



# **PACIFIC REGION TECHNICAL NOTES**

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## Videotape Library of Significant Upper Air Flow Patterns and Weather Events

Laurie Neil, Satellite Meteorologist  
Pacific Weather Centre, Vancouver, B.C.

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### INTRODUCTION

GOES-West animation sequences have been archived at the Pacific Weather Centre (PWC) on a chronological basis for some time. While this has proven to be useful in the past, an archive of animated imagery based on flow pattern types would serve many purposes. Although a large number of different flow patterns can be identified, the archiving procedure would likely have to be limited to a few of the patterns considered most significant in influencing the weather over B.C.

### METHOD

Satellite imagery is now received at the PWC in digital form from the GOES-W geostationary satellite. Images are stored for limited periods of time (up to 72 hours) on discs. To record this imagery on videotape, the data must first be converted to analog form. This process is illustrated in Figure 1.

### SELECTION OF CATEGORIES

A number of flow patterns and significant weather events can be identified as recurring over the eastern Pacific and B.C. A list of some of these is given in Table 1. Also listed are suggested image sector size as well as image type (IR, visual, or water vapour) for each of the patterns to be catalogued. Although fourteen suggested topics are listed in the table, time constraints would likely restrict the actual number of categories to perhaps half a dozen.

An effort has been made to prioritize the different categories based on the importance of the event or pattern to the forecasts, and the amount of assistance which can be provided by animated imagery in solving the associated types of forecast problems. For example, the problems of forecasting heavy convection and coastal stratus and fog, while important at the PWC, are not resolved as well by animated imagery as are some other weather events. As a result they have been placed at the bottom of the list in terms of priority.

### OPERATIONAL PROCEDURE

Whenever a type of flow pattern or weather event occurs which is being archived, it would be necessary for the meteorologist on shift at the time to ensure that the required animation sequence is recorded on the

appropriate tape. A separate tape would be used for each pattern or weather event which is to be archived. In cases where water vapour images are useful, these too should be recorded. If the event does not last long enough to permit a water vapour animation sequence to be recorded (these pictures are received only four times per day), at least the available single frame water vapour pictures should be recorded along with the available infrared or visual loop. Appropriate CMC 500 millibar charts should also be recorded, along with a title on the sequence indicating the type of event, data, and time of occurrence, and any miscellaneous information concerning the event which might be relevant (such as severity). Figure 2 schematically illustrates the manner in which this information would be recorded on videotape.

After a time a library of animation sequences could be built up dealing with all the categories of events that are selected. Once this is done, a forecaster on shift will at times be able to select an appropriate tape dealing with a weather pattern similar to the one which he is concerned with on his shift. He will be able to see how that pattern developed in time, and apply this knowledge to his current forecast problem.

#### REMARKS

There are a considerable number of uses which can be made of a library of animated imagery. Among them are the following:

- 1) assisting forecasters on shift in making decisions concerning day-to-day forecasts (utilizing the "analog" method),
- 2) familiarizing and training of forecasters who are new to the Region concerning the different atmospheric flow patterns, and the actual weather that occurs in conjunction with them,
- 3) facilitating the study of flow patterns, and the nature of cloud development and motion under those patterns,
  - increase our ability to forecast motions of cold lows, rapid development of cyclones, etc.

#### CONCLUSION

A videotape library of significant upper air flow patterns and weather events would benefit the Weather Centre in many ways. Besides contributing to the improvement of day-to-day forecasts, it would aid in the training and development of inexperienced meteorologists and meteorologists who are unfamiliar with weather patterns over the Pacific. It would also benefit meteorologists doing research work on weather system development and satellite meteorology.

Figure 1

Diagram of Process of Recording Satellite Imagery on Videotape

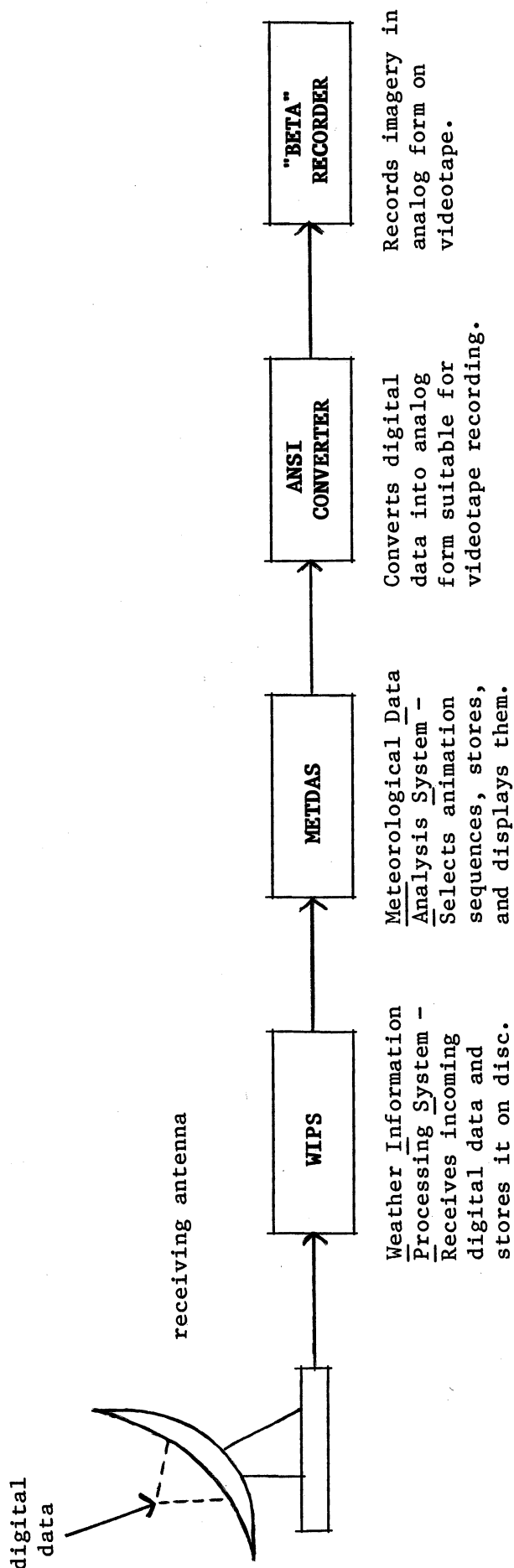


Figure 2

Videotape Recording Sequence

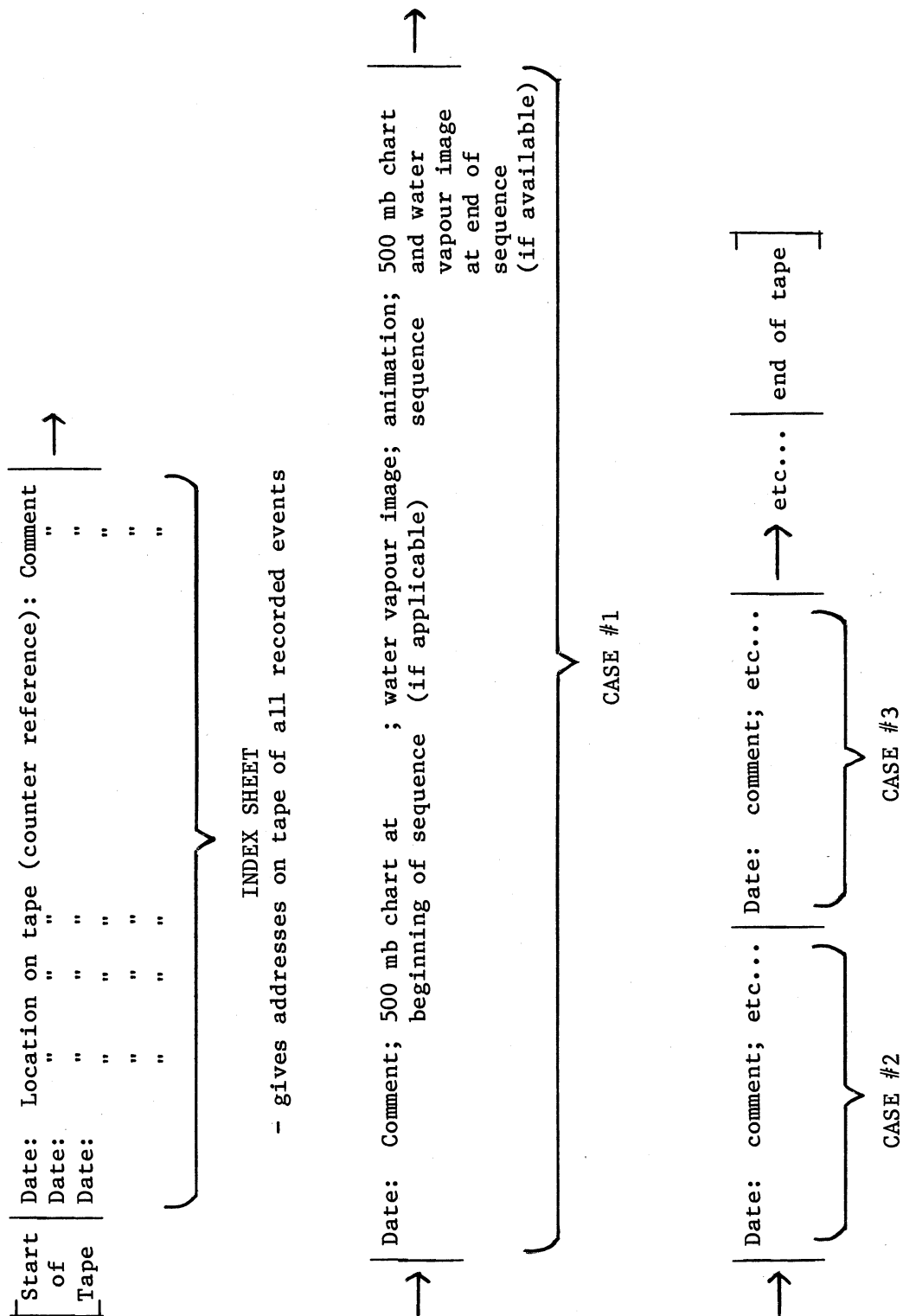


Table 1

Priorized Pattern Categories with Suggested Image Types and Sector Sizes

PRIORITY	PATTERN OR EVENT CATEGORY	SUGGESTED IMAGE TYPE	SUGGESTED SECTOR SIZE (km x 10 <sup>3</sup> )	*
1	Heavy precipitation events	IR	6 x 6 or 10 x 10	
2	Explosive developers	IR, W	6 x 6	
3	Cut-off low being "kicked out" or filling	IR	4 x 4	
4	Main stream breaking through a blocking pattern	W, IR	10 x 10	
5	Significant snowfalls on coast	IR, W	4 x 4 or 6 x 6	
6	Strong surface winds associated with vorticity maxima	IR	2 x 2 or 4 x 4	
7	Formation of cut-off lows	IR, W	6 x 6	
8	Split in flow approaching coast	IR, W	6 x 6	
9	"Dry" cloud systems	IR, W	6 x 6	
10	Behavior of "Non-Developers" and stable waves in strong zonal flows	IR	6 x 6 or 10 x 10	
11	Strongly building upper ridges	IR, W	6 x 6	
12	Major ridges over B.C. with S/WVs coming down the east side	IR	6 x 6	
13	Heavy convection	VI, W, IR	2 x 2	
14	Coastal stratus and fog	VI	2 x 2	

IR = infrared

VI = visual

W = water vapour

\* sector size based on nominal size at satellite subpoint