

TU-12(P) TU-12H(P) CHROMATIC TUNER

SERVICE NOTES *Issued by RJA*

HOW TO DISTINGUISH BETWEEN TU-12A/HA and TU-12(P)/H(P)

The difference between TU-12A/12HA and TU-12(P)/12H(P) is as follows.

- The description of the country origin on the rear side of CASE is different.

MODEL NAME	COUNTRY ORIGIN
TU-12A	MADE IN JAPAN
TU-12HA	MADE IN JAPAN
TU-12(P)	MADE IN PHILIPPINE
TU-12H(P)	MADE IN PHILIPPINE



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TU-12(P)

SPECIFICATION

- | | | | |
|----------------------|--|--------------|--------------------------------|
| • TUNING RANGE: | C1(32.70 Hz) to B5(987.77 Hz) | • ACCESSORY: | Soft Case (#2201074000) |
| • ACCURACY: | +/-1 CENT | | Dry Battery / 9V type (#*****) |
| • MASTER OSCILLATOR: | Quartz(3.579545 MHz) | | Owner's Manual |
| • STANDDARD PITCH: | 400 to 445 Hz 1 Hz step | | ENGLISH (#2602080200) |
| • JACKS: | Input Output AC Adaptor | • OPTION: | AC Adaptor (PSA-Series) |
| • DIMENSIONS: | 145 (W) X 35 (H) X 53 (D)mm | | Owner's Manual |
| | 5-7/16 (W)X1-3/8 (H) X 2-1/16 (D) inches | | JAPANESE (#2602080100) |
| • WEIGHT: | 170 g/6 oz | | |
- * Specifications are subject to change without notice.

PARTS LIST

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

Due to one or more of the following reasons, parts with parts code ***** cannot be supplied as service parts.

- Part supplied only as a component in a complete assembly
- Copyright does not permit the part to be supplied
- Part is sold commercially

NOTE: The parts marked # are new. (initial parts) The description "Q'TY" means a necessary number of the parts per one product.



We can not supply except the following parts. If you need them ,please order the finished goods.

CASING				
	2202064400	BATTERY COVER	202-644	1
JACK,EXT TERMINAL				
	13449711	AC ADAPTOR JACK	HEC0470-01-630	1
	13449145	6.5MM JACK	YKB21-5010	(OUTPUT) 1
	13449146	6.5MM JACK	YKB21-5012 (W/SW)	(INPUT) 1
DISPLAY UNIT				
	2243040300	METER	GM261-R3090A	1
FINISHED GOODS				
	SK000182	FINISHED GOODS (#4001619)	FOR SERVICE ONLY	1
WIRING				
	F3419102	BATTERY CONNECTOR	(006P)	
ACCESSORIES (Standard)				
	2201074000	SOFT CASE(BLK)	201-740	1
	2602080200	OWNER'S MANUAL	ENGLISH	1
	*****	DRY BATTERY	006P	1


TU-12H(P)

SPECIFICATION

- | | | | |
|----------------------|---------------------------------|--------------|------------------------------|
| • TUNING RANGE: | C1(32.70 Hz) to B6 (1975.53 Hz) | • ACCESSORY: | Soft Case(#2201073800) |
| • ACCURACY: | +/-1 CENT | | Dry Battery 9V type(#*****) |
| • MASTER OSCILLATOR: | Quartz(3.579545 MHz) | | Owner's Manual |
| • STANDDARD PITCH: | 400 to 445 Hz 1Hz step | | ENGLISH(#2602081200) |
| • JACKS: | Input Output AC Adaptor | • OPTION: | AC Adaptor (PSA-Series) |
| • DIMENSIONS: | 145 (W) X 35 (H) X 53 (D) mm | | Owner's Manual |
| | 5-7/16 (W)X1-3/8X2-1/16 inches | | JAPANESE(#2602081100) |
| • WEIGHT: | 170 g / 6 oz | | For SHAKUHACHI(#26020814) |
| | | | For KOTO/SYAMISEN(#26020813) |

PARTS LIST

SAFETY PRECAUTIONS:

The parts marked  have safety-related characteristics. Use only listed parts for replacement.

Due to one or more of the following reasons, parts with parts code ***** cannot be supplied as service parts.

- Part supplied only as a component in a complete assembly
- Copyright does not permit the part to be supplied
- Part is sold commercially

NOTE: The parts marked # are new. (initial parts) The description "Q'TY" means a necessary number of the parts per one product.



We can not supply except the following parts. If you need them ,please order the finished goods.

CASING				
2202068000	BATTERY COVER	202-680		1
JACK,EXT TERMINAL				
13449711	AC ADAPTOR JACK	HEC0470-01-630		1
13449145	6.5MM JACK	YKB21-5010	(OUTPUT)	1
13449146	6.5MM JACK	YKB21-5012 (W/SW)	(INPUT)	1
DISPLAY UNIT				
2243040300	METER	GM261-R3090A		1
FINISHED GOODS				
SK000184	FINISHED GOODS (#4001719)	FOR SERVICE ONLY		1
WIRING				
F3419102	BATTERY CONNECTOR	(006P)		1
ACCESSORIES (Standard)				
2201073800	SOFT CASE(BR)	201-738		1
2602081200	OWNER'S MANUAL	TU-12H ENGLISH		1
*****	DRY BATTERY	006P		1

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。

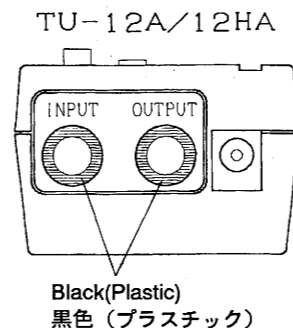
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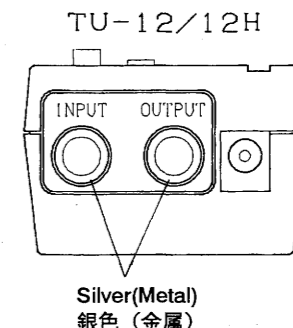
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How to distinguish between TU-12A/12HA(new) and TU-12/12H(old)



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)

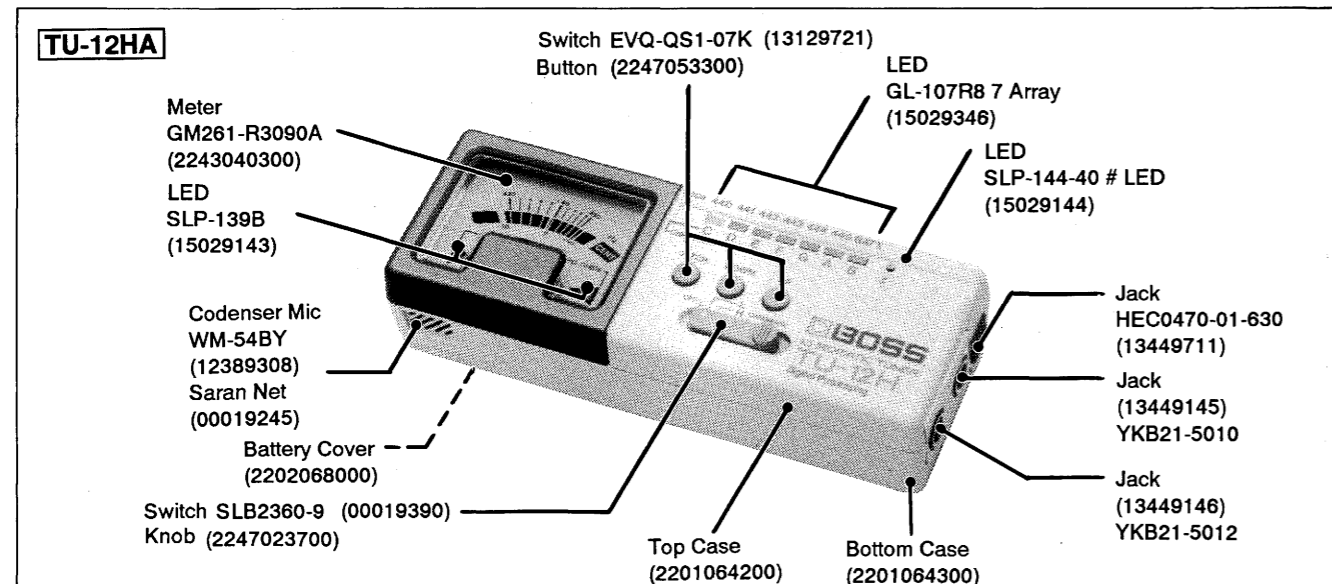
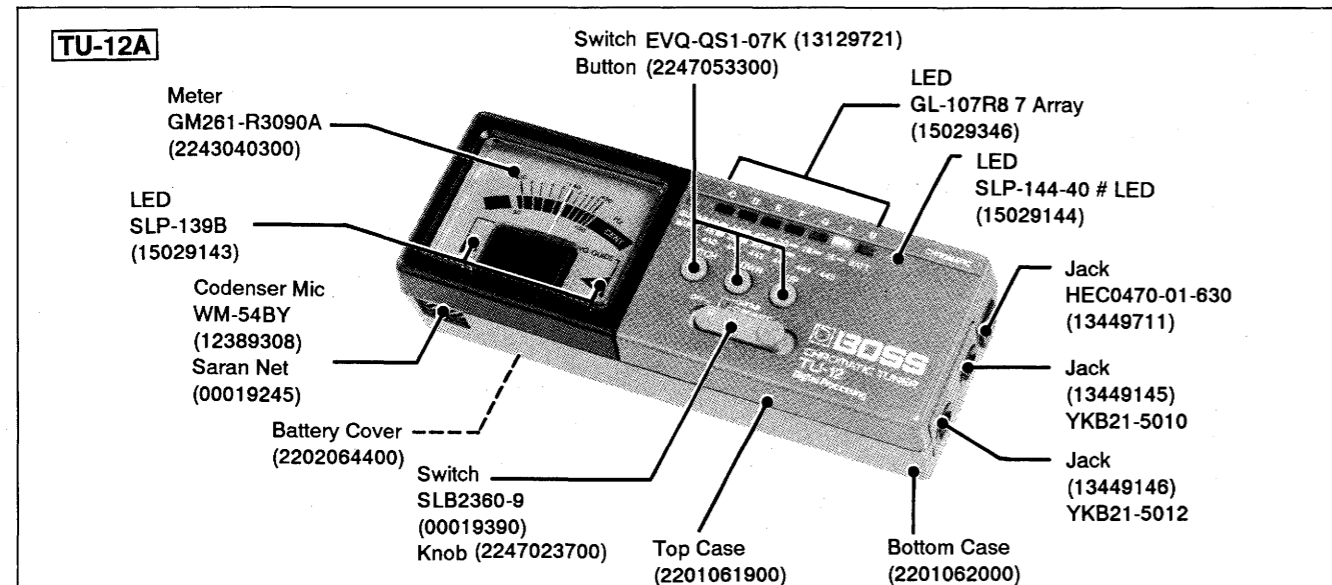
- Controls Power/Mode Selection Switch, PITCH Button, DOWN Button, UP Button
- Indicators NOTE Name/PITCH Indicator, Meter Tuning Guide Indicators
- Jacks Input Jack, Output Jack, AC Adaptor Jack
- Input Impedance 1M Ω
- Standard Pitch 440Hz to 445Hz 1Hz step
- Tuning Range TU-12 :C1 (32.70Hz) to B5 (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。



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

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項目を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、大規模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	Gray
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	White
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 2kB
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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	M5218AP	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	1SS-133	D2, D3
00019356	1SR139-100-T-32	

CRYSTAL/クリスタル

15299216	DSMAT310 4MHz	Xtal
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RESISTER/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**

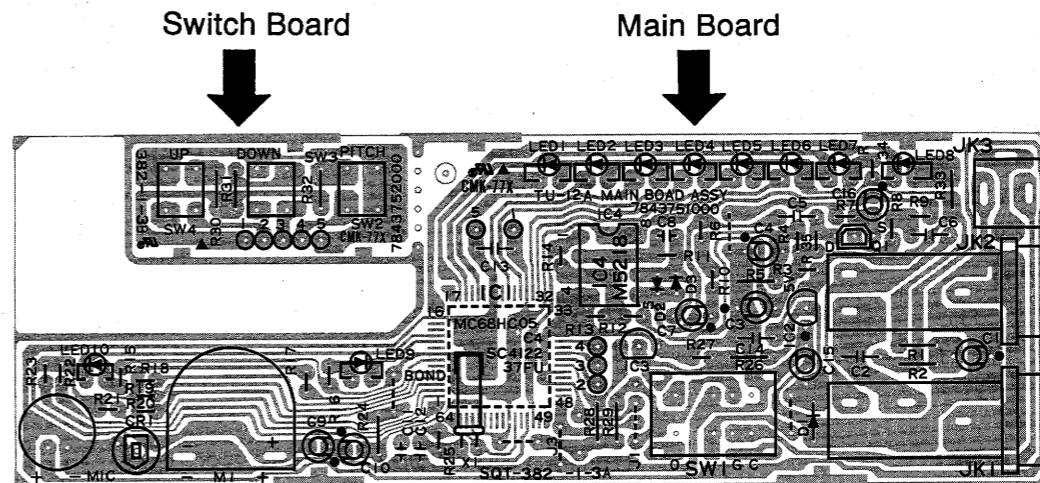
NOTE

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。



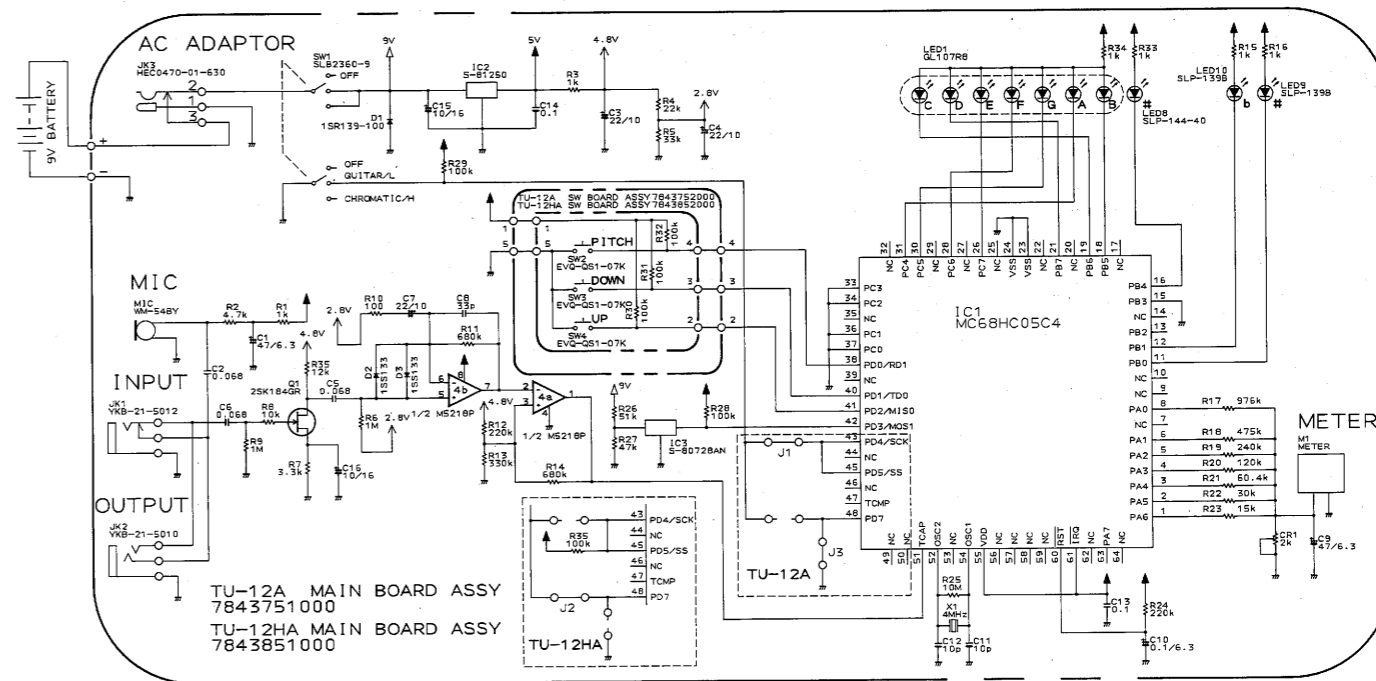
View from component side.

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



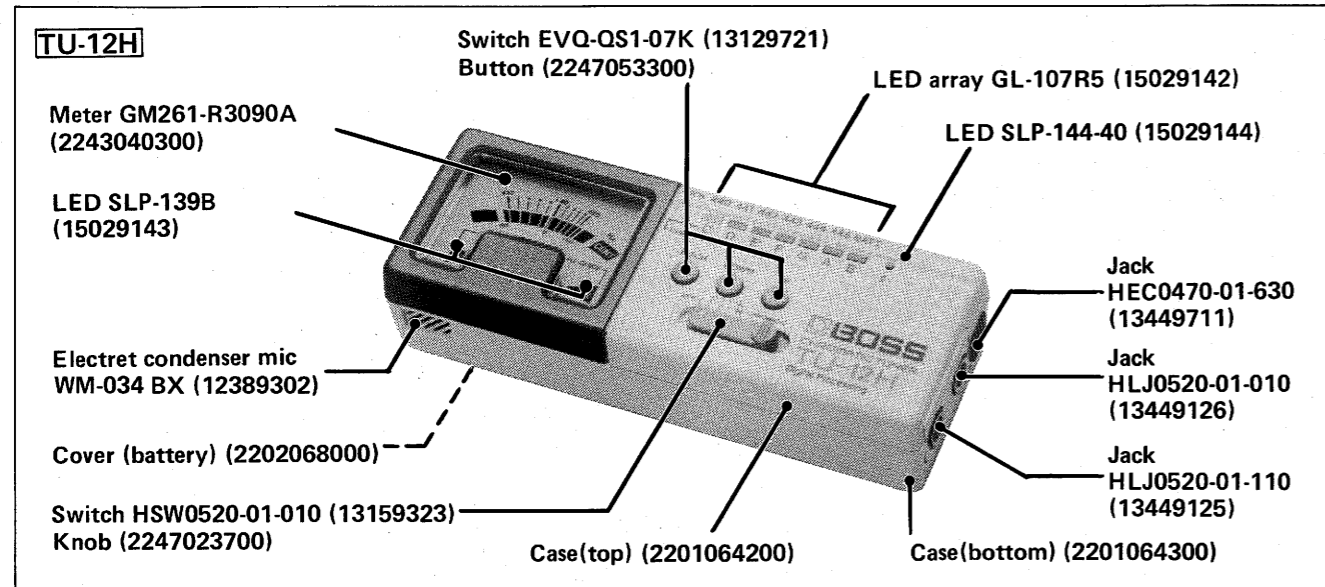
BOSS TU-12H SERVICE NOTES

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)		SN up to 294000
PCB			15019304 RD6.2JB2 (zener) TU-12
79306530	MAIN BOARD (pcb 2291057704) TU-12		SN304100 and up
79306540	SWITCH BOARD (pcb 2291057704) TU-12		15019305 RD6.8JB2 (zener)
79307510	MAIN BOARD (pcb 2291088802) TU-12H		SN 304100 and up TU-12
79307520	SWITCH BOARD (pcb 2291088802) TU-12H		15019128 MA27WB (varistor)
TRIMMER			SN 304100 and up TU-12
13299151	H0651A009 2.2kΩ		15019306 RD7.5JB2 (zener) TU-12H
			15019302 RD5.1JB2 (zener) TU-12H
			LED
			15029142 GL-107R5 (red, 7-array LED)
			15029144 SLP-144-40 (red)
			15029143 SLP-139B (red, TUNING GUIDE)

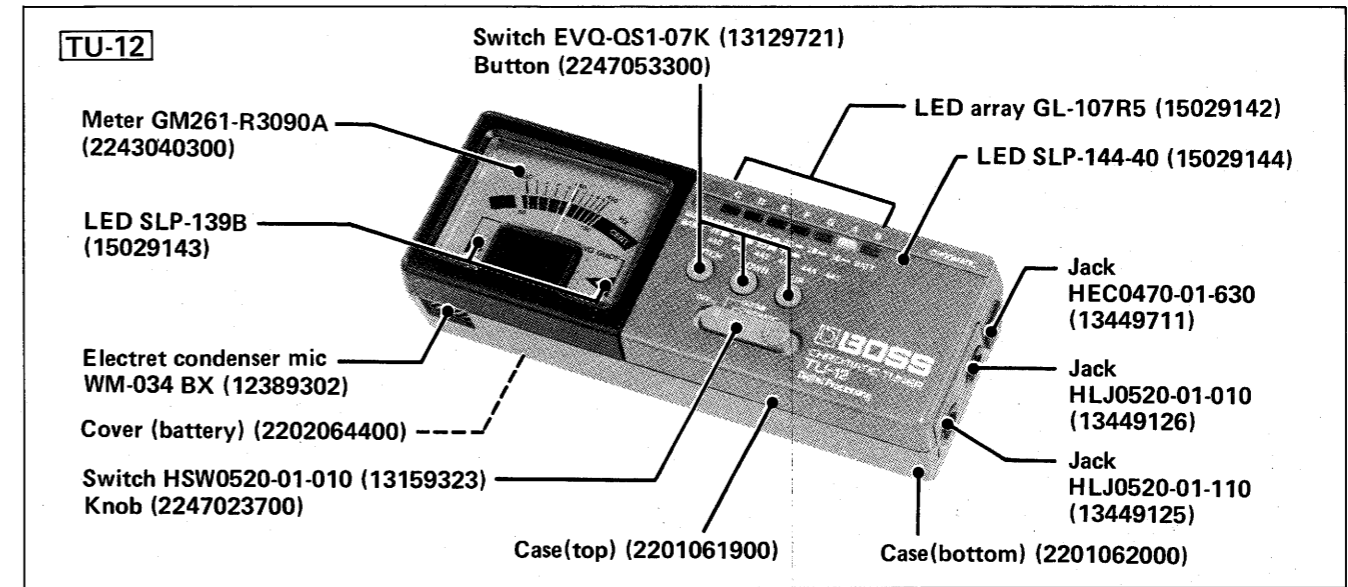
Printed in Japan BE-2

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

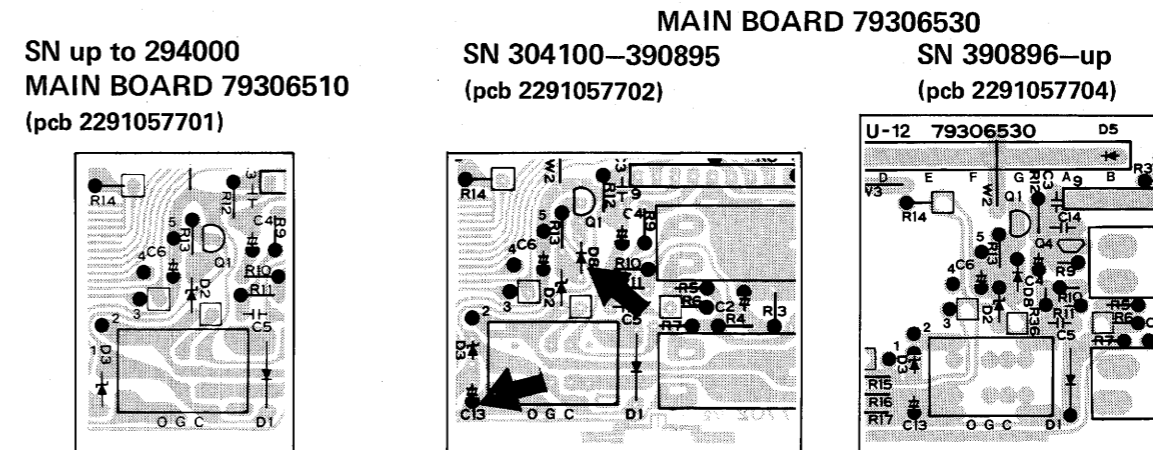
15129108 2SC945-P (or 15129114 2SC1815-GR)
 15139116 2SK118-O (FET)

OTHERS

2225020200 Shield Plate

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

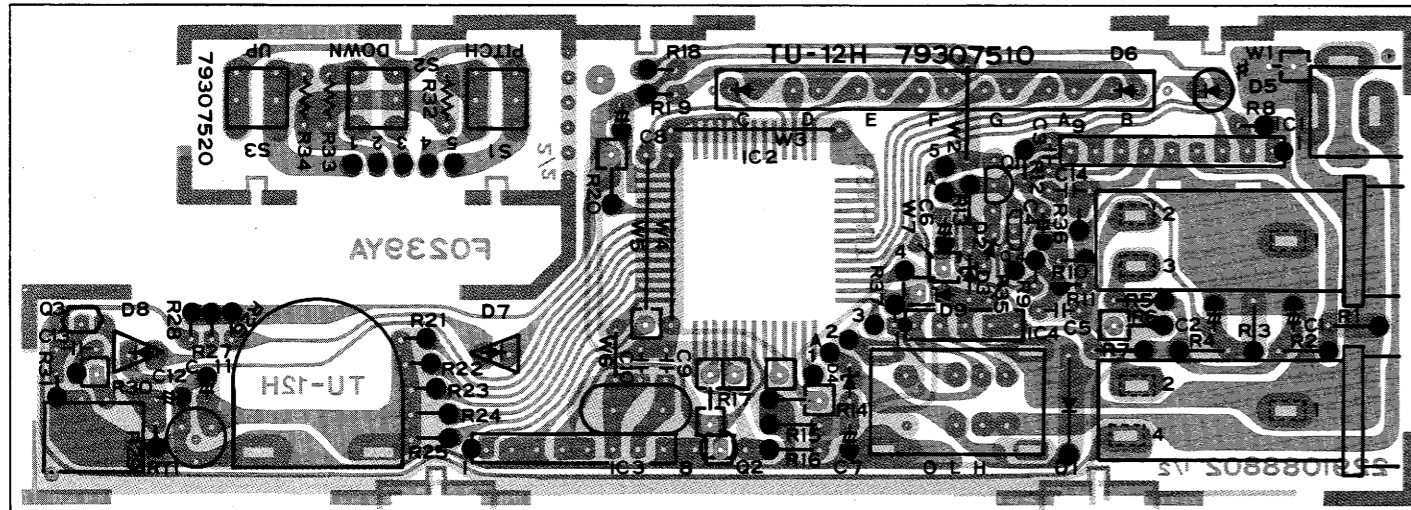
79307520

(pcb 2291088802)

MAIN BOARD

79307510

(pcb 2291088802)



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)

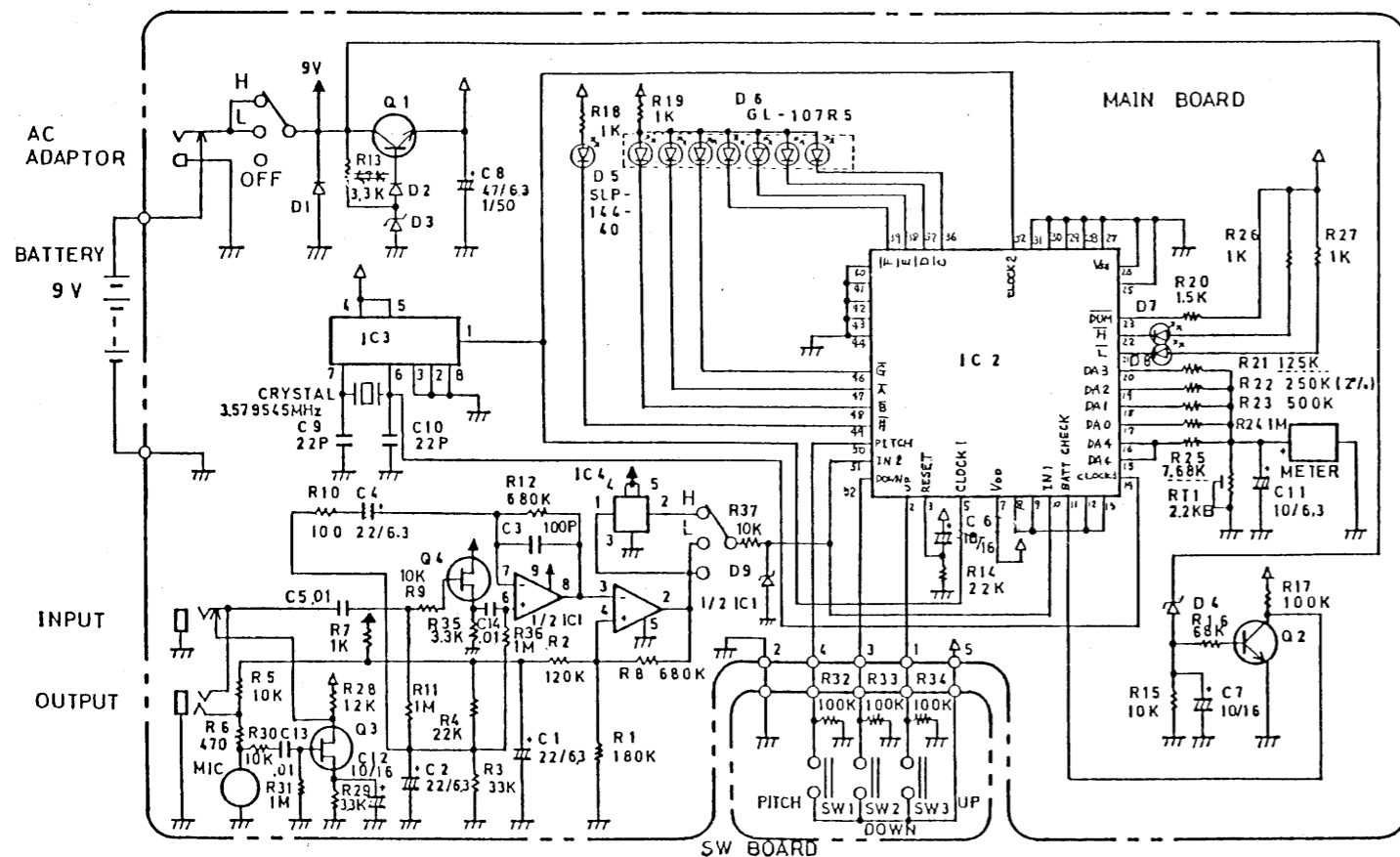
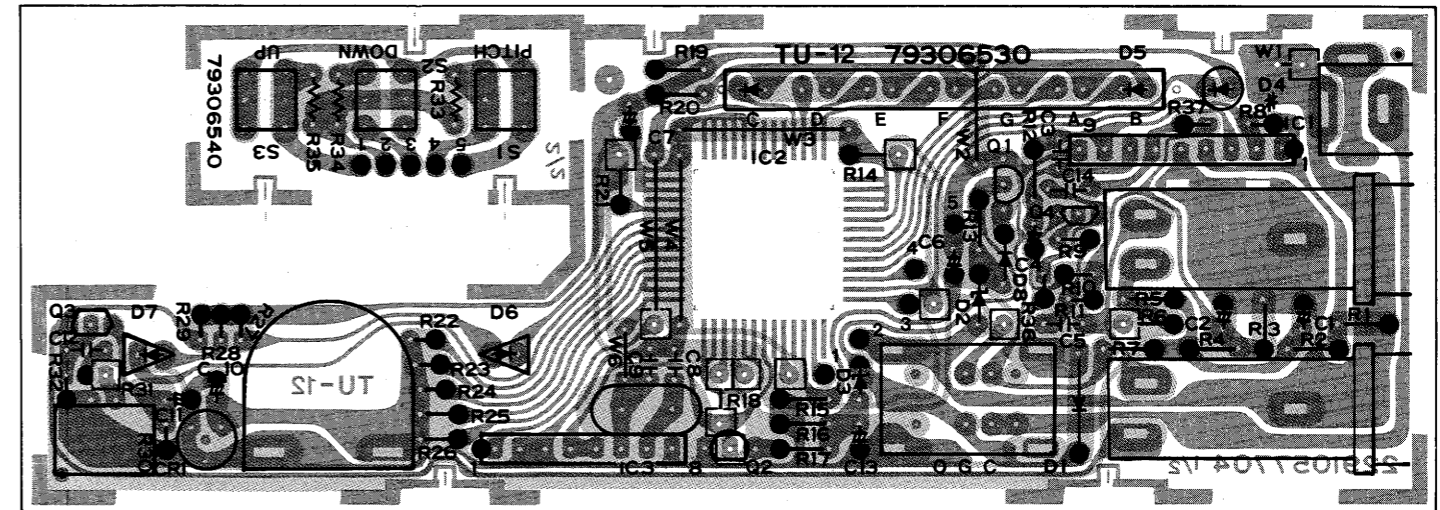
SN 390896-up

compatible with predecessors.

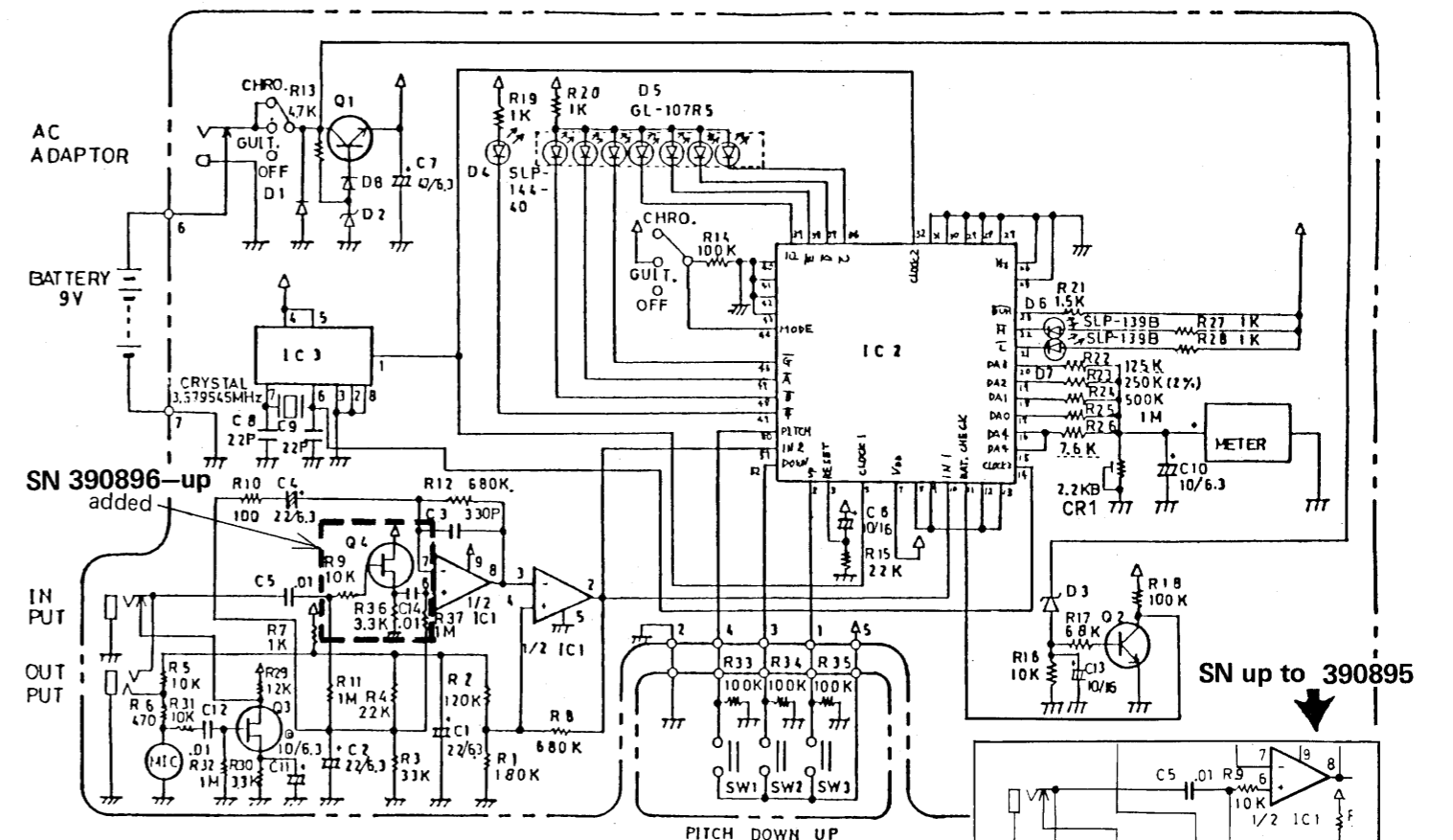
MAIN BOARD

79306530

(pcb 2291057704)



- | | | | |
|---------------|-----------------|-----------------|-------------------|
| 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 |



- | | | |
|-------------------|-----------------|---------------|
| 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 |