APPENDIX

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This section contains various supplementary information that may be useful to advanced users or programmers.

Contents of this section page

Explanation of the preset and internal voices

Preset 1

A01 AP¦Rocks: Bright rock piano, good for powerful chordal and solo playing. MW1 = chorus mix level; MW2 = filter cutoff; DE = wet/dry mix of reverb.

A02 AP¦CrsRock: Chorused rock piano, good for ballads. MW1 = pan LFO and detune amount; MW2 = filter cutoff; DE = reverb mix level.

A03 AP¦Concert: Warm concert grand piano, good for performances in classical and jazz styles. MW1 = pan LFO and reverb time; MW2 = filter cutoff; DE = reverb mix level.

A04 AP¦StgLayr: Grand piano and String section layer, useful in ballads, etc. MW2 = filter cutoff.

A05 EP¦76Stage: Electric piano reminiscent of the classic stage piano. MW1 = vibrato and tremolo; MW2 = EG bias control of brightness, phasing freq. and depth.

A06 EP:Classic: Electric piano in the style of the original DX7 E. piano. MW1 = chorus PM depth; DE = tremolo.

A07 EP:NiteHwk: Contemporary digital EP. MW1 = vibrato; DE = reverb mix level.

A08 EP:Belrose: Traditional EP with bright digital bell overtones. MW1 = vibrato; MW2 = chorus freq. and depth.

A09 -EP¦BellRng: Contemporary digital EP with handbells instead of the usual tines. MW1 = vibrato; MW2 = filter cutoff.

A10 EP:DXism: Solid EP for strong comping that won't interfere with other instruments. MW1 = pan LFO and chorus PM depth; MW2 = filter cutoff; DE = reverb time.

A11 EP¦GrnDual: Classic "FM style" EP layered with a grand piano. MW1 = vibrato; MW2 = chorus mix level.

A12 EP¦VoxLayr: Contemporary digital EP layered with breathy vocal pad. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of EFF1.

A13 KY¦Smokey: Tight, full-bodied digital keyboard voice, useful in many musical styles. MW1 = chorus mod freq. and depth; MW2 = filter cutoff and pan LFO.

A14 KY¦CrsClav: Wet, full-bodied digital keyboard voice, with a percussive character similar to a clav. MW1 = vibrato; MW2 = filter cutoff and pan LFO.

A15 KY¦Clavint: Bright, traditional clav sound. MW1 = vibrato; MW2 = filter cutoff; DE = chorus PM depth, wet/dry output mix of EFF2.

A16 KY¦ResoClv: Very resonant clav, useful for comping and soloing. MW1 = vibrato and pan LFO; MW2 = filter cutoff; DE = mod. depth of stereo phase.

B01 SP:Alaska: Evocative CS80-type of synth pad with portamento. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of EFF2.

B02 SP¦SawPad: Analog sawtooth pad, useful for sustained pads and lines. MW1 = vibrato; MW2 = filter cutoff.

B03 SP¦Square: Analog square wave pad, useful for sustained and moving pads and lines. MW1 = vibrato; MW2 = filter cutoff.

B04 SP¦Elegant: Digital synth pad with bright, airy overtones. MW1 = vibrato; MW2 = filter cutoff and EFF2 level.

B05 SP:DigiPad: Warm pad with percussive, resonant attack. MW1 = vibrato and pan LFO; MW2 = filter cutoff; DE = mod freq. and depth of symphonic effect.

B06 SP¦Lashed: Warm, full-bodied pad with slower attack and filter sweep. MW1 = vibrato; MW2 = filter cutoff.

B07 SP¦Sweeper: Evocative pad with very slow attack, featuring a resonant filter sweep. MW2 = filter cutoff; DE = reverb time; AFT = vibrato.

B08 SP¦Flash: Contemporary pad and musical effect with dramatic harmonic and filter motion. MW1 = vibrato; MW2 = filter cutoff.

B09 SP¦HrpsiPd: Digital pad with a harpsichord-like attack. Also useful for comping parts. MW1 = vibrato; MW2 = filter cutoff.

B10 SP.Skylane: Atmospheric pad with looping EGs and resonant filtering. MW1 = vibrato; MW2 = filter cutoff; DE = mod. depth of symphonic effect.

B11 SP¦Arpeggi: Bright digital pad with vector-like harmonic development, for use in sustained parts. MW1 = vibrato; MW2 = filter cutoff.

B12 SP¦Vecktar: Another digital pad featuring vector-like harmonic development, useful for sustained parts and comping. MW1 = chorus PM depth; MW2 = filter cutoff; DE = EFF2 mix.

B13 SP:Crystal: Very bright and detailed pad. MW1 = vibrato; MW2 = filter cutoff.

B14 SP¦Twinks: Evolving "breathy" pad with bell-like percussive attack. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level; VEL = EQ high gain.

B15 SP:Polydor: Full-bodied, slowly evolving pad, with metallic attack. MW1 = vibrato; MW2 = filter cutoff; DE = delay mix level.

B16 SP¦WarmJet: Luscious, warm analog type string pad with breathy overtones. MW1 = vibrato; MW2 = filter cutoff.

C01 BR¦TrmpSec: Bright trumpet section. MW1 = vibrato and tremolo; MW2 = filter cutoff; DE = symphonic mix level.

C02 BR:BigBand: A full big band, with trumpets, saxes, and trombones. MW2 = filter cutoff; DE = chorus mix level; AFT = vibrato.

C03 BR¦JazzTmp: Solo trumpet useful in jazz and classical styles. MW1 = vibrato and tremolo; MW2 = filter cutoff; DE = flange mix level.

C04 BR.MuteTmp: An expressive muted trumpet for solo playing. MW1 = vibrato; MW2 = filter cutoff and Aural Exciter mix level.

C05 BR¦FrHorns: A section of french horns. DE = output EFF1 wet/dry mix; AFT = vibrato and filter cutoff.

C06 BR¦DrkHorn: An expressive solo french horn. MW1 = vibrato; MW2 = filter cutoff; DE = delay mix level.

C07 BR¦Azen 16: Analog style brass section, octave down. MW1 = vibrato; MW2 = filter cutoff; DE = EFF2 mix.

C08 BR:DaBurbs: Wet, resonant analog type brass section. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level; VEL = EQ high gain.

C09 BR:Splatz: Velocity-sensitive synth brass section, with increasing brightness and "flare" at higher velocities. MW1 = vibrato; MW2 = filter cutoff; DE = EFF1 wet/dry output mix.

C10 BR:Pumped: Sawtooth brass, with heavy effects. MW1 = vibrato; MW2 = filter cutoff.

C11 BR¦StrLayr: Warm brass and string ensemble layer. MW1 = vibrato; MW2 = filter cutoff and pan LFO; DE = chorus mod freq. and chorus PM depth.

C12 ST:Octaves: Large string section, in octaves. MW1 = vibrato; MW2 = filter cutoff.

C13 ST:ChorAna: Analog style string section with chorusing. MW1 = vibrato; MW2 = filter cutoff and pan bias.

C14 ST¦Rosin: Large, transparent acoustic string section, very responsive to velocity. MW1 = vibrato; MW2 = pan bias; DE = chorus PM depth.

C15 ST¦Quartz: Intimate small section, such as a quartet. MW1 = vibrato and pan LFO; MW2 = filter cutoff.

C16 ST:Pizza: Pizzicato string section. MW1 = vibrato; MW2 = filter cutoff, tremolo, and pan LFO.

D01 ST*Concert: Full symphonic string section, very responsive to velocity. MW1 = vibrato; MW2 = filter cutoff.

D02 ST*Chestra: Full orchestra with brass and string sections. MW1 = vibrato; MW2 = filter cutoff.

D03 BR*Spitz: Large synth-brass section. MW1 = reverb time; MW2 = filter cutoff; DE = EFF2 mix; AFT = vibrato.

D04 ME*BigNeck: Orchestral unison hit, works best when played in octaves. MW1 = vibrato; MW2 = filter cutoff.

D05 PC¦Snapper: Very percussive comping synth voice MW1 = vibrato; MW2 = filter cutoff; DE = chorus PM depth.

D06 PC¦Marimba: Vary the positions of MW1 and MW2 to play this marimba with different types of mallets. MW1 = pan LFO and Aural Exciter enhance level; MW2 = filter cutoff; DE = EFF2 mix.

D07 PC.Vibes: Vary the position of MW2 to play the vibes with different types of mallets. MW1 = tremolo, pan LFO, and chorus AM depth; MW2 = filter cutoff; DE = EFF2 mix.

D08 PC¦MusicBx: Light, delicate sound reminiscent of a child's music box. MW1 = vibrato; MW2 = filter cutoff.

D09 PC¦Tahiti: Steel drums from the South Pacific. MW1 = vibrato; MW2 = filter cutoff.

D10 PC: Cloche: Hand bells from the South of France. MW1 = vibrato; MW2 = filter cutoff and left channel initial delay time.

D11 PC¦Balan: Balinese gamelan. MW1 = vibrato; MW2 = filter cutoff.

D12 PC:Berim: Berimbau and tabla from Bombay. MW1 = vibrato and tremolo; MW2 = filter cutoff.

D13 SE¦Slither: Evolving, vector-like special effect, with shifting harmonics and looping EGs. MW1 = vibrato; DE = EFF 2 wet/dry mix.

D14 DR Kits: Several drum kits. A basic kit follows the Yamaha RX-type note assignments. Below this kit are larger ambient and processed kicks (multi-keyed), snares and toms. Above the basic kit are multi-keyed cymbals and electronic drum sounds. At the top of the keyboard are multi-keyed snare drums. All kicks and snares are arranged in fifths for ease of playing.

D15 DR Perc: A full complement of Latin, African and Indian percussion. Most are multi-keyed for easy playing of intricate rhythms.

D16 DR mixed: A mixture of the above two drum voices. The drum kits follow the note assignments in D14 as closely as possible. Percussion voices reside above the electroninc drums.

Preset 2

A01 SC¦Heretic: Hauntingly beautiful sound with handbell attack. MW1 = vibrato; MW2 = pan LFO, chorus mod freq., and chorus PM depth.

A02 SC¦AeroPno: Grand piano with airy synth layer. MW1 = vibrato; MW2 = filter cutoff; DE = mod. FB gain, VEL = reverb time.

A03 SC:Juptier: Lush, detailed digital synth. MW1 = vibrato and tremolo; MW2 = filter cutoff; VEL = EQ high gain.

A04 SC.RezWhap: Resonant, bright analog-type sound. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

A05 SC:Plectar: Bright, wet, digital "plucked" sound. MW1 = vibrato; MW2 = filter cutoff, pan LFO, and tremolo; DE = flange mod. depth and mod. FB gain.

A06 SC:Quatar: Another plucked sound, fuller but still very digital in character. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level; VEL = EQ high gain.

A07 SC¦Plastiq: Strong comping sound with percussive, "plastic" attack. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

A08 SC¦Tanjeln: Resonant synth with strong ethnic flavor. MW1 = vibrato; MW2 = filter cutoff.

A09 SC:Gizmo: Resonant synth with vocal qualities. MW1 = vibrato; MW2 = filter cutoff.

A10 SC:Healing: Warm comping voice with percussive attack. MW1 = vibrato and pan LFO; MW2 = flange modulation freq. and depth.

A11 SC:Angelic: Breathy vocal sound with a digital flavor to the attack. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level; VEL = EQ high gain.

A12 CH¦Glasine: Light, pristine choir voice with bell-like percussive attack via velocity. MW1 = vibrato; MW2 = filter cutoff; DE = chorus modulation freq.

A13 CH:Itopian: Synthetic choir, excellent for pads. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry mix for output 2.

A14 CH.Vespers: Male "Ooh" choir with a hint of digital breathiness. MW1 = vibrato and tremolo; MW2 = filter cutoff; DE = wet/dry mix for ouput 1.

A15 CH:Nebula: Large mixed choir with synth processing. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

A16 CH¦Witches: Dark and breathy choral voice. MW1 = vibrato; MW2 = filter cutoff.

B01 PL¦Steel6: Acoustic steel-string guitar. AFT = vibrato; MW2 = filter cutoff; DE = wet/dry mix for Output 1; VEL = EQ high gain.

B02 PL¦JazzGtr: Acoustic guitar, ideal for expressive solo jazz playing. MW1 = phasing modulation depth; AFT = vibrato.

B03 PL¦Nylon6: Acoustic nylon-string guitar. AFT = vibrato.

B04 PL¦12Strng: Acoustic 12-string guitar. MW2 = filter cutoff; AFT = vibrato; DE = wet/dry mix for Output 1.

B05 PL:Eko12St: Electric/acoustic 12-string guitar with echo. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

B06 PL:Echoes6: Electric 6-string guitar with echo. Useful with arpeggiated and chordal playing. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry mix for Output 1.

B07 PL:Caster: Electric 6-string guitar with echo. Add distortion with MW2. Useful for comping and melodic/solo playing. MW1 = vibrato; MW2 = filter cutoff and pan LFO; DE = distortion level.

B08 PL:SloLead: Distorted electric guitar with harmonics via velocity. MW1 = vibrato; MW2 = filter cutoff, pan LFO, and delay mix level.

B09 PL¦RockAT: Distorted electric guitar with feedback harmonics via aftertouch. Good for solo/lead playing and rhythm comping. MW1 = vibrato; MW2 = filter cutoff; DE = flange mix level.

B10 SL:SawLead: Classic analog-type sawtooth lead synth voice, with distortion for extra "bite." MW1 = vibrato; MW2 = pan LFO; DE = distortion level.

B11 SL.EchoSaw: Analog sawtooth lead synth voice with mono key response. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry mix for Output 1.

B12 SL:Duke: Percussive and expressive lead synth voice, with rich stereo delays. MW1 = vibrato.

B13 SL¦Sync: Lead synth voice with "oscillator sync" sound. MW1 = vibrato, pan LFO; MW2 = filter cutoff; DE = flange modulation Feedback gain.

B14 SL:Square: Classic analog-type square wave lead synth voice with mono key response. MW1 = vibrato; MW2 = filter cutoff; DE = flange mix level.

B15 SL.PulseWM: Pulse width modulation in an AFM lead synth voice! MW1 = vibrato; MW2 = filter cutoff; DE = effect 2 mix.

B16 SL:Lyle: High, breathy melodic synth voice. MW1 = vibrato; DE = ER/reverb balance.

C01 BA¦Picked: Solid, picked electric bass with well-defined "edge." Add chorus effect with MW2. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

C02 BA¦Slapped: Bright, robust slapped electric bass. Add chorus effect with MW2. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

C03 BA¦Fingers: Electric bass, played with the fingertips. Add chorus effect with MW2. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

C04 BA.Fretles: Expressive AWM fretless bass, with good definition on upper range. AFT = vibrato MW1 = effect 1 level.

C05 BA.Classic: Expressive AFM fretless bass, in the tradition of the classic DX7 fretless bass. MW1 = vibrato; MW2 = filter cutoff; AFT = "growl"; DE = chorus mix level.

C06 BA¦Upright: Acoustic upright bass, with good clarity and definition. MW1 = vibrato; MW2 = filter cutoff; VEL = mid EQ frequency.

C07 BA:DXSlap: Bright electric bass, "slaps" with velocity. MW1 = vibrato; MW2 = filter cutoff and pan LFO; DE = chorus mix level.

C08 BA.Anabass: Punchy analog synth-bass. MW1 = vibrato; MW2 = filter cutoff; DE = flange modulation feedback gain.

C09 BA¦ResoSyn: Solid and highly resonant synth-bass. MW1 = vibrato and pan LFO; MW2 = filter cutoff.

C10 BA:FatSyn: Analog style, multi-oscillator synth-bass with mono key response. Wide timbral range via; MW2. MW1 = vibrato; MW2 = filter cutoff; DE = symphonic mix level; VEL = EQ high gain.

C11 BA¦Mogue: Recreation of the classic synth-bass, with a quick, percussive attack. MW1 = vibrato; MW2 = filter cutoff; DE = reverb mix level.

C12 OR¦BJazzy: Full drawbar organ with many live performance features. Well suited to jazz and rock styles. MW1 = vibrato, pan LFO, and rotary speaker speed control; MW2 = filter cutoff and reverb mix level.

C13 OR¦BookerB: Another drawbar organ, with strong upper harmonics, presence, and lots of "air." MW1 = rotary speaker speed control; MW2 = filter cutoff; AFT = vibrato and tremolo; DE = ER/reverb balance.

C14 OR¦Deep: Overdriven drawbar organ, with a strong midrange. MW1 = pan LFO and rotary speaker speed control; MW2 = filter cutoff.

C15 OR¦Purple: The Classic Distorted Rock Organ, with real time control of distortion. MW1 = pan LFO and rotary speaker speed control; MW2 = filter cutoff; DE = distortion level.

C16 OR¦Bsilica: Multi-rank pipe organ. MW2 = filter cutoff and pan LFO.

D01 WN¦Tenor: Expressive solo tenor saxophone, that blossoms with velocity. MW1 = vibrato, tremolo, pan LFO; MW2 = filter cutoff; DE = reverb mix level; VEL = Aural Exciter enhance amount.

D02 WN¦SaxSect: Ensemble sax section. MW2 = filter cutoff; AFT = vibrato and tremolo; DE = chorus mix level; VEL = EQ high gain.

D03 WN¦Alto: Expressive solo alto saxophone that blossoms with velocity. MW1 = vibrato, tremolo, pan LFO; MW2 = filter cutoff; DE = reverb mix level; VEL = Aural Exciter enhance amount.

D04 WN¦Soprano: Expressive solo soprano saxophone that blossoms with velocity and aftertouch. MW1 = vibrato; AFT = tremolo and filter cutoff; DE = flange mix level.

D05 WN¦Clarine: Solo clarinet. MW1 = vibrato; AFT = tremolo; DE = flange mix level.

D06 WN¦PanPipe: Breathy, detailed pan flute. MW1 = vibrato, tremolo, and filter modulation; MW2 = filter cutoff and pan LFO; VEL = Low EQ gain.

D07 ME*Phantom: Swirling, evolving synth pad. MW1 = pan LFO and pan bias; MW2 = filter cutoff; AFT = vibrato; DE = wet/dry mix for Output 2.

D08 ME¦5thsMan: Percussive/bowed 5ths attack, followed by vector-like swirl of harmonics and evolving sustained pad. MW1 = vibrato and tremolo; MW2 = filter cutoff; LFO = flange modulation freq. and chorus modulation freq.

D09 ME*Emperor: Full orchestral blast with swirling, looping bell-like harmonics over sustained pad. MW1 = vibrato and tremolo.

D10 ME¦SloLoop: Moody, dark and evocative pad with "reverse feedback-like" harmonic squeals that swoop and dive. MW1 = vibrato; DE = wet/dry mix of Ouput 1.

D11 ME*Asia: Expressive ethnic voice, with wide range of velocity sensitivity. MW1 = vibrato and pan LFO; MW2 = filter cutoff.

D12 ME:Dreams: Vocal attack which slides down into synth strings with fifths added. MW1 = vibrato; MW2 = filter cutoff; LFO = flange modulation depth.

D13 ME:Galaxy: A soaring, vector-like swirl of evolving harmonics. Open filter with MW2 for a wider path through the galaxy. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry mix of Output 1.

D14 ME¦Isis: Digital pad w/blown-type attack, immediately followed by looping blown-bells and complex upper-harmonic spectral sweeps. MW1 = vibrato; MW2 = filter cutoff.

D15 ME¦ZoZoid: Interstellar metallic bursts circled by radio blips and other cosmic repeating noises. Sustained notes in upper two octaves of keyboard good for melody with radio-isotope accompaniment. MW1 = vibrato.

D16 ME*Thusian: Warm synth pad w/repeating bells and other percussives. Upper octaves good for playing breathy cosmic melodies with bell attacks. MW1 = vibrato; MW2 = filter cutoff.

Internal

A01 SP¦Eternal: Beautiful string pad with lingering release. MW1 = vibrato and pan LFO; MW2 = filter cutoff.

A02 SP:Dreampd: Slightly spooky choral synth pad. MW1 = vibrato and pan LFO; MW2 = filter cutoff; DE = flange effect depth.

A03 SP:Freeze: Shimmering synth pad. MW1 = vibrato; MW2 = filter cutoff and pan LFO.

A04 SP:Polygar: Pad sound with nylon attack. MW1 = vibrato; MW2 = filter cutoff and pan LFO; DE = flange effect depth.

A05 SP:DarkPad: Moody synth pad. MW1 = reverb high gain; MW2 = filter cutoff; DE = wet/dry output mix of EFF2; AFT = vibrato.

A06 SP¦Digi82: Soft digital synth pad. MW1 = vibrato; MW2 = filter cutoff; DE = EFF2 mix level.

A07 SP.Digima: Pad with bell-like attack. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of EFF2.

A08 SP.SynStr: Dramatic synth-string pad. MW1 = mod freq. and vibrato; MW2 = filter cutoff and pan LFO.

A09 SC:Magic: A cute, resonanat sound. MW1 = mod freq. and vibrato; MW2 = filter cutoff and pan LFO; DE = wet/dry output mix of EFF2.

A10 SC.DnzStb: Sharp comping synth. MW1 = vibrato; MW2 = filter cutoff; DE = chorus PM depth; VEL = EFF2 level.

A11 SC¦SlapClv: Slap and clav combined. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

A12 SC.Analogy: Oscillated comping synth. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of EFF1.

A13 SC¦Steps: Hold the key down for another sound. MW1 = vibrato; MW2 = filter cutoff, EFF2 level and mid gain LFO.

A14 SC¦DigiStb: Stabbing metallic sound. MW1 = vibrato; MW2 = filter cutoff; DE = EFF2 reverb mix level.

A15 CH¦ChorWn: Fresh choral sound. MW1 = vibrato; MW2 = freq. mod, pan LFO, and delay level; DE = wet/dry output mix of EFF2.

A16 CH:OooAh: Female oohs, male ahs. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of effects.

B01 AP¦Bright: Bright digital piano. MW2 = filter cutoff; DE = reverb mix level.

B02 EP¦BellEP: Electric piano with bell attack. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of effects.

B03 EP.HrpPhon: EP with harp and pianophone elements. MW1 = vibrato; MW2 = filter cutoff, pan LFO, and symphonic effect mix level ; DE = reverb wet/dry output mix.

B04 EP:DualDA: Hard EP with stereo attack. MW1 = vibrato and pan LFO; MW2 = filter cutoff and symphonic effect mix level ; DE = reverb mix level.

B05 OR¦Ghosty: Organ with a touch of calliope. MW1 = vibrato; MW2 = filter cutoff; DE = EFF2 mix level.

B06 KY¦Squeeze: Classic accordion. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

B07 SL.PrtaSaw: Resonant lead synth. MW1 = mod freq. and vibrato; MW2 = filter cutoff and pan LFO; DE = wet/dry output mix of EFF1.

B08 SL:OctSqu: Square lead synth in octaves. MW1 = vibrato; MW2 = filter cutoff; DE = flange mix level.

B09 ST¦StrgPad: Sedate string pad. MW1 = vibrato; MW2 = filter cutoff and pan bias.

B10 ST¦ClasStr: Elegant classical string section. MW1 = vibrato; MW2 = filter cutoff and pan bias; DE = wet/dry output mix of EFF2.

B11 ST:Tremolo: Tremulous orchestral strings. MW2 = filter cutoff and pan LFO; DE = wet/dry output mix of effects; AFT = tremolo.

B12 ST:Qk Syns: String section playing in octaves. MW2 = filter cutoff; DE = chorus mod freq.; AFT = vibrato.

B13 ST:Violin: Solo violin with subtle aftertouch control. MW2 = filter cutoff; DE = symphonic effect mix level ; AFT = vibrato.

B14 ST:Cello: Expressive cello. MW2 = filter cutoff; DE = symphonic effect mix level ; AFT = vibrato.

B15 BR¦HouseAT: Brass with aftertouch modulation. MW1 = vibrato; DE = symphonic effect mix level ; AFT = filter cutoff.

B16 BR¦SfzSwel: Brass with sforzando attack. MW1 = vibrato; MW2 = filter cutoff; DE = reverb time and wet/dry output mix of effects.

C01 BA.FrtlsBs: Mellow fretless bass with a slight delay. MW1 = vibrato; MW2 = filter cutoff; DE = echo mix level.

C02 BA¦Picky: Fat bass with hard attack. MW1 = vibrato; MW2 = filter cutoff and pan LFO; DE = wet/dry output mix of effects.

C03 BA¦Roque: Electric and synth basses get together. MW1 = vibrato; MW2 = filter cutoff; DE = flange mix level and wet/dry output mix of EFF2.

C04 BA:VelSlap: Bass with velocity-controlled slap attack. MW1 = vibrato; MW2 = filter cutoff and pan LFO; DE = chorus mix level.

C05 BA¦Stile: Wood bass sound gets harder with velocity. MW1 = vibrato; MW2 = filter cutoff and pan LFO; DE = flange mix level and wet/dry output mix of effects.

C06 BA¦Upright: Realistic wood bass sound. MW1 = vibrato; MW2 = filter cutoff; DE = reverb mix level.

C07 BA¦Serious: Fat analog bass sound. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of EFF2.

C08 BA¦DgiWild: Hard sounding bass. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

C09 PL¦Elktrik: Distorted guitar with ping-pong delay. MW1 = vibrato; MW2 = filter cutoff; DE = EFF1 mid and treble gain.

C10 PL¦MetlHed: Lead guitar, perfect for solos. MW1 = vibrato; MW2 = filter cutoff; DE = EFF1 mid and treble gain.

C11 PL¦OvDrive: Guitar with aftertouch-modulated overdrive. MW1 = vibrato; MW2 = filter cutoff; DE = flange mod freq. and wet/dry output mix of EFF2.

C12 PL:Stratus: Clean single-coil guitar sound. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of EFF1.

C13 PL¦ElMute: Fat muted guitar. MW1 = vibrato; MW2 = filter cutoff.

C14 PL¦VelMute: Guitar with aftertouch-controlled muting. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

C15 PL¦Harp: Classic harp sound. MW1 = vibrato; MW2 = filter cutoff; DE = symphonic effect mix level ; VEL = EQ high gain.

C16 PL:LAPizzi: Pretty pizzicato. MW1 = vibrato; MW2 = filter cutoff; DE = EFF2 mix level.

D01 WN¦HrdAlto: Hard-hitting alto sax. MW1 = vibrato and tremolo; MW2 = filter cutoff; DE = wet/dry output mix of reverb.

D02 WN¦HrdTenr: Velocity-sensitive tenor sax. MW1 = vibrato and tremolo; MW2 = filter cutoff; DE = wet/dry output mix of reverb.

D03 WN:BariSax: Breathy baritone sax. MW1 = vibrato and tremolo; MW2 = filter cutoff; DE = wet/dry output mix of reverb; VEL = EQ high gain.

D04 WN.AmpHarp: Slightly over-amplified blues harp. MW1 = vibrato and tremolo; MW2 = filter cutoff; DE = distortion level.

D05 SP*MoonPad: Synth pad with evolving choir. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mod freq.

D06 ME*Cosmos: Soaring synth sounds with menacing low range undertones. MW1 = vibrato; MW2 = filter cutoff and pan LFO; DE = wet/dry output mix of EFF2.

D07 ME*Aurola: Cosmic pad with VEL-sensitive digital effects. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of EFF1.

D08 ME.Galaxy: The sparkling galactic synthesizer. MW1 = wet/dry output mix of EFF2; MW2 = filter cutoff; DE = wet/dry output mix of EFF2; AFT = vibrato.

D09 ME*Catrsis: Eerie, evolving synthesizer ambience. MW1 = vibrato; MW2 = filter cutoff; DE = wet/dry output mix of EFF2.

D10 SE¦Astral: Synth pad evolving from interstellar space. MW2 = filter cutoff; DE = reverb wet/dry output mix.

D11 KY*Harpsi: Realistic harpsichord. MW2 = filter cutoff; DE = reverb mix level.

D12 BR¦Fall: Falling-off horn section. MW2 = filter cutoff; DE = symphonic effect mix level and reverb wet/dry output mix.

D13 PL*VelGtr: Velocity-sensitive eccentric guitar. MW1 = vibrato; MW2 = filter cutoff; DE = chorus mix level.

D14 KS:Anlg +2: Organ-like bass and synth lead voices, split at C3. Velocity-sensitive eccentric guitar. MW1 = vibrato; MW2 = filter cutoff; DE = delay mix level.

D15 KS:Pad/Sax: Synth pad and sax voices, split at F3. MW2 = filter cutoff and pan bias; AFT = vibrato.

D16 KS*JazComb: Bass with velocity-sensitive cymbal and piano with velocity-sensitive horn section, split at C3.

Preset multi chart

Number	Multi Name	Voice Number							
		01	02	03	04	05	06	07	08
		09	10	11	12	13	14	15	16
01	Popular Tune	P1-A11	P2-C01	P1-A04	P1-A06	P2-B06	P2-B04	P1-B04	P1-C12
		P1-C02	P2-D01	P2-A13	P2-B11	off	off	P1-D15	P1-D14
02	Funky Tune	P1-A14	P2-C07	P1-A01	P1-A09	P2-B07	P1-C02	P1-C10	P2-B13
		off	off	off	off	off	off	P1-D15	P1-D14
03	Ballade	P1-A06	P2-C05	P1-A04	P2-A10	P2-B04	P1-B14	P1-B03	P1-C14
		P2-D04	P2-D06	P2-B12	P2-A12	off	off	P1-D15	P1-D14
04	House	P2-A07	P2-C11	P1-A02	P2-A04	P1-D05	P1-B12	P1-C08	P2-B10
		off	off	off	off	off	off	P1-D15	P1-D14
05	Standard Rock	P1-A05	P2-C01	P1-A01	P2-B07	P2-B09	off	off	off
		off	off	off	off	off	off	off	P1-D16
06	American Rock	P2-C14	P2-C02	P1-A01	P1-A10	P1-A15	P1-B02	P2-B06	P2-B09
		P2-D01	off	off	off	off	off	off	P1-D16
07	Combo Jazz	P1-A03	P2-C06	P2-B02	P2-D03	off	off	off	off
		off	off	off	off	off	off	off	P1-D16
08	Horn Jazz Quintet	P2-B02	P2-C06	P1-A01	P2-D03	P2-D01	P2-D04	P1-C03	P1-C04
		off	off	off	off	off	off	P1-D15	P1-D16
09	Big Band Jazz	P1-A01	P2-C03	P2-B02	P2-C12	P2-D03	P2-D01	P2-D04	P2-D02
		P1-C03	P1-C04	P1-C01	P1-C02	off	off	P1-D15	P1-D16
10	Sound Track	P2-D09	P2-C05	P1-A04	P2-A11	P2-A03	P2-A09	P2-A02	P2-A13
		P2-D12	P2-D13	P1-B01	P1-B08	P1-B10	P1-B11	P1-B15	P1-D16
11	Orchstra	P1-D02	P1-D01	P1-C15	P1-C16	P1-C14	P2-A13	P2-A14	P2-A15
		P1-D04	P1-C01	P1-C05	P1-C07	P2-D05	P2-A11	P1-D15	P1-D14
12	Baroque	P1-C15	P1-B09	P1-D01	P1-C16	off	off	off	off
		off	off	off	off	off	off	off	off
13	Wind Unsanble	P2-D05	P2-D01	P2-D03	P2-D04	P2-D06	P2-B04	P1-C16	P2-A01
		P1-A11	P2-C04	off	off	off	off	P1-D15	P1-D14
14	Tropical	P1-D09	P2-C01	P1-A09	P2-A01	P1-D11	P1-D10	P1-D06	P1-D07
		P1-C01	P2-D06	P2-D04	P2-C13	off	off	P1-D15	P1-D14
15	Esnican	P1-D12	P2-C05	P1-A07	P2-A08	P1-D11	P1-D08	P1-D06	P2-D06
		P2-D11	P2-D14	P2-D07	P2-D15	P2-D16	P2-D08	P1-D15	P1-D14
16	Fork	P2-B01	P2-C06	P1-A03	P2-B04	P2-D05	P2-D06	off	off
		off	off	off	off	off	off	P1-D15	P1-D14

P1: Preset 1 P2: Preset 2

Preset drum voice layouts

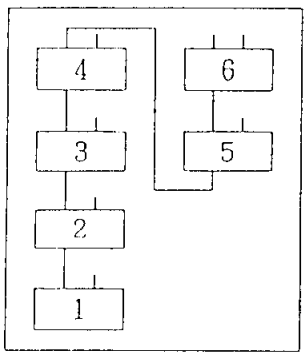
Drum Set	Preset1-D14 Dr Kits		Preset1-D15 Dr Perc		Preset1-D16 Dr Mixed	
Note Number	Wave Form Name	No.	Wave Form Name	No.	Wave Form Name	No.
E0	BD 4	89	Timpani	148	Tom 5	108
F0	BD 4	89	Timpani	148	Tom 5	108
F#0	BD 4	89	NoisePrc	128	BD 4	89
G0	BD 1	86	AnlgPerc	127	Tom 5	108
G#0	BD 1	86	NoisePrc	128	BD 1	86
A0	BD 3	88	AnlgPerc	127	BD 3	88
A#0	BD 3	88	AnlgPerc	127	SD 1	94
B0	Tom 2	105	AnlgPerc	127	Tom 2	105
C1	Tom 2	105	Cowbell2	123	Tom 2	105
C#1	SD 8	101	Cowbell2	123	SD 8	101
D1	Tom 1	104	Cowbell2	123	Tom 1	104
D#1	SD 6	99	Scratch	129	SD 6	99
E1	SD 2	95	Scratch	129	SD 2	95
F1	Tom 1	104	Scratch	129	Tom 1	104
F#1	SD 1	94	Berimbau	131	BD 1	86
G1	BD 2	87	Berimbau	131	BD 2	87
G#1	BD 1	86	Tabla Hi	143	BD 1	86
A1	BD 2	87	Tabla Hi	143	BD 2	87
A#1	SD 7	100	Tabla Hi	143	SD 7	100
B1	Tom 4	107	Tabla Hi	143	Tom 4	107
C2	Tom 4	107	Cga Lo	136	Tom 4	107
C#2	SD 3	96	Cga Lo	136	SD 3	96
D2	Tom 3	106	Cga Lo	136	Tom 3	106
D#2	SD side	103	Cga Lo	136	SD side	103
E2	SD 4	97	Cga Lo	136	SD 4	97
F2	Tom 3	106	Cga Hi	134	Tom 3	106
F#2	Claps 1	120	CgaLoSlp	137	Claps 1	120
G2	HH light	111	Cga Hi	134	HH light	111
G#2	Tambrn	124	Cga Hi	134	Tambrn	124
A2	HH mid	112	Cga Hi	134	HH mid	112
A#2	HH heavy	113	HiCgaSlp	135	HH heavy	113
B2	HH open	114	Timbale1	146	HH open	114
C3	HH foot	110	Timbale1	146	HH foot	110
C#3	Crash	117	Timbale1	146	Crash	117
D3	Crash	117	Timbale1	146	Crash	117
D#3	Ride	118	Timbale2	147	Ride	118
E3	Ride	118	Timbale1	146	Ride	118

Drum Set	Preset1-D14 Dr Kits		Preset1-D15 Dr Perc		Preset1-D16 Dr Mixed	
Note Number	Wave Form Name	No.	Wave Form Name	No.	Wave Form Name	No.
F3	Ride	118	Timbale1	146	Ride	118
F#3	Ride	118	Timbale1	146	Ride	118
G3	Choke	119	Timbale1	146	Choke	119
G#3	SD roll	142	Timbale2	147	BD 7	92
A3	BD 5	90	Bongo	132	BD 5	90
A#3	SD 4	97	SD side	103	NoisePrc	128
B3	Tom 6	109	Bongo	132	Tom 6	109
C4	Tom 6	109	Agogo	130	Tom 6	109
C#4	AnlgPerc	127	Maracas	141	AnlgPerc	127
D4	Tom 6	109	Agogo	130	Tom 6	109
D#4	AnlgPerc	127	Maracas	141	AnlgPerc	127
E4	SD 9	102	Clave	138	SD 9	102
F4	Tom 6	109	Tambrn	124	Tom 6	109
F#4	Claps 2	121	Tambrn	124	Claps 2	121
G4	BD 6	91	Shaker	125	BD 6	91
G#4	FngrSnap	126	Tambrn	124	FngrSnap	126
A4	HHclAnlg	115	Shaker	125	HHclAnlg	115
A#4	Scratch	129	FngrSnap	126	Scratch	129
B4	HHopAnlg	116	FngrSnap	126	HHopAnlg	116
C5	BD 7	92	Guiro 1	139	Cga Lo	136
C#5	NoisePrc	128	Guiro 2	140	CgaLoSlp	137
D5	Tom 5	108	Cabasa	133	Cga Hi	134
D#5	Tom 5	108	Cabasa	133	CgaHiSlp	135
E5	Tom 5	108	Whistle	149	Timbale 1	146
F5	SD 4	97	Whistle	149	Timbale 1	146
F#5	Shaker	125	Belltree	150	Timbale 2	147
G5	SD 4	97	Temple	145	Guiro 1	139
G#5	SD 4	97	Temple	145	Guiro 2	140
A5	SD 4	97	Temple	145	Cabasa	133
A#5	Shaker	125	Temple	145	Shaker	125
B5	SD 3	96	Temple	145	Whistle	149
C6	SD 3	96	Cowbell1	122	Agogo	130
C#6	SD 3	96	Cowbell1	122	Agogo	130
D6	SD 3	96	Claps 1	120	Maracas	141
D#6	Cowbell1	122	Claps 1	120	Cowbell1	122
E6	SD 1	94	Crash	117	Clave	138
F6	SD 1	94	Crash	117	Temple	145
F#6	SD 1	94	Crash	117	Belltree	150
G6	SD 1	94	Choke	119	Temple	145

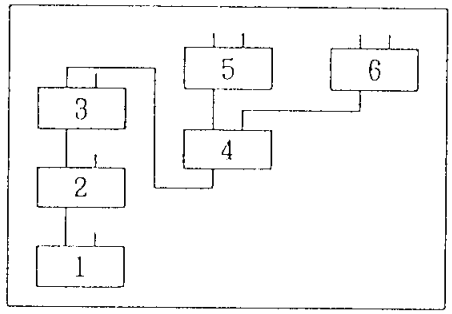
AFM algorithms

One carrier

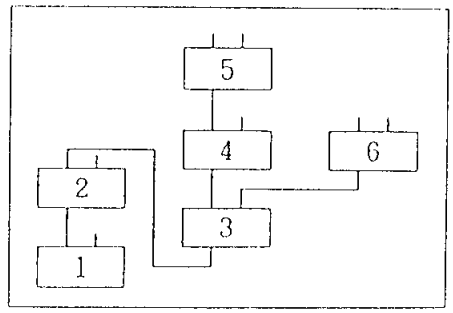
Algorithm: 01



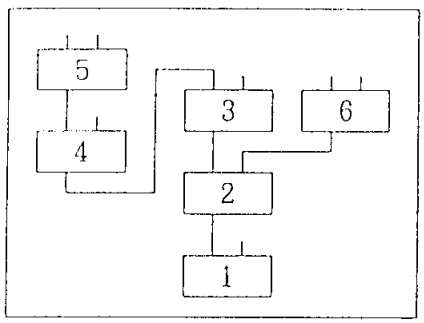
Algorithm: 02



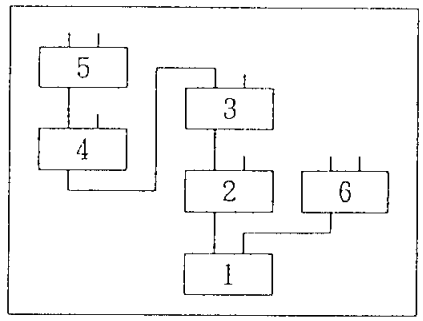
Algorithm: 03



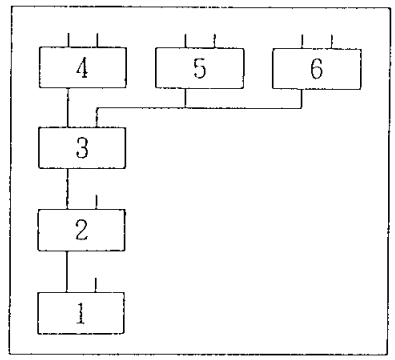
Algorithm: 04



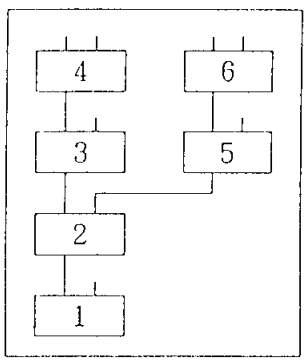
Algorithm: 05



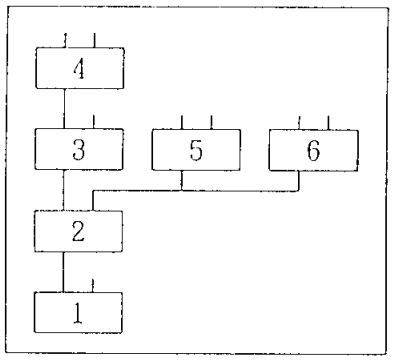
Algorithm: 06



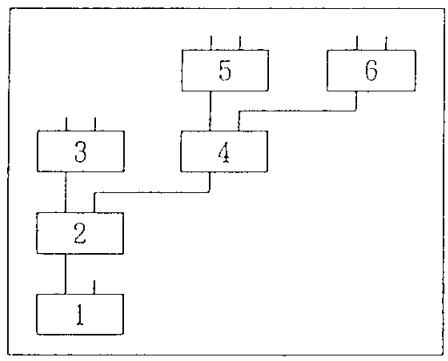
Algorithm: 07



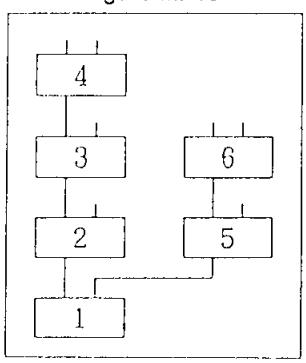
Algorithm: 08



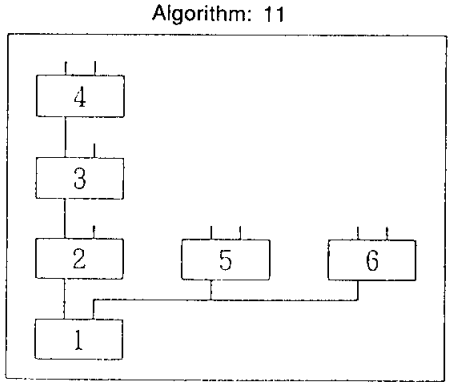
Algorithm: 09



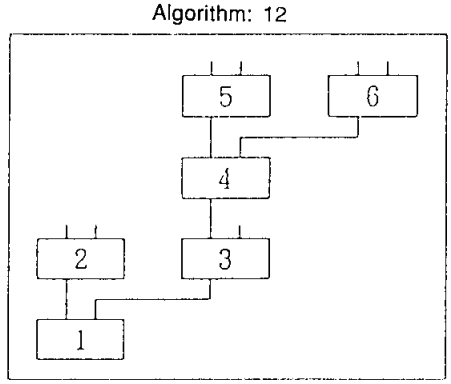
Algorithm: 10



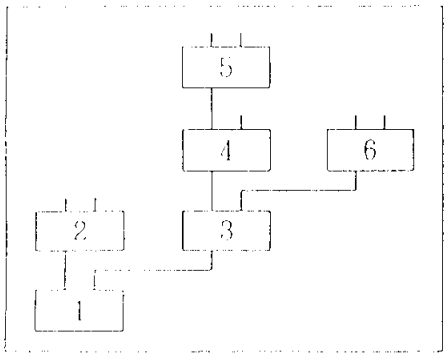
Algorithm: 11



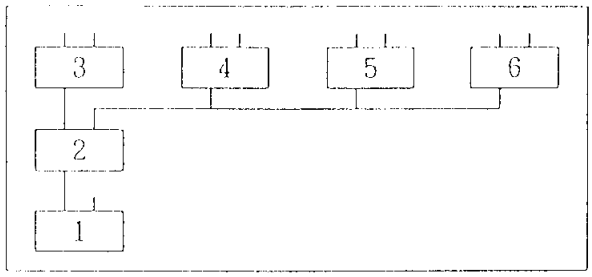
Algorithm: 12



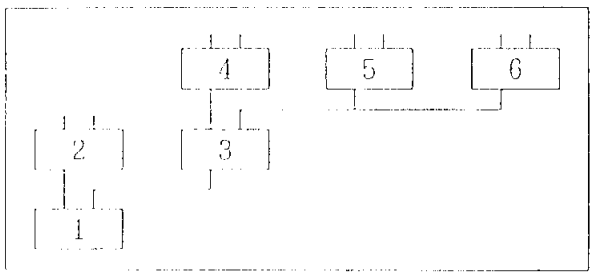
Algorithm: 13



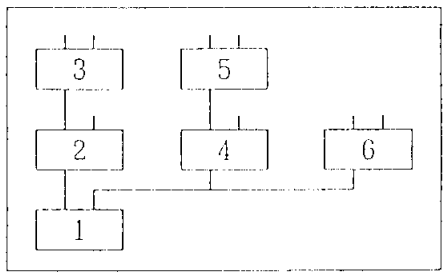
Algorithm: 14



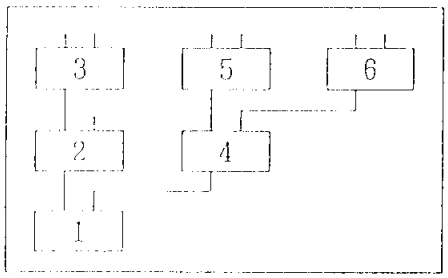
Algorithm: 15



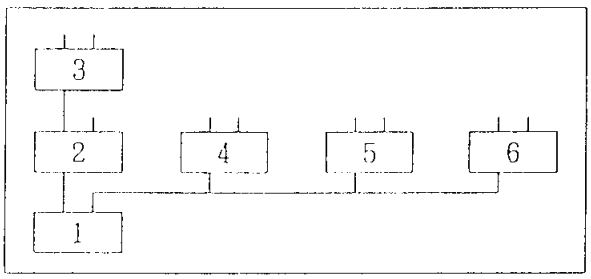
Algorithm: 16



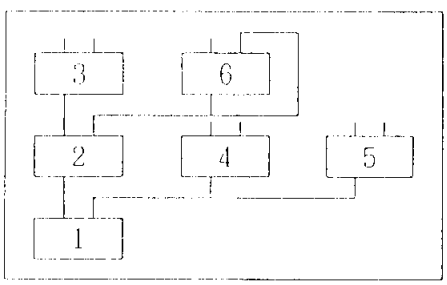
Algorithm: 17



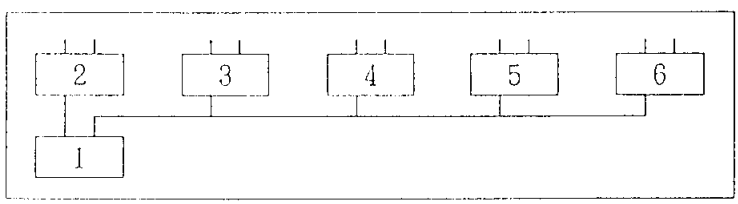
Algorithm: 18



Algorithm: 19

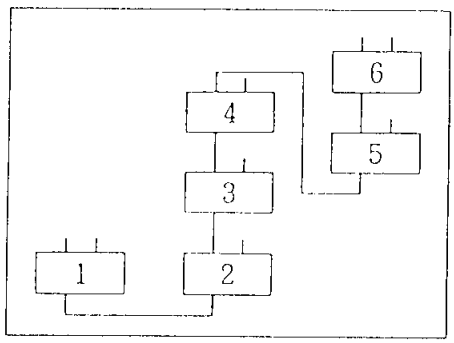


Algorithm: 20

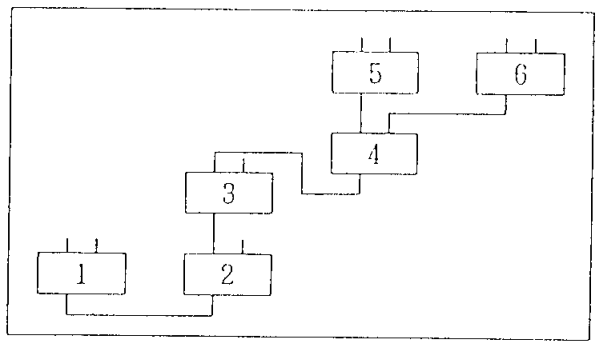


Two carriers

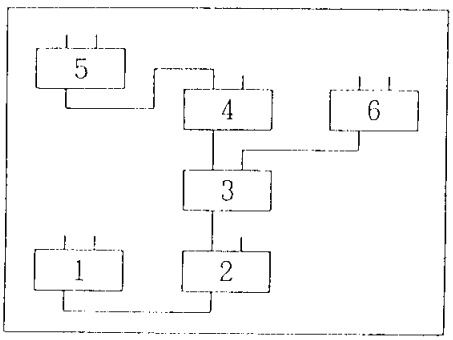
Algorithm: 21



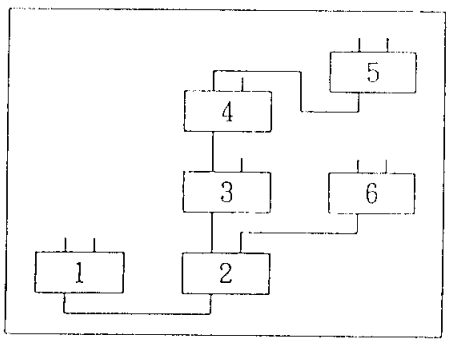
Algorithm: 22



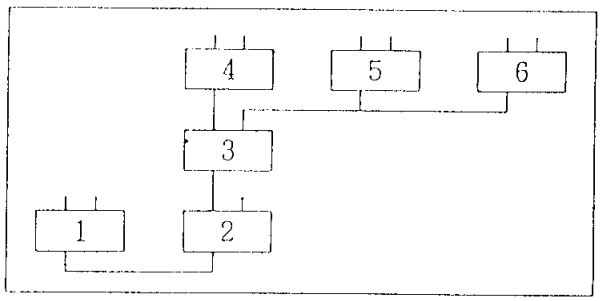
Algorithm: 23



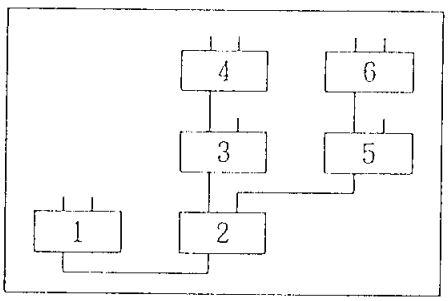
Algorithm: 24



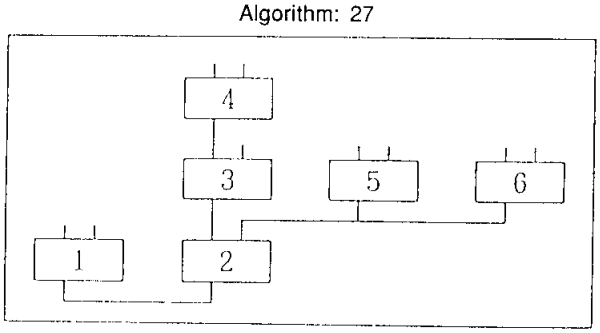
Algorithm: 25



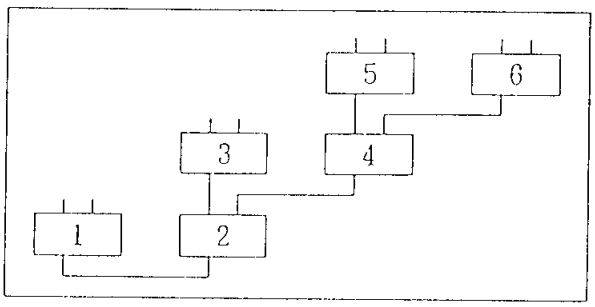
Algorithm: 26



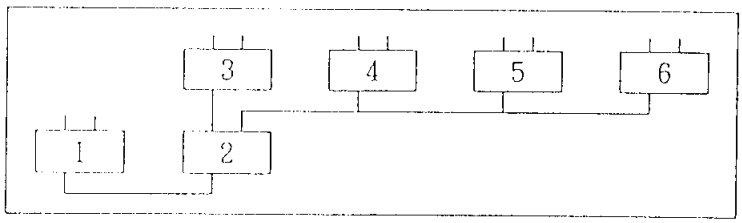
Algorithm: 27



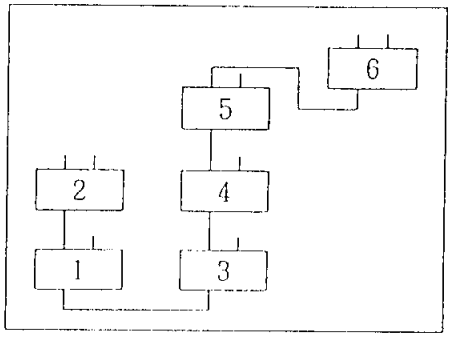
Algorithm: 28



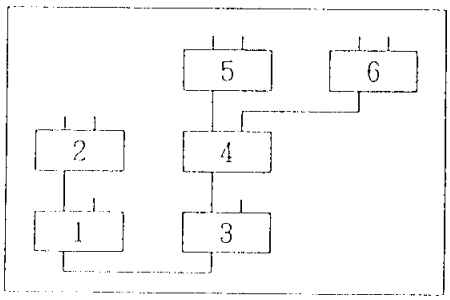
Algorithm: 29



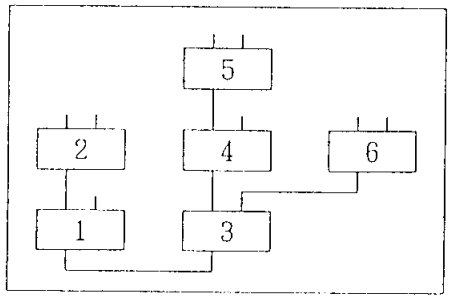
Algorithm: 30



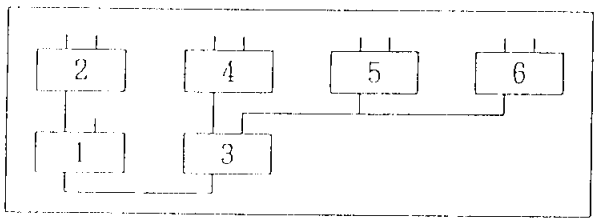
Algorithm: 31



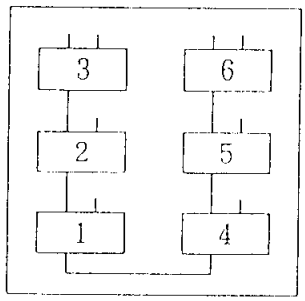
Algorithm: 32



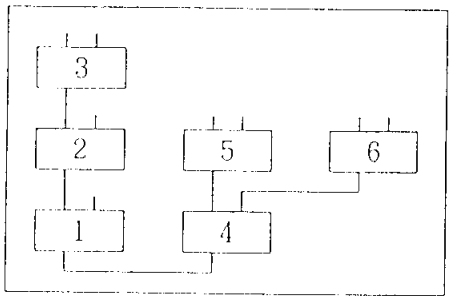
Algorithm: 33



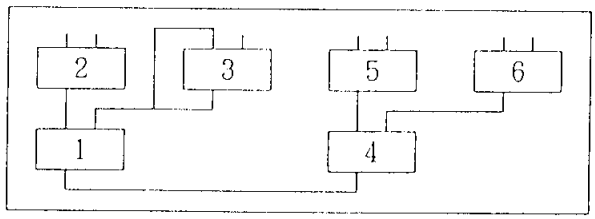
Algorithm: 34



Algorithm: 35

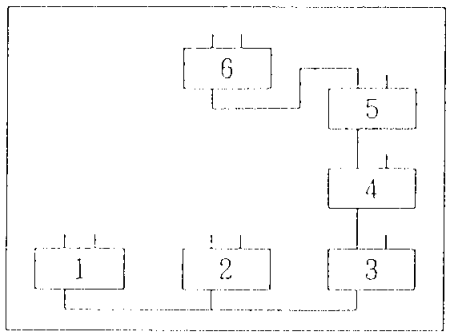


Algorithm: 36

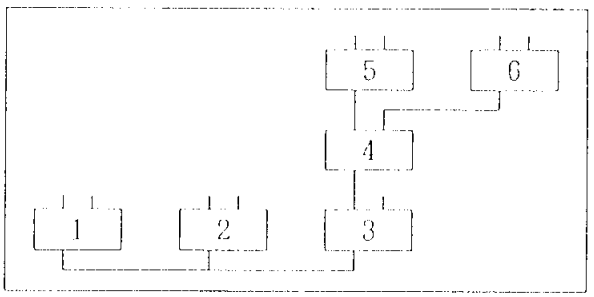


Three carriers

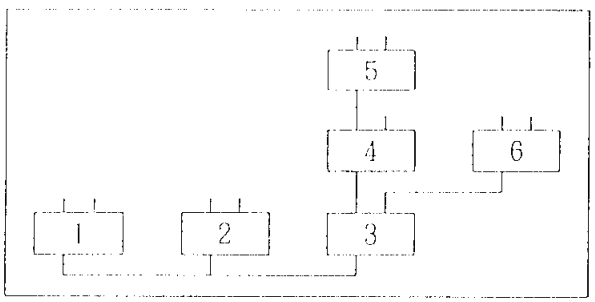
Algorithm: 37



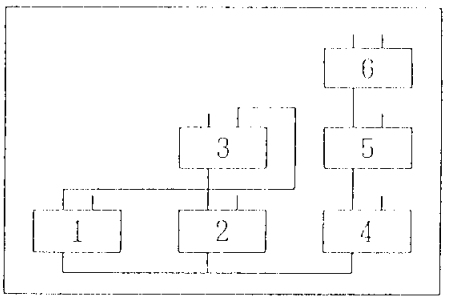
Algorithm: 38



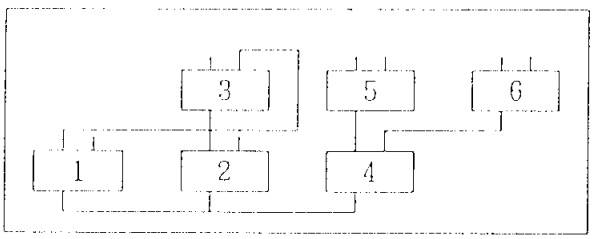
Algorithm: 39



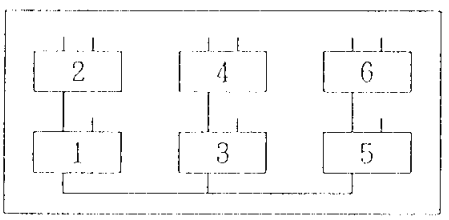
Algorithm: 40



Algorithm: 41

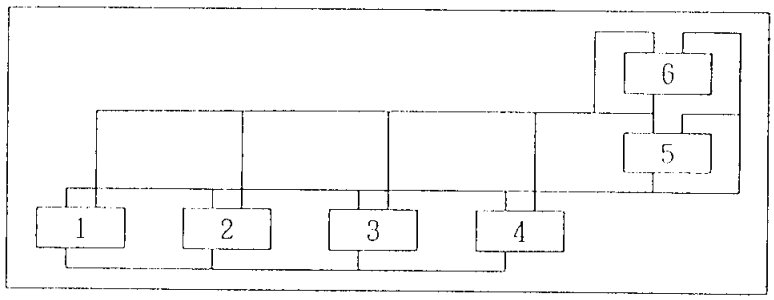


Algorithm: 42

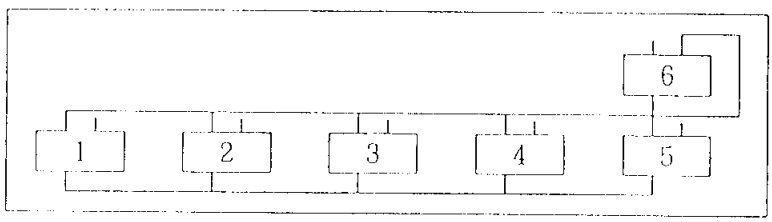


Four carriers

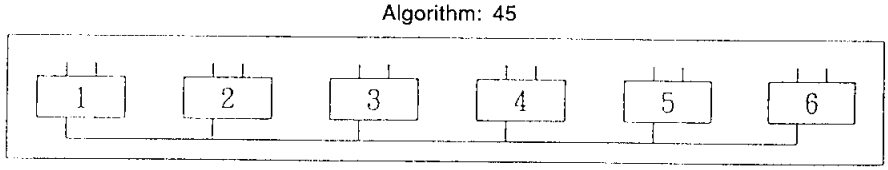
Algorithm: 43



Algorithm: 44



Algorithm: 45



How the SY99 differs from the SY77

Aside from the size of the keyboard and the addition of an expansion memory slot, the SY99 is externally similar to the SY77. However, the SY99 has been enhanced in several ways which you should be aware of if you have previous experience with the SY77, or when you wish to port SY77 voices to the SY99.

Keyboard: The SY77 has a 61 note keyboard. The SY99 has a 76 note keyboard. (See also *Zoned aftertouch* below.)

Master keyboard functions: The SY99 is able to function as a powerful MIDI master keyboard. Eight editable master control setups are provided, each containing four zones that transmit on their own MIDI channel.

An output filter is provided to filter each type of outgoing message for each channel 1–16. For details, refer to *Master control utility*, page 284.

AWM (ROM preset) sample memory: The SY77 has 112 waveforms occupying 2 Mwords (4 Mbytes). The SY99 has 267 waveforms occupying 4 Mwords (8 Mbytes), which include all of the waveforms of the SY77 and many new waveforms. (See *Data compability* below.) A complete listing of the SY99 waveforms is given in *AWM element job 2.AWM waveform set*, page 157.

MDR/sample RAM: The SY99 possesses 512 Kbytes of RAM which can be allocated for use as MIDI data recorder (MDR) memory or as sample memory, in any desired proportion. The allocation procedure is described in *Utility Mode, System utility 5.Memory allocate*, page 256.

RAM allocated as MDR memory is available for receiving bulk data dumps from other MIDI devices. Once received by the SY99, this data can be saved to a floppy disk using the SY99's disk drive. The MDR function allows you to use the SY99's floppy disk capability to store data for other devices which do not have disk storage capability.

RAM allocated as sample memory is available to receive MIDI sample dumps from other devices (such as Yamaha's TX16W sampler), or sample data loaded from disk. This sample data can be assigned to waveforms and used in the same manner as the samples contained in the SY99's AWM sample ROM or waveform cards. For details, refer to *AWM element data 2.Waveform set*, on page 157.

The amount of RAM available for sample data can be increased using expansion RAM kits. Refer to the following section *Expansion RAM* in the appendix.

Effect system: The SY77 has two modulation units (4 effect types) and two reverb units (40 effect types). The SY99 has two effect units (63 effect types), each superior in quality. Cascade and dual effect types are provided, allowing each unit to function as two effect units, each with its own effect send, and effect unit parameters can be controlled in realtime. For details, see *Voice edit mode, Common data 10.Effect set*, page 104.

Zoned aftertouch: A new voice parameter has been added to the SY99 which allows you to specify how aftertouch will affect currently sounding notes; all (all notes, as on the SY77), top (only the highest note), bottom (only the lowest note), split hi (all notes at or above the specified split point), split lo (all notes below the specified split point).

The SY99 has "channel" aftertouch, which produces a single pressure value for the entire keyboard; it does not have "polyphonic" aftertouch. However, its Zoned Aftertouch capability allows you to restrict the effect of aftertouch to a specified zone or note, in this way providing much the same expressive possibilities as polyphonic aftertouch.

Aftertouch can be used to control a wide variety of parameters. For details, see *Common data 12.Controller set*, pages 127 to 130.

Filter sync: When editing a filter in voice edit mode, you can turn Filter Sync on so that parameter adjustments made to one filter will affect the other filter as well (each element has two filters). This is a convenience for editing, not a new parameter. For details, see *AFM element data, 8.AFM filter*, page 149.

Sequencer capacity: The SY77 sequencer has a capacity of approximately 16,000 notes. The SY99 sequencer has a capacity of approximately 27,000 notes.

Switch lock: The Switch Lock function allows you to lock the front panel switches so that they cannot be operated accidentally. This may be convenient when you wish to place books or sheet music on the SY99 front panel. For details, see *System utility 7.Switch lock*, page 257.

MIDI bank select message: The SY99 can transmit and respond to MIDI bank select messages to select voice memories.

Voice edit element job directories: The AWM element job directory of the SY99 starts with job 2 (job 1 has been left blank), so that AFM and AWM element jobs from *EG* to *Filter* will have the same job number (3.EG – 8.Filter). Since these jobs are similar or identical for both AFM and AWM elements, it is conceptually helpful for them to have the same job number.

Other details: There are other differences in the screen displays and function key assignments. Most of these differences are due to the addition of new features to the SY99. However, we have tried to keep the JUMP numbers for pages the same whenever possible. Since some of the jobs in Utility mode have been reordered, this means the JUMP numbers will not necessarily follow the sequence of the jobs.

Data compatibility: As mentioned above in *AWM sample memory*, the SY99 contains all the SY77 AWM waveform data, but the order has been rearranged.When SY77 (or TG77) voice data is loaded into the SY99, the waveform numbers will be converted automatically, and the SY99 waveform equivalent to the SY77 waveform will be used. However since minor adjustments have been made to some of the waveform data itself, the sound of some waveforms may not be precisely identical to the SY77 waveforms.

Since the effect systems of the SY77 and SY99 are significantly different, SY77 voices which depend heavily on effect processing will not sound the same on the SY99.

Disk compatibility: If you wish to load an SY77 disk which contains "All Data", "Synthesizer All" or "Sequencer All" data, or to save "All Data", "Synthesizer All" or "Sequencer All" data to a disk which will later be loaded by an SY77, you must make the appropriate setting for *Disk utility 8.Disk save type* (see page 274). Once the data has been loaded into the SY99 it can be saved in either format.

All other types of disk data are directly compatible.

Using RCM hybrid synthesis

The ability to use an AWM voice as an input to an operator is one of the radical innovations of the SY99. Since the architecture is so flexible it will be a long time before this capability can be fully explored. This section will suggest one possible starting point for experimentation.

1. Select the voice mode

   From: Voice edit mode
   Select: Voice mode (F1) (JUMP #200)
   Select: Voice Mode 9 (1AFM&1AWM)
   Press: F2 (Com)

2. Initialize the voice common data

   From: Voice edit (JUMP #201)
   Select: 15:Initialz (Initialize voice)
   Press: ENTER
   Press: YES at the "Are You sure?" prompt
   Press: EXIT at the "Completed" prompt

3. Initialize the AFM element

   From: Voice edit (JUMP #201)
   Press: F3 (E1) AFM Element (JUMP #230)
   Select: 15:Initialz (Initialize AFM element)
   Press: ENTER
   Press: YES at the "Are You sure?" prompt
   Press: EXIT at the "Completed" prompt

4. Initialize the AWM element

   From: Voice edit (JUMP #230)
   Press: F4 (E2) AWM element (JUMP #256)
   Select: 15:Initialz (Initialize AWM element)
   Press: ENTER
   Press: YES at the "Are You sure?" prompt
   Press: EXIT at the "Completed" prompt

5. Select an AWM wave

   Press: F4 (E2) to edit the AWM element (JUMP #256)
   Select: 2:WaveSet (AWM waveform set) (JUMP #257)
   Press: the -1 +1 buttons or use the data wheel or slider to select the wave you wish to use.

When you play the keyboard you will notice that all waves will sound with the initialized "organ type" EG, and no velocity or filtering. You will probably want to add final touches later. EG filtering and dynamic information are carried over into the FM operator. However for now we will use only a raw wave in order to explain the mechanics of RCM hybrid voicing.

Before trying to use an AWM wave in an AFM algorithm it is useful to turn off the AWM direct output. This is not necessary for final voicing since many voices use *both* the direct AWM sound and the hybrid AWM/AFM combination. However it is easier to understand the effect of the hybrid system if the direct output of the AWM element is temporarily turned off.

6. To turn off the AWM:

   From: Voice Edit (JUMP #201)
   Select: 7:OutSel (JUMP #208)
   Press: F2 (E2) to select element 2.
   Press: -1 three times to turn element output off.
   Press: EXIT to return to the voice edit job directory

7. Select Algorithm 30 (default in INIT AFM voice)

Note: *Any algorithm will work with hybrid voicing. However we will use the default algorithm 30 in this demonstration, so this step is not necessary.*

8. Set operators 1 and 2 to fixed frequency, zero frequency.

   Press: F3 to select the AFM job directory (JUMP #230)
   Select: 2:Osclltr (JUMP #235)
   Press: Operator Select button 1 to choose operator 1
   Select: Freq Mode and use -1 +1 to change "ratio" to "fixed"
   Select: Coarse and use -1 +1 to change 1.0 to 0.00

Press: Operator select button to choose OP2 and repeat the above operation.
Press: EXIT to return to the AFM job directory

9. Introduce the AWM wave into operator 2 of the FM algorithm

From: Voice Edit
Press: F3 (E1) to select the AFM element for editing (JUMP #246)
Select: 1:Algrthm (AFM algorithm) (JUMP #232)
Press: F2 (Extn) This page selects the external inputs to each operator.

Use the cursor keys to position the cursor over the "off" on the AWM line under OP2. Press YES to change the "off" to In1.

Press: EXIT to return to the AFM job directory

10. Raise the output level of operator 2.

From: AFM job directory
Select: 4:Output and press F2 (All) (JUMP #242)
Move: the cursor to OP2 and use the data slider to gradually raise the level until you hear the AWM wave.

Important note: Depending on the harmonic content of the selected wave, the sound may become distorted as you increase the output level of OP2. If it does, exit to the AFM job directory, select 1:Algrthm and press F3 (Inpt) (JUMP #233). Note that under the AWM indicator beneath OP2 there is a number 7. Lower this value to 4 and then return to 4:Output (JUMP #242) and adjust the OP2 output level again. The level set for each operator in the Algorithm Input acts as a multiplier for the value specified in Output. To avoid distorting the sound appearing at Op2, you must set the correct gain values. Of course, distortion can be an interesting effect in its own right. By adjusting the operator output and operator input, a wide range of AWM input levels can be used.

The steps outlined so far may not result in a very interesting sound, but the following points will illustrate some of the possibilities of RCM hybrid synthesis.

- The AFM operator into which the AWM waveform was introduced can be modulated by other operators, or can modulate other operators.
- The same AWM waveform can be introduced into two or more AFM operators, perhaps with each operator set to a different pitch.
- Since the AWM waveform is routed through the filter of the AWM element before being introduced into the AFM operator, its filter settings can be continuously varied, resulting in a realtime filtered waveform which can be modulated by and can modulate other operators (waveforms); i.e., *Realtime Convolution and Modulation* — RCM hybrid synthesis. ("Convolution" refers to proprietary Yamaha digital filtering technology.)

Using loaded samples to create a voice

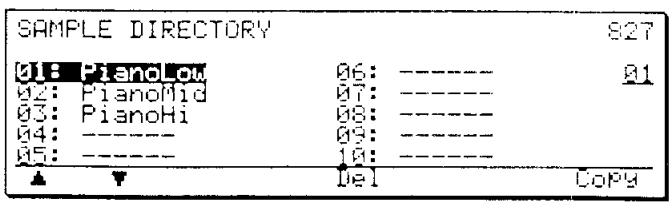
The ability to load sampled sound data for use in voices is an innovative feature which sets the SY99 apart from other digital synthesizers. This feature allows advanced programmers to make use of sound data sampled using digital samplers such as the Yamaha TX16W, in addition to the SY99's own preset waveforms and the waveforms offered as waveform cards.

To make use of this ability, you must first understand the difference between a **sample** and a **waveform**. The SY99 cannot make use of raw sample data *per se;* this data must first be assigned to a waveform before the SY99 can use it as a voice element. The assignment of samples to a waveform is thus the crucial step which allows you to make use of sample data in an SY99 voice.

A sample voice: The process of creating a voice using sampled sound data may thus be divided into three fundamental steps: (1) loading samples into memory; (2) editing the samples and assigning them to a waveform; and finally, (3) editing the voice. In this appendix we would like to focus on the second step, the assignment of samples as waveforms. The simplified example that follows outlines the basic features of this process.

1. Load the samples to be used into to sample RAM area.

   You can load samples into the sample RAM area using Sample utility job *03:Load from disk,* or via MIDI sample dump. Say, for example, you wish to create a voice using three piano samples which were sampled at different locations of the keyboard.



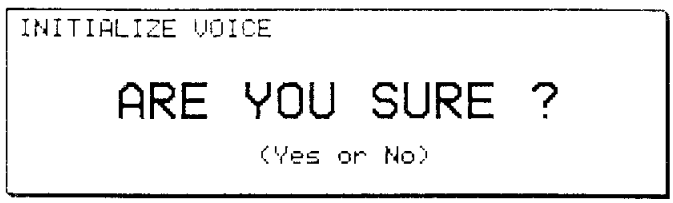
   When you have completed the load procedure, the sample directory might appear as shown above.

2. Select a voice and set the voice mode.

   The next step is to prepare the voice which will use the sample data as a waveform. Begin by choosing voice memory I-A01 and setting the voice mode to Mode 6 (1AWM poly). This step corresponds to step 1 of the procedure described in *Using RCM hybrid synthesis,* above.

3. Initialize the voice common and element data.

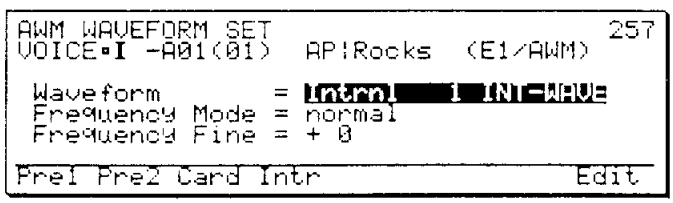
   Initialize both the voice common data and the AWM element, as outlined in steps 2 and 3 of the procedure described in *Using RCM hybrid synthesis,* above.



   You will notice that the waveform assigned to this voice is now a simple triangle wave, preset waveform 2-64.

4. Select an internal waveform.

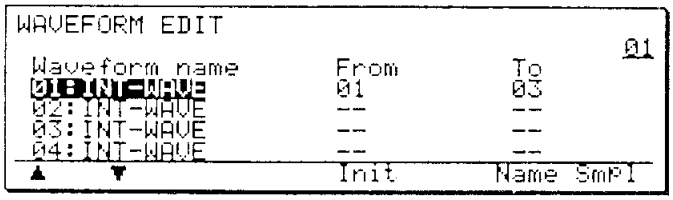
   From: Voice edit (JUMP #256)
   Select: 02:WaveSet (JUMP #257)
   Press: F4 (Intr)
   Select: Intrnl 1 INT-WAVE



   In this step, you can assign an internal waveform for the AWM element of your voice. Since you have not assigned any sample data to this waveform yet, pressing a key will produce no sound.

5. Select the samples you wish to assign to the waveform.

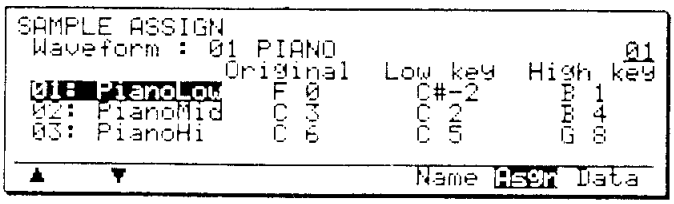
   Press: F8 (Edit)
   Select: samples 1 through 3
   You will use all three of the samples which you loaded in this waveform. Select them by entering 01 in the "From" column and a 03 in the "To" column. (All of the samples used in a waveform must have consecutive numbers.)



   You can also change the name of the waveform at this point by pressing F7 (Name).

6. Assign each sample to a range of keys.

   Press: F8 (SmpI)
   Assign: the keyboard range for each sample.
   You will want to assign a different keyboard range for each of the samples. The range you choose will depend largely on the note bias of the sample itself. For the purpose of this example, we have assigned the sample PianoLow to keys C#-2 through B1, PianoMid to C2 through B4, and PianoHi to C5 through G8.

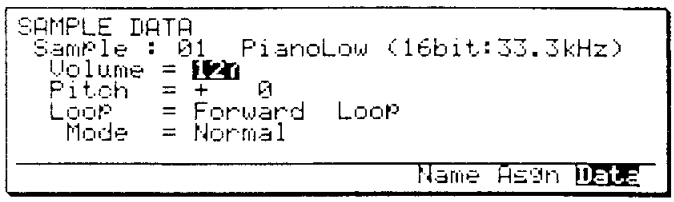


   (When overlapping ranges are assigned, the sample with the lower number is given priority.)

7. Edit the parameters for each sample.

   Move: the cursor to a sample you wish to edit.
   Press: F8 (Data)
   Edit: the volume, pitch, loop type, and loop mode for the sample.

   You may wish to change the sample's volume, fine tune its pitch, or alter its loop type and mode. (Depending on the sample, altering the loop mode can produce some interesting effects!)



   To edit a different sample, press F7 (Asgn), move the cursor to a different sample, and press F8 (Data) once again.

8. Edit the voice.

   This completes the assignment of tones to the waveform. When you are satisfied with your settings, press EXIT three or four times to return to voice edit mode. Try changing the voice's other parameters and adding effects to the sound.

Other possibilities: The preceding example illustrated the preparation of a simple, one-element voice, showing how several samples can be assigned across the keyboard. This helps to overcome the sample's note bias and account for the changes in an instrument's tone which accompany changes in pitch. You are of course not limited to only three samples; a greater number of samples will result in greater realism, and may well be worth the effort.

You can use the same method to produced split keyboards which feature the sounds of two different instruments. Moreover, as with any of the SY99's preset waveforms, combination with additional AWM or AFM elements can produce interesting and exciting sounds. By letting you select the basic waveform ingredients and then combine them with other digital elements and effects, the SY99 brings you closer to "customized sound" than ever before!

Using the master control functions

The SY99's master control utility is a flexible feature that allows you to control a number of digital instruments which are connected to the SY99 in a MIDI system. The SY99 is capable of sending control signals on four channels simultaneously, meaning that a virtually unlimited variety of system arrangements can be accommodated.

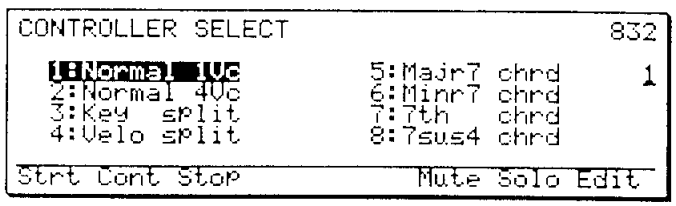
Editing control setups: The most basic use of this feature would be to change the program memory selections of MIDI devices connected to the SY99. Let's say, for example, that you have a multi-timbral tone generator which is receiving song data on channels 5 through 8. To select different program memories for each of these channels, you could use the master control function to transmit information such as the following from the SY99:

Zone:	MIDI-1	MIDI-2	MIDI-3	MIDI-4
Transmit channel:	5	6	7	8
Bank select:	off	off	off	off
Program change:	10	12	14	16

To use the master control function in this way, you must first program a master control setup with this information. The procedure for doing this is as follows:

1. Select a master control setup to edit.

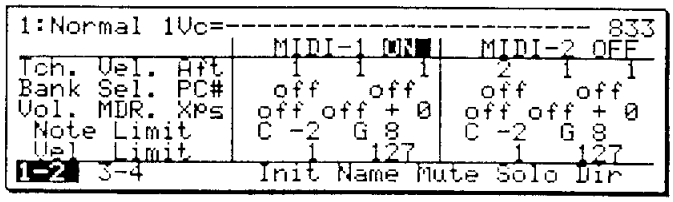
   Press: UTILITY
   Press: F7 (Mstr) (JUMP #831)
   Select: 01:Controller Select (JUMP #832)
   Move: the cursor to control setup 01.
   Press: ENTER to activate the setup.
   You must select a control setup before you can edit it. (The "Edit" label for F8 does not appear on the display otherwise.)



   Notice when you select the control setup that the LED above corresponding memory select switch lights and the name of the setup is displayed in reverse.

2. Initialize the control setup.

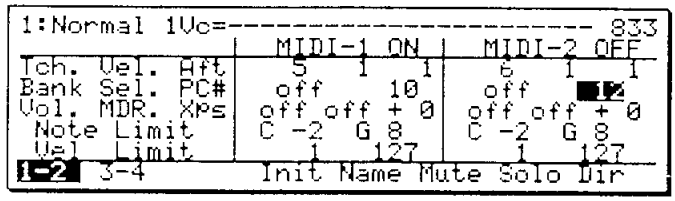
   Press: F8 (Edit) (JUMP #833)
   Press: F4 (Init)
   The controller edit display will appear when you press F8 (Edit).



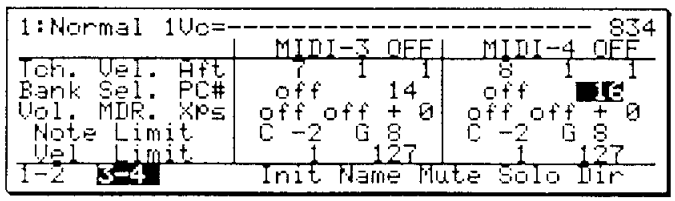
   Press F4 (Init) to initialize the controller settings.

3. Edit the control setup.

   Input the values given for zones 1 and 2 in the table above, as shown here:



   When you are done entering the values for zones 1 and 2, press F2 (3-4) to enter the values for zones 3 and 4.



4. Name and save the control setup.

Press: F5 (Name)
Change: the name of the setup.
Press: EXIT to return to the Controller Select display. (JUMP #832)
Exit: to Utility mode to save the setup.
You can save the control setup to disk as part of an "All Data" or "Synthesizer All" file.

Using control setups: The master control feature is useful because it allows you to make several changes in a MIDI system simultaneously. You will find this capability particularly convenient if you perform live, as it will allow you to effect system changes smoothly, without interrupting the flow of performance.

To activate a control setup from Voice or Multi play mode, press F6 (Mstr). Then move the cursor to the setup you wish to activate, and press ENTER. To de-activate the setup, press ENTER once again.

Of course, the SY99's keyboard responds normally to notes you play while the Controller Select display is showing, so you can use the master control functions to change your system setup even while you are performing.

Advanced applications: The most basic application of the master control function, illustrated above, involves assigning a different channel and program memory to each zone of the setup, as shown above. You can use the master control function in this manner when you wish to prepare each channel to play a different sound – for example, a string-like sound on channel 5, a brass-like sound on channel 6, and so on.

However, the master control utility includes additional features which allow for more subtle applications. For example, you can use the velocity limit parameter to limit the response of external generators depending on the velocity with which you hit the keyboard. To do so, you might edit a control setup as follows:

Zone:	MIDI-1	MIDI-2	MIDI-3	MIDI-4
Transmit channel:	5	6	7	8
Bank select:	off	off	off	off
Program change:	20	22	24	26
Velocity limit:	1-64	65-96	97-112	113-127

With a setup such as this, the tone generator receiving on channel 5 would play the voice assigned to program 20 only when you play the keys gently. If you hit the keys harder, the tone generator receiving on channel 6 will play program 22, and so on.

If each of the voices used represent different shadings of the same sound – slightly different piano sounds, for instance – then such a setup could be used to simulate the subtle tonal changes of an acoustic instrument. On the other hand, you can assign totally different voices to different velocities, to create some very unusual effects.

The note limit feature can be used in a similar manner, to assign external tone generators to the SY99's keyboard in "split keyboard" fashion. Another interesting application of the master controller function, involving use of the MIDI Data Recorder utility, is described in the following appendix. As you can see, the possibilities presented by the master control function are limitless. With a little experimentation, you will find many "tricky" ways to combine these features, maximizing the flexibility of your MIDI system.

Using the MDR functions

You will probably use the SY99's disk drive most often to save voice, multi, sequencer, and setup data from the SY99 on a floppy disk. In addition to these more obvious uses of the disk drive, however, the MIDI data recorder utility allows you to save bulk data from other MIDI devices, such as tone generators or rhythm programmers.

By making the most of the SY99's disk drive, you can use the SY99 to perform all of the functions that would normally be performed by a stand-alone sequencer or personal computer. What's more, if you combine these functions with the SY99's master control utility, the SY99 can be adapted to a wide variety of uses, serving as the core of an extended MIDI system.

Basic application: The fundamental MDR operations have been explained in the description of the MIDI Data Recorder utility (page 279). To perform any of these operations, you must first press UTILITY to enter Utility mode, then press F6 (MDR) to display the MDR utility job directory (if it is not already showing).

The basic MDR procedure consists of two steps:

1. Use job *02:Input* to input data to the SY99 from an external device via MIDI bulk dump.
2. Use job *04:Save to disk* to save the data to a floppy disk using the SY99's floppy disk drive.

Data will be retained in the MDR memory area even if the SY99's power is turned off; however, it is a good idea to save it to a disk in case you accidentally erase it by inputting other bulk data.

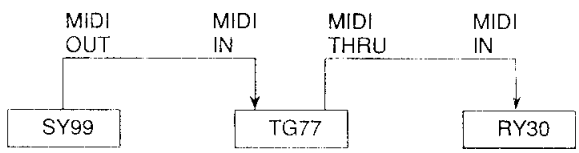
You can return the data to the external device for use by simply reversing the above procedure:

3. Use job *03:Load from disk* to load MDR data into the SY99 from a floppy disk.
4. Use job *01:Output* to output data from the SY99 to the external device.

These two step procedures naturally take more time than it would require to load or save the same data using data cards. The advantage of this method lies in cost, as disks tend to be less expensive than data cards. However, some people may find that a little speed is worth the added cost; in the end, it is a matter of personal taste.

Advanced applications: The MDR functions become most convenient when used in combination with the SY99's master control utility. Taken together, these two functions allow the SY99 to adapt flexibly to a variety of MIDI system configurations. Of course, it is impossible to describe all of the possibilities these functions permit. A single suggestion is presented here to get you started.

Imagine using the SY99 as the core of a MIDI system used for live performance, such as that shown below:



You have connected the SY99 to a tone generator and a rhythm programmer. The SY99 transmits sequencer data to the tone generator on several channels, while the rhythm programmer plays rhythm patterns in synch with the SY99's rhythm voice.

You are to perform ten songs using this setup; but since the songs all involve detailed drum parts, the rhythm programmer can hold enough data for only five songs at one time. It will therefore be necessary to load new data to the rhythm programmer before the sixth song. At the same time, you would like to load some new voices to the tone generator for use in the next five songs.

To effect these changes using data cards, you would have to insert cards to both the tone generator and the rhythm programmer, and then perform the necessary load operations. This could take a while; but the SY99's MDR and master control utilities allow you to perform these both of these tasks from the SY99's console, with the press of a couple buttons!

1. Prepare the data to be loaded:
   A. Input sequence data for the second set of five songs from the rhythm programmer to the SY99 and save it to disk.
   B. Input voice data from the tone generator to the SY99 and save it to disk.

2. Prepare the master control setup:
   A. Set the transmit channel for zone 1 to the rhythm programmer's receive channel, and the transmit channel for zone 2 to the tone generator's receive channel.
   B. Set the number of the MDR data set to be transmitted to each zone when the control setup is activated.
   C. Set any initial messages you may want to transmit (such as bank select/program change for the tone generator) when the control setup is selected.
   D. When you are satisfied with your settings, save the control setup to disk. It may be convenient to save the setup, together with the SY99 voice, multi, and sequencer data to be used, as part of an "All Data" file.

3. Before performance, load all data to the SY99:
   A. Load all synthesizer, sequencer, and setup data to the SY99.
   B. Load the rhythm machine and tone generator data to the SY99's MDR memory area, using the memory numbers you specified in the control setup.

4. During performance, activate the control setup before the sixth song.
   A. The MDR data specified will be transmitted to the rhythm programmer and tone generator.
   B. Bank select, program change, and other initial messages will be transmitted to the external devices as specified.

   In this way, you can change the setup of a large number of MIDI instruments in an instant, by pressing only a few switches on the SY99's panel. And if you think this function saves time when only two external devices are connected to the SY99, you can imagine how convenient it will be with an even larger system!.

   Nor is this the only possible use of these functions. With a little ingenuity and experimentation you are sure to find even more innovative uses for these flexible and handy functions.

Error messages

MIDI

MIDI buffer full !
When the SY99 attempted to receive or transmit a large amount of MIDI data, its handling capacity was exceeded.

MIDI data error !
An error occurred when receiving MIDI data.

MIDI checksum error !
An error occurred when receiving bulk data.

Data empty !
Sequence data (bulk) was received, but the message contained no data.

Bulk rejected; sample exists !
An unoccupied sample number could not be found, so the bulk sample data was not received.

Song memory full !
When receiving sequence data (bulk), the internal memory capacity was exceeded, and not all the data was received.

Device number is off !
Since the device number is off, bulk data cannot be transmitted or received.

Device number mismatch !
Since the device numbers did not match, the bulk data was not received.

Bulk canceled !
While receiving or transmitting bulk data, EXIT was pressed to abort the operation.

Data card

Data card not ready !
The data card is not correctly inserted into the slot.

Card protected !
Since the memory protect switch of the card is on, data cannot be saved to the card.

Illegal format !
The card is the wrong format.

Verify error !
The data was not correctly saved.

Illegal size !
The data card is not of the 64 Kbyte variety accepted by the SY99.

Wave card

Wave card not ready !
The wave card is not correctly inserted into the slot.

Different wave card (ID=) !
The wave card which is inserted is not the one used by the voice or multi.

ID Number mismatch !
A multi includes voices which use two or more wave cards.

Disk

Disk not ready !
The disk is not correctly inserted into the disk drive.

Illegal change !
During the backup operation, the original and back up disks were inserted in the wrong order.

Illegal disk !
The data in the disk is faulty.

Bad disk !
The disk is faulty.

File not found !
The file was not found.

Write protected !
The disk is write protected.

Disk full !
There is no more memory available on the disk.

Directory full !
The directory area on the disk is full, and new files cannot be created.

Media type error !
The disk is the wrong type.

Illegal file !
The file is not for the SY99.

Song memory full !
The sequencer memory is full.

Sample memory full !
The sample memory area is full.

MDR memory full !
The MDR memory area is full.

Sequencer and display

Please stop sequencer !
The sequencer cannot play during disk or card loading or saving, during bulk data transmission, or during master control setting.

Illegal time !
You attempted to execute the Get Pattern operation, but the time signature was incorrect.

Range is exceeded !
The parameter you specified in an edit job is beyond the valid range.

Data not found !
When you executed the Search Part operation in Chain Pattern, the specified data was not found.

Illegal input !
You attempted to enter an invalid data value in Edit Insert mode.

Internal buffer full !
More sequence data was played back than could be sounded.

Battery

Change internal battery !
The internal backup battery needs to be replaced.

Change wave BAT !
The backup battery for the internal MDR/sample RAM area or an expansion memory board (as specified in the message) needs to be replaced.

Change card battery !
The card backup battery needs to be replaced.

Other

Use bank D !
The voice must be stored in bank D.

Only C1–C6 data valid !
You are attempting to save a drum voice to bank A, B, or C. Only the data for notes C1 through C6 will be saved as a result of this operation. Save the voice to bank D if you wish to save the data for all notes E0 through G6.

Illegal mark !
You attempted to mark a display page while using the compare function.

Use bank A–C !
The voice must be stored in bank A, B, or C.

Sample

Please allocate sample memory !
You attempted to enter Sample utility mode, but no memory has been allocated for sample use. Please use the System utility memory allocate function to allocate memory for sample use.

Not enough memory for sample !
You attempted to reduce the memory area allocated for sample use beyond the minimum required by currently existing samples. Please initialize the sample memory or delete samples before attempting to reduce the amount of MDR/sample RAM allocated for sample use.

Sample data not exists !
You attempted copy or save sample data from a sample number which does not contain any data.

Sample data protected !
Copy-protected sample data may not be saved to disk or transmitted via MIDI dump.

Over internal waveform number !

You attempted to load a number of waveforms exceeding the internal memory maximum of 64.

Over sample number !

You attempted to load a number of samples exceeding the internal memory maximum of 99.

MDR

Please allocate MDR memory !

You attempted to enter Sample utility mode, but no memory has been allocated for MDR use. Please use the System utility memory allocate function to allocate memory for MDR use.

Not enough memory for MDR !

You attempted to reduce the memory area allocated for MDR use beyond the minimum required by currently existing MDR data. Please initialize the MDR memory or delete MDR data before attempting to reduce the amount of MDR/sample RAM allocated for MDR use.

MDR data already exists !

You attempted to input data to an MDR number already occupied by data. Please choose a different MDR number as the destination for incoming data.

MDR data not found !

You attempted to output data from an empty MDR number.

Disk filename extensions

The files saved to disk by the SY99 are automatically given the following filename extensions. Although filename extensions are not usually displayed by the SY99, they will be visible when you load disk data using *Disk utility 2.Load from disk* and select data type "10:Other seq", or if you read SY99 disks using a personal computer.

T01–T99	SY99 all data
J01–J99	SY99 synthesizer all data
K01–K99	SY99 sequencer all
W01–W99	SY99 sample
C01–C99	SY99 card
B01–B99	SY99 MDR
M01–M99	SY99 1 song (KSEQ)
L01–L99	SY99 ESEQ
X01–X99	SY99 Standard MIDI File (format 0)

The following filename extensions are used by Yamaha digital music products as of March 1990.

A01–A99	V50 "SEQ" file
	QX5FD song file
	SY77 NSEQ
B01–B99	DX7[II] MDR data
	V50 MDR file
	QX3 bulk file
C01–C99	DX7[II] cartridge data
	V50 CARD file
D01–D99	QX3 play chain file
E01–E99	QX3 bulk chain file
F01–F99	TX16W filter file
I01–I99	DX7[II] internal data (voice + performance + system)
	V50 SYN file
J01–J99	SY77 synthesizer all data
K01–K99	SY77 sequencer all
L01–L99	SY77 ESEQ
M01–M99	SY77 KSEQ
P01–P99	QX3 song file (play file)
R01–R99	V50 RSEQ file
S01–S99	QX3 setup file
	TX16W setup file
T01–T99	TX16W filter table
	SY77 all data
U01–U99	TX16W performance file
V01–V99	V50 ALL file
	TX16W voice file
W01–W99	TX16W wave file
SYS	TX16W system file

About the Standard MIDI File Format

The Standard MIDI File Format is a standard which has recently been implemented by a number of software and hardware makers. This standardized format allows song data to be transferred easily between different sequencers – even between sequencers made by different manufacturers.

The SY99 supports two Standard MIDI File types, known as **format 0** and **format 1**. In the former type, all sequencer data is recorded as a single track, which may include data for more than one MIDI channel. In the latter, an unlimited number of tracks may be used, each of which may contain data for more than one channel. The SY99 is capable of loading data saved in either of these formats. Data saved by the SY99 using the Standard MIDI File format will be saved as format 0.

Loading data: To load sequencer data saved in a Standard MIDI File format, select load operation type *10:Other Seq* from the *Load from disk* job directory. The file to be loaded must meet the following conditions:

- The file must be loaded from a disk formatted by the SY99, or from a 3.5 inch 2DD floppy disk in MS-DOS® or PC-DOS® format. (Refer to the paragraph titled *Acceptable disk formats*, below.)
- It must have been saved as Standard MIDI File format 0 or format 1. Files saved using standard MIDI file format 2 cannot be loaded.
- The MIDI clock must be used as the basic clock.
- The file must have a resolution of 1/96, 192, 288, 384, 480 of a quarter note.

When a format 0 file is loaded, the data for each MIDI channel is loaded to the corresponding track (channel 1 to Track 1, channel 2 to Track 2, and so on). Only data for channels 1 through 15 is loaded, however; any data for channel 16 will be ignored. Tempo change messages and similar information are all loaded to Track 1.

When a format 1 file is loaded, data for the track containing tempo change messages and other "conductor" information is loaded to the SY99 as Track 1. Data for other tracks are loaded in sequence. It will therefore be necessary to reset the channel assignments for each track when loading is complete.

All data loaded to a single track in this way will be transmitted by the SY99 on a single channel. For this reason, even if one track of a format 1 file contains data for two or more MIDI channels, all this data will be played back by the SY99 using a single channel. Since this may mean that sequencer parts may not play back as desired, we recommend that format 0 be used for the transfer of data whenever possible.

No exclusive data is loaded from Standard MIDI Files of either format type.

Saving data: Data may be saved in standard MIDI file format to any of the disk types described in *Acceptable disk formats*, below. To save sequencer data in Standard MIDI File format, select save operation type *06:MIDI File* from the *Save to disk* job directory. The data for each track is saved to the corresponding MIDI channel (Track 1 to channel 1, Track 2 to channel 2, and so on). No exclusive data is saved when this format is used.

Files saved using the Standard MIDI File format are given a file extension .X01 through .X99, which allows the SY99 to recognize the file's format. Other programs, however, may not be able to recognize the file as a Standard MIDI File unless the .MID extension is used; when transferring data saved by the SY99 to another device where it will be used by such a program, you should first rename the file using a personal computer or other means.

Acceptable disk formats: Standard MIDI Files may of course be saved to or loaded from disks formatted by the SY99. Disks formatted by a personal computer may also be used, as long as they are 2DD disks in MS-DOS® or PC-DOS® format. Disks formatted by an Apple Macintosh® may used as long as they are formatted using a SuperDrive or other disk drive device capable of formatting a disk in MS-DOS® format.

To use Standard MIDI Files saved by the SY99 on an Apple Macintosh®, use ResEdit or a similar utility to change the file type attribute to that of a MIDI file.

Expansion memory boards

Users who enjoy capitalizing on the SY99's ability to load in sample data will be happy to know that the SY99 features five expansion slots which allow the size of the MDR/sample RAM area to be expanded to a maximum of 3 Mbytes (1.5 Mwords) using optional expansion memory boards (Model SYEMB05).

Each expansion memory board adds 512 kbytes to the amount of MDR/sample memory available, and is designed to be easily installed by the user.

Please note the fact that these boards can only be used as sample memory. The amount of memory that can be allocated for use by the MIDI data recorder is limited to 512 Kbytes, and cannot be expanded using expansion boards. The following chart shows the minimum and maximum amounts of sample memory that each board makes available:

Boards	Minimum (MDR = 512 Kbytes)	Maximum (MDR = 0 Kbytes)
0	0 Kbytes	512 Kbytes
1	512 Kbytes	1 Mbyte
2	1 Mbyte	1.5 Mbytes
3	1.5 Mbyte	2 Mbytes
4	2 Mbyte	2.5 Mbytes
5	2.5 Mbyte	3 Mbytes

Complete instructions for installing and initializing expansion memory are included with the expansion boards.

Specifications

Tone generator: Realtime Convolution and Modulation (RCM)
AWM2: 16 bit linear waveform data, maximum 48 kHz sampling frequency
AFM: 6 operators, 45 algorithms, 3 feedback loops, 16 waveforms, modulation from AWM output
Filter: Time variant IIR (infinite impulse response) digital filters, 2 filters for each element (maximum of 8 filters per voice)
Maximum simultaneous notes: 16 (Voice mode), 32 (Multi mode)
Maximum simultaneous timbres: 1 (Voice mode), 16 (Multi mode)
Note assignment: Last note priority, DVA (dynamic voice allocation)

Keyboard: 76 notes, key velocity sensitivity, channel aftertouch (with zoned aftertouch)

DSP effects: 2 units, 63 effect types

Sequencer:
Tracks: 16 (15 tracks + 1 pattern track)
Songs: 10
Resolution: 1/96 of a quarter note (for internal clock), 1/24 of a quarter note (for MIDI sync)
Maximum simultaneous notes: 32
Capacity: approximately 27,000 notes
Patterns: 99
Recording: realtime/step/punch in

Memory:
Preset memory: 128 voices, 16 multis
Internal memory: 64 voices, 16 multis
Waveform memory: 4 Mwords (8 Mbytes), 267 sounds
MDR/sample memory: 512 kbytes
(expandable to 3 Mbytes)
Card slots: synthesizer data x 1, waveform data x 1
Disk: 3.5" floppy disk drive
(720 kbyte formatted)

Controllers:
Wheels: PITCH, MODULATION 1, MODULATION 2
Slider: OUTPUT 1, OUTPUT 2, DATA ENTRY
Knobs: LCD contrast, click volume
Dial: data entry dial
Panel switches; MODE x 5, EDIT/COMPARE, COPY/SAVE, EF.BYPASS, SEQUENCER x 7, SHIFT, function x 8, EXIT, PAGE ◁ ▷, JUMP/MARK, cursor △ ▽ ◁ ▷, –1/NO, +1/YES, numeric keypad 0–9, ENTER, [–], MEMORY x 4, BANK x 4, voice select x 16,

Display:
LCD: 240 x 64 pixels (with backlight)
LED: red x 11, red/green x 21

Terminals:
Audio output: OUTPUT 1 (L/MONO, R), OUTPUT 2 (L, R), PHONES
Controller: BREATH, FOOT VOLUME, FOOT CONTROLLER, SUSTAIN, FOOT SWITCH
MIDI: IN, OUT, THRU

Power requirements:
US & Canadian models: 120V
General model: 220–240V

Power consumption:
US & Canadian model: 35W
General model: 35W

Dimensions:
1254(W) x 407(D) x 120(H) mm
(4' 1-3/8" x 1' 4" x 4-3/8")

Weight: 19.6 kg (43 lbs 3 oz)

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