

Both types of static tag can store and transmit 128 bits of information, of which 120 bits can be used for data; and they can be programmed either at the factory or in the field. The new dynamic tags can store and transmit 256 bits—twice as much data.

The transceiver or RF module generates a continuous wave RF signal in the 902 to 928 MHz band. The tags will respond to any frequency within that band; but at sites having more than one reader, different frequencies are used, spaced at least two MHz apart. The RF module, upon command from the reader unit, generates the RF signal that is delivered to the antenna; it then receives and demodulates the reflected tag signal and preamplifies and conditions the demodulated signal before sending it to the reader.

The reader or controller unit, with its associated software, is the heart of an AEI installation. It provides an operational link between the tagged vehicles and the railroad's host computer. The

system software is designed to provide all the data generated by a passing train. In conjunction with the wheel detectors, it identifies vehicles which have no ID

*Southern Pacific recently noted that their AEI system will log the exact location of cars and locomotives into its San Francisco operations database within 15 seconds after they pass the readers.*

tags. It receives the demodulated signal from the RF module, decodes the ID information, validates the ID code, and then transmits the code, along with any other information a particular user may require, to the host computer system. The controller unit can read and store more

than 500 tags in its internal, battery backed-up memory. The data remain in memory even after being passed along to the host computer, and are available for review if required.

In tests at the Transportation Test Center in Pueblo, and in railroad installations, the accuracy of the new RF AEI system has proven to be phenomenal; missed tags are rare. The system's reliability is conservatively rated at about 99.99%, or less than one missed tag in every 10,000 tag reads.

Thus the new AEI system overcomes the major problem that led to the abandonment of the earlier optical ACI system. While that system, which used low-cost passive labels on the cars, achieved 95% or higher accuracy in some installations, it appeared to be impossible or impractical to maintain the labels properly on cars that were in general interchange service.

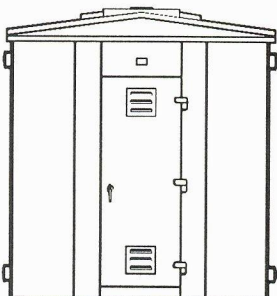
However, in certain "captive" types of operation, such as some urban transit systems, the optical ACI technology has

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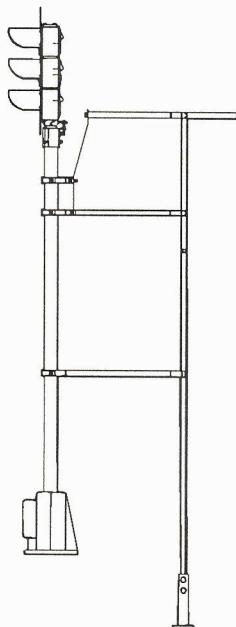
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