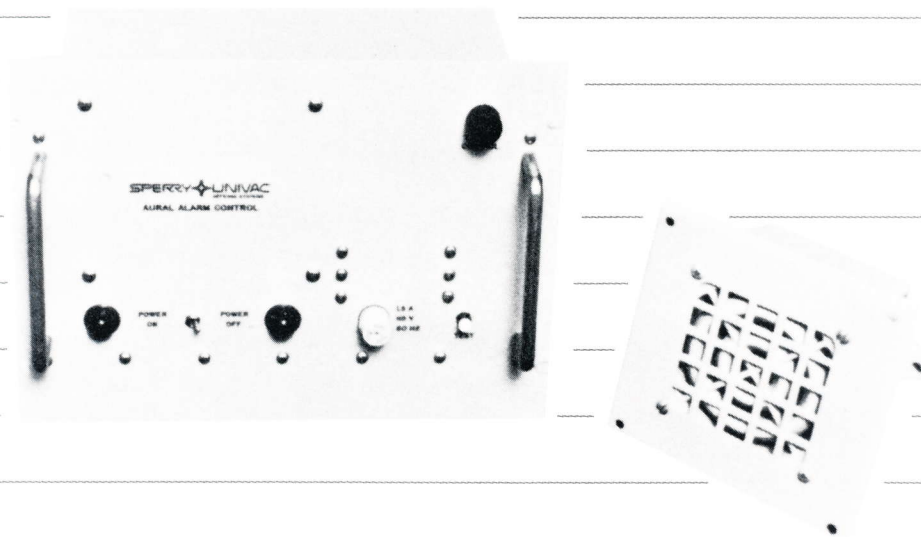# Minimum Safe Altitude Warning (MSAW)

◆ SPERRY

■ Provides audible warning when aircraft falls below safe limits ■ Expandable, up to 6 separate alarms may be activated in the system and each alarm may drive up to 6 speakers ■ May be used at remote sites ■ Operates in a multiprocessor environment ■ Clearly discernable tone ■ Compact.

F e a t u r e s

General Description

The Minimum Safe Altitude Warning (MSAW) device is a system enhancement which may be added to existing Automated Radar Terminal Systems (ARTS) systems or included in any new ARTS hardware system. The MSAW device provides for the audible warning when MSAW software detects aircraft which fall below safe limits. MSAW may be implemented in either a basic ARTS system or a multiprocessing system at either the Data Processing System (DPS) or a remote location.

Implementation of MSAW allowing operating either in local or remote situations may be made as follows. Local operation of MSAW of up to 6 separate alarms is limited to 500 feet from the DPS. Remote operation may be implemented by any of the three remote interface connection methods: (1) distances up to 10,000 feet from the DPS through a Link Adapter, (3) locations further than 10,000 feet from DPS through Remote Display

Buffer Memory (RDBM) or (2) locations further than 10,000 feet from DPS through Remote Tower Cab Controls (RTCC).

Physical Characteristics

ALARM

Voltage: 115 VAC ± 10 VAC, single phase
Power requirements: Less than 1.5 amp
Frequency: 60 HZ ± 2%
Operating temperature: 60—90° F
Operating Relative Humidity: 20—80%
Size (inches):
  Height — 9 inches
  Width — 12 inches
  Depth — 6 inches
Weight: 8 pounds

SPEAKER

No power requirement
Mounted in protective core
Weight: 4 pounds

Software Support

The MSAW alarm is the hardware needed to generate an audible output for the MSAW program. The MSAW program requires 1,100 words of instructions and additionally a data base of 1,250 words for a single beacon site and 2500 words for a dual beacon site. The MSAW program uses transponder and radar information to determine if an aircraft is currently below a safe altitude limit or if it is on a course which will place it at an unsafe altitude. The output of the program results in both a flashing output of "LOW-ALT" on the display in the aircraft data block and the activating of the MSAW alarm.

Applications

- Air Traffic Control Audible Warnings
  Warning device located at DPS
  Warning device location at tower(s)
  Warning device used on training simulator

METHODS OF IMPLEMENTING MSAW