

BOSS TU-12 / SERVICE NOTES

CHROMATIC TUNER TU-12H Third Edition

NOTE
Note that both TU-12A and TU-12 are marked "TU-12" on their panels.

NOTE
Note that both TU-12HA and TU-12H are marked "TU-12H" on their panels.

NOTE
TU-12A, TU-12 どちらもパネル面の表示は "TU-12" となっていますので、注意してください。

NOTE
TU-12HA, TU-12H どちらもパネル面の表示は "TU-12H" となっていますので、注意してください。

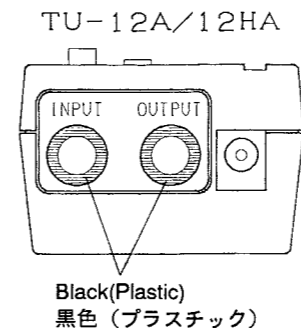
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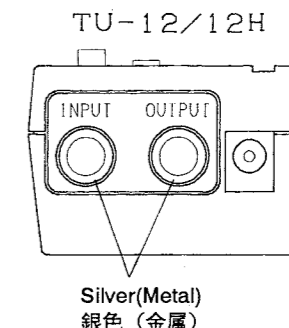
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How to distinguish between TU-12A/12HA(new) and TU-12/12H(old)



(Fig.A)

TU-12A/12HA(新バージョン)と TU-12/12H(旧バージョン)の見分け方



To distinguish between TU-12A/HA(new) and TU-12/12H(old), see the INPUT or OUTPUT jack(Fig.A) and check the serial number(Table 1).
If the jack is silver(Metal), it must be TU-12/12H(old type).
If the jack is black(plastic), it must be TU-12A/12HA(new type).

TU-12A/12HA(新バージョン)とTU-12/12H(旧バージョン)を見分ける為に、「INPUT」(又は「OUTPUT」)ジャックを見て下さい。(Fig.A参照)
もし、ジャックが銀色(金属)なら、TU-12/12H(旧バージョン)です。もし、ジャックが黒色(プラスチック)なら、TU-12A/12HA(新バージョン)です。
又、シリアル・ナンバーからも新旧バージョンを確認することができます。(Table 1参照)

Difference Between TU-12A/12HA(new) and TU-12/12H(old)

TU-12A/12HA(新バージョン)とTU-12/12H(旧バージョン)の違い

(Table.1)

	TU-12A/12HA (NEW)	TU-12/12H (OLD)
Serial No.	QE97100-up (TU-12A) DF05250-up (TU-12HA)	Prior to QE97100 (TU-12) Prior to DF05250 (TU-12H)
PCB Assy No.	7843751000 (TU-12A) 7843851000 (TU-12HA)	79306530 (TU-12) 79307510 (TU-12H)

SPECIFICATIONS/仕様 (new type)

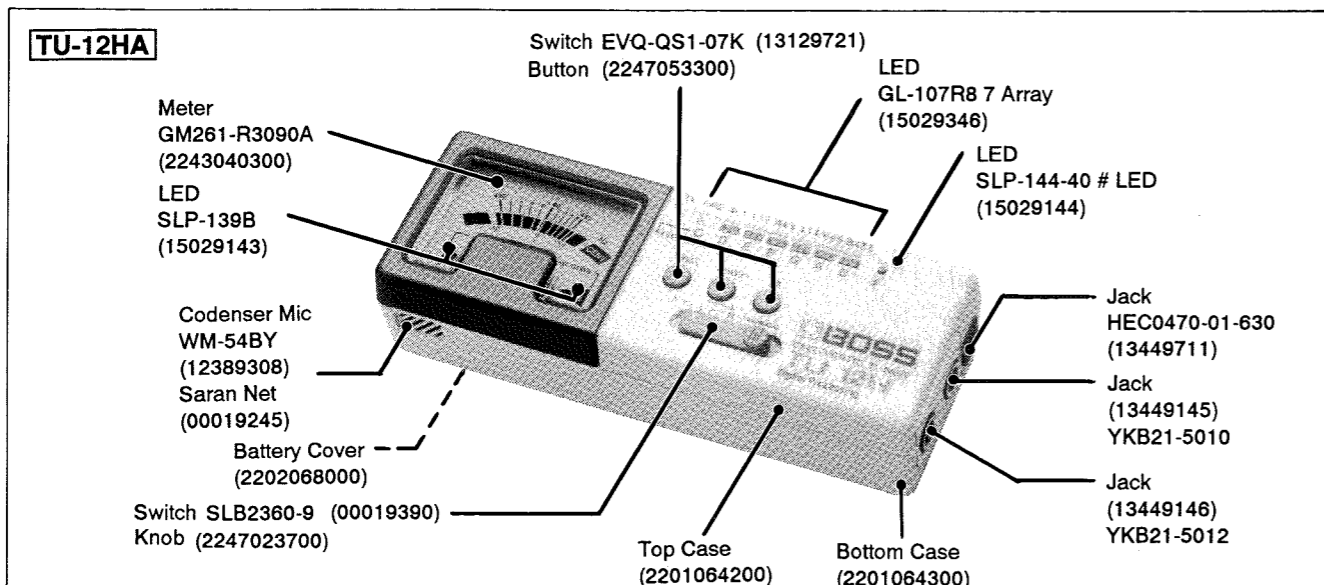
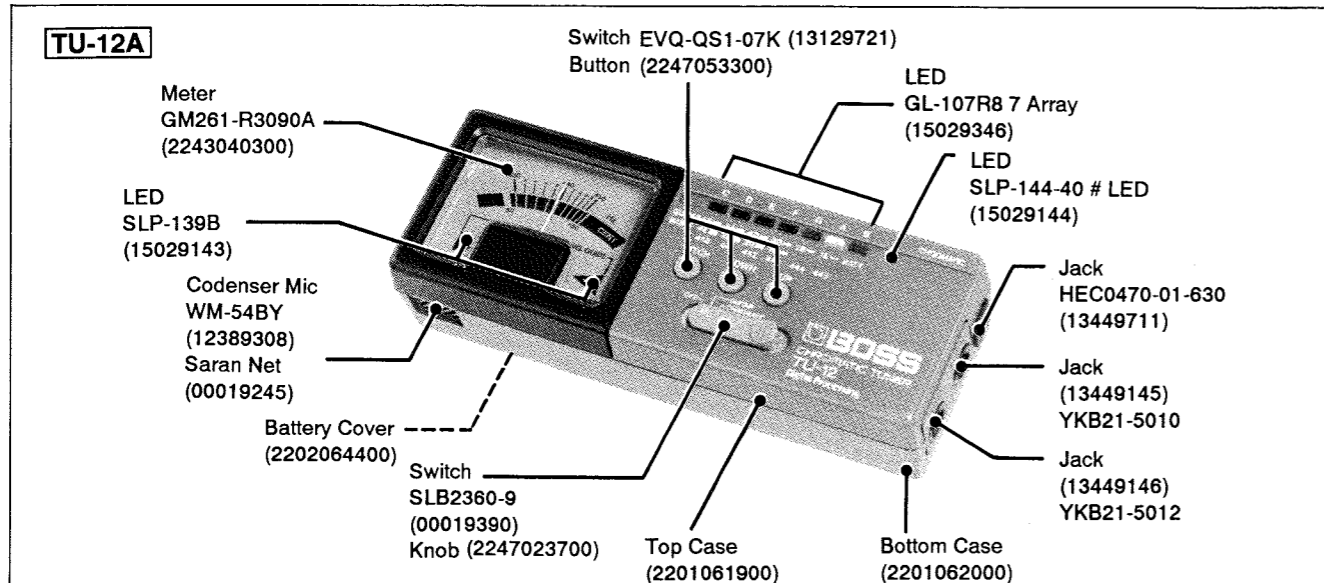
- Controls Power/Mode Selection Switch, PITCH Button, DOWN Button, UP Button
- Indicators NOTE Name/PITCH Indicator, Meter Tuning Guide Indicators
- Jacks Input Jack, Output Jack, AC Adaptor Jack
- Input Impedance 1M Ω
- Standard Pitch 440Hz to 445Hz 1Hz step
- Tuning Range TU-12 :C1 (32.70Hz) to B5 (987.77Hz)
TU-12H :C1 (32.70Hz) to B6 (1975.53Hz)
- Tuning Accuracy ± 1 cent
- Power Supply DC9V : Dry Battery(9V type)
AC Adaptor(PSA - Series : option)
- Current Draw 20mA (DC9V)MAX
- Dimensions 137(W) × 53(D) × 35(H)mm
5 - 3/8(W) × 2 - 1/16(D) × 1 - 3/8(H)inches
- Weight 170 g / 6 oz
- Accessories TU-12A Soft Case (22010740)
TU-12HA Soft Case (22010738)
Dry Battery(9V type) (12569103RT)
TU-12A Owner's Manual(English) (2602080200)
TU-12A Owner's Manual(Japanese) (2602080100)
TU-12HA Owner's Manual(English) (2602081200)
TU-12HA Owner's Manual(Japanese) (2602081100)
TU-12HA Syakuhachi Manual(Japanese Only) (26020814)
TU-12HA Koto and Syamisen Manual(Japanese Only) (26020813)
- Options AC Adaptor;PSA - 100,PSA - 120,PSA - 220,PSA - 240
Dry Battery;S - 006P/9V(6F22/9V),6AM6/9V(alkaline)

METER ADJUSTMENT

- While holding down PITCH, switch the unit ON.
The unit enters test mode.
- Adjust CR1 so that the pointer stays in the 0 cent (center of the meter face).
- Switch the unit OFF to exit the test mode.

メーター調整

- PITCH を押しながら電源を入れる。
(テスト・モードに入る。)
- CR1 を調整して指針をゼロセント (目盛中央) に合わせる。
- 終了すれば電源を切りテスト・モードから出る。



PARTS LIST/パーツリスト (TU-12A/TU-12HA)

SAFETY PRECAUTIONS:
The parts marked Δ have safety-related characteristics. Use only listed parts for replacement.

安全上の注意:
Δが付いている部品は、安全上特別な規格でつくられたものです。交換の際は、指定された部品番号以外の部品は使わないようにして下さい。

CONSIDERATIONS ON PARTS ORDERING

When ordering any parts listed in the parts list, please specify the following items in the order sheet.
Qty PART NUMBER DESCRIPTION MODEL NUMBER
Ex. 10 22575241 Sharp key C-20/50
15 2247017300 Knob (orange) DAC-15D
Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.

パーツ発注に関するお願い

オーダーシートには、必ず下記の4項目は正確に記入して下さい。(例外は除く)
必要数 パーツナンバー 品名 使用機種
例) 10 22575241 Sharp key C-20/50
15 2247017300 Knob (orange) DAC-15D
もし記入漏れ、誤記等がある場合、必要部品が発送できなかったり、大層な遅れの原因になります。御協力をお願いします。

PANEL CASING/パネル、ケース

2201061900	TU-12A	Top Case	Gray
2201062000	TU-12A	Bottom Case	Gray
2202064400	TU-12A	Battery Cover	Gray
2201064200	TU-12HA	Top Case	White
2201064300	TU-12HA	Bottom Case	White
2202068000	TU-12HA	Battery Cover	White

PCB ASSY/基板完成品

7843751000	TU-12A MAIN Board	NOTE: MAIN Board does not include Meter. 注意: 補修用MAIN基板はメーターを含みません。 NOTE: Replacement MAIN Board includes SW Board 注意: 補修用MAIN基板はSW基板を含みます。
7843851000	TU-12HA MAIN Board	NOTE: MAIN Board does not include Meter. 注意: 補修用MAIN基板はメーターを含みません。 NOTE: Replacement MAIN Board includes SW Board 注意: 補修用MAIN基板はSW基板を含みます。

KNOB, BUTTON/ツマミ、ボタン

2247023700	Slide Switch Knob	POWER/MODE SW
2247053300	Tact Switch Knob	PITCH SW, DOWN SW, UP SW

SWITCH/スイッチ

00019390	SLB2360-9	POWER/MODE SW
13129721	EVQ-QS1-07K	PITCH SW, DOWN SW, UP SW

JACK, SOCKET/ジャック、ソケット

13449711	HEC0470-01-630	Adaptor Jack
13449146	YKB21-5012	INPUT
13449145	YKB21-5010	OUTPUT

POTENTIOMETER/ボリューム

00019312	EVM-38GA00B23	Trimmer 2kΩ
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DISPLAY UNIT/ディスプレイユニット

2243040300	Meter
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IC

00019367	SC412237FU	Mask CPU	IC1
15189251	M5218AF	OP AMP	IC4
00019412	S-81250HG-Z	REGULATOR	IC2
00019467	S-80728AN-Z	Battery Level Detector	IC3

DIODE, LED/ダイオード、LED

15029346	GL-107R8	7 Array LED, LED1-7
15029144	SLP-144-40	# LED, LED8
15029143	SLP-139B	TUNING GUIDE LED, LED9, LED10
15019125	ISS-133	D2, D3
00019356	1SR139-100-T-32	

CRYSTAL/クリスタル

15299216	DSMAT310 4MHz	Xtal
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RESISTOR/抵抗

00120012	CRB20T36EFX9763 (metal film)	976k	R17
00120023	CRB20T36EFX4753 (metal film)	475k	R18
00120034	CRB20T36EFX2403 (metal film)	240k	R19
00120045	CRB20T36EFX1203 (metal film)	120k	R20
00120056	CRB20T36EFX6042 (metal film)	60.4k	R21
00120067	CRB20T36EFX3002 (metal film)	30k	R22
00120078	CRB20T36EFX1502 (metal film)	15k	R23
00120101	CRB20T24EFX5102 (metal film)	51k	R26
00120089	CRB20T36EFX4702 (metal film)	47k	R27

WIRING/ワイヤリング

00019256	MAJ-5X26-94-3	CONNECT MAIN Board with SW Board
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MISCELLANEOUS/その他

12389308	Codenser Mic WM-54BY	
00019223	LED Holder A	For NOTE/PITCH LED
00019201	LED Holder B	For # LED
00019212	LED Holder C	For TUNING GUIDE LED
00019234	LED Spacer	For # LED
2341741401	Battery Connector	
22230568	Battery Cushion	
00019245	Saran Net	For MIC.
00120001	Plate	For POWER/MODE SW Knob, Orange

ACCESSORIES/付属品

22010740	TU-12A Soft Case	Black
22010738	TU-12HA Soft Case	Beige
12569103RT	Dry Battery (9V type)	
2602080200	TU-12A Owner's Manual (English)	
2602080100	TU-12A Owner's Manual (Japanese)	
2602081200	TU-12HA Owner's Manual (English)	
2602081100	TU-12HA Owner's Manual (Japanese)	
26020814	TU-12HA Syakuhachi Manual (Japanese Only)	
26020813	TU-12HA Koto and Syamisen Manual (Japanese Only)	

[TU-12A]
MAIN BOARD
ASSY 7843751000

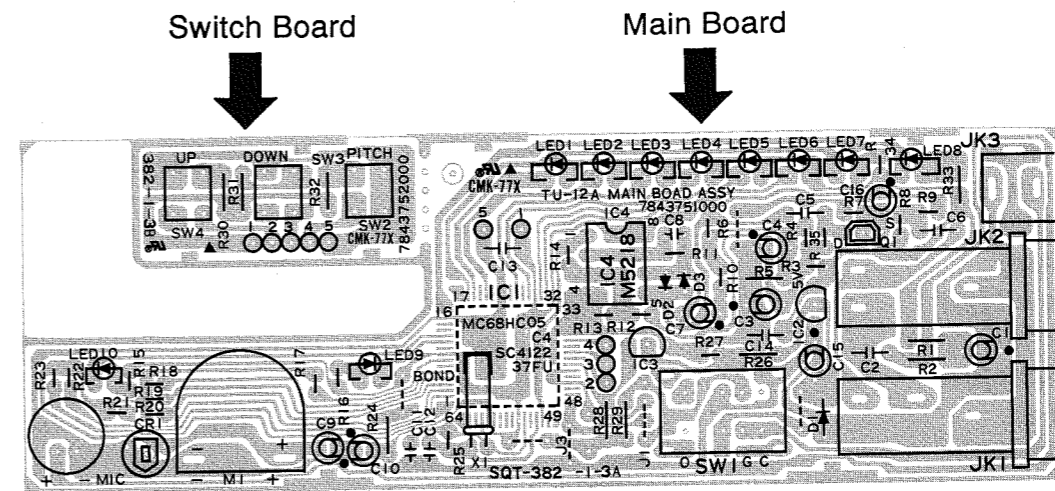
NOTE

MAIN Board does not include Meter.
補修用MAIN基板はメーターを含みません。

[TU-12HA]
MAIN BOARD
ASSY 7843851000

NOTE

Replacement MAIN Board includes SW Board
補修用MAIN基板はSW基板を含みます。



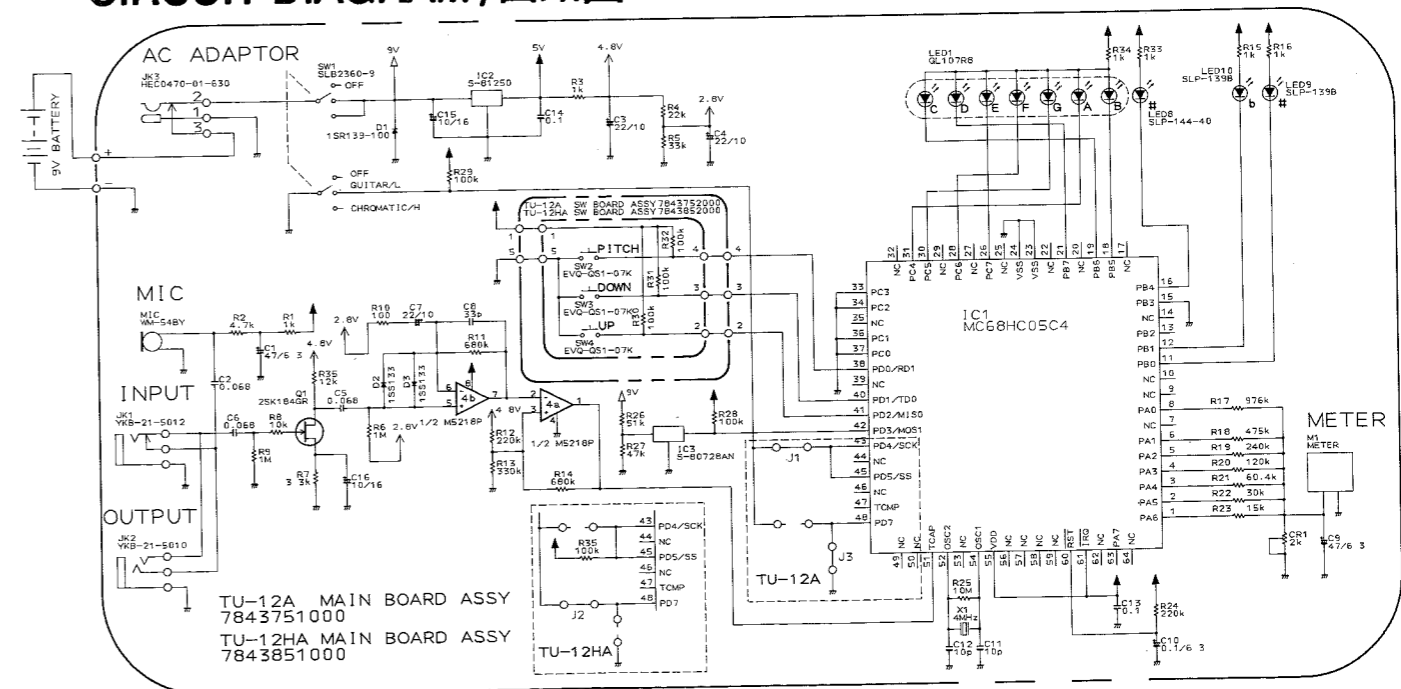
View from component side.

Difference Between TU-12HA PCB and TU-12A PCB

TU-12A PCBとTU-12HA PCBの違い

	TU-12A	TU-12HA
Jumper 1	○	Nothing
Jumper 2	Nothing	○
Jumper 3	○	Nothing
Resistor 35 (100 Ω)	Nothing	○

CIRCUIT DIAGRAM /回路図



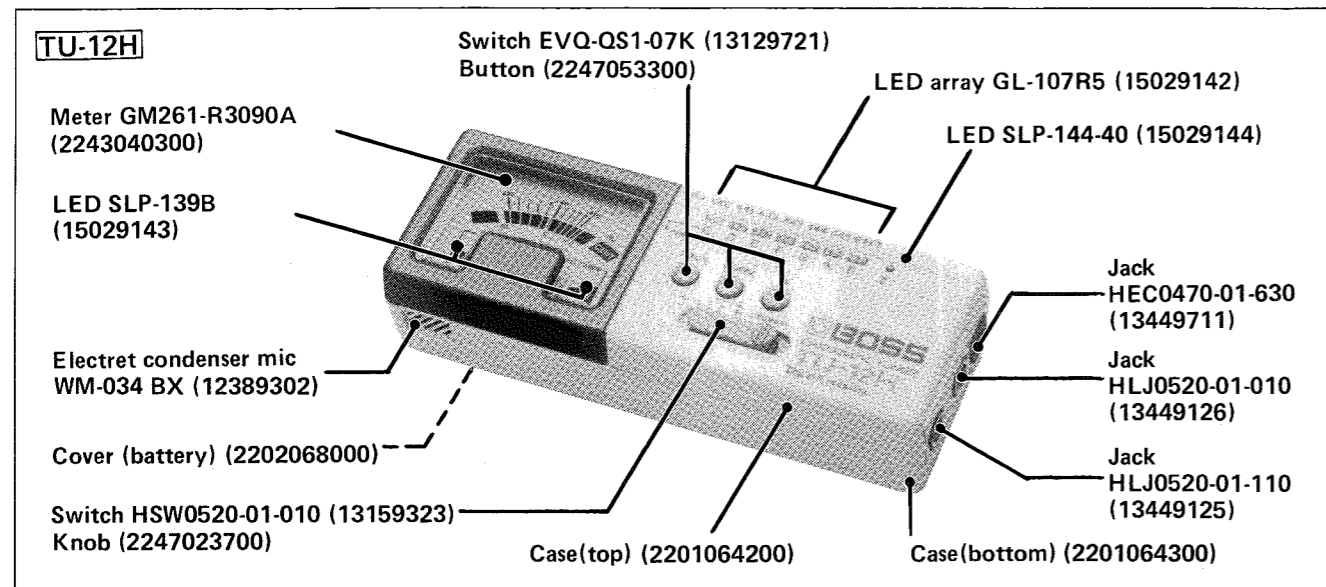
BOSS TU-12H SERVICE NOTES

First Edition

SPECIFICATIONS

Power Consumption : 9V DC @ 20mA
 Tuning Range : C₁ (32.70Hz) to B₆ (1975.53Hz)
 Accuracy : ±1 cent
 Master Oscillator : Quartz (3.579545MHz)

Standard Pitch : 440 to 445Hz 1Hz steps
 Dimensions : 145(W) x 35(H) x 53(D)mm
 5-7/16 x 1-3/8 x 2-1/16 in
 Weight : 170g 6 oz



PARTS LIST

2201064200	Case (top)	TU-12H	ELECTRET CONDENSER MIC	
2201064300	Case (bottom)	TU-12H	12389302	WM-034BX
2202068000	Cover (battery)	TU-12H	CRYSTAL	
2201061900	Case (top)	TU-12	12389712	3.579545MHz
2201062000	Case (bottom)	TU-12	METER	
2202064400	Cover (battery)	TU-12	2243040300	GM261-R3090A (w/o cushion)
2247023700	Knob (power)		2226033300	Cushion (TU-12 meter)
2247053300	Button (PITCH, DOWN, UP)		IC	
2341041400	Battery snap 1007#24		15179140	MBR1012-523 CPU
JACK			15219126	LC7900 Generator/Divider
13449125	HLJ0520-01-110 (INPUT)		15189151	LA6458S or 4558S OP Amp, SIP 9P
13449126	HLJ0520-01-010 (OUTPUT)		15229809	BA634 TU-12H
13449711	HEC0470-01-630 (AC adaptor)		DIODE	
SWITCH			15019209T0	S5500G
13159323	HSW0520-01-010 slide (power)		15019303	RD5.6JB2 (zener) TU-12
13129721	EVQ-QS1-07K light touch (PITCH, DOWN, UP)		15019304	SN up to 294000 RD6.2JB2 (zener) TU-12
PCB			15019305	SN304100 and up RD6.8JB2 (zener) TU-12
79306530	MAIN BOARD (pcb 2291057704) TU-12		15019305	SN 304100 and up TU-12 RD6.8JB2 (zener)
79306540	SWITCH BOARD (pcb 2291057704) TU-12		15019128	MA27WB (varistor) SN 304100 and up TU-12
79307510	MAIN BOARD (pcb 2291088802) TU-12H		15019306	RD7.5JB2 (zener) TU-12H
79307520	SWITCH BOARD (pcb 2291088802) TU-12H		15019302	RD5.1JB2 (zener) TU-12H
TRIMMER			LED	
13299151	H0651A009 2.2kΩ		15029142	GL-107R5 (red, 7-array LED)
			15029144	SLP-144-40 (red)
			15029143	SLP-139B (red, TUNING GUIDE)

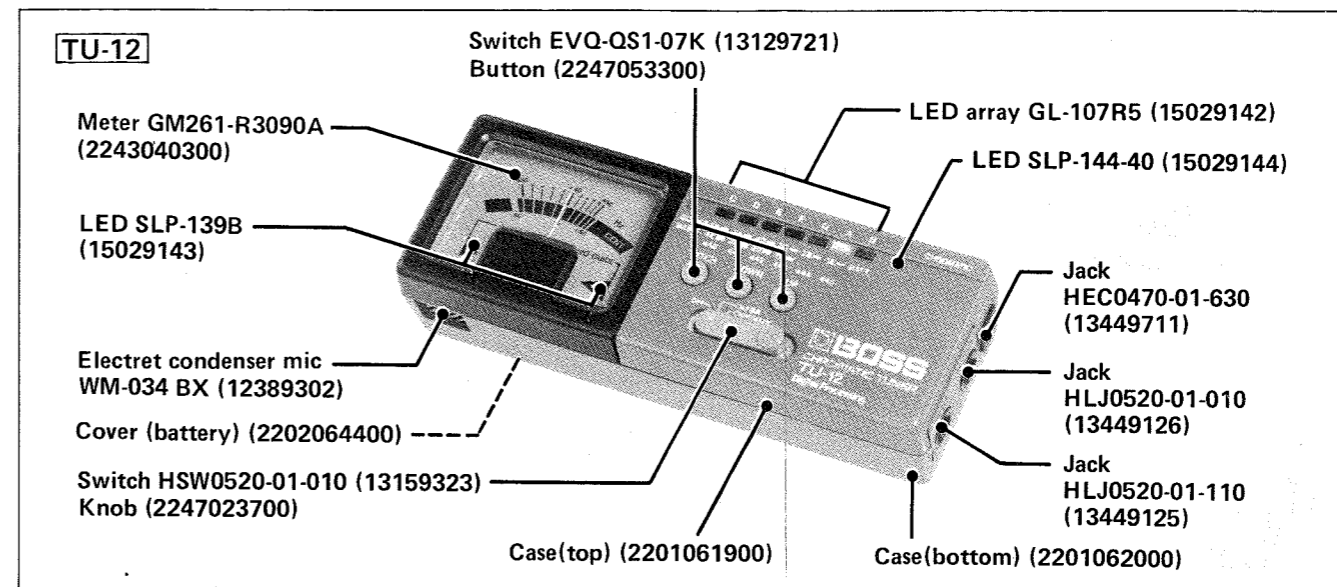
Printed in Japan BE-2

TU-12 Second Edition

SPECIFICATIONS

Power Consumption : 9V DC @ 20mA
 Tuning Range : C₁ (32.70Hz) to B₅ (987.77Hz)
 Accuracy : ±1 cent
 Master Oscillator : Quartz (3.579545MHz)

Standard Pitch : 440 to 445Hz 1Hz steps
 Dimensions : 145(W) x 35(H) x 53(D)mm
 5-7/16 x 1-3/8 x 2-1/16 in
 Weight : 170g 6 oz



RESISTOR

13789114D0	CRB25DY	7.68k	0.5%	(metal film)
13769262D0	CRB25FX	125k	1%	(metal film)
13729490D0	ELR-25G	250k	2%	(vertical mount)
13719491D0	ELR-25J	500k	5%	(vertical mount)

TRANSISTOR

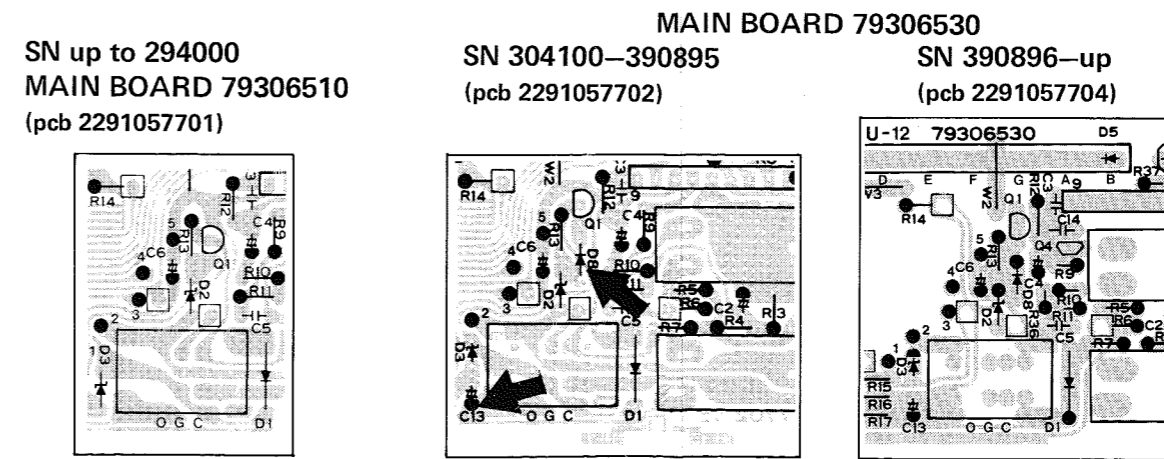
15129108	2SC945-P	(or 15129114 2SC1815-GR)
15139116	2SK118-O	(FET)

OTHERS

2225020200	Shield Plate
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CHANGES ON TU-12 MAIN BOARD

D8, C13 and Q4 are added in later versions for improvement.
 Upward compatible change, later versions can be a substitutive for predecessor(s).



TU-12H

METER CALIBRATION

CAUTION: KEEP PITCH SWITCH ON DURING ADJUSTMENT, OR TU-12H ENTERS NORMAL MODE.
While pushing PITCH, turn power ON (L or H).
Adjust RT1 for 440Hz.

SWITCH BOARD

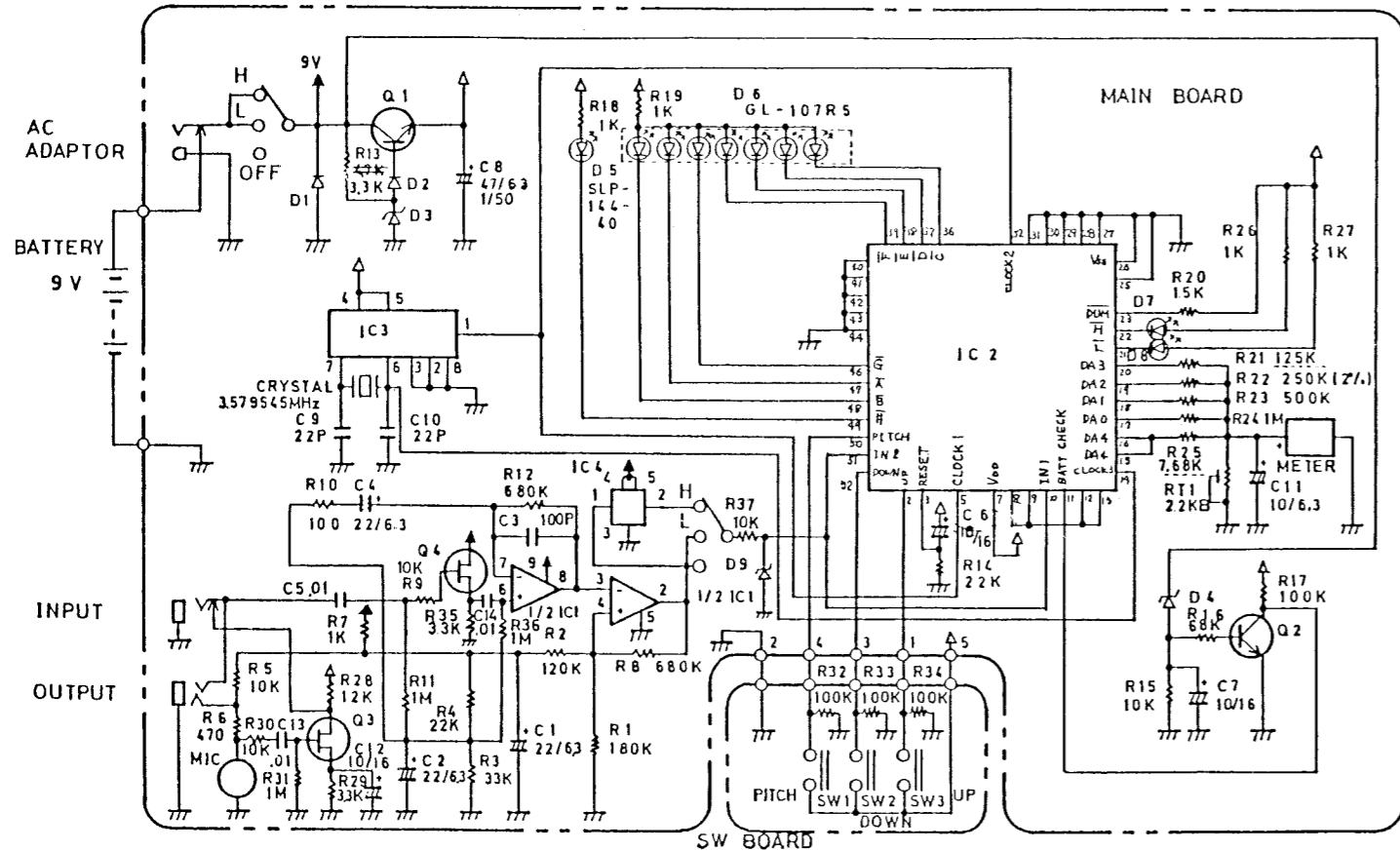
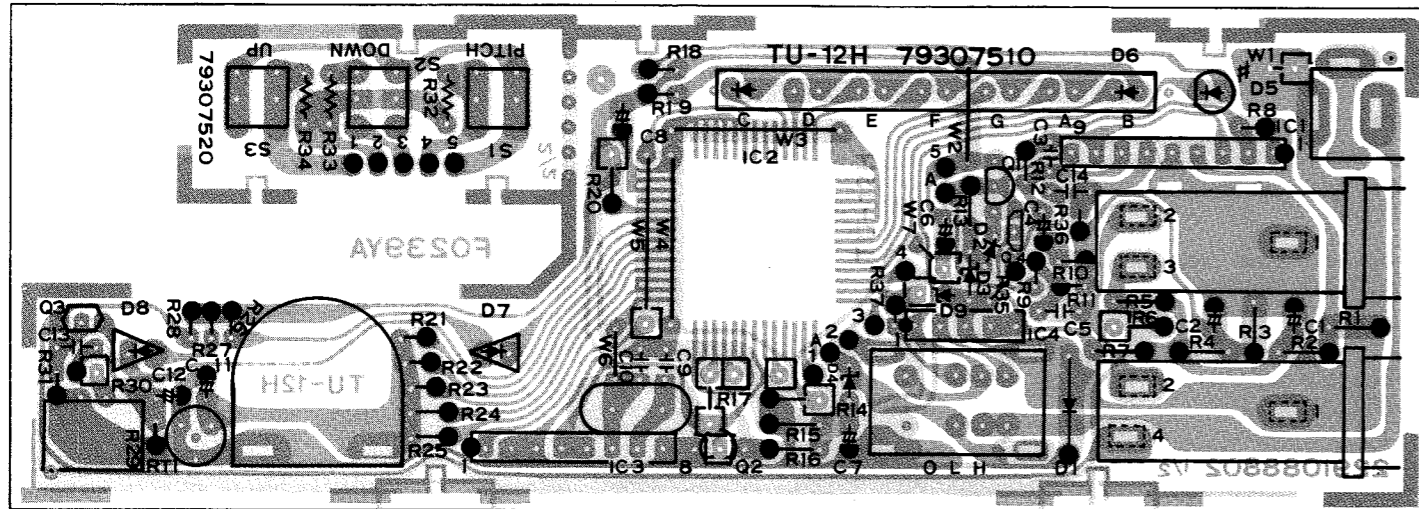
79307520

(pcb 2291088802)

MAIN BOARD

79307510

(pcb 2291088802)



- | | | | |
|---------------|-----------------|-----------------|-------------------|
| D1 : S5500G | D7,8 : SLP-139B | Q1,2 : 2SC945-P | IC1 : LA6458S |
| D2 : MA27WB | D9 : RD5.1JB2 | Q3,4 : 2SK118-O | IC2 : MBR1012-523 |
| D3 : RD7.5JB2 | | | IC3 : LC7900 |
| D4 : RD6.8JB2 | | | IC4 : BA634 |

TU-12

METER CALIBRATION

CAUTION: KEEP PITCH SWITCH ON DURING ADJUSTMENT, OR TU-12 ENTERS NORMAL MODE.
While pushing PITCH, turn power ON (GUITAR or CHROMATIC).
Adjust CR1 for 440Hz.

SWITCH BOARD

79306540

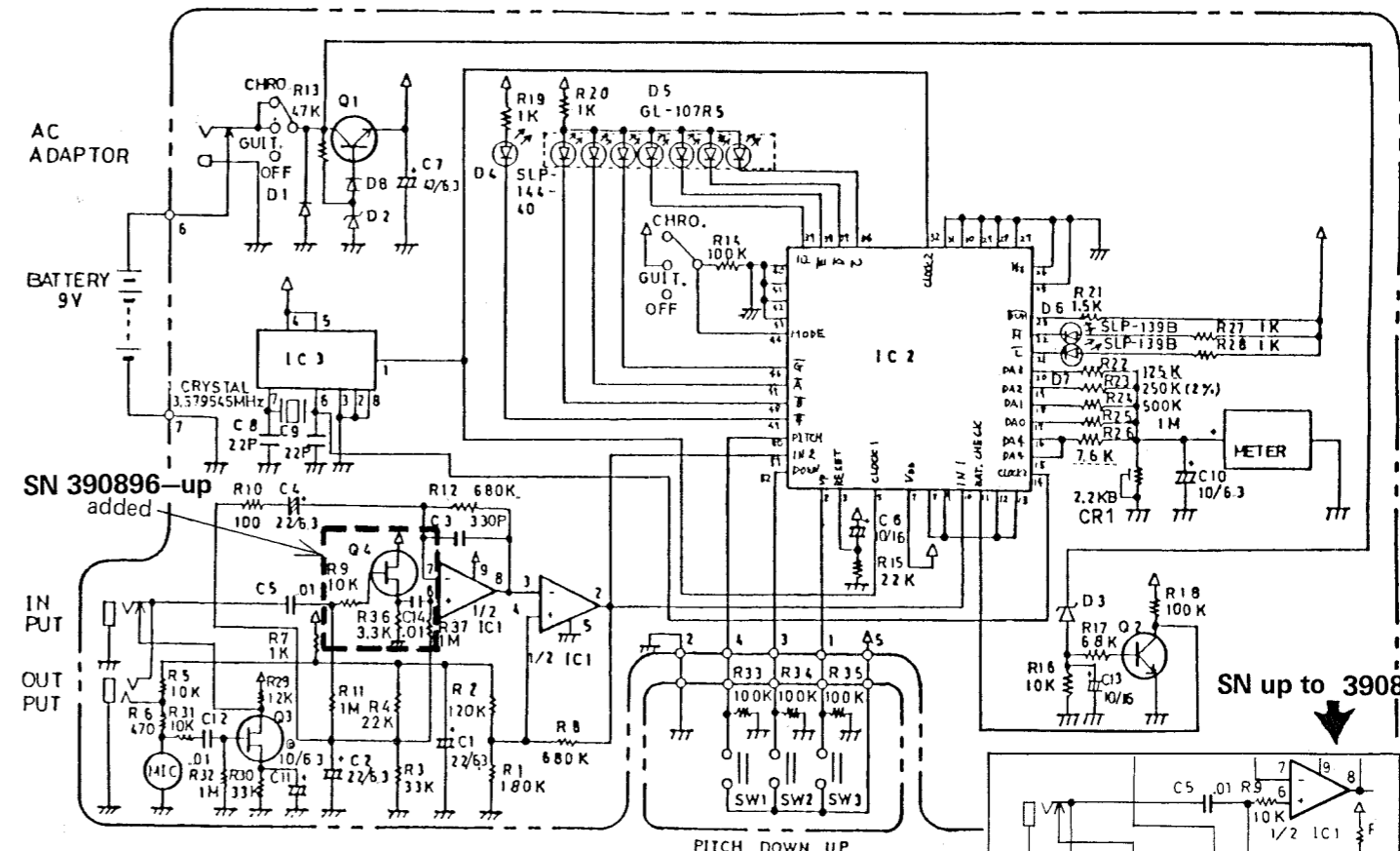
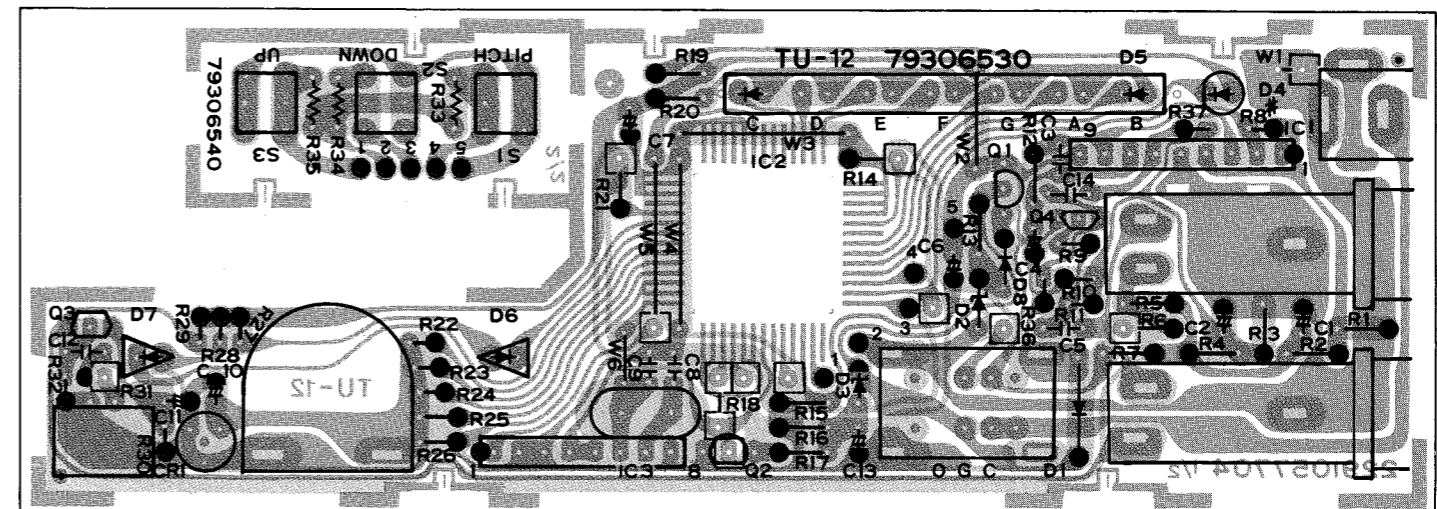
(pcb 2291057704)

SN 390896-up
compatible with
predecessors.

MAIN BOARD

79306530

(pcb 2291057704)



- | | | |
|-------------------|-----------------|---------------|
| IC1 : LA6458S | Q1,2 : 2SC945-P | D1 : S5500G |
| IC2 : MBR1012-523 | Q3,4 : 2SK118-O | D2 : RD6.8JB2 |
| IC3 : LC7900 | | D3 : RD6.2JB2 |
| | | D8 : MA27WB |

SERVICE NOTES

Issued by RJA

ERRATA & SUPPLEMENT / サービスノート正誤表 & 追加情報

1996-12-17

TU-12A/12HA

ER00194

The PCB Assy have been revised. The new PCB Assy is compatible with old one, but the parts on the PCB Assy are not compatible. The parts on the PCB Assy are as follows. Please refer to the attached TU-12B/12HB Circuit Diagram.

PCB Assy が変更になりました。新PCB Assy と旧PCB Assy は互換性があります。変更された PCB Assy 上の部品は以下のとおりです。部品同士の互換性はありません。

添付資料 新PCB Assy TU-12B/12HB Circuit Diagram

(NEW) TU-12B / TU-12HB		(OLD) TU-12A / TU-12HA	
Parts no.	Discription	Parts no.	Discription
70671090 70671123-	TU-12B Main Board Assy TU-12HB Main Board Assy	7843751000 7843851000	TU-12A Main Board Assy TU-12HA Main Baord Assy
-17048186-	IC (CPU) M37471M2-411FP	00019367	IC (MASK CPU) SC412237FU
-17048187-	REGULATOR S-81250HG-RD-T1	00019412	REGULATOR S-81250HG-Z
-17048188-	IC S-80728AN-DR-T1	00019467	IC S-80728AN-Z
-15289148-	IC (OP AMP) M5218AFP	15189251	IC (OP AMP) M5218AP
-17048189-	POTENTIOMETER (TRIMMER) EVMEASA00B23	00019312	POTENTIOMETER (TRIMMER) EVM-38GA00B23
17048190	FET 2SK184GR-TPE4	15139130	FET 2SK209GR-TE85L
-17048191-	DIODE HSM123-TR	15019125	DIODE 1SS-133
-17048192-	JACK (AC ADAPTOR) HTJ-020-05A	13449711	JACK (AC ADAPTOR) HEC0470-01-630
-17048193-	TACT SWITCH EVQ213-07K	13129721	TACT SWITCH EVQ-QS1-07K
-17048194-	WIRING MA J (2.5) - 4 × 26	00019256	WIRING MA J (2.5) - 5 × 26

* Only JACK HTJ-020-05A (#17048192) is compatible with JACK HEC0470-01-630 (#13449711).

JACK HTJ-020-05A(#17048192) と JACK HEC0470-01-630(#13449711) のみ互換性があります。

TU-12B/12HB CIRCUIT DIAGRAM

