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## IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

**WARNING:** Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

**IMPORTANT:** The presentation or sale of this manual to any individual or firm does not constitute authorization, certification, recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and changes in specification are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

**WARNING:** Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

**IMPORTANT:** Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

This product uses a lithium battery for memory back-up.







**WARNING:** Lithium batteries are dangerous because they can be exploded by improper handling. Observe the following precautions when handling or replacing lithium batteries.

- Leave lithium battery replacement to qualified service personnel.
- Always replace with batteries of the same type.
- When installing on the PC board, solder using the connection terminals provided on the battery cells. Never solder directly to the cells. Perform the soldering as quickly as possible.
- Never reverse the battery polarities when installing.
- Do not short the batteries.
- Do not attempt to recharge these batteries.
- Do not disassemble the batteries.
- Never heat batteries or throw them into fire.

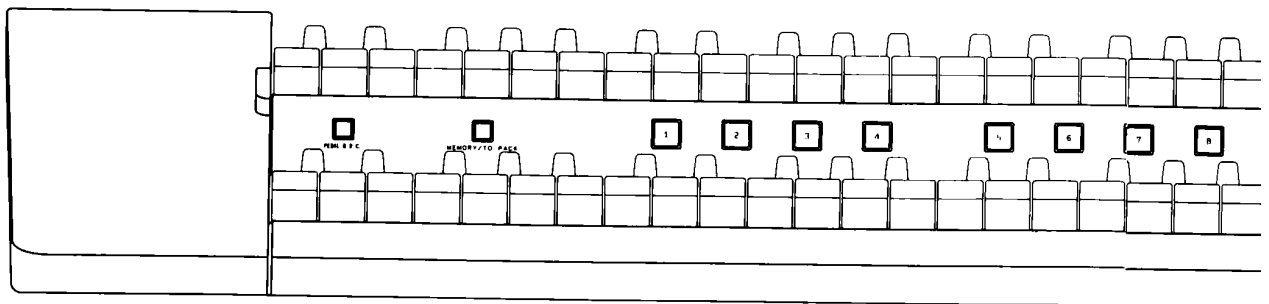
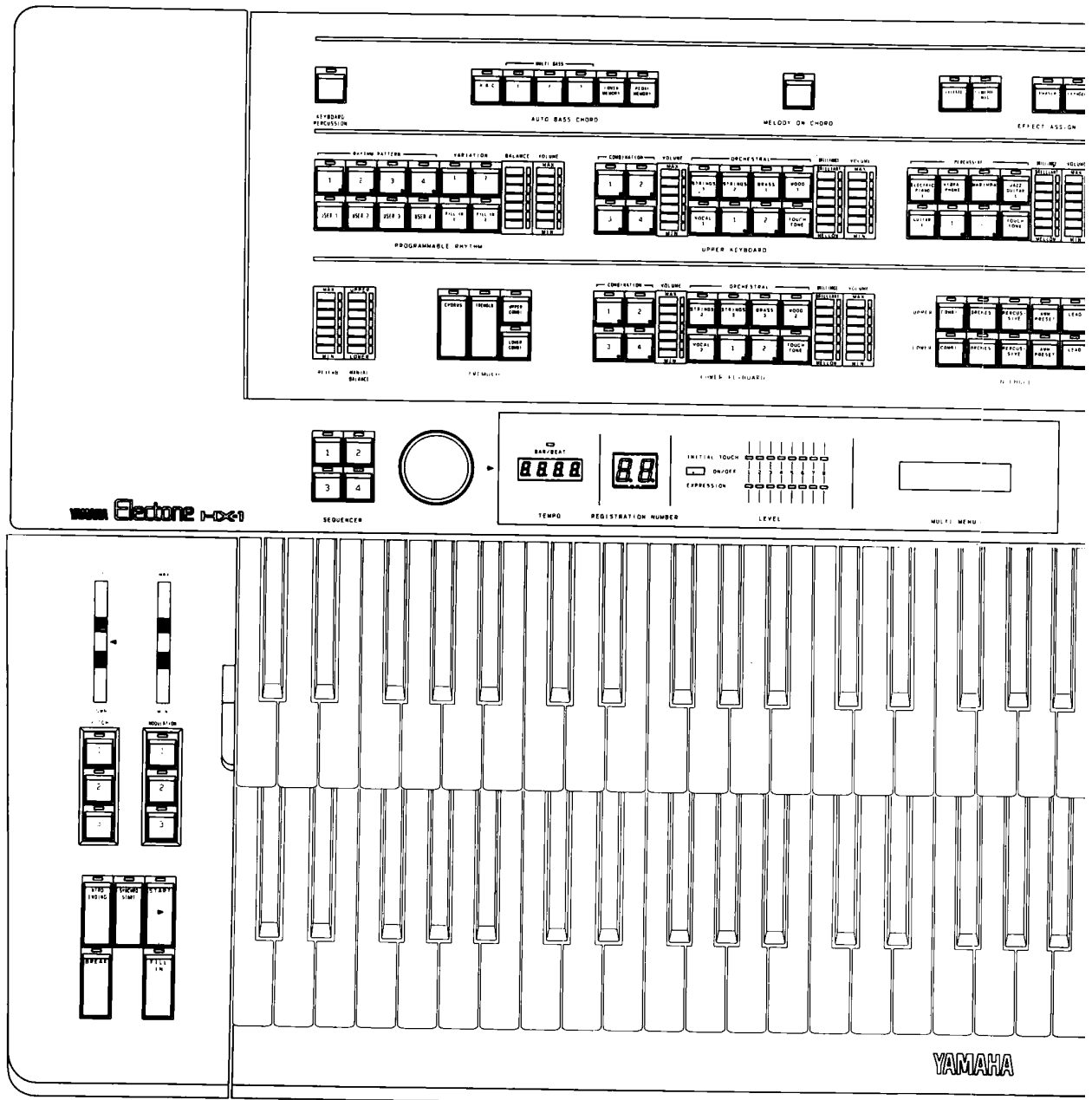
## SPECIFICATIONS

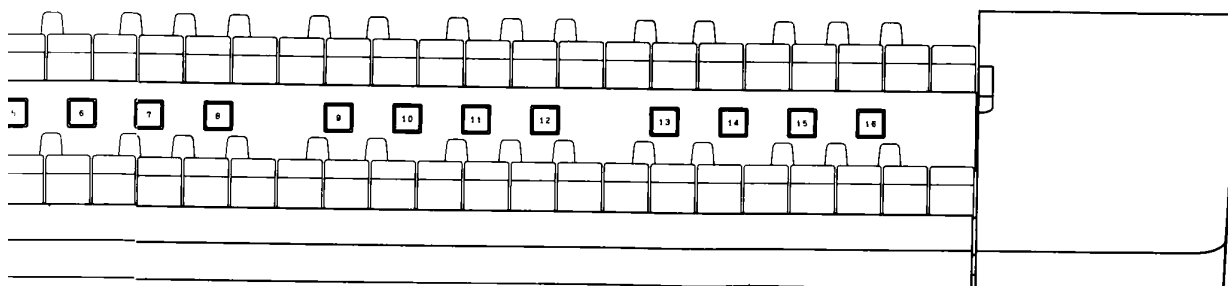
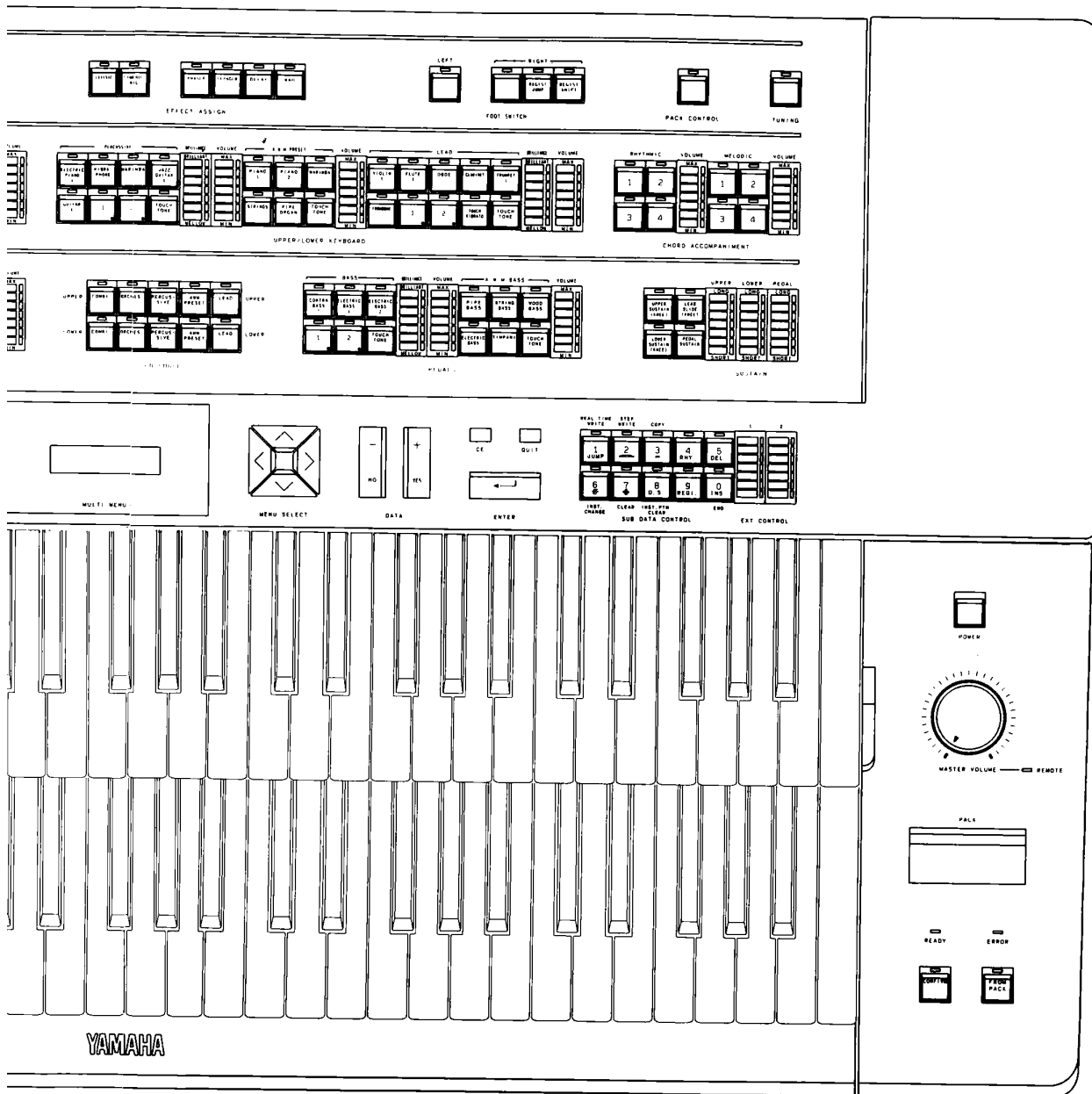
			HX-1		HX-3		HX-5	
TONE GENERATION	UPPER	COMBINATION	WM	POLY (8 notes)	WM	POLY (8 notes)	WM	POLY (8 notes)
		ORCHESTRAL	FM (80P.)	POLY (8 notes)	FM (40P.)	POLY (8 notes)	FM (40P.)	POLY (8 notes)
	UPPER/LOWER	PERCUSSIVE	FM (80P.)	POLY (8 notes)	FM (40P.)	POLY (8 notes)	FM (40P.)	POLY (8 notes)
		AWM PRESET	AWM	POLY (8 notes)	AWM	POLY (8 notes)	—	
		LEAD	FM (160P.)	MONO (1 note)	FM (80P.)	MONO (1 note)	FM (80P.)	MONO (1 note)
	LOWER	COMBINATION	WM	POLY (8 notes)	WM	POLY (8 notes)	WM	POLY (8 notes)
		ORCHESTRAL	FM (80P.)	POLY (8 notes)	FM (40P.)	POLY (8 notes)	FM (40P.)	POLY (8 notes)
	PEDALS	BASS	FM (160P.)	MONO (1 note)	FM (80P.)	MONO (1 note)	FM (80P.)	MONO (1 note)
		AWM BASS	AWM	MONO (1 note)	AWM	MONO (1 note)	AWM	MONO (1 note)
	RHYTHM		AWM	POLY (8 notes)	AWM	POLY (8 notes)	AWM	POLY (8 notes)
ENSEMBLE	UPPER	COMBINATION	COMBI., ORCHES., PERCUSSIVE, AWM PRESET, LEAD		COMBI., ORCHES., PERCUSSIVE, AWM PRESET, LEAD		COMBI., ORCHES., PERCUSSIVE, LEAD	
		LOWER	COMBI., ORCHES., PERCUSSIVE, AWM PRESET, LEAD		COMBI., ORCHES., PERCUSSIVE, AWM PRESET, LEAD		COMBI., ORCHES., PERCUSSIVE, LEAD	
	OTHERS	RHYTHMIC	FM (40P.)	POLY (5 notes)	FM (40P.)	POLY (5 notes)	FM (20P.)	POLY (5 notes)
VOICE SELECTORS	UPPER	COMBINATION	1., 2., 3., 4.		1., 2., 3., 4.		1., 2., 3., 4.	
		ORCHESTRAL	STRINGS 1, STRINGS 2, BRASS 1, WOOD 1, VOCAL 1, 1., 2.		STRINGS 1, STRINGS 2, BRASS 1, WOOD 1, VOCAL 1, 1., 2.		STRINGS 1, STRINGS 2, BRASS 1, WOOD 1, VOCAL 1, 1., 2.	
	UPPER/LOWER	PERCUSSIVE	ELECTRIC PIANO, VIBRAPHONE, MARIMBA, JAZZ GUITAR 1, GUITAR 1, 1., 2.		ELECTRIC PIANO, VIBRAPHONE, MARIMBA, JAZZ GUITAR 1, GUITAR 1, 1., 2.		ELECTRIC PIANO, VIBRAPHONE, MARIMBA, JAZZ GUITAR 1, GUITAR 1, 1., 2.	
		AWM PRESET	PIANO 1, PIANO 2, MARIMBA, STRINGS, PIPE ORGAN		PIANO 1, PIANO 2, MARIMBA, STRINGS, PIPE ORGAN		—	
		LEAD	VIOLIN 1, FLUTE 1, OBOE, CLARINET, TRUMPET 1, TROMBONE, 1., 2.		VIOLIN 1, FLUTE 1, OBOE, CLARINET, TRUMPET 1, TROMBONE, 1., 2.		VIOLIN 1, FLUTE 1, OBOE, CLARINET, 1., 2.	
	LOWER	COMBINATION	1., 2., 3., 4.		1., 2., 3., 4.		1., 2., 3., 4.	
		ORCHESTRAL	STRINGS 2, STRINGS 3, BRASS 3, WOOD 2, VOCAL 2, 1., 2.		STRINGS 2, STRINGS 3, BRASS 3, WOOD 2, VOCAL 2, 1., 2.		STRINGS 2, STRINGS 3, BRASS 3, WOOD 2, VOCAL 2, 1., 2.	
	PEDALS	BASS	CONTRABASS 1, ELECTRIC BASS 1, ELECTRIC BASS 2, 1., 2.		CONTRABASS 1, ELECTRIC BASS 1, 1.		CONTRABASS 1, ELECTRIC BASS 1, 1.	
		AWM BASS	PIPE BASS, STRING BASS, WOOD BASS, ELECTRIC BASS, TIMPANI		PIPE BASS, STRING BASS, WOOD BASS		PIPE BASS, STRING BASS, WOOD BASS	
	VOLUME	UPPER U/L LOWER PEDALS	COMBI., ORCHES. PERC., AWM PRESET, LEAD COMBI., ORCHES. BASS, AWM BASS		COMBI., ORCHES. PERC., AWM PRESET, LEAD COMBI., ORCHES. BASS, AWM BASS		COMBI., ORCHES. PERC., LEAD COMBI., ORCHES. BASS, AWM BASS	
EFFECTS & CONTROLS	MANUAL BALANCE		○		○		○	
	BRILLIANCE	UPPER U/L	ORCHES. PERC., LEAD		— LEAD		—	
		LOWER PEDALS	ORCHES. BASS		— BASS		—	
	TOUCH TONE	UPPER U/L	ORCHES. PERC., AWM PRESET, LEAD		ORCHES. PERC., AWM PRESET, LEAD		ORCHES. PERC., LEAD	
		LOWER PEDALS	ORCHES. BASS, AWM BASS		ORCHES. BASS, AWM BASS		ORCHES. BASS, AWM BASS	
	TOUCH VIBRATO		U/L	LEAD	LEAD		LEAD	
	EFFECT ASSIGN		SYMPHONIC, CELESTE		SYMPHONIC/CELESTE		SYMPHONIC/CELESTE	
			PHASER		PHASER		PHASER	
			FLANGER		—		—	
			DELAY		DELAY		DELAY	
			WAH		WAH		—	
	SUSTAIN	UPPER	○ (KNEE), LENGTH		○ (KNEE), LENGTH		○ (KNEE), LENGTH	
		LOWER PEDAL	○ (KNEE), LENGTH ○, LENGTH		○ (KNEE), LENGTH ○, LENGTH		○ (KNEE), LENGTH ○, LENGTH	
	LEAD SLIDE		○ (KNEE)		○ (KNEE)		○ (KNEE)	
	REVERB		○		○		○	
	TREMOLO		TREMOLO, CHORUS, U. COMBI., L. COMBI.		TREMOLO, CHORUS, U. COMBI., L. COMBI.		TREMOLO, CHORUS, U. COMBI., L. COMBI.	
	FOOT SWITCH		LEFT, RIGHT, REGIST JUMP, REGIST SHIFT		LEFT, RIGHT, REGIST JUMP, REGIST SHIFT		LEFT, RIGHT, REGIST JUMP, REGIST SHIFT	
	TUNING		○		○		○	
	PACK CONTROL		○		○		○	

		HX-1	HX-3	HX-5
RHYTHM	RHYTHM PATTERN	1., 2., 3., 4., USER 1, USER 2, USER 3, USER 4	1., 2., 3., 4., USER 1, USER 2, USER 3, USER 4	1., 2., 3., 4., USER 1, USER 2, USER 3, USER 4
	VARIATION	1, 2	1, 2	1, 2
	FILL IN	1, 2	1, 2	1, 2
	CONTROLS	VOLUME, BALANCE, TEMPO	VOLUME, BALANCE, TEMPO	VOLUME, BALANCE, TEMPO
KEYBOARD PERCUSSION		○	○	○
CHORD ACCOMPANI- MENT	RHYTHMIC SELECTORS VOLUME	1, 2, 3, 4 ○	1, 2 ○	— ○
	MELODIC SELECTORS VOLUME	1, 2, 3, 4 ○	1, 2 ○	— ○
AUTO BASS CHORD	MODE	ABC	ABC	ABC
	MULTI BASS	1, 2, 3	1, 2, 3	1, 2, 3
	MEMORY	LOWER, PEDAL	LOWER, PEDAL	LOWER, PEDAL
MELODY ON CHORD		○	○	○
PROGRAM OPERATORS		MENU SELECT (ΛV<>), DATA (- +), ENTER, QUIT, CE, SUB DATA CONTROL (1-0)	MENU SELECT (ΛV<>), DATA (- +), ENTER, QUIT, CE, SUB DATA CONTROL (1-0)	MENU SELECT (ΛV<>), DATA (- +), ENTER, QUIT, CE, SUB DATA CONTROL (1-0)
PANEL PROGRAM	COMBI. VOICE MENU	CHURCH ORGAN 1, 2, 3, 4, JAZZ ORGAN 1, 2, 3, 4, 5, 6, 7, 8 THEAT. ORGAN 1, 2, 3, 4 USER 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	CHURCH ORGAN 1, 2, 3, 4, JAZZ ORGAN 1, 2, 3, 4, 5, 6, 7, 8 THEAT. ORGAN 1, 2, 3, 4 USER 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	CHURCH ORGAN 1, 2, 3, 4, JAZZ ORGAN 1, 2, 3, 4, 5, 6, 7, 8 THEAT. ORGAN 1, 2, 3, 4
	COMBI. USER VOICE	16', 8', 5 <sup>1</sup> / <sub>3</sub> ', 4', 2 <sup>2</sup> / <sub>3</sub> ', 2', 1 <sup>3</sup> / <sub>5</sub> ', 1 <sup>1</sup> / <sub>3</sub> ', 1', ATTACK 4', 2 <sup>2</sup> / <sub>3</sub> ', 2', ATTACK LENGTH, RESPONSE, CLICK, TIMBRE VARIATION	16', 8', 5 <sup>1</sup> / <sub>3</sub> ', 4', 2 <sup>2</sup> / <sub>3</sub> ', 2', 1 <sup>3</sup> / <sub>5</sub> ', 1 <sup>1</sup> / <sub>3</sub> ', 1', ATTACK 4', 2 <sup>2</sup> / <sub>3</sub> ', 2', ATTACK LENGTH, RESPONSE, CLICK, TIMBRE VARIATION	—
	POLY VOICE MENU	STRINGS 1, 2, 3, 4, 5, PIZZ. STRINGS, VIOLIN 1, 2, CELLO, BRASS 1, 2, 3, 4, 5, TRUMPET 1, 2, 3, TROMBONE 1, 2, 3, HORN, WOOD 1, 2, 3, PICCOLO, FLUTE 1, 2, OBOE 1, 2, E. HORN, BASSOON, CLARINET 1, 2, B. CLARINET, A. SAX, T. SAX, ACCORDION, BANDO- NEON, HARMONICA, VOCAL 1, 2, 3, 4, COSMIC 1, 2, 3, 4, 5, 6, E. PIANO 1, 2, 3, 4, PIANO 1, 2, 3, GUITAR 1, 2, JAZZ GUITAR 1, 2, E. GUITAR 1, 2, 3, VIBRAPHONE, MARIMBA, XYLOPHONE, GLOCKEN SPEIL, CELESTA, HARPSI- CHORD, HARP 1, 2, BANJO, MANDOLIN, SHAMISEN, KOTO, TAISHOGOTO, CHIME 1, 2, CARILLON, STEEL DRUM 1, 2, TIMPANI 1, 2, E. BASS 1, 2, 3, 4, COSMIC 7, 8, 9, USER 1, 2, 3, 4, 5, 6, 7, 8	STRINGS 1, 2, 3, 4, 5, PIZZ. STRINGS, VIOLIN 1, 2, CELLO, BRASS 1, 2, 3, 4, 5, TRUMPET 1, 2, 3, TROMBONE 1, 2, 3, HORN, WOOD 1, 2, 3, PICCOLO, FLUTE 1, 2, OBOE 1, 2, E. HORN, BASSOON, CLARINET 1, 2, B. CLARINET, A. SAX, T. SAX, ACCORDION, BANDO- NEON, HARMONICA, VOCAL 1, 2, 3, 4, COSMIC 1, 2, 3, 4, 5, 6, E. PIANO 1, 2, 3, 4, PIANO 1, 2, 3, GUITAR 1, 2, JAZZ GUITAR 1, 2, E. GUITAR 1, 2, 3, VIBRAPHONE, MARIMBA, XYLOPHONE, GLOCKEN SPEIL, CELESTA, HARPSI- CHORD, HARP 1, 2, BANJO, MANDOLIN, SHAMISEN, KOTO, TAISHOGOTO, CHIME 1, 2, CARILLON, STEEL DRUM 1, 2, TIMPANI 1, 2, E. BASS 1, 2, 3, 4, COSMIC 7, 8, 9, USER 1, 2, 3, 4, 5, 6, 7, 8	STRINGS 1, 2, 3, 4, 5, PIZZ. STRINGS, VIOLIN 1, 2, CELLO, BRASS 1, 2, 3, 4, 5, TRUMPET 1, 2, 3, TROMBONE 1, 2, 3, HORN, WOOD 1, 2, 3, PICCOLO, FLUTE 1, 2, OBOE 1, 2, E. HORN, BASSOON, CLARINET 1, 2, B. CLARINET, A. SAX, T. SAX, ACCORDION, BANDO- NEON, HARMONICA, VOCAL 1, 2, 3, 4, COSMIC 1, 2, 3, 4, 5, 6, E. PIANO 1, 2, 3, 4, PIANO 1, 2, 3, GUITAR 1, 2, JAZZ GUITAR 1, 2, E. GUITAR 1, 2, 3, VIBRAPHONE, MARIMBA, XYLOPHONE, GLOCKEN SPEIL, CELESTA, HARPSI- CHORD, HARP 1, 2, BANJO, MANDOLIN, SHAMISEN, KOTO, TAISHOGOTO, CHIME 1, 2, CARILLON, STEEL DRUM 1, 2, TIMPANI 1, 2, E. BASS 1, 2, 3, 4, COSMIC 7, 8, 9, USER 1, 2, 3, 4, 5, 6, 7, 8
	MONO VOICE MENU	VIOLIN 1, 2, CELLO, TRUMPET 1, 2, TROMBONE, HORN, PICCOLO, FLUTE 1, 2, OBOE, E. HORN, BASSOON, CLARINET, B. CLARINET, A. SAX, T. SAX, HARMONICA, PAN FLUTE, SHAKUHACHI, VOCAL 1, 2, GUITAR, JAZZ GUITAR 1, 2, E. GUITAR 1, 2, D. GUITAR, H. GUITAR, COSMIC 1, 2, 3, 4, 5, CONTRABASS 1, 2, PIZZ. BASS 1, 2, TUBA 1, 2, VOCAL 3, E. BASS 1, 2, 3, 4, 5, COMBI. BASS 1, 2, 3, 4, COSMIC 6, 7, 8, 9, USER 1, 2, 3, 4, 5, 6	VIOLIN 1, 2, CELLO, TRUMPET 1, 2, TROMBONE, HORN, PICCOLO, FLUTE 1, 2, OBOE, E. HORN, BASSOON, CLARINET, B. CLARINET, A. SAX, T. SAX, HARMONICA, PAN FLUTE, SHAKUHACHI, VOCAL 1, 2, GUITAR, JAZZ GUITAR 1, 2, E. GUITAR 1, 2, D. GUITAR, H. GUITAR, COSMIC 1, 2, 3, 4, 5, CONTRABASS 1, 2, PIZZ. BASS 1, 2, TUBA 1, 2, VOCAL 3, E. BASS 1, 2, 3, 4, 5, COMBI. BASS 1, 2, 3, 4, COSMIC 6, 7, 8, 9, USER 1, 2, 3, 4, 5, 6	VIOLIN 1, 2, CELLO, TRUMPET 1, 2, TROMBONE, HORN, PICCOLO, FLUTE 1, 2, OBOE, E. HORN, BASSOON, CLARINET, B. CLARINET, A. SAX, T. SAX, HARMONICA, PAN FLUTE, SHAKUHACHI, VOCAL 1, 2, GUITAR, JAZZ GUITAR 1, 2, E. GUITAR 1, 2, D. GUITAR, H. GUITAR, COSMIC 1, 2, 3, 4, 5, CONTRABASS 1, 2, PIZZ. BASS 1, 2, TUBA 1, 2, VOCAL 3, E. BASS 1, 2, 3, 4, 5, COMBI. BASS 1, 2, 3, 4, COSMIC 6, 7, 8, 9, USER 1, 2, 3, 4, 5, 6
	VIBRATO	DEFAULT, USER (DELAY, SPEED, DEPTH)	DEFAULT, USER (DELAY, SPEED, DEPTH)	DEFAULT, USER (DELAY, SPEED, DEPTH)
	VOLUME	VALUE 0-24	VALUE 0-24	VALUE 0-24
	TOUCH TONE	RANGE 0-15	RANGE 0-15	RANGE 0-15
	TOUCH VIBRATO	RANGE 0-100	RANGE 0-100	RANGE 0-100
	EFFECT ASSIGN	SYMPHONIC CELESTE	SYMPHONIC/CELESTE	SYMPHONIC/CELESTE
		PHASER	MODE 1-4 USER (STAGE, FREQUENCY, DEPTH, FEEDBACK)	MODE 1-4 USER (STAGE, FREQUENCY, DEPTH, FEEDBACK)
		FLANGER	MODE 1-4 USER (DELAY TIME, DEPTH, FREQUENCY, FEEDBACK, DIRCT. LEVEL, DELAY LEVEL)	—
		DELAY	MODE 1-6 USER (DELAY TIME, DEPTH, FREQUENCY, FEEDBACK, DIRCT. LEVEL, DELAY LEVEL, MOD. WAVE)	MODE 1-6 USER (DELAY TIME, DEPTH, FREQUENCY, FEEDBACK, DIRCT. LEVEL, DELAY LEVEL, MOD. WAVE)
		WAH	MODE 1-2 USER (AUTO SPEED, CENTR FREQUENCY, DEPTH)	—

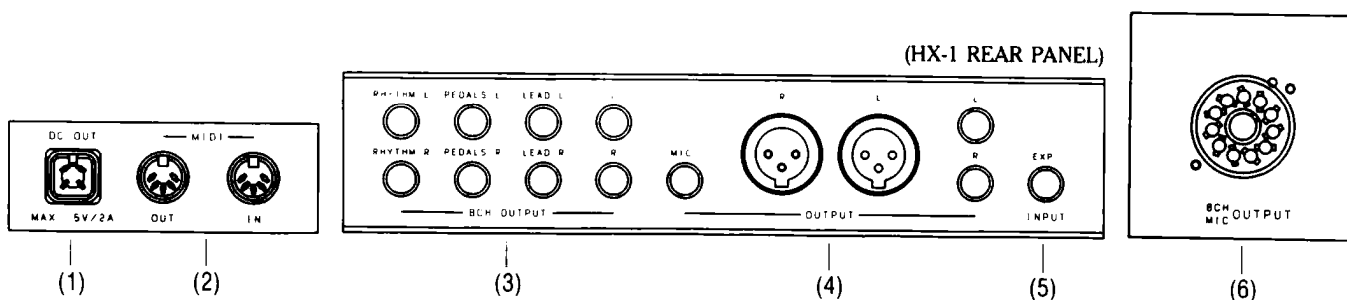
			HX-1	HX-3	HX-5
PANEL PROGRAM	REVERB		MODE 1-6	MODE 1-6	MODE 1-6
	TREMOLO		SPEED 0-100	SPEED 0-100	SPEED 0-100
	FOOT SWITCH	LEFT	RHY.STOP, RHY.ENDING, RHY.FILL IN, RHY. BREAK, LEAD GLIDE, UPPER GLIDE, U & L GLIDE	RHY.STOP, RHY.ENDING, RHY.FILL IN, RHY. BREAK, LEAD GLIDE, UPPER GLIDE, U & L GLIDE	RHY.STOP, RHY.ENDING, RHY.FILL IN, RHY. BREAK, LEAD GLIDE, UPPER GLIDE, U & L GLIDE
		RIGHT	LEAD GLIDE, UPPER GLIDE, U & L GLIDE	LEAD GLIDE, UPPER GLIDE, U & L GLIDE	LEAD GLIDE, UPPER GLIDE, U & L GLIDE
		REGIST	JUMP 1-16, SHIFT ON/OFF	JUMP 1-16, SHIFT ON/OFF	JUMP 1-16, SHIFT ON/OFF
	MODULATION		LEAD SLIDE 0-100 LEAD PAN 0-100 WAH 0-100	LEAD SLIDE 0-100 LEAD PAN 0-100 WAH 0-100	LEAD SLIDE 0-100 LEAD PAN 0-100 —
	PITCH		LEAD PITCH 1-12 U. ORC. PITCH 1-12 PEDALS PITCH 1-12	LEAD PITCH 1-12 U. ORC. PITCH 1-12 PEDALS PITCH 1-12	LEAD PITCH 1-12 U. ORC. PITCH 1-12 PEDALS PITCH 1-12
	TUNING		+23 STEP, -7 STEP	+23 STEP, -7 STEP	+23 STEP, -7 STEP
	RHYTHM PATTERN MENU		8 BEAT 1, 2, 3, 16 BEAT 1, 2, DISCO, BOUNCE 1, 2, SLOW ROCK, BALLAD, 4 BEAT 1, 2, LATIN, SALSA, BOSSA-NOVA, SAMBA, TANGO, COUNTRY, MARCH 1, 2, WALTZ 1, 2	8 BEAT 1, 2, 3, 16 BEAT 1, 2, DISCO, BOUNCE 1, 2, SLOW ROCK, BALLAD, 4 BEAT 1, 2, LATIN, SALSA, BOSSA-NOVA, SAMBA, TANGO, COUNTRY, MARCH 1, 2, WALTZ 1, 2	8 BEAT 1, 2, 3, 16 BEAT 1, 2, DISCO, BOUNCE 1, 2, SLOW ROCK, BALLAD, 4 BEAT 1, 2, LATIN, SALSA, BOSSA-NOVA, SAMBA, TANGO, COUNTRY, MARCH 1, 2, WALTZ 1, 2
	ABC MODE		CUSTOM, F.C., S.F.	CUSTOM, F.C., S.F.	CUSTOM, F.C., S.F.
	MOC MODE		1, 2, 3	1, 2, 3	1, 2, 3
	PACK EDIT		PARTIAL COPY, PACK INITIALIZE, BANK PROTECT	PARTIAL COPY, PACK INITIALIZE, BANK PROTECT	PARTIAL COPY, PACK INITIALIZE, BANK PROTECT
MULTI MENU	SEQUENCER	RECORD	STEP WRITE: RHYTHM, CHORD, REGIST SEQUENCE, REAL TIME WRITE: CHORD SEQUENCE	STEP WRITE: RHYTHM, CHORD, REGIST SEQUENCE, REAL TIME WRITE: CHORD SEQUENCE	STEP WRITE: RHYTHM, CHORD, REGIST SEQUENCE, REAL TIME WRITE: CHORD SEQUENCE
		EDIT	RHYTHM, CHORD, REGIST SEQUENCE	RHYTHM, CHORD, REGIST SEQUENCE	RHYTHM, CHORD, REGIST SEQUENCE
			RECORD/EDIT CONTROL: JUMP,  ,  , D.S. RHY., REGI., DEL., INS.	RECORD/EDIT CONTROL: JUMP,  ,  , D.S. RHY., REGI., DEL., INS.	RECORD/EDIT CONTROL: JUMP,  ,  , D.S. RHY., REGI., DEL., INS.
		PLAY MODE CHANGE	CHORD SEQUENCE, REGIST SEQUENCE, REPEAT, LK ENABLE, INTRO. TACT	CHORD SEQUENCE, REGIST SEQUENCE, REPEAT, LK ENABLE, INTRO. TACT	CHORD SEQUENCE, REGIST SEQUENCE, REPEAT, LK ENABLE, INTRO. TACT
	RHYTHM	RHYTHM PATTERN EDIT	RHYTHM REAL TIME WRITE, RHYTHM STEP WRITE, RHYTHM PATTERN COPY, RHYTHM INSTRUMENT CHANGE, RHYTHM CLEAR, RHYTHM INSTRUMENT PATTERN CLEAR	RHYTHM REAL TIME WRITE, RHYTHM STEP WRITE, RHYTHM PATTERN COPY, RHYTHM INSTRUMENT CHANGE, RHYTHM CLEAR, RHYTHM INSTRUMENT PATTERN CLEAR	RHYTHM REAL TIME WRITE, RHYTHM STEP WRITE, RHYTHM PATTERN COPY, RHYTHM INSTRUMENT CHANGE, RHYTHM CLEAR, RHYTHM INSTRUMENT PATTERN CLEAR
		RHYTHM INSTRUMENT LEVEL	60 INSTRUMENTS RANGE: 0-15	60 INSTRUMENTS RANGE: 0-15	60 INSTRUMENTS RANGE: 0-15
		RHYTHM INSTRUMENT PAN	60 INSTRUMENTS RANGE: L3, L2, L1, C, R1, R2, R3	60 INSTRUMENTS RANGE: L3, L2, L1, C, R1, R2, R3	60 INSTRUMENTS RANGE: L3, L2, L1, C, R1, R2, R3
		KEYBOARD PERCUSSION ASSIGN	60 INSTRUMENTS UPPER KEYBOARD, LOWER KEYBOARD, PEDALS	60 INSTRUMENTS UPPER KEYBOARD, LOWER KEYBOARD, PEDALS	60 INSTRUMENTS UPPER KEYBOARD, LOWER KEYBOARD, PEDALS
	EXTRA FUNCTION	C. DISPLAY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		MIDI CONTROL	RHYTHM SYNCHRONOUS MODE SELECT, BASIC CHANNEL, BULK DATA SELECT, LOCAL CONTROL, AFTER TOUCH	RHYTHM SYNCHRONOUS MODE SELECT, BASIC CHANNEL, BULK DATA SELECT, LOCAL CONTROL, AFTER TOUCH	RHYTHM SYNCHRONOUS MODE SELECT, BASIC CHANNEL, BULK DATA SELECT, LOCAL CONTROL, AFTER TOUCH
		2nd EXP. PEDAL	OFF, RHYTHM TEMPO NARROW, RHYTHM TEMPO WIDE, MODULATION, PITCH	OFF, RHYTHM TEMPO NARROW, RHYTHM TEMPO WIDE, MODULATION, PITCH	OFF, RHYTHM TEMPO NARROW, RHYTHM TEMPO WIDE, MODULATION, PITCH
	EXTERNAL CONTROL		SUB DATA CONTROL (1-0) EXT. CONTROL (1, 2)	SUB DATA CONTROL (1-0) EXT. CONTROL (1, 2)	SUB DATA CONTROL (1-0) EXT. CONTROL (1, 2)
DISPLAY	MULTI MENU (LCD)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	TEMPO & BAR/BEAT		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	DOWN BEAT		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	REGISTRATION NUMBER		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	LEVEL		INITIAL TOUCH, EXPRESSION, ON/OFF	INITIAL TOUCH, EXPRESSION, ON/OFF	INITIAL TOUCH, EXPRESSION, ON/OFF
CONNECTORS	OUTPUT		PHONE L, R, CANNON L, R, MIC.	PHONE L, R, CANNON L, R, MIC.	PHONE L, R, CANNON L, R, MIC.
	8CH OUTPUT		L, R, LEAD L, R, PEDALS L, R, RHYTHM L, R	—	—
	8CH MIC. OUTPUT		11 PIN MULTI	—	—
	INPUT		EXP.	EXP.	EXP.
	MIDI		OUT, IN	OUT, IN	OUT, IN
	DC OUT		5V/2A	5V/2A	5V/2A

# ■PANEL LAYOUT (HX1 and MKX5)





## ACCESSORY JACKS



### (1) DC OUT

This jack supplies power to MDR-2.

### (2) MIDI OUT/IN

The MIDI (Musical Instrument Digital Interface) jacks conform to the MIDI standard for digital electronic instruments and enable you to connect your Electone to MIDI-compatible electronic instruments (or devices) for data communication.

### (3) 8CH OUTPUT

The audio signals of HX are allocated to these 8 channels for output.

RHYTHM L, R: Stereo output of rhythm sounds

PEDALS L, R: Stereo output of pedal keyboard sounds

LEAD L, R: Stereo output of LEAD section sounds

L, R: Stereo output of all sounds not listed above

\*If a Digital Effector of the EFFECT ASSIGN section is assigned to a LEAD voice, the LEAD sound will not be output from LEAD L and R.

### (4) OUTPUT

These jacks perform stereo output of the HX audio signals (including the MIC. sounds) directly to the Keyboard Amplifiers (KA-40, KA-30, KA-20, etc.)

Phone L, R: For connection with the Phone jacks of the amplifiers.

Cannon L, R: For connection with the Cannon jacks of the amplifiers (KA-40, KA-30).

MIC. : Only the sounds input from MIC. IN are output.

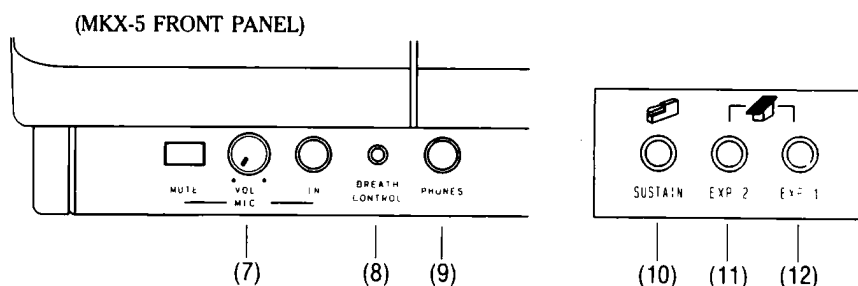
### (5) INPUT

This jack accepts monaural signals from a synthesizer or similar devices. The volume of the device connected here will be controlled by the Electone's Expression Pedal.

### (6) 8CH MIC. OUTPUT

This jack performs multiple output of the 8CH and MIC. signals, and its pin assignment is as follows:

1: L, 2: R, 3: LEAD L, 4: LEAD R, 5: GND, 6: PEDALS L, 7: PEDALS R, 8: RHYTHM L, 9: RHYTHM R, 10: MIC, 11: GND



### (7) MIC.

IN: For connection with the microphone.

VOL.: For volume control of the connected microphone.

MUTE: For muting output of the microphone sounds.

### (8) BREATH CONTROL

This jack is used to connect the Breath Controller (optional) for controlling the Modulation effect. When the Breath Controller is connected, modulation cannot be controlled using the MKX-5 Wheel.

### (9) PHONES

This jack is used to connect headphones (optional) and must not be used for any other purpose.

### (10) SUSTAIN

This jack is used to connect the Foot Pedal (optional) for controlling UPPER SUSTAIN, LOWER SUSTAIN, and LEAD SLIDE.

### (11) EXP.2 (12) EXP.1

Connecting an external Control Pedal to either of these jacks enables the connected Control Pedal to operate similarly to an Expression Pedal of the Electone.



## ■ THE BASIC SYSTEMS & MODULES



System 1 (HX-1/5F)

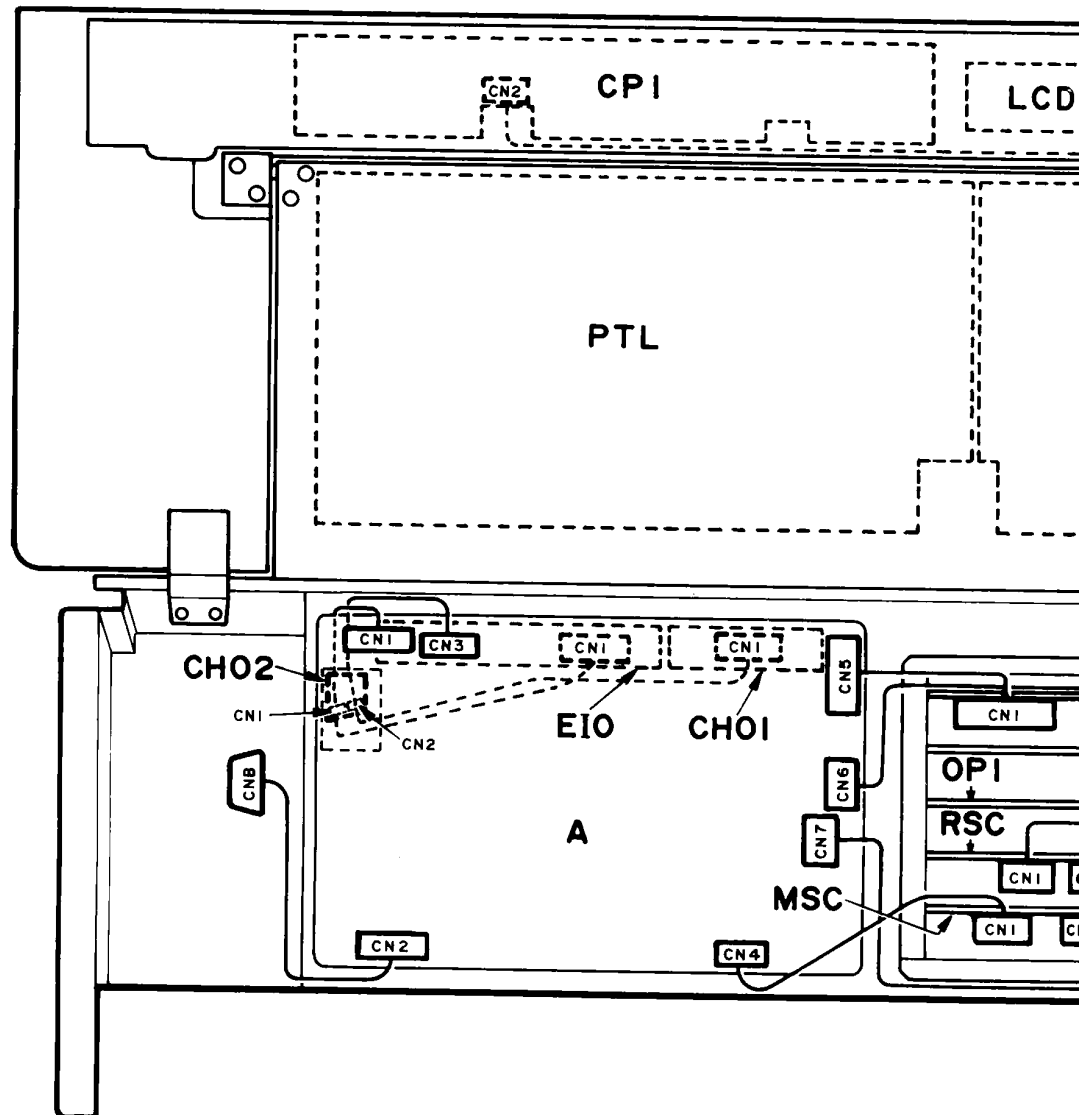
The HX System's flexibility begins with the design of its basic modules. These modules are interchangeable, so you can mix and match them to create your own custom system.

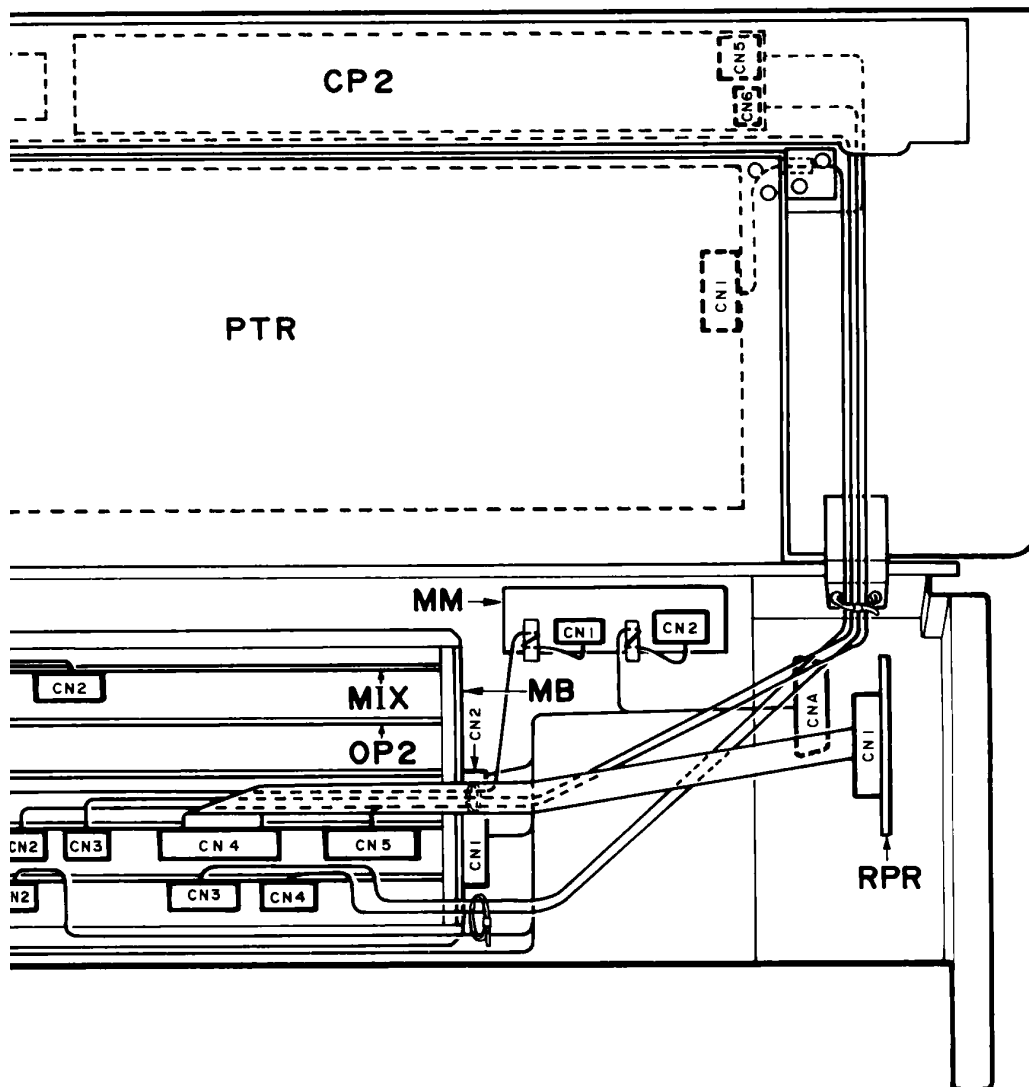
Yamaha has recommendations for five ideally balanced systems, as follows:

System 1 (HX-1/5F) ..... HX-1, MKX-5, PKX-F1, STX-1, BNX-F1  
 System 2 (HX-1/5M) ..... HX-1, MKX-5, PKX-M1, STX-1, BNX-M1  
 System 3 (HX-3/5M) ..... HX-3, MKX-5, PKX-M1, STX-1, BNX-M1  
 System 4 (HX-5/5M) ..... HX-5, MKX-5, PKX-M1, STX-1, BNX-M1  
 System 5 (HX-5/4S) ..... HX-5, MKX-4, PKX-S1, STX-1, BNX-M1

		SYSTEM 1 (HX-1/5F)	SYSTEM 2 (HX-1/5M)	SYSTEM 3 (HX-3/5M)	SYSTEM 4 (HX-5/5M)	SYSTEM 5 (HX-5/4S)
DIMENSIONS	W	1319mm (52")	1319mm (52")	1319mm (52")	1319mm (52")	1319mm (52")
	D	995mm (39")	585mm (23")	585mm (23")	585mm (23")	585mm (23")
	H	941mm (37")	941mm (37")	941mm (37")	941mm (37")	941mm (37")
NET WEIGHT		98kg (215.6 lbs.)	88.5kg (194.7 lbs.)	88kg (193.6 lbs.)	86.5kg (190.3 lbs.)	82.5kg (181.5 lbs.)

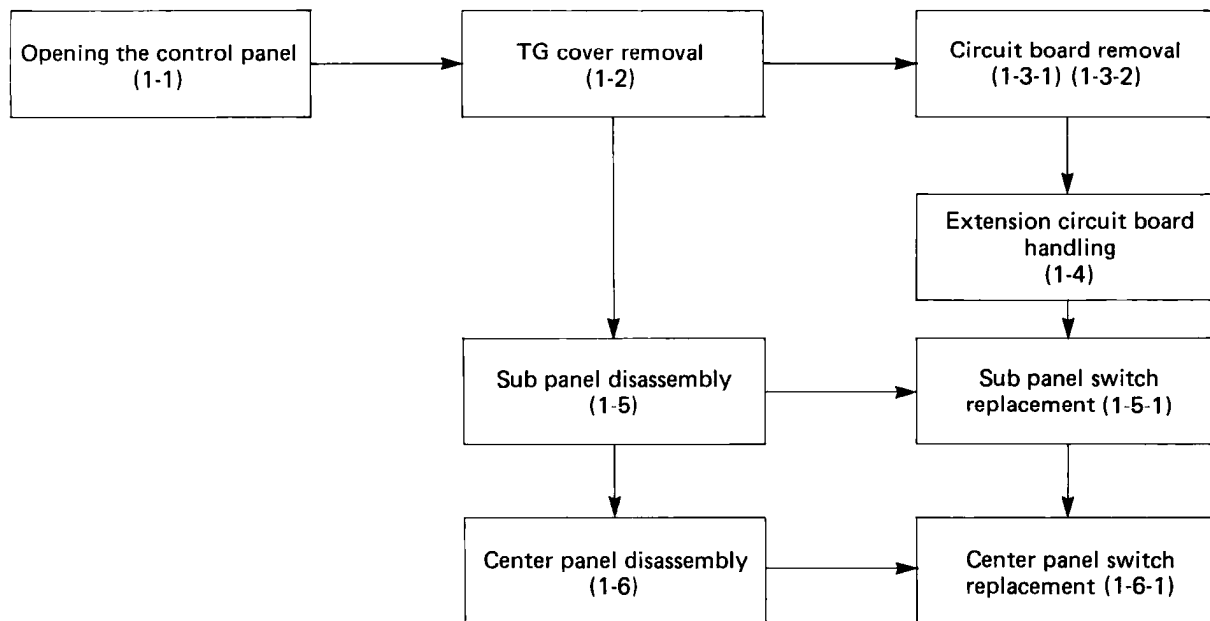
## ■ CIRCUIT BOARDS LAYOUT





## ■ DISASSEMBLY PROCEDURE

### • Disassembly Sequence Flow Chart



#### 1-1 Opening the control panel

Disconnect the left and right external connectors at the bottom of the HX-1 by removing the 5 x 85 panhead screw ① on each side. (Fig. 1)

A plastic nut is attached to screw ① on the inside. Use the grips on either side to lift up the sub panel and slide it toward the back (Fig. 2); then raise the sub panel as shown in Fig. 3.

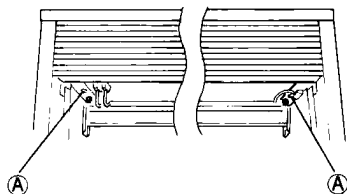


Fig. 1

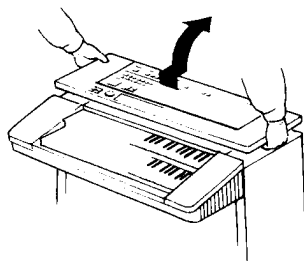


Fig. 2

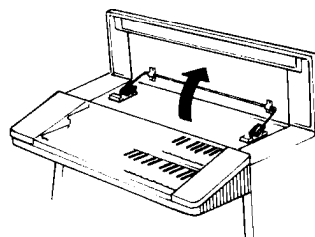


Fig. 3

### 1-2 TG cover removal

Remove the 7 screws **A** (3 x 6 bind screws). The TG cover and center panel are connected by a stay so disconnect on the center panel side by removing the screw **C** (3 x 6 bind screw) of holder **B**.

When removing the holder screw, always hold the panel side of the center panel to prevent the holder moving while removing the screw.

The holder is mounted on the rail of the center panel so slide it off.

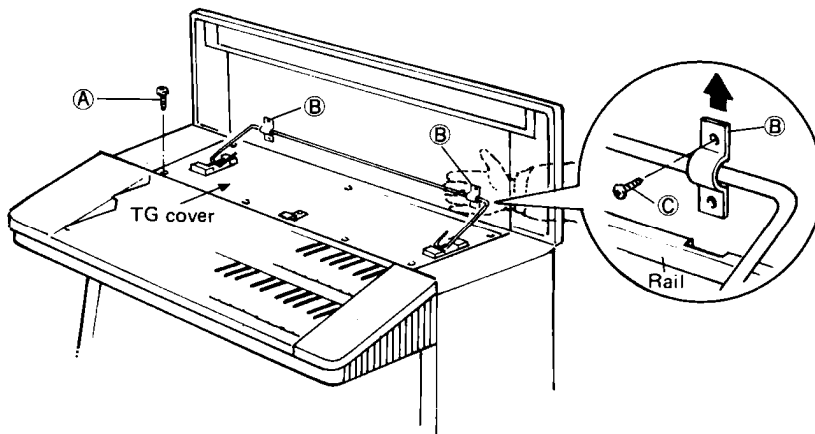


Fig. 4

### 1-3 Circuit board removal

#### 1-3-1 Digital circuit board removal (MSC, RSC, OP1, OP2, MIX)

The digital circuit boards are rack-mounted so remove the screws **A** (3 x 8 bind screws) on the left and right sides and remove the circuit board by sliding it to the left side and lifting up.

**\*Assembly:**

Rails are mounted in the bottom of the rack. The circuit boards are mounted on this rail. When moved to the right, the circuit board is connected to the connector of the MB circuit board. Tighten the screws at either end of the rack to fasten the circuit board.

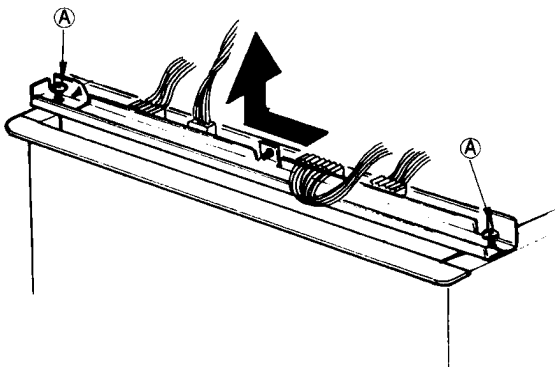


Fig. 5

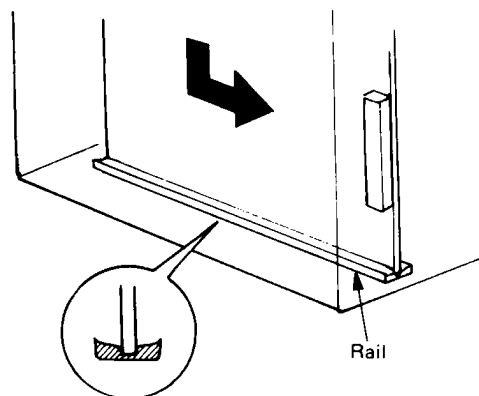


Fig. 6

### 1-3-2 Analog circuit board (A) removal

The A circuit board is mounted at 6 support points so use pliers to compress the tops of the connectors and remove the A circuit board.

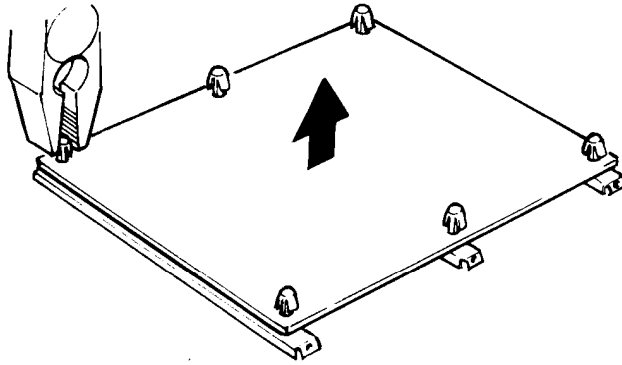


Fig. 7

### 1-4 Extension circuit board handling

Remove the 2 screws fastening the digital circuit board and remove the circuit board. Next, insert the extension circuit board and fasten with screws; then connect the digital circuit board to the connector of the extension circuit board.

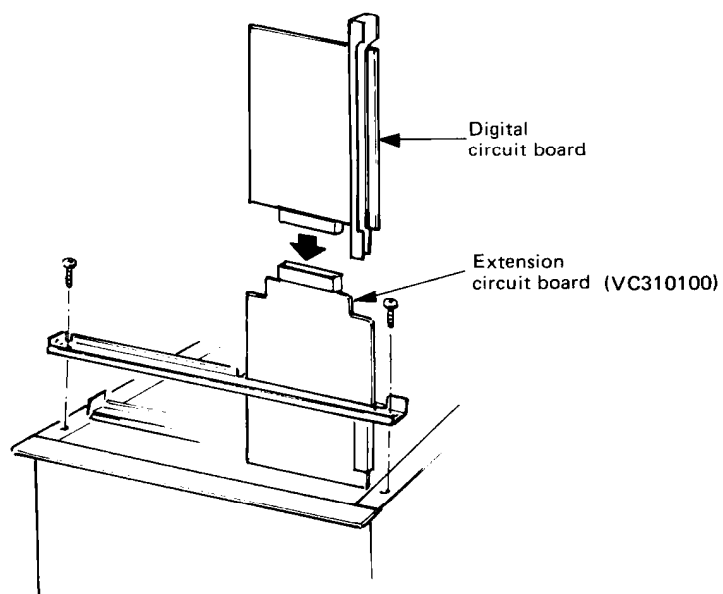


Fig. 8

## 1-5 HX-1 sub panel disassembly

Remove the 4 screws **A** (4 x 8 bind screws) and 14 screws **B** (3 x 8 panhead screws) and remove the panel chassis. The sub panel is connected to the main unit by a hinge assembly, so hold the panel side with one hand, remove the screws.

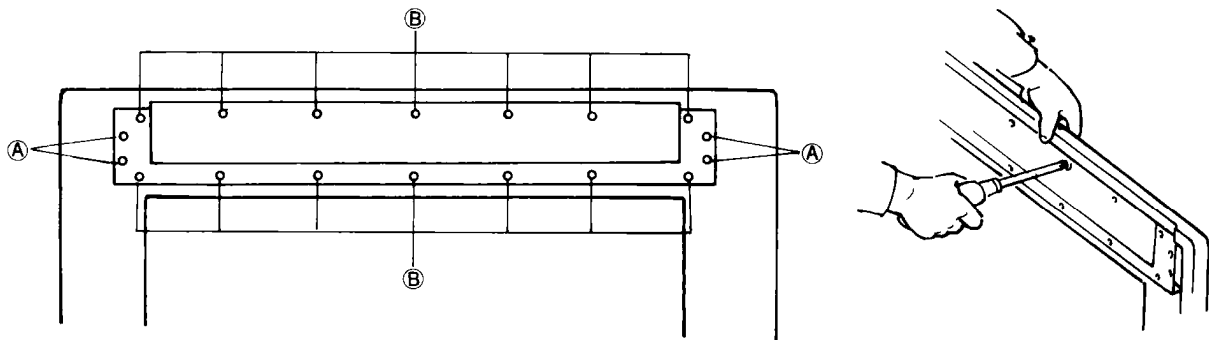


Fig. 9

### 1-5-1 Sub panel switch button replacement

Remove the pitch knob from the panel by pulling it off its shaft. (Fig. 10)

The switch button is fastened to the panel with tabs, so remove the circuit board for the button being replaced. Remove the switch button by pushing the tabs outward, as shown in Fig. 11.

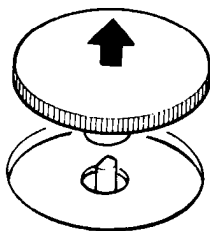


Fig. 10

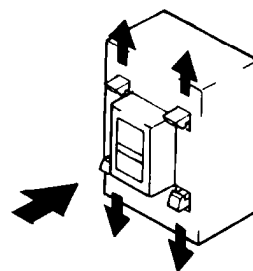


Fig. 11

### 1-6 Center panel disassembly

Lift up the center panel as shown in Fig. 12.

Remove the 5 screws ① (4 x 12 bind P type) and 11 screws ② (4 x 10 bind P type) from the panel cover and remove the panel cover as shown in Fig. 13.

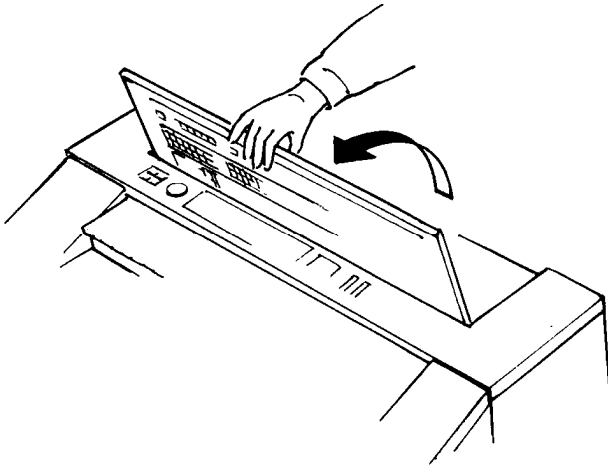


Fig. 12

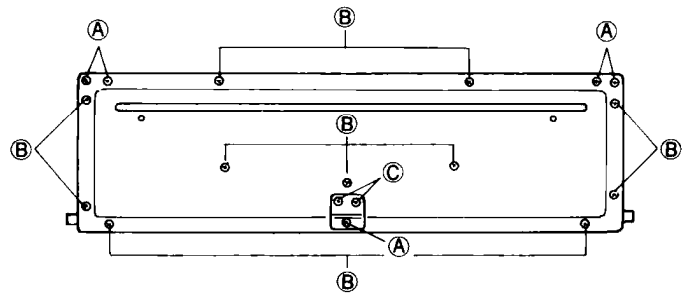


Fig. 13

#### 1-6-1 Center panel switch button replacement

Refer to the item "1-5-1 Replacing the sub panel switch button."



## ■ LSI DATA TABLE

### YM3603 (XA805001) Keyboard Scanner

Pin No.	Name	I/O	Function	Pin No.	Name	I/O	Function
1	VDD	I	+5V	40	CK1	I	Connector for 3.25MHz ceramic etc.
2	$\overline{M_4}$	I	Make point	39	CK2	I	Connector for 3.25MHz ceramic etc.
3	$\overline{M_3}$	I		38	AEN	I	Outputs AD conversion data (1)/ stops (0)
4	$\overline{M_2}$	I		37	$\overline{KI}$	I	Initial set
5	$\overline{M_1}$	I		36	$\overline{D_{12}}$	O	Scan drive pulse
6	$\overline{M_0}$	I	Break point	35	$\overline{D_{11}}$	O	
7	$\overline{B_4}$	I		34	$\overline{D_{10}}$	O	
8	$\overline{B_3}$	I		33	$\overline{D_9}$	O	
9	$\overline{B_2}$	I		32	$\overline{D_8}$	O	
10	$\overline{B_1}$	I		31	$\overline{D_7}$	O	
11	$\overline{B_0}$	I		30	$\overline{D_6}$	O	
12	TRS	I	Transfer (1)/2 make (0) select	29	$\overline{D_5}$	O	
13	S21	I	2 make (1)/1 make (0) select	28	$\overline{D_4}$	O	
14	AVDD		+5 volts for analog circuit	27	$\overline{D_3}$	O	
15	$\overline{TST}$		Test mode (0) select. When testing, the value of the shift register is sent.	26	$\overline{D_2}$	O	
16	AI	I	Analog voltage for AD conversion input.	25	$\overline{D_1}$	O	Host data request. When KBS detects the fall of DR, event data transmission is enabled.
17	DAC OUT	O	DAC output	24	$\overline{D_0}$	O	
18	A GND		Analog circuit Gnd.	23	$\overline{DR}$	I	8 bit key data. A start bit of '0', stop bit of '1' is added, and the LSB is sent.
19	GND		GND	22	KD	O	
20	$\overline{EVR}$	O	Not used.	21	TXC	I	Clock for serial communication (100K-500K)

# HD63B01Y0A39P (XA947001) SUB-CPU

Pin No.	Name	I/O	Function	Pin No.	Name	I/O	Function
1	V <sub>SS</sub>		Ground	33	V <sub>CC</sub>		DC Supply (+ 5V)
2	XTAL	I	Clock (8MHz)	34	P <sub>47</sub>	O	Port 4
3	EXTAL	I		35	P <sub>46</sub>	O	
4	MP <sub>0</sub>	I	Mode program	36	P <sub>45</sub>	O	
5	MP <sub>1</sub>	I		37	P <sub>44</sub>	O	
6	$\overline{\text{RES}}$	I	Reset	38	P <sub>43</sub>	O	
7	$\overline{\text{STBY}}$	I	Stand-by mode signal	39	P <sub>42</sub>	O	Ground
8	$\overline{\text{NMI}}$	I	No-maskable interrupt	40	P <sub>41</sub>	O	
9	P <sub>20</sub>	I/O	Port 2	41	P <sub>40</sub>	O	
10	P <sub>21</sub>	I/O		42	V <sub>SS</sub>		
11	P <sub>22</sub>	I/O		43	P <sub>17</sub>	O	Port 1
12	P <sub>23</sub>	I/O		44	P <sub>16</sub>	O	
13	P <sub>24</sub>	I/O		45	P <sub>15</sub>	O	
14	P <sub>25</sub>	I/O		46	P <sub>14</sub>	O	
15	P <sub>26</sub>	I/O		47	P <sub>13</sub>	O	Port 3
16	P <sub>27</sub>	I/O	Port 5	48	P <sub>12</sub>	O	
17	P <sub>50</sub>	I		49	P <sub>11</sub>	O	
18	P <sub>51</sub>	I		50	P <sub>10</sub>	O	
19	P <sub>52</sub>	I		51	P <sub>37</sub>	I/O	
20	P <sub>53</sub>	I		52	P <sub>36</sub>	I/O	Port 7
21	P <sub>54</sub>	I		53	P <sub>35</sub>	I/O	
22	P <sub>55</sub>	I		54	P <sub>34</sub>	I/O	
23	P <sub>56</sub>	I	Port 6	55	P <sub>33</sub>	I/O	
24	P <sub>57</sub>	I		56	P <sub>32</sub>	I/O	
25	P <sub>60</sub>	I/O		57	P <sub>31</sub>	I/O	Enable
26	P <sub>61</sub>	I/O		58	P <sub>30</sub>	I/O	
27	P <sub>62</sub>	I/O		59	P <sub>74</sub>	O	
28	P <sub>63</sub>	I/O		60	P <sub>73</sub>	O	
29	P <sub>64</sub>	I/O		61	P <sub>72</sub>	O	
30	P <sub>65</sub>	I/O	Port 7	62	P <sub>71</sub>	O	
31	P <sub>66</sub>	I/O		63	P <sub>70</sub>	O	
32	P <sub>67</sub>	I/O		64	E	I	

## Mode Program

	MP <sub>0</sub>	MP <sub>1</sub>
Mode 1	H	L
Mode 2	L	H
Mode 3	H	H

## Port

	Mode 1, 2	Mode 3
Port 1	Address bus (A <sub>0</sub> ~A <sub>7</sub> )	O Port
Port 2	I/O Port	I/O Port
Port 3	Data bus (D <sub>0</sub> ~D <sub>7</sub> )	I/O Port
Port 4	Address bus (A <sub>8</sub> ~A <sub>15</sub> )	O Port
Port 5	I/O Port	I Port
Port 6	I/O Port	I/O Port
Port 7	$\overline{\text{RD}}$ , $\overline{\text{WR}}$ , $\overline{\text{R/W}}$ , $\overline{\text{LIR}}$ , $\overline{\text{BA}}$	O Port