

TYPE ACCEPTANCE APPLICATION FOR ACR/RLB-33S

Operational Description:

Refer to schematic diagrams in Appendix 2.

This section describes the technical differences between the RLB-33S and the RLB-33. Refer to Type Acceptance Application for ACR/RLB-32/33, Section 3.0 for a detailed technical description of the RLB-33.

The RLB-33S is identical to the RLB-33 except for minor changes of the activation circuit required for SSAS beacons. These changes include adding a latch to the activation circuit, removing the integral antenna to provide a 50 Ohm coaxial output, and removal of the strobe and 121.5 MHz circuitry. Each of these changes will be described in detail below.

The RTCM Recommended Standards for SSAS requires external activation switches and a latching activation circuit internal to the beacon. This latching function is accomplished by adding Q15-0638-1 and U8-0638-1 to the RLB-33 control circuitry. Refer to schematics "RLB-33 Activation Circuit" and "RLB-33S Activation Circuit" in Appendix 2 for details.

A strobe and a 121.5 MHz transmitter are not allowed in SSAS beacons. Therefore the circuitry used to generate strobe and 121.5 MHz signal on the RLB-33 is deactivated on the RLB-33S. This includes the 121.5 MHz Crystal (Y3-0638-), the oscillator (Q12-0638-) and amplifiers (Q13-0638- and Q11-0638-). These requirements were fulfilled by hardware modification only. Refer to the marked-up schematic Y1-01-0638-1 in Appendix 2 for details of the strobe and 121.5 MHz transmitter changes.

The removal of the 121.5 MHz transmitter and the requirement for a 50 Ohm output eliminates the need for the antenna coupler. Q3-0635 and U5-0635 already provide the required 50 Ohm 406 MHz output. Refer to the marked-up schematic Y1-01-0638-1 in Appendix 2 for details of the antenna coupler changes.

The microprocessor (U1-0638-1) code was modified only as required for SSAS beacons: required message coding and the elimination of audio beeps indicating transmission. The message coding changes are detailed in Table 1 below: changed 4 bit word to code for SSAS and 1 bit to indicate no 121.5 MHz transmitter. No other software changes that affect the modulated signal of the transmitter were made.

TABLE 1: CODING CHANGES

ACR Model Number	Beacon Type	Protocol Code Bits 37-40	Supplementary Data (121.5 MHz) Bit 112
RLB-33	EPIRB	"0110"	"1"
RLB-33S	SSAS	"1100"	"0"

Each active device and its function are listed in Table 2.

Frequency stability: The 406 MHz carrier is phase locked to a high stability oven controlled oscillator as required by the Cospas-Sarsat system. (This is identical to the RLB-33.)

Suppression of spurious radiation: Spurious radiation is suppressed by means of power supply decoupling (various capacitors and inductors) and low phase noise oscillators. (This is identical to the RLB-33.)

Modulation limitation: Limitations to the modulation of the 406 MHz signal consists of a current source provided by resistors (R6, R7, R11, and R12-0636). These resistors limit the current into the phase lock loop detector circuit (SH2-0636) and the currents set the level of modulation. (This is identical to the RLB-33.)

Power limitation: A regulated control voltage limits the maximum power output of the 406 MHz amplifier (U5-0635). Under best battery voltage, maximum power is limited to 7.9W. (This is identical to the RLB-33.)