

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION

**DIVISION of FISHERIES and OCEANOGRAPHY**

**Report No. 91**

**SATELLITE-TRACKED BUOY DATA REPORT II.  
TASMAN SEA RELEASES NOVEMBER 1976 - JULY 1977**

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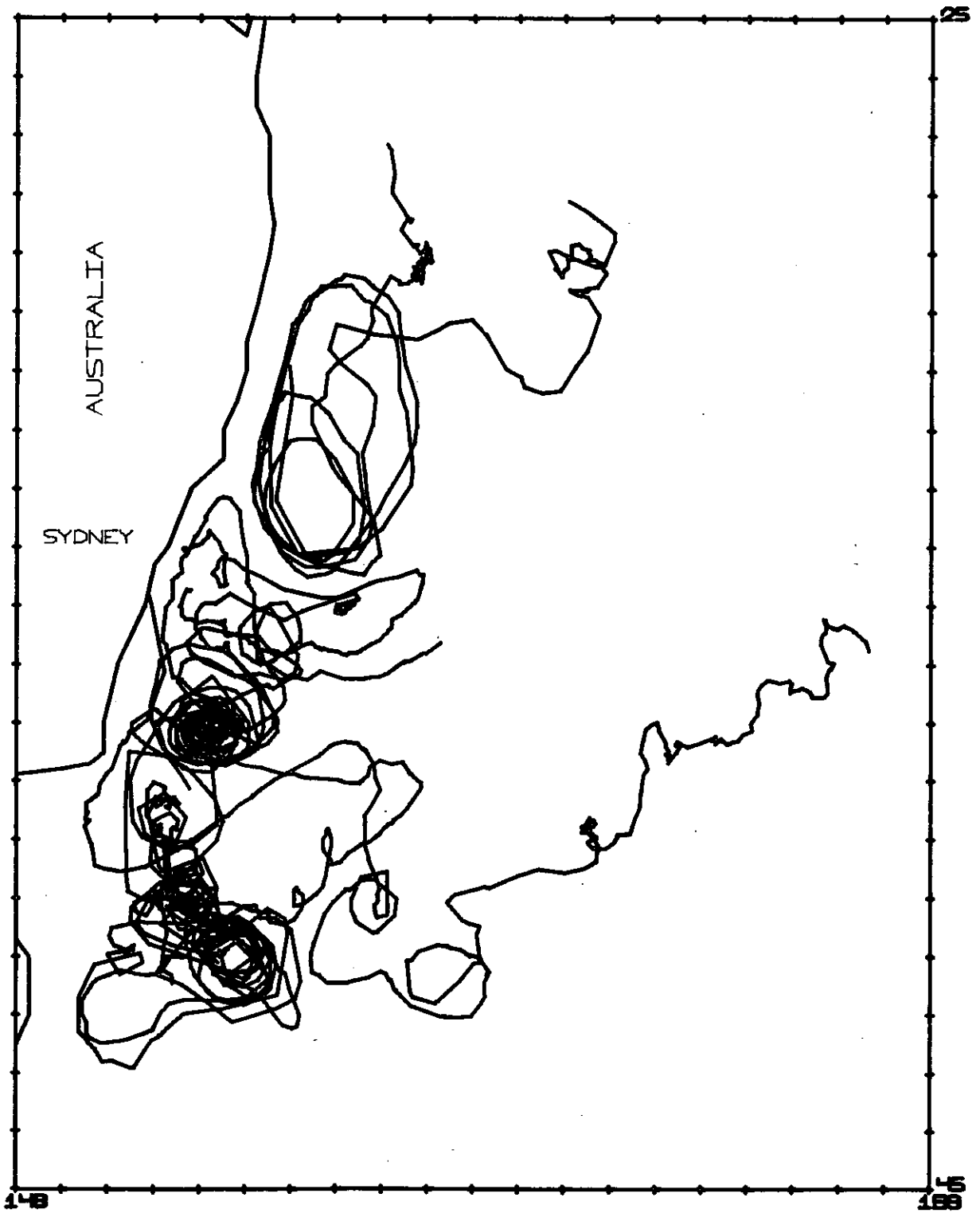


Figure 1. A composite chart of the 1977 tracks of the Tasman Sea buoys (buoy 1364 not included).

## SATELLITE-TRACKED BUOY DATA REPORT II.

TASMAN SEA RELEASES NOVEMBER 1976 - JULY 1977

G.R. Cresswell and J.E. Wood

*Abstract*—Track, speed, and sea surface temperature data from ten buoys released in the western Tasman Sea and tracked by the NASA satellite NIMBUS-6 are presented. The buoys showed the area to be dominated by three mesoscale eddies. One of these moved SSE and held buoys trapped for four months. Another did not move and held a buoy trapped for three months.

### I. INTRODUCTION

Track, speed, and sea surface temperature data from twelve buoys released off the Western Australian coast and tracked by the NASA satellite NIMBUS-6 during 1975 and 1976 have been reported earlier (Cresswell and Vaudrey, 1977). In this report the same format for data presentation is used for ten buoys released in the Tasman Sea during a seven month period commencing November 1976.

### II. THE BUOYS

Seven of the ten buoys were the 4.5 m spars described in Data Report I; the other three (1132, 1234, 1570) were a new type, 2 m long resembling a torpedo (Cresswell, Richardson and Wood, (in prep)). Each buoy was drogued by a parachute at 20 m with the exception of torpedo buoy 1570 which had its parachute at 200 m.

One of the spars (1364) operated erratically for several weeks and then failed. One of the torpedos (1234) also developed battery trouble and failed after 180 days. The other eight buoys continue to be tracked, although 1570 only operates during daylight hours. These troubles can be traced to changing away from the 'Sonnenschein' batteries to those of another manufacturer.

Buoy 1054 is the same one as used in the Indian Ocean (Data Report I); after running aground in the Abrolhos Is — at which time its temperature sensor failed — it was brought to Sydney and released without being opened up. Its lifetime now exceeds 520 days.

### III. THE RELEASES

The time and place of the buoy releases were a function of both the rate at which buoys could be prepared and the availability of ships. Four buoys (1054, 1364, 1546, and 1570) were released on day 63, 1977 into eddy A (Fig.1) which was located and mapped with expendable bathythermographs (XBTs) in a joint cruise with Dr Carl Nilsson of RANRL<sup>1</sup> aboard HMAS "Kimbla". Dr Nilsson used "Kimbla" to map this eddy again one week after the buoys were released. Buoys 1546 and 1570 showed eddy A to move to the SSE and to continue to exist for 4 months.

<sup>1</sup>Royal Australian Navy Research Laboratory.

Buoy 1352 was released into eddy B on day 87 by Dr Nilsson on a "Kimbla" cruise during which XBT data were gathered. This eddy simultaneously trapped buoy 1234 and although this buoy failed after being in the eddy for 2 months, buoy 1352 did not escape from the eddy before 3 months had elapsed. The eddy barely moved in this time.

XBT sections were made through eddy B by R.V. "Sprightly" on day 150 and by Dr Garrey Maxwell and Mr Malcolm Castle of CSIRO aboard the R.V. "Courageous" on days 167/168 and 204 respectively. On the second of these sections a buoy was released at the centre of the eddy as had been indicated by buoy 1352. The behaviour of the new buoy may indicate that eddy B continues to exist.

Buoys 1631 and 1640 were released 30 km apart on day 105 from "Kimbla" by Mr John Andrews of WRE<sup>2</sup>. They traced out a feature which we have called eddy C.

Of the other buoys, 1132, 1234, and 1676 were released by small craft 15 km east of Cronulla (Cronulla is 20 km south of Sydney).

#### IV. DATA HANDLING

Data up to day 120, 1977 once again came from computer cards posted from NASA. After day 120 the cards were replaced by magnetic tapes and we have not yet successfully managed to read these. The data for days 120-180 were transcribed therefore from the computer listings posted from NASA.

#### V. DATA PRESENTATION

For the purpose of comparison we have stayed with the 9° of latitude by 15° of longitude charts of Data Report I, although the Tasman Sea buoy tracks often occupy only a small part of this. In cases where a particular buoy track is complex and difficult to follow in the standard presentation we have made an enlargement of part of the track and fitted this within the chart. The enlargement can be recognized by the thicker line used and the degree of the enlargement is indicated (X2, X3, etc.).

As with Data Report I, a 16 mm movie has been made by a computer display depicting the buoy movements.

#### *Acknowledgements*

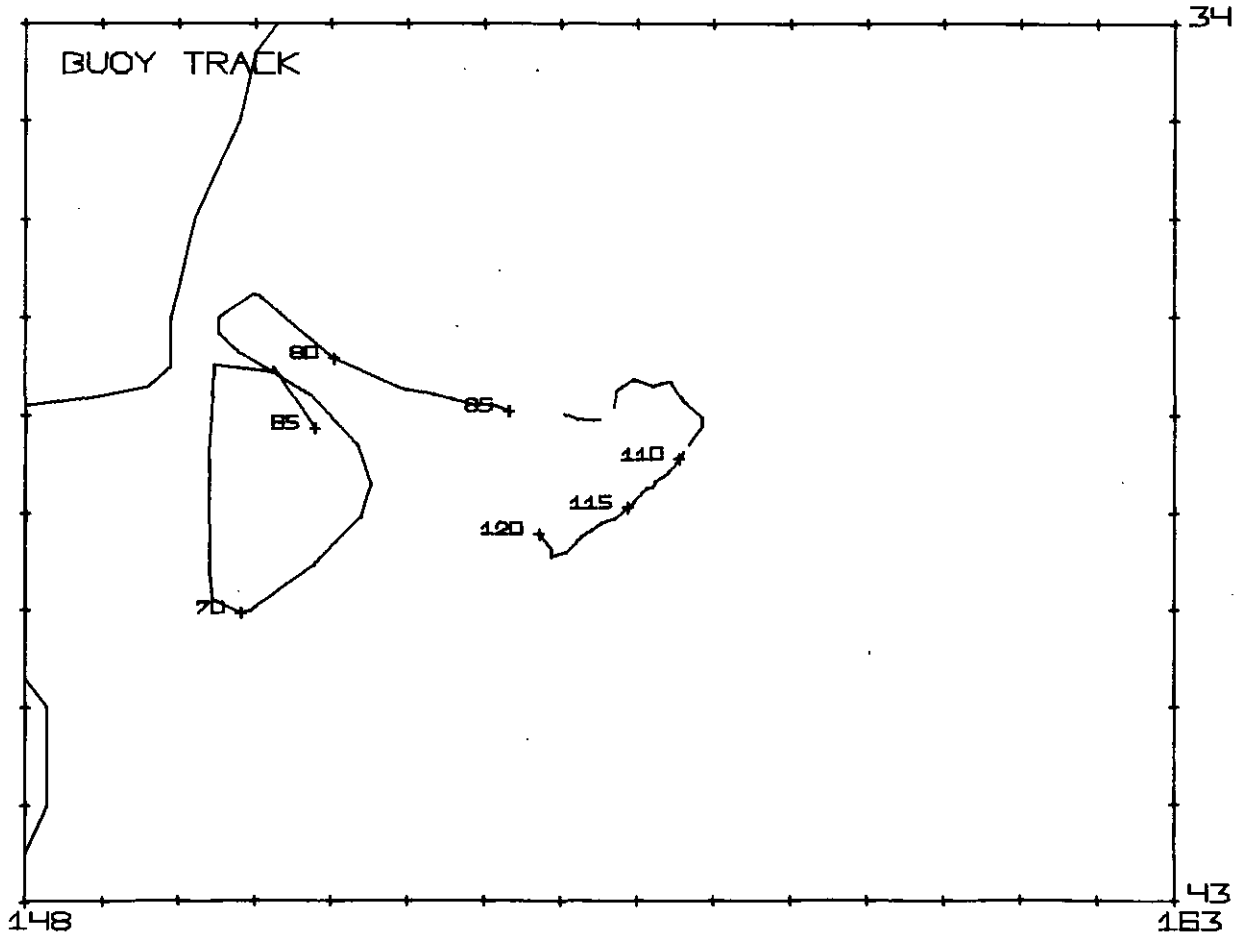
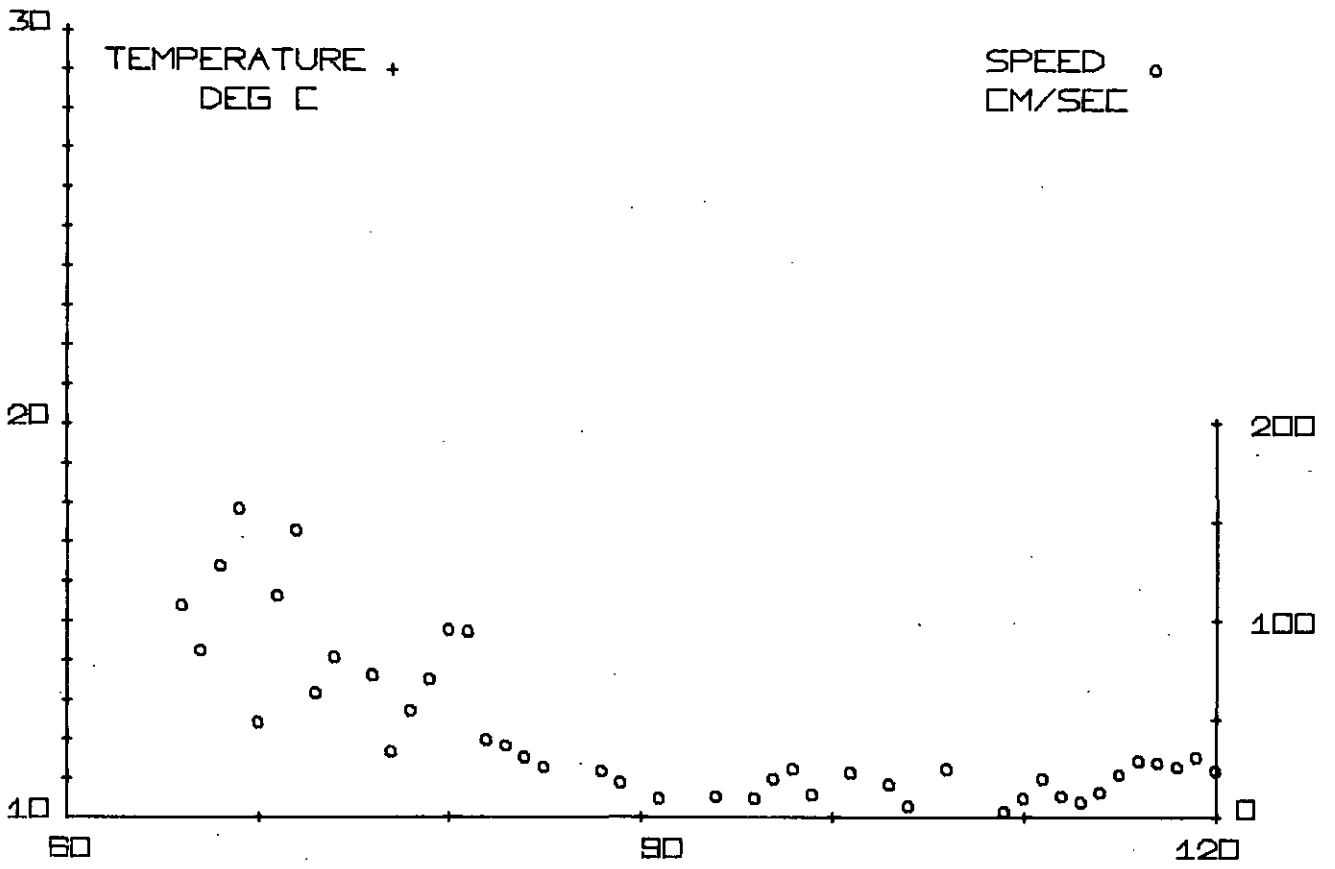
Once again we thank David Crooks and Garry Richardson and their assistants. We thank also the individuals named earlier in the report as well as the Captains and crews of "Kimbla", "Sprightly", "Courageous", and "Karin" for releasing buoys or collecting XBT or other data. Finally we gratefully acknowledge the continuing excellent service provided by NASA.

#### VI. REFERENCES

- Cresswell, G.R., and Vaudrey, D.J. 1977. Satellite-tracked buoy data report. I. Western Australian releases 1975 and 1976. *CSIRO Aust. Div. Fish. Oceanogr. Rep.* No. 86.  
(Cresswell, G.R., Richardson G.T., and Wood, J.E. (In prep)).

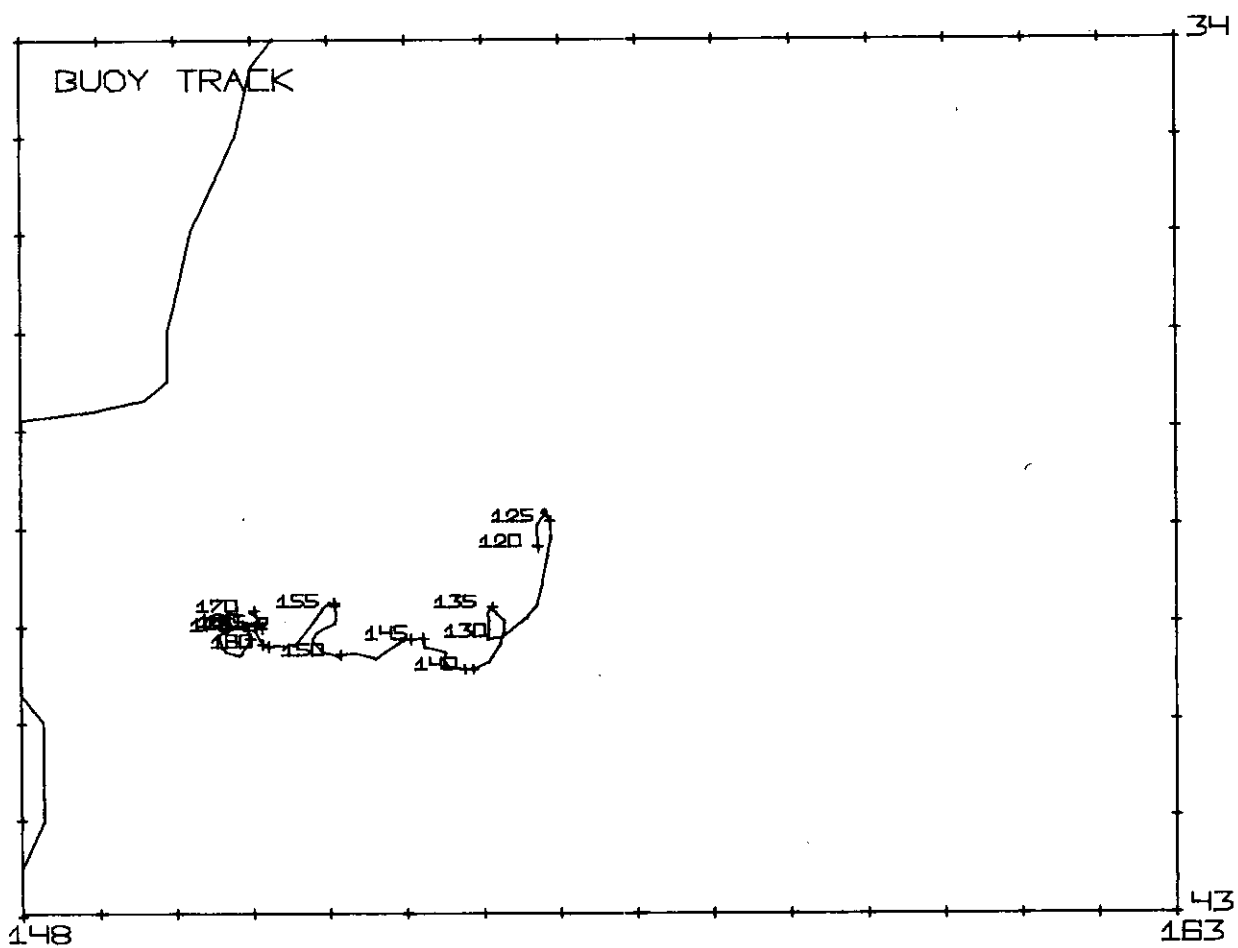
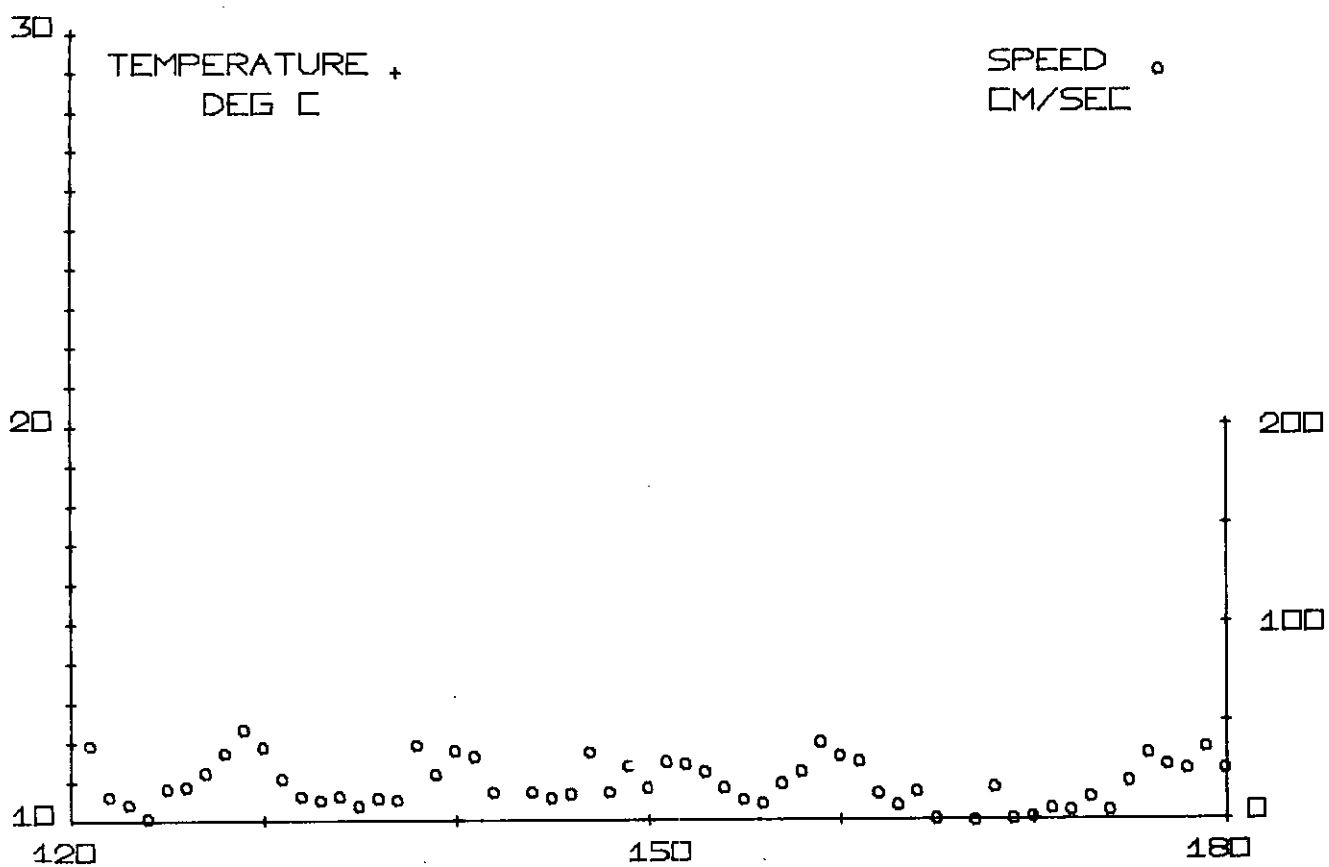
<sup>2</sup>Weapons Research Establishment.

BUOY 1054 DAYS 60-120 1977



BUOY 1054

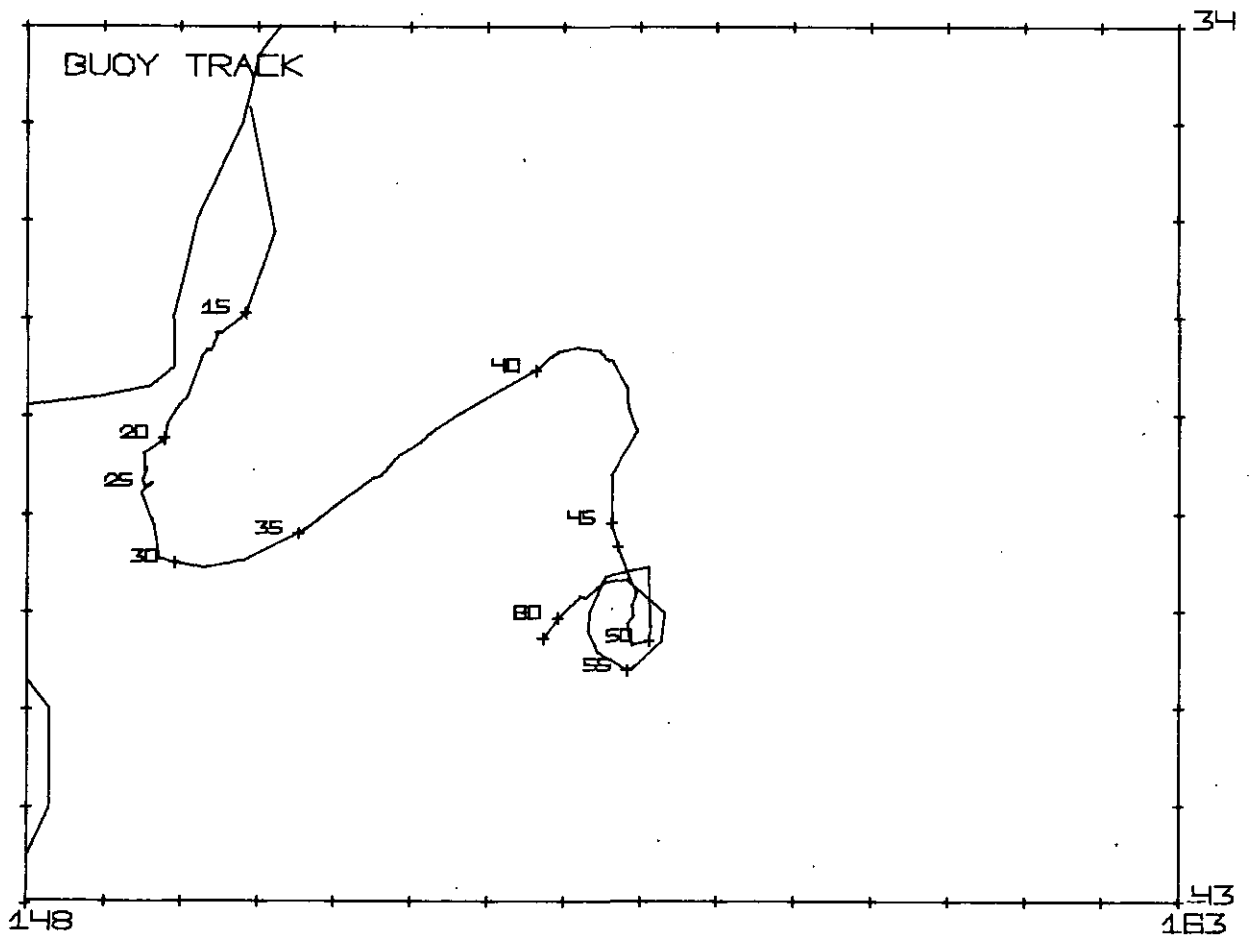
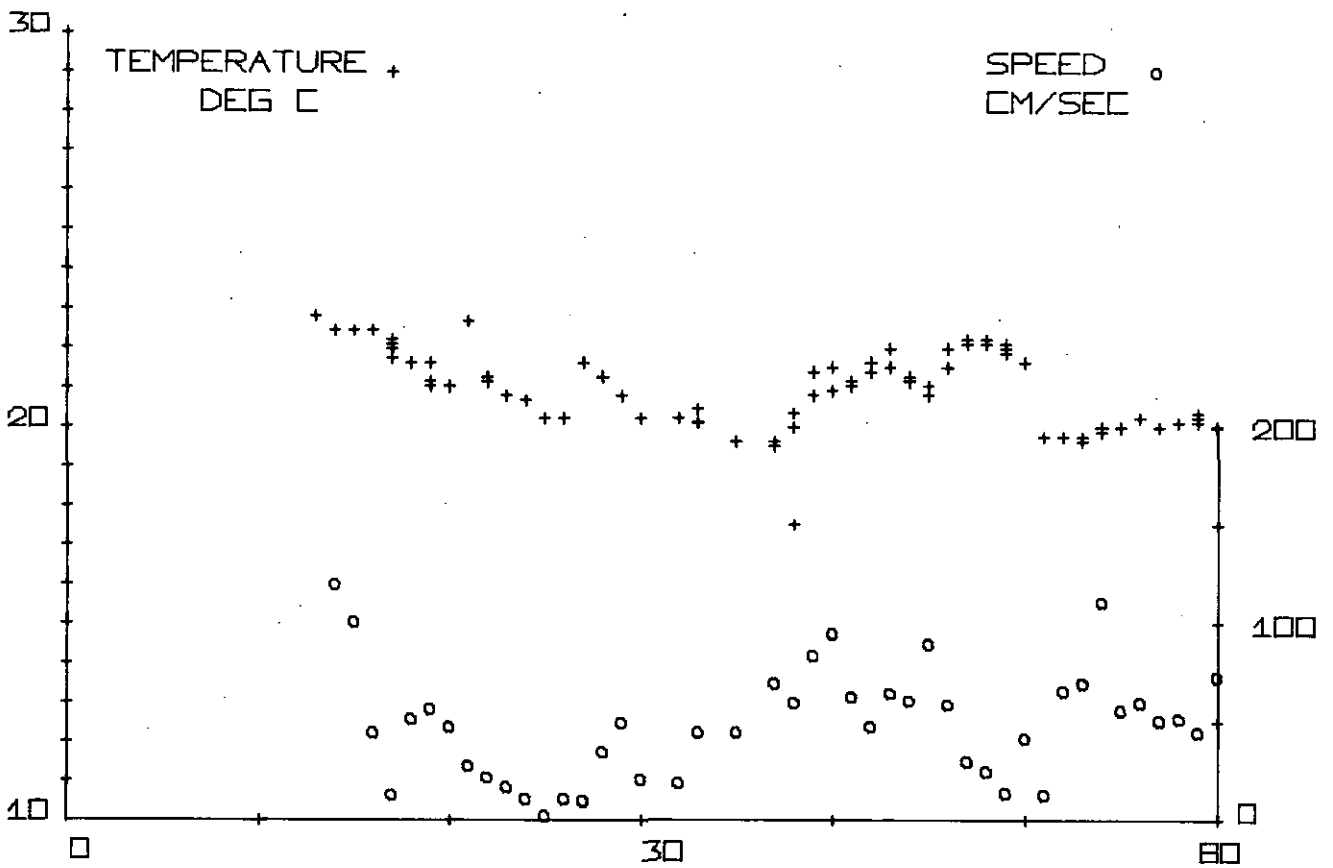
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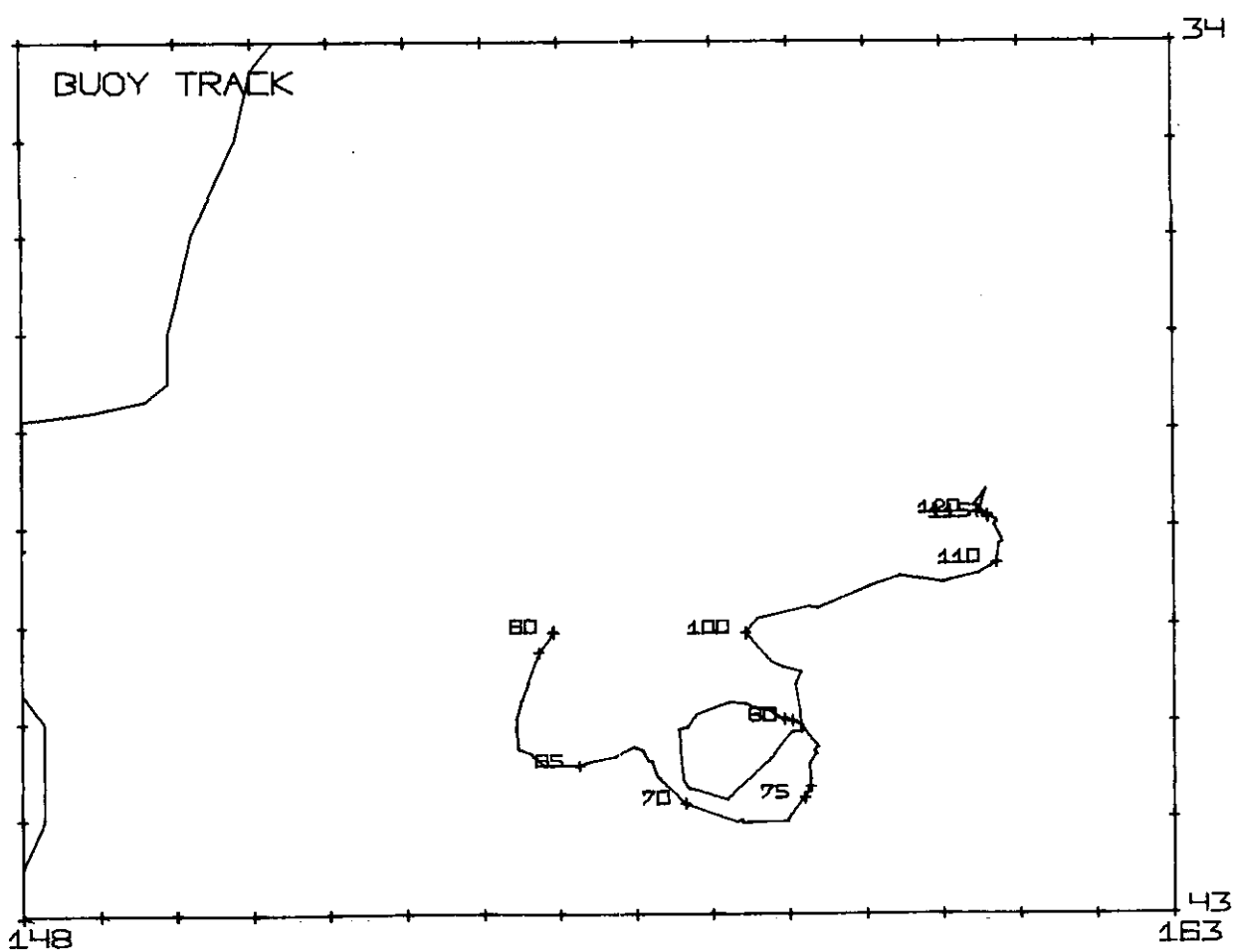
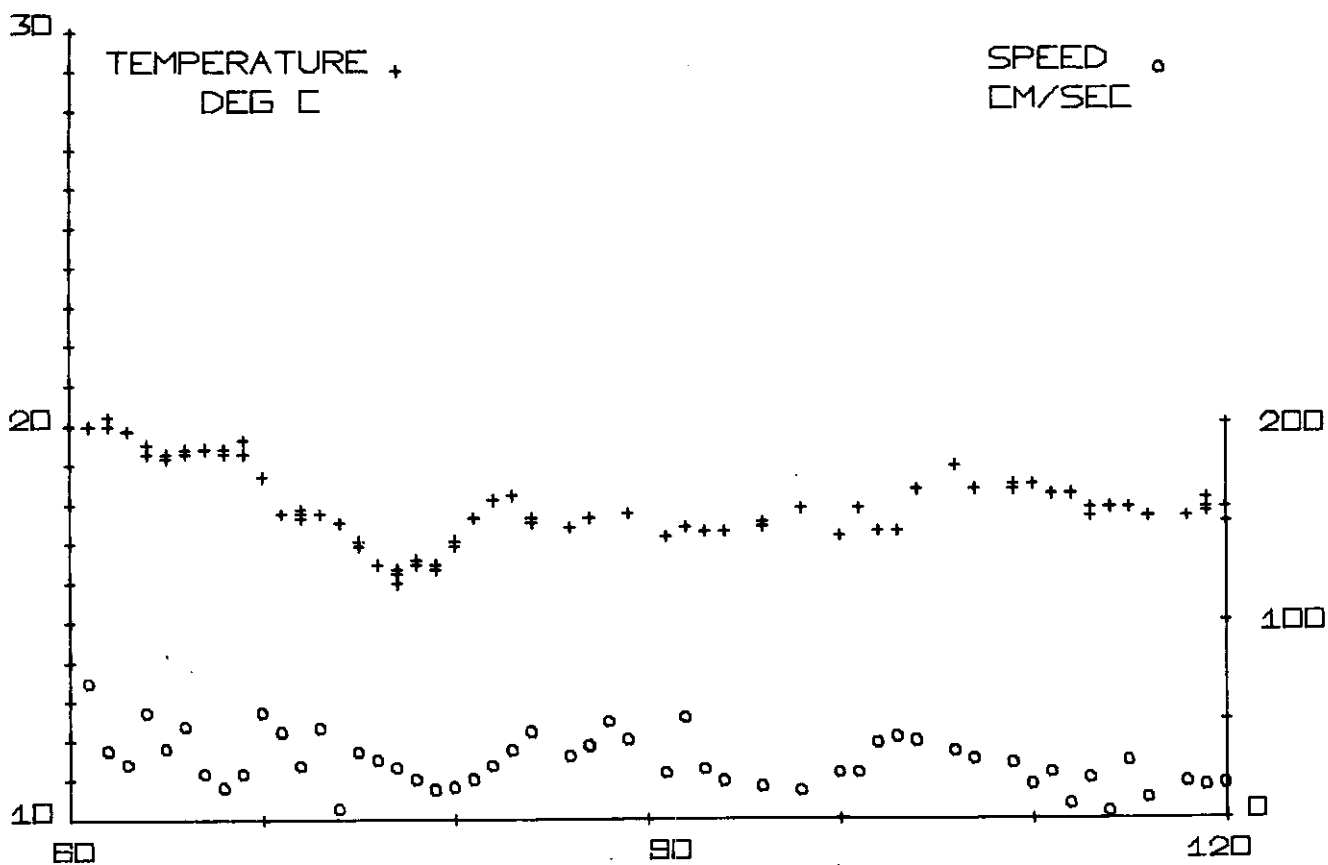
DAYS

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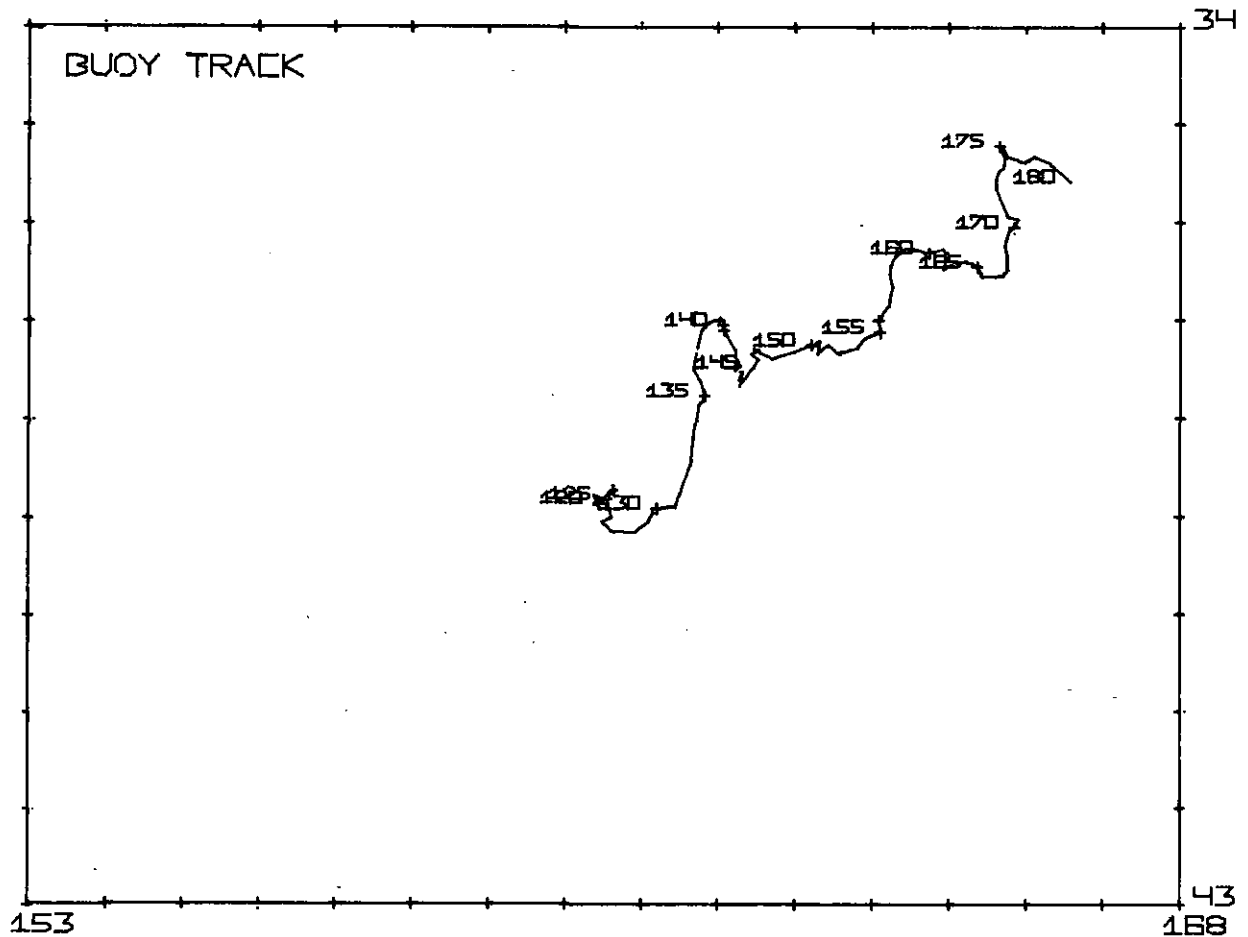
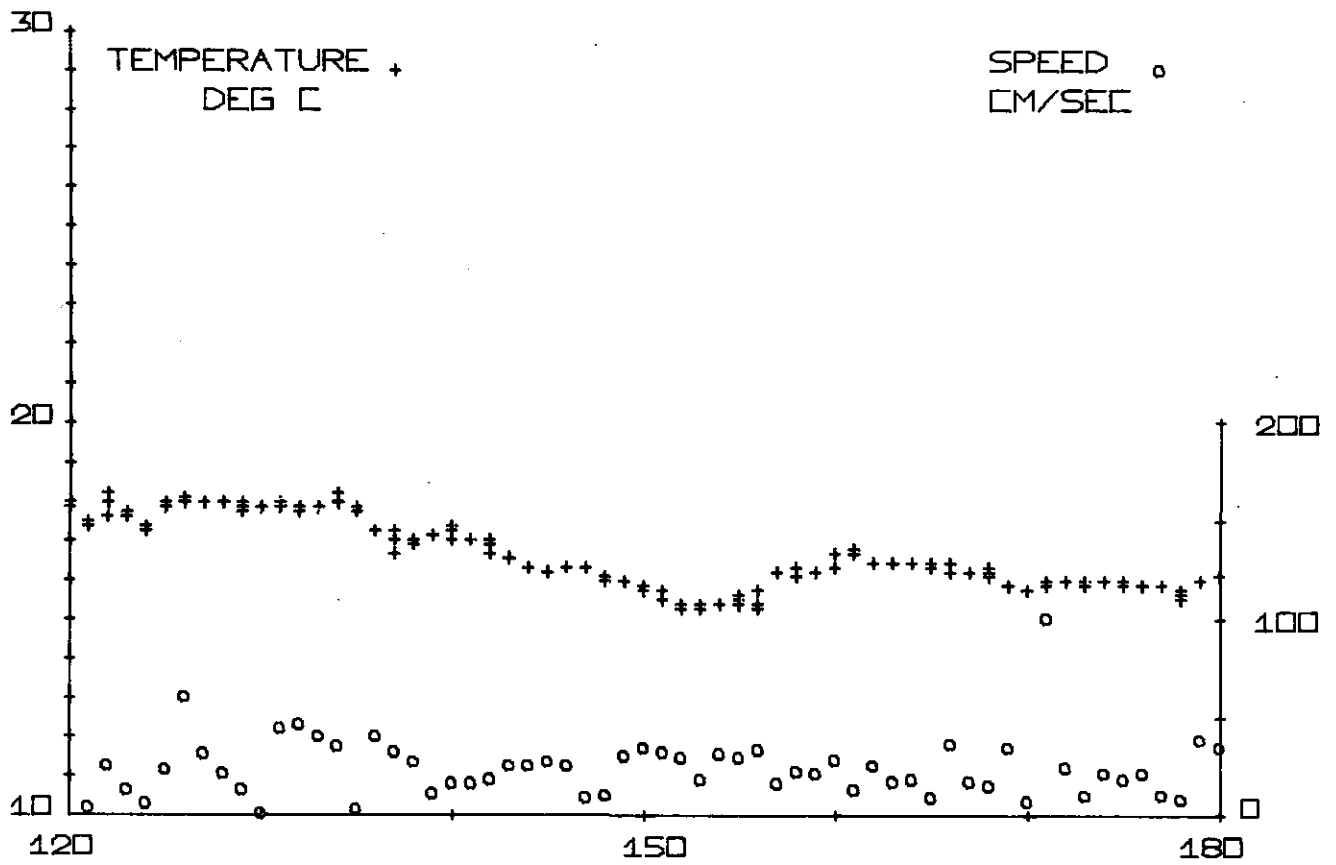


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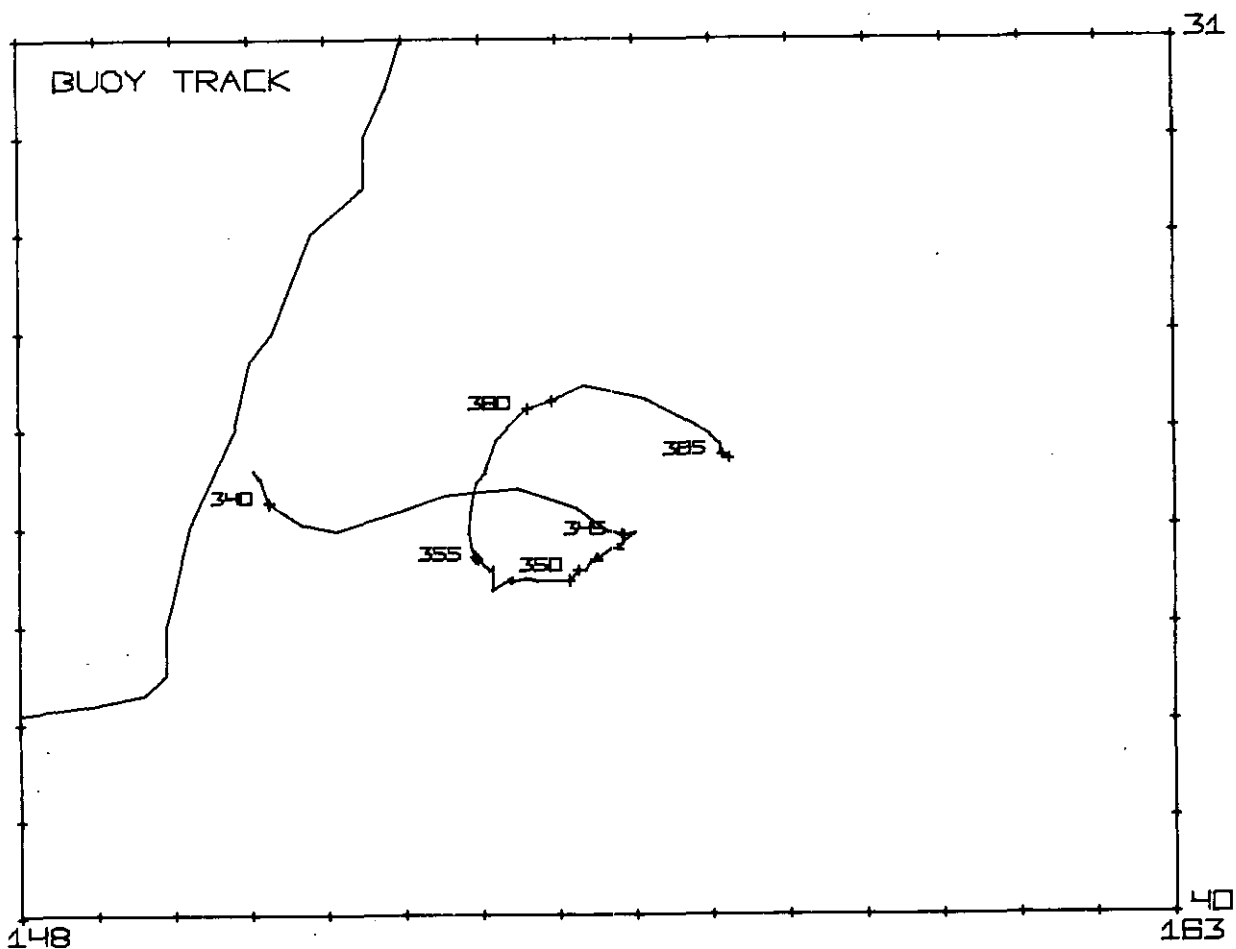
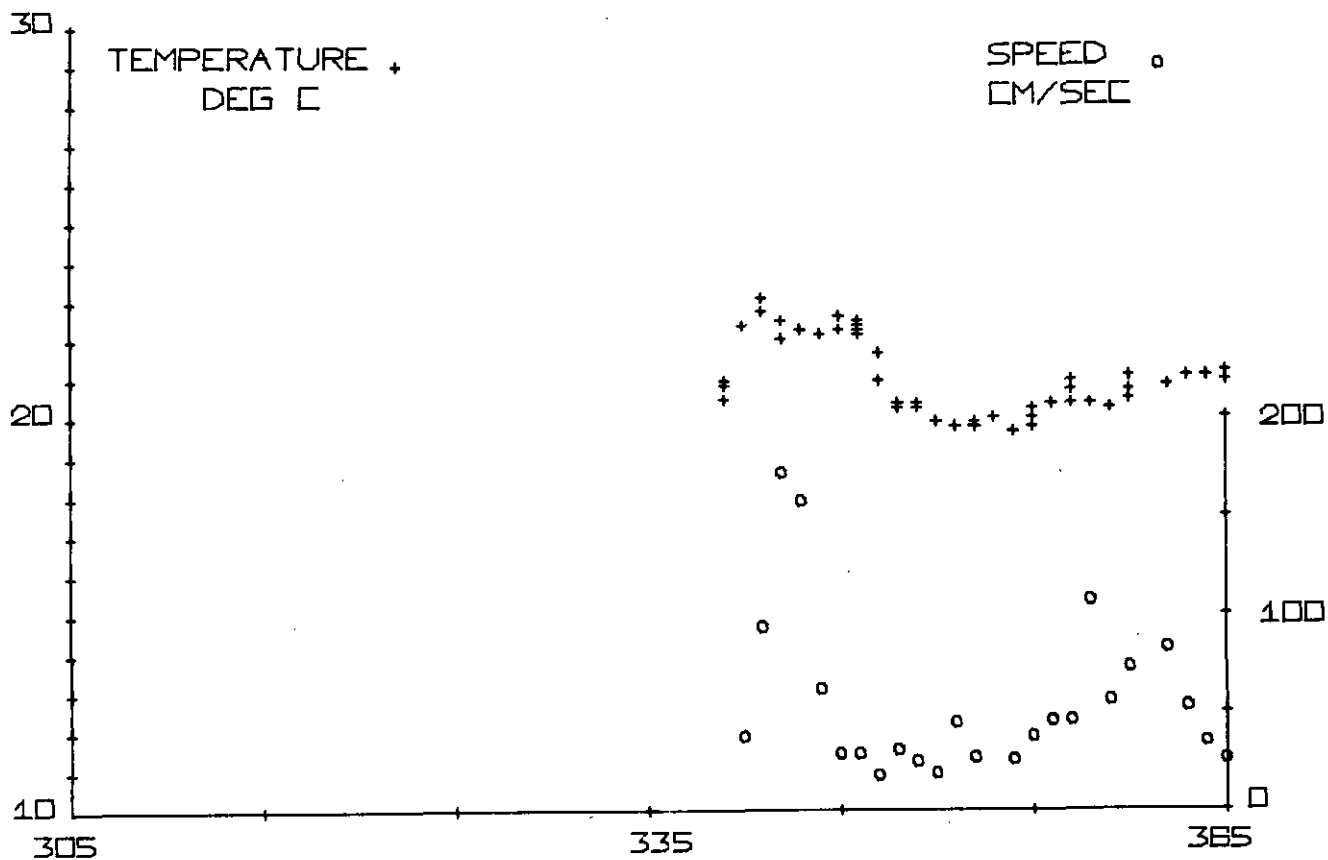


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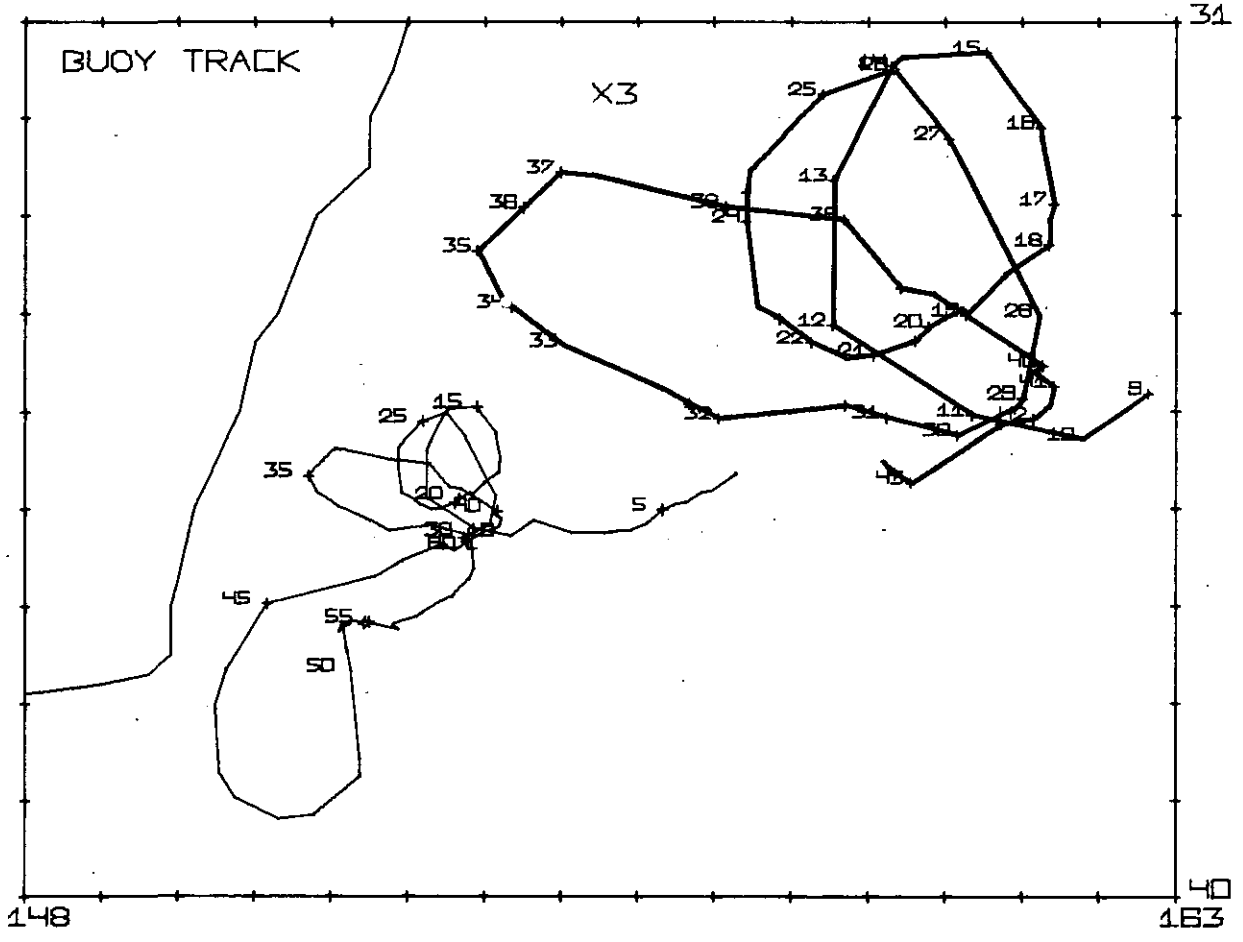
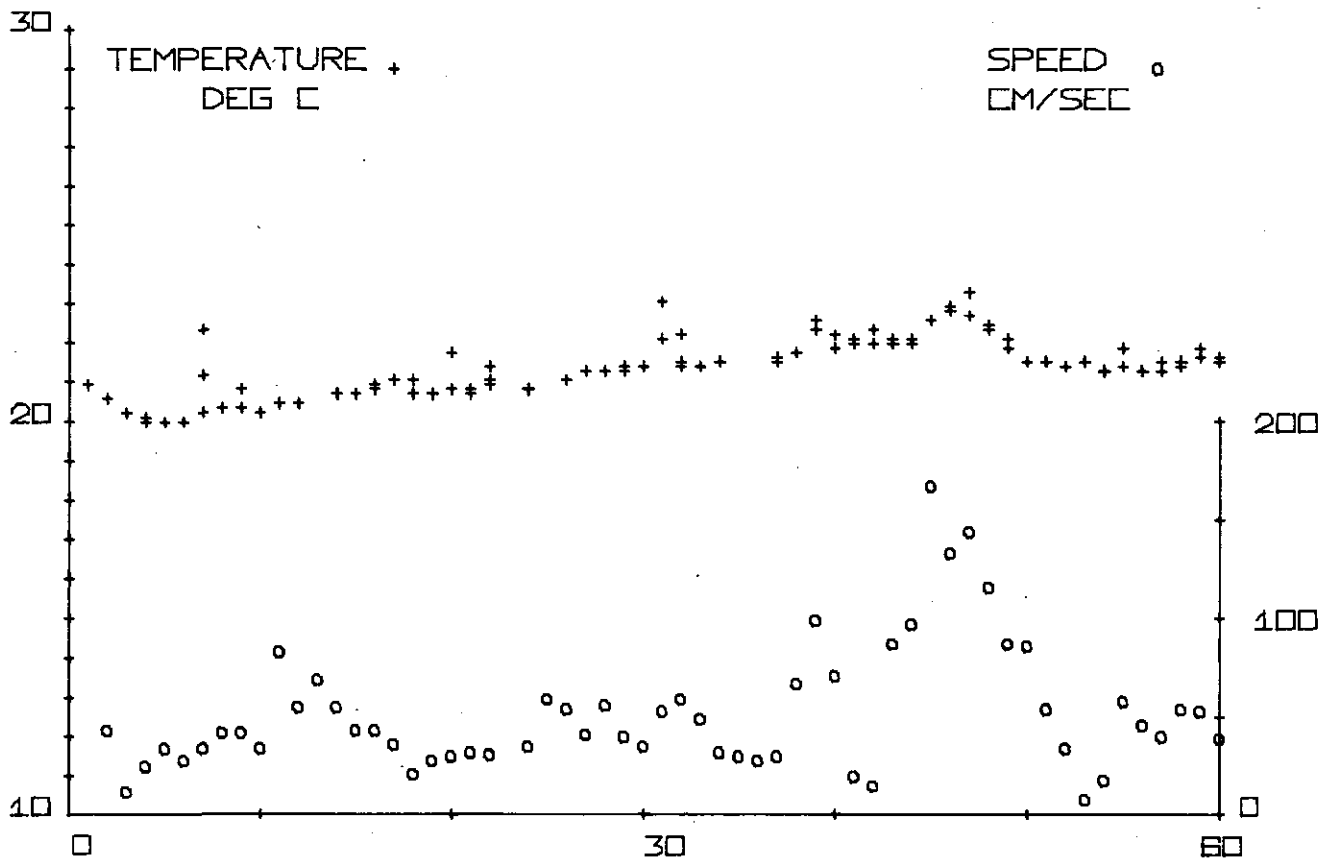
DAYS 120-180 1977



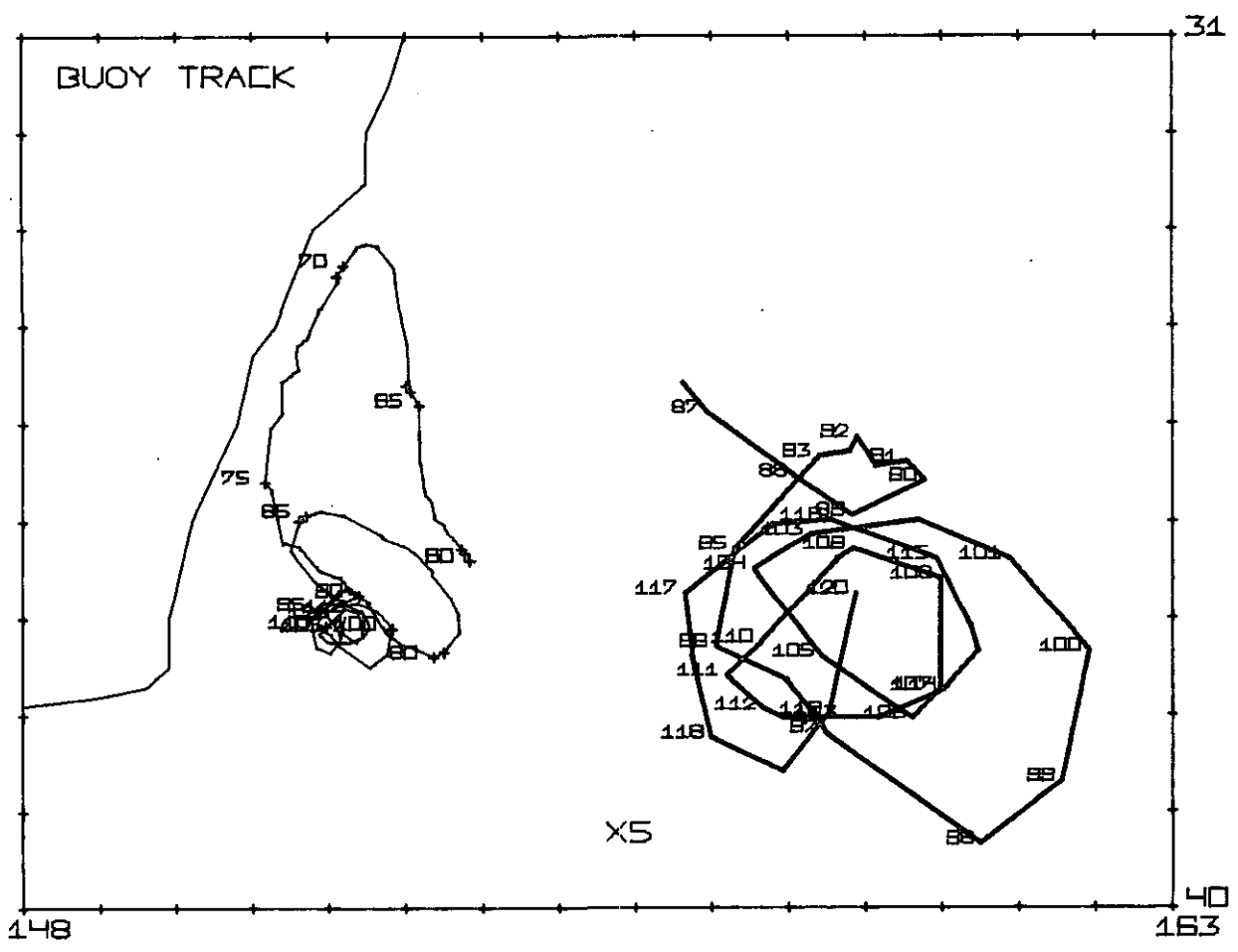
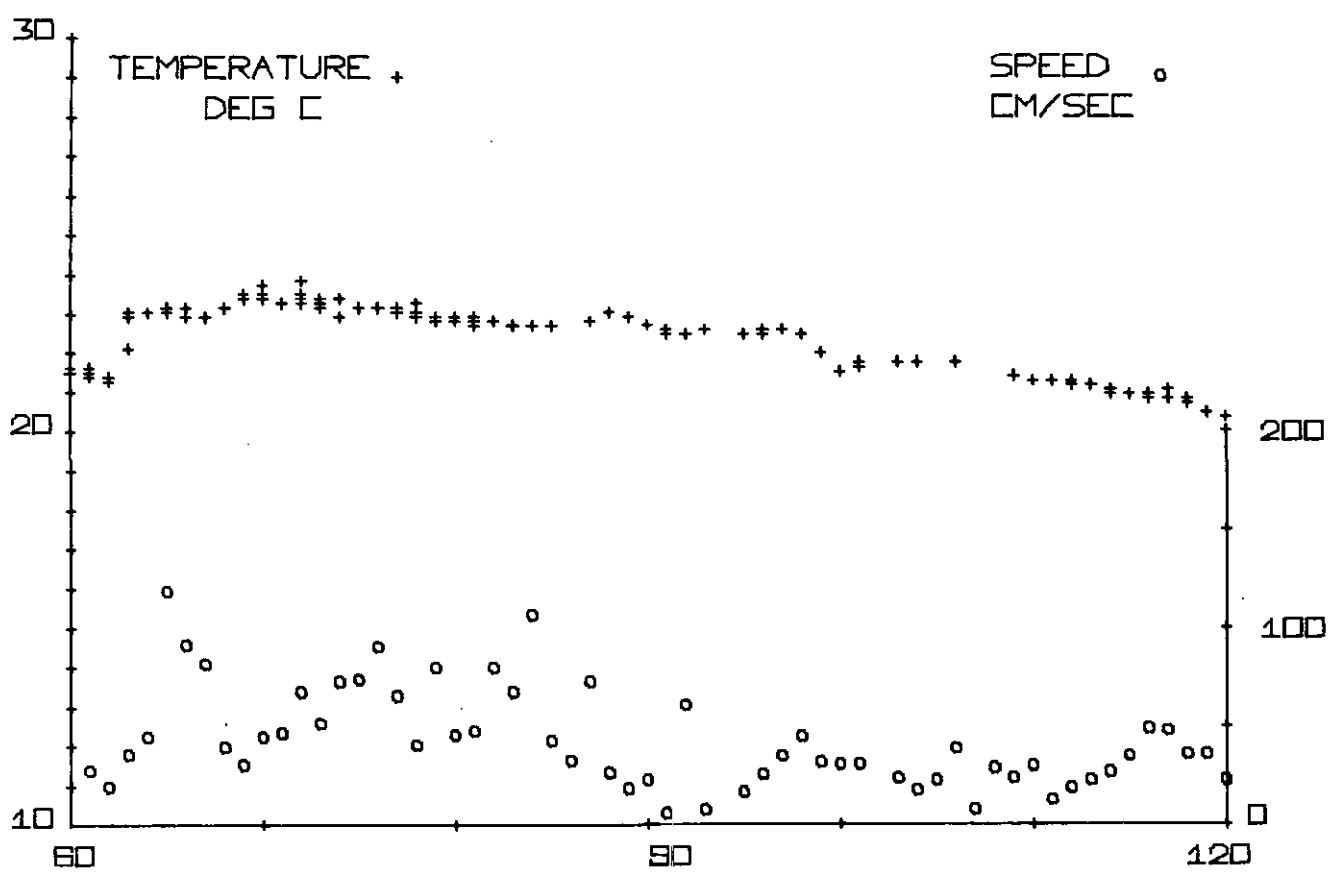
BUOY 1234 DAYS 305-365 1976



BUOY 1234      DAYS      0- 60 1977

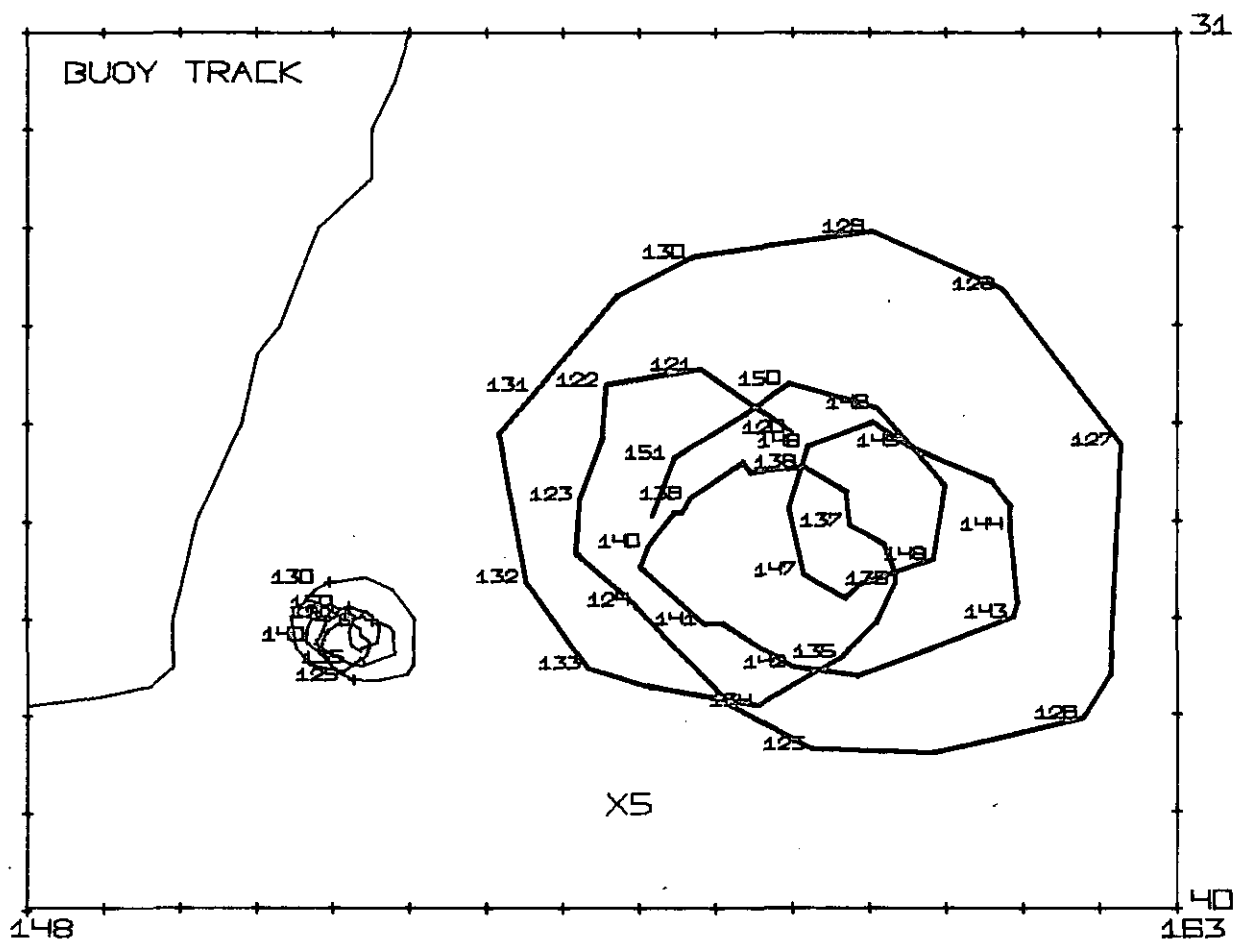
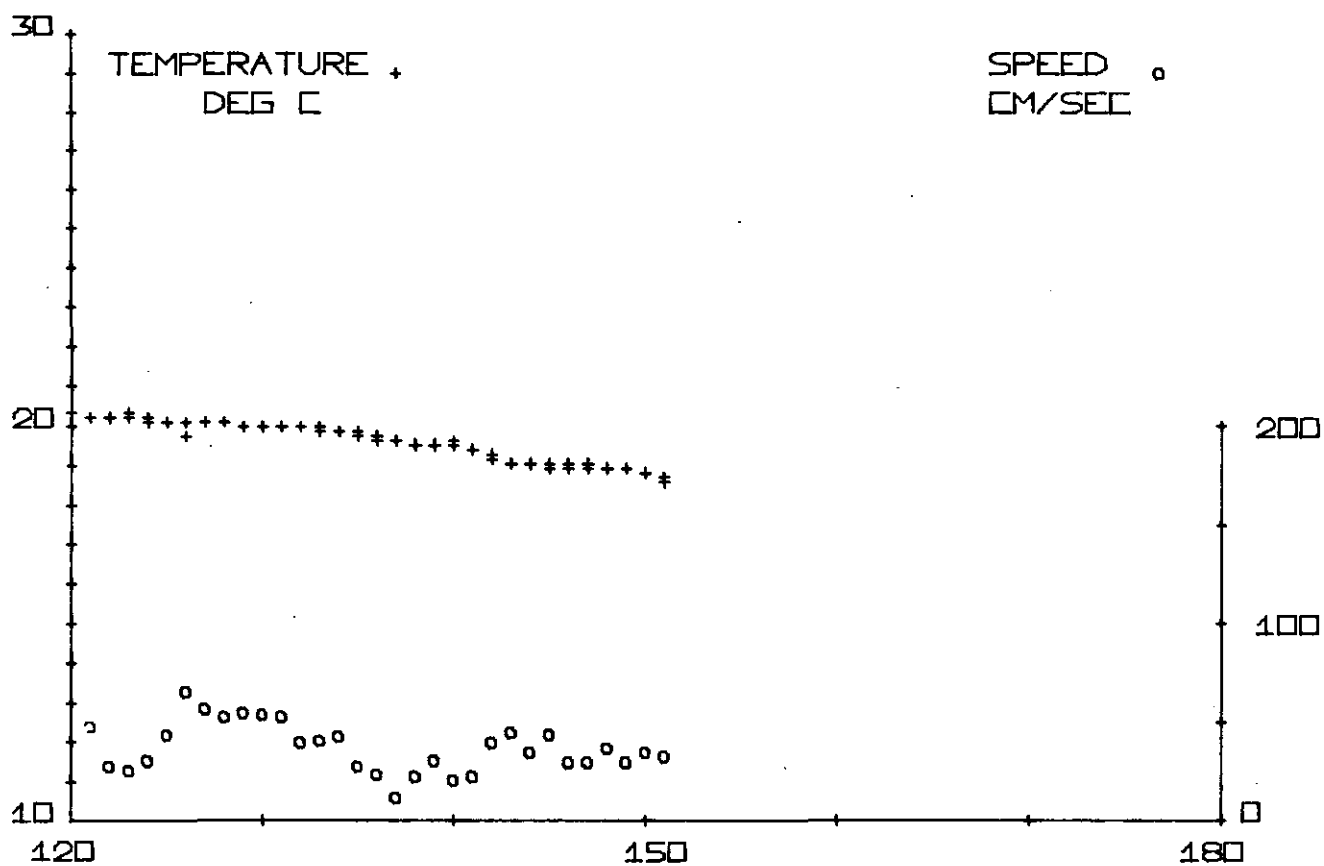


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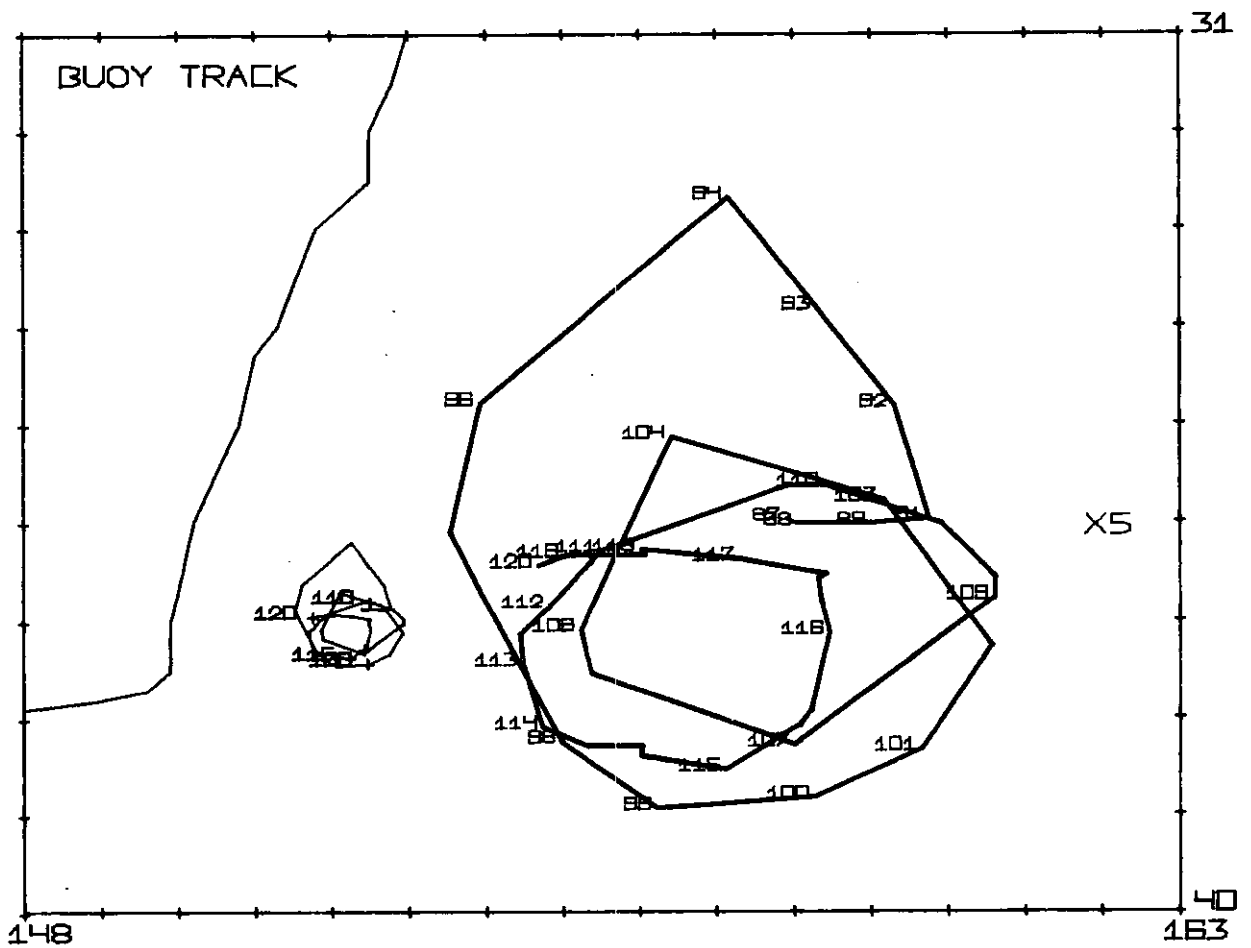
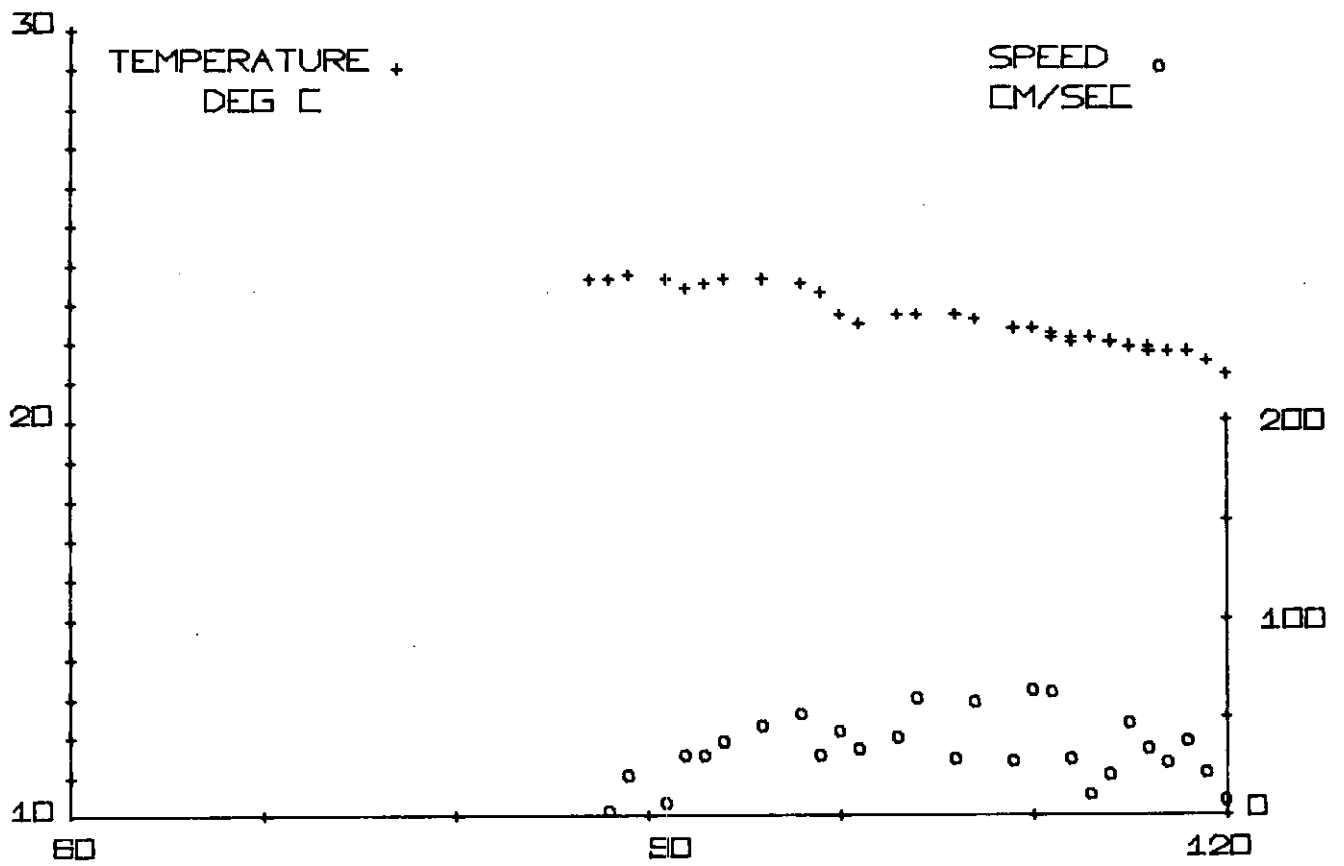
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DAYS 120-180 1977



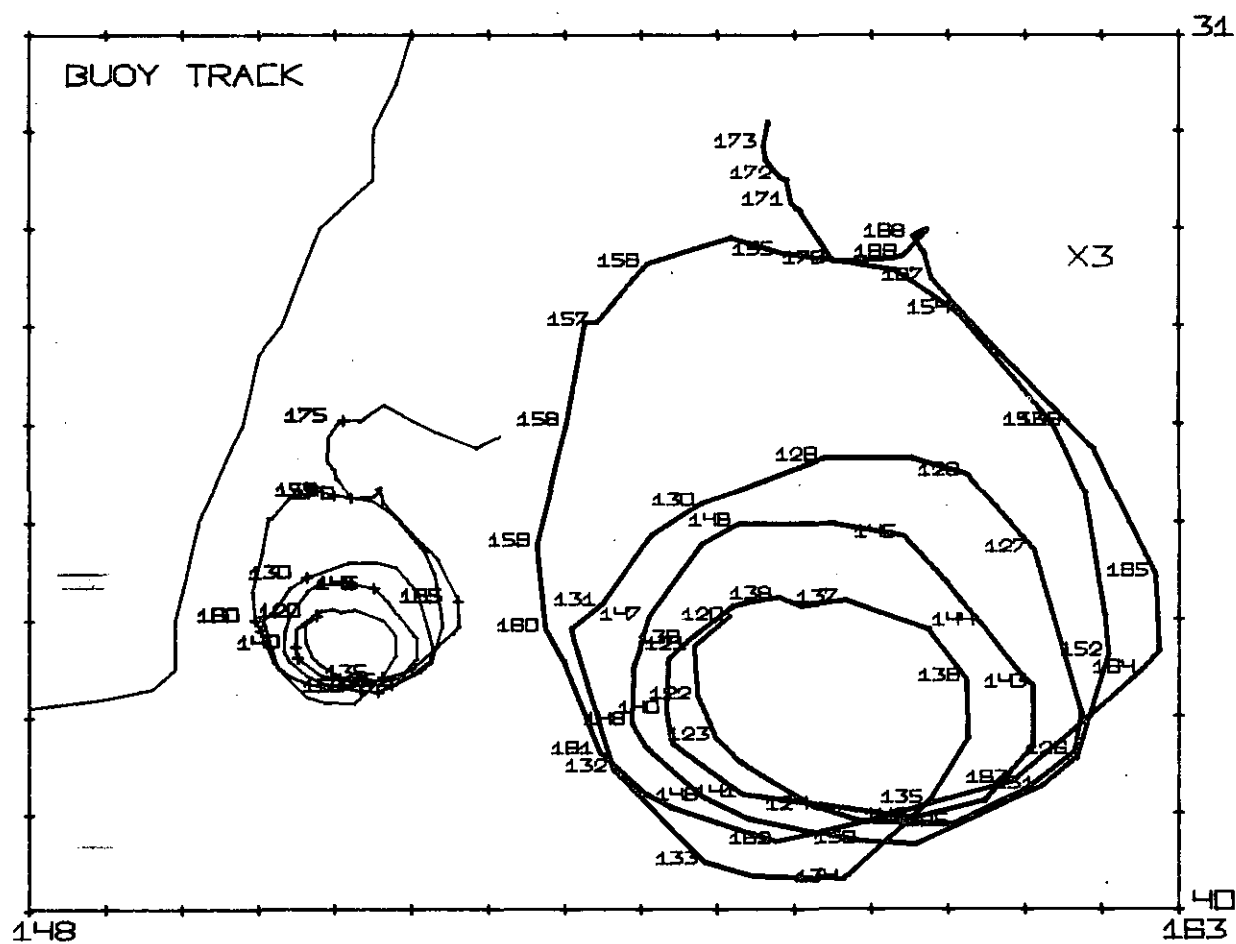
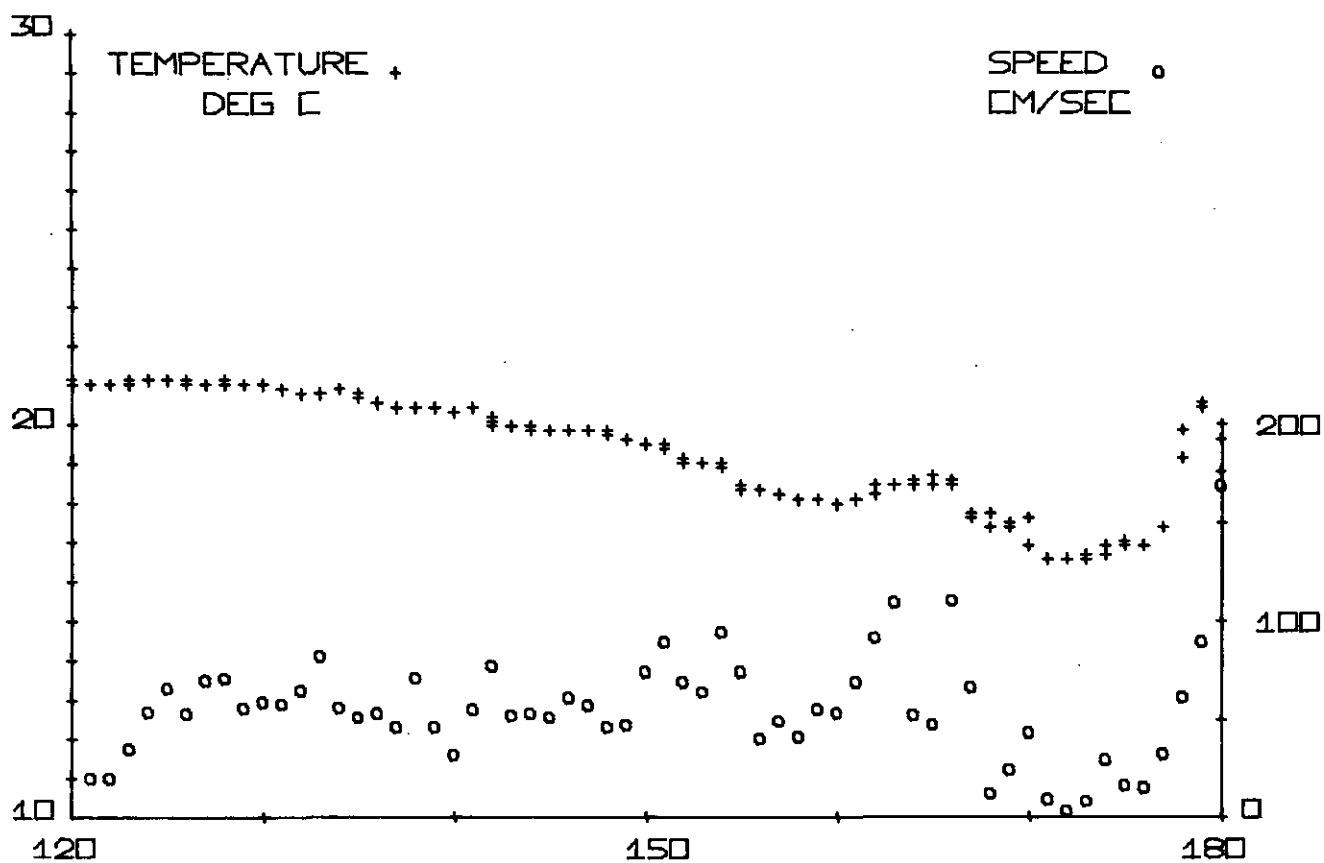
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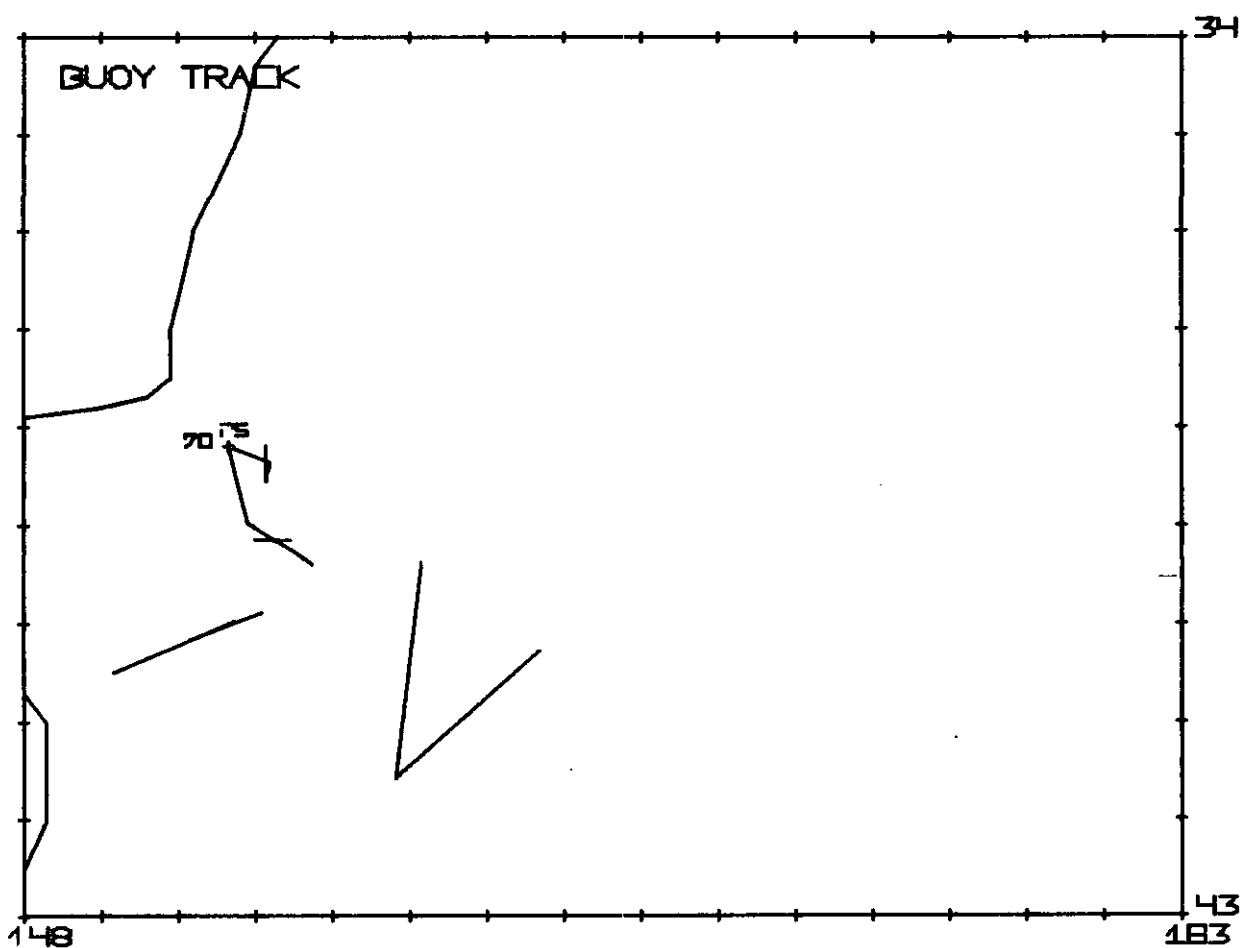
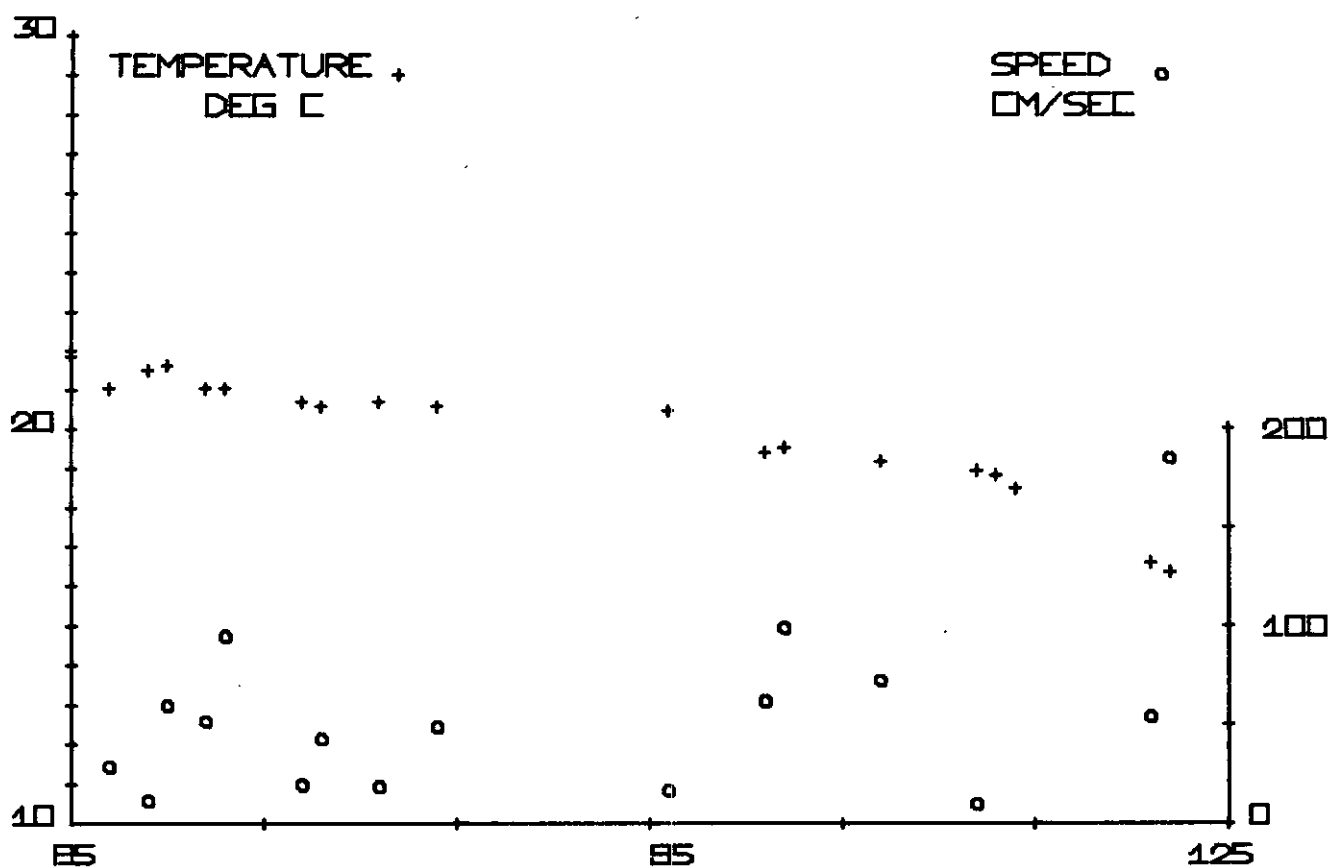
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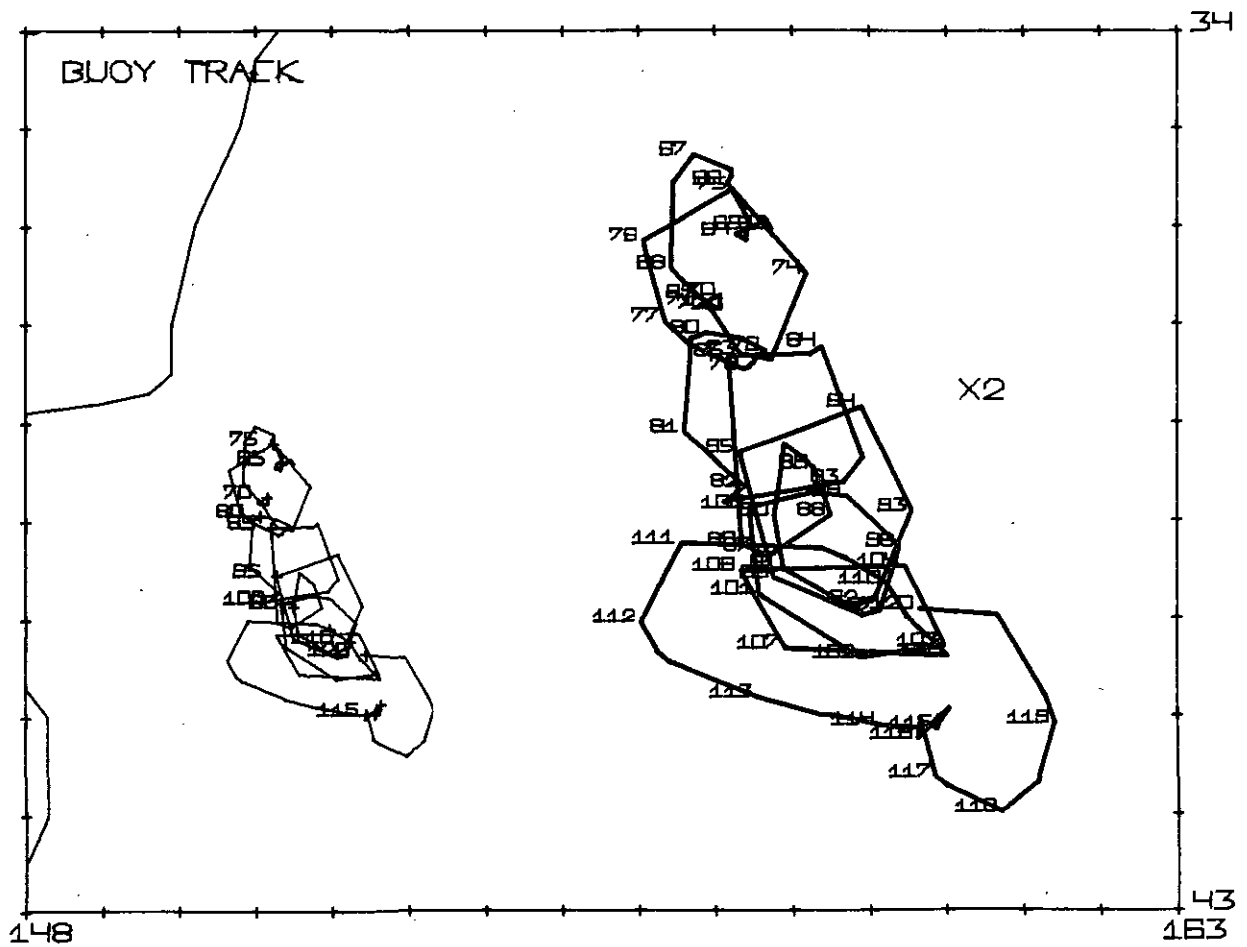
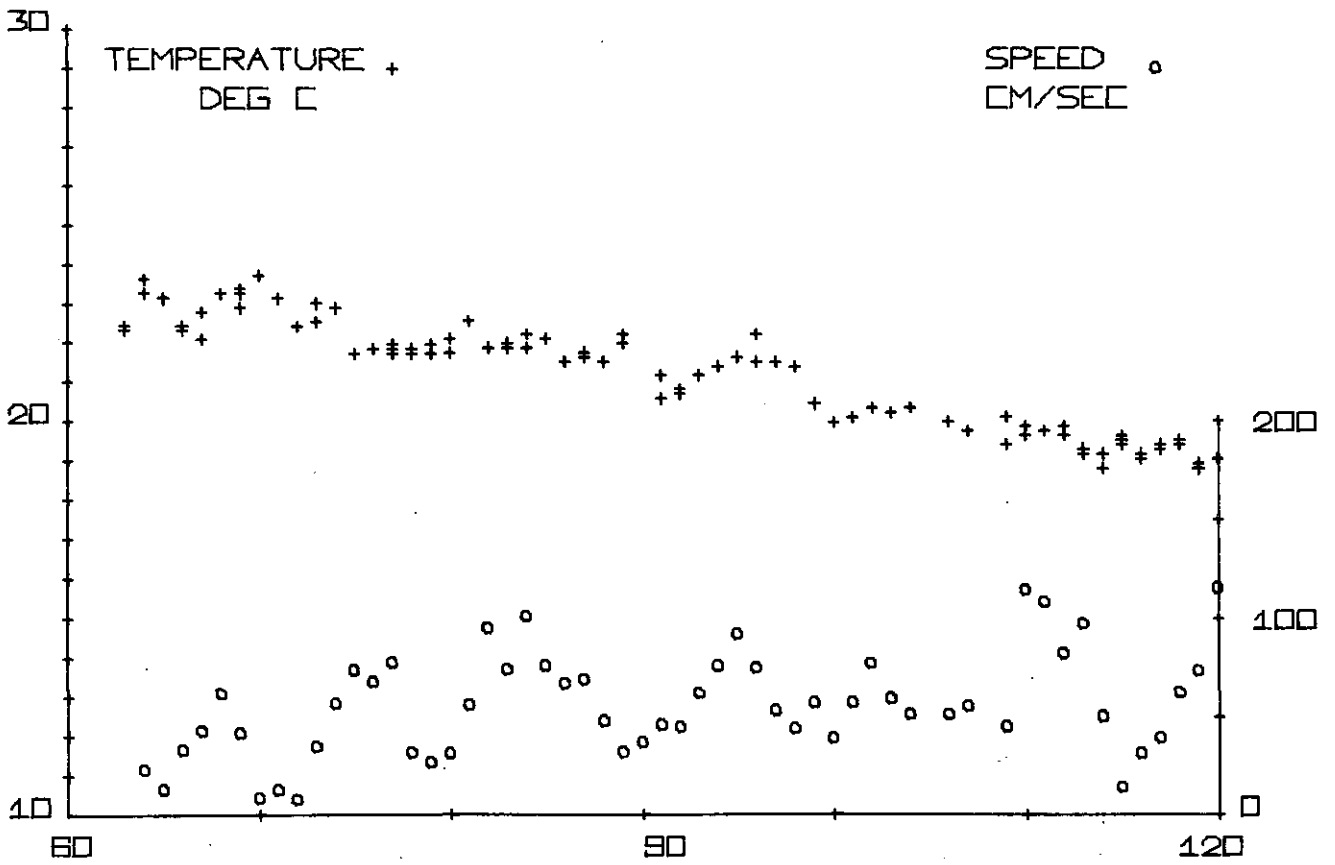
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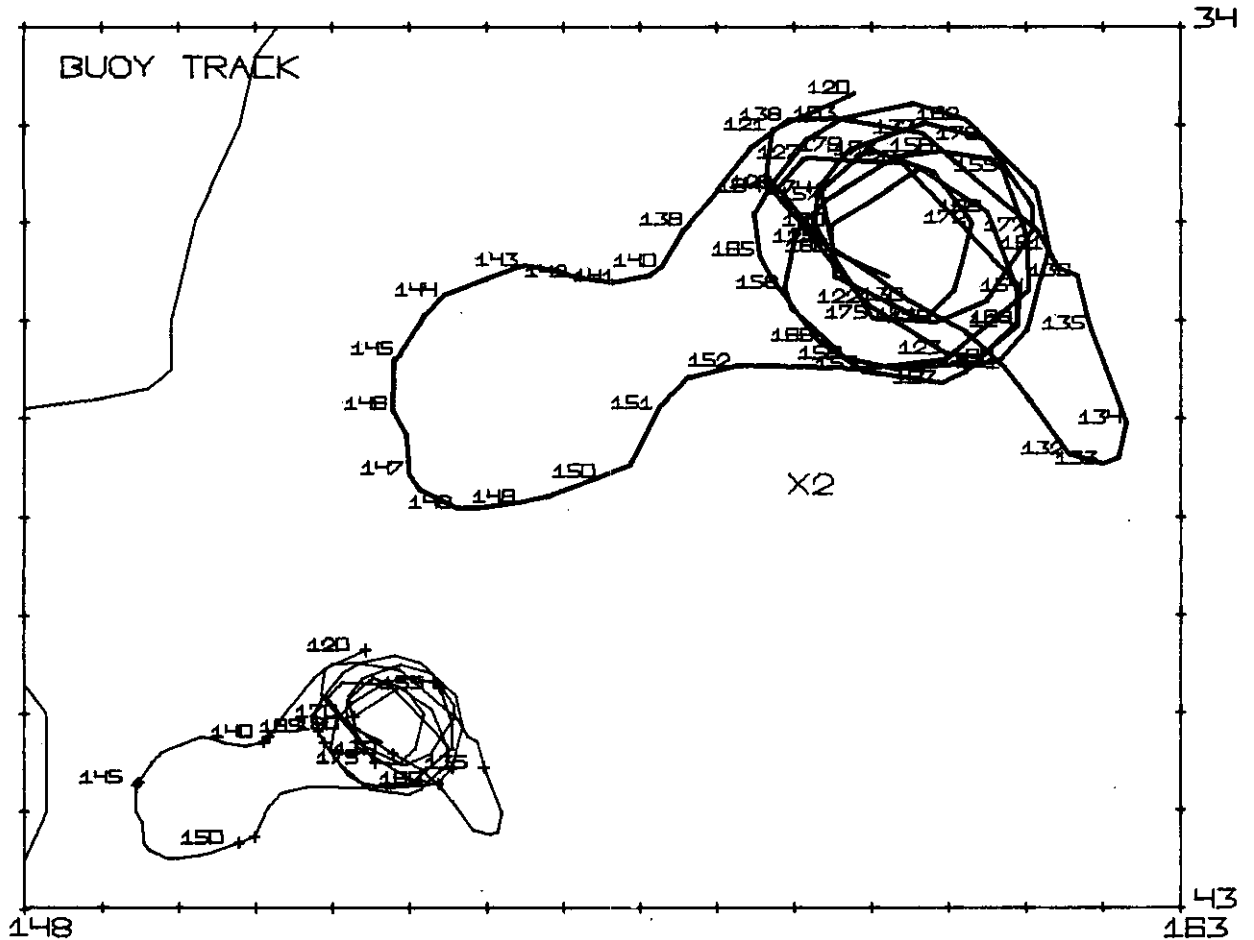
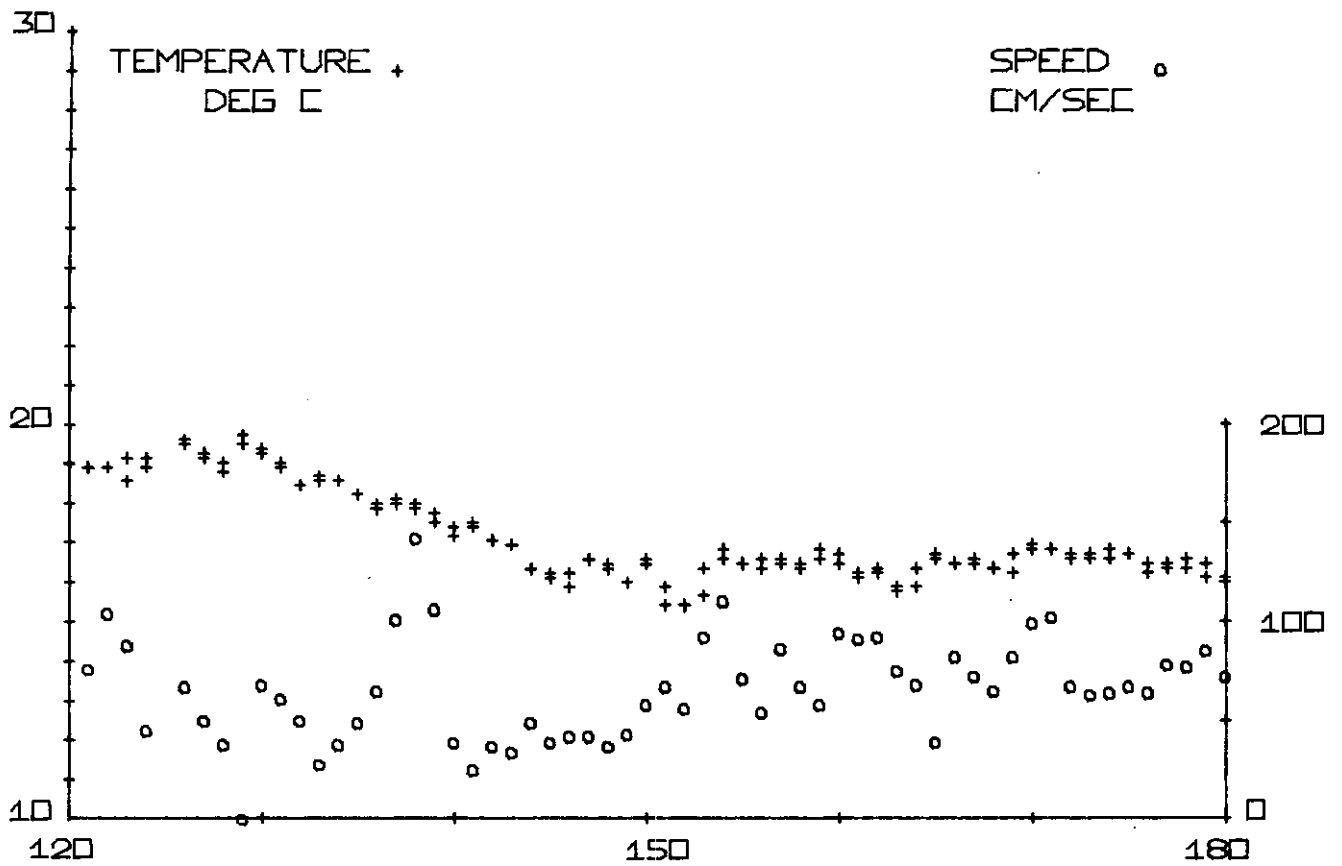
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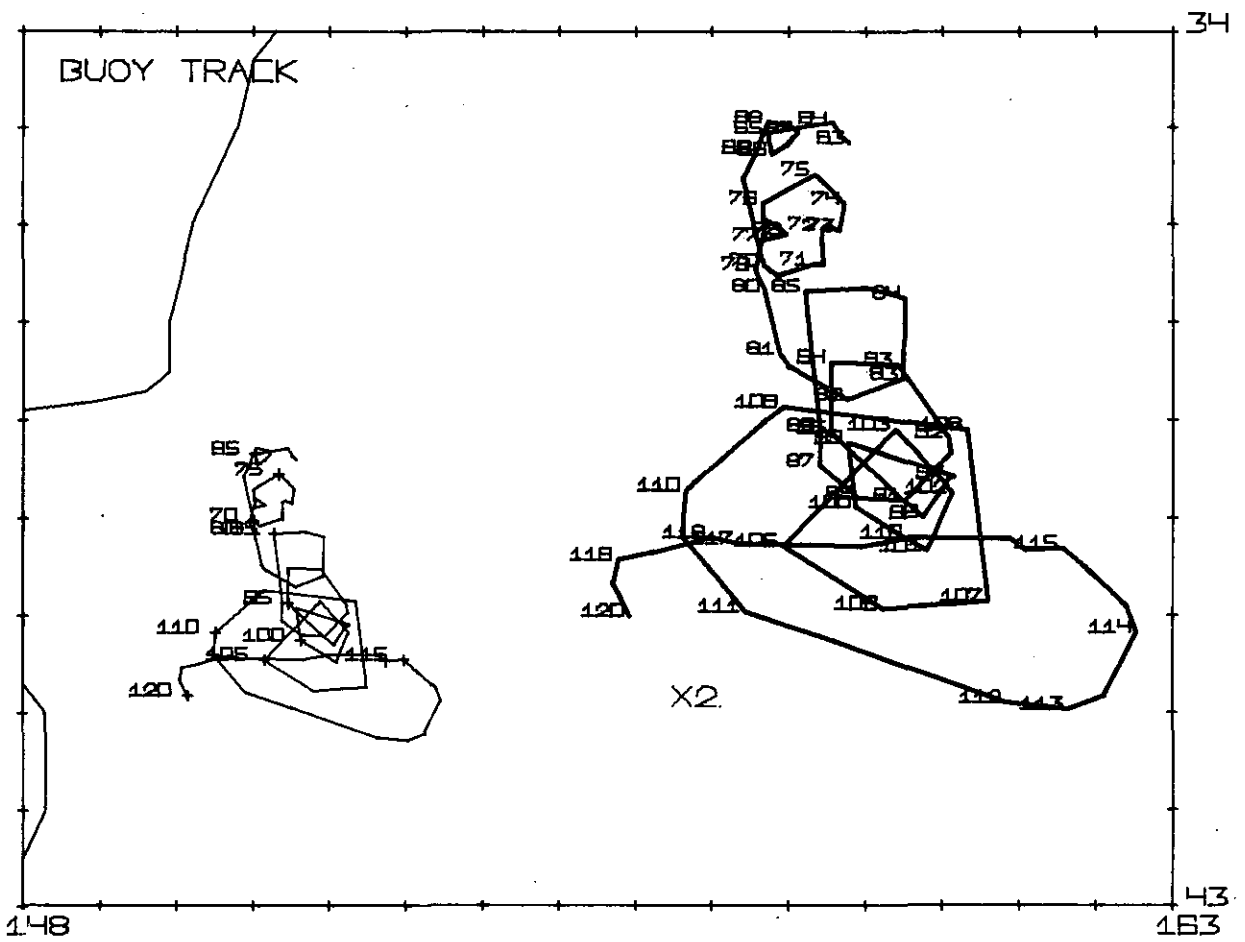
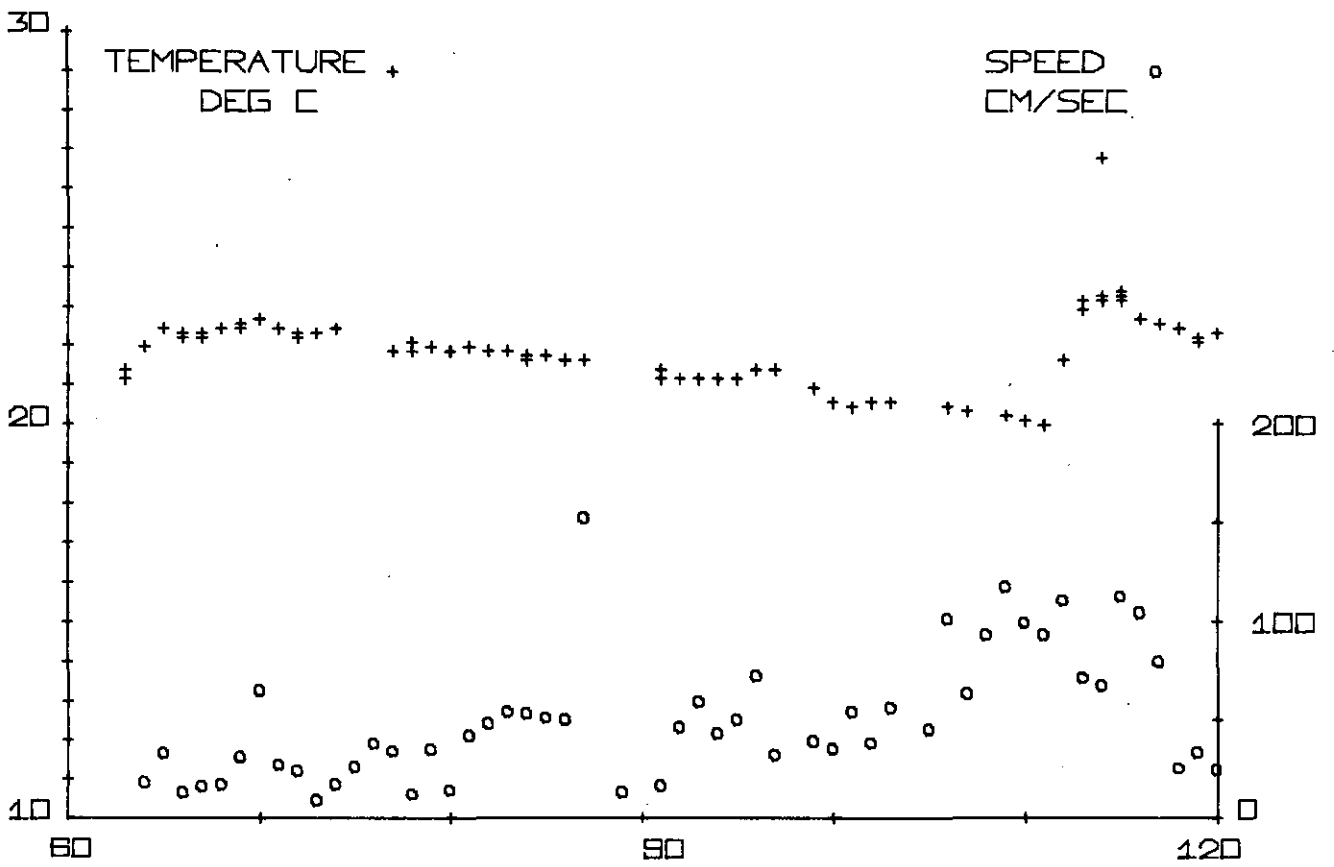
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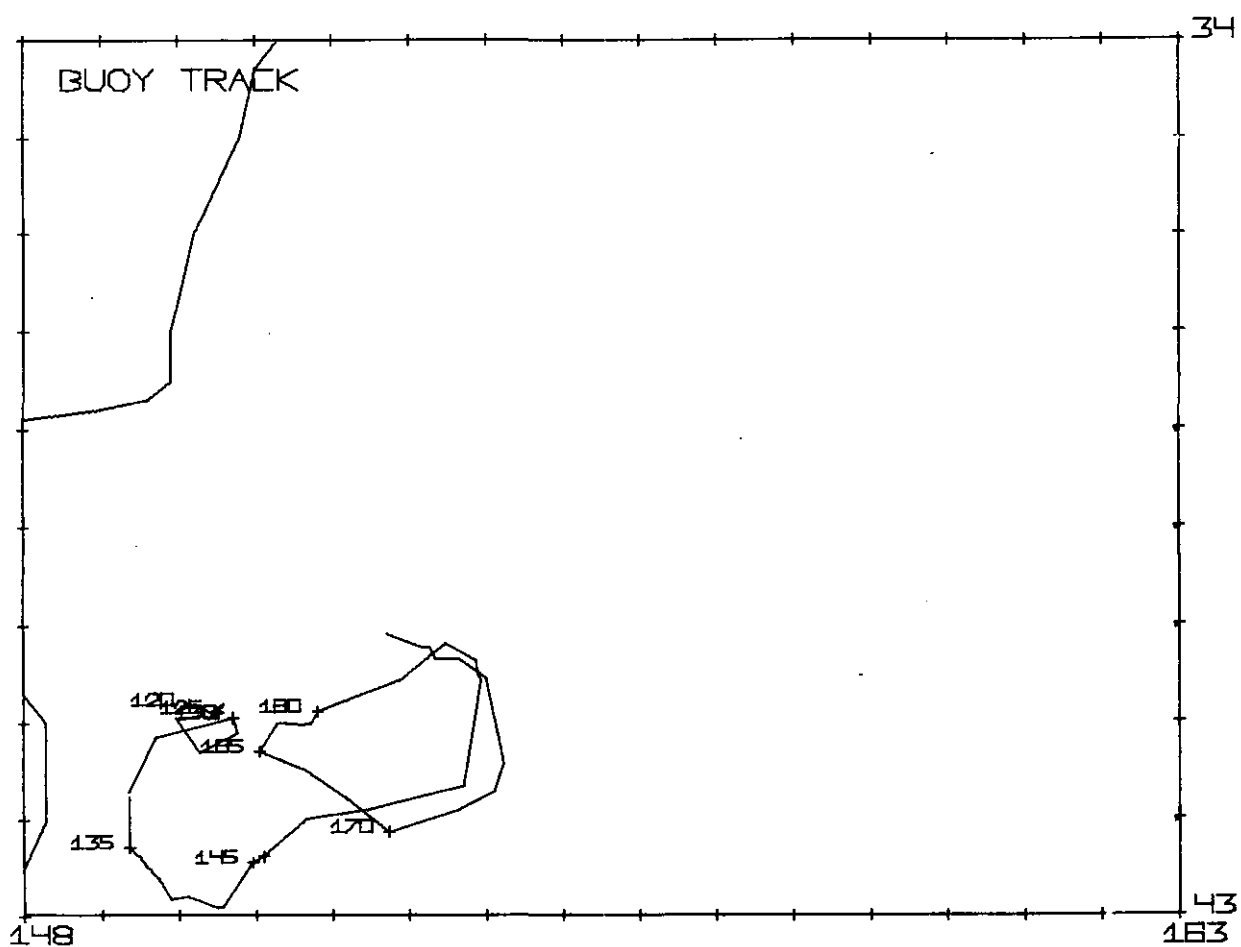
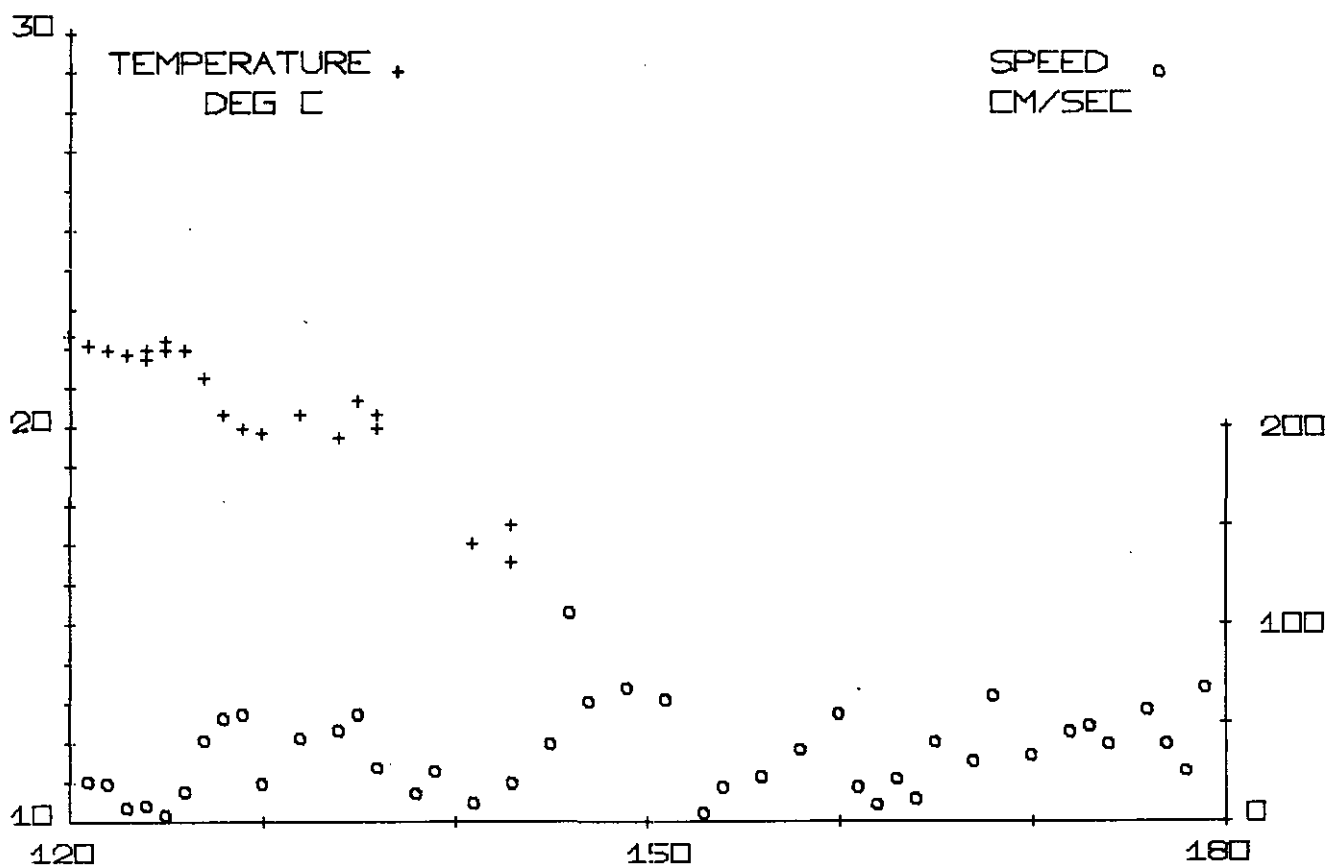
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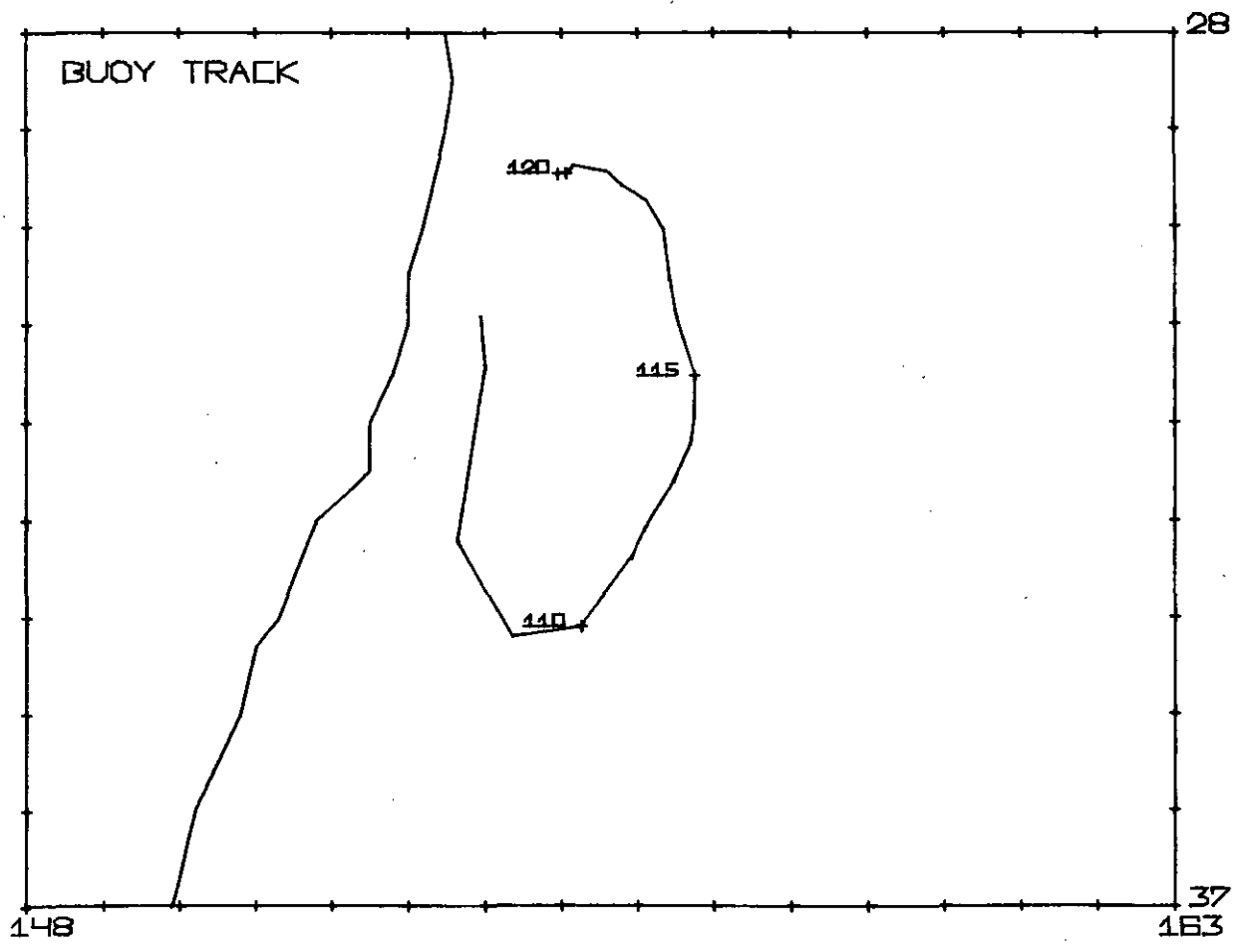
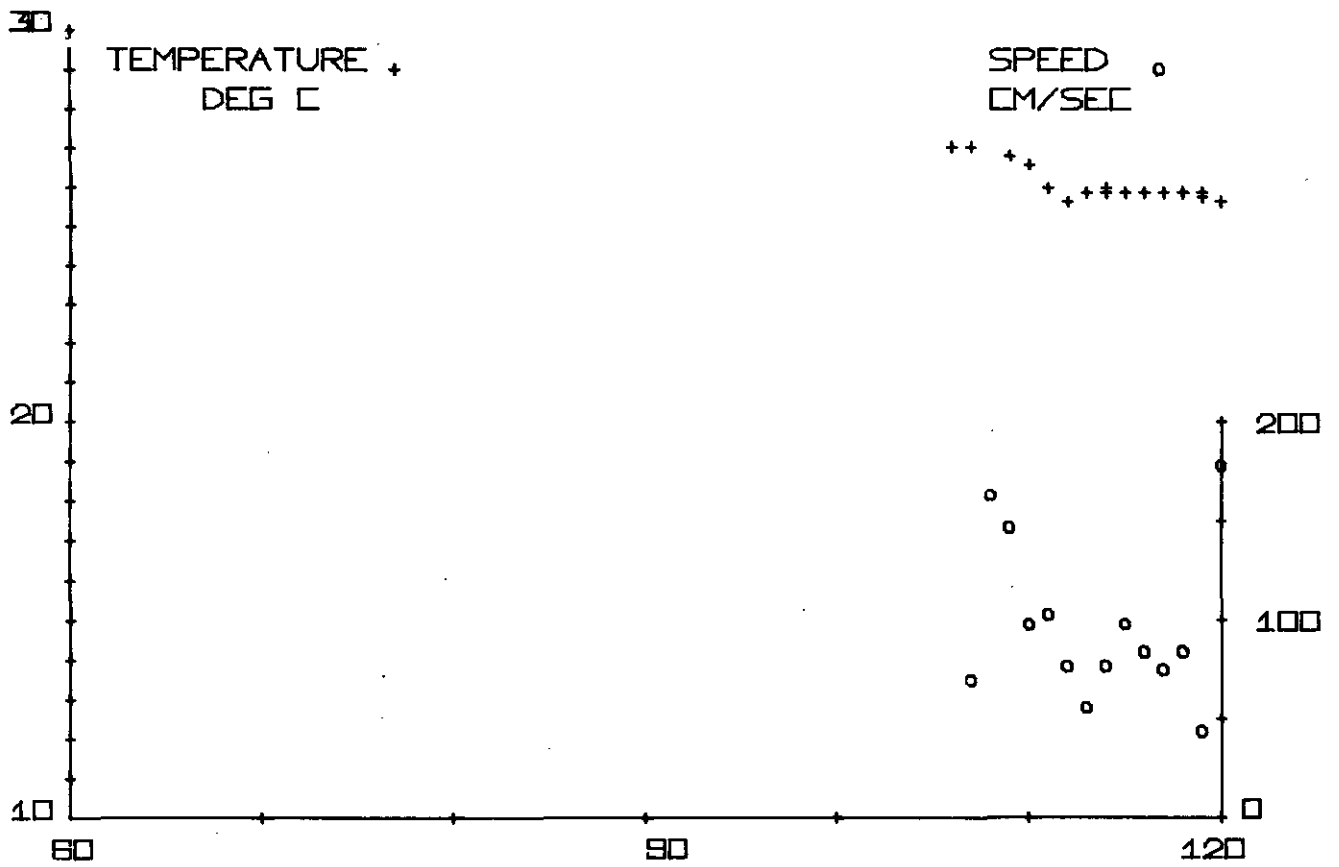
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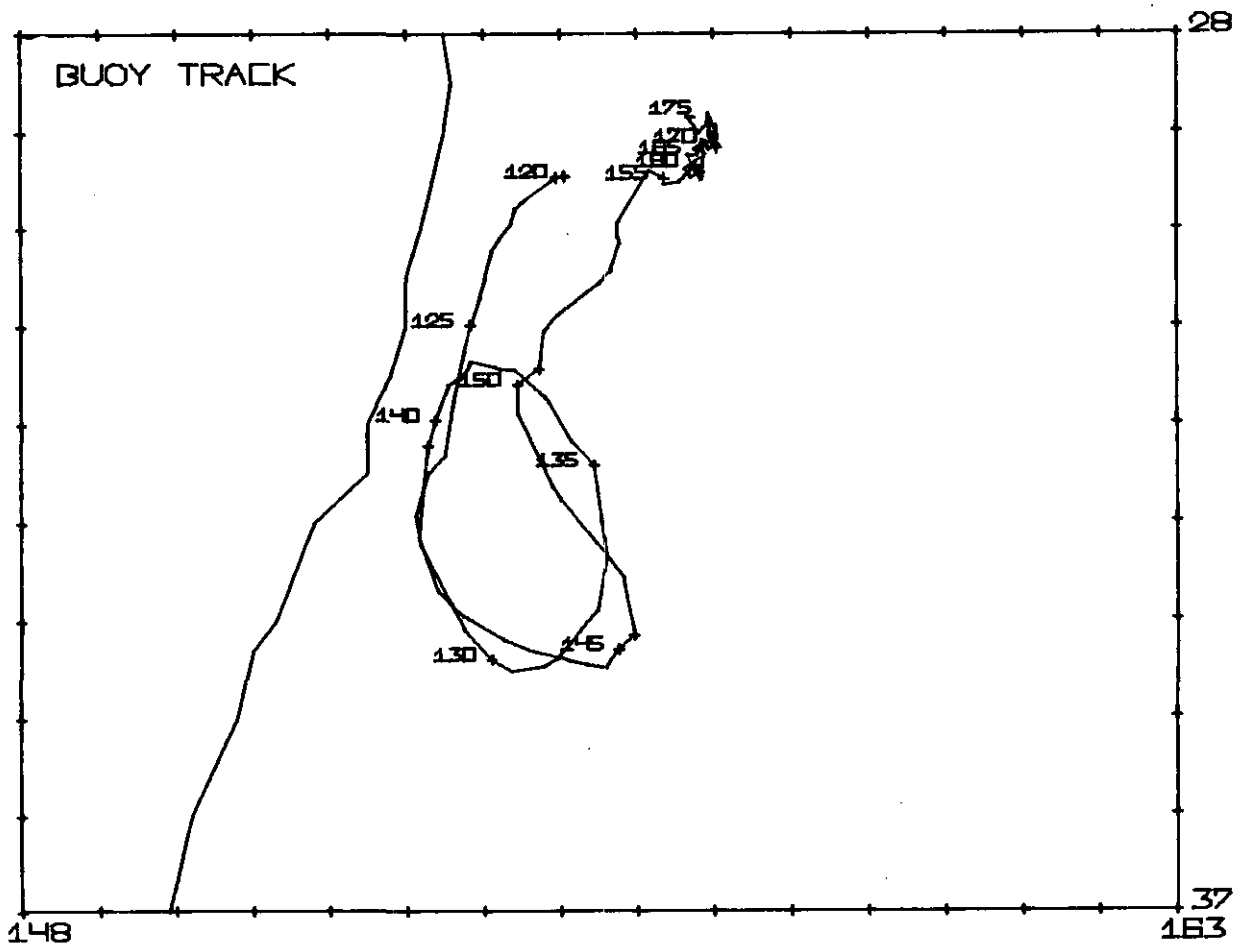
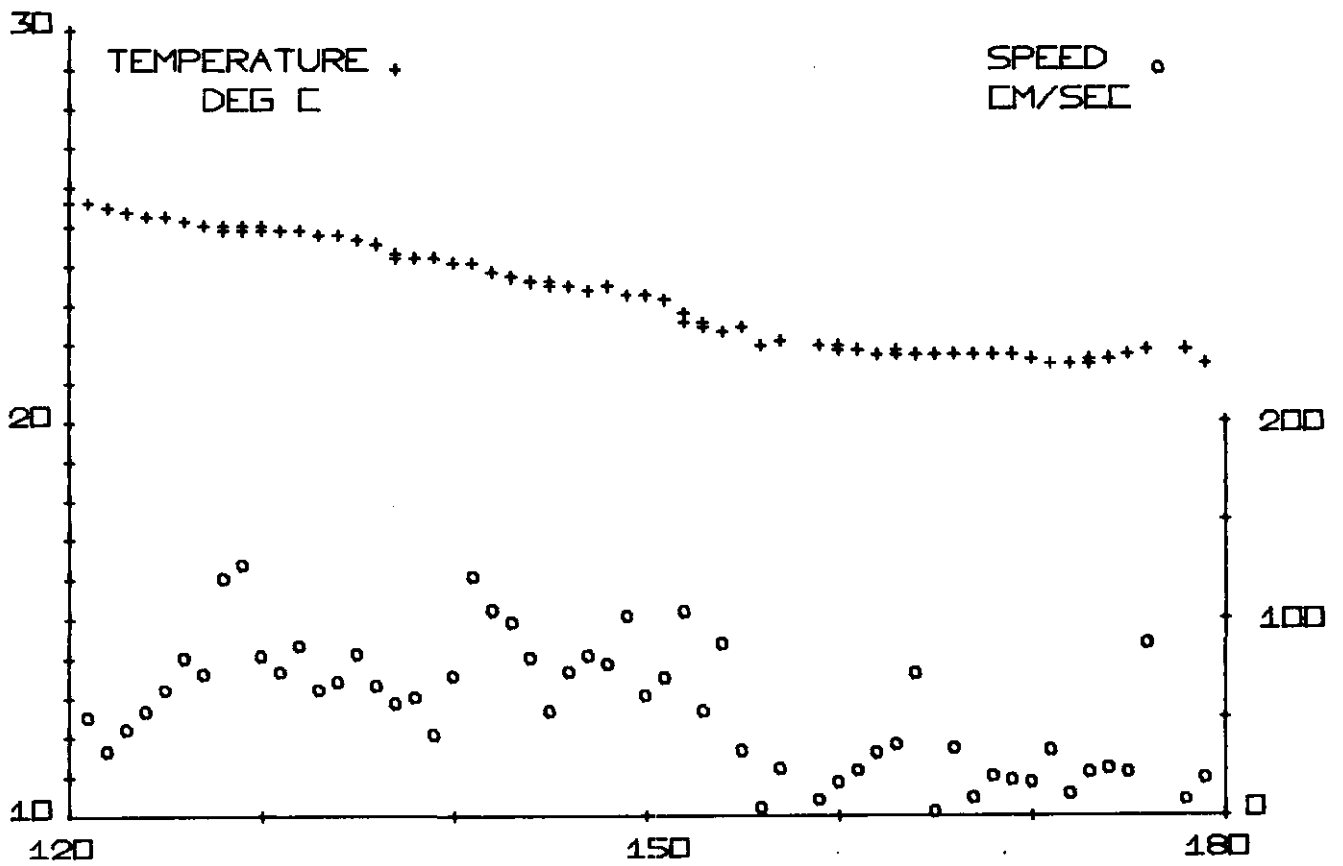
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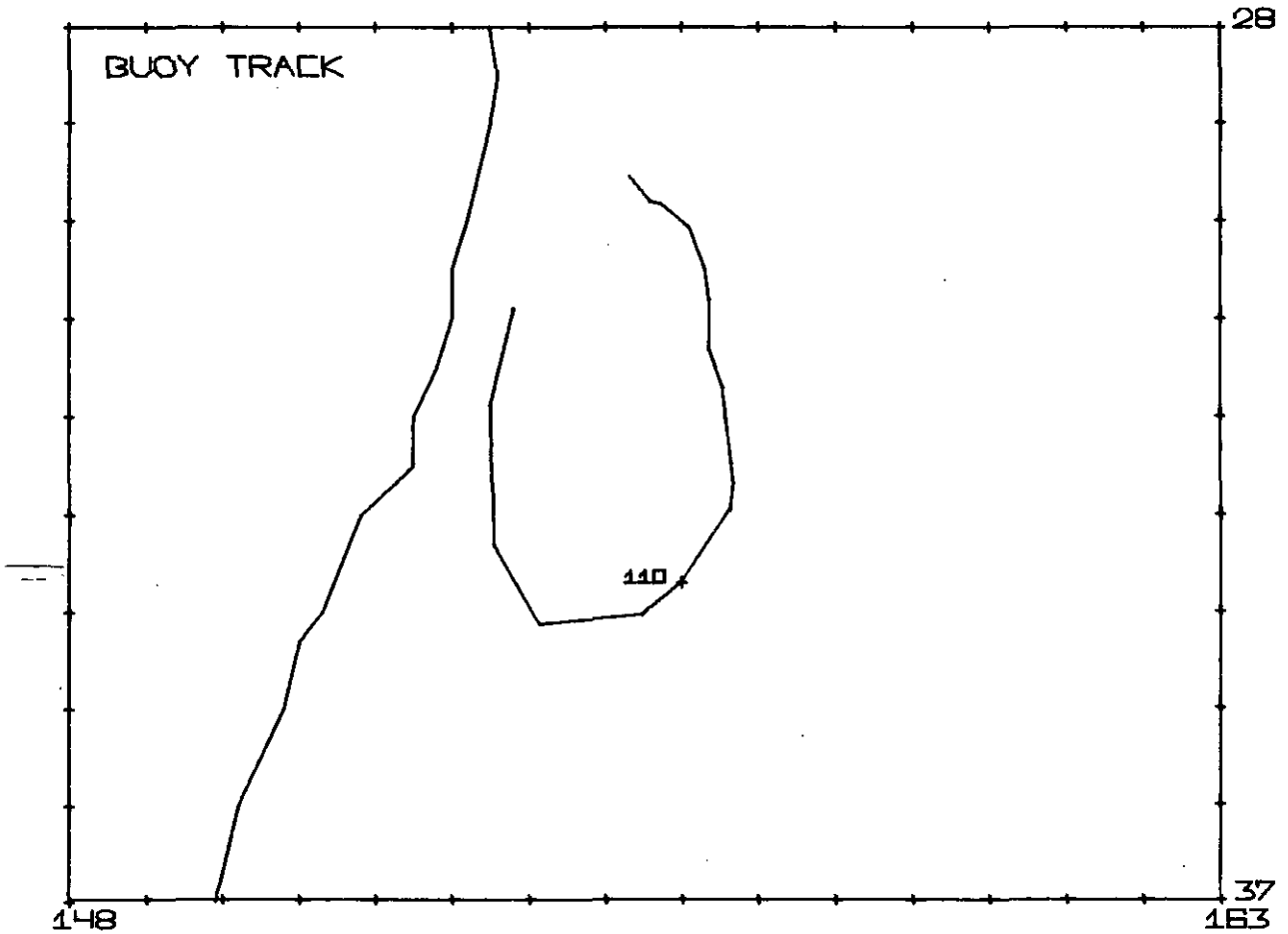
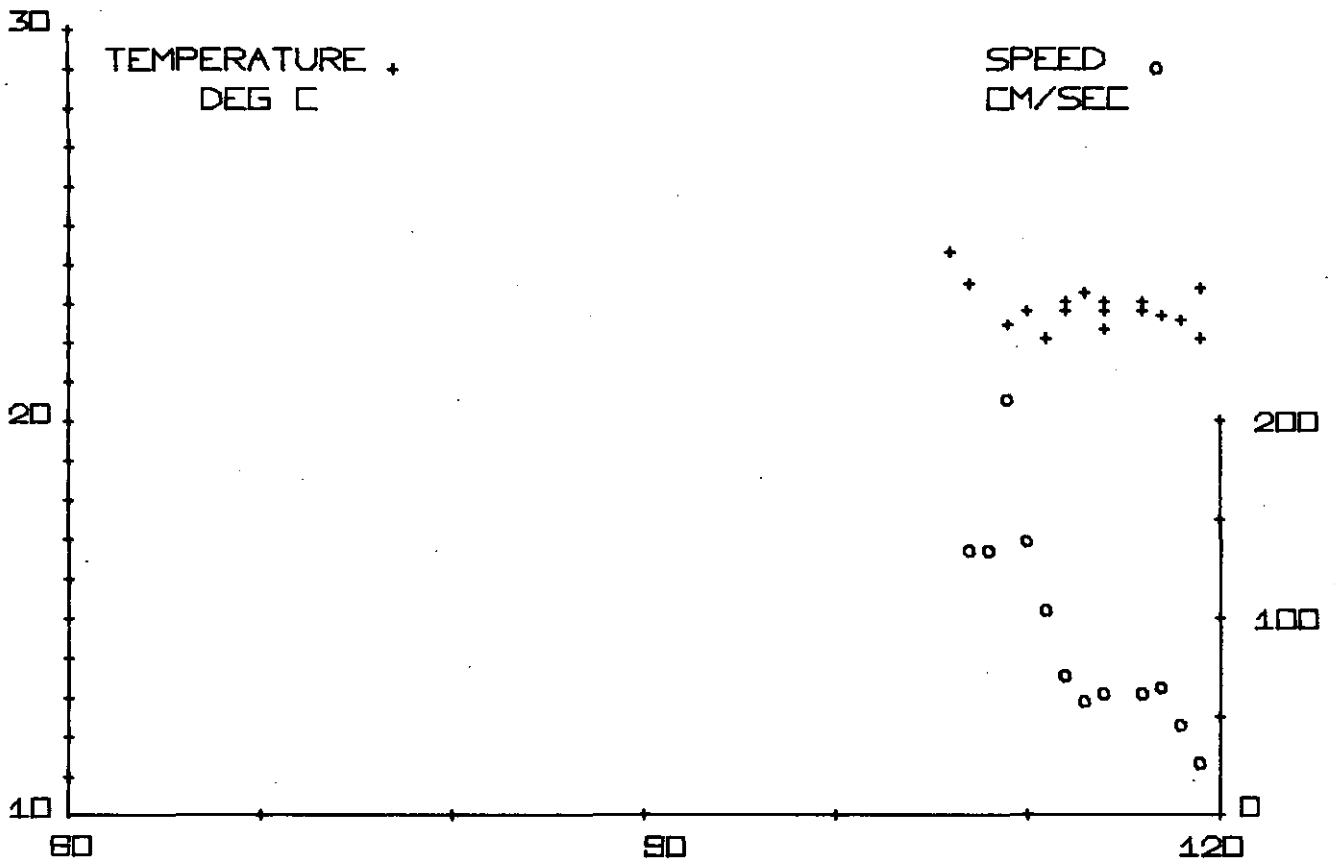
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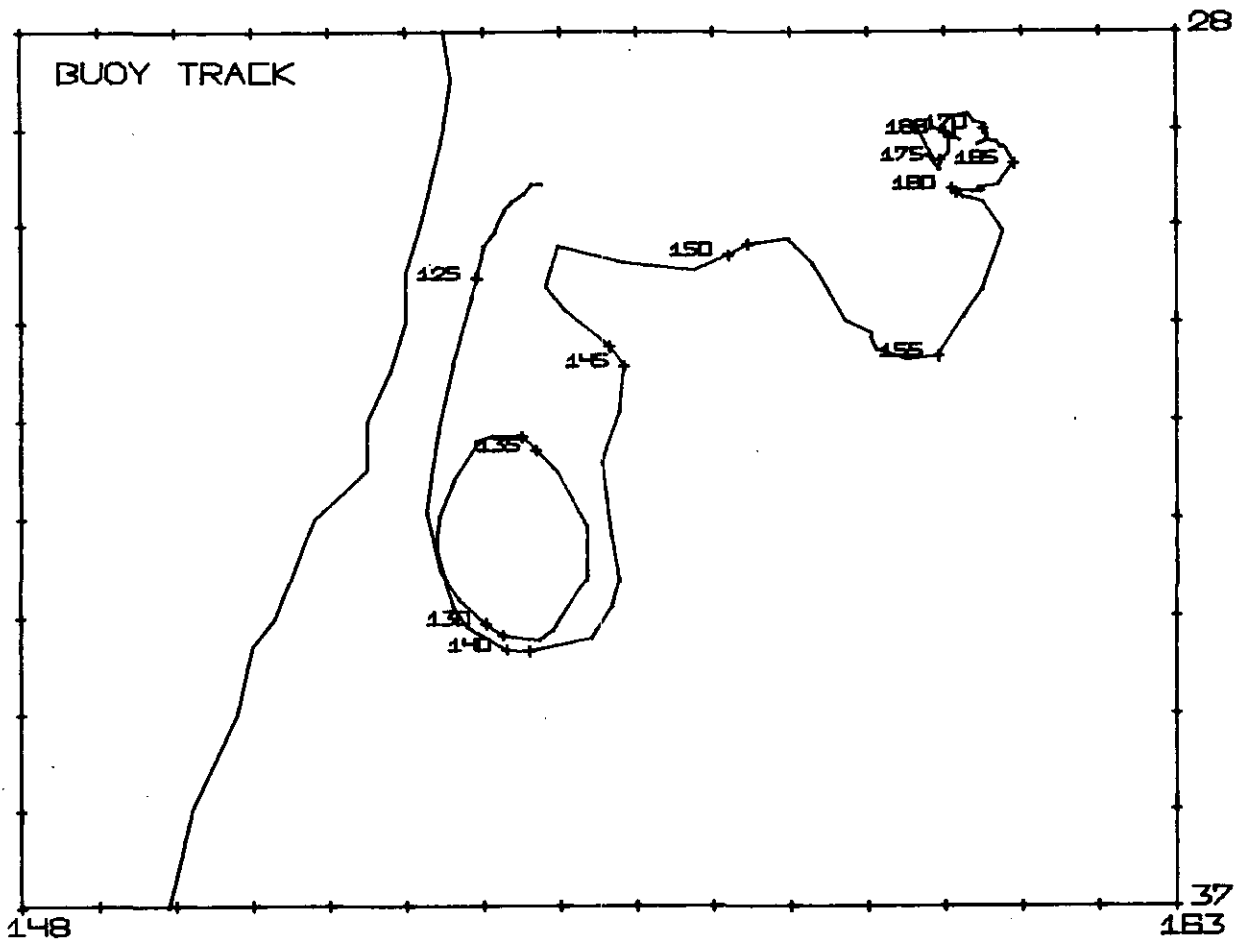
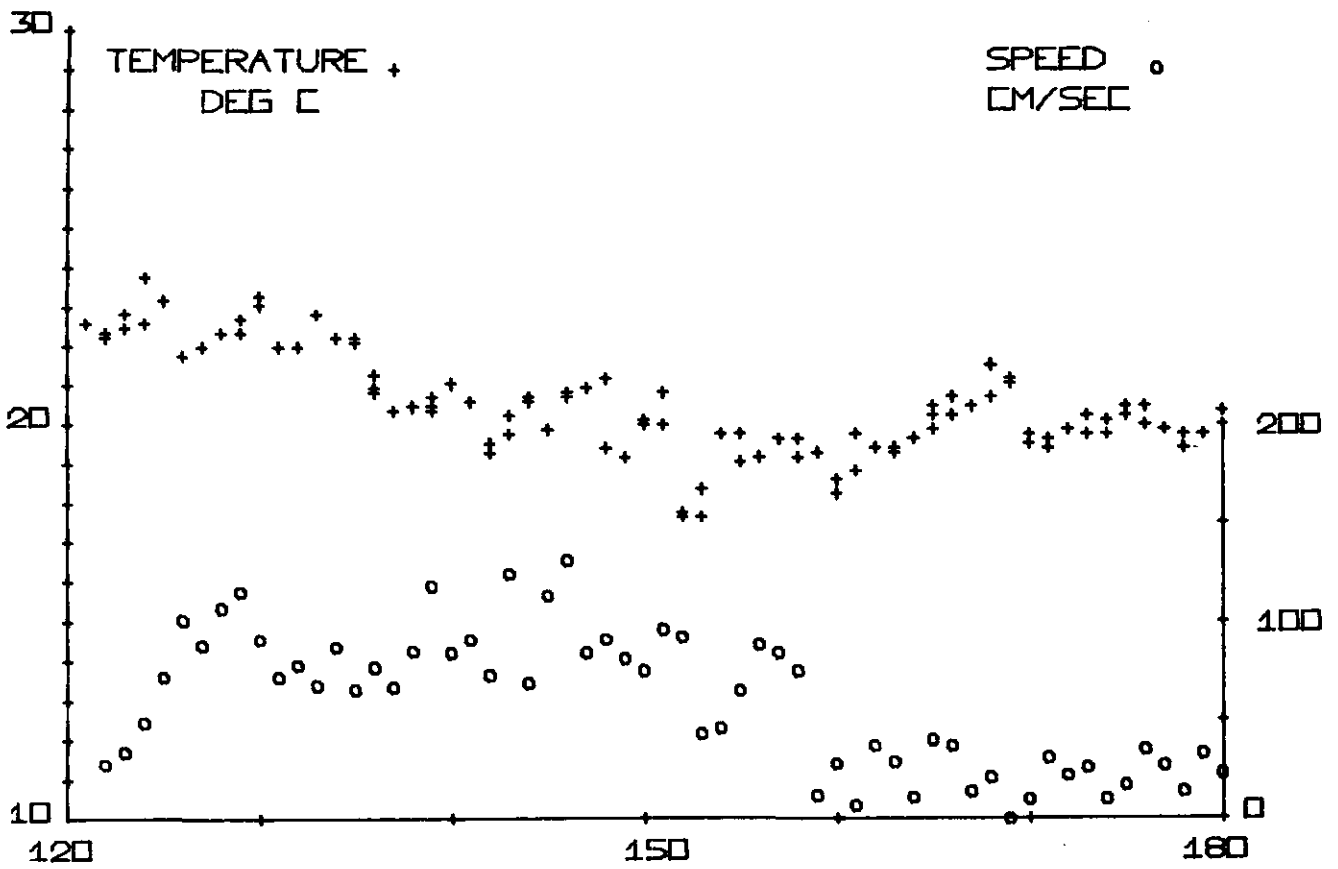
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BUOY 1676

DAYS 120-180 1977

