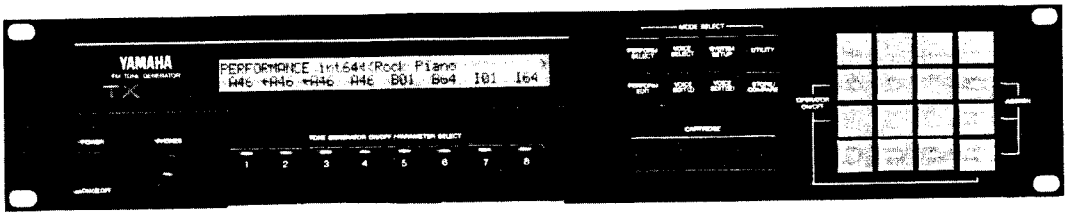
583

FM TONE GENERATOR

TX802

SERVICE MANUAL



■CONTENTS（目次）

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SINCE 1887 YAMAHA
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN
2.3K-452 Ⓚ Printed in Japan '87.6

TX802

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.

ADVARSEL!

Lithiumbatteri. Eksplosionsfare.

Udskiftning må kun foretages af en sagkyndig, og som beskrevet i servicemanualen.

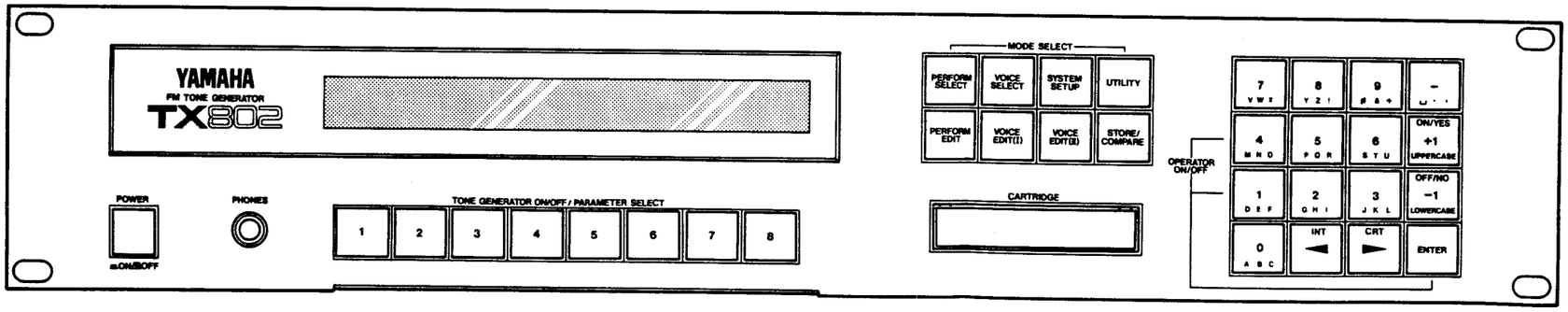
■SPECIFICATIONS（仕様）

Tone Generator
FM tone generator (6 operators, 32 algorithms)
Simultaneous Note Output
16 notes, assignable to up to 8 timbres
Internal Memory
64 performance memory
64 internal (user) voice memory
128 preset voice memory
External Memory
RAM cartridge: 64 performance, 64 voice
Front Panel Controls and Terminal
Power ON/OFF switch
Tone Generator ON/OFF, Parameter Select keys (8)
Mode Select/Edit/Store keys (8)
Data Entry keys (Ten-key pads 0—9, Cursor < >, +1, −1, −, ENTER).
CARTRIDGE slot
PHONES jack
Rear Panel Terminals
MIDI IN, OUT, THRU
MIXED OUTPUTS I, II
INDIVIDUAL OUTPUTS 1—8
Cartridge Capacity
RAM1: 4K bytes (Read only)
RAM4: 16K bytes

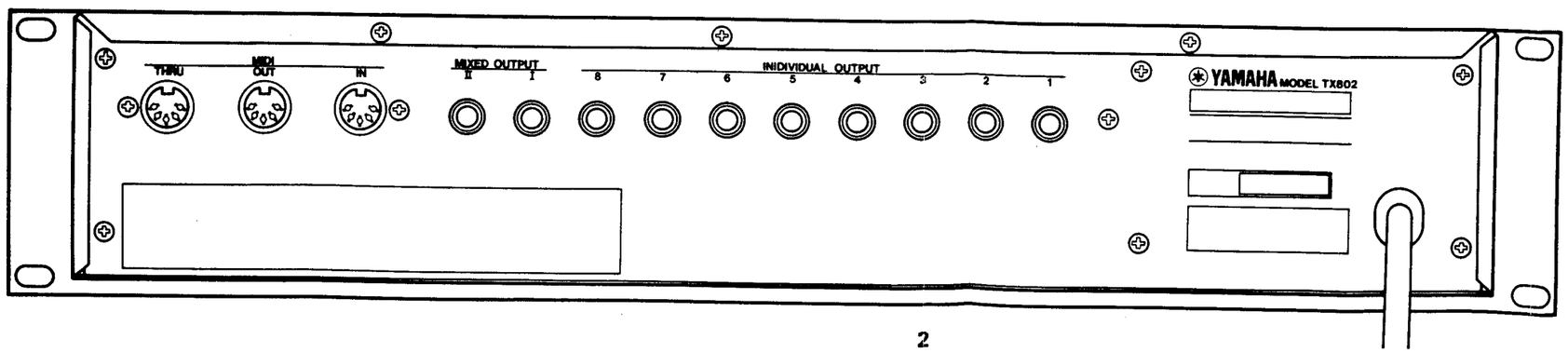
Display
LCD: 40 characters × 2 lines (illuminated)
Power Requirements & Consumption
General Model: 220—240 V (50/60 Hz), 15 W
U.S. & Canadian Models: 120 V (50/60 Hz), 15 W
Dimensions (W × H × D)
480 × 94.5 × 287 mm (18-7/8" × 3-3/4" × 11-1/4")
Weight
4.9 kg (10 lbs 12 oz.)
Standard Accessories
MIDI Cable MIDI-03

■PANEL LAYOUT（パネルレイアウト）

●FRONT PANEL（フロントパネル）



●REAR PANEL（リアパネル）



●音源方式、発音数
6オペレータ、32アルゴリズム、FM音源×8、独立出力付き
同時発音数　最大16音
同時発音可能な音色数　最大8音色
キーアサイン方式　後着優先

●外形寸法、重量
ラックマウント方式　2U
幅 480㎜×奥行き 287㎜×高さ 94.5 ㎜
重量 4.9kg

●定格消費電力
100V　8W

●内部メモリー
64パフォーマンスメモリー
64インターナルボイスメモリー
128プリセットボイスメモリー（読み出し専用）
カートリッジにより、さらに64パフォーマンス、64ボイスの使用が可能

●パネル表示器、パネルキー
40文字×2行　バック照明付き LCD
TONE GENERATOR ON/OFF および PARAMETER SELECT キー（8個、LED 付き）
MODE SELECT および STORE/COMPARE キー
DATA ENTRY キー（10キー、エンターキー、カーソルキー、+1/−1キー）
POWER SWITCH

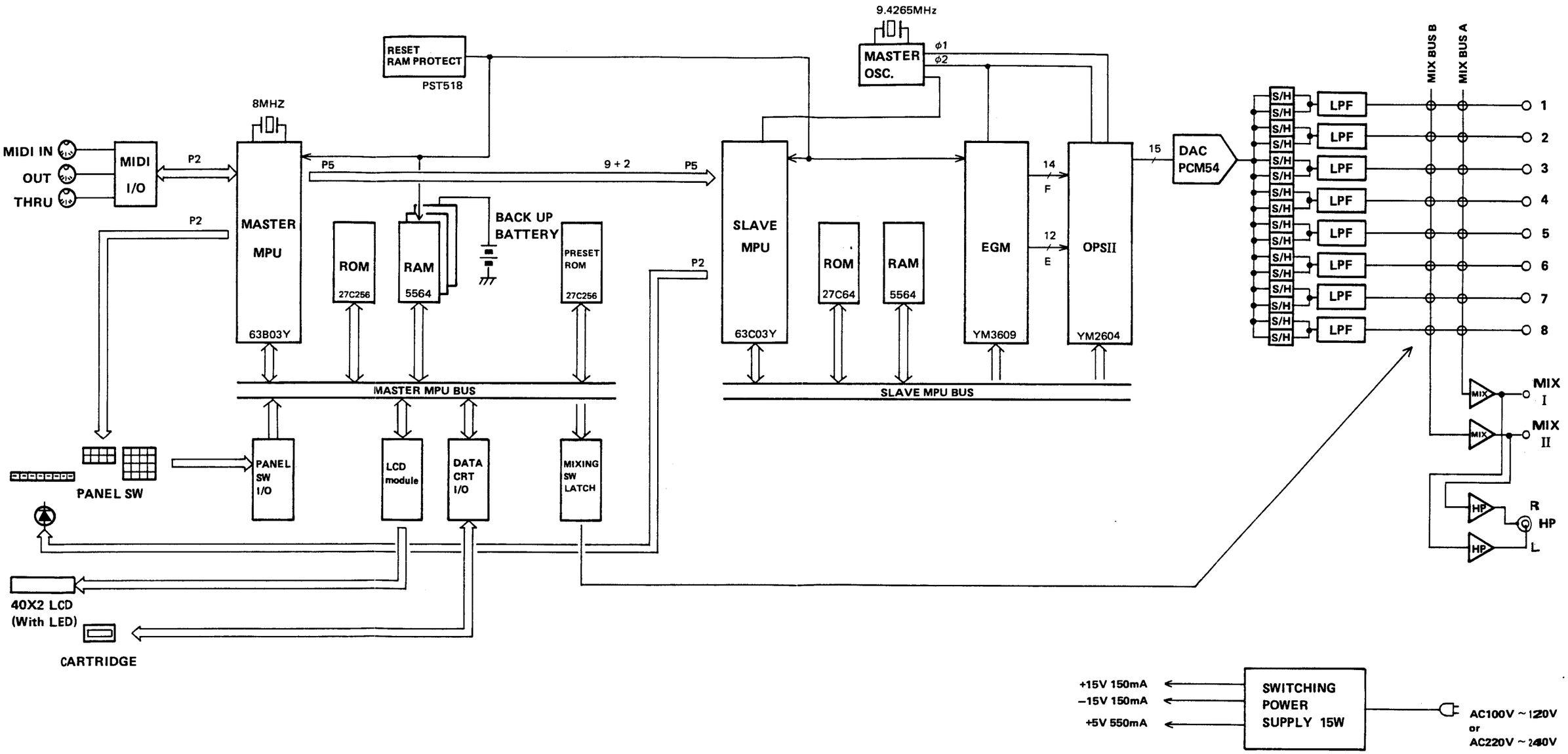
●カートリッジ
4KByte　(RAM1:読み出し専用)
16KByte (RAM4)
その他、1バンク16KByte として16バンクまでのRAMまたはROMカートリッジの使用可能

●出力端子
INDIVIDUAL OUTPUT　1 ～ 8
MIXED OUTPUT　I 、 II
PHONES (MIXED OUTPUT I、II をそれぞれ L, Rに出力)
MIDI IN 、MIDI OUT、MIDI THRU

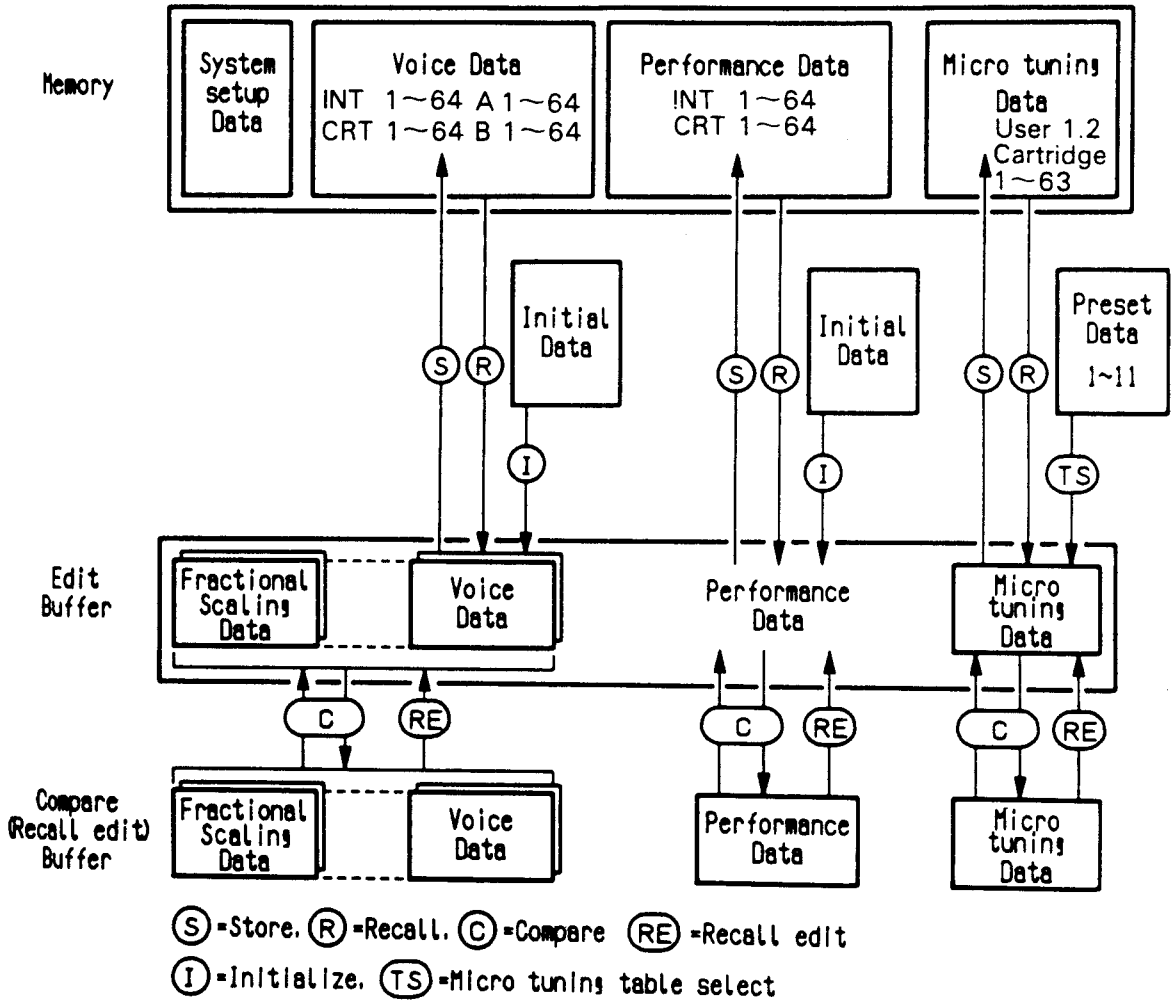
●付属品
MIDIケーブル　MIDI03×2

TX802

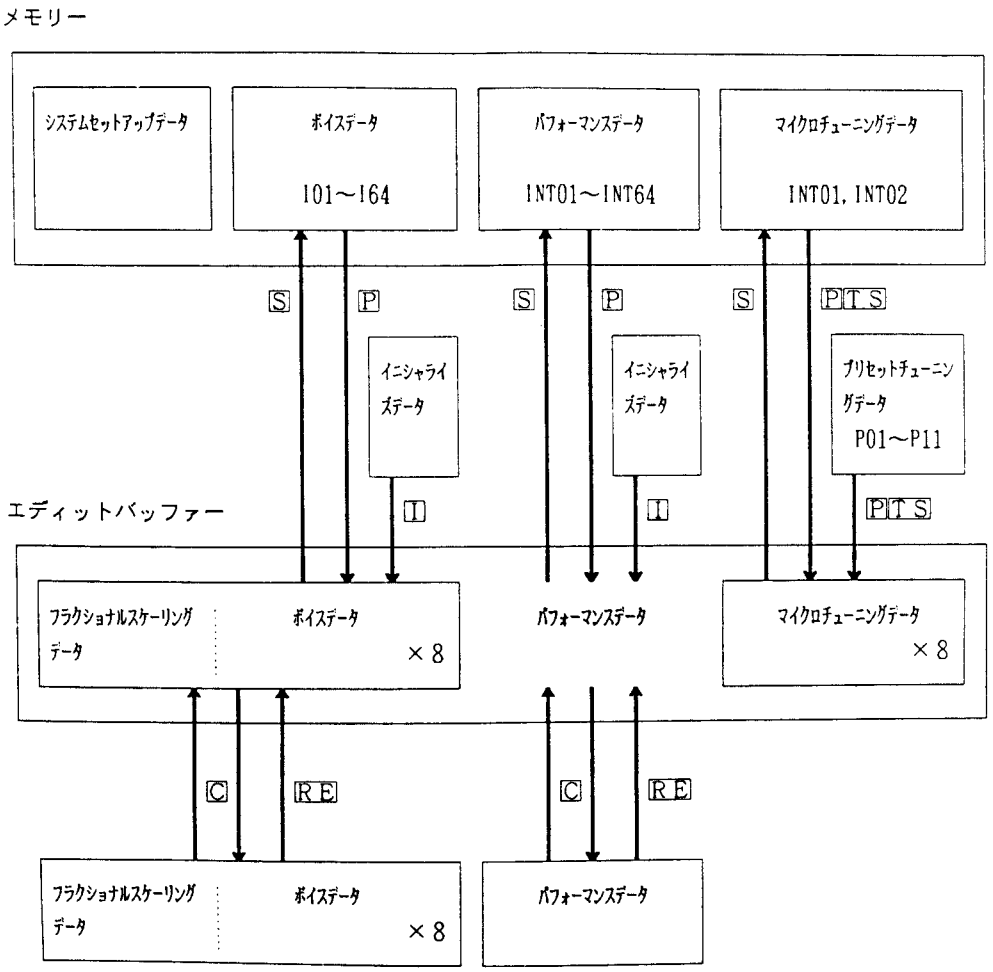
■BLOCK DIAGRAM（ブロックダイアグラム）



■MEMORY CONFIGURATION



■ メモリー構成



コンペア（リコールエディット）バッファー

S：ストア　P：プレイ　C：コンペア　RE：リコールエディット
I：イニシャライズ　TS：マイクロチューニングセレクト

- カートリッジのセーブ（Save）は上図の「メモリー」の部分を保存します。
- 鍵盤を弾いたときに出る音は、「エディットバッファー」内のデータで構成されたものです。

■BANK A/B VOICE LIST (プリセットボイス)

BANK A

1	MellowHorn	33	Piano 1
2	SilvaBrass	34	Piano 2
3	ReverbBras	35	KnockRoad
4	Tuba	36	RubbaRoad
5	Trombone	37	HardRoads
6	HardTrumps	38	FullTines
7	Trumpet A	39	ClaviStuff
8	SilvaTrmpt	40	Clavi
9	Trumpet B	41	Clavecin
10	FrenchHorn	42	ClaviPluck
11	Strings	43	NasalClav
12	HallOrch	44	HarpsiBox
13	NewOrchest	45	HarpsiWire
14	Analog-Str	46	WireStrg A
15	LiveStrg	47	WireStrg B
16	BowedBass	48	TouchOrgan
17	EleCello A	49	ShOrgan
18	EleCello B	50	TapOrgan
19	Violins	51	BriteOrgan
20	Bassoon	52	MagicOrgan
21	Clarinet	53	SoftOrgan
22	Oboe	54	PipeOrgan
23	Flute	55	PuffOrgan1
24	SongFlute	56	PuffPipes
25	SpitFlute	57	PuffOrgan2
26	PanFloot	58	Harmonium1
27	Piccolo	59	Harmonium2
28	Sax	60	Whisper A
29	Harmonica	61	Choir
30	Harp	62	LadyVox
31	EbonyIvory	63	MaleChoir
32	PianoBrite	64	Whisper B

BANK B

1	SuperBass	33	Analog-X
2	StringBass	34	FMilters
3	SkweekBass	35	Phasers
4	SmoohBass	36	Ensemble
5	BopBass	37	MalletHorn
6	OwlBass	38	FM-Growth
7	JazzBass	39	ElectoComb
8	HardBass	40	ClariSolo
9	GuitarBox	41	PitchaPad
10	PickGuitar	42	ClaviBrass
11	FingaPicka	43	WhapSynth
12	LeadaPicka	44	Whasers
13	YesBunk	45	Fifths
14	12 Strings	46	ElecBrass
15	Classipika	47	ElectroBak
16	Shami	48	HarmoSynth
17	Maribumba	49	PianoBells
18	DX Marimba	50	St.Elmo's
19	Nu Marimba	51	MilkyWays
20	StonePhone	52	Pluk
21	VibraPhone	53	TingVoice
22	Celeste	54	Plukatan
23	Swissnare	55	OctiLate
24	Tom C4	56	LateDown
25	CongaDrum	57	Glastine
26	Tub Bells	58	BellWahh
27	Gong	59	RubberGong
28	Timpani	60	Wallop
29	Claves	61	Explosion
30	Bells	62	KoikeCycle
31	SteelCans	63	Thunderon
32	Handrum	64	Science

[FM tone generater]

Model TX802 MIDI Implementation Chart Version : 1.0

Function ...		Transmitted	Recognized	Remarks
Basic	Default	1 - 16	1 - 16	memorized
Channel	Changed	1 - 16	1 - 16	
Mode	Default	x	1, 2, 3, 4	memorized
	Messages		POLY, MONO(M=1)	
	Altered	XXXXXXXXXXXXX	x	
Note Number		x	0 - 127	
	True voice	XXXXXXXXXXXXX	0 - 127	
Velocity	Note ON	x	o v=1-127	
	Note OFF	x	x	
After Touch	Key's	x	x	
	Ch's	x	o	
Pitch Bender		x	o 0-12 semi X2	7 bit resolution
Control Change	1	x	o X1	Modulation wheel
	2	x	o X1	Breath control
	4	x	o X1	Foot control
	5	x	o X1	Portamento time
	7		o X1	Volume
	64	x	o X1	Sustain sw
	65	x	o X1	Portamento sw
Prog Change		x	o 0 - 127	if prgram change
	True #	XXXXXXXXXXXXX	0 - 127 X3	sw is on.
System Exclusive		o X4	o X4	
System Common	Song Pos	x	x	
	Song Sel	x	x	
	Tune	x	x	
System Real Time	Clock	x	x	
	Commands	x	x	
Aux Mes- sages	Local ON/OFF	x	x	
	All Notes OFF	x	o (126,127)	
	Active Sense	x	o	
	Reset	x	x	

Notes: X1 = receive if control change switch is on.
X2 = receive if pitch bend switch is on.
X3 = I1-64 (0-63) , C1-64 (64-127) for Performance.
I1-64 , C1-64 , A1-64 , B1-64 (0-63) for Voice.
X4 = Bulk dump & param. change of Voice;Perf,System,mtune,frac.

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO o : Yes
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO x : No

■LSI DATA TABLE (LSI端子機能表)

- **HD63B03YP-N (XD245001)** CPU
- **HD63C03YP (XB529001)** CPU

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	Vss	I	Ground	33	Vcc		DC Supply (+5V)
2	XTAL	I	Clock (8MHz)	34	V15	O	Address bus
3	EXTAL	I		35	A14	O	
4	MP0	I	Mode program	36	A13	O	
5	MP1	I		37	A12	O	
6	$\overline{RES}$	I	Reset	38	A11	O	
7	$\overline{STBY}$	I	Stand-by mode signal	39	A10	O	
8	$\overline{NMi}$	I	Non-maskable interrupt	40	A9	O	
9	P20	I/O	Port 2	41	A8	O	
10	P21	I/O		42	Vss		Ground
11	P22	I/O		43	A7	O	Address bus
12	P23	I/O		44	A6	O	
13	P24	I/O		45	A5	O	
14	P25	I/O		46	A4	O	
15	P26	I/O		47	A3	O	
16	P27	I/O		48	A2	O	
17	P50	I/O	Port 5	49	A1	O	
18	P51	I/O		50	A0	O	
19	P52	I/O		51	D7	I/O	Data bus
20	P53	I/O		52	D6	I/O	
21	P54	I/O		53	D5	I/O	
22	P55	I/O		54	D4	I/O	
23	P56	I/O		55	D5	I/O	
24	P57	I/O		56	D2	I/O	
25	P60	I/O	Port 6	57	D1	I/O	
26	P61	I/O		58	D0	I/O	
27	P62	I/O		59	$\overline{BA}$	O	Bus available
28	P63	I/O		60	$\overline{LIR}$	O	Load instruction resistor
29	P64	I/O		61	$\overline{R/W}$	O	Read/Write control
30	P65	I/O		62	$\overline{WR}$	O	Write
31	P66	I/O		63	$\overline{RD}$	O	Read
32	P67	I/O		64	E	O	Enable

- **PCM54HP (XA566001)** Digital Analog Converter

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	Vpot		Not used	15	DA4		Bit 13
2	DA16		Bit 1 (MSB)	16	DA3		Bit 14
3	DA15		Bit 2	17	DA2		Bit 15
4	NC		Not used	18	LSB		Bit 16
5	DA14		Bit 3	19	V_0		Voltage Output
6	DA13		Bit 4	20	FBR		Not used
7	DA12		Bit 5	21	INV		Summing Junction
8	DA11		Bit 6	22	GND		Common
9	DA10		Bit 7	23	I_0		Current Output
10	DA9		Bit 8	24	NC		Not Used
11	DA8		Bit 9	25	OFF.S		Not Used
12	DA7		Bit 10	26	+Vcc		+15V
13	DA6		Bit 11	27	ADJ		Not Used
14	DA5		Bit 12	28	−Vcc		−15V

• YM2604 (XA489001) OPSII (Operator-S)

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	Vss	I	DC supply (0V)	33	DA7	O	Digital code for analog convert
2	D6	I/O	Data buses	34	DA8	O	
3	D7	I/O		35	DA9	O	
4	$\overline{DS}$	I	–	36	DA10	O	
5	$\overline{WR}$	I	Read write control	37	DA11	O	
6	–	–	Non connection	38	DA12	O	
7	–	–		39	DA13	O	
8	–	–		40	DA14	O	
9	SH1	O	Sample and hold data	41	DA15	O	
10	SH2	O		42	DA16	O	
11	SYNC	O		43	E1	I	Envelope data (from EGS)
12	F1	I	Frequency data (from EGS)	44	E2	I	
13	F2	I		45	E3	I	
14	F3	I		46	E4	I	
15	F4	I		47	E5	I	
16	F5	I		48	E6	I	
17	Vss	I	DC supply (0V)	49	E7	I	
18	F6	I	Frequency data (from EGS)	50	E8	I	
19	F7	I		51	E9	I	
20	F8	I		52	E10	I	
21	F9	I		53	E11	I	
22	F10	I		54	E12	I	
23	F11	I		55	KON	I	Key ON data
24	F12	I		56	D0	I/O	Data buses
25	F13	I		57	D1	I/O	
26	F14	I		58	D2	I/O	
27	DA2	O	Digital code for analog convert	59	D3	I/O	
28	DA3	O		60	D4	I/O	
29	DA4	O		61	D5	I/O	
30	DA5	O		62	VDD	I	DC supply (+5V)
31	DA6	O		63	ϕ1	I	Master clock pulse
32	Vss	I		64	ϕ2	I	

• YM3609 (XA898001) Envelope Generator

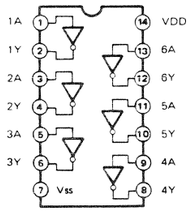
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	Vcc		Power supply	33	Vss		Ground
2	NC			34	ϕ2	I	Clock IN
3	E6	O	Envelope data	35	$\overline{TEST}$	I	Test pin
4	E7	O		36	D0	I	Data bus
5	E8	O		37	D1	I	
6	E9	O		38	D2	I	
7	E10	O		39	D3	I	
8	E11	O		40	NC		
9	E12	O		41	NC		
10	NC			42	NC		
11	NC			43	D4	I	Data bus
12	NC			44	D5	I	
13	KON	O	Key on data	45	D6	I	
14	F1	O	Frequency data	46	D7	I	
15	F2	O		47	NC		
16	F3	O		48	A0	I	Address bus
17	F4	O		49	A1	I	
18	F5	O		50	A2	I	
19	F6	O		51	A3	I	
20	F7	O		52	A4	I	
21	F8	O		53	NC		
22	F9	O		54	NC		
23	NC			55	$\overline{CE1}$	I	Chip enable
24	NC			56	$\overline{CE2}$	I	
25	NC			57	NC		
26	F10	O	Frequency data	58	NC		
27	F11	O		59	$\overline{SYNC}$	I	Synchro pulse
28	F12	O		60	E1	O	Envelope data
29	F13	O		61	E2	O	
30	F14	O		62	E3	O	
31	$\overline{IC}$	I	Initial clear	63	E4	O	
32	Vcc		Power supply	64	E5	O	

TX802

IC BLOCK DIAGRAM (ICブロック図)

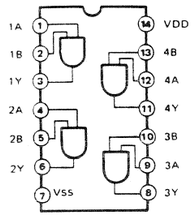
- **HD74LS04P** (IG027010)
- **TC40H004P** (IG051000)
- **SN74HC04N** (IR000450)

Hex Inverter



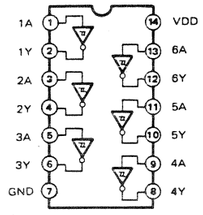
- **SN74HC08N** (IR000850)

Quad 2 Input AND



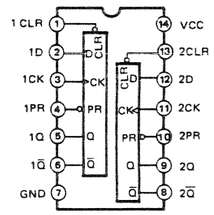
- **SN74HC14N** (IR001450)

Hex Inverter



- **TC40H074P** (IG051100)

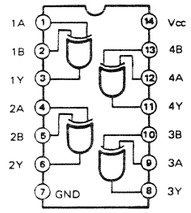
Dual D-Type Flip-Flop



INPUTS				OUTPUTS	
PR	CLR	CLK	D	Q	Q̄
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H	H
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	Q_0	$\bar{Q}_0$

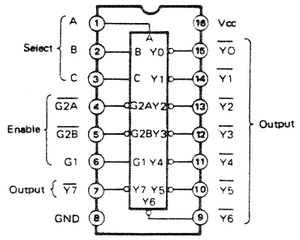
- **TC74HC86** (IR008600)

Quad 2 Input EX-OR



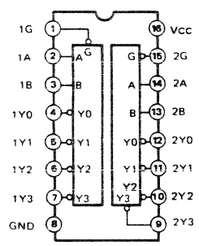
- **TC40H138P** (IG111900)
- **SN74HC138N** (IR013850)

3 to 8 Demultiplexer



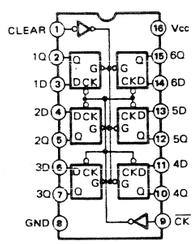
- **SN74HC139N** (IR013950)

Dual 2 to 4 Demultiplexer



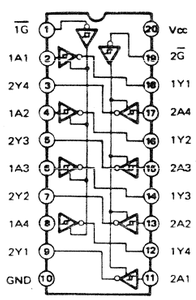
- **SN74HC174N** (IR017450)

Hex D-Type Flip-Flop



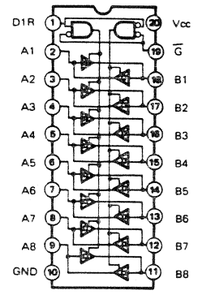
- **TC40H240P** (IG068100)

Octal Bus Inverter



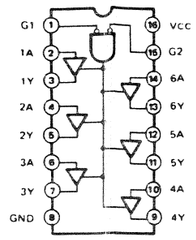
- **TC40H245P** (IG130700)
- **SN74HC245N** (IR024550)

Octal 3-State Bus Transceiver



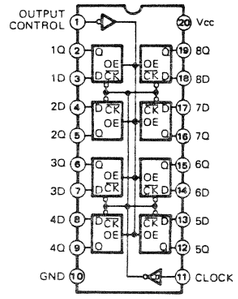
- **SN74HC365N** (IR036550)

Hex 3-State Bus Buffer



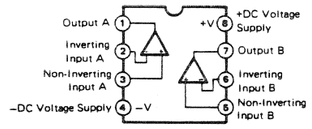
- **TC40H374P** (IG078600)

Octal 3-State D-Type Flip-Flop



- **NJM4556** (IG042500)
- **NJM072D** (IG107000)
- **NJM4558DV** (IG001390)

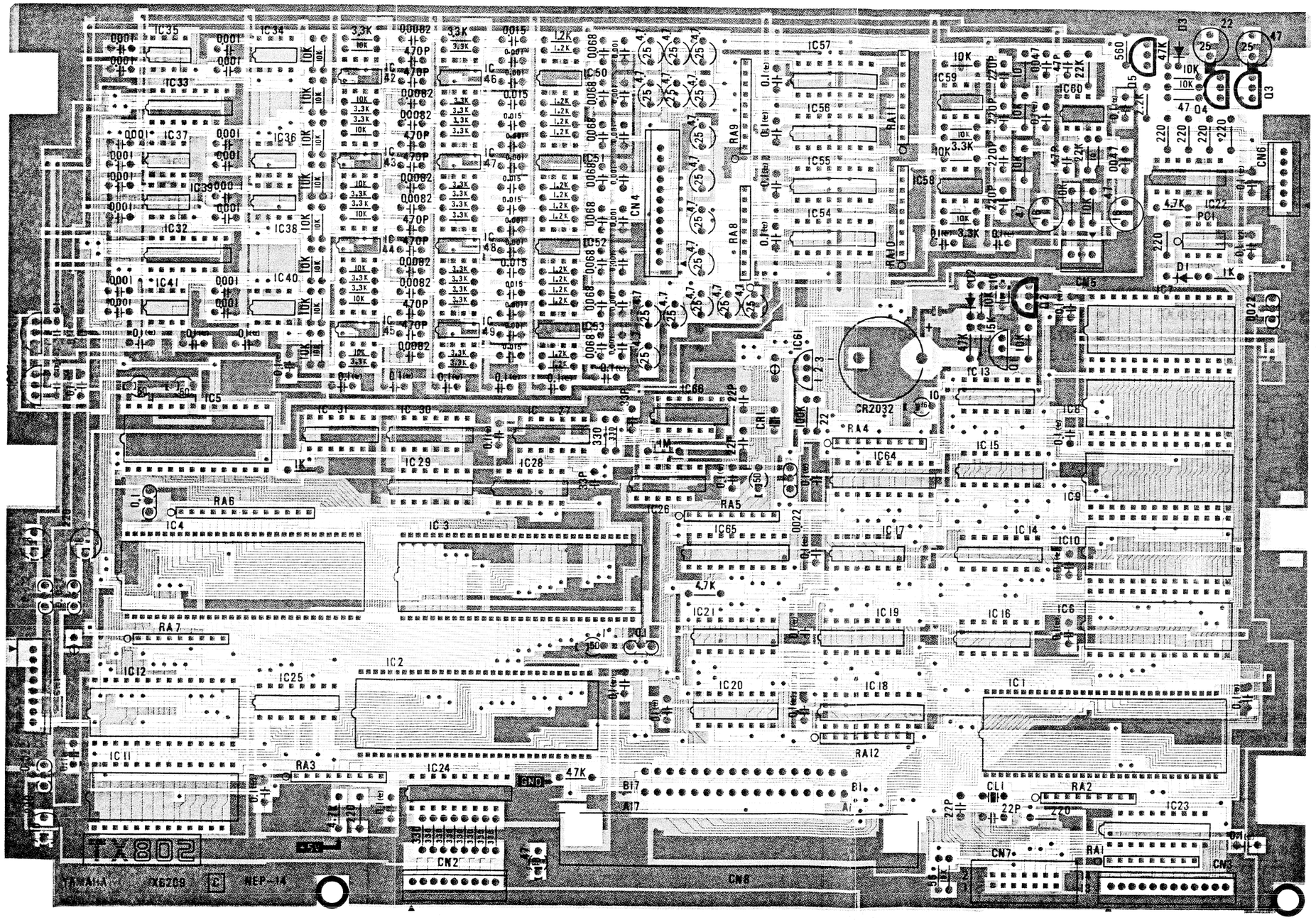
Dual Operation Amplifier



TX802

■CIRCUIT BOARDS（シート基板図）

●DM Circuit Board



Components side（部品側）

Notes)

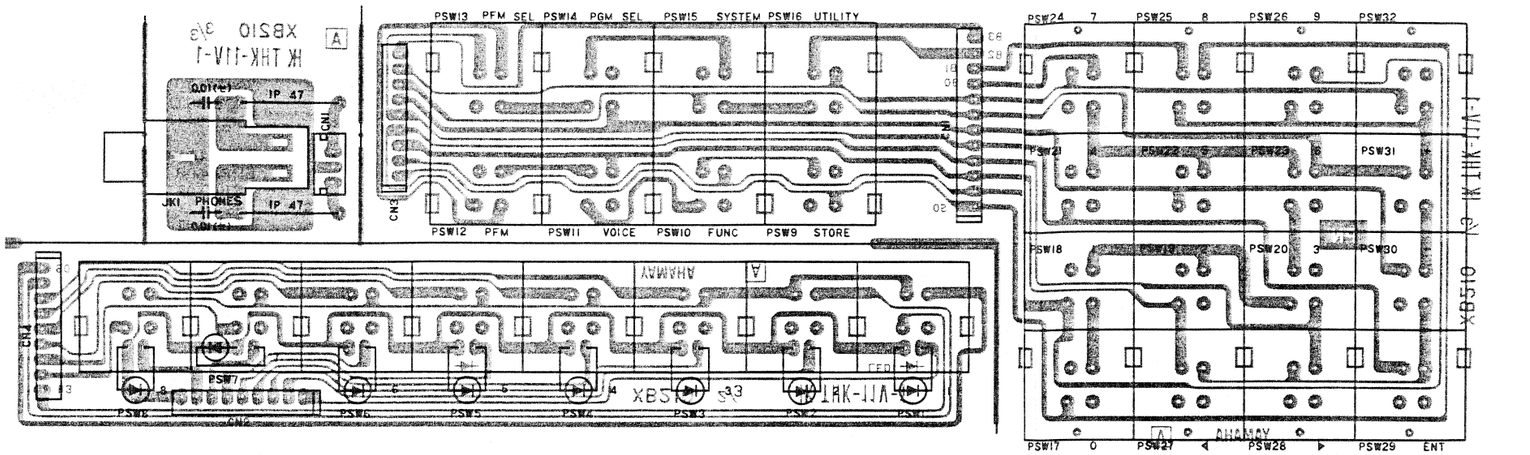
DM. Circuit Board: XB209C

1. IC:
   - IC1: HD63B03YP-N (XD245001) CPU (Master)
   - 2: HD63C03YP (XB529001) CPU (Slave)
   - 3: YM3609 (XA898001) EGM
   - 4: YM2604 (XA489001) OPS2
   - 5: PCM54HP (XA566001) DAC
   - 6: 952AV100 (XB223002) (Main)
   - 7 ~ 9: TC5564PL-15 (XB013001) 8kX8 SRAM
   - 10: 952BV100 (XB224002) (Wave)
   - 11: 952CB100 (XB536002) (Slave)
   - 12: TC5565L-12, 15 (IG148500) 64K SRAM
   - 13: SN74HC14N (IR001450) INV
   - 14: SN74HC139N (IR013950) DECO2
   - 15: TC40H138P (IG111900) DEC DEMP
   - 16, 29, 30: SN74HC174N (IR017450) D.FF
   - 17, 28: SN74HC08N (IR000850) AND
   - 18: SN74HC245N (IR024550) Transceiver
   - 19 ~ 21: SN74HC365N (IR036550) BUS DRI
   - 22: HD74LS04P (IG027010) INV
   - 23: TC40H240P (IG068100) INV
   - 24: TC40H245P (IG130700) BUS BUFF
   - 25: SN74HC138N (IR013850) DECO3
   - 26: TC40H004P (IG51000) INV
   - 27: TC40H074P (IG051100) DFF
   - 31: SN74HC04N (IR000450) INV
   - 32, 33: MC74HC4051N (IR405170) ANALOG MPX
   - 34 ~ 41: NJM072D (IG107000) OP AMP.
   - 42 ~ 53,
   - 58, 59: NJM4558DV (IG001390) OP AMP.
   - 54 ~ 57: NJU7301D (XB476001) ANALOG Switch
   - 60: NJM4556 (IG042500) OP AMP.
   - 61: PST518B-2 (IG116200) System Reset
   - 62: NJM78L05A (IG065510) 5V Regulator
   - 63: NJM79L05 (IG130500) –5V 0.1A
   - 64, 65: TC40H374P (IG078600) DFF
   - 66: TC74HC86 (IR008600) EX-OR
2. Photo Coupller:
   - PC1: TLP552
3. Transistor:
   - Q1: 2SC1815 Y, GR
   - 2: 2SA1015 O, Y
   - 3 ~ 5: 2SA933S Q, R
4. Diode:
   - D1 ~ 3: 1SS176
5. Resistor Array:
   - RA1 ~ 5: 4.7kΩ x 8 EX-F9E472J5
   - 6: RML12 4.7K
   - 7: RMLS8-102J
   - 8 ~ 11: 10kΩ x 8 EXB-F9E103J5
   - 12: EXB-F9E474J
6. Semiconductive Cera. Cap.
   - Marked (±): 0.1μ 16V M
7. EMI Filter:
   - EMI1 ~ 4,7: LS MT Y223NB
   - 5, 6: DS310-55D-104M1
8. Resonator:
   - CR1: Quartz Crystal Unit 9.4265M AT-49
   - CL1: Ceramic Resonat or 8M CSA8MT
9. Ferrite Bead:
   - FB1, 2: BL02RN1-R62T2
10. Lithium Battery:
    - B1: CR2032-P5-2

3NA-VB49870-72 ⚠

TX802

●PN Circuit Board



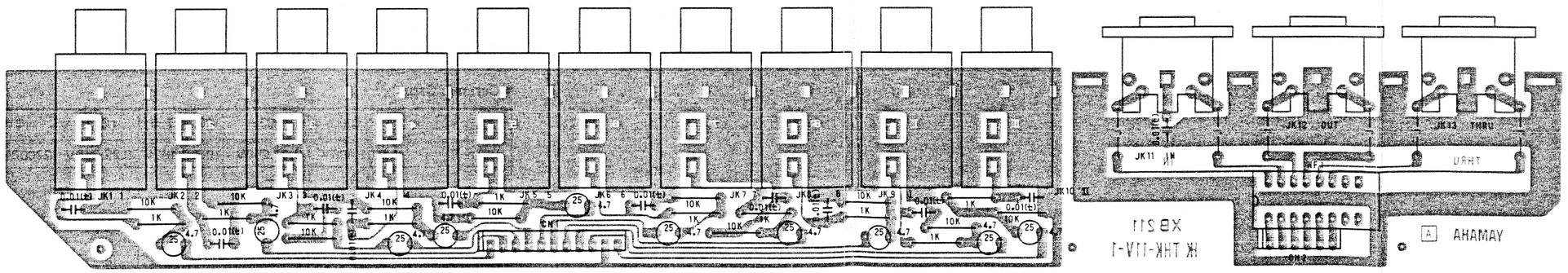
Components side (部品側)

Notes)

PN Circuit Board: XB210B

1. LED:
   LED1 ~ 8: LN242RP RE
2. Push Switch:
   PSW1 ~ 32: EVQ-Q8R13K
3. Coil:
   L: 20μH

●JK Circuit Board



Components side (部品側)

Notes)

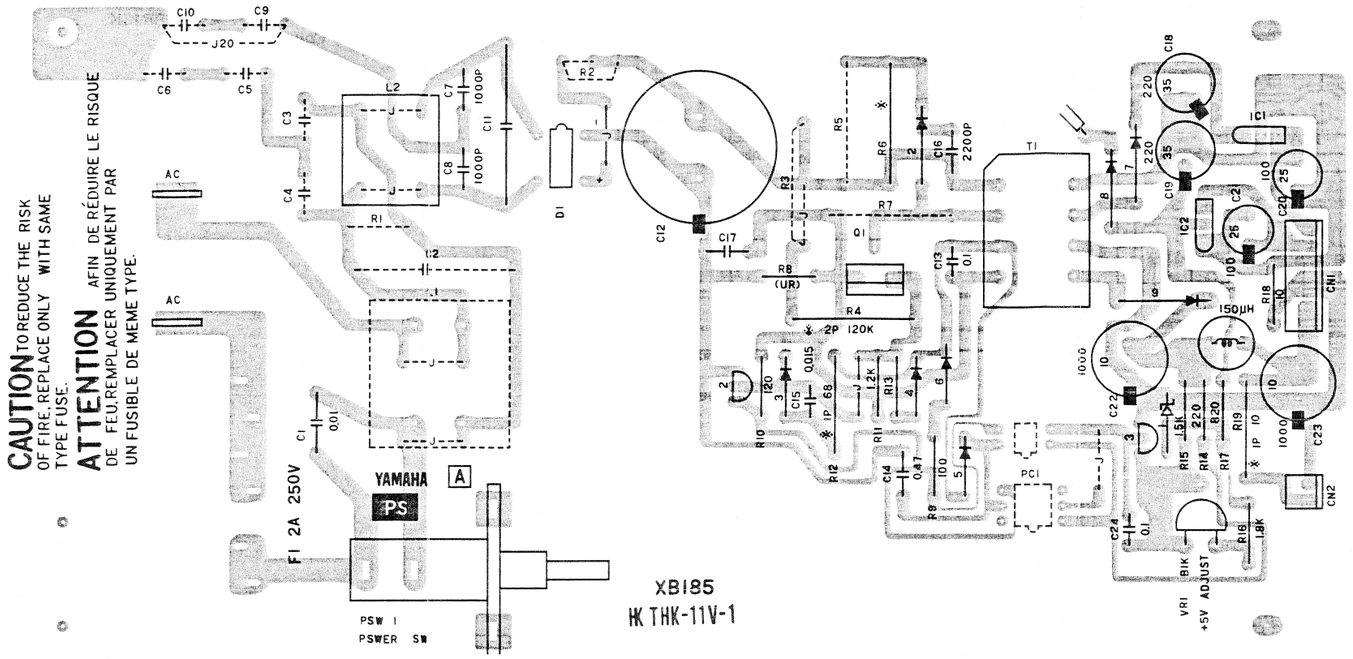
JK Circuit Board: XB211B

1. Transistor:
   Q1 ~ 10: 2SC2878 A, B
2. Filter:
   NF1: D-03C

3NA-VB50160-72 ⚠: PN
3NA-VB50170-72 ⚠: JK

TX802

●PS Circuit Board



Components side (部品側)

Notes)

PS Circuit Board: XB185B

1. IC:
   IC1: AN7815F (XB449001) +15V Regulator
   2: AN7915F (XB450001) −15V Regulator
2. Photo Coupller:
   PC1: PC817
3. Transistor:
   Q1: 2SC3310
   2: 2SC2655 O, Y
   3: 2SC2634 R, S, T
4. Diode:
   D1: S1WB (A) 40 1A 40 Diode Stack
   2: ERB44-06
   3: ERB43-02
   4 ~ 6: 1SS84
   7, 8: ERB44-02
   9: S2K-20
5. Zener Diode:
   ZD1: RD6.2EB2 6.2V
6. Wire Wound Resistor:
   R2: 10Ω 3W
   8: 2.2Ω 3W
7. Potentiometer:
   VR1: B1.0kΩ RVF
8. Coil:
   L2: 5mH NF01UA502
   3: 150μH
9. Push Switch:
   PSW1: ESB-8213A

PS Circuit Board

● Metal Oxide Resistor

Model	R4	R6	R7	R12	R19
Japanese	120kΩ 2W	68kΩ 2W	220Ω 2W	68Ω 1W	10Ω 1W
U.S.	↓	↓	↓	↓	↓
Canadian	↓	↓	↓	↓	↓
North European	↓	–	–	↓	↓
West German	↓	–	–	↓	↓

● Ceramic Cap.

Model	C1	C2	C3, 4, 7, 8	C11	C16	C17
Japanese	0.01 400V	0.47 250V	1000P 400V	0.22 250V	2200P 400V	220P 400V
U.S.	↓	–	↓	↓	↓	↓
Canadian	↓	–	↓	↓	↓	↓
North European	↓	–	↓	↓	↓	–
West German	↓	0.47 250V	↓	↓	↓	–

● Fuse & Transformer

Model	F1	T1
Japanese	▽ 2A 250V	TM205
U.S.	ST-4 2A 250V	↓
Canadian	↓	TYA018
North European	500mA 250V	TYA020
West German	↓	↓

3NA-VB50220-72 ⚠0: J, U, C
3NA-VB50260-72 ⚠0: H, D

■TEST PROGRAM(テストプログラム)

1. Preparation Instructions

(1) Connect the MIDI IN jack to the MIDI OUT with a MIDI cable.

(2) You can input a test program number with the +1 or −1 switch.

(3) If the LCD display indicates the message as shown in the figure 1, pressing the ENTER switch will advance the Test Program to the next routine and activate that test.

Push "ENTER" to next

(fig. 1)

(4) If the LCD display indicates the message as shown in the figure 2, pressing the ENTER switch will initiate the Test Program indicated on the LCD:

Push "ENTER"

(fig. 2)

2. Test Program Entry

(1) While pressing the 8 and 9 switches, turn the POWER switch on. The LCD display indicates the version number of the Test Program message as shown in the figure 3.

TEST PROGRAM V□.□ Push "ENTER"

(fig. 3)

(2) If the ENTER switch is pressed, the Test Program 1 will be initiated.

(3) If the NO switch is pressed, the routine will reset the system to normal operating mode.

3. TEST 1 : RAM check

When this test is initiated, the RAM check is performed automatically. If the test is OK, the Program will proceed to the next routine. If the test is NG, the LCD display will indicate the error message as shown in the figure 4.

TEST-01 RAM IC7 Error!

(fig. 4)

1 準 備

MIDI OUT と MIDI IN を接続しておきます。

2 テストプログラム エントリー

1). テンキーの「8」,「9」を同時に押しながら, POWER ON します。

2). LCD にバージョン番号と, Push "ENTER" が表示されたら「8」,「9」を離します。

▼LCD 表示

TEST PROGRAM V1.0 Push "ENTER"

3). テストモードに入るためには「ENTER」キーを押します。「NO」を押したときは, 通常の動作モードとなります。

4). 各々のテストにおいて下行に Push "ENTER" to next と表示される場合は,「ENTER」キーを押すことにより次のテストに移り, 実行されます。Push "ENTER" と表示される場合は「ENTER」キーを押すことによりそのテストが実行されます。「+1」,「−1」キーはテスト番号の増減を行いますが, テストは実行されません。

3 RAM チェック(自動チェック)

テストモードに入ると自動的に RAM のチェックを行いますが, RAMに異常がある場合のみエラー表示され, 正常なときは何も表示されずに次のテストに移ります。

▼LCD 表示(エラー時のみ)

TEST-01 RAM IC7 Error!

(IC……7 − 9)

4 LCD チェック

LCD のドットがすべて同時に点滅するので, 目視にてドットの欠け等がないことを確認します。

5 パネル LED チェック

TONE GENERATOR ON/OFF スイッチに付いている LED が, 以下の動作を 2 巡行いますので, 目視にて点灯不良が無いことを確認します。

1). 1から8まで順次点灯。
2). 全 消 灯
3). 全 点 灯
4). 全 消 灯

◆1).−4). を 2 巡行い, 最後に全点灯。

4. TEST 2 : LCD check

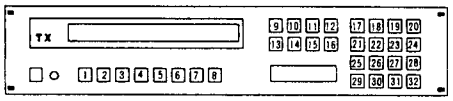
The entire LCD turns "ON and OFF" repeatedly, so that you can verify proper lighting of the LCD display.

5. TEST 3 : LED check

The LED indicators for the TONE GENERATOR ON/OFF will light one after another from left to right, then all of the LED indicators will light simultaneously. This operation occurs 2 times, so that you can verify proper lighting of the LED indicators.

6. TEST 4 – 35 : Panel switch check

When this test is initiated, Test 3 and switch number/name message will appear in the LCD display. Press the switch that is indicated by the LCD display. Pressing the correct switch will advance the Switch Test Program. If an incorrect switch is pressed, or the switch that is indicated by the LCD display is opened, the routine will not proceed to the next step. If the switch is bridged, the LCD display will indicate the switch error message.



(fig. 5)

7. TEST 36 : MIDI check

When this test is initiated, the MIDI check is performed automatically.

8. TEST 37 – 41 : Cartridge check

(1) TEST 37 – 39 : Cartridge type check

1 Insert a 64kbits RAM cartridge and press the ENTER switch.

2 Insert a 256kbits RAM cartridge and press the ENTER switch.

3 Insert a 1Mbits RAM cartridge and press the ENTER switch.

(2) TEST 40 : Protect switch check
Insert a 64kbits RAM cartridge and making sure the cartridge "Memory Protect Switch" is ON. Press the ENTER switch.

(3) TEST 41 : Read/write check
Turn the cartridge memory protect switch OFF. Press the ENTER switch.

6 パネルスイッチチェック

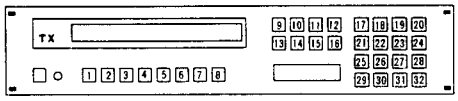
LCD に次に押すスイッチが表示されますので，そのスイッチを押します。正常であれば次のスイッチに進みますが，オープンまたはブリッジしているときは進みません。また，ブリッジしている時のみLCDにエラーが表示されます。

▼LCD 表示

```
TEST-04 SW TG 1
```

TEST-04,,,11＝(TG…1－8)
TEST-12,,,19＝(MODE…PS,VS,SY,UT,PE,V1,V2,ST)
TEST-20,,,35＝(10key…0－9,←,→,EN,－1,＋1,－)

パネルスイッチを押す順番は，以下の図のとうりです。



7 MIDI チェック(自動チェック)

MIDI の送受信チェックを行います。
MIDI OUT から "AA, FF, 00, 55" を送信し，それを MIDI IN で受信して自動判定を行います。

8 カートリッジ端子チェック

カートリッジのタイプ，プロテクト，読み出し／書込みの各チェックを行います。

タイプチェック……以下のカートリッジを挿入し，「ENTER」を押す。
type1＝ 64Kbit(RAM4)
type2＝256Kbit
type3＝ 1Mbit

プロテクトチェック……
RAM カートリッジ (64K) のプロテクトスイッチを ON にし，「ENTER」を押す。

リード／ライトチェック……
RAM カートリッジ (64K) のプロテクトスイッチを OFF にし，「ENTER」を押す。

- TEST-37,,,39＝(type1-3)
- TEST-40 , 41＝(protect, read/write)

9. TEST 42 – 51 : LINE OUT level check

When this test is initiated, the LCD display indicates Test 42 and OUTPUT message as shown in the figure 6.

TEST 42 OUTPUT 1

(fig. 6)

(1) TEST 42 – 49 : INDIVIDUAL OUTPUT level check

1 Continuous sounds (–6.5 ± 3 dBm at 880 Hz) can be obtained from the 1-8 INDIVIDUAL OUTPUT connectors (RL: 10kΩ, Maximum noise level: –77.0 dBm).

2 Continuous sounds (–16.0 ± 3 dBm at 880 kHz) can be obtained from the MIXED OUTPUT I and II connectors (RL: 10kΩ, Maximum noise level: –80.0 dBm).

10. TEST 52 – 53 : Headphones output level check

When this test is initiated, continuous sounds (–15.0 ± 3dBm at 880 kHz) can be obtained from the PHONES connector (RL: 47Ω, Maximum noise level: –64.0 dBm).

※ TEST 52, 53 = L, R

11. TEST 54 – 55 : Mix gates check

When this test is initiated, continuous sound can be obtained in the order of note C, D, D#, E, ... , B, C from the MIXED OUT I and II connectors or the PHONES connector.

※ TEST 54, 55 = I, II

12. TEST 56 : Memory Initialization

When this routine is initiated, the LCD display indicates the message as shown in the figure 7.

TEST-56 Init system? (ENT + YES)

(fig. 7)

If the +1 switch is pressed while pressing the ENTER switch, the memory will be initialized. If the +1 switch is pressed without pressing the ENTER switch, the initialization will not be activated.

9 ラインアウトレベルチェック

各ライン出力端子のレベルチェックを行います。
自動的にA4 (880Hz) の音が出力されるので，以下のレベル範囲であるかどうかをチェックします。

出力レベル　（負荷抵抗　10kオーム）

1 – 8 = –6.5± 3 dbm

I，II = –16.0± 3 dbm

ノイズレベル

1 – 8 = –77.0dbm 以下

I，II = –80.0dbm 以下

▼LCD 表示

TEST-42 OUTPUT 1

●TEST-42,,,49 = (1 – 8)

●TEST-50 , 51 = (I , II)

10 ヘッドフォンレベルチェック

ヘッドフォン端子のレベルチェックを行います。
自動的にA4 (880Hz) の音が出力されるので，以下のレベル範囲であるかどうかをチェックします。

出力レベル　（負荷抵抗　47オーム）

L , R = –15.0± 3 dbm

ノイズレベル

L , R = –64.0 dbm 以下

●TEST-52, 53 = (L, R)

11 ミックスゲートチェック

MIXOUT I，II から自動的にドレミファソラシドが出力されるので，耳で聞いて音抜けや複音同時発音が無いことを確認します。

◆ヘッドフォンによる確認でも可。(I , II = L,R)

●TEST-54, 55 = (I , II)

12 システムイニシャライズ

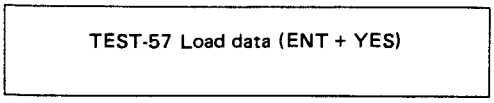
TX802 のシステムメモリーを初期化します。
初期化する場合は「ENTER」キーを押しながら「+1 (YES)」キーを，初期化しない場合は「+1(YES)」キーのみを押します。

▼LCD 表示

TEST-56 Init system ? (ENT + YES)

13. TEST 57 : Store data

When this routine is initiated, the LCD display indicates the message as shown in the figure 8.



(fig. 8)

(1) Insert a standard accessory ROM cartridge to the CARTRIDGE slot.

(2) If the +1 switch is pressed while pressing the ENTER switch, VOICE and PERFORMANCE data will be stored in internal memory.

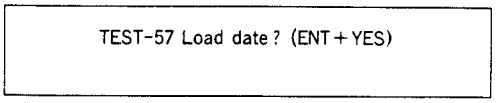
(3) If the +1 switch is pressed without pressing the ENTER switch, data will not be stored.

(4) If this routine is performed, normal operation will be restored.

13 出荷データロード

TX802 の内部メモリーに出荷用のボイス，パフォーマンスの各データをカートリッジからロードします。所定のカートリッジをカートリッジスロットに挿入し，「ENTER」キーを押しながら「+1(YES)」キーを押します。ロードしない場合は「+1(YES)」キーのみを押します。

▼LCD 表示



◆このテストが修了すると，通常動作となります。

FM TONE GENERATOR

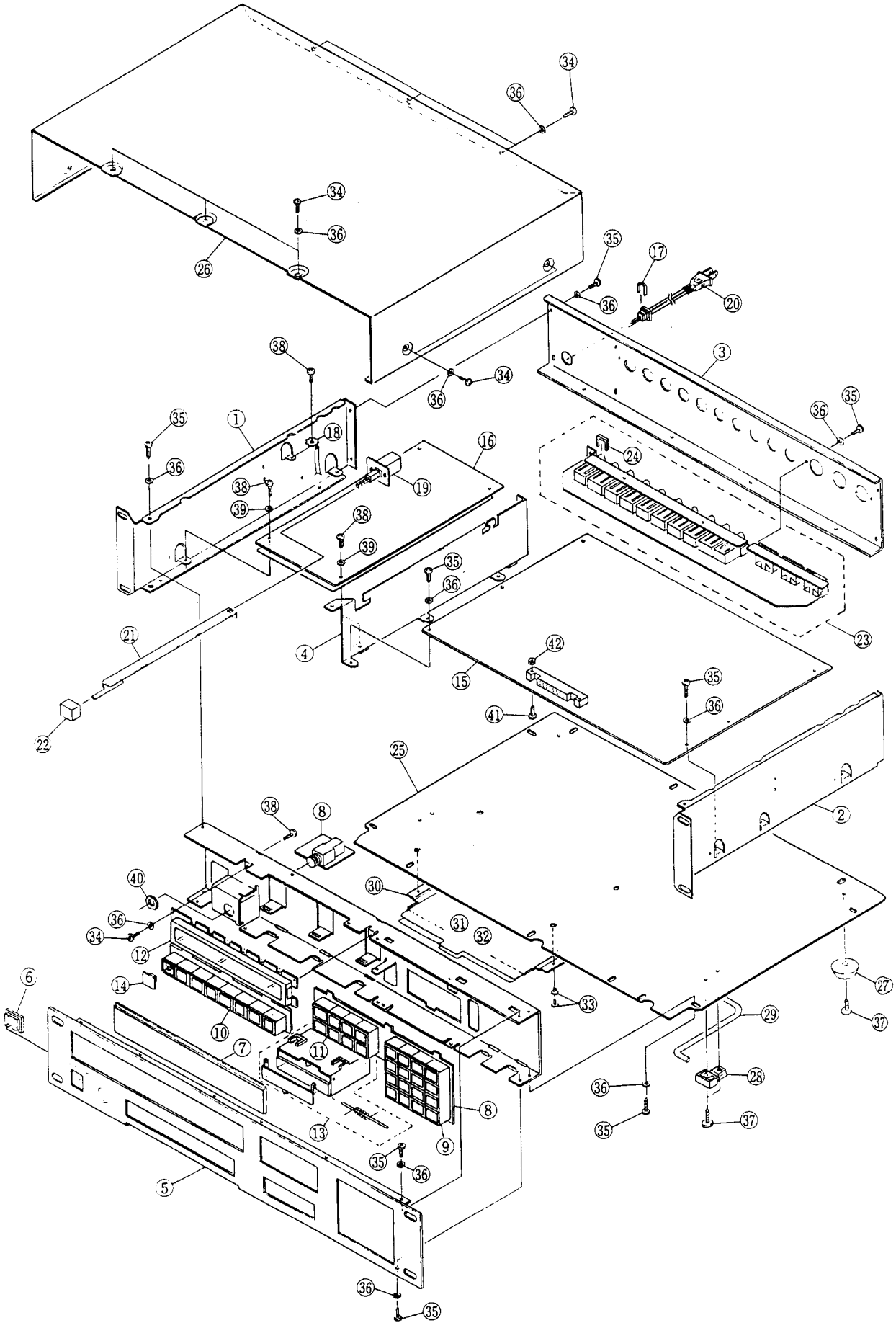
TX802

PARTS LIST

Notes DESTINATION ABBREVIATIONS

A	: Australian model	J	: Japanese model
B	: British model	M	: South African model
C	: Canadian model	Q	: South-east Asia model
D	: West German model	U	: U.S. model
E	: European model	V	: General export model (110V)
F	: French model	W	: General export model (220V)
G	: Belgian model	X	: General export model
H	: North European model	Y	: Export model
I	: Indonesian model		

■OVERALL ASSEMBLY（総組立）



■OVERALL ASSEMBLY（総組立）

	Ref. No.	Part No.	Description		部品名	Remarks	ランク
*	1	VB667200	Side Board	L	側板（L）		05
*	2	VB667300	Side Board	R	側板（R）		05
*	3	VB667400	Rear Panel		リアパネル	J	
*	3	VB672700	Rear Panel		リアパネル	U	
*	3	VB672900	Rear Panel		リアパネル	C	
*	3	VB673000	Rear Panel		リアパネル	H	
*	3	VB671300	Rear Panel		リアパネル	D	
*	4	VB667500	Stay		ステー		04
*	5	VB670300	Front Panel		フロントパネル		11
	6	VA029600	Escutcheon	(L)	SWエスカッション	Power ON/OFF	02
*	7	VB670500	Cover,Meter		メーターカバー		
*	8	VB501600	Circuit Board	PN	PNシート		12
	9	VA001000	Escutcheon		SWエスカッション	16	01
	10	VA314300	Escutcheon		SWエスカッション	8	01
	11	VA314400	Escutcheon		SWエスカッション	MODE SELECT	01
*	12	VC006700	LCD Assembly	40X2 LED	LCD Ass'y		24
	13	VB671900	Cartridge Assembly		カートリッジAss'y		05
	14	VB248500	Key Top		トップキャップ	1	02
	14	VB248600	Key Top		トップキャップ	2	02
	14	VB248700	Key Top		トップキャップ	3	02
	14	VB248800	Key Top		トップキャップ	4	02
	14	VB248900	Key Top		トップキャップ	5	02
	14	VB249000	Key Top		トップキャップ	6	02
	14	VB249100	Key Top		トップキャップ	7	02
	14	VB249200	Key Top		トップキャップ	8	02
*	14	VB676000	Key Top		トップキャップ	PERFORM SELECT	01
*	14	VB676100	Key Top		トップキャップ	PERFORM EDIT	01
*	14	VB676200	Key Top		トップキャップ	VOICE SELECT	01
*	14	VB676300	Key Top		トップキャップ	VOICE EDIT(I)	01
*	14	VB676400	Key Top		トップキャップ	SYSTEM SETUP	01
*	14	VB676500	Key Top		トップキャップ	VOICE EDIT(II)	01
*	14	VB676600	Key Top		トップキャップ	UTILITY	01
*	14	VD781400	Key Top		トップキャップ	STORE/COMPARE	02
*	14	VB676700	Key Top		トップキャップ	← INT	01
*	14	VB676800	Key Top		トップキャップ	→ CRT	01
*	14	VB676900	Key Top		トップキャップ	-/.,	01
*	14	VB677000	Key Top		トップキャップ	ENTER SPACE→	01
*	14	VB677100	Key Top		トップキャップ	ON/YES+1 UPPER	01
*	14	VB677200	Key Top		トップキャップ	OFF/NO-1 LOWER	01
*	14	VC472500	Key Top		トップキャップ	0 ABC	01
*	14	VC472800	Key Top		トップキャップ	1 DEF	01
*	14	VC472900	Key Top		トップキャップ	2 GHI	01
*	14	VC473000	Key Top		トップキャップ	3 JKL	01
*	14	VC473200	Key Top		トップキャップ	4 MNO	01
*	14	VC473300	Key Top		トップキャップ	5 PQR	01
*	14	VC473400	Key Top		トップキャップ	6 STU	01
*	14	VC473500	Key Top		トップキャップ	7 VWX	01
*	14	VC473600	Key Top		トップキャップ	8 YZ!	01
*	14	VC473700	Key Top		トップキャップ	9 #&+	01
*	15	VB498700	Circuit Board	DM	DMシート		57
*	16	VB502200	Circuit Board	PS	PSシート	J	
*	16	VB502300	Circuit Board	PS	PSシート	U	
*	16	VB502500	Circuit Board	PS	PSシート	C	
*	16	VB502600	Circuit Board	PS	PSシート	H	
*	16	VB970900	Circuit Board	PS	PSシート	D	
	17	CB811230	Cord Strain Relief	SR-6N-4	コードストッパー	U	02
	17	CB806850	Cord Strain Relief	SR-6N3-4	コードストッパー	C	02
	17	CB072750	Cord Strain Relief	SR-4N-4	コードストッパー	H	01
	17	CB032840	Cord Strain Relief	SR-5N-4	コードストッパー	D	01
	18	LA003690	Lug Terminal		ラグ端子	C,D	01
	19	VA803700	Switch Panel		スイッチパネル		02
	20	MG001820	AC Cord	7A 3.0M	電源コード	J	05
	20	MG000100	AC Cord	10A 12FT	電源コード	U	08
	20	MG000270	AC Cord	10A 3.3M	電源コード	C	09
	20	VC309900	AC Cord	2.5A 3.3M	電源コード	H	06
	20	MG000450	AC Cord	6A 3.5M	電源コード	D	
*	21	VB667600	Rod		ロッド		02
	22	CB812380	Push Button		プッシュボタン		01
*	23	VB671800	Circuit Board Assembly	JK	JKシートAss'y		12
	24	LB301910	Angle Bracket	HLJ0999-01-480	U字金具		01
	25	VB248100	Bottom Cover		ボトムカバー		07
	26	VB248000	Top Cover		トップカバー		09
	27	CB801270	Foot	BL	ゴム足		01
	28	CB834960	Holder		スタンドホルダー		02
*	29	VC048700	Tilt Stand		チルトスタンド		11
*	30	VC075400	OP Guide Holder		OPガイドホルダー		04
*	31	VC104100	OP Guide Sheet A		OPガイドシートA		09
*	32	VC104200	OP Guide Sheet B		OPガイドシートB		09
*	33	VC089400	Nylon Rivet	NRP-232	ナイロンリベット		

＊：New Parts（新規部品）　NR

ランク：Japan Only

Ref. No.	Part No.	Description		部品名	Remarks	ランク
34	ED330066	Bind Head Screw	3.0X6 FCM3BL	バインド小ネジ		01
35	ED330086	Bind Head Screw	3.0X8 FCM3BL	バインド小ネジ		01
36	EV413036	Toothed Lock Washer	A3.0 FCM3BL	歯付座金		01
37	ED340126	Bind Head Screw	4.0X12 FCM3BL	バインド小ネジ		01
38	ED340066	Bind Head Screw	4.0X6 FCM3BL	バインド小ネジ		01
39	EV403046	Toothed Lock Washer	A4.0 FCM3BL	歯付座金		01
40	EV103126	Hexagohal Nut	12 BL	特殊六角ナット		01
41	EA330146	Pan Head Screw	3X14 FCM3BL	ナベ小ネジ		01
42	EV108030	Hexagonal Nut	3.0 ZMC2Y	フランジ付六角ナット		01

＊：New Parts（新規部品）　NR

ランク：Japan Only

■ELECTRICAL PARTS（電気部品）

Ref. No.	Part No.	Description		部品名	Remarks	ランク
	VB498700	Circuit Board	DM	DMシート		57
*	VB671800	Circuit Board Assembly	JK	JKシートAss'y		12
*	VB501600	Circuit Board	PN	PNシート		12
*	VB502200	Circuit Board	PS	PSシート	J	
*	VB502300	Circuit Board	PS	PSシート	U	
*	VB502500	Circuit Board	PS	PSシート	C	
*	VB502600	Circuit Board	PS	PSシート	H	
*	VB970900	Circuit Board	PS	PSシート	D	
*	VB498700	Circuit Board	DM	DMシート		57
	IG001390	IC	NJM4558DV	IC	OP AMP.	03
	IG042500	IC	NJM4556	IC	OP AMP.	04
	IG107000	IC	NJM072D	IC	OP AMP.	04
*	IG065510	IC	NJM78L05A	IC	5V Regulator	03
	IG130500	IC	NJM79L05	IC	-5V 0.1A	03
	IG116200	IC	PST518B-2	IC	System Reset	04
*	XB476001	IC	NJU7301D	IC	ANALOG Switch	06
	IG027010	IC	HD74LS04P	IC	INV	04
	IG051000	IC	TC40H004P	IC	INV	03
	IG051100	IC	TC40H074P	IC	DFF	04
*	IR008600	IC	TC74HC86	IC	EX-OR	
	IG068100	IC	TC40H240P	IC	INV	07
	IG078600	IC	TC40H374P	IC	DFF	07
	IG111900	IC	TC40H138P	IC	DEC DEMP	04
	IG130700	IC	TC40H245P	IC	BUS BUFF	06
*	IR036550	IC	SN74HC365N	IC	BUS DRI	03
	IR000450	IC	SN74HC04N	IC	INV	03
	IR000850	IC	SN74HC08N	IC	AND	03
	IR001450	IC	SN74HC14N	IC	INV	05
	IR013850	IC	SN74HC138N	IC	DEC03	05
	IR013950	IC	SN74HC139N	IC	DEC02	05
	IR017450	IC	SN74HC174N	IC	D.FF	05
	IR024550	IC	SN74HC245N	IC	Transceiver	06
*	IR405170	IC	MC74HC4051N	IC	ANALOG MPX	04
	XB529001	IC	HD63C03YP	IC	CPU (Slave)	13
*	XA898001	IC	YM3609	IC	EGM	15
*	XD245001	IC	HD63B03YP-N	IC	CPU (Master)	
	IG148500	IC	TC5565L-12,15	IC	64K SRAM	21
	XB013001	IC	TC5564PL-15	IC	8KX8 SRAM	20
*	XB223002	IC	952AV100	IC	ROM(Main)	
*	XB224002	IC	952BV100	IC	ROM(Wave)	
*	XB536002	IC	952CV100	IC	ROM(Slave)	
*	XA489001	IC	YM2604	IC	OPS2	14
*	XA566001	IC	PCM54HP	IC	DAC	12
	IK000470	Photo Coupller	TLP552	フォトカプラ		06
	IA101570	Transistor	2SA1015 O,Y	トランジスタ		03
	IC181580	Transistor	2SC1815 Y,GR	トランジスタ		03
	IA093370	Transistor	2SA933S Q,R	トランジスタ		01
	IX000760	Diode	1SS176	ダイオード		01
	VB187300	Resistor Array	4.7kΩ×8	抵抗アレイ	EXB-F9E472J5	01
	VB187500	Resistor Array	10kΩ×8	抵抗アレイ	EXB-F9E103J5	01
	HZ004700	Resistor Array	RML12 4.7K	抵抗アレイ		01
	VB350600	Resistor Array	RMLS8-102J	抵抗アレイ		01
*	VC005700	Resistor Array	EXB-F9E474J	抵抗アレイ		01
	FZ004110	Semiconductive Cera. Cap.	0.1μ 16V M	半導体セラコン		01
	FZ006970	EMI Filter	LS MT Y223NB	LCフィルターEMI		02
	VB576900	EMI Filter	DS310-55D-104M1	LCフィルターEMI		01
*	VD065600	Quartz Crystal Unit	9.4265M AT-49	水晶振動子		
	VB817500	Ceramic Resonator	8M CSA8MT	セラミック振動子		03
	GE300610	Ferrite Bead	BL02RN1-R62T2	フェライトビーズ		01
	VB436900	Lithium Battery	CR2032-P5-2	リチュウム電池		05
*	VB671800	Circuit Board Assembly	JK	JKシートAss'y		12
	IC287800	Transistor	2SC2878 A,B	トランジスタ		03
	VA928000	Filter	D-03C	ノイズフィルタDIP		07
*	VC017500	Phone Jack	HLJ4306	ホーンジャック	Monaural	02
	LB500520	DIN Jack	5P TCS4650	DINジャック		03
*	VB501600	Circuit Board	PN	PNシート		12
	VA262300	LED	LN242RP RE	LED		01
	HL314470	Metal Oxide Resistor	47Ω 1W	酸化金属被膜抵抗		01
	KA906530	Push Switch	EVQ-Q8R13K	プッシュSW		02
	LB203090	Phone Jack	HLJ0521	ホーンジャック	Stereo	02
	VB971100	Coil	20μH	コイル		01
*	VB502200	Circuit Board	PS	PSシート	J	
*	VB502300	Circuit Board	PS	PSシート	U	
*	VB502500	Circuit Board	PS	PSシート	C	
*	VB502600	Circuit Board	PS	PSシート	H	

* : New Parts（新規部品）　NR

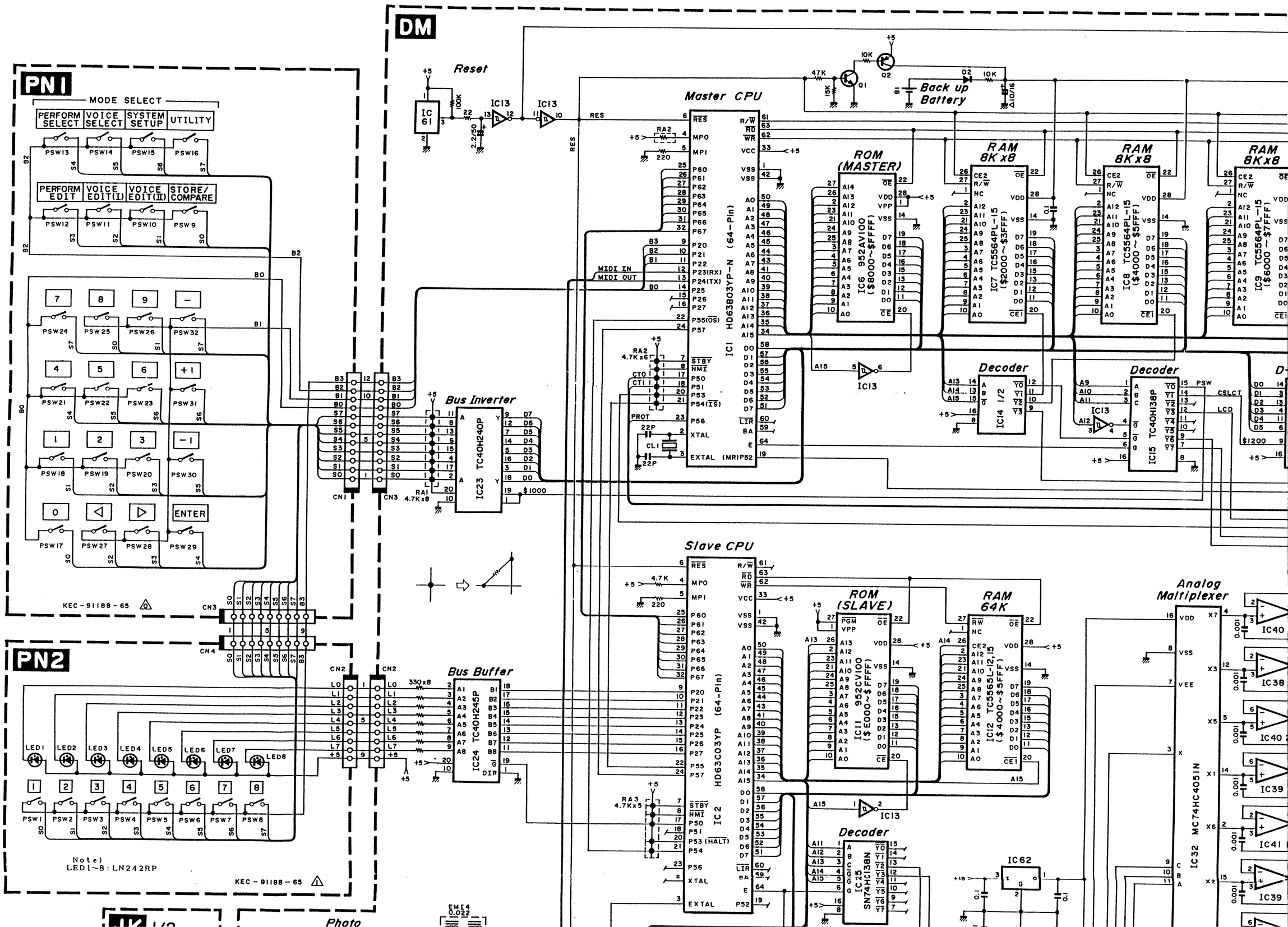
ランク：Japan Only

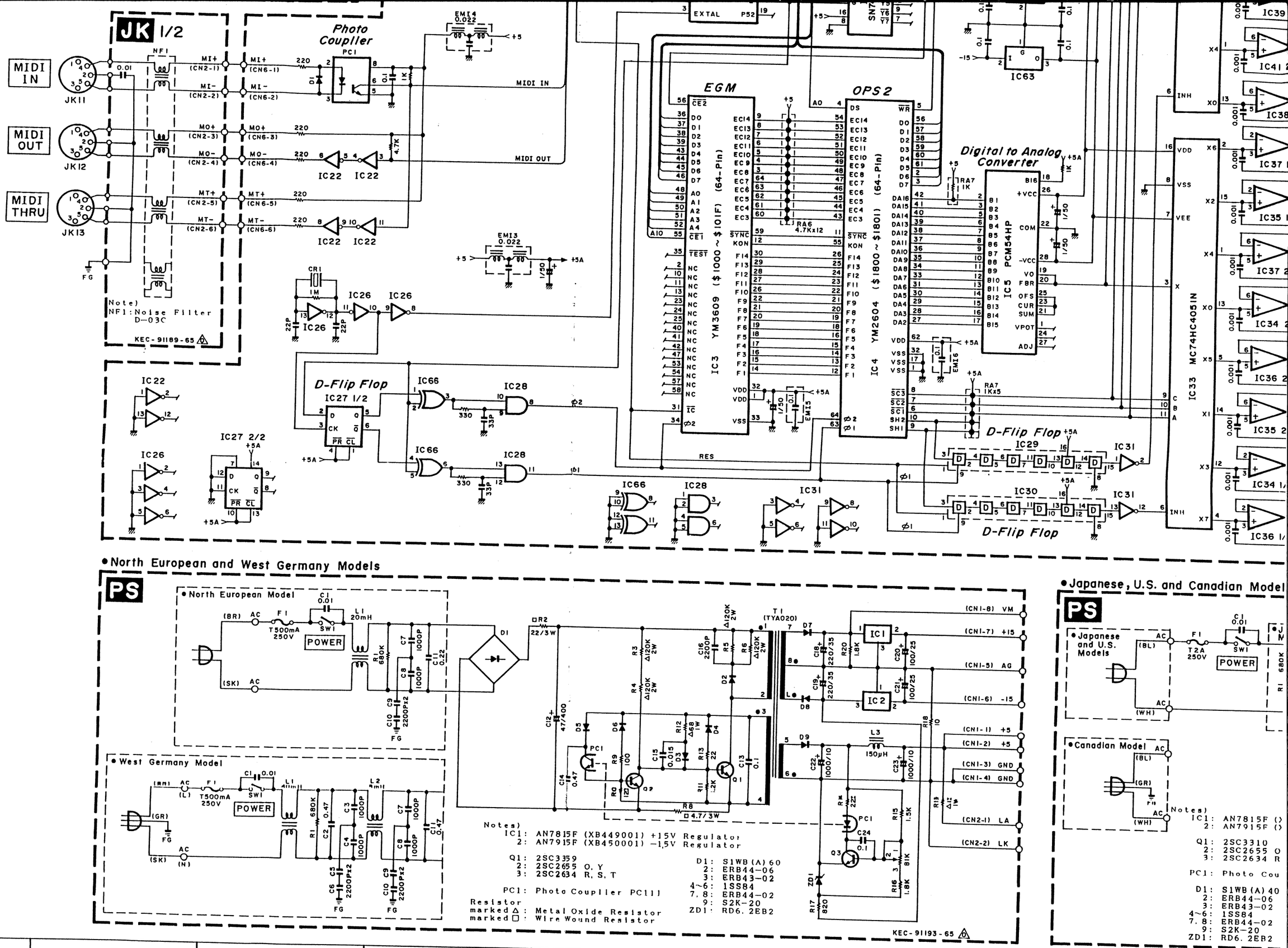
	Ref. No.	Part No.	Description		部品名	Remarks	ランク
*		VB970900	Circuit Board	PS	PSシート	D	
*		XB449001	IC	AN7815F	IC	+15V Regulator	04
*		XB450001	IC	AN7915F	IC	-15V Regulator	04
		IK000480	Photo Coupller	PC817	フォトカプラ	J,U,C	03
*		VB642500	Photo Coupller	PC111	フォトカプラ	H,D	
		IC263400	Transistor	2SC2634 R,S,T	トランジスタ		03
		IC265500	Transistor	2SC2655 O,Y	トランジスタ		03
		IX554350	Transistor	2SC3310	トランジスタ	J,U,C	03
		IX553890	Transistor	2SC3559	トランジスタ	H,D	07
		IF001380	Diode	1SS84	ダイオード		01
		IF008590	Diode	ERB44-02	ダイオード		01
		IX800880	Diode	S2K-20	ダイオード		
		IH001740	Diode	ERB44-06	ダイオード		01
		IH001750	Diode	ERB43-02	ダイオード		01
*		VB845200	Diode Stack	S1WB(A)40 1A 40	ダイオードスタック	J,U,C	02
		IX553900	Diode Stack	S1WB(A)60	ダイオードスタック	H,D	04
		IF001470	Zener Diode	RD6.2EB2 6.2V	ツェナーダイオード		01
		HL314100	Metal Oxide Resistor	10Ω 1W	酸化金属被膜抵抗	J,U,C,H,D	01
		HL314680	Metal Oxide Resistor	68Ω 1W	酸化金属被膜抵抗	J,U,C,H,D	01
		HL325220	Metal Oxide Resistor	220Ω 2W	酸化金属被膜抵抗	J,U,C	01
		HL327680	Metal Oxide Resistor	68KΩ 2W	酸化金属被膜抵抗	J,U,C	01
		HL328120	Metal Oxide Resistor	120KΩ 2W	酸化金属被膜抵抗	J,U,C,H,D	01
		HZ004840	Thermo Fusing Resistor	10Ω 2W	抵抗温度ヒューズ	C	
		HZ004850	Wire Wound Resistor	10Ω 3W	セメント抵抗	J,U	01
		HZ004870	Wire Wound Resistor	2.2Ω 3W	セメント抵抗	J,U,C	01
		HZ004880	Wire Wound Resistor	4.7Ω 3W	セメント抵抗	H,D	
		HZ004860	Wire Wound Resistor	22Ω 3W	セメント抵抗	H,D	
		HT570540	Trimmer Potentiometer	B1.0KΩ RVF	半固定VR		02
*		VA879300	Ceramic Cap.	220P 400V	規格認定コン	J,U,C	
*		VA879600	Ceramic Cap.	1000P 400V	規格認定コン	J,U,C,H,D	
		VA879900	Ceramic Cap.	2200P 400V	規格認定コン	J,U,C,H,D	01
		FI494100	Ceramic Cap.	0.01 400V	規格認定コン	J,U,C,H,D	01
		FR203220	Ceramic Cap.	0.22 250V	規格認定コン	J,U,C,H	
*		VC097300	Ceramic Cap.	0.47 250V	規格認定コン	J,D	
		FJ129100	Electrolytic Cap.	1000μ 10V	ケミコン		02
		GE300820	Coil	150μH	コイル		02
*		VB638000	Coil	NF01UA502	コイル		04
		KA803610	Push Switch	ESB-8213A	プッシュSW		03
		KB000350	Fuse	T250V 2A	ヒューズ	J	01
		KB001240	Fuse	T250V 2A	ヒューズ	U,C	03
		KB000710	Fuse	T250V 500mA	ヒューズ	H,D	02
		LB201530	Fuse Holder	PC-FH1	ヒューズホルダー		01
*		VC006700	LCD Assembly	40X2 LED	LCD Ass'y		24
		GA839100	Power Transformer		電源トランス	J,U	12
		GA841400	Power Transformer		電源トランス	C	
		GA839510	Power Transformer		電源トランス	H,D	
		MG001820	AC Cord	7A 3.0M	電源コード	J	05
		MG000100	AC Cord	10A 12FT	電源コード	U	08
		MG000270	AC Cord	10A 3.3M	電源コード	C	09
		VC309900	AC Cord	2.5A 3.3M	電源コード	H	06
		MG000450	AC Cord	6A 3.5M	電源コード	D	

＊：New Parts（新規部品）　NR

ランク：Japan Only

■TX802 OVERALL CIRCUIT DIAGRAM（総回路図）




JK 1/2
MIDI IN
MIDI OUT
MIDI THRU
JK11
JK12
JK13
NF1
Photo Coupller
PC1
MIDI IN
MIDI OUT
IC22
IC22
IC22
IC22
EMI4 0.022
EMI3 0.022
CR1
IC26
IC26
IC26
Note)
NF1:Noise Filter
D-03C
KEC-91189-65
D-Flip Flop
IC27 1/2
IC66
IC28
IC27 2/2
EGM
IC3 YM3609 ($1000 ~ $101F) (64-Pin)
OPS2
IC4 YM2604 ($1800 ~ $1801) (64-Pin)
Digital to Analog Converter
IC5 PCM54HP
RA6 4.7Kx12
RA7 1K
RA7 1Kx5
IC63
IC33 MC74HC4051N
IC29
IC30
IC31
D-Flip Flop
RES
EMI5
EMI6
• North European and West Germany Models
PS
• North European Model
• West Germany Model
POWER
T500mA 250V
Notes)
IC1: AN7815F (XB449001) +15V Regulator
2: AN7915F (XB450001) −15V Regulator
Q1: 2SC3359
2: 2SC2655 O, Y
3: 2SC2634 R, S, T
PC1: Photo Coupller PC111
Resistor
marked △: Metal Oxide Resistor
marked □: Wire Wound Resistor
D1: S1WB(A)60
2: ERB44-06
3: ERB43-02
4~6: 1SS84
7, 8: ERB44-02
9: S2K-20
ZD1: RD6.2EB2
KEC-91193-65
• Japanese, U.S. and Canadian Model
• Japanese and U.S. Models
T2A 250V
• Canadian Model
Notes)
IC1: AN7815F ()
2: AN7915F ()
Q1: 2SC3310
2: 2SC2655 O
3: 2SC2634 R
PC1: Photo Cou
D1: S1WB(A)40
2: ERB44-06
3: ERB43-02
4~6: 1SS84
7, 8: ERB44-02
9: S2K-20
ZD1: RD6.2EB2

TX802

CARTRIDGE
CN8

ROM (WAVE)
IC10 952BV100 ($6000~$7FFF)

Bus Driver
IC19 SN74HC365N

Bus Driver
IC20 SN74HC365N

Transceiver
IC18 SN74HC245N

Bus Driver
IC21 SN74HC365N

D-Flip Flop
IC16 SN74HC174

Decoder
IC14 2/2

IC17

LCD Display

(CN7-1) VSS
(CN7-2) VDD
(CN7-3) VO
(CN7-4) RS
(CN7-5) R/W
(CN7-6) E
(CN7-7) D0
(CN7-8) D1
(CN7-9) D2
(CN7-10) D3
(CN7-11) D4
(CN7-12) D5
(CN7-13) D6
(CN7-14) D7

PS CN2-1
PS CN2-2

D-Flip Flop
IC64 TC40H374P

D-Flip Flop
IC65 TC40H374P

RA4 4.7Kx8
RA5 4.7Kx8
RA12 470Kx8

IC45 1/2
IC49 1/2
IC53 1/2
IC45 2/2
IC49 2/2
IC53 2/2
IC44 1/2
IC48 1/2
IC52 1/2

CH1
CH2
CH3
CH4

Analog Switch
IC54

RA8 10Kx8
RA10 10Kx8

IC60 1/2

HP
PHONES
JK1

Notes)

IC1:	HD63B03YP-N	(XD245001)	MASTER CPU
2:	HD63C03YP	(XB529001)	SLAVE CPU
3:	YM3609	(XA898001)	EGM
4:	YM2604	(XA489001)	OPS2
5:	PCM54HP	(XA566001)	DAC
6:	952AV100	(XB223002)	ROM (MASTER)
7, 8, 9:	TC5564PL-15	(XB013001)	RAM 8K×8
10:	952BV100	(XB224002)	ROM (WAVE)
11:	952CV100	(XB536002)	ROM (SLAVE)
12:	TC5565L-12, 15	(IG148500)	RAM 64K
13:	SN74HC14N	(IR001450)	INV
14:	SN74HC139N	(IG013950)	DECO2
15:	TC40H138P	(IG111900)	DEC DEMP
16, 29, 30:	SN74HC174N	(IR017450)	D-FF
17, 28:	SN74HC08N	(IR000850)	AND
18:	SN74HC245N	(IR024550)	Transceiver
19~21:	SN74HC365N	(IR036550)	Bus DRI
22:	HD74LS04P	(IG027010)	INV
23:	TC40H240P	(IR068100)	INV
24:	TC40H245P	(IG130700)	Bus Buff
25:	SN74HC138N	(IR013850)	DECO3
26:	TC40H004P	(IG051000)	INV
27:	TC40H074P	(IG051100)	DFF
31:	SN74HC04N	(IR000450)	INV
32, 33:	MC74HC4051N	(IR405170)	ANALOG MPX
34~41:	NJM072D	(IG107000)	OP AMP.
42~53, 58, 59:	NJM4558DV	(IG001390)	OP AMP
54~57:	NJU7301D	(XB476001)	ANALOG Switch
60:	NJM4556	(IG042500)	OP AMP.
61:	PST518B-2	(IG116200)	System Reset
62:	NJM78L05A	(IG065510)	5V Regulator
63:	NJM79L05	(IG130500)	-5V 0.1A
64, 65:	TC40H374P	(IG078600)	DFF
66:	TC74HC86	(IR008600)	EX-OR

PC1: TLP552

Q1: 2SC1815 Y, GR
2: 2SA1015 O, Y
3~5: 2SA933S Q, R

D1~3: 1SS133

RA1~5: 4.7k×8
6: 4.7k×12
7: 1k×8
8~11: 10k×8
12: 470k×8

CL1: Ceramic Resonator 8MHz

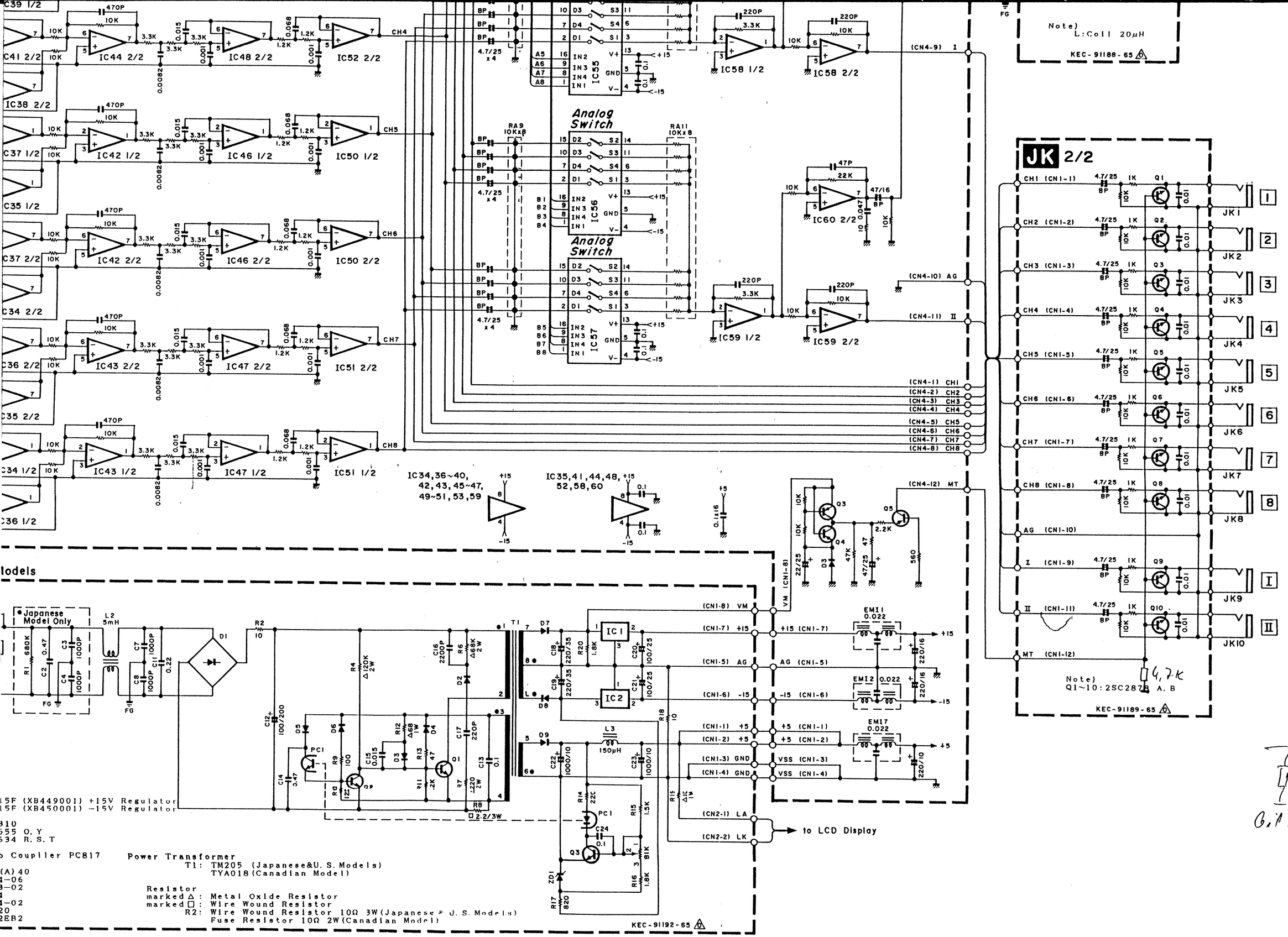
CR1: Quartz Crystal Unit 9.4265MHz

B1: Lithium Battery CR2032T

EMI Filter
EMI1~4, 7: 0.022μF
5, 6: 0.1μF

Capacitor marked Δ: Tantalum Cap.

KEC-91187-65 Δ


IC39 1/2
IC41 2/2
IC38 2/2
IC37 1/2
IC35 1/2
IC42 2/2
IC34 2/2
IC36 2/2
IC35 2/2
IC34 1/2
IC36 1/2
IC44 2/2
IC48 2/2
IC52 2/2
IC42 1/2
IC46 1/2
IC50 1/2
IC46 2/2
IC50 2/2
IC43 2/2
IC47 2/2
IC51 2/2
IC43 1/2
IC47 1/2
IC51 1/2
CH4
CH5
CH6
CH7
CH8
470P
10K
3.3K
0.015
0.001
0.0082
0.068
1.2K
Analog Switch
IC55
IC56
IC57
RA9 10K×8
RA11 10K×8
4.7/25 ×4
IC58 1/2
IC58 2/2
IC59 1/2
IC59 2/2
IC60 2/2
220P
22K
47P
47/16
(CN4-9) I
(CN4-10) AG
(CN4-11) II
(CN4-1) CH1
(CN4-2) CH2
(CN4-3) CH3
(CN4-4) CH4
(CN4-5) CH5
(CN4-6) CH6
(CN4-7) CH7
(CN4-8) CH8
(CN4-12) MT
IC34,36~40, 42,43,45~47, 49~51,53,59
IC35,41,44,48, 52,58,60
0.1×16
Note) L:Coil 20μH
KEC-91188-65
JK 2/2
CH1 (CN1-1)
CH2 (CN1-2)
CH3 (CN1-3)
CH4 (CN1-4)
CH5 (CN1-5)
CH6 (CN1-6)
CH7 (CN1-7)
CH8 (CN1-8)
AG (CN1-10)
I (CN1-9)
II (CN1-11)
MT (CN1-12)
JK1
JK2
JK3
JK4
JK5
JK6
JK7
JK8
JK9
JK10
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
4.7K
Note) Q1~10: 2SC2878 A, B
KEC-91189-65
Japanese Model Only
L2 5mH
D1
R1 680K
C1 0.47
C2 0.47
C3 1000P
C4 1000P
C7 1000P
C8 1000P
C11 0.22
R2 10
R4 120K 2W
C12 100/200
C14 0.47
C15 0.015
C16 2200P
R6 68K 2W
D2
D3
D4
D5
D6
D7
D8
D9
PC1
Q1
Q2
R9 100
R10 12Ω
R11 2K
R12 680 1W
R13 47
R14 22Ω
R15 1.5K
R16 1.8K
R17 820
R18 10
R20 1.8K
C17 220P
C18 220/35
C19 220/35
C20 100/25
C21 100/25
C22 1000/10
C23 1000/10
C24 0.1
L3 150μH
R15 1Ω 1W
R8 2.2Ω 3W
ZD1
IC1
IC2
T1
EMI1 0.022
EMI2 0.022
EMI7 0.022
(CN1-8) VM
(CN1-7) +15
(CN1-5) AG
(CN1-6) -15
(CN1-1) +5
(CN1-2) +5
(CN1-3) GND
(CN1-4) GND
(CN2-1) LA
(CN2-2) LK
VM (CN1-8)
+15 (CN1-7)
AG (CN1-5)
-15 (CN1-6)
+5 (CN1-1)
+5 (CN1-2)
VSS (CN1-3)
VSS (CN1-4)
to LCD Display
KEC-91192-65
Power Transformer
T1: TM205 (Japanese&U. S. Models)
TYA018(Canadian Model)
Resistor
marked △: Metal Oxide Resistor
marked □: Wire Wound Resistor
R2: Wire Wound Resistor 10Ω 3W(Japanese & U. S. Models)
Fuse Resistor 10Ω 2W(Canadian Model)
5F (XB449001) +15V Regulator
5F (XB450001) −15V Regulator
310
555 O, Y
534 R, S, T
Coupller PC817
(A) 40
4-06
3-02
4
4-02
20
2EB2
7
8
9
10
11
12
TX802

TX802 MIDI SYSTEM EXCLUSIVE MESSAGES

1. PARAMETER CHANGE

The TX802 receives seven types of System Exclusive Parameter Change. (These messages are not transmitted.) When a Parameter Change message is received, the LCD will show the current value of the affected parameter. (In the case of 7. Remote Switch, the LCD will show the effect of pressing the specified switch.)

1. VCED (voice edit buffer)
2. ACED (additional voice edit buffer)
3. PCED (performance edit buffer)
4. SYCED (system setup)
5. Micro tuning
6. Fractional scaling
7. Remote switch

Parameter change messages 1-4 and 7 have the following format:

11110000	F0H	
01000011	43H	
0001nnnn	nnnn	= device #
0ggggghh	ggggg	= group number, hh = subgroup number
0ppppppp	ppppppp	= parameter number
0ddddddd	ddddddd	= data
11110111	F7H	

Details of "ggggg/hh/ppppppp/ddddddd" are given in the respective sections.

The format for parameter change message 5 (micro tuning) is given in section 1.5.

The format for parameter change message 6 (fractional scaling) is given in section 1.6.

1.1 VCED Parameter Change

ggggg	= 00000	(0)
hh	= 00	(0)

These messages affect the VCED (voice edit buffer) data one parameter at a time. ppppppp (parameter number) and ddddddd (data) are explained in Table 1.

1.2 ACED Parameter Change

ggggg	= 00110	(6)
hh	= 00	(0)

These messages affect the ACED (additional voice edit buffer) data one parameter at a time. ppppppp (parameter number) and ddddddd (data) are explained in Table 2.

1.3 PCED Parameter Change

ggggg	= 00110	(6)
hh	= 00	(2)

These messages affect the PCED (performance edit buffer) data one parameter at a time. ppppppp (parameter number) and ddddddd (data) are explained in Table 3.

1.4 SYCED Parameter Change

The only system setup data that can be accessed via Parameter Change is the Voice Data Receive Block and Master Tuning.

Voice data receive block

ggggg	= 00110	(6)
hh	= 01	(1)
ppppppp	= 1001101	(77)
ddddddd	= 0 (voice data 1-32) or 1 (voice data 33-64)	

Master tuning

ggggg	= 00001	(1)
hh	= 00	(0)
ppppppp	= 1000000	(64)
ddddddd	= 0 — 127	

1.5 Micro Tuning Parameter Change

11110000	F0H	
01000011	43H	
0001nnnn	nnnn	= device #
0ggggghh	ggggg	= 00110 (6), hh = 00 (0)
0ppppppp	ppppppp	= 1111110 (126)
0kkkkkkk	kkkkkkk	= key number
0hhhhhhh	hhhhhhh	= data (upper)
0lllllll	lllllll	= data (lower)
11110111	F7H	

These messages affect the data in the micro tuning edit buffer one note at a time.

1.6 Fractional Scaling Parameter Change

11110000	F0H	
01000011	43H	
0001nnnn	nnnn	= device #
0ggggghh	ggggg	= 00110 (6), hh = 00 (0)
0ppppppp	ppppppp	= 1111111 (127)
00000ooo	ooo	= operator number
00kkkkkk	kkkkkk	= key group number
0hhhhhhh	hhhhhhh	= data (upper)
0lllllll	lllllll	= data (lower)
11110111	F7H	

These messages affect the data in the fractional scaling edit buffer one operator, one key group at a time.

1.7 Remote Switch Parameter Change

ggggg	= 00110	(6)
hh	= 11	(3)
ddddddd	= don't care	

Remote control is possible for all panel switches, and will have the same effect as actually pressing the switch.
For "ppppppp" (switch number), see Table 4.

2. VOICE DATA BULK DUMP

There are two types of bulk dump for voice data.

1. Voice edit buffer bulk dump
2. Voice memory bulk dump

For details of the format of each bulk dump, see Fig. 1.
When "device # = all", data will be transmitted as if "device # = 1".

2.1 Voice Edit Buffer Bulk Dump

These messages transmit or receive the data in the voice edit buffer.

Transmission is in the following order;

1. Fractional scaling edit buffer bulk data
2. ACED (additional voice edit buffer) bulk data
3. VCED (voice edit buffer) bulk data

Reception is in the order of 1, 2, 3. However, if VCED is received immediately after receiving ACED, the additional voice edit buffer is initialized.

2.2 Voice Memory Bulk Dump

These messages transmit or receive voice data, either 1-32 or 33-64.

Transmission is in the following order;

1. Voice data receive block parameter change
2. Fractional scaling cartridge bulk data
3. AMEM (additional voice memory) bulk data
4. VMEM (voice memory) bulk data

However, "2" is transmitted only when a cartridge is inserted.

Reception is in the order of 1, 2, 3, 4. However, if VMEM is received immediately after receiving AMEM, the additional voice memory is initialized.

3. PERFORMANCE DATA BULK DUMP

There are two types of bulk dump for performance data.

1. Performance edit buffer bulk dump
2. Performance memory bulk dump

3.1 Performance Edit Buffer Bulk Dump

These messages transmit or receive the data in the performance edit buffer. For details of the format, see Fig. 1.

3.2 Performance Memory Bulk Dump

These messages transmit or receive the 64 performances in memory. For details of the format, see Fig. 1.

4. SYSTEM SETUP DATA BULK DUMP

These messages transmit or receive system setup data; i.e. settings made in System Setup Mode except for Micro Tuning data. For details of the format, see Fig. 1.

5. MICRO TUNING DATA BULK DATA

There are three types of bulk dump for micro tuning data. For details of the format, see Fig. 1

1. Micro tuning edit buffer bulk dump
   Transmits or receives the micro tuning data in the edit buffer.

2. Micro tuning with memory # bulk dump
   Transmits or receives the micro tuning data 1-2 in internal micro tuning memory together with the memory number.

3. Micro tuning cartridge bulk dump
   Transmits or receives the data for 63 micro tunings in a cartridge.

6. FRACTIONAL SCALING DATA BULK DUMP

There are two types of bulk dump for fractional scaling data. For details of the format, see Fig. 1

1. Fractional scaling edit buffer bulk dump
   Transmits or receives the fractional scaling data in the edit buffer.

2. Fractional scaling cartridge bulk dump
   Transmits or receives the data for 64 fractional scalings in a cartridge.

7. DUMP REQUEST

The following data dumps can be requested.

VCED	F0H, 43H, 2nH, 00H, F7H
VMEM	F0H, 43H, 2nH, 09H, F7H
ACED	F0H, 43H, 2nH, 05H, F7H
AMEM	F0H, 43H, 2nH, 06H, F7H
PCED	F0H, 43H, 2nH, 7EH, LM--8952PE, F7H
PMEM	F0H, 43H, 2nH, 7EH, LM--8952PM, F7H
System setup	F0H, 43H, 2nH, 7EH, LM--8952S-, F7H
Micro tuning edit buffer	F0H, 43H, 2nH, 7EH, LM--MCRYE-, F7H
Micro tuning internal memory	F0H, 43H, 2nH, 7EH, LM--MCRYMx, F7H
Micro tuning cartridge data	F0H, 43H, 2nH, 7EH, LM--MCRYC-, F7H
Fractional scaling edit buffer	F0H, 43H, 2nH, 7EH, LM--FKSYE-, F7H
Fractional scaling cartridge data	F0H, 43H, 2nH, 7EH, LM--FKSYC-, F7H

Figure 1 - Detail of Bulk D

NOTE: The contents of VCED, VMEM, ACED, AMEM, Micro Tuning Edit Buffer, Micro Tuning Internal Memory, Micro Tuning Cartridge Data, Fractional Scaling Edit Buffer and Fractional Scaling Cartridge Data are the same format as the DX7II.

VCED (voice edit buffer)
F0H, 43H, 0nH, 00H, 01H, 1BH, ⟨VCED data⟩, sum, F7H
Data size = 155 (009BH)
Data format = 7-bit binary
Total bulk size = 155 + 8 = 163

VMEM (voice memory)
F0H, 43H, 0nH, 09H, 20H, 00H, ⟨VMEM data⟩, sum, F7H
Data size = 128 x 32 = 4,096 (1000H)
Data format = 7-bit binary
Total bulk size = 4,096 + 8 = 4,104

ACED (additional voice edit buffer)
F0H, 43H, 0nH, 05H, 00H, 31H, ⟨ACED data⟩, sum, F7H
Data size = 49 (0031H)
Data format = 7-bit binary
Total bulk size = 49 + 8 = 57

AMEM (additional voice memory)
F0H, 43H, 0nH, 06H, 08H, 60H, ⟨AMEM data⟩, sum, F7H
Data size = 35 x 32 = 1,120 (460H)
Data format = 7-bit binary
Total bulk size = 1,120 + 8 = 1,128

PCED (performance edit buffer)
F0H, 43H, 0nH, 7EH, 01H, 68H, LM--8952PE, ⟨PCED data⟩, sum, F7H
Data size = 116 x 2 + 10 = 242 (00F2H)
Data format = ASCII hexadecimal
Total bulk size = 258 + 8 = 266
Data as shown in Table 3 PCED format is split into upper and lower 4 bits, and converted into ASCII codes 0-F.

PMEM (performance memory)
F0H, 43H, 0nH, 7EH,
01H, 28H, LM--8952PM, ⟨PMEM data 1⟩, sum,
01H, 28H, LM--8952PM, ⟨PMEM data 2⟩, sum,
....., ..., ..., ..., ...,
01H, 28H, LM--8952PM, ⟨PMEM data 64⟩, sum, F7H
Block division = 64
Data size = 10 + 84 x 2 = 178 (00B2H)/block
Data format = ASCII hexadecimal
Total bulk size = 4 + (178 + 3) x 64 + 1 = 11, 589
Data as shown in Table 5 PMEM format is split into upper and lower 4 bits, and converted into ASCII codes 0-F.

Figure 1 - Details of Bulk Dump Format (Continued)

System setup
F0H, 43H, 0nH, 7EH, 02H, 11H, LM--8952S-, (system data), sum, F7H
Data size = 10 + 263 = 273 (0111H)
Data format = 7-bit binary
Total data size = 273 + 8 = 281
The data format is explained in Table 3. However, PROTCT and MCTMEM are not transmitted.

Micro tuning edit buffer
F0H, 43H, 0nH, 7EH, 02H, 0AH, LM--MCRYE-, (MCR edit buf), sum, F7H
Data size = 256 + 10 = 266 (010AH)
Data format = 7-bit binary
Total bulk size = 266 + 8 = 274

Micro tuning internal memory
F0H, 43H, 0nH, 7EH, 02H, 0AH, LM--MCRYMx, (MCR INT1 data), sum, F7H
F0H, 43H, 0nH, 7EH, 02H, 0AH, LM--MCRYMx, (MCR INT2 data), sum, F7H
Data size = 256 + 10 = 266 (010AH)
Data format = 7-bit binary
Total bulk size = 266 + 8 = 274

Micro tuning cartridge data
F0H, 43H, 0nH, 7EH,
02H, 0AH, LM--MCRYC-, (MCR CRT1 data), sum,
02H, 0AH, LM--MCRYC-, (MCR CRT2 data), sum,
....., ..., ..., ..., ...,
02H, 0AH, LM--MCRYC-, (MCR CRT63 data), sum, F7H

Fractional scaling edit buffer
F0H, 43H, 0nH, 7EH, 03H, 76H, LM--FKSYE-, (FKS eidt buf), sum, F7H
Data size = 264 x 2 + 10 = 502 (01F6H)
Data format = ASCII hexadecimal
Total bulk size = 502 + 8 = 510

Fractional scaling cartridge data
F0H, 43H, 0nH, 7EH,
02H, 76H, LM--FKSYC-, (FSK CRT1/32 data), sum,
02H, 76H, LM--FKSYC-, (FKS CRT2/33 data), sum,
....., ..., ..., ..., ...,
02H, 76H, LM--FKSYC-, (FKS CRT32/64 data), sum, F7H

Table 1 - VCED Parameter Change

g	h	p	Parameter	Description	Data Value
0	0	0	R1	EG rate 1	0 — 99
		1	R2	EG rate 2	0 — 99
		2	R3	EG rate 3	0 — 99
		3	R4	EG rate 4	0 — 99
		4	L1	EG level 1	0 — 99
		5	L2	EG level 2	0 — 99
		6	L3	EG level 3	0 — 99
		7	L4	EG level 4	0 — 99
		8	BP	Break point	0 — 99
		9	LD	Left depth	0 — 99
		10	RD	Right depth	0 — 99
		11	LC	Left curve	0 — 3
		12	RC	Right curve	0 — 3
		13	RS	Rate scaling	0 — 7
		14	AMS	Modulation sensitivity	0 — 3
		15	TS	Touch sensitivity	0 — 7
		16	TL	Level	0 — 99
		17	PM	Oscillator mode	0 — 1
		18	PC	Oscillator coarse	0 — 31
		19	PF	Oscillator fine	0 — 99
		20	PD	Detune	0 — 14
		126	PR1	PEG rate 1	0 — 99
		127	PR2	PEG rate 2	0 — 99
0	1	0	PR3	PEG rate 3	0 — 99
		1	PR4	PEG rate 4	0 — 99
		2	PL1	PEG level 1	0 — 99
		3	PL2	PEG level 2	0 — 99
		4	PL3	PEG level 3	0 — 99
		5	PL4	PEG level 4	0 — 99
		6	ALS	Algorithm selector	0 — 31
		7	FBL	Feedback level	0 — 7
		8	OPI	Oscillator phase initialize	0 — 1
		9	LFS	LFO speed	0 — 99
		10	LFD	LFO delay time	0 — 99
		11	LPMD	LFO pitch modulation depth	0 — 99
		12	LAMD	LFO amplitude modulation depth	0 — 99
		13	LFKS	LFO key sync	0 — 1
		14	LFW	LFO wave	0 — 5
		15	LPMS	LFO pitch modulation sensitivity	0 — 7
		16	TRNP	Transpose	0 — 48
		17	VNAM1	Voice name	ASCII
		18	VNAM2	Voice name	ASCII
		19	VNAM3	Voice name	ASCII
		. .	.....	.....	.....
		26	VNAM10	Voice name	ASCII
		27	OPE	Operator enable (bit 5: OP1, --, bit 0: OP6)	
		28	OPSEL	Operator select (0: OP6, --, 5: OP1)	

Table 2 - ACED Parameter Change

g	h	p	Parameter	Description	Data Value
6	0	0	SCM	OP6 scaling mode	0 — 1
		1	SCM	OP5 scaling mode	0 — 1
		2	SCM	OP4 scaling mode	0 — 1
		3	SCM	OP3 scaling mode	0 — 1
		4	SCM	OP2 scaling mode	0 — 1
		5	SCM	OP1 scaling mode	0 — 1
		6	AMSN	OP6 amplitude modulation sensitivity	0 — 7
		7	AMSN	OP5 amplitude modulation sensitivity	0 — 7
		8	AMSN	OP4 amplitude modulation sensitivity	0 — 7
		9	AMSN	OP3 amplitude modulation sensitivity	0 — 7
		10	AMSN	OP2 amplitude modulation sensitivity	0 — 7
		11	AMSN	OP1 amplitude modulation sensitivity	0 — 7
		12	PEGR	Pitch EG range	0 — 3
		13	LTRG	LFO key trigger mode	0 — 1
		14	VPSW	Velocity pitch sensitivity	0 — 1
		15	PMOD	Mono/poly	0 — 3
		16	PBR	Pitch bend range	0 — 12
		17	PBS	Pitch bend step	0 — 12
		—	—	—	
		19	RNDP	Random pitch depth	0 — 7
		20	PORM	Portamento mode	0 — 1
		21	PONT	Portamento step	0 — 12
		22	POS	Portamento time	0 — 99
		23	MWPM	Mod. wheel - Pitch modulation	0 — 99
		24	MWAM	Mod. wheel - Amplitude modulation	0 — 99
		25	MWEB	Mod. wheel - EG bias	0 — 99
		26	FCPM	Foot controller - Pitch modulation	0 — 99
		27	FCAM	Foot controller - Amplitude modulation	0 — 99
		28	FCEB	Foot controller - EG bias	0 — 99
		29	FCVL	Foot controller - Volume	0 — 99
		30	BCPM	Breath controller - Pitch modulation	0 — 99
		31	BCAM	Breath controller - Amplitude modulation	0 — 99
		32	BCEB	Breath controller - EG bias	0 — 99
		33	BCPB	Breath controller - Pitch bias	0 — 100
		34	ATPM	After touch - Pitch modulation	0 — 99
		35	ATAM	After touch - Amplitude modulation	0 — 99
		36	ATEB	After touch - EG bias	0 — 99
		37	ATPB	After touch - Pitch bias	0 — 100
		38	PEGS	Pitch EG rate scaling	0 — 7

Table 3 - PCED Parameter Change

g	h	p	Parameter	Description	Data Value
6	2	0 — 7	VCHOFS	Voice channel offset	0 — 7
		8 — 15	RXCH	MIDI receive ch. (16: OMNI on)	0 — 16
		16 — 23	VNUM	Voice number (2 bytes, 0 — 63: Internal, 64 — 127: Cartridge, 128 — 191: Preset A, 192 — 255: Preset B)	
		24 — 31	DETUNE	Detune (7: Center)	0 — 14
		32 — 39	OUTVOL	Output volume	0 — 99
		40 — 47	OUTCH	Output assign (0: off, 1: I, 2: II, 3: I + II)	0 — 3
		48 — 55	NLMTL	Note limit low (C-2 — G8)	0 — 127
		56 — 63	NLMTH	Note limit high (C-2 — G8)	0 — 127
		64 — 71	NSHFT	Note shift (24: Center, +/−2 octaves)	0 — 48
		72 — 79	FDAMP	EG forced damp (0: off, 1: on)	0 — 1
		80 — 87	KASG	Key assign group	0 — 1
		88 — 95	MTTNUM	Micro tuning table # (2 bytes)	0 — 254
		96 — 115	PNAM	Performance name	ASCII

Table 4 - Remote Switch Parameter Change

g	h	p	Parameter	Description	Data Value
6	3	64		Power on	
		65		0	
		66		1	
		. .		.	
		74		9	
		75		Cursor left	
		76		Cursor right	
		77		Enter	
		78		−1	
		79		+1	
		80		—	
		81		Performance select	
		82		Voice select	
		83		System setup	
		84		Utility	
		85		Performance edit	
		86		Voice edit (I)	
		87		Voice edit (II)	
		88		Store	
		89		Tone generator on/off — 1	
		. .		.....	
		96		Tone generator on/off — 8	

Table 5 - PMEM Data Format

No.	Parameter		Bit 7	6	5	4	3	2	1	0
0 — 7	VCHOFS/RXCH	(TG1-8)	VCHOFS				RXCH			
8 — 15	VNUM	(TG1-8)	VNUM							
16 — 23	MTTNUM	(TG1-8)	MTTNUM							
24 — 31	OUTVOL	(TG1-8)	—	OUTVOL						
32 — 39	DETUNE/KASG/OUTCH	(TG1-8)	—	DETUNE			KASG		OUTCH	
40 — 47	NLMTL	(TG108)	—	NLMTL						
48 — 55	NLMTH	(TG1-8)	—	NLMTH						
56 — 63	FDAMP/NSHFT	(TH1-8)	—	FDMP			NSHFT			
64 — 83	PNAM	(20 chara.)	PNAM (ASCII)							

Table 6 - SYCED Data Format

No.	Parameter	Description	Data Value
0	PROTCT	Internal memory protect	0 — 1
1	PRXCH	MIDI receive channel for performance select	0 — 17
2	DEVNO	System exclusive device #	0 — 15
3	VBLOK	Voice bulk receive block	0 — 1
4	PGMSW	Program change receive switch	0 — 17
5	AFTSW	After touch receive switch	0 — 17
6	PBSW	Pitch bend receive switch	0 — 17
7	NOTESW	Note on/off receive switch	0 — 2
8	PRTSW	Program change assign table enable switch	0 — 1
9	BNK802	Bank select for TX802 format	0 — 15
10	BNKFRAC	Bank select for fractional scaling	0 — 15
11	BNKMCT	Bank select for micro tuning	0 — 15
12	MTUNING	Master tuning	0 — 127
13	CONTSW	Control change receive switch	0 — 17
14 — 135	CTABLE	Control # assign table	*
136 — 263	PTABLE	Program # table for perf. select	0 — 127
264 — 775	MCTMEM	Micro tuning internal user's memory	**

NOTE: * 0, 1, 2, 4, 5, 7, 64, 65 (0: off, Others : standard control #)

** 0 — 10,794 x 4 (0 — 43,176), 2 bytes for 1 key
The lowest 2 bits are always zero.