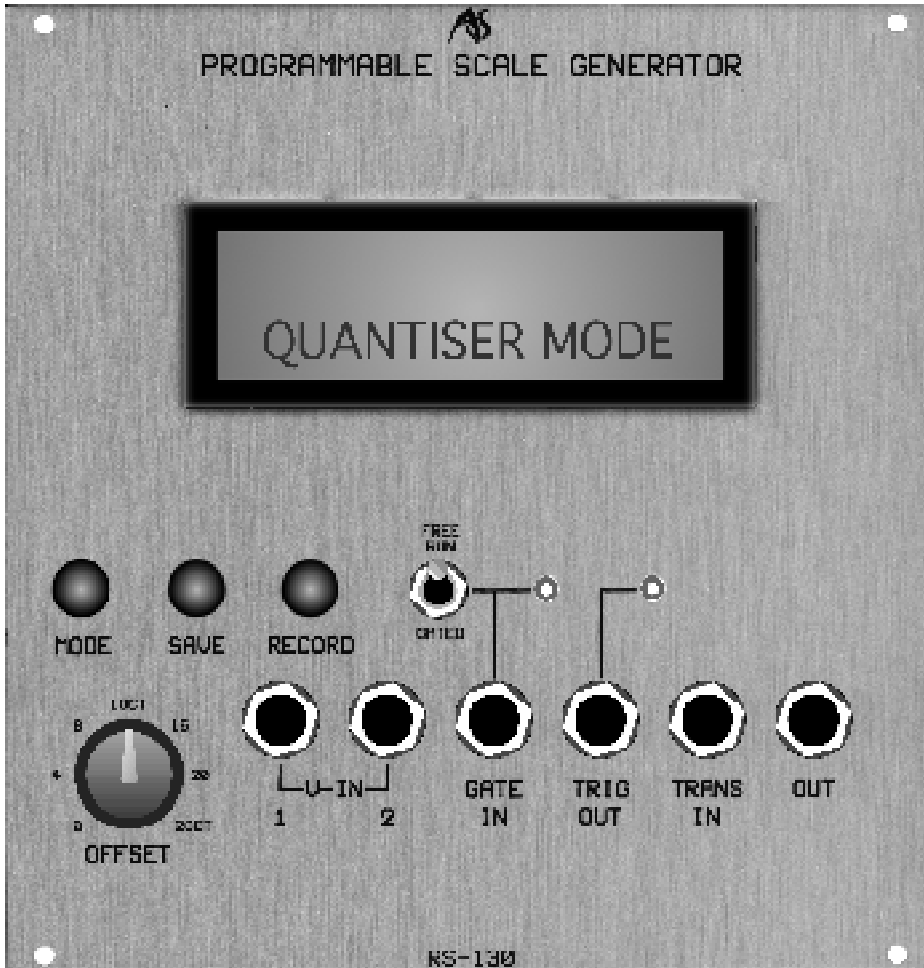


RS130

PROGRAMMABLE SCALE GENERATOR



INTRODUCTION

Before learning about the RS130 Programmable Scale Generator you should study the section of this manual that describes the philosophy and operation of a conventional Quantiser. You will find this in the chapter headed "RS260 QUANTISER". The rest of this chapter will assume that you have already done so, or that you are already fully acquainted with the ideas relating to voltage quantisation.

To recap, a Voltage Quantiser is a device that rounds (or "quantises") every voltage passing through it up or down to an exact semitone. This means that any voltages output by the Quantiser will lie on one of the 12 semitones of the conventional 'even-tempered' scale

A "Scale Generator" (or Scale Quantiser) takes this principal one step further: it quantises the signal in such a way that the output conforms to a predetermined musical scale. Examples of such scales are the common 'major' and 'minor' scales.

A *programmable* scale generator goes further still: while it may include predetermined scales as *options*, it also allows you to choose the notes that define any required scale. The RS130 is such a device.

Like the RS260, the RS130 incorporates software that ensures glitch-free transitions between quantised

notes, and offers the same two timing modes. These are "Free Run", in which the output CV shifts every time the input changes enough to move from one note to another; and "Gate", which requires a pulse to tell the device when to determine the next note.

But in addition to these, the RS130 incorporates no fewer than six quantisation modes, and you must fully understand these if you are to get the best from the module.

Quantiser Mode

When this is selected the RS130 will act in the same way as an RS260 Quantiser, quantising the input to an even-tempered semitone (also known as "chromatic") scale.

C Maj Scale Mode

With the OFFSET set to zero and no CV applied to the TRANS IN socket, the RS130 will quantise the input to the *C major* scale. This means that, no matter what voltages you apply to the input, the only notes present at the output will be the 'white' notes: C, D, E, F, G, A, and B.

C Min Scale Mode

With the OFFSET set to zero and no CV applied to the TRANS IN socket, the RS130 will quantise the input to the *C minor* scale. This means that the only notes present at the output will be: C, D, E^b, F, G, A^b, and B^b.

C Maj Arpeggio Mode

With the OFFSET set to zero and no CV applied to the TRANS IN socket, the RS130 will quantise the input to the notes of the *C major* arpeggio. This means that the only notes present at the output will be: C, E, and G.

C Min Arpeggio Mode

With the OFFSET set to zero and no CV applied to the TRANS IN socket, the RS130 will quantise the input to the notes of the *C minor* arpeggio. This means that the only notes present at the output will be: C, E^b, and G.

User Memory (Programmable) Mode

The RS130 will quantise the input to any scale that you determine and save within the module's single non-volatile memory.

Note: If you do not understand the musical terms involved - major, minor, and so on - we advise you to acquaint yourself with them. Otherwise, you will not be able to get the best from your PSG.

IN USE

MODE

Use the MODE button to step through the Quantisation Modes.

SAVE

This is used to SAVE a user-programmed scale (see below: Programming the User Memory).

RECORD

This is used to RECORD the notes within a user-programmed scale (see below: Programming the User Memory).

Mode Select Switch

There are timing modes, selected using the FREE RUN/GATE switch.

- **FREE RUN**
In Free Run, the RS130 outputs a new CV every time the mixed input CV changes enough to move from one note to another.
- **GATE**
In Gated mode, the RS130 requires a pulse to tell the device when to determine the next note.

OFFSET

You can apply a fixed transposition (offset) of up to 2V (2 octaves) to the input. You can also use this control to program a scale, but you will then be limited to the 2 octave range it offers. If you wish to program notes across the full 5 octave range of the RS130 you should use a 0V to +5V CV source from another module.

CV Inputs: V-IN 1 and V-IN 2

Any two voltages in the range 0v to +5v presented to the V-IN 1 and V-IN 2 inputs are summed linearly by an internal mixer. The summed voltage will also lie within the range 0v to +5V giving a maximum output range of 5 octaves.

Note: You can use V-IN 2 as a quantised "transposer" that shifts the output according to the voltage presented to it. This allows you to shift each of the preset scales - C maj, C min, and so on - into any key desired. In this way, all 12 major scales, all 12 minor scales, and (using the programmable scale function) all of the diminished, augmented and other scales are available to you.

GATE IN

If the Quantiser is in GATE mode, you must apply a Gate pulse in the range +1V to +20V to this input to cause it to determine the next output voltage. The output is determined on the positive-going edge of the pulse, and will be held until the next positive-going pulse is received. The GATE IN LED will light when a suitable pulse is detected at the GATE IN.

TRIG OUT

A +10v trigger pulse is output every time the output voltage shifts. In FREE RUN mode the timing of this trigger will be determined by the voltages received at V-IN 1 and V-IN 2. In GATED mode, the output trigger will echo the leading edge of the pulses received at the GATE IN. The TRIG OUT LED will light each time a trigger is output.

You can use this trigger to perform tasks such as clocking a sequencer, or triggering an envelope generator so that each new note is articulated independently of previous notes.

TRANS (Transpose) IN

Any voltage applied at the TRANS IN input will be added to the quantised output derived from V-IN 1 and V-IN 2. This will transpose the output up or down allowing you, for example, to fine-tune the output to match the tuning of other instruments. Note however that TRANS IN operates *after* the Quantiser circuit, so any voltage applied here will shift the output by an unquantised amount.

OUT

There is a single output that carries the quantised CV.

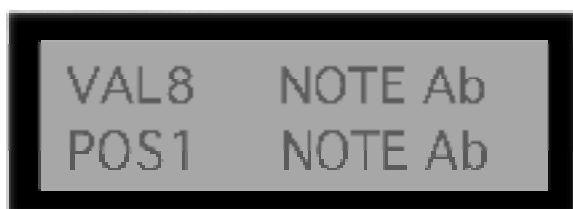
PROGRAMMING THE USER MEMORY

Use the MODE button to select the Quantiser mode.

Now use an external voltage source connected to either of the V-IN sockets, or use the OFFSET control, to select the notes in the desired scale, as follows:

Starting from the bottom of the range, you should sweep slowly upwards through the chromatic scale. Then, each time the display shows one of the notes that you wish to include in the scale, press RECORD.

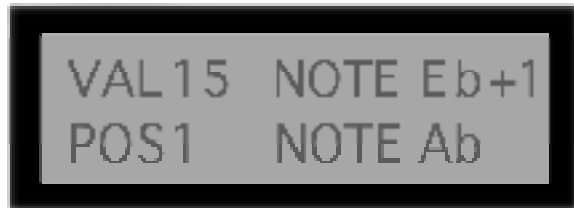
For example, if you have decided that the first note in your scale is to be the A^b in the lowest octave, the RS130 screen will look like this:



The four parts of the screen show:

- VAL: The note value, where C0 is note VAL=0
- NOTE: The note name, in this case A^b
- POS: The position of the note in the programmable scale
- NOTE: The note stored in POS1.

If this duplication of note information seems odd, it makes more sense when you choose the next note in the scale. Let's say that the next note is to be E^b in the octave above the first note. The screen will now look like this:



The four statements now show:

- VAL: The new note value, where C0 is note 0
- NOTE: The new note name, in this case E^b+1
- POS: The position of the previous note in the programmable scale
- NOTE: The note in the previous position.

The two NOTE names now allow you to see the previous note in the scale, plus the current note. This makes it simpler to see how your scale is developing.

If you now press RECORD, the screen will change to show that NOTE Eb+1 is stored in POSITION 2.

When you have incorporated all the notes you require, press SAVE to store the scale into the single User Memory. This memory is non-volatile, and it will retain your scale even when the power to the Integrator is removed.

Note 1: Do not RECORD the same note twice. It will confuse the PSG and lead to unpredictable results.

Note 2: Always RECORD your scale in one direction. Do not alternate between "up" and "down" when selecting the notes. To do so will cause problems when User Memory Mode is selected and you try to use the scale.

If you use the OFFSET control to program a scale you will be limited to the 2 octave range it offers. If you wish to use the full 5 octave range of the RS130 you must use a 0V to +5V CV source from another module.

To replace an existing scale, simply return to Quantiser mode and repeat the exercise.

RS130 SCALES

NOTE	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6
63	D [#] / E ^b	IF SELECTED		YES		YES
62	D	IF SELECTED	YES	YES		
61	C [#] / D ^b	IF SELECTED				
60	C	IF SELECTED	YES	YES	YES	YES
59	B	IF SELECTED	YES			
58	A [#] / B ^b	IF SELECTED		YES		
57	A	IF SELECTED	YES			
56	G [#] / A ^b	IF SELECTED		YES		
55	G	IF SELECTED	YES	YES	YES	YES
54	F [#] / G ^b	IF SELECTED				
53	F	IF SELECTED	YES	YES		
52	E	IF SELECTED	YES		YES	
51	D [#] / E ^b	IF SELECTED		YES		YES
50	D	IF SELECTED	YES	YES		
49	C [#] / D ^b	IF SELECTED				
48	C	IF SELECTED	YES	YES	YES	YES
47	B	IF SELECTED	YES			
46	A [#] / B ^b	IF SELECTED		YES		
45	A	IF SELECTED	YES			
44	G [#] / A ^b	IF SELECTED		YES		
43	G	IF SELECTED	YES	YES	YES	YES
42	F [#] / G ^b	IF SELECTED				
41	F	IF SELECTED	YES	YES		
40	E	IF SELECTED	YES		YES	
39	D [#] / E ^b	IF SELECTED		YES		YES
38	D	IF SELECTED	YES	YES		
37	C [#] / D ^b	IF SELECTED				
36	C	IF SELECTED	YES	YES	YES	YES
35	B	IF SELECTED	YES			
34	A [#] / B ^b	IF SELECTED		YES		
33	A	IF SELECTED	YES			
32	G [#] / A ^b	IF SELECTED		YES		
31	G	IF SELECTED	YES	YES	YES	YES
30	F [#] / G ^b	IF SELECTED				
29	F	IF SELECTED	YES	YES		
28	E	IF SELECTED	YES		YES	
27	D [#] / E ^b	IF SELECTED		YES		YES
26	D	IF SELECTED	YES	YES		
25	C [#] / D ^b	IF SELECTED				
24	C	IF SELECTED	YES	YES	YES	YES
23	B	IF SELECTED	YES			
22	A [#] / B ^b	IF SELECTED		YES		
21	A	IF SELECTED	YES			
20	G [#] / A ^b	IF SELECTED		YES		
19	G	IF SELECTED	YES	YES	YES	YES
18	F [#] / G ^b	IF SELECTED				
17	F	IF SELECTED	YES	YES		
16	E	IF SELECTED	YES		YES	
15	D [#] / E ^b	IF SELECTED		YES		YES
14	D	IF SELECTED	YES	YES		
13	C [#] / D ^b	IF SELECTED				
12	C	IF SELECTED	YES	YES	YES	YES
11	B	IF SELECTED	YES			
10	A [#] / B ^b	IF SELECTED		YES		
9	A	IF SELECTED	YES			
8	G [#] / A ^b	IF SELECTED		YES		
7	G	IF SELECTED	YES	YES	YES	YES
6	F [#] / G ^b	IF SELECTED				
5	F	IF SELECTED	YES	YES		
4	E	IF SELECTED	YES		YES	
3	D [#] / E ^b	IF SELECTED		YES		YES
2	D	IF SELECTED	YES	YES		
1	C [#] / D ^b	IF SELECTED				
0	C	IF SELECTED	YES	YES	YES	YES