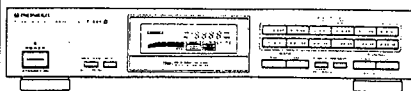


Service Manual

PIONEER
The Art of Entertainment



ORDER NO.
ARP2243

FM/AM DIGITAL SYNTHESIZER TUNER

F-449

F-449-S

F-449L

F-449, F-449-S AND F-449L HAVE THE FOLLOWING:

Type	Model			Power Requirement	Remarks
	F-449	F-449-S	F-449L		
HEWZ	○	○	—	AC220V-230V, 240V (switchable) *	
HE	—	—	○	AC220V-230V, 240V (switchable) *	
HB	—	—	○	AC220V-230V, 240V (switchable) *	
HIX1B	○	—	—	AC220V-230V, 240V (switchable) *	
HEWX1B	—	—	○	AC220V-230V, 240V (switchable) *	
KU	○	—	—	AC120V only	
SD	○	—	—	AC110V, 120-127V, 220V, 240V (switchable)	

* Change the primary wiring of the power transformer.

- This manual is applicable to the F-449/HEWZ, F-449-S/HEWZ, F-449L/HE and HB types.
- As to the F-449-S/HEWZ, F-449L/HE and HB types, refer to page 30.
- As to the other types, refer to applicable service manuals.
- The F-449-S is the same as the F-449 except for color.
- The F-449L covers MW/LW bands while the F-449 covers MW only.
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

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This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SAFETY INFORMATION

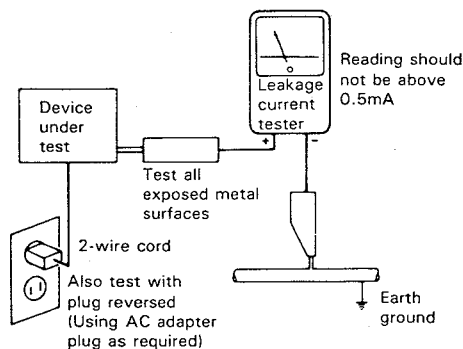
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

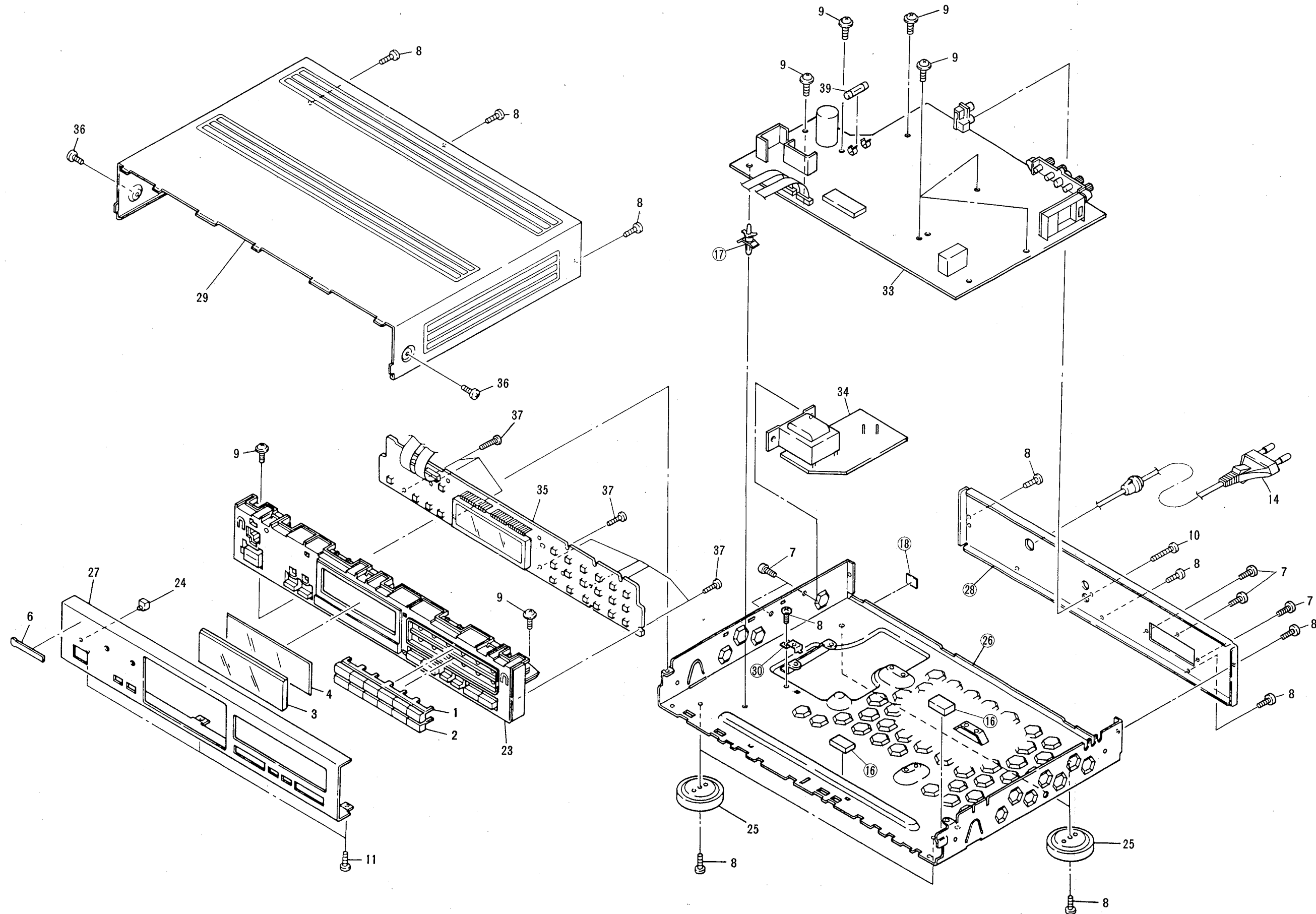
Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

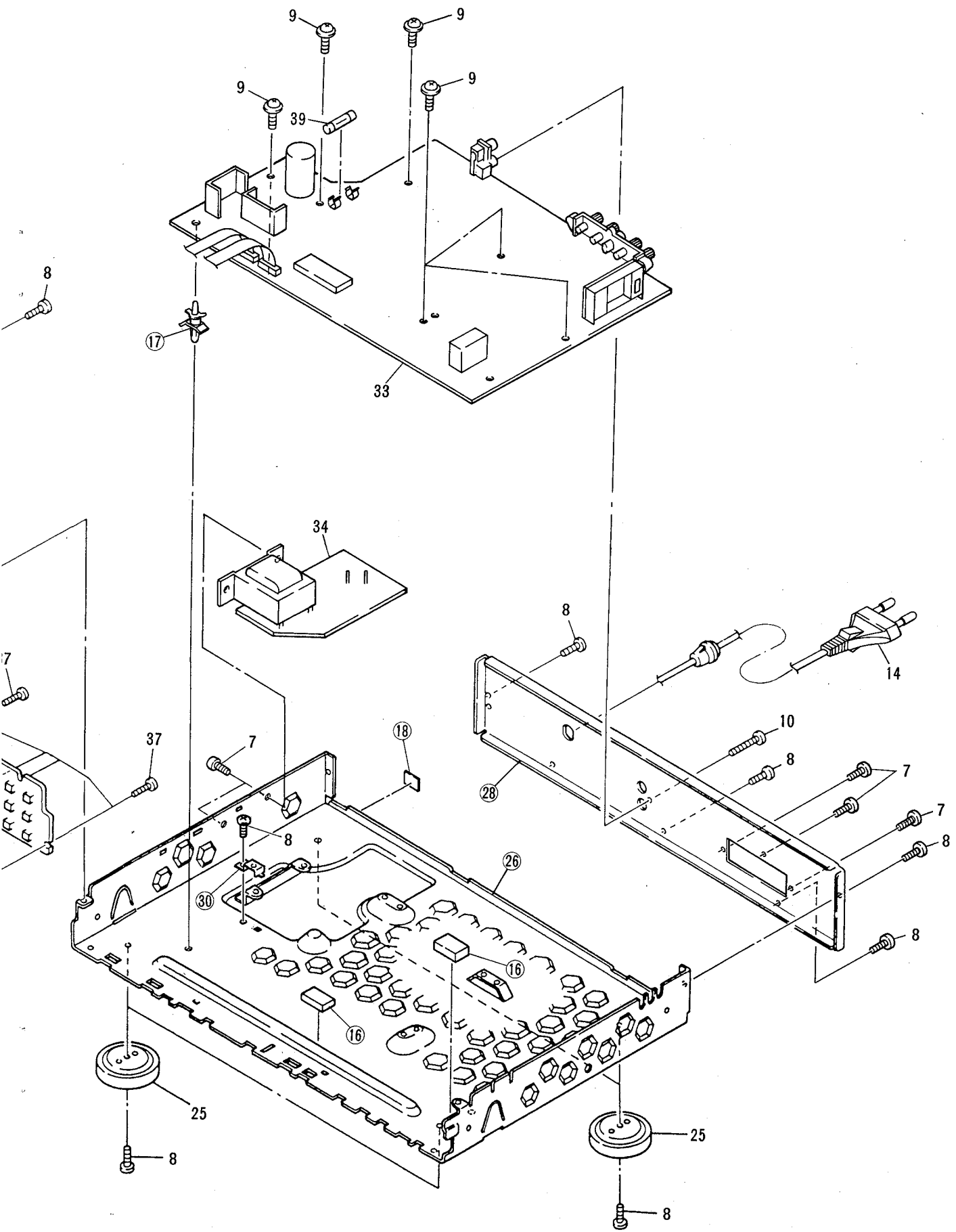
Electrical components having such features are identified by marking with a Δ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. EXPLODED VIEWS, PACKING AND PARTS LIST





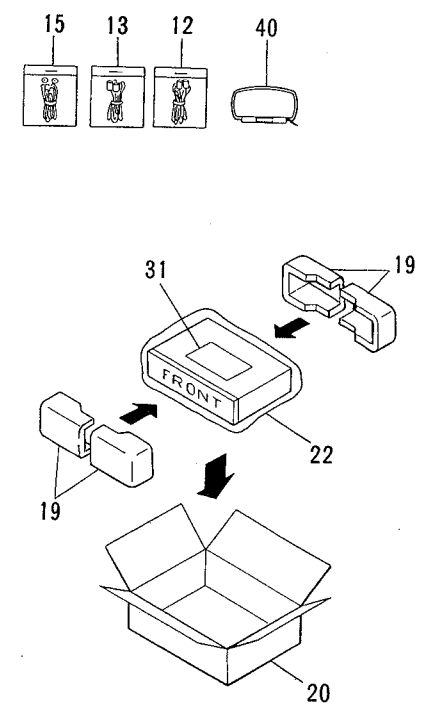
NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "©" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

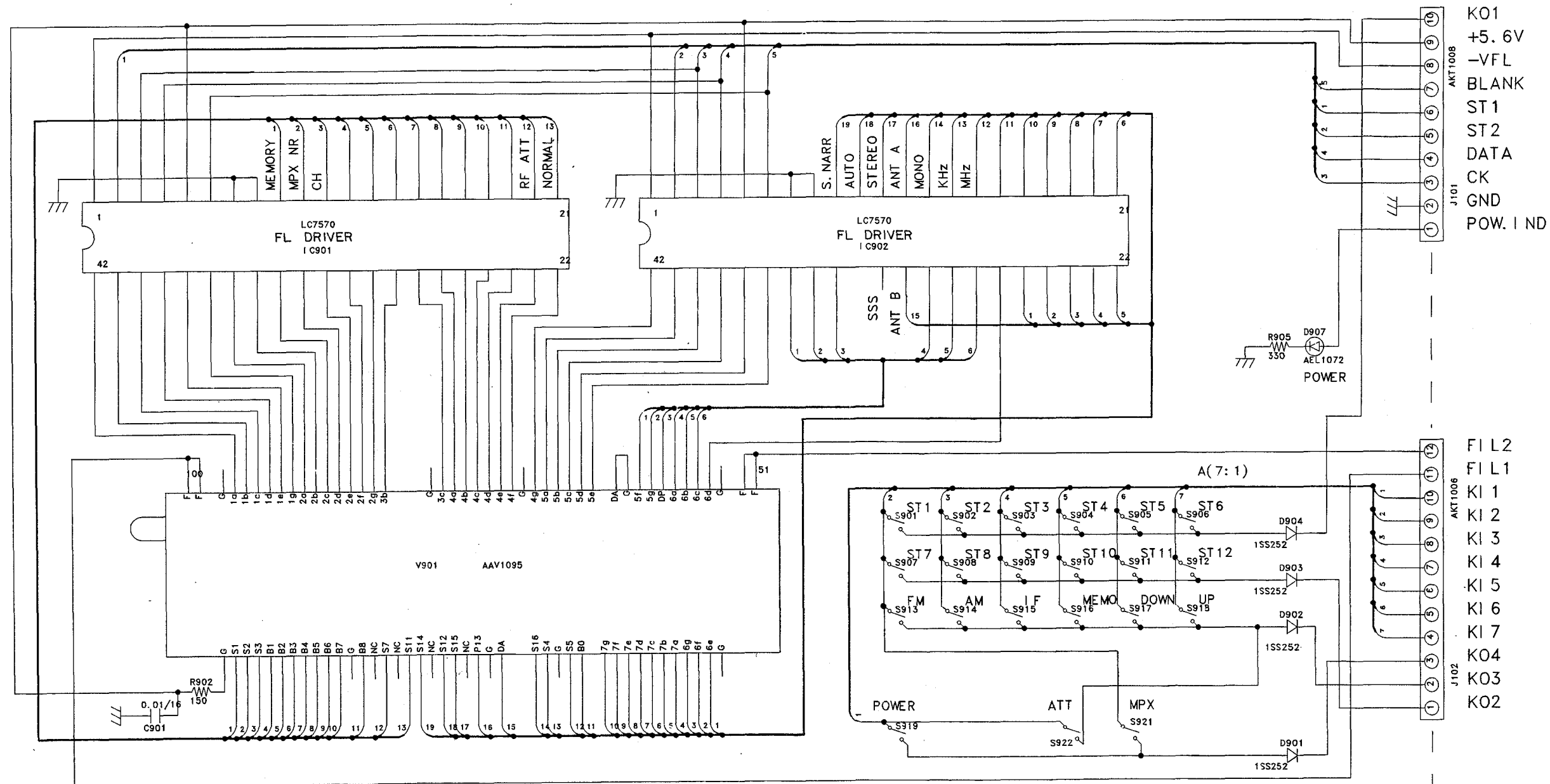
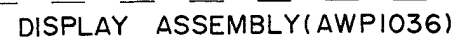
Mark	No.	Description	Part No.
A	1	STATION BUTTON(ABS) (1/13/25 - 6/18/30)	AAD1751
	2	STATION BUTTON(ABS) (7/19/31 - 12/24/36)	AAD1752
	3	PANEL	AAK1685
	4	FL FILTER	AAK1785
	5	.....	
B	6	NAME PLATE (METAL)	AAM1029
	7	SCREW	ABA - 298
	8	SCREW (STEEL)	ABA1009
	9	SCREW (STEEL)	ABA1011
	10	SCREW (STEEL)	ABA1047
C	11	SCREW (STEEL)	ABA1048
	12	PLUG CORD	ADE - 044
	13	CORD WITH PLUG	ADE - 085
	14	AC POWER CORD	ADG1021
	15	FM ANTENNA	ADH1002
D	16	CUSHION (RUBBER)	
	17	PCB SUPPORT	
	18	SPACER	
	19	FRONT REAR PAD	AHA1095
	20	PACKING CASE	AHD2056
	21	.....	
	22	PACKING SHEET	AHG1017
	23	PANEL BASE	AMB1842
	24	INDICATING LENS	AMR1160
	25	INSULATOR ASSY	AMR2140
	26	CHASSIS ASSY	
	27	FRONT PANEL	ANB1451
	28	REAR PANEL	
	29	BONNET	AZN1745
	30	PCB HOLDER	
	31	OPERATING INSTRUCTIONS (GERMAN)	ARC1264
	32	.....	
	33	TUNER ASSEMBLY	AWZ3643
	34	POWER ASSEMBLY	AWZ3649
	35	DISPLAY ASSEMBLY	AWP1036
	36	SCREW	BBT30P060FZK
	37	SCREW	BPZ26P080FMC
	38	.....	
	39	FU101 FUSE (T400MA)	AEK - 504
	40	L1 LOOP ANTENNA	ATB1006

Packing



3. SCHEMATIC DIAGRAM

3.1 DISPLAY ASSEMBLY (AWP1036)



1. RESISTORS
Indicated in
noted k; k-
(M); $\pm 20\%$
 2. CAPACITOR:
Indicated in
Indication v
 3. VOLTAGE C
← mA; DC
mV; Sign
• The table
 4. OTHERS :
⇒ ; Signal r
⊗ ; Adjust
The Δ mar
importance
replacing, be
※ marked c
- This is the
vary due to

Pin No.	Volts
1	1.45
2	1.45
3	0
4	9.14
5	11.3

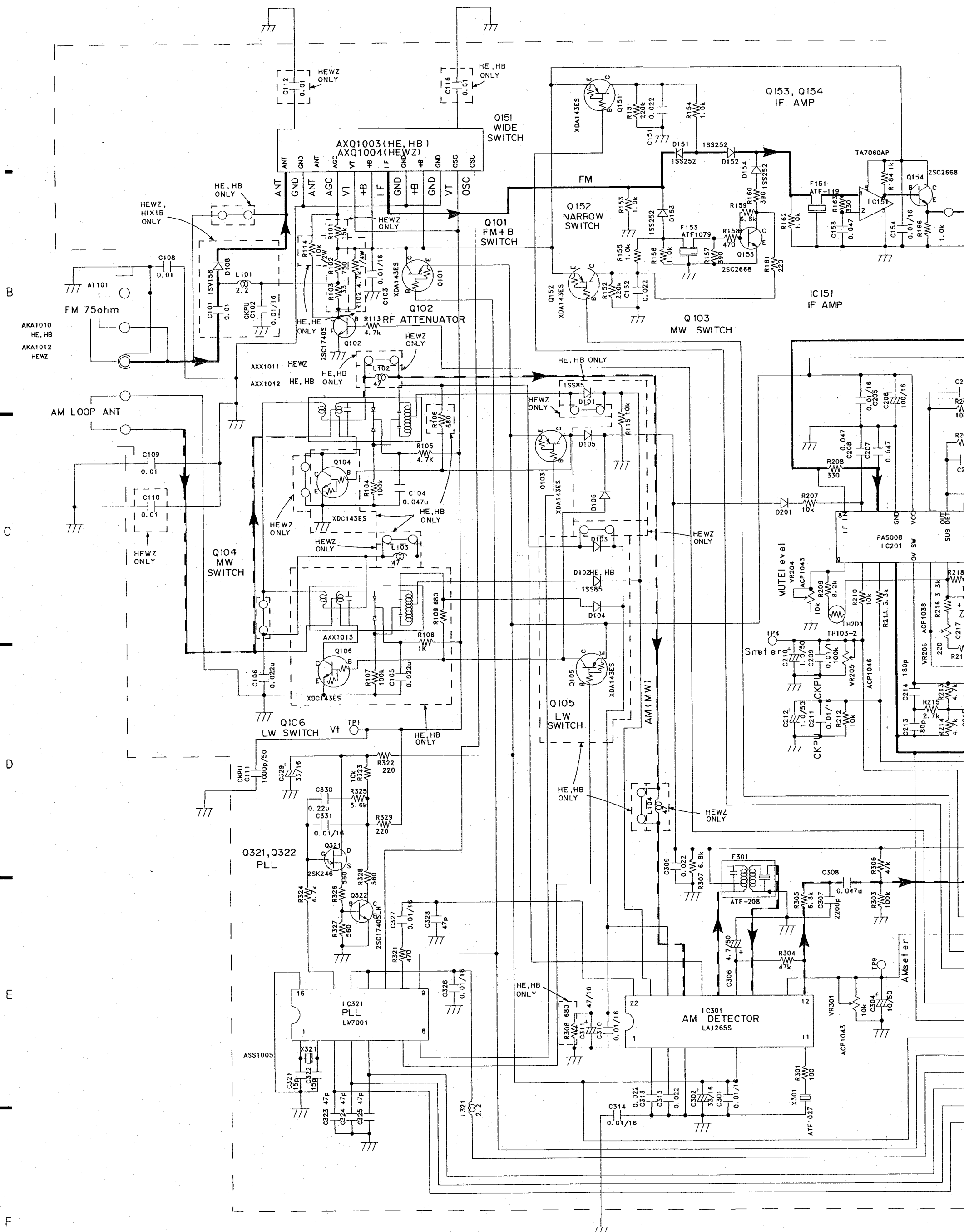
IC 351
(NJM78M56FAS)

Pin No.	Volt
V IN	22.0
V OUT	5.6



- | | |
|---------|-------|
| Pin No. | Volts |
| V IN | — |
| V OUT | 12.7 |

3.2 TUNER ASSEMBLY (1/2) (AWZ3643)



A



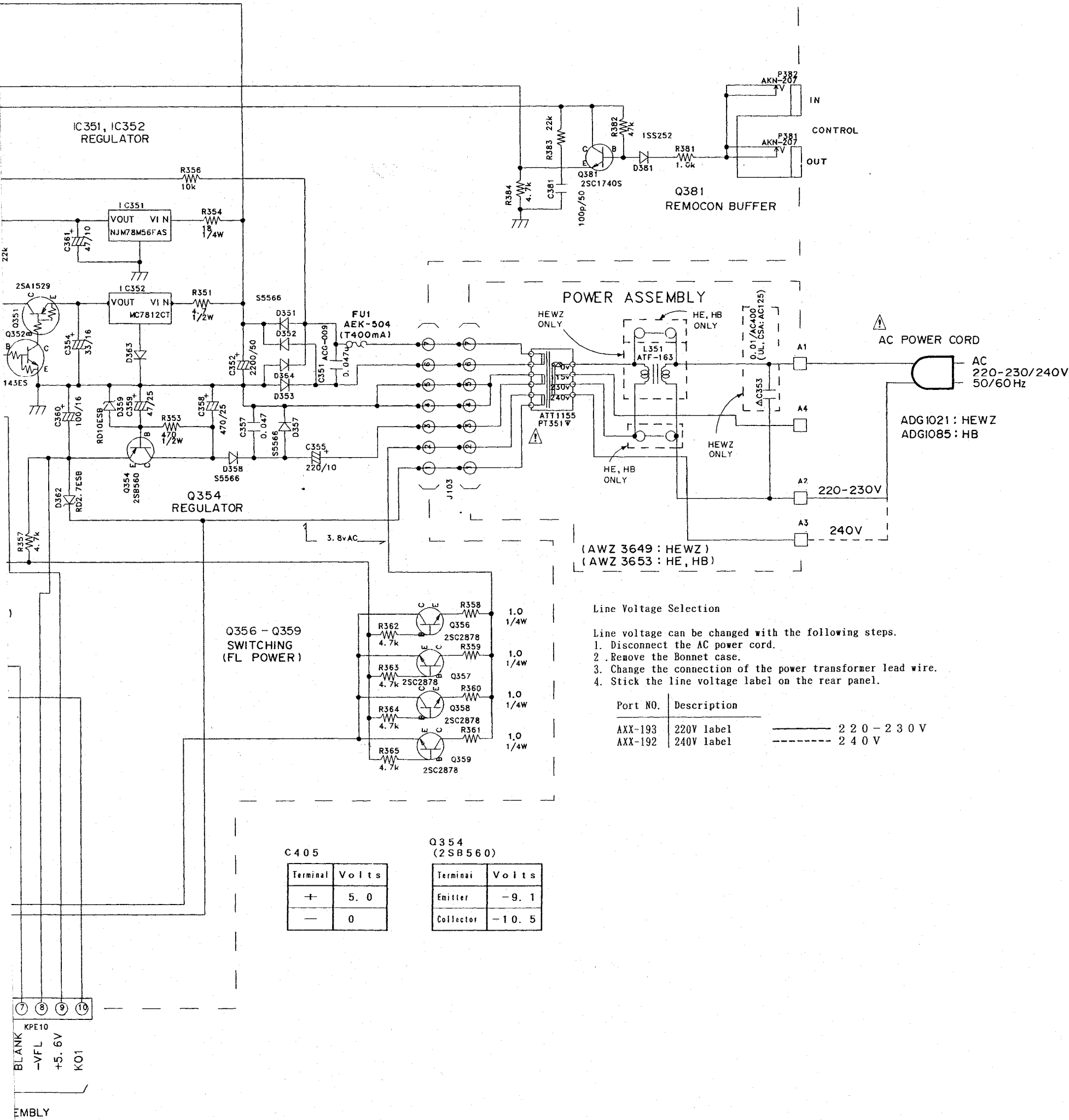
C

D

3

F

TUNER ASSEMBLY (2/2)
(AWZ 3643 : HEWZ)
(AWZ 3647 : HE, HB)



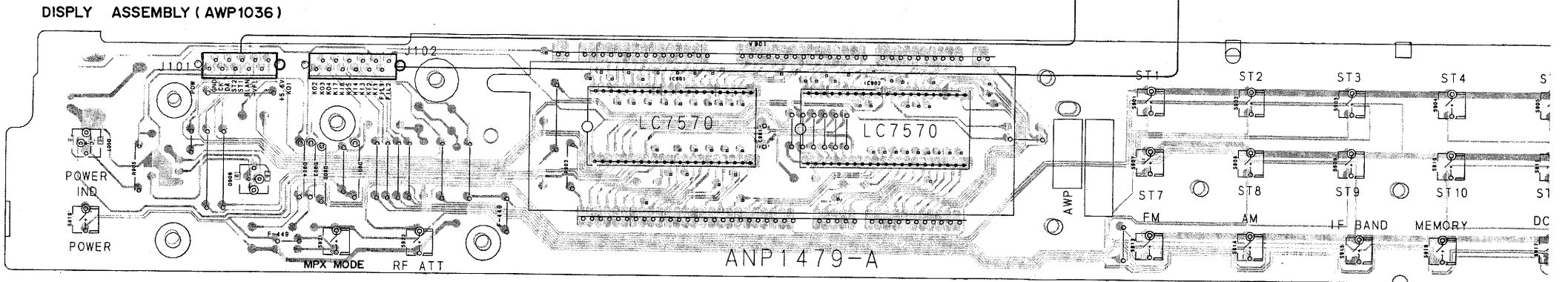
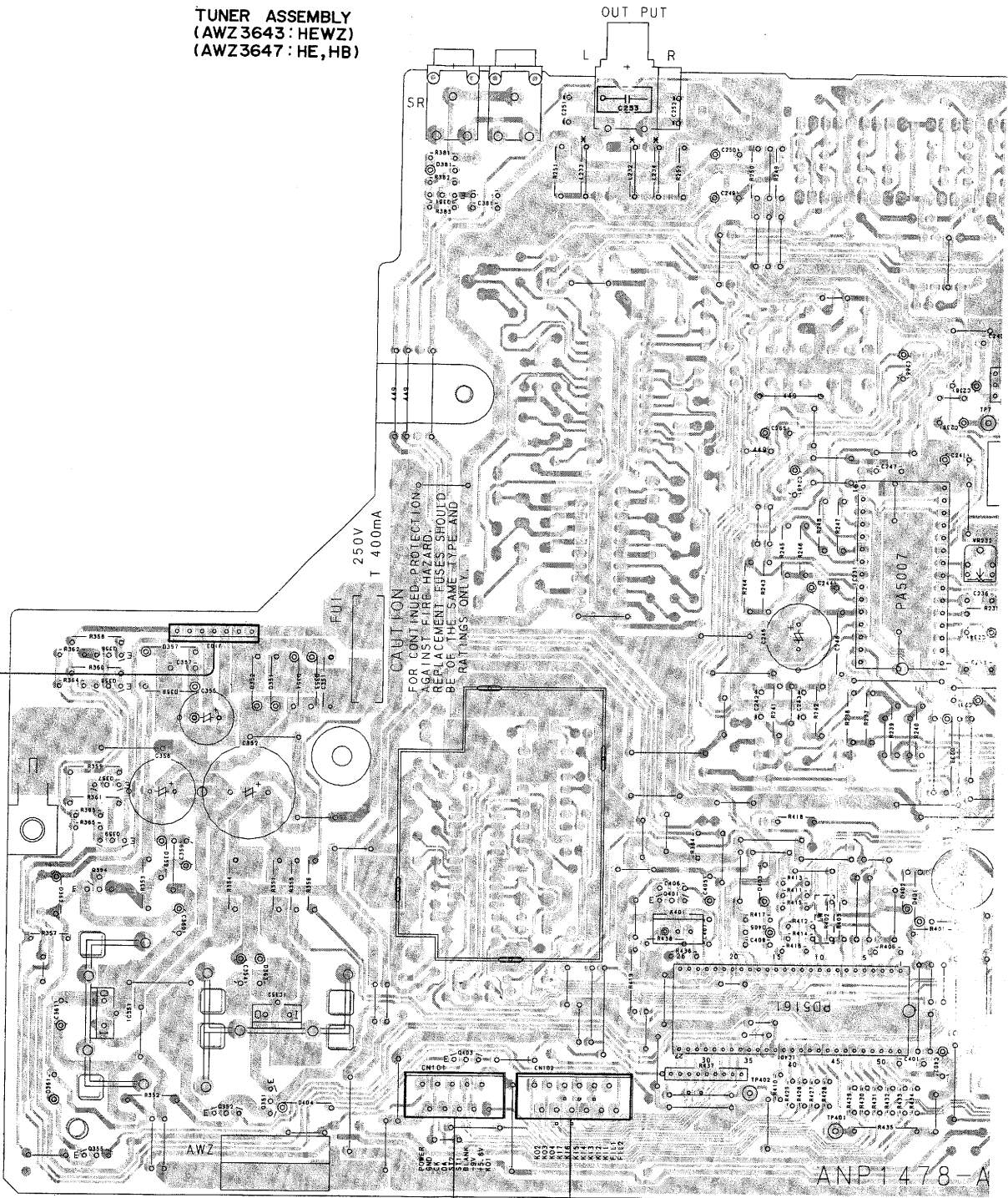
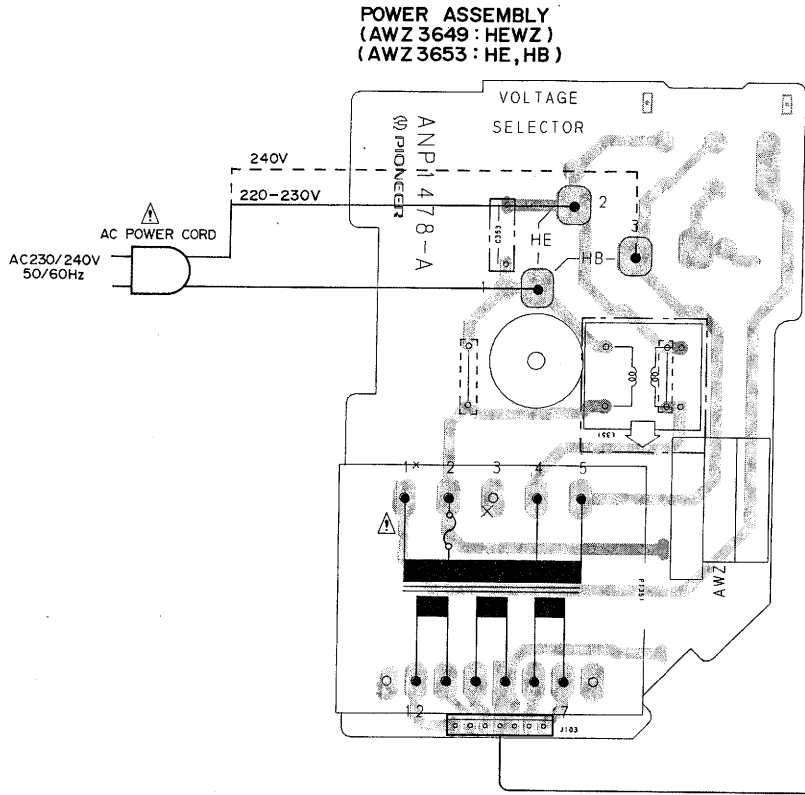
4. P.C. BOARDS CONNECTION DIAGRAM

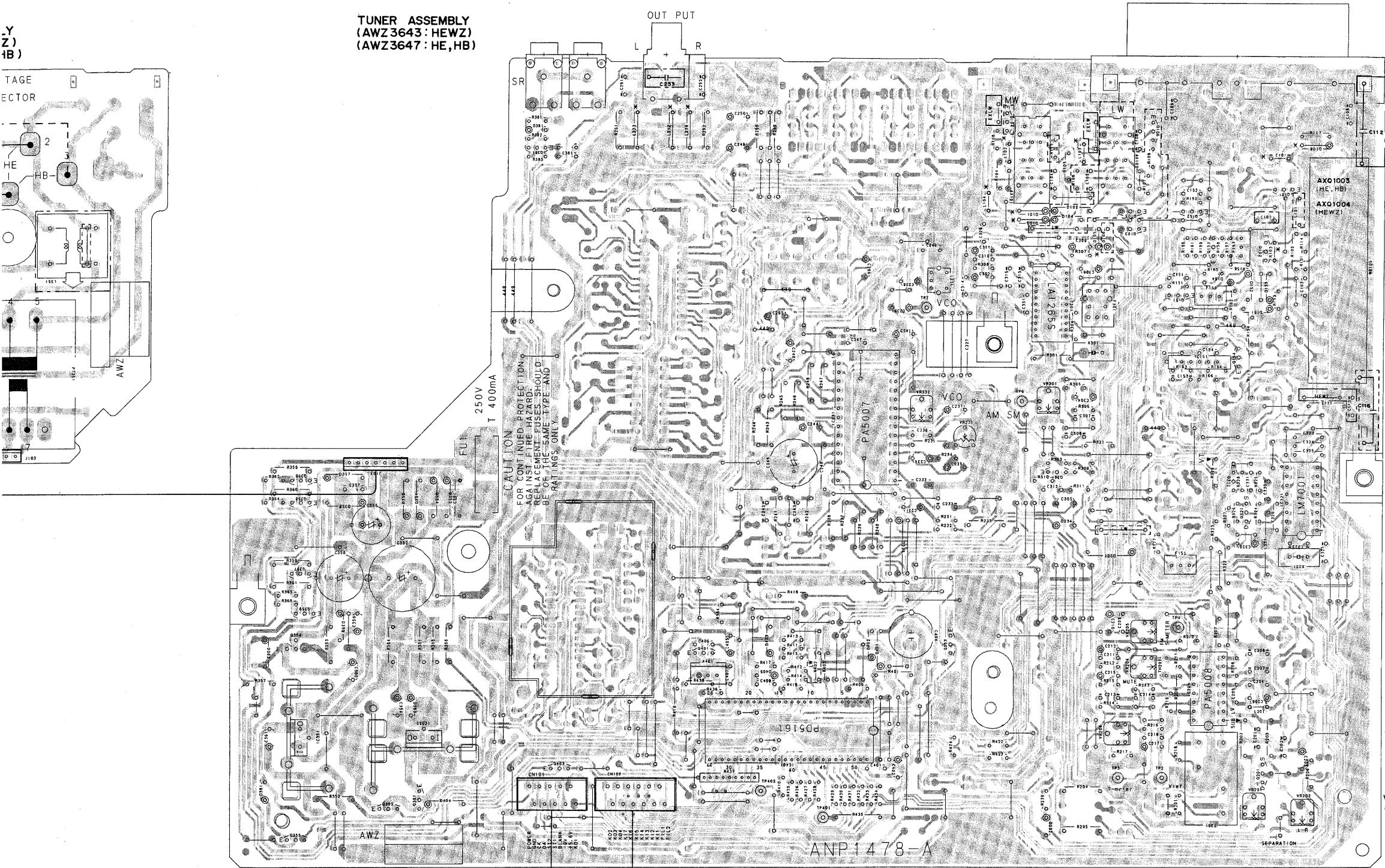
NOTE
1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
		Transistor
		Radiator type transistor
		Diode
		Resistor
		Capacitor (Polarity)
		Capacitor (Non-polarity)

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

- The capacitor terminal marked with ⊕ (double circles) shows negative terminal.
- The diode terminal marked with ⊕ (double circles) shows cathode side.
- The transistor terminal to which E is affixed shows the emitter.





Q104 Q106

Q101

Q105 Q152

Q103 Q153
Q102

Q151

IC301

IC151

Q303

Q322

IC321

Q321

Q401

Q353

IC201

IC401

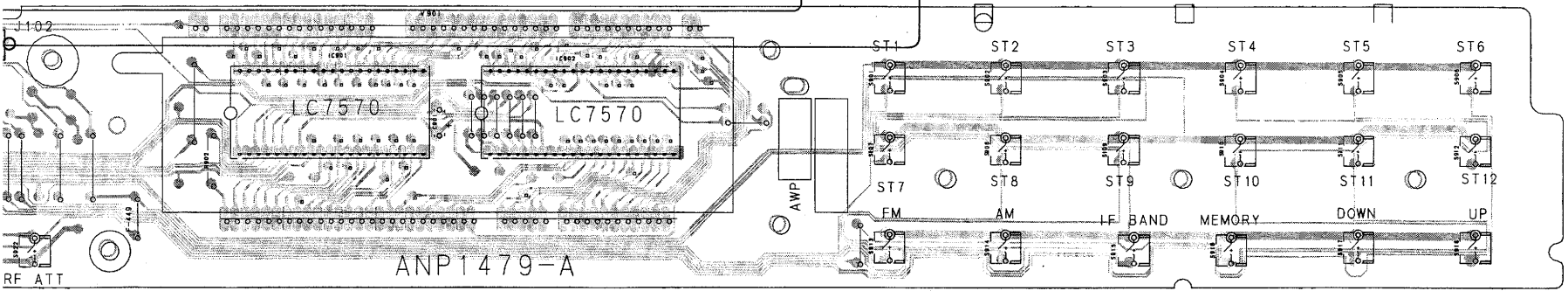
Q201

A

B

C

D

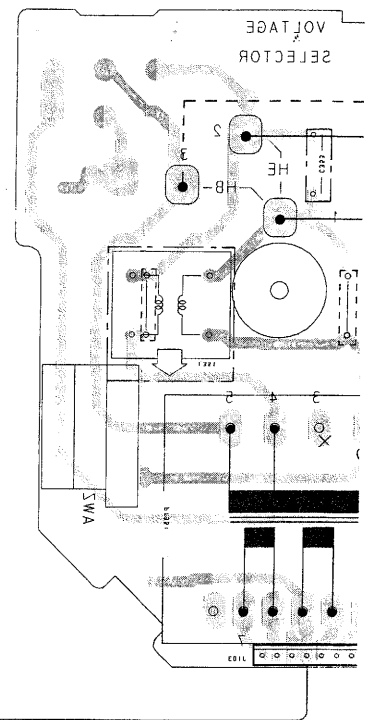


NOTE

HEWZ ONLY

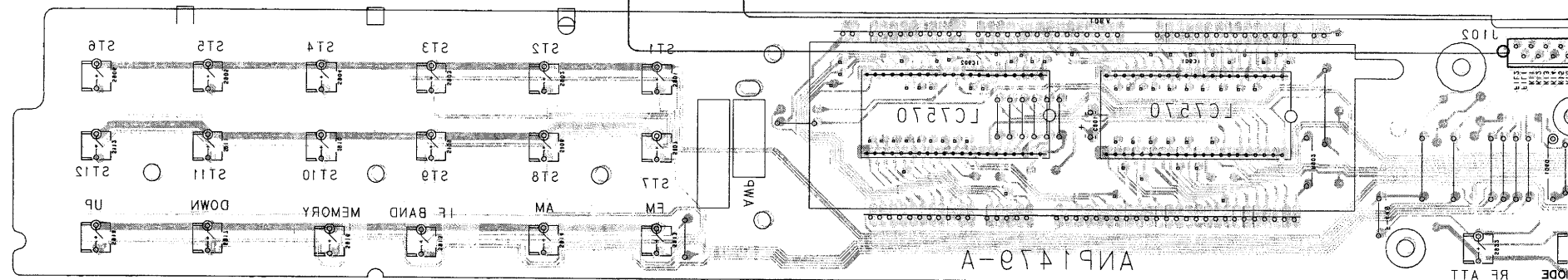
HE,HB ONLY

X	L102	L232	D101	D108	C101	R103
	L103	L233	D103			
	L104	L234	D105			
HE, HB ONLY	JUMPER	JUMPER	UESD	JUMPER	JUMPER	JUMPER
HEWZ ONLY	USED	USED	JUMPER	USED	USED	USED



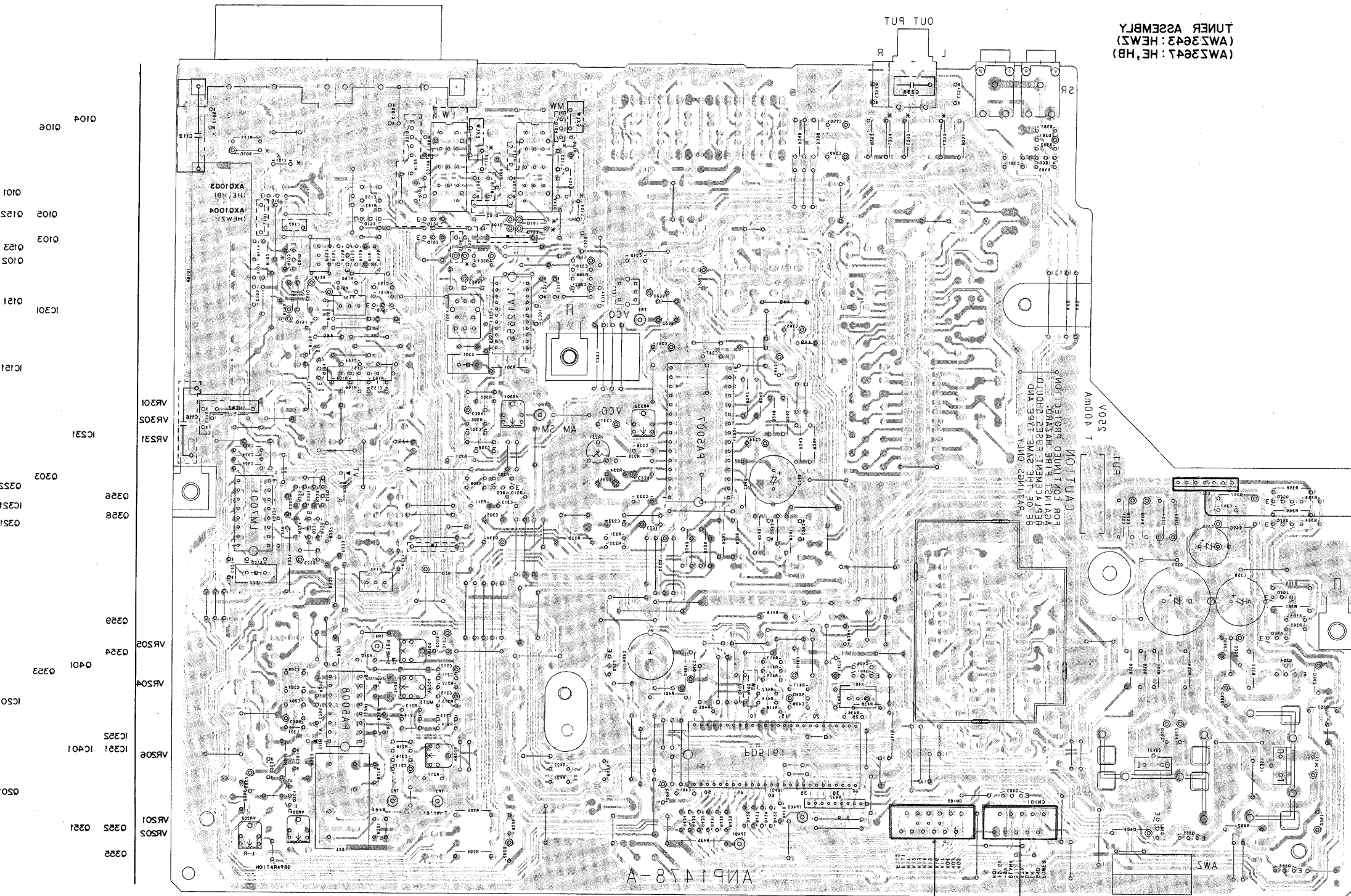
8: HE, HB)
9: HEWS)
ASSEMBLY

(AWΣ3647: HE, HB)
(AWΣ3643: HEWΣ)
TUNER ASSEMBLY



A-974191A

REF ATT



A-874191A

NOTUAS
O NOTISTOPOR CAUINIOS ROZ
GRATIA ZRII TSIADADA
QUONGS SESU? INIMACAJ3ER
DMA 39YT AMAS 3HT FO 38
YINO 26M1TAR

V025
Am004

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1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

○

Figure 6

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A black and white micrograph showing a cross-section of a plant stem. The central vascular cylinder is prominent, surrounded by cortical cells. The image is labeled with 'a' and 'b' in the lower left corner.

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Journal of Internal Medicine 255: 111–118

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NOTE

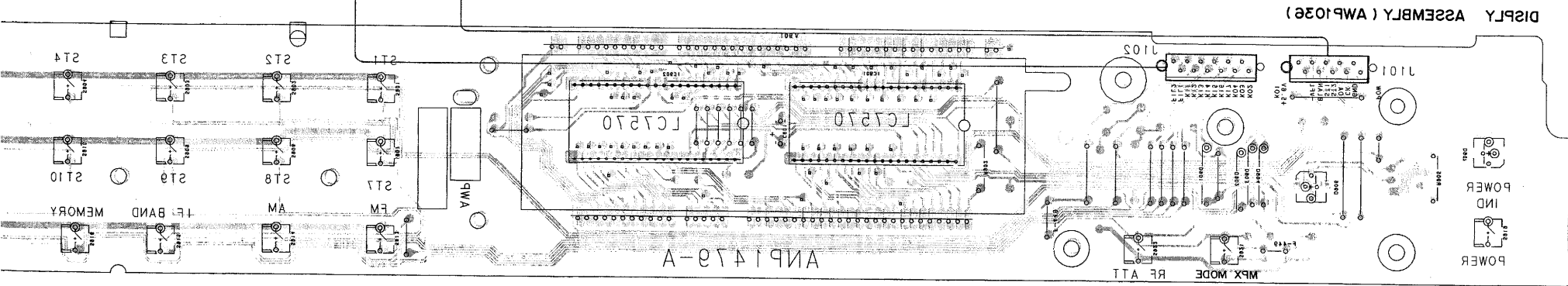
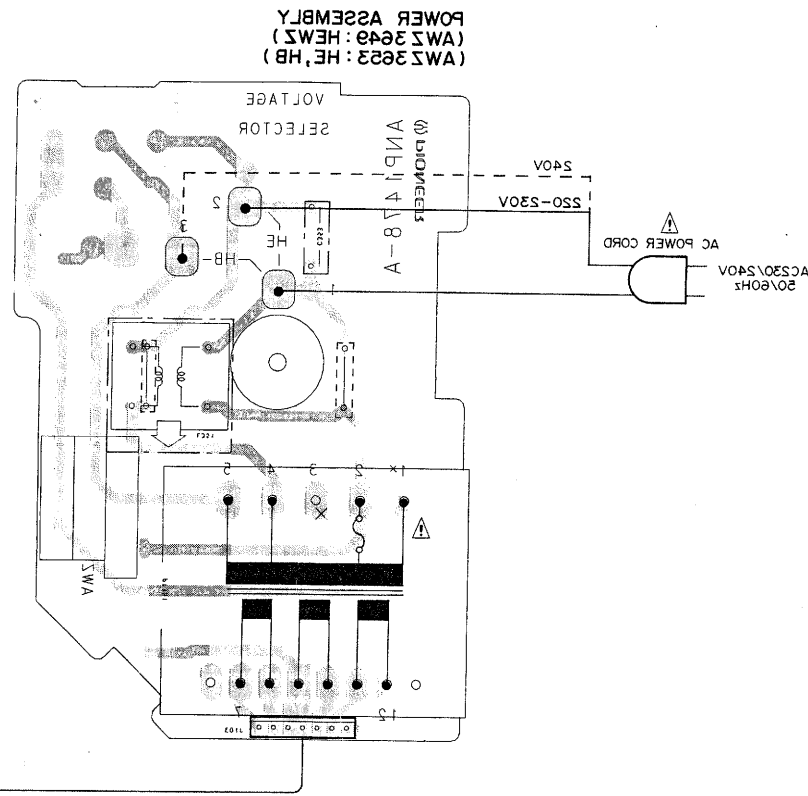
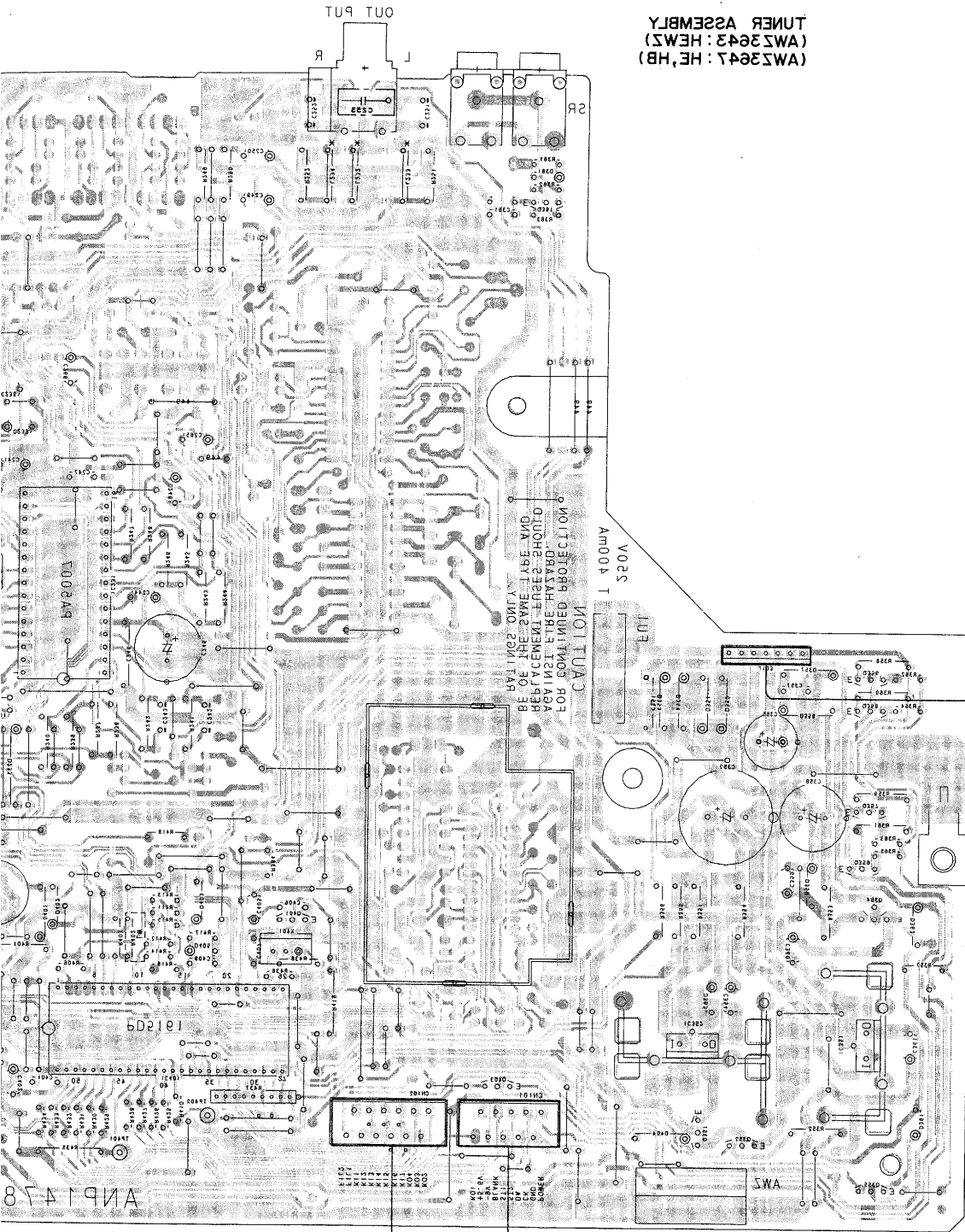
HE, HB ONLY: ☐

HEWS ONLY: ☐

		L104	L103	L102	L101	D108	C101	R103
ONLY	HE. HB	NUMBER	NUMBER	NUMBER	USED	NUMBER	NUMBER	NUMBER
HEWS.	USED				NUMBER	USED	USED	USED

4. P.C. BOARDS CONNECTION DIAGRAM

• View from soldering side



ANP1479-A (Main PCB)
ANP1479-B (Sub-board)
ANP1479-C (Sub-board)
ANP1479-D (Sub-board)
ANP1479-E (Sub-board)
ANP1479-F (Sub-board)
ANP1479-G (Sub-board)
ANP1479-H (Sub-board)
ANP1479-I (Sub-board)
ANP1479-J (Sub-board)
ANP1479-K (Sub-board)
ANP1479-L (Sub-board)
ANP1479-M (Sub-board)
ANP1479-N (Sub-board)
ANP1479-O (Sub-board)
ANP1479-P (Sub-board)
ANP1479-Q (Sub-board)
ANP1479-R (Sub-board)
ANP1479-S (Sub-board)
ANP1479-T (Sub-board)
ANP1479-U (Sub-board)
ANP1479-V (Sub-board)
ANP1479-W (Sub-board)
ANP1479-X (Sub-board)
ANP1479-Y (Sub-board)
ANP1479-Z (Sub-board)

ANP1479-A (Main PCB)
ANP1479-B (Sub-board)
ANP1479-C (Sub-board)
ANP1479-D (Sub-board)
ANP1479-E (Sub-board)
ANP1479-F (Sub-board)
ANP1479-G (Sub-board)
ANP1479-H (Sub-board)
ANP1479-I (Sub-board)
ANP1479-J (Sub-board)
ANP1479-K (Sub-board)
ANP1479-L (Sub-board)
ANP1479-M (Sub-board)
ANP1479-N (Sub-board)
ANP1479-O (Sub-board)
ANP1479-P (Sub-board)
ANP1479-Q (Sub-board)
ANP1479-R (Sub-board)
ANP1479-S (Sub-board)
ANP1479-T (Sub-board)
ANP1479-U (Sub-board)
ANP1479-V (Sub-board)
ANP1479-W (Sub-board)
ANP1479-X (Sub-board)
ANP1479-Y (Sub-board)
ANP1479-Z (Sub-board)

ANP1479-A (Main PCB)
ANP1479-B (Sub-board)
ANP1479-C (Sub-board)
ANP1479-D (Sub-board)
ANP1479-E (Sub-board)
ANP1479-F (Sub-board)
ANP1479-G (Sub-board)
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ANP1479-Q (Sub-board)
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ANP1479-S (Sub-board)
ANP1479-T (Sub-board)
ANP1479-U (Sub-board)
ANP1479-V (Sub-board)
ANP1479-W (Sub-board)
ANP1479-X (Sub-board)
ANP1479-Y (Sub-board)
ANP1479-Z (Sub-board)

5. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω $\rightarrow$ $56 \times 10^1 \rightarrow 561$ RD1/4PS $\begin{bmatrix} 5 & 6 & 1 \end{bmatrix}$ J

47k Ω $\rightarrow$ $47 \times 10^3 \rightarrow 473$ RD1/4PS $\begin{bmatrix} 4 & 7 & 3 \end{bmatrix}$ J

0.5 Ω $\rightarrow$ OR5 RN2H $\begin{bmatrix} 0 & R & 5 \end{bmatrix}$ K

1 Ω $\rightarrow$ 010 RS1P $\begin{bmatrix} 0 & 1 & 0 \end{bmatrix}$ K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω $\rightarrow$ $562 \times 10^1 \rightarrow 5621$ RN1/4SR $\begin{bmatrix} 5 & 6 & 2 & 1 \end{bmatrix}$ F

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
⊙ TUNER ASSEMBLY(AWZ3643)							
SEMICONDUCTORS							
	IC151	AMPLIFIER IC	TA7060AP		D381	DIODE	1SS252
	IC201	FM IC	PA5008		D401-403	DIODE	1SS252
	IC231	MPX IC	PA5007		D404	ZENER DIODE	RD6. 2ESB2
	IC301	AM/FM IC	LA1265S		D405	ZENER DIODE	RD5. 1ESB1
	IC321	PLL IC	LM7001		TH201	THERMISTOR	TH103-2
	IC351	REGULATOR IC	NJM78M56FAS	COILS/TRANSFORMERS			
	IC352	REGULATOR IC	MC7812CT		L101	AXIAL INDUCTOR	LAU2R2M
	IC401		PD5161A		L102-104	AXIAL INDUCTOR	LAU470K
	Q101	TRANSISTOR	XDA143ES		L231	COIL	ATM1003
	Q102	TRANSISTOR	2SC1740S		L232	AXIAL INDUCTOR	LAU010M
	Q103	TRANSISTOR	XDA143ES		L233, 234	AXIAL INDUCTOR	LAU100K
	Q151, 152	TRANSISTOR	XDA143ES		L321	AXIAL INDUCTOR	LAU2R2M
	Q153, 154	TRANSISTOR	2SC2668		T201	IF TRANSFORMER	ATE-068
	Q201	N-FET	2SK246		F151	CERAMIC FILTER	ATF-119
	Q301	TRANSISTOR	2SC1740S		F153	CERAMIC FILTER	ATF1079
	Q321	N-FET	2SK246		F155	CERAMIC FILTER	ATF-107
	Q322	TRANSISTOR	2SC1740SLN		F301	CERAMIC FILTER	ATF-208
	Q351	TRANSISTOR	2SA1529	CAPACITORS			
	Q352, 353	TRANSISTOR	XDC143ES		C101	CERAMIC CAPACITOR	CKDYX103M25
	Q354	TRANSISTOR	2SB560		C102, 103	CERAMIC CAPACITOR	CKPUYY103M16
	Q355	TRANSISTOR	XDA143ES		C104	CERAMIC CAPACITOR	CKDYF473Z50
	Q356-359	TRANSISTOR	2SC2878		C106	CERAMIC CAPACITOR	CKDYF223Z50
	Q381	TRANSISTOR	2SC1740S		C108-110	CERAMIC CAPACITOR	CKDYX103M25
	Q401	TRANSISTOR	XDC143ES		C111	CERAMIC CAPACITOR	CKPUYB102K50
	Q403	TRANSISTOR	XDA143ES		C112	CERAMIC CAPACITOR	CKDYX103M25
	D108	DIODE	1SV156		C151, 152	CERAMIC CAPACITOR	CKDYF223Z50
	D151-154	DIODE	1SS252		C153	CERAMIC CAPACITOR	CKDYX473M25
	D201	DIODE	1SS252		C154	CERAMIC CAPACITOR	CKPUYY103M16
	D232-234	DIODE	1SS252		C201	CERAMIC CAPACITOR	CCMCH150J50
Δ	D351-354	DIODE	S5566		C202	CERAMIC CAPACITOR	CCMCH330J50
Δ	D357, 358	DIODE	S5566		C203	ELECTR. CAPACITOR	CEAS010M50
	D359	ZENER DIODE	RD10ESB		C205	CERAMIC CAPACITOR	CKPUYY103M16
	D361	DIODE	1SS252		C206	ELECTR. CAPACITOR	CEAS010M16
	D362	ZENER DIODE	RD2. 7ESB		C207, 208	CERAMIC CAPACITOR	CKDYX473M25
	D363	DIODE	1SS252		C209	CERAMIC CAPACITOR	CKPUYY103M16
					C210	ELECTR. CAPACITOR	CEAS010M50
					C211	CERAMIC CAPACITOR	CKPUYY103M16
					C212	ELECTR. CAPACITOR	CEAS010M50

Mark	No.	Description	Part No.
	C213, 214	CERAMIC CAPACITOR	CKMYB181K50
	C215	ELECTR. CAPACITOR	CEAS3R3M50
	C216	CERAMIC CAPACITOR	CKPUYY103M16
	C217	ELECTR. CAPACITOR	CEAS101M16
	C231	ELECTR. CAPACITOR	CEAS220M25
	C232	AUDIO FILM CAPACITOR	CFTXA473J50
	C233	CERAMIC CAPACITOR	CKDYB152K50
	C234	ELECTR. CAPACITOR	CEAS1R5M50
	C235	ELECTR. CAPACITOR	CEAS100M50
	C236	CKA (390P/50V)	ACG-023
	C237	ELECTR. CAPACITOR	CEAS6R8M50
	C238, 239	ELECTR. CAPACITOR	CEAS100M50
	C240	PL. STYRENE CAPACITOR	CQSA682J50
	C241	ELECTR. CAPACITOR	CEAS220M25
	C242, 243	MYLOR FILM CAPACITOR	CQMA152J50
	C244	ELECTR. CAPACITOR	CEAS470M10
	C245	ELECTR. CAPACITOR	CEAS471M10
	C246, 247	CERAMIC CAPACITOR	CKPUYY103M16
	C248	ELECTR. CAPACITOR	CEAS221M16
	C249, 250	ELECTR. CAPACITOR	CEAS4R7M50
	C251, 252	CERAMIC CAPACITOR	CKDYB472K50
	C253	CERAMIC CAPACITOR	CKDYX103M25
	C265, 266	ELECTR. CAPACITOR	CEAS4R7M50
	C301	CERAMIC CAPACITOR	CKPUYY103M16
	C302	ELECTR. CAPACITOR	CEAS330M16
	C304	ELECTR. CAPACITOR	CEAS100M50
	C305	ELECTR. CAPACITOR	CEANP4R7M35
	C306	ELECTR. CAPACITOR	CEAS4R7M50
	C307	CERAMIC CAPACITOR	CKDYB222K50
	C308	CERAMIC CAPACITOR	CKDYX473M25
	C309	CERAMIC CAPACITOR	CKDYF223Z50
	C310	CERAMIC CAPACITOR	CKPUYY103M16
	C311	ELECTR. CAPACITOR	CEAS470M10
	C312	CERAMIC CAPACITOR	CKPUYY103M16
	C313	CERAMIC CAPACITOR	CKDYF223Z50
	C314	CERAMIC CAPACITOR	CKPUYY103M16
	C315	CERAMIC CAPACITOR	CKDYF223Z50
	C321, 322	CERAMIC CAPACITOR	CCMCH150J50
	C323-325	AXIAL CERAMIC C.	CCPUSL470J50
	C326, 327	CERAMIC CAPACITOR	CKPUYY103M16
	C328	AXIAL CERAMIC C.	CCPUSL470J50
	C329	ELECTR. CAPACITOR	CEAS330M16
	C330	AUDIO FILM CAPACITOR	CFTXA224J50
	C331	CERAMIC CAPACITOR	CKPUYY103M16
△	C351	CAPACITOR (CERAMIC)	ACG-009
	C352	ELECTR. CAPACITOR	CEAS222M50
	C354	ELECTR. CAPACITOR	CEAS330M16
	C355	ELECTR. CAPACITOR	CEAS221M10
	C357	CERAMIC CAPACITOR	CKDYF473Z50
	C358	ELECTR. CAPACITOR	CEAS471M25
	C359	ELECTR. CAPACITOR	CEAS470M25
	C360	ELECTR. CAPACITOR	CEAS101M16
	C361	ELECTR. CAPACITOR	CEAS470M10
	C381	CERAMIC CAPACITOR	CKPUYB101K50

Mark	No.	Description	Part No.
	C401	CERAMIC CAPACITOR	CKPUYY103M16
	C402	ELECTR. CAPACITOR	CEAS221M10
	C404	CEA (47000/5.5V)	ACH1037
	C405	ELECTR. CAPACITOR	CEAS100M50
	C406, 407	CERAMIC CAPACITOR	CKPUYB101K50
	C409	CERAMIC CAPACITOR	CKPUYB101K50
RESISTORS			
	R101	CARBONFILM RESISTOR	RD1/8PM□□□J
	R102	CARBONFILM RESISTOR	RD1/2PM□□□J
	R103-105	CARBONFILM RESISTOR	RD1/8PM□□□J
	R113	CARBONFILM RESISTOR	RD1/8PM□□□J
	R151-164	CARBONFILM RESISTOR	RD1/8PM□□□J
	R166	CARBONFILM RESISTOR	RD1/8PM□□□J
	R177	CARBONFILM RESISTOR	RD1/8PM□□□J
	R201-219	CARBONFILM RESISTOR	RD1/8PM□□□J
	R231-234	CARBONFILM RESISTOR	RD1/8PM□□□J
	R235	METALFILM RESISTOR	RN1/4PQ□□□□F
	R236-252	CARBONFILM RESISTOR	RD1/8PM□□□J
	R301	CARBONFILM RESISTOR	RD1/8PM□□□J
	R303-307	CARBONFILM RESISTOR	RD1/8PM□□□J
	R309-311	CARBONFILM RESISTOR	RD1/8PM□□□J
	R321-329	CARBONFILM RESISTOR	RD1/8PM□□□J
	R351	CARBONFILM RESISTOR	RD1/2PM□□□J
	R352	CARBONFILM RESISTOR	RD1/8PM□□□J
	R353	CARBONFILM RESISTOR	RD1/2PM□□□J
△	R354	FUSIBLE RESISTOR	RFA1/4PS□□□J
	R355	CARBONFILM RESISTOR	RD1/2PM□□□J
	R356, 357	CARBONFILM RESISTOR	RD1/8PM□□□J
	R358-361	CARBONFILM RESISTOR	RD1/4PM□□□J
	R362-365	CARBONFILM RESISTOR	RD1/8PM□□□J
	R381-384	CARBONFILM RESISTOR	RD1/8PM□□□J
	R401	CARBONFILM RESISTOR	RD1/8PM□□□J
	R403	CARBONFILM RESISTOR	RD1/8PM□□□J
	R406	CARBONFILM RESISTOR	RD1/8PM□□□J
	R410-419	CARBONFILM RESISTOR	RD1/8PM□□□J
	R422-436	CARBONFILM RESISTOR	RD1/8PM□□□J
	R437	RESISTOR ARRAY (22K)	RA8T□□□J
	R438	CARBONFILM RESISTOR	RD1/8PM□□□J
	VR201, 202	VR	ACP1042
	VR204	VR	ACP1043
	VR205	VR	ACP1046
	VR206	VR	ACP1038
	VR231	VR	VRTS6VS222
	VR232	VR	ACP1044
	VR301	VR	ACP1043
OTHERS			
	SCREW		ABA-298
	ANTENNA TERMINAL 2-P		AKA1012
	PIN JACK (2P)		AKB1039
	JACK		AKN-207
	FRONT END MODULE ASSEMBLY		AXQ1004
	AM RF TUNING BLOCK		AXX1011
	CN101 CONNECTOR (10P)		KPE10
	CN102 CONNECTOR (12P)		KPE12

Mark	No.	Description	Part No.
	X301	CERAMIC RESONATOR	ATF1027
	X321	CRYSTAL RESONATOR	ASS1005
	X401	CERAMIC RESONATOR	ASS1055

⊙ POWER ASSEMBLY(AWZ3649)

COILS/TRANSFORMERS

△	L351	FILTER	ATF-163
△	T351	POWER TRANSFORMER	ATT1155

CAPACITORS

△	C353	CKA (0.01/AC400V)	ACG1002
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DISPLAY ASSEMBLY(AWP1036)

SEMICONDUCTORS

	IC901, 902	FL STATIC DRIVER IC	LC7570
	D901-904	DIODE	1SS252
	D907	LED	AEL1072

SWITCHES

	S901-919	SWITCH	ASG1034
	S921, 922	SWITCH	ASG1034

CAPACITORS

	C901	CERAMIC CAPACITOR	CKPUYY103M16
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RESISTORS

	R902	CARBONFILM RESISTOR	RD1/8PM□□□J
	R905	CARBONFILM RESISTOR	RD1/8PM□□□J

OTHERS

	V901	FL TUBE	AAV1095
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FRONT END MODULE ASSEMBLY (AXQ1004)

The component parts of Front End Module assembly (AXQ1004) cannot be supplied.

6. ADJUSTMENTS

6.1 FM TUNER ADJUSTMENTS

- Connect as shown in Fig. 6-1.

6.1.1 FM MONO

Step	Adjustment name	FM SG (1 kHz $\pm$ 75 kHz dev.)			FL display, IF BAND etc.	Location	Adjustment
		Frequency	Modulation	Level			
1	T meter adjustment	98 MHz	MONO	60 dB μ	98 MHz NORMAL	T201-B	Adjust so that the voltage between TP2 and TP3 becomes 0 ± 100 mV.
2	MONO distortion adjustment	98 MHz	MONO	60 dB μ	98 MHz NORMAL	T201-A	Adjust so that the distortion becomes minimum.
3	Sub-balance adjustment	98 MHz	MONO	60 dB μ	98 MHz NORMAL	VR206	Adjust so that the AC voltage at IC201 pin 2 becomes minimum.

6.1.2 FM STEREO

Step	Adjustment name	FM SG (1 kHz $\pm$ 75 kHz dev.)			FL display, IF BAND etc.	Location	Adjustment
		Frequency	Modulation	Level			
1	VCO adjustment	108 MHz	OFF	60 dB μ	108 MHz	VR231	Adjust so that the output at TP7 becomes $38 \text{ kHz} \pm 100 \text{ Hz}$.
2	Pilot cancel	107 MHz	PILOT ONLY	60 dB μ	107 MHz NORMAL	VR232	Adjust so that the AC voltage at output terminal becomes minimum. (MAX LPF: OFF)
3	Separation adjustment	89 MHz	R-ONLY	60 dB μ	89 MHz NORMAL	VR202	Adjust so that the separation R $\rightarrow$ L becomes maximum.
4			L-ONLY	60 dB μ	89 MHz NORMAL	VR201	Adjust so that the separation L $\rightarrow$ R becomes maximum.

Stereo modulation: Main 1 kHz L+R $\pm$ 68.25 Hz, Pilot 19 kHz $\pm$ 6.75 kHz.

6.1.3 FM ETC

Step	Adjustment name	FM SG (1 kHz $\pm$ 75 kHz dev.)			FL display, IF BAND etc.	Location	Adjustment
		Frequency	Modulation	Level			
1	S meter adjustment	99 MHz	MONO	75 dB μ	99 MHz NORMAL	VR205	Adjust so that the voltage between TP4 and GND becomes $4.9^{+0.05}_{-0.1}$ V.
2	Muting level adjustment	99 MHz	MONO	12 dB μ	99 MHz NORMAL	VR204	Adjust so that the muting is released at the input level shown on the left.

6.2 AM TUNER ADJUSTMENTS

- Connect as shown in Fig. 6-2.

Step	Adjustment name	FM SG (400 Hz 30% modulation)			FL display, IF BAND etc.	Location	Adjustment
		Frequency	Modulation	Level			
1	Tracking adjustment * 1	603 kHz	OFF	Low input level	603 kHz	ANT coil of MW block	Adjust so that the voltage between TP9 and GND becomes maximum.
		1395 kHz	OFF	Low input level	1395 kHz	TC101	
2	IFT adjustment * 1	603 kHz	OFF	Low input level	603 kHz	F301	
3	S meter adjustment	1008 kHz	ON	74 dB μ V/m	1008 kHz	VR301	Adjust so that the voltage between TP9 and GND becomes 2.5 ± 0.05 V.

* 1: Adjustment only for HIX1B.

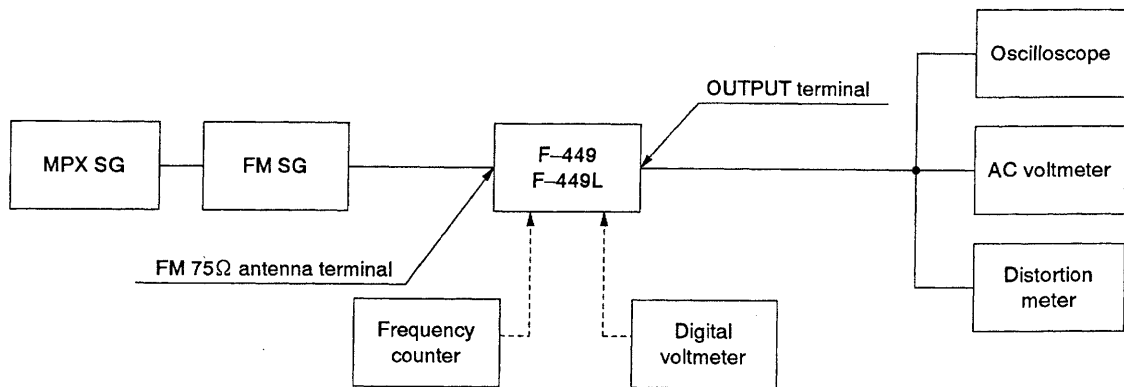


Fig. 6-1 FM Tuner Connection

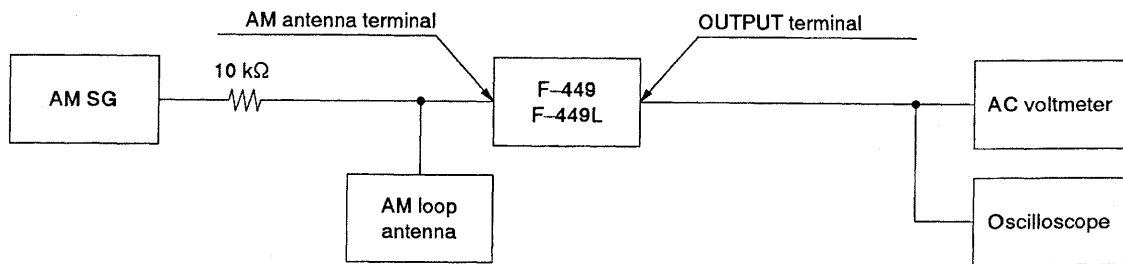


Fig. 6-2 AM Tuner Connection

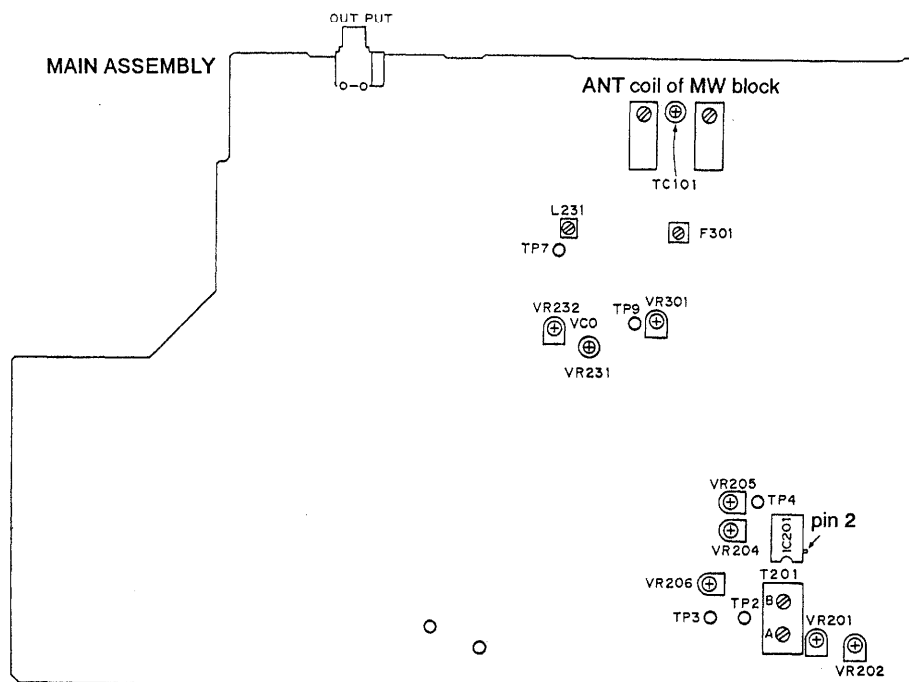


Fig. 6-3 Adjusting Point

6. RÉGLAGES

6.1 RÉGLAGES DU SYNTONISEUR FM

- Raccorder comme indiqué à la figure 6-1.

6.1.1 MONO FM

Etape	Nom du réglage	FM SG (1 kHz $\pm$ 75 kHz dev.)			Affichage FL, GAMME FI, etc.	Emplacement	Réglage
		Fréquence	Modulation	Niveau			
1	Appareil de mesure en T	98 MHz	MONO	60 dB μ	98 MHz NORMAL	T201-B	Régler afin que la tension entre TP2 et TP3 soit de 0 ± 100 mV.
2	Réglage de distorsion MONO	98 MHz	MONO	60 dB μ	98 MHz NORMAL	T201-A	Régler afin que la distorsion soit minimale.
3	Réglage de l'équilibre auxiliaire	98 MHz	MONO	60 dB μ	98 MHz NORMAL	VR208	Régler afin que la tension CA à IC201 Broche 2 soit minimale.

6.1.2 STEREO FM

Etape	Nom du réglage	FM SG (1 kHz $\pm$ 75 kHz dev.)			Affichage FL, GAMME FI, etc.	Emplacement	Réglage
		Fréquence	Modulation	Niveau			
1	Réglage du VCO	108 MHz	OFF	60 dB μ	108 MHz	VR231	Régler afin que la sortie à TP7 soit de $38 \text{ kHz} \pm 100 \text{ Hz}$
2	Neutralisation pilote	107 MHz	PILOT ONLY	60 dB μ	107 MHz NORMAL	VR232	Régler afin que la tension CA, bornes de sortie, soit minimale. (MAX LPF: HORS CIRCUIT)
3	Réglage de séparation	89 MHz	R-ONLY	60 dB μ	89 MHz NORMAL	VR202	Régler afin que la séparation D $\rightarrow$ G soit maximale.
4			L-ONLY	60 dB μ	89 MHz NORMAL	VR201	Régler afin que la séparation G $\rightarrow$ D soit maximale.

Modulation de stéréo: Principal $1 \text{ kHz L+R} \pm 68,25 \text{ Hz}$, Pilote $19 \text{ kHz} \pm 6,75 \text{ kHz}$.

6.1.3 ETC FM

Etape	Nom du réglage	FM SG (1 kHz $\pm$ 75 kHz dev.)			Affichage FL, GAMME FI, etc.	Emplacement	Réglage
		Fréquence	Modulation	Niveau			
1	Appareil de mesure en S	99 MHz	MONO	75 dB μ	99 MHz NORMAL	VR205	Régler afin que la tension entre TP4 et GND soit $4,9^{+0,05}_{-0,1}$ V.
2	Réglage de niveau de sourdine	99 MHz	MONO	12 dB μ	99 MHz NORMAL	VR204	Régler afin que la sourdine soit relâchée au niveau d'entrée indiqué sur la gauche.

6.2 RÉGLAGES DU SYNTONISEUR AM

- Raccorder comme indiqué à la figure 6-2.

Etape	Nom du réglage	FM SG (400 Hz 30% modulation)			Affichage FL, GAMME FI, etc.	Réglage	Fréquence
		Modulation	Niveau	Emplacement			
1	Réglage d'alignement * 1	603 kHz	OFF	Niveau bas d'entrée	603 kHz	Bobine ANT du bloc OM	Régler afin que la tension entre TP9 et GND soit maximale.
		1395 kHz	OFF	Niveau bas d'entrée	1395 kHz	TC101	
2	Réglage du transformateur de FI * 1	603 kHz	OFF	Niveau bas d'entrée	603 kHz	F301	
3	Appareil de mesure en S	1008 kHz	ON	74 dB μ V/m	1008 kHz	VR301	Régler afin que la tension entre TP9 et GND soit $2,5 \pm 0,05$ V.

* 1: Réglage pour HIX1B seulement.

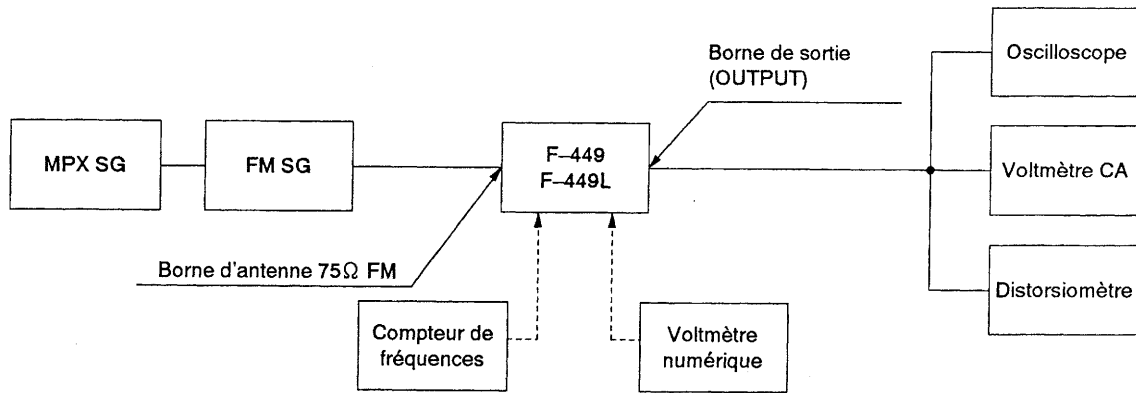


Fig. 6-1 Branchement du syntoniseur FM

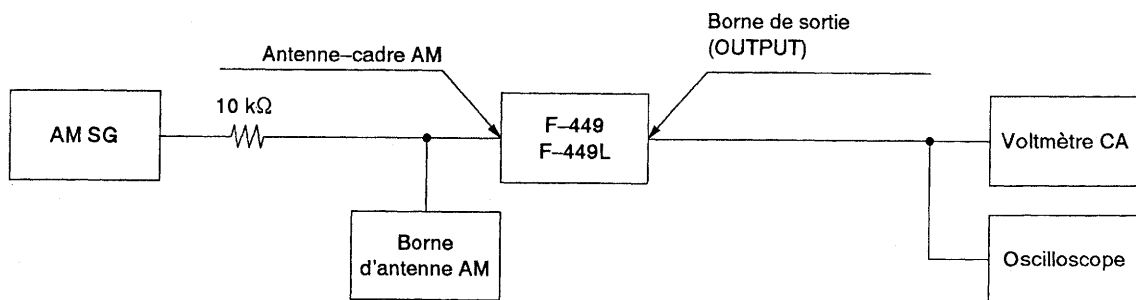


Fig. 6-2 Branchement du syntoniseur FM

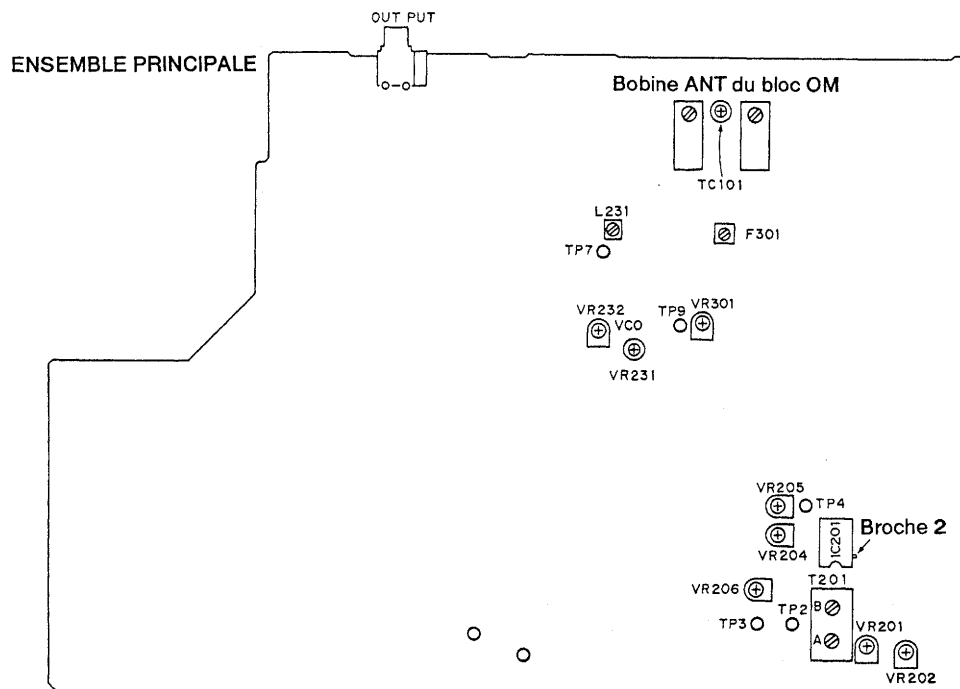


Fig. 6-3 Point de réglage

6. AJUSTES

6.1 AJUSTES DEL SINTONIZADOR DE FM

- Conecte como indica la Fig. 6-1.

6.1.1 FM MONO

Paso	Ajuste	FM SG (1 kHz $\pm$ 75 kHz dev.)			Visualización fluorescente, banda de FI, etc.	Posición	Ajuste
		Frecuencia	Modulación	Nivel			
1	Ajuste del medidor T	98 MHz	MONO	60 dB μ	98 MHz NORMAL	T201-B	Ajuste de modo que la tensión entre TP2 y TP3 sea 0 ± 100 mV.
2	Ajuste de la distorsión monofónica	98 MHz	MONO	60 dB μ	98 MHz NORMAL	T201-A	Ajuste de modo que la distorsión sea mínima.
3	Ajuste del subbalance	98 MHz	MONO	60 dB μ	98 MHz NORMAL	VR206	Ajuste de modo que la tensión de CA en IC201 patilla 2 sea mínima.

6.1.2 FM STEREO

Paso	Ajuste	FM SG (1 kHz $\pm$ 75 kHz dev.)			Visualización fluorescente, banda de FI, etc.	Posición	Ajuste
		Frecuencia	Modulación	Nivel			
1	Ajuste del VCO	108 MHz	OFF	60 dB μ	108 MHz	VR231	Ajuste de modo que la salida en TP7 sea 38 kHz $\pm$ 100 Hz
2	Cancelación del piloto	107 MHz	PILOT ONLY	60 dB μ	107 MHz NORMAL	VR232	Ajuste de modo que la tensión de, terminales de salida, CA sea mínima (MAX LPF: OFF)
3	Ajuste de la separación	89 MHz	R-ONLY	60 dB μ	89 MHz NORMAL	VR202	Ajuste de modo que la separación R $\rightarrow$ L sea máxima.
4			L-ONLY	60 dB μ	89 MHz NORMAL	VR201	Ajuste de modo que la separación L $\rightarrow$ R sea máxima.

Modulación de estéreo: Principal 1 kHz L+R $\pm$ 68,25 Hz, Piloto 19 kHz $\pm$ 6,75 kHz.

6.1.3 FM ETC

Paso	Ajuste	FM SG (1 kHz $\pm$ 75 kHz dev.)			Visualización fluorescente, banda de FI, etc.	Posición	Ajuste
		Frecuencia	Modulación	Nivel			
1	Ajuste del medidor S	99 MHz	MONO	75 dB μ	99 MHz NORMAL	VR205	Ajuste de modo que la tensión entre TP4 y masa sea $4,9^{+0,05}_{-0,1}$ V.
2	Ajuste del nivel silenciador	99 MHz	MONO	12 dB μ	99 MHz NORMAL	VR204	Ajuste de modo que el silenciamiento se desconecte en el nivel de entrada mostrado a la izquierda.

6.2 AJUSTES DEL SINTONIZADOR DE AM

- Conecte como indica la Fig. 6-2.

Paso	Ajuste	FM SG (400 Hz 30% modulación)			Visualización fluorescente, banda de FI, etc.	Posición	Ajuste
		Frecuencia	Modulación	Nivel			
1	Ajuste del seguimiento * 1	603 kHz	OFF	Nivel de entrada bajo	603 kHz	Bobina de antena del bloque de MW	Ajuste de modo que la tensión entre TP9 y masa sea máxima.
		1395 kHz	OFF	Nivel de entrada bajo	1395 kHz	TC101	
2	Ajuste del IFT * 1	603 kHz	OFF	Nivel de entrada bajo	603 kHz	F301	
3	Ajuste del medidor S	1008 kHz	ON	74 dB μ V/m	1008 kHz	VR301	Ajuste de modo que la tensión entre TP9 y masa sea $2,5 \pm 0,05$ V

* 1: Ajuste sólo para HIX1B.

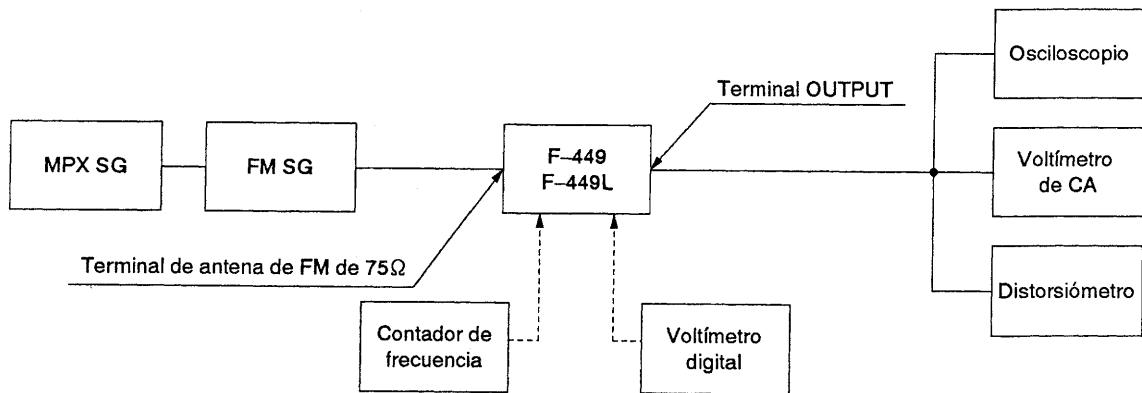


Fig. 6-1 Conexión del sintonizador de FM

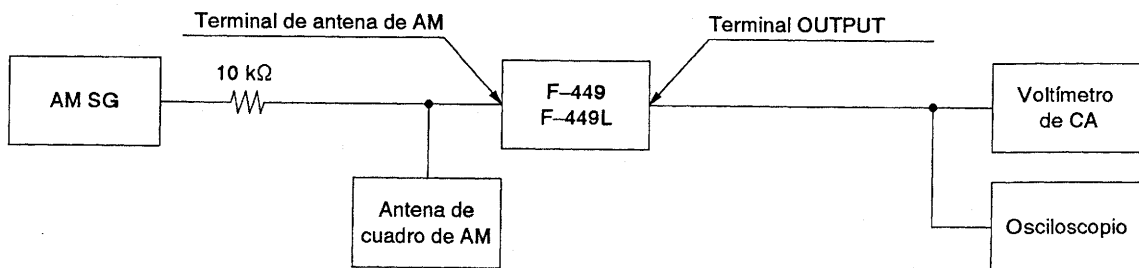


Fig. 6-2 Conexión del sintonizador de AM

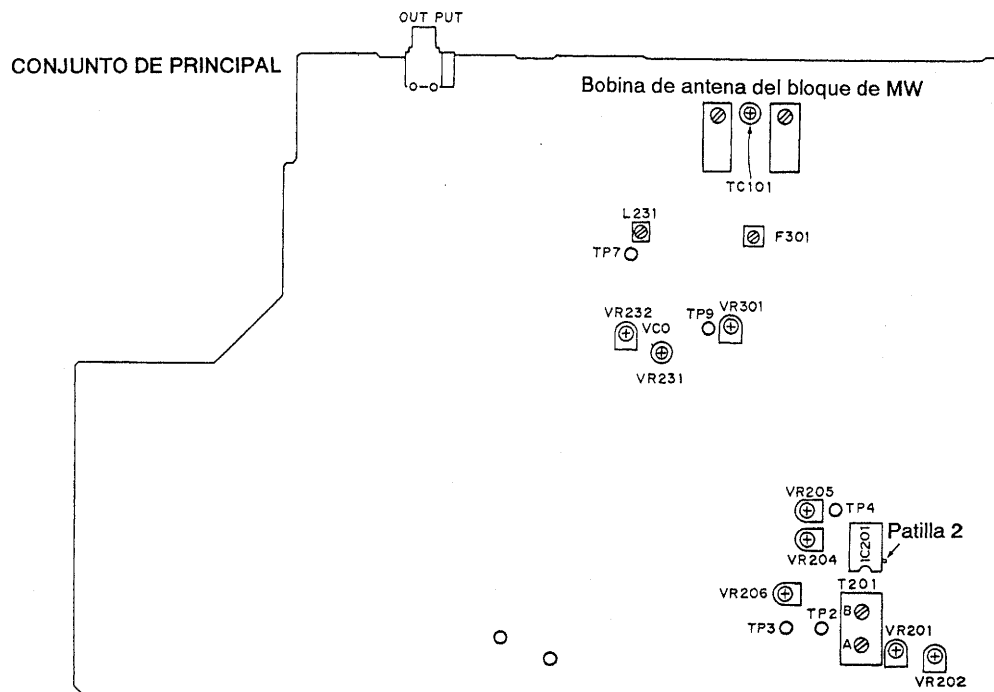


Fig. 6-3 Punto de ajuste

F-449-S/HEWZ, F-449L/HE, HB

7. FOR F-449L/HE, HB AND F-449-S/HEWZ TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The F-449L/HE, HB and F-449-S/HEWZ types are the same as the F-449/HEWZ type with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		F-449/ HEWZ type	F-449L/ HE type	F-449L/ HB type	F-449-S/ HEWZ type	
⊙	TUNER assembly	AWZ3643	AWZ3647	AWZ3647	AWZ3643	
⊙	POWER assembly	AWZ3649	AWZ3653	AWZ3653	AWZ3649	
Δ	AC Power cord	ADG1021	ADG1021	ADG1085	ADG1021	
	Station button	AAD1751	AAD1751	AAD1751	AAD1753	
	Station button	AAD1752	AAD1752	AAD1752	AAD1754	
	Panel base	AMB1842	AMB1842	AMB1842	AMB1843	
	Bonnet	AZN1745	AZN1745	AZN1745	.....	
	Bonnet case	.....	.....	.....	AZN1803	
	Screw	ABA1047	.....	.....	ABA1047	
	Screw	BBT30P060FZK	BBT30P060FZK	BBT30P060FZK	.....	
	Screw	.....	.....	.....	ABA-274	
	Packing case	AHD2056	AHD2057	AHD2057	AHD2058	
	FM antenna assembly	ADH1002	.....	.....	ADH1002	
	FM antenna	.....	ADH1005	ADH1005	.....	
	Operating instructions (German)	ARC1264	.....	.....	ARC1264	
	Operating instructions (English/French/Italian/Spanish/ Portuguese/Dutch/Swedish/German)	.....	ARE1191	.....	.....	
	Operating instructions (English)	.....	.....	ARB1314	.....	

⊙ TUNER ASSEMBLY (AWZ3647)

The TUNER assembly (AWZ3647) is the same as the TUNER assembly (AWZ3643) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		AWZ3643	AWZ3647	
	L101	LAU2R2M	.....	
	L102-L104	LAU470K	.....	
	L232	LAU010M	.....	
	L233, L234	LAU100K	.....	
	D108	1SV156	.....	
	D101, D102	.....	1SS85	
	D103-D106	1SS252	.....	
	Q104-Q106	.....	XDC143ES	
	C101	CKDYX103M25	.....	
	C102	CKPUYY103M16	.....	
	C105	.....	CKDYF223Z50	
	C110, C112, C253	CKDYX103M25	.....	
	C116	.....	CKDYX103M25	
	R101	RD1/8PM153J	.....	
	R102	RD1/2PM751J	RD1/4PM472J	
	R103	RD1/8PM330J	.....	
	R106, R109, R308	.....	RD1/8PM681J	
	R107	.....	RD1/8PM104J	
	R108, R402	.....	RD1/8PM102J	
	R114, R115	.....	RD1/8PM103J	
	R247, R248	RD1/8PM103J	RD1/8PM102J	
	R177	RD1/8PM221J	RD1/8PM331J	
	Antenna terminal 2P	AKA1012	.....	
	Antenna terminal 4P	.....	AKA1010	
	Front End Module Assembly	AXQ1004	AXQ1003	
	AM RF Tuning Block	AXX1011	.....	
	AM RF Tuning Block	.....	AXX1012	
	AM RF Tuning Block	.....	AXX1013	

⊙ POWER ASSEMBLY (AWZ3653)

The POWER assembly (AWZ3653) is the same as the POWER assembly (AWZ3649) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		AWZ3649	AWZ3653	
⚠	C353	ACG1002	.....	
⚠	L351	ATF-163	.....	

8. SPECIFICATIONS

8.1 TECHNISCHE DTEN (F-449/HEWZ)

UKW-Tunerteil

Frequenzbereich	87,5 bis 108 MHz
Nutzempfindlichkeit	
NORMAL	Mono: 12,1 dBf, IHF (1.1 μ V/75 Ω)
50 dB Empfindlichkeitsschwelle	
NORMAL	Mono: 16,2 dBf, IHF (1.8 μ V/75 Ω)
	Stereo: 36,2 dBf, IHF (17.7 μ V/75 Ω)
Empfindlichkeit (DIN)	
NORMAL	Mono: 0,9 μ V/75 Ω
	Stereo: 28 μ V/75 Ω
Rauschabstand	Mono: 83 dB (bei 80 dBf)
	Stereo: 78 dB (bei 80 dBf)
Verzerrung (bei 80 dBf)	
NORMAL	Mono: 0,2% (1 kHz)
	Stereo: 0,3% (1 kHz)
Ausweichkanal-Trennschärfe	
NORMAL	70 dB (400 kHz)
SUPER NARROW	65 dB (300 kHz)
Stereotrennung	50 dB (1 kHz)
	40 dB (20 Hz bis 10 kHz)
Frequenzgang	± 1 dB (20 Hz bis 15 kHz)
Spiegelselektion	50 dB
ZF-Sicherheit	90 dB
AM-Unterdrückung	60 dB
Nebenwellenunterdrückung	70 dB
Hilfsträgerunterdrückung	55 dB
Ansprechschwelle für Geräuschsperre	23,2 dBf (4 μ V/75 Ω)
Antenneneingang	75 Ω unsymmetrisch

8.2 SPECIFICATIONS (F-449L/HE)

FM Tuner Section

Frequency range	87.5 MHz to 108 MHz
Usable Sensitivity	
NORMAL	Mono: 12.1 dBf, IHF (1.1 μ V/75 Ω)
50 dB Quieting Sensitivity	
NORMAL	Mono: 16.2 dBf, IHF (1.8 μ V/75 Ω)
	Stereo: 36.2 dBf, IHF (17.7 μ V/75 Ω)
Sensitivity (DIN)	
NORMAL	Mono: 0.9 μ V/75 Ω
	Stereo: 28 μ V/75 Ω
Signal-to-Noise Ratio	Mono: 83 dB (at 80 dBf)
	Stereo: 78 dB (at 80 dBf)
Signal-to-Noise Ratio (DIN)	Mono: 72 dB
	Stereo: 65 dB
Distortion (at 80 dBf)	
NORMAL	Mono: 0.2 % (1 kHz)
	Stereo: 0.3 % (1 kHz)
Alternate Channel Selectivity	
NORMAL	70 dB (400 kHz)
SUPER NARROW	65 dB (300 kHz)
Stereo Separation	50 dB (1 kHz)
	40 dB (20 Hz to 10 kHz)
Frequency Response	± 1 dB (20 Hz to 15 kHz)
Image Response Ratio	50 dB
IF Response Ratio	90 dB
AM Suppression Ratio	60 dB
Spurious Response Ratio	70 dB
Subcarrier Product Ratio	55 dB
Muting Threshold	23.2 dBf (4 μ V/75 Ω)
Antenna Input	75 Ω unbalanced

MW-Tunerteil

Frequenzbereich	531 kHz bis 1.602 kHz (Step 9 kHz)
Empfindlichkeit (IHF, Rahmenantenne)	300 μ V/m
Trennschärfe	30 dB
Rauschabstand	50 dB
Spiegelselektion	40 dB
ZF-Sicherheit	50 dB
Antenne	Rahmenantenne

Audiotteil

Ausgang (Pegel/Impedanz)	
UKW (100% Mod.)	650 mV/0,9 k Ω
MW (30% Mod.)	150 mV/0,9 k Ω

Sonstiges

Netzanschluß	Wechselstrom 220 — 230 V, 50/60 Hz
Leistungsaufnahme	15 W
Abmessungen	420 (B) x 86 (H) x 316 (T) mm
Gewicht (ohne Verpackung)	3,4 kg

Mitgeliefertes Zubehör

T-förmige UKW-Antenne	1
MW-Rahmenantenne	1
Cinch-Anschlußkabel	1
Bedienungsanleitung	1
Steuerungskabel	1

HINWEIS:

Änderungen der technischen Daten und des Designs zum Zwecke der Verbesserung vorbehalten.

AM (MW) Tuner Section

Frequency range	531 kHz to 1,602 kHz (9 kHz step)
Sensitivity (IHF, Loop antenna)	300 μ V/m
Selectivity	30 dB
Signal-to-Noise Ratio	50 dB
Image Response Ratio	40 dB
IF Response Ratio	50 dB
Antenna	Loop Antenna

LW Tuner Section

Frequency range	153 kHz to 281 kHz
Sensitivity (IHF, Loop antenna)	1,000 μ V/m
Antenna	Loop Antenna

Audio Section

Output (Level/Impedance)	
FM (100 % MOD)	650 mV/0.9 k Ω
AM (30 % MOD)	150 mV/0.9 k Ω

Miscellaneous

Power requirements	a.c. 220 — 230 Volts ~, 50/60 Hz
Power Consumption	15 W
Dimensions	420 (W) x 86 (H) x 316 (D) mm
Weight (without package)	3.4 kg

Furnished Parts

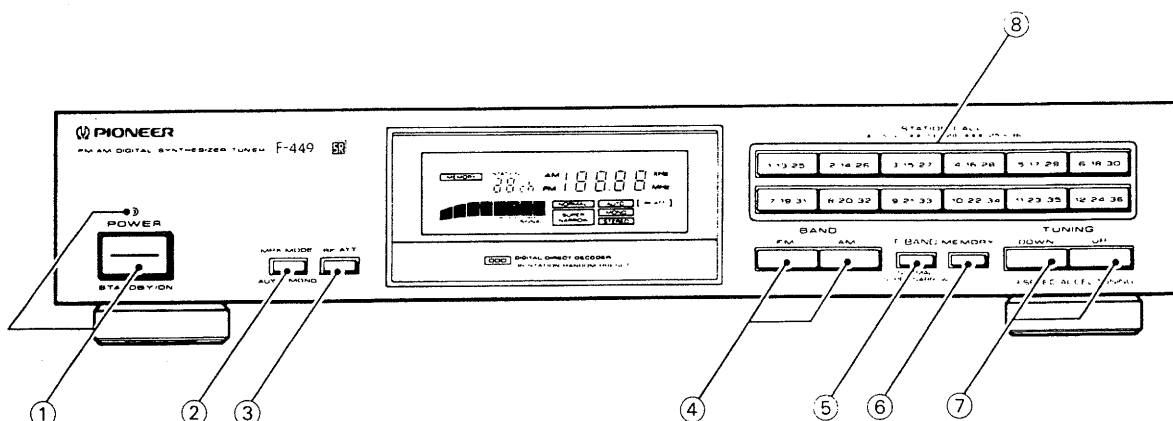
FM T-type Antenna	1
AM Loop Antenna	1
Connecting Cord with Pin Plugs	1
Operating Instructions	1
Control cord	1

NOTE:

Specifications and design subject to possible modification without notice due to improvements.

9. PANEL FACILITIES

9.1 BEDIENELEMENTE AUF DER VORDERSEITE (F-449/HEWZ)



① Netzschalter (POWER, STANDBY/ON) mit Anzeige

Bei eingeschaltetem Strom, leuchtet die Anzeige.

ON (ein) Wenn der Schalter auf die Position ON gestellt ist, wird Strom zugeführt und das Gerät ist betriebsbereit.

STANDBY

(Bereitschaft) ... Wenn der Schalter auf die Position STANDBY gestellt ist, wird der Haupt-Stromzufluß abgeschaltet und das Gerät ist nicht länger vollständig bedienbar. Ein Stromzufluß von einer Minute reicht aus, um das Gerät wieder in Betriebsbereitschaft zu versetzen.

HINWEIS:

- Die Festsender bleiben dauerhaft gespeichert, solange das Gerät an einer Steckdose angeschlossen ist.
- Nach dem Abtrennen des Netzkabels bleiben die Daten im Festspeicher noch einige Tage lang erhalten.

② Multiplex-Betriebsartenschalter (MPX MODE)

Beim Betätigen dieses Schalters wird nach folgendem Schema zur jeweils nächsten Betriebsart gewechselt:



Beim MW-Empfang ist dieser Schalter funktionslos.

AUTO:

Die Rundfunksendungen werden, abhängig vom eingestellten Sender, automatisch in Stereo oder Mono empfangen.

Die **AUTO** -Anzeige leuchtet.

HINWEIS:

Wenn der Signalpegel für ausreichend guten Empfang zu schwach ist, wird der Ton automatisch stummgeschaltet.

MONO:

Zum Empfang von Stereosendern in Mono.

Die **MONO** -Anzeige leuchtet.

HINWEIS:

Die Einstellung des Schalters wird beim Einspeichern eines Senders zusammen mit der Sendefrequenz gespeichert.

③ Schalter für HF-Dämpfung (RF ATT)

Das HF-Dämpfungsglied kann durch Drücken dieses Schalters aktiviert werden (Anzeige RF ATT leuchtet), um beim Empfang eines stark einfallenden Senders (Nahsender) Tonverzerrungen zu reduzieren. Das HF-Dämpfungsglied sollte normalerweise ausgeschaltet bleiben.

HINWEIS:

Dieser Tastenzustand ist für jeden Sender im Senderspeicher voreingestellt.

④ Wellenbereich-Wahltasten (BAND)

FM (UKW):

Für den Empfang von UKW-Sendungen.

AM (MW):

Für den Empfang von MW-Sendungen.

⑤ Bandbreitenschalter (IF BAND)

Bei jedem Tastendruck, schaltet die Bandbreite der IF-Schaltung zwischen "normal" und "super schmal" für den UKW-Wellenbereich. Die gewählte Bandbreite wie folgt angezeigt:

Die **NORMAL** oder **SUPER NARROW** Anzeige leuchtet auf.

Wenn von anderen Sendern Störungen auftreten, stellen Sie diesen Schalter auf SUPER NARROW.

HINWEIS:

Die Einstellung des Schalters wird beim Einspeichern eines Senders zusammen mit der Sendefrequenz gespeichert.

⑥ Speichertaste (MEMORY)

Diese Taste ist zum Einspeichern eines Festsenders zu drücken.

Die Anzeige **MEMORY** leuchtet danach einige Sekunden lang, wobei der eingestellte Sender innerhalb dieses Zeitraums durch Betätigen einer der Festsendertasten (STATION CALL) gespeichert werden kann. Siehe auf der Seite 8 für weitere Einzelheiten zur Bedienung.

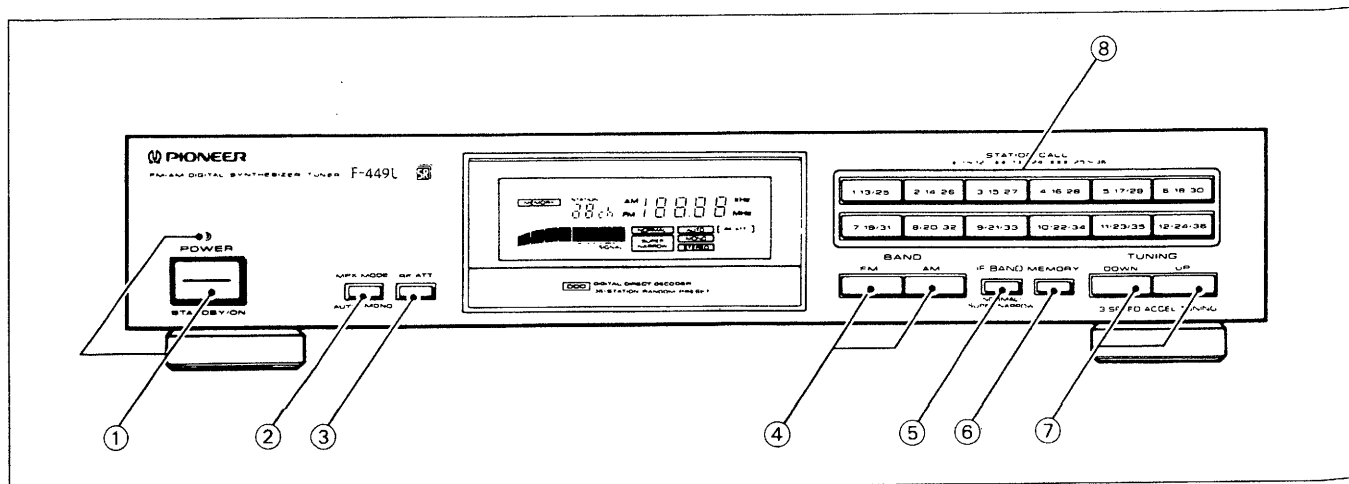
⑦ Abstimmtasten (TUNING UP/DOWN)

Diese Tasten dienen zum Abstimmen des Tuners auf die jeweilige Sendefrequenz. Zur Einstellung frequenzmäßig höherer Sender als der gegenwärtig abgestimmte, ist hierbei die UP -Taste zu drücken und für frequenzmäßig tiefere Sender die DOWN -Taste.

⑧ Festsendertasten (STATION CALL)

In den Speicherplätzen dieser Tasten können beliebige Sendefrequenzen für späteren Abruf auf Tastendruck vorgespeichert werden.

9.2 PANEL FACILITIES



① POWER (STANDBY/ON) switch/indicator

When the power is on, indicator lights.

ON When set to ON position, power is supplied and the unit becomes operational

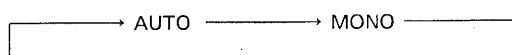
STANDBY .. When set to STANDBY position, the main power flow is cut and the unit is no longer fully operational. A minute flow of power feeds the unit to maintain operation readiness.

NOTE:

- The memory will be backed up so long as the power cord is not unplugged.
- If the power cord is unplugged, the memory will be retained for several days.

② MPX (multiplex) MODE button

Mode changes as follows each time this button is pressed:



This button does not affect AM reception.

AUTO:

Depending on the broadcast station, STEREO or MONO is automatically selected.

AUTO indicator lights up.

NOTE:

When the signal level is too weak for reception, sound output is automatically muted.

MONO:

To receive stereo broadcasts in monaural.

MONO indicator lights up.

NOTE:

This button's status is preset for each station in station memory.

③ RF ATT button

Set this switch to ON when receiving strong FM signals (nearby stations) to reduce sound distortion ([RF ATT] indicator lights).

Normally, this switch should be set to OFF.

NOTE:

This button's status is preset for each station in station memory.

④ BAND selector buttons

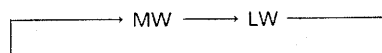
FM:

Press to receive FM broadcasts.

AM:

Press to receive AM broadcasts.

Each time you press this button, the band switches in the following way.



⑤ IF BAND button

Each time this button is pressed the bandwidth of the IF circuit switches between "normal" and "super narrow" for the FM band.

The selected bandwidth is displayed as follows:

The **NORMAL** or **SUPER NARROW** indicator lights up.

Set to SUPER NARROW in case of interference from other stations.

NOTE:

This button's status is preset for each station in station memory.

⑥ MEMORY button

Press to memorize preset stations. The **MEMORY** indicator will remain lit for several seconds. Press the desired STATION CALL buttons to memorize it during this period.

See page 10 for operational details.

⑦ TUNING UP/DOWN buttons

Use these buttons to tune in broadcasting stations. Press UP to receive a station whose frequency is higher than the displayed frequency, and DOWN to tune into a lower frequency station.

⑧ STATION CALL buttons

Use these buttons to preset stations and to receive already preset stations.