

# FM TONE GENERATOR

# TX81Z

## SERVICE MANUAL



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## SPECIFICATIONS

### Switches

POWER, STORE/EG COPY, UTILITY, EDIT/  
COMPARE, PLAY/PERFORM, PARAMETER UP,  
PARAMETER DOWN, DEC, INC, CURSOR LEFT,  
CURSOR RIGHT, CURSOR

### Display

16 character x 2 row backlit LCD

### Terminals

CASSETTE, MIDI THRU, MIDI OUT, MIDI IN,  
OUTPUT I/II, PHONES

### Power Requirements

(US and Canadian model) . . . AC 110 - 120V,  
50/60Hz  
(General model) . . . . . AC 220 - 240V,  
50/60Hz

### Power Consumption

8W

### Dimensions

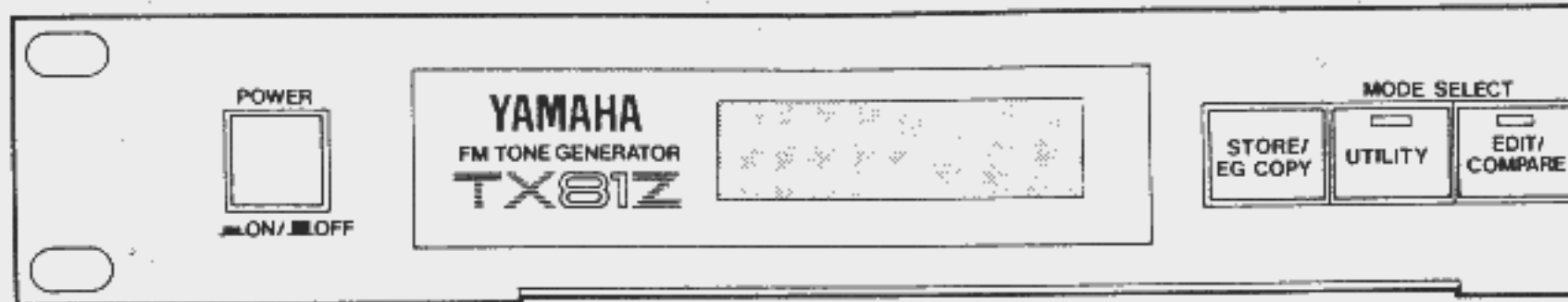
480 x 282 x 45.2 mm (W x D x H)  
(18-15/16" x 11-1/8" x 1-3/4")

### Weight

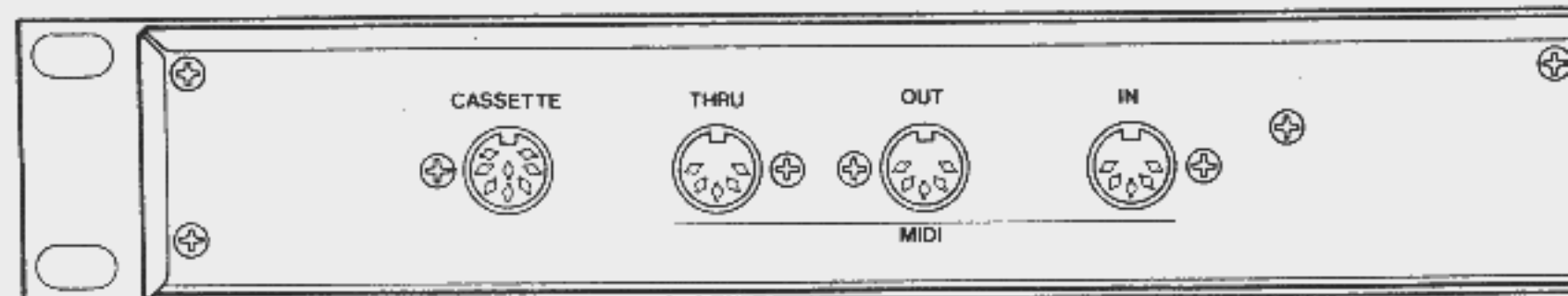
3.4 kg (7 lbs. 8 oz.)

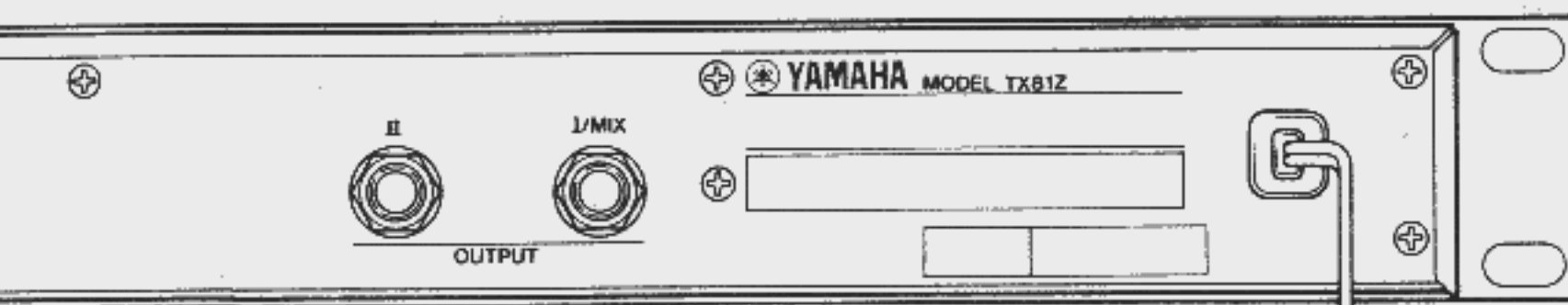
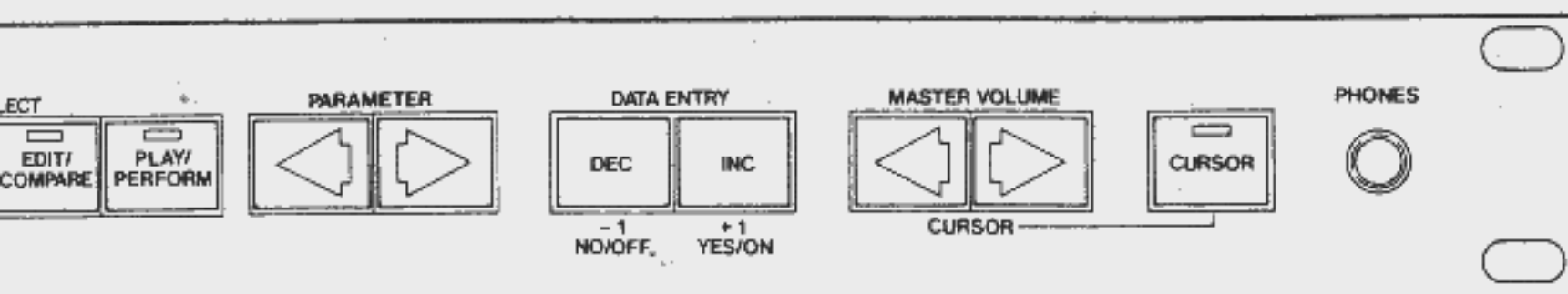
## PANEL LAYOUT

### • Front Panel

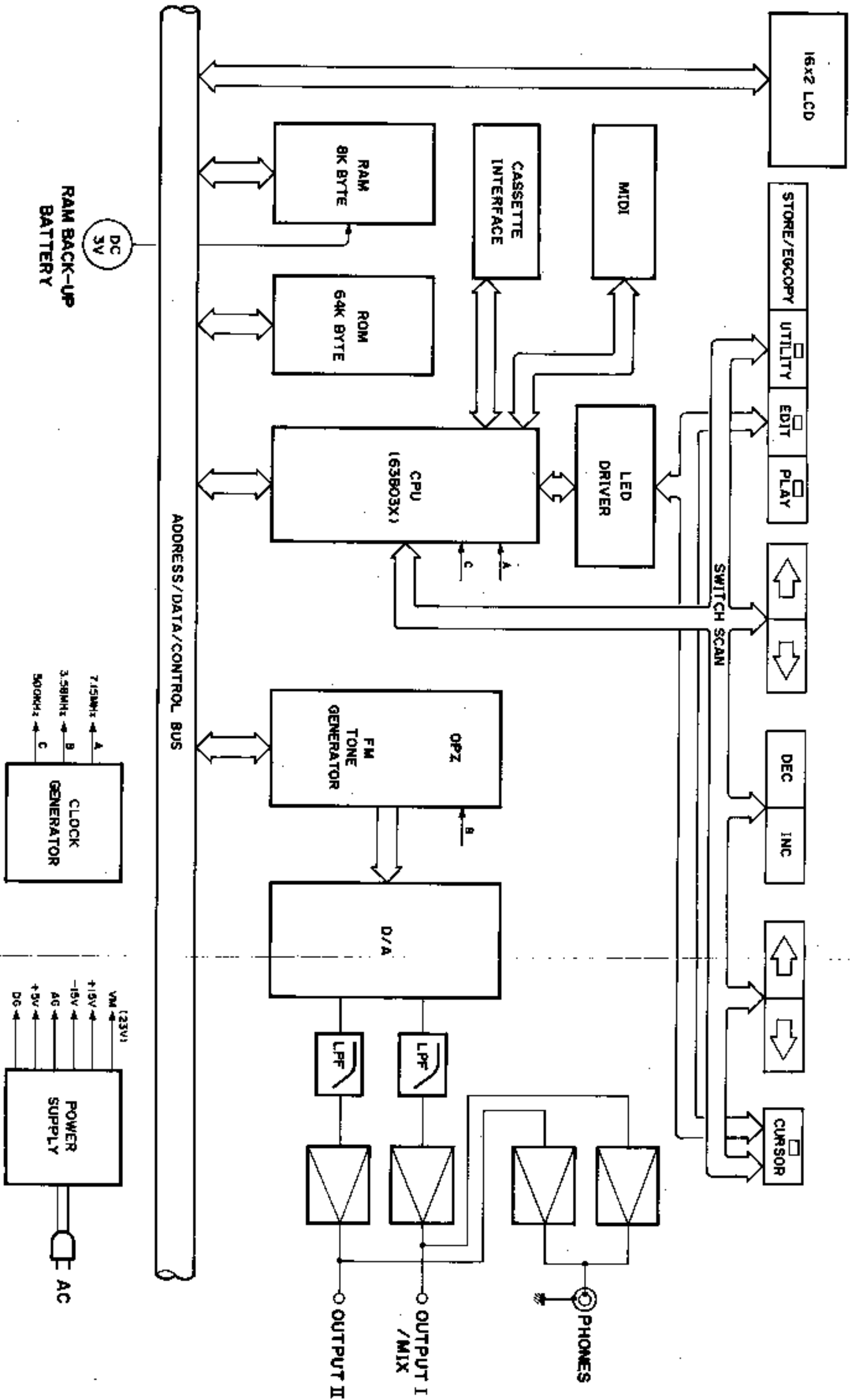


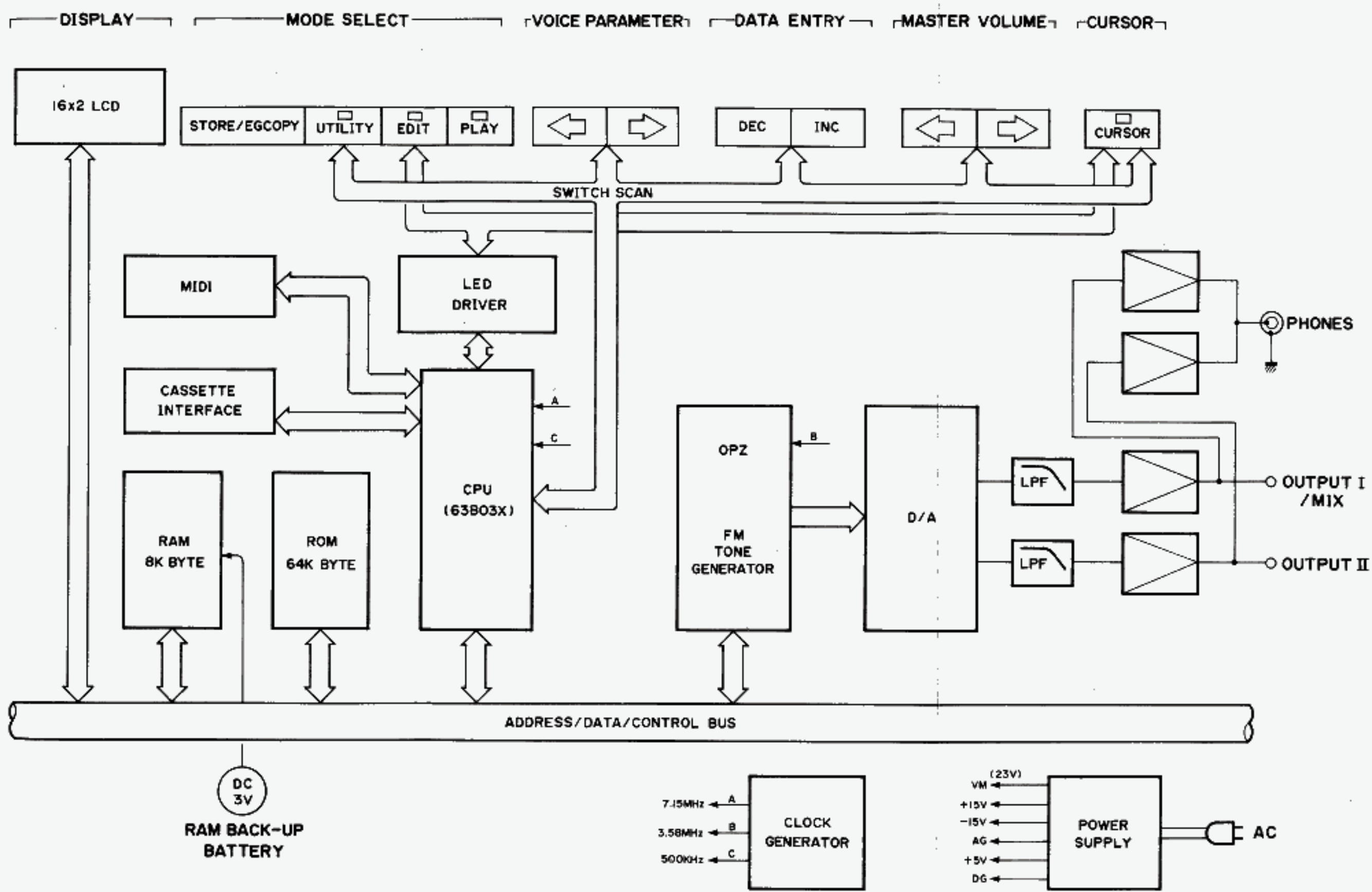
### • Rear Panel



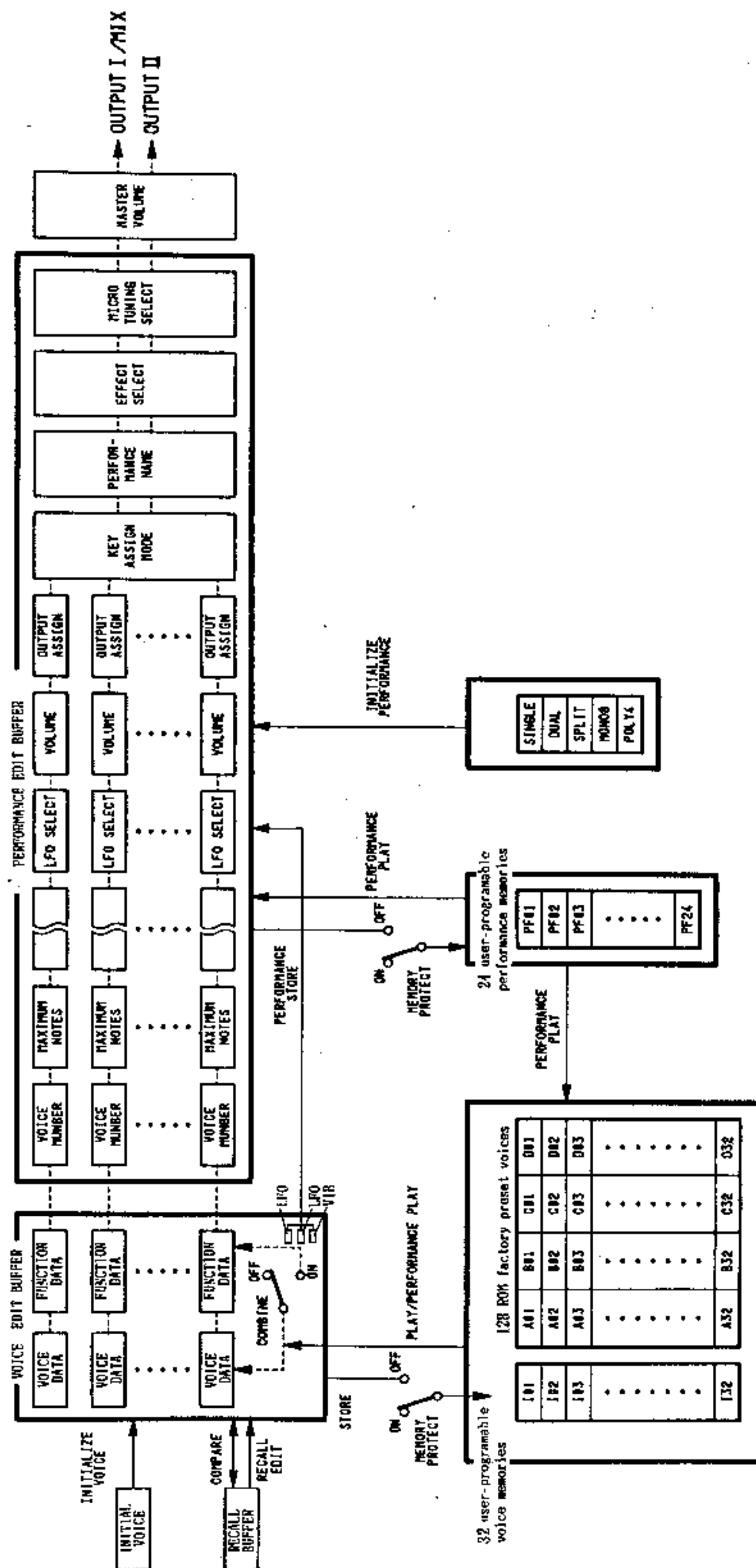


DISPLAY MODE SELECT VOICE PARAMETER DATA ENTRY MASTER VOLUME CURSOR





## ■ MEMORY CONFIGURATION

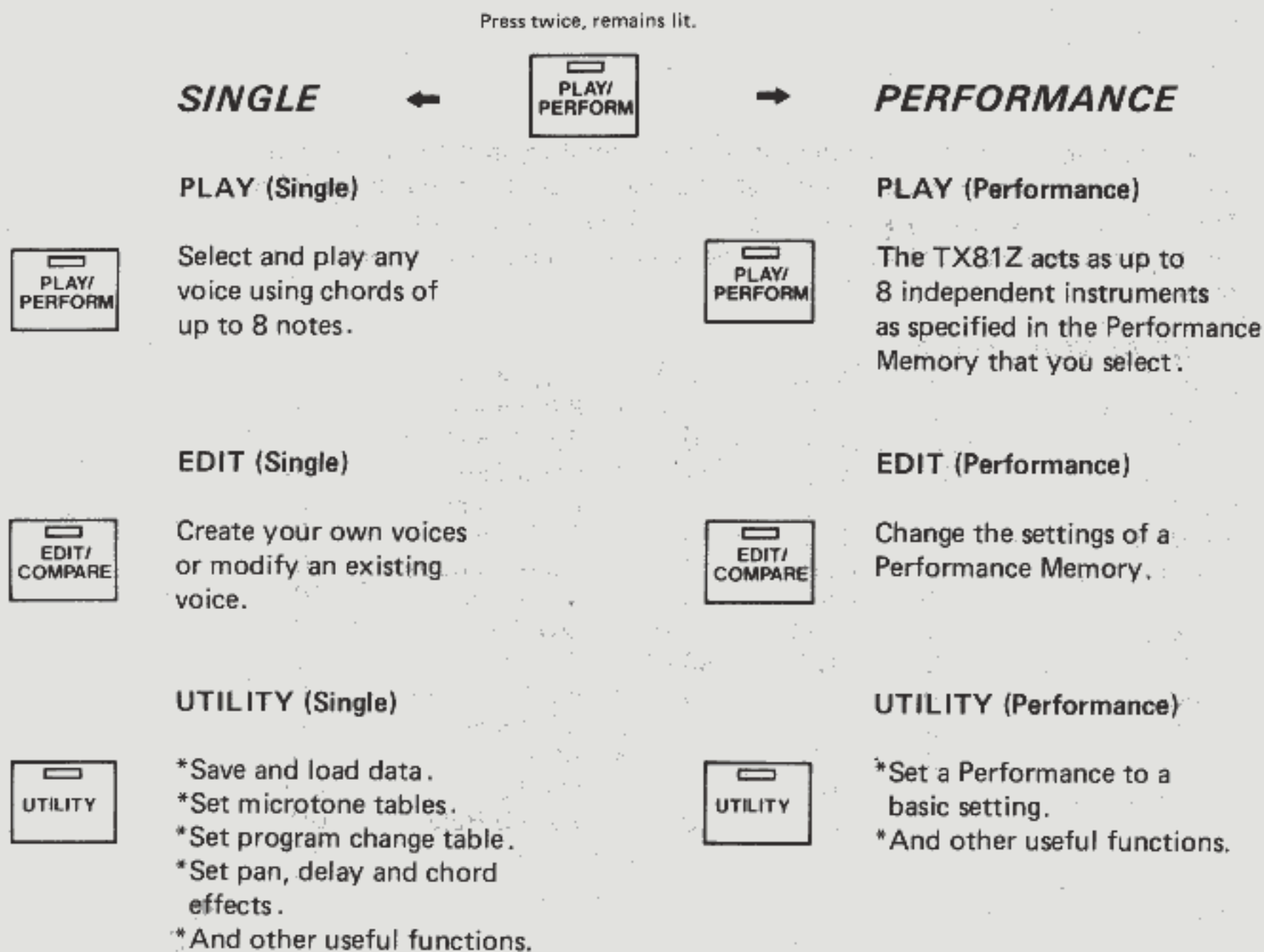


# PRESET VOICE NAME

| BANK A |            | BANK B |            | BANK C |            | BANK D |            |
|--------|------------|--------|------------|--------|------------|--------|------------|
| 1      | GrandPiano | 1      | Trumpet81Z | 1      | NylonGuit  | 1      | BaadBreath |
| 2      | Uprt Piano | 2      | Full Brass | 2      | Guitar #1  | 2      | VocalNuts  |
| 3      | Deep Grd   | 3      | FlugelHorn | 3      | TwelveStrg | 3      | KrstlChoir |
| 4      | HonkeyTonk | 4      | ChorusBras | 4      | Funky Pick | 4      | Metalimba  |
| 5      | Elec Grand | 5      | FrenchHore | 5      | AllThatJaz | 5      | WaterGlass |
| 6      | Fuzz Piano | 6      | AteckBrass | 6      | HeavyMetal | 6      | BowedBell  |
| 7      | SkoolPiano | 7      | SpitBoneBC | 7      | Old Banjo  | 7      | >>WOW<<    |
| 8      | Thump Pno  | 8      | Horns BC   | 8      | Zither     | 8      | Fuzzy Koto |
| 9      | LoTine81Z  | 9      | MelloTenor | 9      | ElecBass 1 | 9      | Spc Midiot |
| 10     | HiTine81Z  | 10     | RaspAlto   | 10     | SqncrBass  | 10     | Gurgle     |
| 11     | ElectroPno | 11     | Flute      | 11     | SynFunkBas | 11     | Hole in 1  |
| 12     | NewElectro | 12     | Pan Floot  | 12     | ElecBass 2 | 12     | Birds      |
| 13     | DynomiteEP | 13     | Bassoon    | 13     | AnalogBass | 13     | MalibuNite |
| 14     | DynoWurlie | 14     | Oboe       | 14     | Jaco Bass  | 14     | Helicopter |
| 15     | Wood Piano | 15     | Clarinet   | 15     | LatelyBass | 15     | Flight Sim |
| 16     | Reed Piano | 16     | Harmonica  | 16     | MonophBass | 16     | Brthbells  |
| 17     | PercOrgan  | 17     | DoubleBass | 17     | StadiumSol | 17     | Storm Wind |
| 18     | 16 8 4 2 F | 18     | BowCello   | 18     | TrumptSolo | 18     | Alarm Call |
| 19     | PumpOrgan  | 19     | BoxCello   | 19     | BCSexyPhon | 19     | Recing Car |
| 20     | <6 Tease>  | 20     | SoloViolin | 20     | Lyrisyn    | 20     | Whistling  |
| 21     | Farcheeza  | 21     | HiString 1 | 21     | WarmSquare | 21     | Space Talk |
| 22     | Small Pipe | 22     | LowString  | 22     | Sync Lead  | 22     | Space Vibe |
| 23     | Big Church | 23     | Pizzicato  | 23     | MellowSqar | 23     | Timpani    |
| 24     | AnalogOrgn | 24     | Harp       | 24     | Jazz Flute | 24     | FM Hi-Hats |
| 25     | Thin Clav  | 25     | ReverbStrg | 25     | HeavyLead  | 25     | Bass Drum  |
| 26     | EZ Clav    | 26     | SynString  | 26     | Java Jive  | 26     | Tube Bells |
| 27     | Fuzz Clavi | 27     | Voices     | 27     | Xylophone  | 27     | Noise Shot |
| 28     | LiteHarpsi | 28     | HarmoPad   | 28     | GreatVibes | 28     | Snare 1    |
| 29     | RichHarpsi | 29     | FanfarTpts | 29     | Sitar      | 29     | Snare 2    |
| 30     | Celeste    | 30     | HiString 2 | 30     | Bell Pad   | 30     | Hand Drum  |
| 31     | BriteCelst | 31     | PercFlute  | 31     | PlasticHit | 31     | Synballs   |
| 32     | Squeezebox | 32     | BreathOrgn | 32     | DigiAnnie  | 32     | Efem Toms  |

## MODE SELECT

The TX81Z has two main modes. Each main mode has three "sub-modes".



## ■ INITIALIZE VOICE

This will set the voice data in the edit buffer to the settings shown below.

UTILITY MODE  
Init Voice?

When creating a voice from scratch, it is often useful to start from this "basic setting" rather than having to reset all the parameters by hand. Press YES. The LCD will ask "Are you sure?", press YES again. The edit buffer will be set to the voice data shown below, and you will automatically enter Edit Mode.

### INITIAL VOICE-DATA

|             |   |         |        |   |           |                 |              |
|-------------|---|---------|--------|---|-----------|-----------------|--------------|
| ALG         | = | 1       | (Mode) | = | RATIO     | Poly Mode       |              |
| Feedback    | = | 0       | OSW    | = | W1 (sine) | P Bend Range    | = 4          |
| Wave        | = | triangl | DET    | = | 0         | Full Time Porta |              |
| Speed       | = | 35      | AR     | = | 31        | Porta Time      | = 0          |
| Delay       | = | 0       | D1R    | = | 31        | FC Volume       | = 40         |
| P Mod Depth | = | 0       | D1L    | = | 15        | FC Pitch        | = 0          |
| A Mod Depth | = | 0       | D2R    | = | 0         | FC Amplitude    | = 0          |
| Sync        | = | off     | RR     | = | 15        | MW Pitch        | = 50         |
| P Mod Sens. | = | 6       | SHFT   | = | off       | MW Ampli        | = 0          |
| AMS         | = | 0       | OUT    | = | 90 OP 1   | BC Pitch        | = 0          |
| AME         | : | off     |        |   | 0 2       | BC Amplitude    | = 0          |
| EBS         | = | 0       |        |   | 0 3       | BC P Bias       | = 0          |
| KVS         | = | 0       |        |   | 0 4       | BC EG Bias      | = 0          |
| (Frequency) | = | 1.00    | RS     | = | 0         | Middle C        | = C3         |
|             |   |         | LS     | = | 0         | Reverb Rate     | = off        |
|             |   |         |        |   |           | Name            | = INIT VOICE |

## ■ INITIALIZE PERFORMANCE

This lets you initialize the Performance Buffer to one of the standard settings.

P.UTILITY Singl  
Init Perfrm?

Singl/dual/split/mono 8/poly 4

Press NO to select the initialization setting you want. When the LCD shows the desired setting, press YES. You will be asked "Are you sure?" as press YES again.

### • Standard Settings

| Performance name           |     | SINGLE                      |          |          |          |          |          |          |          |
|----------------------------|-----|-----------------------------|----------|----------|----------|----------|----------|----------|----------|
| Instrument                 |     | 1                           | 2        | 3        | 4        | 5        | 6        | 7        | 8        |
| Assign Mode                |     | (Normal) / Alternate        |          |          |          |          |          |          |          |
| Max Notes (0-8)            |     | 8                           | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| Voice No. (I01-D32)        |     | I01                         | I01      | I01      | I01      | I01      | I01      | I01      | I01      |
| Receive Ch. (1-16, omni)   |     | 1                           | 2        | 3        | 4        | 5        | 6        | 7        | 8        |
| Limit /L (C-2 – G8)        |     | C-2                         | C-2      | C-2      | C-2      | C-2      | C-2      | C-2      | C-2      |
| Limit /H (C-2 – G8)        |     | G8                          | G8       | G8       | G8       | G8       | G8       | G8       | G8       |
| Detune (–7 – +7)           |     | 0                           | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| Note Shift (–24 – +24)     |     | 0                           | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| Volume (0-99)              |     | 99                          | 99       | 99       | 99       | 99       | 99       | 99       | 99       |
| Out Assign (off,I,II,I II) |     | I II                        | I II     | I II     | I II     | I II     | I II     | I II     | I II     |
| LFO Select (off,1,2,vib)   |     | 1                           | 2        | vib      | vib      | vib      | vib      | vib      | vib      |
| Micro Tune (select)        | Oct | (off)/on                    | (off)/on | (off)/on | (off)/on | (off)/on | (off)/on | (off)/on | (off)/on |
| Effect Select              |     | (off) / Delay / Pan / Chord |          |          |          |          |          |          |          |

| Performance name         |     | DUAL                     |        |        |        |        |        |        |        |
|--------------------------|-----|--------------------------|--------|--------|--------|--------|--------|--------|--------|
| Instrument               |     | 1                        | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
| Assign Mode              |     | (Normal) / Alternate     |        |        |        |        |        |        |        |
| Max Notes (0-8)          |     | 4                        | 4      | 0      | 0      | 0      | 0      | 0      | 0      |
| Voice No. (I01-D32)      |     | I01                      | I01    | I01    | I01    | I01    | I01    | I01    | I01    |
| Receive Ch. (1-16, omni) |     | 1                        | 1      | 3      | 4      | 5      | 6      | 7      | 8      |
| Limit /L (C-2 – G8)      |     | C-2                      | C-2    | C-2    | C-2    | C-2    | C-2    | C-2    | C-2    |
| Limit /H (C-2 – G8)      |     | G8                       | G8     | G8     | G8     | G8     | G8     | G8     | G8     |
| Detune (–7 – +7)         |     | 0                        | +2     | 0      | 0      | 0      | 0      | 0      | 0      |
| Note Shift (–24 – +24)   |     | 0                        | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Volume (0-99)            |     | 99                       | 99     | 99     | 99     | 99     | 99     | 99     | 99     |
| Out Assign (I,II,I+II)   |     | I II                     | I II   | I II   | I II   | I II   | I II   | I II   | I II   |
| LFO Select (off,1,2,vib) |     | 1                        | 2      | vib    | vib    | vib    | vib    | vib    | vib    |
| Micro Tune (select)      | Oct | off/on                   | off/on | off/on | off/on | off/on | off/on | off/on | off/on |
| Effect Select            |     | off/ Delay / Pan / Chord |        |        |        |        |        |        |        |

| Performance name         |     | SPLIT                    |        |        |        |        |        |        |        |
|--------------------------|-----|--------------------------|--------|--------|--------|--------|--------|--------|--------|
| Instrument               |     | 1                        | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
| Assign Mode              |     | (Normal) / Alternate     |        |        |        |        |        |        |        |
| Max Notes (0-8)          |     | 4                        | 4      | 0      | 0      | 0      | 0      | 0      | 0      |
| Voice No. (I01-D32)      |     | I01                      | I01    | I01    | I01    | I01    | I01    | I01    | I01    |
| Receive Ch. (1-16, omni) |     | 1                        | 1      | 3      | 4      | 5      | 6      | 7      | 8      |
| Limit /L (C-2 – G8)      |     | C-3                      | C-2    | C-2    | C-2    | C-2    | C-2    | C-2    | C-2    |
| Limit /H (C-2 – G8)      |     | G8                       | B2     | G8     | G8     | G8     | G8     | G8     | G8     |
| Detune (–7 – +7)         |     | 0                        | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Note Shift (–24 – +24)   |     | 0                        | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Volume (0-99)            |     | 99                       | 99     | 99     | 99     | 99     | 99     | 99     | 99     |
| Out Assign (I,II,I+II)   |     | I II                     | I II   | I II   | I II   | I II   | I II   | I II   | I II   |
| LFO Select (off,1,2,vib) |     | 1                        | 2      | vib    | vib    | vib    | vib    | vib    | vib    |
| Micro Tune (select)      | Oct | off/on                   | off/on | off/on | off/on | off/on | off/on | off/on | off/on |
| Effect Select            |     | off/ Delay / Pan / Chord |        |        |        |        |        |        |        |

| Performance name         |     | MONO8                     |        |        |        |        |        |        |        |
|--------------------------|-----|---------------------------|--------|--------|--------|--------|--------|--------|--------|
| Instrument               |     | 1                         | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
| Assign Mode              |     | (Normal) / Alternate      |        |        |        |        |        |        |        |
| Max Notes (0-8)          |     | 1                         | 1      | 1      | 1      | 1      | 1      | 1      | 1      |
| Voice No. (I01-D32)      |     | I01                       | I02    | I03    | I04    | I05    | I06    | I07    | I08    |
| Receive Ch. (1-16, omni) |     | 1                         | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
| Limit /L (C-2 – G8)      |     | C-2                       | C-2    | C-2    | C-2    | C-2    | C-2    | C-2    | C-2    |
| Limit /H (C-2 – G8)      |     | G8                        | G8     | G8     | G8     | G8     | G8     | G8     | G8     |
| Detune (–7 – +7)         |     | 0                         | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Note Shift (–24 – +24)   |     | 0                         | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Volume (0-99)            |     | 99                        | 99     | 99     | 99     | 99     | 99     | 99     | 99     |
| Out Assign (I, II, I+II) |     | I II                      | I II   | I II   | I II   | I II   | I II   | I II   | I II   |
| LFO Select (1, 2, vib)   |     | 1                         | 2      | vib    | vib    | vib    | vib    | vib    | vib    |
| Micro Tune (select)      | Oct | ⓪ff/on                    | ⓪ff/on | ⓪ff/on | ⓪ff/on | ⓪ff/on | ⓪ff/on | ⓪ff/cn | ⓪ff/on |
| Effect Select            |     | ⓪ff / Delay / Pan / Chord |        |        |        |        |        |        |        |

| Performance name         |     | POLY4                     |        |        |        |        |        |        |        |
|--------------------------|-----|---------------------------|--------|--------|--------|--------|--------|--------|--------|
| Instrument               |     | 1                         | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
| Assign Mode              |     | (Normal) / Alternate      |        |        |        |        |        |        |        |
| Max Notes (0-8)          |     | 2                         | 2      | 2      | 2      | 0      | 0      | 0      | 0      |
| Voice No. (I01-D32)      |     | I01                       | I02    | I03    | I04    | I05    | I06    | I07    | I08    |
| Receive Ch. (1-16, omni) |     | 1                         | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
| Limit /L (C-2 – G8)      |     | C-2                       | C-2    | C-2    | C-2    | C-2    | C-2    | C-2    | C-2    |
| Limit /H (C-2 – G8)      |     | G8                        | G8     | G8     | G8     | G8     | G8     | G8     | G8     |
| Detune (–7 – +7)         |     | 0                         | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Note Shift (–24 – +24)   |     | 0                         | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Volume (0-99)            |     | 99                        | 99     | 99     | 99     | 99     | 99     | 99     | 99     |
| Out Assign (I, II, I+II) |     | I II                      | I II   | I II   | I II   | I II   | I II   | I II   | I II   |
| LFO Select (1, 2, vib)   |     | 1                         | 2      | vib    | vib    | vib    | vib    | vib    | vib    |
| Micro Tune (select)      | Oct | ⓪ff/on                    | ⓪ff/on | ⓪ff/on | ⓪ff/on | ⓪ff/on | ⓪ff/on | ⓪ff/on | ⓪ff/on |
| Effect Select            |     | ⓪ff / Delay / Pan / Chord |        |        |        |        |        |        |        |

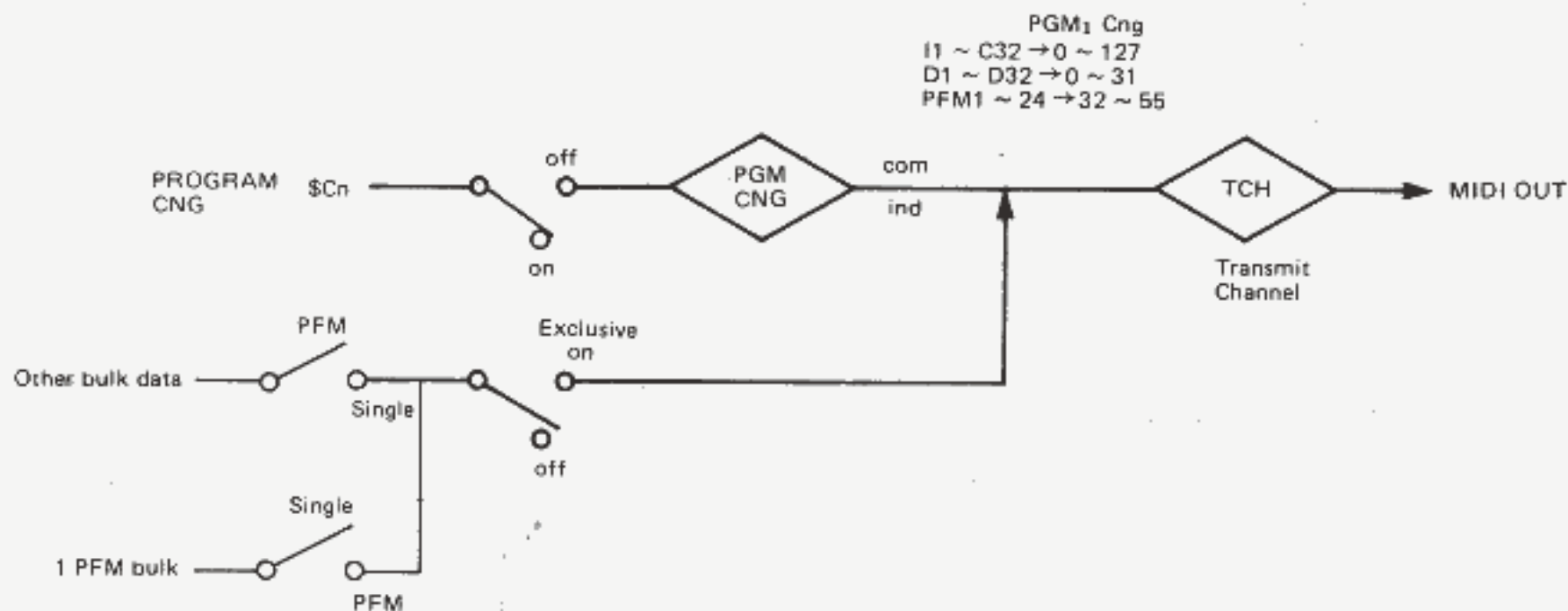
## ■ MIDI DATA FORMAT

The TX81Z responds to MIDI messages as shown in the diagram. BCH indicates Basic Rcv. Ch. and RCH indicates the receive channel for an individual instrument. G1-G16 indicates the Global Channel for Controller or Pitch Bend.

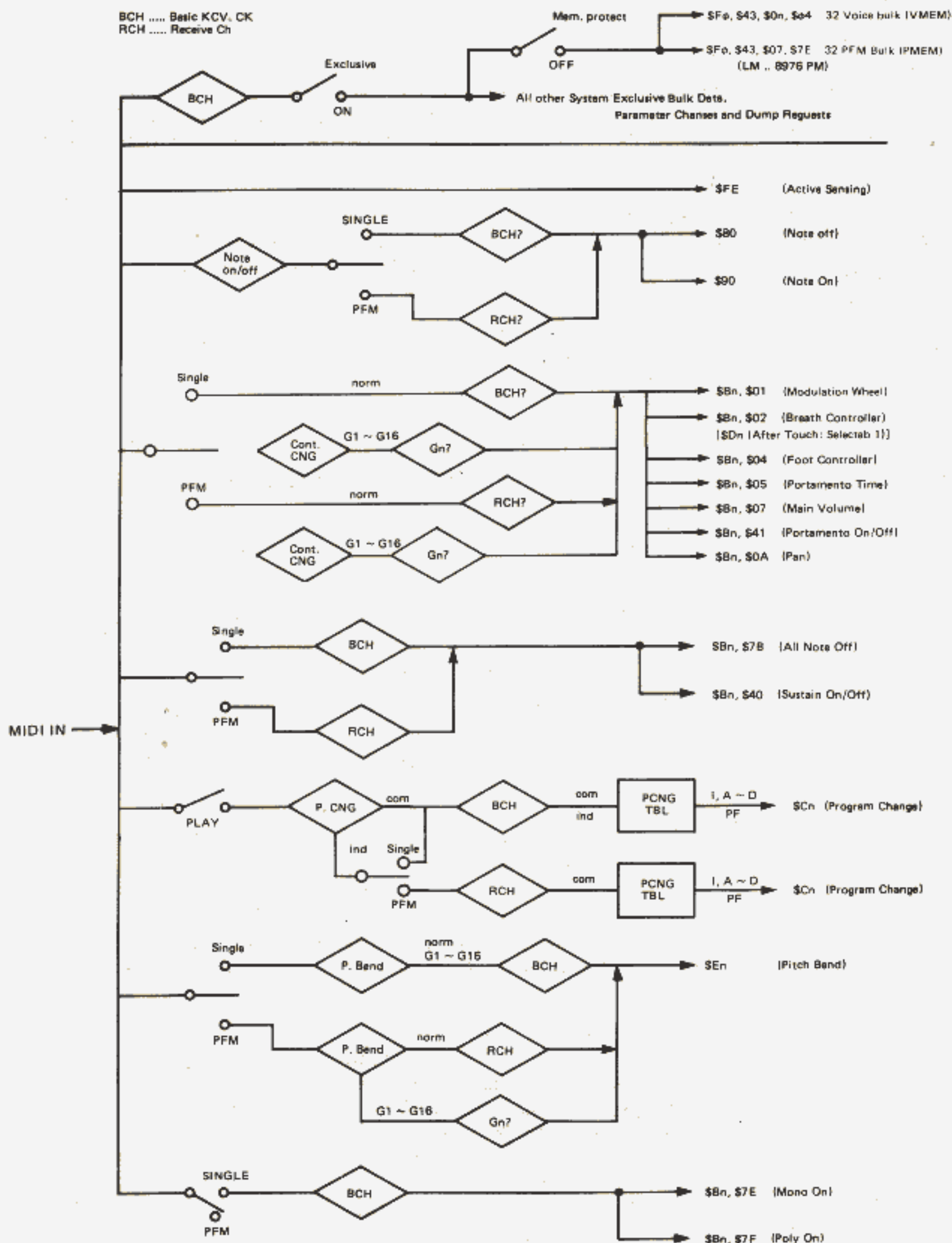
\*In the case of Control Change "Pan" (Bn.0A.xx), data values of 0 ~ 42 = output I, 43 ~ 85 = output I + II and 86 ~ 127 = output II.

\*System Common messages F1h-F7h and System Realtime messages F8h-FDh and FFh are ignored.

\*Once an Active Sensing message FEh is received, the TX81Z will expect a continuing stream of MIDI messages. If no messages come for a period of about 300 msec, it clears the MIDI input buffer and turns off any notes that are currently sounding.



\*In PLAY mode when a voice or performance is selected using the front panel keys, the TX81Z will send a program change message: 101-C32 (0-127), D01-D32 (0-31), PF01-PF24 (32-55).



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## SYSTEM EXCLUSIVE DATA FORMAT

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Reading this section will not necessarily help you use the TX81Z. This data is provided to comply with the MIDI Specification, and will be helpful to those who write computer programs to process TX81Z data. The TX81Z has three types of System Exclusive message; Parameter Change messages, Bulk Data messages and Dump Request messages.

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### PARAMETER CHANGE MESSAGES

These messages change the value of a parameter in TX81Z memory. There are 8 subgroups of Parameter Changes; VCED, ACED, PCED, Remote Switch, Micro Tuning, Program Change, Effect data and System data.

VCED, ACED, PCED and Remote Switch parameter change messages have the following format.

```

11110000  F0h  Exclusive
01000011  43h  I.D. number (Yamaha)
0001nnnn  1nh  Basic receive channel
0gggggghh  ggggg = Group number, hh = Subgroup number
0pppppppp  ppppppp = Parameter number
0ddddddd  ddddddd = Data
11110111  F7h  End Of Exclusive

```

\*VCED (Voice parameters compatible with DX21/27/100)  
ggggg = 00100 (4), hh = 10 (2)

\*ACED (Additional voice parameters for TX81Z)  
ggggg = 00100 (4), hh = 11 (3)

\*PCED (Performance parameters)  
ggggg = 00100 (4), hh = 11 (3)

\*Remote Switch (The same effect as pressing a switch on the TX81Z front panel, ie. "remote control".)  
ggggg = 00100 (0), hh = 00 (0), ddddddd = 0 (off), 7F (on)

System Parameter Change (basic receive channel settings, etc.) and Effect Parameter Change (data for delay, pan and chord) messages have the following format.

```

11110000  F0h  Exclusive
01000011  43h  I.D. number (Yamaha)
0001nnnn  1nh  Basic receive channel
0gggggghh  ggggg = 00100 (4), hh = 00 (0)
0kkkkkkkk  kkkkkkk = Parameter number
              (123 = System Parameter, 124 = Effect Parameter)
0ddddddd  ddddddd = data
11110111  F7h  End of Exclusive

```

Micro Tune parameter change messages have the following format.

```

11110000  F0h  Exclusive
01000011  43h  I.D. number (Yamaha)
0001nnnn  1nh  Basic receive channel
0gggggghh  ggggg = 00100 (4), hh = 00
0pppppppp  ppppppp = 1111101 (125) OCT
                    1111110 (126) FULL
0kkkkkkkk  kkkkkkkk = key number
ohhhhhhhh  hhhhhhhh = note C #-1 to C7 (13-108)
0l l l l l l l  l l l l l l = data fine tuning 0 to +31, -31 to -1 (0-32, 33-63)
11110111  F7h End Of Exclusive

```

Program Change Table parameter change messages have the following format. The data is 0-184d, indicating the TX81Z memory to be selected in response to the incoming program change number. 0-31 (I1-I32), 32-63 (A1-A32), 64-95 (B1-B32), 96-127 (C1-C32), 128-160 (D1-D32), 161-184 (PF1-PF24)

```

11110000  F0h  Exclusive
01000011  43h  I.D. number (Yamaha)
0001nnnn  1nh  Basic receive channel
0gggggghh  ggggg = 00100 (4), hh = 00
0pppppppp  ppppppp = 1111111 (127)
0kkkkkkkk  kkkkkkkk = program change number
Ohhhhhhhh  hhhhhhhh = data (high)
0l l l l l l l  l l l l l l = data (low)
11110111  F7h End Of Exclusive

```

## BULK DATA MESSAGES

The TX81Z receives and transmits 10 types of bulk data message. Each has the format F0 (System Exclusive), 43 (Yamaha ID number), 0n (bulk data on channel n), data size (high), data size (low), data, checksum (twos complement of the lower 7 bits of the sum of all databytes), F7 (EOX). Some bulk data messages have a 10-character ASCII header. These characters are considered to be part of the data.

### \*Voice (ACED)

Additional voice parameters for the TX81Z. f = 126 (7Eh) "LM\_8986-AE", data size = 23 + 10 = 33 (0021h)  
F0. 43. 0n. 7E. 00. 21. "LM\_8976-AE". (ACED data). checksum. F7

### \*1 Voice (VCED)

Voice parameters for the TX81Z. f = 4, data size = 93 (005dh), total size = 93 + 8 = 101 (5Dh)  
F0. 43. 0n. 03. 00. 5D. (VCED data). checksum. F7

### Note

These two bulk data messages are transmitted when a voice is selected while in PLAY SINGLE mode, or when you "Init Voice" or "Recall Edit".  
If ACED is received alone, the VCED edit buffer will be unaffected.  
If VCED is received alone, the ACED edit buffer will be initialized.

**\*32 Voice (VMEM)**

This message includes both ACED and VCED parameters for 32 voices.

$f = 4$ , data size =  $128 \times 32 = 4096$  (1000h), total size =  $4096 + 8 = 4104$

F0. 43. 0n. 04. 10. 00. (VMEM data). checksum. F7

**\*1 Performance (PCED)**

The contents of the performance edit buffer.

$f = 126$  (7Eh) "LM..8976PE", data size = 120 (0078h), total size =  $120 + 8 = 128$

F0. 43. 0n. 7E. 00. 78. "LM..8976PE". (data). checksum. F7

**\*32 Performance (PMEM)**

Data for 24 internal performance memories + 8 initial performances.

$f = 126$  "LM..8976PM", data size =  $10 + (76 \times 32) = 2442$  (098Ah)  
total size =  $2442 + 8 = 2450$

F0. 43. 0n. 7E. 13. 0A. "LM..8976PM". (data). checksum. F7

**\*System (SYS)**

TX81Z system data (basic receive channel, etc.)

$f = 126$  "LM..8976S0", data size =  $10 + 27 = 37$ , total size =  $37 + 8 = 45$

F0. 43. 0n. 7E. 00. 25. "LM..8976S0". (data). checksum. F7

**\*Program Change Table (SYS)**

Selected memory numbers I1-PF24 for each incoming program change.

$f = 126$  "LM..8976S1", data size =  $10 + 128 \times 2 = 266$  (010Ah), total size =  $266 + 8 = 274$

F0. 43. 0n. 7E. 02. 0A. "LM..8976S1". (data). checksum. F7

**\*Effect Data (SYS)**

Data for the three effects (delay, pan, chord)

$f = 126$  "LM..8976S2", data size =  $10 + 55 = 65$  (0041h), total size =  $65 + 8 = 73$

F0. 43. 0n. 7E. 00. 41. "LM..8976S2". (data). checksum. F7

**\*Micro Tune Octave**

Contents of the user octave micro tune memory.

$f = 126$  "LM..MCRTE0", data size =  $24 + 10 = 34$  (0022h), total size =  $34 + 8 = 42$

F0. 43. 0n. 7E. 00. 22. "LM..MCRTE0". (data). checksum. F7

**\*Micro Tune Full Kbd**

Contents of the user full keyboard micro tune memory.

$f = 126$  "LM..MCRTE1", data size =  $256 + 10 = 266$  (010Ah), total size = 274

F0. 43. 0n. 7E. 00. 22. "LM..MCRTE1". (data). checksum. F7

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**DUMP REQUEST  
MESSAGES**

When the TX81Z receives one of these messages with a channel number "n" that matches its Basic Receive channel, it will transmit the requested data as described above in Bulk Data.

|              |                                 |
|--------------|---------------------------------|
| VCED         | F0. 43. 0n. 03. F7              |
| VMEM         | F0. 43. 0n. 04. F7              |
| ACED + VCED  | F0. 43. 0n. 7E. "LM_8976AE". F7 |
| PCED         | F0. 43. 0n. 7E. "LM_8976PE". F7 |
| PMEM         | F0. 43. 0n. 7E. "LM_8976PM". F7 |
| System Setup | F0. 43. 0n. 7E. "LM_8976Sx". F7 |
| Micro Tune   | F0. 43. 0n. 7E. "LM_MCRTEx". F7 |

**Voice Edit Parameters (VCED)**

| Parameter number | Parameter                        | LCD             | Data               |
|------------------|----------------------------------|-----------------|--------------------|
| 0                | Attack Rate                      | AR              | 0-31               |
| 1                | Decay 1 Rate                     | D1R             | 0-31               |
| 2                | Decay 2 Rate                     | D2R             | 0-31               |
| 3                | Release Rate                     | RR              | 0-15               |
| 4                | Decay 1 Level                    | D1L             | 0-15               |
| 5                | Level Scaling                    | LS              | 0-99               |
| 6                | Rate Scaling                     | RS              | 0-3 OP. 4          |
| 7                | EG Bias Sensitivity              | EBS             | 0-7                |
| 8                | Amplitude Modulation Enable      | AME             | 0-1                |
| 9                | Key Velocity Sensitivity         | KVS             | 0-7                |
| 10               | Operator Output Level            | OUT             | 0-99               |
| 11               | Frequency                        | CRS             | 0-63               |
| 12               | Detune                           | DET             | 0-6 (Center = 3)   |
| 13<br>           |                                  |                 | OP. 3              |
| 26<br>           |                                  |                 | OP. 2              |
| 39<br>           |                                  |                 | OP. 1              |
| 52               | Algorithm                        | ALG             | 0-7                |
| 53               | Feedback                         | Feedback        | 0-7                |
| 54               | LFO Speed                        | Speed           | 0-99               |
| 55               | LFO Delay                        | Delay           | 0-99               |
| 56               | Pitch Modulation Depth           | P Mod Depth     | 0-99               |
| 57               | Amplitude Modulation Depth       | A Mod Depth     | 0-99               |
| 58               | LFO Sync                         | Sync            | 0-1                |
| 59               | LFO Wave                         | Wave            | 0-3                |
| 60               | Pitch Modulation Sensitivity     | P Mod Sens      | 0-7                |
| 61               | Amplitude Modulation Sensitivity | AMS             | 0-3                |
| 62               | Transpose                        | Middle C =      | 0-48 (Center = 24) |
| 63               | Poly/Mono                        | Poly Mode       | 0-1                |
| 64               | Pitch Bend Range                 | P Bend Range    | 0-12               |
| 65               | Portamento Mode                  | Full Time Porta | 0-1                |
| 66               | Portamento Time                  | Porta Time      | 0-99               |
| 67               | Foot Control Volume              | FC Volume       | 0-99               |
| 68               | Sustain                          | —               | 0-1                |
| 69               | Portamento                       | —               | 0-1                |
| 70               | Chorus                           | —               | 0-1 (Set 0)        |
| 71               | Modulation Wheel Pitch           | MW Pitch        | 0-99               |
| 72               | Modulation Wheel Amplitude       | MW Amplitude    | 0-99               |
| 73               | Breath Control Pitch             | BC Pitch        | 0-99               |
| 74               | Breath Control Amplitude         | BC Amplitude    | 0-99               |

| Parameter number                          | Parameter                  | LCD           | Data               |
|-------------------------------------------|----------------------------|---------------|--------------------|
| 75                                        | Breath Control Pitch Bias  | BC Pitch Bias | 0-99 (Center = 50) |
| 76                                        | Breath Control EG Bias     | BC EG Bias    | 0-99               |
| 77                                        | Voice name char 1          | —             | 32-127             |
| 78                                        | Voice name char 2          | —             | 32-127             |
| 79                                        | Voice name char 3          | —             | 32-127             |
| 80                                        | Voice name char 4          | —             | 32-127             |
| 81                                        | Voice name char 5          | —             | 32-127             |
| 82                                        | Voice name char 6          | —             | 32-127             |
| 83                                        | Voice name char 7          | —             | 32-127             |
| 84                                        | Voice name char 8          | —             | 32-127             |
| 85                                        | Voice name char 9          | —             | 32-127             |
| 86                                        | Voice name char 10         | —             | 32-127             |
| (Parameters 87-92 not used in the TX81Z.) |                            |               |                    |
| 93                                        | Operator On/Off (bits 0-3) | —             | 0-15 (OP. on = 1)  |

### Voice Edit Additional Parameters (ACED)

| Parameter number | Parameter                 | LCD          | Data                                     |
|------------------|---------------------------|--------------|------------------------------------------|
| 0                | Fixed Frequency           | FIX          | 0-1                                      |
| 1                | Fixed Frequency Range     | Fix Range    | 0-7 0(250Hz)-<br>7(32kHz)                |
| 2                | Frequency Range Fine      | FIN (RATIO)  | 0-15 OP. 4                               |
| 3                | Operator Waveform         | OSW          | 0-7                                      |
| 4                | EG Shift                  | SHFT         | 0-3 0(96dB), 1(48dB)<br>2(24dB), 3(12dB) |
| 5                |                           |              | OP. 3                                    |
| 10               |                           |              | OP. 2                                    |
| 15               |                           |              | OP. 1                                    |
| 20               | Reverb Rate               | Reverb Rate  | 0-7 0(off), 7(fast)                      |
| 21               | Foot Controller Pitch     | FC Pitch     | 0-99                                     |
| 22               | Foot Controller Amplitude | FC Amplitude | 0-99                                     |

**Performance Edit Parameters (PCED)**

| Parameter number | Parameter                     | LCD         | Data                                      |
|------------------|-------------------------------|-------------|-------------------------------------------|
| 0                | Maximum Notes                 | MAX NOTES   | 0-8 INST 1                                |
| 1                | Voice Number MSB              | —           | 0-1                                       |
| 2                | Voice Number                  | I01-D32     | 0-127 } 0-159                             |
| 3                | Receive Channel               | RECEIVE CH  | 0-16 omni = 16                            |
| 4                | Low Note Limit                | LIMIT/L     | 0-127 0(C-2)-127(G8)                      |
| 5                | High Note Limit               | LIMIT/H     | 0-127 0(C-2)-127(G8)                      |
| 6                | Instrument Detune             | INST DETUNE | 0-14 center = 7                           |
| 7                | Note Shift                    | NOTE SHIFT  | 0-48 center = 24                          |
| 8                | Volume                        | VOL         | 0-99                                      |
| 9                | Output Assign                 | OUT ASSIGN  | 0-3 0(off), 1(I), 2(HI),<br>3(I II)       |
| 10               | LFO Select                    | LFO SELECT  | 0-3 0(off), 1(inst1),<br>2(inst2), 3(vib) |
| 11               | Micro Tune Enable             | off/on      | 0-1                                       |
| 12<br>           |                               |             | INST 2                                    |
| 24<br>           |                               |             | INST 3                                    |
| 36<br>~          |                               |             | INST 4                                    |
| 48<br>           |                               |             | INST 5                                    |
| 60<br>           |                               |             | INST 6                                    |
| 72<br>           |                               |             | INST 7                                    |
| 84<br>           |                               |             | INST 8                                    |
| 96               | Micro Tune Table              | MICTUN      | 0-12                                      |
| 97               | Assign Mode                   | Assign Mode | 0-1 0(norm), 1(altr)                      |
| 98               | Effect Select                 | Effect Sel  | 0-3                                       |
| 99               | Key (for Micro Tune)          | —           | 0-11 (C-B)                                |
| 100              | Performance Name Character 1  | —           | 32-127 (ASCII)                            |
| 101              | Performance Name Character 2  | —           | 32-127 (ASCII)                            |
| —                |                               |             |                                           |
| 109              | Performance Name Character 10 | —           | 32-127 (ASCII)                            |

**Remote Switch Parameters**

| Parameter number | Parameter        | Data                            |
|------------------|------------------|---------------------------------|
| 64               | POWER ON (reset) | 0 (switch off), 127 (switch on) |
| 65               | STORE            |                                 |
| 66               | UTILITY          |                                 |
| 67               | EDIT             |                                 |
| 68               | PLAY             |                                 |
| 69               | PARAMETER -1     |                                 |
| 70               | PARAMETER +1     |                                 |
| 71               | DATA ENTRY -1    |                                 |
| 72               | DATA ENTRY +1    |                                 |
| 73               | MASTER VOLUME -1 |                                 |
| 74               | MASTER VOLUME +1 |                                 |
| 75               | CURSOR           |                                 |

## Voice Bulk Data Format (VMEM)

| address | b7 | b6    | b5            | b4    | b3    | b2    | b1    | b0  | dd<br>(value)           | comment         |
|---------|----|-------|---------------|-------|-------|-------|-------|-----|-------------------------|-----------------|
| 0       | 0  | 0     | 0             | ----- | AR    | ----- |       |     | 0-31                    |                 |
| 1       | 0  | 0     | 0             | ----- | DIR   | ----- |       |     | 0-31                    |                 |
| 2       | 0  | 0     | 0             | ----- | D2R   | ----- |       |     | 0-31                    |                 |
| 3       | 0  | 0     | 0             | 0     | ----- | RR    | ----- |     | 0-15                    |                 |
| 4       | 0  | 0     | 0             | 0     | ----- | D1L   | ----- |     | 0-15                    | OP.4            |
| 5       | 0  | ----- | LS            | ----- |       |       |       |     | 0-99                    |                 |
| 6       | 0  | AME   | -----         | EBS   | ----- | KVS   | ----- |     | 0-1, 0-7, 0-7           |                 |
| 7       | 0  | ----- | OUT           | ----- |       |       |       |     | 0-99                    |                 |
| 8       | 0  | 0     | -----         | F     | ----- |       |       |     | 0-63                    |                 |
| 9       | 0  | 0     | 0             | ---RS | ---   | DBT   | ---   |     | 0-3, 0-6                |                 |
| 10      |    |       |               |       |       |       |       |     |                         |                 |
| ~       |    |       |               |       |       |       |       |     |                         | OP.2            |
| ~       |    |       |               |       |       |       |       |     |                         |                 |
| 20      |    |       |               |       |       |       |       |     |                         |                 |
| ~       |    |       |               |       |       |       |       |     |                         | OP.3            |
| ~       |    |       |               |       |       |       |       |     |                         |                 |
| 30      |    |       |               |       |       |       |       |     |                         |                 |
| ~       |    |       |               |       |       |       |       |     |                         | OP.1            |
| ~       |    |       |               |       |       |       |       |     |                         |                 |
| 40      | 0  | SY    | -----         | FBL   | ----- | ALG   | ---   |     | 0-1, 0-7, 0-7           |                 |
| 41      | 0  | ----- | LFS           | ----- |       |       |       |     | 0-99                    |                 |
| 42      | 0  | ----- | LFD           | ----- |       |       |       |     | 0-99                    |                 |
| 43      | 0  | ----- | PMD           | ----- |       |       |       |     | 0-99                    |                 |
| 44      | 0  | ----- | AMD           | ----- |       |       |       |     | 0-99                    |                 |
| 45      | 0  | ----- | PMS           | ---   | AMS   | ---   | LFW   | --- | 0-7, 0-3, 0-3           |                 |
| 46      | 0  | 0     | -----         | TRPS  | ----- |       |       |     | 0-48                    |                 |
| 47      | 0  | 0     | 0             | 0     | ----- | PBR   | ----- |     | 0-12                    |                 |
| 48      | 0  | 0     | 0             | CH    | MO    | SU    | PO    | PM  | 0-1, 0-1, 0-1, 0-1, 0-1 |                 |
| 49      | 0  | ----- | PORT          | ----- |       |       |       |     | 0-99                    |                 |
| 50      | 0  | ----- | FC            | ---   | VOL   | ---   |       |     | 0-99                    |                 |
| 51      | 0  | ----- | MW PITCH      | ----- |       |       |       |     | 0-99                    |                 |
| 52      | 0  | ----- | MW AMPLI      | ----- |       |       |       |     | 0-99                    |                 |
| 53      | 0  | ----- | BC PITCH      | ----- |       |       |       |     | 0-99                    |                 |
| 54      | 0  | ----- | BC AMPLI      | ----- |       |       |       |     | 0-99                    |                 |
| 55      | 0  | ----- | BC P BIAS     | ----- |       |       |       |     | 0-99                    |                 |
| 56      | 0  | ----- | BC E BIAS     | ----- |       |       |       |     | 0-99                    |                 |
| 57      | 0  | ----- | VOICE NAME 1  | ----- |       |       |       |     | 32-127 (ASCII)          |                 |
| 58      | 0  | ----- | VOICE NAME 2  | ----- |       |       |       |     |                         |                 |
| 59      | 0  | ----- | VOICE NAME 3  | ----- |       |       |       |     |                         |                 |
| 60      | 0  | ----- | VOICE NAME 4  | ----- |       |       |       |     |                         |                 |
| 61      | 0  | ----- | VOICE NAME 5  | ----- |       |       |       |     |                         |                 |
| 62      | 0  | ----- | VOICE NAME 6  | ----- |       |       |       |     |                         |                 |
| 63      | 0  | ----- | VOICE NAME 7  | ----- |       |       |       |     |                         |                 |
| 64      | 0  | ----- | VOICE NAME 8  | ----- |       |       |       |     |                         |                 |
| 65      | 0  | ----- | VOICE NAME 9  | ----- |       |       |       |     |                         |                 |
| 66      | 0  | ----- | VOICE NAME 10 | ----- |       |       |       |     | 32-127 (ASCII)          |                 |
| 67      | 0  | ----- | PR1           | ----- |       |       |       |     | 0-99                    | PEG (DX21 only) |
| 68      | 0  | ----- | PR2           | ----- |       |       |       |     | 0-99                    | Set 99          |
| 69      | 0  | ----- | PR3           | ----- |       |       |       |     | 0-99                    |                 |
| 70      | 0  | ----- | PL1           | ----- |       |       |       |     | 0-99                    | Set 50          |
| 71      | 0  | ----- | PL2           | ----- |       |       |       |     | 0-99                    |                 |
| 72      | 0  | ----- | PL3           | ----- |       |       |       |     | 0-99                    |                 |

**Additional Voice Bulk Data Format**

| No. | b7 | b6 | b5 | b4        | b3  | b2 | b1        | b0      | Data | note |
|-----|----|----|----|-----------|-----|----|-----------|---------|------|------|
| 0   |    |    |    |           |     |    |           |         |      |      |
| .   |    |    |    |           |     |    |           |         |      |      |
| .   |    |    |    |           |     |    |           |         |      |      |
| 67  |    |    |    |           |     |    |           |         |      |      |
| .   |    |    |    |           |     |    |           |         |      |      |
| 72  |    |    |    |           |     |    |           |         |      |      |
| .   |    |    |    |           |     |    |           |         |      |      |
| 73  | 0  | 0  |    | — EGSFT — | FIX |    | — FIXRG — |         |      | OP.4 |
| 74  | 0  |    |    | — OPW —   |     |    | — FINE —  |         |      |      |
| 75  |    |    |    |           |     |    |           |         |      | OP.2 |
| .   |    |    |    |           |     |    |           |         |      |      |
| 77  |    |    |    |           |     |    |           |         |      | OP.3 |
| .   |    |    |    |           |     |    |           |         |      |      |
| 79  |    |    |    |           |     |    |           |         |      | OP.1 |
| .   |    |    |    |           |     |    |           |         |      |      |
| 81  | 0  | 0  | 0  | 0         | 0   |    |           | — REV — |      |      |
| 82  | 0  |    |    |           |     |    |           |         |      |      |
| 83  | 0  |    |    |           |     |    |           |         |      |      |

**Performance Bulk Data Format (PMEM)**

| No. | b7 | b6           | b5          | b4         | b3          | b2     | b1    | b0     | Data              | note  |
|-----|----|--------------|-------------|------------|-------------|--------|-------|--------|-------------------|-------|
| 0   | 0  | OUT_ASGN     | MSB         | ----       | NUM of NOTE | -----  |       |        |                   | INST1 |
| 1   | 0  | -----        | VOICE NO    | -----      |             |        |       |        |                   |       |
| 2   | 0  | --- LFOS --- | -----       | RCV CII    | -----       |        |       |        |                   |       |
| 3   | 0  | -----        | LIMIT/L     | -----      |             |        |       |        |                   |       |
| 4   | 0  | -----        | LIMIT/H     | -----      |             |        |       |        |                   |       |
| 5   | 0  |              |             |            | -----       | DETUNE | ----- |        | 0 ~ 14 (7 center) |       |
| 6   | 0  | MTE          | -----       | NOTE SHIFT | -----       |        |       |        |                   |       |
| 7   | 0  | -----        | VOLUME      | -----      |             |        |       |        |                   |       |
| 8   |    |              |             |            |             |        |       |        |                   | INST2 |
| 16  |    |              |             |            |             |        |       |        |                   | INST3 |
| 24  |    |              |             |            |             |        |       |        |                   | INST4 |
| 32  |    |              |             |            |             |        |       |        |                   | INST5 |
| 40  |    |              |             |            |             |        |       |        |                   | INST6 |
| 48  |    |              |             |            |             |        |       |        |                   | INST7 |
| 56  |    |              |             |            |             |        |       |        |                   | INST8 |
| 64  | 0  | 0            | 0           | 0          | -----       | MTBL   | ----- |        |                   |       |
| 65  | 0  | -----        | KEY         | -----      | -----       | EFSEL  | ----- | ASMODE |                   |       |
| 66  | 0  | -----        | PFM NAME 1  | -----      |             |        |       |        |                   |       |
| 67  | 0  | -----        | PFM NAME 2  | -----      |             |        |       |        |                   |       |
| .   |    |              |             |            | .           |        |       |        |                   |       |
| .   |    |              |             |            | .           |        |       |        |                   |       |
| 75  | 0  | -----        | PFM NAME 10 | -----      |             |        |       |        |                   |       |

# System Setup Bulk Data Format (SYS)

| No. | b7 | b6             | b5 | b4               | b3               | b2 | b1         | b0 | Data   | note                                    |
|-----|----|----------------|----|------------------|------------------|----|------------|----|--------|-----------------------------------------|
| 0   | 0  | -----TUNE----- |    |                  |                  |    |            |    | 0-127  | master tune center = 64                 |
| 1   | 0  | 0              | 0  | -----MIDBCH----- |                  |    |            |    | 0-16   | basic rcv ch 16: omni                   |
| 2   | 0  | 0              | 0  | 0                | -----MIDTCH----- |    |            |    | 0-15   | trans ch                                |
| 3   | 0  | 0              | 0  | 0                | 0                | 0  | --PCINF--  |    | 0-2    | p. cng sw                               |
| 4   | 0  | 0              | 0  | -----COINF-----  |                  |    |            |    | 0-17   | cont. cng sw 1: norm<br>2-17 (G1 ~ G16) |
| 5   | 0  | 0              | 0  | -----PBSW-----   |                  |    |            |    | 0-17   | p. bend sw 1: norm<br>2-17 (G1 ~ G16)   |
| 6   | 0  | 0              | 0  | 0                | 0                | 0  | --NOTESW-- |    | 0-2    | note on/off 0: all, 1: odd, 2: even     |
| 7   | 0  | 0              | 0  | 0                | 0                | 0  | 0 SYSAVL   |    | 0-1    | exclusive on/off                        |
| 8   | 0  | 0              | 0  | 0                | 0                | 0  | 0 MLOCK    |    | 0-1    | mem. protect                            |
| 9   | 0  | 0              | 0  | 0                | 0                | 0  | 0 CMBIN    |    | 0-1    | combine                                 |
| 10  | 0  | 0              | 0  | 0                | 0                | 0  | 0 AT       |    | 0-1    | after touch                             |
| 11  | 0  | -----ID1-----  |    |                  |                  |    |            |    | 32-127 | ID (ascii)                              |
| 12  | 0  | -----ID2-----  |    |                  |                  |    |            |    |        |                                         |
| 13  | 0  | -----ID3-----  |    |                  |                  |    |            |    |        |                                         |
| .   |    |                |    |                  |                  |    |            |    |        |                                         |
| .   |    |                |    |                  |                  |    |            |    |        |                                         |
| .   |    |                |    |                  |                  |    |            |    |        |                                         |
| 26  | 0  | -----ID16----- |    |                  |                  |    |            |    |        |                                         |

| 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       | XXXXXXXXXXXXXXXX | x               |                         |
| Note                                                    |               | x                | 0 - 127         |                         |
| Number                                                  | True voice    | XXXXXXXXXXXXXXXX | 13 - 108        |                         |
| Velocity                                                | Note ON       | x                | 0 v=1-127       |                         |
|                                                         | Note OFF      | x                | x               |                         |
| After                                                   | Key's         | x                | x               |                         |
| Touch                                                   | Ch's          | x                | 0 X1            | (Breath control)        |
| Pitch Bender                                            |               | x                | 0 0-12 semi X2  | 7 bit resolution        |
| Control                                                 | 1             | x                | 0 X1            | Modulation wheel        |
|                                                         | 2             | x                | 0 X1            | Breath control          |
|                                                         | 4             | x                | 0 X1            | Foot control            |
|                                                         | 5             | x                | 0 X1            | Portamento time         |
|                                                         |               |                  |                 | (single mode only)      |
|                                                         | 7             |                  | 0 X1            | Volume                  |
|                                                         | 10            | x                | 0 X1            | Pan(I,I+II,II)          |
|                                                         |               |                  |                 | (performance mode only) |
|                                                         | 64            | x                | 0               | Sustain                 |
|                                                         | 65            | x                | 0 X1            | Portamento              |
| Prog                                                    |               | 0 0 - 127 X3     | 0 0 - 127       | if pgm cng sw is        |
| Change                                                  | True #        | XXXXXXXXXXXXXXXX | 0 - 183         | on.(assignable)         |
| System Exclusive                                        |               | 0 X4             | 0 X4            | Voice parameters        |
| System                                                  | Song Pos      | x                | x               |                         |
|                                                         | Song Sel      | x                | x               |                         |
| Common                                                  | Tune          | x                | x               |                         |
| System                                                  | Clock         | x                | x               |                         |
| Real Time                                               | Commands      | x                | x               |                         |
| Aux                                                     | Local ON/OFF  | x                | x               |                         |
|                                                         | All Notes OFF | x                | 0 (123,126,127) |                         |
| Mes-                                                    | Active Sense  | x                | 0               |                         |
| sages:                                                  | Reset         | x                | x               |                         |
| Notes: X1 = receive if cont. change switch is on.       |               |                  |                 |                         |
| X2 = receive if pitch bend sw is on.                    |               |                  |                 |                         |
| X3 = transmit if program change switch is on            |               |                  |                 |                         |
| and system exclusive switch is off.                     |               |                  |                 |                         |
| X4 = transmit/receive if system exclusive switch is on. |               |                  |                 |                         |

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

## ■ TEST PROGRAM

### 1. Preparation Instructions

- (1) Connect the MIDI IN connector to the MIDI OUT connector with a MIDI cable.
- (2) Connect the CASSETTE connector to the 10dB amplifier with a DIN cable.

\*Use an 10dB amplifier or set a cassette deck to REC/PAUSE and adjust it so that there is 10dB gain.

### 2. Test Program Entry

- (1) Starting from Test 1

While pressing and holding the MASTER VOLUME ← and CURSOR switches, turn on the POWER switch. The LCD will display a message as shown below.

P.UT  
Test Entry ?

Press the INC switch, and the preset voice data is loaded into the RAM and the MIDI parameters are set as shown in the chart below.

|                 |               |
|-----------------|---------------|
| Ch. Info:       | ON            |
| Basic Rcv. Ch.: | all (OMNI ON) |
| Transmit Ch.:   | 1             |
| Sys. Info:      | ON            |

- (2) Starting from Test 5

While pressing and holding the MASTER VOLUME ← and → switches, turn on the POWER switch. The Test routine will start from the Test Program 5.

### 3. Test Program 1: Output check

- (1) The LCD will display the message shown below.

Check LVL 1 (L)

An output signal of  $-19 \pm 2\text{dBm}$  at 440Hz (A3 note) can be detected at the OUTPUT I (L) connector. If the INC switch is pressed, the Test Program will proceed to the next step.

- (2) The LCD will display the message shown below.

Check LVL 2 (R)

An output signal of  $-19 \pm 2\text{dBm}$  at 440Hz (A3 note) can be detected at the OUTPUT II (R) connector. If the INC switch is pressed, the Test Program will proceed to the next step.

- (3) The LCD will display the message shown below.

Check LVL HP (L)

An output signal of  $-13 \pm 2\text{dBm}$  at 440Hz (A3 note) can be detected at the Lch. of the HEAD-PHONES connector. If the INC switch is pressed, the Test Program will proceed to the next step.

- (4) The LCD will display the message shown below.

Check LVL HP (R)

An output signal of  $-13 \pm 2\text{dBm}$  at 440Hz (A3 note) can be detected at the Rch. of the HEAD-PHONES connector. If the INC switch is pressed, the Test Program will proceed to the next routine.

### 4. Test Program 2: RAM check, CASSETTE I/F check and MIDI I/O check.

- (1) When this test is initiated, the RAM check, CASSETTE I/F check and the MIDI I/O check are performed automatically. If an error is detected, the Test Program will stop at that step. If the CASSETTE I/F check is in error, pressing the DEC switch will advance the Test Program to the next step.
- (2) The LCD will display the message shown below.

Check MIDI THRU

The MSX monitor and the program for the MIDI THRU connector and check on the MSX monitor for continuous output of the test data (AA, FF, 00, 55) from the MIDI THRU connector. If the INC switch is pressed, the Test Program will advance to the next routine.

#### \*MIDI THRU check

Connect the MSX monitor to the MIDI THRU connector and check on the MSX monitor for continuous output of the test data (AA, FF, 00, 55) from the MIDI THRU connector. If the INC switch is pressed, the Test Program will advance to the next routine.

**5. Test Program 3: LCD check**

The entire LCD turns "ON and OFF" three times. If the INC switch is pressed, the LCD will display as shown below.



When proper lighting of the LCD display has been verified, press the INC switch, and the Test Program will proceed to the next routine.

**6. Test Program 4: LED check**

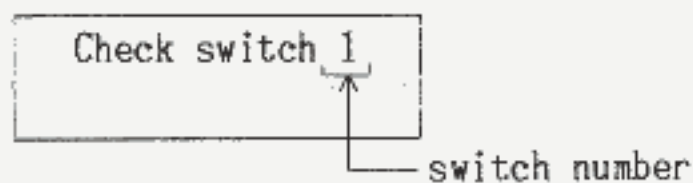
The LCD will display the message shown below.

Check LED 1-4

The switch LED indicators will light one after another from left to right, then all of the switch LED indicators will light simultaneously. When proper lighting of the LEDs has been verified, press the INC switch, and the Test Program will proceed to the next routine.

**7. Test Program 5: Panel switch check**

When this test is entered, switch number 1 will appear in the LCD display as shown below.



Press the switch that is indicated by the LCD display. If an incorrect switch is pressed, the Test Program will not advance. Pressing the correct switch will advance the Test Program to the next routine.

| Switch Number | Switch Name     |
|---------------|-----------------|
| 1             | STORE/EG COPY   |
| 2             | UTILITY         |
| 3             | EDIT/COMPARE    |
| 4             | PLAY/PERFORM    |
| 5             | PARAMETER ←     |
| 6             | PARAMETER →     |
| 7             | DEC             |
| 8             | INC             |
| 9             | MASTER VOLUME ← |
| 10            | MASTER VOLUME → |
| 11            | CURSOR          |

Upon completion of these tests, the test routine will reset the system to the normal operating mode.

## LSI DATA TABLE

### • YM2414 (XB768001) Operator

| PIN NO. | NAME | I/O | FUNCTION           | PIN NO. | NAME | I/O | FUNCTION              |
|---------|------|-----|--------------------|---------|------|-----|-----------------------|
| 1       | Vss  |     | GND                | 24      | oM   | I   | Clock 3.58 MHz        |
| 2       | IRQ  | O   | Interrupt data     | 23      | o1   | I   | Synchro pulse for DAC |
| 3       | IC   | I   | Initial clear      | 22      | VDD  | I   | DC Supply (+5V)       |
| 4       | AD0  | I   | Address bus        | 21      | S0   | O   | Tone signal data      |
| 5       | WR   | I   | Write control      | 20      | SH1  | O   | Sample and hold (Ch1) |
| 6       | RD   | I   | Read control       | 19      | SH2  | O   | Sample and hold (Ch2) |
| 7       | CS   | I   | Chip Select        | 18      | D7   | I/O | Data bus              |
| 8       | CT1  | O   | Control data out 1 | 17      | D6   | I/O |                       |
| 9       | CT2  | O   | Control data out 2 | 16      | D5   | I/O |                       |
| 10      | D0   | I/O | Data bus           | 15      | D4   | I/O |                       |
| 11      | Vss  |     | GND                | 14      | D3   | I/O |                       |
| 12      | D1   | I/O | Data bus           | 13      | D2   | I/O |                       |

### • HD63B03XP (IG140800) Central Processing Unit

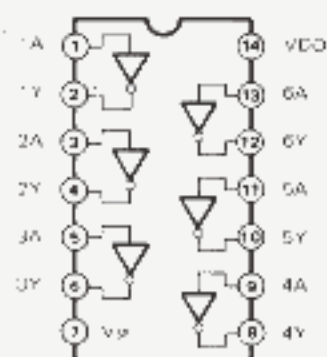
| PIN NO. | NAME  | I/O | FUNCTION               | PIN NO. | NAME | I/O | FUNCTION                  |
|---------|-------|-----|------------------------|---------|------|-----|---------------------------|
| 1       | Vss   | I   | Ground                 | 33      | Vcc  |     | DC Supply (+5V)           |
| 2       | XTAL  | I   | Clock (8MHz)           | 34      | A15  | O   | Address bus               |
| 3       | EXTAL | I   |                        | 35      | A14  | O   |                           |
| 4       | MP0   | I   | Mode program           | 36      | A13  | O   |                           |
| 5       | MP1   | I   |                        | 37      | A12  | O   |                           |
| 6       | RES   | I   | Reset                  | 38      | A11  | O   |                           |
| 7       | STBY  | I   | Stand-by mode signal   | 39      | A10  | O   | Address bus               |
| 8       | 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 | Port 5                 | 46      | A4   | O   |                           |
| 15      | P26   | I/O |                        | 47      | A3   | O   |                           |
| 16      | P27   | I/O |                        | 48      | A2   | O   | Data bus                  |
| 17      | P50   | I/O |                        | 49      | A1   | O   |                           |
| 18      | P51   | I/O |                        | 50      | A0   | O   |                           |
| 19      | P52   | I/O | Port 6                 | 51      | D7   | I/O |                           |
| 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      | D3   | I/O | Data bus                  |
| 24      | P57   | I/O | Port 6                 | 56      | D2   | I/O |                           |
| 25      | P60   | I/O |                        | 57      | D1   | I/O |                           |
| 26      | P61   | I/O |                        | 58      | D0   | I/O |                           |
| 27      | P62   | I/O |                        | 59      | BA   | O   | Bus available             |
| 28      | P63   | I/O |                        | 60      | LIR  | O   | Load instruction resistor |
| 29      | P64   | I/O | Port 6                 | 61      | R/W  | O   | Read/Write control        |
| 30      | P65   | I/O |                        | 62      | WR   | O   | Write                     |
| 31      | P66   | I/O |                        | 63      | RD   | O   | Read                      |
| 32      | P67   | I/O |                        | 64      | E    | O   | Enable                    |

● YM3012 (IT301200) Digital to Analog Converter

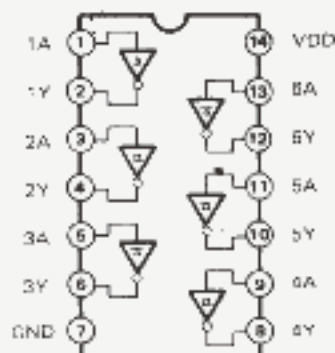
| PIN NO. | NAME   | I/O | FUNCTION              | PIN NO. | NAME   | I/O | FUNCTION                               |
|---------|--------|-----|-----------------------|---------|--------|-----|----------------------------------------|
| 1       | VDD    | I   | DC supply (+5V)       | 9       | CH1    | O   | Sample and hold analog SW output (ch1) |
| 2       | CLOCK  | I   | Timing clock          | 10      | CH2    | O   | " " (ch2)                              |
| 3       | D GND  | I   | Digital ground        | 11      | COM    | I   | Ch1 ch2 analog SW common input         |
| 4       | SD     | I   | Serial data input     | 12      | A OUT  | O   | Analog output to Buffer AMP            |
| 5       | SAM2   | I   | Sample and hold (ch2) | 13      | MP     | I   | Middle point 1/2 VDD bias              |
| 6       | SAM1   | I   | " " (ch1)             | 14      | BC     | I   | Bias compensation                      |
| 7       | ICL    | I   | Initial clear         | 15      | RB     | O   | Bias-R                                 |
| 8       | A. GND | I   | Analog ground         | 16      | A. GND | I   | Analog ground                          |

## IC BLOCK DIAGRAM

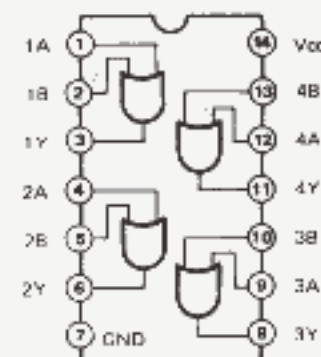
- TC40H004P (IG051000)
- SN74HC04N (IR000450)  
Hex Inverter



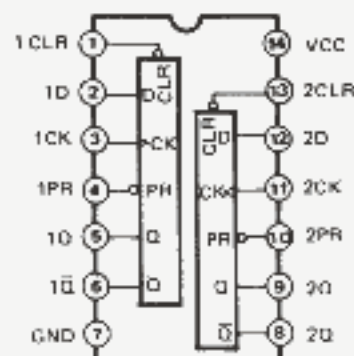
- SN74HC14N (IR001450)  
Hex Inverter



- SN74HC32N (IR003250)  
Quad 2 Input OR

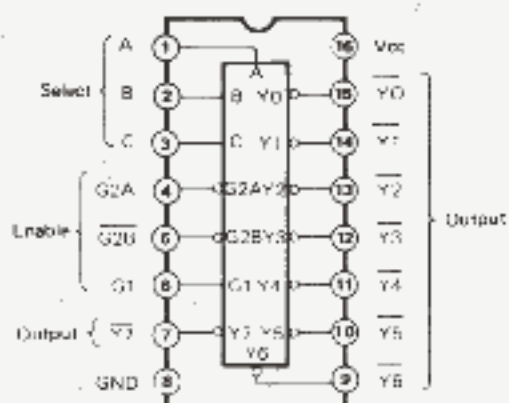


- TC40H074P (IG051100)  
Dual D-Type Flip-Flop

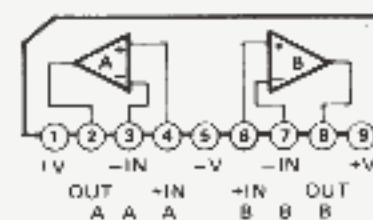


| INPUTS |     |     |   | OUTPUTS        |                |
|--------|-----|-----|---|----------------|----------------|
| PR     | CLR | CLK | D | Q              | Q'             |
| L      | H   | X   | X | H              | L              |
| H      | L   | X   | X | L              | H              |
| L      | L   | X   | X | H              | H              |
| H      | H   | F   | H | H              | L              |
| H      | H   | F   | L | L              | H              |
| H      | H   | L   | X | Q <sub>a</sub> | Q <sub>a</sub> |

- SN74HC138N (IR013850)  
3 to 8 Demultiplexer



- NJM072D (IG107000)  
Dual Operational Amplifier



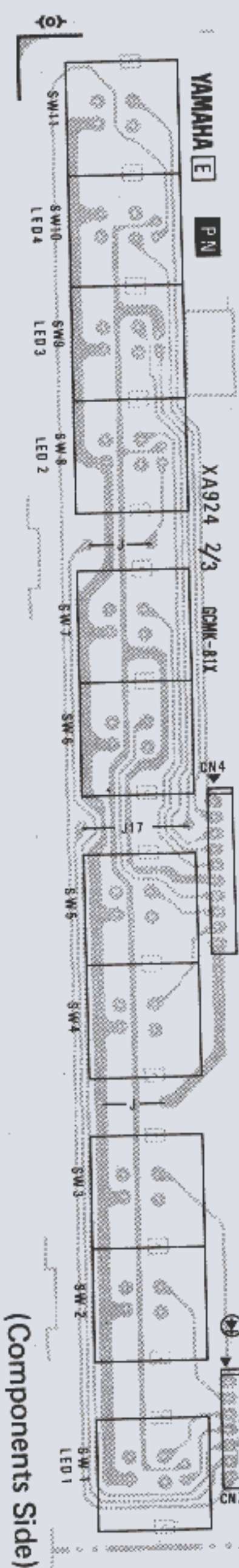
- **DM Circuit Board**



(Components Side)

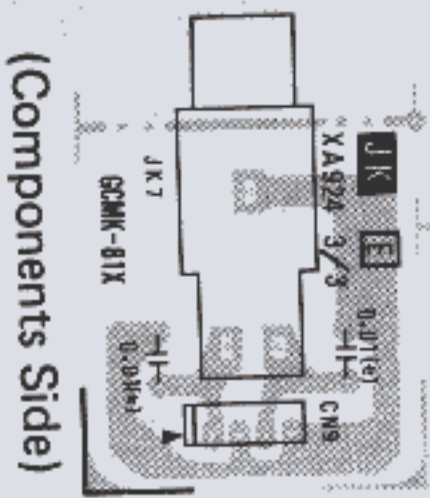
YAMAHA  
XBRZ

# ● PN Circuit Board



(Components Side)

# ● JK Circuit Board



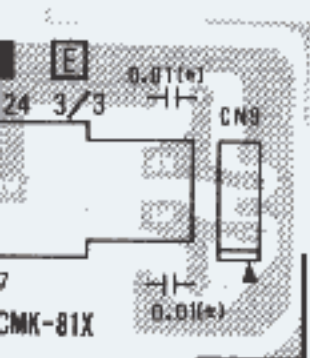
## Notes)

## DM, PN, JK Circuit Boards

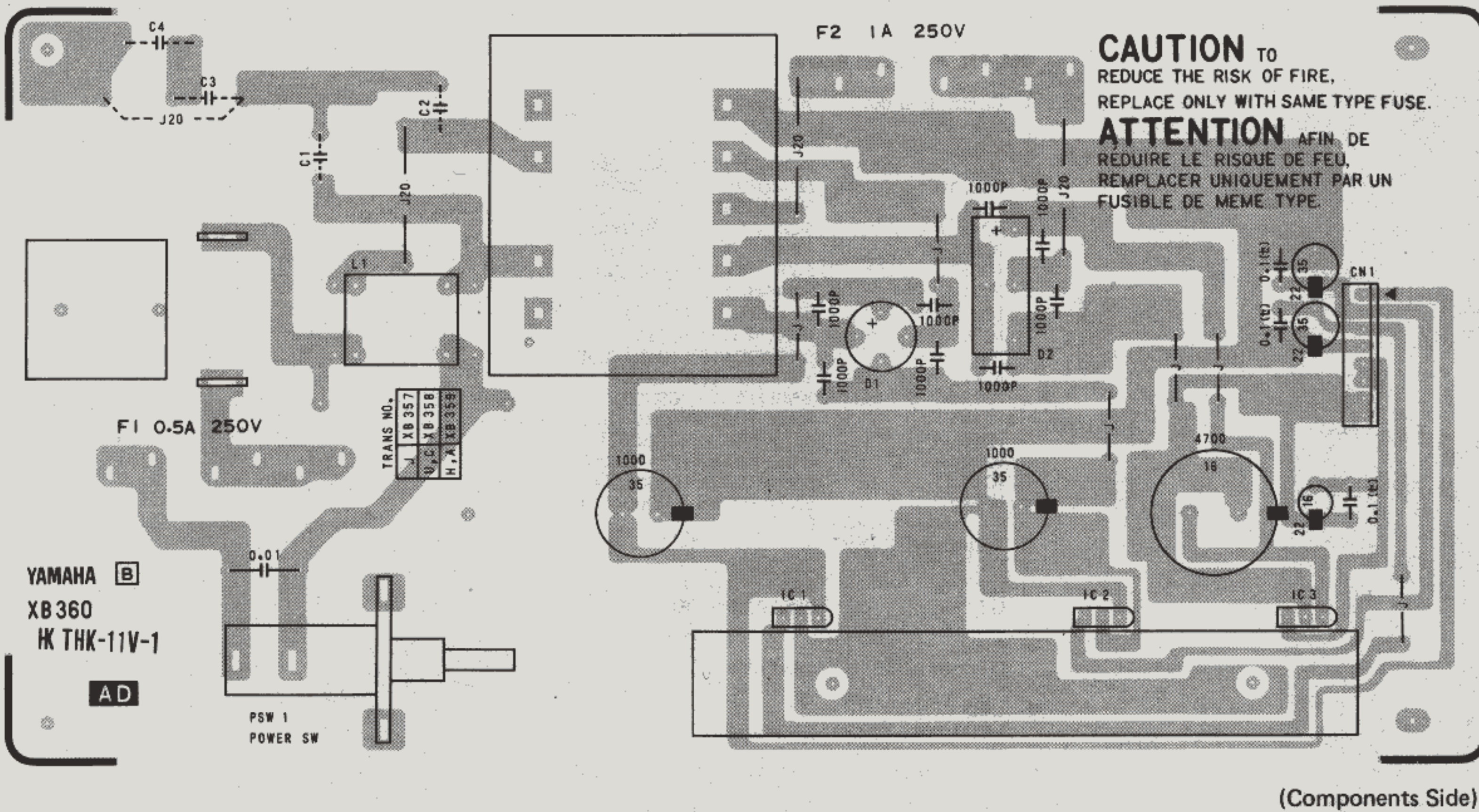
1. Circuit Boards: XA924D
2. IC
  - IC1: NJM4558DV (IG001390)
  - IC2, 10: NJM072D (16107000)
  - IC3: NJM4556DV (IG042500)
  - IC4: TC40H004P (IG051000)
  - IC5: TC40H074P (IG05110)
  - IC6: PST518B-2 (IG116200)
  - IC7: SN74HC14N (IR001450)
  - IC8: TLP552 (IK000470)
  - IC9: IR9311 (IG134900)
  - IC11: SN74HC138N (IR013850)
  - IC12: YM3012 (IT301200)
  - IC13: YM2414 (XB768001)
  - IC14: RAM TC5564PL-15 (XB013001)
  - IC15: ROM 64K (XB186002)
  - IC16: HD63B03XP (IG140800)
  - IC17: SN74HC32N (IR003250)
  - IC18: SN74HC04N (IR000450)
3. Transistor
  - Q1, 2: 2SC2878 (A, B)
  - Q3 ~ 6: 2SA1115 (E, F)
  - Q7 ~ 9: 2SC2603 (E, F)
4. Diode
  - D1 ~ 3: 1SS176
5. LED
  - LED1 ~ 4: LN242RP (RE)
6. (セ) marked: Semiconductive Cera. Cap.
7. 6.8Ω 1W: Metal Oxide Resistor  
47Ω 1W: Metal Oxide Resistor
8. Resistor Array
  - RA1: RMNG12472/103J (4.7K x 6 + 10K x 6)
  - RA2: RMNG10472/103J (4.7K x 5 + 10K x 5)
  - RA3: RMLA-391J (390 x 4)
9. CL1: Ceramic Resonator 500kHz  
CR1: Quartz Crystal Unit 7.15909MHz
10. EMI1: EMI Filter 0.022μF
11. Lithium Battery  
B1: CR2032

ments Side)

## Circuit Board



• AD Circuit Board



Notes)

AD Circuit Board

1. Circuit Board: XB360B
2. IC  
IC1: AN78M15F (XB466001)  
IC2: AN79M15F (XB467001)  
IC3: AN78M05F (XB646001)
3. Diode  
D1: 1D4B1  
D2: SIRBA10
4. (セ) marked: Semiconductive Cera. Cap.
5. Coil  
L1: PLA3021A

| Spec.                                       | C1, C2 | C3, C4 | F1                  | F2                | T1    |
|---------------------------------------------|--------|--------|---------------------|-------------------|-------|
| Japanese                                    | 2200P  | X      | ▽ 0.5A 250V         | ▽ 1A 250V         | XB357 |
| U.S.A.<br>Canadian                          | 2200P  | X      | UL ST4<br>0.5A 250V | UL ST4<br>1A 250V | XB358 |
| North European<br>West German<br>Australian | 2200P  | 4700P  | Ⓢ T500mA 250V       | Ⓢ T630mA 250V     | XB359 |

# FM TONE GENERATOR

## TX81Z

# PARTS LIST

### Notes DESTINATION ABBREVIATIONS

|                          |                       |
|--------------------------|-----------------------|
| J : Japanese model       | A : Australian model  |
| U : U.S.A. model         | E : European model    |
| C : Canadian model       | D : West German model |
| X : General model        | B : British model     |
| M : South African model  | I : Indonesian model  |
| H : North European model |                       |

**OVERALL ASSEMBLY**