

Z80 ACCESS TO FM SOUND CHIP

\$4000=register select for...channels 0,1,2
 \$4001=data register for...channels 0,1,2
 \$4002=register select for...channels 3,4,5
 \$4003=data register for...channels 3,4,5

CHIP MISC REGISTERS *ALL FROM \$4000 SELECT*

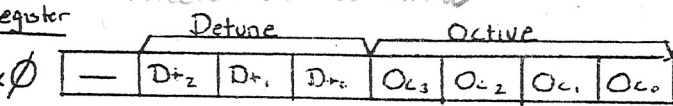
Bt07:Bt06:Bt05:Bt04:Bt03:Bt02:Bt01:Bt00 :
 : : : : : : : : :
 0 :0 :1 :0 :0 :1 :1 :1 : Rg0f. (\$27) ???
 0 :0 :0 :0 :1 :1 :1 :1 : Rg22. (\$0f) ???
 lor0:lor0:lor0:lor0:CNa3:CNa2:CNa1:CNa0 : Rg2B. top nibble=#fx to activate, #0x=force release, bottom nibble=channel (0,1,2,4,5,6)
 smp7:smp6:smp5:smp4:smp3:smp2:smp1:smp0 : Rg2a. 8 bit sample channel (affected by stereo mixing of channel 6 ?)
 Rg2B. \$8D TO ENABLE SAMPLE CHANNEL "IF ENABLED CHAN6 OUT OF ACTION"
 \$00 TO DISABLE

OPERATOR SETTINGS FOR EACH CHANNEL : OPERATOR 0 : OPERATOR 2 : OPERATOR 3 : OPERATOR 4 :
 Bt07:Bt06:Bt05:Bt04:Bt03:Bt02:Bt01:Bt00 : CHN0:CHN1:CHN2:xxxx: CHN0:CHN1:CHN2:xxxx: CHN0:CHN1:CHN2:xxxx: CHN0:CHN1:CHN2:xxxx:
 : : : : : : : : :
 xxxx:Dt2: Dt1 :Dt0 :Nhs3:Nhs2:Nhs1:Nhs0 : Rg30:Rg31:Rg32:xxxx: Rg34:Rg35:Rg36:Rg37: Rg38:Rg39:Rg3a:xxxx: Rg3c:Rg3d:Rg3e:xxxx:
 : : : : : : : : :
 xxxx:Vol6:Vol5:Vol4:Vol3:Vol2:Vol1:Vol0 : Rg40:Rg41:Rg42:xxxx: Rg44:Rg45:Rg46:Rg47: Rg48:Rg49:Rg4a:xxxx: Rg4c:Rg4d:Rg4e:xxxx:
 : : : : : : : : :
 Ers1:Ers0:xxxx:Atk4:Atk3:Atk2:Atk1:Atk0 : Rg50:Rg51:Rg52:xxxx: Rg54:Rg55:Rg56:Rg57: Rg58:Rg59:Rg5a:xxxx: Rg5c:Rg5d:Rg5e:xxxx:
 : : : : : : : : :
 xxxx:xxxx:xxxx:1Dc4:1Dc3:1Dc2:1Dc1:1Dc0 : Rg60:Rg61:Rg62:xxxx: Rg64:Rg65:Rg66:Rg67: Rg68:Rg69:Rg6a:xxxx: Rg6c:Rg6d:Rg6e:xxxx:
 : : : : : : : : :
 xxxx xxxx:2Dc4:2Dc3:2Dc2:2Dc1:2Dc0 : Rg70:Rg71:Rg72:xxxx: Rg74:Rg75:Rg76:Rg77: Rg78:Rg79:Rg7a:xxxx: Rg7c:Rg7d:Rg7e:xxxx:
 : : : : : : : : :
 Sus3:Sus2:Sus1:Sus0:Rel3:Rel2:Rel1:Rel0 : Rg80:Rg81:Rg82:xxxx: Rg84:Rg85:Rg86:Rg87: Rg88:Rg89:Rg8a:xxxx: Rg8c:Rg8d:Rg8e:xxxx:
 : : : : : : : : :
 xxxx:xxxx:xxxx:xxxx:Lf0 :Lf0 :Lf0 :Lf0 : Rg90:Rg91:Rg92:xxxx: Rg94:Rg95:Rg96:Rg97: Rg98:Rg99:Rg9a:xxxx: Rg9c:Rg9d:Rg9e:xxxx:

GLOBAL SETTINGS FOR EACH CHANNEL
 Bt07:Bt06:Bt05:Bt04:Bt03:Bt02:Bt01:Bt00 : CHN0:CHN1:CHN2:xxxx:
 : : : : : : : : :
 Frq7:Frq6:Frq5:Frq4:Frq3:Frq2:Frq1:Frq0 : Rga0:Rga1:Rga2:xxxx:
 : : : : : : : : :
 xxxx:xxxx:Oct2:Oct1:Oct0:Frqa:Frq9:Frq8 : Rga4:Rga5:Rga6:xxxx:
 : : : : : : : : :
 xxxx:xxxx:Fbk2:Fbk1:Fbk0:Alg2:Alg1:Alg0 : Rgb0:Rgb1:Rgb2:xxxx:
 : : : : : : : : :
 MixR:MixL:xxxx:xxxx:xxxx:Hfm2:Hfm1:Hfm0 : Rgb4:Rgb4:Rgb4:xxxx:

STEREO LR ON CHANNEL 6 ALSO AFFECTS THE SAMPLE COUNTER

Sega Sound Chip



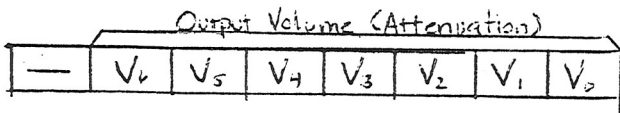
ym 2612

Detune	
0	0
1	+10%
2	+20%
3	+25%
4	0
5	-10%
6	-20%
7	-25%

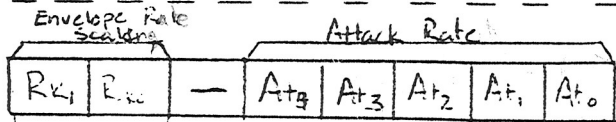
5TH NOT OCTAVE

Octave		Adjust	
0	-1	9	F7
1	Normal	9	F8
2	+1	10	F9
3	+2	11	F10
4	+3	12	F11
5	+4	13	F12
6	+5	14	F13
7	+6	15	F14

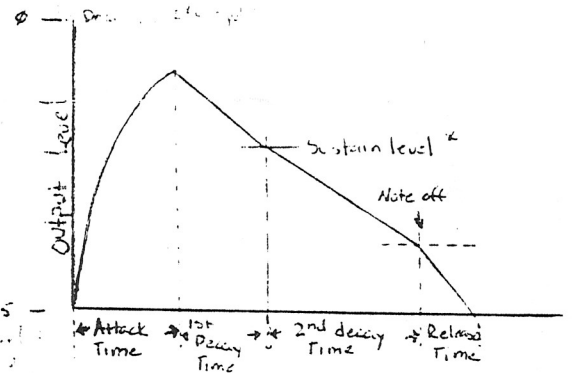
NATURAL HARMONIC SERIES



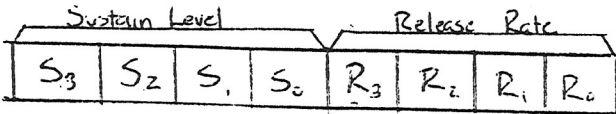
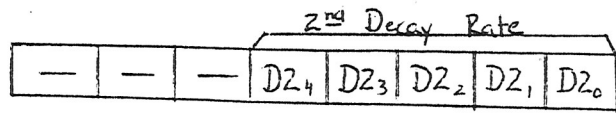
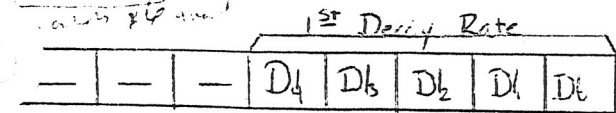
0 = Maximum Volume 127 = No Volume



Rate Key Scaling scales the envelope rates by the frequency of the notes, making higher notes have faster envelopes.
0 = no Rate Key Scaling
3 = Maximum



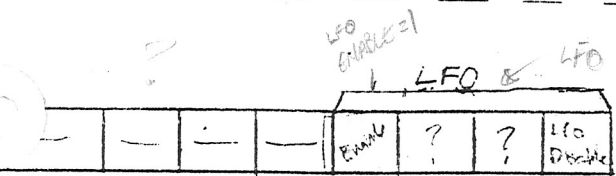
*Note: Sustain level is not an actual 'Sustain', but the level at which Decay 2 takes over from Decay 1. You may achieve sustain by setting Decay 2 to 0 (Never).



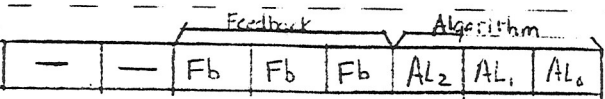
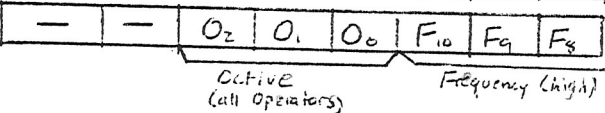
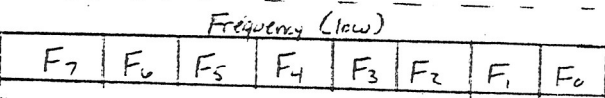
Attack / Decay Rates: 0 = Never → 31 = Immediate

Sustain Level: 0 = Max. Volume, 15 = No Volume

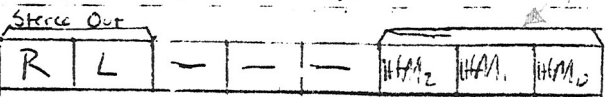
Release Rate: 0 = Very Long, 15 = Immediate



LFO on when sustain is 0 or 15, using the attack and decay of the envelope for the wave



Feedback: 0 = None 7 = Maximum (Noise)
Algorithm: See chart to right



High-Frequency Modulation Amount

