Naval Oceanographic Office

Stennis Space Center
MS 39522-5001

Technical Report
TR 300
December 1989

SEISMIC REFLECTION PROFIL

USNS WILKES
1977-1979

William J. Vestal
William P. Searcy III
Geoacoustics Branch

(2)

TR 300

)FILES — SOMALI BASIN

1977-1979

William J. Vestal
William P. Searcy III
Geoacoustics Branch

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Prepared under the authority of
Commander
Naval Oceanography Command

FOREWORD

During the period 1977 to 1979, the USNS WILKES recorded some 20,000 miles of seismic data in the Somali Basin. Reduced-scale sections of most of the 10-second analogs are reproduced in this report as an aid to future research and planning.

ROBERT Y. FELT
Captain, U.S. Navy
Acting

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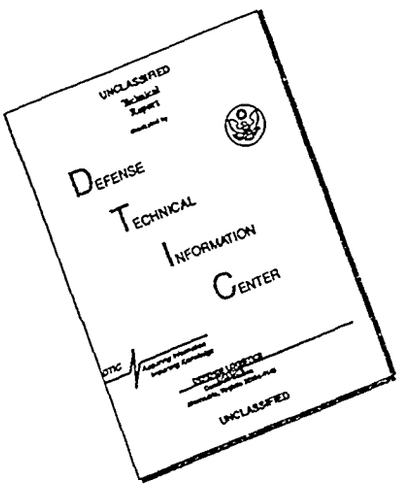

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Photographic reproductions of reduced-scale analogs as a guide to seismic data taken in the Somali Basin during the period 1977-1979.

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The Somali Basin and contiguous sedimentary basins comprise an inverted L-shaped area of about 1,300,000 square miles in the western Indian Ocean, bounded by the African coasts of Somalia, Kenya, and Tanzania on the west, the Carlsberg Ridge on the north and east, and the northwest coast of the Malagasi Republic (Madagascar) and the Amirante Ridge-trench complex on the southwest.

During the period 1977 to 1979, the USNS WILKES collected over 20,000 miles of reflection seismic data in the Somali Basin,

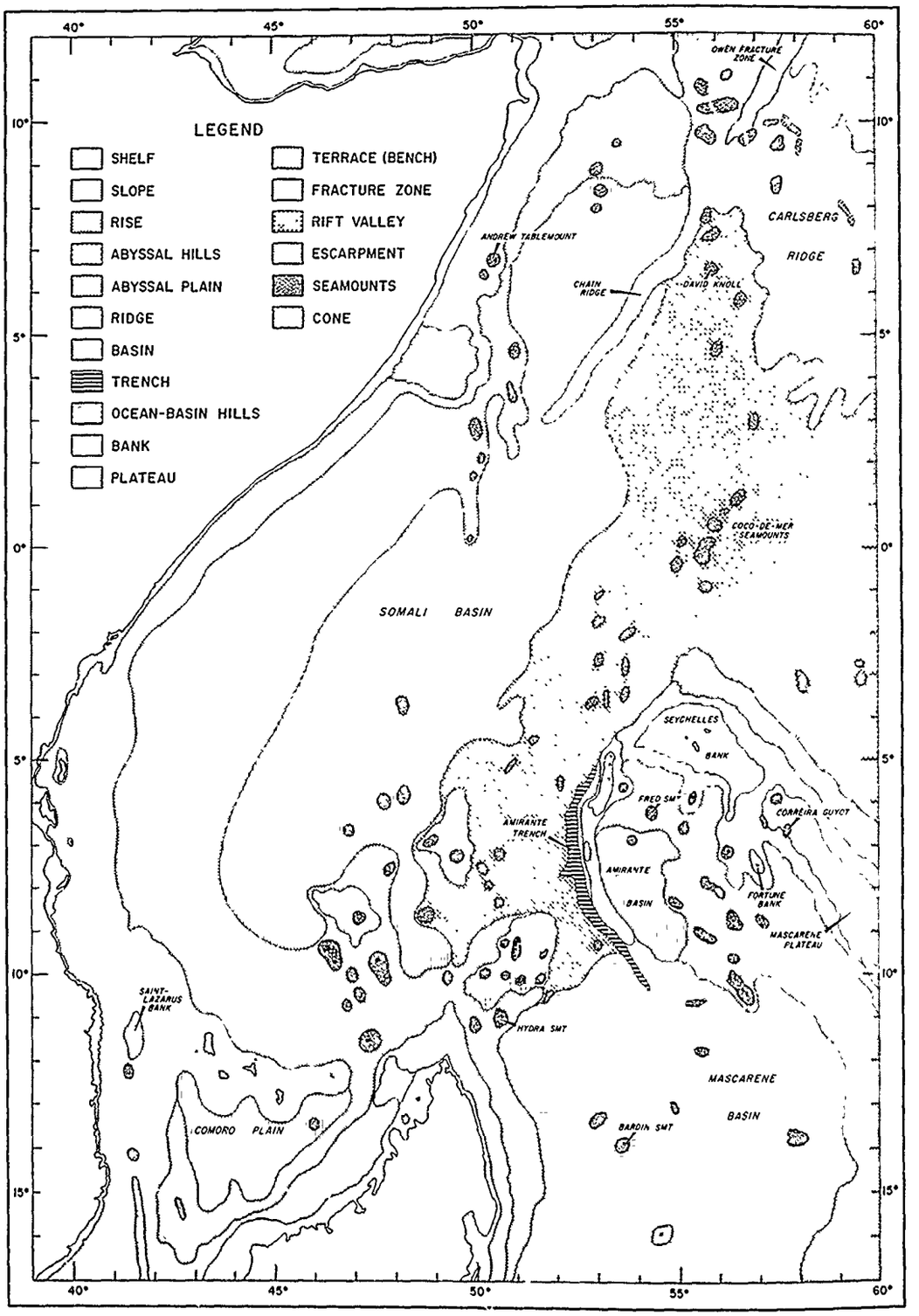

Figure 1. Physiographic Provinces of the Somali Basin.

basins comprise
re miles in the
asts of Somalia,
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ILKES collected
he Somali Basin,

along with bathymetry, magnetics, and other data. Photographic reproductions of much of the ten-second seismic analogs are reproduced in this volume. Emphasis has been placed on data in the main part of the basin where survey tracks were concentrated.

This report is not intended as an interpretive study. It is hoped that the reduced-scale seismic sections will be a convenient format for future geological studies.

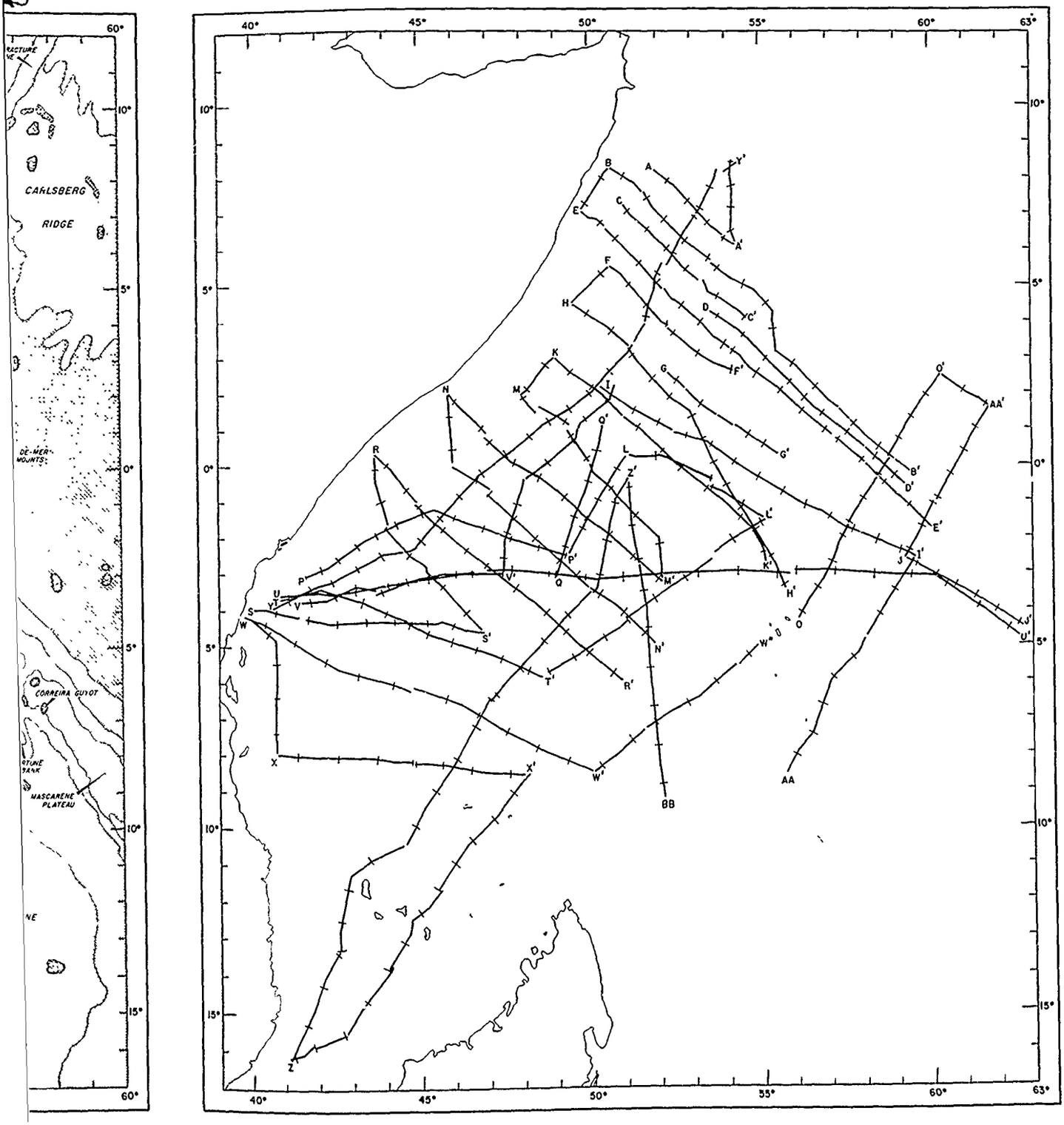

Figure 2. Track Chart, USNS Wilkes—Somali Basin, 1977-1979.

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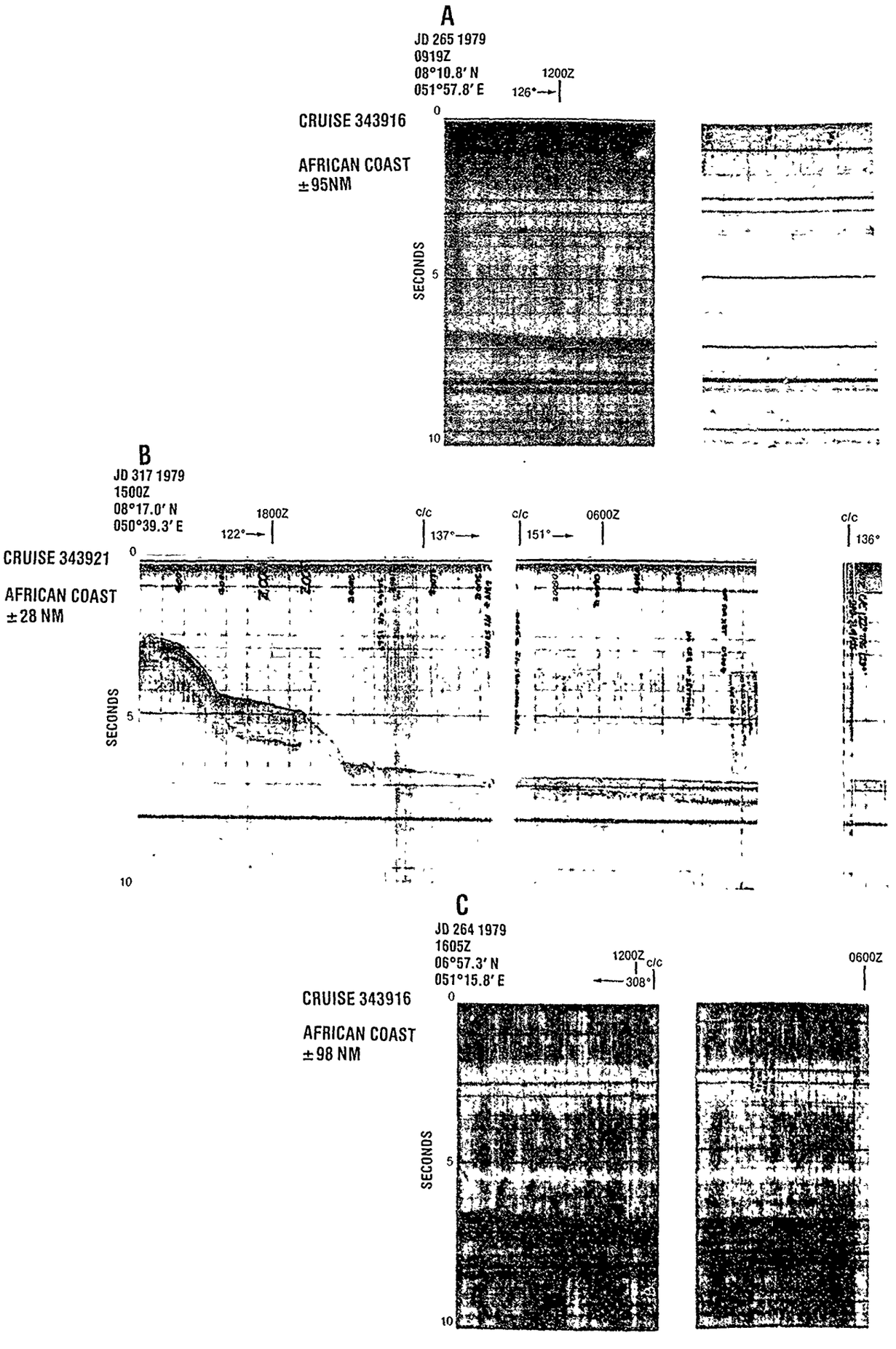
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0919Z
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1200Z
126°
CRUISE 343916
AFRICAN COAST
±95NM
SECONDS
0
5
10
B
JD 317 1979
1500Z
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050°39.3′ E
1800Z
122°
c/c
137°
c/c
151°
0600Z
c/c
136°
CRUISE 343921
AFRICAN COAST
±28 NM
SECONDS
0
5
10
C
JD 264 1979
1605Z
06°57.3′ N
051°15.8′ E
1200Z
c/c
308°
0600Z
CRUISE 343916
AFRICAN COAST
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SECONDS
0
5
10

PLATE 1A

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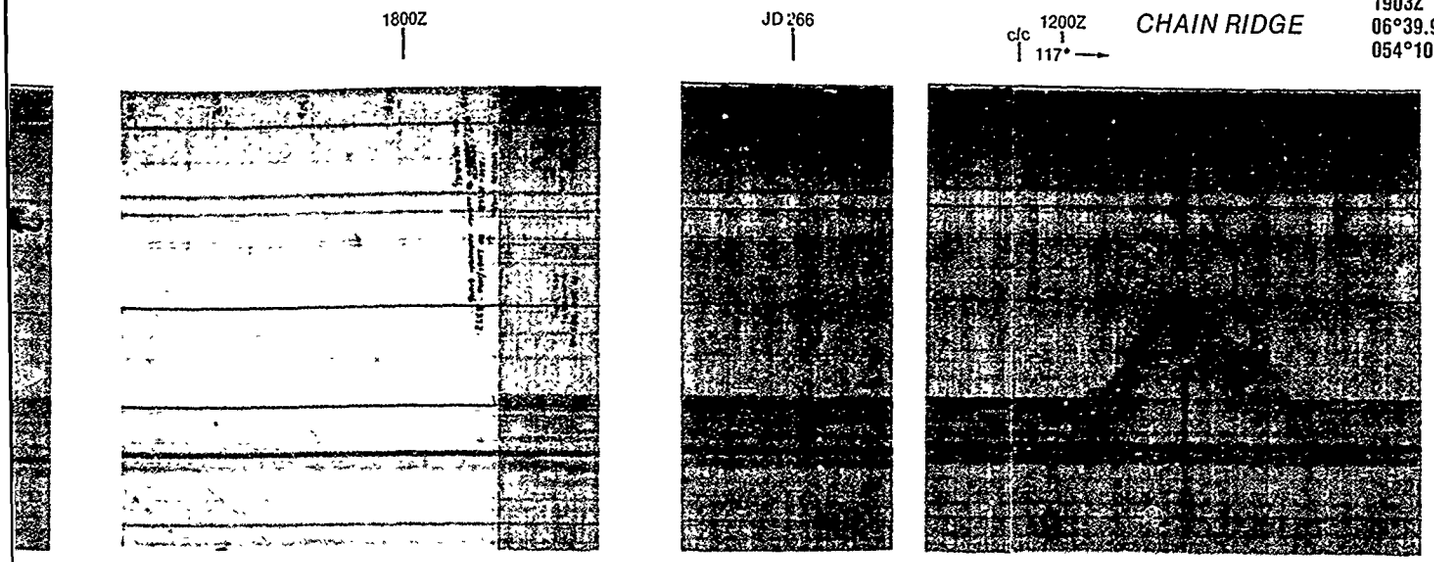
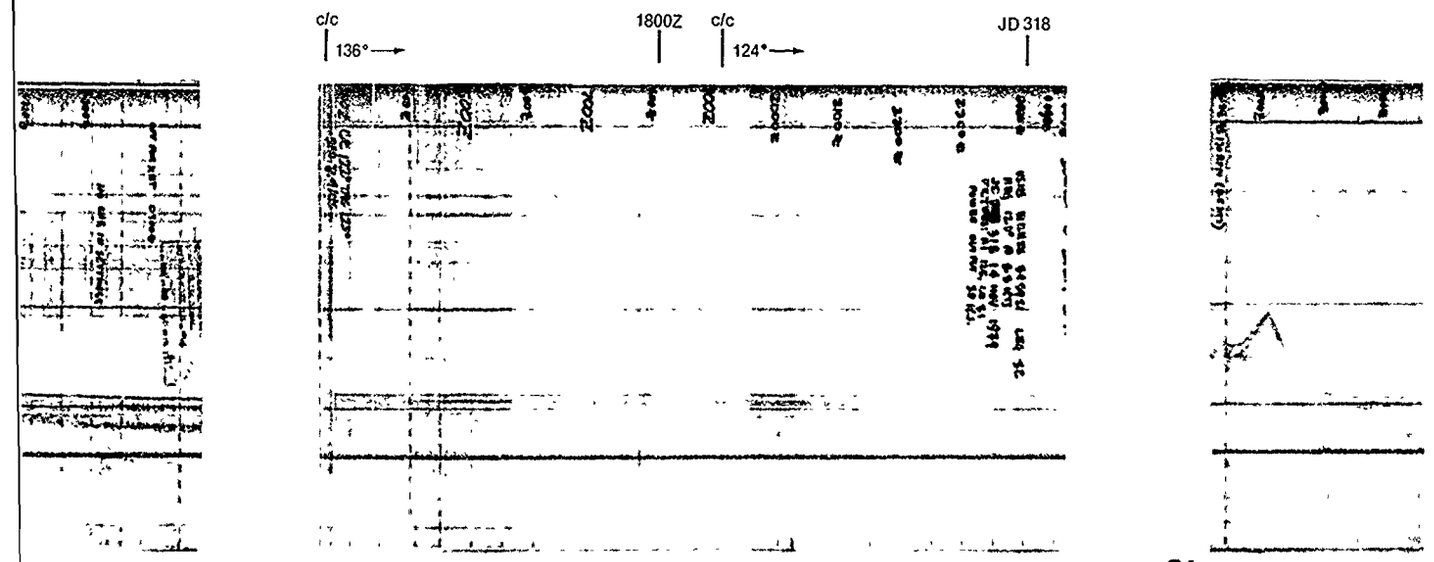
054°10.4′ E





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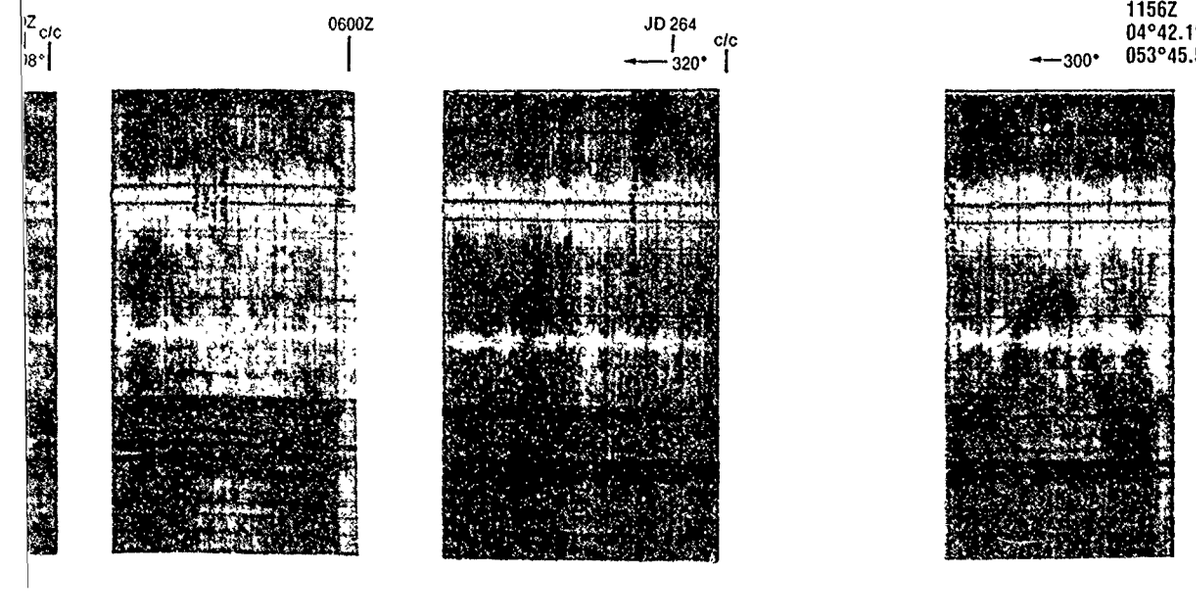

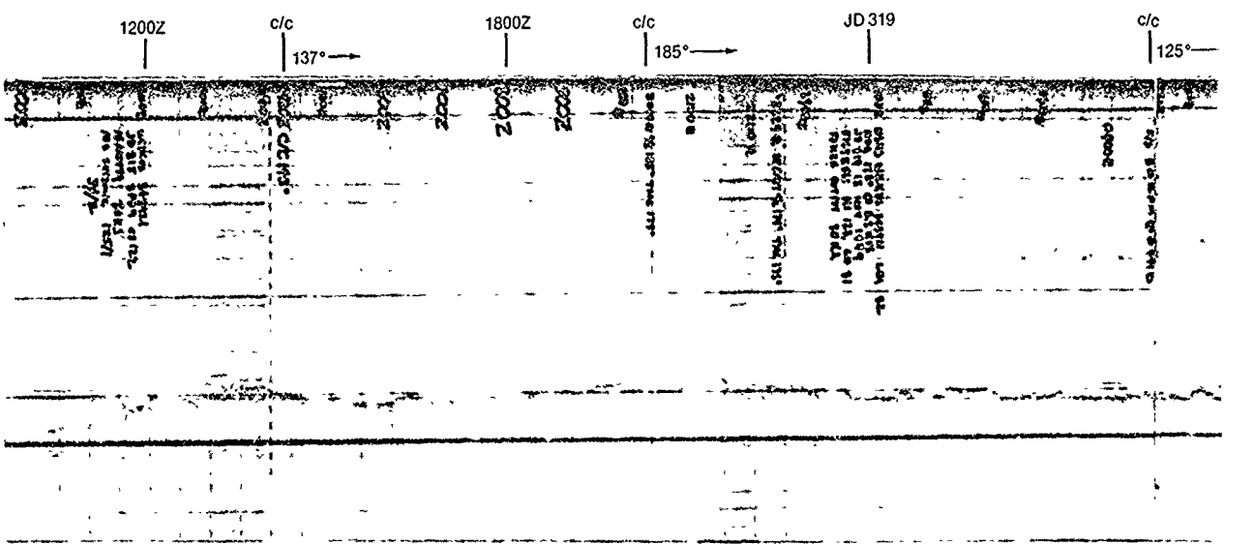
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137°
1800Z
c/c
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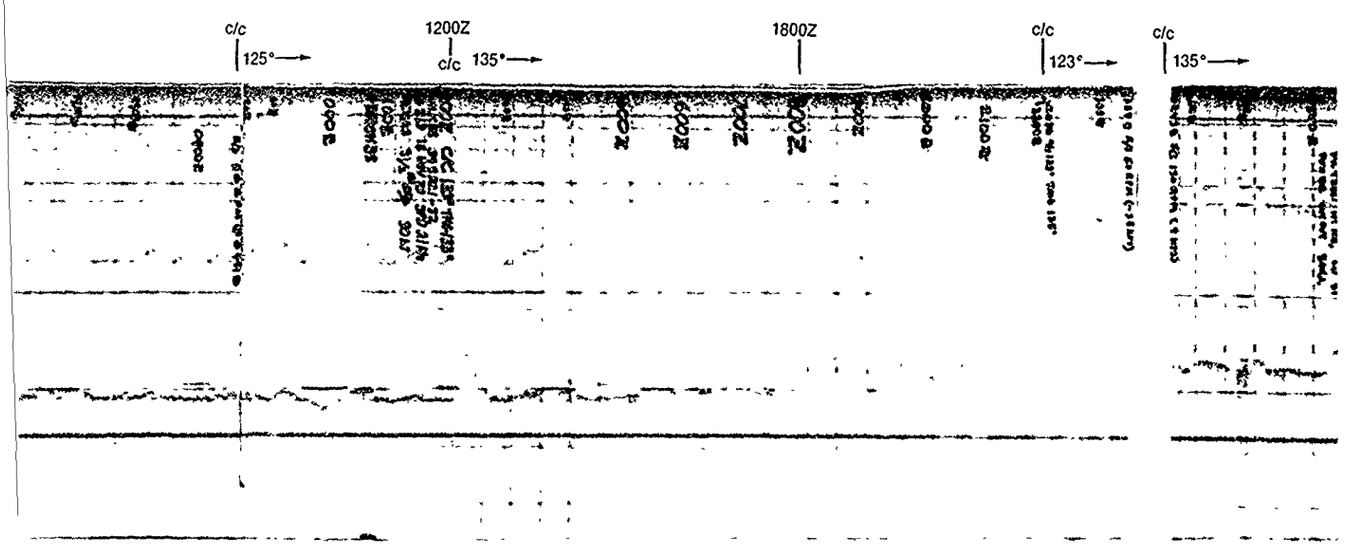
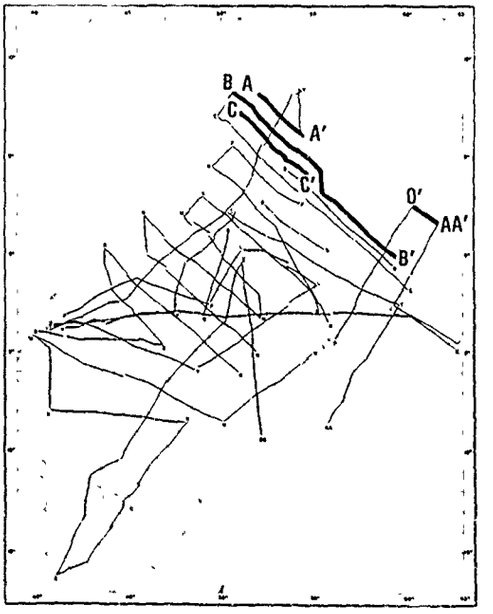
JD 319
c/c
125°

PLATE 1B





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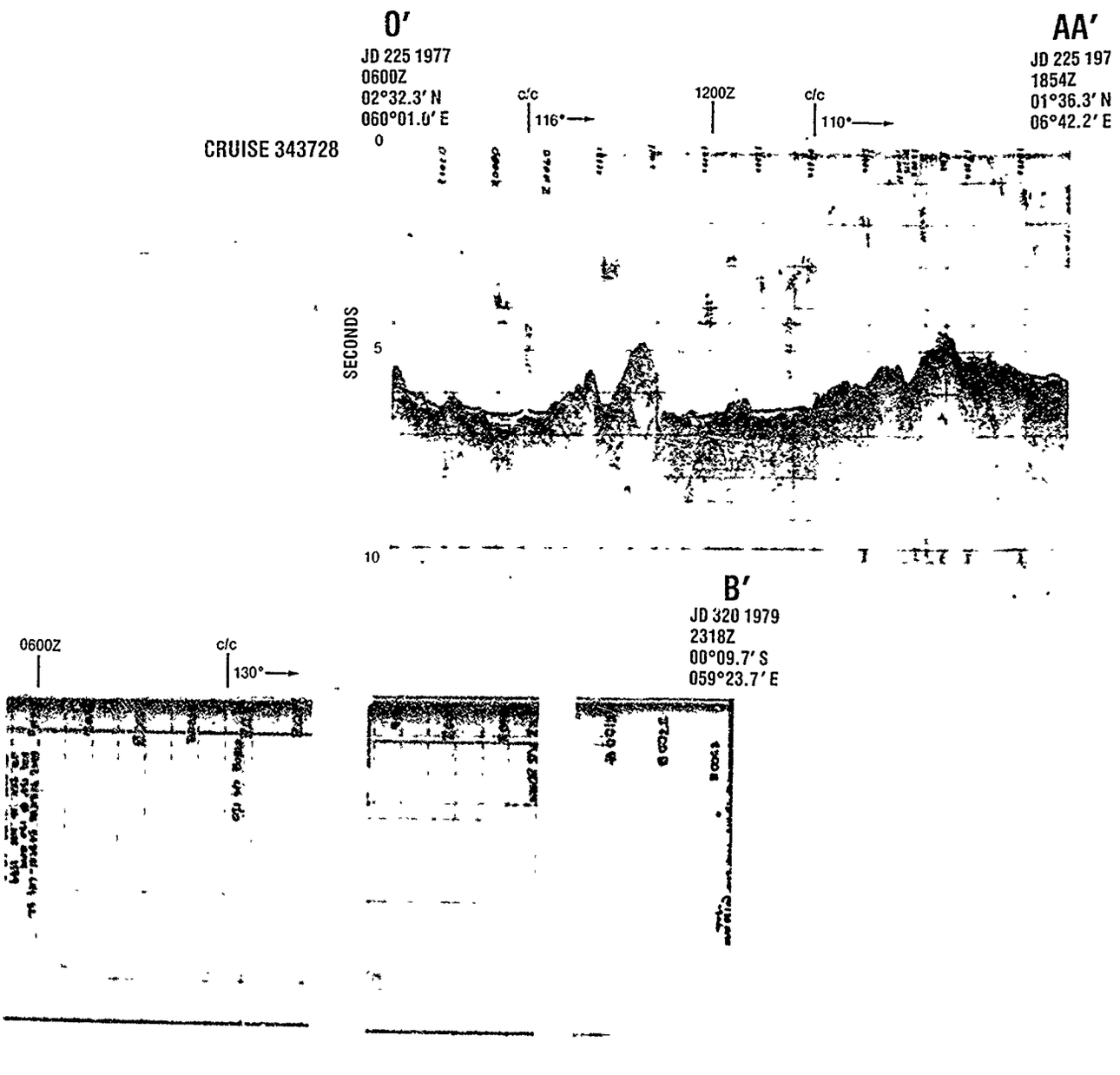
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060°01.0′ E
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116°
1200Z
c/c
110°
AA′
JD 225 197
1854Z
01°36.3′ N
06°42.2′ E
CRUISE 343728
0
SECONDS
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10
B′
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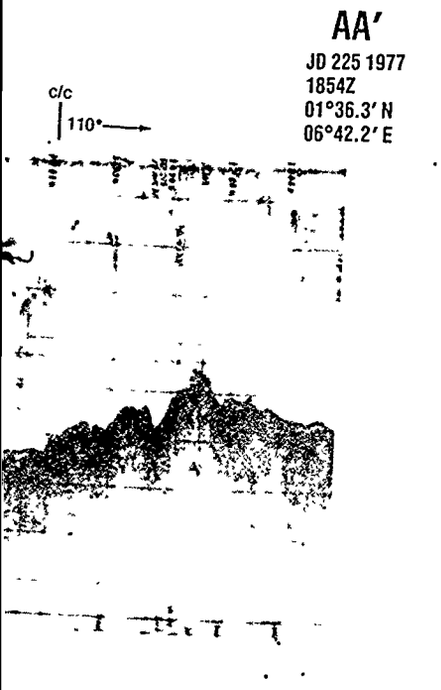
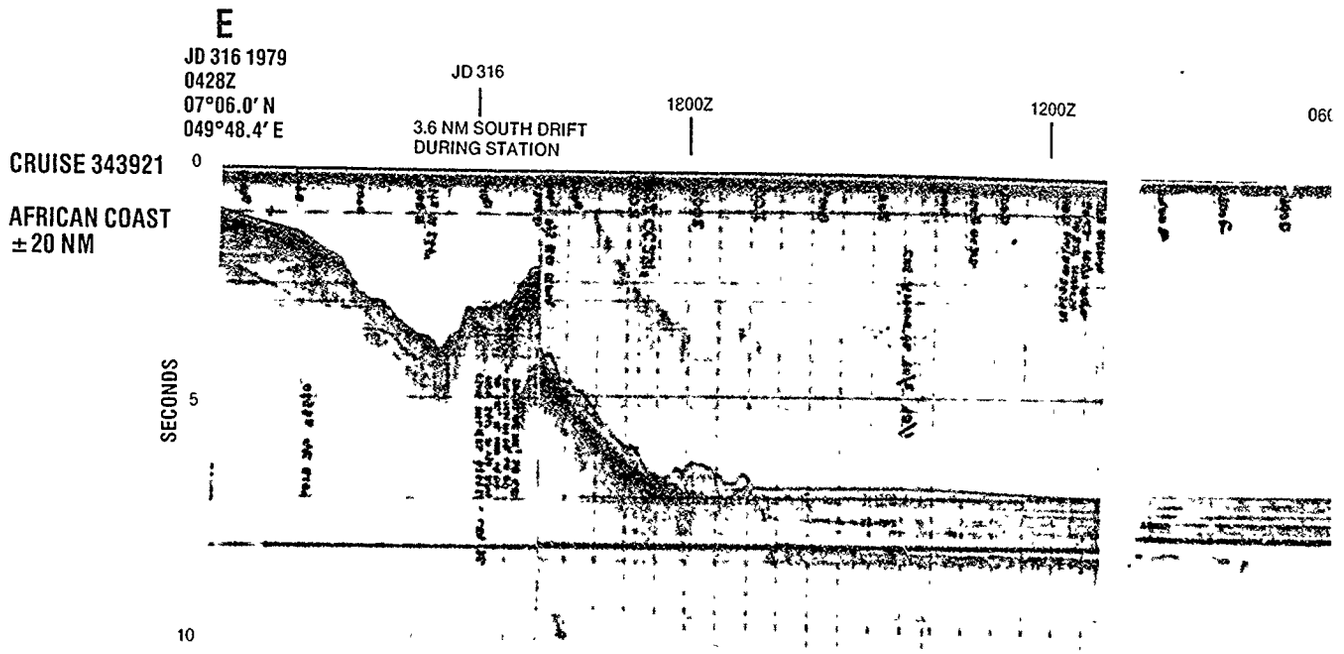
059°23.7′ E
0600Z
c/c
130°

PLATE 1C

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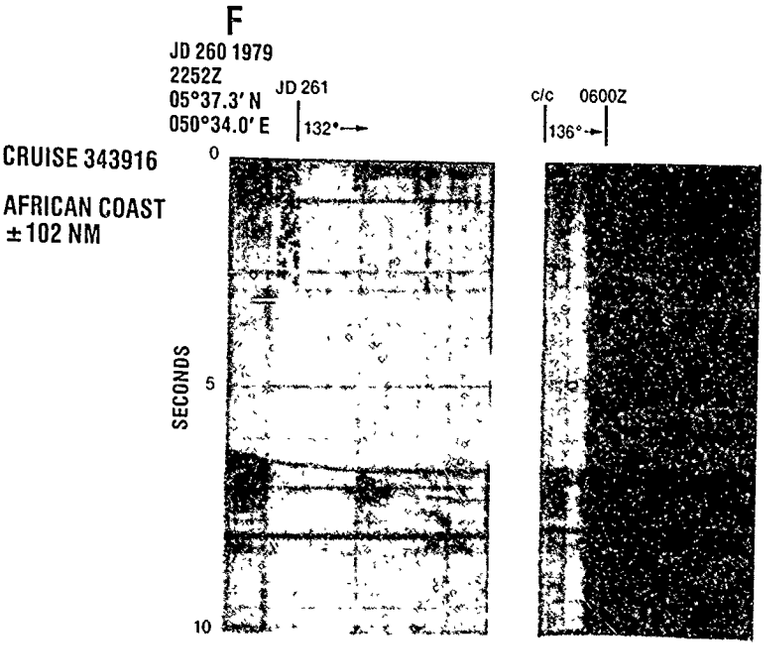
0
SECONDS
5
10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050°34.0′ E
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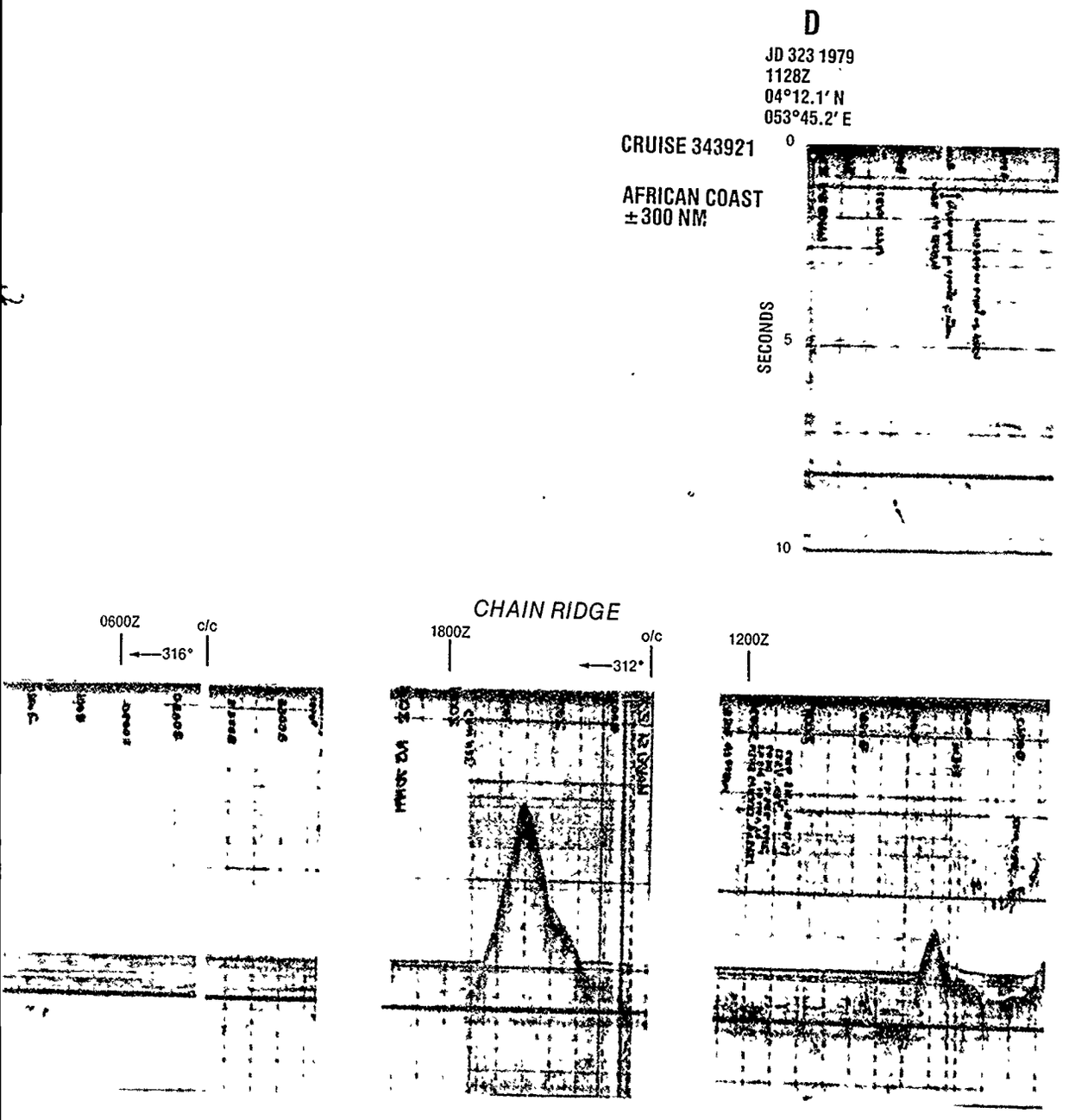
AFRICAN COAST
±102 NM
0
SECONDS
5
10

PLATE 2A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±300 NM
0
SECONDS
5
10
CHAIN RIDGE
0600Z
c/c
316°
1800Z
o/c
312°
1200Z
c/c
140°
1200Z
c/c
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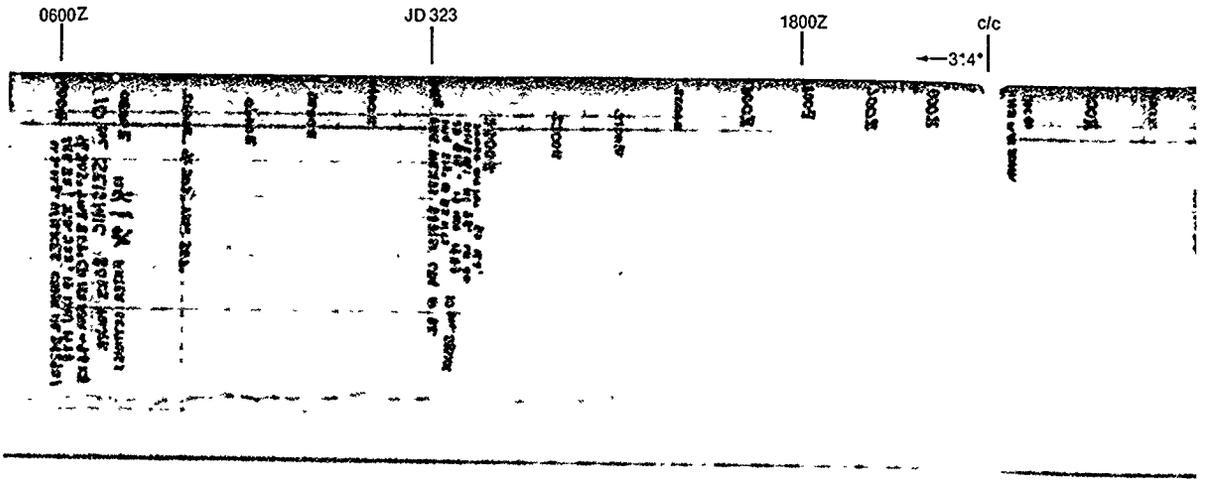
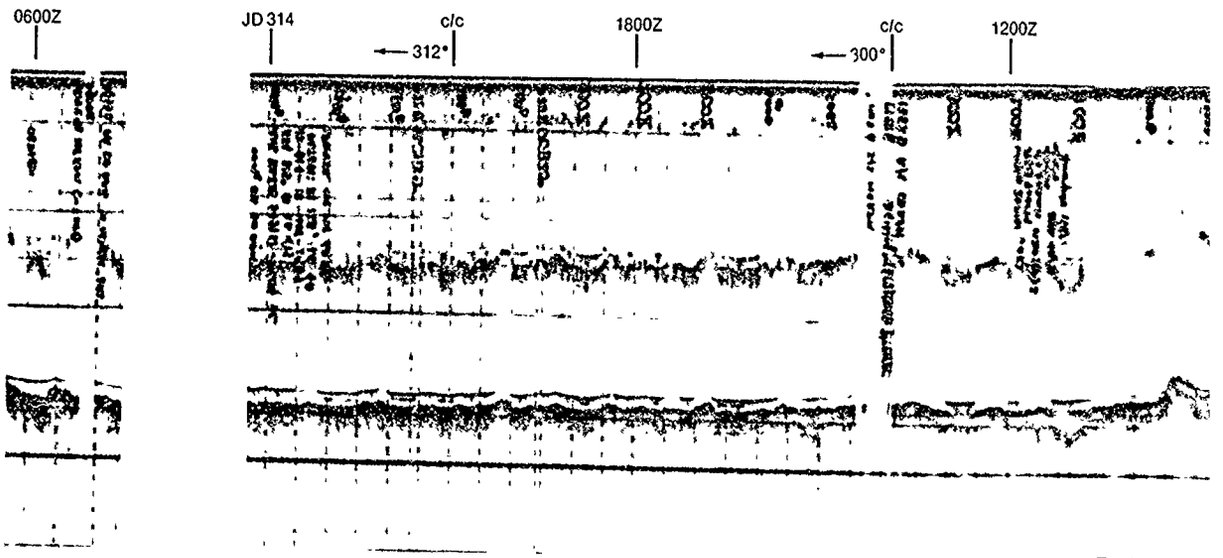
c/c
132°
JD 262
c/c
116°
0600Z





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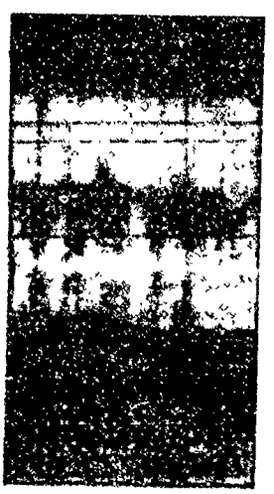

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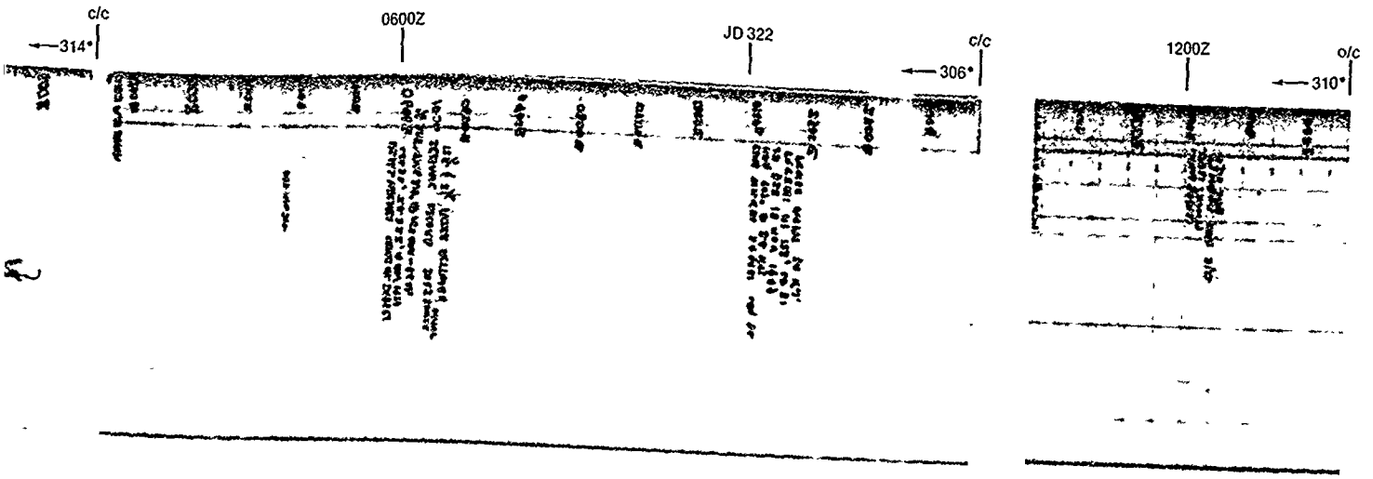

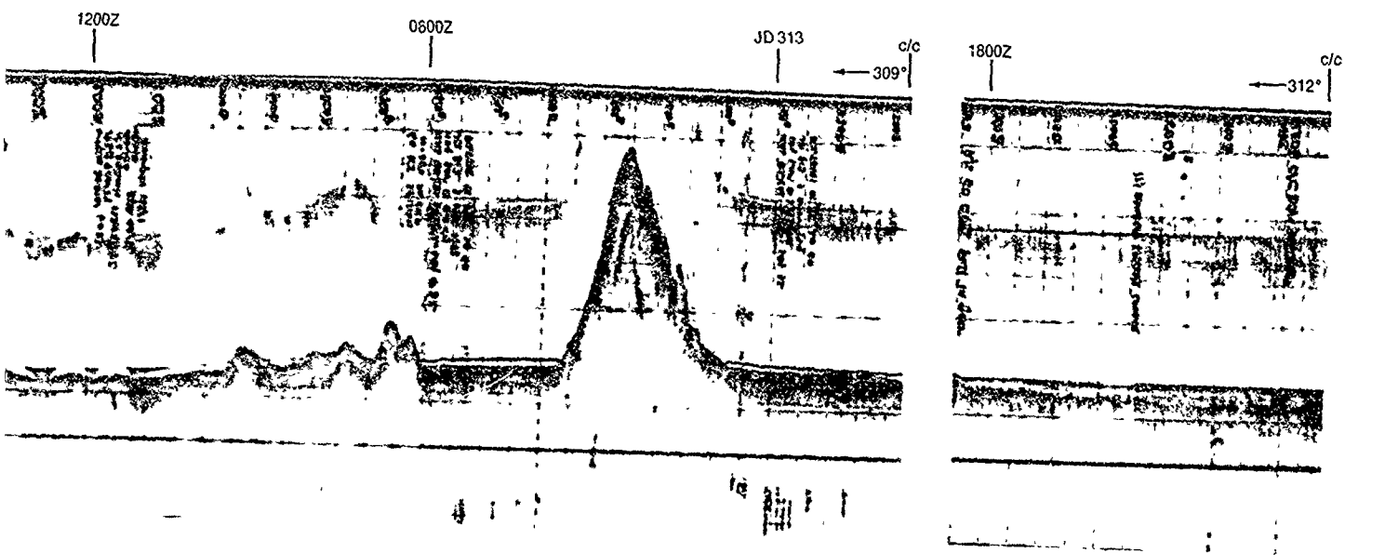

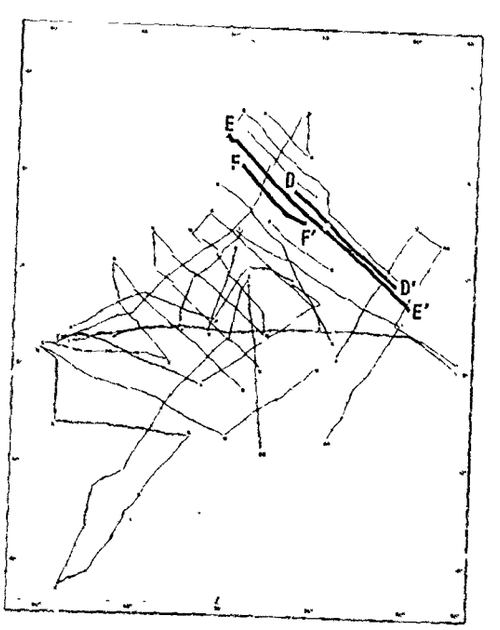

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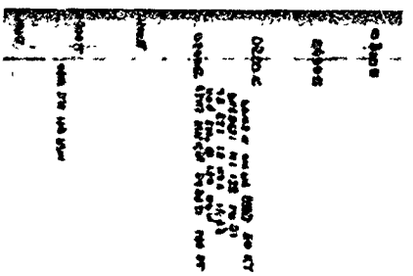
0600Z

←310°



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JD 311 1979
1812Z
01°40.5′ S
059°58.2′ E

1200Z

0600Z

JD 312

←311°

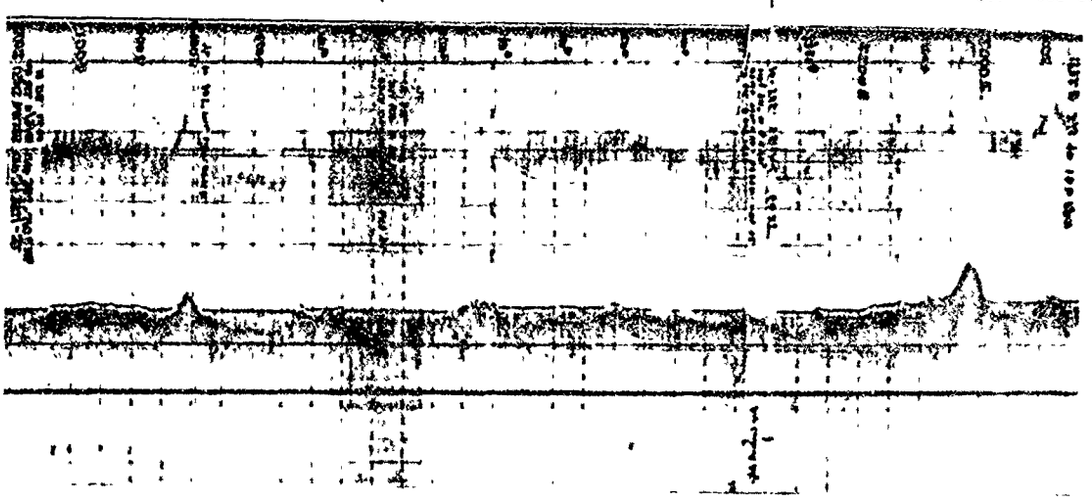
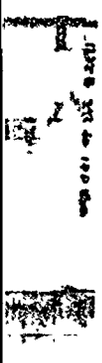


PLATE 2C

E′

JD 311 1979
1812Z
01°40.5′ S
11° 059°58.2′ E

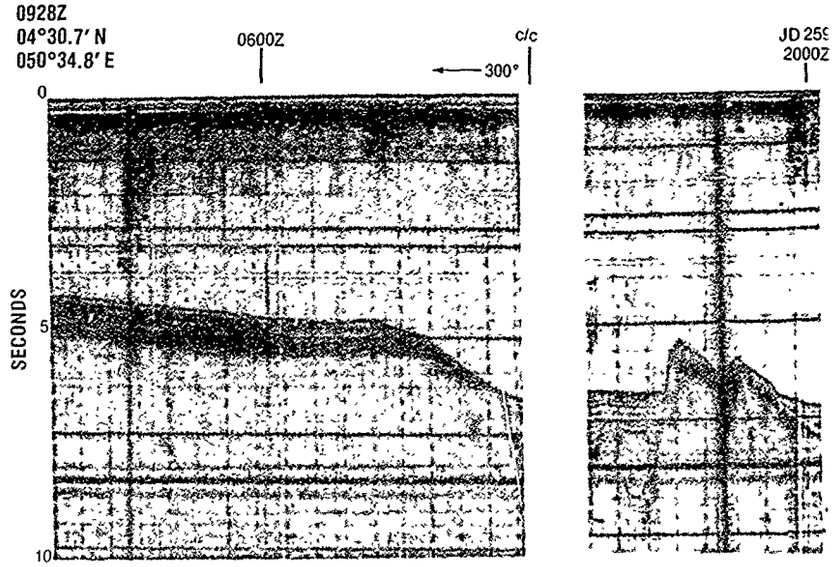


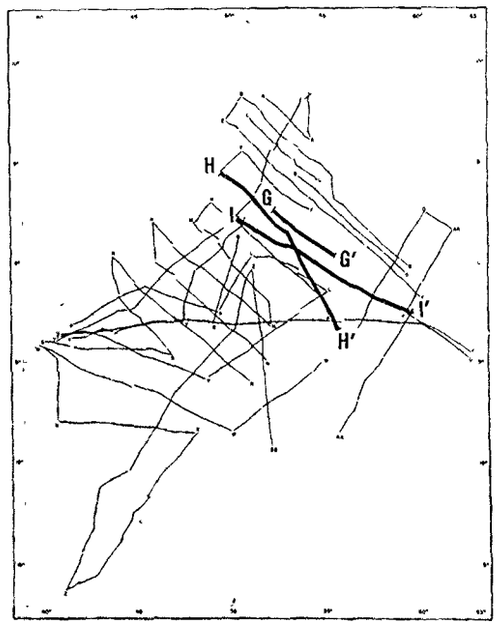
H

JD 260 1979
0928Z
04°30.7′ N
050°34.8′ E

CRUISE 343916

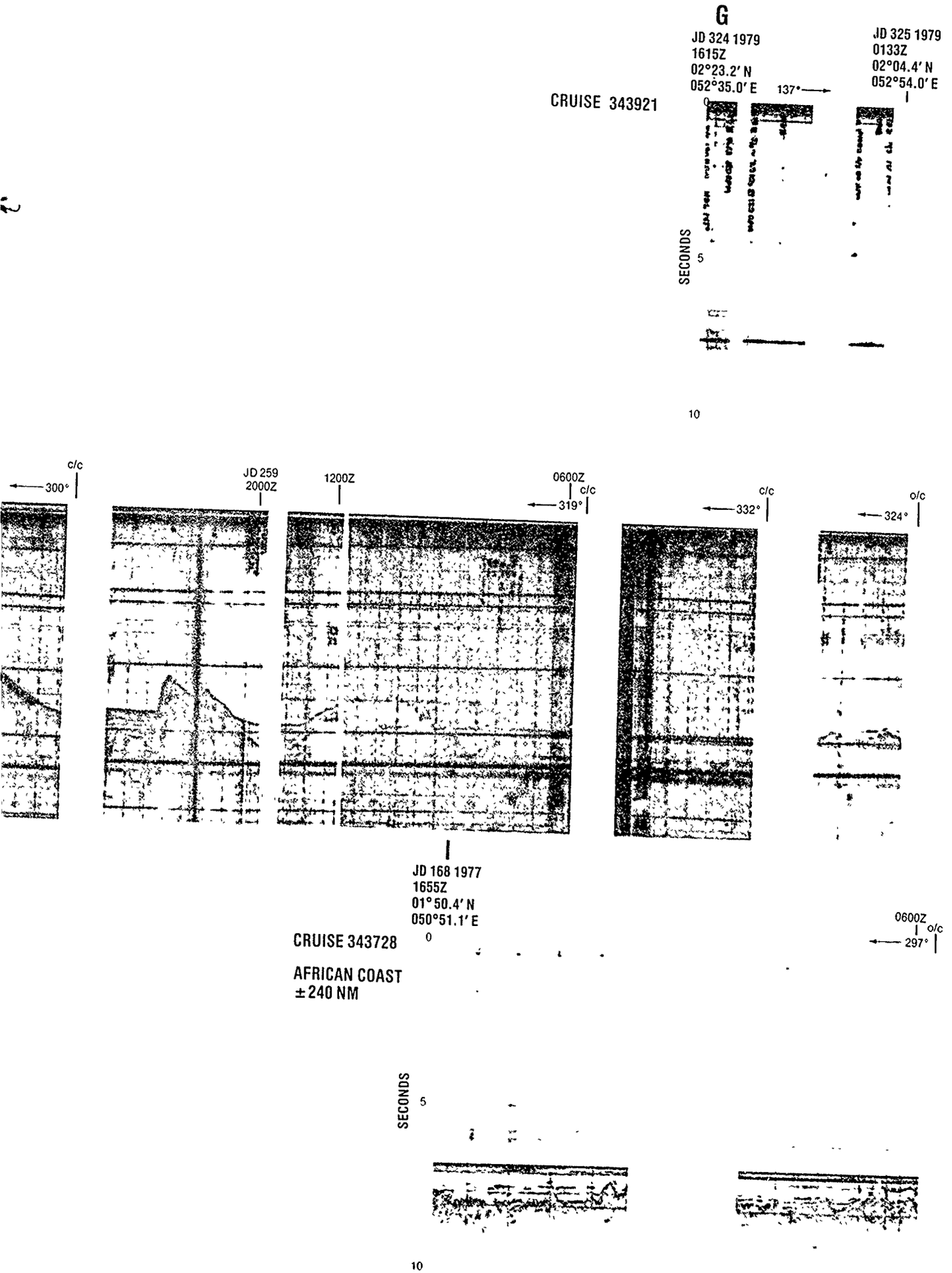
AFRICAN COAST
±80 NM





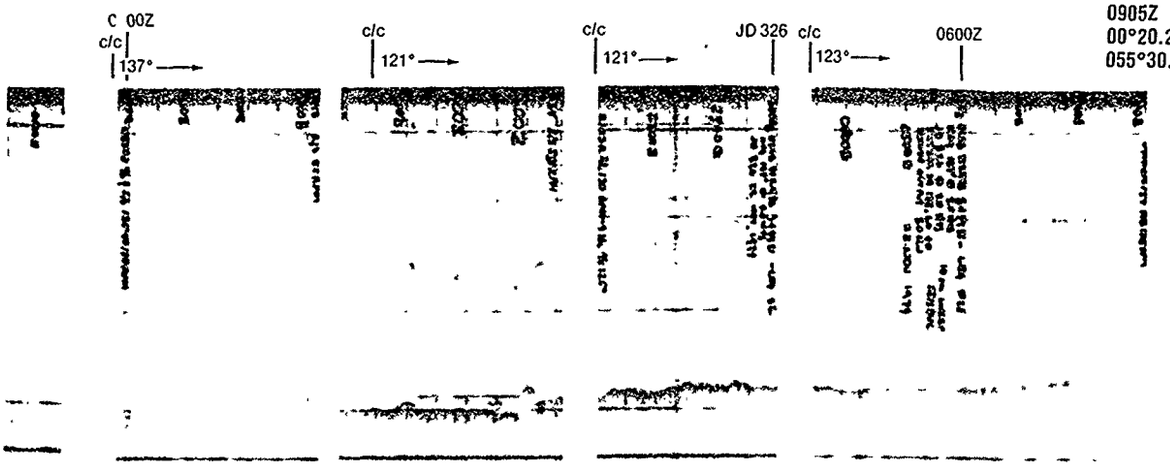
INDEX CHART (PLATES 3A, 3B, 3C)

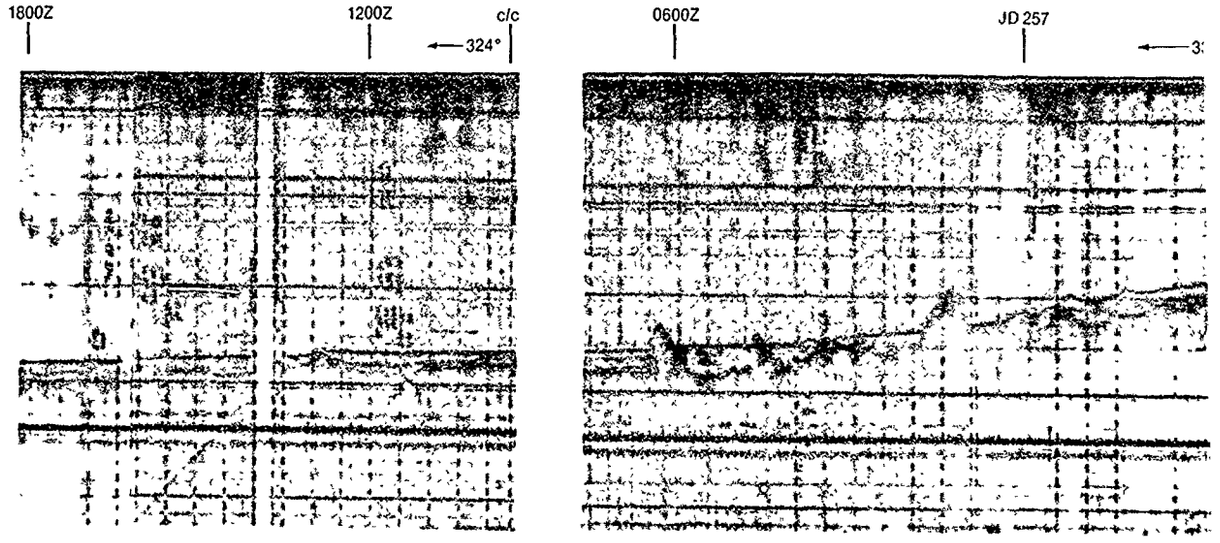
PLATE 3A


G
JD 324 1979
1615Z
02°23.2′ N
052°35.0′ E
137°
JD 325 1979
0133Z
02°04.4′ N
052°54.0′ E
CRUISE 343921
SECONDS
0
5
10
c/c
300°
JD 259
2000Z
1200Z
0600Z
c/c
319°
c/c
332°
o/c
324°
JD 168 1977
1655Z
01°50.4′ N
050°51.1′ E
0600Z
o/c
297°
CRUISE 343728
AFRICAN COAST
±240 NM
SECONDS
5
10

G′

JD 326 19
0905Z
00°20.2′ N
055°30.8′





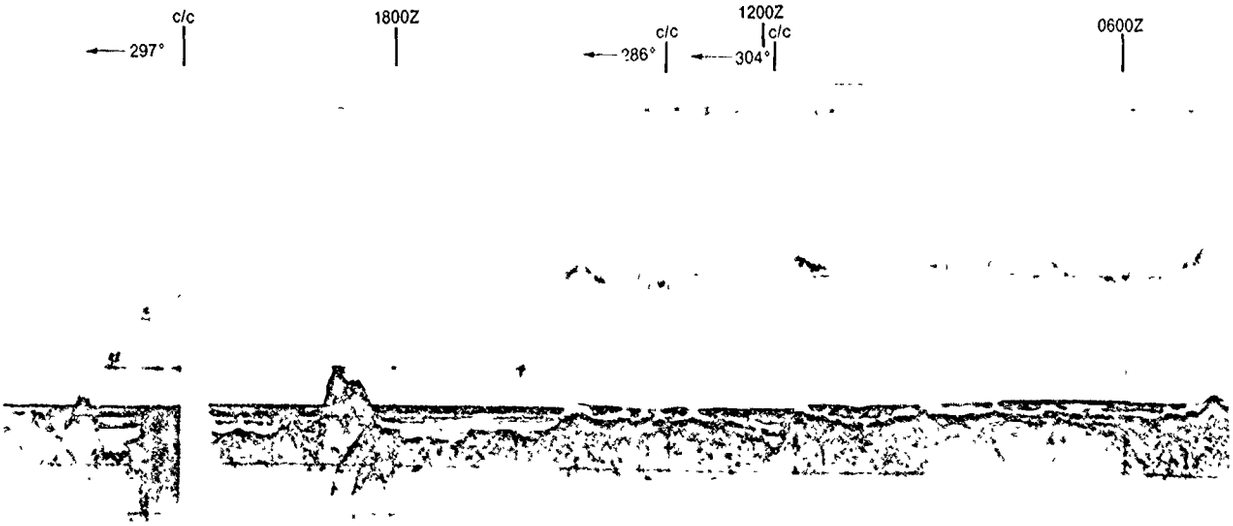
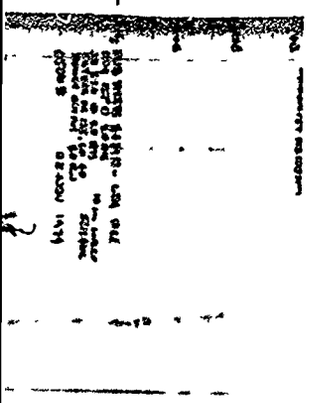


PLATE 3B

G′

JD 326 1979
0905Z
00°20.2′ N
055°30.8′ E

0600Z

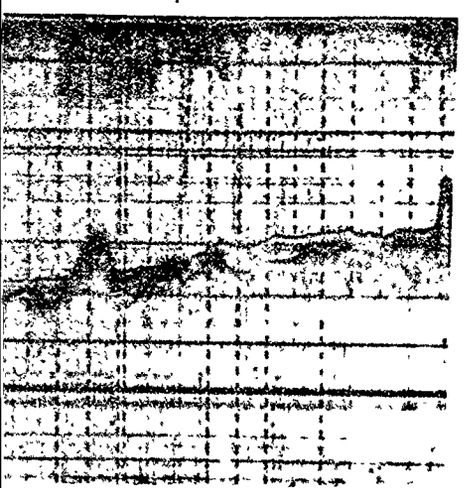


H′

JD 256 1979
1815Z
03°17.1′ S
055°38.9′ E

JD 257

331°



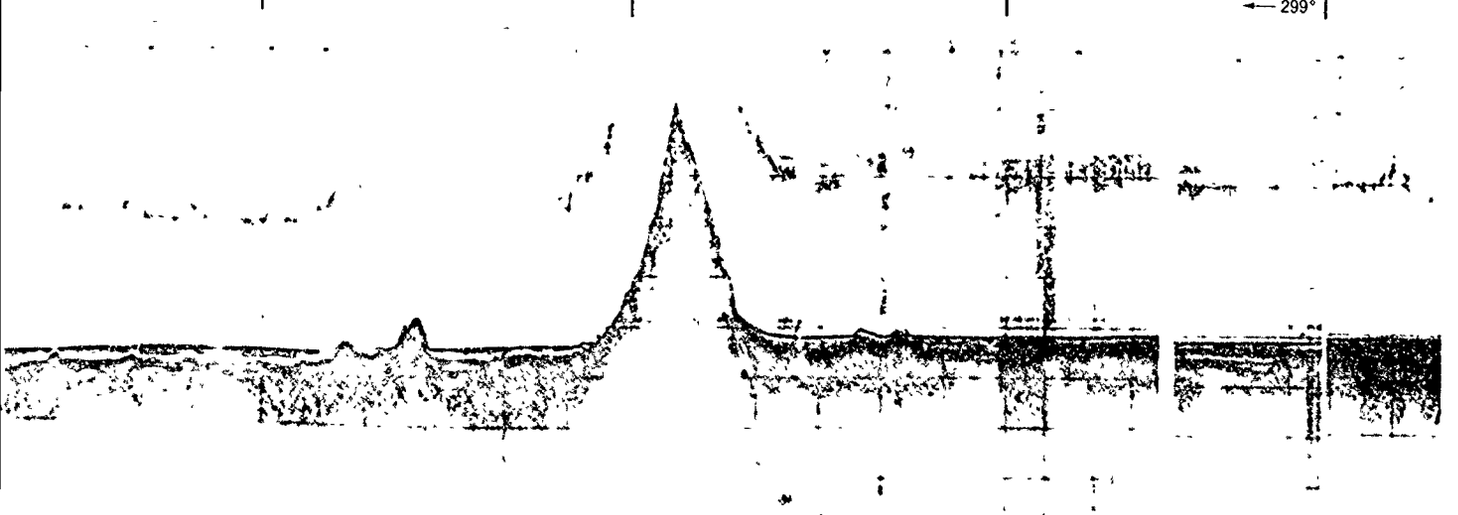
0600Z

JD 167

1800Z

c/c

299°



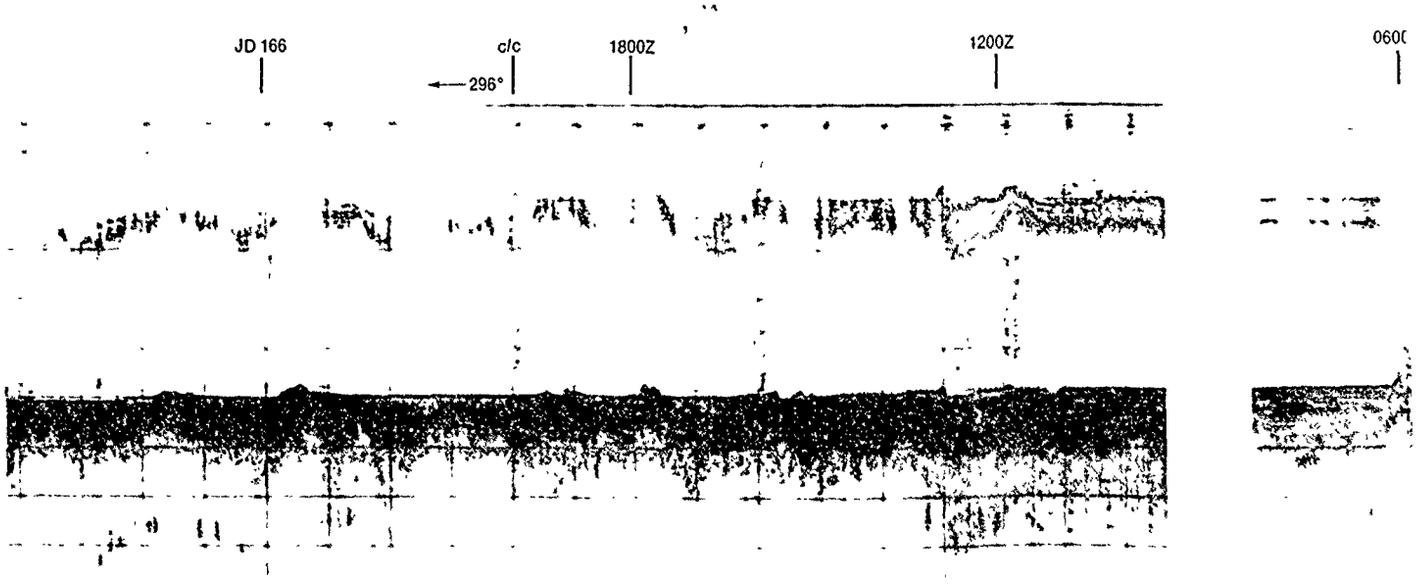

JD 166
c/c
296°
1800Z
1200Z
0600

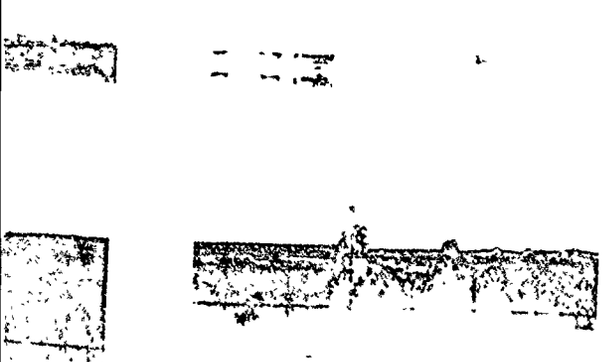
PLATE 3C

I′

JD 165 1977
0200Z
02°33.2 S
059°32.3′ E

0600Z

292°

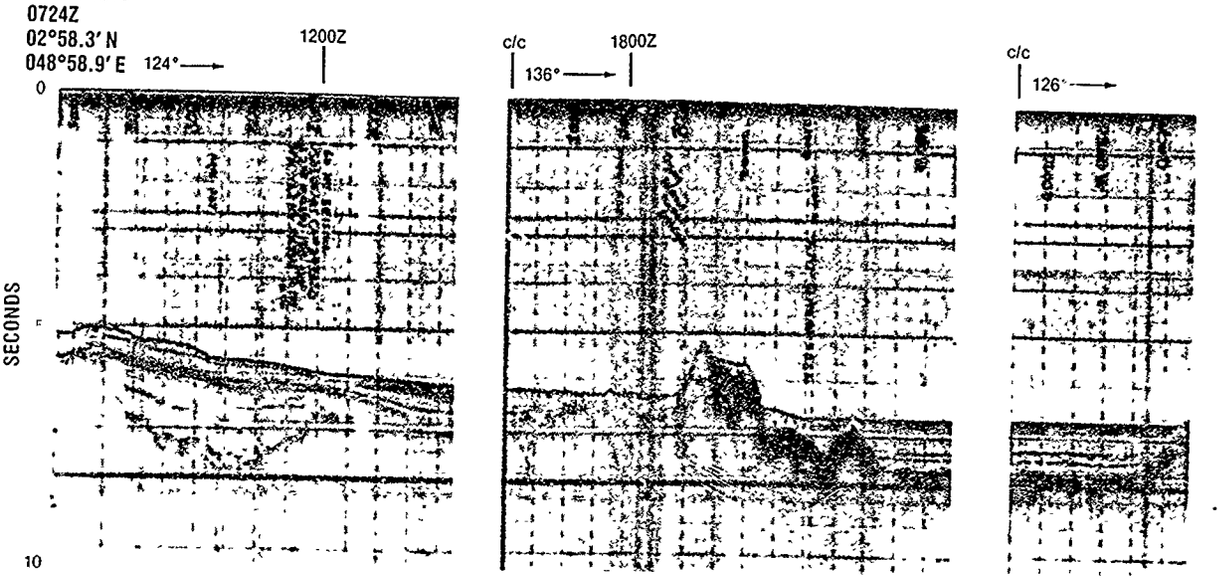


K

JD 298 1979
0724Z
02°58.3′ N
048°58.9′ E

CRUISE 343920

AFRICAN COAST
±100 NM



M

JD 297 1979
1250Z
01°58.1′ N
048°00.8′ E

CRUISE 343920

AFRICAN COAST
±105 NM

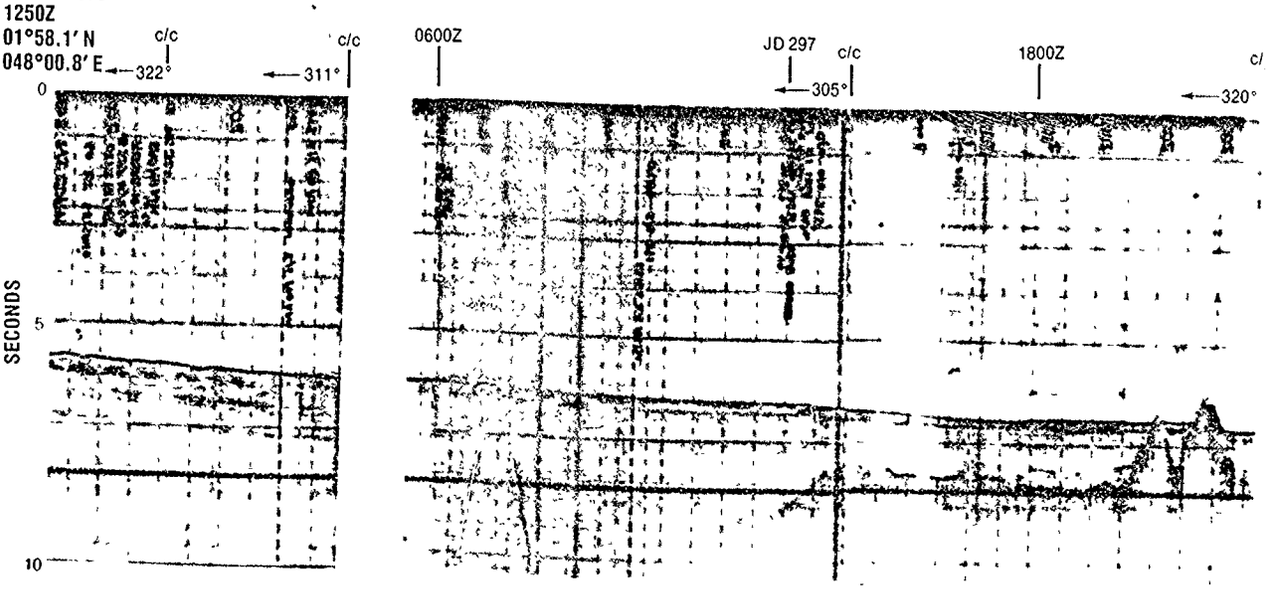
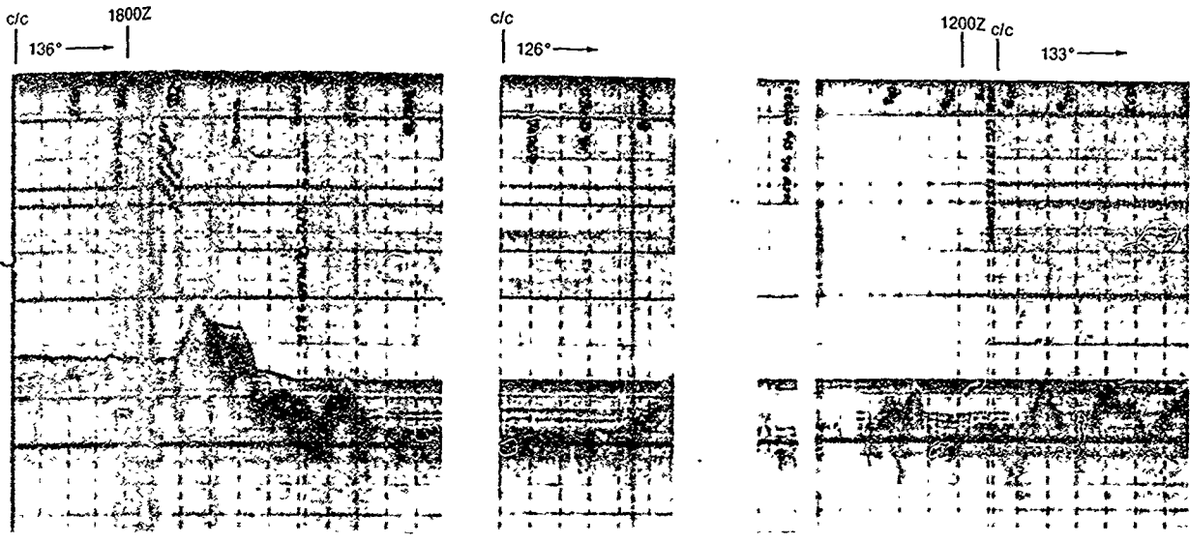


PLATE 4A

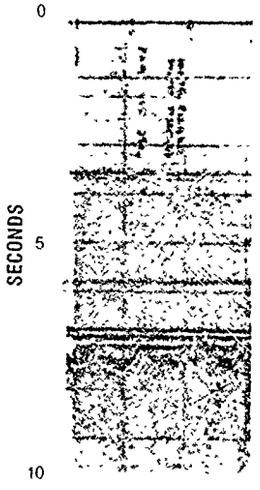


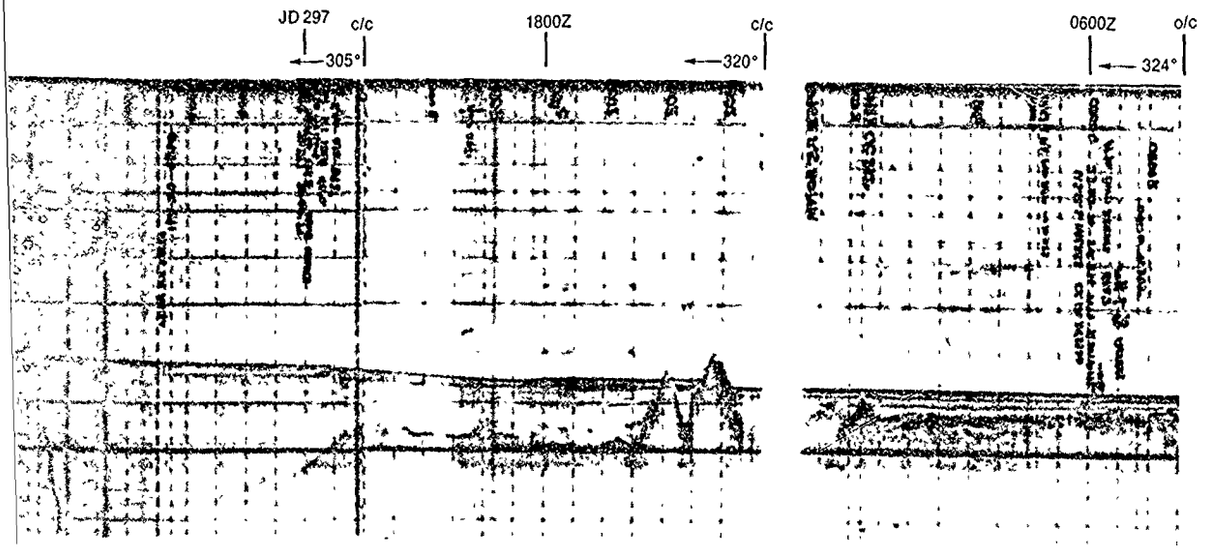
L

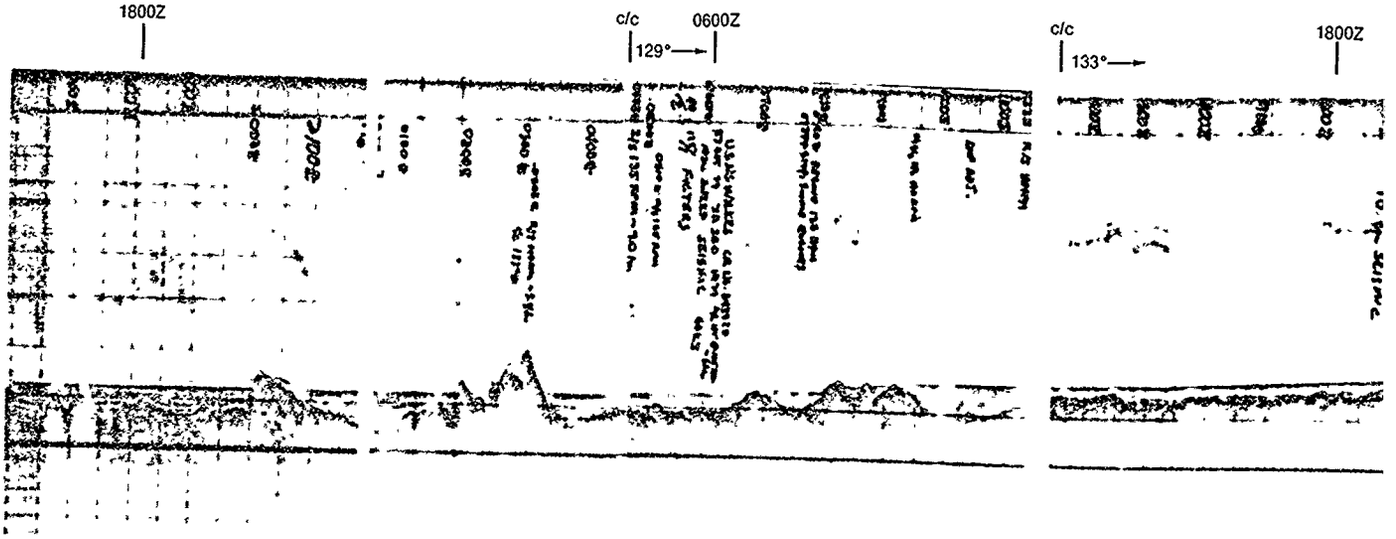
JD 202 1977
2148 Z
00°17.2N
051°15.4' E

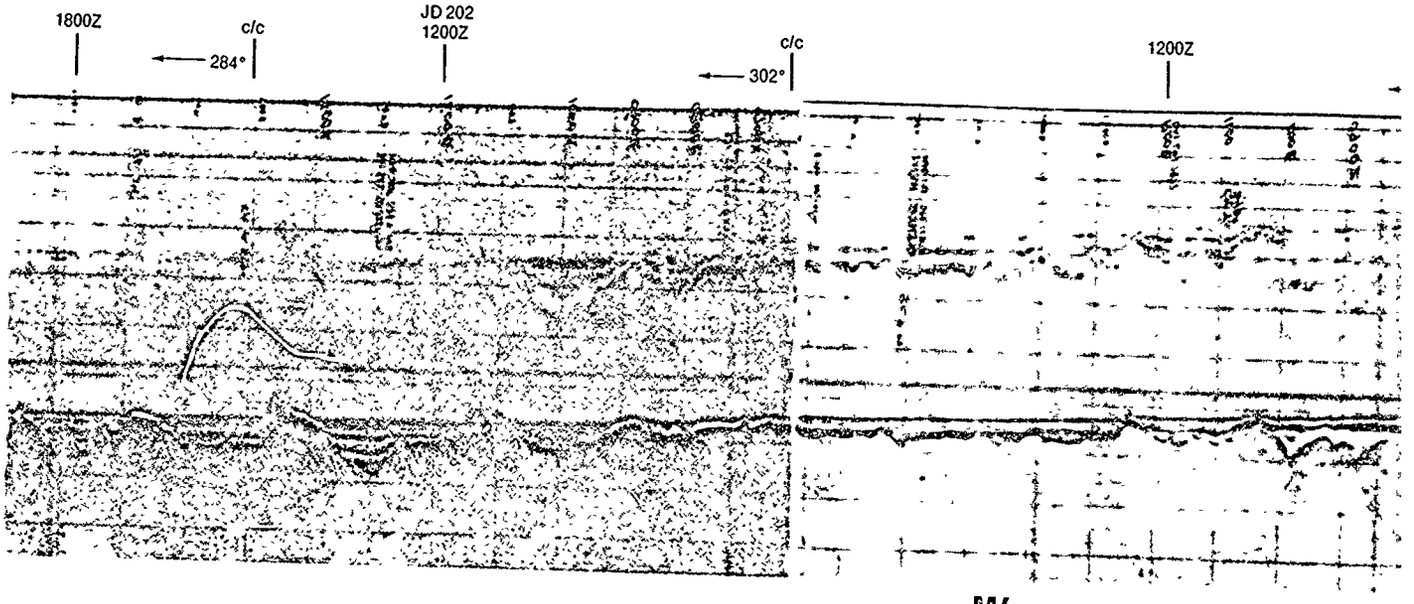
CRUISE 343728

AFRICAN COAST
±320 NM









M′
JD 295 1979
1220Z
03°07.8′ S
052°07.3′ E

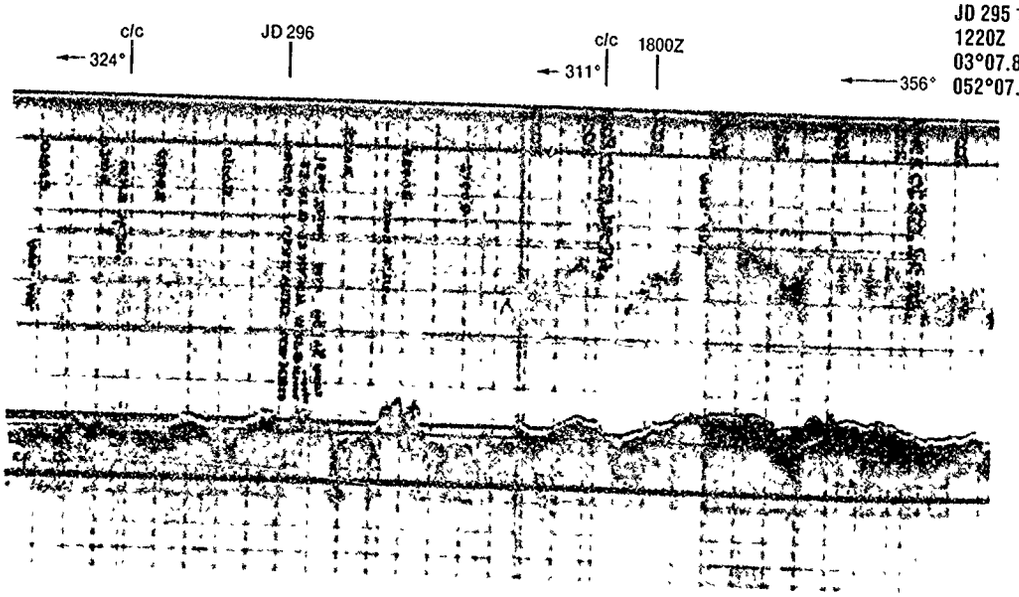
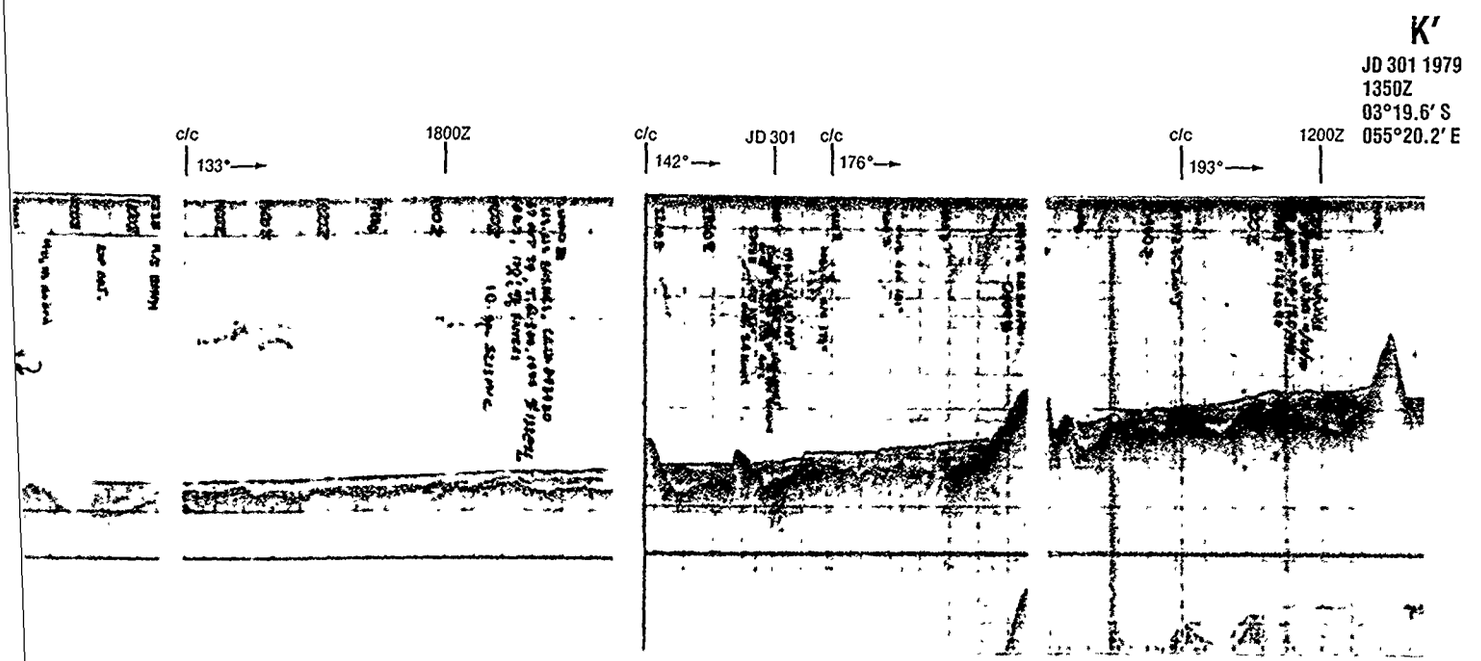
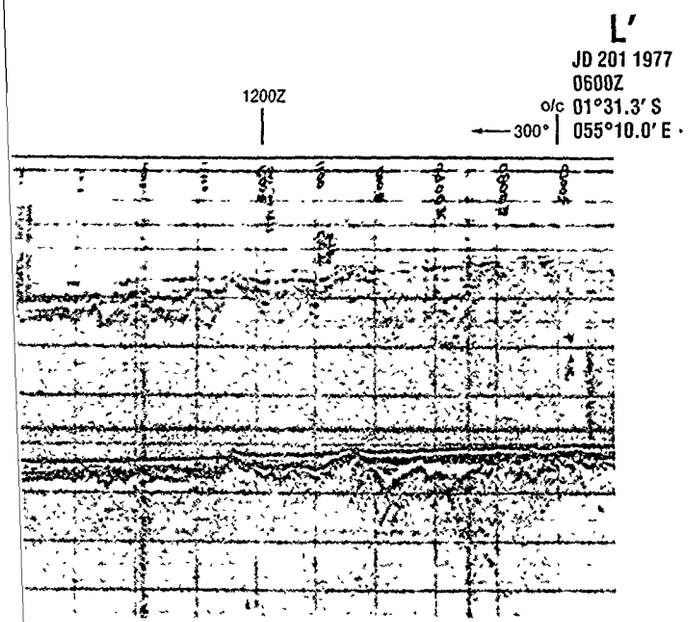
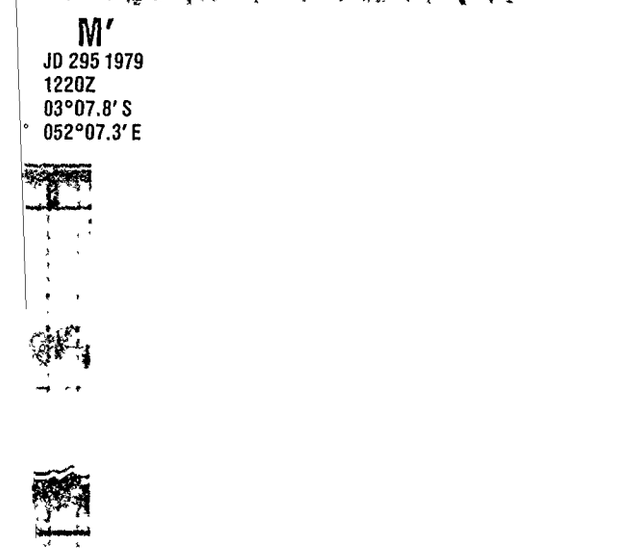
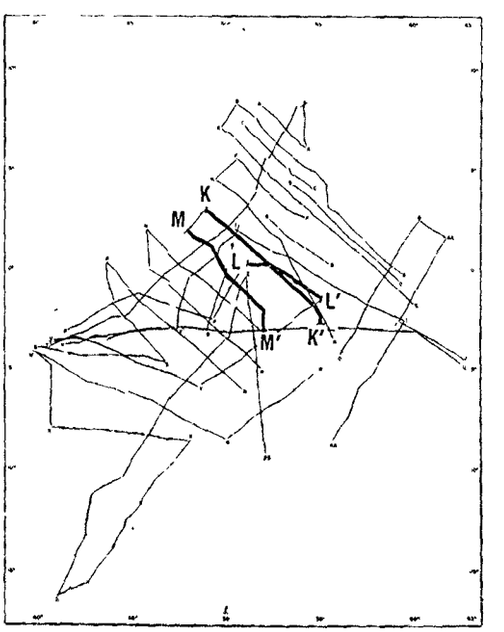


PLATE 4B









INDEX CHART (PLATES 4A, 4B)

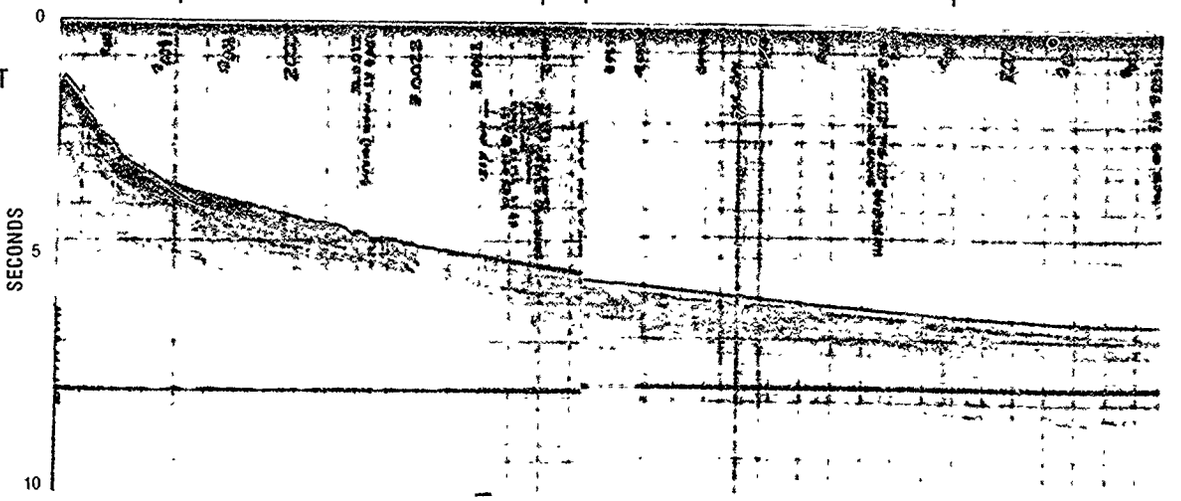
N

JD 292 1979
1603Z
02°01.9′ N
045°48.6′ E

1800Z
133°
JD 293 c/c
120°
1200Z

CRUISE 343920

AFRICAN COAST
±12 NM



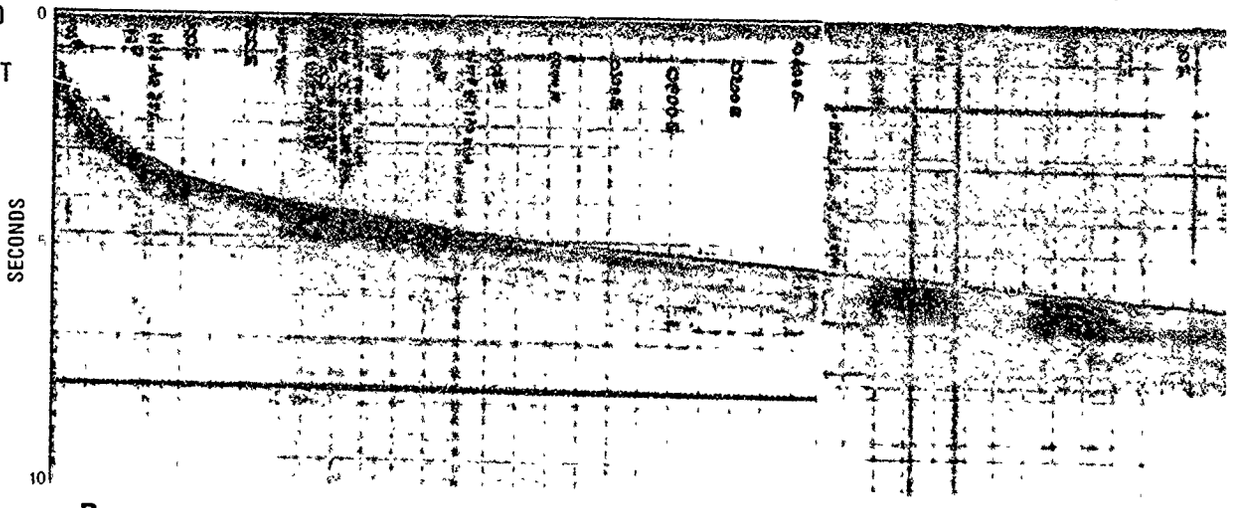
N

JD 292 1979
1603Z
02°01.9′ N
045°48.6′ E

1200Z
0600Z
c/c
350°
1800Z

CRUISE 343920

AFRICAN COAST
±12 NM



R

JD 286 1979
0233Z
00°19.8′ N
043°43.7′ E

0600Z
139°
1200Z
JD 287
c/c
29°

CRUISE 343920

AFRICAN COAST
±18 NM

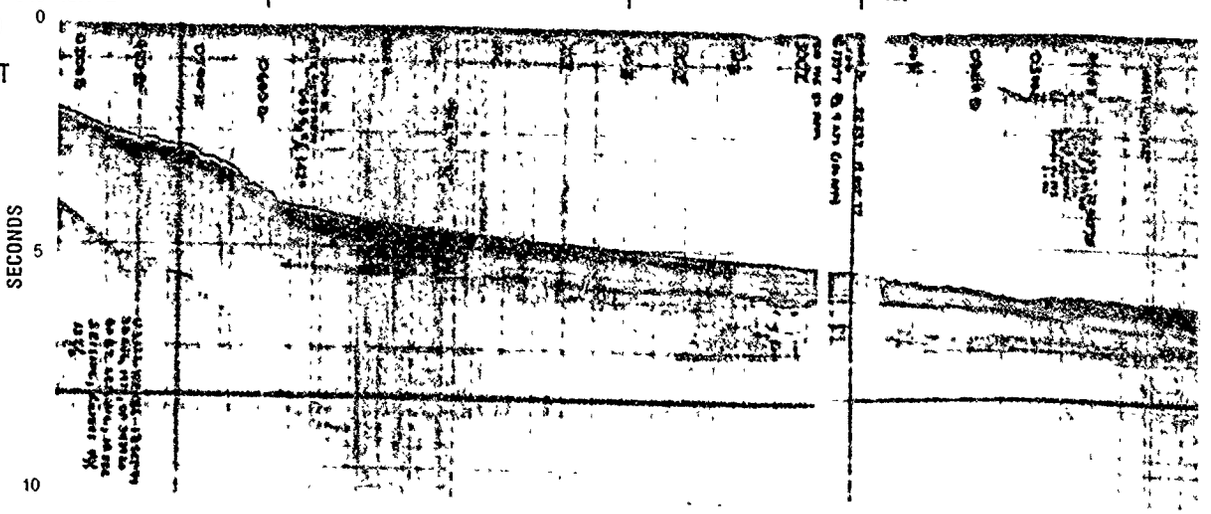
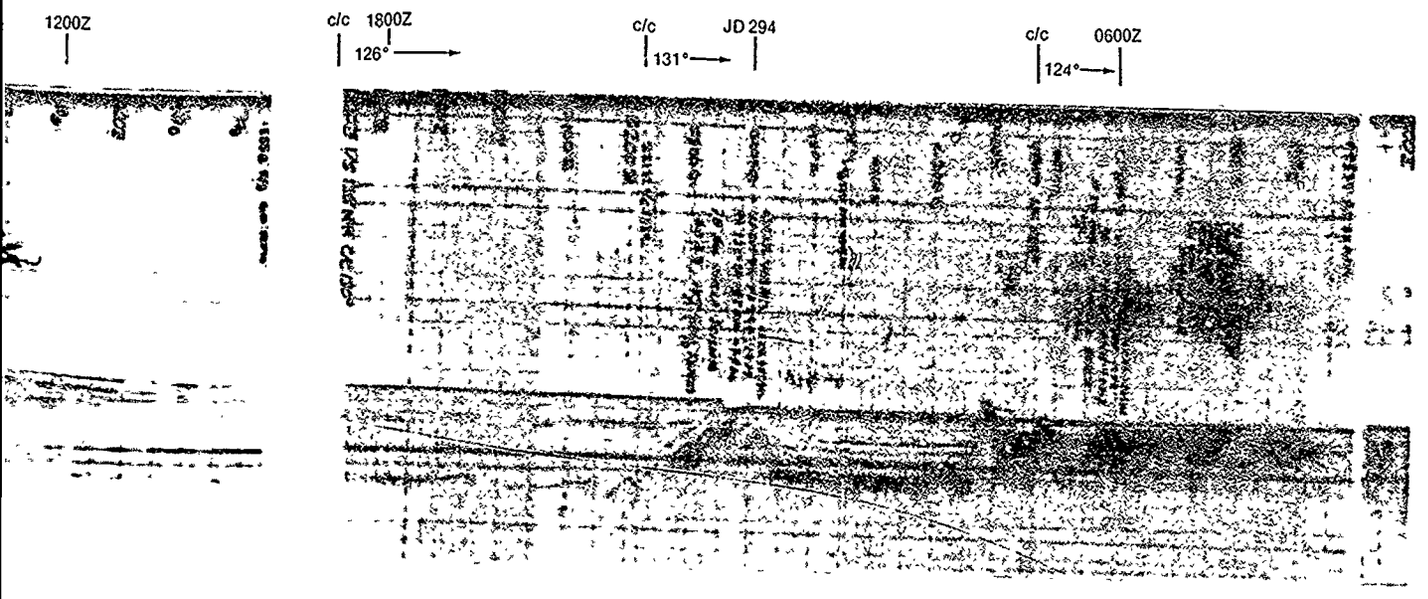
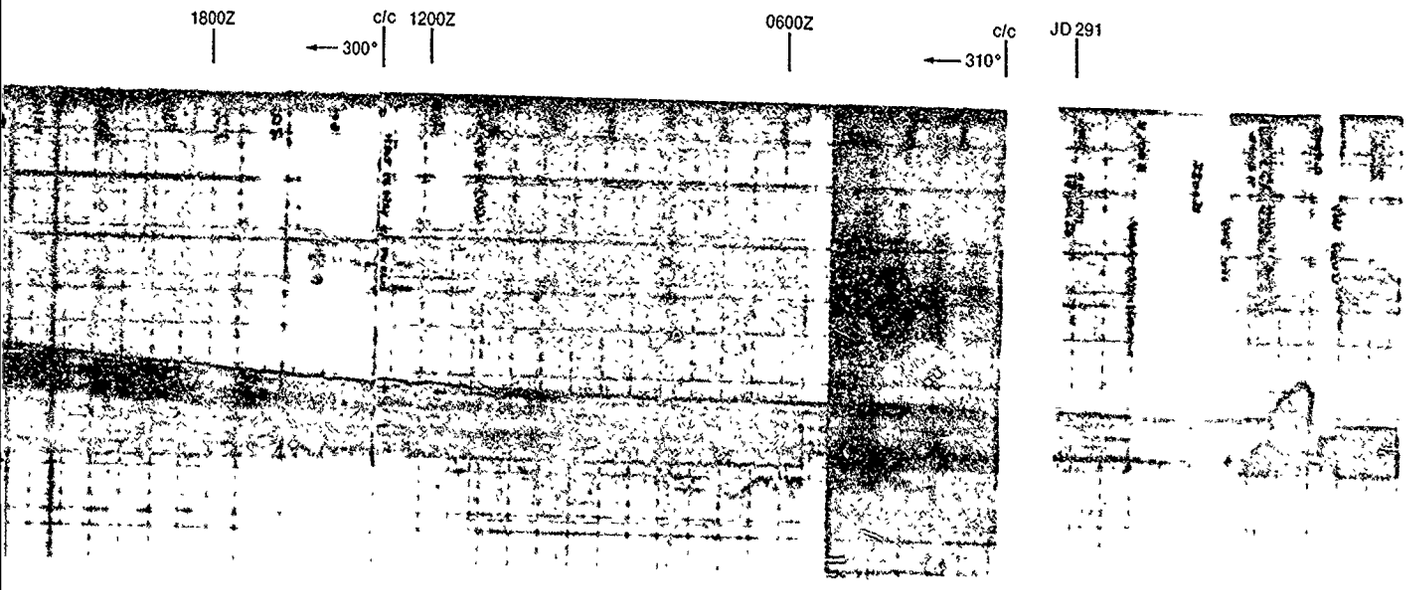
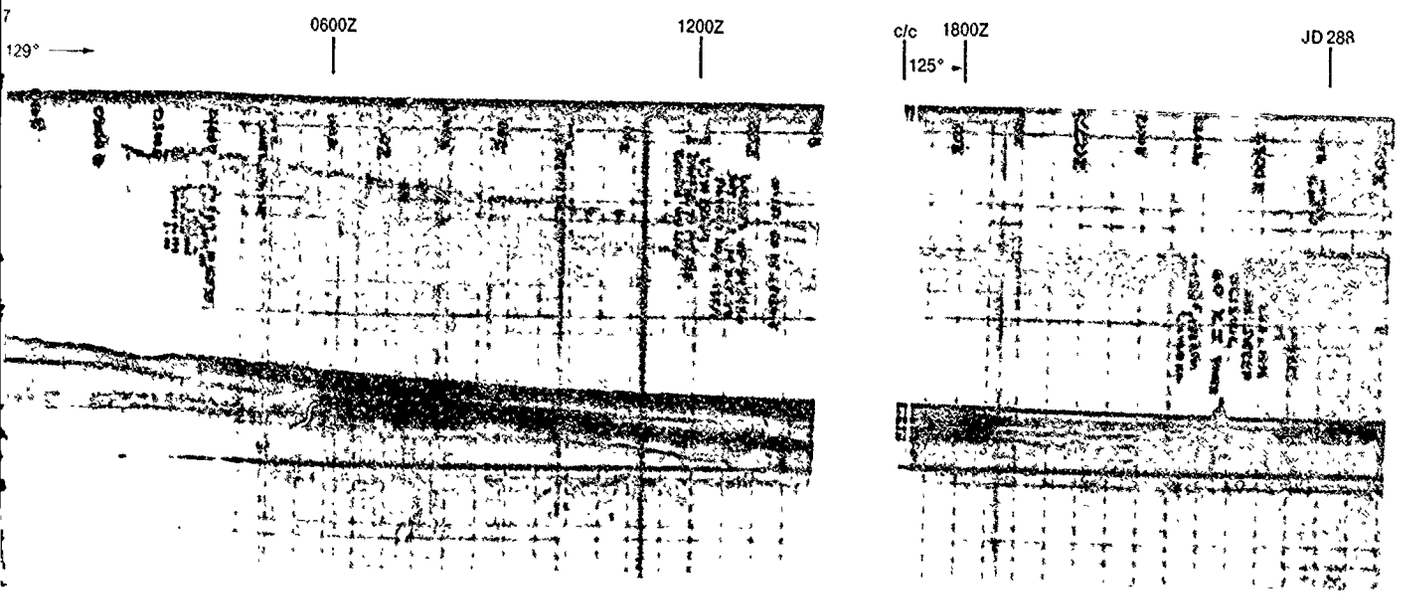


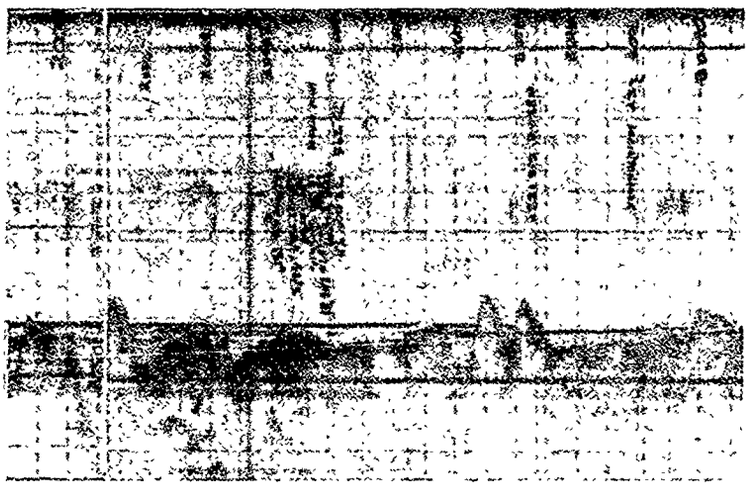
PLATE 5A

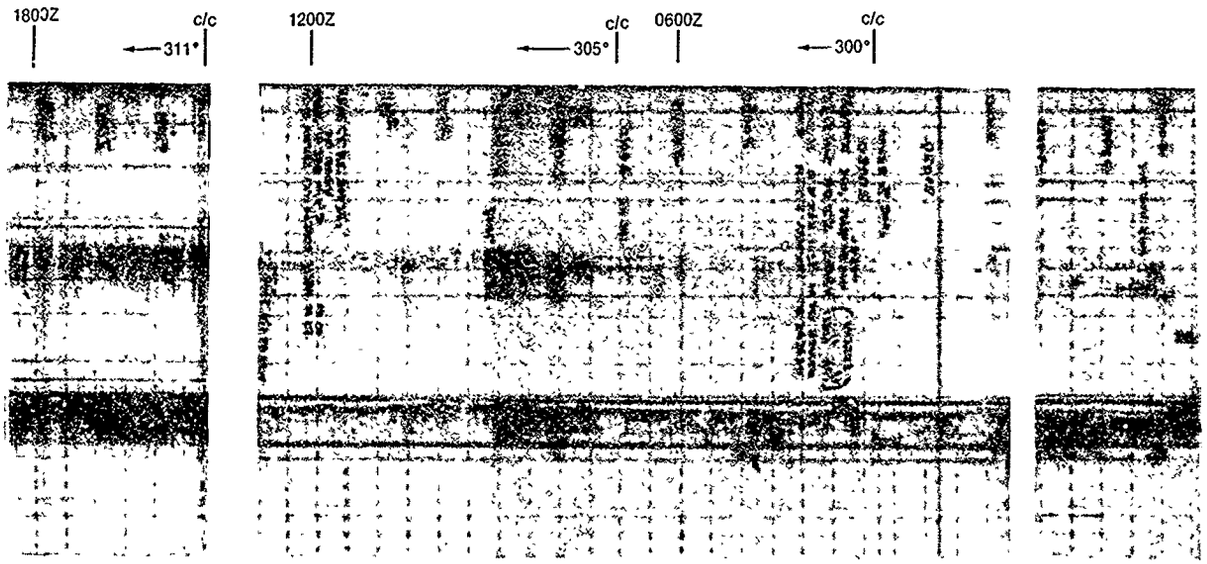

1200Z
c/c 1800Z
126°
c/c
131°
JD 294
c/c 0600Z
124°


1800Z
c/c 1200Z
300°
0600Z
c/c
310°
JD 291


129°
0600Z
1200Z
c/c 1800Z
125°
JD 288

M′
JD 295 1979
0644Z
03°12.9′ S
052°05.6′ E





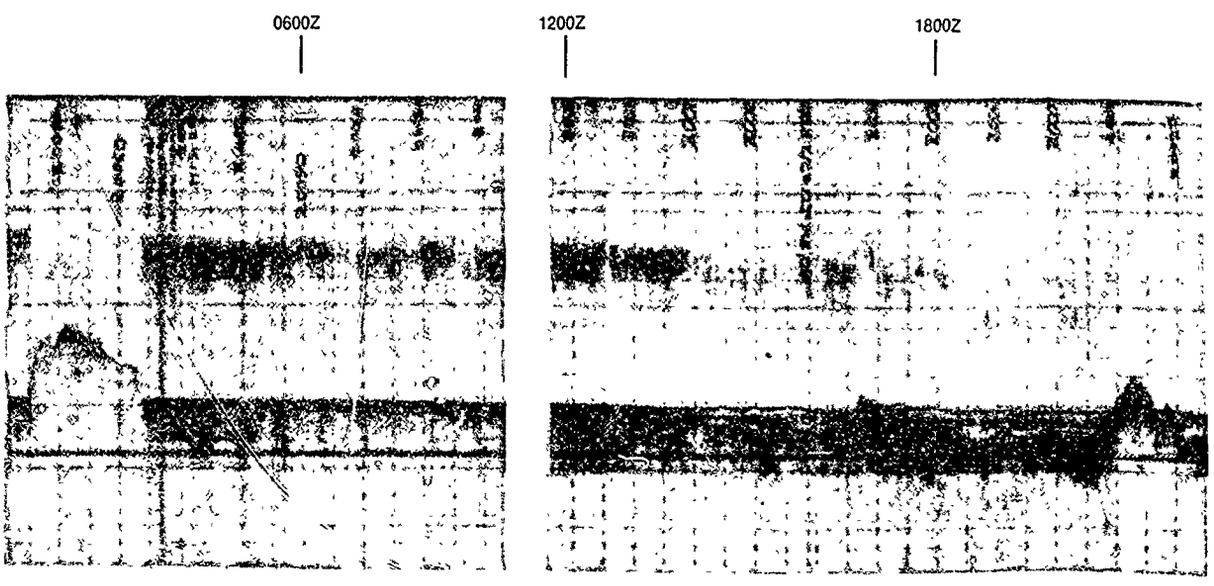
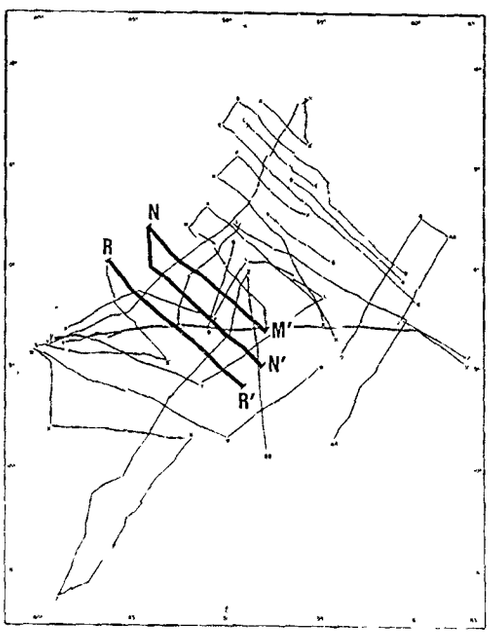


PLATE 5B



INDEX CHART (PLATES 5A, 5B)

N′
JD 289 1979
1505Z
04°56.5′ S
051°56.0′ E

1800Z
312°

R′
JD 289 1979
0230Z
05°58.3′ S
050°57.8′ E

1800Z

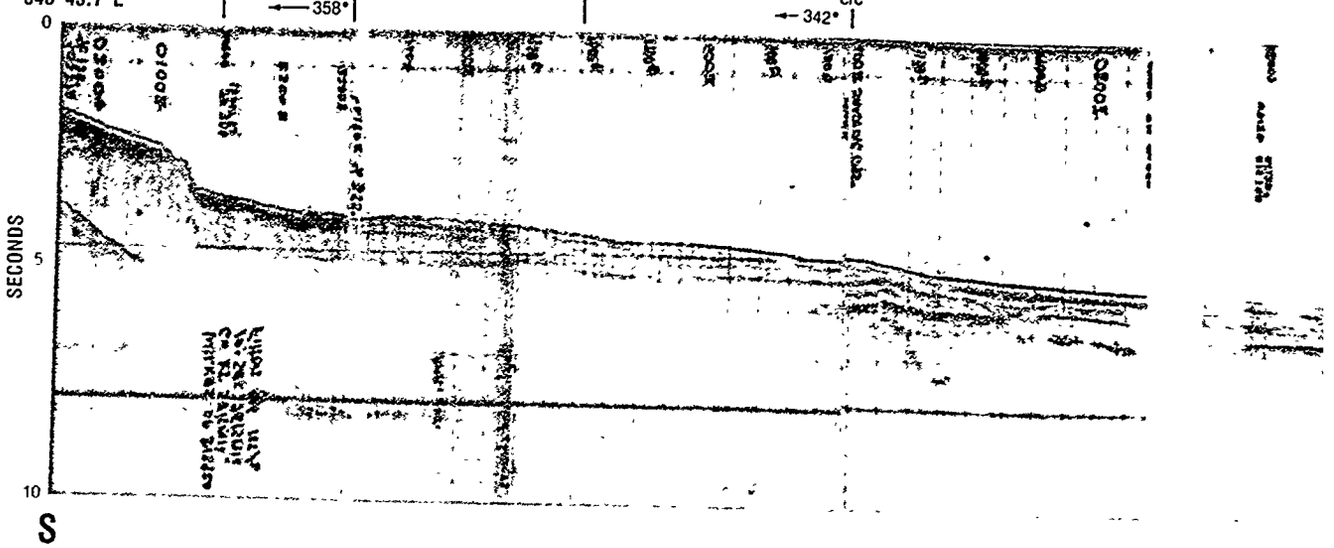
JD 289

R

JD 286 1979
0237Z
00°19.8′ N
043°43.7′ E

CRUISE 343920

AFRICAN COAST
±18 NM

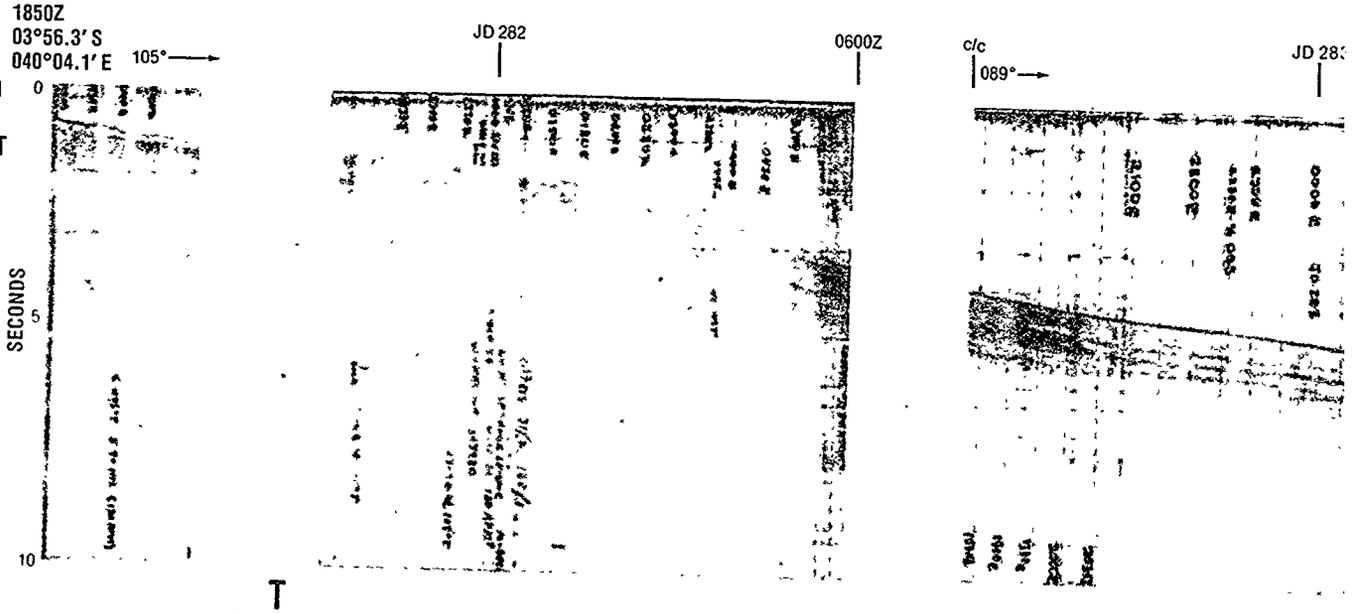


S

JD 281 1979
1850Z
03°56.3′ S
040°04.1′ E

CRUISE 343920

AFRICAN COAST
±16 NM



T

JD 194 1977
2200Z
03°45.0′ S
040°48.1′ E

CRUISE 343728

AFRICAN COAST
± 152NM

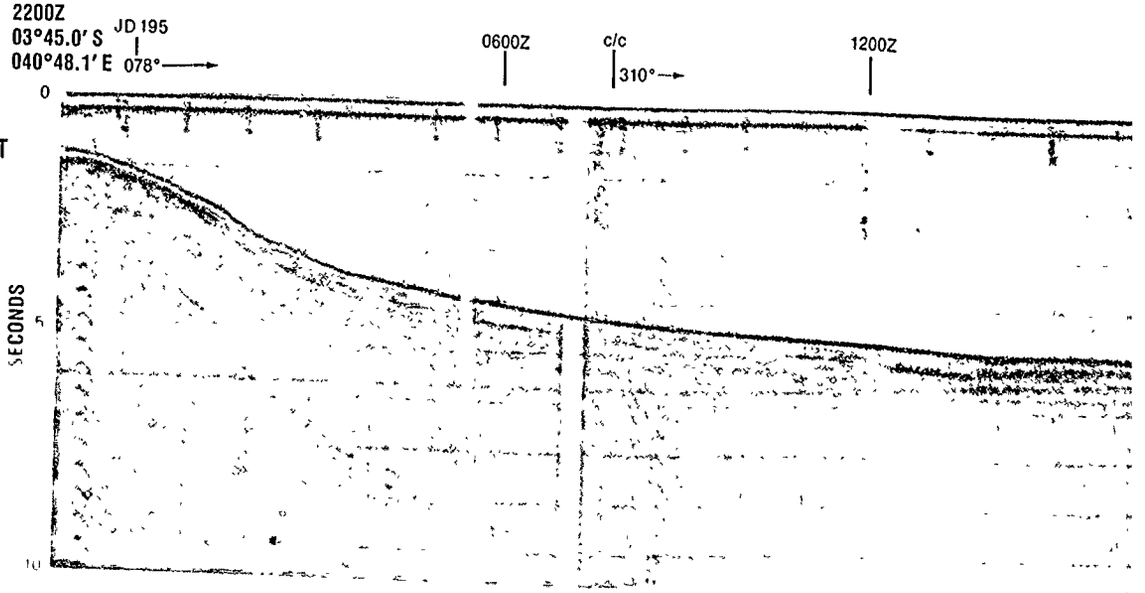
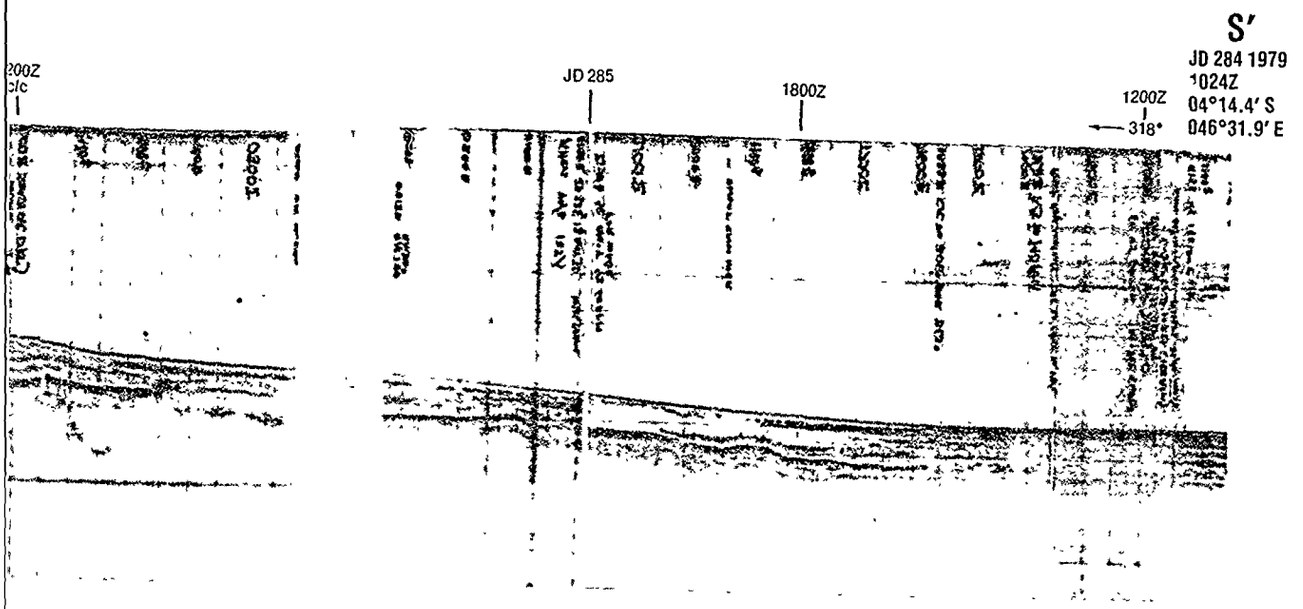
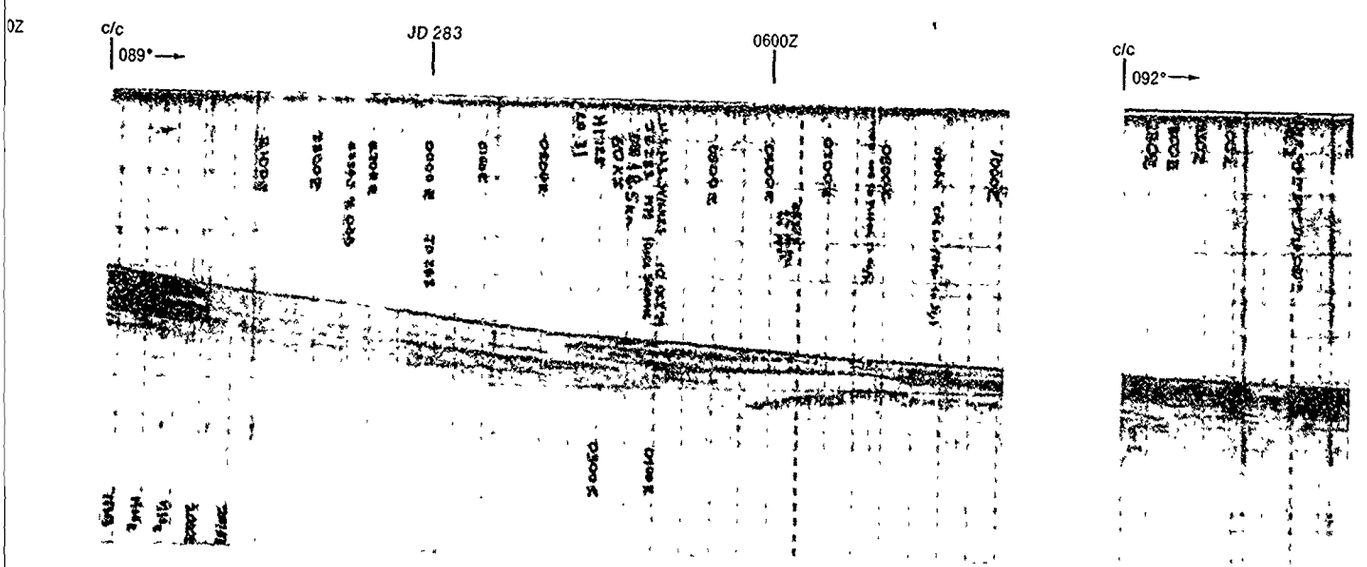
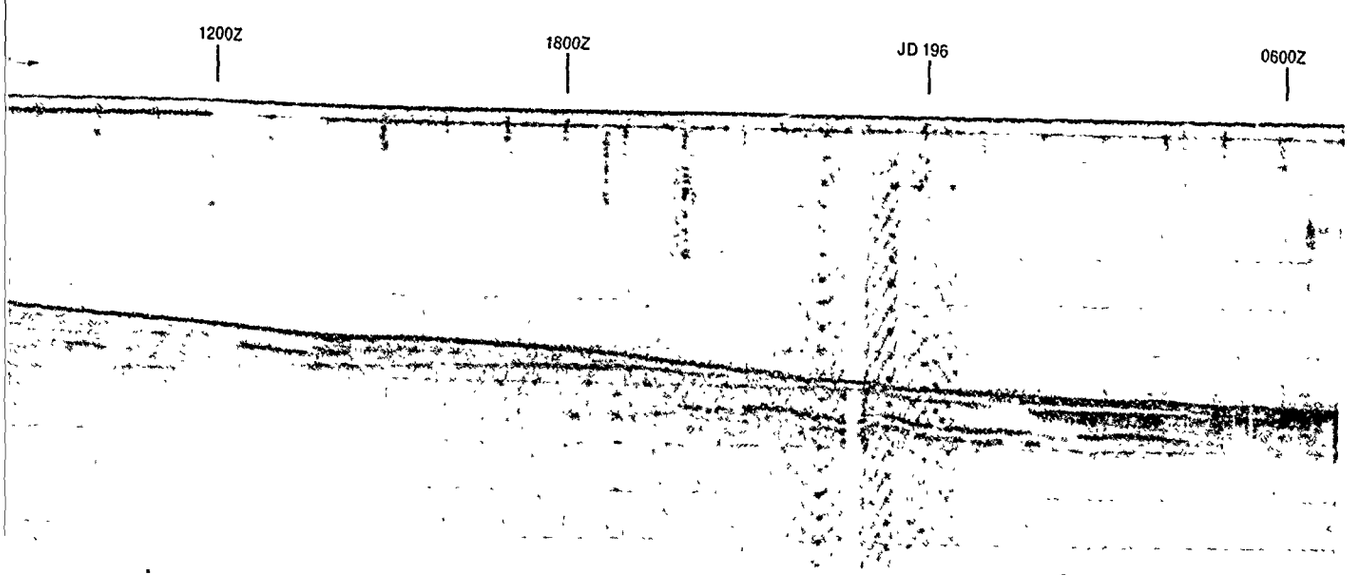


PLATE 6A


S'
JD 284 1979
1024Z
04°14.4' S
046°31.9' E
200Z
c/c
JD 285
1800Z
1200Z
318°


0Z
c/c
089°
JD 283
0600Z
c/c
092°


1200Z
1800Z
JD 196
0600Z

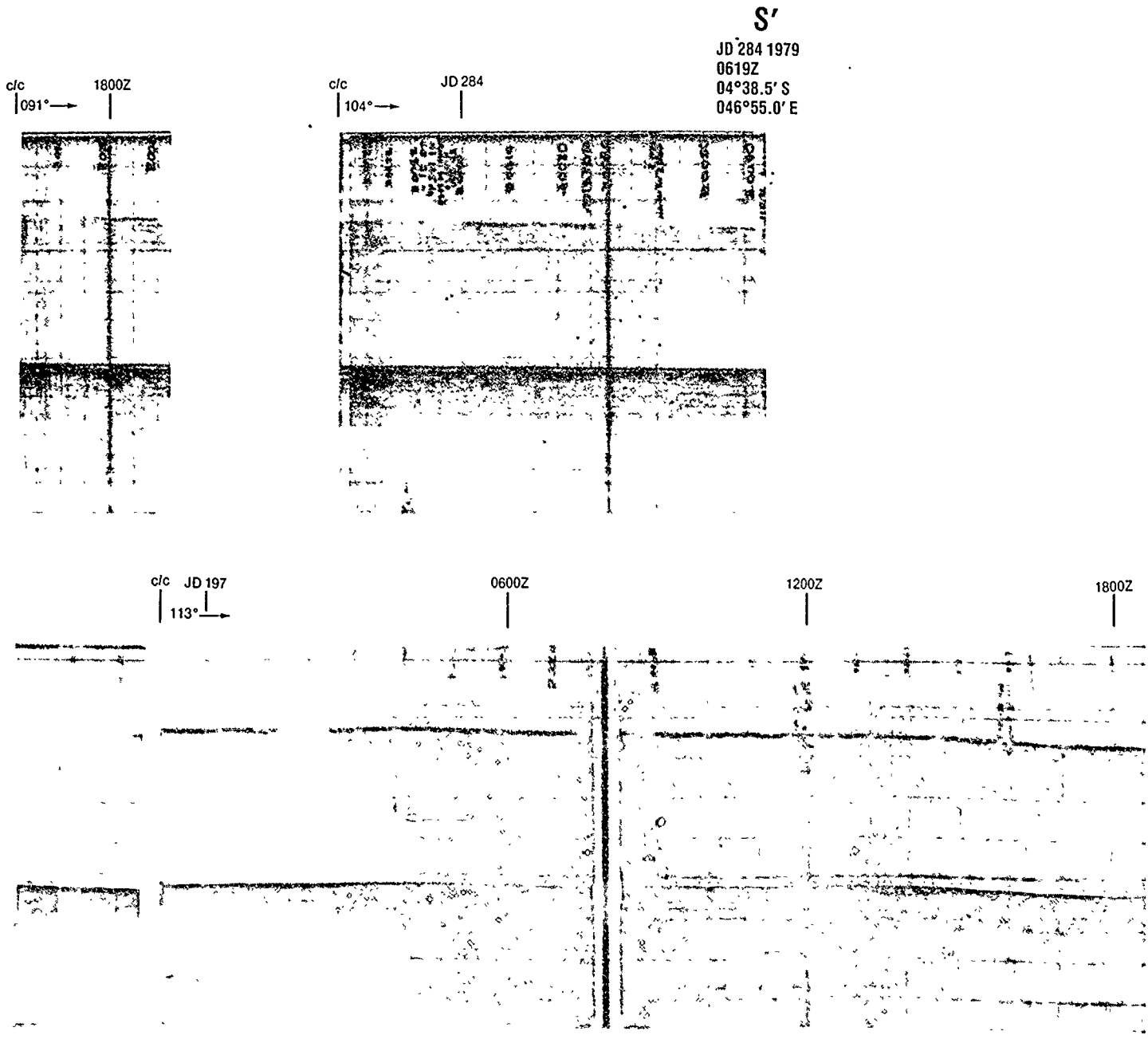
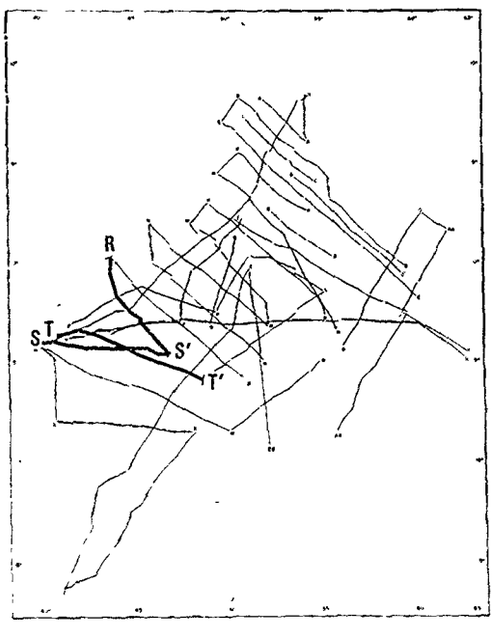

S′
JD 284 1979
0619Z
04°38.5′ S
046°55.0′ E
c/c
091°
1800Z
c/c
104°
JD 284
c/c
113°
JD 197
0600Z
1200Z
1800Z

PLATE 6B

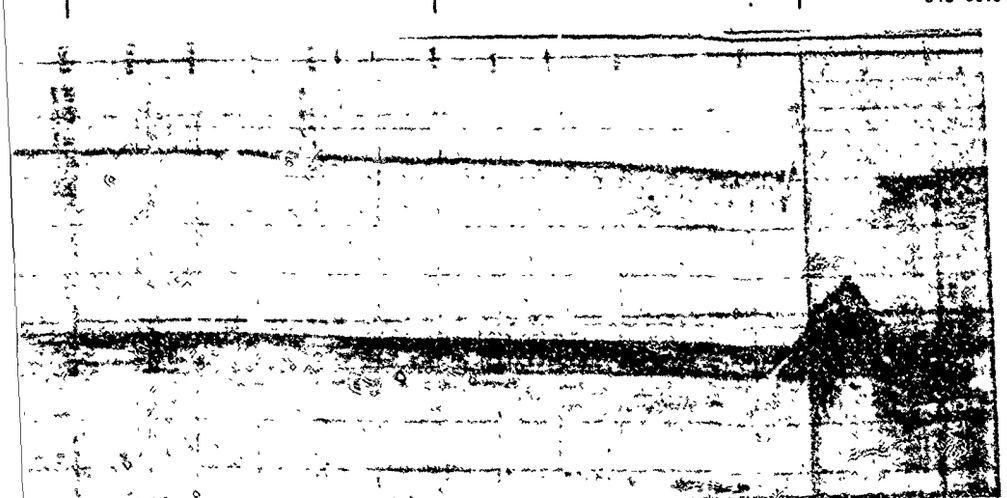


INDEX CHART (PLATES 6A, 6B)

S′
284 1979
9Z
38.5′ S
°55.0′ E

T′
JD 198 1977
0254Z
05°52.3′S
048°35.0′ E

1200Z 1800Z JD 198

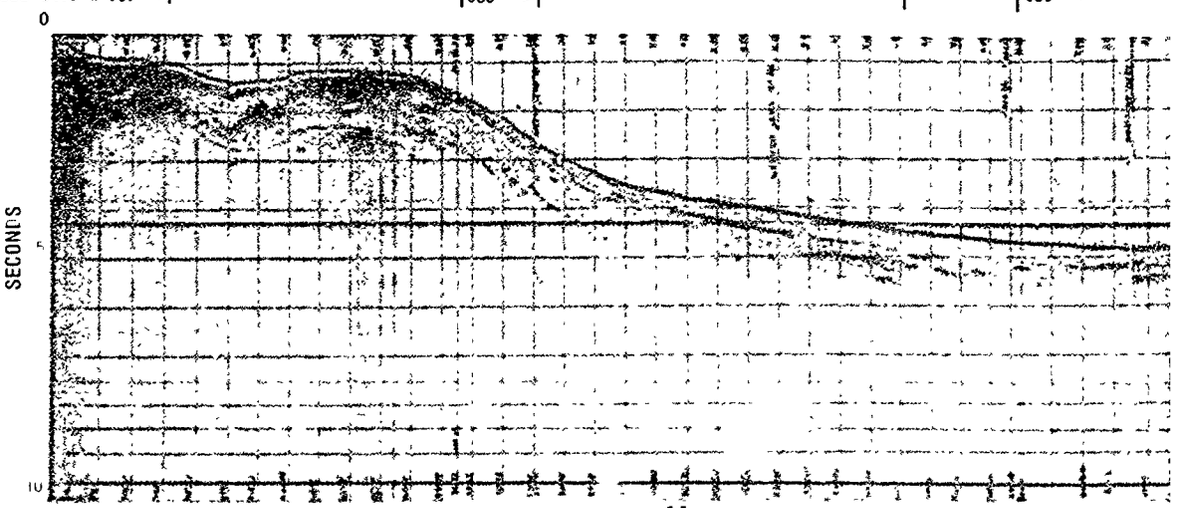


U

JD 280 1977
1608Z
04°0.3′ S
039°51.0′ E

CRUISE 343731

AFRICAN COAST
±10 NM

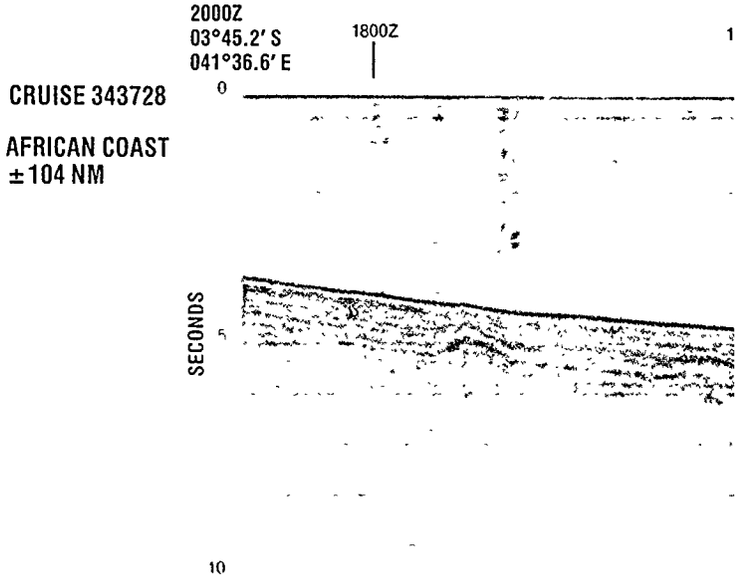


V

JD 174 1977
2000Z
03°45.2′ S
041°36.6′ E

CRUISE 343728

AFRICAN COAST
±104 NM



W

JD 211 1977
1500Z
04°12.7′ S
040°01.3′ E

CRUISE 343728

AFRICAN COAST
±23 NM

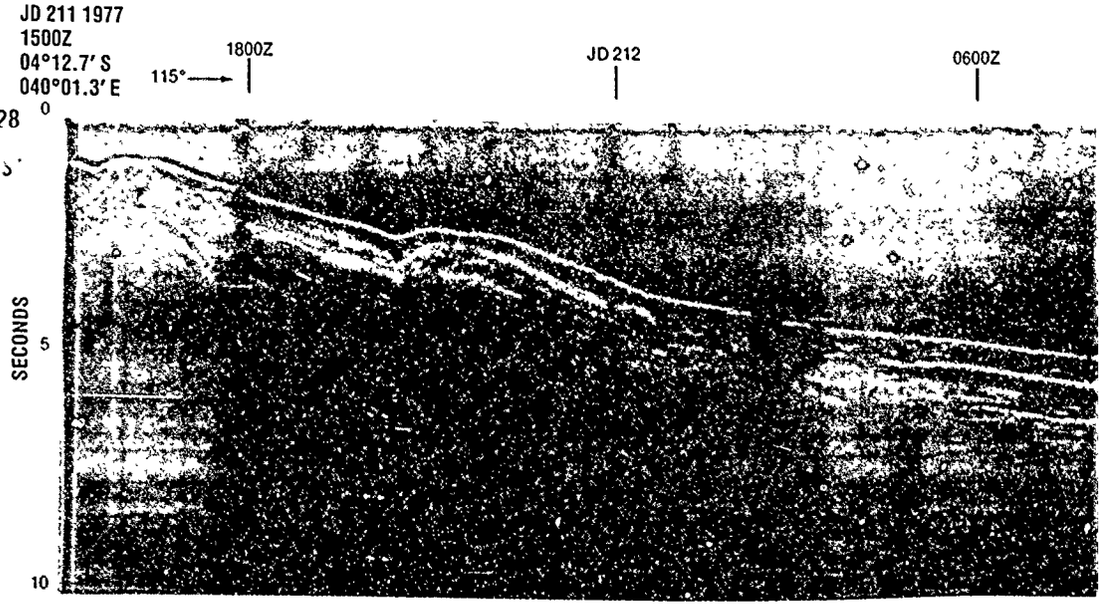
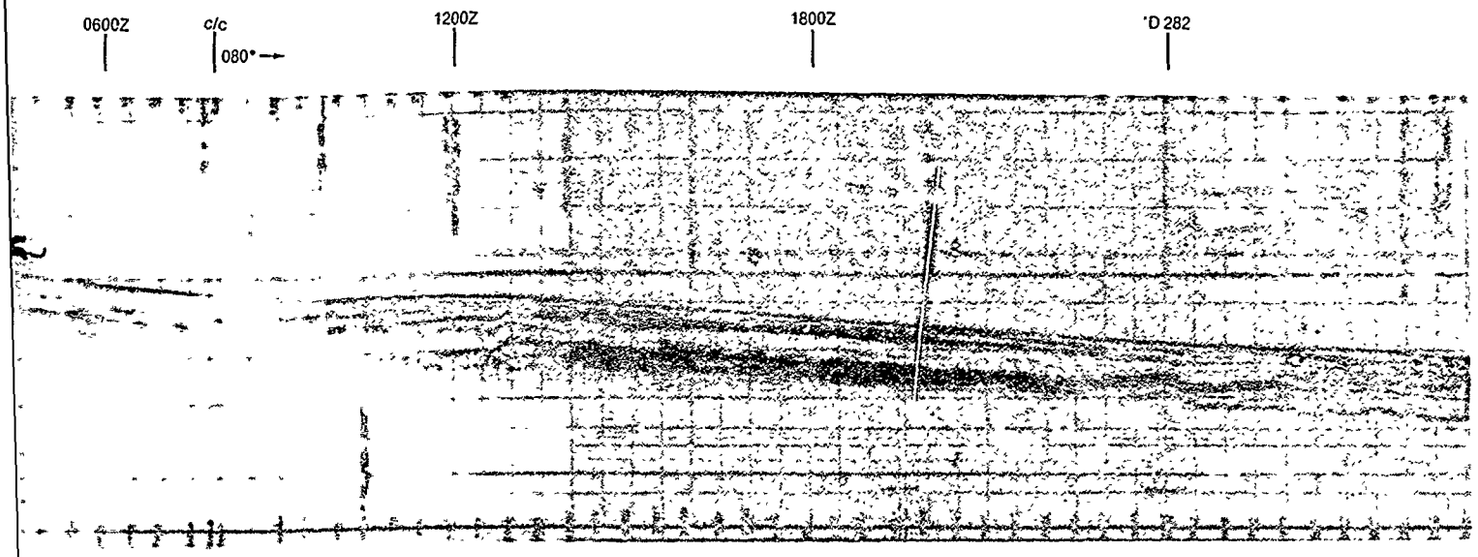
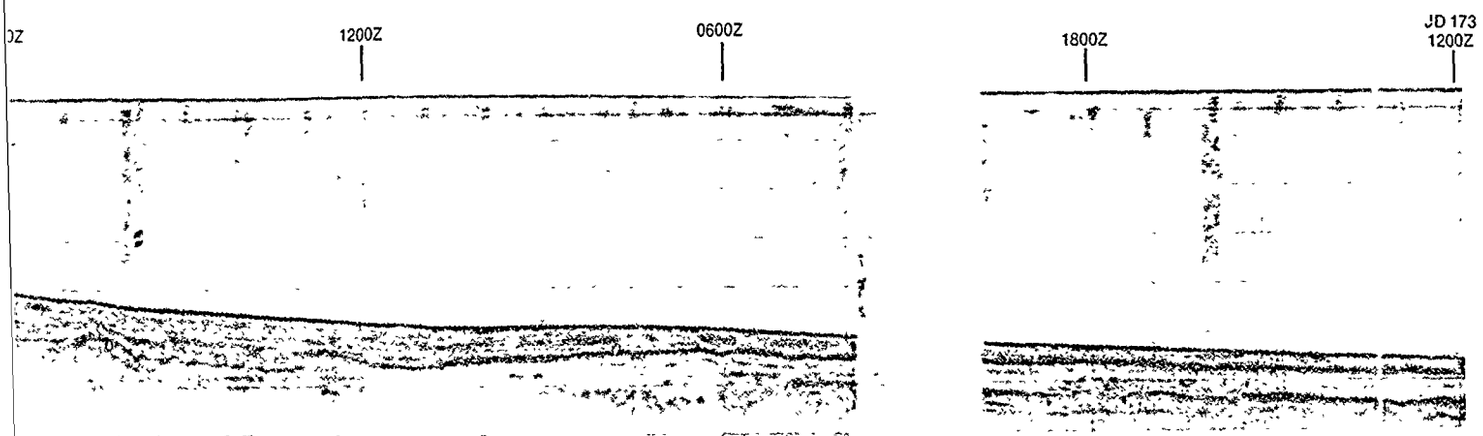
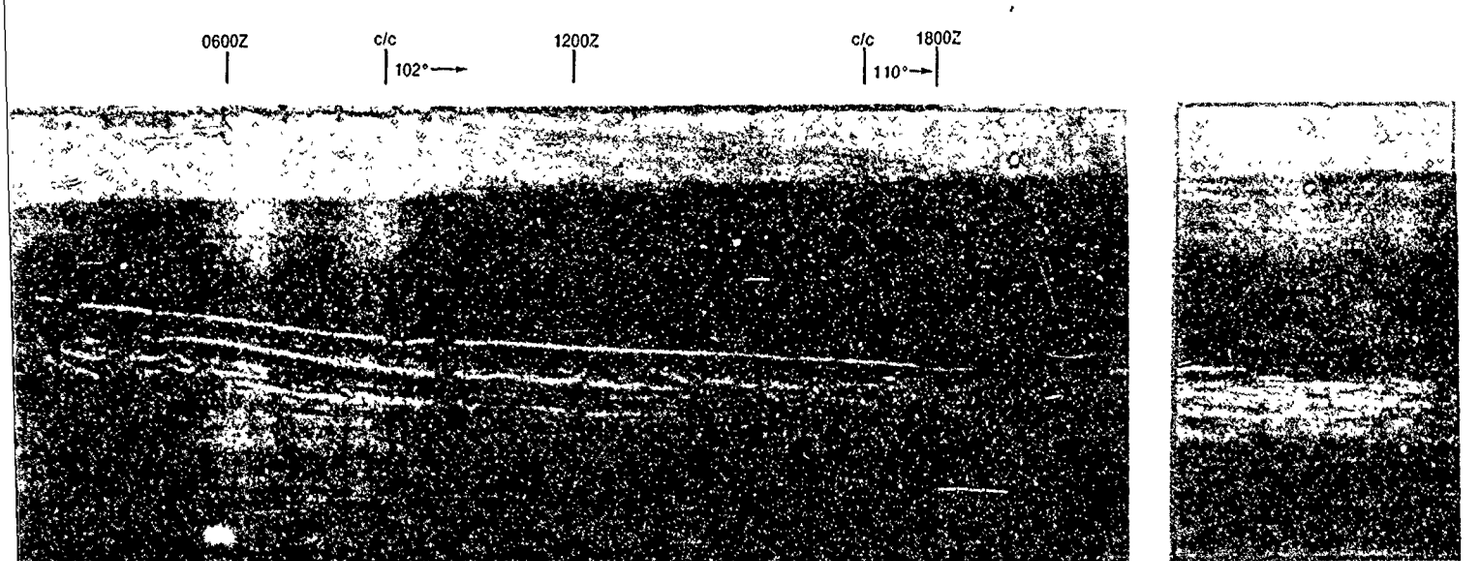


PLATE 7A


0600Z
c/c
080°
1200Z
1800Z
D 282


0Z
1200Z
0600Z
1800Z
JD 173
1200Z


0600Z
c/c
102°
1200Z
c/c
110°
1800Z

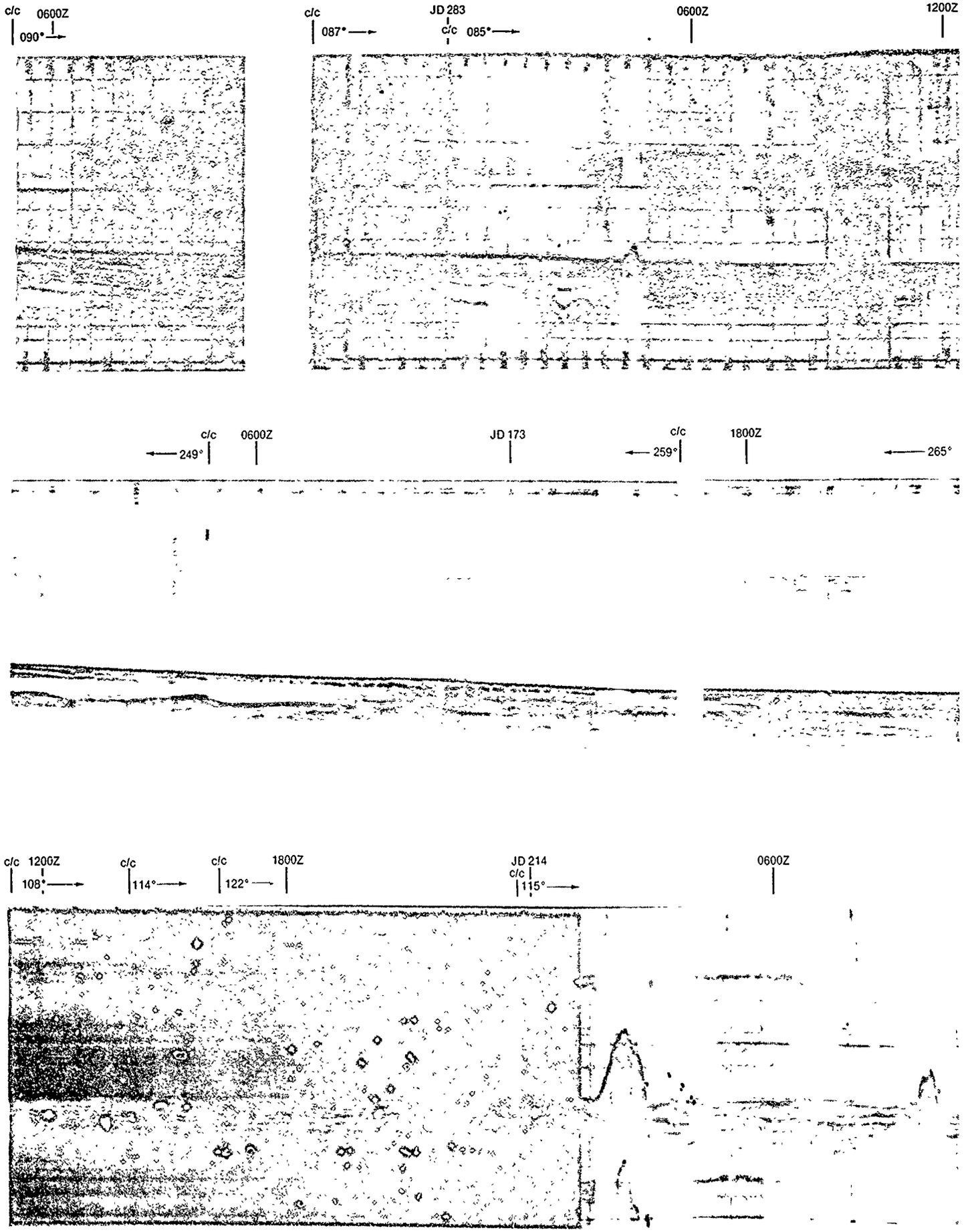
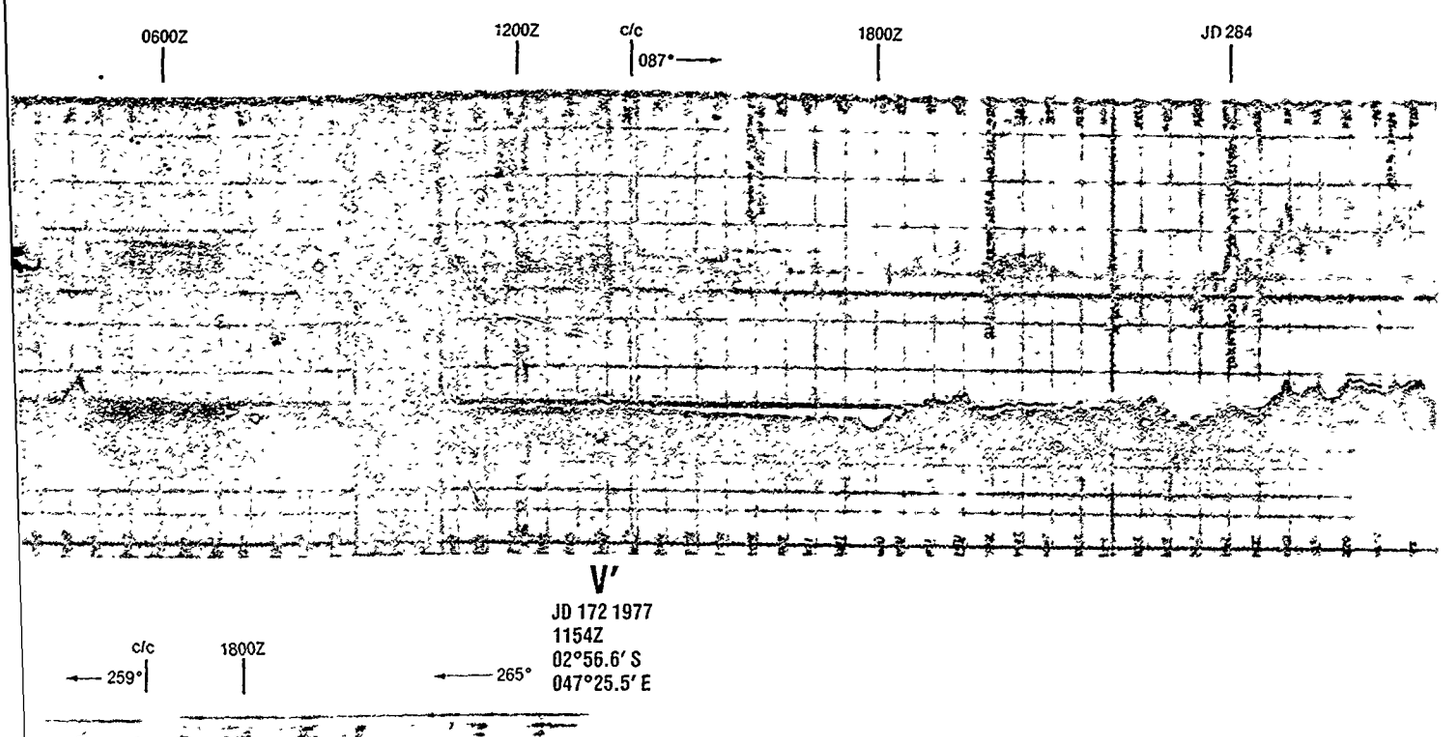
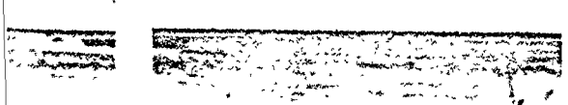

c/c
0600Z
090°
c/c
JD 283
c/c
087°
085°
0600Z
1200Z
c/c
0600Z
249°
JD 173
c/c
259°
1800Z
265°
c/c
1200Z
108°
c/c
114°
c/c
122°
1800Z
JD 214
c/c
115°
0600Z

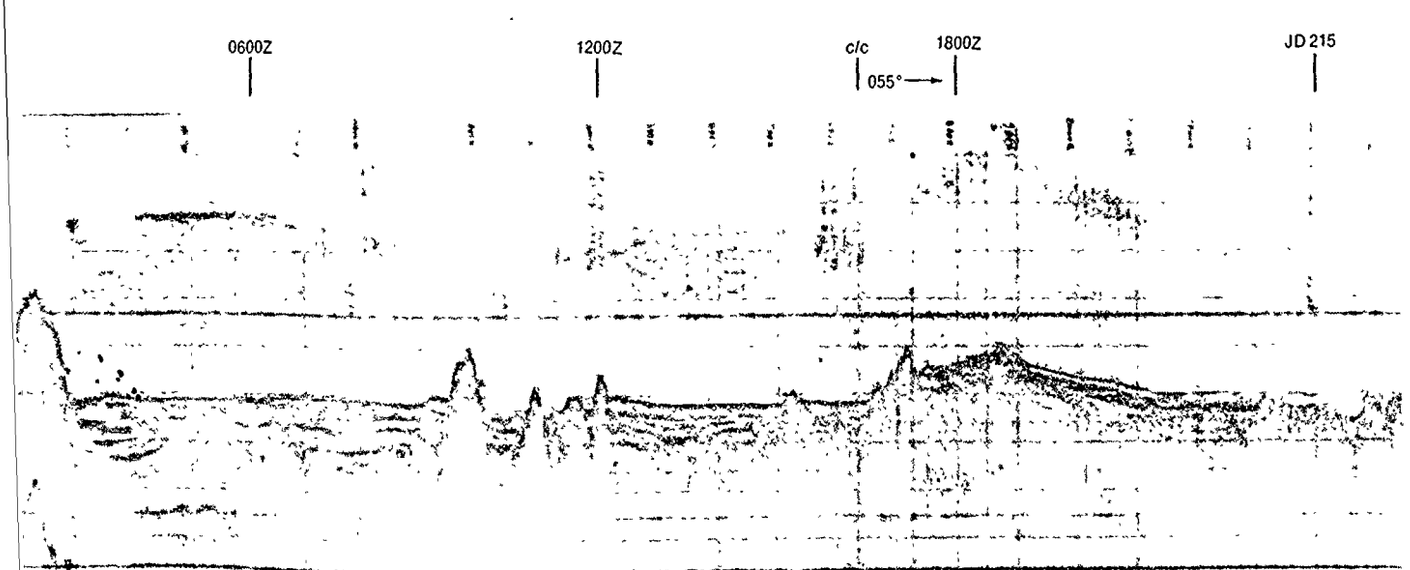
PLATE 7B

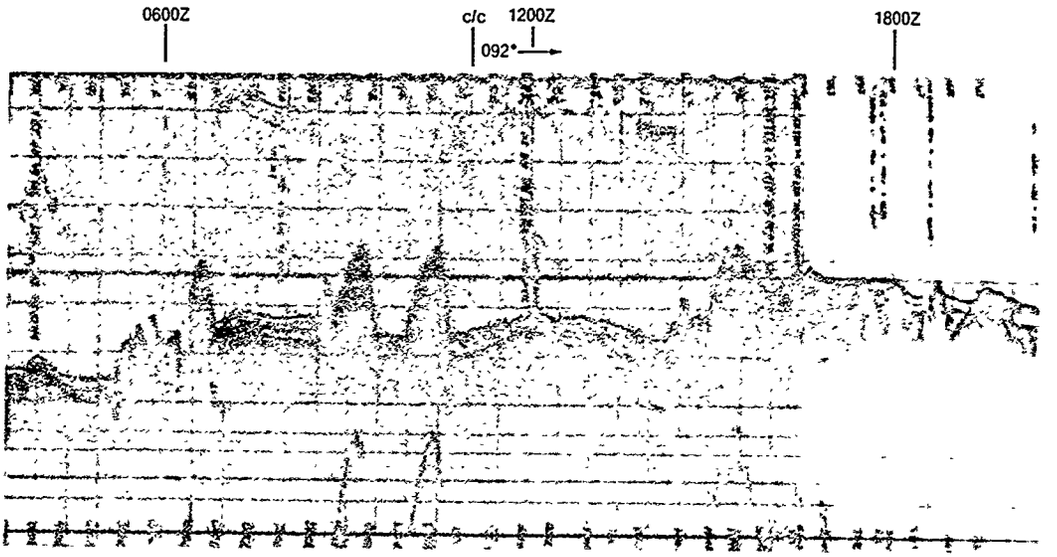


V′

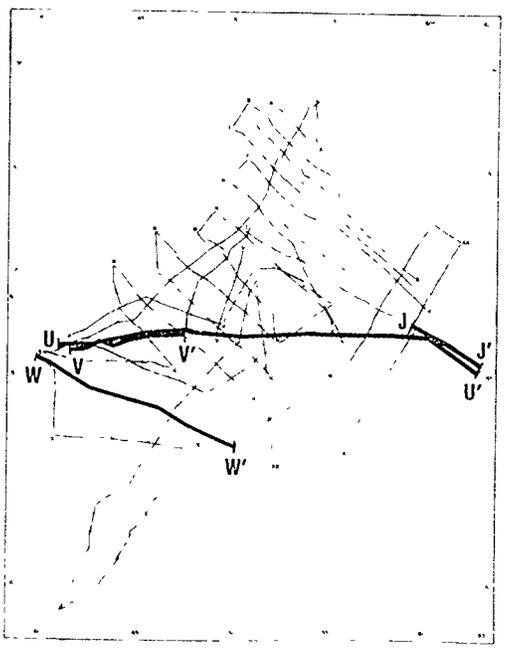
JD 172 1977
1154Z
02°56.6′ S
047°25.5′ E





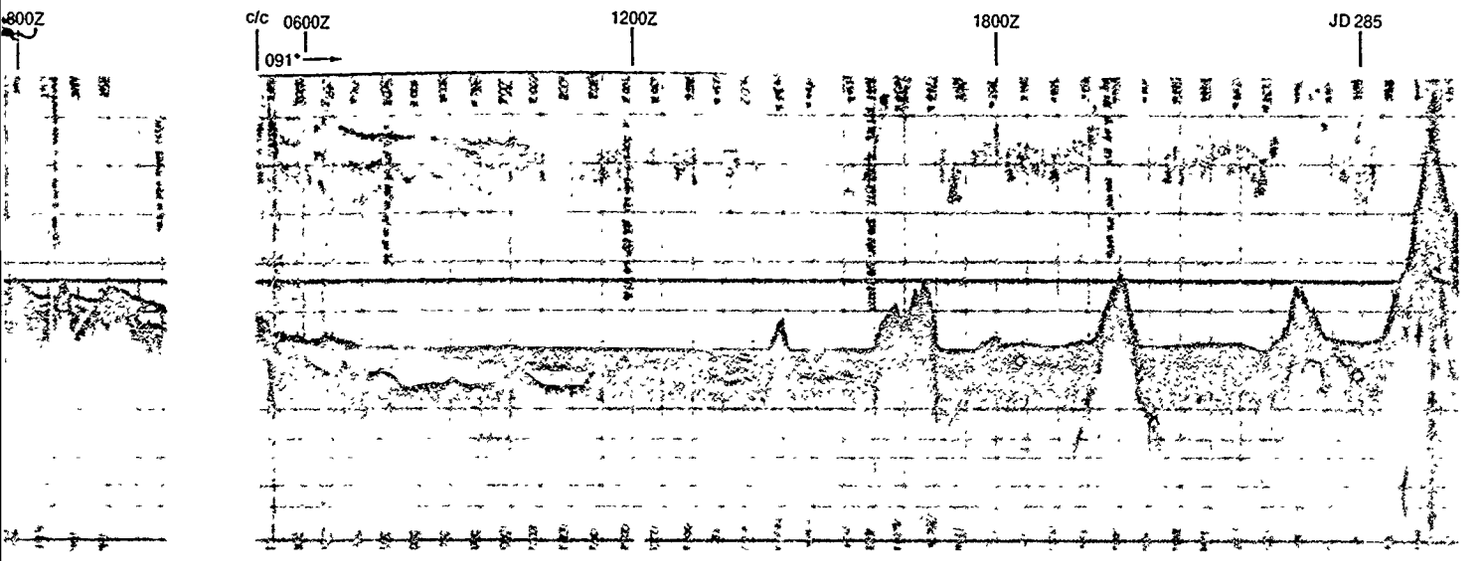


W′
JD 214 1977
0206Z
07°19.6′ S
051°30.4′ E



INDEX CHART (PLATES 7A, 7B, 7C, 7D)

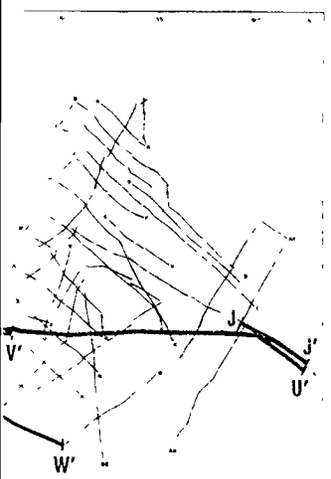
PLATE 7C

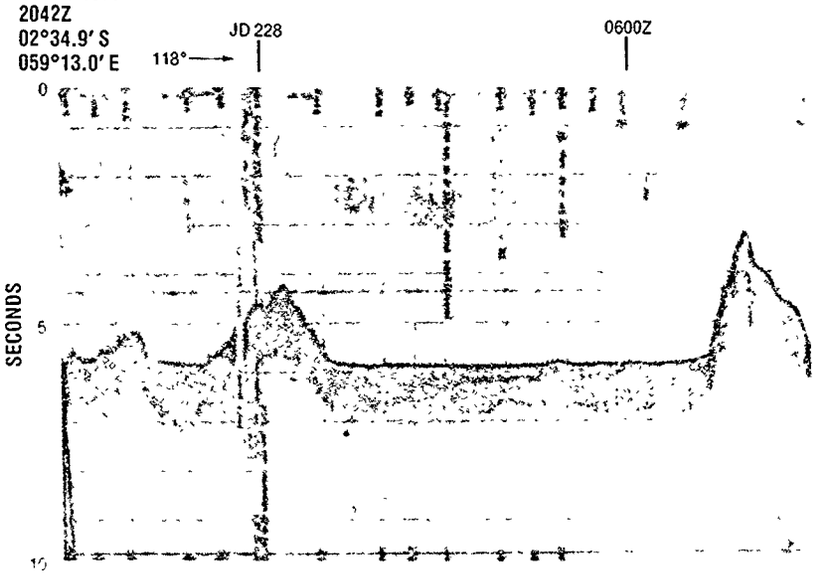


J

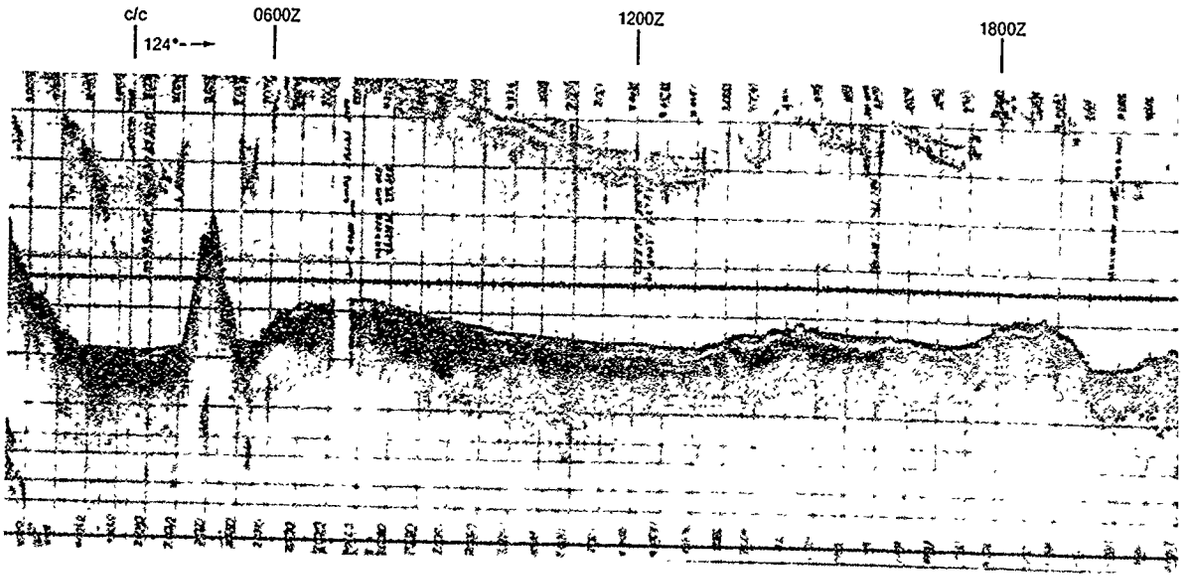
JD 227 1977
2042Z
02°34.9′ S
059°13.0′ E

CRUISE 343728





RT (PLATES 7A, 7B, 7C, 7D)


c/c
124°
0600Z
1200Z
1800Z

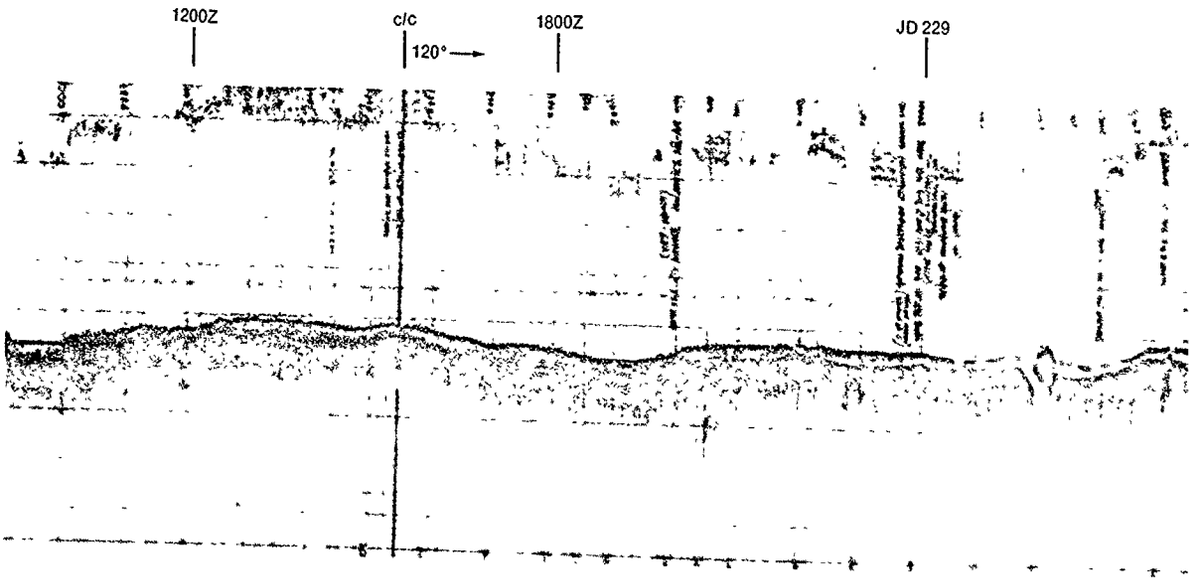
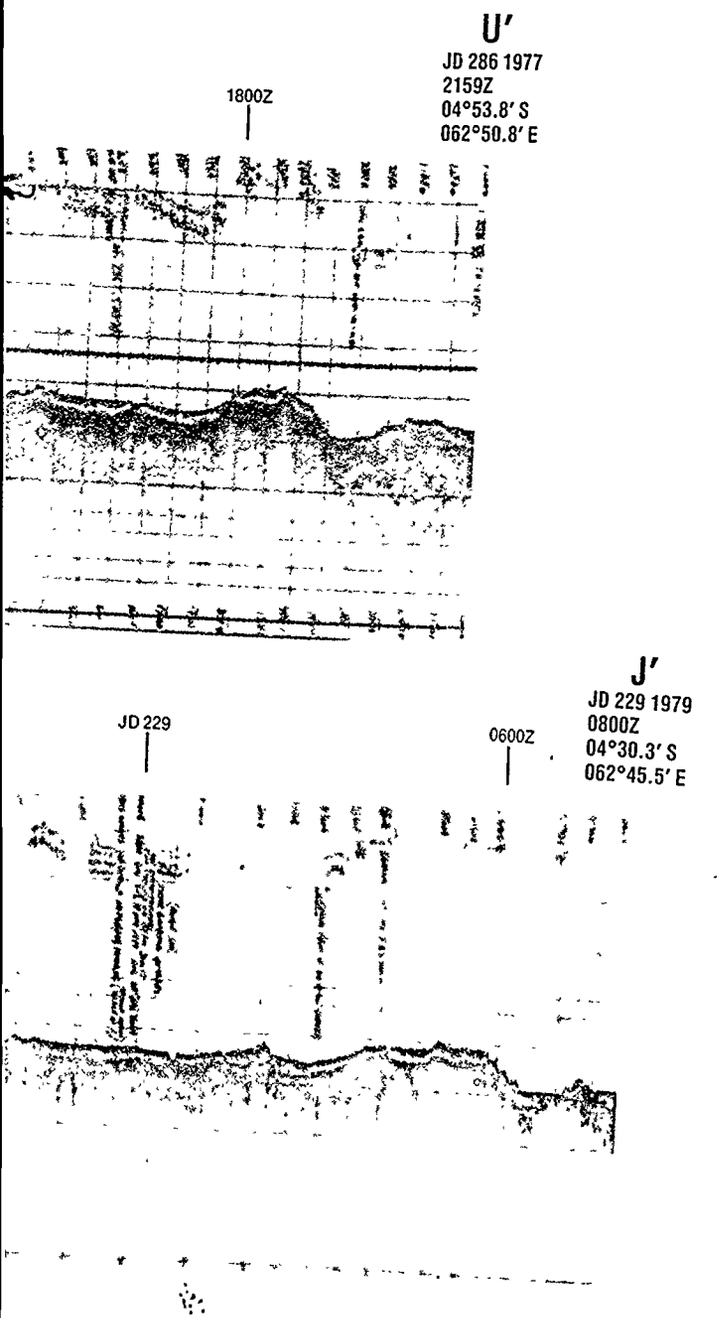

1200Z
c/c
120°
1800Z
JD 229

PLATE 7D

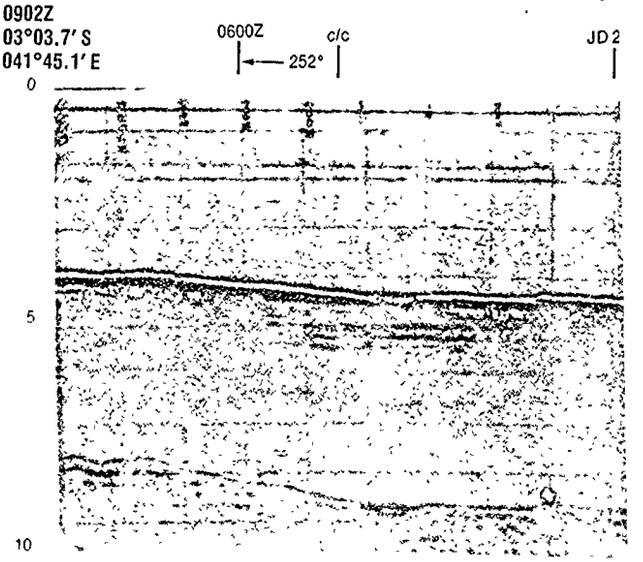

U′
JD 286 1977
2159Z
04°53.8′ S
062°50.8′ E
1800Z
J′
JD 229 1979
0800Z
04°30.3′ S
062°45.5′ E
JD 229
0600Z

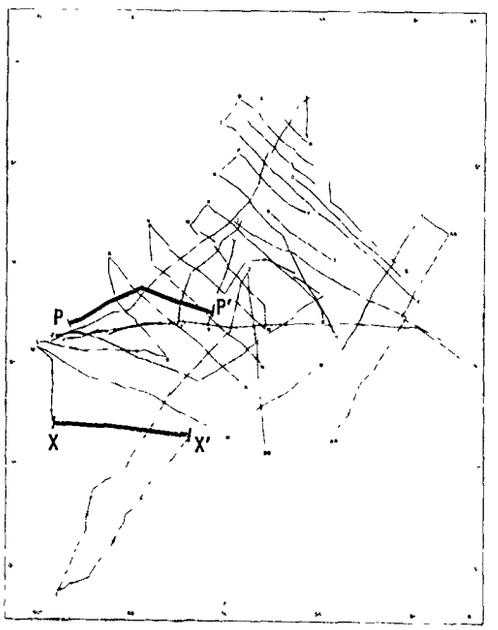
P

JD 207 1977
0902Z
03°03.7′ S
041°45.1′ E

CRUISE 343728

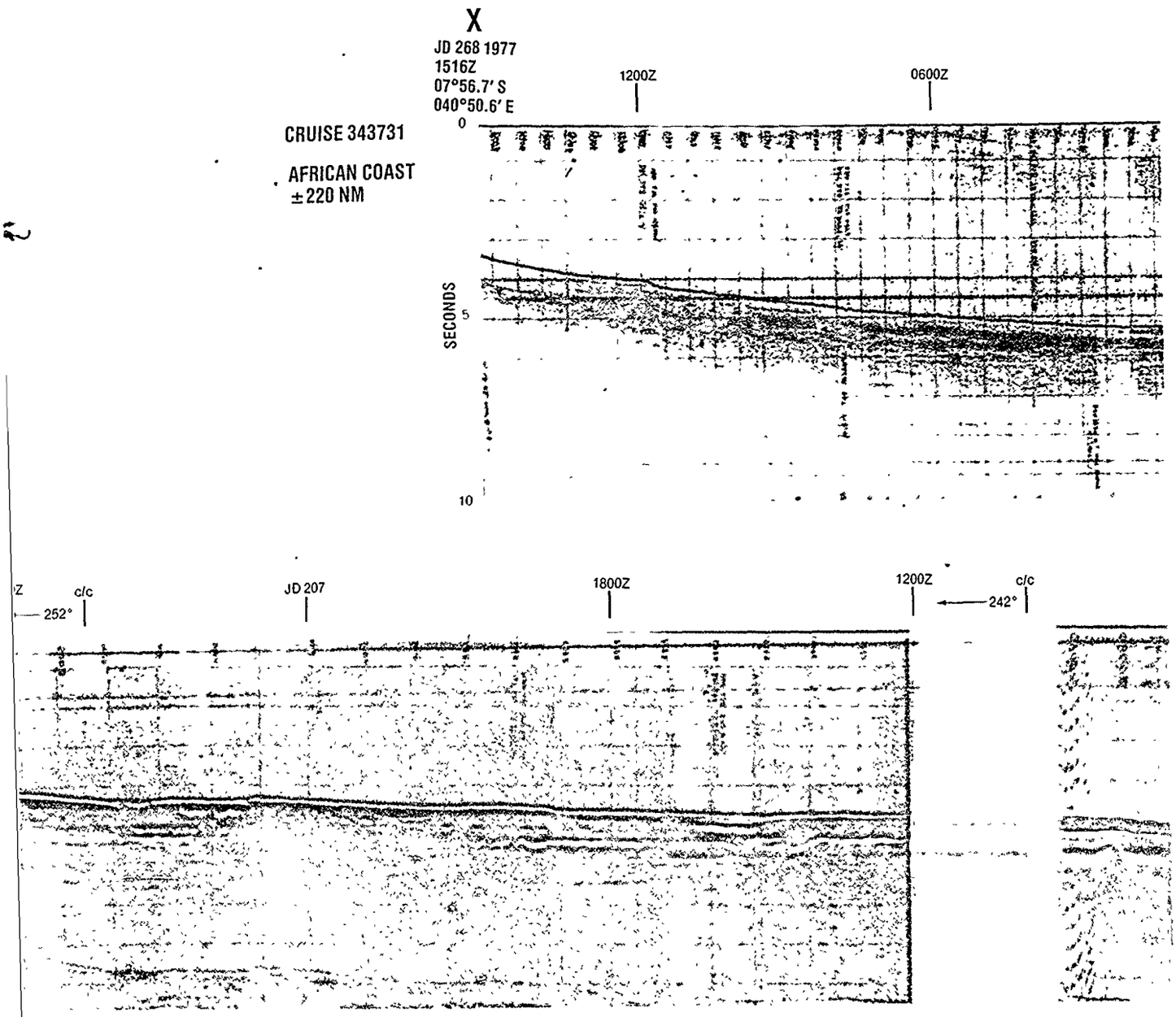
AFRICAN COAST
±110 NM

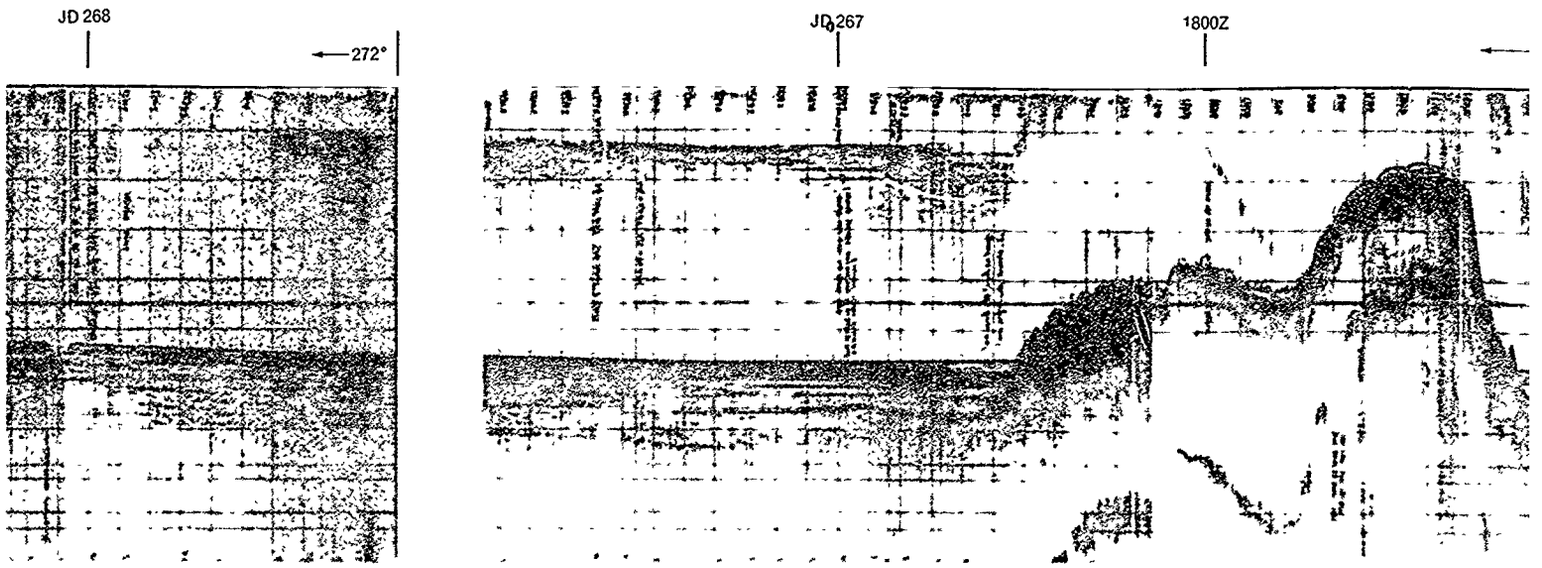




INDEX CHART (PLATES 8A, 8B)

PLATE 8A


X
JD 268 1977
1516Z
07°56.7′ S
040°50.6′ E
CRUISE 343731
AFRICAN COAST
±220 NM
1200Z
0600Z
0
SECONDS
5
10
Z
c/c
252°
JD 207
1800Z
1200Z
c/c
242°


JD 268
272°
JD 267
1800Z

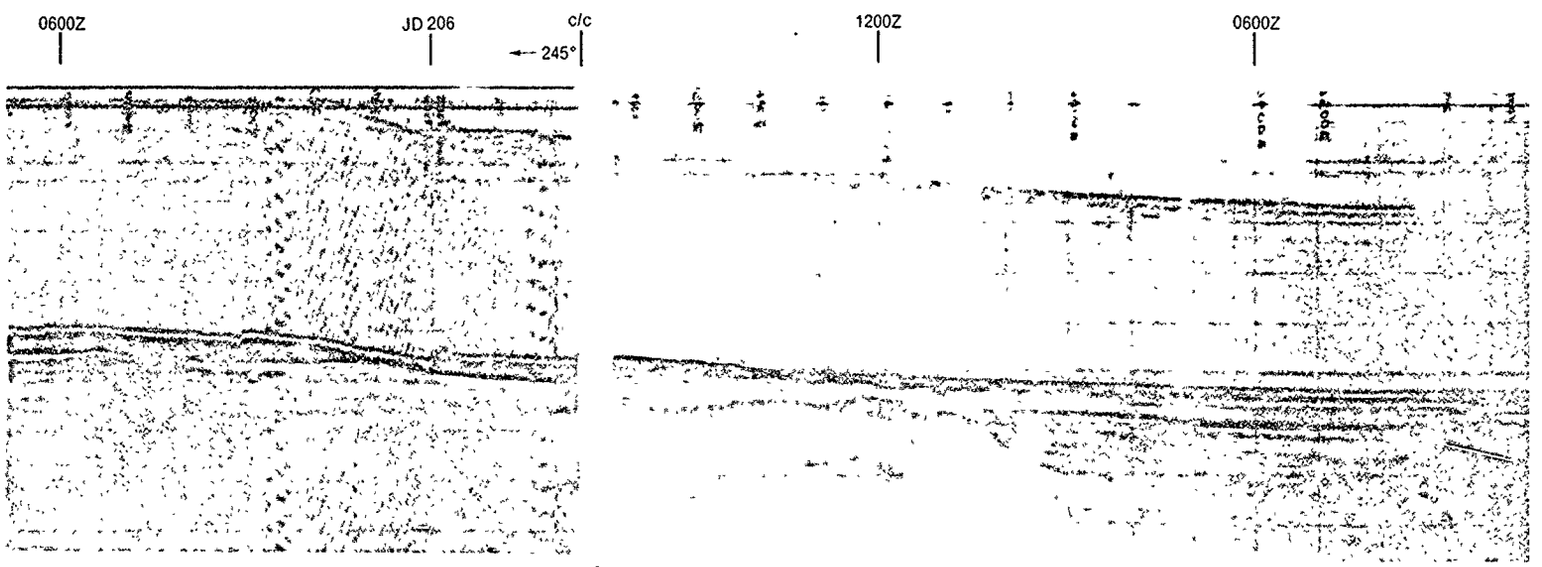
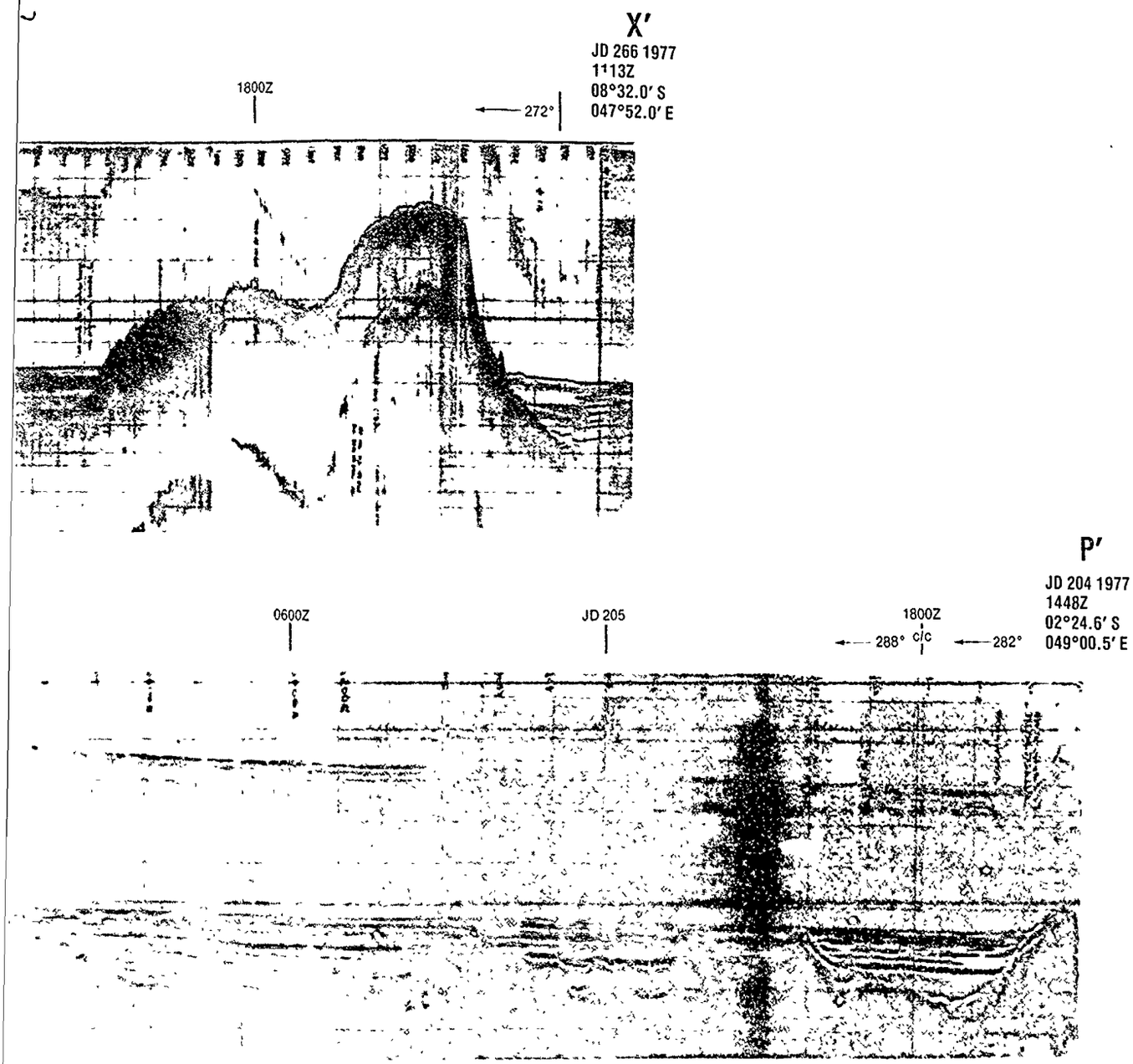

0600Z
JD 206
c/c
245°
1200Z
0600Z

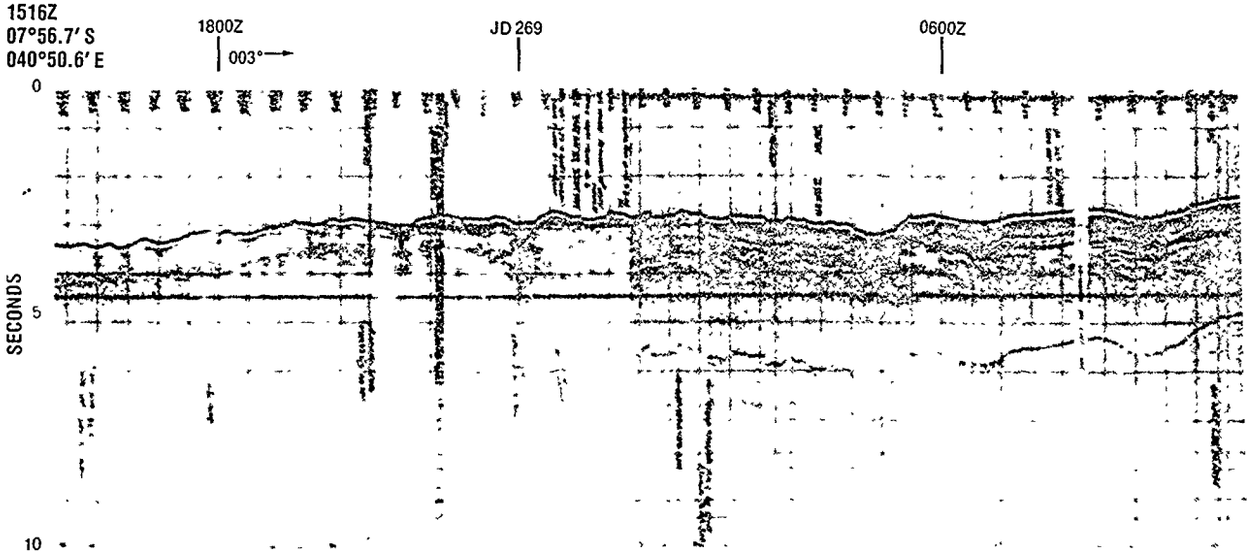
PLATE 8B


X′
JD 266 1977
1113Z
08°32.0′ S
047°52.0′ E
1800Z
272°
P′
JD 204 1977
1448Z
02°24.6′ S
049°00.5′ E
0600Z
JD 205
1800Z
288°
c/c
282°

X

JD 268 1977
1516Z
07°56.7′ S
040°50.6′ E

CRUISE 343731



Y

JD 275 1979
0557Z
03°56.0′ S
040°39.8″E

CRUISE 343916

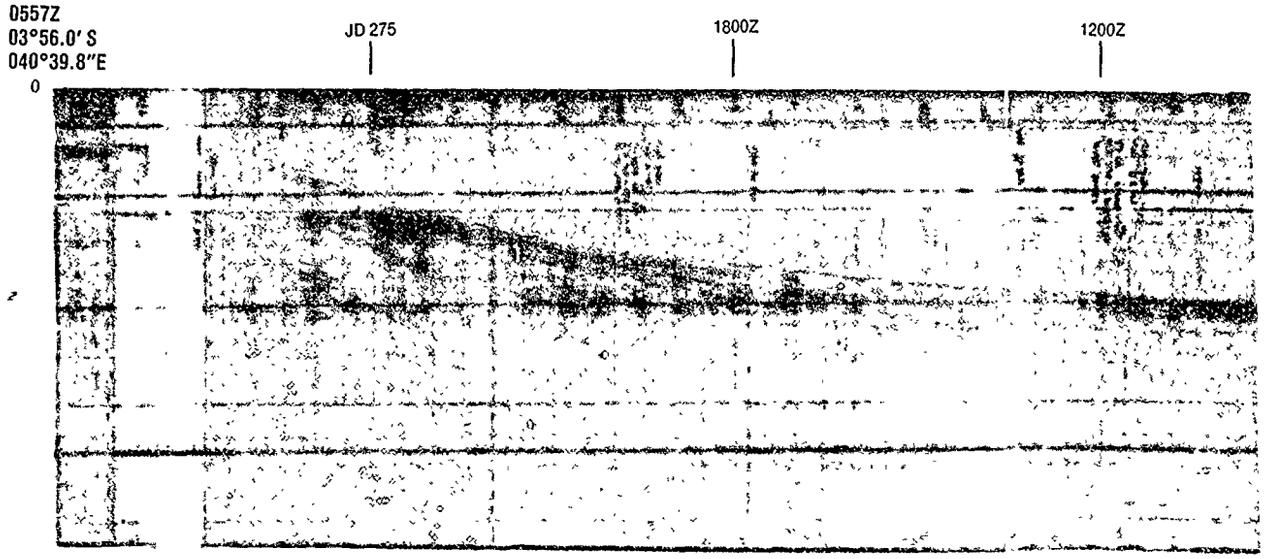
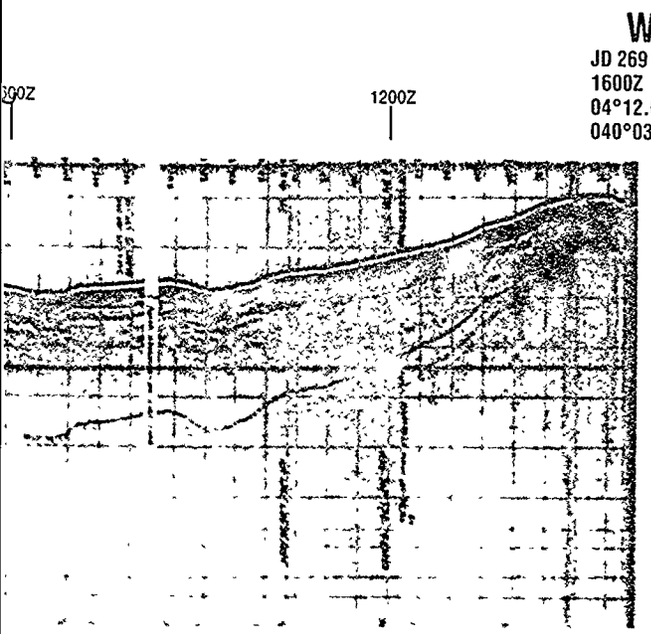
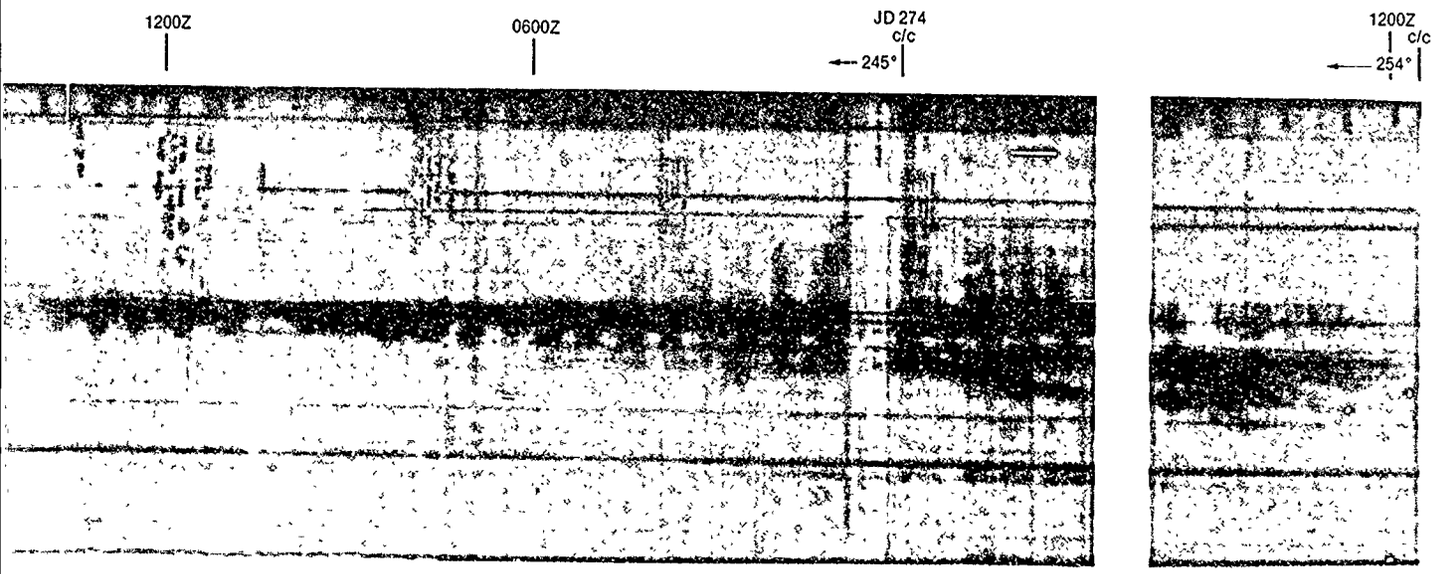
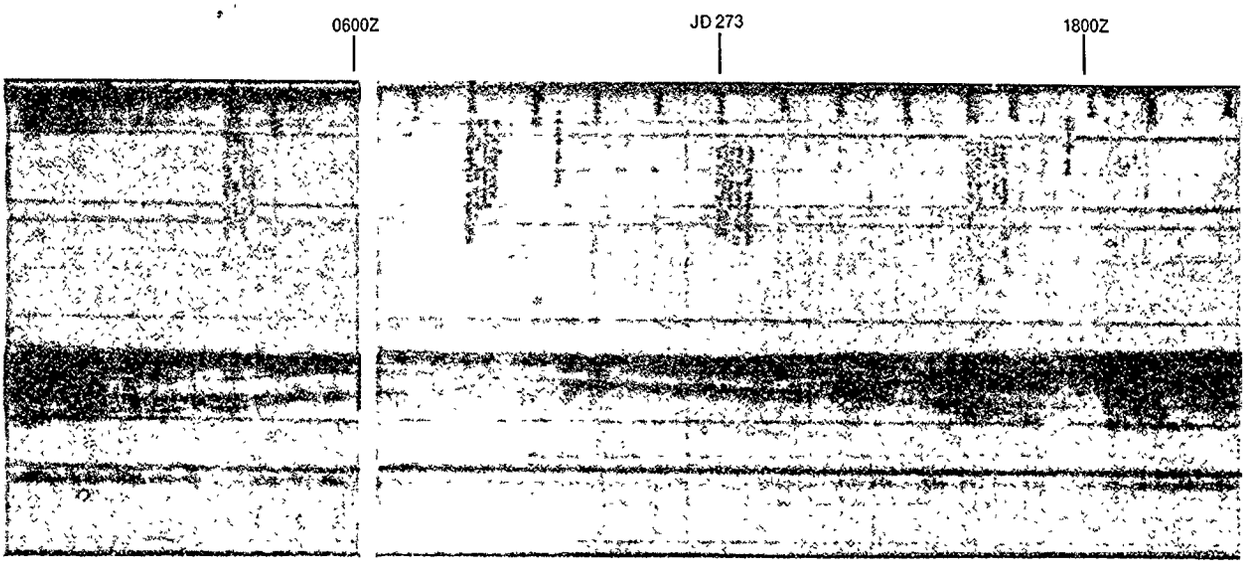
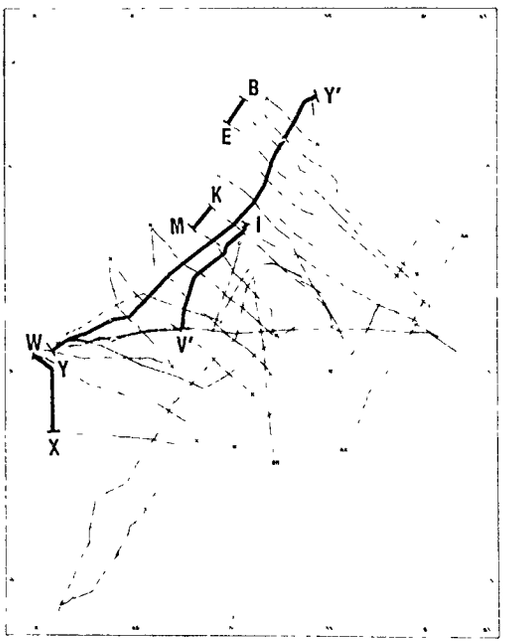


PLATE 9A


W
JD 269 1977
1600Z
04°12.6′ S
040°03.5′ E
1200Z


1200Z
0600Z
JD 274
c/c
245°
1200Z
c/c
254°





INDEX CHART (PLATES 9A, 9B, 9C)

V'
JD 172 1977
0330Z
02°58.8' S
047°27.8' E

CRUISE 343728

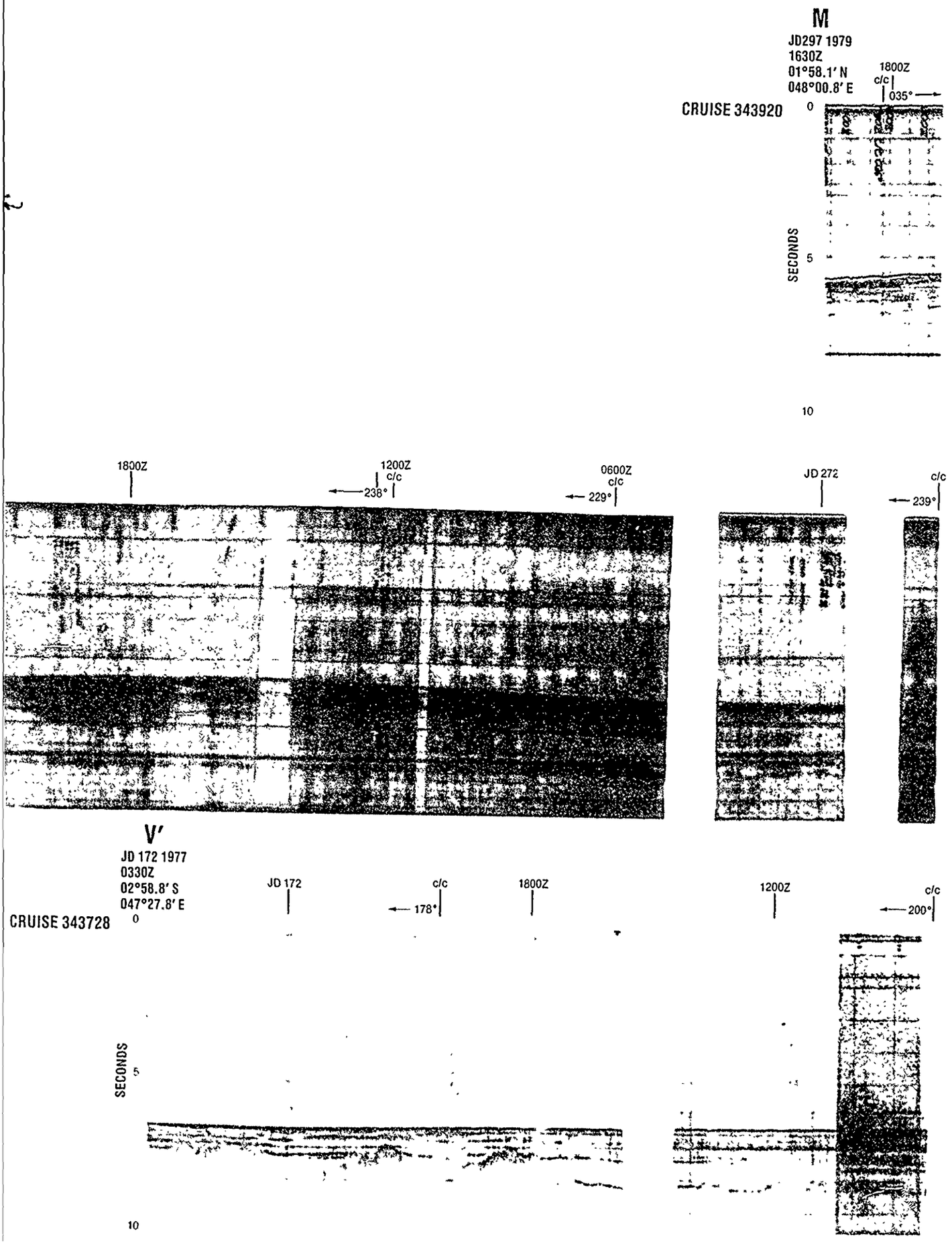
0

SECONDS

5

10

PLATE 9B


M
JD297 1979
1630Z
01°58.1' N
048°00.8' E
CRUISE 343920
1800Z
c/c
035°
0
SECONDS
5
10
1800Z
1200Z
c/c
238°
0600Z
c/c
229°
JD 272
c/c
239°
V'
JD 172 1977
0330Z
02°58.8' S
047°27.8' E
CRUISE 343728
0
JD 172
c/c
178°
1800Z
1200Z
c/c
200°
SECONDS
5
10

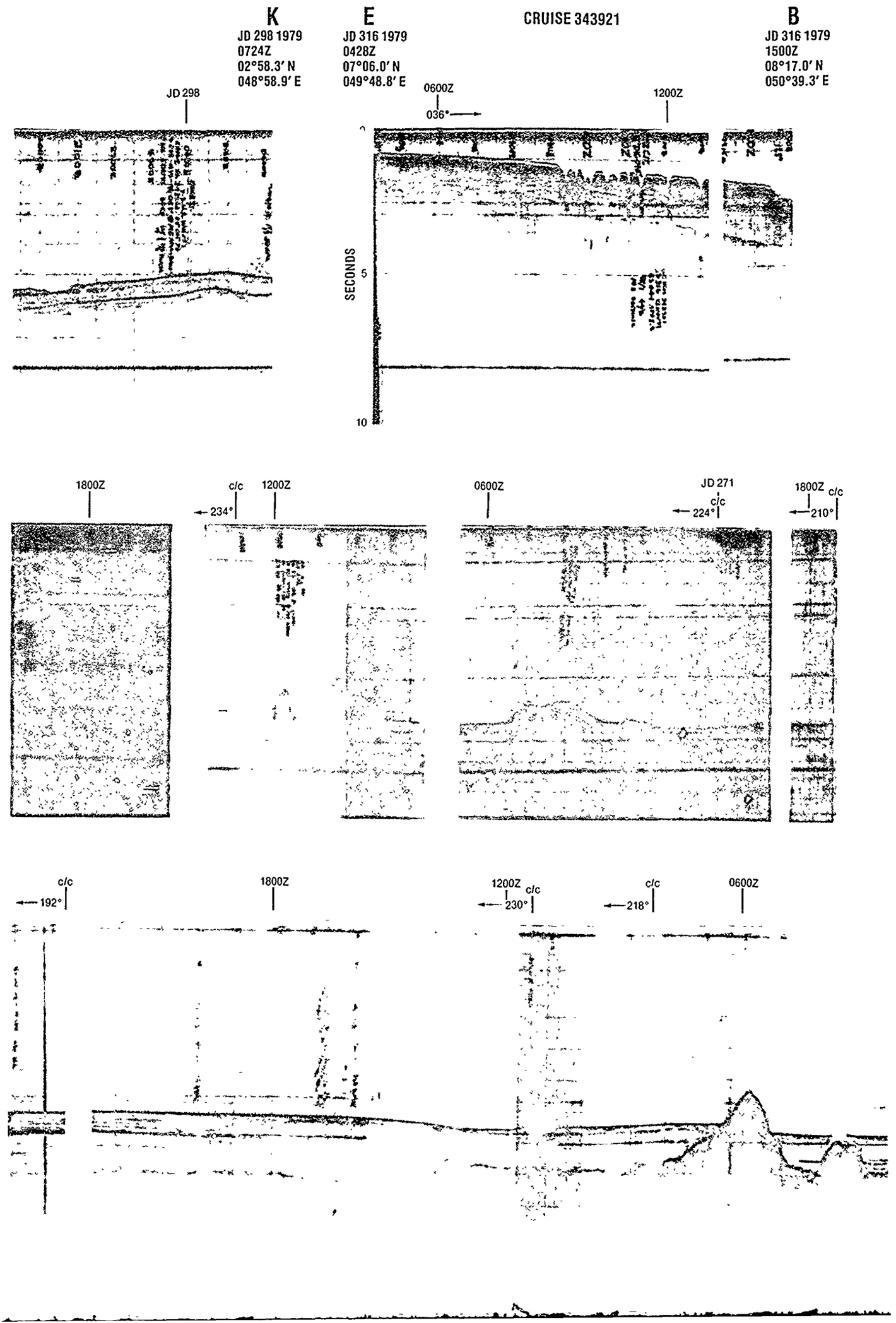
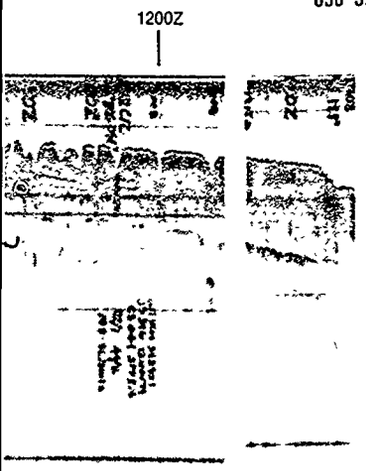

K
JD 298 1979
0724Z
02°58.3′ N
048°58.9′ E
E
JD 316 1979
0428Z
07°06.0′ N
049°48.8′ E
CRUISE 343921
B
JD 316 1979
1500Z
08°17.0′ N
050°39.3′ E
JD 298
0600Z
036°
1200Z
SECONDS
5
10
1800Z
c/c
1200Z
234°
0600Z
JD 271
c/c
224°
1800Z
c/c
210°
c/c
192°
1800Z
1200Z
c/c
230°
c/c
218°
0600Z

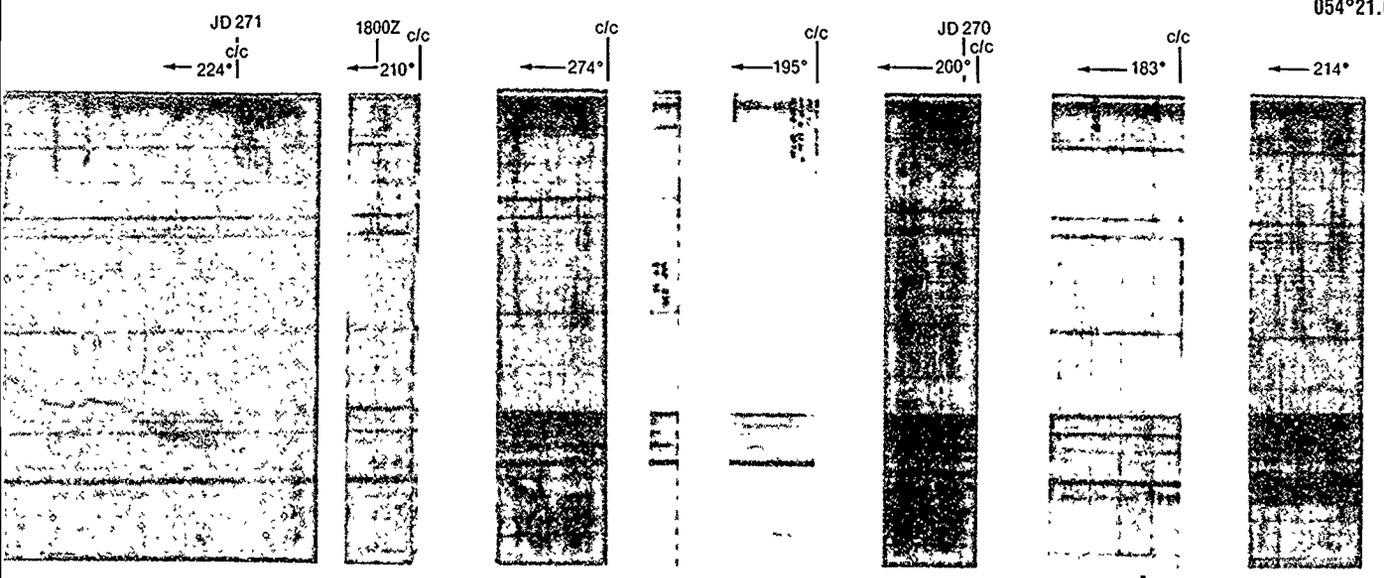
PLATE 9C

343921

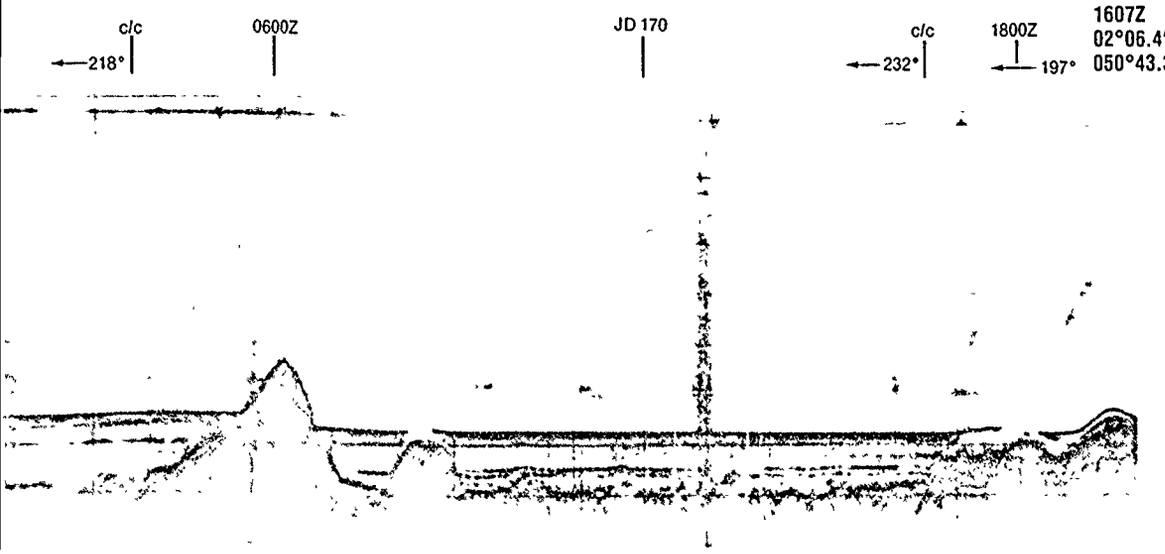
B
JD 316 1979
1500Z
08°17.0′ N
050°39.3′ E



Y′
JD 269 1979
1827Z
08°24.1′ N
054°21.6′ E



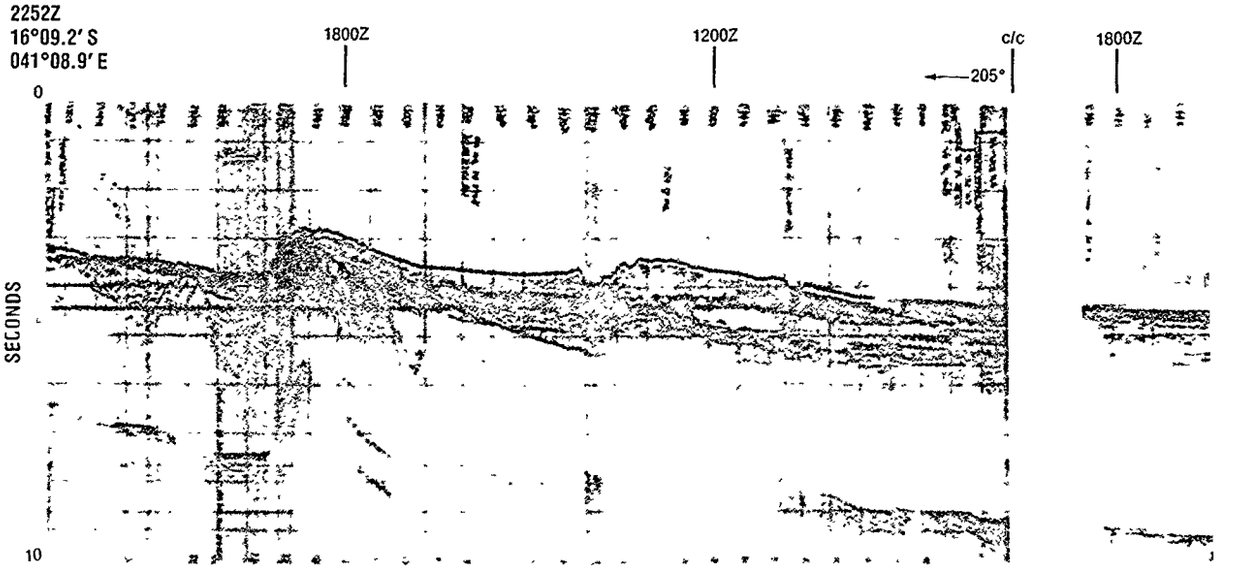
JD 169 1977
1607Z
02°06.4′ N
050°43.3′ E



Z

JD 261 1977
2252Z
16°09.2′ S
041°08.9′ E

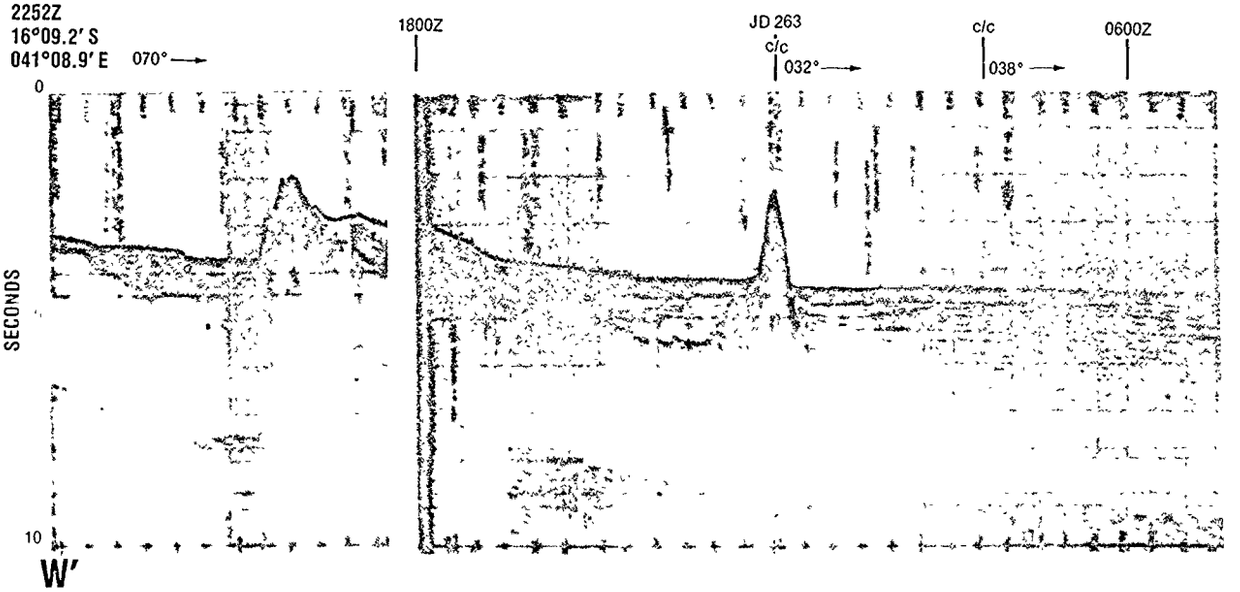
CRUISE 343731



Z

JD 261 1977
2252Z
16°09.2′ S
041°08.9′ E

CRUISE 343731



W′

JD 214 1977
1613Z
08°26.6′ S
050°03.0′ E

CRUISE 343728

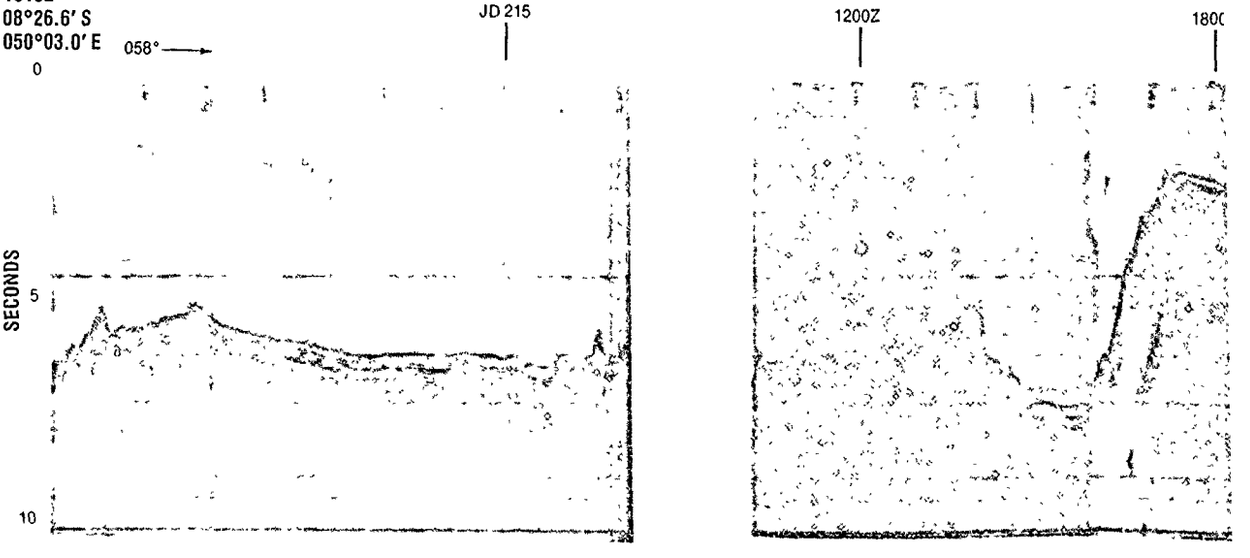
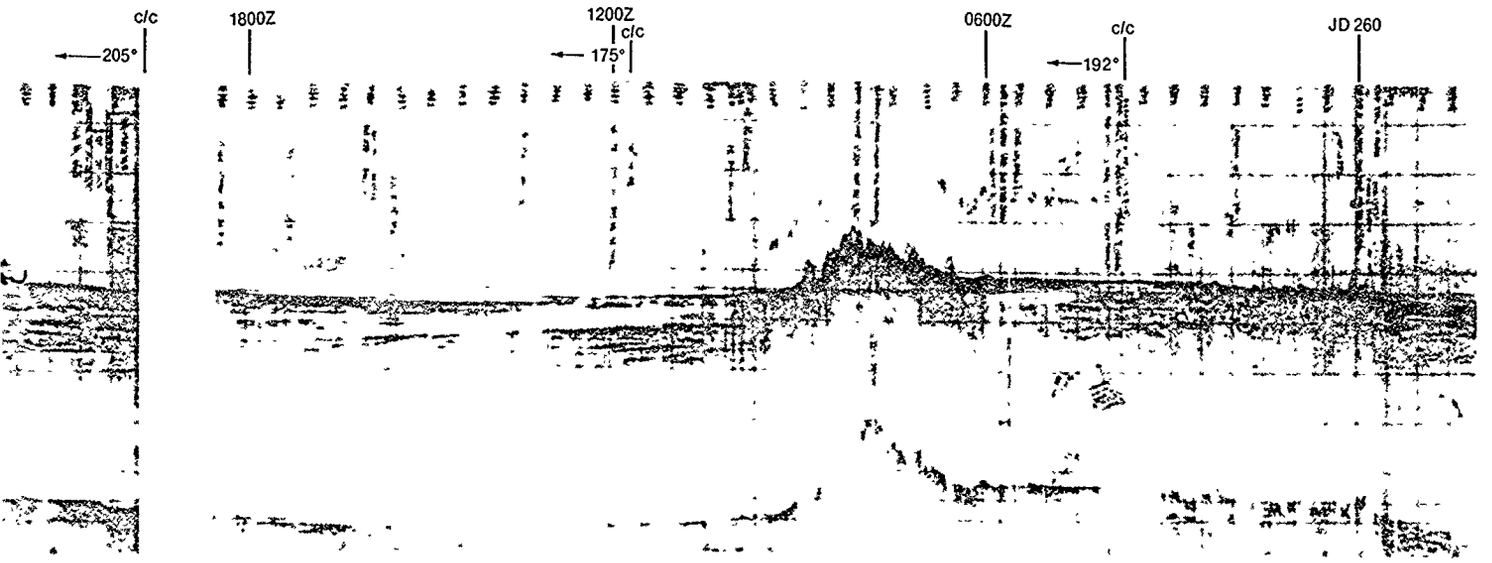
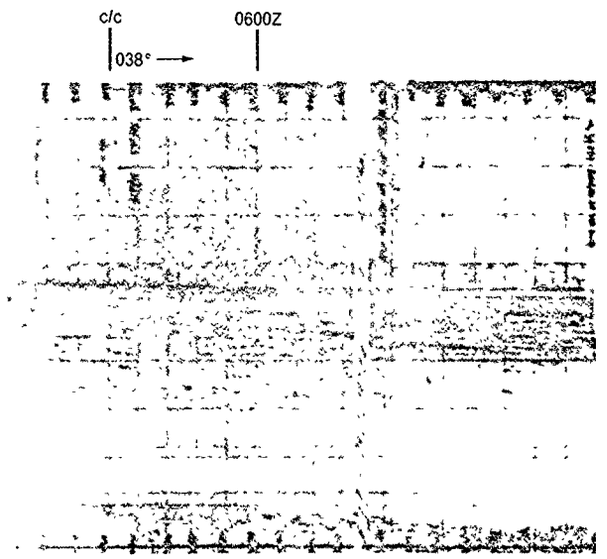
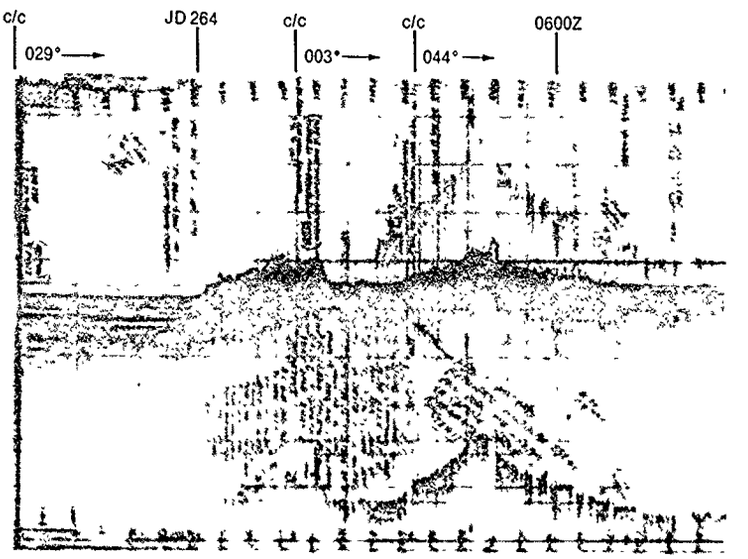


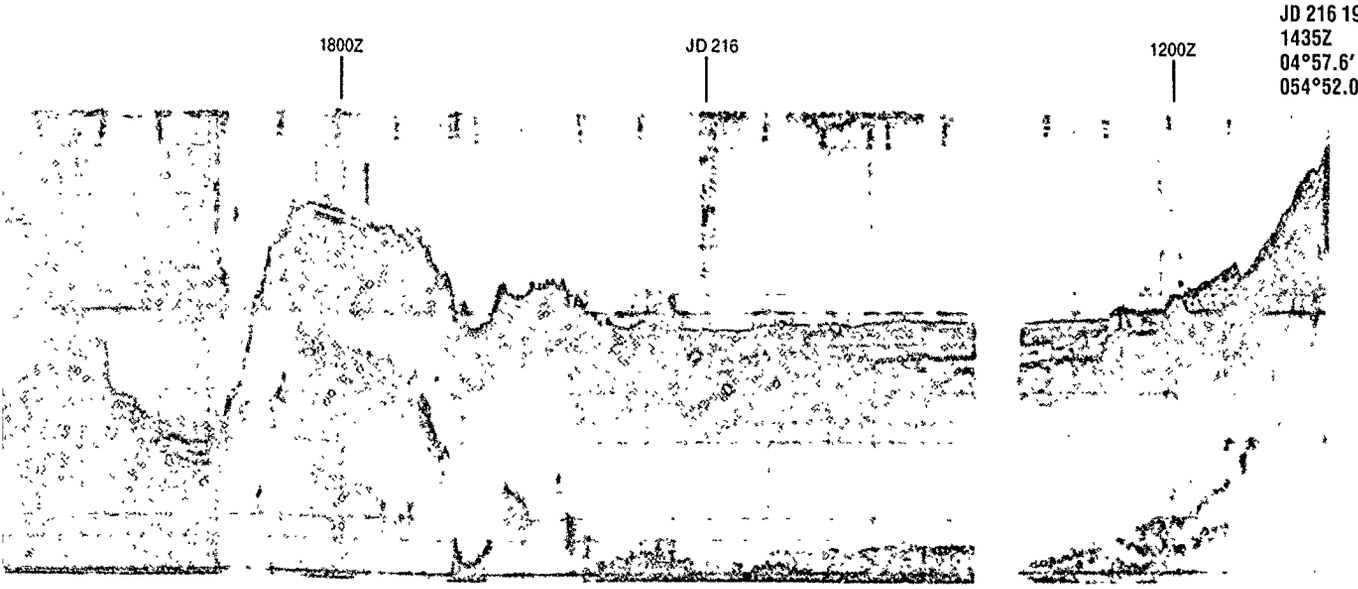
PLATE 10A

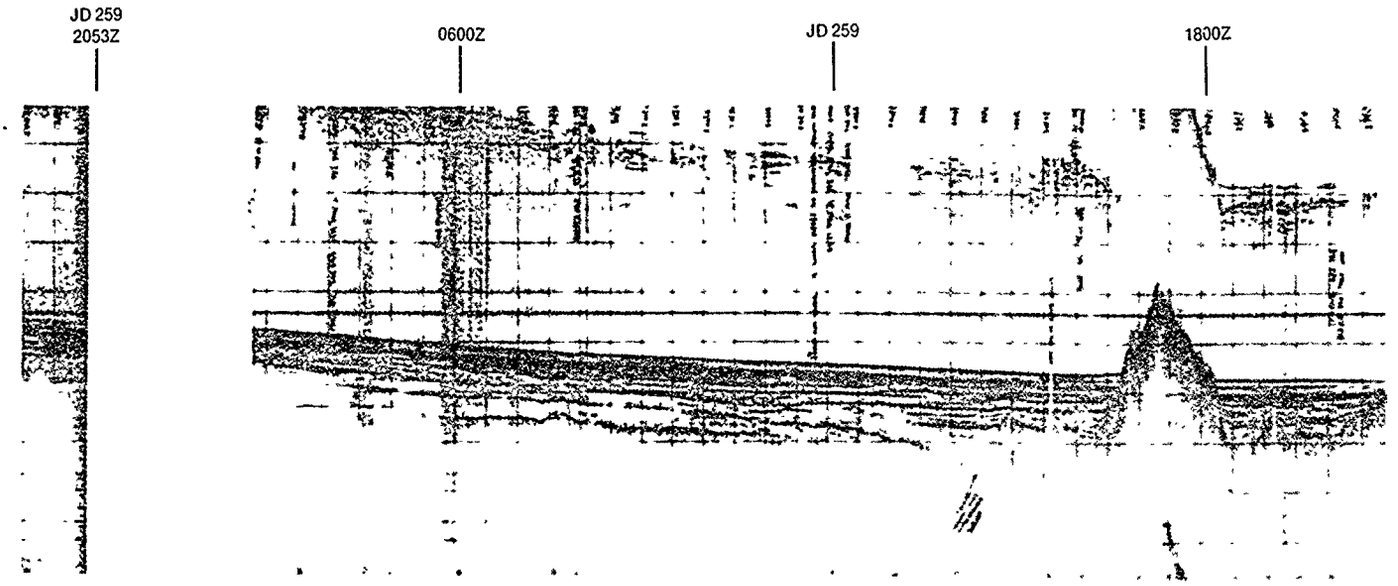


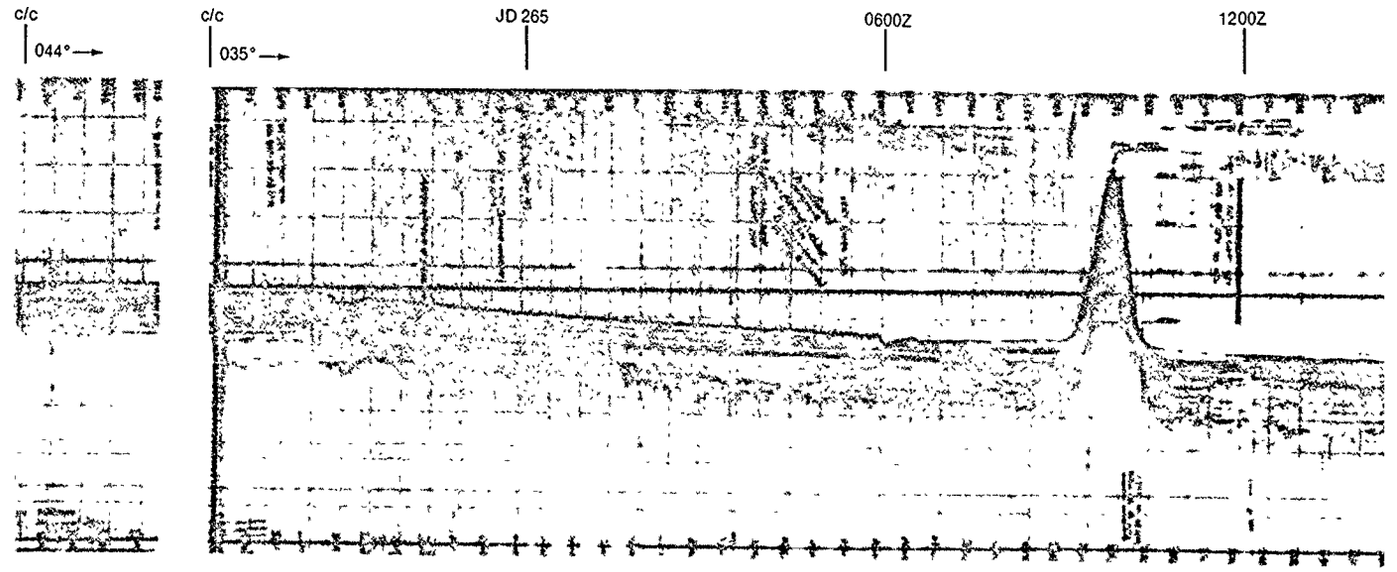




W″
JD 216 1977
1435Z
04°57.6′ S
054°52.0′ E







BB

JD 253 1977
2138Z
09°08.7′ N
052°06.9′ E

CRUISE 343731

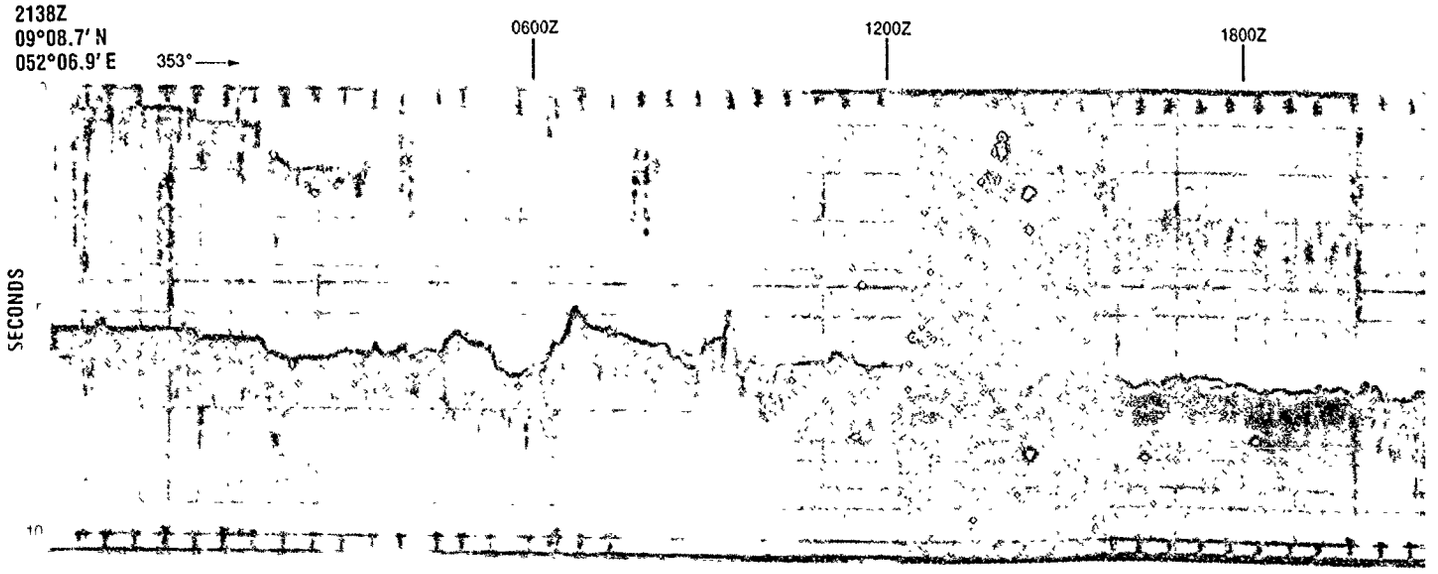
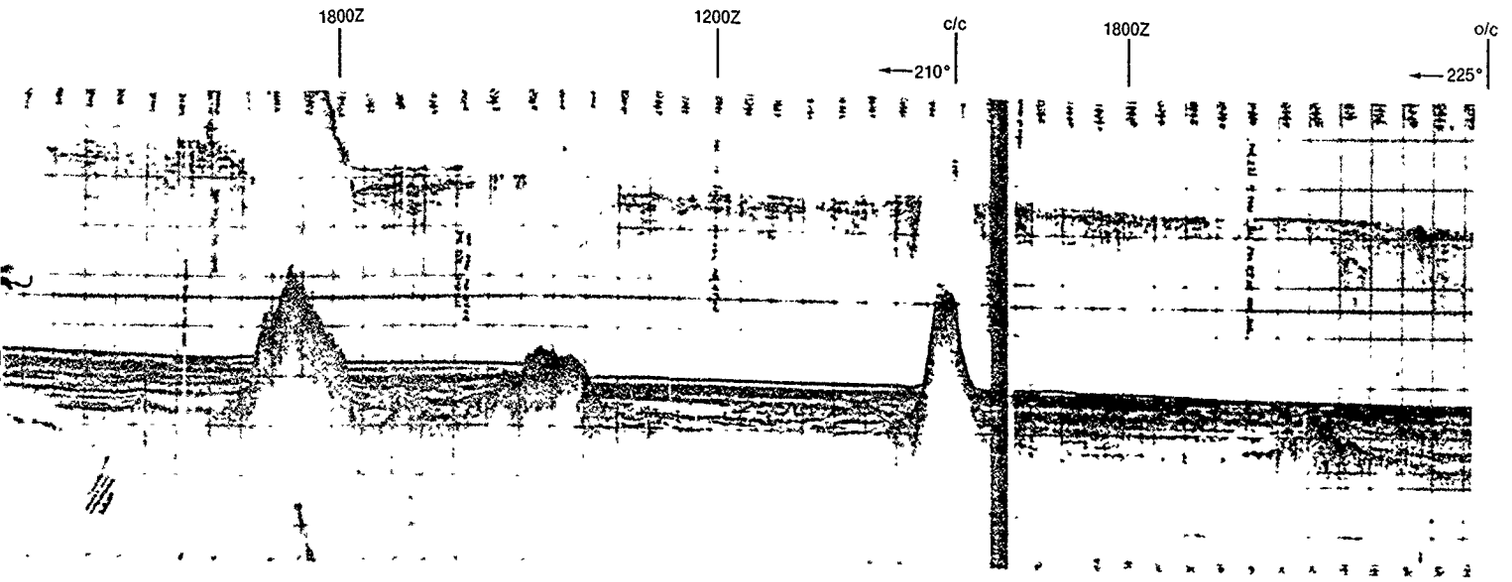
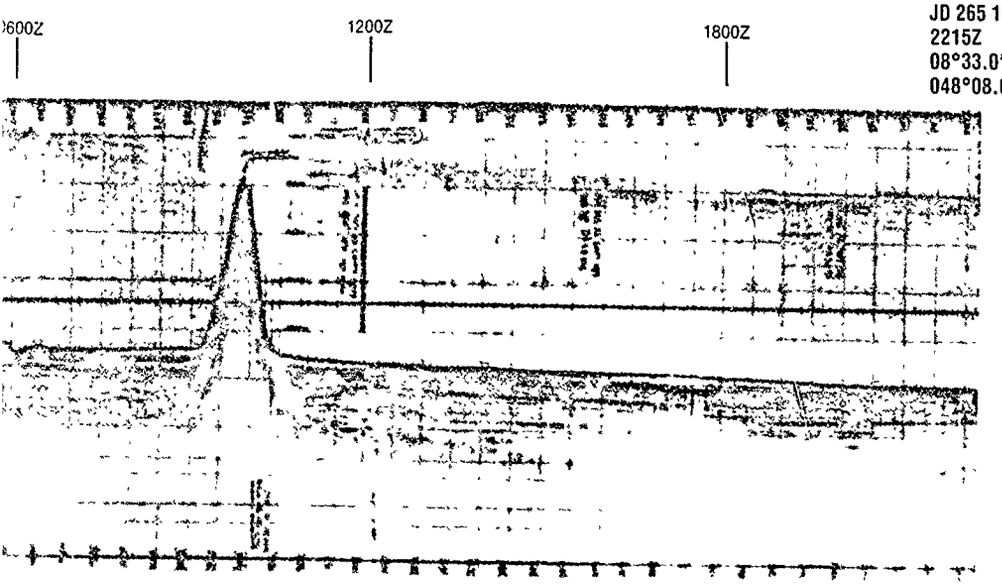
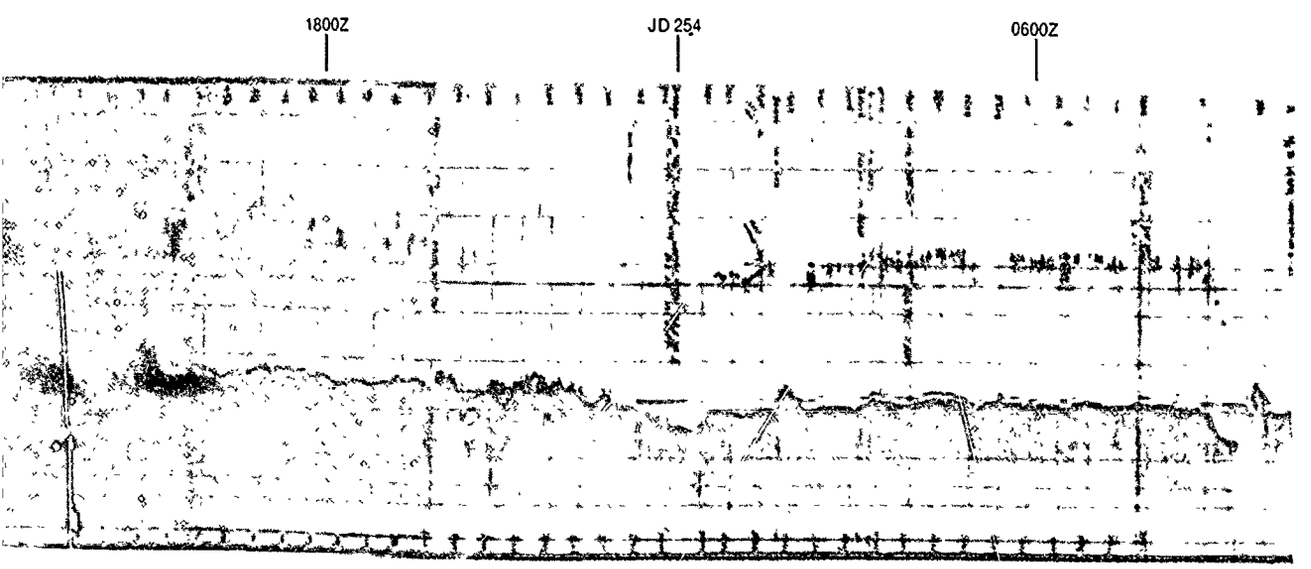


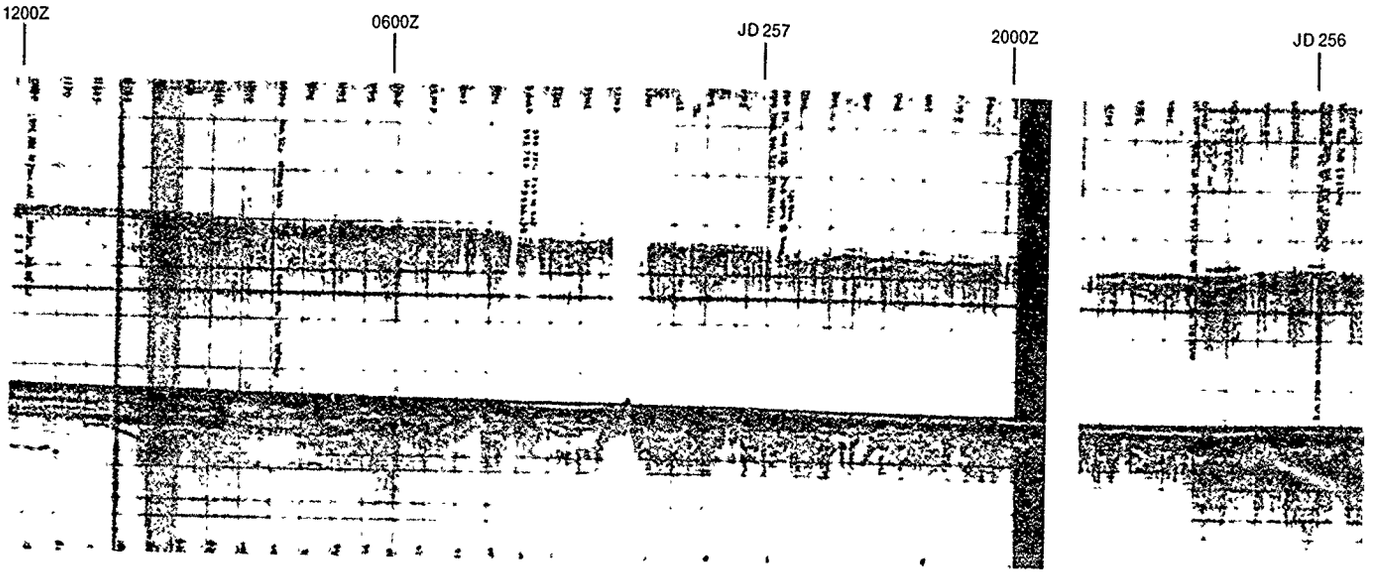
PLATE 10B



X′
JD 265 1977
2215Z
08°33.0′ S
048°08.0′ E






1200Z
0600Z
JD 257
2000Z
JD 256

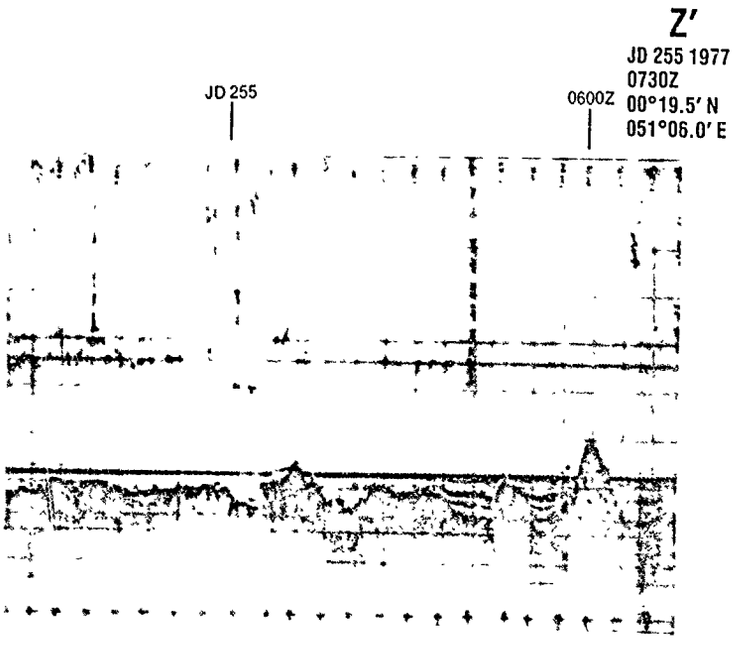
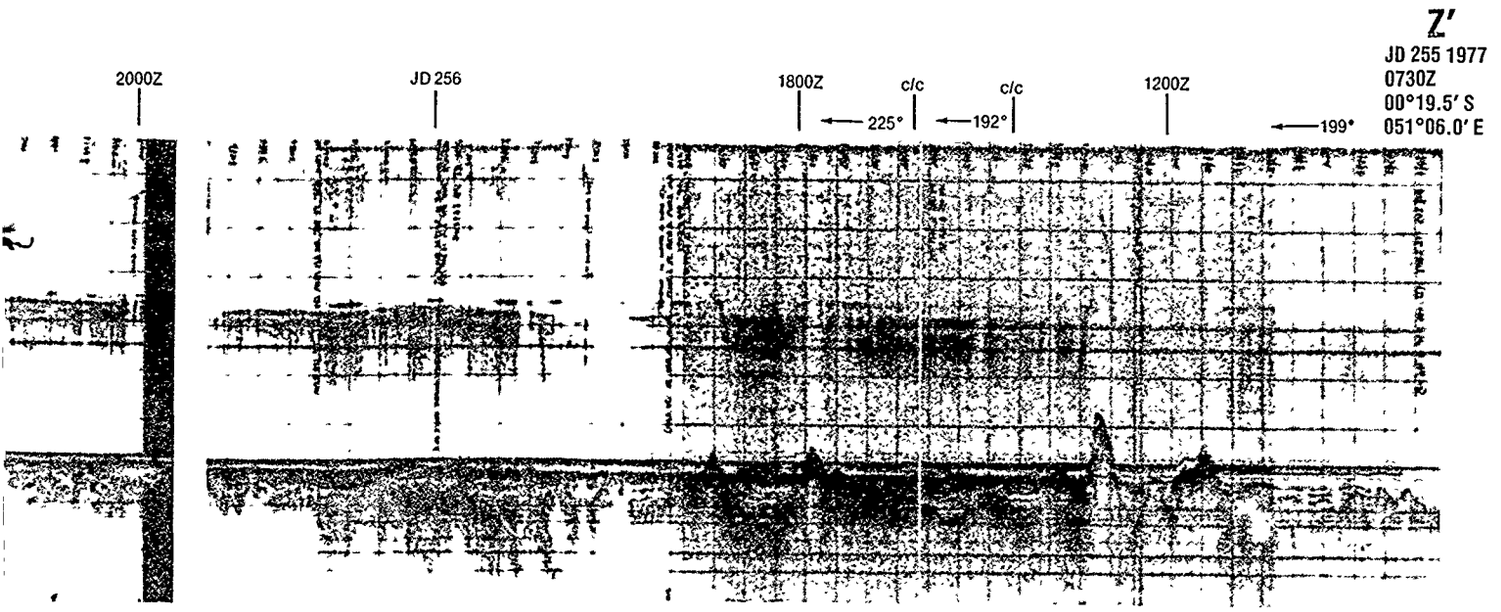
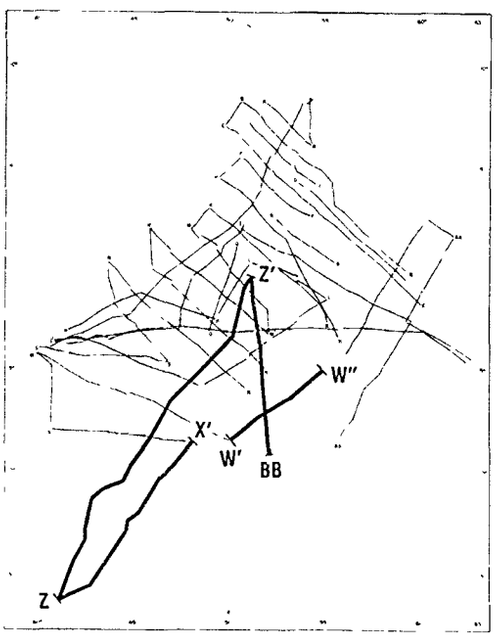
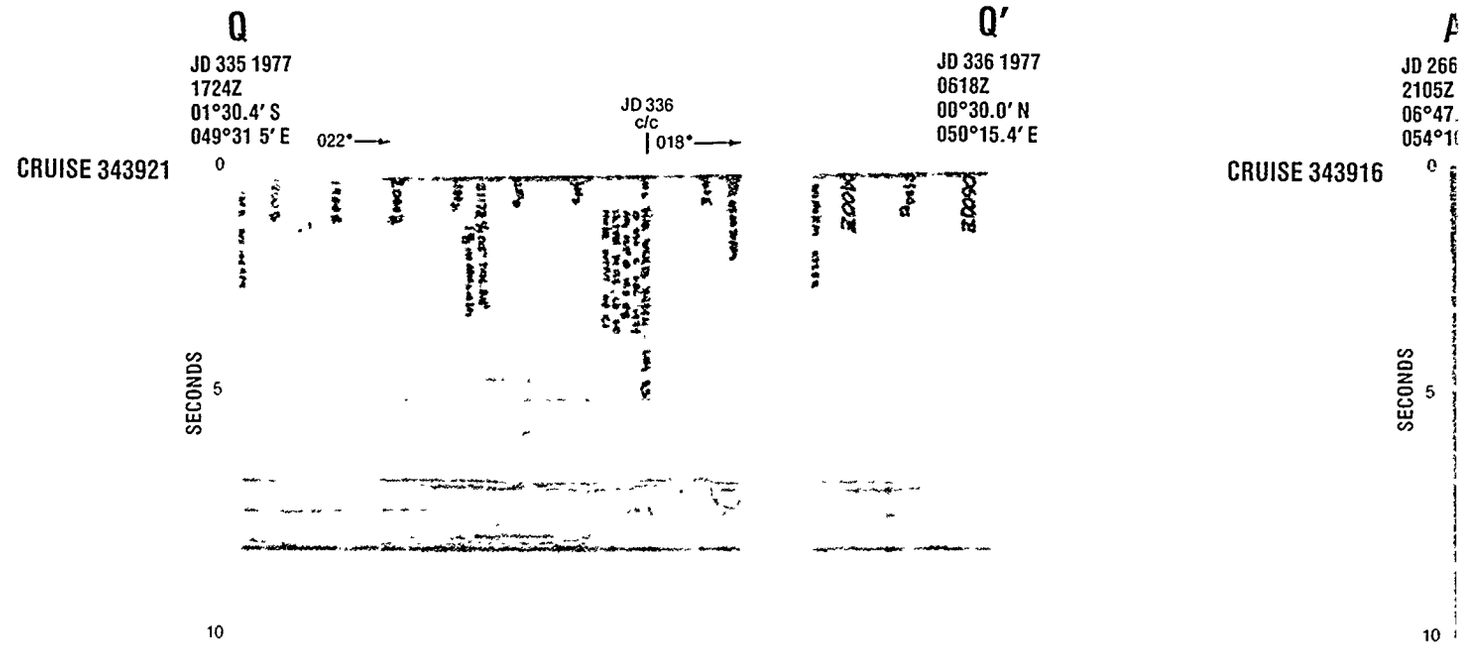

Z′
JD 255 1977
0730Z
00°19.5′ N
051°06.0′ E
JD 255
0600Z

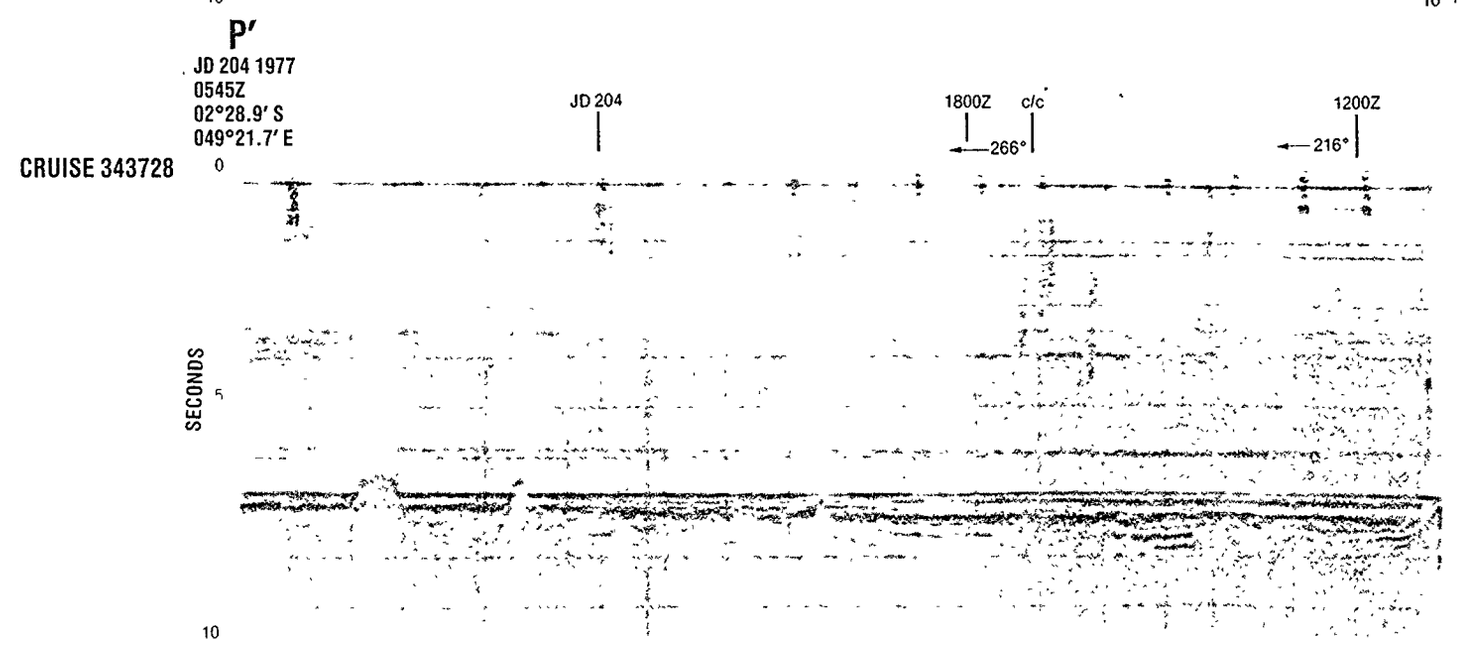
PLATE 10C





INDEX CHART (PLATES 10A, 10B, 10C)


Q
JD 335 1977
1724Z
01°30.4′ S
049°31 5′ E
CRUISE 343921
022°
JD 336
c/c
018°
Q′
JD 336 1977
0618Z
00°30.0′ N
050°15.4′ E
SECONDS
0
5
10


P′
JD 204 1977
0545Z
02°28.9′ S
049°21.7′ E
CRUISE 343728
JD 204
1800Z
c/c
266°
1200Z
216°
SECONDS
0
5
10

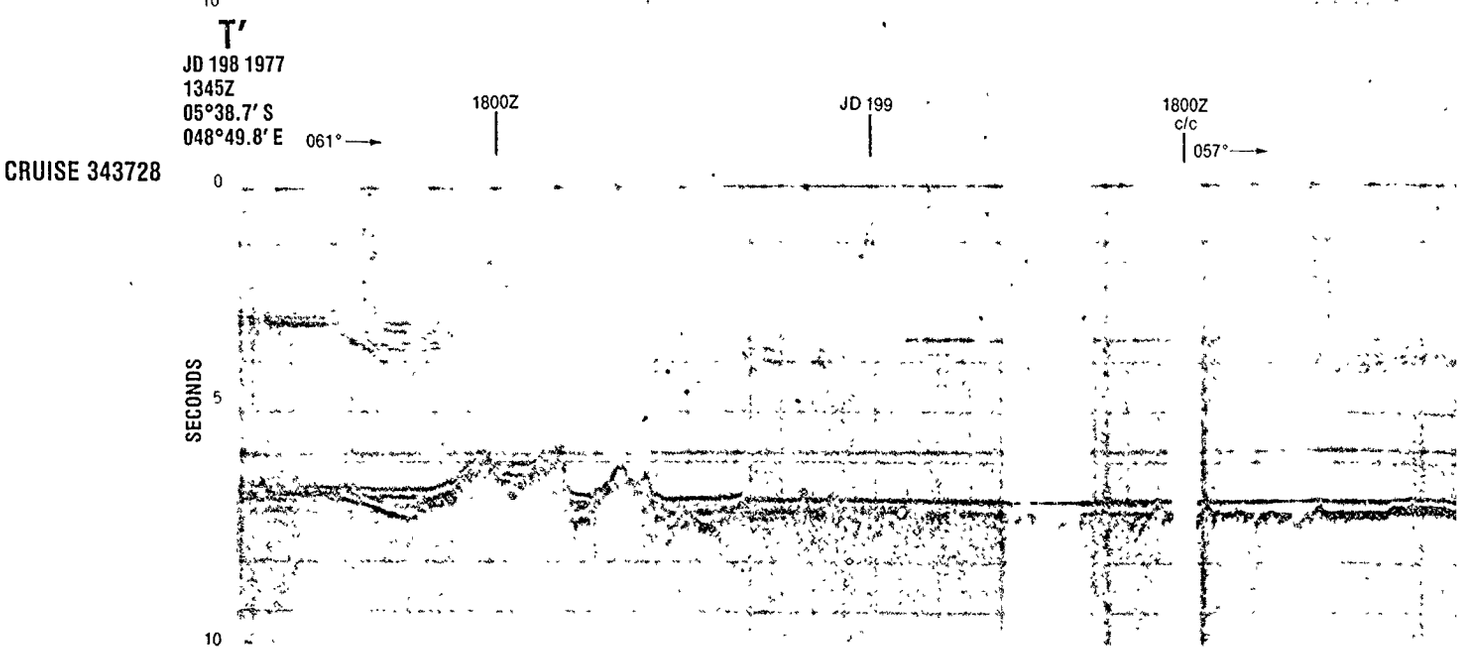
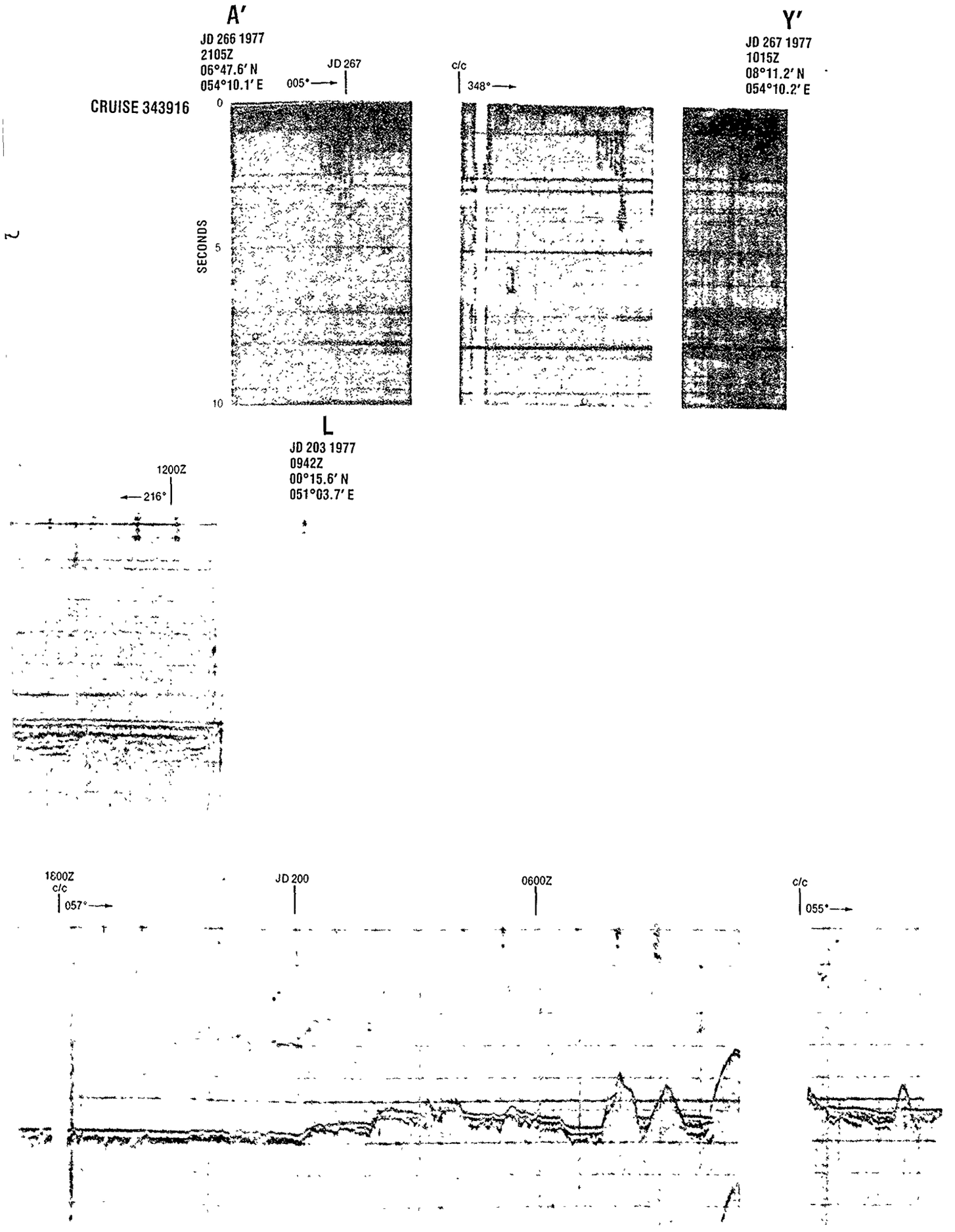
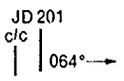

T′
JD 198 1977
1345Z
05°38.7′ S
048°49.8′ E
CRUISE 343728
061°
1800Z
JD 199
1800Z
c/c
057°
SECONDS
0
5
10

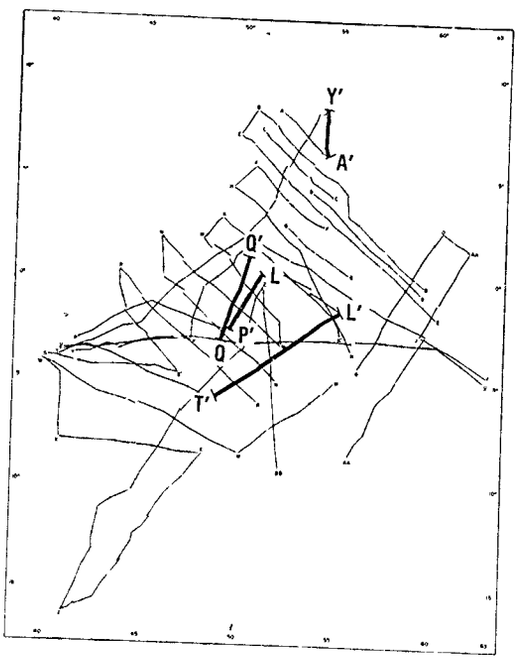
PLATE 11A


A'
JD 266 1977
2105Z
06°47.6' N
054°10.1' E
JD 267
005°
CRUISE 343916
0
SECONDS
5
10
c/c
348°
Y'
JD 267 1977
1015Z
08°11.2' N
054°10.2' E
L
JD 203 1977
0942Z
00°15.6' N
051°03.7' E
1200Z
216°
1800Z
c/c
057°
JD 200
0600Z
c/c
055°

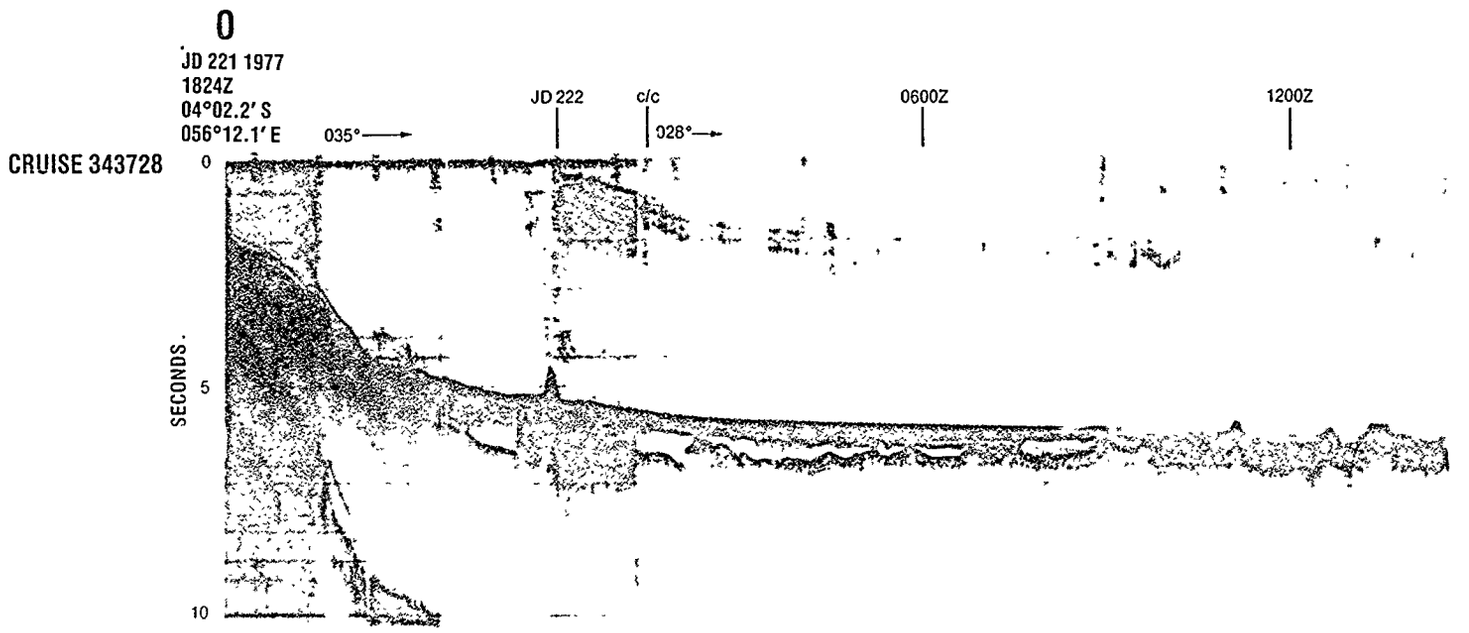


L′
JD 201 1977
0600Z
01°33.4′ S
054°58.3′ E

PLATE 11B



INDEX CHART (PLATES 11A, 11B)


0
JD 221 1977
1824Z
04°02.2′ S
056°12.1′ E
035°
JD 222
c/c
028°
0600Z
1200Z
CRUISE 343728
0
SECONDS
5
10

CRU

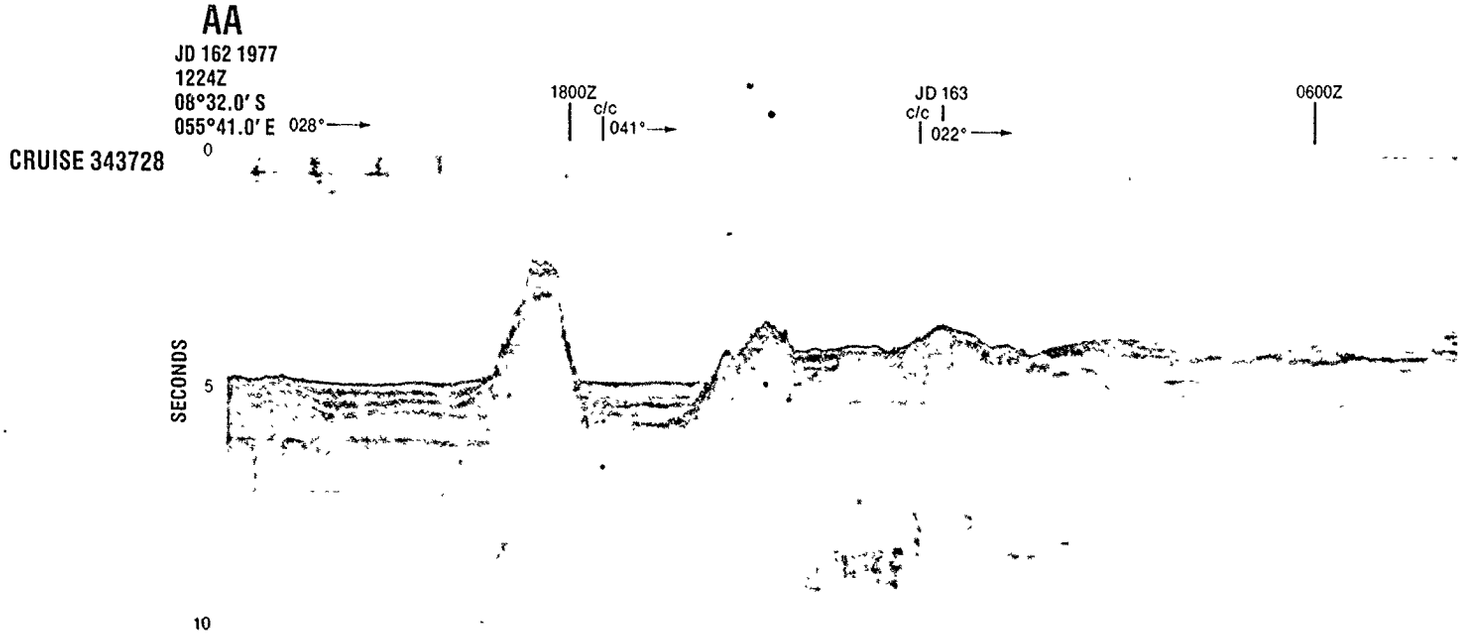
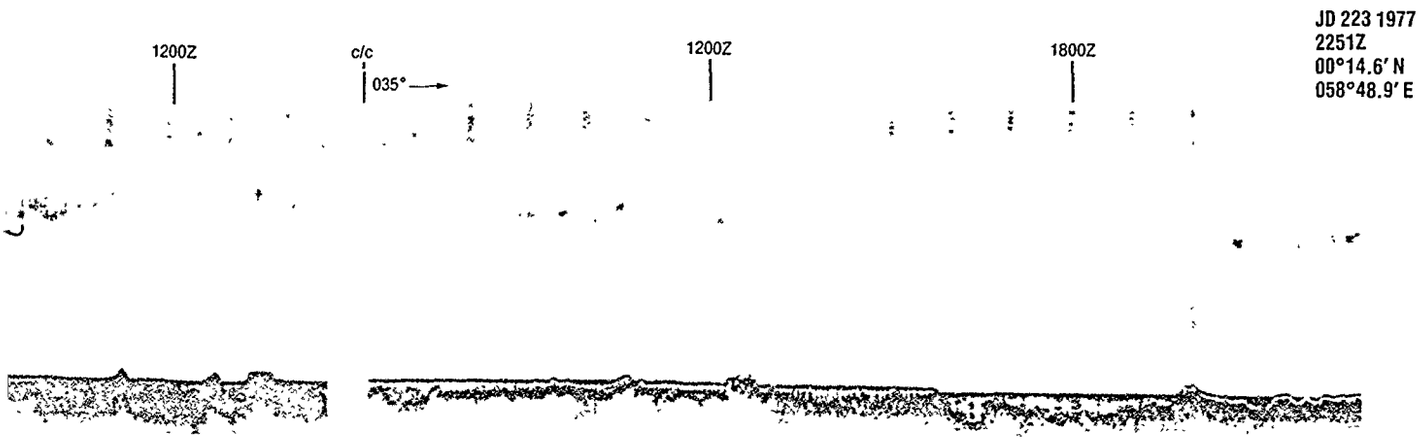
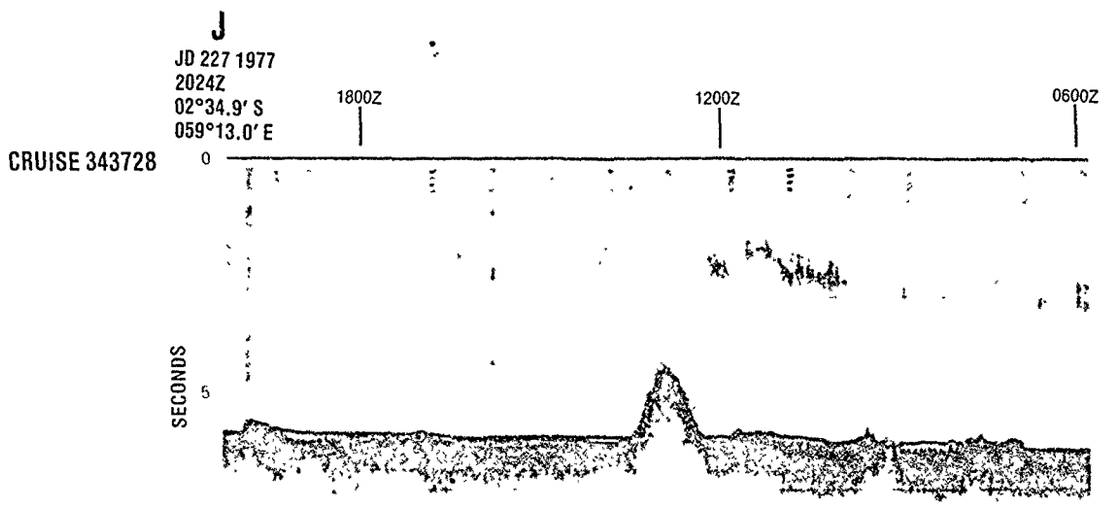
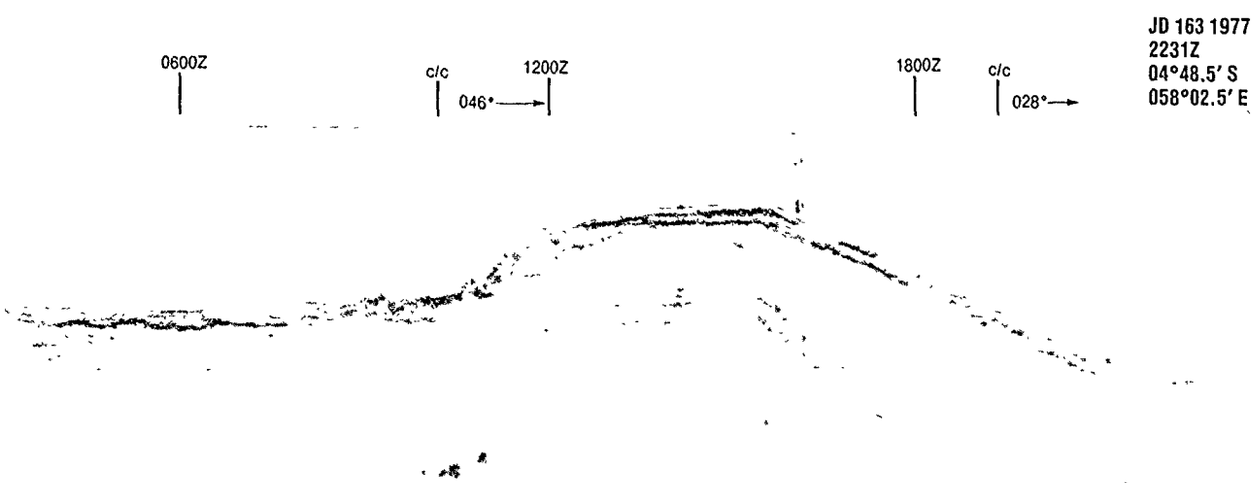

AA
JD 162 1977
1224Z
08°32.0′ S
055°41.0′ E
028°
1800Z
c/c
041°
JD 163
c/c
022°
0600Z
CRUISE 343728
0
SECONDS
5
10

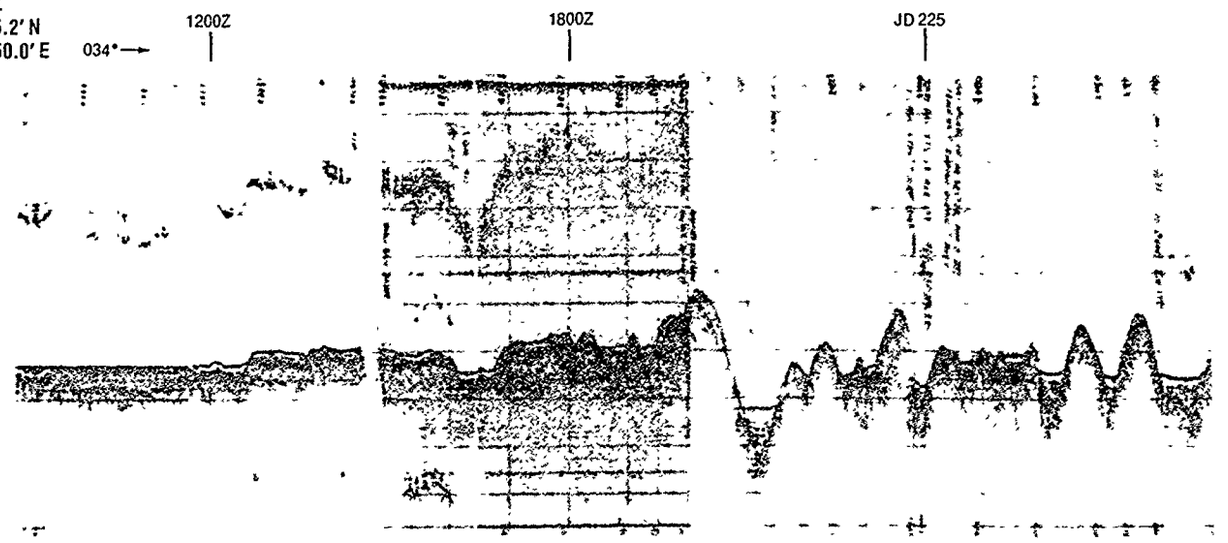
PLATE 12A


1200Z
c/c
035°
1200Z
1800Z
JD 223 1977
2251Z
00°14.6′ N
058°48.9′ E

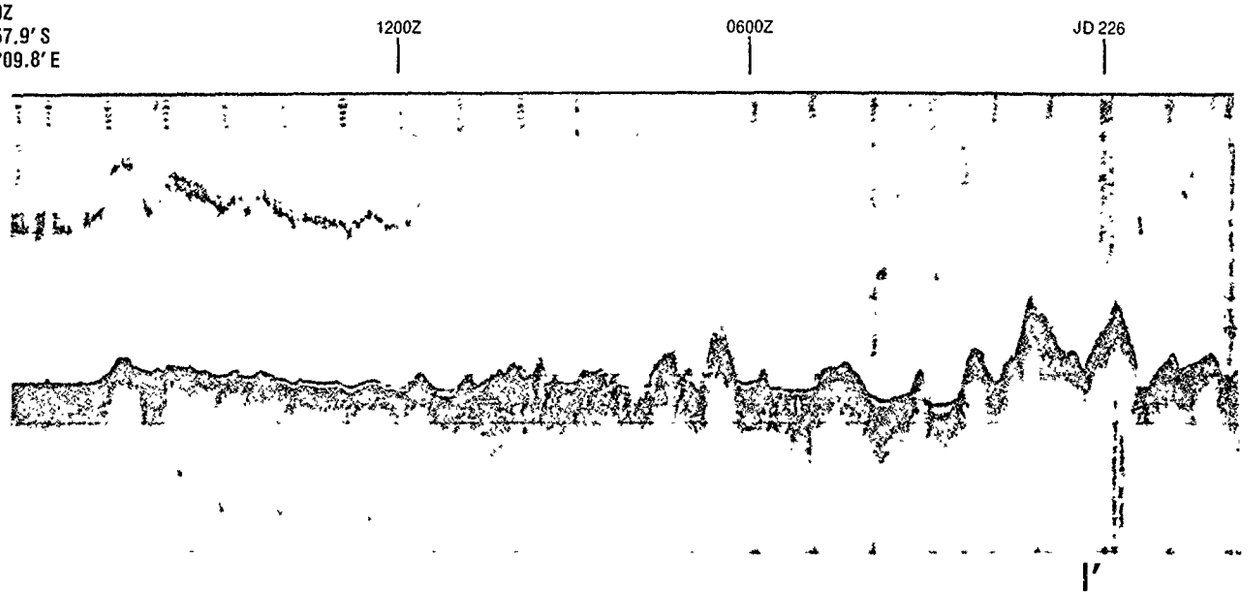

J
JD 227 1977
2024Z
02°34.9′ S
059°13.0′ E
CRUISE 343728
1800Z
1200Z
0600Z
0
SECONDS
5
10


0600Z
c/c
046°
1200Z
1800Z
c/c
028°
JD 163 1977
2231Z
04°48.5′ S
058°02.5′ E

JD 224 1977
0845Z
00°25.2′ N
058°50.0′ E



JD 226 1977
1830Z
00°57.9′ S
060°09.8′ E



JD 164 1977
0826Z
04°29.9′ S
058°13.8′ E

JD 165 1977
0200Z
02°33.2′ S
059°32.3′ E

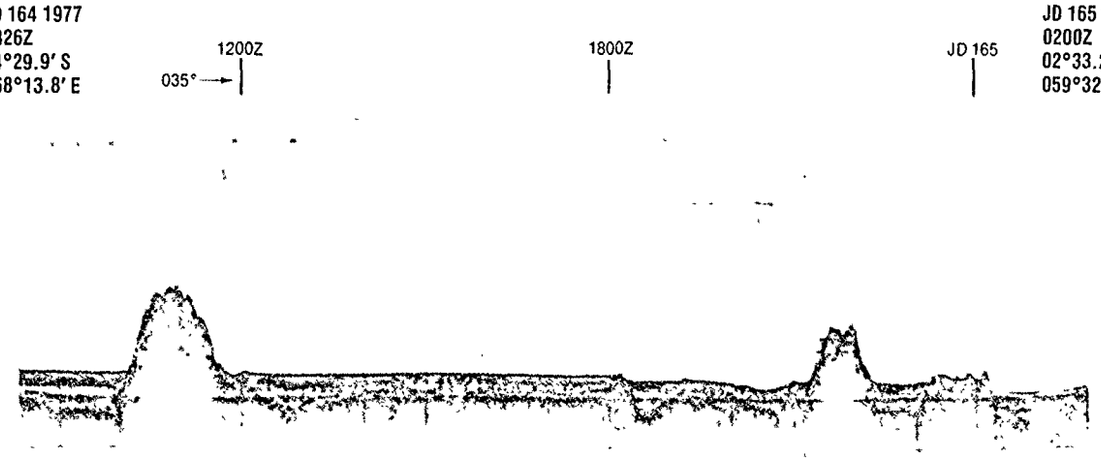
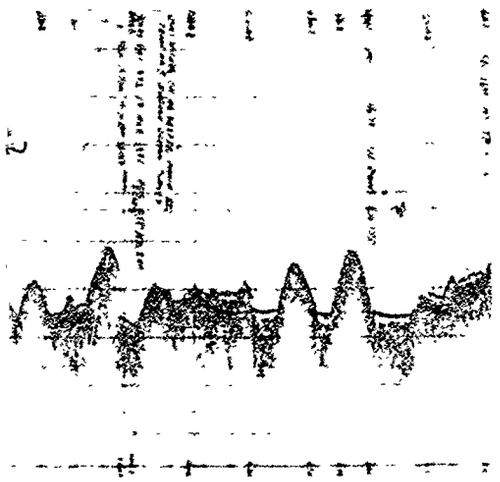


PLATE 12B

O′
JD 225 1977
0600Z
02°32.3′ N
060°18.0′ E

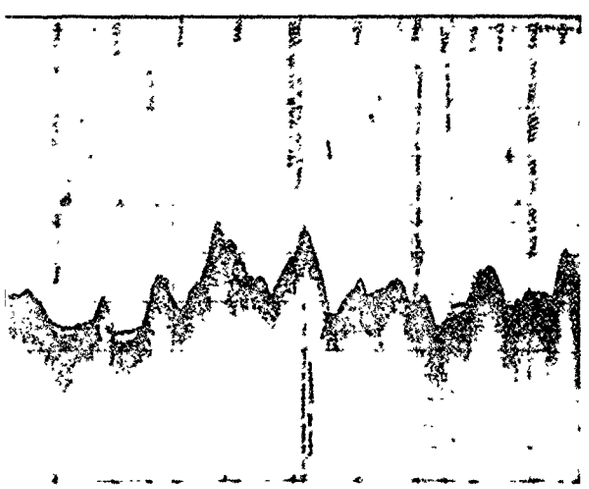
JD 225



AA′
JD 225 1977
1854Z
01°36.3′ N
061°42.2′ E

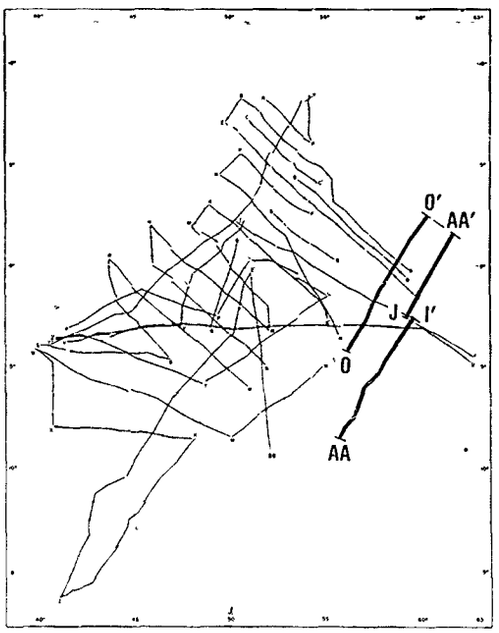
JD 226

211°



I′
JD 165 1977
0200Z
02°33.2′ S
059°32.3′ E

JD 165



INDEX CHART (PLATES 12A, 12B)

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