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July 27, 1988

7JDBX27/LBT
To: L. B. Tyler, dbx
From: M. Takarada, BSR J
cc: MK/DM
JAR
Chiba/Muroi

Subject: BX-3MKII circuit design

Our intention is to make minor modifications to the present BX-3. Schematic diagram is not ready but the following should give you ideas of the modifications. Please refer to the circuit diagram for the BX-3 and make comments/suggestions. We would like to receive them by 7/29 our time, please.

B-C ?

1. 10pF between C-E on KC8 and KC9 is changed to between B-E per the schematic diagram. This is to avoid power transistor damage due to high frequency oscillation. Is it C-E on present units?

2. Improve stability by lowering gain.

KR10	delete
KR18,19	change to 220ohms from 100ohms
KR8	change to 150ohms from 47ohms
KC2	change to 2200p from 1800p
KC8,9	increase 10p to somewhat larger value

ok.

3. Limiter circuit
With the present BX-3 the limiter is triggered under 2-ohm load at the 4-ohm position yielding less power than under 4-ohm load with more power TR heat generation. Modify the limiter circuit so that it is triggered only under a near-short condition and make sure that it is not triggered down to 2-ohm load. Current capability and dynamic power are imporved.

Forget limiter use ~~fuse~~ relay + thermal sw. instead.

4. Power transistor protection

a. Use relay for short-ciruit protection (same as now).
b. Install a self-resetting type thermal switch of 85 to 95 degrees C to the heatsink to avoid junctin temperature exceeding the rated temperature. The current design exceeds the rated junction temperature under full power condition at 8-ohm position, bridged mode 8-ohm load; at 4-ohm position, bridged mode 4-ohm load; and at 4-ohm position, 4-ch mode 2-ohm load.

make air

Best regards,

M. Takarada

Reliability has been very good

1 PR 2 · 5.29 (2W) to lower up — others a fix

METER DRIVER BOARD BF-20

1. METER LEVEL ADJUSTMENT

1) Take off the front pannel.
2) Connect the test equipments to the unit as shown in Fig. 1.

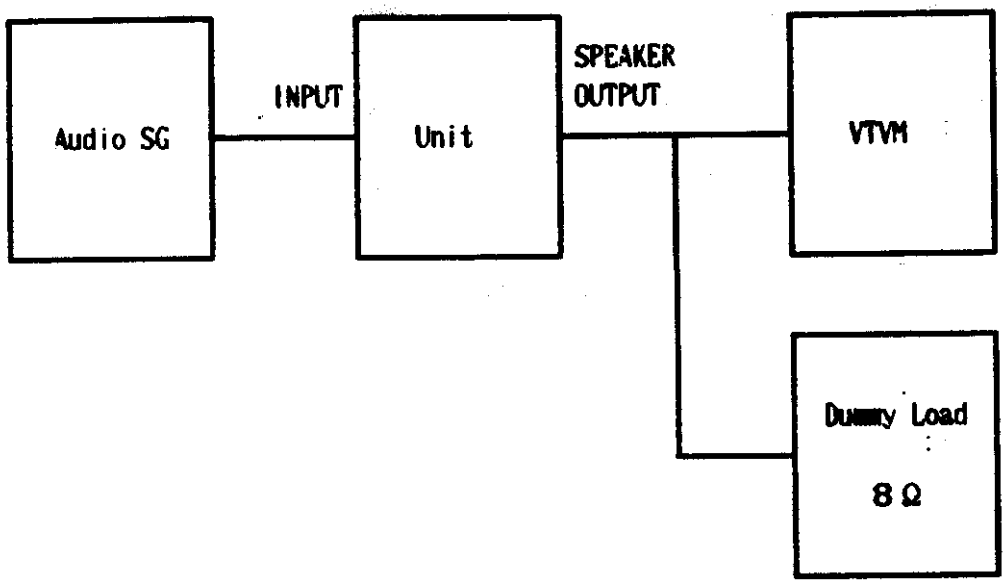

Fig. 1

3) Set all INPUT LEVEL attenuators MAX.
4) Set METER SELECTOR switch FRONT and METER SENSITIVITY switch "x 1" position.
5) Apply a sine wave 1kHz signal from audio SG to the LF input terminal.
6) Increase input signal untill the speaker output signal of LF channel becomes 20V.
7) Adjust MVR-1 on BF-20 to set the left power meter indicates -5 dB.
8) Apply a sine wave 1kHz signal from audio SG to the RF input terminal.
9) Increase input signal untill the speaker output signal of RF channel becomes 20V.
10) Adjust MVR-2 on BF-20 to set the right power meter indicates -5 dB.
11) Set METER SELECTOR switch REAR.
12) Apply a sine wave 1kHz signal from audio SG to the LR input terminal.
13) Increase input signal untill the speaker output signal of LR channel becomes 20V.
14) Verify that the left power meter indicates -5 dB.
15) Apply a sine wave 1kHz signal from audio SG to the RR input terminal.
16) Increase input signal untill the speaker output signal of RR channel becomes 20V.
10) Verify that the right power meter indicates -5 dB.

BX-3 CIRCUIT IMPROVEMENT HISTORY

1. Meter Lamp Specifications

To improve life time of meter lamp, the meter lamps are changed as the following list.
In case of meter lamp fault, change both (L & R) meter lamps as shown below :

Parts No.	Q'ty	Original Parts	Current Parts
LM2	1	8V 0.11A	10V 0.1A
LM3	1	8V 0.11A	10V 0.1A

* These parts were applied from serial No. 60710001 to 60710100.

2. Power Amp Circuit (BF-30)

1) To improve stability of power amplifier, some capacitors on PWB BF-30 are changed as the following list :

Parts No.	Q'ty	Serial No. 60710001-0100	Serial No. 60810001-60913250	Serial No. 61014001-61115250	After Serial No. 61116001
kC15(FRONT)	2	5pF 50V	10pF 50V	5pF 50V	10pF 50V
kC15(REAR)	2	15pF 50V	15pF 50V	5pF 50V	10pF 50V

2) To improve channel separation at BTL mode and S/N, some resistors on PWB BF-30 are changed to the current value as the following list :

Parts No.	Q'ty	Original Parts	Current Parts
kR45	1	27k ohm 1/4 carbon	12k ohm 1/4 carbon
kR46	1	100 ohm 1/4 carbon	15k ohm 1/4 carbon

* These parts were applied from serial No. 60710001 to 60913250.

BX-3 MECHANICAL PARTS LIST
(Corresponding to the Exproded View)

1. Front Pannel
2. Push Knob A
3. Tapping Screw 3x6
4. Front Glass
5. Display Pannel
6. VR Bracket
7. Collar Bushing A
8. VR Knob
9. Shieldng sheet
10. M7 Nut
11. PWB Ass'y BF-91
12. Meter Hood
13. Power Meter
14. Bracket A
15. Push Knob B
16. PWB Ass'y BF-20
17. Collar Bushing B
18. Bracket B
19. Power Switch
20. Collar Bushing C
21. Logo Mark Lamp Case
22. Logo Mark Lamp
23. PWB Ass'y BF-80
24. Back-up Pannel
25. M3 Plane Washer
26. M3 Spring Washer
27. M3 Nut
28. Bracket C
29. Rubbre Bushing A
30. Meter Lamp
31. Lighting Plate
32. AC Power Cable
33. Power Cable Bushing
34. AC Outlet
35. Rear Pannel
36. PWB Ass'y BF-70
37. Voltage Selector
38. PWB Ass'y BF-60
39. PWB Ass'y BF-50
40. Ground Terminal
41. Power Fuse
42. PWB Ass'y BF-10
43. PWB Ass'y BF-40
44. Cooling Fan Cover
45. Cooling Fan
46. M3 Spring Washer
47. M3 Nut
48. Electrolystic Capacitor
49. 1P Lug Terminal
50. Capacitor Chassis
51. Diode Block
52. M6 Nut
53. Screw M6x12
54. Power Transformer
55. Screw M4
56. Thermal Sensor
57. Temp. Compensate TR Fitting
58. Collar Busing D
59. PWB Ass'y BF-30
60. PWB Ass'y BF-30
61. Heat Sink
62. Bracket D
63. Frame L
64. Frame R
65. Center Frame
66. Side Wood L
67. Side Frame
68. Side Wood R
69. Bottom Plate
70. Leg Ass'y
71. Bonnet
72. Screw M3x8
73. Tapping Screw 3x8
74. Screw M3x16
75. Tapping Screw 3x8
76. Tapping Screw 3x14
77. Screw M6x16
78. Chassis Insulator
79. PWB Ass'y BF-90

BX-3 ELECTRONIC PARTS LIST

1. PWB BF-10(1) Protector Board

* Accuracy of resistors is 5% unless special notice.

Symbol No.	Description	Q'ty	
1R15	Carbon 47kΩ 1/4W	1	
1R16	Carbon 220kΩ 1/4W	1	
1R17	Carbon 56kΩ 1/4W	1	
1R18	Carbon 22kΩ 1/4W	1	
1R19	Carbon 220kΩ 1/4W	1	
1R20	Carbon 56kΩ 1/4W	1	
1R21	Carbon 33kΩ 1/4W	1	
1R22	Carbon 18kΩ 1/4W	1	
1R23	Carbon 56kΩ 1/4W	1	
1R24	Carbon 56kΩ 1/4W	1	
1R25	Carbon 56kΩ 1/4W	1	
1R26	Non-inflamable 1.2kΩ 1/2W	1	
1R27	Non-inflamable 1.2kΩ 1/2W	1	
1R28	Carbon 330Ω 1/4W	1	
1R29	Carbon 4.7kΩ 1/4W	1	
1R30	Carbon 100kΩ 1/4W	1	
1R31	Carbon 6.8kΩ 1/4W	1	
1R32	Carbon 100kΩ 1/4W	1	
1R33	Carbon 1.5kΩ 1/4W	1	
1R34	Carbon 1kΩ 1/4W	1	
1R35	Carbon 56kΩ 1/4W	1	
1R36	Carbon 56kΩ 1/4W	1	
1R37	Non-inflamable 10Ω 2W	1	
pR1	Cement 3.9Ω 10W	1	
1C6	Electrolystic 100μF 6.3V BP	1	
1C7	Electrolystic 22μF 25V	1	
1C8	Electrolystic 0.47μF 50V	1	
1C9	Electrolystic 4.7μF 50V	1	
1C10	Electrolystic 4.7μF 50V	1	
1C11	Electrolystic 100μF 6.3V BP	1	
1C14	Mylar 0.047μF 100V	2	
1C15	Ceramic 1000pF 50V	1	
1IC1	IC TA7317P	1	
1Q7	Transistor 2SC2705	1	
1Q8	Transistor 2SC1815	1	
1Q9	Transistor 2SA1815	1	
1ZD1	Zenor Diode 05Z-24Y	1	
1D2	Silicon Diode 1S1588	1	
1D3	Silicon Diode 1S1588	1	

Symbol No.	Description	Q'ty	
1D4	Silicon Diode 1S1588	1	
1D5	Silicon Diode 1S1588	1	
pRL1	DC Relay 24V JC-2a G4W-1112P	1	
1RL1	DC Relay 24V JC-2a FBR6000	1	
1RL2	DC Relay 24V JC-2a FBR6000	1	
1J1	Speaker terminal YKC-21-0061	1	
pF1	Powe Fuse 250V 10A	1	
pFH1	Fuse Holder NT41-0013	2	
pWP1	Wrapping post	2	
1N1	EH connector 6P(H-type)	1	

2. PWB BF-20 (m) Meter Amp Board

Symbol No.	Description	Q'ty	
mR1	Carbon 220kΩ 1/4W	1	
mR2	Carbon 220kΩ 1/4W	1	
mR3	Carbon 47kΩ 1/4W	1	
mR4	Carbon 47kΩ 1/4W	1	
mR5	Carbon 100kΩ 1/4W	1	
mR6	Carbon 100kΩ 1/4W	1	
mR7	Carbon 27kΩ 1/4W	1	
mR8	Carbon 27kΩ 1/4W	1	
mR9	Carbon 27kΩ 1/4W	1	
mR10	Carbon 27kΩ 1/4W	1	
mR11	Non-inflamable 2.2kΩ 1W	1	
mR12	Non-inflamable 2.2kΩ 1W	1	
mR13	Carbon 1.2kΩ 1/4W	4	
mC1	Mylar 0.012μF 100V	1	
mC2	Mylar 0.012μF 100V	1	
mVR1	Semi-variable VR 20kΩ(B)	1	
mVR2	Semi-variable VR 20kΩ(B)	1	
mIC1	IC TA7318P	1	
mLD1～2	Green LED TLG206	2	
mLD3～6	Red LED TLR206	4	
mS3～8	Push SW 6 key 2C/4C-2P SPEA	1	

3. PWB BF-30(k) Power Amp Board

Symbol No.	Description	Q'ty	
kR1	Carbon 1kΩ 1/4W	4	
kR2	Carbon 150kΩ 1/4W	4	
kR3	Carbon 1kΩ 1/4W	4	
kR4	Carbon 27kΩ 1/4W	4	
kR6	Carbon 680Ω 1/4W	4	
kR7	Carbon 680Ω 1/4W	4	
kR8	Carbon 47Ω 1/4W	4	
kR9	Carbon 18kΩ 1/4W	4	
kR10	Carbon 100Ω 1/4W	4	
kR11	Carbon 1kΩ 1/4W	4	
kR12	Carbon 1kΩ 1/4W	4	
kR13	Carbon 1kΩ 1/4W	4	
kR14	Carbon 100kΩ 1/4W	4	
kR15	Carbon 33kΩ 1/4W	4	
kR16	Carbon 820Ω 1/4W	4	
kR17	Carbon 820Ω 1/4W	4	
kR18	Carbon 100Ω 1/4W	4	
kR19	Carbon 100Ω 1/4W	4	
kR20	Carbon 1.5kΩ 1/4W	4	
kR21	Carbon 33kΩ 1/4W	4	
kR22	Carbon 820Ω 1/4W	4	
kR23	Non-inflamable 120Ω 1/2W	4	
kR24	Carbon 3.9kΩ 1/4W	4	
kR25	Carbon 560Ω 1/4W	4	
kR26	Carbon 820Ω 1/4W	4	
kR27	Non-inflamable 120Ω 1/2W	4	
kR28	Carbon 39Ω 1/4W	4	
kR29	Carbon 33kΩ 1/4W	4	
kR30	Carbon 33kΩ 1/4W	4	
kR31	Non-inflamable 390Ω 1/2W	4	
kR32	Non-inflamable 390Ω 1/2W	4	
kR33	Non-inflamable 1kΩ 1/2W	4	
kR34	Non-inflamable 150Ω 1/2W	4	
kR35	Non-inflamable 4.7Ω 1/2W	4	
kR36	Non-inflamable 4.7Ω 1/2W	4	
kR37	Non-inflamable 4.7Ω 1/2W	4	
kR38	Non-inflamable 4.7Ω 1/2W	4	
kR39	Cement 0.22Ω 5W RGCW5	4	
kR40	Cement 0.22Ω 5W RGCW5	4	
kR41	Cement 0.22Ω 5W RGCW5	4	
kR42	Cement 0.22Ω 5W RGCW5	4	
kR43	Non-inflamable 10Ω 2W	4	
kR44	Non-inflamable 4.7Ω 2W	4	

Symbol No.	Description	Q'ty	
kR45	Carbon 27k(12k)Ω 1/4W	4	
kR46	Carbon 100(15k)Ω 1/4W	4	
1R1	Carbon 47kΩ 1/4W	4	
1R2	Carbon 47kΩ 1/4W	4	
1R3	Carbon 1kΩ 1/4W	4	
1R4	Carbon 1kΩ 1/4W	4	
1R5	Carbon 100Ω 1/4W	4	
1R6	Carbon 100Ω 1/4W	4	
1R7	Carbon 150Ω 1/4W	4	
1R8	Carbon 150Ω 1/4W	4	
1R9	Carbon 10kΩ 1/4W	4	
1R10	Carbon 22kΩ 1/4W	4	
1R11	Carbon 10kΩ 1/4W	4	
1R12	Carbon 12kΩ 1/4W	4	
1R13	Carbon 3.3kΩ 1/4W	4	
1R14	Carbon 47kΩ 1/4W	4	
kC1	Ceramic 150pF 50V	4	
kC2	Ceramic 1800pF 50V	4	
kC3	Mylar 0.1μF 100V	4	
kC4	Electrolystic 10μF 25V	4	
kC5	Electrolystic 10μF 25V	4	
kC6	Electrolystic 10μF 25V	4	
kC7	Mylar 0.1μF 100V	4	
kC8	Ceramic 10pF 50V	4	
kC9	Ceramic 10pF 50V	4	
kC10	Mylar 0.1μF 100V	4	
kC11	Electrolystic 1μF 25V	4	
kC12	Ceramic 33pF 50V	4	
kC13	Ceramic 33pF 50V	4	
kC14	Mylar 0.047μF 100V	4	
kC15	Ceramic 10pF 50V	4	
kC16	Mylar 0.047μF 200V	4	
1C1	Ceramic 1000pF 50V	4	
1C2	Ceramic 1000pF 50V	4	
1C3	Ceramic 470pF 50V	4	
1C4	Mylar 0.022μF 100V	4	
1C5	Electrolystic 100μF 10V	4	
1C6	Ceramic 1000pF 50V	4	
1C7	Ceramic 1000pF 50V	4	
kFT1	FET μPA68H	4	
kQ1	Transistor 2SA970	4	
kQ2	Transistor 2SC2240	4	
kQ3	Transistor 2SC2705	4	
kQ4	Transistor 2SA899	4	
kQ5	Transistor 2SC2240	4	

Symbol No.	Description	Q'ty	
kQ6	Transistor 2SC2240	4	
kQ7	Transistor 2SC2240	4	
kQ8	Transistor 2SA970	4	
kQ9	Transistor 2SA1145	4	
kQ10	Transistor 2SC2705	4	
kQ11	Transistor 2SC2240	4	
kQ12	Transistor 2SC2705	4	
kQ13	Transistor 2SA1145	4	
kQ14	Transistor 2SC3298	4	
kQ15	Transistor 2SA1306	4	
kQ16	Transistor 2SC3281	4	
kQ17	Transistor 2SA1302	4	
kQ18	Transistor 2SC3281	4	
kQ19	Transistor 2SA1302	4	
lQ1	Transistor 2SA1015	4	
lQ2	Transistor 2SC1815	4	
lQ3	Transistor 2SC1815	4	
lQ4	Transistor 2SA1015	4	
lQ5	Transistor 2SC1815	4	
lQ6	Transistor 2SA1015	4	
kZD1	Zenor Diode 05Z-12X(or Y)	4	
kZD2	Zenor Diode 05Z-12X(or Y)	4	
kZD3	Zenor Diode 05Z-6.3X(or Y)	4	
kD1	Silicon Diode 1S1588	4	
kD2	Silicon Diode 1S1588	4	
kD3	Silicon Diode 1S1588	4	
lD1	Silicon Diode 1S1588 x 2	4	
kVR1	Semi-variable VR 100Ω(B)	4	
kVR2	Semi-variable VR 1kΩ(B)	4	
kL1	Output Inductor 0.5μH	4	
lN1	EH connector 3P(V-type)	8	
lN2	EH connector 2P(V-type)	12	
lN3	SIN connector SIN-01T-1.8	48	
lN4	SDF connector SDF-01T-1.3B	4	
lN5	Tub terminal 26001	20	

4. PWB BF-40(1) Protector/PS Board

Symbol No.	Description	Q'ty	
fR1	Carbon 22kΩ 1/4W	1	
fR2	Carbon 1kΩ 1/4W	1	

Symbol No.	Description	Q'ty	
fR3	Carbon 4.7kΩ 1/4W	1	
fR4	Carbon 220Ω 1/4W	1	
pR5	Carbon 560Ω 1/4W	2	
lR26	Non-inflamable 1.2kΩ 1/2W	1	
lR27	Non-inflamable 1.2kΩ 1/2W	1	
lR37	Non-inflamable 10Ω 2W	2	
fC1	Electrolystic 100μF 25V	1	
pC2	Electrolystic 220μF 50V	1	
pC3	Electrolystic 220μF 50V	1	
lC14	Mylar 0.047μF 100V	2	
plC1	IC TA78L008	1	
fQ1	Transistor 2SC1815	1	
fQ2	Transistor 2SC1815	1	
fQ3	Transistor 2SC3298	1	
lD1	Silicon Diode 1S1588	1	
lD2	Silicon Diode 1S1588	1	
pD3	Silicon Bridge Diode 1D4B41	1	
fD4	Silicon Bridge Diode 1D4B41	1	
lRL1	DC Relay 24V JC-2a FBR6000	1	
lRL2	DC Relay 24V JC-2a FBR6000	1	
pN1～6	EH connector 2P(V-type)	6	
pN2	EH connector 3P(V-type)	1	
pN3	EH connector 5P(V-type)	1	
pN4～5	VH connector 3P(S-type)	2	

5. PWB BF-50(i) Input Jack Board

Symbol No.	Description	Q'ty	
ij1	RCA Input Jack 4P(H-type)	1	

6. PWB BF-60(o) OP Selector Board

Symbol No.	Description	Q'ty	
oS1	Slide SW SSSP 6C-3P	1	

7. PWB BF-70(p) Power Selector Board

Symbol No.	Description	Q'ty	
pS1	Slide SW J-S5084	1	

8. PWB BF-80(h) Lamp Holder Board

Symbol No.	Description	Q'ty	
hLH1	Mini Lamp holder	1	
hLM1	18V Mini Lamp for dbx mark	1	

9. PWB BF-90(v) Input VR Board

Symbol No.	Description	Q'ty	
vVR1	1-Gang monoaxial VR 20k(A)	1	
vVR2	1-Gang monoaxial VR 20k(A)	1	
vN1～2	EH connector 2P(V-type)	2	
vLD1～2	Red LED TLR 124	2	

10. PWB BF-91(v) Input VR Board

Symbol No.	Description	Q'ty	
vVR1	1-Gang monoaxial VR 20k(A)	1	
vVR2	1-Gang monoaxial VR 20k(A)	1	
vN1～2	EH connector 2P(V-type)	2	
vLD1～2	Red LED TLR 124	2	

11. Other Electrical Parts

Symbol No.	Description	Q'ty	
pR1	Non-inflamable 4.7kΩ 2W	2	
pR2	Non-inflamable 3.9Ω 2W	1	
pC1	Electrolystic 18000μF 80V	2	
pC2	Film 0.01μF 630V	2	
pD1	Silicon Bridge Diode 15G4B41	1	
pS1	Power Switch TV-5 SDDLB	1	
pS2	Voltage selector SDKG DP-3T	1	
pT1	Power Transformer	1	
pJ1	AC outlet 1P 6498	1	
TM1	Ground terminal 1P KD41-004	1	
TM2	Ground lug terminal	1	
TM3	E-5 4φ lug terminal	2	
TM4	3P lug terminal	1	
pW1	Power Cord (13A)	1	
RTH1～2	Thermister D-33A	2	
M1～2	Power Meter KP-3G(90G-107)	2	
pLD1	Power/Protector LED TLR 206	1	
LM2～3	Meter lighting Lamp 10V	2	
GT1～2	Fiberglass Tube 10φ 150 mm	2	
GT3～6	Fiberglass Tube 7φ 150 mm	4	
F1	Cooling Fan DC12V 80 mm sq.	1	