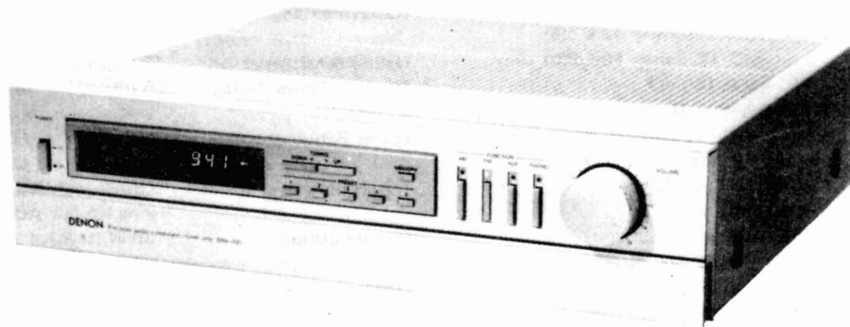


DENON

Hi-Fi Component Tuner Amplifier

SERVICE MANUAL MODEL DRA-400



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NIPPON COLUMBIA CO., LTD.

SPECIFICATIONS

AMPLIFIER SECTION

Continuous Power

Output: 40 watts per channel minimum RMS, both channels driven at 8 ohm from 20 Hz ~ 20 kHz no more than 0.02% total harmonic distortion (45 W per channel, 0.05% T.H.D.)
50 W per channel minimum RMS, both ch. driven at 4 ohm 1 kHz, T.H.D. 0.009%

Power Bandwidth (IHF): 5 Hz ~ 40 kHz (T.H.D. 0.02% both ch. driven at 8 ohm)

Total Harmonic Distortion (20 Hz to 20 kHz): rated power into 8 ohm 0.02%
Damping Factor: More than 80 (at 1 kHz, 8 ohms)

PREAMPLIFIER SECTION

Frequency Response: PHONO RIAA Standard Curve (Recording Output) ±0.5 dB
TAPE, AUX 20 Hz ~ 20 kHz ±0.5 dB

Input Sensitivity and Impedance: PHONO MM 2.5 mV 47 k ohm
MC 0.25 mV 100 ohm
TAPE, AUX 150 mV
More than 33 k ohm

Maximum Input Level (at 1 kHz): PHONO MM 200 mV
MC 20 mV

Signal to Noise Ratio (IHF-A): PHONO MM 80 dB
PHONO MC 62 dB
TAPE, AUX 95 dB

Tone Control Range: BASS at 50 Hz ±10 dB
TREBLE at 20 kHz ±10 dB

Loudness Control Effect: at -30 dB attenuation 100 Hz / 10 kHz
+10 dB / +5 dB

Subsonic Filter Effect: 18 Hz, 6 dB/octave

TUNER SECTION

[FM]

Receiving Range: 87.9 ~ 107.9 MHz (For E3, EC), 87.5 ~ 108.0 MHz (For E2)

Mono IHF Sensitivity: 10.3 dBf
Signal to Noise Ratio: MONO 75 dB } (For E3, EC)
STEREO 71 dB }

S/N 46 dB Sensitivity: MONO 2.2µV } (For E2)
STEREO 25µV }

Total Harmonic Distortion 1 kHz: MONO 0.07% } at 1 kHz 100% mod.
STEREO 0.15% } (For E3, EC)
MONO 0.1% } at 1 kHz, 40 kHz
STEREO 0.2% } deviation (For E2)

Capture Ratio: 1.2 dB
Image Rejection: 45 dB
AM Suppression: 60 dB
Frequency Response: +0.5 dB (10 Hz ~ 15 kHz)
-1.0 dB

Stereo Separation: 50 dB

[AM]

Receiving Range: 530 ~ 1620 kHz (for E3, EC), 522 ~ 1611 kHz (For E2)

Usable Sensitivity: 15 dBµ (For E3, EC), 5.6µV (For E2)
Signal to Noise Ratio: 55 dB

GENERAL

Power Requirements: Europe: AC 220 V, 50 Hz
U.K.: AC 240 V, 50 Hz
U.S.A.: AC 120 V, 60 Hz
Hong Kong: AC 200 V, 50 Hz
Consumption: 130 W (U.S.A.)
270 VA (Canada)

Power Outlets: SWITCHED x 1,100 W
UNSWITCHED x 1,250 W

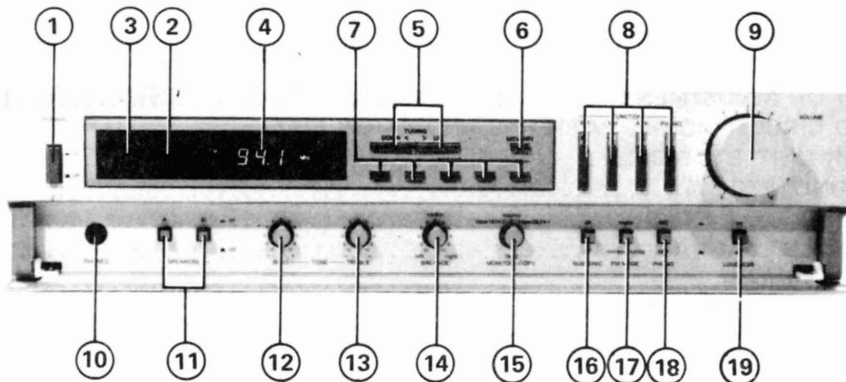
(Not included in systems for European use)

Dimensions: 434mm (W) x 112mm (H) x 408mm (D)
Weight: 9 kg

Design and specifications subject to change without notice.

NOTE: The following codes correspond to the appropriate models. E3 for U.S.A., EC for Canada, E2 for Europe, EF for France, EG for Germany, E1 for Hongkong. This Service Manual is prepared base on E3.

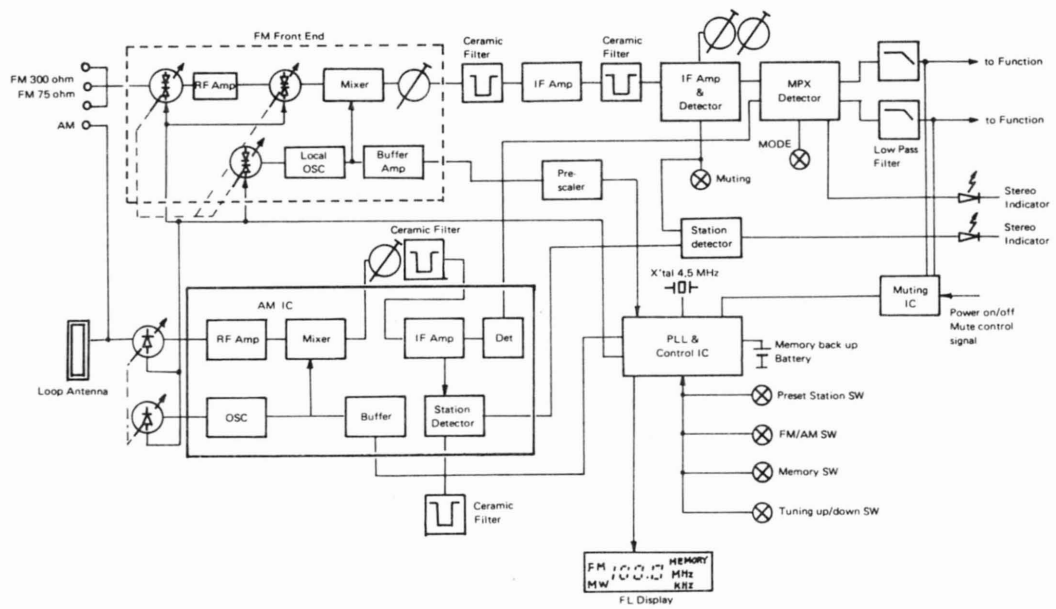
APPELLATIONS AND FUNCTION OF PARTS



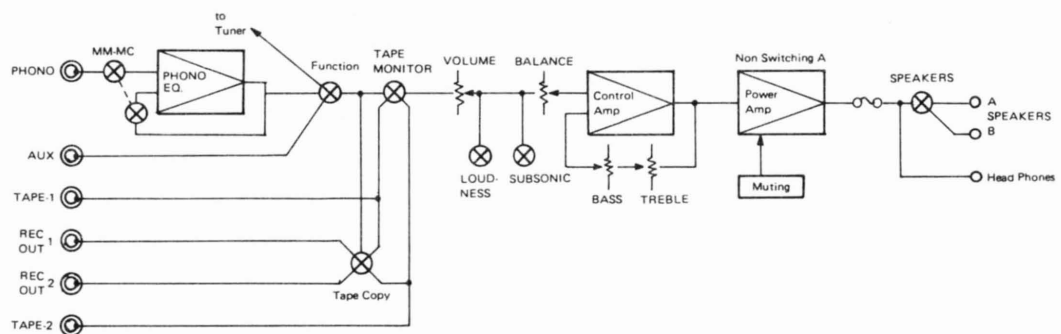
- ① POWER (Power Source Switch)
- ② FM STEREO (Stereo Indicator)
- ③ SIGNAL (Signal Amplitude)
- ④ FREQUENCY DISPLAY
- ⑤ TUNING (Tuning) DOWN, UP
- ⑥ MEMORY SWITCH
- ⑦ PRESET CHANNEL 1-5
- ⑧ FUNCTION (Input Change-Over Switch)
- ⑨ VOLUME (Volume Control Knob)
- ⑩ PHONES (Head Phone Jack)
- ⑪ SPEAKERS (Speaker Change-over Switch)
- ⑫ BASS (Bass Control)
- ⑬ TREBLE (Treble Control)
- ⑭ BALANCE (Balance Control)
- ⑮ MONITOR (Monitor Switch)
- ⑯ SUBSONIC FILTER (Subsonic Filter Switch)
- ⑰ MODE (Mode Switch) ■ stereo/muting ■ mono
- ⑱ PHONO (Phono Input Change-over Switch)
- ⑲ LOUDNESS (Loudness Switch)

BLOCK DIAGRAM SCHEMA SIMPLIFIE

Tuner Section



Amp Section

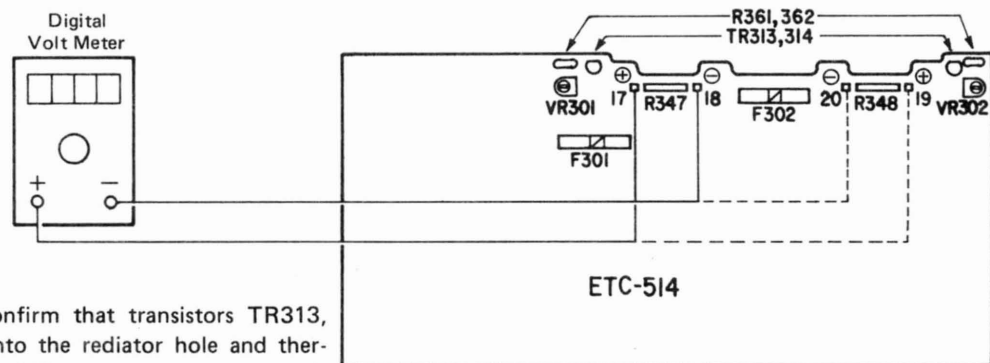


METHOD OF ADJUSTMENT

AMP SECTIONS

Carry out adjustments at room temperature and normal humidity and with the power source operating at the rated voltage.

IDLE CURRENT ADJUSTMENT METHOD OF POWER AMP (ETC-514 BOARD)

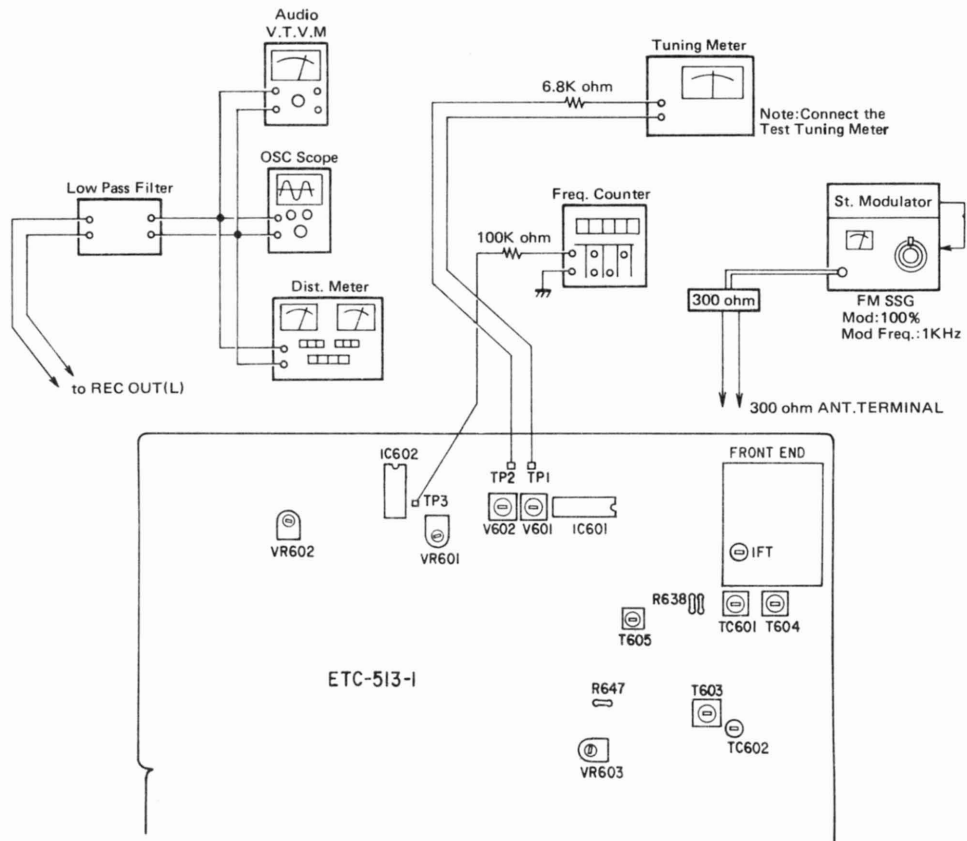


1. Be sure to confirm that transistors TR313, 314 are set into the radiator hole and thermistors R361, 362 are touched at the radiator. If not, make them to do so.
2. Connect a digital voltmeter to the L-ch test points ①⑦ and ①⑧ .
3. Set the MAIN VOL to MIN position.
4. Turn the POWER SW on and wait about 2 minutes for warming-up, then conduct the following adjustments.
5. Rotate VR301 and obtain 10 mV ± 1 mV DC on the digital voltmeter.
6. Connect the digital voltmeter to the R-ch test point ①⑨ and ②① .
7. Rotate VR302 and obtain 10 mV ± 1 mV DC on the digital voltmeter.

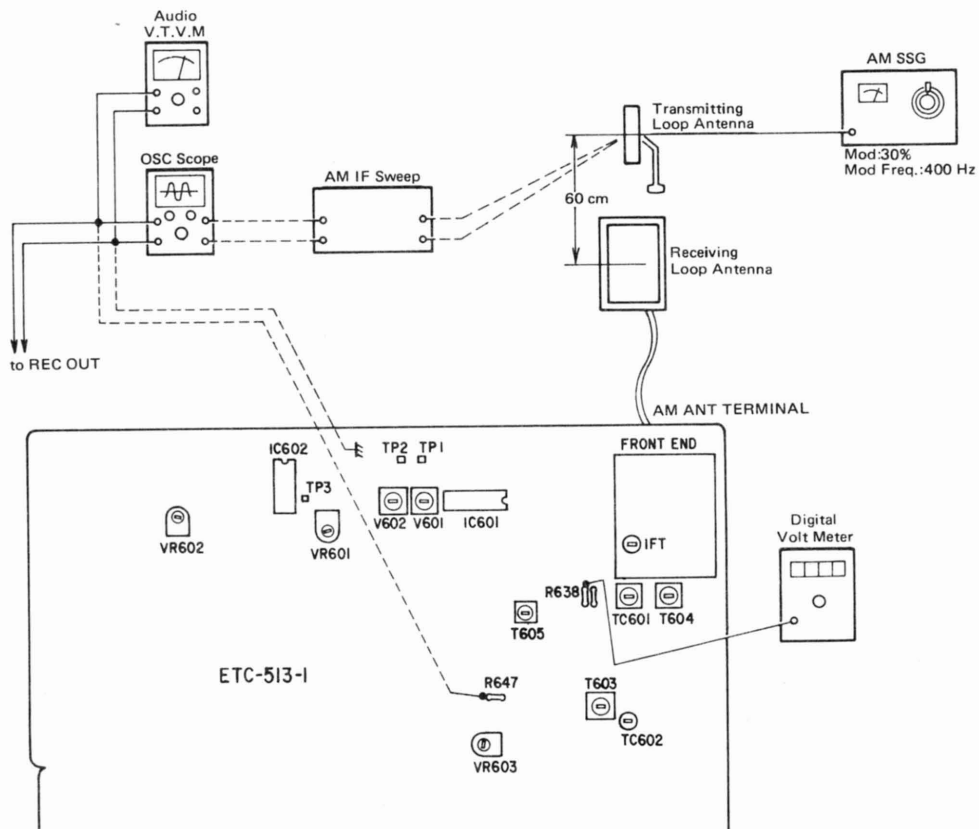
NOTE: Turn VR301 and VR302 clockwise to increase the idle current.

TUNER SECTIONS

FM/MPX ALIGNMENT POINTS & CONNECTIONS



AM ALIGNMENT POINTS & CONNECTIONS



METHOD OF ADJUSTMENTS

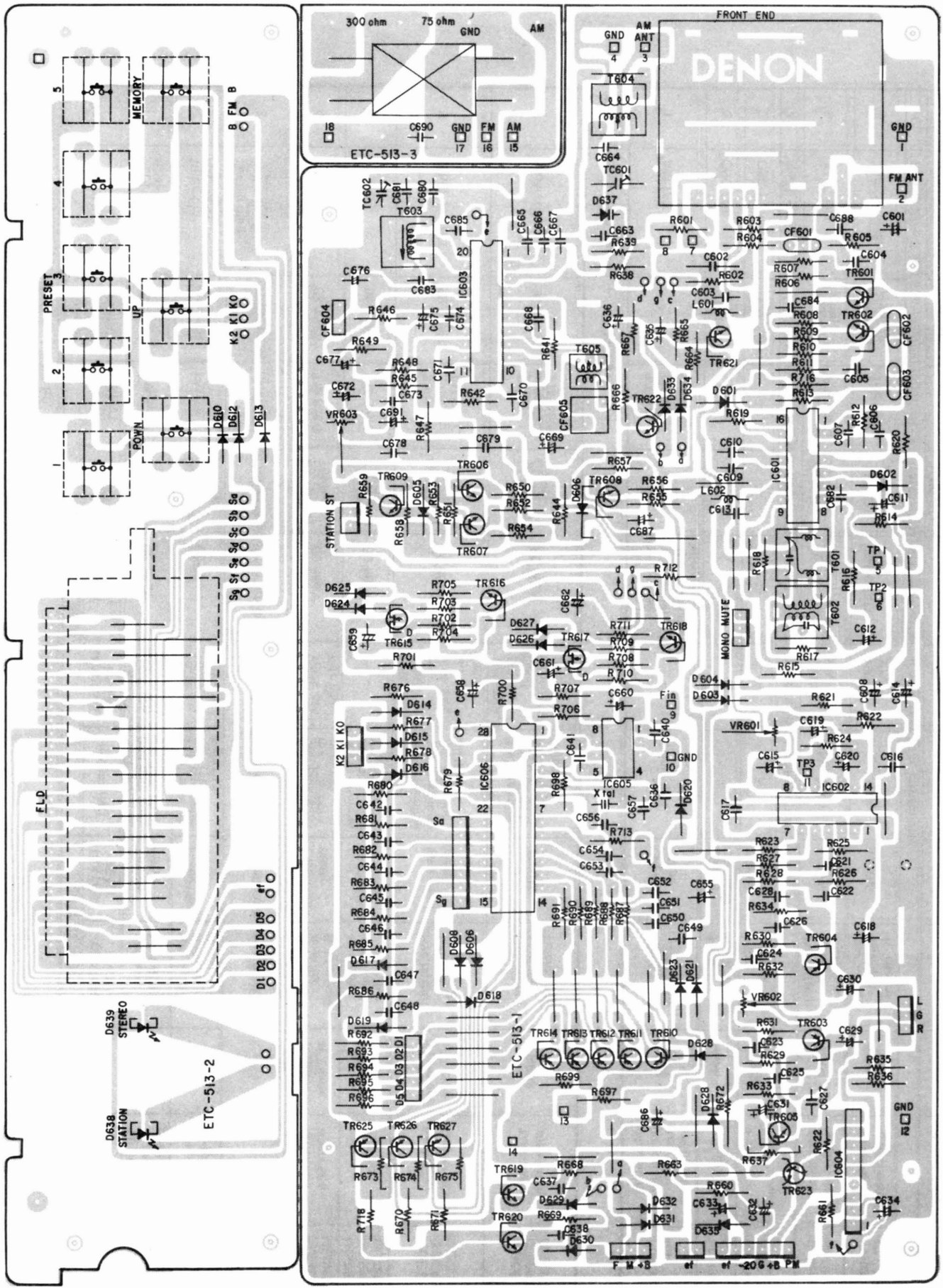
Carry out adjustment at room temperature and normal humidity with the power source operating at the rated voltage.

FM/MPX ALIGNMENT Note: () is for E2.

STEP	ITEM	RECEIVING FREQUENCY	INPUT SIDE					OUTPUT SIDE		ADJUST	ADJUST LIMIT	REMARKS
			INSTRUMENT	FREQ.	INPUT LEVEL	MODULATION	COUPLING	INSTRUMENT	CONNECTION			
1	Tuning meter to center position	98.1 MHz	FM S.S.G.	98.10MHz ±5kHz	60 dBμV	1kHz 100% (40 kHz Dev.)	ANT. terminal 300 ohm dummy (75 ohm dummy)	Tuning meter	Between TP-1 & IP-2	T601	Tuning meter to center position	Function FM[MODE MONO]
2	Minimum distortion	98.1 MHz	FM S.S.G.	98.10MHz ±5kHz	60 dBμV	1kHz 100% (40 kHz Dev.)	ANT. terminal 300 ohm dummy (75 ohm dummy)	Distortion meter	Rec output terminal [L-channel]	T602	Minimum distortion	Function FM[MODE MONO]
3	Tuning meter center position minimum distortion	Repeat Step 1 and 2 so that the pointer of the tuning meter comes to the center when minimum distortion is obtained.										
4	Front end IFT	98.1 MHz	FM S.S.G.	98.10MHz ±5kHz	60 dBμV	1kHz 100% (40 kHz Dev.)	ANT. terminal 300 ohm dummy (75 ohm dummy)	Distortion meter	Rec output terminal [L-channel]	Front end IFT core	Minimum distortion	Function FM[MODE MONO]
5	19 kHz	98.1 MHz	FM S.S.G.	98.10MHz ±5kHz	60 dBμV	—	ANT. terminal 300 ohm dummy (75 ohm dummy)	Frequency counter	Through 100 k ohm to TP-3	VR601	19 kHz ±30 Hz	MODE [STEREO/MUTING]
6	Front end IFT	98.1 MHz	Stereo modulator FM S.S.G.	98.10MHz ±5kHz	60 dBμV	1kHz 90% (40kHz Dev.) Pilot 10% (6kHz Dev.)	ANT. terminal 300 ohm dummy (75 ohm dummy)	Distortion meter	Rec output terminal [L-channel]	Front end IFT core	Minimum distortion	MODE [STEREO/MUTING]
7	Separation	98.1 MHz	Stereo modulator FM S.S.G.	98.10MHz ±5kHz	60 dBμV	1kHz 90% (40kHz Dev.) Pilot 10% (6kHz Dev.)	ANT. terminal 300 ohm dummy (75 ohm dummy)	VTVM	Rec output terminal [L-channel]	VR602	Maximum separation	MODE [STEREO/MUTING]

AM ALIGNMENT Note: () is for E2.

1	AM IFT	—	AM IF Sweep generator	—	Regulate to a half of the level at which the waveform distorts	—	Loop ANT.	Oscilloscope	R647 = 33 k ohm	T605	Maximum height and best symmetry curve	Function AM
2	OSC Coil	530 kHz (522)	—	—	—	—	—	Digital voltmeter	R638 = 100 k ohm	T603	1.2±0.1 Volts	Function AM
3	OSC trimmer	1620 kHz (1611)	—	—	—	—	—	Digital voltmeter	R638 = 100 k ohm	TC602	8.0±0.1 Volts	Function AM
4	Repeat Step 2 and 3 so that the tuning voltage at 600 (603) kHz & 1400 (1404) kHz are within the adjust limit.											
5	ANT. coil	600 kHz (603)	AM S.S.G.	600kHz ±0.2kHz	Below AGC level	400Hz 30%	Loop ANT.	VTVM	Rec output terminal (L-channel)	T604	Maximum audio output	Function AM
6	ANT trimmer	1400 kHz (1404)	AM S.S.G.	1400kHz ±0.2kHz	Below AGC level	400Hz 30%	Loop ANT.	VTVM	Rec output terminal (L-channel)	TC601	Maximum audio output	Function AM
7	Repeat Step 5 and 6 so that 600 (603) kHz and 1400 (1404) kHz are received at maximum gain, respectively.											
8	Signal LED Lighting level	100 kHz (999)	AM S.S.G.	1000kHz ±0.2kHz (999kHz)	57 dBμ/m	400Hz 30%	Loop ANT.	—	—	VR603	Signal LED Lighting level	Function AM



PRINTED WIRING BOARD PATTERNS AND PARTS LIST
ETC-513, 513B TUNER UNIT

ETC-513, 513B TUNER UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
IC601	2630083000	HA11225	INTEGRATED CIRCUIT
IC602	2630043011	HA-1156(R)	INTEGRATED CIRCUIT
IC603	2630145003	LA1245	INTEGRATED CIRCUIT
IC604	2630169005	AN-6135	INTEGRATED CIRCUIT
IC605	2630162002	μPB553AC	INTEGRATED CIRCUIT
IC606	2620297000	μPD1703C-016	INTEGRATED CIRCUIT
TR601	2730025010	2SC461(B)	TRANSISTOR
TR602	2730025010	2SC461(B)	TRANSISTOR
TR603	2710113007	2SA999(F)	TRANSISTOR
TR604	2710113007	2SA999(F)	TRANSISTOR
TR605	2730198031	2SC1815(BL/GR)	TRANSISTOR
TR606	2730204035	2SC2320(F/E)	TRANSISTOR
TR607	2730204035	2SC2320(F/E)	TRANSISTOR
TR608	2730204035	2SC2320(F/E)	TRANSISTOR
TR609	2730204035	2SC2320(F/E)	TRANSISTOR
TR610	2710113023	2SA999(E/F)	TRANSISTOR
TR611	2710113023	2SA999(E/F)	TRANSISTOR
TR612	2710113023	2SA999(E/F)	TRANSISTOR
TR613	2710113023	2SA999(E/F)	TRANSISTOR
TR614	2710113023	2SA999(E/F)	TRANSISTOR
TR615	2750020008	2SK163(M)	FIELD EFFECT TRANSISTOR
TR616	2730204019	2SC2320(F)	TRANSISTOR
TR617	2750020008	2SK163(M)	FIELD EFFECT TRANSISTOR
TR618	2730204019	2SC2320(F)	TRANSISTOR
TR619	2730204035	2SC2320(F/E)	TRANSISTOR
TR620	2730204035	2SC2320(F/E)	TRANSISTOR
TR621	2730204035	2SC2320(F/E)	TRANSISTOR
TR622	2730204035	2SC2320(F/E)	TRANSISTOR
TR623	2730204035	2SC2320(F/E)	TRANSISTOR
TR626	2710113023	2SA999(E/F)	TRANSISTOR
TR627	2710113023	2SA999(E/F)	TRANSISTOR
D601	2760049008	1S2076	DIODE
D602	2760049008	1S2076	DIODE
D603	2760049008	1S2076	DIODE
D604	2760049008	1S2076	DIODE
D605	2760049008	1S2076	DIODE
D606	2760049008	1S2076	DIODE
D608	2760049008	1S2076	DIODE
D609	2760049008	1S2076	DIODE
D610	2760049008	1S2076	DIODE
D612	2760049008	1S2076	DIODE
D613	2760049008	1S2076	DIODE
D614	2760049008	1S2076	DIODE
D615	2760049008	1S2076	DIODE
D616	2760049008	1S2076	DIODE
D620	2760049008	1S2076	DIODE
D621	2760049008	1S2076	DIODE
D622	2760049008	1S2076	DIODE
D623	2760049008	1S2076	DIODE
D624	2760049008	1S2076	DIODE
D625	2760049008	1S2076	DIODE
D626	2760049008	1S2076	DIODE
D627	2760049008	1S2076	DIODE
D628	2760173039	HZ6-B2	DIODE
D629	2760049008	1S2076	DIODE
D630	2760049008	1S2076	DIODE
D631	2760049008	1S2076	DIODE
D632	2760049008	1S2076	DIODE
D633	2760049008	1S2076	DIODE
D634	2760049008	1S2076	DIODE
D635	2760236031	HZ5C-1	DIODE
D636	2760302004	SVC321SP-D2	
D637	2760302004	SVC321SP-D2	
D638	2760049008	1S2076	DIODE
D638	3939093004	LED (GREEN)	LIGHT EMITTING DIODE
D639	3939092005	LED (RED)	LIGHT EMITTING DIODE

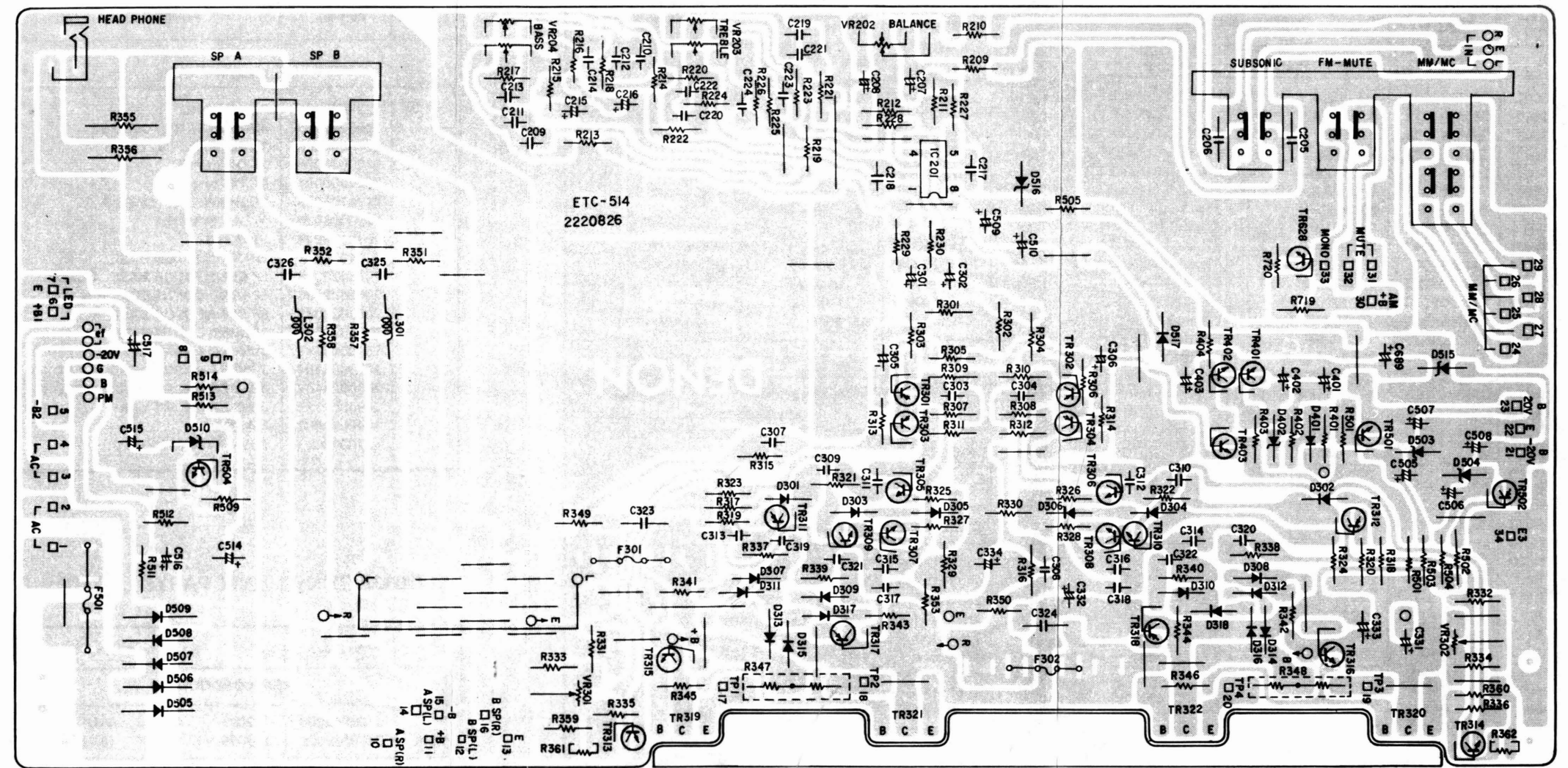
Ref. No.	Part No.	Part Name & Descriptions	
COIL & TRANS			
L601	TRT0565H1	INDUCTOR	
L602	TRT0565H1	INDUCTOR	
L603	2310017008	BALUN TRANS	
T601	2312026000	FM IF DET (A)	
T602	2312027009	FM IF DET (B)	
T603	2311065004	MW OSC COIL	
T604	2311061008	MW ANT. TRANS	
T605	2310056001	AM IFT	
CF601	2610038008	CERAMIC FILTER (BFU450C4)	
CF602	2610038004	CERAMIC FILTER (BFU450C4)	
CF603	2610038008	CERAMIC FILTER (SEP450H)	
CF604	2610031001	BFU450C4	
CF605	2610034008	SFP450H	
RESISTORS (not included Carbon Film ¼W ±5% Type)			
VR601	2116000015	SEMI FIXED RESISTOR	10 kohm
VR602	2116000044	SEMI FIXED RESISTOR	50 kohm
VR603	2116000015	SEMI FIXED RESISTOR	10 kohm
R672	2440037026	470 ohm ±5%	1W METAL OXIDE
R697	2420195001	2.2 Mohm ±10%	¼W CARBON COMPOSIT
CAPACITORS (not included Ceramic 50WV Type)			
TC601	2130012008	TRIMMER CONDENCER	
TC602	2130014003	TRIMMER CONDENCER	
C602	2551082009	0.068μF ±10%	50V PLASTIC FILM
C608	2544132005	10μF	16V ELECTROLYTIC
C611	2544145005	0.47μF	50V ELECTROLYTIC
C612	2544136001	100μF	16V ELECTROLYTIC
C614	2544148002	3.3μF	50V ELECTROLYTIC
C615	2544145005	0.47μF	50V ELECTROLYTIC
C616	2556159092	470pF	±5% 50V PLASTIC FILM
C617	2551120084	0.047μF	±5% 50V PLASTIC FILM
C618	2544021006	470μF	16V ELECTROLYTIC
C619	2544145005	0.47μF	50V ELECTROLYTIC
C620	2544145005	0.47μF	50V ELECTROLYTIC
C621	2551120055	0.027μF	±5% 50V PLASTIC FILM
C622	2551120055	0.027μF	±5% 50V PLASTIC FILM
C629	2544146004	1μF	50V ELECTROLYTIC
C630	2544146004	1μF	50V ELECTROLYTIC
C631	2544132005	10μF	16V ELECTROLYTIC
C632	2544141009	10μF	35V ELECTROLYTIC
C633	2544140000	4.7μF	35V ELECTROLYTIC
C634	2544138009	47μF	16V ELECTROLYTIC
C635	2544132005	10μF	16V ELECTROLYTIC
C636	2544132005	10μF	16V ELECTROLYTIC
C655	2544003008	100μF	6.3V ELECTROLYTIC
C656	2533127005	18pF	±5% 50V CERAMIC
C657	2533127005	18pF	±5% 50V CERAMIC
C658	2544145005	0.47μF	50V ELECTROLYTIC
C659	2541015002	3.3μF	16V ELECTROLYTIC
C660	2544145005	0.47μF	50V ELECTROLYTIC
C661	2541015002	3.3μF	16V ELECTROLYTIC
C662	2544136001	100μF	16V ELECTROLYTIC
C669	2544132005	10μF	16V ELECTROLYTIC
C672	2544149001	4.7μF	50V ELECTROLYTIC
C675	2544146004	1μF	50V ELECTROLYTIC
C676	2544149001	4.7μF	50V ELECTROLYTIC
C677	2544148002	3.3μF	50V ELECTROLYTIC
C679	2551082009	0.068μF ±10%	50V PLASTIC FILM
C680	2556160065	430pF	±5% 50V PLASTIC FILM
C686	2544004007	220μF	6.3V ELECTROLYTIC
C687	2544149001	4.7μF	50V ELECTROLYTIC

Ref. No.	Part No.	Part Name & Descriptions
OTHER PARTS		
	2220825005	P.W. BOARD
	2090047903	JUMPER WIRE USED 20
	2050134908	TERMINAL PIN USED 14
	2160041004	FRONT END
	2050060001	4P TERMINAL
	2124253003	PUSH SWITCH USED 8
	3990008025	X-TAL (4.5MHz)
	3939128018	FIP7G8A
	2032075001	2P CONNECTOR BASE
	2035622008	3P CONNECTOR BASE USED 5
	2035622066	5P MINI. CONNECTOR PIN
	2035622082	6P CONNECTOR BASE
	2035622079	7P MINI. CONNECTOR PIN
	2090008117	JUMPER SHORT LEAD USED 10
	2090008104	JUMPER SHORT LEAD USED 10
	2090008162	JUMPER SHORT LEAD USED 10
	2090008159	JUMPER SHORT LEAD USED 10
	1440983003	MASK
	4770096007	PUSH RIVET USED 2

ETC-513B TUNER UNIT PARTS LIST (For E2)

Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
D614	2760049008	1S2076 DIODE (ADD)
D616	2760049008	1S2076 DIODE (ADD)
RESISTOR (not included Carbon Film ±5% ¼W Type)		
CAPACITORS (not included Ceramic 50V Type)		
C614	2544148002	3.3µF 50V ELECTROLYTIC (DELETE)
COILS & TRANS		
L603	2310017008	BALUN TRANS (DELETE)
CF601	2610023006	FM CERAMIC FILTER (CHANGE)
CF602	2610023006	FM CERAMIC FILTER (CHANGE)
CF603	2610023006	FM CERAMIC FILTER (CHANGE)
OTHER PARTS		
	2160043002	FRONT END (CHANGE)
	2090008104	JUMPER P=15MM USED 3 (CHANGE)
	2090008162	JUMPER P=20MM USED 4 (CHANGE)
	2050060001	4P TERMINAL (DELETE)

Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
IC201	1650118014	NJM4560D-D INTEGRATED CIRCUIT
TR301	2710094016	2SA970(BL) TRANSISTOR
TR302	2710094016	2SA970(BL) TRANSISTOR
TR303	2710094016	2SA970(BL) TRANSISTOR
TR304	2710094016	2SA970(BL) TRANSISTOR
TR305	2730187039	2SC2240(BL)/(GR) TRANSISTOR
TR306	2730187039	2SC2240(BL)/(GR) TRANSISTOR
TR307	2730198015	2SC1815(BL) TRANSISTOR
TR308	2730198015	2SC1815(BL) TRANSISTOR
TR309	2730187039	2SC2240(BL)/(GR) TRANSISTOR
TR310	2730187039	2SC2240(BL)/(GR) TRANSISTOR
TR311	2710094016	2SA970(BL) TRANSISTOR
TR312	2710094016	2SA970(BL) TRANSISTOR
TR313	2730198015	2SC1815(BL) TRANSISTOR
TR314	2730198015	2SC1815(BL) TRANSISTOR
TR315	2730163011	2WC1735(D) TRANSISTOR
TR316	2730163011	2SC1735(D) TRANSISTOR
TR317	2710072009	2SA850(D) TRANSISTOR
TR318	2710072009	2SA850(D) TRANSISTOR
TR401	2730198015	2SC1815(BL) TRANSISTOR
TR402	2730198015	2SC1815(BL) TRANSISTOR
TR403	2730198015	2SC1815(BL) TRANSISTOR
TR501	2730111050	2SC1213A(C) TRANSISTOR
TR502	2710040057	2SC673A(C) TRANSISTOR
TR504	2740065002	2SD880(Y) TRANSISTOR
D301	2760049008	1S2076 DIODE
D302	2760049008	1S2076 DIODE
D303	2760049008	1S2076 DIODE
D304	2760049008	1S2076 DIODE
D305	2760049008	1S2076 DIODE
D306	2760049008	1S2076 DIODE
D307	2760049008	1S2076 DIODE
D308	2760049008	1S2076 DIODE
D309	2760049008	1S2076 DIODE
D310	2760049008	1S2076 DIODE
D311	2760049008	1S2076 DIODE
D312	2760049008	1S2076 DIODE
D313	2760049008	1S2076 DIODE
D314	2760049008	1S2076 DIODE
D315	2760049008	1S2076 DIODE
D316	2760049008	1S2076 DIODE
D317	2760049008	1S2076 DIODE
D401	2760049008	1S2076 DIODE
D402	2760255009	HZ12C-3 DIODE
D503	2760313019	HZ20-2 DIODE
D504	2760313019	HZ20-2 DIODE
D505	2760158009	W06A DIODE
D506	2760158009	W06A DIODE
D507	2760158009	W06A DIODE
D508	2760158009	W06A DIODE
D509	2760158009	W06A DIODE
D510	2760255009	HZ12C-3 DIODE
D515	2760253001	HZ15-2 DIODE
D517	2760049008	1S2076 DIODE
RESISTORS (not included Carbon Film 1/4 Watts ±5% Type)		
VR203, VR202	2110328007	VARIABLE RESISTOR 100 kohm TONE
VR202	2110198004	VARIABLE RESISTOR 250 kohm BALANCE
R345	2412315080	330 ohm ±2% 1/4W CARBON (FUSIBLE)
R346	2412315080	330 ohm ±2% 1/4W CARBON (FUSIBLE)
R347	2432026003	0.47/0.47 ohm ±10% 3.15W ALLOY PLATE
R348	2432026003	0.47/0.47 ohm ±10% 3.15W ALLOY PLATE
R349	2412314049	10 ohm ±5% 1/4W CARBON (NON BURNING)



Ref. No.	Part No.	Part Name & Descriptions
R350	2412314049	10 ohm ±5% 1/4W CARBON (NON BURNING)
R351	2412314049	10 ohm ±5% 1/4W CARBON (NON BURNING)
R352	2412314049	10 ohm ±5% 1/4W CARBON (NON BURNING)
R353	2412313066	47 ohm ±2% 1/4W CARBON (FUSIBLE)
R355	2440033020	220 ohm ±5% 1W METAL OXIDE
R356	2440033020	220 ohm ±5% 1W METAL OXIDE
R501	2412316034	470 ohm ±2% 1/4W CARBON (FUSIBLE)
R502	2412316034	470 ohm ±2% 1/4W CARBON (FUSIBLE)
R509	2412313082	4.7 ohm ±5% 1/4W CARBON (FUSIBLE)
CAPACITORS (not included Ceramic 50WV Type)		
C205	2551084007	0.1µF ±10% 50V PLASTIC FILM
C206	2551084007	0.1µF ±10% 50V PLASTIC FILM
C207	2544140000	4.7µF 35V ELECTROLYTIC
C208	2544140000	4.7µF 35V ELECTROLYTIC
C209	2551120097	0.0056µF ±5% 50V PLASTIC FILM
C210	2551120097	0.0056µF ±5% 50V PLASTIC FILM
C213	2551121096	0.039µF ±5% 50V PLASTIC FILM
C214	2551121096	0.039µF ±5% 50V PLASTIC FILM
C215	2544140000	4.7µF 35V ELECTROLYTIC
C216	2544140000	4.7µF 35V ELECTROLYTIC
C219	2551120000	0.001µF ±5% 50V PLASTIC FILM
C220	2551120000	0.001µF ±5% 50V PLASTIC FILM
C223	2551121009	0.0068µF ±5% 50V PLASTIC FILM
C224	2551121009	0.0068µF ±5% 50V PLASTIC FILM

Ref. No.	Part No.	Part Name & Descriptions
C301	2544128006	22µF 10V ELECTROLYTIC
C302	2544128006	22µF 10V ELECTROLYTIC
C305	2544128006	22µF 10V ELECTROLYTIC
C306	2544128006	22µF 10V ELECTROLYTIC
C325	2551121067	0.022µF ±10% 50V PLASTIC FILM
C326	2551121067	0.022µF ±10% 50V PLASTIC FILM
C332	2544146004	1µF 50V ELECTROLYTIC
C333	2544060025	1µF 100V ELECTROLYTIC
C334	2544050006	100µF 50V ELECTROLYTIC
C401	2544138009	47µF 25V ELECTROLYTIC
C402	2544146004	1µF 50V ELECTROLYTIC
C403	2544138009	47µF 25V ELECTROLYTIC
C505	2544138009	47µF 25V ELECTROLYTIC
C506	2544138009	47µF 25V ELECTROLYTIC
C507	2544139008	100µF 25V ELECTROLYTIC
C508	2544139008	100µF 25V ELECTROLYTIC
C509	2544132005	10µF 16V ELECTROLYTIC
C510	2544132005	10µF 16V ELECTROLYTIC
C514	2544031009	470µF 25V ELECTROLYTIC
C515	2544135002	47µF 16V ELECTROLYTIC
C516	2544146004	1µF 50V ELECTROLYTIC
C517	2544031009	470µF 25V ELECTROLYTIC
OTHER PARTS		
	2220826101	P.W. BOARD

Ref. No.	Part No.	Part Name & Descriptions
	2090047903	JUMPER WIRE USED 36
	2050134908	TERMINAL PIN USED 32
	2124257009	2P PUSH SWITCH FOR SP
	2124367009	3P PUSH SWITCH
L301	2320017001	INDUCTOR
L302	2320017001	INDUCTOR
	2048047007	HEAD PHONE JACK
	EP-5870	FUSE HOLDER USED 4
F301	2061023066	FUSE 125V 4A
F302	2061023066	FUSE 125V 4A
	2090008162	JUMPER SHORT LEAD USED 5

ETC-514B AMP UNIT PARTS LIST (For E2)

Ref. No.	Part No.	Part Name & Descriptions
OTHER PARTS		
F301, 302	2020014003	FUSE CLIP USED 6 (CHANGE)
	2061015087	FUSE (4A) USED 2 (CHANGE)
F501	2061015029	FUSE (T1A) (ADD)

ETC-515 (For E3) P/S & EQ. UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
IC101	2650037007	NJM2043 INTEGRATED CIRCUIT
TR503	2710113023	2SA999(E/F) TRANSISTOR
D501	2760305001	S4VB20 DIODE
D502	2760313019	HZ20-2 DIODE
D511	3939040002	TLG206 (GREEN) LIGHT EMITTING DIODE
D512	3939040002	TLG206 (GREEN) LIGHT EMITTING DIODE
D513	3939040002	TLG206 (GREEN) LIGHT EMITTING DIODE
D514	3939040002	TLG206 (GREEN) LIGHT EMITTING DIODE
RESISTORS (not included Carbon Film 1/4 Watts ±5% Type)		
VR201	2110251006	VARIABLE RESISTOR 100 kohm VOLUME
R203	2420203003	10 Mohm ±10% 1/4W CARBON COMPOSIT
R204	2420203003	10 Mohm ±10% 1/4W CARBON COMPOSIT
R507	2412313053	1 kohm ±2% 1/4W CARBON (FUSIBLE)
CAPACITORS (not included Ceramic 50WV Type)		
C105	2544132005	10µF 16V ELECTROLYTIC
C106	2544132005	10µF 16V ELECTROLYTIC
C109	2544006005	470µF 6.3V ELECTROLYTIC
C110	2544006005	470µF 6.3V ELECTROLYTIC
C111	2551121054	0.018µF ±5% 50V PLASTIC FILM
C112	2551121054	0.018µF ±5% 50V PLASTIC FILM
C113	2551120097	0.0056µF ±5% 50V PLASTIC FILM
C114	2551120097	0.0056µF ±5% 50V PLASTIC FILM
C115	2551120055	0.0027µF ±5% 50V PLASTIC FILM
C116	2551120055	0.0027µF ±5% 50V PLASTIC FILM
C117	2544146004	1µF 50V ELECTROLYTIC
C118	2544146004	1µF 50V ELECTROLYTIC
C121	2544132005	10µF 16V ELECTROLYTIC
C122	2544132005	10µF 16V ELECTROLYTIC
C203	2551080001	0.047µF ±10% 50V PLASTIC FILM
C204	2551080001	0.047µF ±10% 50V PLASTIC FILM
C501	2531053003	0.01µF +10% -0% 500V CERAMIC
C502	2531053003	0.01µF +10% -0% 500V CERAMIC
C503	2546051003	6800µF 50V ELECTROLYTIC
C504	2546051003	6800µF 50V ELECTROLYTIC
C511	2544138009	47µF 25V ELECTROLYTIC
C512	2544141009	10µF 35V ELECTROLYTIC
OTHER PARTS		
2220827003	P.W. BOARD	
2090047903	JUMPER WIRE USED 41	
2050134908	TERMINAL PIN USED 57	
2050151004	8P PUSH TERMINAL	
2050152003	6P CONNECTOR BASE USED 2	
2124368008	4P PUSH SWITCH	
2124254002	SLIDE SWITCH (REMOTE)	
2124168004	1P PUSH SWITCH	
EP-5870	FUSE HOLDER USED 2	
2035622066	5P MINI. CONNECTOR PIN	
2033912008	2P AC OUTLET	
2090008117	JUMPER SHORT LEAD USED 7	
2090008120	JUMPER SHORT LEAD USED 1	

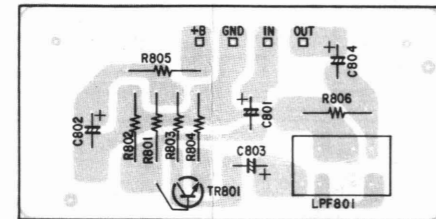
ETC-515B P/S & EQ. UNIT PARTS LIST (For E2)

Ref. No.	Part No.	Part Name & Descriptions
OTHER PARTS		
EP-5870	FUSE HOLDER	(DELETE)
2033912008	2P AC OUTLET	(DELETE)

ETC-515C P/S & EQ. UNIT PARTS LIST (For EC)

Ref. No.	Part No.	Part Name & Descriptions
OTHER PARTS		
2033914006	2P AC OUTLET	(CHANGE)

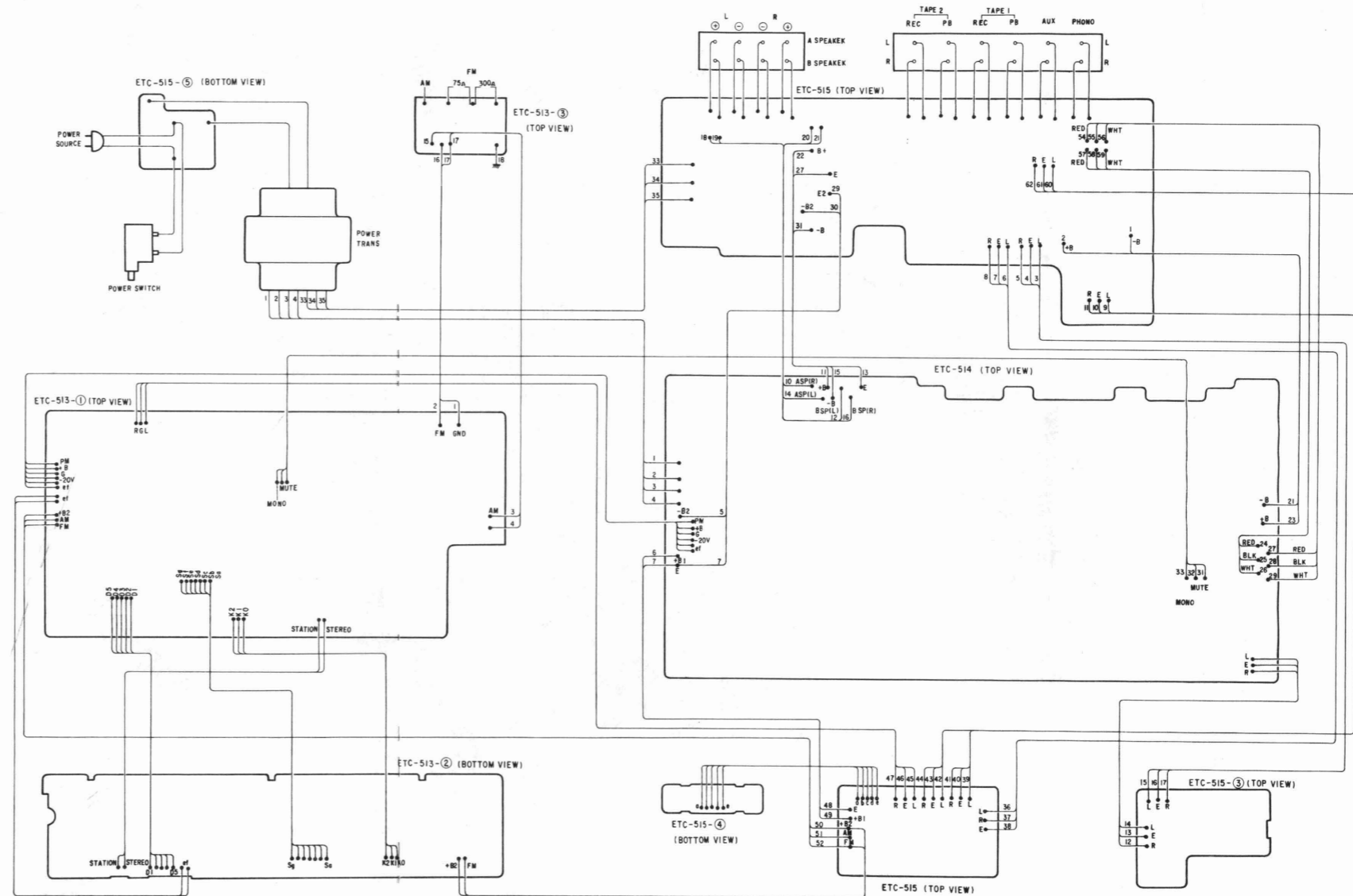
ETC-526 FILTER UNIT (For E2)



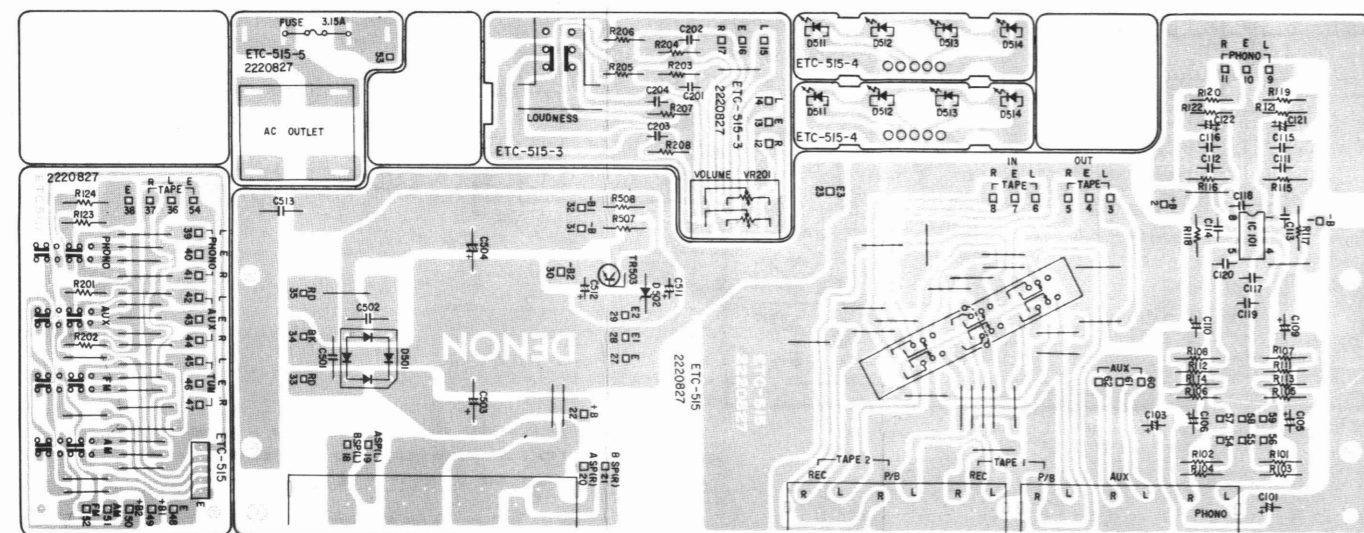
ETC-526 FILTER UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTOR		
TR801	2730204035	2SC2320(F/E) TRANSISTOR
RESISTORS (not included Carbon Film ±5%, 1/4W Type)		
CAPACITORS (not included Ceramic 50V Type)		
C801	2544023004	3.3µF 25V ELECTROLYTIC
C802	2544015009	10µF 16V ELECTROLYTIC
C803	2544015009	10µF 16V ELECTROLYTIC
C804	2544015009	10µF 16V ELECTROLYTIC
OTHER PARTS		
2220839004	P.W. BOARD	
EP-5667H3	TERMINAL FOR WRAPPING PIN USED 4	
2320056004	ANTI BIRDIE FILTER	

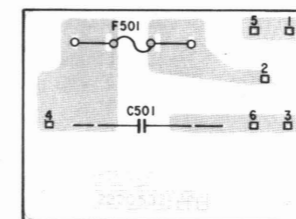
CONNECTION DIAGRAM



ETC-515, 515B P/S & EQ. UNIT



ETC-124G POWER SOURCE UNIT

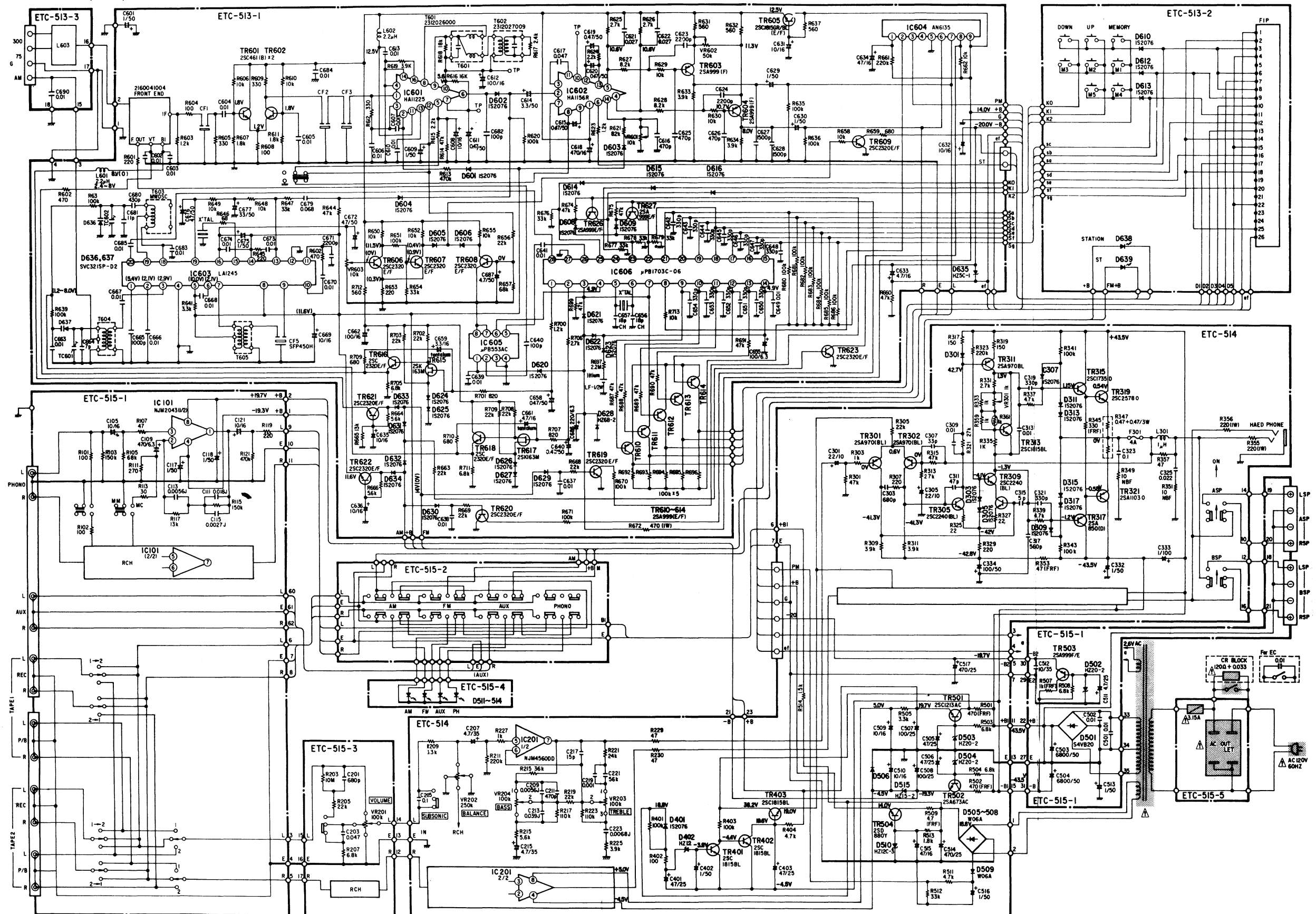


ETC-124G POWER SOURCE UNIT PARTS LIST (For E2)

Ref. No.	Part No.	Part Name & Descriptions
RESISTOR (not included Carbon Film ±5%, 1/4W Type)		
CAPACITORS		
C	2518001007	0.01µF ±20% 450V OIL
C	2518001007	0.01µF ±20% 450V OIL
OTHER PARTS		
2220532107	P.W. BOARD	
2020014033	FUSE CLIP USED 2	
2061015058	FUSE 1.6A	
5130530018	FUSE LABEL	

Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

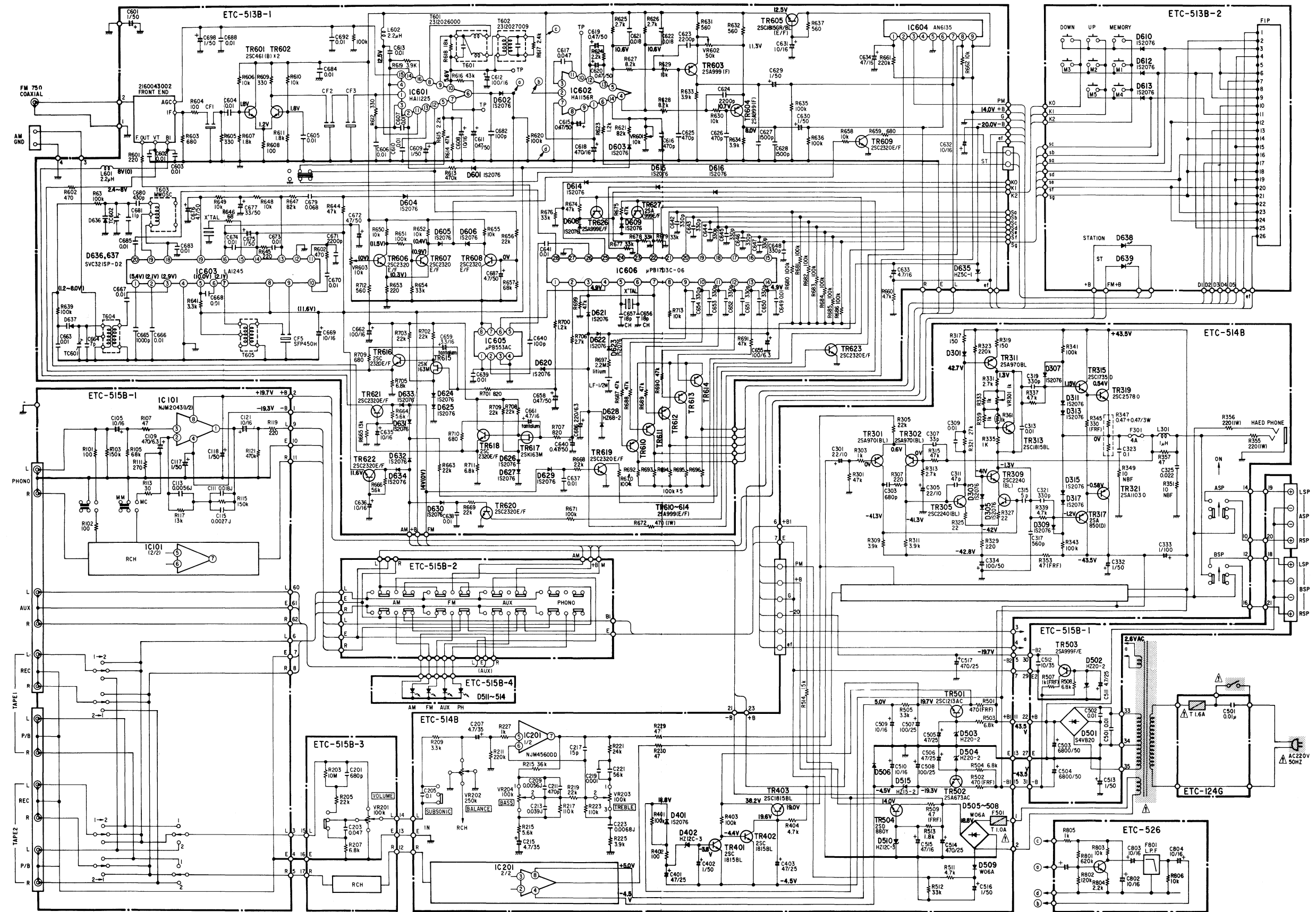
WIRING DIAGRAM (For E3)



NOTES:
 ALL RESISTANCE VALUES IN OHM, K = 1,000 OHM, M = 1,000,000 OHM.
 ALL CAPACITANCE VALUES IN MICROFARAD, P = MICRO-MICRO FARAD.
 EVERY VOLTAGES AND CURRENTS IS MEASURED AT NO SIGNAL INPUT CONDITION.
 () VOLTAGE VALUES ARE IN AM POSITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

WIRING DIAGRAM (For E2)

Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



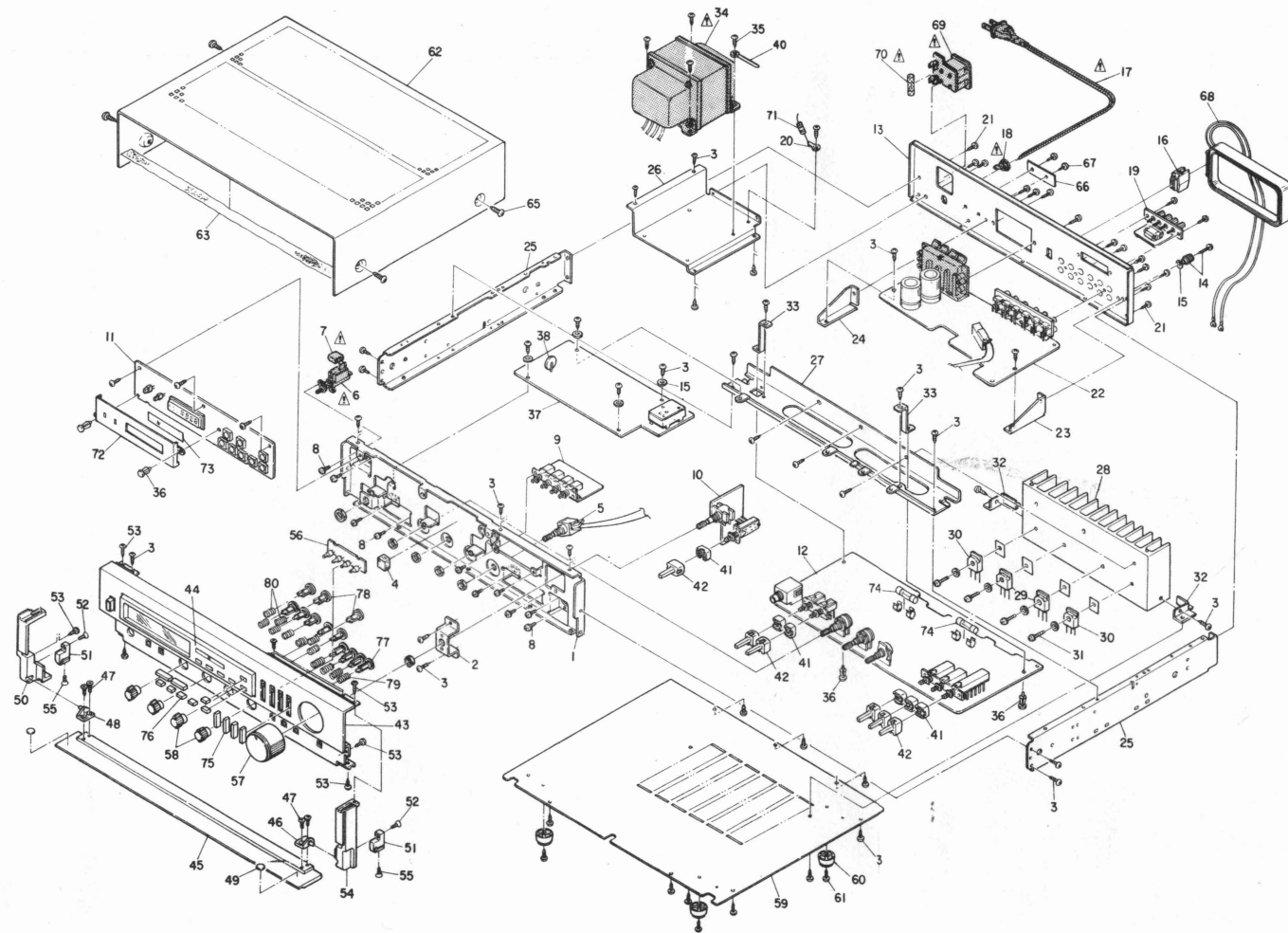
NOTES:
 ALL RESISTANCE VALUES IN OHM, K = 1,000 OHM, M = 1,000,000 OHM.
 ALL CAPACITANCE VALUES IN MICROFARAD, P = MICRO - MICRO FARAD.
 EVERY VOLTAGES AND CURRENTS IS MEASURED AT NO SIGNAL INPUT CONDITION.
 () VOLTAGE VALUES ARE IN AM POSITION.
 CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

EXPLODED VIEW OF CHASSIS AND CABINET (This exploded view for E3)

EXPLODED VIEW OF PARTS LIST

NOTE: See addendum list below for the parts with asterisk(*) on the Ref No. and the other parts not included in the list.

Ref. No.	Part No.	Part Name & Descriptions
1	4110258104	FRONT CHASSIS
2	4120763003	VOLUME BRACKET
3	4730354019	TAPPING SCREW 3x8
4	4610121016	CUSHION
5	2120209006	ROTARY REMOTE SWITCH
* Δ 6	2124154050	POWER SWITCH
* Δ 7	2610035007	C.R. BLOCK
8	4700090006	CROSS PAN SCREW WITH S. WASHER 3x6
* 9	ETC05152	P/S & EQ UNIT (FUNCTION SWITCH)
* 10	ETC0515-3	P/S & EQ UNIT (VOLUME)
* 11	ETC0513-2	TUNER UNIT (DISPLAY)
* 12	ETC0514	AMP UNIT
* 13	1050469001	BACK PANEL
14	2050071016	TERMINAL ASS'Y
15	4770018001	WASHER
16	1460262005	ANTENNA HOLDER
* Δ 17	2062019008	AC CORD
* Δ 18	MD-3802	BUSHING
* 19	ETC0513-3	TUNER UNIT
* 20	2050003107	3T LUG
21	4470064107	FIXING SCREW
* Δ 22	ETC0515	P/S & EQ UNIT
23	4120990009	PCB BRACKET (L)
24	4120989007	PCB BRACKET (R)
25	4110216706	SIDE CHASSIS
26	4120767407	TRANS BRACKET
27	4110344005	CHASSIS FRAME
28	4170168001	POWER RADIATOR
29	2710132004	TRANSISTOR 2SA1103(O)
30	2730234005	TRANSISTOR 2SC2578(O)
31	4700012022	CROSS PAN SCREW WITH S.W. W 3x12
32	4120914001	RADIATOR BRACKET
33	4121065001	FIX. BRACKET
* Δ 34	2335353006	POWER TRANS
35	4734454038	TAPPING SCREW (TRUS) 4x8
36	4770096007	PUSH RIVET
* 37	ETC0513	TUNER UNIT
38	3940005007	LITIUM BATTERY
39	4450033005	WIRE CLAMP BAND USED 10
40	EP-4772	CORD HOLDER
41	1140056007	FLEXIBLE RING
42	1130225026	PUSH KNOB (C)
43	1440984002	FRONT PANEL ASS'Y
44	1460482005	CONTROL PANEL ASS'Y
45	1440719028	DOOR
46	4010057227	SHAFT (R)
47	4712302047	FLAT HEAD SCREW 3x5
48	4010058129	SHAFT (L)
49	1220039012	SPACER
50	1460305111	SIDE PANEL (L)
51	4010088102	HINGE
52	4732306010	FLAT HEAD TAPPING SCREW (I) 3x12
53	4730304014	TAPPING SCREW (I) 3x8
54	1460306110	SIDE PANEL (R)
55	4712305015	FLAT HEAD SCREW 3x10
* 56	ETC0515-4	P/S & EQ UNIT (LED)
57	1120312101	KNOB (A)
58	1120379005	KNOB (C)
59	1050470003	BOTTOM COVER
60	1048001002	FOOT
61	SC-06271	FIX. SCREW
62	1020145009	TOP COVER
63	1220064003	SPACER
64	-	-
65	4734801005	TAPPING SCREW (TRUS) 4x8 (MFCR)
* 66	5130675009	SERIAL NO. PLATE
67	4770126010	RIVET
68	2311060009	LOOP ANTENNA
* Δ 69	2033912008	2P AC OUTLET
* Δ 70	2061023053	FUSE 3.15A
* 71	2420073000	CARBON COMPOSIT RESISTOR 2.2M OHM 1/4W TYPE
72	1440983100	MASK
73	1430243025	FILTER
* 74	2061023066	FUSE 125V 4A
75	1130223015	PUSH KNOB (A) BIG
76	1130213041	PUSH KNOB (A) SMALL
77	1198005107	STOPPER
78	1190030002	STOPPER (B)
79	4630182051	SPRING
80	4630182048	SPRING
PACKING ACCESSORIES (not included EXPLODED VIEW)		
a	5010755052	CARTON CASE
b	5030262004	CUSHION
c	5040052013	CABINET COVER
* d	5130662009	FCC LABEL
* e	5130364006	CAUTION SHEET
f	5020496000	DOOR PAD
g	5050061007	ENVELOPE
* h	5111005009	INST. MANUAL
i	3950005107	FM ANT. ASS'Y



Δ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	E2 for Europe	EC for Canada	EF for France	E1 for Hong Kong Singapore
Δ 6	POWER SWITCH	2124154021			
Δ 7	C.R. BLOCK	-	2588019007		
9	P/S & EQ. UNIT (FUNCTION SWITCH)	ETC0515B-2			
10	P/S & EQ. UNIT (VOLUME)	ETC0515B-3			
11	TUNER UNIT (DISPLAY)	ETC0513B-2			
12	AMP UNIT	ETC0514B			
13	BACK PANEL	1050497002			
Δ 17	AC CORD	2062002031			
Δ 18	BUSHING	4450020005			
19	TUNER UNIT	ETC0513B-3			
20	3T LUG	-			
Δ 22	P/S & EQ. UNIT	ETC0515B			
Δ 34	POWER TRANS	2335370005			
37	TUNER UNIT	ETC0513B			
56	P/S & EQ. UNIT (LED)	ETC0515B-4			
66	SERIAL NO. PLATE	-			
67	RIVET	-			
Δ 69	2P AC OUTLET	-	2033914008		
Δ 70	FUSE 3.15A	-			
71	CARBON COMPOSIT RESISTOR 2.2 MOHM	-			
74	FUSE 125V 4A	-			
81	ANTENNA ADAPTOR (ADD)	2050164004			
82	2P TERMINAL (ADD)	2050165003			
83	CROSS PAN SCREW 2.6x6 (BLACK) (ADD)	4711203037			
84	NUT φ2.6 (N1) (ADD)	4756004000			
85	POWER SOURCE UNIT (ADD)	ETC0124G			
86	BRACKET (A) (ADD)	4120584004			
87	FILTER UNIT (ADD)	ETC0526			
88	PIN CORD (ADD)	2030228012			
PACKING & ACCESSORIES (not included EXPLODED VIEW)					
d	FCC LABEL	-			
e	CAUTION SHEET	-			
h	INST. MANUAL	5111031002			

DENON

NIPPON COLUMBIA CO., LTD.

No. 14-14, 4-CHOME AKASAKA,
MINATO-KU, TOKYO 107 JAPAN

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