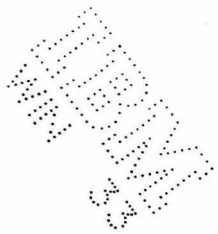
APPENDIX A: SPECIFICATIONS OF THE IBM MUSIC FEATURE CARD

Number of Instruments:	8 (each instrument can have a different voicing or tone quality)
Factory Supplied Voicings:	240 (see voicing list in Appendix B)
User Definable Voicings:	96 (voicing creation software required)
Audio Channels:	2 (stereo)
Special Features:	Detune Octave Transpose Pan (Left, Center, Right) Pitch Bend Portamento Velocity Sensing
Pedal Inputs:	Portamento pedal Sostenuto pedal Sustain pedal Volume pedal
Vibrato Inputs:	After Touch Breath Controller Foot Controller Modulation Wheel
Connectors:	MIDI IN, OUT, THRU Stereo Mini Headphone Jack Female RCA Left Audio Output Female RCA Right Audio Output



Instruments

While most MIDI keyboards and synthesizers can produce only one voicing or tone quality at a time, the IBM Music Feature card can produce eight different instrument sounds at once. Appendix B contains a list of the 240 factory preset voicings that come with the card. Devices that can generate more than one voicing at a time are called *multi-timbral.*

Special Features

To emulate the sounds of acoustic instruments and performance halls, special controls have been provided as explained below.

Detune

Think of the first violin section in an orchestra. Each violinist has the same music and is supposed to play the same pitches, but due to individual differences in the way the violins are fingered and bowed, they do not sound exactly the same; rather, there are slight tuning deviations that make the sound thicker and richer than if each violinist played exactly the same pitch. The detune feature allows the IBM PC to simulate this effect.

Octave Transpose

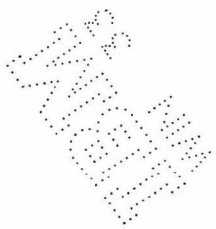
When a man and a woman sing the same song, the notes sung by the woman sound higher because she sings in a higher octave. The octave transpose feature lets the IBM PC simulate this effect by shifting instruments up or down by one or two octaves.

Pan (Left, Center, Right)

When you listen to an orchestra perform in a concert hall, sound comes from many directions. For example, the violins are on the left, the clarinets and trumpets are in the center, and the double basses are on the right. The stereo pan feature lets you simulate this effect by routing each instrument on the IBM Music Feature card to the left, right, or both audio outputs to center the sound.

Pitch Bend

Pitch bend is a special effect that originated on the guitar. After picking a note with the right hand, the left hand moves the string back and forth, in effect "bending" it. This stretches the string and produces a smooth change in pitch called pitch bend. Most MIDI keyboards have pitch bend wheels or levers that simulate this effect. The IBM Music Feature card lets you define the pitch bend range in steps from one to twelve keys on the music keyboard.



Portamento Instruments like the violin and the trombone can produce portamento, which is a continuous sliding in pitch from one note to the next. Violinists accomplish this by sliding up or down a string while bowing it, and trombonists do it by moving the slide on the trombone in or out while playing a tone. The IBM Music Feature card lets you turn portamento on or off for each instrument and vary the speed at which the pitches slide from 0 for no effect to 6 1/2 seconds for each octave of glide.

Velocity Sensing The harder you strike a note on the piano, the louder it sounds. Many MIDI keyboards simulate this effect through velocity sensing. When you hit a key hard, it goes down quickly and has a high velocity. When you play a key softly, it goes down slowly and has low velocity. The IBM Music Feature card responds to velocity sensing keyboards by playing notes louder or softer depending on how hard you strike them.

Pedal Inputs

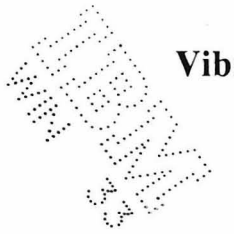
Foot pedals are very popular among musicians. You only have two hands to play the music, so if you can use your feet to control special effects, so much the better! The IBM Music Feature card supports four pedals:

Portamento pedal The portamento pedal turns on or off a smooth glide between the pitches you play.

Sostenuto pedal When the sostenuto pedal is down, the notes you play sound slightly longer and softer than normal; this simulates the effect of the middle pedal on an acoustic piano.

Sustain pedal When the sustain pedal is down, the notes you play sound much longer than normal and blend in with subsequent notes; this simulates the effect of the damper pedal on an acoustic piano.

Volume pedal The volume pedal gives you continuous control over the loudness of the music. The further down you press the pedal, the louder the music gets. This gives you much more control over volume than the pedals on an acoustic piano.



Vibrato Inputs

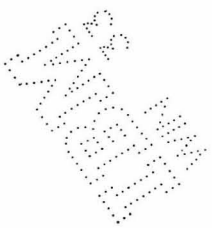
Vibrato means to vibrate. Vibrato causes notes to vibrate by repeatedly bending them up and down as they sound. Vibrato occurs naturally in singers. Sing a note, and you will hear it; as you prolong the tone, it wavers slightly, moving up and down in pitch. Violinists produce vibrato by wiggling one of their left-hand fingers on a violin string while the right hand bows it. The IBM Music Feature card can be set to one of the following four vibrato controllers (not all MIDI keyboards have these controllers, and not all programs support them):

After Touch You turn the vibrato on and off by altering finger pressure while you hold a note down on your MIDI keyboard. The harder you press, the deeper the vibrato.

Breath Controller You turn the vibrato on by blowing into a breath controller. The harder you blow, the deeper the vibrato.

Foot Controller You control vibrato with a foot pedal. The more you press the pedal, the deeper the vibrato.

Modulation Wheel You turn vibrato on and off by turning a wheel on your MIDI keyboard. The further you turn the wheel, the deeper the vibrato.



APPENDIX B: VOICING LIST

Each one of the eight instruments on the IBM Music Feature card can sound a different voicing or tone quality. There are seven banks of voicings; each bank can hold up to 48 voicings. Banks 3 to 7 have been filled at the factory, providing you with 240 preset voicings. Banks 1 and 2 let you define up to 96 custom voicings. The preset voicings are listed below. Their names are for reference only and may not make the sounds you expect. Some produce sound effects, such as helicopter noises, storms, and outer space sounds.

	Bank 3	Bank 4	Bank 5	Bank 6	Bank 7
1	Brass	UpPiano	Horn2	FnkSyn2	JOrgan1
2	Horn	Spiano	Horn3	FnkSyn3	JOrgan2
3	Trumpet	Piano2	Horns	SynOrgn	COrgan1
4	LoStrig	Piano3	Flugelh	SynFeed	COrgan2
5	Strings	Piano4	Trombon	SynHarm	EOrgan3
6	Piano	Piano5	Trumpt2	SynClar	EOrgan4
7	New EP	PhGrand	Brass2	SynLead	EOrgan5
8	EGrand	Grand	Brass3	HuffTak	EOrgan6
9	Jazz Gt	DpGrand	HardBr1	SoHeavy	EOrgan7
10	EBass	LPiano1	HardBr2	Hollow	EOrgan8
11	WodBass	LPiano2	HardBr3	Schmooh	SmlPipe
12	EOrgan1	EGrand2	HardBr4	MonoSyn	MidPipe
13	EOrgan2	Honkey1	HuffBrs	Cheeky	BigPipe
14	POrgan1	Honkey2	PercBr1	SynBell	SftPipe
15	POrgan2	Pfbell	PercBr2	SynPluk	Organ
16	Flute	PfVibe	String1	EBass3	Guitar
17	Picolo	NewEP2	String2	RubBass	Folk Gt
18	Oboe	NewEP3	String3	SolBass	Pluck Gt
19	Clarine	NewEP4	String4	PlukBas	Brite Gt
20	Glocken	NewEP5	SoloVio	UprtBas	Fuzz Gt
21	Vibes	EPiano1	RichSt1	Fretles	Zither2
22	Xylophn	EPiano2	RichSt2	FlapBs	Lute
23	Koto	EPiano3	RichSt3	MonoBas	Banjo
24	Zither	EPiano4	RichSt4	SynBas1	SftHarp
25	Clav	EPiano5	Cello1	SynBas2	Harp2
26	Harpsic	High Tin	Cello2	SynBas3	Harp3
27	Bells	HardTin	LoStrg3	SynBas4	SftKoto
28	Harp	PercPf	LoStrg4	SynBas5	HitKoto
29	SmadSyn	WoodPf	LoStrg5	SynBas6	Sitar1
30	Harmoni	EPStrng	Orchest	SynBas7	Sitar2
31	SteelDr	EPBrass	5th Str	Marimb2	HuffSyn
32	Timpani	Clav2	Pizzic1	Marimb3	Fantasy
33	LoStrg2	Clav3	Pizzic2	Xyloph2	Synvoic
34	Horn Lo	Clav4	Flute2	Vibe2	M.Voice
35	Whistle	FuzzClv	Flute3	Vibe3	VSAR
36	zingPip	MuteClv	Flute4	Glockn2	Racing
37	Metal	MuteCl2	Pan Flt	TubeBe1	Water
38	Heavy	SynClv1	Slow Flt	TubeBe2	WildWar
39	FunkSyn	SynClv2	5th Flt	Bells 2	Ghostie
40	Voices	SynClv3	Oboe2	TempleG	Wave
41	Marimba	SynClv4	Bassoon	SteelDr	Space 1
42	EBass2	Harpsi2	Reed	ElectDr	SpChime
43	SnareDr	Harpsi3	Harmon2	HandDr	SpTalk
44	RD Cymb	Harpsi4	Harmon3	SynTimp	Winds
45	Tom Tom	Harpsi5	Harmon4	Clock	Smash
46	Mars to	Circust	MonoSax	Heifer	Alarm
47	Storm	Celeste	Sax 1	SanreD2	Helicop
48	Windbel	Squeeze	Sax 2	SnareD3	Simeway