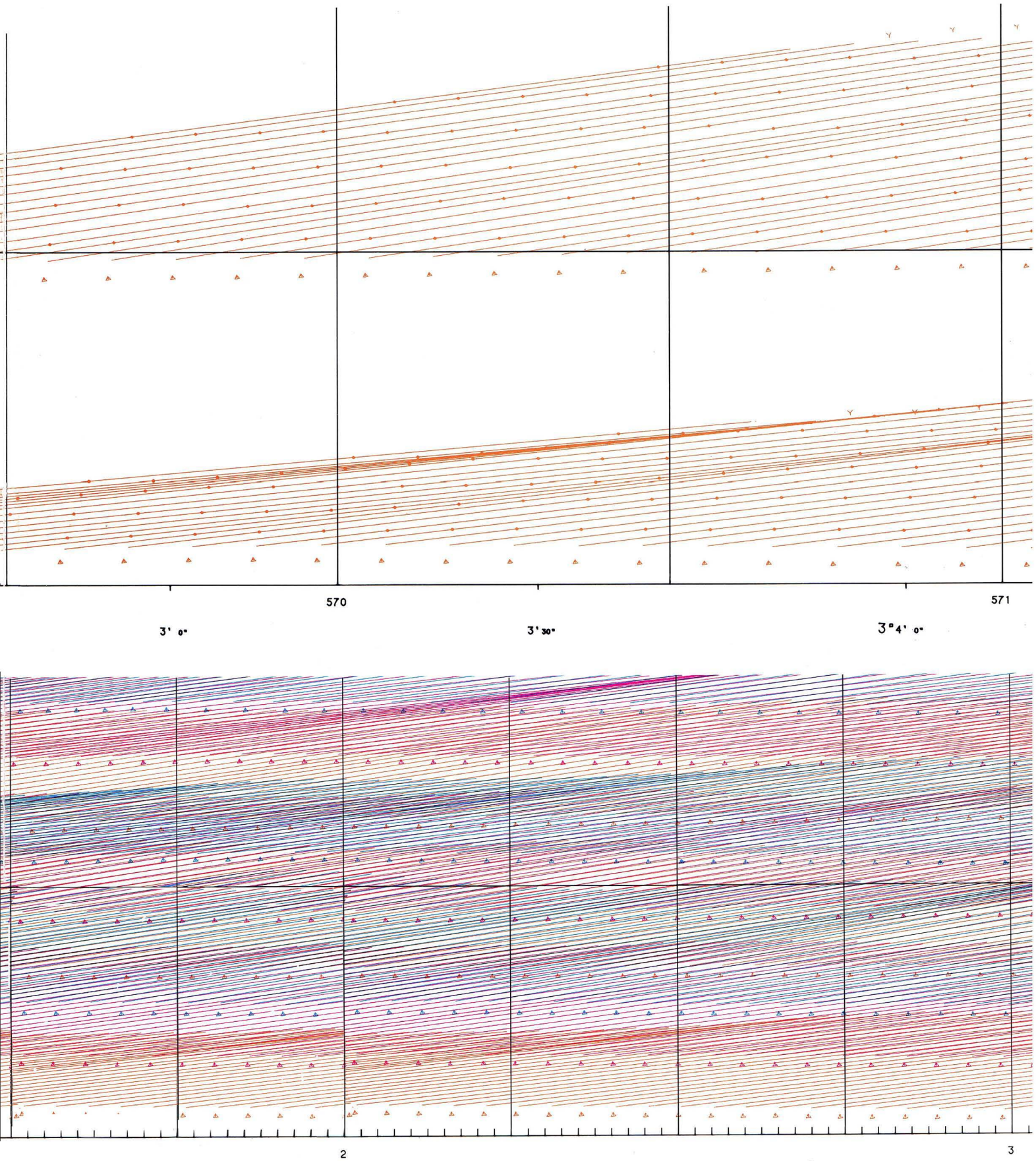
PRAKLA-SEISMOS INFORMATION No.22

Streamer Positioning for 3-D Processing



Survey

1. Equipment

- Tailbuoy positioning system PRAKLA-SEISMOS, type: PDF (fig. 1)
  Method: Phase difference measurement
  Resolution: ± 0.1°
  Internal sampling rate: 0.1 sec
- Heading sensors (with compasses), type: Digi Course, Model 318 (fig. 2)
  Internal sampling rate: 30 msec
  Resolution: ± 0.35°
  Built-in interval: 400 m
  Quantity: depends on streamer length (e. g. 6 for 2400 m cable)

2. Recording

- 3-D positioning data integrated in navigation tape format:
  – streamer layout in profile headers
  – compass and tailbuoy azimuths (δ_i,β) in shot records
- Magnetic tape recording at every pop
- Selective print-out on teletype
- Display

3. Navigation

- 3-D navigational requirements controlled by navigation computer
  – computation of navigation offset
  – tracking of CDP midpoints on projected line
  – track-plot with subsurface scattering

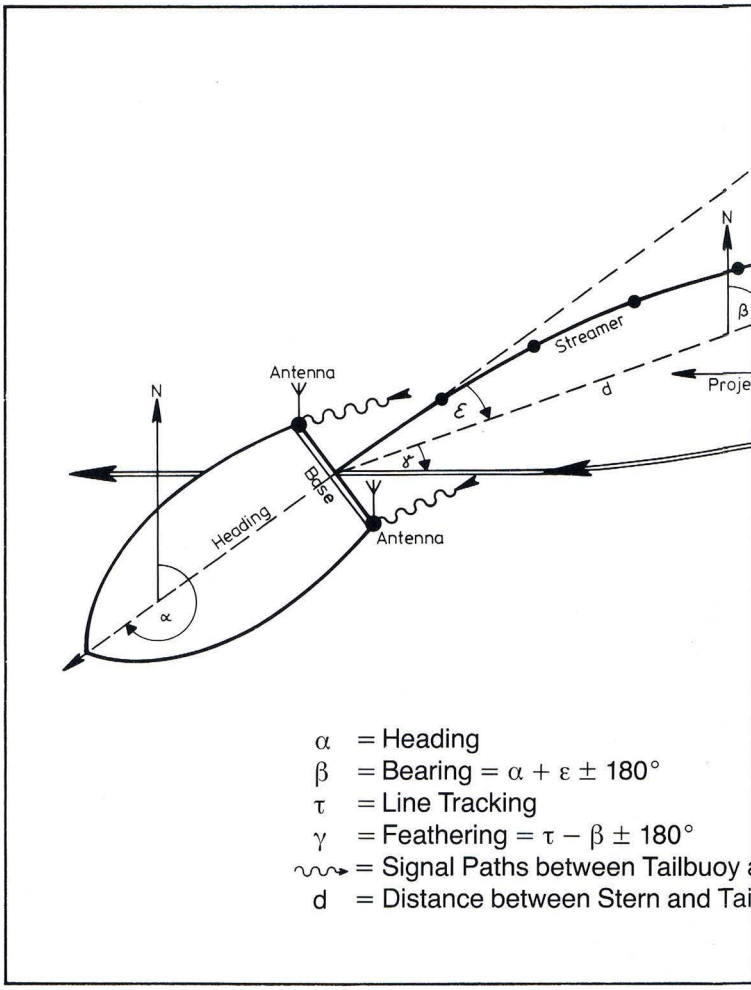


Fig. 1: Tailbuoy Positioning

Processing

1. Absolute Positioning

A conventional processing, resulting in final geographicals and plane (e. g. UTM) coordinates, precedes the 3-D streamer positioning.

2. Relative Positioning

- Streamer positioning
  – editing and filtering on compass and tailbuoy azimuths (fig. 3.1)
  – determination of streamer polygon (fig. 3.1)
  – adjustment of streamer polygon to tailbuoy position (fig. 3.2)
- CDP-positioning
  – pick-up of field trace positions from adjusted polygon
  – determination of CDP-positions

3. Presentation

- Conventional shotpoint location map
- Streamer location map (fig. 4.1)
- Scattergram (fig. 4.2)
- Final 3-D positioning tape

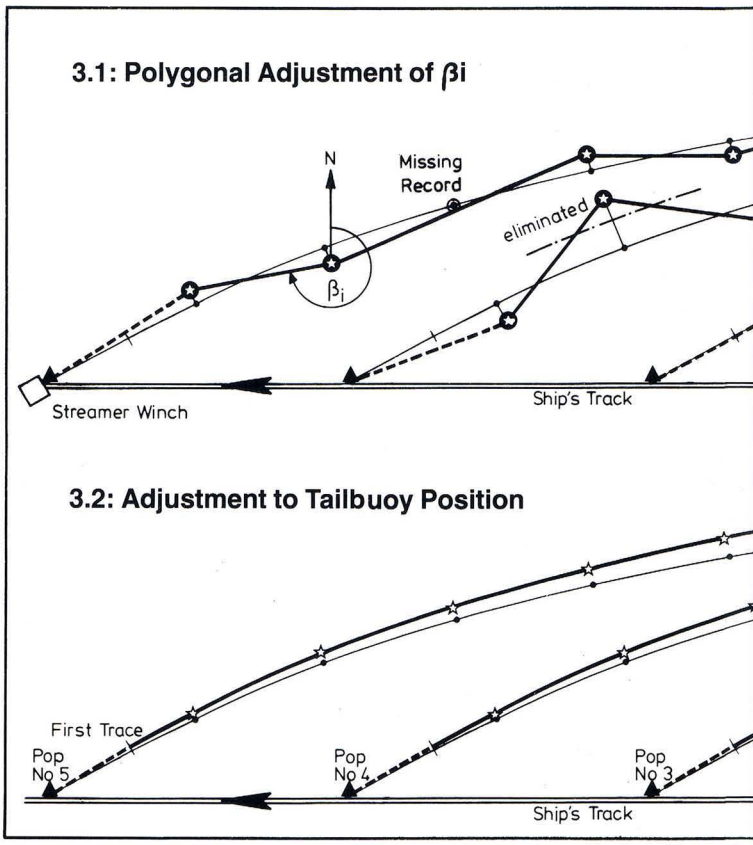


Fig. 3: Postmission Streamer Positioning

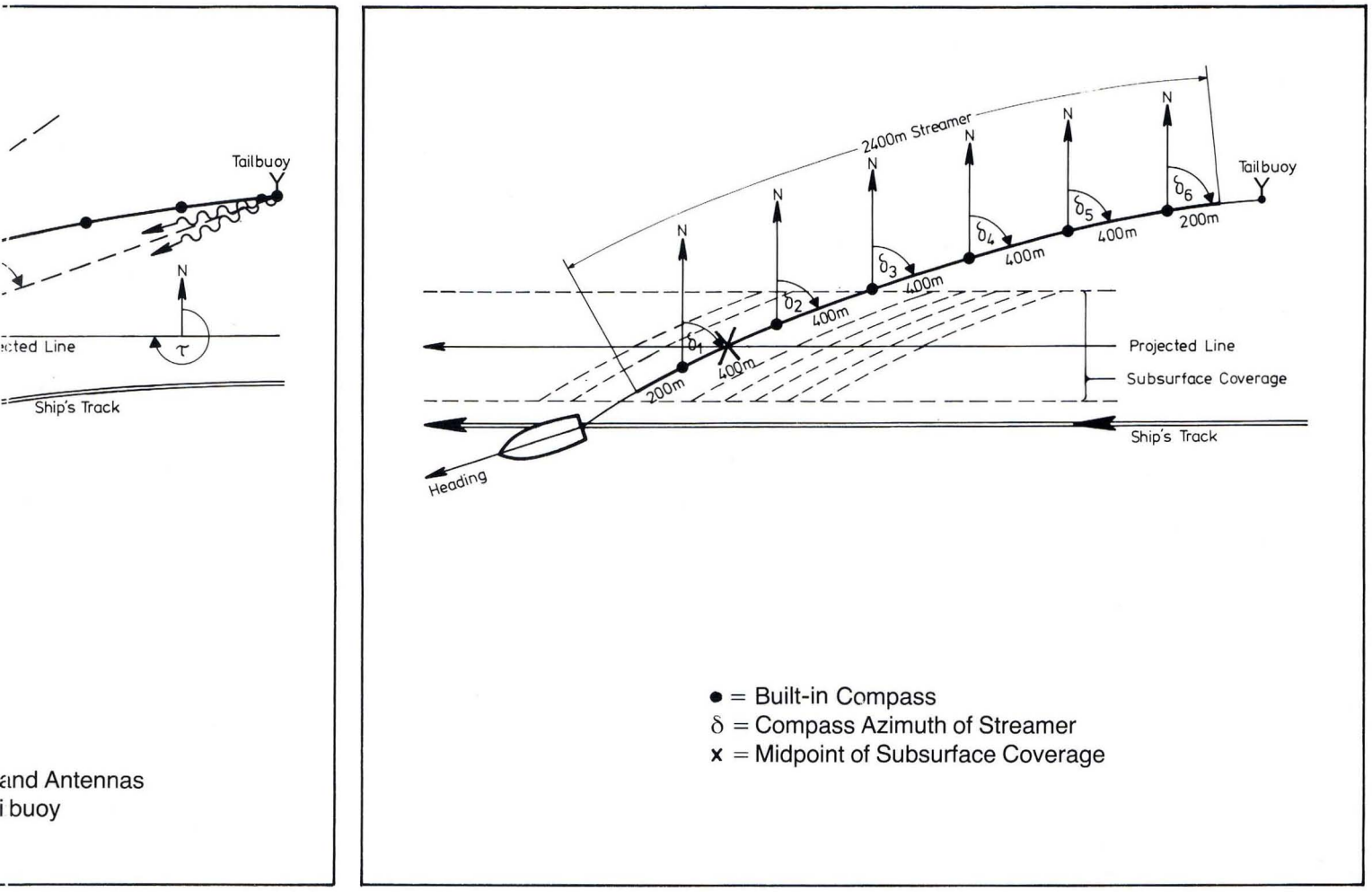


Fig. 2: Streamer Layout and Subsurface Coverage

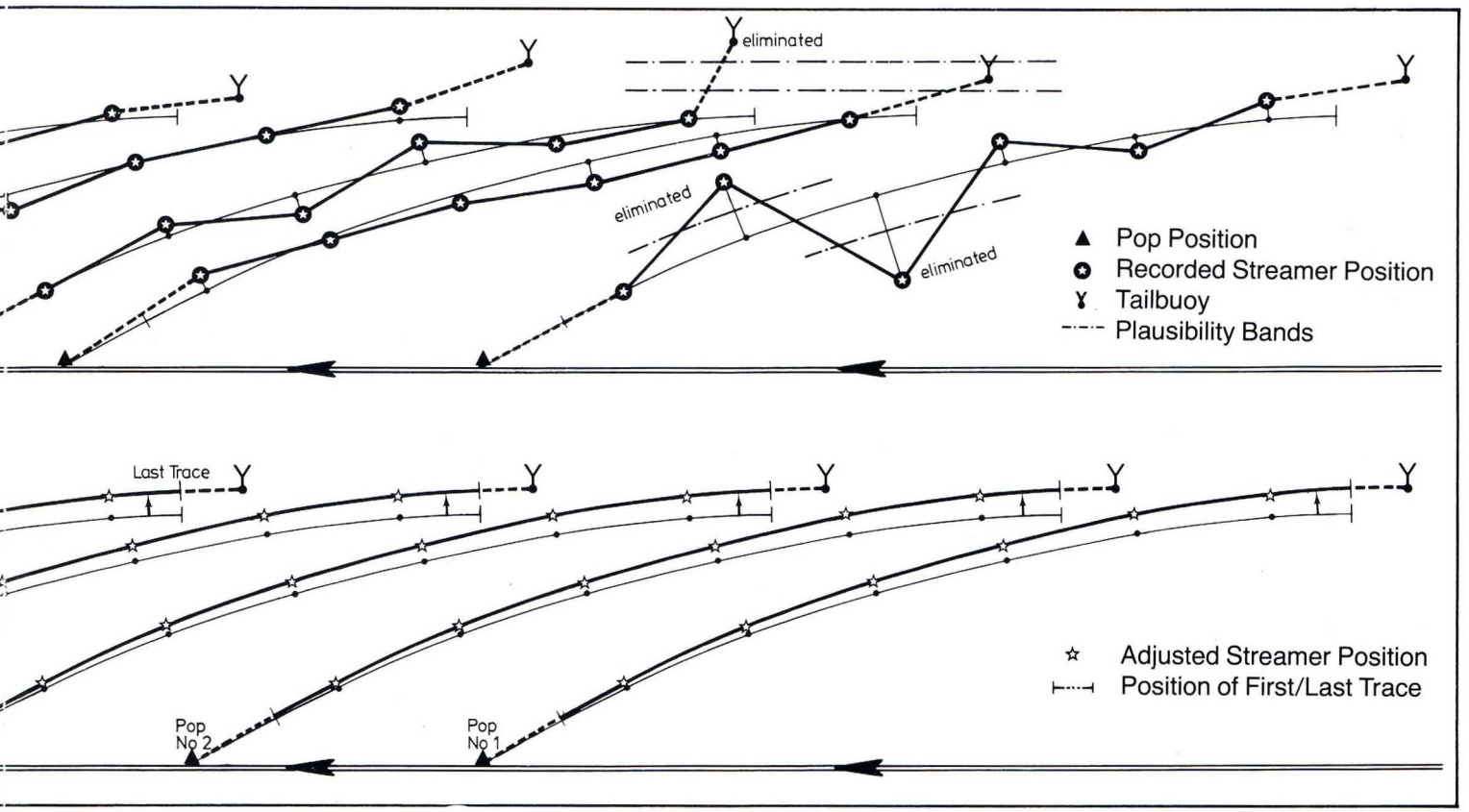


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Fig. 4.1: Streamer Location Map

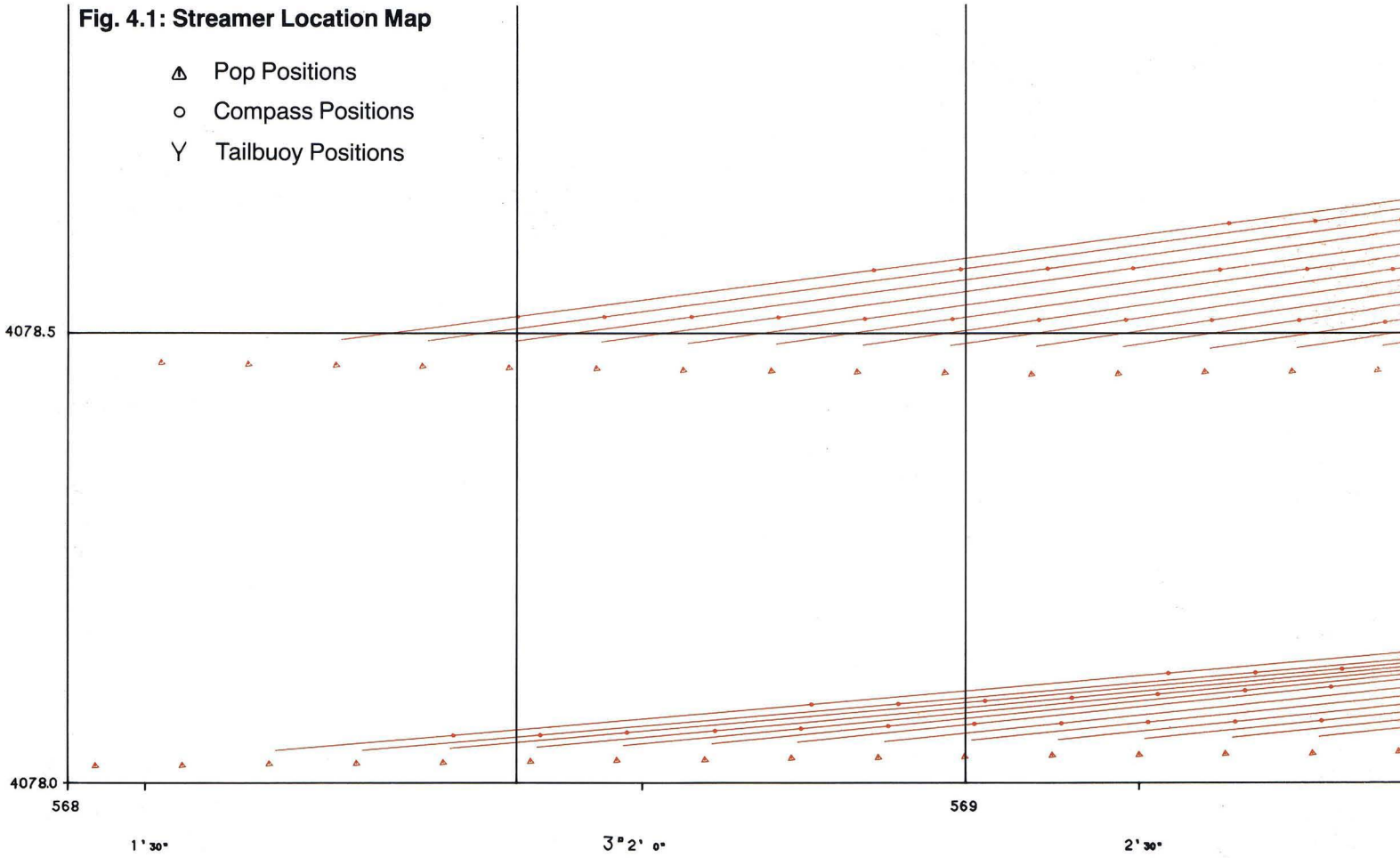

Fig. 4.2: Scattergram