


SERVICE MANUAL

AUDIO PROGRAM TIMER

SANSUI AT-F1



CAUTION

1. Parts identified by the  symbol on the schematic diagram and the parts list are critical for safety. Use only replacement parts that have critical characteristics recommended by the manufacturer.
2. Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

•SPECIFICATIONS

Clock type.....	12-hour digital clock
Quartz oscillator	32768 Hz
Display accuracy	Normal temperature max. ± 10 sec monthly error (Crystal Controlled not synchro with AC)
Sleep timer	Any setting up to 1 hr 59 min in 1-minute units
Time counter.....	Max. 1 hr 59 min 59 sec, 1-second 1-count system, switching between minutes/ seconds and hours/minutes
AC outlets	3, total capacity of 700W
Power requirements	120, 220, 240V 50/60 Hz
Power consumption	7W
Dimensions	
Commander	121 mm (4-3/4") W 150 mm (5-29/32") H 121 mm (4-3/4") D
Power supply	100 (3-15/16") W 73 mm (2-7/8") H 195 mm (7-11/16") D
Weight	
Commander	0.4 kg (0.9 lbs) net
Power supply	1.0 kg (2.2 lbs) net 2.0 kg (4.4 lbs) packed

* Design and specifications subject to change without notice for improvements.

Sansui

SANSUI ELECTRIC CO., LTD.

CAUTION

1. The symbols, UL, CSA, SA, BS, UK, EU, AS and XX (EXPORT) on the parts list and the schematic diagram mean followings respectively.
 - UL..... Manufactured for U.S.A market.
(Underwriters Laboratories approved model.)
 - CSA Manufactured for Canadian market.
 - SA..... Manufactured for South African market.
 - BS, UK Manufactured for United Kingdom market.
 - EU Manufactured for European market.
 - AS..... Manufactured for Australian market.
 - XX (EXPORT) Standard Version.
 - NON MARK Common Parts.

2. Some printed circuit boards are not supplied as the assembled. To separate these in this service manual, the stock No's are not indicated at the ends of the board names. However, the individual parts on the circuit boards are provided by orders.

3. Since some of capacitors and resistors are omitted from parts lists in this service manual, refer to the Common Parts List for capacitors & resistors, which was issued on February 1983.

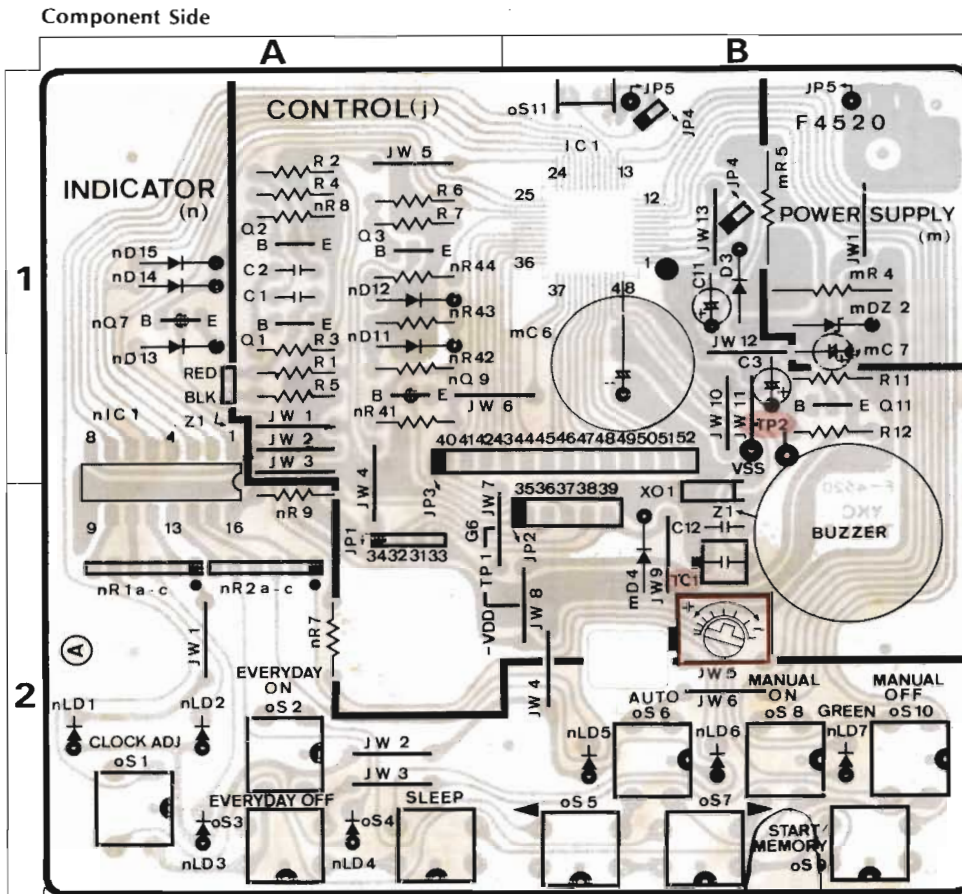
4. Abbreviations in this service manual are as follows.

•Abbreviations List

C.R. : Carbon Resistor	E.B.L. : Low Leak Bi-Polar Electrolytic Capacitor
S.R. : Solid Resistor	Ta.C. : Tantalum Capacitor
Ce.R. : Cement Resistor	F.C. : Film Capacitor
M.R. : Metal Film Resistor	M.P. : Metalized Paper Capacitor
F.R. : Fusing Resistor	P.C. : Polystyrene Capacitor
N.I.R. : Non-Inflammable Resistor	G.C. : Gimmic Capacitor
A.R. : Array Resistor	A.C. : Array Capacitor
C.C. : Ceramic Capacitor	V.R. : Variable Resistor
C.T. : Ceramic Capacitor, Temoerature Compensation	S.V.R. : Semi Variable Resistor
E.C. : Electrolytic Capacitor	SW. : Switch
E.L. : Low Leak Electrolytic Capacitor	Chip R. : Chip Resistor
E.B. : Bi-Polar Electrolytic Capacitor	Chip C. : Chip Capacitor

1. PARTS LOCATION & PARTS LIST

1-1. F-4520 Control IC Circuit Board (Stock No. 00805501)



Parts List

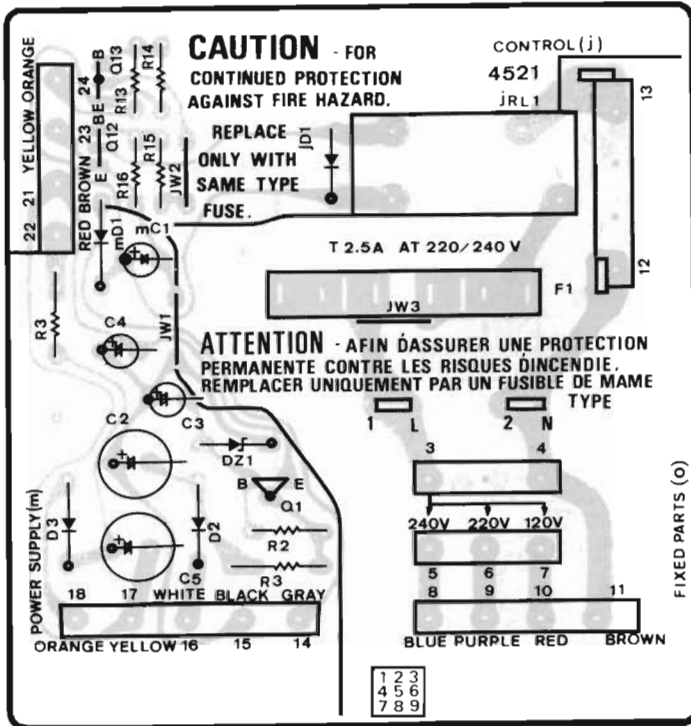
Parts No.	Stock No.	Description
• Transistor		
jQ2	07194801	2SC1815
jQ3	07194801	2SC1815
jQ11	07194801	2SC1815
• IC		
jIC1	46949200	LR3474
jXO1	48001800	Quartz Element
• Diode		
jD3	07176400	1S2473HS
jTC1	46437400	Trimmer Capacitor 20pF
• Diode		
mD4	07176400	1S2473HS
• Zener Diode		
mDZ2	46101300	05Z5.6-Y
mC6	46579700	4700µF 6.3V E.C.
mR4	46243000	330Ω 1W N.I.R.
mR5	46243000	330Ω 1W N.I.R.
• Transistor		
nQ7	07194701	2SA1015
nQ9	07194701	2SA1015
• IC		
nIC1	46911900	IR2411
• Diode		
nD11	07176400	1S2473HS
nD12	07176400	1S2473HS

Parts List

Parts No.	Stock No.	Description
• Varistor		
nD13	03401500	MV12
• Diode		
nD14	07176400	1S2473HS
nD15	07176400	1S2473HS
• LED		
nLD1	46858300	GL-1HD201
nLD2	46858300	GL-1HD201
nLD3	46858300	GL-1HD201
nLD4	46858300	GL-1HD201
nLD5	46858300	GL-1HD201
nLD6	46858300	GL-1HD201
nLD7	46858500	GL-1HG201
nR1	48053400	560Ω × 3 A.R.
nR2	48053400	560Ω × 3 A.R.
oS1	48055800	Push SW., CLOCK ADJUST
oS2	48055800	Push SW., EVERY DAY ON
oS3	48055800	Push SW., EVERY DAY OFF
oS4	48055800	Push SW., SLEEP OFF
oS5	48055800	Push SW., < (ADJUSTMENT)
oS6	48055800	Push SW., AUTO
oS7	48055800	Push SW., > (ADJUSTMENT)
oS8	48055800	Push SW., MANUAL ON
oS9	48055800	Push SW., START/MEMORY
oS10	48055800	Push SW., MANUAL OFF
oS11	46547000	Push SW., RESET
	07244900	Buzzer PKM12

1-2. F-4521 Power Supply Circuit Board (Stock No. 00805601)

Component Side

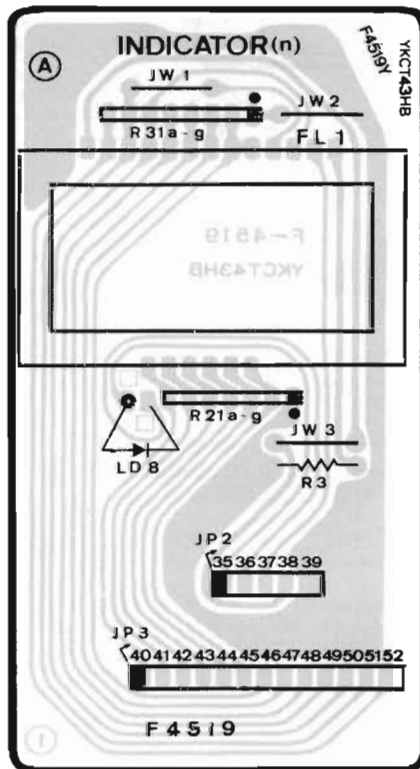


Parts List

Parts No.	Stock No.	Description
• Transistor		
jQ1	07194801	2SC1815
jQ12	07194801	2SC1815
jQ13	07194801	2SC1815
• Diode		
jD1	03117700	10E-2
△ jRL1	48055600	Relay
• Zener Diode		
jZD1	46100900	05Z5.1
• Transistor		
△ mQ1	03032301	2SB507V11AL
• Diode		
△ mD1	03117700	10E-2
△ mD2	03117700	10E-2
△ mD3	03117700	10E-2
• Zener Diode		
mDZ1	46106400	05Z30-Y
△ mR1	00119700	10Ω 1/2W F.R.
△ mR3	00122400	4.7Ω 1/2W F.R.

1-3. F-4519 Display Tube Circuit Board

Component Side



Parts List

Parts No.	Stock No.	Description
• Zener Diode		
nDZ1	46098500 or 46098600	05Z2.2-Z 05Z2.4-X
nFL1	46948700	FL. Display Tube FG48BF2
nLD8	46176900	LED TLS-123
nR21	46346800	100kΩ × 6 A.R.
nR31	46392900	100kΩ × 7 A.R.

1-4. F-4584 4P Socket Board

Component Side

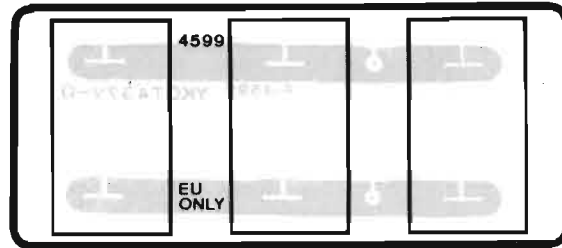


Parts List

Parts No.	Stock No.	Description
	48001200	4P Socket

1-5. F-4599 AC Outlet Board <EU & UK>

Component Side



2-1. Front View (Control Unit and Power Supply Unit)



2. OTHER PARTS

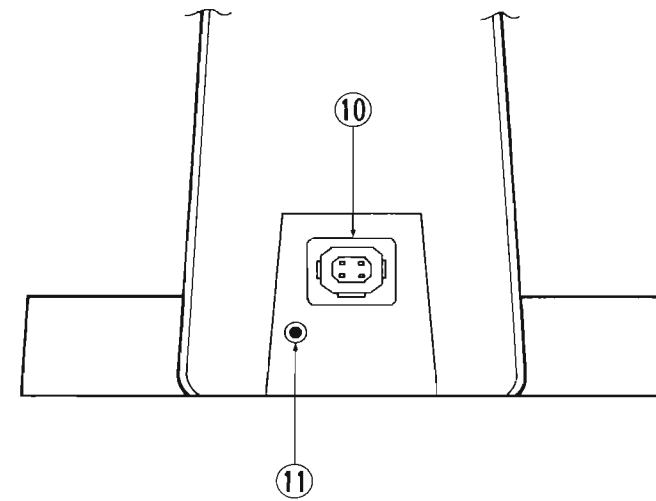
Parts List <2-1. Front View (Control Unit and Power Supply Unit)
2-2. Rear View (Power Supply Unit)>

Parts No.	Stock No.	Description
1	47531700	Front Panel Ass'y
2	46948700	FL. Display Tube
3	47527700	Case
4	47531000	Control Sheet
5	48055800	Push SW., CLOCK ADJUST, Time adjust, AC OUTLET CONTROL, Timer set
6	47253500	Leg
7	47527800	AC Outlet Panel <XX,UL,CSA>
	47531600	AC Outlet Panel <EU,BS>
⚠ 8	46360100	AC Outlet <XX,UL,CSA>
⚠ 8	46364800	AC Outlet <EU,BS>
9	47225000	Bonnet
10	48001200	4P Socket
11	46549500	Push SW., PRESET

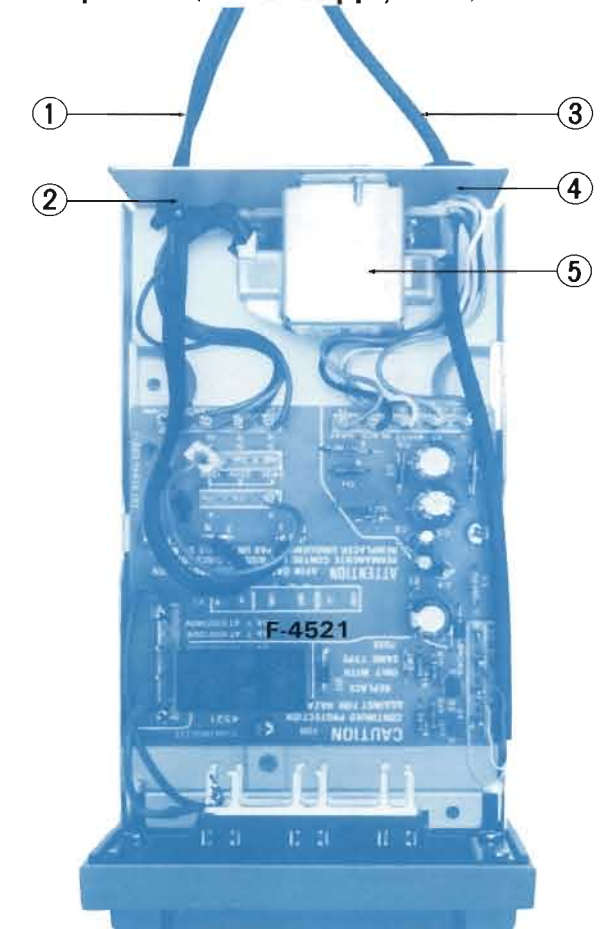
Parts List <2-3. Top View (Power Supply Unit)>

Parts No.	Stock No.	Description
⚠ 1	38004700	Power Supply Cord <XX,UL,CSA>
	38004500	Power Supply Cord <EU>
⚠ 2	38004300	Power Supply Cord <BS>
	39106000	Strain Relief <XX,UL,CSA>
	39104900	Strain Relief <EU,BS>
3	46949100	4P Cord
4	46526800	Strain Relief
⚠ 5	15016201	Power Transformer <XX>
⚠ 5	15016202	Power Transformer <UL,CSA>
⚠ 5	15016205	Power Transformer <EU,BS>
	07204700	Slide SW., Voltage Selector <EU,BS>

2-2. Rear View (Control Unit)

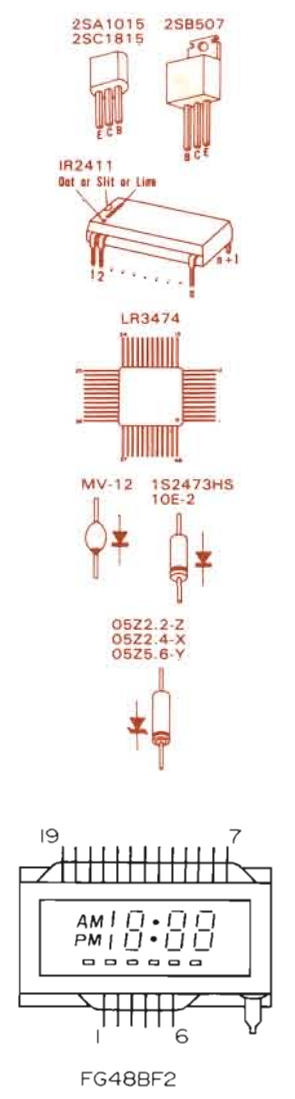
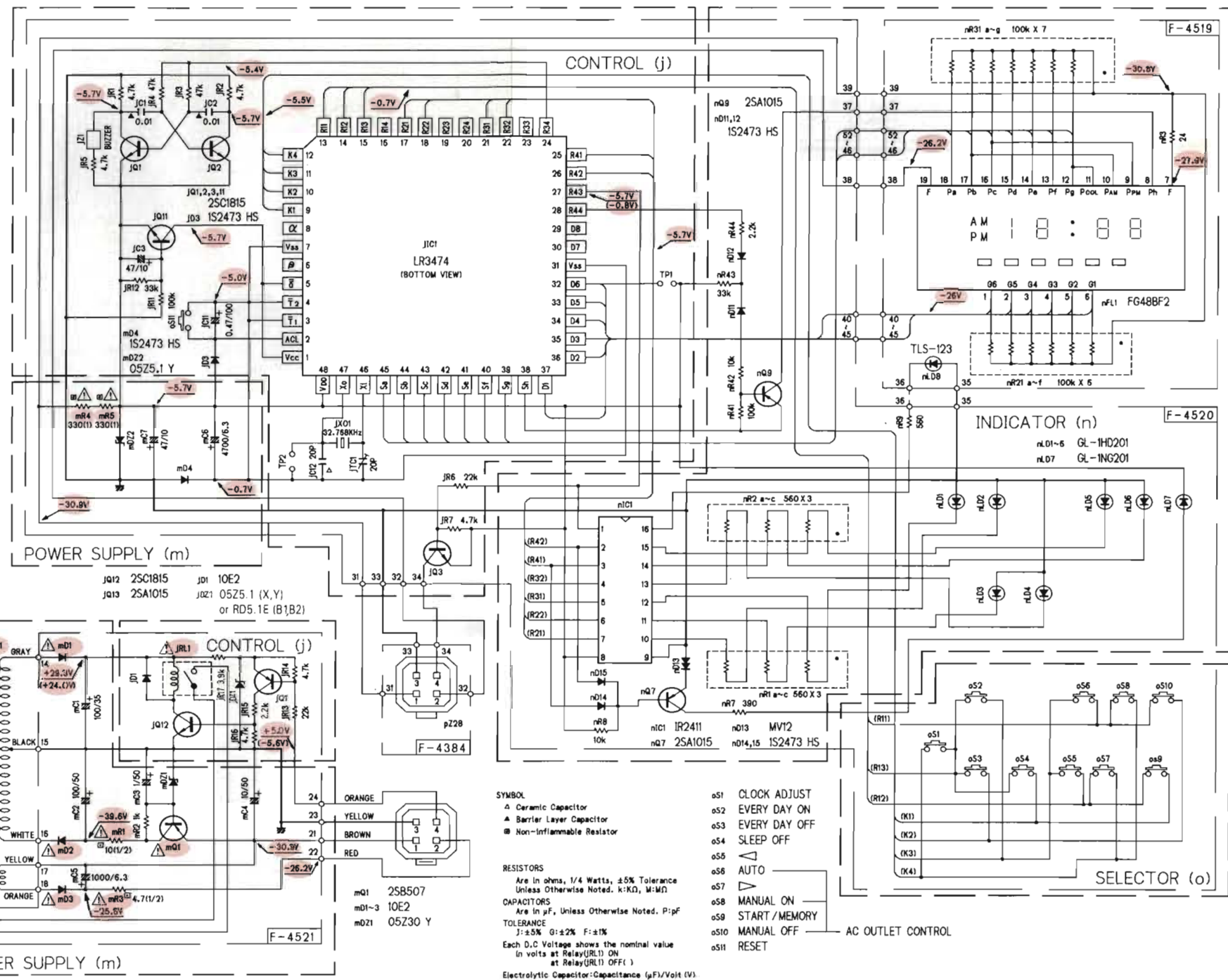
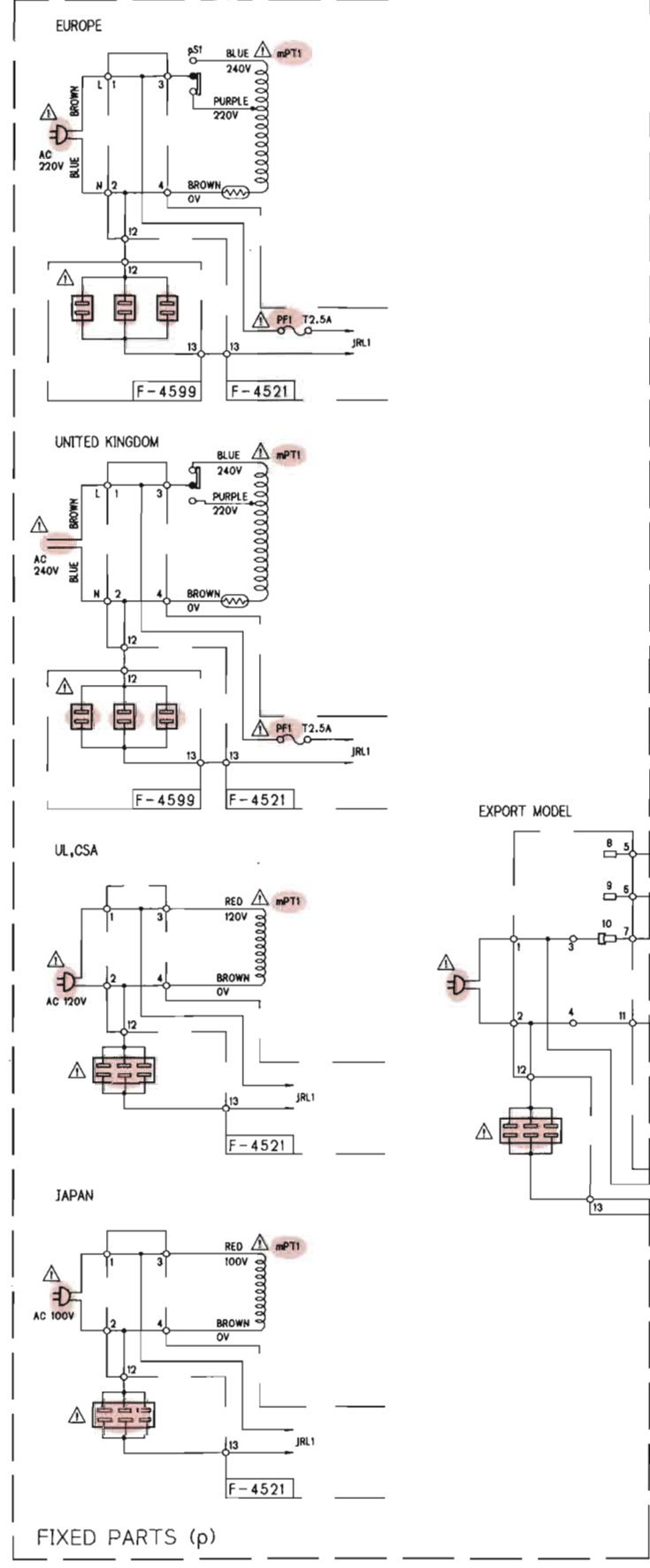


2-3. Top View (Power Supply Unit)



3. SCHEMATIC DIAGRAM

*Design and specifications subject to change without notice for improvement.
 *La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
 *Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



SYMBOL
 ▲ Ceramic Capacitor
 ▲ Barrier Layer Capacitor
 ■ Non-inflammable Resistor

RESISTORS
 Are in ohms, 1/4 Watts, ±5% Tolerance Unless Otherwise Noted. k:KΩ, M:MΩ

CAPACITORS
 Are in μF, Unless Otherwise Noted. P:pF

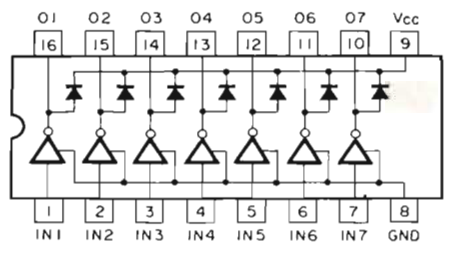
TOLERANCE
 J:±5% G:±2% F:±1%

Each D.C Voltage shows the nominal value in volts at Relay(JRL1) ON at Relay(JRL1) OFF()

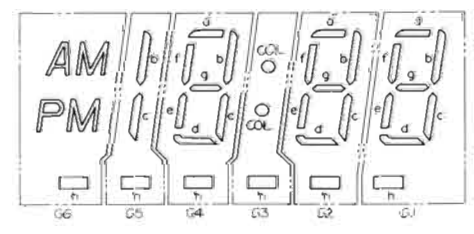
Electrolytic Capacitor:Capacitance (μF)/Volt (V)

- oS1 CLOCK ADJUST
 - oS2 EVERY DAY ON
 - oS3 EVERY DAY OFF
 - oS4 SLEEP OFF
 - oS5
 - oS6 AUTO
 - oS7 MANUAL ON
 - oS8 START/MEMORY
 - oS9 MANUAL OFF
 - oS10
 - oS11 RESET
- AC OUTLET CONTROL

•IR-2411 <7 Unit Transistor Array with Clamp Diode>



•FG48BF2 Display Pattern & Assignment

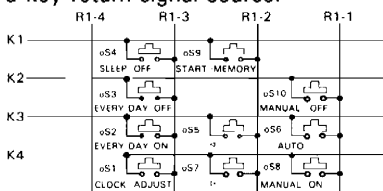


PIN ASSIGNMENT

Pin No.	1	2	3	4	5	6	7	8	9	10
Assignment	G6	G5	G4	G3	G2	G1	F(-)	P _H	P _{PM}	P _{AM}
Pin No.	11	12	13	14	15	16	17	18	19	
Assignment	P _{COL}	P _g	P _f	P _e	P _d	P _c	P _b	P _a	F(+)	
Segment Color										
AM, h segment Red										
PM, a,b,c,d,e,f,g, Colon segment Blue green										

4. TERMINAL FUNCTION OF IC/LR3474

•Terminal Function of LR3474

Pin No.	Terminal Name	Input/Output	Description
1	Vcc	Input	When a H-level signal is applied to this terminal, circuit of driving fluorescent tube displays stops.
2	ACL	Input	Terminal for inputting a signal for initialization. When a H-level signal is applied, LSI is initialized.
3	T1 T2	Input Input	Terminal for testing LSI, being connected Vss terminal usually.
5	f	Input	When a H-level signal is applied to this terminal, interior operation of LSI is limited.
6	β	Input	Terminal for inputting a signal for selectable 12/24 hr. format. In 12 hr.; Open or L-level. In 24 hr.; H-level.
7	Vss	—	Power supply terminal.
8	α	Input	Not now in used.
9 ~ 12	K1 ~ K4	Input	Terminals (K1 ~ K4) for inputting a key return signal from externally connected key matrix.
13 ~ 16	R1-1 ~ R1-4	Output	Terminals (R1-1 ~ R1-4) for outputting a key return signal source. 
17	R2-1	Output	Terminal for outputting LED driver signal for indicating EVERY DAY ON.
18	R2-2	Output	Terminal for outputting LED driver signal for indicating EVERY DAY OFF.
19 20	R2-3 R2-4	Output	Not now in used.

Pin No.	Terminal Name	Input/Output	Description
21	R3-1	Output	Terminal for outputting LED driver signal for indicating CLOCK ADJUST.
22	R3-2	Output	Terminal for outputting LED driver signal for indicating SLEEP OFF.
23	R3-3	Output	Not now in used.
24	R3-4	Output	Terminal for outputting an audible-sound to confirm each key operation.
25	R4-1	Output	Terminal for outputting LED driver signal for indicating MANUAL ON.
26	R4-2	Output	Terminal for outputting LED driver signal for indicating AUTO.
27	R4-3	Output	Terminal for outputting a signal for timer.
28	R4-4	Output	Terminal for outputting a signal for 1 Hz.
29 30	D8 D7	Output	Not now in used.
31	Vss	—	Power supply terminal.
32	D6	Output	Terminal for outputting AM/FM indication.
33 34	D5 D4	Output	Terminals for outputting indicator digit signals.
35	D3	Output	Terminal for outputting colon indication signal.
36 37	D2 D1	Output	Terminals for outputting indicator digit signals.
38 ~ 45	Sh ~ Sa	Output	Terminals for outputting indicator digit segment signals.
46 47	Xin Xout	— —	Terminals for connecting a 32.768 kHz quartz oscillator.
48	Vdd	—	Power supply terminal.

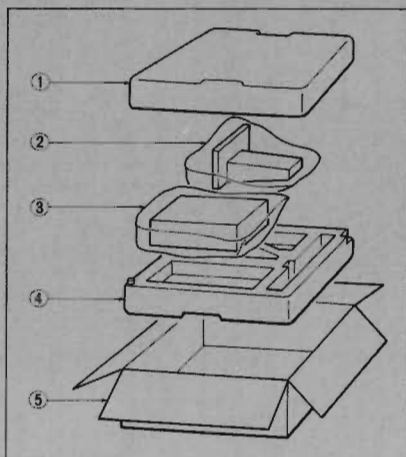
5. REFERENCE FREQUENCY ADJUSTMENT

(See Parts Location F-4520 on page 2)

SUBJECT	MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
X'tal Frequency Adj.	Across jC12 (TP2), F-4520 Frequency Counter	jTC1 (F-4520)	32.768kHz	

6. PACKING LIST

Parts No.	Stock No.	Description
1	47536800	Styrofoam Packing (A)
2	47536700	Vinyl Bag
3	47364500	Vinyl Bag
4	47536900	Styrofoam Packing (B)
5	47536500	Carton Case



7. ACCESSORY LIST

Stock No.	Description
46952000	Operating Instruction

SANSUI ELECTRIC CO., LTD.:

SANSUI ELECTRONICS CORPORATION:

SANSUI ELECTRONICS (U.K.) LTD.:
SANSUI ELECTRONICS G.M.B.H.:

14-1, Izumi 2-chome, Suginami-ku, Tokyo 168 Japan
 PHONE: (03) 324-8891/TELEX: 232-2076 (International Division)
 1250 Valley Brook Ave. Lyndhurst, N.J. 07071 U.S.A.
 17150 South Margay Ave. Carson, California 90746 U.S.A.
 3036 Koapaka Street, Honolulu, Hawaii 96819 U.S.A.
 Unit 10A, Lyon Industrial Estate, Rockware Avenue, Geenford, Middx UB6. OAA, England
 Pau Ehrich Strasse 8, 6074 Rödermark 2, West Germany

(SM1-167)

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