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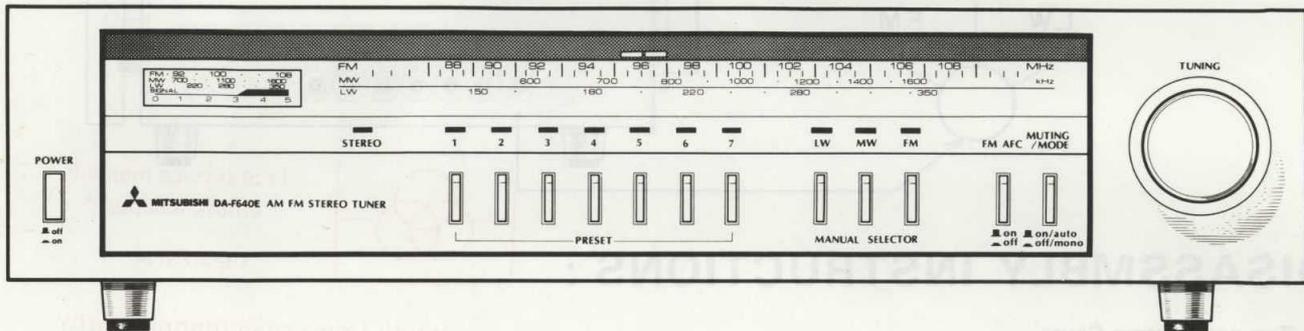
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SERVICE MANUAL

AM FM STEREO TUNER

MODEL DA-F640E



SPECIFICATIONS

1-(1) FM TUNER SECTION (IHF)

Usable sensitivity (at 98MHz)	10.8 dB (1.9 μ V)
50 dB quieting sensitivity (at 98MHz)	
MONO	16.4 dBf (3.6 μ V)
STEREO	37.3 dBf (41 μ V)
Signal to noise ratio (at 98MHz, 1mV)	
MONO	80 dB
STEREO	75 dB
Frequency response	± 3 dB from 40Hz to 15kHz
Total harmonic distortion (at 1kHz, 100% modulation)	
MONO	0.2%
STEREO	0.4%
Capture ratio	1.5 dB
Alternate channel selectivity (at 98MHz)	60 dB
Spurious response ratio (at 98MHz)	70 dB
Image response ratio (at 98MHz)	50 dB
IF response ratio (98MHz)	80 dB
AM suppression ratio	50 dB
Stereo separation	40 dB
Subcarrier product ratio	30 dB
Tuning range	87.5MHz to 108MHz
Output level	320mV

1-(2) FM TUNER SECTION (DIN)

Sensitivity (at 40kHz deviation, 75 Ω)	
MONO (S/N 26 dB)	0.6 μ V
STEREO (S/N 46 dB)	16 μ V
Image frequency rejection (at 98MHz)	50 dB

IF rejection (at 98MHz)	80 dB
Spurious rejection (at 98MHz)	70 dB
AM rejection	50 dB
Selectivity (at 40kHz deviation, ± 300 kHz)	60 dB
Signal to noise ratio (at 40kHz deviation)	
MONO	70 dB
STEREO	68 dB
Total harmonic distortion (at 1kHz, 40kHz, deviation)	
MONO	0.2%
STEREO	0.4%
Stereo separation (at 1kHz, 40kHz deviation)	40 dB
Frequency response	± 3 dB from 40Hz to 15kHz
Output level	200mV

2-(1) MW TUNER SECTION (IHF)

Usable sensitivity	300 μ V/m
Selectivity	30 dB
Total harmonic distortion	1.0%
Image response ratio	35 dB
IF response ratio	30 dB
Hum and noise (94 dB)	50 dB
Tuning range	525kHz to 1605kHz
Output level	110mV

2-(2) MW TUNER SECTION (DIN)

Sensitivity (at 30% modulation, S/N 26 dB)	600 μ V/m
Signal to noise ratio (at 50mV/m, 30% modulation)	50 dB

Selectivity (at ± 9 kHz)	25 dB
Image frequency rejection (at 1 MHz)	35 dB
Total harmonic distortion (at 30% modulation)	1.0%
Output level	110mV

3-(1) LW TUNER SECTION (IHF)

Usable sensitivity (bar aerial)	500 μ V/m
Image response ratio	30 dB
IF response ratio	50 dB
Timing range	150kHz to 350kHz
Output level	110mV

3-(2) LW TUNER SECTION (DIN)

Sensitivity (bar aerial, at 30% modulation, S/N 26 dB)	1000 μ V/m
Image frequency rejection at 250kHz	30 dB
IF rejection at 200kHz	50 dB
Output level	100mV

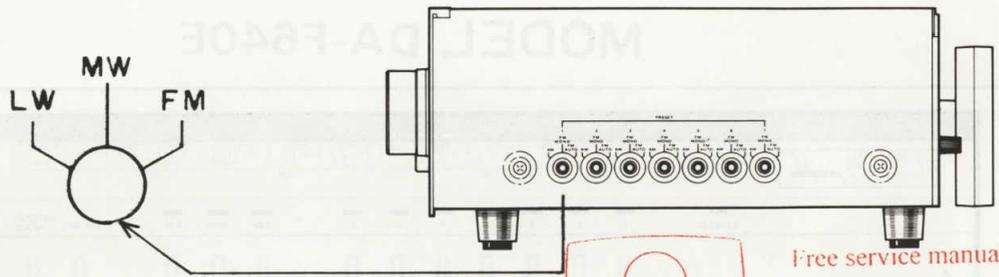
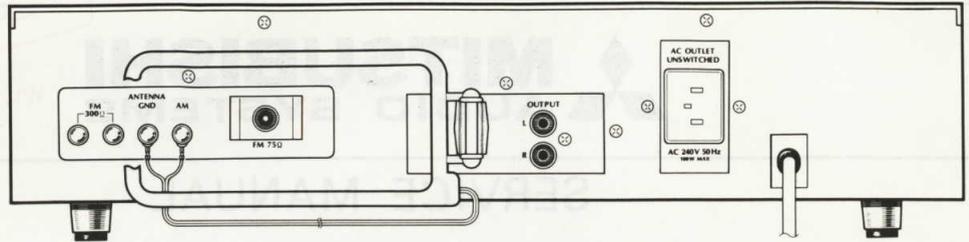
4. GENERAL

Output impedance	3k ohms
Power consumption	10W
Dimensions (W x H x D)	424 x 105 x 266 mm (16-11/16 x 4-1/8 x 10-1/2")
Weight	3.1 kg (6.8 lb)

Design and specifications are subject to change without notice for improvement

MITSUBISHI ELECTRIC CORPORATION

BACK PANEL



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DISASSEMBLY INSTRUCTIONS :

1. Top and Bottom Cover

Remove screws that secure the top and bottom covers then they may be removed.

- When reinstalling the top cover tighten the screws in the rear first.

2. Panel Assembly

- (1) Remove the tuning knob with a 1.5mm Hex wrench.
- (2) Remove the 4 screws securing the front panel to the unit.
- (3) The panel can now be removed.
 - When reinstalling, if the LED's do not go inside the panel, remove two screws as shown in figure 1. Next, install the panel, then insert the LED's, tighten the screws.

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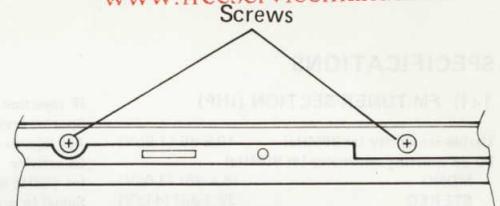


Figure 1

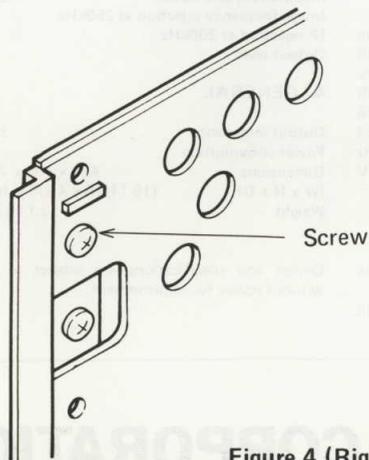


Figure 4 (Right side)

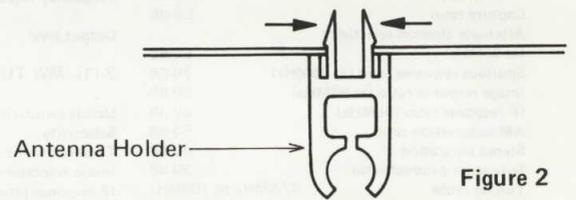


Figure 2

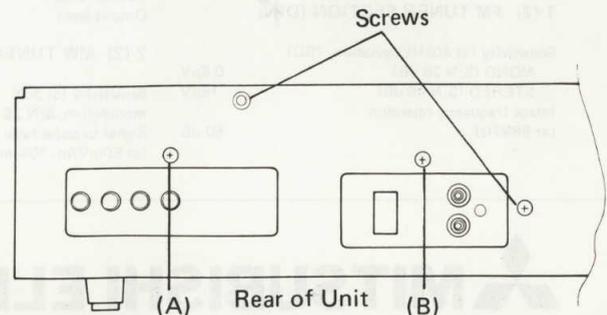


Figure 3

3. Main P.C. Board Removal

- (1) Squeeze the antenna holder at the points shown by the black arrows then carefully pull the antenna holder from its mount.
- (2) Remove the screws shown in figure 3 from the rear of the unit.
- (3) Remove a screw from each side as shown in figure 4.
- (4) Remove the seven screws shown in figure 5. Now the Main P.C. board with the front sub-panel can be removed. By doing this it is not necessary to remove the dial cord.
- (5) When reinstalling insert the rear portion in first. Reinstall screw (A) shown in figure 3.
- (6) Install screw (B) shown in figure 3 along with the lead clammer shown in figure 6. Dial lamp cord should be as shown in figure 5.

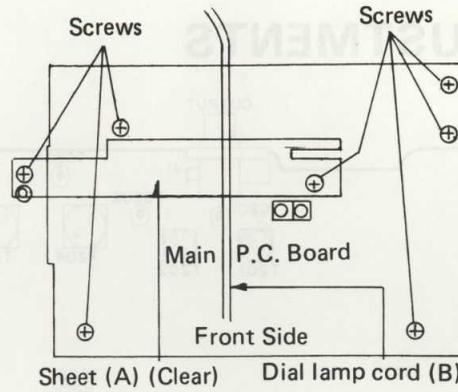


Figure 5

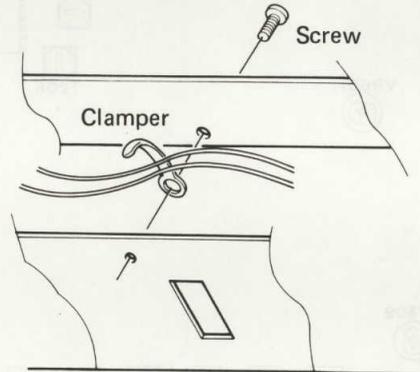
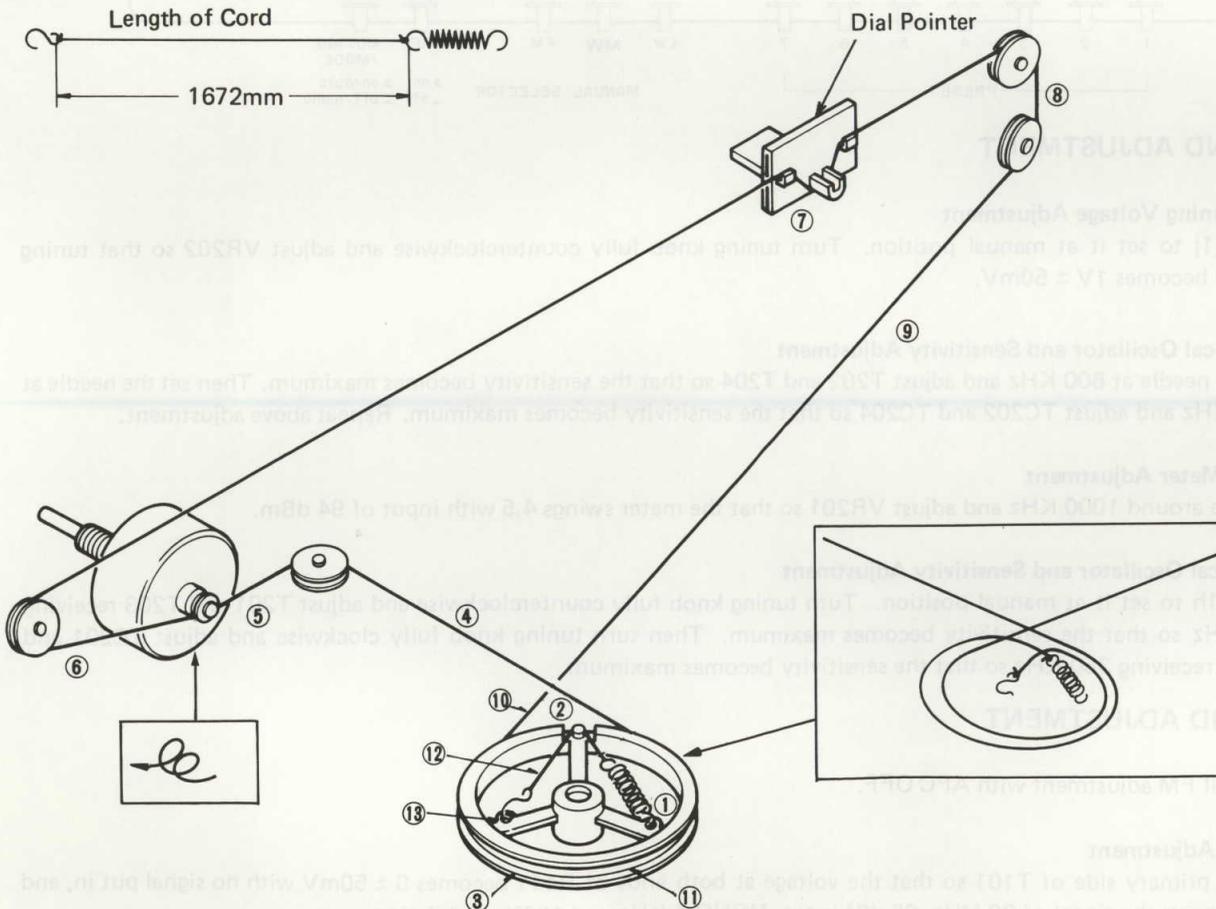
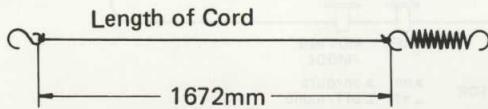
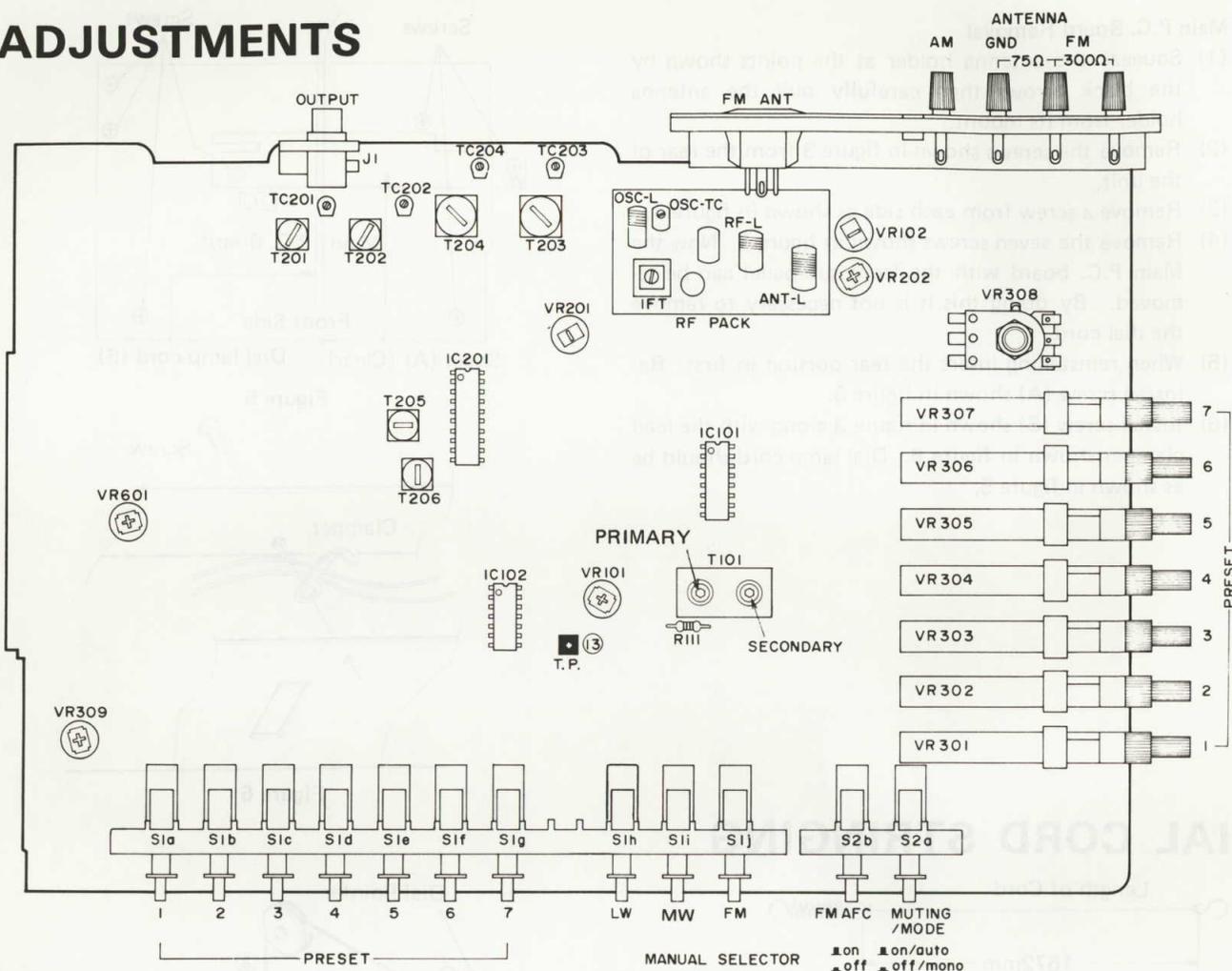


Figure 6

DIAL CORD STRINGING



ADJUSTMENTS



MW BAND ADJUSTMENT

1. MW Tuning Voltage Adjustment

Push S1j to set it at manual position. Turn tuning knob fully counterclockwise and adjust VR202 so that tuning voltage becomes $1V \pm 50mV$.

2. MW Local Oscillator and Sensitivity Adjustment

Set the needle at 600 KHz and adjust T202 and T204 so that the sensitivity becomes maximum. Then set the needle at 1400 KHz and adjust TC202 and TC204 so that the sensitivity becomes maximum. Repeat above adjustment.

3. Signal Meter Adjustment

Receive around 1000 KHz and adjust VR201 so that the meter swings 4.5 with input of 94 dBm.

4. LW Local Oscillator and Sensitivity Adjustment

Push S1h to set it at manual position. Turn tuning knob fully counterclockwise and adjust T201 and T203 receiving 150 KHz so that the sensitivity becomes maximum. Then turn tuning knob fully clockwise and adjust TC201 and TC203 receiving 350 KHz so that the sensitivity becomes maximum.

FM BAND ADJUSTMENT

Perform all FM adjustment with AFC OFF.

1. FM IF Adjustment

Adjust primary side of T101 so that the voltage at both ends of R111 becomes $0 \pm 50mV$ with no signal put in, and then receive the signal of 98 MHz, 65 dBf input, MONO 1 KHz and 100% modulation.

When receiving the signal, the voltage at both ends of R111 above should be $0 \pm 50mV$ after receiving the signal,

adjust secondary side of T101 to make the distortion minimum.
If the voltage at both ends of R111 exceeds $0 \pm 50\text{mV}$ in above case, adjust primary side also.

2. FM Tuning Voltage Adjustment

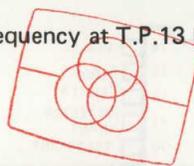
Push S1j to set it at manual position. Turn tuning knob fully counterclockwise and set the needle of dial scale at "0". Turn tuning knob clockwise to set the needle at 108 MHz and adjust VR601 to receive 108 MHz. Then turn tuning knob counterclockwise to set the needle at 88 MHz and adjust VR102 to receive 88 MHz. Repeat above adjustment. After completing adjustment to set the needle at 88 MHz and 108 MHz on the scale panel, receive 94 MHz and fix the needle at 94 MHz. (When adjusting the needle, fix it on the edge of the letter where the needle inclines to.) For USA model, receive 98 MHz and fix the needle at 98 MHz.

3. F. Meter Adjustment

Adjust VR309 to set F. Meter needle at 108 MHz under the condition of 108 MHz reception.

4. MPX Adjustment

Receive 98 MHz and 65 dBf modulation, and adjust VR101 so that the frequency at T.P.13 becomes $19\text{KHz} \pm 50\text{Hz}$.

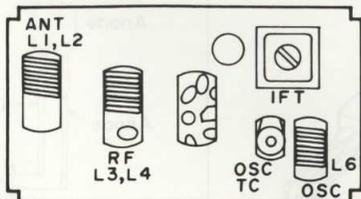
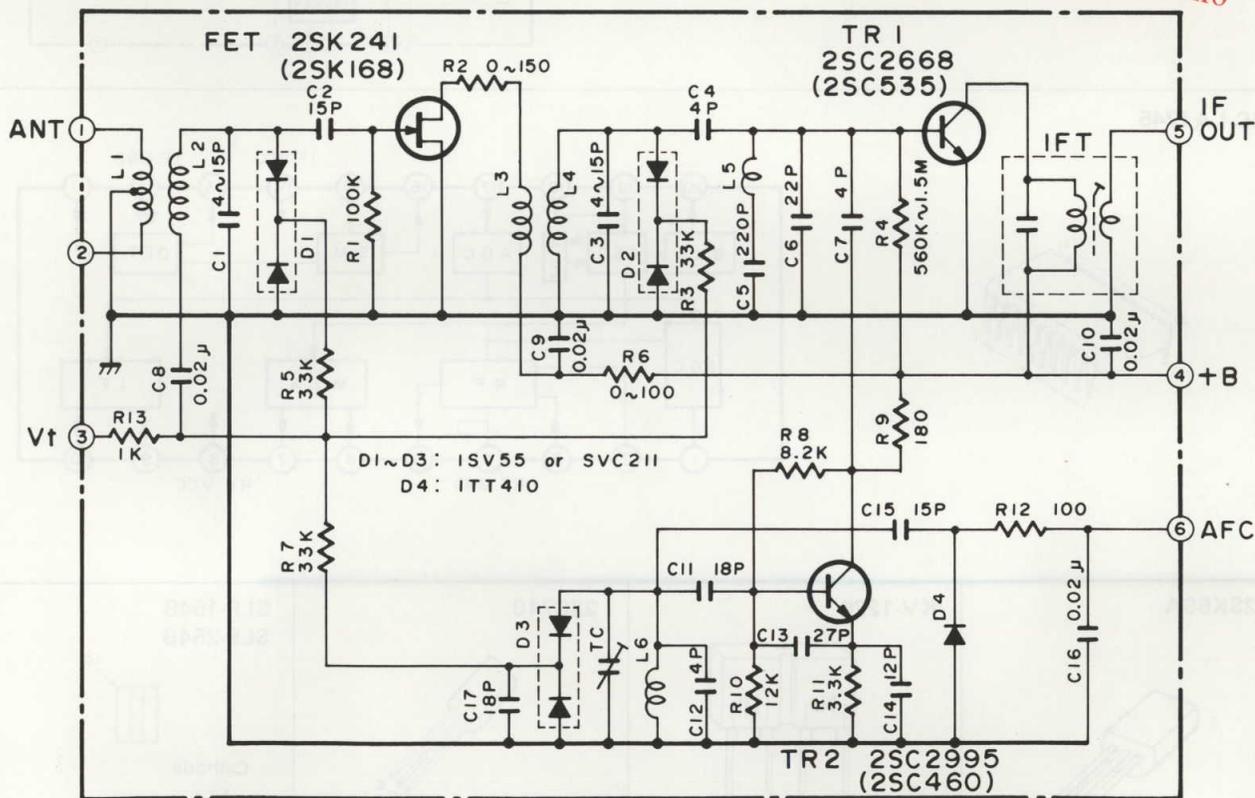


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RF FRONT-END

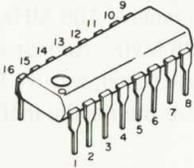
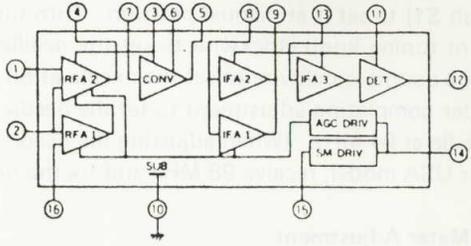


NOTES:

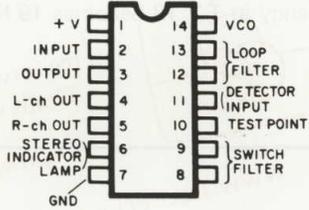
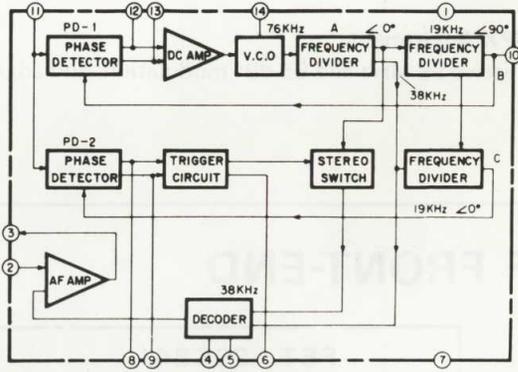
- 1) TERMINAL NUMBER REFER TO OVERALL APPEARANCE.
- 2) RECEIVING FREQUENCY 87.5 - 108 MHz.
- 3) INPUT IMPEDANCE 300 OHMS.
- 4) OUTPUT IMPEDANCE 300 OHMS.
- 5) SUPPLY VOLTAGE 12V.
- 6) TUNING VOLTAGE 3 - 23V.
- 7) AFC VOLTAGE 5.6V.

INTERNAL DIAGRAMS AND PINOUT OF INTEGRATED CIRCUIT

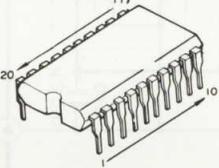
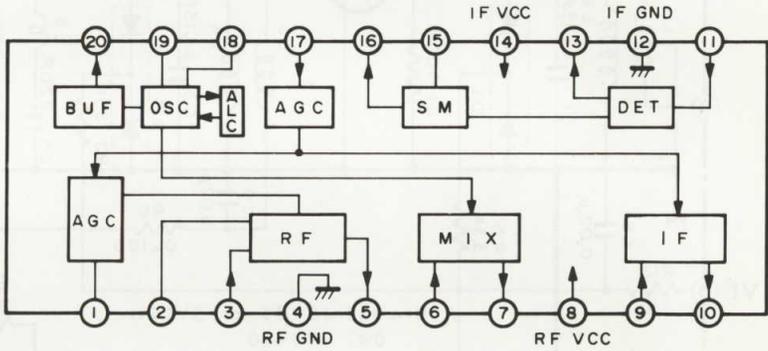
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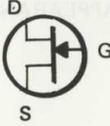
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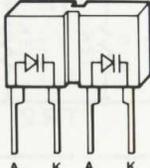
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2SK68A

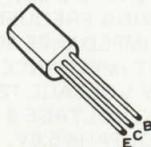



KV-1226



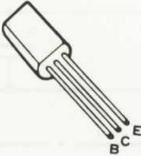
A₁ K₁ A₂ K₂

**2SA1115
2SC2603
2SD1012**



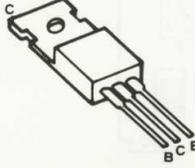
C B E

2SC710



B C E

2SD330

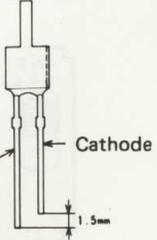


C B E

**SLP-154B
SLP-254B**



Cathode

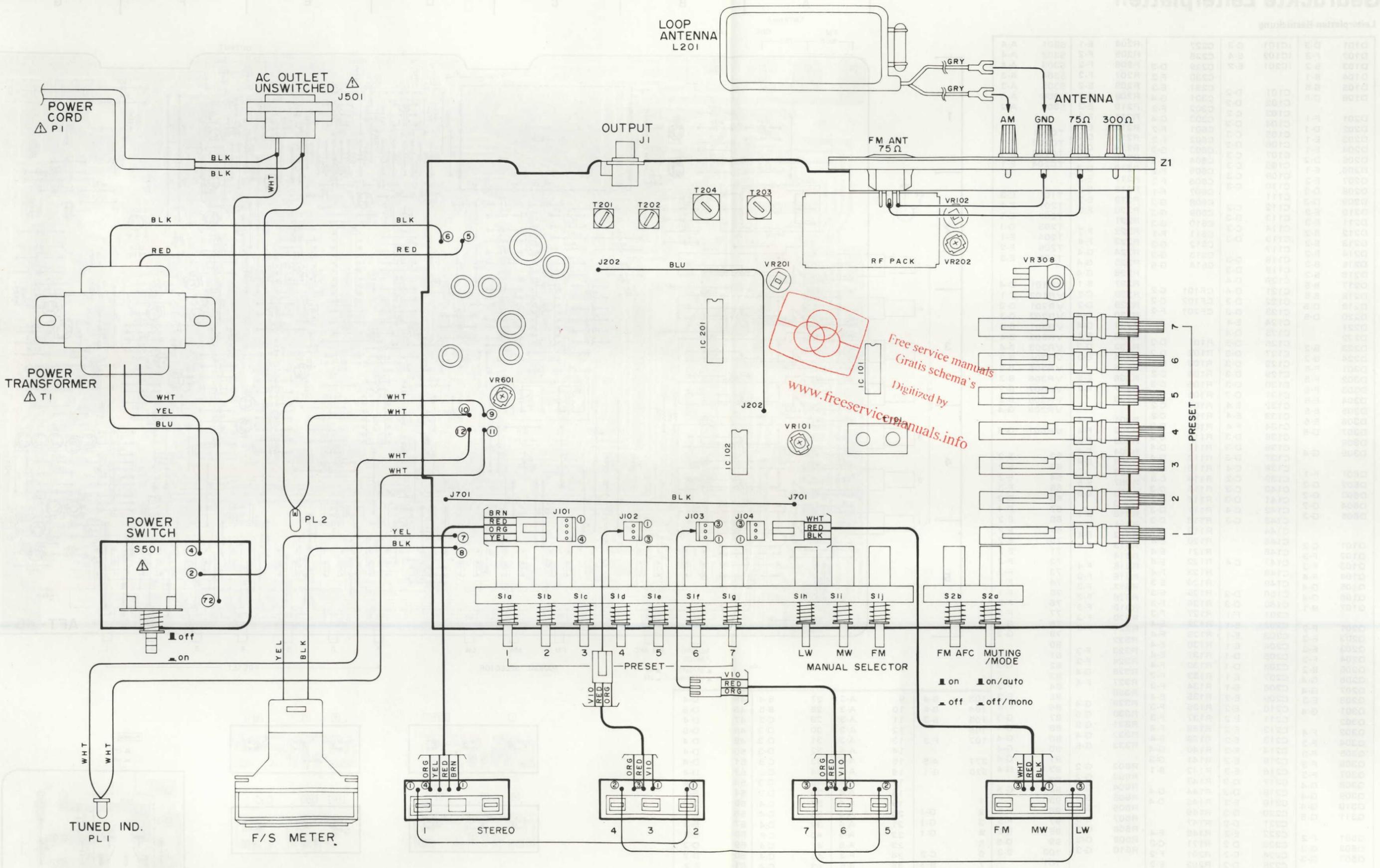


Anode

Anode Cathode

1.5mm

WIRING DIAGRAM:

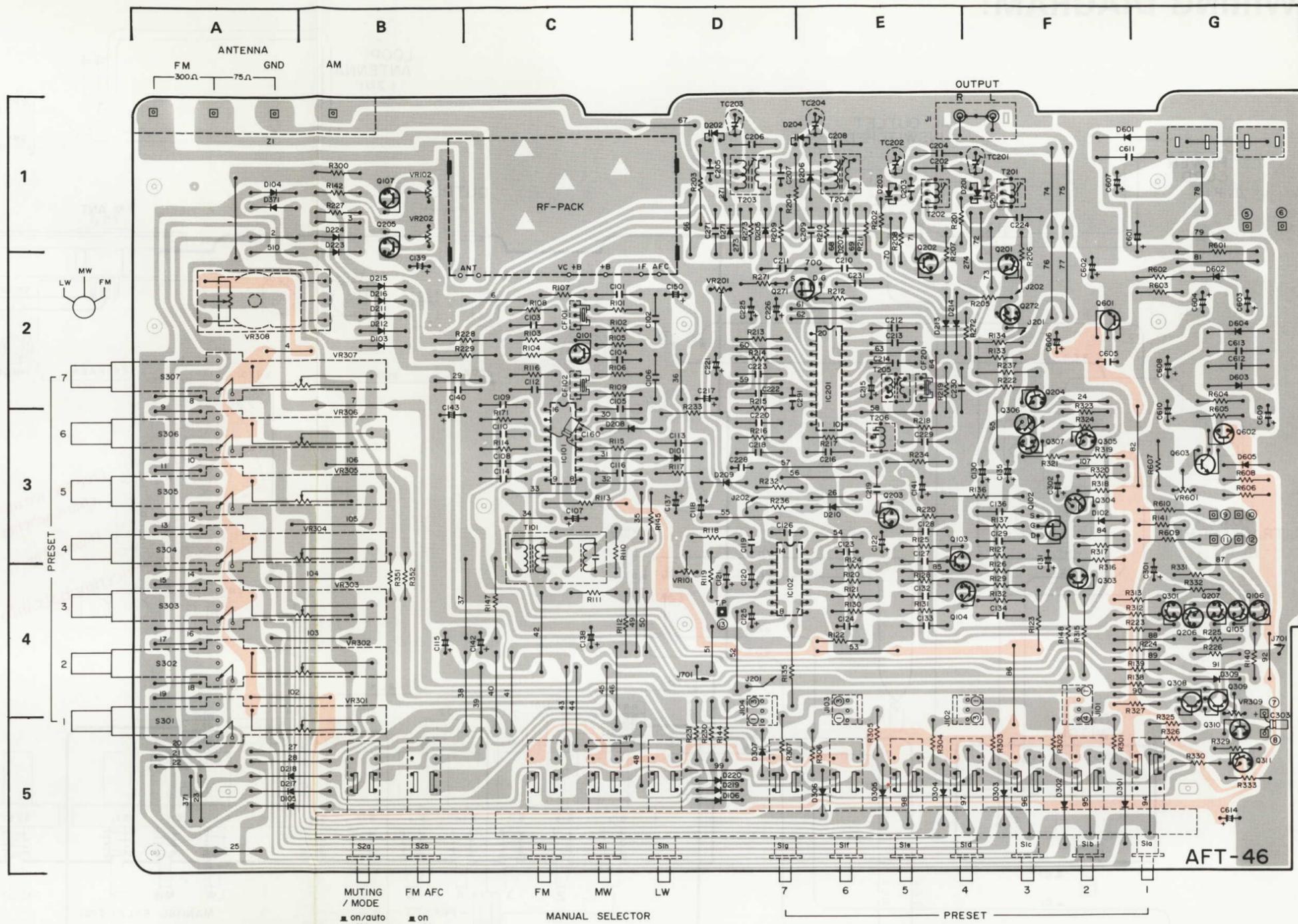


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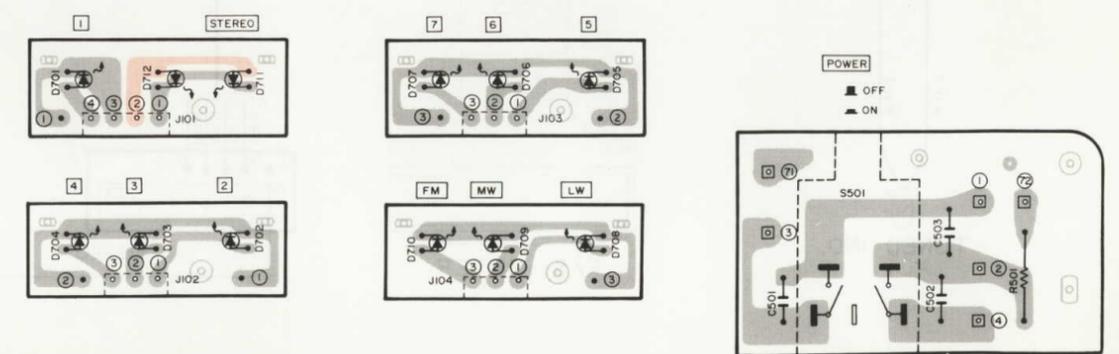
Gedruckte Leiterplatten

Leiterplatten-Bestückung

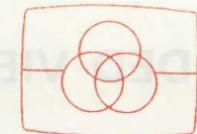
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D102	F-3	IC102	E-4	C228	R205	F-2	S302	A-4	
D103	B-2	IC201	E-2	C229	D-3	R206	F-2	S303	A-4
D104	B-1			C230	F-2	R207	F-2	S304	A-3
D105	B-5			C291	E-3	R208	E-2	S305	A-3
D106	D-5	C101	D-2	C301	G-4	R209	E-2	S306	A-3
		C102	D-2	C302	F-3	R210	E-2	S307	A-2
D201	F-1	C103	C-2	C303	G-4	R211	E-2		
D202	D-1	C104	D-2	C601	F-2	R212	E-2	TC201	F-1
D203	E-1	C105	C-3	C602	F-2	R213	D-2	TC202	E-1
D204	E-1	C106	D-2	C603	G-2	R214	D-2	TC203	D-1
D205	D-2	C107	C-3	C604	G-2	R215	D-3	TC204	E-1
D206	E-1	C108	C-3	C605	F-2	R216	D-3		
D207	E-2	C109	C-3	C606	F-2	R217	E-3		
D208	D-3	C110	C-3	C607	F-1	R218	E-3	T101	C-3
D209	D-3	C111		C608	G-2	R219	E-2	T201	F-1
D210	E-3	C112	C-2	C609	G-3	R220	E-3	T202	E-1
D211	E-3	C113	D-3	C610	G-3	R221	F-2	T203	D-1
D212	B-2	C114	C-3	C611	F-1	R222	F-2	T204	E-1
D213	E-2	C115	D-3	C612	G-2	R223	F-4	T205	E-2
D214	F-2	C117		C613	G-2	R224	G-4	T206	E-3
D215	B-2	C118	D-3	C614	G-5	R225	G-4		
D216	B-2	C119	D-3			R226	G-4		
D217	B-5	C120	D-4			R227	B-1	VR101	D-4
D218	B-5	C121	D-4	CF101	C-2	R228	C-2	VR102	C-1
D219	D-5	C122	D-3	CF102	C-2	R229	C-2	VR201	D-2
D220	D-5	C123	D-3	CF201	F-2	R230	D-4	VR202	C-3
D221		C124	E-4			R231	D-4	VR301	B-4
D222		C125	D-4			R232	E-3	VR302	B-4
D223	B-2	C126	D-3	R101	D-2	R233	D-3	VR303	B-4
D224	B-2	C127	D-3	R102	D-2	R234	E-3	VR304	B-3
D301	F-5	C128	D-3	R103	C-2	R235	E-3	VR305	B-3
D302	F-5	C129	D-3	R104	C-2	R236	E-3	VR306	B-3
D303	F-5	C130	D-3	R105	D-2	R237	F-2	VR307	B-2
D304	E-5	C131	D-3	R106	D-2	R238	F-2	VR308	B-2
D305	E-5	C132	E-4	R107	C-2			VR309	G-4
D306	E-5	C133	E-4	R108	C-2	R301	F-4		
D307	D-5	C134	F-4	R109	D-2	R302	F-4	VR601	G-3
D308		C135	D-3	R110	D-3	R303	F-4		
D309	G-4	C136	D-3	R111	D-4	R304	E-4		
		C137	D-3	R112	D-4	R305	E-4		
		C138	C-4	R113	D-3	R306	E-2		
D601	F-1	C139	C-2	R114	C-3	R307	E-5		
D602	G-2	C140	C-3	R115	D-3	R308	E-5		
D603	G-2	C141	D-3	R116	C-2	R309	E-5		
D604	G-2	C142	C-4	R117	D-3	R310	B-1		
D605	G-3	C143	C-3	R118	D-3	R311	B-1		
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Q101	C-2	C145		R120	E-4	R313	F-4		
Q102	F-3	C146		R121	E-4	R314	F-4		
Q103	F-3	C147	C-4	R122	E-4	R315	F-4		
Q104	F-4	C148		R123	F-4	R316	F-3		
Q105	G-4	C149		R124	E-3	R317	F-3		
Q106	G-4	C150	D-2	R125	E-3	R318	F-3		
Q107	B-1	C160	D-3	R126	F-3	R319	F-3		
		C201	F-1	R127	F-3	R320	F-3		
Q201	F-2	C202	E-1	R128	E-4	R321	F-3		
Q202	E-2	C203	E-1	R129	F-4	R322	F-3		
Q203	E-3	C204	E-1	R130	E-4	R323	F-3		
Q204	F-3	C205	D-1	R131	E-4	R324	F-3		
Q205	B-2	C206	D-1	R132	F-4	R325	G-4		
Q206	G-4	C207	E-1	R133	F-2	R327	F-4		
Q207	G-4	C208	E-1	R134	F-2	R328			
Q208	E-3	C209	E-2	R135	E-4	R329	G-4		
Q301	G-4	C210	E-2	R136	F-3	R330	G-5		
Q302		C211	E-2	R137	F-3	R331	G-3		
Q303	F-4	C212	E-2	R138	F-4	R332	G-4		
Q304	F-3	C213	E-2	R139	F-4	R333	G-5		
Q305	F-3	C214	E-2	R140	G-4				
Q306	F-3	C215	E-2	R141	G-3				
Q307	F-3	C216	E-3	R142	B-1	R602	G-2		
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Q309	G-4	C218	D-3	R144	D-4	R604	G-3		
Q310	G-4	C219	E-3	R145	D-4	R605	G-3		
Q311	G-5	C220	D-3	R146		R606	G-3		
		C221	D-2	R147		R607	G-3		
Q601	F-2	C222	E-2	R148	F-4	R608	G-3		
Q602	G-3	C223	D-2	R171	C-3	R609	G-3		
Q603	G-3	C224	E-2	R201	F-2	R610	G-3		
		C225	D-2	R202	E-2				
		C226	E-2	R203	D-1				



103	B-4	9	A-3	27	B-4	45	D-4
104	B-4	10	A-3	28	B-5	46	D-6
105	B-3	11	A-3	29	C-2	47	D-4
106		12	A-3	30	D-3	48	D-5
107	F-3	13	A-3	31	D-3	49	D-4
		14	A-4	32	D-3	50	D-4
		15	A-4	33	C-3	51	D-4
371	A-5	16	A-4	34	C-3	52	D-4
570	G-1	17	A-4	35	D-3	53	E-4
		18	A-4	36	D-2	54	E-3
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2	G-1	21	A-4	39	C-4	57	E-3
3	G-1	22	A-5	40	C-4	58	E-3
4	G-1	23	A-5	41	C-4	59	D-2
5		24	F-3	42	C-4	60	D-2
6	C-2	25	B-5	43	C-4	61	D-2
7	B-3	26	E-3	44	C-4		E-2
8	A-3						

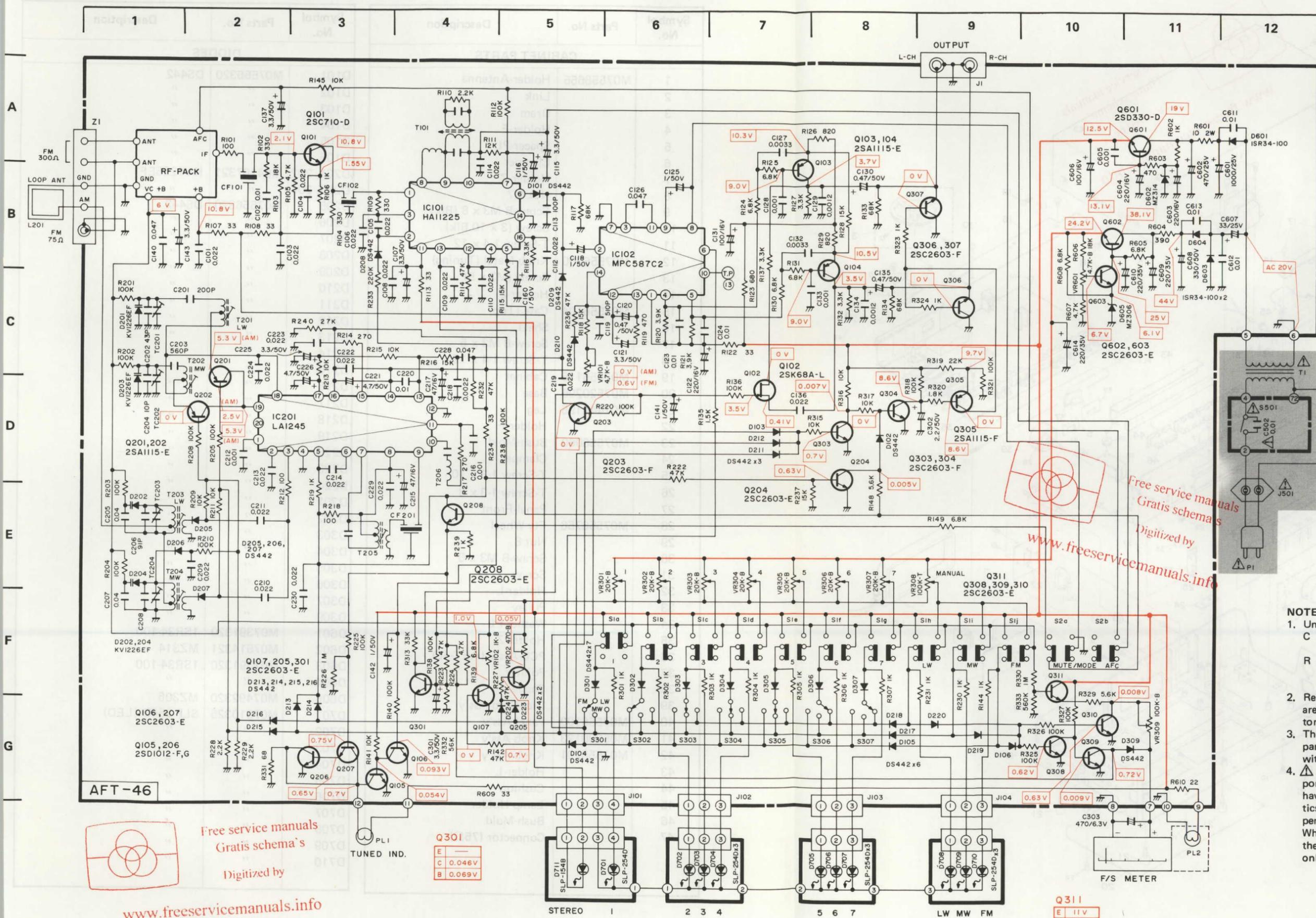


SCHEMATIC DIAGRAM



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IC101 (FM)

1	1.35V	9	5.5V
2	1.36V	10	5.5V
3	1.35V	11	12V
4	0V	12	0.33V
5	0V	13	0.18V
6	4.8V	14	0V
7	5.3V	15	—
8	5.5V	16	3.1V

IC102 (AM) (FM)

1	12V	12V
2	1.42V	2.3V
3	4.6V	4.6V
4	9.5V	9.5V
5	9.5V	9.5V
6	11V	11V
7	0V	0V
8	0V	0V
9	1.55V	1.4V
10	3.0V	1.5V
11	1.55V	1.85V
12	2.1V	1.9V
13	1.2V	1.9V
14	2.3V	3.0V

IC201 (AM)

1	2.0V	11	0.68V
2	2.3V	12	0V
3	2.3V	13	3.0V
4	0V	14	10.5V
5	11V	15	1.5V
6	1.75V	16	2.3V
7	10.2V	17	3.0V
8	10.2V	18	5.3V
9	2.7V	19	5.3V
10	8.4V	20	—

Q311

E	11V
C	24.5V
B	0.6V

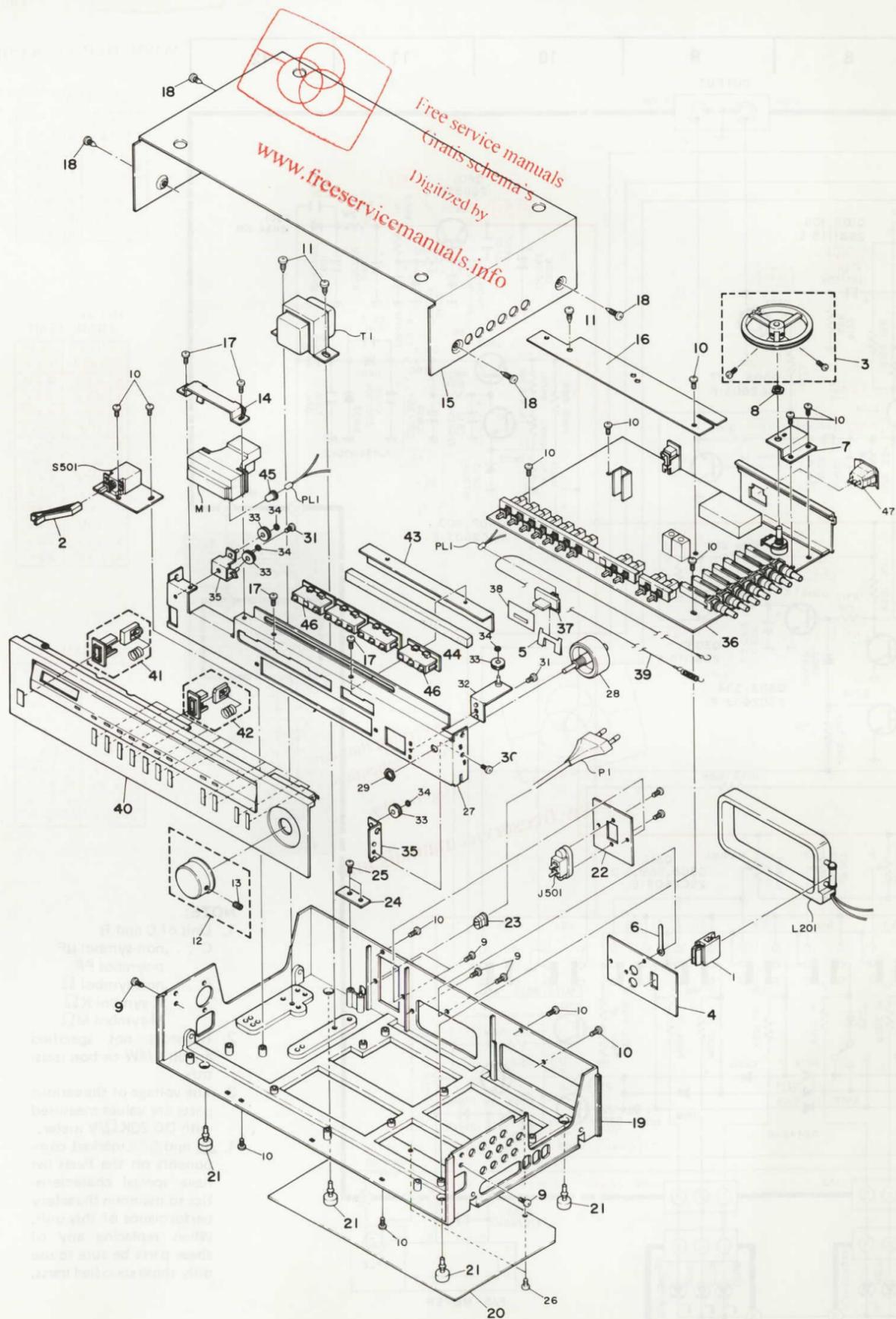
NOTE:

- Unit of C and R
C . . .non-symbol μ F
p-symbol PF
R . . .non-symbol Ω
K-symbol K Ω
M-symbol M Ω
- Resistors not specified are all 1/4W carbon resistors.
- The voltage of the various parts are values measured with DC 20K Ω /V meter.
- Δ and \square marked components on the Parts list have special characteristics to maintain the safety performance of this unit. When replacing any of these parts be sure to use only those specified parts.

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EXPLODED VIEW



PARTS LIST

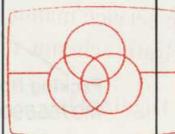
NOTE: and marked components on the parts list have special characteristics to maintain the safety performance of this unit. When replacing any of these parts, be sure to use only the specified parts.

Symbol No.	Parts No.	Description	Symbol No.	Parts No.	Description
CABINET PARTS			DIODES		
1	M07556655	Holder-Antenna	D101	M07556320	DS442
2		Link	D102	"	"
3		Dram	D103	"	"
4		Holder-F	D104	"	"
5		Spacer-PL	D105	"	"
6		Clamper	D106	"	"
7		Holder-Z	D201, 202	M04167321	KV1226EF
8		Nut M7	D203, 204	"	"
9		Screw-B M3 x 8 (BIK)	D205	M07556320	DS442
10		Screw (3 x 10 BIK)	D206	"	"
11		T-Screw 1-4 x 12	D207	"	"
12	M07556200	Knob-Metal (Tuning)	D208	"	"
13		Screw (M3 x 5)	D209	"	"
14		Holder-Z	D210	"	"
15	M07556104	Case (Top)	D211	"	"
16		Sheet	D212	"	"
17		Screw-B M3 x 5	D213	"	"
18		T-Screw 1-4 x 12	D214	"	"
19	M07556116	Cabinet	D215	"	"
20	M07520296	Base	D216	"	"
21	M07444195	Leg	D217	"	"
22		Holder-F	D218	"	"
23	M07556060	Bush-Mold	D219	"	"
24		Clamper	D220	"	"
25		T-Screw 1-3 x 10	D223	"	"
26		T-Screw 1-3 x 8	D224	"	"
27		Panel-Front	D301	"	"
28	M07556756	Fly-Wheel	D302	"	"
29		Nut 8	D303	"	"
30		Screw-B M3 x 5	D304	"	"
31		Screw	D305	"	"
32		Holder-L	D306	"	"
33		Pulley	D307	"	"
34		Washer-PL	D309	"	"
35		Holder-Z	D601	M07391320	1SR34-100
36		PCB-Ass'y (AFT-46)	D602	M07514321	MZ314
37		Pointer	D603	M07391320	1SR34-100
38		Shade	D604	"	"
39		Dial-Cord-Ass'y	D605	M07492320	MZ306
40	M07556100	Panel-Ass'y	D701	M07510325	SLP-254D (LED)
41	M05200123	Knob-Ass'y	D702	"	"
42	M07556201	Knob-Ass'y	D703	"	"
43		Holder-L	D704	"	"
44		Cushion	D705	"	"
45		Lamp-Holder	D706	"	"
46		Bush-Mold	D707	"	"
47		Connector (75Ω)	D708	"	"
			D709	"	"
			D710	"	"

NOTE:  and  marks components on Parts list are for performance of this unit, replace them, use safety critical components or designed components as specified.

Symbol No.	Part No.	Description
D711	M07444320	SLP-154B
TRANSISTORS		
Q101	M04070304	2SC710 (D)
Q102	M07139304	2SK68A
Q103	M07556300	2SA1115 (E)
Q104	"	"
Q105	M07454303	2SD1012 (F, G)
Q106	M07543300	2SC2603 (E)
Q107	"	"
Q201	M07556300	2SA1115 (E)
Q202	"	"
Q203	M07390303	2SC2603 (F)
Q204	M07543300	2SC2603 (E)
Q205	"	"
Q206	M07454303	2SD1012 (F, G)
Q207	M07390303	2SC2603 (F)
Q208	M07543300	2SC2603 (E)
Q301	"	"
Q303	M07390303	2SC2603 (F)
Q304	"	"
Q305	M07390304	2SA1115 (F)
Q306	M07390303	2SC2603 (F)
Q307	"	"
Q308	M07543300	2SC2603 (E)
Q309	"	"
Q310	"	"
Q311	"	"
Q601	M07061304	2SD330 (F)
Q602	M07543300	2SC2603 (E)
Q603	"	"
IC's		
IC101	M07465343	HA11225
IC102	M07361344	MPC587C2
IC201	M07556310	LA1245
ELECTRICAL PARTS		
C502	M07554430	C-Ceramic-400V103P 
CF101	M07532445	Ceramic-Filter
CF102	"	"
CF201	M07556445	Ceramic Filter

Symbol No.	Part No.	Description
J1	M07556481	Terminal-Board (Pin)
J501	M07535465	Socket (AC) 
L201	M07556516	Coil-Ant
M1	M07556560	Meter
P1	M05209700	Power-Cord 
PL1	M07556565	Lamp
RF	M07556540	RF-Pack
S1	M07556356	SW-Push
S2	M07556355	SW-Push
S501	M05113430	SW-Push (Power) 
T1	M07556500	Trans-Power 
T101	M07482510	Trans-IF
T201	M07556510	Coil-OSC
T202	M07556511	Coil-OSC
T203	M07556512	Coil-Ant.
T204	M07556513	Coil-Ant.
T205	M07556502	Trans-IF
T206	M07556503	Trans-IF
TC201	M07556425	VC-Trim-30N750 (Grn)
TC202	"	"
TC203	"	"
TC204	"	"
VR101	M07115352	VR-Semi-B4.7K
VR102	M05067353	VR-Semi-B1K
VR201	M05067352	VR-Semi-B10K
VR202	M07556411	VR-Semi-B470
VR301	M07556410	VR-Semi-B20K
VR302	"	"
VR303	"	"
VR304	"	"
VR305	"	"
VR306	"	"
VR307	"	"
VR308	M07556400	VR-W
VR309	M07213437	VR-Semi-B100K
VR601	M07115352	VR-Semi-B4.7K
Z1	M07556480	Terminal-Board (Ant)

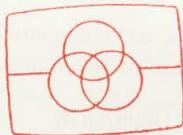
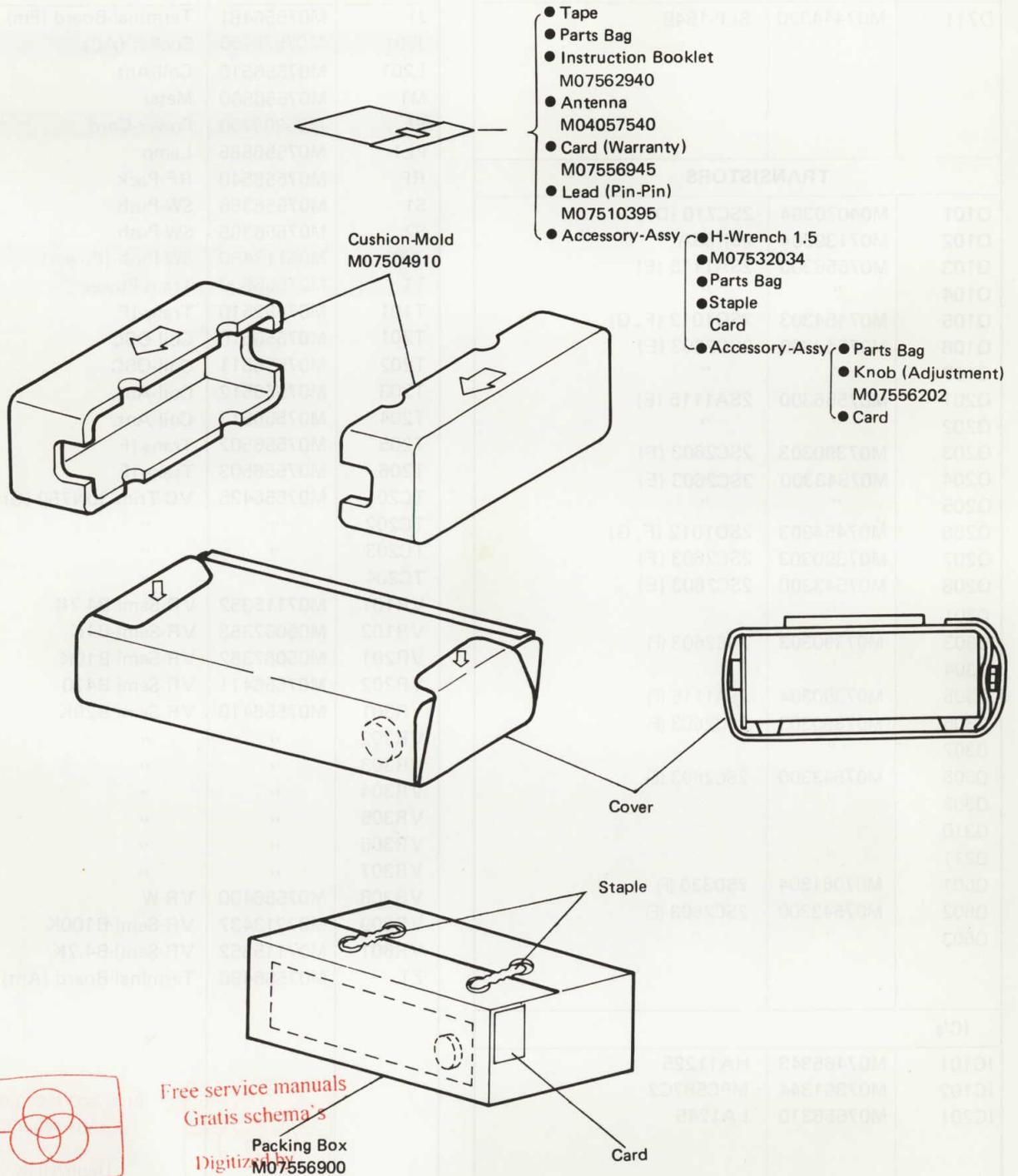


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