

of the claw () a

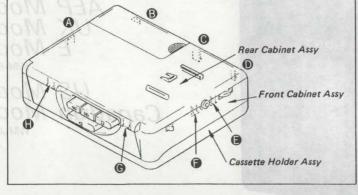
Digitized in Heiloo Netherlands

3/29/2018

SECTION 1 DISASSEMBLY

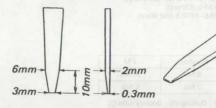
Location and shape of claws

The symbols $(\mathbf{A} - \mathbf{B})$ show the order to uncouple the linkage of the claw, and names of the parts.

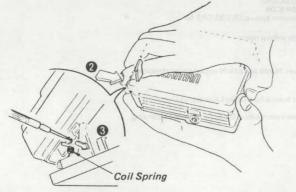


Note: Follow the disassembly procedure the numerical order given. Tools: Precision Screwdrivers (), width 0.8mm, 1.4mm, and 2.0mm) Adhesive tape 1-2cm Wedge (hand made)

> Material . . . soft plastic (such as PVC) etc. Sizes are for the reference.



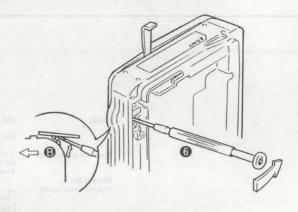
[1] Cassette Holder Removal



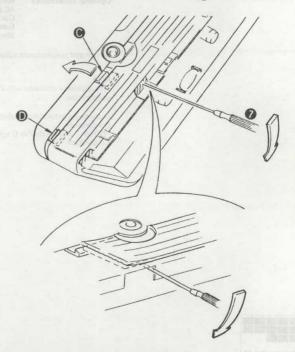
- Open the cassette holder.
- 2 While pressing the edge of the cassette holder, pull up it in order to take off the cassette holder.
- 3 Take off the end of coil spring with a precision screwdriver (width: 0.8mm).

- 4 Insert a precision screwdriver (width: 2.0mm) into the slit of front cabinet, lift the front cabinet as shown in the figure for making a clearance (**V**).
- **(5)** Insert a wedge in the clearance.

[2] Rear Cabinet Removal



6 Insert a precision screwdriver (width: 2.0mm), and lift the front cabinet so that the claw (B) comes off.



1 In a similar way as procedure 6, uncouple the linkage Digitized in Heiloo Netherlands f the claw () and (). -2 ∞

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SECTION 2 MECHANICAL AND ELECTRICAL ADJUSTMENTS

MECHANICAL ADJUSTMENTS

- Procedure :
- rubber belts 2. Demagnetize the playback head with a head demagne-

pinch roller

tizer. 3. Do not use a magnetized screwdriver for the adjustments.

PRECAUTION

Clean the following parts with a denatured-alcohol-

idlers

- 4. After the adjustments, apply suitable locking compound to the parts adjusted.
- . The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

moistened swab :

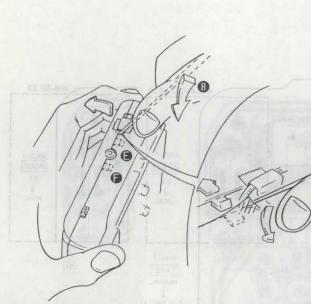
capstan

playback head

Torque Meter Reading Torque Meter 22-45g · cm Foward CQ-102C (0.31-0.63oz · inch) 55-130g · cm Fast Forward CQ-201B (0.77-1.82oz · inch) 55-150g · cm Rewind CQ-201B (0.77-2.1oz · inch) 1-2g • cm CQ-102C Back Tension (0.014-0.028oz · inch)

Tape Tension Measurement

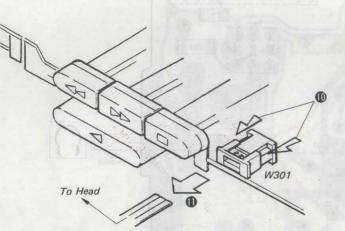
Meter	Meter Reading
CQ-403A	more than 90g (1.26oz)

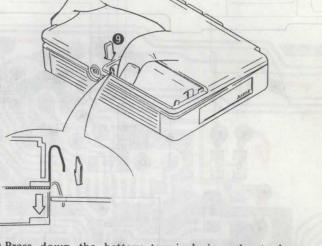


¹ Put a adhesive tape on the volume for protection. Insert a precision screwdriver (width: 1.4 mm) and lift the shaded portion, so that the claw () and () come off.

CAUTION: Be sure not to touch the volume knob, when inserting precision screwdriver.

[3] Head Flexible Board Removal





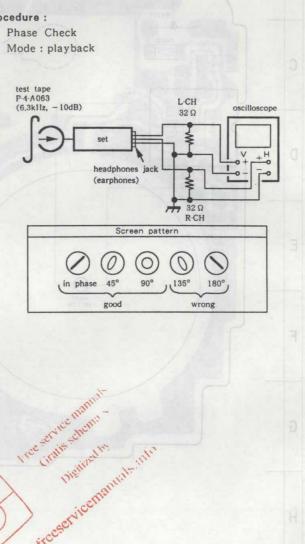
• Press down the battery terminals in order to leave Mounted PCB in the rear cabinet, and then remove the rear cabinet.

WM-AF23/AF29/BF233

ELECTRICAL ADJUSTMENTS CASSETTE SECTION

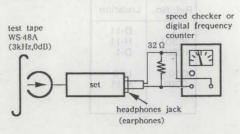
Playback Head Phase Check

Note :When replacing the head, check the both L-ch and R-ch phases.



Tape Speed Adjustment

Procedure : Mode : playback

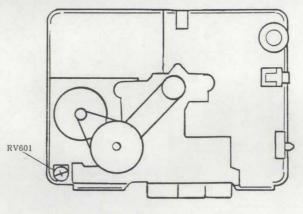


Specification :

speed checker	digital frequency counter (TAPE END)
+0.5%	2,990-3,015Hz

Frequency difference between the beginning and the end of the tape should be within $\pm 1.5\%$ (± 45 Hz).

Adjustment Location



ELECTRICAL ADJUSTMENTS

TUNER SECTION

SUPPLIED VOLTAGE 2.5V



Put the lead-wire nna close to the set.

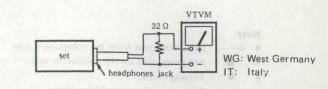
30% amplitude modulation by 400Hz signal Output lavel : as low as possible

FM rf signal

22,5kHz frequenc deviation by 1kHz signal · FM antenna terminal Output level : as low as possible

Note :

For adjustment of WM-AF23/AF29 SENS SW at DX. For adjustment of WM-BF23 MODE SW at MONO.



• Repcat the procedures in each adjustment several times. and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

> < > : CANADIAN model ():WG model []:IT model (()): WG, IT model

Pointer position	sG frequency minimum (87,35MHz) [87,5MHz] [87,5MHz] 109,0MHz (107,8MHz)	Adjustment part	Reading on VTVM
f minimum	(87.35MHz)	L3	maximum
f minimum		СТЗ	maximum

FM Tracking Adjustment

SG and set frequency	Adjustment part	Reading on VTVN
87.0MHz (87.35MHz) [87.5MHz]	L2	maximum
109.0MHz (107.8MHz) [108.0MHz]	CT2	nu

MW Frequency Coverage Adjustment

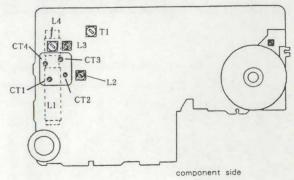
FM Frequency Coverage Adjustment

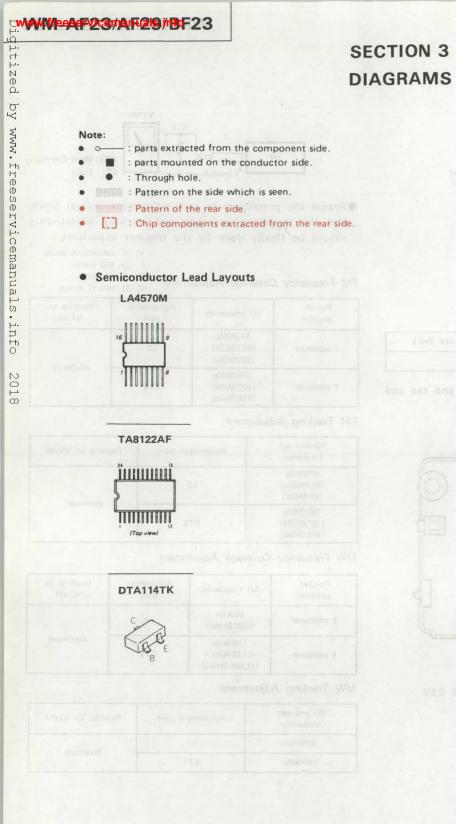
Pointer position	SG frequency	Adjustment part	Reading on VTVM
f minimum	520kHz ((526,5kHz))	LA	
f minimum	1,650kHz <1,750kHz> ((1,606,5kHz))	CT4	maximum

MW Tracking Adjustment

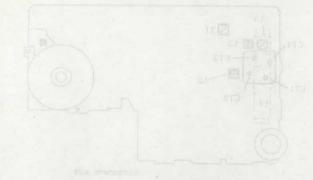
SG and set frequency	Adjustment part	Reading on VTVN
620kHz	L1	mavimum
1,400kHz	CT1	maximum

ADJUSTMENT LOCATION

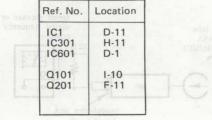


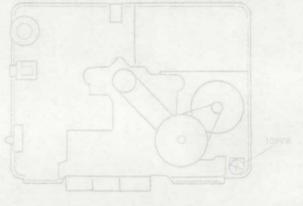




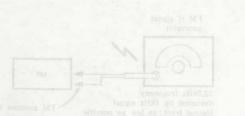


3-1. PRINTED WIRING BOARDS Semiconductor Location

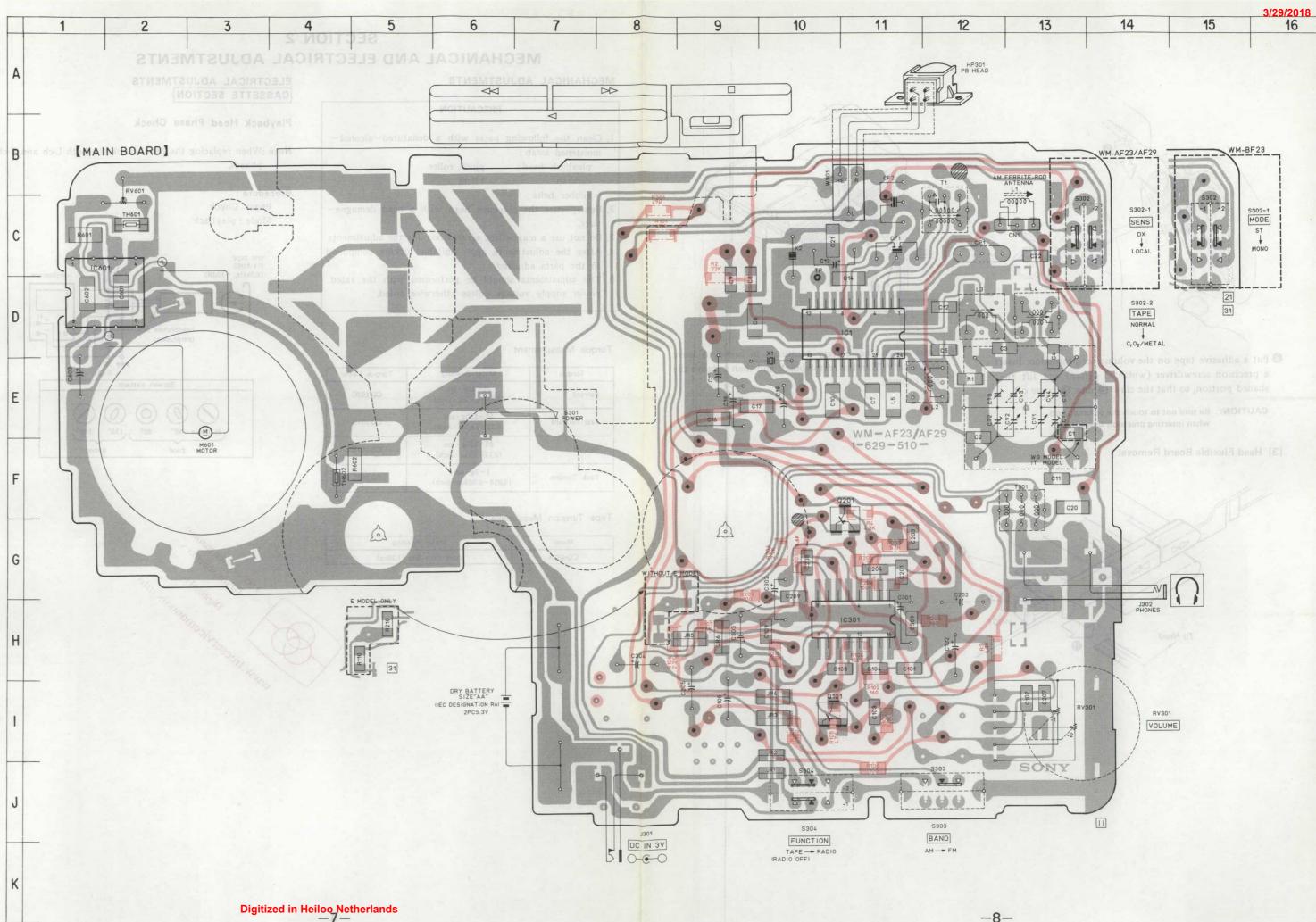


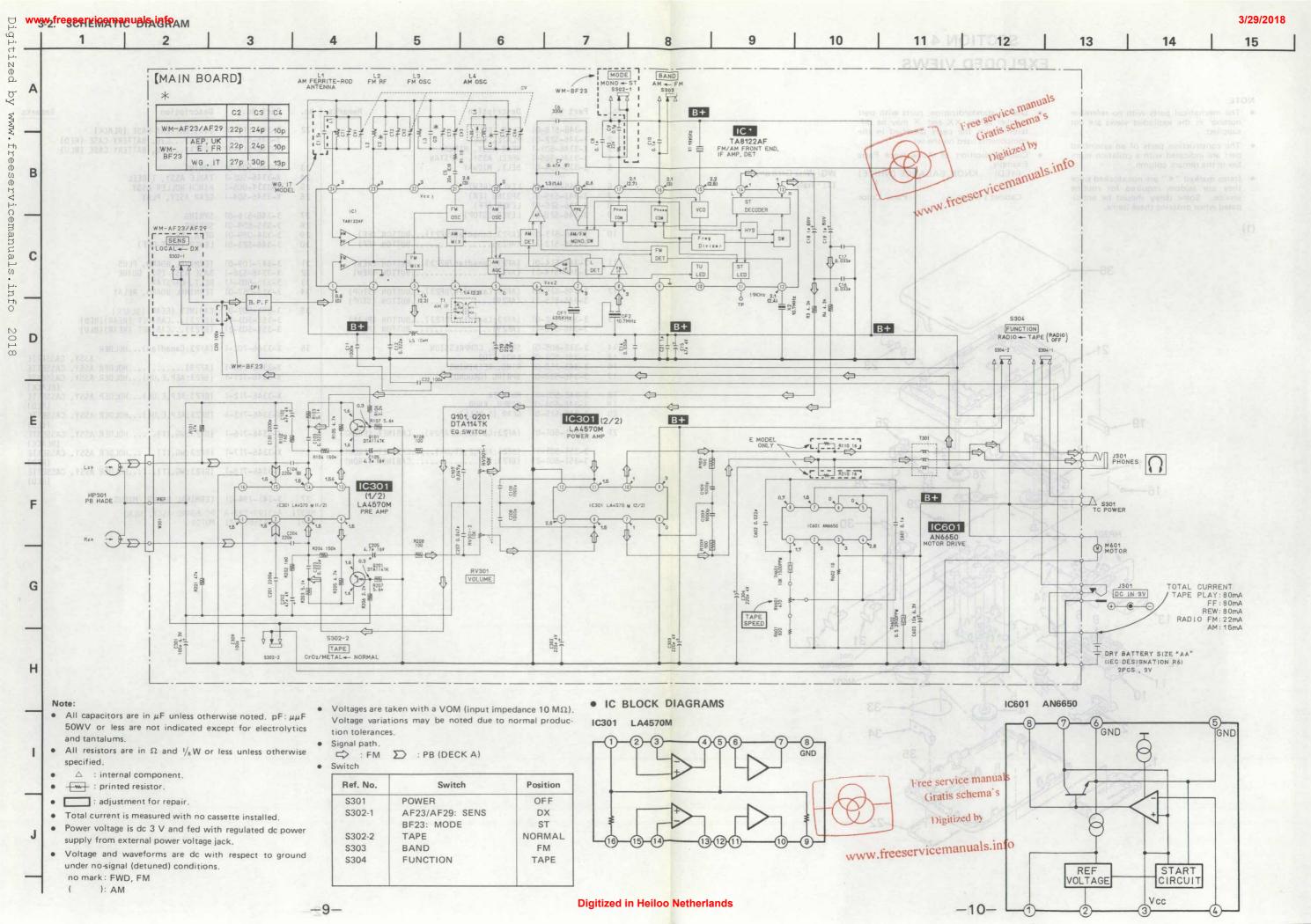


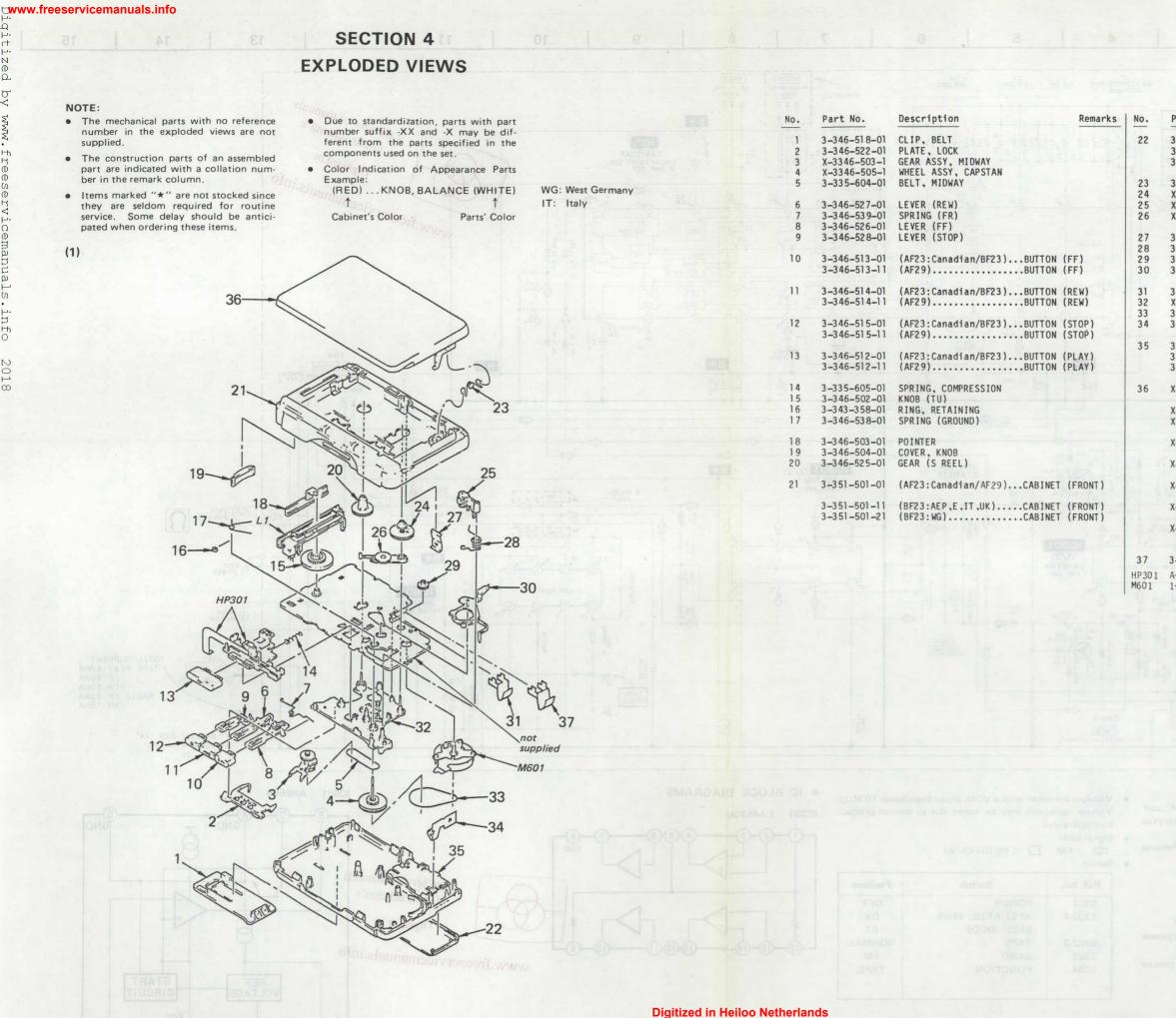




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3/29/2018

Part No.	Description Remarks	s
3–346–517–01 3–346–517–61 3–346–517–71	LID, BATTERY CASE (BLACK) (BF23)LID, BATTERY CASE (RED) (BF23)LID, BATTERY CASE (BLU)	
3-346-509-01 X-3346-502-1 X-3334-005-1 X-3346-504-1	SPRING TABLE ASSY, T REEL PINCH ROLLER ASSY GEAR ASSY, PLAY	
3-346-516-01 3-335-608-01 3-334-089-01 3-346-523-01	SPRING SPRING GEAR, FF LEVER (SHUT-OFF)	
3-347-109-01 X-3346-536-1 3-335-603-11 3-334-057-01	TERMINAL BOARD, PLUS BASE ASSY (B), GUIDE BELT, CAPSTAN TERMINAL BOARD, RELAY	
3-351-503-01 3-351-503-11 3-351-503-21	CABINET (REAR)(BLACK) (BF23)CABINET (REAR)(RED) (BF23)CABINET (REAR)(BLU)	
X-3346-702-1	(AF23:Canadian)HOLDER	
X-3346-706-1 X-3346-711-1	ASSY, CASSETTE (AF29)HOLDER ASSY, CASSETTE (BF23:AEP,E,UK)HOLDER ASSY, CASSETTE (BLACK)	
X-3346-712-1	(BF23:AEP,E,UK)HOLDER ASSY, CASSETTE	
X-3346-713-1	(RED) (BF23:AEP,E,UK)HOLDER ASSY, CASSETTE	
x-3346-716-1	(BLU) (BF23:WG,IT)HOLDER ASSY, CASSETTE	
x-3346-717-1	(BF23:WG,IT)HOLDER ASSY, CASSETTE	
K-3346-718-1	(RED) (BF23:WG,IT)HOLDER ASSY, CASSETTE (BLU)	
3-341-794-01	TERMINAL BOARD, MINUS	
-3108-202-A	DC ROADD ASSY UPAD	

HP301 A-3108-292-A PC BOARD ASSY, HEAD M601 1-541-650-21 MOTOR

C11

C12

C13

C14

1-163-009-11

1-163-037-11

1-126-153-11

CERAMIC CHIP 0.001MF

CERAMIC CHIP 0.022MF

22MF

ELECT

1-163-078-11 CERAMIC CHIP 0.033MF

	ww.free	servicemanual	s.info						WM-	AF23/AF	29%
igit				5	SECT	ION 5	5	-	1.		
tized			ELE	CTR	ICAL	PAR	TS LIST				
Уq	NO	TE:									
www.	1	Due to standardiz ist may be differ the diagrams or th									
freese	•	Items marked " * are seldom requir delay should be a tems.	" are not stocked since ed for routine service. S nticipated when ordering t or more same circuits in a	they ome hese	F:rCOILSMM	resistors ar nonflamma H: mH, Ul	H: μΗ 1 22				
rvicemanua	5	such as a stereor circuit parts may	shonic machine, only ty be indicated and capacitors same circuits may be omit	pical and tted.	UA UP(: µA,	DRS J: μ, for exampl UPA: μPA UPD: μPD		NG: West Ger T: Italy	many 0-090-1	
lan	Ref.No	. Part No.	Description			Ref.No.	Part No.	Descrip			
uals	C1	1-163-088-91	(BF23:WG,IT) CERAMIC CHIP 5P	F 0.25PF	257	C205 C207	1-126-094-11 1-163-809-11		4.7MF CHIP 0.047M		16V 25V
· in	C2	1-163-101-00	(WITHOUT WM-BF23:WG,IT CERAMIC CHIP 22		507	C208	1-163-009-11		CHIP 0.001M CHIP 0.001M		50V
fo	C2	1-163-103-91	(WM-BF23:WG,IT) CERAMIC CHIP 27		507	C3 01 C3 02	1-124-225-00 1-124-434-00	ELECT	100MF 220MF	20%	6.3V 4V
N 0	C3	1-163-102-00	(WITHOUT WM-BF23:WG,IT CERAMIC CHIP 24		50V	C3 03 C3 04	1-124-434-00		22 OMF 22 OMF	20%	4V 4V
14 80	C3	1-163-364-91	(WM-BF23:WG,IT) CERAMIC CHIP 30		507	C304	1-163-117-00		CHIP 100PF	00-0 5%	500
	C4	1-163-093-00	(WITHOUT WM-BF23:WG,IT CERAMIC CHIP 10		50V	C601 C602 C603	1-163-077-00 1-163-063-00 1-126-157-11		CHIP 0.1MF CHIP 0.022M 10MF	F 10% 20%	50V 50V 16V
	C4	1-163-356-91	(WM-BF23:WG,IT) CERAMIC CHIP 13	PF 5%	507	CF1 CF1	1-527-870-00 1-567-129-11		T WM-BF23:UK 3:UK)FILT)FILTER(1	0.7MHz)
	C5 C6 C7	1-163-100-00 1-163-193-00 1-162-637-11	CERAMIC CHIP 20PF CERAMIC CHIP 330PF CERAMIC CHIP 0.47MF	5% 10%	50V 50V 16V	CF2	1-577-344-71		CERAMIC (45		
	C7		CERAMIC CHIP 0.47MF		257	CN1	*1-565-285-11	HOUSING	, CONNECTOR(PC BAORD)3P	
	C9 C10	1-163-038-00	CERAMIC CHIP 0.1MF CERAMIC CHIP 0.1MF CERAMIC CHIP 0.1MF		25V 25V 50V	CP1	1-236-022-11	FILTER,	BAND PASS		
	0.0		or and other or the		001	CVI	1 151 500 11	0.40	D DOL VETUN		4 0111

CV1 1-151-629-11 CAP, VAR, POLYETHYLENE (WITH CT1-4, CV1-4) 501 A-3108-292-A PC BOARD ASSY, HEAD 251 HP301 6.3V 8-759-230-39 IC TA8122AF 8-759-820-19 IC LA4570M IC1 251 IC301 (N 3V)

C15 C16	1-124-432-00	ELECT CERAMIC CH	47MF IP 0.033MF	20%	4V 25V	IC601	8-759-403-83	IC AN6650
C1 7	1-163-078-11	CERAMIC CH		10%	257	J301 J302	1-568-228-11	JACK, EXTERNAL POWER (DC IN 3V)
C18	1-126-160-11	ELECT	1 MF	20%	50V			JACK (PHONES)
C19	1-126-160-11	ELECT	1 MF	20%	50V	JR1 JR2	1-216-295-00	METAL GLAZE 0 5% 1/10W METAL GLAZE 0 5% 1/10W
C20 C21	1-163-181-00	CERAMIC CH		5%	50V 25V	JR3	1-216-296-00	METAL GLAZE 0 5% 1/8W
C22	1-163-117-00	CERAMIC CH		5%	507	JR4	1-216-296-00	METAL GLAZE 0 5% 1/8W
C1 01 C1 02	1-164-161-11	CERAMIC CH	IP 0.0022MF 47MF	10%	50V 4V	JR5 JR6	1-216-296-00 1-216-296-00	METAL GLAZE 0 5% 1/8W METAL GLAZE 0 5% 1/8W
C1 03	1-163-037-11	CERAMIC CH		10%	25V	L1	1-402-412-11	ANTENNA, FERRITE-ROD
C104 C105	1-163-125-00 1-126-094-11	CERAMIC CH	IP 220PF 4.7MF	10%	50V 16V	L2	1-459-955-11	(WITHOUT WM-BF23:WG,IT) COIL(WITH CORE)(
C107	1-163-809-11	CERAMIC CH	IP 0.047MF	10%	251	L2	1-459-956-11	(WM-BF23:WG,IT)COIL(WITH CORE)(
C108 C109	1–163–009–11 1–163–009–11	CERAMIC CH CERAMIC CH		10%	50V 50V	L3	1-459-953-11	(WITHOUT WM-BF23:WG,IT) COIL(WITH CORE)(
C2 01	1-164-161-11	CERAMIC CH	IP 0.0022MF	10%	50V	L3	1-459-954-11	(WM-BF23:WG,IT)COIL(WITH CORE)(
C2 02	1-124-432-00	ELECT	47MF	20%	4 V	L4	1-406-330-21	COIL (OSC)(AM)
C2 03 V C2 04	1-163-037-11 1-163-125-00	CERAMIC CH CERAMIC CH		10% 10%	25V 50V	L5	1-410-204-31	INDUCTOR CHIP 100H
							a tractoral designation and	

10%

10%

20%

10%

CORE)(FM RF) CORE)(FM RF)

CORE) (FM OSC) CORE) (FM OSC)

WM-AF23/AF29/8523

Digitized in Helloo Netherlands

M601

1-541-650-21 MOTOR

WWM free For 30 A Far als Bill 23

LECTRICAL PARTS LIST

Ref.No.	Part No.	Description				AC	CESSOR	Y & P/	ACKING M	ATERIAL		
0101	8-729-900-51	TRANSISTOR DTAIl4TK				26341-	-528-239	9-21	(AF29).	BATTERY, S	TORAGE, LEAD (B	
Q2 01 R1 R2 R3	8-729-900-51 1-216-001-00 1-249-433-11 1-215-436-00	TRANSISTOR DTAll4TK METAL GLAZE 10 CARBON 22K CARBON 4.3K	5% 5%	1/10W 1/32W 1/32W		▲.1-	-528-238 -528-263 -351-508	3–11	(AF29:0	anadian)B	ATTERY CHARGER ATTERY CHARGER	
R4 R1 01 R1 02	1-215-436-00 1-249-437-11 1-000-030-11	CARBON 4.3K CARBON 47K CARBON 160	5% 5% 5%	1/32W 1/32W 1/32W		BEMIC	-786-982 -786-982	2-11	(AF23/A	F29:Canadian MANUA		
R1 03 R1 04 R1 05	1-215-438-00 1-215-473-00 1-249-425-11	CARBON 5.1K CARBON 150K CARBON 4.7K	5% 5% 5%	1 /32W 1 /32W 1 /32W			-952 -3 50 -952 -44			T WM-BF23:E)	ONE MDR-E454 SE ONE MDR-OO6L SE	
R106 R107 R108	1-249-421-11 1-249-426-11 1-249-405-11	CARBON 2.2K CARBON 5.6K CARBON 100	5% 5% 5%	1/32W 1/32W 1/32W	2051 1051 1051	¥28						
R109 R110 R201	1-249-405-11 1-216-006-91 1-249-437-11	CARBON 100 (WM-BF23:E)METAL CARBON 47K	GLAZE	1/32W 16 5% 1/32W	1/10W	50V 50V						
R2 02 R2 03 R2 04	1-000-030-11 1-215-438-00 1-215-473-00	CARBON 160 CARBON 5.1K CARBON 150K	5% 5% 5%	1/32W 1/32W 1/32W								
R205 R206 R207	1-249-425-11 1-249-421-11 1-249-426-11	CARBON 4.7K CARBON 2.2K CARBON 5.6K	5% 5% 5%	1/32W 1/32W 1/32W	10A) 5060 10A0							
R2 08 R2 09 R2 1 0	1-249-405-11 1-249-405-11 1-216-006-91	CARBON 100 CARBON 100 (WM-BF23:E)METAL	5% 5% GLAZE	1/32W 1/32W	1/10W							
R601 R602	1 –21 6–1 96–00 1 –21 6–1 50–00	METAL GLAZE 820 METAL GLAZE 10	5% 5%	1/8W	, 200							
RV301 RV601	1-238-072-11 1-238-011-11	RES, VAR, CABON 10K RES, ADJ, CARBON 47	O (TAP) 190							
S3 01 S3 02 S3 03 S3 04	1-570-549-11 1-571-478-11 1-571-478-11 1-571-478-11 1-571-478-11	SWITCH, LEAF (POWER SWITCH, SLIDE (SENS SWITCH, SLIDE (BAND SWITCH, SLIDE (FUNC	/MODE-	-TAPE)	PG CHI							
T1	1-404-791-11	(WITHOUT WM-BF23:UK		R, IF (AM							
TI	1-404-792-11	(WM-BF23:UK)TRAN	SFORME	R. IF (AM)							
T301	1-409-444-11	COIL, TRAP			. 13.02							
T H601 T H602	1-808-664-21 1-807-489-41	THERMISTOR, POSITIV THERMISTOR (POSITIV			SSL.							
W3 01	*1-565-288-11	HOUSING, CONNECTOR	3 P		281,							
X1 X2	1 –577–091 –1 1 1 –577–344–71	OSILLATOR, CERAMIC FILTER, CERAMIC (10	.7MHz)		281 anti-							

Note: The components identified by mark A or dotted line with mark A are critical for safety. Replace only with part number specified. Note: Les composants identifiés par une marque A sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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