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## SOME CONVERSATIONS ABOUT YARD COMPUTER SYSTEMS

### Introduction

This informal note documents my interpretation of three conversations I had on yard computers systems with:

- Jim Wetzel - Chief Yard Designer at CONRAIL  
(January 26, 1978 at CONRAIL)
- Nick Lay - Manager of Yard Implementation of Sophisticated RAILS (Railroad Automated Identification and Location System) system for GTW  
(February 2, 1978)
- Sam Rittberg - Project Leader involved in yard computers at CONRAIL  
(January 26, 1978 at CONRAIL)

### Minimum MIS Requirements (Wetzel)

The minimum MIS requirements of the yard computer system must be sufficient to support a manual (e.g., card-PICLE<sup>\*</sup>) yard inventory system.

This minimum system must have the ability to:

1. Accept as input a list of cars to be humped.
2. Printout a switch list telling where cars went; yardmaster checks and corrects this list
3. The computer must have the capacity to process three trains: train at hump, next train to be switched, and train already switched.
4. Yard inventory is maintained manually.

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\* PICLE: Perpetual-inventory and car-location system

A more sophisticated MIS requirement would include:

- 1) Instantaneous car inventory
- 2) List for pull-out conductor telling what is on each track.

In addition to these MIS requirements the computer must control the speed of cars and throw switches. The control of car speed involves measurements of car rolling resistance, car speed, and control of retarders.

A luxury system would include T.V. monitors showing the "fan area" of the class tracks.

#### Sophisticated MIS Requirements (Lay)

Herein we discuss a sophisticated MIS terminal system which supports the main yard, satellite yards, and industrial sidings; the system is similar to that implemented in the GT RAILS system. The specifications of the operational functions are as follows:

##### Inputs

- Provide/transmit advanced consists
  - detail/summary counts
  - store in file
- Load industrial data from release information/reports from shippers
- Allows positive verification and correction of inbound trains list; (i.e., validate/correct against advanced consist file)

##### Yard Inventory (Perpetual disk--PICLE<sup>\*</sup>)

- Maintain "track-standing inventory" (i.e., what cars on each track and their order) of receiving, class, and departure track of main yard.

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\* Computer equivalent to card--PICLE

- Maintain "semi-track standing" inventory (i.e., what cars on each track, but not ordered) of repair tracks, engine tracks, and work equipment tracks.
- Maintain "bulk-inventory" (i.e., what cars are in a geographical area) of industry and support yards.
- Update inventory after switching; can be done manually, (i.e., track assign on an individual car basis) or automatically update as switched (i.e., by list).
- Ability to move trains between several yards in the terminal area (i.e., corresponds to a drag movement between main yard and support yard).
- Ability to access disk - PICKLE to see what is there by track or by yard or by area.
- Ability to maintain outbound train makeup.

#### Outputs

- Creation of a switch list which tell what track a car switched to.
- Summary/Management Reports
  - Block summaries (i.e., block count) by area, zone, or track.
  - Yard summary, number of cars on each track.
  - Track standing inventory.
  - Tonnage summary by area, zone, track (LUXURY).
  - Track overflow report--length of cars on each track and length of track (LUXURY).
  - Track status reports (e.g., track assignments, spiking tracks, overflow, maintenance, out of service) (LUXURY).
  - General purpose inquiry reports--Where is car "x"? Random sequential sorts; where are all cars of type "x"? (LUXURY).
  - Car characteristics (weight, length) through a mini-UMBLER file (i.e., cars are "ranged", contain ID, weight, length; 60,000 car entries sufficient) (LUXURY).

#### Yard Computer Configurations (Rittberg)

These are some of the configurations at various yards known to Rittberg.

1. Selkirk and Buckeye Yards (CONRAIL)
  - GRS installed 2 GE 420 process control computers at hump; one computer "shadows" other computer. Does retarder control, switching, and inventory.
  - Pullout-end, small separate computer which aligns routes in throat.

2. Elkart Plan (CONRAIL)

- Three process control computers; one computer for retarder control; one computer for switching and pull-out track alignment, and one spare computer.
- Two computers to perform MIS functions, i.e., yard inventory.

3. Argentine Yard (Santa Fe)

Separate process control function from MIS function, therefore can have much smaller process control computer. If MIS fail, then process control not fail.

- Process control - Honeywell 516
- MIS - IBM 370/135

4. North Platt Yard (Union Pacific)

One large machine does all.

Distribution

Project 6364 Team  
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