

SOME NOTES REGARDING OPERATION OF THE UTILITY SWEEP GENERATOR

The Utility Sweep Generator is a versatile, flexible instrument that can output a highly controllable voltage sweep. All the sweep variables including manual and automatic operation, sweep speed, and sweep voltage limits are operator controlled with front panel switches and variable controls.

The sweep output voltage limits - both start and stop ends - are controlled by the MODE SELECT switch and the SET LO V and SET HI V 10-turn controls. Probably the most frequently used and easiest to understand of the setting options is the Start / Stop MODE.

With the MODE SELECT switch in "S/S" position, the output sweep starting point (voltage level) is set by the SET LO V control. This control can vary the output voltage ramp starting value over the full 0 to 16 volt range. The voltage setting can be monitored by setting the SPDTCO toggle labeled "AVG" to the left position. If the USG is used to sweep a VFO then this control will set the starting frequency of an RF sweep using an external counter with the USG DVM now being a "logging" indicator for future reference.

Moving the AVG toggle to the right allows the DVM to read the SET HI V control voltage which is the ending voltage value of the sweep. This control also can adjust the output voltage over the full 0 to 16 volt range. In fact, if this control is used to set a low voltage value while the SET LO V control is used to establish a higher voltage value, the output sweep will be a negative going ramp instead of the usual positive going ramp.

Note that while the AVG toggle is in either full left or full right position the associated output voltage is that governed by the respective variable control. Only when the AVG toggle is in mid (center off or "AVG") position is the output voltage sweep dictated by either the manual or auto SWEEP switch selection. In auto, for a faster sweep repetition, the DVM will display the average of the established output ramp voltage since the DVM is comparatively slow to respond - hence the "AVG" nomenclature.

With the MODE SELECT switch in DC position, the SET LOW V control can be used to output a variable DC output voltage from the SWP OUT port. While somewhat redundant to other possible options, this operation is useful in determining a desired range of output voltage values such as when seeking the tuning limits for some VFO. Another

application is that of obtaining a high resolution manual sweep of some circuit response where the more coarse SWEEP / manual combination is not appropriate. Note that in this MODE the SET HI V control is inoperative as is the AVG switch.

With the MODE switch in "delta" position, the USG is set up to sweep around some center point. Here the SET HI V control is first set fully CCW - this represents "zero sweep width". Then the SET LO V control is used to tune some center voltage (frequency). After this point is established, the SET HI V control is used to set the sweep width. Advancing this control will cause the chosen center voltage value to drop and represents the lower value to which the sweep will ultimately excursion. The upper value will then automatically be that same voltage value change so that the total sweep width will be that of both the downward and upward swings about the chosen center value. This is actually easier to do than to explain - so consider this example.

Consider the case of a sweep center value of 4 volts with a total sweep width of 2 volts or 4 +/- 1 volt. The SET HI V control is turned fully CCW (= zero sweep width) and the SET LO V control is adjusted for 4 volts on the DVM as read with the AVG switch set to the left. Then the SET HI V control is advanced until the DVM reading drops to 3 volts ($\frac{1}{2}$ the desired total sweep width). Moving the AVG switch to the right will result in the DVM display of 5 volts. Hence, the output sweep - either manual or auto - will be from 3 to 5 volts or 4 volts +/- 1 volt. Note that the SET HI V control can then be used to modify the sweep width to any value without disturbing the chosen center value. Note again that only when the AVG switch is in center position is the SWEEP switch selection of either manual or auto effective.