DESCRIPTION OF SHIFTS USED IN VELOCITY LOG CALIBRATION

TWO TYPES OF SHIFT MAY BE APPLIED :

(1) SHIFTS TO LOWER VELOCITIES WHICH ARE APPLIED LINEARLY.
THESE SHIFTS ARE CALCULATED USING THE FORMULA :-

$$\frac{(T_L - T_C)_2 - (T_L - T_C)_1}{Z_2 - Z_1} \times 10^3$$

WHERE TL AND TC ARE THE TRAVEL TIMES TO A GIVEN CHECK LEVEL.
MEASURED FROM THE VELOCITY LOG AND WELL GEOPHONE DATA RESPECTIVELY;
AND WHERE Z IS THE DEPTH OF THE CHECK LEVEL BELOW DATUM.
(TL -TC) IS EXPRESSED IN MS (AS ON THE CALIBRATION CURVE) AND THE
RESULTING LINEAR SHIFT IS EXPRESSED IN μS/FT.

(2) SHIFTS TO HIGHER VELOCITIES WHICH ARE APPLIED DIFFERENTIALLY
IN ORDER TO APPLY LARGER CORRECTIONS TO LOWER VELOCITY SECTIONS OF LOG.
THIS IS BASED ON THE ASSUMPTION THAT LOWER VELOCITY SECTIONS
OF LOG CONTRIBUTE MORE TRANSIT TIME ERRORS THAN HIGHER VELOCITY
SECTIONS DUE TO CAVING AND OTHER BOREHOLE EFFECTS.
ADDITIONALLY. THIS TYPE OF SHIFT MAY BE RESTRICTED BY DEFINING A
BASELINE VALUE SUCH THAT SECTIONS OF LOG RECORDED AT A HIGHER
VELOCITY THAN THAT OF THE BASELINE WILL RECEIVE NO SHIFT.

RESTRICTED DIFFERENTIAL SHIFTS (UNRESTRICTED SHIFTS WILL HAVE
A BASELINE VALUE OF ZERO) ARE CALCULATED USING THE FORMULA :-

$$\left[\frac{(T_{C_2} - T_{C_1}) - (Z_2 - Z_1) \times \text{BASELINE VALUE} \times 10^{-6}}{(T_{L_2} - T_{L_1}) - (Z_2 - Z_1) \times \text{BASELINE VALUE} \times 10^{-6}} \right] \times 100\%$$

WHERE TC AND TL ARE EXPRESSED IN SECONDS AND THE BASELINE VALUE
IS EXPRESSED IN μS/FT.