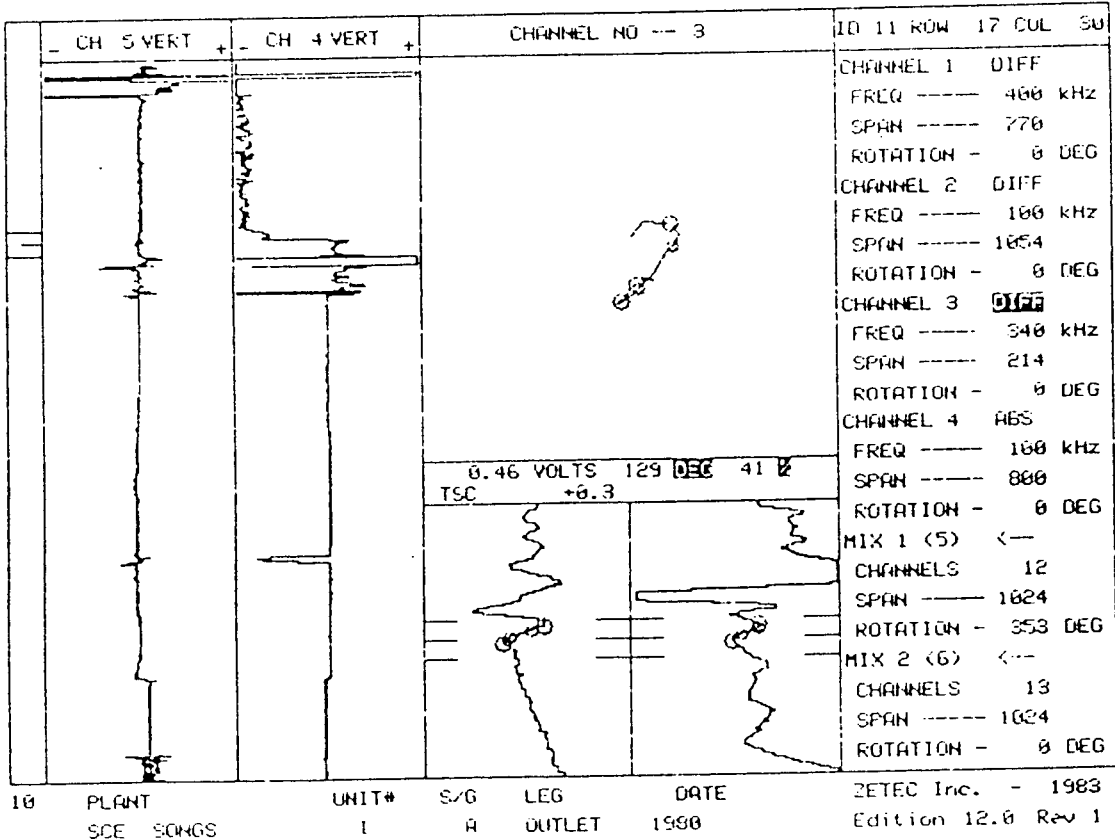
CHANNEL 2 DIFF  
FREQ ---- 100 kHz  
SPAN ---- 434  
ROTATION - 0 DEG

CHANNEL 3 **DIFF**  
FREQ ---- 340 kHz  
SPAN ---- 586  
ROTATION - 0 DEG

CHANNEL 4 ABS  
FREQ ---- 100 kHz  
SPAN ---- 664  
ROTATION - 0 DEG

MIX 1 (5) <--  
CHANNELS 12  
SPAN ---- 1014  
ROTATION - 353 DEG

MIX 2 (6) <--  
CHANNELS 13  
SPAN ---- 1024  
ROTATION - 0 DEG



CHANNEL 1 DIFF  
FREQ ---- 400 kHz  
SPAN ---- 770  
ROTATION - 0 DEG

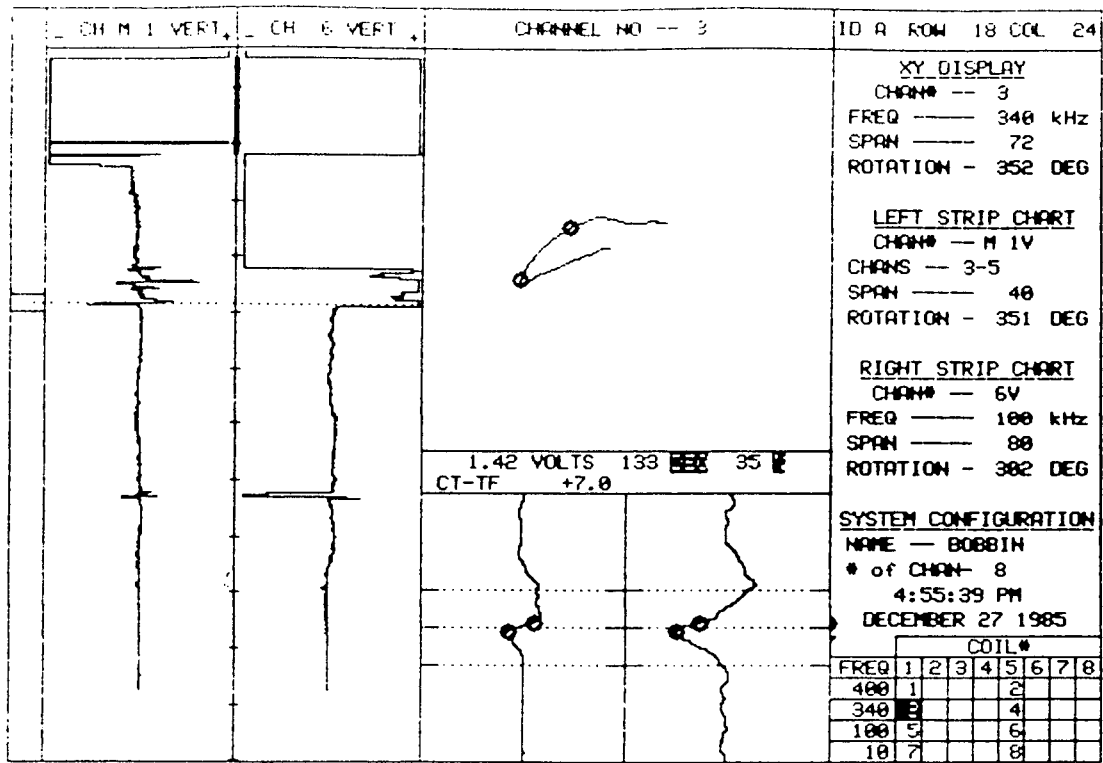
CHANNEL 2 DIFF  
FREQ ---- 100 kHz  
SPAN ---- 1054  
ROTATION - 0 DEG

CHANNEL 3 **DIFF**  
FREQ ---- 340 kHz  
SPAN ---- 214  
ROTATION - 0 DEG

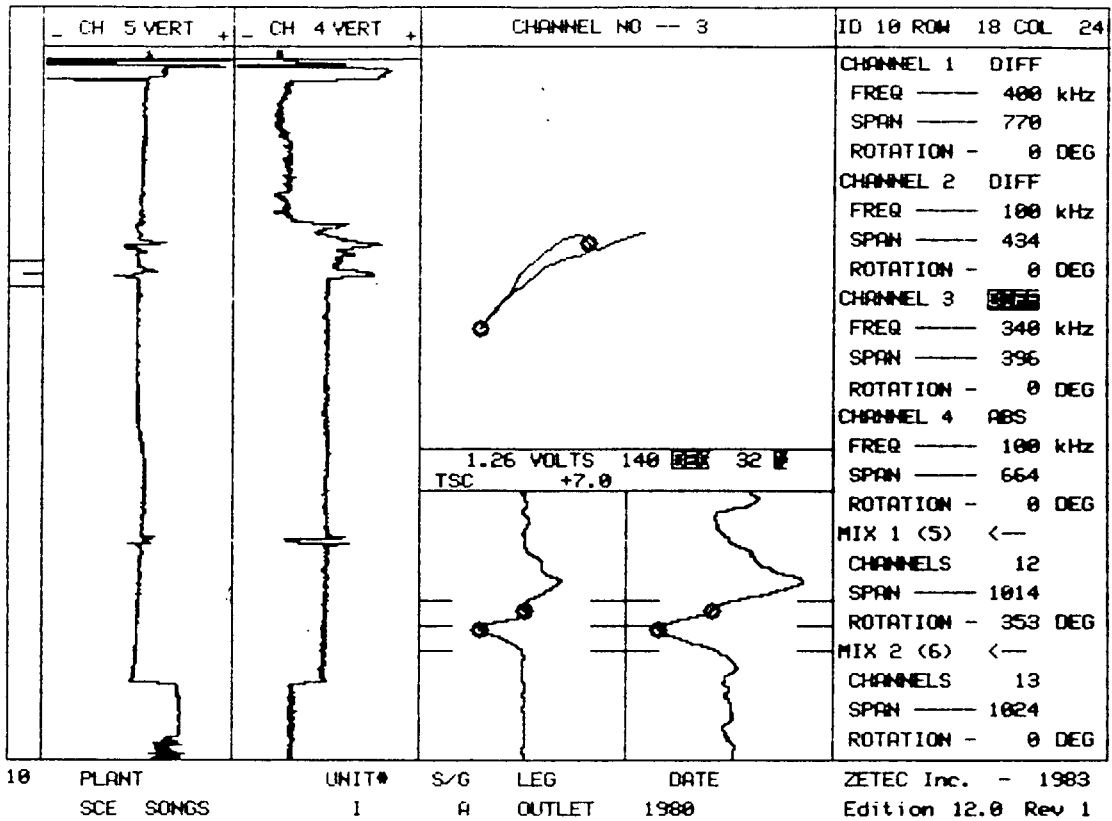
CHANNEL 4 ABS  
FREQ ---- 100 kHz  
SPAN ---- 800  
ROTATION - 0 DEG

MIX 1 (5) <--  
CHANNELS 12  
SPAN ---- 1024  
ROTATION - 353 DEG

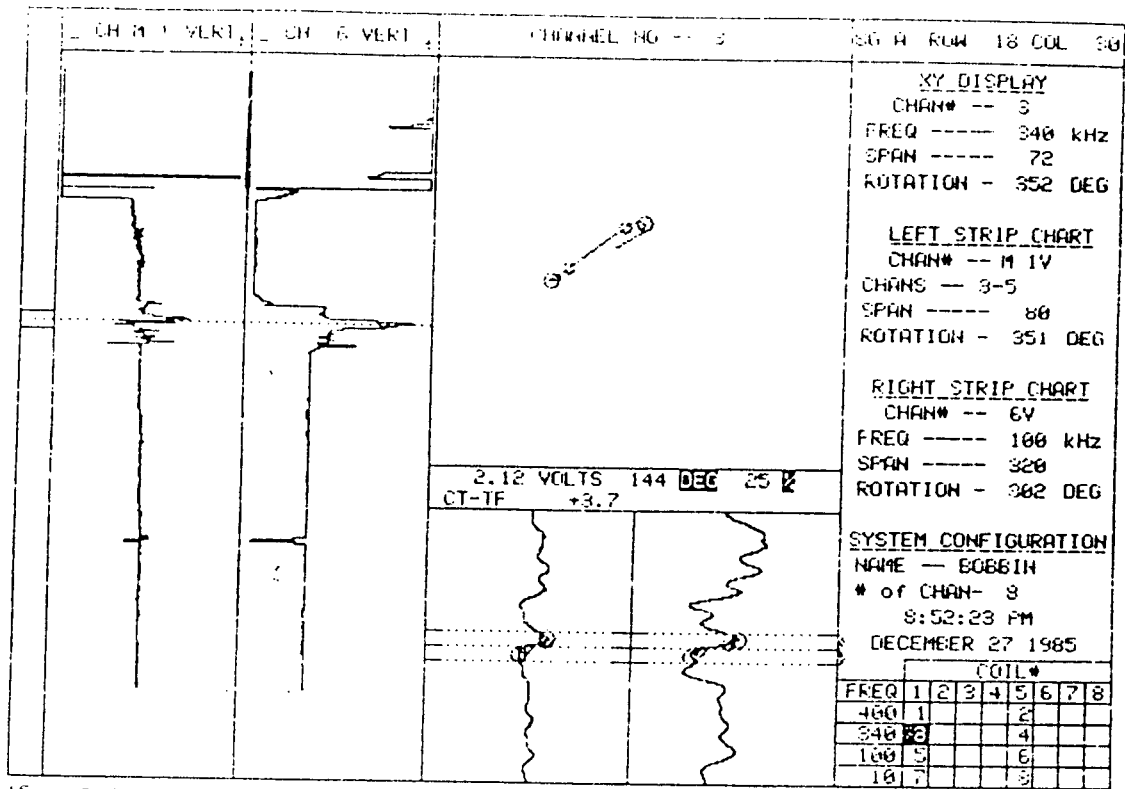
MIX 2 (6) <--  
CHANNELS 13  
SPAN ---- 1024  
ROTATION - 0 DEG



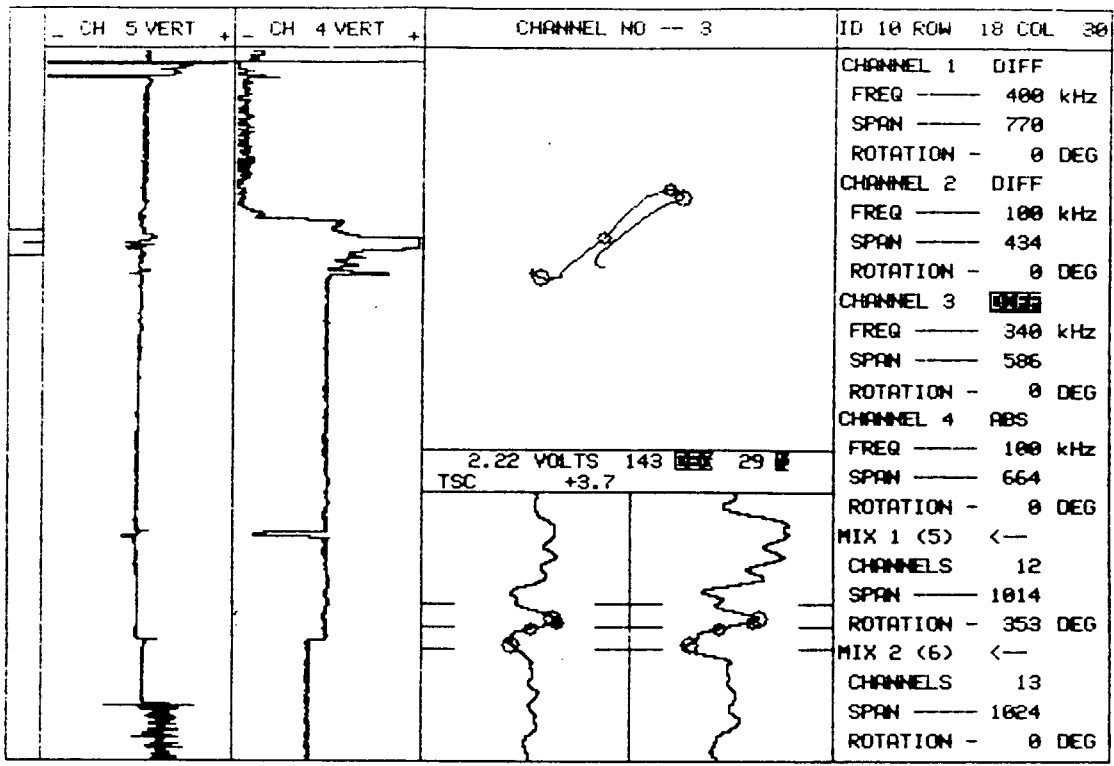
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



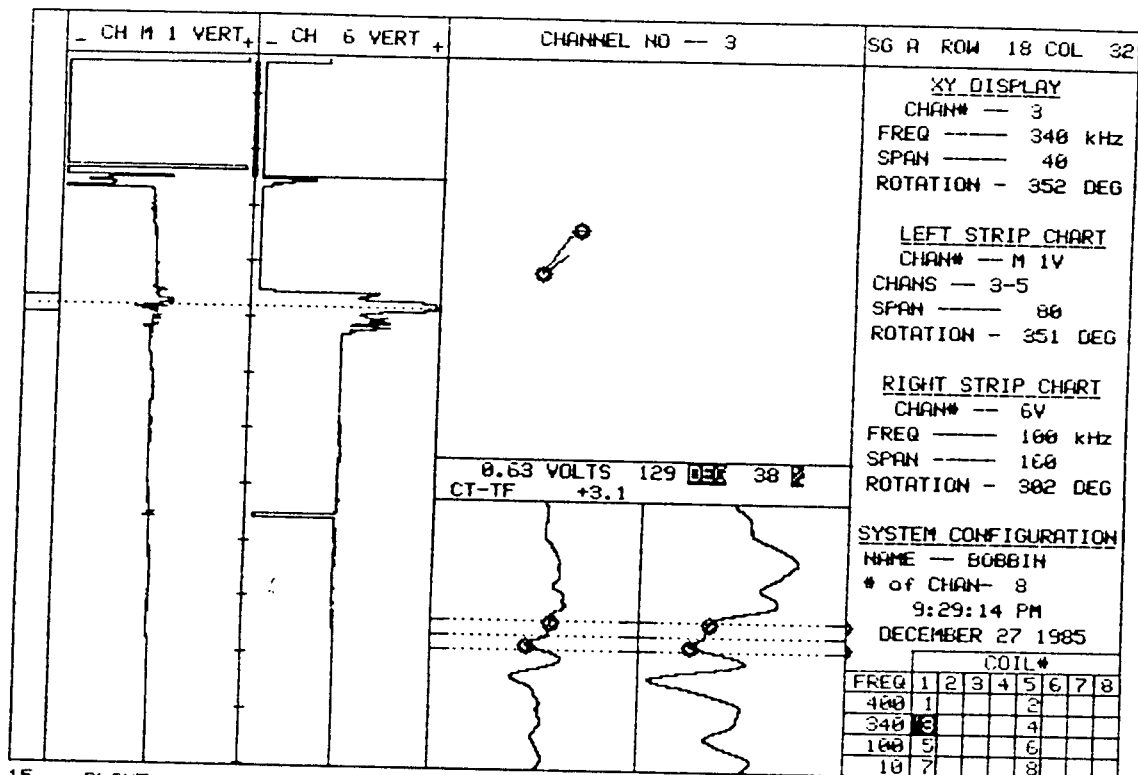




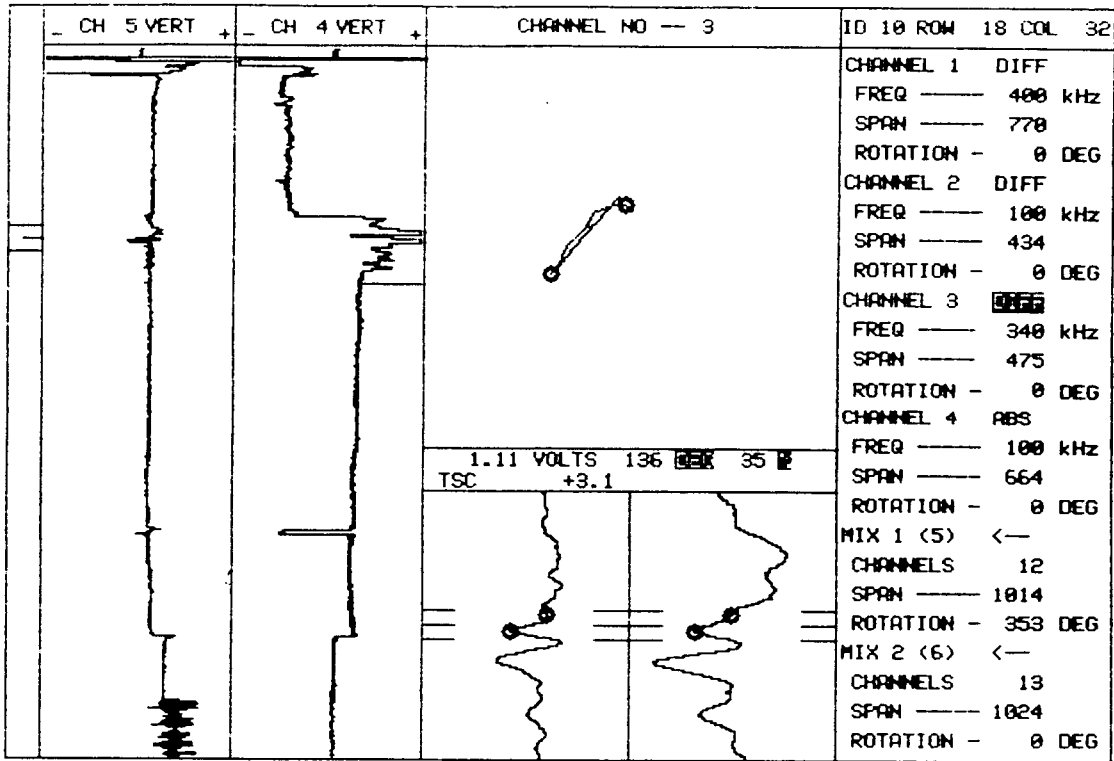
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK D36    1    A    OUTLET    12/27/85



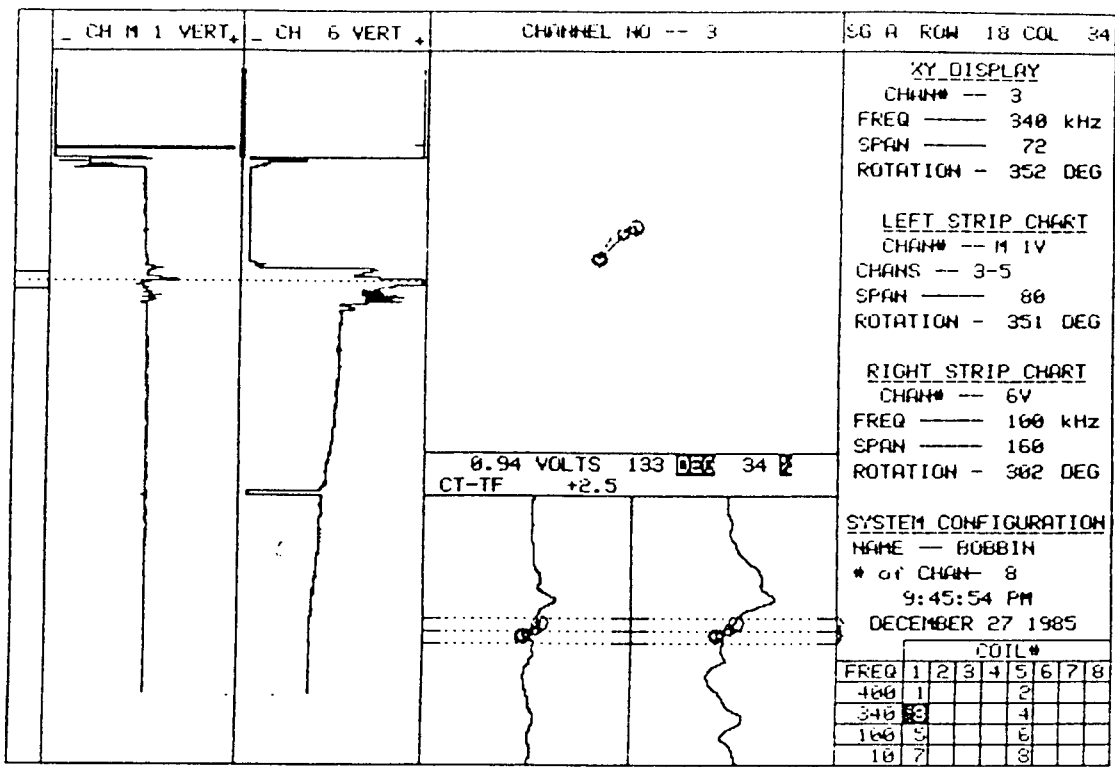
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



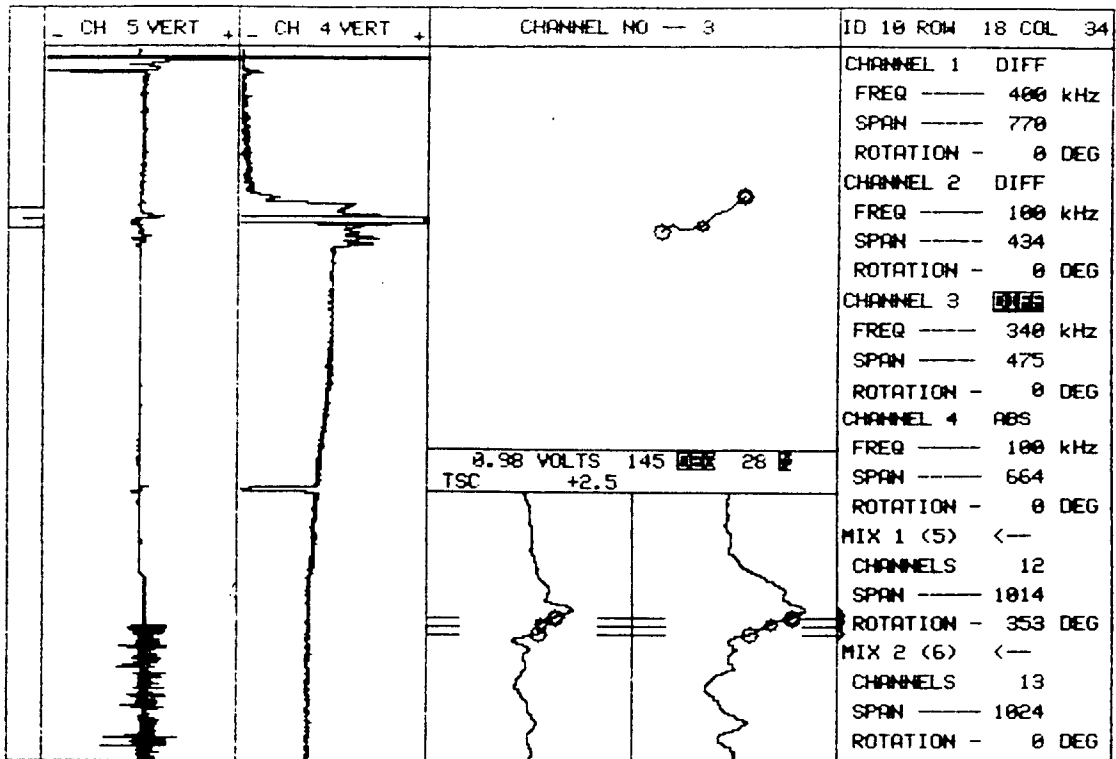
15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



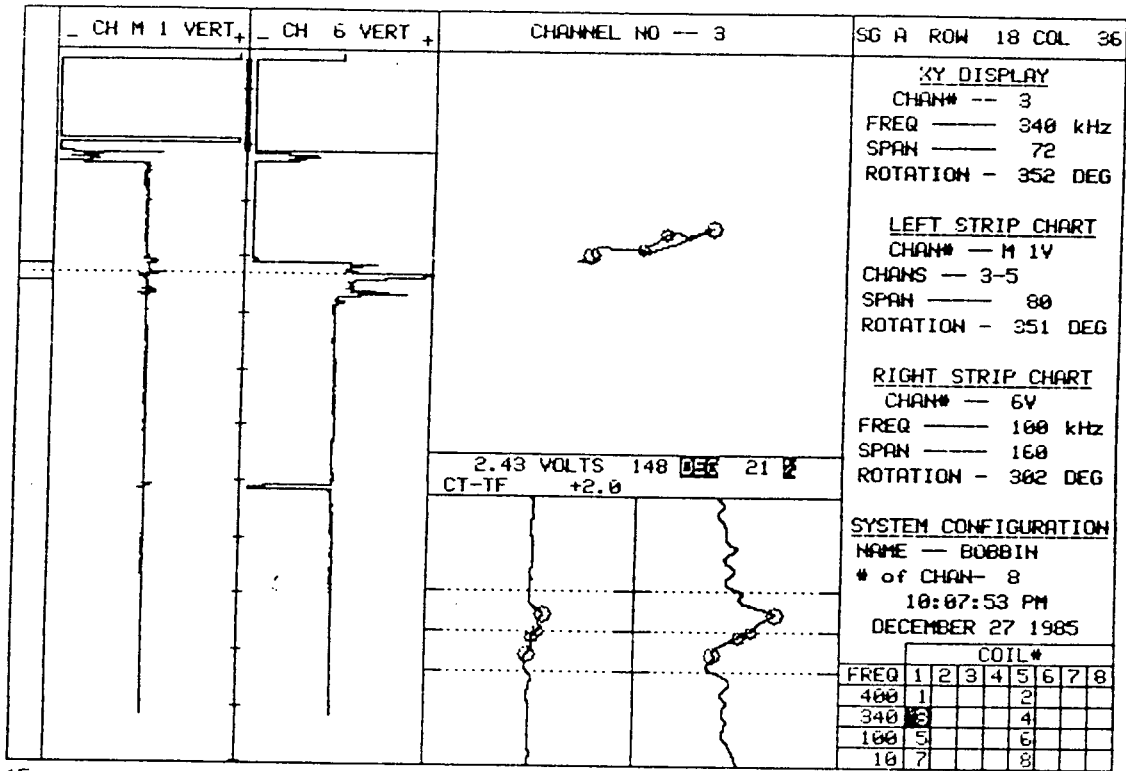
10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



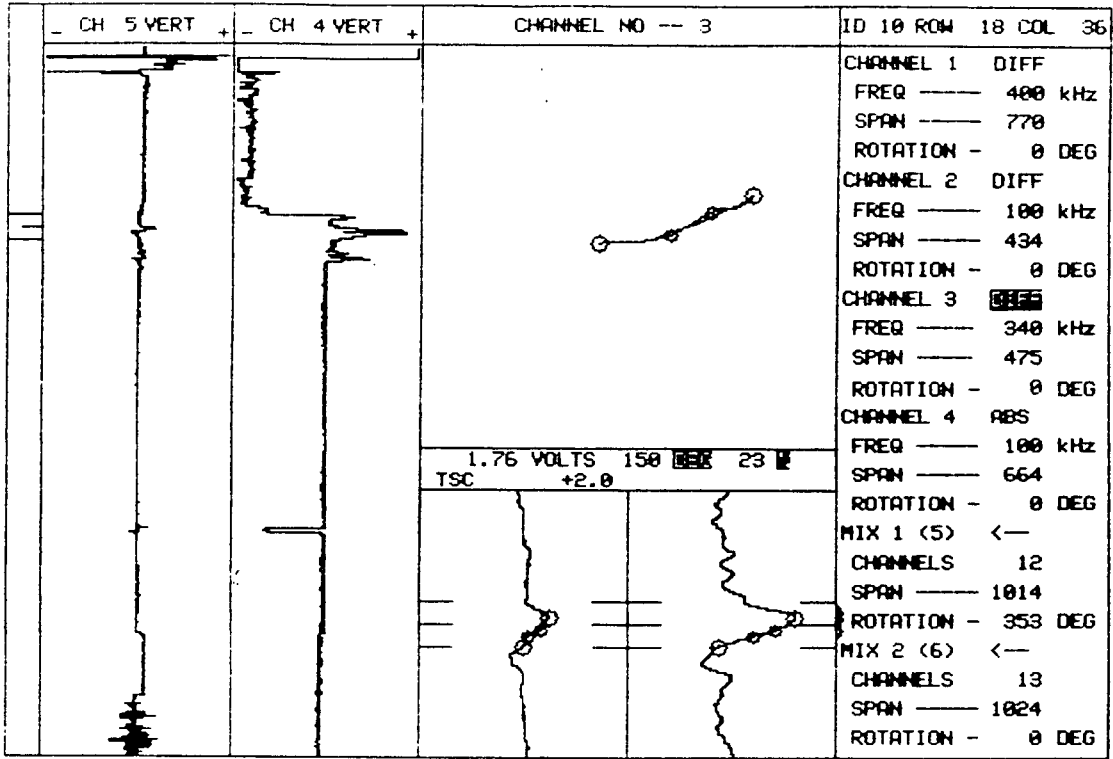
15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



11	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

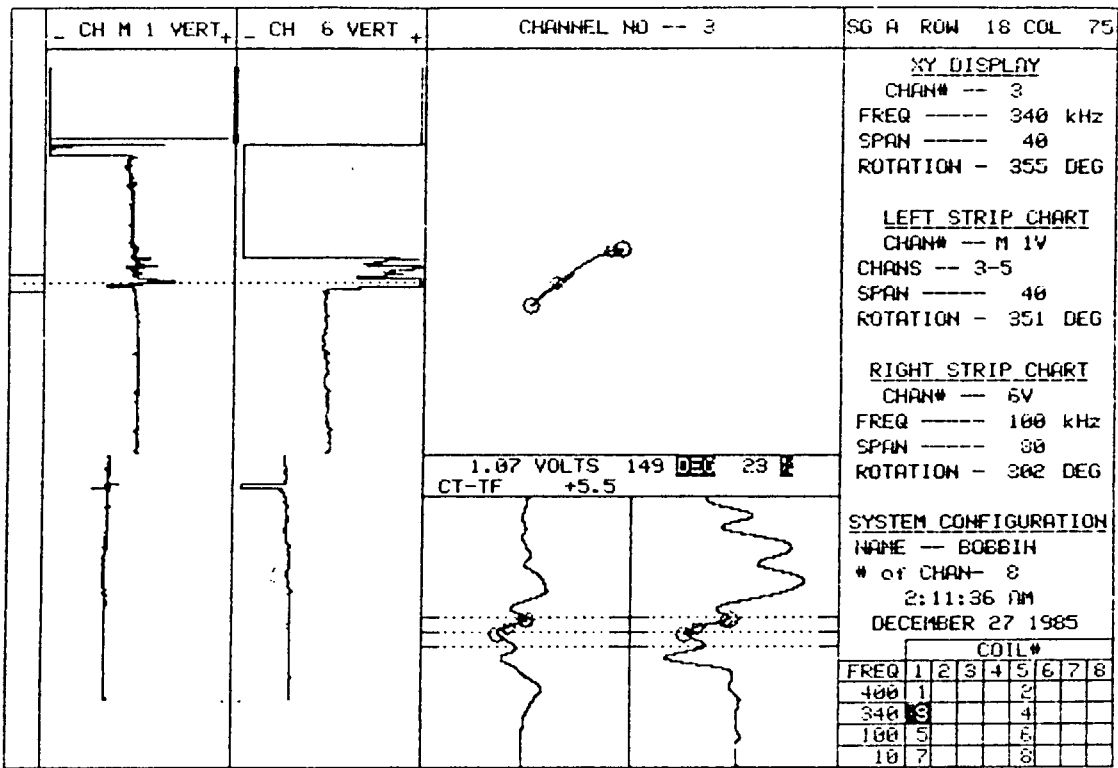


15    PLANT                      UNIT#    S/G    LEG                      DATE  
      SONGS DISK C36        1        A        OUTLET                12/27/85

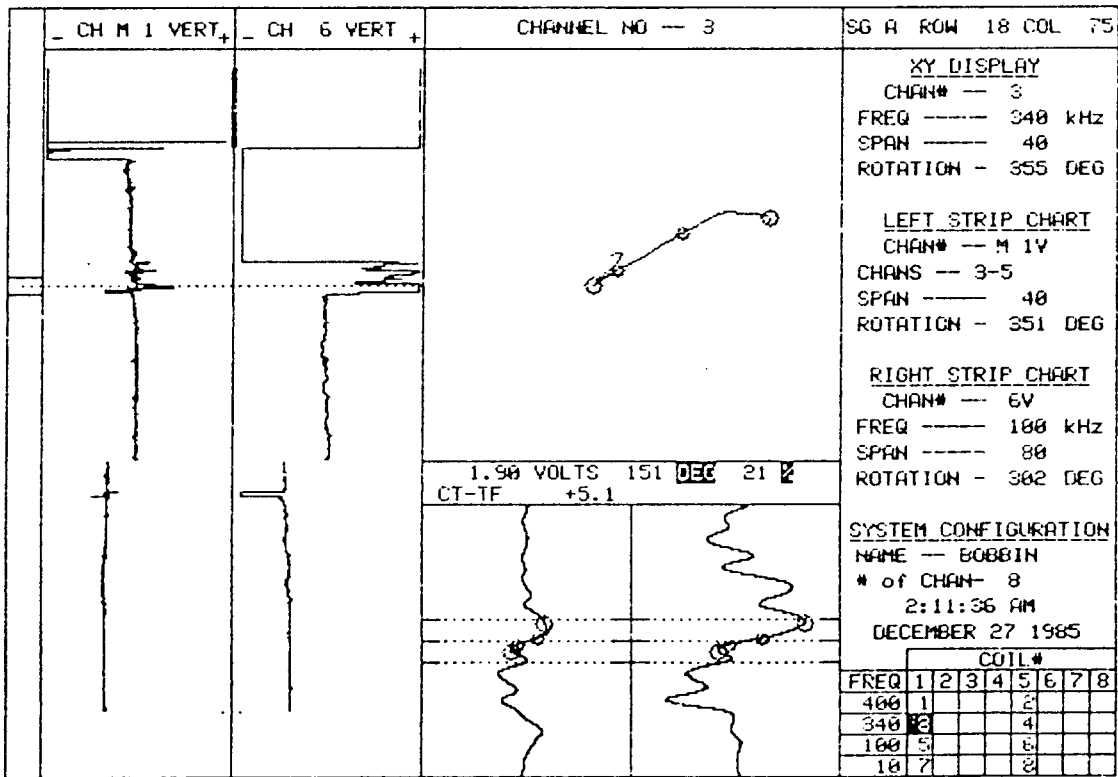


10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

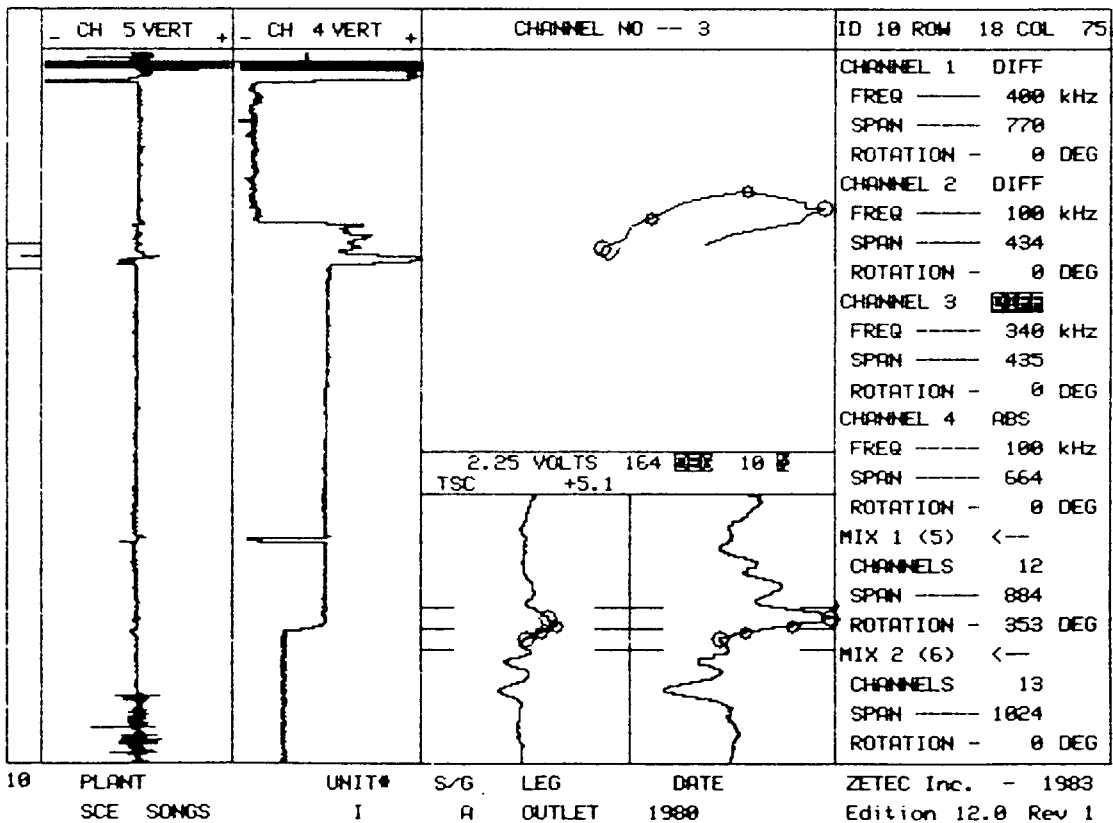
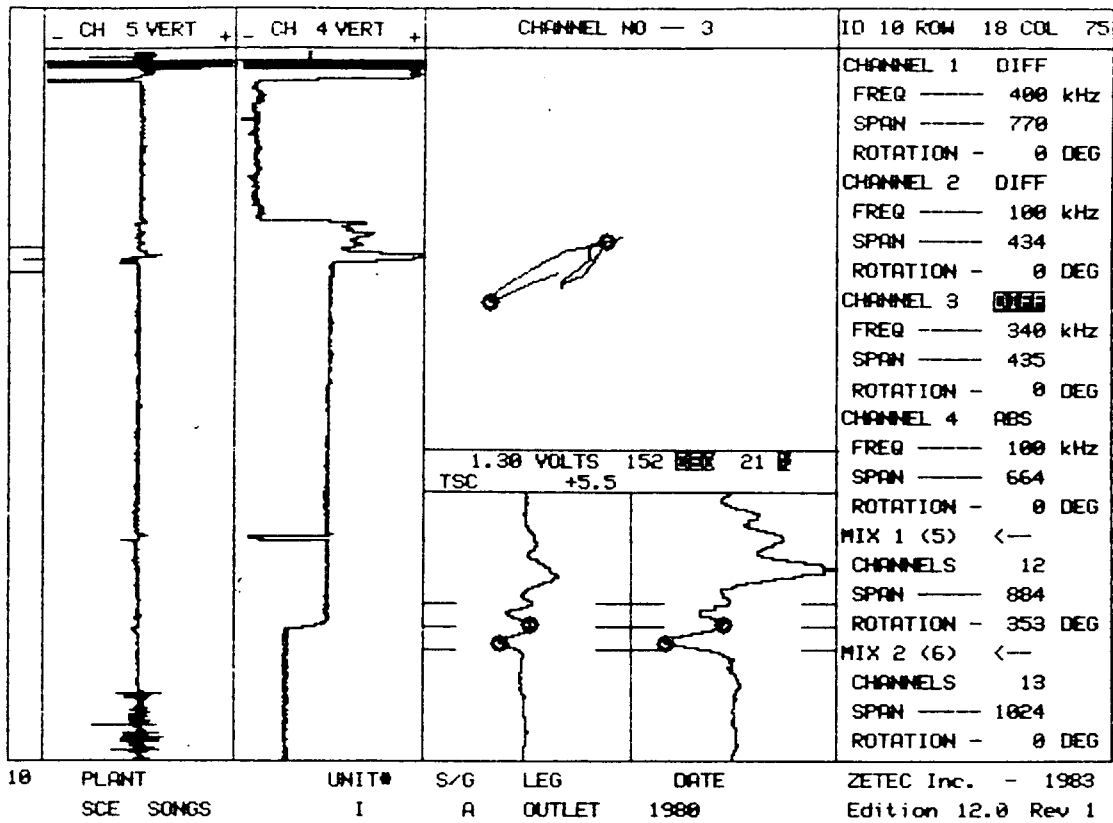


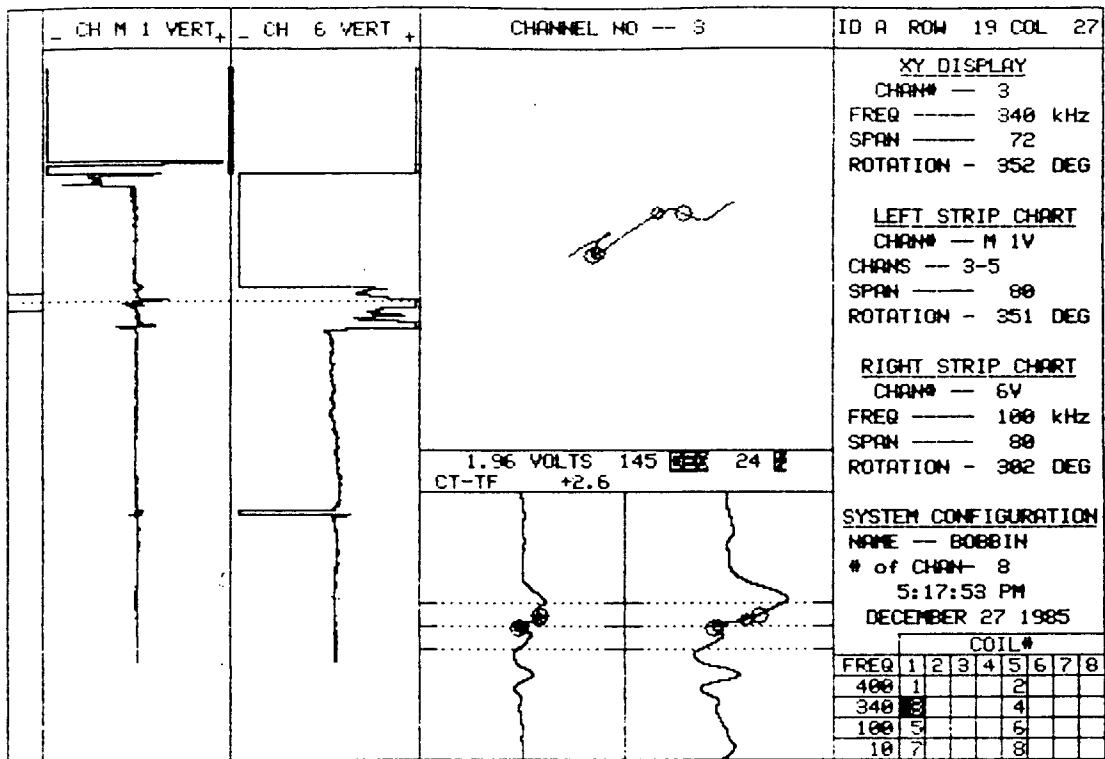


15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85

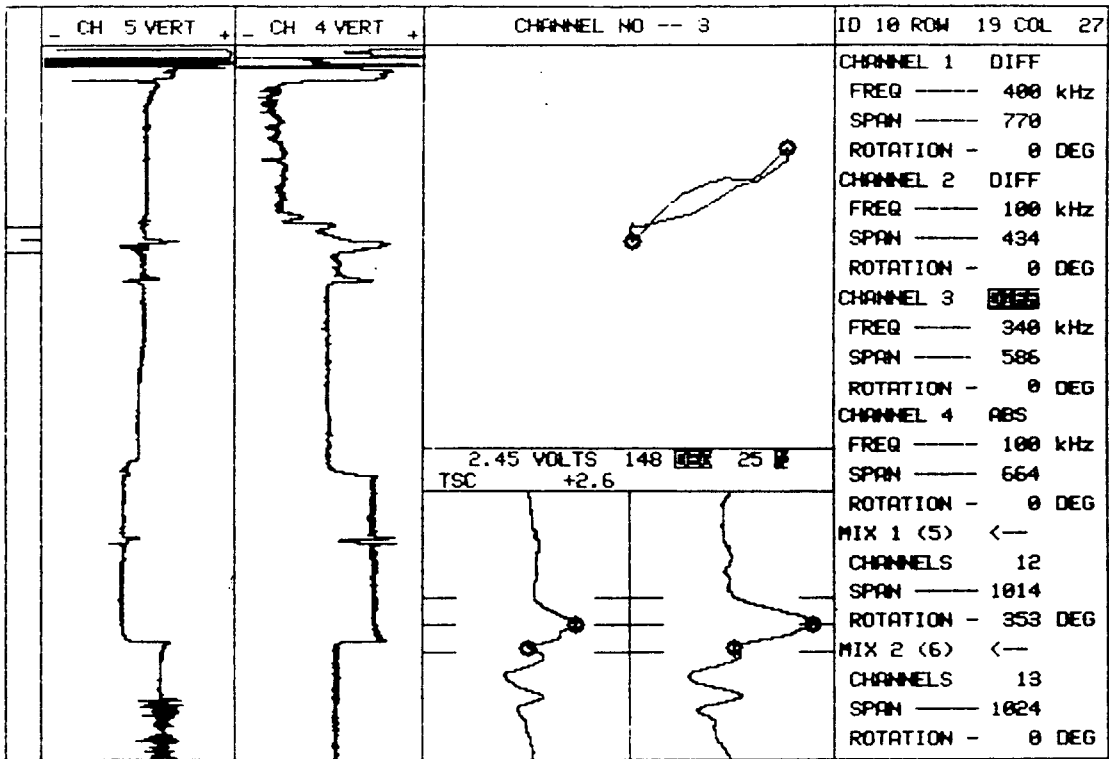


15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85

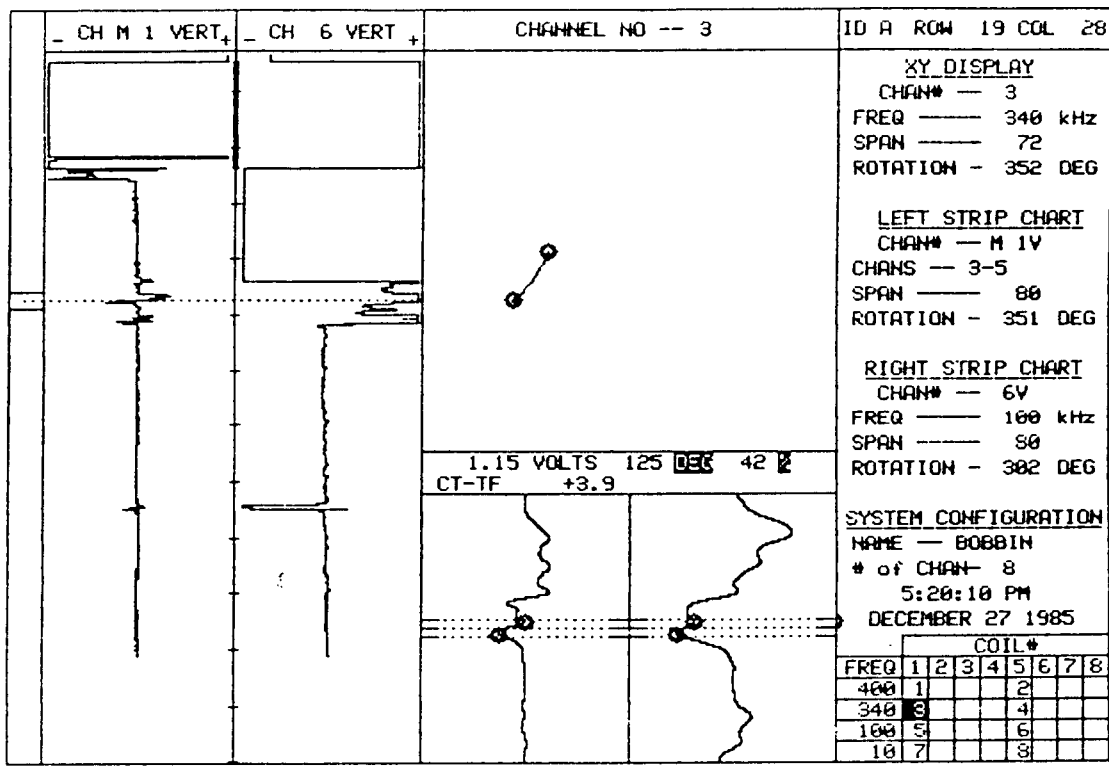




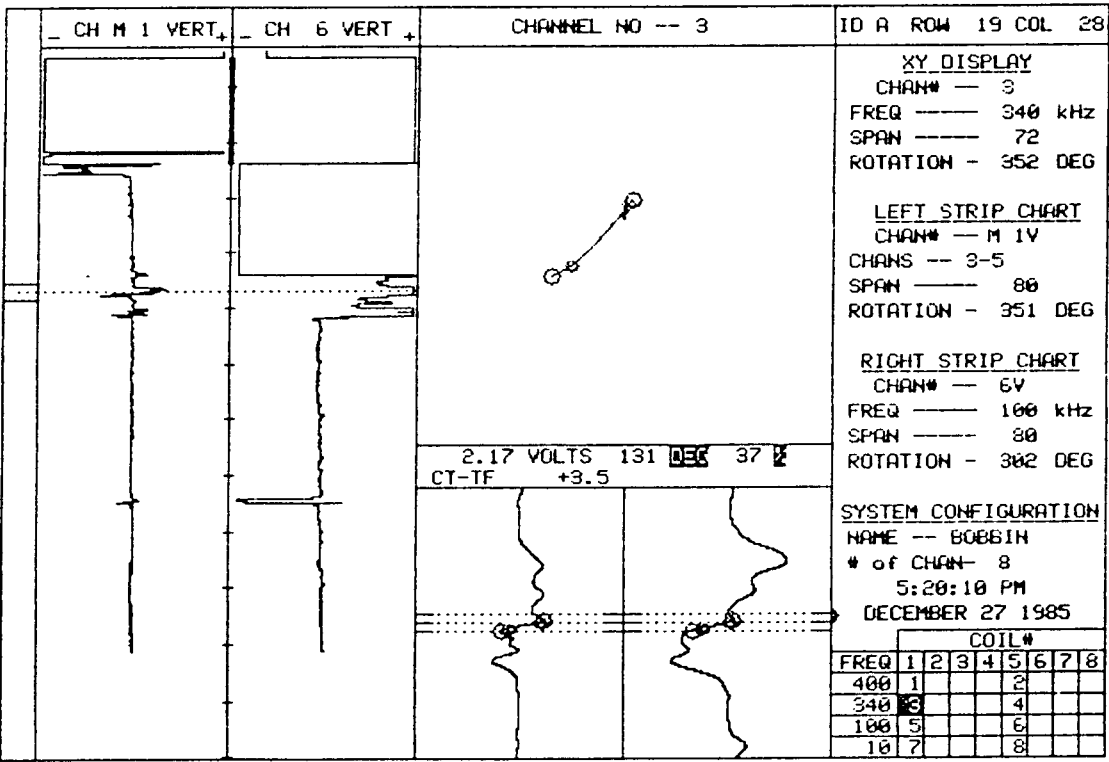
15    PLANT    UNIT#    S/G    LEG    DATE  
      SONGS DISK C35    1    A    OUTLET    12/27/85



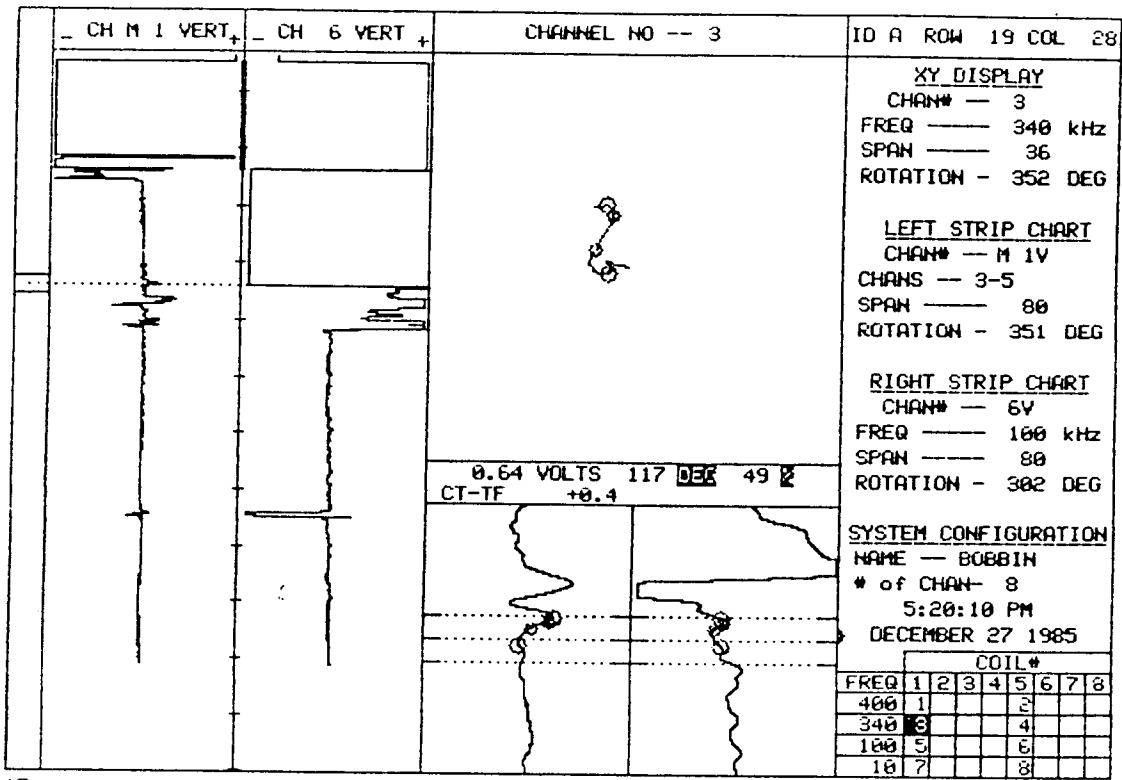
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



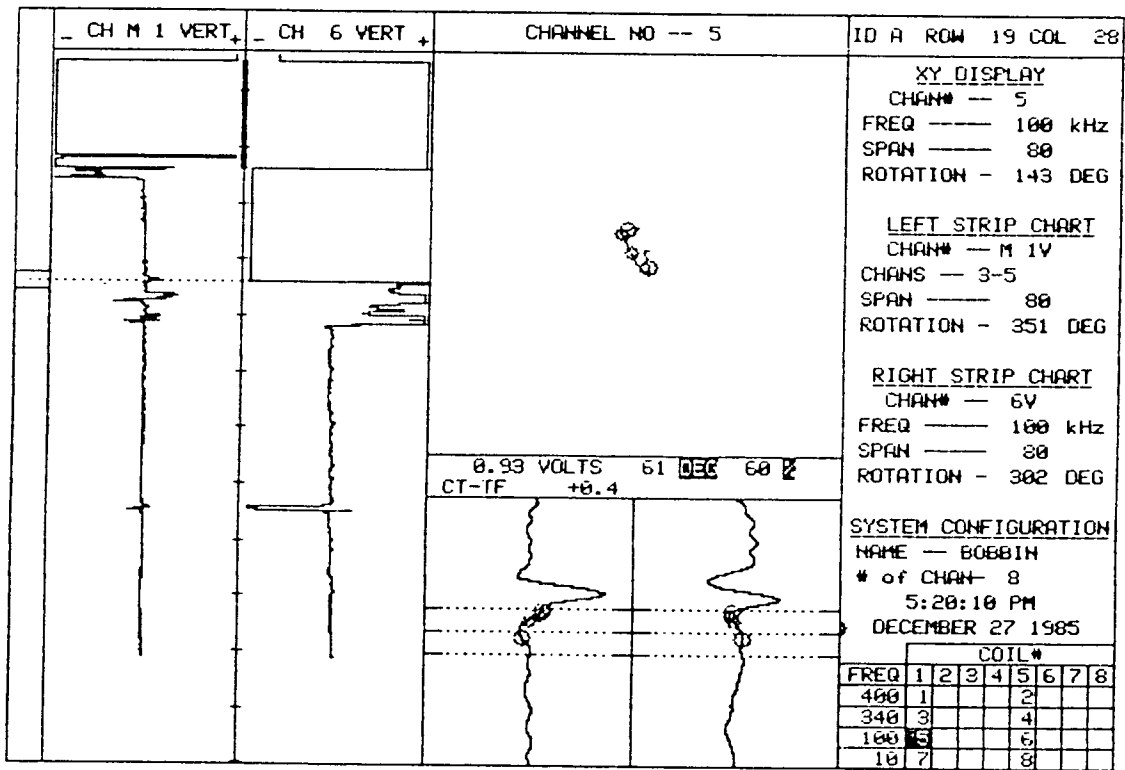
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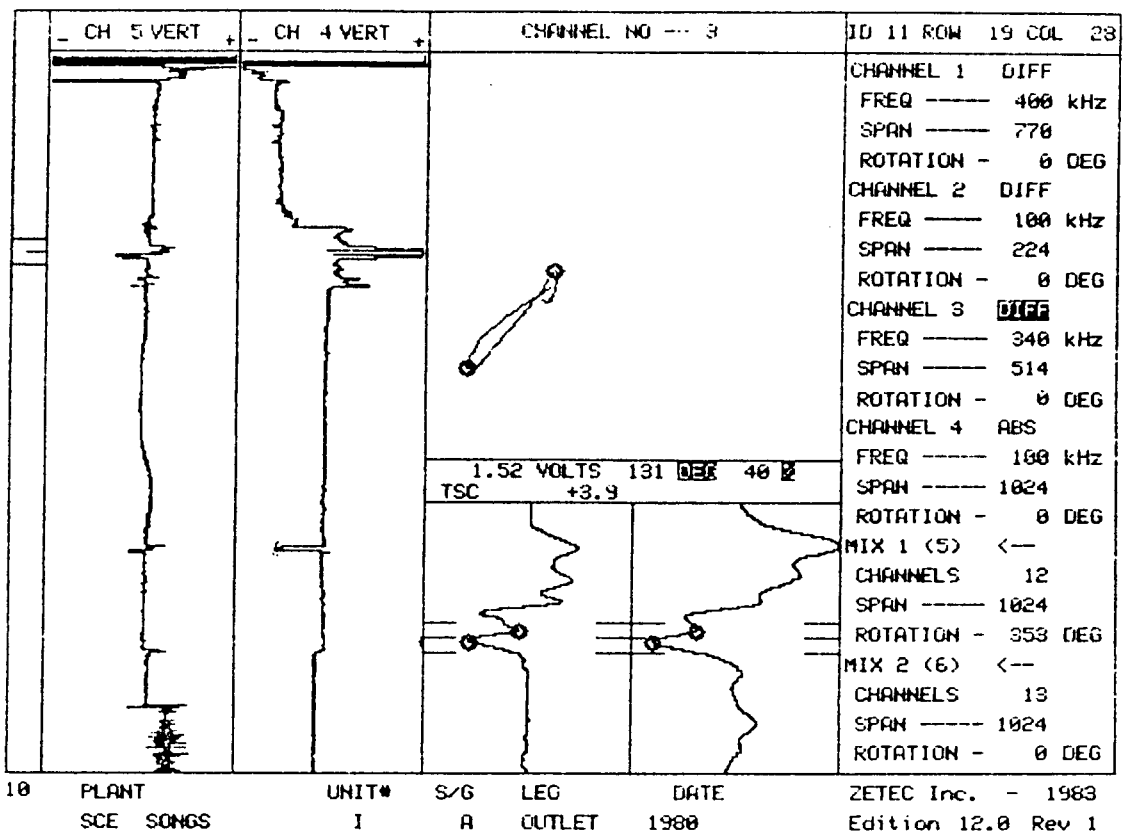
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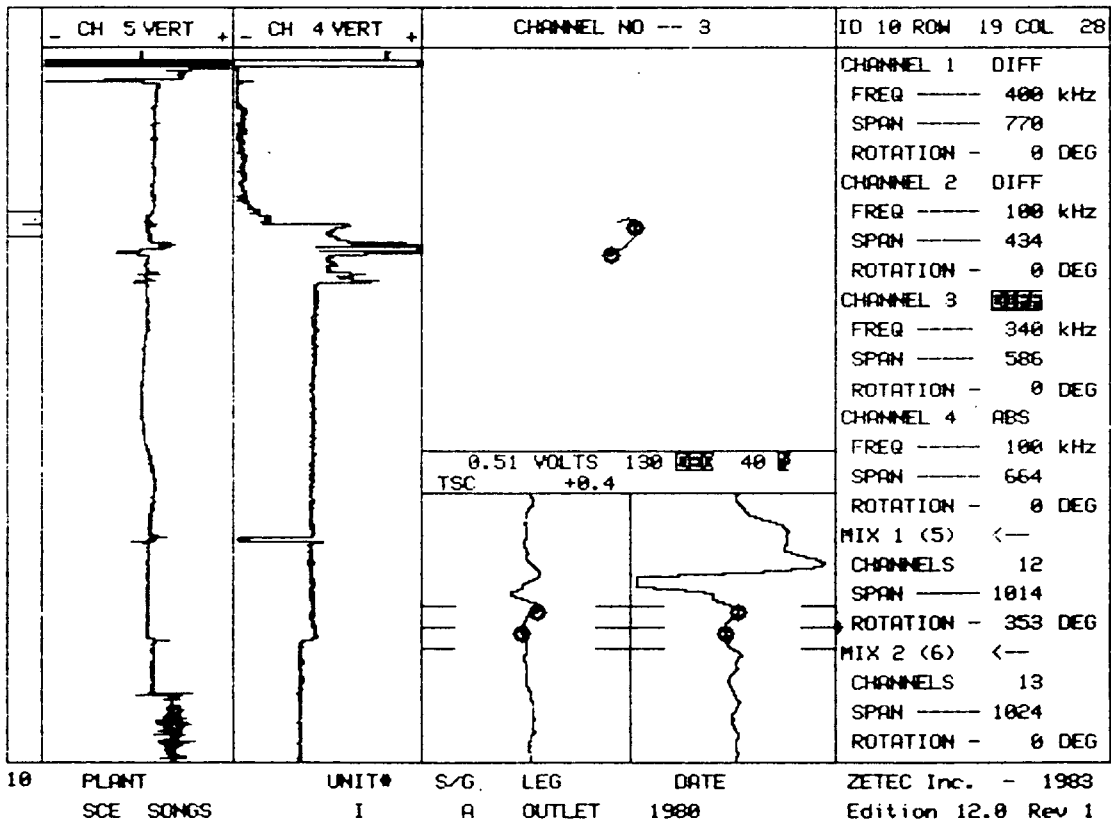
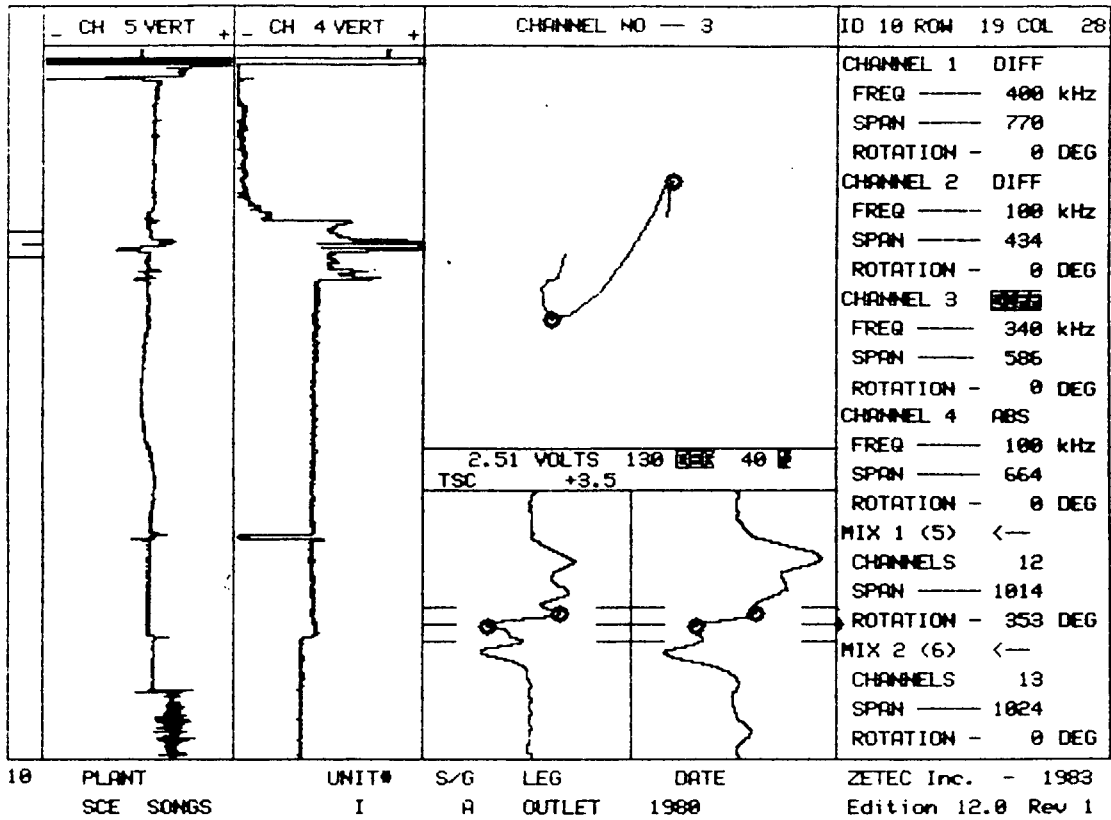


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

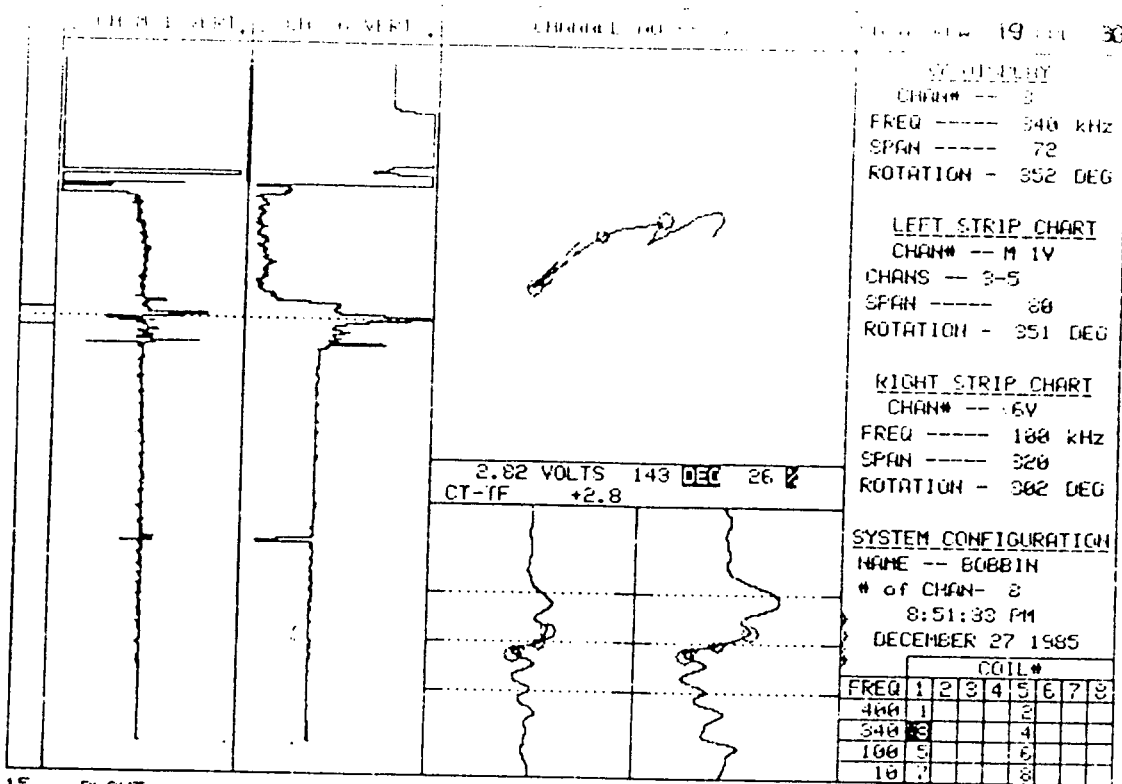


PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85









19 30

W. WILLEY  
 CHAN# -- 3  
 FREQ ----- 340 KHz  
 SPAN ----- 72  
 ROTATION - 352 DEG

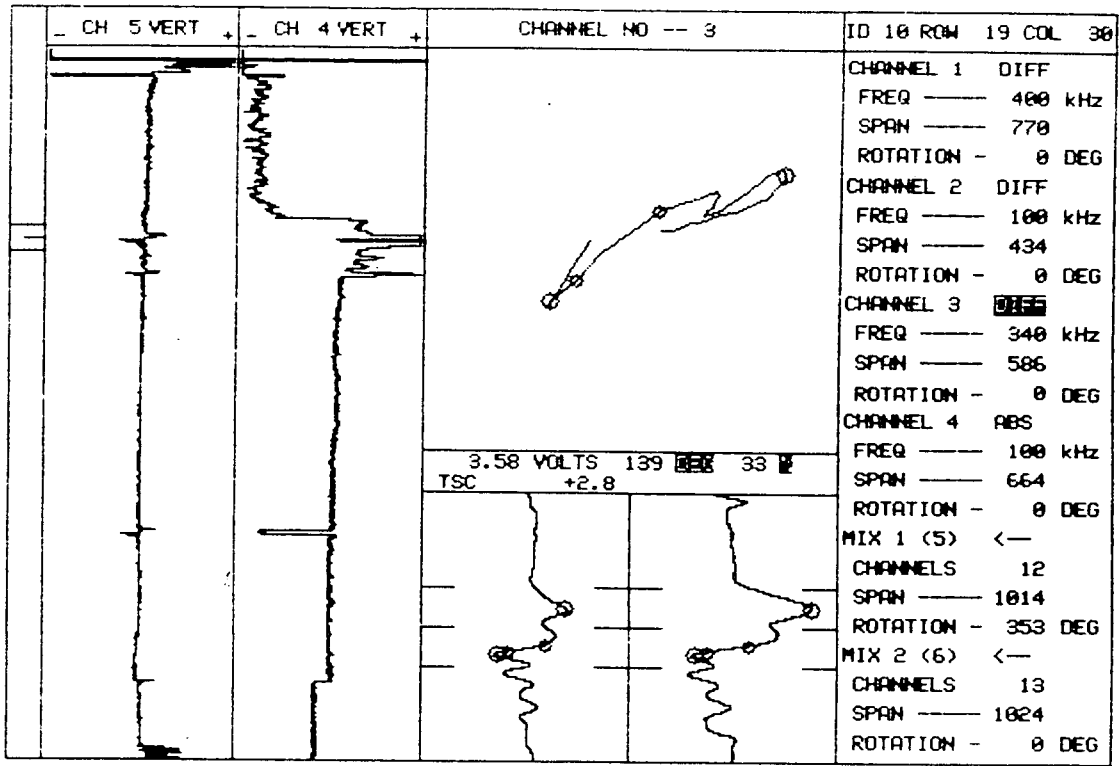
LEFT STRIP CHART  
 CHAN# -- M 1V  
 CHANS -- 3-5  
 SPAN ----- 80  
 ROTATION - 351 DEG

RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ ----- 180 KHz  
 SPAN ----- 320  
 ROTATION - 302 DEG

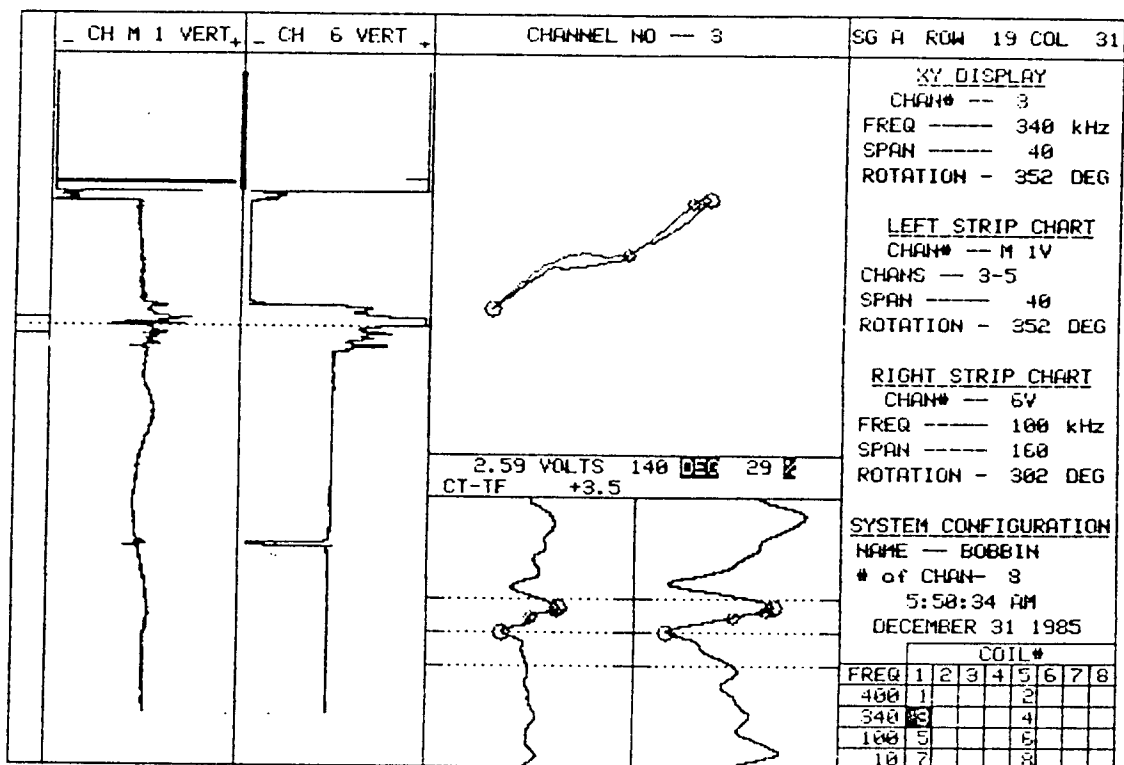
SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 8:51:33 PM  
 DECEMBER 27 1985

FREQ	COIL #							
	1	2	3	4	5	6	7	8
400	1				2			
340	3				4			
100	5				6			
10	7				8			

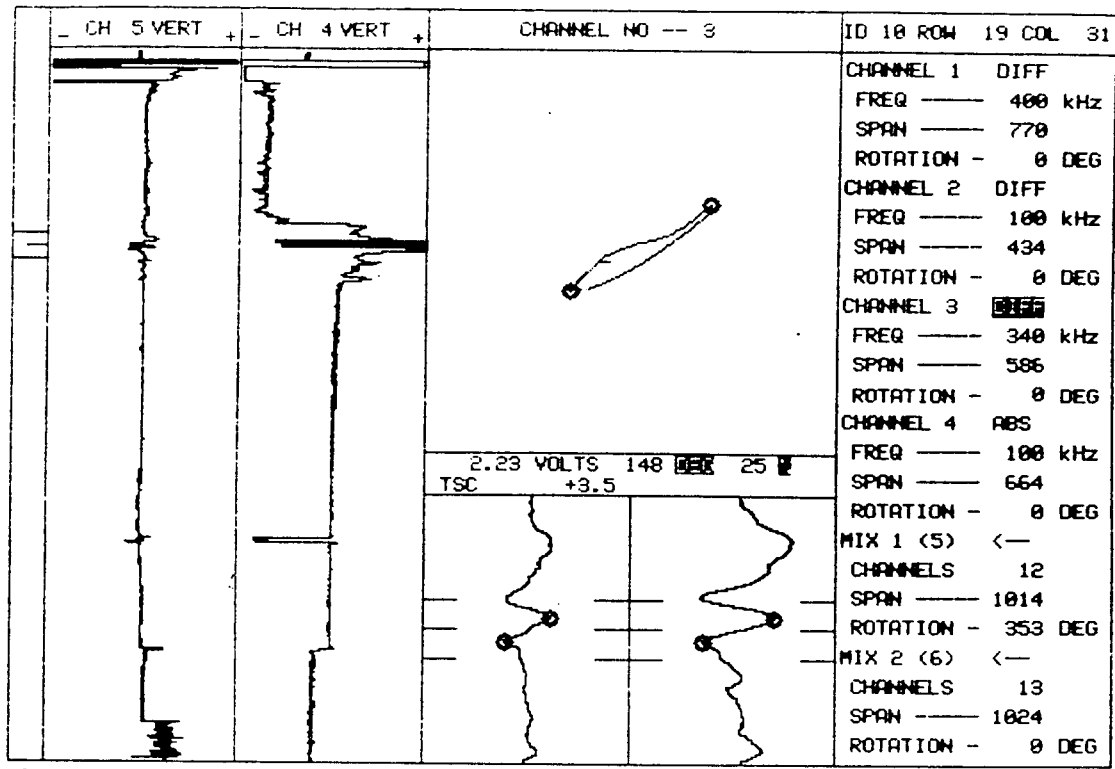
15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10 PLANT SCE SONGS UNIT# I S/G A LEG A OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



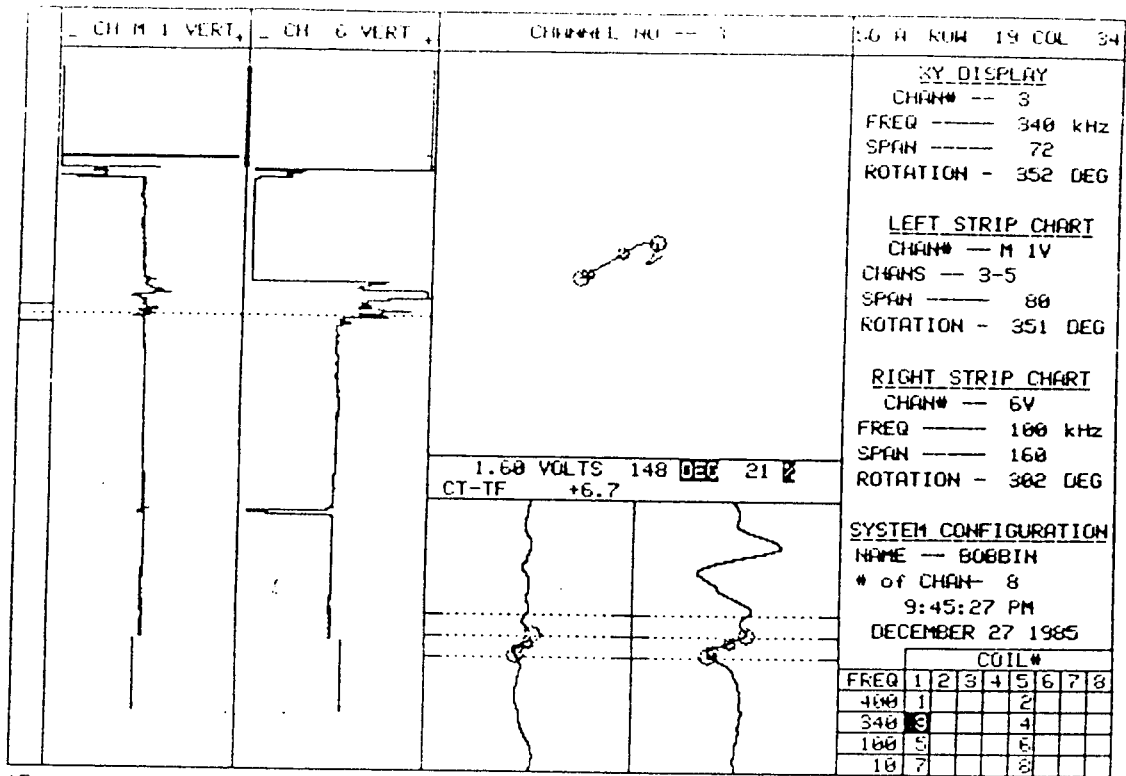
15    PLANT                    UNIT#    S/G    LEG                    DATE  
       SONGS DISK C46        1        A        OUTLE                12/31/85



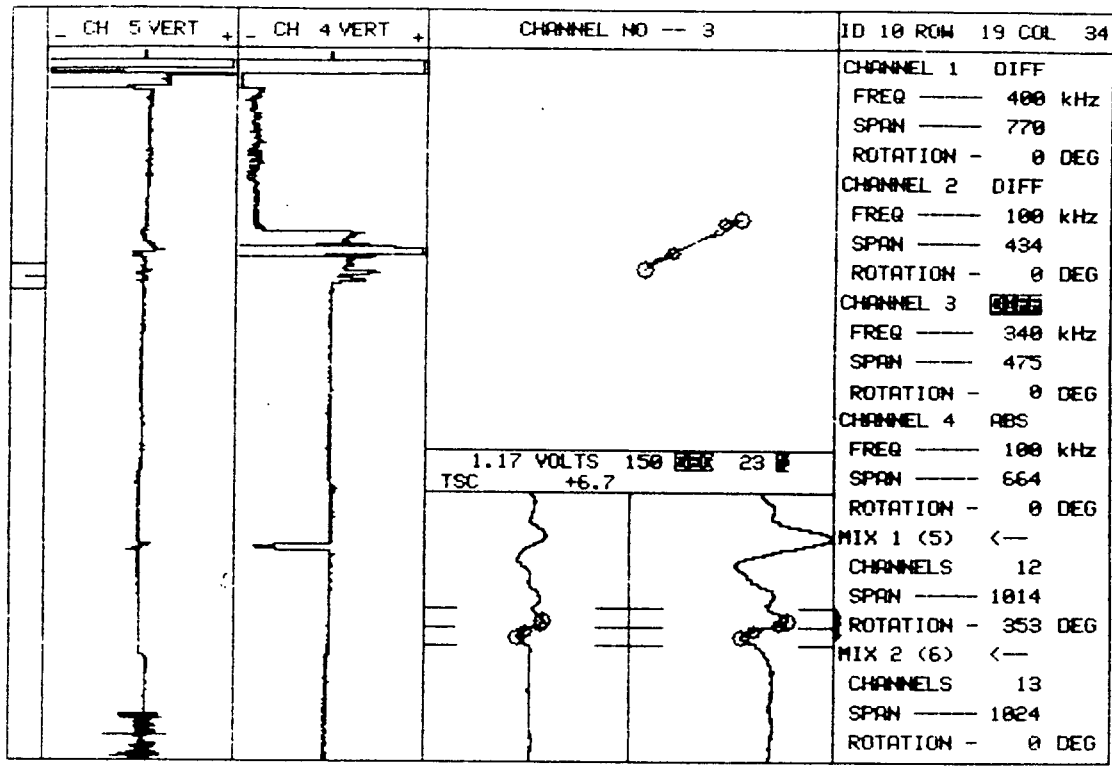
2.23 VOLTS 148 DEG 25  
TSC +3.5

10 PLANT SCE SONGS UNIT# I S/G R LEG A DATE 1980

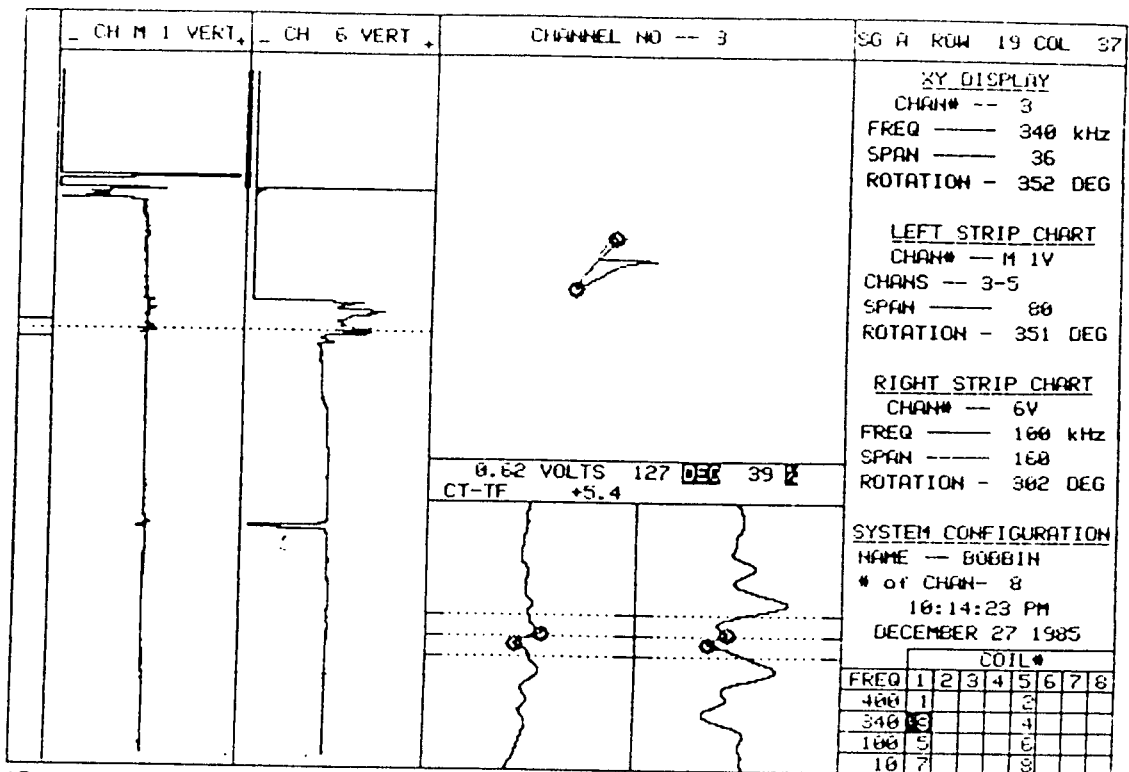
ZETEC Inc. - 1983  
Edition 12.0 Rev 1



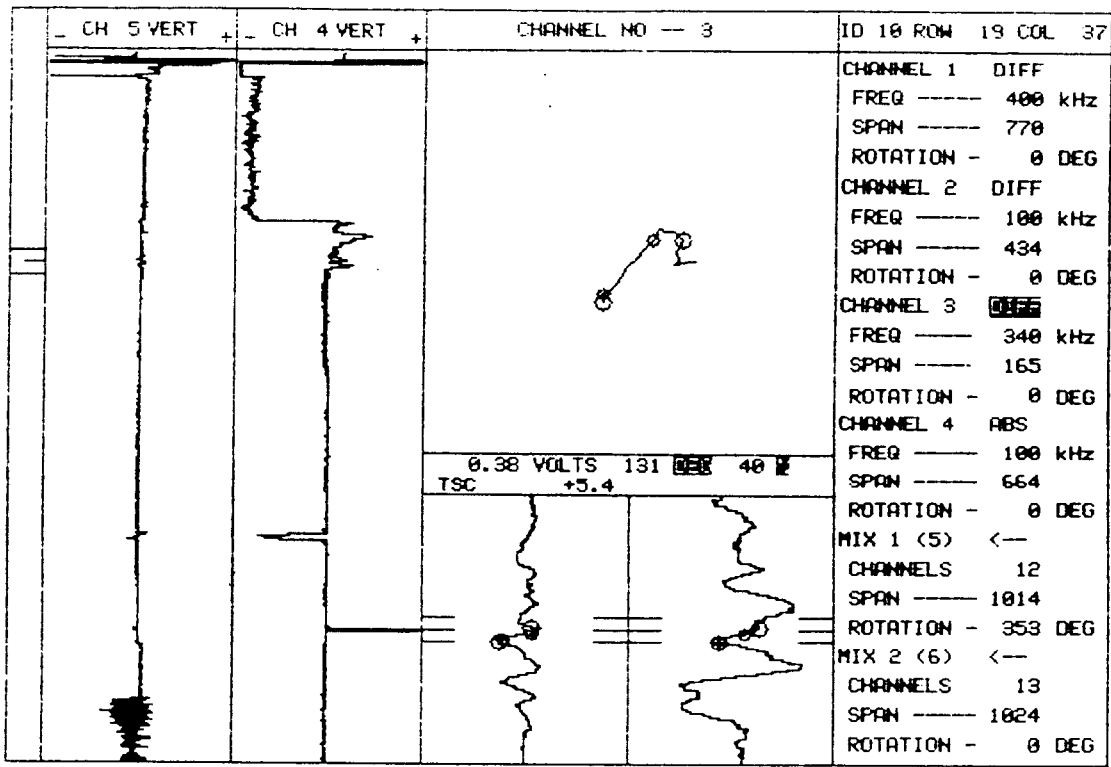
15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10	PLANT SCE SONGS	UNIT# I	S/G A	LEG OUTLET	DATE 1980	ZETEC Inc. - 1983 Edition 12.0 Rev 1
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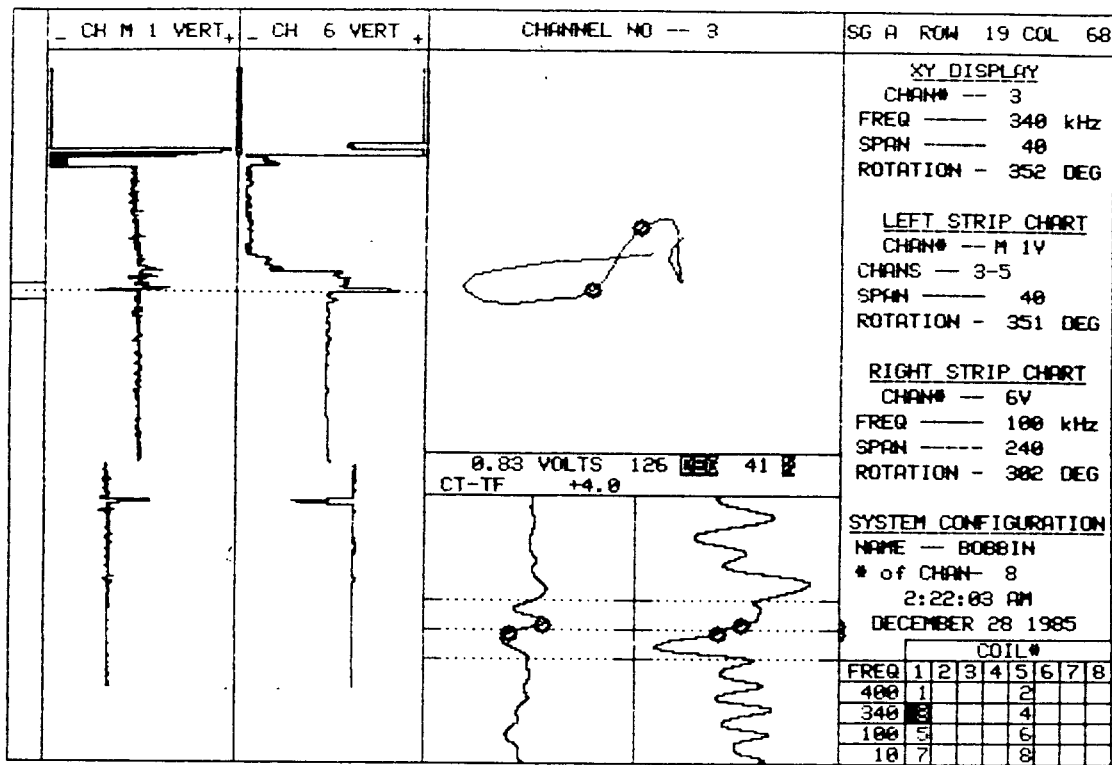


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85

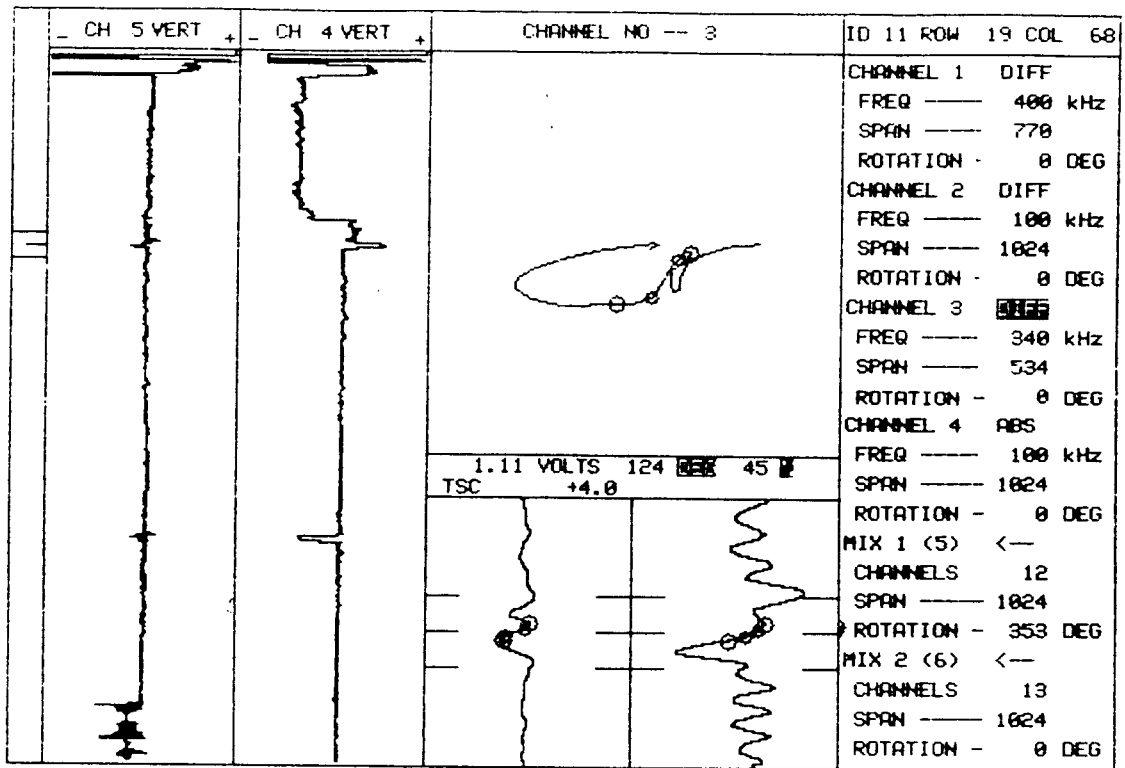


10 PLANT SCE SONGS UNIT# I S/G A LEG R DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1





15 PLANT SONGS DISK C37 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

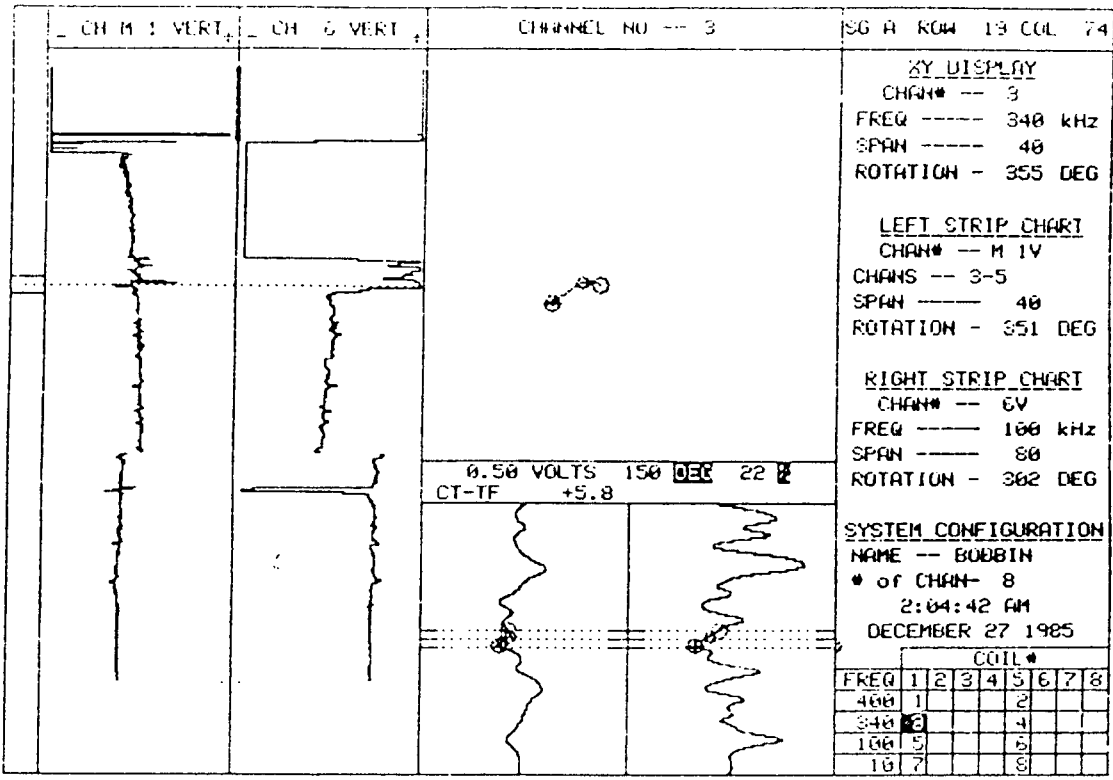


1.11 VOLTS 124 DEG 45 μ  
TSC +4.0

10

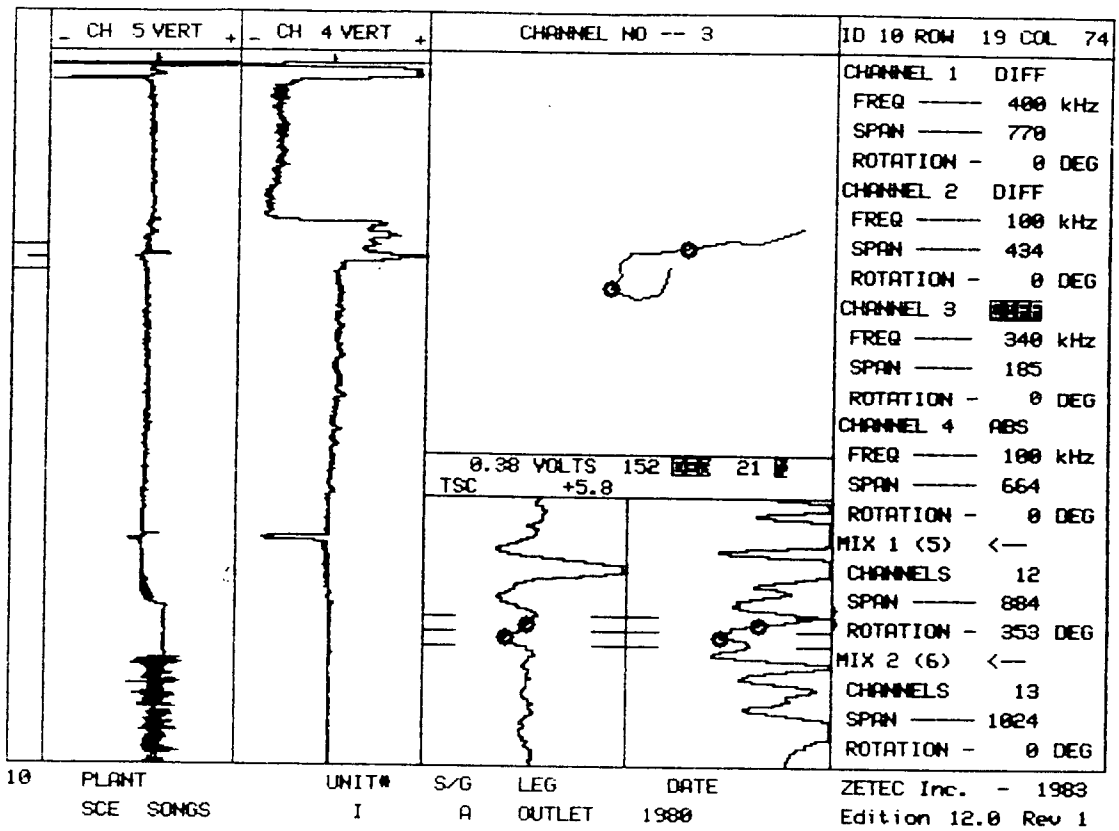
ZETEC Inc. - 1983  
Edition 12.0 Rev 1

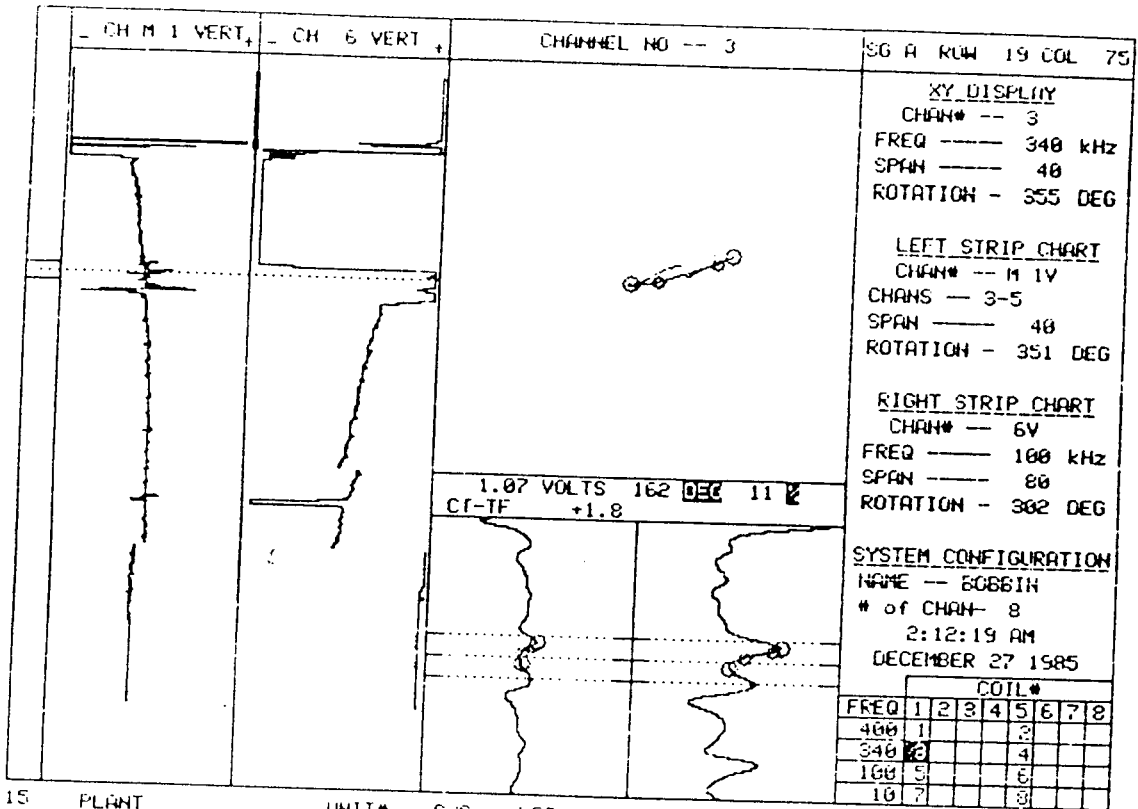
S/G A 19D



15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85

CT +





XY DISPLAY  
 CHAN# -- 3  
 FREQ --- 340 KHz  
 SPAN --- 40  
 ROTATION - 355 DEG

LEFT STRIP CHART  
 CHAN# -- 1 IV  
 CHANS -- 3-5  
 SPAN --- 40  
 ROTATION - 351 DEG

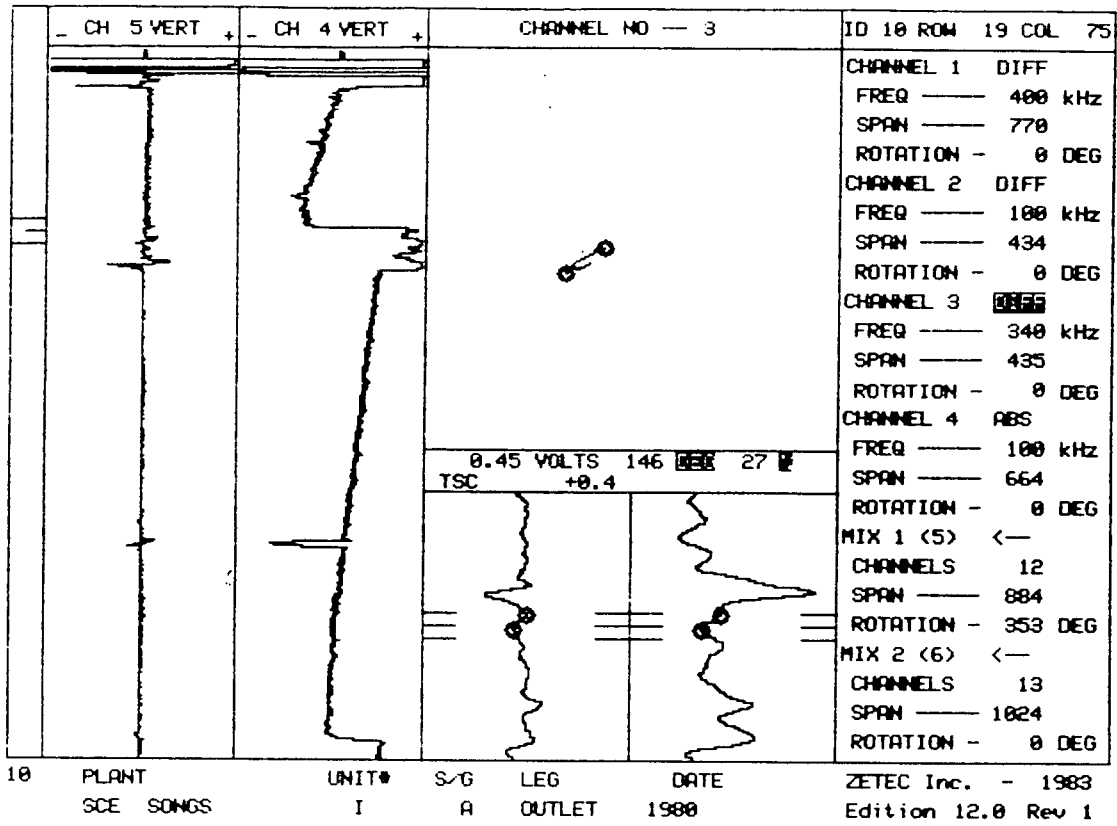
RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ --- 100 KHz  
 SPAN --- 80  
 ROTATION - 302 DEG

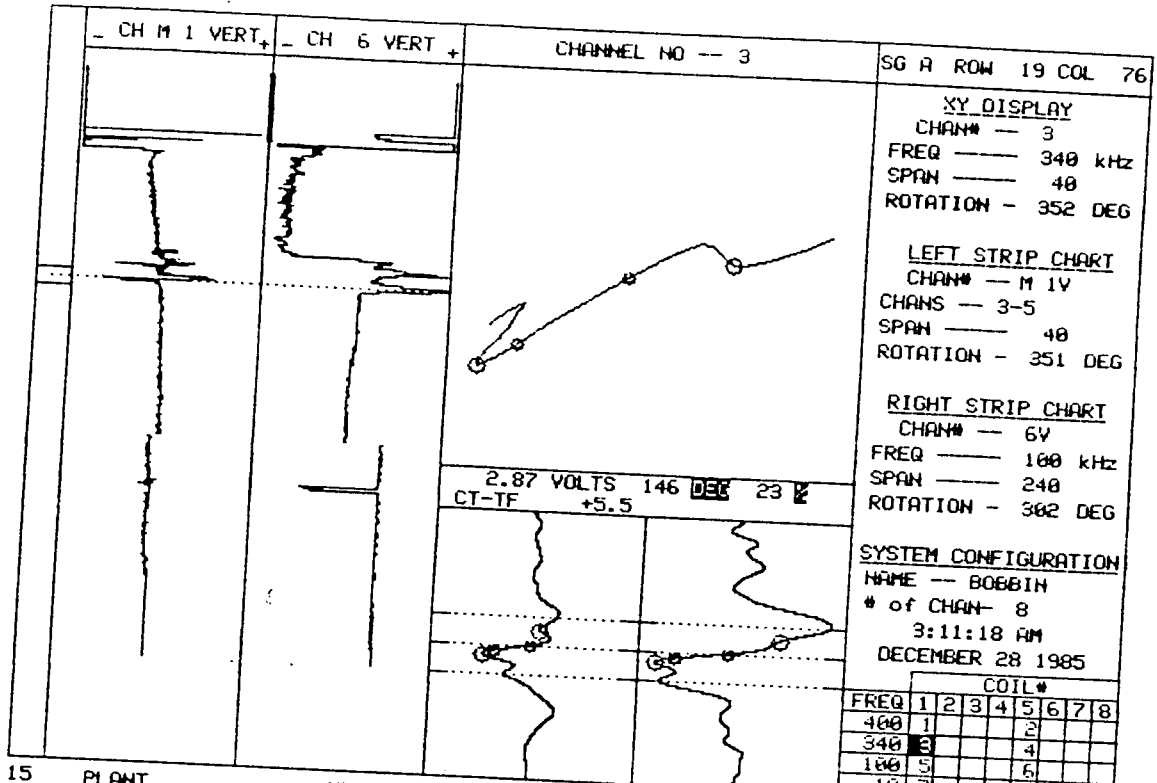
1.07 VOLTS 162 DEC 11  
 Cf-TF +1.8

SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 2:12:19 AM  
 DECEMBER 27 1985

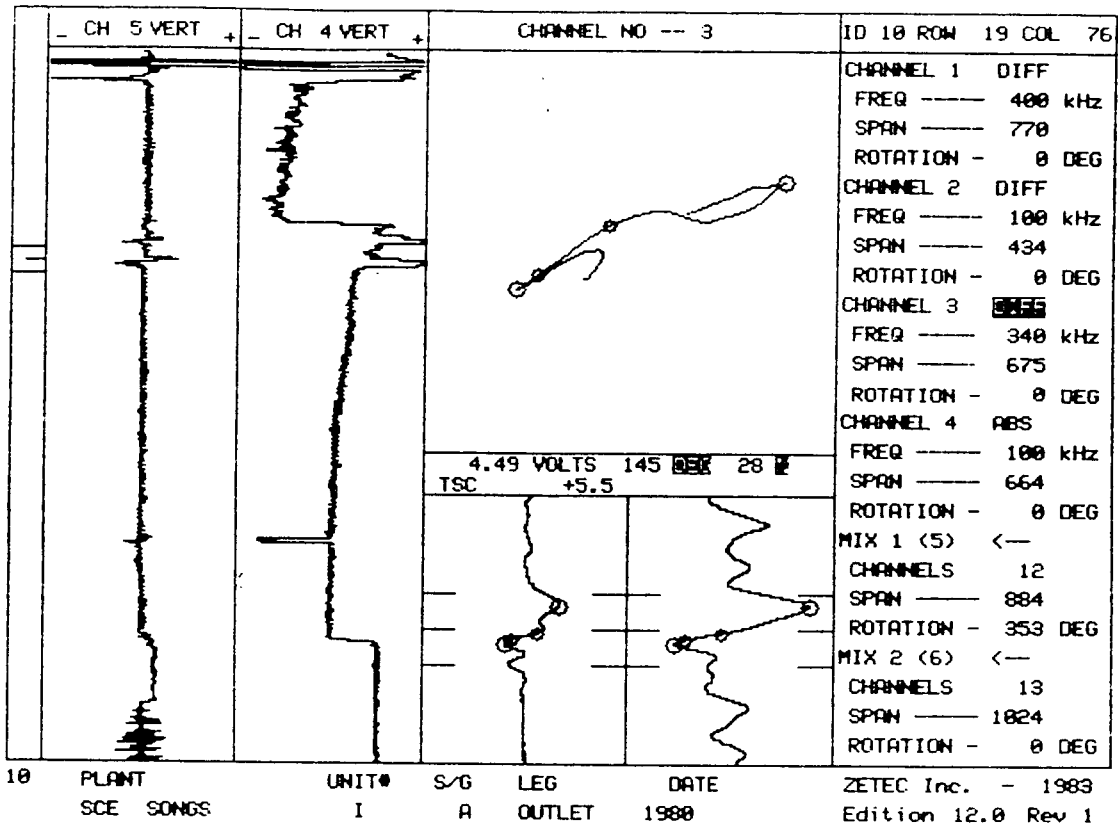
		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	2					4			
100	3					6			
10	7					8			

15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85

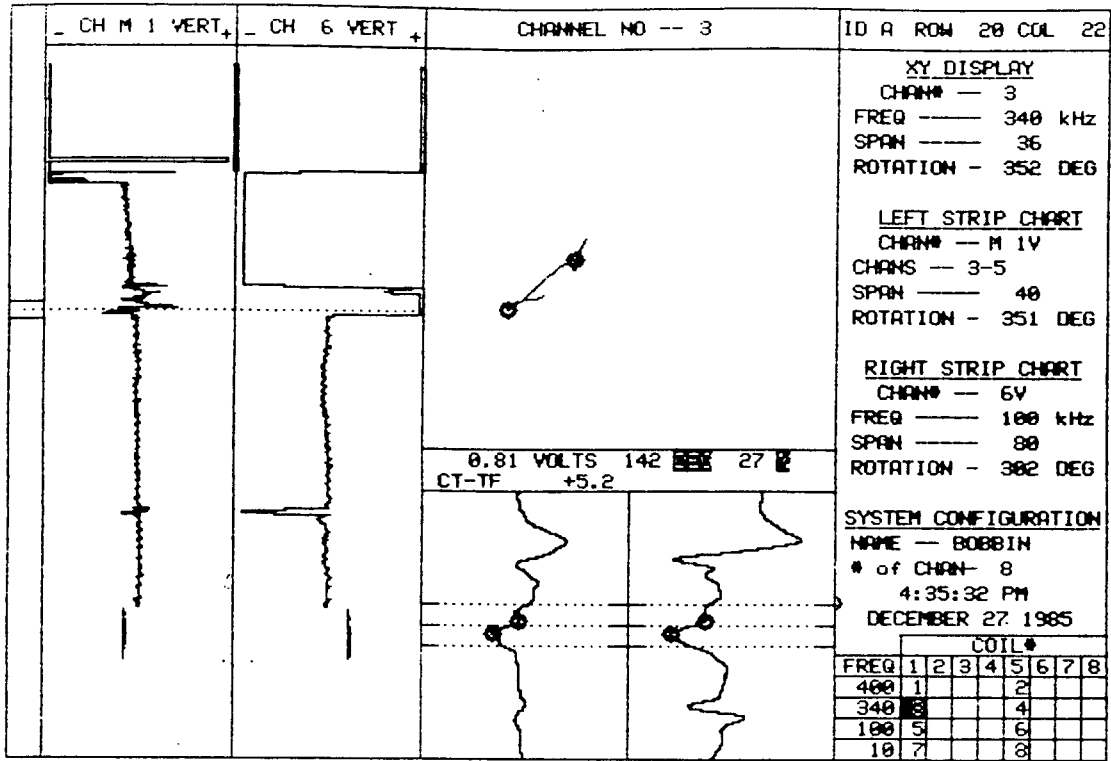




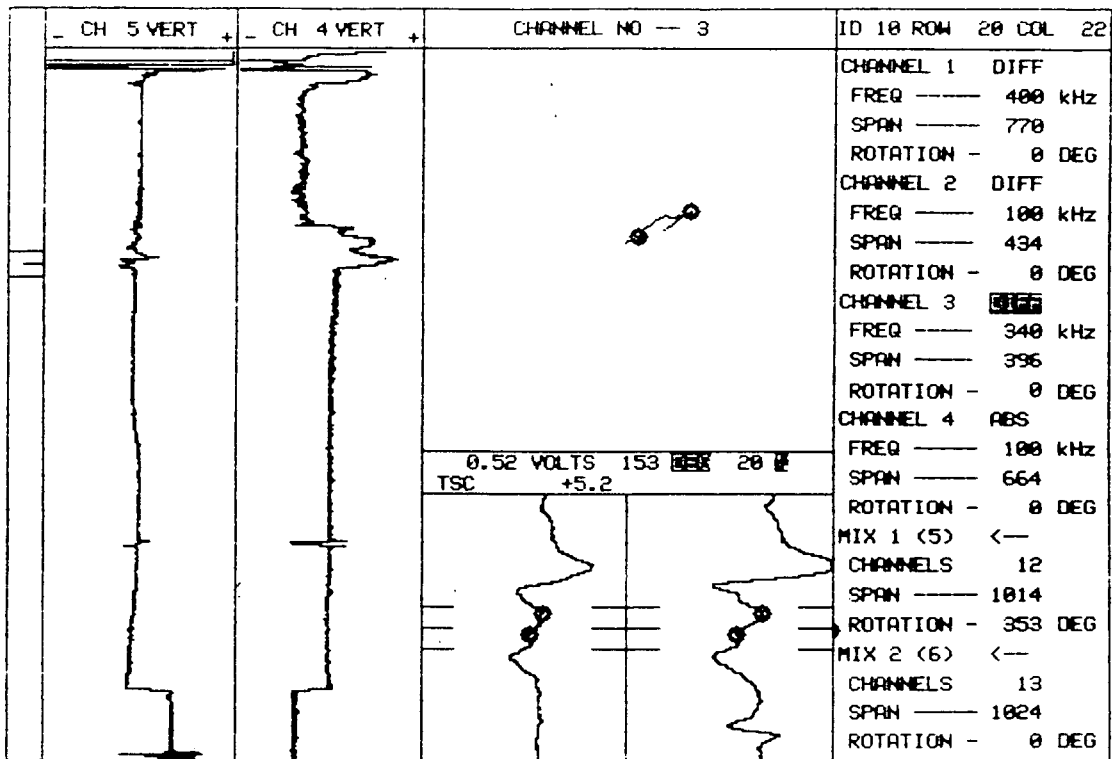
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C37    1    A    OUTLET    12/27/85





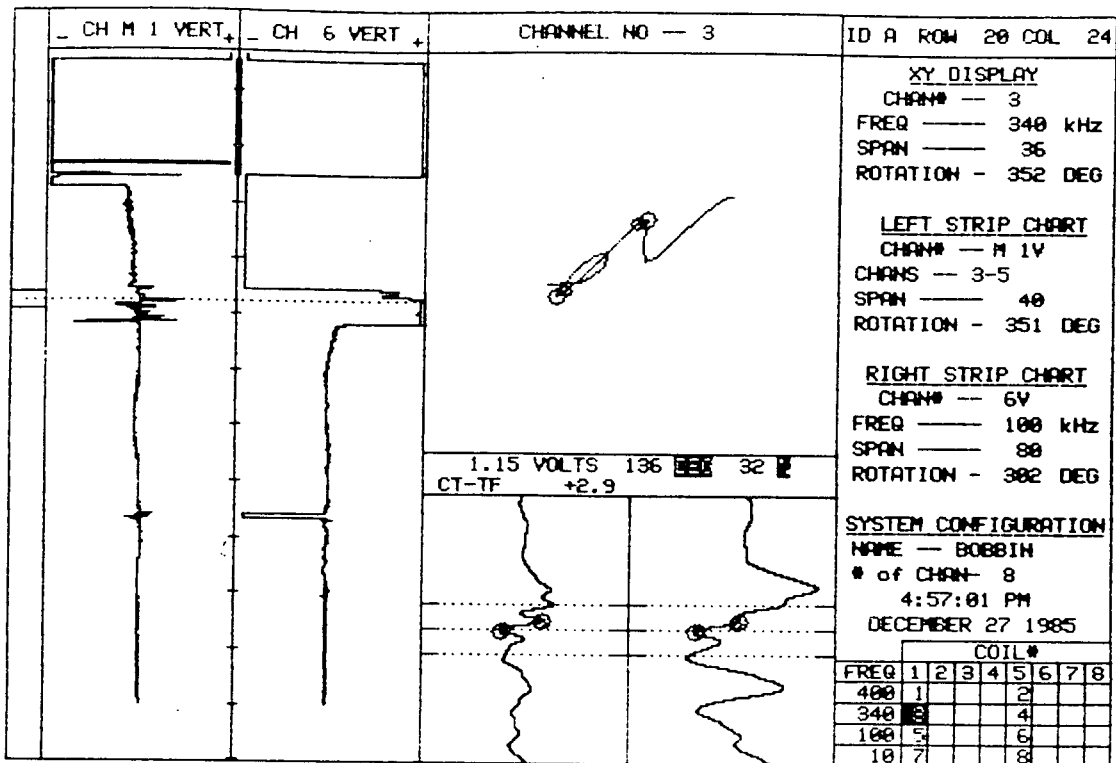


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85

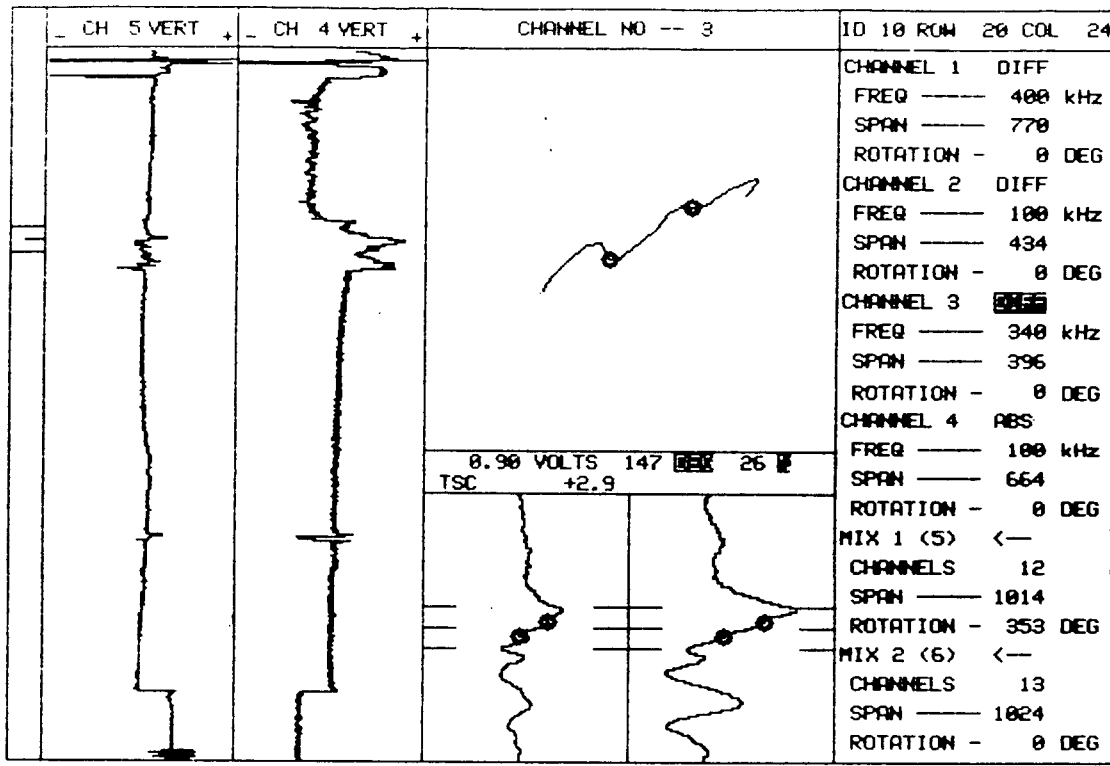


0.52 VOLTS 153 ~~DEG~~ 20 ~~Hz~~  
TSC +5.2

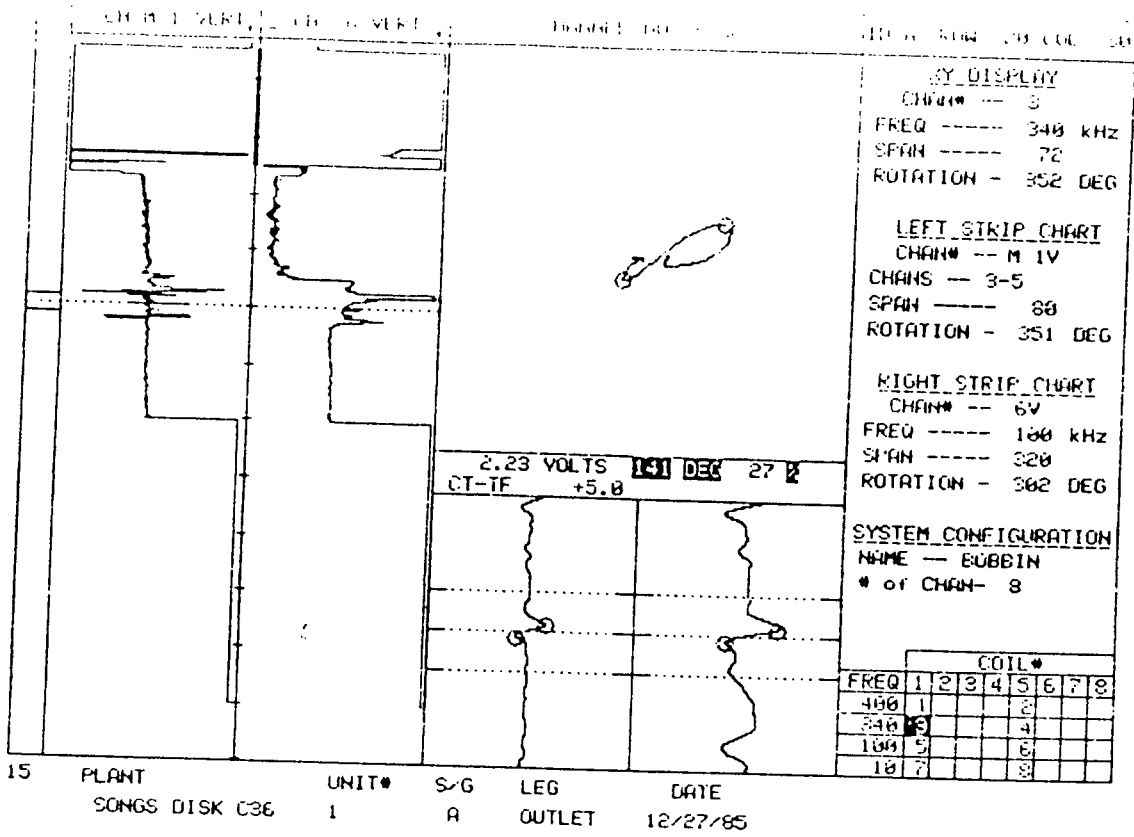
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



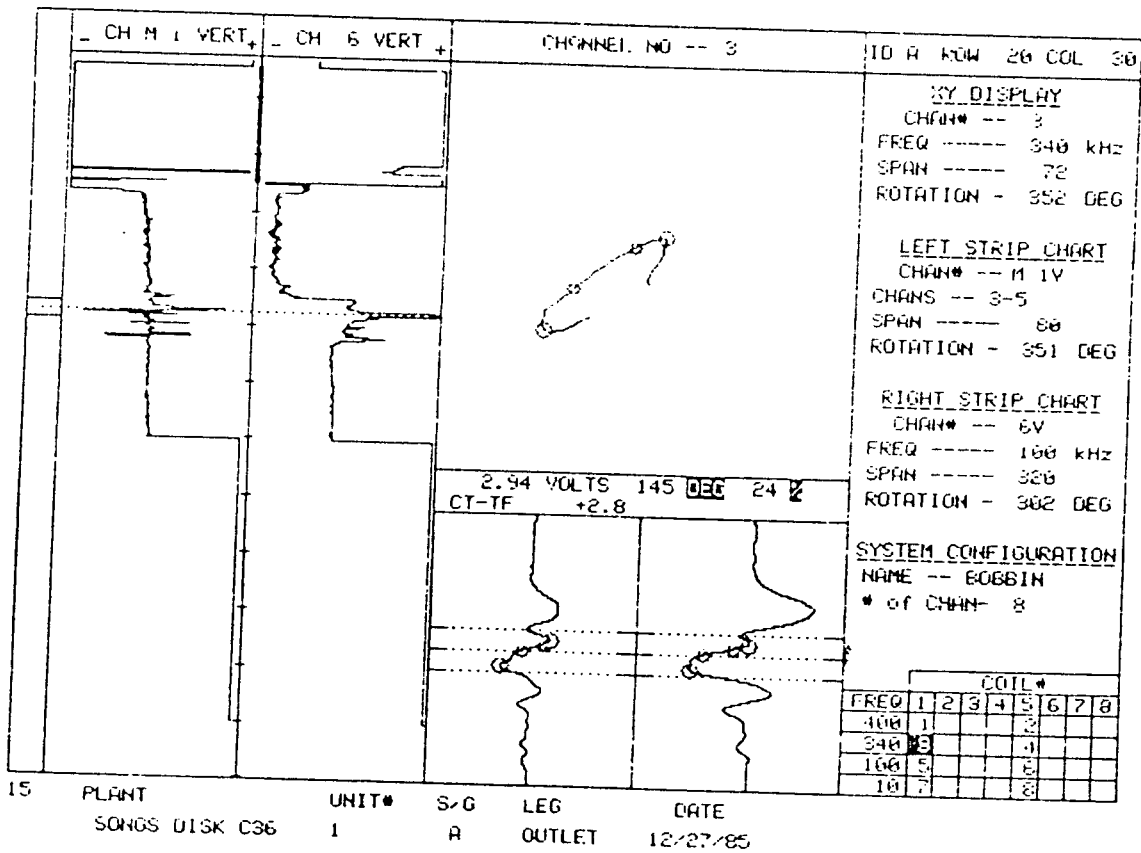
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



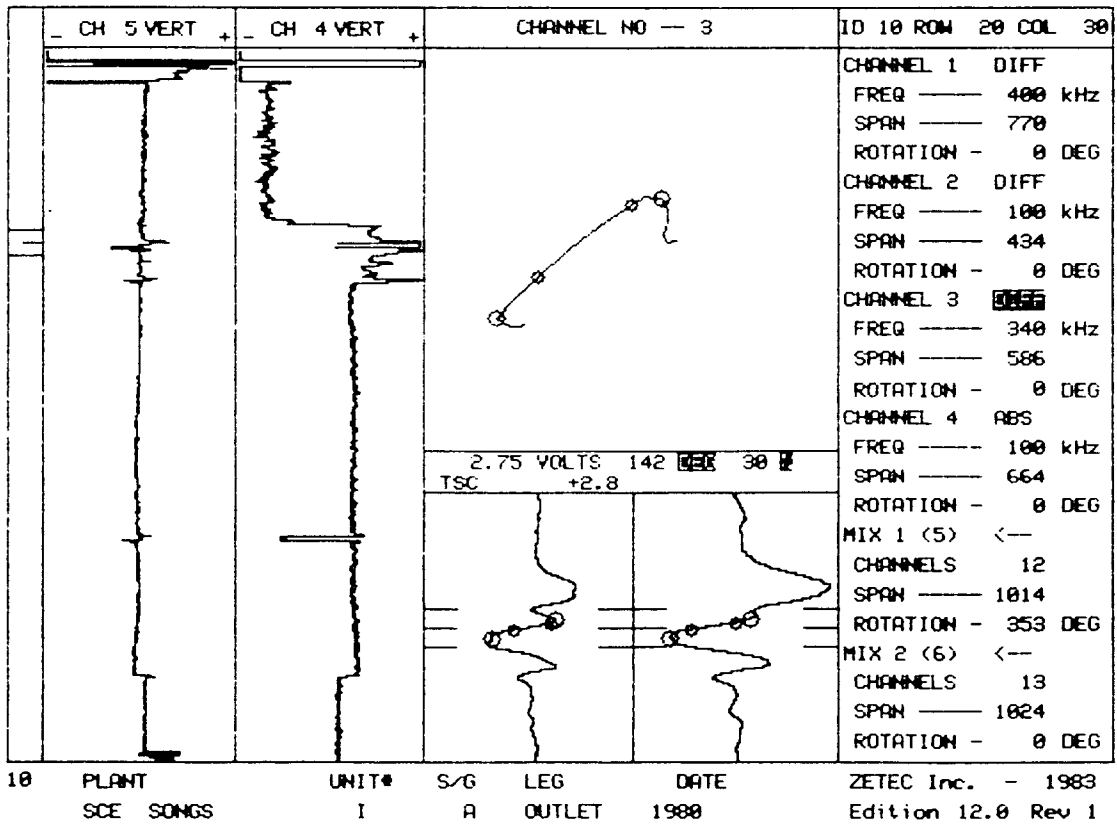
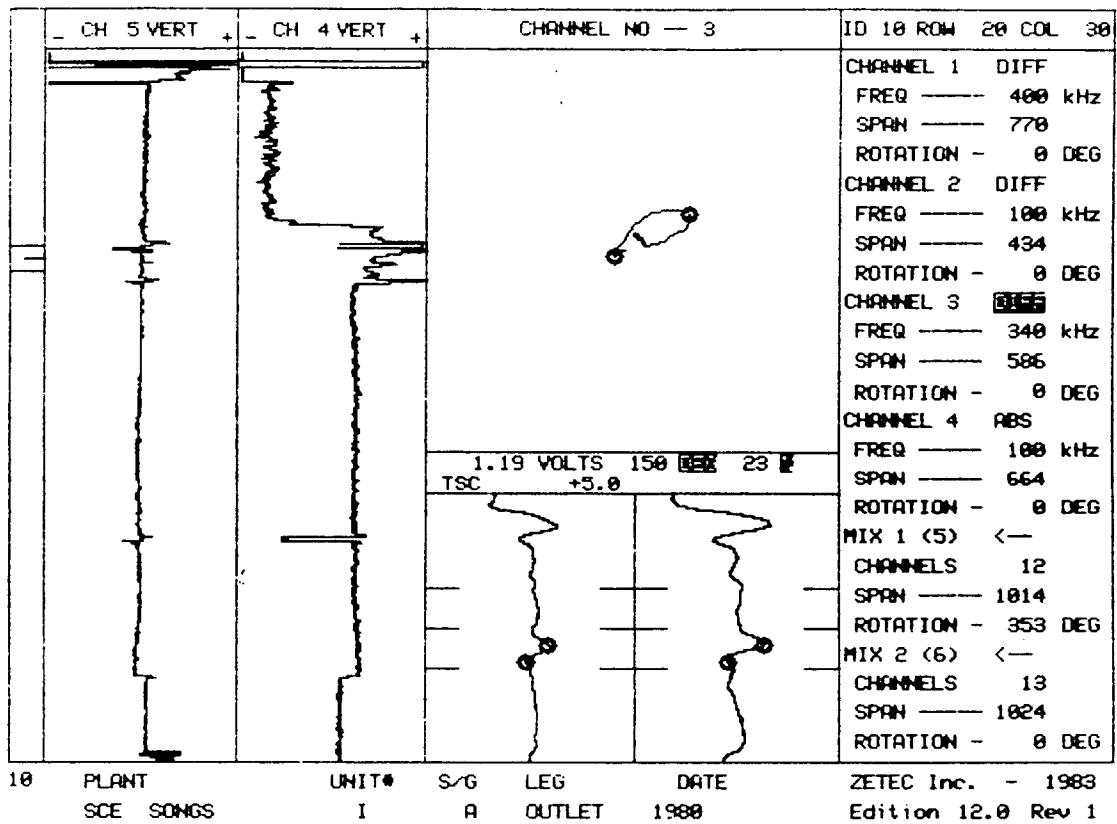
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

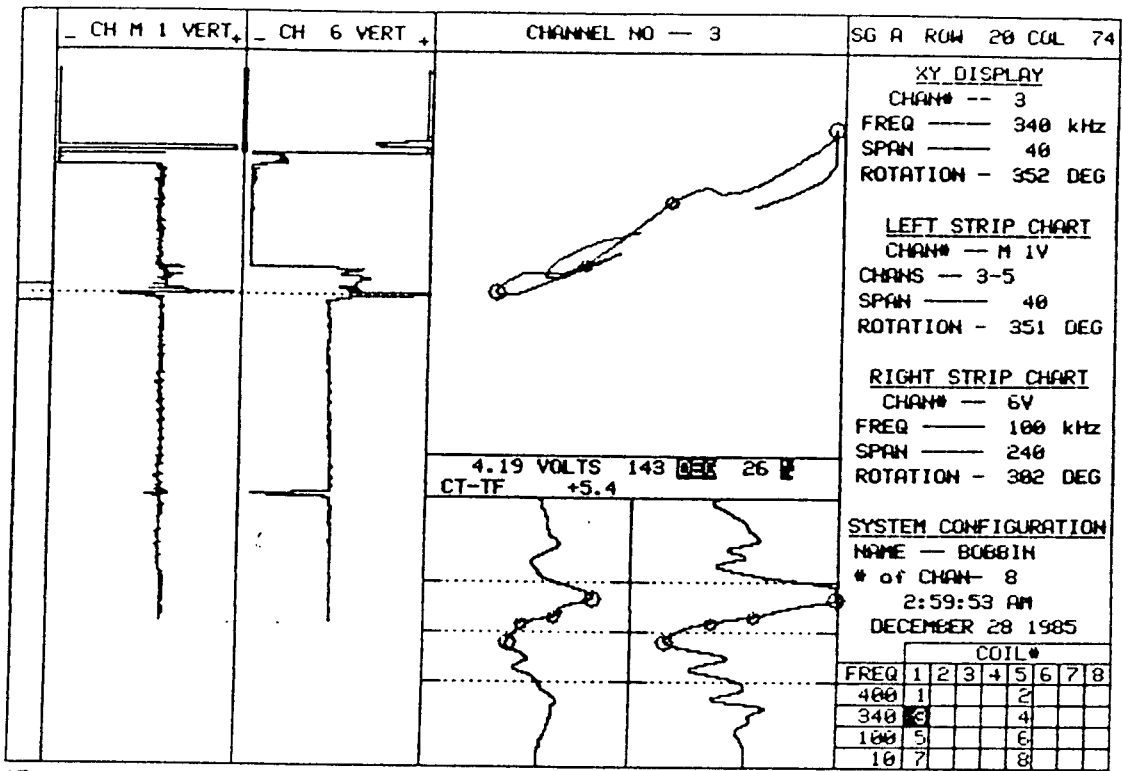


15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

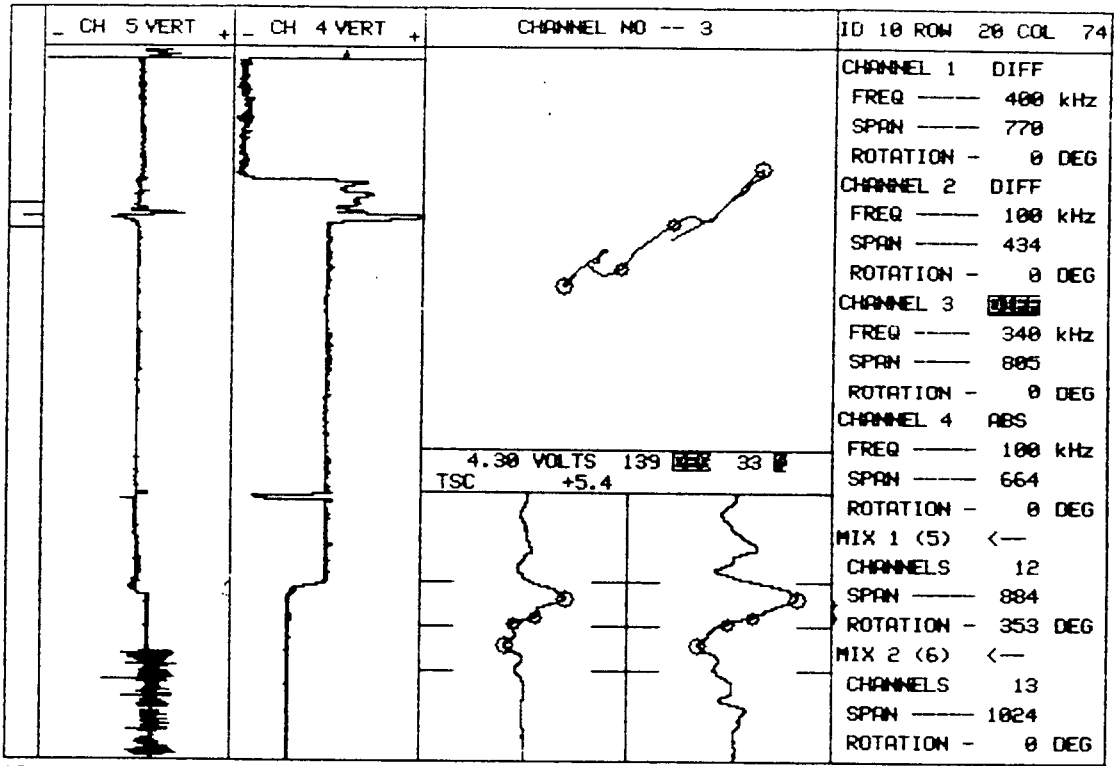


15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85





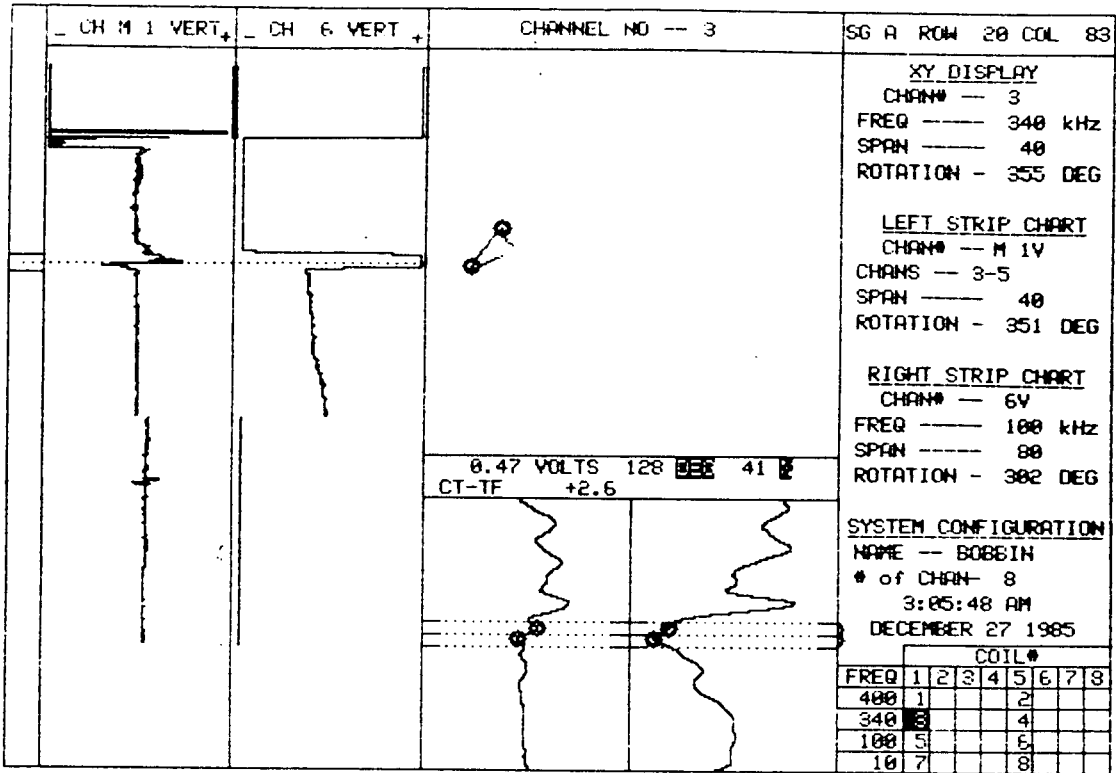
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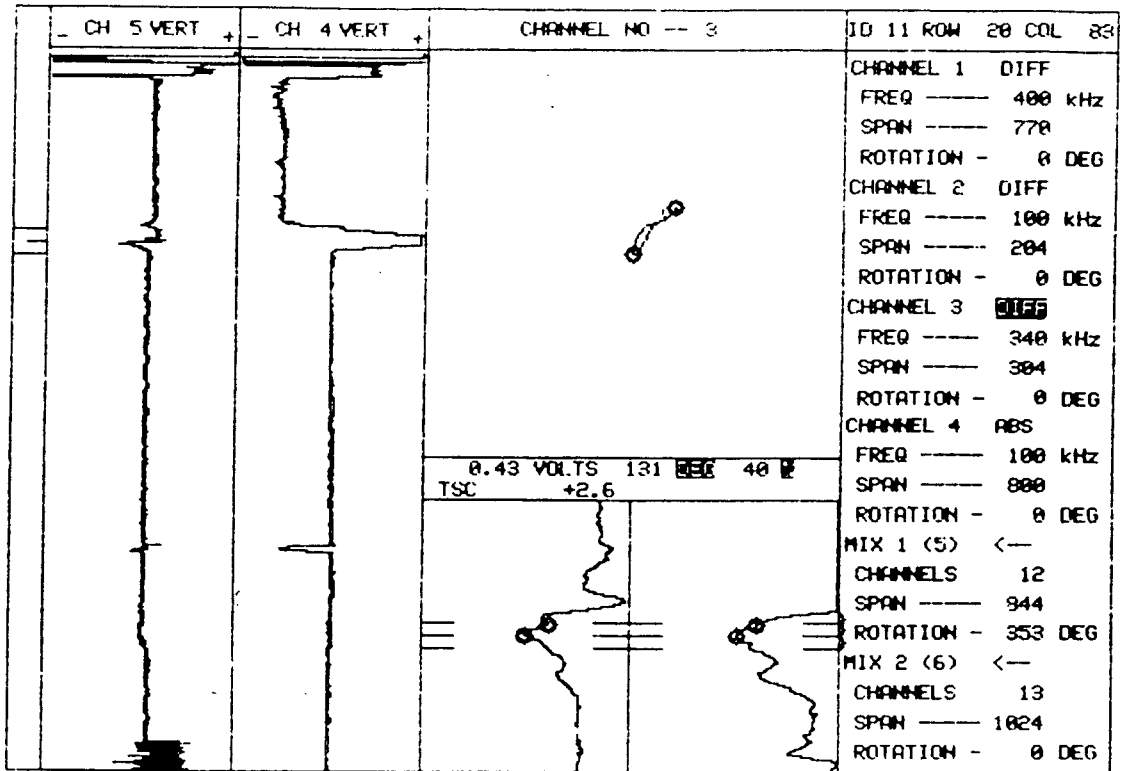
4.30 VOLTS 139 33  
TSC +5.4

10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

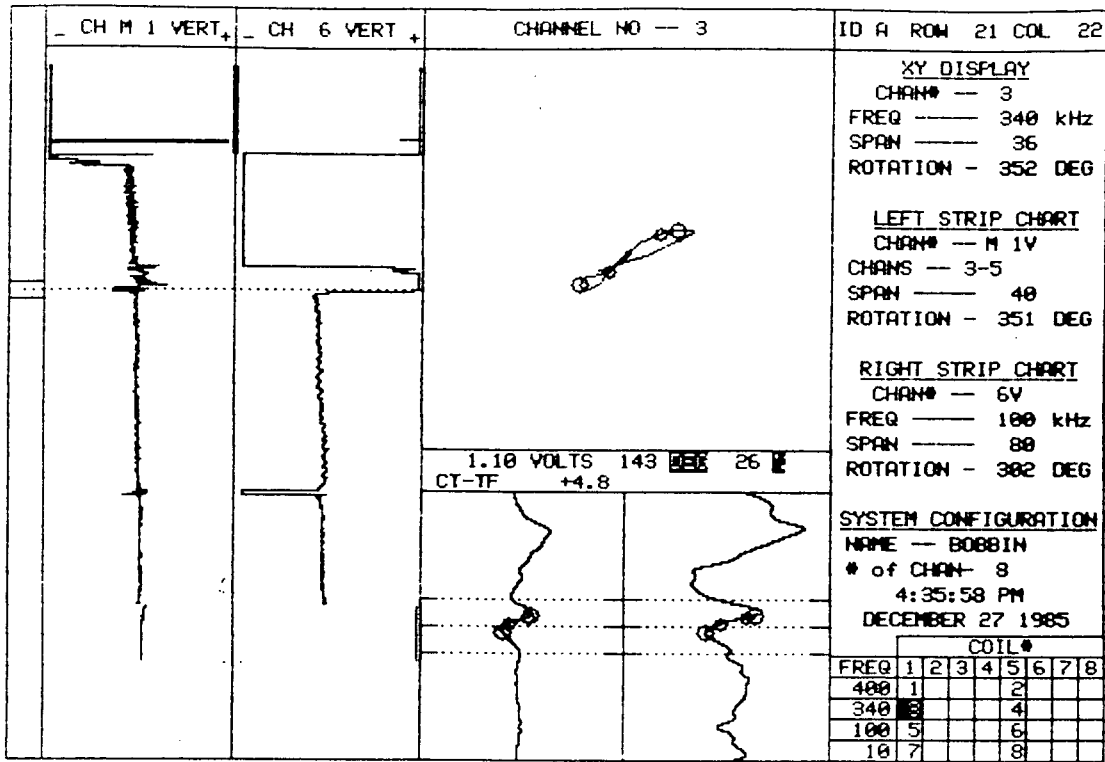




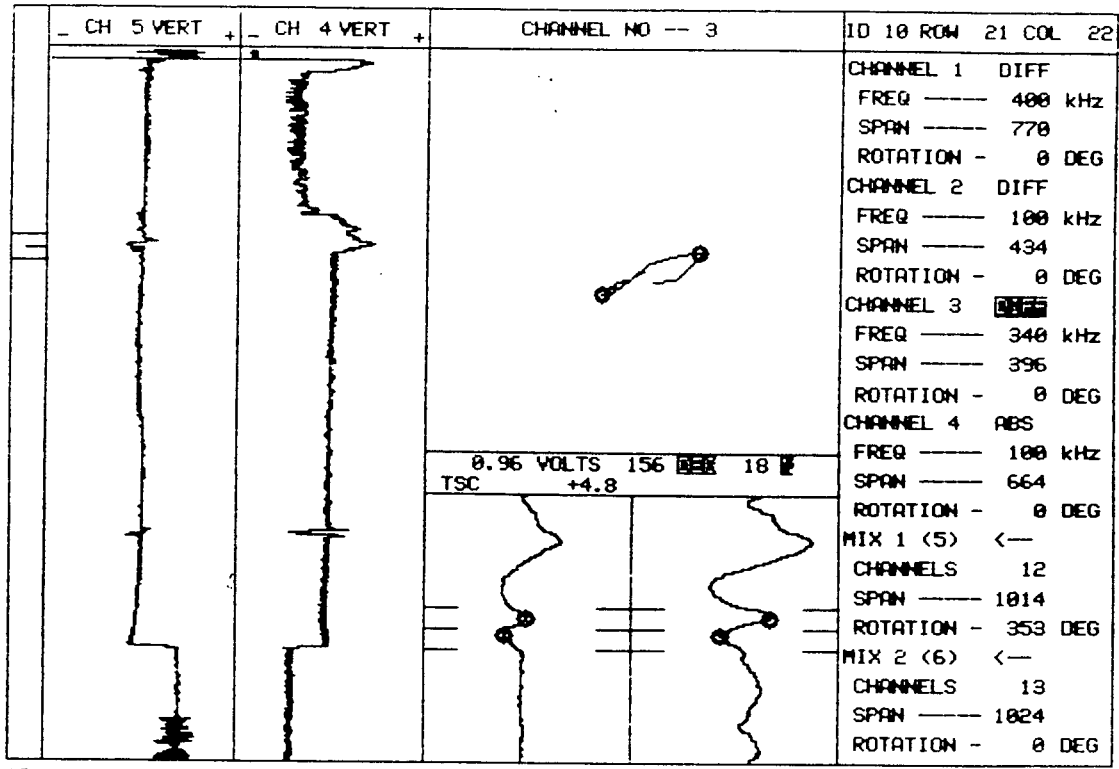
15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



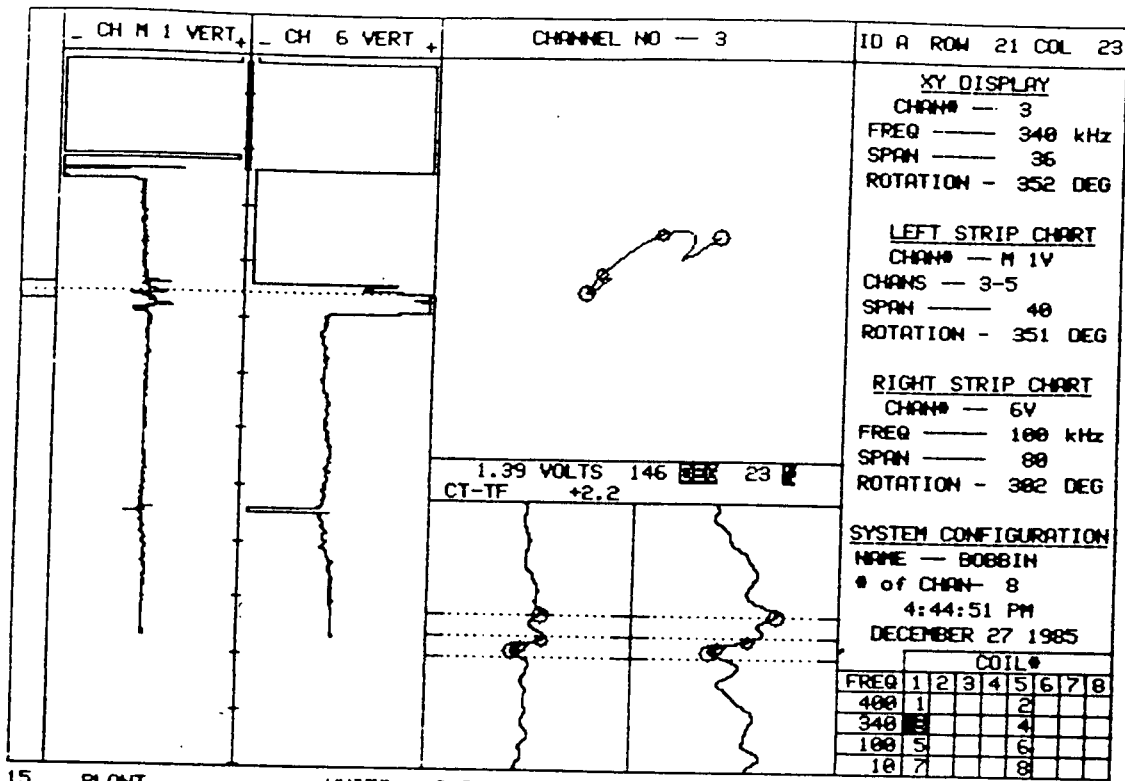
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	1	A	OUTLET	1980	Edition 12.0 Rev 1



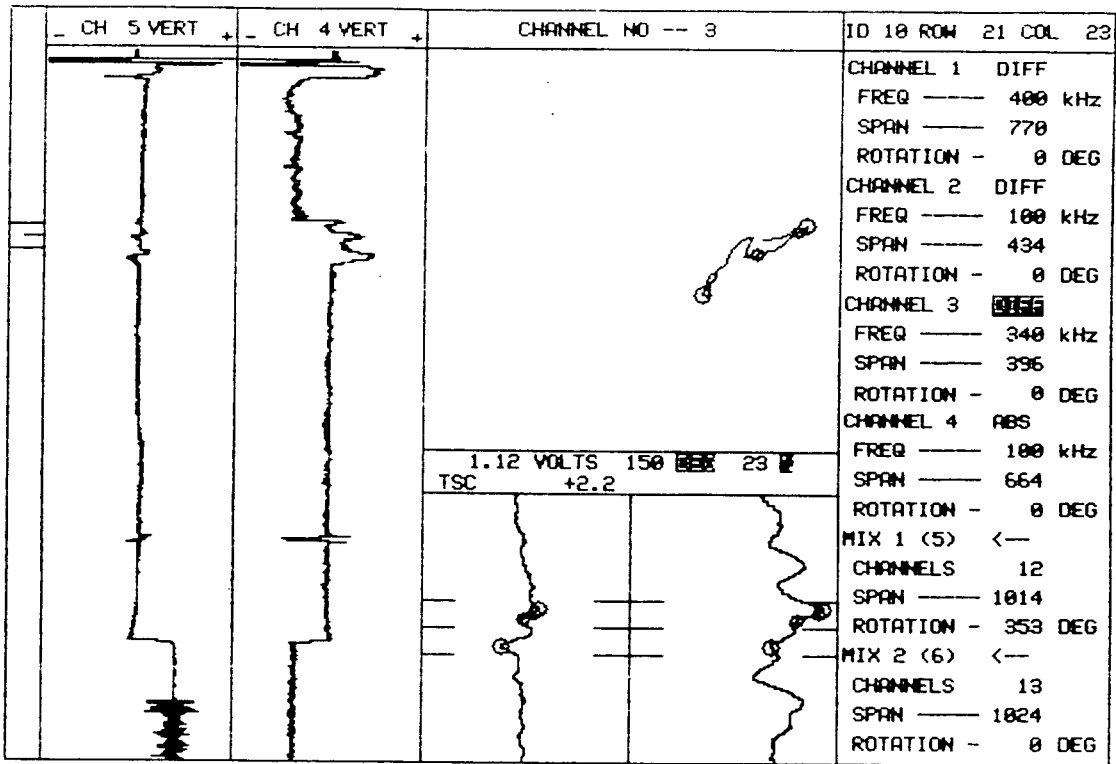
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

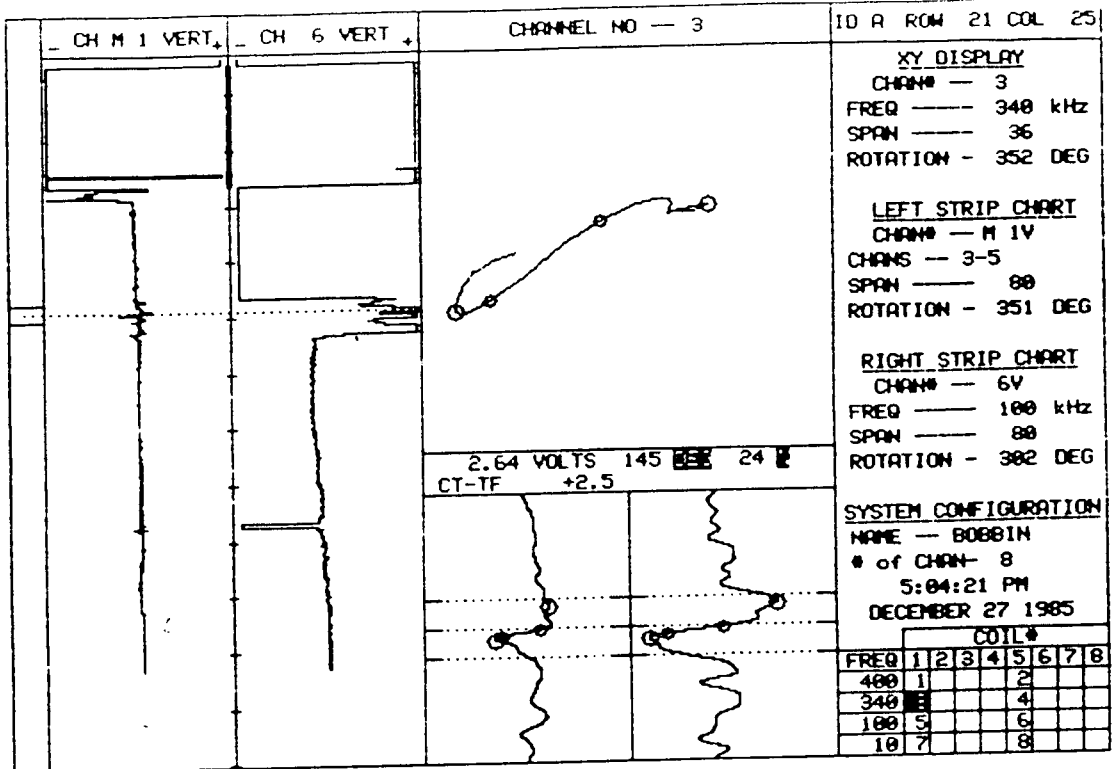


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85

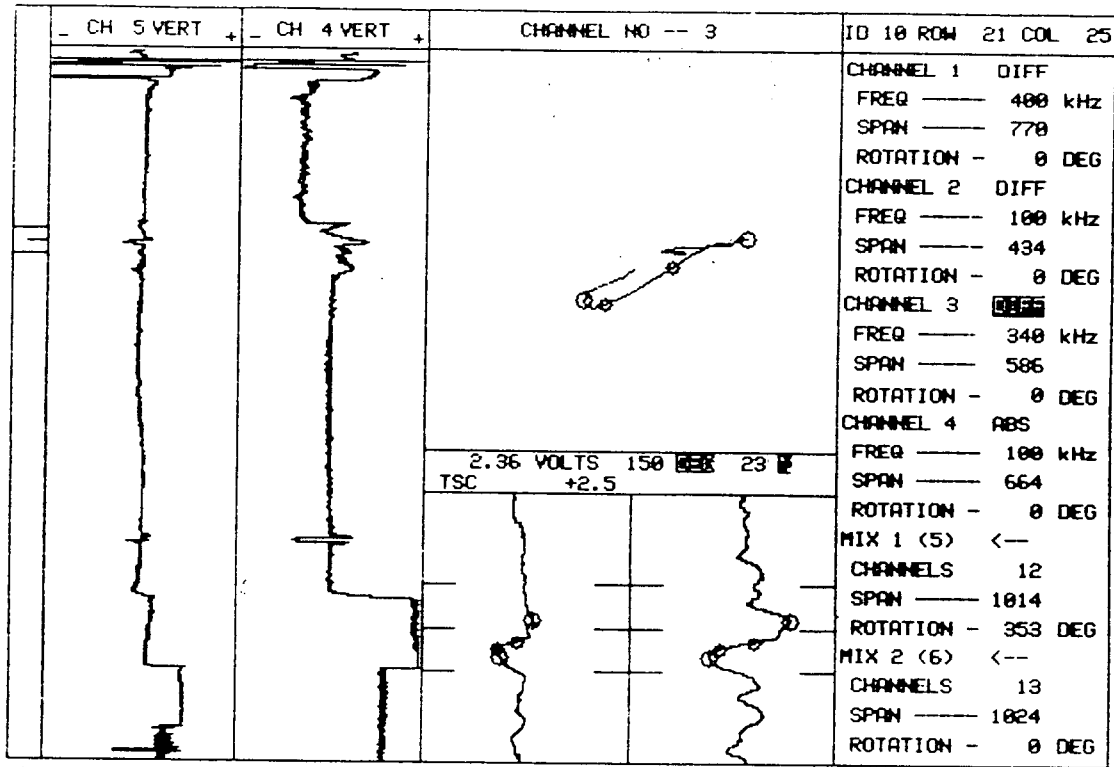


1.12 VOLTS 150 **SEC** 23 **SEC**  
TSC +2.2

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

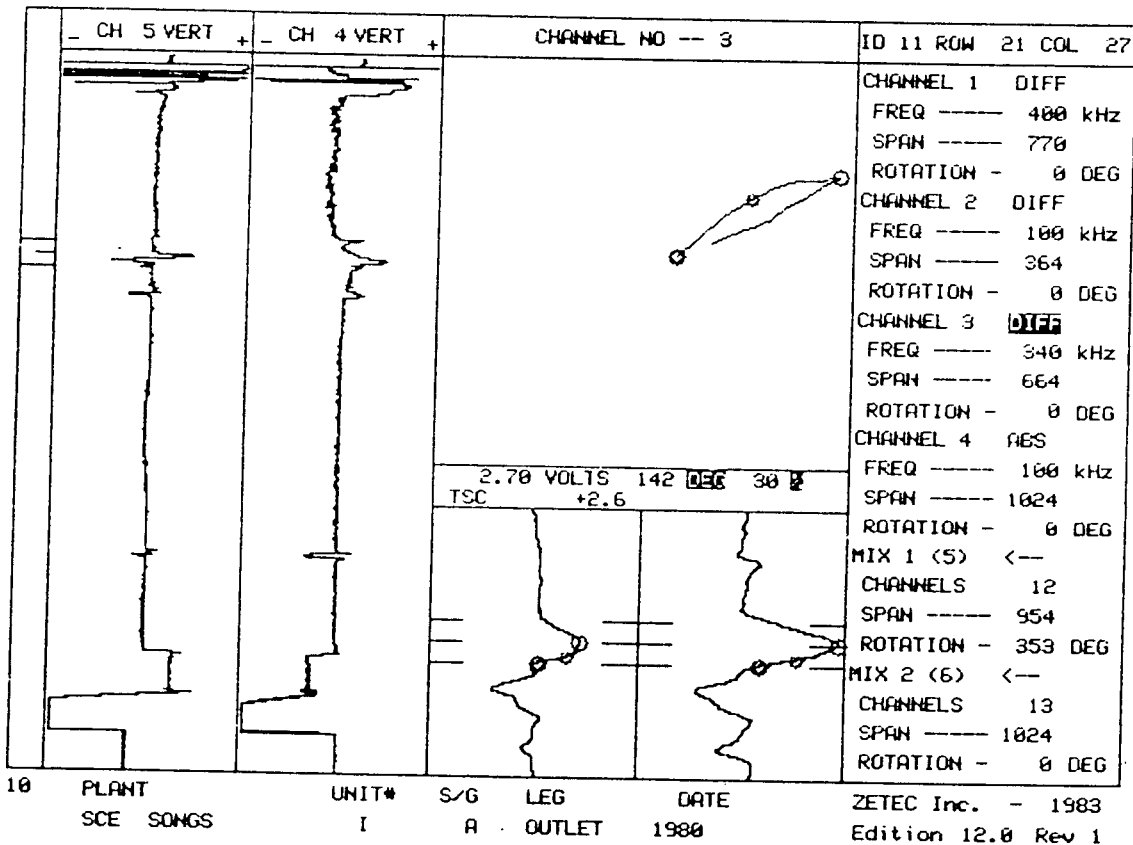
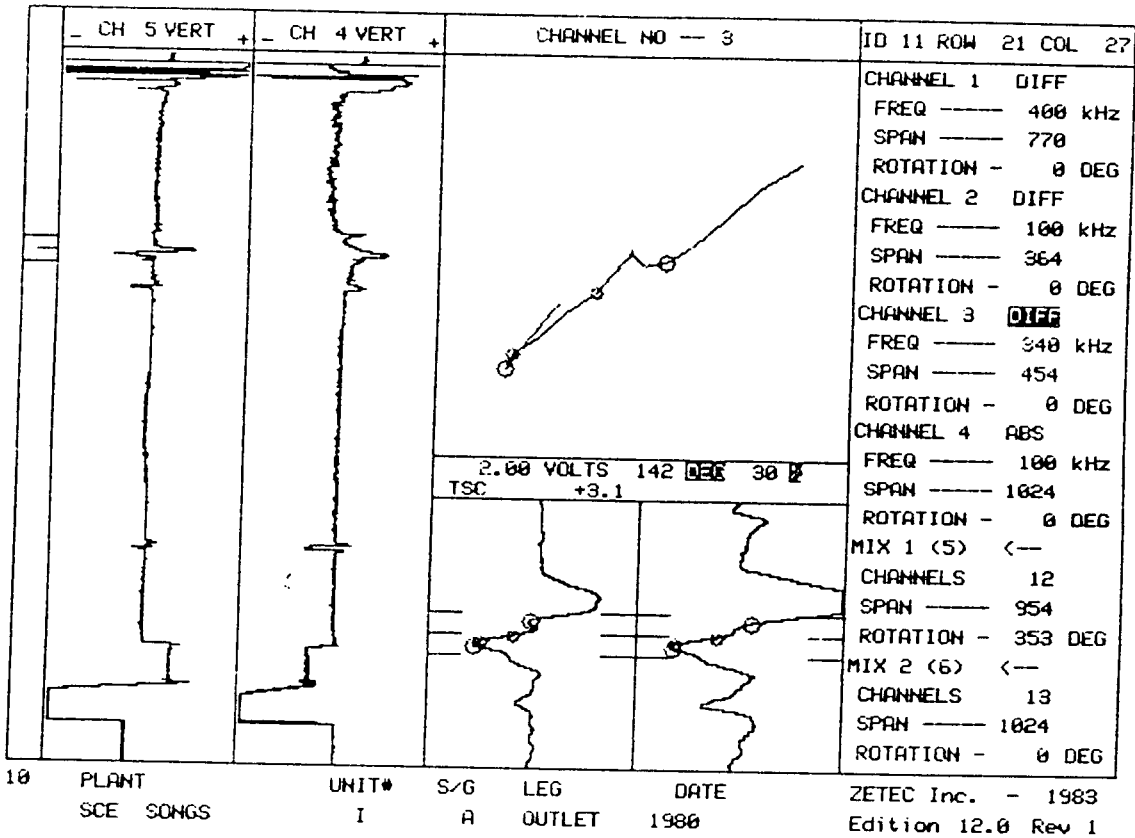


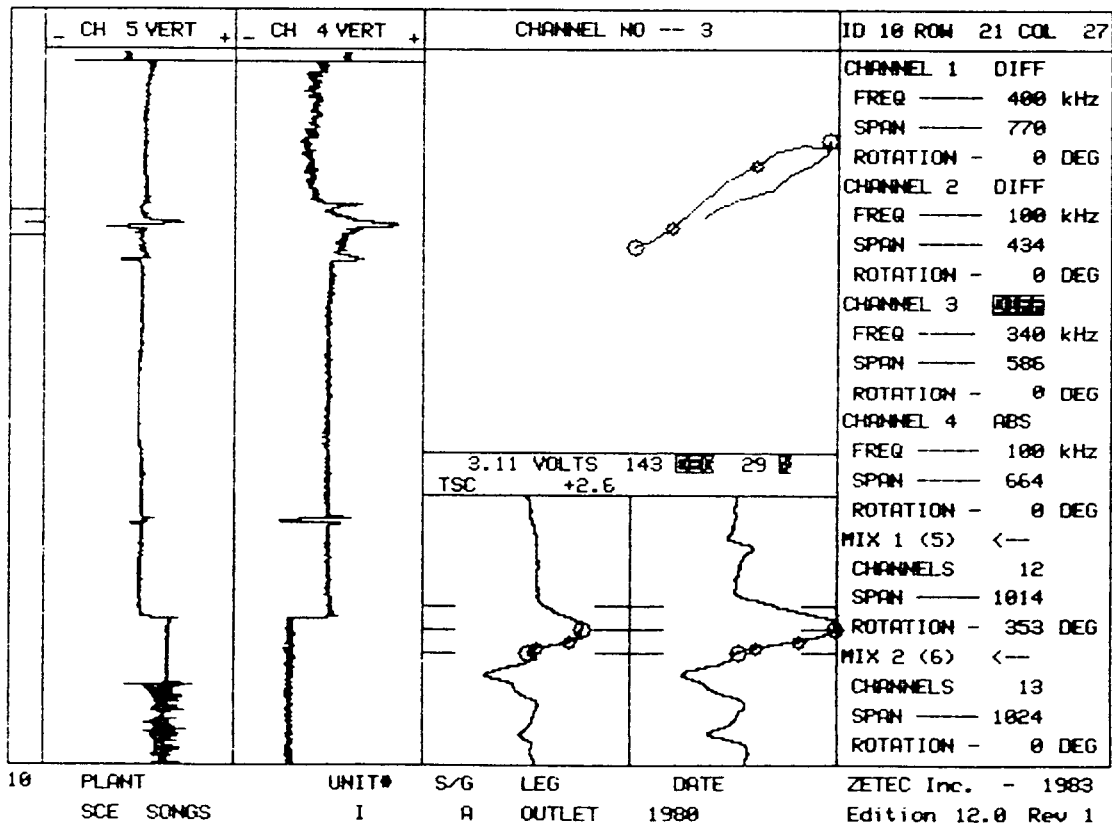
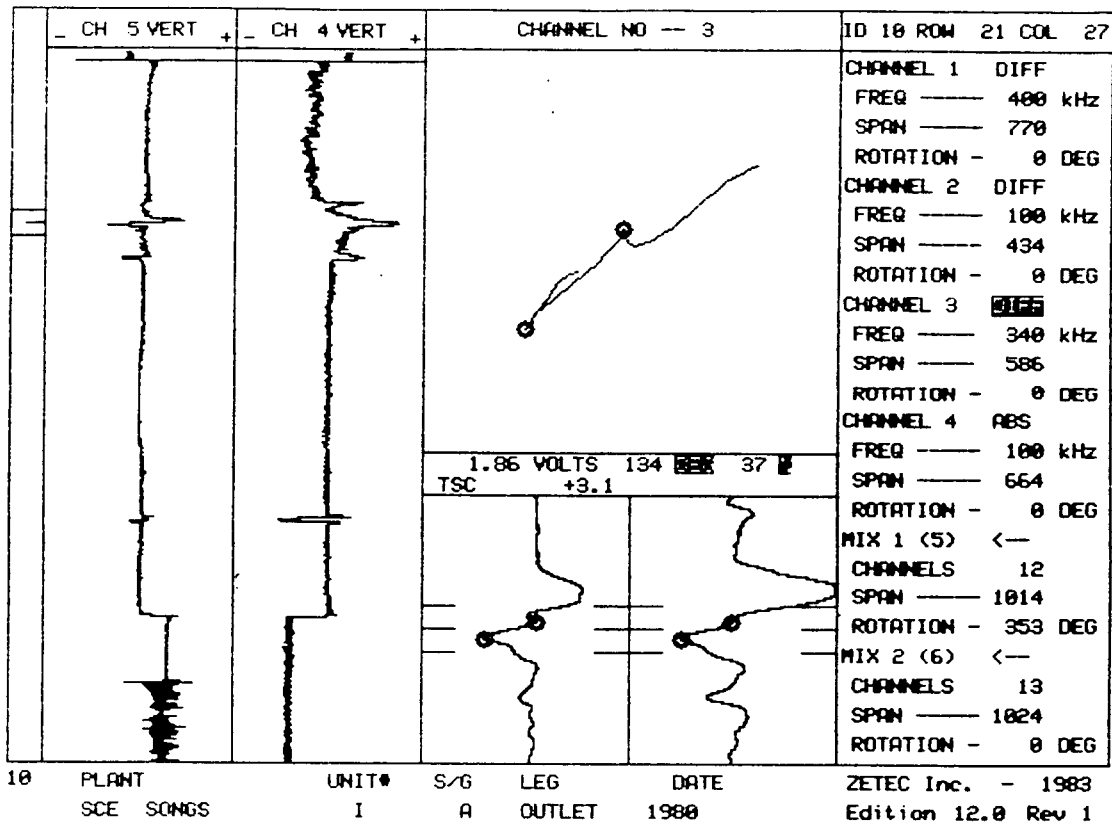
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

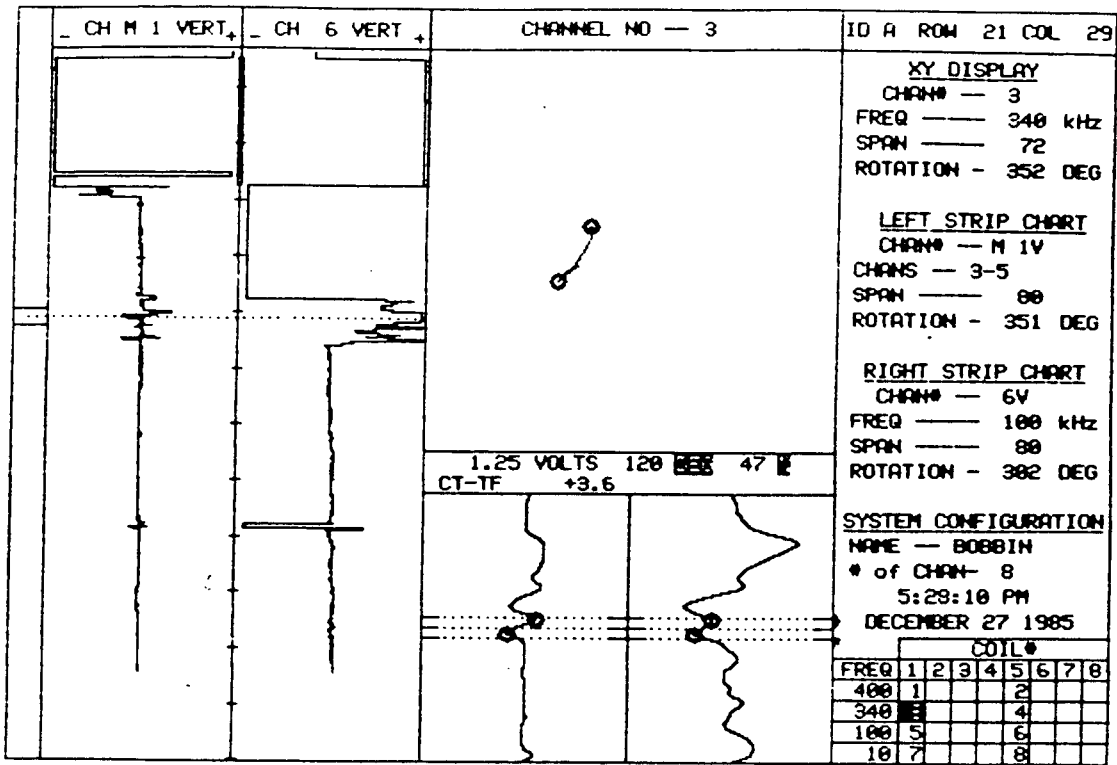


10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1

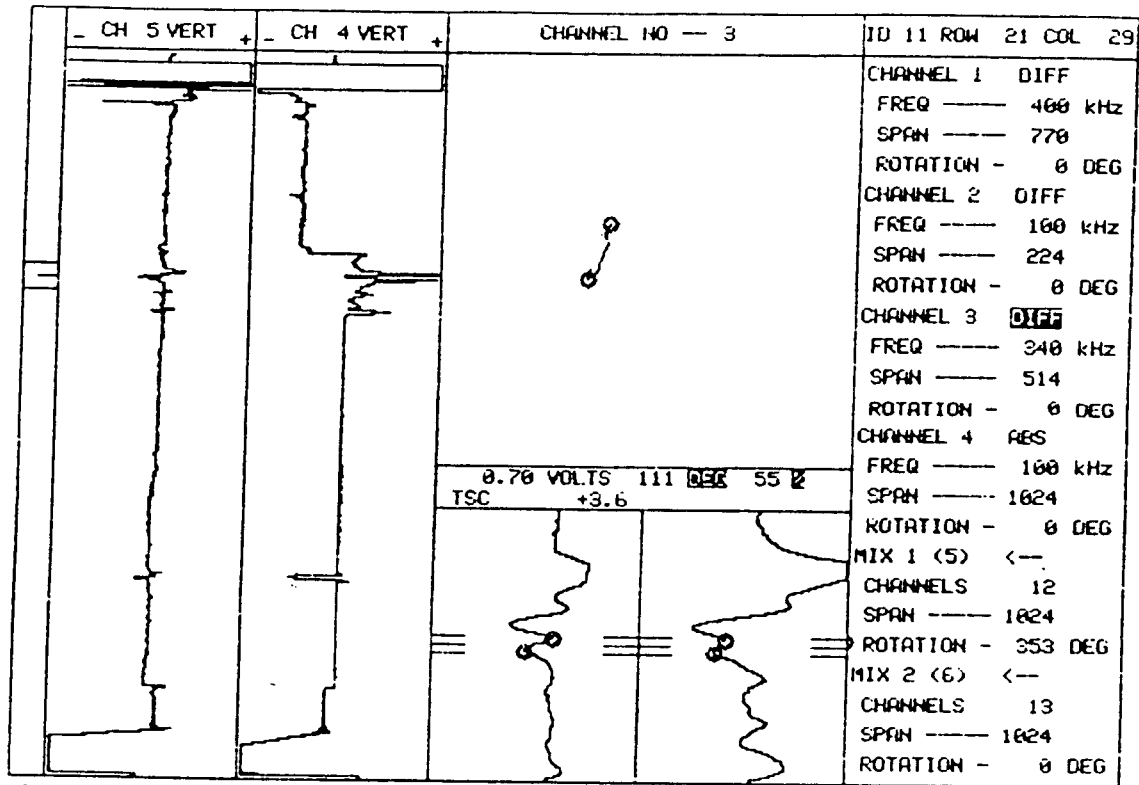




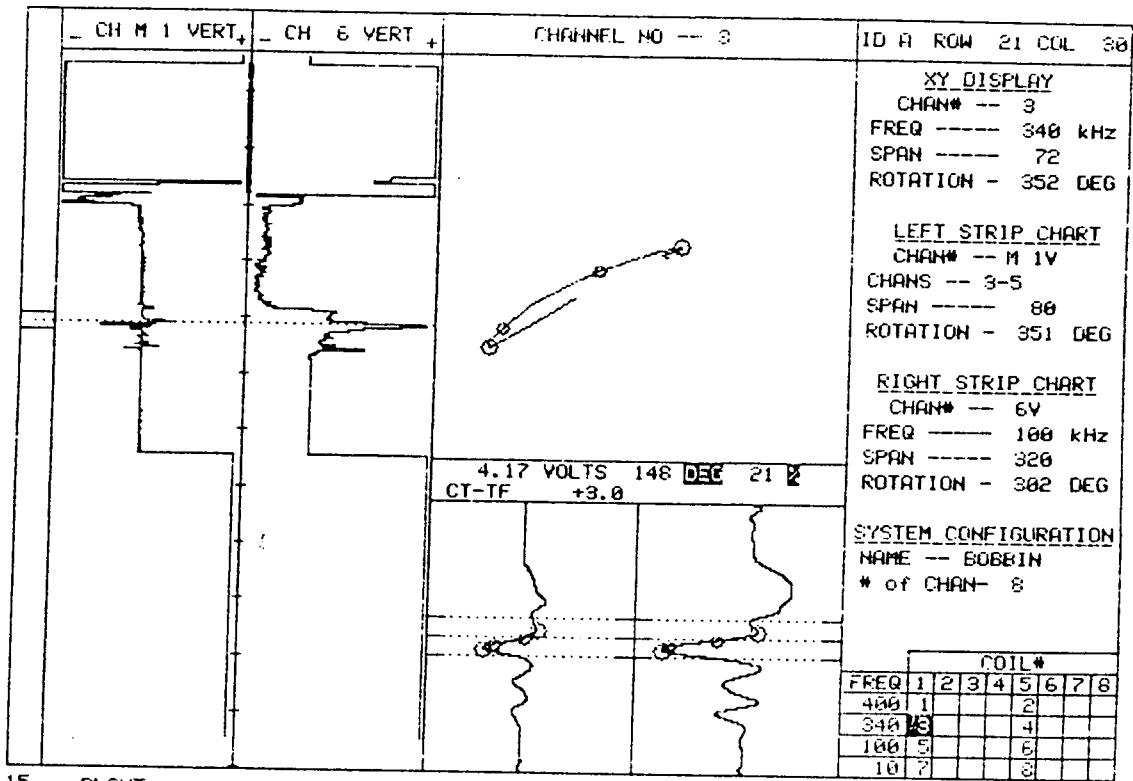




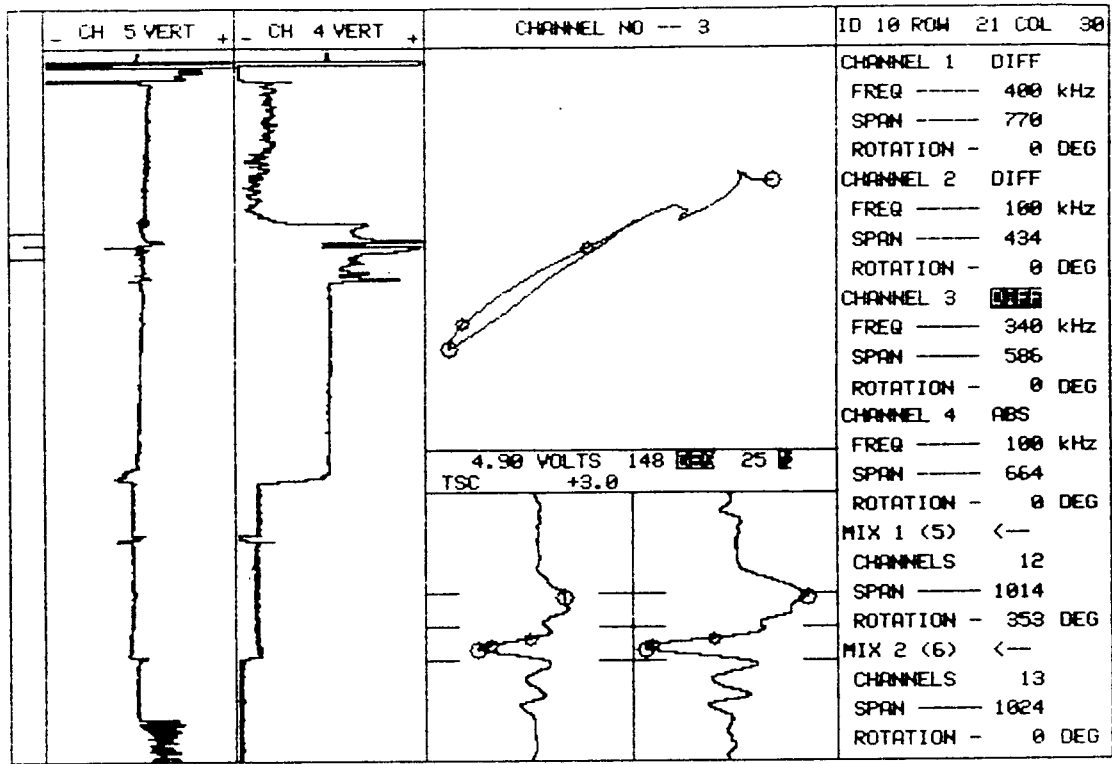
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

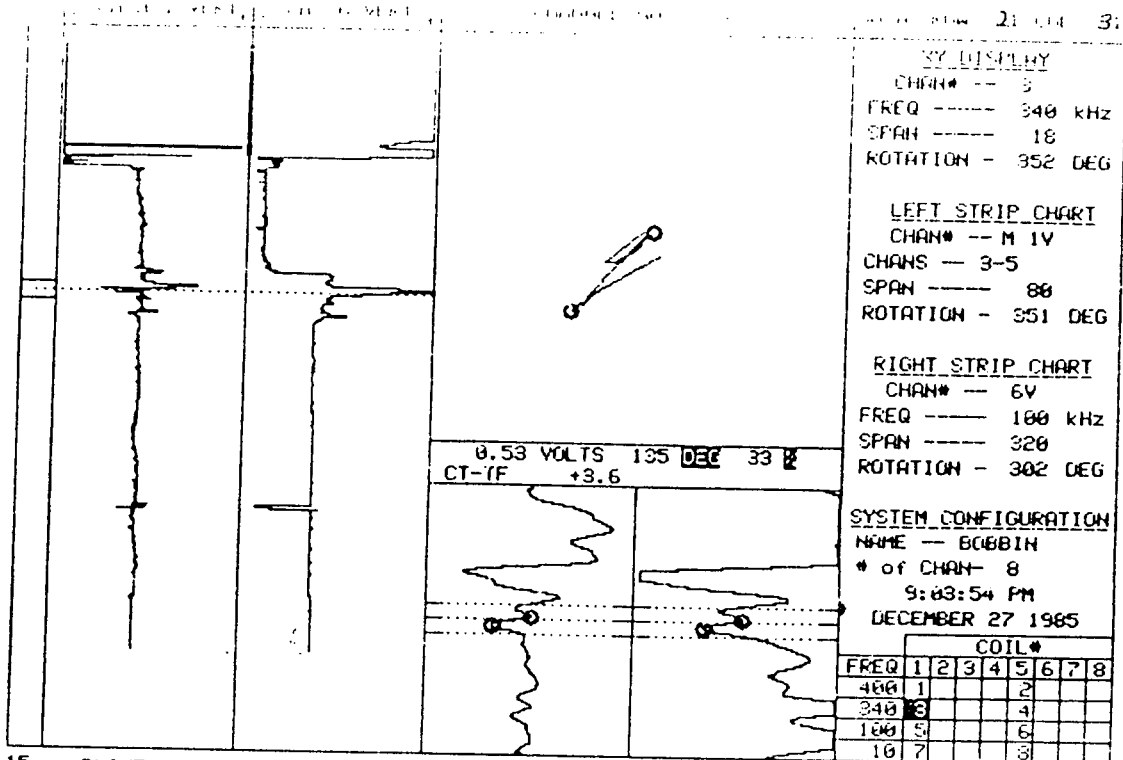


15    PLANT                    UNIT#    S/G    LEG            DATE  
      SONGS DISK C36        1        A        OUTLET        12/27/85

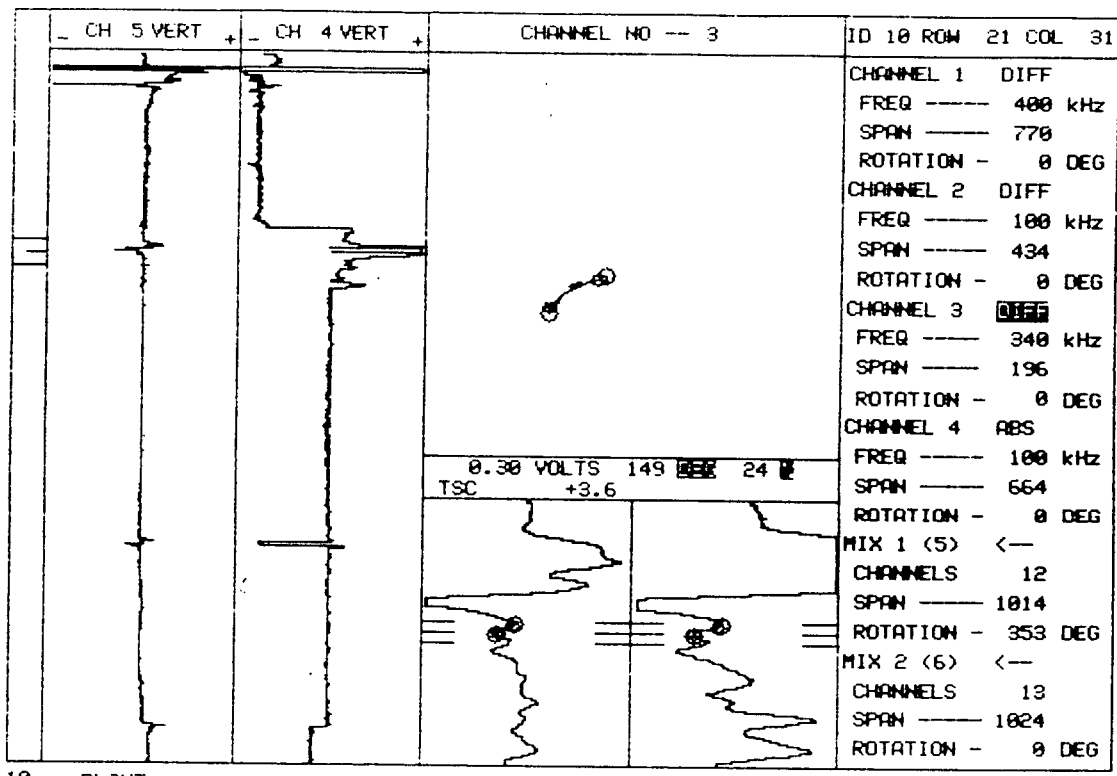


4.90 VOLTS 148 ~~000~~ 25 ~~0~~  
TSC +3.0

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

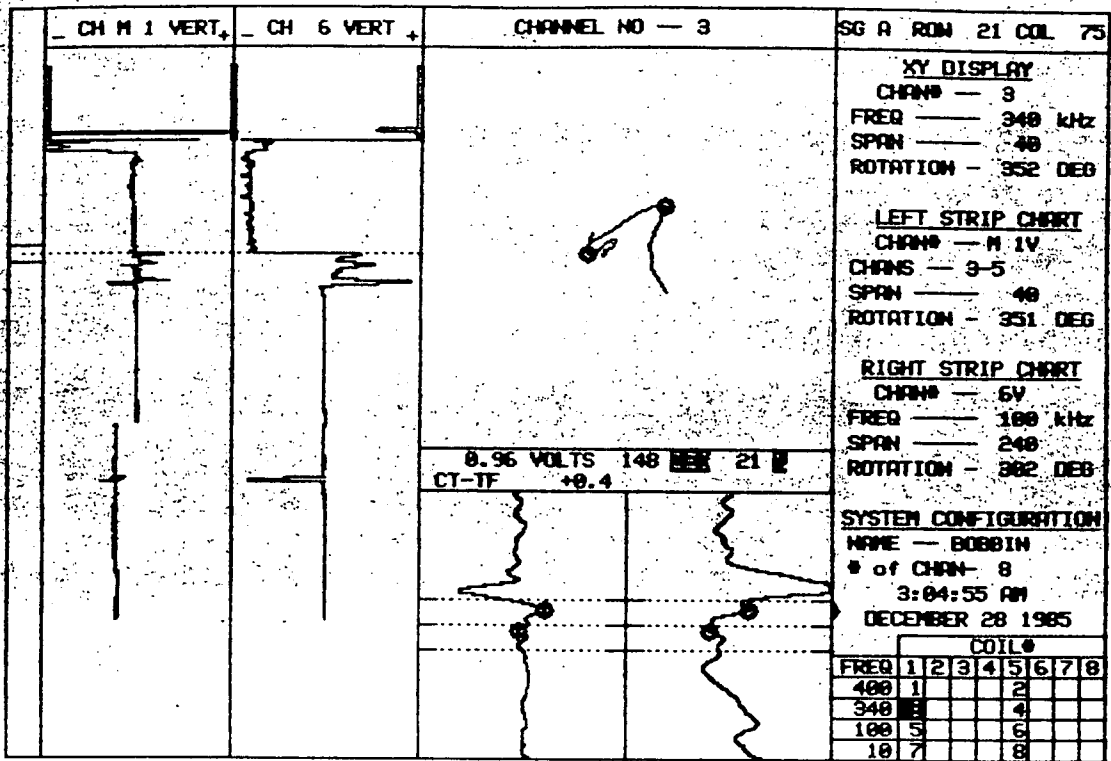


15 PLANT SONGS DISK C36 UNIT# 1 S/G R LEG A DATE 12/27/85

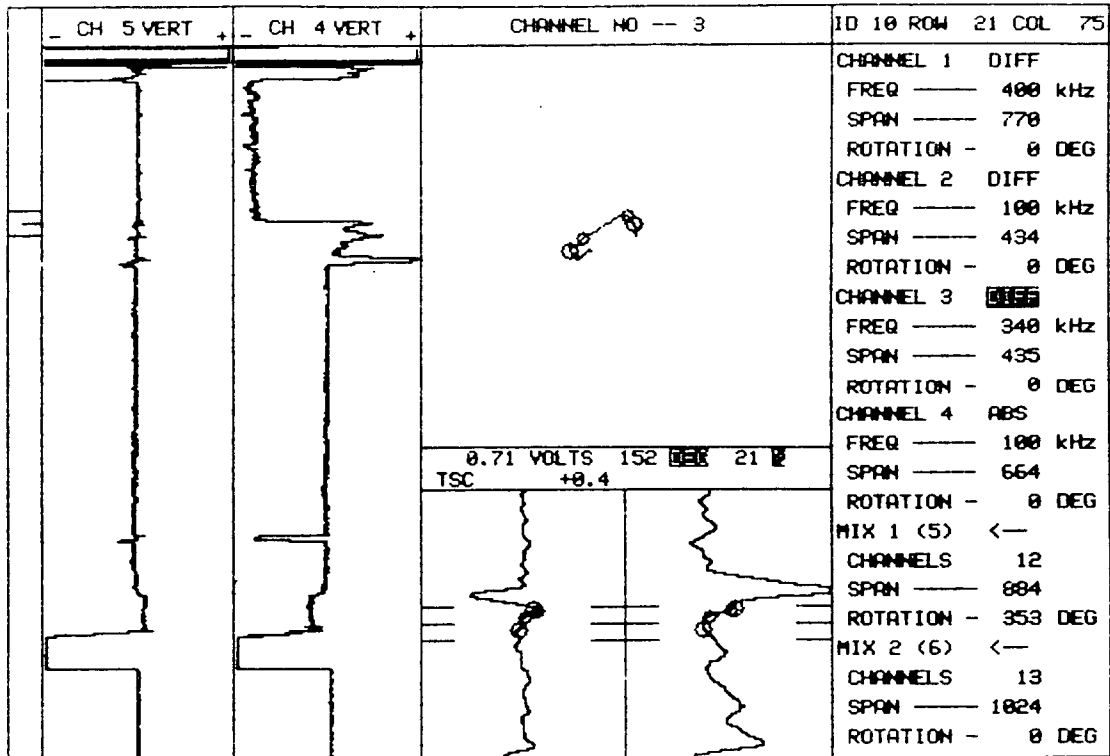


10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

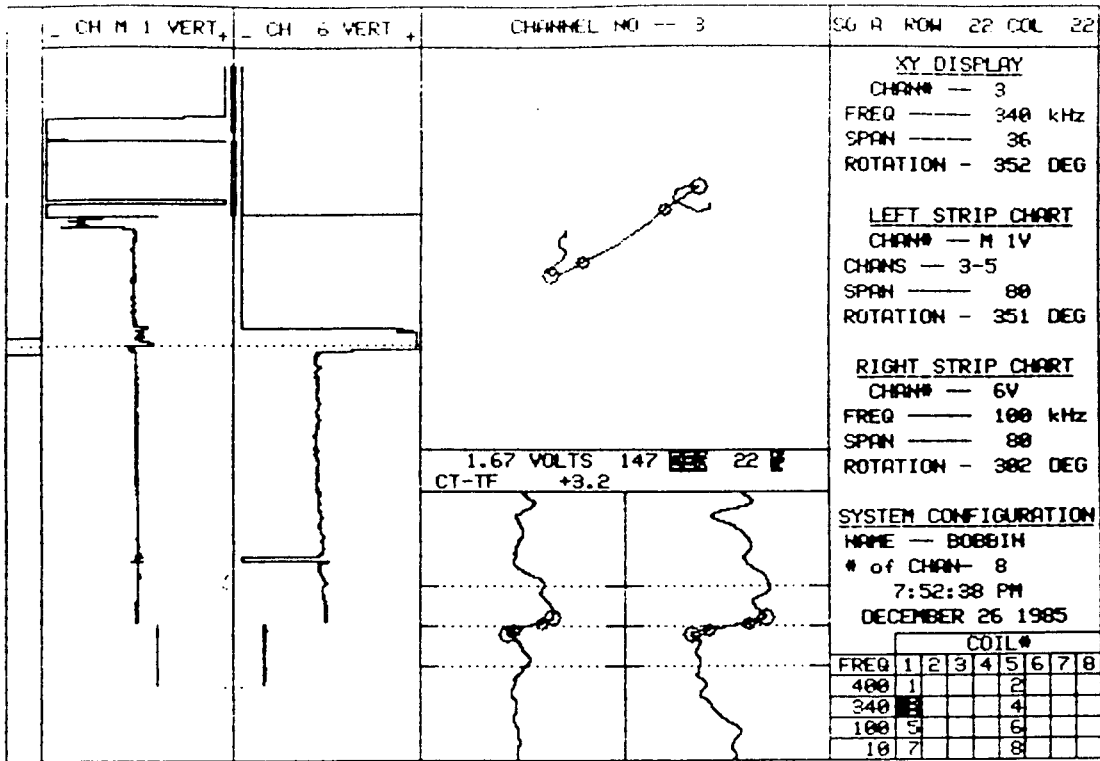




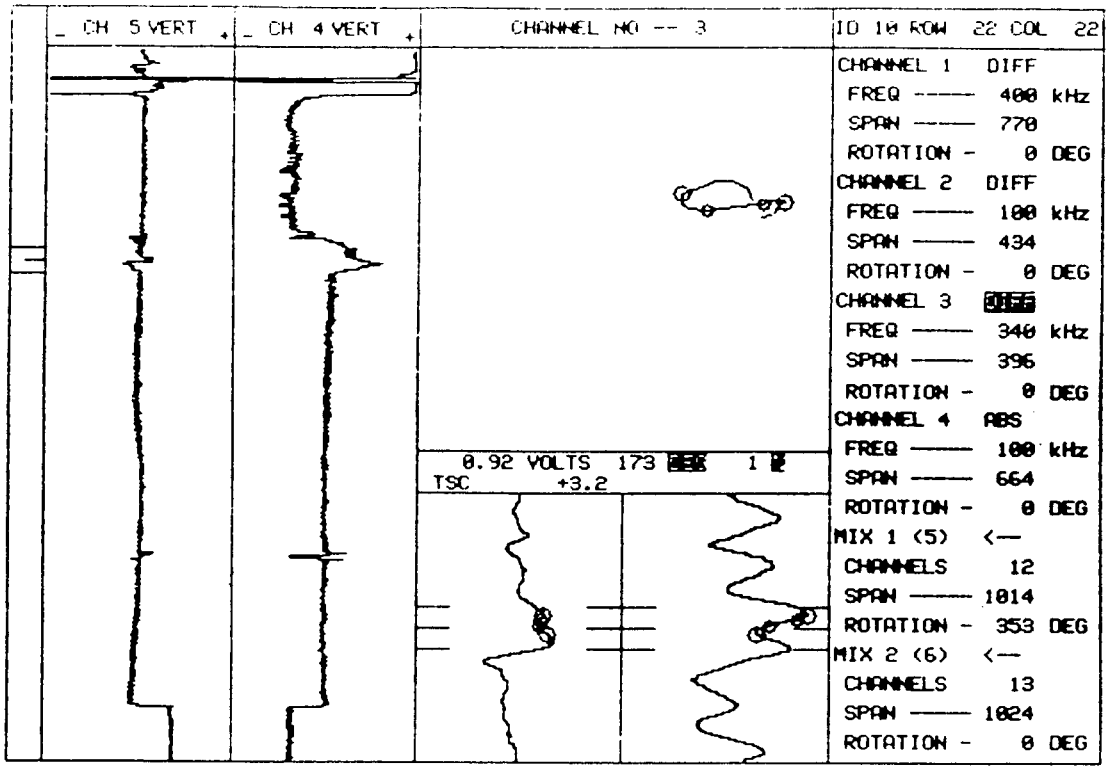
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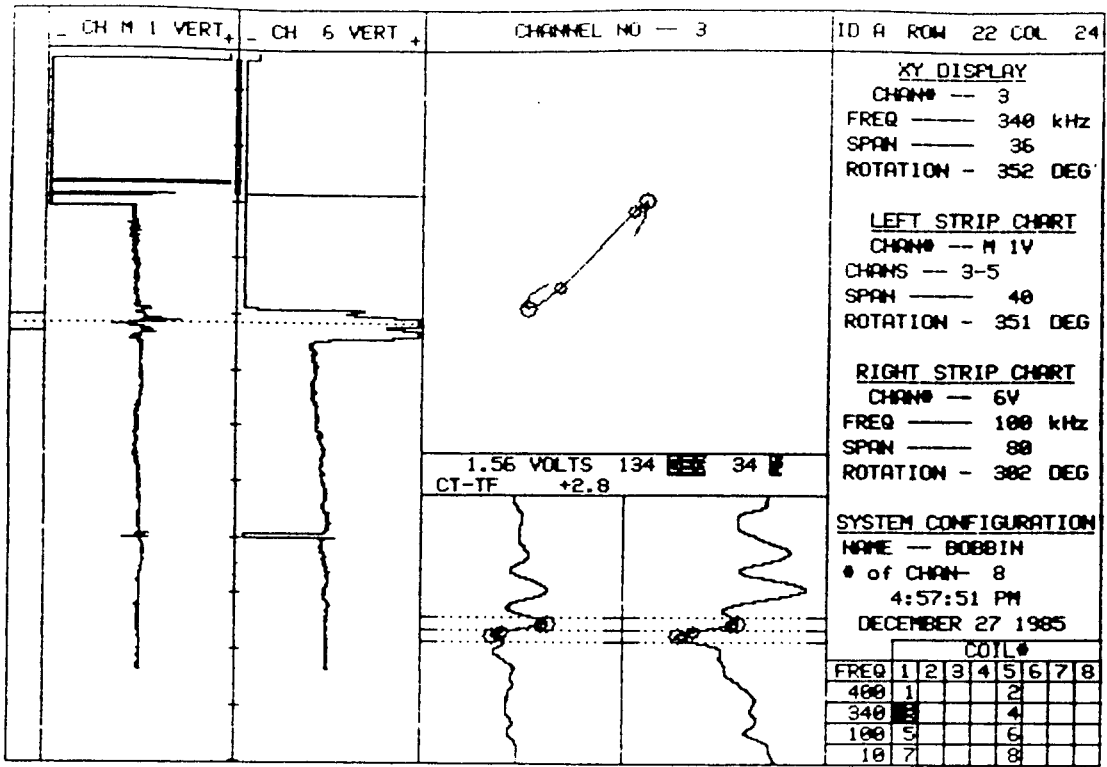
10 PLANT SCE SONGS UNIT# I S/G A LEG A OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



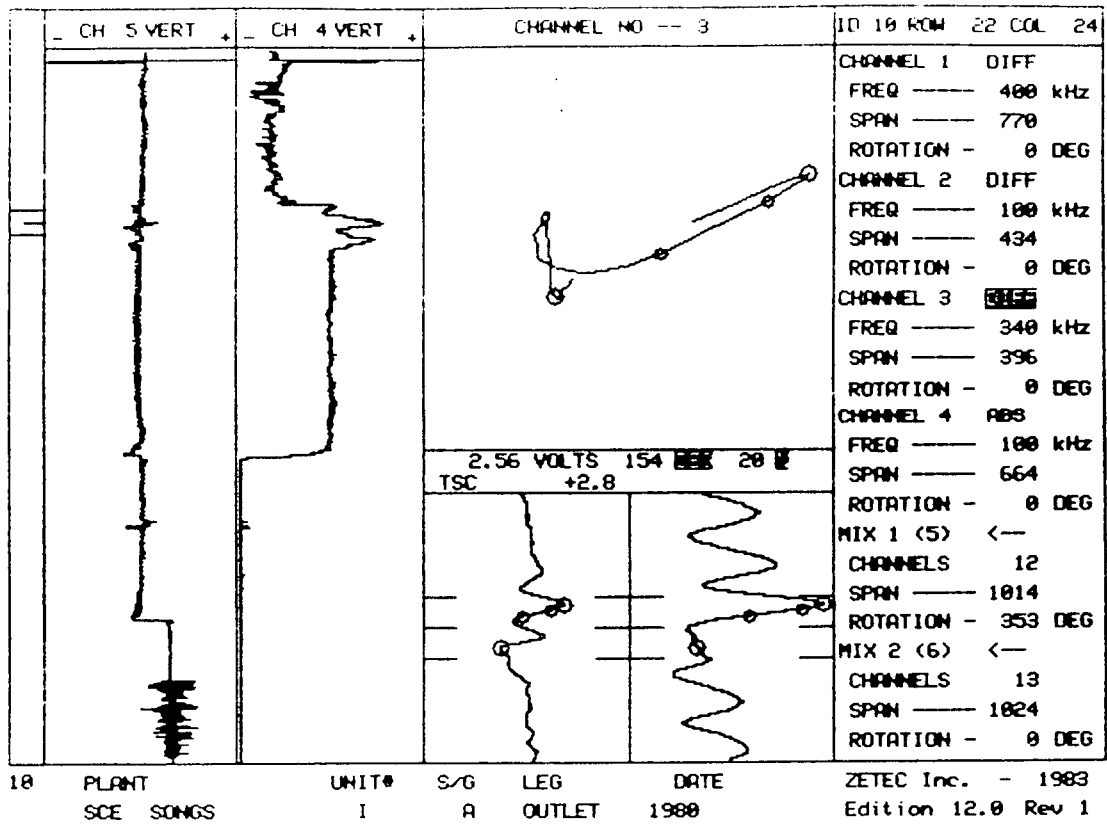
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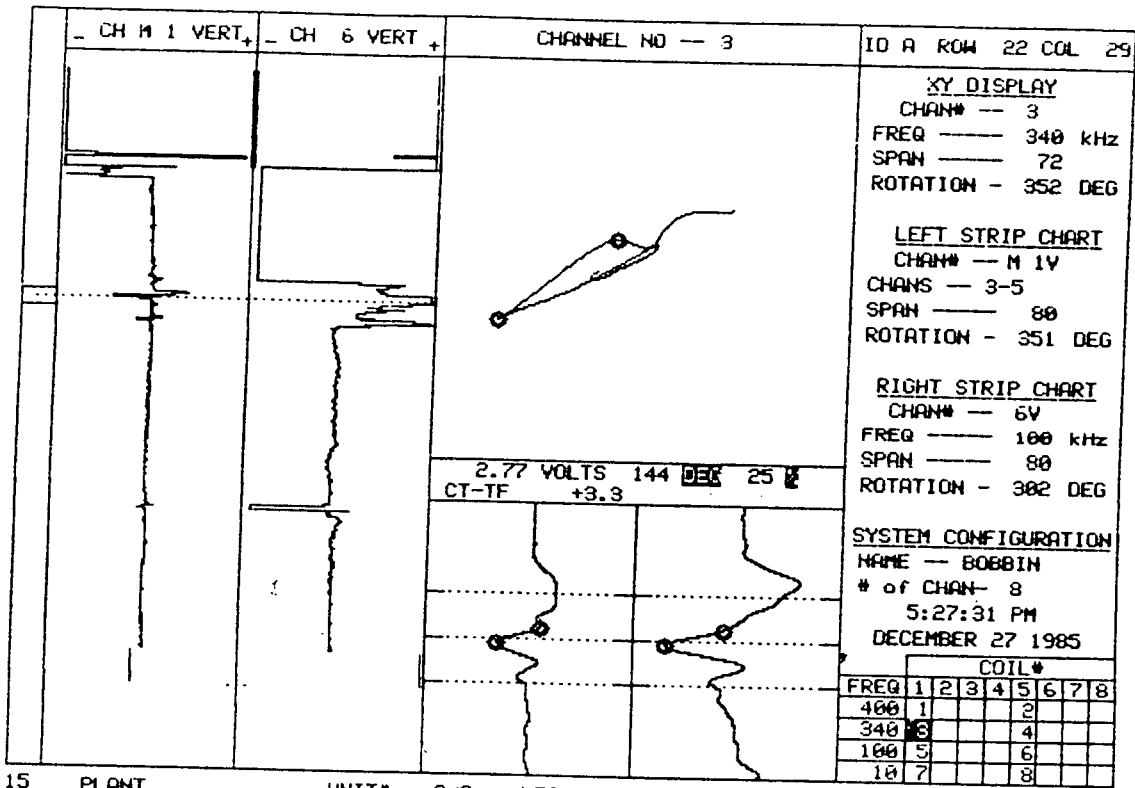


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

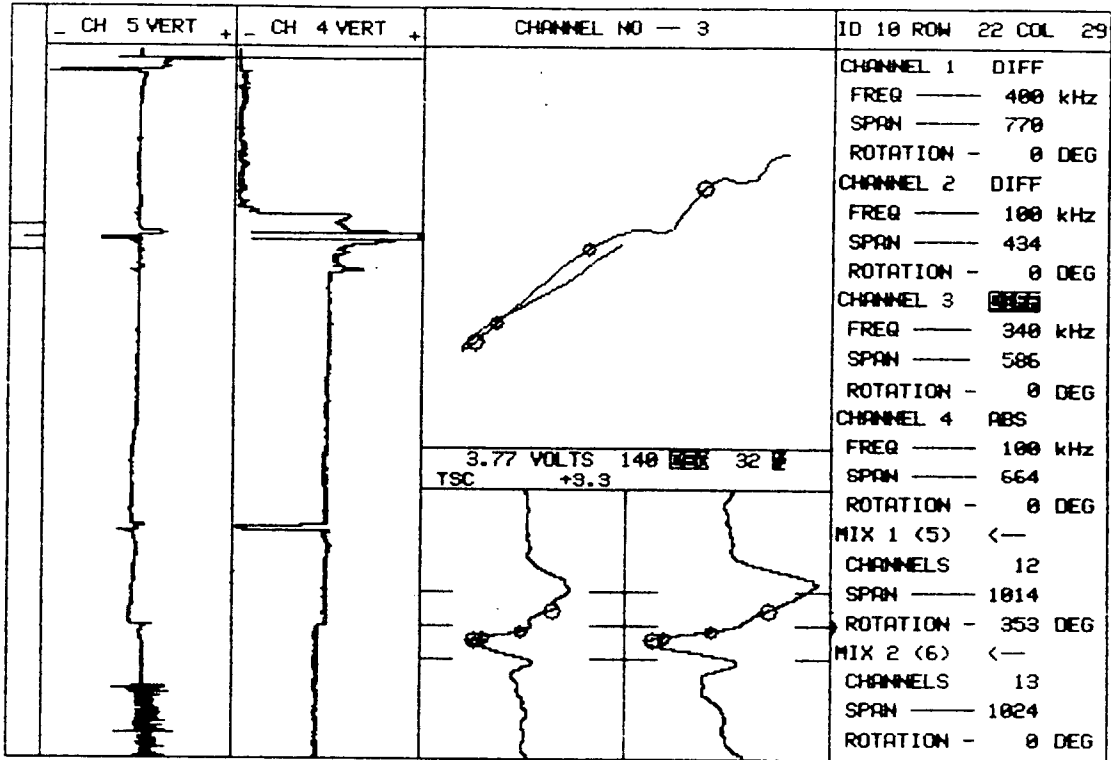


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85





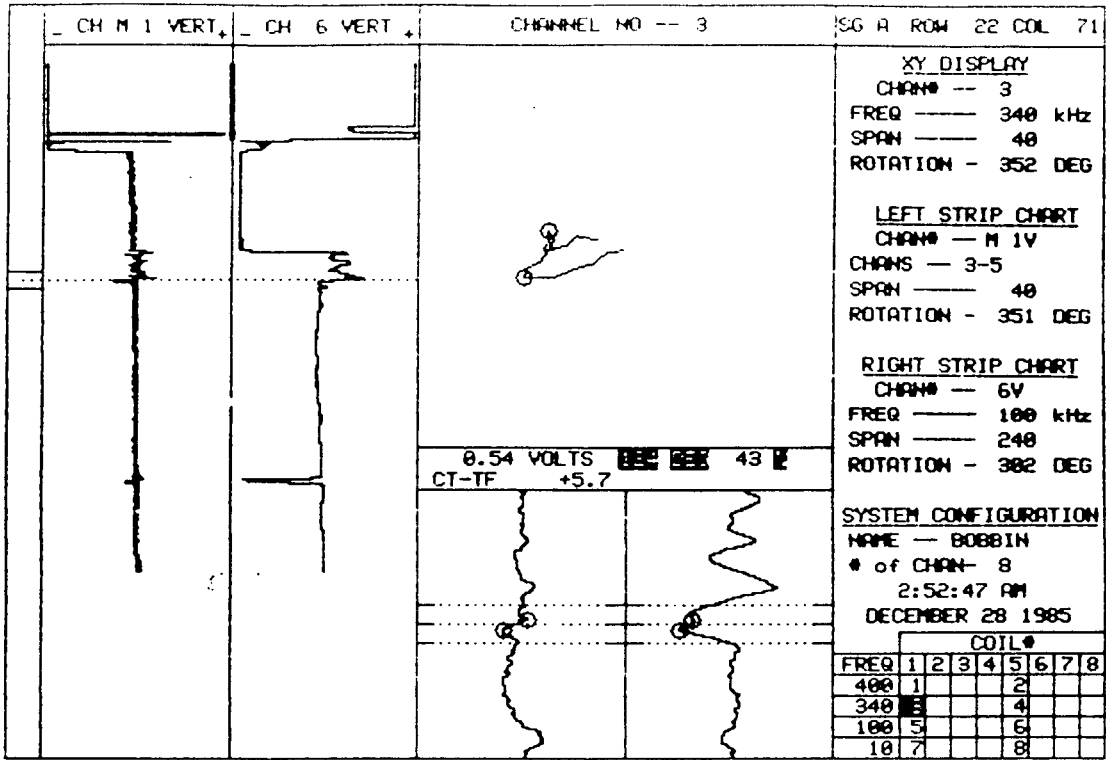
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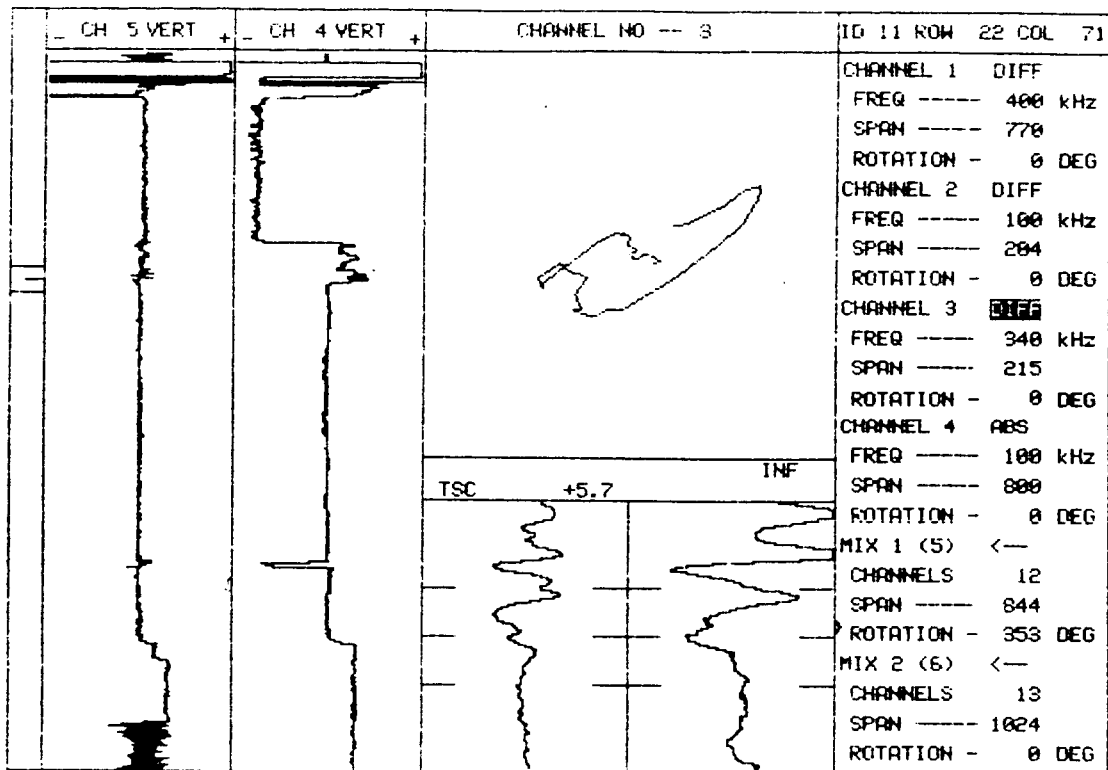
3.77 VOLTS 140 **DEG** 32 **DEG**  
TSC +3.3

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

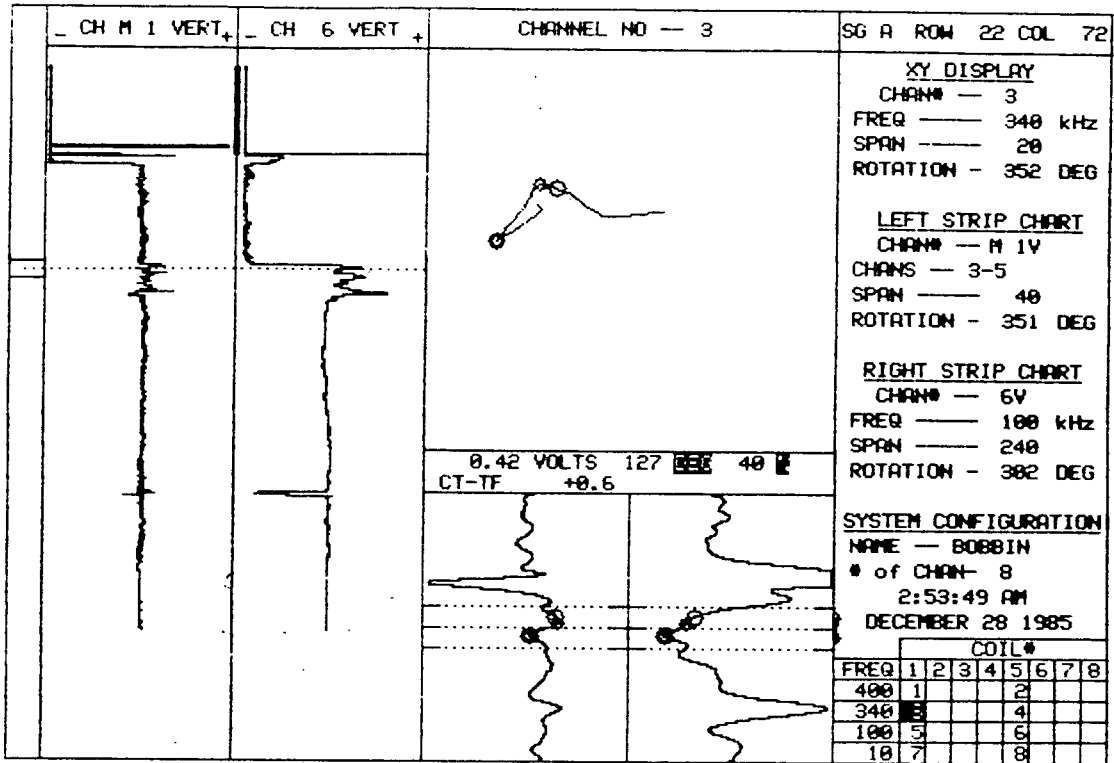




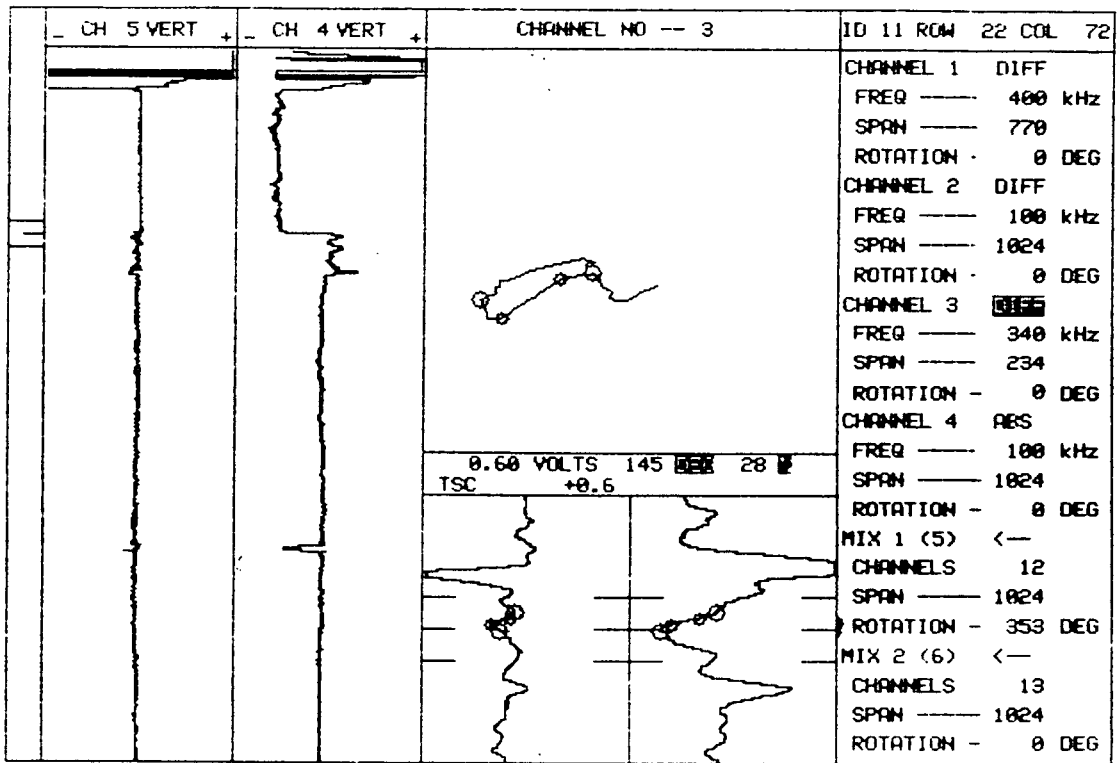
15 PLANT SONGS DISK C37 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C37    1    A    OUTLET    12/27/85

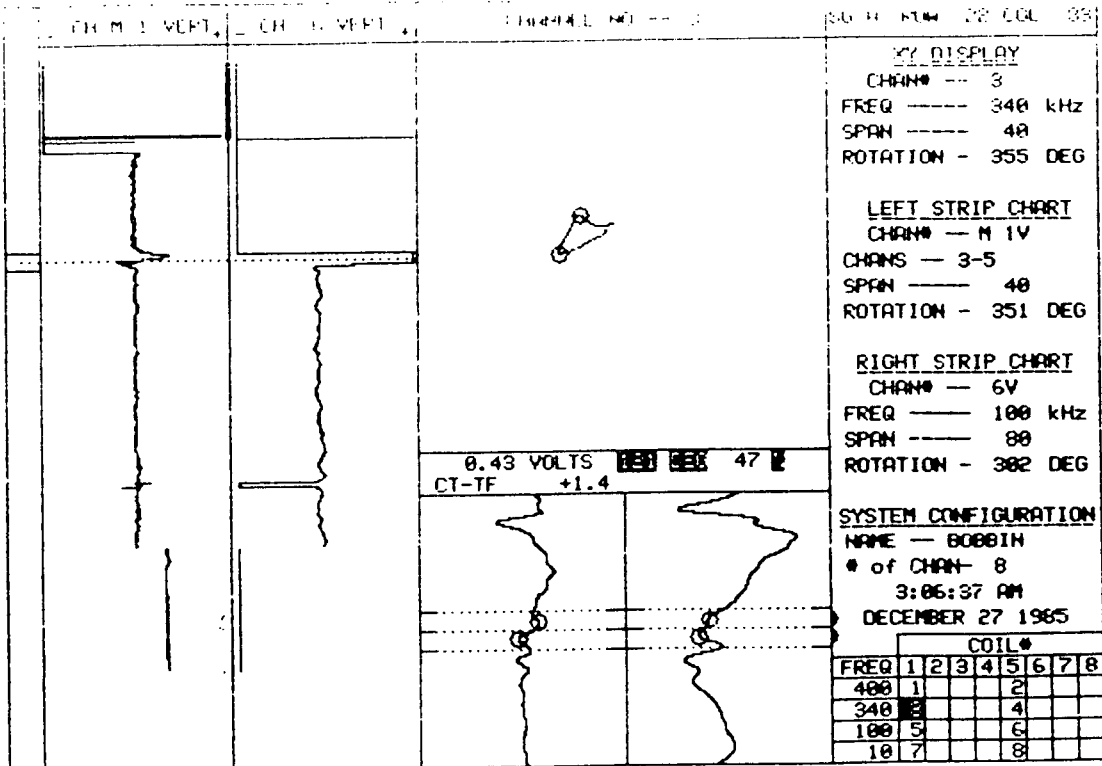


0.60 VOLTS 145 **DEC** 28 **M**  
TSC +0.6

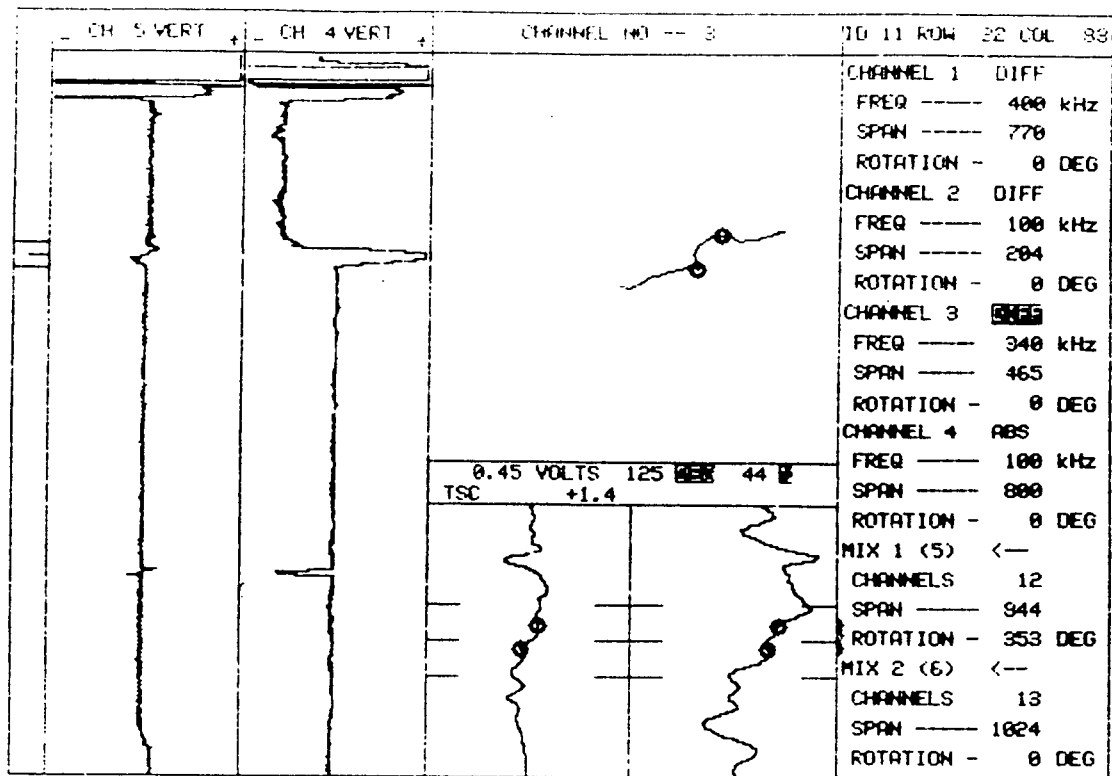
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ZETEC Inc. - 1983  
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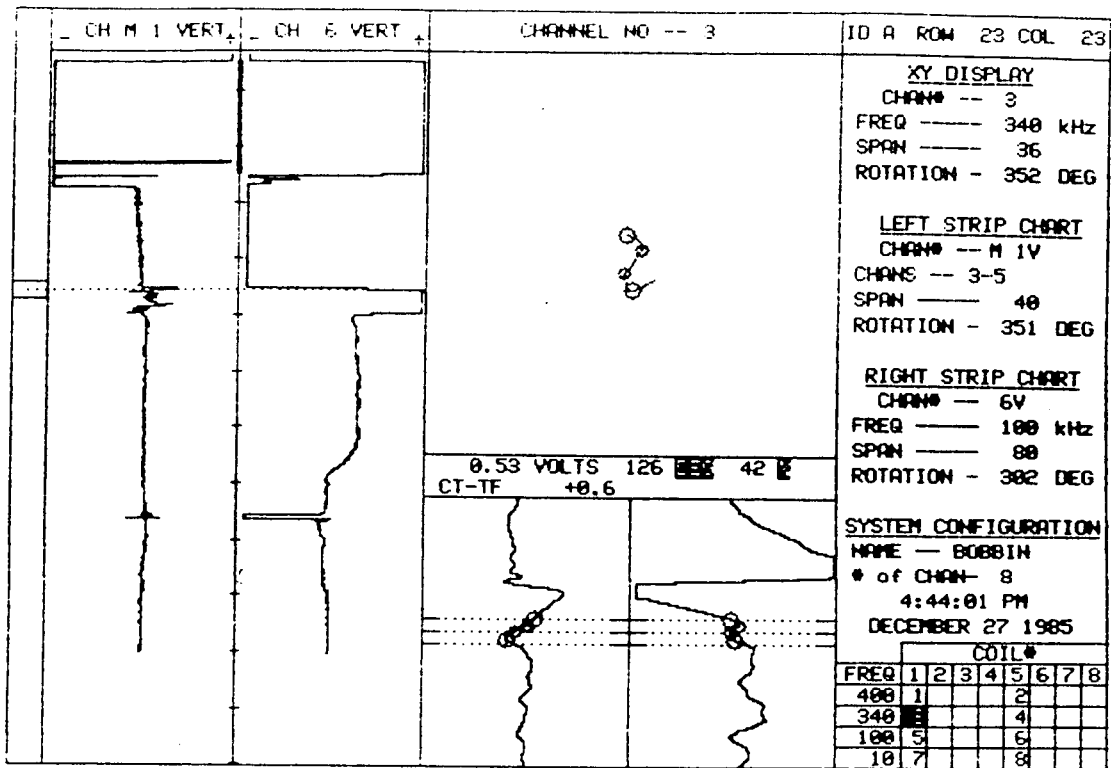
S/G A 1980



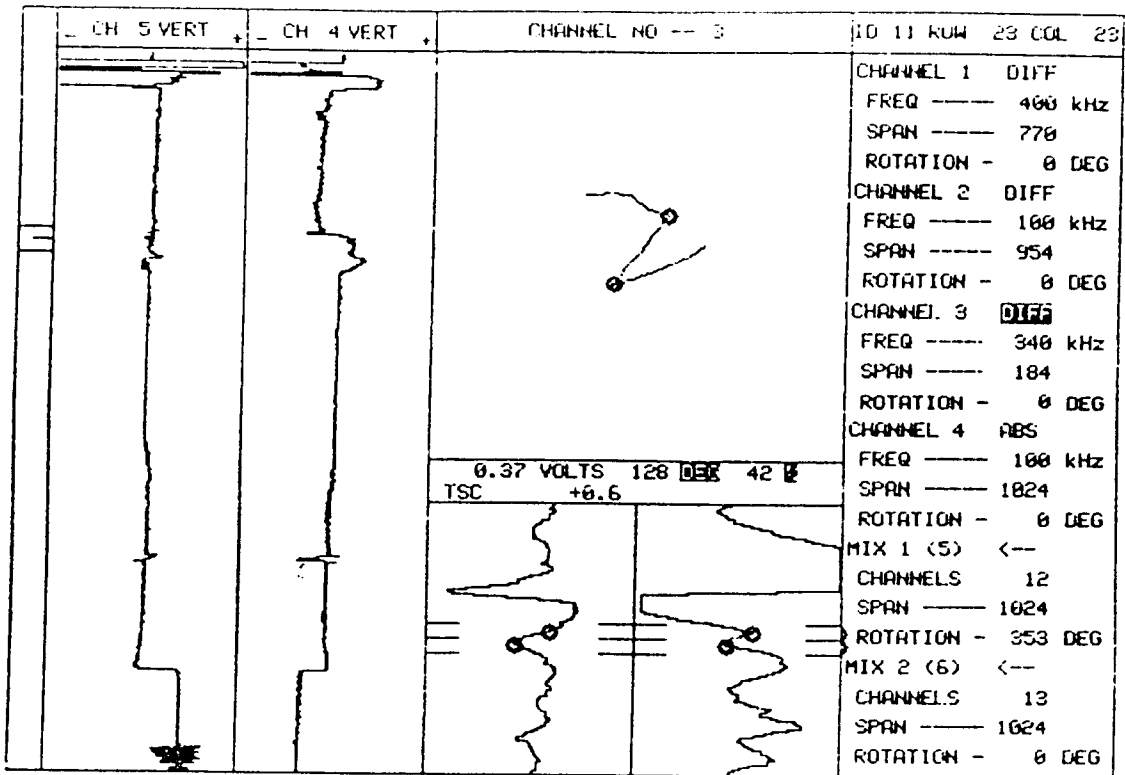
15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1

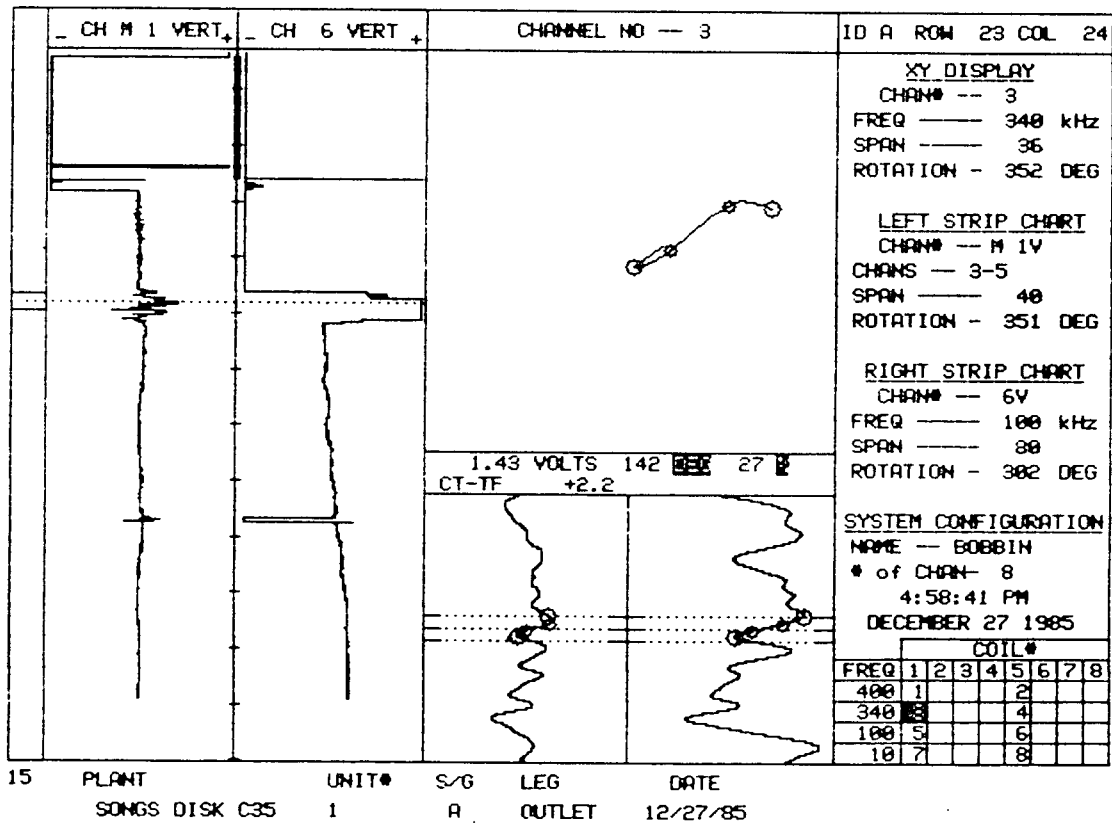
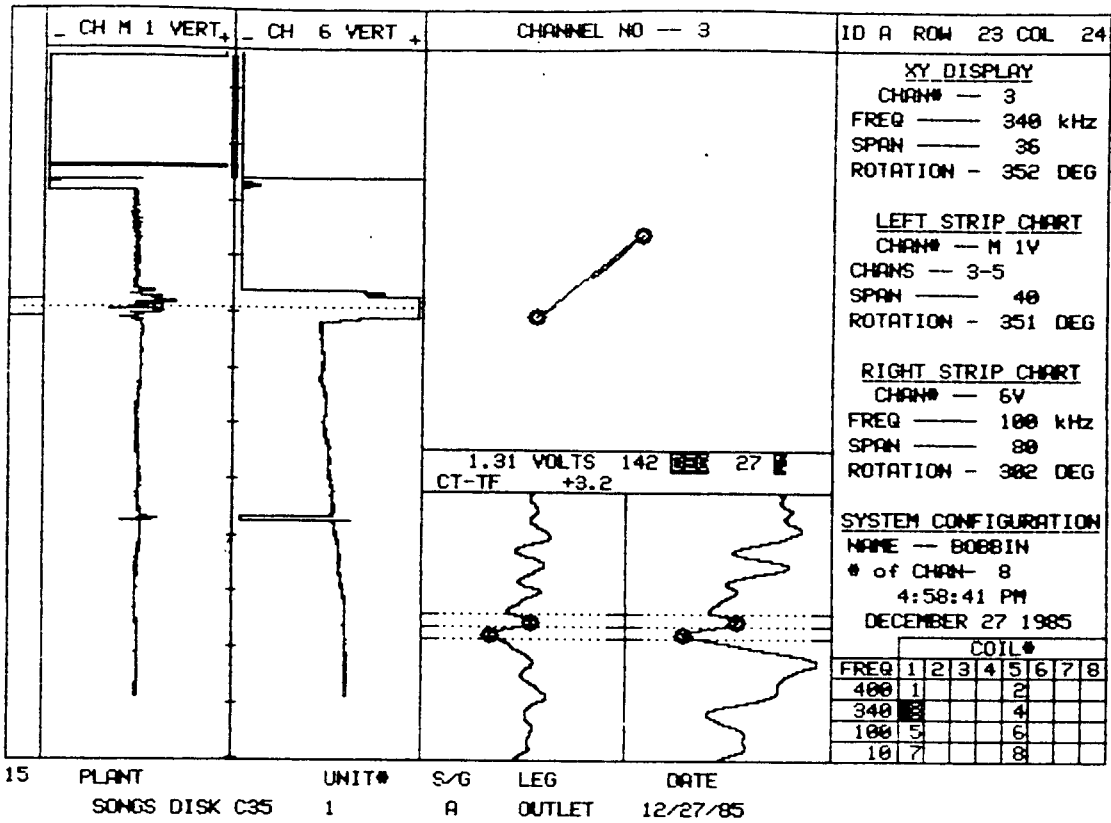


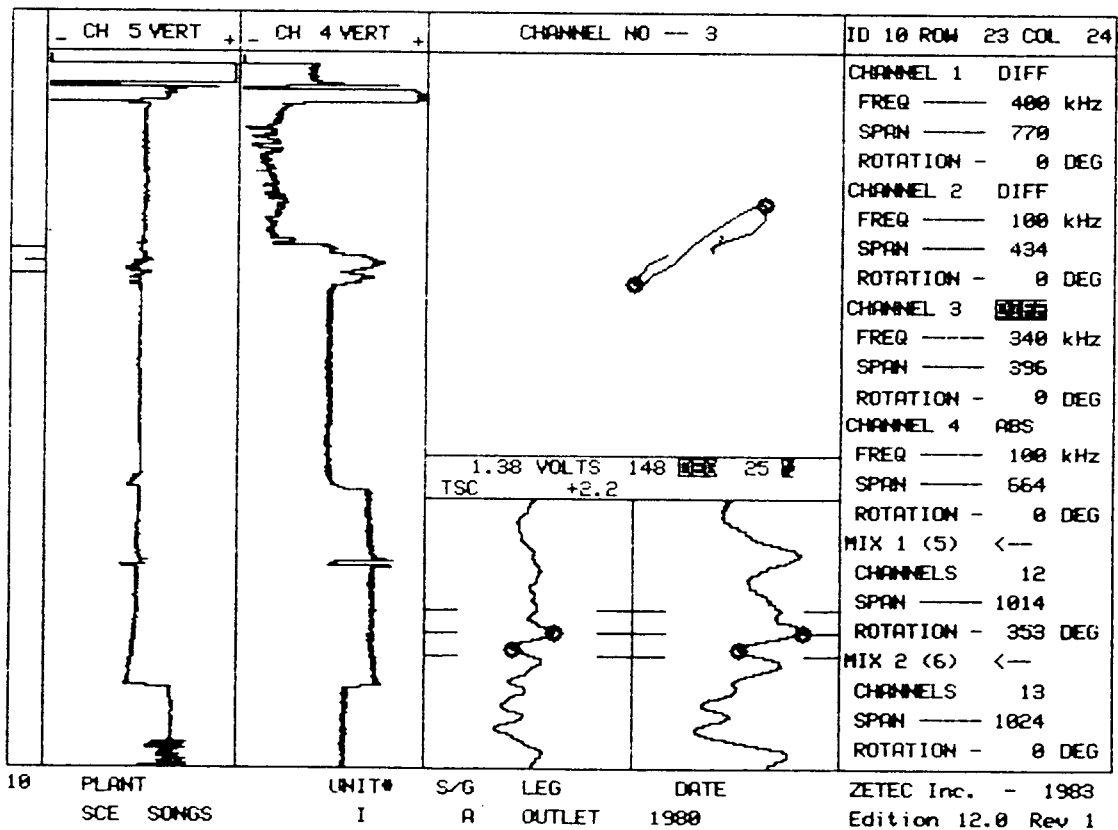
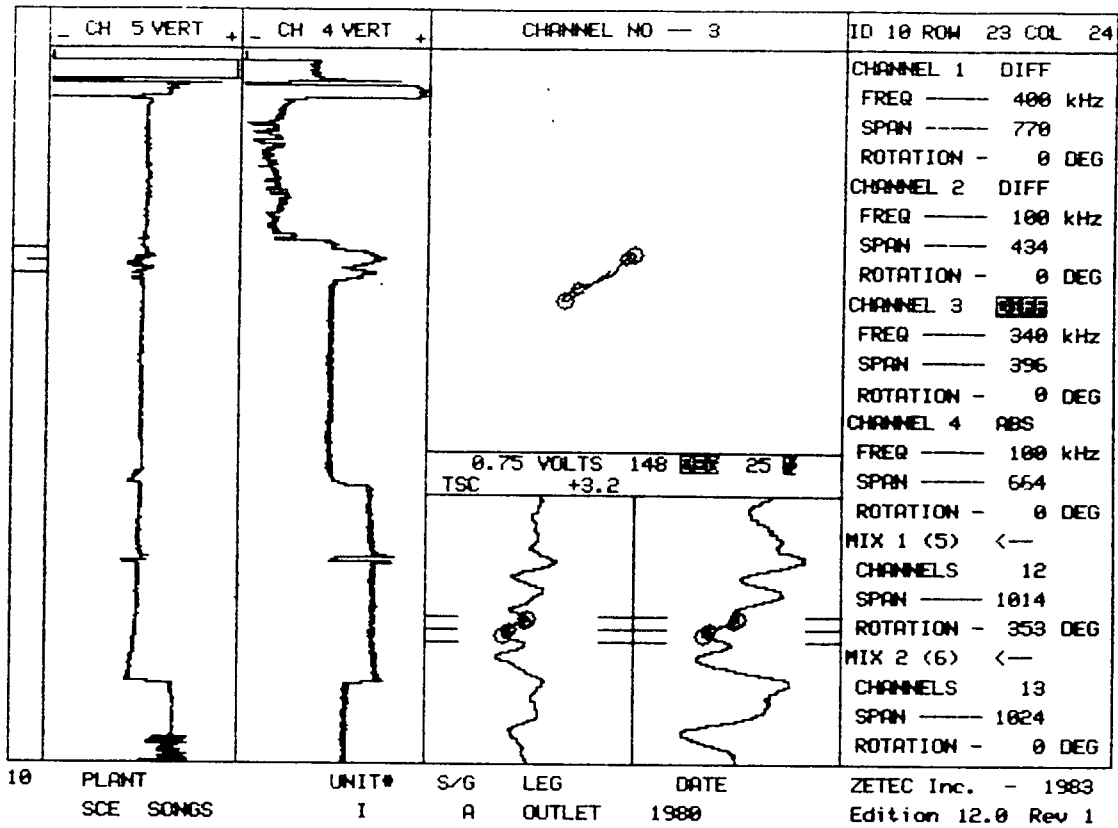
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85

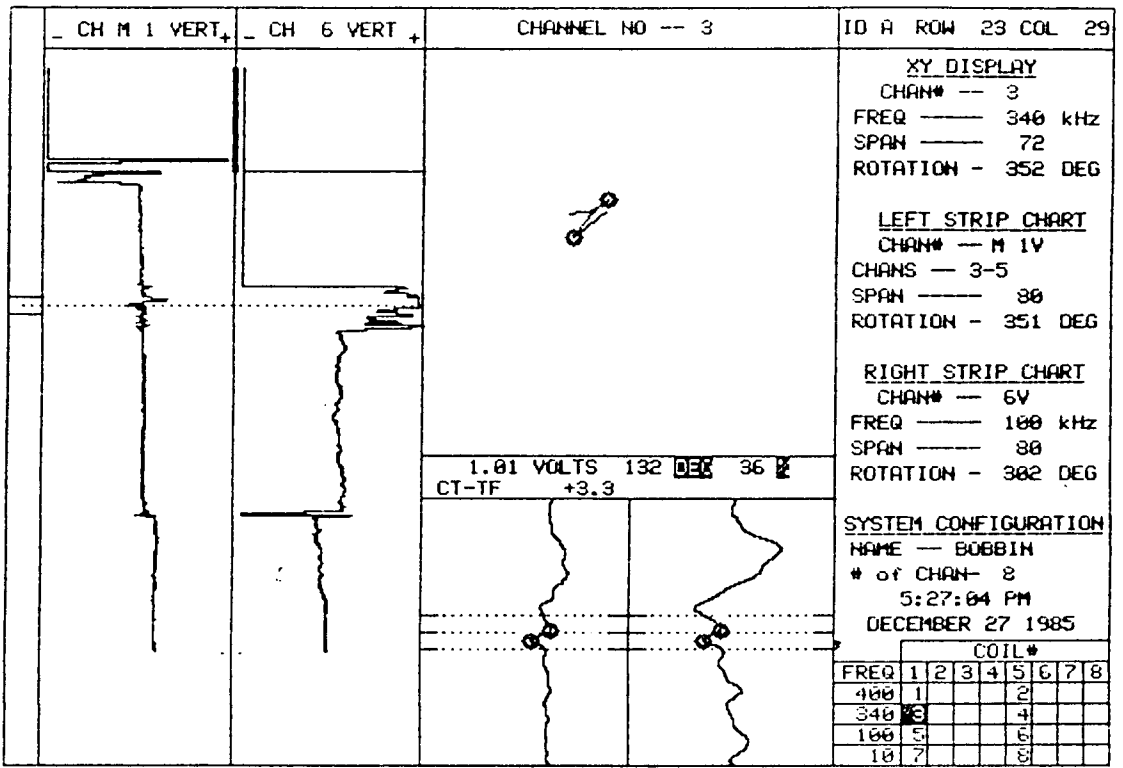


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

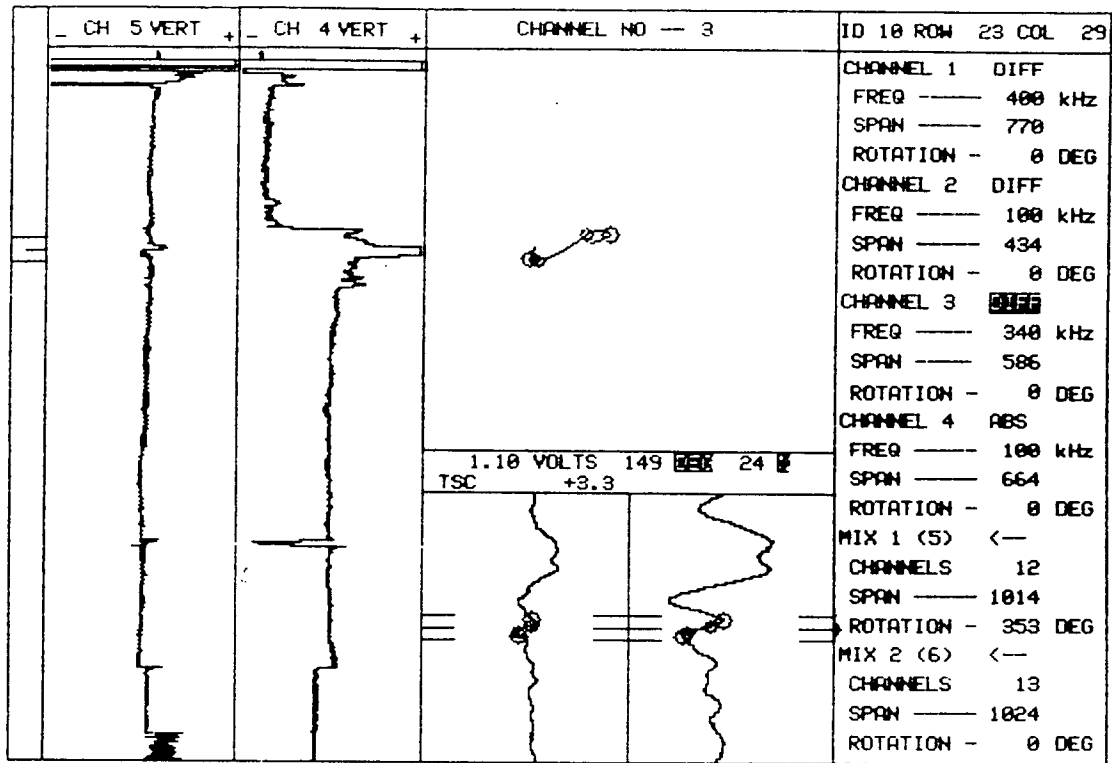




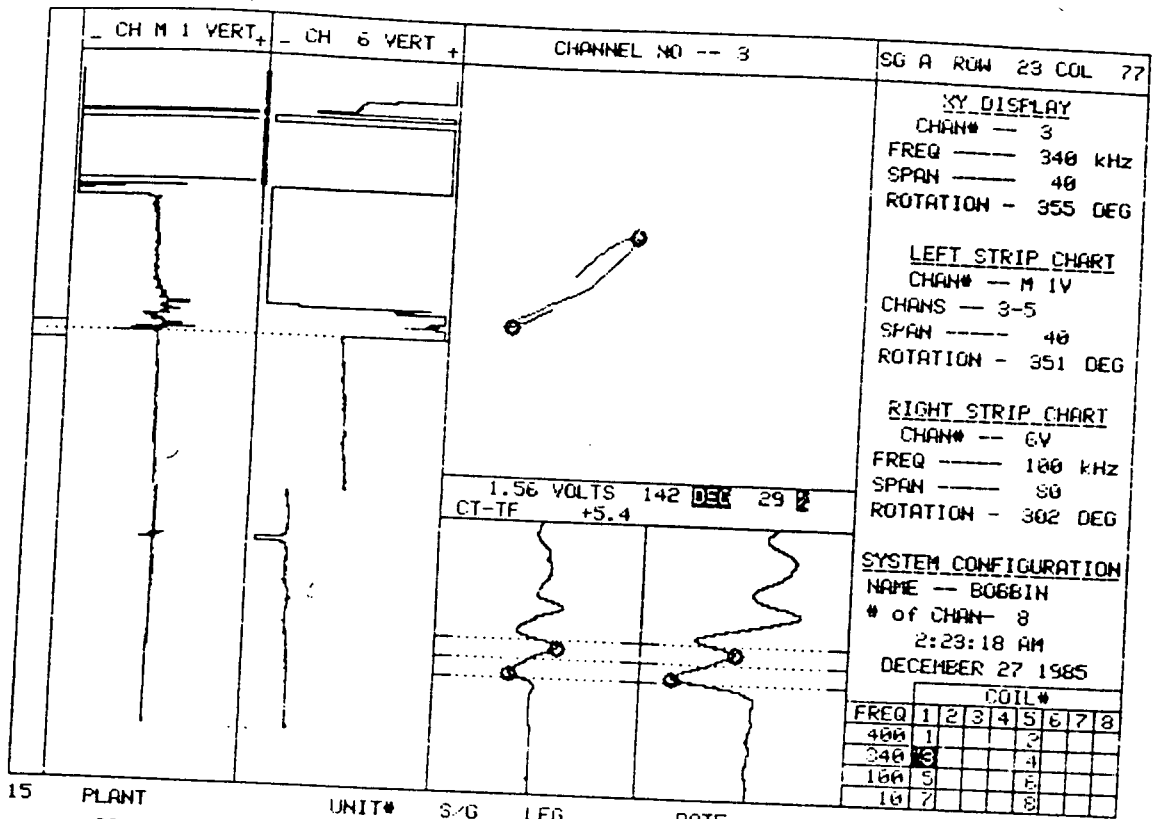




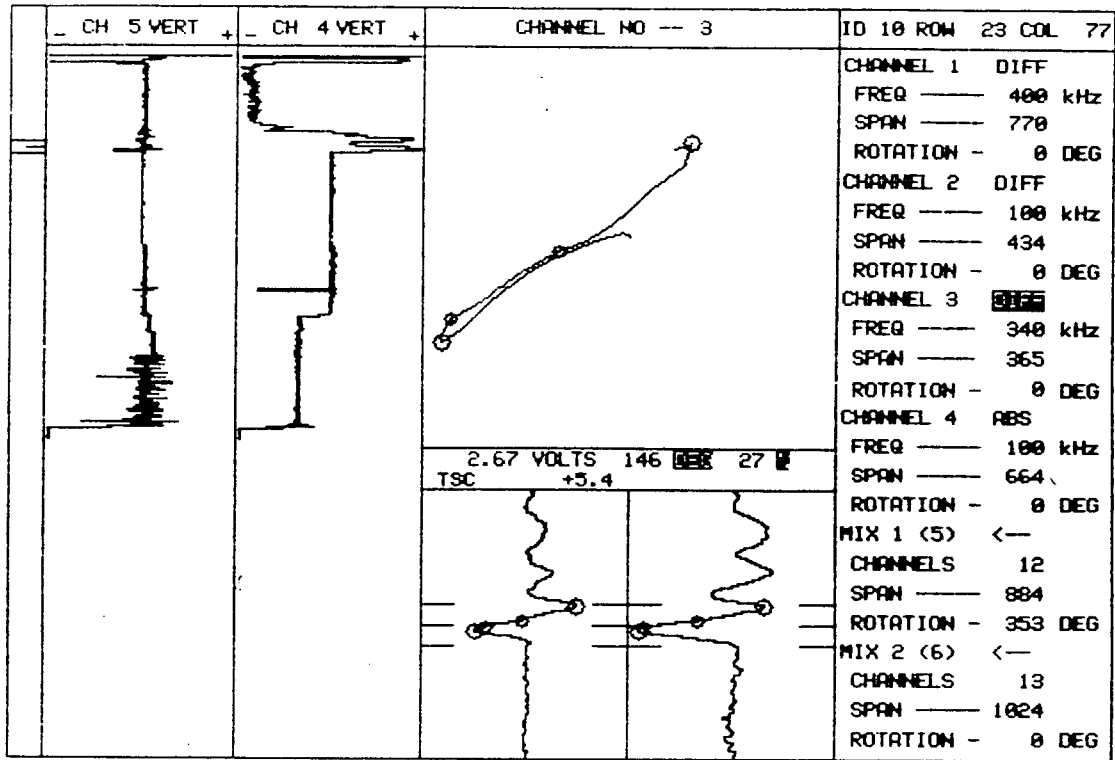
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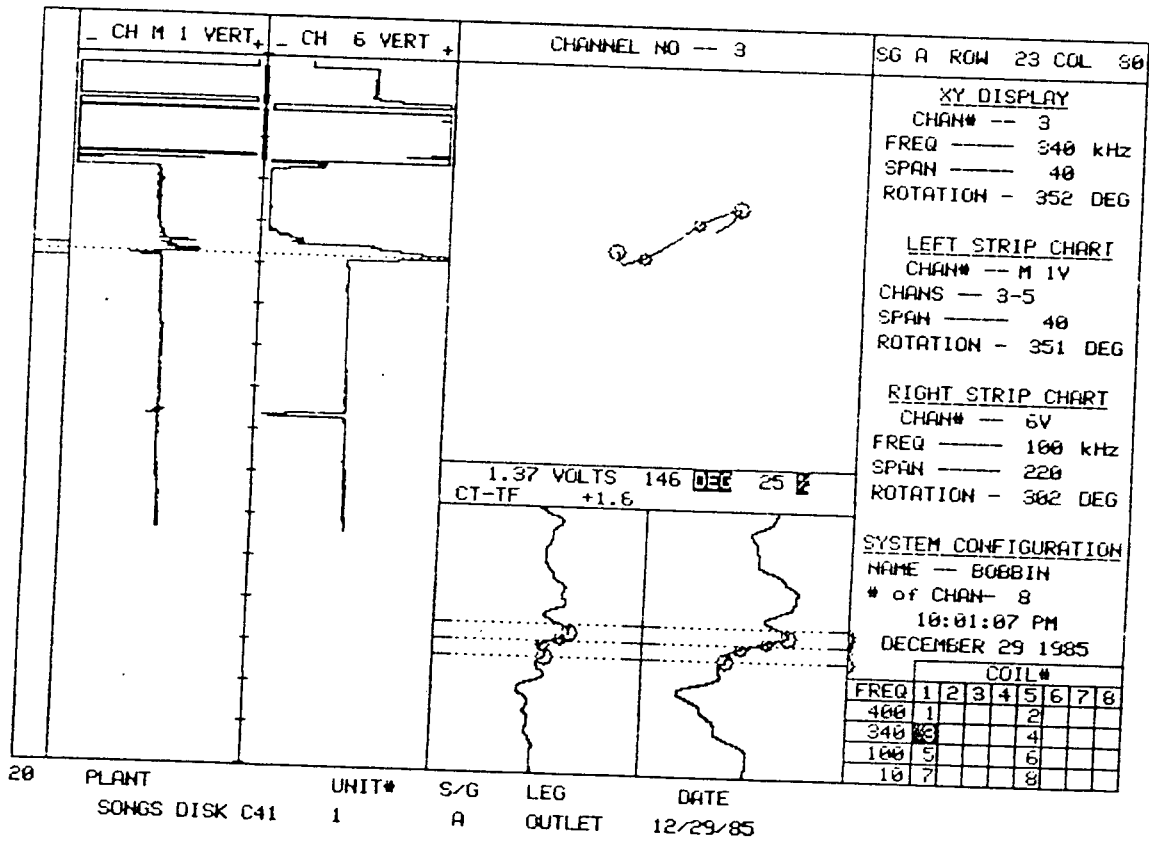
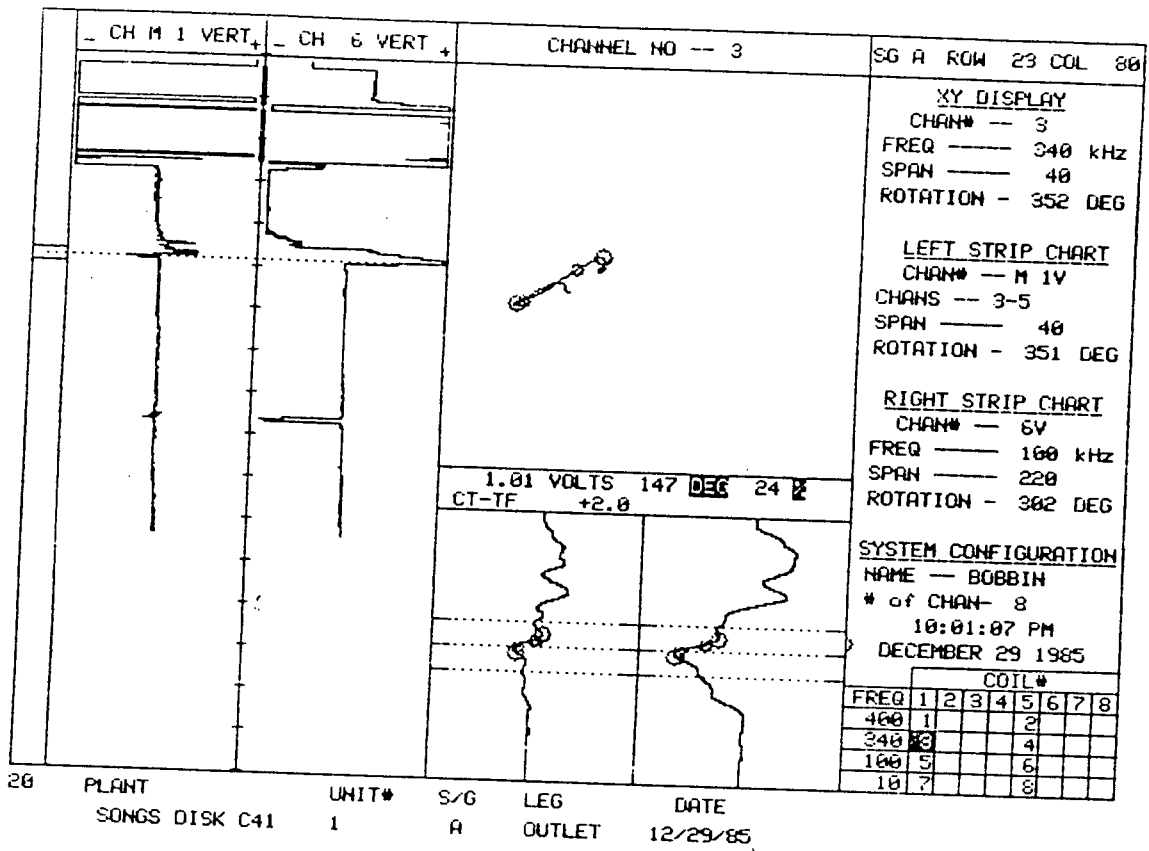
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

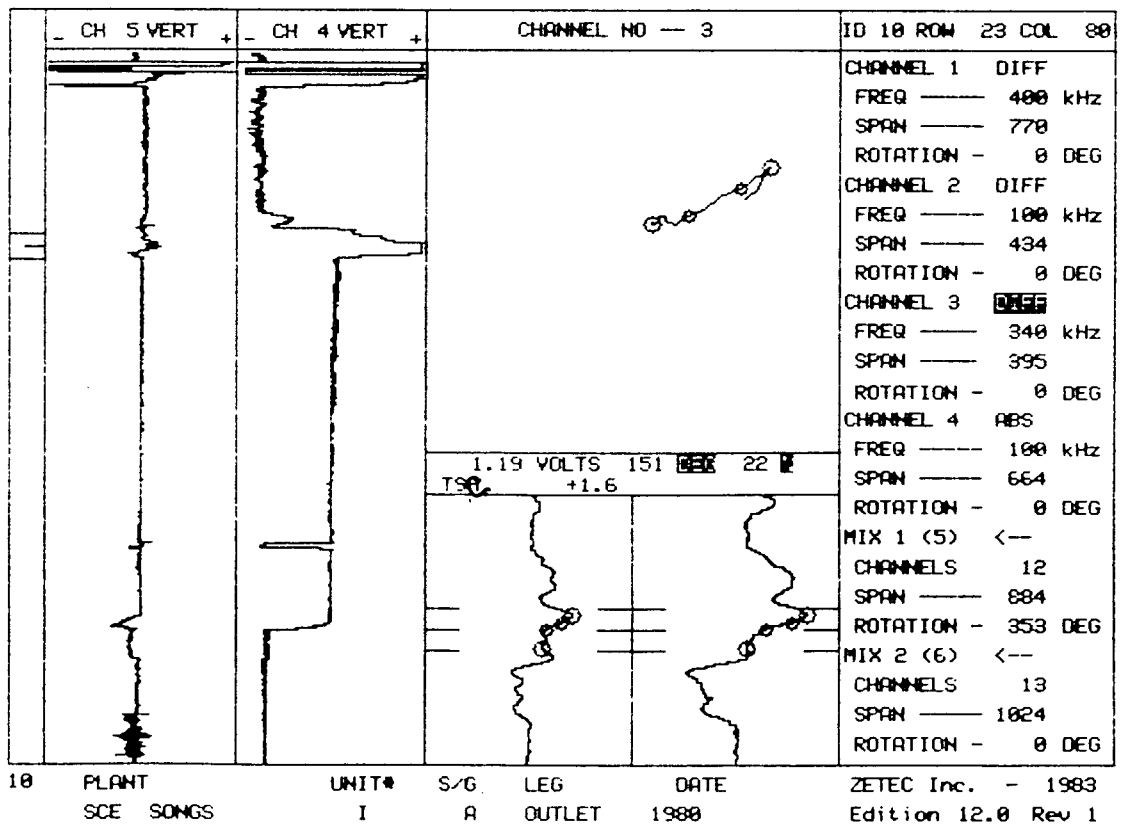
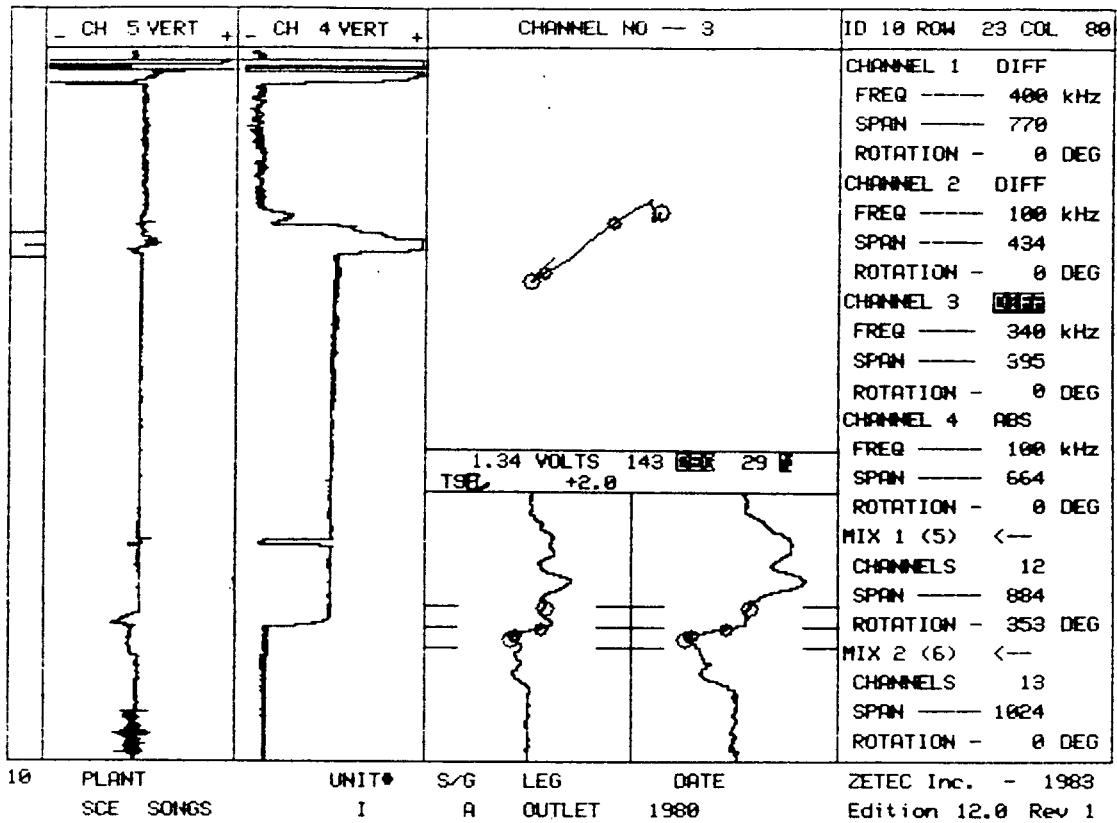


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C34    1    A    OUTLET    12/26/85

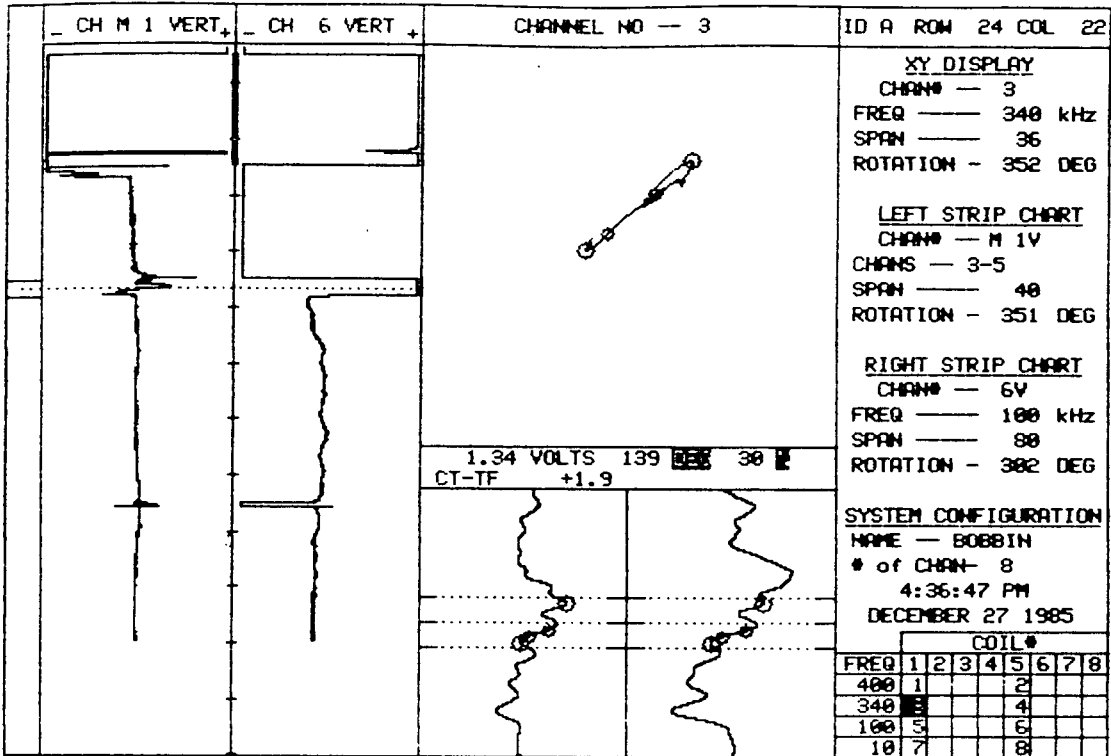


20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

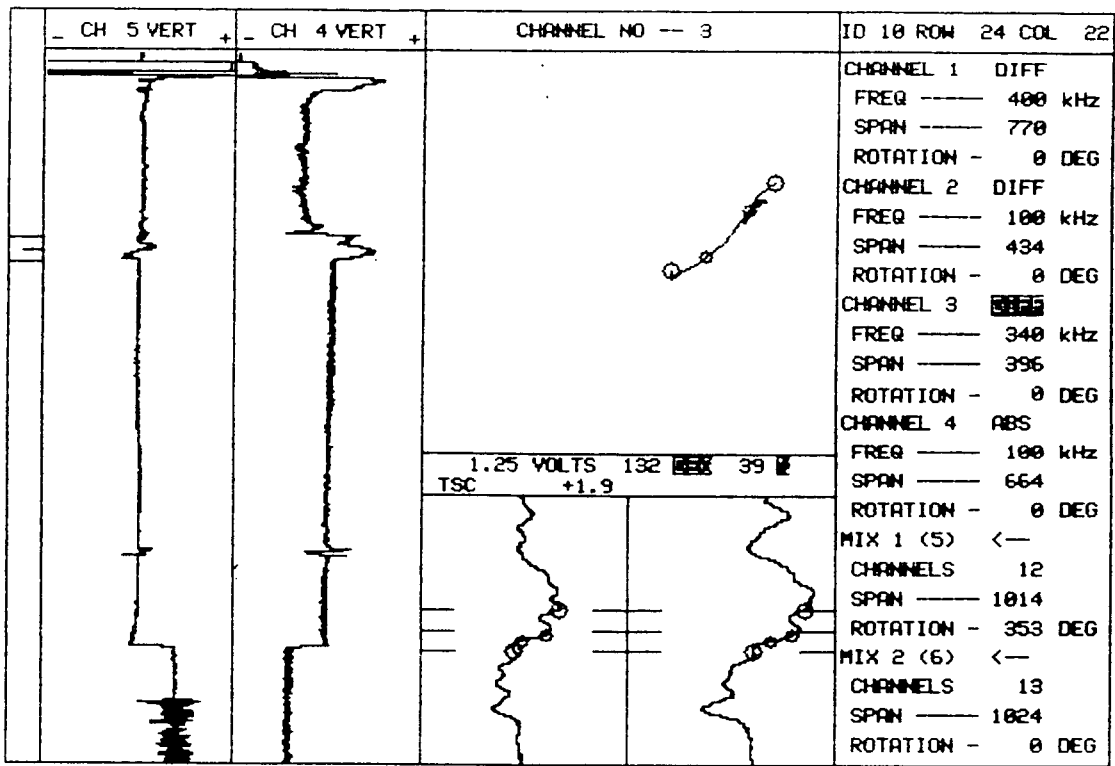




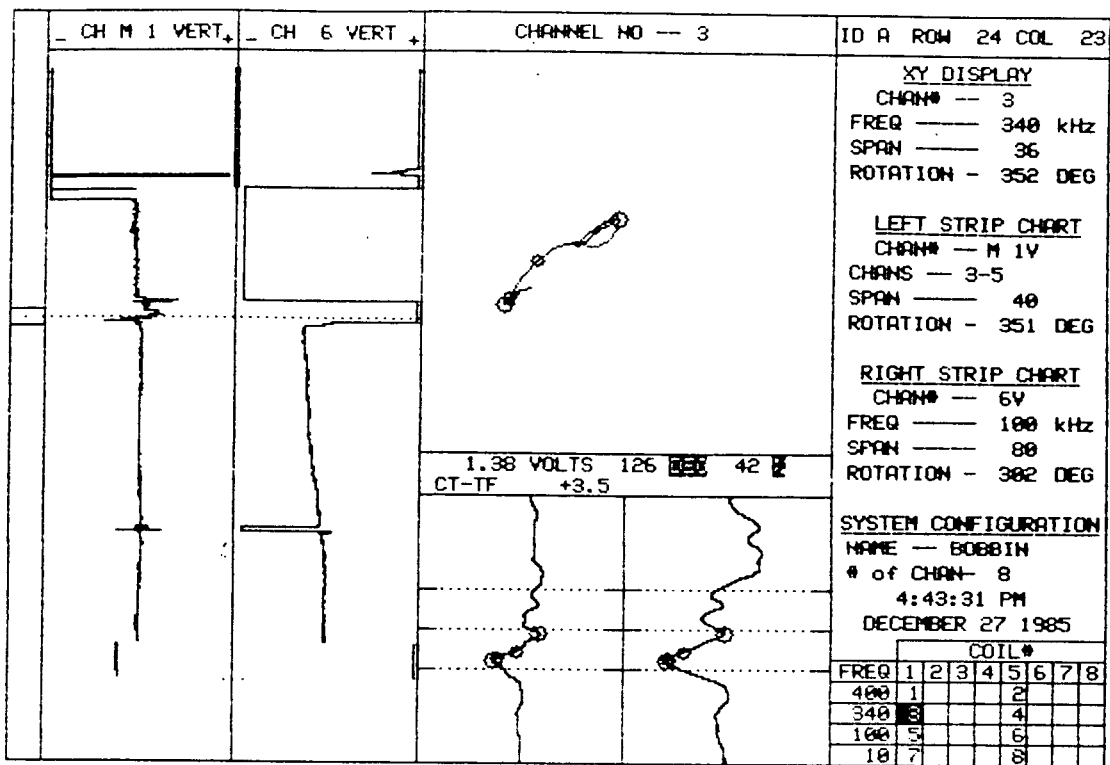




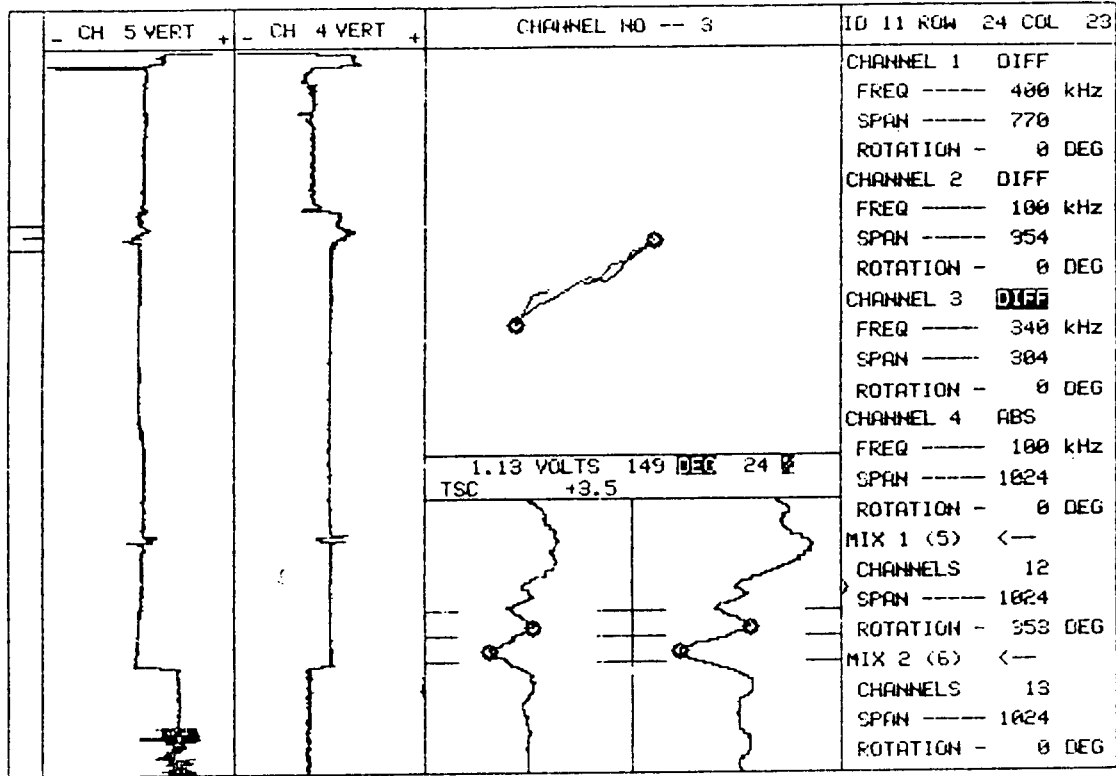
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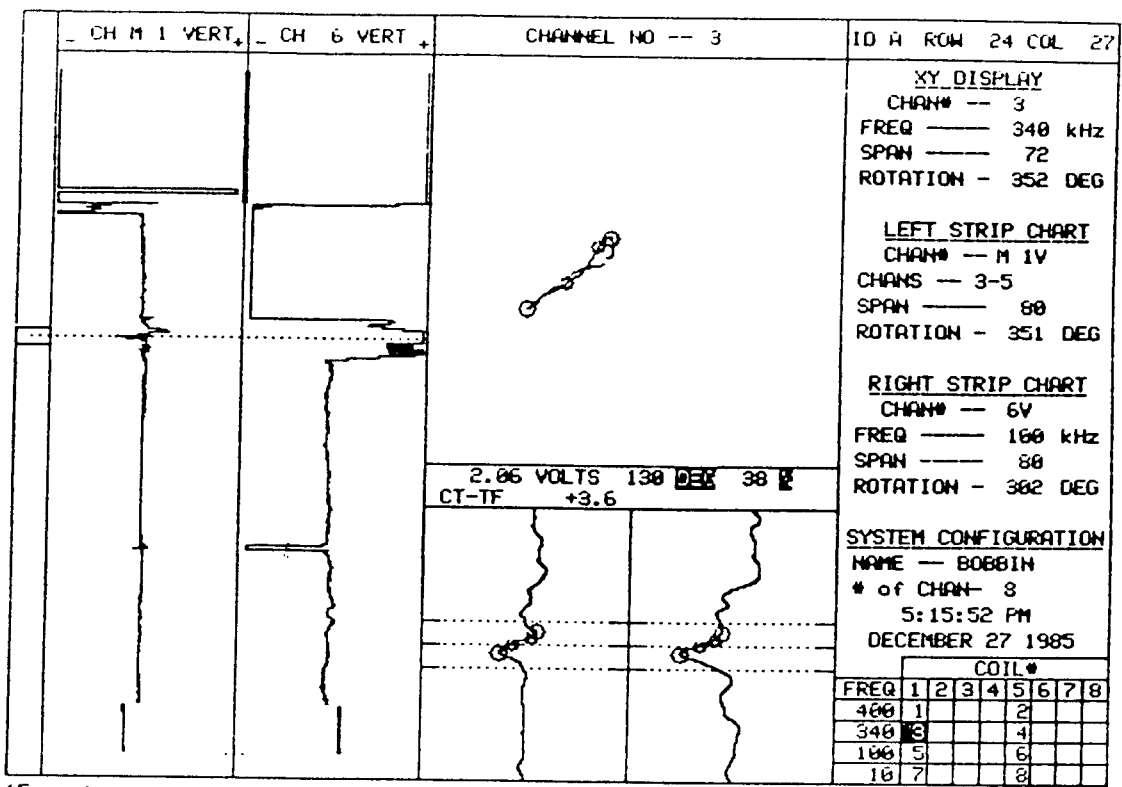
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



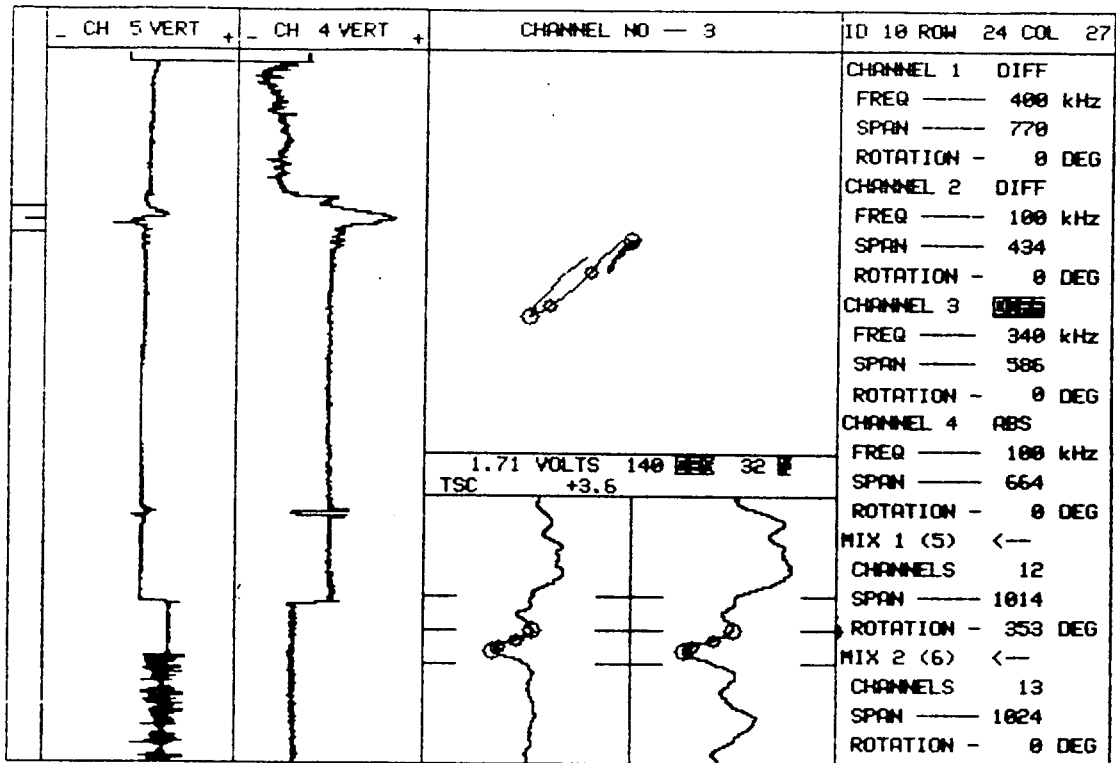
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1

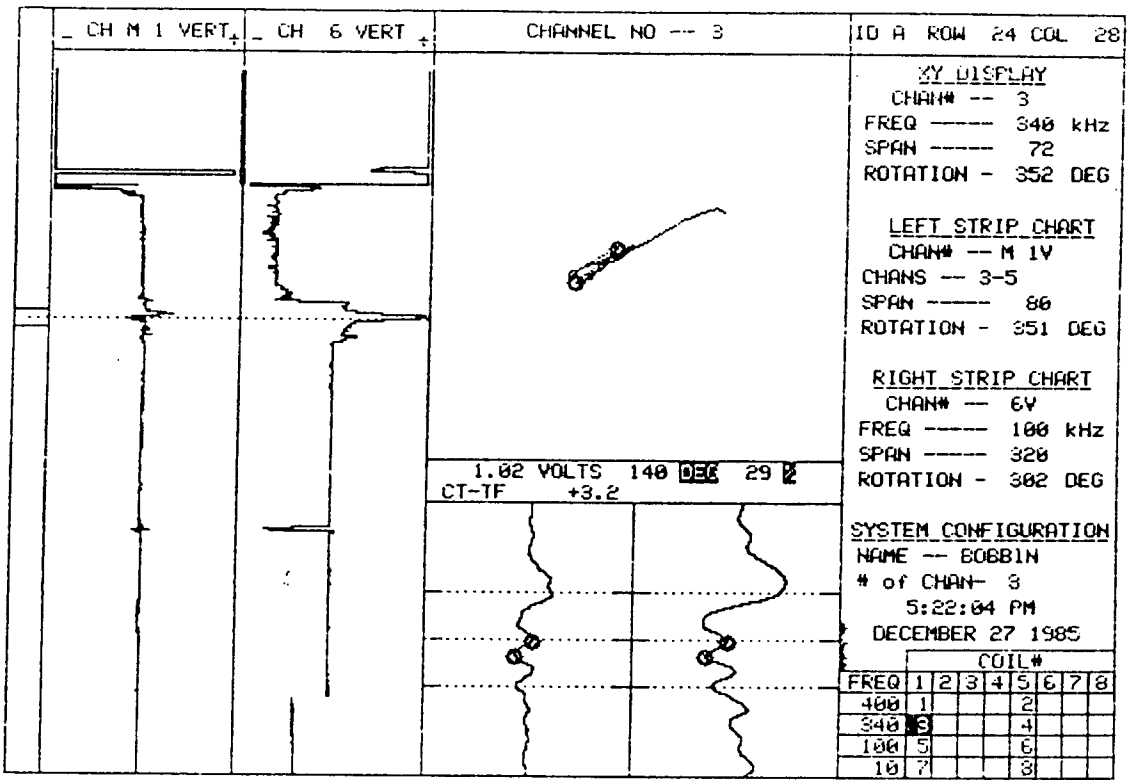


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



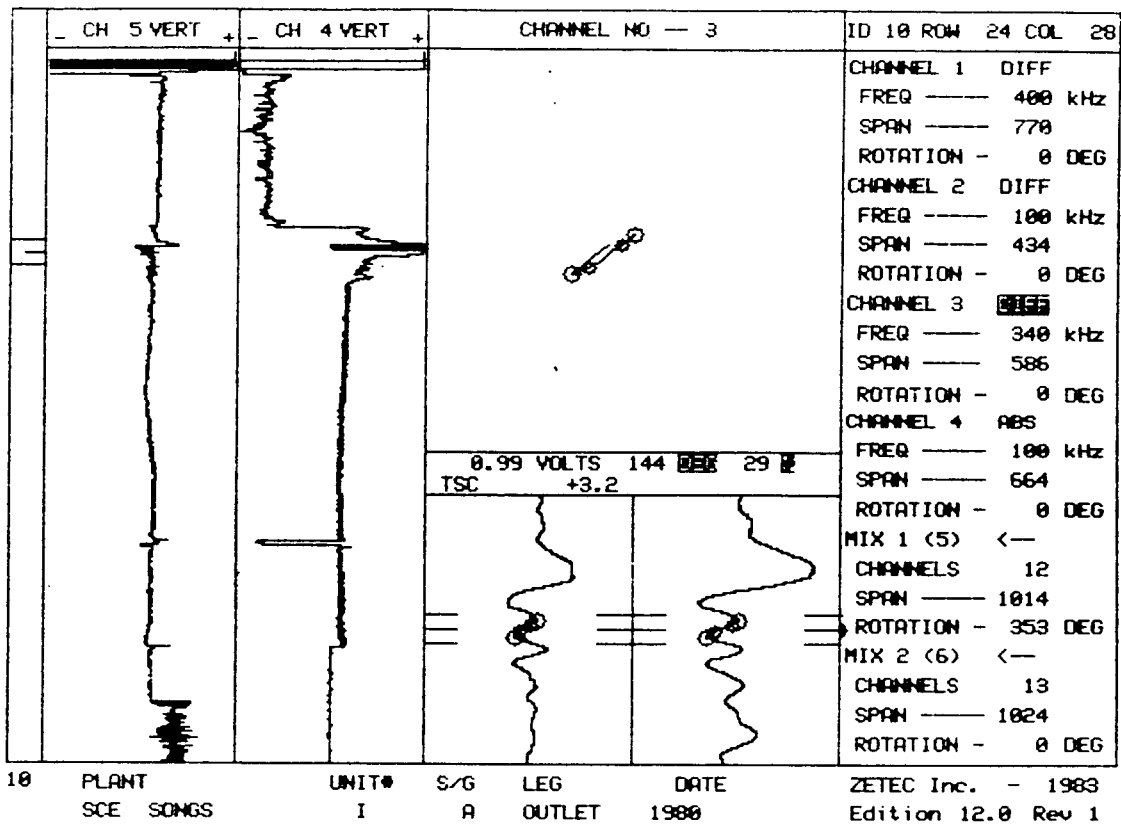
1.71 VOLTS 140 **HEX** 32 **W**  
TSC +3.6

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

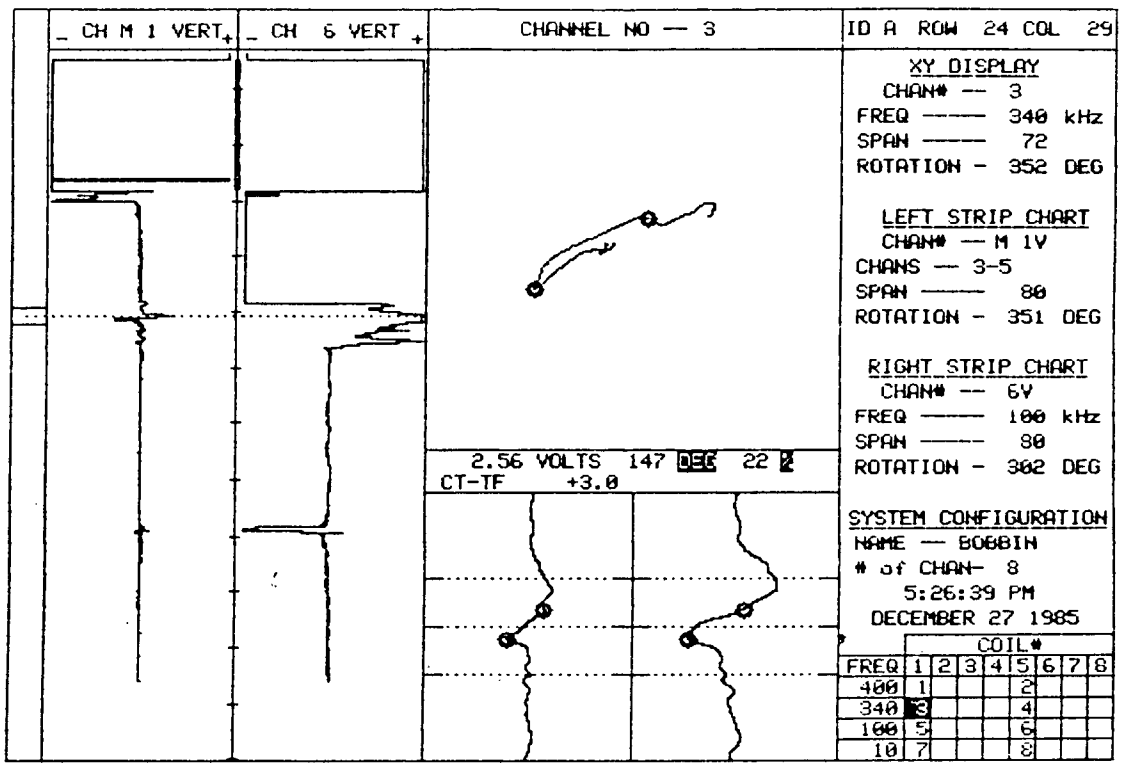


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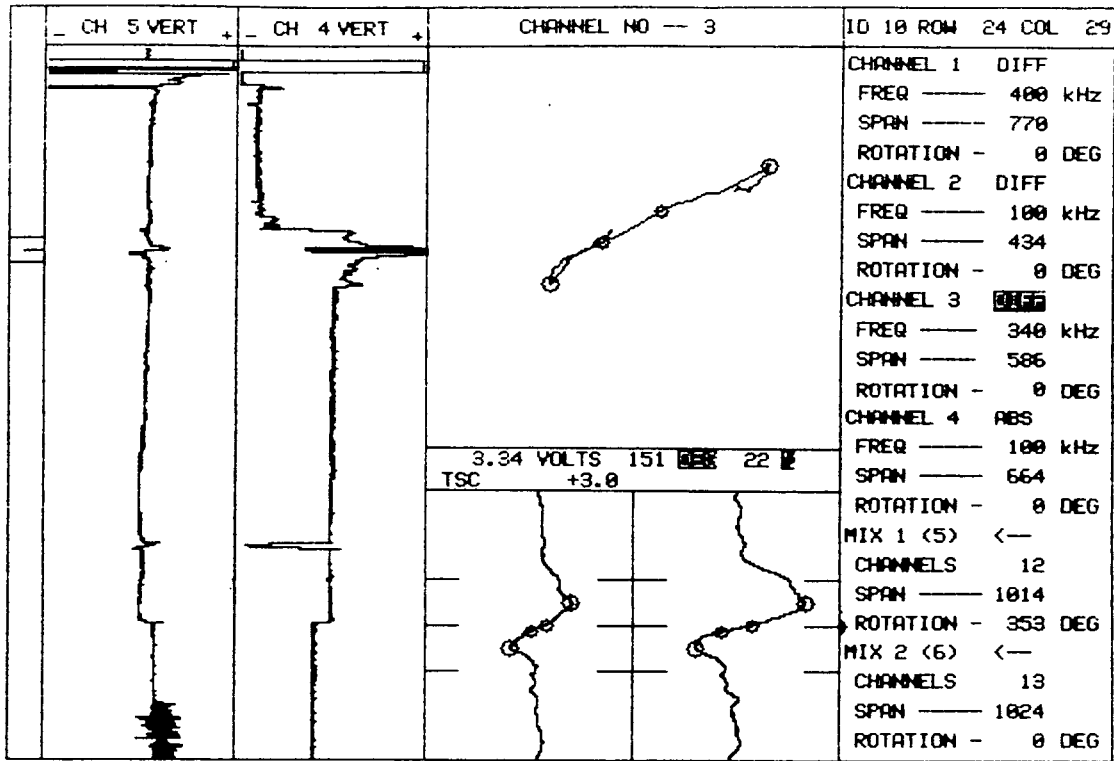
C 35





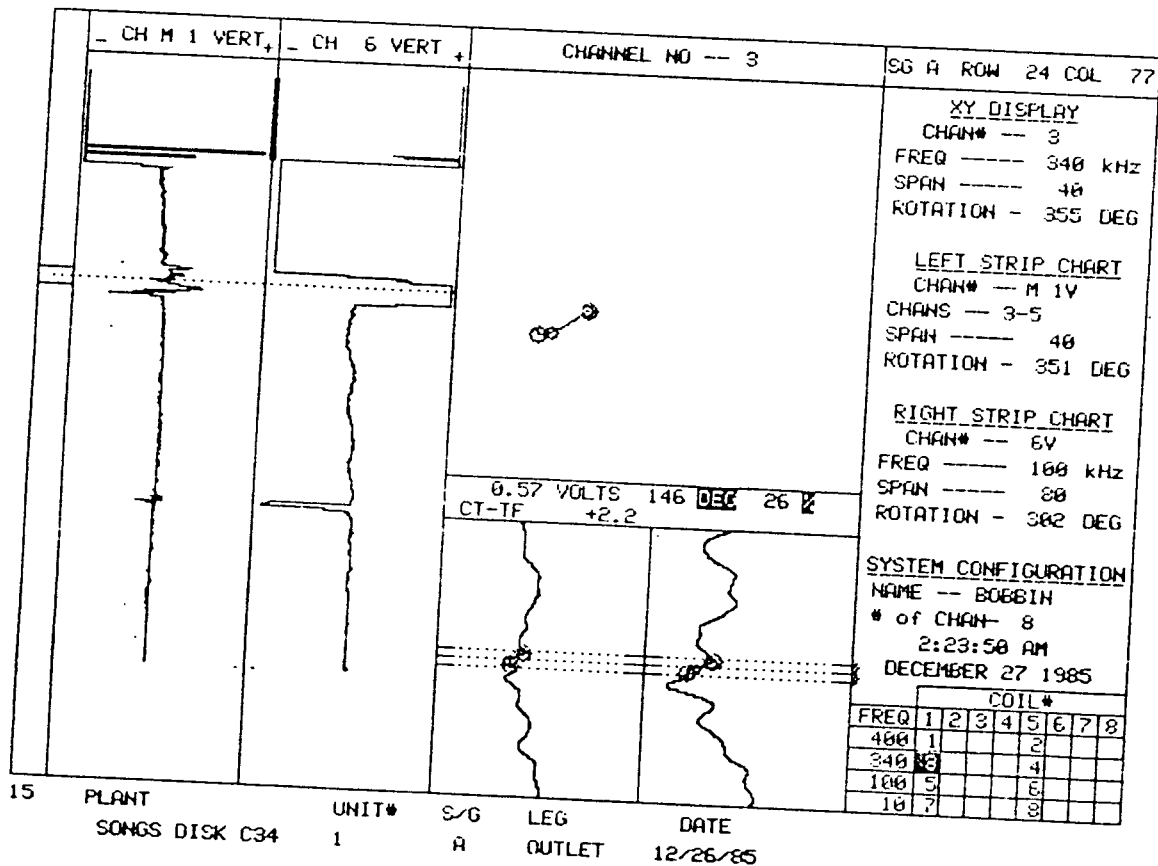
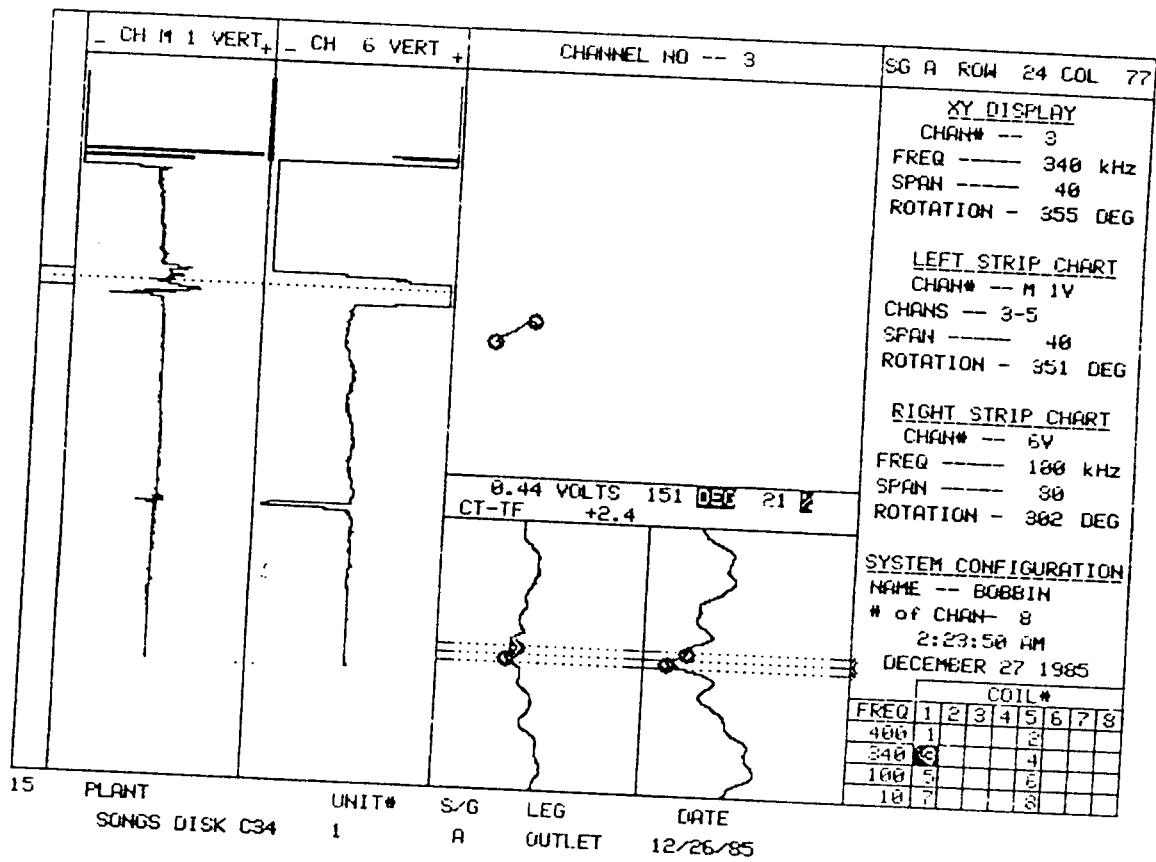


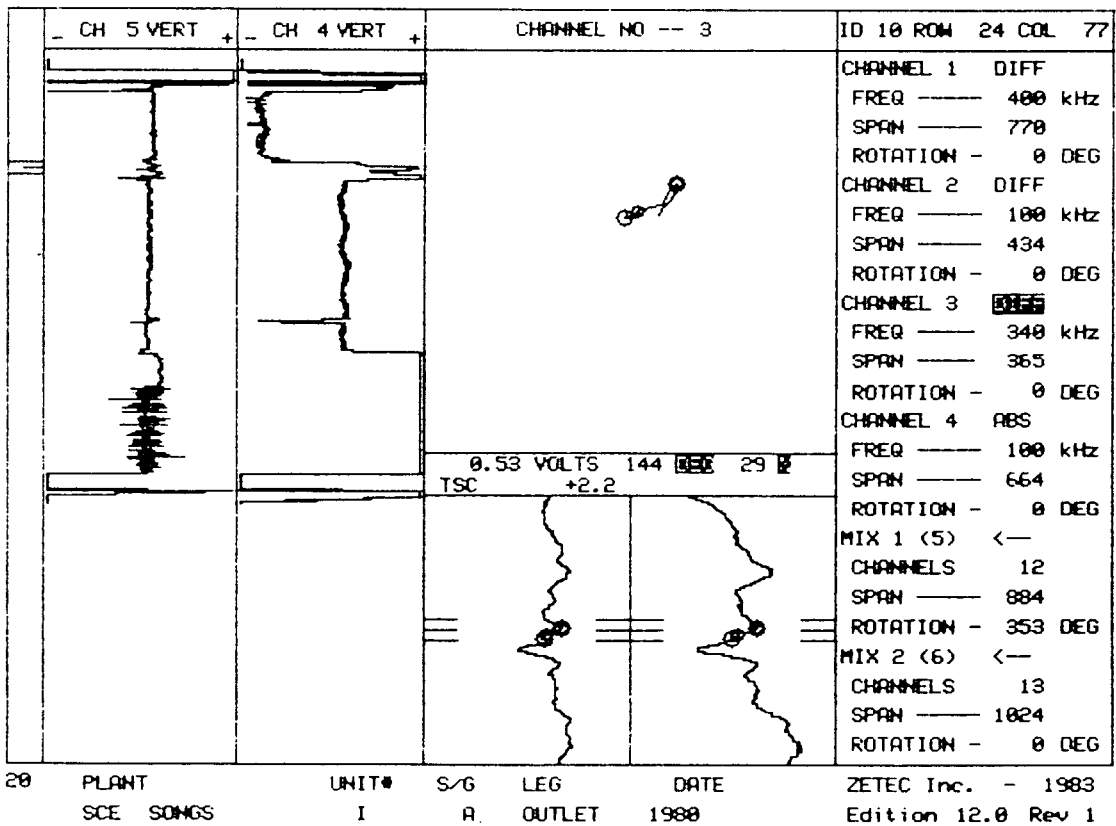
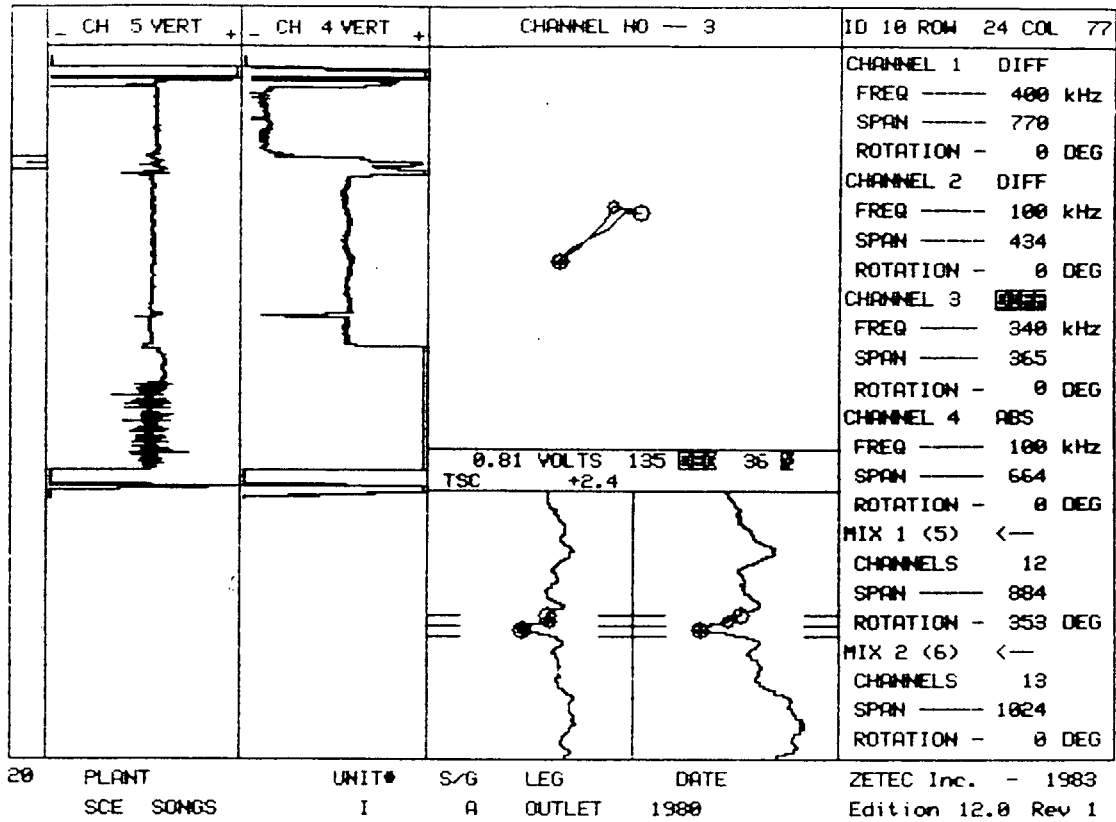
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85

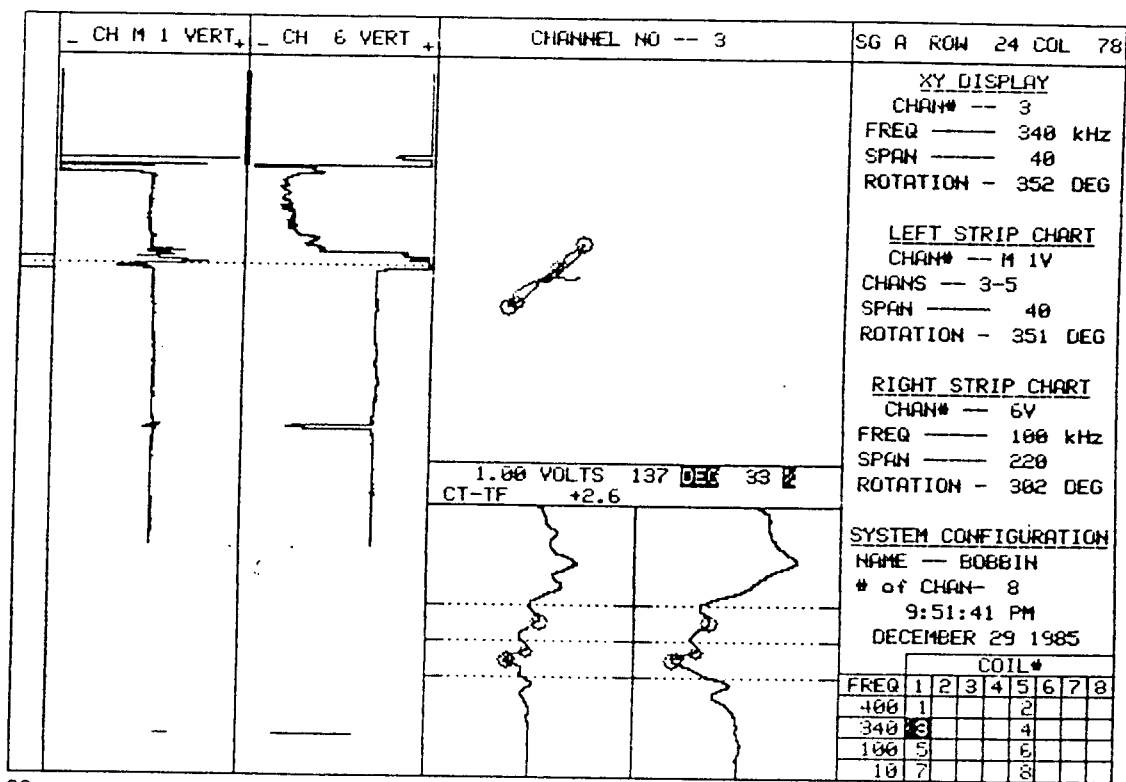


3.34 VOLTS 151 **DEG** 22 **V**  
TSC +3.0

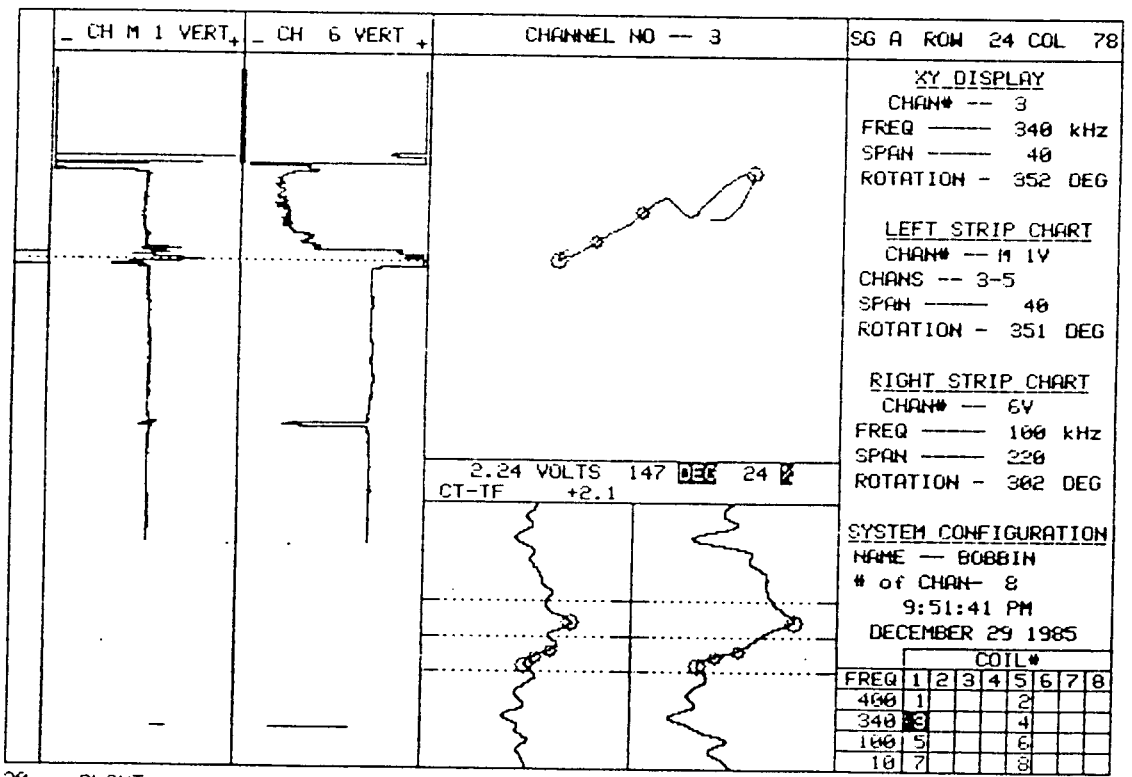
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



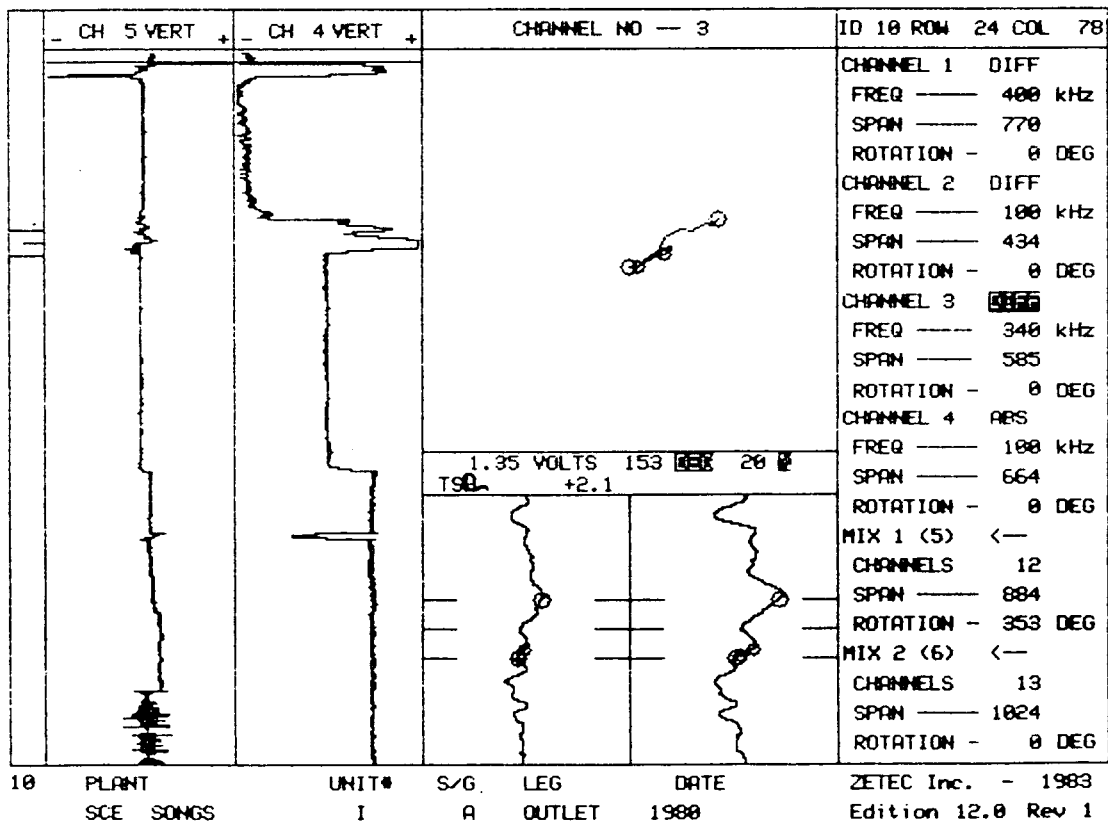
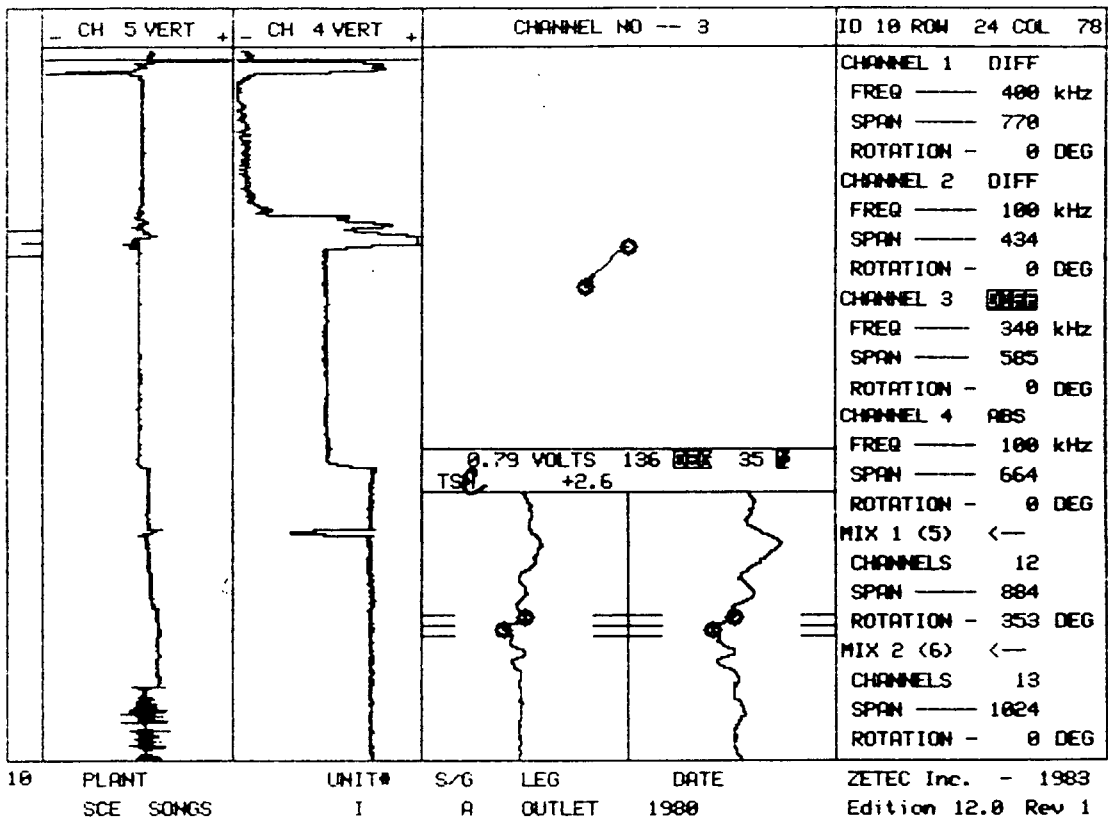


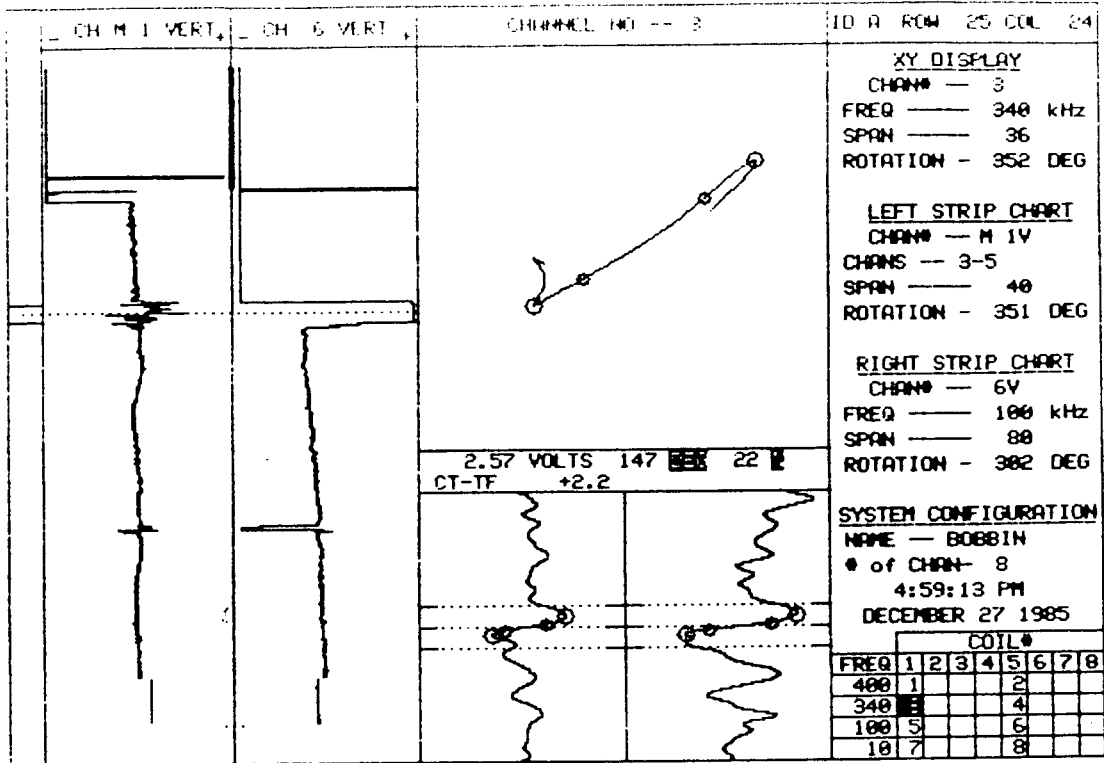


20 PLANT SONGS DISK C41 UNIT# 1 S/G A LEG OUTLET DATE 12/29/85

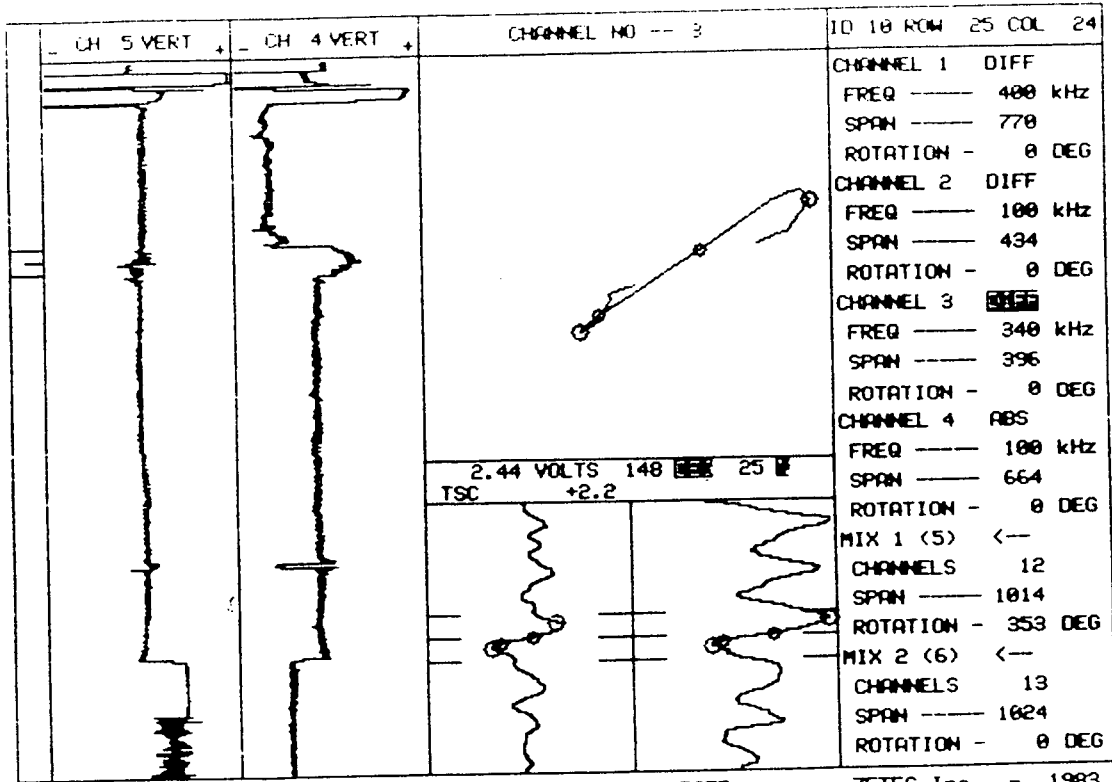


20 PLANT SONGS DISK C41 UNIT# 1 S/G A LEG OUTLET DATE 12/29/85



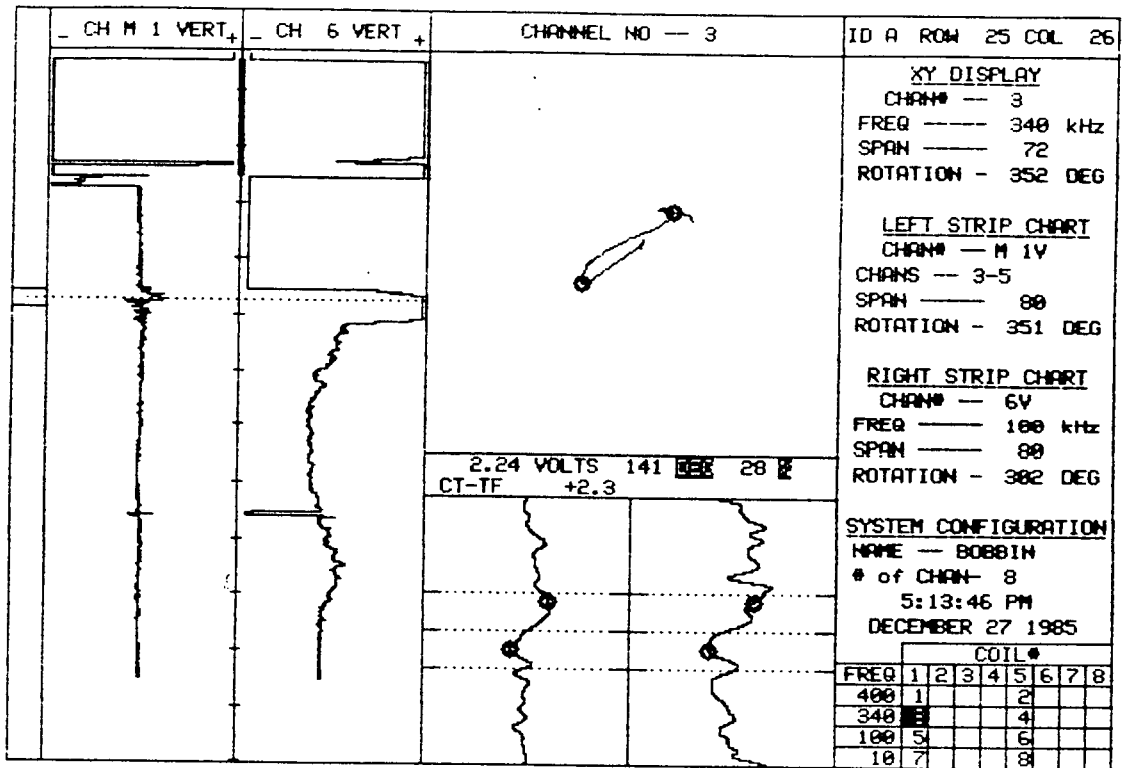


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

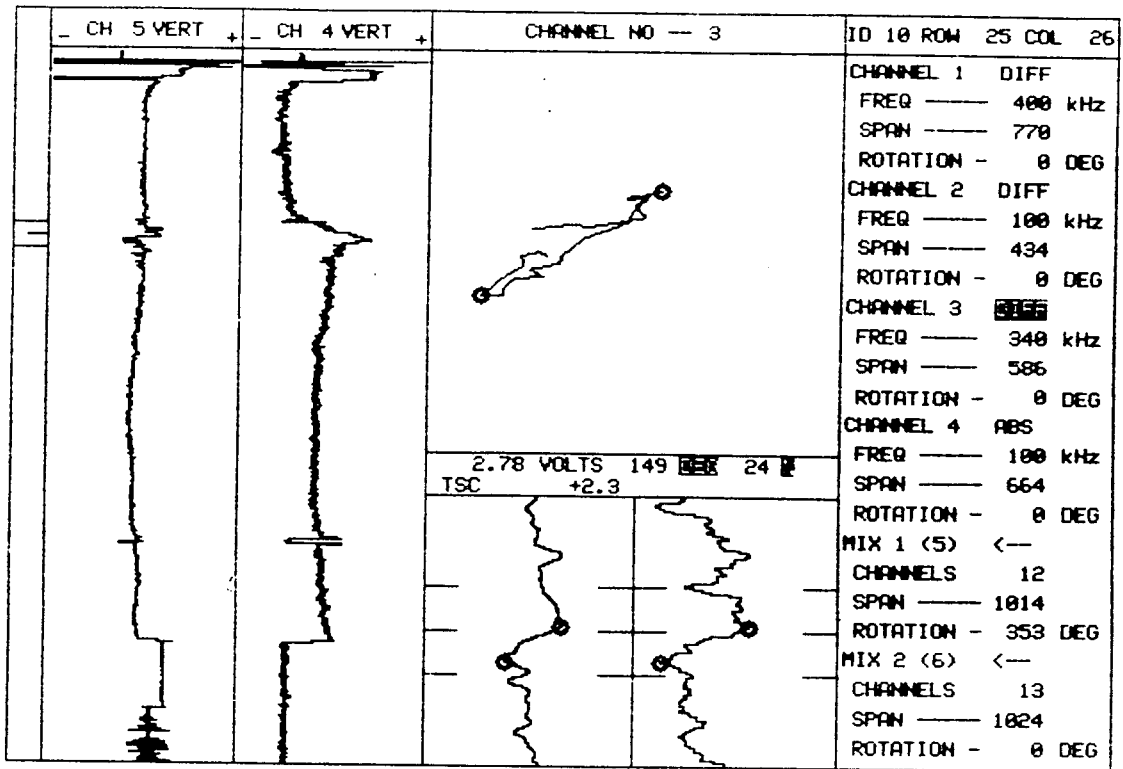


10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1



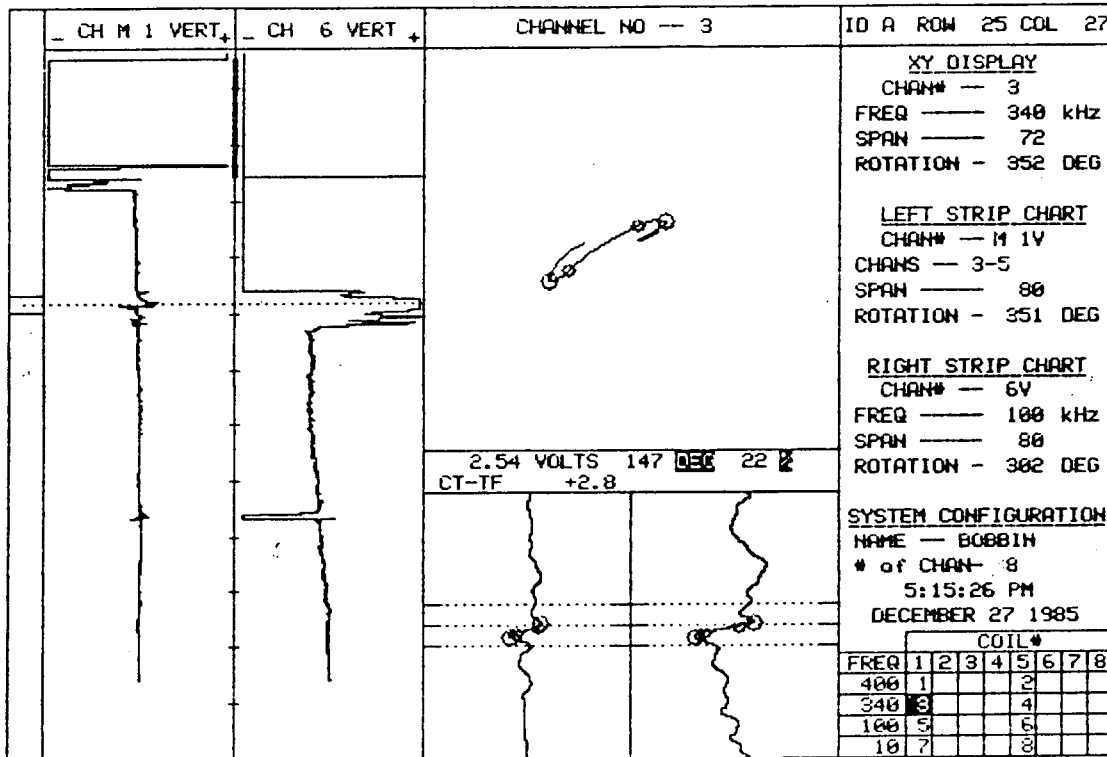


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG A DATE 12/27/85

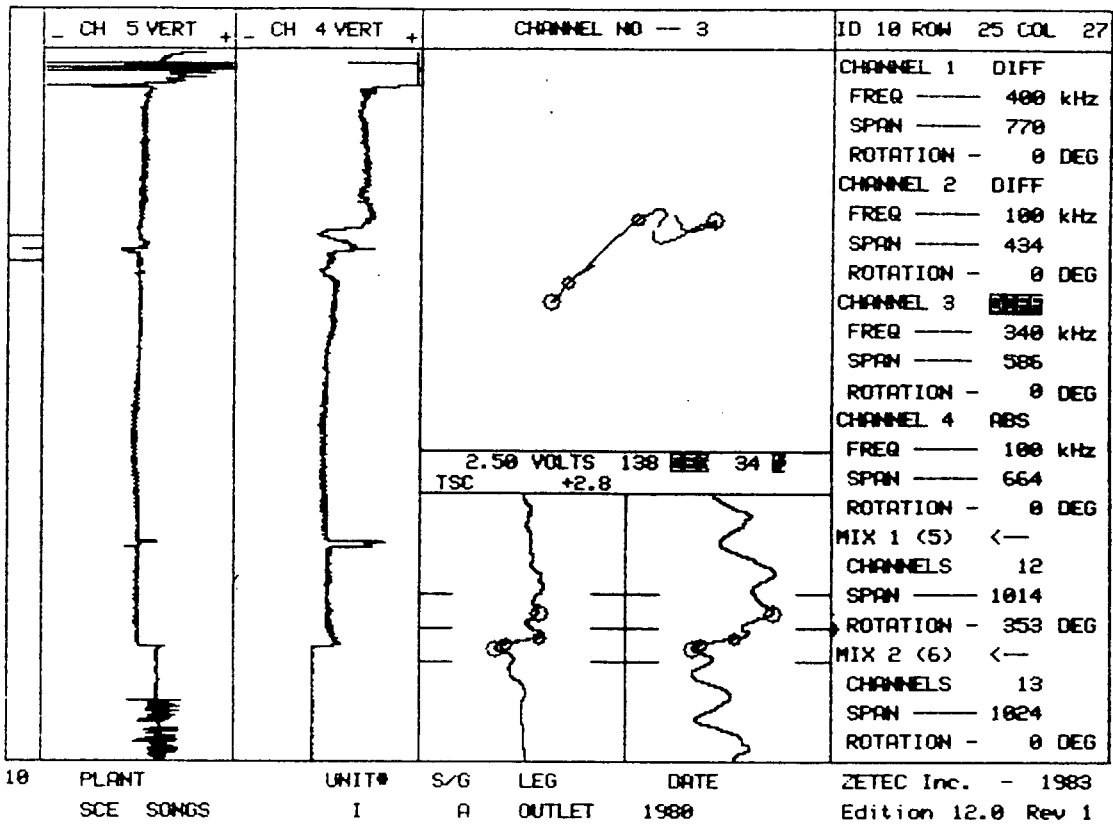


2.78 VOLTS 149 ~~DEG~~ 24 ~~DEG~~  
TSC +2.3

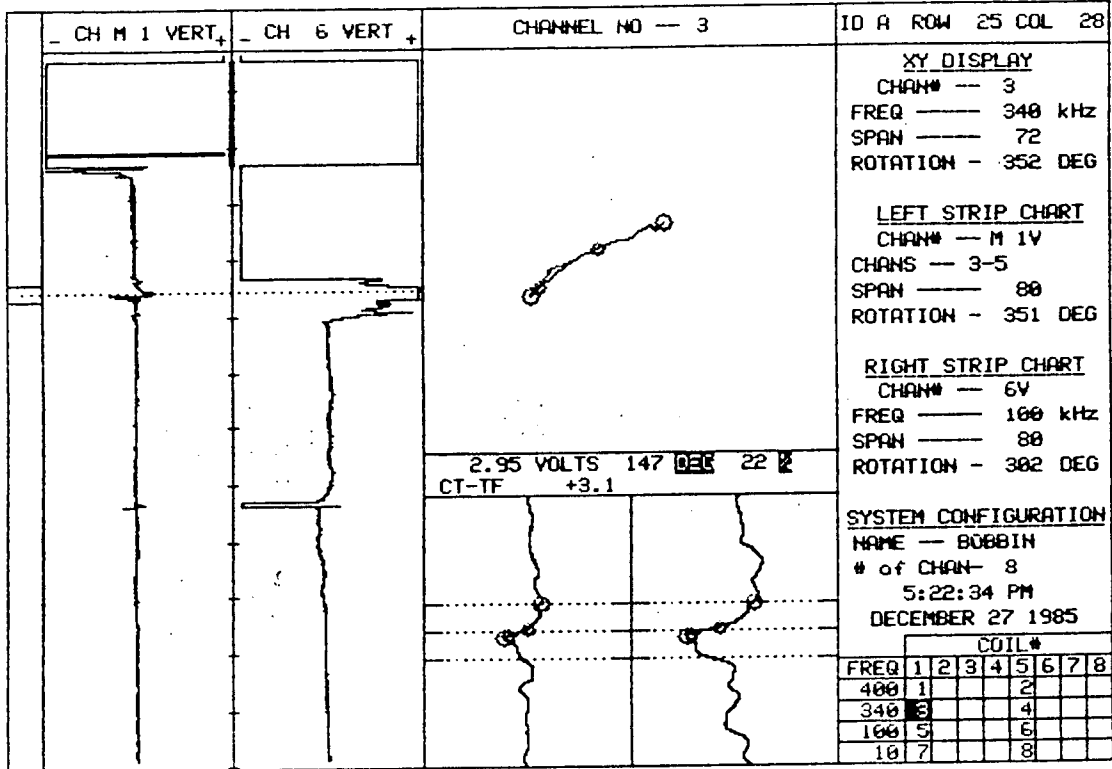
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



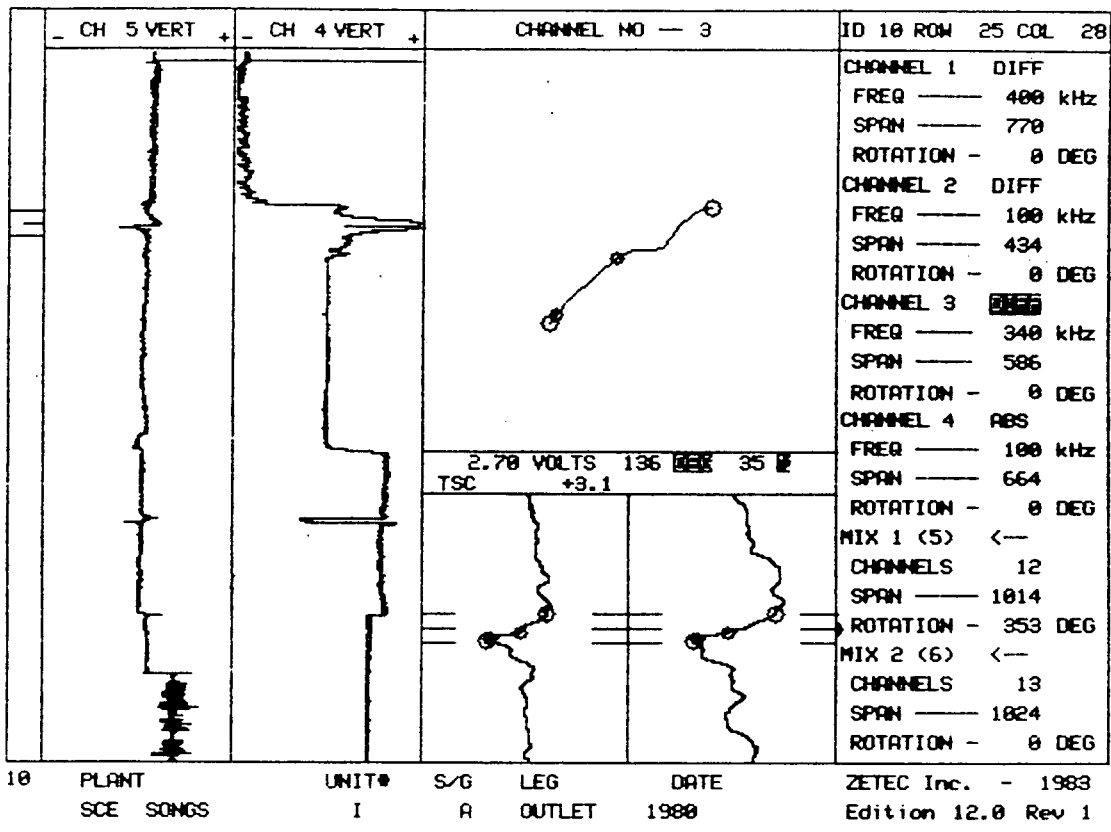
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



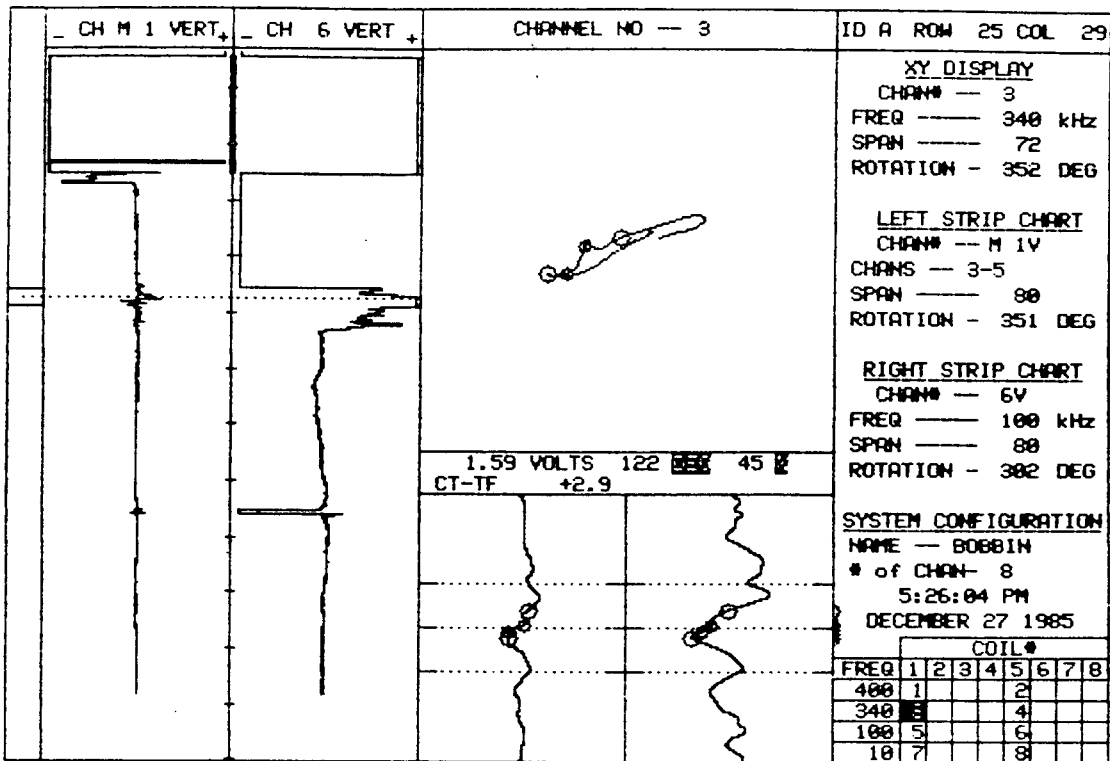
2.50 VOLTS 138 ~~138~~ 34 ~~34~~  
TSC +2.8



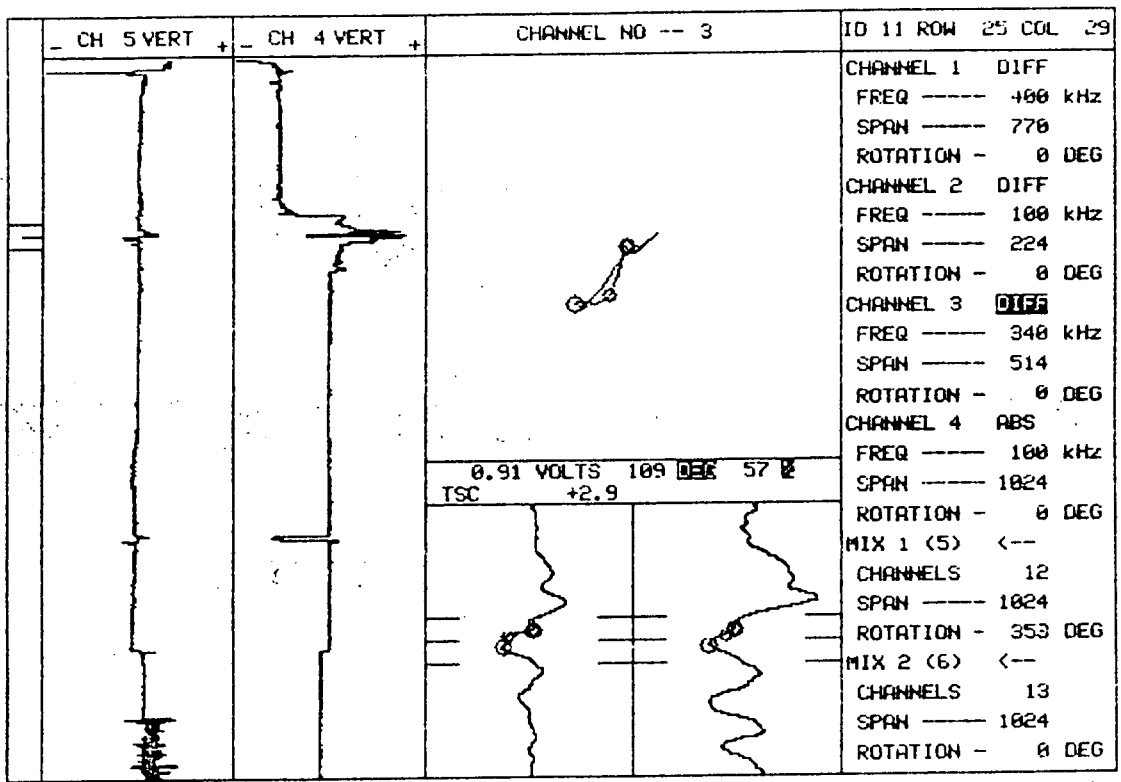
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



2.78 VOLTS 136 DEG 35  
TSC +3.1

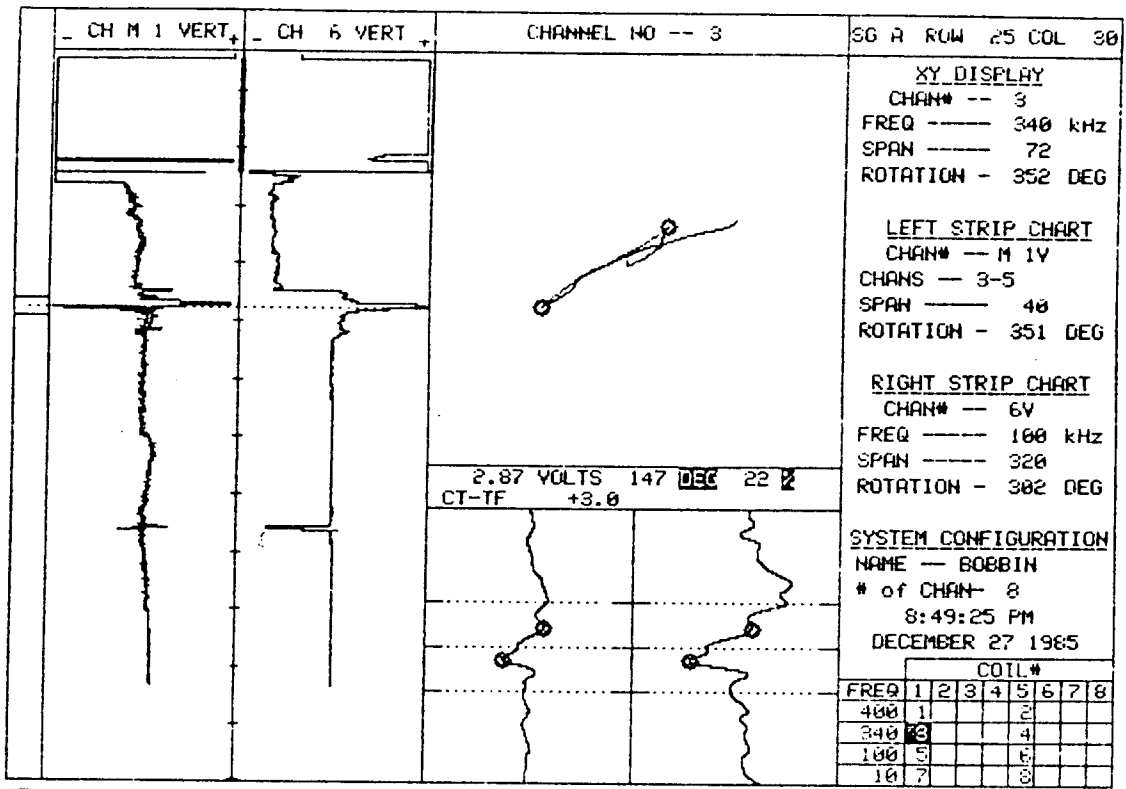


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

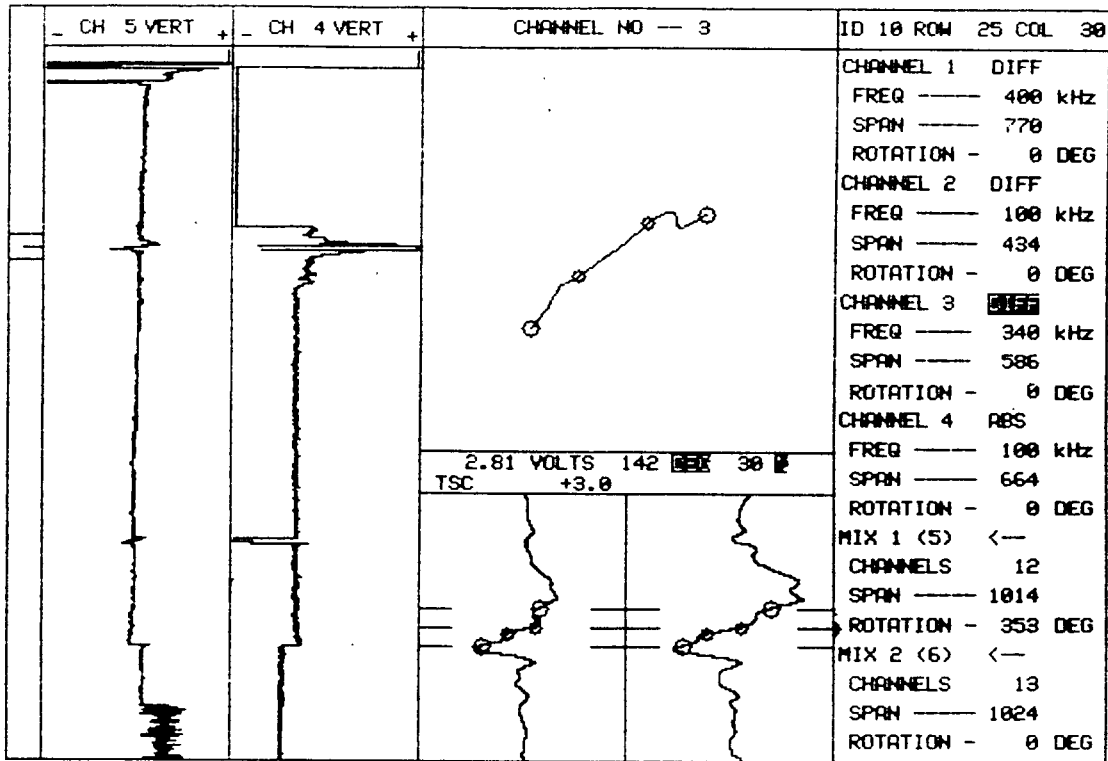


10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

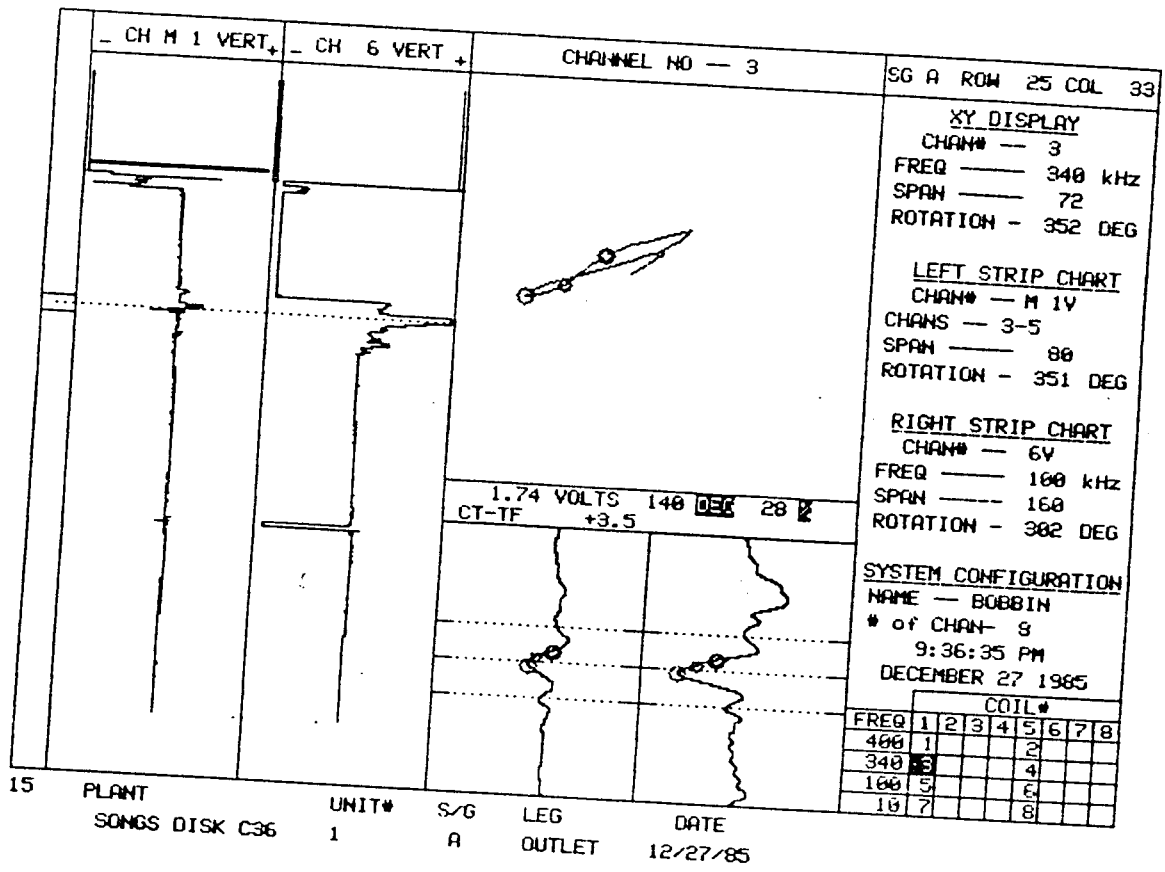


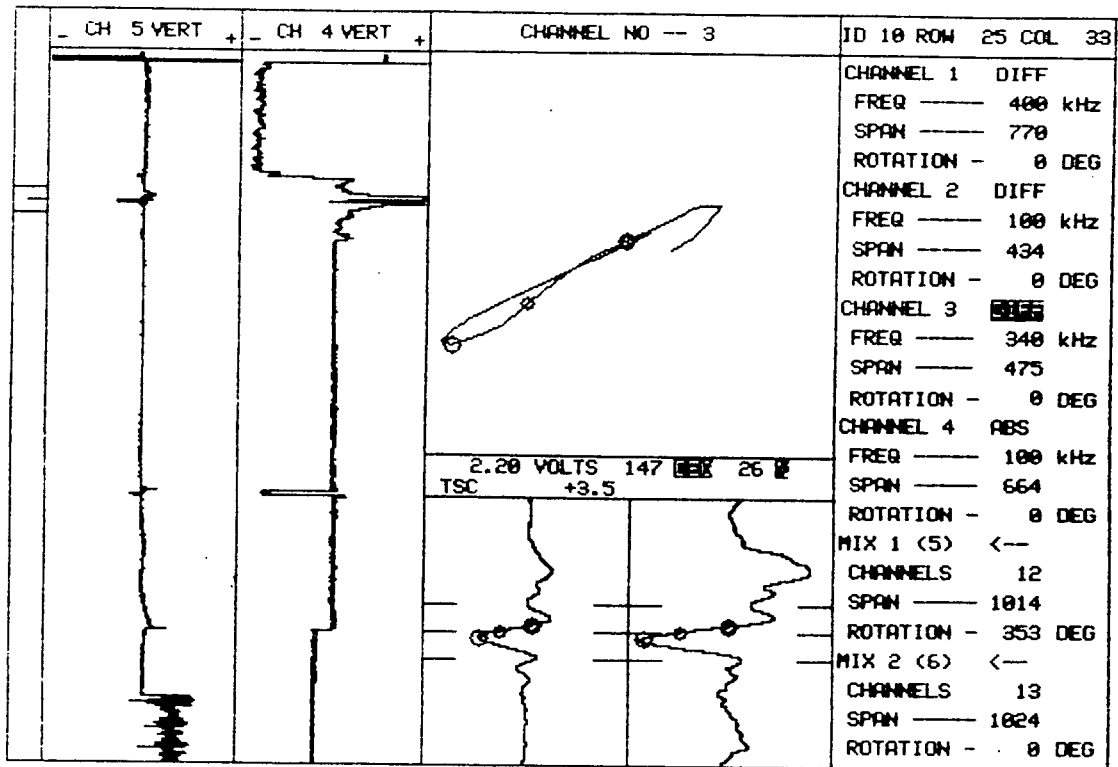


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85



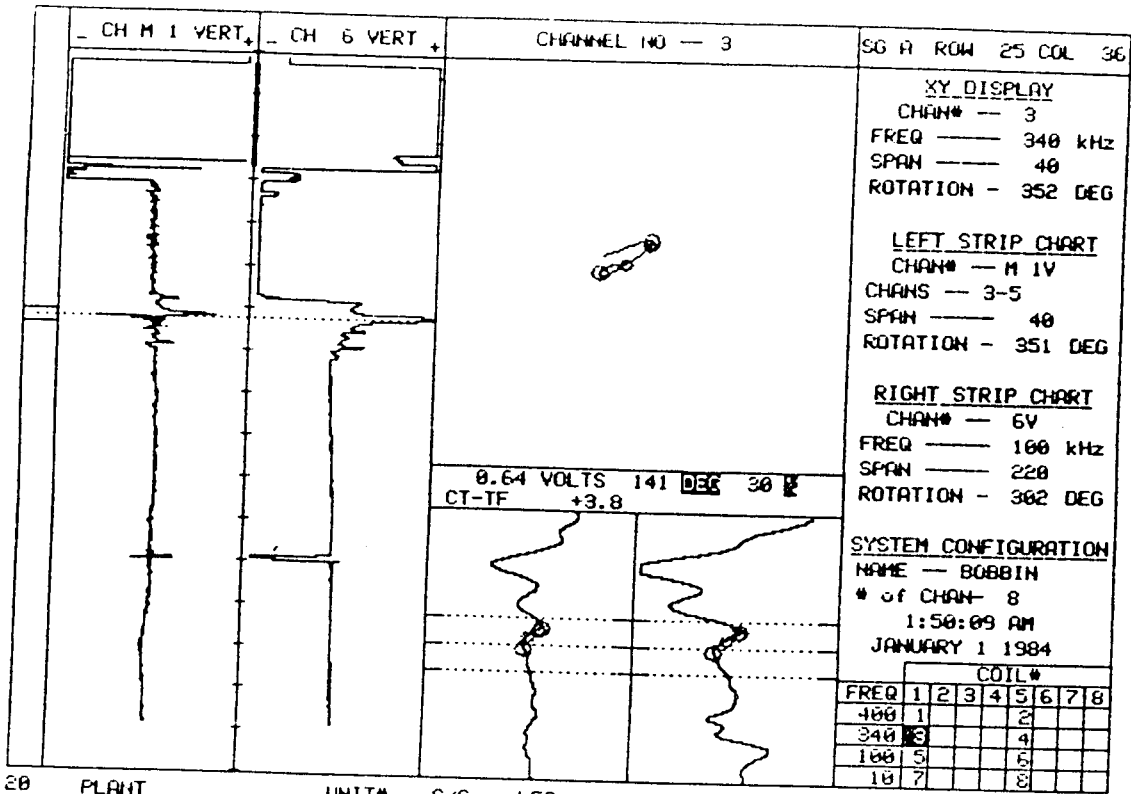
10 PLANT SCE SONGS    UNIT# I    S/G A    LEG OUTLET    DATE 1980    ZETEC Inc. - 1983 Edition 12.0 Rev 1





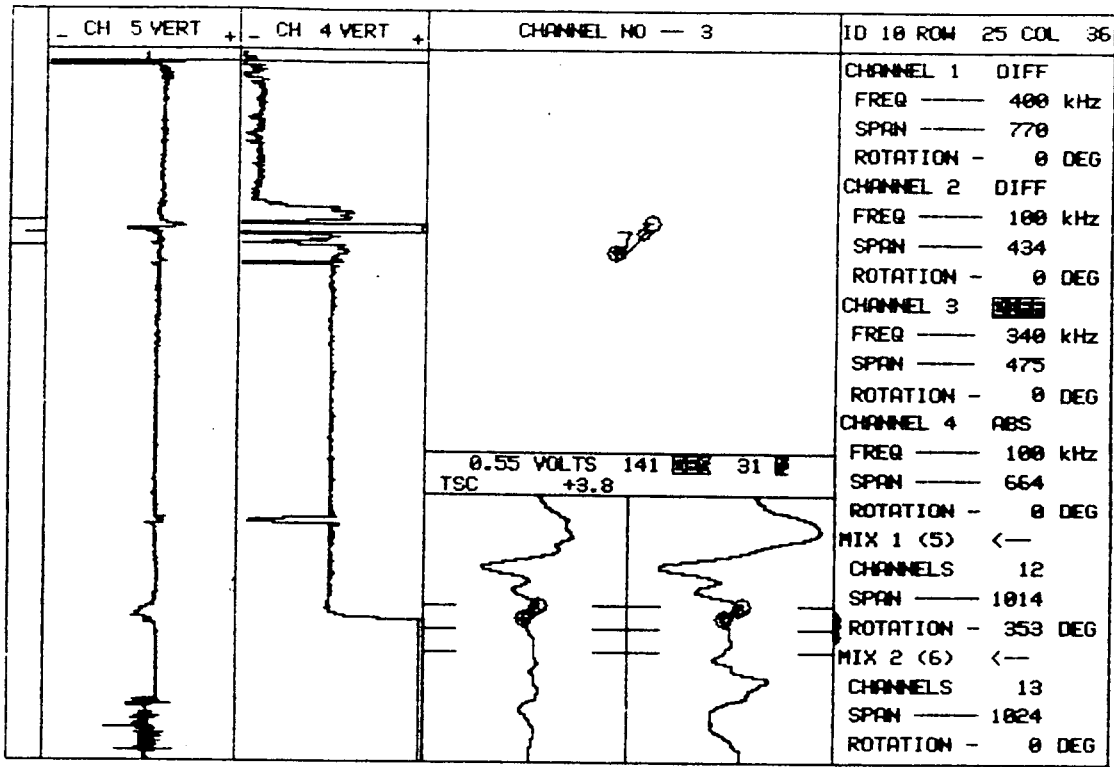
2.20 VOLTS 147 ~~EEK~~ 26 ~~W~~  
TSC +3.5

10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

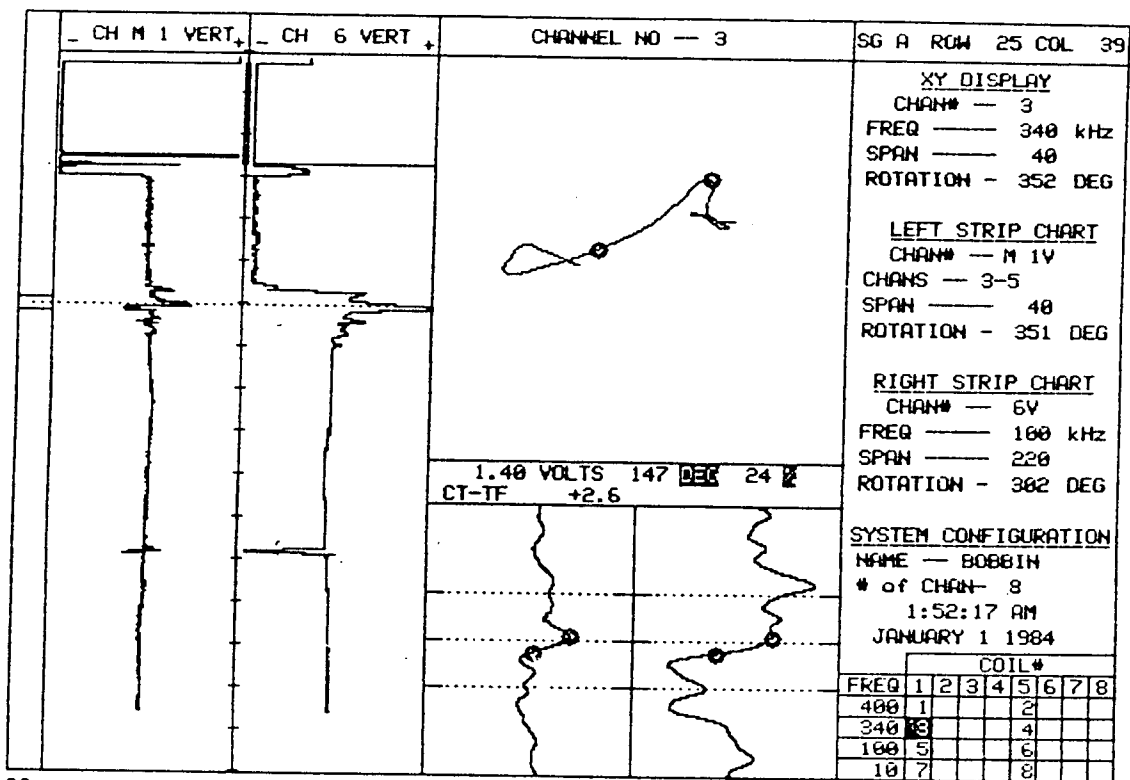


20 PLANT SONGS DISK C40 UNIT# 1 S/G A LEG OUTLET DATE 12/29/85

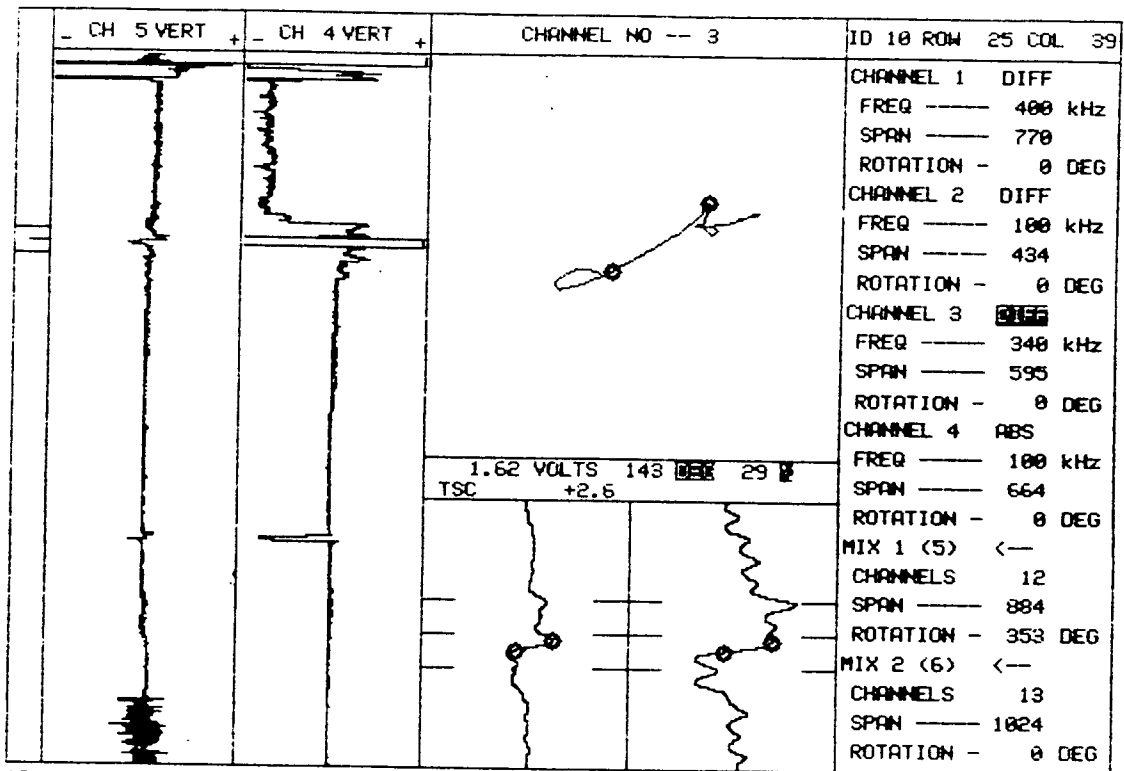
CHA



10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



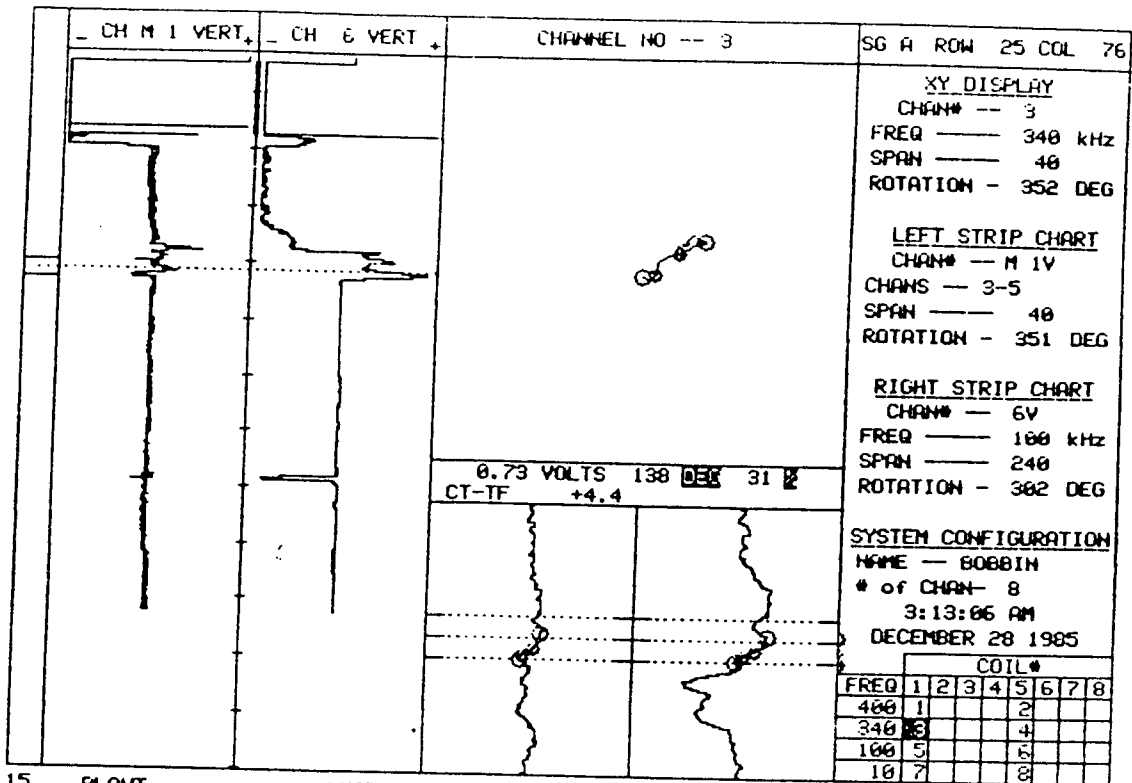
20 PLANT SONGS DISK C40 UNIT# 1 S/G A LEG OUTLET DATE 12/29/85



10 PLANT UNIT# S/G LEG DATE  
 SCE SONGS I A OUTLET 1980

ZETEC Inc. - 1983  
 Edition 12.0 Rev 1





SG A ROW 25 COL 76

XY DISPLAY  
 CHAN# -- 3  
 FREQ --- 340 kHz  
 SPAN --- 40  
 ROTATION - 352 DEG

LEFT STRIP CHART  
 CHAN# -- M 1V  
 CHANS -- 3-5  
 SPAN --- 40  
 ROTATION - 351 DEG

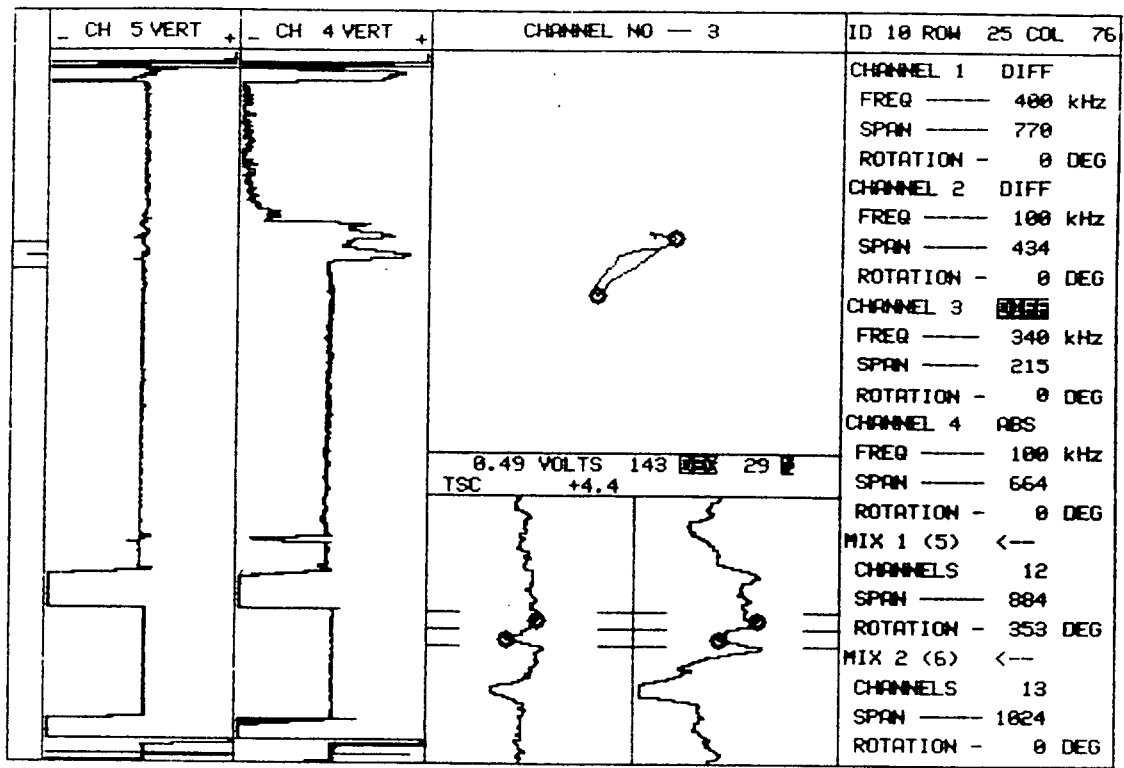
RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ --- 100 kHz  
 SPAN --- 240  
 ROTATION - 302 DEG

0.73 VOLTS 138 DEG 31 2  
 CT-IF +4.4

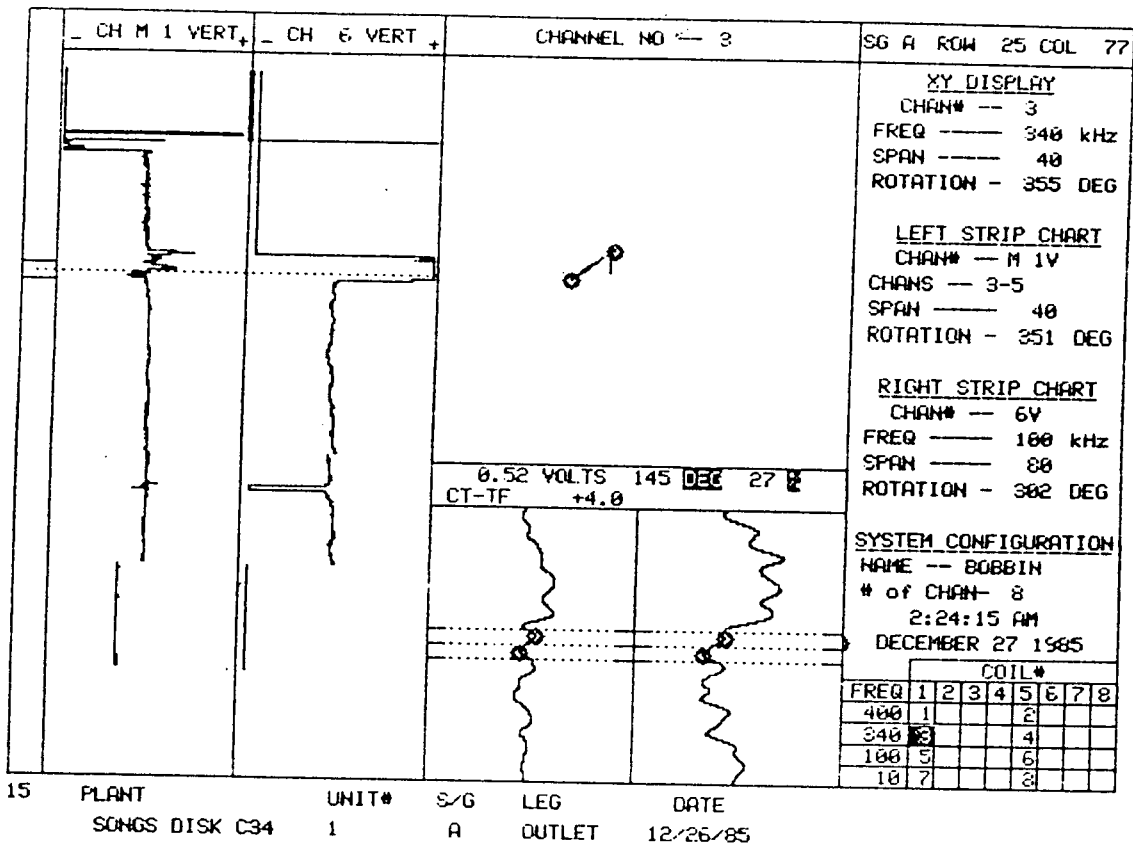
SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 3:13:06 AM  
 DECEMBER 28 1985

FREQ	COIL#							
	1	2	3	4	5	6	7	8
400	1				2			
340	3				4			
100	5				6			
10	7				8			

15 PLANT SONGS DISK C37 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1



CHANNEL NO -- 3  
SG A ROW 25 COL 77

**XY DISPLAY**  
CHAN# -- 3  
FREQ --- 340 kHz  
SPAN --- 40  
ROTATION - 355 DEG

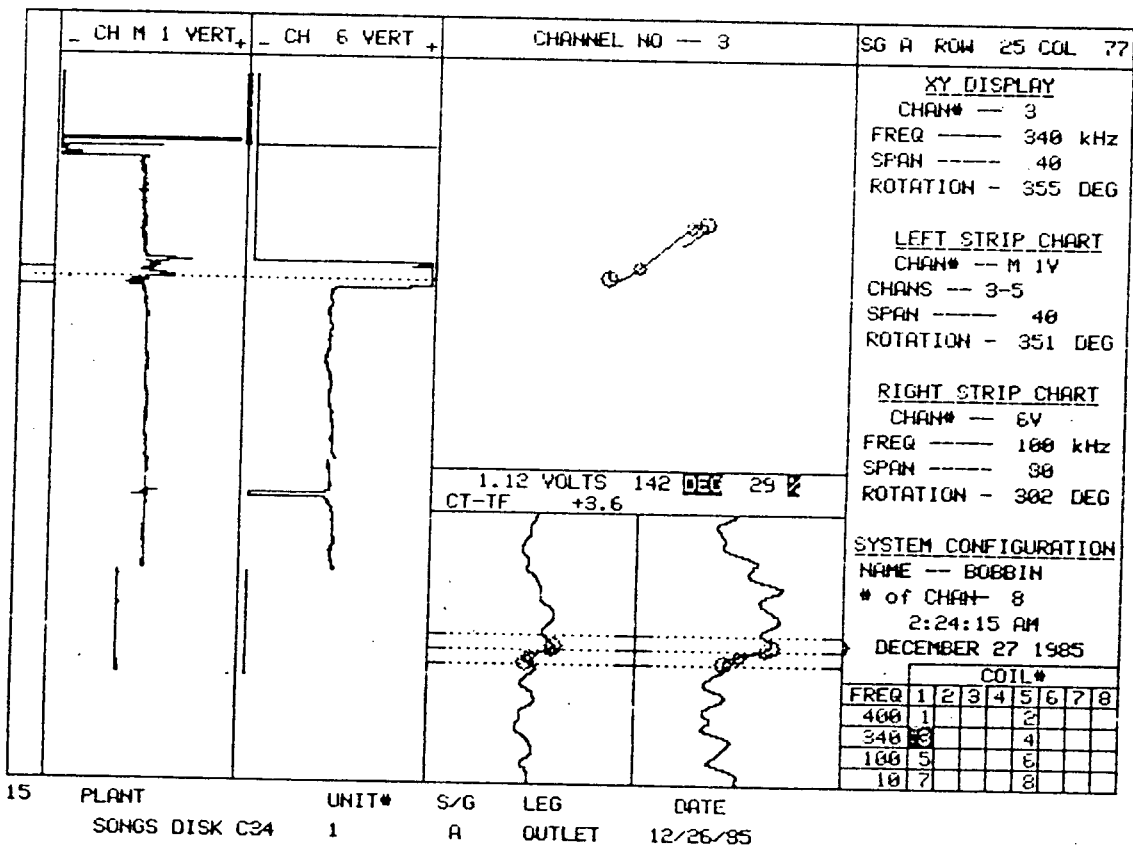
**LEFT STRIP CHART**  
CHAN# -- M 1V  
CHANS -- 3-5  
SPAN --- 40  
ROTATION - 351 DEG

**RIGHT STRIP CHART**  
CHAN# -- 6V  
FREQ --- 100 kHz  
SPAN --- 80  
ROTATION - 302 DEG

0.52 VOLTS 145 DEC 27  
CT-TF +4.0

**SYSTEM CONFIGURATION**  
NAME -- BOBBIN  
# of CHAN- 8  
2:24:15 AM  
DECEMBER 27 1985

COIL#	
FREQ	COIL#
400	1
340	2
100	3
10	4



CHANNEL NO -- 3  
SG A ROW 25 COL 77

**XY DISPLAY**  
CHAN# -- 3  
FREQ --- 340 kHz  
SPAN --- 40  
ROTATION - 355 DEG

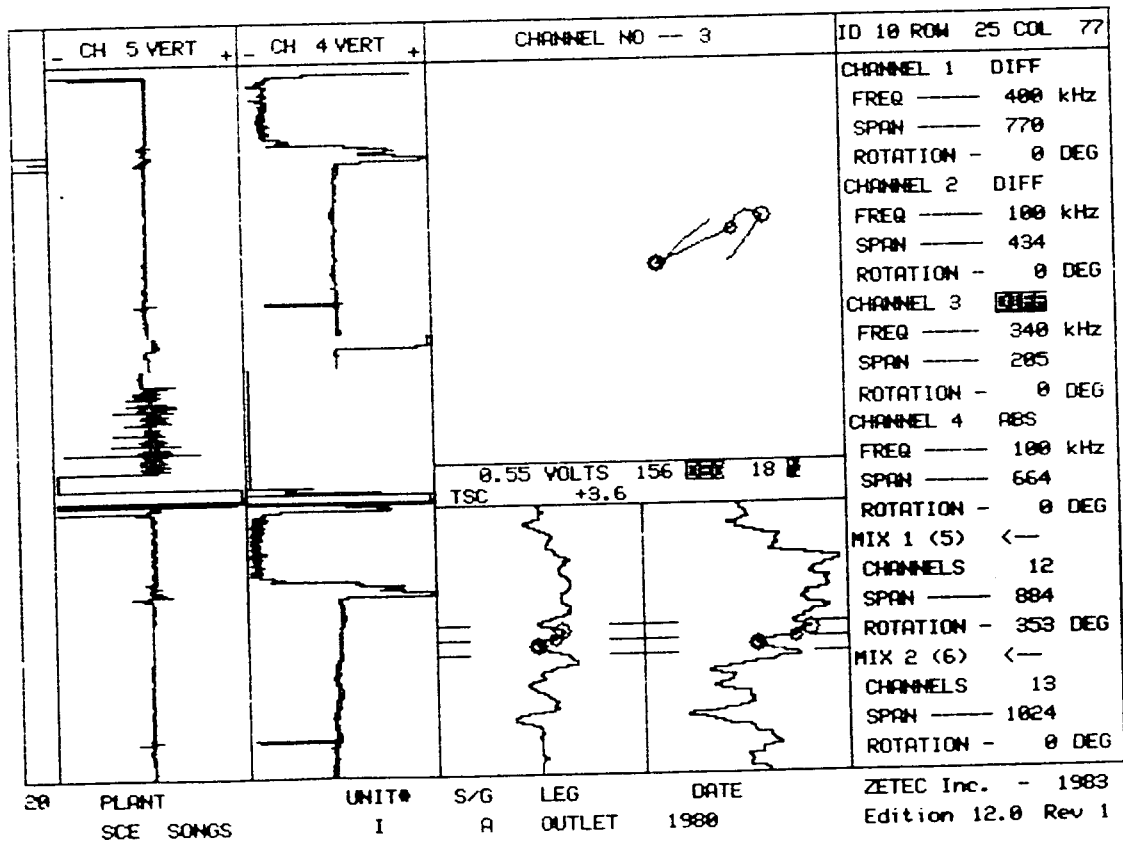
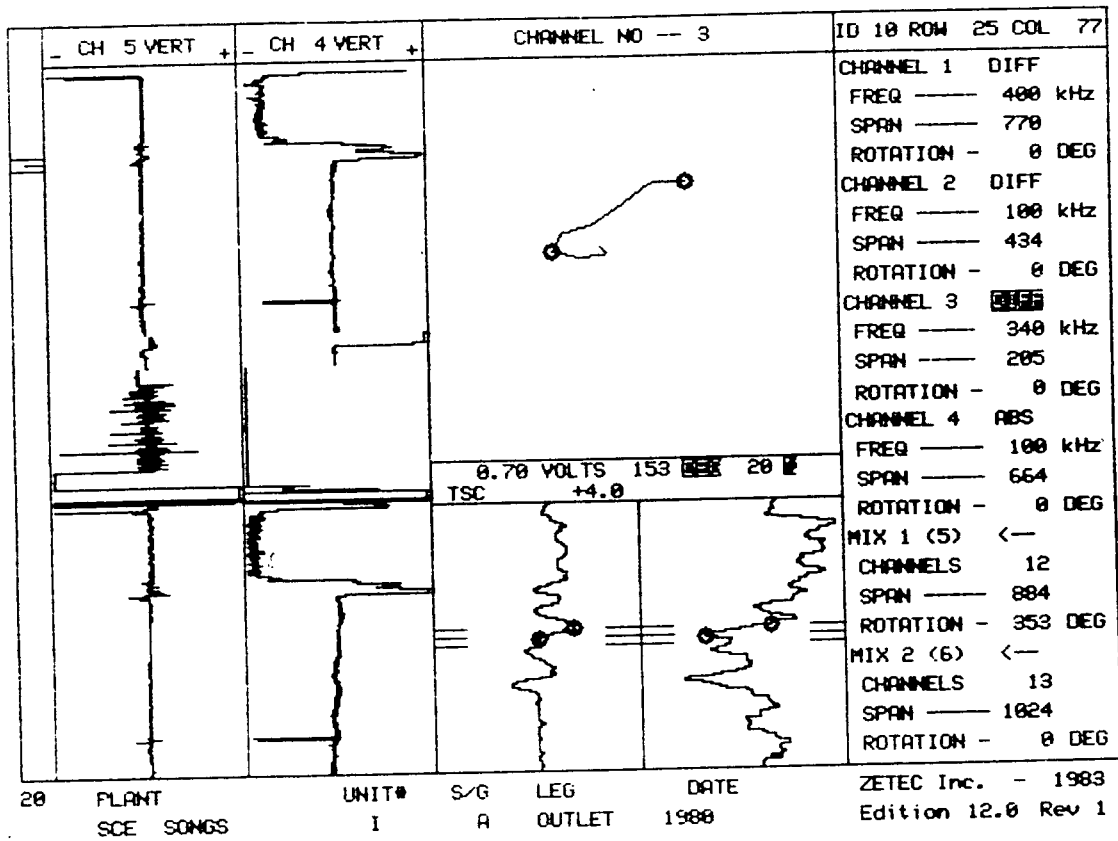
**LEFT STRIP CHART**  
CHAN# -- M 1V  
CHANS -- 3-5  
SPAN --- 40  
ROTATION - 351 DEG

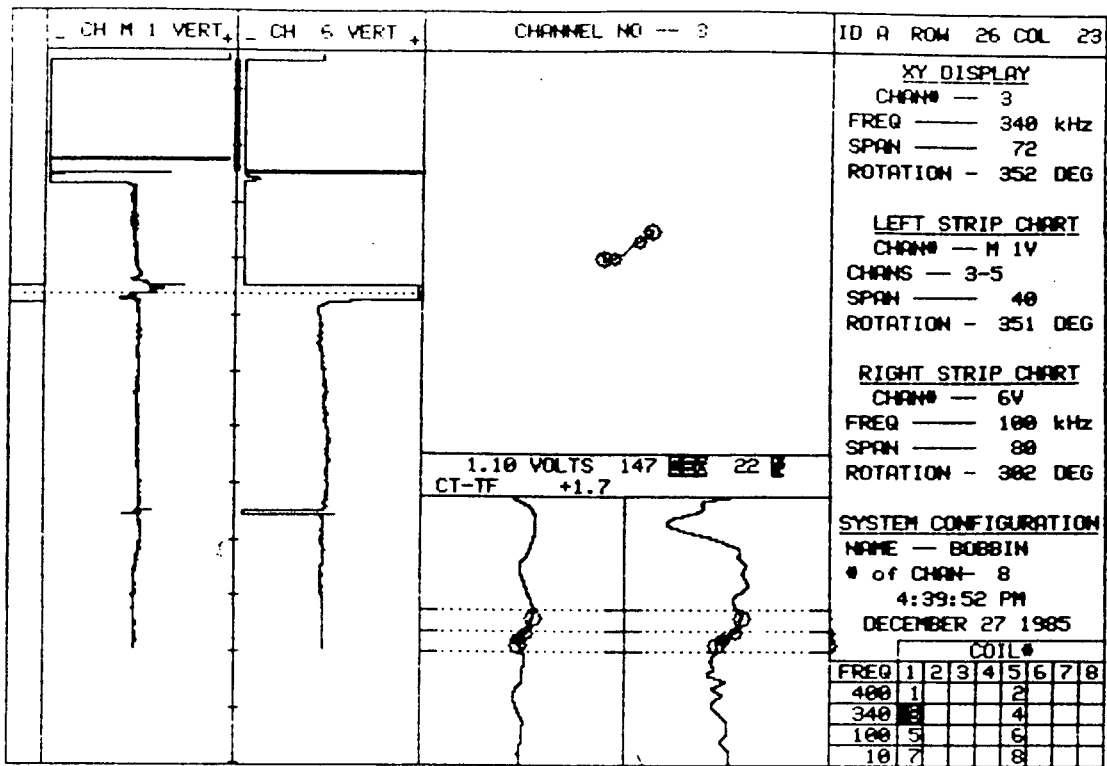
**RIGHT STRIP CHART**  
CHAN# -- 6V  
FREQ --- 100 kHz  
SPAN --- 80  
ROTATION - 302 DEG

1.12 VOLTS 142 DEC 29  
CT-TF +3.6

**SYSTEM CONFIGURATION**  
NAME -- BOBBIN  
# of CHAN- 8  
2:24:15 AM  
DECEMBER 27 1985

COIL#	
FREQ	COIL#
400	1
340	2
100	3
10	4





XY DISPLAY  
 CHAN# — 3  
 FREQ — 340 kHz  
 SPAN — 72  
 ROTATION — 352 DEG

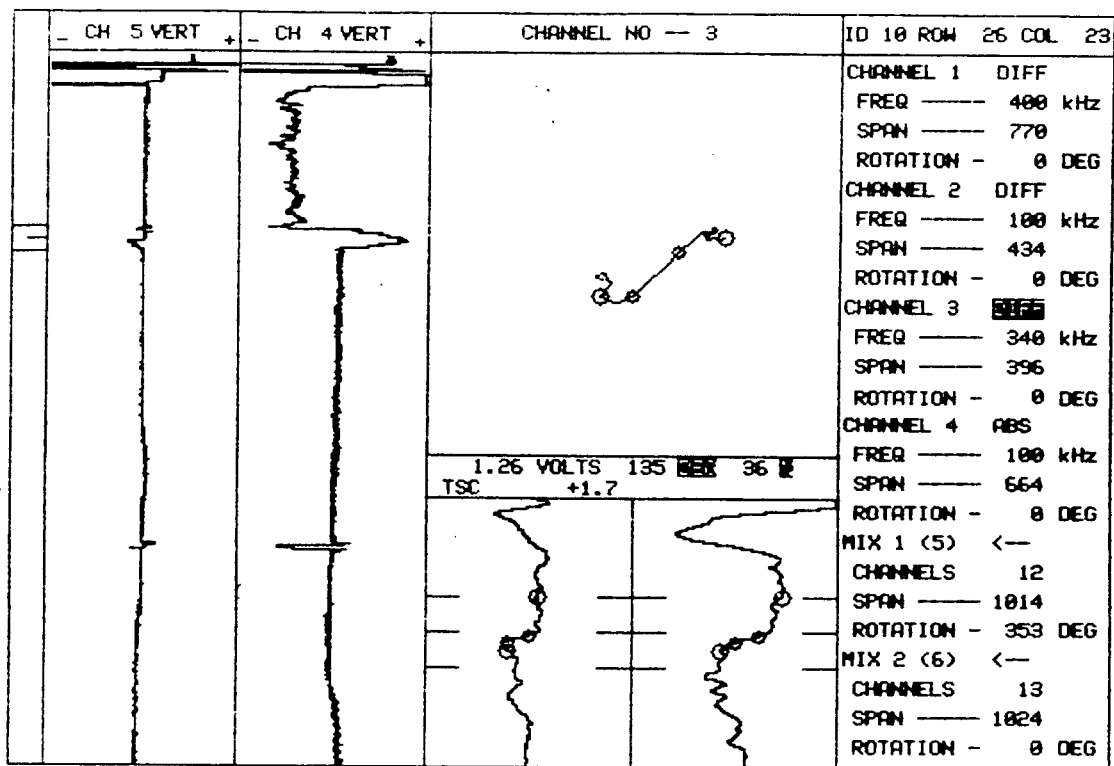
LEFT STRIP CHART  
 CHAN# — M 1V  
 CHANS — 3-5  
 SPAN — 40  
 ROTATION — 351 DEG

RIGHT STRIP CHART  
 CHAN# — 6V  
 FREQ — 100 kHz  
 SPAN — 80  
 ROTATION — 302 DEG

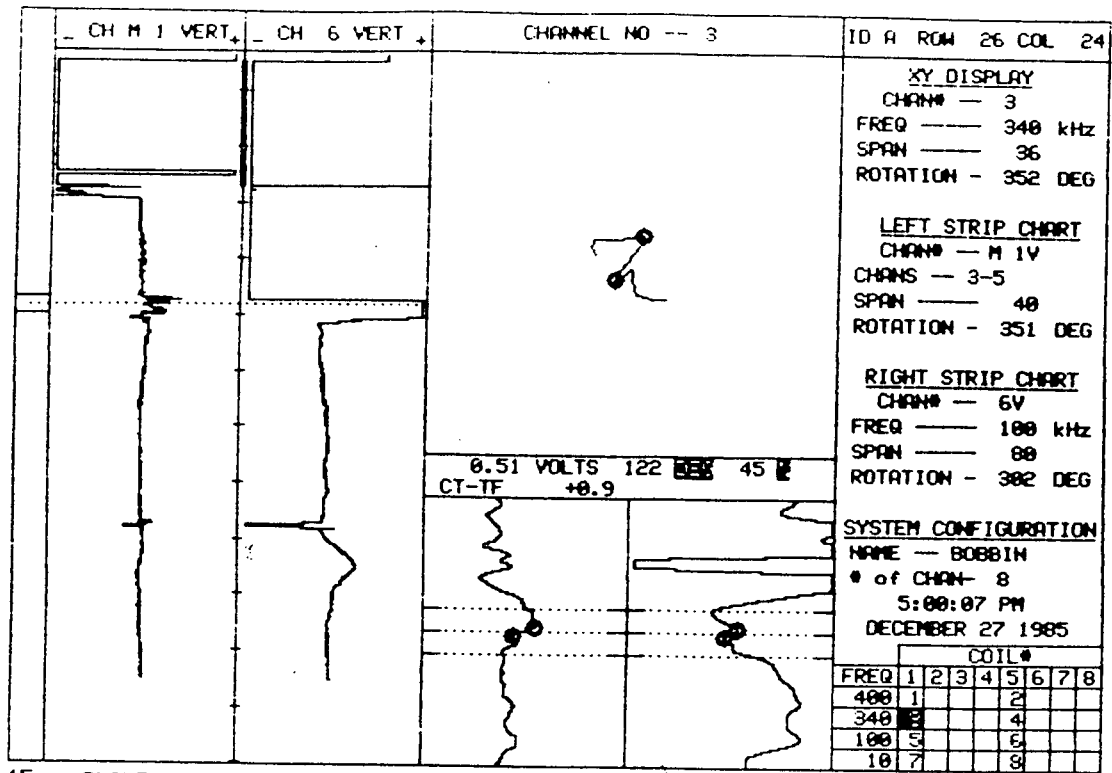
SYSTEM CONFIGURATION  
 NAME — BOBBIN  
 # of CHAN — 8  
 4:39:52 PM  
 DECEMBER 27 1985

COIL#								
FREQ	1	2	3	4	5	6	7	8
400	1				2			
340	3				4			
100	5				6			
10	7				8			

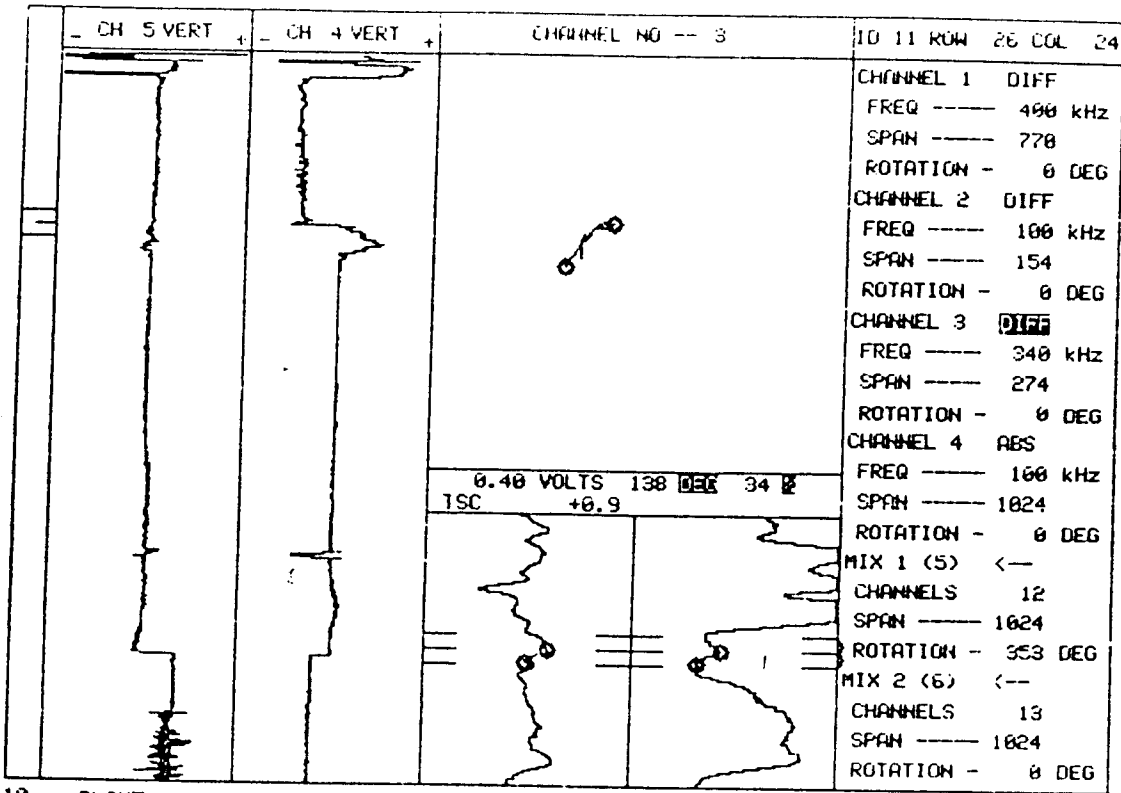
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG A DATE 12/27/85



10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1

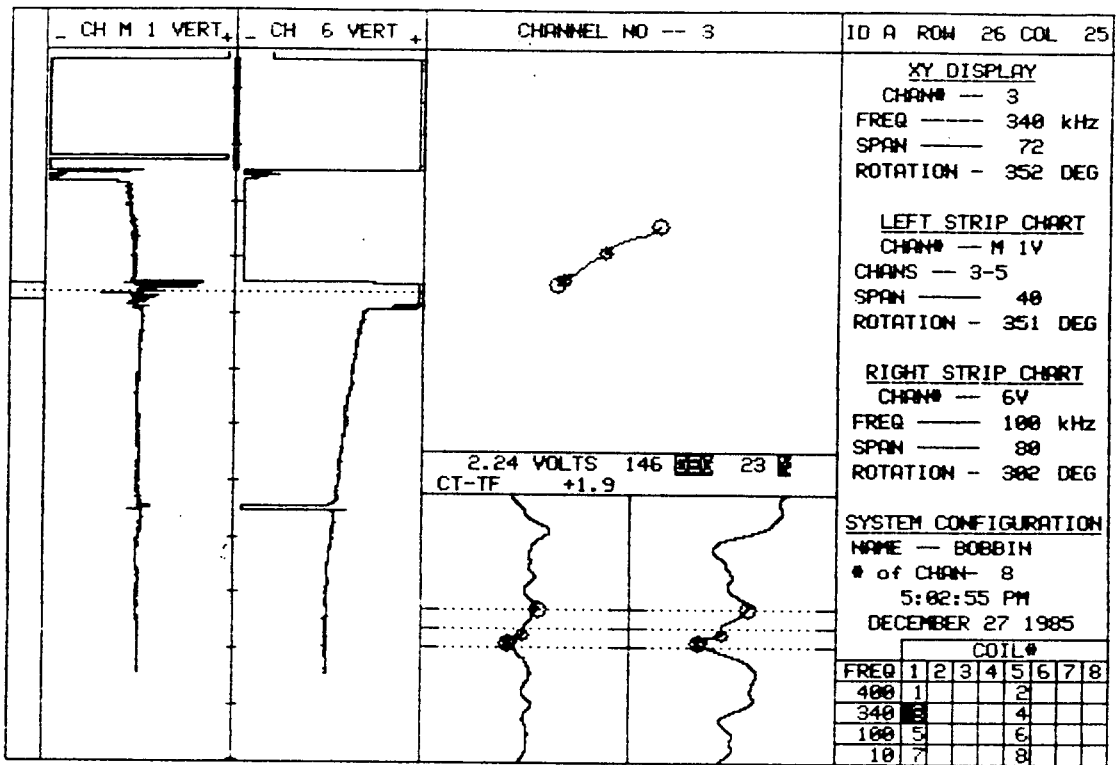


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG A DATE 12/27/85

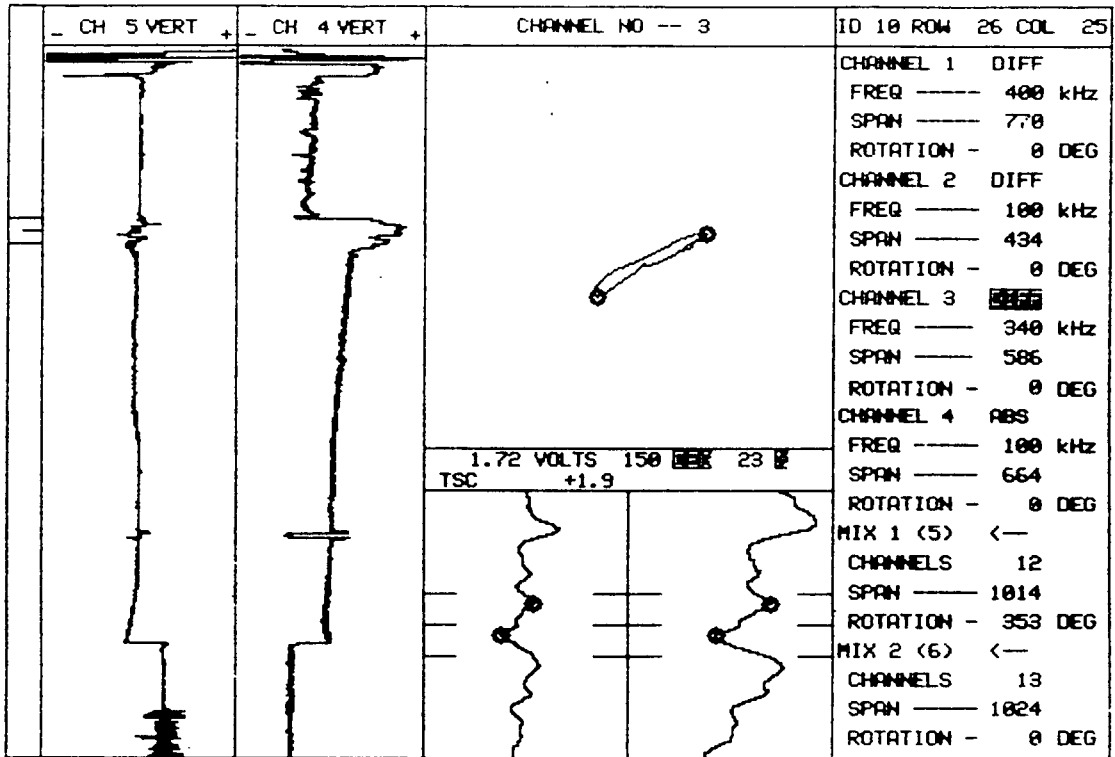


10 PLANT SCE SONGS UNIT# I S/G R LEG A OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

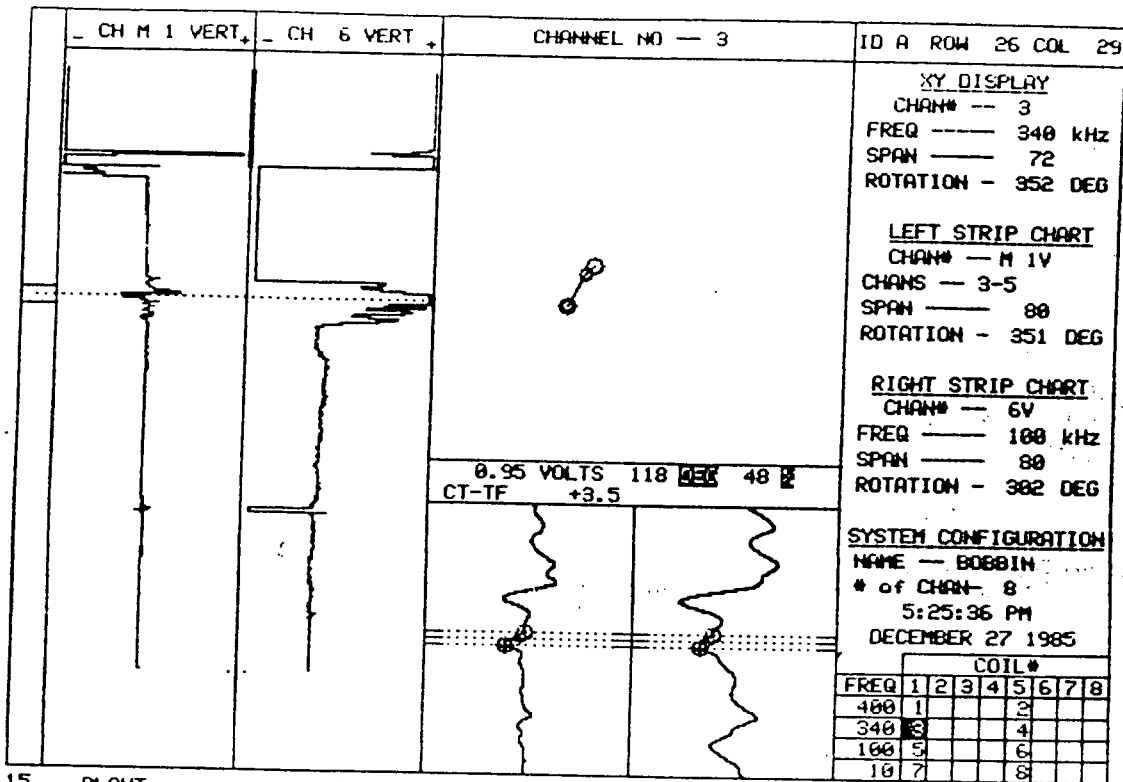




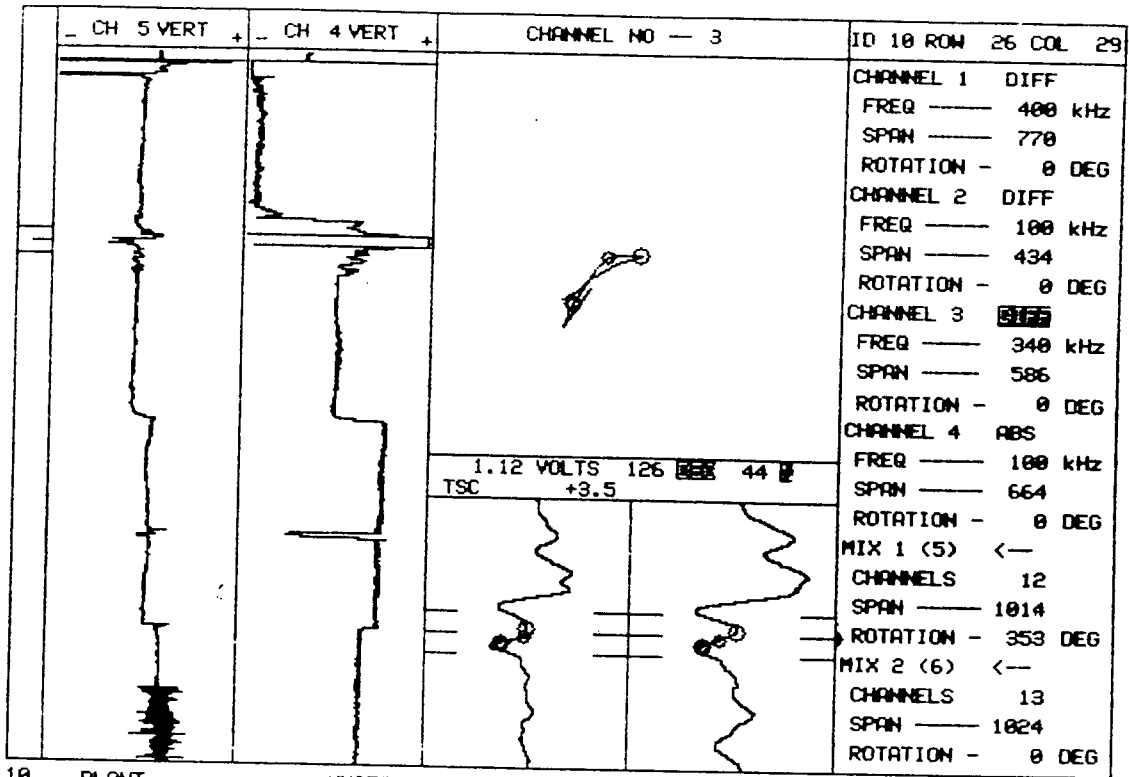
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG A DATE 12/27/85



10 PLANT SCE SONGS UNIT# I S/G A LEG R DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



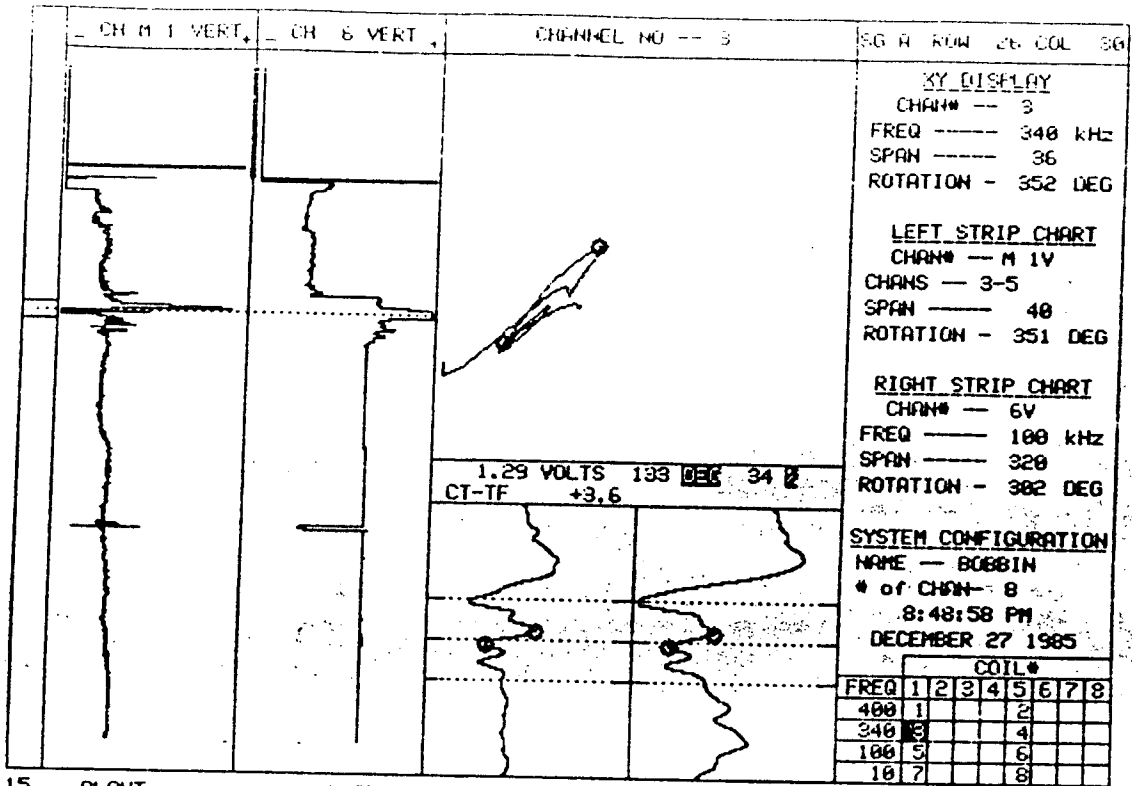
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



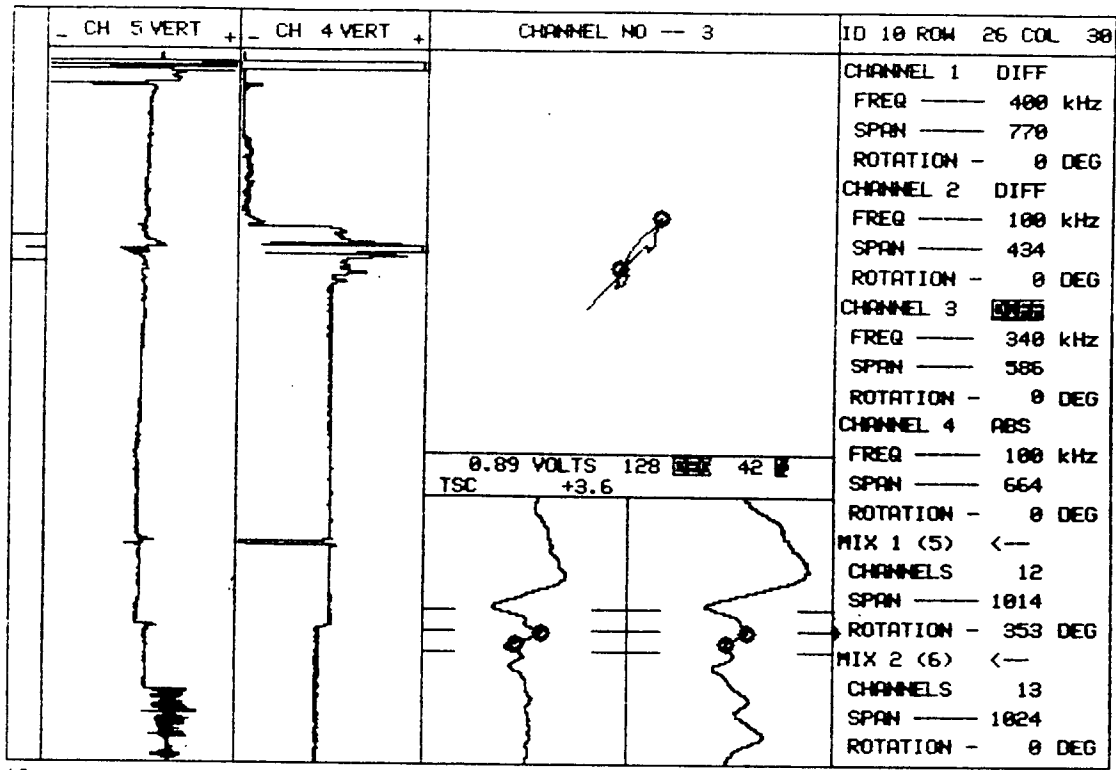
10 PLANT  
SCE SONGS

UNIT# S/G LEG DATE  
I A OUTLET 1980

ZETEC Inc. - 1983  
Edition 12.0 Rev 1

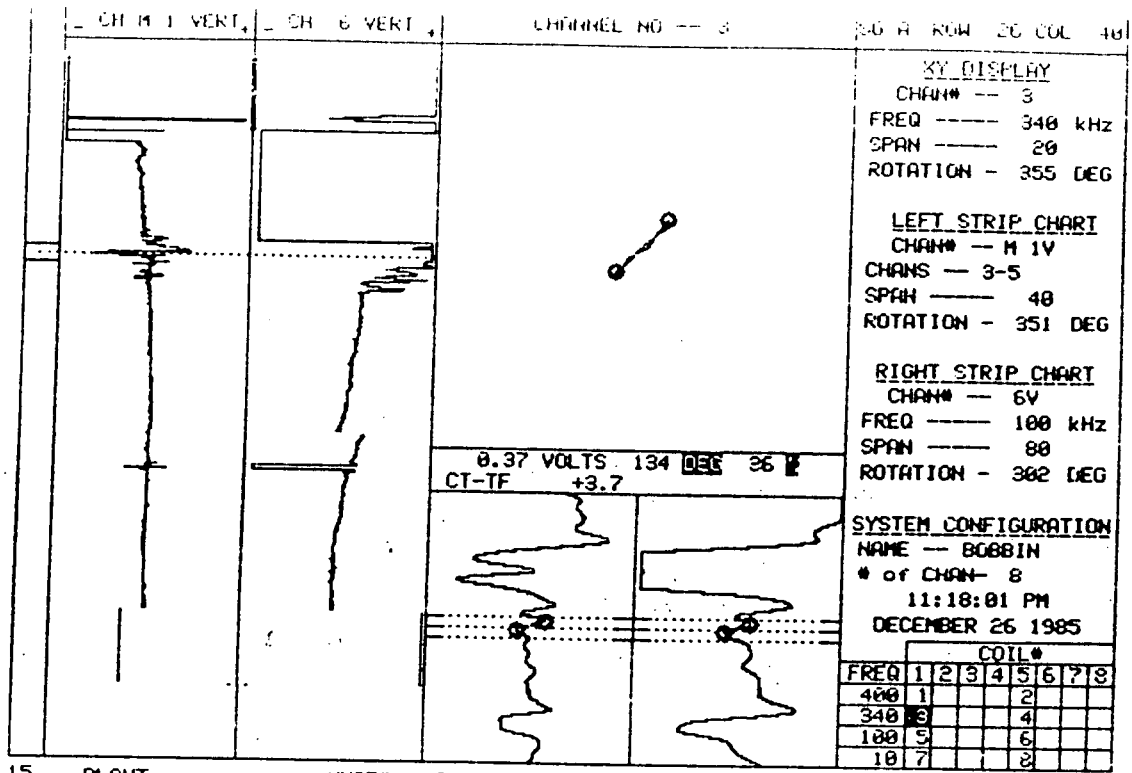


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85

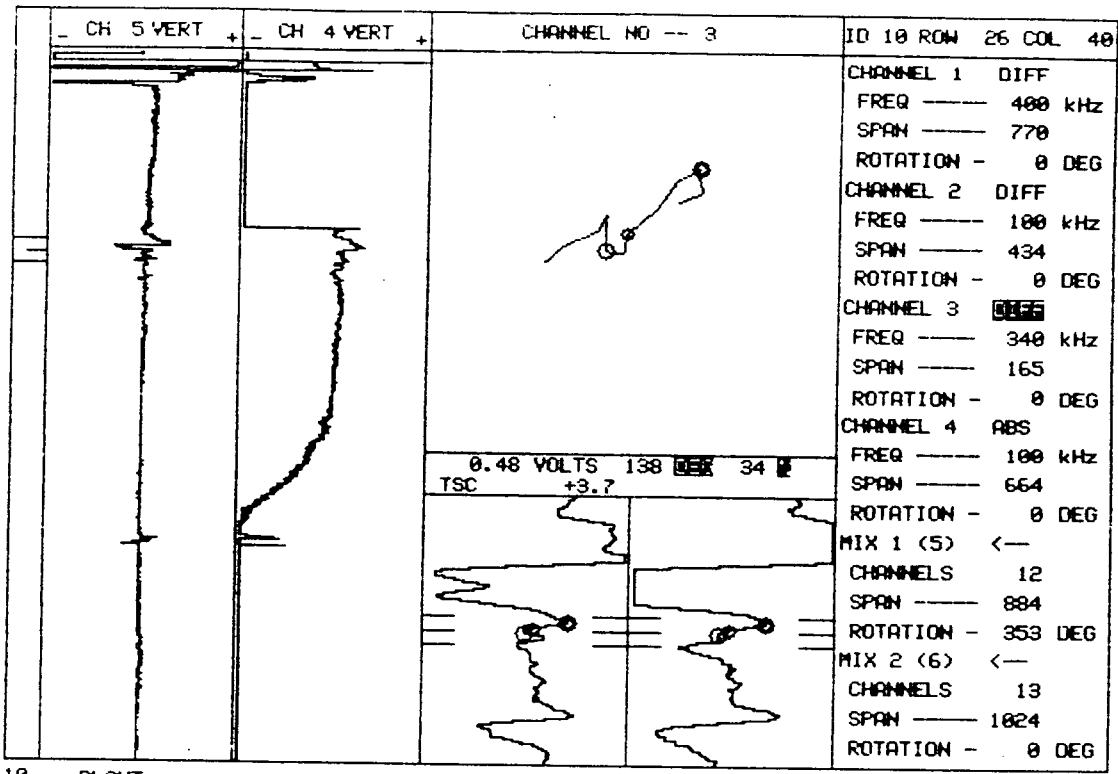


0.89 VOLTS 128 ~~DEG~~ 42 ~~DEG~~  
TSC +3.6

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

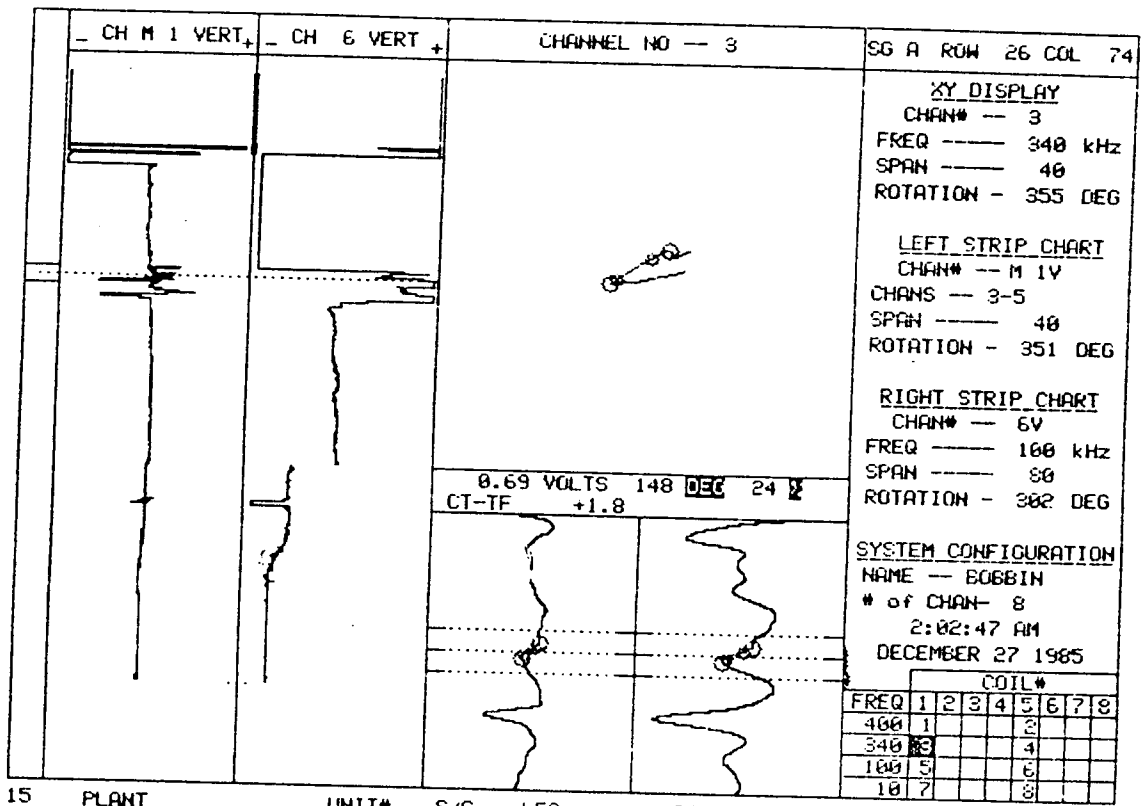


15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85

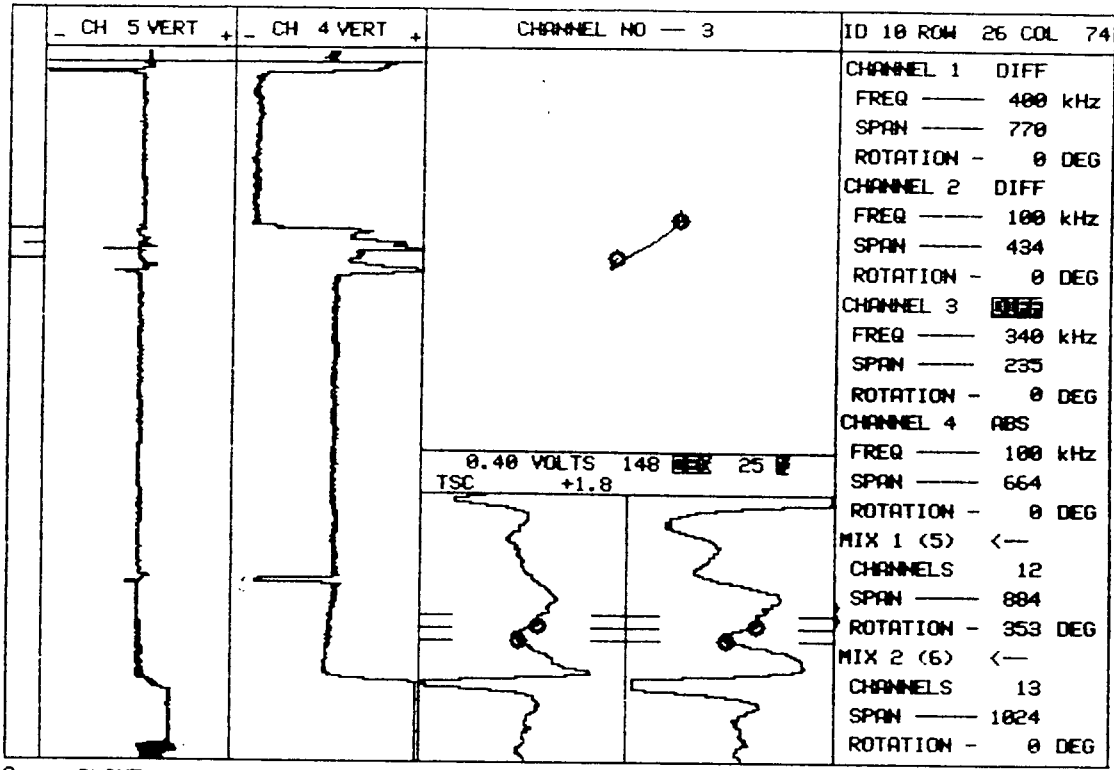


10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1

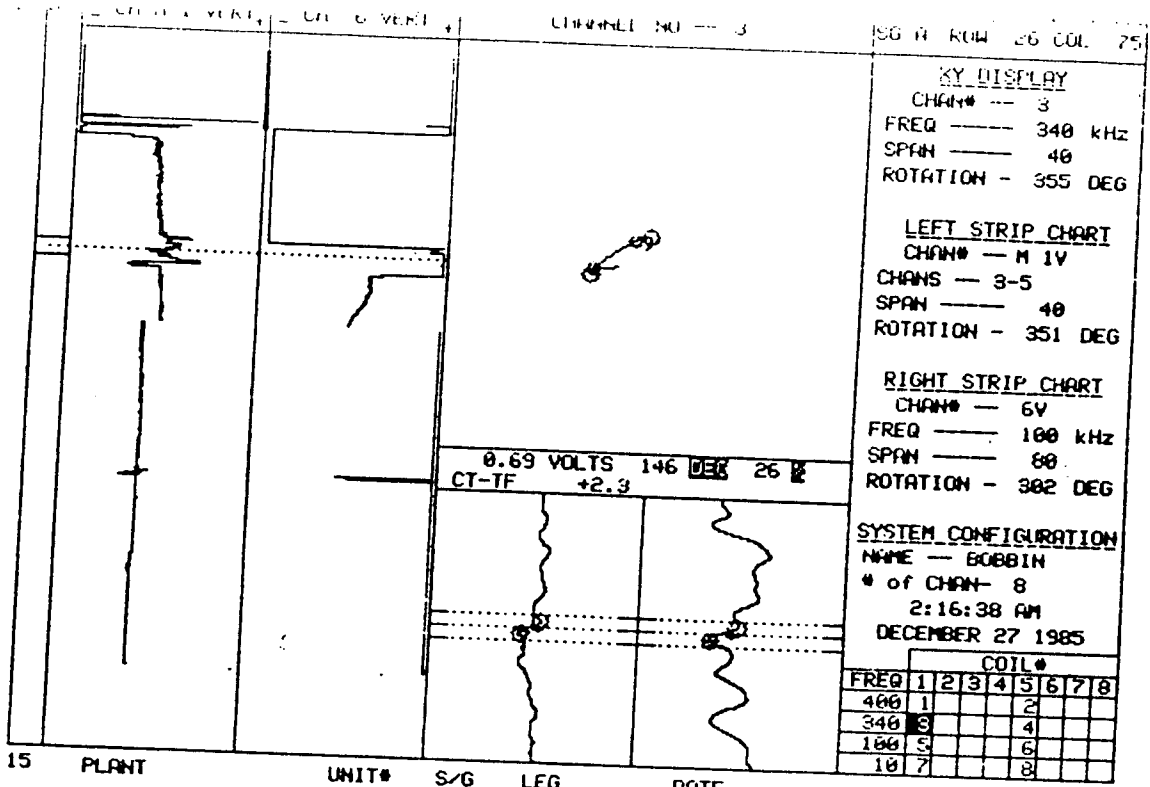




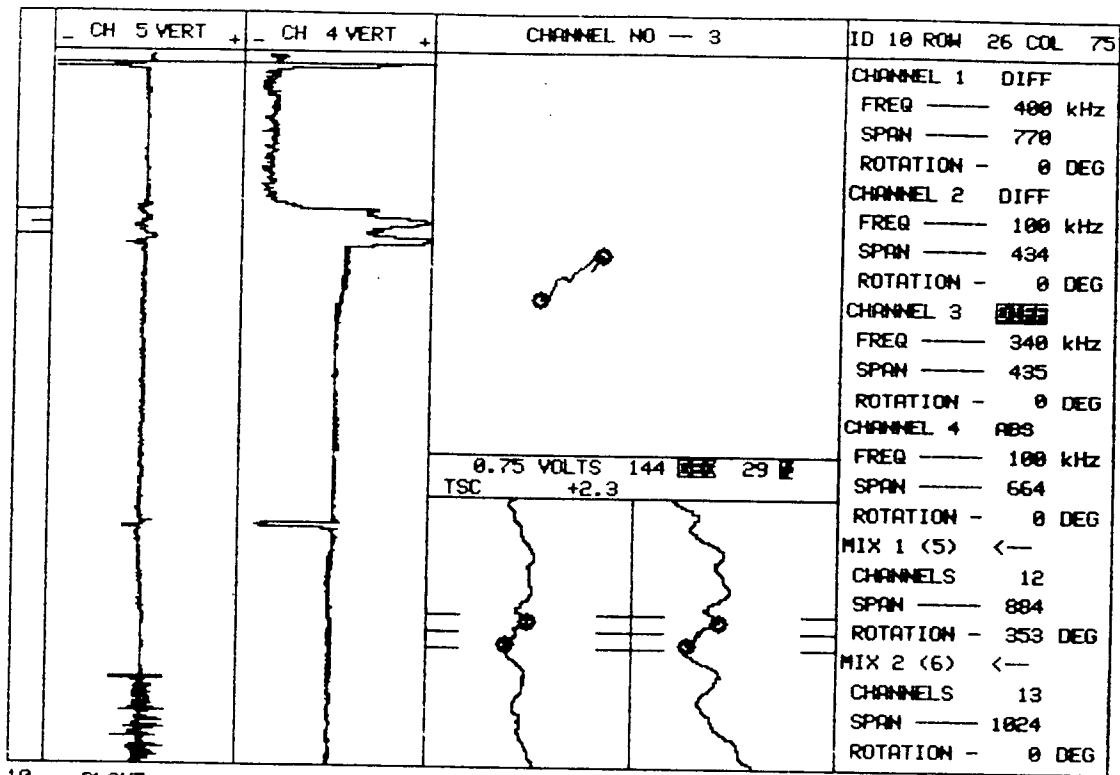
15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



9 PLANT SCE SONGS UNIT# I S/G R LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

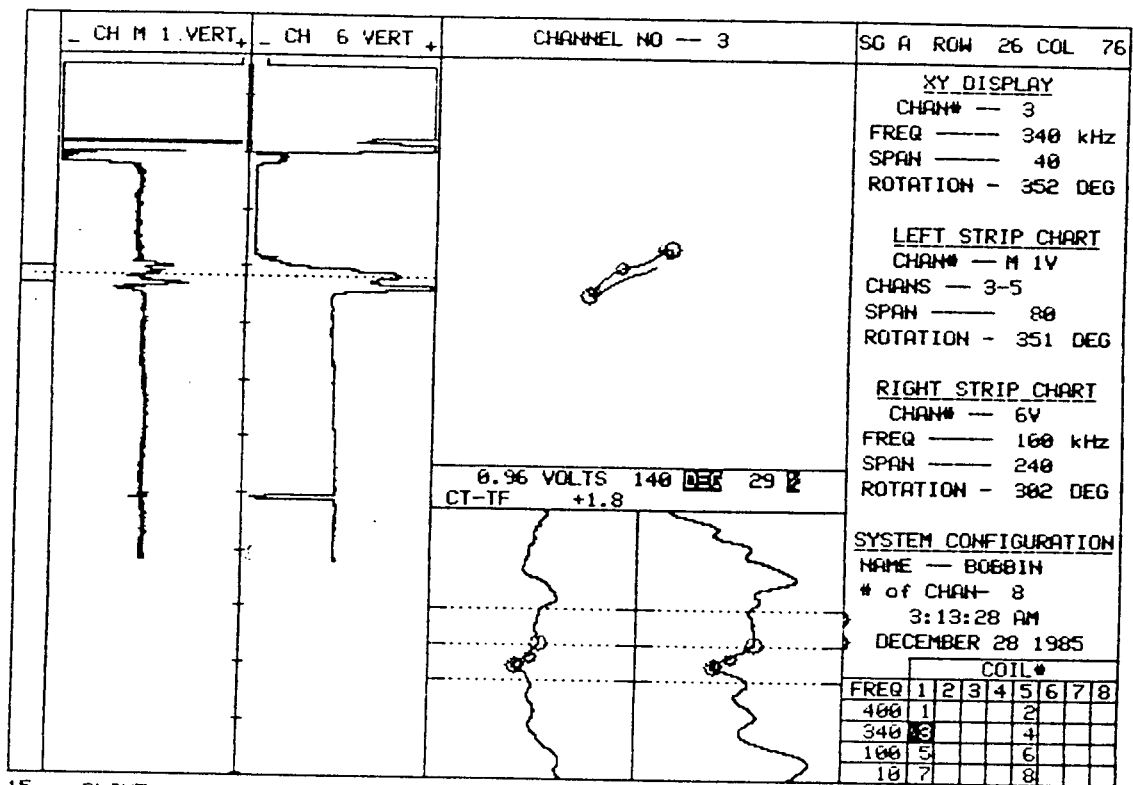


15 PLANT SONGS DISK C34 UNIT# 1 S/G R LEG OUTLET DATE 12/26/85

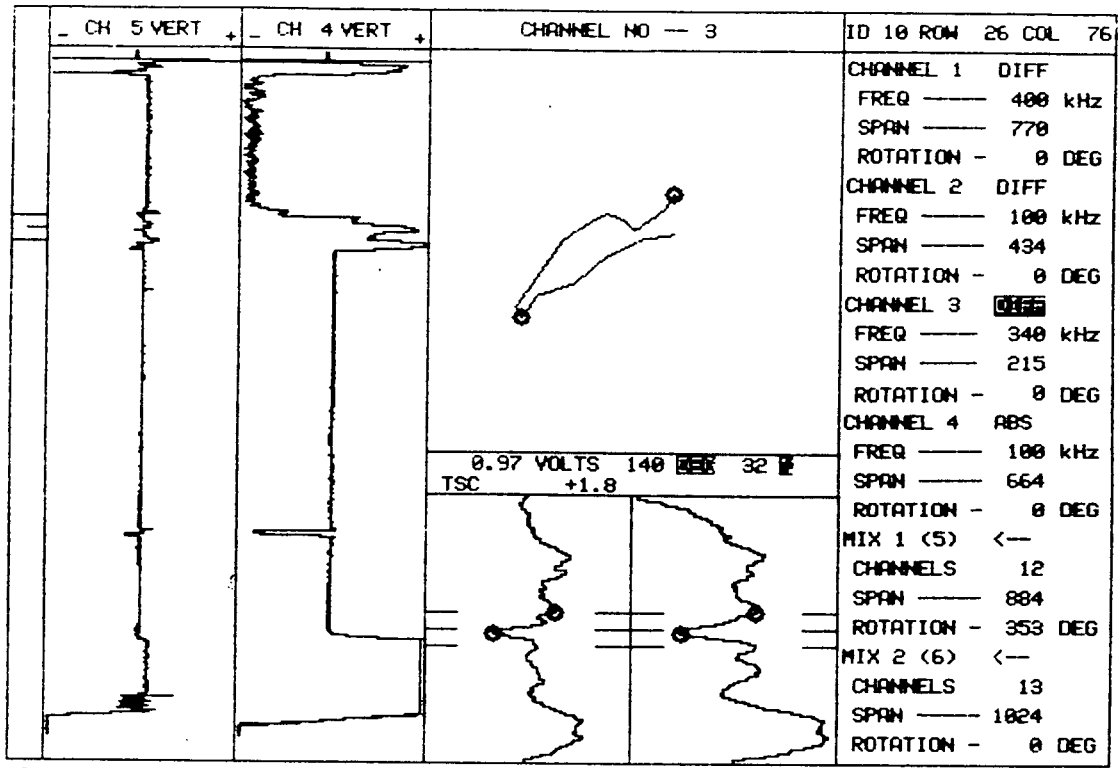


10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980

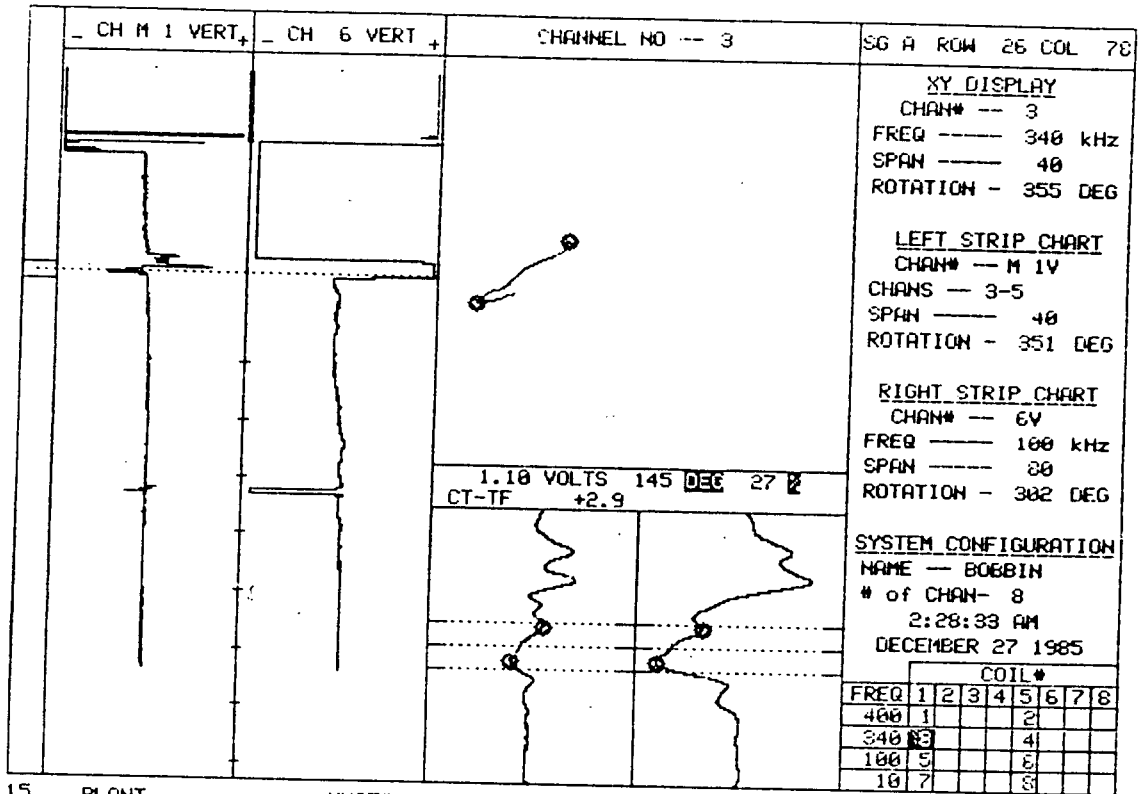
ZETEC Inc. - 1983  
Edition 12.0 Rev 1



15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C37    1    A    OUTLET    12/27/85



10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
      SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1



SG A ROW 26 COL 78

XY DISPLAY

CHAN# -- 3  
FREQ ---- 340 kHz  
SPAN ---- 40  
ROTATION - 355 DEG

LEFT STRIP CHART

CHAN# -- M 1V  
CHANS -- 3-5  
SPAN ---- 40  
ROTATION - 351 DEG

RIGHT STRIP CHART

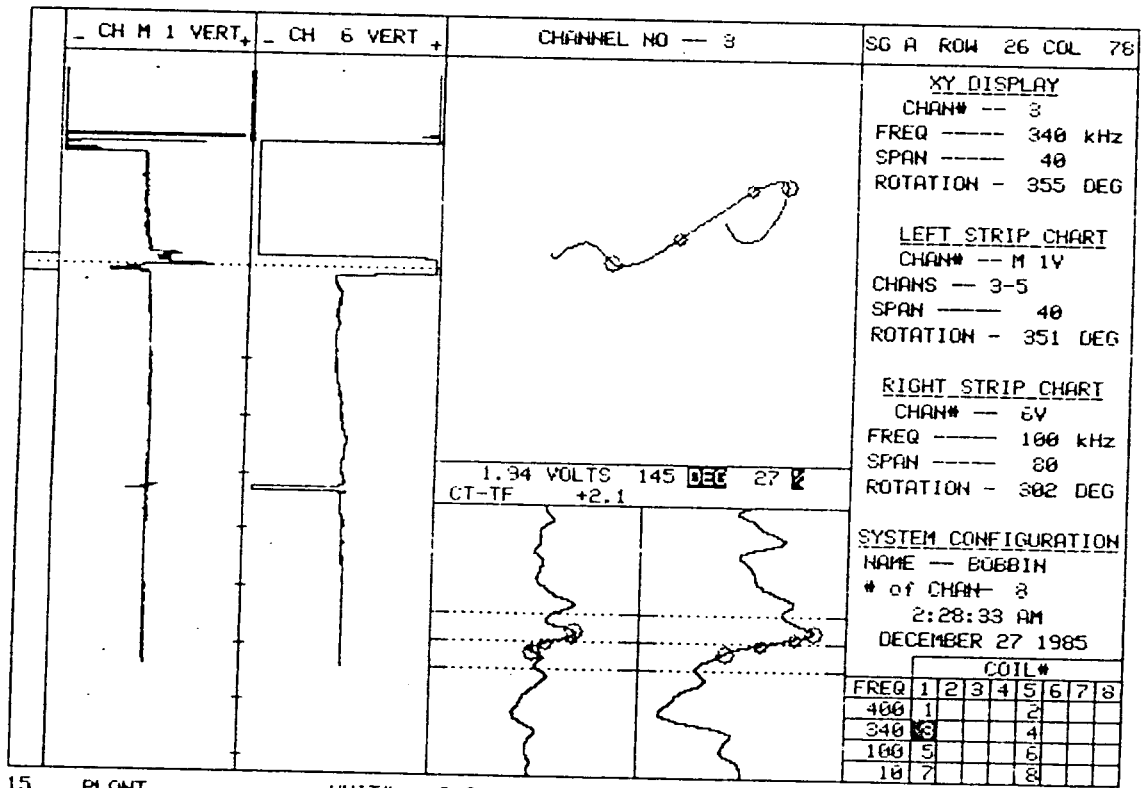
CHAN# -- 6V  
FREQ ---- 100 kHz  
SPAN ---- 80  
ROTATION - 302 DEG

SYSTEM CONFIGURATION

NAME -- BOBBIN  
# of CHAN- 8  
2:28:33 AM  
DECEMBER 27 1985

		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	3				4				
100	5					6			
10	7						8		

15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



SG A ROW 26 COL 78

XY DISPLAY

CHAN# -- 3  
FREQ ---- 340 kHz  
SPAN ---- 40  
ROTATION - 355 DEG

LEFT STRIP CHART

CHAN# -- M 1V  
CHANS -- 3-5  
SPAN ---- 40  
ROTATION - 351 DEG

RIGHT STRIP CHART

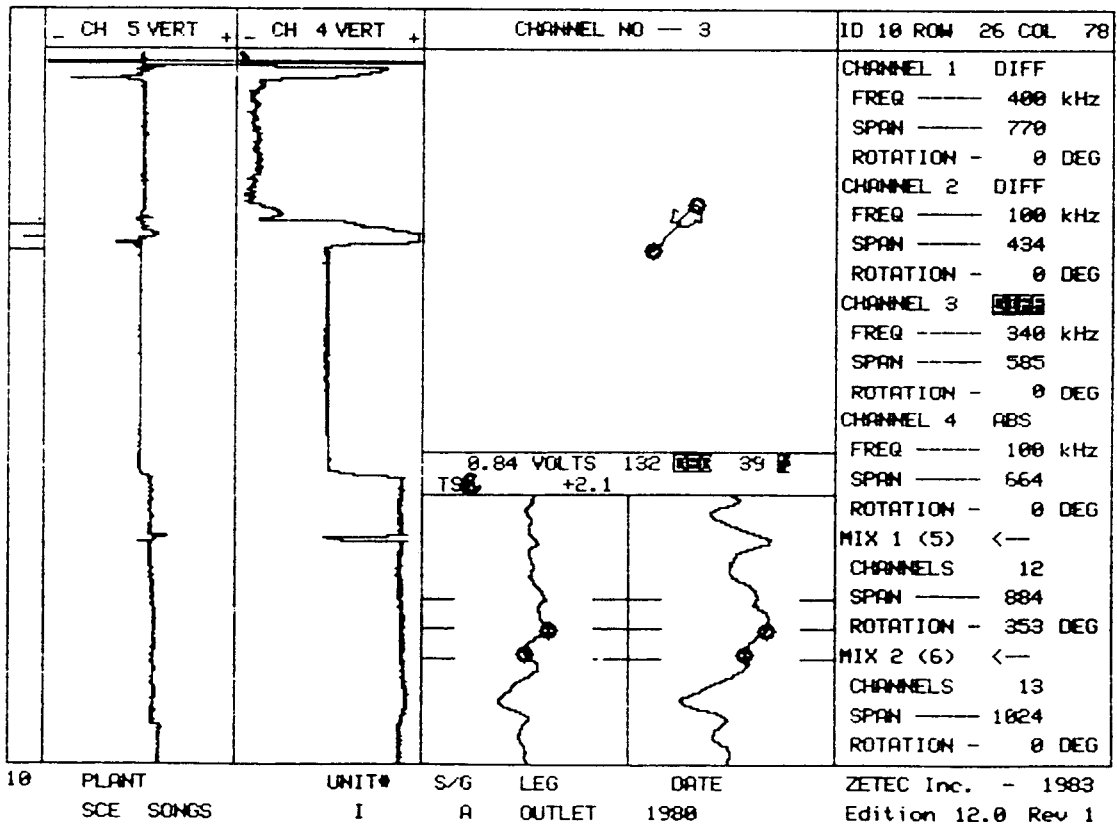
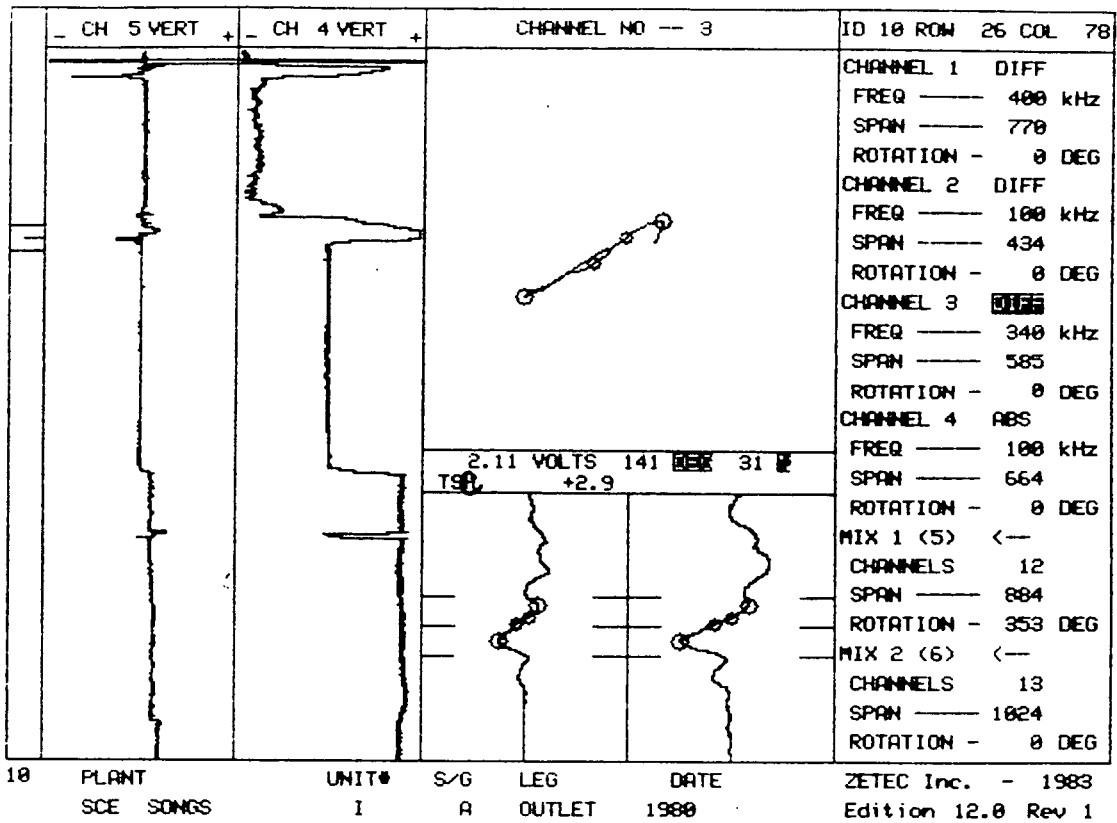
CHAN# -- 6V  
FREQ ---- 100 kHz  
SPAN ---- 80  
ROTATION - 302 DEG

SYSTEM CONFIGURATION

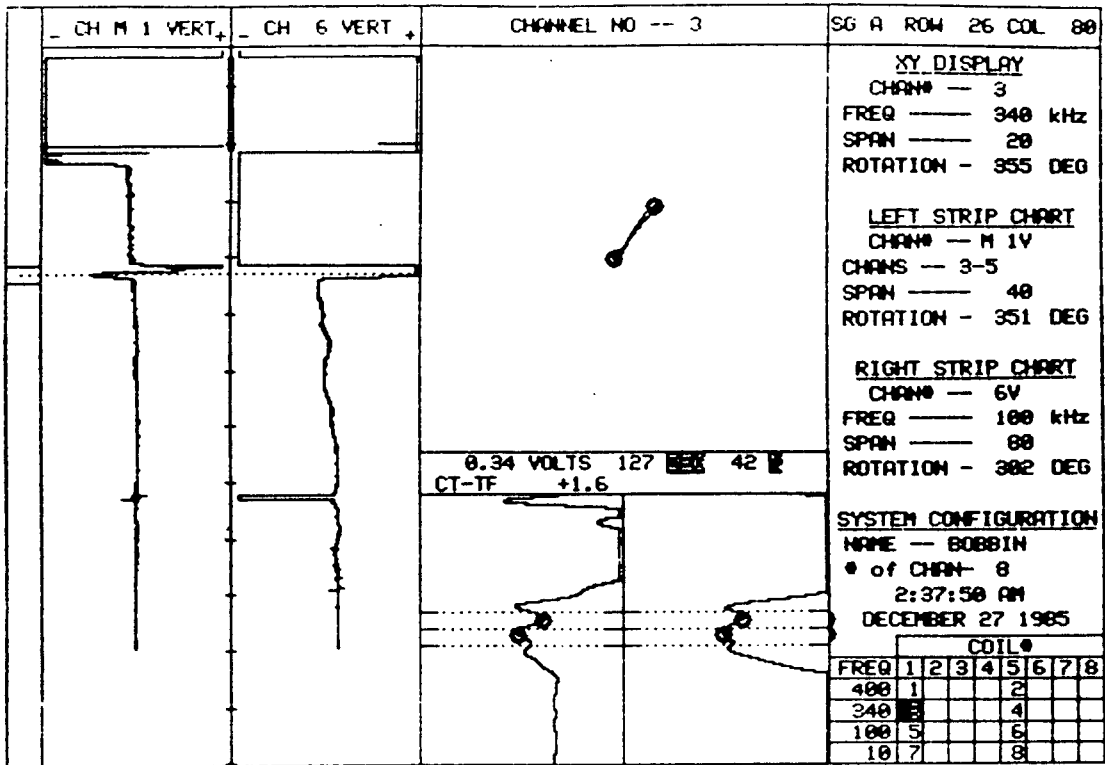
NAME -- BOBBIN  
# of CHAN- 8  
2:28:33 AM  
DECEMBER 27 1985

		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	3				4				
100	5					6			
10	7						8		

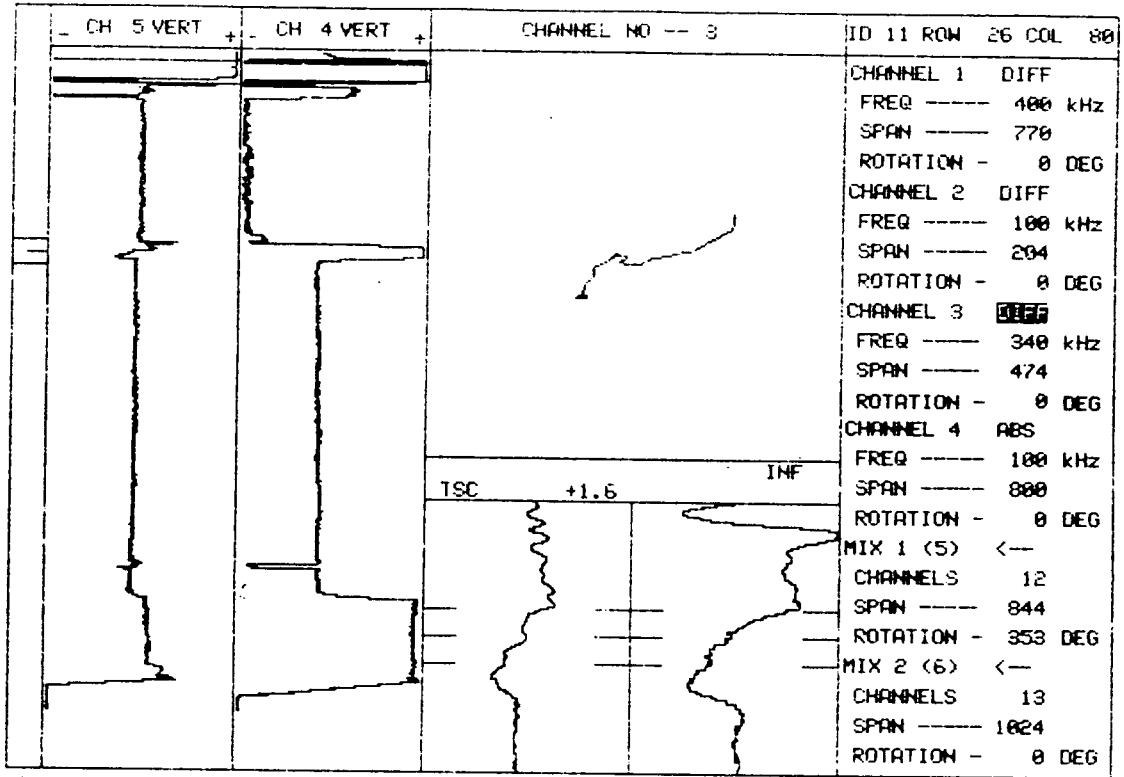
15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



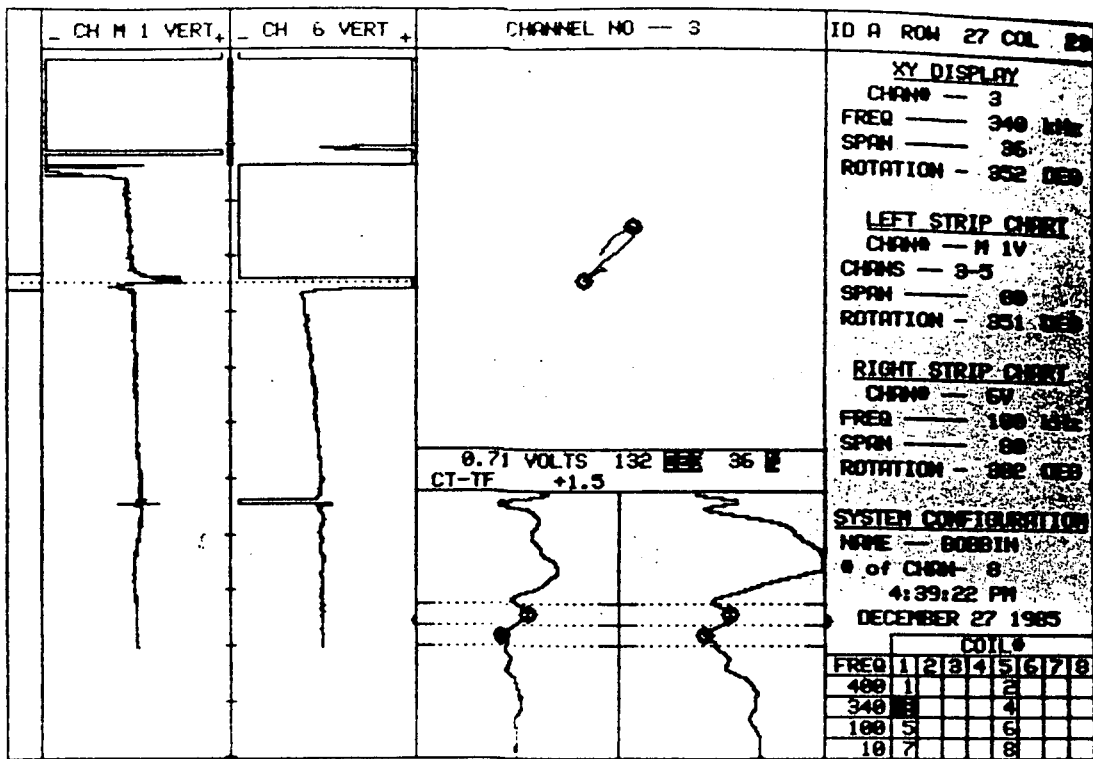




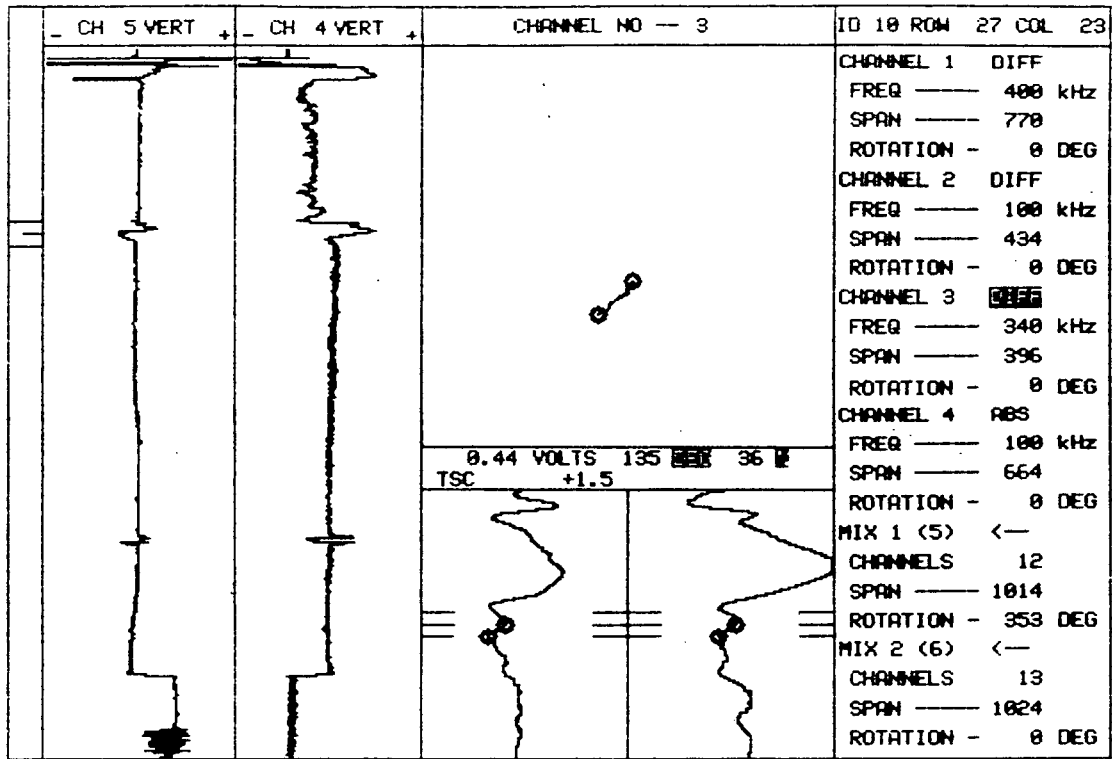
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C34    1    A    OUTLET    12/26/85



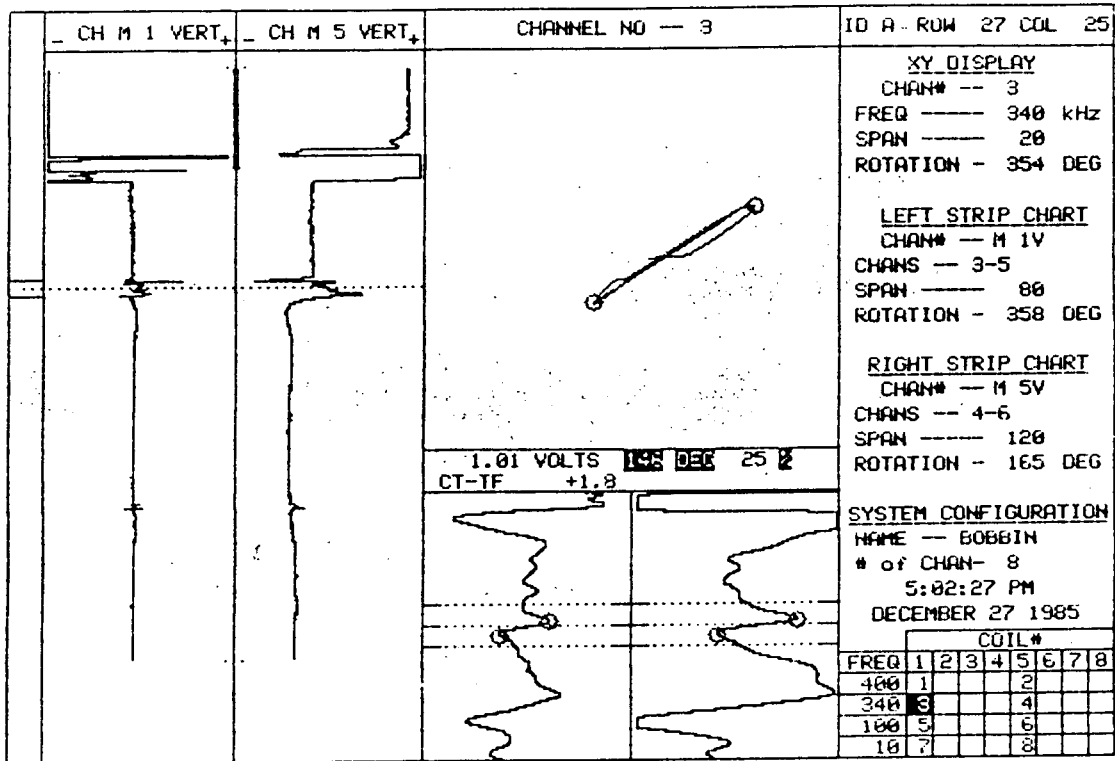
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



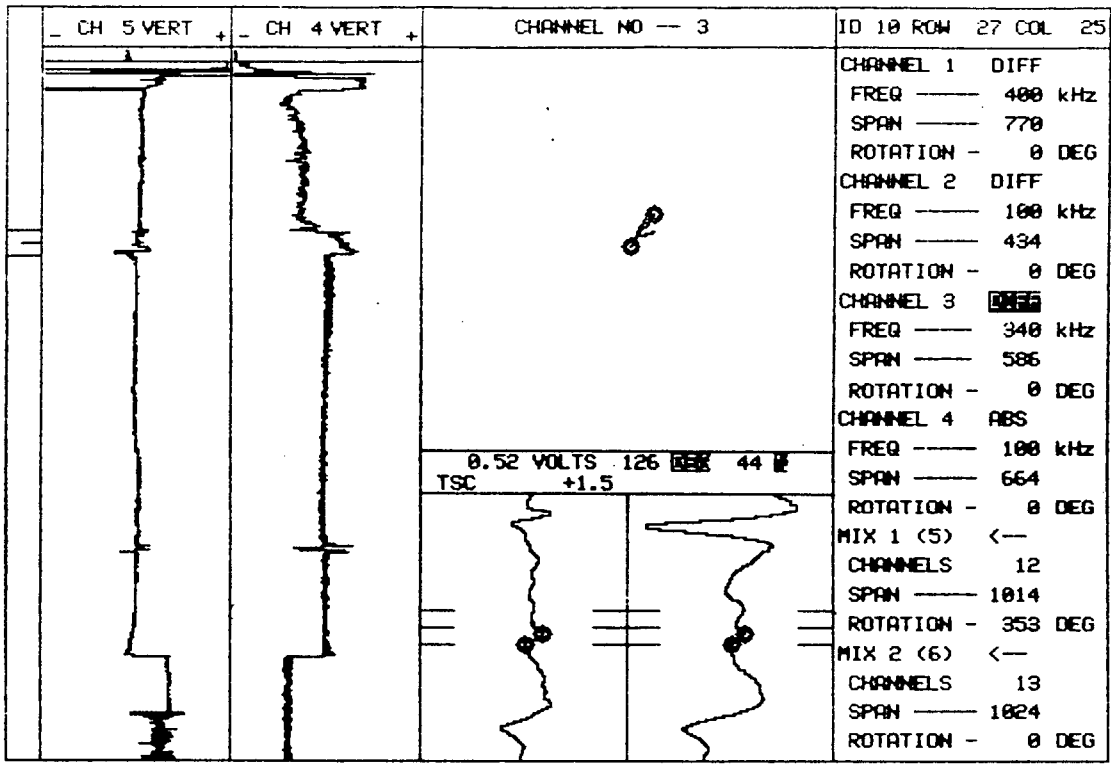
15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



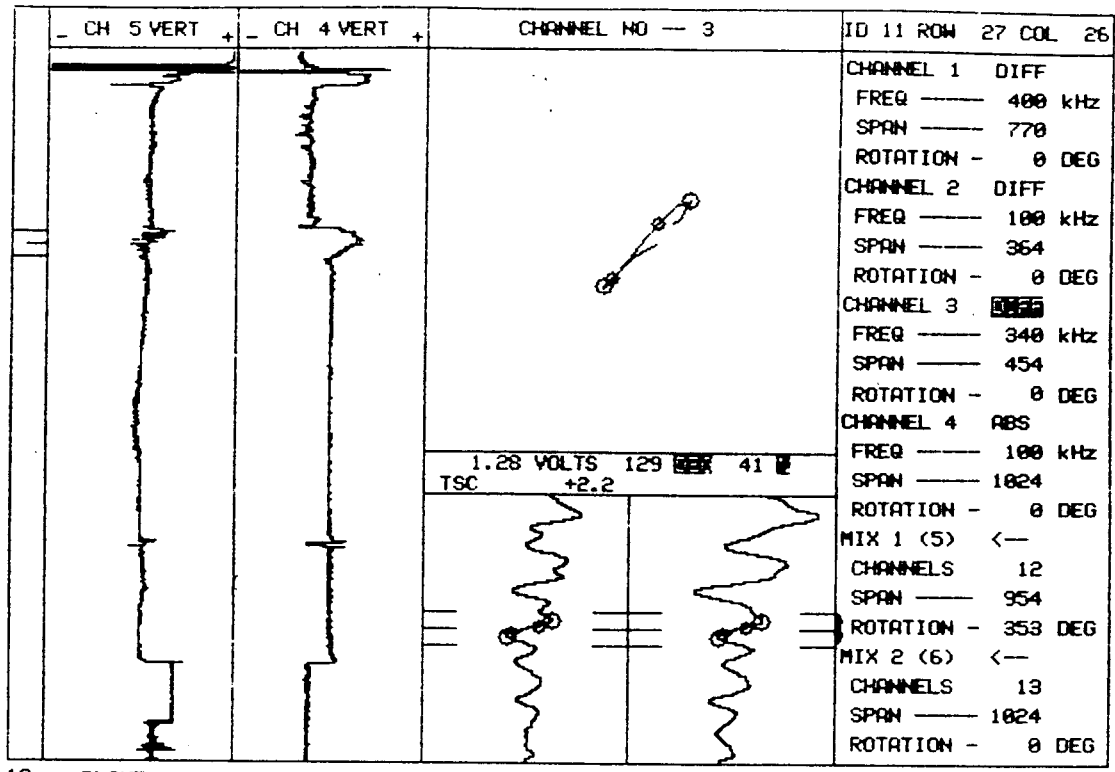
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



15 PLANT SONGS REEL C35 UNIT# 1 S/G A LEG OUTLE DATE 12/27/85

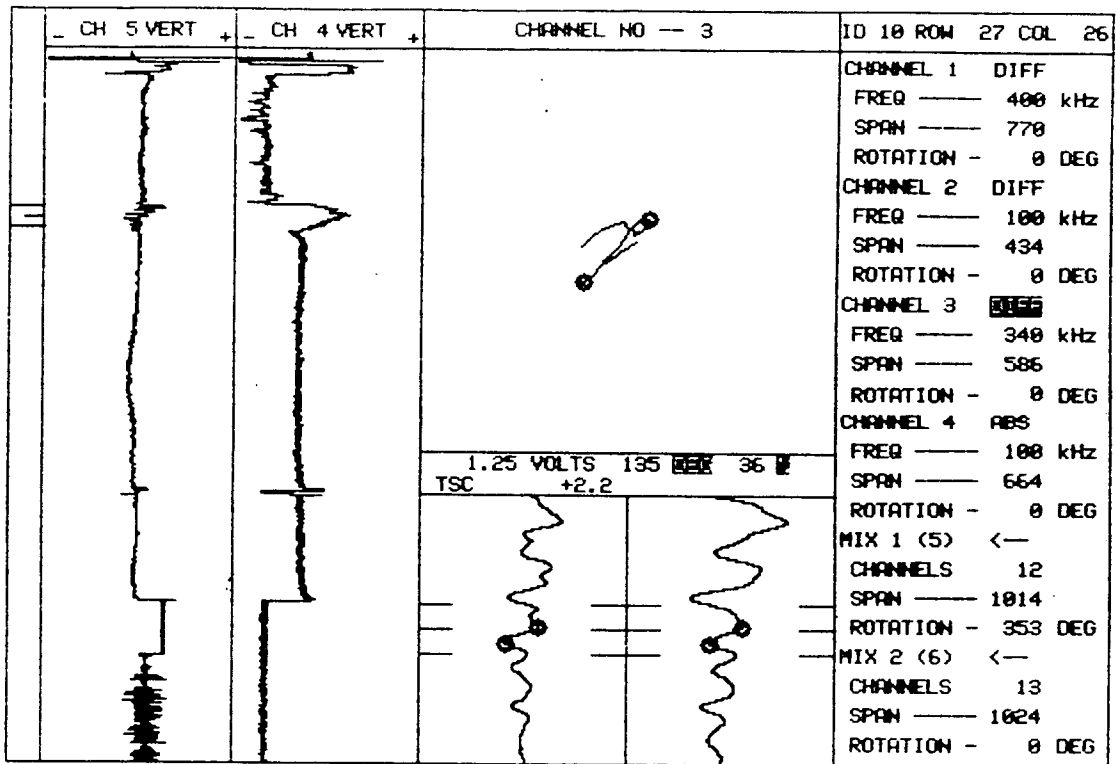


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980

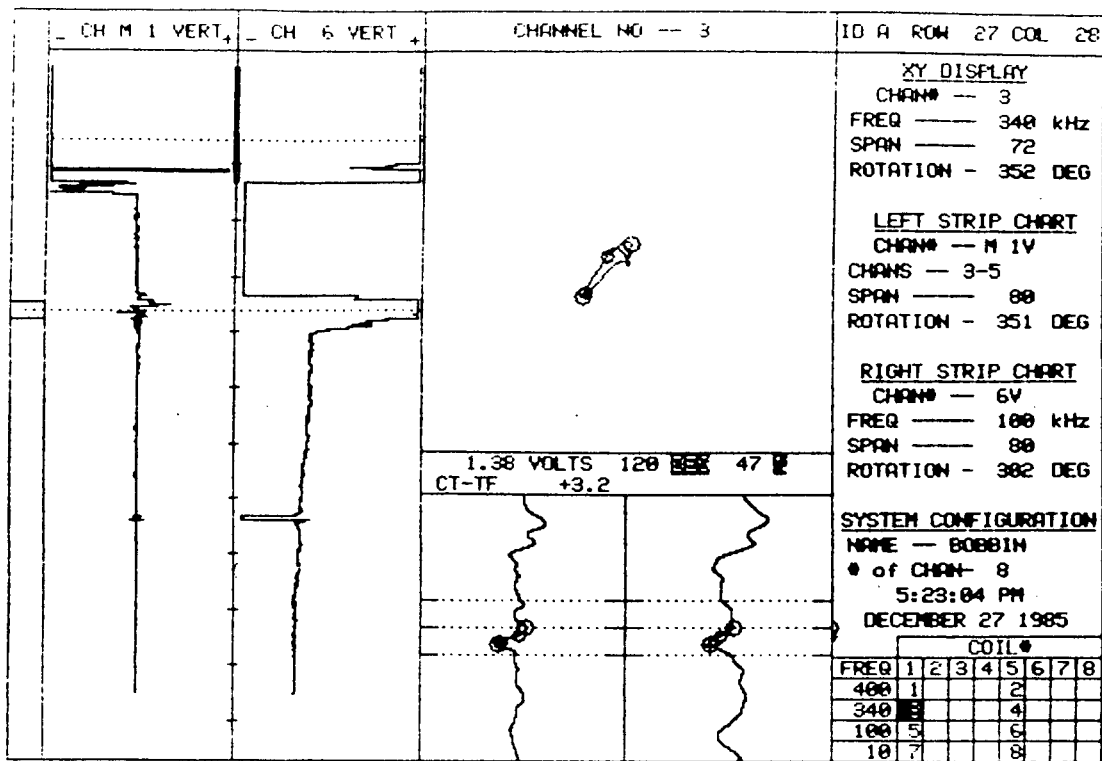
ZETEC Inc. - 1983  
Edition 12.0 Rev 1



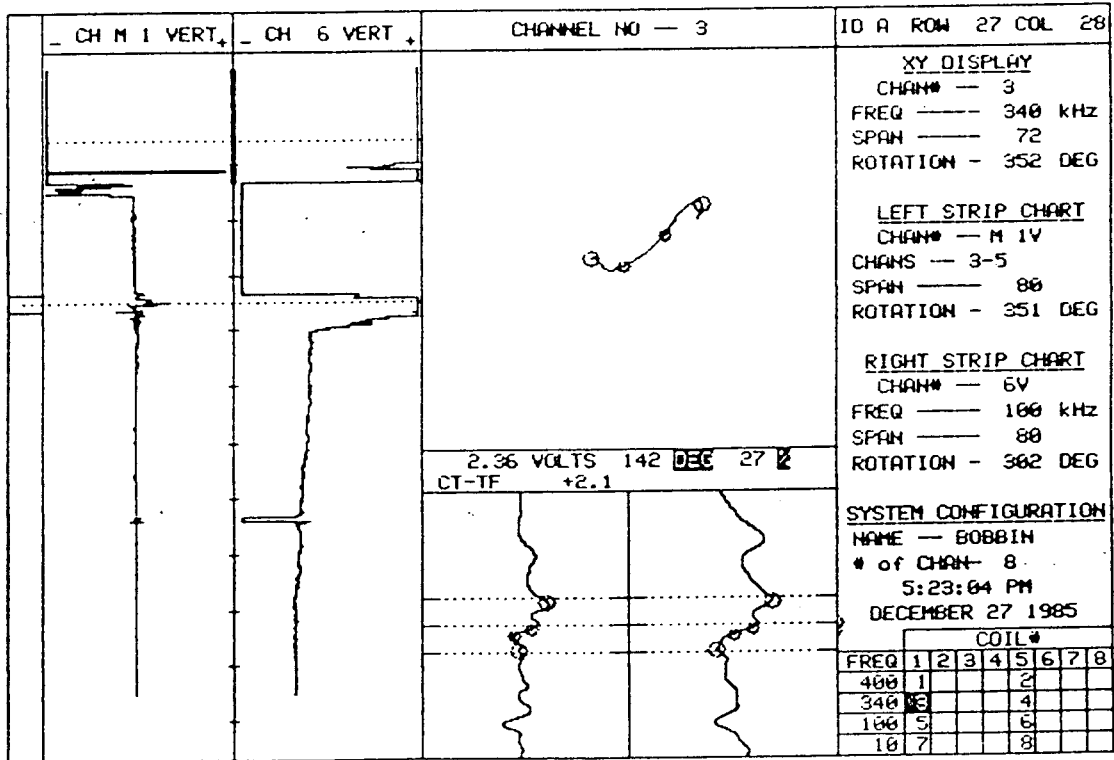
1.25 VOLTS 135 **DEG** 36 **DEG**  
TSC +2.2

11	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

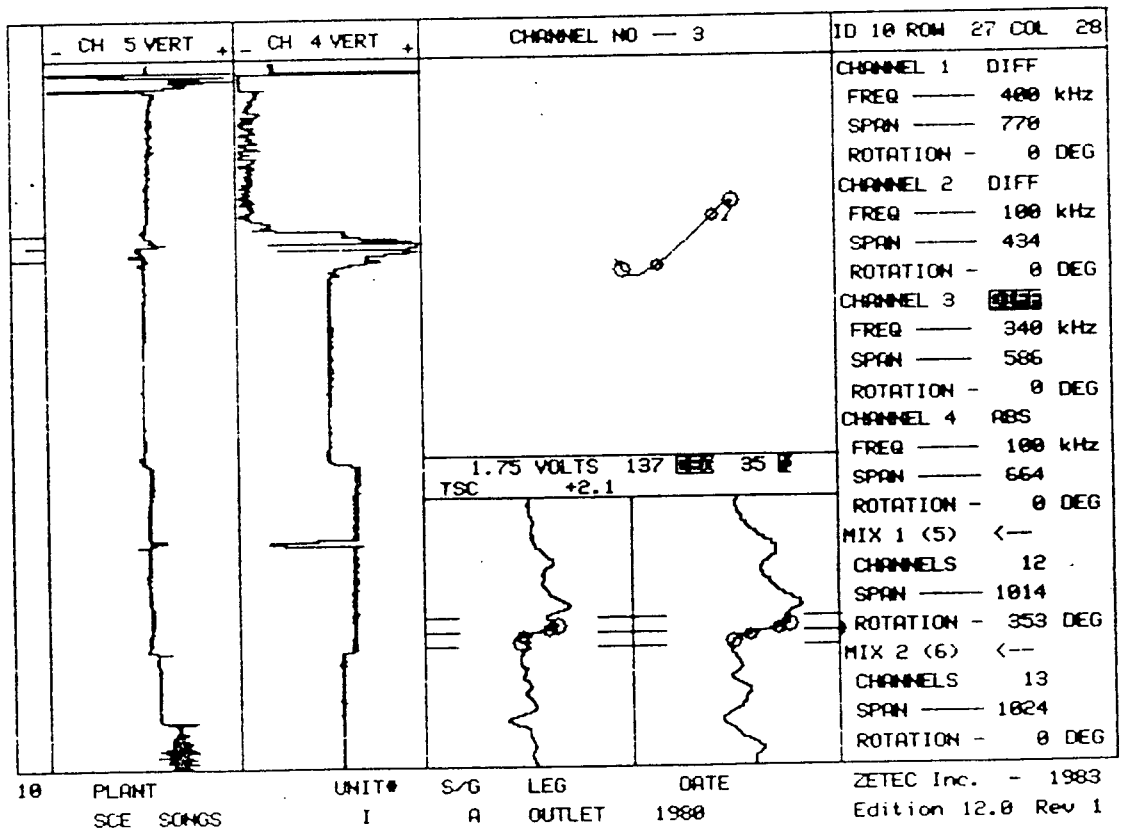
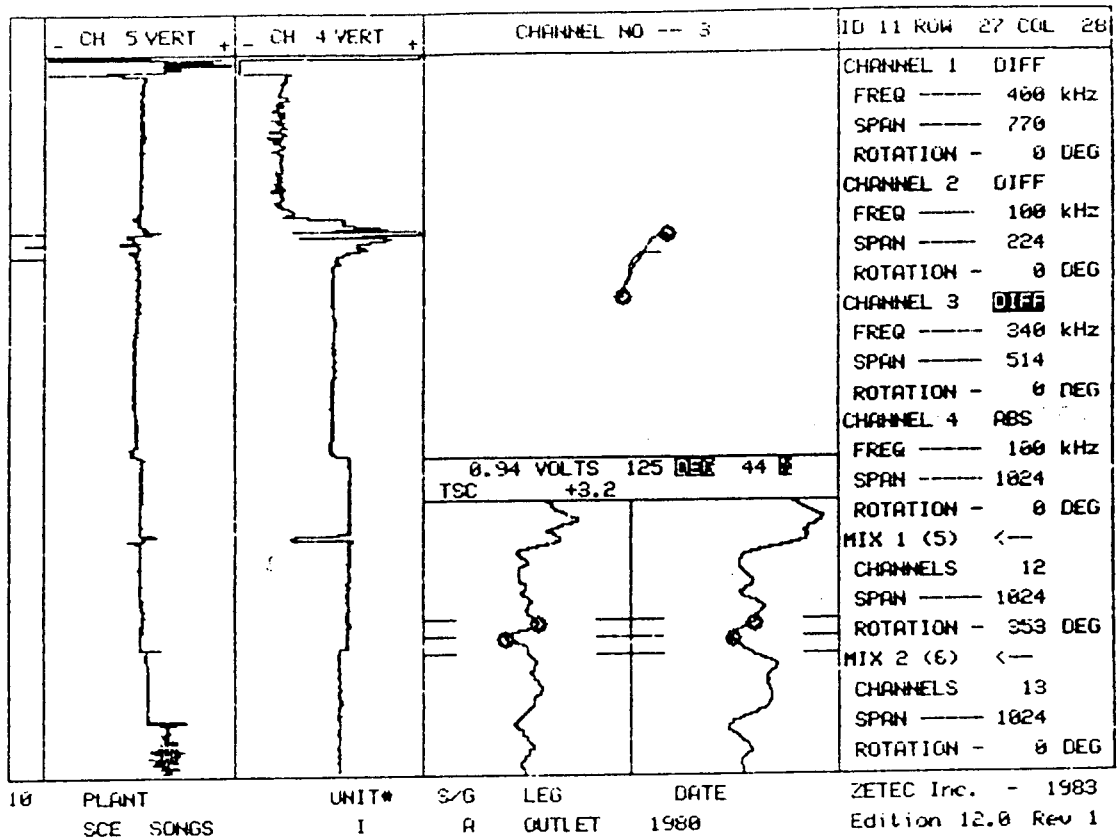


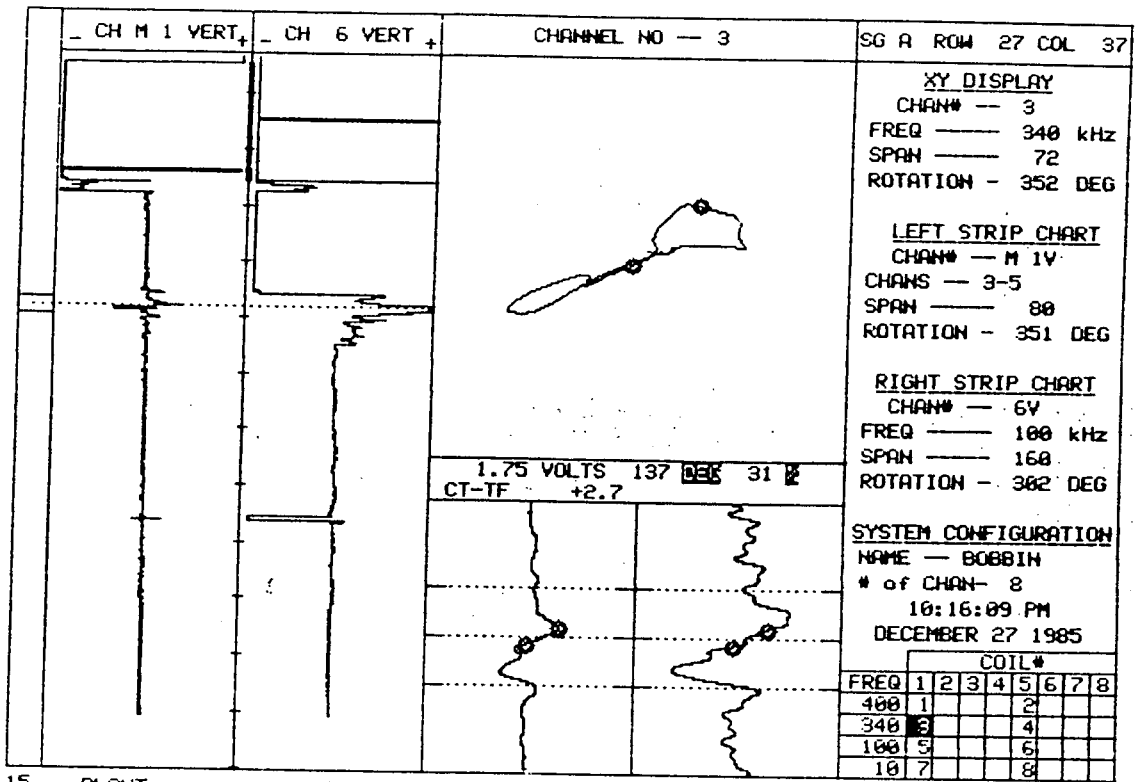


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

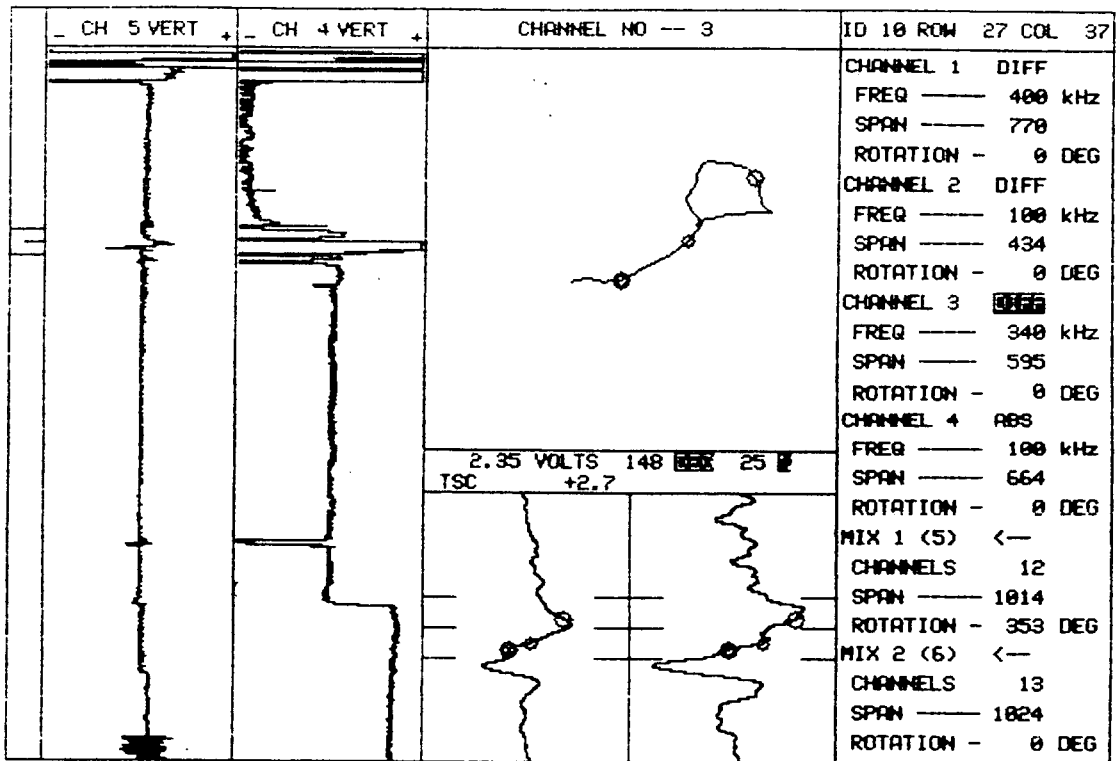


15 PLANT SONGS DISK C35 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

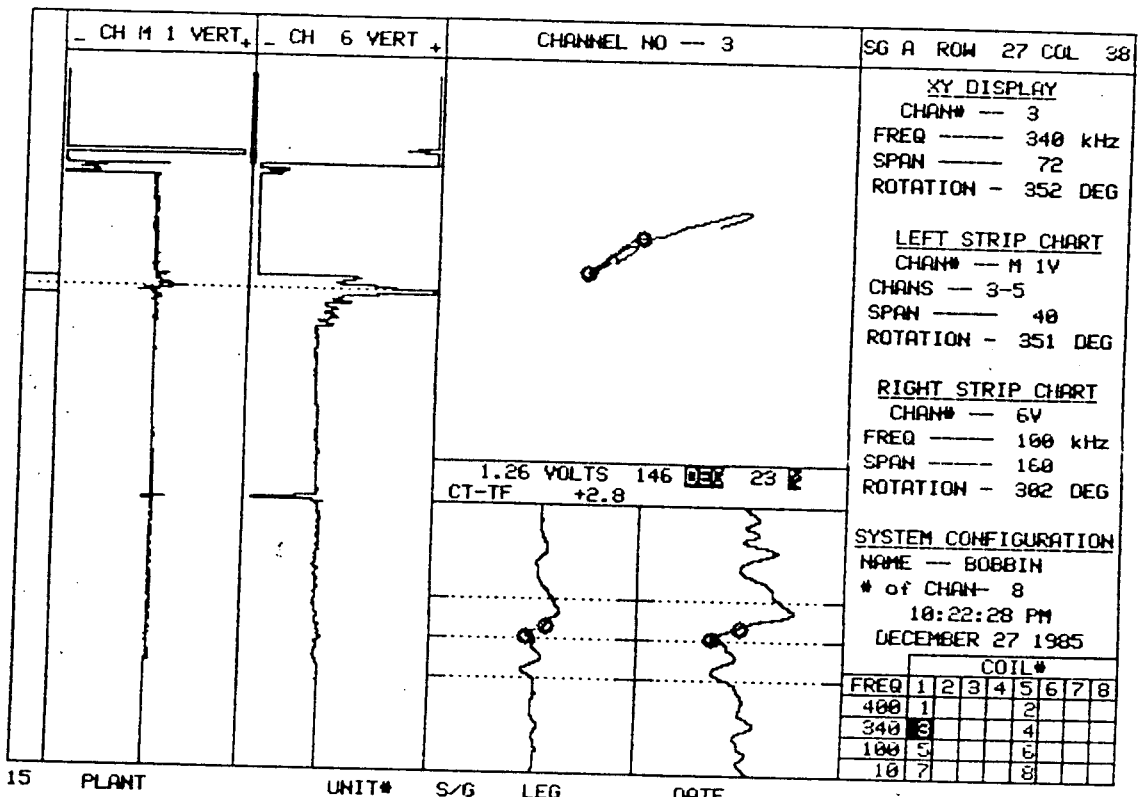




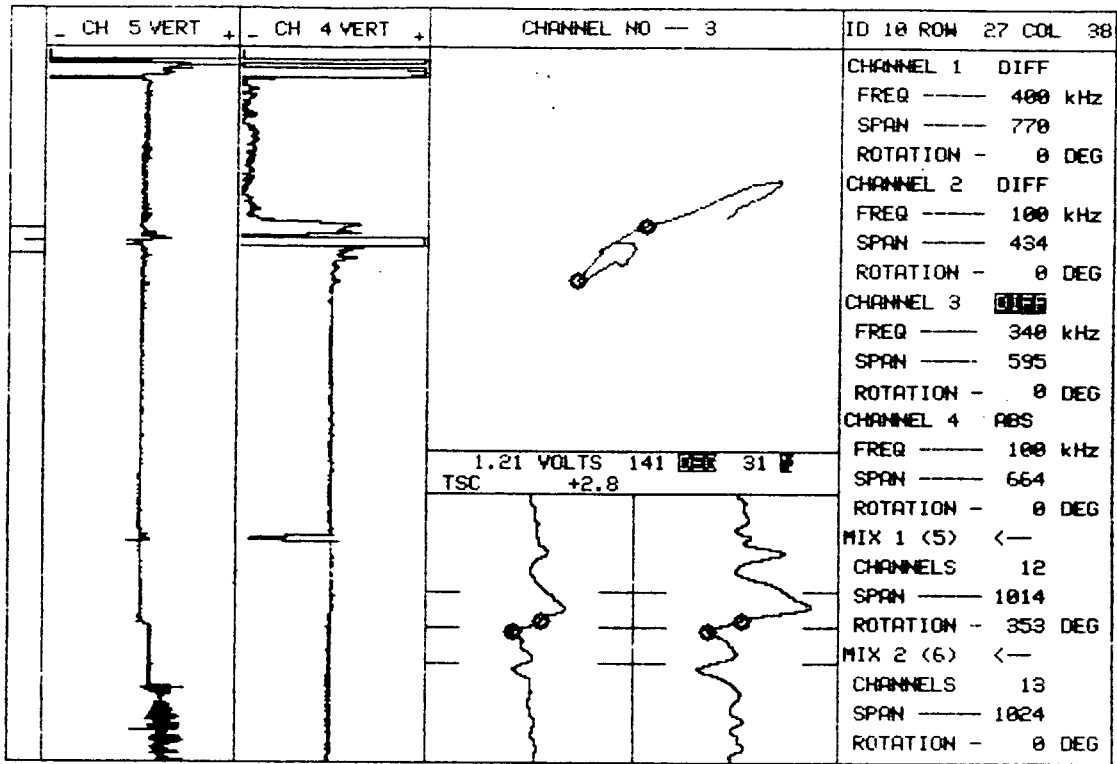
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

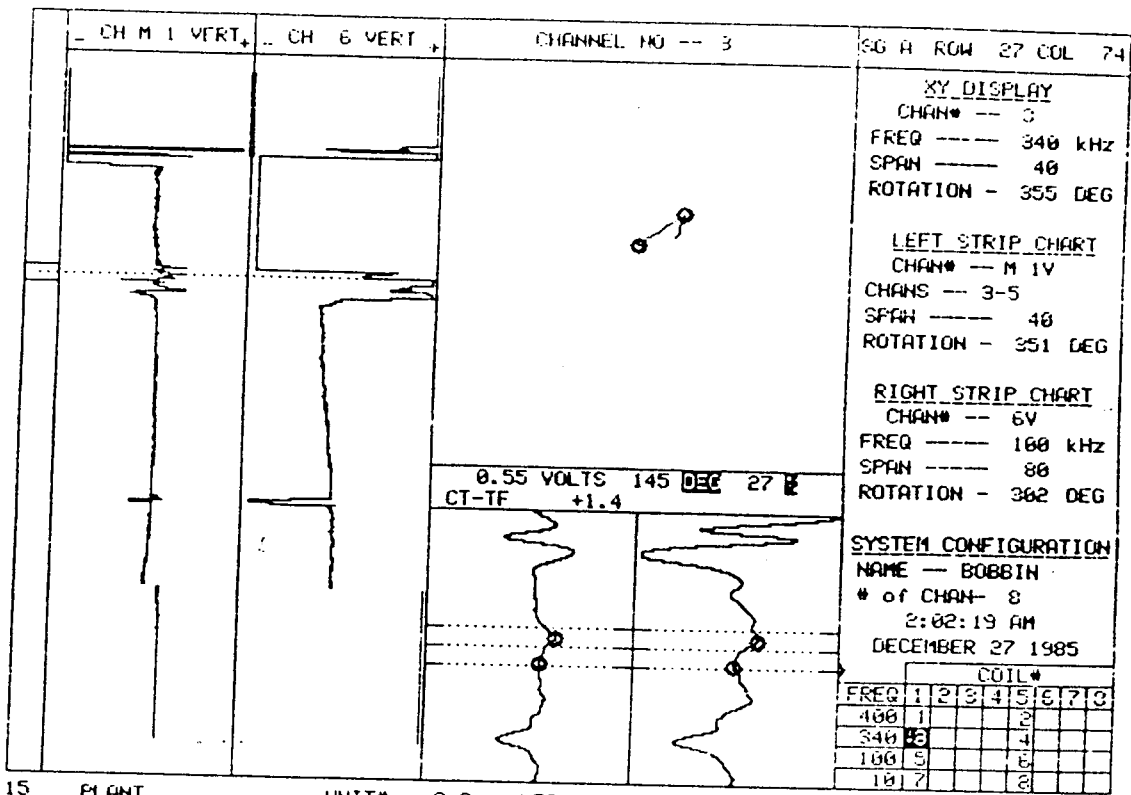


15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

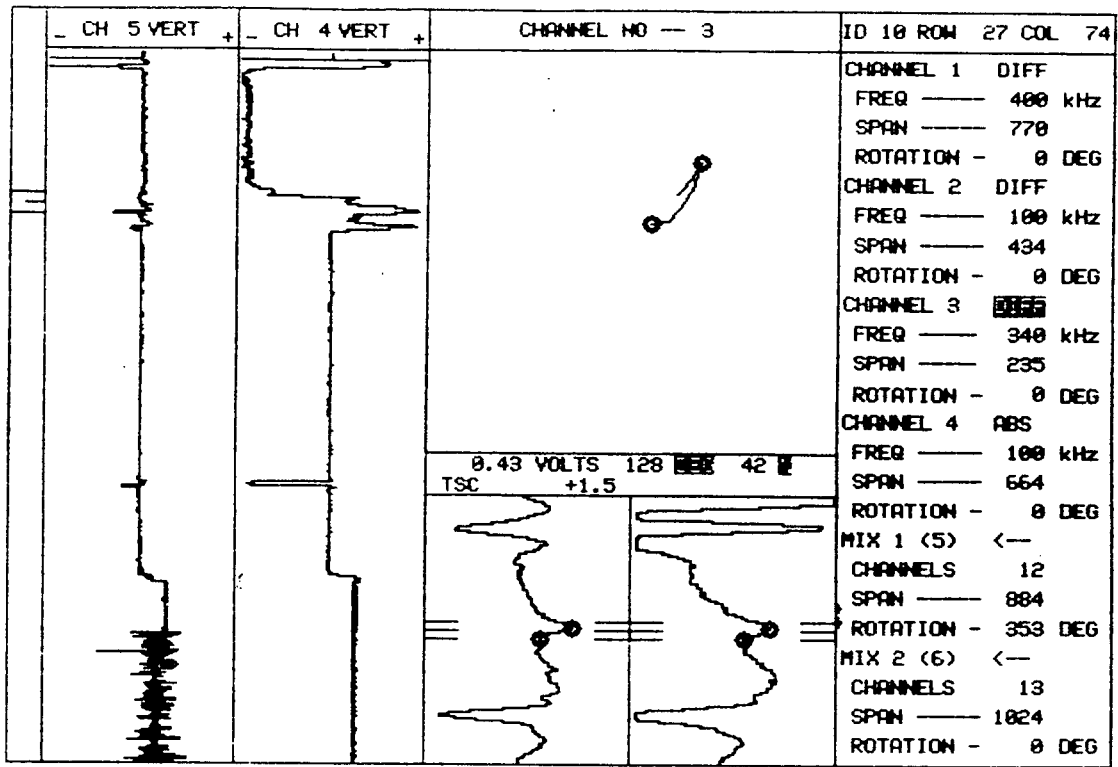


1.21 VOLTS 141 ~~DEG~~ 31 ~~DEG~~  
TSC +2.8

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

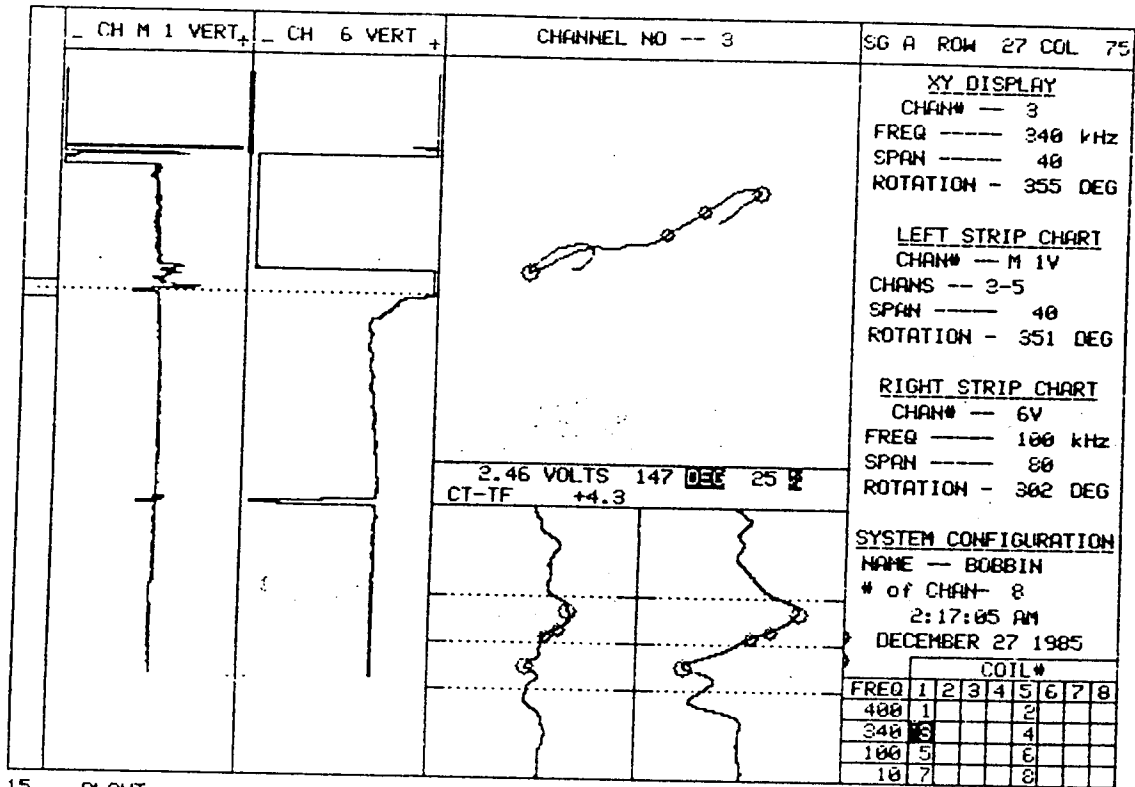


15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85

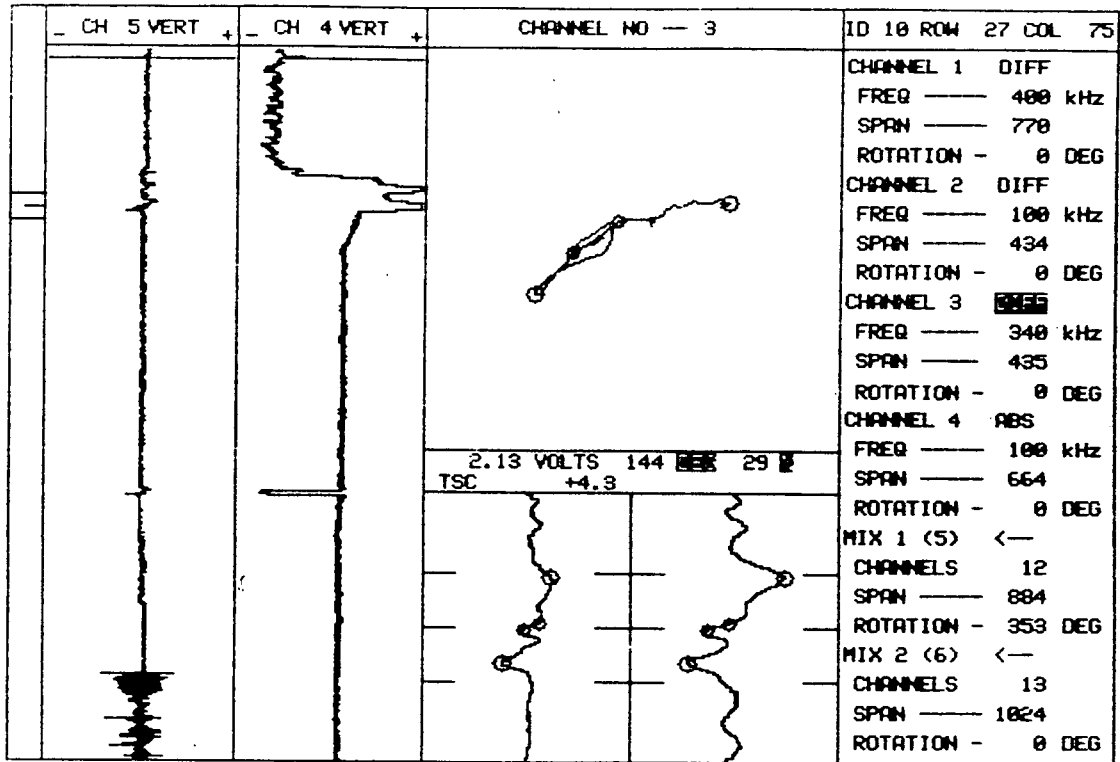


11	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

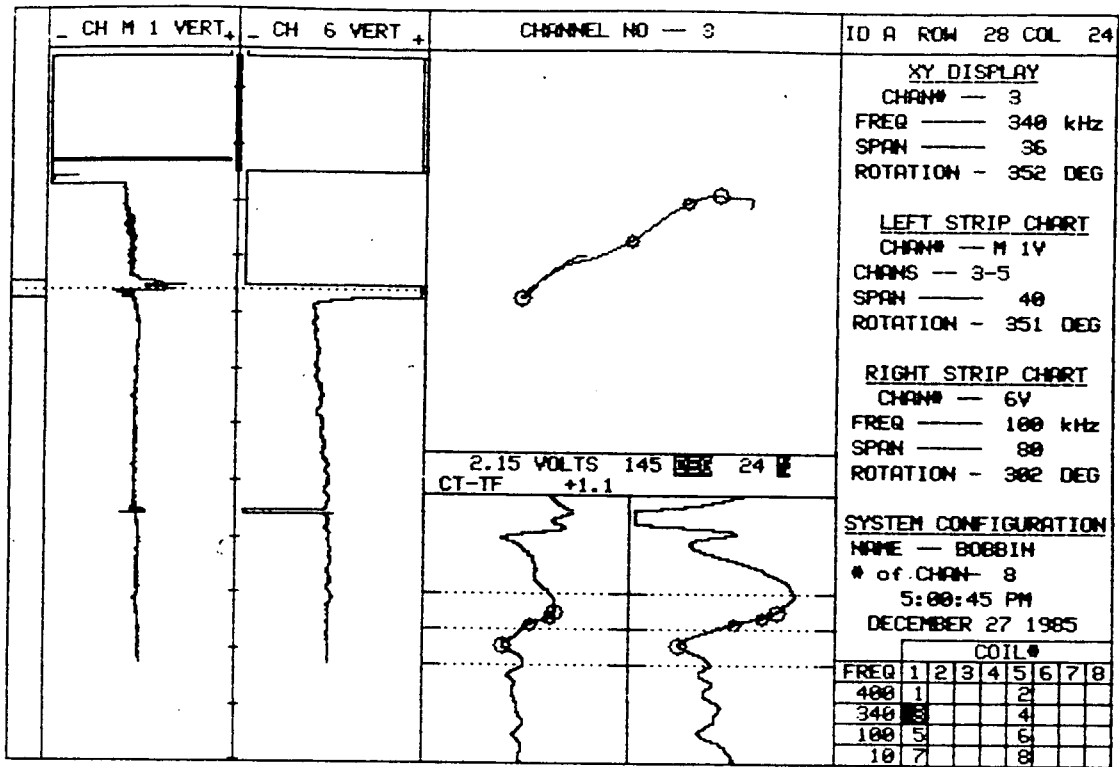




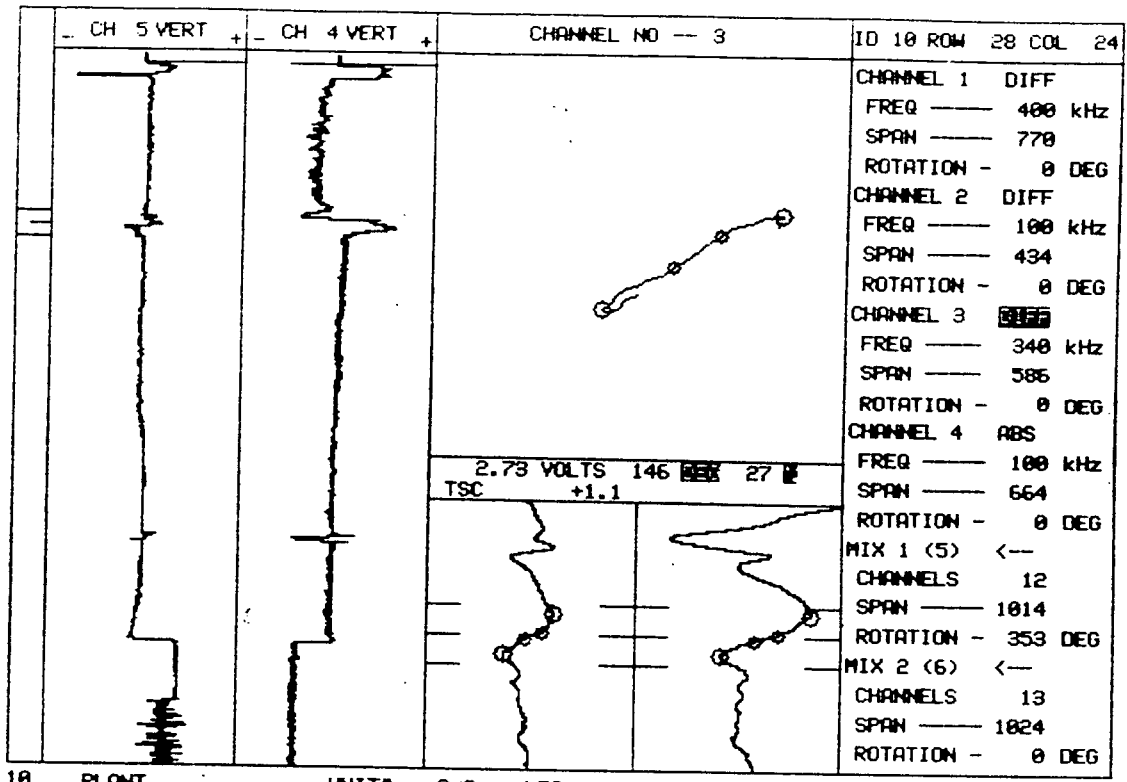
15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



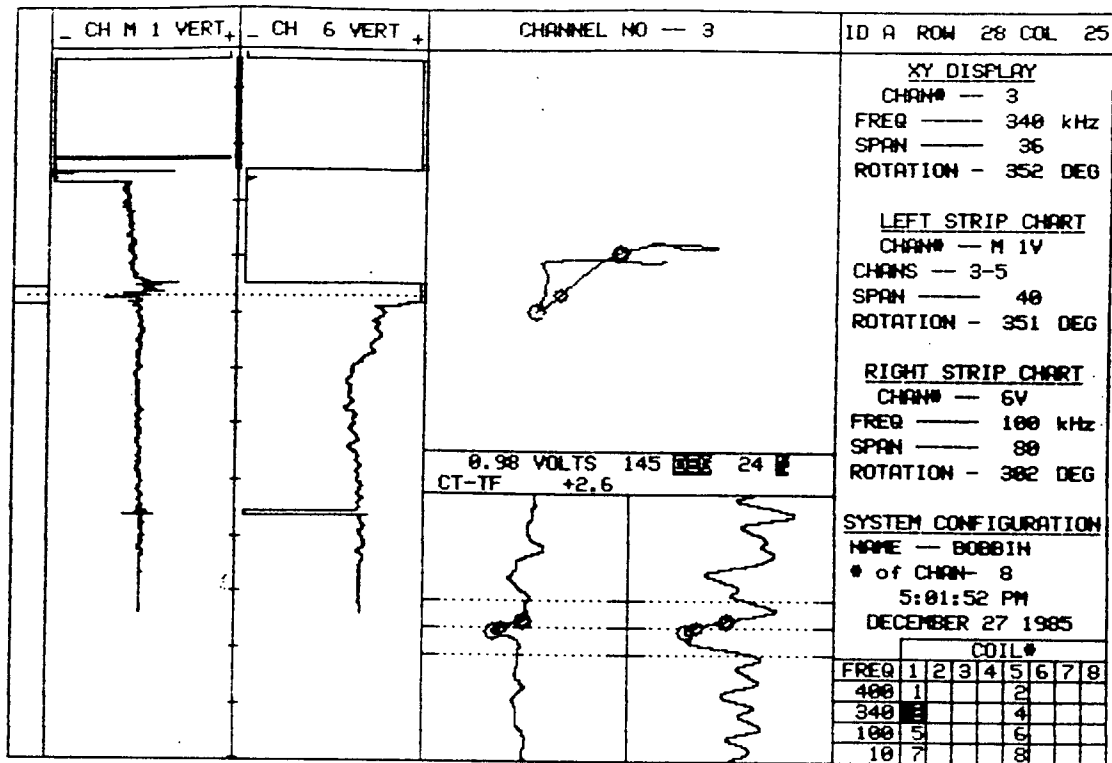
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



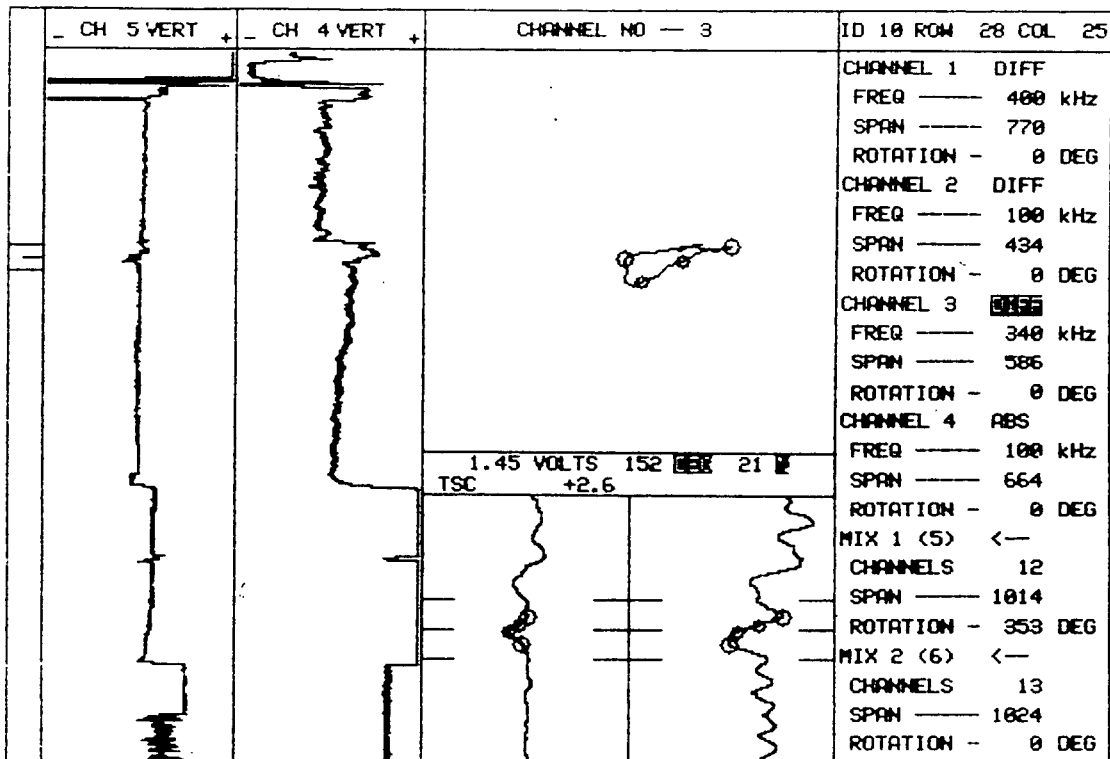
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



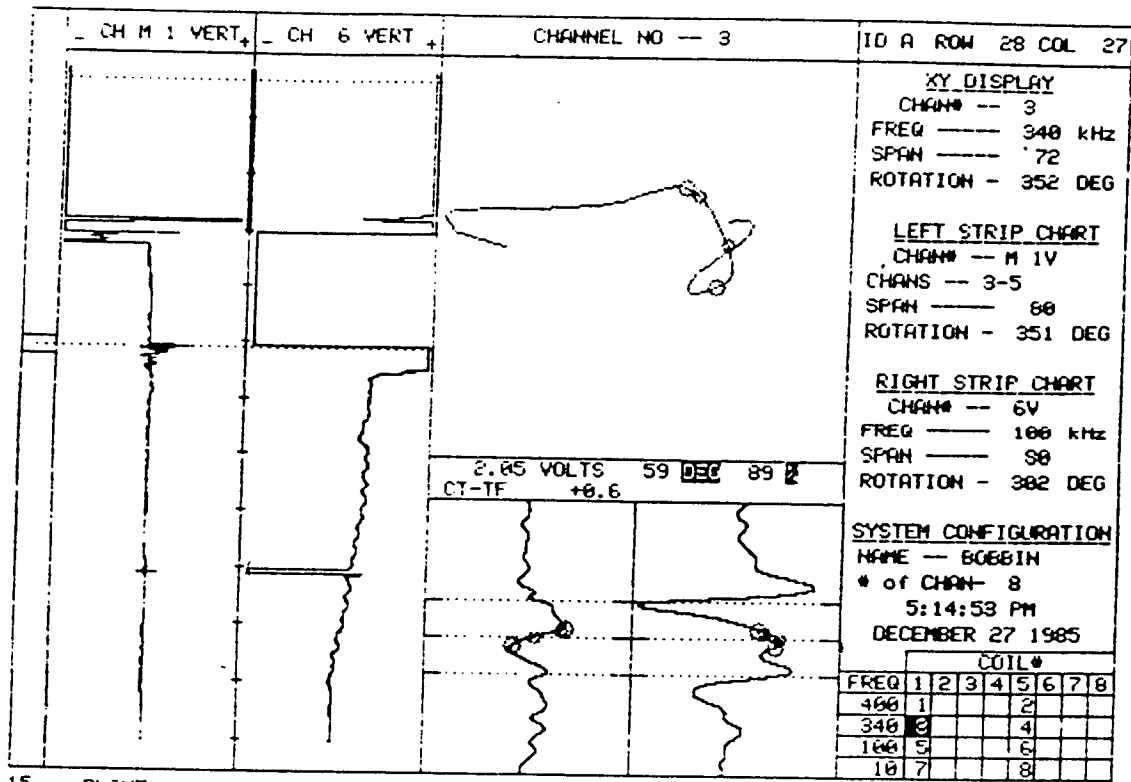
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



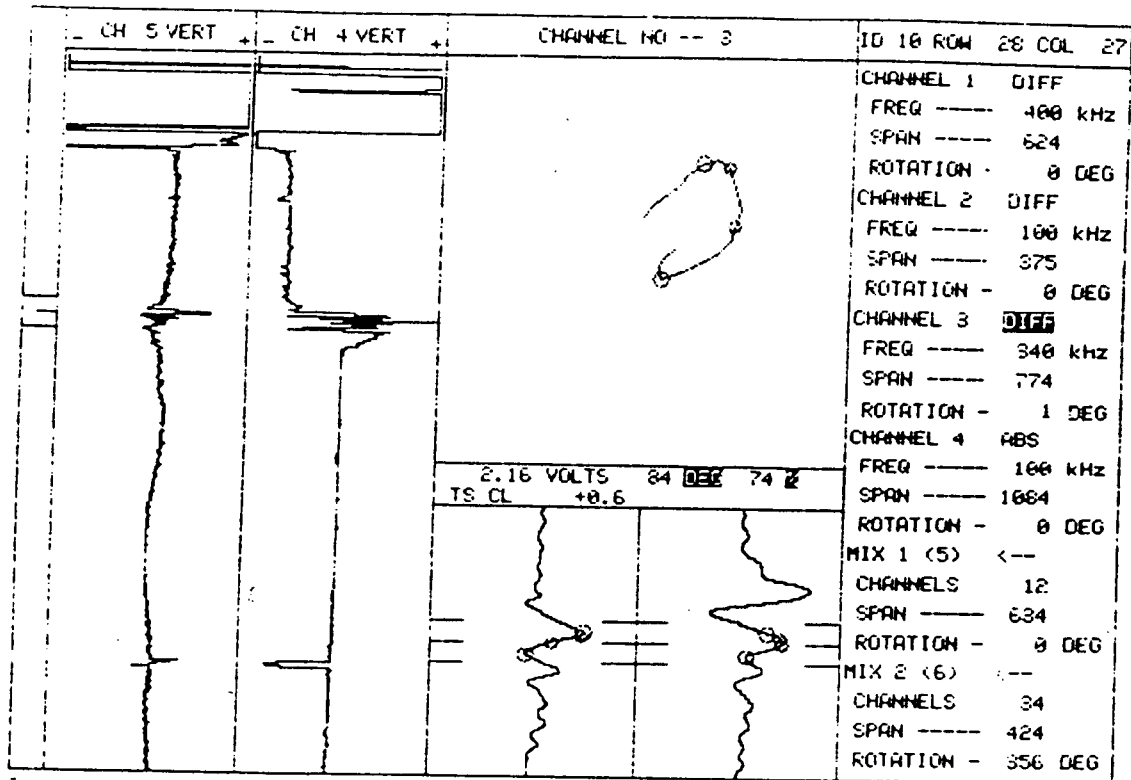
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85



10 PLANT SCE SONGS UNIT# I S/G R LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

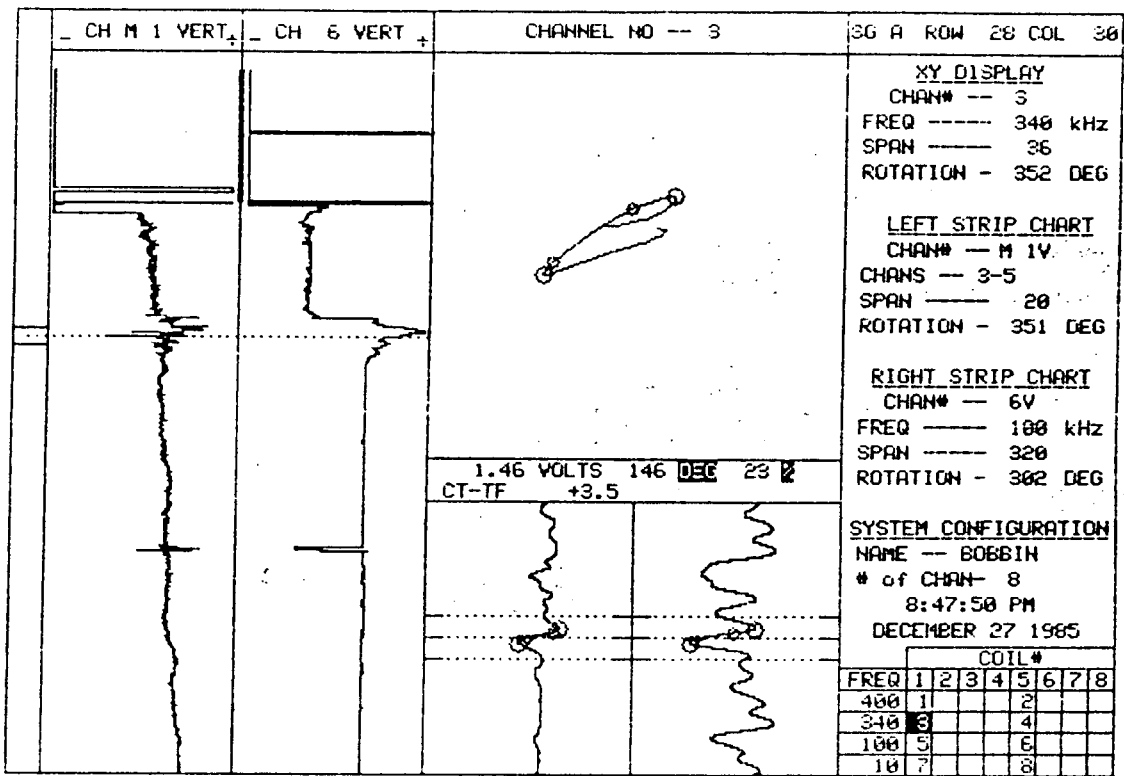


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C35    1    A    OUTLET    12/27/85

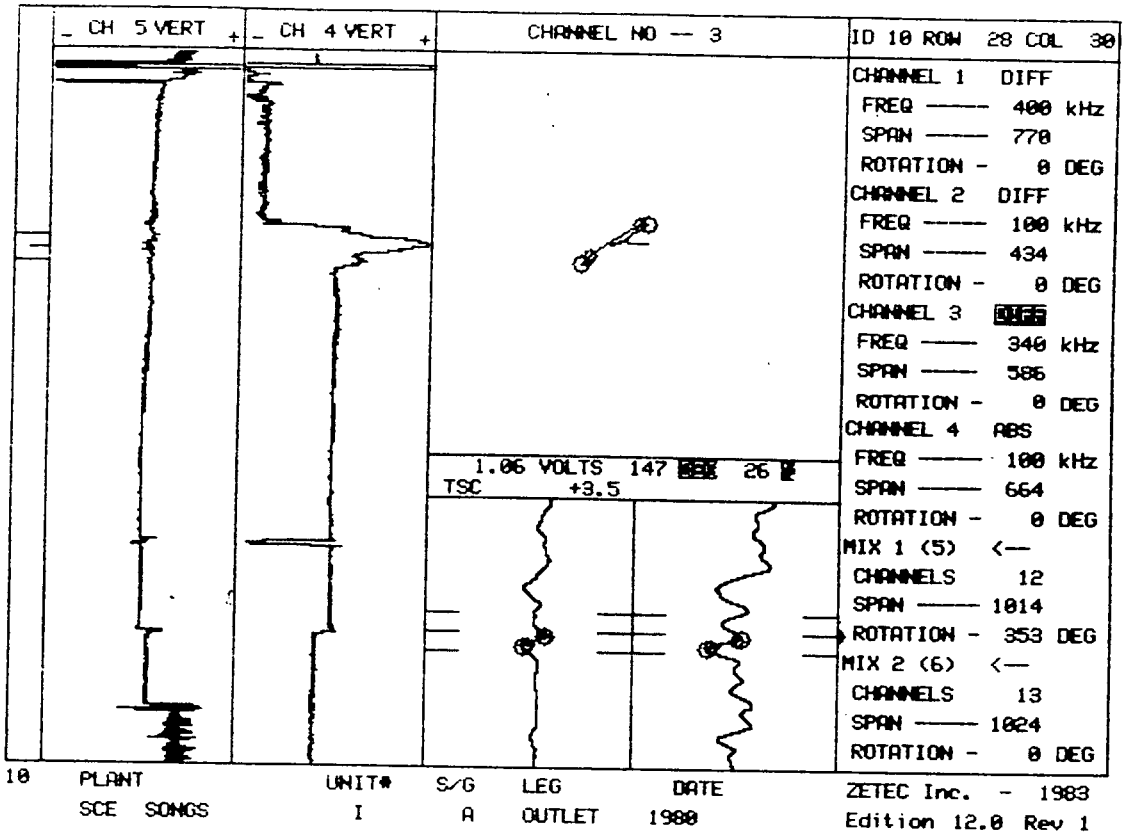


9 PLANT SCE SONGS    UNIT# I    S/G "A"    LEG COLD    DATE 06/03/80    ZETEC Inc. - 1983    Edition 12.0 Rev 1

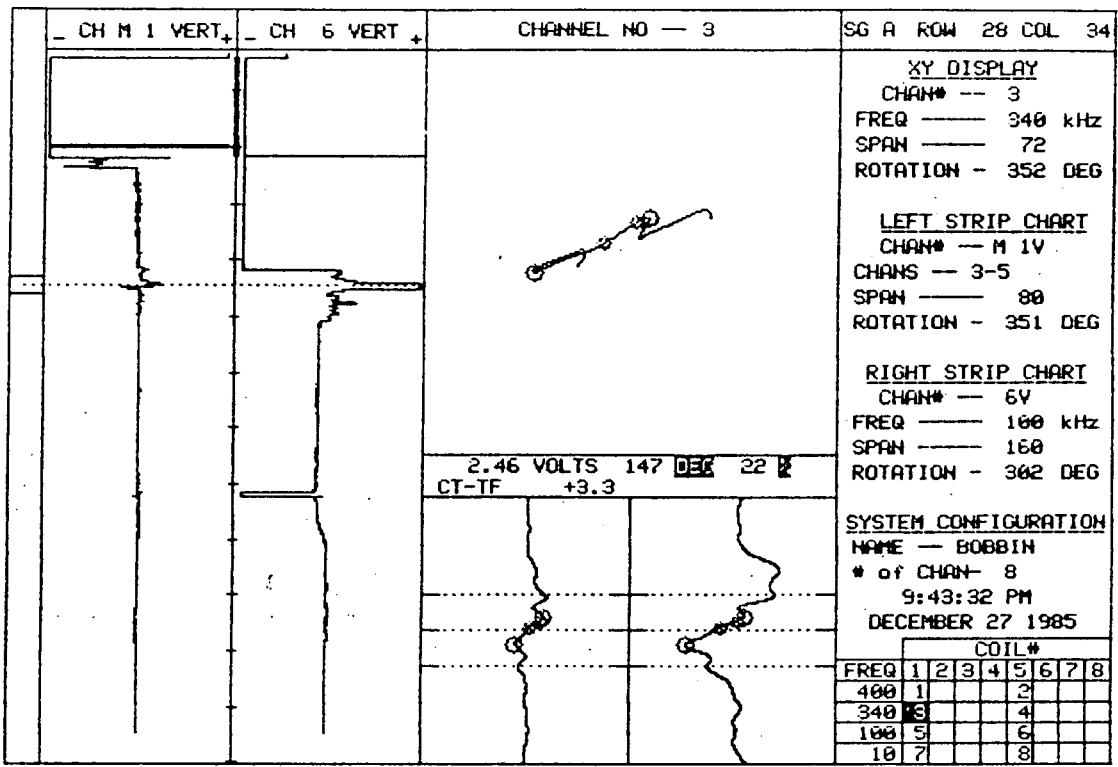




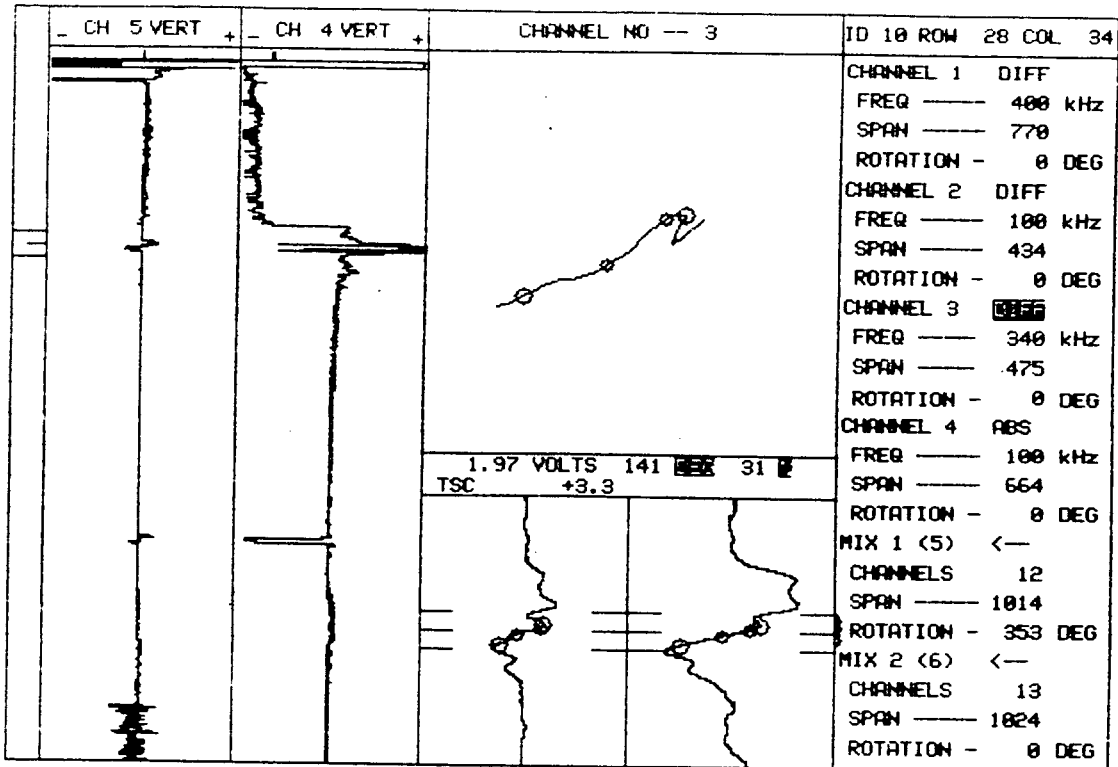
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85



1.06 VOLTS 147 **DEG** 26 **W**  
TSC +3.5

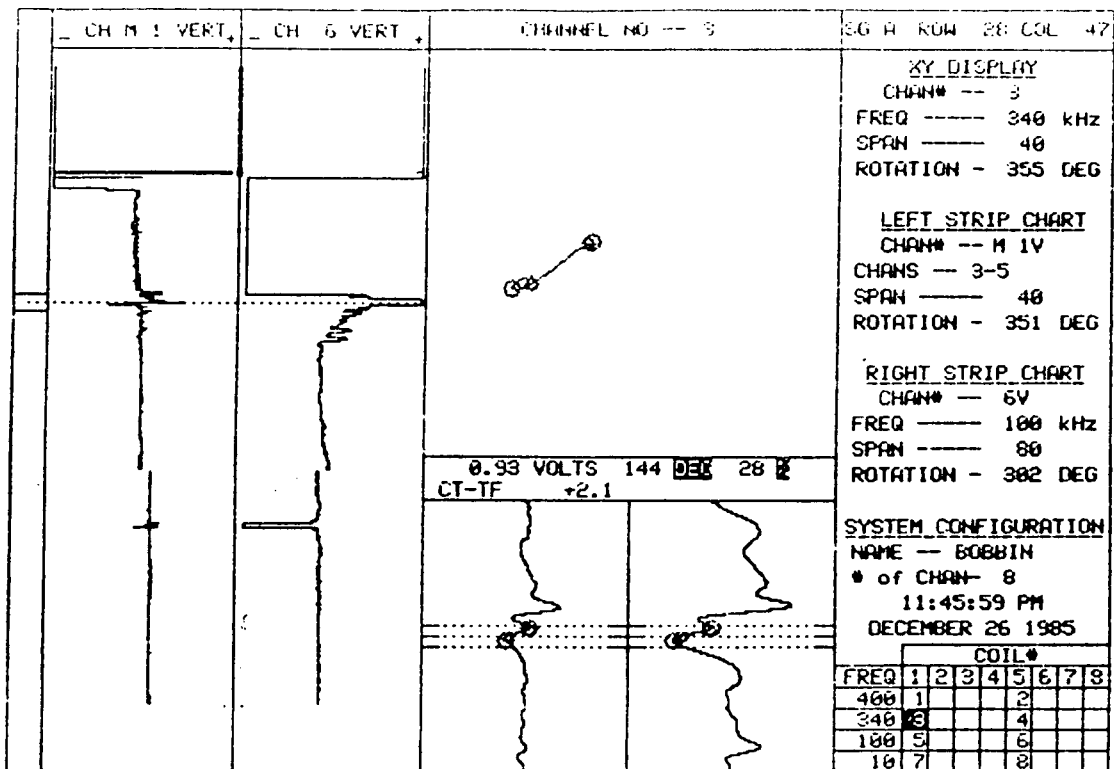


15    PLANT                      UNIT#    S/G    LEG                      DATE  
      SONGS DISK C36        1        A        OUTLET        12/27/85

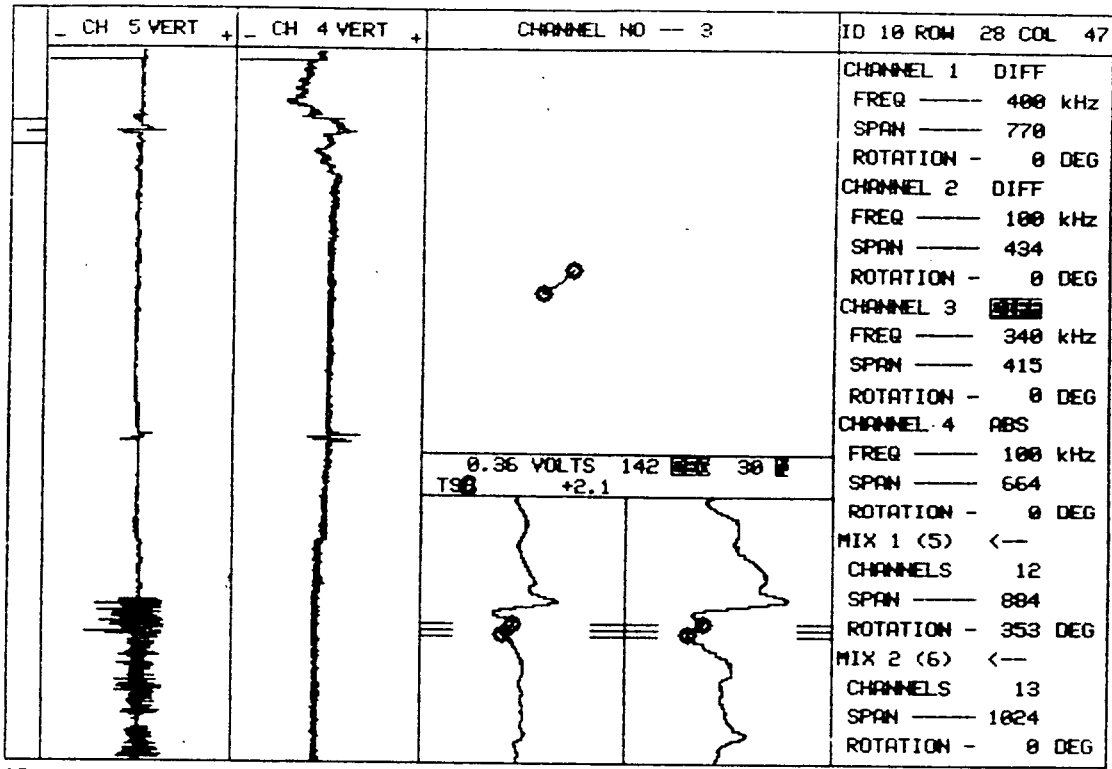


1.97 VOLTS 141 **REV** 31 **REV**  
TSC +3.3

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

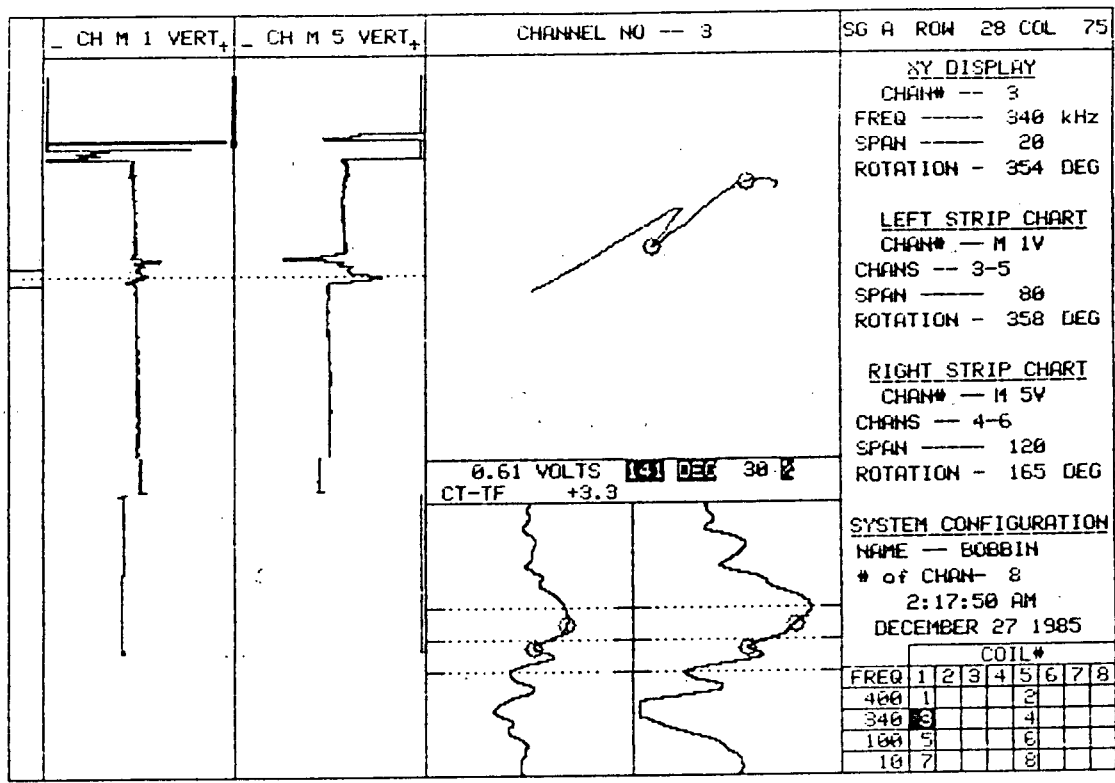


15    PLANT                    UNIT#    S/G    LEG                    DATE  
       SONGS DISK C34        1        A        OUTLET                12/26/85

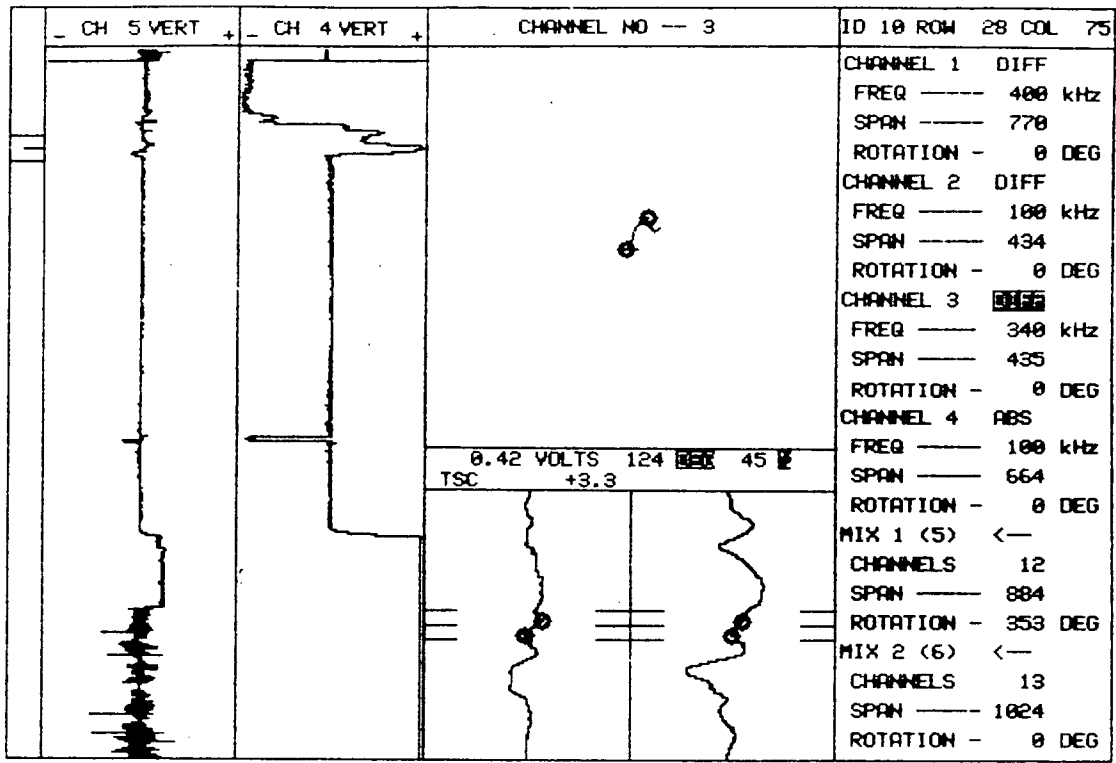


0.36 VOLTS 142 **SEC** 30 **SEC**  
 TS6 +2.1

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

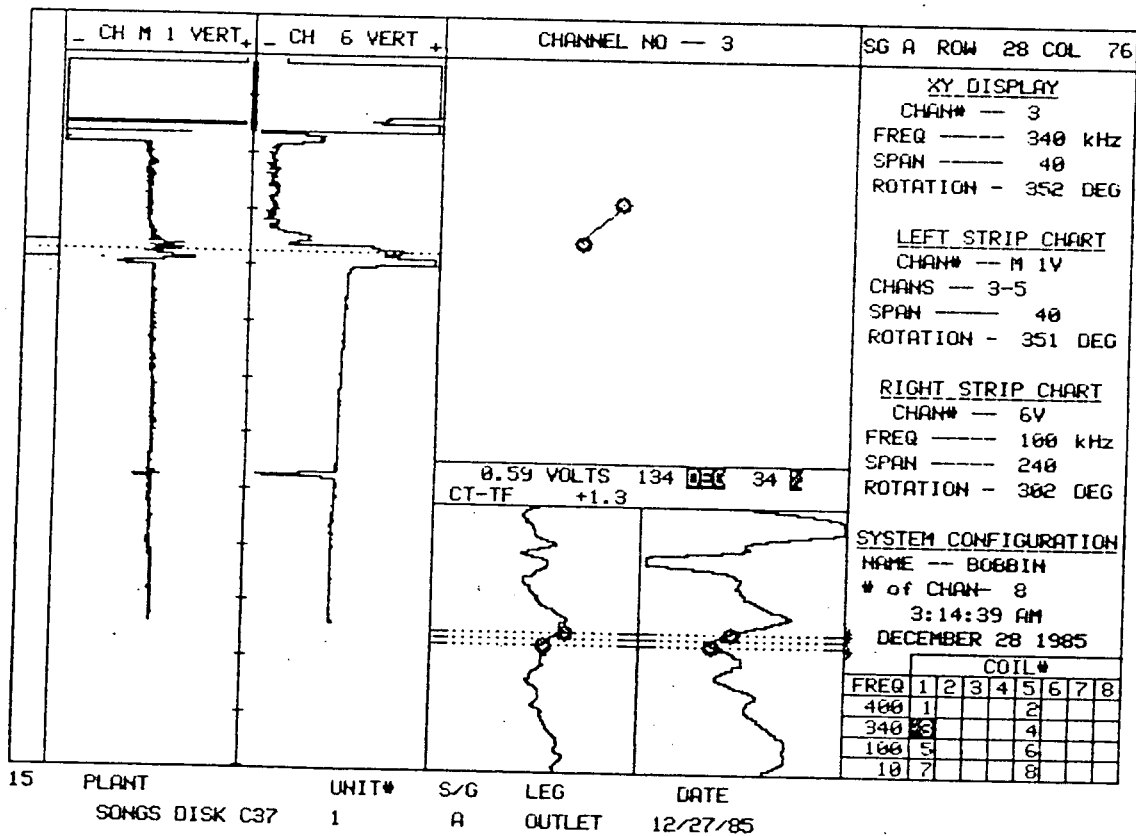
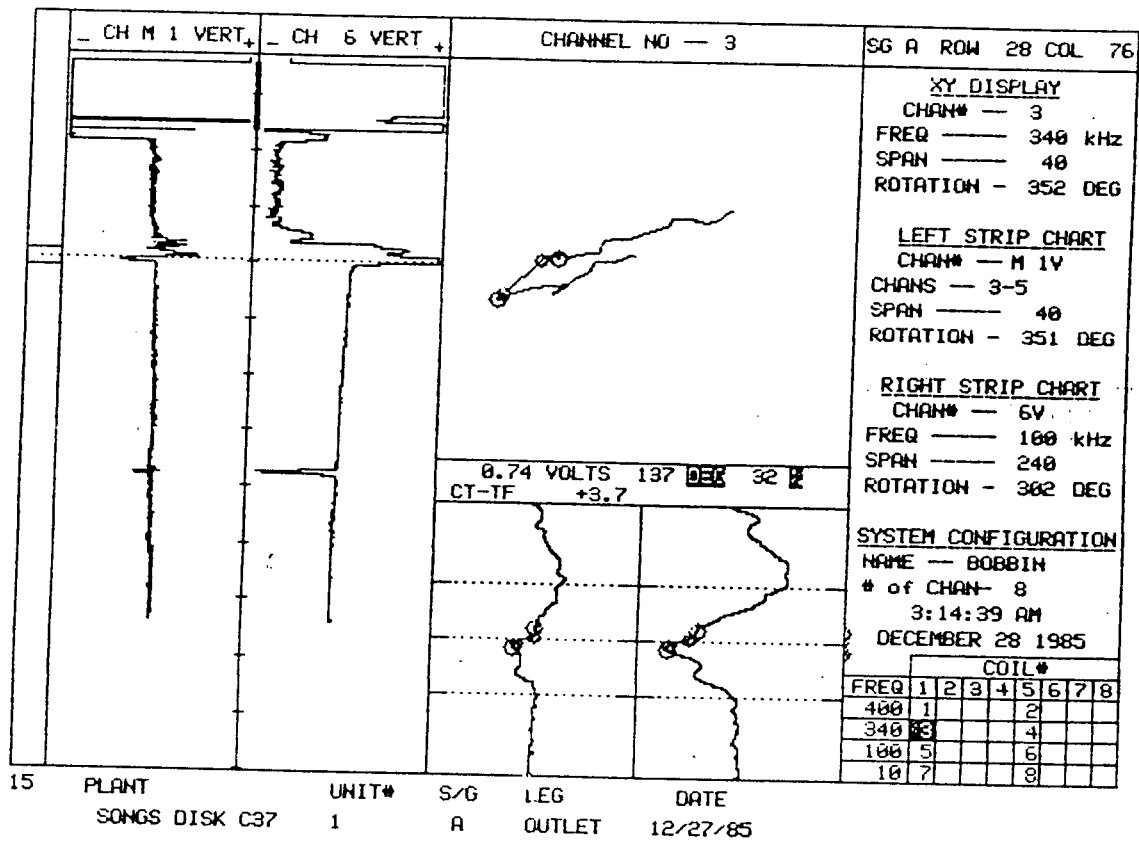


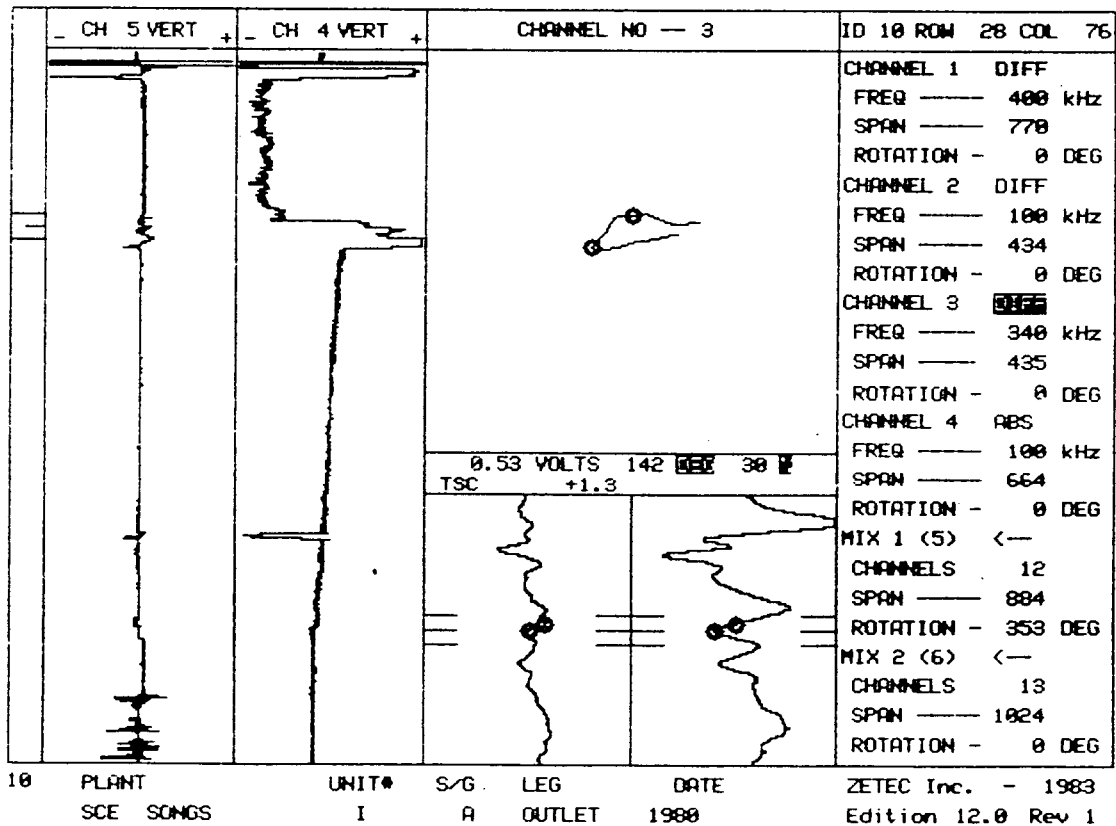
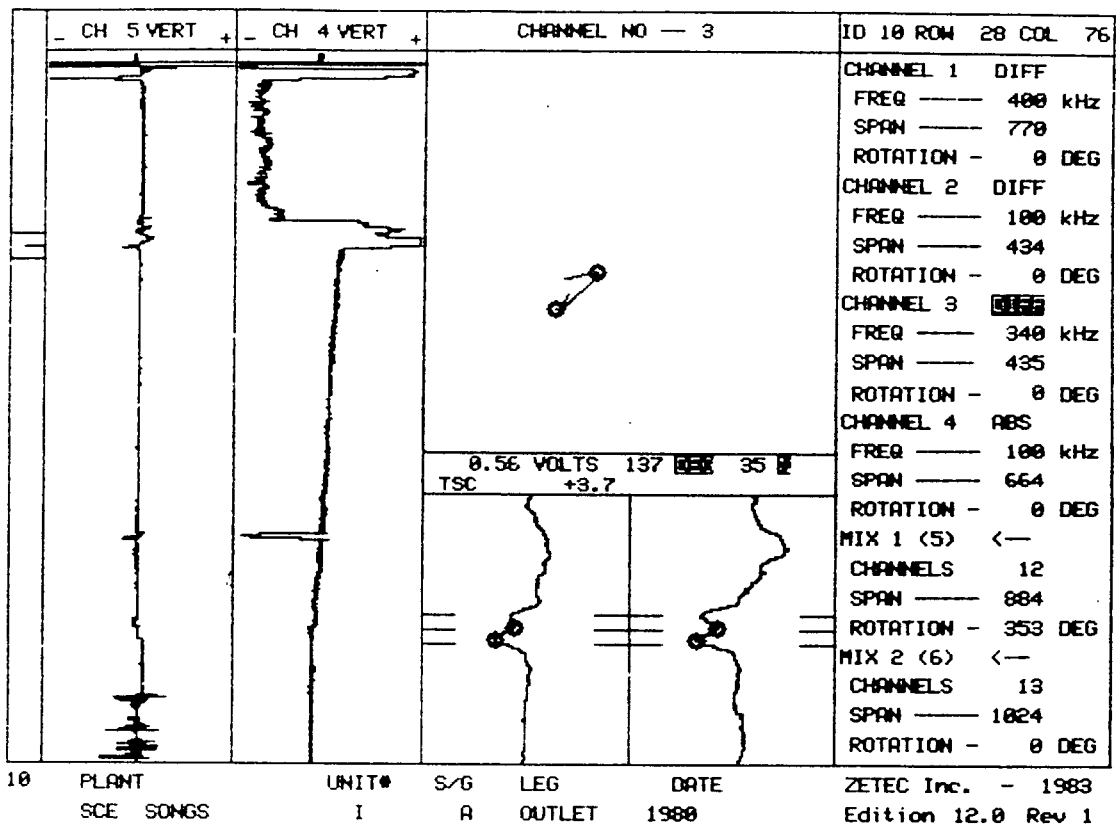
15 PLANT SCE SONGS UNIT# I S/G 'A' LEG OUTLET DATE 12/ /85

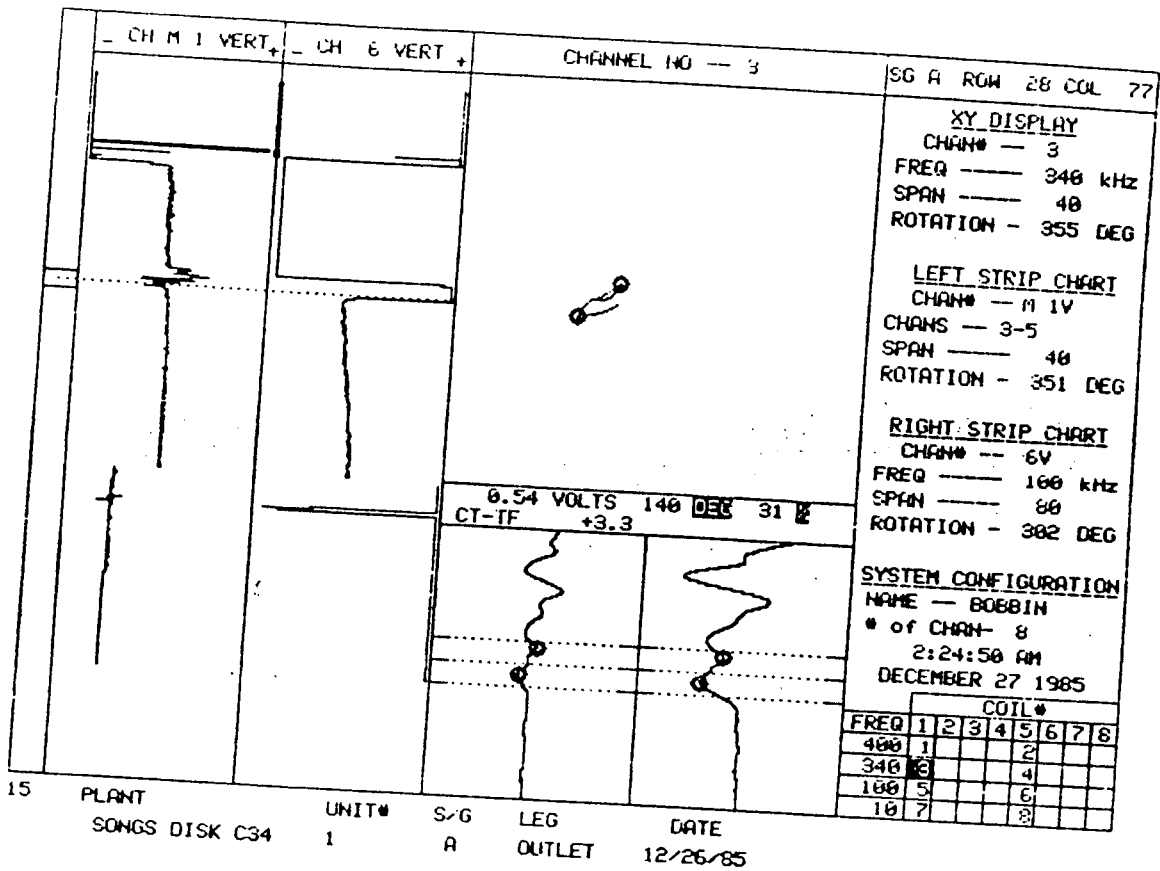


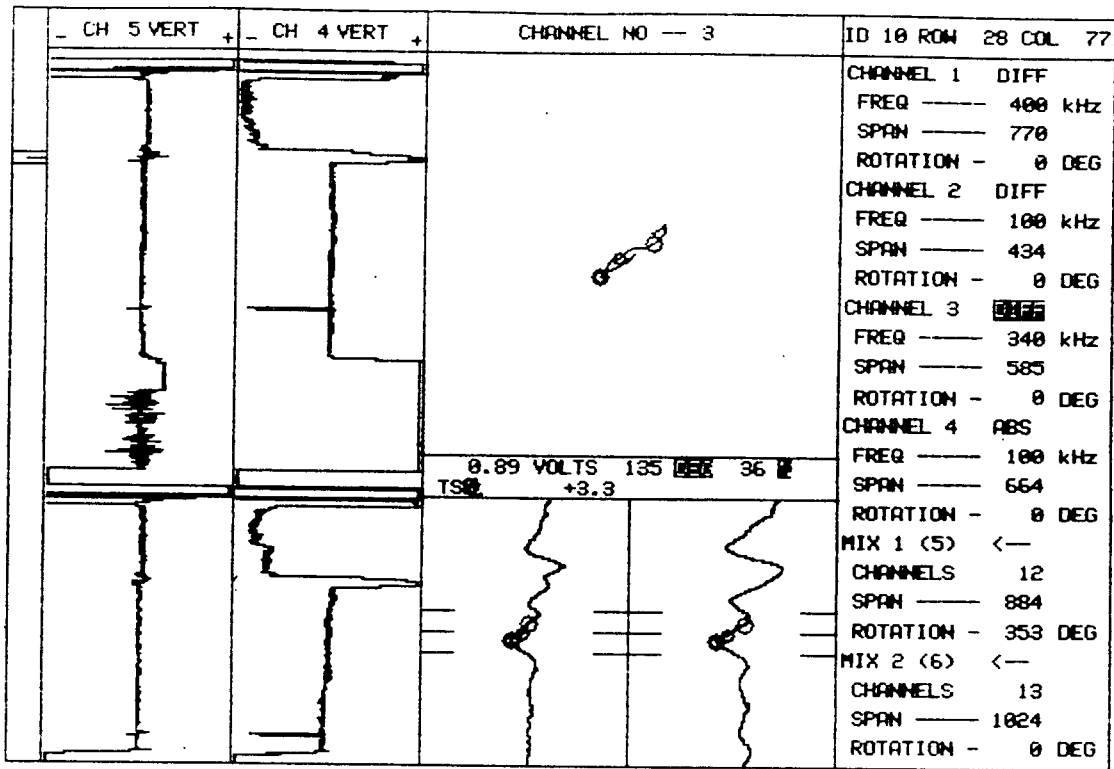
10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1





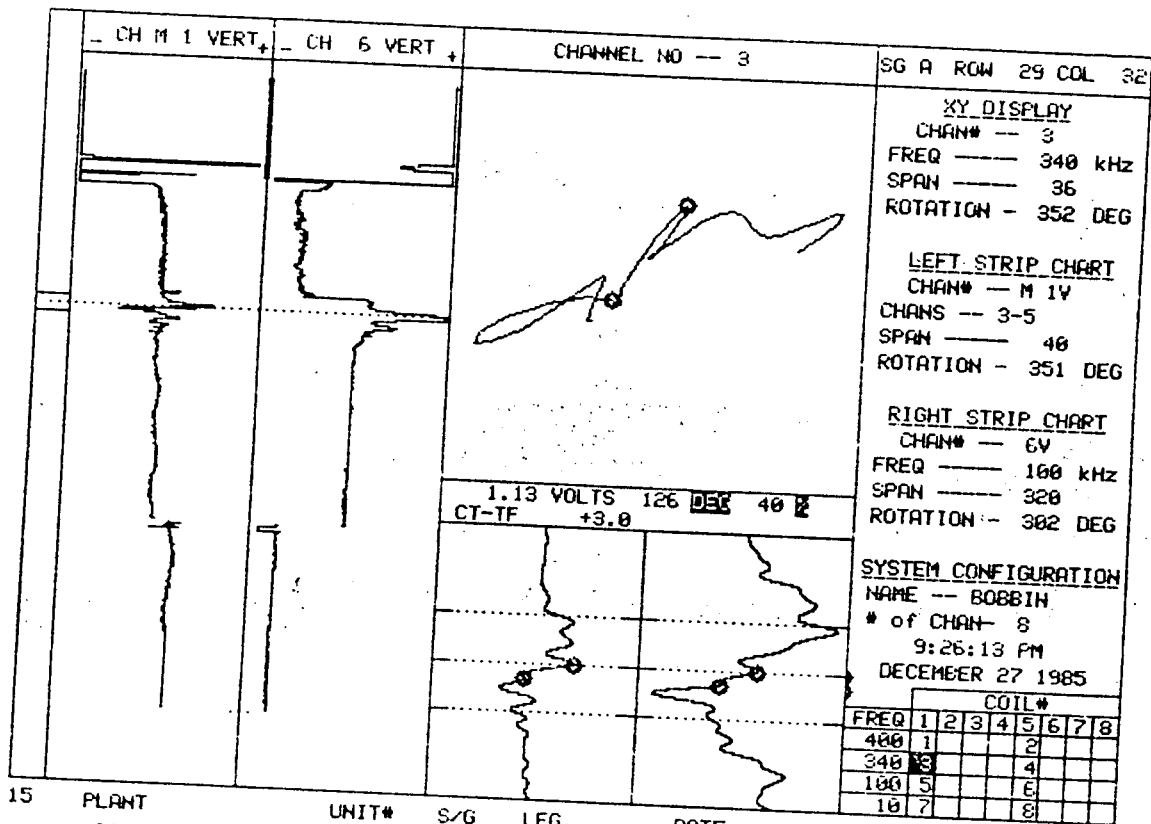




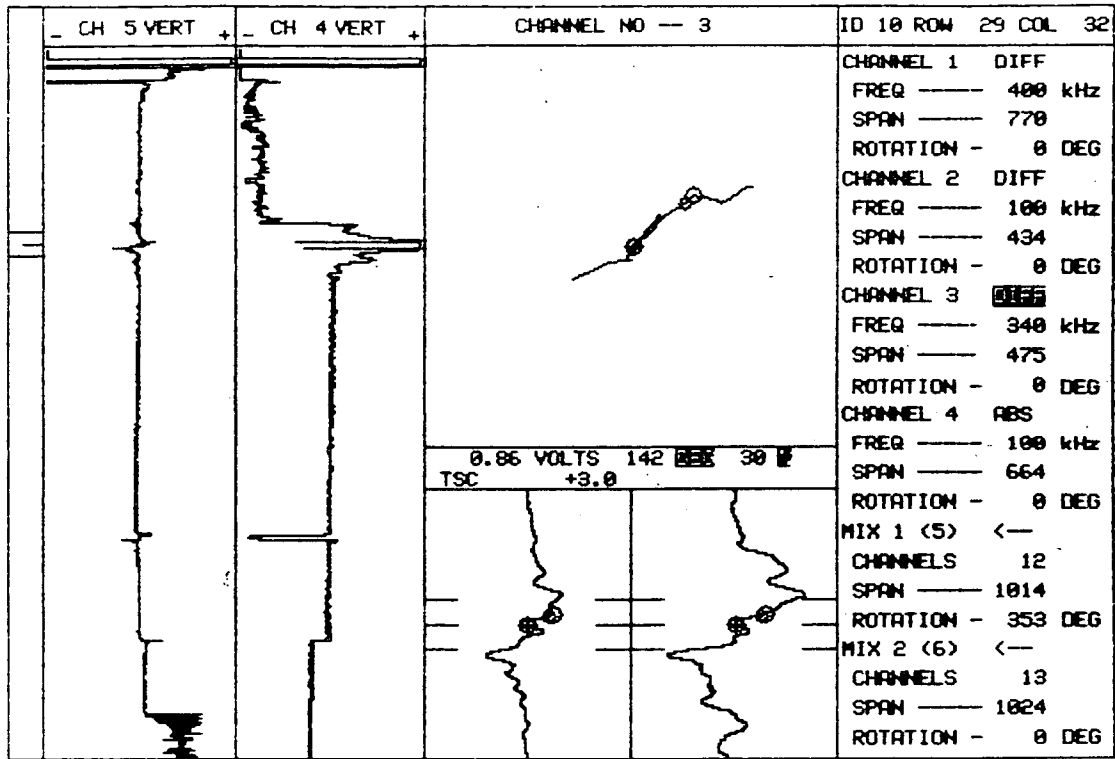


0.89 VOLTS 135 ~~DEC~~ 36 ~~μ~~  
TSR +3.3

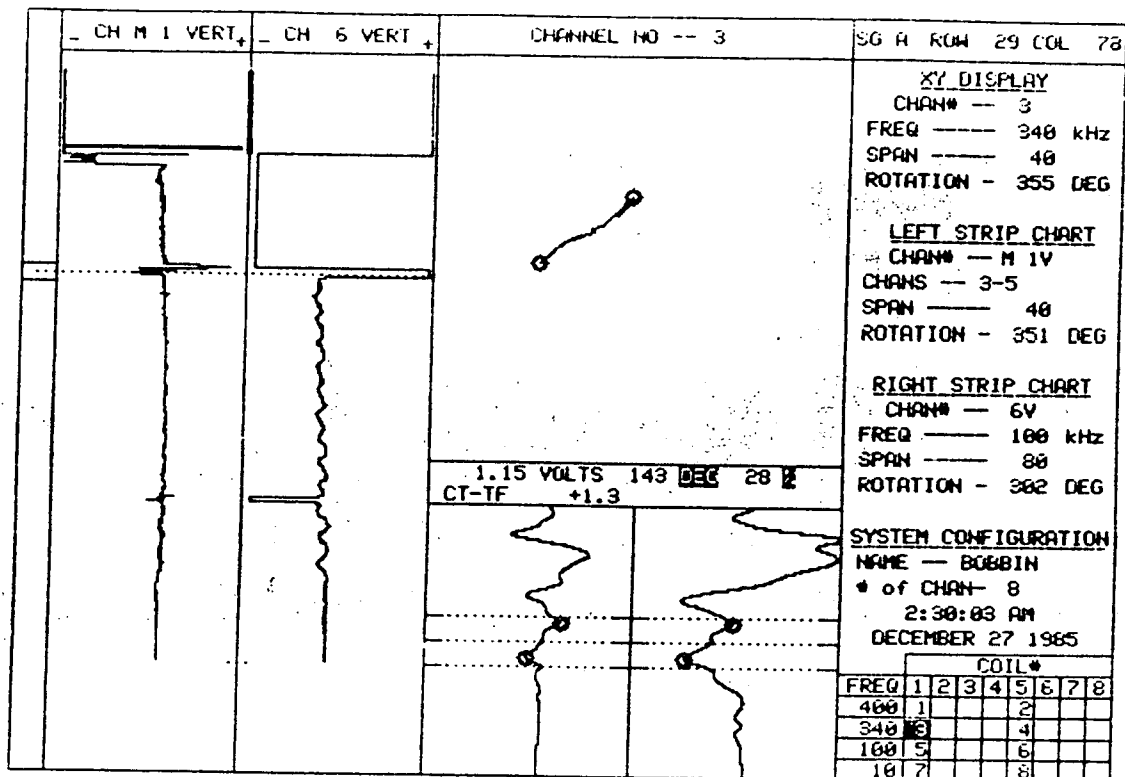
20 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



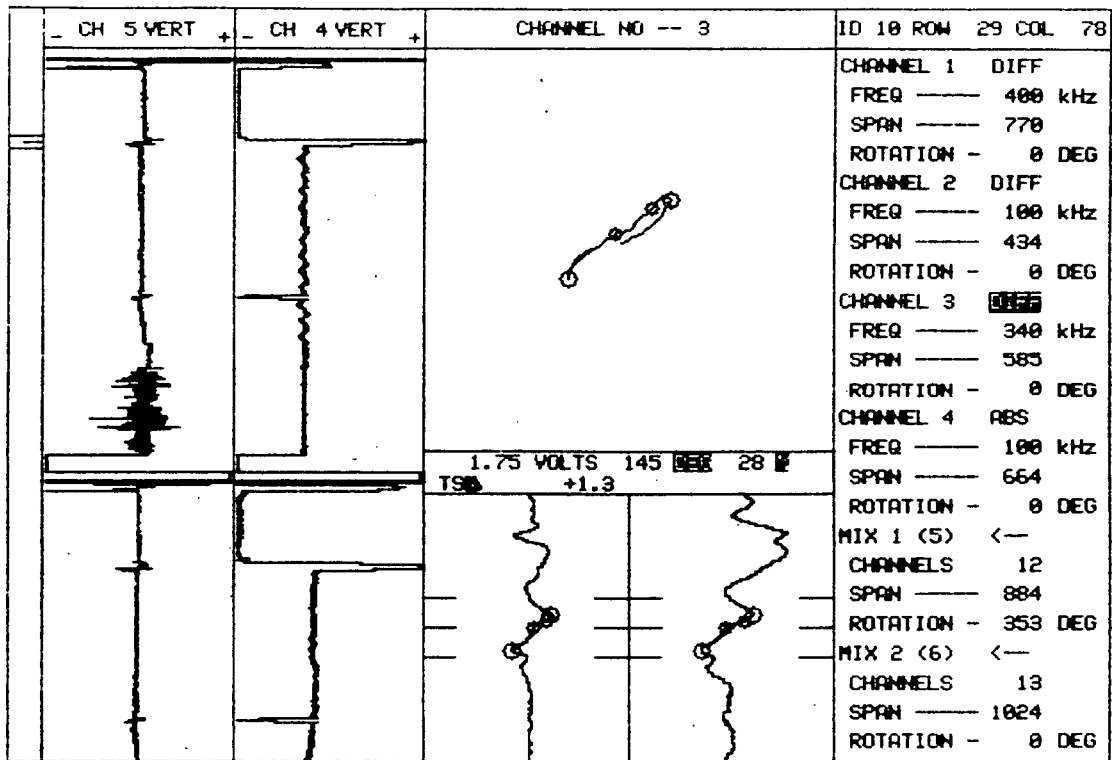
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85



10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

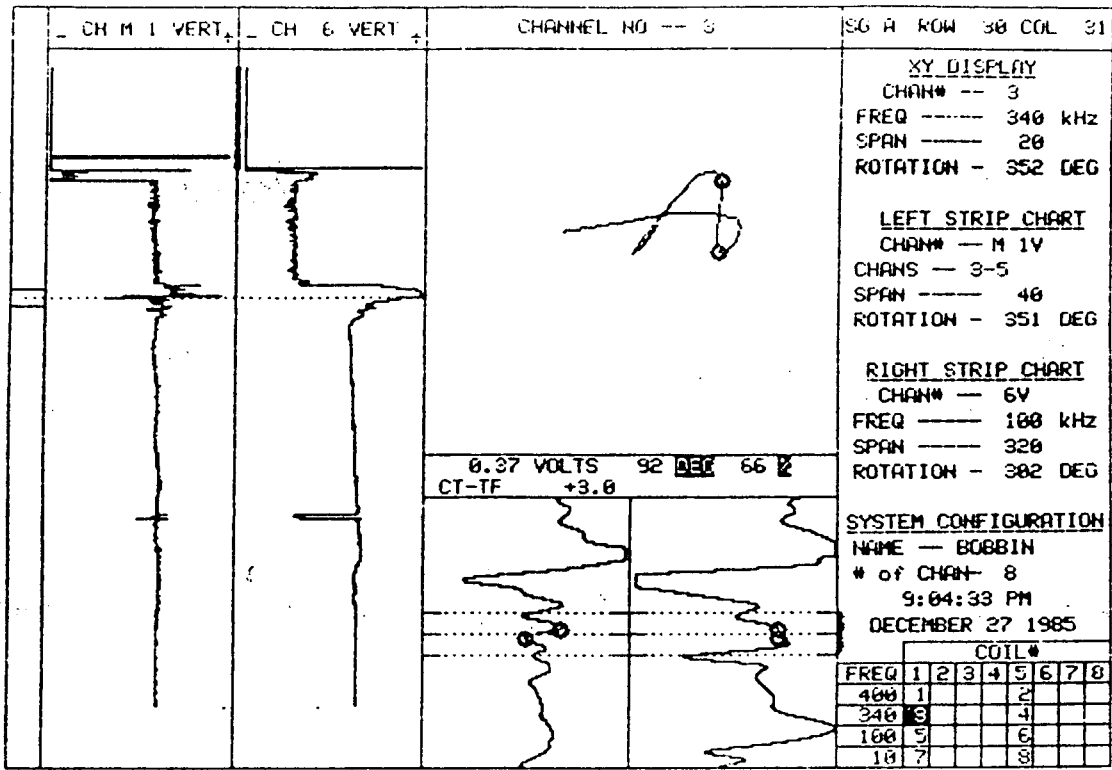


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C34    1    A    OUTLET    12/26/85

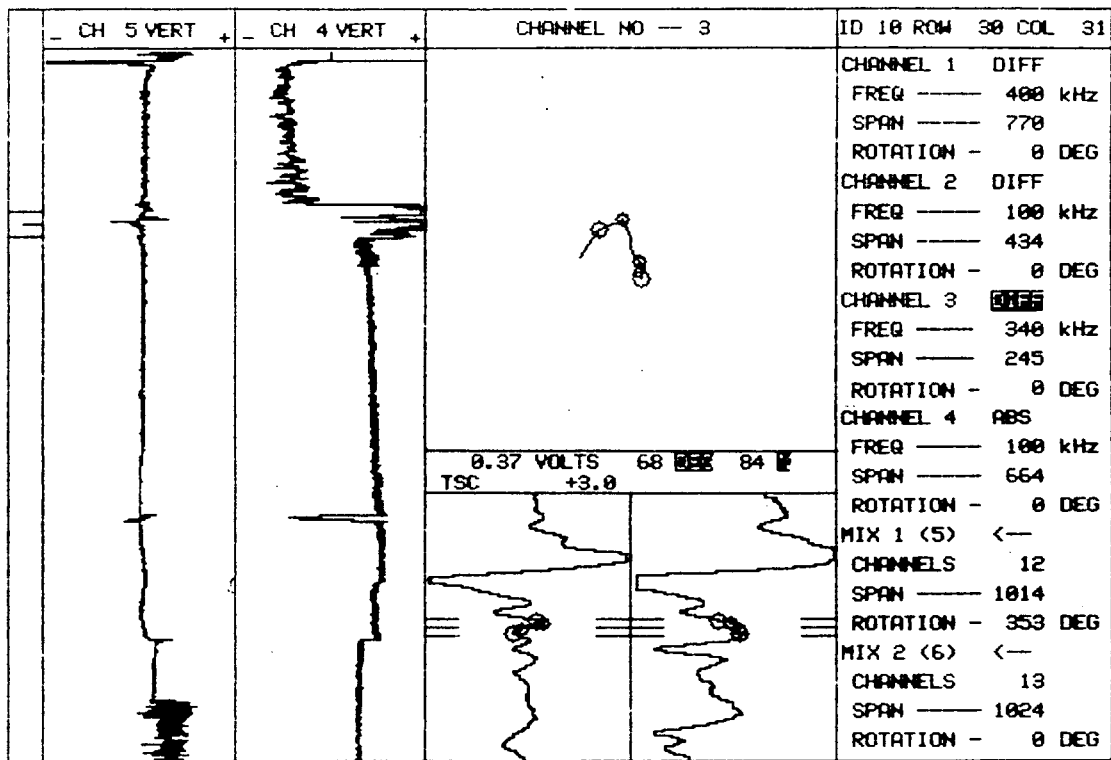


20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

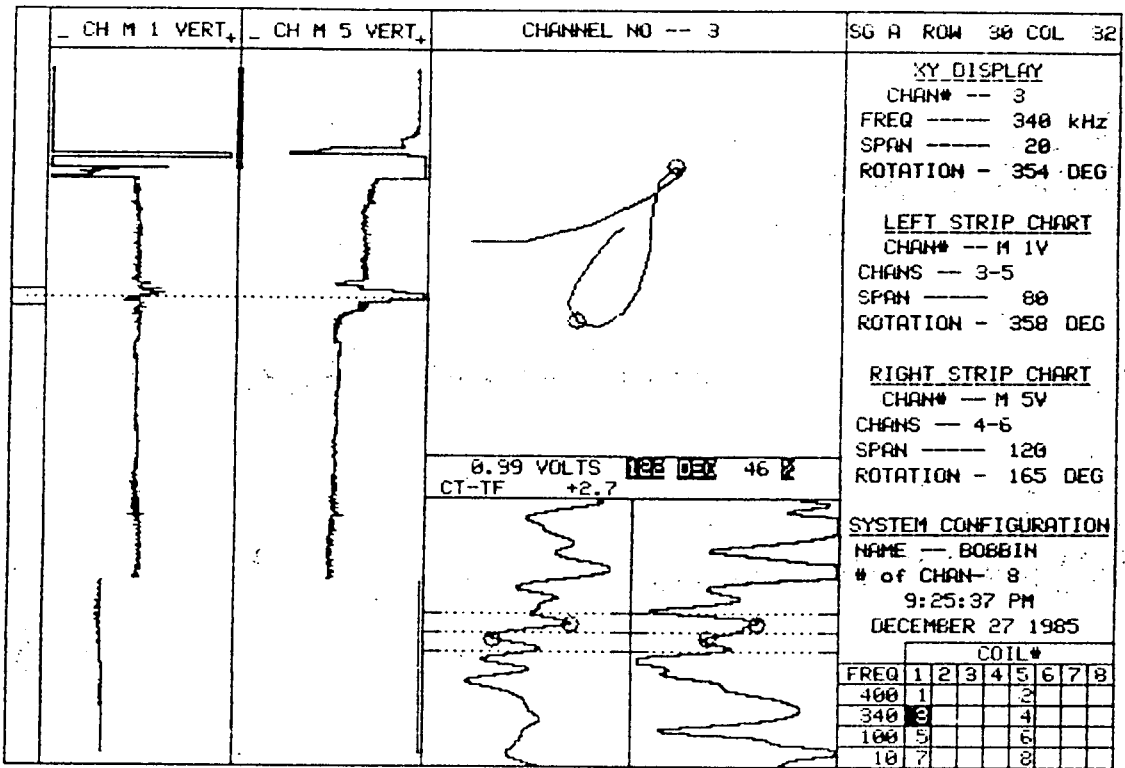




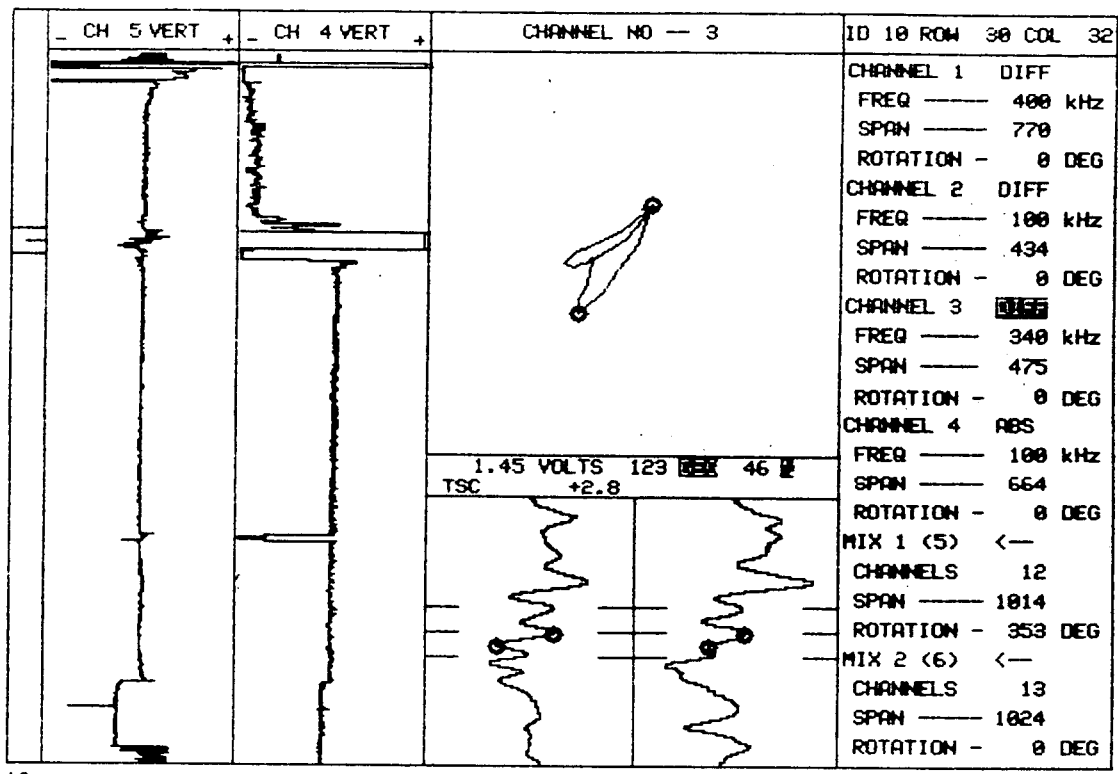
15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

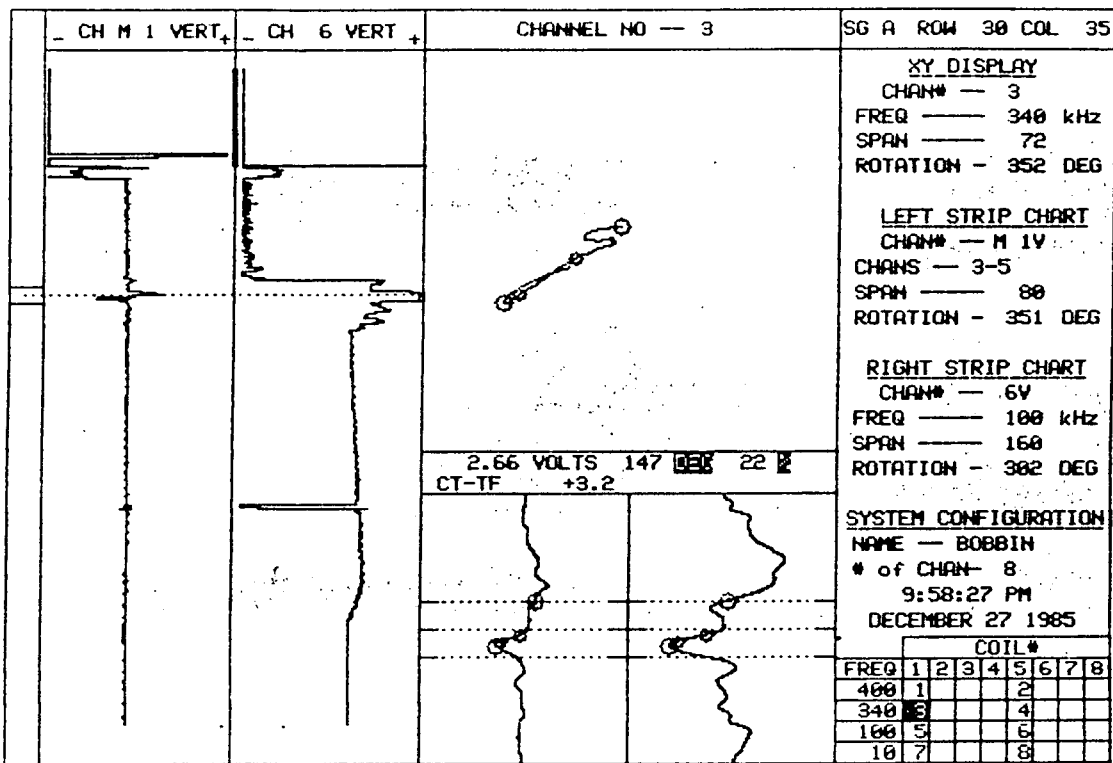


15 PLANT SONGS REEL C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

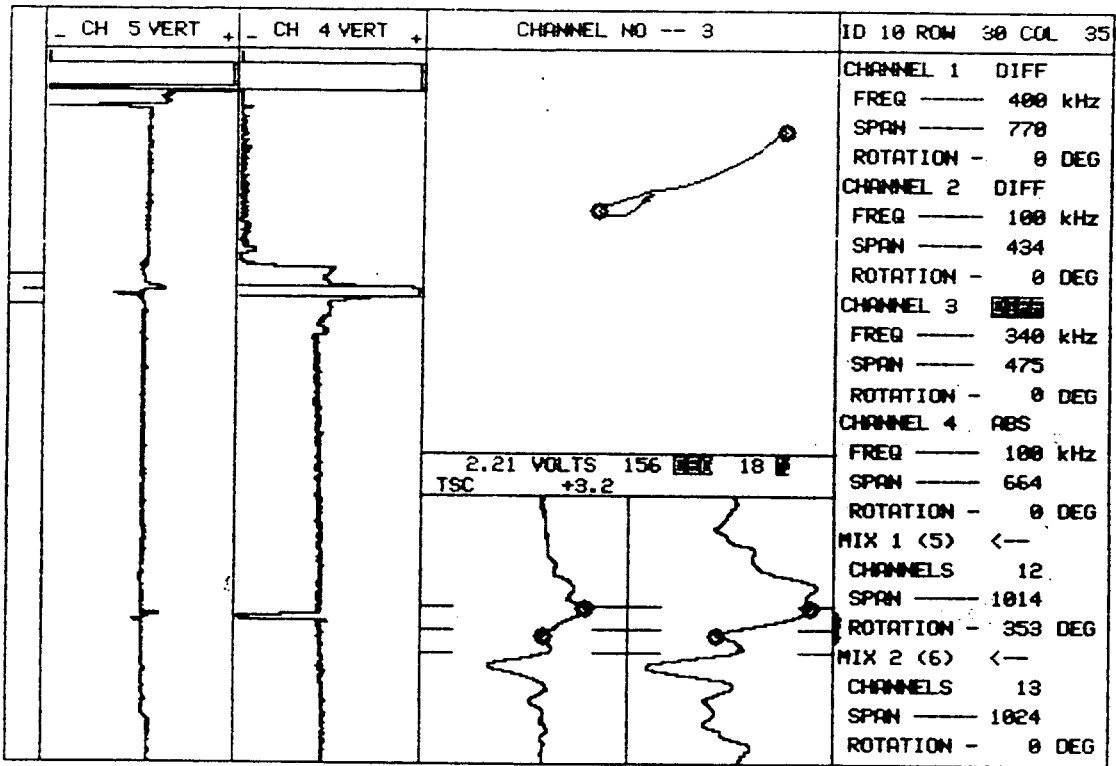


1.45 VOLTS 123 DEG 46 μ  
TSC +2.8

10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

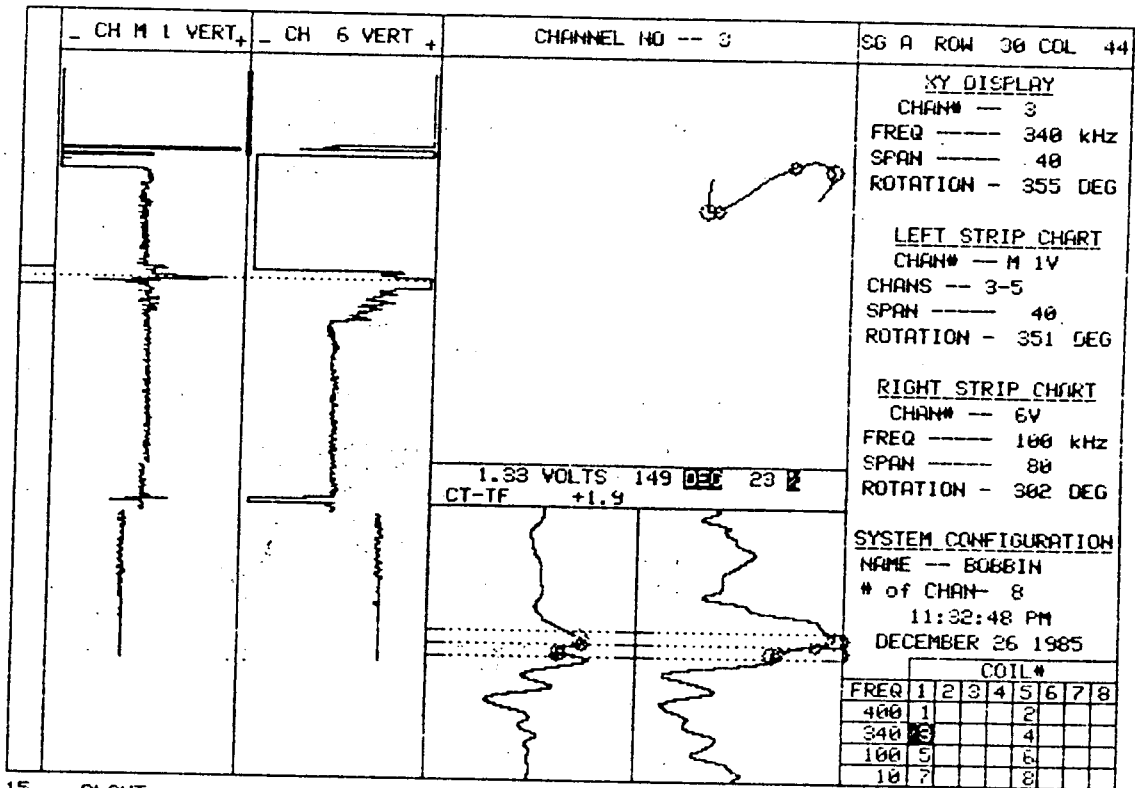


15    PLANT                    UNIT#    S/G    LEG            DATE  
       SONGS DISK C36        1        A        OUTLET        12/27/85

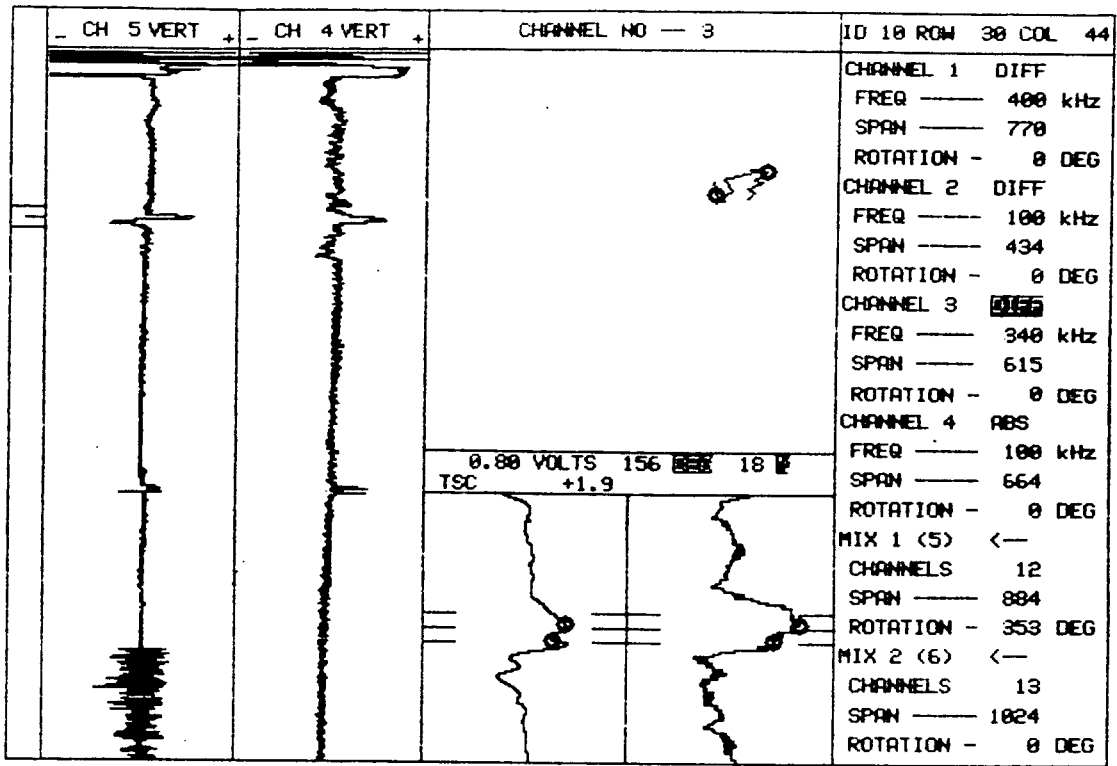


2.21 VOLTS 156 ~~BEK~~ 18 ~~█~~  
TSC +3.2

9	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

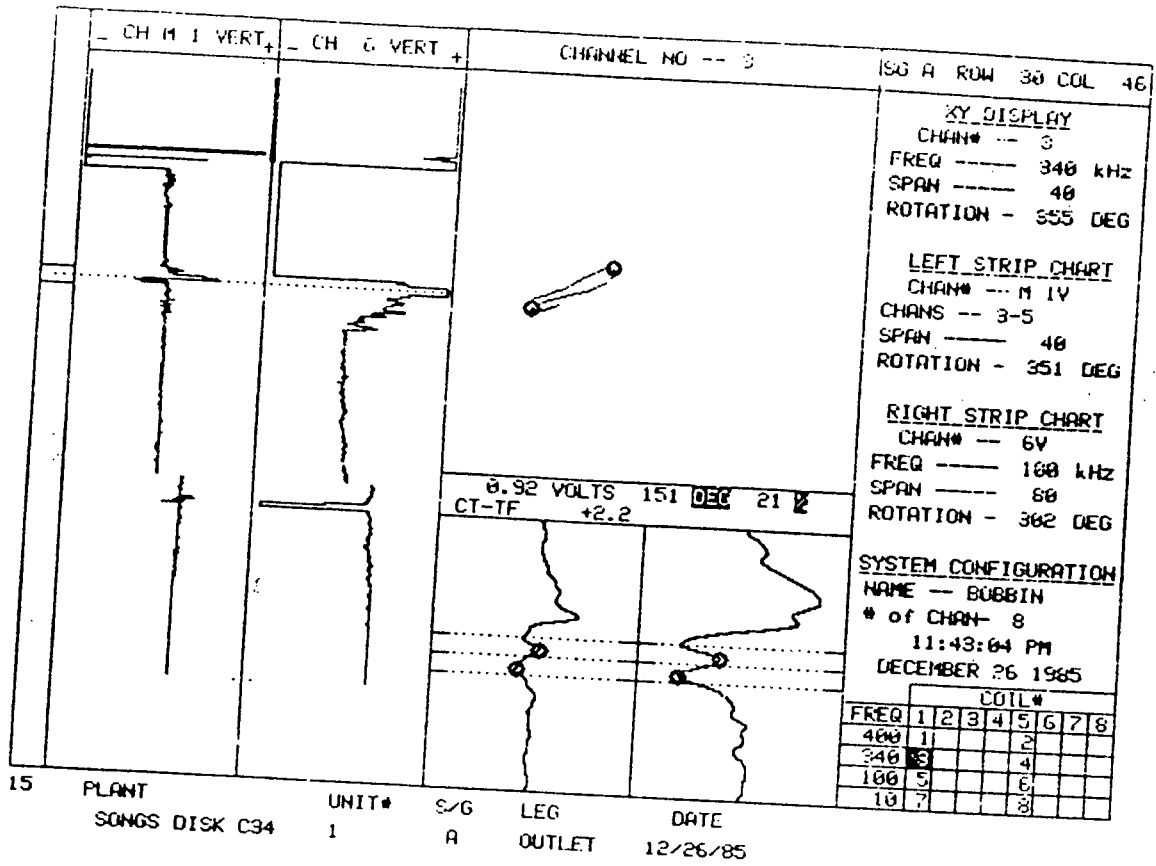


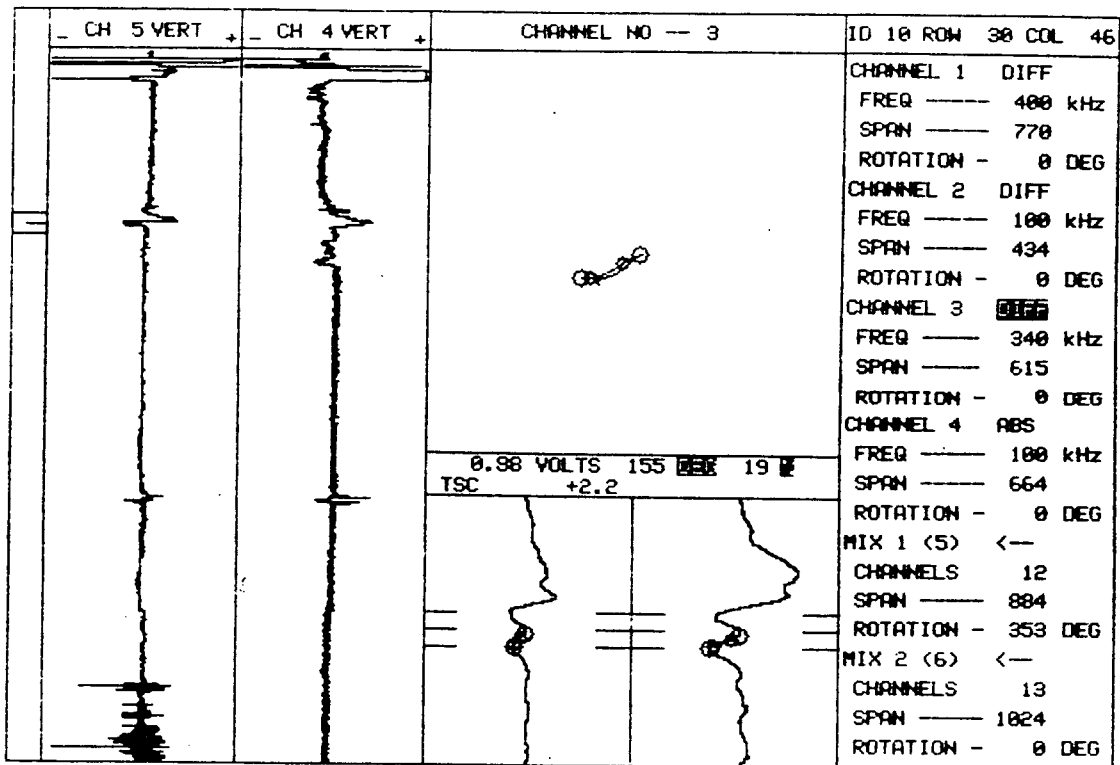
15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



11	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

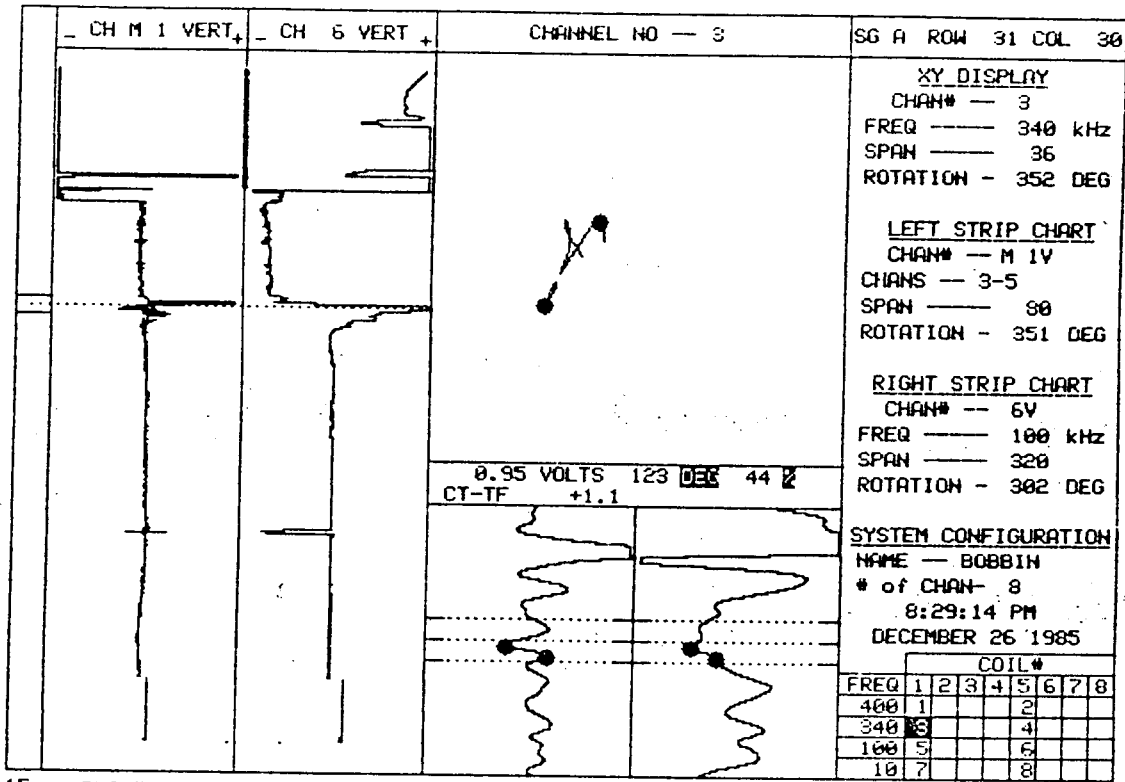




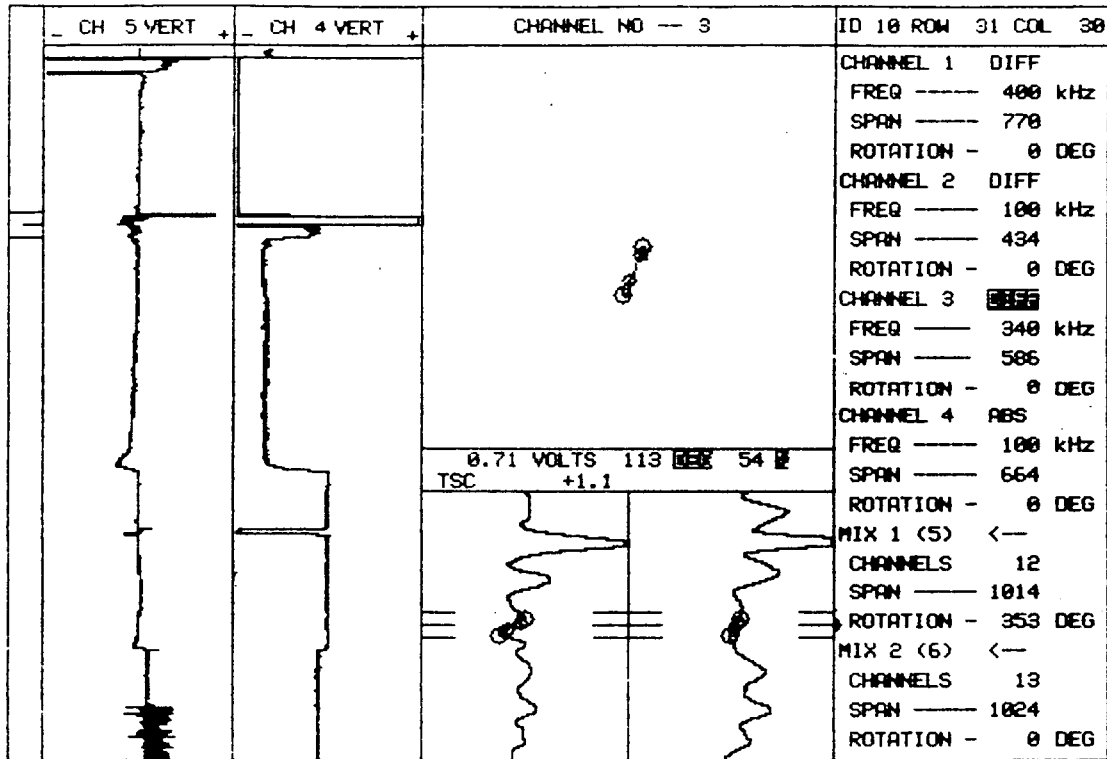


0.98 VOLTS 155 DEG 19 W  
TSC +2.2

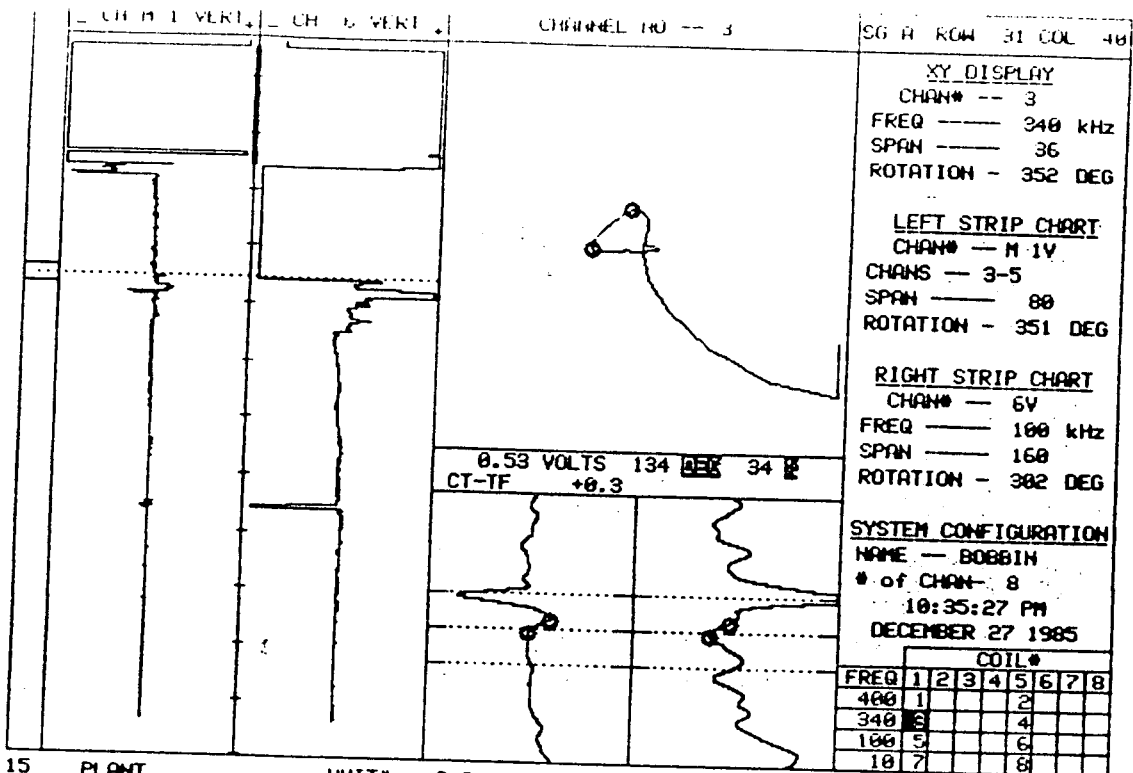
11	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



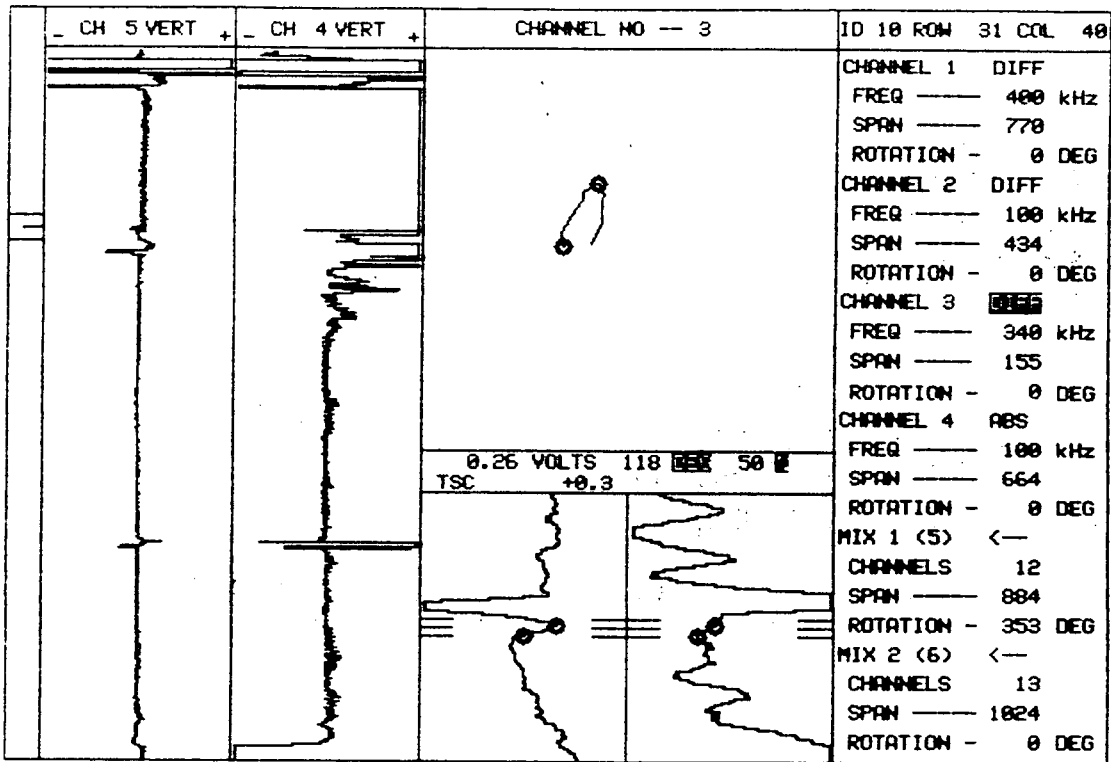
15    PLANT    UNIT#    S/G    LEG    DATE  
       SONGS DISK C33    1    A    OUTLET    12/26/85



10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1980    Edition 12.0 Rev 1

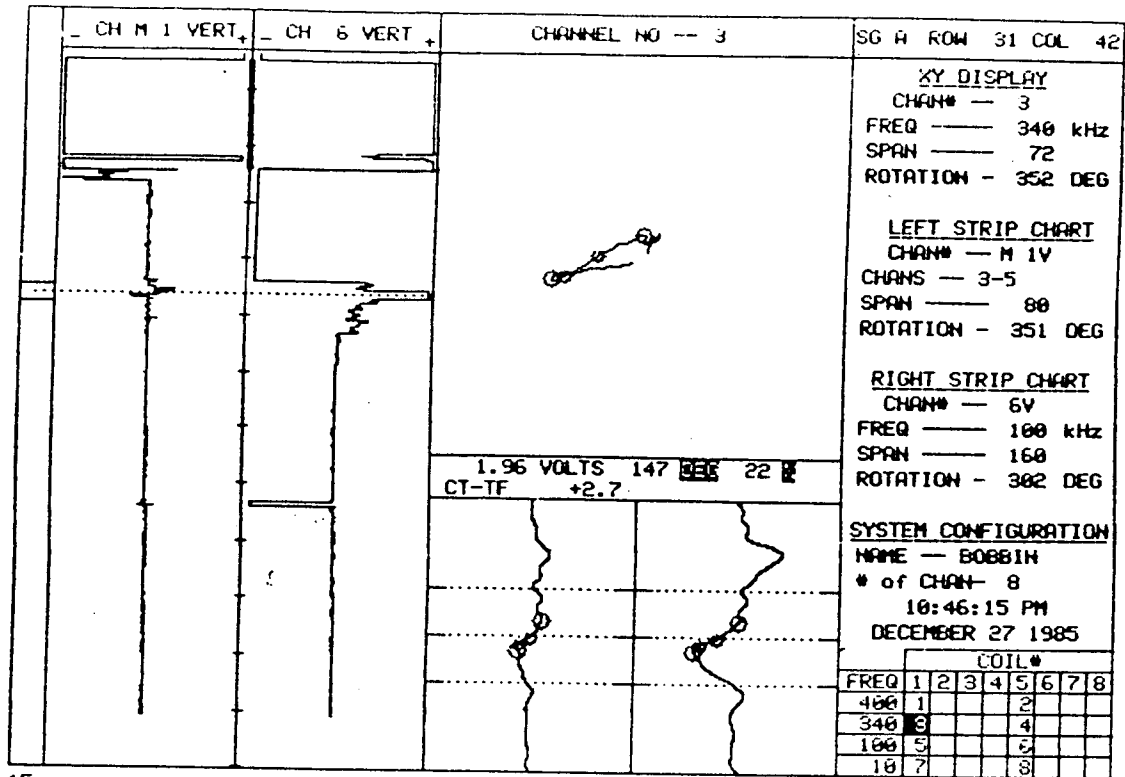


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85

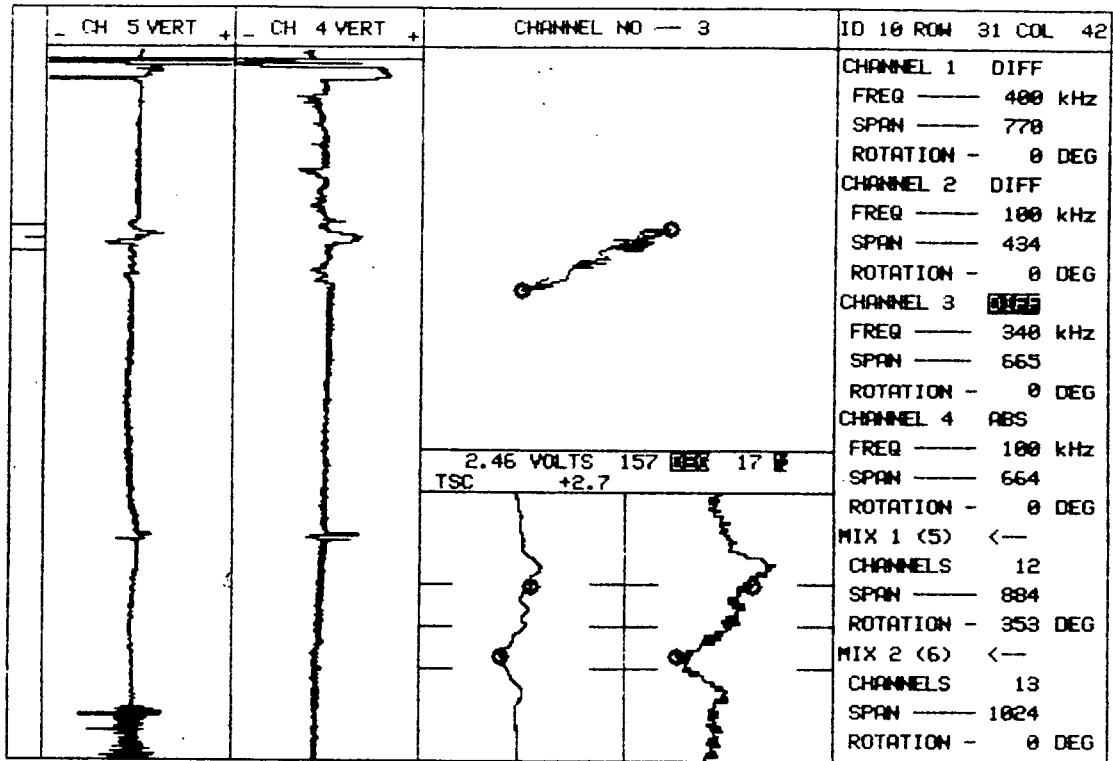


0.25 VOLTS 118 ~~DEG~~ 50 ~~Hz~~  
TSC +0.3

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85

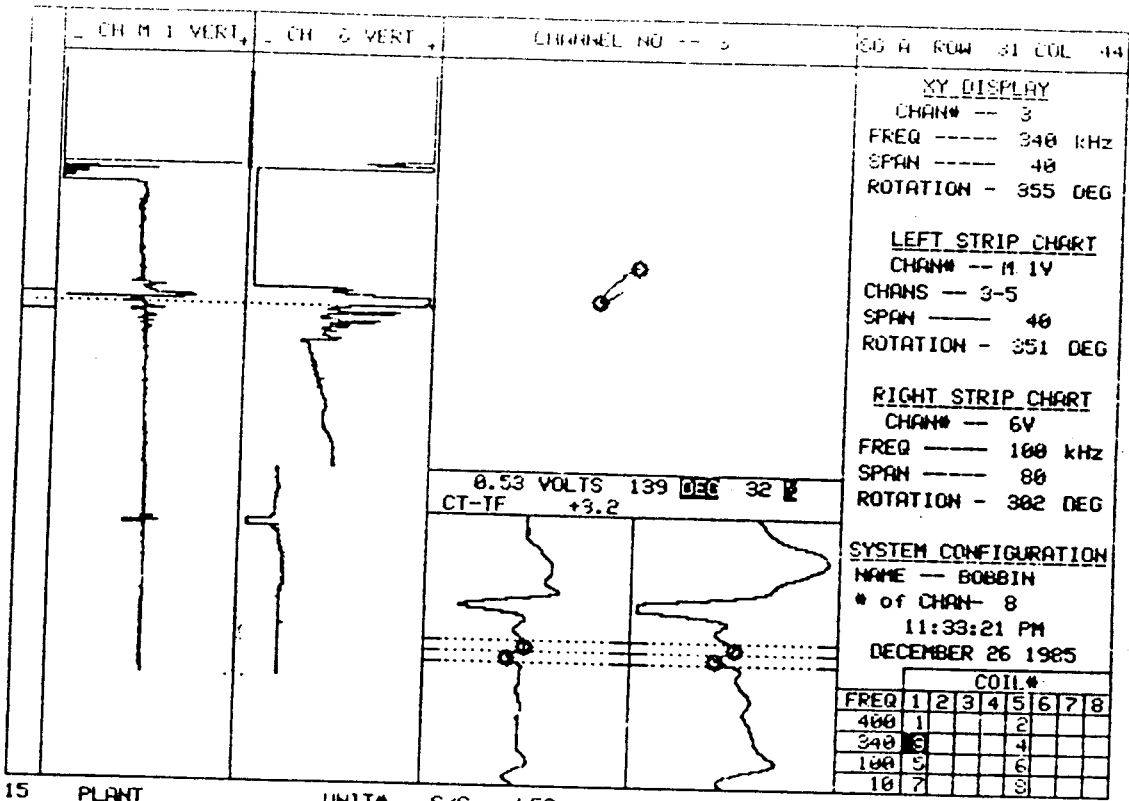


2.46 VOLTS 157 DEG 17  
TSC +2.7

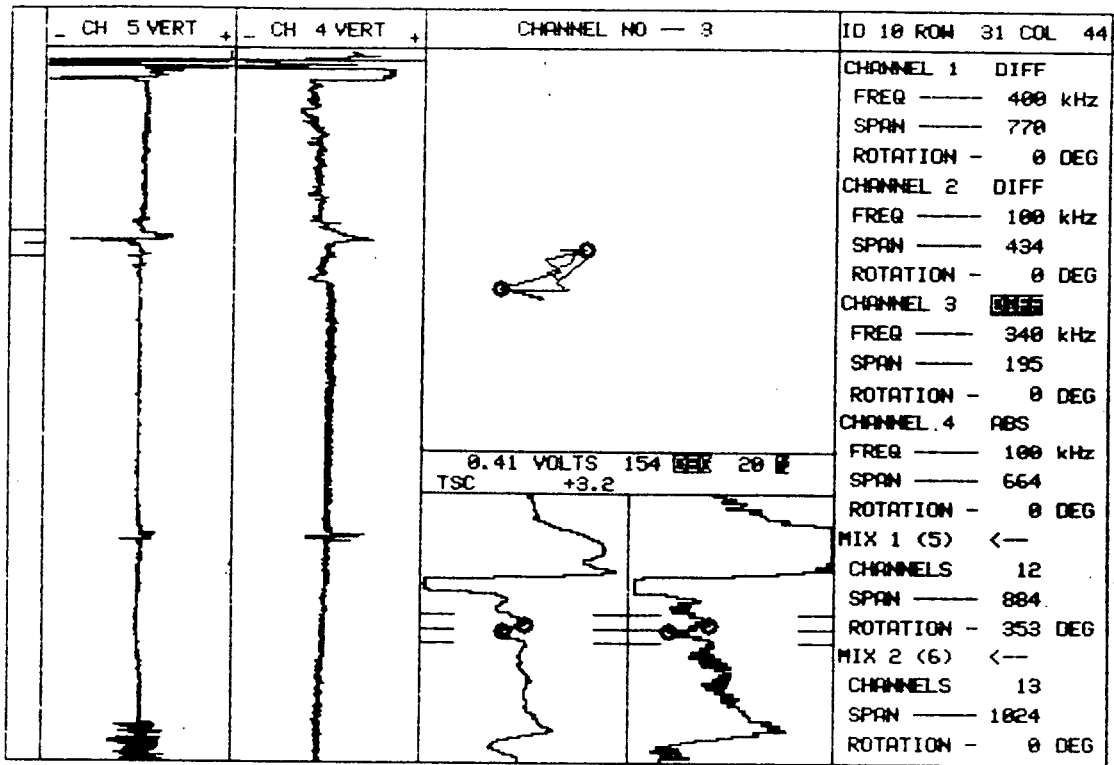
10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980

ZETEC Inc. - 1983  
Edition 12.0 Rev 1



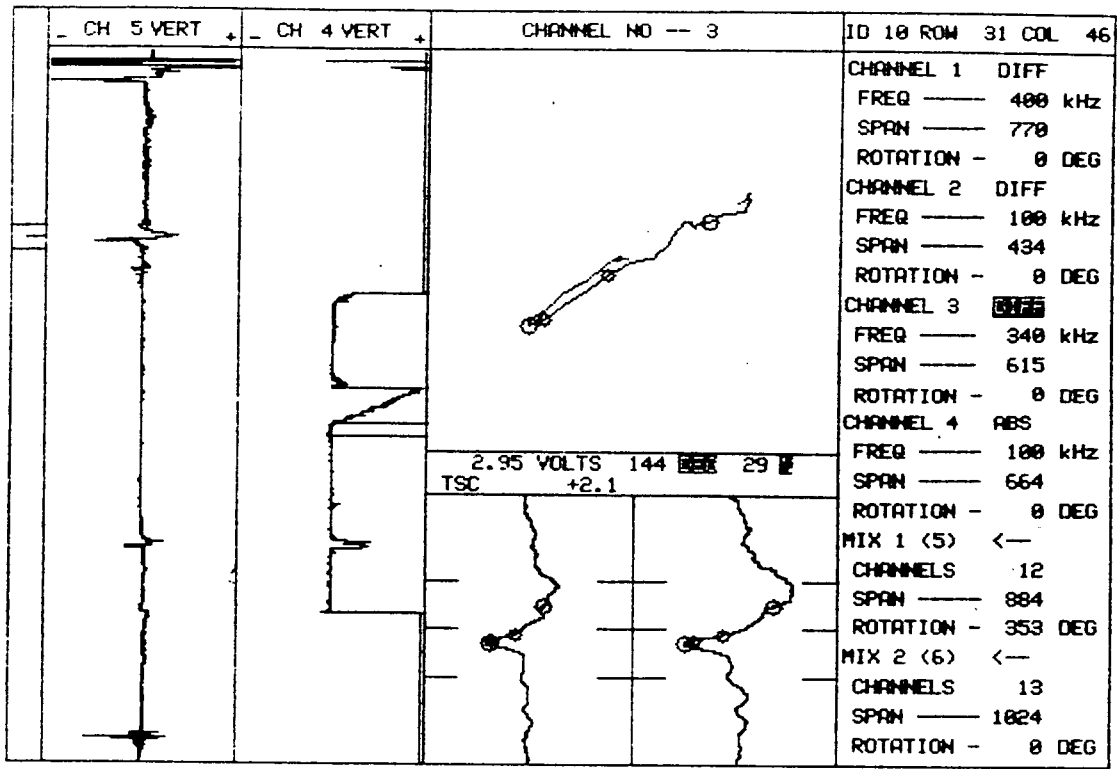


15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85

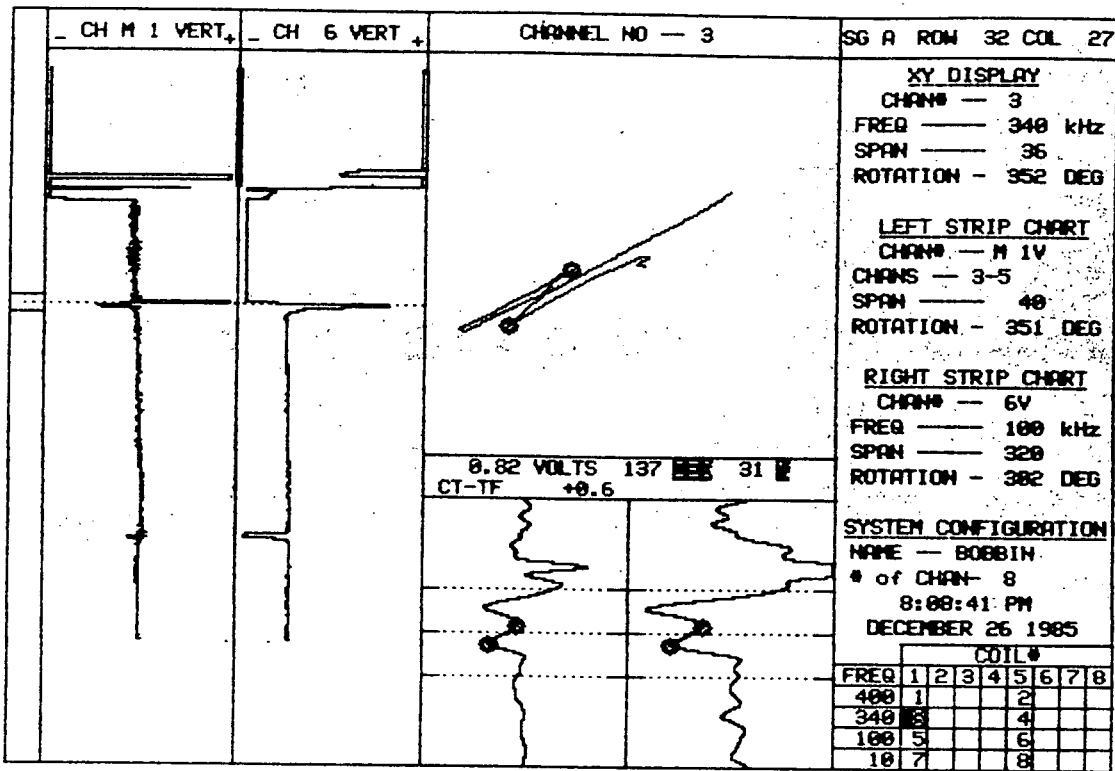


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

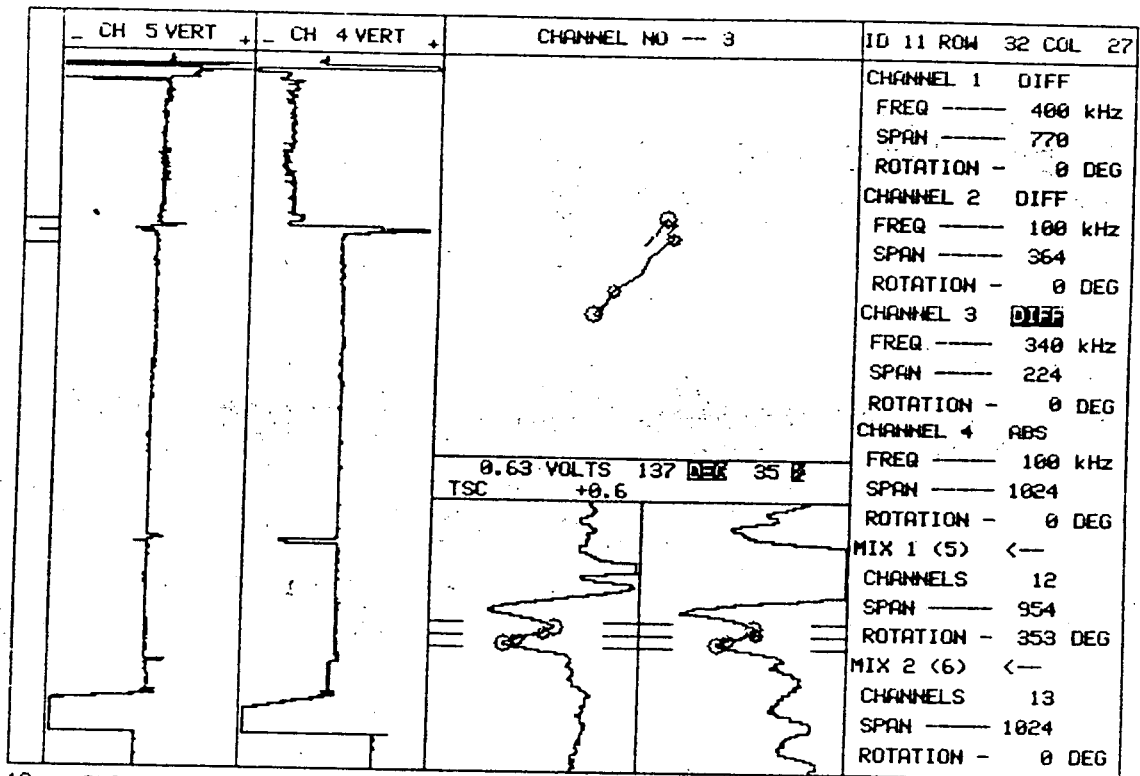




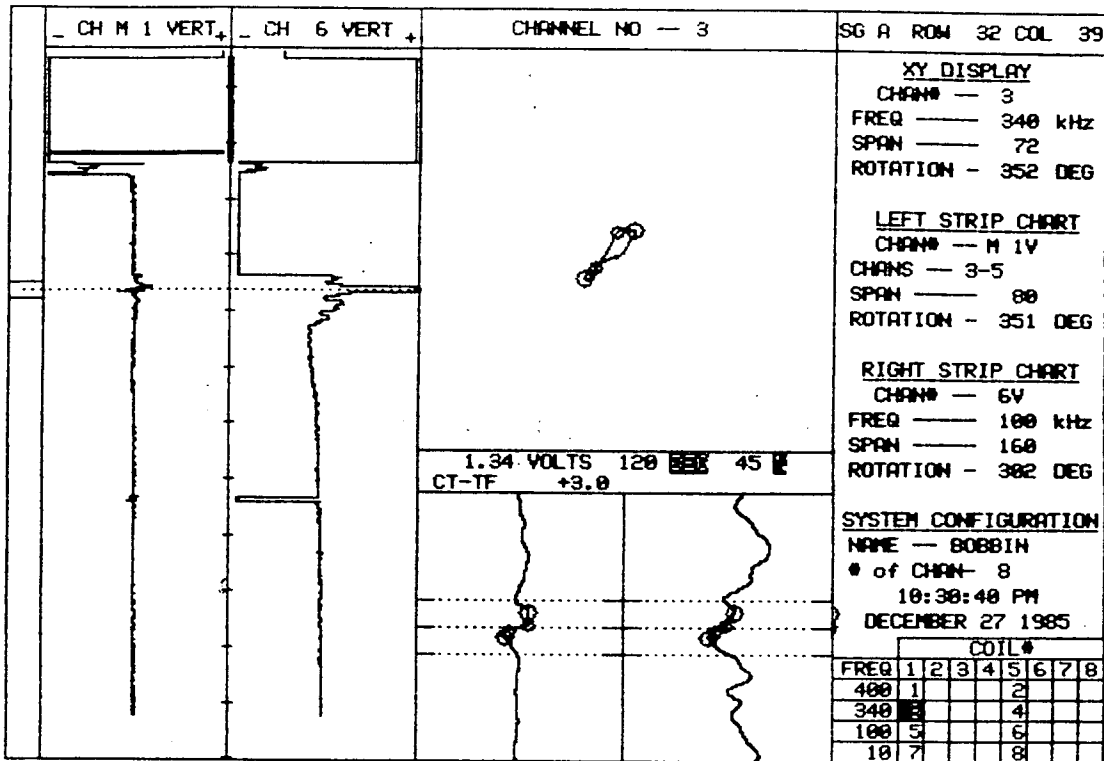
10 PLANT SCE SONGS UNIT# I S/G A LEG A DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



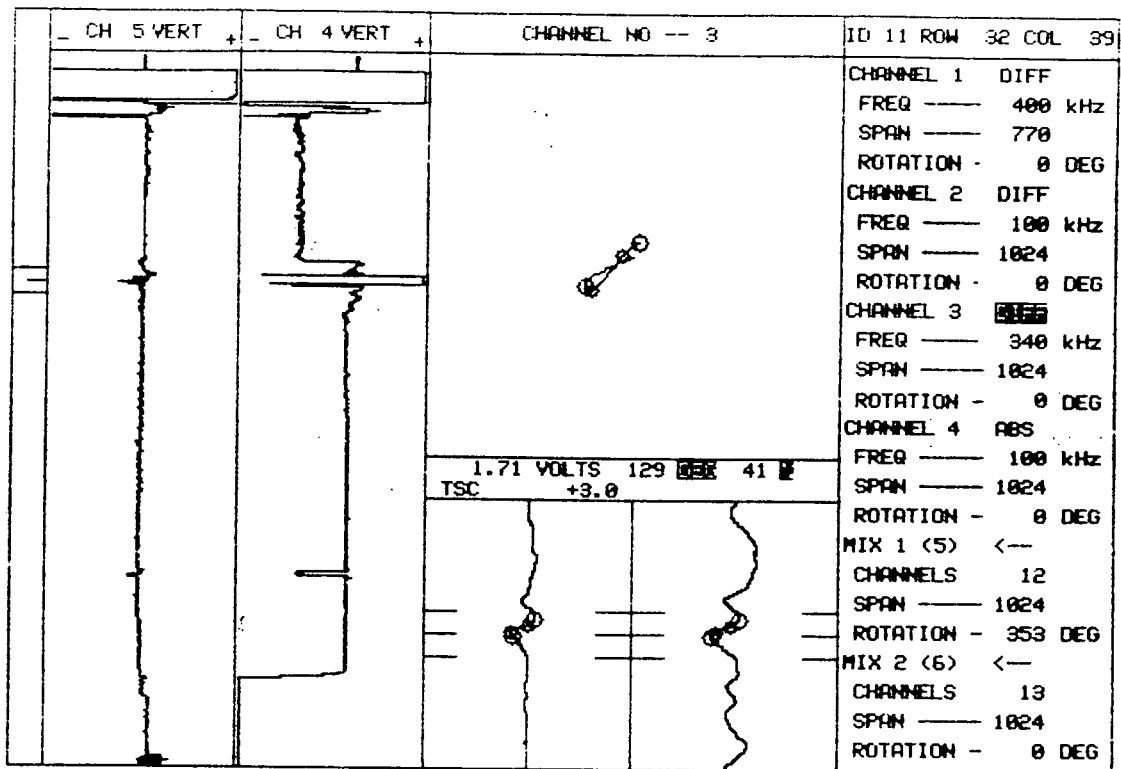
15 PLANT SONGS DISK C33 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

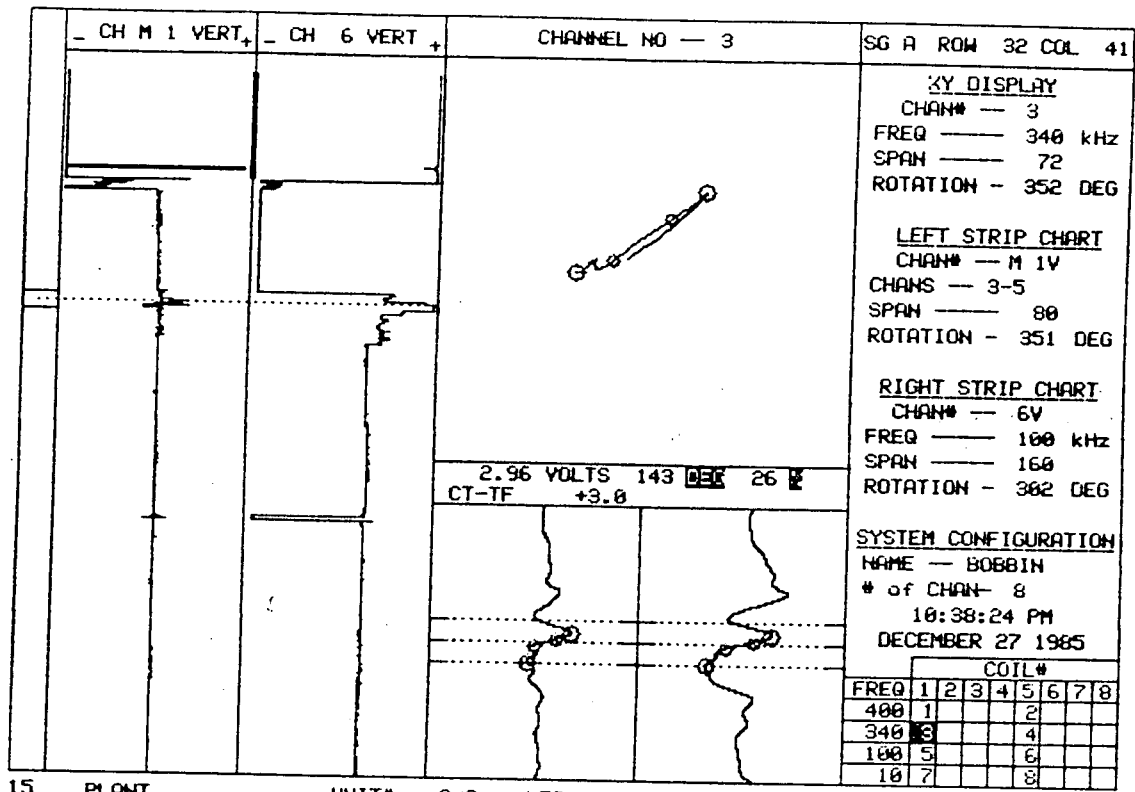


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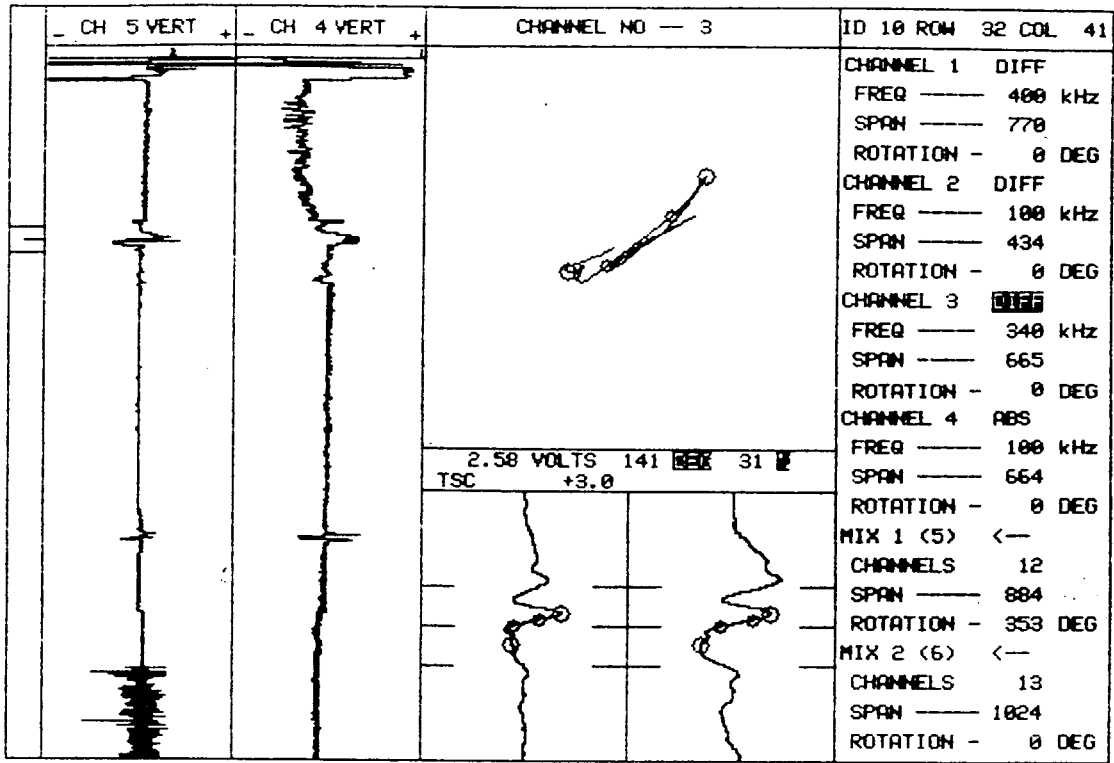
ZETEC Inc. - 1983  
Edition 12.0 Rev 1

S/6 A 1990

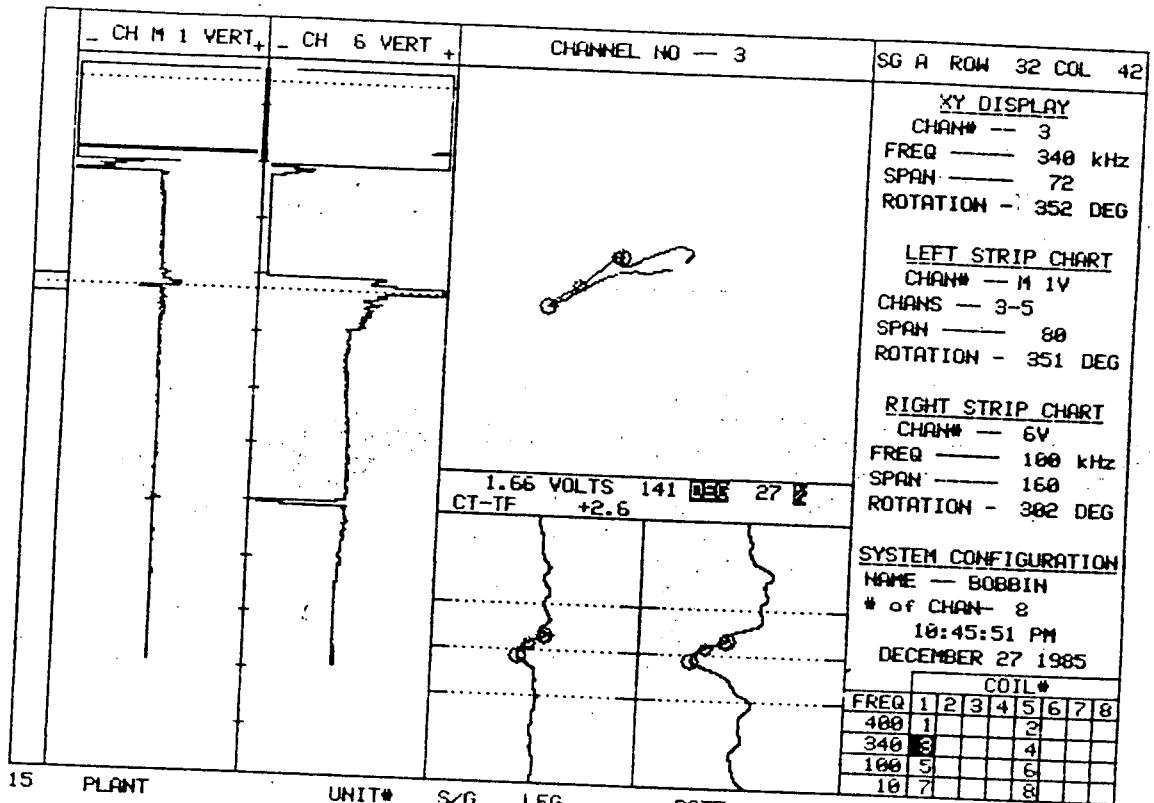




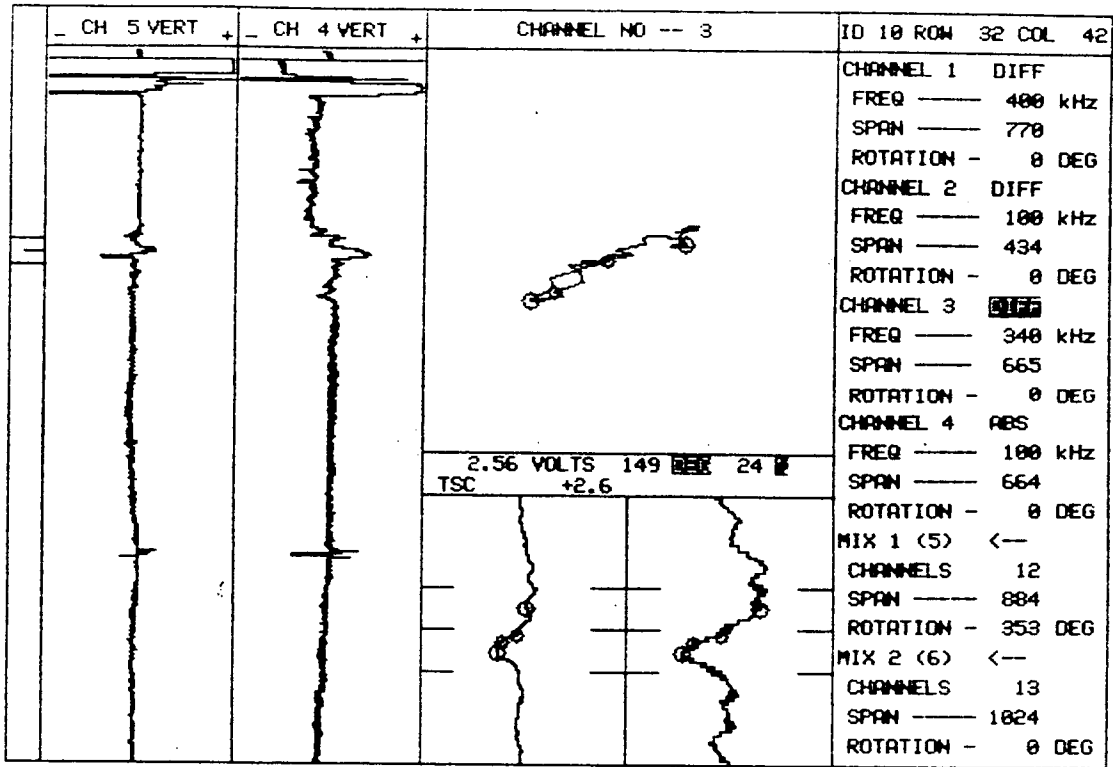
15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10 PLANT SCE SONGS UNIT# I S/G A LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

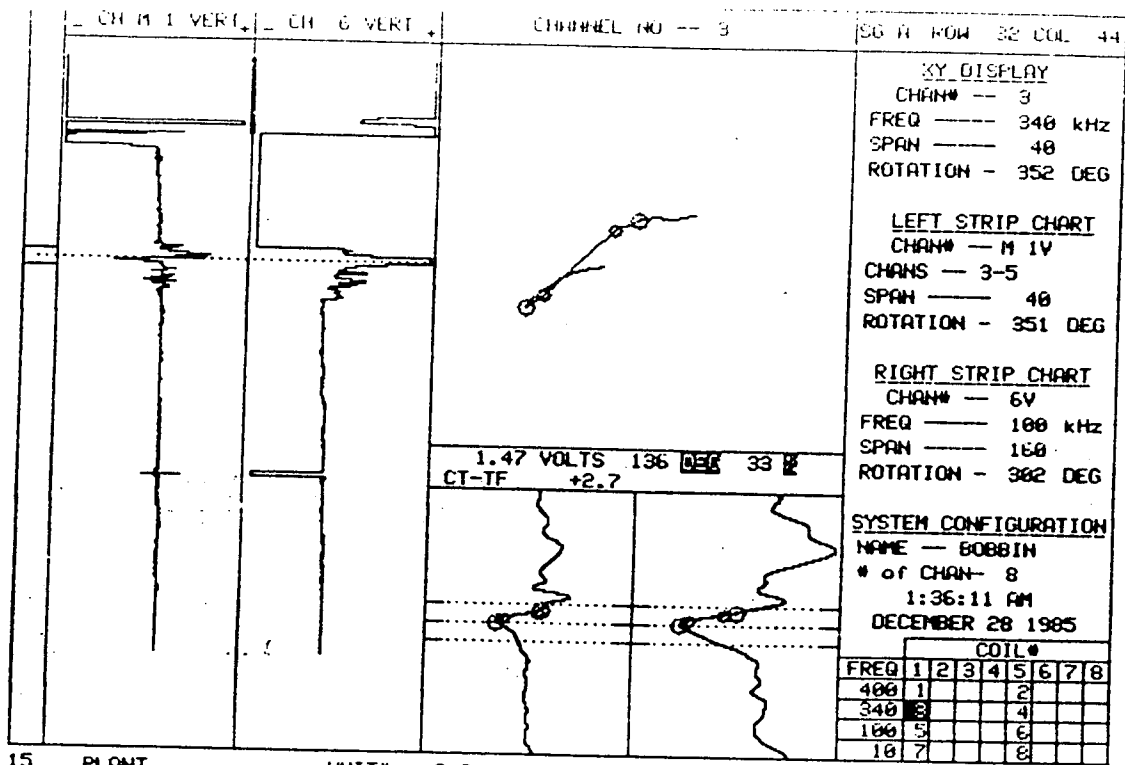


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85

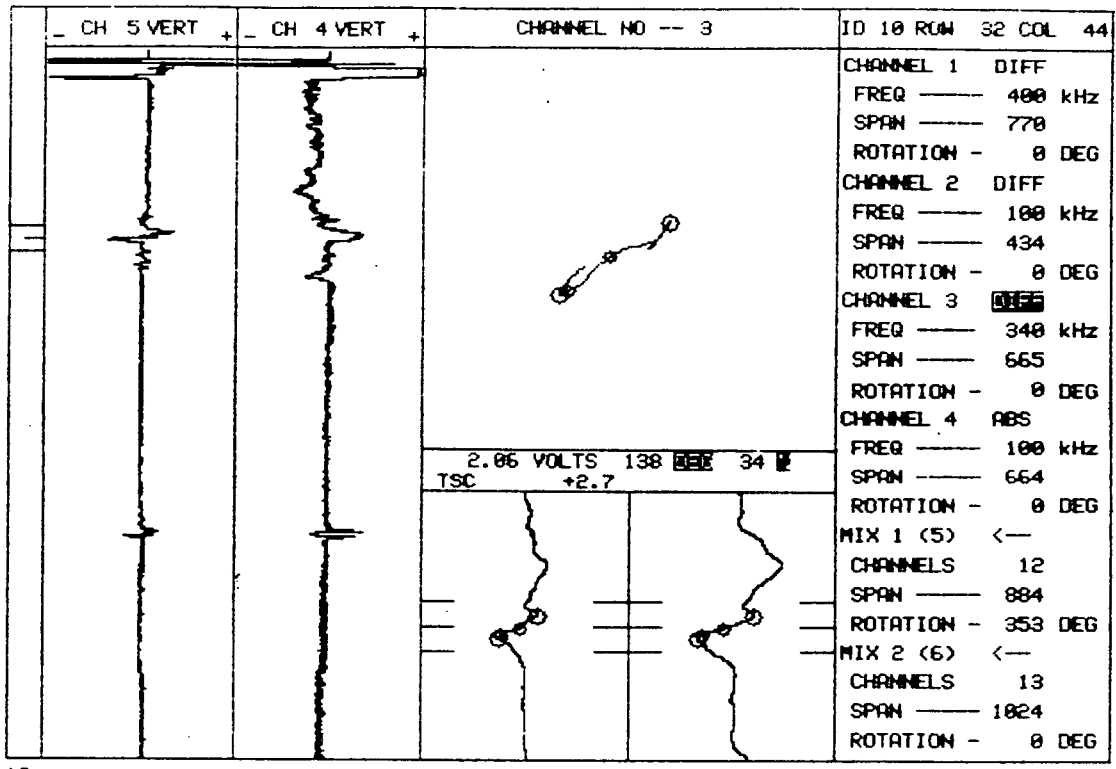


2.56 VOLTS 149 DEG 24  
TSC +2.6

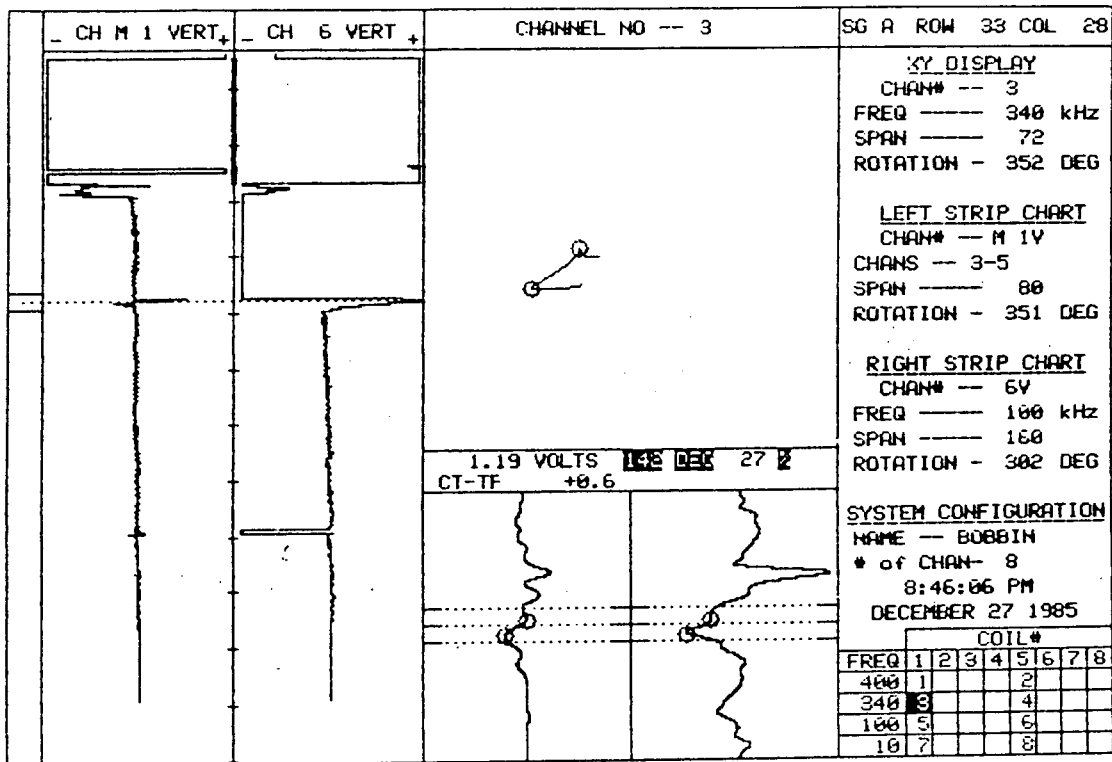
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



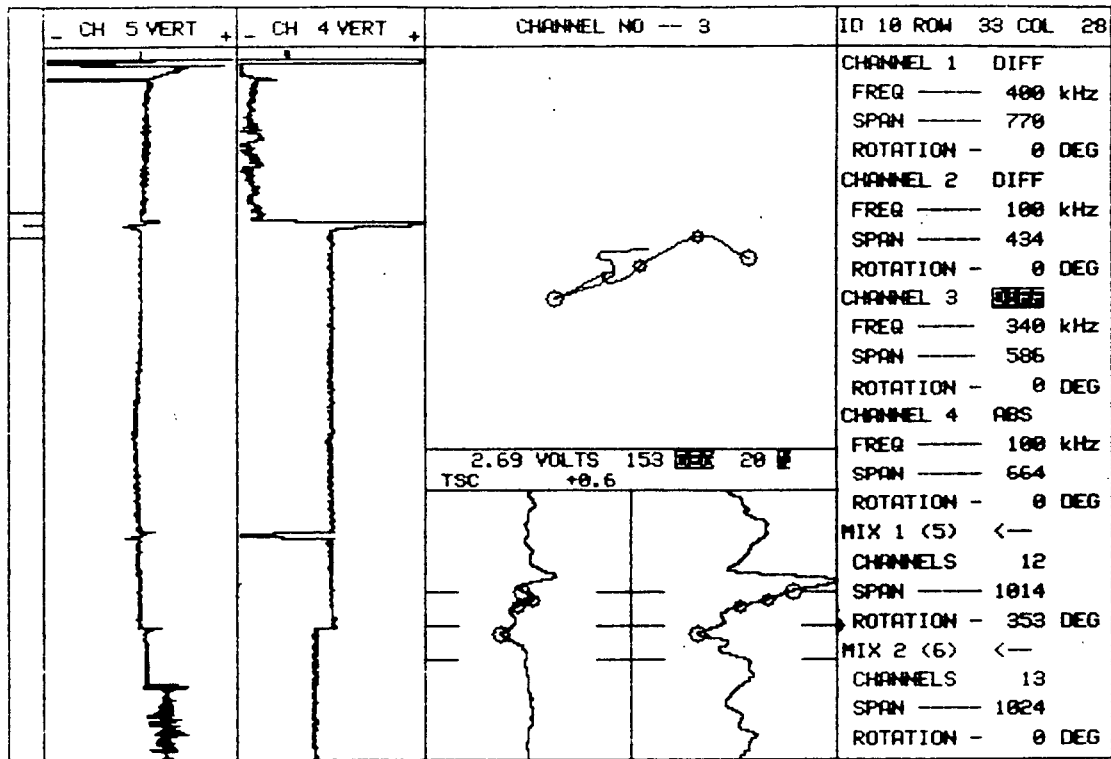
15 PLANT SONGS DISK C37 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85



10 PLANT SCE SONGS UNIT# I S/G A LEG A OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

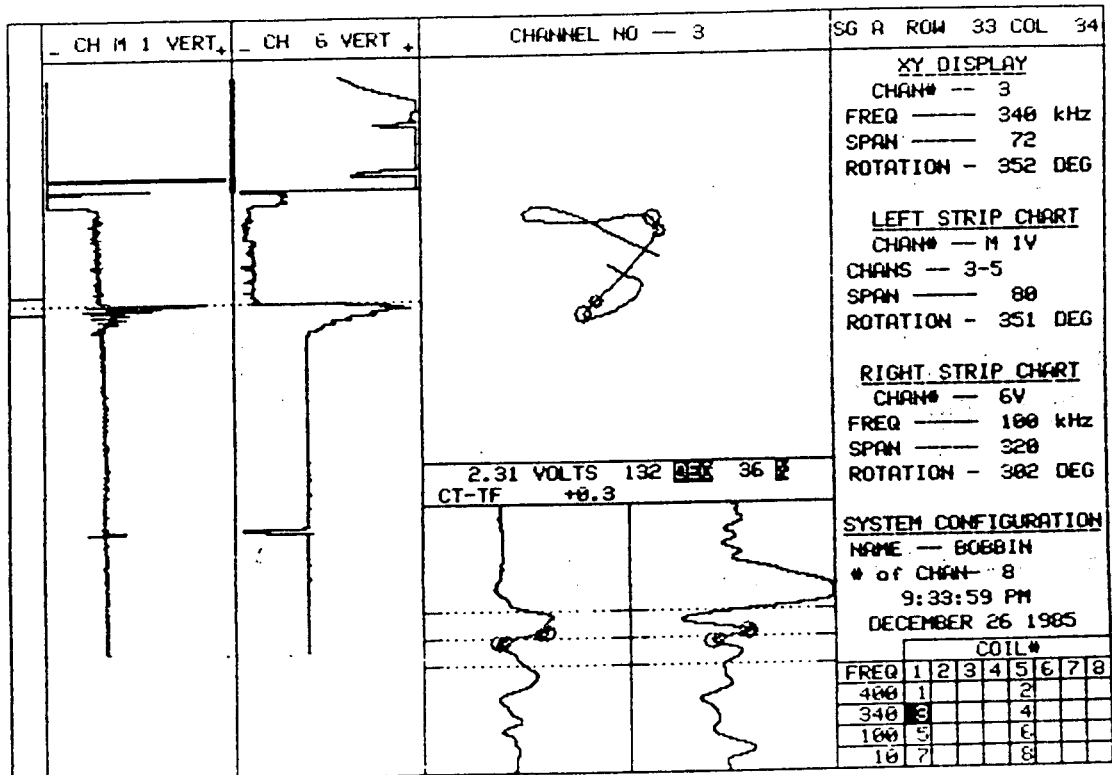


15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

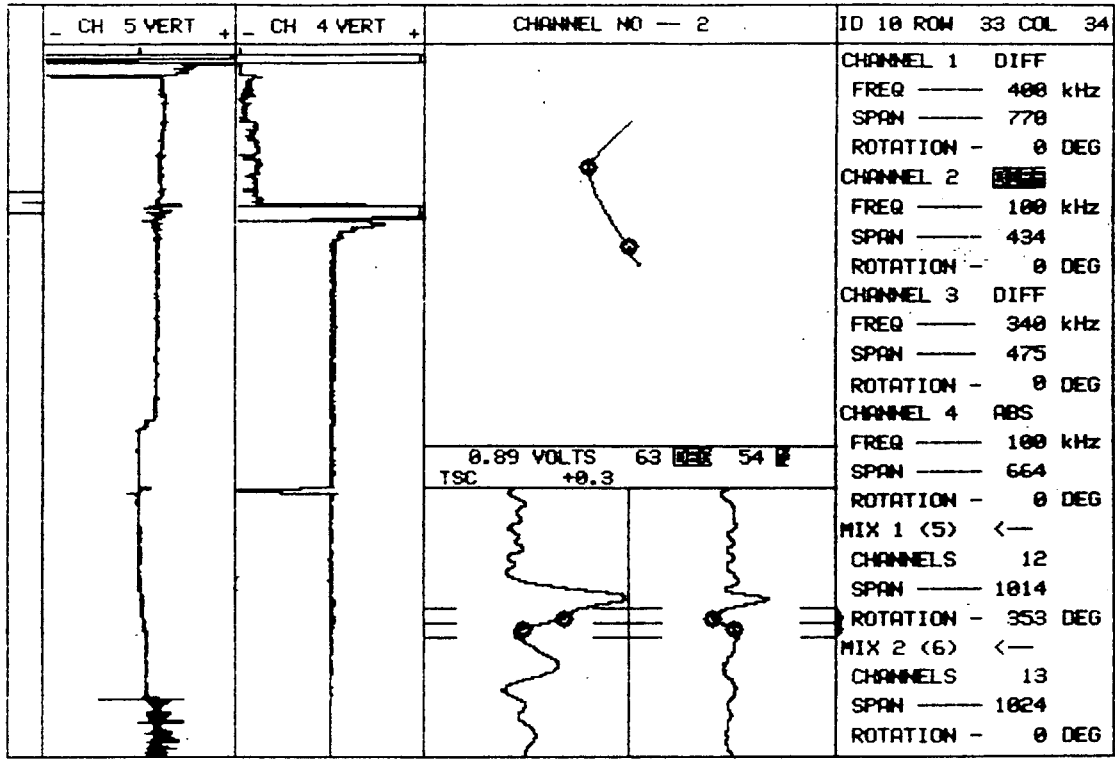


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

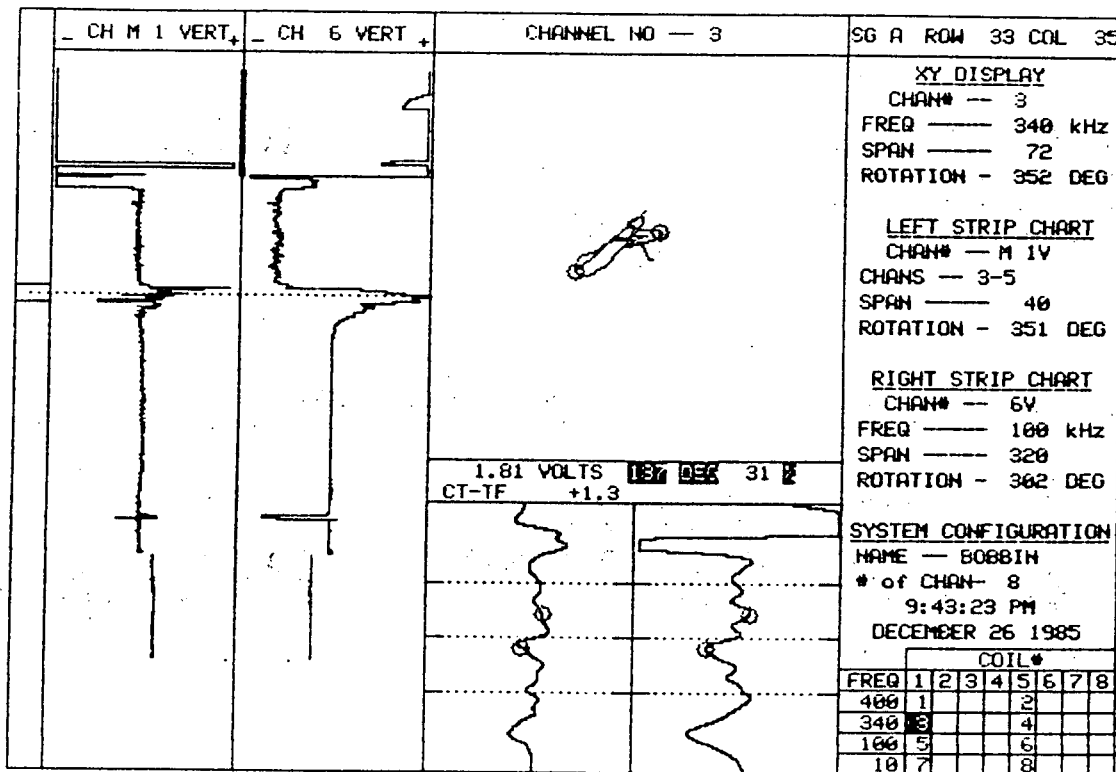




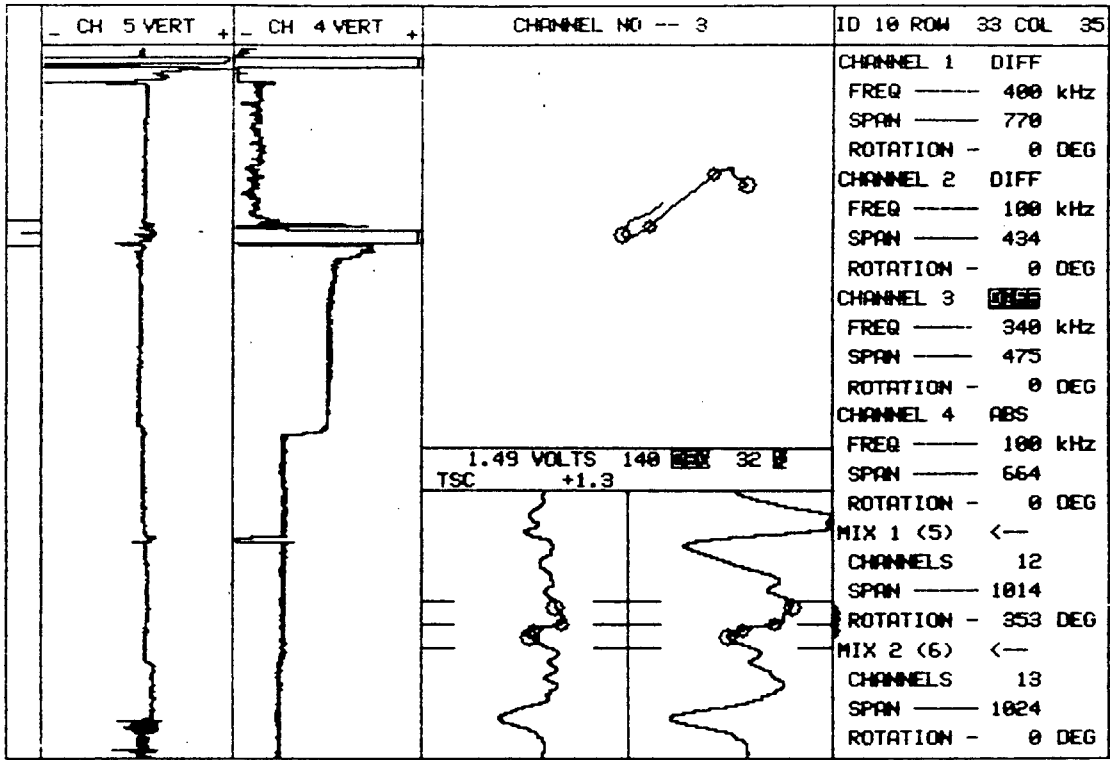
15 PLANT SONGS DISK C33 UNIT# 1 S/G A LEG OUTLET DATE 12/26/85



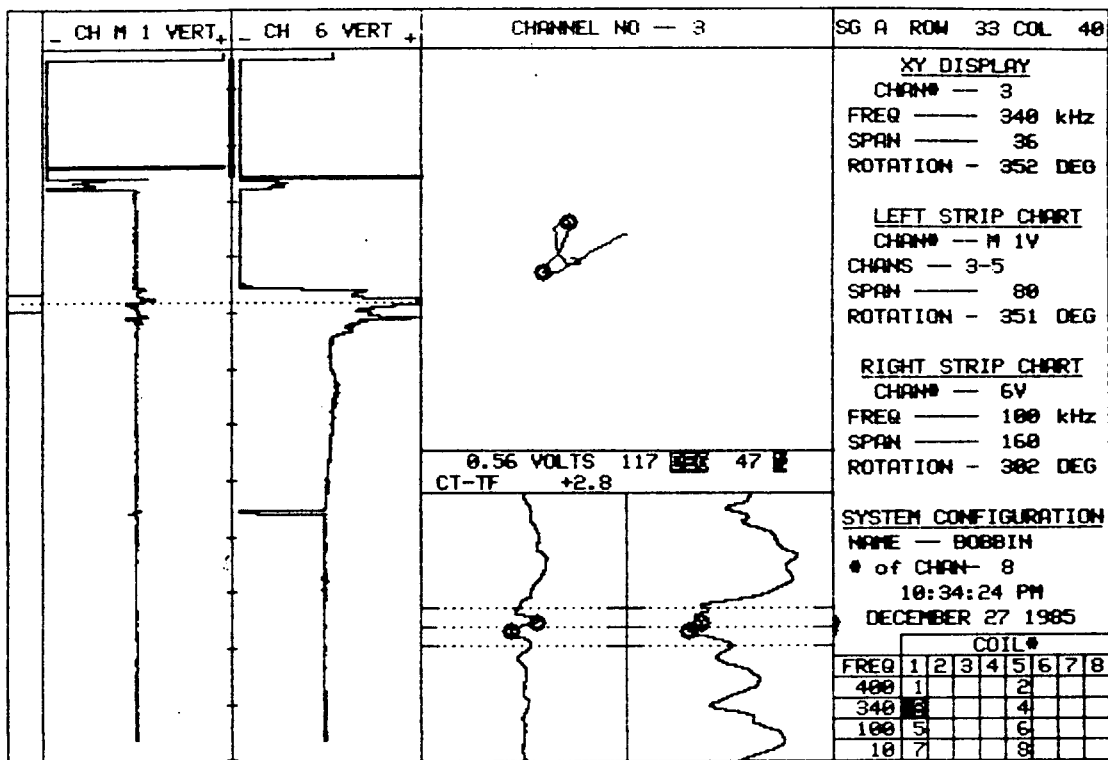
11	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



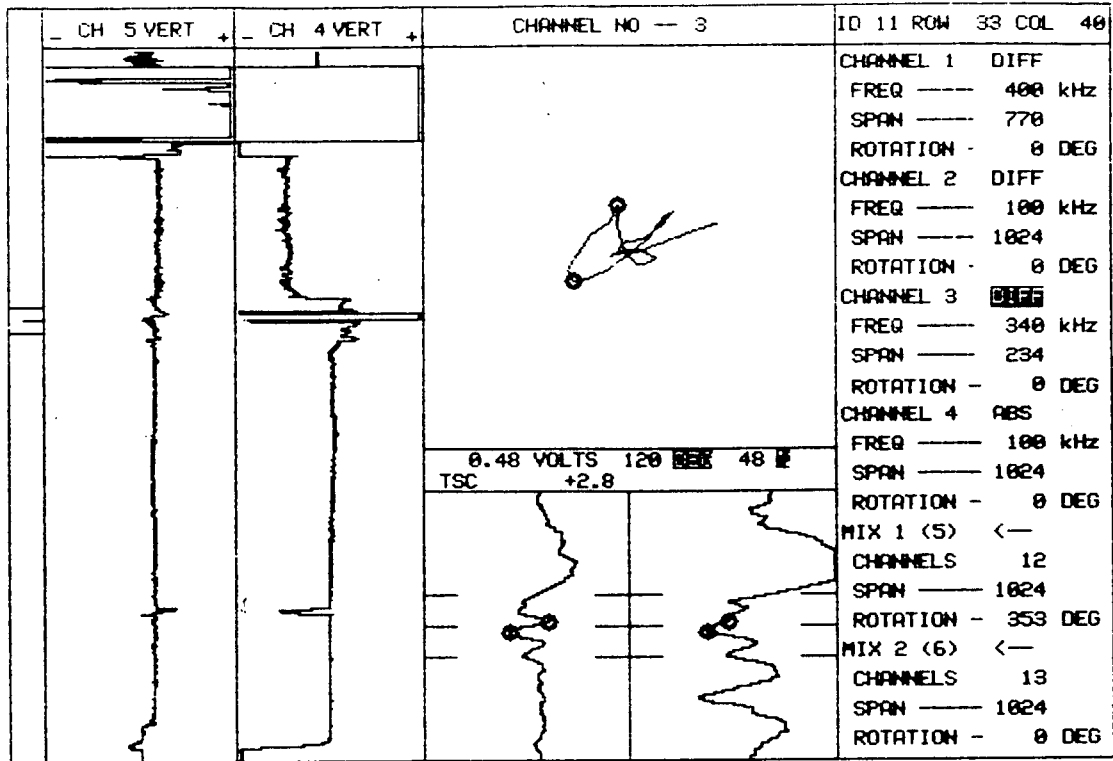
15    PLANT    UNIT#    S/G    LEG    DATE  
      SONGS DISK C33    1    A    OUTLET    12/26/85



10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    A    OUTLET    1988    Edition 12.0 Rev 1



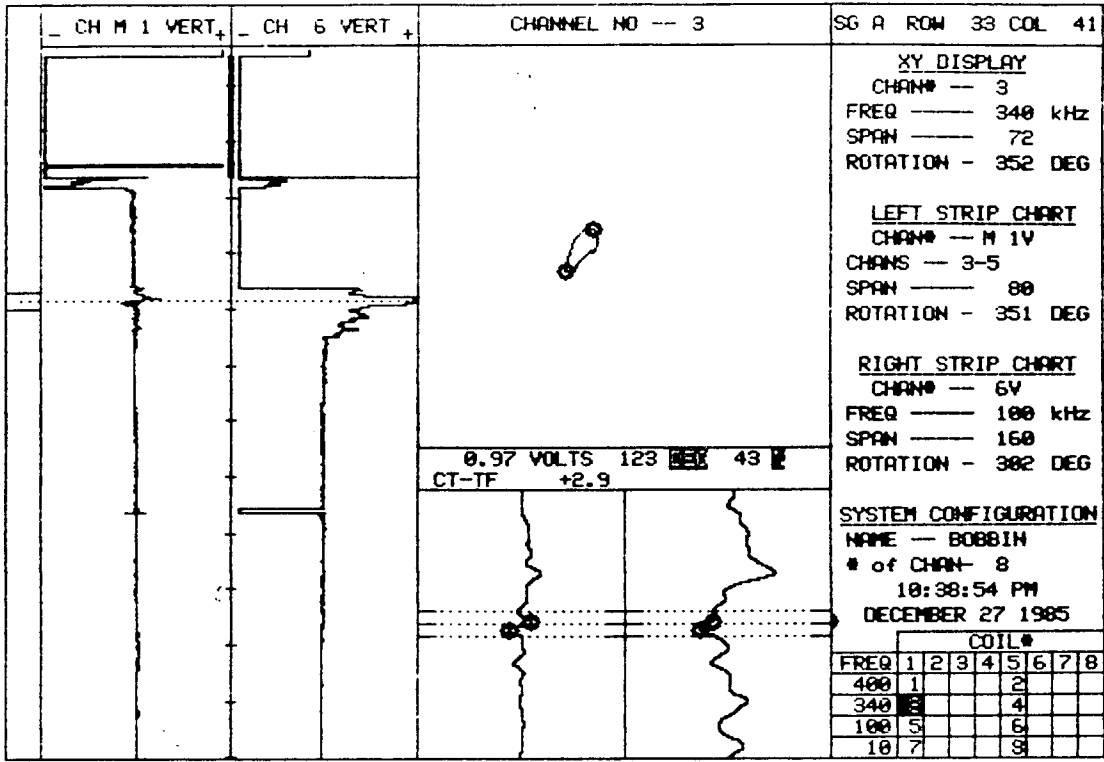
PLANT SONGS DISK C36 UNIT# 1 S/G R LEG OUTLET DATE 12/27/85



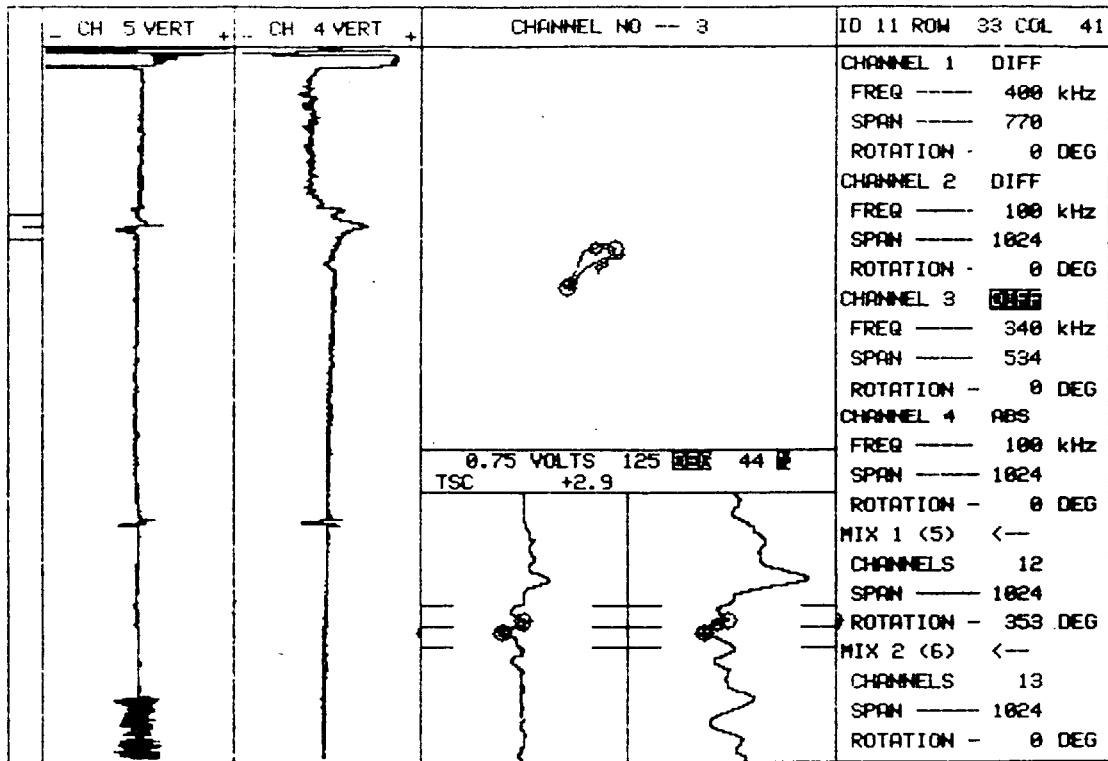
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ZETEC Inc. - 1983  
Edition 12.0 Rev 1

S/G A 1980



15 PLANT SONGS DISK C36 UNIT# 1 S/G A LEG OUTLET DATE 12/27/85

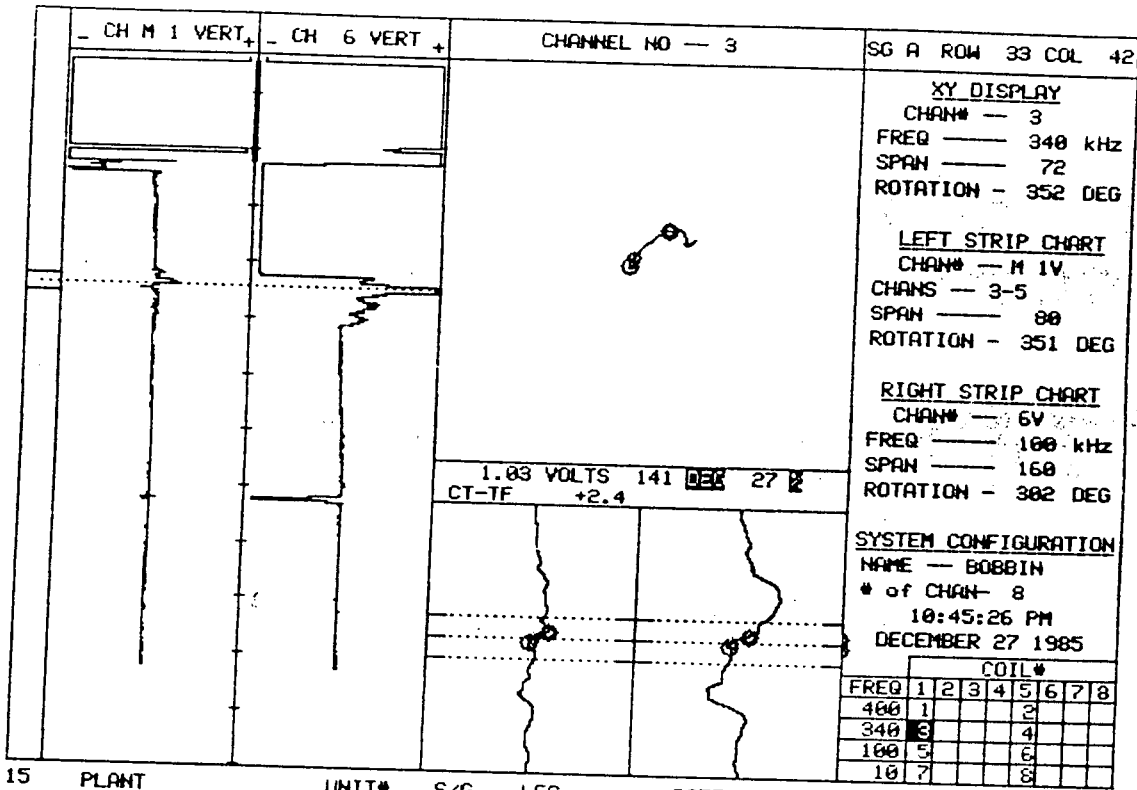


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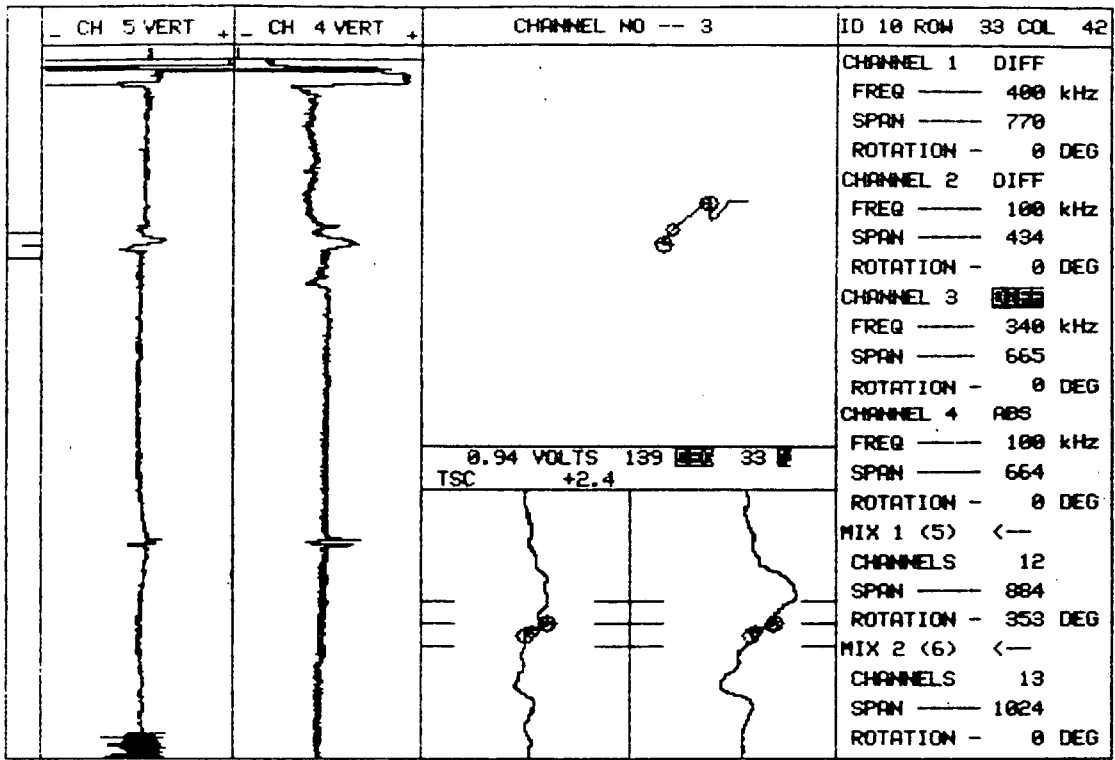
ZETEC Inc. - 1983  
Edition 12.0 Rev 1

S/G A 1980

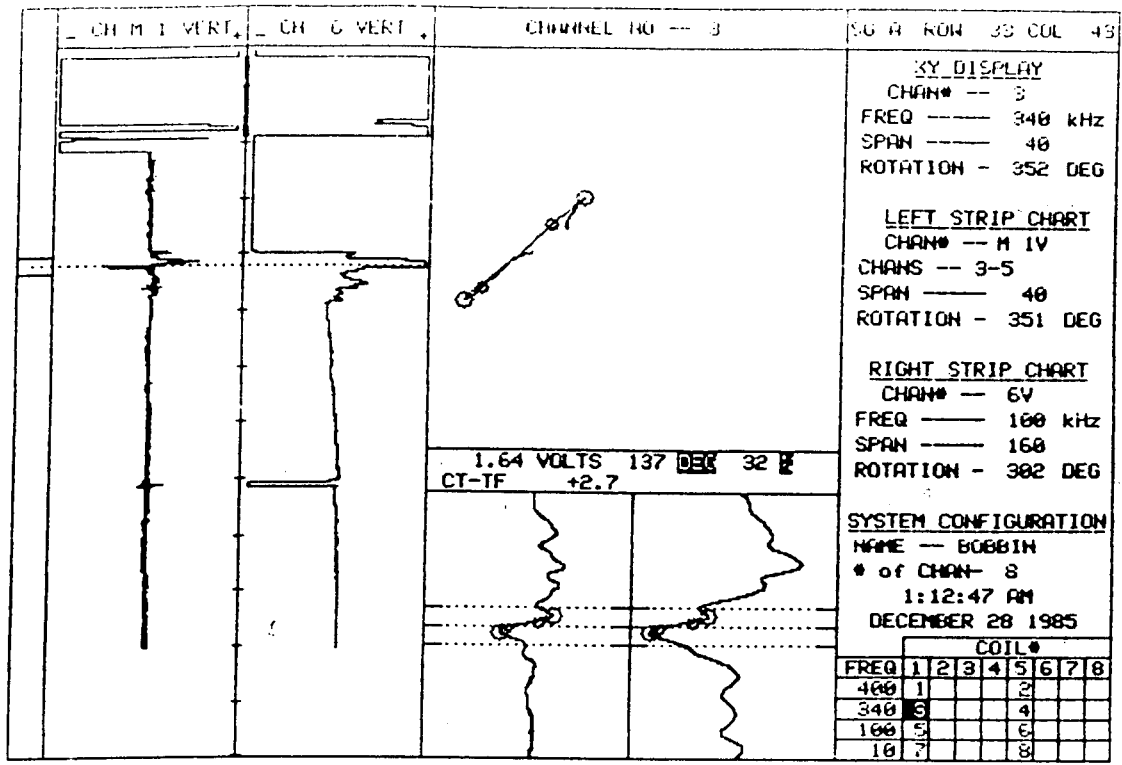




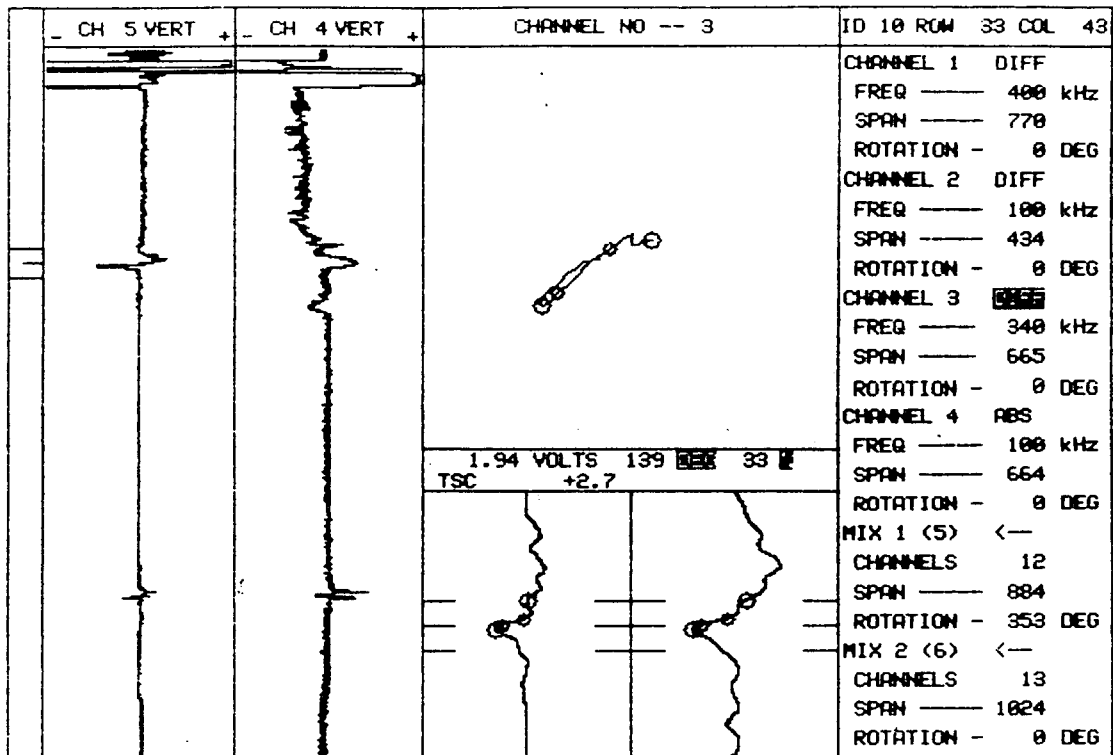
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C36    1    A    OUTLET    12/27/85



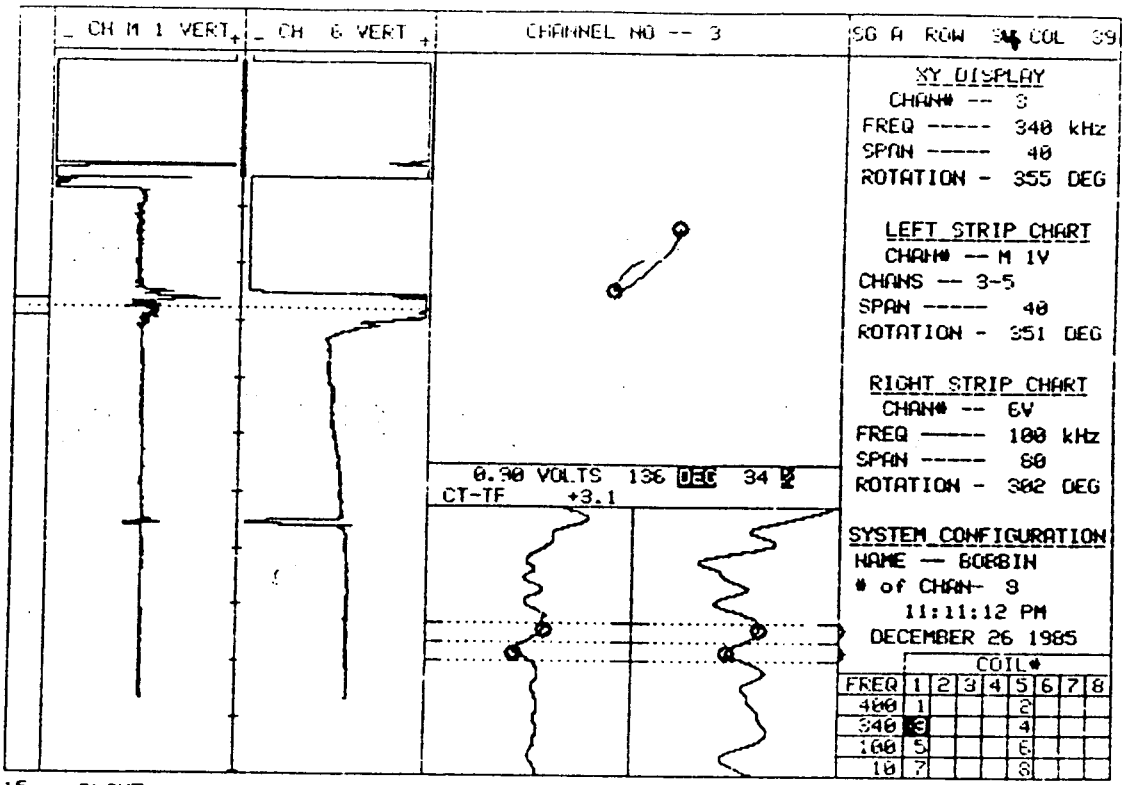
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1



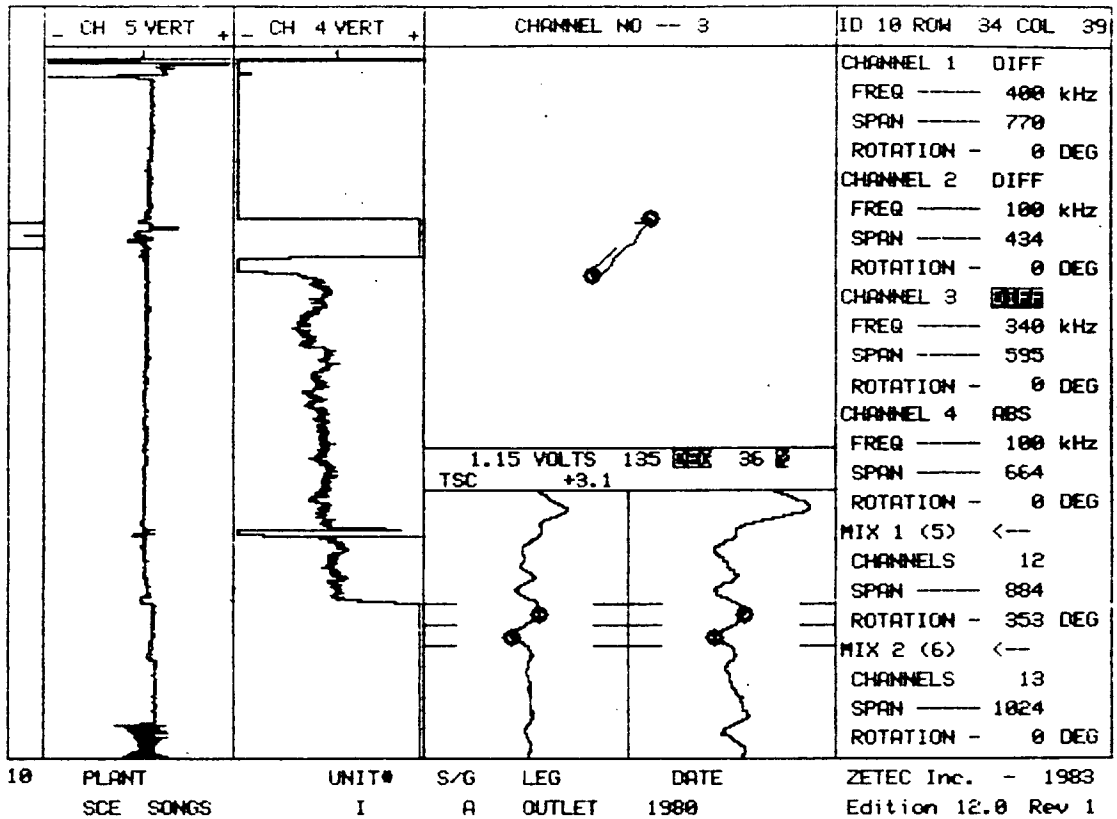
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C37    1    A    OUTLE    12/27/85

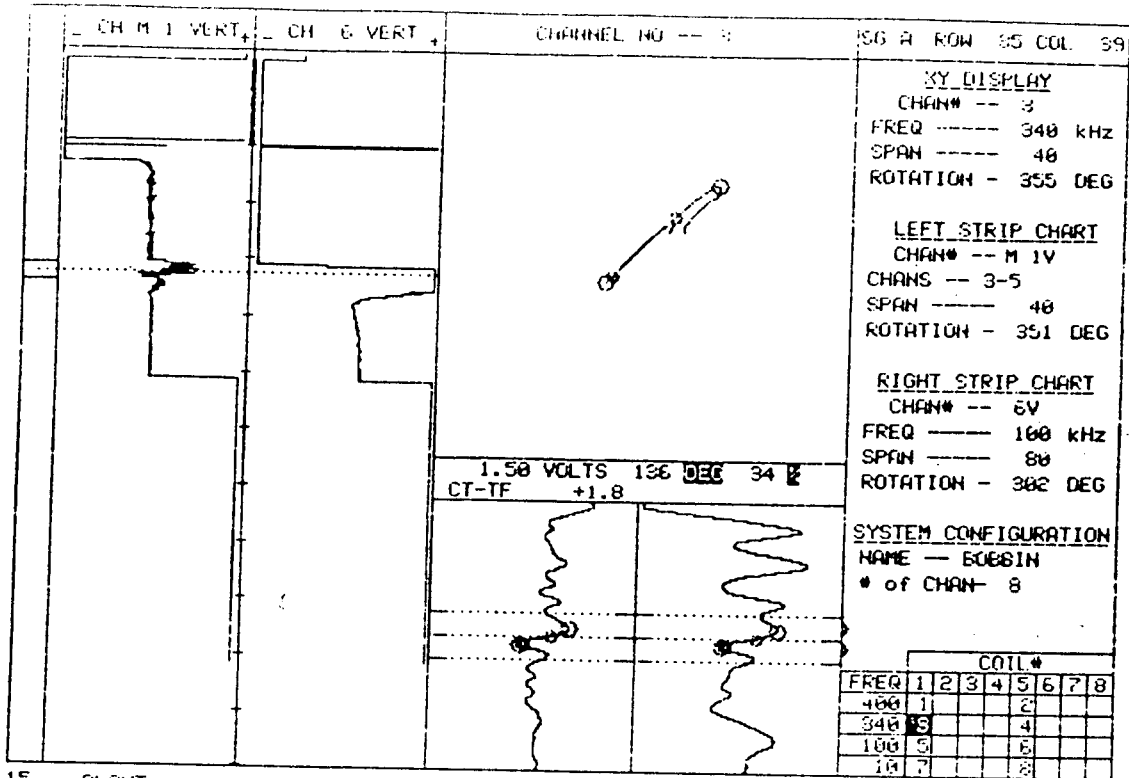


9	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

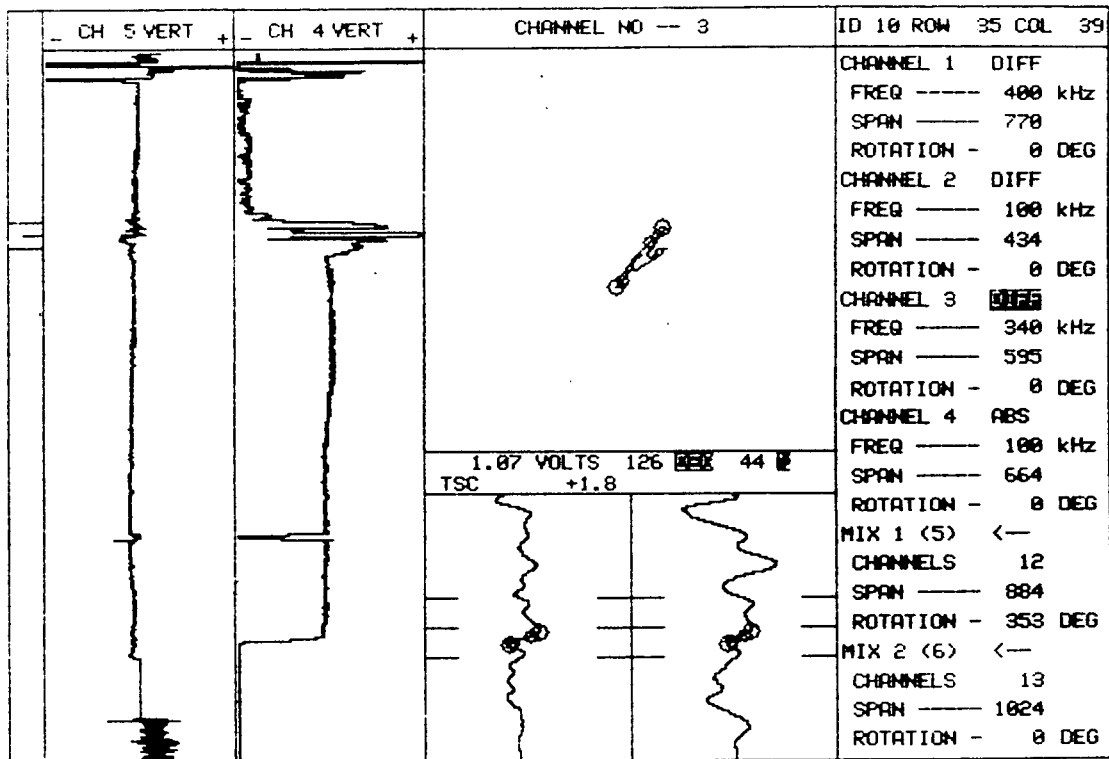


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C34    1    A    OUTLE    12/26/85



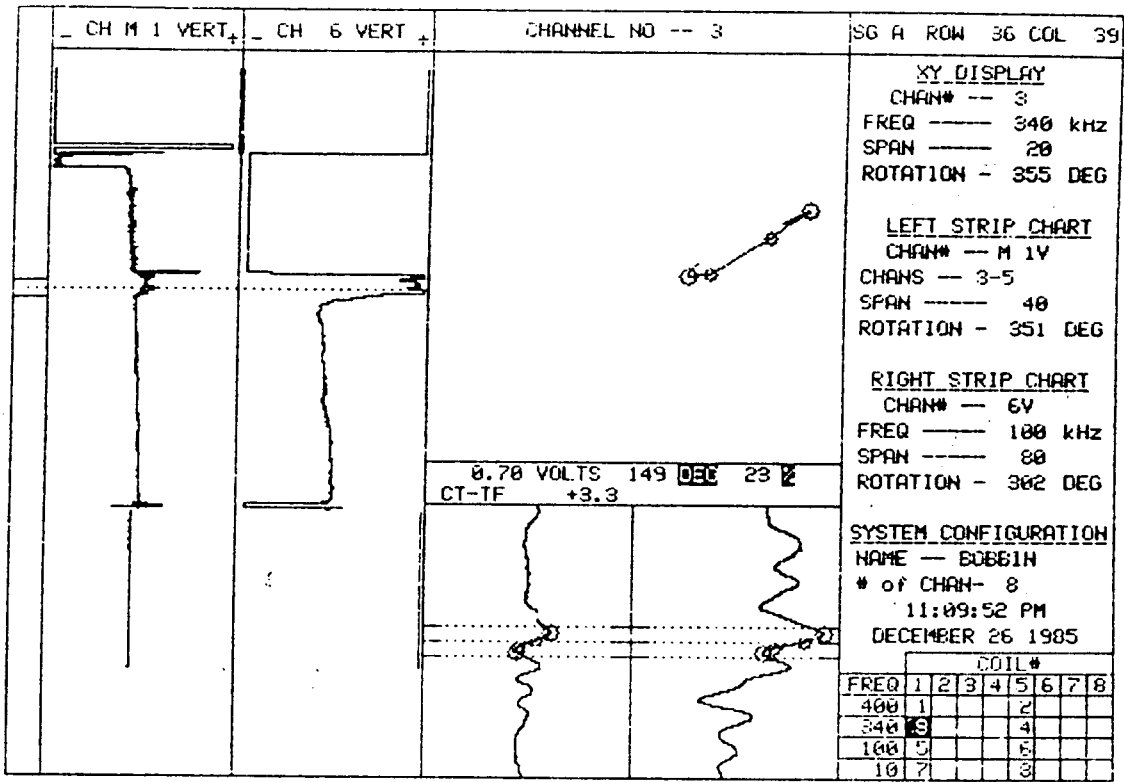


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C34    1    A    OUTLE    12/26/55

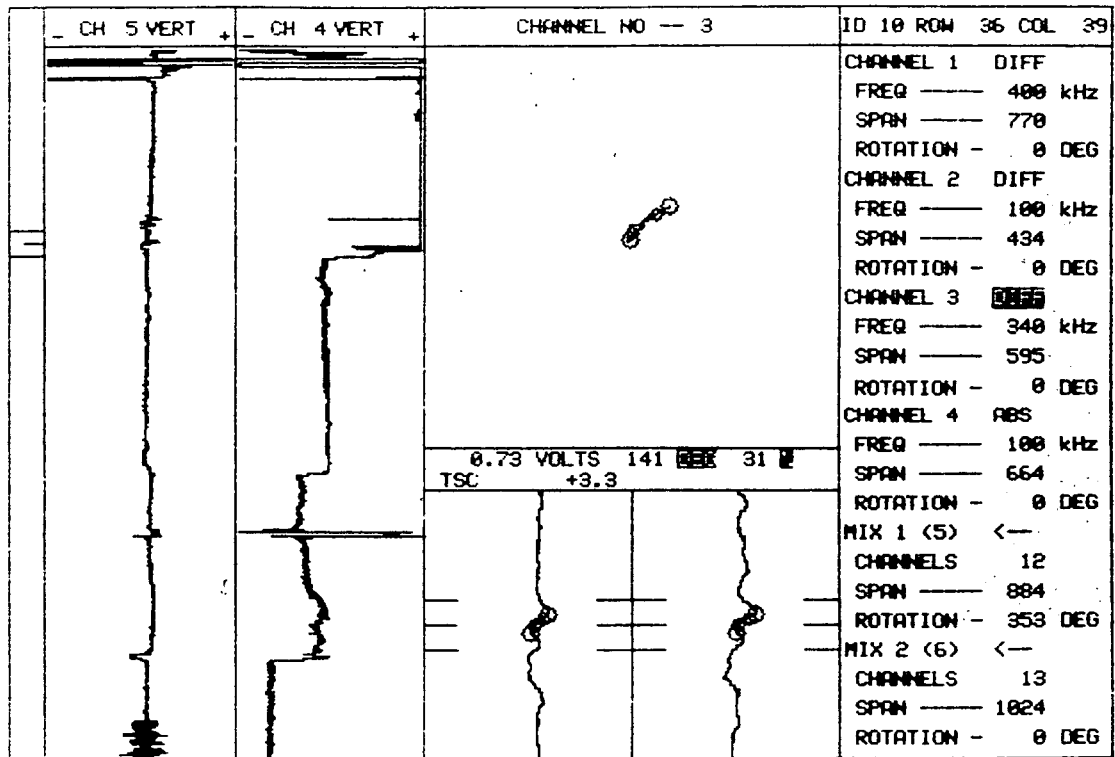


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1





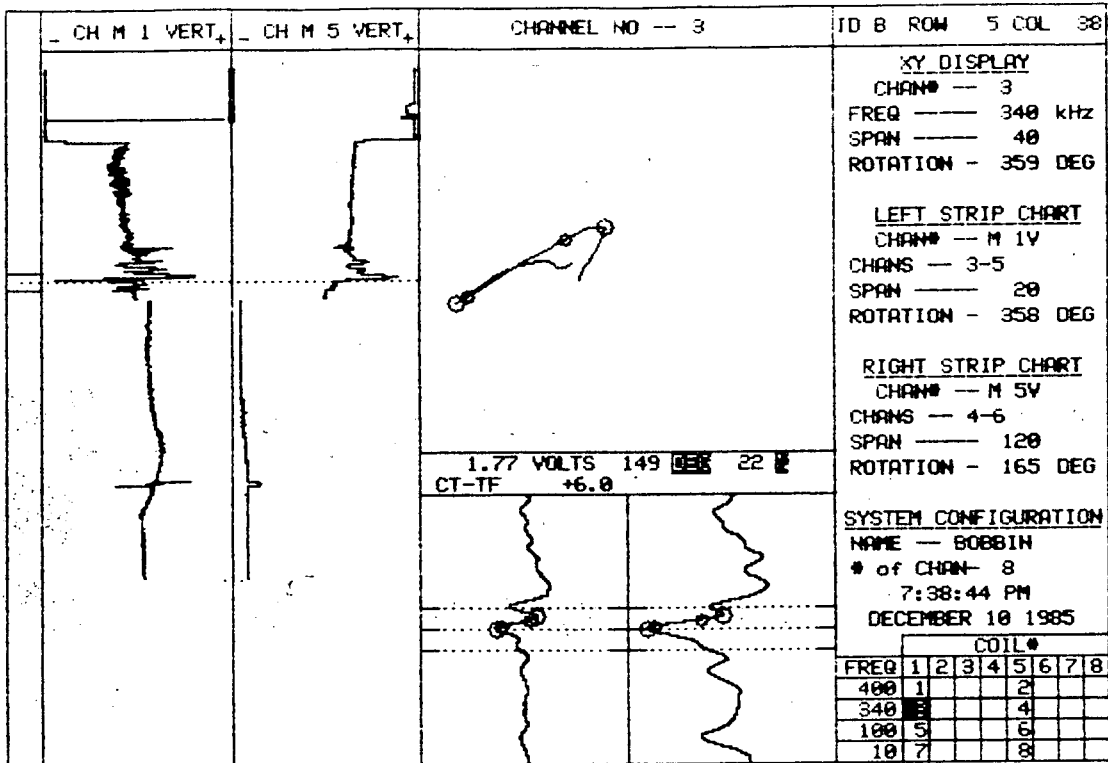
15 PLANT SONGS DISK C34 UNIT# 1 S/G A LEG OUTLE DATE 12/26/85



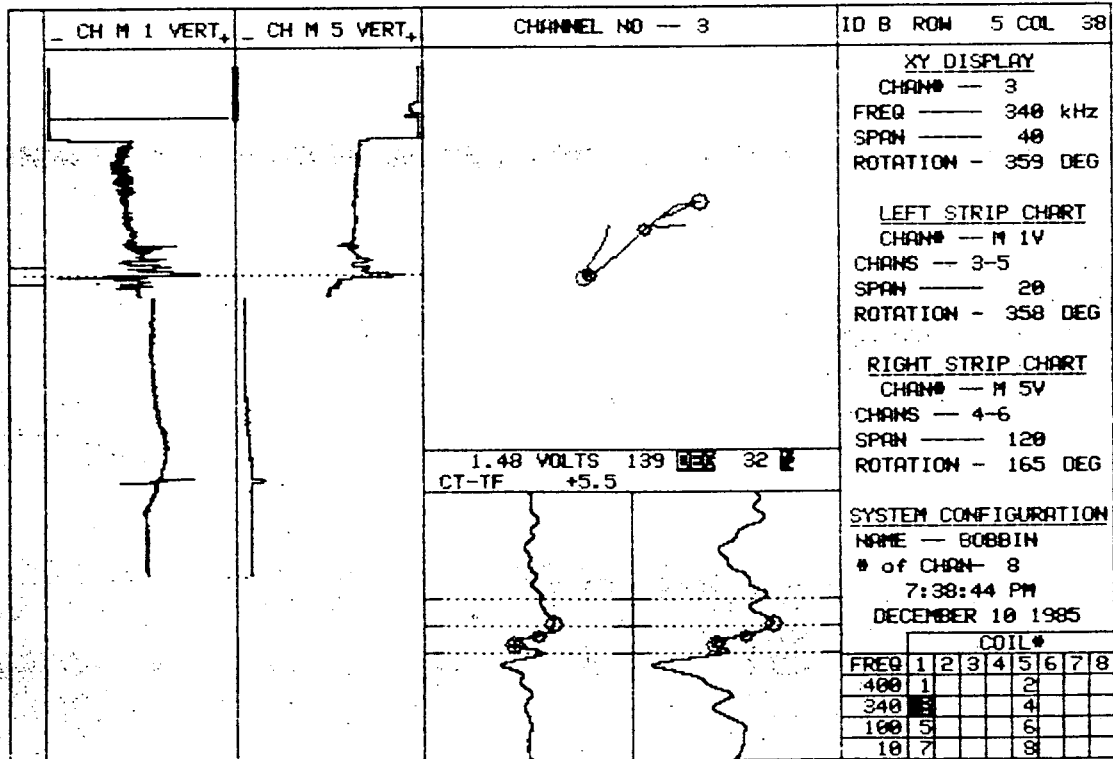
0.73 VOLTS 141 ~~255~~ 31 ~~2~~  
TSC +3.3

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	A	OUTLET	1980	Edition 12.0 Rev 1

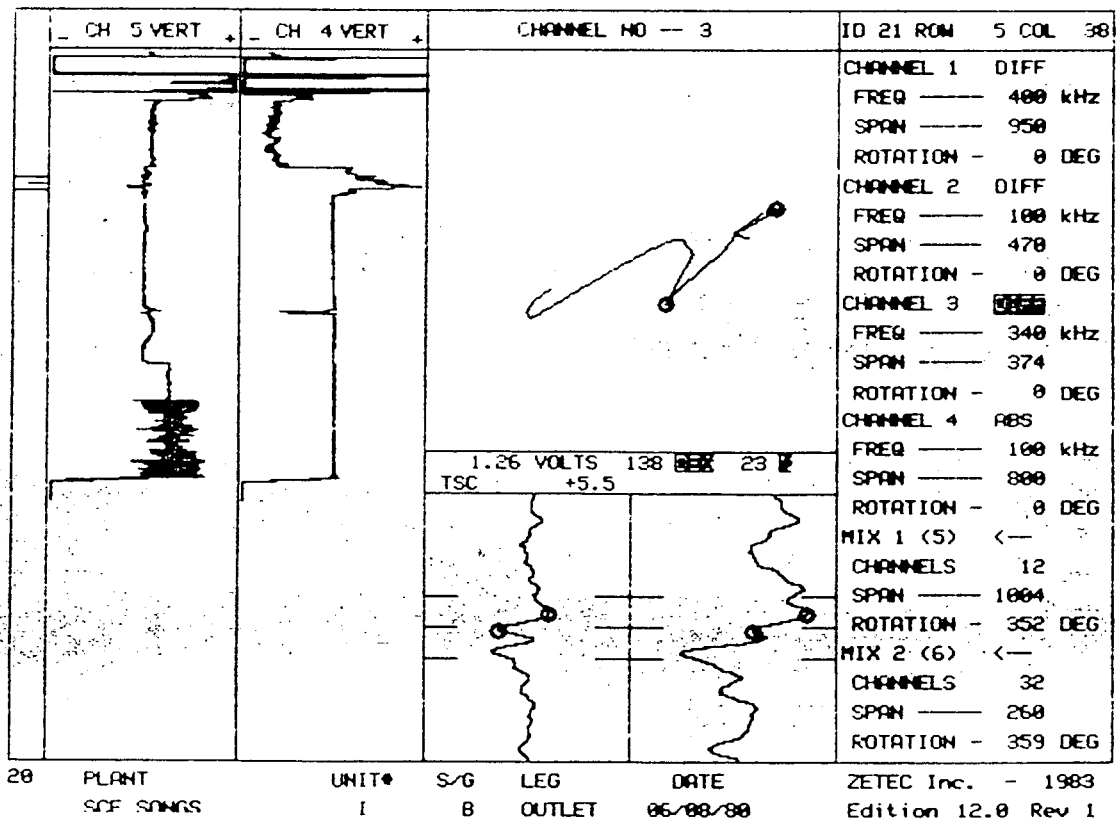
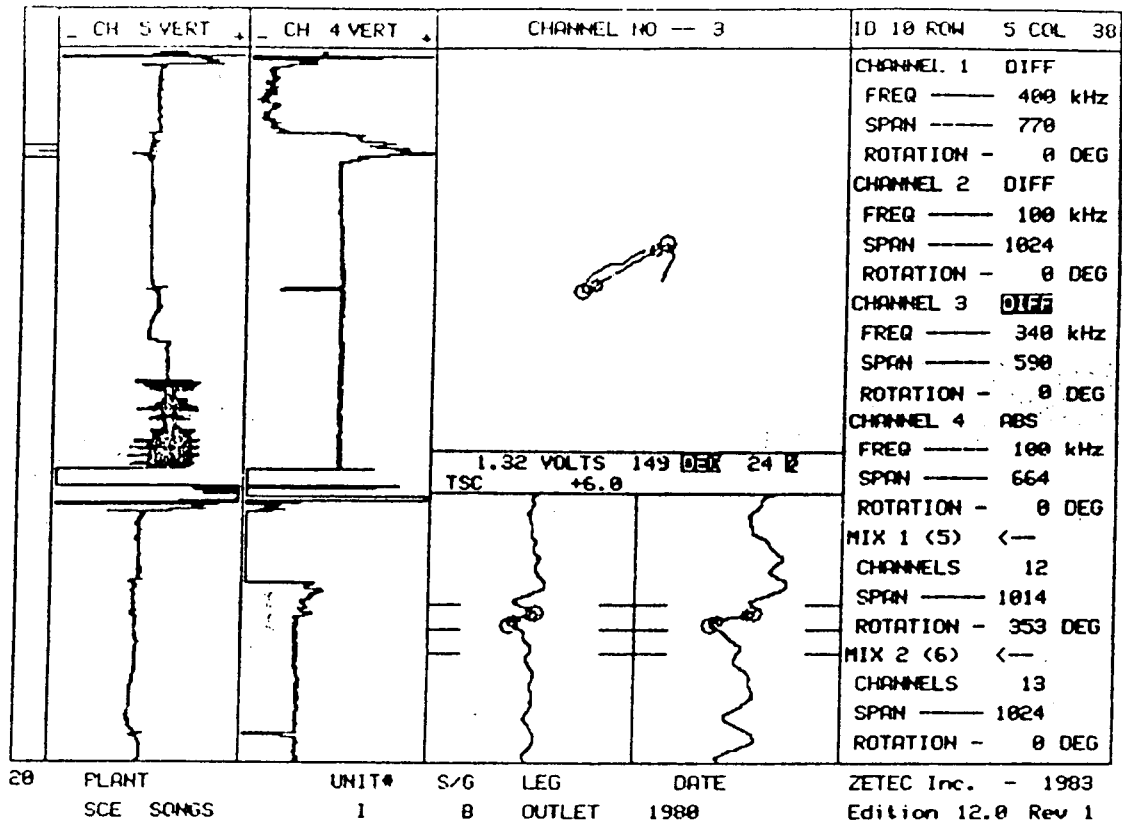
Steam Generator "B" Cold Leg Data Comparisons

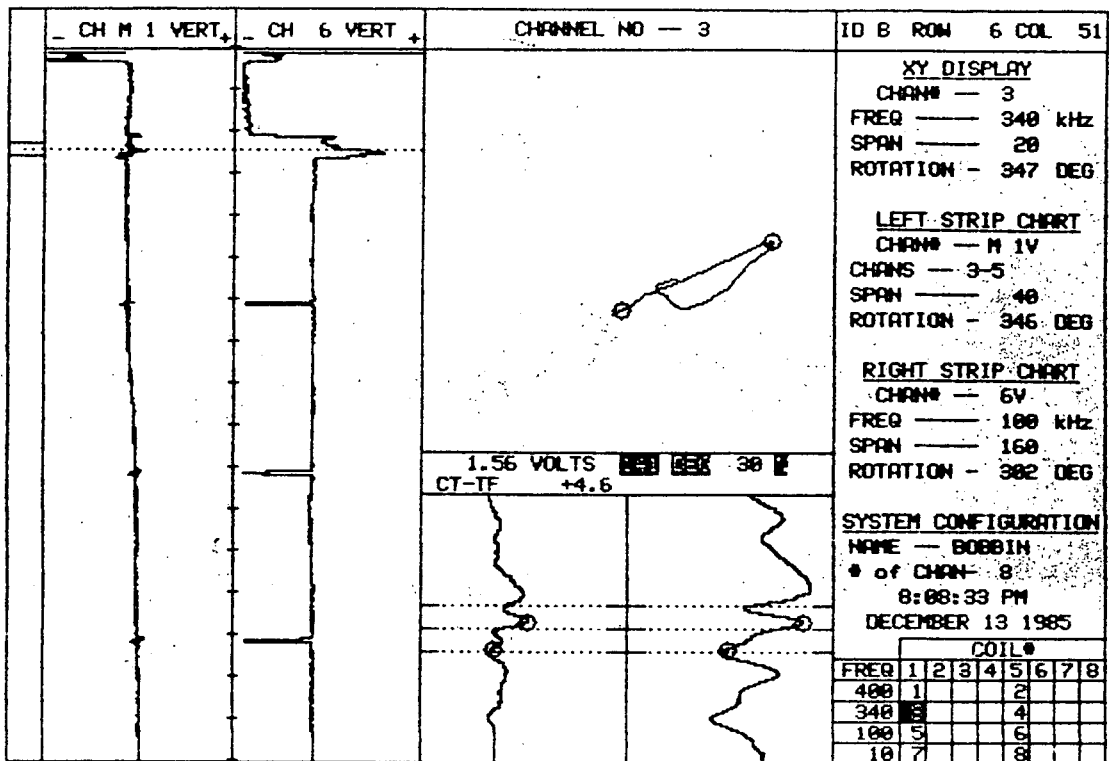


15 PLANT SONGS DD-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85

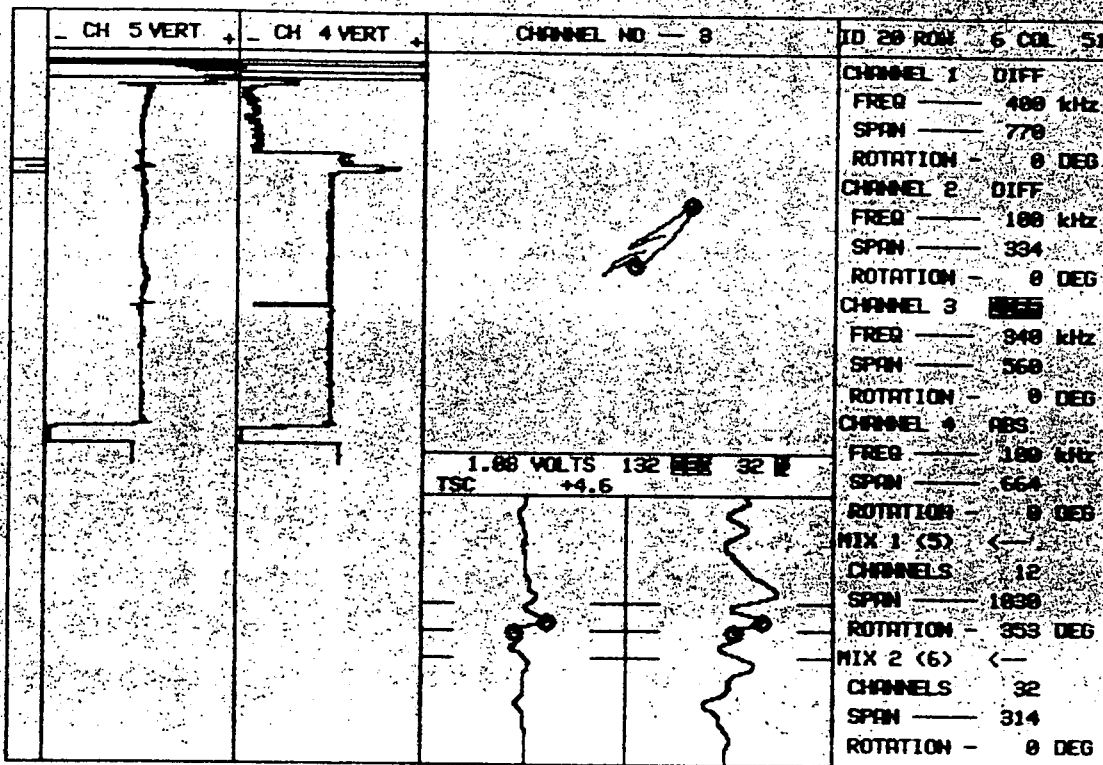


15 PLANT SONGS DD-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85



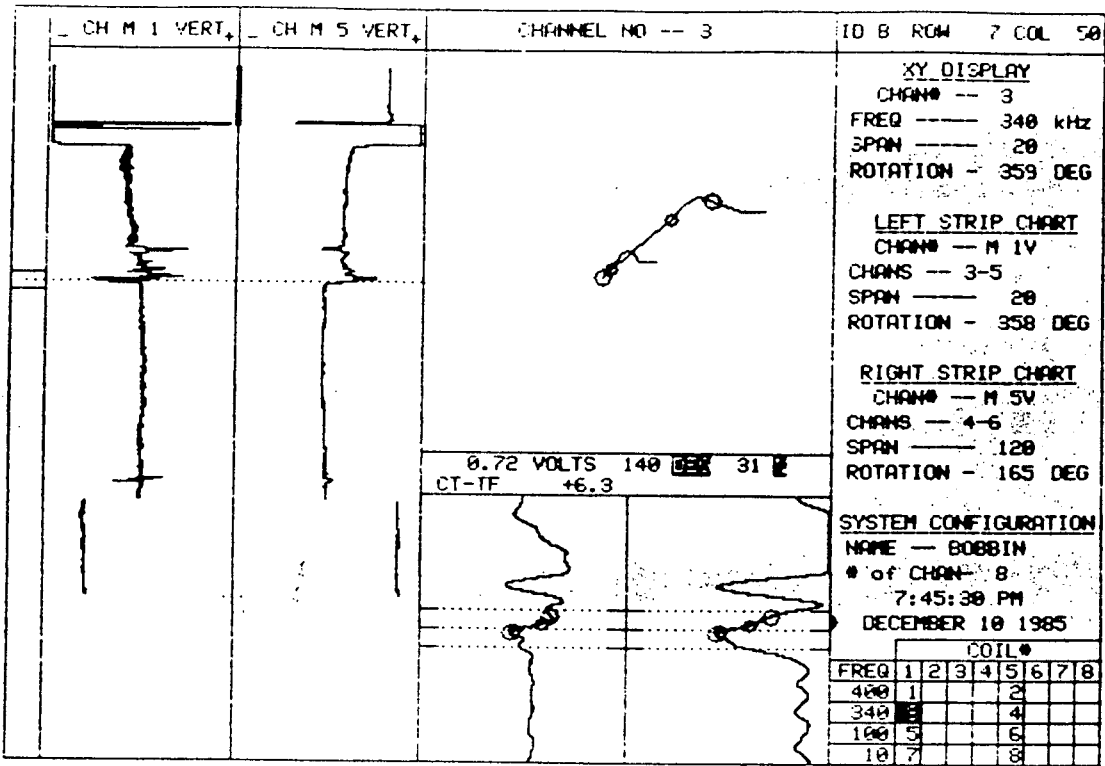


28    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS REEL C11    1    B    OUTLET    12/13/85



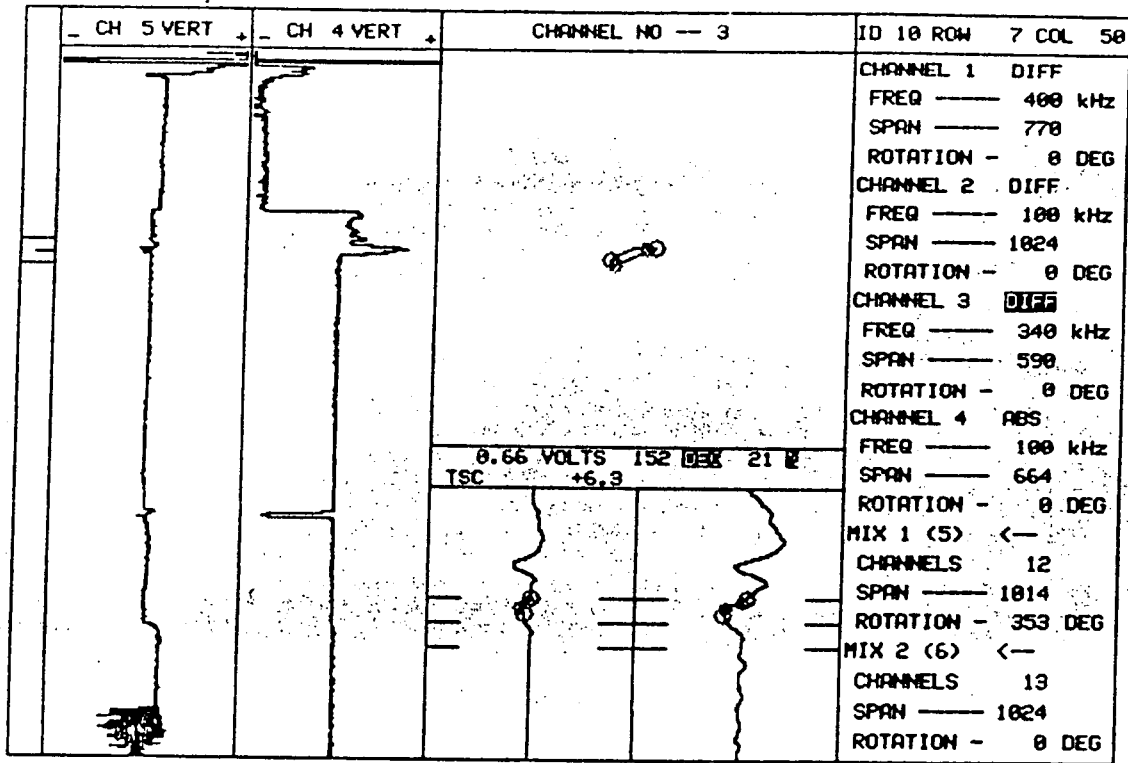
1.00 VOLTS 132 ~~Hz~~ 32 ~~Hz~~  
TSC +4.6

20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	B	OUTLET	06/00/80	Edition 12.0 Rev 1

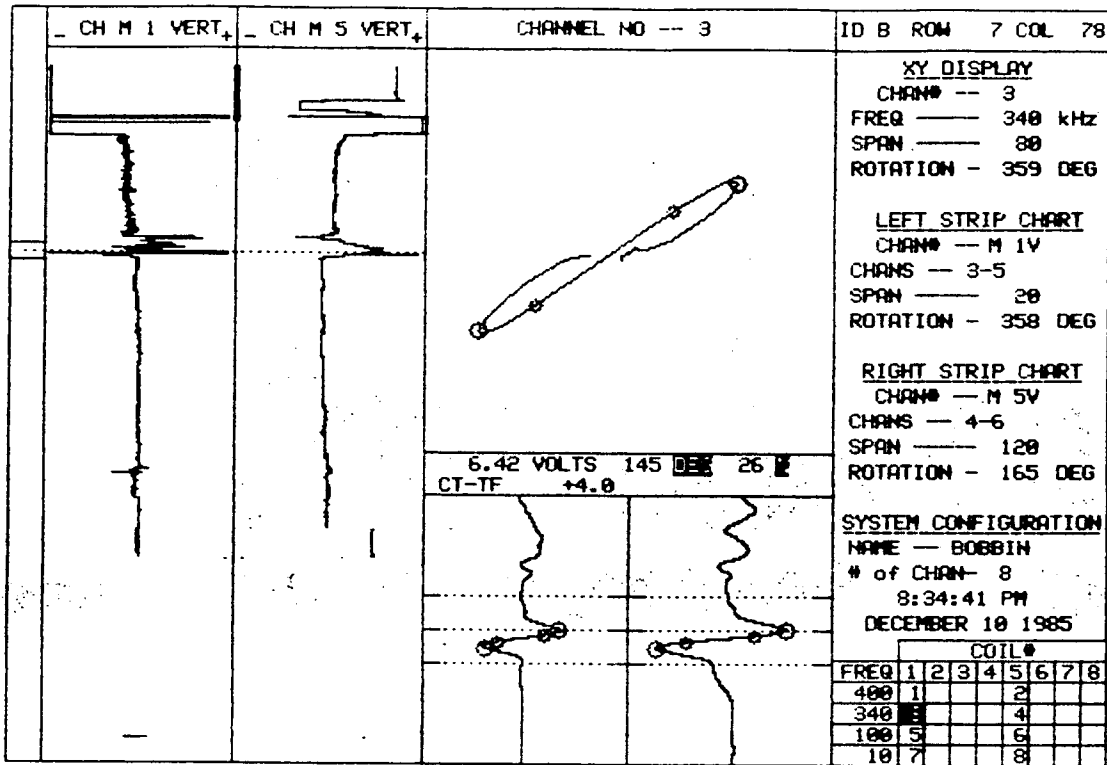


15 PLANT SONGS DD-C02 UNIT# 1 S/G 8 LEG B DATE 12/10/85

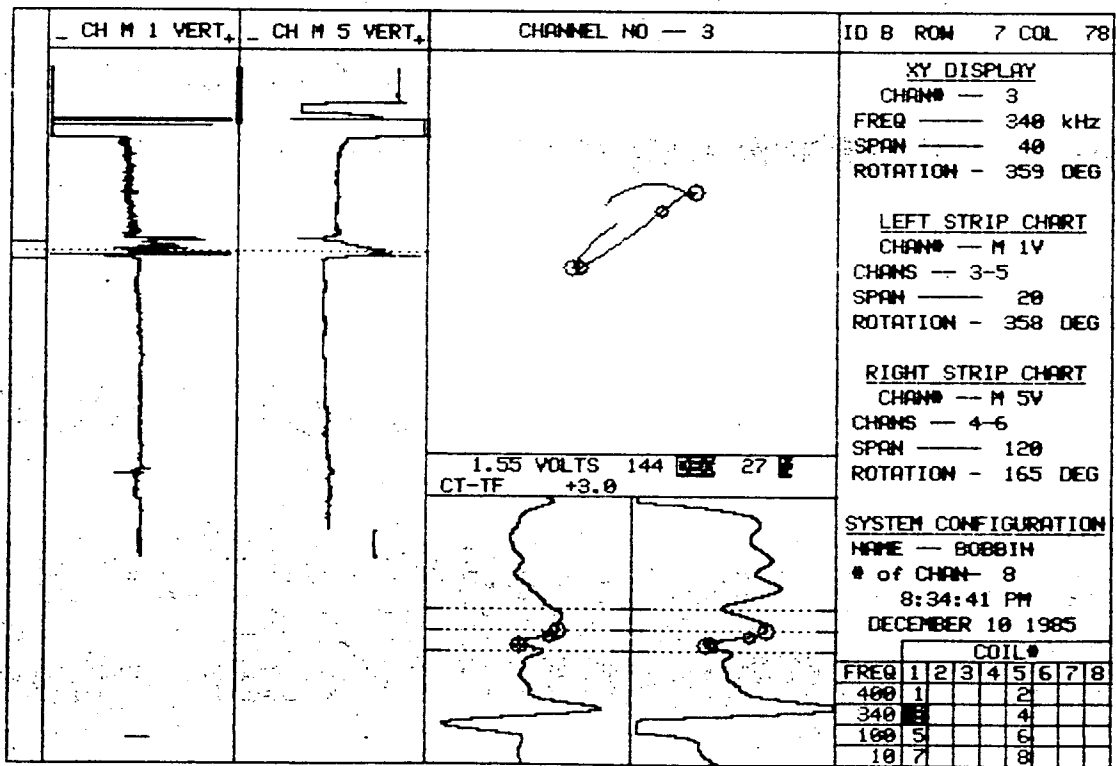




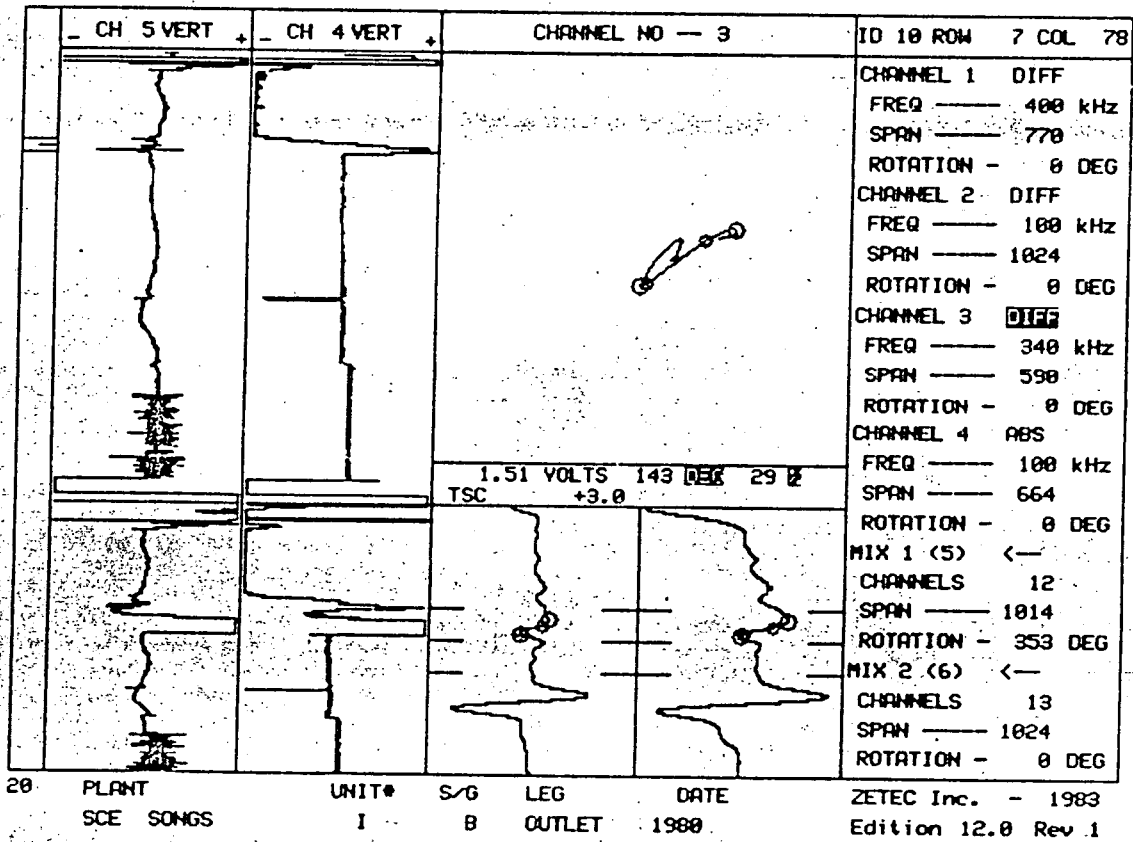
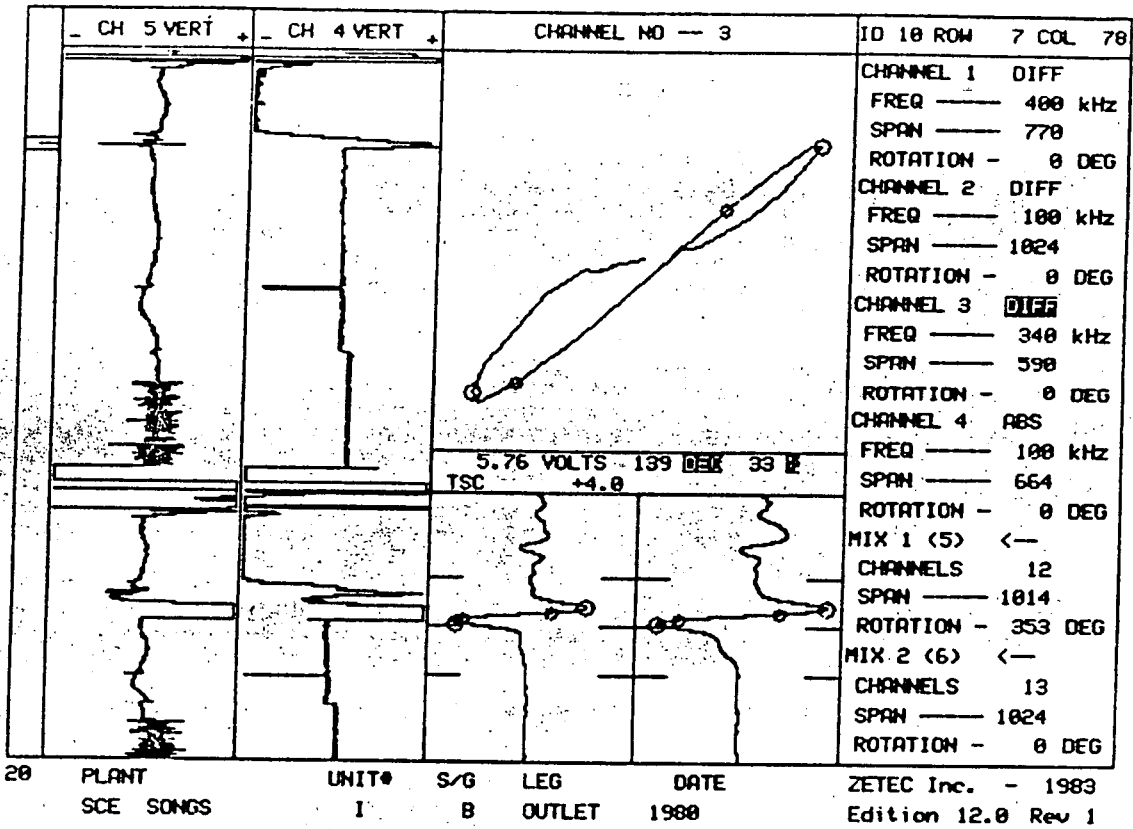
10 PLANT SCE SONGS UNIT# I S/G B LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

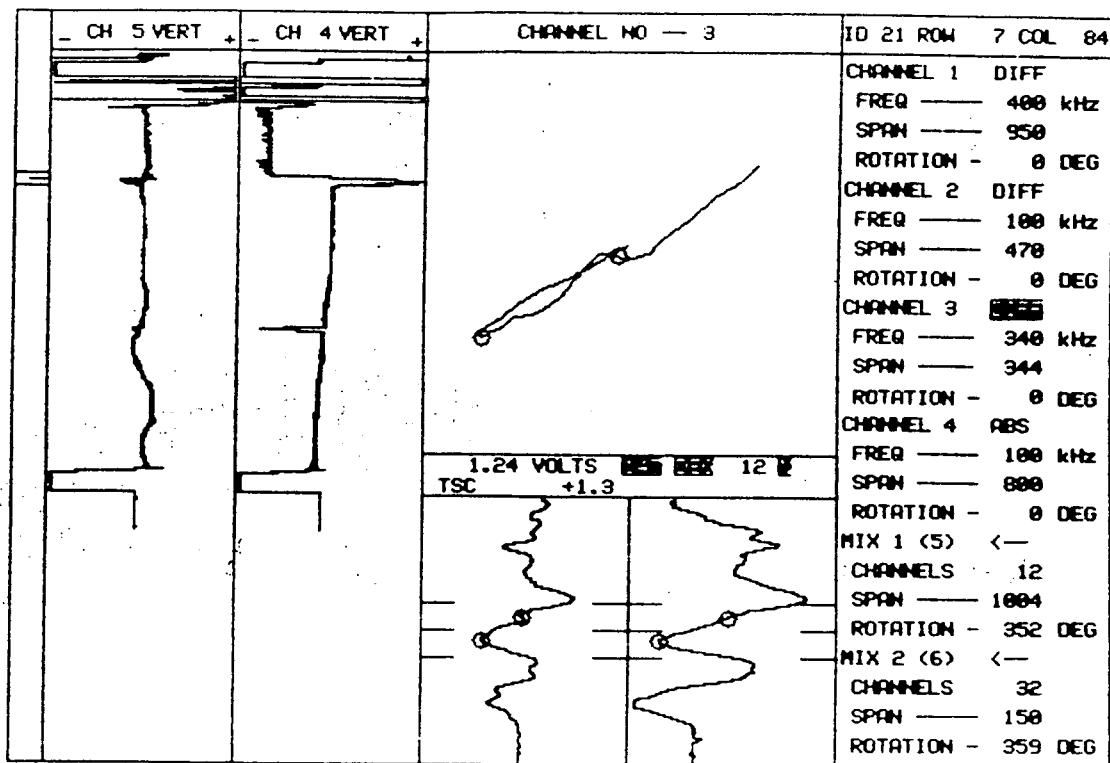


15 PLANT SONGS DD-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85

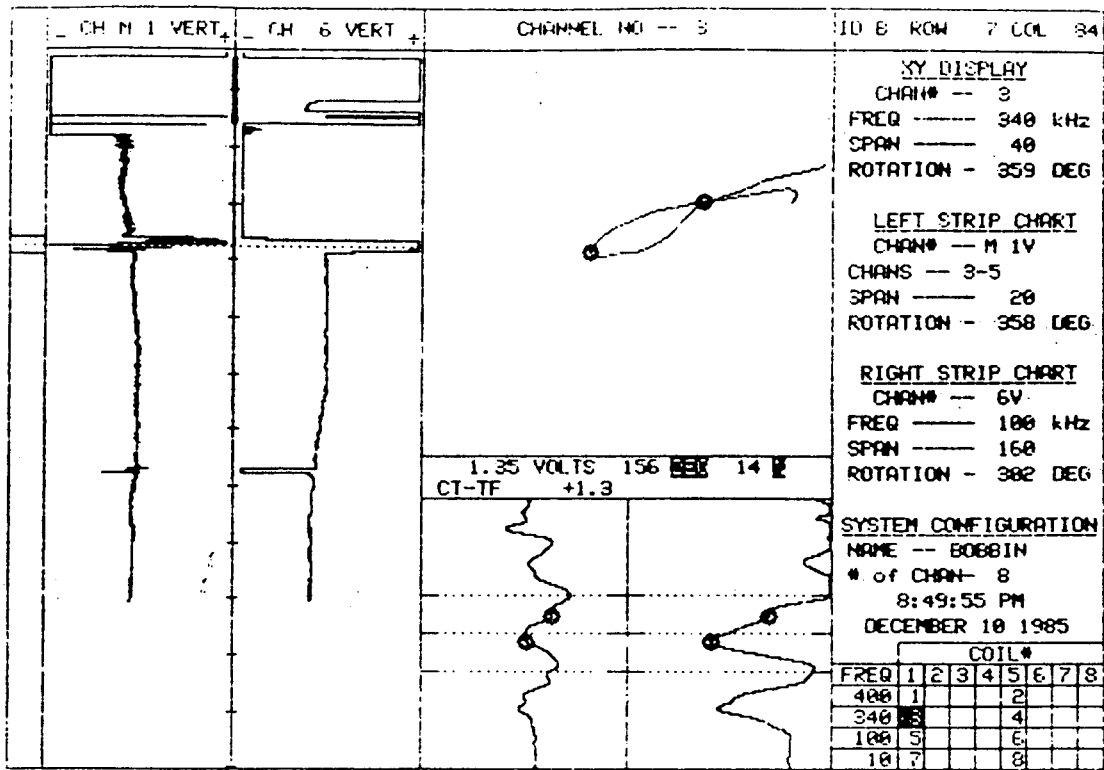


15 PLANT SONGS DD-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85

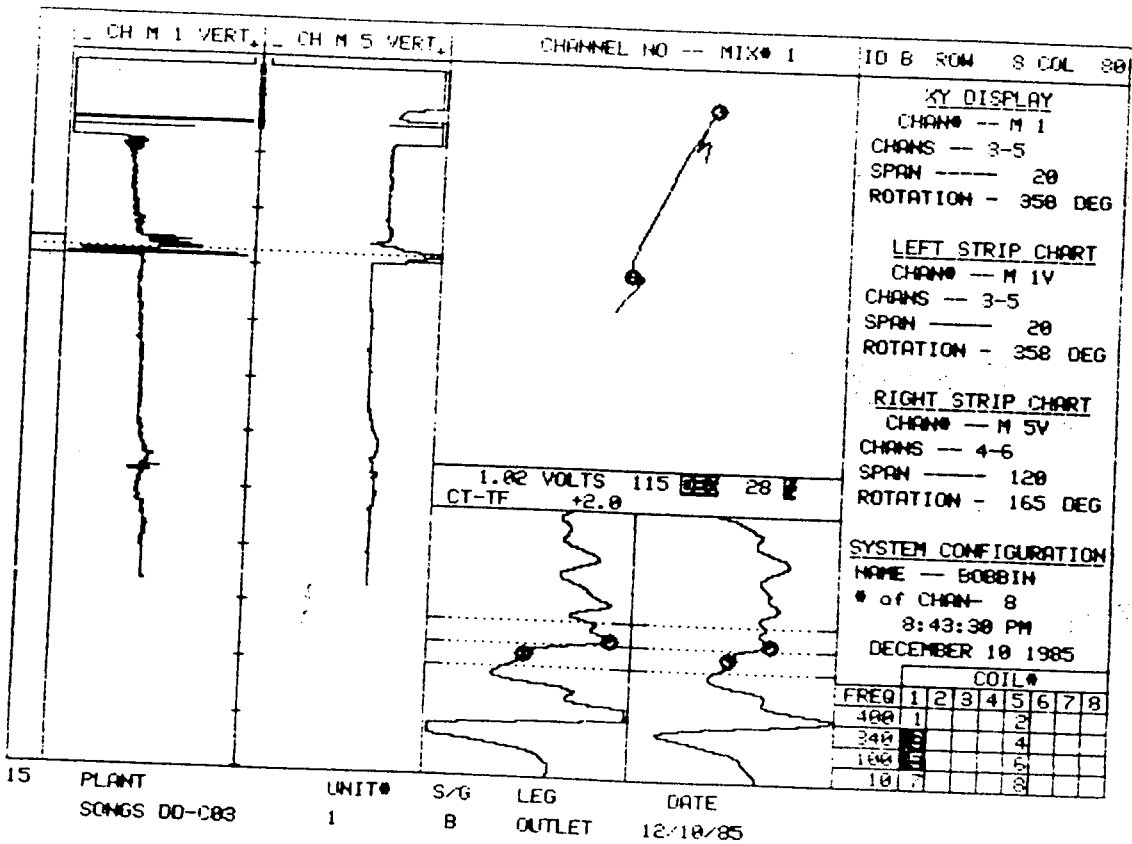




20    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    B    OUTLET    06/08/80    Edition 12.0 Rev 1



15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS 00-C02    1    B    OUTLET    12/10/85



CHANNEL NO -- MIX# 1 ID B ROW S COL 80

KEY DISPLAY  
 CHAN# -- M 1  
 CHANS -- 3-5  
 SPAN ---- 20  
 ROTATION - 358 DEG

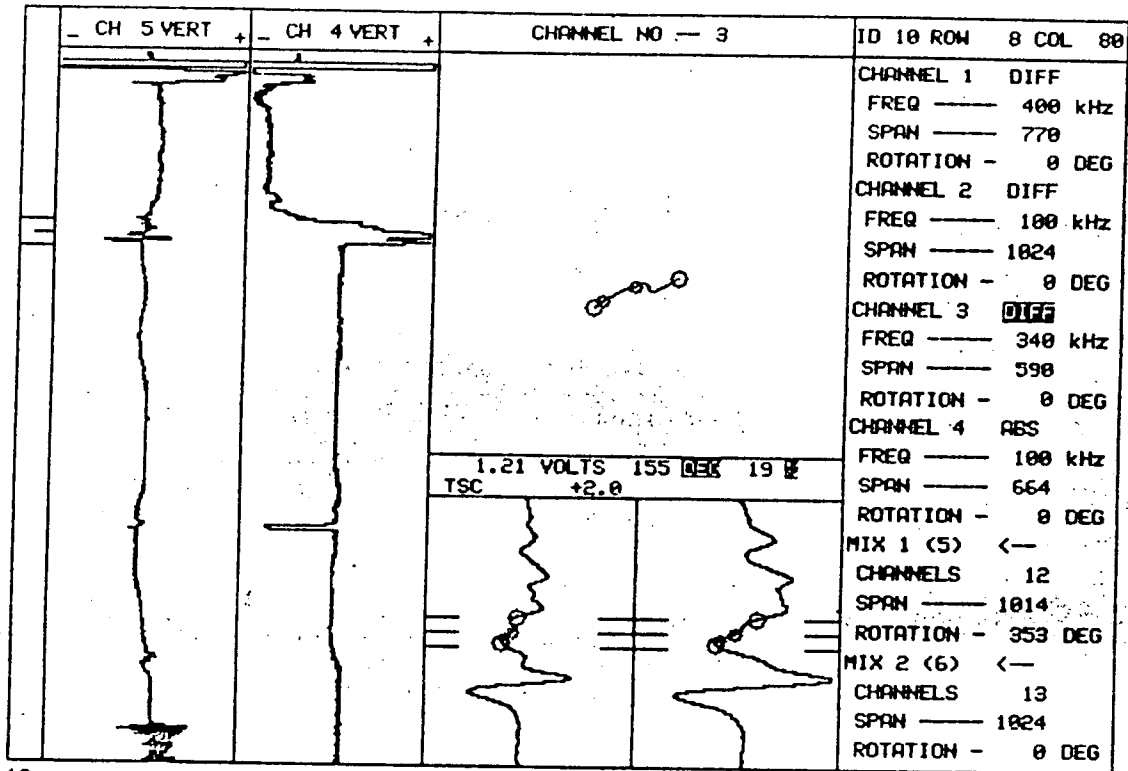
LEFT STRIP CHART  
 CHAN# -- M 1V  
 CHANS -- 3-5  
 SPAN ---- 20  
 ROTATION - 358 DEG

RIGHT STRIP CHART  
 CHAN# -- M 5V  
 CHANS -- 4-6  
 SPAN ---- 120  
 ROTATION - 165 DEG

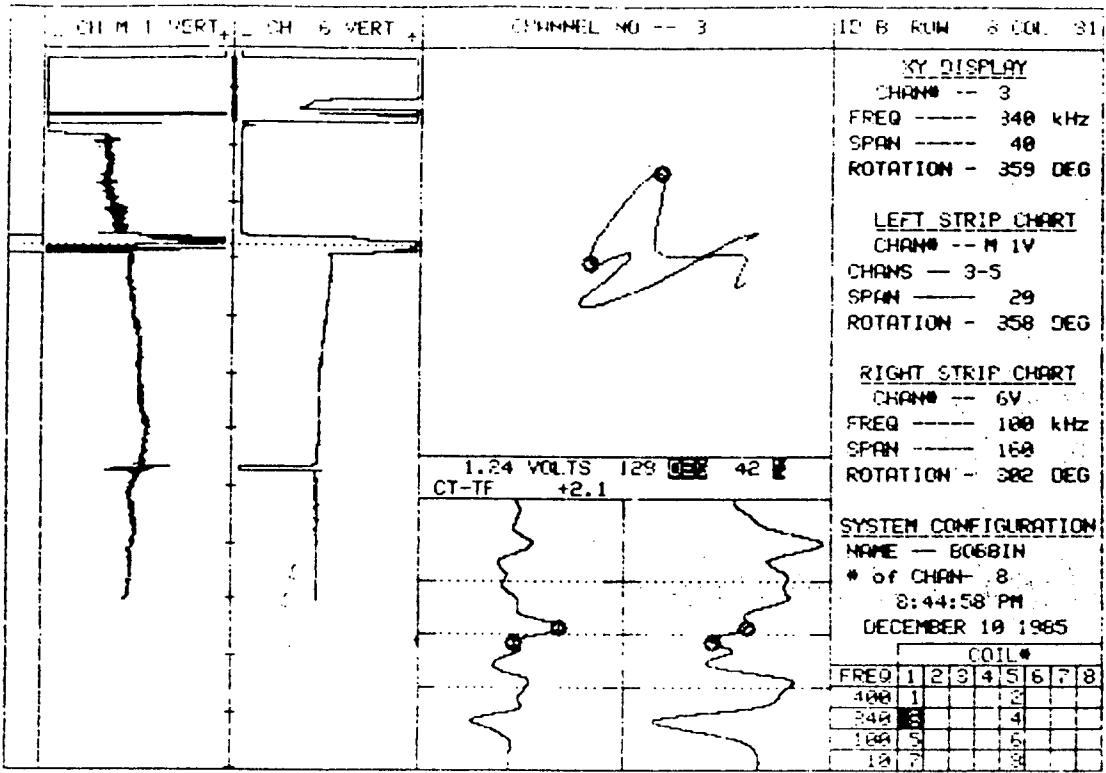
SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 8:43:30 PM  
 DECEMBER 10 1985

		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	3					4			
160	5					5			
10	7					8			

15 PLANT SONGS DO-C83 UNIT# 1 S/G B LEG B OUTLET DATE 12/10/85



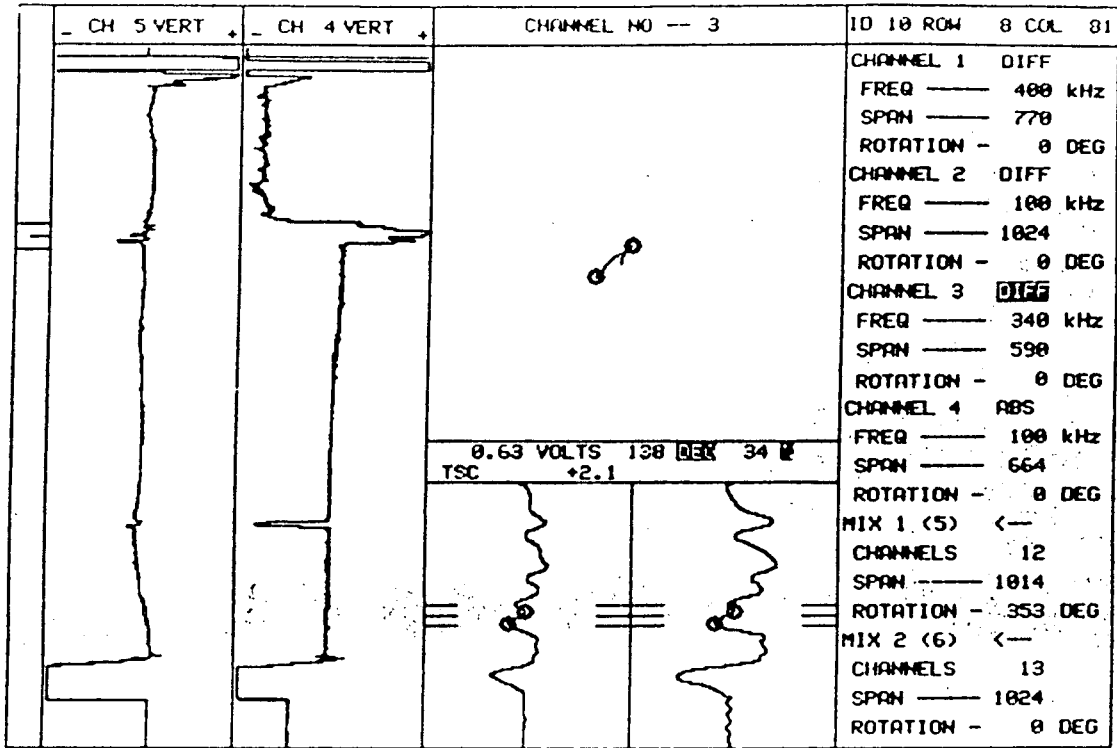
10 PLANT SCE SONGS UNIT# I S/G B LEG. OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



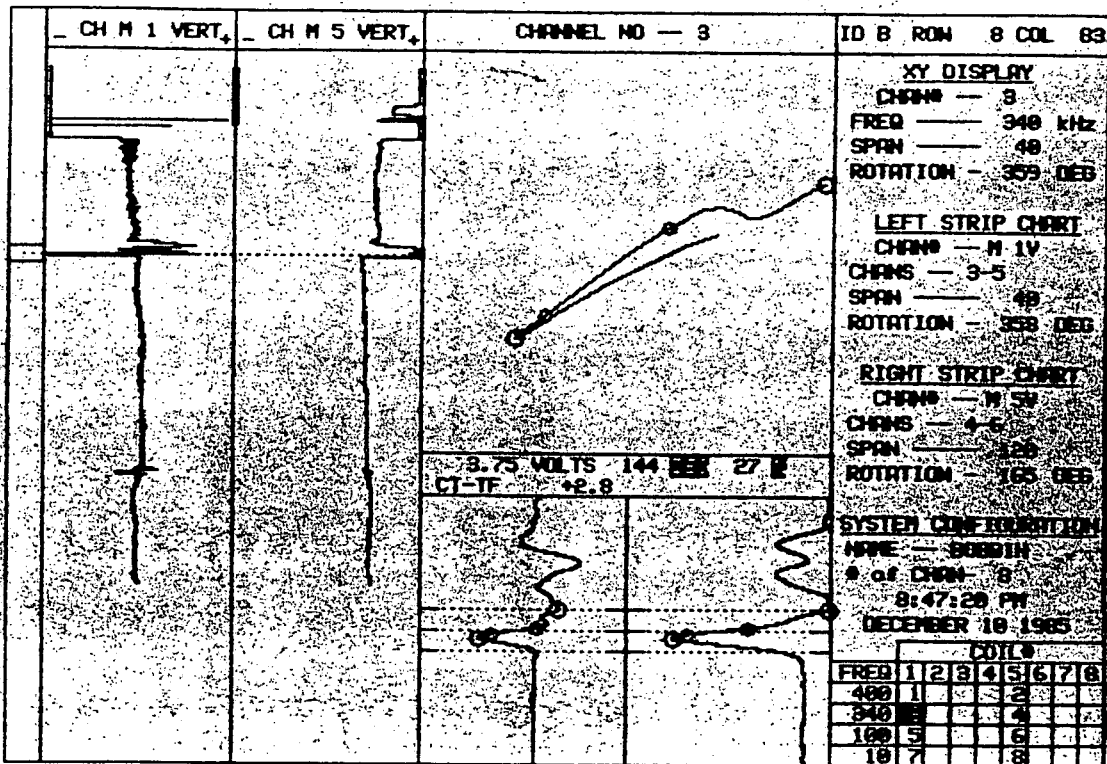
COIL #								
FREQ	1	2	3	4	5	6	7	8
400	1				2			
240	3				4			
160	5				6			
10	7				8			

PLANT                      UNIT#      S/G      LEG              DATE  
 SONGS DD-C02            1            B            OUTLET        12/10/65

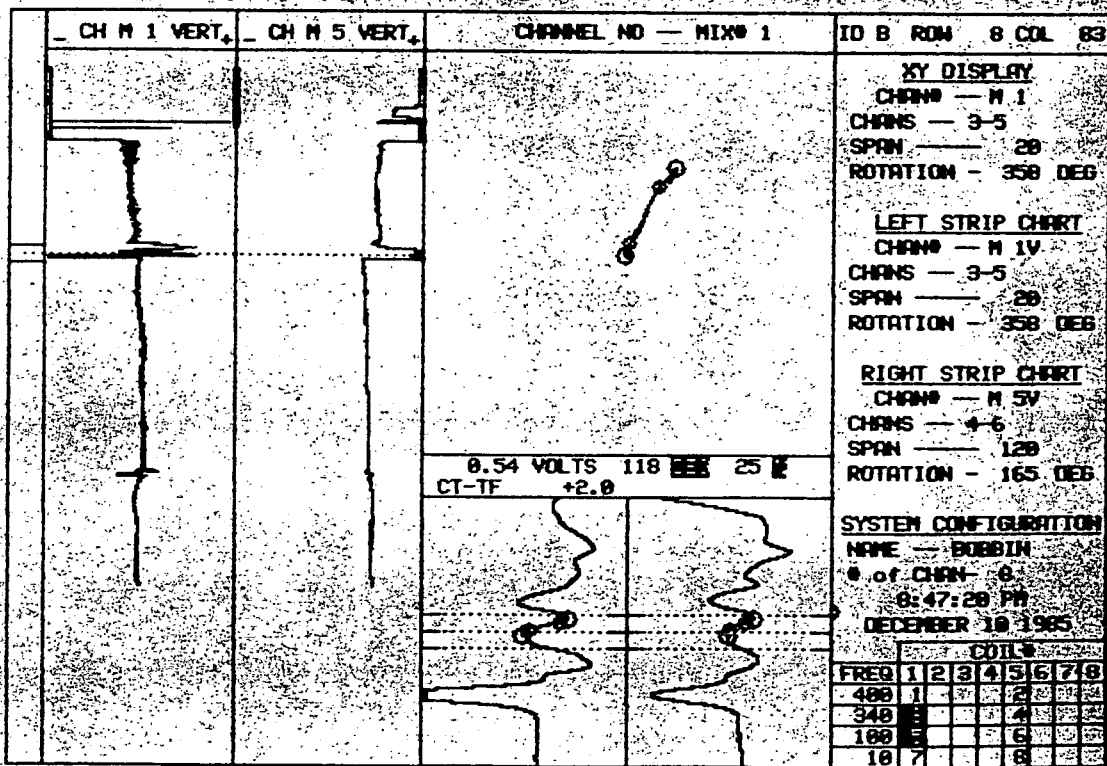




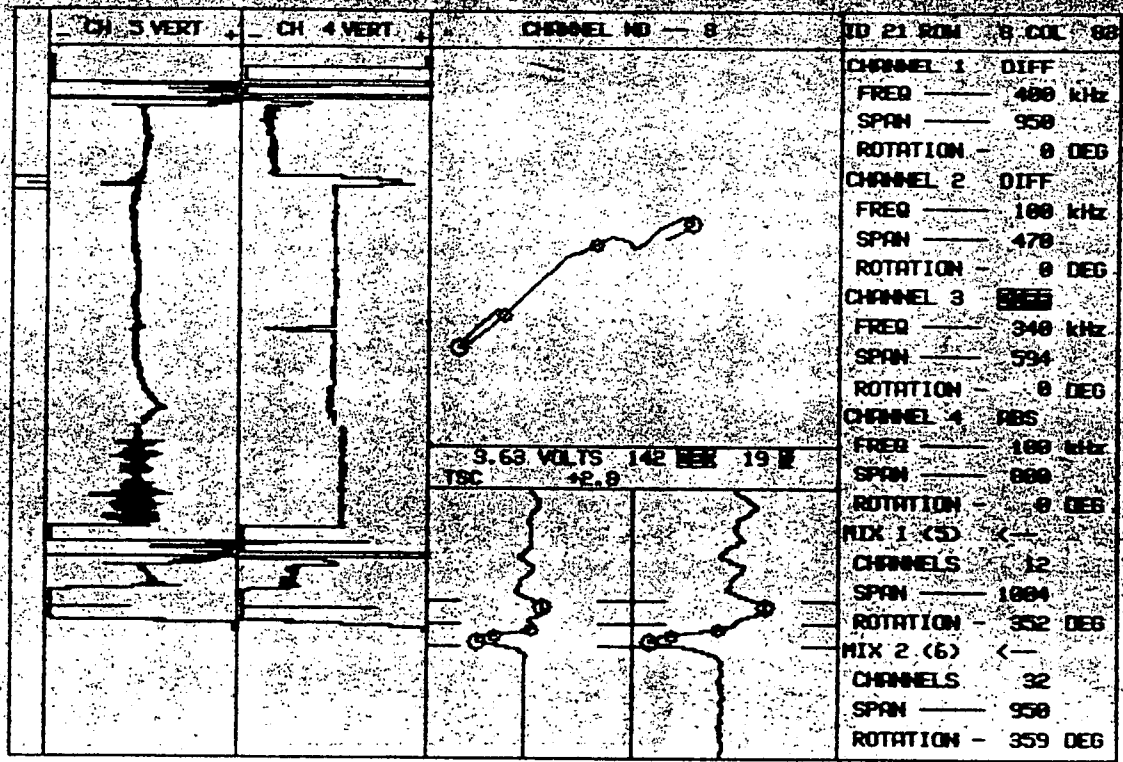
10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    B    OUTLET    1980    Edition 12.0 Rev 1



15 PLANT SONGS DD-C83 UNIT# 1 S/G B LEG OUTLET DATE 12/18/85



15 PLANT SONGS DD-C83 UNIT# 1 S/G B LEG OUTLET DATE 12/18/85



ID 21 ROW 8 COL 83

CHANNEL 1 DIFF  
 FREQ — 400 kHz  
 SPAN — 950  
 ROTATION — 0 DEG

CHANNEL 2 DIFF  
 FREQ — 100 kHz  
 SPAN — 470  
 ROTATION — 0 DEG

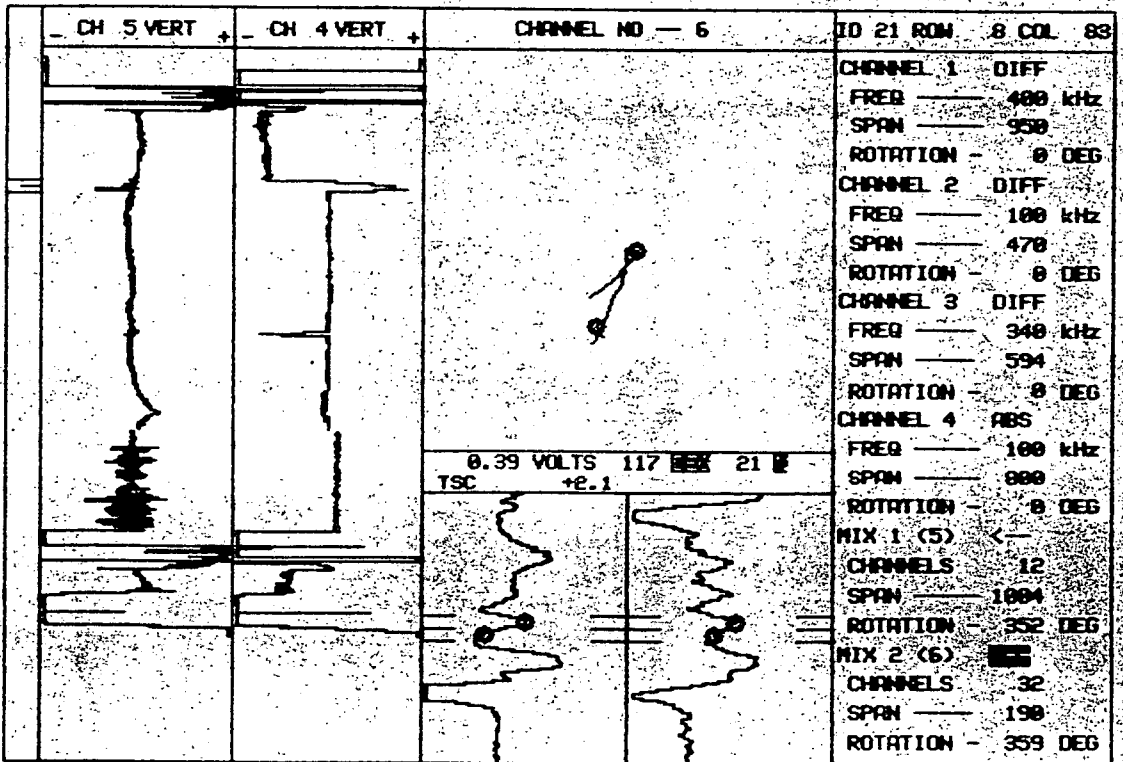
CHANNEL 3 DIFF  
 FREQ — 340 kHz  
 SPAN — 594  
 ROTATION — 0 DEG

CHANNEL 4 ABS  
 FREQ — 100 kHz  
 SPAN — 800  
 ROTATION — 0 DEG

MIX 1 (5) <—  
 CHANNELS — 12  
 SPAN — 1004  
 ROTATION — 352 DEG

MIX 2 (6) <—  
 CHANNELS — 32  
 SPAN — 950  
 ROTATION — 359 DEG

20 PLANT SCE SONGS UNIT# I S/G B LEG B DATE 06/08/88 ZETEC Inc. - 1983 Edition 12.0 Rev 1



ID 21 ROW 8 COL 83

CHANNEL 1 DIFF  
 FREQ — 400 kHz  
 SPAN — 950  
 ROTATION — 0 DEG

CHANNEL 2 DIFF  
 FREQ — 100 kHz  
 SPAN — 470  
 ROTATION — 0 DEG

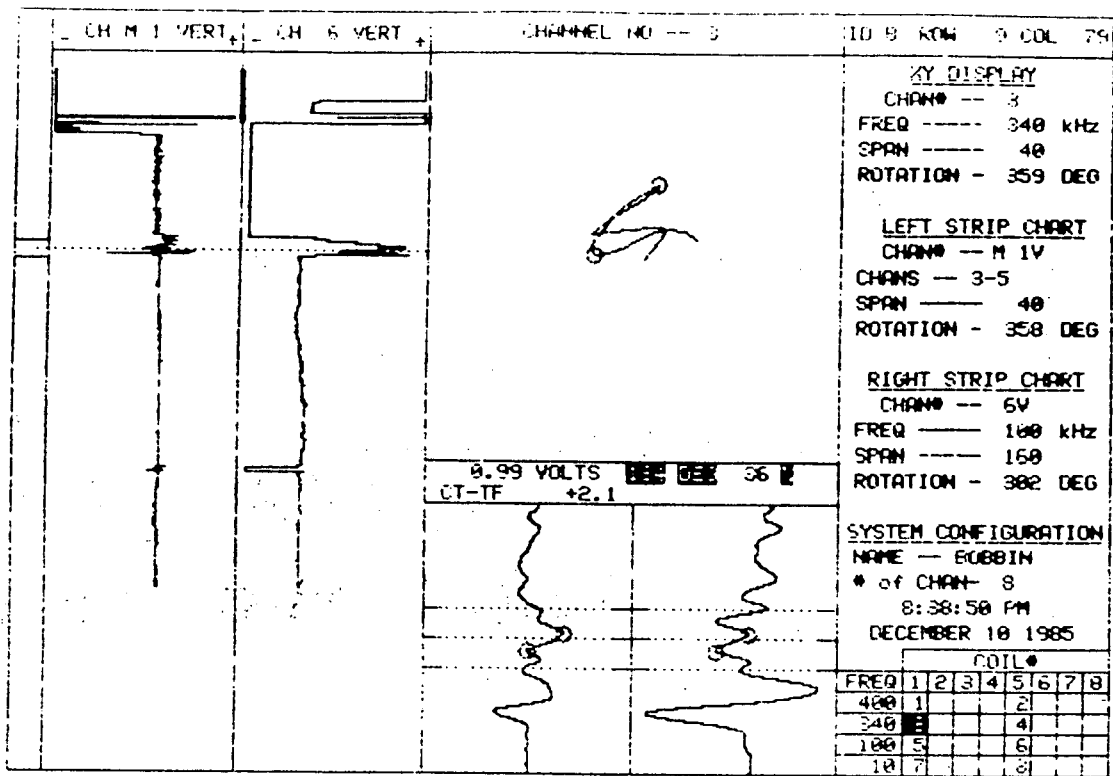
CHANNEL 3 DIFF  
 FREQ — 340 kHz  
 SPAN — 594  
 ROTATION — 0 DEG

CHANNEL 4 ABS  
 FREQ — 100 kHz  
 SPAN — 800  
 ROTATION — 0 DEG

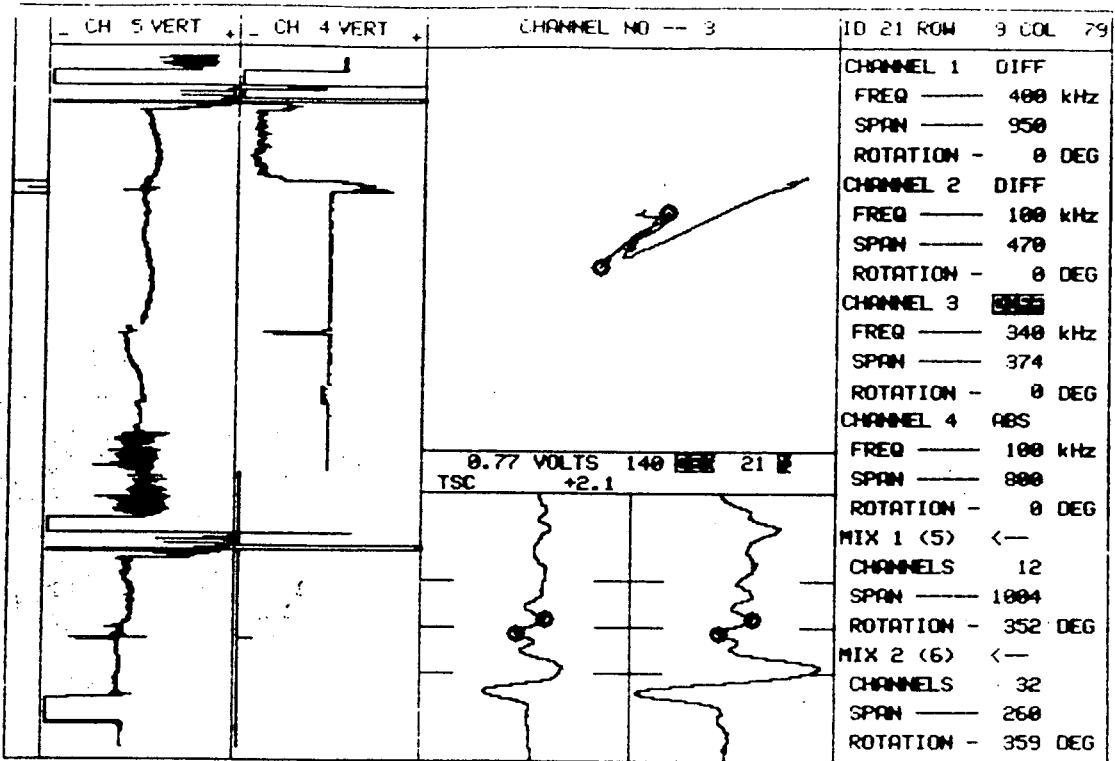
MIX 1 (5) <—  
 CHANNELS — 12  
 SPAN — 1004  
 ROTATION — 352 DEG

MIX 2 (6) <—  
 CHANNELS — 32  
 SPAN — 190  
 ROTATION — 359 DEG

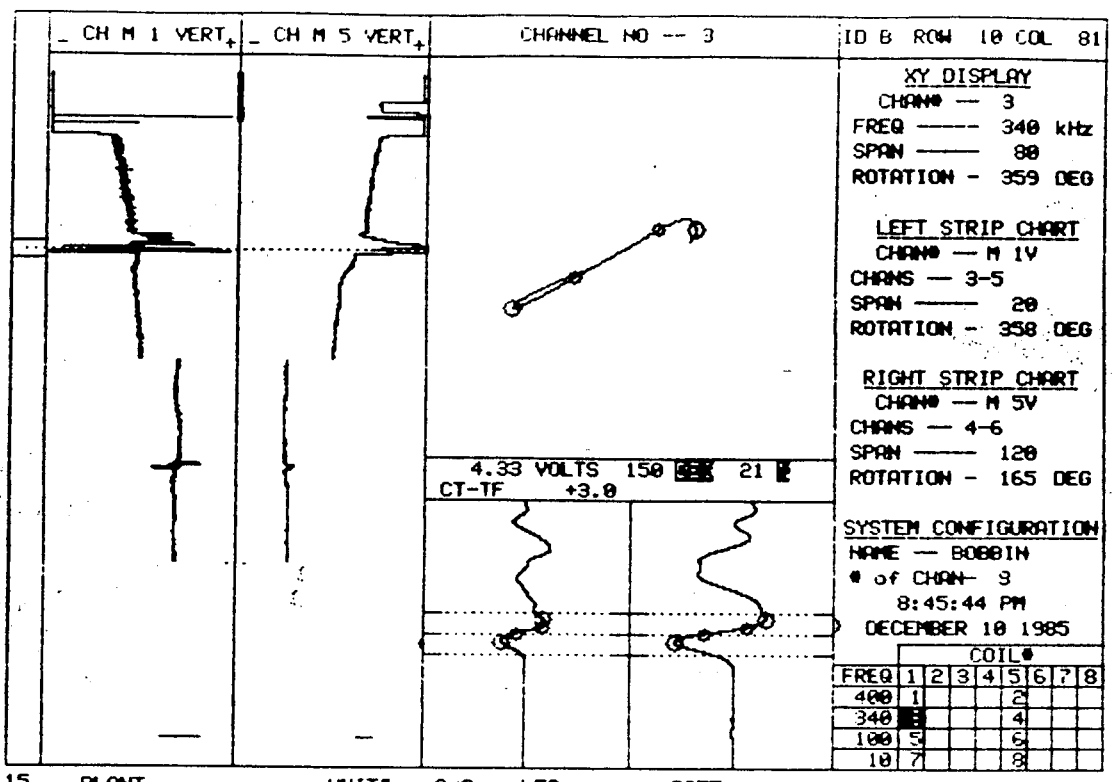
20 PLANT SCE SONGS UNIT# I S/G B LEG B DATE 06/08/88 ZETEC Inc. - 1983 Edition 12.0 Rev 1



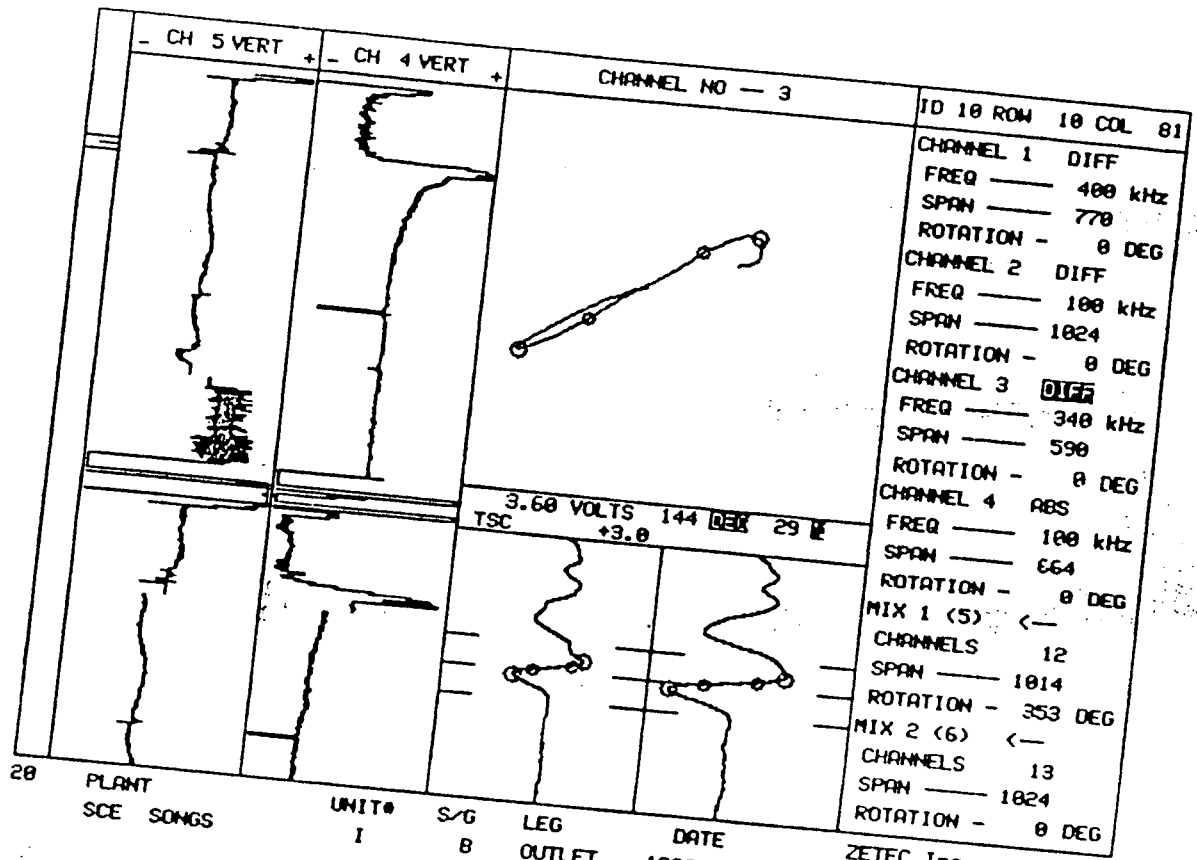
15 PLANT SONGS DO-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85



20    PLANT    UNIT\*    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    B    OUTLET    06/08/80    Edition 12.0 Rev 1



15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DD-C03    1    B    OUTLET    12/10/85



ID 10 ROW 10 COL 81

CHANNEL 1 DIFF  
 FREQ \_\_\_\_\_ 400 kHz  
 SPAN \_\_\_\_\_ 770  
 ROTATION - 0 DEG

CHANNEL 2 DIFF  
 FREQ \_\_\_\_\_ 100 kHz  
 SPAN \_\_\_\_\_ 1024  
 ROTATION - 0 DEG

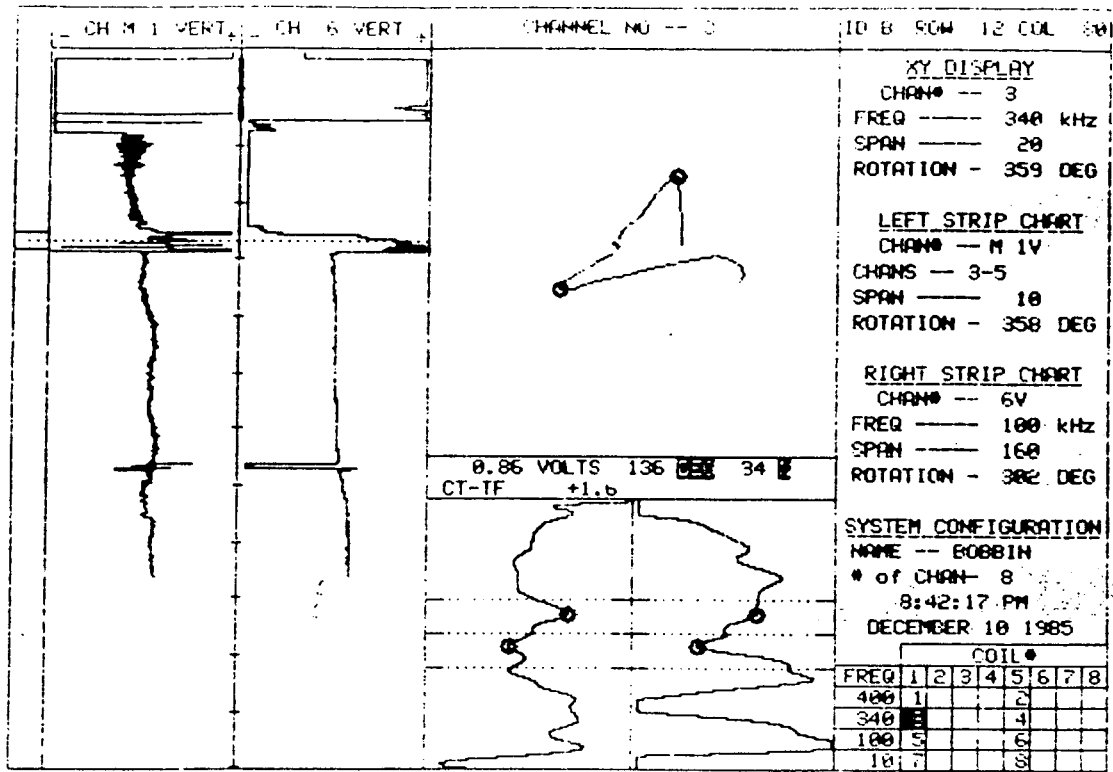
CHANNEL 3 ~~DIFF~~  
 FREQ \_\_\_\_\_ 340 kHz  
 SPAN \_\_\_\_\_ 590  
 ROTATION - 0 DEG

CHANNEL 4 ABS  
 FREQ \_\_\_\_\_ 100 kHz  
 SPAN \_\_\_\_\_ 664  
 ROTATION - 0 DEG

MIX 1 (5) <-  
 CHANNELS \_\_\_\_\_ 12  
 SPAN \_\_\_\_\_ 1014  
 ROTATION - 353 DEG

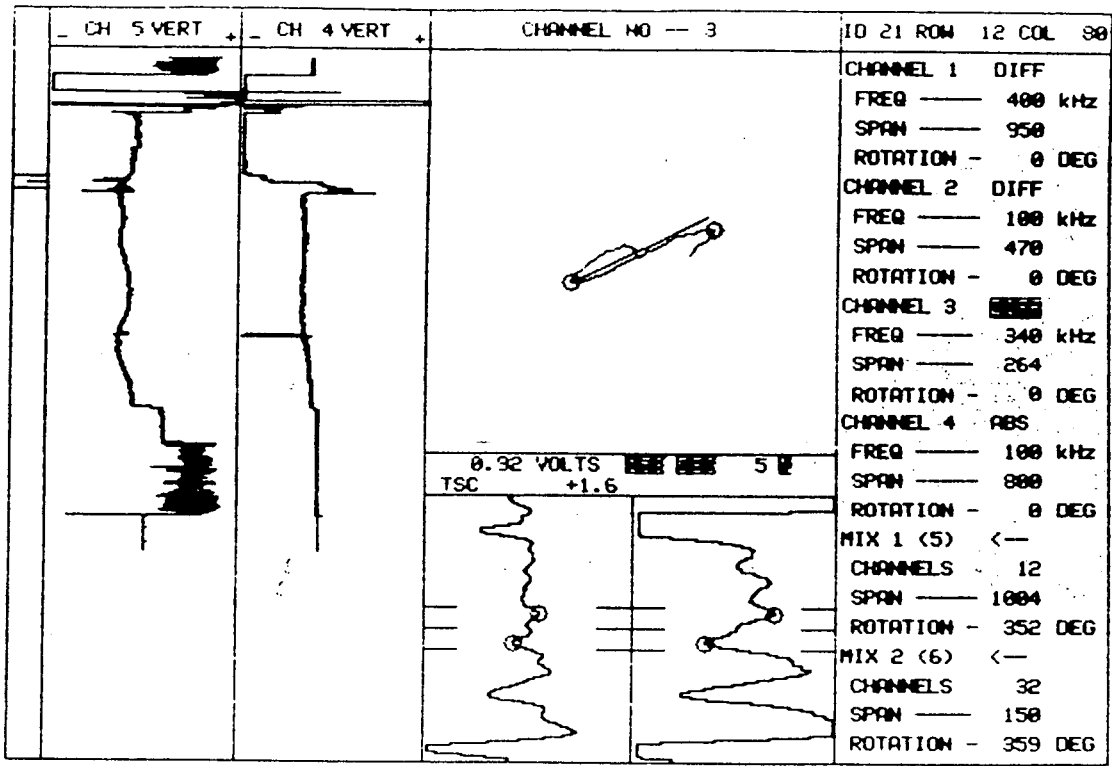
MIX 2 (6) <-  
 CHANNELS \_\_\_\_\_ 13  
 SPAN \_\_\_\_\_ 1024  
 ROTATION - 0 DEG

28 PLANT SCE SONGS UNIT# I S/G B LEG B DATE 1980

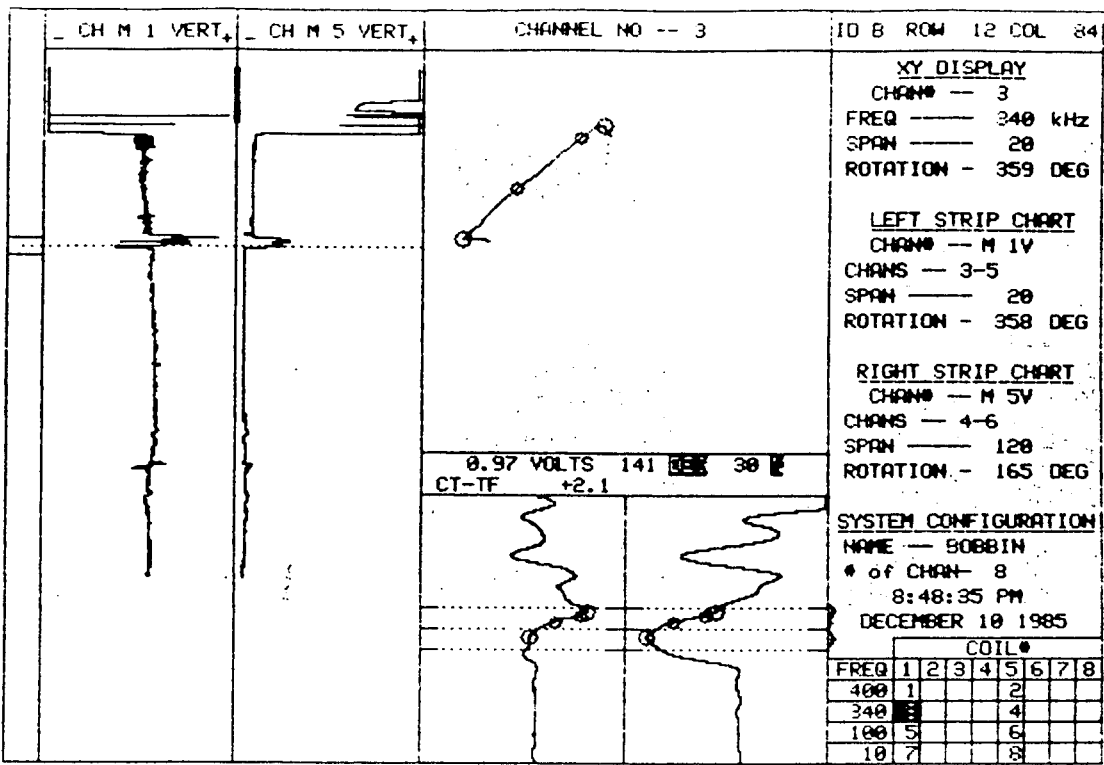


15 PLANT SONGS DD-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85

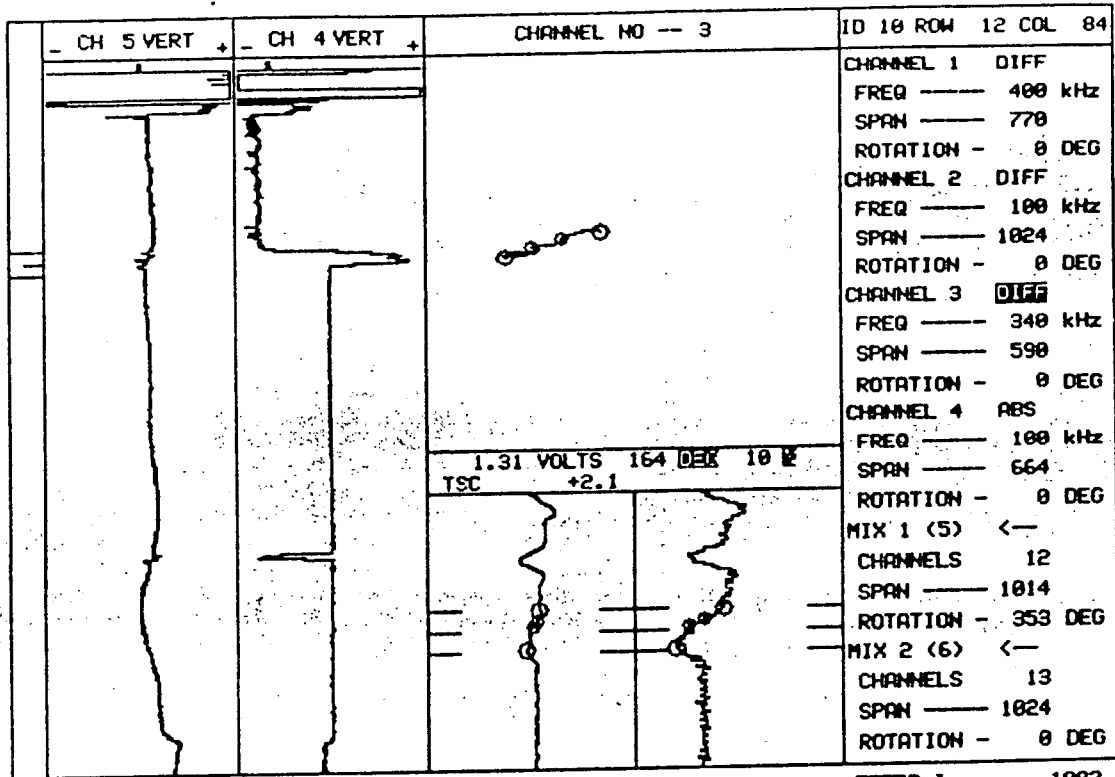




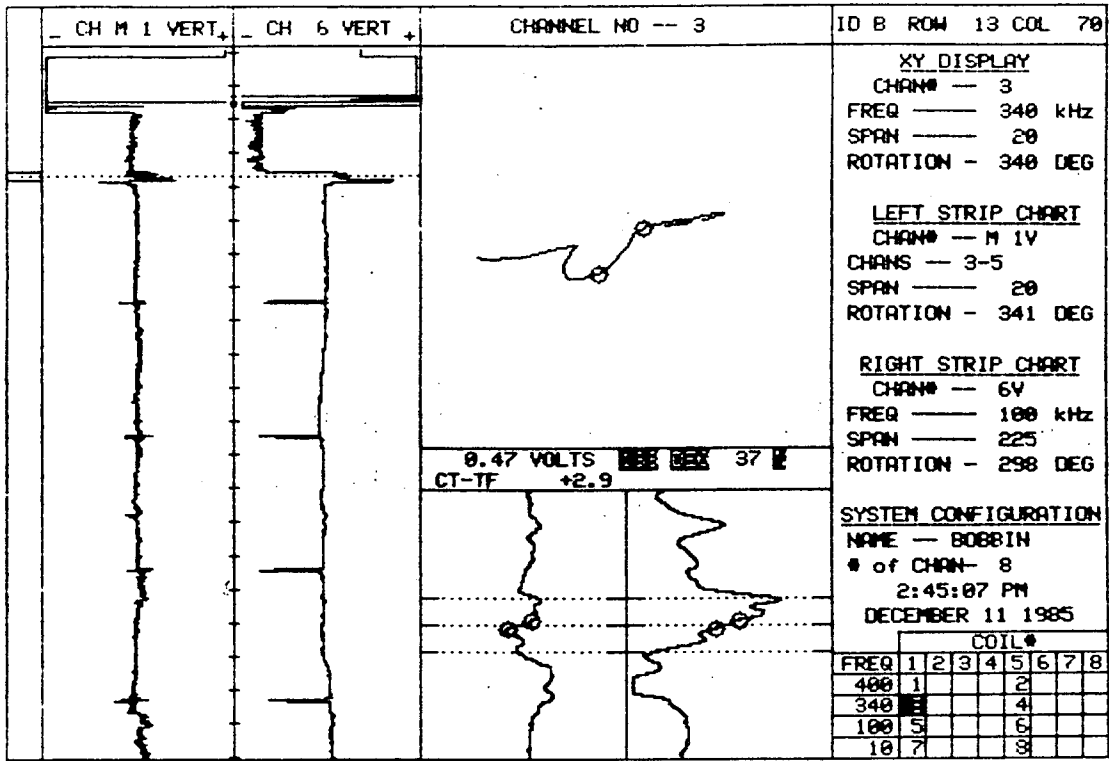
20 PLANT SCE SONGS UNIT# I S/G B LEG OUTLET DATE 06/08/80 ZETEC Inc. - 1983 Edition 12.0 Rev 1



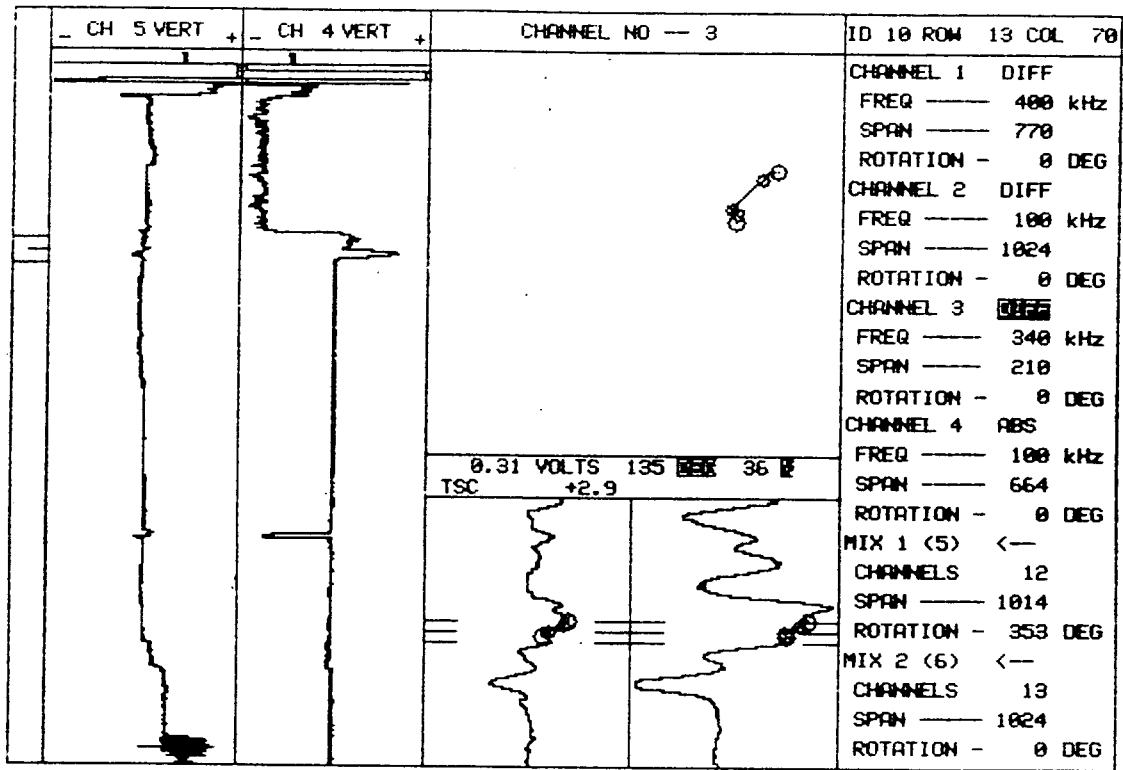
15    PLANT                    UNIT#    S/G    LEG            DATE  
 SONGS DD-C03            1        B        OUTLET        12/10/85



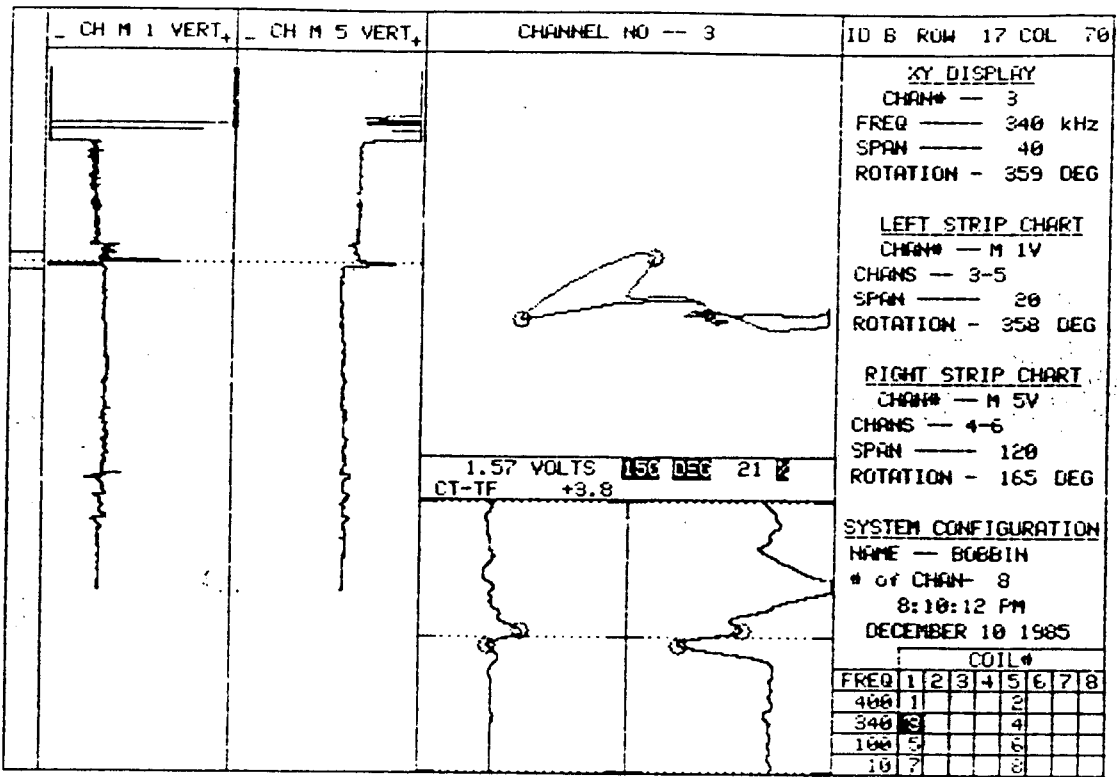
10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    B    OUTLET    1980    Edition 12.0 Rev 1



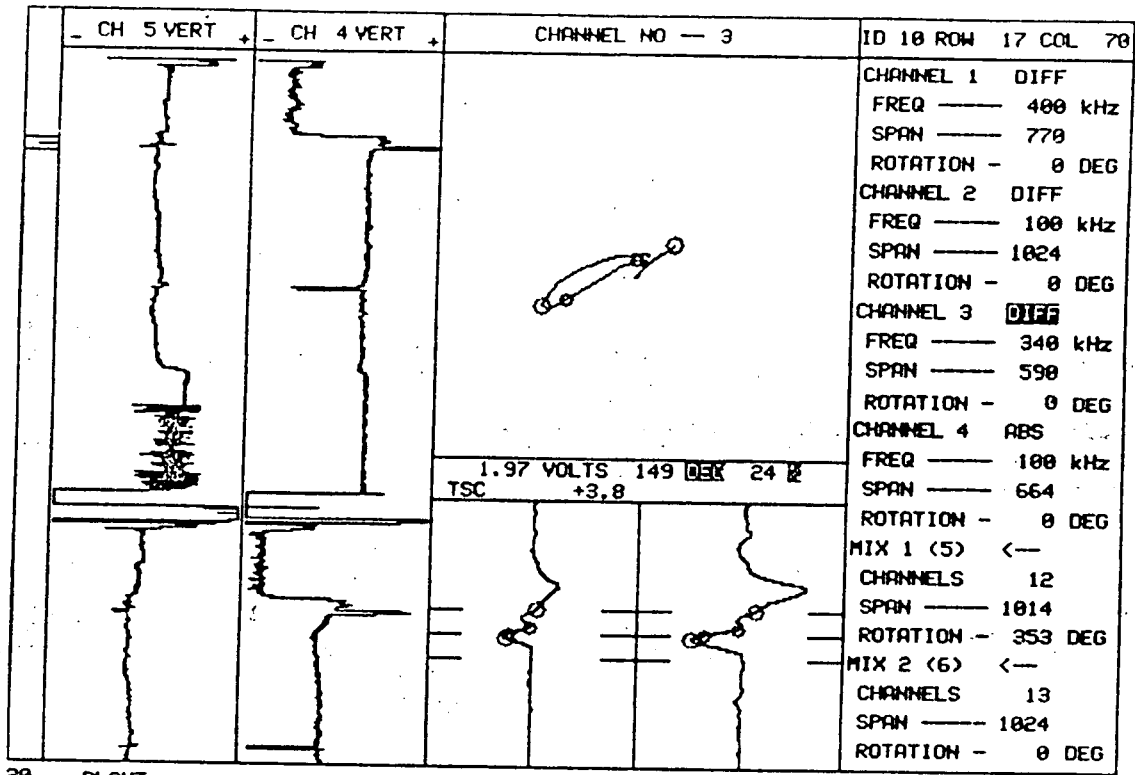
25    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C06    1    B    OUTLET    12/11/85



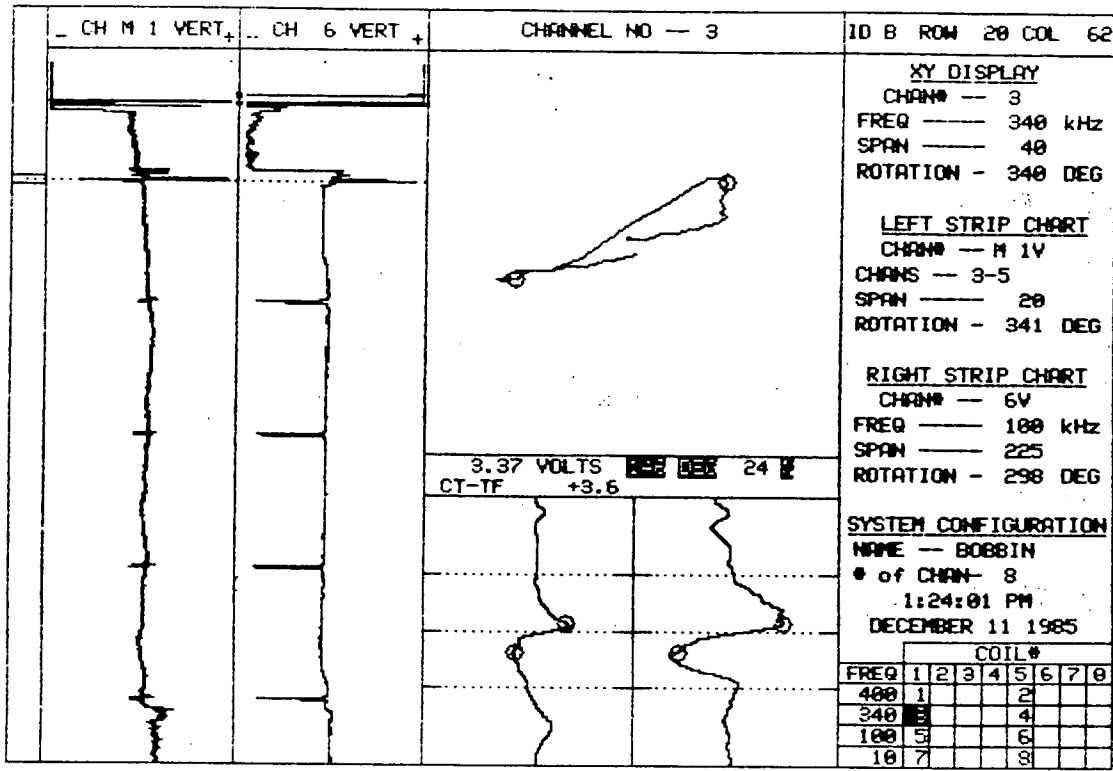
10    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    B    OUTLET    1980    Edition 12.0 Rev 1



15 PLANT SONGS DD-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85

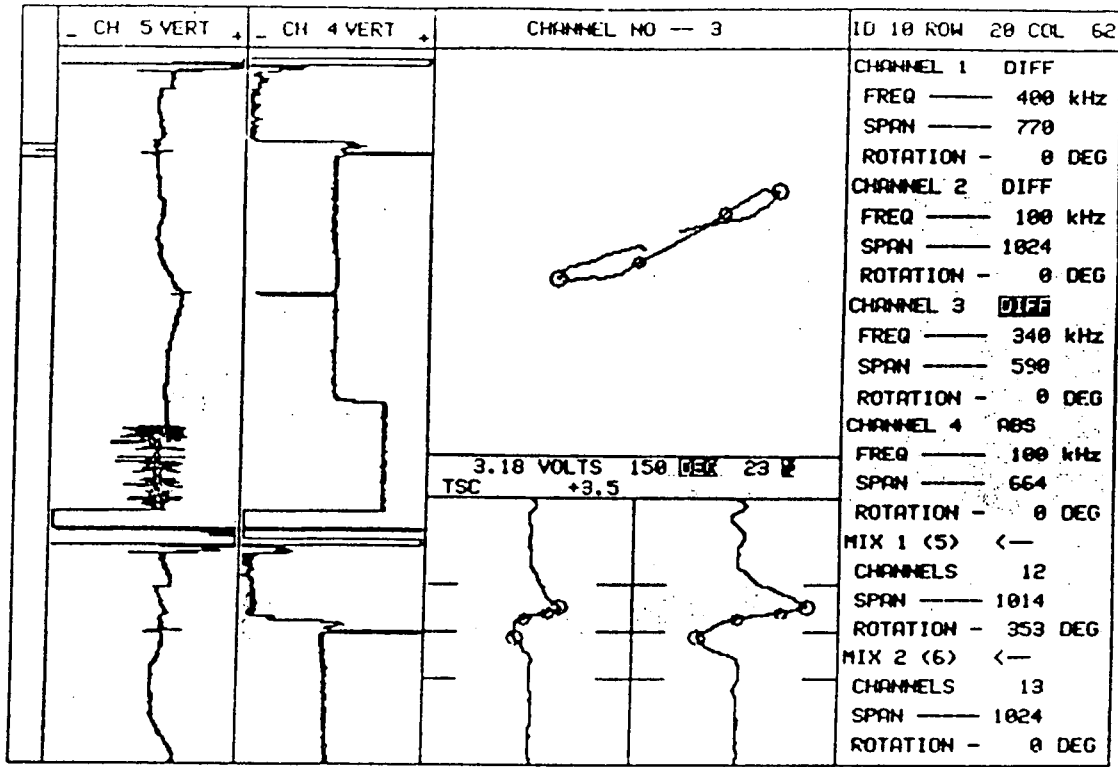


20    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS.    I    B    OUTLET    1980    Edition 12.0 Rev 1

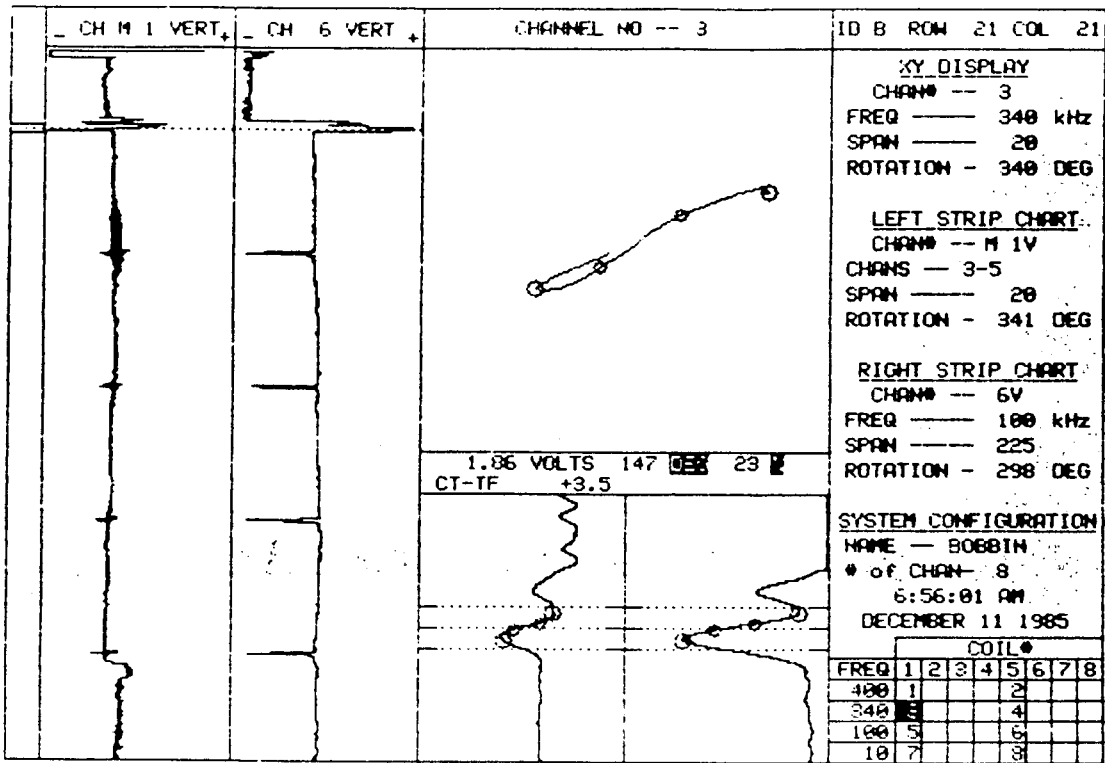


25 PLANT SONGS DISK C06 UNIT# 1 S/G B LEG B DATE 12/11/85

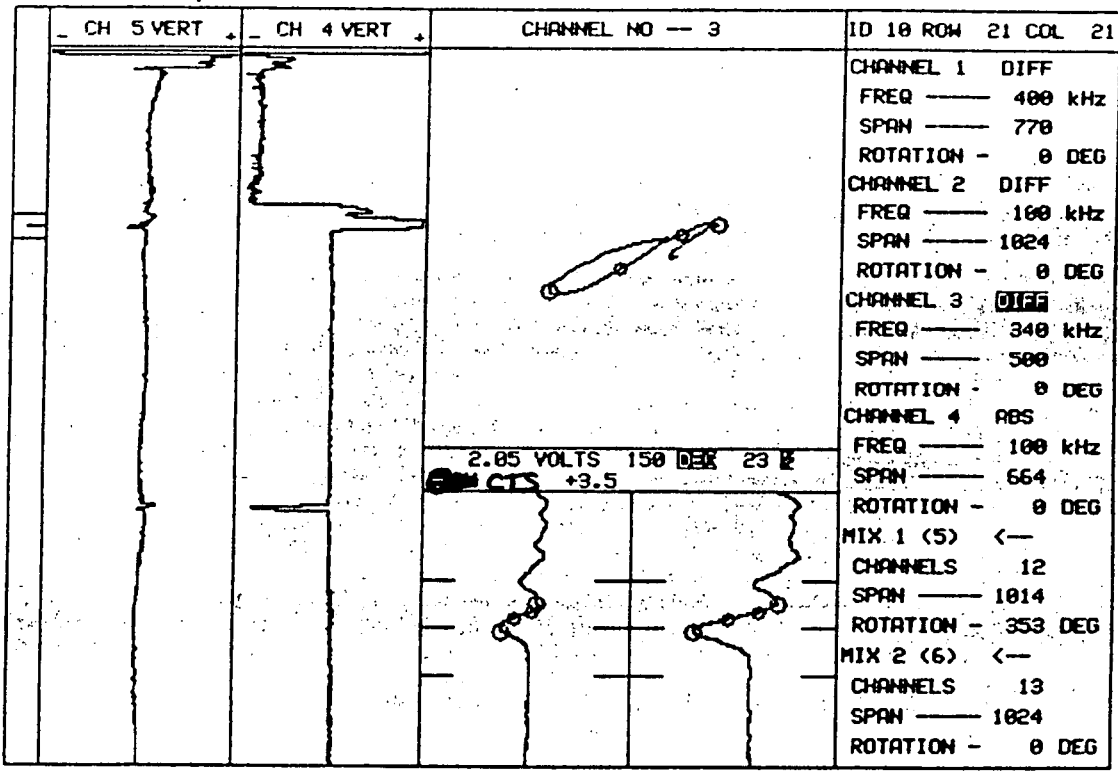




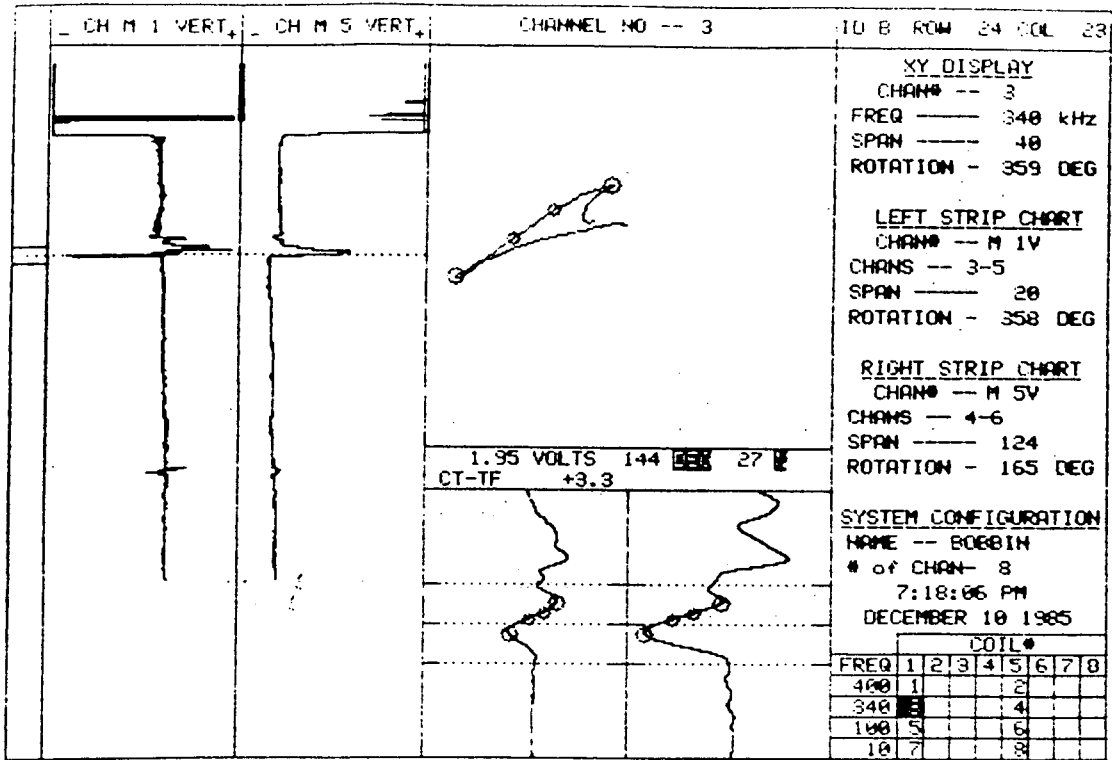
20 PLANT SCE SONGS UNIT# I S/G B LEG B DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



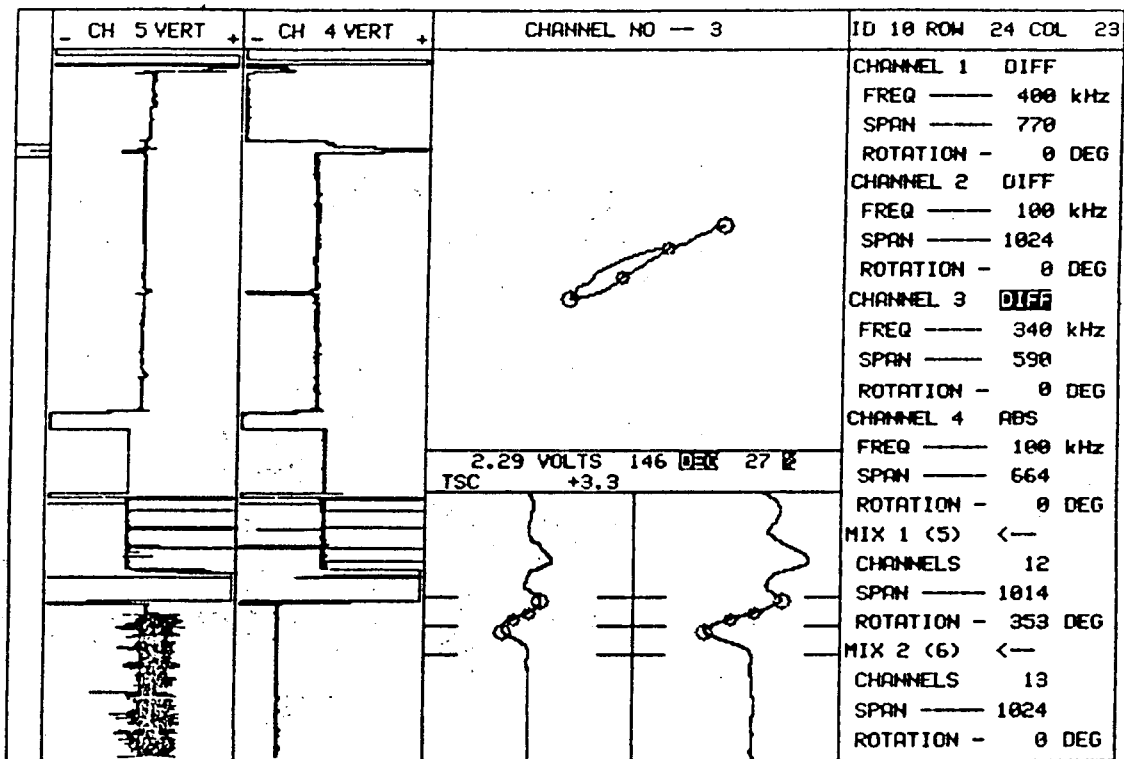
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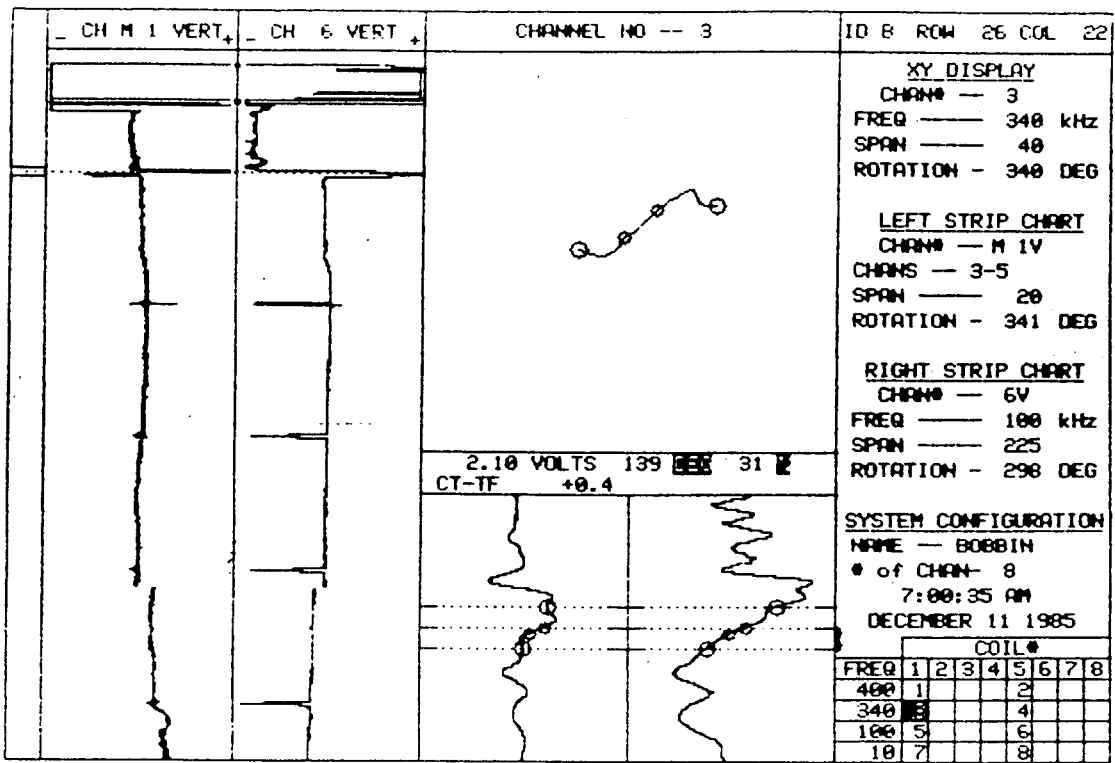
10 PLANT SCE SONGS UNIT# I S/G B LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



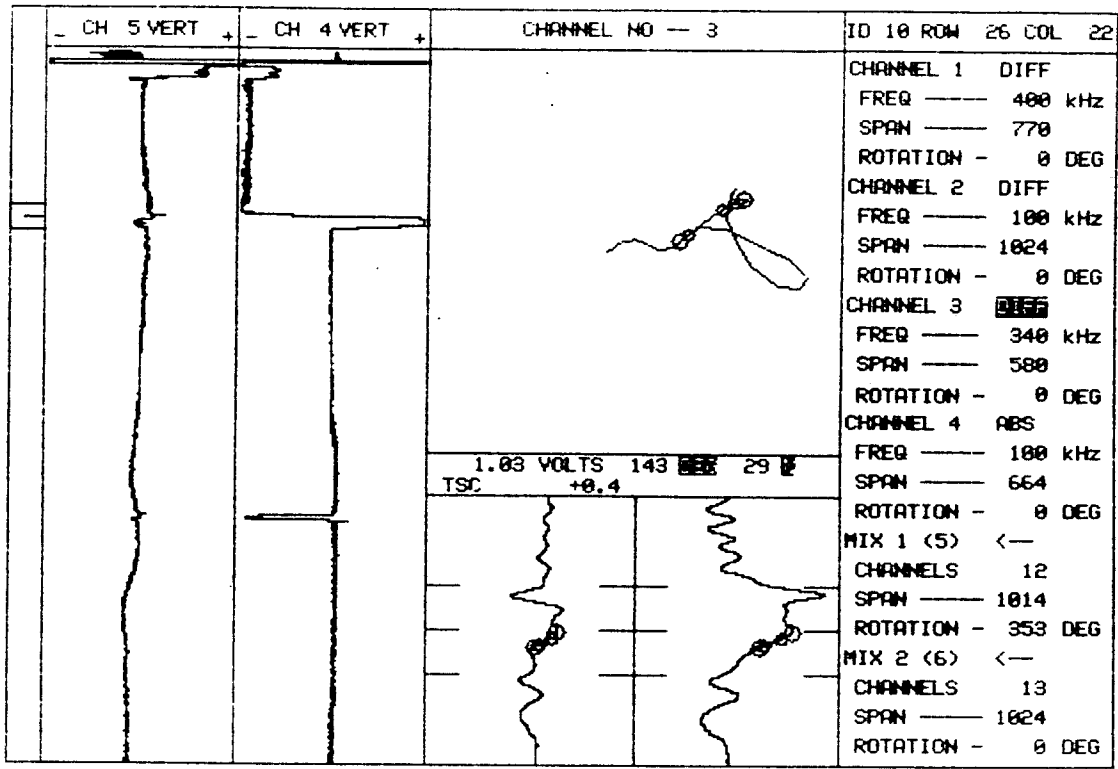
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS 00-002    1    B    OUTLET    12/10/85



20    PLANT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    B    OUTLET    1980    Edition 12.0 Rev 1

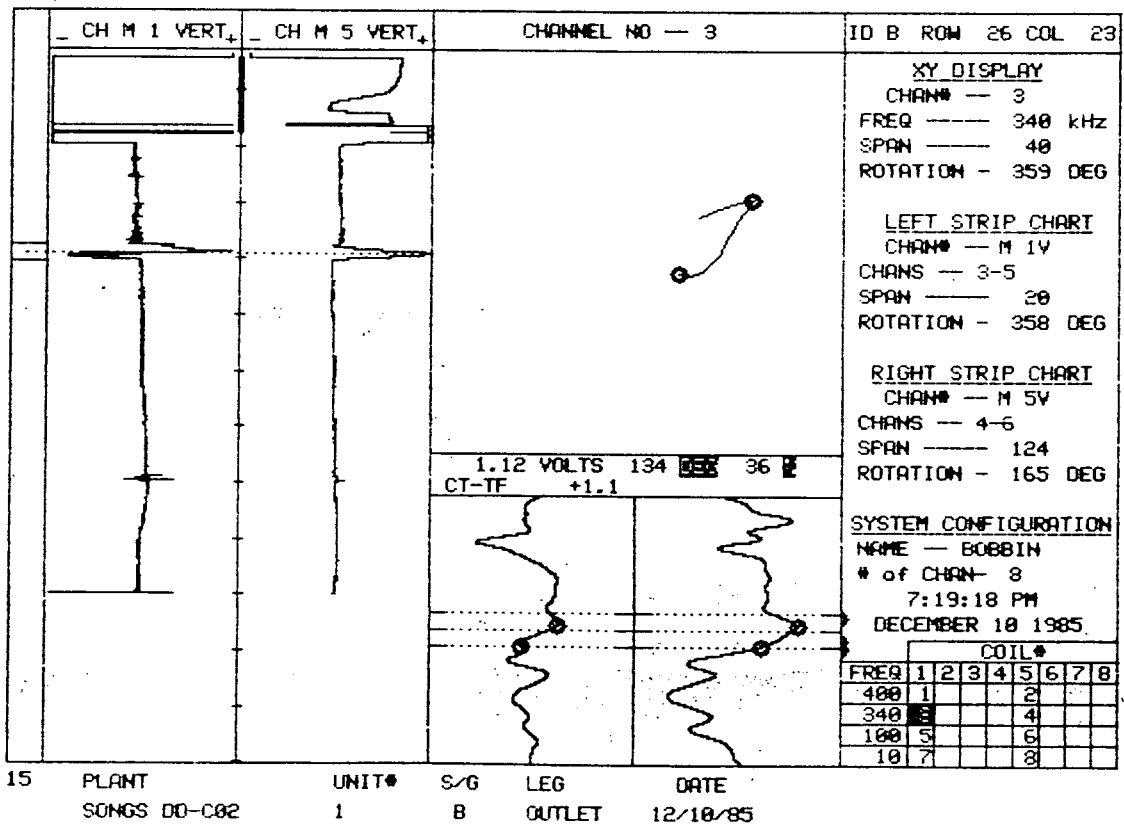
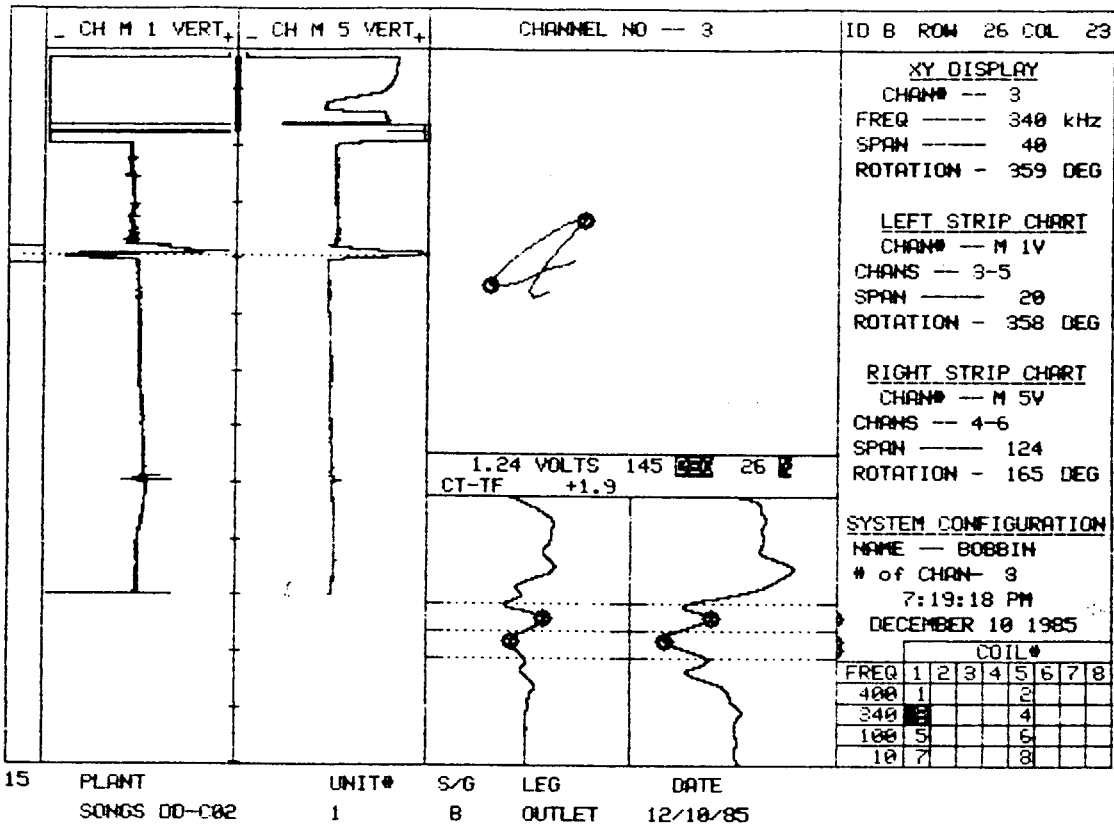


25 PLANT SONGS REEL C05 UNIT# 1 S/G B LEG B DATE 12/11/85

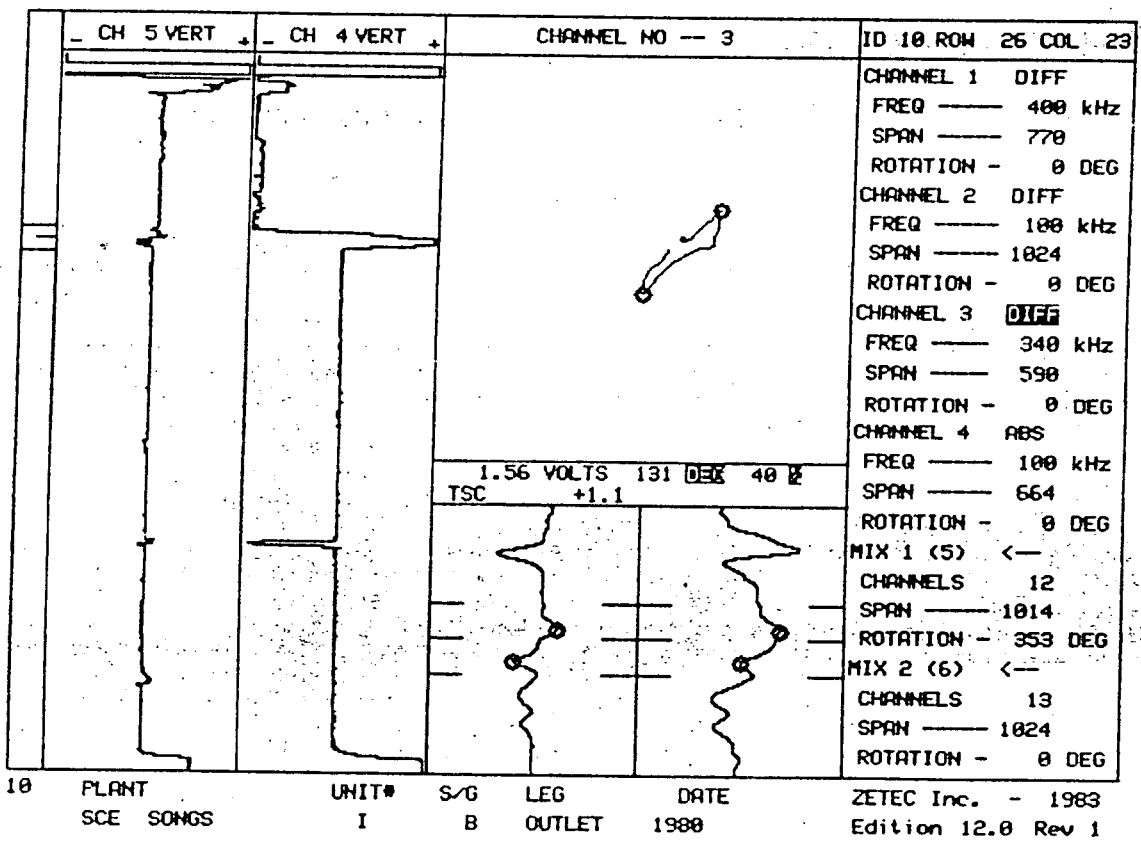
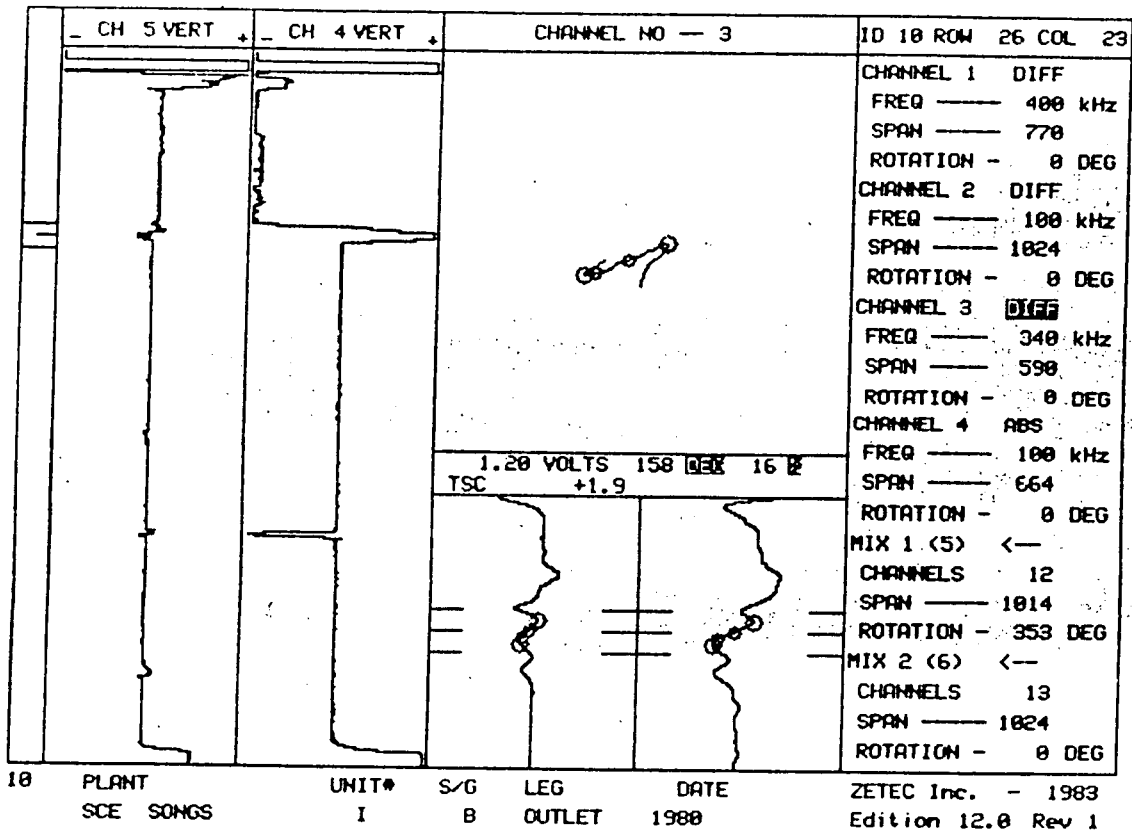


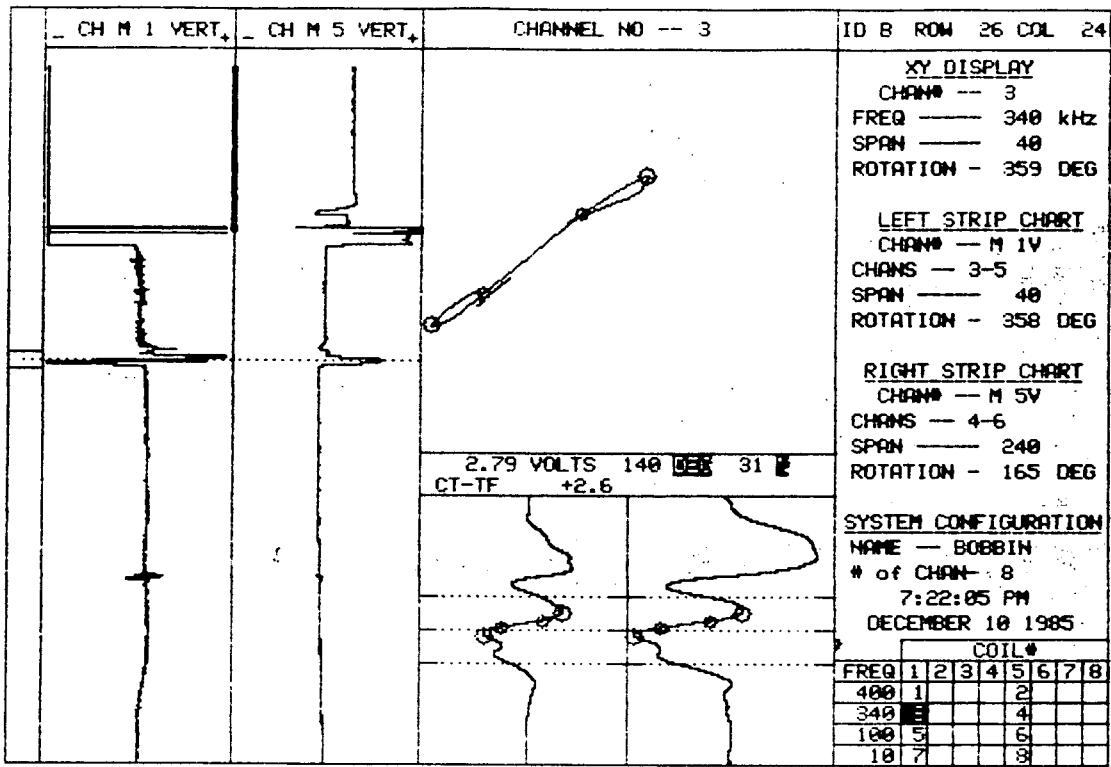
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TSC +0.4

10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	B	OUTLET	1980	Edition 12.0 Rev 1

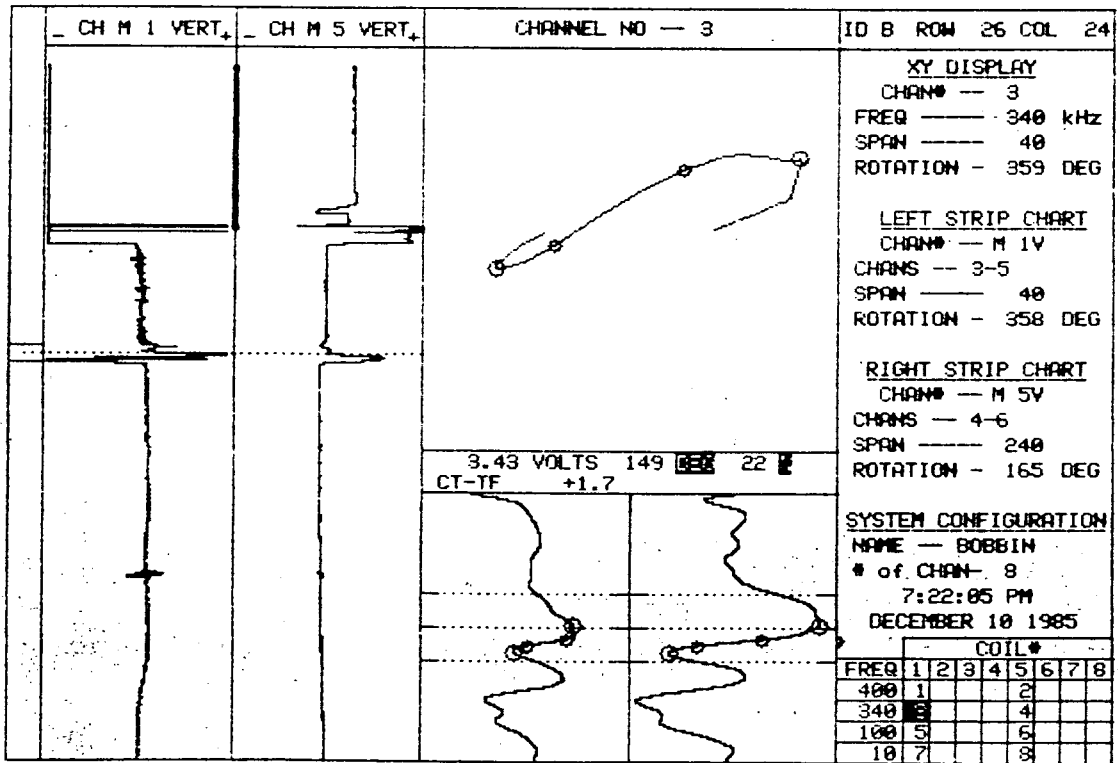




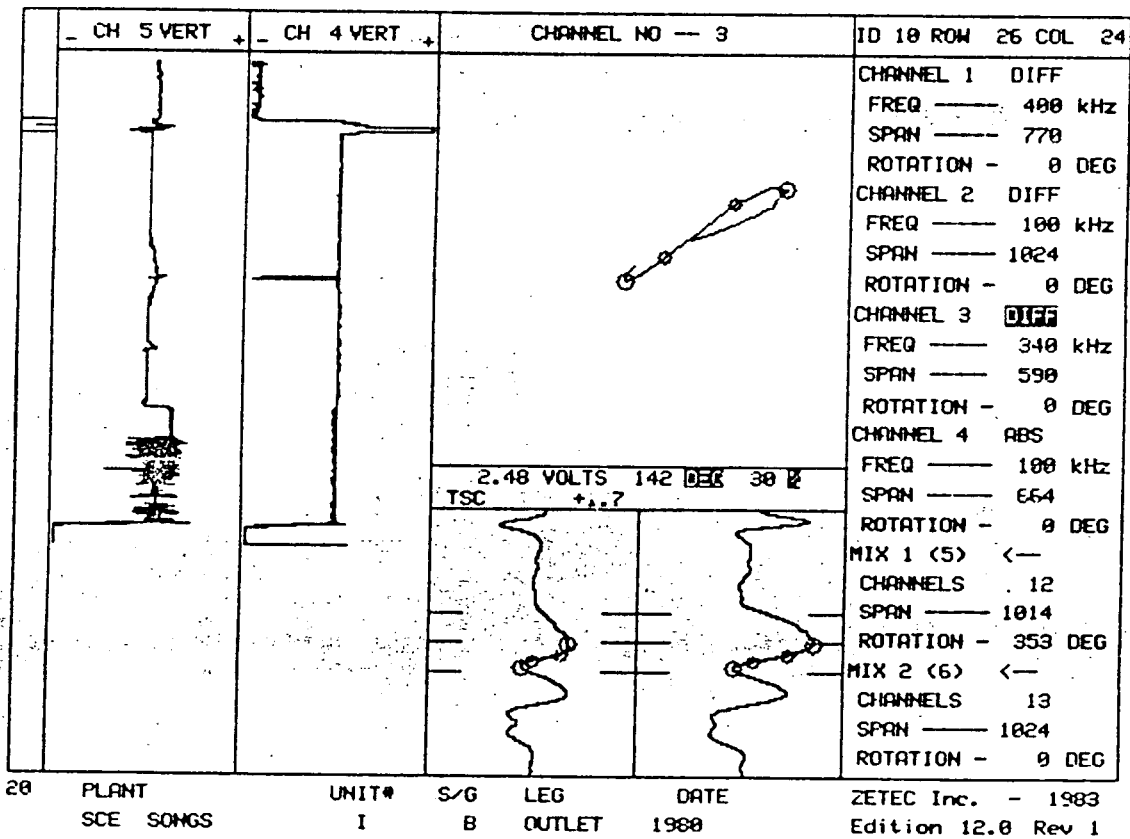
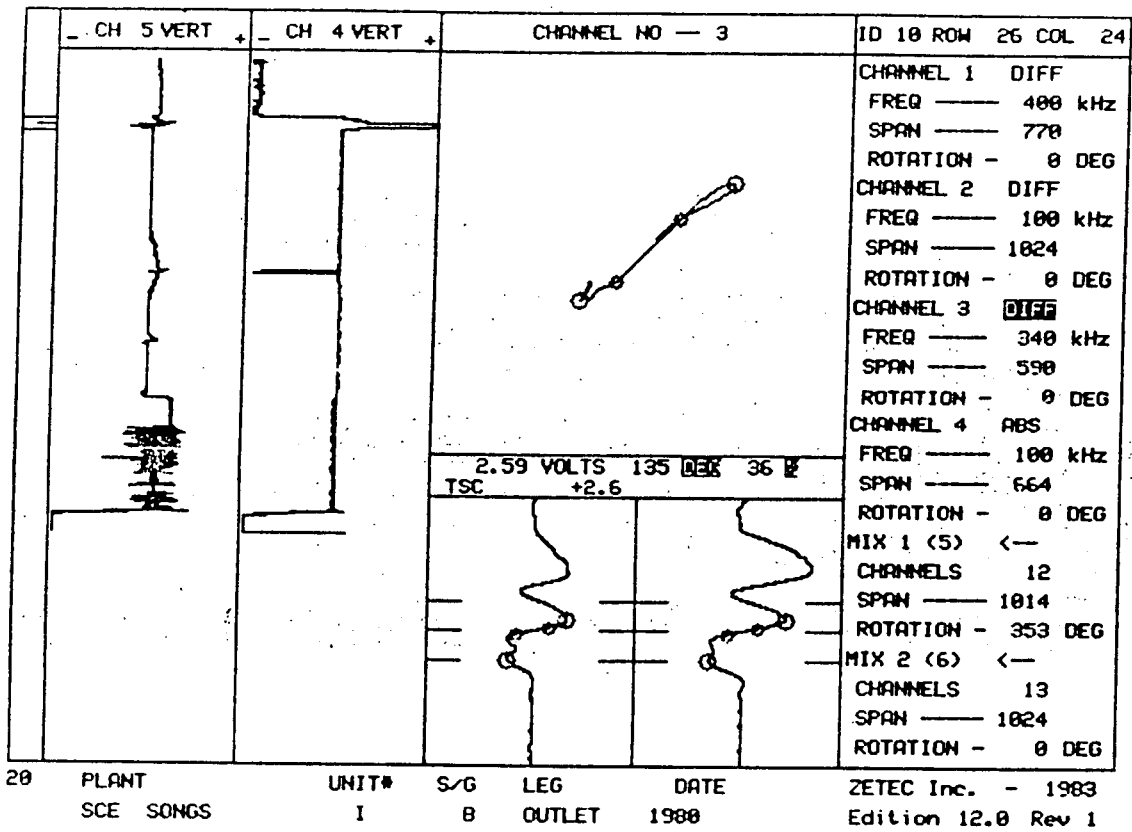


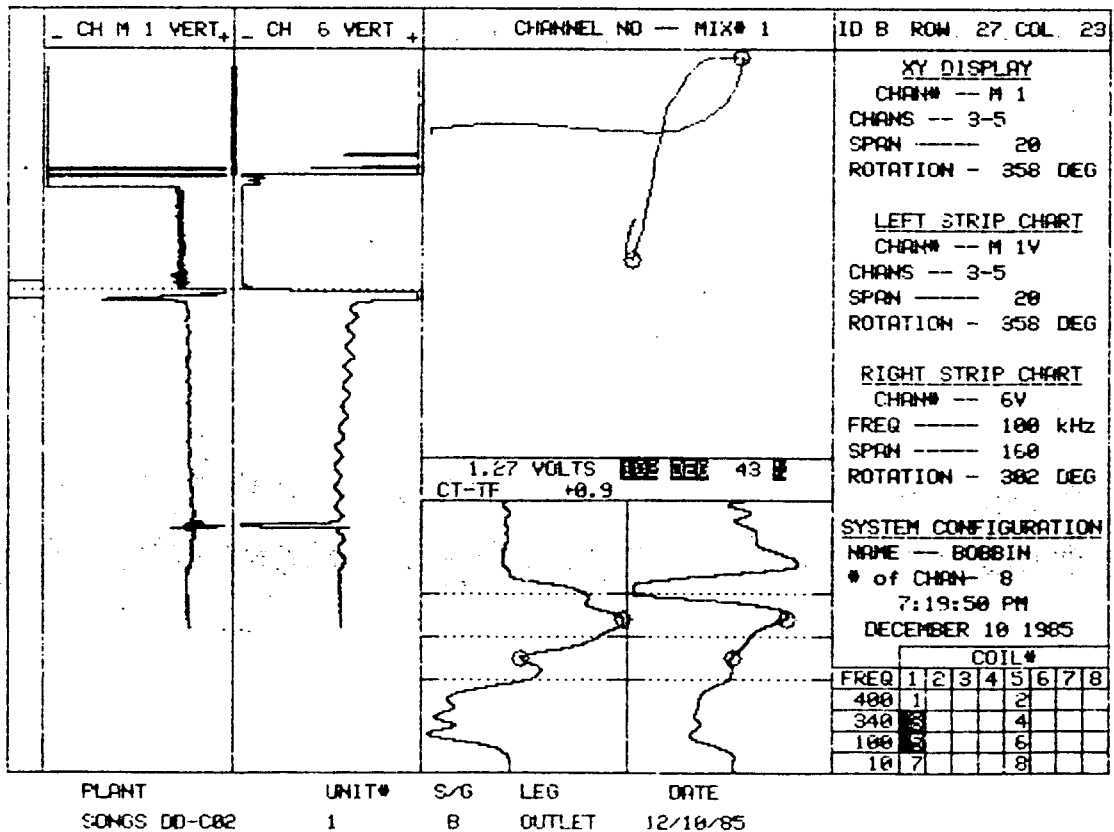
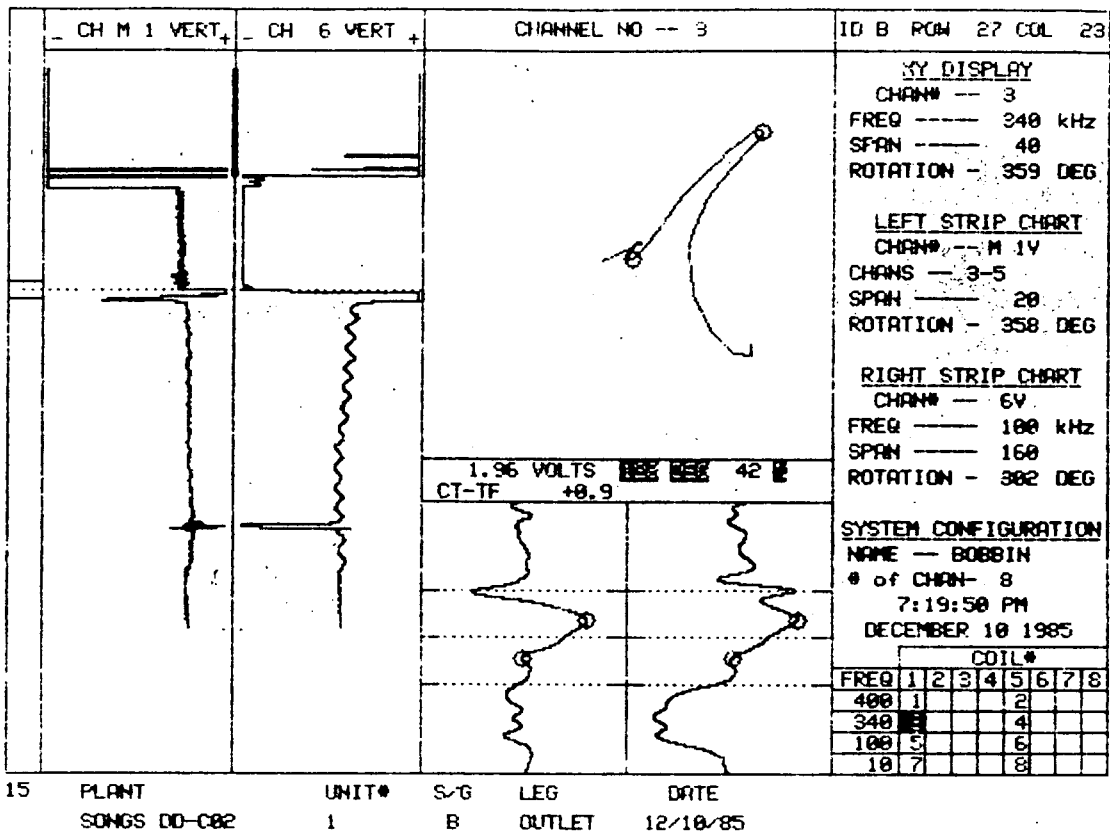


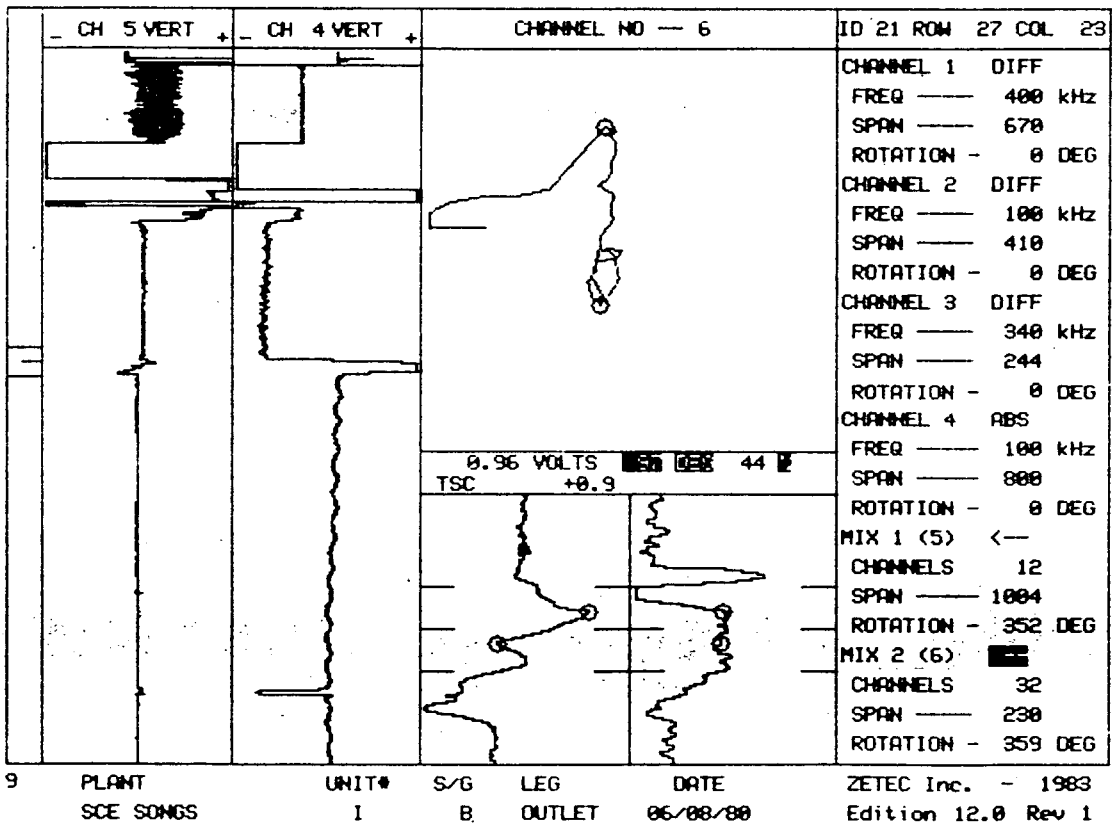
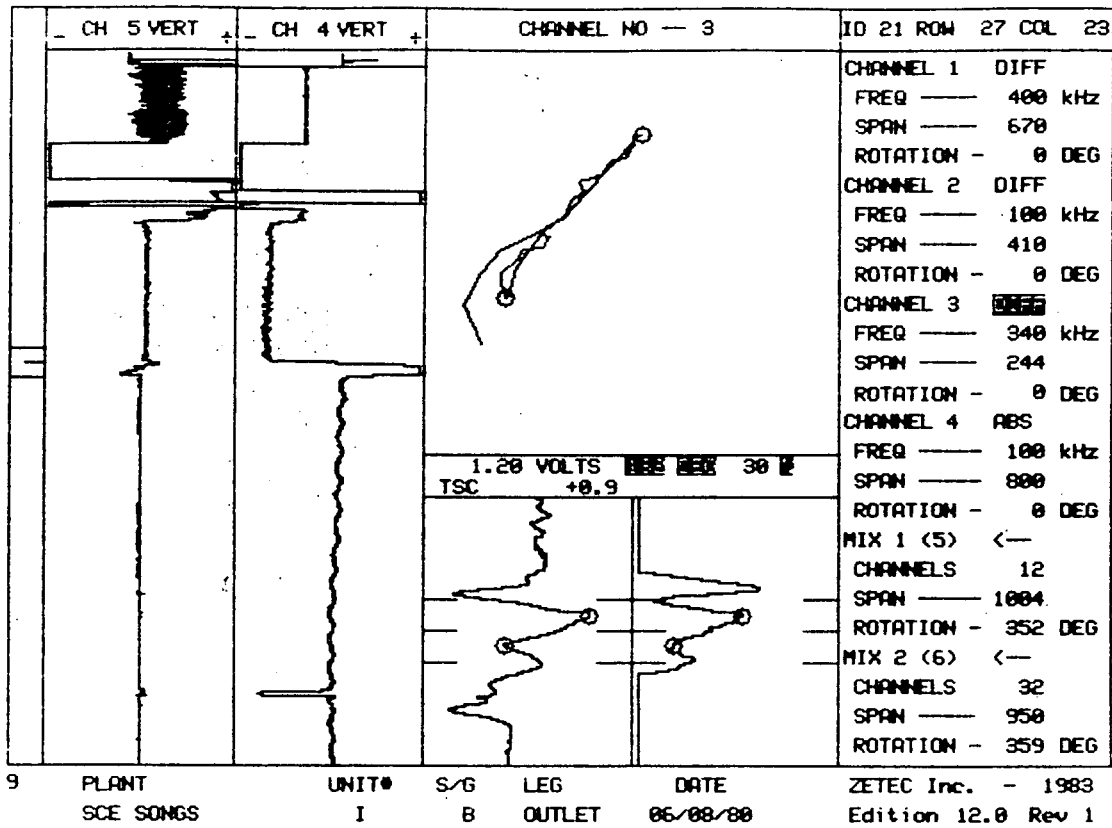
15 PLANT SONGS DD-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85

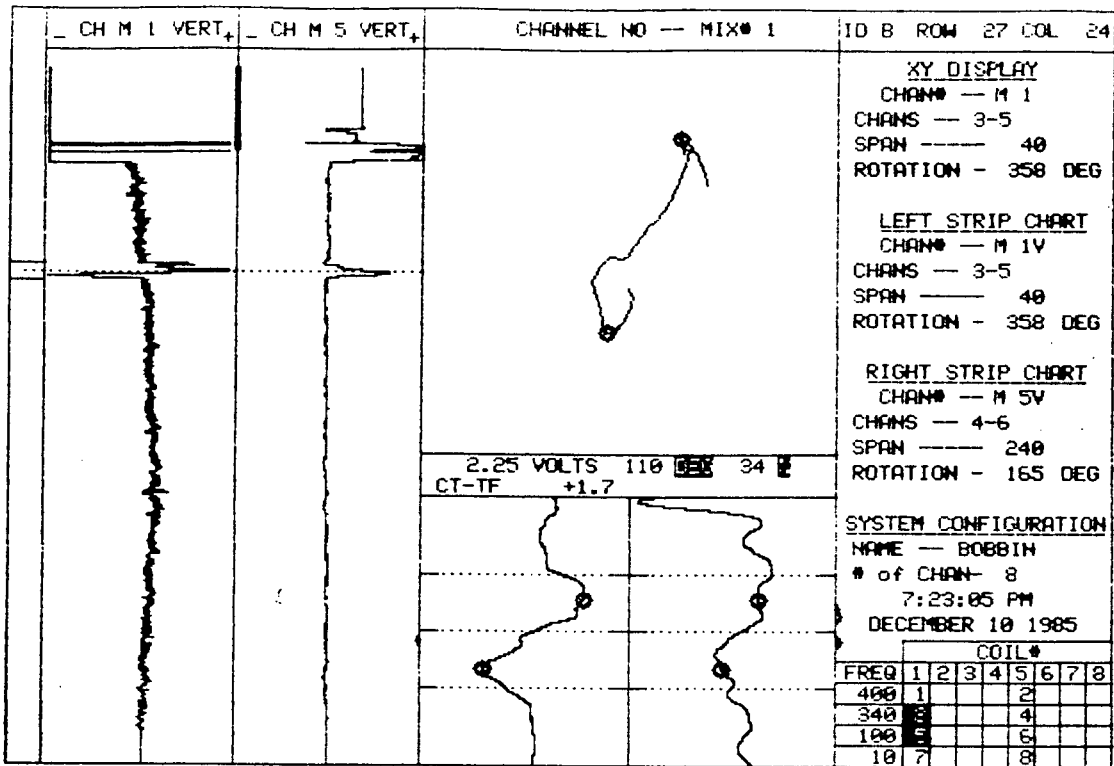


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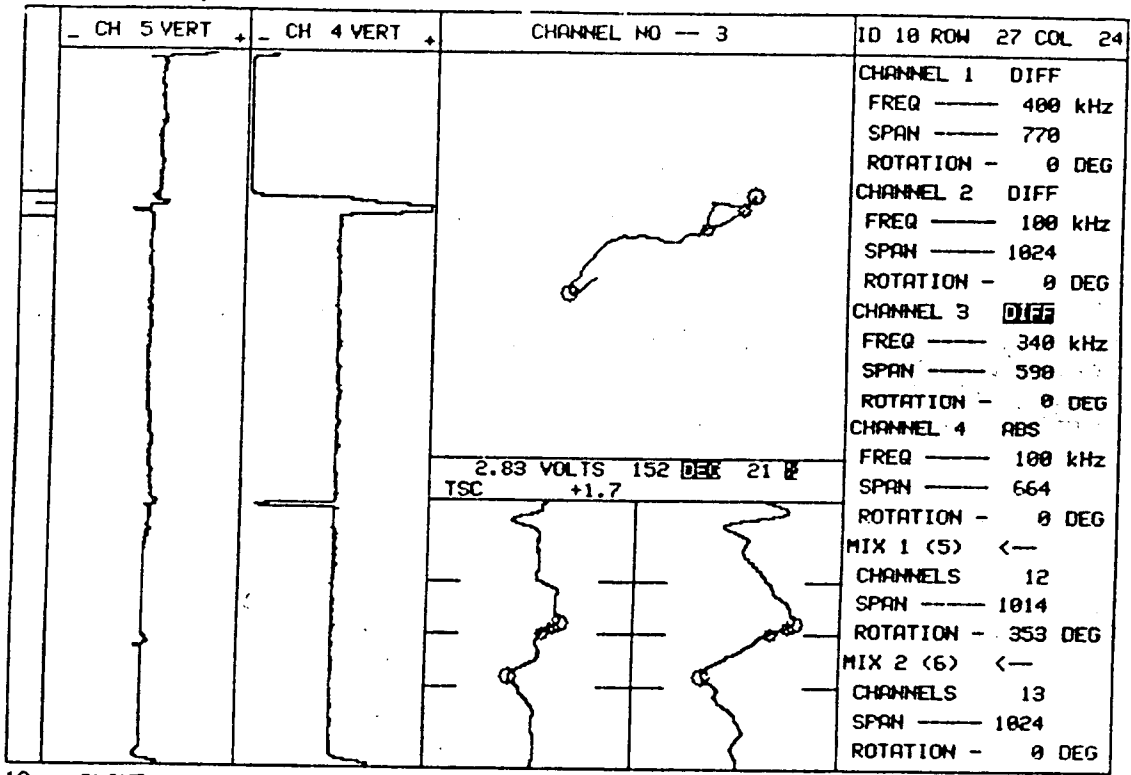




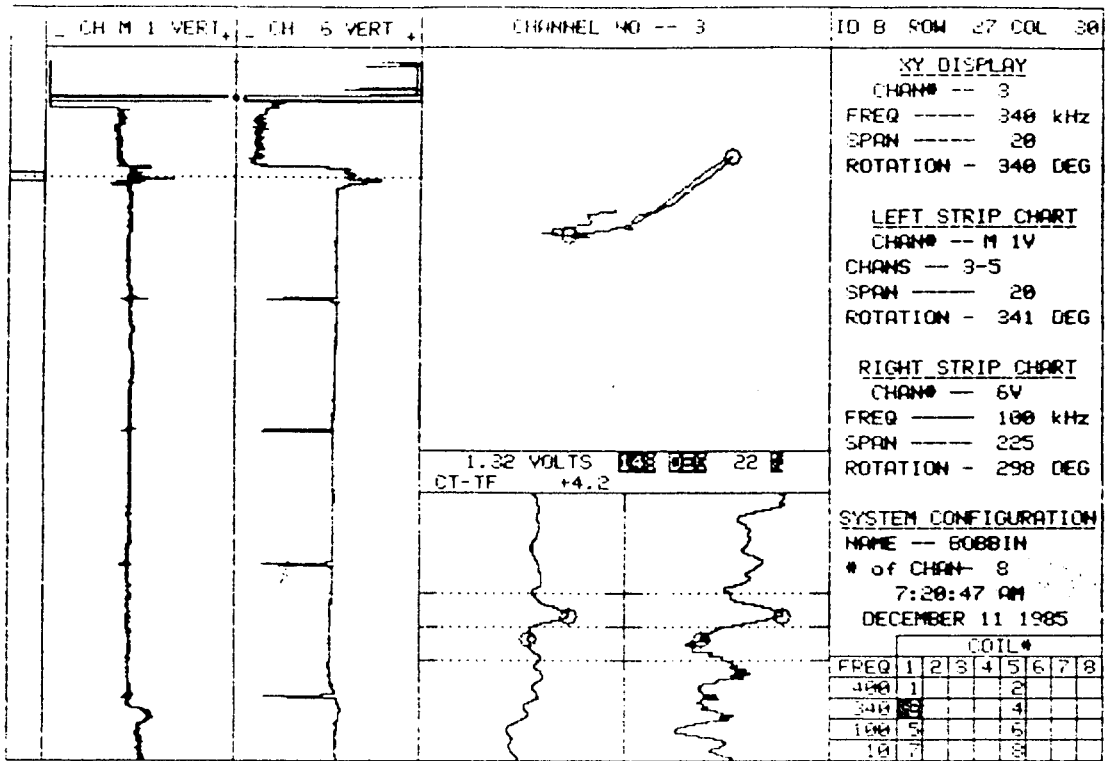




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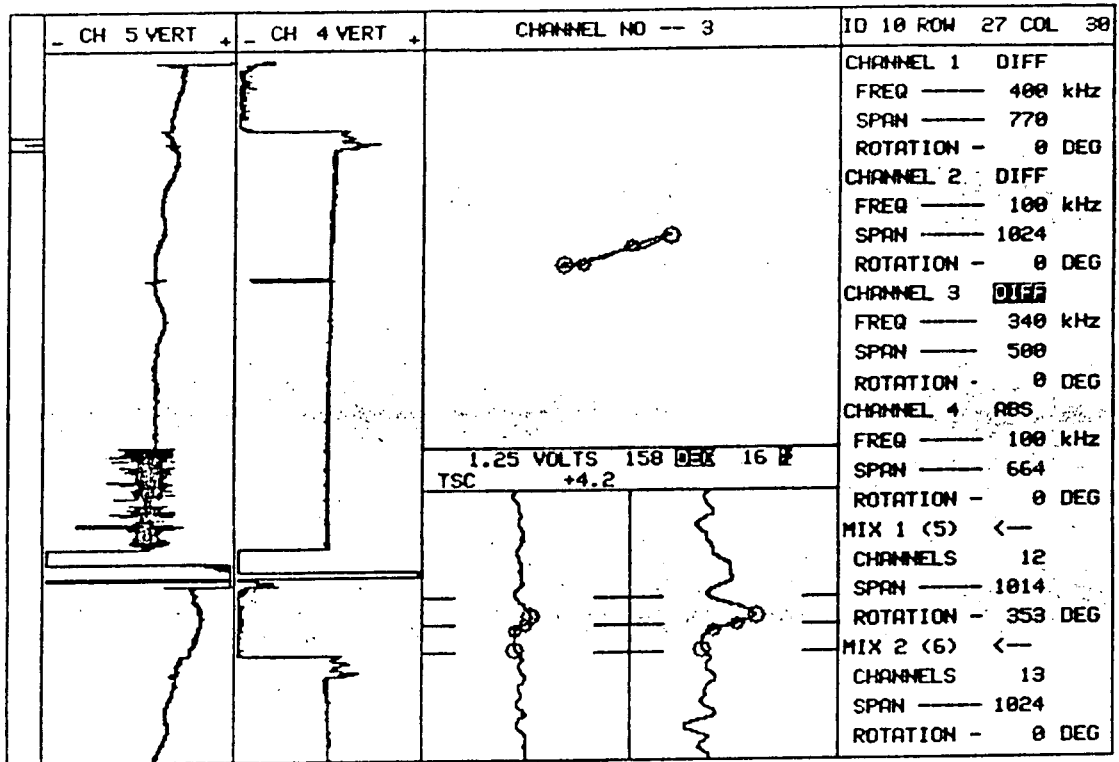


10 PLANT SCE SONGS UNIT# I S/G B LEG OUTLET DATE 1980  
 ZETEC Inc. - 1983 Edition 12.0 Rev 1

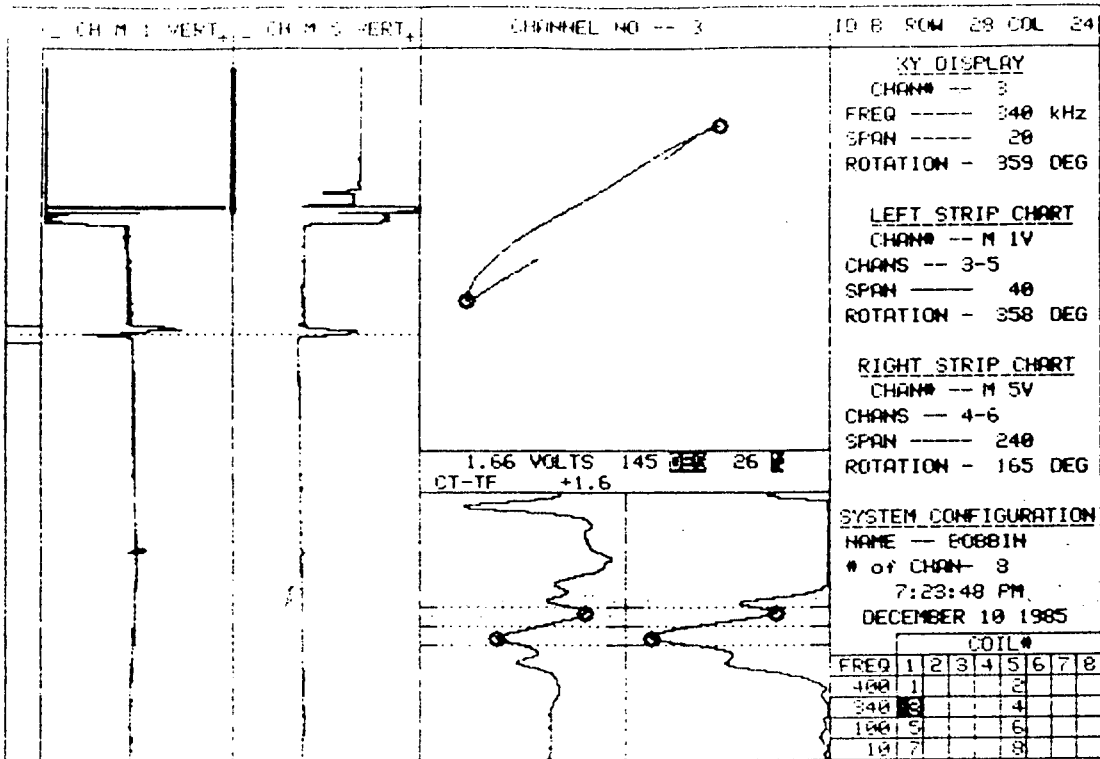


25    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS REEL 005    1    B    OUTLET    12/11/85

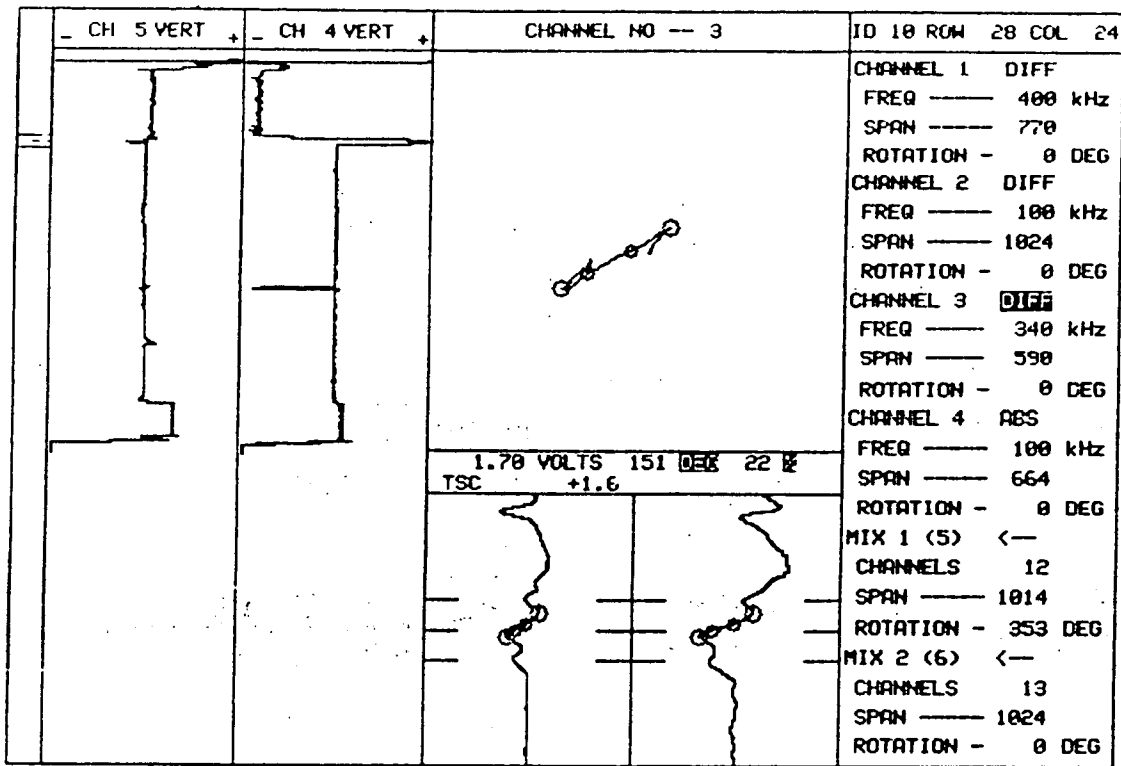




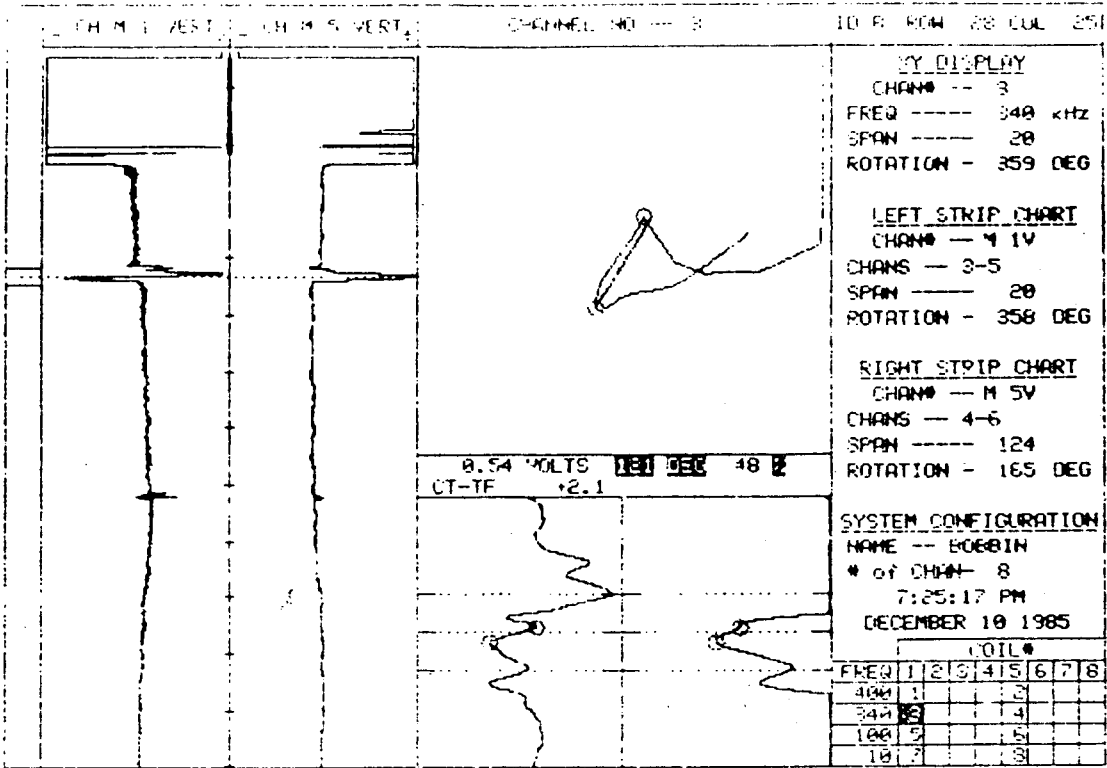
20 PLANT SCE SONGS UNIT# I S/G B LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



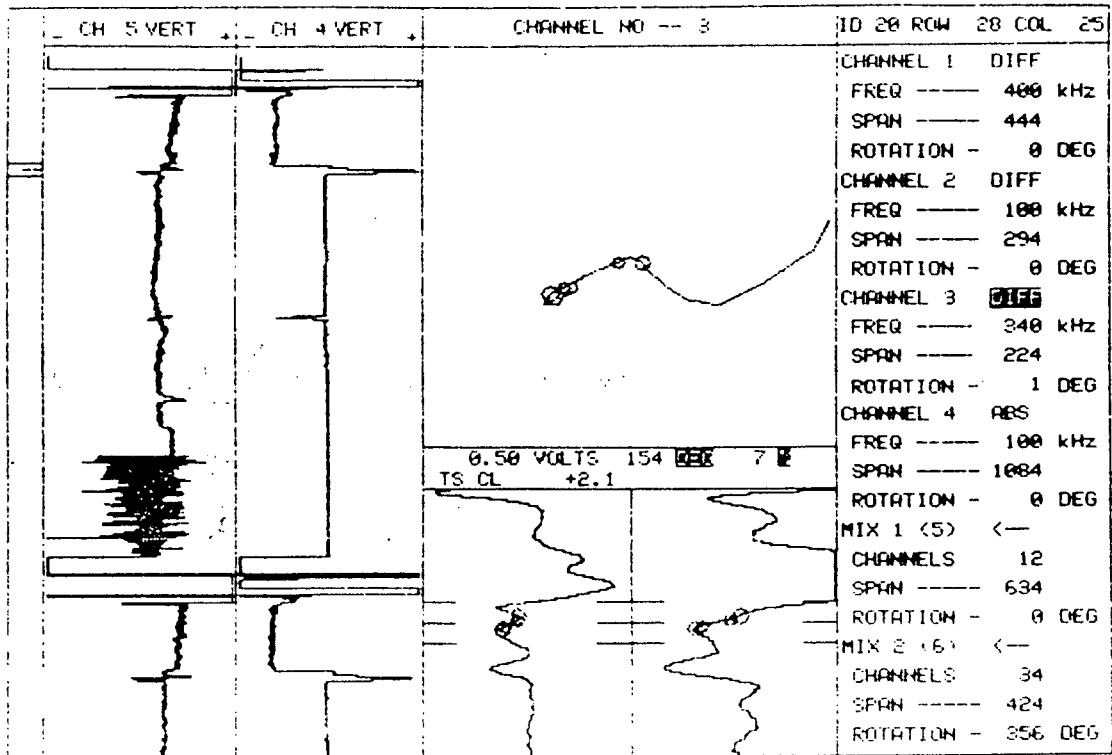
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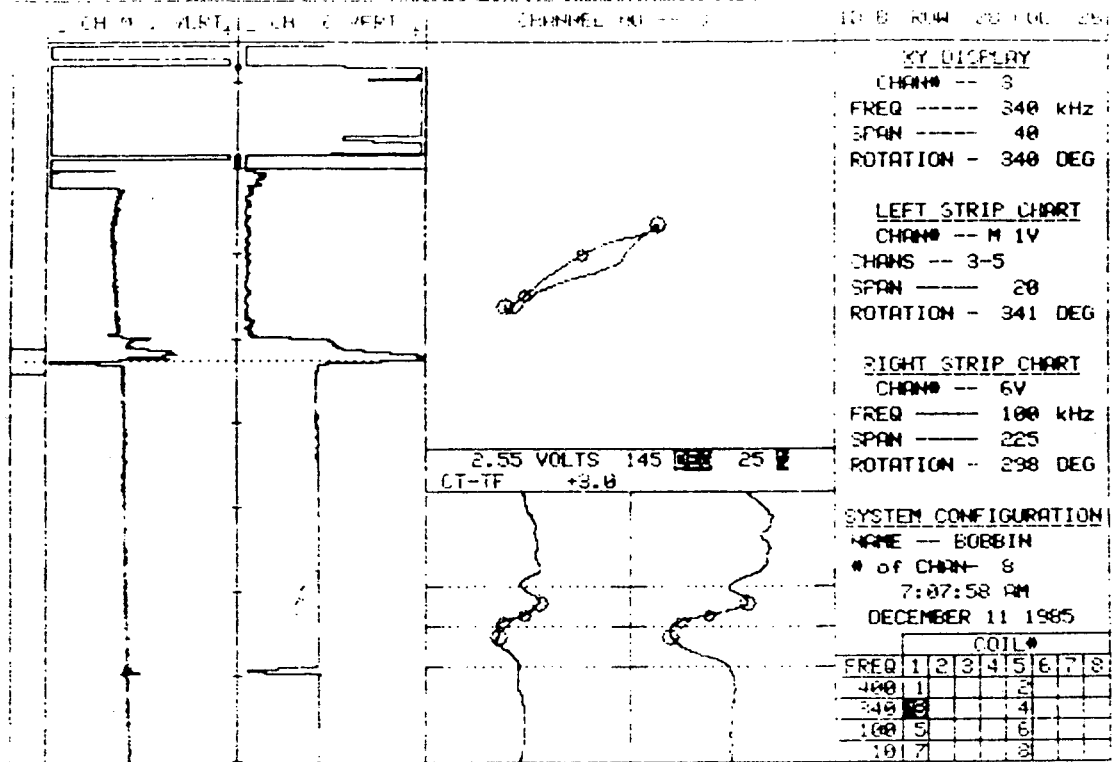
20 PLANT SCE SONGS UNIT# I S/G B LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



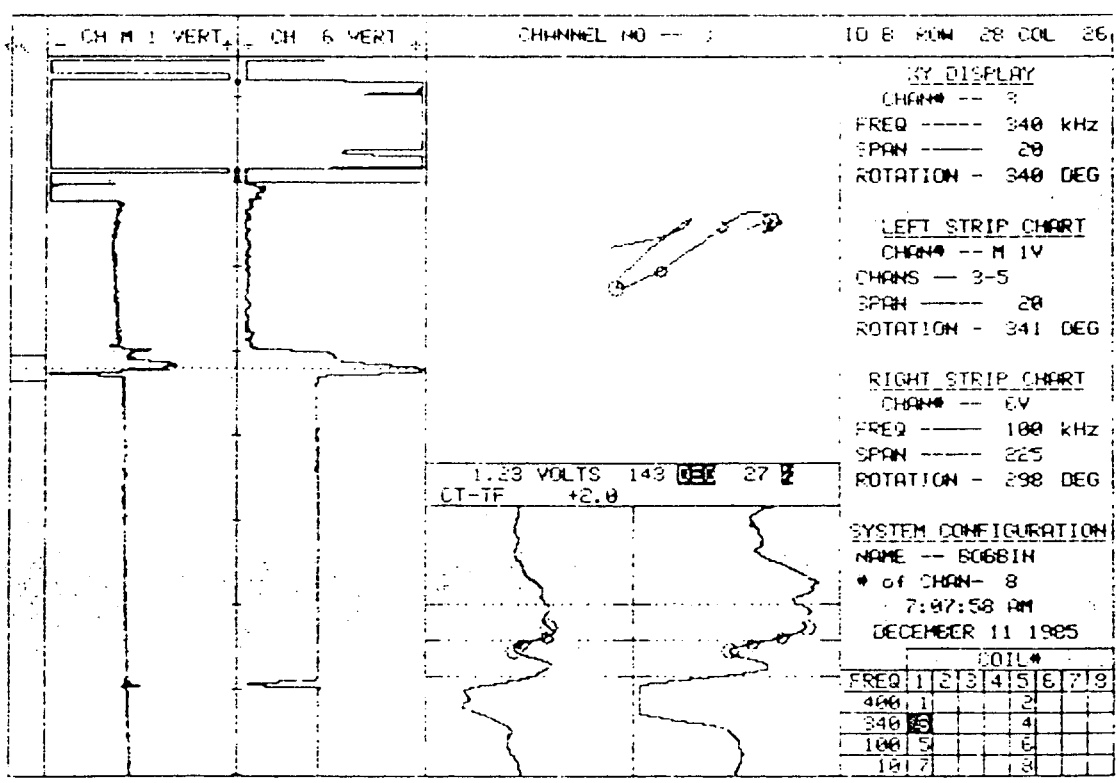
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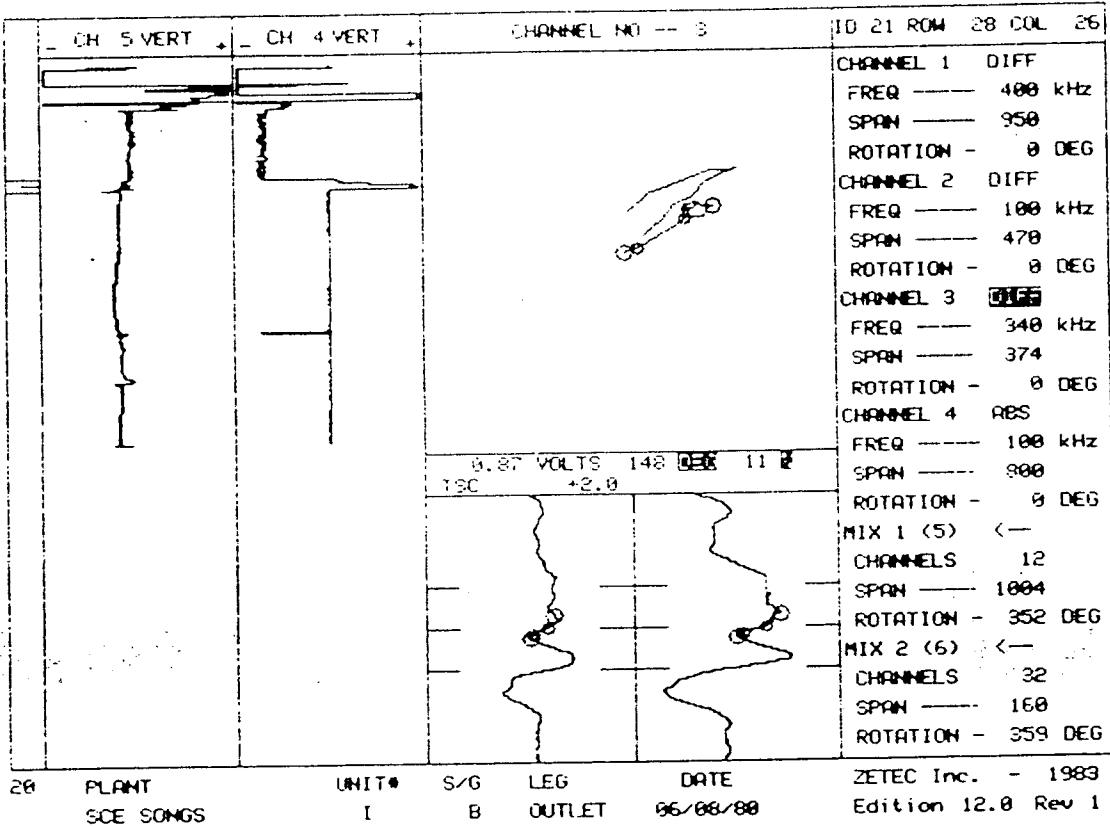
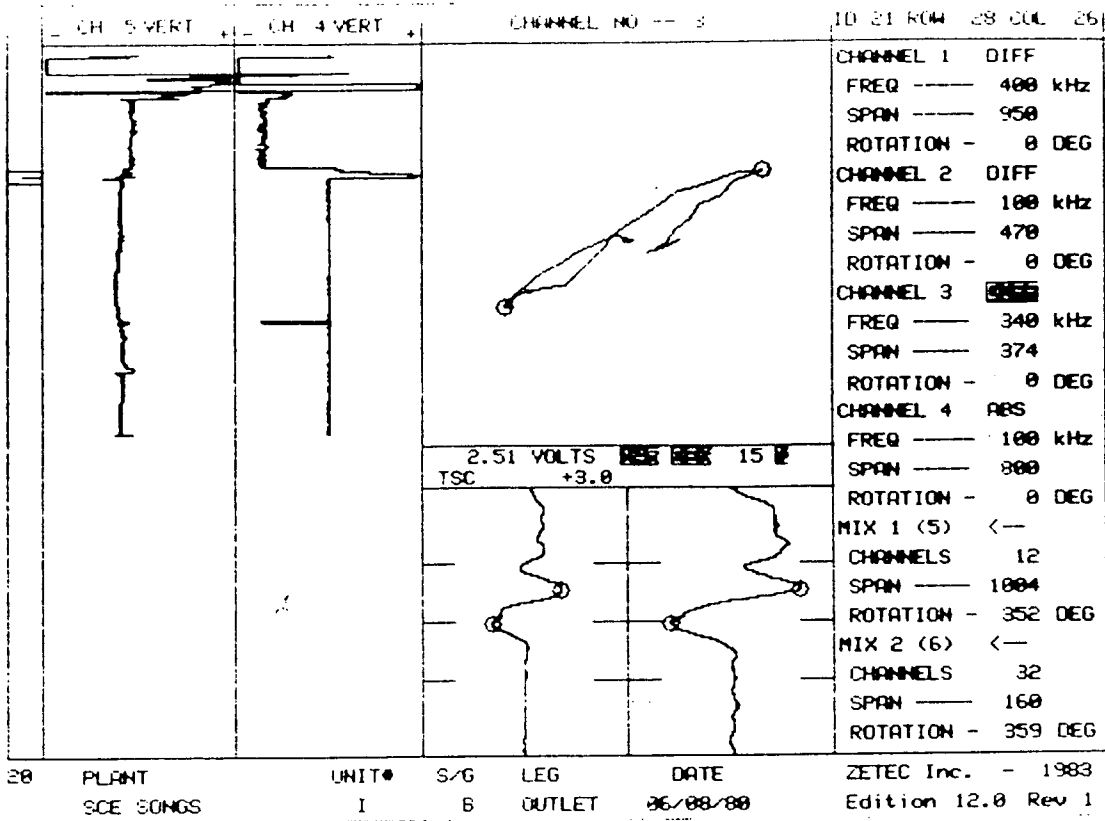
20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	"B"	COLD	06/03/80	Edition 12.0 Rev 1

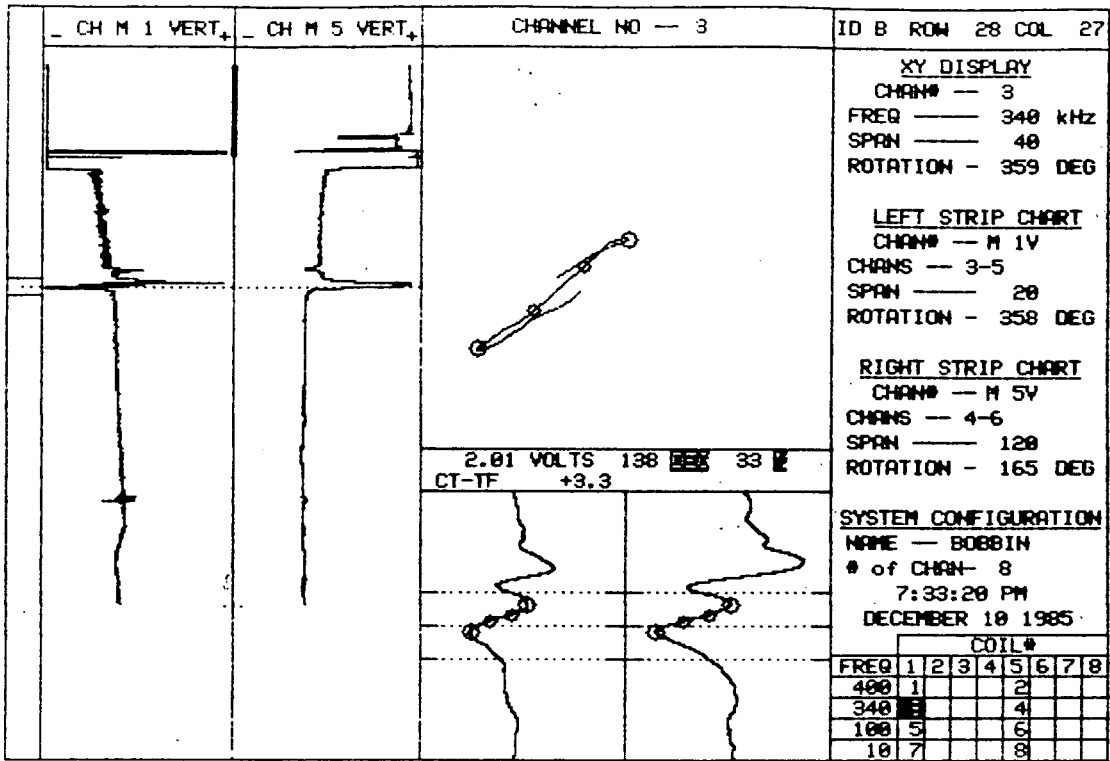


10 PLANT SONGS DISK 086 UNIT# 1 S/G B LEG OUTLET DATE 12/11/85

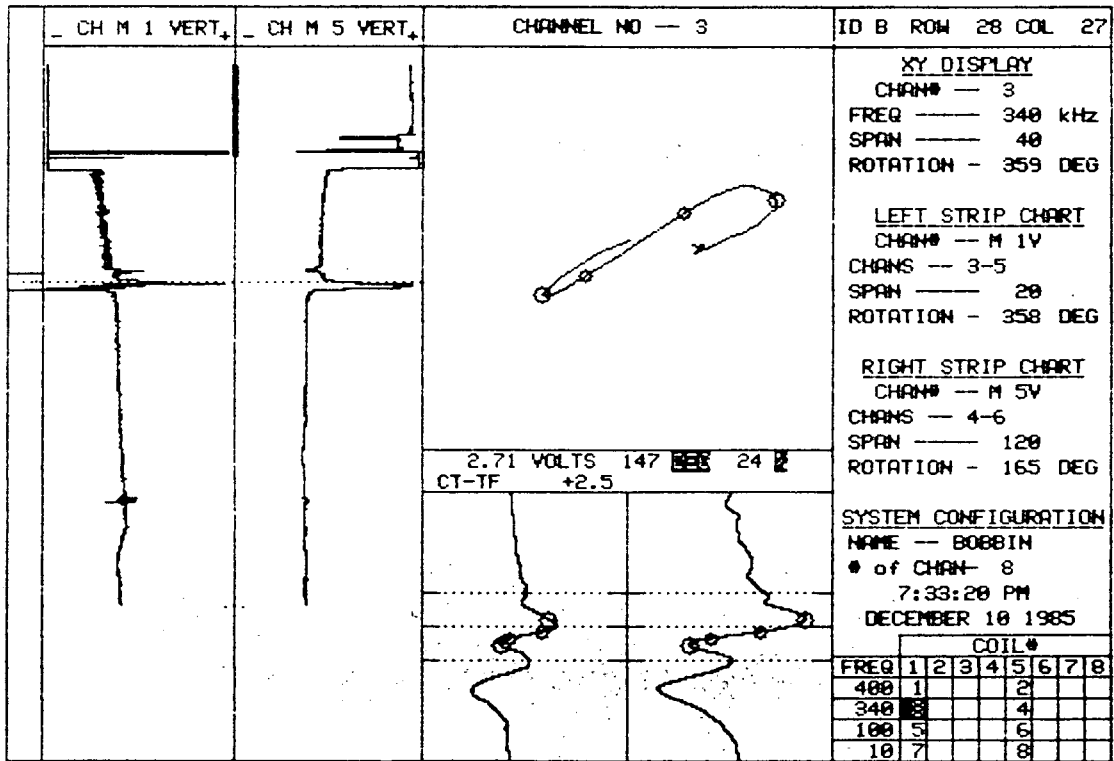


10 PLANT SONGS DISK 086 UNIT# 1 S/G B LEG OUTLET DATE 12/11/85



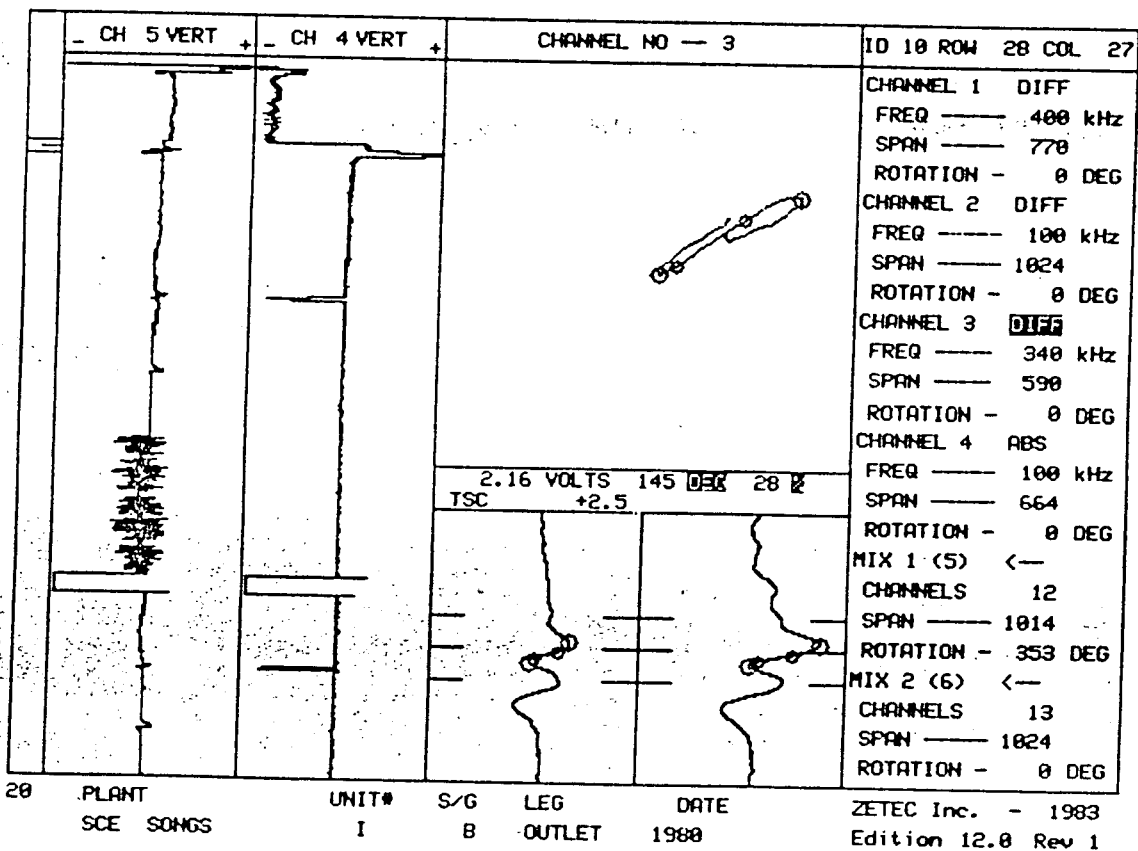
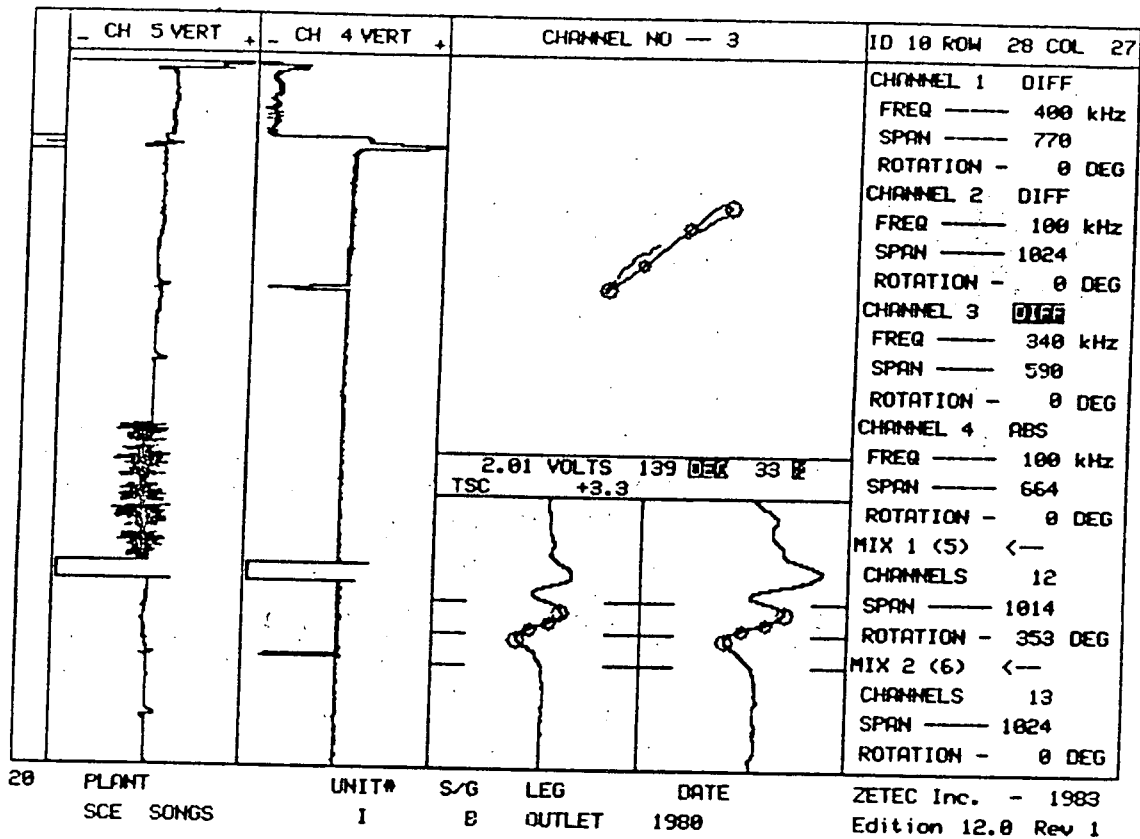


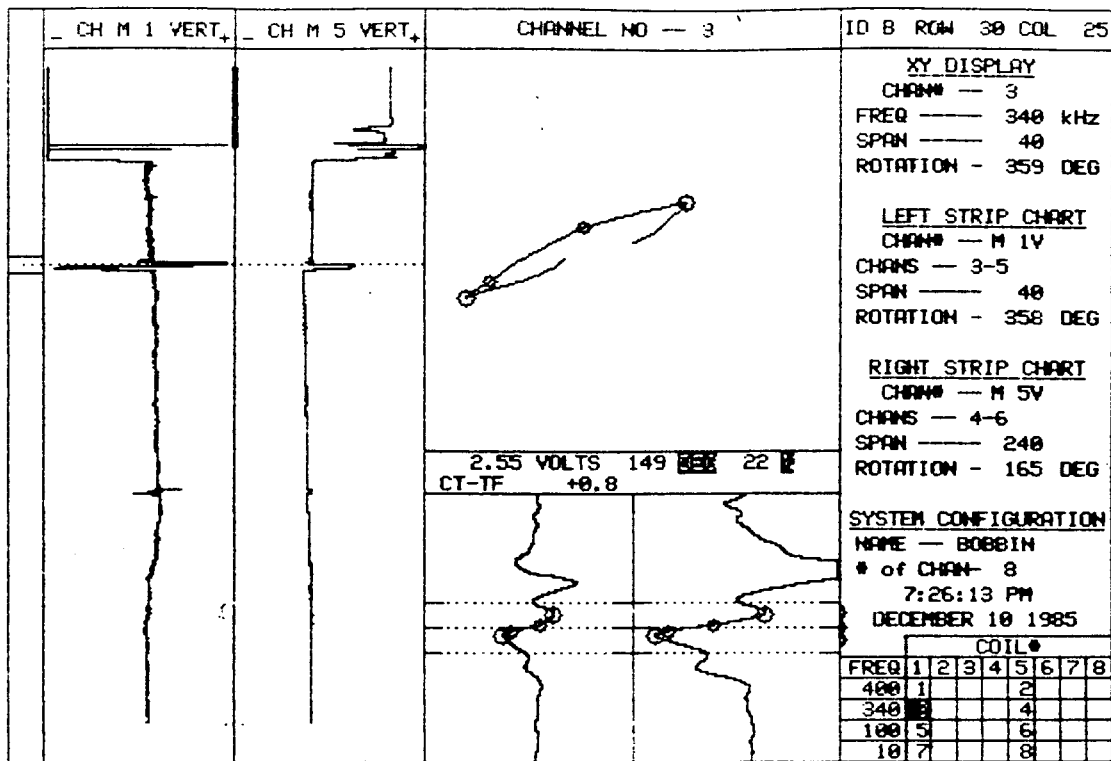
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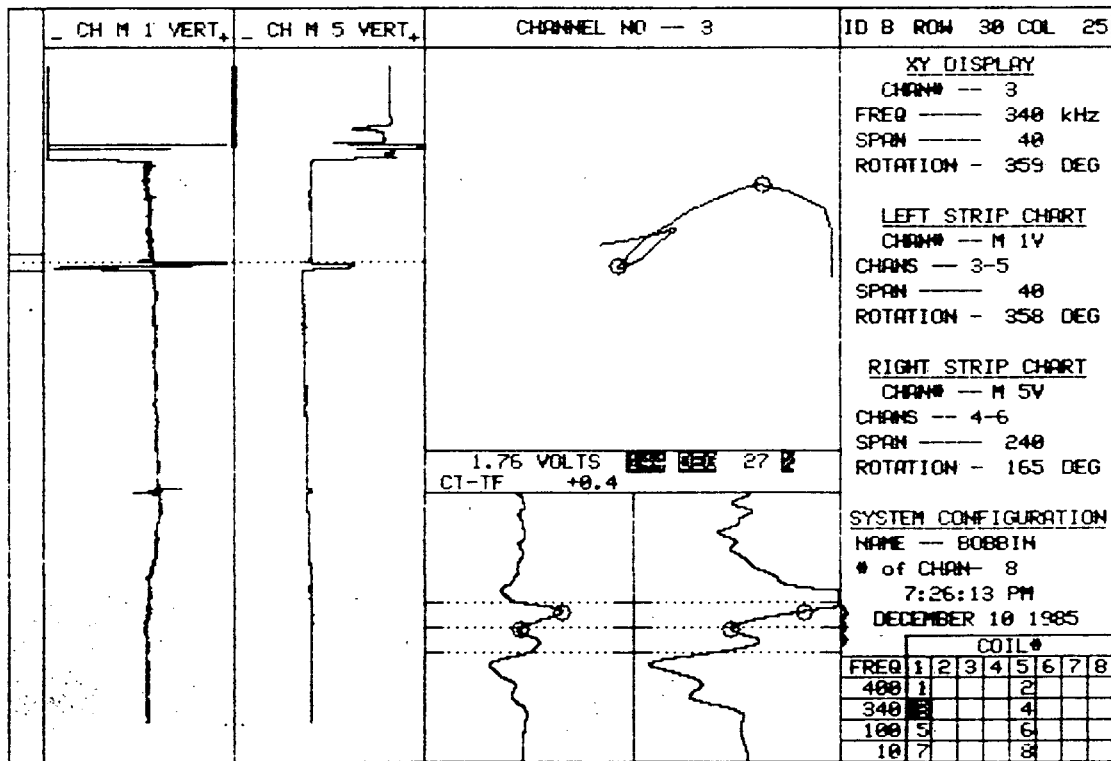
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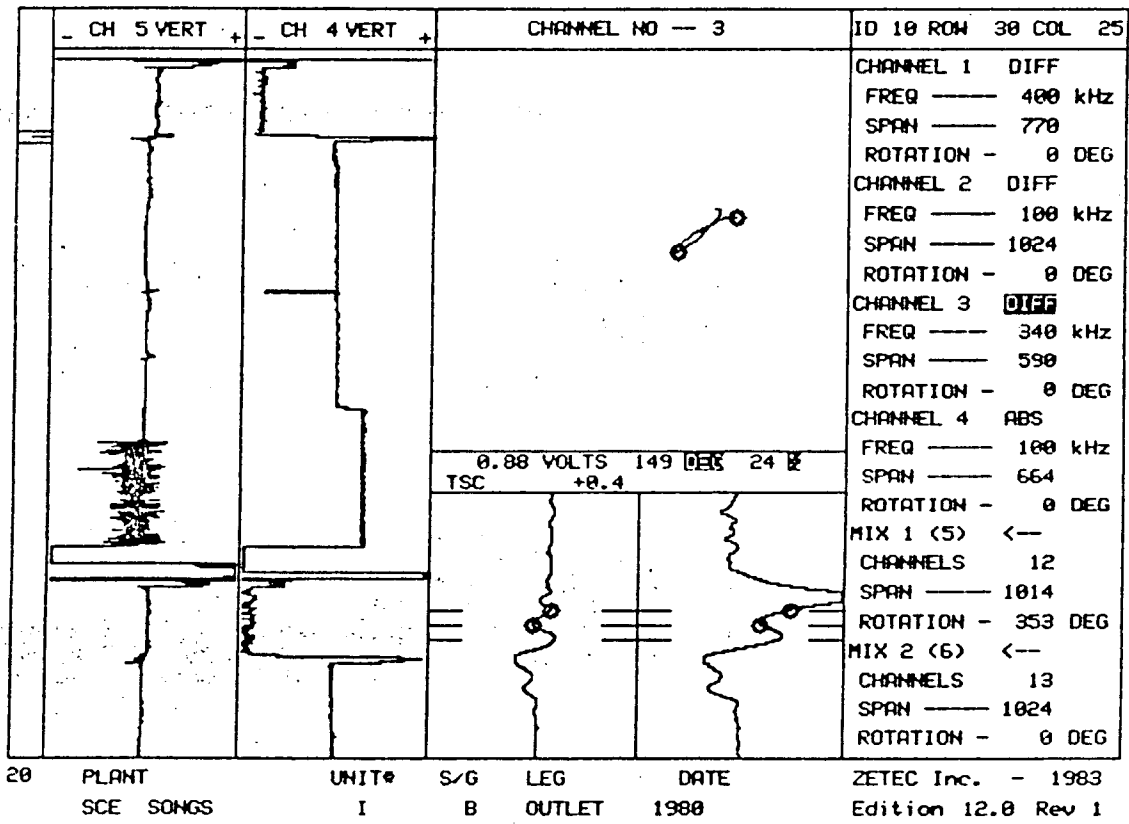
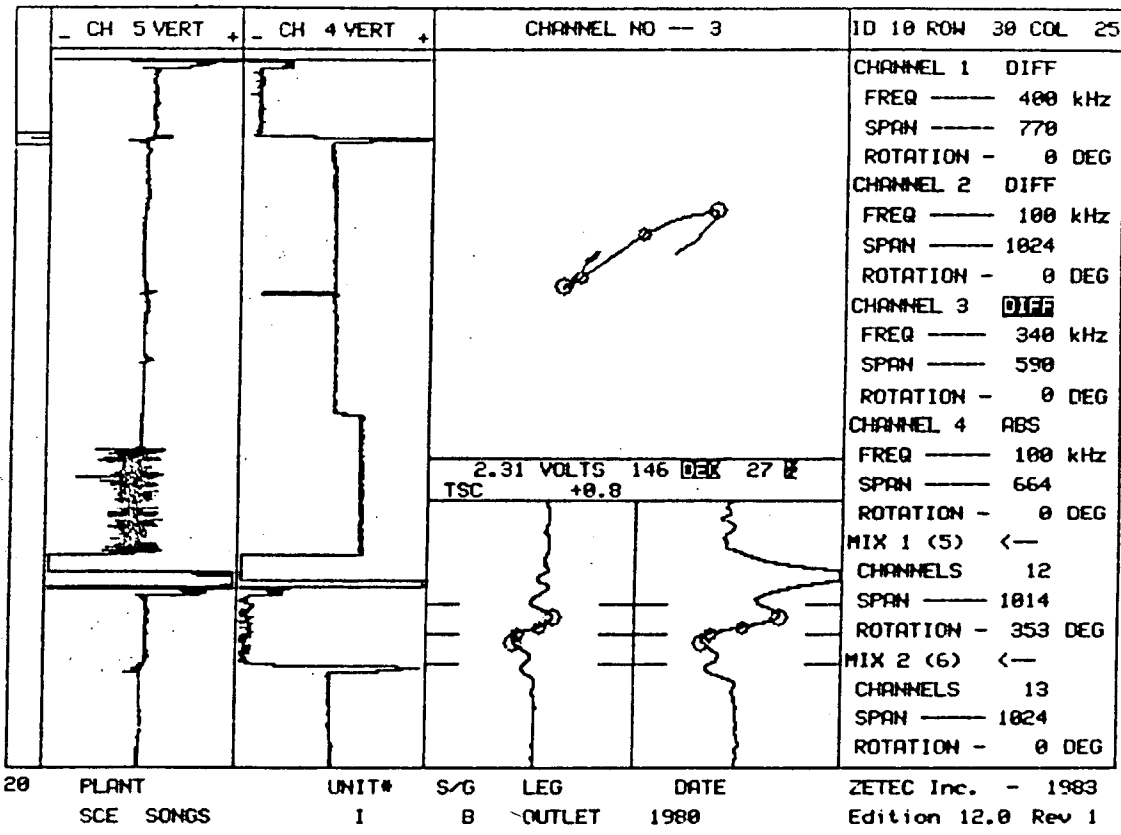


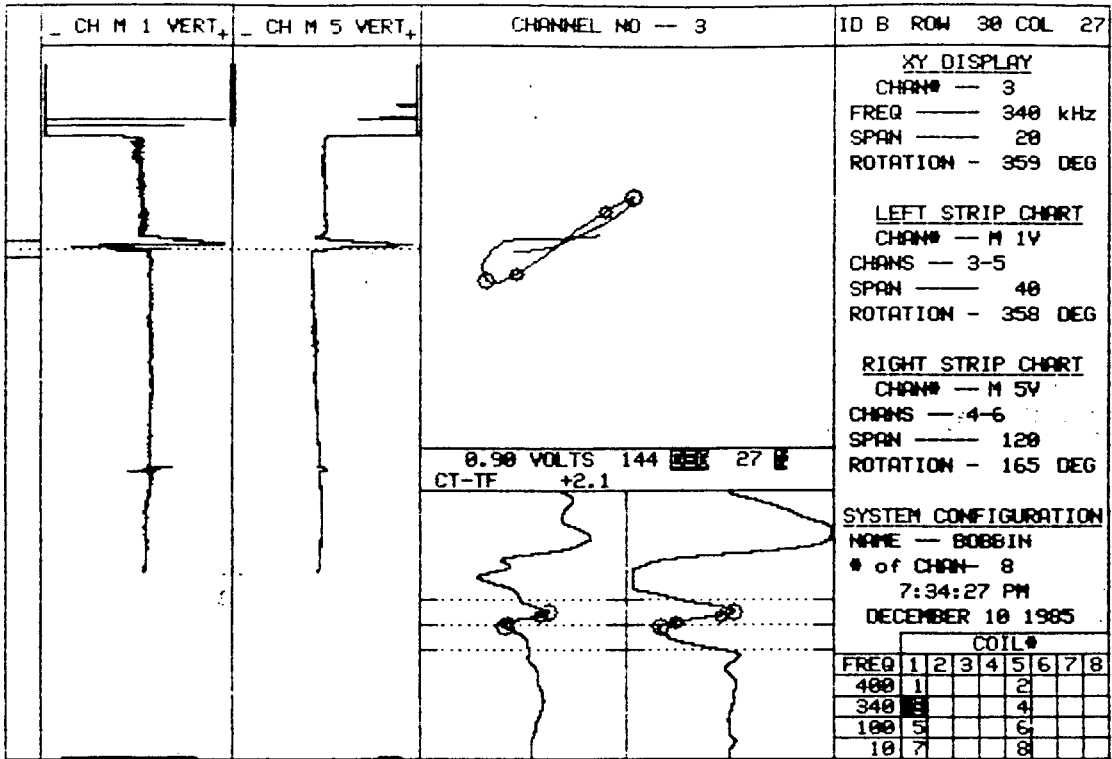


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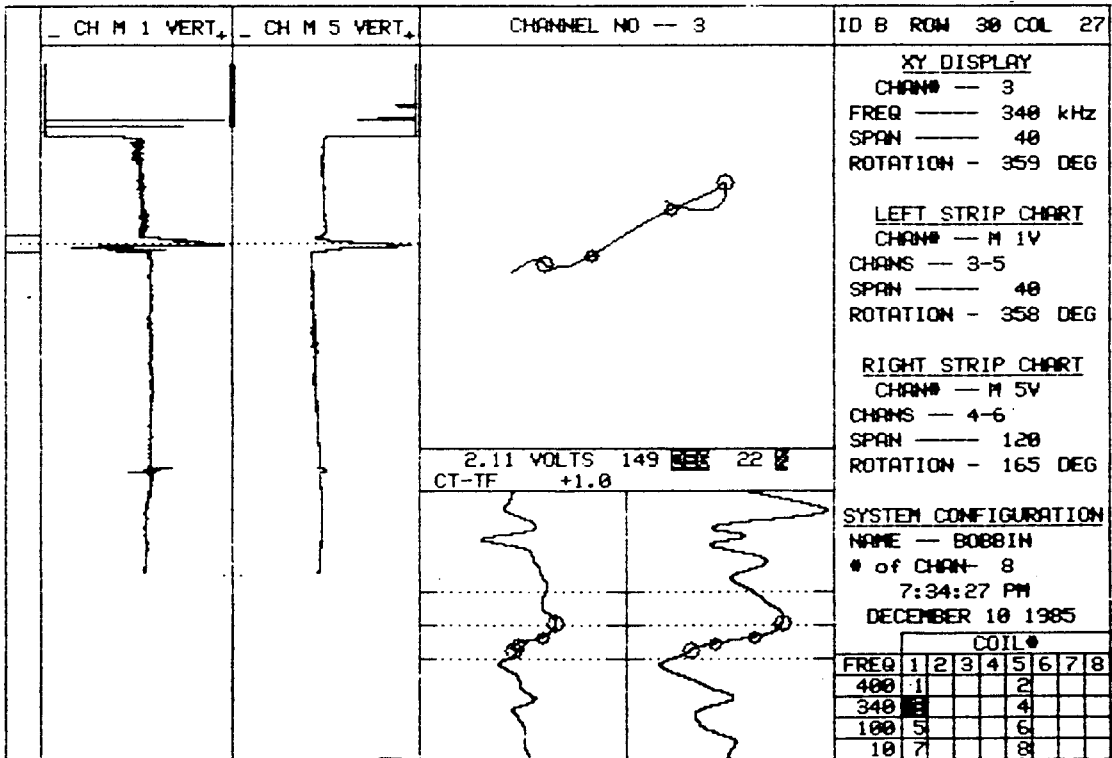


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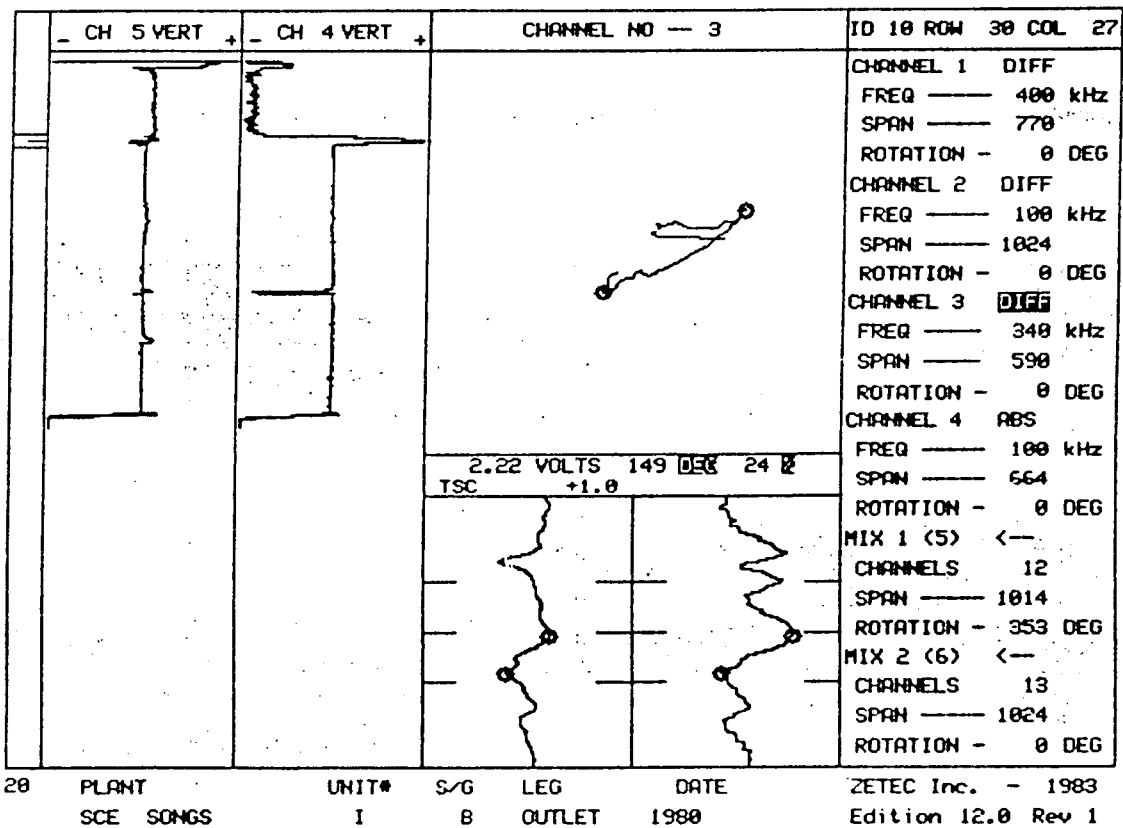
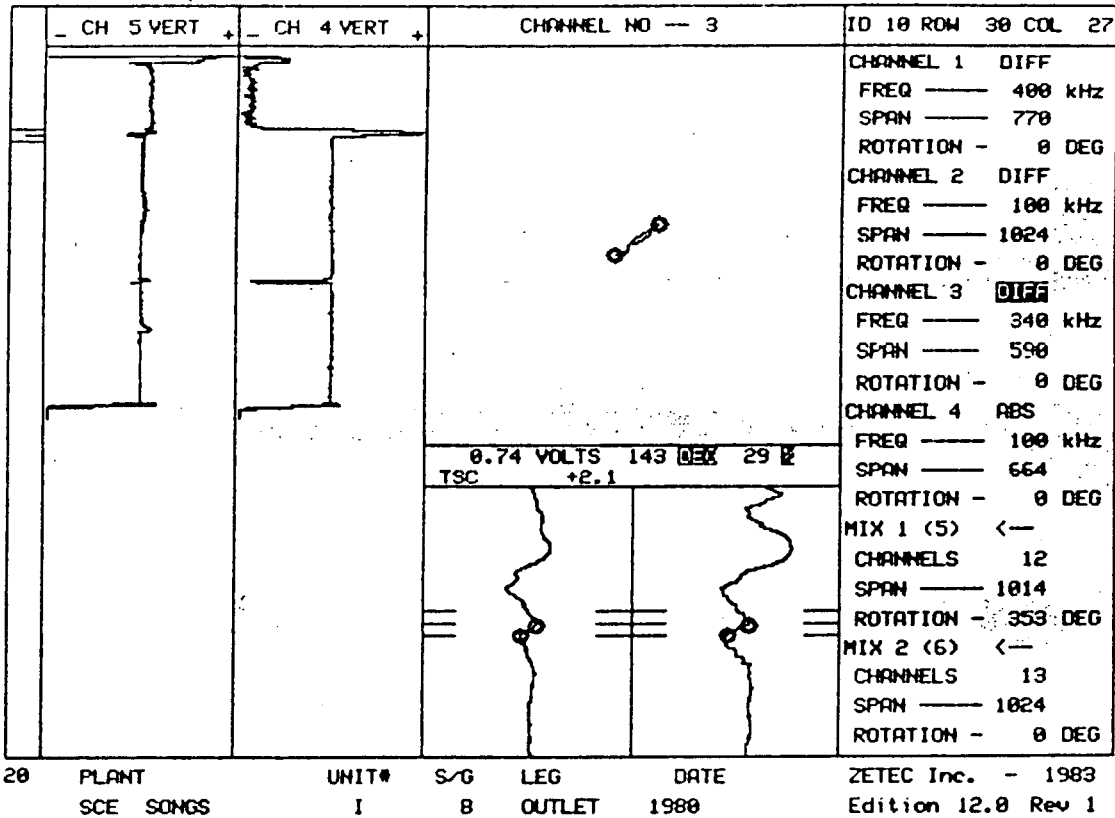




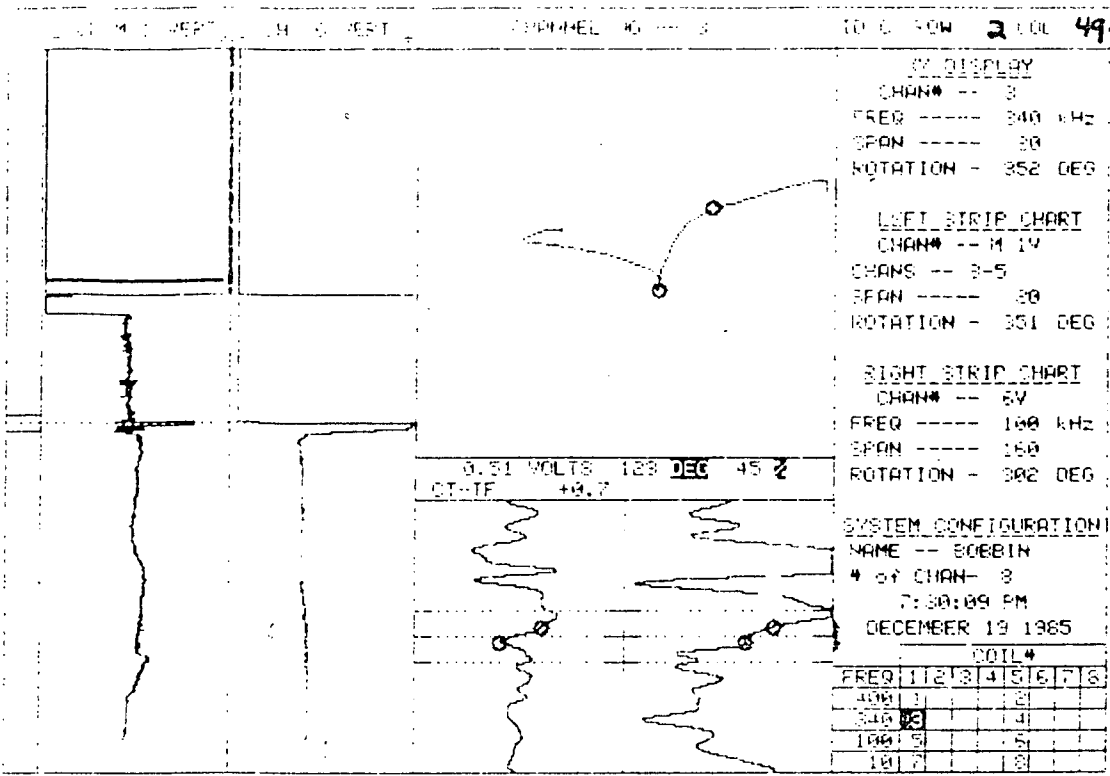
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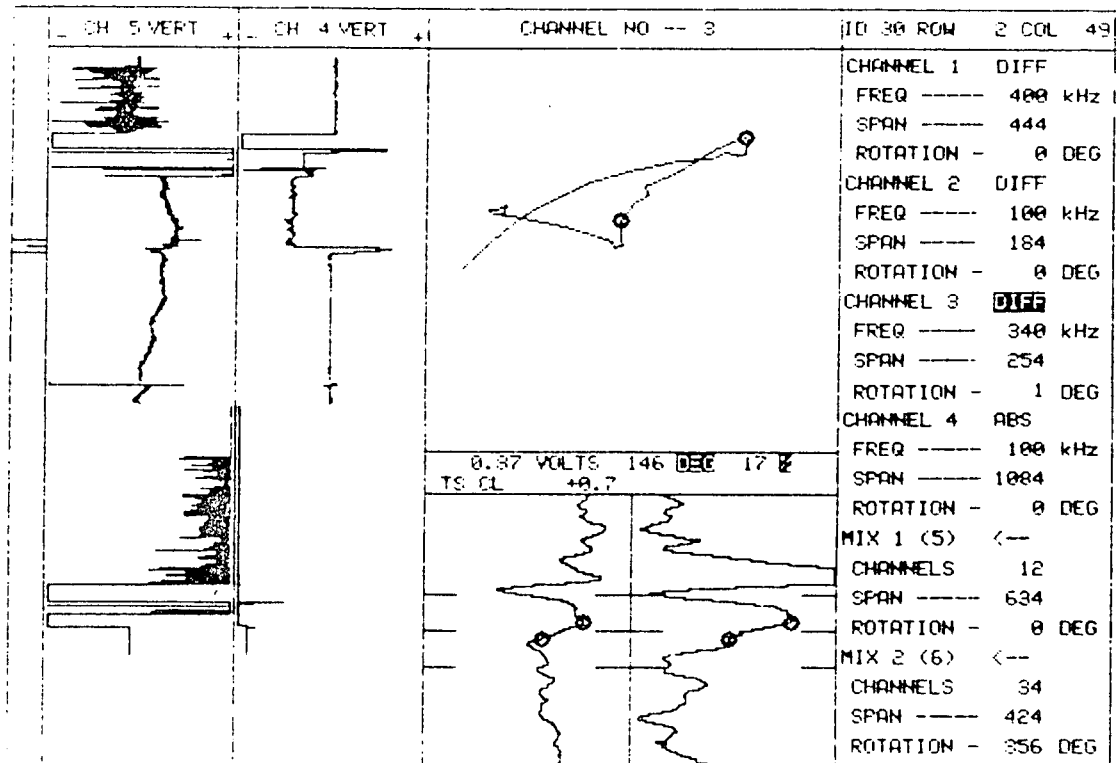
15 PLANT SONGS DD-C02 UNIT# 1 S/G B LEG OUTLET DATE 12/10/85



Steam Generator "C" Cold Leg Data Comparisons

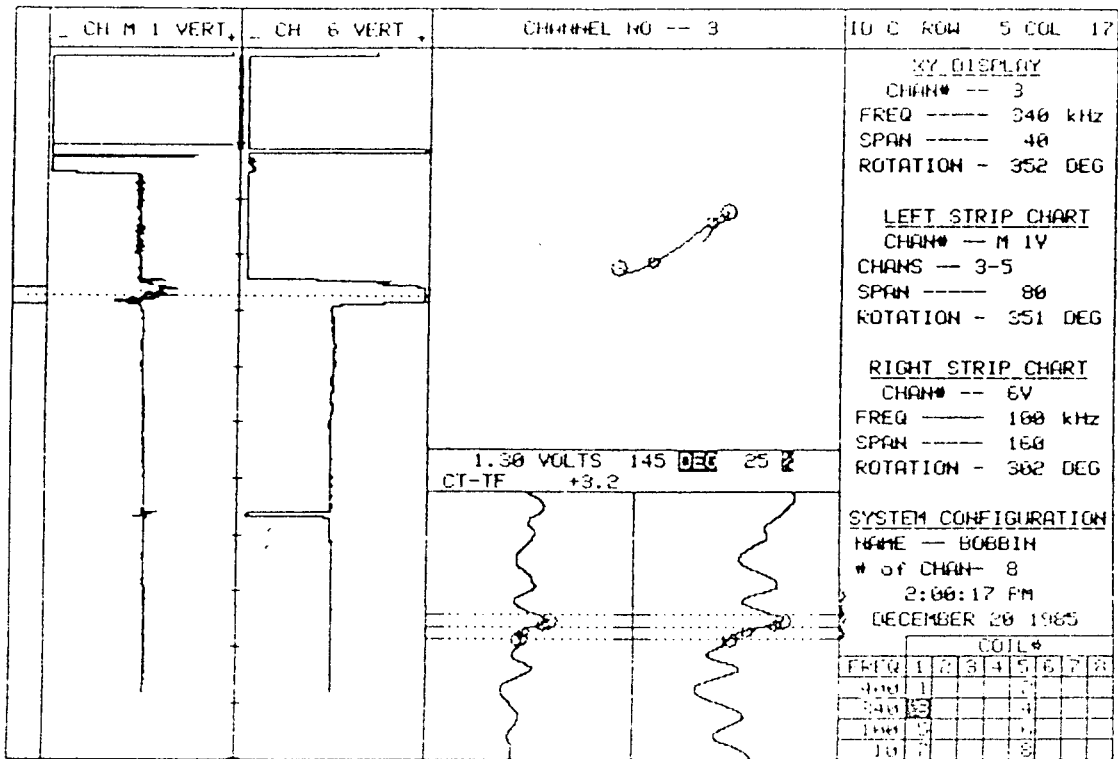


PLANT	UNIT#	S/G	LEG	DATE
LONGS DISK 017	1	C	OUTLET	12/19/85

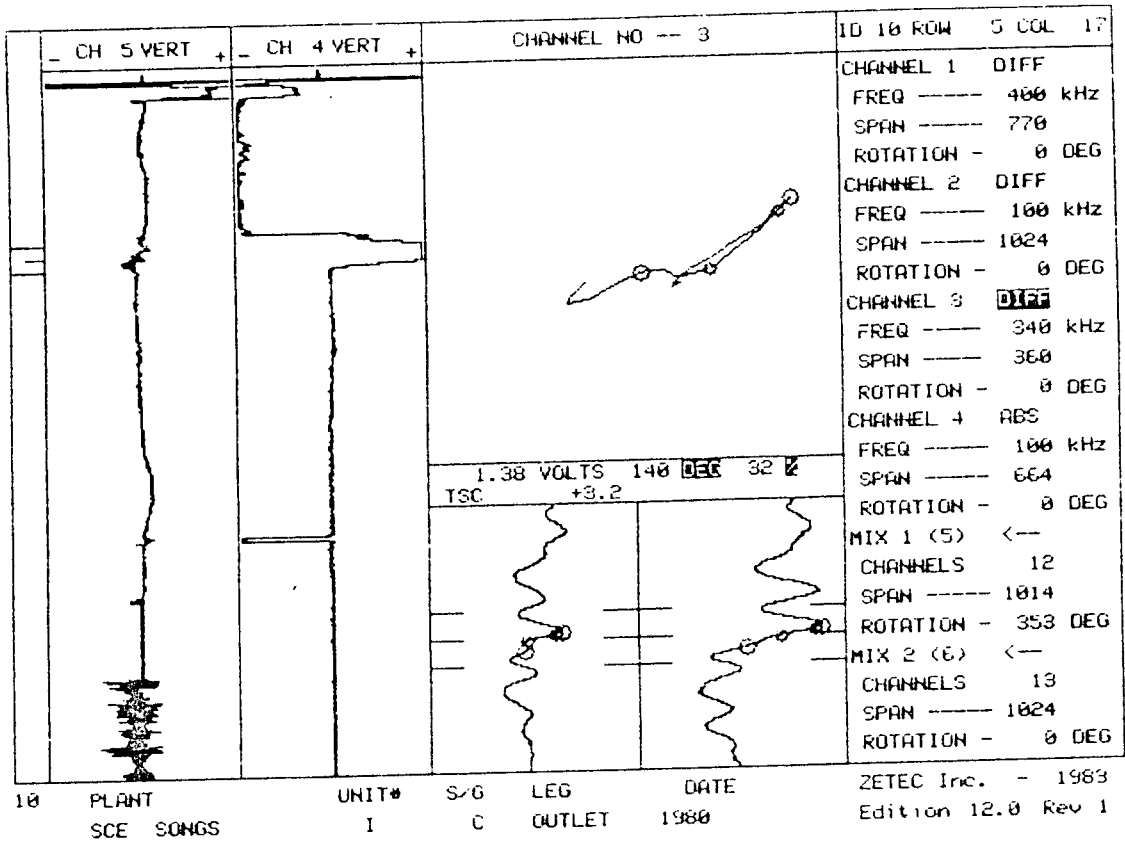


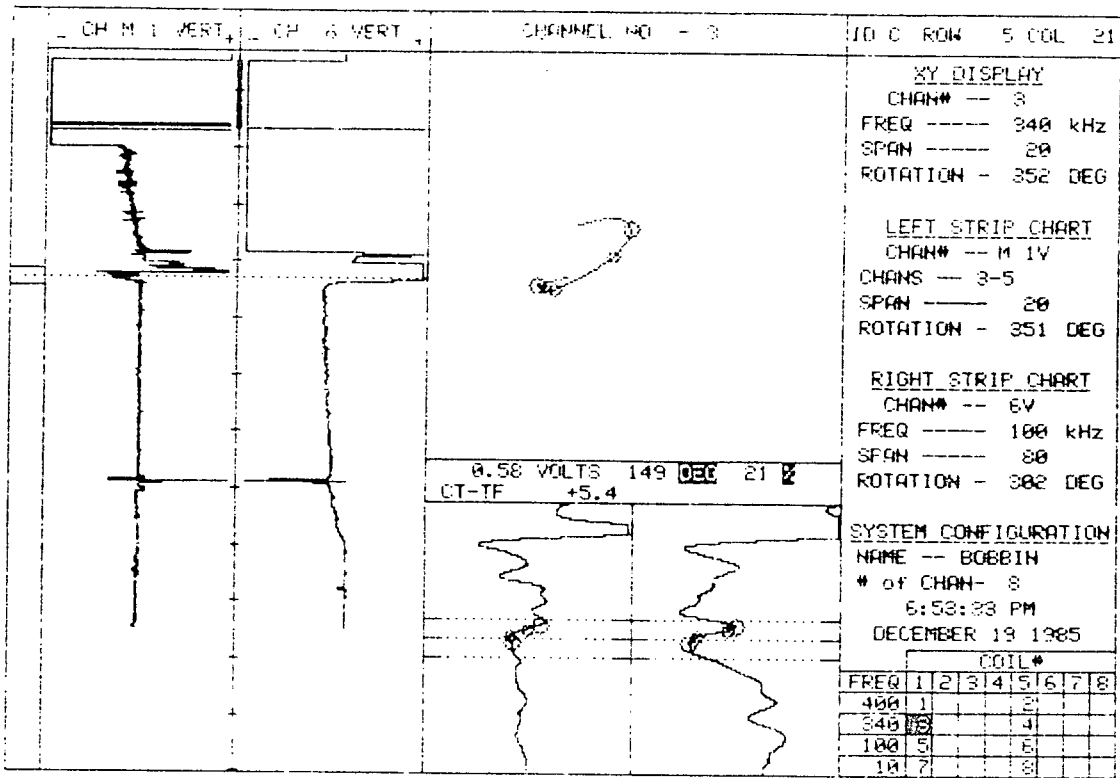
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	SCE SONGS	I	"C"	COLD	06/03/88	Edition 12.0 Rev 1



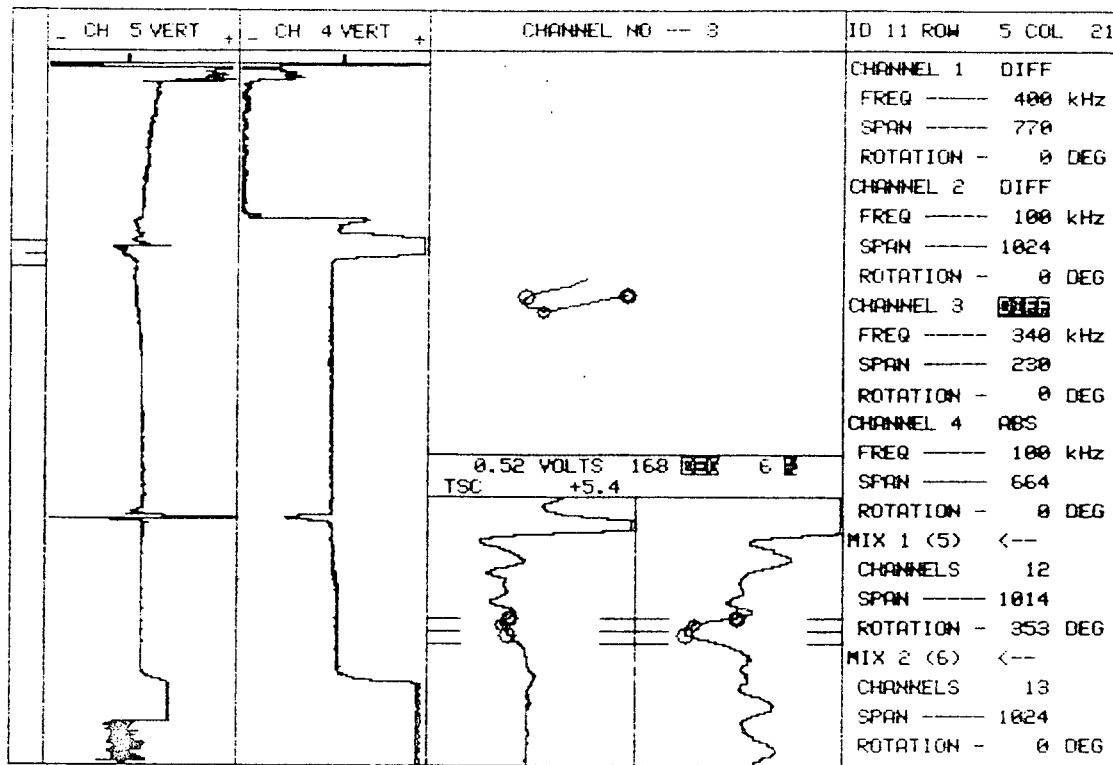


15 PLANT SONGS DISK C20- UNIT# 1 S/G C LEG C DATE 12/20/85

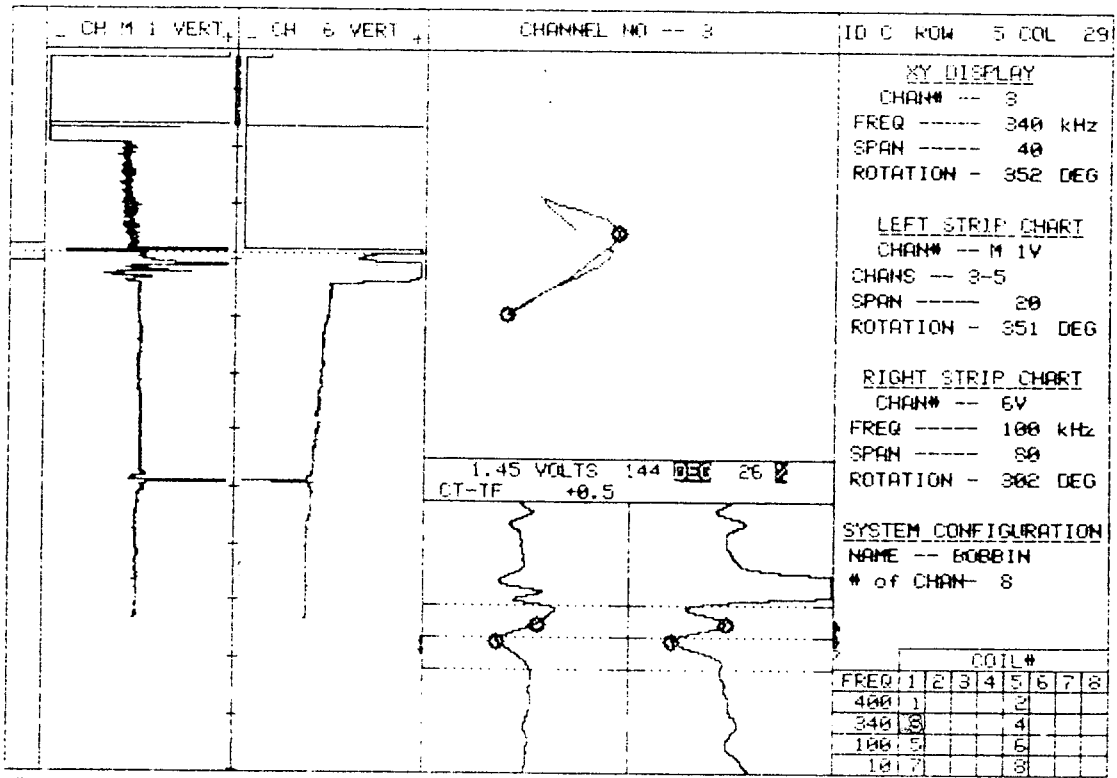




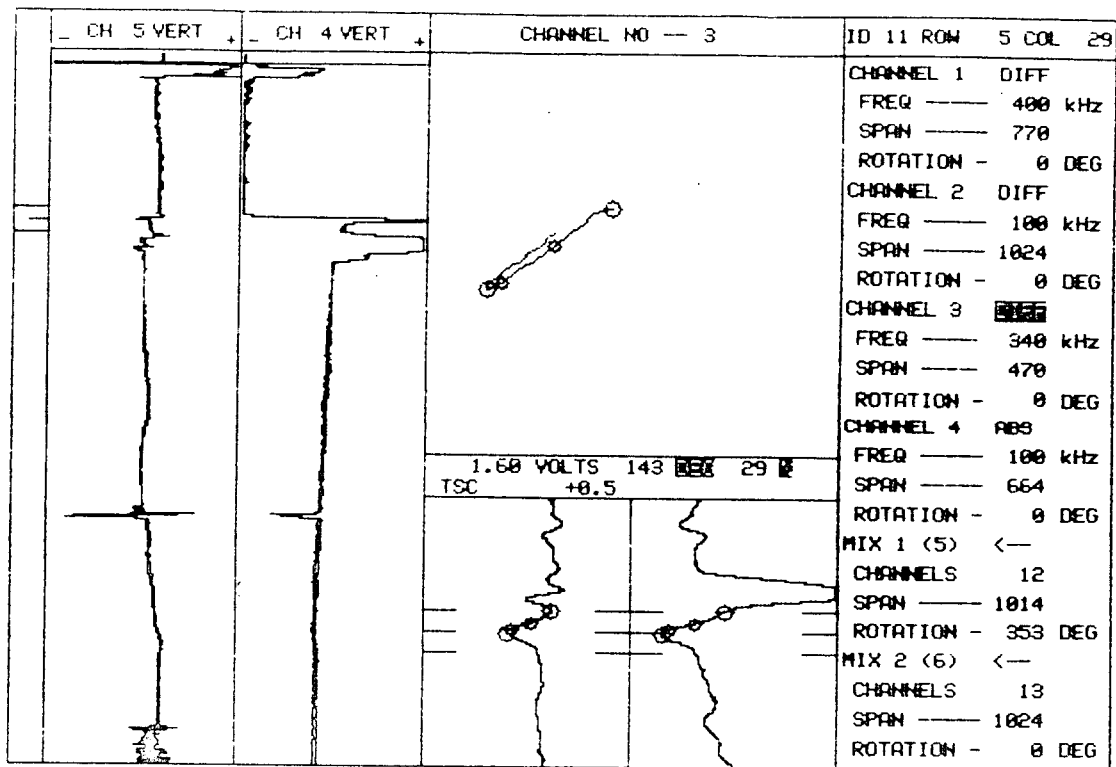
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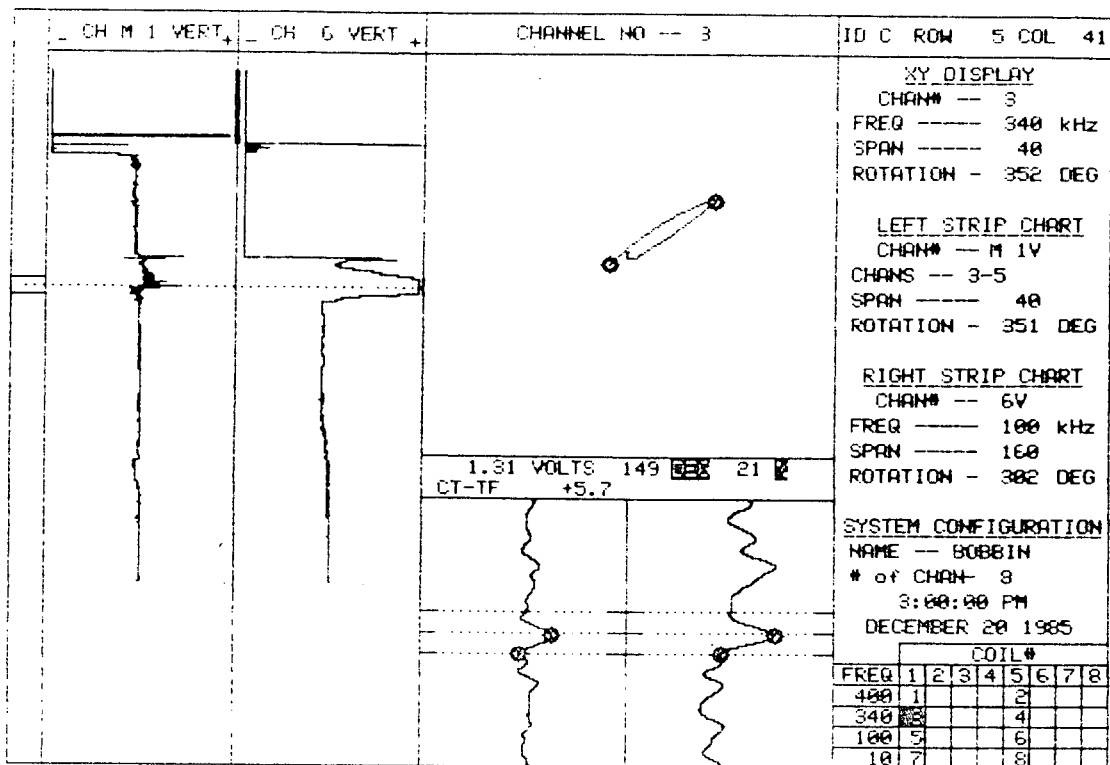
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1



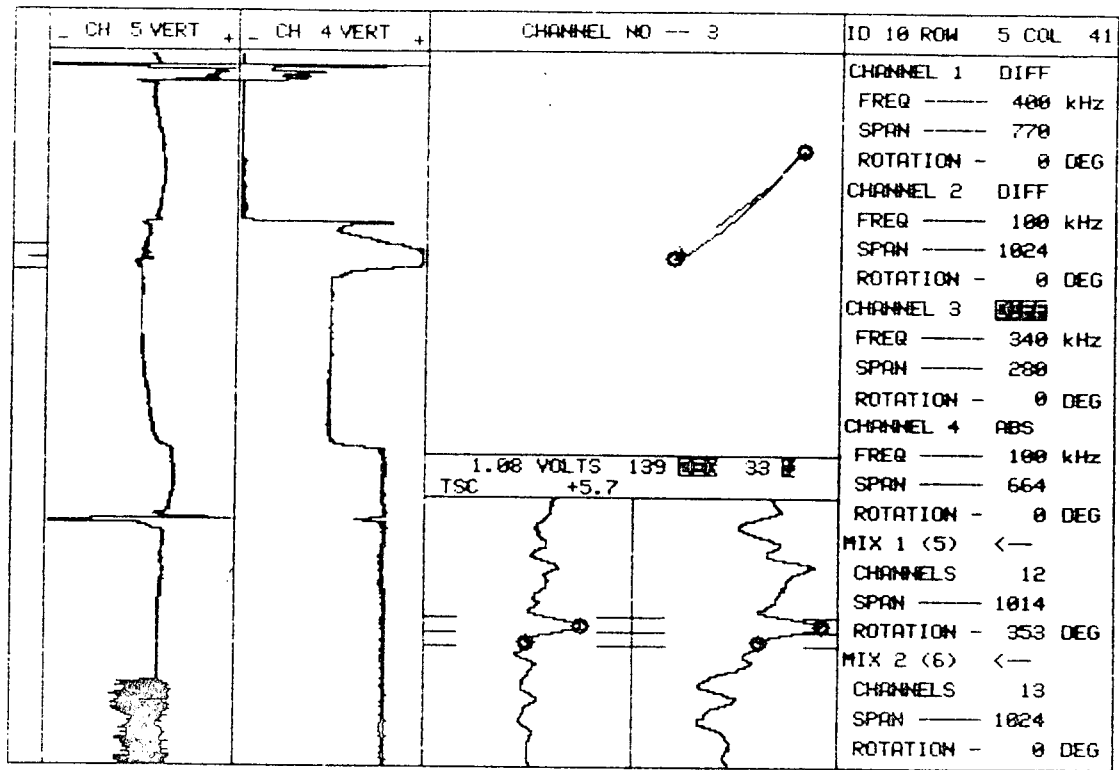
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10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

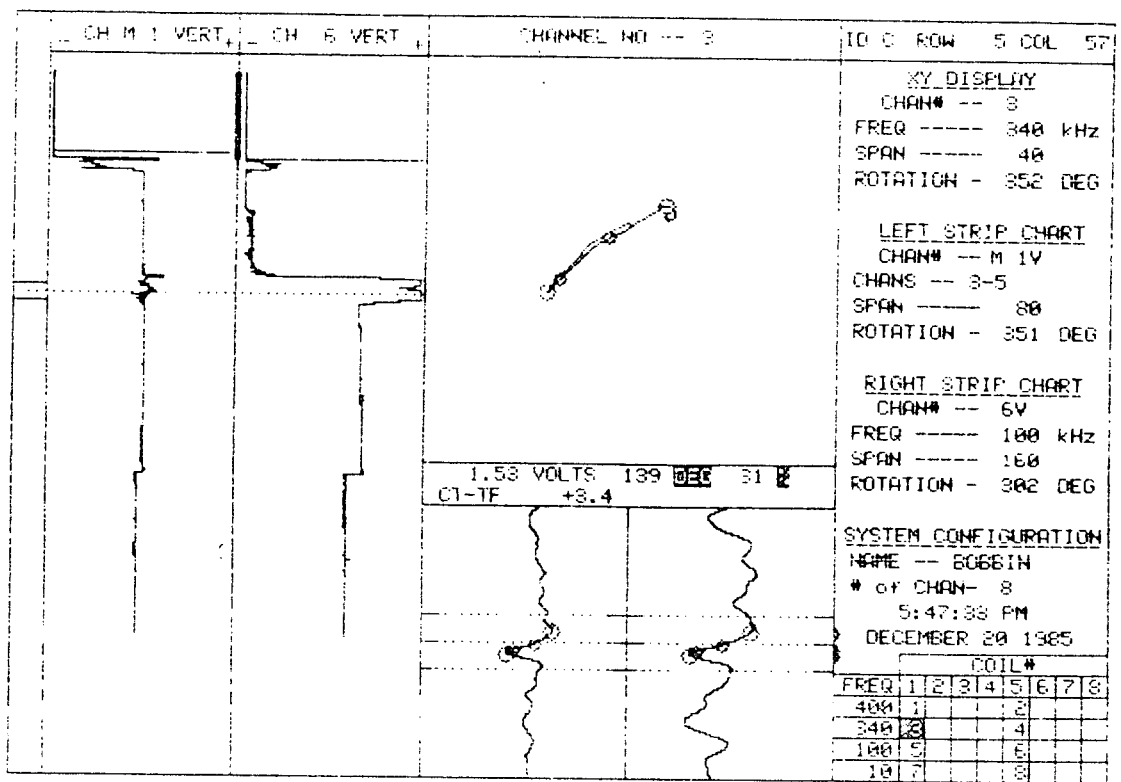


15 PLANT SONGS DISK C20- UNIT# 1 S/G C LEG C DATE 12/20/85

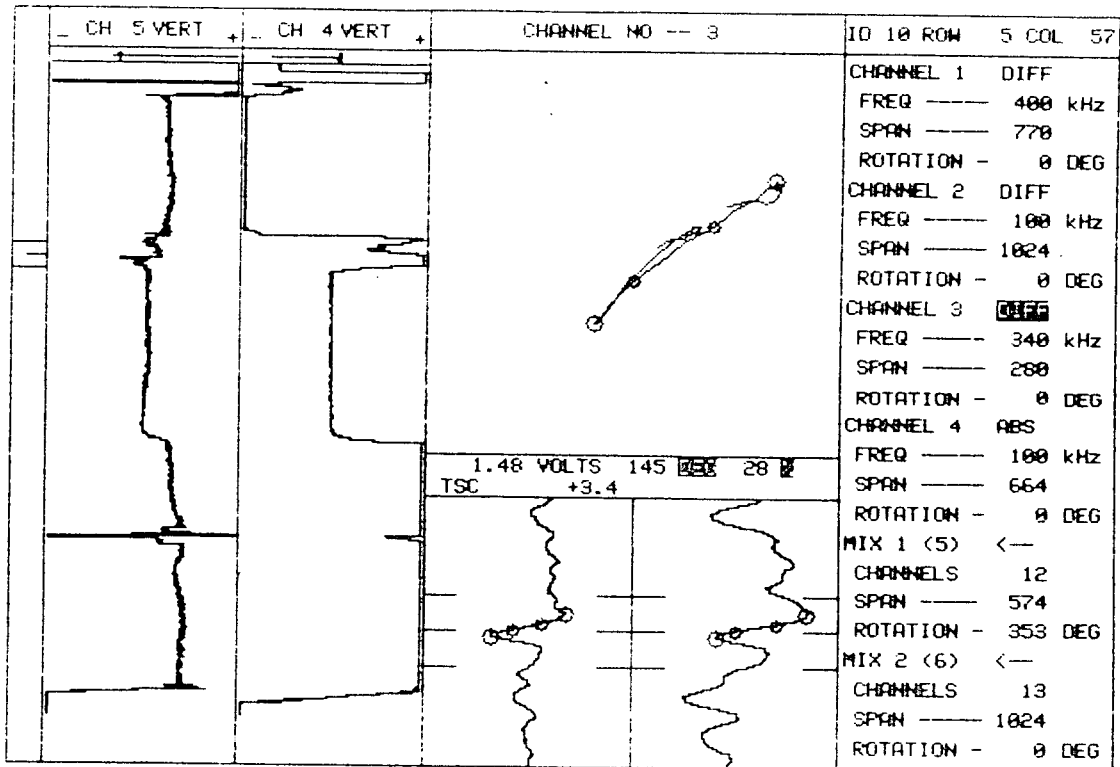


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

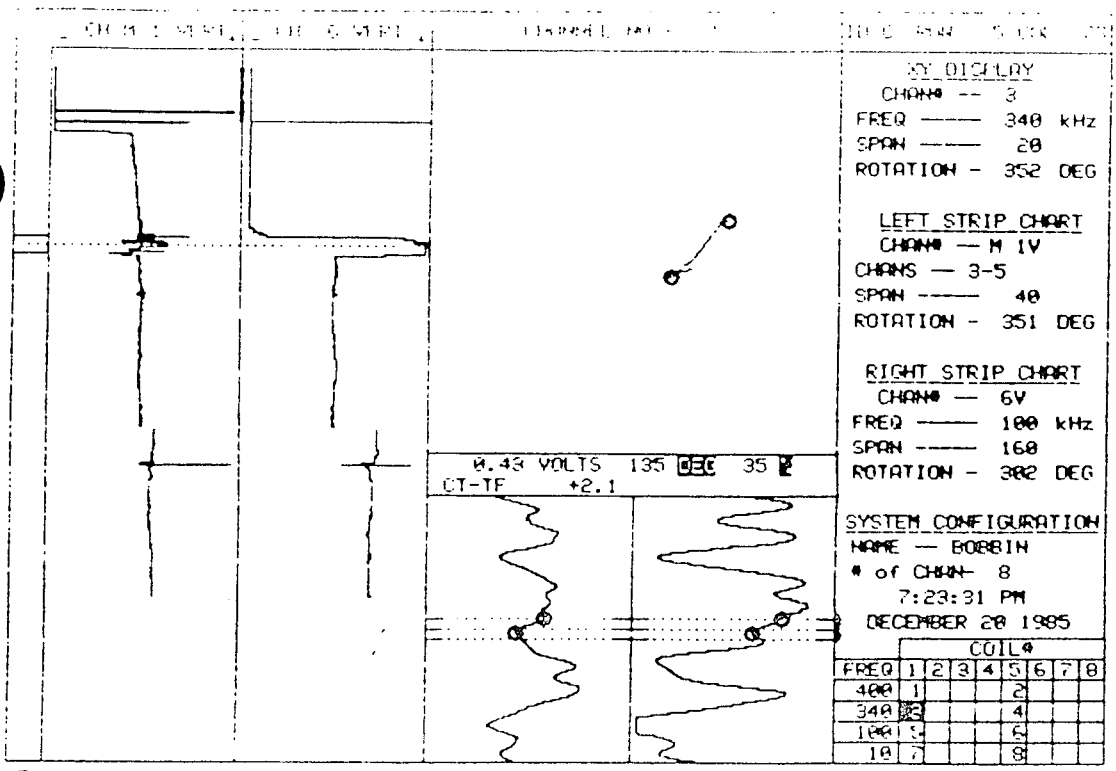




15    PLANT                    UNIT#    S/G    LEG                    DATE  
      SONGS DISK C20-    1        C        OUTLET                12/20/85



10 PLANT SCE SONGS    UNIT# I    S/G C    LEG OUTLET    DATE 1980    ZETEC Inc. - 1983    Edition 12.0 Rev 1



SY DISPLAY  
 CHAN# -- 3  
 FREQ ---- 340 kHz  
 SPAN ---- 20  
 ROTATION - 352 DEG

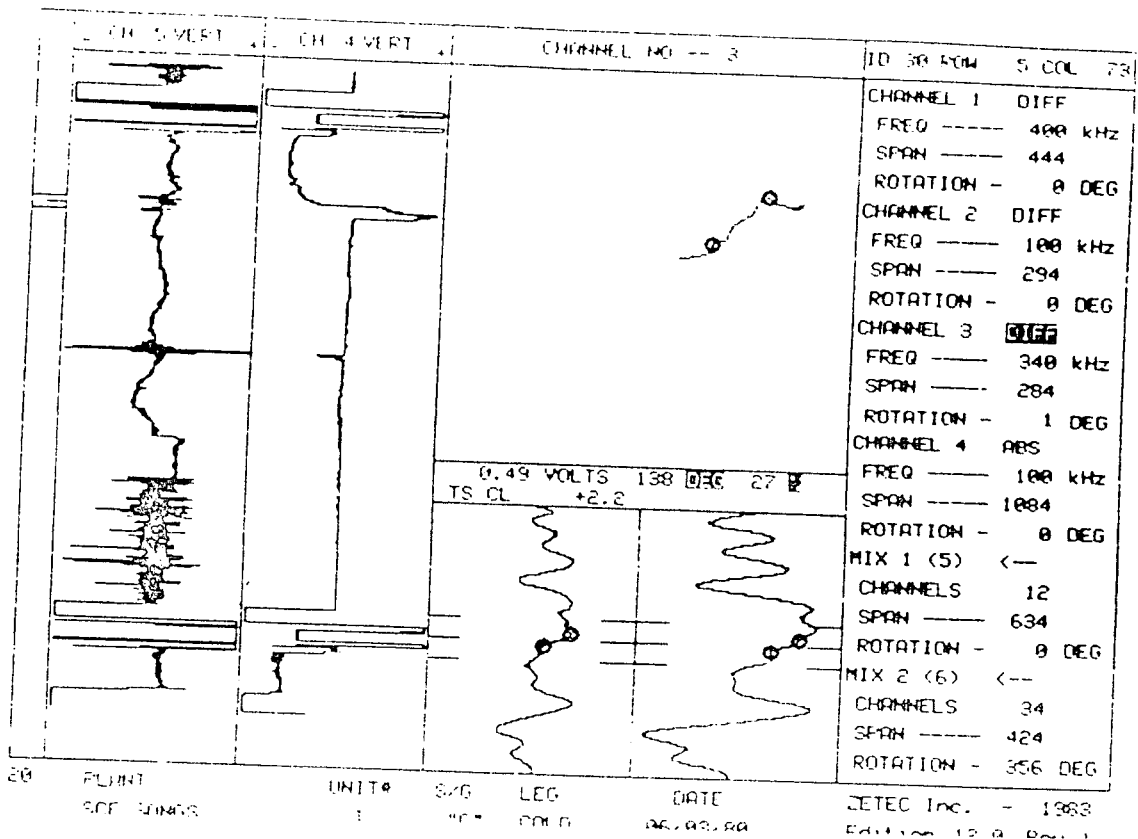
LEFT STRIP CHART  
 CHAN# -- M IV  
 CHANS -- 3-5  
 SPAN ---- 40  
 ROTATION - 351 DEG

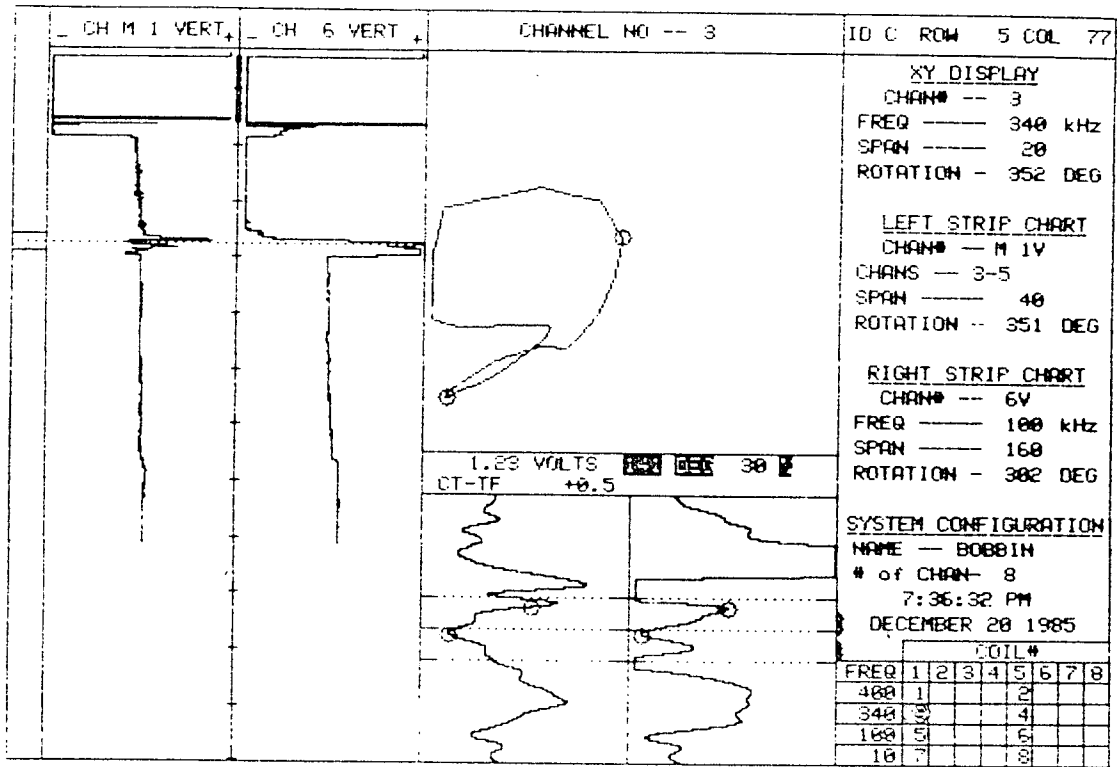
RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ ---- 100 kHz  
 SPAN ---- 160  
 ROTATION - 302 DEG

SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 7:23:31 PM  
 DECEMBER 20 1985

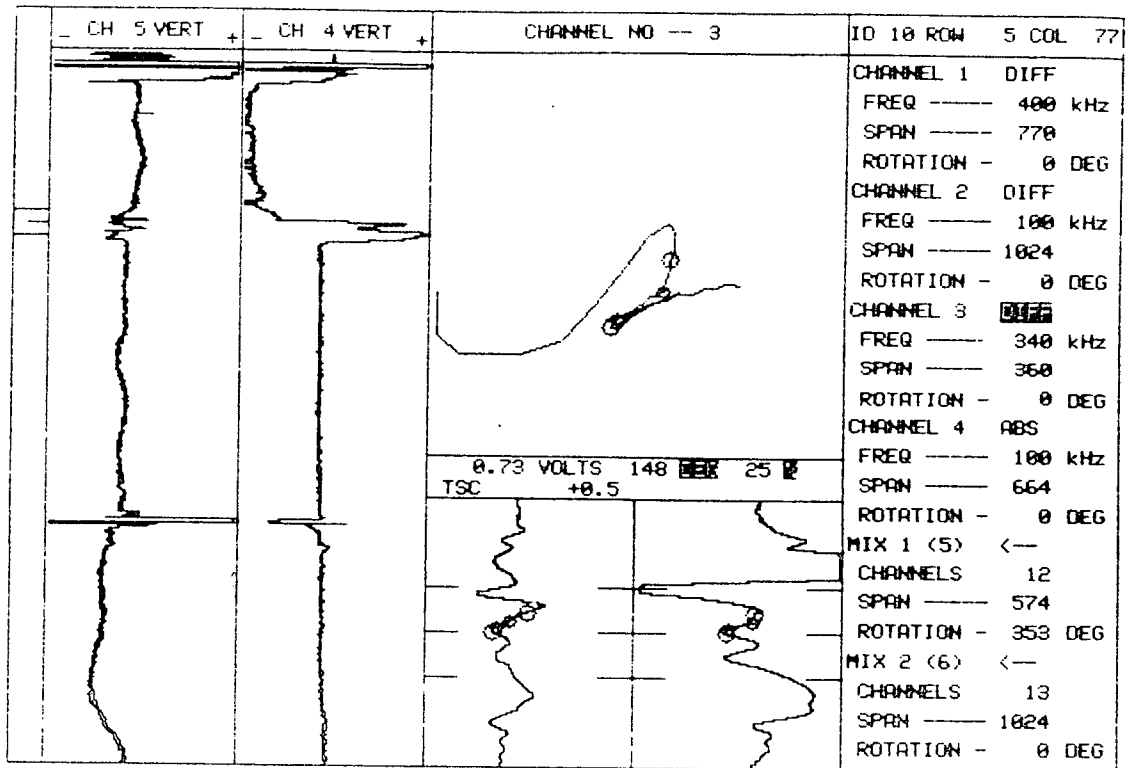
		COIL#							
FREQ		1	2	3	4	5	6	7	8
400	1					2			
340	2					4			
100	3					6			
10	4					8			

15 PLANT SONGS DISK 021 UNIT# 1 S.G. C LEG C DATE 12/20/85

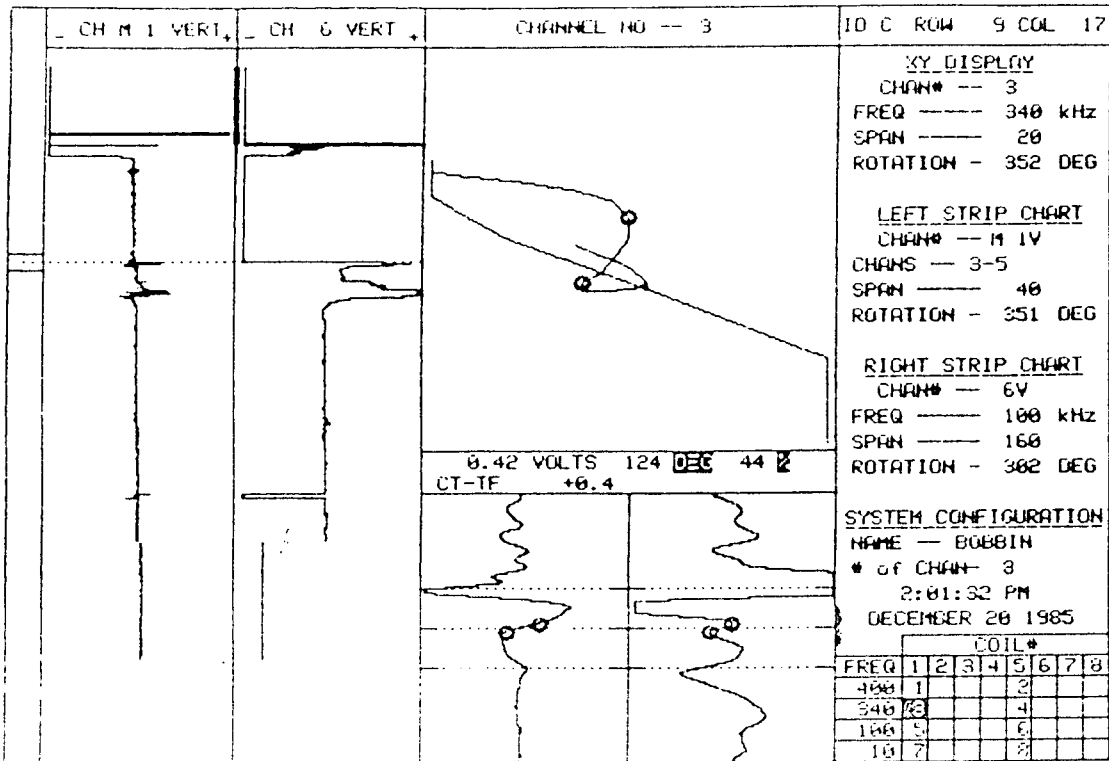




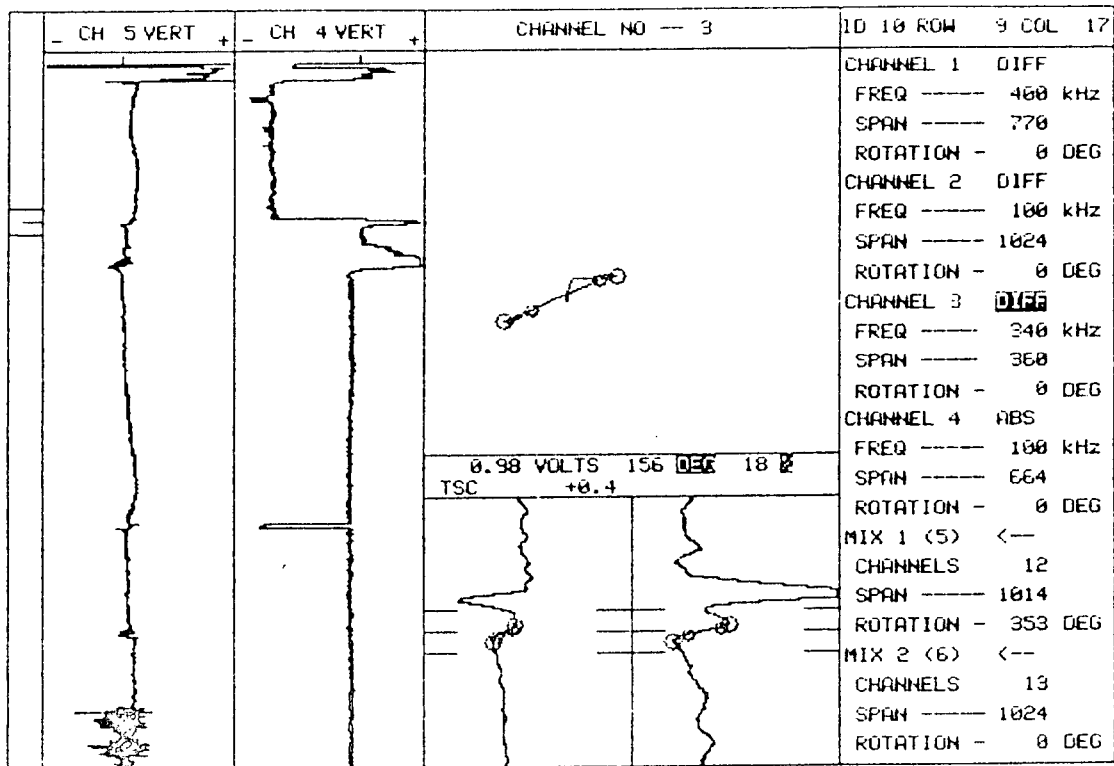
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C21    1    0    OUTLET    12/20/95



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

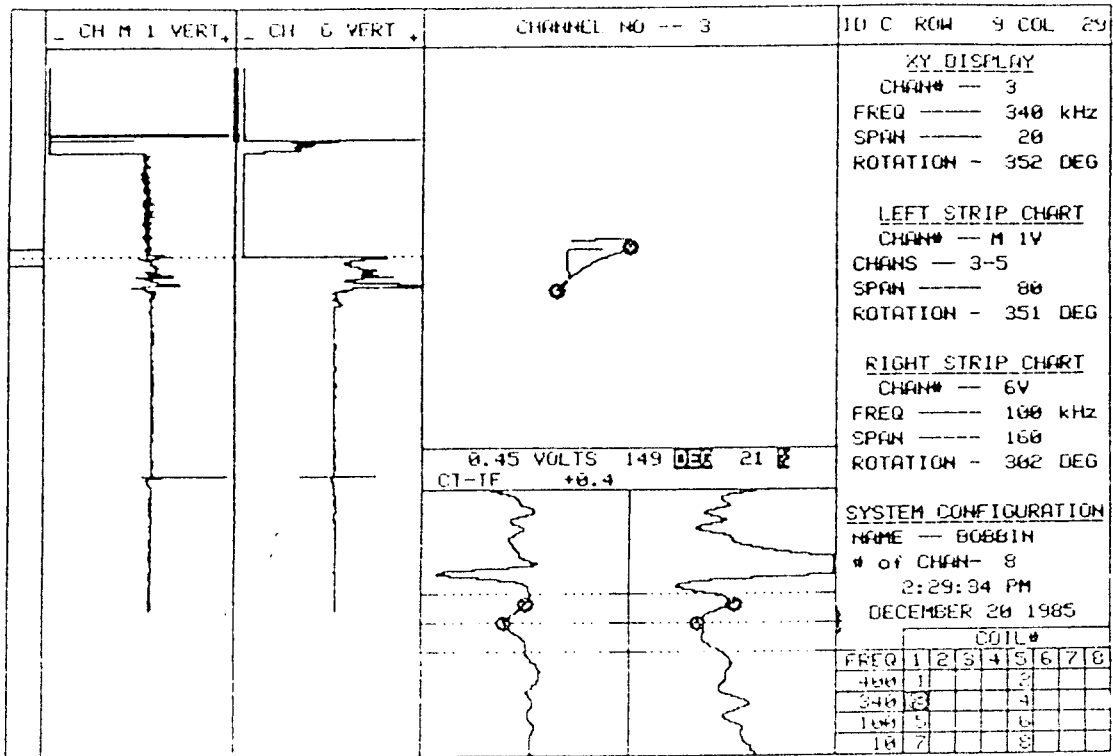


15    PLANT                    UNIT#    S/G    LEG                    DATE  
 SONGS DISK C20-    1                    C                    OUTLET                12/20/85

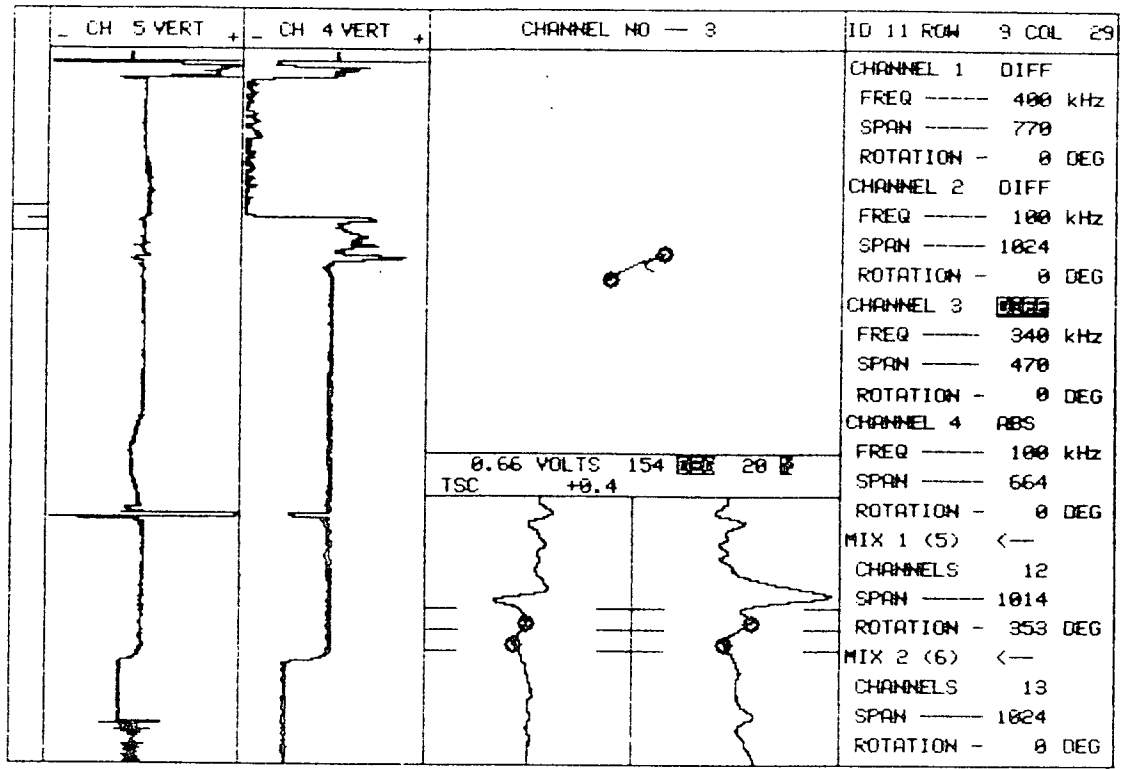


18 PLANT UNIT# S/G LEG DATE ZETEC Inc. - 1983  
 SCE SONGS I C OUTLET 1980 Edition 12.0 Rev 1

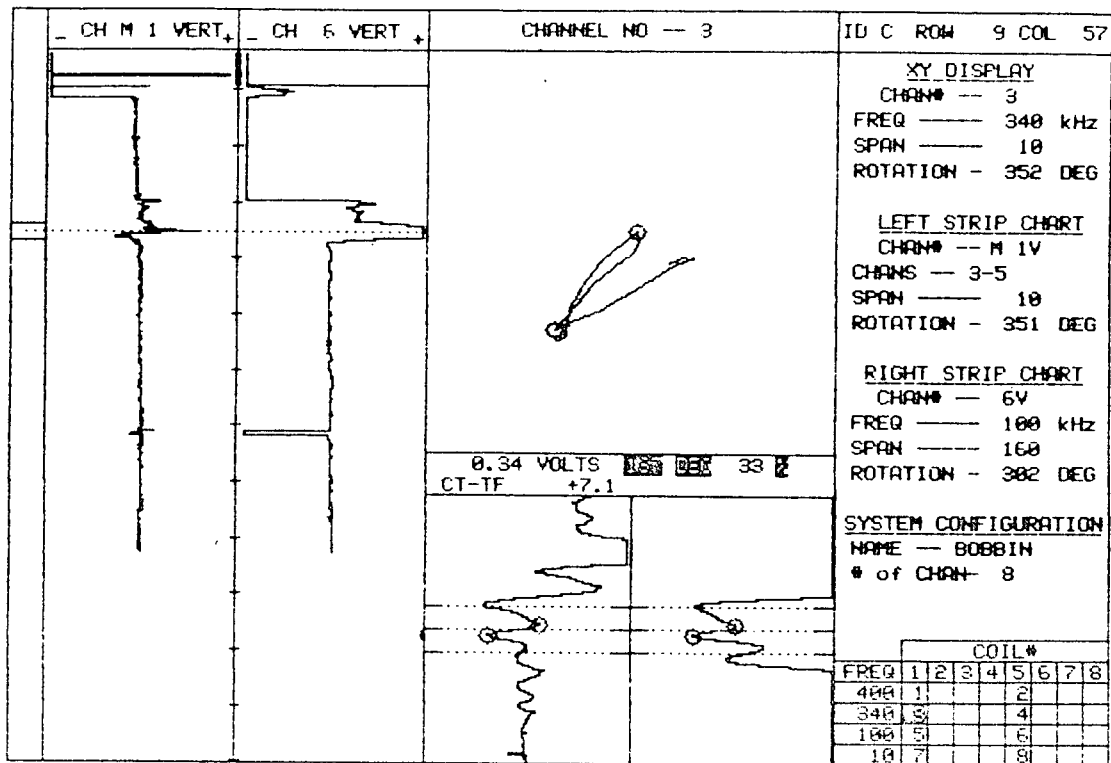




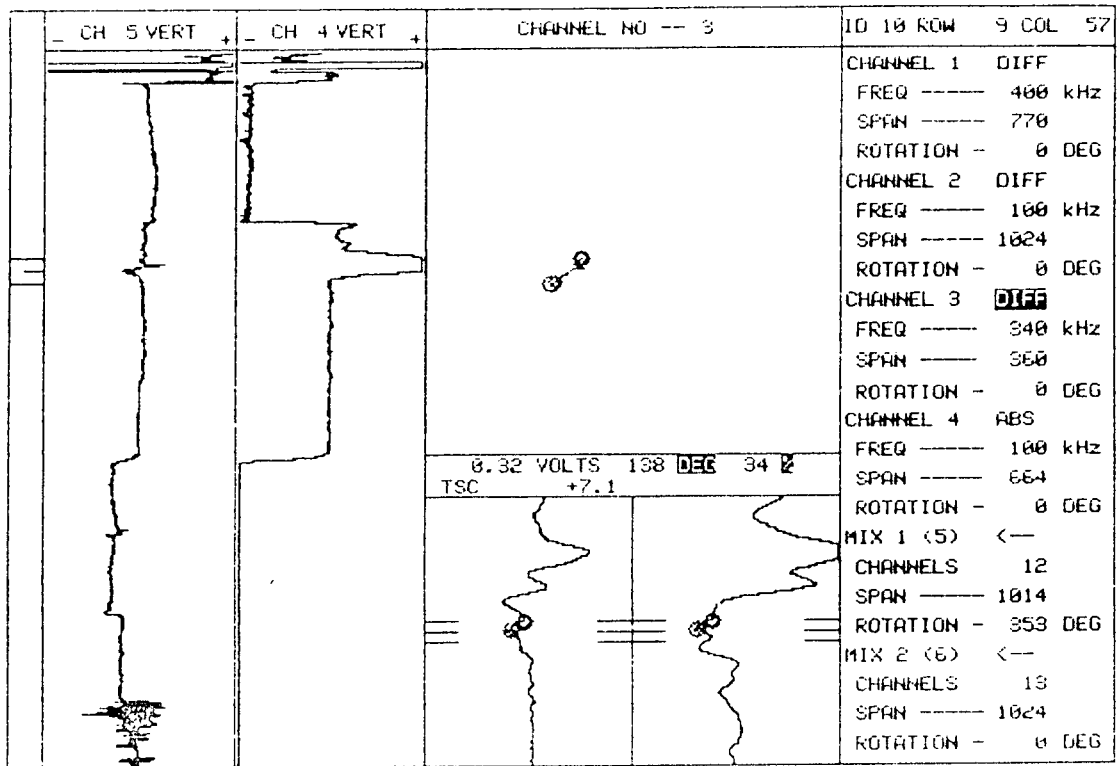
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 SONGS DISK C20-    1    C    OUTLET    12/20/85



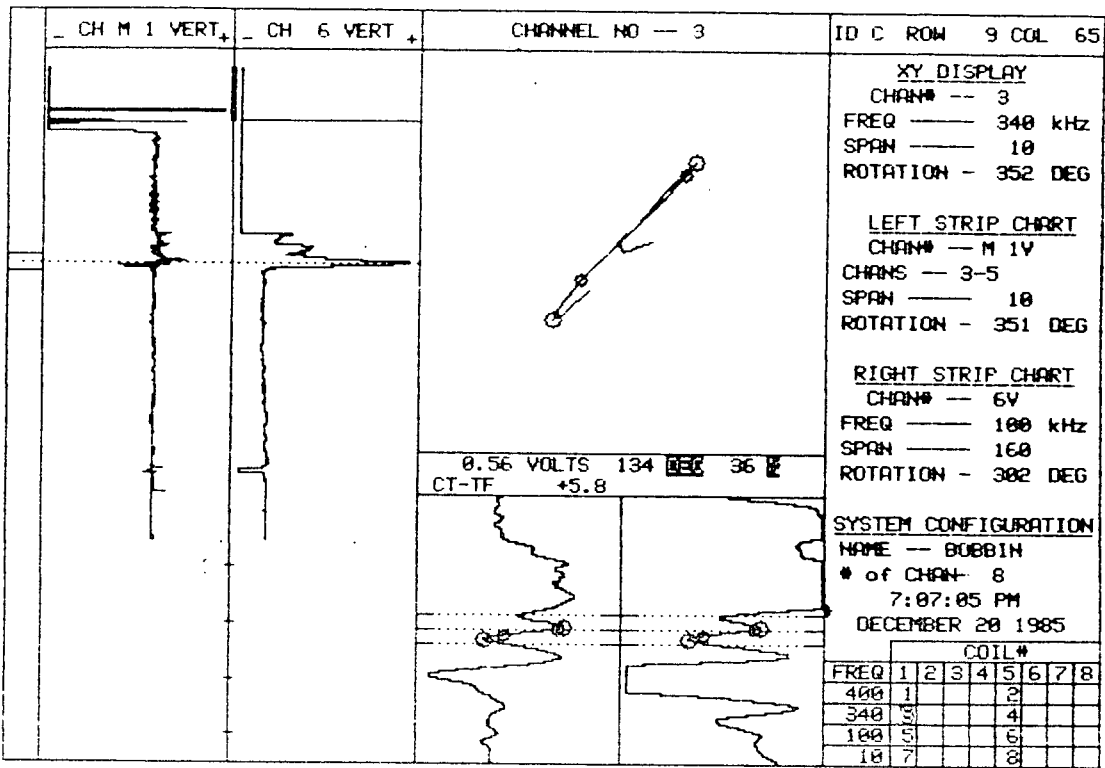
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1



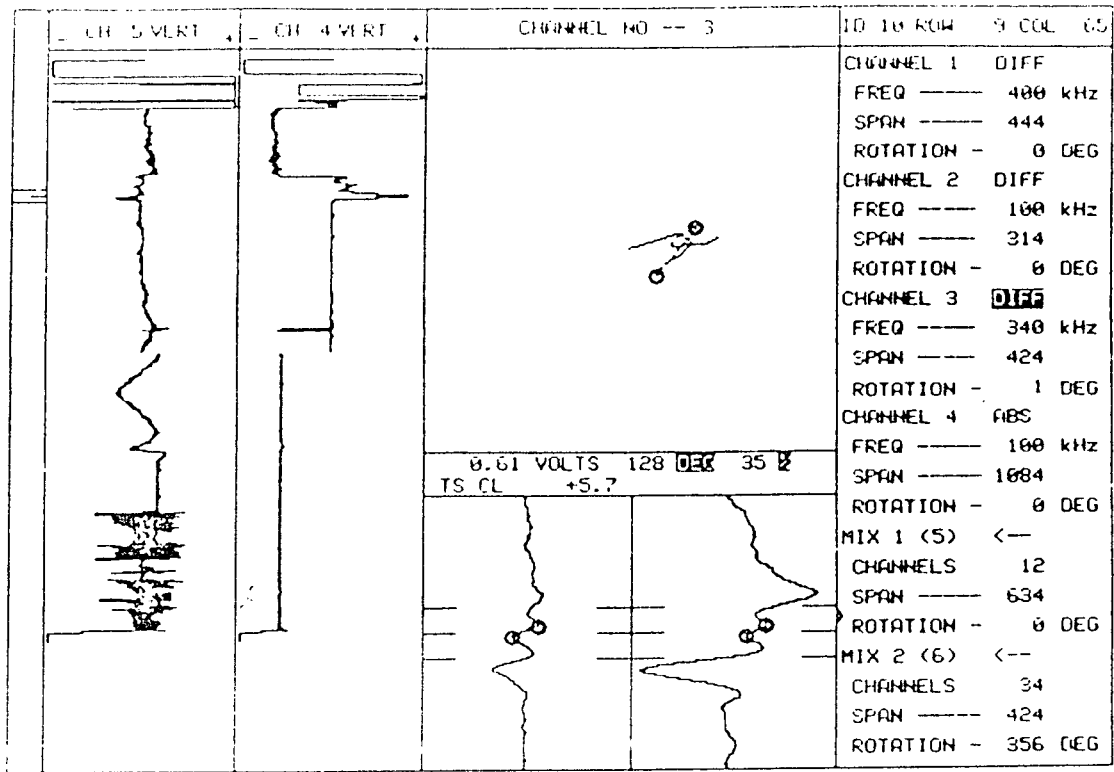
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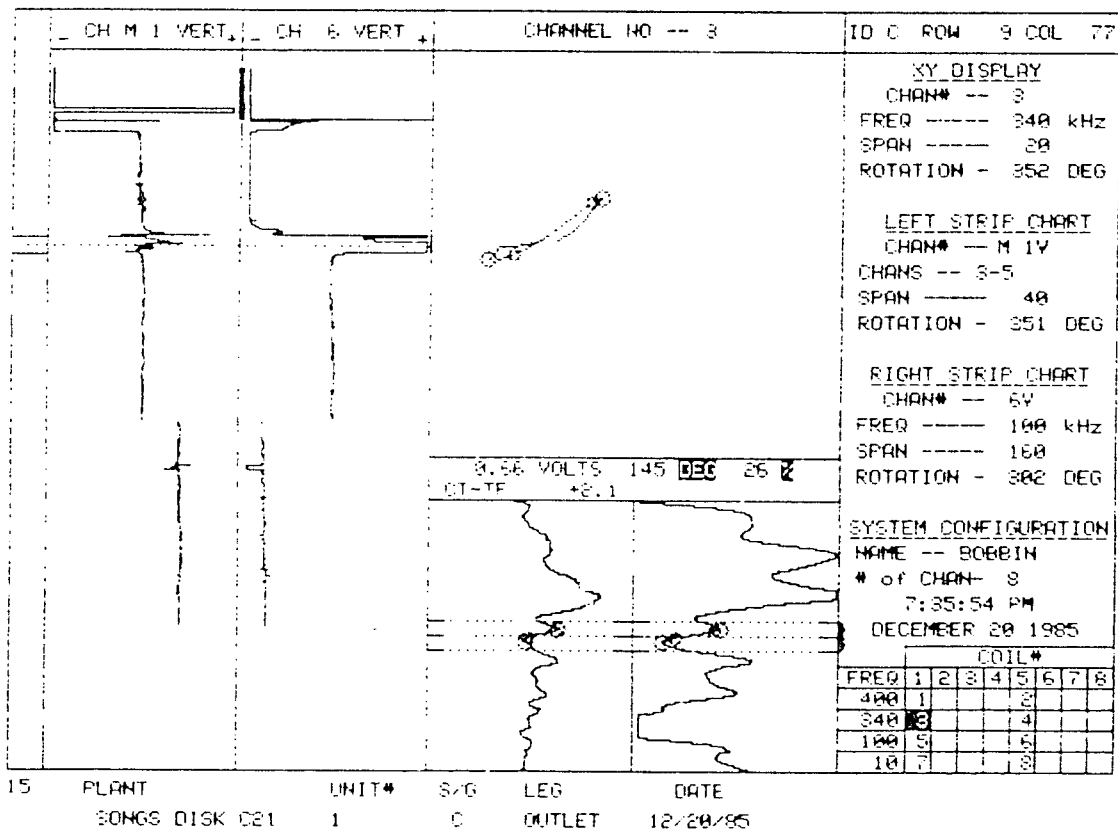
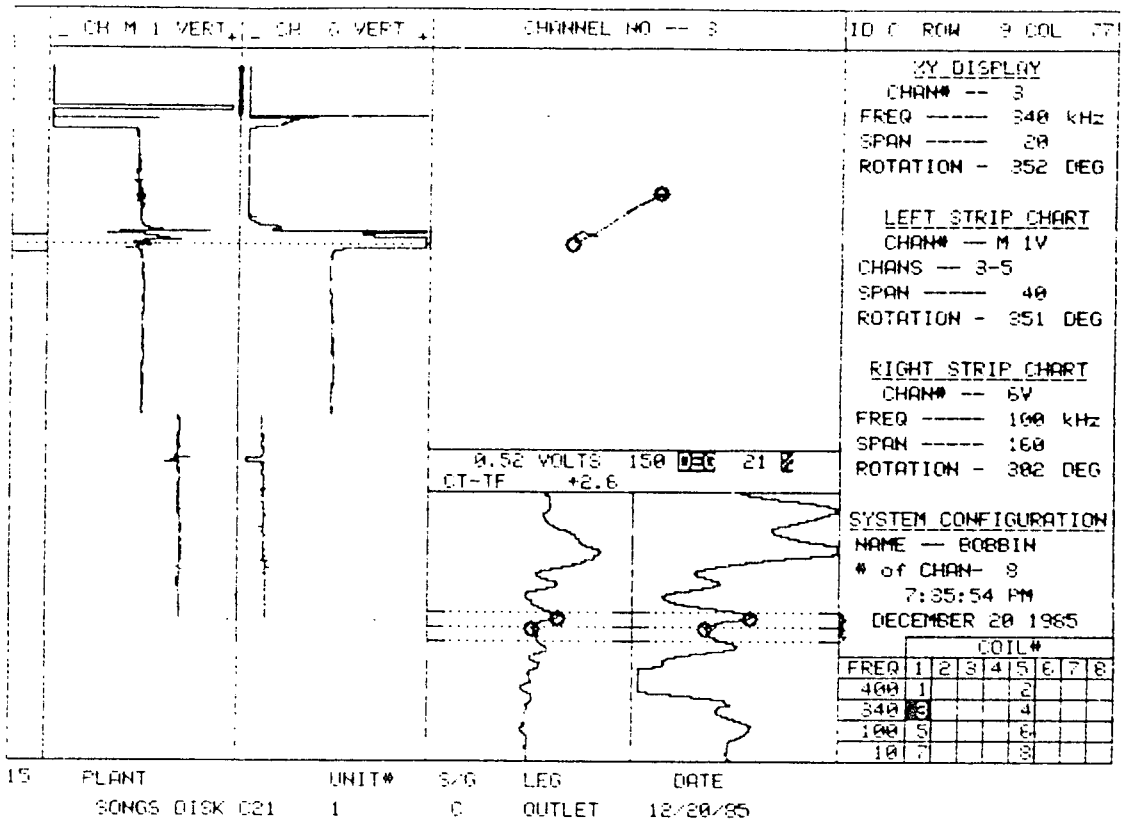
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	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

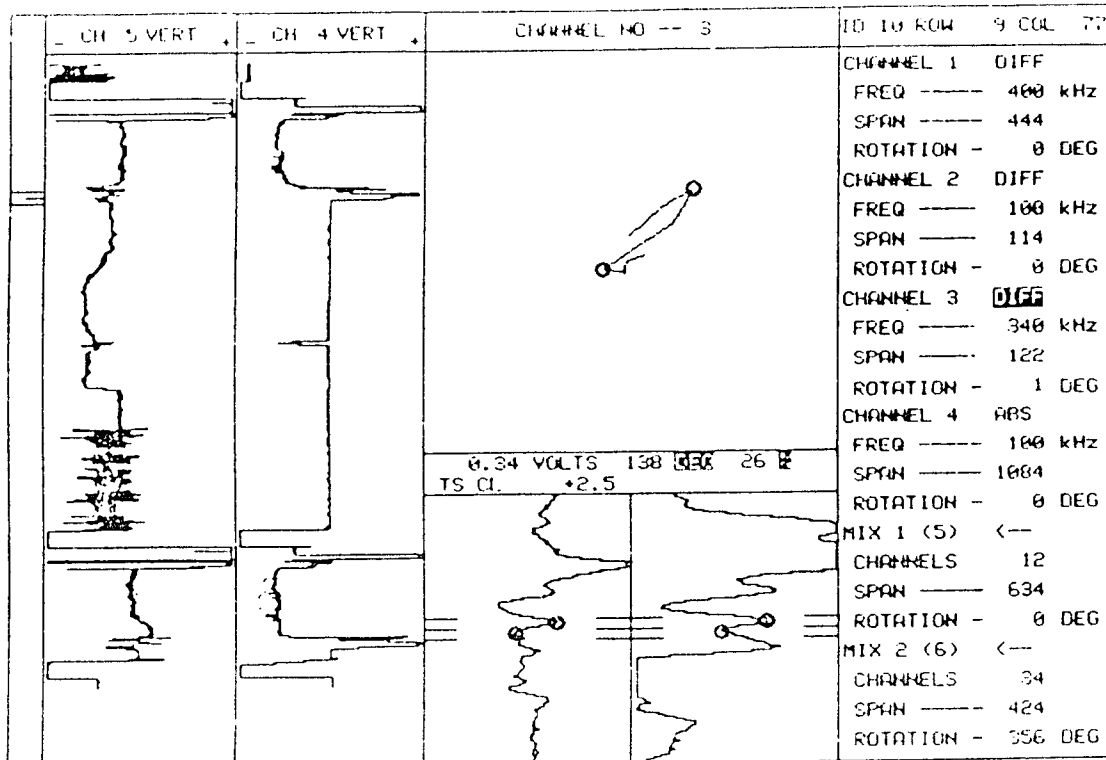


15    PLANT                                  UNIT#    S/G    LEG                                  DATE  
 SONGS DISK C21                                  1        C        OUTLET                                  12/20/85

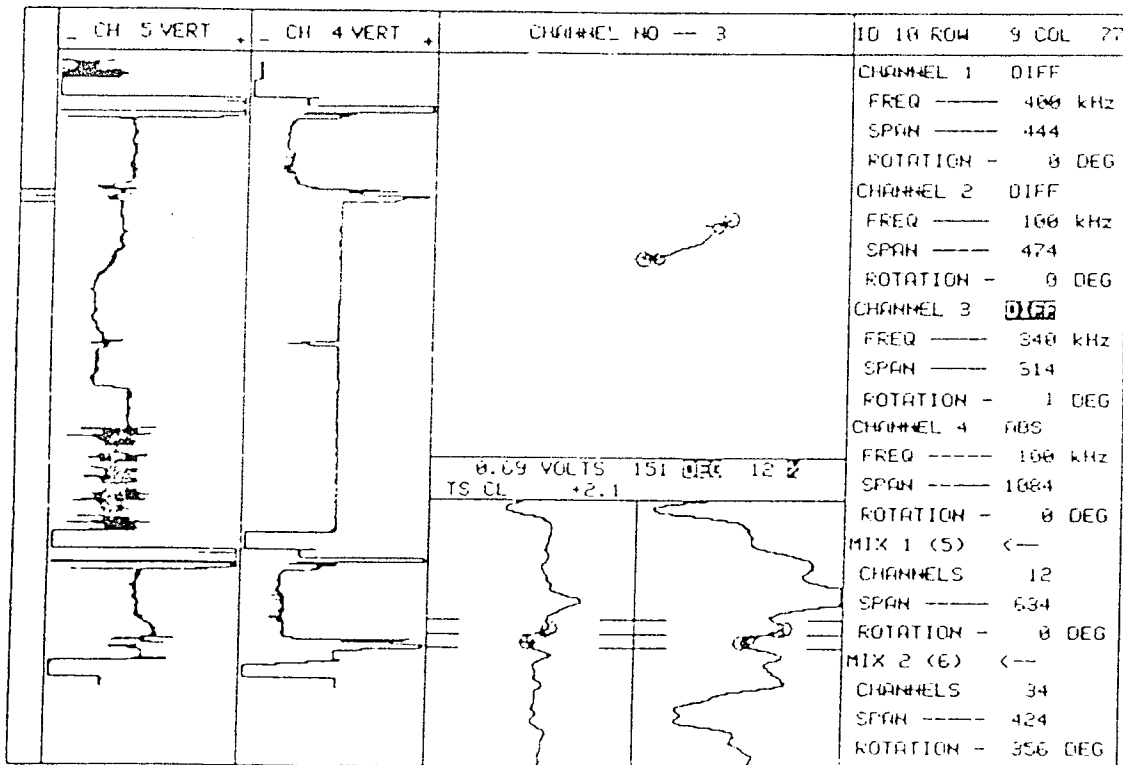


20 PLANT                    UNIT#    S/G    LEG            DATE                    ZETEC Inc. - 1983  
 SCF SONGS                    i       "C"    COLD            06/03/80                Edition 12.0 Rev 1



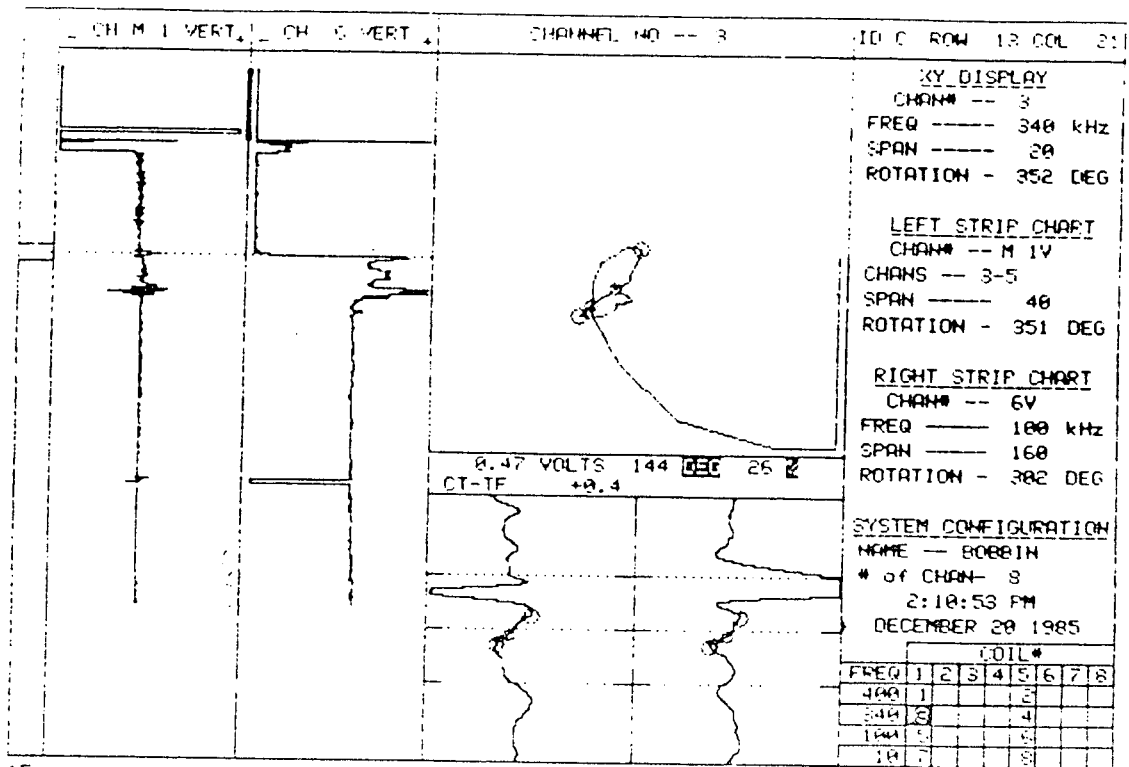


20 PLANT SCE SONGS UNIT# 1 S/G \*C\* LEG COLD DATE 06/03/80 ZETEC Inc. - 1983 Edition 12.0 Rev 1

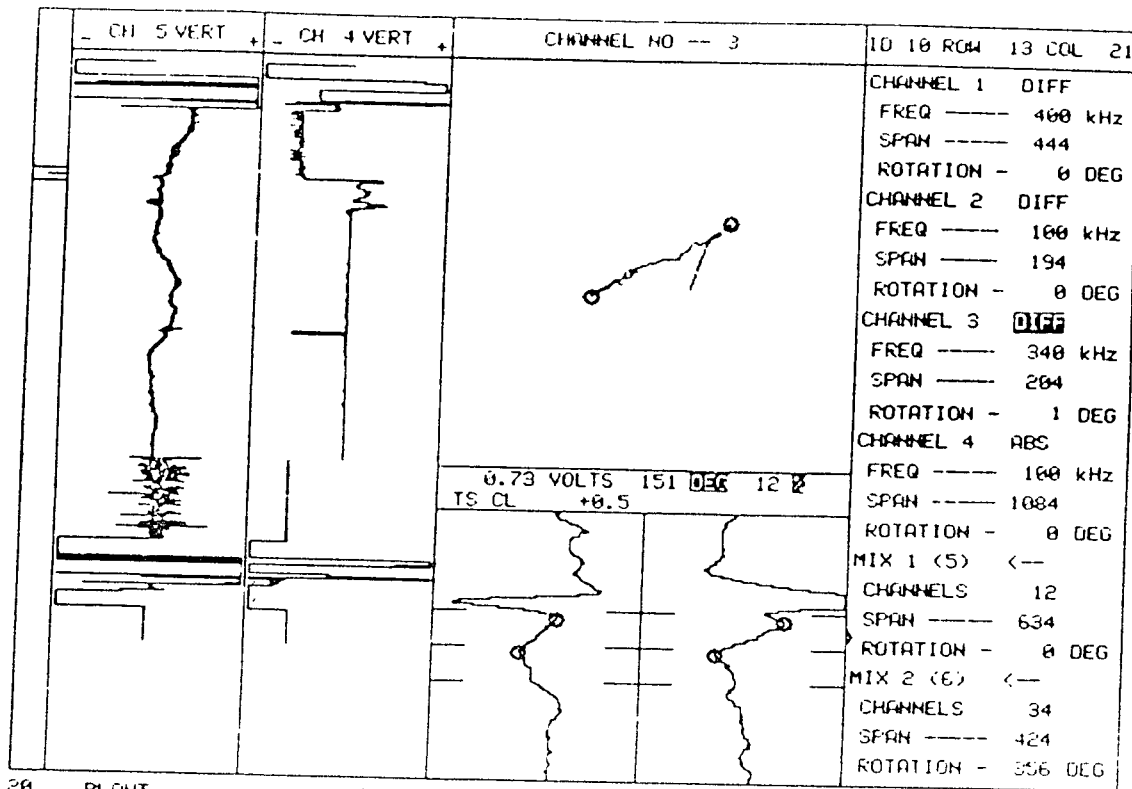


20 PLANT SCE SONGS UNIT# 1 S/G \*C\* LEG COLD DATE 06/03/80 ZETEC Inc. - 1983 Edition 12.0 Rev 1

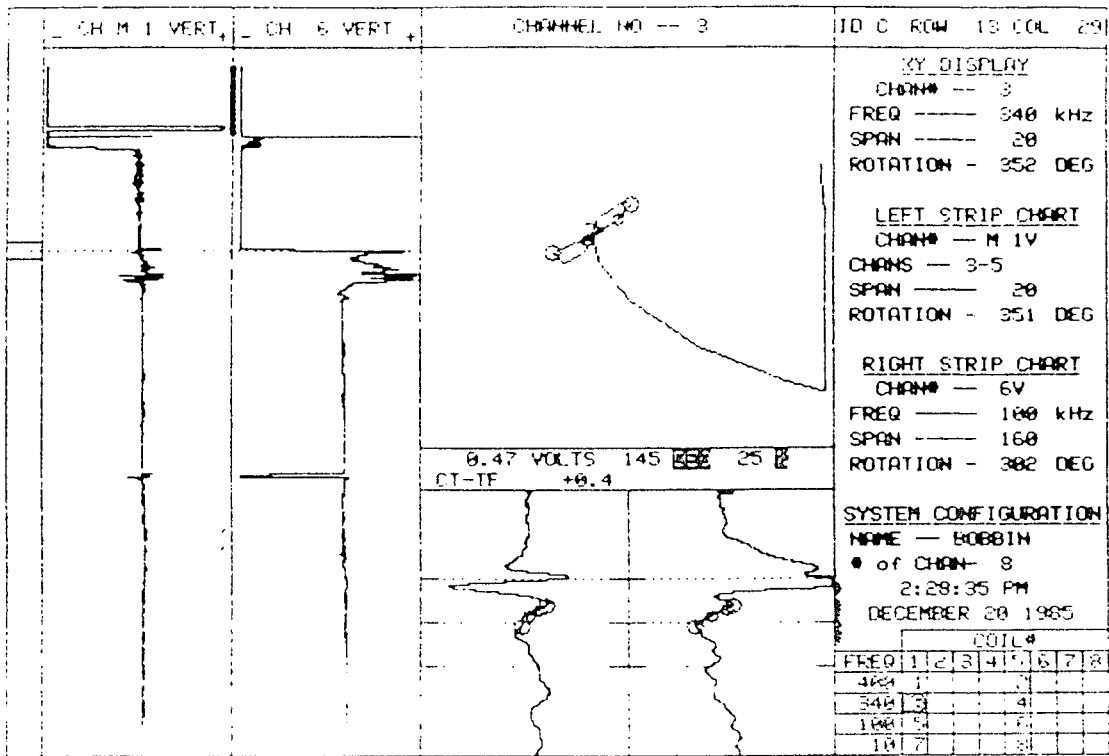




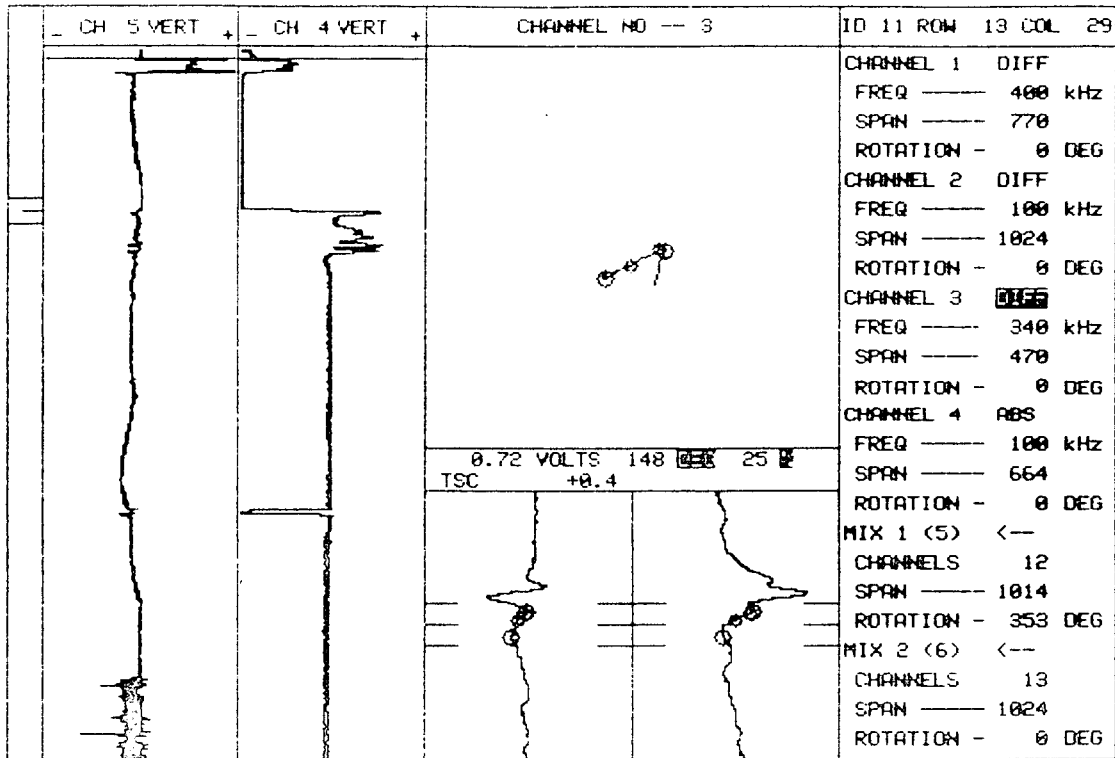
15 PLANT SONGS DISK C20- UNIT# 1 S/G C LEG C DATE 12/20/85



20 PLANT SCE SONGS UNIT# 1 S/G "C" LEG COLD DATE 06/03/80 ZETEC Inc. - 1983 Edition 12.0 Rev 1

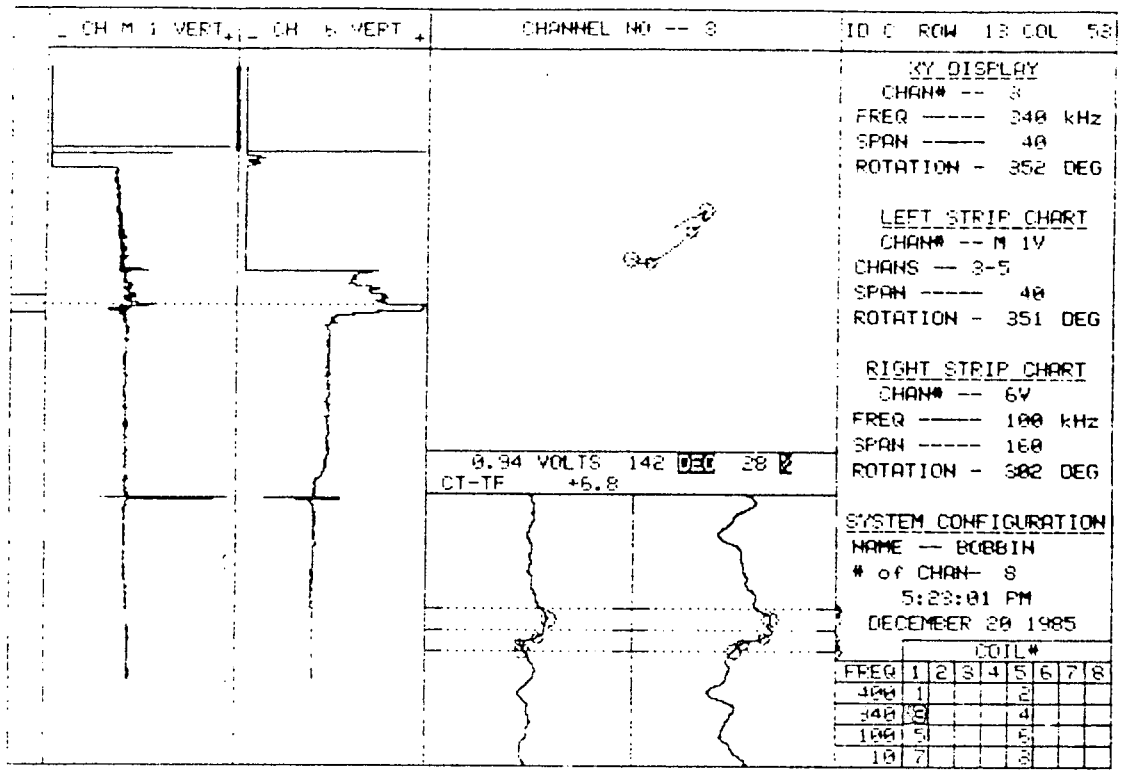


15 PLANT SONGS DISK C28- UNIT# 1 S/G C LEG C DATE 12/20/55

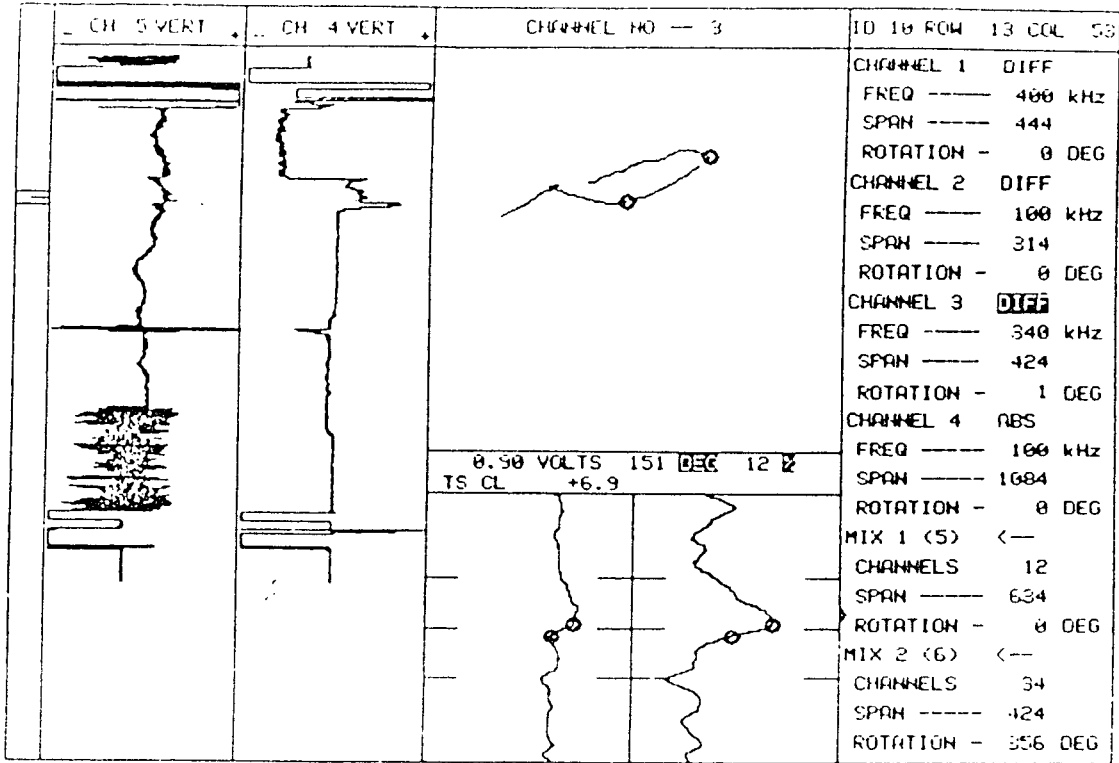


0.72 VOLTS 148 ~~0.35~~ 25 ~~0.4~~  
TSC +0.4

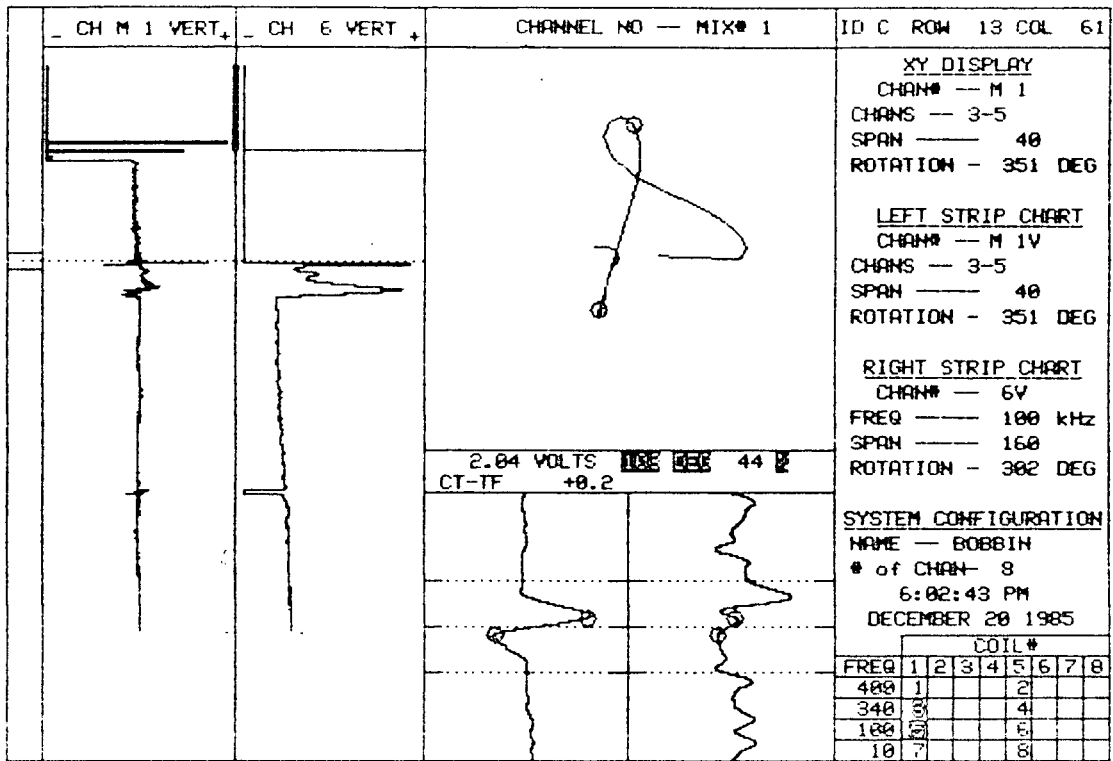
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	1	C	OUTLET	1980	Edition 12.0 Rev 1



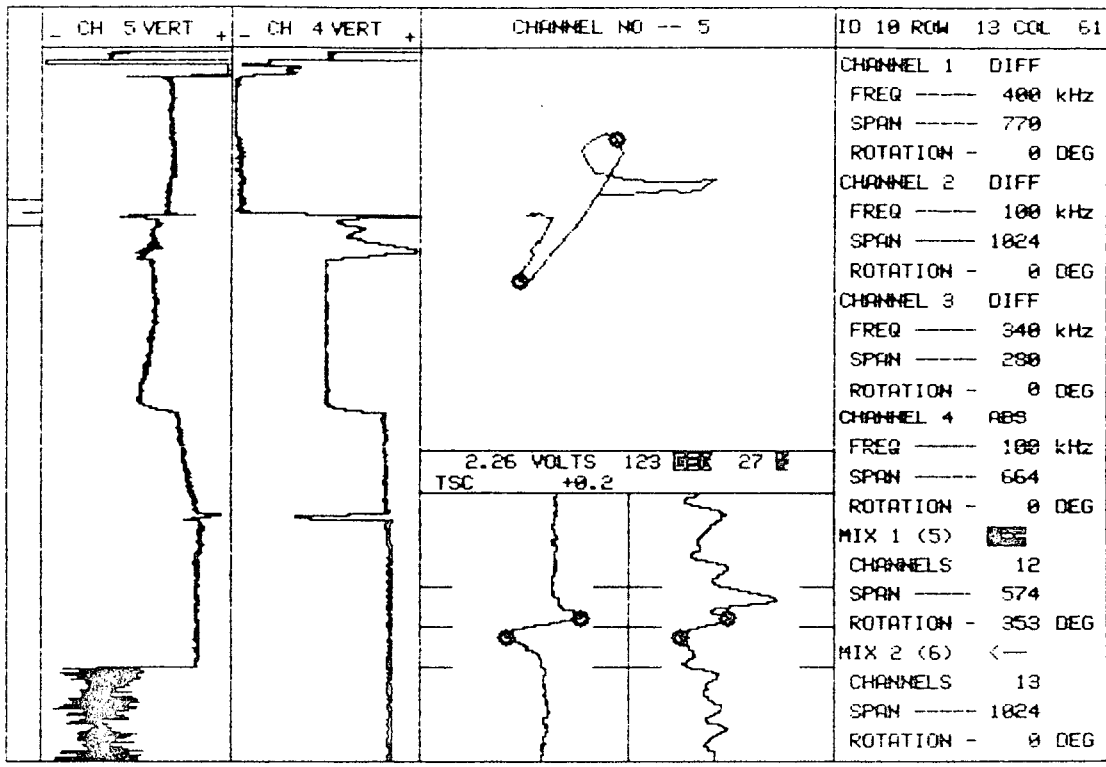
15 PLANT SONGS DISK 020- UNIT# 1 S/G C LEG C DATE 12/20/85



30	PLANT	UNIT#	S/G	LEG	DATE	DETEC Inc. - 1983
	OCE SONGS	1	"C"	COLD	06/03/88	Edition 12.0 Rev 1

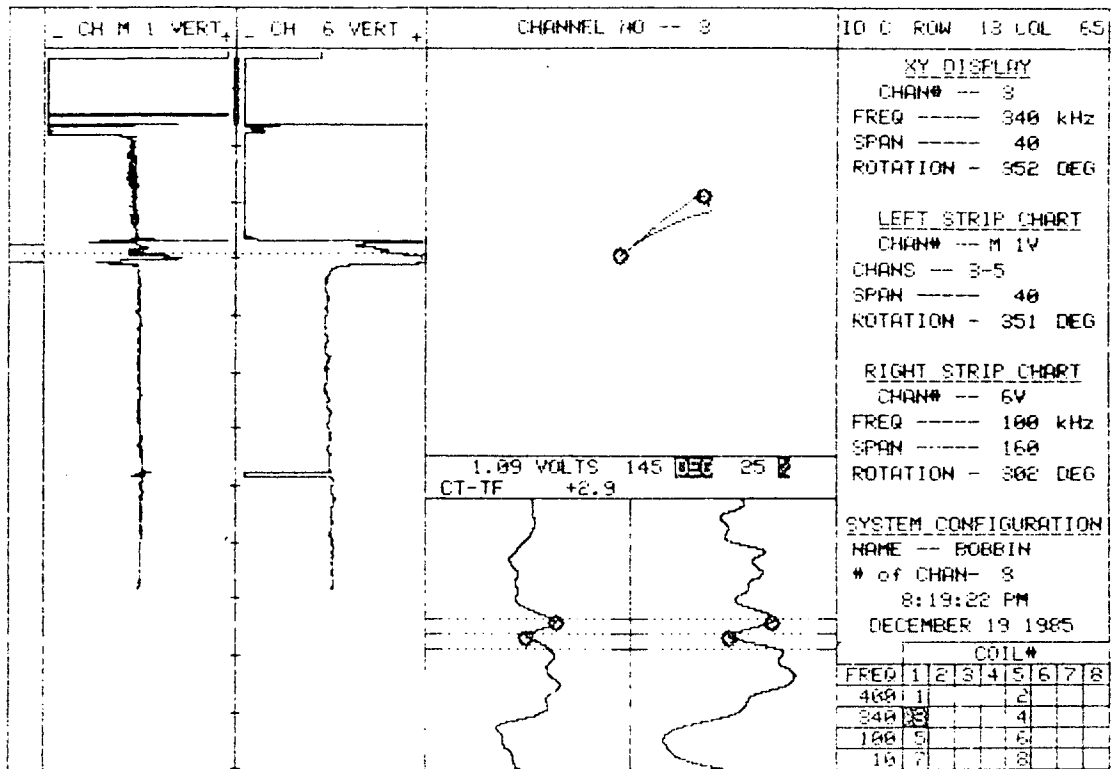


15	PLANT	UNIT#	S/G	LEG	DATE
	SONGS DISK C20-	1	C	OUTLET	12/20/85

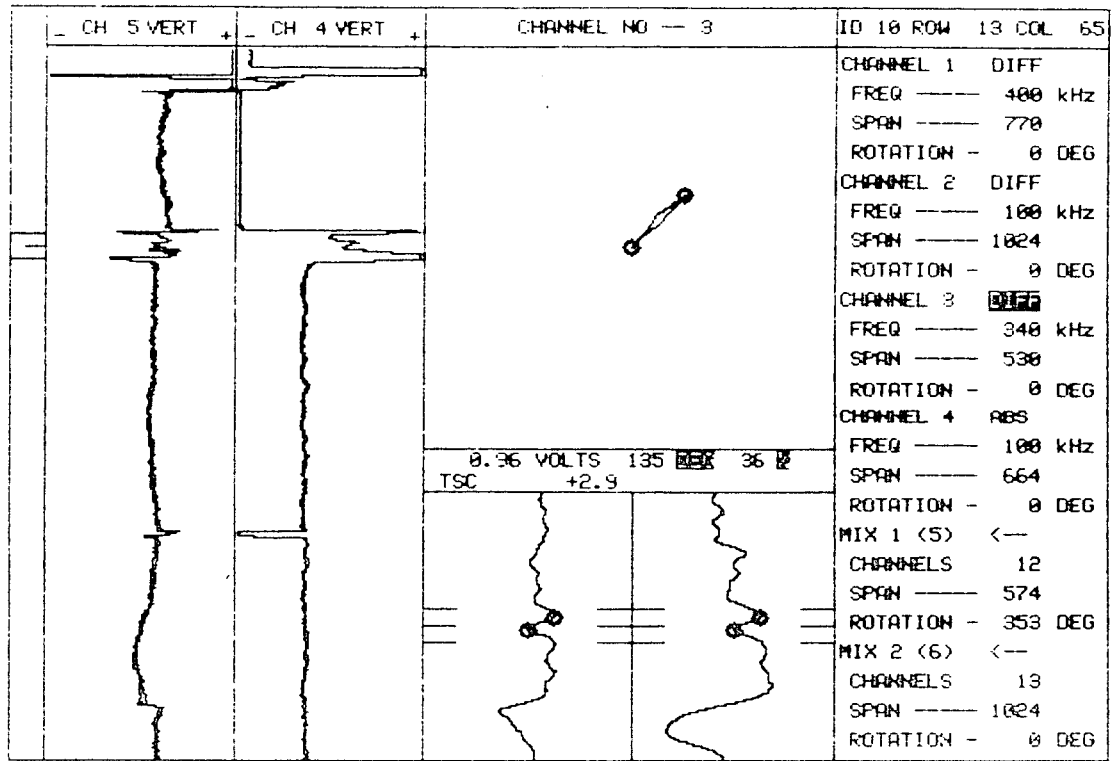


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

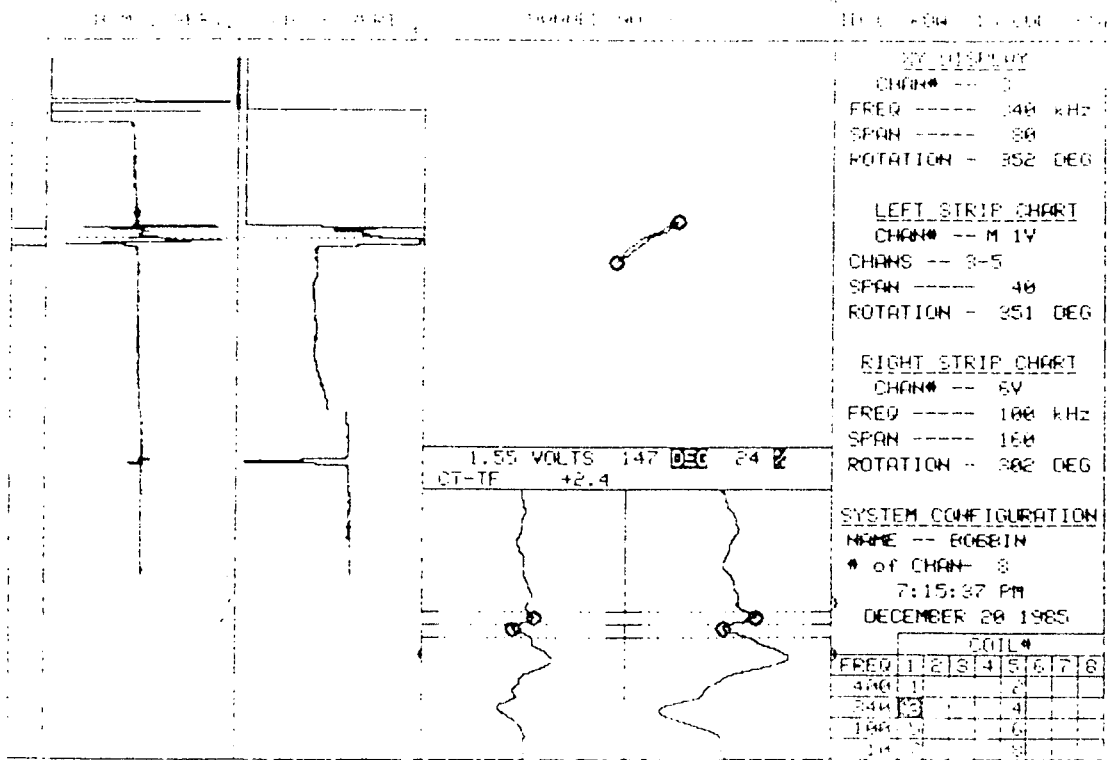




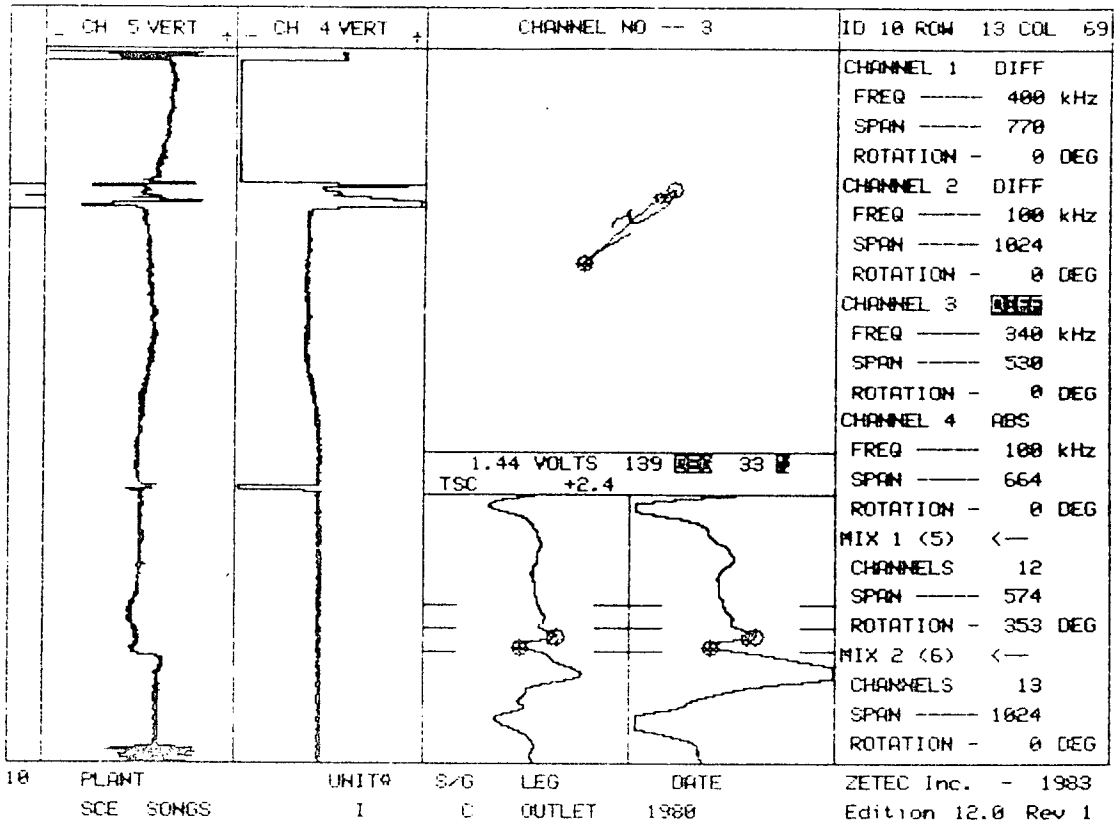
15    PLANT                    UNIT#    S/G    LEG            DATE  
      SONGS DISK C17        1        C        OUTLET        12/19/85



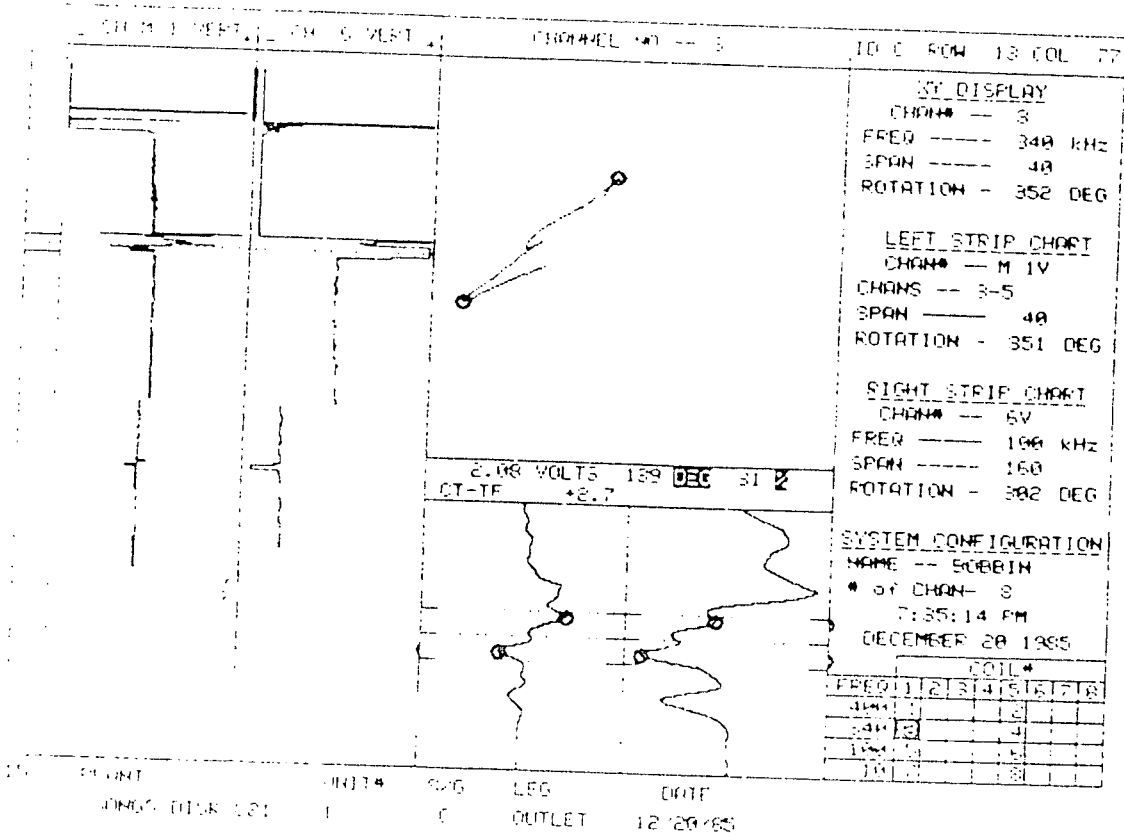
10    PLRNT    UNIT#    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    C    OUTLET    1980    Edition 12.0 Rev 1

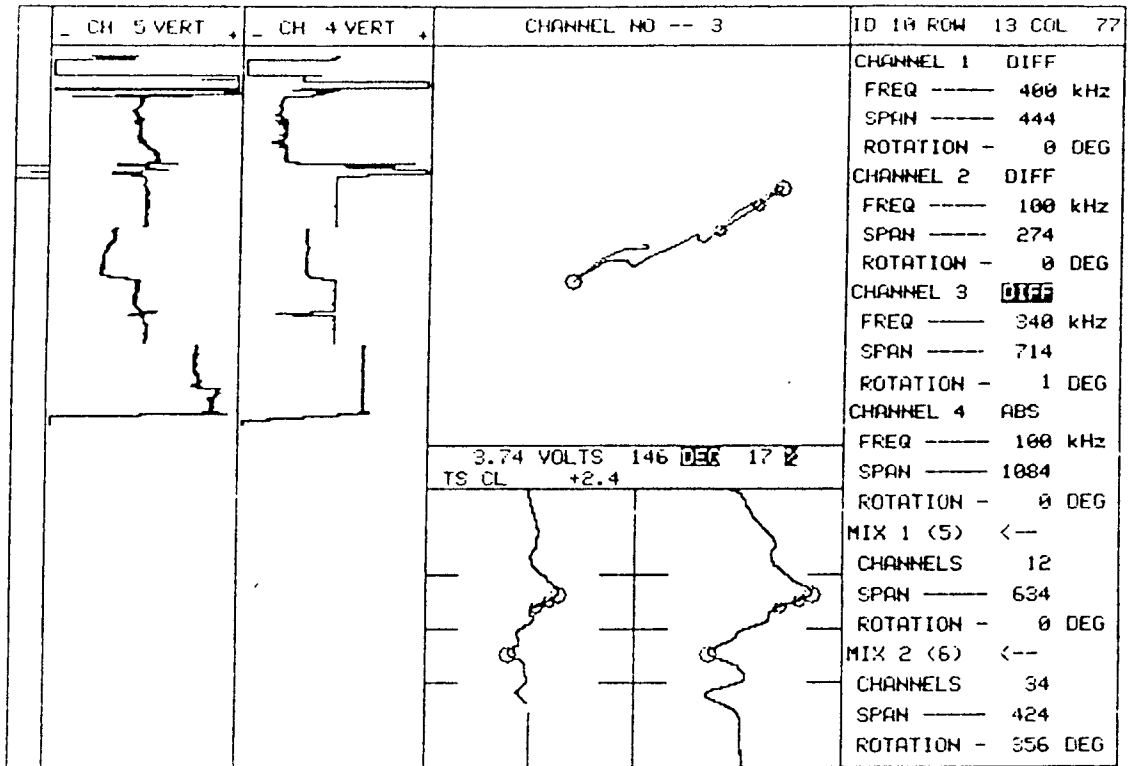


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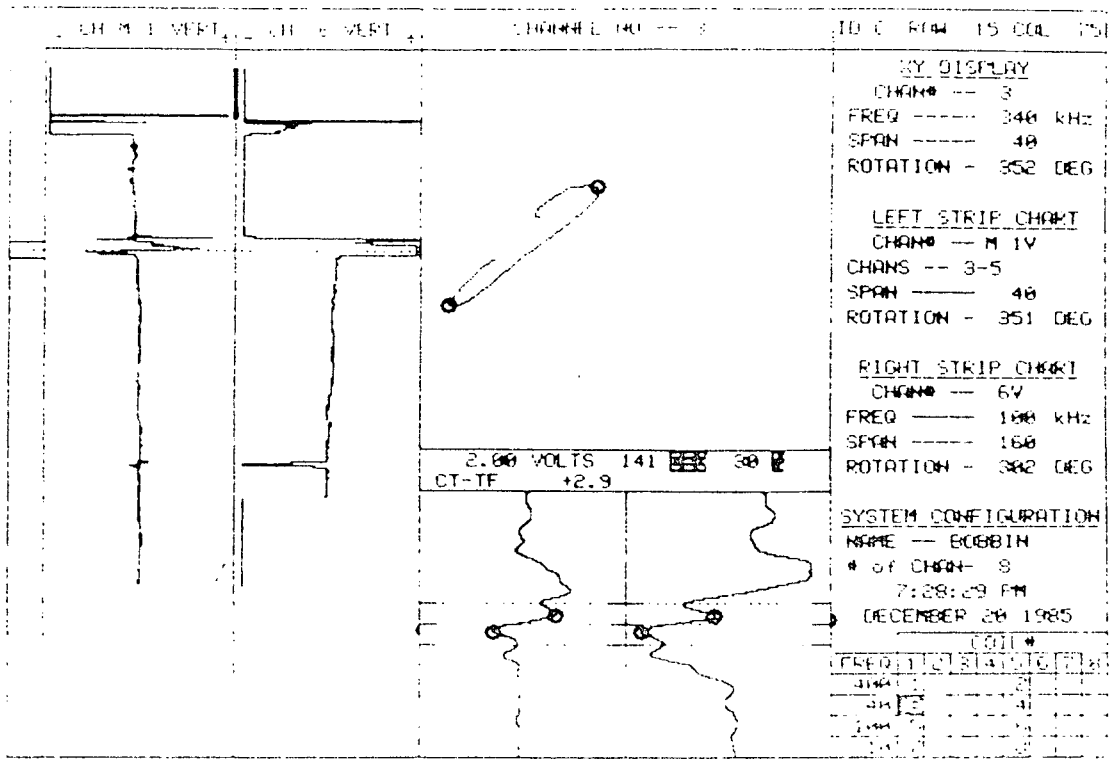


1.44 VOLTS 139 **REG** 33 **M**  
TSC +2.4

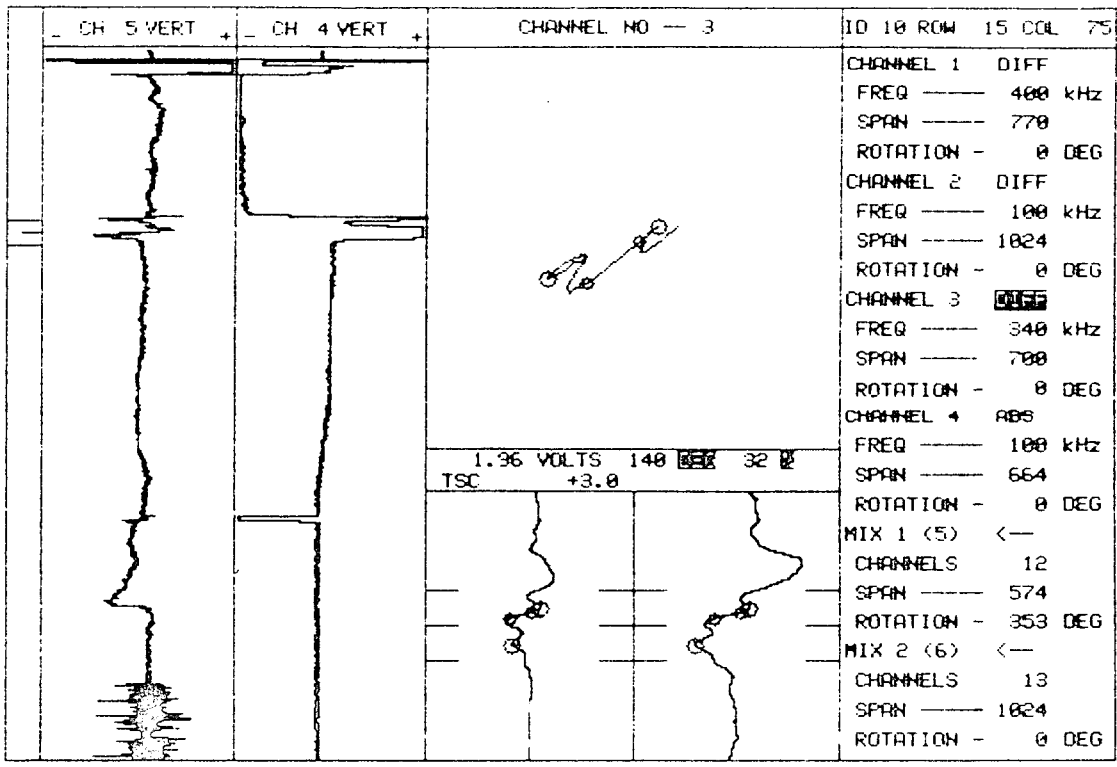




20	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	"C"	COLD	06/03/80	Edition 12.0 Rev 1

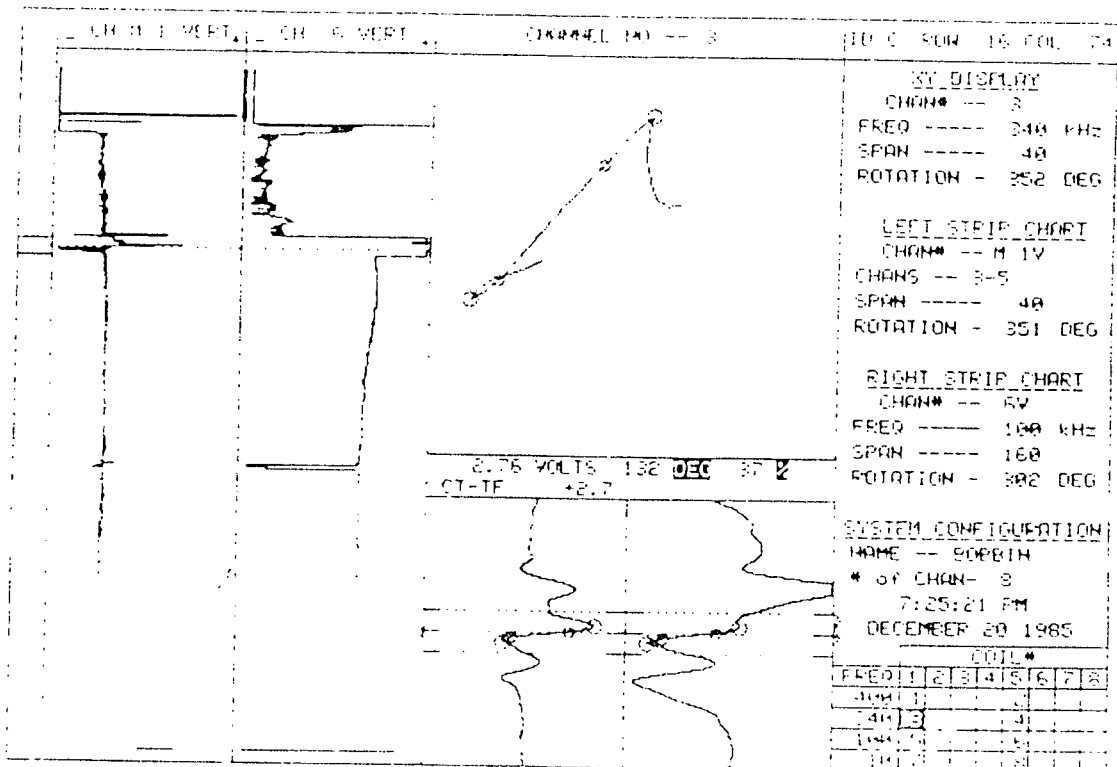


IS	PLANT	UNIT#	S/C	LEG	DATE
	SONAR DISK (2)		0	OUTLET	12/20/85

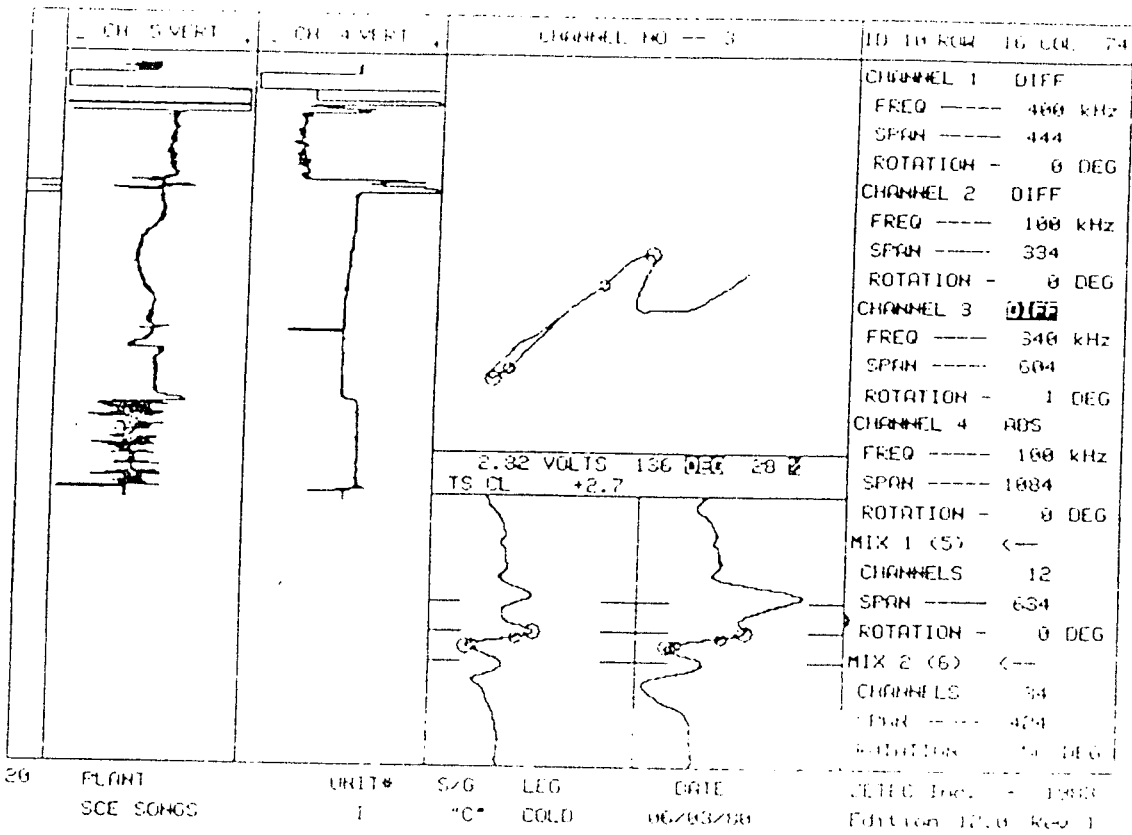


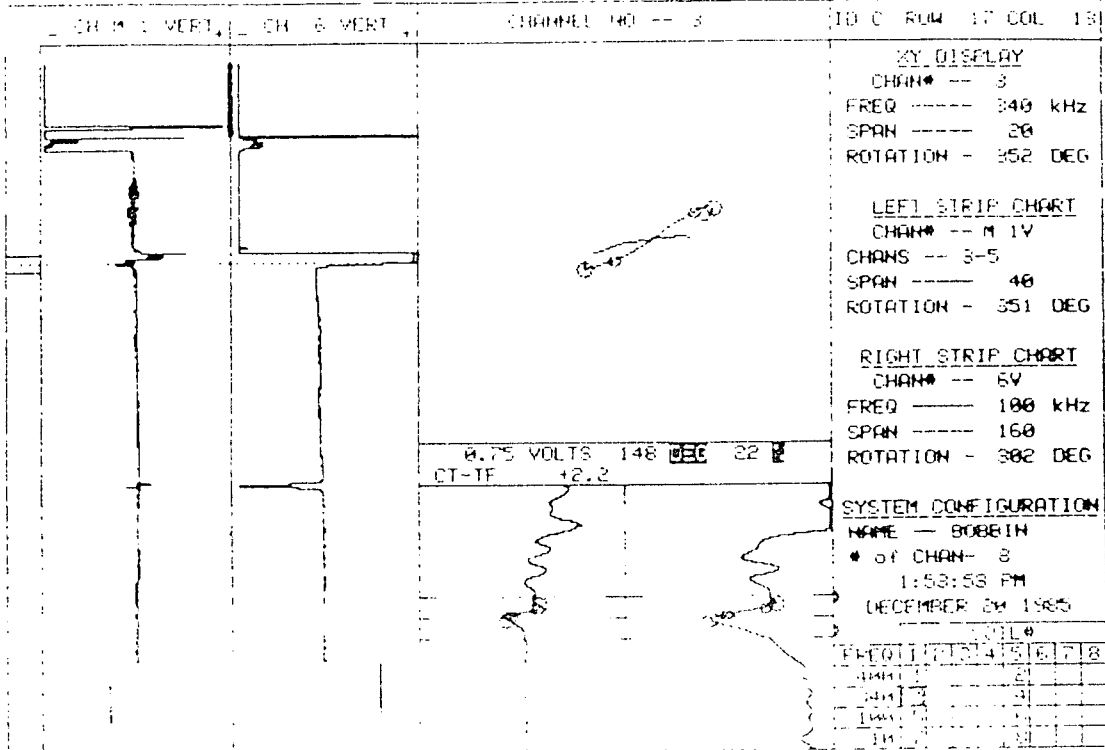
10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1



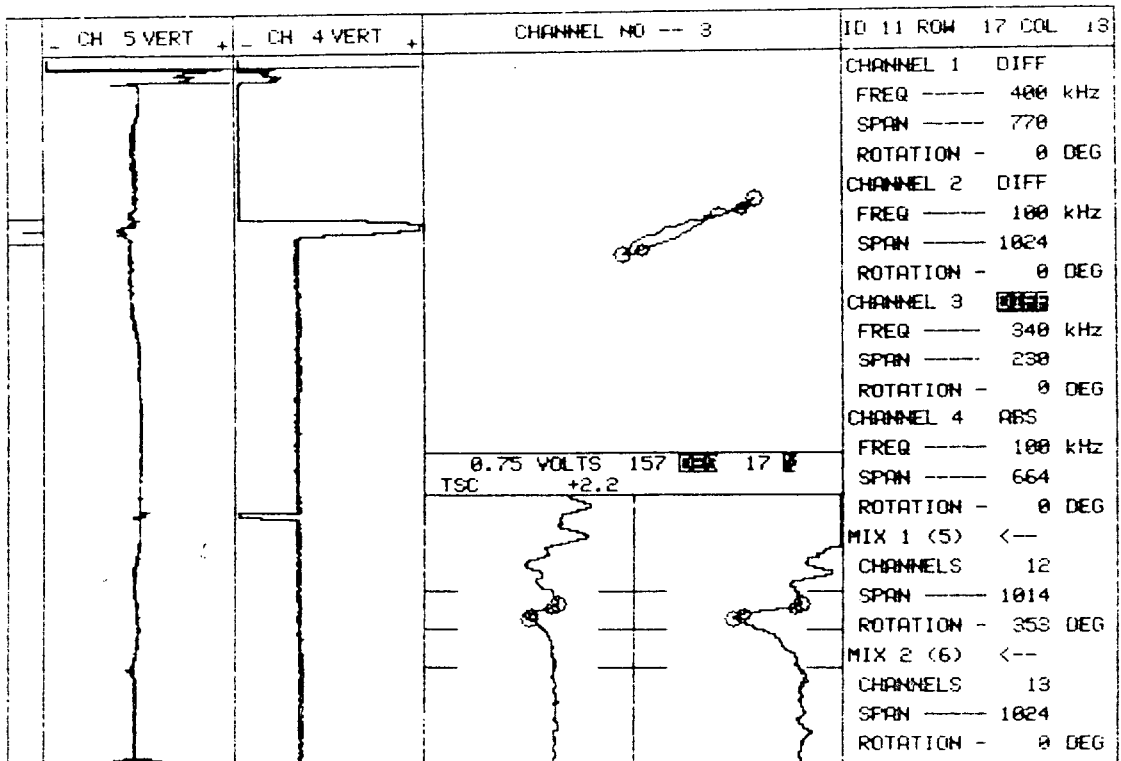


15 PLANT UNIT# S/C LEG DATE  
 SONGS DISK 021 1 C OUTLET 12-20-85

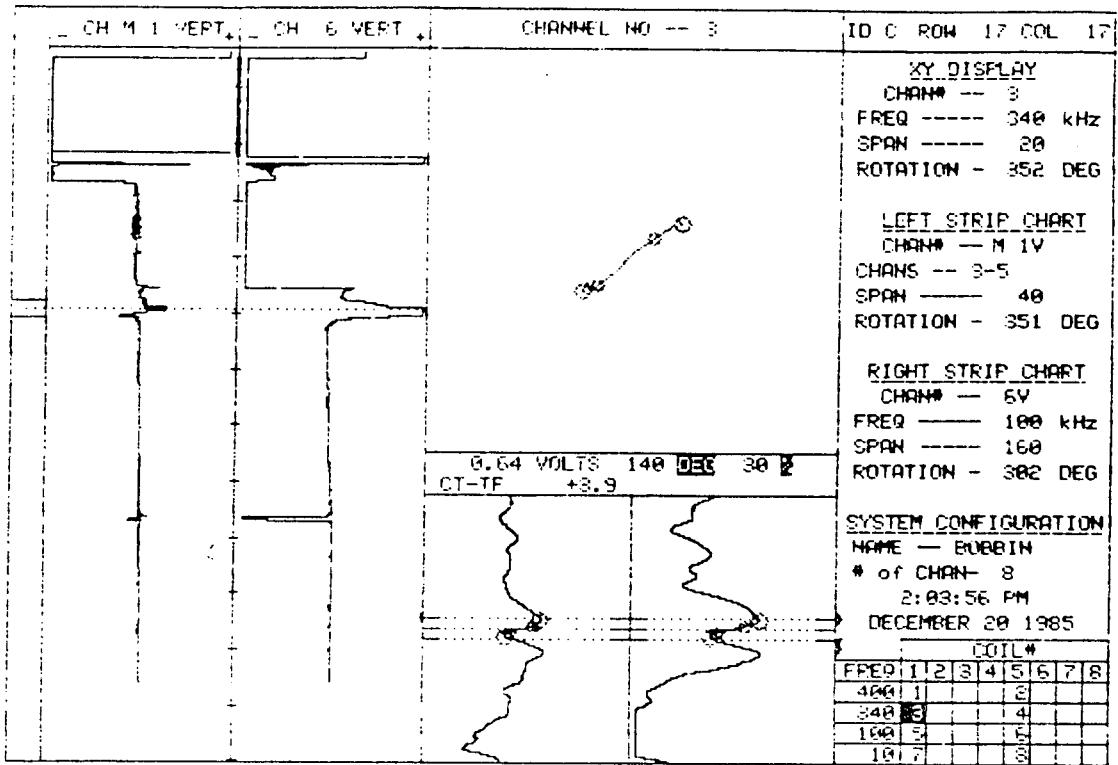




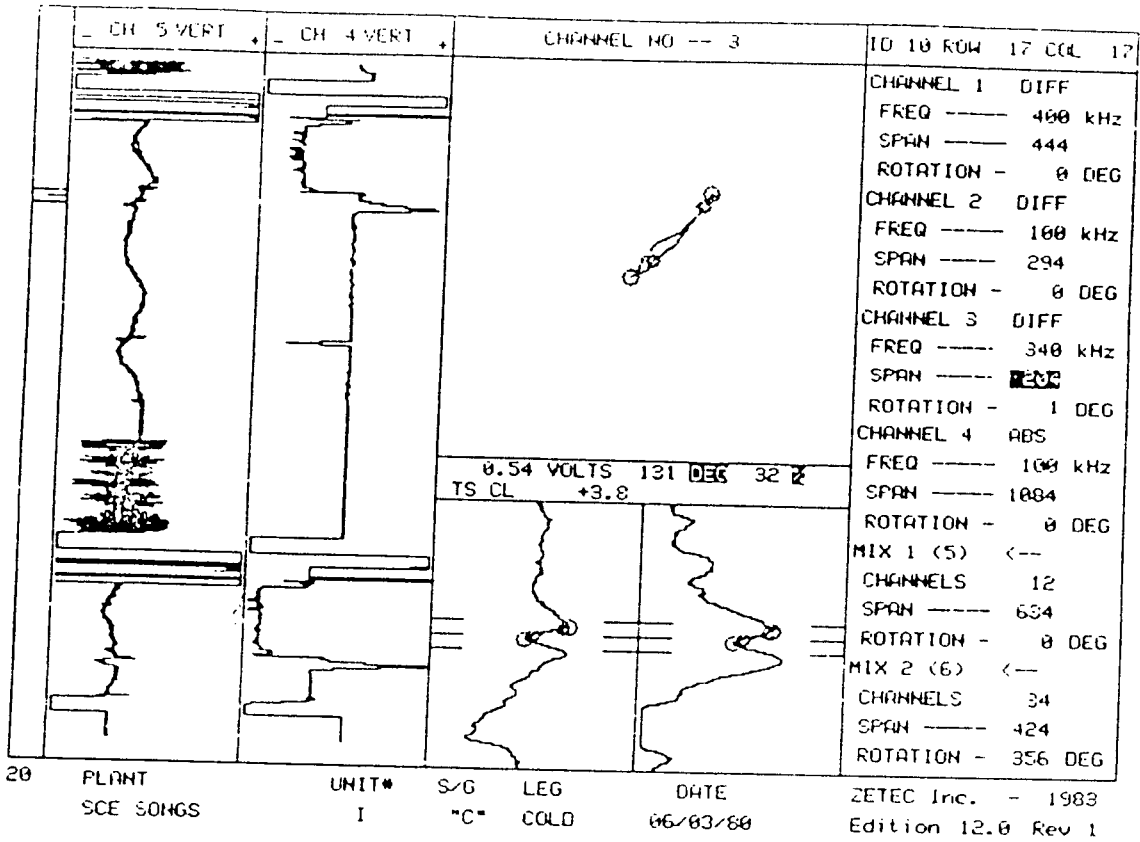
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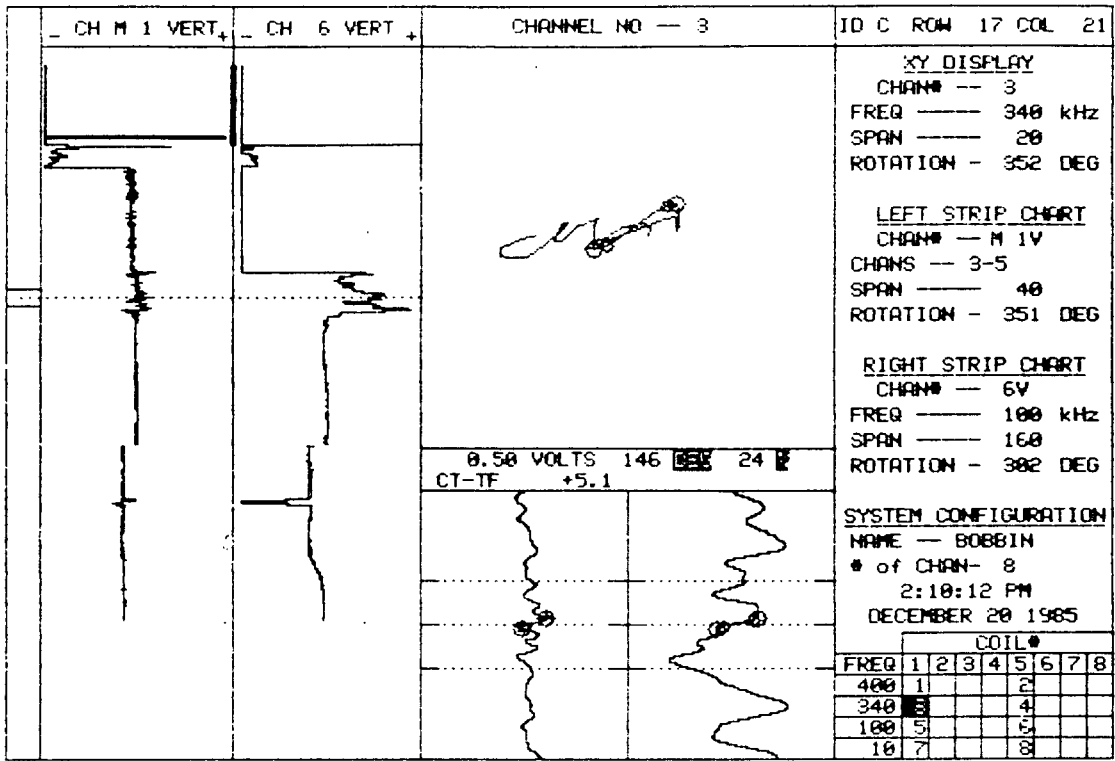


10 PLANT SCE SONGS UNIT# I S/G C LEG C DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

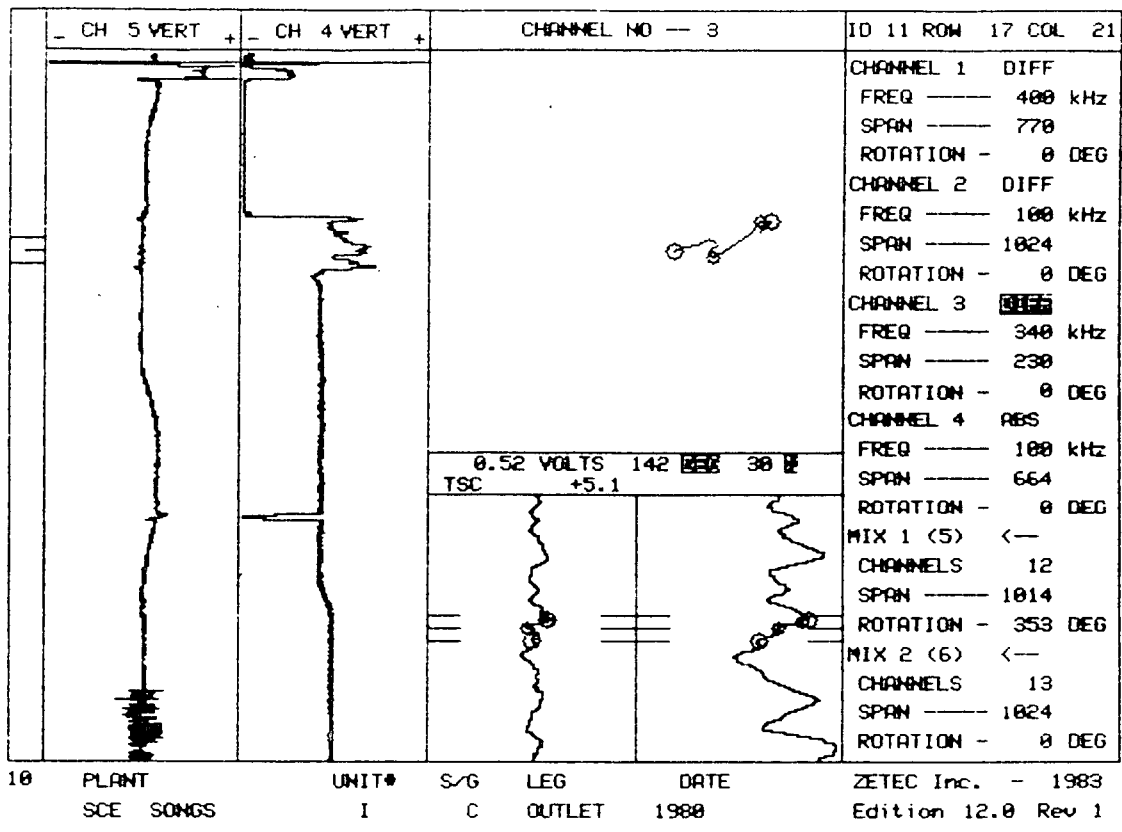


15    PLANT                    UNIT#    S/G    LEG            DATE  
      SONGS DISK C20-    1        C        OUTLET        12/20/85



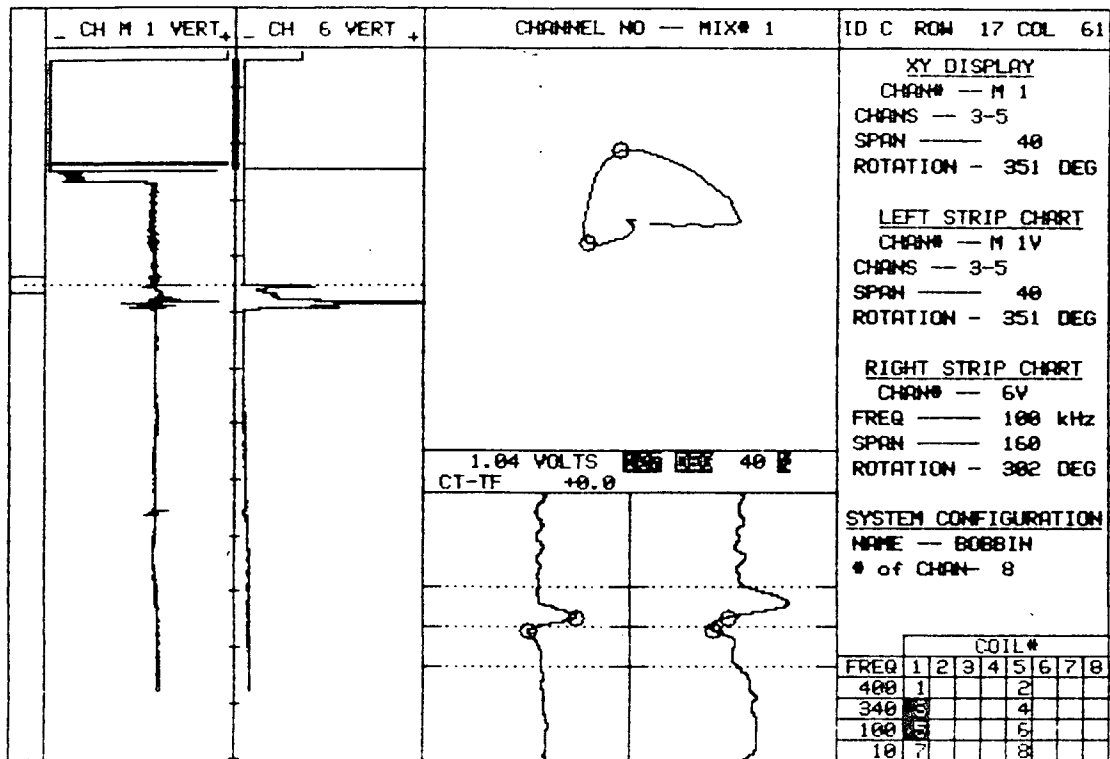


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 SONGS DISK C20-    1    C    OUTLET    12/20/85

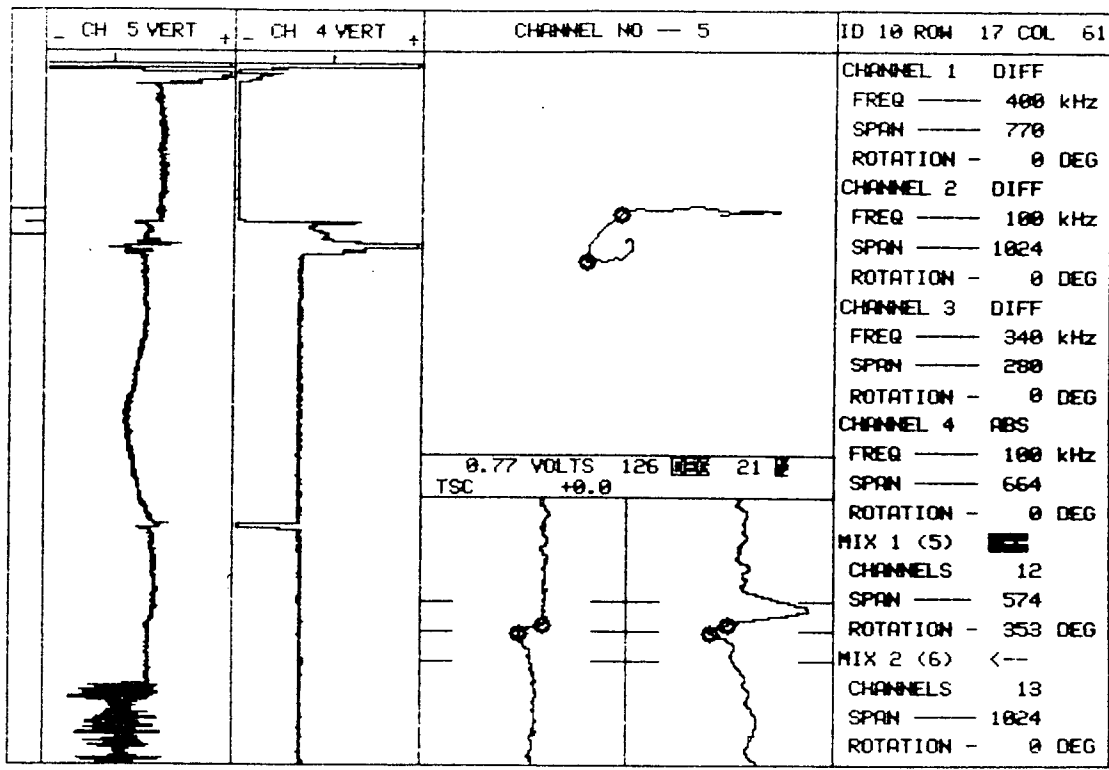


0.52 VOLTS 142 DEG 30 H  
TSC +5.1

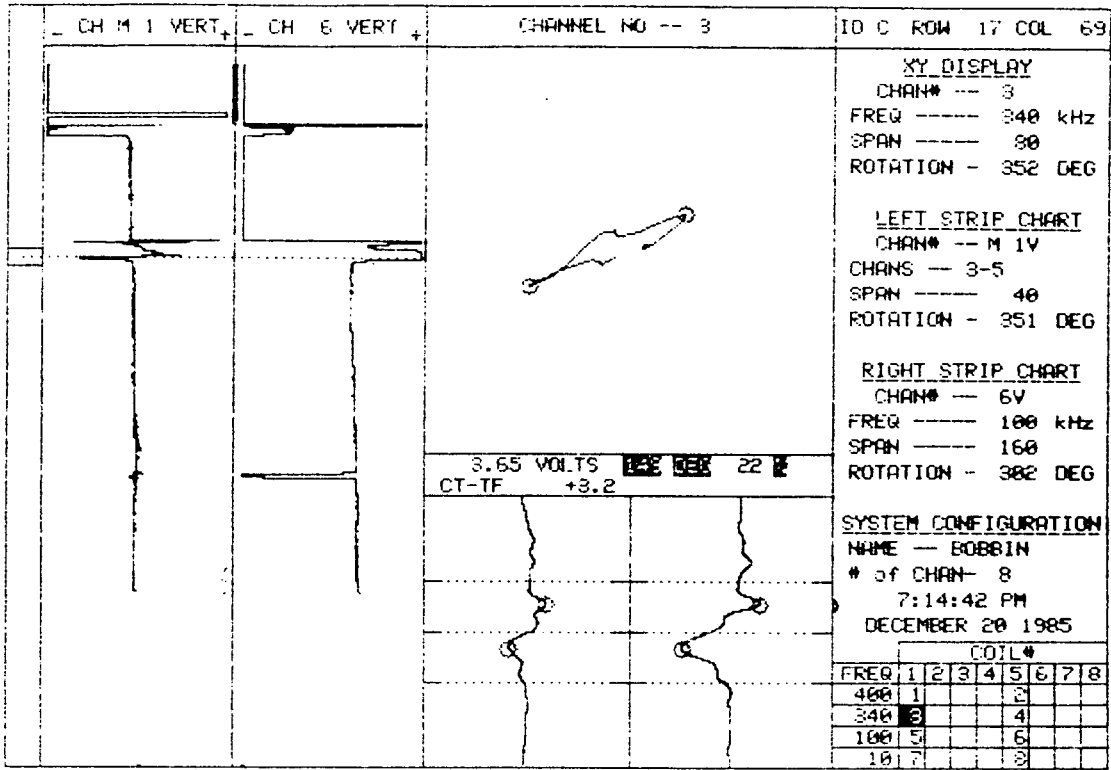




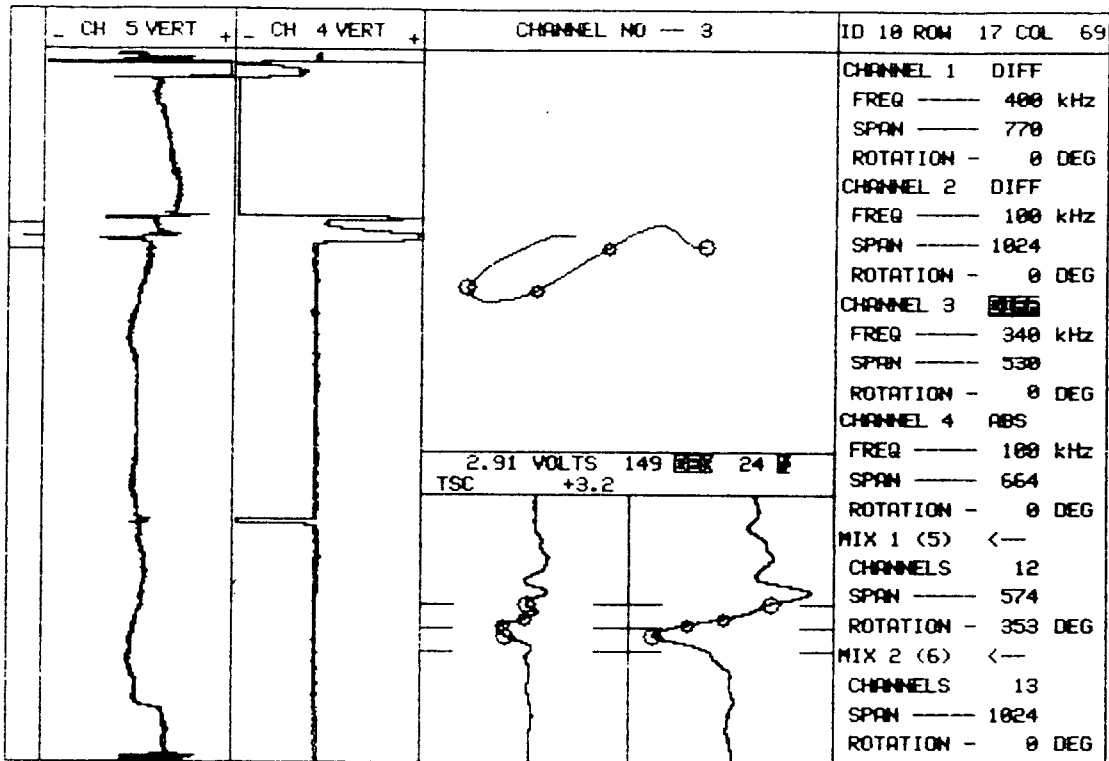
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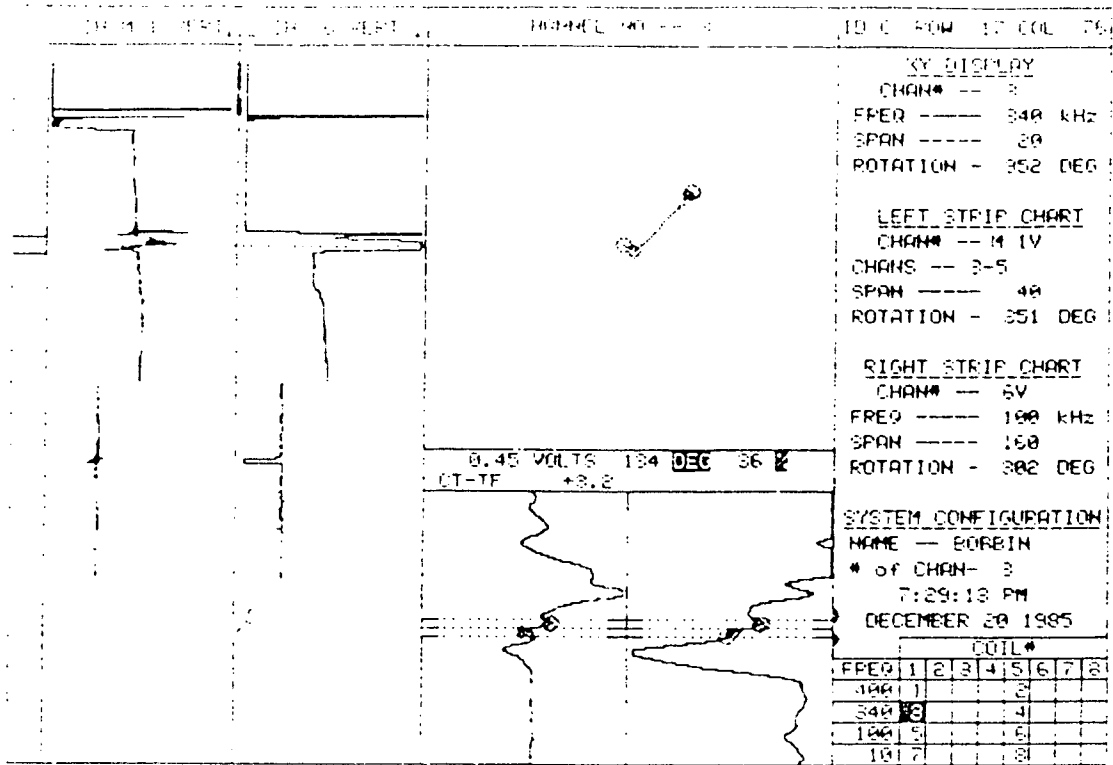
10 PLANT SCE SONGS UNIT# I S/G C LEG C DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



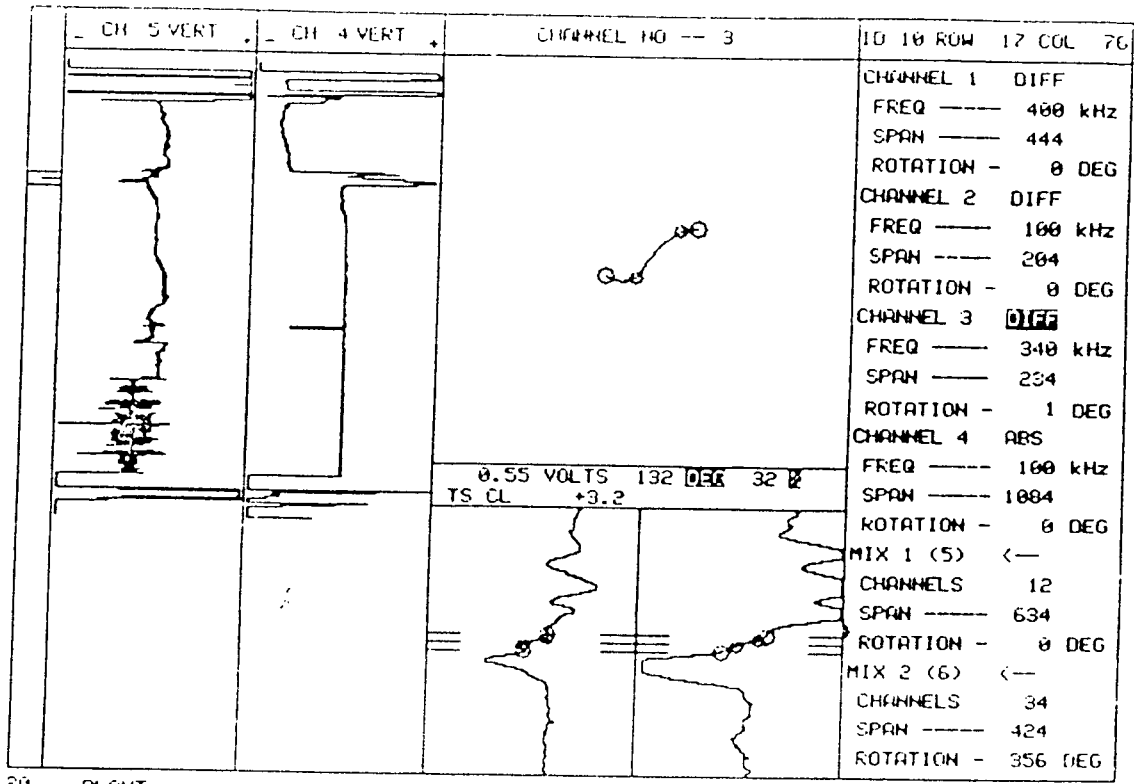
15    PLANT                    UNIT#    S/G    LEG                    DATE  
      SONGS DISK C21        1        C        OUTLET                12/20/85



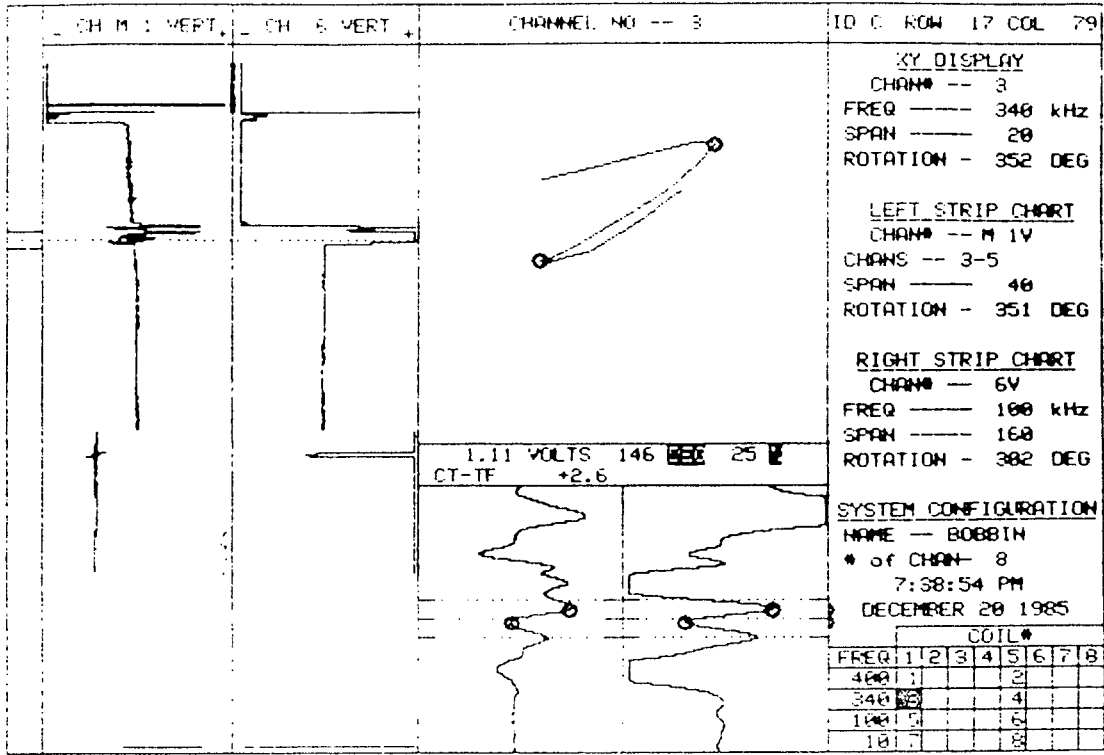
10 PLANT SCE SONGS UNIT\* I S/G C LEG OUTLET DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



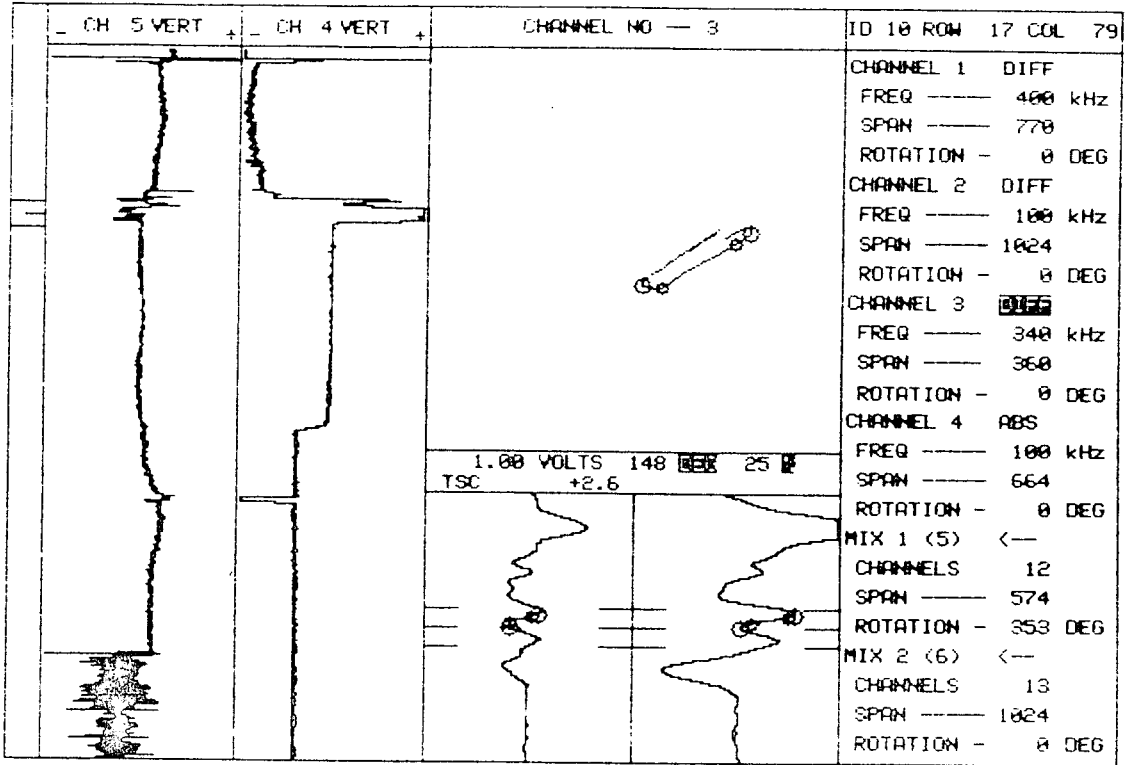
15 PLANT SONGS DISK 021 UNIT# 1 S/G 0 LEG C DATE 12/20/85



20    PLANT    UNIT\*    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    "C"    COLD    06/03/88    Edition 12.0 Rev 1

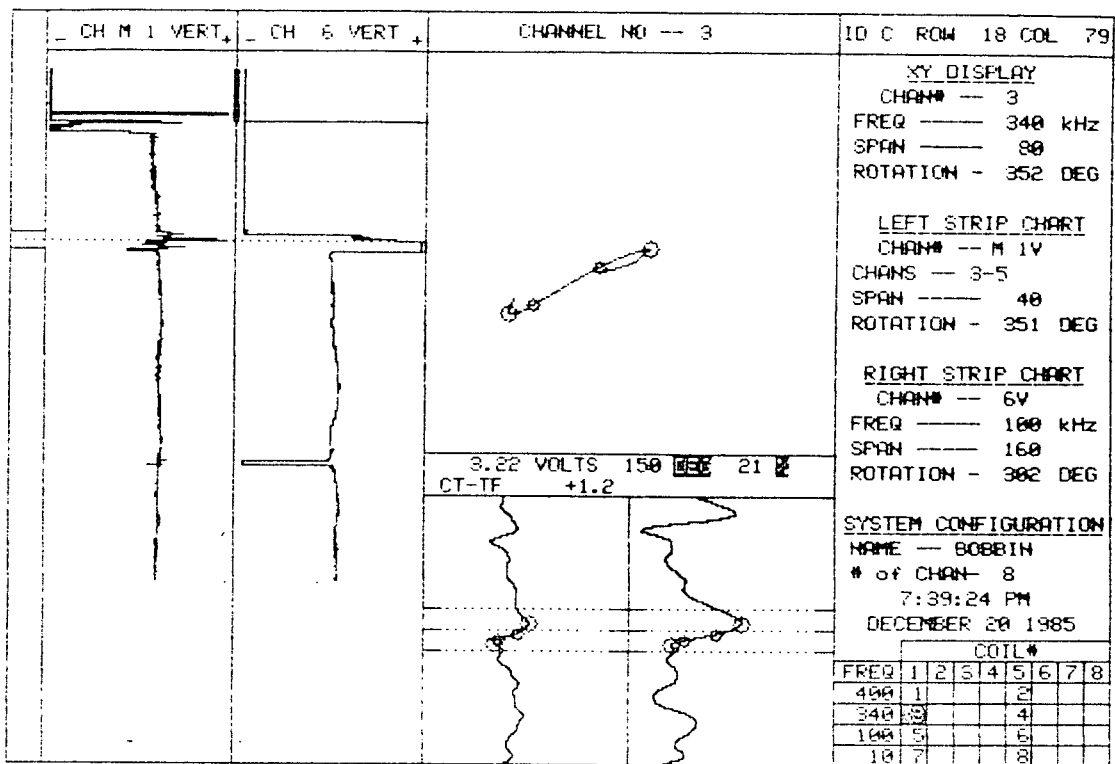


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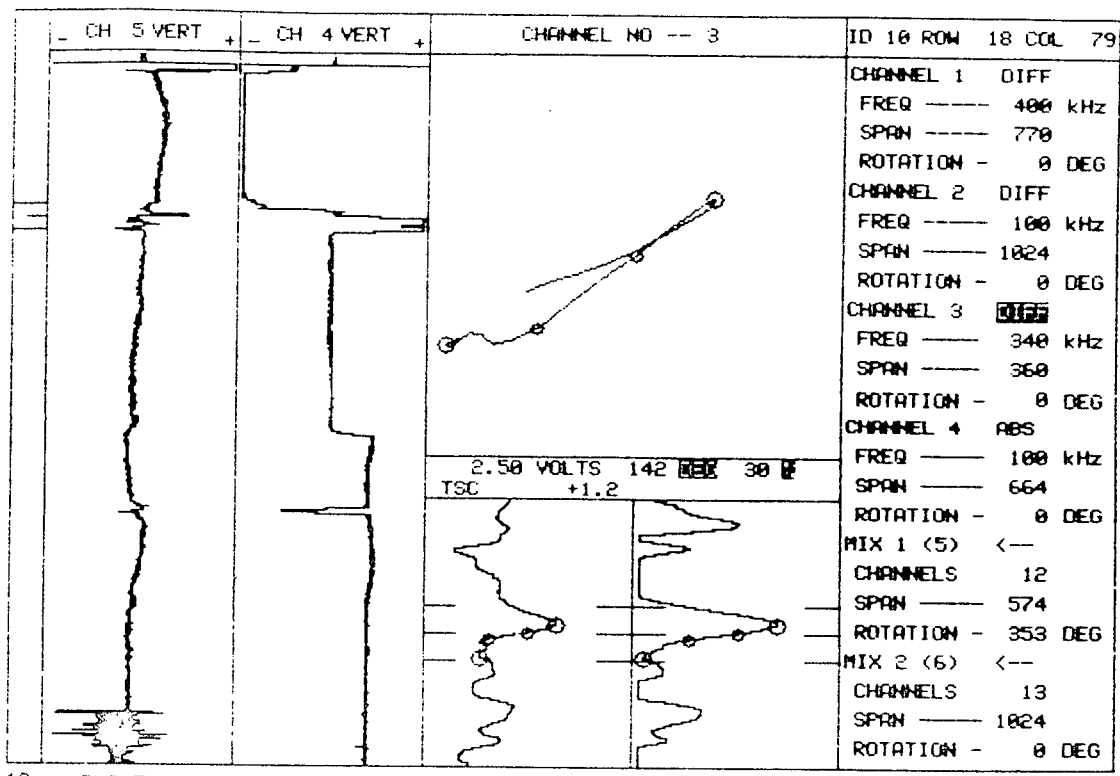


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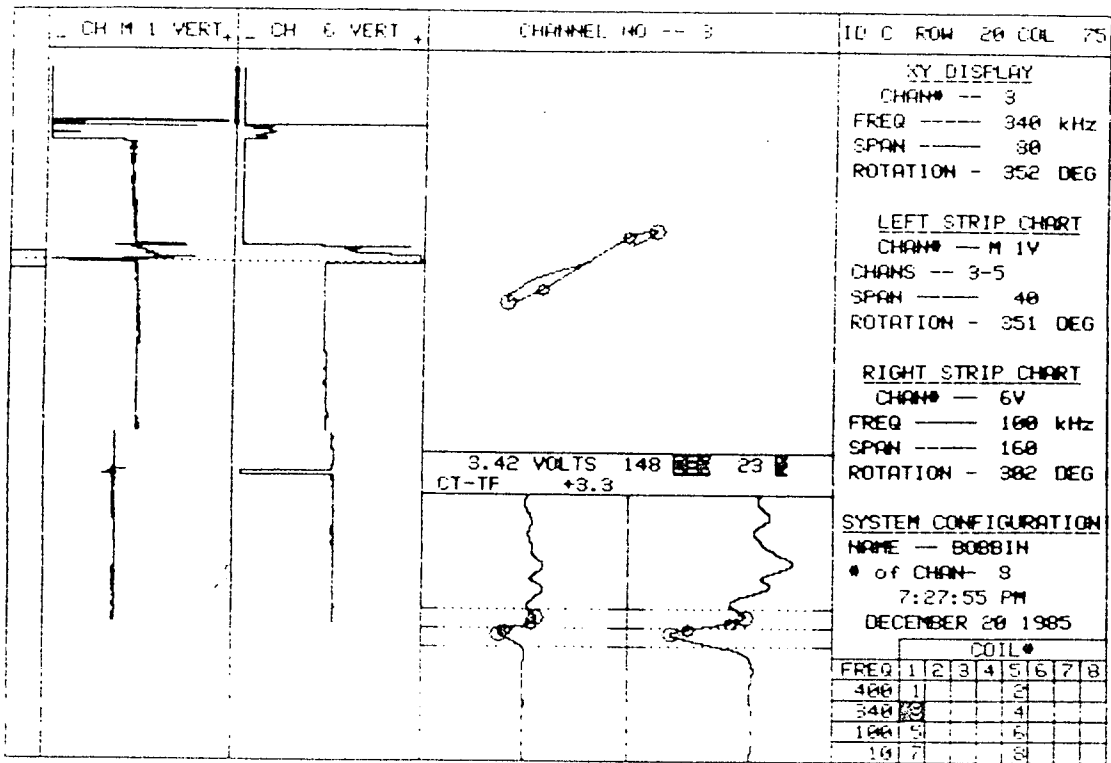




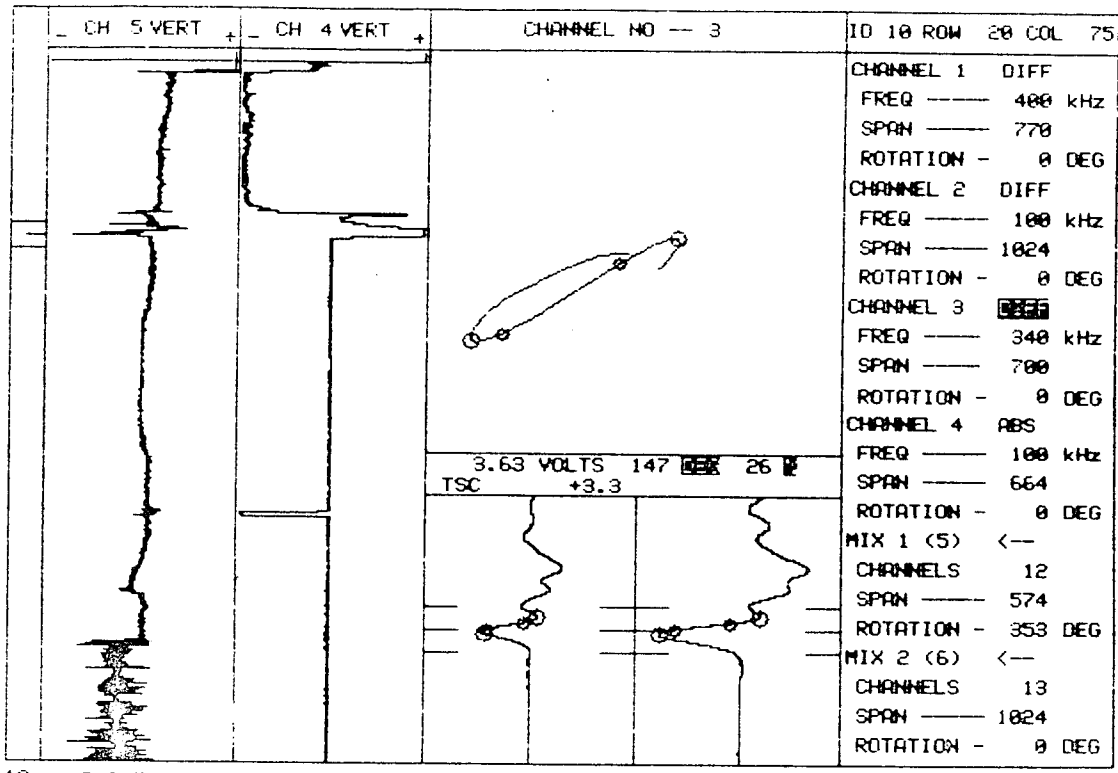
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C21    1    C    OUTLET    12/20/85



10 PLANT SCE SONGS UNIT# I S/G C LEG C DATE 1988 ZETEC Inc. - 1983 Edition 12.0 Rev 1



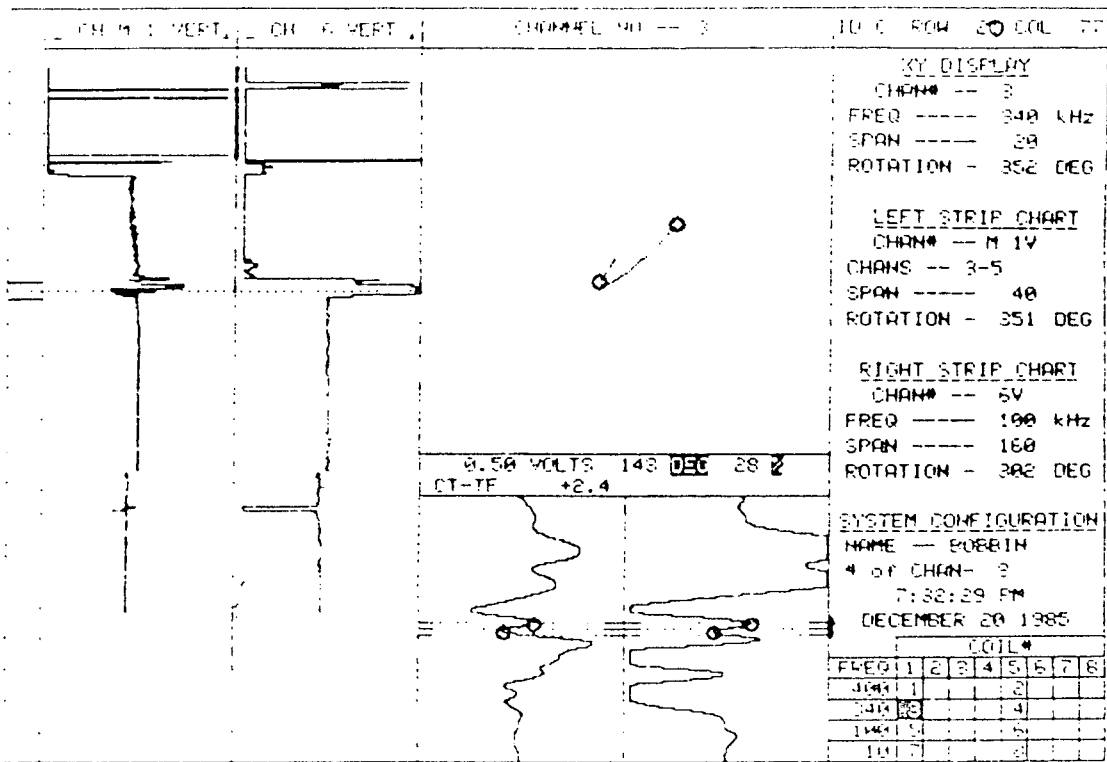
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 SONGS DISK C21    1                          C                          OUTLET    12/20/85



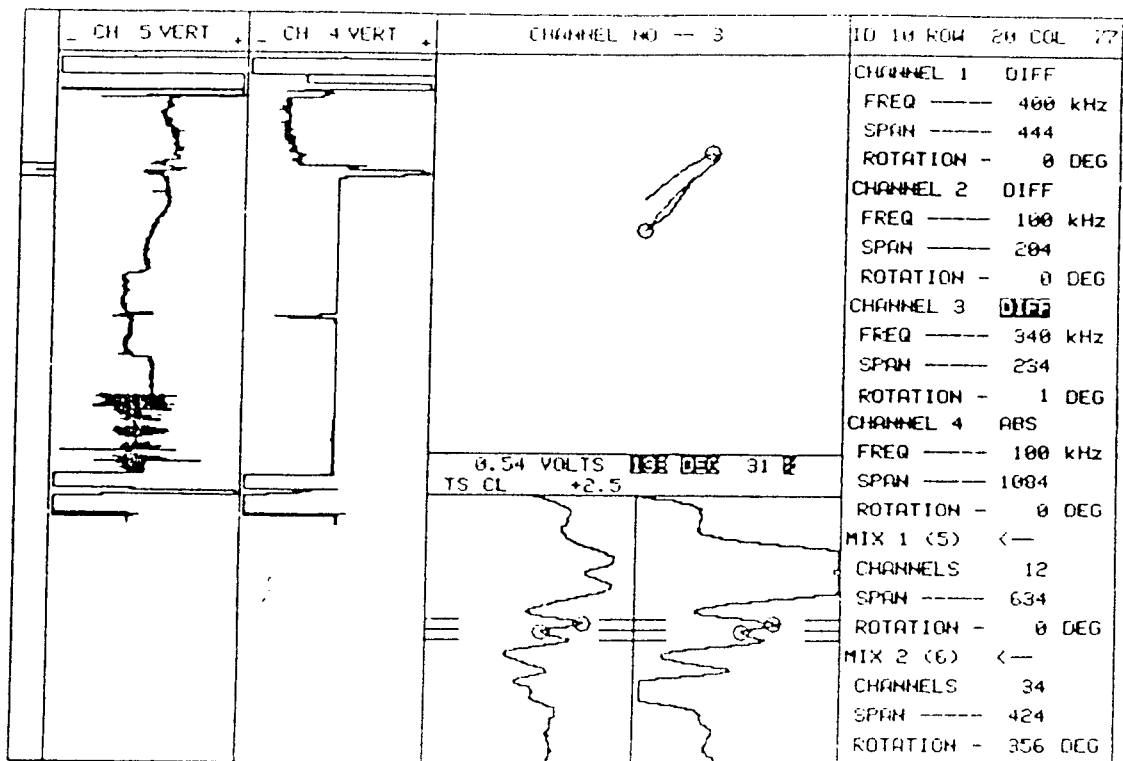
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     SCE SONGS    I    C    OUTLET    1980

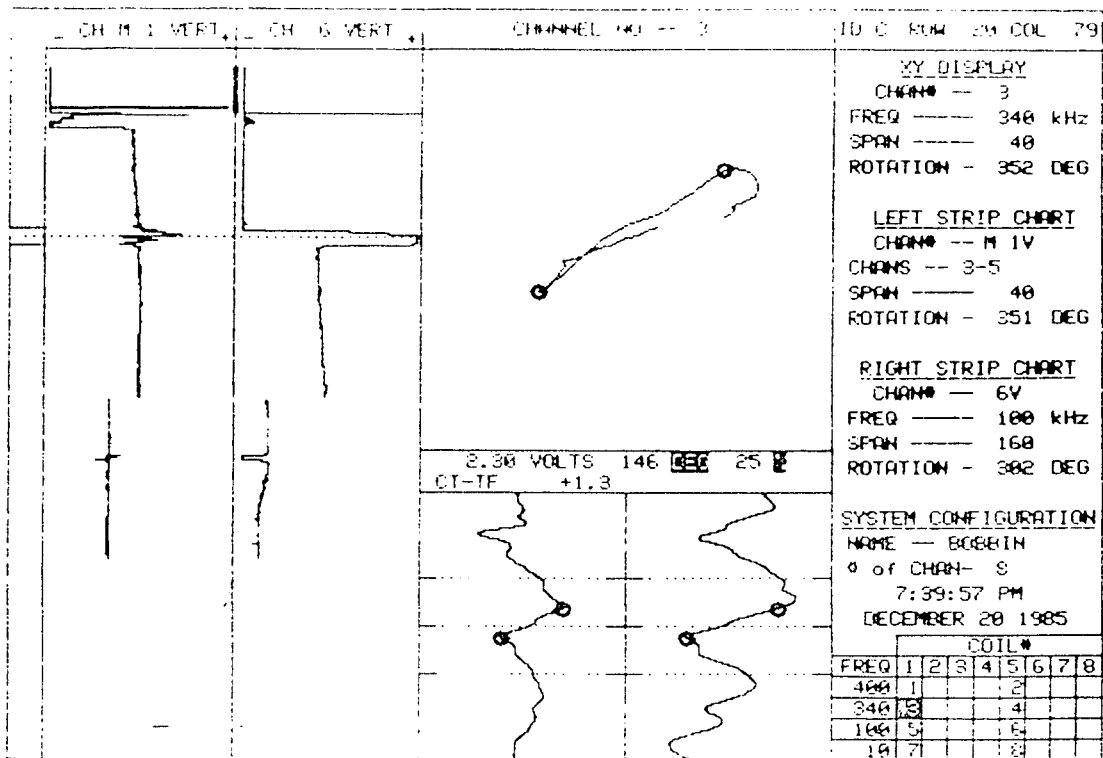
ZETEC Inc. - 1983  
Edition 12.0 Rev 1



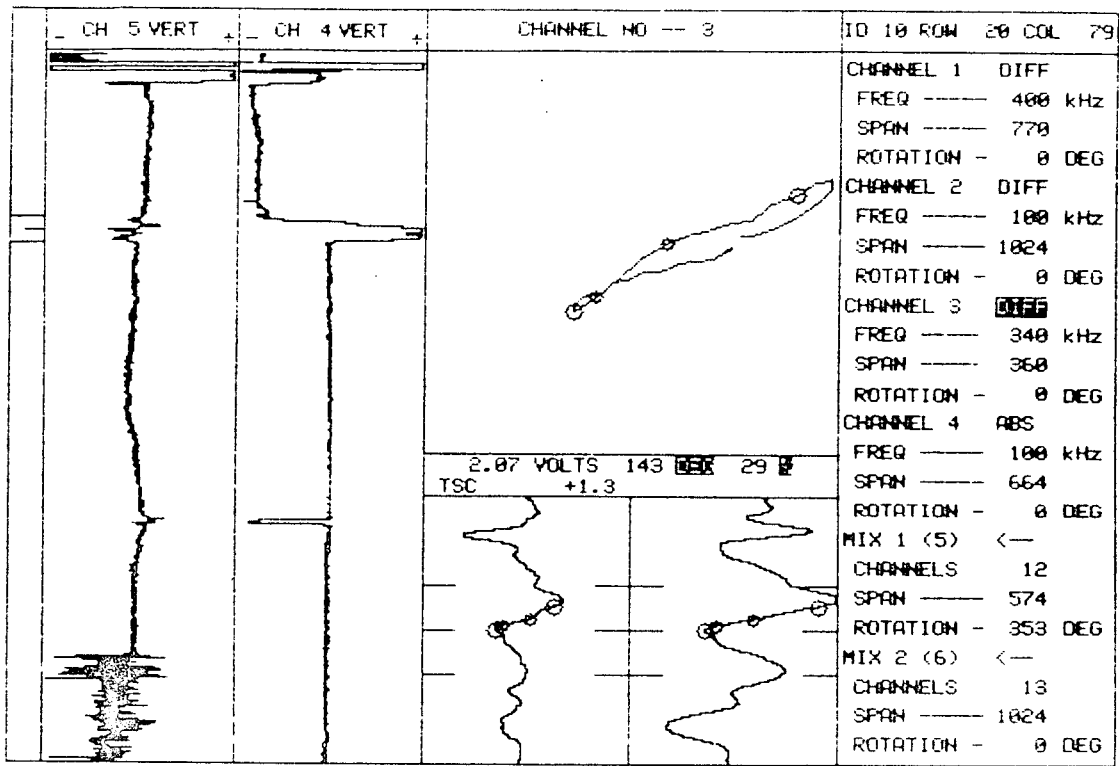
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 SONGS DISK 021 1 0 OUTLET 12-28-85



20    PLANT    UNIT\*    S/G    LEG    DATE    ZETEC Inc. - 1983  
 SCE SONGS    I    "C"    COLD    06/03/80    Edition 12.0 Rev 1



15 PLANT SONGS DISK C21 UNIT# 1 S/G C LEG OUTLET DATE 12/20/85

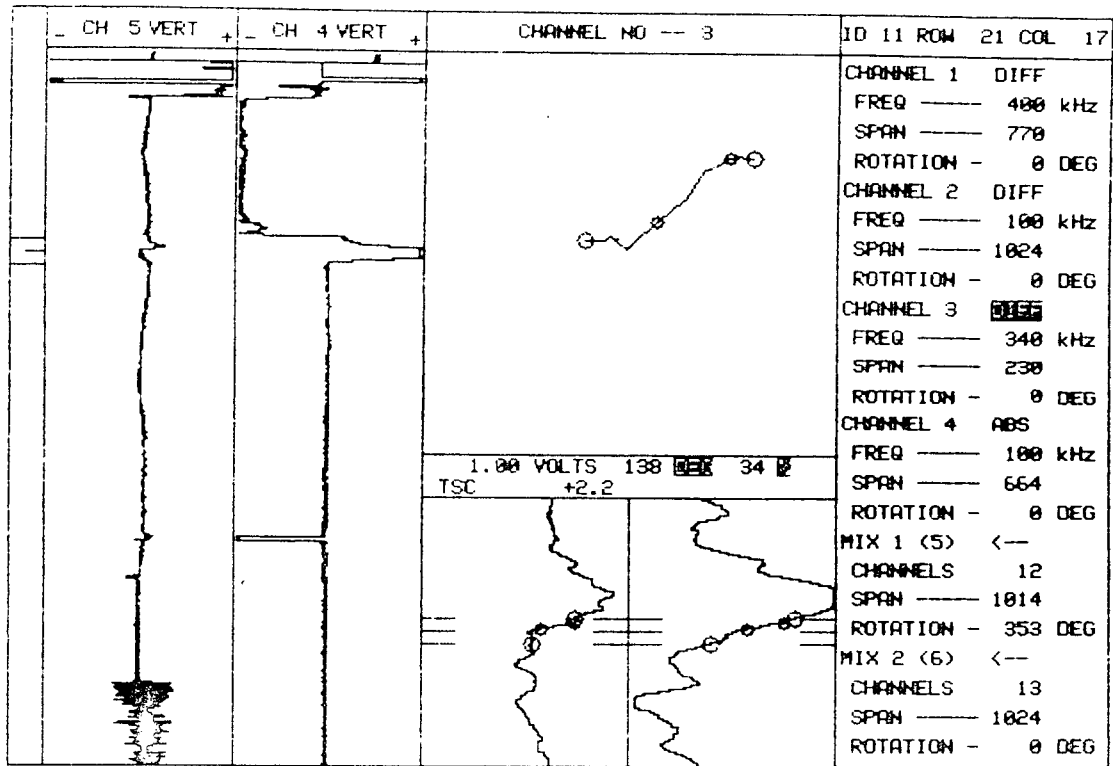


18 PLANT UNIT# S/G LEG DATE  
 SCE SONGS I C OUTLET 1980

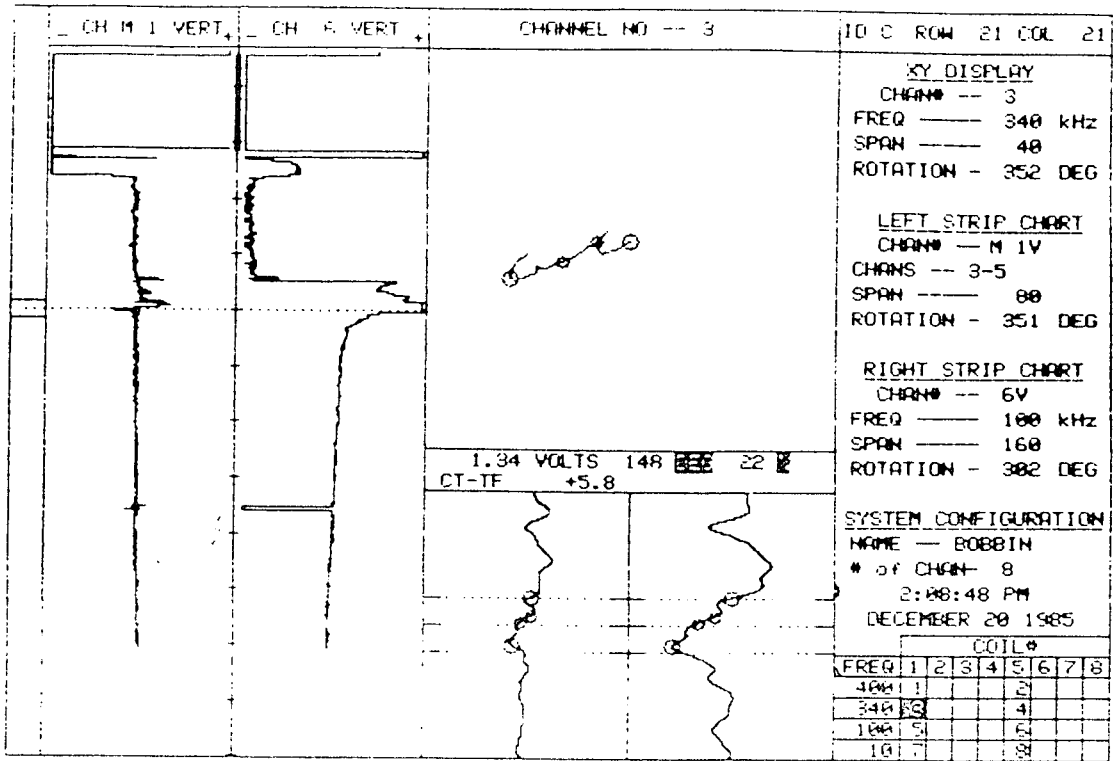
ZETEC Inc. - 1983  
 Edition 12.0 Rev 1



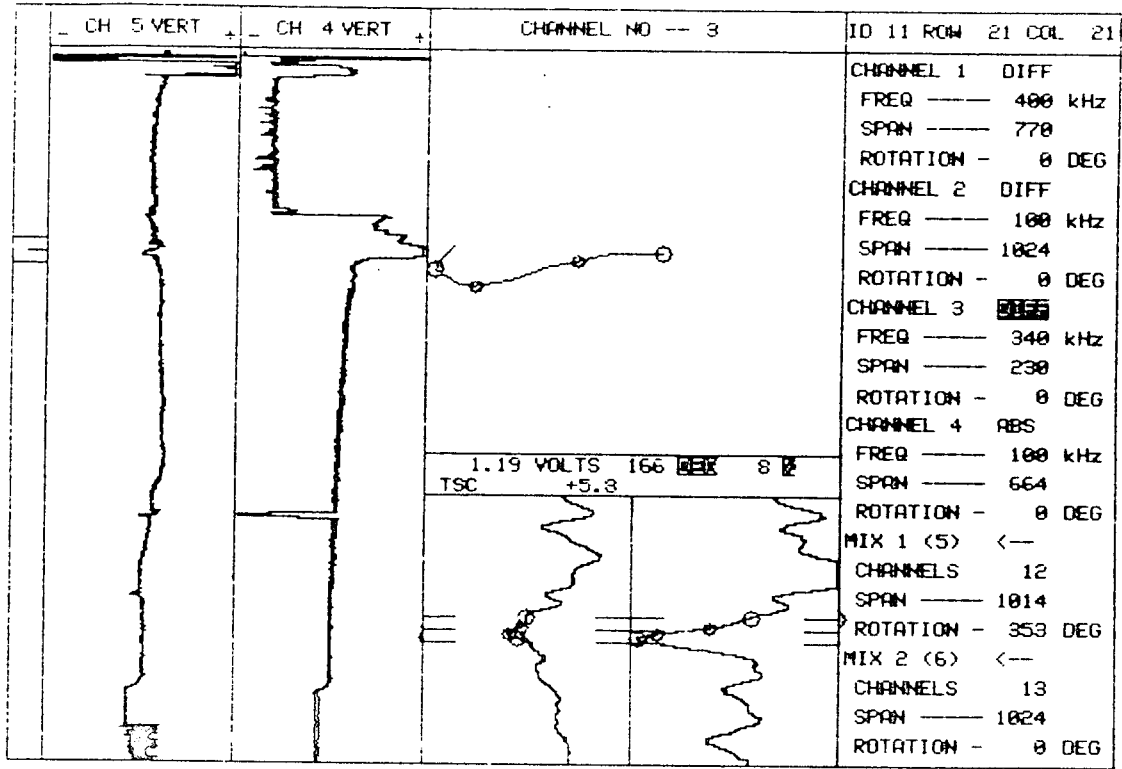




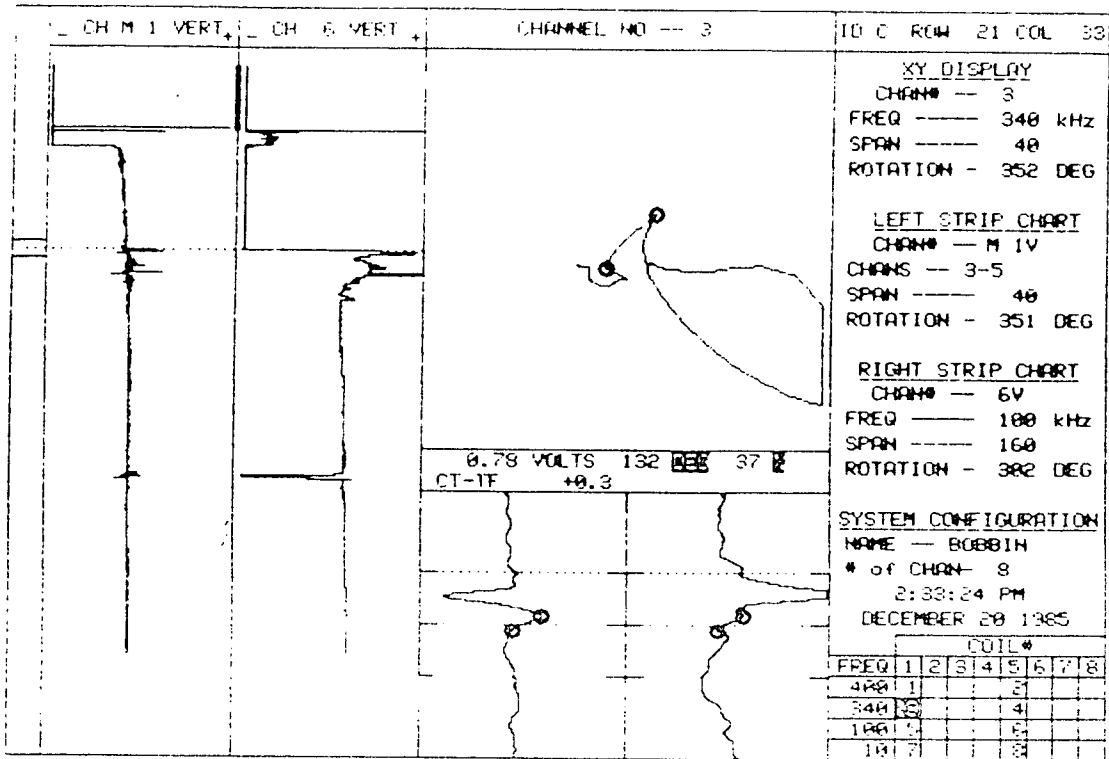
10 PLANT SCE SONGS UNIT# I S/G C LEG C DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



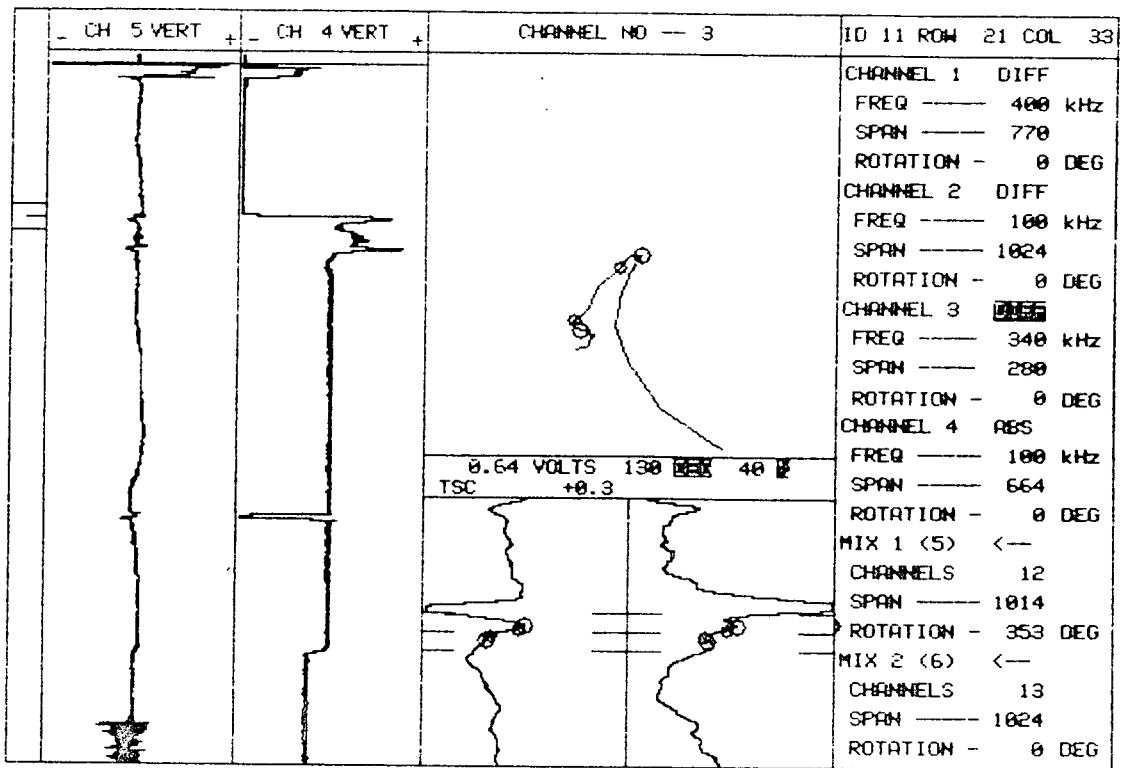
15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK CDR    1    C    OUTLET    12/20/85



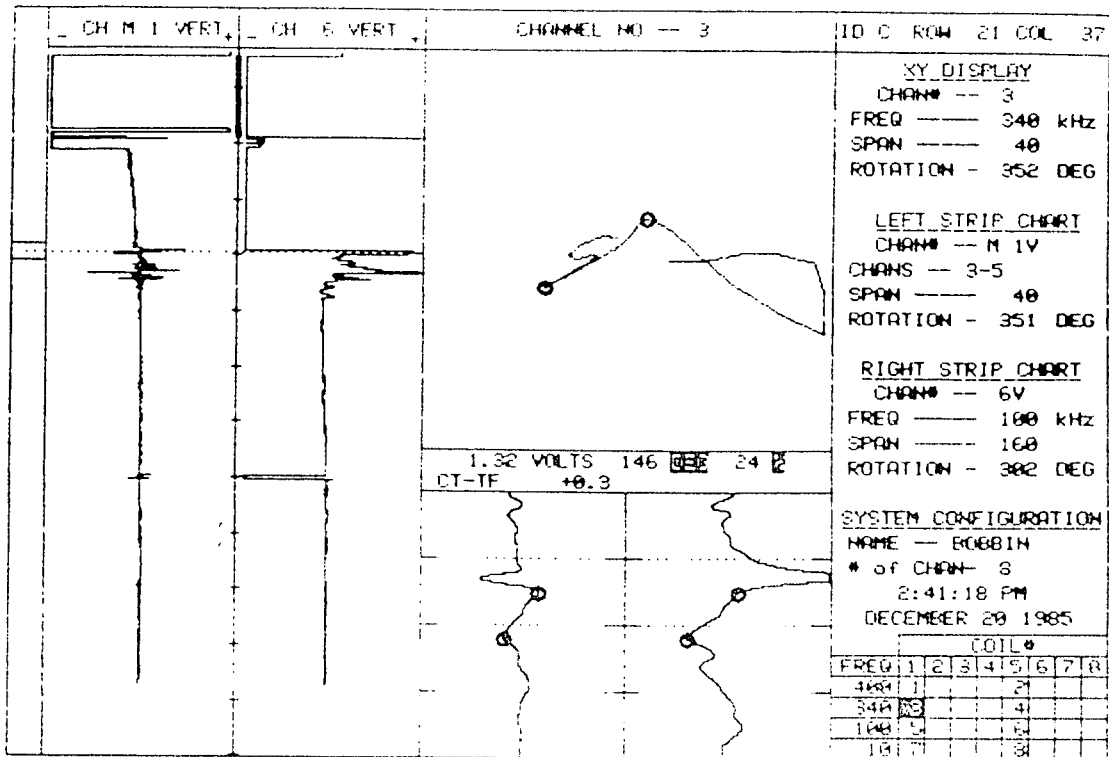
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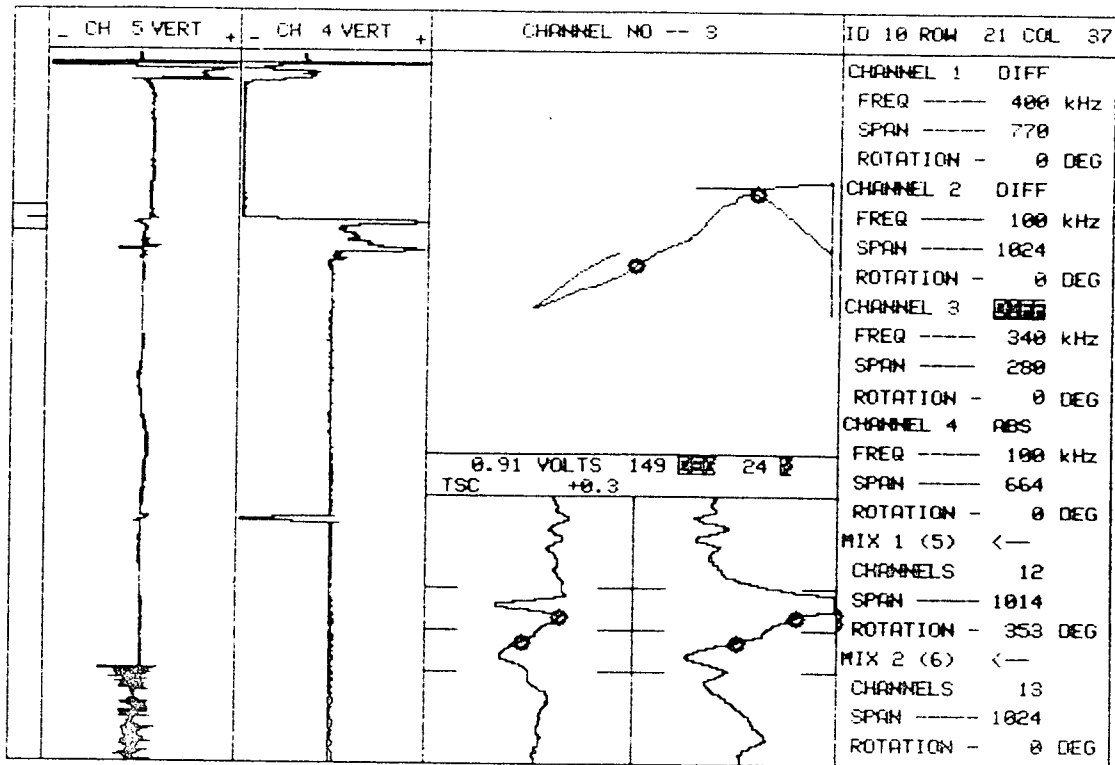
15 PLANT SONGS DISK C28- UNIT# 1 S/G C LEG C OUTLET DATE 12/20/85



10 PLANT SCE SONGS UNIT# I S/G C LEG C DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

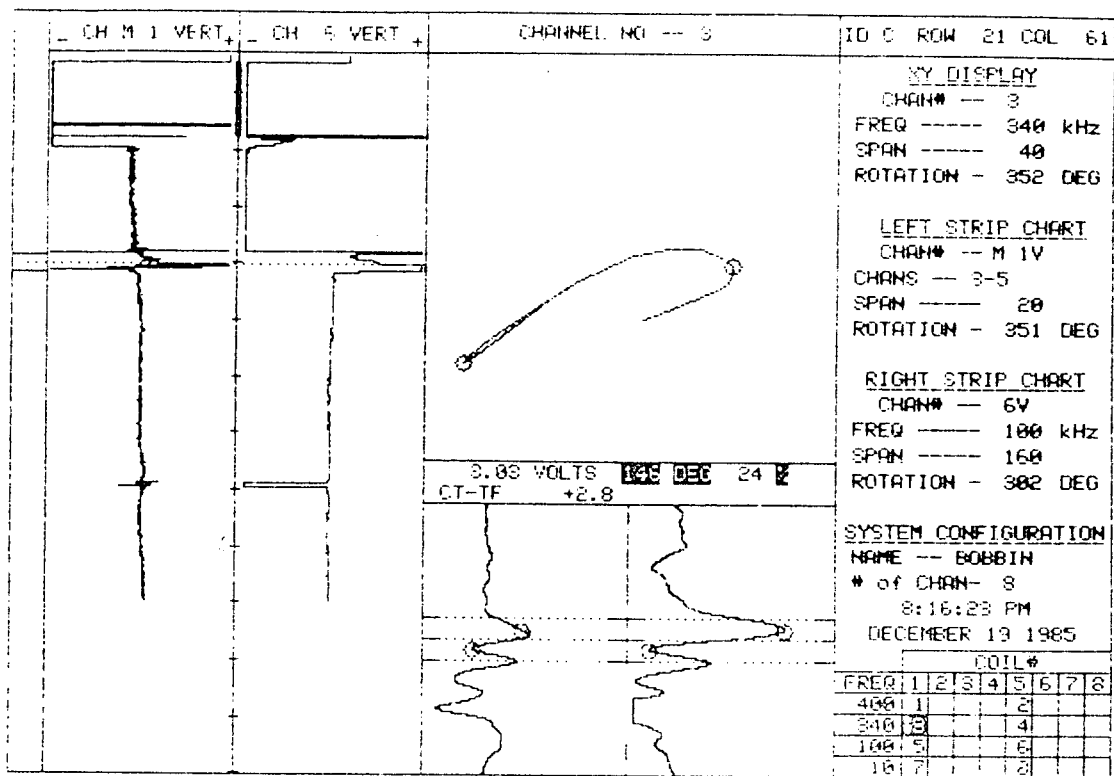


15    PLANT    UNIT#    S/G    LEG    DATE  
 SONGS DISK C20-    1    C    OUTLET    12/20/85

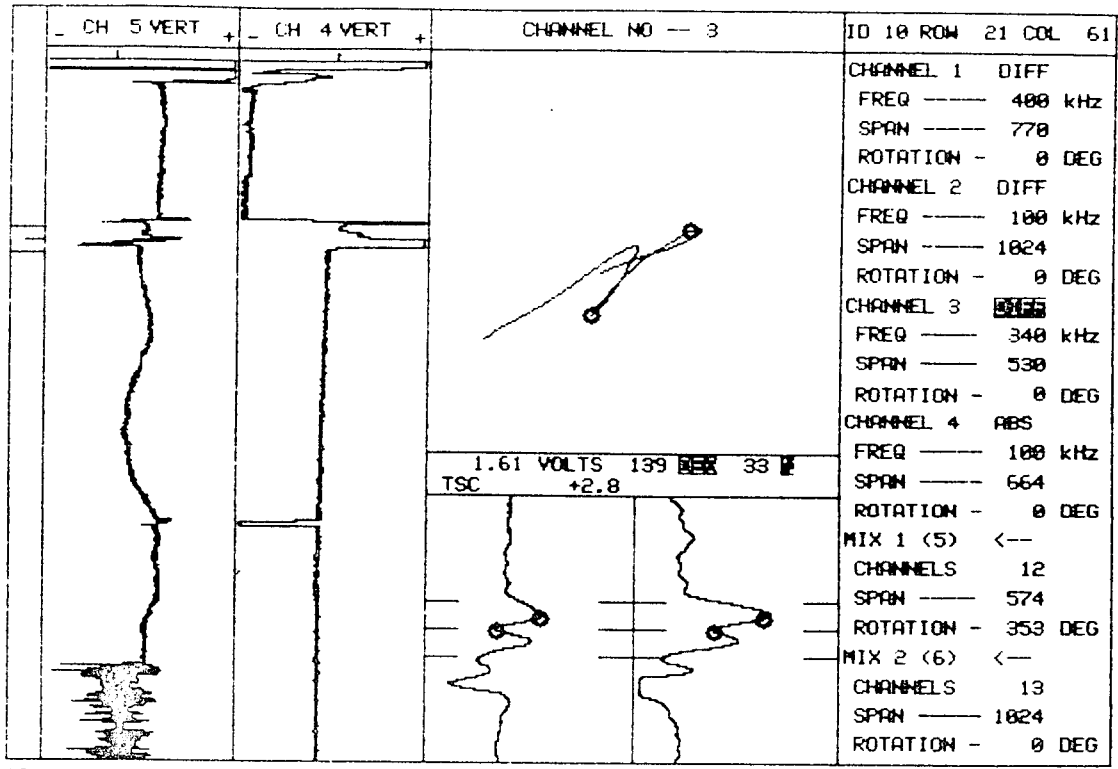


10 PLANT SCE SONGS UNIT# I S/G C LEG C DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1

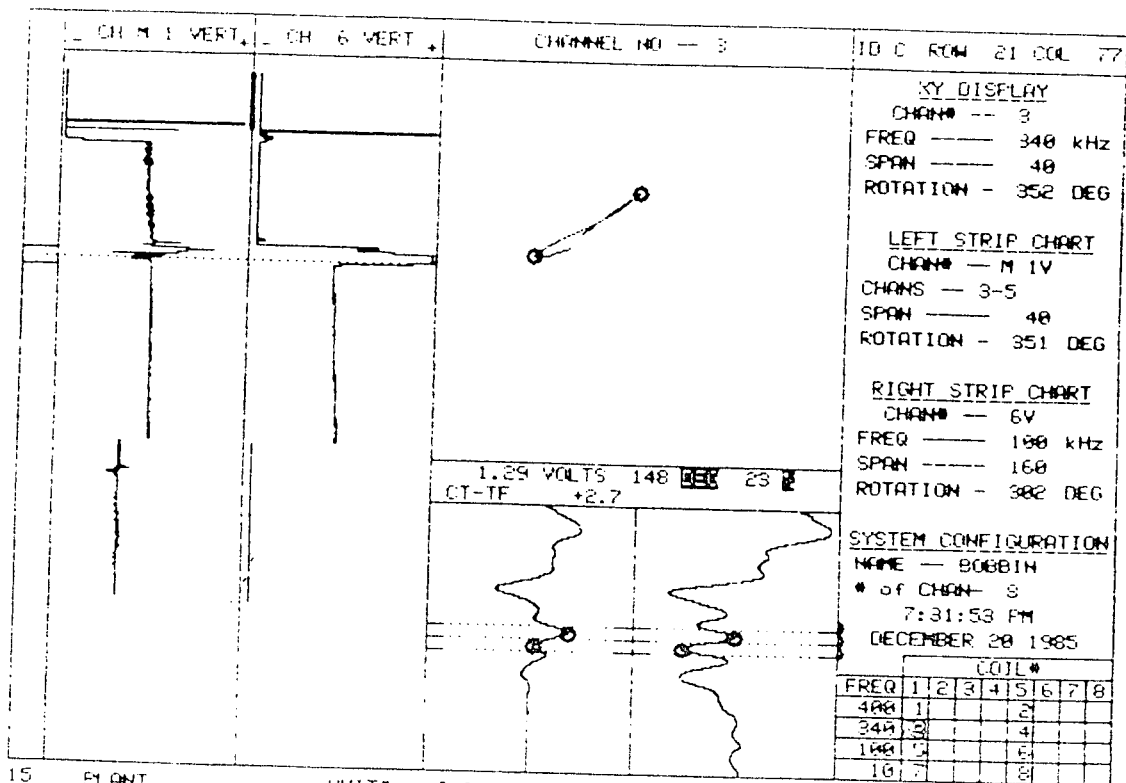




15    PLANT                    UNIT#    S/O    LEG                    DATE  
       SONGS DISK C17       1       C       OUTLET                12/19/85

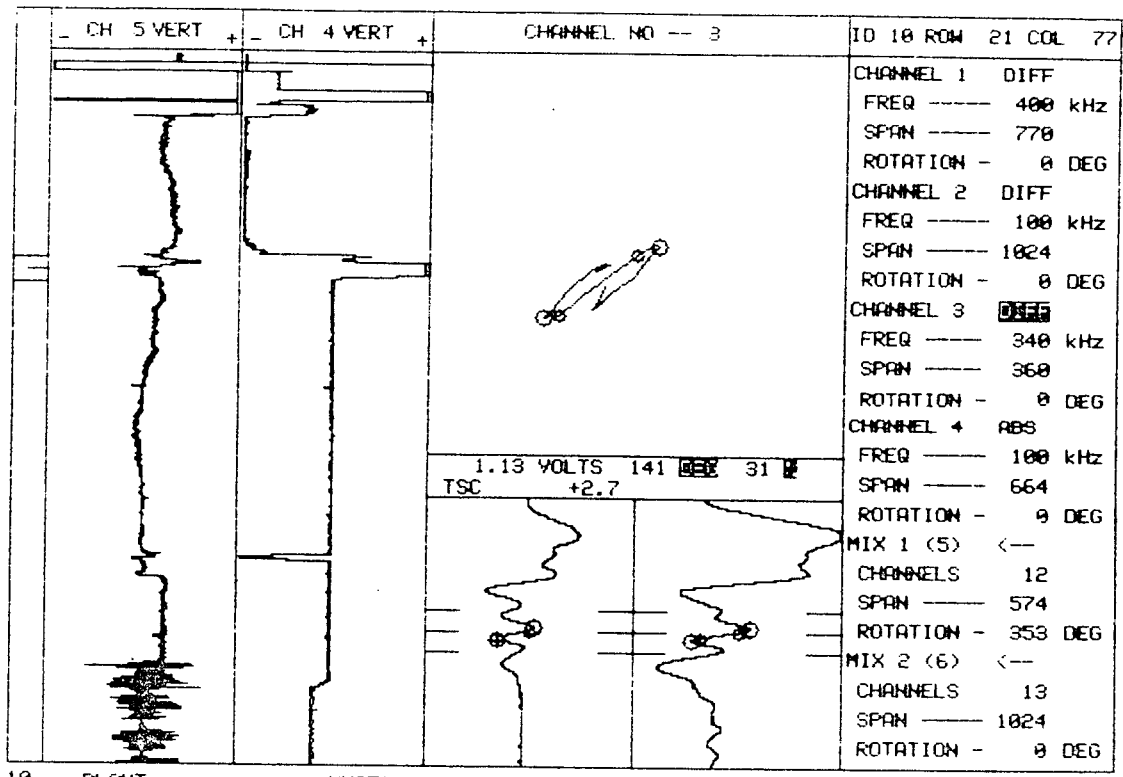


10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

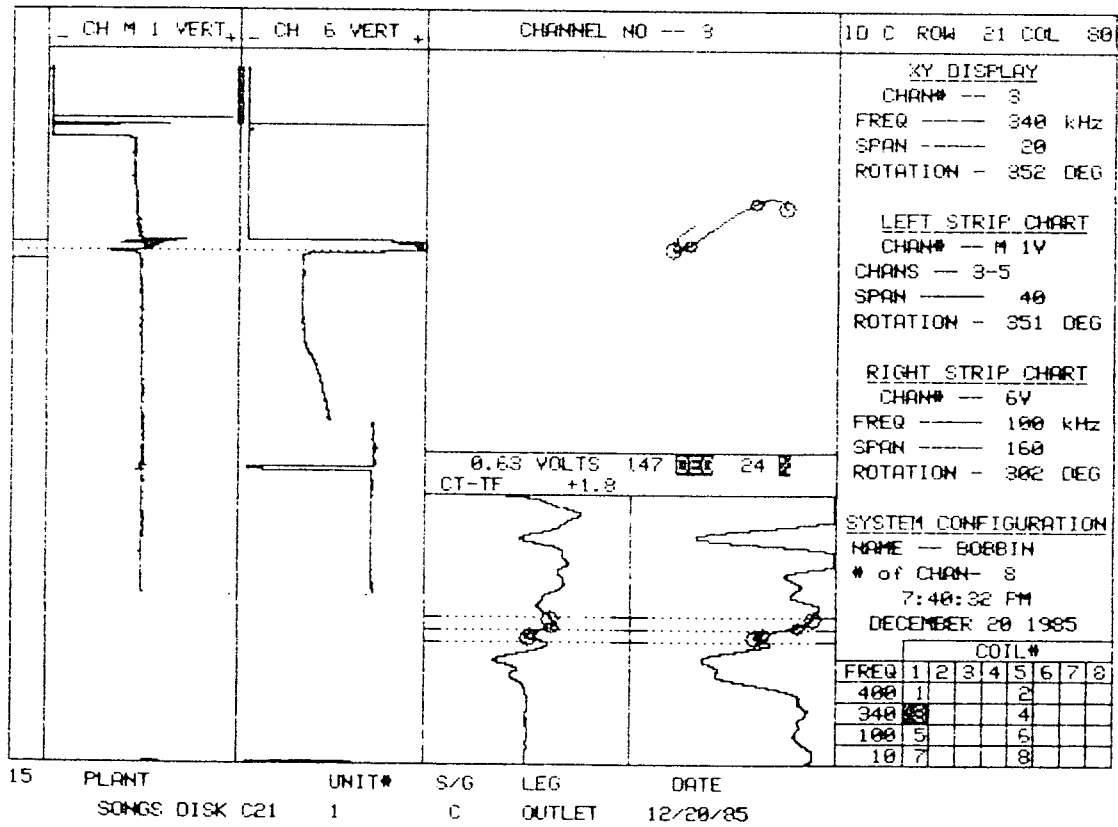
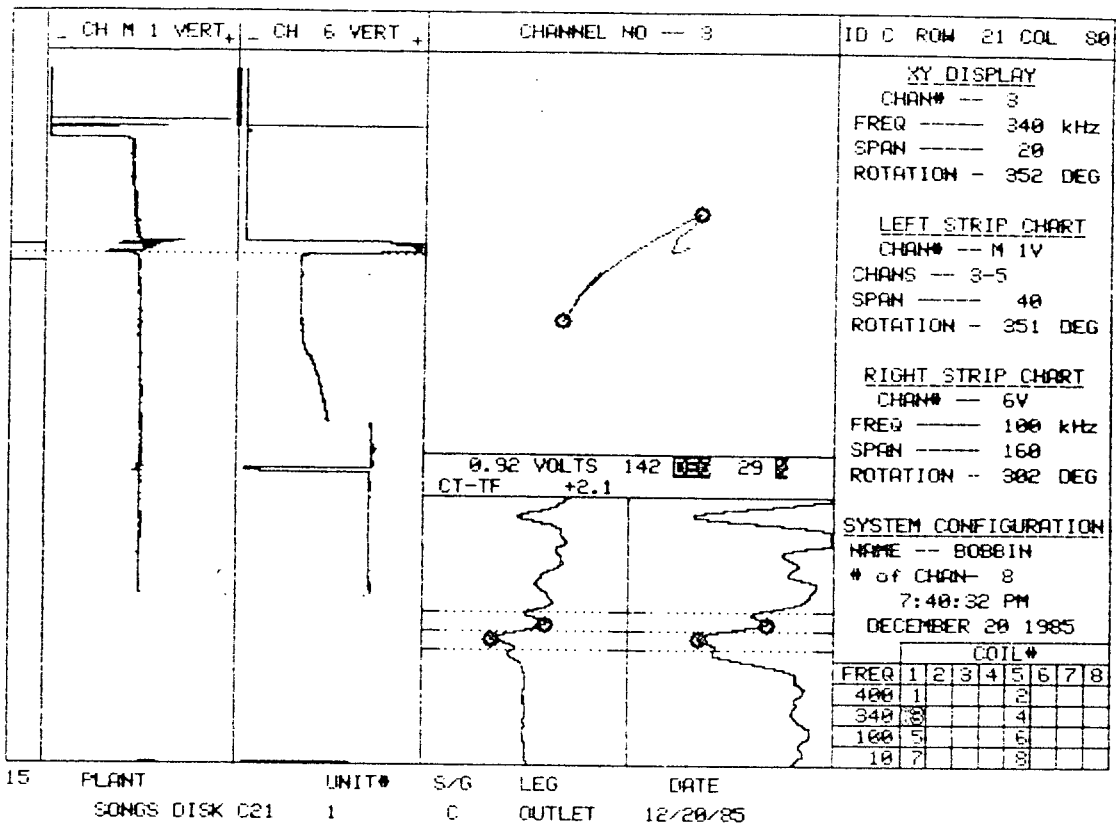


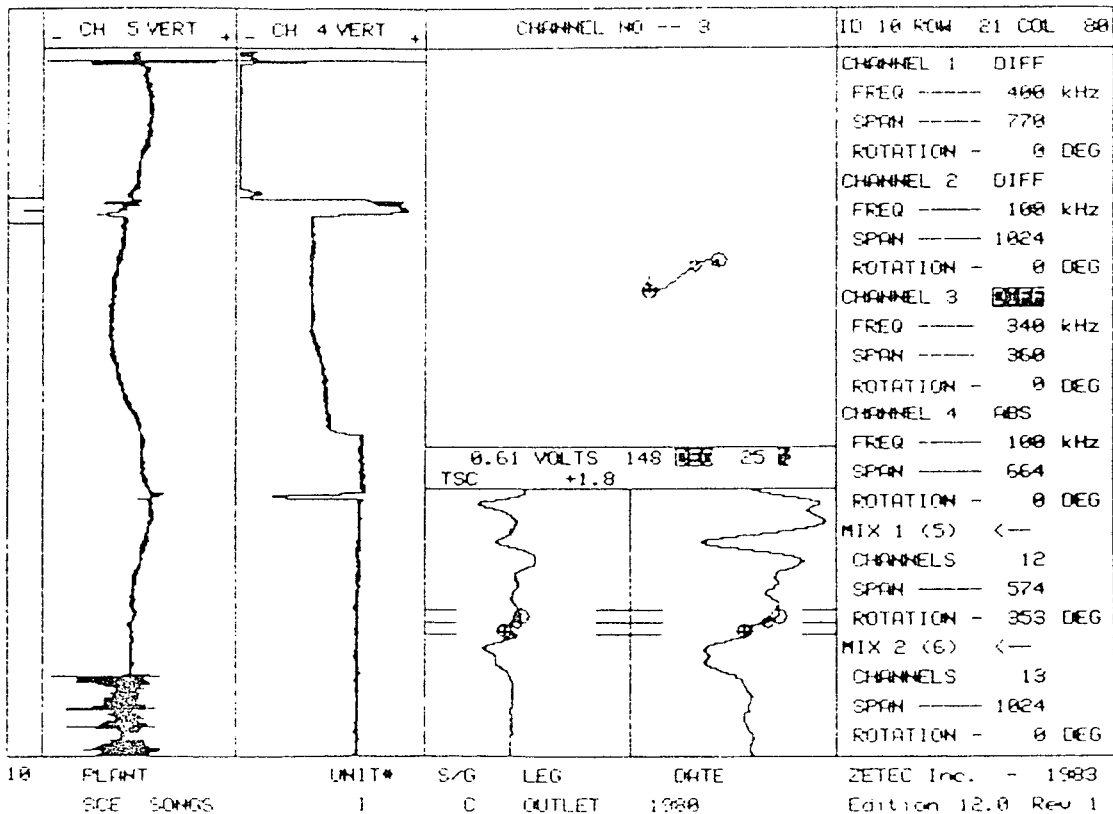
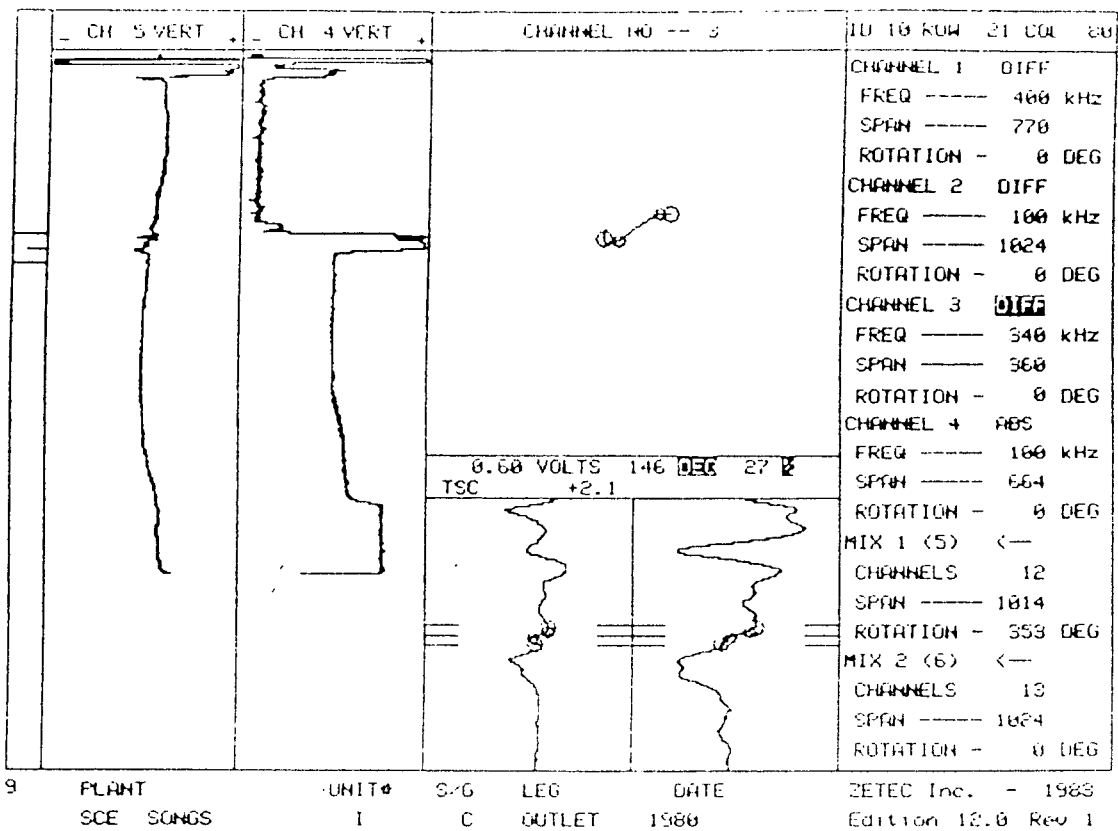
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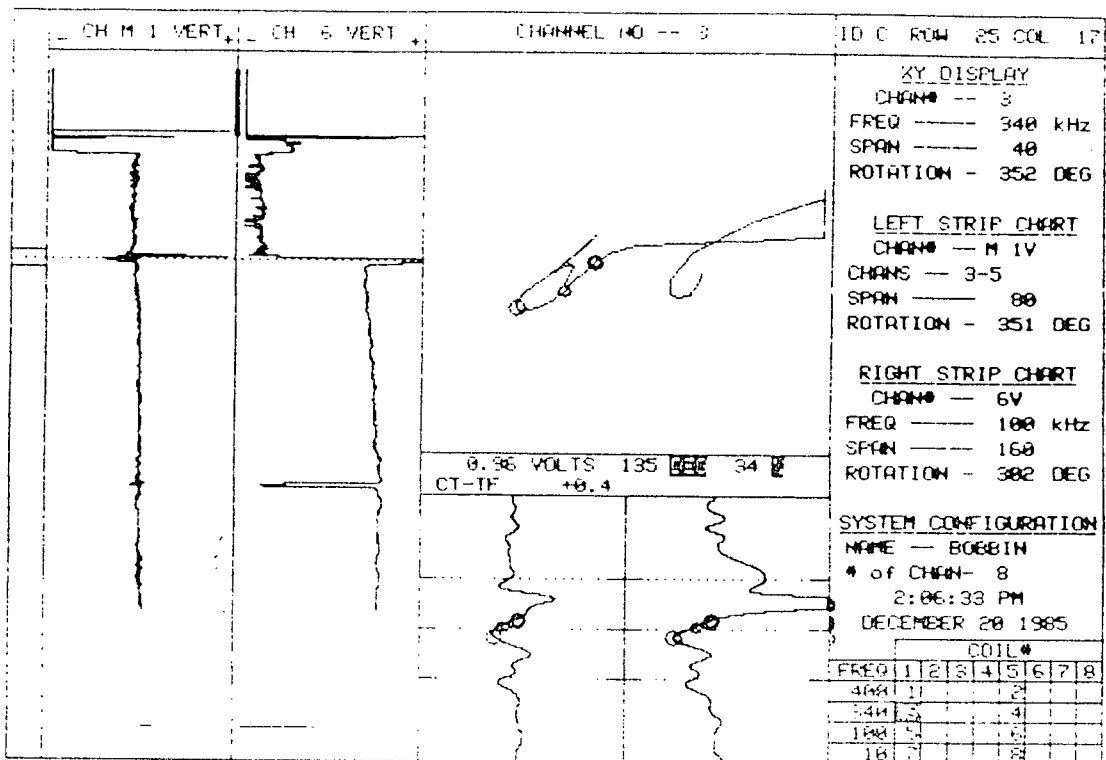
COIL #								
FREQ	1	2	3	4	5	6	7	8
400	1				2			
340	2				4			
100	4				6			
10	7				8			



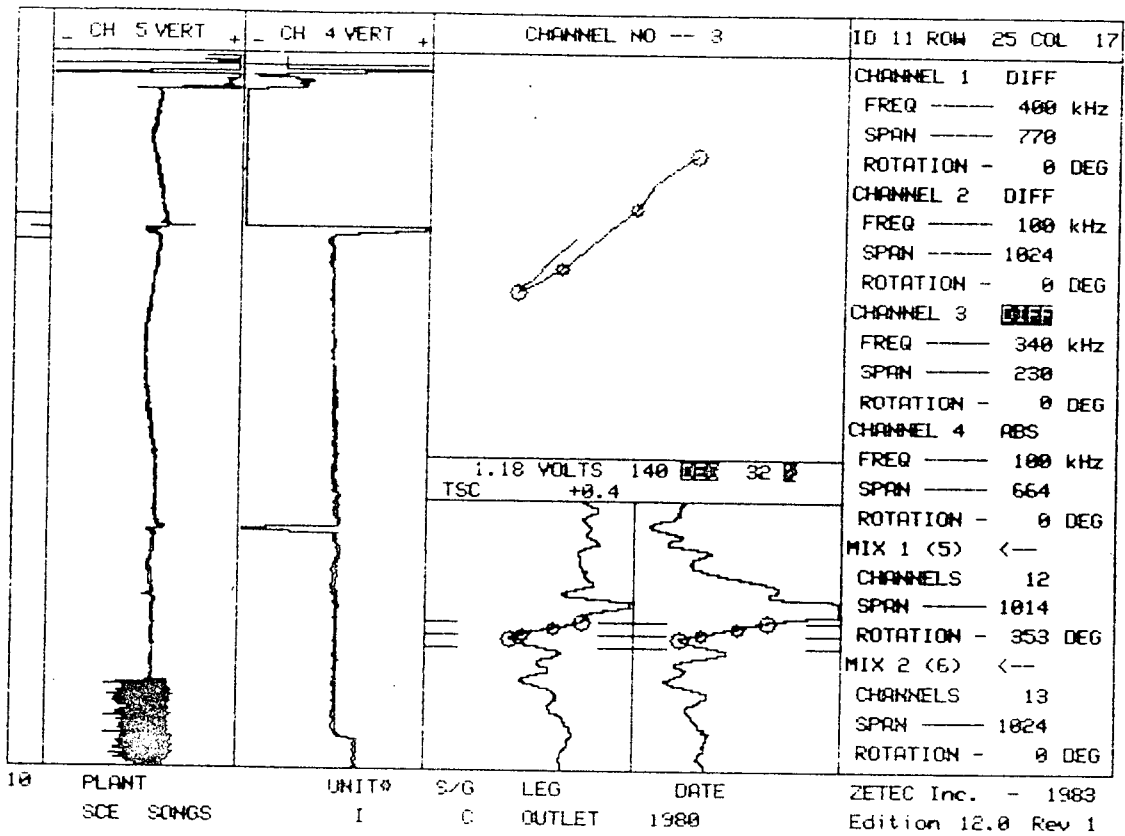
10 PLANT SCE SONGS UNIT# 1 S/G C LEG C DATE 1980 ZETEC Inc. - 1983 Edition 12.0 Rev 1



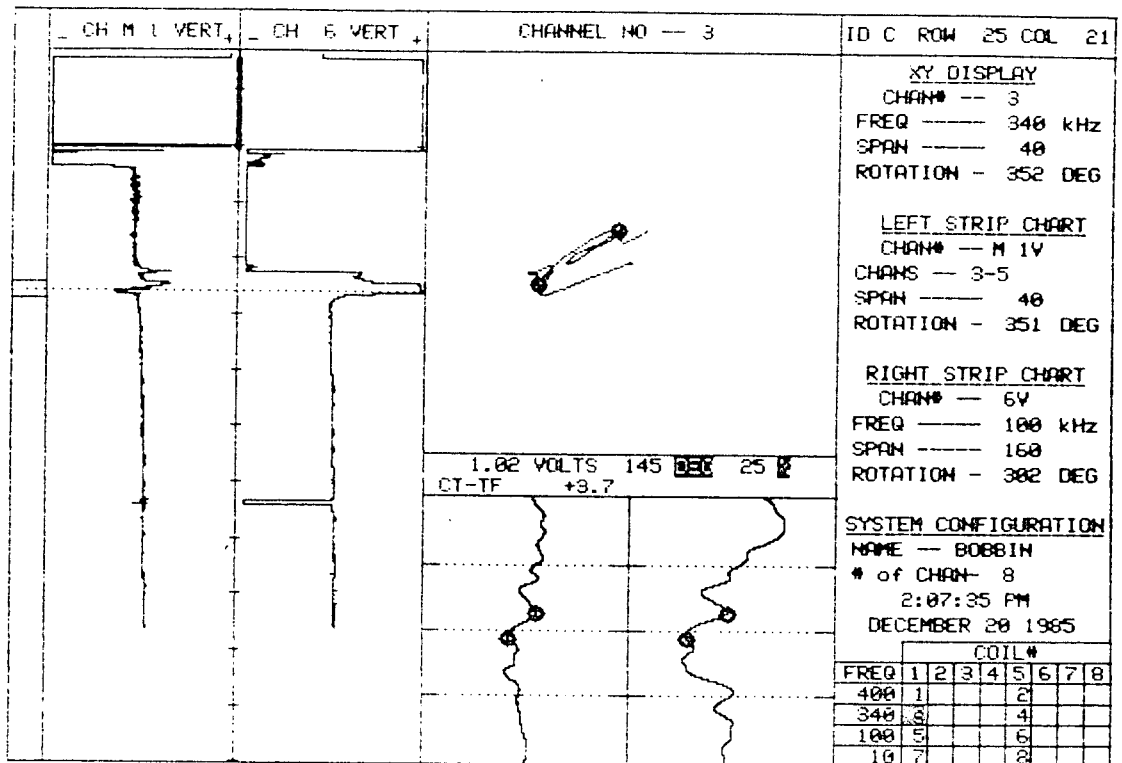




15 PLANT SONGS DISK C20L UNIT# 1 S/G C LEG C DATE 12/20/85







1.02 VOLTS 145 DEG 25 %  
 CT-TF +3.7

XY DISPLAY  
 CHAN# -- 3  
 FREQ ----- 340 KHZ  
 SPAN ----- 40  
 ROTATION - 352 DEG

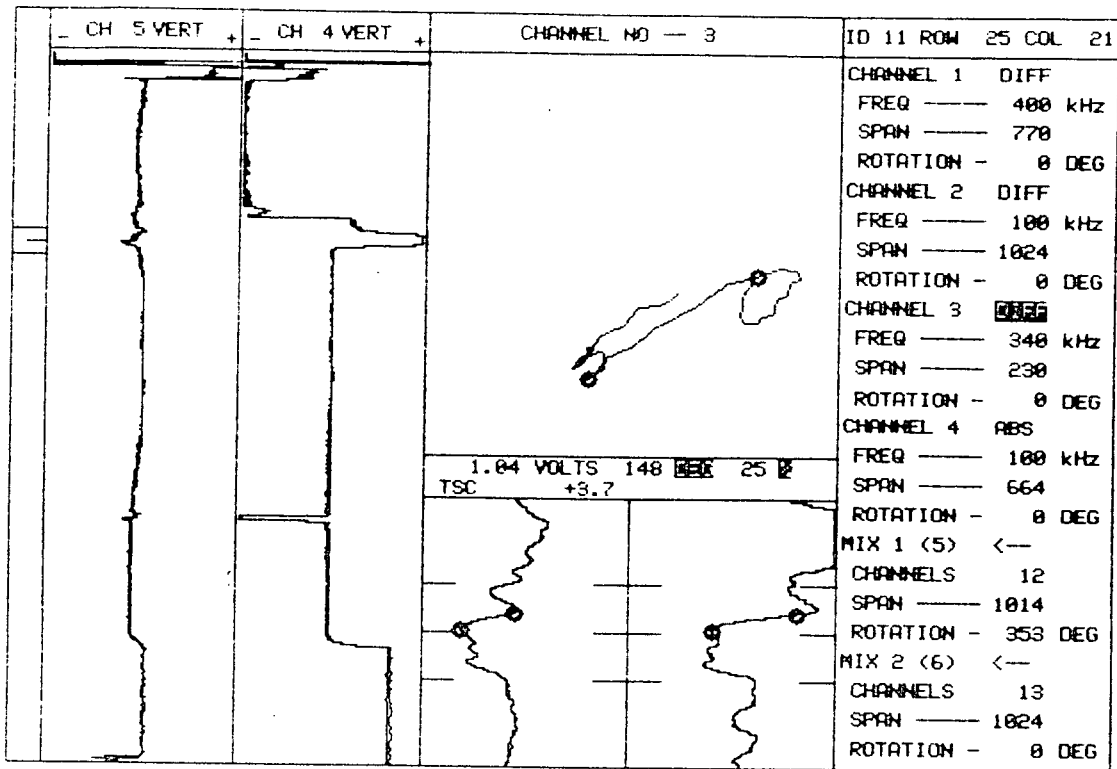
LEFT STRIP CHART  
 CHAN# -- M 1V  
 CHANS -- 3-5  
 SPAN ----- 40  
 ROTATION - 351 DEG

RIGHT STRIP CHART  
 CHAN# -- 6V  
 FREQ ----- 100 KHZ  
 SPAN ----- 160  
 ROTATION - 302 DEG

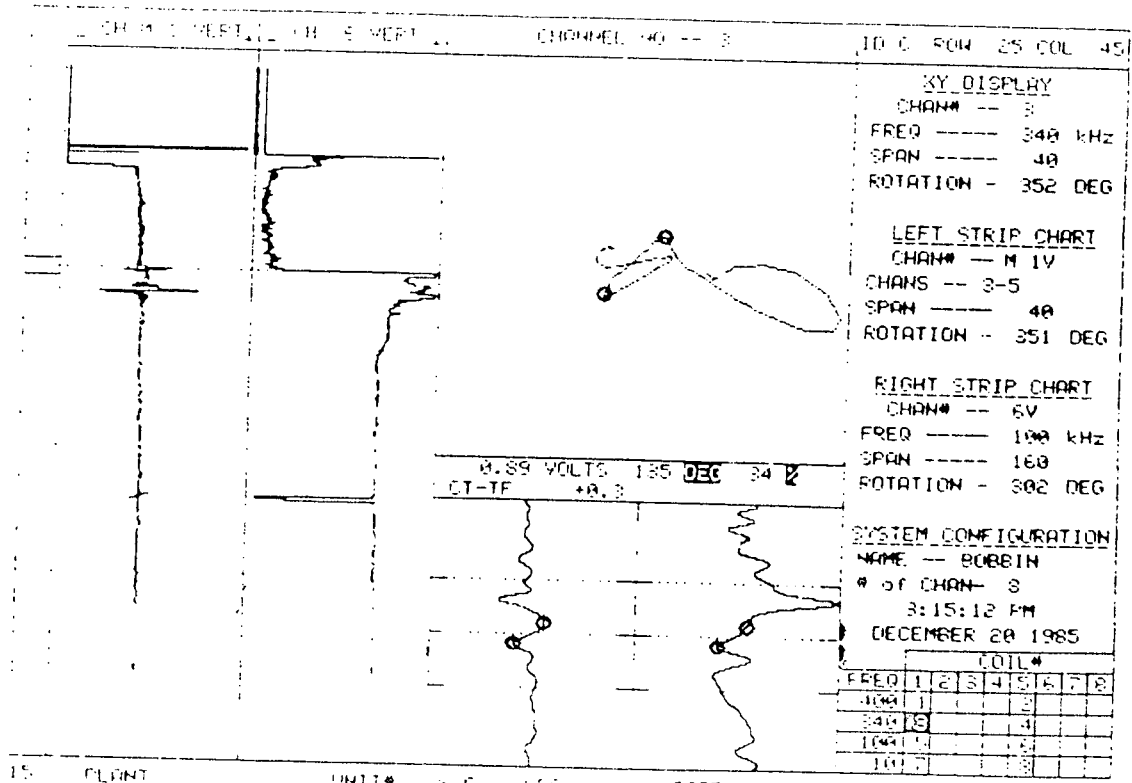
SYSTEM CONFIGURATION  
 NAME -- BOBBIN  
 # of CHAN- 8  
 2:07:35 PM  
 DECEMBER 20 1985

FREQ	COIL#							
	1	2	3	4	5	6	7	8
400	1				2			
340	3				4			
100	5				6			
10	7				8			

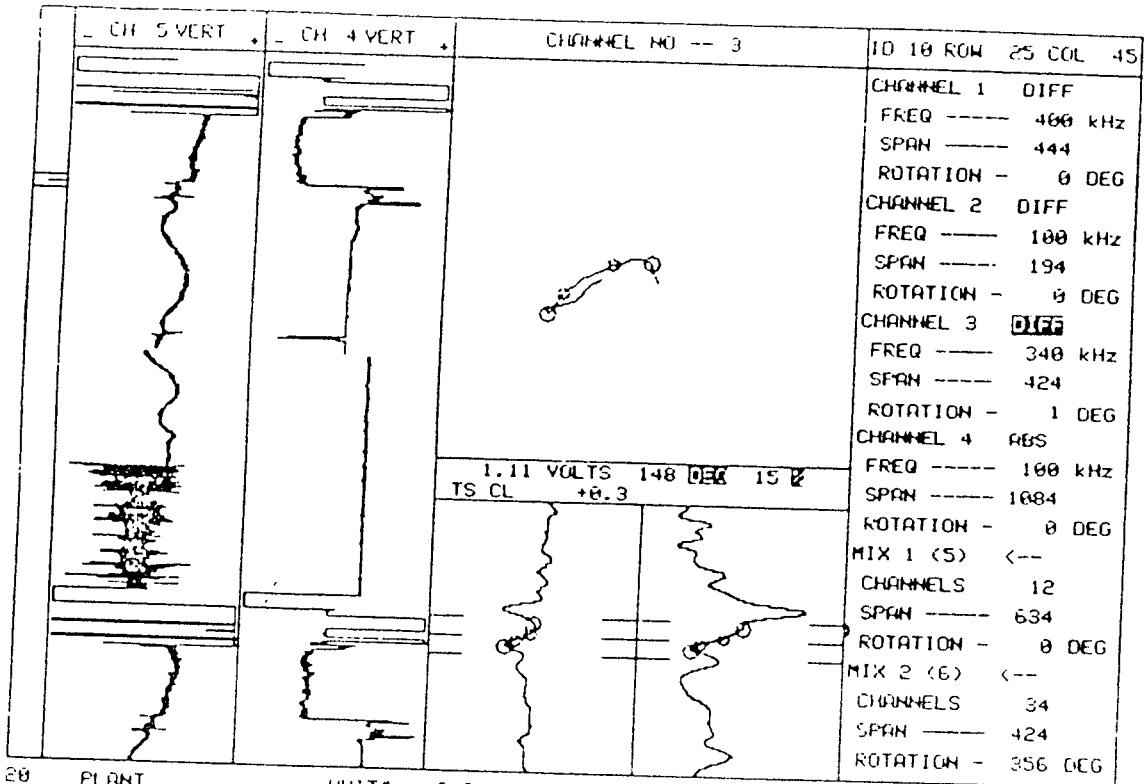
15 PLANT SONGS DISK C20- UNIT# 1 S/G C LEG C OUTLET DATE 12/20/85



10	PLANT	UNIT#	S/G	LEG	DATE	ZETEC Inc. - 1983
	SCC SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

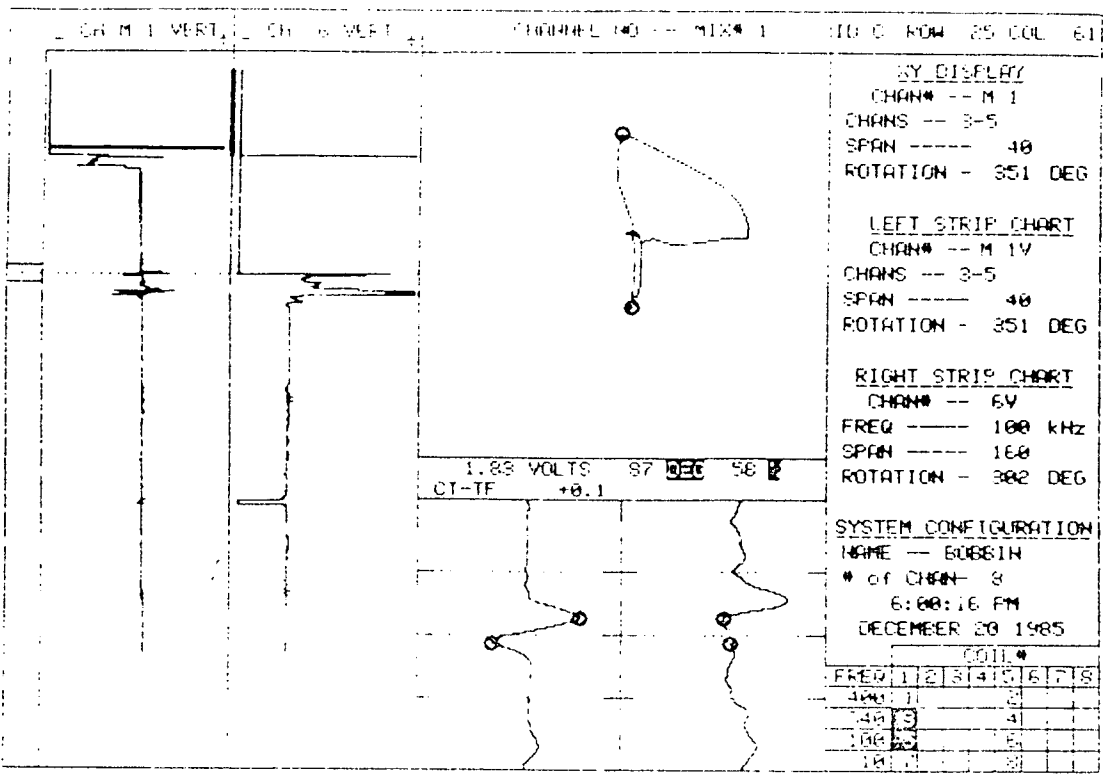


15 PLANT UNIT# S-G LEG DATE  
 SANDS DISK 029- 1 0 OUTLET 12/20/85

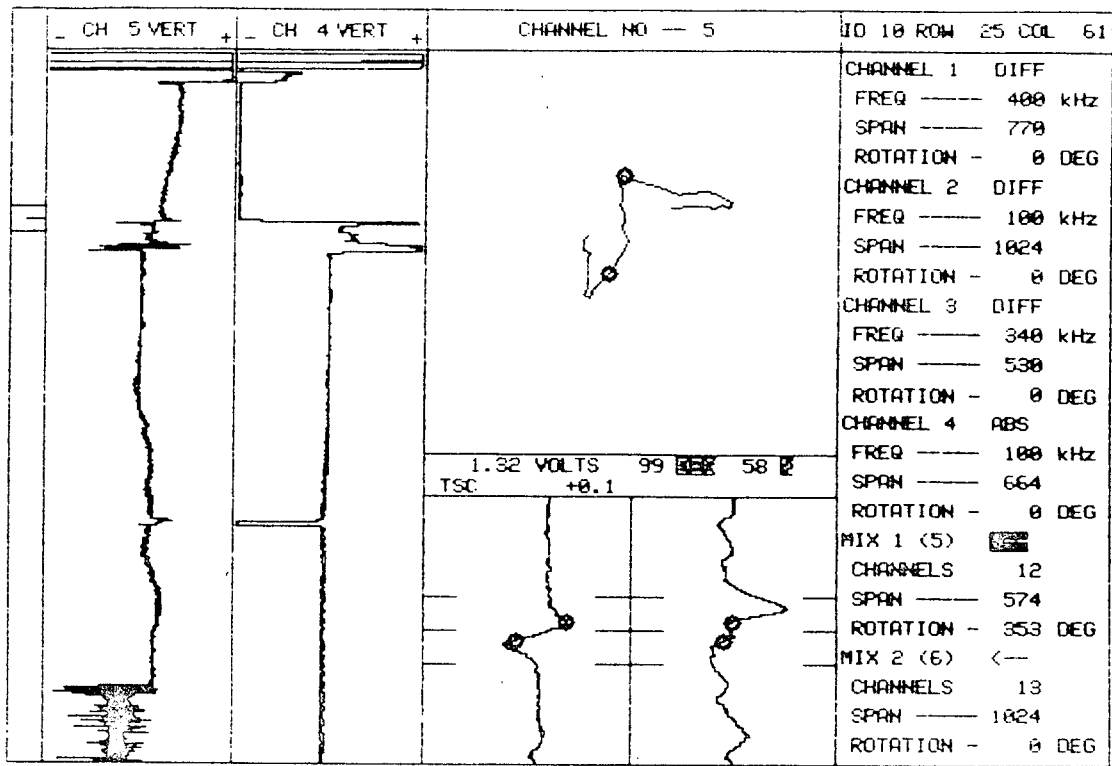


1.11 VOLTS 148 DEG 15 V  
 TS CL +0.3

20 PLANT SCE SONGS UNIT# I S/G "C" LEG COLD DATE 06/03/80 ZETEC Inc. - 1983 Edition 12.0 Rev 1

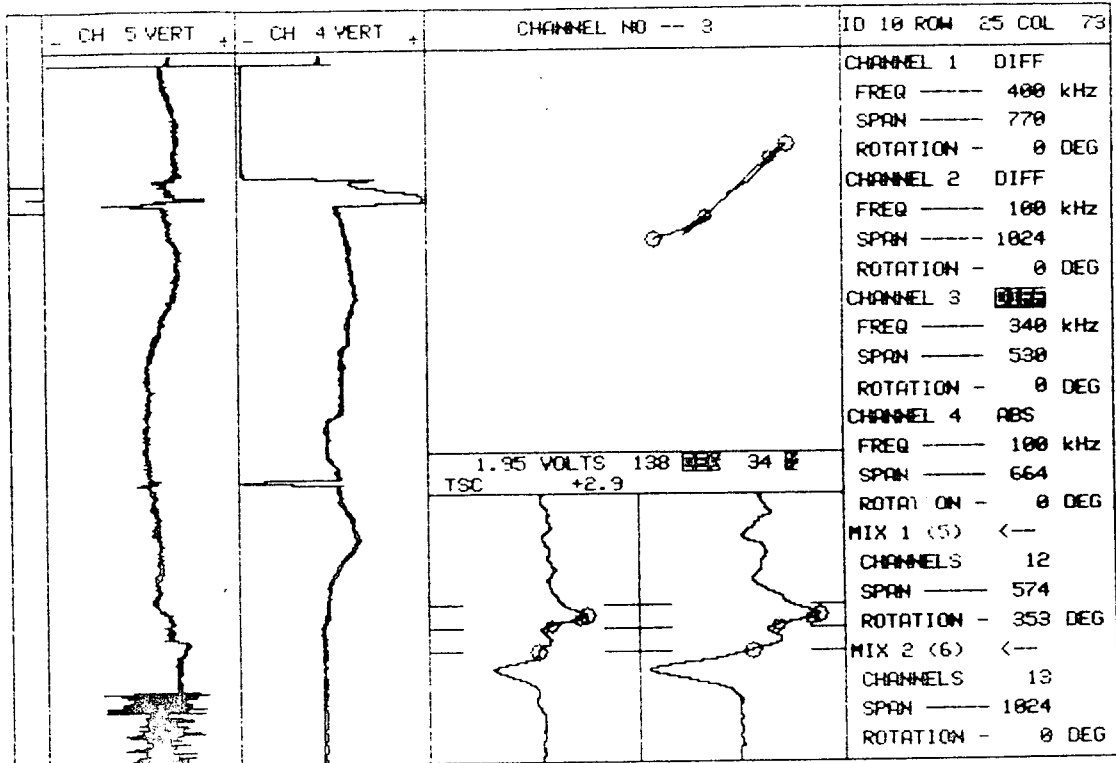


15 PLANT SONGS DISK 028- UNIT# 1 S/G C LEG C DATE 12-20-85



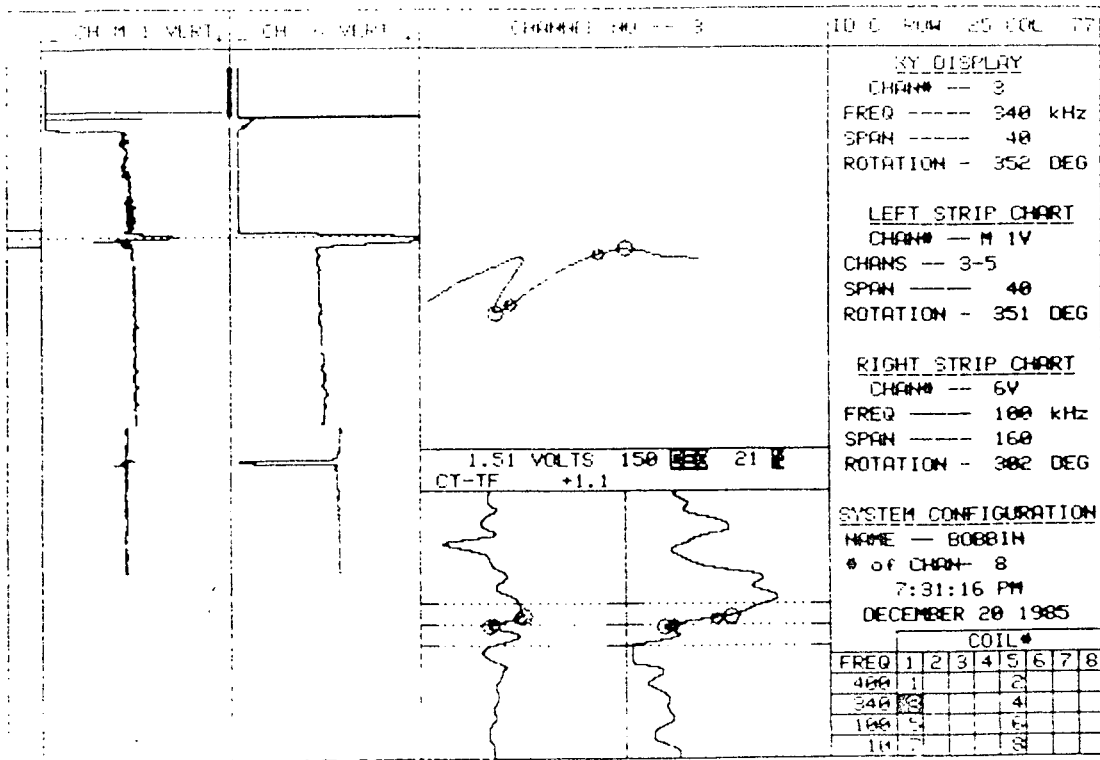
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	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1



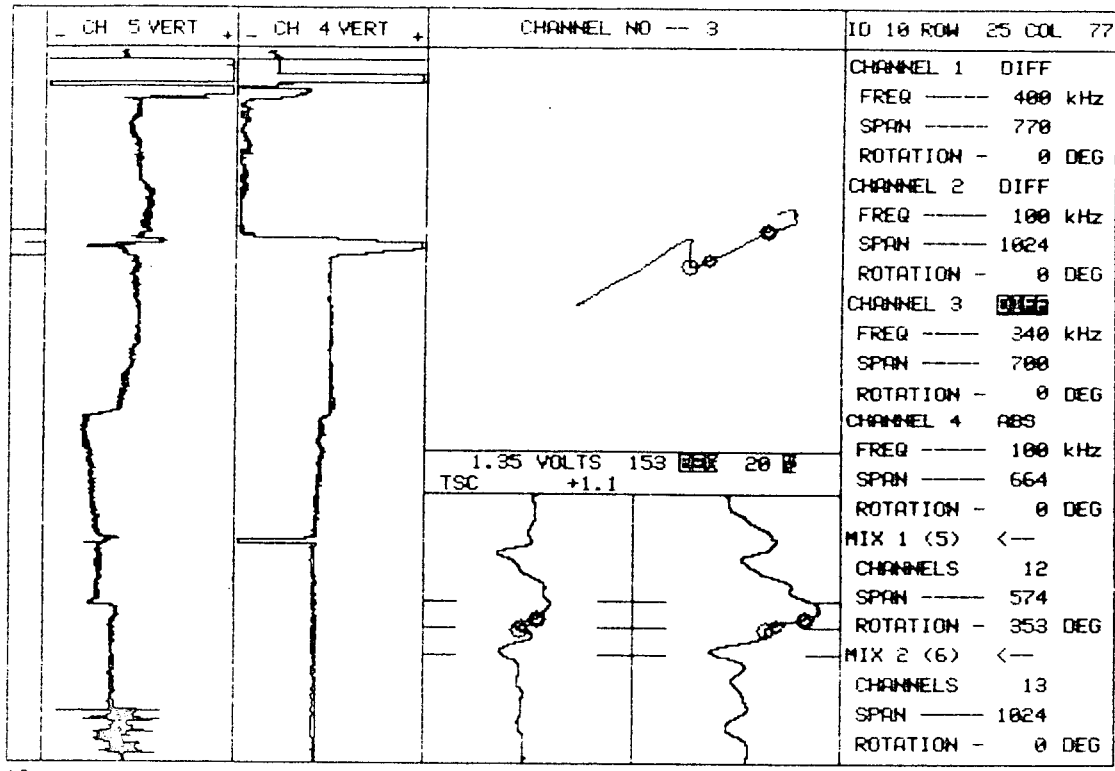


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 SCE SONGS    I    C    OUTLET    1980    Edition 12.0 Rev 1

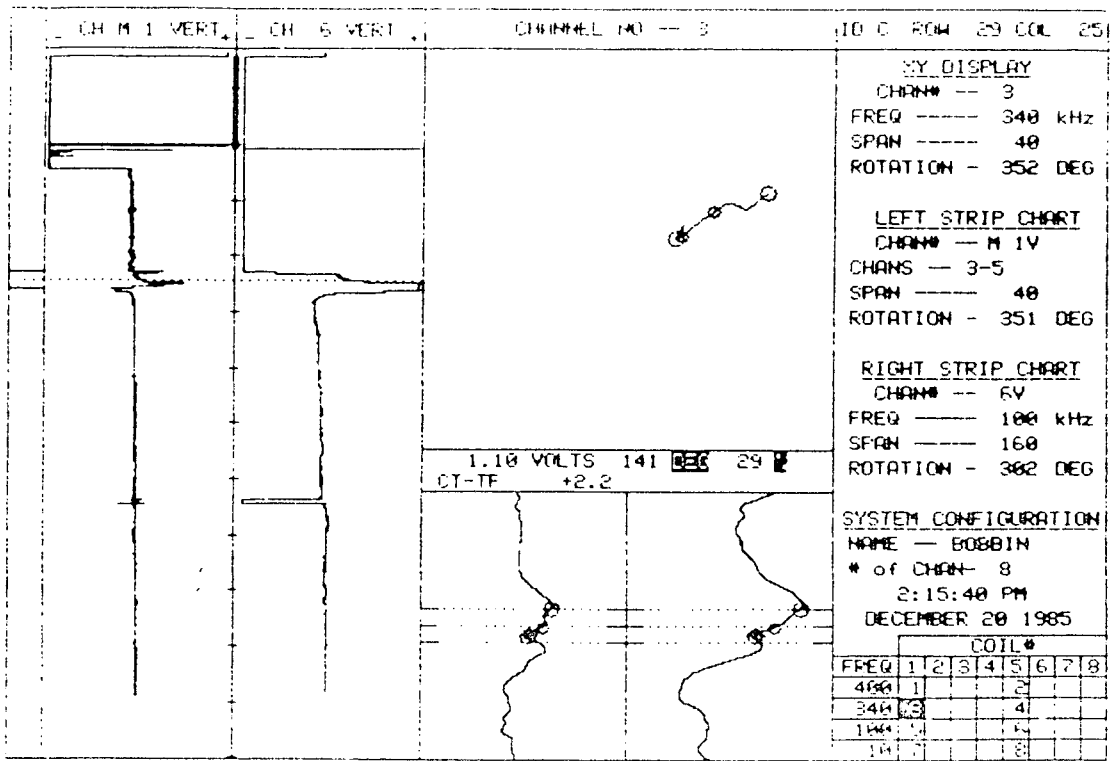




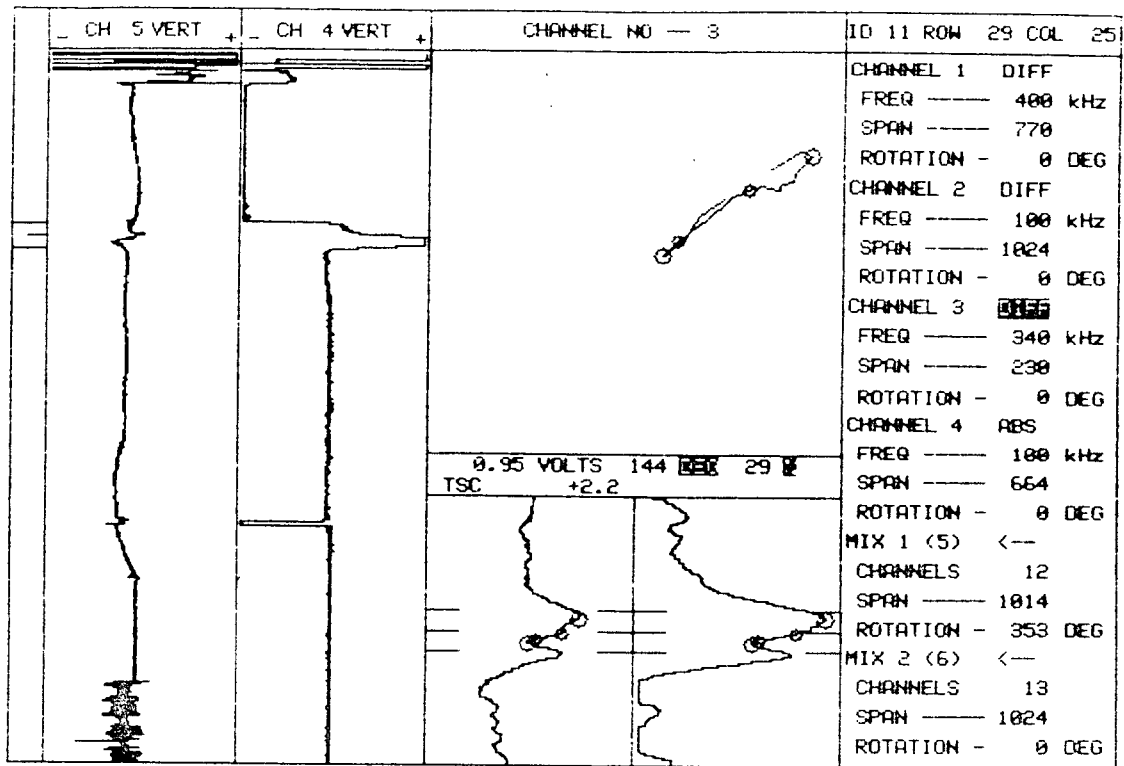
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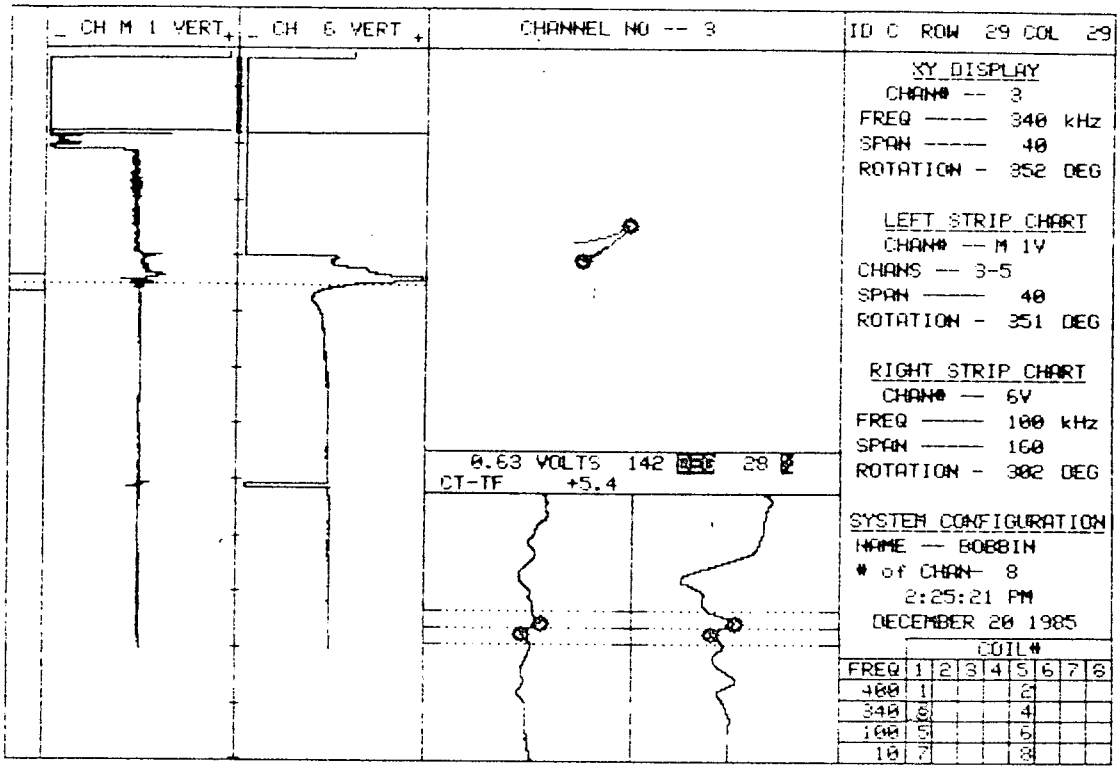
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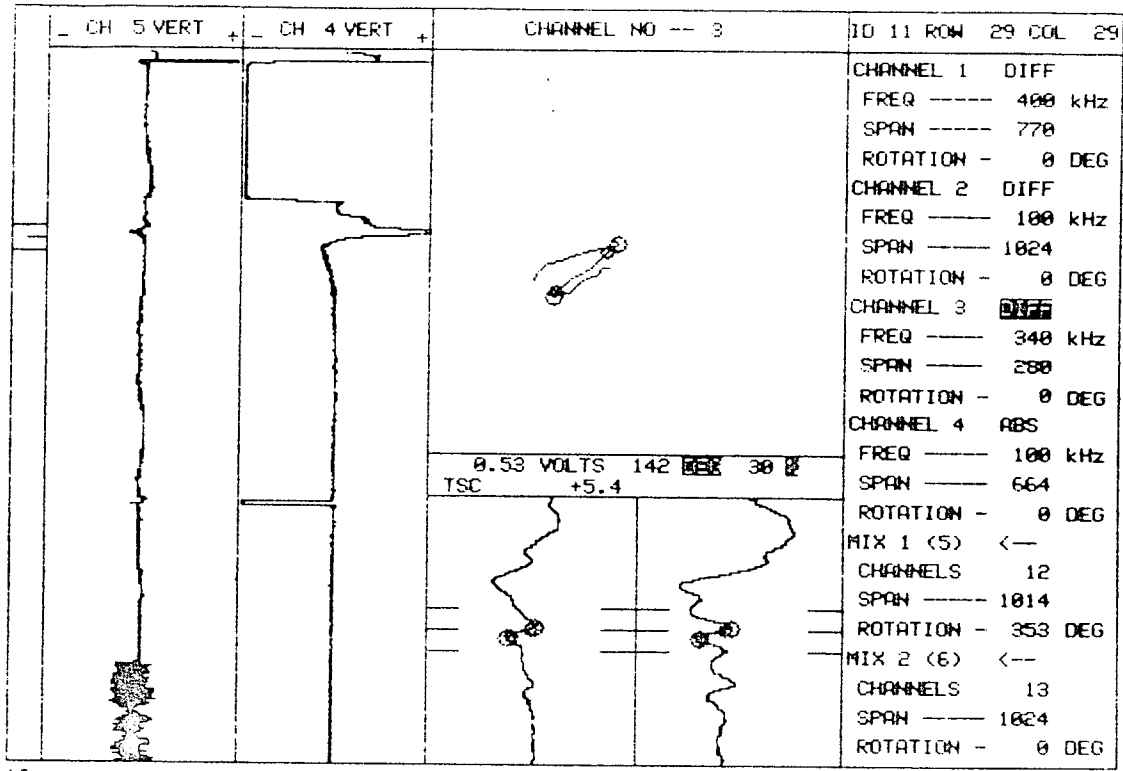
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 SONGS DISK C20-      1              C              OUTLET      12.20.85



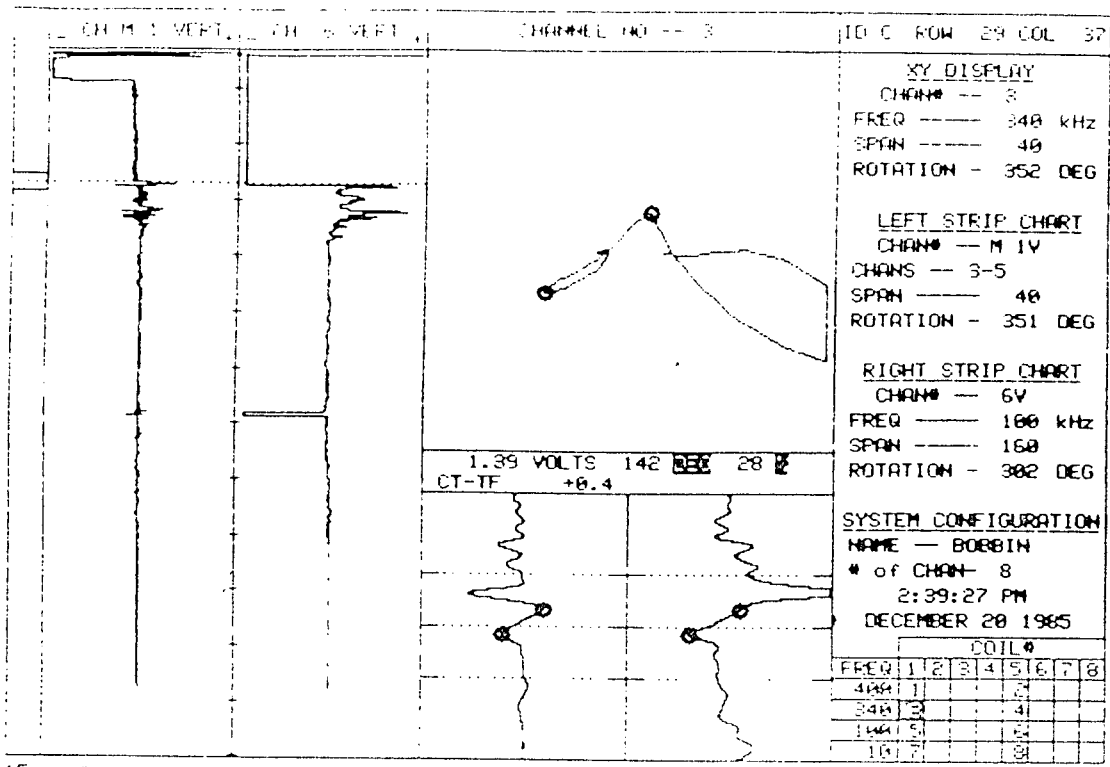
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 SCE SONGS    I    C    OUTLET    1980    Edition 12.0 Rev 1



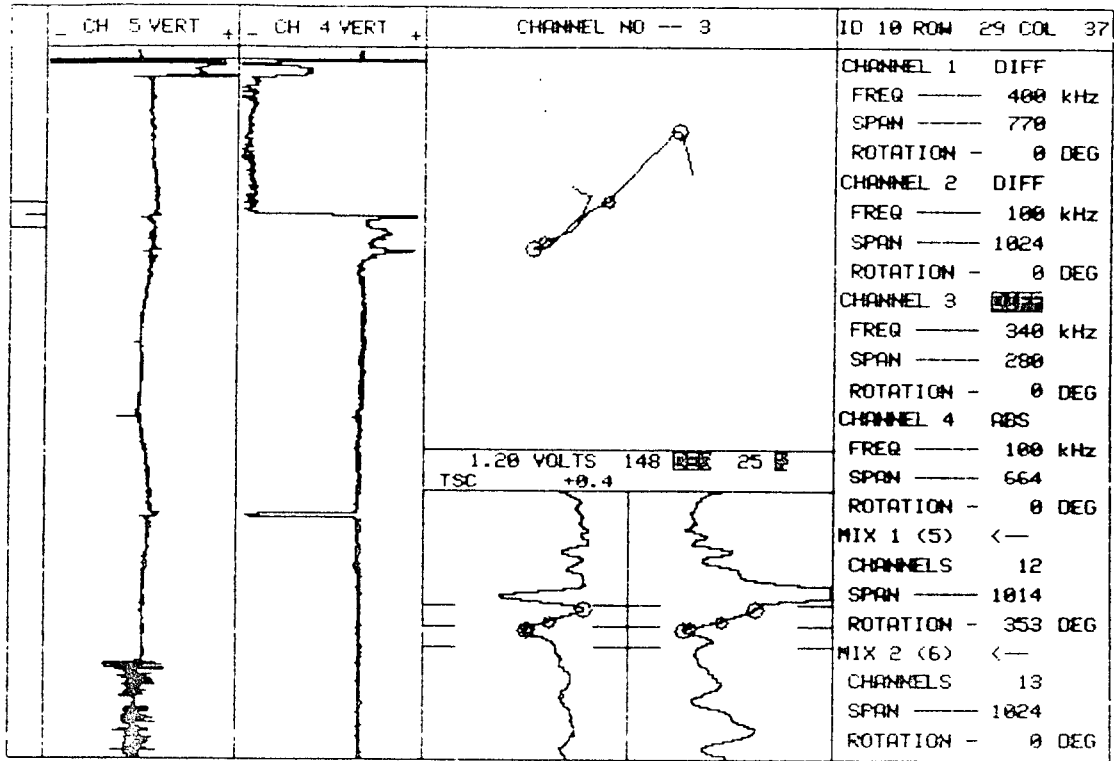
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 SCE SONGS    I    C    OUTLET    1980    Edition 12.0 Rev 1

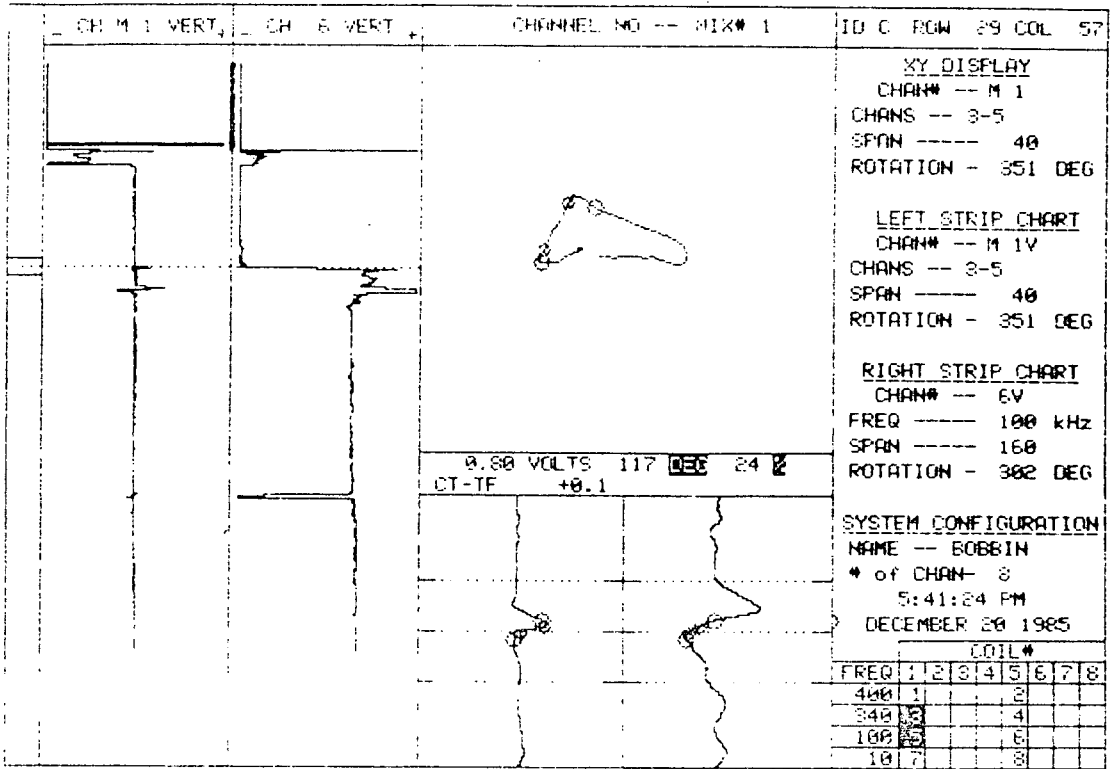


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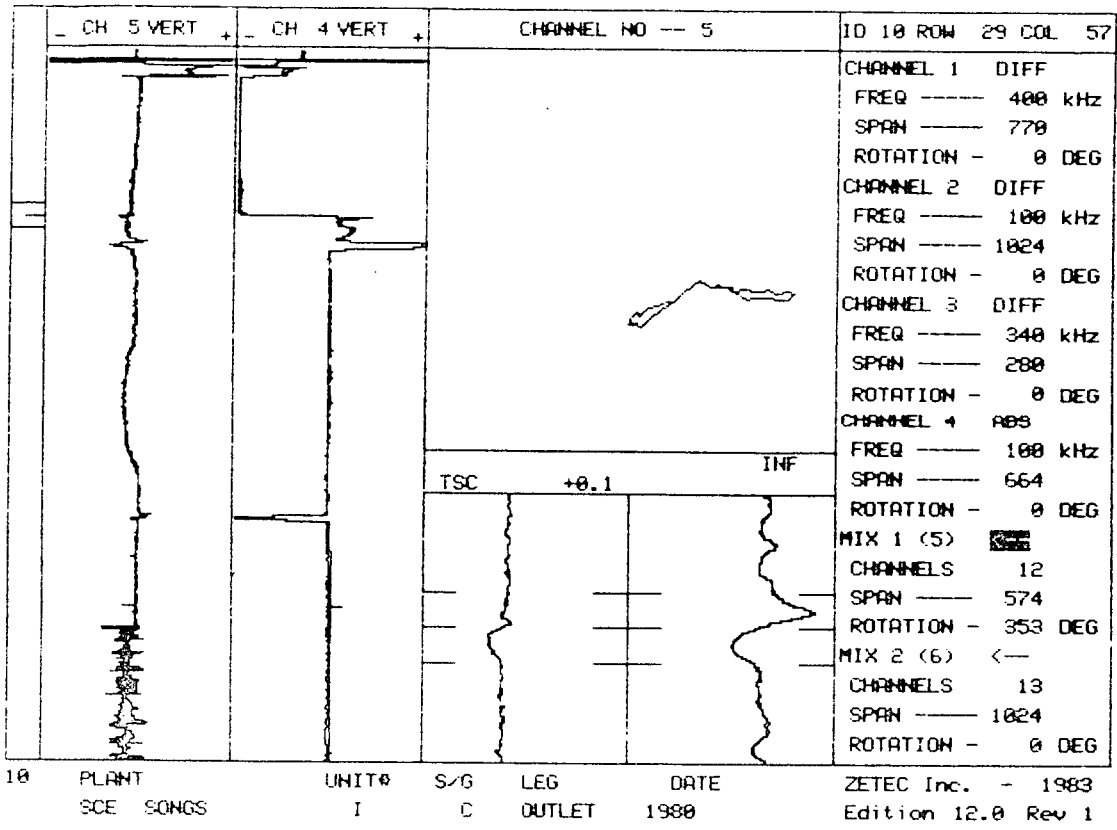


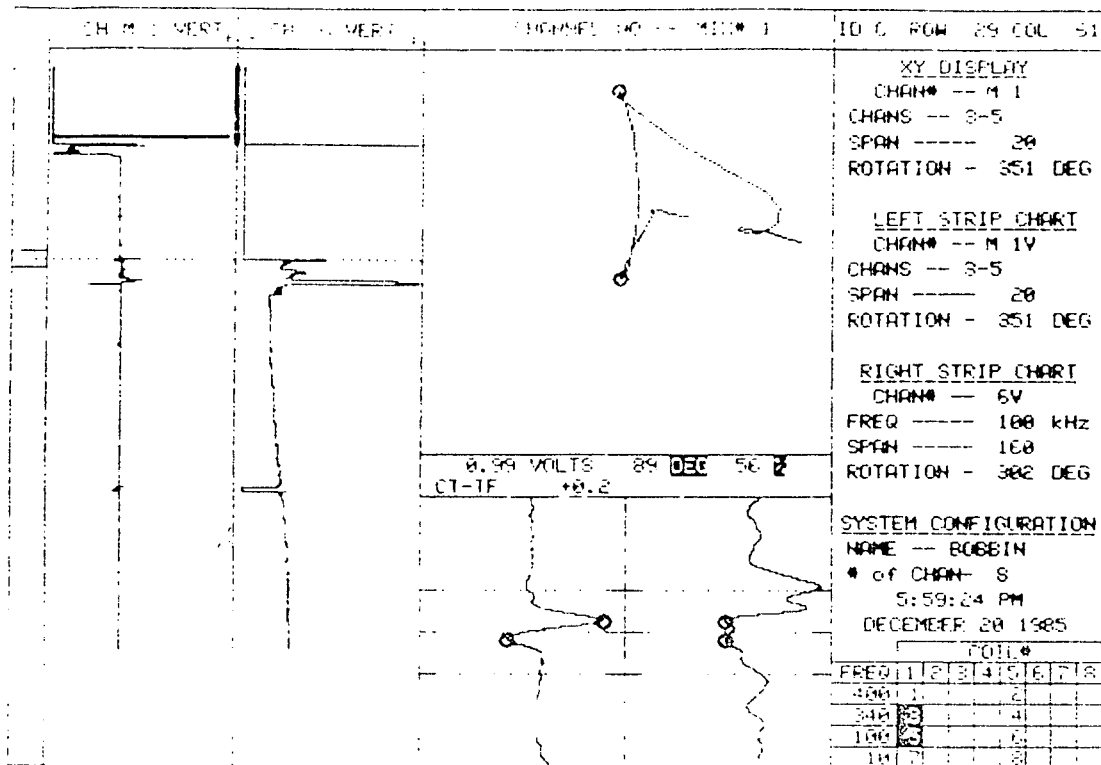
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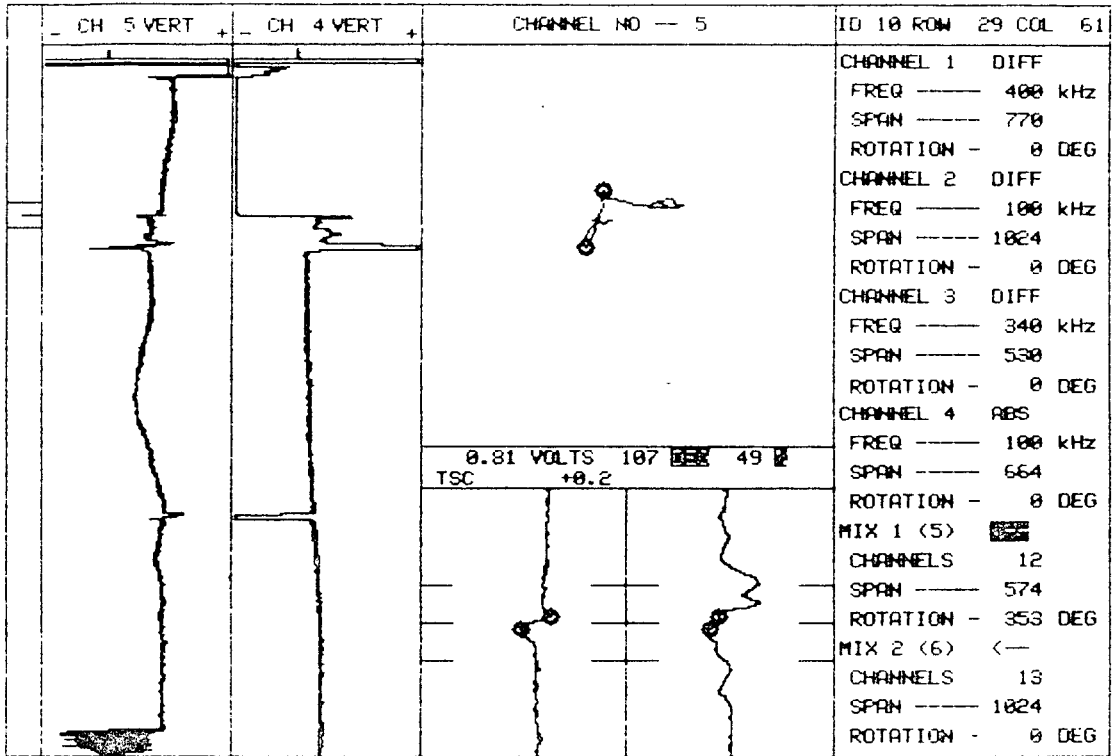


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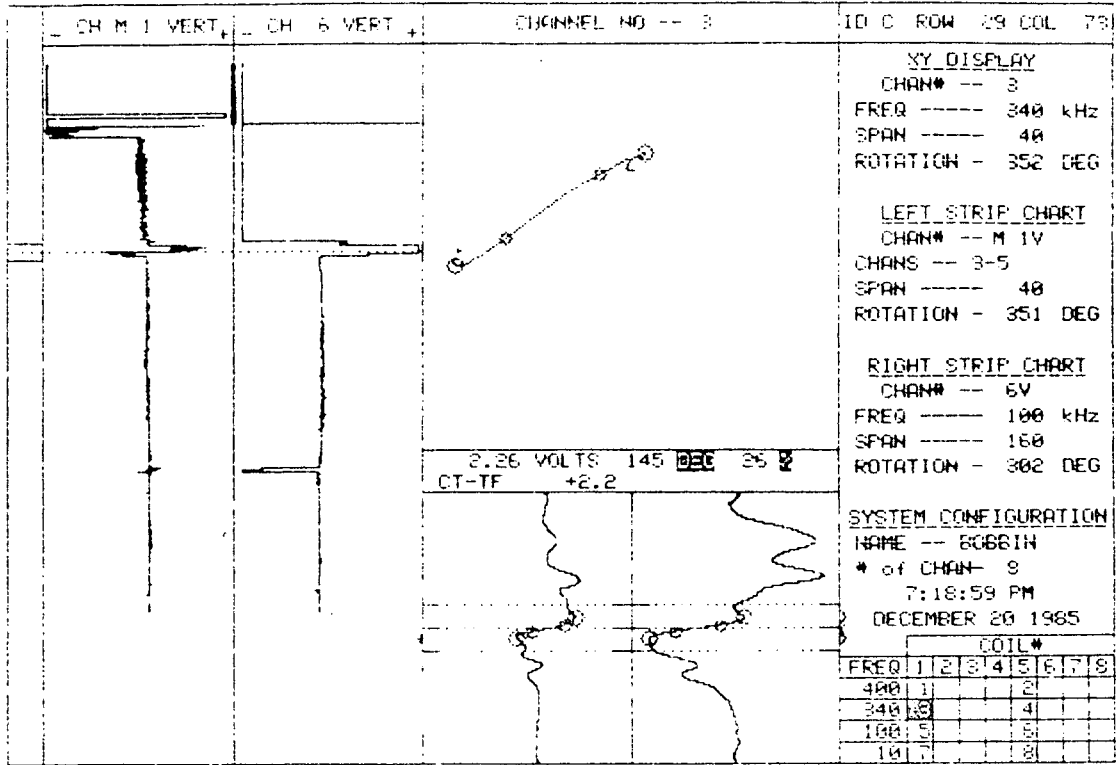




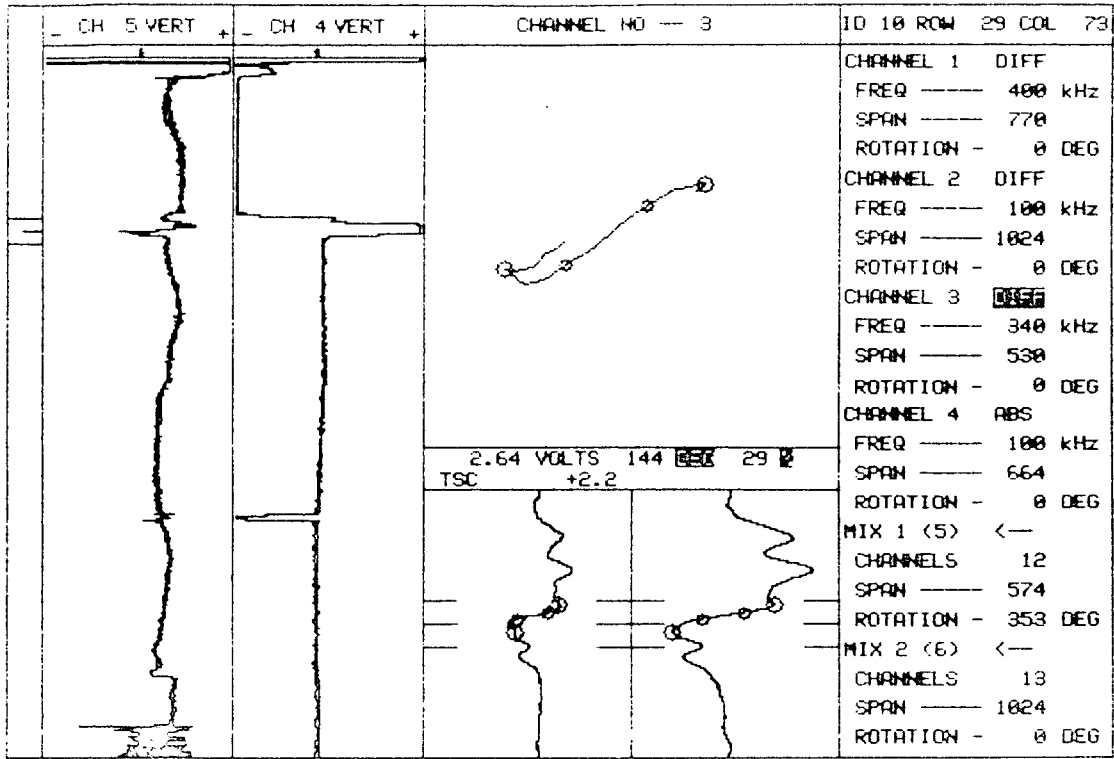
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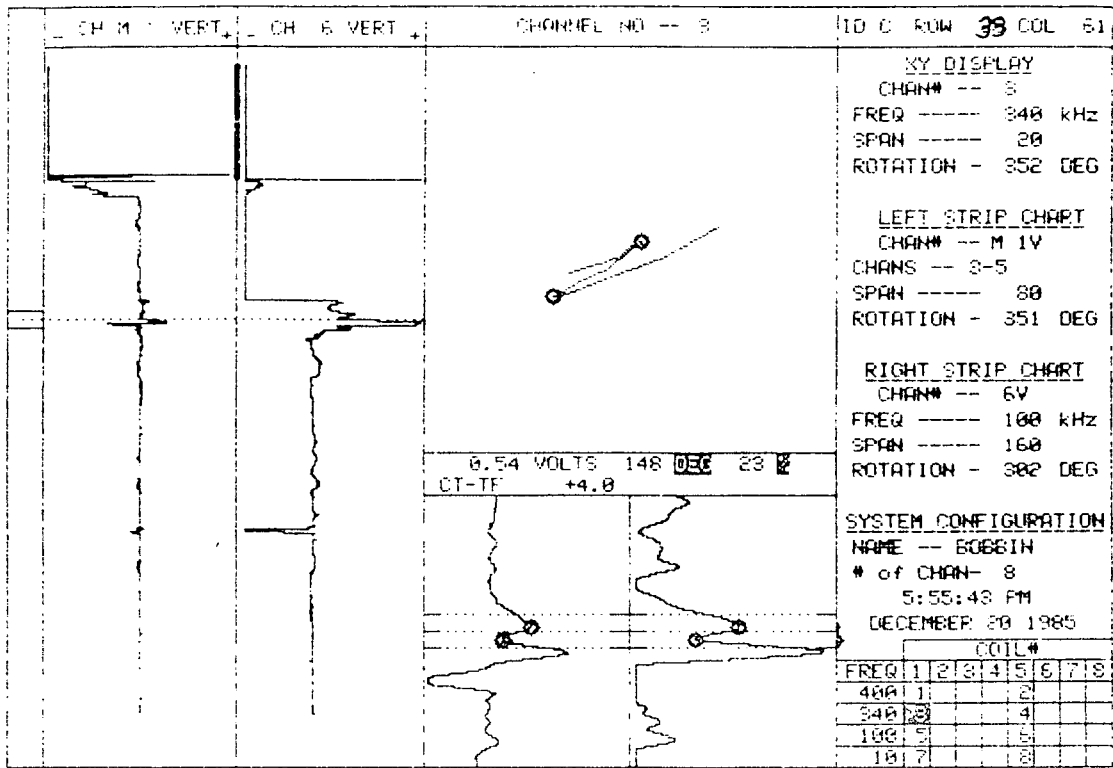
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	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1



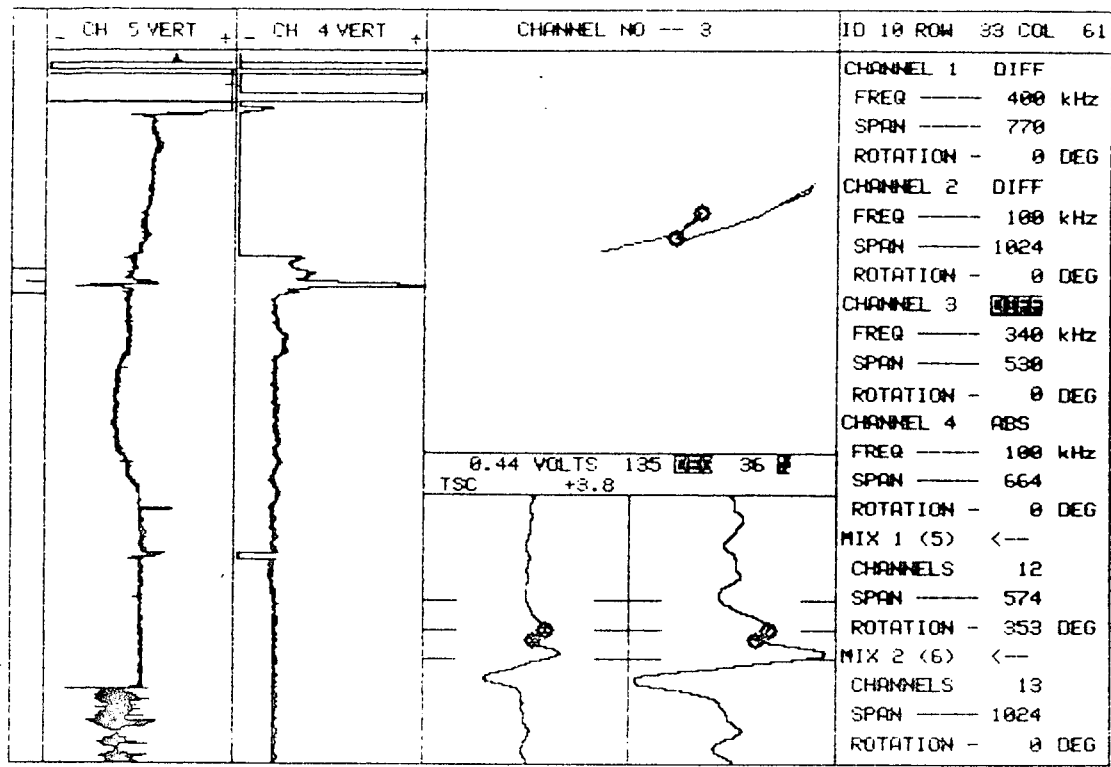
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	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

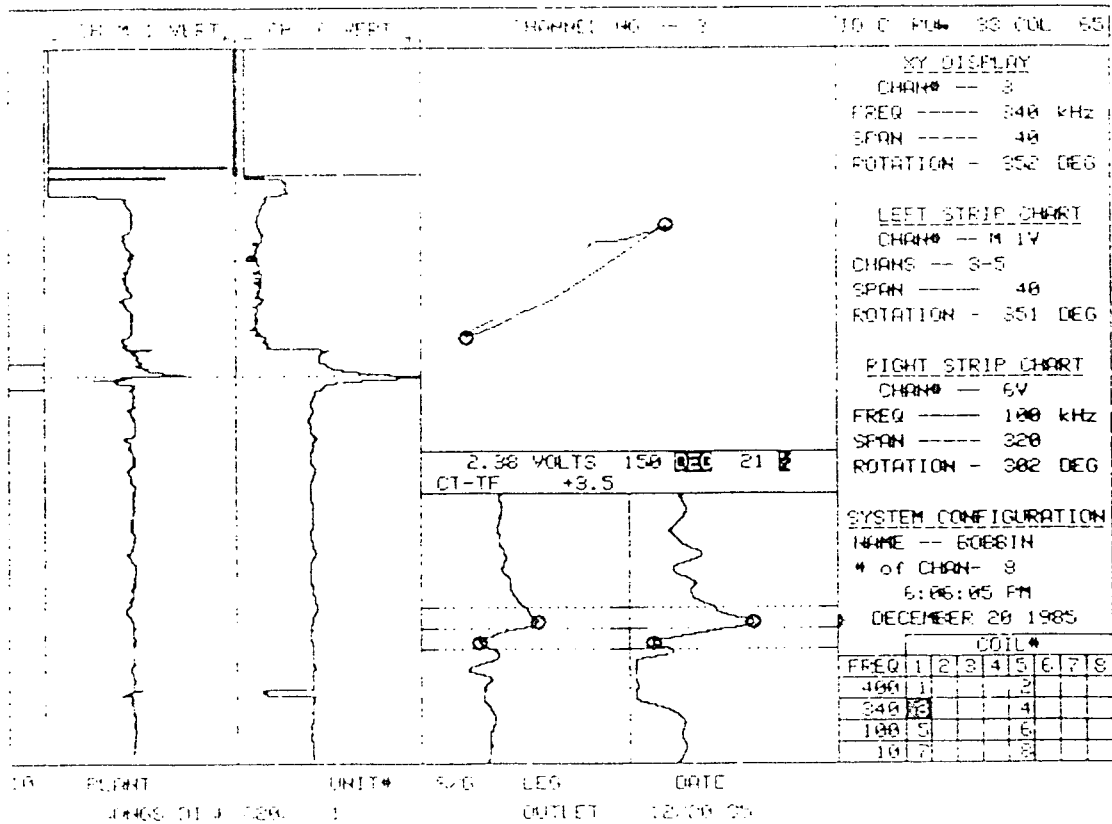
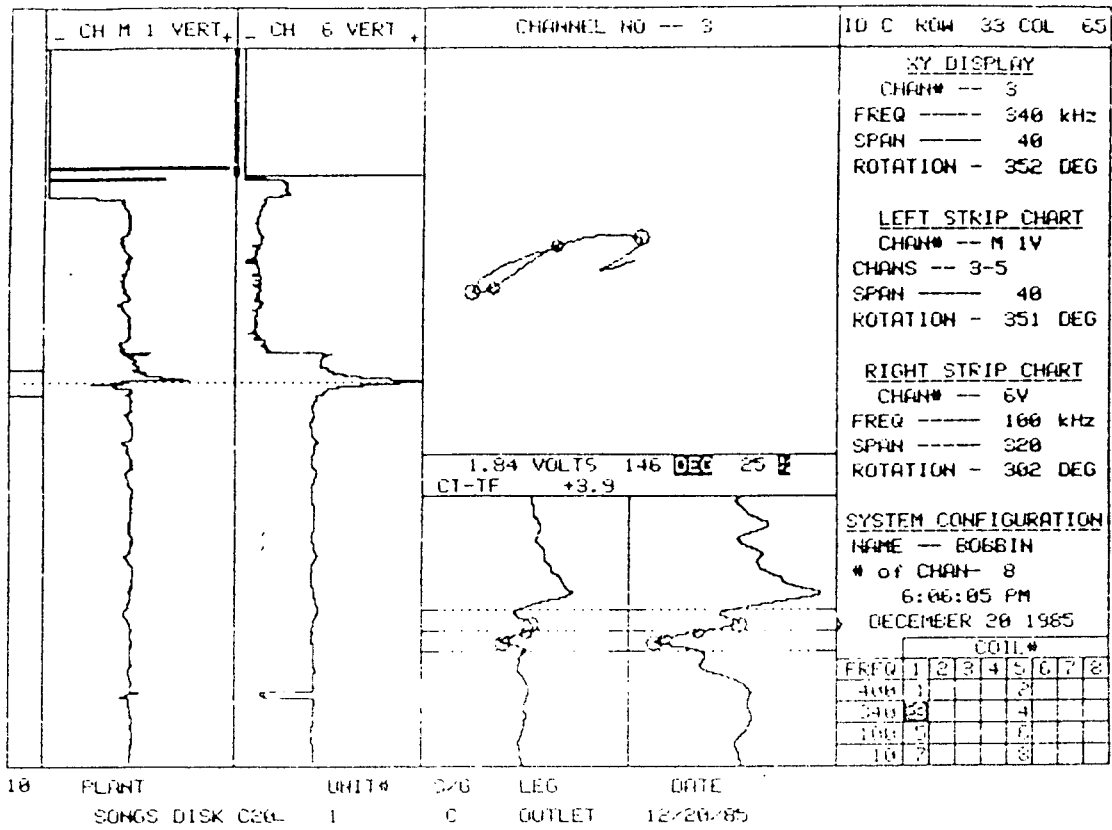


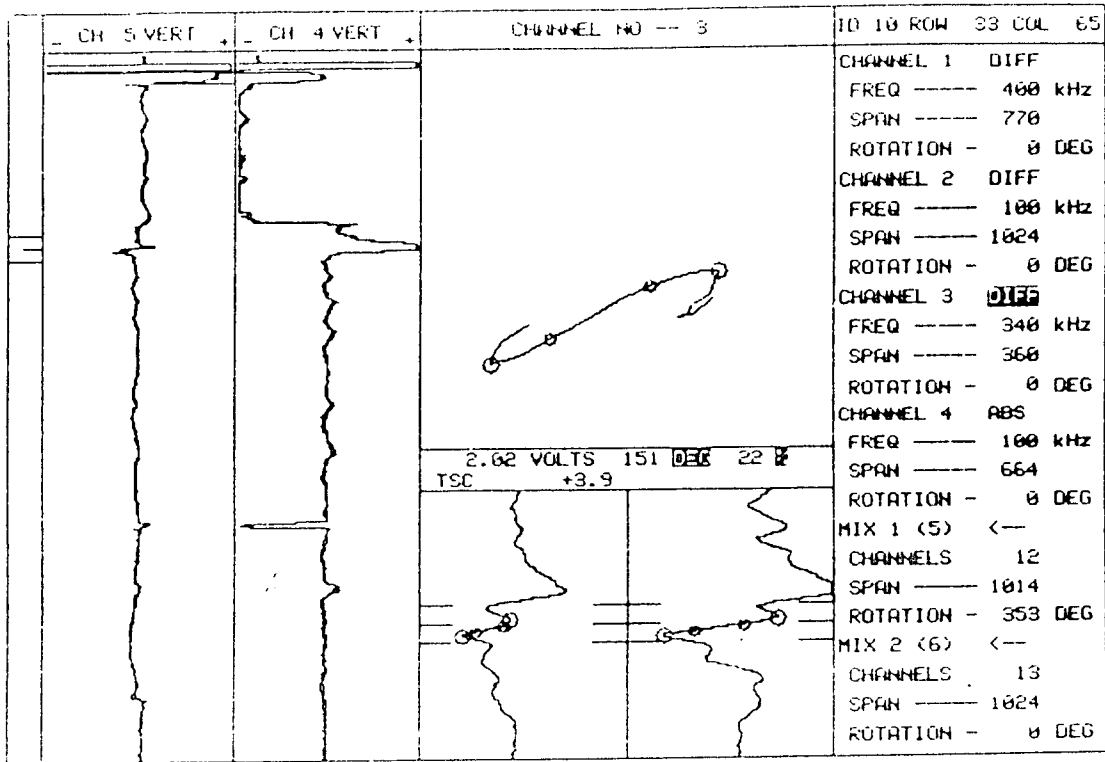
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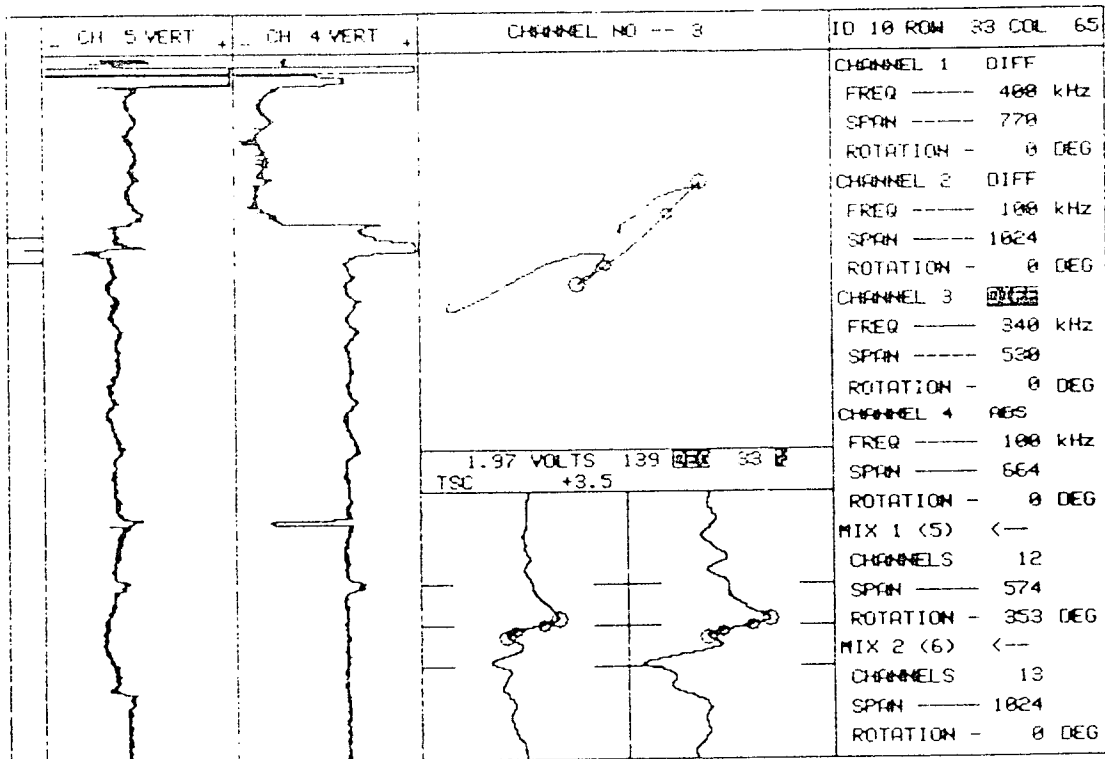
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SCE SONGS I C OUTLET 1980 Edition 12.0 Rev 1



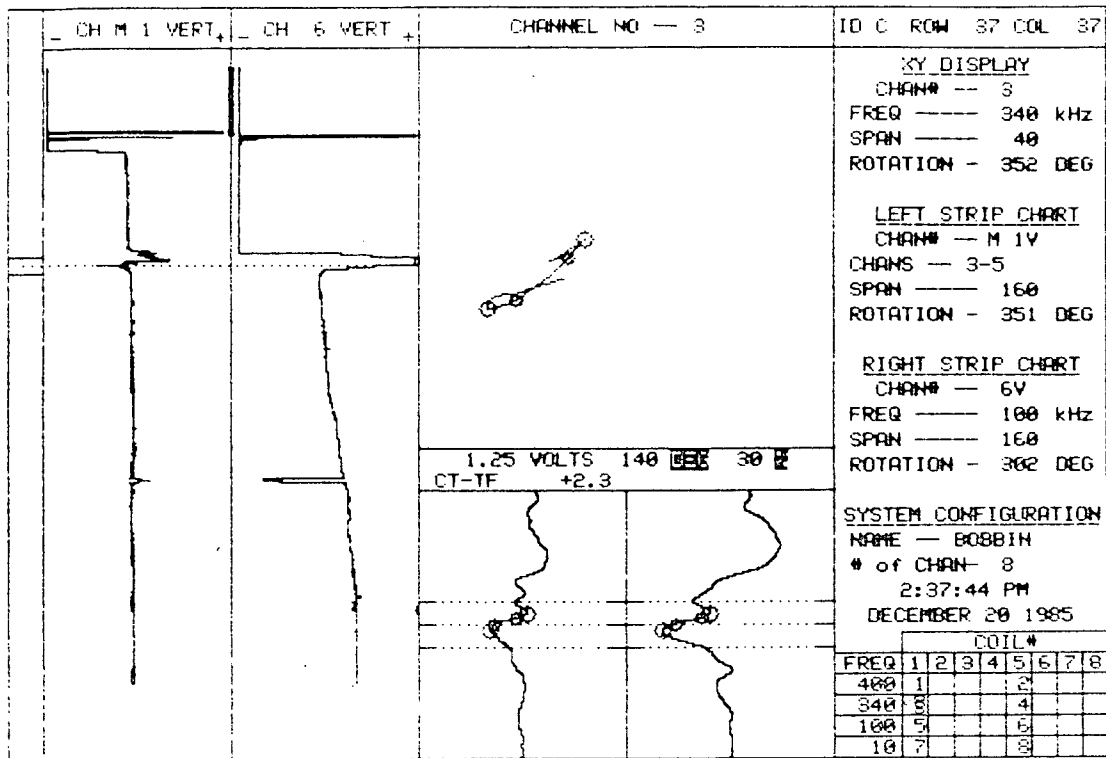




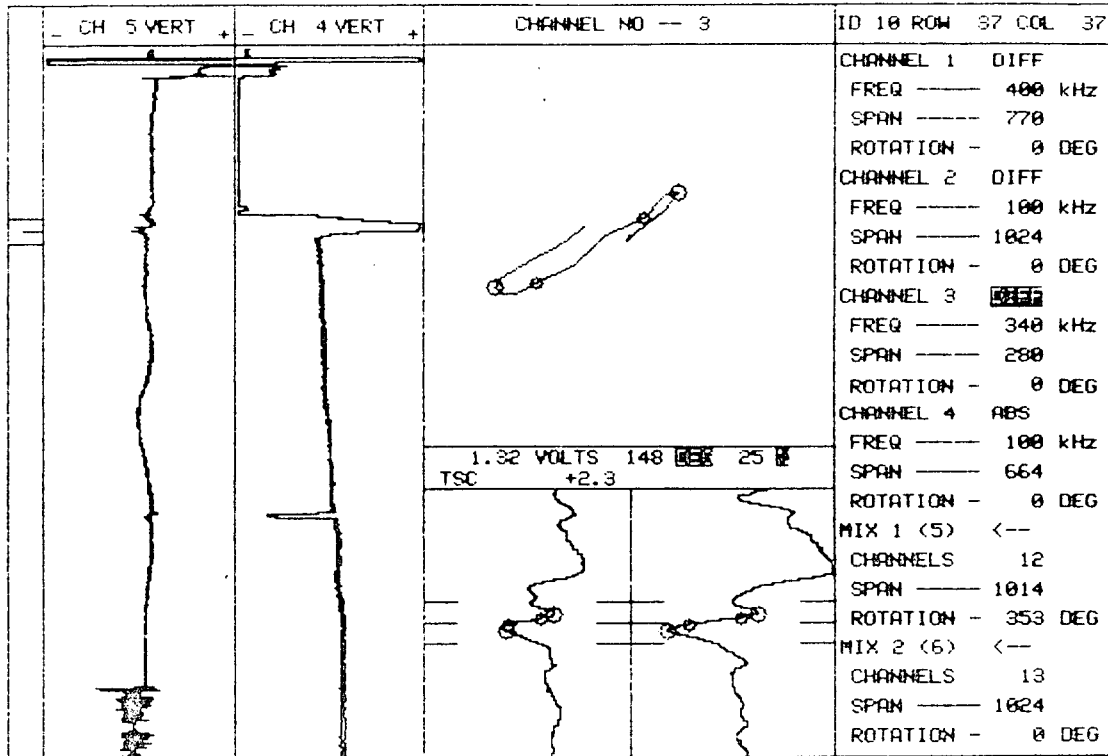
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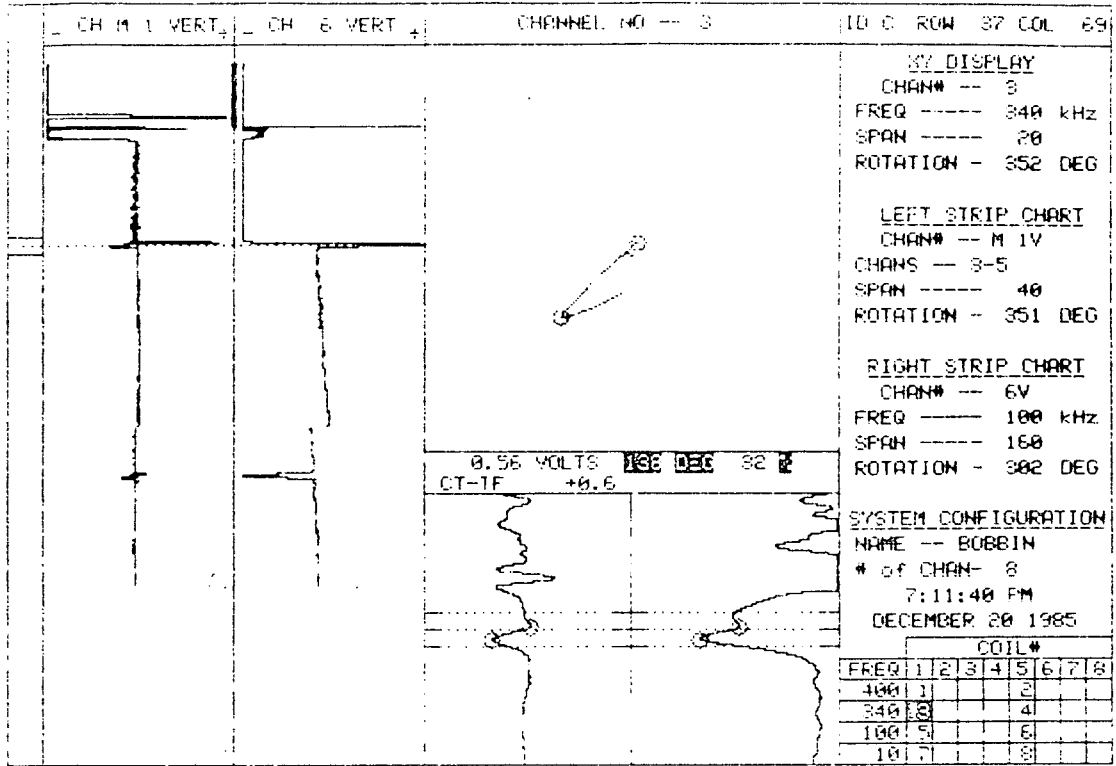
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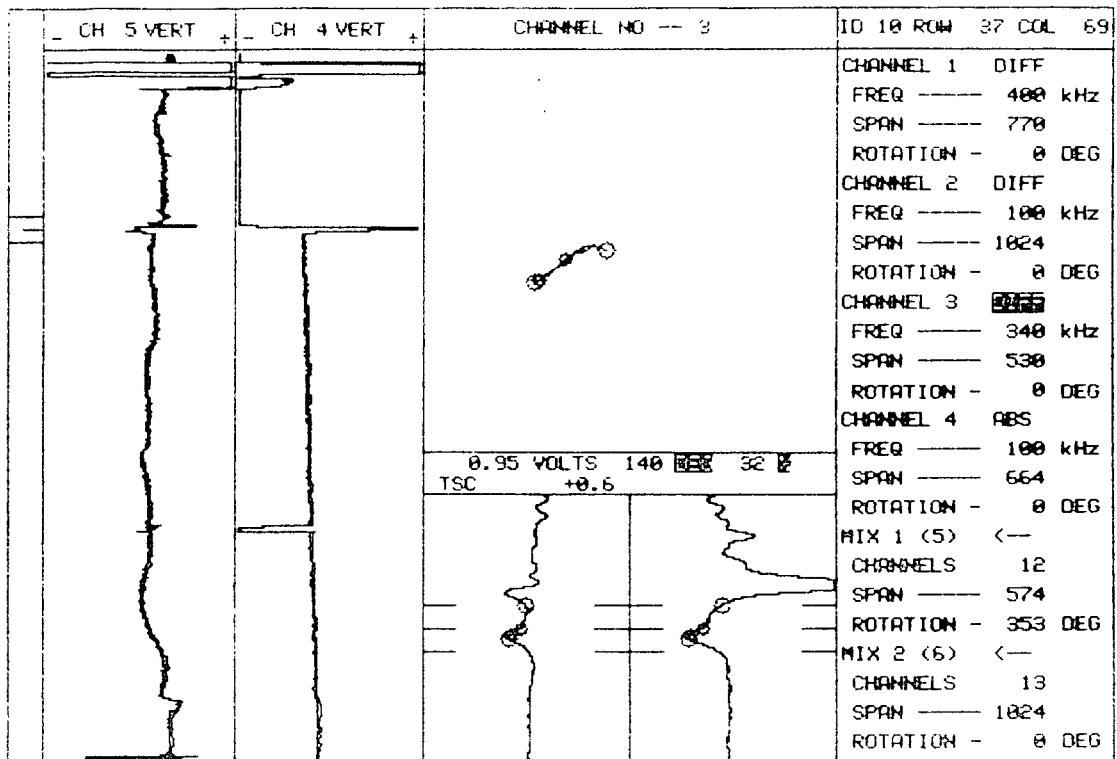
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 SONGS DISK C28-    1    C    OUTLET    12/20/85



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	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1



15 PLANT SONGS DISK 021 UNIT# 1 S/G C LEG OUTLET DATE 12/20/85



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	SCE SONGS	I	C	OUTLET	1980	Edition 12.0 Rev 1

Appendix D

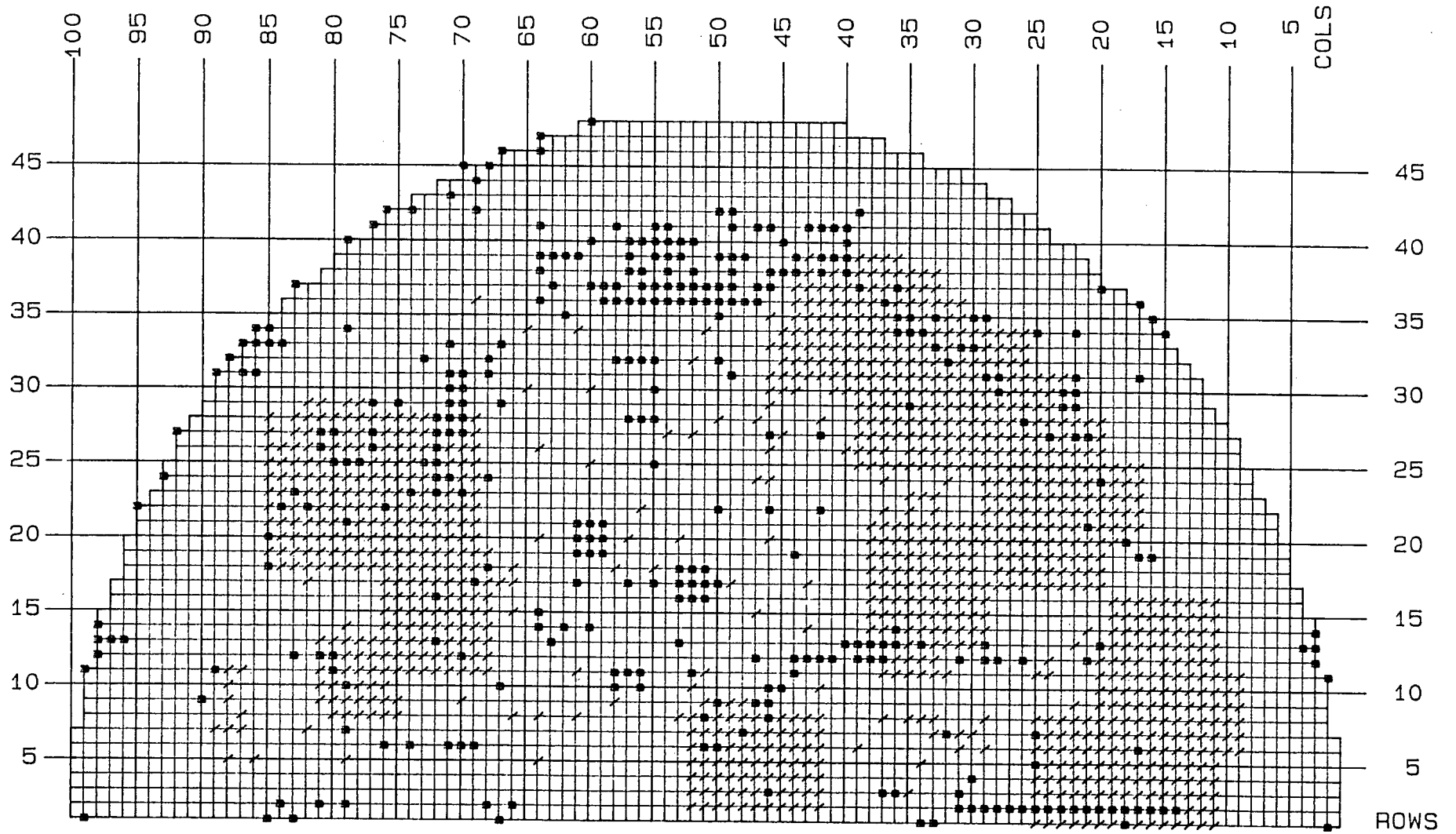
Steam Generators "A", "B" and "C" Inspection Tubesheet Maps

SAN ONOFRE UNIT 1 S/G A

COLD LEG

12/85 TECH SPEC EXP'N

REPORT DATE: 1/15/86



<--- MANWAY

NOZZLE --->

■ = PRE-OUTAGE PLUGGING STATUS

/ = TUBES TESTED - 1118

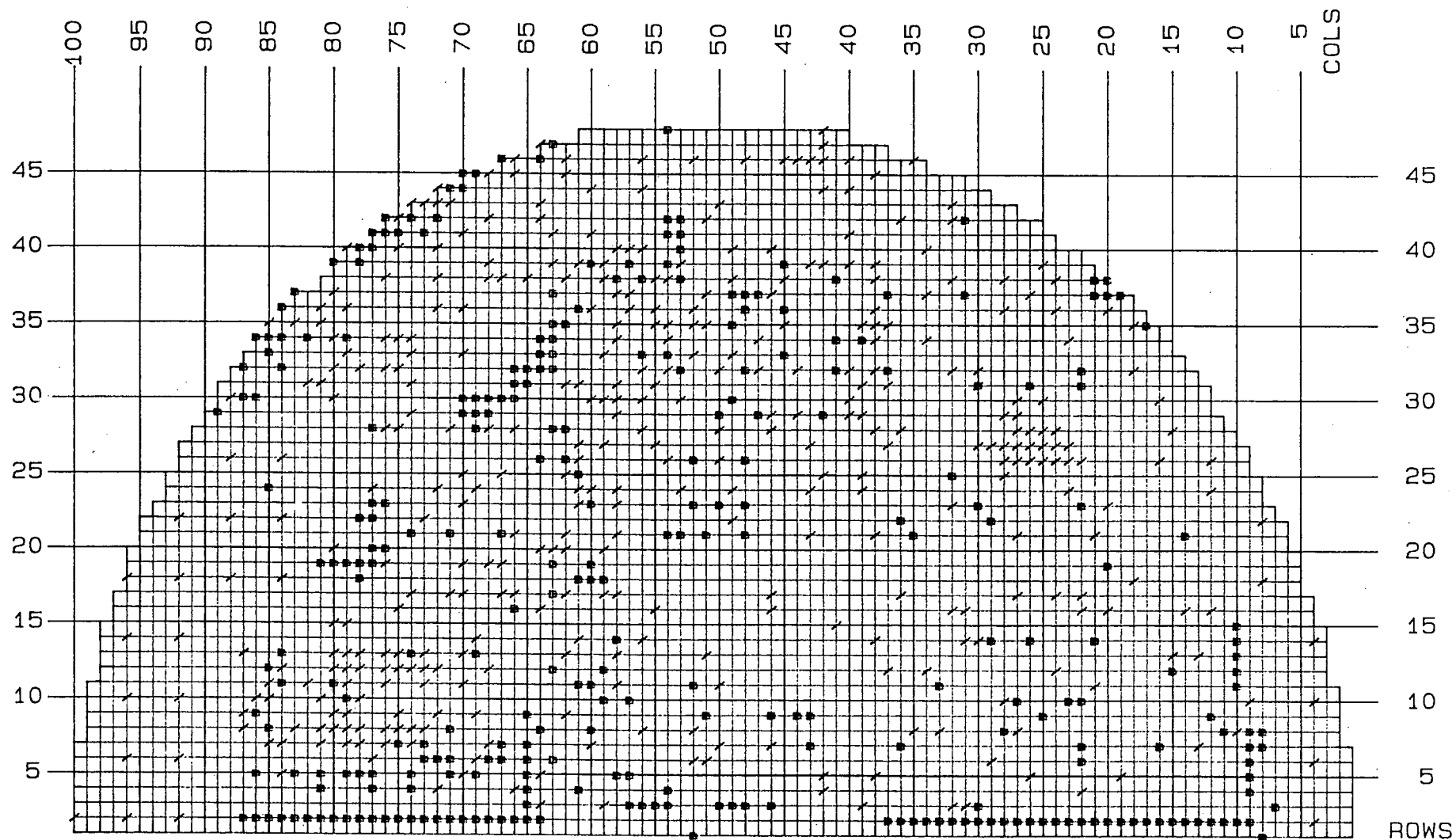


SAN ONOFRE UNIT 1 S/G B

COLD LEG

12/85 OUTLET EXAM'N

REPORT DATE: 1/15/86



<--- MANWAY

NOZZLE --->

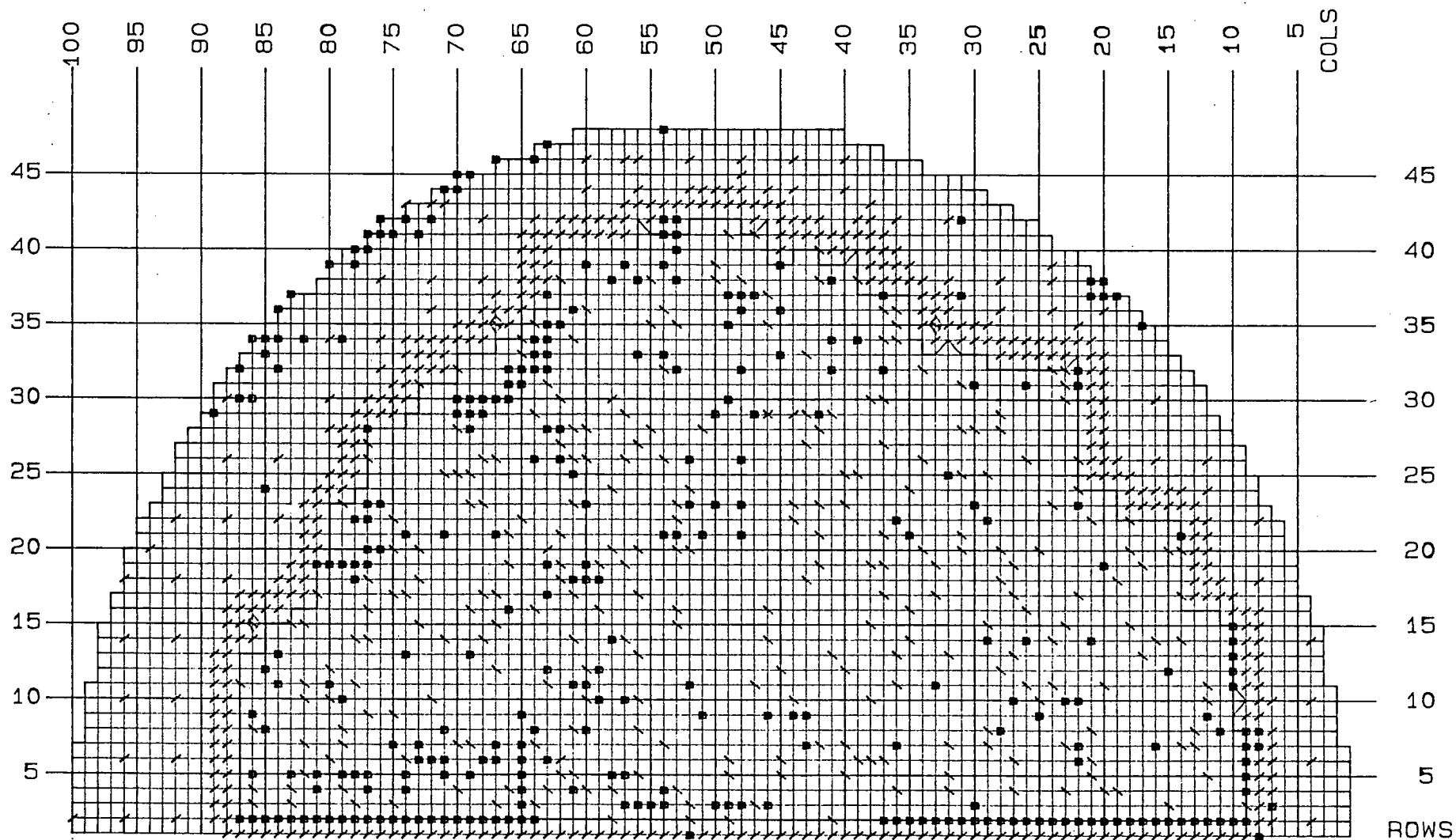
■ = PRE-OUTAGE PLUGGING STATUS / = TUBES TESTED - 400

SAN ONOFRE UNIT 1 S/G B

HOT LEG

12/85 INLET EXAM'N

REPORT DATE: 1/15/86



<--- MANWAY

— = B SLEEVING BOUNDARY

NOZZLE --->

■ = PRE-OUTAGE PLUGGING STATUS

/ = PARENT TUBES TESTED - 431

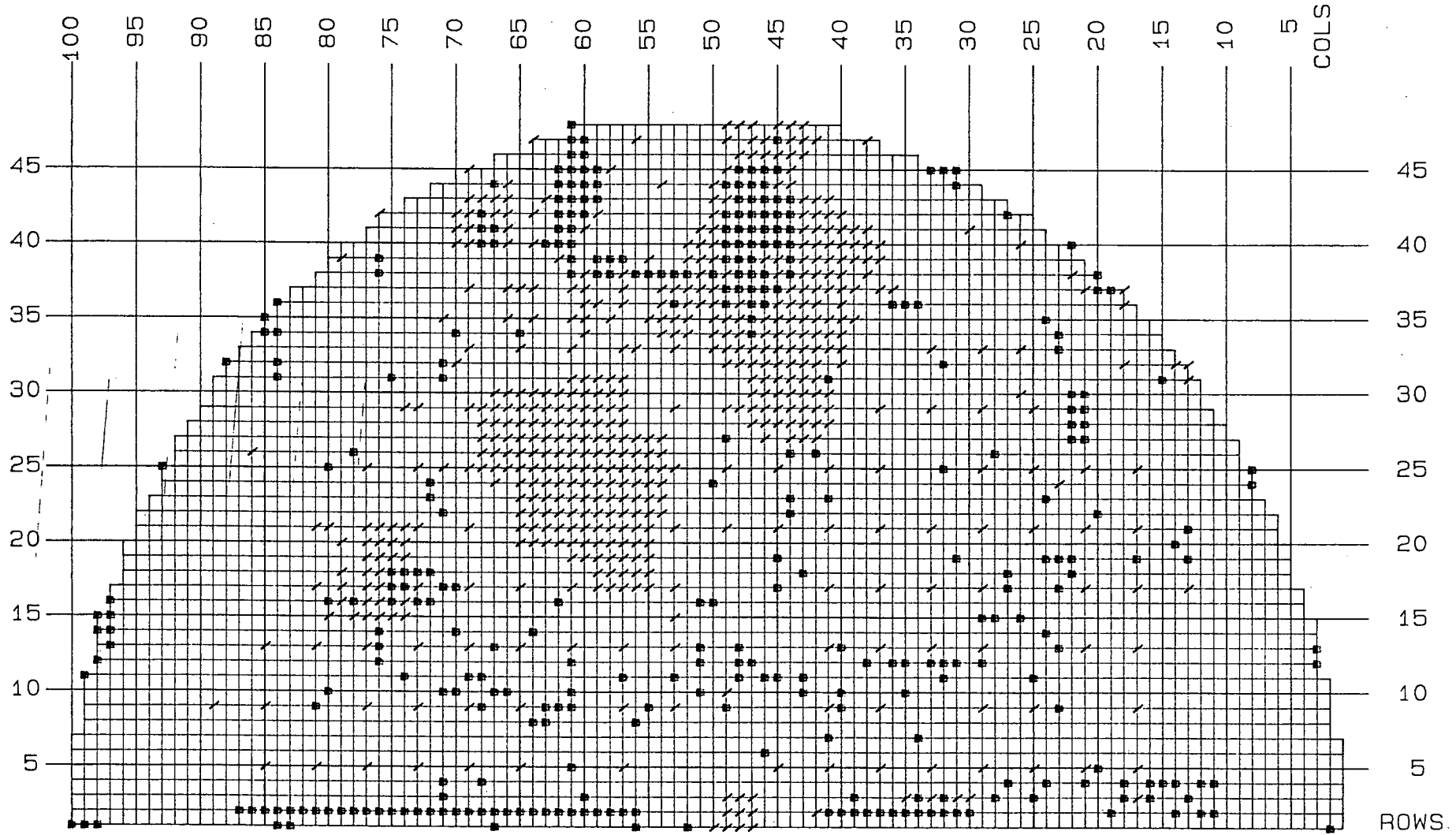
\ = SLEEVES TESTED - 273

SAN ONOFRE UNIT 1 S/G C

COLD LEG

12/85 TECH SPEC EXP'N

REPORT DATE: 1/15/86



<--- MANWAY

NOZZLE --->

■ = PRE-OUTAGE PLUGGING STATUS

/ = TUBES TESTED - 546

Appendix E

Intact Wrapper Support Bar Locations

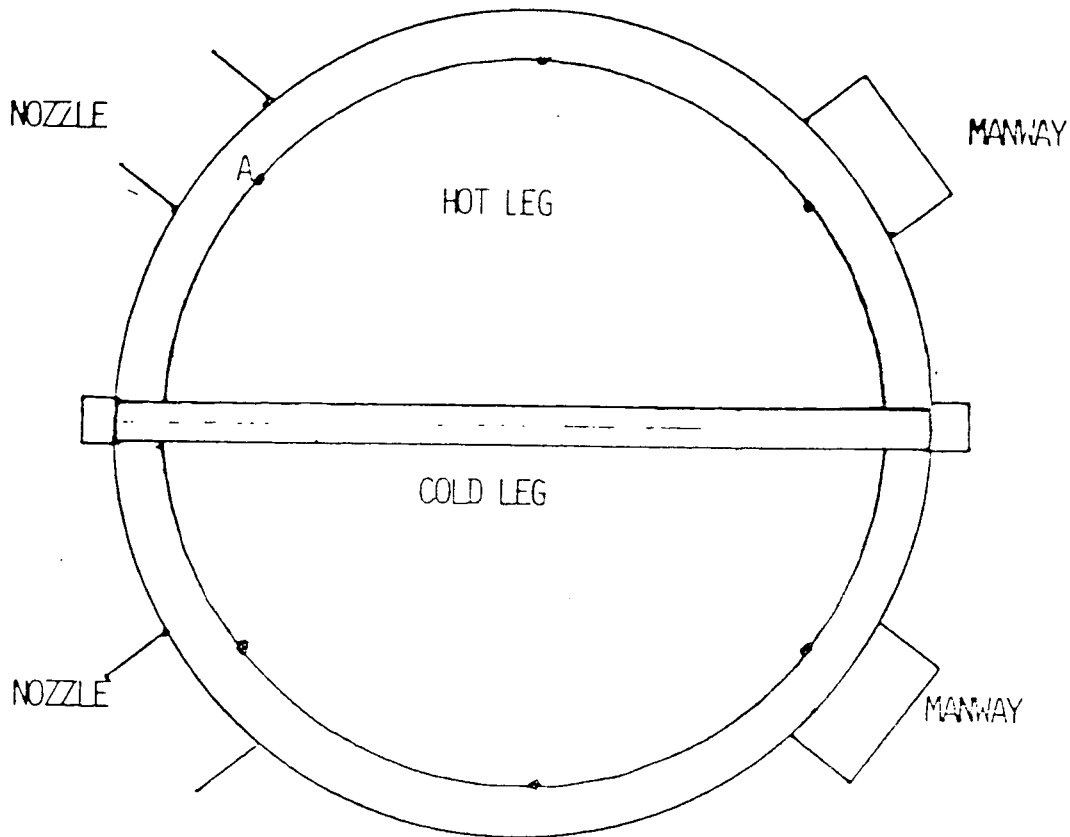


FIGURE E.1

STEAM GENERATOR A INTACT WRAPPER SUPPORT BAR LOCATION

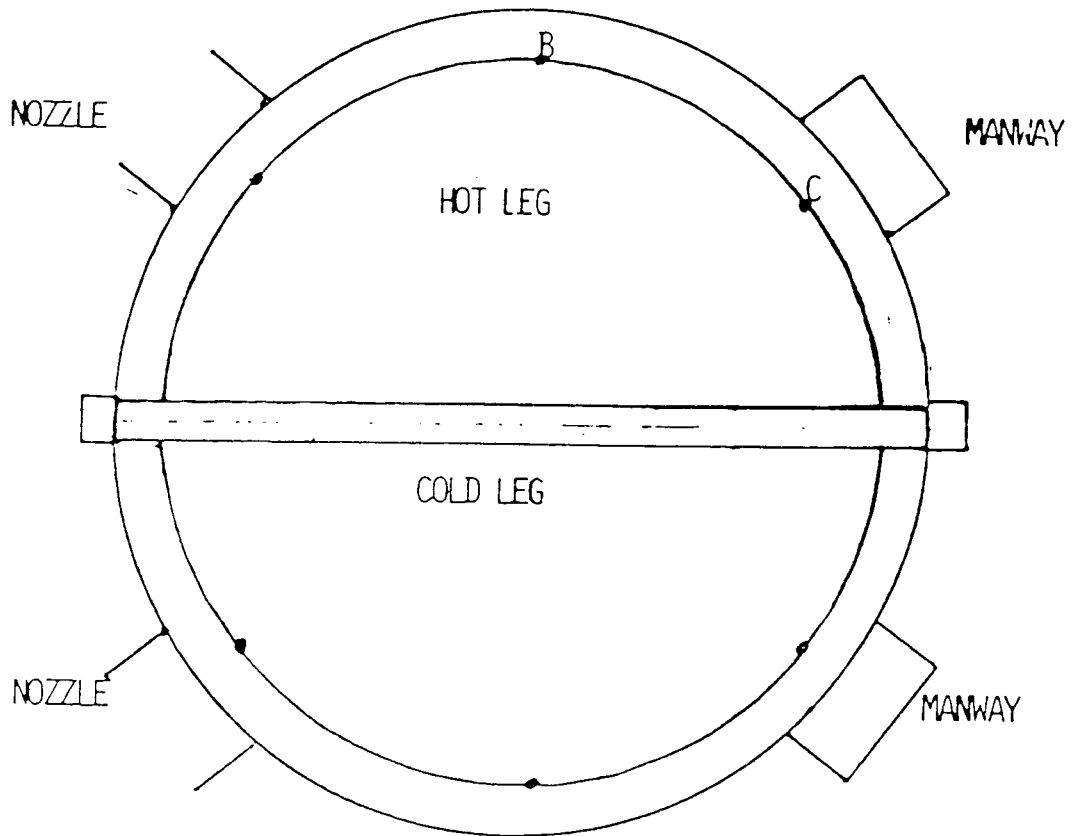


FIGURE E.2

STEAM GENERATOR B INTACT WRAPPER SUPPORT BAR LOCATION

Appendix F

Summary of Steam Generator Repairs

Table F.1

## Tubes Plugged Following the 1985 Steam Generator Inspection

A Steam Generator

<u>Tube Plugged</u>	<u>Reason</u>
1. R4C16	Distorted Indication Near Top of Cold Leg Tubesheet
2. R5C17	Distorted Indication Near Top of Cold Leg Tubesheet
3. R5C20	Distorted Indication Near Top of Cold Leg Tubesheet
4. R5C21	Distorted Indication Near Top of Cold Leg Tubesheet
5. R5C45	Distorted Indication Near Top of Cold Leg Tubesheet
6. R5C49	Distorted Indication Near Top of Cold Leg Tubesheet
7. R8C11	Distorted Indication Near Top of Cold Leg Tubesheet
8. R8C16	Distorted Indication Near Top of Cold Leg Tubesheet
9. R13C17	Distorted Indication Near Top of Cold Leg Tubesheet
10. R20C79	Distorted Indication Near Top of Cold Leg Tubesheet
11. R22C21	Distorted Indication Near Top of Cold Leg Tubesheet
12. R24C24	Distorted Indication Near Top of Cold Leg Tubesheet
13. R24C83	Distorted Indication Near Top of Cold Leg Tubesheet
14. R28C27	Distorted Indication Near Top of Cold Leg Tubesheet
15. R29C31	Distorted Indication Near Top of Cold Leg Tubesheet
16. R35C41	Distorted Indication Near Top of Cold Leg Tubesheet
17. R5C46	≥ 50% Indication Near Top of Cold Leg Tubesheet
18. R5C48	≥ 50% Indication Near Top of Cold Leg Tubesheet
19. R5C50	≥ 50% Indication Near Top of Cold Leg Tubesheet
20. R12C15	≥ 50% Indication Near Top of Cold Leg Tubesheet



Table F.1 (continued)

## Tubes Plugged Following the 1985 Steam Generator Inspection

A Steam Generator

<u>Tube Plugged</u>	<u>Reason</u>
21. R15C72	≥ 50% Indication Near Top of Cold Leg Tubesheet
22. R15C72	≥ 50% Indication Near Top of Cold Leg Tubesheet
23. R17C34	≥ 50% Indication Near Top of Cold Leg Tubesheet
24. R23C81	≥ 50% Indication Near Top of Cold Leg Tubesheet
25. R24C25	≥ 50% Indication Near Top of Cold Leg Tubesheet
26. R26C27	≥ 50% Indication Near Top of Cold Leg Tubesheet
27. R27C27	≥ 50% Indication Near Top of Cold Leg Tubesheet
28. R30C31	≥ 50% Indication Near Top of Cold Leg Tubesheet
29. R31C32	≥ 50% Indication Near Top of Cold Leg Tubesheet
30. R31C34	≥ 50% Indication Near Top of Cold Leg Tubesheet
31. R32C33	≥ 50% Indication Near Top of Cold Leg Tubesheet
32. R32C35	≥ 50% Indication Near Top of Cold Leg Tubesheet
33. R33C34	≥ 50% Indication Near Top of Cold Leg Tubesheet
34. R33C39	≥ 50% Indication Near Top of Cold Leg Tubesheet
35. R34C37	≥ 50% Indication Near Top of Cold Leg Tubesheet

Table F.1 (continued)

## Tubes Plugged Following the 1985 Steam Generator Inspection

B Steam Generator

<u>Tube Plugged</u>	<u>Reason</u>
1. R20C94	≥ 50% Indication Near top of Hot Leg Tubesheet
2. R38C54	Distorted Indication Near Top of Cold Leg Tubesheet
3. R29C44	≥ 50% Indication at AVB
4. R30C58	≥ 50% Indication at AVB
5. R43C72	≥ 50% Indication at AVB

C Steam Generator

<u>Tube Plugged</u>	<u>Reason</u>
1. R33C44	≥ 50% Indication Near Top of Cold Leg Tubesheet
2. R37C21	Distorted Indication Near Top of Cold Leg Tubesheet
3. R39C46	Distorted Indication Near Top of Cold Leg Tubesheet
4. R35C45	≥ 50% Indication at AVB
5. R35C46	≥ 50% Indication at AVB
6. R35C48	≥ 50% Indication at AVB
7. R36C44	≥ 50% Indication at AVB
8. R36C45	≥ 50% Indication at AVB
9. R36C48	≥ 50% Indication at AVB

Table F.1 (continued)

## Tubes Plugged Following the 1985 Steam Generator Inspection

C Steam Generator

<u>Tube Plugged</u>	<u>Reason</u>
10. R37C50	≥ 50% Indication at AVB
11. R38C45	≥ 50% Indication at AVB
12. R38C49	≥ 50% Indication at AVB
13. R39C43	≥ 50% Indication at AVB
14. R39C50	≥ 50% Indication at AVB
15. RR39C51	≥ 50% Indication at AVB
16. R40C43	≥ 50% Indication at AVB
17. R40C50	≥ 50% Indication at AVB
18. R41C43	≥ 50% Indication at AVB
19. R41C69	≥ 50% Indication at AVB
20. R42C67	≥ 50% Indication at AVB
21. R43C49	≥ 50% Indication at AVB
22. R44C45	≥ 50% Indication at AVB
23. R46C46	≥ 50% Indication at AVB

Table F.2

## Steam Generator Repair Summary

<u>Plugging Summary</u>	<u>Steam Generator</u>			<u>Total</u>
	<u>A</u>	<u>B</u>	<u>C</u>	
Tubes Plugged to 5-84	343	296	339	978
Tubes Plugged 12-85 Outage	<u>35</u>	<u>5</u>	<u>23</u>	<u>63</u>
Overall Total	378	301	362	1,041
 <u>Sleeving Summary</u>				
Brazed Only	171	92	197	460
Mechanical and Mechanical Conversions	<u>2,073</u>	<u>2,049</u>	<u>1,941</u>	<u>6,063</u>
Overall Total	2,244	2,141	2,138	6,523
 <u>Equivalent plugging Level</u> (25 sleeves equal 1 plug)				
Overall Plugging Percentage	12.3	10.2	11.8	11.4