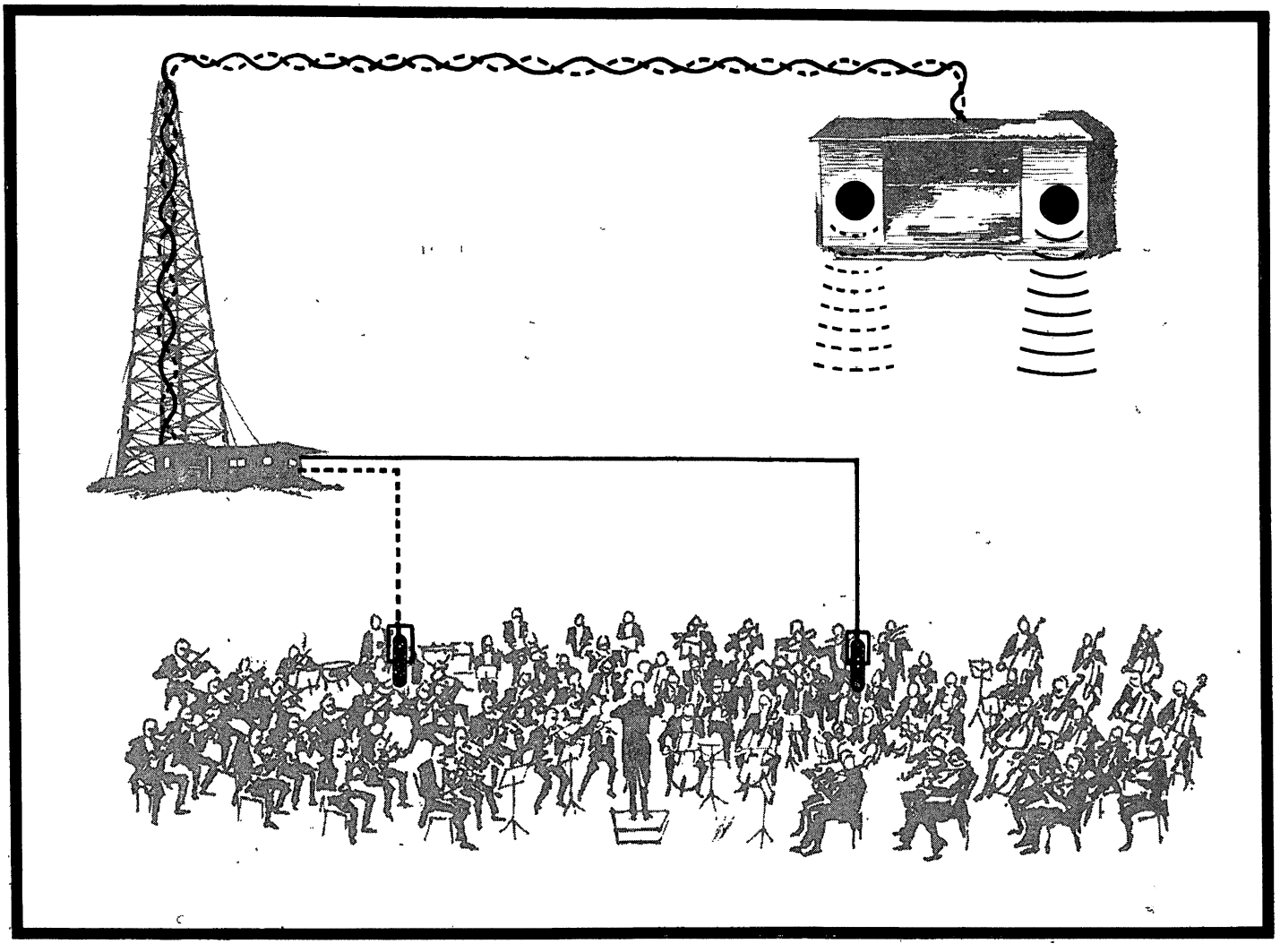
HF 26

HF 26

ZENITH®

SERVICE MANUAL



HIGH FIDELITY AND STEREO FM MODELS

ZENITH RADIO CORPORATION

1900 N. AUSTIN AVENUE CHICAGO, ILLINOIS 60639

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Solid State Device Theory and Circuit Applications are found in the following Service Manuals:

HF 18: Theory – Diodes (including Zener and SCR), Transistors (PNP, NPN, Darlington, and JFET). Applications – Chassis 29AT24 (JFET FM-RF, Multiplex, Electronic Touch Switching), Complementary Symmetry, Chassis 11ZT27 (Electronic Filter).

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FEATURES OF HIGH FIDELITY & STEREO FM MODELS

CABINET			CHASSIS			SPEAKERS		
MODEL	STYLE	COLOR	MODEL	TYPE	MPO OUTPUT NOTE II	PART NUMBER	VOICE COIL IMPED. (In Ohms)	SIZE (In Inches)
B505B Note 2 (RA7)	Portable (Removable Lid)	Blue & White	—	Phono Only	—	849-48B	8	1-3½
B505F Note 2 (RA7)	Portable (Removable Lid)	Green & White	—	Phono Only	—	849-48B	8	1-3½
D507F	Portable (With Handle, Lift Lid)	Green	3AT20	Phono Only	1x1W	49-1184	32	1-2x6
D507L	Portable (With Handle, Lift Lid)	Beige	3AT20	Phone Only	1x1W	49-1184	32	1-2x6
B525J Note 2 (RA7)	Portable (Removable Lid)	Brown & Beige	—	AM/Phono	—	849-48B	8	1-3½
C526R Note 2 (RA29)	Portable (Removable Lid)	Rosewood	—	FM/AM/Phono	—	849-66B	8	1-3½
D535L	Portable (With Handle, Lift Lid, Detachable Speaker Enclosures)	Beige	1WDA10	Phono Only	2x1W	49-1230	16	2-4
B545W Note 2 (HF24)	Portable (With Handle, Detachable Speaker Enclosures)	Walnut	—	Phono Only	2x1W	964-24020	16	2-5¼
D546W	Portable (With Handle, Detachable Speaker Enclosures)	Walnut	—	Phono Only	2x1W	964-24020	16	2-5¼
D554W	Modular Table (Lift Lid)	Walnut	—	Phono Only	2x4W	849-77B	16	2-6½
D556W	Modular Table (Lift Lid)	Walnut	—	Phono Only	2x6W	849-80 849-81	16 45	2-8 2-4
C565W1	Modular Table (Lift Lid) (Circle Of Sound Speakers)	Walnut	16CT21	Phono Only	2x25W	49-1168 49-1214	8 6.4	2-Horn 2-6

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

RECORD CHANGER					OTHER FEATURES			
PART NUMBER	MOUNTING	CARTRIDGE	STYLUS NOTE 1	45 RPM ADAPTER	POWER INDICATOR LIGHT	TAPE PROVISION	RECORD STORAGE	REMOTE SPEAKER PROVISION
Manual Player	Integral	942-8B	S 856-15B	827-18B	—	—	—	—
Manual Player	Integral	942-8B	S 856-15B	827-18B	—	—	—	—
169-427	Integral	142-170	D-S 56-567	S-85021	—	—	—	—
169-427	Integral	142-170	D-S 56-567	S-85021	—	—	—	—
Manual	Integral	942-8B	S 856-15B	827-17B	—	—	—	—
Manual	Integral	942-17B	S 856-22B	827-21B	—	—	—	—
169-423	Integral	142-178	D-S 56-598	S-72910	—	—	—	—
169-407	Hinged Shelf	142-175	D-S 56-560	S-72648	—	—	—	—
169-455	Hinged Shelf	142-167	D-S S-82621	S-82964	—	—	—	—
169-418	Shelf	142-176	D-S 56-621	S-78980	—	—	—	Note 5
169-445	Shelf	142-167	D-S S-82621	S-78980	—	Note 7	—	—
169-436	Shelf	142-167	D-S S-82621	S-82964	—	Note 7	—	Note 6

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

CABINET			CHASSIS			SPEAKERS		
MODEL	STYLE	COLOR	MODEL	TYPE	MPO OUTPUT NOTE II	PART NUMBER	VOICE COIL IMPED. (In Ohms)	SIZE (In Inches)
D583W	Modular Table (Lift Lid)	Walnut	–	FM/AM/Phono	2x4W	849-78B	8	2-6½
D587W	Modular Table (Lift Lid)	Walnut	25WDR50	FM/AM/Phono	2x25W	Note 12	–	–
C590W2	Modular Table (Lift Lid) (Circle Of Sound Speakers)	Walnut	29CT21Z2	FM/AM/Phono	2x25W	49-1168 49-1214	8 6.4	2-Horn 2-6
C590W3	Modular Table (Lift Lid) (Circle Of Sound Speakers)	Walnut	29CT21Z2	FM/AM/Phono	2x25W	49-1168 49-1214	8 6.4	2-Horn 2-6
D593W	Modular Table (Lift Lid)	Walnut	25WDR50	FM/AM/Phono/ Tape	2x25W	49-1237 49-1239	8 8	2-3 2-6½
D715W	Modular Table (Lift Lid)	Walnut	15WDR51	FM/AM/Phono	4x15W	49-1168 49-1231	8 16	4-Horn 4-6½
D742W	Portable (With Handle, Detachable Speaker Enclosures)	Walnut	–	Phono Only	2x4W	964-28872	8	4-6x9
D901W	Console (Lift Lid)	Walnut	4WDR50X	FM/AM/Phono	2x4W	49-1094 49-1224-01	45 8	2-3½ 2-6x9
D902W11	Console (Lift Lid)	Walnut	4WDR50X	FM/AM/Phono	2x4W	49-1094 49-1224-01	45 8	4-3½ 2-6x9
D903M	Console (Lift Lid)	Maple	4WDR50X	FM/AM/Phono	2x4W	49-1094 49-1224-01	45 8	2-3½ 2-6x9
D904DE	Console (Lift Lid)	Dark Oak	4WDR50X	FM/AM/Phono	2x4W	49-1094 49-1224-01	45 8	4-3½ 2-6x9
D907M11	Console (Lift Lid)	Maple	15WDR50Z1	FM/AM/Phono	2x15W	49-1094 49-1153	45 16	4-3½ 2-6x9
D908DE11	Console (Lift Lid)	Dark Oak	15WRD50Z1	FM/AM/Phono	2x15W	49-1094 49-1153	45 16	4-3½ 2-6x9
D908P11	Console (Lift Lid)	Pecan	15WRD50Z1	FM/AM/Phono	2x15W	49-1094 49-1153	45 16	4-3½ 2-6x9

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

RECORD CHANGER					OTHER FEATURES			
PART NUMBER	MOUNTING	CARTRIDGE	STYLUS NOTE	45 RPM ADAPTER	POWER INDICATOR LIGHT	TAPE PROVISION	RECORD STORAGE	REMOTE SPEAKER PROVISION
169-418	Shelf	142-176	D-S 56-621	S-78980	—	Note 7	—	Note 6
169-436	Shelf	142-167	D-S S-82621	S-82964	—	Note 7	—	Note 6
169-436	Shelf	142-167	D-S S-82621	S-82964	—	Note 7	—	Note 6
169-436	Shelf	142-167	D-S S-82621	S-82964	—	Note 7	—	Note 6
169-436	Shelf	142-167	D-S S-82621	S-82964	—	169-456	—	Note 6
169-420	Shelf	142-167	D-S S-82621	S-82964	—	Note 7	—	Note 6
169-457	Hinged Shelf	142-167	D-S S-82621	S-72648	—	—	—	—
169-415	Shelf	142-177	D-S 56-560	S-82964	—	Note 7	Yes	Note 5
169-415	Shelf	142-177	D-S 56-560	S-82964	—	Note 8	Yes	Note 5
169-415	Shelf	142-177	D-S 56-560	S-82964	—	Note 8	Yes	Note 5
169-415	Shelf	142-177	D-S 56-560	S-82964	—	Note 8	Yes	Note 5
169-419	Shelf	142-167	D-S S-82621	S-82964	—	Note 8	Yes	Note 5
169-419	Shelf	142-167	D-S S-82621	S-82964	—	Note 8	Yes	Note 5
169-419	Shelf	142-167	D-S S-82621	S-82964	—	Note 8	Yes	Note 5

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

CABINET			CHASSIS			SPEAKERS		
MODEL	STYLE	COLOR	MODEL	TYPE	MPO OUTPUT NOTE II	PART NUMBER	VOICE COIL IMPED. (In Ohms)	SIZE (In Inches)
D910W11	Console (Lift Lid)	Walnut	15WDR50Z1	FM/AM/Phono	2x15W	49-1094 49-1153	45 16	4-3½ 2-6x9
D921DE	Console (Lift Lid)	Dark Oak	15WDR50Z1	FM/AM/Phono	2x15W	49-1094 49-1166 49-1221	45 8 16	2-3½ 2-Horn 2-10
D921P	Console (Lift Lid)	Pecan	15WDR50Z1	FM/AM/Phono	2x15W	49-1094 49-1166 49-1221	45 8 16	2-3½ 2-Horn 2-10
D922M	Console (Lift Lid)	Maple	15WDR50Z1	FM/AM/Phono	2x15W	49-1094 49-1166 49-1221	45 8 8	2-3½ 2-Horn 2-10
D924W	Console (Lift Lid)	Walnut	15WDR50Z1	FM/AM/Phono	2x15W	49-1094 49-1166 49-1221	45 8 8	2-3½ 2-Horn 2-10
D931W	Console (Lift Lid)	Walnut	35WDR50	FM/AM/Phono	2x35W	49-1094 49-1166 49-1217	45 8 8	2-3½ 2-Horn 2-10
D935M	Console (Lift Lid)	Maple	35WDR50	FM/AM/Phono	2x35W	49-1094 49-1166 49-1217	45 8 8	2-3½ 2-Horn 2-10
D939P	Console (Lift Lid)	Pecan	35WDR50	FM/AM/Phono	2x35W	49-1094 49-1166 49-1221	45 8 8	2-3½ 2-Horn 2-10
D945DE	Console (Lift Lid)	Dark Oak	35WDR50	FM/AM/Phono	2x35W	49-1094 49-1162 49-1203	45 6.4 8	2-3½ 2-Horn 2-8x12
D952X	Console (Lift Lid)	White	35WDR50	FM/AM/Phono	2x35W	49-1094 49-1168 49-1241	45 8 8	2-3½ 2-3½ 2-10
D966DE	Console (Lift Lid)	Dark Oak	29AT24Z2 6AT24	FM/AM/Phono	2x80W	49-1073 49-1094 49-1190	6.4 45 6.4	2-15 4-3½ 2-Horn
D966P	Console (Lift Lid)	Pecan	29AT24Z2 6AT24	FM/AM/Phono	2x80W	49-1073 49-1094 49-1190	6.4 45 6.4	2-15 4-3½ 2-Horn

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

RECORD CHANGER					OTHER FEATURES			
PART NUMBER	MOUNTING	CARTRIDGE	STYLUS NOTE I	45 RPM ADAPTER	POWER INDICATOR LIGHT	TAPE PROVISION	RECORD STORAGE	REMOTE SPEAKER PROVISION
169-419	Shelf	142-167	D-S S-82621	S-82964	—	Note 8	Yes	Note 5
169-419	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 8	Yes	Note 5
169-419	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 8	Yes	Note 5
169-419	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 8	Yes	Note 5
169-419	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 8	Yes	Note 5
169-420	Shelf	142-167	D-S S-82621	S-92964	Yes	Note 8	Yes	Note 4
169-420	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 8	Yes	Note 4
169-420	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 7	Yes	Note 4
169-420	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 8	Yes	Note 4
169-420	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 7	Yes	Note 4
169-421	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 8	Yes	Note 4
169-421	Shelf	142-167	D-S S-82621	S-82964	Yes	Note 8	Yes	Note 4

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

CABINET			CHASSIS			SPEAKERS		
MODEL	STYLE	COLOR	MODEL	TYPE	MPO OUTPUT NOTE II	PART NUMBER	VOICE COIL IMPED. (In Ohms)	SIZE (In Inches)
SD2568X	Console Combination (Lift Lid) (W/Remote Speaker Systems)	White	5WDR50X 25WDA10 Note 3	FM/AM/Tape Amplifier Color TV	2x5W 2x25W	49-1094 49-1168 49-1240 49-1238	45 8 16 8	2-3½ 2-3½ 2-10 2-5
SD2568X5	Console Combination (Lift Lid) (W/Remote Speaker Systems)	White	5WDR50X1 25WDA10 Note 3	FM/AM/Tape Amplifier Color TV	2x5W 2x25W	49-1094 49-1168 49-1240 49-1238	45 8 16 8	2-3½ 2-3½ 2-10 2-5
SD2569P	Console Combination (Lift Lids)	Pecan	35WDR50 Note 3	FM/AM/Phono Color TV	2x35W	49-1094 49-1162 49-1177 49-1234-01	45 6.4 6.4 3.2	2-3½ 2-Horn 2-9x15 1-5
D8725W Note 2 (HF 24)	Console Combination (Lift Lids)	Pecan	29CT30 Note 3	FM/AM/Phono Color TV	2x25W	49-1162 49-1177	6.4 6.4	2-Horn 2-9x15
D9011W	Table Extension Speaker	Walnut	—	—	—	49-1237 49-1239	8 8	1-3 1-6½
D9013W	Table Extension Speaker	Walnut	—	—	—	49-1168 49-1241	8 8	1-Horn 1-10
C9016W Note 2 (HF 25)	Table Extension Speaker	Walnut	—	—	—	849-74B 849-75B	16 16	1-6x9 1-2½
S9017W1 Note 2 (HF22)	Table Extension Speaker	Walnut	—	—	—	49-1102 49-1162	6.4 8	1-12 1-Horn
C9024W Note 2 (RC5)	Component Record Changer	Walnut	—	—	—	—	—	—
D9026W Note 2 (*)	Component Record Changer	Walnut	—	—	—	—	—	—
C9029W Note 2 (HF24)	Component Decoder	Walnut	15WCA10	Amplifier	2x15	49-1168 49-1220	8 8	2-Horn 2-6

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

RECORD CHANGER					OTHER FEATURES			
PART NUMBER	MOUNTING	CARTRIDGE	STYLUS NOTE I	45 RPM ADAPTER	POWER INDICATOR LIGHT	TAPE PROVISION	RECORD STORAGE	REMOTE SPEAKER PROVISION
—	—	—	—	—	Yes	Built-in D631	—	Note 4A
—	—	—	—	—	Yes	Built-in D631	—	Note 4A
169-420	Shelf	142-167	D-S S-82621	S-82965	Yes	Note 7	—	Note 4
169-434	Shelf	142-167	D-S S-82621	S-82965	Yes	Note 7	—	Note 4
—	—	—	—	—	—	—	—	Note 12
—	—	—	—	—	—	—	—	Note 12
—	—	—	—	—	—	—	—	Note 9
—	—	—	—	—	—	—	—	Note 10
169-446	Shelf	142-172	D-S 56-597	S-78980	—	—	—	—
169-435	Shelf	142-167	D-S S-82621	S-82965	—	—	—	—
—	—	—	—	—	Yes	Yes	—	—

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

NOTES

1. Stylus: S = Manufactured Sapphire, D = Diamond.

2. Model listed for reference only. For chassis information refer to Service Manual shown in parenthesis ( ).
   (*) Denotes Service Manual number has not been assigned.

3. Refer to Color TV Service Manuals for Color chassis information.

4. Built-in Sound Control Center with external speaker terminals and headphone jack.
   4A. Head phones connect to radio only.

5. External speaker terminals.

6. Headphone jack.

7. Tape Input and Output - May be used with the following:
   Model D635 - Cartridge Tape Player.
   Model A636 - Cassette Tape Player/Recorder.
   Model D638 - Cartridge Tape Player/Recorder.
   Model D762 - Cartridge Tape Player.

8. Tape Input and Output - May be used with the following:
   Model D631 - Cartridge Tape Player,
   Model D632 - Cassette Tape Player/Recorder,
   Model D635 - Cartridge Tape Player,
   Model A636 - Cassette Tape Player/Recorder,
   Model D638 - Cartridge Tape Player/Recorder,
   Model D762 - Cartridge Tape Player.

9. One pair of Model C9015W or Model C9016W Extension Speakers may be used with any Zenith stereo model (not exceeding 25 watts, MPO, per channel) which have external speaker terminals (see notes 4 and 5 above).

10. One pair of Models S9017W or S9017W1 Extension Speakers may be used with any Zenith stereo model which has external speaker terminals (see notes 4 and 5 above).

11. Indicates number of channels and Momentary Power Output per channel. Less than 5% Total Harmonic Distortion, all channels added.

12. Model D587W is not supplied with speaker systems. One pair of Model D9011W, or D9013W Extension Speakers are designed for use with Model D587W only.

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

RECORD CHANGER FEATURES

PART NO.	MFG.	BASE PLATE	TURNTABLE
169-407	(BSR)	Black	Black
169-415	(VM)	Black	Light Gray
169-418	(BSR)	Black	Black
169-419	(VM)	Black	Light Gray
169-420	(VM)	Black	Light Gray
169-421	(VM)	Black	Aluminum
169-423	(BSR)	Brown	Brown and White
169-427	(BSR)	Black	Black and White
169-434	(VM)	Dark Brown	Light Beige
169-435	(VM)	Tree Bark Brown	Light Beige
169-436	(VM)	Black	Light Gray and Metal
169-445	(BSR)	Black	Light Gray and Metal
169-446	(BSR)	Black	Black
169-455	(VM)	Black	Black
169-457	(VM)	Black	Light Gray

SECTION TWO
FM/MX/AM ALIGNMENT AND GENERAL INFORMATION

THEORY

From time to time Zenith includes the use of new components and circuit applications in product design. Theory and explanation of such components and circuits is included in various manuals. Refer to the index for further information.

MULTIPLEX ALIGNMENT

These receivers have been properly aligned at the factory and will not require further adjustment. As a result, it is not recommended that any attempt be made to alter the multiplex stages. However, should any major components in these circuits require replacement or should anyone tamper with the multiplex adjustments then, of course, realignment will be necessary.

MUTING CONTROL

A muting control (some models), which supplies a reverse bias voltage to the base of the 19KHz amplifier, is factory adjusted, and should not require readjustment. However, if the receiver is operated in an extremely noisy area, there is a possibility that there may be noise bursts of sufficient magnitude to overcome this mute voltage . . . when this occurs, the Stereophonic FM Indicator will light up. To further cut off the 19KHz amplifier, carefully rotate the muting control in a clockwise direction. This should only be done when a stereo signal is on the air since the mute control must only be advanced to a point where the Stereo Indicator does not light up on noise, but is should not be advanced to a point where the desired stereo signal is cut off.

ANTENNAS FOR STEREO FM

Due to the characteristics of the stereo FM system, it will require more signal for proper performance than does monaural FM. As a result, it may be necessary to operate the stereo FM receiver with an external antenna. The necessity for an external antenna will be determined by the signal conditions at each individual installation.

EXTERNAL FM ANTENNA

If the receiver is operated in an area of either low signal strength, high noise, or where multipath (FM ghosts) signals are present, a good external FM antenna will be required. The necessity of an external antenna as a result of weak signal or noise, will be quite evident since the set will not limit, and/or noise will be quite evident. It is extremely difficult to determine if multipath (FM ghosts) signals are present, however, should the program material be distorted, the best manner to decide if multipath signals are the cause of the problem, is to connect an external FM antenna to the receiver. Usually a TV antenna may be available for trial, but even then the results can be misleading, since many TV antennas are of low gain on FM frequencies. Reduction of multipath distortion under high signal conditions may be accomplished by relocation of the receivers antenna system.

FM CABINET ANTENNA

Certain models contain an FM antenna built into the cabinet. This antenna is a folded dipole cut to the desired frequency, and is attached to the internal periphery of the cabinet. The following models use line cord antennas: D583, D587, C590, D593, D715, D901, D902, D903, and D904.

SIGNAL STRENGTH CHART

There are certain minimum voltages necessary for proper stereo FM reception. To help determine if there is sufficient signal available, the following developed AGC voltage versus microvolt input voltage charts have been compiled. Since the desired FM Station may not always be operating in the stereo mode when an installation is made, these AGC voltage measurements have been taken with a monaural FM signal. The point "*" of minimum AGC voltage necessary for good stereo FM reception has been indicated on these charts.

AGC voltages are to be measured with a V.T.V.M. connected to the following Test Points.

Chassis 4WDR50X, (X1), Model D583 – Test Point "C". Located between Transistor Q1 (FM-RF) and AM Antenna (L101).

Chassis 5WDR50X, (X1) – Test Point at junction of R1, R2, and C3. Located adjacent to Q1.

Chassis 15WDR50Z1 – Test Point "C". Located between Transistors Q101 (A.M. Converter) and Q201 (1ST. I.F.).

Chassis 15WDR51 – Test Point Q101 end of Purple wire going around pulley end of gang.

Chassis 25WDR50, 29CT20, 29CT21, (Z1), (Z2), 29CT30, 35WDR50 – Test Point at junction of R2, R229; either end of purple wire at pulley end of gang.

Chassis 29AT24, (Z1), (Z2) – Test Point "C" RF Amplifier AGC Feed Thru on FM Tuner.

Chassis 4WDR50X, (X1), Model D583

Micro Volts Input	Reverse AGC Voltage at Test Point "C"
0	1.50
25	1.48
100	1.36
200	1.20
500	1.04
1K	0.96
5K	0.92
50K	0.60
100K	0.49

Chassis 5WDR50X, (X1)

Micro Volts Input	Reverse AGC Voltage at Test Point "C"
0	.016
25	.012
100	-.037
200	-.124
500	-.312
1K	*.470
5K	-.710
50K	-3.49
100K	-4.55

Chassis 15WDR50Z1

Micro Volts Input	Reverse AGC Voltage at Test Point "C"
0	1.34
25	1.23
100	0.91
200	0.82
500	0.73
1K	*0.70
5K	0.58
50K	0.10
100K	0.06

Chassis 15WDR51

Micro Volts Input	Reverse AGC Voltage at Test Point "C"
0	5.00
25	4.20
100	2.80
200	2.40
500	1.70
1K	*1.10
5K	0.05
50K	–2.40
100K	–3.20

Chassis 25WDR50, 29CT20, 29CT21, (Z1), (Z2), 29CT30, 35WDR50		Chassis 29AT24, (Z1), (Z2)	
Micro Volts Input	Reverse AGC Voltage At Gate 2 of FM RF	Micro Volts Input	AGC Voltage At 1st.I.F. (See Note)
0	5.7	0	1.50
25	4.5	25	1.40
100	2.8	100	1.10
200	2.2	200	.95
500	1.5	500	.80
1K	*−0.96	1K	* .75
5K	−0.22	5K	.65
50K	−1.10	50K	.52
100K	−1.20	100K	.40

AGC ADJUSTMENT NOTE

Chassis 29AT24, (Z1), (Z2) – Adjust AGC control so that under no signal conditions a voltage of 1.5 volts is measured across the 820 ohm resistor connected from 1st IF emitter to "B-" (-12.4V) when in A.M.

TROUBLE SHOOTING AND SIGNAL TRACING

The old technique of "screwdriver testing" is definitely not recommended while trouble shooting any solid state product. In that method various circuit points were touched or shorted to ground to cause a hum or click in the speaker. This must be avoided because a solid state component can be destroyed if excessive voltage or if wrong voltage polarity is applied. Only standard point to point signal tracing with the proper RF, IF, and Audio Signal Sources should be used.

RESISTANCE MEASUREMENTS

It is recommended that you use an ohmmeter having a very low voltage in the meter circuit. If the voltage is too high at the meter terminals, it could bias solid state devices into conduction, resulting in misleading readings. As an alternate procedure, remove transistor, or other solid state devices from the circuit before making measurements.

SPEAKER PHASING

It is important that coded speaker leads be connected to coded terminals on speakers for proper polarity within each speaker group. It is then important that the speaker groups be in phase with each other. One excellent method is to play a monaural record with the volume of each speaker group equal. The sound should appear to come from a point midway between the speaker groups. If the sound comes from other than midpoint, you should check polarity. One of the easiest methods of checking polarity within the speaker group is to momentarily place a 4½ volt battery across the speaker feed terminals. All the speaker cones should simultaneously move in the same direction.

POWER AMPLIFIERS

Power transistors and their circuits are unique in operation, therefore, repair procedure differs from those steps followed when repairing tube type-circuits.

1. Each channel of the following amplifiers use a pair of matched power transistors in the final output stage. Therefore, should one transistor fail, both transistors must be replaced simultaneously, since they will not perform properly unless matched. (In chassis using complementary symmetry circuits a matched pair consists of one NPN and one PNP transistor.) (In chassis using quasi-complementary symmetry circuits, the outputs consist of two matched NPN's. The drivers, which are matched NPN and PNP should also be replaced as matched pairs): 3AT20, 4WDR50X, (X1), 6AT24, 15WCA10, 15WDR50Z1, 15WDR51, 16CT21, 25WDR50, 29CT20, 29CT21, (Z1), (Z2), 29CT30, 35WDR50, B545, D546, D583, D742.
2. When a power transistor is replaced the insulator (when used) between the transistor and the heat sink should also be replaced. On the following be certain to apply Dow Corning No. 340 heat conductive grease between the transistor and the insulator. Also between the insulator and the chassis. The Dow Corning grease can be obtained in 1 c.c. quantities by ordering part No. 205-51: 4WDR50X, (X1), 6AT24, 15WCA10, 15WDR50Z1, 15WDR51, 16CT21, 25WDR50, 29CT20, 29CT21, (Z1), (Z2), 29CT30, 35WDR50.
3. On the following place the heat conductive grease in the clamp, or on the chassis, and all around the transistor: B545, D546, D583, D742.
4. Do not operate these amplifiers without their proper speaker load.
5. Do not short out the audio output of either channel when the amplifier is operating.
6. Should a power transistor fail (short) be certain to replace the emitter resistors for the specific channel. Also be certain to check the condition of the silicon diode rectifiers, and driver transistors.
7. Remove plug-in transistors from their sockets before doing any soldering to the socket lugs.

CIRCUIT BOARD COMPONENT IDENTIFICATION

As a special feature to aid the Service Technician, Zenith has identified the location of components which are mounted on certain circuit boards. This information is printed on the circuit boards and also appears on the schematic. We also have prepared a two-color drawing of the foil side of the circuit board showing the relationship between the components and the foil. This will aid the Technician in quickly tracing circuits, as not only are the components shown, but also the voltages at various check points. Components are identified by a letter/number combination. A letter prefix to indicate the type of component: C=Capacitor, L=Coil, R=Resistor, CR=Diode, etc. The numbers are assigned in blocks to identify the circuit, in which it is used, as follows.

Block	Stage	Example
1 - 99	FM Tuner	R1, C1, L1.
101 - 199	AM Tuner	R101, C101, L101.
201 - 299	IF	R201, C201, L201.
301 - 399	Multiplex	R301, C301, L301.
401 - 449	Audio, Right Channel	R401, C401, L401.
451 - 499	Audio, Left Channel	R451, C451, L451.
501 - 599	Power Supply	R501, C501, L501.
601 - 699	Switching Circuits	R601, C601, L601.
701 - 799	Special Applications	R701, C701, L701.
801 - 849	Audio, Right Back Channel	R801, C801, L801.
851 - 899	Audio, Left Back Channel	R851, C851, L851.

CIRCUIT BOARD SERVICING

Servicing circuit board sets is, in general, much the same as servicing ordinary receivers. However, certain tools and techniques are helpful for this type of work.

1. Good pair of long-nose pliers.
2. Sharp wire cutters.

3. Small stiff glue brush (for solder removal).
4. Metal pick (soldering aid).
5. Pencil type soldering iron with a small tip (25 watts or less).
6. Tin leads on component before soldering.
7. Use only solder with an extremely low melting point, (60% Tin, 40% Lead).

WARNING: Excessive heat may damage the circuit board foil during component replacement if a soldering pencil, iron or gun of higher wattage rating is used.

If a unit, such as the oscillator coil or I.F. transformer is to be removed, heat the mounting lugs with a pencil type soldering iron and move them away from the soldered connection with a long nose pliers or metal pick. Continue heating the lugs and brush away the molten solder with a small stiff glue brush. Remove the defective unit. Before inserting the new unit, be certain that the lug holes are open and free from solder. Forcing a lug against a solder filled hole may break the bond between the chassis base and the wiring foil. Exercise care when replacing units. An open or damaged section of circuit board wiring foil can be repaired by soldering a short jumper wire across the points to be connected. When soldering low voltage electrolytics, transistors and diodes, the wire should be held with a pair of long nose pliers. The long nose pliers will act as a heat sink.

FM ALIGNMENT

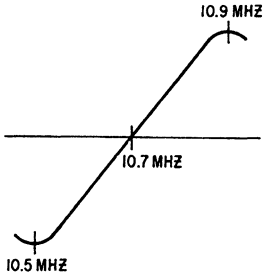
Alignment of these chassis will, in most cases, not be necessary unless an RF or IF transformer is replaced or if someone has tampered with the adjustment.

Because of the wide band pass required in the multiplex FM tuner, it is desirable to use an FM signal generator having a deviation of 400 KHz with a sweep rate of 60 Hertz as well as an oscilloscope when aligning both the IF and RF FM portions of this receiver. It is not only necessary to obtain maximum amplitude in the IF amplifier stages, but also necessary to maintain symmetry. It is desirable to use 10.6, 10.7 and 10.8 Megahertz markers in obtaining IF curve symmetry.

Capacitors mentioned in the alignment procedure should be as small as possible and the ground lead of the generator must be connected to ground as close as possible to the point of injection.

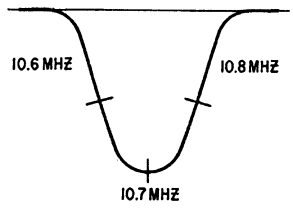
AM ALIGNMENT

A V.T.V.M. on low AC scale connected across the speaker voice coil output terminals (either left or right channels), will be satisfactory for all AM, IF and RF adjustments.



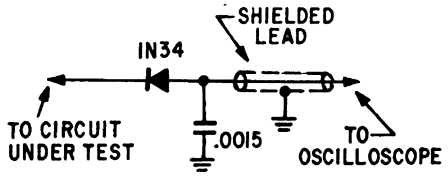
Scope Pattern - A

Adjust for maximum amplitude while maintaining linearity and symmetry. 10.7 MHZ marker must be on the curve at base line.



Scope Pattern - B

10.6 and 10.8 MHZ markers must be symmetrically positioned with 10.7 MHZ at center of curve. This point must be adjusted for maximum.



Detector Probe -

If your oscilloscope is not equipped with a detector probe, one can easily be constructed. For best results the probe should be shielded.

RF AND IF ALIGNMENT PROCEDURE FOR CHASSIS D583

STEP	CONNECT VTVM / SCOPE TO	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST	PURPOSE
NOTE: For AM Alignment Use A Signal With 400 Hertz Modulation, Bandswitch in AM.							
1	VTVM Speaker Voice Coil	One turn loosely coupled to wavemagnet		455 KHz	600 KHz	Top & Bottom T204, T205	Align IF channel for maximum output
2				1600 KHz	1600 KHz	C1H	Set oscillator to dial scale
3				600 KHz	600 KHz	T101	
4				Repeat Steps 2 & 3			
5				1400 KHz	1400 KHz	C1G	Align antenna stage
NOTE: For FM Alignment Use A Signal With 400 KHz Deviation, Bandswitch in FM AFC "OFF".							
6	Scope Ratio Detector Test Point "H"	Term No. 5 of T202 2nd IF Trans. Test Point "G"	47 Ohm in shunt with gen. output. Then from hot lead a 27 ohm in series with a .001 MFD capacitor.	10.7 MHz	Gang Closed	T203 Bottom	Adjust Primary and Secondary of ratio detector for maximum amplitude and symmetry, as shown on Scope Pattern "A".
7						T203 Top	
8	Scope Last FM IF Test Point "G"	Term No. 3 of T201 1st IF Trans. Test Point "E"				T202 Top & Bottom	Align I.F. transformed for maximum output and symmetry. This pattern is not necessarily identical to the overall Scope Pattern "B"
9		Base of FM Mixer Transistor Test Point "D"				T201 Top & Bottom	
10						Readjust T201, T202	Align I.F. transformer for maximum output and symmetry as indicated in Scope Pattern "B".
11		FM Antenna Post (Remove Antenna) Test Point "A"	300 ohm	106 MHz	106 MHz	C17	Set oscillator to dial scale
12				90 MHz	90 MHz	L3 if necessary	
13				Repeat Steps 11 and 12			
14				106 MHz	106 MHz	C1D	Align FM Detector stage for maximum
15				90 MHz	90 MHz	L1 if necessary	
16				106 MHz	106 MHz	C1B	Align FM Antenna stage for maximum
17				90 MHz	90 MHz	T1 if necessary	
18				Repeat Steps 14 thru 17			

RF AND IF ALIGNMENT PROCEDURE FOR CHASSIS 4DWR50X, (X1)

STEP	CONNECT VTVM / SCOPE TO	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST	PURPOSE
NOTE: For AM Alignment Use A Signal With 400 Hertz Modulation, Bandswitch in AM.							
1	VTVM Speaker Voice Coil	One turn loosely coupled to wavemagnet		455 KHz	600 KHz	Top & Bottom T202,T204,T206	Align IF channel for maximum output
2				1600 KHz	1600 KHz	C1H	Set oscillator to dial scale
3				600 KHz	600 KHz	T101	
4				Repeat Steps 2 & 3			
5				1400 KHz	1400 KHz	C1G	Align antenna stage
NOTE: For FM Alignment Use A Signal With 400 KHz Deviation, Bandswitch in FM AFC "OFF".							
6	Scope Ratio Detector Test Point "H"	Term No. 5 of T205 3rd IF Trans. Test Point "G"	47 Ohm in shunt with gen. output. Then from hot lead a 27 ohm in series with a .001 MFD capacitor.	10.7 MHz	Gang Closed	T207 Bottom	Adjust Primary and Secondary of ratio detector for maximum amplitude and symmetry, as shown on Scope Pattern "A"
7						T207 Top	
8	Scope Last FM IF Test Point "G"	Term No. 3 of T203 2nd IF Trans. Test Point "F"				T205 Top & Bottom	Align I.F. transformer for maximum output and symmetry. This pattern is not necessarily identical to the overall Scope Pattern "B"
9		Term No. 3 of T201 1st IF Trans. Test Point "E"				T203 Top & Bottom	
10		Base of FM Mixer Transistor Test Point "D"				T201 Top & Bottom	
11						Readjust T201, T203, T205	Align I.F. transformer for maximum output and symmetry as indicated in Scope Pattern "B".
12		FM Antenna Post (Remove Antenna) Test Point "A"	300 ohm	106 MHz	106 MHz	C17	Set oscillator to dial scale
13				90 MHz	90 MHz	L3 if necessary	
14				Repeat Steps 12 and 13			
15				106 MHz	106 MHz	C1D	Align FM Detector stage for maximum
16				90 MHz	90 MHz	L1 if necessary	
17				106 MHz	106 MHz	C1B	Align FM Antenna stage for maximum
18				90 MHz	90 MHz	T1 if necessary	
19				Repeat Steps 15 thru 18			

RF AND IF ALIGNMENT PROCEDURE FOR CHASSIS 5WDR50X, (X1)

STEP	CONNECT VTVM / SCOPE TO	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST	PURPOSE
NOTE: For AM Alignment Use A Signal Of 400 Hz At 30% Modulation, Bandswitch in AM.							
1	Across Voice Coil	One Turn Loosely Coupled to Wavemagnet	NONE	455 KHz	600 KHz	T203, T204	Align I.F. for maximum output.
2				1600 KHz	1600 KHz	C1K	Set Oscillator to dial scale.
3				600 KHz	600 KHz	T101	
4				Repeat steps 2 and 3			
5				1400 KHz	1400 KHz	C11	Align Antenna Stage.
6				600 KHz	600 KHz	L101 if necessary	
7				Repeat steps 5 and 6			
NOTE: For FM IF Alignment Use A Signal Of 400 Hz At 250 KHz Deviation, Bandswitch in FM, AFC "OFF".							
8	Test Point "M"	Test Point "J" Emitter of Q205	47 ohm in shunt with generator output, then from hot lead, a 27 ohm in series with a .04 capacitor.	10.7 MHz	88 MHz	Top and Bottom T202	Adjust Primary and Secondary of ratio detector for maximum amplitude and symmetry, as shown in Scope Pattern "A".
9	Test Point "K" Pin 3 of T202	Test Point "H" Disconnect FM Antenna	300 ohm			T201	Adjust I.F. transformer for maximum output and symmetry. This pattern is not necessarily identical to the overall Scope Pattern "B".
10	Test Point "M"			Repeat steps 8 and 9			Align I.F. transformers for maximum output and symmetry as indicated in Scope Pattern "B".
11				108 MHz	108 MHz	C1G	Set Oscillator to Dial Scale.
12				88 MHz	88 MHz	L4	
13				Repeat steps 11 and 12			
14				100 MHz	100 MHz	C1C	Align Neutralizing Capacitor for maximum.
15				108 MHz	108 MHz	C1L	Align RF for maximum.
16				90 MHz	90 MHz	L2 if necessary	
17				Repeat steps 15 and 16			
18				108 MHz	108 MHz	C1B	Align Antenna for maximum.
19				90 MHz	90 MHz	L1 if necessary	
20				Repeat steps 18 and 19			

RF AND IF ALIGNMENT PROCEDURE FOR CHASSIS 15WDR50Z1

STEP	CONNECT VTVM / SCOPE TO	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST	PURPOSE
NOTE: For AM Alignment Use A Signal With 400 Hertz Modulation, Bandswitch in AM.							
1	VTVM Speaker Voice Coil	One turn loosely coupled to wavemagnet		455 KHz	600 KHz	L203, L204, L207, L210, L211	Align IF channel for maximum output
2				1600 KHz	1600 KHz	C1G	
3				600 KHz	600 KHz	T101	
4				Repeat Steps No. 2 & 3			
5				1400 KHz	1400 KHz	C1D	Align antenna stage
NOTE: For FM Alignment Use A Signal With 400 KHz Deviation, Bandswitch in FM. AFC "Off".							
6	Scope Ratio Detector Test Point "H"	Term No. 5 of T205 3rd IF Trans. Test Point "G"	47 ohm in shunt with gen. output. Then from hot lead a 27 ohm in series with a .001 MFD capacitor.	10.7 MHz	Gang Closed	L212	Adjust Primary and Secondary of ration detector for maximum amplitude and symmetry, as shown in Scope Pattern "A"
7						L214	
8	Scope Last FM IF Test Point "G"	Term No. 3 of T203 2nd IF Trans. Test Point "F"				L208 & L209	Align I.F. transformer for maximum output and symmetry. This pattern is not necessarily identical to the overall Scope Pattern "B".
9		Term. No. 3 of T201 1st IF Trans. Test Point "E"				L205 & L206	
10		Connect to Test Point "D"				L201 & L202	
11						Readjust L201, L202, L205, L206, L208, L209	Align I.F. transformer for maximum output and symmetry as indicated in Scope Pattern "B".
NOTE: In Steps 10 and 11 Generator ground Must be Connected On Braid As Close To Gang As Possible.							
12	Scope Last FM IF Test Point "G"	FM Antenna Post (Remove Antenna) Test Point "A"	300 ohm	106 MHz	106 MHz	C13	Set oscillator to dial scale
13				90 MHz	90 MHz	L4	
14				Repeat Steps 12 and 13			
15				106 MHz	106 MHz	C1A	Align FM Detector stage for maximum
16				90 MHz	90 MHz	L2 if necessary	
17				106 MHz	106 MHz	C1H	Align FM Antenna stage for maximum
18				90 MHz	90 MHz	L1 if necessary	
19				Repeat Steps 15 thru 18			

RF AND IF ALIGNMENT PROCEDURE FOR CHASSIS 15WDR51

STEP	CONNECT VTVM / SCOPE TO	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST	PURPOSE
NOTE: For AM Alignment Use A Signal With 400 Hertz Modulation, Bandswitch is AM.							
1	VTVM Speaker Voice Coil	One turn loosely coupled to wavemagnet		455 KHz	600 KHz	L203, L204, L207 L208, L211, L212	Align IF channel for maximum output
2				1600 KHz	1600 KHz	C1K	Set oscillator to dial scale
3				600 KHz	600 KHz	L103	
4				Repeat Steps No. 2 & 3			
5				1400 KHz	1400 KHz	C1H	Align RF stage.
6				600 KHz	600 KHz	L106	
7				Repeat Steps No. 5 & 6			
8				1400 KHz	1400 KHz	C1F	Align antenna stage.
NOTE: For FM Alignment Use A Signal With 400 KHz Deviation, Bandswitch in FM, AFC "Off"							
9	Scope Ratio Detector Test Point "H"	Term No. 5 of T205 3rd IF Trans. Test Point "G"	47 ohm in shunt with gen. output Then from hot lead a 27 ohm in series with a .001 MFD capacitor.	10.7 MHz	Gang Closed	L213	Adjust Primary and Secondary of ratio detector for maximum amplitude and symmetry as shown in Scope Pattern "A"
10						L215	
11	Scope Last FM IF Test Point "G"	Term. No. 3 of T203 2nd IF Trans. Test Point "F"				L209 & L210	Align I.F. transformer for maximum output and symmetry. This pattern is not necessarily identical to the overall Scope Pattern "B".
12		Term. No. 4 of T201 1st IF Trans. Test Point "E"				L205 & L206	
13		Connect to Test Point "D"				L201 & L202	
14						Readjust L201, L202, L205, L206, L209 & L210	Align I.F. transformer for maximum output and symmetry as indicated in Scope Pattern "B".
NOTE: In Steps 13 and 14 Generator ground Must be Connected On Braid As Close To Gang As Possible.							
15	Scope Last FM IF Test Point "G"	FM Antenna Post (Remove Antenna) Test Point "A"	300 ohm	106 MHz	106 MHz	C13	Set oscillator to dial scale
16				90 MHz	90 MHz	L4	
17				Repeat Steps 15 & 16			
18				106 MHz	106 MHz	C1C	Align FM Detector stage for maximum
19				90 MHz	90 MHz	L2 if necessary	
20				106 MHz	106 MHz	C1A	Align FM Antenna stage for maximum
21				90 MHz	90 MHz	L1 if necessary	
22				Repeat Steps 15 thru 21			

RF AND IF ALIGNMENT PROCEDURE FOR CHASSIS 25WDR50, 29CT20, 29CT21, Z1, Z2, 29CT30, 35WDR50

STEP	CONNECT VTVM / SCOPE TO	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST	PURPOSE
NOTE: For AM Alignment Use A Signal With 400 Hertz Modulation, Bandswitch in AM.							
1	VTVM Speaker Voice Coil	One turn loosely coupled to wavemagnet		455 KHz	600 KHz	L203, L204, L207, L210, L215	Align IF channel for maximum output
2				1600 KHz	1600 KHz	C1K	Set oscillator to dial scale
3				600 KHz	600 KHz	L103	
4				Repeat Steps No. 2 & 3			
5				1400 KHz	1400 KHz	C1H	
6				600 KHz	600 KHz	T101	Align RF stage
7				Repeat Steps No. 5 & 6			
8				1400 KHz	1400 KHz	C1F	Align antenna stage.
NOTE: For FM Alignment Use A Signal With 400 KHz Deviation, Bandswitch in FM, AFC "OFF".							
9	Scope Ratio Detector TestPoint "H"	Term. No. 5 of T205 3rd IF Trans. Test Point "G"	47 ohm in shunt with gen. output. Then from hot lead a 27 ohm in series with a .001 MFD capacitor.	10.7 MHz	Gang Closed	L212	Adjust Primary and Secondary of ratio detector for maximum amplitude and symmetry, as shown in Scope Pattern "A"
10						L214	
11	Scope Last FM IF Test Point "G"	Term. No. 3 of T203 2nd IF Trans. Test Point "F"				L208 & L209	Align I.F. transformer for maximum output and symmetry. This pattern is not necessarily identical to the overall Scope Pattern "B"
12		Term. No. 4 of T201 1st IF Trans. Test Point "E"				L205 & L206	
13		Connect to Test Point "D"				L201 & L202	
14						Readjust L201, L202, L205, L206, L208 & L209	Align I.F. transformer for maximum output and symmetry as indicated in Scope Pattern "B"
NOTE: In Steps 13B and 14B Generator ground Must be Connected On Braid As Close To Gang As Possible							
15	Scope Last FM IF Test Point "G"	FM Antenna Post (Remove Antenna) Test Point "A"	300 ohm	106 MHz	106 MHz	C13	Set oscillator to dial scale
16				90 MHz	90 MHz	L4	
17				Repeat Steps 15 & 16			
18				106 MHz	106 MHz	C1C	Align FM Detector stage for maximum
19				90 MHz	90 MHz	L2 if necessary	
20				106 MHz	106 MHz	C1A	Align FM Antenna stage for maximum
21				90 MHz	90 MHz	L1 if necessary	
22				Repeat Steps 15 thru 21			

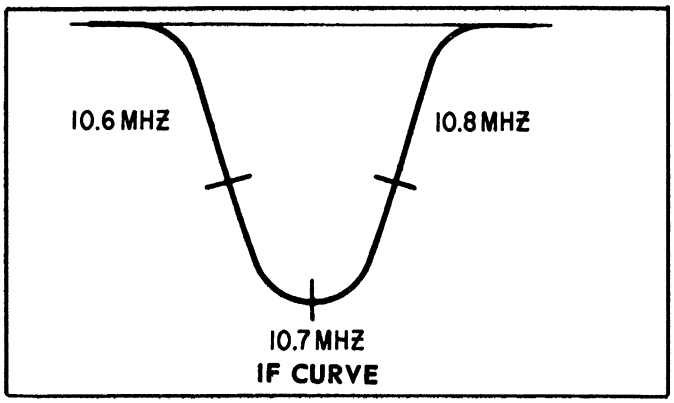
RF AND IF ALIGNMENT PROCEDURE FOR CHASSIS 29AT24, (Z1), (Z2)

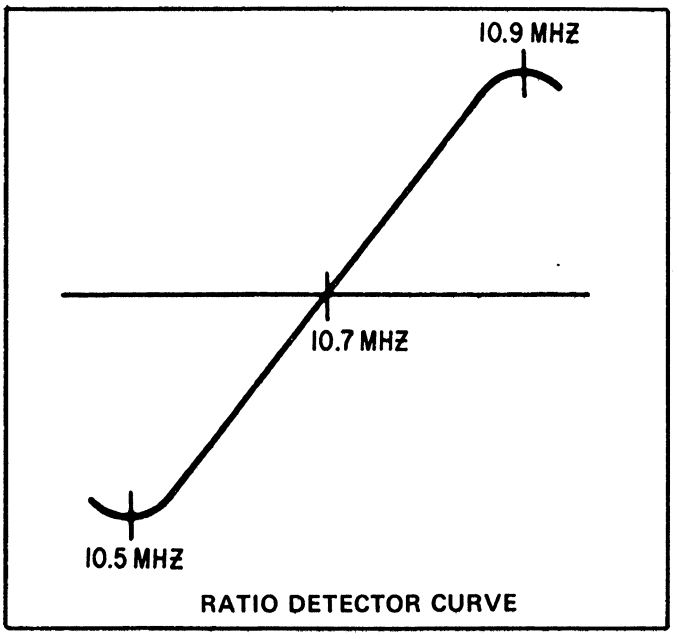
STEP	CONNECT VTVM / SCOPE TO	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST	PURPOSE
NOTE: For FM Alignment Use A Signal With 400 KHz Deviation, Bandswitch in FM, AFC "OFF".							
1	Scope Ratio Detector Test Point "H"	Term. No. 3 of T205 4th IF Trans.	47 ohm in shunt with gen. output. Then from hot lead a 27 ohm in series with a .001 MFD capacitor.	10.7 MHz	88 MHz	L212	Adjust Primary and Secondary of ratio detector for maximum amplitude and symmetry as shown in Scope Pattern "A"
2						L214	
3	Scope Last FM IF Test Point "G"	Term. No. 3 of T203 3rd IF Trans. Test Point "F"				L210, L211	Align I.F. transformers for maximum output and symmetry. This pattern is not necessarily identical to the overall Scope Pattern "B"
4		Term. No. 3 of T201 2nd IF Trans. Test Point "E"				L206, L207	
5		Connect to emitter of Q2 Mixer Test Point No. K				L202, L203	
6						L5, L6	Align I.F. transformers for maximum output and symmetry as indicated in Scope Pattern "B"
7						Readjust L5, L6, L202, L203, L206, L207, L210, L211	
8		FM Antenna Post (Remove Antenna)	300 ohm	98 MHz	98 MHz	L7	Set oscillator to Dial Scale.
9				98 MHz	98 MHz	L3, L2, L1	Align RF output, RF input and FM Antenna stages for maximum.
NOTE: For AM Alignment Use A Signal With 400 Hertz Modulation, Bandswitch in AM.							
10	VTVM Speaker Voice Coil	Base of A101	.05 in series with hot lead of gen.	455 MHz	600 KHz	L108, L109, L204, L205, L208, L209	Align AM IF for maximum.
11		Two turn loop loosely coupled to wavemagnet		1600 KHz	1600 KHz	C101E	Set oscillator to dial scale.
12				1400 KHz	1400 KHz	C101B, C101D	Align detector and antenna stages.

Refer to Page 12 for A.G.C. adjustment.

SECTION THREE
MULTIPLEX ALIGNMENT PROCEDURE

Before any attempt is made to align, or service, FM Multiplex circuitry, the technician must be certain that the RF, IF, and Ratio Detector alignment is correct, and that the receiver functions normally on monaural signals.





Because of the wide band pass required in a FM multiplex receiver, it is desirable to use a FM signal generator having a deviation of at least 200 KHz with a sweep rate of 60 Hertz, as well as an oscilloscope. During the IF and Ratio Detector alignment it is not only necessary to obtain maximum gain, but also extremely important to maintain symmetry.

To help achieve IF curve symmetry 10.6 and 10.8 megahertz markers must be positioned symmetrically to each side of the 10.7 megahertz marker, which must be at the center of the curve. When aligning the Ratio Detector, 10.5 and 10.9 megahertz markers are desirable to achieve S curve symmetry. The pattern illustrating marker use to obtain S curve symmetry indicates it is most necessary to adjust for maximum gain and at the same time maintain linearity and symmetry. 10.7 megahertz must be on the curve at the reference line. 10.5 megahertz and 10.9 megahertz must be at the lower and upper turn of the S curve respectively. Only when the I.F. and Ratio Detector circuitry have been aligned in accordance with these specifications should the technician proceed to align the multiplex portion of the receiver.

Preliminary Procedures

Before using a FM multiplex signal generator, it is recommended that it be turned on, giving it a 10 to 20 minute warmup period. This will allow ample time for the RF, audio, and 19kHz oscillators to stabilize.

Although the 19kHz pilot generator oscillator is extremely stable, there is always the possibility that it could shift from its precisely assigned frequency. There is a very simple method to check the 19kHz pilot frequency using a FM multiplex receiver and a FM multiplex station as a frequency standard. Proceed as follows:

1. Tune your FM multiplex receiver to a FM multiplex station. When the pilot indicator lights up, it indicates the 19 kHz pilot amplifier is functioning. Since the 19kHz sine wave is from the transmitter it must be on frequency and can be used as a reference standard. Connect a cable between the output of the 19kHz amplifier and the vertical input of a good oscilloscope.
2. Connect the composite output terminal of the generator, directly to the horizontal input of the oscilloscope. Apply a 10% pilot carrier. The oscilloscope will display an oval Lissajous figure which should be motionless when the 19kHz output of the generator is synchronized with the 19kHz signal from the transmitter. Should the Lissajous figure rotate, it will only be necessary to adjust the pilot carrier frequency adjustment on the multiplex generator, until the Lissajous figure ceases to rotate. Refer to generator instruction book after the generator has been adjusted to zero beat, disconnect all cables.

Multiplex generators provide a composite multiplex signal as well as an RF signal, which is FM modulated by the composite multiplex signal. The composite signal is very useful since it is an excellent tool that can be used in signal tracing the multiplex portion of the receiver. We do not recommend that multiplex alignment be made using only the composite signal injected at the output terminal of the ratio detector tertiary winding, since there is always some phase shift occurring in the RF, IF or Ratio Detector circuits. As a result, multiplex alignment made by a signal injected at the Ratio Detector would not be correct. For proper multiplex alignment the composite signal must FM modulate the RF carrier and then be fed into the FM antenna terminals. With the signal injected in this manner, the multiplex alignment would then be the best that could possibly be obtained, and separation would be at the maximum for this receiver.

The RF signal should be injected at a point in the FM band where no other signal is present. If at all possible this should be at a frequency near the middle of the FM band. Tune the FM receiver to this point and adjust the RF frequency adjustment on the generator to this same frequency. The AGC voltage developed in the receiver should be maximum. AGC voltage substantially less than this will indicate the RF frequency adjustment is tuned to an image.

FM — MULTIPLEX ALIGNMENT PROCEDURE

CHASSIS — 10ZT30, 11AT30, 15WDR50Z1, 20AT21, 20AT21Z, 20AT30, 20AT30Z, 20AT31Z, 21BT30, 21BT34, (Z1), 25AT20, 25BT22, 25WDR50, 27BT30, 29CT20, 29CT21, (Z1), (Z2), 29AT24, (Z1), (Z2), 29CT30, 35WDR50.

Before aligning or servicing Multiplex Circuits be certain that RF, IF, and Ratio Detector are correctly aligned and that operation is normal on monaural FM signals.

STEP	CONNECT SCOPE AND/ OR VTVM	CONNECT GENERATOR	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL TO	ADJUST	PURPOSE
NOTE: PLACE BANDSWITCH IN FM POSITION AND STEREO/MONO SWITCH IN STEREO. USE RF FREQUENCY NEAR CENTER SCALE								
1**	Test Point "M" Composite Amp VTVM(AC)	Test Point "A" FM ANT.	300 Ohm	98MHz, 67kHzSCA	FM	98MHz	(T301**)	Adjust 67kHz Trap for minimum.
2	Test Point "N" Doubler VTVM(DC)			98MHz, 10% Pilot			T301, T302, R308 (T302, T303, R309**)	Adjust 19kHz Amp and Doubler for maximum.
							NOTE— Adjust this step with Test Point "T" Shorted Adjust mute control at same time so voltage does not exceed —.2 volt. Voltage must be kept at **minimum** for proper alignment. If stereo indicator lamp lights up, readjust mute control to extinguish lamp and continue adjustment of transformers for maximum.	
3				98MHz, 5% Pilot			R308(R309**)	Adjust mute control to point where stereo lamp lights up.
4	"L" Audio Output (After 38kHz filter) VTVM(AC)			98MHz, 10% Pilot L+R, L—R, (Mod. L Only)			T303(T304**)	Adjust 38kHz Detector for maximum at "L" Output. NOTE— "L" Output should be approximately 10 (or greater) times "R" Output.
5	"R" Audio Output (After 38kHz filter) VTVM(AC)			Check "R" channel output				

**FOR CHASSIS 29AT24, (Z1), (Z2) ONLY.

GENERAL TROUBLE-SHOOTING PROCEDURE

Should a problem arise in aligning the FM multiplex portion of the receiver, the technician must determine whether the difficulty lies in the RF, IF, limiter and ratio detector portions of the receiver, or whether the difficulty lies in the multiplex portion. A multiplex generator is an excellent signal tracing device to determine if the multiplex section of the receiver is functioning properly. The composite output of the multiplex generator can be injected at the output of the ratio detector.

To reduce possible extraneous signals coming through the ratio detector, short the ratio detector primary with a jumper lead. The wave forms and their magnitude may vary slightly from chassis to chassis, however, they are quite indicative of what will be seen when signal tracing the multiplex circuitry.

67kHz Signal Tracing

1. Turn generator pilot carrier amplitude control to zero.
2. Move L+R and L-R switches to OFF position.
3. Move 67kHz generator ON. Sequentially connect an oscilloscope to the input and output of the 67kHz trap. The 67kHz signal at the output of the trap if it is properly nulled, will be much smaller than at the input. The voltage ratio should be approximately 20 to 1, input to output.

19kHz Signal Tracing

1. Move the 67kHz generator OFF.
2. Move the generator 19kHz pilot carrier amplitude control to 10% position.
3. Sequentially connect your scope to the base of composite amplifier, base of 19kHz amplifier and collector of 19kHz amplifier. The amplitude of the 19kHz signal should greatly increase as you proceed along the 19kHz chain.

Doubler and Subcarrier Signal Tracing

To determine if the doubler is functioning, place your scope at the junction of the two diodes and you will see 38kHz DC pulses. Placing the scope at the collector of the subcarrier amplifier, you should see a 38kHz sine wave which will indicate that the subcarrier amplifier and associated ringing circuitry is functioning properly.

Multiplex Detector Signal Tracing

1. Move the 19kHz pilot amplitude control to 10%.
2. Move the L - R generator switch to L - R. You should see equal amplitude 1000 hertz sine waves at both L and R outputs.
3. Move the L+R switch to L+R and look at the L audio output, and measure the magnitude of the 1000 Hertz sine wave. If the multiplex detector and preceeding circuitry are aligned properly, the magnitude of the wave form at L should be greater than at R.

If all the waves are similar in form and magnitude to those indicated, then it can be assumed that the multiplex portion of the receiver is functioning properly and the problem lies ahead of this in the FM receiver. If any of the wave forms are missing at a latter point but are apparent at a previous point, then something is amiss in the circuitry between the two test points.

FM — MULTIPLE ALIGNMENT PROCEDURE — CHASSIS 4WDR50X, (X1), MODEL D538

Before aligning or servicing Multiplex Circuits be certain that RF, IF and Ratio Detector are correctly aligned and that operation is normal on monaural FM signals.

STEP	CONNECT SCOPE AND/ OR VTVM	CONNECT GENERATOR	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL TO	ADJUST	PURPOSE
NOTE—PLACE BANDSWITCH IN FM STEREO POSITION. USES RF FREQUENCY NEAR CENTER SCALE.								
1	Test Point "M"	Test Point "A" FM ANT.	300 Ohm	98MHz, 10% Pilot	FM	98MHz	L302	Adjust 19kHz Amp for maximum.
2							L303	
3	"L" Tape Output			98MHz, 10% Pilot, L+R, L—R, (Mod. L Only)			L301, L302, L303	Adjust for maximum L Channel reading.
4	"R" Tape Output						L303	Adjust for minimum R Channel reading.
5				Repeat Steps 3 and 4 for minimum change.				To provide maximum separation.

FM – MULTIPLEX ALIGNMENT PROCEDURE – CHASSIS 5WDR50X, (X1)

Before aligning or servicing Multiplex Circuits be certain that RF, IF and Ratio Detector are correctly aligned and that operation is normal on monaural FM signals.

STEP	CONNECT SCOPE AND/ OR VTVM	CONNECT GENERATOR	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL TO	ADJUST	PURPOSE
NOTE – PLACE BANDSWITCH IN FM-STEREO AND AFC IN OFF. FOR FOLLOWING ADJUSTMENTS USE 98MHz OR OTHER CLEAR RF FREQUENCY NEAR CENTER SCALE.								
1	Test Point "R" Pin 4 on T301	Test Point "H" Disconnect FM Antenna	300 Ohm	98MHz 10% Pilot	FM	98MHz	T301	Adjust 19kHz Amp for maximum.
2	Test Point "U" Junct. of CR301 and CR302						T302	Adjust 19kHz Amp for maximum.
3	Test Point "Z" Left Output			98MHz 10% Pilot L+R, L – R, (L only)			T303	Adjust 38kHz Amp for maximum L Channel reading to provide maximum separation.
4	Test Point "X" Right Output						R305	Adjust for minimum R Channel reading to provide maximum separation.
5	Test Point "Z" Left Output			98MHz 10% Pilot L+R, L – R, (R only)				Adjust for minimum, should be equal to step 4.

FM – MULTIPLEX ALIGNMENT PROCEDURE – CHASSIS 15WDR51

Before aligning or servicing Multiplex Circuits be certain that RF, IF, and Ratio Detector are correctly aligned and that operation is normal on monaural FM signals.

STEP	CONNECT SCOPE AND/ OR VTVM	CONNECT GENERATOR	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL TO	ADJUST	PURPOSE
NOTE – PLACE BANDSWITCH IN FM STEREO POSITION. USES RF FREQUENCY NEAR CENTER SCALE.								
1	Test Point "M"	Test Point "A" FM Antenna	300 Ohm	98MHz 10% Pilot	FM	98MHz	T301	Adjust 19kHz Amp for maximum.
							T302	
2							NOTE – Stereo Indicator Lamp may be on or off during the above steps.	
3				98MHz 5% Pilot			R302	Adjust mute control to point where stereo lamp lights up.
							NOTE – Stereo Indicator Lamp must remain on during the following steps.	
4	"L" Tape Output			98MHz 10% Pilot L+R, L – R, (Mod. L Only)			T303	Adjust for maximum L Channel reading.
5	"R" Tape Output						T303 if necessary	Adjust for minimum R Channel reading.
6				REPEAT STEPS 4 and 5 for MINIMUM CHANGE.				To provide max. separation.

SECTION FOUR
THEORY AND APPLICATION

INTRODUCTION

New circuits are being introduced including those in Chassis 15WDR51 (a FM/Stereo FM/AM tuner, with provisions for decoding some four channel encoded records or broadcasts, and also has discrete four channel audio capabilities). We will discuss a JFET used in a meter circuit, an IC used in the multiplex, Four Channel decoding, and other audio circuitry.

JFET METER CIRCUIT

This circuit (see Figure 1) uses a N channel JFET in conjunction with a balanced bridge configuration consisting of: Q204, meter M1, and R230 thru R234. The Bias Adjust pot, R234, is adjusted for zero center meter reading on no signal when the Bandswitch is in the FM or FM Stereo positions. This pot should be readjusted if transistor Q204 or any related components are replaced. It should be noted that the meter will read plus and minus when tuning FM stations, but will function as a peak reading meter on AM (NOTE: on AM the meter will only deflect in a positive direction from zero). The low value resistor in series with the JFET's source terminal permits use of JFET's having a wide range of characteristics.

When signals are applied, from either the FM or AM detectors, they will cause the current in the JFET to unbalance the bridge circuit, resulting in a change of current thru the meter, thereby indicating a tuning change. A capacitor, C230, is connected between ground and gate of Q204 in order to remove audio components that would otherwise appear on the gate and cause misleading tuning indications. The combination of the high impedance of the JFET and gate circuit resistors (from FM and AM detectors) results in minimum loading on the detectors, providing high sensitivity of this circuit on FM and AM.

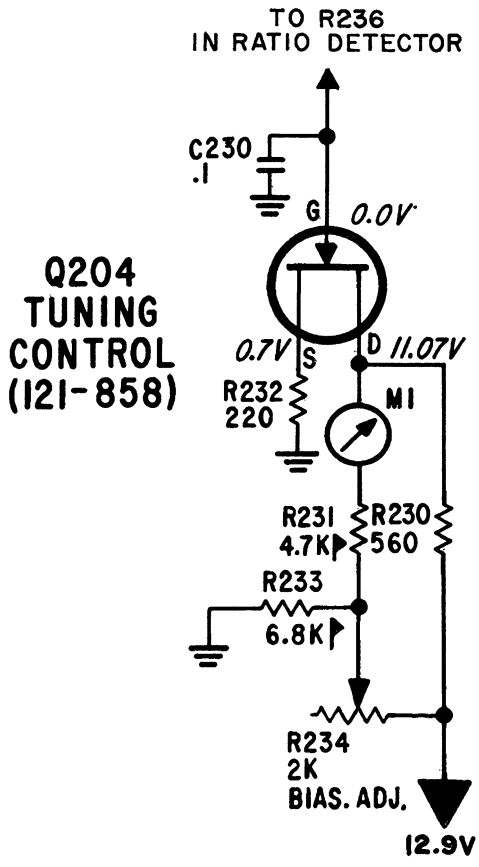


FIGURE 1 – JFET METER CIRCUIT

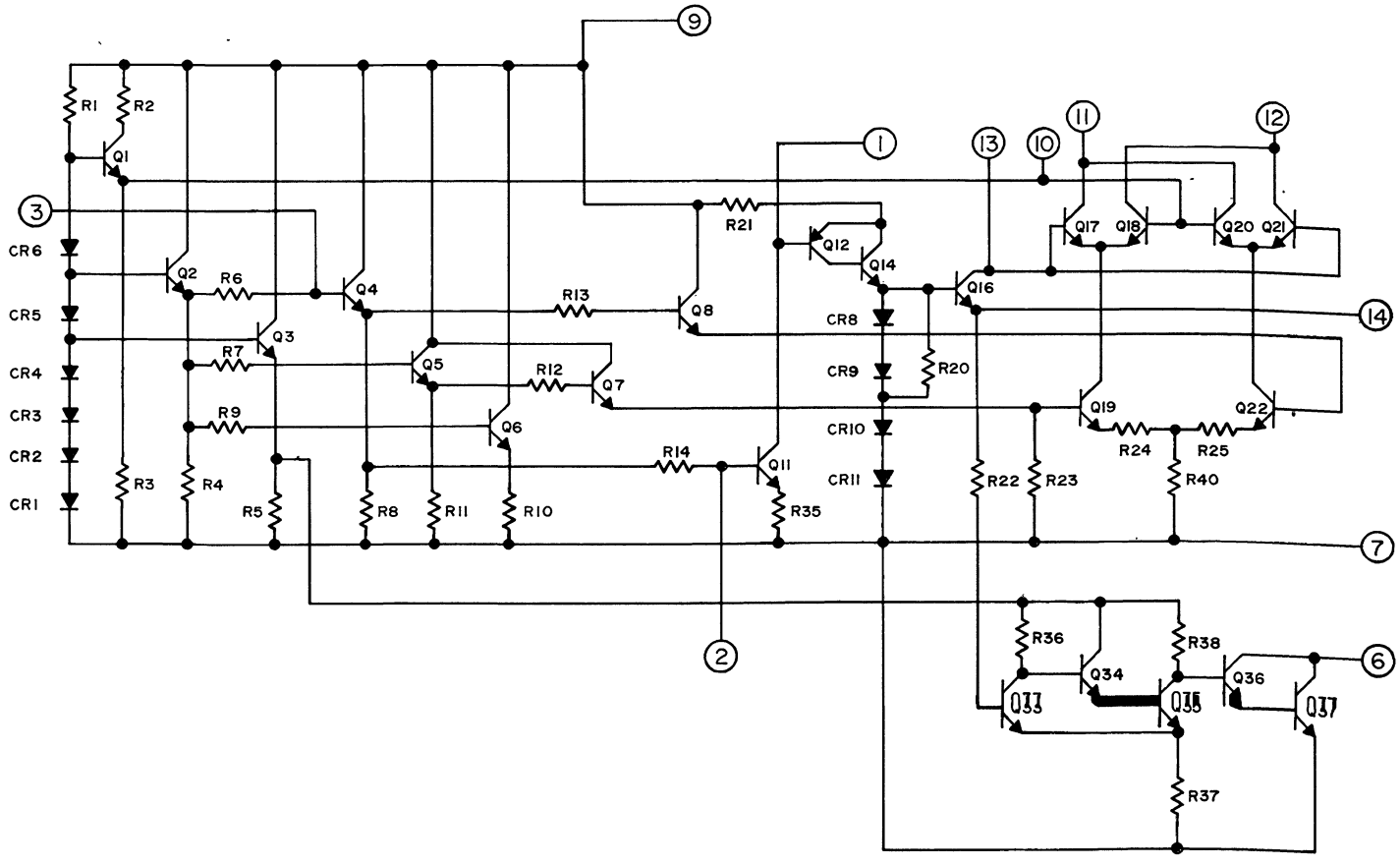


FIGURE 2 – IC INTERNAL CIRCUITRY

FM MULTIPLEX

An Integrated Circuit is currently being used as a multiplex demodulater in chassis 15WDR51. The IC performs the functions of: 19kHz amplifier, doubler, 38kHz amplifier, demodulater and stereo lamp driver; and is of the 14 pin dual inline configuration.

A schematic of the internal circuitry is shown in Figure 2. In order to simplify explanation of the overall circuit, we can look at the following segments, of the IC's circuitry, as separate functions:

1. DC Bias
2. AC Signal
3. Demodulater
4. Indicator Lamp

Before proceeding with the signal processing circuitry, we shall look at the DC bias circuits. As noted in Figure 3, there are six series connected diodes (CR1 – CR6), which are used to establish reference voltages for the demodulater circuits. In addition, transistors Q1 – Q3 function as regulators, to provide internal decoupling and improved regulation.

Since a single ended signal input connection is made to one transistor of the lower differential pair (Q22), it is necessary to provide a matching dc level on the other side of the pair (Q19). The two diode point (between CR2 and CR3) could have been used. In the interest of maximum matching, a duplicate of the Q4, Q8 path was incorporated as Q5, Q7. This matching can result in a very low 38kHz residue in the right and left outputs. This matching can also result in noise attenuation when the pilot signal circuitry is functioning on a weak signal.

Figure 4 is a block diagram of the signal processing circuits while Figure 5 is a more detailed circuit.

The composite signal (L+R, L-R, pilot) is applied to pin 3, and then to Q4. From the emitter of Q4, there are two paths. One contains the L+R and L-R which is applied to Q8, then via Q22 to the demodulater, which will be explained later. The other path is from the emitter of Q4, via R14, to the 19kHz amplifier Q11 which is tuned in both the base and collector circuits (external from IC pins 2 and 1 respectively). The tuned circuits extract the 19kHz pilot signal. A frequency doubler (a composite PNP consisting of Q12, and Q14) will conduct when a negative going signal is applied to the base of Q12. The output of Q12, Q14 is applied to Q16, the 38kHz amplifier. Transistor Q16 is the 38kHz amplifier with a tuned circuit (connected externally via IC pin 13) in its output. The output of Q16 is limited by the diode string CR8 - CR11, so that amplitude variations are held to a minimum to avoid overload of Q16.

An emitter bypass capacitor is connected to IC pin 14. This capacitor will charge to a dc level proportional to the level of the pilot signal. This dc level is then used to drive the stereo indicator light circuit which will be explained in more detail later. At this point, we now have: 1) the 38kHz pulses which are being applied to the bases of Q17 and Q21, and 2) the composite signal which is applied to the base of Q22. Figure 6 shows a basic differential amplifier. In this circuit we show a signal being applied to the base of Q22, with a fixed bias applied to the base of Q19. These voltages establish conditions required for operation as a differential amplifier. Resistor R40, in the emitters of Q19 and Q22, functions as a current limiting device. Under such conditions, the current thru R40 will equal the sum of the current in the emitter circuits of Q19 and Q22. When the current increases in one transistor, it will decrease in the other. When a positive going sinewave is applied to the base of Q22, it will be forward biased, driving it further into conduction. The emitter voltage on Q22 will go positive as will the emitter voltage on Q19, reducing forward bias on Q19, causing the collector of Q19 to go more positive. The positive going signal on the base of Q22 results in out of phase voltages on the collectors of Q19 and Q22 as illustrated in Figure 6.

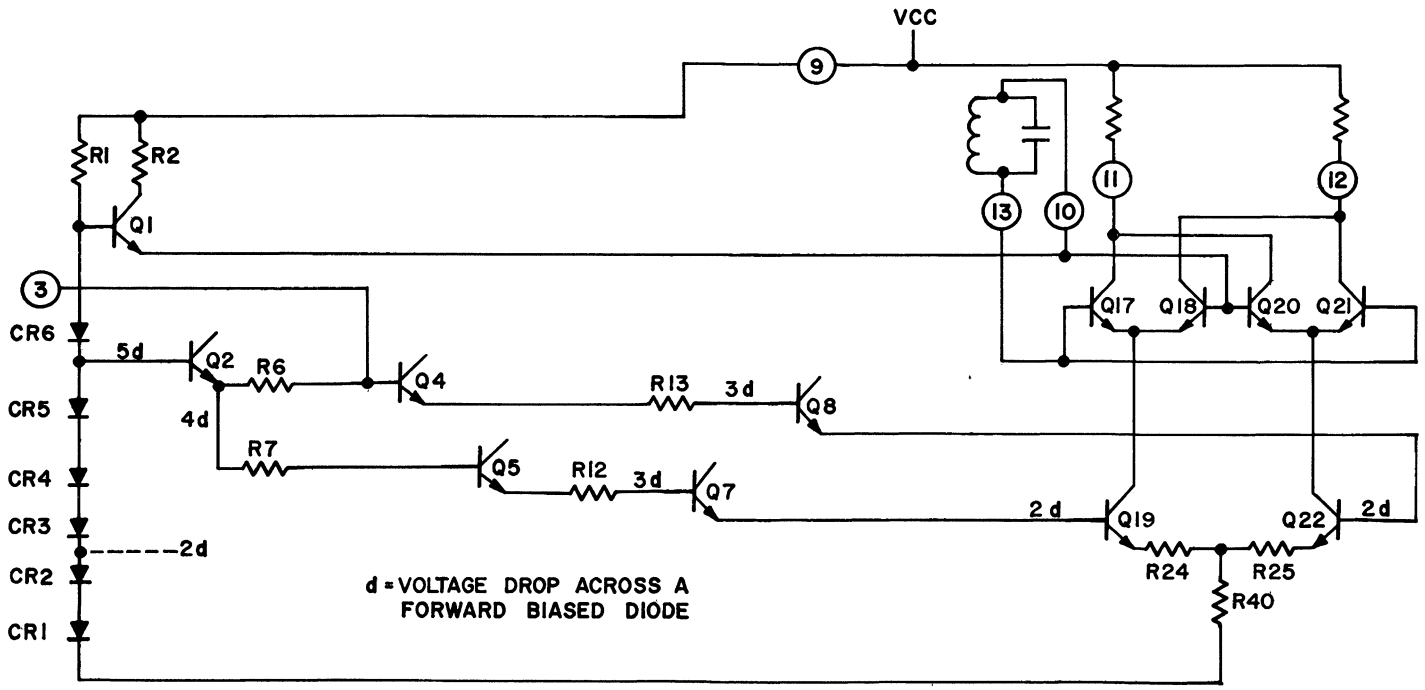


FIGURE 3 – DC BIAS CIRCUITS

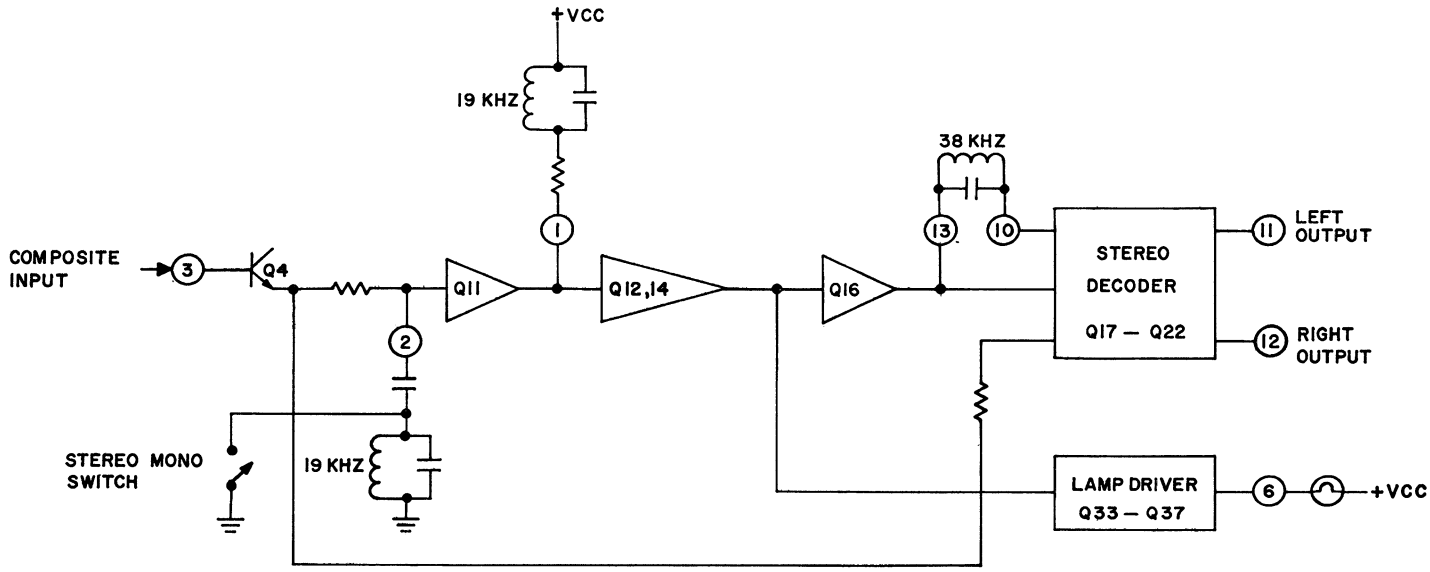


FIGURE 4 – SIGNAL PROCESSING CIRCUITS - BLOCK DIAGRAM

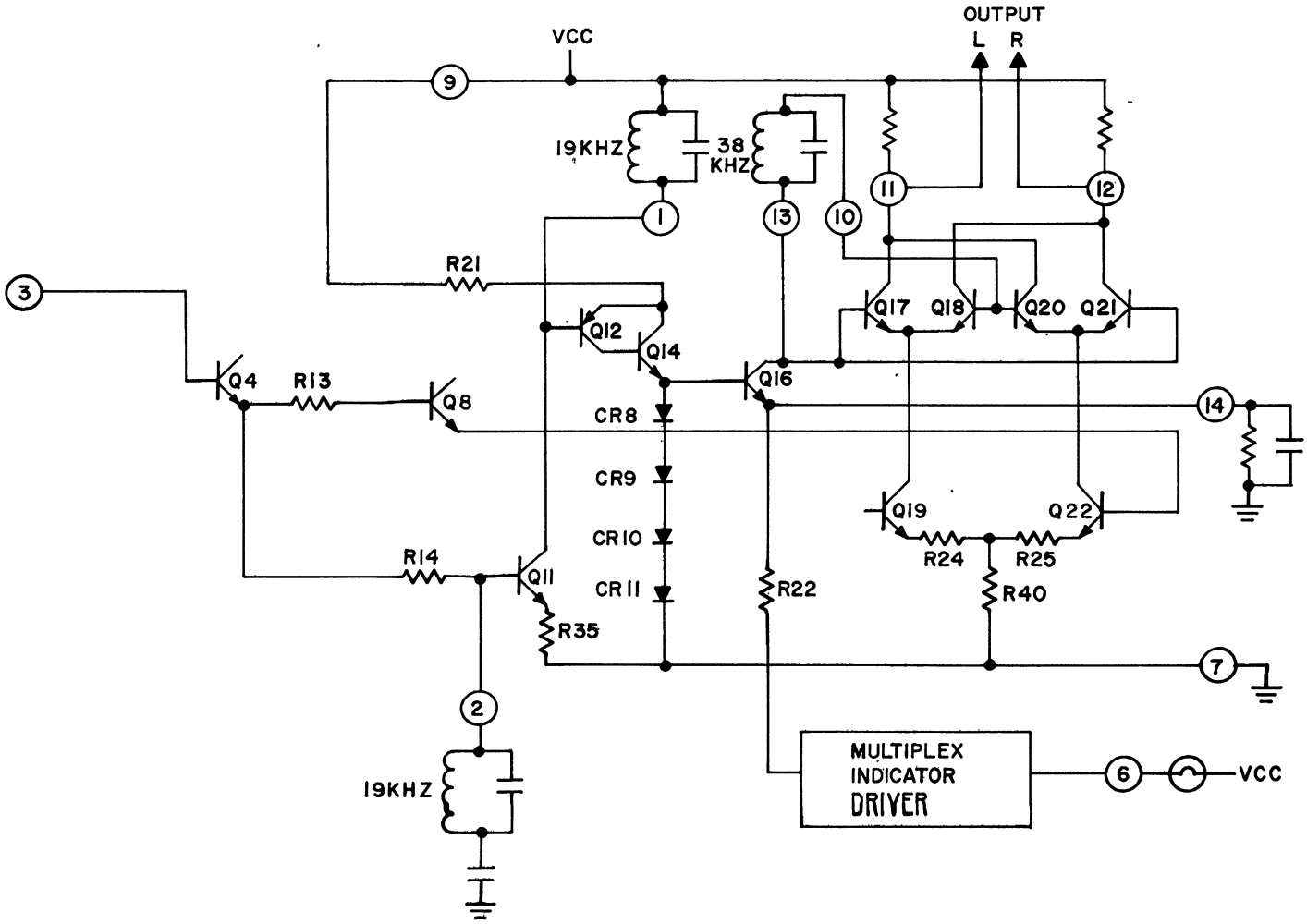


FIGURE 5 – SIGNAL PROCESSING CIRCUITS

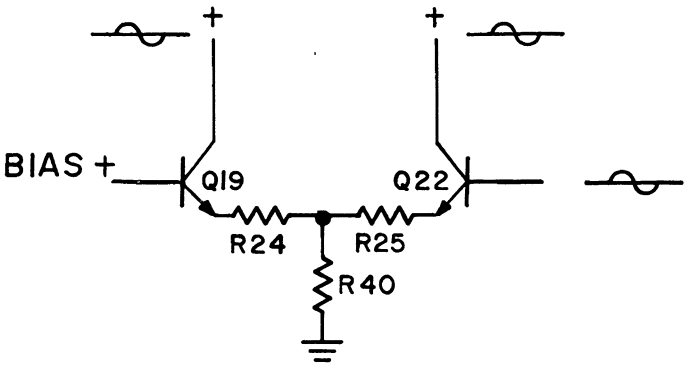


FIGURE 6 – DIFFERENTIAL AMPLIFIER

To repeat! the current flowing in emitter resistor R40 is the sum of the individual emitter currents of Q19 and Q22. When the current increases in one transistor, it decreases in the other.

Figure 7 illustrates the complete circuit of the balanced differential synchronus demodulater. The lower portion (Q19, Q22) is the same as that shown in Figure 6. We have added two more differential circuits to the collectors of Q19 and Q22. These circuits include transistors Q17, Q18, Q20 and Q21. The amplitude of the 38kHz pulses is large enough to provide instantaneous gating of the audio signal (L+R, L-R) alternately to the L and R outputs. When the 38kHz signal is of the same phase as that of the composite signal, the L and R components will be correctly separated.

The differential stage consisting of Q17, Q18, and Q19 is added for two reasons. First, the 38kHz signal switches the dc current in the collector of Q22. This would result in a large undesired 38kHz signal in the L and R outputs. Q19, being gated by the 38kHz signal, out of phase with Q22, will result in cancellation of such unwanted signals. The second reason is, addition of Q17, Q18 and Q19 results in better separation and reduced crosstalk than that available without the added circuit. Crosstalk correction is achieved by use of resistors R24, R25, and R40.

This design of demodulater results in the reduction of interference from SCA signals, because beat frequencies between the 67kHz SCA and the 38kHz switching signal (or its harmonics) will fall above the audio range.

Reception of a stereo program is indicated by illumination of the stereo indicator (See Figure 8). As noted previously, a large value bypass capacitor is connected to the emitter of Q16 (Via IC pin 14) to establish a dc level for the stereo lamp driver circuit, when a 19kHz signal causes Q16 to turn on. This dc signal is applied to a Schmitt trigger circuit (Q33 - Q35). When the Schmitt trigger is turned on, the NPN driver stage (Q36, Q37) will saturate, placing the full supply voltage across the stereo indicator light (connected to IC pin 6). When the Schmitt trigger is off, bias is removed from the lamp driver (Q36, Q37). This results in a positive indication of the lamp.

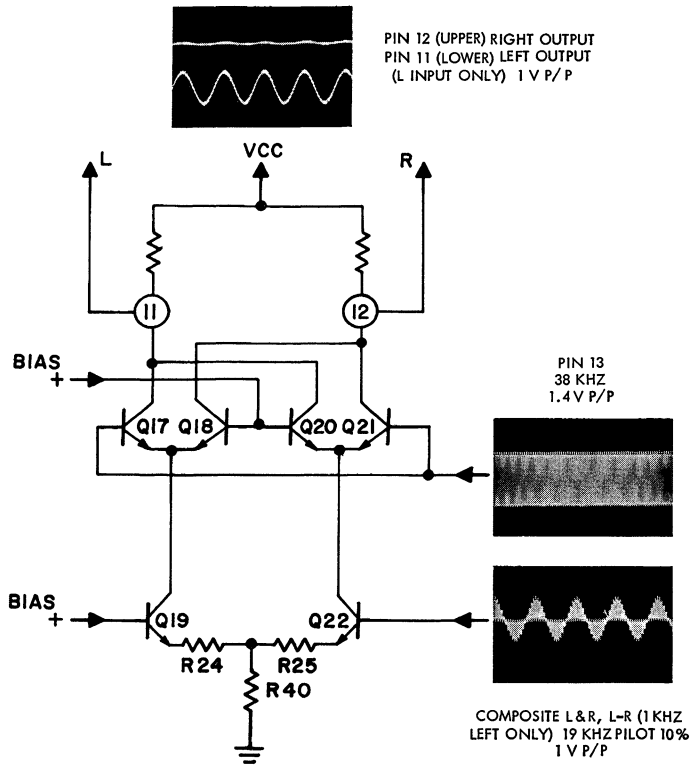


FIGURE 7 – BALANCED SYNCRONUS DEMODULATOR

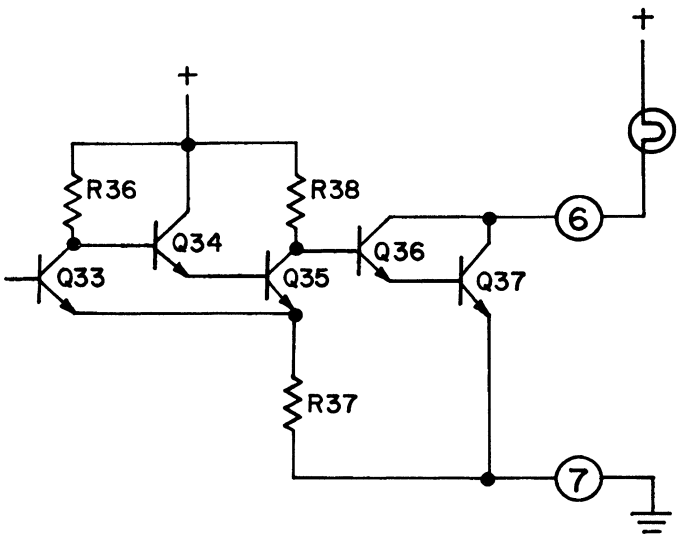


FIGURE 8 – STEREO INDICATOR CIRCUIT

A complete IC schematic is shown in Figure 9, the same as Figure 2, but this time including the major external components, and signal information.

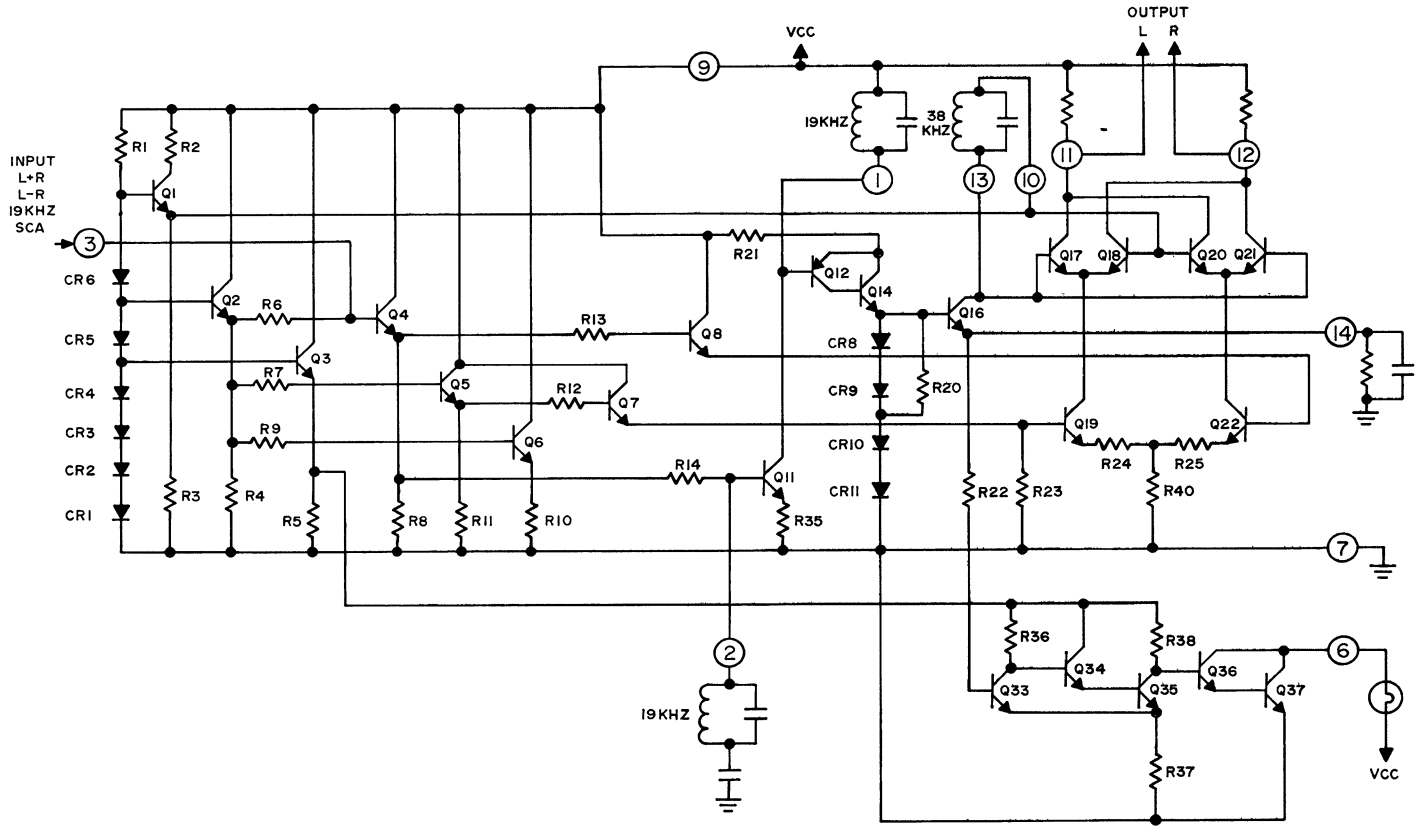
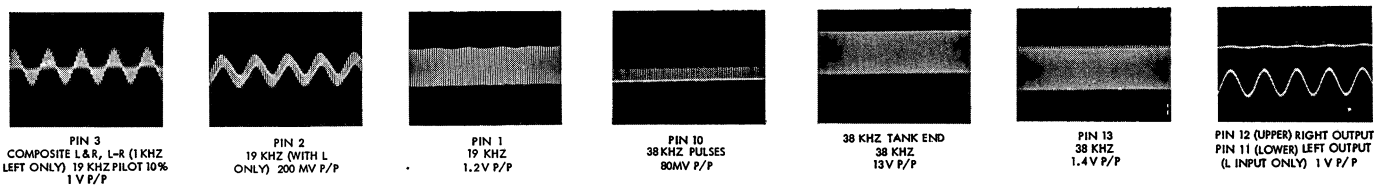


FIGURE 9 – IC INTERNAL CIRCUITRY WITH EXTERNAL COMPONENTS



PIN 3
COMPOSITE L&R, L-R (1 KHZ LEFT ONLY) 19 KHZ PILOT 10% 1 V P/P

PIN 2
19 KHZ (WITH L ONLY) 200 MV P/P

PIN 1
19 KHZ
1.2V P/P

PIN 10
38 KHZ PULSES
80MV P/P

38 KHZ TANK END
38 KHZ
13V P/P

PIN 13
38 KHZ
1.4V P/P

PIN 12 (UPPER) RIGHT OUTPUT
PIN 11 (LOWER) LEFT OUTPUT
(L INPUT ONLY) 1 V P/P

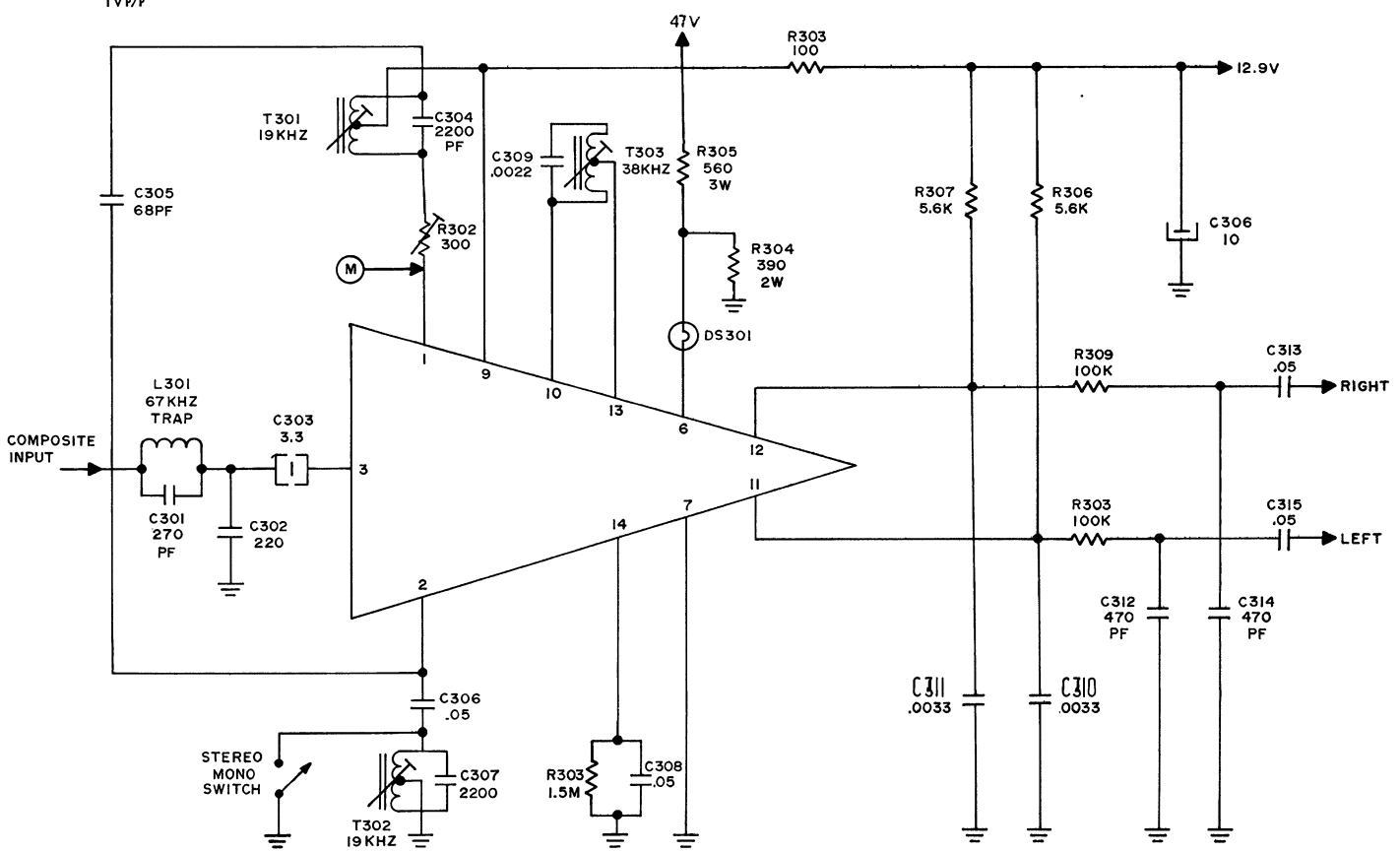


FIGURE 10 – IC EXTERNAL CIRCUIT WITH WAVEFORMS

Complete external circuitry is shown in Figure 10, along, with the voltages and wave forms which can be found at the key terminals of the IC. Next to be noted is the Stereo-Mono switch. This switch (located on the control panel of the stereo model) shorts the 19kHz input trap, when in the mono position, effectively grounding the 19kHz circuit, deactivating the stereo function.

When a mono signal is received (no 19kHz pilot), a 38kHz switching signal will not be created. At such time, a fixed bias will be applied to the bases of Q17, and Q22, via the 38kHz coil. The bias is taken from the opposite end of the 38kHz coil, connected to the same point that supplies the fixed bias to Q18 and Q20. By this method, the pair Q20, Q21 will be forward biased, permitting the mono signal to pass to the L and R outputs.

FOUR CHANNEL SOUND

As the state of the art advances, new devices and circuits are developed, resulting in rapid and wide spread changes in a given industry. An example of this would be the following changes which have occured in the audio related fields:

1. Monophonic records, radio broadcasts, and tape.
2. Stereophonic records and tape.
3. Stereophonic FM radio broadcasts.

Monophonic records and broadcasts provided the listener with a basic medium of transmission. Figure 11 illustrates the studio (radio or recording) in which are found the orchestra, and one microphone. Below that we show the listening room containing one loudspeaker system and one listener. While a "direct connection" is shown between the microphone and the loudspeaker, it should be understood that, in place of the direct connection, there will be storage devices (tape and records), and transmission systems (transmitters and receivers). While those four elements (tape, records, transmitters and receivers) will normally be used, they have been omitted from the illustrations to simplify explanations.

Introduction of stereophonic sound provided the means by which it was possible to present sound that would identify the left - right position of entertainers, or their instruments. This resulted in a more realistic sound image to the listener. In the early days of stereo we were limited to the use of records and tape, until a technique was develped which would allow transmission of stereo records and tape via FM (referred to as multiplexing, or more commonly FM stereo).

In Figure 12 we have illustrated the studio, but this time with two microphones, which in turn are "connected" to two loudspeakers in the listening room.

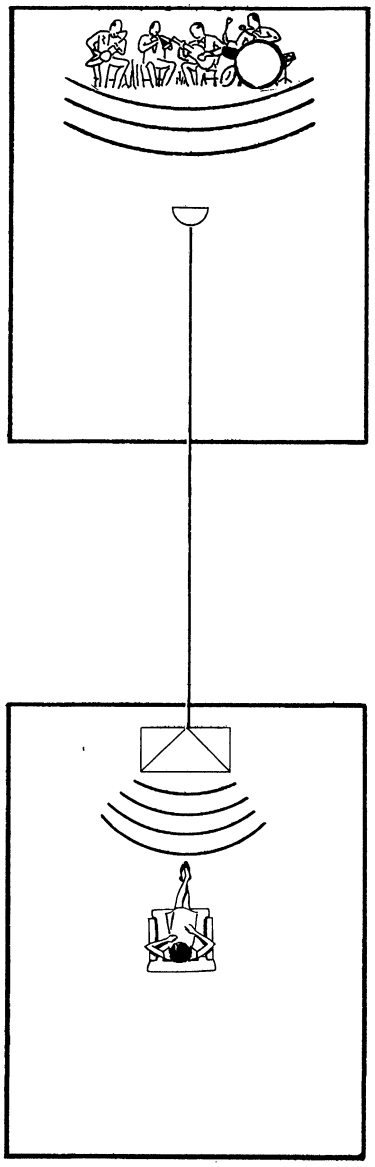


FIGURE 11 – MONO

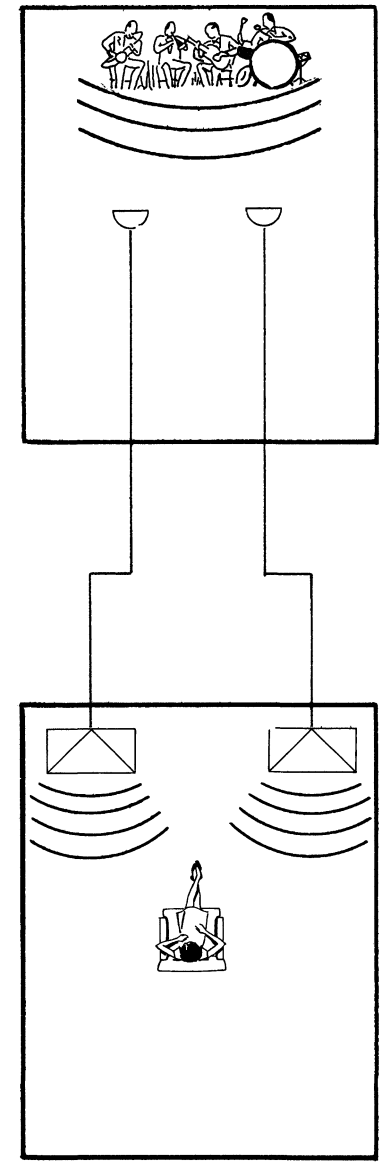


FIGURE 12 – STEREO

At this point we should make note of the fact that the human auditory system responds to sounds which approach not only from left to right, but also from the front and rear. This is due, in part, to the reflected sounds in the listening room. If both the listener and the sound source were in an area that had no echos, such as an open field, the sound would arrive from only one direction, as illustrated in Figure 13. However, most areas (such as the average room) do have echos (or indirect sound) as shown in Figure 14. These sounds (direct or indirect) will also be received from the rear of the room.

It is known that the human auditory system will detect sounds from the front, back, left, right, and directions in between. A human, with normal hearing, can pinpoint most individual sounds from any point within a 360 degree circle. Human hearing can also detect the intermix of sounds (or lack of) caused by room accoustics (due to amplitude, phase, frequency, and time delay). This is referred to as "ambient sound" (meaning surrounding). Ambient sound, when part of, or added to stereo records or tape can result in greatly enhanced sound.

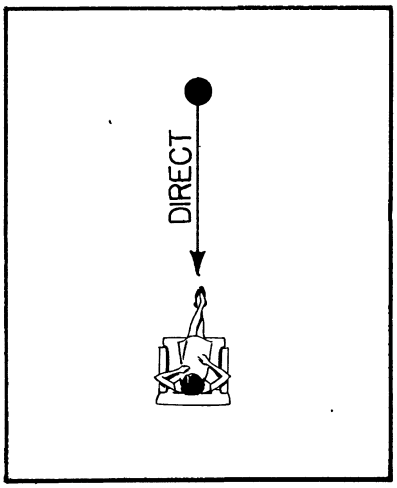


FIGURE 13 DIRECT SOUND

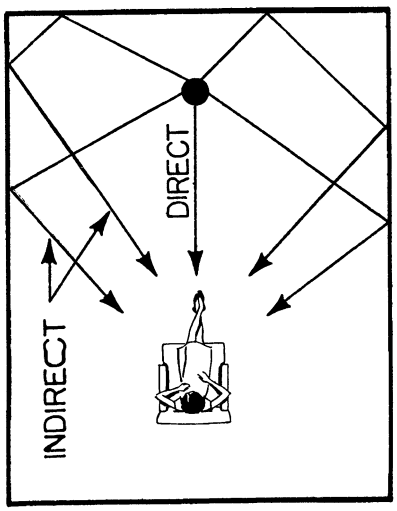


FIGURE 14 – INDIRECT SOUND

WHAT IS FOUR CHANNEL SOUND?

Now comes the introduction of Four Channel Sound (sometimes referred to as quadra-sonic or quadri-phonic sound, etc.).

Since sounds are in the four quarters of the room, what can be done with them? How can they be reproduced? Figure 15 illustrates four microphones, one in each quarter of the room. They in turn are "connected" to four loudspeakers in the listening room (one in each corner).

So far this looks simple, but – how can four separate channels be recorded? The most practical method is on tape (at this moment). There would be no problem if one were to use only tape. However, how does one broadcast the tape? The Federal Communications Commission (FCC) has approved a system of broadcasting two channel stereo, but has not approved a system for four separate channels. How can a four channel system be processed, when most of the media (radio, disc, tape) is designed around a two channel system?

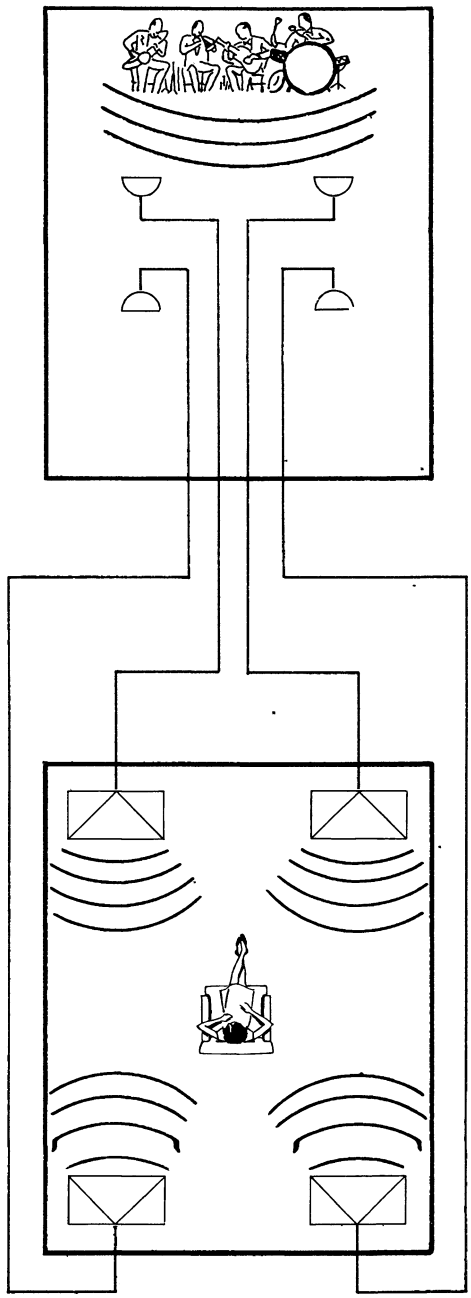


FIGURE 15 – FOUR CHANNEL

DEFINITIONS

Several terms are used when referring to Four Channel Sound Systems.

A. DISCRETE: Separate or distinct. A discrete system would pick up 1, 2 or 4 separate sound sources and send them via 1, 2 or 4 separate channels to 1, 2 or 4 separate sound reproducers as illustrated in Figures 11, 12, and 15 respectively. As noted before, this results in limitations as far as broadcasts and discs are concerned. In addition, if you were to put separate channels on tape, you would cut the available time in half, increasing tape cost (based on current tape cassette and cartridge design).

B. MATRIX: In this discussion, refers to a circuit for combining two or more incoming signals in such a way as to create other signals which will contain specific percentage levels of each incoming signal.

C. ENHANCEMENT: Refers to the enhanced or "surround" sound derived from the recovery of ambient sound.

D. SOURCES: Used in this discussion to indicate the number of sources that are the result of the "mix down" following the original recording session. Perhaps 20 microphones were used during the actual recording session.

E. 4 – 4 – 4: Refers to the fact that there are four separate sources (microphones, etc.), four separate channels on the media (such as tape), and four separate reproducing systems (amplifiers and speakers). Figure 16 shows four separate sources have been recorded on tape, for play back on a four channel tape unit, for reproduction via four separate amplifiers and speaker systems. The four horizontal lines represent the four separate channels. Since we are describing a system using four separate channels from start to finish, we can call it a discrete system.

F. 2 – 2 – 4: Many records contain ambient sound, that is, sounds which are of different amplitudes, phases, frequencies, and time delays. It is possible to recover these sounds from stereo records and use them to reproduce a surrounding or enhanced sound. Figure 17 illustrates a conventional stereo record, being played on a stereo phonograph, via a decoder which will recover the ambient sound, and finally to the four amplifiers and speakers systems.

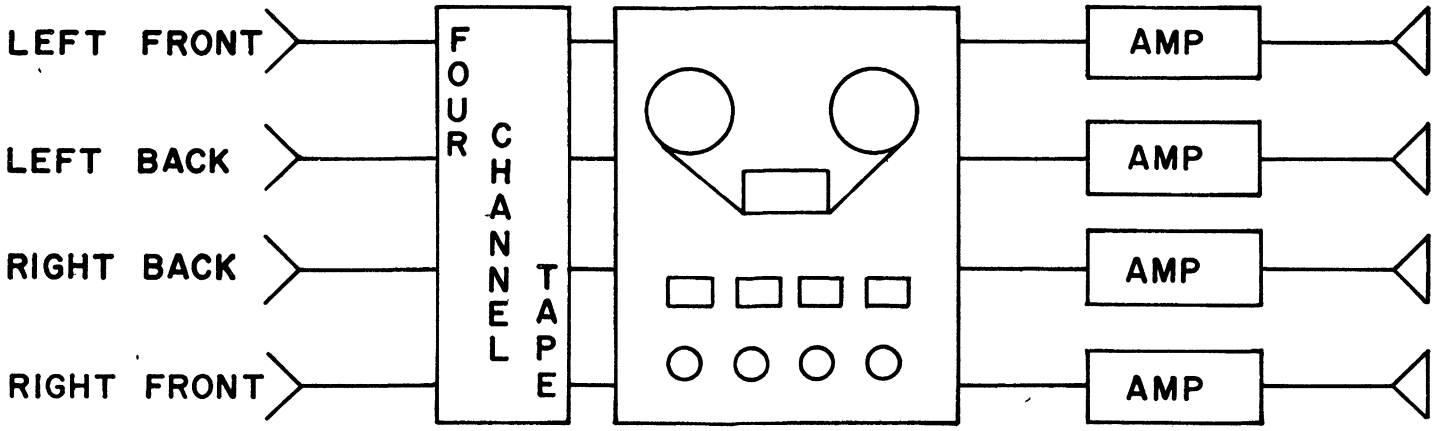


FIGURE 16 – 4 - 4 - 4 SYSTEM

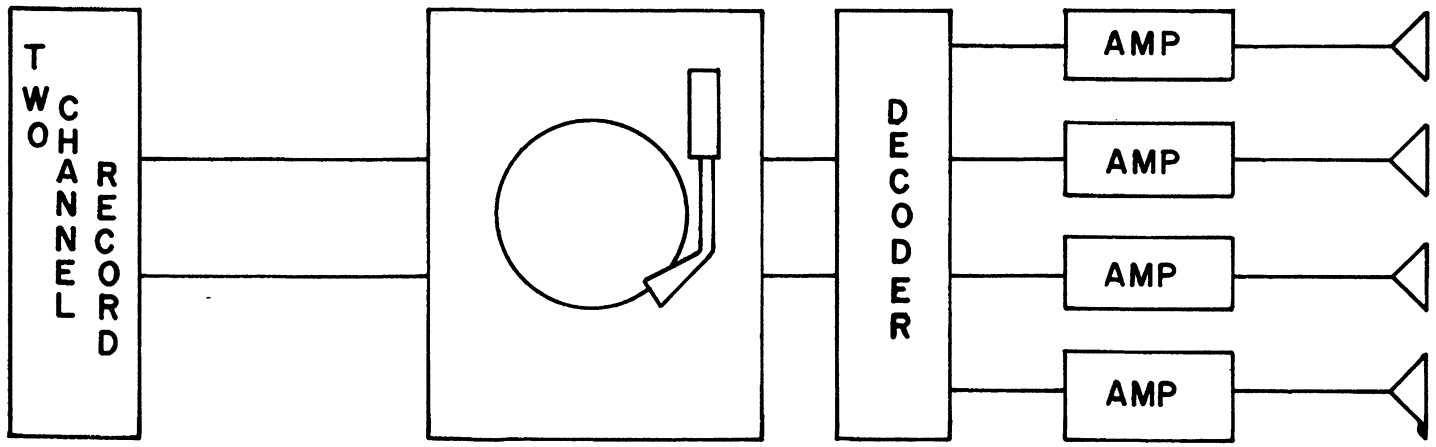


FIGURE 17 – 2 - 2 - 4 SYSTEM

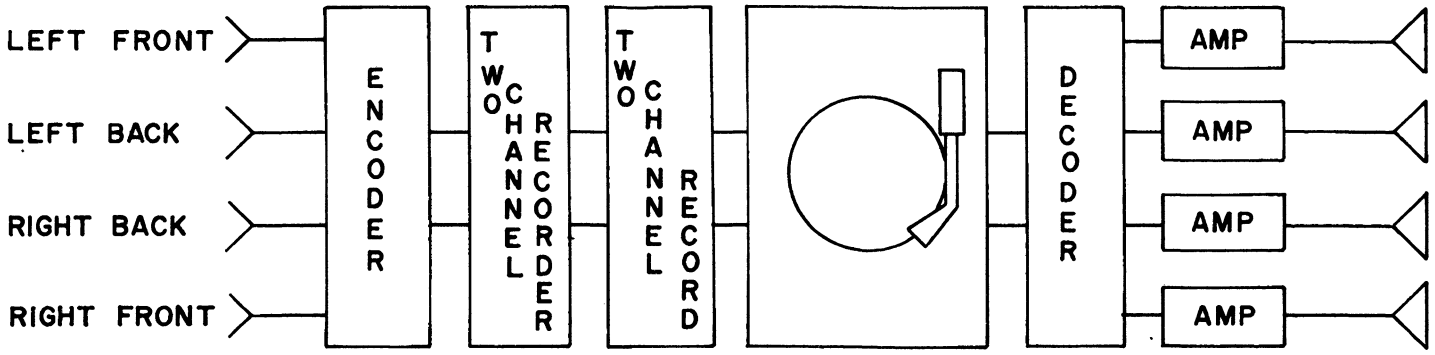


FIGURE 18 – 4 - 2 - 4 SYSTEM

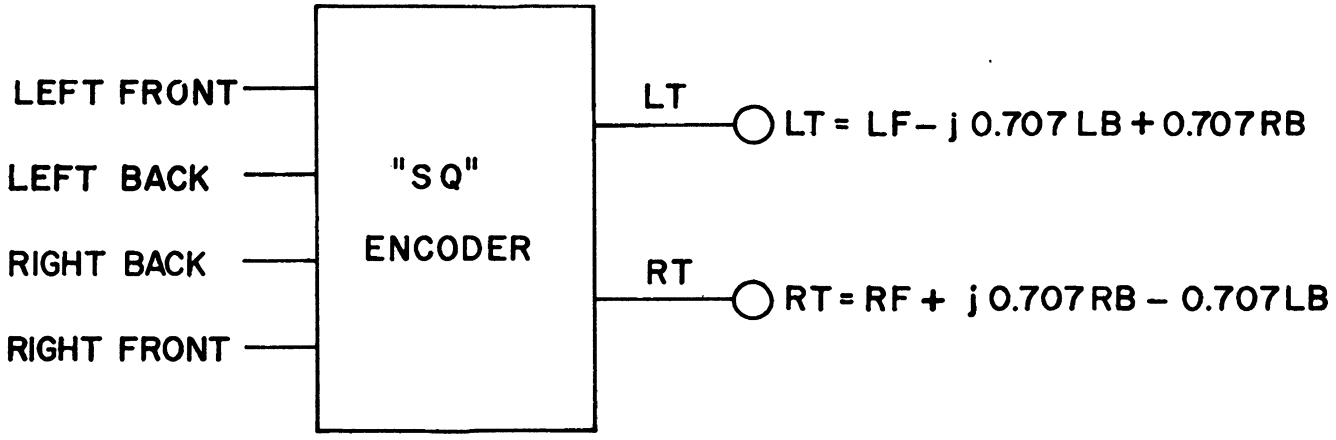


FIGURE 19 – SQ ENCODING

G. 4 – 2 – 4: In this system, as shown in Figure 18, there are four sources which are fed to an Encoder (containing matrix circuitry) and reduced to two channels on record or tape. When the record (or tape) is played back via a Decoder, and four reproduction systems, you will derive sound distribution which is representative of the original sound. Electro-Voice and CBS SQ systems of encoding and decoding are two systems that are representative of this catagory.

ENCODING MATRIX

How is a regular stereo disc or stereo tape broadcast on FM? A matrix circuit which combines the L and the R signals into sum (L + R) and difference (L - R) signals! Could the same, or some similar system be devised that would permit the current media (records or broadcasts) to handle four channel sound?

Matrix systems are being used in both the E-V and SQ systems. The basic difference being that the one system uses an amplitude matrix which relies on signals which exhibit a basic 180 degree phase difference relationship, while, the other system uses a phase shift matrix for signals having additional phase relationships (via more complex circuitry).

SQ ENCODING MATRIX

Figure 19 shows a block diagram for a SQ type matrix encoder. The circuit of the encoder combines the input in such a way that the outputs, will contain signals of certain relative levels and phases as follows:

LT = LF, –j.707LB, + .707RB (1)
RT = RF, +j.707RB, – .707LB (2)

LT and RT are the encoded Left and Right channels respectively. LF, RF, LB and RB represent the four input channels. +j and -j denote a + or - 90 degree phase shift. As you will note, there is no Right Front (RF) in the LT and no Left Front (LF) in the RT signals.

Regular stereo records are "cut" using the 45/45 method, that is, the left signal is cut into one side of the groove, while the right signal is cut into the opposite side of the same groove. This will result in the reproduction of the front channels of the two channel stereo as illustrated in Figure 20.

Next comes the question: What about the two back channels, how can they be handled on records? The two back channel signals are recorded by double-helical modulation, as shown in Figure 21. As you will note, there is a rotating motion at right angles to the grooves.

The Left Back (LB) channel is recorded with a circular motion in a clockwise direction, while the Right Back (RB) channel forms a helix in a counterclockwise direction. In actual playback, the stylus would not trace a helix, but would trace the complex motion that represents the combined motions of all channels.

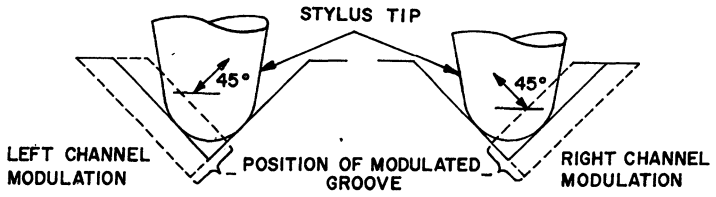


FIGURE 20 – STYLUS MOTION

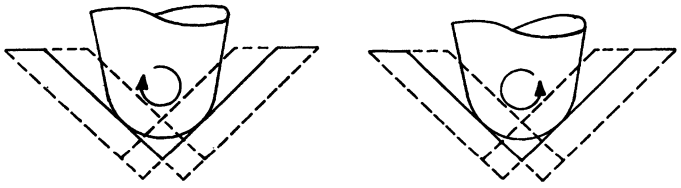


FIGURE 21 – STYLUS MOTION

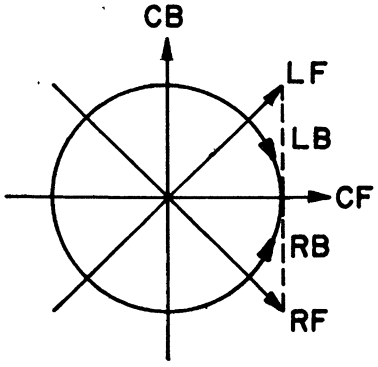


FIGURE 22 – RECORD MODULATIONS

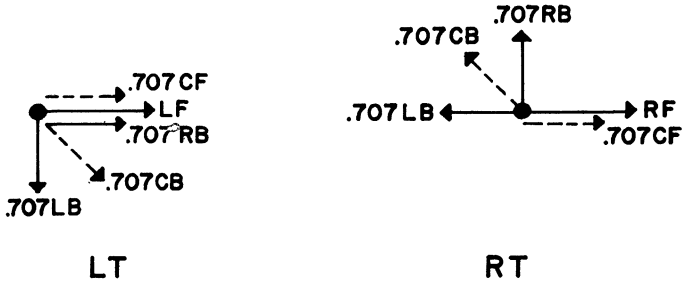


FIGURE 23 – PHASORS

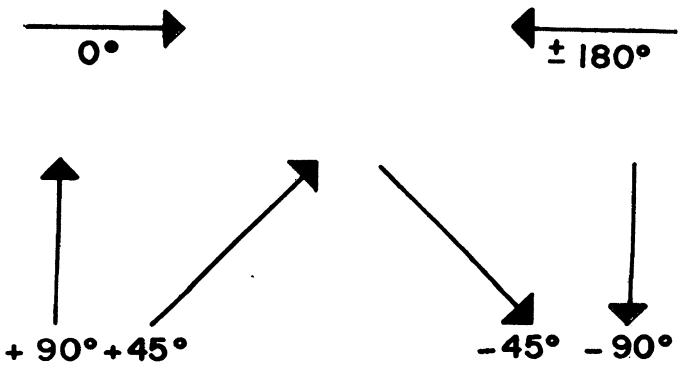


FIGURE 24 – PHASE ANGLES

Perhaps we could look at it another way by use of the phase drawings shown in Figure 22. Center-Front (CF) sound is equal to the Center sound of a stereo record and is represented by lateral motion, while the LF and RF correspond to the 45/45 Left and Right stereo channels. To this we add the circular motion of the LB and RB signals. Center back (CB) signals would result in the combination of the two oppositely formed helixes, resulting in vertical modulations. These are the six basic modulations of this system.

Figure 23 illustrates separate phase vector drawings for LT and RT showing:

A. LF and RF to be equal amplitude and in-phase with each other.

B. No RF in LT, and no LF and RT. This factor results in high front channel separation.

C. LB in RT lags LB in LT by 90 degrees.

D. RB in RT leads RB in LT by 90 degrees.

It is the quadrature relationship of LB and RB in C and D above that results in the circular motion of the stylus that has been described previously. Figure 23 indicates not only the phase, but also the relative amplitude of the various signals which are shown in the encoding block diagram of Figure 19 (including CF and CB which will be discussed later).

Vector symbols, as shown in Figure 23, will be used to show both the phase relationships of various signals, as well as to indicate their relative amplitudes. Figure 24 identifies the vector symbols being used. Zero degrees, for example, is identified by an arrow pointing to the right (at 3 o'clock). The length of the line represents the relative amplitude of the signal. In this discussion, the normal amplitudes will be either 1 or .707. These symbols represent both the electrical and acoustic signals that are involved.

SQ DECODING MATRIX

In order to recover the four original signals, which have been encoded, it is necessary to use the proper decoder matrix circuits. The diagram shown in Figure 25 illustrates the overall action of the decoder circuit. When encoded LT and RT signals are applied to the decoder circuits, the outputs will contain signals of the phase and amplitude shown.

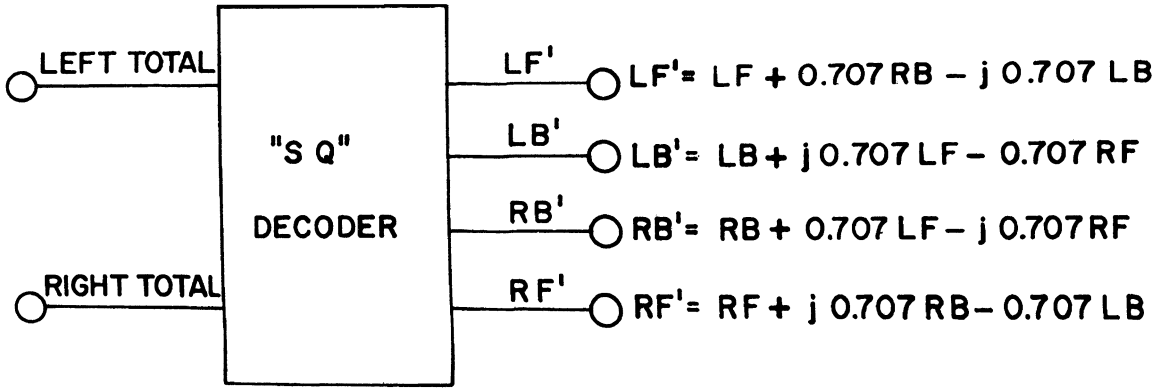


FIGURE 25 – SQ DECODING

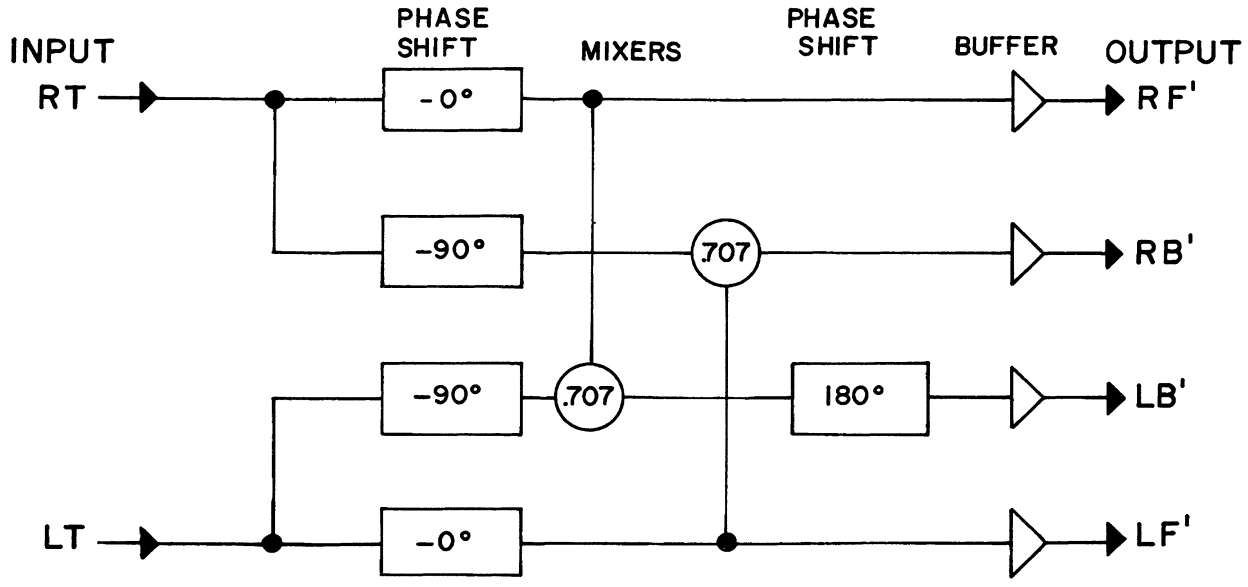


FIGURE 26 – PHASE SHIFT BLOCK DIAGRAM.

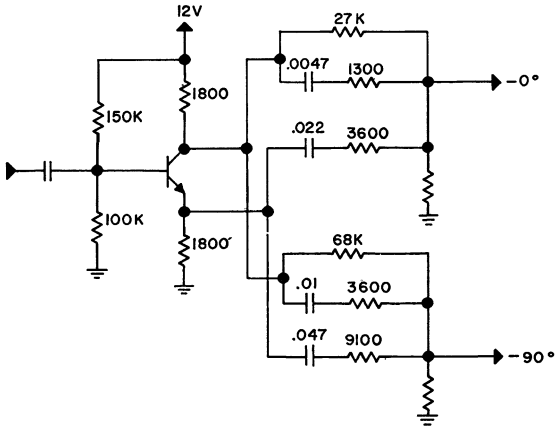


FIGURE 27 – PHASE SHIFT CIRCUIT

The equations that apply to the decoding operation are:

LF' = LT (3)
RF' = RT (4)
LB' = .707 (-RT + jLT) (5)
RB' = .707 (+LT - jRT) (6)

LF', RF', LB' and RB' represent the four decoded channels.

Figure 26 illustrates the phase shifting steps required to achieve proper matrixing. LT and RT signals are applied to the LF and RF outputs respectively (without phase shift) and also to the mixer (matrix) circuits. In addition, LT and RT signals are applied to the mixers (basically two resistors) via – 90 degree phase shifts. The output of the - 90^{0} LT + RT is applied to a 180 degree phase inverting stage and then to the LB' output, while the output of the – 90^{0} RT + LT goes to the RB' output. Each of the mixers provides an output of .707 times the respective inputs. (The .707 value is not as important as is the need for each mixer to mix each signal equally and to have the proper balance with the following amplifier stages).

Phase difference circuits appear in Figure 27. These circuits have been designed to provide the desired phase difference over a broad band of audio frequencies. The gain of each circuit will be the same across the desired band of frequencies. While there is an increasing phase lag as the frequency increases with-in the audio band, the two circuits will maintain a constant phase difference of 90 degrees throughout the audio band.

For those who are interested, Figure 28 charts the relative phase and amplitude of the signals as follows:

A. The upper portion of the chart shows what signals will appear at the LT and RT encoded outputs when a given signal is applied (Example: if a LF only signal were applied, there would be no signal in the RT output, while the full LF signal level would appear in LT at zero phase.)
B. The lower portion of the chart shows the phase and amplitude of the signals which will appear at the four outputs when any given signal appears at a given input.

It should be noted from Figure 28 that when a LF, RF, LB, or RB signal is processed by the decoder, there is a signal in that speaker (represented by the Zero phase symbol with an amplitude of 1), no signal in the corresponding speaker to its left or right (represented by 0) and .707 signals in the two remaining speakers.

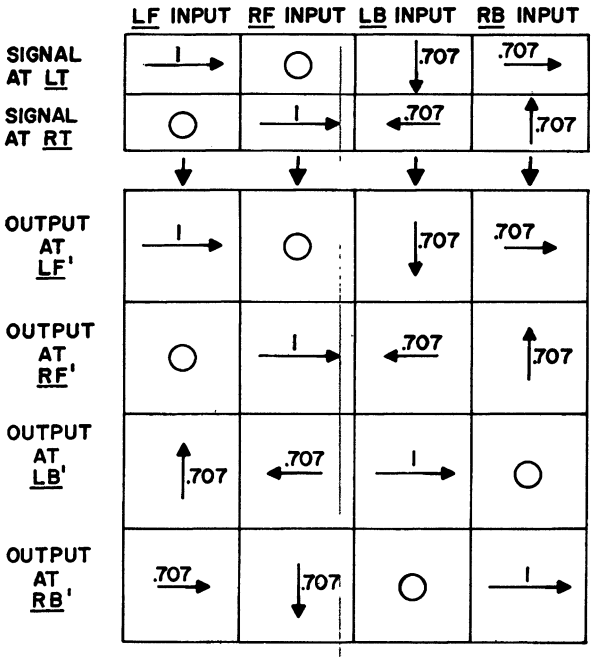


FIGURE 28 – PHASE RELATIONSHIP

SIGNAL PATHS

A brief description of the various signal paths follows for the various modes of operation which will vary depending on positions of the Bandswitch and Decoder switches.

The Bandswitch has the following positions:

AM, FM MONO, FM STEREO, PHONO, 2 CHANNEL TAPE, AND 4 CHANNEL TAPE: while the Decoder switch has positions for ENHANCE (EV), OFF, and DECODE (SQ).

All front channel signals will be processed via the Preamp stages of Q601 and Q651. Next the signals will go to Q602 and Q652 which drive the phase shift Networks (See Figure 27). Q602 drives the RF and RB networks, while Q652 drives the LF and LB networks.

FM STEREO/PHONO/2 CHANNEL TAPE – Placing the Bandswitch in any of these positions will permit the Decoder switch to be used (See Figure 29). The signals LT and RT are applied to the phase shift networks, resulting in four outputs: -0° RT, -0° LT, -90° RT, and -90° LT. The -0° RT and -0° LT are applied to the RF and LF outputs via C610 and C660 respectively. The -90° RT and -0° LT are applied to the mixing circuit of R668 and R671 to recreate the RB, while R617 and R618 mix the -0° RT and -90° LT to create the LB.

When the Decode switch is in the DECODE position, the outputs of the phase networks and mixers will distribute the signals as follows:

RF' (-0° RT) via C610
LF' (-0° LT) via C660
RB' (-0° LT, -90° RT) via C611, C660, R668, and R671.
LB' (-0° RT, -90° LT) via R617, R618, C661, and Q603.

After the above, the signals are applied via the RF', LF', RB', and LB' sections of the Bandswitch and then to buffer amplifier stages Q401, Q451, Q801 and Q851, respectively. From there the signals are applied to the loudness controls and the balance of the audio circuitry.

If the Decoder switch is turned OFF, the RT and LT will continue to the RB' and LB' outputs, but the Back channels will receive only RT and LT via R628 and R629.

AM/FM MONO – When the Bandswitch is in these positions the signals will be applied to the RF and LF sections of the Bandswitch (via C610 and C660). The signals will also be supplied to the RB' and LB' sections of the Bandswitch via resistors R628 and R629. When in these two positions the Decode position of the Decoder switch is by-passed.

4 CHANNEL TAPE – In this position the signals are routed via Q601, C605, R619 and Q651, C655, R669 for Right Front and Left Front respectively, while the Right Back and Left Back signals are applied to the RB' and LB' sections of the Bandswitch via R625 and R622 respectively.

Isolation capacitors are also included to keep DC voltages off of the Bandswitch and Decode switch in order to avoid speaker noise which could otherwise occur when operating these switches. These capacitors are C401, C451, C605, C610, C611, C660, C663, C665, C801, and C851. In addition the phase networks are designed to work into given loads and all resistor networks are designed with this in mind.

The following pairs function as attenuators to provide the proper signal levels for each switch position: R619/R620, R621/R669, R622/R623, R625/R626, R624/R629, R627/R628, and R633/R673.

EV ENCODING MATRIX

In Figure 30 we show four separate sources of sound: Left-Front (LF), Right-Front (RF), Right-Back (RB), and Left-Back (LB). As you will note, a certain ratio of each source (LF, RF, RB, and LB) is fed to a matrix. The resultant mixtures, or "encoded" signals, are available at the LT and RT outputs. We now have LT and RT outputs which are compatible with current media, that is, we can record on discs, tape, or can broadcast encoded signals on FM stereo.

Since there are several similar methods for encoding, we have selected a typical matrix type encoder, that would be used in a radio station or recording studio, to provide reference data for our explanation of the decoding system operation.

Let us restate the data from Figure 30 which represents the output of the encoder (LT denotes encoded L, and RT denotes encoded R):

$$LT = +1.0\,LF + 0.3\,RF + 1.0\,LB - 0.5\,RB \quad (7)$$
$$RT = +0.3\,LF + 1.0\,RF - 0.5\,LB + 1.0\,RB \quad (8)$$

What we are saying in equation (7) is that the encoded LT channel contains four basic signal components, representing the four basic corner sources, in a given ratio. The encoded LT signal contains LF and LB signals that are equal to the LF and LB inputs and are in phase, an in-phase signal that is 30% of the RF input, and a signal which is 50% of the RB input (but out of phase with the input).

A similar interpretation also applies to the R encoded output.

Since the four sources have been reduced to two channels, one can process them as one would process two channel material, that is broadcast via FM, or recorded on disc or tape.

EV DECODING MATRIX

If encoded material is applied to a conventional stereo system (no decoding) it will be reproduced, but without the enhancement due to the ambient sound or any of the front to rear depth of sound. There will only be the conventional left-right composition of the sound. Figure 31 illustrates the decoding action. The LT and RT signals will be applied to the decoding matrix so there will be specific ratios of LT and RT at the output of the matrix. While four decoded outputs could be

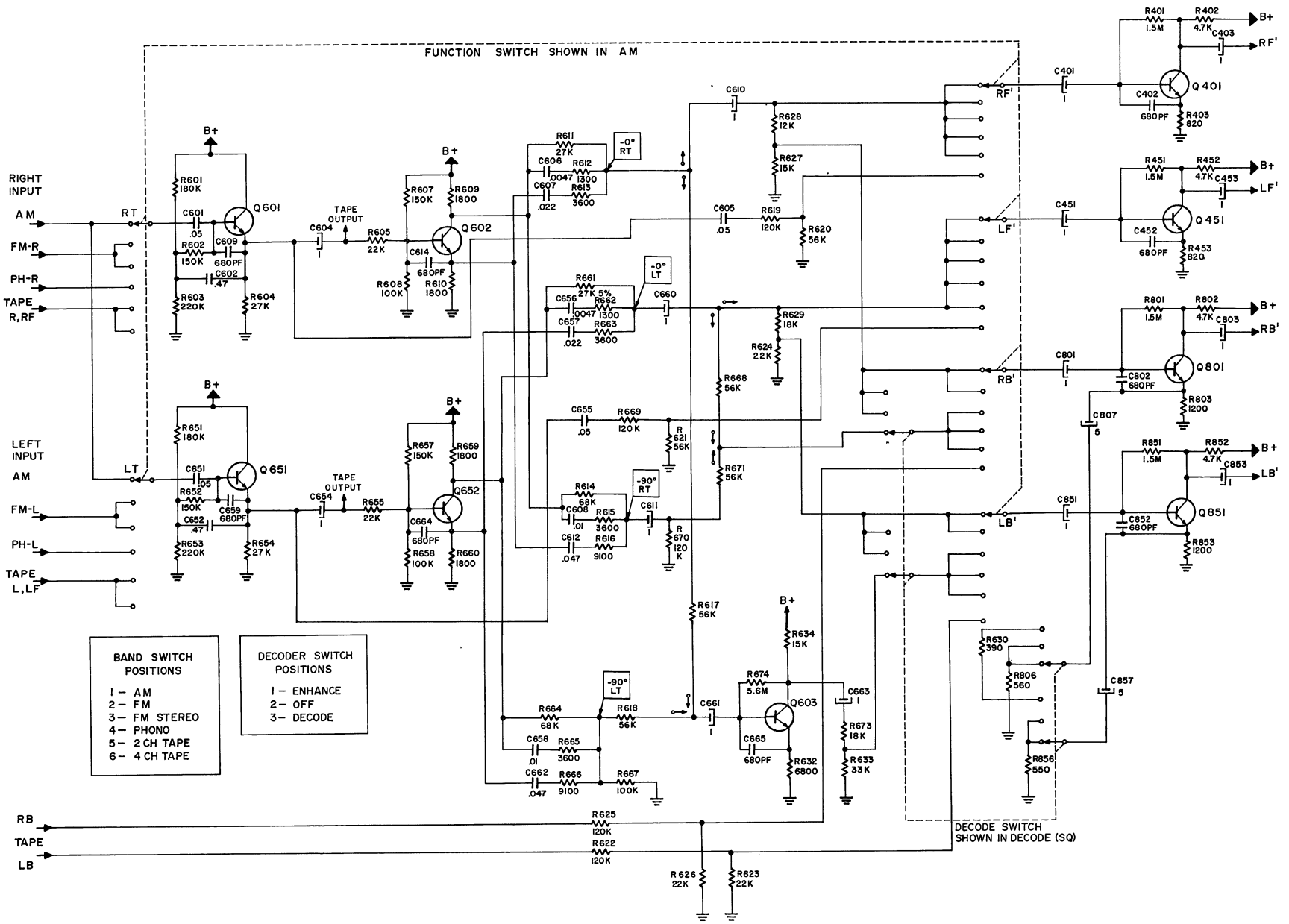


FIGURE 29 – DECODING SCHEMATIC

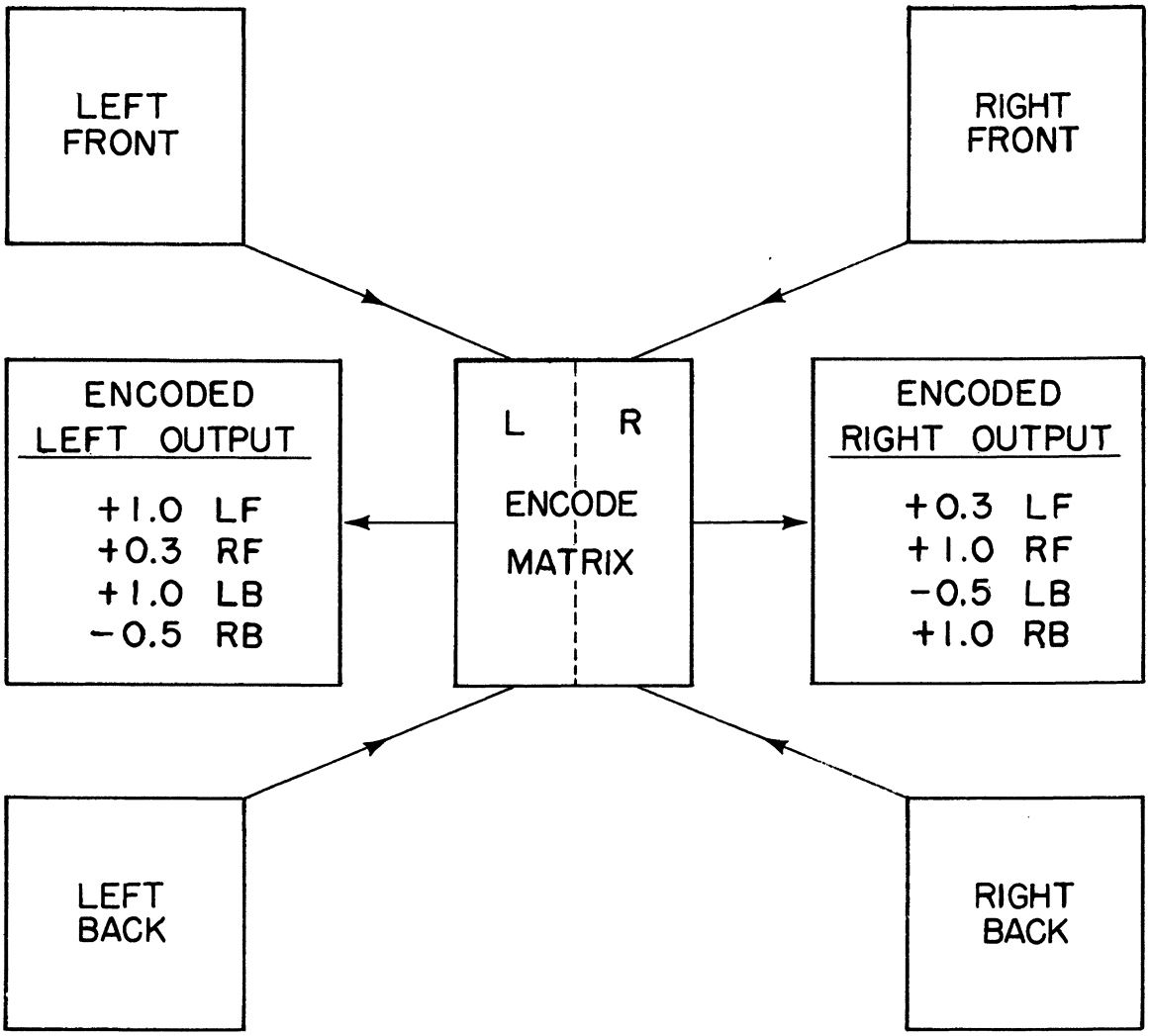


FIGURE 30 – EV ENCODE MATRIX

derived, it has been determined that decoding the Left-Front (LF) and Right-Front (RF) provides no significant advantage, under most conditions. For this reason only the Left-Back (LB) and the Right-Back (RB) are being decoded. It has also been found that optimum reproduction is obtained when a given ratio of LT and RT signals are available at the output of the matrix.

Chassis 15WDR51 uses the following ratio values:

$$LB = +.68LT - .53RT \quad (9)$$
$$RB = -.53LT + .68RT \quad (10)$$

When equations 1, 2 and 3 are combined we derive:

$$LB = +.52LF - .33RF + .94LB - .87RB \quad (11)$$

Likewise, combining equations 1, 2 and 4 yield:

$$RB = -.33LF + .52RF - .87RB + .94LB \quad (12)$$

From equation 11 for the LB output we see that the LB signal is predominant, while RB is of lower value and of a phase opposite to LB. The LF is of a lower value and in phase, while RF is lower yet and of a phase opposite to LF.

Equations 11 and 12 are represented in Figure 31 as the derived LB and RB outputs. The LF and RF outputs are those of the inputs LT and RT, the encoded signals as in equations 7 and 8 respectively.

EV DECODER MATRIX CIRCUIT

Now that we have discussed operation of the encoding and decoding matrix circuits, we will move on to the circuit in use. Figure 32 shows the circuitry as used in Chassis 15WDR51 (Model D715). Starting at the input, the RT and LT signals (encoded) will be fed through the Bandswitch, capacitors C801 and C851, to the bases of Q801 and Q851. These transistors will have their outputs (collectors) out of phase with their respective inputs (bases). In addition, a signal at the emitter (in phase with the base) will be fed via capacitors C807 and C857 and resistor R630 to the opposite emitters. Capacitors C807 and C857 serve as DC isolation between the two emitter circuits. Resistors R630, R803, and R853 form divider networks controlling the ratio of RT and LT injected into the opposite emitters.

At the collector of each transistor (Q801 and Q851) there will be an element of LT in phase with the LT input and RT out of phase with the RT input (if we have looked at Q801 for the right channel). A similar observation will be noted at the collector of Q851. Values at either collector are determined by the divider network consisting of R630, R803, and R853, will reflect the ratios shown previously in equations (9) and (10).

Decode switch connected in series with C807, C857 and R630 activates the decoding circuit when in the ENHANCE position. When this switch is in the OFF position, the decoding circuit is not in operation. When in the DECODE or OFF positions, capacitors C807 and C857 are

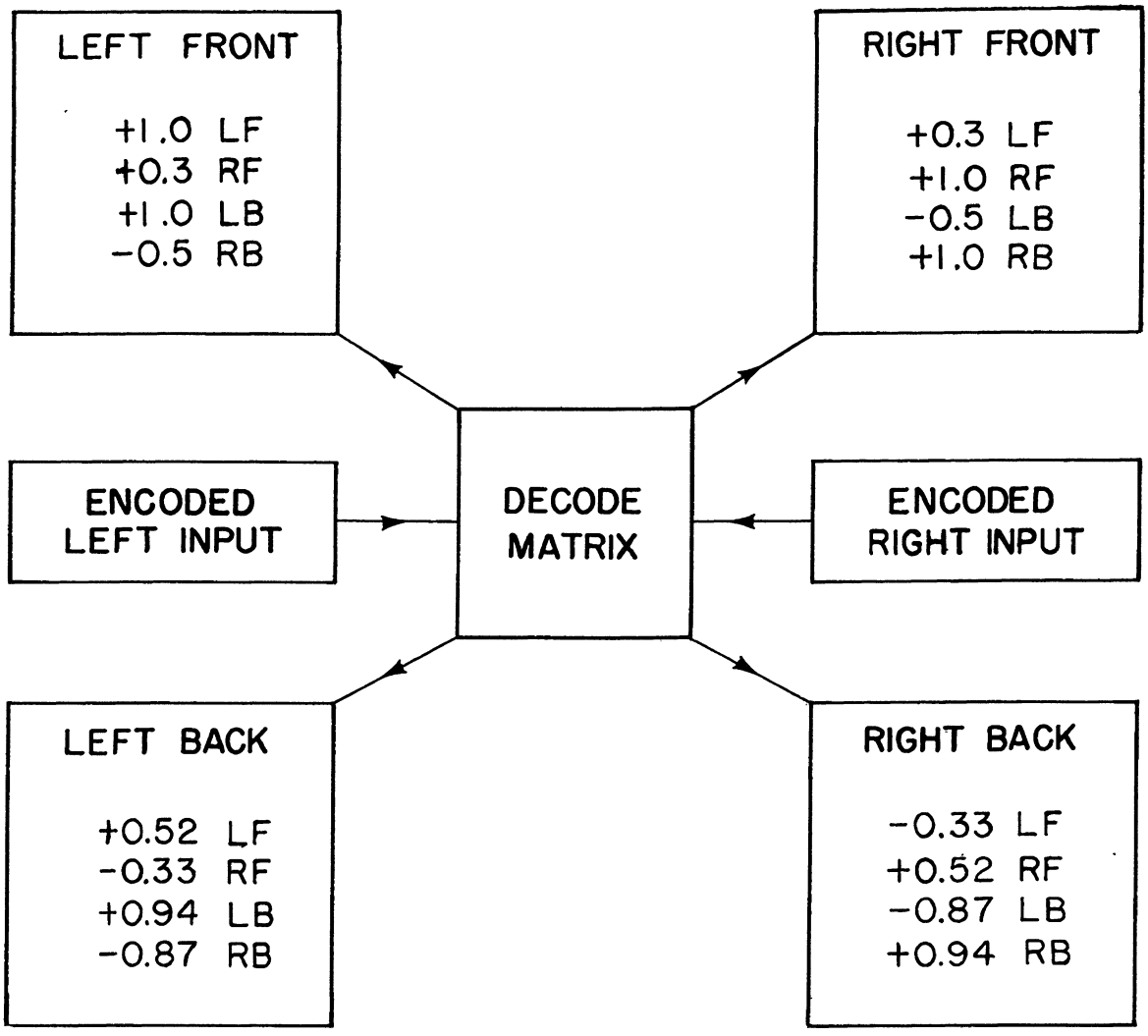


FIGURE 31 – EV DECODER MATRIX

connected to ground via resistors R806 and R856 to provide comparable gain for all positions of the Decode, Off, Enhance Switch.

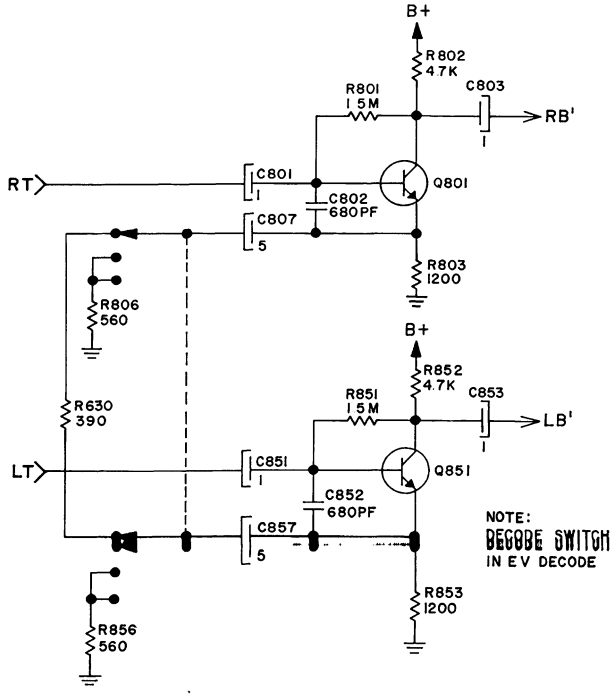


FIGURE 32 – EV DECODE CIRCUIT

DECODER TROUBLESHOOTING

Proper operation of the Decoder circuits may be determined by injecting an audio signal at given input points and then comparing the phase and amplitudes at successive points in the circuits. The phase may be compared by monitoring the signals with either dual trace scopes or use the vertical and horizontal inputs on standard scopes.

If a standard (non-dual trace) scope is used, a phase difference of 90 degrees will result in a circle being displayed when the scope is adjusted to provide equal vertical and horizontal displacement on the scope's CRT .(See Chart A). In-phase (0 degrees) or out of phase (180 degrees) signals will appear as lines at a 45 degree slant.

CHART A

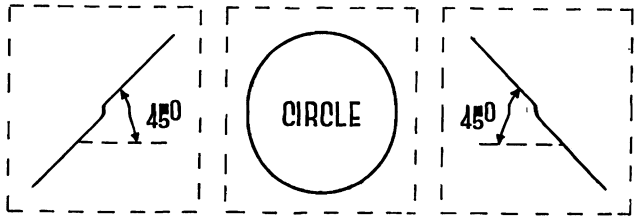


CHART B

1. APPLY SIGNAL TO EITHER BOTH PHONO OR BOTH 2 CHANNEL TAPE INPUTS WITH BANDSWITCH IN CORRESPONDING POSITION.
2. DECODE SWITCH IN DECODE (CBS).
3. INPUT SIGNAL .3 VOLTS AT 1KHz.

CONNECT SCOPE INPUTS TO	PHASE READS
Q602 EMITTER Q602 COLLECTOR	180°
Q652 EMITTER Q652 COLLECTOR	180°
C610 + SIDE C611 + SIDE	90°
C660 + SIDE R618, R664 JUNCTION	90°
Q602 COLLECTOR Q652 COLLECTOR	0°
Q401 COLLECTOR Q451 COLLECTOR	0°
Q801 COLLECTOR Q851 COLLECTOR	180° *
LF OUTPUT RF OUTPUT	0°
LB OUTPUT RB OUTPUT	180° *

*Scope will show a 90 degree relationship if only one input is fed and the other input is grounded.

Chart B describes the input point and signal conditions vs. the phase relationship of signals between pairs of circuit test points.

In addition to the phase shift measurements described above, one must check the gain, at designated points in the circuits, when a signal is applied to one or more inputs. Chart C lists representative gains (in db) that will be found by injecting a signal into the Two Channel Tape Inputs (LF and RF). The second footnote of Chart C reflects the 1 db gain that will exist when a signal is applied, while operating in the Four Channel Tape mode. That is, if a signal is applied to any given Four Channel Tape Input (RF, LF, RB, LB – with the other inputs grounded), the signal at the collector of its corresponding preamp (Q401, Q451, Q801, Q851) will show a 1 db gain. The remaining collectors will read approximately 25 db down, representing crosstalk.

FOUR CHANNEL OPERATION

In the event that a person has a "Discrete Four Channel" source, such as a Four Channel Tape Player, you should connect that unit to the Right Front, Left Front, Right Rear and Left Rear tape inputs on Model D715. With the Bandswitch in the 4 CH TAPE position, each input will be connected to separate outputs of this system via the various sections of the Bandswitch, amplifiers, and speaker systems.

CHART C – STAGE GAIN IN DB

1. APPLY SIGNAL TO ONE OR BOTH 2 CHANNEL OR 4 CHANNEL TAPE INPUTS AS INDICATED. GROUND UNUSED INPUTS. PLACE BANDSWITCH IN CORRESPONDING POSITION.
2. DECODE SWITCH IN POSITION SPECIFIED.
3. INPUT SIGNAL .1 VOLTS AT 1KHz.

INPUT SOURCE	2 CHANNEL								4 CH CHANNEL
DECODE SWITCH POSITION	OFF		DECODE (CBS)			ENHANCE (EV)			OFF
INPUT TO	BOTH		LEFT	RIGHT	BOTH	LEFT	RIGHT	BOTH	**
READ AT	EMITTER	COLLECTOR							
Q401	-11	+1	-25*	+1	+1	-25*	+1	+1	**
Q451	-11	+1	+1	-25*	+1	+1	-25*	+1	**
Q801	-17	+2	0	0	+3	0	+3	-8	**
Q851	-17	+2	0	0	+3	+3	0	-8	**
Q601	0	–	SAME AS IN "OFF" POSITION						
Q651	0	–							
Q602	-2.5	-2.5							
Q652	-2.5	-2.5							
Q603	-13	-9							

*Denotes approximate reading.

**When in 4 Channel Tape Position, collectors of Q401, Q451, Q801, and Q851 will read 1 db gain when a signal is applied to its respective Tape Input. The remaining collectors will read approximately -50 db with respect to the referenced input.

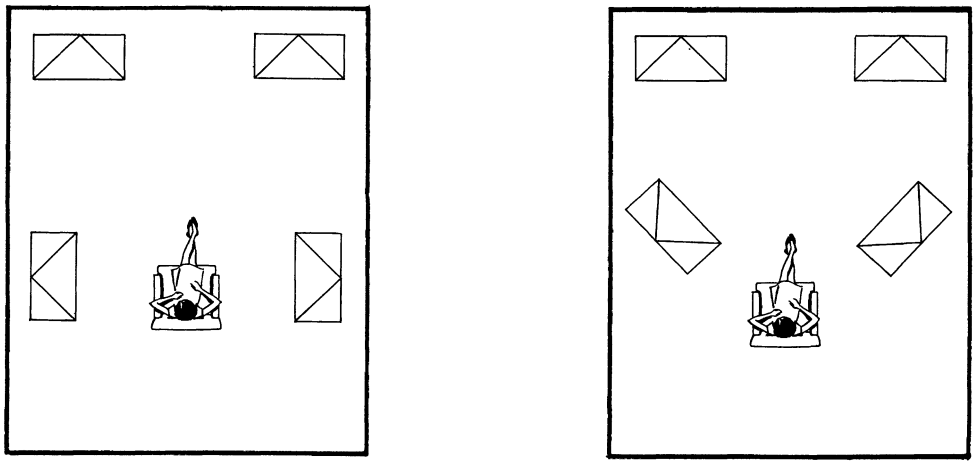


FIGURE 33 – ALTERNATE SPEAKER POSITIONS

SPEAKER POSITIONS

While it is recommended that the speakers be positioned as shown in Figure 15 (Front speakers facing the rear of the room and the rear speakers facing the front of the room) it is possible that alternate speaker positions (see Figure 33) may provide a more desirable sound for some FM broadcasts, tape, or records.

AUDIO BALANCE

Since this model has four separate audio channels, it is desirable to provide individual control for Left to Right balance of the two Front channels. Left to Right balance of the two Back channels, and also balance between the Front and Back speakers. For this reason, there are three Balance controls, one for each of the above functions, located in a cluster on the control panel. In looking at the schematic in Figure 34 one can see that the Front and the Back Balance controls (R430 and R830 respectively) are both 500K ohms and function as normal Right to Left Balance controls. A dual 500K ohm pot (R429) is connected across the ends of the Front and Back Balance controls. It functions in a manner similar to the others, except that it varies the Front to Back Balance.

COMPLEMENTARY SYMMETRY

Output stages of most transistor amplifiers contain two transistors which are connected in a class "B" amplifier circuit. Both are normally a matched pair consisting of either two NPN or two PNP types. The class "B" circuit will provide greater efficiency in the use of current supplied to the output stage than would be true in the case of class "A" amplifiers.

Normal class "B" circuits have some limitations of frequency response due to driver and output transformers. A further limitation is cross-over distortion caused by one output transistor going into cut-off before the other output transistor has started to conduct. Cross-over distortion and the point of conduction are determined by the bias on the output stage.

Many bias circuits only consist of a resistance divider network and when supply voltage varies, bias voltage changes. This supply voltage change can become critical in battery operated amplifiers but must still be considered when operating on the AC power line. Another factor that adds to the problem of controlling bias is temperature change, which will cause reduced base-emitter junction resistance, resulting in increased base-emitter current flow. As the current flow in the base-emitter circuit increases, both an increase in collector current and a change in base bias voltage will occur. This bias voltage variation results in a change of operating voltages accompanied by a change in distortion.

Cross-over distortion is heard due to high order harmonics and may be recognized as a discordant sound. When viewed on a scope the waveform may appear as a sinewave with straight sides or with a step between positive and negative half cycles. (The latter is more common.) (Figure 35).

This distortion can be greatly reduced or eliminated by applying forward bias to the output stage. Forward bias will cause a small current to flow in the base circuit of each transistor and the bias voltage causes a shift in the zero base current points (of each transistor) which results in a smooth crossover between conduction of each output transistor. (Figure 36).

With the development of complementary symmetry circuits, we can eliminate the driver and output transformers and improve the frequency response of the amplifier. These transformers have provided the phase relation required to permit the class "B" push-pull output circuit to operate correctly. Proper signal phase will now be developed by the combination of the driver transistor type (NPN or PNP) and a matched pair of output transistors consisting of a NPN and a PNP.

A brief look at the complementary symmetry circuit (Figure 37) will reveal that we have direct coupling between the collector of the driver transistor, and the base of the output transistor nearest ground. The output circuit design is such that there is a center point between the emitters. This point has a DC voltage, which, under no-signal conditions, is equal to approximately one-half of the voltage on the collector of the transistor nearest the high side of the supply voltage. Connected to this center point are a feedback loop to the pre-driver emitter, a feedback loop through the 62K ohm resistor to the base of the driver transistor, and an output coupling capacitor to the speaker.

Between the base of each output transistor there is a series connected resistor-diode circuit. Bias voltage is developed across this resistor-diode combination and controls idling current in the output stage. Under no signal conditions voltage drops across the diode is equal to base emitter voltages of the output transistors, plus voltage drop across the emitter resistor. Due to the very low value of the emitter resistor, and therefore voltage drop across it, voltage on the emitter can be considered to be same as the center point voltage. While many refer to this as a class "B" circuit, it should be called class "AB" due to the idling current.

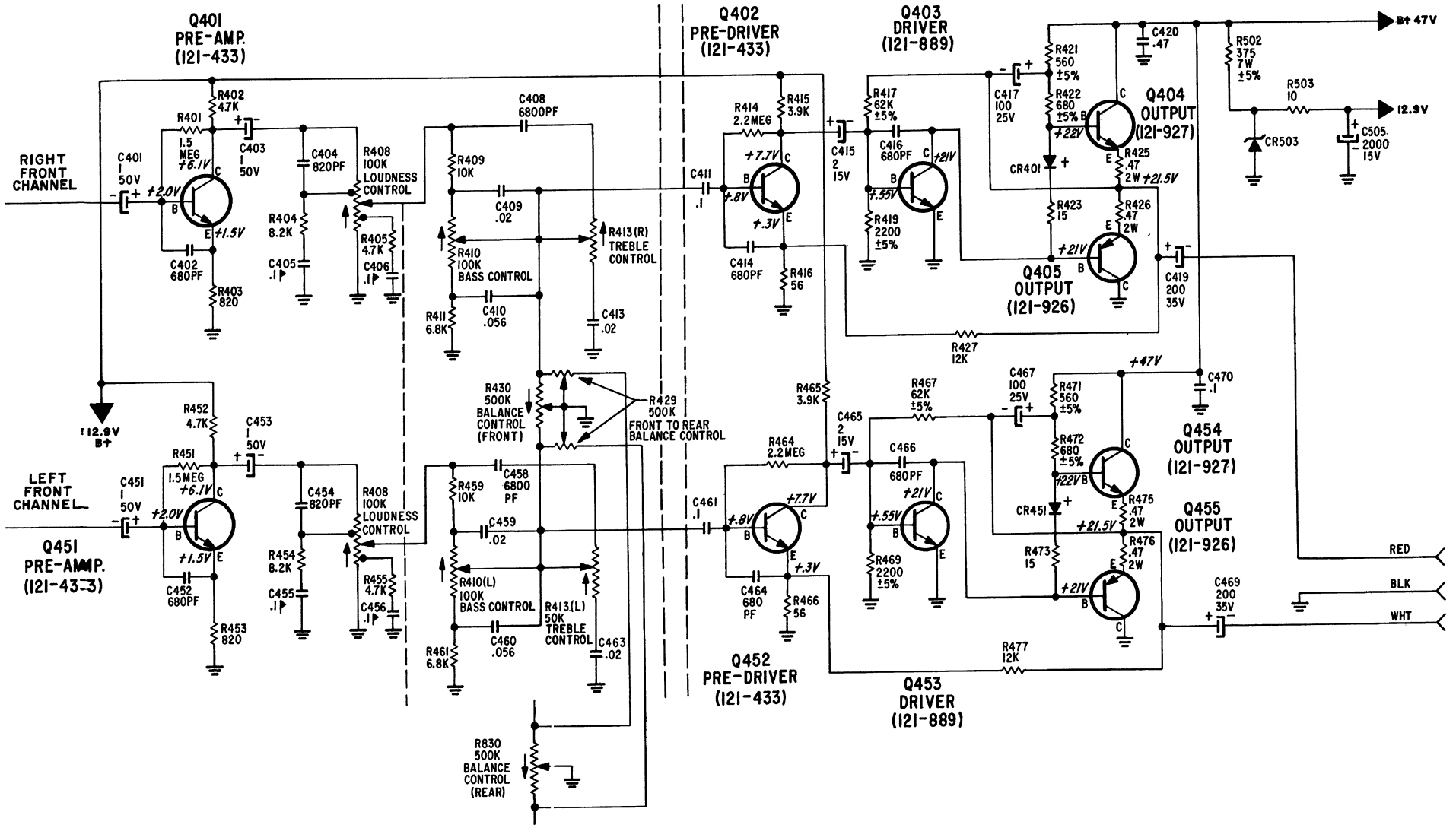


FIGURE 34 – AUDIO SCHEMATIC

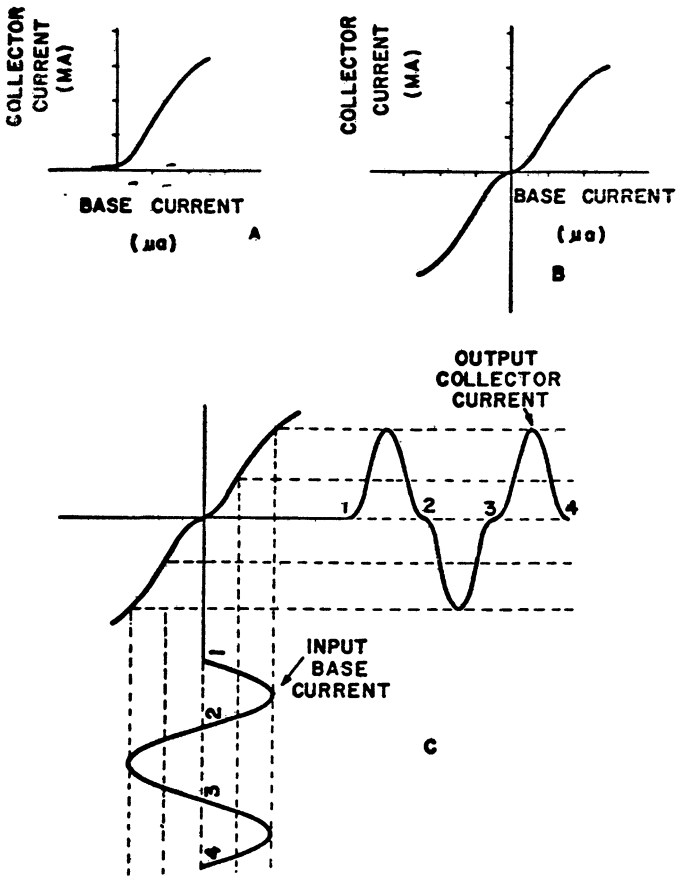


FIGURE 35 – CROSSOVER DISTORTION

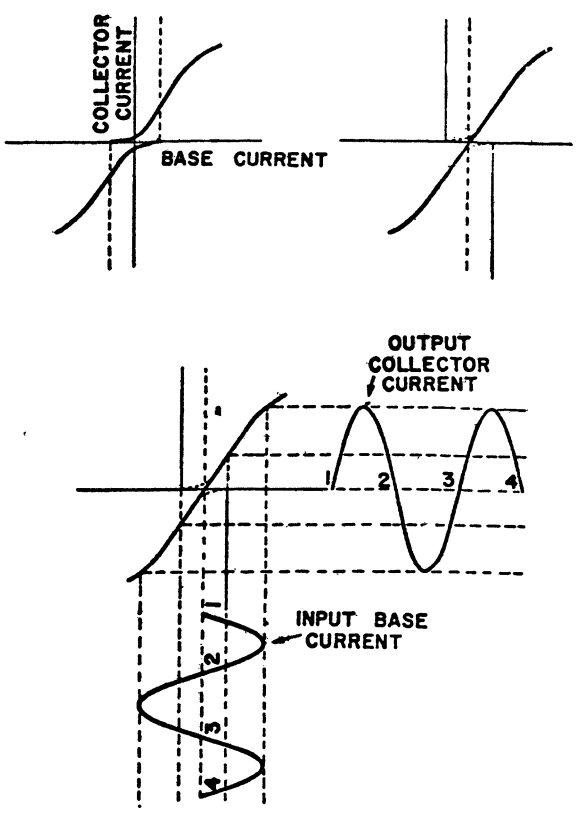


FIGURE 36 – DISTORTION REMOVED BY CLASS AB OPERATION

A bias diode has non-linear voltage/current relationships which results in the following characteristics. Voltage across the diode falls more slowly than current flowing through it. Current would be approximately proportional to supply voltage. Voltage across the diode will decrease with rising temperature.

This non-linear diode voltage/current curve is similar to that of the output transistors allowing a near linear relationship to exist between diode and transistors. Under no-signal conditions both the diode and transistors will show similar effects due to any temperature change. If there is an increase in temperature both the diode and transistors will show increased current flow. The added current flow in the diode will offset increased flow in the transistor and stabilize bias voltage.

Since this diode has a low AC resistance, any change of current in driver stage results in less effect on the output stage than would be true with biasing resistors.

Operating conditions for the driver transistor are determined by base-emitter voltage and driver transistor beta. Also effecting the operating point are values of driver base resistor, feedback resistor to driver base, and two resistors in the driver's collector circuit. All these factors will effect voltage at previously mentioned center point.

When a negative going signal is applied to the driver base, current gain of the driver is reduced. At the same time however, the charge on the high value electrolytic will maintain a near constant current through the resistor connected between base and emitter of the upper output transistor. This will cause voltage across the resistor to maintain almost a constant value, which in turn determines base-emitter bias of the upper transistor. Notice that current flow from this bias resistor goes not only through the diode and collector circuit of the driver transistor but also to base of the upper transistor. Current in this base circuit will determine the amount of transistor gain. As the upper transistor is conducting, the lower one is cut-off as a result of reverse bias which has been applied to it.

When a positive going signal is applied to the driver base, collector current of the driver will increase. The electrolytic will still maintain a near constant voltage across the bias resistor of the upper transistor. Under these condtions the upper transistor is now reverse biased to cut-off, and the lower transistor is conducting.

Since each output transistor conducts on alternating halves of each cycle, voltage change at the center point will result in an output signal that will duplicate input. Use of this complementary symmetry circuit will also result in a much reduced distortion and better frequency response.

Jumpers have been incorporated between the B+ circuits and the output circuits of Chassis 15WDR51. This permits isolation of the separate output stages to facilitate servicing.

Note: Certain mechanical components in the following parts lists are manufactured to metric standards. Caution should be used in selection replacement hardware.

PART NO.	DESCRIPTION
	CHASSIS 1WDA10
12-5411	Mtg. Bracket - Control & P.C. Board
22-6	470 PF Ceramic Capacitor - 100
22-3010	.01 MF Ceramic Capacitor - 25V.
22-3362	560 PF Disc Capacitor
22-3973	100 MF Electrolytic
22-4577	50 MF Electrolytic
22-5167	1000 MF Electrolytic
22-5413	100 MF Electrolytic
22-5722	.068 MF Capacitor
63-1743	100 Ohm Resistor - 1/2W. 10%
63-1803	2700 Ohm Resistor - 1/2W. 10%
63-1887	270K Ohm Resistor - 1/2W. 10%
63-4529	4.7 Ohm Resistor - 1/2W. 10%
*63-5649	330 Ohm Resistor - 2W. 10%
63-5965	3.3 Ohm Resistor - 1W. 10%
63-9772	1.5M Ohm Volume Control (Left)
63-9773	500K Ohm Tone Control
63-9778	1.5 Ohm Volume Control (Right)
86-329	Connector Terminal (4 Req.)
94-1527	Snap Bushing
212-76	Silicon Rectifier
*221-64	Integrated Circuit Package (2 Req.)
	CHASSIS 3AT20
12-5331	Chassis Support Bracket
22-3034	.05 MF Disc Capacitor - 25V.
22-3255	330 PF Disc Capacitor - 25V.
22-3652	.1 MF Disc Capacitor - 10V.
22-4568	100 MF Electrolytic Capacitor - 15V.
22-4570	100 MF Electrolytic Capacitor - 35V.
22-5201	.0022 MF Disc Capacitor - 25V.
22-6096	470 MFD. Electrolytic Capacitor - 35V.
63-1747	120 Ohm Resistor - 1/2W. 10%
63-1785	1000 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1820	6800 Ohm Resistor - 1/2W. 10%
63-1901	560K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1911	1 Megohm Resistor - 1/2W. 10%
63-4529	4.7 Ohm Resistor - 1/2W. 10%
63-8321	Volume Control
64-1033	Grip Eyelet (6 Req.)
86-329	Connector Terminal (2 Req.)
103-145	Diode
121-433	Transistor - Driver
-OR-	
121-764	Transistor - Driver
212-71	Rectifier
800-328	Output Transistor Assem. - Matched Pair (PNP) (NPN)
-OR-	
800-305	Output Transistor Assem. - Matched Pair (PNP) (NPN)
	CHASSIS 4WDR50X
100-249	Dial Lamp
*811-40B	Line Cord Assem.
*812-363B	Dial Lamp Bracket
*812-364B	Connector Mtg. Bracket
*817-24B	Cable Clamp (2 Req.)
*820-256B	Coil, FM RF
*820-257B	Coil, FM Oscillator
*820-258B	Coil, FM Choke
*820-259B	Coil 19 KHz
*820-260B	Coil 19 KHz
*820-261B	Coil 38 KHz
*820-262B	Antenna Assem. - AM
*822-134B	470 MF Electrolytic Capacitor - 25V. (2 Req.)
822-286B	470 MF Electrolytic Capacitor - 16V. (2 Req.)
*822-321B	10 MF Electrolytic Capacitor - 25V. (2 Req.)
*822-528B	22 MF Electrolytic Capacitor - 16V. (2 Req.)
*822-783B	470 PF Capacitor 10% - 50V. (4 Req.)
*822-959B	Gang Capacitor

PART NO.	DESCRIPTION
*822-960B	Trimmer Capacitor
*822-961B	2.2 MF Electrolytic Capacitor - 35V. (2 Req.)
*822-962B	2200 +470 MF Electrolytic Capacitor - 25V.
*822-963B	.1 Mylar Capacitor - 50V. 10% (5 Req.)
*822-964B	.039 Mylar Capacitor - 50V. 10% (2 Req.)
*822-965B	.0056 Mylar Capacitor - 50V. 10% (2 Req.)
*822-966B	390 PF Mica Capacitor - 50V. 5%
*822-967B	1.5 PF Gimmick Capacitor - 500V. 5%
*822-968B	.5 Ceramic Capacitor +80% -20% - 12V. (3 Req.)
*822-969B	.1 Ceramic Capacitor - 50V. +80% -20%
*822-970B	680 PF Ceramic Capacitor - 500V. 10%
*822-971B	560 PF Ceramic Capacitor - 500V. 10% (2 Req.)
*822-972B	390 PF Ceramic Capacitor - 500V. 10% (2 Req.)
*822-973B	220 PF Ceramic Capacitor - 500V. 10%
*822-974B	50 PF Ceramic Capacitor - 500V. 5%
*822-975B	47 PF Ceramic Capacitor - 500V. 10% (4 Req.)
*822-976B	20 PF Ceramic Capacitor - 50V. 5% (2 Req.)
*822-977B	5.6 Ceramic Capacitor - 50V. ±0.25 PF (3 Req.)
*822-978B	5.6 PF Ceramic Capacitor - 50V. ±0.25 PF - N750
*822-979B	4.7 MF Electrolytic Capacitor - 25V.
*822-980B	4.7 MF Electrolytic Capacitor - 25V.
*822-981B	.047 Mylar Capacitor - 50V. 10% (2 Req.)
*822-982B	.022 Mylar Capacitor - 50V. 10% (3 Req.)
*822-983B	.0068 Mylar Capacitor - 50V. 10% (2 Req.)
*822-984B	.05 Ceramic Capacitor - 50V. +80% -20% (6 Req.)
*822-985B	.02 Ceramic Capacitor - 50V. +80% -20% (2 Req.)
*822-986B	.02 Ceramic Capacitor - 500V. +80% -20% (2 Req.)
*822-987B	.01 Ceramic Capacitor - 50V. +80% -20% (10 Req.)
*822-988B	.01 Ceramic Capacitor - 50V. +80% -20% (5 Req.)
*822-989B	.005 Ceramic Capacitor - 50V. 20%
*822-990B	.001 Ceramic Capacitor - 50V. 10%
*822-991B	500 PF Ceramic Capacitor - 50V.
*822-992B	330 PF Ceramic Capacitor - 50V. (2 Req.)
*822-993B	15 PF Ceramic Capacitor - 50V. 5%
*822-994B	12 PF Ceramic Capacitor - 50V. 5% (2 Req.)
*822-995B	10 PF Ceramic Capacitor - 50V. 5%
*822-996B	10 PF Ceramic Capacitor - 50V. 5%
*822-997B	10K PF Poly. Capacitor - 50V. 5%
*822-998B	4.7 PF Ceramic Capacitor - 50V. ±0.25 PF
*822-999B	4700 PF Poly. Capacitor - 50V. 5%
*822-1000B	2400 PF Poly. Capacitor - 50V. 5%
*822-1001B	1500 PF Poly. Capacitor - 50V. 5%
*823-8B	Wire Connector
*824-150B	Switch Cover
*826-49B	Dial Scale (Part of 857-583B)
*832-48B	Dial Cord Assem.
*843-57B	Housing Receptacle
*852-48B	2 Conductor Shielded Cable
*852-49B	2 Conductor Shielded Cable
*852-50B	Feeder Cable - VHF 300 Ohm
854-43B	3/8-32 Lock Nut (5 Req.)
*854-106B	3/8-32 Nut
*854-107B	3MM Nut (4 Req.)
*857-581B	Front Plate Assem.
*857-582B	Wraparound Assem.
*857-583B	Escutcheon
*857-584B	Background Plate
*857-585B	Shield Plate, Antenna
*857-586B	Shield Plate, Oscillator
*858-25B	Plug Assem.
*859-101B	Pointer
*861-130B	Dial Pulley
863-97B	100K Ohm Resistor - 1/4W. 10% (2 Req.)
*863-102B	10 Ohm Resistor - 1/4W. 10%
*863-113B	150 Ohm Resistor - 1/4W. 10%
*863-115B	270 Ohm Resistor - 1/4W. 10%
*863-118B	470 Ohm Resistor - 1/4W. 10% (9 Req.)
*863-120B	680 Ohm Resistor - 1/4W. 10% (2 Req.)
*863-122B	1000 Ohm Resistor - 1/4W. 10% (5 Req.)
*863-125B	1800 Ohm Resistor - 1/4W. 10% (2 Req.)
*863-126B	2200 Ohm Resistor - 1/4W. 10% (2 Req.)
*863-127B	2700 Ohm Resistor - 1/4W. 10%
*863-128B	3300 Ohm Resistor - 1/4W. 10% (3 Req.)

*Denotes parts not previously used.

PART NO.	DESCRIPTION

CHASSIS 4WDR50X (CONT'D.)

*863-129B	3900 Ohm Resistor - 1/4W. 10%
*863-130B	4700 Ohm Resistor - 1/4W. 10% (3 Req.)
*863-132B	6800 Ohm Resistor - 1/4W. 10% (2 Req.)
*863-133B	8200 Ohm Resistor - 1/4W. 10%
*863-134B	10K Ohm Resistor - 1/4W. 10% (2 Req.)
*863-135B	12K Ohm Resistor - 1/4W. 10%
*863-136B	15K Ohm Resistor - 1/4W. 10%
*863-141B	68K Ohm Resistor - 1/4W. 10% (5 Req.)
*863-167B	120K Ohm Resistor - 1/4W. 10%
*863-190B	220 Ohm Resistor - 1/2W. 10% (2 Req.)
863-204B	390 Ohm Resistor - 1/2W. 10%
*863-290B	68 Ohm Resistor - 1/4W. 10%
*863-397B	220K Ohm Resistor - 1/4W. 10% (3 Req.)
*863-398B	47K Ohm Resistor - 1/4W. 10% (3 Req.)
863-414B	390 Ohm Resistor - 1/4W. 10% (3 Req.)
863-417B	100 Ohm Resistor - 1/4W. 10% (2 Req.)
*863-442B	39K Ohm Resistor - 1/4W. 10%
*863-580B	27K Ohm Resistor - 1/4W. 10%
*863-645B	Balance Control - 3M
*863-646B	Tone Control - 3M (2 Req.)
*863-647B	Loudness Control - 500K
*863-648B	3.3 Megohm Resistor - 1/4W. 5% (2 Req.)
*863-649B	220K Ohm Resistor - 1/4W. 5% (2 Req.)
*863-650B	180K Ohm Resistor - 1/4W. 5% (2 Req.)
*863-651B	120K Ohm Resistor - 1/4W. 5%
*863-652B	10K Ohm Resistor - 1/4W. 5% (2 Req.)
*863-653B	8200 Ohm Resistor - 1/4W. 5% (2 Req.)
*863-654B	6800 Ohm Resistor - 1/4W. 5%
*863-655B	5600 Ohm Resistor - 1/4W. 5% (2 Req.)
*863-656B	4700 Ohm Resistor - 1/4W. 5% (6 Req.)
*863-657B	2200 Ohm Resistor - 1/4W. 5% (2 Req.)
*863-658B	3900 Ohm Resistor - 1/4W. 5% (2 Req.)
*863-659B	1000 Ohm Resistor - 1/4W. 5% (2 Req.)
*863-660B	680 Ohm Resistor - 1/4W. 5% (2 Req.)
*863-661B	24 Ohm Resistor - 1/4W. 5% (2 Req.)
*863-662B	1.5 Megohm Resistor - 1/4W. 10%
*863-663B	3.9 Megohm Resistor - 1/2W. 10%
*863-664B	560 Ohm Resistor - 1W. 5% (2 Req.)
*863-665B	330 Ohm Resistor - 1/2W. 5%
*863-666B	1 Ohm Resistor - 1W. 10% (4 Req.)
*864-86B	Eyelet - 3MM (2 Req.)
*876-114B	Tuning Shaft
*880-253B	Tension Spring
*883-294B	Metal Inlay (Part of 857-583B)
*885-123B	Slide Switch
*885-124B	Function Switch
*886-74B	Power Plug Lug (3 Req.)
*886-75B	Terminal Pin
*886-76B	Terminal Pin (2 Req.)
*893-268B	Washer - 3MM (2 Req.)
*894-71B	Bushing
*895-349B	FM Antenna Coil
*895-350B	AM Oscillator Coil
*895-351B	FM 1st. I.F. Transformer
*895-352B	FM 2nd. I.F. Transformer
*895-353B	FM 3rd. I.F. Transformer
*895-354B	FM Detector I.F. Transformer
*895-355B	AM 1st. I.F. Transformer
*895-356B	AM 2nd. I.F. Transformer
*895-357B	AM 3rd. I.F. Transformer
*895-358B	Power Transformer
*900-32B	Indicator Lamp
*903-51B	Diode (4 Req.)
*903-95B	Diode, Bias (2 Req.)
*903-96B	Diode, AFC
*903-97B	Diode, 'Z' - 12V. 5%
*905-24B	Integrated Circuit, Multiplex
912-223B	5.5L Self-Tap. Screw (9 Req.)
*912-626B	3 x 6 Screw (2 Req.)
*912-627B	3 x 10 Screw (4 Req.)
*912-628B	10L Self-Tap. Screw (2 Req.)
*912-629B	10L Self-Tap. Screw (4 Req.)
*921-141B	Transistor, FM RF
*921-142B	Transistor, FM Mixer
*921-143B	Transistor (1) Limiter (2) I.F. (3 Req.)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
*921-195B	Transistor (1) FM Oscillator (2) AM RF Converter (3 Req.)
*921-196B	Transistor (2) Pre. Amp. (2) Pre-Driver (4 Req.)
*921-197B	Transistor, Driver (2 Req.)
*921-198BX	Transistor, Output - Matched Pair PNP - NPN (2 Req.)
925-5B	Strain Relief Grommet (S)
*925-10B	Rubber Grommet
*925-11B	Strain Relief Grommet (L)
*926-37B	Heat Sink
*936-5B	Fuse 0.4 Amp
*936-6B	Fuse 0.25 Amp
*936-7B	Fuse 1 Amp
*971-9B	Jewel Window, Red
*977-14B	Dual Rectifier
*988-85B	Compression Ring
*988-86B	'E' Ring (2 Req.)

CHASSIS 5WDR50X

802-17B	Back Board
804-102B	Chassis Assem.
812-161B	Holder, Lamp
812-162B	Bracket, Meter
812-163B	Bracket, Switch
812-164B	Stopper
812-171B	Lamp Chassis
812-173B	Bracket, Antenna
812-174B	Holder, Antenna
812-175B	Holder, Cord
812-352B	Stopper
820-139B	Coil, VHF
820-140B	Coil, VHF
820-141B	Coil, VHF
820-142B	I.F. Trap
820-143B	Antenna, Fellite
820-144B	Coil, Oscillator
820-145B	Coil, Sca.
820-147B	Coil
820-202B	Filter - 19 KHz
820-252B	I.F. Trap
822-18B	20 MF Electrolytic - 16V.
822-419B	.005 MF Mylar Capacitor
822-475B	1 PF Trimmer
822-476B	2 PF Trimmer
822-488B	.02 MF Mylar Capacitor 20%
822-489B	.01 MF Mylar Capacitor
822-490B	.03 MF Mylar Capacitor
822-492B	.04 MF Mylar Capacitor 20%
822-493B	.05 MF Mylar Capacitor 20%
822-497B	2500 PF Styrol Capacitor 5%
822-498B	760 PF Styrol Capacitor 5%
822-499B	360 PF Styrol Capacitor 5%
822-500B	250 PF Styrol Capacitor 5%
822-503B	.04 MF Ceramic Capacitor
822-504B	.02 MF Ceramic Capacitor
822-505B	.01 MF Ceramic Capacitor
822-506B	.005 MF Ceramic Capacitor
*822-507B	.04 MF Ceramic Capacitor
822-509B	500 PF Ceramic Capacitor 10%
822-510	200 PF Ceramic Capacitor 10%
822-511B	100 PF Ceramic Capacitor 10%
822-512B	15 PF Ceramic Capacitor 5%
822-514B	22 PF Ceramic Capacitor 5%
822-517B	1 PF Ceramic Capacitor 5%
822-518B	5 PF Ceramic Capacitor 5%
822-520B	15 PF Ceramic Capacitor ± .5 Pf
822-521B	1000 MF Electrolytic - 16V.
822-524B	10 MF Electrolytic - 16V.
822-525B	1 MF Electrolytic - 25V.
822-526B	4.7 MF Electrolytic - 16V.
822-527B	10 MF Electrolytic - 10V.
822-528B	22 MF Electrolytic - 16V.
822-530B	2200 MF Electrolytic - 35V.
822-532B	10 MF Electrolytic - 16V.
822-533B	47 MF Electrolytic - 16V.
822-534B	100 MF Electrolytic - 16V.
822-535B	1000 MF Electrolytic - 16V.

CHASSIS 5WDR50X (CONT'D.)

PART NO.	DESCRIPTION
822-537B	.5 MF Solid Capacitor - 10V.
822-538B	.5 MF Solid Capacitor - 10V.
822-541B	470 MF Ceramic Capacitor - 16V.
822-552B	25 PF Ceramic Capacitor - 5%
822-556B	Variable Condenser
822-702B	300 PF Ceramic Capacitor - 10%
822-703B	18 PF Ceramic Capacitor ± .5 Pf
822-705B	250 PF Ceramic Capacitor
822-706B	100 PF Ceramic Capacitor - 10%
822-707B	5 PF Ceramic Capacitor ±..5 Pf
822-709B	1 MF Electrolytic - 16V.
822-710B	3.3 MF Electrolytic - 16V.
822-711B	1000 PF Styrol Capacitor 10%
822-715B	7 PF Ceramic Capacitor ± .5 Pf
822-930B	3000 PF Mylar Capacitor 20%
822-931B	.12 MF Mylar Capacitor 20%
822-932B	500 PF Styrol Capacitor 5%
822-933B	5000 PF Styrol Capacitor 5%
822-934B	.01 MF Ceramic Capacitor
822-935B	150 PF Ceramic Capacitor 10%
822-937B	470 MF Electrolytic - 16V.
822-1010B	.47 MF Capacitor - 10V.
822-1042B	.1 MF Mylar Capacitor - 20%
822-1044B	680 PF Styrol Capacitor 10%
822-1045B	10 MF Electrolytic - 10V.
822-1046B	10 MF Electrolytic - 16V.
822-1048B	.1 MF Ceramic Capacitor
822-1063B	.0022 MF Mylar Capacitor 20%
823-12B	Connector Assem.
824-76B	Cover, Indicator
826-40B	Scale, Dial
832-49B	Cord, Dial
835-6B	Drum
844-19B	Jack
844-25B	Jack, Headphone
846-240B	Knob, Volume
846-241B	Knob, Tuning
846-243B	Knob, Push Switch
846-347B	Knob, Band
*846-364B	Knob, Balance
854-73B	Nut
857-321B	Panel, Front
857-628B	Escutcheon
859-65B	Dial Pointer Assem.
861-67B	Pulley
861-135B	Pulley
861-139B	Pulley
862-2B	Holder, Fuse
863-110B	82 Ohm Resistor
863-461B	330 Ohm Resistor - 1/2W.
863-463B	7500 Ohm Resistor - 1/4W.
863-471B	Control, Double Volume
863-472B	Control, Double Volume (With Switch)
863-473B	Control Volume
863-479B	82K Ohm Resistor - 1/4W.
863-531B	470 Ohm Resistor
863-532B	220 Ohm Resistor
863-533B	33K Ohm Resistor
863-534B	220K Ohm Resistor
863-535B	470K Ohm Resistor
863-536B	560 Ohm Resistor
863-537B	3900 Ohm Resistor
863-539B	7500 Ohm Resistor - 1/4W.
863-541B	56K Ohm Resistor - 1/4W.
863-542B	4700 Ohm Resistor - 1/4W.
863-633B	1K Ohm Resistor
863-681B	330 Ohm Resistor - 1W.
863-694B	680 Ohm Resistor - 1/2W.
863-695B	3.3 Megohm Resistor - 1/2W.
863-696B	100 Ohm Resistor - 1/4W.
863-697B	180 Ohm Resistor - 1/4W.
863-698B	220 Ohm Resistor - 1/4W.
863-699B	330 Ohm Resistor - 1/4W.
863-700B	470 Ohm Resistor - 1/4W.
863-701B	560 Ohm Resistor - 1/4W.
863-702B	820 Ohm Resistor - 1/4W.
863-703B	1K Ohm Resistor - 1/4W.
863-704B	1200 Ohm Resistor - 1/4W.
863-705B	1500 Ohm Resistor - 1/4W.
863-706B	6800 Ohm Resistor - 1/4W.
863-709B	4.7 Ohm Resistor - 1/4W.
863-711B	47 Ohm Resistor - 1/4W.
863-712B	2200 Ohm Resistor - 1/4W.
863-713B	3300 Ohm Resistor - 1/4W.
863-714B	4700 Ohm Resistor - 1/4W.
863-715B	5600 Ohm Resistor - 1/4W.
863-716B	8200 Ohm Resistor - 1/4W.
863-717B	10K Ohm Resistor - 1/4W.
863-718B	12K Ohm Resistor - 1/4W.
863-719B	22K Ohm Resistor - 1/4W.
863-720B	27K Ohm Resistor - 1/4W.
863-721B	100K Ohm Resistor - 1/4W.
863-722B	120K Ohm Resistor - 1/4W.
863-723B	330K Ohm Resistor - 1/4W.
863-724B	270K Ohm Resistor - 1/4W.
863-725B	820 Ohm Resistor - 1/4W.
863-726B	2200 Ohm Resistor - 1/4W.
863-727B	33K Ohm Resistor - 1/4W.
863-728B	150K Ohm Resistor - 1/4W.
863-729B	180K Ohm Resistor - 1/4W.
*866-81B	Connector
876-56B	Shaft, Tuning
876-57B	Shaft, Pulley
876-120B	Shaft, Pulley
880-142B	Spring
880-143B	Spring
883-191B	Strip (Used on 859-65B)
885-68B	Switch, Rotary
885-69B	Switch, Push
886-34B	Terminal
886-35B	Terminal
886-50B	Lug
886-83B	Lug
893-154B	Washer (Used on 971-5B, 885-69B, 802-17B, Condenser & P.C. Board)
893-155B	Washer
893-158B	Washer, Special (Used on 804-102B)
893-163B	Washer, Spring
893-164B	Washer, Spring
893-172B	Washer
893-223B	Washer
893-228B	Washer, Spring (Used on 885-69B)
893-229B	Washer (Used on 885-69B)
894-43B	Spacer
894-44B	Bushing
894-45B	Bushing
894-90B	Bushing
895-198B	Transformer - I.F.
895-199B	Transformer - I.F.
895-200B	Transformer - I.F. - Ceramic Filter
895-201B	Transformer - I.F.
895-202B	Transformer - Multiplex Coil 19KHz
895-203B	Transformer - Multiplex Coil 19KHz
895-204B	Transformer - Multiplex Coil 38 KHz
895-211B	Transformer, Power
900-8B	Lamp, Pilot
900-9B	Lamp
900-10B	Lamp
903-37B	Diode - 1S188AM
903-47	Diode - 1S533
903-48B	Diode - CDG22
903-49B	Diode - 10D1
903-51B	Diode - 1S188FM
903-83B	Diode - 1S188MPX
905-5B	Integrated Circuit
905-6B	Filter, Ceramic
912-403B	Screw - 2.6 x 4
912-404B	Screw - 3 x 6 (Used on 885-69B)
912-406B	Screw - 4 x 6 (Used on 804-102B)
912-409B	Screw, Tapping - 2.6 x 6 (Used on 971-5B & 922-3B)
912-414B	Screw
912-415B	Screw, Tapping - 3 x 8
912-416B	Screw, Tapping - 3 x 12

*Denotes parts not previously used.

PART NO.	DESCRIPTION
	CHASSIS 5WDR50X (CONT'D.)
912-417B	Screw - 2.6 x 5
912-419B	Screw - 3 x 12
912-420B	Screw - 4 x 18
912-600B	Screw - 3 x 8 (Used on 826-40B)
912-722B	Screw - 3 x 6
*912-745B	Screw, Tapping - 2 x 4 (Used on 812-161B)
921-109B	Transistor - 2SC537F1
921-110B	Transistor - CS7228E
921-111B	Transistor - 2SC693FU
921-114B	Transistor - 2SC929C
921-115B	Transistor - 2SC930D
921-116B	Transistor - 2SC930E
921-117B	Transistor - 2SC537F2
921-127B	Transistor - 2SC929D
921-152B	Transistor - 2SC668C1
921-188B	Transistor - 2SC537G1
921-202B	Transistor - 2SC930C
921-203B	Transistor - 2SK41D
921-205B	Transistor - 2SC536F2
922-3B	Meter, Tuning
926-22B	Cover, Lamp
971-5B	Indicator
992-24B	Plate, Clear
	CHASSIS 6AT24
12-475	Chassis MTG. Bracket (4 Req.)
19-546	Capacitor Retaining Clip (2 Req.)
22-2939	680 PF Disc Capacitor - 500V. (2 Req.)
22-3239	.1 MF Capacitor - 400V. (4 Req.)
22-3878	2000 MF Electrolytic Capacitor - 75V.
22-3881	1500 MF Electrolytic Capacitor - 50V.
22-4145	.1 MF Capacitor - 200V. (2 Req.)
22-4415	.47 MF Capacitor - 200V.
22-5162	3 Section Electrolytic Capacitor - 50V/50V/25V.
22-5262	100 MF Electrolytic Capacitor - 50V. (2Req.)
22-5362	1000 MF Electrolytic Capacitor - 50V. (2 Req.)
22-5455	50 MF Elelctrolytic Capacitor - 50V.
*22-5903	.0015 MF Disc Capacitor - 1.4KV.
43-333	3 Contact Housing
43-574	9 Contact Housing
43-874	9 Contact Housing
54-579	10-32 x 3/8 x 3/16 Think - Hex Nut - Cadmium (1 Used on each 212-62)
62-30	Fuse Holder
63-1747	120 Ohm Resistor - 1/2W. 10%
63-1757	220 Ohm Resistor - 1/2W. 10%
63-1761	270 Ohm Resistor - 1/2W. 10%
63-1820	6800 Ohm Resistor - 1/2 W. 10% (2Req.)
63-1827	10K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1926	2.2 Megohm Resistor - 1/2W. 20%
63-1954	10 Megohm Resistor - 1/2W. 20%
63-4851	125 Ohm Resistor - 4W. 10%
63-5217	2 Ohm Resistor - 10W. 10%
63-5282	.39 Ohm Resitor - 5W. 5% (2 Req.)
63-5367	.43 Ohm Resistor - 5W. 5% (2 Req.)
63-5369	220 Ohm Resistor - 5W. 10%
63-5638	180 Ohm Resistor - 2W. 10%
63-5641	220 Ohm Resistor - 2W. 20%
63-5645	270 Ohm Resistor - 2W. 10% (2 Req.)
63-5961	2.7 Ohm Resistor - 1W. 10% (4 Req.)
63-6442	560 Ohm Resistor - 3W. 10% (2 Req.)
64-4	1/8 Dia. x 1/4 LG. Tubular Rivet - N.P. 30248 (2 Used on each 78-1812)
64-5	1/8 Dia. x 7/32 LG. Tubular Rivet - Cadmium (2 Join each 83-5052 & 83-5054, 3 Join 83-4987 & 83-5038, 2 Used on 78-402, & 2 Join each 83-5284 & 83-5291) (13 Req.)
64-6	1/8 Dia. x 3/16 LG. Tubular Rivet - Cadmium (2 Used on each 12-475, 78-1347 & 1 Used on each 86- 328) (16 Req.)

PART NO.	DESCRIPTION
64-7	1/8 Dia. x 5/32 LG. Tubular Rivet - Cadmium (1 Used on 83-7330, 2 Used on 95-2736 & 95-2737) (5 Req.)
78-402	4 Contact Housing
78-1347	Electrolytic Socket (3 Req.)
78-1812	2 Contact Transistor Socket (2 Part of each S–73152) (6 Req.)
79-174-12	18 Sleeving - Yellow - 1 1/2"
83-4633	Felt Strip
83-4987	12 Lug Terminal Strip
83-5038	Insulating Strip
83-5052	6 Lug Terminal strip (2 Req.)
83-5054	Insulating Strip (6 Req.)
83-5277	Transistor Insulating Strip (6 Req.)
83-5284	5 Lug Terminal Strip (2 Req.)
83-5291	Insulating Strip (2 Req.)
*83-7330	8 Lug Terminal Strip
86-303	Terminal - Male (3 Req.)
86-328	Wire Retaining Terminal (2 Req.)
86-389	Terminal - Female (9 Req.)
86-484	Connector Terminal (7 Req.)
86-496	Connector Terminal
93-2	Rivet Washer (2 Used on 95-2737)
93-369	Internal Lockwasher Shakeproof 1210 (1 Used On each 212-62)
95-2425	Power Transformer
*95-2736	Transformer - Driver
*95-2737	Transformer - Driver
*101-2947	Label (Indicator Light & Speaker)
102-9536	Fuse Label (3 Amp.)
114-601	10-16 x 1/2 x 5/16 Hex Washer HD. Self-tap Screw-Stat. Bronze (4 MT. 95-2425)
114-801	8-18 x 5/16 x 1/4 Hex HD. Self-tap. Screw-Stat. Bronze (4 Used on each S-73152) (8 Req.)
114-1001	6-32 x 1/2 Hex Washer HD. Self-tap. Screw-Special (2 Used on each 121-398 & 121-382) (12 Req.)
121-382	Transistor - Power - Matched Pair (2 Req,)
121-398	Transistor - Driver (2 Req.)
136-61	Fuse - 3 Amp. (Type C)
212-62	Silicon Rectifier (2 Req.)
212-71	Silicon Rectifier
S-73152	Heat Sink Assem. (2 Req.)
	CHASSIS 15WDR50Z1
*12-5425	Pulley Mtg. Bracket (Part of S-85563 & S-86475) (2 Req.)
*12-5524	Control Mtg. Bracket
12-5568	Backgroud Bracket (Dial Scale)
17-130	Cable Clamp
17-156	Cable Clamp
19-480	Wire Retaining Clip
19-485	Cable Retaining Clip (3 Req.)
19-614	Clip (Part of S-85104)
20-1256	Trap Coil – 10.7 Mhz
20-1648	FM R.F. Coil
20-1649	FM Oscillator Coil
20-2033	Peaking Coil
*20-3080	Trap Coil - 67 Khz (2 Req.)
-OR-	
S-79435	Multiplex Trap Coil Assem.
20-3291	FM Antenna Coil
22-13	.0033 MF Disc Capacitor - 500V.
22-14	.0047 MF Disc Capacitor - 500V. (2 Req.)
22-18	.0022 MF Disc Capacitor - 500V. (2 Req.)
22-2428	1.8 PF Gimmick Capacitor - 500V.
22-2481	8 PF Disc Capacitor ±.25 PF -500V. (3 Req.)
22-2729	.001 MF Disc Capacitor - 25V. (3 Req.)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
	CHASSIS 15WDR50Z1 (CONT'D.)
22-2884	5 MF Electrolytic Capacitor - 12V. (4 Req.)
22-2939	680 PF Disc Capacitor - 500V. (4 Req.)
22-3033	.02 MF Disc Capacitor - 25V.
22-3034	.05 MF Disc Capacitor - 25V. (12 Req.)
22-3080	.005 MF Disc Capacitor - 25V.
22-3177	390 PF Disc Capacitor - 500V. (2 Req.)
22-3255	330 PF Disc Capacitor - 500V. (2 Req.)
22-3310	2.7 PF Gimmick Capacitor - 500V. (2 Req.)
22-3393	.01 MF Disc Capacitor - 25V. (5 Req.)
22-3415	.0068 MF Disc Capacitor - 25V.
22-3541	3.3 PF Gimmick Capacitor 5% - 500V.
22-3558	16 PF Disc Capacitor 5% - 500V.
22-3652	.1 MF Disc Capacitor - 10V. (3 Req.)
22-3661	.05 MF Disc Capacitor - 100V.
22-3675	10 PF Disc Capacitor 5% - 500V.
22-3687	1 MF Electrolytic Capacitor - 50V. (2 Req.)
22-3721	200 MF Electrolytic Capacitor - 35V. (2 Req.)
22-3770	5.5 PF Disc Capacitor ±.25 PF - 500V.
22-3791	42 PF Disc Capacitor 5% - 500V.
22-3792	17 PF Disc Capacitor 5% - 500V.
22-3896	5 MF Electrolytic Capacitor - 25V.
22-3973	100 MF Electrolytic Capacitor - 25V. (2 Req.)
22-4572	500 MF Electrolytic Capacitor - 15V. (2 Req.)
22-4617	.01 MF Disc Capacitor - 500V. (2 Req.)
22-4855	Trimmer Capacitor - 1.7 To 10 PF Ceramic
22-5480	390 PF Mica Capacitor - 100V.
22-5481	560 PF Disc Capacitor - 500V. (2 Req.)
22-5482	680 PF Disc Capacitor - 500V. (6 Req.)
22-5483	.0015 MF Disc Capacitor - 500V.
22-5486	10 MF Electrolytic Capacitor - 6V.
22-5487	.47 MF Disc Capacitor - 3V. (2 Req.)
22-5780	270 PF Polystyrene Capacitor 5% - 500V.
-OR-	
22-3424	270 PF Mica Capacitor 5% - 100V.
22-5781	1000 PF Polystyrene Capacitor 5% - 500V. (2 Req.)
-OR-	
22-3613	1000 PF Mica Capacitor 5% - 100V. (2 Req.)
22-5782	2200 PF Polystyrene Capacitor 5% - 500V.
-OR-	
22-3635	2200 PF Mica Capacitor 5% - 100V.
22-5814	.022 MF Mylar Capacitor 10% - 100V. (4 Req.)
22-5815	.056 MF Mylar Capacitor 10% - 100V. (2 Req.)
22-5878	5.5 PF Disc Capacitor ±.5 PF - 50V.
22-5879	3.3 PF Disc Capacitor ±.25 PF - 50V.
22-6048	.22 MF Disc Capacitor 10% - 50V. (2 Req.)
22-6112	1000 MF Electrolytic Capacitor - 65V.
*22-6136	2000 PF Polystyrene Capacitor 5% - 100V.
*22-6137	5 Section Variable Capacitor - FM Detector Trimmer, FM Detector Tuning - FM Oscillator Tuning - AM Antenna Trimmer - AM Antenna Tuning - AM Oscillator Tuning - AM Oscillator Trimmer - FM Antenna Trimmer FM Antenna Tuning
*22-6246	3.3 MF Electrolytic Capacitor - 15V.
*33-327	PC Board Support Frame
43-571	9 Contact Housing (Used on 86-390)
44-48	Connector Jack (4 Part of S-89969 & S-92170)
52-1062	2 Conductor Cable (Used on 86-344 or 86-357)
52-1425	2 Conductor Shielded Cable (Used on 58-214)
52-1443	4 Conductor Cable (Used on S-82104)
52-1588	2 Conductor Shielded Lead (Part of S-82528)
52-1589	2 Conductor Shielded Lead (Part of S-82528)
52-1590	2 Conductor Shielded Lead (Used on 85-1343)
*52-1884	2 Conductor Shielded Cable
*52-2022	2 Conductor Shielded Cable (Used on 58-338)
*52-2023	2 Conductor Shielded Cable (Used on 58-338)
52-2080	2 Conductor Shielded Lead
52-2081	2 Conductor Shielded Lead
54-139	3/8-32 x 9/16 Palnut (1 Used on 63-7681, 63-7682, 63-7683, 63-7684 & 114-802) (5 Req.)
54-334	Tinnerman Speed Nut (1 Used on Ea. 114-591) (4 Req.)
54-828	1/2-20 Palnut (Used on 114-802)
57-7850	Side Plate
57-8147	Side Plate (Gang)
58-214	Single Prong Plug (2 Used on 52-1425)
58-338	Plug Shorting Bar (2 Req.) Note: (Bars must Be Removed When 4 Chan. Audio System Is Used)
*59-1103	Pointer (Dial) Blade w/Carriage
61-222	Idler Pulley (1 Used on S-85564, 2 Used on S-85565, S-86475 & 1 Used On Ea. S-85563) (6 Req.)
63-1701	10 Ohm Resistor - 1/2W. 10%
63-1708	15 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1740	82 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1761	270 Ohm Resistor - 1/2W. 10%
63-1764	3300 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1768	390 Ohm Resistor - 1/2W. 10%
63-1771	470 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1772	470 Ohm Resistor - 1/2W. 20% (4 Req.)
63-1774	560 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1775	560 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1777	680 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1778	680 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1781	820 Ohm Resistor - 1/2W. 5%
63-1782	820 Ohm Resistor - 1/2W. 10%
63-1785	1000 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1796	1800 Ohm Resistor - 1/2W. 10%
63-1798	2200 Ohm Resistor - 1/2W. 5% (3 Req.)
63-1799	2200 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1803	2700 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1806	3300 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1810	3900 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1813	4700 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1817	5600 Ohm Resistor - 1/2W. 10%
63-1820	6800 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1824	8200 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1826	10K Ohm Resistor - 1/2W. 5% (2 Req.)
63-1827	10K Ohm Resistor - 1/2W. 10% (6 Req.)
63-1831	12K Ohm Resistor - 1/2W. 10% (3 Req.)
63-1835	15K Ohm Resistor - 1/2W. 20%
63-1841	22K Ohm Resistor - 1/2W. 10%
63-1845	27K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1848	33K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1855	47K Ohm Resistor - 1/2W. 10% (2 Req.)
*63-1860	62K Ohm Insulated Resistor - 1/2W. 5% (2 Req.)
63-1869	100K Ohm Resistor - 1/2W. 10%
63-1876	150K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1880	180K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1883	220K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1898	470K Ohm Resistor - 1/2W. 20% (3 Req.)
63-1904	680K Ohm Resistor - 1/2W. 10%
63-1918	1.5 Megohm Resistor - 1/2W. 10% (2 Req.)
63-4122	33 Ohm Resistor - 1/4W. 10%
63-4185	1000 Ohm Resistor - 1/4W. 10%
63-4196	1800 Ohm Resistor - 1/4W. 10%
63-4213	4700 Ohm Resistor - 1/4W. 10%
63-4501	1 Ohm Resistor - 1/2W. 10% (2 Req.)
*63-5085	680 Ohm Resistor - 3W. 10%
*63-5663	680 Ohm Resistor - 2W. 10%
63-6495	Mute Control - 100K Ohm
63-7681	Dual Treble Control - 50K Ohm
63-7682	Dual Bass Control - 100K Ohm
63-7683	Dial Loudness Control
63-7684	Balance Control & Switch Assem.
64-6	1/8 Dia. x 3/16 Lg. Tubular Rivet (2 Part of S-89969)
64-288	Shoulder Rivet (Part of S-85563, S-85564 & 2 Part of S-85565) (4 Req.)
*64-720	Shoulder Rivet - Rd. Hd. (Part of S-86475)
76-1987	Tuning Shaft
78-1988	Light Socket & Wire (Part of S-86608)
79-174-12	No. 18 Sleeving - Yellow - 1-1/2" (2 Req.)
80-2143	Tension Spring, Cord
82-153	2nd. I.F. Grounding Strap
82-165	Grounding Strap (Part of S-85104)
82-182	Oscillator Coil Ground Strap
83-1961	Antenna Terminal Strip (Part of S-89969)
83-3320	Retaining Strip
83-6173	Plastic Tie Strip (2 Req.)
83-7417	Antenna Protective Strip
83-7803	3 Lug Terminal Strip
*83-8163	Antenna Mtg. Strip (Part of S-82104)
85-1343	Switch, Rotary (6 Position)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
	CHASSIS 15WDR50Z1 (CONT'D.)
86-344	Connector Terminal (Used on 52-1062 & 3 Part of S-91095 & 2 Part of S-92166)
86-357	Connector Terminal (Used on 52-1062)
86-390	Connector Terminal (9 Used on 43-571 & 2 Part of S-86608)
86-500	Connector Terminal (15 Req.)
86-543	Miniature Spring Terminal (51 Req.)
93-1833	Transistor Insulating Washer (2 Req.)
*93-1906	No. 4 Washer (1 Used on Ea. 114-591) (4 Req.)
94-1532	Nylon Shaft Bushing
94-1545	Nylon Insulating Bushing (4 Req.)
95-2541	Transformer - AM 1st. I.F. 455 KHz
95-2542	Transistor - AM 2nd. I.F. 455 KHz
95-2543	Transformer - 3rd. I.F. 455 KHz
95-2544	Transformer - AM Oscillator
95-2545	Transformer - FM Ratio Detector 10.7 MHz
95-2546	Transformer - FM 1st. I.F. 10.7 MHz
95-2547	Transformer - FM 2nd. I.F. 10.7 MHz
95-2548	Transformer - FM 3rd. I.F. 10.7 MHz
95-2856	Doubler Coil 19 KHz
95-2857	Detector Coil 38 KHz
95-2858	Input Coil 19 KHz
100-249	Indicator Lamp
103-23	Germanium Diode (4 Req.)
103-47	Silicon Diode - AFC
-OR-	
103-189	Silicon Diode
103-74	Germanium Diode
103-90	Germanium Diode - Matched Pair
103-96	Diode
103-222	Diode, Silicon - Low Voltage General (2 Req.)
105-107	Integnet (2 Req.) (38 KHz Filter)
114-591	4-24 x 3/8 x 3/16 Slotted Hex Hd. Self-Tap. Screw - Cadmium (2 Used on Ea. 800-362 or 800-366)
114-801	8-18 x 5/16 x 1/4 Hex Hd. Self-Tap. Screw-Stat. Bronze (1 Used On S-85563, S-85564, S-85569 & 83-7803, 2 Used on S-85565 & 57-8147, 3 Used on 33-327 & 12-5568) (14 Req.)
114-802	8-18 x 5/16 x 1/4 Hex Washer Hd. Self-Tap. Screw-Stat. Bronze (1 Mts. 17-156 & 17-130, 2 Mt. S-82104) (4 Req.)
121-430	Transistor - Pre-Driver (2 Req.)
121-433	Transistor - Pre-Amp. (2 Req.)
121-546	Transistor - AM - FM 2nd. I.F., FM 3rd. I.F. (2 Req.)
121-612	Transistor - R.F. (FM)
121-613	Transistor - Autodyne Converter (FM)
121-614	Transistor - 1st. I.F. Amplifier AM, FM
121-639	Transistor - Amplifier - Com. Amp., 19 KHz Amp., 38 KHz Amp. (3 Req.)
121-714	Transistor - AM - Converter
121-737	Transistor - Stereo Indicator Switch
*121-858	Transistor - Biplex Detector
*121-889	Transistor - Driver - NPN (2 Req.)
126-1336	Coil Shield (Use Only When S-79435 Is Used)
*126-1534	Heat Sink
*126-1535	Heat Sink
149-311	Iron Core
188-140	Retaining Ring
188-155	Clamping Ring (Part of S-85569)
199-319	Sleeving (3 Used on 86-344)
212-71	Silicon Rectifier (2 Req.)
-OR-	
212-94B	Silicon Rectifier (2 Req.)
*800-362	Output Transistor - Matched Pair (2 Req.)
-OR-	
*800-366	Output Transistor - Matched Pair (2 Req.)
S-82104	Wave Magnet Antenna Assem.
S-82528	Antenna Cable & Terminal Assem.
S-85104	I.F. Grounding Strap, Braid & Clip Assem.
S-85562	Drive Cord & Eyelet Assem.
S-85563	Pulley Mtg. Bracket Assem.
S-85564	Pulley Mtg. Bracket Assem.
S-85565	Pointer Guide Bracket Assem.
S-85569	Drive Pulley Assem.
S-86475	Pulley Mtg. Bracket Assem.
*S-86608	Socket & Terminal Assem.
*S-89969	Jack Assem. w/Bracket
*S-91095	Cable Assem. - Multi Conductor & Terminal
S-92166	Line Cord & Terminal Assem.
S-92170	Connector Jack & Bracket Assem.
	CHASSIS 15WDR51
11-150	AC Cord
*19-680	Mtg. Clip (2 Req.)
20-1256	Trap Coil (10.7 MHz)
20-3076	FM Antenna Coil
20-3077	FM Detector Coil
20-3080	Trap Coil (67 KHz)
-OR-	
S-79435	Trap Coil Assem. (Used with 126-1336)
*20-3545	Turntable RCF Coil
22-13	.0033 MF Ceramic Capacitor - 500V. 10%
22-16	470 PF Ceramic Capacitor - 500V.
22-2397	100 PF Ceramic Capacitor - 500V. 10%
22-2428	1.8 PF Capacitor - 500V. 10%
22-2592	3.4 PF Ceramic Capacitor - 500V. ±.25 PF
22-2729	1000 PF Ceramic Capacitor - 25V. +50 -30%
22-2884	5 MF Electrolytic - 12V. +100 -10%
22-2976	220 PF Ceramic Capacitor - 500V. 5%
22-3034	.05 MF Ceramic Capacitor - 25V. +100 -50%
22-3080	5000 PF Ceramic Capacitor - 25V. +100 -30%
22-3177	390 PF Ceramic Capacitor - 500V. 10%
22-3310	2.7 PF Capacitor - 500V. 10%
22-3381	39 PF Ceramic Capacitor - 500V. 5%
22-3393	.01 MF Ceramic Capacitor - 25V. +80 -30%
22-3412	820 PF Ceramic Capacitor - 500V. 10%
22-3415	6800 PF Ceramic Capacitor - 25V. 10%
22-3541	3.3 PF Capacitor - 500V. 5%
22-3652	.1 MF Ceramic Capacitor (3 Req.)
22-3661	.05 MF Ceramic Capacitor (2 Req.)
22-3675	10 PF Ceramic Capacitor - 500V. 5%
22-3687	1 MF Electrolytic (15 Req.)
22-3721	200 MF Electrolytic (4 Req.)
22-3751	20 PF Ceramic Capacitor - 500V. 5%
22-3768	68 PF Ceramic Capacitor - 500V. 5%
22-3770	5.5 PF Ceramic Capacitor - 500V. ±.25 PF
22-3896	5 MF Electrolytic
22-3973	100 MF Electrolytic (4 Req.)
22-4819	2 PF Capacitor
22-4855	Trimmer Capacitor
22-5056	.02 MF Ceramic Capacitor - 25V. +80 -20%
22-5091	2 MF Electrolytic (4 Req.)
22-5257	.1 MF Disc Capacitor (10 Req.)
22-5473	.056 MF Mylar Capacitor - 200V. 10%
22-5481	560 PF Disc Capacitor (2 Req.)
22-5482	680 PF Disc Capacitor
22-5486	10 MF Electrolytic
22-5632	.022 MF Mylar Capacitor - 200V. 10%
22-5637	4700 PF Mylar Capacitor - 200V. 10%
22-5638	.47 MF Mylar Capacitor - 100V. 20%
22-5780	270 PF Polystyrene Capacitor - 50V. 5%
22-5782	2200 PF Polystyrene Capacitor - 50V. 5%
22-5862	.1 MF Mylar Capacitor - 100V. 10%
22-5863	.01 MF Mylar Capacitor - 100V. 10%
22-5866	.047 MF Mylar Capacitor - 100V. 10%
22-5903	1500 PF Disc Capacitor
22-5972	390 PF Polystyrene Capacitor - 125V. 5%
22-5989	.02 MF Ceramic Capacitor (8 Req.)
22-6005	.01 MF Ceramic Disc Capacitor (2 Req.)
22-6246	3.3 MF Electrolytic
22-6276	4700 PF Capacitor - 150AC
22-6344	7 PF Ceramic Capacitor - 500V. 7%
*22-6752	Gang Capacitor - 6 Section (AM Oscillator Trimmer, FM Antenna Trimmer, AM Antenna Trimmer, FM Antenna Tuning, AM Antenna Tuning, FM Detector Trimmer, AM Detector Trimmer, FM Detector Tuning, AM Detector Tuning, FM Oscillator Tuning, AM Oscillator Tuner)
*22-7112	2000 MF Electrolytic - 15V. +100% -10%
*22-7113	1500 MF Electrolytic - 65V. +100% -10%

*Denotes parts not previously used.

CHASSIS 15WDR51 (CONT'D.)

PART NO.	DESCRIPTION
*22-7114	.47 MF Tantalum Capacitor - 35V. 20%
33-408	P.C. Board Frame
43-1143	Housing Connector - Female
52-1500	Conductor Cable
52-1609	Conductor Cable
*52-1990	Shielded Lead & Plug (Used on 85-1333)
*52-2120	Shielded Lead Cable
*52-2121	Shielded Lead Cable
*52-2122	Shielded Lead Cable
*52-2123	Shielded Lead Cable
*52-2124	Shielded Lead Cable
*52-2125	Shielded Lead Cable
54-139	Palnut - 3/8-32 x 9/16 (5 Req.)
54-349	Nut, Machine (Used on 95-3027)
54-808	Nut, Spring (1 Used on Ea. 121-926 & 121-927)
54-828	Palnut - 1/2-20 (1 Used on 94-1532)
61-222	Pulley, Idler (Used on S-85563 & S-89118)
*61-263	Pulley, Idler
*61-350	Pulley, Ground
*62-103	Holder, Lamp
*63-1458	390 Ohm Resistor - 2W. 10%
63-1701	10 Ohm Resistor - 1/2W. 10%
63-1705	12 Ohm Resistor - 1/2W. 10%
63-1733	56 Ohm Resistor - 1/2W. 10%
63-1757	220 Ohm Resistor - 1/2W. 10%
63-1761	270 Ohm Resistor - 1/2W. 10%
63-1771	470 Ohm Resistor - 1/2W. 10%
63-1772	470 Ohm Resistor - 1/2W. 20%
63-1774	560 Ohm Resistor - 1/2W. 5%
63-1775	560 Ohm Resistor - 1/2W. 10%
63-1777	680 Ohm Resistor - 1/2W. 5%
63-1778	680 Ohm Resistor - 1/2W. 10%
63-1782	820 Ohm Resistor - 1/2W. 10%
63-1785	1K Ohm Resistor - 1/2W. 10%
63-1789	1200 Ohm Resistor - 1/2W. 10%
63-1790	1300 Ohm Resistor - 1/2W. 5%
63-1796	1800 Ohm Resistor - 1/2W. 10%
63-1798	2200 Ohm Resistor - 1/2W. 5%
63-1799	2200 Ohm Resistor - 1/2W. 10%
63-1803	2700 Ohm Resistor - 1/2W. 10%
*63-1808	3600 Ohm Resistor - 1/2W. 5%
63-1810	3900 Ohm Resistor - 1/2W. 10%
63-1813	4700 Ohm Resistor - 1/2W. 10%
63-1814	4700 Ohm Resistor - 1/2W. 20%
63-1816	5600 Ohm Resistor - 1/2W. 5%
63-1817	5600 Ohm Resistor - 1/2W. 10%
63-1820	6800 Ohm Resistor - 1/2W. 10%
63-1821	6800 Ohm Resistor - 1/2W. 20%
63-1824	8200 Ohm Resistor - 1/2W. 10%
63-1825	9100 Ohm Resistor - 1/2W. 5%
63-1827	10K Ohm Resistor - 1/2W. 10%
63-1831	12K Ohm Resistor - 1/2W. 10%
63-1834	15K Ohm Resistor - 1/2W. 10%
63-1838	18K Ohm Resistor - 1/2W. 10%
63-1841	22K Ohm Resistor - 1/2W. 10%
63-1844	27K Ohm Resistor - 1/2W. 5%
63-1845	27K Ohm Resistor - 1/2W. 10%
63-1848	33K Ohm Resistor - 1/2W. 10%
*63-1852	39K Ohm Resistor - 1/2W. 10%
63-1855	47K Ohm Resistor - 1/2W. 10%
63-1858	56K Ohm Resistor - 1/2W. 5%
63-1859	56K Ohm Resistor - 1/2W. 10%
63-1860	62K Ohm Resistor - 1/2W. 5%
63-1861	68K Ohm Resistor - 1/2W. 5%
63-1862	68K Ohm Resistor - 1/2W. 10%
63-1869	100K Ohm Resistor - 1/2W. 10%
63-1873	120K Ohm Resistor - 1/2W. 10%
63-1876	150K Ohm Resistor - 1/2W. 10%
*63-1880	180K Ohm Resistor - 1/2W. 10%
63-1883	220K Ohm Resistor - 1/2W. 10%
*63-1890	330K Ohm Resistor - 1/2W. 10%
63-1897	470K Ohm Resistor - 1/2W. 10%
63-1898	470K Ohm Resistor - 1/2W. 20%
*63-1918	1.5 Megohm Resistor - 1/2W. 10%
*63-1925	2.2 Megohm Resistor - 1/2W. 10%

PART NO.	DESCRIPTION
63-1932	3.3 Megohm Resistor - 1/2W. 10%
63-1939	4.7 Megohm Resistor - 1/2W. 10%
63-1943	5.6 Megohm Resistor - 1/2W. 10%
63-4122	33 Ohm Resistor - 1/4W. 10%
63-4129	47 Ohm Resistor - 1/4W. 10%
63-4157	220 Ohm Resistor - 1/4W. 10%
63-4168	390 Ohm Resistor - 1/4W. 10%
63-4185	1K Ohm Resistor - 1/4W. 10%
63-4196	1800 Ohm Resistor - 1/4W. 10%
63-4231	12K Ohm Resistor - 1/4W. 10%
63-4241	22K Ohm Resistor - 1/4W. 10%
63-4255	47K Ohm Resistor - 1/4W. 10%
63-4269	100K Ohm Resistor - 1/4W. 10%
*63-4273	120K Ohm Resistor - 1/4W. 10%
63-4287	270K Ohm Resistor - 1/4W. 10%
63-4290	330K Ohm Resistor - 1/4W. 10%
63-6442	560 Ohm Resistor - 3W. 10%
63-8328	Potentiometer
*63-8982	Control, Dual Slide
*63-8983	Control, Dual Slide
*63-9250	Control, Single Rotary
63-9784	.47 Ohm Resistor - 2W. 10%
*63-9841	Control, Rotary
*63-9842	Control, Dual Slide
*63-9860	Control, Single Slide
*63-9928	375 Ohm Resistor - 7W. 5%
64-288	Shoulder Rivet
*64-297	Shoulder Rivet
*64-307	Rivet, Shoulder
64-747	Rivet, Tubular
64-818	Rivet, Tubular
64-1033	Eyelet, Grip
64-1046	Eyelet, Grip
73-123	Screw, Set - 8-32 x 1/4" (Used on 61-350)
*76-2081	Shaft, Solid
*78-2080	Socket, Integrated Circuit
78-2137	Phono Jack
79-174-1	Sleeving - Yellow No. 18
79-174-4	Sleeving - Yellow No. 18
79-212-6	Sleeving - Fibre Glass
79-243-7	Sleeving - 3/8"
*80-1407	Spring Wire
80-2069	Spring, Tension
*82-235	Strap, Ground Formed
83-3588	Strip, Terminal
83-6173	Strip, Tie
83-8122	Strip, Terminal
83-8148	Strip, Insulating
83-8298	Strip, Insulating
*83-8459	Strip, Insulating
85-1274	Switch, Rocker
*85-1309	Switch, Rocker
*85-1333	Switch, Rocker
*85-1352	Switch, Rocker
	-OR-
85-1349	Switch, Rocker
86-389	Terminal, Female (3 Req.)
86-449	Terminal, Connector
86-450	Terminal, Connector
86-500	Pin, Connector
86-542	Terminal, Spring
94-1532	Bushing, Nylon Shaft
94-1545	Bushing, Nylon Shoulder (8 Req.)
95-2543	Transformer - 3rd. I.F. AM - 455 KHz
95-2544	Transformer - AM Oscillator
95-2750	Transformer - B.C. R.F.
95-2751	Transformer - AM 1st. I.F. AM - 455 KHz
95-2752	Transformer - AM 2nd. I.F. AM - 455 KHz
95-2753	Transformer - FM 1st. I.F. - 10.7 MHz
95-2754	Transformer - FM 2nd. I.F. - 10.7 MHz
95-2755	Transformer - FM 3rd. I.F. - 10.7 MHz
95-2756	Transformer - FM Ratio Detector - 10.7 MHz
*95-3021	Transformer - Input
*95-3022	Transformer - Filter
*95-3023	Transformer - Detector
*95-3027	Transformer - Power

*Denotes parts not previously used.

PART NO.	DESCRIPTION

CHASSIS 15WDR51 (CONT'D.)

*100-604	Lamp, Indicator
*100-610	Lamp, Indicator
*100-611	Lamp, Indicator
103-23	Diode, Crystal (3 Req.)
103-90	Diode, Germanium - Matched Pair
103-96	Diode, Zener
103-189	Diode, Silicon
103-222	Diode, Silicon (4 Req.)
*112-801	Screw, Phillips Hd. - 6-20 x 1/4" (2 Used on S-93544)
*112-2267	Screw, Mach. - M3.0 x 0.5 x 5.0 (2 Used on 63-8982 & 63-8983)
*112-2268	Screw, Mach. - M2.6 x 0.45 x 5.0 (2 Used on Ea. 63-9842 & 63-9860)
114-802	Screw, Hex Washer Self-Tap. - 8-18 x 5/16 x 1/4 (3 Req.)
114-803	Screw, Hex Washer Self-Tap. - 6-20 x 0.250 (16 Req.)
114-816	Screw, Hex Washer Self-Tap. - 8-18 x 0.312 (4 Req.)
114-1103	Screw, Hex Washer Self-Tap. - 8-18 x 7/16 (4 Req.)
*114-1302	Screw, Hex Washer Self-Tap. - 4-24 x 5/8
121-430	Transistor - Audio - AM (2 Req.)
121-433	Transistor - Pre-Amp (2 Req.)
121-613	Transistor - Autodyne Converter - FM
121-614	Transistor - AM - FM 1st. I.F.
121-714	Transistor - AM Converter
121-826	Transistor - RM RF (FET)
121-850	Transistor - AM RF
121-858	Transistor - Biplex Detector
121-889	Transistor, Silicon
121-926	Transistor, Silicon
121-927	Transistor, Silicon
*121-950	Transistor, Silicon
125-140	Bushing, Cord
125-194	Grommet, Symmetrical
126-1336	Shield, Coil (Used with S-79435)
*126-1584	Heat Sink
*126-1603	Shield, Radiation
136-79	Fuse - 1.25 Amp.
149-311	Iron Core (2 Req.)
*149-426	Ferrite Core, Antenna Rod
188-140	Retaining Ring (1 Used on 76-2081)
*192-557	Lens, Filter (2 Req.)
*199-567	Sleeve, Plain
199-569	Sleeve, Shielded
212-76	Rectifier, Silicon
*221-65	Integrated Circuit Package
S-88463	Antenna Assem.
S-88986	Dial Cord & Eyelet Assem.
S-91614	Pulley & Bracket Assem.
S-92067	Jack & Bracket Assem.
S-92251	Jack & Bracket Assem.
*S-92534	Pointer & Mtg. Bracket Assem.
S-92543	Pulley & Bracket Assem.
S-92544	Pulley & Bracket Assem.
*S-93158	Antenna Cable & Terminal Assem.
*S-93160	Bracket & Terminal Assem.
*S-93163	Wire & Antenna Assem.
*S-93164	Pulley & Bracket Assem.

CHASSIS 16CT21

*12-5701	Audio Amplifier Mtg. Bracket
*12-5702	Audio Amplifier Mtg. Bracket
*12-5703	Front Panel Support Bracket
*12-5704	Switch Mtg. Bracket
17-130	Retaining Clamp
17-135	Cable Clamp
19-448	Ground Clip
43-571	9 Contact Housing (Used on 86-390)
52-1391	2 Conductor Shielded Lead (Used on 86-599)
52-1867	2 Conductor Shielded Lead (Used on 85-1212)
*52-1990	2 Conductor Shielded Lead & Plugs (Used on 85-1212)
*58-338	Plug Shorting Bar (2 Req.)
*78-2016	Pilot Light Socket & Wire
*83-8167	Insulating Strip
*85-1211	A.C. Power Switch

*Denotes parts not previously used.

PART NO.	DESCRIPTION
*85-1212	Phono - Auxiliary Switch
86-312	Shakeproof Terminal
86-390	Connector Terminal (8 Used on 43-571)
86-599	Connector Terminal (Used on 52-1391)
*94-1384	Insulating Bushing
114-344	6-20 x 1/4 x 1/4 Hex Hd. Self-Tap. Screw-Stat. Bronze (1 Mts. Ea. 12-5701, 12-5702, 12-5703, 12-5706 & 3 Mt. 12-5704) (7 Req.)
114-984	6-20 x 7/16 x 1/4 Hex Washer Hd. Self-Tap. Screw-Stat. Bronze (1 Mts. 17-130 & 17-135) (2 Req.)
199-246	Insulating Sleeve (1 Used on Ea. 86-599) (2 Req.)
*199-568	Shielded Sleeving
*S-89929	Jack Assem. w/Bracket - Staking

CHASSIS 16CT21 – AUDIO AMPLIFIER COMPONENTS

22-2884	5 MF Electrolytic Capacitor - 12V. (2 Req.)
22-3362	560 PF Disc Capacitor - 500V. (2 Req.)
22-3687	1 MF Electrolytic Capacitor - 50V. (2 Req.)
22-5168	300 MF Electrolytic Capacitor
22-5316	500 MF Electrolytic Capacitor - 50V. (2 Req.)
22-5482	680 PF Disc Capacitor - 500V. (2 Req.)
22-5866	.047 MF Mylar Capacitor - 100V. (4 Req.)
22-5986	50 MF Electrolytic Capacitor - 25V. (2 Req.)
*33-377	Frame, P.C. Bd., Audio Amp.
54-808	Tinnerman Speednut (1 Used on Ea. 114-1144) (4 Req.)
54-851	Speednut Fastener (7 Mt. 33-377)
63-1701	10 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1715	22 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1736	68 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1757	220 Ohm Resistor - 1/2W. 10% (4 Req.)
*63-1777	680 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1794	1600 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1805	3300 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1810	3900 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1813	4700 Ohm Resistor - 1/2W. 10% (4 Req.)
*63-1827	10K Ohm Resistor - 1/2W. 10%
63-1834	15K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1868	100K Ohm Resistor - 1/2W. 5% (2 Req.)
*63-1918	1.5 Megohm Resistor - 1/2W. 10% (2 Req.)
63-6424	1 Ohm Resistor - 5W. 10% (2 Req.)
*63-8977	1000 Ohm Bias Adjustment Control (2 Req.)
83-7197	2 Lug Terminal Strip
83-7552	Transistor Insulating Strip (2 Part of Ea. 121-853X)
*94-1586	Shoulder Bushing (4 Req.)
114-77	6-20 x 5/16 x 1/4 Hex Hd. Self-Tap. Screw-Stat. Bronze (3 Mt. 126-1521)
114-344	6-20 x 1/4 x 1/4 Hex Hd. Self-Tap. Screw-Stat. Bronze (Mts. 83-7197)
*114-1144	4-24 x 1/2 x 3/16 Slotted Hex Hd. Self-Tap. Screw-Stat. Bronze (2 Used on Ea. 121-853X)
121-430	Transistor - Audio Amplifier (2 Req.)
121-767	Transistor - Bias Control (2 Req.)
121-768	Transistor - Pre-Driver (2 Req.)
121-773	Transistor - Driver (2 Req.)
121-774	Transistor - Driver (2 Req.)
*121-853X	Transistor - Output - Matched Pr. (2 Req.)
*126-1521	Transistor Heat Sink

CHASSIS 16CT21 CONTROL PANEL ASSEMBLY COMPONENTS

*12-5706	Chassis Front Bracket
19-448	Ground Clip
22-3034	.05 MF Disc Capacitor - 25V. (2 Req.)
22-3255	330 PF Disc Capacitor - 500V. (2 Req.)
22-3415	.0068 MF Disc Capacitor - 25V. (2 Req.)
22-3687	1 MF Electrolytic Capacitor - 50V. (2 Req.)
22-5482	680 PF Disc Capacitor - 500V. (2 Req.)
22-5483	1500 PF Disc Capacitor - 500V. (2 Req.)
22-5814	.022 MF Mylar Capacitor - 100V. (2 Req.)
22-5815	.056 MF Capacitor - 100V. (2 Req.)
22-5884	.082 MF Mylar Capacitor - 100V. (4 Req.)
*22-6343	.33 MF Mylar Capacitor - 50V. (2 Req.)
*52-1988	2 Conductor Shielded Lead (Used on 86-599)
*52-2019	2 Conductor Shielded Lead

PART NO.	DESCRIPTION
	CHASSIS 16CT21 (CONT'D.)
*52-2020	2 Conductor Shielded Lead
*54-139	3/8-32 x 9/16 Palnut (1 Used on Ea. 63-7681, 63-7682, 63-8324 & 63-9000)
*54-851	Speed Nut (2 Used on 12-5706)
63-1813	4700 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1820	6800 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1827	10K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1835	15K Ohm Resistor - 1/2W. 20%
63-1845	27K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1848	33K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1876	150K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1880	180K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1883	220K Ohm Resistor - 1/2W. 10% (2 Req.)
63-7681	Dual Treble Control - 50K
63-7682	Dual Bass Control - 100K
63-8324	Dual Loudness Control - 100K
*63-9000	Balance Control - 250K
86-599	Connector Terminal (2 Used on 52-1988)
	CHASSIS 16CT21 — POWER SUPPLY ASSEMBLY
11-150	Line Cord
17-130	Cable Clamp
19-546	Capacitor Mtg. Clip
22-5362	1000 MF Electrolytic Capacitor - 50V.
22-6005	.01 MF Disc Capacitor - 150V. A.C. (2 Req.)
43-519	4 Contact Housing (Used on 52-1507)
43-574	9 Contact Housing (Used on 86-389)
*52-1507	3 Conductor Cable (Used on 43-519)
63-1912	1 Megohm Resistor - 1/2W. 20%
63-4380	390 Ohm Resistor - 7W. 10%
*83-8147	18 Lug Terminal Strip
86-334	Connector Terminal (3 Used on 52-1507)
86-389	Connector Terminal (8 Used on 43-574)
*95-2940	Power Transformer
101-4711	Fuse Label
114-802	8-18 x 5/16 x 1/4 Hex Washer Hd. Self-Tap. Screw-Stat. Bronze (4 Mt. 95-2940)
136-24	2 Amp. Fuse
212-61	Silicon Rectifier (2 Req.)
	CHASSIS 25WDR50
12-5425	Pulley Mtg. Bracket (Part of S-85563)
*12-5710	Escutcheon Mtg. Plate
*12-5739	Dial Scale Mtg. Bracket
17-130	Loop Retaining Clamp
19-480	Wire Retaining Clip
19-485	Cable Retaining Clip
*20-1256	Trap Coil (10.7 MHz)
*20-1649	FM Oscillator Coil
*20-3076	FM Antenna Coil (Part of S-89134)
*20-3077	FM Detector Coil (Part of S-89122)
20-3080	Trap Coil - 67 KHz
22-13	.0033 MF Disc Capacitor - +10 -10% 500V. (2 Req.) (1 Used on S-88463)
22-14	.0047 MF Disc Capacitor - 500V. (3 Req.)
22-18	2200 PF Ceramic Capacitor 10% 500V.
22-2428	1.8 PF Gimmick Capacitor - 500V.
22-2592	3.4 MF Ceramic Disc Capacitor - 500V.
22-2729	.001 MF Disc Capacitor - 25V. (6 Req.)
22-2884	5 MF Electrolytic Capacitor - 12V. (4 Req.)
22-3034	.05 MF Disc Capacitor - 25V. (10 Req.)
22-3080	.005 MF Disc Capacitor - 25V. (2 Req.)
22-3177	390 PF Disc Capacitor - 500V. (2 Req.)
22-3255	330 PF Disc Capacitor - 500V. (2 Req.)
22-3310	2.7 PF Gimmick Capacitor - 500V. (2 Req.)
22-3362	560 PF Ceramic Capacitor - 500V. ±10%
22-3381	39 PF Ceramic Disc Capacitor - 5% 500V. (2 Req.)
22-3393	.01 MF Disc Capacitor - 25V. (5 Req.)
22-3415	.0068 MF Disc Capacitor - 25V. (3 Req.)
22-3541	3.3 PF Gimmick Capacitor - 500V. (Part of S-89122)
22-3652	.1 MF Disc Capacitor - 10V. (2 Req.)
22-3675	10 PF Disc Capacitor - 500V. (2 Req.)
22-3687	1 MF Electrolytic Capacitor - 50V. (4 Req.)

PART NO.	DESCRIPTION
22-3751	20 PF Capacitor - 5% 500V.
*22-3770	5.5 PF Disc Capacitor - 500V.
22-3896	5 MF Electrolytic Capacitor - 25V.
22-4573	1000 MF Electrolytic Capacitor - 15V.
22-4819	2 PF Capacitor - ±.25% 500V.
22-4855	Trimmer Capacitor - 1.7 To 10 PF Ceramic
22-5056	.02 MF Disc Capacitor - 25V.
22-5316	500 MF Electrolytic Capacitor - 50V. (2 Req.)
22-5481	560 PF Disc Capacitor - 500V. (2 Req.)
22-5482	680 PF Disc Capacitor - 500V. (5 Req.)
22-5486	10 MF Electrolytic - 6V.
22-5683	.47 MF Mylar Capacitor - 100V. 20%
*22-5780	270 PF Polystyrene Capacitor - 500V.
*22-5781	1000 PF Polystyrene Capacitor - 500V. (2 Req.)
22-5782	2200 PF Capacitor - 5% 500V.
22-5814	.022 MF Mylar Capacitor - 50V. 20% (4 Req.)
22-5815	.056 MF Mylar Capacitor - 100V. 10%
22-5866	.047 MF Mylar Capacitor - 100V. (4 Req.)
22-5867	.12 MF Mylar Capacitor - 100V. 10% (2 Req.)
*22-5972	390 PF Polystyrene Capacitor - 125V.
*22-5986	50 MF Electrolytic - 25V. (2 Req.)
22-6082	.68 MF Mylar Capacitor - 50V. 20% (2 Req.)
*22-6095	1200 PF Mylar Capacitor - 50V. 10% (2 Req.)
*22-6245	Gang Capacitor, Six Section (FM Antenna Trimmer, FM Antenna Tuning, FM Detector Trimmer, FM Detector Tuning, FM Oscillator Tuning, AM Antenna Trimmer, AM Antenna Tuning, AM Detector Trimmer, AM Detector Tuning, AM Oscillator Trimmer, AM Oscillator Tuning)
*22-6246	3.3 MF Electrolytic Capacitor - 15V.
22-6344	7 PF Ceramic Disc Capacitor - ±.5 PF 500V.
22-6347	2000 PF Capacitor 5% 50V.
-OR-	
22-6136	2000 PF Capacitor 5% 100V.
*33-374	P.C. Bd. Frame
*33-377	P.C. Board Frame - Power Amp.
43-571	9 Contact Housing (Used on 86-390)
44-48	Connector Jack (4 Part of S-89928 & 2 Part of S-83558)
52-1062	2 Conductor Cable (Used on 86-344 & 86-357)
52-1391	Two Conductor Shielded Lead (Used on 85-1210)
52-1591	Two Conductor Shielded Lead
*52-1988	Two Conductor Shielded Lead
*52-1990	Shielded Lead & Plug (Used on 85-1210)
*52-2019	Two Conductor Shielded Lead
52-2020	Two Conductor Shielded Lead
54-139	3/8-32 x 9/16 Palnut (5 Req.)
54-808	Tinnerman Speed Nut (4 Req.)
54-828	1/2-20 Palnut
*54-851	Speed Nut - Palnut (25 Used on P.C. Bd.)
58-338	Plug (2 Req.)
*59-1133	Blade & Dial Pointer
61-222	Idler Pulley (Part of S-85563 & 3 Part of S-89118)
*61-322	Pulley (Part of S-89118)
61-324	Pulley, Flanged (Part of S-89195)
63-1701	10 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1715	22 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1736	68 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1757	220 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1761	270 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1764	330 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1771	470 Ohm Resistor - 1/2W. 10%
63-1772	470 Ohm Resistor - 1/2W. 20% (5 Req.)
63-1775	560 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1776	620 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1778	680 Ohm Resistor - 1/2W. 10% (5 Req.)
63-1781	820 Ohm Resistor - 1/2W. 5%
63-1782	820 Ohm Resistor - 1/2W. 10%
63-1785	1000 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1790	1300 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1796	1800 Ohm Resistor - 1/2W. 10%
63-1798	2200 Ohm Resistor - 1/2W. 5%
63-1799	2200 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1803	2700 Ohm Resistor - 1/2W. 10%
63-1805	3300 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1806	3300 Ohm Resistor - 1/2W. 10%
63-1810	3900 Ohm Resistor - 1/2W. 10% (3 Req.)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
	CHASSIS 25WDR50 (CONT'D.)
63-1813	4700 Ohm Resistor - 1/2W. 10% (9 Req.)
63-1817	5600 Ohm Resistor - 1/2W. 10%
63-1824	8200 Ohm Resistor - 1/2W. 10%
63-1826	10K Ohm Resistor - 1/2W. 5% (2 Req.)
63-1827	10K Ohm Resistor - 1/2W. 10% (5 Req.)
63-1834	15K Ohm Resistor - 1/2W. 10% (5 Req.)
63-1838	18K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1848	33K Ohm Resistor - 1/2W. 10% (3 Req.)
63-1852	39K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1855	47K Ohm Resistor - 1/2W. 10% (4 Req.)
63-1862	68000 Ohm Resistor - 1/2W. 10%
63-1868	100K Ohm Resistor - 1/2W. 5% (2 Req.)
63-1873	120K Ohm Resistor - 1/2W. 10%
63-1898	470K Ohm Resistor - 1/2W. 20% (3 Req.)
63-1904	680K Ohm Resistor - 1/2W. 10%
63-1918	1.5 Megohm Resistor - 1/2W. 10% (4 Req.)
63-4122	33 Ohm Resistor - 1/4W. 10%
63-4129	47 Ohm Resistor - 1/4W. 10% (Part of S-89122)
63-4157	220 Ohm Resistor - 1/4W. 10%
63-4185	1000 Ohm Resistor - 1/4W. 10%
63-4196	1800 Ohm Resistor - 1/4W. 10%
63-4231	12K Ohm Resistor - 1/4W. 10%
63-4255	47K Ohm Resistor - 1/4W. 10%
63-4269	100K Ohm Resistor - 1/4W. 10%
63-4287	270K Ohm Resistor - 1/4W. 10%
63-5085	680 Ohm Resistor - 3W. 10%
63-5663	680 Ohm Resistor - 2W. 10%
63-6424	1 Ohm Resistor - 5W. 10% (2 Req.)
63-6495	Mute Control - 100K
63-8996	250K Ohm Single Rotary Control - 1/8W. 30% (Balance Control)
63-8997	100K Ohm Dual Rotary Control - 1/8W. 30% (Bass Control)
63-8998	50K Ohm Dual Rotary Control - 1/8W. 30% (Treble Control)
63-8999	100K Ohm Dual Rotary Control - 1/8W. 30% (Loudness Control)
*63-9261	Rotary Control, Single - 500 Ohm Bias Adjust (2 Req.)
64-6	1/8" Dia. x 3/16" Lg. Tubular Rivet (2 Part of S-89928)
64-7	Tubular Rivet
64-288	Shoulder Rivet (Part of S-85563)
64-303	Shoulder Rivet (Part of S-89118)
*64-310	Shoulder Rivet (Part of S-89118)
64-1033	Grip Eyelet
64-1046	Grip Eyelet
64-1098	Shoulder Rivet - Flat Hd. (2 Part of S-89118)
*76-2033	Tuning Shaft
78-2024	Lamp Socket (2 Req.)
79-53	Sleeving (6 Req.)
*79-174-8	No. 18 Sleeving - Yellow
*79-205-2	No. 16 Sleeving - Fiberglass
80-2143	Cord Tension Spring
*82-195	Ground Strap
82-196	Ground Strap
83-1961	Antenna Terminal Strip (Part of S-89928)
83-6173	Tie Strip
*83-7552	Transistor Insulating Washer
83-7803	Terminal Strip
83-8148	Insulating Strip w/Perforation
83-8151	Terminal Strip
83-8163	Antenna Mtg. Terminal Strip (2 Part of S-88463)
*85-1210	5 Position Bandswitch
*85-1352	Rocker Switch
86-344	Terminal, Connector (Used on 52-1062)
86-390	Connector Terminal, Male (8 Used on 43-571)
86-357	Connector Terminal (Used on 52-1062)
86-500	Terminal
86-543	Miniature Spring Terminal
93-1978	Spring Washer
94-1532	Nylon Shaft Bushing
94-1586	Shoulder Bushing (4 Req.)
95-2543	Transformer - 3rd. I.F. AM 455 KHz
95-2544	Transformer - AM - Oscillator

*Denotes parts not previously used.

PART NO.	DESCRIPTION
*95-2750	Transformer - B.C. R.F.
*95-2751	Transistor - AM 1st. I.F. AM 455 KHz
*95-2752	Transformer - AM 2nd. I.F. AM 455 KHz
*95-2753	Transformer - FM 1st. I.F. 10.7 MHz
*95-2754	Transformer - FM 2nd. I.F. 10.7 MHz
*95-2755	Transformer - FM 3rd. I.F. 10.7 MHz
*95-2756	Transformer - FM Ratio Detector 10.7 MHz
*95-2856	Multiplex Doubler - 19 KHz Transformer
*95-2857	Multiplex Detector - 38 KHz Transformer
*95-2858	Multiplex Input - 19 KHz Transformer
100-249	Indicator Lamp, Pilot Light Bulb (2 Req.)
100-507	Stereo Indicator Lamp
103-23	Germanium Diode (6 Req.)
103-90	Germanium Diode - Matched Pair
103-96	Diode, Zener
103-189	AFC Diode
	OR–
103-47	AFC Diode
*105-107	Integnet - 38 KHz Filter (2 Req.)
114-77	6-20 x 5/16" Lg. x 1/4" Hex Hd. Self-Tap. Screw-Stat. Bronze (14 Req.)
114-1108	6-20 x 3/8 Hex Washer Hd. Self-Tap. Screw-Stat. Bronze (2 Req.)
114-1144	4-24 x 0.500 x 0.187 Hex Washer Hd. Screw-Stat. Bronze (2 Used on ea. 121-853X) (4 Req.)
121-430	Transistor - Audio - Amp. (2 Req.)
121-613	Transistor - Autodyne Converter - FM
121-614	Transistor - AM-FM 1st. I.F.
121-639	Transistor - Comp. Amp., 19 KHz Amp. & 38 KHz Amp., Tuning Meter Control (4 Req.)
121-714	Transistor - AM Converter
*121-737	Transistor - Stereo Indicator Switch
*121-767	Transistor - Bias Control (2 Req.)
*121-768	Transistor - Pre-Driver (2 Req.)
*121-773	Transistor - Driver (2 Req.)
*121-774	Transistor - Driver (2 Req.)
121-826	Transistor, FM RF
121-850	Transistor, NPN Silicon
*121-858	Transistor - Biplex Detector
*121-880	Transistor - Output (4 Req.)
*121-950	Transistor - AF 2nd. I.F., FM 3rd. I.F. (2 Req.)
*125-188	Rubber Grommet
126-1521	Heat Sink
126-1545	Bulb Shield
*126-1548	Dial Scale Reflector
149-311	Ferrite Core (Sleeve) (2 Req.)
*149-426	Ferrite Core, Antenna Rod (Part of S-88463)
159-199	Plug Button, Nylon
188-140	Retaining Ring
188-155	Clamping Ring (Part of S-89195)
*199-567	Sleeving (Part of S-88463)
*199-568	Shielded Sleeve
205-51	Dow Corning Heat Conductive Grease (Part of 121-853X)
223-6	Integrated Circuit Package
S-82528	Antenna Cable & Terminal Assem.
S-85563	Pulley Mtg. Bracket Assem.
*S-88463	Wavemagnet Antenna Assem.
S-88986	Dial Cord & Eyelet Assem.
S-89117	Pulley & Bracket Assem.
S-89118	Pulley & Bracket Assem. (Chassis Front)
S-89122	FM Detector Coil Assem.
S-89134	FM Antenna Coil Assem.
S-89195	Pulley & Ring Assem.
*S-89928	Phono Jack & Bracket Assem.
	CHASSIS 29CT21Z2
12-5425	Pulley Mtg. Bracket (Part of S-85563)
*12-5689	Dial Scale Mtg. Bracket
*12-5710	Escutcheon Mtg. Plate
17-130	Loop Retaining Clamp
19-480	Wire Retaining Clip
19-485	Cable Retaining Clip
*20-1256	Trap Coil (10.7 MHz)
*20-1649	FM Oscillator Coil

CHASSIS 29CT21Z2 (CONT'D.)

PART NO.	DESCRIPTION
*20-3076	FM Antenna Coil (Part of S-89134)
*20-3077	FM Detector Coil (Part of S-89122)
20-3080	Trap Coil - 67 KHz
22-13	.0033 MF Disc Capacitor - +10 -10% 500V. (1 Used on S-88463)
22-14	.0047 MF Disc Capacitor - 500V. ±20% (3 Req.)
22-18	.0022 MF Ceramic Capacitor ±10% - 500V.
22-2428	1.8 PF Gimmick Capacitor - 500V.
22-2592	3.4 MF Ceramic Disc Capacitor - 500V.
22-2729	.001 MF Disc Capacitor - 25V. (6 Req.)
22-2884	5 MF Electrolytic - 12V. (4 Req.)
22-3034	.05 MF Disc Capacitor - 25V. (10 Req.)
22-3080	.005 MF Disc Capacitor - 25V. (2 Req.)
22-3177	390 PF Disc Capacitor - 500V. (2 Req.)
22-3255	330 PF Disc Capacitor - 500V. (2 Req.)
22-3310	2.7 PF Gimmick Capacitor - 500V. (2 Req.)
22-3381	39 PF Ceramic Disc Capacitor - ±5% 500V. (2 Req.)
22-3393	.01 MF Disc Capacitor - 25V. (5 Req.)
22-3415	.0068 MF Disc Capacitor - 25V. (3 Req.)
22-3541	3.3 PF Gimmick Capacitor - 500V. (Part of S-89122)
22-3652	.1 MF Disc Capacitor - 10V. (2 Req.)
22-3675	10 PF Disc Capacitor - 500V. (2 Req.)
22-3687	1 MF Electrolytic - 50V. (4 Req.)
22-3751	20 MF Capacitor - ±5% 500V.
*22-3770	5.5 PF Disc Capacitor - 500V.
22-3896	5 MF Electrolytic - 25V.
22-4573	1000 MF Electrolytic - 15V.
22-4819	2 PF Capacitor - ±.25% 500V.
22-4855	Trimmer Capacitor - 1.7 To 10 PF Ceramic
22-5056	.02 MF Disc Capacitor - 25V.
22-5316	500 MF Electrolytic - 50V. (2 Req.)
22-5481	560 PF Disc Capacitor - 500V. (2 Req.)
22-5482	680 PF Disc Capacitor - 500V. (6 Req.)
22-5483	.0015 MF Disc Capacitor - 500V. (2 Req.)
22-5486	10 MF Electrolytic - 6V.
22-5638	.47 MF Mylar Capacitor 20% - 100V.
*22-5780	270 PF Polystyrene Capacitor - 500V.
*22-5781	1000 PF Polystyrene Capacitor - 500V. (2 Req.)
-OR-	
22-3613	1000 PF Mica Capacitor (2 Req.)
22-5782	2200 PF Capacitor - 5% 500V.
22-5814	.022 MF Mylar Capacitor - 50V. 20% (4 Req.)
22-5866	.047 MF Mylar Capacitor - 100V. (2 Req.)
22-5884	.082 MF Mylar Capacitor - 100V. (6 Req.)
*22-5972	390 PF Polystyrene Capacitor - 125V.
*22-5986	50 MF Electrolytic - 25V. (2 Req.)
*22-6245	Gang Capacitor, Six Section (FM Antenna Trimmer, FM Antenna Tuning, FM Detector Trimmer, FM Antenna Tuning, FM Detector Trimmer, FM Detector Tuning, FM Oscillator Tuning, AM Antenna Trimmer, AM Antenna Tuning, AM Detector Trimmer, AM Detector Tuning, AM Oscillator Trimmer, AM Oscillator Tuning)
*22-6246	3.3 MF Electrolytic - 15V.
22-6343	.33 MF Mylar Capacitor - 20% 50V. (2 Req.)
22-6344	7 PF Ceramic Disc Capacitor - ±7% 500V.
22-6347	2000 PF Capacitor - ±5% 50V.
-OR-	
22-6136	2000 PF Capacitor - ±5% 100V.
*33-374	P.C. Bd. Frame
*33-377	P.C. Bd. - Power Amp.
43-571	9 Contact Housing (Used on 86-390)
44-48	Connector Jack (4 Part of S-89928)
52-1062	2 Conductor Cable (Used on 86-344 & 86-357)
52-1391	Two Conductor Shielded Lead (Used on 85-1210)
52-1591	Two Conductor Shielded Lead
*52-1988	Two Conductor Shielded Lead
*52-1990	Shielded Lead & Plug (Used on 85-1210)
*52-2019	Two Conductor Shielded Lead
52-2020	Two Conductor Shielded Lead
54-139	3/8-32 x 9/16 Palnut (5 Req.)
54-808	Tinnerman Speed Nut (4 Req.)
54-828	1/2-20 Palnut
*54-851	Speed Nut - Palnut (25 Used on P.C. Bd.)

PART NO.	DESCRIPTION
61-222	Idler Pulley (Part of S-85563 & 3 Part of S-89118)
61-324	Pulley, Flanged (Part of S-89195)
63-1701	10 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1715	22 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1736	68 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1757	220 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1761	270 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1764	330 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1771	470 Ohm Resistor - 1/2W. 10%
63-1772	470 Ohm Resistor - 1/2W. 20% (5 Req.)
63-1775	560 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1777	680 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1778	680 Ohm Resistor - 1/2W. 10% (6 Req.)
63-1781	820 Ohm Resistor - 1/2W. 5%
63-1782	820 Ohm Resistor - 1/2W. 10%
63-1785	1000 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1794	1600 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1796	1800 Ohm Resistor - 1/2W. 10%
63-1798	2200 Ohm Resistor - 1/2W. 5%
63-1799	2200 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1803	2700 Ohm Resistor - 1/2W. 10%
63-1805	3300 Ohm Resistor - 1/2W. 5% (2 Req.)
63-1806	3300 Ohm Resistor - 1/2W. 10%
63-1810	3900 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1813	4700 Ohm Resistor - 1/2W. 10% (9 Req.)
63-1817	5600 Ohm Resistor - 1/2W. 10%
63-1820	6800 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1824	8200 Ohm Resistor - 1/2W. 10%
63-1826	10K Ohm Resistor - 1/2W. 5% (2 Req.)
63-1827	10K Ohm Resistor - 1/2W. 10% (3 Req.)
63-1831	12K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1834	15K Ohm Resistor - 1/2W. 10% (5 Req.)
63-1848	33K Ohm Resistor - 1/2W. 10% (3 Req.)
63-1852	39K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1855	47K Ohm Resistor - 1/2W. 10% (4 Req.)
63-1859	56K Ohm Resistor - 1/2W. 10%
63-1862	68K Ohm Resistor - 1/2W. 10%
63-1868	100K Ohm Resistor - 1/2W. 5% (2 Req.)
63-1873	120K Ohm Resistor - 1/2W. 10%
63-1898	470K Ohm Resistor - 1/2W. 20% (3 Req.)
63-1904	680K Ohm Resistor - 1/2W. 10%
63-1918	1.5 Megohm Resistor - 1/2W. 10% (4 Req.)
63-4122	33 Ohm Resistor - 1/4W. 10%
63-4129	47 Ohm Resistor - 1/4W. 10% (Part of S-89122)
63-4157	220 Ohm Resistor - 1/4W. 10%
63-4185	1K Ohm Resistor - 1/4W. 10%
63-4196	1800 Ohm Resistor - 1/4W. 10%
63-4231	12K Ohm Resistor - 1/4W. 10%
63-4255	47K Ohm Resistor - 1/4W. 10%
63-4269	100K Ohm Resistor - 1/4W. 10%
63-4287	270K Ohm Resistor - 1/4W. 10%
63-5085	680 Ohm Resistor - 3W. 10%
63-5663	680 Ohm Resistor - 2W. 10%
63-6424	1 Ohm Resistor - 5W. 10% (2 Req.)
63-6495	Mute Control - 100K
*63-8708	Rotary Control, Single - 5K Ohm 30% 1/4W. Bias Adjust
*63-8977	Rotary Control, Single 1K Ohm 30% 1/4W. Bias Adjust. (2 Req.)
63-8996	250K Ohm Single Rotary Control - 1/8W. 30% (Balance Control)
63-8997	100K Ohm Dual Rotary Control - 1/8W. 30% (Bass Control)
63-8998	50K Ohm Dual Rotary Control - 1/8W. 30% (Treble Control)
63-8999	100K Ohm Dual Rotary Control - 1/8W. 30% (Loudness Control)
64-6	1/8" Dia. x 3/16" Lg. Tubular Rivet (2 Part of S-89928)
64-7	Rivet, Lg. Tubular - 1/8" Dia. x 5/32 (Part of S-89201)
64-288	Shoulder Rivet (Part of S-85563)
64-303	Shoulder Rivet (Part of S-89118)
64-1033	Grip Eyelet
64-1046	Grip Eyelet
64-1098	Shoulder Rivet - Flat Hd. (2 Part of S-89118)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
	CHASSIS 29CT21Z2 (CONT'D.)
*76-2033	Tuning Shaft
78-2024	Lamp Socket (2 Req.)
79-174-12	No. 18 Sleeving - Yellow - 1-1/2" (2 Req.)
80-2143	Cord Tension Spring
*82-195	Ground Strap
82-196	Ground Strap
83-1961	Antenna Terminal Strip (Part of S-89928)
83-5791	Rubber Strip (Chassis)
83-6173	Tie Strip
*83-7552	Transistor Insulating Washer
83-7803	Terminal Strip
83-8148	Insulating Strip w/Perforation
83-8151	Terminal Strip (Part of S-89201)
83-8155	Strain Relief Strip (Part of S-89201)
83-8163	Antenna Mtg. Terminal Strip (2 Part of S-88463)
*85-1210	5 Position Bandswitch
*85-1212	Rocker Switch (Stereo - Mono)
*85-1349	Switch, Rocker
86-344	Terminal, Connector (Used on 52-1062)
86-390	Connector Terminal, Male (8 Used on 43-571)
86-357	Connector Terminal (Used on 52-1062)
86-500	Terminal (19 Req.)
86-543	Miniature Spring Terminal (80 Req.)
86-565	Connector Terminal (2 Req.)
93-1906	No. 4 Flat Washer (1 Used on Ea. 114-1144) (4 Req.)
*93-1978	Washer, Metal Spring (1 Used on 114-77)
94-1532	Nylon Shaft Bushing
94-1586	Shoulder Bushing (4 Req.)
95-2543	Transformer - 3rd. I.F. AM 455 KHz
95-2544	Transformer - AM - Oscillator
*95-2750	Transformer - B.C. R.F.
*95-2751	Transistor - AM 1st. I.F. AM 455 KHz
*95-2752	Transformer - AM 2nd. I.F. AM 455 KHz
*95-2753	Transformer - FM 1st. I.F. 10.7 MHz
*95-2754	Transformer - FM 2nd. I.F. 10.7 MHz
*95-2755	Transformer - FM 3rd. I.F. 10.7 MHz
*95-2756	Transformer - FM Ratio Detector 10.7 MHz
*95-2856	Multiplex Doubler - 19 KHz Transformer
*95-2857	Multiplex Detector - 38 KHz Transformer
*95-2858	Multiplex Input - 19 KHz Transformer
100-249	Pilot Light Bulb (2 Req.)
*100-507	Stereo Indicator Lamp
103-23	Germanium Diode (6 Req.)
103-90	Germanium Diode - Matched Pair
103-96	Diode, Zener
103-189	AFC Diode
-OR-	
103-47	AFC Diode
114-77	6-20 x 5/16" Lg. x 1/4" Hex Hd. Self-Tap. Screw-Stat. Bronze (14 Req.)
114-1108	6-20 x 3/8 Hex Washer Hd. Self-Tap. Screw-Stat. Bronze (2 Req.)
114-1144	4-24 x 0.500 x 0.187 Hex Washer Hd. Screw-Stat. Bronze (2 Used on Ea. 121-853X) (4 Req.)
121-430	Transistor - Audio - Amp. (2 Req.)
121-546	Transistor - AM-FM 2nd. I.F., FM 3rd. I.F. (2 Req.)
121-613	Transistor - Autodyne Converter - FM
121-614	Transistor - AM-FM 1st. I.F.
121-639	Transistor - Comp. Amp., 19 KHz Amp. & 38 KHz Amp., Tuning Meter Control (4 Req.)
121-714	Transistor - AM Converter
*121-737	Transistor - Stereo Indicator Switch
*121-767	Transistor - Bias Control (2 Req.)
*121-768	Transistor - Pre-Driver (2 Req.)
*121-773	Transistor - Driver (2 Req.)
*121-774	Transistor - Driver (2 Req.)
121-826	Transistor, FM RF
121-850	Transistor, NPN Silicon
*121-858	Transistor - Biplex Detector
*121-880	Transistor - Output (4 Req.)
*122-66	Tuning Meter
126-1521	Heat Sink
*126-1533	Dial Scale Reflector (Part of S-89201)
149-311	Ferrite Core (Sleeve) (2 Req.)
*149-426	Ferrite Core, Antenna Rod (Part of S-88463)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
188-140	Retaining Ring
188-155	Clamping Ring (Part of S-89195)
*199-567	Sleeving (Part of S-88463)
*199-568	Shielded Sleeve
205-51	Dow Corning Heat Conductive Grease
*223-6	Integrated Circuit Package
S-82528	Antenna Cable & Terminal Assem.
S-85563	Pulley Mtg. Bracket Assem.
*S-88463	Wavemagnet Antenna Assem.
S-88986	Dial Cord & Eyelet Assem.
S-89051	Pointer & Carriage Assem.
S-89117	Pulley & Bracket Assem.
S-89118	Pulley & Bracket Assem. (Chassis Front)
S-89122	FM Detector Coil Assem.
S-89134	FM Antenna Coil Assem.
S-89195	Pulley & Ring Assem.
*S-89201	Dial Light Shield, Terminal Strip & Insulator Strip Assem.
*S-89928	Phono Jack & Bracket Assem.
	CHASSIS 29AT24Z2
11-122	Dial Cord
11-244	Drive Cord
12-4120	Variable Capacitor Mtg. Bracket
12-4729	Stereo Reflector Bracket
12-4945	I.F. Shield Bracket
12-5272	Switch Mtg. Bracket
12-5295	Mtg. Bracket
12-5335	Tuning Meter Mtg. Bracket
12-5367	Heat Sink Bracket
*12-5552	Support Bracket
17-143	Nylon Clamp
19-238	Mtg. Strip (1 Used on Ea. S-82954 & S-82955)
19-448	Ground Clip
19-453	Resistor Mtg. Clip (2 Req.)
19-464	Coil Mtg. Clip
19-480	Wire Retaining Clip (2 Req.)
19-492	Wire Retaining Clip (4 Req.)
19-561	Capacitor Retaining Clip
19-656	Retaining Clip (4 Req.)
20-1422	Trap Coil
20-2008	Peaking Coil
20-2033	Peaking Coil (2 Req.)
22-9	100 Mmfd Ceramic Disc Capacitor ±10% - 500V.
22-13	.0033 Mfd Ceramic Disc Capacitor ±10% - 500V.
22-14	.0047 Mfd Disc Capacitor - 500V. 20% (2 Req.)
22-18	.0022 Mfd Ceramic Disc Capacitor ±10% - 500V. (3 Used on Chassis Wiring Assem. & 6 Used on Printed Circuit Board)
22-2333	2.2 Pfd Gimmick Capacitor - 500V.
22-2374	6 Pfd Compensating Capacitor - 500V. (2 Req.)
22-2424	1.5 Pfd Gimmick Capacitor - 500V.
22-2642	15 PF Ceramic Capacitor - 5%
22-2715	1.2 Pfd Molded Gimmick Capacitor - 500V.
22-2720	1.0 Pfd Molded Gimmick Capacitor - 500V.
22-2729	.001 Mfd Ceramic Disc Capacitor - 25V. (1 Used on Ea. S-82954 & Chassis Wiring Assem.)
22-2884	5 Mfd Electrolytic Capacitor - 12V. (3 Req.)
22-2903	22 Pfd Ceramic Disc Capacitor - 500V.
22-3010	.01 Mfd Ceramic Disc Capacitor - 25V. (2 Req.)
22-3034	.05 Mfd Ceramic Disc Capacitor (15 Used on Chassis Wiring Assem., 10 Used on Printed Circuit Board & 1 Used on Ea. S-82954 & S-82955)
22-3080	.005 Mfd Ceramic Disc Capacitor - 25V. (2 Used on on Printed Circuit Board)
22-3177	390 Pfd Ceramic Disc Capacitor - 500V. (2 Req.)
22-3254	.1 Mfd Ceramic Disc Capacitor - 25V. (2 Req.)
22-3362	560 Pfd Disc Capacitor - 500V. (2 Req.)
22-3393	.01 MF Disc Capacitor
22-3444	.018 Mfd Molded Capacitor - 50V. (2 Req.)
22-3448	10 Mfd Electrolytic Capacitor - 15V.
22-3479	2.2 PF Capacitor
22-3527	.22 Mfd Disc Capacitor - 12V. (Used on S-82954)
22-3596	.1 Mfd Mylar Capacitor - 50V. (2 Req.)
22-3599	.015 Mfd Mylar Capacitor - 50V. (2 Req.)
22-3675	10 Pfd Disc Capacitor - 500V.

CHASSIS 29AT24Z2 (CONT'D.)

PART NO.	DESCRIPTION
22-3687	1 Mfd Electrolytic Capacitor - 50V. (8 Used on Chassis Wiring Assem. & 5 Used on Printed Circuit Board)
22-3826	.22 Mfd Mylar Capacitor - 100V. (5 Req.)
22-3891	.0068 Mfd Capacitor - 100V. (2 Req.)
22-3896	5 Mfd Electrolytic Capacitor - 25V. (2 Req.)
22-3944	.0047 Mfd Disc Capacitor - 25V. (Part of S-76801)
22-4509	20 Mfd Electrolytic Capacitor - 25V.
22-4515	1.8 PF Gimmick Capacitor
22-4564	10 Mfd Capacitor - 25V.
22-4617	.01 Mfd Ceramic Capacitor - 500V.
22-4817	3 Section Variable Capacitor - AM Antenna Tuning - Trimmer, AM Detector Tuning - Trimmer, AM Oscillator Tuning - Trimmer
22-4905	.01 Mfd Disc Capacitor - 500V. (11 Used on Printed Circuit Board)
22-5012	.15 Mfd Disc Capacitor - 50V. (4 Req.)
22-5018	.47 Mfd Capacitor - 50V.
22-5167	1000 Mfd Electrolytic Capacitor - 30V.
22-5168	300 Mfd Electrolytic Capacitor - 25V.
22-5188	.1 Mfd Mylar Capacitor - 50V. (2 Req.)
22-5237	.01 Mfd Capacitor - 100V. (2 Req.)
22-5281	23 PF Disc Capacitor
22-5612	180 Pfd Disc Capacitor - 500V. (2 Used on Printed Circuit Board)
22-5626	.0082 Mfd Disc Capacitor - 500V. (2 Req.)
22-5883	.033 Mfd Capacitor - 100V. (2 Used on Printed Circuit Board)
22-5904	.15 Mfd Capacitor - 50V. (2 Used on Printed Circuit Board)
22-5907	.1 Mfd Capacitor - 50V. (12 Used on Printed Circuit Board)
26-2025	Dial Scale
43-571	Contact Housing - Male
43-875	9 Contact Housing - Female
43-878	Contact Housing - Female (3 Req.)
43-879	12 Contact Housing - Male (3 Req.)
43-1224	20 Contact Housing - Male (2 Req.)
46-7607	Loudness, Treble, Balance & Bass Knob (4 Req.)
46-9092	Stereo - Mono - On-Off Knob (2 Req.)
52-1214	2 Conductor Shield
52-1644	2 Conductor Cable
52-1645	Shielded Cable
52-1646	Shielded Cable
52-1647	2 Conductor Cable
52-1648	Shielded Cable
*52-2018	2 Conductor Cable
*52-2021	Shielded Lead Cable
54-31	10-32 x 3/8 Hex Nut (Used on 103-158)
54-139	3/8-32 x 9/16 Palnut (Used on 63-8244)
54-450	Thread Forming Palnut (8 Req.)
54-541	Palnut (4 Req.)
54-590	Tinnerman Speed Nut (2 Req.)
54-652	Palnut (3 Req.)
54-793	Modified Spring Nut (10 Req.)
54-835	Circular Spring Nut (4 Req.)
54-851	Palnut (6 Req.)
54-867	Tinnerman Nut (4 Req.)
56-426	Roll Pin
57-5333	Bearing Plate
57-7504	Retaining Plate (4 Req.)
57-7551	Slide Clutch Mtg. Plate
57-7552	Slide Mtg. Plate
57-7553	Function Plate & Socket
57-7573	Bearing Plate
57-8086	Background Plate
57-8655	Die-Cast Escutcheon
58-315	Connector Plug (Used on 52-1644)
59-859	Pointer
61-222	Idler Pulley (Part of S-84096, 4 Part of S-84097 & 3 Part of S-84098)
63-1701	10 Ohm Resistor - 1/2W. 10%
63-1722	33 Ohm Resistor - 1/2W. 10%
63-1733	56 Ohm Resistor - 1/2W. 10%
63-1743	100 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1747	120 Ohm Resistor - 1/2W. 10%
63-1764	330 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1768	390 Ohm Resistor - 1/2W. 10%
63-1771	470 Ohm Resistor - 1/2W. 10% (4 Req.)
63-1775	560 Ohm Resistor - 1/2W. 10%
63-1778	680 Ohm Resistor - 1/2W. 10% (7 Req.)
63-1782	820 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1785	1000 Ohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board, 1 Used on S-82954 & 5 Used on Chassis Wiring Assem.)
63-1792	1500 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1796	1800 Ohm Resistor - 1/2W. 10% (2 Req.)
63-1799	2200 Ohm Resistor - 1/2W. 10% (2 Used on Chassis Wiring Assem. & 1 Used on S-82955)
63-1803	2700 Ohm Resistor - 1/2W. 10%
63-1806	3300 Ohm Resistor - 1/2W. 10% (3 Req.)
63-1810	3900 Ohm Resistor - 1/2W. 10% (5 Req.)
63-1813	4700 Ohm Resistor - 1/2W. 10% (9 Used on Chassis Wiring Assem., 3 Used on Printed Circuit Board & 1 Used on S-82954)
63-1814	4700 Ohm Resistor - 1/2W. 20%
63-1817	5600 Ohm Resistor - 1/2W. 10%
63-1824	8200 Ohm Resistor - 1/2W. 10%
63-1825	9100 Ohm Resistor - 1/2W. 5%
63-1826	10K Ohm Resistor - 1/2W. 5%
63-1827	10K Ohm Resistor - 1/2W. 10% (4 Used on Printed Circuit Board, 2 Used on Chassis Wiring Assem. & 1 Used on S-82954)
63-1831	12K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1834	15K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1838	18K Ohm Resistor - 1/2W. 10% (5 Req.)
63-1841	22K Ohm Resistor - 1/2W. 10% (4 Used on Chassis Wiring Assem. & 6 Used on Printed Circuit Board)
63-1848	33K Ohm Resistor - 1/2W. 10% (4 Req.)
63-1852	39K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1859	56K Ohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board)
63-1862	68K Ohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board)
63-1866	82K Ohm Resistor - 1/2W. 10% (3 Req.)
63-1869	100K Ohm Resistor - 1/2W. 10% (5 Used on Chassis Wiring Assem. & 6 Used on Printed Circuit Board)
63-1870	100K Ohm Resistor - 1/2W. 20% (2 Req.)
63-1876	150K Ohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board)
63-1880	180K Ohm Resistor - 1/2W. 10% (5 Used on Printed Circuit Board)
63-1883	220K Ohm Resistor - 1/2W. 10% (3 Used on Printed Circuit Board)
63-1887	270K Ohm Resistor - 1/2W. 10% (2 Req.)
63-1890	330K Ohm Resistor - 1/2W. 10% (1 Used on Ea. Wiring Chassis Assem. & Printed Circuit Board)
63-1894	390K Ohm Resistor - 1/2W. 10%
63-1897	470K Ohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board)
63-1911	1.0 Megohm Resistor - 1/2W. 10% (1 Used on Chassis Wiring Assem. & 8 Used on Printed Circuit Board)
63-1915	1.2 Megohm Resistor - 1/2W. 10%
63-1918	1.5 Megohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board)
63-1922	1.8 Megohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board & 2 Used on Chassis Wiring Assem.)
63-1925	2.2 Megohm Resistor - 1/2W. 10% (2 Req.)
63-1929	2.7 Megohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board)
63-1932	3.3 Megohm Resistor - 1/2W. 10% (6 Used on Printed Circuit Board & 6 Used on 83-7410)
63-1936	3.9 Megohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board)
63-1939	4.7 Megohm Resistor - 1/2W. 10% (2 Req.)
63-1946	6.8 Megohm Resistor - 1/2W. 10% (2 Used on Printed Circuit Board)
63-1953	10 Megohm Resistor - 1/2W. 10% (2 Req.)
63-3238	Vertical Amplifier Control
63-4171	470 Ohm Resistor
63-4227	10K Ohm Resistor
63-4548	22 Megohm Resistor - 1/2W. 20% (18 Used on Printed Circuit Board)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
	CHASSIS 29AT24Z2 (CONT'D.)
63-4561	47 Megohm Resistor - 1/2W. 10% (Used On Printed Circuit Board)
63-8244	Dual Loudness Control
63-8258	Potentiometer
63-8259	Bass Slide Control
63-8260	Treble Slide Control
63-8282	Balance Slide Control
63-8298	200 Ohm Resistor - 15W. 10%
64-5	1/8" Dia x 7/32" Tubular Rivet
*64-27	1/8" Dia x 1/8'. Tubular Rivet
*64-78	Plain Eyelet
64-88	Tubular Rivet
64-151	.088" Dia x 3/32" Lg. Tubular Rivet
*64-158	.088" Dia x 7/32" Lg. Tubular Rivet
64-296	Should Rivet (Part Of S-84096)
64-862	Steel Eyelet (4 Used On FM Tuner Assem.)
64-1046	Grip Eyelet (242 Used On Printed Circuit Board)
69-160	4-40 x 1/4 Rd. Hd. Mach. Screw (4 Mts. 12-5272)
78-1099	3 Contact Socket (Used On S-89962)
78-1761	Stereo Indicator Socket & Wire
78-1838	Transistor Socket (18 Req.)
78-1920	Pilot Light Socket & Wire
*79-28-6	Plastic Sleeving (2 Req.)
*79-55-6	Plastic Sleeving
*79-169-6	Plastic Sleeving
*79-174-1	No. 8 Yellow Sleeving (4 Req.)
*79-174-3	No. 18 Yellow Sleeving
*79-174-4	No. 18 Yellow Sleeving
*79-174-5	No. 18 Yellow Sleeving
*79-174-7	No. 18 Yellow Sleeving
80-1091	Dial Tension Spring
80-1140	Dial Cord Tension Spring
83-1475	Loop Fastening Strip
83-5164	4 Lug Terminal Strip
83-5165	Insulating Strip
83-5170	3 Lug Terminal Strip
83-5171	Insulating Strip
83-5288	13 Lug Terminal Strip
83-5290	19 Lug Terminal Strip
83-5391	20 Lug Terminal Strip (3 Req.)
83-5392	32 Lug Terminal Strip
83-5736	3 Lug Terminal Strip
83-5737	Insulating Strip
83-6430	3 Lug Terminal Strip (Part Of S-84098)
83-6800	Rubber Strip (2 Req.)
83-7206	Slide Guide (8 Req.)
83-7383	Escutcheon Strip
83-7384	Indicator Strip (3 Req.)
83-7385	Indicator Strip (3 Req.)
83-7386	Indicator Strip (3 Req.)
83-7387	Indicator Strip (3 Req.)
83-7397	2 Lug Terminal Strip
83-7410	Terminal Board
83-7411	30 Lug Terminal Strip
83-7412	8 Lug Terminal Strip
83-7557	Insulating Strip
83-7567	2 Lug Terminal Strip
83-7575	Dial Crystal Insulating Strip (2 Req.)
83-7598	Wire Retaining Strip
*83-7818	Bottom Strip
83-7951	Tape Strip (3 Req.)
83-7953	Adhesive Strip (8 Req.)
83-8175	Retaining Strip (8 Req.)
*83-8256	Insulating Strip
*83-8257	Insulating Strip
84-105	Pointer Support
85-1075	Conture Switch
85-1077	AFC Switch
85-1078	Contact Function Switch - AM/FM - Phono - External Bass - Tape - Mono
86-388	Connector Terminal (2 Used On 78-1761 & 1 Used on 43-1224)
83-390	Connector Terminal (9 Used On 43-571)

PART NO.	DESCRIPTION
86-450	Connector Terminal (Used On 78-1920)
86-483	Connector Terminal (Used On 43-875 & 22 Used On 43-879)
86-484	Connector Terminal - Male (34 Used On 43-878)
86-496	Insertion Terminal (7 Req.)
86-512	Miniature Contact (5 Req.)
86-543	Miniature Spring Terminal (48 Used On Printed Circuit Board)
86-579	Connector Terminal (29 Used On 43-1224 & 1 Used On S-84058)
93-369	External Shakeproof Lockwasher - Cadmium (1 Used On 103-158)
93-502	No. 6 External Shakeproof Lockwasher (7 Req.)
93-1455	.016 Steel Washer - Cadmium
93-1804	Brass Sleeve (2 Joins Escutcheon & Chassis)
94-1379	Insulating Bushing (2 Req.)
95-2313	Double Mixer Transformer
95-2314	Detector Mixer Transformer
95-2315	Input Mixer Transformer
95-2316	Trap Coil Mixer Transformer
95-2322	1st. I.F. Transformer - FM
95-2324	Ratio Detector Transformer
95-2328	2nd. & 4th I.F. FM Transformer
95-2387	3rd. I.F. Transformer - FM (2 Req.)
95-2721	1st. I.F. AM Transformer
95-2722	2nd. I.F. AM Transformer
95-2723	3rd. I.F. AM Transformer
100-249	Pilot Light Bulb (9 Req.)
100-384	Indicator Lamp - AM/FM - Phono - Tape - Mono Stereo - External Bass Indicator Light (6 Req.)
103-23	Crystal Diode (8 Req.)
103-47	Diode
103-96	Zener Diode
103-142	Diode (2 Used On Printed Circuit Board)
103-158	Zener Diode
105-93	RC/Network (2 Req.)
112-793	6-20 x 1/4" Phillips Rd. Hd. Self-Tap. Screw (2 Req.)
112-1376	4-24 x 3/8 Phillips Pan Hd. Self-Tap. Screw (8 Req.)
113-8	6-32 x 1/4 x 1/4 AF Hex Hd. Mach. Screw
114-26	8-18 x 1/4 x 1/4 AF Hex Hd. Self-Tap. Screw-Stat. Bronze (2 Mts. 12-4120 & 1 Mts. S-84096)
114-77	6-20 x 5/16 x 1/4 AF Hex Hd. Self-Tap. Screw-Stat. Bronze
114-344	6-20 x 1/4 x 1/4 Hex Hd. Self-Tap. Screw-Stat. Bronze (2 Mts. S-89962, 2 Mts. 126-1204 & 2 Mts. Ea. 12-4729 & 12-5355)
114-390	8 x 7/16 x 1/4 AF Hex Hd. Self-Tap. Screw-Stat. Bronze (6 Joins Escutcheon Assem. & Chassis)
114-654	6-20 x 3/8 x 1/4 AF Hex Hd. Self-Tap. Screw-Stat. Bronze (2 Mts. 12-5272)
114-801	8-18 x 5/16 x 1/4 AF Hex Hd. Self-Tap Screw-Stat. Bronze (4 Mts. Ea. S-84097 & S-84098, 2 Mts. 12-4945 & 1 Mts. 83-7397)
114-804	8-18 x 1/2 Hex Hd. Self-Tap. Screw-Stat. Bronze - Flat Washer Att. (4 Mts. FM Tuner Assem.)
114-816	8-18 x 5/16 Hex Hd. Self-Tap. Screw-Stat Bronze - 3/8" Flat Washer Att. (1 Mts. 17-143)
114-920	8-15 x 3/8 Hex Hd. Self-Tap. Screw-Stat. Bronze (2 Mts. Printed Circuit Board & 2 Joins Printed Circuit Board & Chassis Wiring Assem.)
121-430	Phase Inverter Sound Amplifier Transistor (2 Req.)
121-433	Transistor (2 Used On Printed Circuit Board)
121-447	Horizontal, AFC, Noise Gate, Syns, AGC & Output Transistor
121-496	Transistor (Stereo Indicator Switch - Comp. Amp. 19KHz Amp. - 38KHz Amp. (4 Req.)
121-497	Transistor (Switching - A.M.)
121-546	Transistor (FM/AM 2nd. & 3rd. I.F.) (3 Req.)
121-602	Transistor (1st. Audio) (2 Req.)

*Denotes parts not previously used.

PART NO.	DESCRIPTION

CHASSIS 29AT24Z2 (CONT'D.)

121-603	Transistor - 3 Amp. (Pre-Amplifier) (2 Req.)
121-614	1st. I.F. Transistor - FM/AM 1st. & 2nd I.F.
OR	
121-775	1st. I.F. Transistor - FM/AM 1st. & 2nd. I.F.
121-638	Converter Transistor - FM/AM 1st. & 2nd. I.F.
121-734	Transistor - Biplex Detector
121-753	Transistor (AM Oscillator) (2 Req.)
121-756	Transistor - Phono Stereo - Mono Switch
122-43	Tuning Meter
OR	
122-42	Tuning Meter
OR	
122-51	Tuning Meter
125-117	Rubber Grommet (4 Used On FM Tuner Assem.)
126-1204	Shield
126-1281	Dial Light Shield
126-1419	Stereo Light Shield
126-1430	Light Shield (Part Of Ea. S-84283)
126-1437	Pilot Light Shield (2 Req.)
149-211	Iron Core (1 Used On Ea. S-82954 & S-82955)
149-311	Iron Core (2 Req.)
149-370	Iron Core (Part Of S-76801)
185-3	Silicone Controlled Rectifier (AM Switch - Phono Peak Tape Switch) (4 Req.)
185-4	Silicone Controlled Rectifier - Stereo Switch (2 Req.)
185-5	Silicone Controlled Rectifier - External Bass Switch (2 Req.)
188-367	Clamping Ring
192-88	Dial Crystal
S-72362	Drive Cord & Eyelet Assem.
S-74470	AM Antenna Coil (Part Of S-76801)
S-76801	Antenna Coil & Capacitor Assem.
S-79037	Drive Cord & Eyelet Assem.
S-82954	Broadcast Oscillator Coil Assem.
S-82955	Broadcast Detector Coil Assem.
S-83179	FM Tuner Final Assem.
12-4192	Tuner Guide Bracket (Used On S-80123)
12-4193	Coil Mtg. Bracket
19-322	Speed Clip (4 Req.)
20-1256	Trap Coil - 10.7 MHz
22-2374	6 PF Capacitor ±5% - 500V.
22-2424	1.5 PF Gimmick Capacitor - 500V.
22-3393	.01 MF Disc Capacitor - 25V. (2 Used On S-83179 & 1 Used On 83-3829)
22-3675	10 PF Disc Capacitor - 500V. 5% (Used On S-83412)
22-4613	.001 Feed-Thru Capacitor - 500V. (5 Req.)
22-4718	1000 Pfd Feed-Thru Capacitor - 500V.
22-5164	1.2 PF Gimmick Capacitor - 500V. 5% (1 Used On Ea. S-83411 & S-83412)
22-5318	34 Pf Disc Capacitor - 500V. 5% (1 Used On Ea. S-83411 & S-83412)
24-1372	Tuner Cover
44-48	Connector Base
56-426	Roll Pin (2 Used On S-83179 & 4 Used On S-80123)
*57-5333	Bearing Plate (Used On S-80123)
63-1778	680 Ohm Resistor - 1/2W. 10%
63-4122	33 Ohm Resistor
63-4157	220 Ohm Resistor
63-4175	560 Ohm Resistor
63-4185	1000 Ohm Resistor
63-4199	2200 Ohm Resistor
63-4219	3900 Ohm Resistor
63-4241	22K Ohm Resistor
63-4269	100K Ohm Resistor
63-4283	220K Ohm Resistor (Used On 83-3829)
63-4297	470K Ohm Resistor
64-318	Plain Brass Eyelet (6 Req.)
76-1541	Guide Shaft
76-1820	Drive Shaft (Used On S-80123)
78-1227	Transistor Socket (2 Req.)
78-1378	Transistor Socket
80-1467	Retaining Ring
80-1853	Transformer Retaining Spring
83-3829	2 Lug Terminal Strip (Used On S-69085)
86-441	Insulator Feed-Thru Terminal (2 Req.)
94-613	Iron Cord Insulating Bushing (4 Used On S-80123)
94-1472	Shaft Bushing
95-2322	FM - 1st. I.F. Transformer
103-47	Diode Voltage Dependent Capacitor (Used On 83-389)
113-26	6-32 x 1/4 x 1/4 AF Hex Hd. Mach. Screw (4 Req.)
121-432	Oscillator Transistor
121-731	FM - RF Transistor
121-732	FM Mixer Transistor
126-1141	Side Coil Shield (2 Req.)
126-1142	Center Shield
149-368	Iron Core & Spring (3 Used On S-80123)
149-385	Iron Core & Spring (Used On S-80123)
188-232	Knob Clamping Ring (4 Used On S-80123)
S-62887	FM Coil Assem. (1 Used On Ea. S-83411 & S-83412)
S-69085	Shield & Terminal Assem.
S-80123	Bracket, Shaft & Antenna Assem.
S-83409	Detector Coil Assem.
S-83410	FM Oscillator Coil Assem.
S-83411	Antenna Coil Assem.
S-83412	RF Input Coil Assem.
S-84057	Wire & Terminal Assem. - White
S-84058	Wire & Terminal Assem. - White/Red
S-84096	Bracket & Pulley Assem.
S-84097	Right Hand Escutcheon Mtg. Bracket Assem.
S-84098	Left Hand Escutcheon Mtg. Bracket Assem.
S-84104	Drive Cord & Eyelet Assem.
S-84283	Light Shield & Bracket Assem. (2 Req.)
*S-89962	Socket W/Bracket Assem.
S-92058	Switch & Bracket Assem.
OR	
85-1345	AC Switch

CHASSIS 35WDR50

*11-299	Line Cord
*12-5425	Pulley Mtg. Bracket (Part Of S-85563 & S-86475)
*12-5508	Heat Sink Bracket
12-5810	Bracket
17-143	Nylon Clamp (2 Req.)
19-480	Wire Retaining Clip
19-485	Cable Retaining Clip (2 Req.)
*20-1256	Trap Coil (10.7 MHz)
*20-1649	FM Oscillator Coil
*20-3076	FM Antenna Coil
*20-3077	FM Detector Coil
20-3080	Trap Coil - 67 KHz
22-13	.0033 MF Disc Capacitor - 10% 500V. (2 Req.)
22-14	.0047 MF Disc Capacitor - 500V. (3 Req.)
22-2428	1.8 PF Gimmick Capacitor - 500V.
22-2592	3.4 MF Ceramic Disc Capacitor - 500V.
22-2729	.001 MF Disc Capacitor - 25V. (5 Req.)
22-2884	5 MF Electrolytic Capacitor - 12V. (4 Req.)
22-3034	.05 MF Disc Capacitor - 25V. (14 Req.)
22-3080	.005 MF Disc Capacitor - 25V. (2 Req.)
22-3177	390 PF Disc Capacitor - 500V. (2 Req.)
22-3255	330 PF Disc Capacitor - 500V. (2 Req.)
22-3310	2.7 PF Gimmick Capacitor - 500V. (2 Req.)
22-3362	560 PF Disc Capacitor - 500V. (2 Req.)
22-3381	39 PF Ceramic Disc Capacitor - 5% 500V. (2 Req.)
22-3393	.01 MF Disc Capacitor - 25V. (6 Req.)
22-3415	.0068 MF Disc Capacitor - 25V.

*Denotes parts not previously used.

PART NO.	DESCRIPTION
	CHASSIS 35WDR50 (CONT'D.)
22-3541	3.3 PF Gimmick Capacitor - 500V.
22-3652	.1 MF Disc Capacitor - 10V. (2 Req.)
22-3675	10 PF Disc Capacitor - 500V. (2 Req.)
22-3687	1 MF Electrolytic Capacitor - 50V. (4 Req.)
22-3751	20 PF Capacitor - 5% 500V.
22-3770	5.5 PF Disc Capacitor - 500V.
22-3896	5 MF Electrolytic Capacitor - 25V.
22-4573	1000 MF Electrolytic Capacitor - 15V.
22-4819	2 PF Capacitor - ±.25% 500V.
22-4855	Trimmer Capacitor - 1.7 to 10 PF Ceramic
22-5233	.015 MF Mylar Capacitor - 20% 50V. (2 Req.)
22-5316	500 MF Electrolytic Capacitor - 50V. (2 Req.)
22-5481	560 PF Disc Capacitor - 500V. (2 Req.)
22-5482	680 PF Disc Capacitor - 500V. (7 Req.)
22-5486	10 MF Electrolytic Capacitor - 6V.
22-5780	270 PF Polystyrene Capacitor - 500V.
22-5781	1000 PF Polystyrene Capacitor - 500V. (2 Req.)
OR	
22-3613	1000 PF Mica Capacitor (2 Req.)
22-5782	2200 PF Capacitor - 5% 500V.
22-5862	.1 MF Mylar Capacitor - 100V. (2 Req.)
22-5866	.047 MF Mylar Capacitor - 100V. (6 Req.)
22-5883	.033 MF Mylar Capacitor - 100V. (2 Req.)
22-5971	.0033 MF Mylar Capacitor (2 Req.)
22-5972	390 PF Polystyrene Capacitor - 125V.
*22-5986	50 MF Electrolytic Capacitor - 25V. (2 Req.)
*22-6111	.001 MF Mylar Capacitor - 50V. (2 Req.)
22-6343	.33 MF Mylar Capacitor 20% - 50V.
22-6363	270 PF Ceramic Capacitor 10% - 500V.
*22-6752	Gang Capacitor, Six Section (FM Antenna Trimmer, FM Antenna Tuning, FM Detector Trimmer, FM Detector Tuning, FM Oscillator Tuning, AM Antenna Trimmer, AM Antenna Tuning, AM Detector Trimmer, AM Detector Tuning, AM Oscillator Trimmer, AM Oscillator Tuning)
43-571	9 Contact Housing (Used With 86-390)
44-48	Connector Jack (4 Part Of S-89969 & S-92170)
52-1062	2 Conductor Twin Lead
52-1425	2 Conductor Shielded Phono Cable - Red, White (Used With 58-214)
52-1501	3 Conductor Cable - Red, Black, White Approx. 20" (Part Of S-87113)
*52-1588	2 Conductor Shielded Lead - Red, White (Used On S-89969)
*52-1589	2 Conductor Shielded Lead - Yellow, Green (Used On S-89969)
*52-1590	2 Conductor Shielded Lead - Purple, Gray (Used On Bandswitch)
*52-2022	2 Conductor Shielded Cable - Blue, Black (Used On S-89969)
*52-2023	2 Conductor Shielded Cable - Brown, Orange (Used On S-89969)
*52-2080	Shielded Lead Cable
*52-2081	Shielded Lead Cable
54-139	3/8 -32 x 9/16 Palnut (5 Req.)
54-808	Tinnerman Speed Nut (1 Used On Ea. 114-1129)
54-828	1/2-20 Palnut
58-214	Single Prong Plug (2 Used On 52-1425)
58-338	Plug Shorting Bar (2 Used On S-89969)
59-1103	Dial Pointer
61-222	Idler Pulley (Part Of S-86475, S-85563, S-85564 & 2 Part Of S-89890, S-91614)
*61-349	Drive Pulley (Part Of S-92496)
63-4122	33 Ohm Resistor - 1/4W. 10%
63-4129	47 Ohm Resistor - 1/4W. 10%
63-4157	220 Ohm Resistor - 1/4W. 10%
63-4185	1000 Ohm Resistor - 1/4W. 10%
63-4196	1800 Ohm Resistor - 1/4W. 10%
63-4231	12K Ohm Resistor - 1/4W. 10%
63-4255	47K Ohm Resistor - 1/4W. 10%
63-4269	100K Ohm Resistor - 1/4W. 10%
63-4287	270K Ohm Resistor - 1/4W. 10%
63-5663	680 Ohm Resistor - 2W. 10%
63-6424	1 Ohm Resistor - 5W. 10% (2 Req.)
63-6495	Mute Control -100K
*63-8708	Rotary Control, Single - 5K Ohm 30% 1/4W. Bias Adjust.
*63-8745	270K Ohm Resistor - 1/2W. 10%
*63-8746	470K Ohm Resistor - 1/2W. 20%
*63-8747	680K Ohm Resistor - 1/2W. 10%
*63-8748	1.5 Megohm Resistor - 1/2W. 10%
*63-8749	3.3 Megohm Resistor - 1/2W. 20%
*63-8750	130K Ohm Resistor - 1/2W. 5%
*63-8964	Rotary Control, Dual Treble - 250K Ohm 30% 1/8W.
*63-8965	Rotary Control, Dual Bass - 250K Ohm 30% 1/8W.
*63-8966	Rotary Control, Single Balance W/Switch 500K Ohm
*63-8967	Rotary Control, Dual Loudness - 100K Ohm
*63-9261	Rotary Control, Single Bias Adjust. (2 Req.)
64-6	1/8" Dia. x 3/16" Lg. Tubular Rivet (2 Part Of S-89969)
64-720	Rivet, Shoulder (Part Of S-86475)
64-288	Shoulder Rivet (1 Part Of Ea. S-85563, S-85564, 2 Part Of S-89890, S-91614) (6 Req.)
64-1033	Grip Eyelet (42 Req.)
*76-2032	Tuning Shaft
78-1988	Light Socket & Wire
80-1180	Wire Spring
*82-195	Ground Strap
82-208	Ground Strap
83-1961	Antenna Terminal Strip (Part Of S-89969)
83-3320	Retaining Strip
*83-7417	Antenna Protective Strip
*83-7552	Transistor Insulating Washer (2 Part Of Ea. 121-853X)
83-7803	3 Lug Terminal Strip
83-8163	Antenna Mtg. Terminal Strip (2 Part Of S-88463)
83-8216	Insulating Strip
*85-1207	6 Pos. Bandswitch & On-Off Switch Assem.
85-1344	6 Pos. Bandswitch & On-Off Switch Assem.
86-344	Terminal, Connector (Used On 52-1062 & 52-1501) (6 Req.)
86-390	Connector Terminal (9 Used On 43-571)
86-449	Connector Terminal (Used On 52-1062)
OR	
86-357	Connector Terminal (Used On 52-1062)
86-500	Terminal (23 Req.)
86-543	Miniature Spring Terminal (88 Req.)
93-1906	No. 4 Flat Washer (1 Used On Ea. 114-1129)
94-1532	Nylon Shaft Bushing
94-1586	Should Bushing (4 Req.)
95-2543	Transformer - 3rd. I.F. AM 455 KHz
95-2544	Transformer - AM Oscillator
*95-2750	Transformer - AM R.F.
*95-2751	Transformer - AM 1st. I.F. 455 KHz
*95-2752	Transformer - AM 2nd. I.F. 455 KHz
*95-2753	Transformer - FM 1st. I.F. 10.7 MHz
*95-2754	Transformer - FM 2nd. I.F. 10.7 MHz
*95-2755	Transformer - FM 3rd. I.F. 10.7 MHz
*95-2756	Transformer - FM Ratio Detector 10.7 MHz
*95-2856	Multiplex Doubler Coil - 19 KHz
*95-2857	Multiplex Detector Coil - 38 KHz
*95-2858	Multiplex Input Coil - 19 KHz
100-249	Indicator Lamp
103-23	Germanium Diode (6 Req.)
103-47	Diode AFC
103-90	Germanium Diode - Matched Pair (FM)
103-96	Diode, Zener
*105-107	Integnet - 38 KHz Filter (2 Req.)
114-801	8-18 x 5/16 Hex Hd. Self-Tap. Screw-Stat. Bronze (3 Mt. Chassis, 12-5508, 1 Mts. 83-7803 & 2 Mt. 12-5810) (6 Req.)
114-802	8-18 x 5/16 x 1/4 Hex Washer Self-Tap. Screw (2 Used On 83-7417)
114-864	8-18 x 3/8 Hex Washer Hd. Self-Tap. Screw-Stat. Bronze (1 Mts. Ea. 17-143) (2 Req.)
114-1144	4-24 x 0.500 x 0.187 Hex Washer Hd. Washer Hd. Screw-Stat. Bronze (4 Req.)
121-430	Transistor - Audio Amp. (2 Req.)
121-433	Transistor - Pre-Amp. (2 Req.)
121-546	Transistor - AM-FM 2nd. I.F., FM 3rd. I.F. (2 Req.)
121-613	Transistor - FM Converter

*Denotes parts not previously used.

PART NO.	DESCRIPTION

CHASSIS 35WDR50 (CONT'D.)

121-614	Transistor - AM-FM 1st. I.F.
121-639	Transistor - Comp. Amp., 19 KHz Amp., 38 KHz Amp., Tuning Meter Control (4 Req.)
121-714	Transistor - AM Converter
*121-737	Transistor - Stereo Indicator Switch
*121-767	Transistor - Bias Control (2 Req.)
121-826	Transistor - FM RF (FET)
121-850	Transistor - AM RF
*121-877	Transistor - Pre-Driver (2 Req.)
*121-878	Transistor - Driver (2 Req.)
121-879	Transistor - Driver (2 Req.)
121-880	Transistor - Output (2 Req.)
149-311	Ferrite Core (Sleeve) (2 Req.)
*149-426	Ferrite Core, Antenna Rod (Part Of S-88463)
188-140	Retaining Ring
188-155	Clamping Ring (Part Of S-92496)
199-319	Insulating Sleeve (6 Req.)
*199-567	Sleeving (Part Of S-88463)
205-51	Dow Corning Heat Conductive Grease
885-12	AC Switch Only Spst. (Part Of 85-1207 or 85-1344)
885-13	AC Switch Only Spdt. (Part Of 85-1207 Or 85-1344)
S-82528	Antenna Cable & Terminal Assem. - FM
S-85563	Pulley & Bracket Assem. - Flat Bracket
S-85564	Pulley & Bracket Assem. - Angled Bracket
S-86475	Pulley Mounting Bracket
S-86608	Socket & Terminal Assem. - Pilot Light
S-87113	Speaker Cable, Terminal & Sleeve Assem. (3 Wire - Red, Black, White)
*S-88463	Wavemagnet Antenna Assem. - AM
S-88984	Dial Cord & Eyelet Assem. - Approx 27"
S-88988	Dial Cord & Eyelet Assem. - Approx 44"
*S-89890	Pulley & Pointer Guide Bracket Assem.
S-89969	Tape Jack & Antenna Bracket Assem.
S-92170	Jack & Bracket Assem.
*S-92496	Pulley & Ring Assem.

S-83179 FM TUNER ASSEMBLY

12-4192	Tuner Guide Bracket
12-4193	Coil Mtg. Bracket
19-322	Coil Mtg. Clip (4 Req.)
20-1256	Trap Coil
22-2374	6 PF Disc Capacitor - 500V.
22-2424	1.5 Gimmick Capacitor - 500V.
22-2642	15 PF Disc Capacitor - 500V. (Used On S-83409)
22-3393	.01 MF Disc Capacitor - 25V. (2 Used On Ea. FM Tuner Assem. & S-83410)
22-3479	2.2 PF Disc Capacitor - 500V. (Used On S-83410)
22-3675	10 PF Disc Capacitor - 10V. (Used On S-83412)
22-4515	1.8 PF Gimmick Capacitor - 500V. (Used On S-83409)
22-4613	Feed-Thru Capacitor - 500V. (5 Req.)
22-4718	Feed-Thru Capacitor - 500V.
22-5164	1.2 PF Gimmick Capacitor - 500V. (Used On S-83412)
22-5281	23 PF Disc Capacitor - 500V. (Used On S-83410)
22-5318	34 PF Disc Capacitor - 500V. (1 Used On Ea. S-83409, S-83411, S-83412)
24-1372	Tuner Cover
44-48	Antenna Jack
56-426	Roll Pin (6 Used On 76-1820)
57-5333	Bearing Plate
63-1778	680 Ohm Resistor - 1/2W. 10%
63-4122	33 Ohm Resistor - 1/4W. 10%
63-4157	220 Ohm Resistor - 1/4W. 10%
63-4171	470 Ohm Resistor - 1/4W. 10%
63-4175	560 Ohm Resistor - 1/4W. 10%
63-4185	1000 Ohm Resistor - 1/4W. 10%
63-4199	2200 Ohm Resistor - 1/4W. 10%
63-4210	3900 Ohm Resistor - 1/4W. 10%

*Denotes parts not previously used.

PART NO.	DESCRIPTION
63-4227	10K Ohm Resistor - 1/4W. 10%
63-4241	22K Ohm Resistor - 1/4W. 10%
63-4269	100K Ohm Resistor - 1/4W. 10%
63-4283	220K Ohm Resistor - 1/4W. 10%
63-4297	470K Ohm Resistor - 1/4W. 10%
64-88	.088 Dia. x 1/8 Lg. Tubular Rivet - N.P.
64-318	Brass Eyelet - USNC No. SE 37 (6 Req.)
76-1541	Guide Shaft (2 Req.)
76-1820	Drive Shaft (Used On 12-4192)
78-1227	Transistor Socket (2 Req.)
78-1378	Transistor Socket
79-174-12	No. 18 Sleeving - Yellow - 1-1/2"
80-1467	Shaft Retaining Spring
80-1853	Transformer Retaining Spring
83-3829	2 Lug Terminal Strip
86-441	Insulated Feed-Thru Terminal (2 Req.)
94-613	Iron Core Bushing (4 Req.)
94-1472	Tuning Shaft Bushing
95-2322	1st. I.F. Transformer (FM)
103-47	Diode
113-26	6-32 x 1/4 x 1/4 Hex Hd. Mach. Screw - N.P. - Ext. Lockwasher Att. (2 Used On Ea. 12-4193 & 57-5333) (4 Req.)
121-432	Transistor - FM - Oscillator
121-731	Transistor - FM - R.F.
121-732	Transistor - FM - Mixer
126-1141	Coil Shield - Side (2 Req.)
126-1142	Coil Shield - Center
149-368	Iron Core Spring (3 Req.)
149-385	Iron Core & Spring
188-232	Retaining Ring (4 Req.)
S-69085	Shield & Terminal Strip Assem.
S-83409	Detector Coil Assem.
S-83410	Oscillator Coil Assem.
S-83411	Antenna Coil Assem.
S-83412	R.F. Input Coil Assem.

MODEL D546W CHASSIS COMPONENTS

964-19610	200 MF Electrolytic - 15V.
964-19614	.001 MF Capacitor
964-19615	5 MF Electrolytic - 15V.
964-19638	.05 MF Capacitor - 100V.
964-19755	100 PF Capacitor - 500V.
964-19758	1 MF Electrolytic - 15V.
964-23096	1000 MF Capacitor - 25V.
964-23464	1 MF Capacitor - 100V.
964-25922	33 MF Electrolytic - 16V.
*964-28826	33 PF Capacitor
*964-28854	270 PF Capacitor
*964-28859	.0068 MF Capacitor - 100V.
*964-09306	390K Ohm Resistor - 1/2W. 10%
*964-09326	68K Ohm Resistor - 1/2W. 10%
*964-10303	150K Ohm Resistor - 1/2W. 10%
*964-10940	820 Ohm Resistor - 1/2W. 10%
*964-10943	470 Ohm Resistor - 1/2W. 10%
*964-12879	120K Ohm Resistor - 1/2W. 10%
*964-16587	330K Ohm Resistor - 1/2W. 10%
964-18014	4.7 Ohm Resistor - 1/2W. 10%
964-19582	1.8 Megohm Resistor - 1/2W. 10%
964-22099	4.7 Megohm Resistor - 1/2W. 10%
964-24412	Control, Treble - 3 Megohm
964-25868	43 Ohm Resistor - 1/2W. 5%
964-27674	4.7 Megohm Resistor - 1/2W. 5%
964-27675	820K Ohm Resistor - 1/2W. 5%
*964-28754	Control, Bass - 500K Ohm
*964-28850	Control, Volume - 50K Ohm
*964-28857	Control, Balance - 3 Megohm
964-22008	Transistor, Output
964-22009	Transistor
964-22158	Transistor, Output
964-21866	Rectifier
964-25046	Diode
964-25771	Transformer, Power
964-18243-3	Cord, Power
964-20746-03	Remote Cable Assem.
964-24020	Speaker

PART NO.	DESCRIPTION

MODEL D546W CHASSIS COMPONENTS (CONT'D.)

*964-25157	Cable, Audio
*964-28501	Double Heat Sink
*964-28855	Chassis Bracket
964-28858	Shield, Hum
964-28986	Fuse

MODEL D546W CABINET COMPONENTS

S-82621	Stylus Assem. (Part of 142-167)
S-82964	Adapter, Spindle
142-167	Cartridge, Dual Pickup
169-455	4 Speed Record Changer
*964-00857	Welting, Tee (Used on 964-20745-03)
964-09197	Nut, Hex
964-12916-A	Eyelet (Used on Bottom of Remote)
964-13364-09	Screw, truss - 6x3/8 (2 Req.)
964-13621	Terminal, Amp. (2 Req.)
964-14195	Bumper, Inside - Brown
964-14605-H	Screw, Truss - 6x1/2 (8 Req.)
964-14220	Housing, Plug
964-15821-F	Retainer, Cable (24 Req.)
964-16374-9	Botton Hole
964-16380	Screw, Machine
964-16579	Lockwasher
964-16580	Eyelet
964-16981	Grommet
964-17170	Terminal, Flat - .205 (4 Req.)
964-17310	Bumper - Brown
964-17445	Clamp, Cable
964-17602-F	Bushing
964-18315	Nut, Tee
*964-18586-09	Clip, Spindle
964-19998-9	Eyelet (Used on Back of Cabinet)
*964-20288	Nut, Washer
964-20623	Terminal - .090 Dia. (6 Req.)
964-20641	Catch (Used on 964-29011)
964-22410	Terminal, Splice
964-23137	'U' Channel
964-23138	Strike (Used on 964-20746-03)
964-23362	Terminal, Double Amp.
*964-24783	Hinge (Male)
*964-24784-H	Hinge (Female)
*964-24785-H	Hinge (Male)
*964-24786-H	Hinge (Female)
*964-25134-H	Hinge (Male)
*964-25136-H	Hinge (Male)
964-25181	Screw (Mtg. 964-28855)
*964-25778-9	Handle
*964-27728-9C	Knob Assem. (4 Req.)
*964-28732-F	Plate, Control
*964-28753	Layout, Transistor
*964-28755	Instruction Book
*964-29001	Case Assem.

MODELS D554W AND D554W1 CHASSIS COMPONENTS

822-449B	.01 MF Capacitor - 1400V.
822-472B	500PF Disc Capacitor - 20% (2 Req.)
822-554B	.005 MF Disc Capacitor - 20% (4 Req.)
*822-1065B	500 MF Electrolytic - 35V.
*822-1066B	5 MF Electrolytic - 25V. (2 Req.)
*822-1067B	.068 MF Mylar Capacitor - 100V. (2 Req.)
*822-1068B	150 PF Disc Capacitor - 20% (2 Req.)
*822-1069B	.0015 MF Disc Capacitor - 20% (2 Req.)
*822-1070B	.002 MF Disc Capacitor - 20% (2 Req.)
*822-1071B	.018 MF Capacitor (2 Req.)
*822-1072B	250 MF Electrolytic - 25V (2 Req.)
*822-1073B	68 PF Capacitor (2 Req.)

*Denotes parts not previously used

PART NO.	DESCRIPTION

*822-1074B	4.7 PF Capacitor (2 Req.)
*822-1075B	5 MF Electrolytic - 35V.
*822-1076B	250 MF Electrolytic - 16V.
863-156B	2.2 Ohm Resistor - 1/2W. 10%
863-194B	1200 Ohm Resistor - 1/2W. 10%
863- 197B	220K Ohm Resistor - 1/2W. 10%
863-215B	1 Megohm Resistor - 1/2W. 10%
863-560B	47K Ohm Resistor - 1/2W. 10%
*863-749B	Control, Single Balance - 3 Megohm
*863-750B	Control, Bass - Treble (2 Req.)
*863-751B	Control, Dual Volume - 3 Megohm
*811-48B	Line Cord
*849-77B	Speaker - 6" (2 Req.)
*852-63B	Cable, Remote (2 Req.)
*852-64B	Cable (2 Req.)
*852-65B	Phone Cable Assem.
*852-66B	Cable
*852-67B	Speaker Cable Assem. - Red
*852-68B	Speaker Cable Assem. - white
*852-69B	Speaker Cable Assem. - Black
*895-375B	Transformer
*903-106B	Diode - 1 Amp. (2 Req.)
*905-27B	Integrated Circuit
*926-44B	Heat Sink
*936-4B	Fuse - 1 Amp. (Used With D554-1 Only)

MODELS D554W AND D554W1 CABINET COMPONENTS

*800-370B	Remote Speaker Assem.
*808-1B	45 Spindle Adapter
*812-446B	Bracket
*814-207B	Cabinet - Remote White/Black (2 Req.)
*814-208B	Cabinet
*824-170B	Bottom
*824-171B	Cover, Dust
*827-25B	Insert, Dust Cover Disc
*827-26B	Insert, 45 Adapter
*841-23B	Holder, 45 Adapter
*843-65B	Amplock Sub Assem.
*843-66B	Housing
*846-358B	Knob (3 Req.)
*846-359B	Knob
*854-123B	Palnut - 6/32 (10 Req.)
*855-24B	Control Panel
*858-29B	Plug
*878-23B	Receptical (3 Req.)
*878-24B	Receptical (4 Req.)
*883-368B	Sheet, Plastic - 16 x 16 (4 Req.)
*883-369B	Wraps, Cable (4 Req.)
*883-370B	Sheet, Plastic - 22 x 10 (2 Req.)
*883-376B	Strip, Terminal
*886-89B	Terminal (10 Req.)
*886-90B	Faston, Malco - .205 (7 Req.)
*901-122B	Disc, Changer Instruction
*902-962B	Manual, Owners
*912-738B	Screw - 8 x 3/8 (2 Req.)
*912-739B	Screw, Hex - 6 x 1/2 (11 Req.)
*912-740B	Screw, Truss - 6 x 1/2 (2 Req.)
*912-741B	Screw, Pan HD. - 8 x 3/8 (4 Req.)
*926-45B	Shield, Amplifier
*927-20B	Contact (2 Req.)
*927-21B	Contact
*966-37B	Bumper, Plastic (12 Req.)
*969-1B	Record Change
*988-96B	Grip, Master (Hog Ring)
*999-39B	Sleeving - 3/4"
*999-40B	Bulk, Red
*999-41	Bulk, White
*999-42B	Bulk, Black
*999-43B	Terminal, Sleeving

PART NO.	DESCRIPTION

MODEL D556W, W1 CHASIS COMPONENTS

822-424B	.01 MF Disc Capacitor (2 Req.)
822-449B	.01 MF Capacitor - 1400V.
822-472B	500 PF Disc Capacitor - 20% (4 Req.)
822-554B	.005 MF Disc Capacitor - 20% (4 Req.)
*822-1065B	500 MF Electrolytic - 35V.
*822-1066B	5 MF Electrolytic - 25V. (2 Req.)
*822-1067B	.068 MF Mylar Capacitor - 100V. (2 Req.)
*822-1068B	150 PF Disc Capacitor - 20% (2 Req.)
*822-1069B	.0015 MF Disc Capacitor - 20% (2 Req.)
*822-1070B	.002 MF Disc Capacitor - 20% (2 Req.)
*822-1072B	250 MF Electrolytic - 25V. (3 Req.)
*822-1074B	4.7 PF Capacitor (2 Req.)
*822-1075B	5 MF Electrolytic - 35V.
822-1105B	33 PF Capacitor (2 Req.)
863-156B	2.2 Ohm Resistor - ½W. 10% (2 Req.)
863-197B	220K Ohm Resistor - ½W. 10% (6 Req.)
863-214B	470K Ohm Resistor (2 Req.)
863-215B	1 Megohm Resistor - ½W. 10% (2 Req.)
863-560B	47K Ohm Resistor - ½W. 10% (2 Req.)
863-583B	220 Ohm Resistor (2 Req.)
*863-678B	560 Ohm Resistor (2 Req.)
*863-749B	Control, Single Balance - 3 Megohm
*863-750B	Control, Bass - Treble (2 Req.)
*863-751B	Control, Dual Volume - 3 Megohm
*863-765B	100K Ohm Resistor (4 Req.)
*811-51B	Line Cord
*844-46B	Head Phono Jack Assem.
*844-49B	Jack (Part of 844-46B)
*844-50B	Jack Assem.
*849-80B	Speaker - 8" (2 Req.)
*849-81B	Speaker - 4" (2 Req.)
*852-61B	Cable Assem., Phono
*852-62B	Cable Assem., Tape In-Tape Out
*852-76B	Cable, Remote (2 Req.)
*852-77B	Cable (2 Req.)
*852-78B	Cable, Jumper - White (2 Req.)
*852-79B	Cable, Jumper - Black (2 Req.)
*852-80B	Cable & Plug
*852-81B	Cable, Bulk
*885-141B	Switch, Function
*895-387B	Transformer
*903-106B	Diode - 1 Amp. (2 Req.)
*905-28B	Integrated Circuit
*926-47B	Heat Sink
*936-10B	Fuse - 2 Amp. (Used Only on D556W1)

MODEL D556W, W1 CABINET COMPONENTS

*488-96B	Grip Master - Hog Ring
*800-369B	Remote Speaker Assem.
*802-19B	Cabinet, Rack
*808-2B	45 Spindle Adapter
*812-453B	Bracket
*814-206B	Case Assem.
*814-212B	Cabinet, Master
*817-29B	Clamp, Cable
*823-14B	Splice, Butt
*824-181B	Cover, Switch Shield
*824-182B	Cover, Dust
*824-183B	Cover, Bottom
*827-26B	Insert, 45 Adapter
*827-27B	Disc, Changer - White
*827-28B	Logo, Dust Cover
*841-23B	Holder, 45 Adapter
*843-65B	Amplock Sub Assem. (Used Only on D556W)
*843-66B	Housing (Part of 843-65B)
846-66B	Knob (5 Req.)
*854-123B	Palnut - 6/32 (17 Req.)
*854-126B	Nut, Nick - 3/8
*854-127B	Nut, Hex - 3/8
*854-128B	Nut - 3/8
*855-26B	Control Panel
*866-39B	Bumper (4 Req.)
*878-24B	Receptical (12 Req.)
*879-13B	Tubing (2 Req.)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
*883-369B	Wraps, Cable (4 Req.)
*886-89B	Terminal (16 Req.)
*886-90B	Faston, Malco - .205 (14 Req.)
893-328B	Washer, Nick - 3/8
*902-1110B	Manual, Owners
*912-738B	Screw - 8 x 3/8 (2 Req.)
*912-739B	Screw, Hex - 6 x ½ (11 Req.)
*912-740B	Screw, Truss - 6 x ½ (2 Req.)
926-49B	Shield, Amplifier
*927-20B	Contact (3 Used on 843-65B)
*927-21B	Contact
*966-37B	Bumper, Plastic (8 Req.)
*969-2B	Record Changer
*999-39B	Sleeving - 3/4"
*999-41B	Bulk - White
*999-43B	Terminal, Sleeving
*999-45B	Sleeving

MODEL D583W

100-249	Dial Lamp
*800-371B	Remote Speaker Assem.
*808-1B	Adapter, 45 RPM
*811-50B	Line Cord Assem.
*812-447B	Bracket
*812-452B	Dial Lamp Bracket
*814-209B	Case Assem.
*817-3B	AC Cord Clamp
*817-29B	Cable Clamp (2 Req.)
*820-258B	Coil, FM Choke
*820-259B	Coil - 19 KHz
*820-260B	Coil - 19 KHz
*820-261B	Coil - 38 KHz
*820-279B	Coil, FM Antenna
*820-280B	Coil, FM Oscillator
*820-281B	Antenna Coil Assem.
*822-12B	.02 MF Ceramic Capacitor - 50V. +80 -20%
822-166B	.01 MF Ceramic Capacitor - 500V. +80 -20%
*822-281B	4.7 MF Electrolytic - 25V. (2 Req.)
822-286B	470 MF Electrolytic - 16V. (3Req.)
*822-528B	22 MF Electrolytic - 16V. (2 Req.)
822-543B	220 MF Electrolytic - 16V.
*822-783B	470 Capacitor ± 10% - 50V. (2 Req.)
822-785B	.01 MF Polyester Capacitor - 50V. 5%
822-786B	4700 PF Polyester Capacitor - 50V. 5%
*822-959B	Gang Capacitor
*822-960B	Trimmer Capacitor
*822-961B	2.2 MF Electrolytic - 35V. (3 Req.)
*822-964B	.039 MF Mylar Capacitor - 50V. 10% (2 Req.)
*822-965B	5600 PF Ceramic Capacitor - 50V. 10% (2 Req.)
*822-966B	390 PF Mica Capacitor - 50V. 5%
*822-967B	1.5 PF Gimmick Capacitor - 500V. 5%
*822-969B	.1 Ceramic Capacitor - 50V. +80% -20%
*822-970B	680 PF Ceramic Capacitor - 500V. ±10%
*822-971B	560 PF Ceramic Capacitor - 500V. ±10% (2 Req.)
*822-972B	390 PF Ceramic Capacitor - 500V. ±10% (2 Req.)
*822-973B	220 PF Ceramic Capacitor - 500V. ±10%
*822-976B	20 PF Ceramic Capacitor - 50V. ±5%
*822-977B	5.6 Ceramic Capacitor - 50V. ±0.25 PF (3 Req.)
*822-978B	5.6 PF Ceramic Capacitor - 50V. ±0.25 PF - N750
*822-979B	4.7 MF Electrolytic Capacitor - 25V.
*822-981B	.047 MF Mylar Capacitor - 50V. 10% (2 Req.)
*822-982B	.022 MF Mylar Capacitor - 50V. 10% (3 Req.)
*822-983B	6800 PF Mylar Capacitor - 50V. 10% (2 Req.)
*822-984B	.05 MF Ceramic Capacitor - 50V. +80% -20% (4 Req.)
*822-985B	.02 MF Ceramic Capacitor - 50V. +80% -20% (7 Req.)
*822-992	330 PF Ceramic Capacitor - 50V. 10%
*822-987B	.01 Ceramic Capacitor - 50V. +80% -20%
*822-988B	.01 Ceramic Capacitor - 50V. +80% -20%
*822-989B	.005 Ceramic Capacitor - 50V. ±20%
*822-1000B	2400 PF Poly. Capacitor - 50V. 5%
*822-1086B	3300 MF Electrolytic - 25V.
*822-1087B	10 MF Electrolytic - 25V.
*822-1088B	.001 MF Poly. Capacitor - 50V. 5%
*822-1089B	5000 PF Ceramic Capacitor - 50V. +80% -20%
*822-1090B	500 PF Ceramic Capacitor - 500V. 10%
*822-1091B	470 PF Ceramic Capacitor - 500V. 10%

PART NO.	DESCRIPTION

MODEL D583W (CONT'D.)

*822-1092B	47 PF Ceramic Capacitor - 50V. 10%
*822-1093B	14 PF Ceramic Capacitor - 500V. 5%
*822-1094B	12 PF Ceramic Capacitor - 500V. 5%
*822-1095B	12 PF Ceramic Capacitor - 500V. 5%
*822-1096B	10 PF Ceramic Capacitor - 500V. 5%
*822-1097B	8.2 PF Ceramic Capacitor - 500V. ±.25 PF
*822-1098B	8.2 PF Ceramic Capacitor - 500V. ±.25 PF
*822-1099B	6.8 PF Ceramic Capacitor - 50V. ±.25 PF
*822-1100B	5.6 PF Ceramic Capacitor - 500V. ±.25 PF
*822-1101B	4.7 PF Ceramic Capacitor - 500V. ±.25 PF
*823-13B	Wire Connector
*824-171B	Cover, Dust
*824-174B	Bottom, Printed
*832-54B	Dial String
*827-25B	Insert, Dust Cover
*827-26B	Insert, 45 Adapter
*841-23B	Holder, 45 Adapter
*843-69B	Housing Connector
*844-48B	Phono Jack
*846-358B	Knob (3 Req.)
*846-359B	Knob
*846-360B	Knob, Selector
*846-361B	Knob, Tuning
*849-78B	Speaker - 6"
*852-63B	Cable - 20'
*852-70B	Cable, VHF Feeder - 300 Ohm
*852-71B	Cable, 2 Conductor Shielded
*852-72B	Cable, 2 Conductor Shielded
*852-73B	Cable 2 Conductor Shielded
854-43B	3/8-32 Lock Nut (5 Req.)
854-45B	4-40 Nut (5 Req.)
*854-106B	3/8-32 Nut
*854-123B	6/32 Nut (12 Req.)
*855-25B	Panel, Control
*857-636B	Front Plate Assem.
*857-637B	Shield Plate Antenna
*857-638B	Shield Plate Oscillator
*857-639B	Dial Background
*858-30B	Plug Assem.
*859-106B	Pointer
*861-152B	Dial Pulley
*863-45B	68K Ohm Resistor - ½W. 10%
863-97B	100K Ohm Resistor - ¼W. 10%
863-111B	100 Ohm Resistor - ¼W. 10%
*863-112B	120 Ohm Resistor - ¼W. 10%
*863-117B	390 Ohm Resistor - ¼W. 10%
*863-118B	470 Ohm Resistor - ¼W. 10% (9 Req.)
863-119B	560 Ohm Resistor - ¼W. 10%
*863-120B	680 Ohm Resistor - ¼W. 10% (3 Req.)
*863-122B	1000 Ohm Resistor - ¼W. 10% (3 Req.)
*863-126B	2200 Ohm Resistor - ¼W. 10% (6 Req.)
*863-127B	2700 Ohm Resistor - ¼W. 10%
*863-128B	3300 Ohm Resistor - ¼W. 10% (2 Req.)
*863-129B	3900 Ohm Resistor - ¼W. 10%
*863-130B	4700 Ohm Resistor - ¼W. 10% (3 Req.)
*863-134B	10K Ohm Resistor - ¼W. 10% (3 Req.)
863-135B	12K Ohm Resistor - ¼W. 10%
*863-136B	15K Ohm Resistor - ¼W. 10% (2 Req.)
863-139B	47K Ohm Resistor - ¼W. 10% (2 Req.)
863-166B	220 Ohm Resistor - ¼W. 10%
*863-190B	220 Ohm Resistor - ½W. 10% (5 Req.)
863-209B	6.8K Ohm Resistor - ½W. 10% (2 Req.)
*863-290B	68 Ohm Resistor - ¼W. 10% (2 Req.)
*863-397B	220K Ohm Resistor - ¼W. 10% (5 Req.)
*863-398B	47K Ohm Resistor - ¼W. 10% (2 Req.)
863-399B	33K Ohm Resistor - ¼W. 10% (2 Req.)
863-438B	150K Ohm Resistor - ¼W. 10% (3 Req.)
*863-648B	3.3M Ohm Resistor - ¼W. 5% (2 Req.)
*863-652B	10K Ohm Resistor - ¼W. 5% (3 Req.)
*863-653B	8200 Ohm Resistor - ¼W. 5% (2 Req.)
*863-654B	6800 Ohm Resistor - ¼W. 5%
*863-655B	5600 Ohm Resistor - ¼W. 5% (2 Req.)
*863-656B	4700 Ohm Resistor - ¼W. 5% (4 Req.)
*863-657B	2200 Ohm Resistor - ¼W. 5%
*863-658B	3900 Ohm Resistor - ¼W. 5% (2 Req.)

*Denotes parts not previously used.

PART NO.	DESCRIPTION
*863-662B	1.5 Megohm Resistor - ¼W. 10%
*863-666B	1 Ohm Resistor - 1W. 10% (4 Req.)
*863-738B	560 Ohm Resistor - ¼W. 5%
*863-741B	820 Ohm Resistor - ¼W. 5%
*863-755B	Control, Balance
*863-756B	Tone Control
*863-757B	Control, Tone
*863-758B	Control, Volume
*863-759B	330K Ohm Resistor - ¼W. 5%
*863-760B	150K Ohm Resistor - ¼W. 5%
*863-761B	18 Ohm Resistor - ¼W. 5% (2 Req.)
*864-104B	Eyelet - 3mm (2 Req.)
*876-132B	Tuning Shaft
*880-253B	Tension Spring
*883-89B	Line Cord Strip
*883-328B	Terminal Strip
*883-369B	Cable Wrap (4 Req.)
*883-371B	Terminal
*883-374B	Terminal Board Assem.
*883-375B	Jack Board Assem.
*885-139B	Function Switch
*885-140B	Slide Switch
*886-94B	Terminal Pin
*887-4B	Antenna Insulation
*893-324B	Washer
*893-325B	Washer
*894-10B	Bushing, Shaft
*895-349B	FM Antenna Coil
*895-350B	AM Oscillator Coil
*895-351B	FM 1st. I. F. Transformer
*895-352B	FM 2nd. I. F. Transformer
*895-353B	FM 3rd. I. F. Transformer
*895-354B	FM Detector I. F. Transformer
*895-355B	AM 1st. I. F. Transformer
*895-357B	AM 3rd. I. F. Transformer
*895-385B	Power Transformer
*900-48B	Indicator Lamp
*902-967B	Manual, Owners
*903-95B	Diode, Bias (2 Req.)
*903-97B	Diode
*903-107B	Diode, AFC
*903-108B	Diode (5 Req.)
*905-24B	Integrated Circuit, Multiplex
*912-225B	4-40 Screw (2 Req.)
*912-683B	4-40 Screw (2 Req.)
*912-684B	8.0L Set Screw (4 Req.)
*912-739B	Screw - 6 x ½ (10 Req.)
*912-740B	Screw - 6 x ½ (2 Req.)
*912-741B	Screw - 8 x 5/16 (6 Req.)
*912-742B	Screw (2 Req.)
*912-743B	Screw, Tapping (2 Req.)
*912-744B	Screw – 4-40
*921-195B	Transistor (1) FM Oscillator (1) AM RF Converter (2 Req.)
*921-196B	Transistor (2) Pre. Amp. (2) Pre-driver (4 Req.)
*921-197B	Transistor, Driver (2 Req.)
*921-198BX	Transistor, Output - Matched Pair PNP - NPN (2 Req.)
*921-218B	Transistor, FM/RF
*921-219B	Transistor, FM Converter
*921-220B	Transistor, I. F. (2 Req.)
*921-221B	Transistor, I. F. Limiter
*925-10B	Rubber Grommet
926-45B	Amplifier Shield
*926-46B	Heat Sink
*927-22B	Contact
*936-8B	Fuse - .3 Amp.
*949-28B	Ferrite Core
*957-10B	Fastner - On-sert (2 Req.)
*966-37B	Plastic Bumper (8 Req.)
*969-1B	Record Changer
*971-9B	Jewel Window, Red
*977-14B	Dual Rectifier
*988-34B	'E' Ring
*988-35B	Compression Ring
*988-96B	Grip Master
*992-41B	Lens, Dial
*999-448	Sleeving, Lamp - 3/16"

PART NO.	DESCRIPTION

MODEL D742W CHASIS COMPONENTS

964-19638	.05 MF Capacitor - 100V.
964-19755	100 PF Capacitor - 500V.
964-19758	1 MF Capacitor - 15V.
*964-20061	10 MF Capacitor - 15V.
*964-24481	2200 PF Capacitor - 20% 500V.
964-25784	1000 MF Capacitor - 35V.
964-25903	250 MF Capacitor - 25V.
964-25922	33 MF Capacitor - 16V.
964-27741	.0082 Capacitor
*964-28942	10 PF Capacitor - 10% 500V.
*964-28943	5600 MF Capacitor - 20% 500V.
*964-28944	.015 MF Capacitor - 20% 500V.
*964-09144	39K Ohm Resistor - ½W. 10%
*964-09326	68K Ohm Resistor - 2W. 10%
964-09513	220K Ohm Resistor - ½W. 10%
*964-09515	2.2 Megohm Resistor - ½W. 10%
964-10303	150K Ohm Resistor - ½W. 10%
964-10940	820K Ohm Resistor - ½W. 10%
964-10943	470 Ohm Resistor - ½W. 10%
*964-11141	100 Ohm Resistor - ½W. 10%
964-12879	120K Ohm Resistor - ½W. 10%
964-15621	1K Ohm Resistor - ½W. 10%
964-18014	4.7 Ohm Resistor - ½W. 10%
964-22099	4.7 Megohm Resistor - ½W. 10%
964-25902	2.2 Ohm Resistor - ½W. 10%
964-26371	15 Ohm Resistor - ½W.
964-27674	4.7 Megohm Resistor - ½W. 5%
*964-28969	470K Ohm Resistor - ½W. 5%
*964-28970	2.7 Ohm Resistor - 5W. 10%
*964-28884	Control, Balance
*964-28885	Control, Volume - 250K Ohm
*964-28928	Control, Tone Base - 2 Megohm
*964-28930	Control, Tone - Treble - 3 Megohm
964-21866	Rectifier
964-22008	Transistor - PNP
964-22009	Transistor - Driver
964-22158	Transistor - NPN
964-25046	Diode
964-25157	Cable, Audio
964-27172	Transformer, Power
964-27986	Transistor - NPN
*964-28872	Speaker
*964-28974	Power Cable Assem. (Primary)
964-28986	Fuse - Secondary
*964-29004	Fuse - .2 Amp
*964-29125	Power Cable Assem.

MODEL D742W CABINET COMPONENTS

142-167	Cartridge, Dual Pickup
169-455	4 Speed Record Changer
964-09197	Nut, Hex – 6-32
964-10545	Nut – 3/8-32
*964-12128-09	Screw, Truss - 6 x 7/8
964-13364-09	Screw, Truss - 6 x 3/8
964-14195-09	Bumper (2 Req.)
964-14902-09	Button (Used on 964-29094)
964-15821	Retainer, Cable (4 Req,)
964-16380	Screw (2 Req.)
964-16579	Washer, Lock (2 Req.)
964-16580	Eyelet (2 Req.)
*964-17310-03	Bumper (Used on 964-29089)
964-17445	Clamp, Cable
*964-17602	Bushing (2 Req.)
964-18315	Nut, Tee (2 Req.)
964-18586-09	Clip (Used on S-82965)
964-19998-09	Eyelet (Used on 964-29089)
964-20288	Nut, Washer
964-20641	Catch – Chrome (2 Req.)
964-23138	Strike - Chrome (2 Req.)
*964-23140-09	Strike - Plastic (2 Req.)
*964-23141-09	Catch - Plastic Block (2 Req.)
964-24783-H	Hinge - Male, Long Pin
964-24784-H	Hinge - Female (2 Req.)
964-24785-H	Hinge - Male, Long Pin

*Denotes parts not previously used.

PART NO.	DESCRIPTION
964-24786-H	Hinge - Female (2 Req.)
964-25134-H	Hinge - Male, Short Pin
964-25136-H	Hinge - Male, Short Pin
964-25181	Screw – 6-32 x 1" (18 Req.)
964-25397	Handle
964-25398-09	Screw (2 Used on 964-25397)
964-25806	Screw - 6-32 x 1¼" (2 Req.)
*964-26551	Screw, Flat Hd. - 4 x ¾
*964-28874	Cover, Remote Back
*964-28877	Knob
*964-28881	Instruction Book
*964-28882	Carton
*964-28883	Plate, Control
*964-28886	Chassis
*964-28888	Shield, Hum
*964-28889-03	Remote Cable Assem. - 10
*964-28890-03	Remote Cable Assem. - 25
*964-28929	Layout, Transistor
*964-28956	Motor Board
*964-28958-H	Hinge - Female (2 Req.)
*964-28959-H	Hinge - Female (2 Req.)
*964-28960-H	Hinge - Male, Long Pin
*964-28961-H	Hinge - Male, Long Pin
*964-28962-H	Hinge - Male, Short Pin
*964-28963-H	Hinge - Male, Short Pin
*964-28972	Escutcheon
*964-28976	Sticker, Cable (FR)
*964-28977	Sticker, Cable (FL)
*964-28978	Sticker, Cable (RR)
*964-28979	Sticker, Cable (RL)
*964-29003	Fuse Holder Assem. - Primary
*964-29090	Remote- Inside Right
*964-29091	Remote - Outside Right
*964-29092	Remote - Inside Left
*964-29093	Remote - Outside Left
*964-29094	Changer Drawer Comp.
*964-29096	Welting, Tee (4 Used On Face Of Remote)
*964-29097	Welting, Tee (2 Used On Main Case)
*964-29098	Welting, Tee (Used On 964-29094)
S-82621	Stylus Assem. (Part Of 142-167)
S-82965	45 RPM Spindle Adapter

MODEL D9011W

*2-3655	Cabinet Back (2 Req.)
*14-10605	Main Speaker Cabinet (2 Req.)
*16-4394	Carton
22-4588	2 MF Electrolytic - 30V. (2 Req.)
*30-463	Emblem
46-4649	AC Cord Retainer (4 Req.)
49-1237	Round Speaker - 3" (2 Req.)
*49-1239	Round Speaker - 6.5" (2 Req.)
54-423	6-32 x 5/16 Hex Palnut Washer (16 Req.)
*54-910	Spring Flat Nut (2 Req.)
83-8140	12" x 11" x 1" Sound Pad (2 Req.)
86-329	Connector Terminal (8 Req.)
112-1636	6-18 x 3/4 Phillips Screw (12 Req.)
114-1011	8-18 x 1" x 1/4 Self-Tap Screw (4 Req.)
*S-92889	Speaker Lead & Plug Assem. (2 Req.)

MODEL D9013W

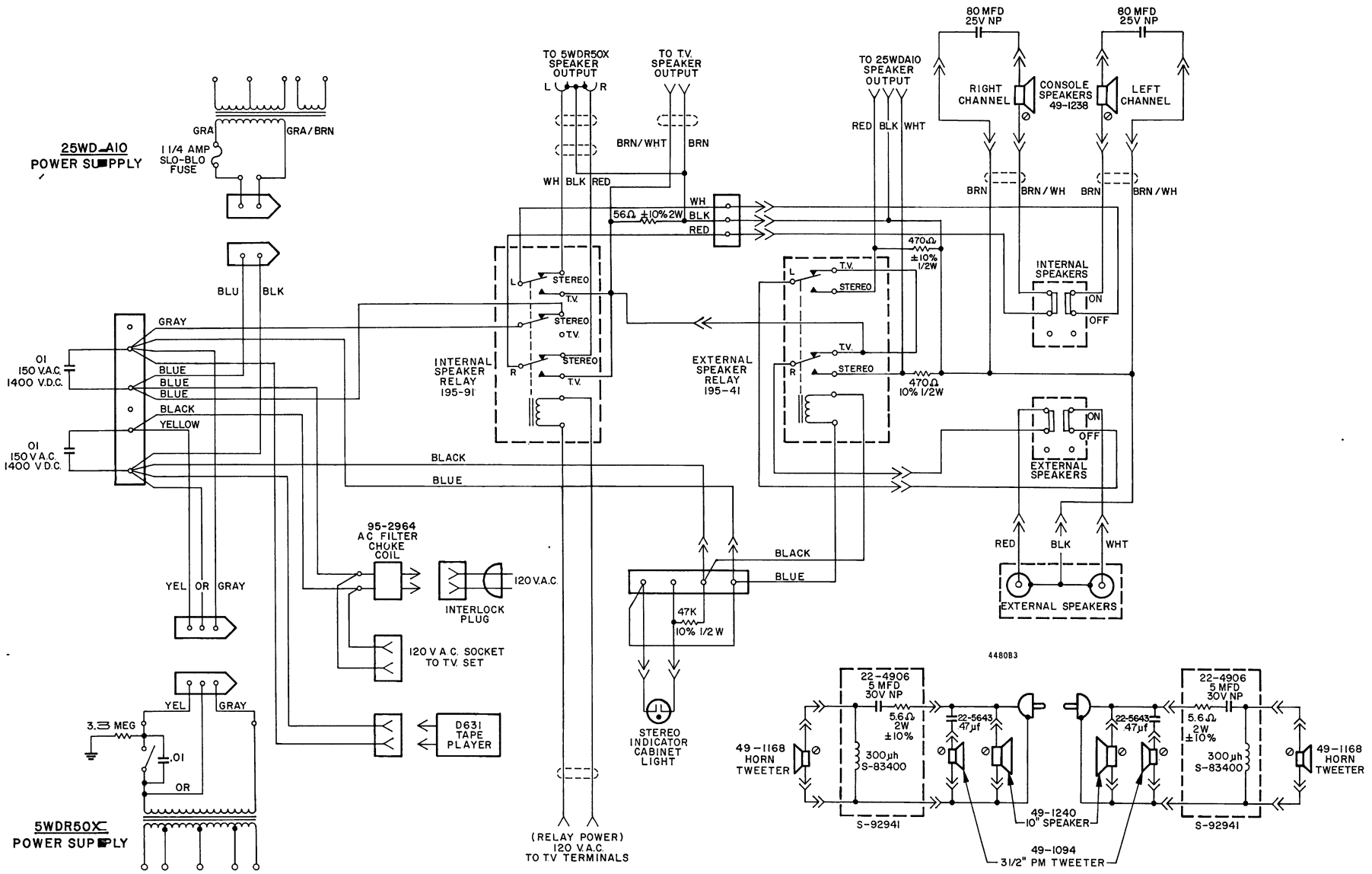
*2-3681	Cabinet (2 Req.)
*14-10606	Main Speaker Cabinet (2 Req.)
*16-4398	Carton
20-3491	Cross-Over Coil (2 Req.)
22-4906	5 MF Electrolytic - 30 V. (2 Req.)
49-1168	Horn Speaker (2 Req.)
*49-1241	Round Speaker - 10" (2 Req.)
54-424	8-32 x 11/32 Palnut Washer (16 Req.)
63-5958	2.2 Ohm Resistor - 1W. 10% (2 Req.)
83-4601	Terminal Strip (2 Req.)
*83-8466	Sound Pad (6 Req.)
86-329	Connector Terminal (8 Req.)
86-452	Connector Terminal (4 Req.)
157-22	Coil Fastener (4 Req.)
*S-92899	Speaker Lead & Plug Assem. (2 Req.)

NOTES

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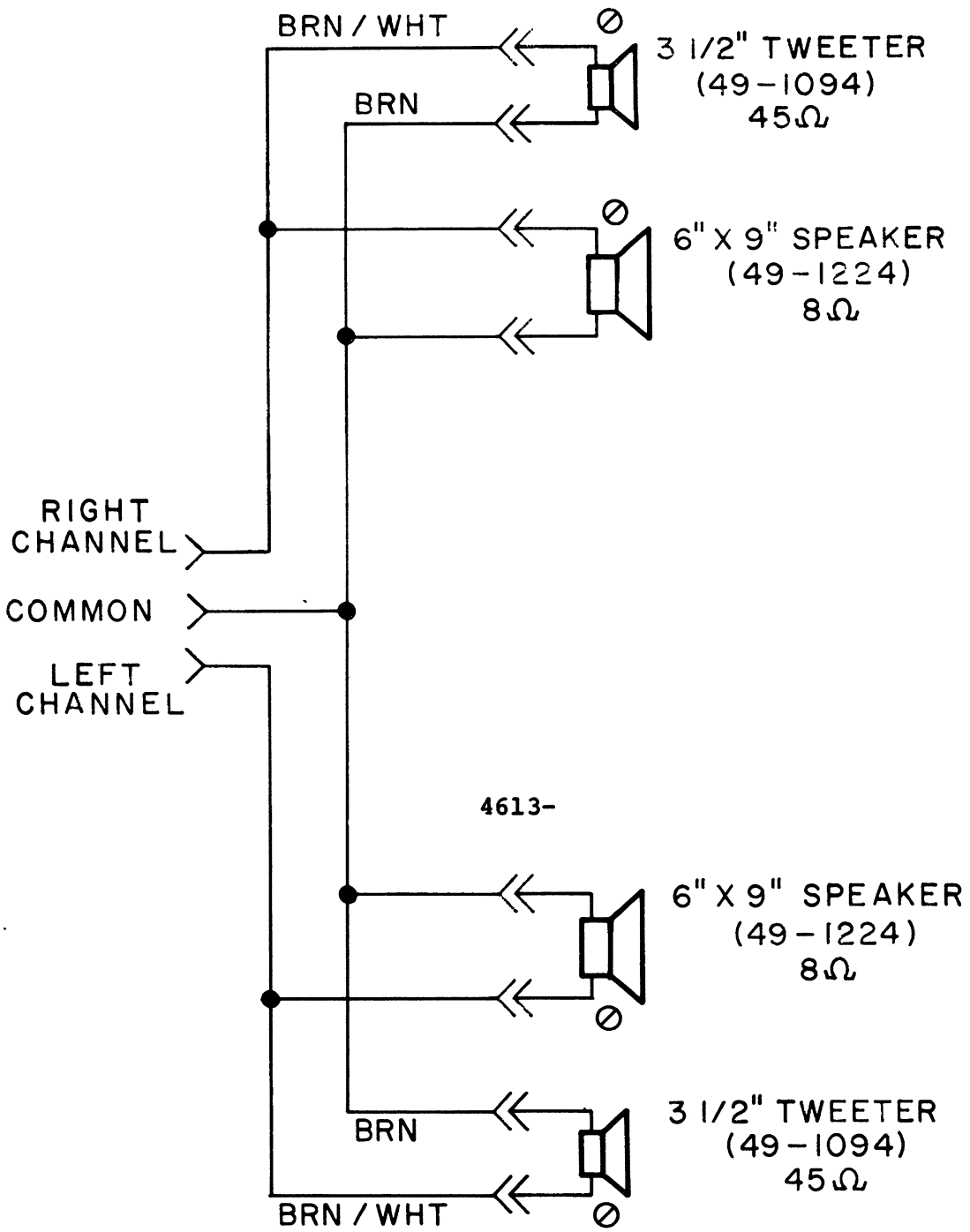
NOTES

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SPEAKER WIRING -- SCHEMATIC

D901W, D902WI, D903M, D904DE

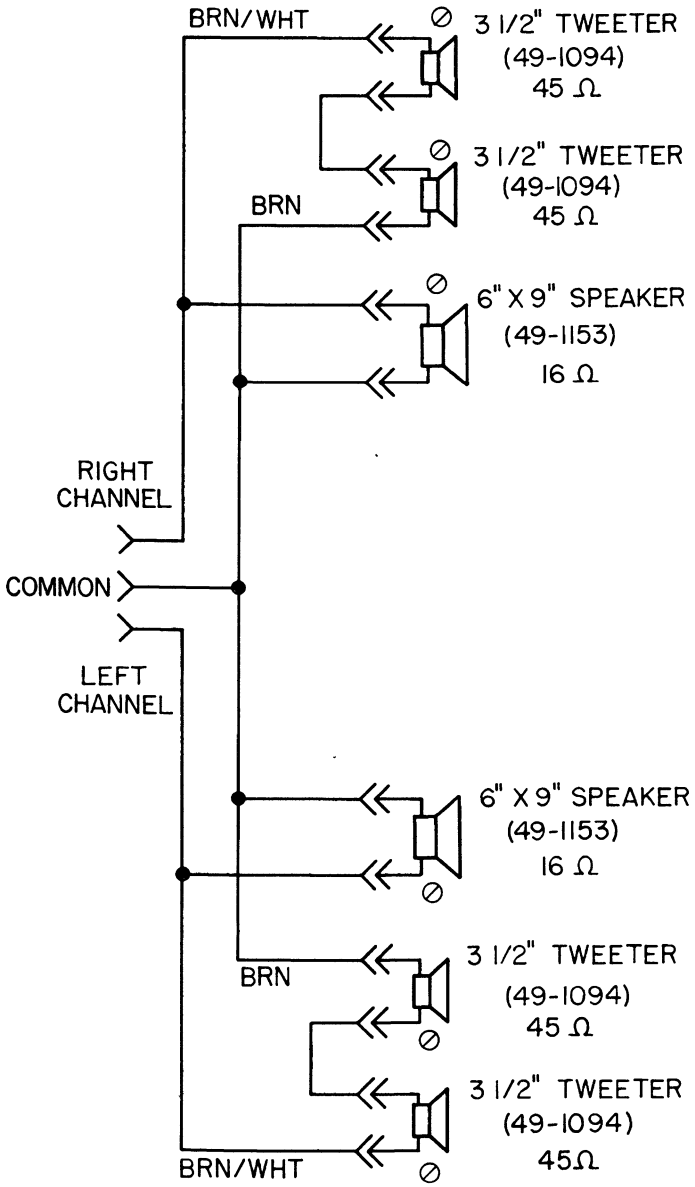


NOTE:

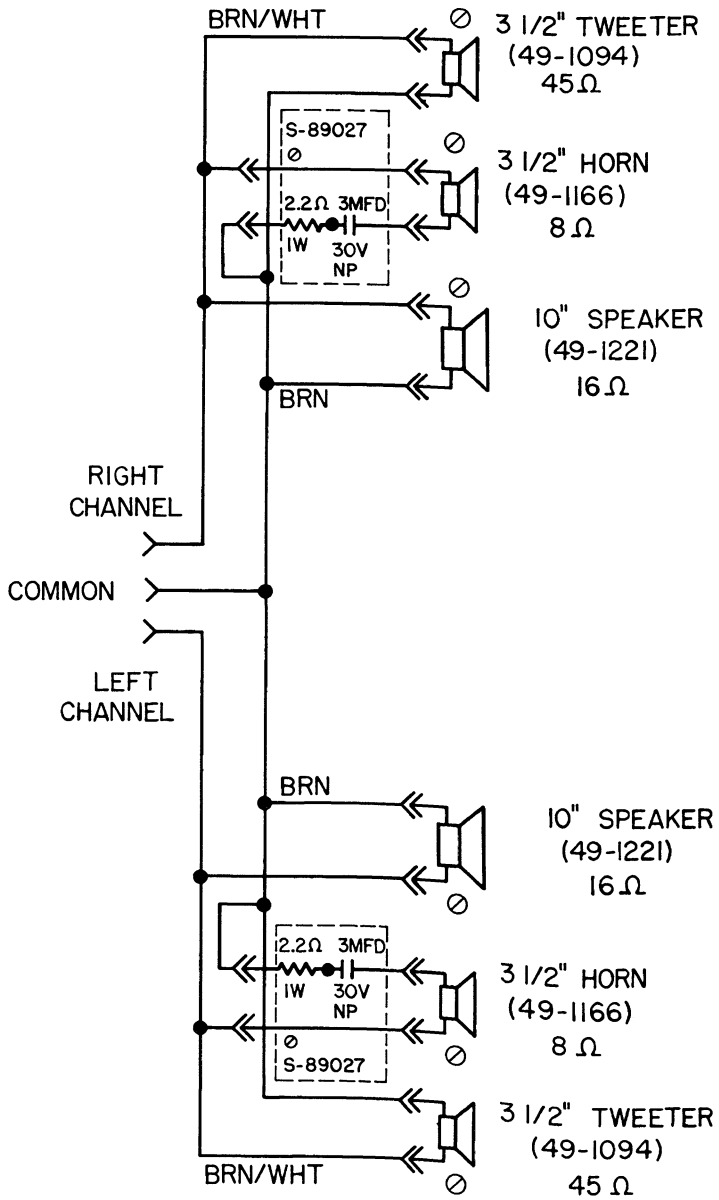
⊘ INDICATES WHITE OR YELLOW VOICE COIL POLARITY IDENTIFICATION DOT ON SPEAKER.

SPEAKER WIRING – SCHEMATIC

D907M, D908DE, D908P, D910W, D911W



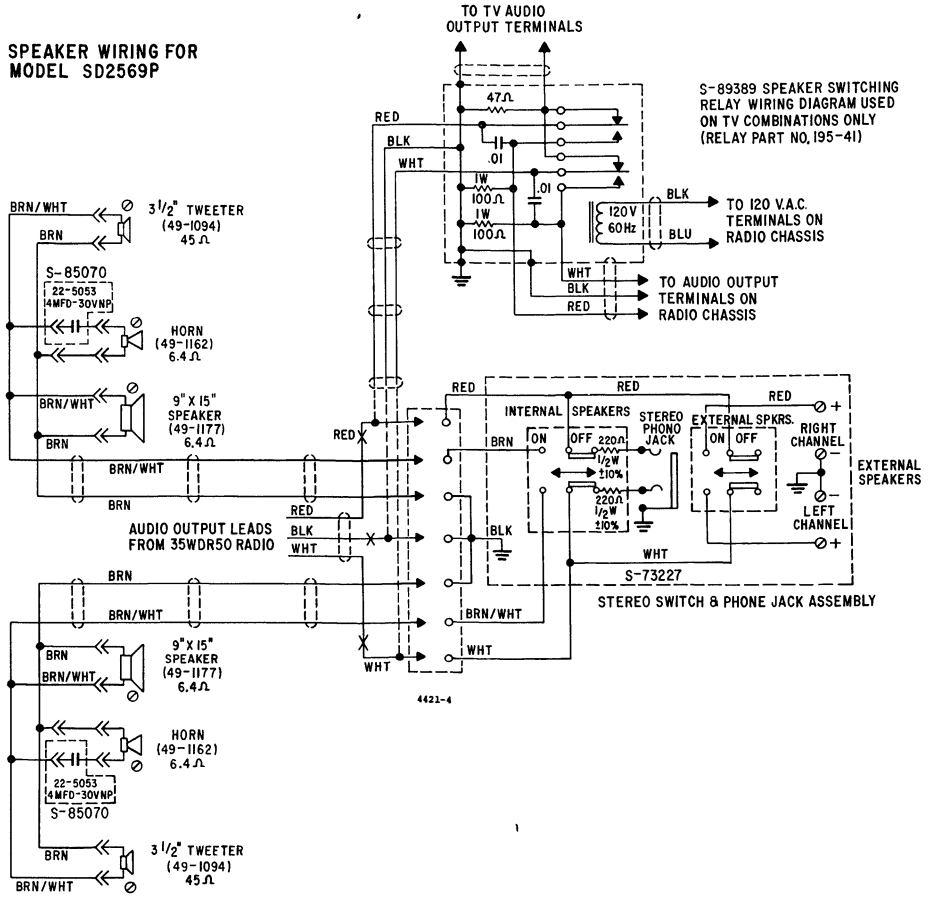
D920W, D921DE, P, D922M, D923W, D927DE



NOTE:
⊘ INDICATES WHITE OR YELLOW VOICE COIL POLARITY IDENTIFICATION DOT ON SPEAKER

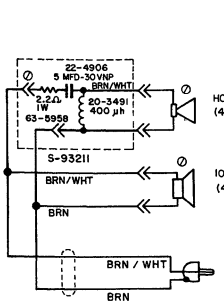
SPEAKER WIRING – SCHEMATIC

SPEAKER WIRING FOR MODEL SD2569P

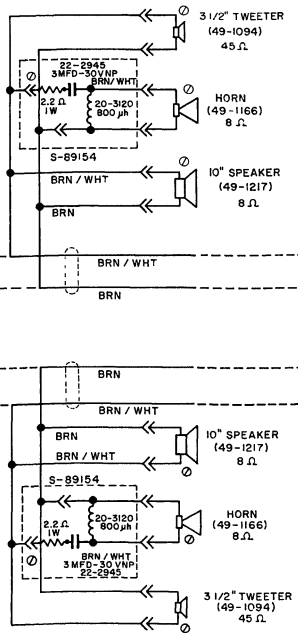


⊘INDICATES WHITE OR YELLOW VOICE COIL POLARITY IDENTIFICATION DOT ON SPEAKER

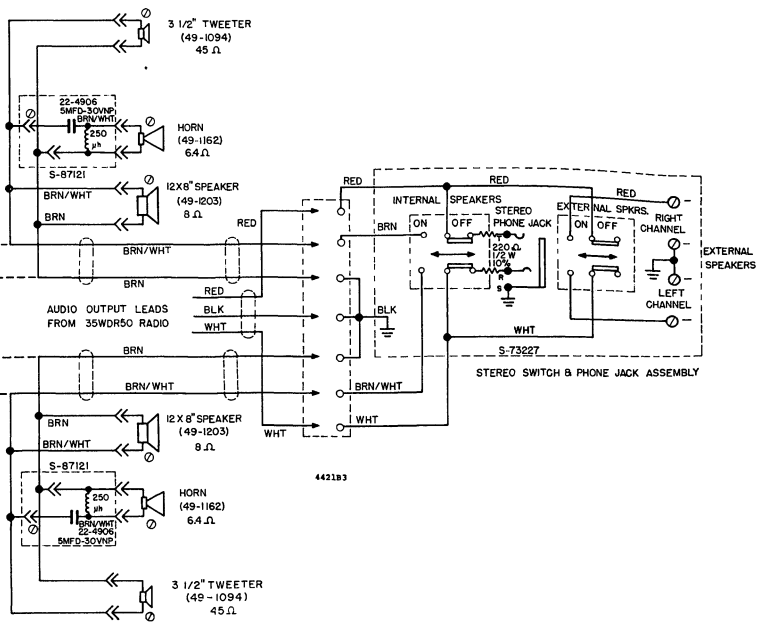
SPEAKER WIRING FOR MODEL D952X



SPEAKER WIRING FOR MODELS: D931W, D935M & D939P

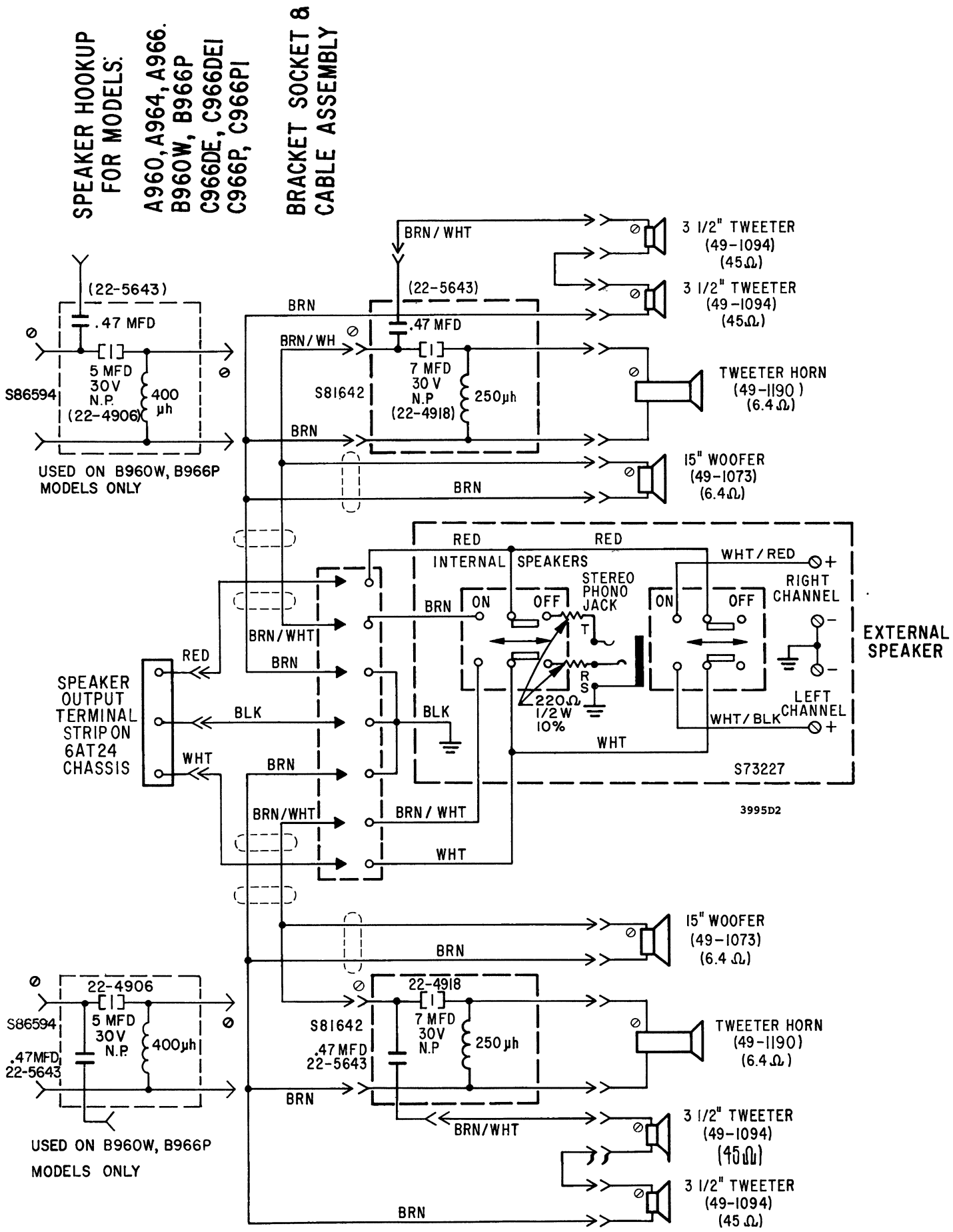


SPEAKER WIRING FOR MODELS: D941W, D945DE & D948W

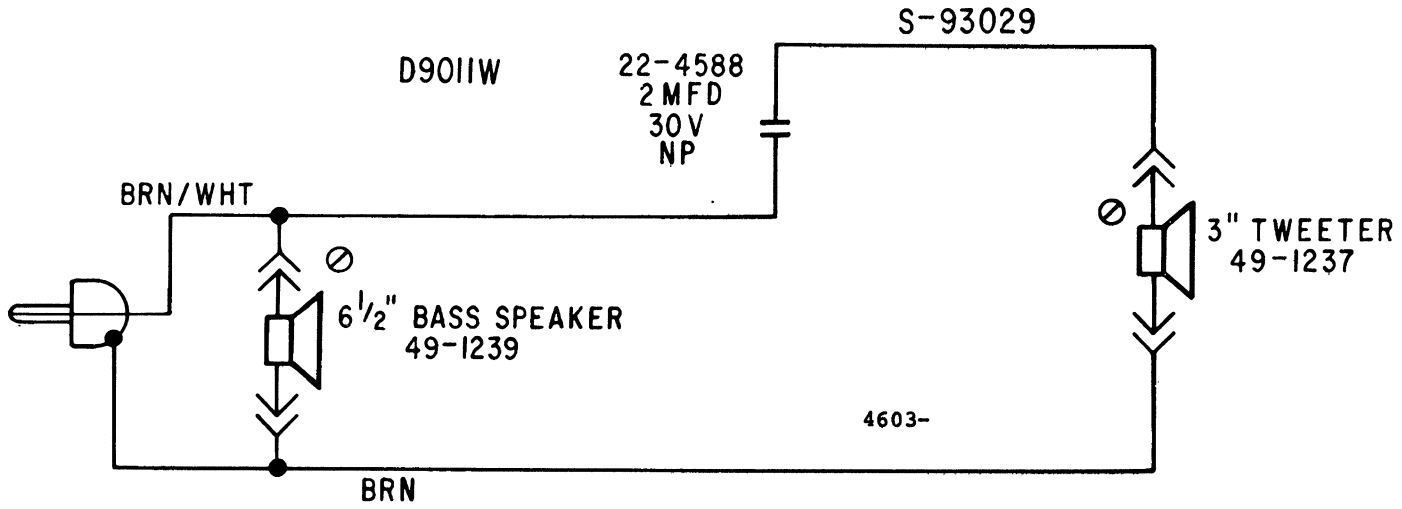


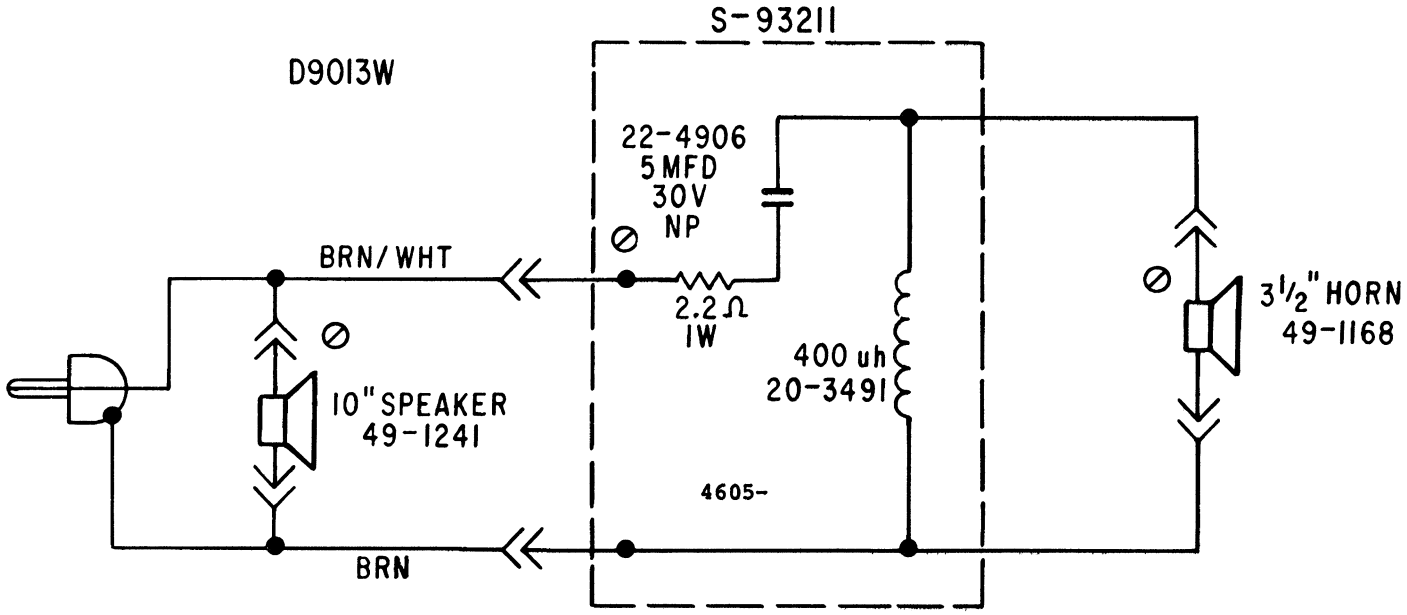
⊘ INDICATES WHITE OR YELLOW VOICE COIL POLARITY IDENTIFICATION DOT ON SPEAKER

SPEAKER WIRING – SCHEMATIC



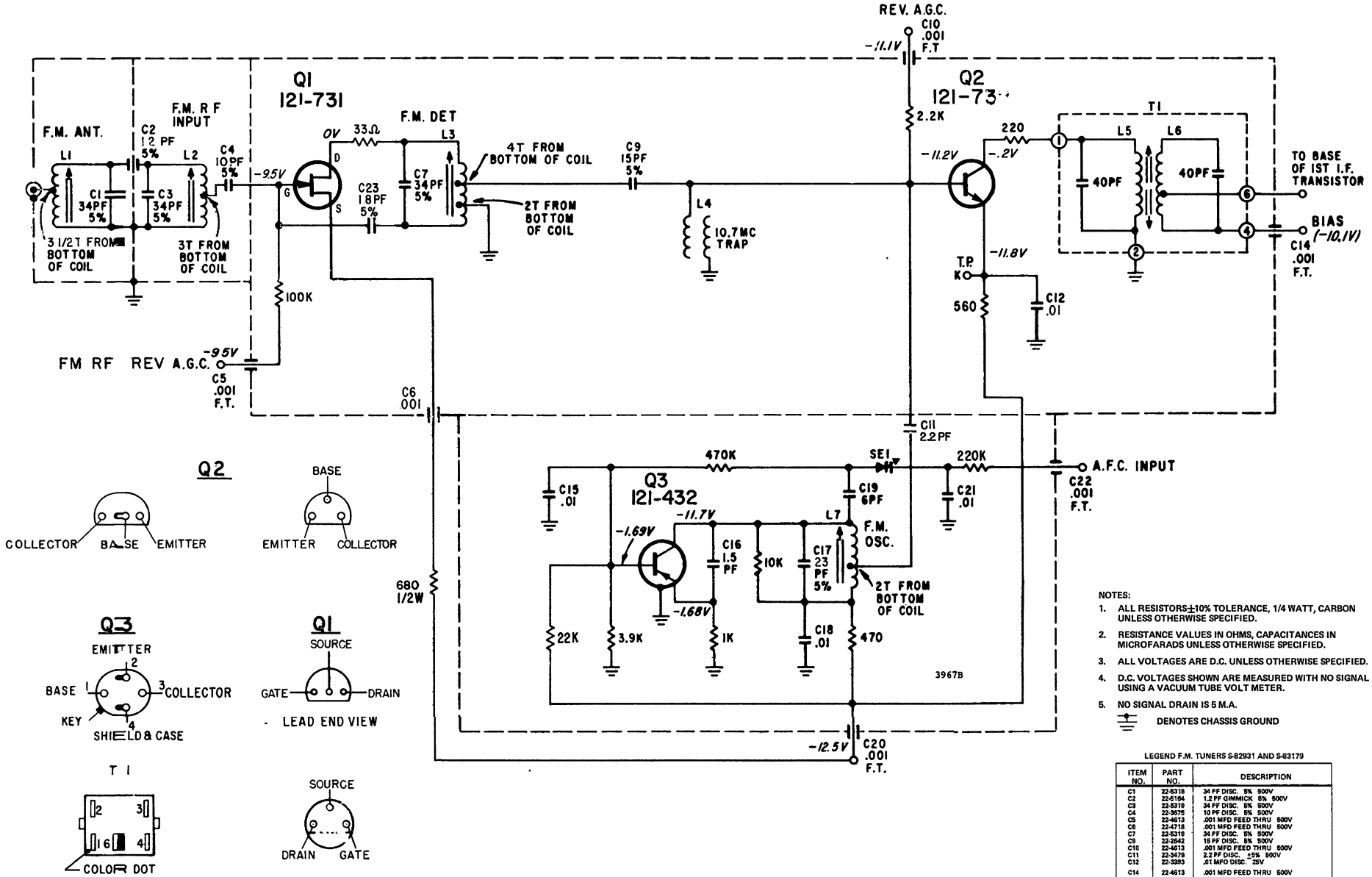
SPEAKER WIRING – SCHEMATIC





⊘ INDICATES SPEAKER POLARIZATION

SPEAKER WIRING – SCHEMATIC



NOTES:

1. ALL RESISTORS ±10% TOLERANCE, 1/4 WATT, CARBON UNLESS OTHERWISE SPECIFIED.
2. RESISTANCE VALUES IN OHMS, CAPACITANCES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
4. D.C. VOLTAGES SHOWN ARE MEASURED WITH NO SIGNAL USING A VACUUM TUBE VOLT METER.
5. NO SIGNAL DRAIN IS 5 M.A.

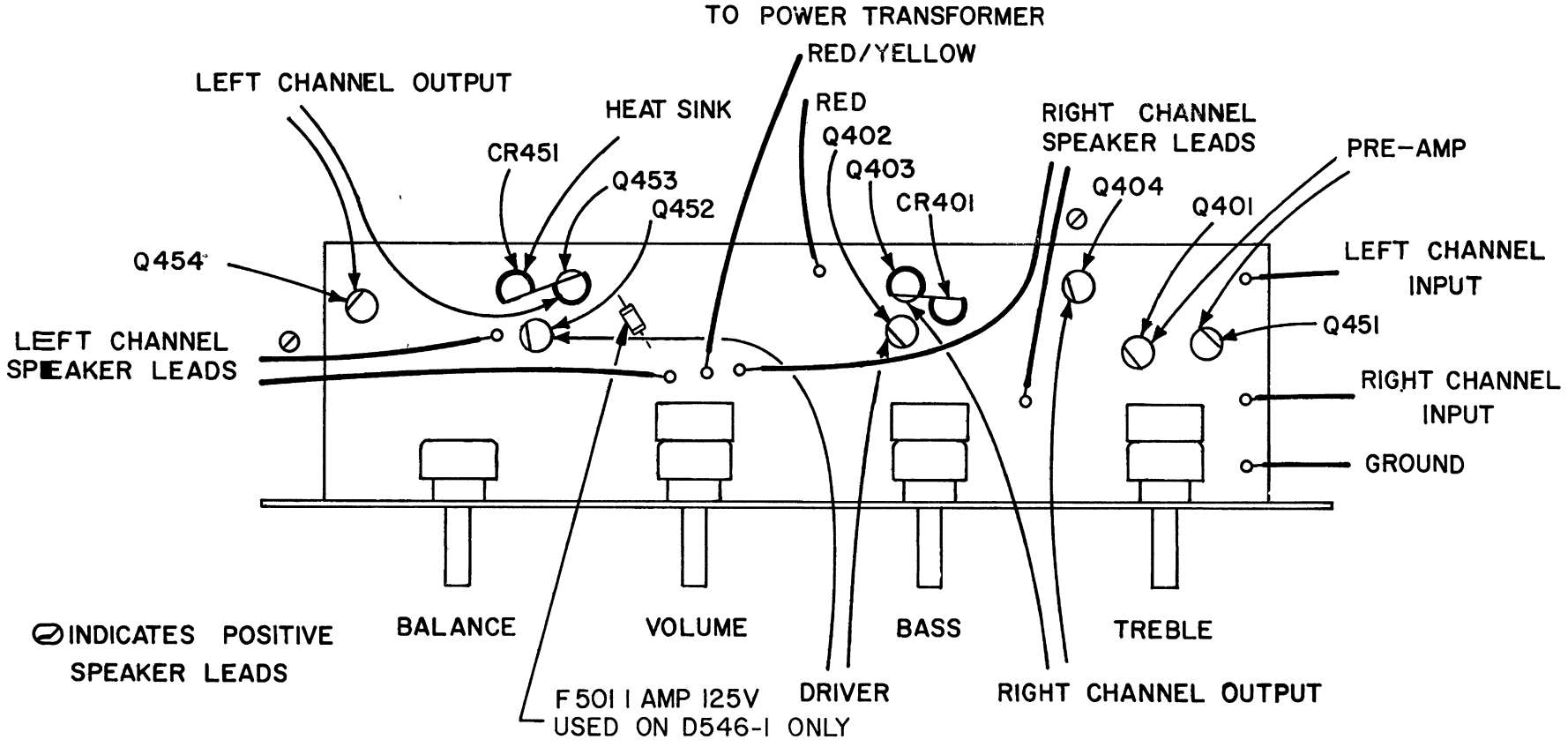
DENOTES CHASSIS GROUND

LEGEND F.M. TUNERS S-82931 AND S-83179

ITEM NO.	PART NO.	DESCRIPTION
C1	22-5318	34 PF DISC. 5% 500V
C2	22-6194	1.2 PF GIMMICK 5% 500V
C3	22-5318	34 PF DISC. 5% 500V
C4	22-3675	10 PF DISC. 5% 500V
C5	22-4613	.001 MFD FEED THRU 500V
C6	22-4718	.001 MFD FEED THRU 500V
C7	22-5318	34 PF DISC. 5% 500V
C9	22-2642	15 PF DISC. 5% 500V
C10	22-4613	.001 MFD FEED THRU 500V
C11	22-3479	2.2 PF DISC. ±5% 500V
C12	22-3393	.01 MFD DISC. 25V
C14	22-4613	.001 MFD FEED THRU 500V
C15	22-3393	.01 MFD DISC. 25V
C16	22-2424	1.5 PF GIMMICK 500V
C17	22-5281	23 PF DISC. 5% 500V
C18	22-3393	.01 MFD DISC. 25V
C19	22-2374	6 PF DISC. ±5% 500V
C20	22-4613	.001 MFD FEED THRU 500V
C21	22-3393	.01 MFD DISC. 25V
C22	22-4613	.001 MFD FEED THRU 500V
C23	22-4515	1.8 PF GIMMICK 500V
L1	S-82887	FM ANTENNA COIL ASSEMBLY
L2	S-82887	FM RF INPUT COIL ASSEMBLY
L3	S-82887	FM DET.COIL ASSEMBLY
L4	20-1256	TRAP COIL 10.7 MHz
L5	IN T1	
L6	IN T1	
L7	S-82887	FM OSCILLATOR COIL ASSEMBLY
SE1	103-47	DIODE
T1	95-2322	1ST FM I.F. TRANSFORMER 10.7 MHz
Q1	121-731	FM-RF TRANSISTOR
Q2	121-732	FM-MIXER TRANSISTOR
Q3	121-432	FM-OSCILLATOR TRANSISTOR

3967B

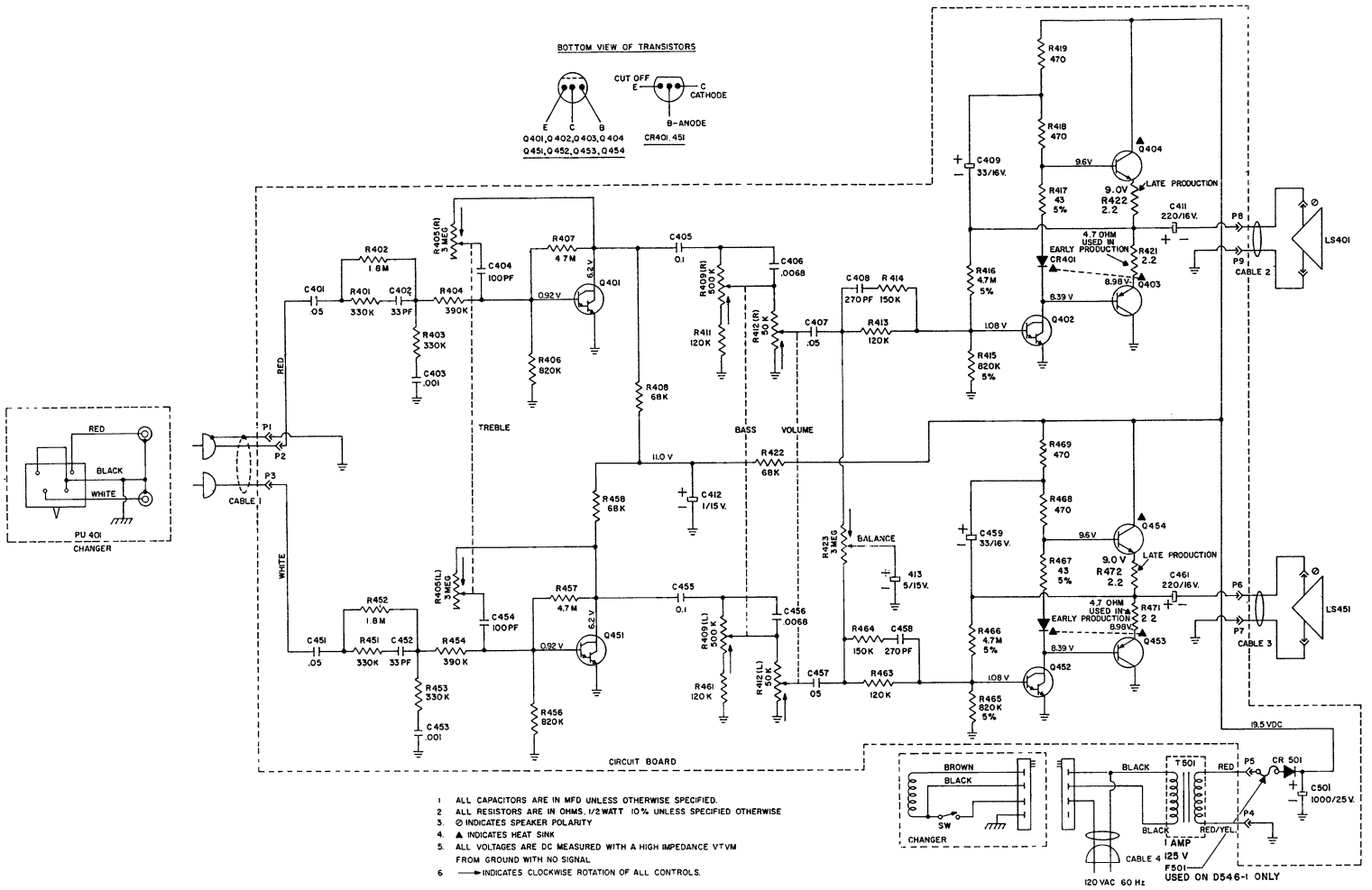
FM TUNER S-83179 – SCHEMATIC



MODEL D546 (-1) – CHASSIS LAYOUT

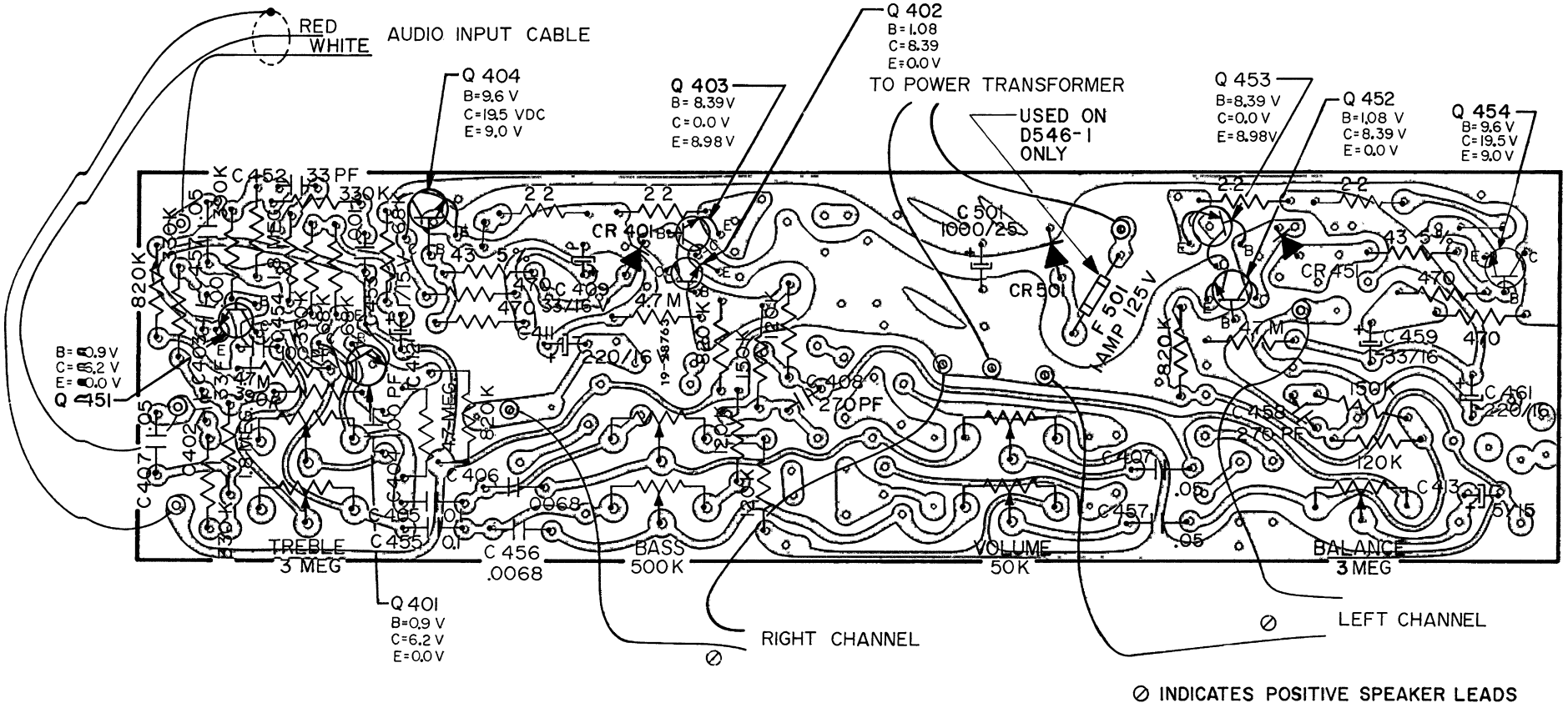
LEGEND MODEL D546W

ITEM NO.	PART NO.	DESCRIPTION
C401	964-19638	.05 MF 100V.
C402	964-25826	33 PF
C403	964-19614	.001 MF
C404	964-19755	100 PF 500V.
C405	964-23464	1 MF 100V.
C406	964-28859	.0068 MF 100V.
C407	964-19638	.05 MF 100V.
C408	964-28854	270 PF
C409	964-25922	33 MF ELECT 16V
C411	964-19610	200 MF ELECT 15V.
C412	964-19758	1 MF ELECT 15V.
C413	964-19615	5 MF ELECT 15V.
C451	964-19638	.05 MF 100V.
C452	964-25825	33 PF
C453	964-19614	.001 MF
C454	963-19755	100 PF 500V.
C455	964-23464	.1 MF 100V.
C456	964-28859	.0068 MF 100V.
C457	964-19638	.05 MF 100V.
C458	964-28854	270 PF
C459	964-25922	33 MF ELECT 16V
C461	964-19610	200 MF ELECT 15V.
C501	964-23098	1000 MF 25V.
R401	964-16587	330K OHM 1/2W. 10%
R402	964-19582	1.8 MEGOHM 1/2W. 10%
R403	964-16587	330K OHM 1/2W. 10%
R404	964-25309	390K OHM 1/2W. 10%
R405	964-24412	TREBLE 3 MEGOHM
R406	964-10960	820K OHM 1/2W. 10%
R407	964-22098	4.7 MEGOHM 1/2W. 10%
R408	964-09328	68K OHM 1/2W. 10%
R409	964-28754	BASS 500K OHM
R411	964-12879	120K OHM 1/2W. 10%
R412	964-28850	VOLUME 50K OHM
R413	964-12879	120K OHM 1/2W. 10%
R414	964-10303	150K OHM 1/2W. 10%
R415	964-27675	820K OHM 1/2W. 5%
R416	964-27674	4.7 MEGOHM 1/2W. 5%
R417	964-25866	43 OHM 1/2W. 5%
R418	964-10943	470 OHM 1/2W. 10%
R419	964-10943	470 OHM 1/2W. 10%
R421	964-19614	4.7 OHM 1/2W. 10%
R422	964-09328	68K OHM 1/2W. 10%
R423	964-28857	BALANCE 3 MEGOHM
R451	964-16587	330K OHM 1/2W. 10%
R452	964-19582	1.8 MEGOHM 1/2W. 10%
R453	964-16587	330K OHM 1/2W. 10%
R454	964-25309	390K OHM 1/2W. 10%
R456	964-10960	820K OHM 1/2W. 10%
R457	964-22098	4.7 MEGOHM 1/2W. 10%
R458	964-09328	68K OHM 1/2W. 10%
R461	964-12879	120K OHM 1/2W. 10%
R463	964-12879	120K OHM 1/2W. 10%
R464	964-10303	150K OHM 1/2W.
R465	964-27675	820K OHM 1/2W. 5%
R466	964-27674	4.7 MEGOHM 1/2W. 5%
R467	964-25866	43 OHM 1/2W. 5%
R468	964-10943	470 OHM 1/2W. 10%
R469	964-10943	470 OHM 1/2W. 10%
R471	964-19614	4.7 OHM 1/2W. 10%
Q401	964-22009	TRANSISTOR
Q402	964-22009	TRANSISTOR
Q403	964-22008	TRANSISTOR, OUTPUT
Q404	964-22168	TRANSISTOR, OUTPUT
Q451	964-22009	TRANSISTOR
Q452	964-22009	TRANSISTOR
Q453	964-22008	TRANSISTOR, OUTPUT
Q454	964-22158	TRANSISTOR, OUTPUT
CR401	964-25048	DIODE
CR451	964-25048	DIODE
CR501	964-21856	RECTIFIER
T501	964-25771	TRANSFORMER, POWER
LS401	964-24020	SPEAKER
LS451	964-24020	SPEAKER
F501	964-28986	FUSE 2061072



1. ALL CAPACITORS ARE IN MFD UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE IN OHMS, 1/2 WATT 10% UNLESS SPECIFIED OTHERWISE
3. Ø INDICATES SPEAKER POLARITY
4. ▲ INDICATES HEAT SINK
5. ALL VOLTAGES ARE DC MEASURED WITH A HIGH IMPEDANCE VTVM FROM GROUND WITH NO SIGNAL
6. ⟶ INDICATES CLOCKWISE ROTATION OF ALL CONTROLS.

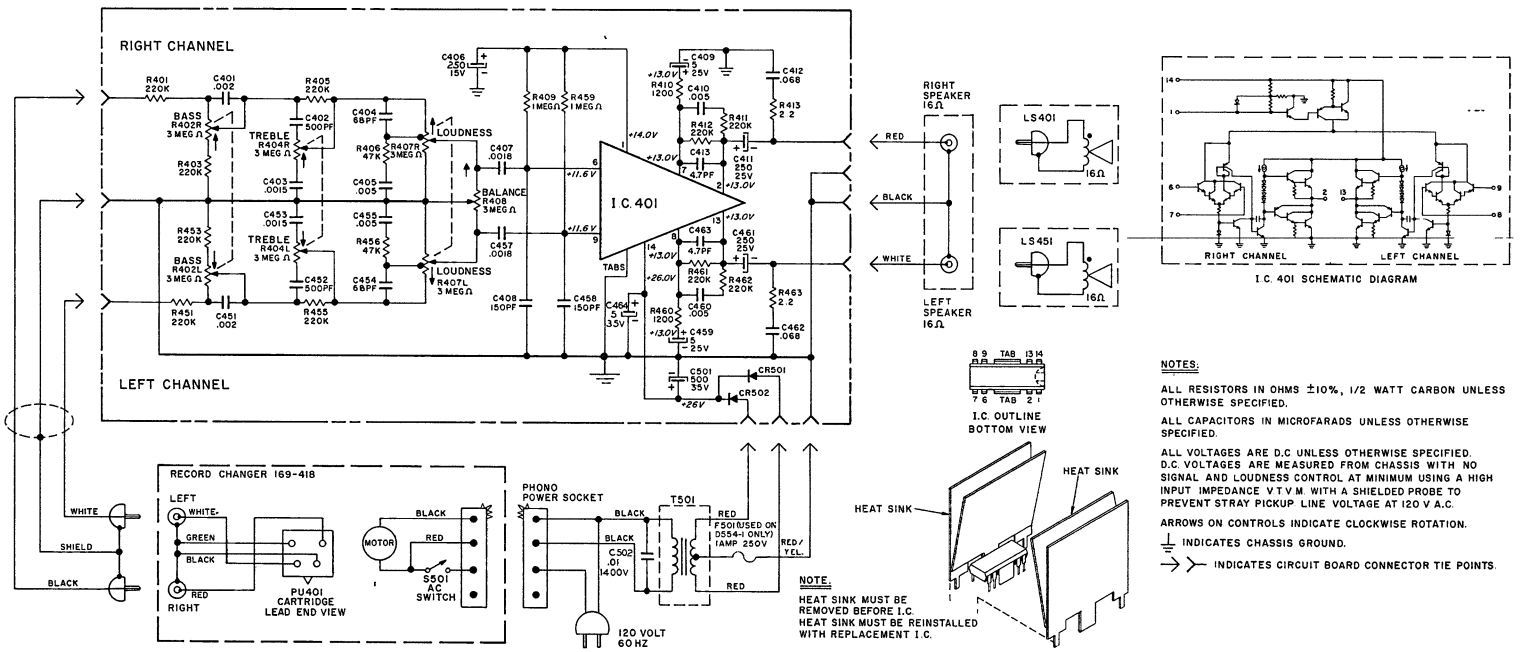
MODEL D546 (-1) – SCHEMATIC



MODEL D546 (-1) — CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

LEGEND MODELS D554[illegible]W AND D554W1

ITEM NO.	PART NO.	DESCRIPTION
C401	822-1070B	.002 MF DISC 20[illegible]%
C402	822-472B	500 PF DISC 20%[illegible]
C403	822-1069B	.0015 MF DISC 2[illegible]0%
C404	822-1073B	68 PF
C405	822-554B	.005 MF DISC 20[illegible]%
C406	822-1076B	250 MF 16V.
C407	822-1071B	.0018 MF
C408	822-1068B	150 PF DISC 20%[illegible]
C409	822-1066B	5 MF ELECT. 25V[illegible]
C410	822-554B	.005 MF DISC
C411	822-1072B	250 MF ELECT 2[illegible]5V.
C412	822-1067B	.068 MF MYLAR 100V.
C413	822-1074B	4.7 PF
C451	822-1070B	.002 MF DISC 20[illegible]%
C452	822-472B	500 PF DISC. 20[illegible]%
C453	822-1069B	.0015 MF DISC 2[illegible]0%
C454	822-1073B	68 PF
C455	822-1066B	.005 MF DISC. 2[illegible]%
C457	822-1071B	.0018MF
C458	822-1068B	150 PF DISC 20%[illegible]
C459	822-1066B	5 MF ELECT. 25V[illegible]
C460	822-554B	.005 MF DISC 20[illegible]%
C461	822-1072B	250 MF ELECT 2[illegible]5V.
C462	822-1067B	.068 MF MYLAR 100V.
C463	822-1074B	4.7 PF
C464	822-1075B	5 MF ELECT 35[illegible]
CR501	923-1066B	500 MF ELECT 3[illegible]5V.
CR502	923-446B	.01 MF 1400V.
R401	863-197B	220K OHM 1/2W[illegible] 10%
R402	863-750B	BASS
R403	863-197B	220K OHM 1/2W[illegible] 10%
R404	863-750B	TREBLE
R405	863-197B	220K OHM 1/2W[illegible] 10%
R406	863-560B	47K OHM 1/2W. [illegible] 10%
R407	863-751B	DUAL VOLUME 3 MEGOHM
R408	863-749B	BALANCE 3 ME[illegible]OHM
R409	863-215B	1 MEGOHM 1/2W[illegible]. 10%
R410	863-194B	1200 OHM 1/2W[illegible] 10%
R411	863-197B	220K OHM 1/2W[illegible] 10%
R412	863-197B	220K OHM 1/2W[illegible] 10%
R413	863-156B	2.2 OHM 1/2W, 1[illegible]0%
R451	863-197B	220K OHM 1/2W[illegible] 10%
R453	863-197B	220K OHM 1/2W[illegible] 10%
R455	863-197B	220K OHM 1/2W[illegible] 10%
R456	863-560B	47K OHM 1/2W [illegible]10%
R459	863-215B	1 MEGOHM 1/2W[illegible]. 10%
R460	863-194B	1200 OHM 1/2W[illegible] 10%
R463	863-156B	2.2 OHM 1/2W, 1[illegible]0%
R461	863-197B	220K OHM 1/2W[illegible] 10%
R462	863-197B	220K OHM 1/2W[illegible] 10%
LS401	849-77B	SPEAKER 6"
LS451	849-77B	SPEAKER 6"
IC401	906-27B	INTEGRATED CI[illegible]RCUIT
CR501	903-106B	DIODE 1 AMP.
CR502	903-106B	DIODE 1 AMP.
T501	895-276B	TRANSFORMER
F501	936-4B	FUSE 1 AMP (U[illegible]SED WITH D554-1 ONLY) 2061012



NOTES:

ALL RESISTORS IN OHMS ±10%, 1/2 WATT CARBON UNLESS OTHERWISE SPECIFIED.

ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.

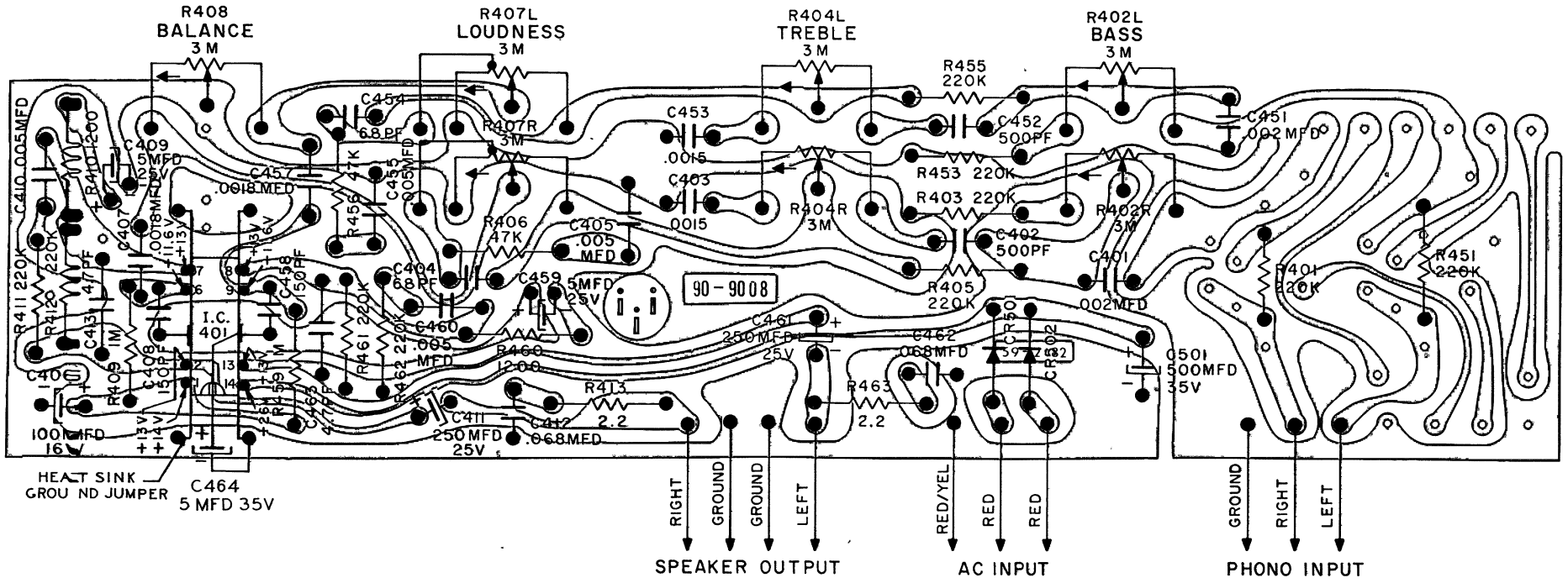
ALL VOLTAGES ARE D.C UNLESS OTHERWISE SPECIFIED. D.C. VOLTAGES ARE MEASURED FROM CHASSIS WITH NO SIGNAL AND LOUDNESS CONTROL AT MINIMUM USING A HIGH INPUT IMPEDANCE V.T.V.M. WITH A SHIELDED PROBE TO PREVENT STRAY PICKUP. LINE VOLTAGE AT 120 V A.C.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION.

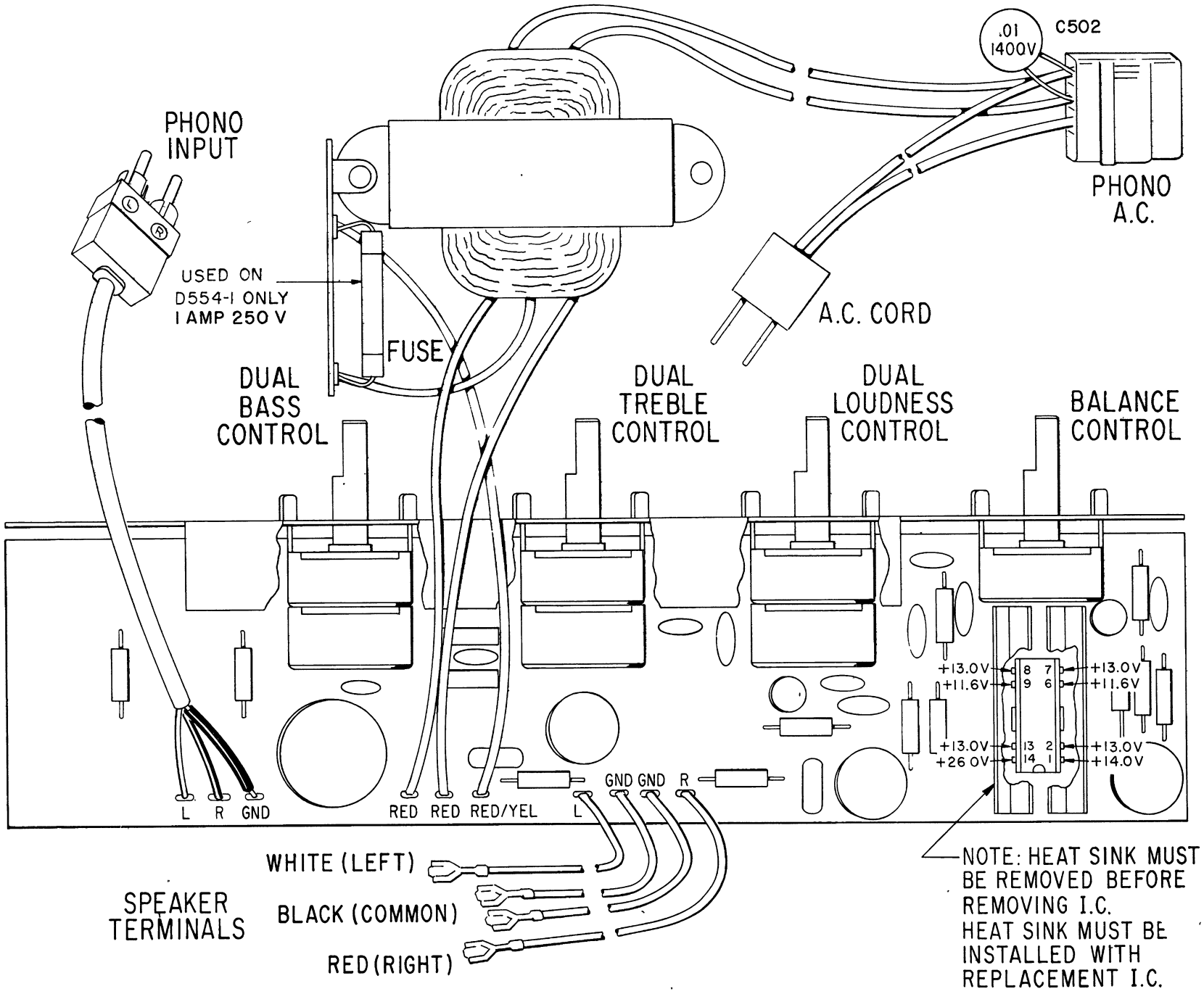
⏚ INDICATES CHASSIS GROUND.

→ >— INDICATES CIRCUIT BOARD CONNECTOR TIE POINTS.

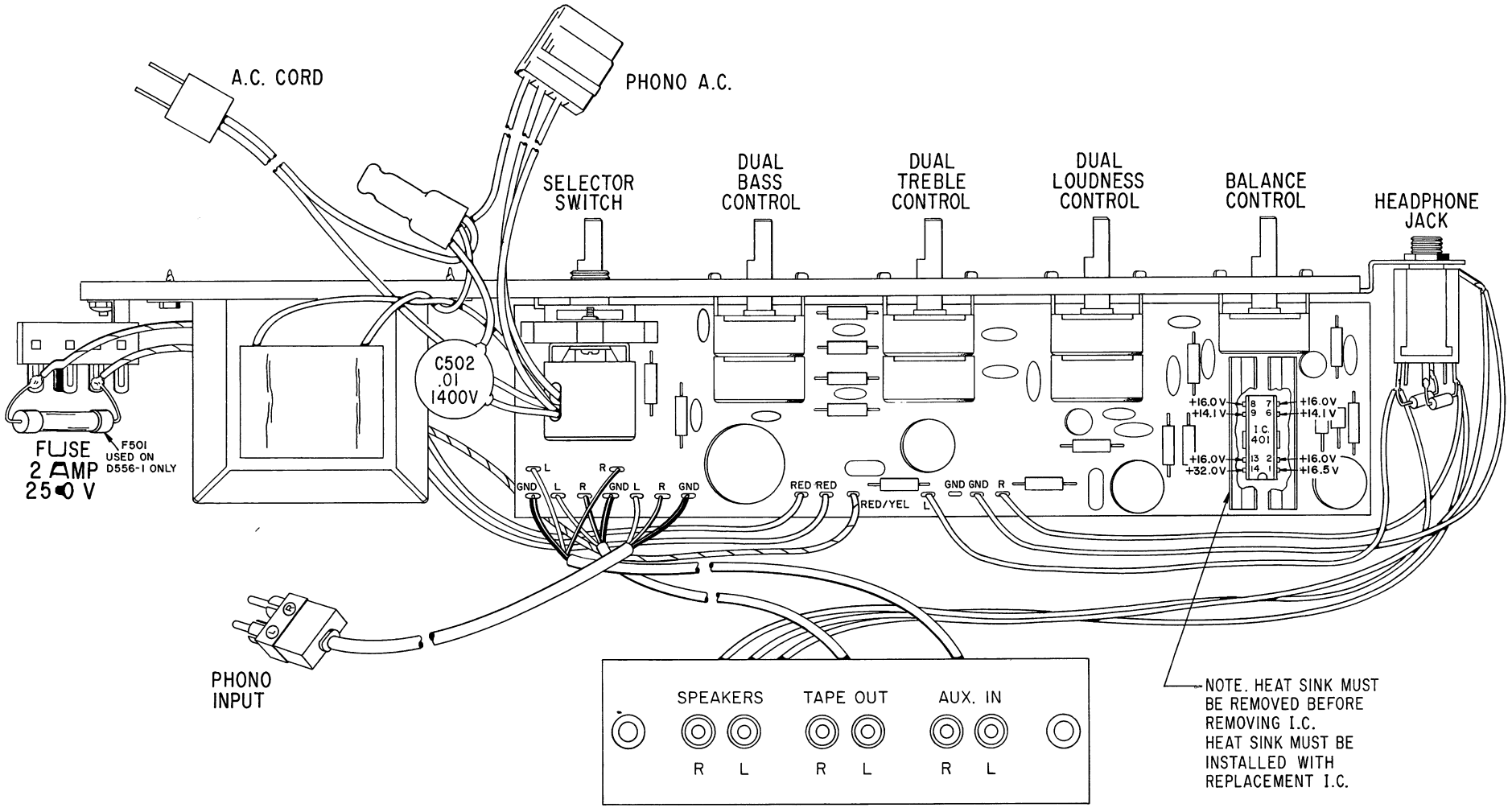
MODEL D554 (-1) – SCHEMATIC



MODEL D554 (-1) – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



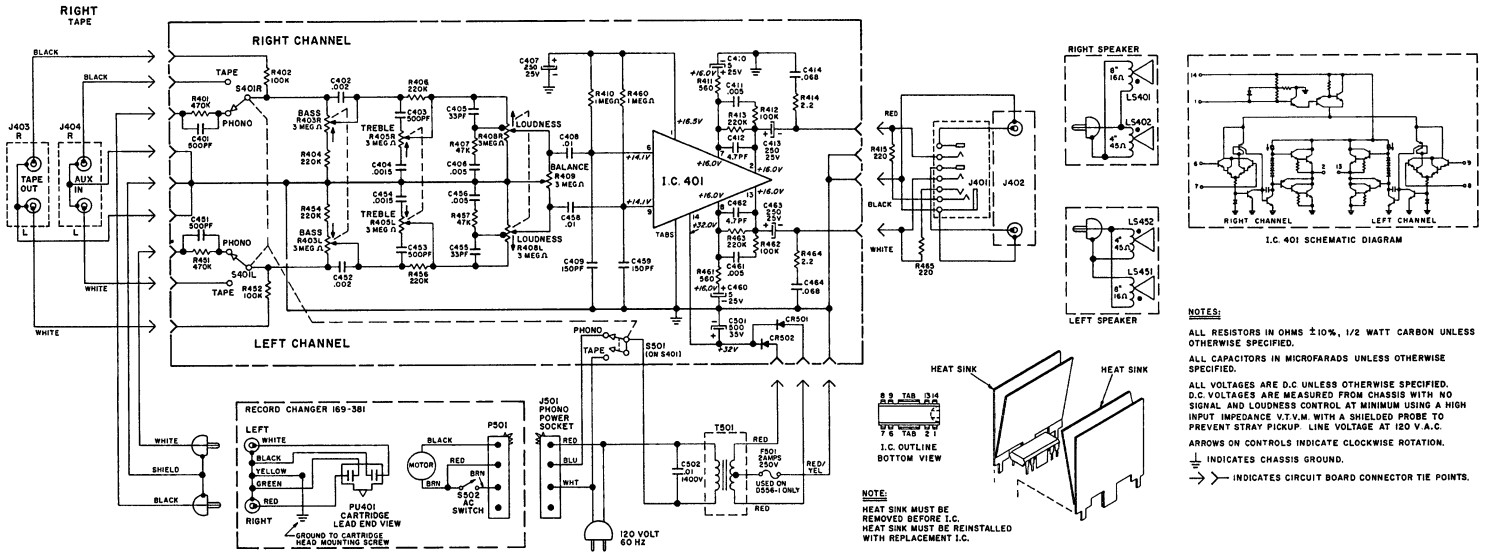
MODEL D554 (-1) – CHASSIS LAYOUT



MODEL D556 (-1) -- CHASSIS LAYOUT

LEGEND MODELS D556W AND D556W1

ITEM NO.	PART NO.	DESCRIPTION
C401	822-1072B	250 MF EL__ECTROLYTIC 25V.
C401	822-472B	500 PF DI__SC CAPACITOR 20%
C402	822-1070B	.002 MF D__SC CAPACITOR 20%
C403	822-472B	500 PF DI__SC CAPACITOR 20%
C404	822-1069B	.0015 MF __SC CAPACITOR 20%
C405	823-1108B	33 PF CAP__ACITOR
C406	822-854B	.005 MF D__SC CAPACITOR 20%
C407	822-1072B	250 MF EL__ECTROLYTIC 25V.
C408	822-424B	.01 MF DI__SC CAPACITOR
C409	822-1068B	150 PF DI__SC CAPACITOR 20%
C410	822-1088B	5 MF E__TROLYTIC 25V.
C411	822-854B	.005 MF D__SC CAPACITOR 20%
C412	822-1074B	4.7 PF CAP__ACITOR
C413	822-1072B	250 MF EL__ECTROLYTIC 25V.
C414	822-1067B	.068 MF M__YLAR CAPACITOR 100V.
C451	822-472B	500 PF DI__SC CAPACITOR 20%
C452	822-1070B	.002 MF D__SC CAPACITOR 20%
C453	822-472B	500 PF DI__SC CAPACITOR 20%
C454	822-1069B	.0015 MF __SC CAPACITOR 20%
C455	823-1109B	33 PF CAP__ACITOR
C456	822-854B	.005 MF D__SC CAPACITOR 20%
C458	823-424B	.01 MF DI__SC CAPACITOR
C459	822-1068B	150 PF DI__SC CAPACITOR 20%
C460	822-1088B	5 MF E__TROLYTIC 25V.
C461	822-854B	.005 MF D__SC CAPACITOR 20%
C462	822-1074B	4.7 PF CAP__ACITOR
C463	822-1072B	250 MF EL__ECTROLYTIC 25V.
C463	822-1072B	250 MF EL__ECTROLYTIC 25V.
C464	822-1067B	.068 MF M__YLAR CAPACITOR 100V.
C501	822-1055B	500 MF EL__ECTROLYTIC 35V.
C502	823-448B	.01 MF CA__ACITOR 1400V
R401	863-214B	470K OHM__ RESISTOR
R402	863-765B	100K OHM__ RESISTOR (4 REQ.)
R403	863-750B	CONTROL__BASS TREBLE
R404	863-197B	220K OHM__ RESISTOR 1/2W, 10%
R405	863-750B	CONTROL__BASS TREBLE
R406	863-197B	220K OHM__ RESISTOR 1/2W, 10%
R407	863-860B	47K OHM __RESISTOR 1/2W, 10%
R408	863-751B	CONTROL__DUAL VOLUME 3 MEGOHM
R409	863-749B	CONTROL__BALANCE 3 MEGOHM
R410	863-215B	1 MEGOHM__ RESISTOR 1/2W, 10%
R411	863-678B	560 OHM __RESISTOR
R412	863-765B	100K OHM__ RESISTOR (4 REQ.)
R413	863-197B	220K OHM__ RESISTOR 1/2W, 10%
R414	863-156B	2.2 OHM __RESISTOR 1/2W, 10%
R415	863-853B	220 OHM __RESISTOR
R451	863-214B	470K OHM__ RESISTOR
R452	863-765B	100K OHM__ RESISTOR (4 REQ.)
R453	822-473B	500 PF DI__SC CAPACITOR 20%
R454	863-197B	220K OHM__ RESISTOR 1/2W, 10%
R456	863-197B	220K OHM__ RESISTOR 1/2W, 10%
R457	863-860B	47K OHM __RESISTOR 1/2W, 10%
R460	863-215B	1 MEGOHM__ RESISTOR 1/2W, 10%
R461	863-678B	560 OHM __RESISTOR
R462	863-765B	100K OHM__ RESISTOR (4 REQ.)
R463	863-197B	220K OHM__ RESISTOR 1/2W, 10%
R464	863-156B	2.2 OHM __RESISTOR 1/2W, 10%
R465	863-853B	220 OHM __RESISTOR
T501	895-387B	TRANSFO__RMER
S401	885-141B	SWITCH F__UNCTION
IC401	906-26B	INTEGRA__TED CIRCUIT
CR501	903-106B	DIODE 1__AMP. (2 REQ.)
CR502	903-106B	DIODE 1__AMP. (2 REQ.)
LS401	848-80B	SPEAKER __8" (2 REQ.)
LS402	848-81B	SPEAKER __4" (2 REQ.)
LS451	848-80B	SPEAKER __8" (2 REQ.)
LS452	848-81B	SPEAKER __4" (2 REQ.)
J401	844-48B	JACK (PA__RT OF 844-46B)



I.C. 401 SCHEMATIC DIAGRAM

NOTE:
HEAT SINK MUST BE REMOVED BEFORE I.C. HEAT SINK MUST BE REINSTALLED WITH REPLACEMENT I.C.

NOTES:

ALL RESISTORS IN OHMS ±10%, 1/2 WATT CARBON UNLESS OTHERWISE SPECIFIED.

ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.

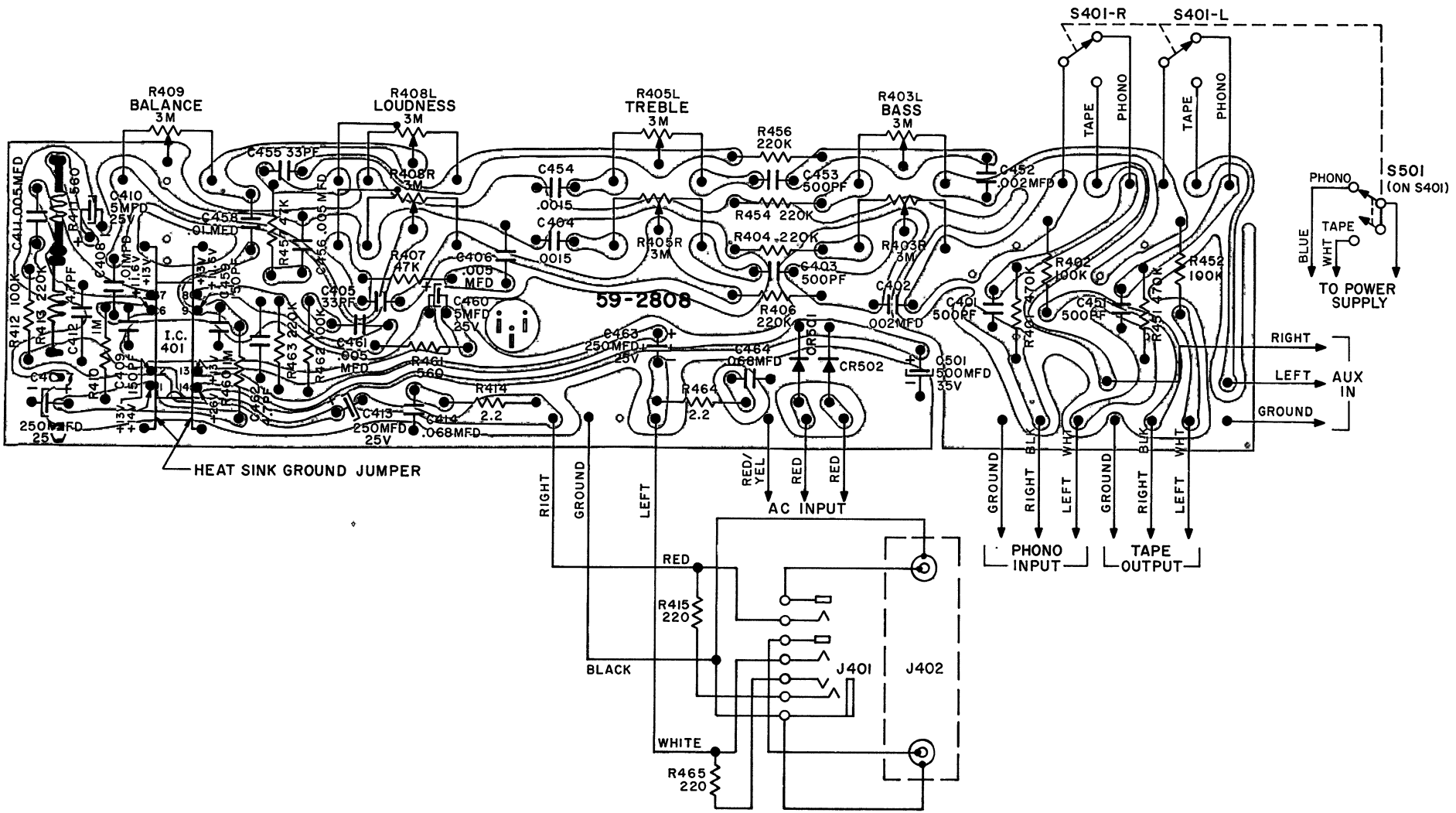
ALL VOLTAGES ARE D.C UNLESS OTHERWISE SPECIFIED. D.C VOLTAGES ARE MEASURED FROM CHASSIS WITH NO SIGNAL AND LOUDNESS CONTROL AT MINIMUM USING A HIGH INPUT IMPEDANCE V.T.V.M. WITH A SHIELDED PROBE TO PREVENT STRAY PICKUP. LINE VOLTAGE AT 120 V.A.C.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION.

⏚ INDICATES CHASSIS GROUND.

→⟩— INDICATES CIRCUIT BOARD CONNECTOR TIE POINTS.

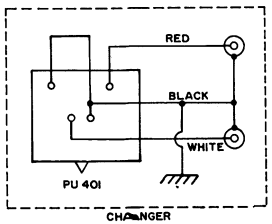
MODEL D556 (-1) – SCHEMATIC

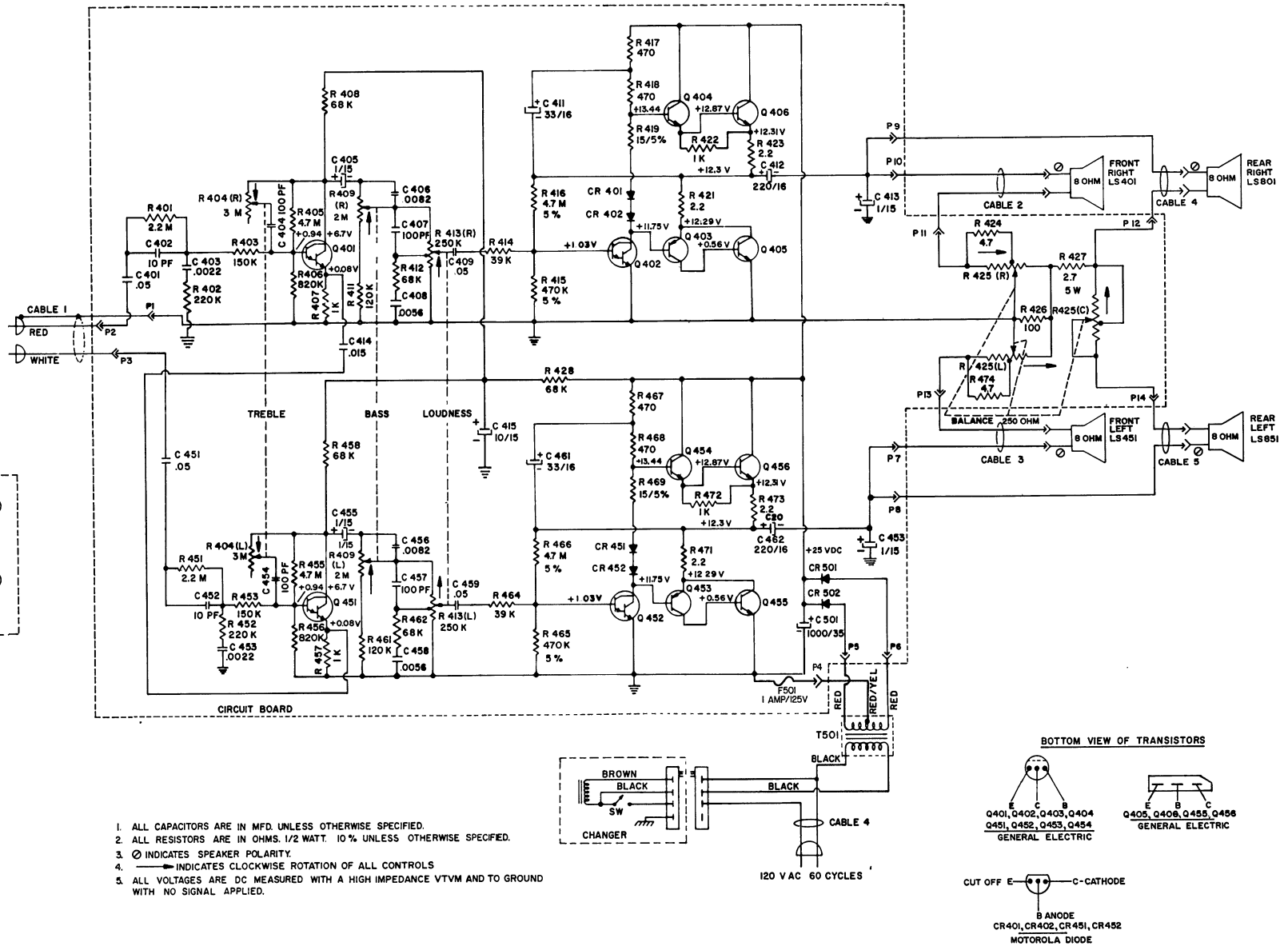


MODEL D556 (-1) – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

LEGEND MODEL D742W

ITEM NO.	PART NO.	DESCRIPTION
C401	964-10638	.05 MF CAPACITOR 200V.
C402	964-28942	10 PF CAPACITOR 10% 500V.
C403	964-24851	2200 PF CAPACITOR 20% 500V.
C404	964-10755	100 PF CAPACITOR 500V.
C405	964-10758	1 MF CAPACITOR 15 V.
C406	964-27741	.0082 MF CAPACITOR
C407	964-10755	100 PF CAPACITOR 500V.
C408	964-28943	5600 PF CAPACITOR 20% 500V.
C409	964-10638	.05 MF CAPACITOR 200V.
C411	964-29922	33 MF CAPACITOR 15 V.
C412	964-28902	220 MF CAPACITOR 25V.
C413	964-10758	1 MF CAPACITOR 15 V.
C414	964-28944	.015 MF CAPACITOR 20% 500V.
C415	964-28901	10 MF CAPACITOR 15 V.
C451	964-10638	.05 MF CAPACITOR 200V.
C452	964-28943	10 PF CAPACITOR 10% 500V.
C453	964-24481	2200 PF CAPACITOR 20% 500V.
C454	964-10755	100 PF CAPACITOR 500V.
C455	964-10758	1 MF CAPACITOR 15 V.
C456	964-27741	.0082 MF CAPACITOR
C457	964-10755	100 PF CAPACITOR 500V.
C458	964-28943	5600 PF CAPACITOR 20% 500V.
C459	964-10638	.05 MF CAPACITOR 200V.
C461	964-29922	33 MF CAPACITOR 15 V.
C462	964-28902	220 MF CAPACITOR 25V.
C463	964-10758	1 MF CAPACITOR 15 V.
C501	964-25794	1000 MF CAPACITOR 35V.
R401	964-09518	2.2 MEGOHM RESISTOR 1/2W, 10%
R402	964-09513	220K OHM RESISTOR 1/2W, 10%
R403	964-10303	150K OHM RESISTOR 1/2W, 10%
R404	964-28930	TREBLE CONTROL 3 MEGOHM
R405	964-27674	4.7 MEGOHM RESISTOR 1/2W, 5%
R406	964-10840	820K OHM RESISTOR 1/2W, 10%
R407	964-10521	1K OHM RESISTOR 1/2W, 10%
R408	964-09226	68K OHM RESISTOR 1/2W, 10%
R409	964-28938	BASE CONTROL 2 MEGOHM
R411	964-12879	120K OHM RESISTOR 1/2W, 10%
R413	964-09226	68K OHM RESISTOR 1/2W, 10%
R414	964-28950	VOLUME CONTROL 250K OHM
R416	964-09184	39K OHM RESISTOR 1/2W, 10%
R415	964-28960	470K OHM RESISTOR 1/2W, 5%
R418	964-22999	4.7 MEGOHM RESISTOR 1/2W, 10%
R417	964-10843	470 OHM RESISTOR 1/2W, 10%
R419	964-10943	470 OHM RESISTOR 1/2W, 10%
R421	964-26371	15 OHM RESISTOR 2W, 10%
R422	964-25902	2.2 OHM RESISTOR 2W, 10%
R423	964-15621	1K OHM RESISTOR 2W, 10%
R424	964-25902	2.2 OHM RESISTOR 2W, 10%
R425	964-18014	4.7 OHM RESISTOR 2W, 10%
R426	964-28884	BALANCE CONTROL
R428	964-11161	100 OHM RESISTOR 1/2W, 10%
R427	964-28970	2.7 OHM RESISTOR 5W, 10%
R451	964-09518	2.2 MEGOHM RESISTOR 1/2W, 10%
R452	964-09513	220K OHM RESISTOR 1/2W, 10%
R453	964-10303	150K OHM RESISTOR 1/2W, 10%
R454	964-10303	150K OHM RESISTOR 1/2W, 10%
R456	964-27674	4.7 MEGOHM RESISTOR 1/2W, 5%
R458	964-10840	820K OHM RESISTOR 1/2W, 10%
R457	964-10621	1K OHM RESISTOR 1/2W, 10%
R461	964-09238	68K OHM RESISTOR 2W, 10%
R462	964-12879	120K OHM RESISTOR 1/2W, 10%
R463	964-09226	68K OHM RESISTOR 1/2W, 10%
R464	964-08144	39K OHM RESISTOR 1/2W, 5%
R465	964-28969	470K OHM RESISTOR 1/2W, 5%
R466	964-22999	4.7 MEGOHM RESISTOR 1/2W, 10%
R467	964-10943	470 OHM RESISTOR 1/2W, 10%
R468	964-10943	470 OHM RESISTOR 1/2W, 10%
R469	964-26371	15 OHM RESISTOR 2W, 10%
R471	964-25902	2.2 OHM RESISTOR 2W, 10%
R472	964-15621	1K OHM RESISTOR 2W, 10%
R473	964-25902	2.2 OHM RESISTOR 2W, 10%
R474	964-18014	4.7 OHM RESISTOR 2W, 10%
T501	964-27172	TRANSFORMER, POWER
CR401	964-25044	DIODE
CR402	964-25044	DIODE
CR451	964-25046	DIODE
CR452	964-25046	DIODE
CR501	964-21886	RECTIFIER
CR502	964-21886	RECTIFIER
LS401	964-26872	SPEAKER
LS451	964-26872	SPEAKER
LS801	964-26872	SPEAKER
LS851	964-26872	SPEAKER
P501	964-28974	POWER CABLE ASSEMBLY (PRIMARY)
F501	964-28986	FUSE SECONDARY 1 AMP/125V
F502	964-29004	FUSE .2 AMP.

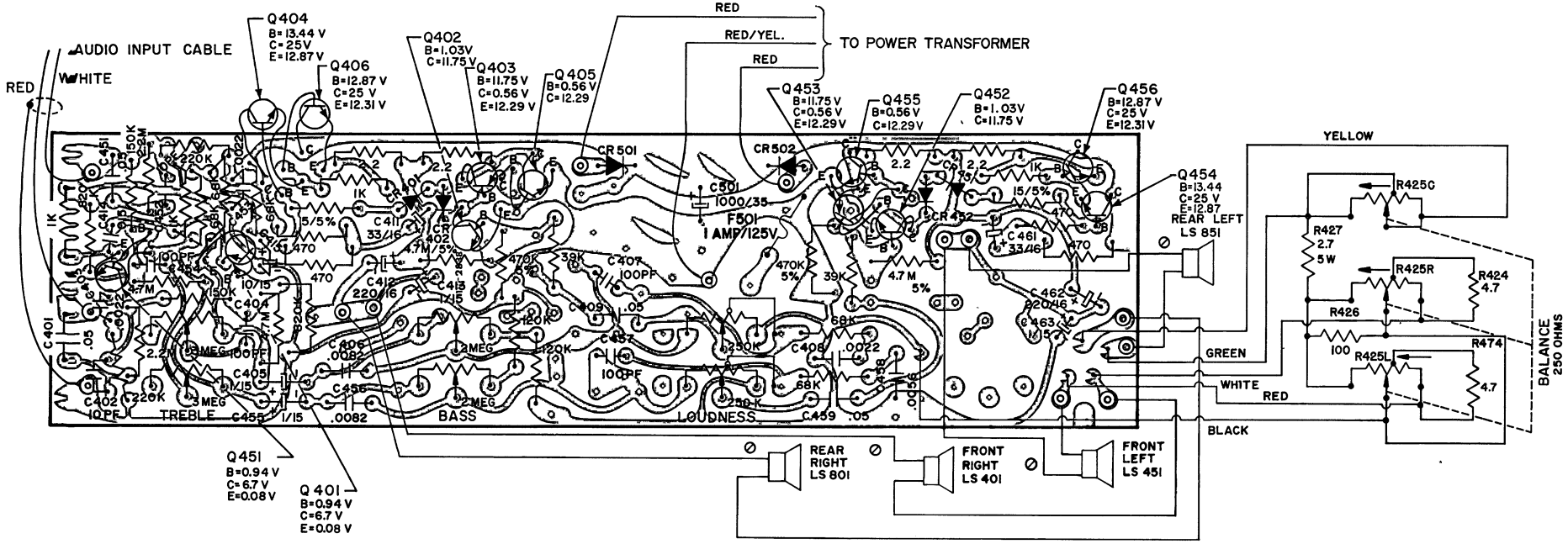




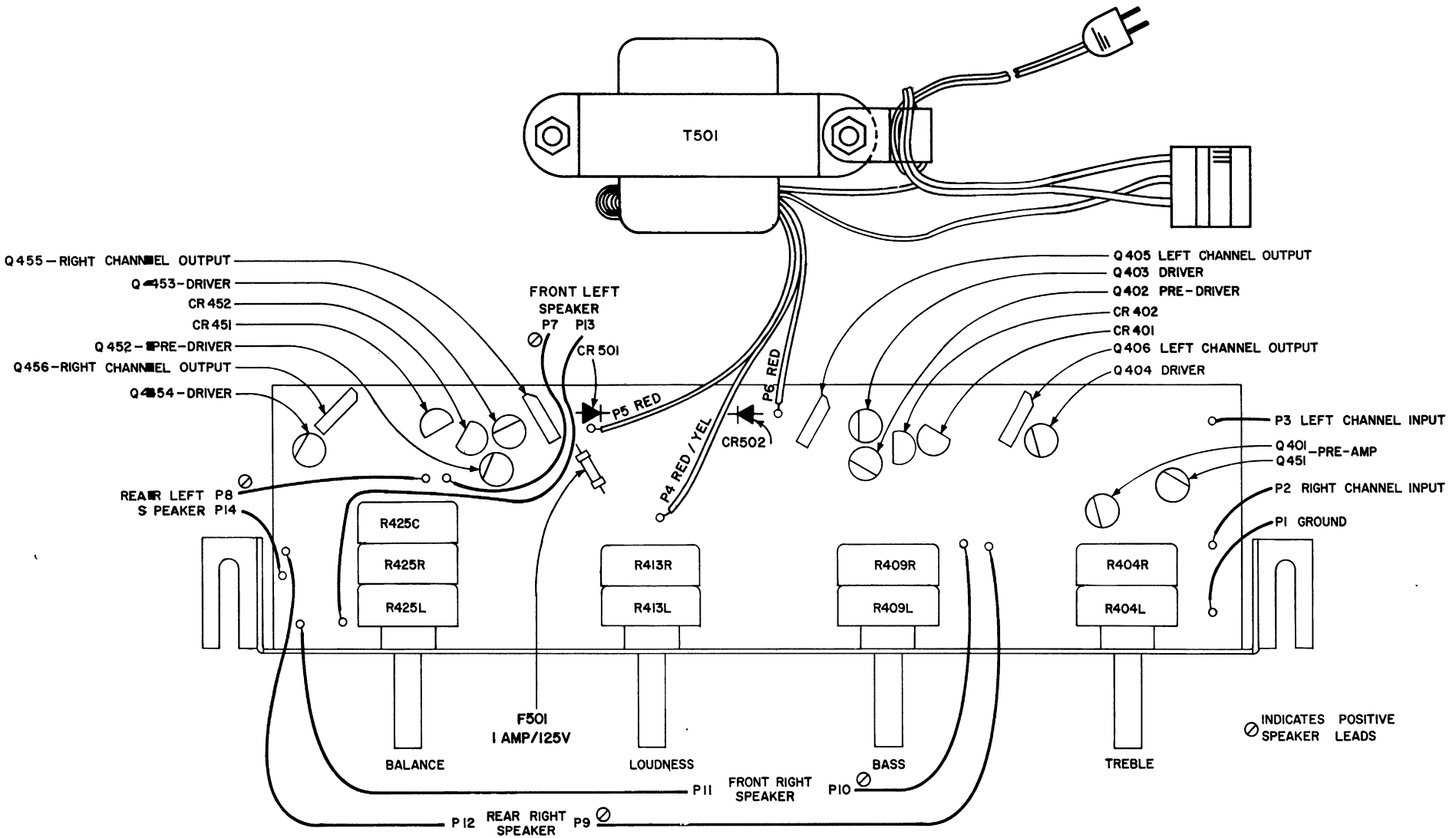
1. ALL CAPACITORS ARE IN MFD. UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE IN OHMS. 1/2 WATT. 10% UNLESS OTHERWISE SPECIFIED.
3. ⊘ INDICATES SPEAKER POLARITY.
4. ⟶ INDICATES CLOCKWISE ROTATION OF ALL CONTROLS
5. ALL VOLTAGES ARE DC MEASURED WITH A HIGH IMPEDANCE VTVM AND TO GROUND WITH NO SIGNAL APPLIED.

BOTTOM VIEW OF TRANSISTORS

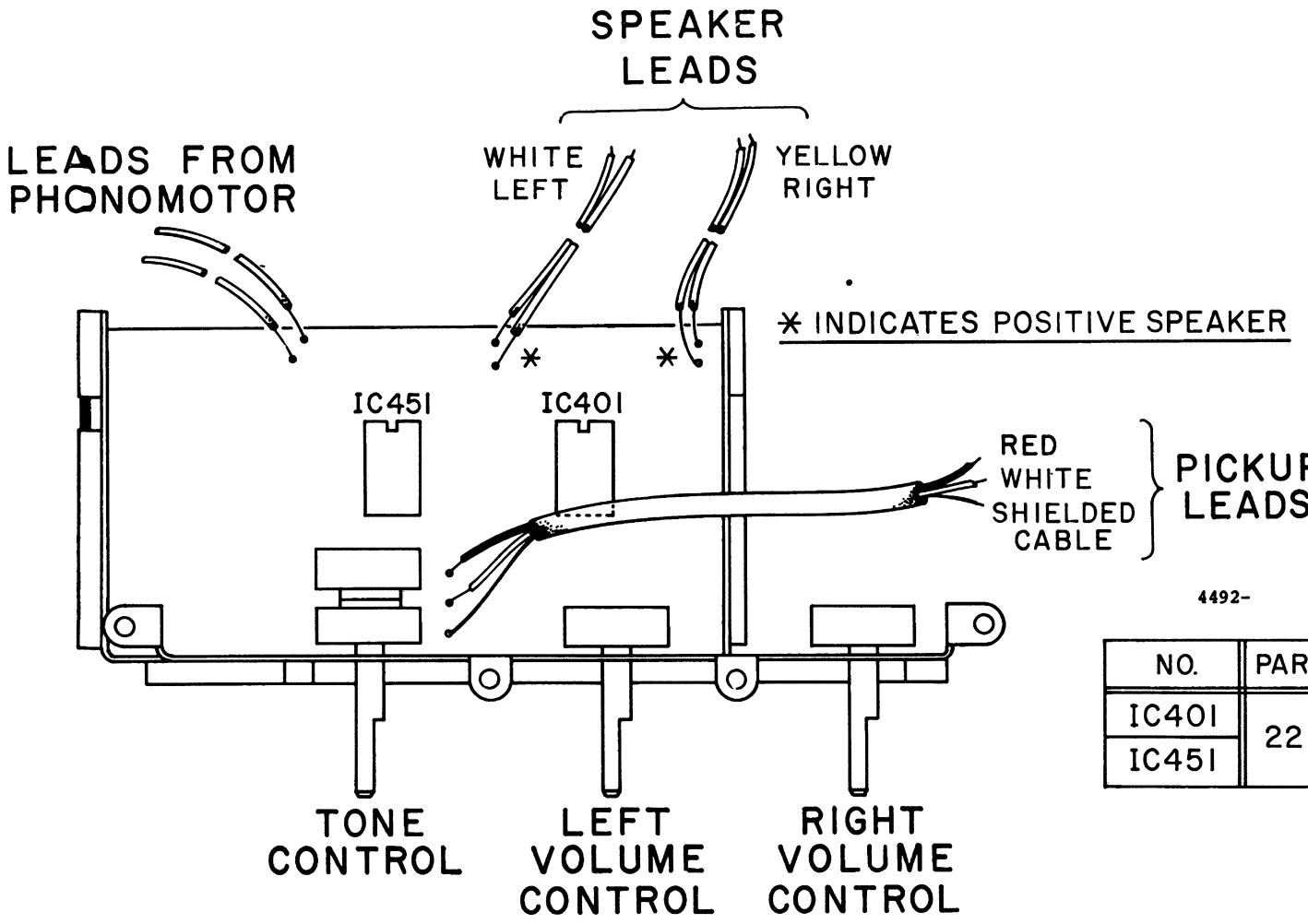
MODEL D742 (-1) – SCHEMATIC



MODEL D742 (-1) – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



MODEL D742 (-1) – CHASSIS LAYOUT



4492-

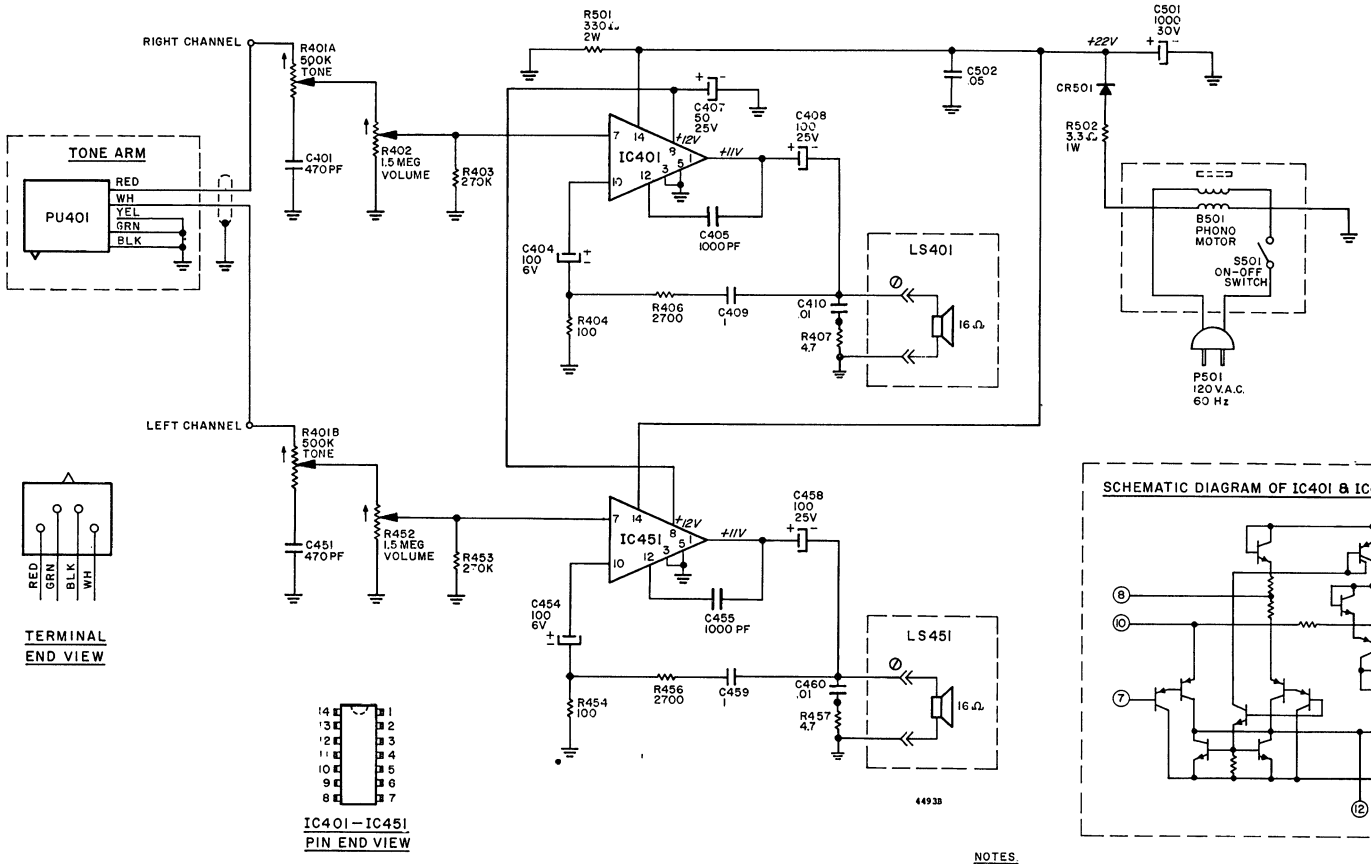
NO.	PART NO.	DESCRIPTION
IC401	221-64	RIGHT AMPLIFIER
IC451		LEFT AMPLIFIER

CHASSIS 1WDA10 – CHASSIS LAYOUT

CHASSIS 1WTDA10

ITEM NO.	PART NO.	DESCRIPTION
C401	22-6	470 PF DISC. ±2%, 0% 1000 V
C404	22-5413	100 MFD. ELECTROLYTIC 6 V
C405	22-3748	1000 PF DISC. ± 10% 1000 V
C407	22-4577	50 MFD. ELECTROLYTIC 25 V
C408	22-3973	100 MFD. ELECTROLYTIC 25 V
C409	22-5188	1 MFD. MYLAR ±10 50 V
C410	22-3010	.01 MFD. DISC. +80-30% 25 V
C451	22-6	470 PF DISC. ±2%, 0% 1000 V
C454	22-5413	100 MFD. ELECTROLYTIC 6 V
C455	22-3748	1000 PF DISC. ± 10% 1000 V
C458	22-3973	100 MFD. ELECTROLYTIC 25 V
C459	22-5188	1 MFD. MYLAR ±10% 50 V
C460	22-3010	.01 MFD. DISC. +80-30% 25 V
C501	22-6167	1000 MFD. ELECTROLYTIC 30 V
C502	22-3034	.05 MFD. DISC. +100-50% 25 V
R401A	63-9773	500K OHM DUAL (TONE)
R402	63-9778	1.5 MEGOHM (RIGHT) VOLUME CONTROL
R403	63-1887	270K OHM
R404	63-1743	100 OHM
R406	63-1803	2700 OHM
R407	63-4529	4.7 OHM
R452	63-9772	1.5 MEGOHM (LEFT) VOLUME CONTROL
R453	63-1887	270K OHM
R454	63-1743	100 OHM
R456	63-1803	2700 OHM
R457	63-4529	4.7 OHM
R501	63-5649	330 OHM 2W
R502	63-5965	3.3 OHM 1W
CR501	212-76	SILICON RECTIFIER
LS401	49-1230	SPEAKER 4"
LS451	49-1230	SPEAKER 4"
IC401	221-64	INTEGRATED CIRCUIT
IC451	221-64	INTEGRATED CIRCUIT

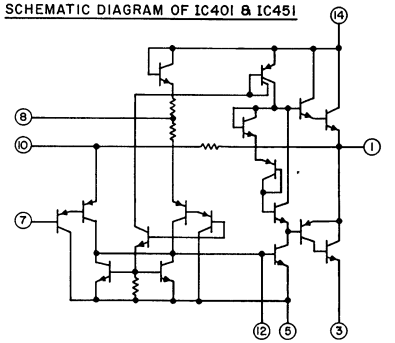
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TERMINAL END VIEW

IC401—IC451 PIN END VIEW

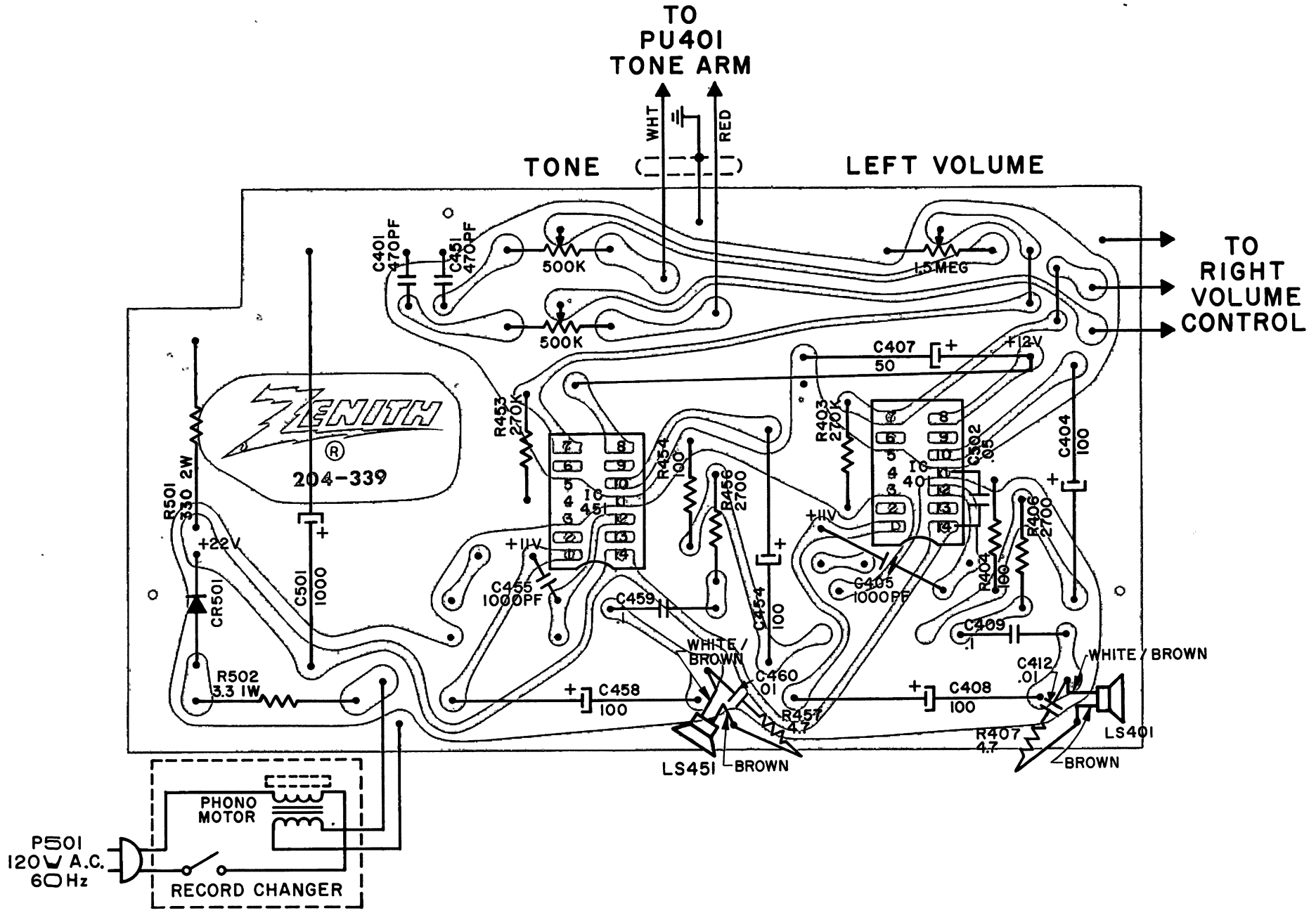
SCHEMATIC DIAGRAM OF IC401 & IC451



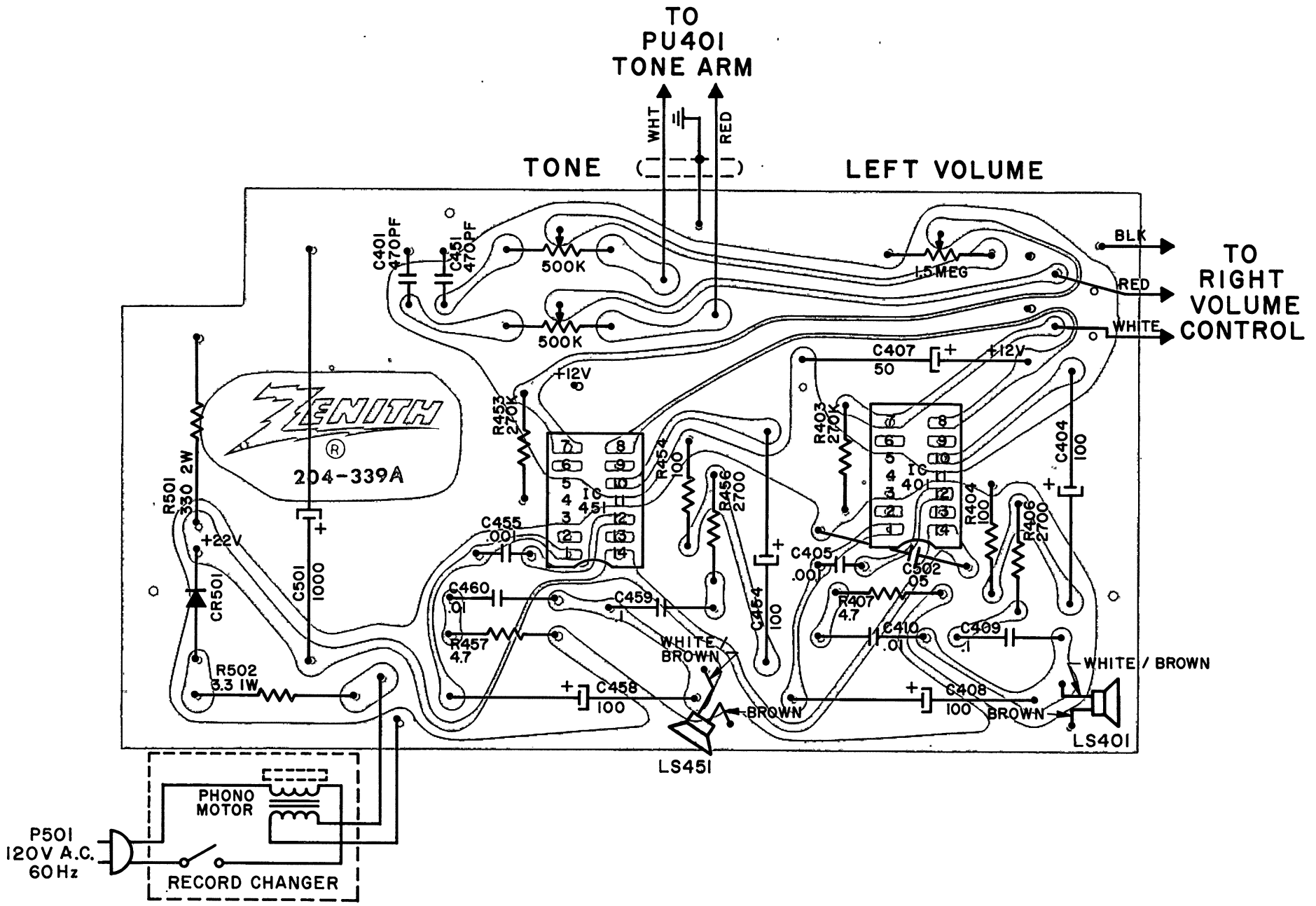
NOTES

1. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
2. D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL INPUT, LOUDNESS CONTROL AT MINIMUM, LINE VOLTAGE 120 V.A.C. USING A HIGH IMPEDANCE V.T.V.M.
3. ALL RESISTORS IN OHMS, 1/2 WATT CARBON, ±10% UNLESS OTHERWISE SPECIFIED.
4. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
5. ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION.
6. ⏚ INDICATES CHASSIS GROUND.

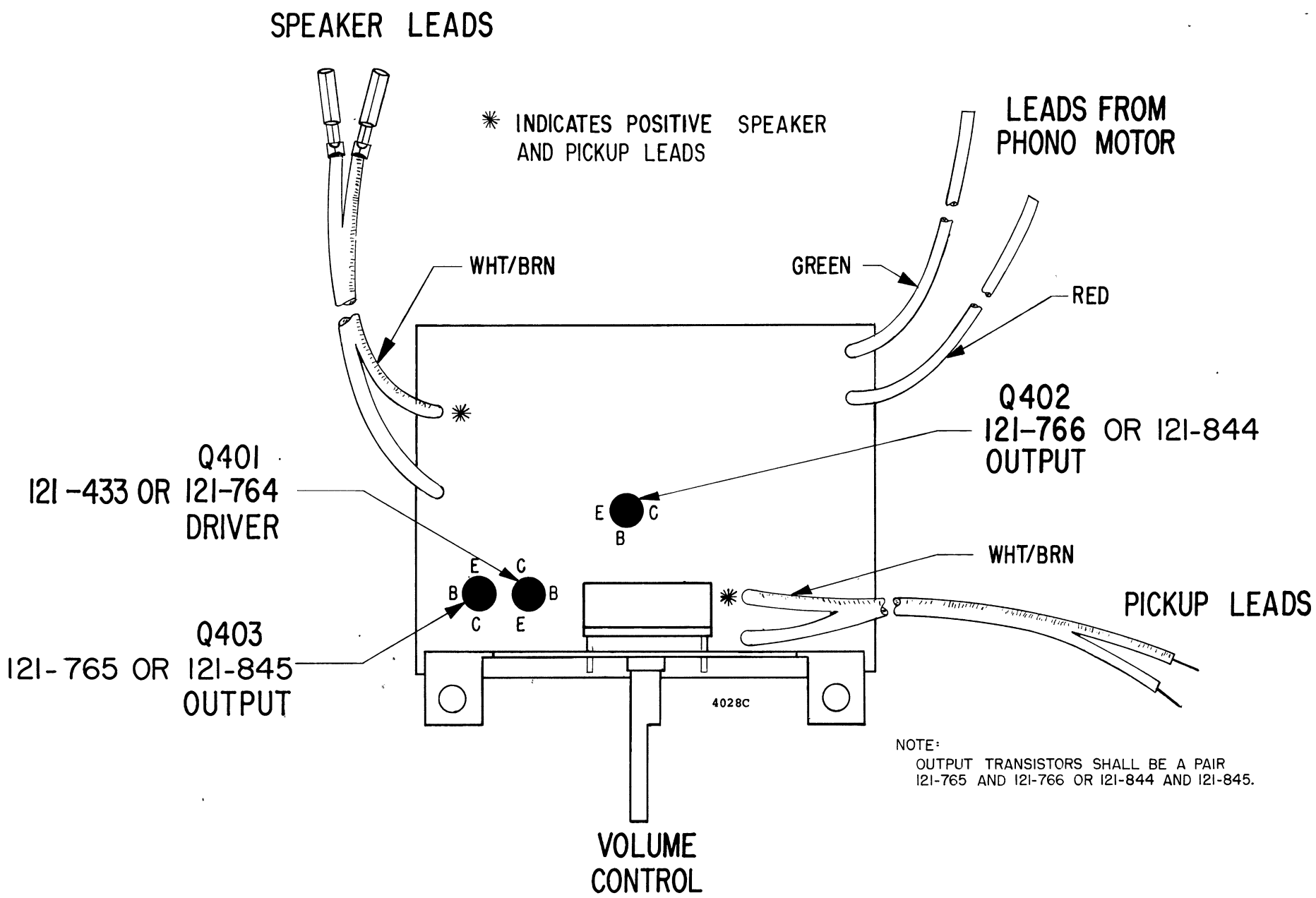
CHASSIS 1WDA10 – SCHEMATIC



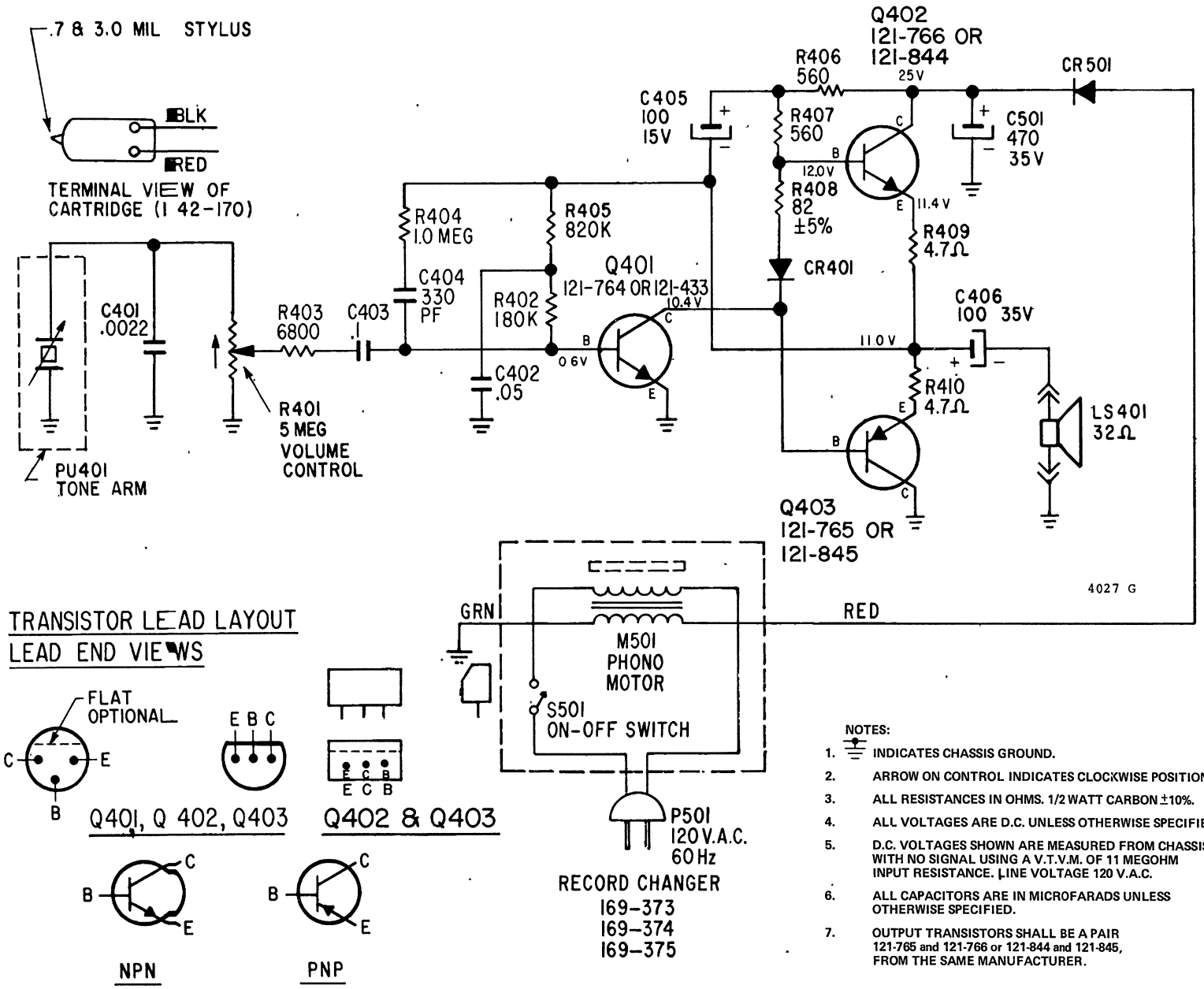
CHASSIS 1WDA10 – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE – EARLY PRODUCTION



CHASSIS 1WDA10 – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE – LATE PRODUCTION



CHASSIS 3AT20 – CHASSIS LAYOUT



LEGEND CHASSIS 3AT20

ITEM NO.	PART NO.	DESCRIPTION
C401	22-5201	.0022 MFD DISC. 25V
C402	22-3034	.05 MFD DISC. 25V
C404	22-3255	330 PF DISC. 25V
C403	22-3652	.1 MFD DISC. 10V
C405	22-4568	100 MFD ELECTROLYTIC 15V
C406	22-4570	100 MFD ELECTROLYTIC 35V
C501	22-6096	470 MFD ELECTROLYTIC 35V
R401	63-8321	5 MEG OHMS VOLUME CONTROL
R402	63-1880	180K
R403	63-1820	6800
R404	63-1911	1.0 MEG
R405	63-1908	820K
R406	63-1775	560
R407	63-1775	560
R408	63-1739	82 5%
R409	63-4529	4.7
R410	63-4529	4.7
CR401	103-145	BIASING DIODE
CR501	212-94	RECTIFIER DIODE
LS401	49-1184	SPEAKER

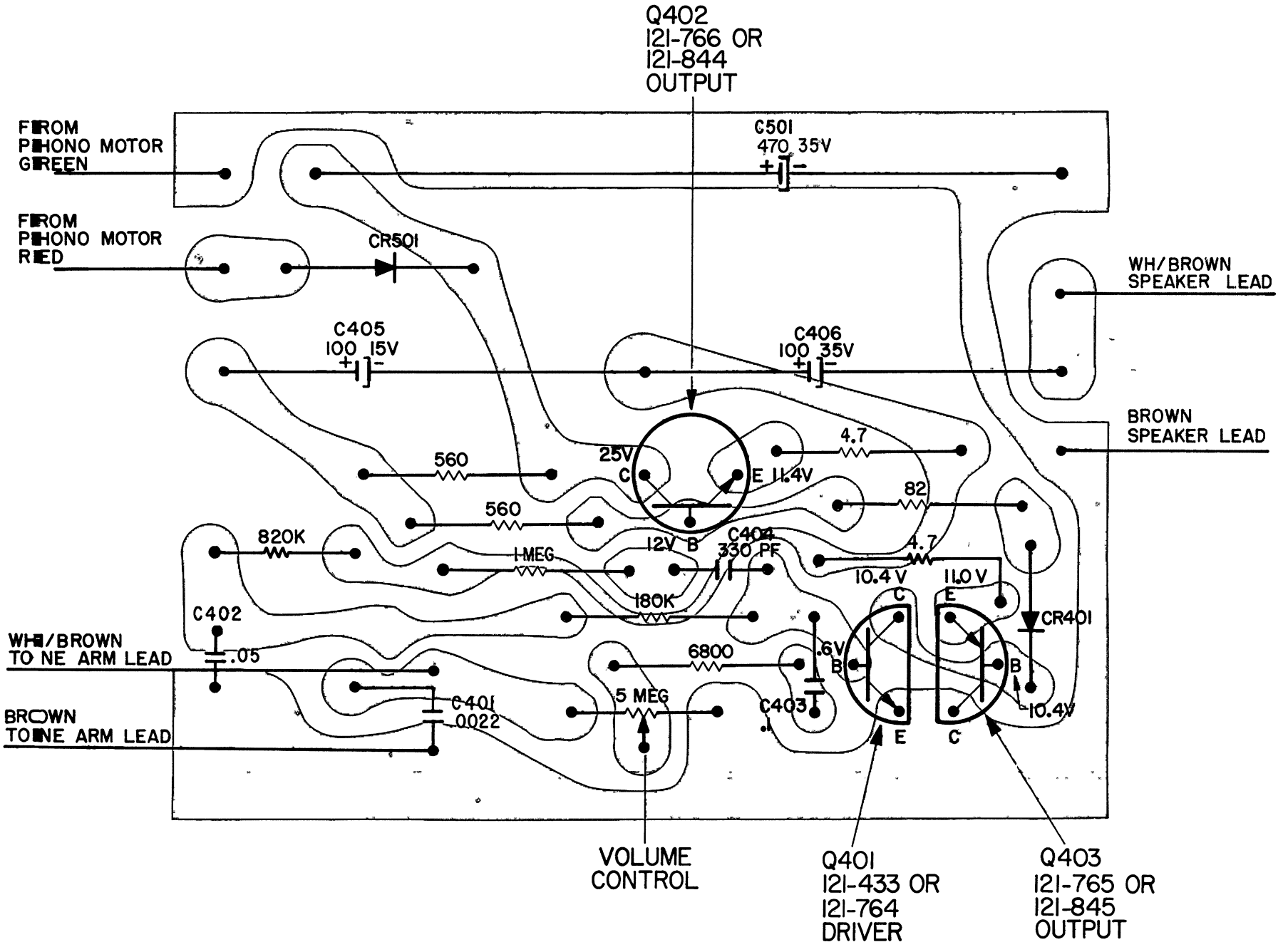
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TRANSISTOR LEAD LAYOUT
LEAD END VIEWS

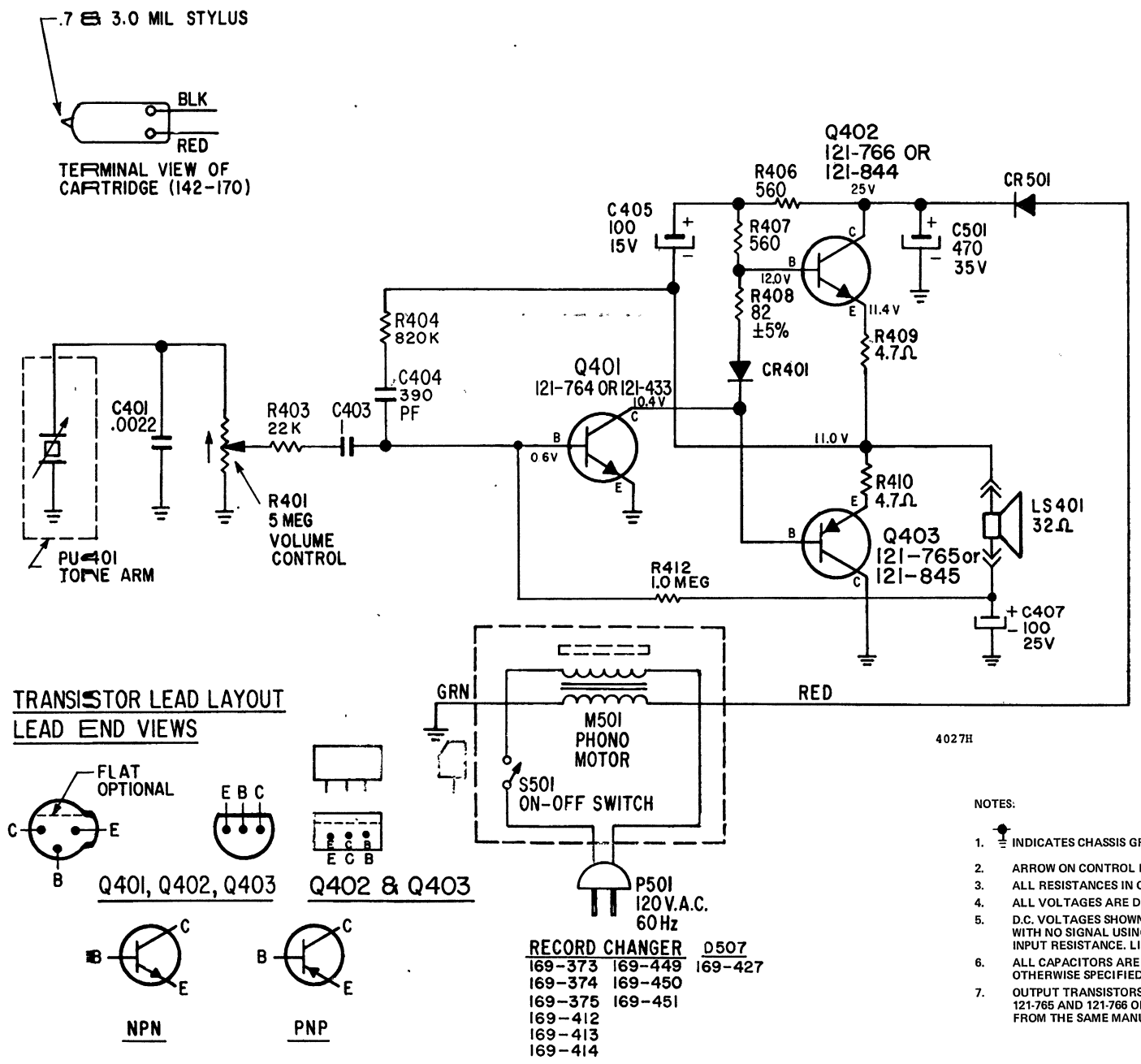
NOTES:

1. ⏚ INDICATES CHASSIS GROUND.
2. ARROW ON CONTROL INDICATES CLOCKWISE POSITION.
3. ALL RESISTANCES IN OHMS. 1/2 WATT CARBON ±10%.
4. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
5. D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL USING A V.T.V.M. OF 11 MEGOHM INPUT RESISTANCE. LINE VOLTAGE 120 V.A.C.
6. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
7. OUTPUT TRANSISTORS SHALL BE A PAIR 121-765 and 121-766 or 121-844 and 121-845, FROM THE SAME MANUFACTURER.

CHASSIS 3AT20 – SCHEMATIC – EARLY PRODUCTION



CHASSIS 3AT20 – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE – EARLY PRODUCTION



CHASSIS 3AT20

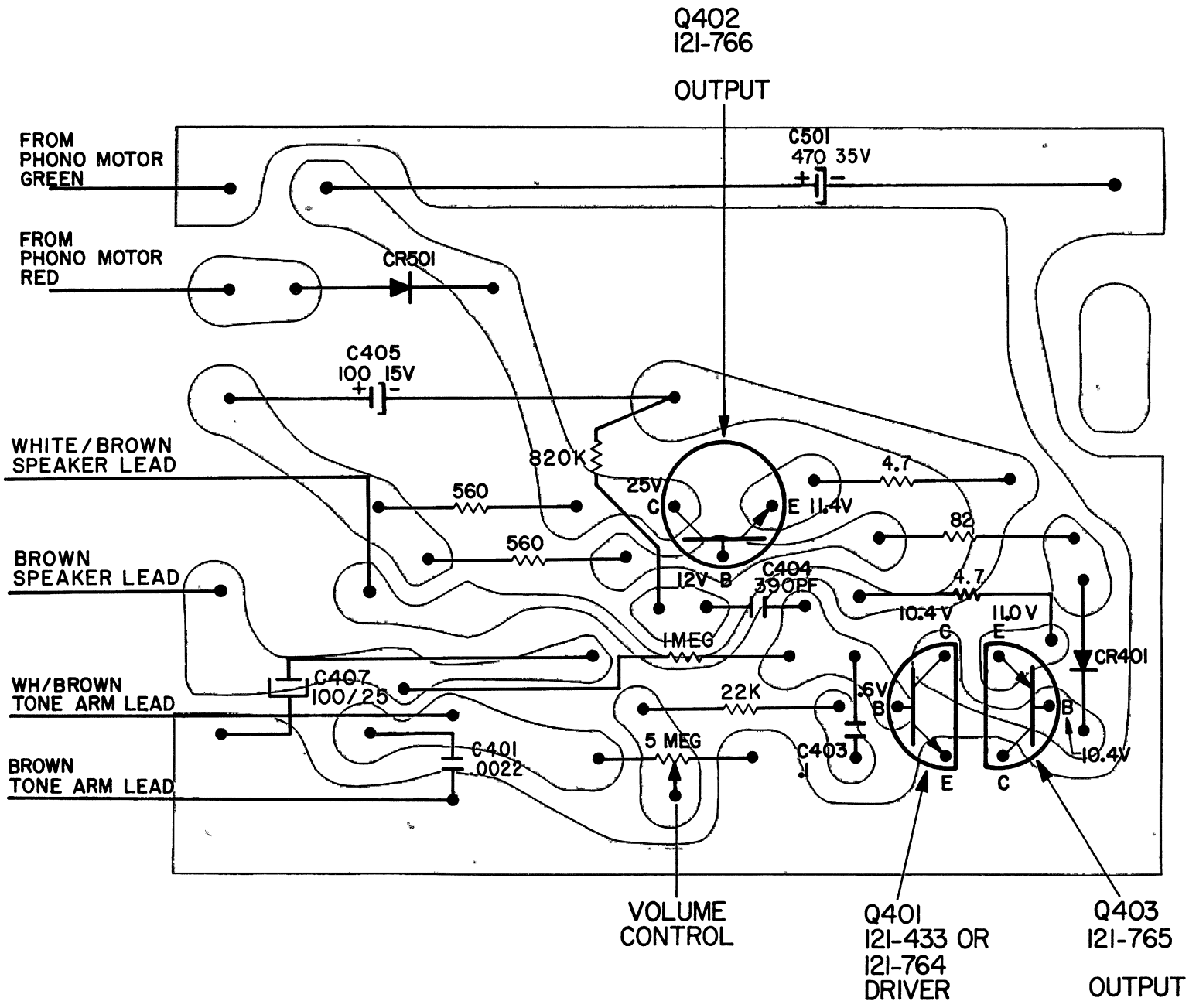
ITEM NO.	PART NO.	DESCRIPTION
C401	22-5201	.0022 MFD DISC. 25 V
C403	22-3652	.1 MFD DISC. 10 V
C404	22-3177	390 PF DISC. 500 V
C405	22-4568	100 MFD ELECTROLYTIC 15 V
C407	22-3973	100 MFD ELECTROLYTIC 25 V
C501	22-6096	470 MFD ELECTROLYTIC 35 V
R401	63-8321	5 MEG OHMS VOLUME CONTROL
R403	63-1841	22K
R404	63-1908	820K
R406	63-1775	560
R407	63-1775	560
R408	63-1739	82 ±5%
R409	63-4529	4.7
R410	63-4529	4.7
R412	63-1911	1.0 MEG
CR401	103-145	BIASING DIODE
CR501	212-76	SILICON RECTIFIER
LS401	49-1184	SPEAKER (6 1/4 x 2 1/4)

4027H

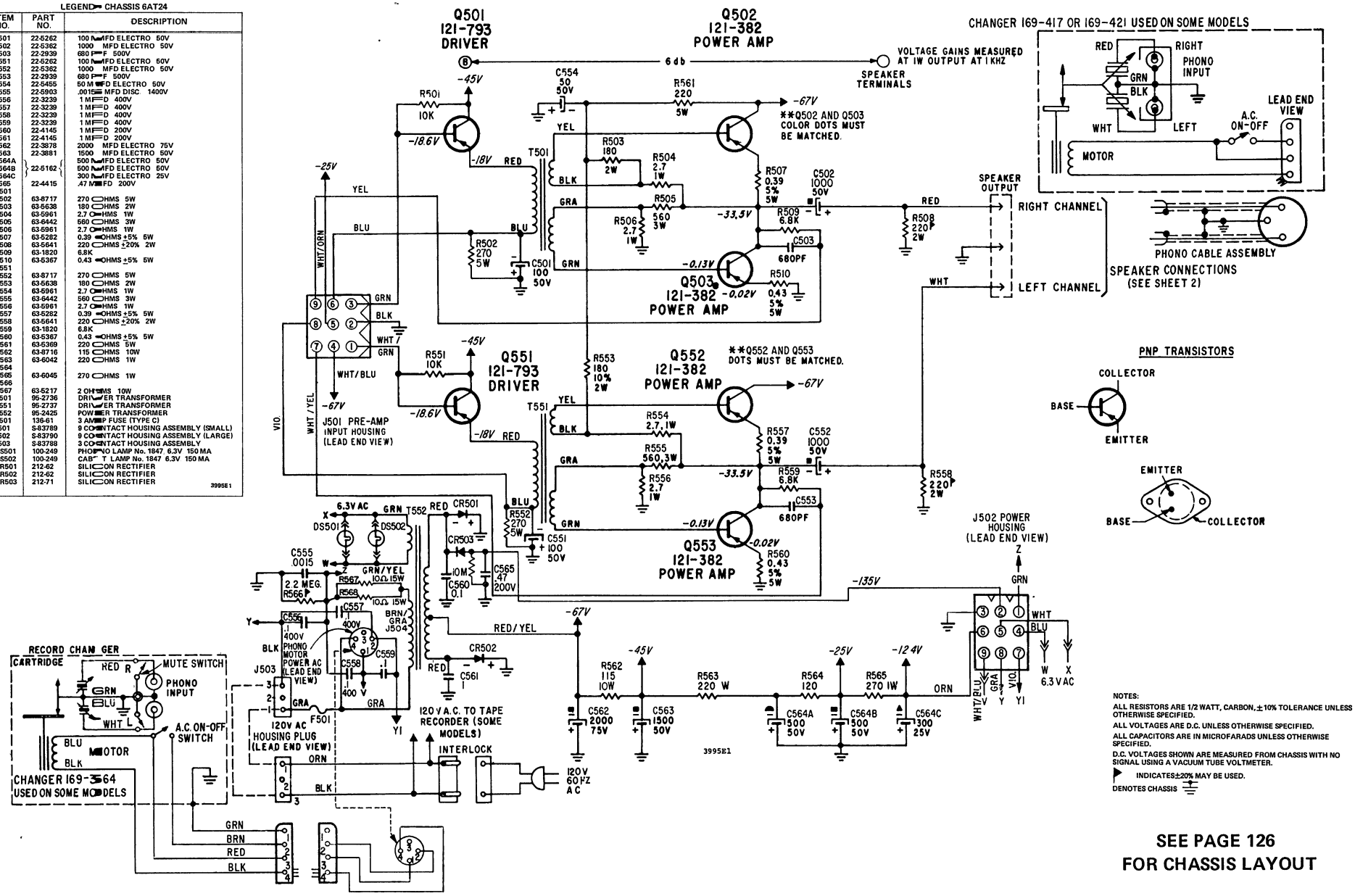
NOTES:

1. ⏚ INDICATES CHASSIS GROUND.
2. ARROW ON CONTROL INDICATES CLOCKWISE POSITION.
3. ALL RESISTANCES IN OHMS. 1/2 WATT CARBON ± 10%.
4. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
5. D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL USING A V.T V.M. OF 11 MEGOHM INPUT RESISTANCE. LINE VOLTAGE 120 V.A.C.
6. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
7. OUTPUT TRANSISTORS SHALL BE A PAIR 121-765 AND 121-766 OR 121-844 AND 121-845, FROM THE SAME MANUFACTURER.

CHASSIS 3AT20 – SCHEMATIC – LATE PRODUCTION



CHASSIS 3AT20 – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE – LATE PRODUCTION



SEE PAGE 126
FOR CHASSIS LAYOUT

CHASSIS 6AT24 – SCHEMATIC

NOTES

DESCRIPTION FOR THE TRANSISTORS AND IC							
Q1	FM RF	Q102	AM CONV	Q401	PRE AMPLIFIER	Q403	DRIVER	Q405	OUTPUT
Q2	FM MIX	Q201	AM FM 1st IF	Q451	PRE AMPLIFIER	Q453	DRIVER	Q455	OUTPUT
Q3	FM OSC	Q202	AM FM 2nd IF	Q402	PRE DRIVER	Q404	OUTPUT	IC301	MPX DEMODULATOR
Q101	AM RF	Q203	FM 3rd IF	Q452	PRE DRIVER	Q454	OUTPUT		



PIN 3 COMPOSITE L&R, L-R (1 KHZ LEFT ONLY) 19 KHZ PILOT 10% 1 V P/P

PIN 2 19 KHZ (WITH L ONLY) 200 MV P/P

PIN 1 19 KHZ 1.2V P/P

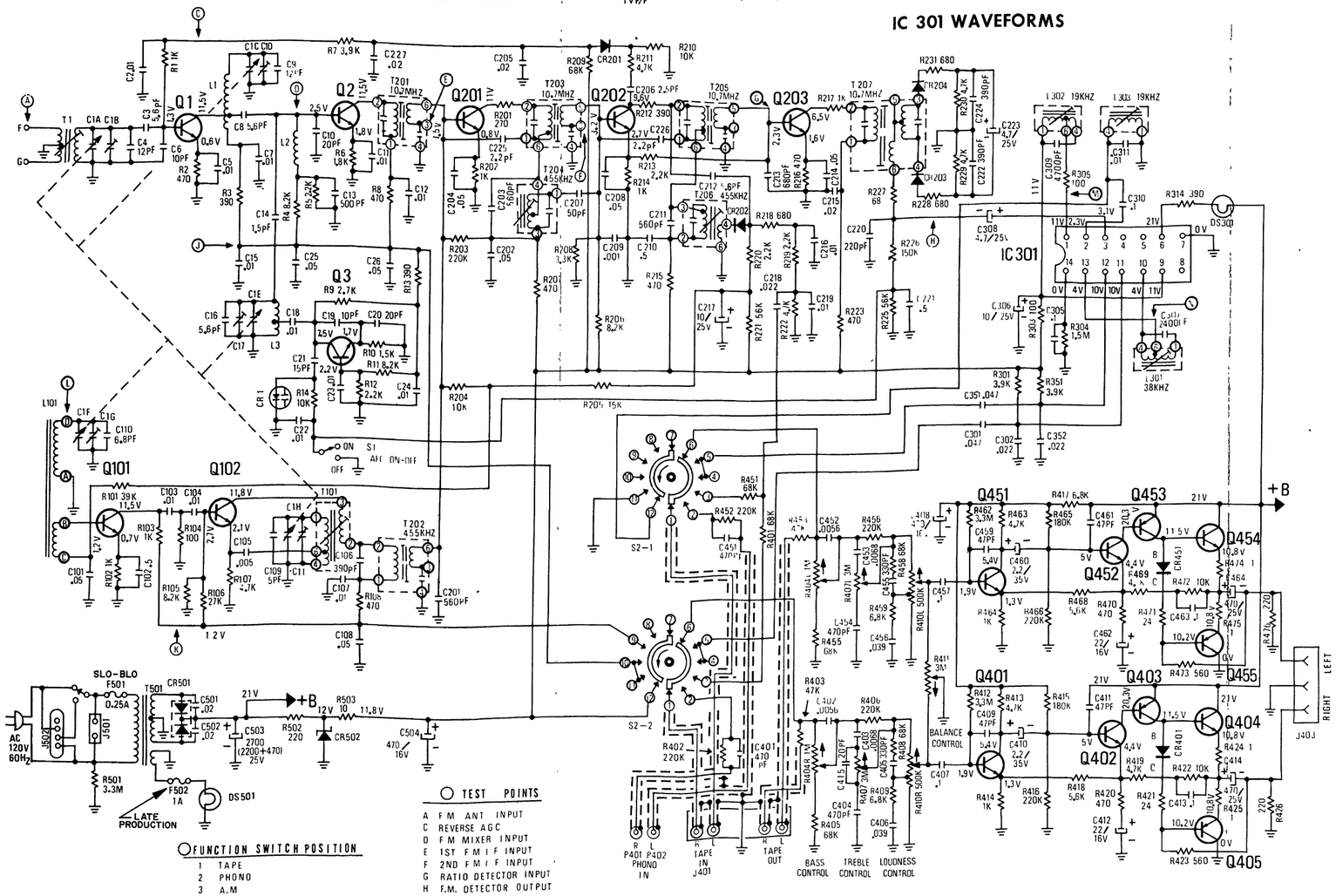
PIN 10 38 KHZ PULSES 80MV P/P

38 KHZ TANK END 38 KHZ 13V P/P

PIN 13 38 KHZ 1.4V P/P

PIN 12 (UPPER) RIGHT OUTPUT PIN 11 (LOWER) LEFT OUTPUT (L INPUT ONLY) 1 V P/P

IC 301 WAVEFORMS

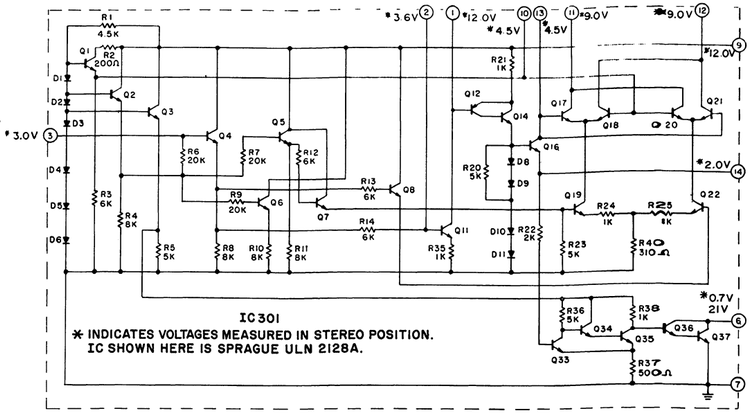


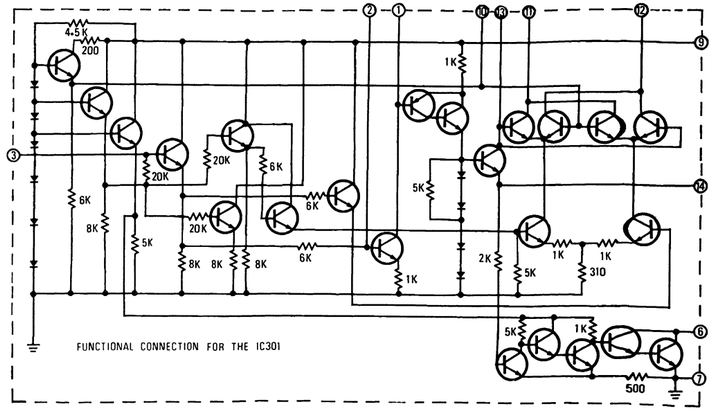
○ TEST POINTS

A	FM ANT INPUT
C	REVERSE AGC
D	FM MIXER INPUT
E	1ST FM I F INPUT
F	2ND FM I F INPUT
G	RATIO DETECTOR INPUT
H	F.M. DETECTOR OUTPUT
J	FM. B+
K	A.M B+
L	A.M. RF & I F INPUT
M	19KHZ OUTPUT
N	38KHZ OUTPUT

○ FUNCTION SWITCH POSITION

1	TAPE
2	PHONO
3	A.M
4	F M STEREO
5	FM





NOTES

1 I.F. FREQUENCY — AM 455KHZ; FM 10.7MHZ

2 TUNING RANGE — AM 540KHZ — 1600KHZ; FM 88 MHZ — 108 MHZ

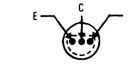
3 RESISTANCE VALUES IN OHMS CAPACITANCE IN MICRO FARADS UNLESS OTHERWISE SPECIFIED

4 ALL VOLTAGES ARE D C UNLESS OTHERWISE SPECIFIED AND ARE MEASURED WITHOUT SIGNAL INPUT USING A VACUUM TUBE VOLT METER

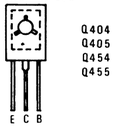
5 VOLTAGES MEASURED IN THE FM STEREO POSITION WITHOUT AM SECTION

6 ⏚ DENOTE CHASSIS GROUND

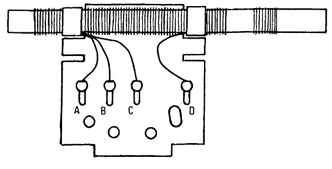
TRANSISTOR LEAD LAYOUTS
LEAD END VIEWS



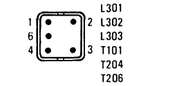
Q1 Q2 Q3 Q101 Q102 Q203 Q202 Q203 Q401 Q402 Q403 Q451 Q452 Q453



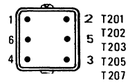
Q404 Q405 Q454 Q455



L101 A.M. ANTENNA

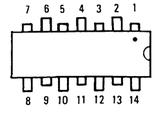


L301
L302
L303
T101
T204
T206

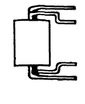


T201
T202
T203
T205
T207

TRANSFORMER TERMINATION BOTTOM VIEWS

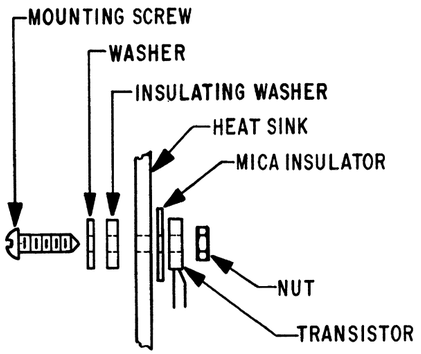


IC BASE DIAGRAM



LEGEND CHASSIS 4WDR50X (X1)

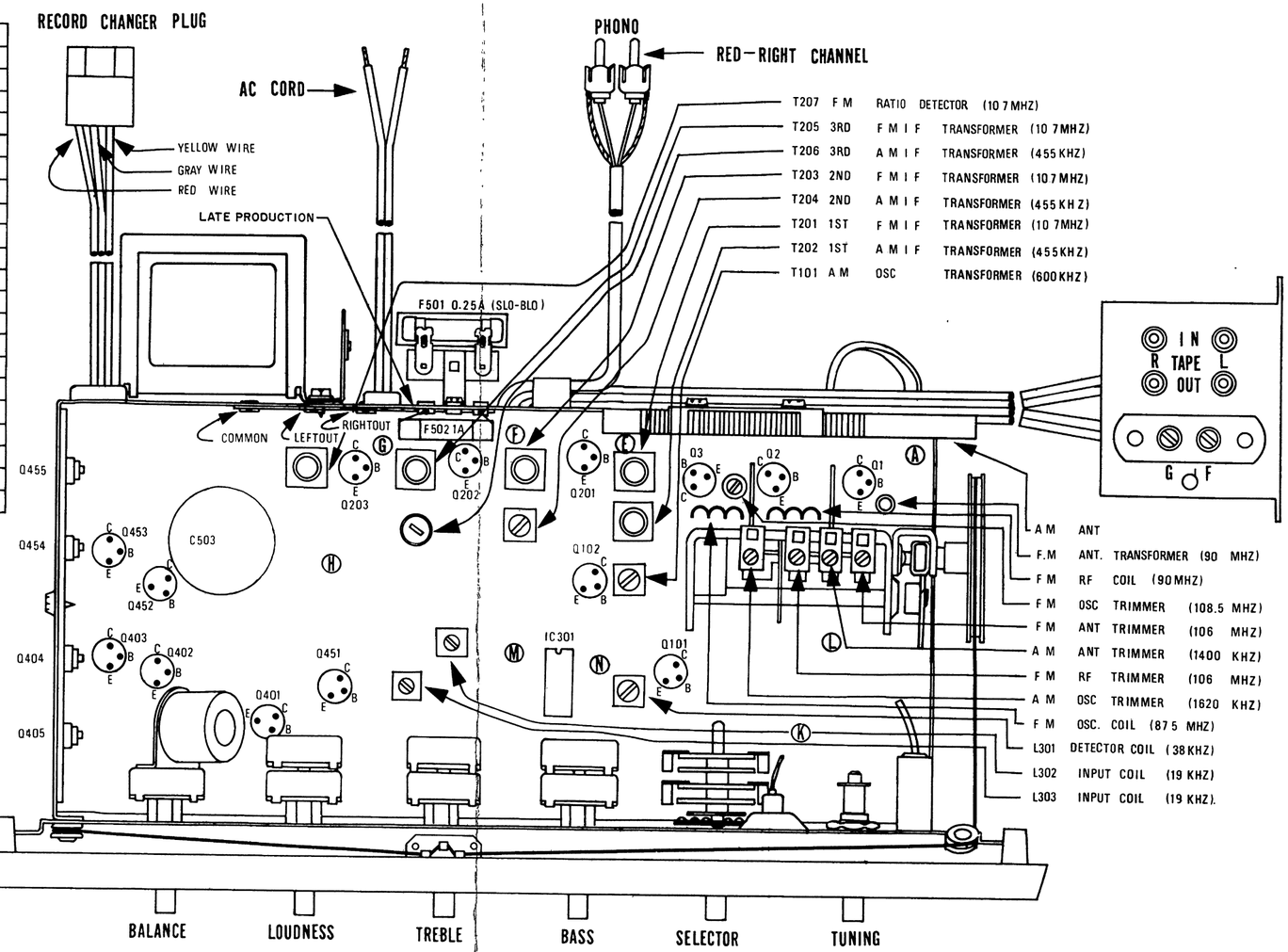
ITEM NO.	PART NUMBER	DESCRIPTION
C1	020-0008	TUNING
C2	020-0009	.01 MF CERAMIC 50V -20%
C3	020-0019	4.6 PF CERAMIC 50V +/-0.25 PF
C4	020-0018	12 PF CERAMIC 50V +/-5%
C5	020-0009	.01 MF CERAMIC 50V +80% -20%
C6	020-0009	.01 MF CERAMIC 50V +80% -20%
C7	020-0018	12 PF CERAMIC 50V +/-5%
C8	020-0018	5.6 PF CERAMIC 50V +/-0.25 PF
C9	020-0018	10 PF CERAMIC 50V +/-5%
C10	020-0018	6.8 PF CERAMIC 50V +/-0.25 PF
C11	020-0010	.01 MF CERAMIC 50V +80% -20%
C12	020-0010	.01 MF CERAMIC 50V +80% -20%
C13	020-0010	680 PF CERAMIC 50V 10%
C14	020-0018	1.5 PF CERAMIC 50V 5%
C15	020-0019	4.6 PF CERAMIC 50V +/-0.25 PF RTRD
C16	020-0020	TRIMMER
C17	020-0009	.01 MF CERAMIC 50V +80% -20%
C18	020-0018	10 PF CERAMIC 50V 5%
C19	020-0018	10 PF CERAMIC 50V 5%
C20	020-0018	10 PF CERAMIC 50V 5%
C21	020-0010	.01 MF CERAMIC 50V +80% -20%
C22	020-0010	.01 MF CERAMIC 50V +80% -20%
C23	020-0010	.01 MF CERAMIC 50V +80% -20%

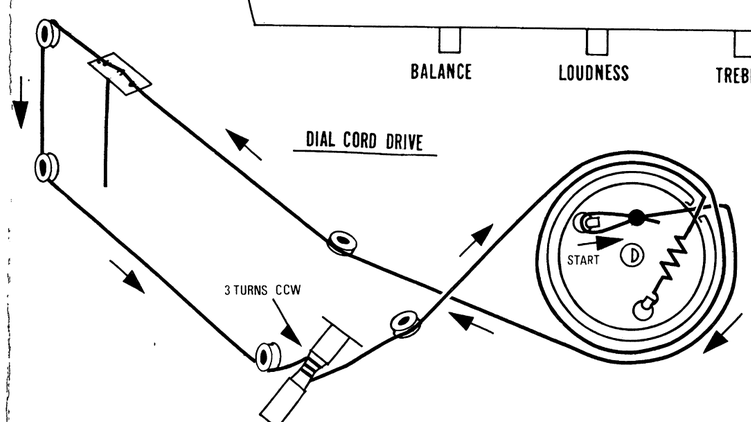


OUTPUT TRANSISTOR MOUNTING VIEW

TERMINAL STRIP

TRANSISTORS & IC	
NO	DESCRIPTION
Q1	F M R F
Q2	F M MIX
Q3	F M OSC
Q101	A M RF
Q102	A M CONV
Q201	A M F M 1ST I F
Q202	A M F M 2ND I F
Q203	F M 3RD I F
Q401	PRE AMPLIFIER R
Q451	PRE AMPLIFIER L
Q402	PRE DRIVER R
Q452	PRE DRIVER L
Q403	DRIVER R
Q453	DRIVER L
Q404	OUTPUT R
Q454	OUTPUT L
Q405	OUTPUT R
Q455	OUTPUT L
IC301	MPX DEMODULATOR

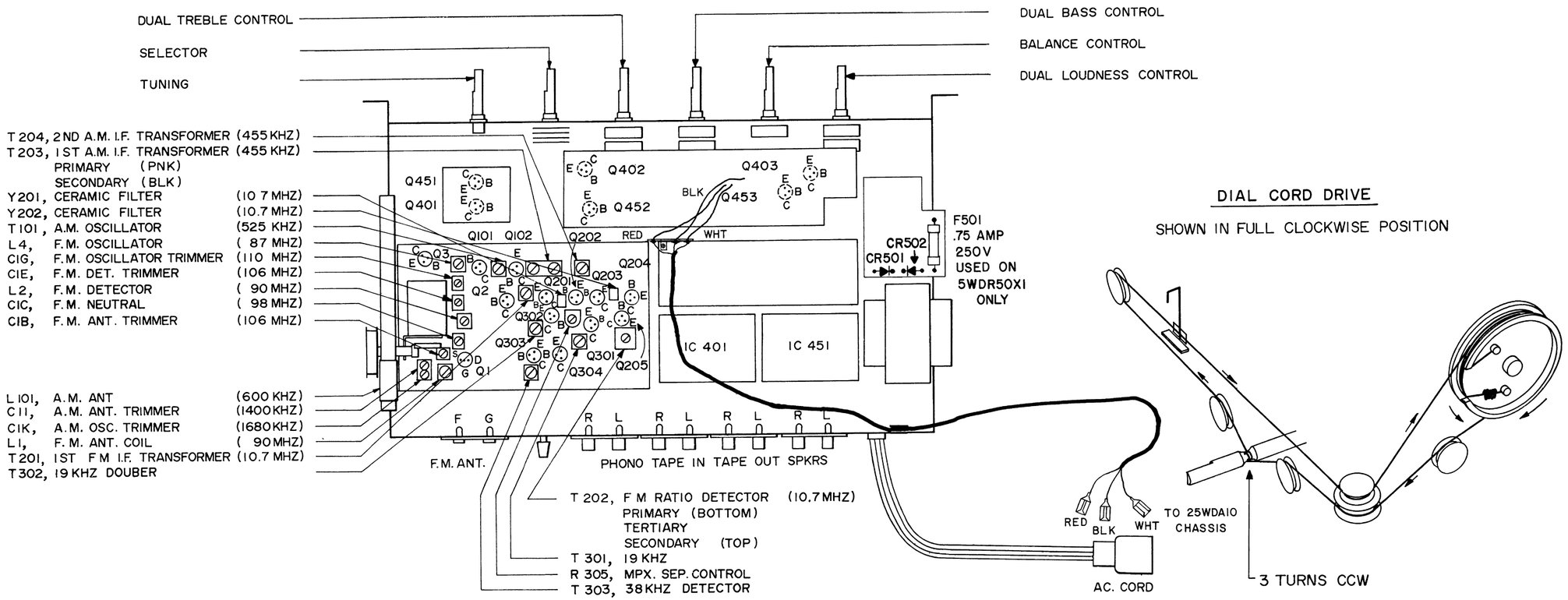




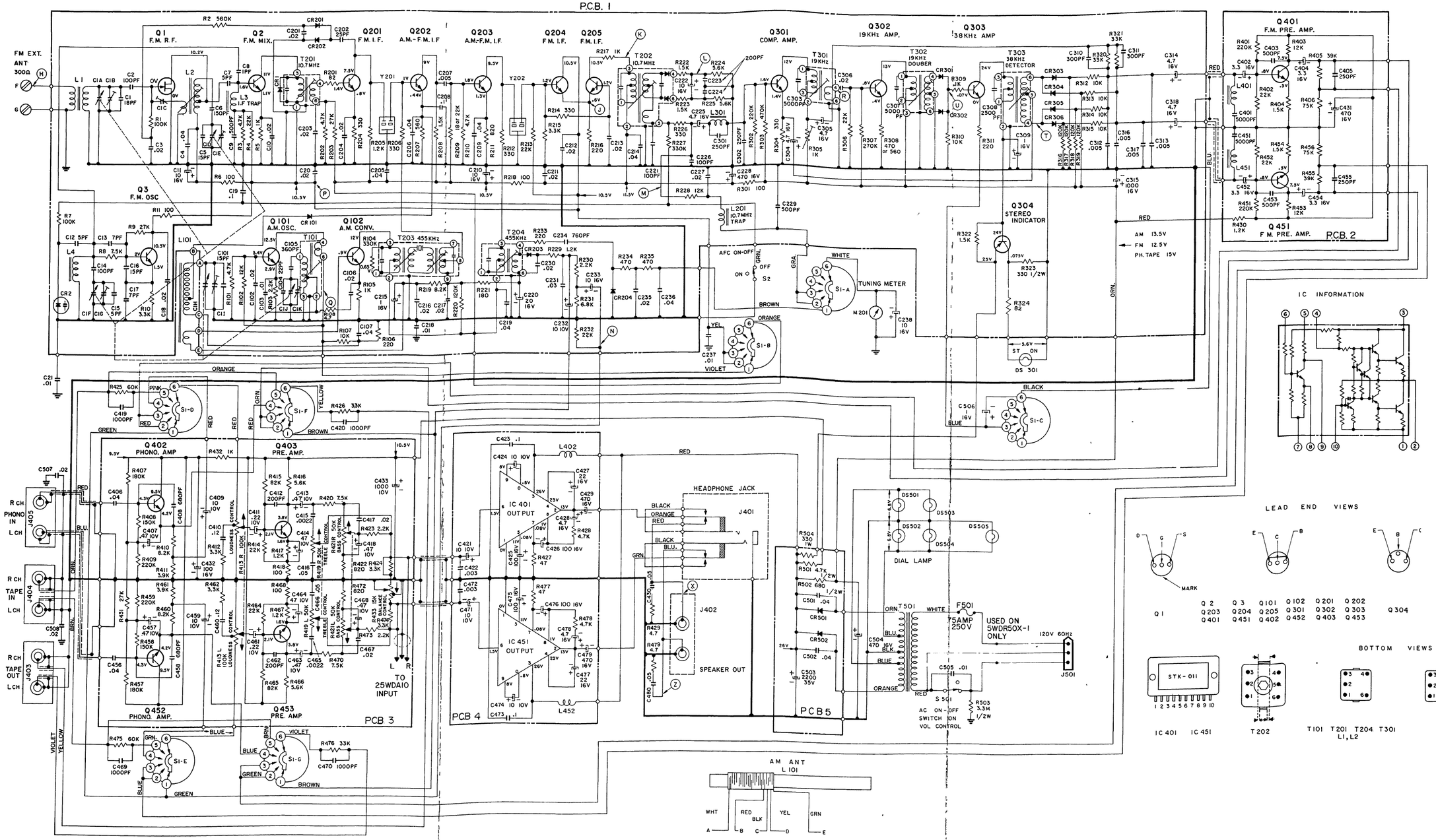
TEST POINTS			
A	F M ANT INPUT	H	F.M DETECTOR OUTPUT
C	REVERSE AGC	I	F M. B+
D	F M MIXER INPUT	K	A.M B+
E	1ST F M I F INPUT	L	A.M R F & I F INPUT
F	2ND F M I F INPUT	M	19KHZ OUTPUT
G	RATIO DETECTOR INPUT	N	38KHZ OUTPUT

CHASSIS 4WDR50X(X1) — CHASSIS LAYOUT

TRANSISTOR and IC'S			
Q1	F.M. - R.F.	Q302	19 KHZ AMP.
Q2	F.M. - MIX.	Q303	38KHZ AMP.
Q3	F.M. - OSC.	Q304	STEREO INDIC.
Q101	A.M. - OSC.	Q401	F.M. PRE. AMP.
Q102	A.M. - CONV.	Q451	F.M. PRE. AMP.
Q201	F.M. - I.F.	Q402	PHONO. PRE.AMP.
Q202	A.M.-F.M.-I.F.	Q452	PHONO. PRE AMP.
Q203	A.M.-F.M.-I.F.	Q403	PRE. AMP.
Q204	F.M. - I.F.	Q453	PRE. AMP.
Q205	F.M. - I.F.	IC401	OUTPUT RIGHT
Q301	COMP. AMP.	IC451	OUTPUT LEFT



CHASSIS 5WDR50X(X1) – CHASSIS LAYOUT



TEST POINT

H	F.M. ANT. INPUT
J	RATIO DETECTOR INPUT
K	F.M. I.F. OUTPUT
L	RATIO DET PRIMARY TUNING
M	F.M. DETECTOR OUTPUT
N	A.M. DETECTOR OUTPUT
P	F.M. B^+
Q	A.M. B^+
R	19KHz OUTPUT
U	DOUBLER OUTPUT
T	MPX PHASING
X	RIGHT OUTPUT
Z	LEFT OUTPUT

NOTES:

- I.F. FREQUENCY: A.M. 455KHz, F.M. 10.7MHz
- TUNING RANGE: A. M. 540-1600KHz, F. M. 88-108MHz
- ALL RESISTORS ±10% TOLERANCE. 1/4 WATT. CARBON UNLESS OTHERWISE SPECIFIED.
- RESISTANCE VALUES IN OHMS, CAPACITANCE IN MICROFARADS UNLESS OTHEWISE SPECIFIED.
- ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED, AND ARE MEASURED WITHOUT SIGNAL INPUT USING A HIGH IMPEDANCE VACUUM TUBE VOLTMETER.
- VOLTAGE MEASURED IN THE FM MPX POSITION, EXCEPT AM SECTION,

⏚ DENOTES CHASSIS

BANDSWITCH POSITIONS:

1 AM
2 FM MONO
3 FM MPX
4 PHONO
5 TAPE

LEAD END VIEWS

Q1	Q 2 Q 203 Q 401	Q 3 Q 204 Q 451	Q101 Q 205 Q 402	Q 102 Q 301 Q 452	Q 201 Q 302 Q 403	Q 202 Q 303 Q 453	Q 304	

BOTTOM VIEWS

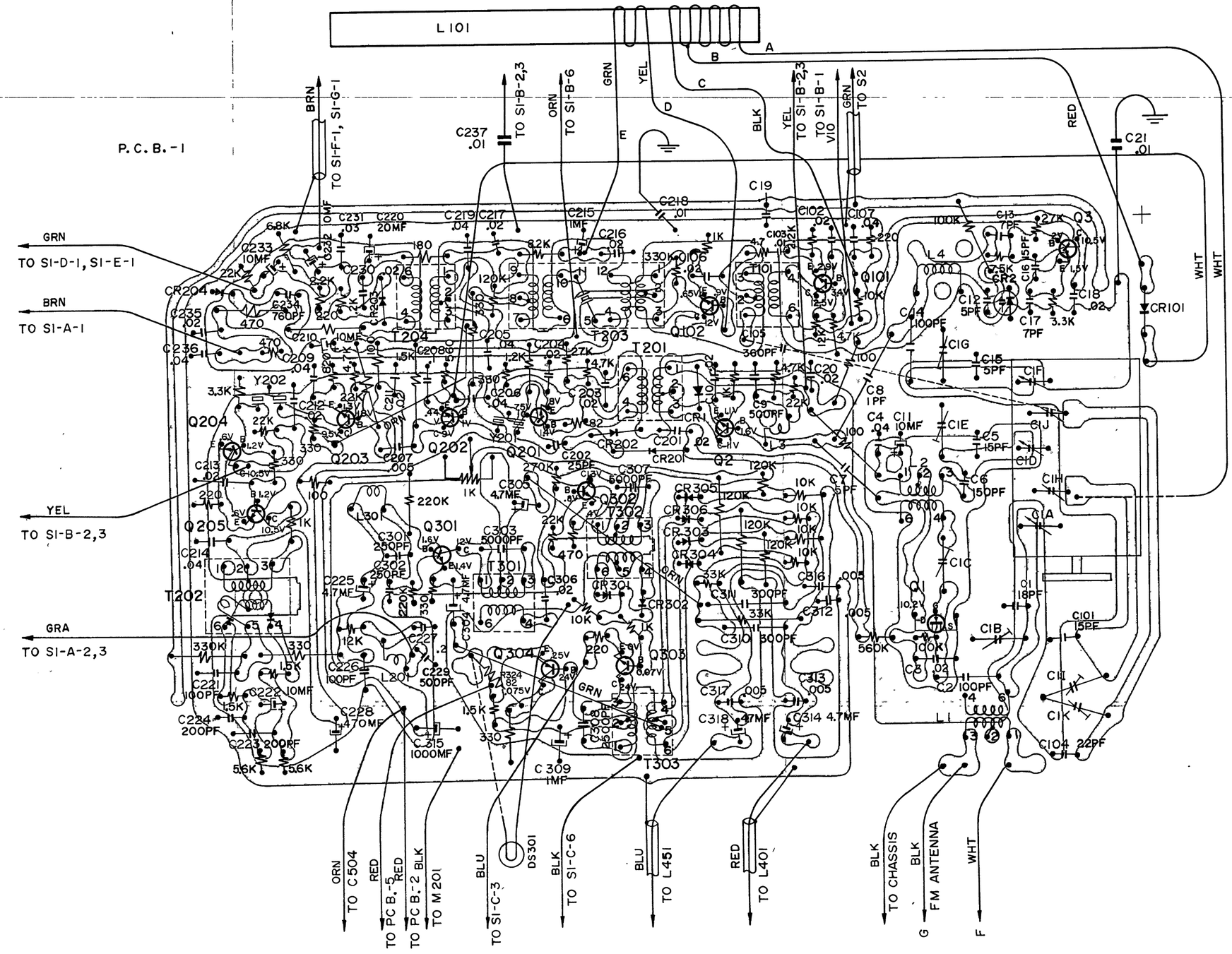


IC 401 IC 451 T 202 T101 T201 T204 T301 L1, L2 T 203 T 302 T303

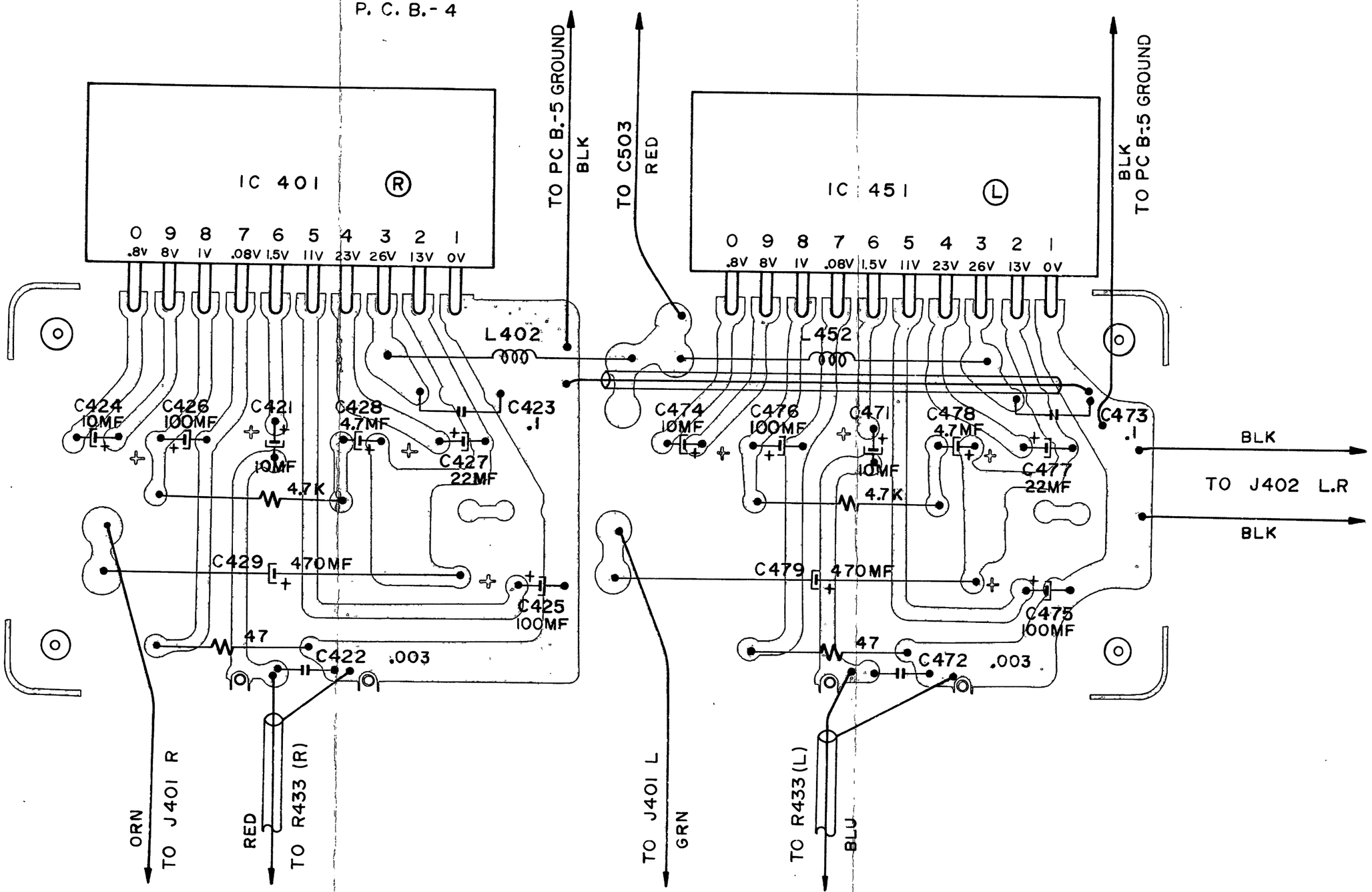
LEGEND CHASSIS 5WDR50X AND X1

ITEM NO.	PART NUMBER	DESCRIPTION	ITEM NO.	PART NUMBER	DESCRIPTION
C101	822-7038	18 PF +/-0.5 PF CERAMIC	R200	863-6998	220 OHM-1/4W, 10%
C102	822-6046	VARIABLE CONDENSER	R201	863-7013	1000 OHM-1/4W, 10%
C103	822-5686	VARIABLE CONDENSER	R202	863-7013	1000 OHM-1/4W, 10%
C104	822-5565	VARIABLE CONDENSER	R203	863-7186	22K OHM-1/4W, 10%
C105	822-5565	VARIABLE CONDENSER	R204	863-7146	4700 OHM-1/4W, 10%
C106	822-5565	VARIABLE CONDENSER	R211	863-7028	820 OHM-1/4W, 10%
C107	822-5565	VARIABLE CONDENSER	R212	863-6998	220 OHM-1/4W, 10%
C108	822-4756	1 PF TRIMMER	R213	863-7198	22K OHM-1/4W, 10%
C109	822-4758	1 PF TRIMMER	R214	863-6858	330 OHM-1/4W, 10%
C110	822-4758	1 PF TRIMMER	R215	863-7130	3300 OHM-1/4W, 10%
C111	822-4758	1 PF TRIMMER	R216	863-7130	3300 OHM-1/4W, 10%
C112	822-4758	1 PF TRIMMER	R217	863-7030	1000 OHM-1/4W, 10%
C113	822-6115	100 PF 10% CERAMIC	R218	863-6968	100 OHM-1/4W, 10%
C114	822-5046	0.02 MF CERAMIC	R219	863-7150	6200 OHM-1/4W, 10%
C115	822-6036	0.04 MF CERAMIC	R220	863-7228	120K OHM-1/4W, 10%
C116	822-6138	10 PF 5% CERAMIC	R221	863-6978	150 OHM-1/4W, 10%
C117	823-5958	150 PF 10% CERAMIC	R222	863-7056	1500 OHM-1/4W, 10%
C118	822-6138	10 PF 5% CERAMIC	R223	863-7056	1500 OHM-1/4W, 10%
C119	823-5173	1 PF +/-0.5 PF CERAMIC	R224	863-7150	6200 OHM-1/4W, 10%
C120	823-5323	500 PF 5% STYROL	R225	863-7151	5600 OHM-1/4W, 10%
C121	822-6045	0.01 MF CERAMIC	R226	863-6983	330 OHM-1/4W, 10%
C122	822-5268	10 MF ELECTROLYTIC-16V	R227	863-7239	330K OHM-1/4W, 10%
C123	823-5075	5 PF +/-0.5 PF CERAMIC	R228	863-7103	12K OHM-1/4W, 10%
C124	823-7158	7 PF +/-0.5 PF CERAMIC	R229	863-7138	3900 OHM-1/4W, 10%
C125	823-7158	7 PF +/-0.5 PF CERAMIC	R230	863-7128	2200 OHM-1/4W, 10%
C126	823-7078	0.99 +/-0.5 PF CERAMIC	R231	863-7068	6800 OHM-1/4W, 10%
C127	823-7078	15 PF +/-0.5 PF CERAMIC	R232	863-7198	22K OHM-1/4W, 10%
C128	823-7158	7 PF +/-0.5 PF CERAMIC	R233	863-8228	2200 OHM-1/2W, 10%
C129	822-5045	0.02 MF CERAMIC	R234	863-8318	470 OHM-1/2W, 10%
C130	822-5045	0.1 MF CERAMIC	R235	863-8318	470 OHM-1/2W, 10%
C131	822-5045	0.02 MF CERAMIC	R301	863-7058	1500 OHM-1/4W, 10%
C132	822-5045	0.02 MF CERAMIC	R302	863-7138	3300 OHM-1/4W, 10%
C133	823-5128	10 PF +/-0.5 PF CERAMIC	R303	863-7150	6200 OHM-1/4W, 10%
C134	822-5048	0.05 MF CERAMIC	R304	863-6998	220 OHM-1/4W, 10%
C135	822-5046	0.01 MF 20% CERAMIC	R305	863-7168	15K OHM-1/4W, 10%
C136	822-6141	22 PF 5% CERAMIC	R306	863-7160	9100 OHM-1/4W, 10%
C137	822-6051	390 PF 5% STYROL	R307	863-7010	680 OHM-1/4W, 10%
C138	822-4888	0.02 MF 20% CERAMIC	R308	863-7030	1000 OHM-1/4W, 10%
C139	822-4888	0.02 MF 20% CERAMIC	R309	863-7178	18K OHM-1/4W, 10%
C140	822-5045	0.02 MF CERAMIC	R310	863-7128	2200 OHM-1/4W, 10%
C141	822-5529	26 PF 5% CERAMIC	R311	863-6958	220 OHM-1/4W, 10%
C142	822-5048	0.05 MF CERAMIC	R312	863-7178	18K OHM-1/4W, 10%
C143	822-5048	0.02 MF CERAMIC	R313	863-7176	16K OHM-1/4W, 10%
C144	822-5038	0.04 MF CERAMIC	R314	863-7178	18K OHM-1/4W, 10%
C145	822-5938	0.01 MF CERAMIC	R315	863-7229	120K OHM-1/4W, 10%
C146	822-5048	0.05 MF CERAMIC	R316	863-7229	120K OHM-1/4W, 10%
C147	823-10438	0.1 MF MYLAR	R317	863-7228	120K OHM-1/4W, 10%
C148	822-5038	0.04 MF CERAMIC	R318	863-7228	120K OHM-1/4W, 10%
C149	822-5268	10 MF ELECTROLYTIC-16V	R319	863-7228	120K OHM-1/4W, 10%
C150	822-4888	0.02 MF 20% CERAMIC	R320	863-6338	33K OHM-1/4W, 10%
C151	822-5045	0.02 MF CERAMIC	R321	863-7068	6800 OHM-1/4W, 10%
C152	822-5048	0.05 MF CERAMIC	R322	863-6618	330 OHM-1/2W, 10%
C153	822-5268	10 MF ELECTROLYTIC-16V	R323	863-7110	4700 OHM-1/4W, 10%
C154	822-5045	0.02 MF CERAMIC	R401	863-3138	220K OHM-1/4W, 10%
C155	822-5045	0.02 MF CERAMIC	R402	863-7188	33K OHM-1/4W, 10%
C156	822-5038	0.01 MF CERAMIC	R403	863-7188	33K OHM-1/4W, 10%
C157	822-5038	0.04 MF CERAMIC	R404	863-6368	39K OHM-1/4W, 10%
C158	822-5268	10 MF ELECTROLYTIC-16V	R405	863-7398	75K OHM-1/4W, 10%
C159	822-6115	100 PF 10% CERAMIC	R406	863-7388	180K OHM-1/4W, 10%
C160	822-5268	10 MF ELECTROLYTIC-16V	R407	863-7228	120K OHM-1/4W, 10%
C161	822-6102	200 PF 10% CERAMIC	R408	863-7228	120K OHM-1/4W, 10%
C162	822-6102	200 PF 10% CERAMIC	R409	863-7228	120K OHM-1/4W, 10%
C163	823-5288	4.7 MF ELECTROLYTIC-16V	R410	863-6378	39K OHM-1/4W, 10%
C164	822-5268	10 MF ELECTROLYTIC-16V	R411	863-6378	39K OHM-1/4W, 10%
C165	822-5048	0.02 MF CERAMIC	R412	863-6378	39K OHM-1/4W, 10%
C166	822-5415	470 MF ELECTROLYTIC-16V	R413	863-6778	100K OHM LOUDNESS CONTROL W/SWITCH
C167	822-5058	100 PF 10% CERAMIC	R414	863-7198	22K OHM-1/4W, 10%
C168	822-4888	0.02 MF 20% CERAMIC	R415	863-7198	22K OHM-1/4W, 10%
C169	822-4868	0.03 MF 20% MYLAR	R416	863-7048	5600 OHM-1/4W, 10%
C170	822-10408	10 MF ELECTROLYTIC-10V	R417	863-7048	5600 OHM-1/4W, 10%
C171	822-5268	10 MF ELECTROLYTIC-16V	R418	863-6998	220 OHM-1/4W, 10%
C172	822-5058	100 PF 10% CERAMIC	R419	863-7018	820 OHM-1/4W, 10%
C173	822-5323	500 PF 5% STYROL	R420	863-4718	50K OHM TREBLE CONTROL
C174	822-5038	0.04 MF CERAMIC	R421	863-4718	50K OHM BASS CONTROL
C175	822-5068	0.01 MF 20% MYLAR	R422	863-7228	120K OHM-1/4W, 10%
C176	822-10408	10 MF ELECTROLYTIC-16V	R423	863-7388	180K OHM-1/4W, 10%
C201	822-5926	300 PF 10% CERAMIC	R424	863-7128	2200 OHM-1/4W, 10%
C202	822-5538	5000 PF 5% STYROL	R425	863-7138	3300 OHM-1/4W, 10%
C203	822-5538	5000 PF 5% STYROL	R426	863-7278	33K OHM-1/4W, 10%
C204	822-5268	4.7 MF ELECTROLYTIC-16V	R427	863-7178	18K OHM-1/4W, 10%
C205	822-5268	4.7 MF ELECTROLYTIC-16V	R428	863-6458	47K OHM-1/4W, 10%
C206	822-4888	0.02 MF 20% CERAMIC	R429	863-7133	4.7 OHM-1/4W, 10%
C207	822-5038	0.04 MF CERAMIC	R430	863-7045	5600 OHM-1/4W, 10%
C208	822-4978	250 PF 5% STYROL	R431	863-7208	270K OHM-1/4W, 10%
C209	822-5268	10 MF ELECTROLYTIC-25V	R432	863-7218	470K OHM-1/4W, 10%
C210	822-5028	300 PF 10% CERAMIC	R433	863-6458	47K OHM-1/4W, 10%
C211	822-5928	200 PF 10% CERAMIC	R434	863-7045	5600 OHM-1/4W, 10%
C212	822-4978	250 PF 5% STYROL	R435	863-7045	5600 OHM-1/4W, 10%
C213	822-4888	0.02 MF 20% CERAMIC	R436	863-7133	3300 OHM-1/4W, 10%
C214	822-4888	0.02 MF 20% CERAMIC	R437	863-7045	5600 OHM-1/4W, 10%
C215	822-4888	0.02 MF 20% CERAMIC	R438	863-7133	3300 OHM-1/4W, 10%
C216	822-4888	0.02 MF 20% CERAMIC	R439	863-7133	3300 OHM-1/4W, 10%
C217	822-4888	0.02 MF 20% CERAMIC	R440	863-7133	3300 OHM-1/4W, 10%
C218	822-4888	0.02 MF 20% CERAMIC	R441	863-7045	5600 OHM-1/4W, 10%
C219	822-4888	0.02 MF 20% CERAMIC	R442	863-7045	5600 OHM-1/4W, 10%
C220	822-4888	0.02 MF 20% CERAMIC	R443	863-7045	5600 OHM-1/4W, 10%
C221	822-4888	0.02 MF 20% CERAMIC	R444	863-7045	5600 OHM-1/4W, 10%
C222	822-4888	0.02 MF 20% CERAMIC	R445	863-7133	3300 OHM-1/4W, 10%
C223	822-4888	0.02 MF 20% CERAMIC	R446	863-7133	3300 OHM-1/4W, 10%
C224	822-4888	0.02 MF 20% CERAMIC	R447	863-7133	3300 OHM-1/4W, 10%
C225	822-5268	4.7 MF ELECTROLYTIC-16V	R448	863-6418	4.7 OHM-1/4W, 10%
C226	822-5268	4.7 MF ELECTROLYTIC-16V	R449	863-7045	5600 OHM-1/4W, 10%
C227	822-5038	0.04 MF CERAMIC	R450	863-7045	5600 OHM-1/4W, 10%
C228	822-5268	4.7 MF ELECTROLYTIC-16V	R451	863-7045	5600 OHM-1/4W, 10%
C229	822-5268	4.7 MF ELECTROLYTIC-16V	R452	863-7198	22K OHM-1/4W, 10%
C230	822-5268	4.7 MF ELECTROLYTIC-16V	R453	863-7198	22K OHM-1/4W, 10%
C231	822-5268	4.7 MF ELECTROLYTIC-16V	R454	863-7198	22K OHM-1/4W, 10%
C232	822-5268	4.7 MF ELECTROLYTIC-16V	R455	863-7198	22K OHM-1/4W, 10%
C233	822-5268	4.7 MF ELECTROLYTIC-16V	R456	863-7198	22K OHM-1/4W, 10%
C234	822-5268	4.7 MF ELECTROLYTIC-16V	R457	863-7198	22K OHM-1/4W, 10%
C235	822-5268	4.7 MF ELECTROLYTIC-16V	R458	863-7198	22K OHM-1/4W, 10%
C236	822-5268	4.7 MF ELECTROLYTIC-16V	R459	863-7198	22K OHM-1/4W, 10%
C237	822-5268	4.7 MF ELECTROLYTIC-16V	R460	863-7198	22K OHM-1/4W, 10%
C238	822-5268	4.7 MF ELECTROLYTIC-16V	R461	863-7198	22K OHM-1/4W, 10%
C239	822-5268	4.7 MF ELECTROLYTIC-16V	R462	863-7198	22K OHM-1/4W, 10%
C240	822-5268	4.7 MF ELECTROLYTIC-16V	R463	863-7198	22K OHM-1/4W, 10%
C241	822-5268	4.7 MF ELECTROLYTIC-16V	R464	863-7198	22K OHM-1/4W, 10%
C242	822-5268	4.7 MF ELECTROLYTIC-16V	R465	863-7198	22K OHM-1/4W, 10%
C243	822-5268	4.7 MF ELECTROLYTIC-16V	R466	863-7198	22K OHM-1/4W, 10%
C244	822-5268	4.7 MF ELECTROLYTIC-16V	R467	863-7198	22K OHM-1/4W, 10%
C245	822-5268	4.7 MF ELECTROLYTIC-16V	R468	863-7198	22K OHM-1/4W, 10%
C246	822-5268	4.7 MF ELECTROLYTIC-16V	R469	863-7198	22K OHM-1/4W, 10%
C247	822-5268	4.7 MF ELECTROLYTIC-16V	R470	863-7198	22K OHM-1/4W, 10%
C248	822-5268	4.7 MF ELECTROLYTIC-16V	R471	863-7198	22K OHM-1/4W, 10%
C249	822-5268	4.7 MF ELECTROLYTIC-16V	R472	863-7198	22K OHM-1/4W, 10%
C250	822-5268	4.7 MF ELECTROLYTIC-16V	R473	863-7198	22K OHM-1/4W, 10%
C251	822-5268	4.7 MF ELECTROLYTIC-16V	R474	863-7198	22K OHM-1/4W, 10%
C252	822-5268	4.7 MF ELECTROLYTIC-16V	R475	863-7198	22K OHM-1/4W, 10%
C253	822-5268	4.7 MF ELECTROLYTIC-16V	R476	863-7198	22K OHM-1/4W, 10%
C254	822-5268	4.7 MF ELECTROLYTIC-16V	R477	863-7198	22K OHM-1/4W, 10%
C255	822-5268	4.7 MF ELECTROLYTIC-16V	R478	863-7198	22K OHM-1/4W, 10%
C256	822-5268	4.7 MF ELECTROLYTIC-16V	R479	863-7198	22K OHM-1/4W, 10%
C257	822-5268	4.7 MF ELECTROLYTIC-16V	R480	863-7198	22K OHM-1/4W, 10%
C258	822-5268	4.7 MF ELECTROLYTIC-16V	R481	863-7198	22K OHM-1/4W, 10%
C259	822-5268	4.7 MF ELECTROLYTIC-16V	R482	863-7198	22K OHM-1/4W, 10%
C260	822-5268	4.7 MF ELECTROLYTIC-16V	R483	863-7198	22K OHM-1/4W, 10%
C261	822-5268	4.7 MF ELECTROLYTIC-16V	R484	863-7198	22K OHM-1/4W, 10%
C262	822-5268	4.7 MF ELECTROLYTIC-16V	R485	863-7198	22K OHM-1/4W, 10%
C263	822-5268	4.7 MF ELECTROLYTIC-16V	R486	863-7198	22K OHM-1/4W, 10%
C264	822-5268	4.7 MF ELECTROLYTIC-16V	R487	863-7198	22K OHM-1/4W, 10%
C265	822-5268	4.7 MF ELECTROLYTIC-16V	R488	863-7198	22K OHM-1/4W, 10%
C266	822-5268	4.7 MF ELECTROLYTIC-16V	R489	863-7198	22K OHM-1/4W, 10%
C267	822-5268	4.7 MF ELECTROLYTIC-16V	R490	863-7198	22K OHM-1/4W, 10%
C268	822-5268	4.7 MF ELECTROLYTIC-16V	R491	863-7198	22K OHM-1/4W, 10%
C269	822-5268	4.7 MF ELECTROLYTIC-16V	R492	863-7198	22K OHM-1/4W, 10%
C270	822-5268	4.7 MF ELECTROLYTIC-16V	R493	863-7198	22K OHM-1/4W, 10%
C271	822-5268	4.7 MF ELECTROLYTIC-16V	R494	863-7198	22K OHM-1/4W, 10%
C272	822-5268	4.7 MF ELECTROLYTIC-16V	R495	863-7198	22K OHM-1/4W, 10%
C273	822-5268	4.7 MF ELECTROLYTIC-16V	R496	863-7198	22K OHM-1/4W, 10%
C274	822-5268	4.7 MF ELECTROLYTIC-16V	R497	863-7198	22K OHM-1/4W, 10%
C275	822-5268	4.7 MF ELECTROLYTIC-16V	R498	863-7198	22K OHM-1/4W, 10%
C276	822-5268	4.7 MF ELECTROLYTIC-16V	R499	863-7198	22K OHM-1/4W, 10%
C277	822-5268	4.7 MF ELECTROLYTIC-16V	R500	863-7198	22K OHM-1/4W, 10%
C278	822-5268	4.7 MF ELECTROLYTIC-16V	R501	863-7198	22K OHM-1/4W, 10%
C279	822-5268	4.7 MF ELECTROLYTIC-16V	R502	863-7198	22K OHM-1/4W, 10%
C280	822-4978	470 MF ELECTROLYTIC-16V	R503	863-7198	22K OHM-1/4W, 10%
C281	822-4938	0.05 MF 20% MYLAR	R504	863-7198	22K OHM-1/4W, 10%
C282	822-5078	0.04 MF CERAMIC	L1	820-1418	FM OSCILLATOR COIL
C283	822-5078	220 PF 5% CERAMIC	L2	820-1438	FM ANTENNA COIL
C284	822-5268	4.7 MF ELECTROLYTIC-35V	L3	820-2628	10.7 MHz TRAP COIL
C285	822-5418	470 MF ELECTROLYTIC-16V	L4	820-2628	LF. TRAP COIL
C286	822-4948	0.05 MF 20% MYLAR	L301	820-1458	67 KHz TRAP COIL
C287	822-4948	0.05 MF 20% MYLAR	L401	820-3028	19 KHz FILTER
C288	822-5415	470 MF ELECTROLYTIC-16V	L451	820-3028	19 KHz FILTER
C289	822-5395	1500 PF 5% STYROL	L501	820-3028	19 KHz FILTER
C290	822-5415	470 MF ELECTROLYTIC-16V	T101	820-1445	OSCILLATOR COIL AM.
C291	822-5335	5000 PF 5% STYROL	T201	895-1083	10.7 I.F. TRANSFORMER
C292	823-7158	3.3 MF ELECTROLYTIC-16V	T202	895-1083	10.7 I.F. TRANSFORMER
C293	822-5098	680 PF 10% CERAMIC	T203	895-2045	MULTIPLEX DET. TRANSFORMER + CERAMIC FILTER
C294	822-7158	3.3 MF ELECTROLYTIC-16V	T204	895-2018	455 I.F. TRANSFORMER
C295	822-7056	250 PF 5% STYROL	T301	895-2028	MULTIPLEX COIL-19 KHz
C296	822-4928	0.1 MF 20% MYLAR	T302	895-2038	MULTIPLEX COIL-19 KHz
C297	822-5045	0.02 MF CERAMIC	T303	895-2048	MULTIPLEX COIL-38 KHz
C298	823-10438	680 PF 10% STYROL	T501	895-2118	POWER TRANSFORMER
C299	822-5328	10 MF ELECTROLYTIC-16V	D1	903-3178	DIODE-1S88A
C300	822-5192	0.12 MF 20% MYLAR	CR1	903-3178	DIODE-1S88A
C301	822-4378	0.1 MF 10V	CR101	903-3178	DIODE-1S188AM
C302	823-5108	82 PF 5% CERAMIC	CR201	903-3178	DIODE-1S188AM
C303	822-5038	0.04 MF 10V	CR202	903-3178	DIODE-1S188AM
C304	822-6335	47 MF ELECTROLYTIC-16V	CR203	903-3178	DIODE-1S188AM
C305	822-10638	0.0022 MF 20% MYLAR	CR204	903-3178	DIODE-1S188AM
C306	822-4938	0.05 MF 20% MYLAR	CR301	903-3178	DIODE-1S188FM
C307	822-4888	0.02 MF 20% MYLAR	CR302	903-3178	DIODE-1S188FM
C308	822-10108	0.47 MF 10V	CR303	903-4038	DIODE-1S188MFX
C309	822-5128	1 MF 10% STYROL	CR304	903-4038	DIODE-1S188MFX
C310	822-7118	1000 PF 10% STYROL	CR305	903-4038	DIODE-1S188MFX
C311	822-5278	10 MF ELECTROLYTIC-50V	CR306	903-4038	DIODE-1S188MFX
C312	822-5038	0.050 MF 20% MYLAR	CR501	903-3188	DIODE-1S2076A
C313	822-10428	0.1 MF 20% MYLAR	CR502	903-889	DIODE-1S10-1
C314	822-5278	10 MF ELECTROLYTIC-16V	Q1	921-1528	TRANSISTOR-2SK61D
C315	822-5348	100 MF ELECTROLYTIC-16V	Q2	921-1528	TRANSISTOR-2SC868C2
C316	822-5268	4.7 MF ELECTROLYTIC-16V	Q3	921-1528	TRANSISTOR-2SC858E1
C317	822-5268	22 MF ELECTROLYTIC-16V	Q101	921-1178	TRANSISTOR-2SC829D
C318	822-5268	4.7 MF ELECTROLYTIC-16V	Q102	921-1178	TRANSISTOR-2SC829D
C319	822-4978	470 MF ELECTROLYTIC-16V	Q103	921-1528	TRANSISTOR-2SC829E
C320	822-4938	0.05 MF 20% MYLAR	Q201	921-1188	TRANSISTOR-2SC930E
C321	822-5078	0.04 MF CERAMIC	Q202	921-1188	TRANSISTOR-2SC930C
C322	822-5078	220 PF 5% CERAMIC	Q204	921-1158	TRANSISTOR-2SC930
C323	822-5078	220 PF 5% CERAMIC	Q205	921-1158	TRANSISTOR-2SC930
C324	822-5418	470 MF ELECTROLYTIC-16V	Q301	921-1089	TRANSISTOR-2SC633
C325	822-5048	0.01 MF CERAMIC	Q302	921-1089	TRANSISTOR-2SC633TM1
C326	823-7088	1 MF ELECTROLYTIC-16V	Q303	921-3958	TRANSISTOR-2SC536FF2
C327	822-6046	0.02 MF CERAMIC	Q304	921-1108	TRANSISTOR-CS72298
C328	822-5948	0.02 MF CERAMIC	Q401	921-1178	TRANSISTOR-2SC537F2
R1	863-7268	180K OHM-1/4W, 10%	Q402	921-1118	TRANSISTOR-2SC635TU
R2	863-7268	180K OHM-1/4W, 10%	Q403	921-1888	TRANSISTOR-2SC537D1
R3	863-7148	47K OHM-1/4W, 10%	Q451	921-1178	TRANSISTOR-2SC537F2
R4	863-7198	22K OHM-1/4W, 10%	Q501	921-1178	TRANSISTOR-2SC537F2
R5	863-7038	1500 OHM-1/4W, 10%	Q502	921-1888	TRANSISTOR-2SC537D1
R6	863-6988	150 OHM-1/4W, 10%	DS301	900-88	LAMP
R7	863-7218	470K OHM-1/4W, 10%	DS501	900-88	PILOT LAMP
R8	863-7208	270K OHM-1/4W, 10%	DS502	900-88	PILOT LAMP
R9	863-7208	270K OHM-1/4W, 10%	DS503	900-88	PILOT LAMP
R10	863-7138	3300 OHM-1/4W, 10%	DS504	900-88	PILOT LAMP
R11	863-6988	150 OHM-1/4W, 10%	J1	844-1988	JACK
R101	863-7148	47K OHM-1/4W, 10%	J101	844-2088	HEAD PHONE JACK
R102	863-7188	33K OHM-1/4W, 10%	J402	844-1988	2 PRONG JACK-SPEAKER OUT
R103	863-7128	2200 OHM-1/4W, 10%	J403	844-1988	2 PRONG JACK-TAPE OUT
R104	863-7238	330K OHM-1/4W, 10%	J404	844-1988	2 PRONG JACK-TAPE IN
R105	863-7228	120K OHM-1/4W, 10%	J405	844-1988	2 PRONG JACK-PHONO IN
R106	863-6988	220 OHM-1/4W, 10%	S1	885-6698	ROTARY SWITCH-BANDSWITCH
R107	863-7178	18K OHM-1/4W, 10%	S2	885-6698	ROTARY SW. SECT.
R108	863-7058	4.7 OHM-1/4W, 10%	M201	922-30	TUNING METER
R201	863-7108	82 OHM-1/4W, 10%	IC401	906-91	INTEGRATED CIRCUIT
R202	863-7188	33K OHM-1/4W, 10%	IC451	906-92	INTEGRATED CIRCUIT
R203	863-6898	270 OHM-1/4W, 10%	Y201	908-89	CERAMIC FILTER 10.7 MHz
R204	863-7048	5600 OHM-1/4W, 10%	Y202	908-88	CERAMIC FILTER 10.7 MHz

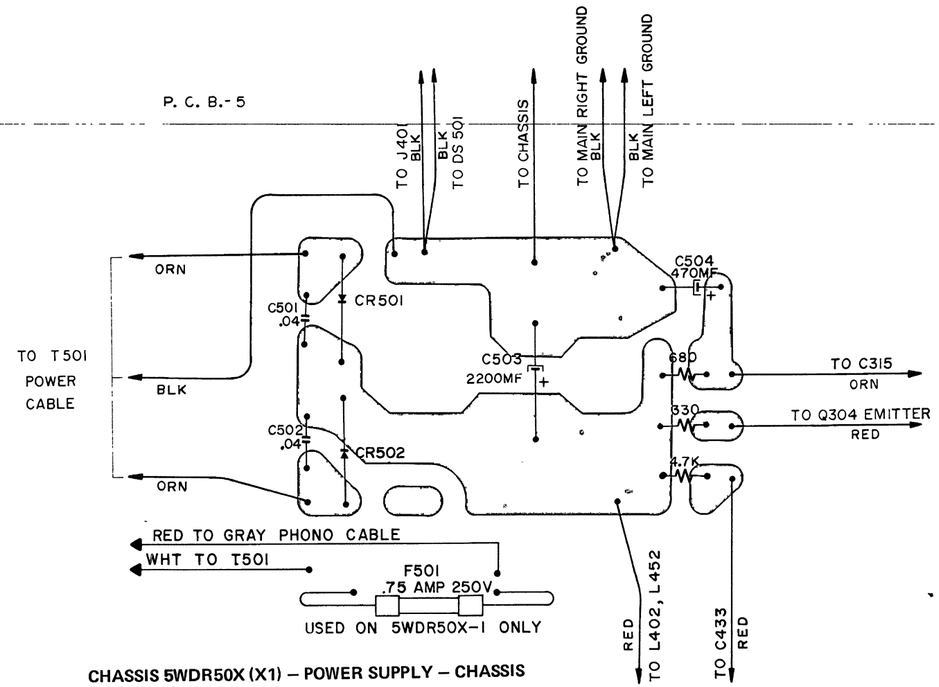
Z050872


L101
A
B
C
D
E
F
BRN
TO SI-F-1, SI-G-1
P.C.B.-1
C237 .01
TO SI-B-2,3
ORN
TO SI-B-6
GRN
YEL
BLK
TO SI-B-1
VIO
TO S2
RED
C21 .01
WHT
GRN
TO SI-D-1, SI-E-1
BRN
TO SI-A-1
YEL
TO SI-B-2,3
GRA
TO SI-A-2,3
C233 10MF
C231 .03
C220 20MF
C219 .04
C217 .02
C215 1MF
C218 .01
C19
C102 .02
C107 .04
C13 7PF
C16 15PF
C12 5PF
C17 3.3K
C18 .02
C14 100PF
C15 5PF
C1G
C1F
C1E
C1J
C1D
C1H
C1A
C1C
C1I
C101 15PF
C1B
C1K
C104 22PF
C2 100PF
C3 100K
C8 .03
C4 .04
C11 10MF
C5 15PF
C6 150PF
C7 5PF
C8 1PF
C9 500PF
C10 18PF
C103 .02
C105 360PF
C106 .02
C109 .02
C110 .02
C111 .02
C112 .02
C113 .02
C114 .02
C115 .02
C116 .02
C117 .02
C118 .02
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C121 .02
C122 .02
C123 .02
C124 .02
C125 .02
C126 .02
C127 .02
C128 .02
C129 .02
C130 .02
C131 .02
C132 .02
C133 .02
C134 .02
C135 .02
C136 .04
C201 .02
C202 25PF
C203 .02
C204 .02
C205 .04
C206 .04
C207 .005
C208 .04
C209 .04
C210 10MF
C211 .02
C212 .02
C213 .02
C214 .04
C215 .02
C216 .02
C217 .02
C218 .02
C219 .02
C220 .02
C221 100PF
C222 10MF
C223 200PF
C224 200PF
C225 4.7MF
C226 100PF
C227 .2
C228 470MF
C229 50PF
C230 .02
C231 .02
C232 .02
C233 .02
C234 .02
C235 .02
C236 .04
C301 250PF
C302 250PF
C303 5000PF
C304 .02
C305 4.7MF
C306 .02
C307 5000PF
C308 .02
C309 1MF
C310 300PF
C311 300PF
C312 .005
C313 .005
C314 4.7MF
C315 1000MF
C316 .005
C317 .005
C318 47MF
R1 180
R2 6.8K
R3 22K
R4 470
R5 2.2K
R6 470
R7 4.7K
R8 82K
R9 120K
R10 1K
R11 4.7K
R12 330K
R13 10K
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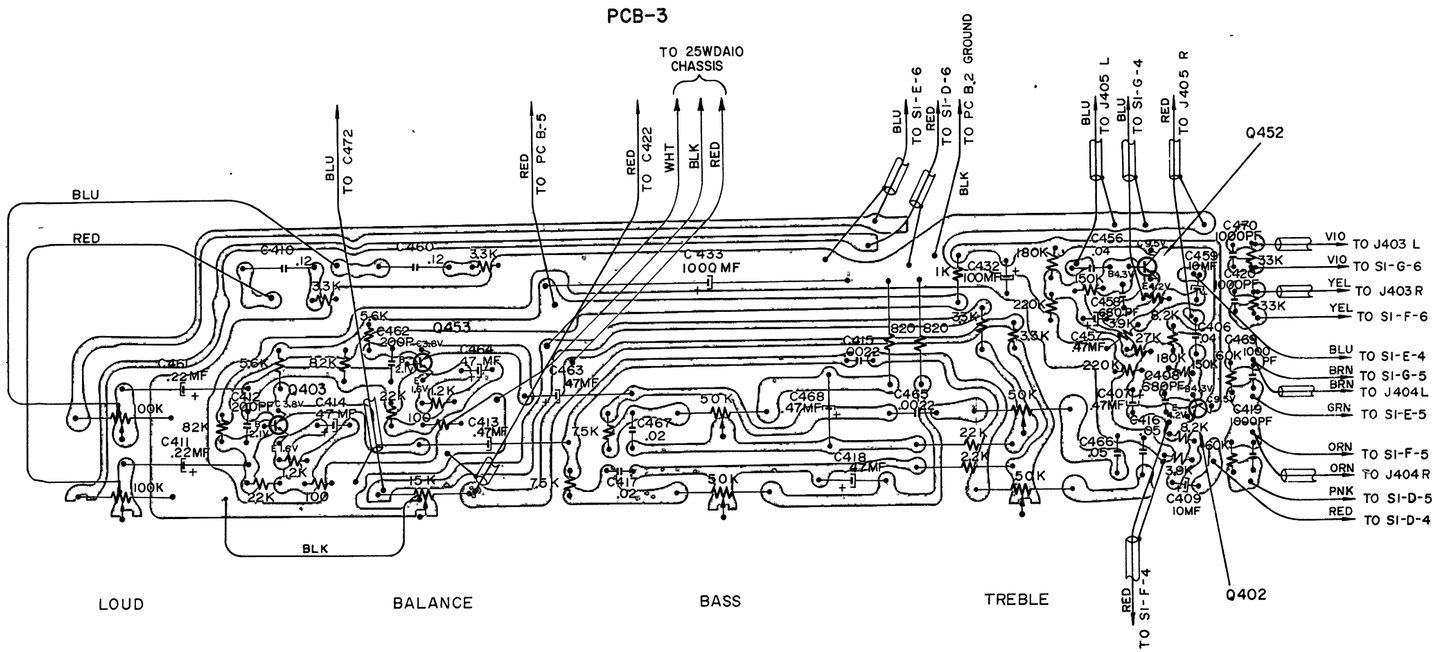
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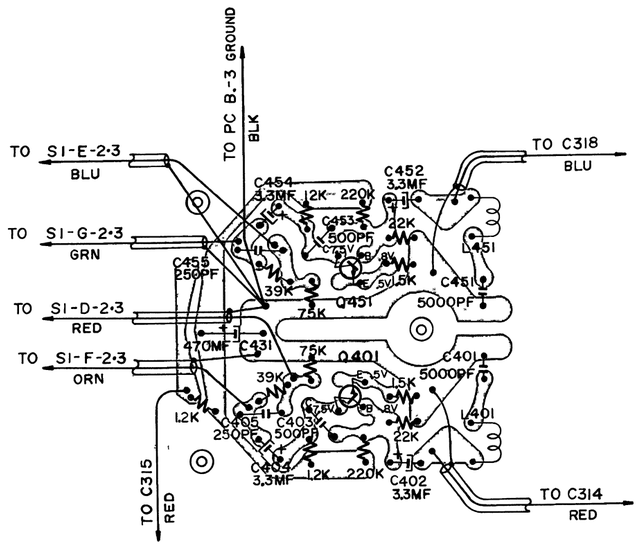
CHASSIS 5WDR50X(X1) – OUTPUT – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



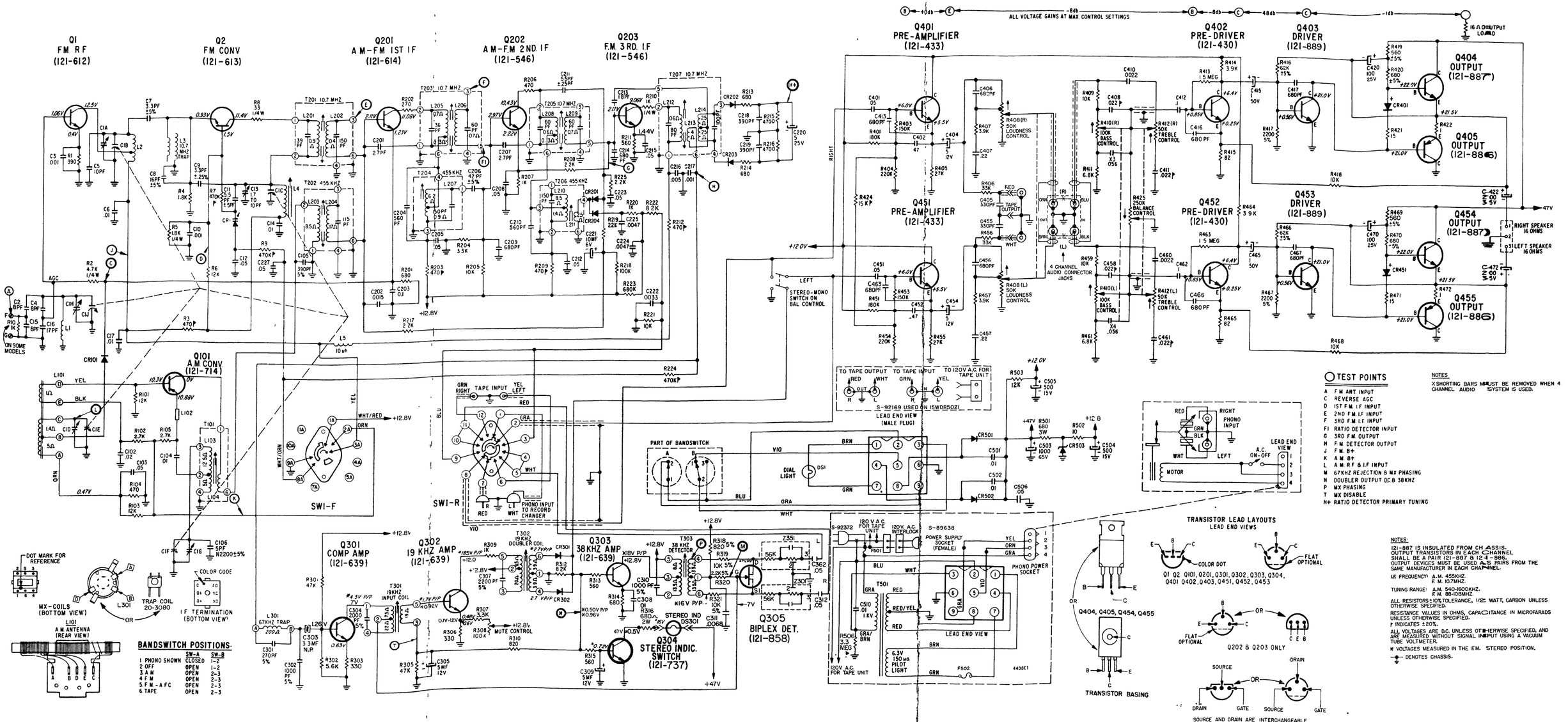
CHASSIS 5WDR50X (X1) – POWER SUPPLY – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



CHASSIS 5WDR50X(X1) – TONE – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



CHASSIS 5WDR50X(X1) – PRE-AMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

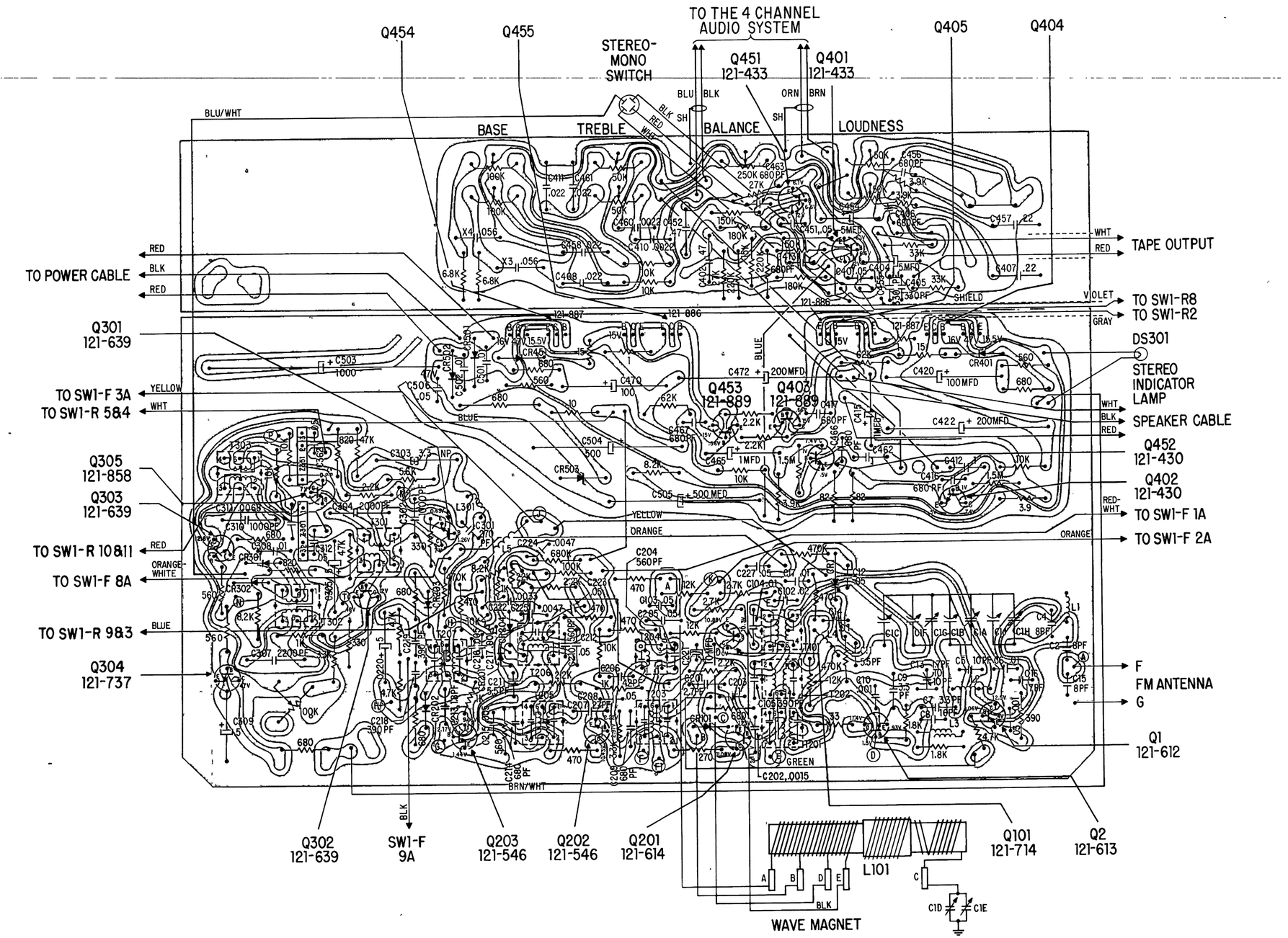


CHASSIS 15WDR50Z1 – SCHEMATIC

LEGEND CHASSIS 15WDR50Z1

ITEM NO.	PART NUMBER	DESCRIPTION
C1A		F.M. DETECTOR TRIMMER
C1B		F.M. DETECTOR TUNING
C1C		F.M. OSCILLATOR TUNING
C1D		A.M. ANTENNA TRIMMER
C1E	22-6137	A.M. ANTENNA TUNING
C1F		A.M. OSCILLATOR TUNING
C1G		A.M. OSCILLATOR TRIMMER
C1H		F.M. ANTENNA TRIMMER
C1J		F.M. ANTENNA TUNING
C2	22-2481	8 PF DISC ± .25PF 500V
C3	22-2729	.001 MFD DISC 25V
C4	22-2581	8 PF DISC ±.25 PF 500V
C5	22-3675	10 PF DISC ± 5% 500V
C6	22-3393	.01 MFD DISC 25V
C7	22-3641	3.3 PF GIMMICK ± 5% 500V
C8	22-3958	16 PF DISC ± 5% 500V
C9	22-6879	3.3 PF DISC ± .25PF 25V
C10	22-2729	.001 MFD DISC 25V
C11	22-6978	5.5 PF DISC ± .5 PF 25V
C12	22-3034	.05 MFD DISC 25V
C13	22-4555	1.7 TO 10PF CERAMIC TRIMMER
C14	22-3351	.01 MFD DISC 25V
C15	22-2481	8 PF DISC ± .25 PF 500V
C16	22-3792	17 PF DISC ± 5% 500V
C17	22-3393	.01 MFD DISC 25V
C102	22-3033	.02 MFD DISC 25V
C103	22-3034	.05 MFD DISC 25V
C104	22-3392	.01 MFD DISC 25V
C105	22-6480	330 PF MICA ± 5% 100V
OR	22-5972	
C106	22-3378	SPF N2200 +5%
C201	22-3310	2.7 PF GIMMICK 500V
C202	22-5483	.0015 MFD DISC 500V
C203	22-3652	1 MFD DISC 10V
C204	22-6481	560 PF DISC 500V
C205	22-3034	.05 MFD DISC 25V
C206	22-3791	42 PF DISC ±5% 500V
C207	22-3310	2.7 PF GIMMICK 500V
C208	22-3034	.05 MFD DISC 25V
C209	22-6482	680 PF DISC 500V
C210	22-6481	560 PF DISC 500V
C211	22-3770	5.5 PF DISC ±.25PF 500V
C212	22-3034	.05 MFD DISC 25V
C213	22-2428	1.8 PF GIMMICK 500V
C214	22-5482	680 PF DISC 500V
C215	22-3034	.05 MFD DISC 25V
C216	22-3660	.005 MFD DISC 25V
C217	22-2729	.001 MFD DISC 25V
C218	22-3177	390 PF DISC 500V
C219	22-3177	390 PF DISC 500V
C220	22-3896	5 MFD ELECTROLYTIC 25V
C221	22-5486	10 MFD ELECTROLYTIC 6V
C222	22-13	.0033 25V
C223	22-3034	.05 MFD DISC 500V
C224	22-14	.0047 MFD 500V
C226	22-14	.0047 MFD 500V
C227	22-3034	.05 MFD DISC 25V
C301	22-5780	270PF POLYSTYRENE 15% 500V
OR	22-3424	270PF MICA ±5% 100V
C302	22-2781	1000PF POLYSTYRENE ± 5% 500V
OR	22-3613	1000PF MICA ± 5% 100V
C303	22-6248	3.3MFD N.P 16V
C304	22-6347	2000PF ± 5% PREFERRED 500V
OR	22-6136	2000PF ± 5% 300V
C305	22-2884	5 MFD ELECTROLYTIC 12V
C307	22-5782	2200 PF POLYSTYRENE ±5% 500V
OR	22-3636	2200 PF MICA ± 5% 100V
C308	22-3393	.01 MFD DISC 25V
C309	22-2884	5 MFD ELECTROLYTIC 12V
C310	22-6781	1000 PF POLYSTYRENE ± 5% 500V
OR	22-3613	1000 PF MICA ± 5% 100V
C311	22-3419	.0068 MFD DISC 25V
C312	22-3034	.05 MFD DISC 25V
C313	22-3034	.05 MFD DISC 25V
C401	22-3034	.06 MFD DISC 25V
C402	22-5487	.47 MFD DISC 3V
C404	22-2884	5 MFD ELECTROLYTIC 12V
C405	22-3265	330 PF DISC 500V
C406	22-2939	680 PF DISC 500V
C407	22-6048	.22 MFD ±10% 50V
C408	22-6814	.022 MFD ±20% 100V
X3	22-6815	.056 MFD ±10% 100V
C410	22-18	.0022 MFD DISC 500V
C411	22-6814	.022 MFD ±20% 100V
C412	22-3662	1 MFD DISC 10V
C414	22-5482	680 PF DISC 500V
C415	22-3687	1 MFD ELECTROLYTIC 50V
C416	22-5482	680 PF DISC 500V
C417	22-2939	680 PF DISC 500V
C420	22-3973	100 MFD ELECTROLYTIC 25V
C422	22-3721	200 MFD ELECTROLYTIC 35V
C451	22-3034	.05 MFD DISC 25V
C452	22-5487	.47 MFD DISC 3V
C454	22-2884	5 MFD ELECTROLYTIC 12V
C455	22-3265	330 PF DISC 500V
C456	22-2939	680 PF DISC 500V
C457	22-6048	.22 MFD ±10% 50V
C458	22-6814	.022 MFD ± 20% 100V
X4	22-6815	.056 MFD ± 10% 100V
C460	22-18	.0022 MFD DISC 500V
C461	22-6814	.022 MFD ± 20% 100V
C462	22-3662	1 MFD DISC 10V
C463	22-3687	1 MFD ELECTROLYTIC 50V
C465	22-5482	680 PF DISC 500V
C466	22-2939	680 PF DISC 500V
C467	22-5482	680 PF DISC 500V
C468	22-3973	100 MFD ELECTROLYTIC 25V
C472	22-3721	200 MFD ELECTROLYTIC 35V
C501	22-4617	.01 MFD DISC 500V
C502	22-4617	.01 MFD DISC 500V
C503	22-4112	1000 MFD ELECTROLYTIC 6V
C504	22-4572	500 MFD ELECTROLYTIC 15V
C505	22-4571	500 MFD ELECTROLYTIC 15V
C506	22-3661	.05 MFD 100V
C510	22-6020	.01 MFD DISC CAP 150V AC
R1	63-1768	390 OHM
R2	63-4210	4.7K OHM 1/4W
R3	63-1772	470 OHM 20%
R4	63-1796	1.8K OHM
R5	63-4196	1.8K OHM 1/4W
R6	63-1831	12K OHM
R7	63-1898	470K OHM 20%
R8	63-4122	33 OHM 1/4W
R9	63-1838	470K OHM 20%
R10	63-1785	1K OHM
R101	63-1831	12K OHM
R102	63-1803	2.7K OHM
R103	63-1831	12K OHM
R104	63-1771	470 OHM
R105	63-1803	2.7K OHM
R201	63-1778	680 OHM
R202	63-1761	270 OHM
R203	63-1772	470 OHM 20%
R204	63-1806	3.3K OHM
R205	63-1827	10K OHM
R206	63-1771	470 OHM
R207	63-1785	1K OHM
R208	63-1799	2.2K OHM
R209	63-1772	470 OHM 20%
	63-4185	1K OHM 1/4W
	63-1775	560 OHM

ITEM NO.	PART NUMBER	DESCRIPTION
R212	63-1772	470 OHM 20%
R213	63-1778	680 OHM
R214	63-1778	680 OHM
R215	63-1813	4700 OHM
R216	63-1813	4700 OHM
R217	63-1799	2.2K OHM
R218	63-1869	100K OHM
R219	63-1841	22K OHM
R220	63-1785	1K OHM
R221	63-1827	10K OHM
R222	63-1824	8.2K
R223	63-1904	680K OHM
R224	63-1898	470K OHM 20%
R225	63-1799	2.2K OHM
R301	63-1855	47K OHM
R302	63-1817	5.6K OHM
R303	63-1764	380 OHM
R305	63-1855	47K OHM
R306	63-1764	330 OHM
R307	63-1806	3.3K OHM
R308	63-4085	100K MUTE CONTROL
R309	63-1785	1K OHM
R310	63-1782	820 OHM
R312	63-1824	8.2K OHM
R313	63-1775	560 OHM
R314	63-1778	680 OHM
R315	63-1775	560 OHM
R316	63-5663	680 OHM 2W
R317	63-1791	820 OHM 5%
R318	63-1826	10K OHM 5%
R319	63-1796	1.8K OHM 5%
R320	63-1798	2.2K OHM 5%
R321	63-1826	10K OHM 5%
R401	63-1800	180K OHM
R403	63-1876	150K OHM
R404	63-1863	220K OHM
R405	63-1845	27K OHM
R406	63-1848	33K OHM
R407	63-1810	3.9K OHM
R408R	63-7683	50K DUAL LOUDNESS CONTROL
R408L		
R409	63-1827	10K OHM
R410R	63-7682	100K DUAL BASS CONTROL
R410L		
R411	63-1820	6.8K OHM
R412R	63-7681	50K DUAL TREBLE CONTROL
R412L		
R413	63-1918	1.5 MEGOHM
R414	63-1810	3.9K OHM
R415	63-1740	82 OHM
R416	63-1860	62K OHM 5%
R417	63-1798	2200 OHM 5%
R418	63-1827	10K OHM
R419	63-1774	560 OHM 5%
R420	63-1777	680 OHM 5%
R421	63-1708	15 OHM
R422	63-4501	1 OHM
R424	63-1835	15K OHM 20%
R426	63-7684	250K BALANCE CONTROL & SWITCH
X2		JUMPER WIRE
R451	63-1880	150K OHM
R453	63-1876	150K OHM
R454	63-1863	220K OHM
R455	63-1845	27K OHM
R456	63-1848	33K OHM
R457	63-1810	3.9K OHM
R459	63-1827	10K OHM
R461	63-1820	6.8K OHM
R463	63-1918	1.5 MEGOHM
R464	63-1810	3.9K OHM
R465	63-1740	82 OHM
R466	63-1860	62K OHM 5%
R467	63-1798	2200 OHM 5%
R468	63-1827	10K OHM
R469	63-1774	560 OHM 5%
R470	63-1777	680 OHM 5%
R471	63-1708	15 OHM
R472	63-4501	1 OHM
X1		JUMPER WIRE
R501	63-5085	680 OHM 3W
R502	63-1701	10 OHM
R503	63-1831	12K OHM
R506	63-1933	3.3 MEG OHM 20%
L1	20-2291	FM ANTENNA COIL
L2	20-1648	FM RF COIL
L3	20-1258	TRAP COIL 10.7 MHz
L4	20-1649	FM OSCILLATOR COIL
L5	20-2033	PEAKING COIL
L101	5-82104	AM ANTENNA ASSEMBLY
L102	149-311	FERRITE CORE SLEEVE
IN T101		AM OSCILLATOR TRANS. PRI.
IN T101		AM OSCILLATOR TRANS. SEC.
IN T201		1ST IF TRANSFORMER 10.7 MHz PRI.
IN T201		1ST IF TRANSFORMER 10.7 MHz SEC.
IN T202		1ST IF AM 455 KHz PRI.
IN T202		1ST IF AM 455 KHz SEC.
IN T203		2ND IF TRANSFORMER 10.7 MHz PRI.
IN T203		2ND IF TRANSFORMER 10.7 MHz SEC.
IN T204		2ND IF AM 455 KHz
IN T205		3RD IF TRANSFORMER 10.7 MHz PRI.
IN T205		3RD IF TRANSFORMER 10.7 MHz SEC.
IN T206		3RD IF AM 455 KHz PRI.
IN T206		3RD IF AM 455 KHz SEC.
IN T207		RATIO DETECTOR TRANS. 10.7 MHz PRI.
IN T207		RATIO DETECTOR TRANS. 10.7 MHz TERTIARY
IN T207		RATIO DETECTOR TRANS. 10.7 MHz SEC.
L301	5-79430	67 KHz TRAP COIL (ALTERNATE)
OR	20-3080	67 KHz TRAP COIL (PREFERRED)
T101	95-2544	AM OSCILLATOR TRANSFORMER
T201	95-2546	FM 1ST IF TRANSFORMER 10.7 MHz
T202	95-2541	AM 1ST IF AM 455 KHz
T203	95-2547	FM 2ND IF TRANSFORMER 10.7 MHz
T204	95-2542	AM 2ND IF AM 455 KHz
T205	95-2548	FM 3RD IF TRANSFORMER 10.7 MHz
T206	95-2543	AM 3RD IF AM 455 KHz
T207	95-2545	FM RATIO DETECTOR 10.7 MHz
T301	95-2858	INPUT COIL 19 KHz
T302	95-2856	DOUBLER COIL 19 KHz
T303	95-2857	DETECTOR COIL 38 KHz
T501	96-2958	POWER TRANSFORMER
SW1	85-1343	BAND SWITCH
CR1	103-42	AFC DIODE
OR	103-189	
CR101	103-74	GERMANIUM DIODE
CR201	103-23	GERMANIUM DIODE
CR202	103-901	GERMANIUM DIODES (MATCHED PAIR)
CR203	103-901	
CR204	103-23	GERMANIUM DIODE
CR301	103-23	GERMANIUM DIODES
CR302	103-23	
CR401	103-222	DIODE
CR451	103-222	DIODE
CR501	212-76	SILICON RECTIFIER
CR502	212-76	SILICON RECTIFIER
CR503	103-96	DIODE
Z301	105-107	INTEGNET
Z451	105-107	
DS1	105-249	PILOT LIGHT NO. 1847
DS301	100-507	STEREO INDICATOR LIGHT
PC	204-350	PRINTED CIRCUIT BOARD
FS01	136-96	1 AMP. FUSE 4408P2
FS02	136-96	1 AMP. FUSE (PILOT LIGHT)

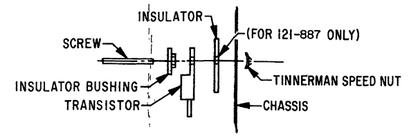


CHASSIS 15WDR50Z1 — CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

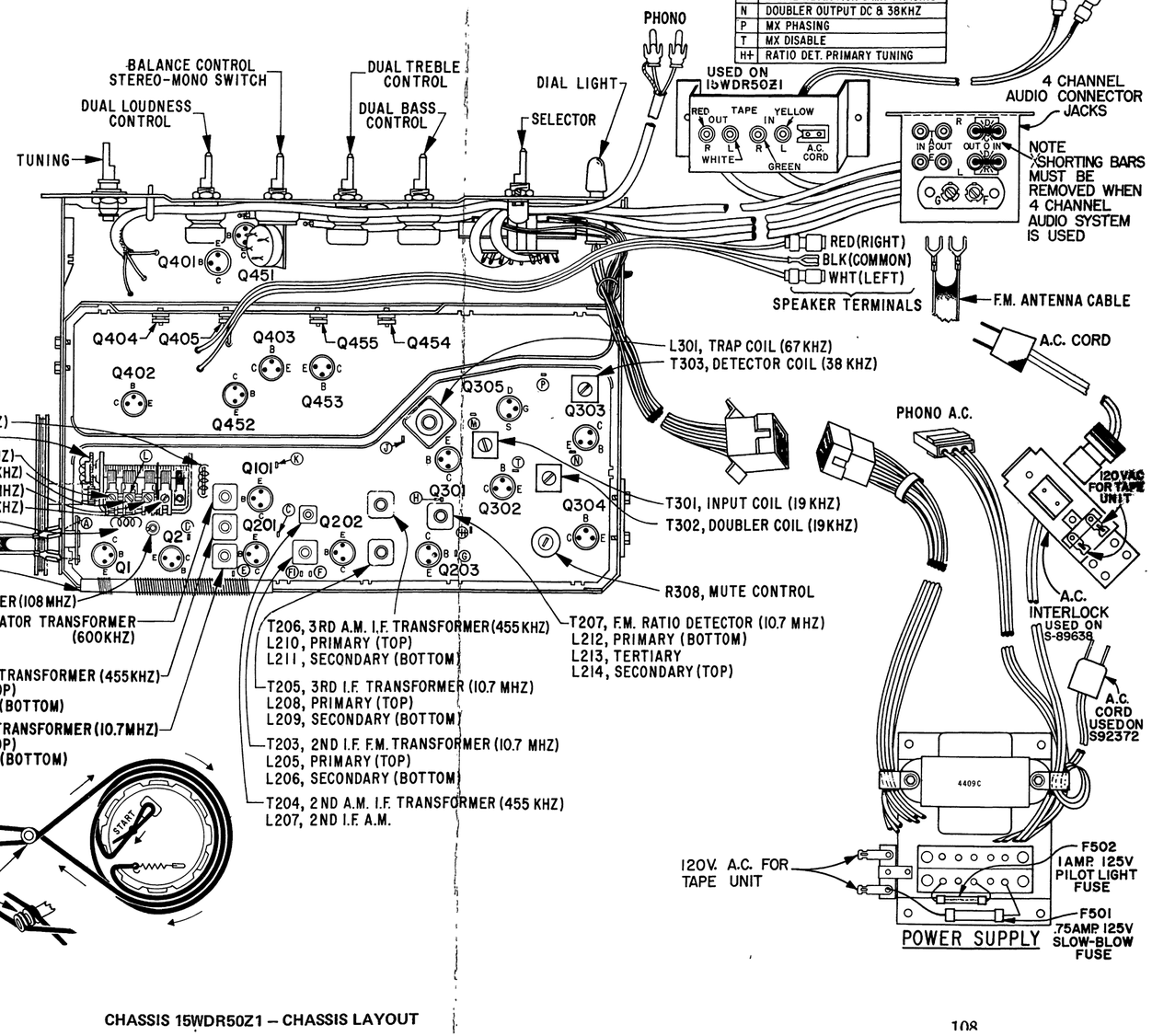
TRANSISTORS		
No.	PART No.	DESCRIPTION
Q1	121-612	F.M.-R.F.
Q2	121-613	F.M. CONVERTER
Q101	121-714	A.M. CONVERTER
Q201	121-614	A.M.-F.M. 1st I.F.
Q202	121-546	A.M.-F.M. 2nd I.F.
Q203	121-546	F.M. 3rd I.F.
Q301	121-639	COMP. AMPLIFIER
Q302	121-639	19 KHZ AMPLIFIER
Q303	121-639	38 KHZ
Q304	121-737	STEREO IND. SWITCH
Q305	121-858	BI-PLEX DET.
Q401	121-433	PRE-AMPLIFIER
Q451	121-433	PRE-AMPLIFIER
Q402	121-430	PRE-DRIVER
Q452	121-430	PRE-DRIVER
Q403	121-889	DRIVER
Q453	121-889	DRIVER
Q404	121-887	OUTPUT
Q405	121-886	OUTPUT
Q454	121-887	OUTPUT
Q455	121-886	OUTPUT

TRANSISTOR MOUNTING VIEW

(121-886 & 121-887)



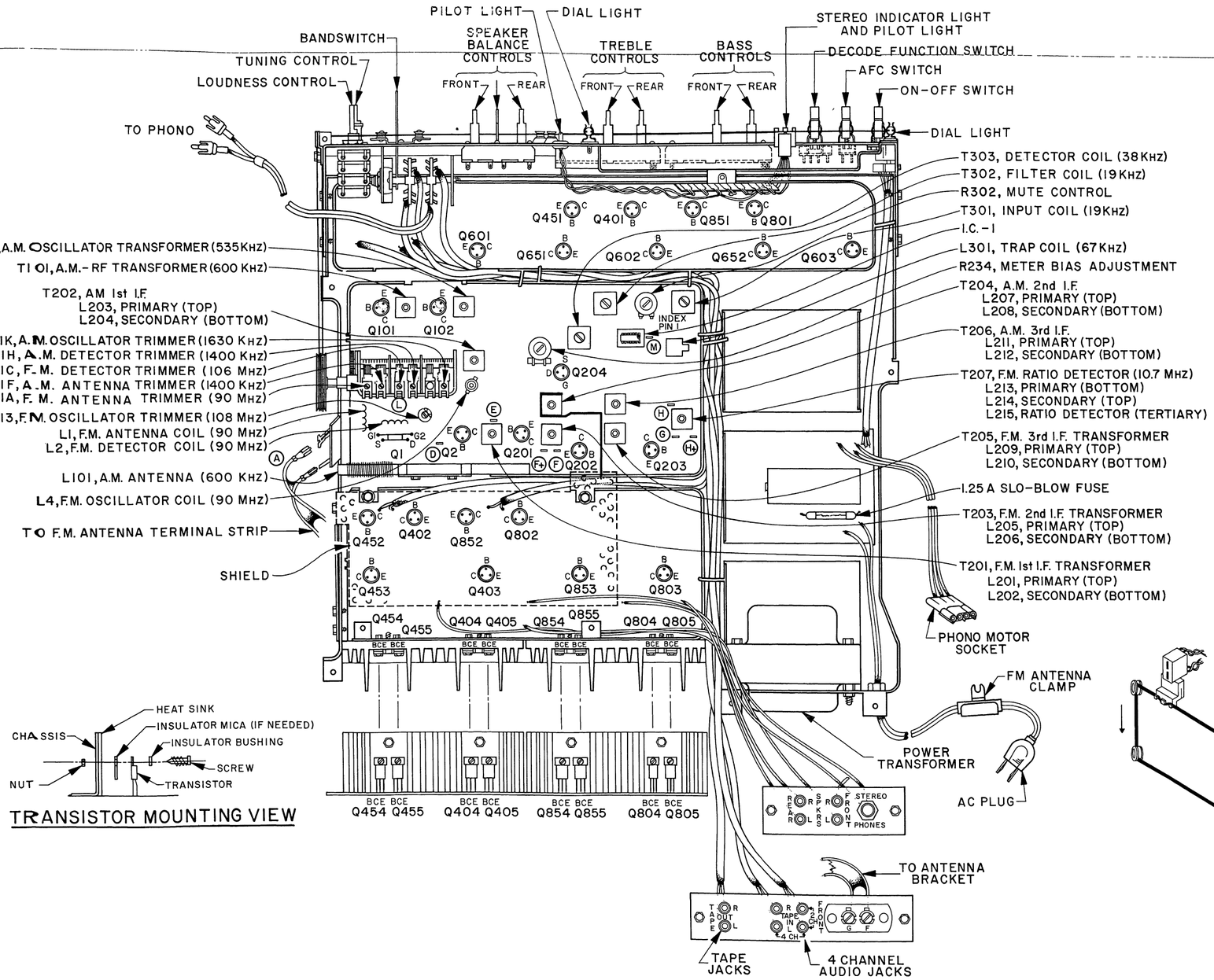
TEST POINTS	
A	F.M. ANT. INPUT
C	REVERSE AGC
D	IST F.M. I.F. INPUT
E	2ND F.M. I.F. INPUT
F	3RD F.M. I.F. INPUT
FI	RATIO DETECTOR INPUT
G	3RD F.M. OUTPUT
H	F.M. DETECTOR OUTPUT
J	F.M. B+
K	A.M. B+
L	A.M. R.F. & I.F. INPUT
M	67KHZ REJECTION & MX PHASING
N	DOUBLER OUTPUT DC & 38KHZ
P	MX PHASING
T	MX DISABLE
H+	RATIO DET. PRIMARY TUNING



DIAL CORD DRIVE

SHOWN IN FULL CLOCKWISE POSITION

CHASSIS 15WDR50Z1 – CHASSIS LAYOUT



TRANSISTOR MOUNTING VIEW

TRANSISTORS			
No.	PART No.	DESCRIPTION	
Q1	121-826	F.M.-R.F.	
Q2	121-613	F.M. CONVERTER	
Q101	121-850	A.M.-R.F.	
Q102	121-714	A.M. CONVERTER	
Q201	121-614	A.M.-F.M. 1st I.F.	
Q202	121-950	A.M.-F.M. 2nd I.F.	
Q203		F.M. 3rd I.F.	
Q204	121-858	TUNING METER CONTROL	
Q401	121-433	PRE-AMPLIFIER	RIGHT FRONT CHANNEL
Q402		PRE-DRIVER	
Q403	121-889	DRIVER	
Q404	121-927	OUTPUT (NPN)	
Q405	121-926	OUTPUT (PNP)	
Q451	121-433	PRE-AMPLIFIER	LEFT FRONT CHANNEL
Q452		PRE-DRIVER	
Q453	121-889	DRIVER	
Q454	121-927	OUTPUT (NPN)	
Q455	121-926	OUTPUT (PNP)	
Q601	121-430	PRE-AMPLIFIER	
Q602	121-433	DECODE	
Q603		PHASE INVERTER	
Q651	121-430	PRE-AMPLIFIER	
Q652	121-433	DECODE	
Q801		PRE-AMPLIFIER	RIGHT REAR CHANNEL
Q802		PRE-DRIVER	
Q803	121-889	DRIVER	
Q804	121-927	OUTPUT (NPN)	
Q805	121-926	OUTPUT (PNP)	
Q851	121-433	PRE-AMPLIFIER	LEFT REAR CHANNEL
Q852		PRE-DRIVER	
Q853	121-889	DRIVER	
Q854	121-927	OUTPUT (NPN)	
Q855	121-926	OUTPUT (PNP)	
IC-1	221-65	MULTIPLEX INTEGRATED CIRCUIT	

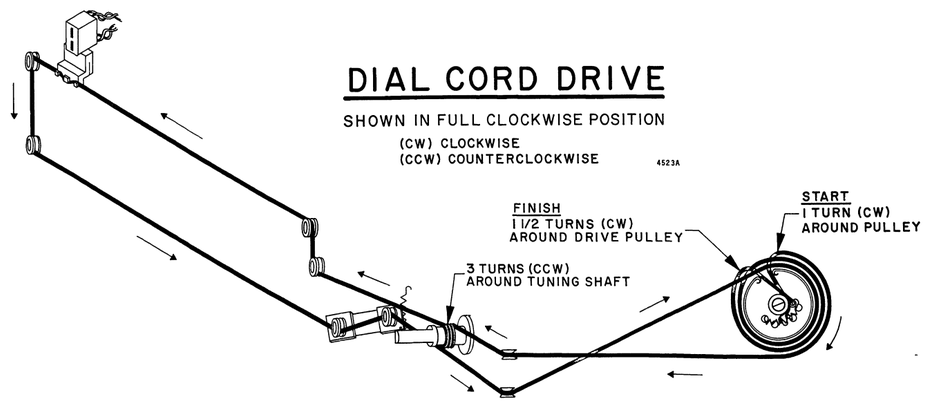
TEST POINTS	
A	F.M. ANTENNA INPUT
D	1st F.M. I.F. INPUT
E	2nd F.M. I.F. INPUT
F	3rd F.M. I.F. INPUT
F1	RATIO DETECTOR INPUT
G	3rd F.M. OUTPUT
H	F.M. DETECTOR
H+	RATIO DETECTOR PRIMARY TUNING
L	A.M.-R.F. & I.F. INPUT
M	19 KHz ALIGNMENT

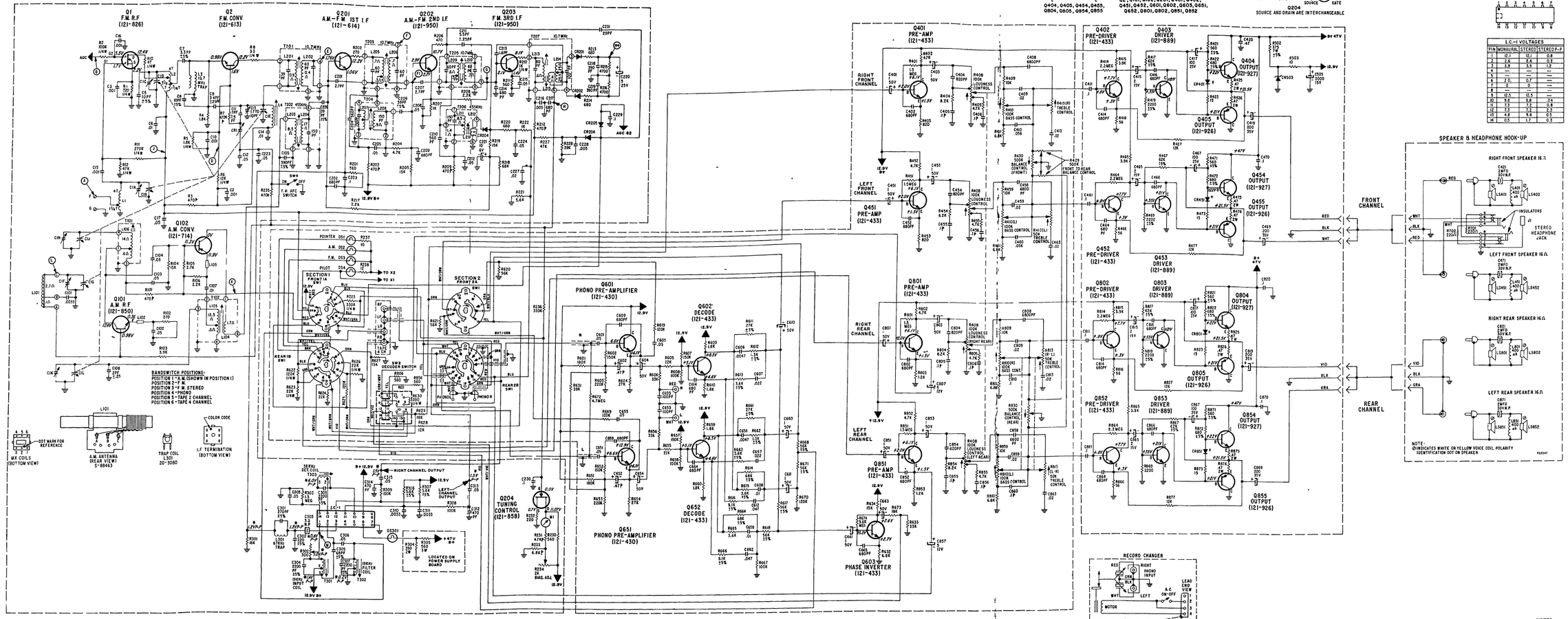
DIAL CORD DRIVE

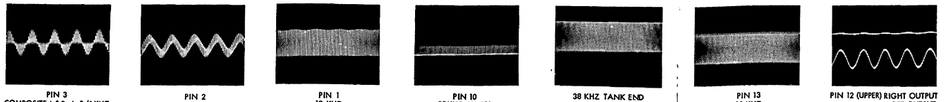
SHOWN IN FULL CLOCKWISE POSITION

(CW) CLOCKWISE
(CCW) COUNTERCLOCKWISE

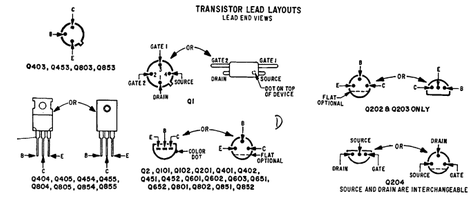
4523A

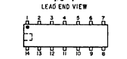






IC 1 WAVEFORMS





I.C.-1 VOLTAGES			
PIN	MONAURAL	STEREO	STEREO P-P
1	12.1	12.1	0.8
2	2.4	2.4	0.2
3	5.3	5.3	1.2
4	—	—	—
5	—	—	—
6	2.0	0.7	—
7	0	0	—
8	—	—	—
9	12.5	12.5	—
10	9.8	9.8	0.6
11	7.3	7.3	0.8
12	7.3	7.6	2.3
13	6.8	6.8	0.5
14	0.5	1.7	0.3

NOTES:
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS, WITH NO SIGNAL INPUT LOUDNESS CONTROL AT MINIMUM, LINE VOLTAGE 120 V.A.C. USING A HIGH IMPEDANCE V.T.V.M.
ALL RESISTORS IN OHMS, ± 1/2 WATT CARBON, ± 10% UNLESS OTHERWISE SPECIFIED.
ALL CAPACITORS ARE IN MICROFARADS ± 10% UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY A.M. 455 KHz F.M. 10.7 MHz
TUNING RANGE: A.M. 54 - 1600 KHz F.M. 88 - 108 MHz
⏚ INDICATES CHASSIS GROUND.
INDICATES ± 20% TOLERANCE.
INDICATES VOLTAGE.
⓪ INDICATES TEST POINTS.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION.
121-927 IS INSULATED FROM CHASSIS. OUTPUT TRANSISTORS IN EACH CHANNEL SHALL BE A PAIR 121-926 & 121-927 OUTPUT DEVICES MUST BE USED AS PAIRS FROM THE SAME MANUFACTURER IN EACH CHANNEL.
✱ VOLTAGES MEASURED WITH STEREO INPUT (10% PILOT 45% L+R, 45% L-R).

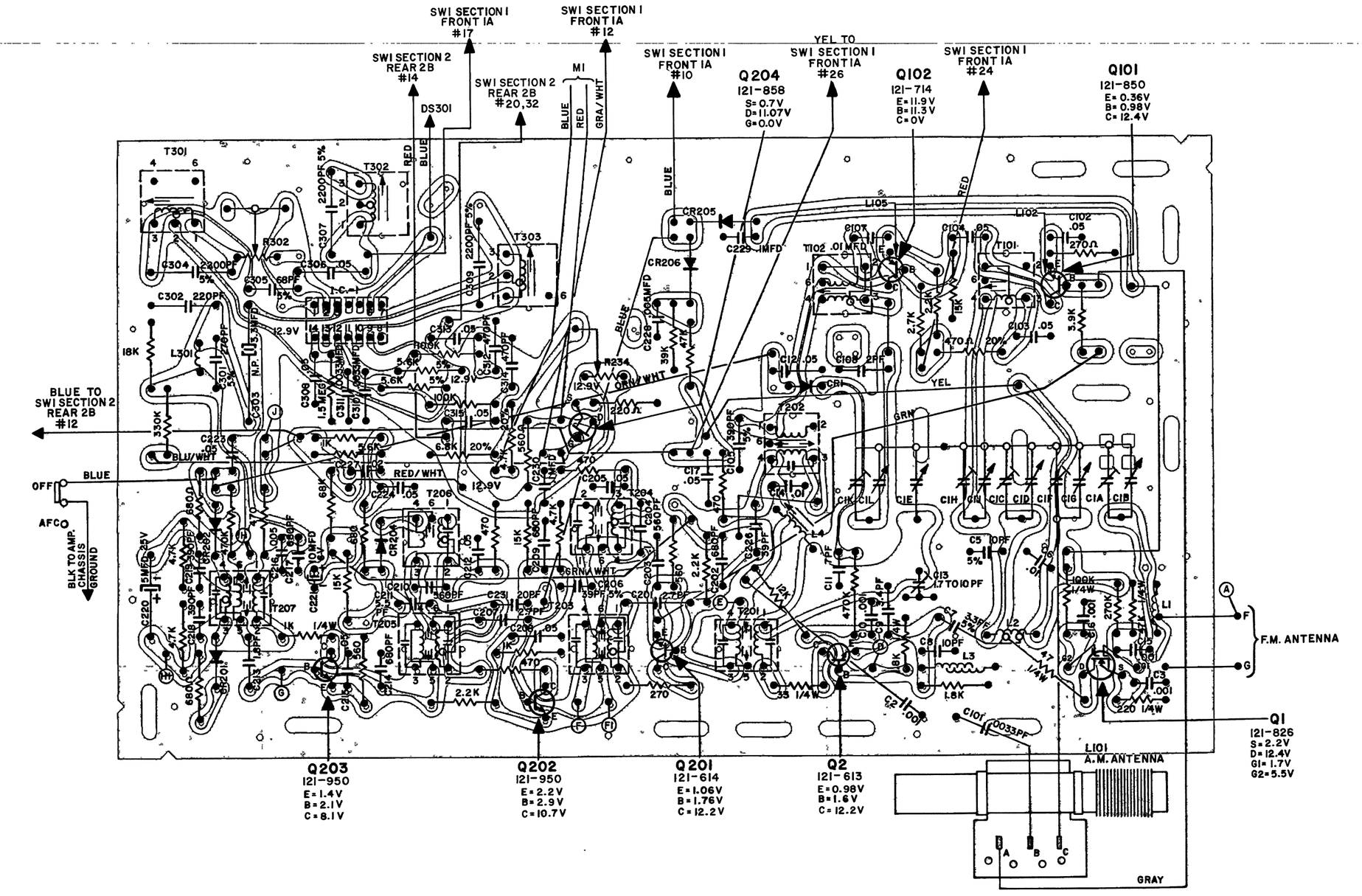
LEGEND CHASSIS 15WDR51

ITEM NO.	PART NUMBER	DESCRIPTION
C1A		FM1 ANTENNA TRIMMER
C1B		FM1 ANTENNA TUNING
C1C		FM1 DETECTOR TRIMMER
C1D		FM1 DETECTOR TUNING
C1E		FM1 OSCILLATOR TUNING
C1F	22-6752	AM1 OSCILLATOR TRIMMER (VARIABLE GANG)
C1G		AM1 ANTENNA TUNING
C1H		AM1 DETECTOR TRIMMER
C1J		AM1 DETECTOR TUNING
C1K		AM1 OSCILLATOR TRIMMER
C1L		AM1 OSCILLATOR TUNING
C2	22-3723	.02 1 MFD. DISC 25V
C3	22-2729	.001 1 MFD. DISC 25V
C4	22-3675	10 MMFD DISC ±5% 500V
C5	22-3393	.01 MFD. DISC 25V
C6	22-3541	3.3 PF GIMMICK ±5% 500V
C8	22-3675	10 MMFD DISC ±5% 500V
C9	22-3682	.005 MFD. DISC 25V
C10	22-2729	.001 1 MFD. DISC 25V
C11	22-2727	7 PF IF DISC ± 5 PF 500V
C12	22-3034	.05 MFD. DISC 25V
C13	22-4955	1.7 PF TO 10PF CERAMIC TRIMMER
C14	22-3393	.01 MFD. DISC 25V
C15	22-2729	.001 1 MFD. DISC 25V
C16	22-3682	.005 MFD. DISC 25V
C17	22-3034	.05 MFD. DISC 25V
C101	23-13	.03 33 MFD. DISC 500V
C102	22-3034	.05 MFD. DISC 25V
C103	22-3034	.05 MFD. DISC 25V
C104	22-3034	.05 MFD. DISC 25V
C105	22-5972	2.2 MFD. 4V POLYSTYRENE ±5% 125V
C106	22-3682	.005 MFD. DISC 25V
C107	22-4519	2 PF P. 500V
C201	22-3310	2.7* PF GIMMICK 500V
C202	22-5482	68 PF DISC 500V
C203	22-3652	1 PMFD. DISC 10V
C204	22-5481	56 PF DISC 500V
C205	22-3393	.01 MFD. DISC 25V
C206	22-3301	39 PF DISC ±5% 500V
C207	22-3310	2.7* PF GIMMICK 500V
C208	22-3034	.05 MFD. DISC 25V
C209	22-5482	68 PF DISC 500V
C210	22-5481	56 PF DISC 500V
C211	22-3034	.05 MFD. DISC 25V
C212	22-3429	1.8 PF GIMMICK 500V
C213	22-3034	.05 MFD. DISC 25V
C215	22-3034	.05 MFD. DISC 25V
C216	22-3034	.05 MFD. DISC 25V
C217	22-3177	39 PF DISC 500V
C218	22-3177	39 PF DISC 500V
C220	22-3996	5 MFD. ELECTROLYTIC 25V
C221	22-5486	10 MFD. ELECTROLYTIC 6V
C222	22-3034	.05 MFD. DISC 25V
C223	22-3034	.05 MFD. DISC 25V
C224	22-3301	39 PF DISC 500V
C227	22-3066	.02 MFD. DISC 25V
C228	22-3069	.02 MFD. DISC 25V
C229	22-3652	1 PMFD. DISC 10V
C230	22-3652	1 PMFD. DISC 10V
C231	22-3701	27 PF DISC 500V
C232	22-3701	27 PF DISC 500V
C233	22-3976	22 PF DISC ±5% 500V
C303	22-5246	1.3 MFD. N.P. 15V
C304	22-5782	2200 PF POLYSTYRENE ±5% 50V
C306	22-3768	68 PF DISC ±5% 500V
C308	22-3768	68 PF DISC ±5% 500V
C309	22-3034	.05 MFD. DISC 25V
C310	22-5782	2200 PF POLYSTYRENE ±5% 50V
C311	22-5782	2200 PF POLYSTYRENE ±5% 50V
C312	22-13	.03 33 MFD. DISC 500V
C313	22-13	.03 33 MFD. DISC 500V
C314	22-3054	.47 PF DISC 500V
C315	22-3034	.05 MFD. DISC 25V
C401	22-3697	1 PMFD. ELECTROLYTIC 50V
C402	22-5483	68 PF DISC 500V
C403	22-3697	1 PMFD. ELECTROLYTIC 50V
C404	22-3034	.05 MFD. DISC 25V
C405	22-5257	1 PMFD. DISC 12V
C406	22-5257	1 PMFD. DISC 12V
C408	22-3415	68 PF DISC 100V
C409	22-3393	.01 MFD. DISC 25V
C410	22-5473	.068 MFD. MYLAR 200V
C411	22-5257	1 PMFD. DISC 12V
C412	22-3682	.005 MFD. DISC 25V
C413	22-5482	68 PF DISC 500V
C414	22-5482	68 PF DISC 500V
C415	22-5481	56 PF DISC 500V
C416	22-5481	56 PF DISC 500V
C417	22-3973	10 MFD. ELECTROLYTIC 25V
C418	22-3973	10 MFD. ELECTROLYTIC 25V
C419	22-3723	.02 MFD. DISC 25V
C420	22-4588	2 PMFD. N.P. 25V
C421	22-4588	2 PMFD. ELECTROLYTIC 50V
C422	22-5482	68 PF DISC 500V
C423	22-5482	1 PMFD. ELECTROLYTIC 50V
C424	22-3417	.022 MFD. DISC 100V
C451	22-3697	1 PMFD. ELECTROLYTIC 50V
C452	22-3697	1 PMFD. ELECTROLYTIC 50V
C453	22-5482	68 PF DISC 500V
C454	22-5482	68 PF DISC 500V
C455	22-3697	1 PMFD. ELECTROLYTIC 50V
C456	22-5482	68 PF DISC 500V
C457	22-5482	68 PF DISC 500V
C458	22-5482	68 PF DISC 500V
C459	22-5482	68 PF DISC 500V
C460	22-5723	.02 DISC 25V
C461	22-5472	.056 MFD. MYLAR 200V
C462	22-5482	68 PF DISC 500V
C463	22-5482	68 PF DISC 500V
C464	22-5482	68 PF DISC 500V
C465	22-5481	56 PF DISC 500V
C466	22-5482	68 PF DISC 500V
C467	22-3973	10 MFD. ELECTROLYTIC 25V
C468	22-3721	70 MFD. ELECTROLYTIC 35V
C469	22-3697	1 PMFD. ELECTROLYTIC 50V
C471	22-4588	2 PMFD. N.P. 25V
C501	22-4606	.01 MFD. DISC 150 VAC
C502	22-3681	.005 MFD. DISC 100V
C503	22-3961	.05 MFD. DISC 150V
C504	22-3113	15 MFD. ELECTROLYTIC 65V
C506	22-3973	10 MFD. ELECTROLYTIC 25V
C507	22-4605	.01 MFD. DISC 150 VAC
C508	22-5003	.02 X 2 MFD. DISC 150 VAC
C509	22-5274	.02 X 2 MFD. DISC 150 VAC
C510	22-3034	.05 MFD. DISC 25V
C602	22-7154	.47 MFD. TANTALUM 20% 35V
C603	22-3397	10 MFD. ELECTROLYTIC 50V
C604	22-3682	.005 MFD. DISC 25V
C606	22-3637	.0047 MFD. MYLAR 200V
C607	22-5632	.0022 MFD. MYLAR 200V
C608	22-5583	.01 MFD. MYLAR 100V
C609	22-5482	68 PF DISC 500V
C610	22-3697	1 PMFD. ELECTROLYTIC 50V
C611	22-3697	1 PMFD. ELECTROLYTIC 50V
C612	22-5666	.047 MFD. MYLAR 100V
C613	22-5482	68 PF DISC 500V
C614	22-5482	68 PF DISC 500V
C615	22-3034	.05 MFD. DISC 25V
C616	22-7154	.47 MFD. TANTALUM 20% 35V
C617	22-3397	1 PMFD. ELECTROLYTIC 50V
C618	22-3682	.005 MFD. DISC 25V
C619	22-5637	.0047 MFD. MYLAR 200V
C620	22-5632	.0022 MFD. MYLAR 200V
C621	22-5583	.01 MFD. MYLAR 100V
C622	22-3397	1 PMFD. ELECTROLYTIC 50V
C623	22-3697	1 PMFD. ELECTROLYTIC 50V
C624	22-5666	.047 MFD. MYLAR 100V
C625	22-3687	1 PMFD. ELECTROLYTIC 50V
C626	22-5482	68 PF DISC 500V
C627	22-5482	68 PF DISC 500V
C628	22-3697	1 PMFD. ELECTROLYTIC 50V
C629	22-5482	68 PF DISC 500V
C630	22-3687	1 PMFD. ELECTROLYTIC 50V
C801	22-3412	.02 MFD. DISC 500V
C802	22-5257	1 MMFD. DISC 12V
C803	22-5473	.068 MFD. MYLAR 200V
C804	22-5989	.02 MFD. DISC 500V

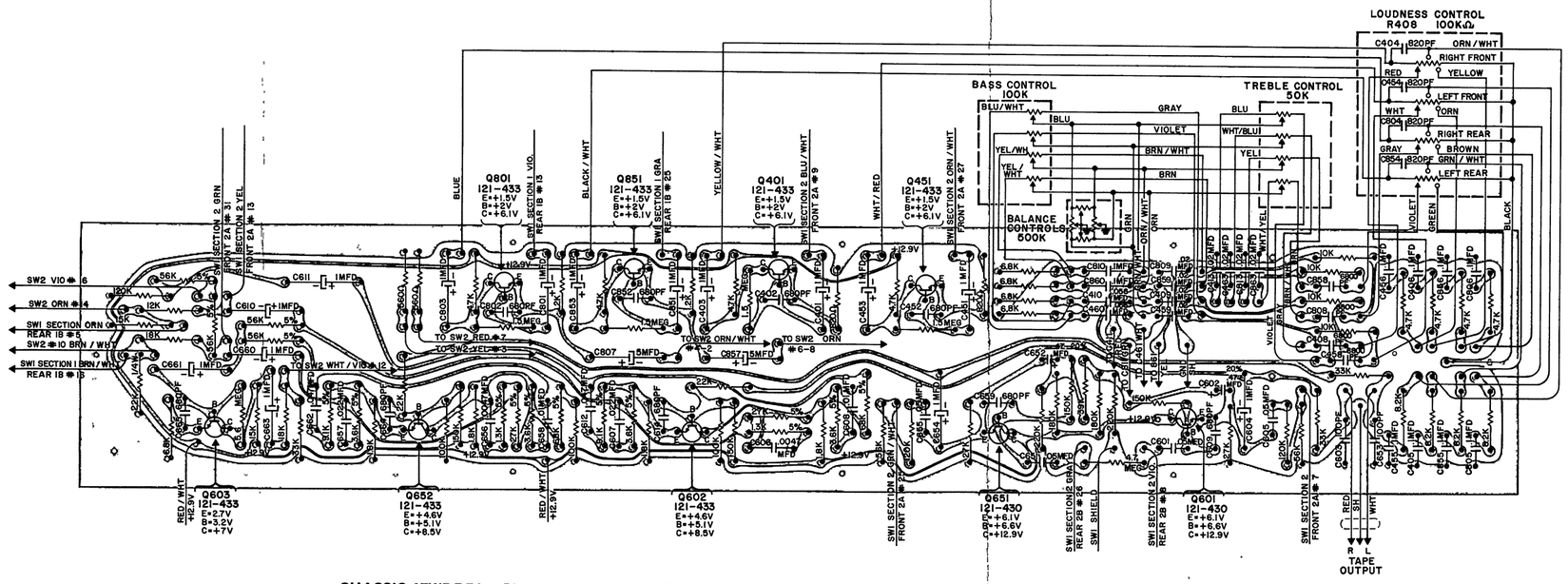
ITEM NO.	PART NUMBER	DESCRIPTION
C810	22-5257	1 DISC 20% 12V
C811	22-5662	1 MYLAR 100V
C813	22-5989	.02 DISC 25V
C814	22-5482	680 PF DISC 500V
C815	22-5097	2 MFD. ELECTROLYTIC 25V
C816	22-3973	10 MFD. ELECTROLYTIC 25V
C817	22-3973	100 MFD. ELECTROLYTIC 25V
C819	22-3721	200 MFD. ELECTROLYTIC 25V
C820	22-5662	1 MFD. MYLAR 100V
C821	22-4588	2 MFD. N.P. 25V
C822	22-3397	1 MFD. ELECTROLYTIC 12V
C823	22-3682	1 MFD. ELECTROLYTIC 50V
C852	22-5482	680 PF DISC 500V
C853	22-3397	1 MFD. ELECTROLYTIC 50V
C854	22-3412	.020 PF DISC 500V
C855	22-5257	1 MFD. DISC 12V
C856	22-5257	1 MFD. DISC 12V
C857	22-3682	.005 MFD. DISC 100V
C858	22-5989	.02 DISC 25V
C860	22-5257	1 DISC 20% 12V
C861	22-5662	1 MYLAR 100V
C863	22-5989	.02 DISC 25V
C864	22-5482	680 PF DISC 500V
C865	22-3973	10 MFD. ELECTROLYTIC 25V
C866	22-5482	680 PF DISC 500V
C867	22-3973	100 MFD. ELECTROLYTIC 25V
C868	22-3721	200 MFD. ELECTROLYTIC 25V
C870	22-5662	1 MFD. MYLAR 100V
C871	22-4588	2 MFD. N.P. 25V
C872	22-3397	1 MFD. ELECTROLYTIC 12V
R1	63-4197	220 OHM 1/4W
R2	63-4269	100K OHM 1/4W
R3	63-1772	470 OHM 20%
R4	63-1796	1.8K OHM
R5	63-4196	1.8K OHM 1/4W
R6	63-4231	12K OHM 1/4W
R7	63-4243	22K OHM 1/4W
R8	63-4122	33 OHM 1/4W
R10	63-4129	47 OHM 1/4W
R11	63-4257	270K OHM 1/4W
R12	63-4255	47K OHM 1/4W
R13	63-1772	470 OHM 20%
R103	63-1810	2.7K OHM
R104	63-1810	2.7K OHM
R105	63-1803	2.7K OHM
R106	63-1799	2.2K OHM
R201	#63-1775	560 OHM
R202	63-1772	470 OHM
R203	63-1772	470 OHM 20%
R204	63-1813	4.7K OHM
R205	63-1824	10K OHM
R208	63-1771	470 OHM
R209	63-1772	470 OHM
R210	63-1772	470 OHM 20%
R211	63-1772	470 OHM 20%
R212	63-1775	560 OHM
R213	63-1772	470 OHM 20%
R214	63-1778	680 OHM
R215	63-1813	4.7K OHM
R216	63-1813	4.7K OHM
R217	63-1813	4.7K OHM
R218	63-1802	68K OHM
R219	63-1824	10K OHM
R220	63-1779	1K OHM
R221	63-1824	10K OHM
R222	63-1785	1K OHM
R223	63-4200	330K OHM 1/4W
R227	63-1805	47K OHM
R228	63-1852	39K OHM
R229	63-1824	10K OHM
R231	63-1772	470 OHM 20%
R233	63-1707	220 OHM
R234	63-1824	10K OHM 20%
R236	63-5050	3K BIAS ADJUSTMENT
R237	63-1867	470K OHM
R238	63-1890	330K OHM
R239	63-1707	220 OHM
R240	63-1703	10 OHM
R301	63-1838	180 OHM
R302	63-5038	100 OHM POTENTIOMETER
R303	63-1818	1.2 MEG OHM
R304	63-6442	390 OHM 2W
R305	63-6442	390 OHM 2W
R306	63-1816	5.6K OHM 5%
R307	63-1818	1.2 MEG OHM
R308	63-1869	100K OHM
R309	63-1816	5.6K OHM 5%
R401	63-1818	1.2 MEG OHM
R402	63-1813	4.7K OHM
R403	63-1703	10 OHM
R404	63-1813	4.7K OHM
R405	63-1796	1.8K OHM
R406	63-1796	1.8K OHM
R407	63-1827	18K OHM
R408	63-5992	100K BASS CONTROL (FRONT)
R411	63-1820	5.6K OHM
R412	63-5993	100K TREBLE CONTROL (FRONT)
R414	63-1825	8.2 MEG OHM
R415	63-1810	3.9K OHM
R416	63-1723	56 OHM
R417	63-1800	62K OHM 5%
R418	63-1795	5.2K OHM 5%
R419	63-1795	5.2K OHM 5%
R420	63-1777	680 OHM
R421	63-1798	2.0K OHM
R423	63-5784	.47 OHM 2W
R424	63-5784	.47 OHM 2W
R425	63-1831	12K OHM
R426	63-5992	100K BASS CONTROL TO REAR BALANCE CONTROL
R427	63-5992	100K FRONT BALANCE CONTROL
R451	63-1818	1.2 MEG OHM
R452	63-1813	4.7K OHM
R453	63-1782	820 OHM
R454	63-1824	8.2K OHM
R455	63-1813	4.7K OHM
R456	63-1772	470 OHM
R461	63-1824	6.8K OHM
R464	63-1825	2.2 MEG OHM
R465	63-1810	3.9K OHM
R466	63-1723	56 OHM
R467	63-1824	6.8K OHM 5%
R468	63-1824	6.2K OHM 5%
R471	63-1774	560 OHM 5%
R472	63-1774	560 OHM 5%
R473	63-1709	15 OHM
R475	63-5784	.47 OHM 2W
R476	63-5784	.47 OHM 2W
R501	63-1832	3.3 MEG OHM 7W
R502	63-6928	225 OHM 5%
R503	63-1816	5.6K OHM
R601	63-1890	180K OHM
R602	63-1890	180K OHM
R603	63-1845	270K OHM
R604	63-1845	270K OHM
R605	63-1841	220K OHM
R606	63-1848	33K OHM
R607	63-1788	100K OHM
R608	63-1788	100K OHM
R610	63-1786	1.8K OHM
R611	63-1844	27K OHM 5%
R612	63-1796	1.8K OHM 5%
R613	63-1868	1.8K OHM 5%
R614	63-1839	82K OHM 5%
R615	63-1825	8.1K OHM 5%
R616	63-1864	45K OHM 5%
R618	63-1858	56K OHM 5%
R619	63-1872	120K OHM
R620	63-1858	56K OHM
R621	63-1872	120K OHM
R622	63-4272	150K OHM 1/4W
R623	63-4241	22K OHM 1/4W

ITEM NO.	PART NUMBER	DESCRIPTION
R624	63-4251	220K OHM 1/4W
R625	63-4273	120K OHM 1/4W
R626	63-1841	33K OHM
R627	63-1834	15K OHM
R628	63-1831	12K OHM
R629	63-1838	18K OHM
R630	63-4182	390 OHM 1/4W
R631	63-1818	1.2 MEG OHM
R632	63-1820	5.6K OHM
R633	63-1848	33K OHM
R634	63-1834	15K OHM
R651	63-1880	180K OHM
R652	63-1876	150K OHM
R653	63-1868	100K OHM
R654	63-1845	270K OHM
R655	63-1841	220K OHM
R656	63-1848	33K OHM
R657	63-1876	150K OHM
R658	63-1868	100K OHM
R659	63-1796	1.8K OHM
R660	63-1796	1.8K OHM
R661	63-1844	27K OHM 5%
R662	63-1790	1.3K OHM 5%
R663	63-1808	3.6K OHM 5%
R664	63-1861	68K OHM 5%
R665	63-1825	8.2K OHM 5%
R666	63-1825	8.1K OHM 5%
R667	63-1869	100K OHM
R668	63-1858	56K OHM 5%
R669	63-1873	120K OHM
R670	63-1873	120K OHM
R671	63-1858	56K OHM 5%
R672	63-1858	56K OHM
R673	63-1838	18K OHM
R674	63-1843	6.8 MEG OHM
R701	63-1797	220 OHM (ON JACK
R702	63-1757	220 OHM (ASSEMBLY
R801	63-1818	1.2 MEG OHM
R802	63-1813	4.7K OHM
R803	63-1788	1.2K OHM
R804	63-1824	10K OHM
R805	63-1813	4.7K OHM
R806	63-1775	560 OHM
R807	63-1827	18K OHM
R808	63-1827	18K OHM
R809	63-1827	18K OHM
R810	63-1825	8.2K OHM 5%
R811	63-1820	5.6K OHM
R812	63-0963	50K POTENTIOMETER BASS CONT (REAR)
		50K POTENTIOMETER TREBLE CONTROL (REAR)
R814	63-1825	2.2 MEG OHM
R815	63-1810	3.9K OHM
R816	63-1723	56 OHM
R817	63-1825	8.2K OHM 5%
R818	63-1788	1.2K OHM 5%
R821	63-1774	560 OHM 5%
R822	63-1777	680 OHM 5%
R823	63-3708	15 OHM
R824	63-1734	47 OHM 2W
R825	63-1734	47 OHM 2W
R829	63-1831	12K OHM
R830	63-0962	500K REAR BALANCE CONTROL
R851	63-1818	1.2 MEG OHM
R852	63-1813	4.7K OHM
R853	63-1788	1.2K OHM
R854	63-1813	4.7K OHM
R855	63-1813	4.7K OHM
R856	63-1775	560 OHM
R857	63-1827	18K OHM
R861	63-1820	5.6K OHM
R862	63-1818	1.2 MEG OHM
R865	63-1713	56 OHM
R871	63-1827	18K OHM 5%
R888	63-1788	1.2K OHM 5%
R871	63-1774	560 OHM 5%
R872	63-1777	680 OHM 5%
R873	63-1734	47 OHM 2W
R874	63-1734	.47 OHM 2W
R875	63-5784	.47 OHM 2W
L1	20-3075	FM ANTENNA COIL
L2	20-3077	FM OSCILLATOR COIL
L3	20-3266	FM OSCILLATOR COIL
L4	20-3077	AM OSCILLATOR TRANS. PRI.
L101	20-6842	AM ANTENNA COIL ASSEMBLY
L102	149-311	FERRITE CORE SLEEVE
L103	IN T102	AM OSCILLATOR TRANS. SEC.
L104	IN T102	AM OSCILLATOR TRANS. PRI.
L105	149-311	FERRITE CORE SLEEVE
L106	IN T102	AM OSCILLATOR COIL
L201	IN T201	1ST IF TRANSFORMER 10.7 MHz PRI.
L202	IN T201	1ST IF TRANSFORMER 10.7 MHz SEC.
L203	IN T202	1ST IF AM 455 KHz PRI.
L204	IN T202	1ST IF AM 455 KHz SEC.
L205	IN T203	2ND IF TRANSFORMER 10.7 MHz PRI.
L206	IN T203	2ND IF TRANSFORMER 10.7 MHz SEC.
L207	IN T204	3RD IF TRANSFORMER 10.7 MHz PRI.
L208	IN T204	3RD IF TRANSFORMER 10.7 MHz SEC.
L209	IN T205	3RD IF AM 455 KHz PRI.
L210	IN T205	3RD IF AM 455 KHz SEC.
L211	IN T206	RATIO DETECTOR TRANS. 10.7 MHz PRI.
L212	IN T206	RATIO DETECTOR TRANS. 10.7 MHz SEC.
L213	IN T207	RATIO DET. TRANS. 10.7 MHz TERTIARY
L214	IN T207	2ND AM 455 KHz PRI.
L301	20-3660	67 KHz TRAP COIL
L302	20-3660	67 KHz TRAP COIL
T101	95-2753	AM 1ST IF TRANSFORMER
T102	95-2751	AM OSCILLATOR TRANSFORMER
T201	95-2754	FM 1ST IF TRANSFORMER 10.7 MHz
T202	95-2751	AM 1ST IF TRANSFORMER 455 KHz
T203	95-2754	FM 2ND IF TRANSFORMER 10.7 MHz
T204	95-2753	AM 2ND IF TRANSFORMER 455 KHz
T205	95-2755	FM 3RD IF TRANSFORMER 10.7 MHz
T206	95-2756	FM RATIO DETECTOR 10.7 MHz
T207	95-2757	FM RATIO DETECTOR 10.7 MHz
T301	95-5021	19 KHz INPUT COIL
T302	95-5022	19 KHz OUTPUT COIL
T303	95-5023	38 KHz OSCILLATOR COIL
T601	95-5027	POWER TRANSFORMER
F601	25-1422	1.25 AMP SLO BLOW FUSE
SW1	85-1329	BAND SWITCH
SW2	85-1330	DECODER SWITCH
SW3	85-1352	A.C. ON-OFF SWITCH
SW4	85-1329	AFC SWITCH
I.C. 1	221-65	MONOLITHIC MULTIPLEX DEMODULATOR
CR1	103-47	AFC DIODE
CR201	103-90	GERMANIUM DIODE } MATCHED PAIR
CR202	103-90	GERMANIUM DIODE }
CR204	103-23	GERMANIUM DIODE
CR208	103-23	GERMANIUM DIODE
CR209	103-23	GERMANIUM DIODE
CR451	103-222	DIODE
CR451	103-222	DIODE
CR501	212-76	SILICON RECTIFIER
CR502	212-76	SILICON RECTIFIER
CR503	103-90	DIODE SERIES
CR601	103-222	DIODE
CR602	103-222	DIODE
M1	12-249	TUNING METER
J1	5-93366	JACK ASSEMBLY WIRING
DS1	100-610	POINTER LIGHT
DS2	100-604	A.M. LIGHT
DS3	100-610	F.M. LIGHT
DS4	100-610	PILOT LIGHT
DS301	100-611	STEREO INDICATOR LIGHT
LS101	49-1221	6 1/2" SPEAKER
LS402	49-1169	HORN SPEAKER
LS451	49-1231	6 1/2" SPEAKER
LS452	49-1231	6 1/2" SPEAKER
LS501	49-1231	6 1/2" SPEAKER
LS502	49-1169	HORN SPEAKER
LS851	49-1231	6 1/2" SPEAKER
LS852	49-1169	HORN SPEAKER
L401	20-3481	400 uh
L451	20-3481	400 uh
L501	20-3481	400 uh
L851	20-3481	400 uh

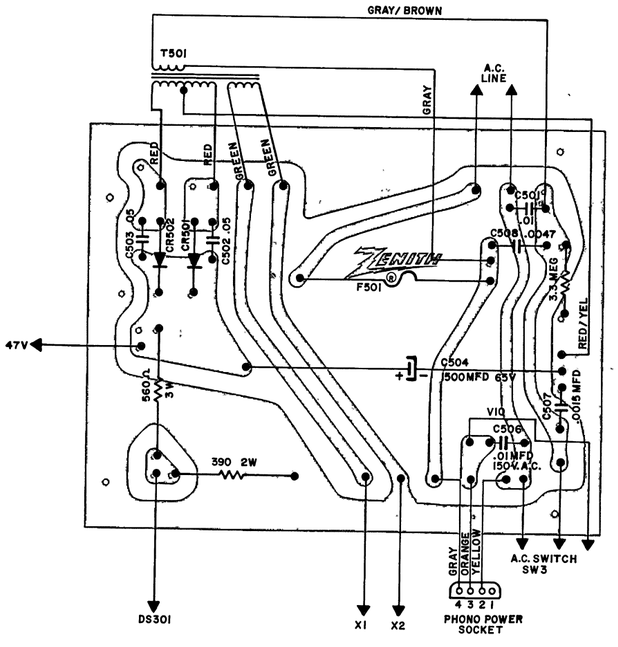
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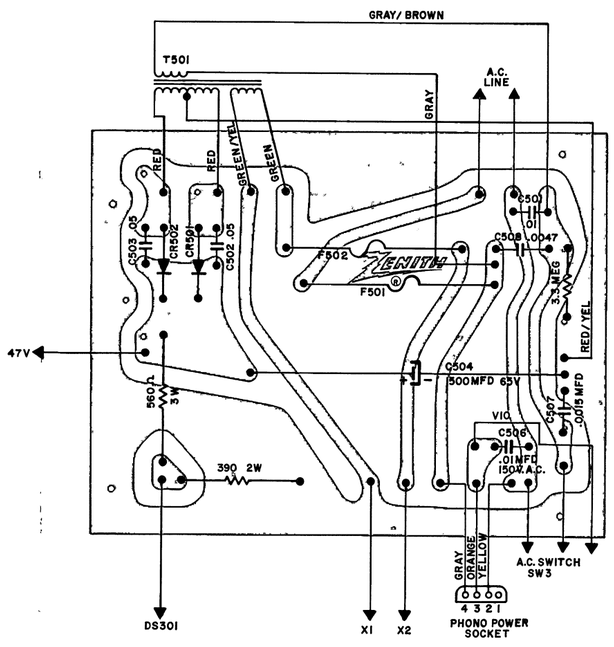
CHASSIS 15WDR51 – RF/IF – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



CHASSIS 15WDR51 – PREAMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

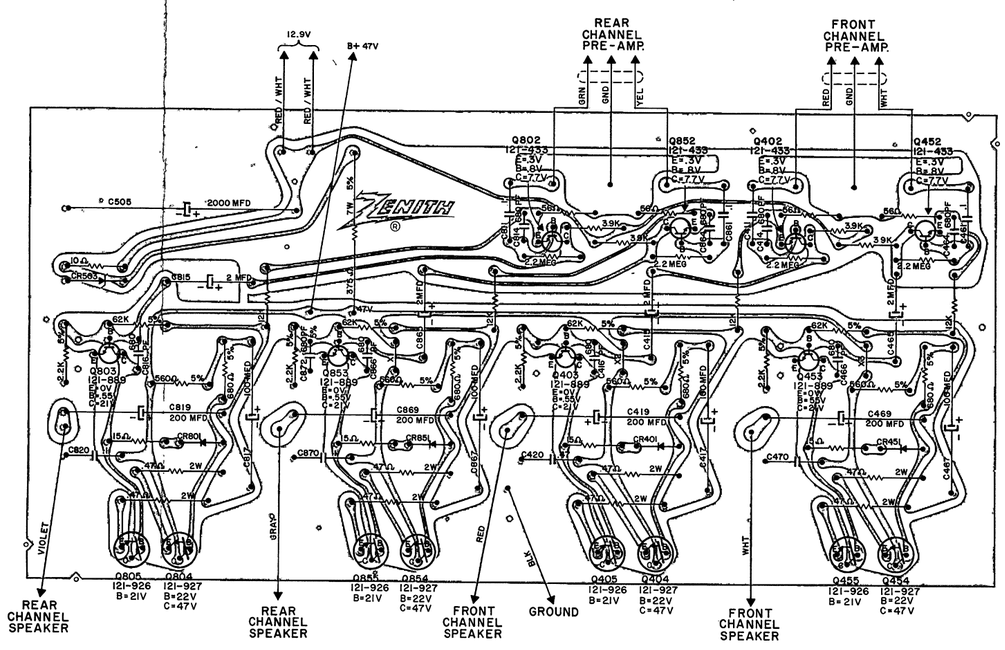


EARLY PRODUCTION



LATE PRODUCTION

CHASSIS 15WDR51 – POWER SUPPLY – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



CHASSIS 15WDR51 – POWER AMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

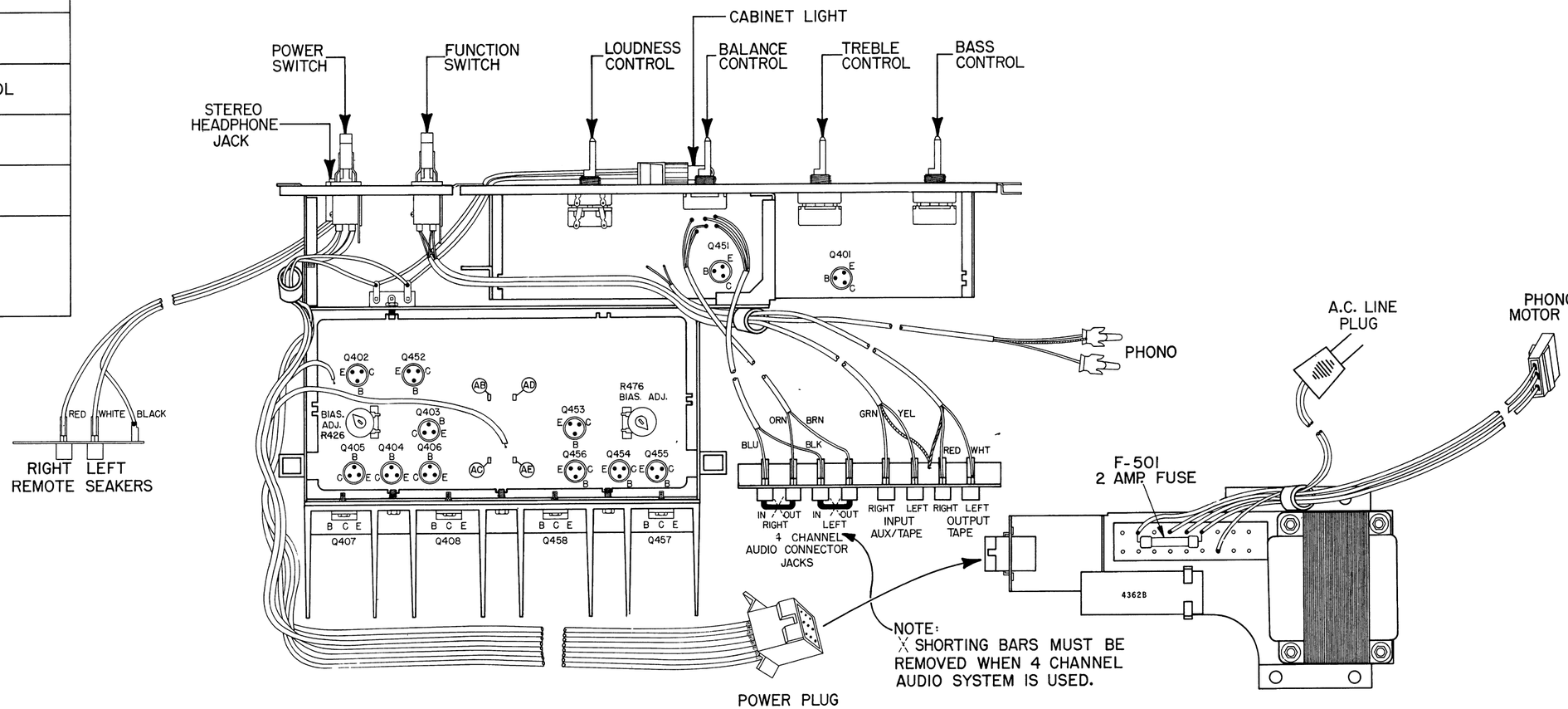
TRANSISTORS		
NO.	PART NO.	DESCRIPTION
Q401	121-430	PRE-AMPLIFIER
Q451		
Q402	121-430	AUDIO AMPLIFIER
Q452		
Q403	121-768	PRE-DRIVER
Q453		
Q404	121-767	BIAS CONTROL
Q454		
Q405	121-773	DRIVER
Q455		
Q406	121-774	DRIVER
Q456		
Q407	121-853 or 121-880	OUTPUT
Q457		
Q408		
Q458		

TEST POINTS

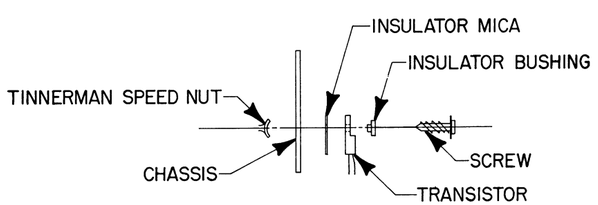
BIAS TEST POINTS: (AB), (AC), (AD), (AE).

TO ADJUST BIAS CONNECT A DIGITAL VOLTMETER OR ACCURATE LOW RANGE VOLTMETER ACROSS TEST POINTS AB-AC AND ADJUST R426 FOR .010V TO .015V.

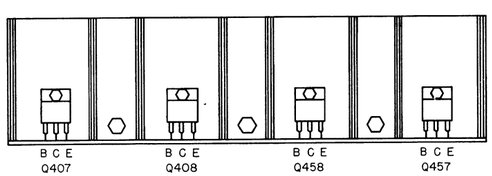
REPEAT ABOVE ADJUSTMENT FOR TEST POINTS AD-AE AND ADJUST R476 FOR .010V TO .015V.

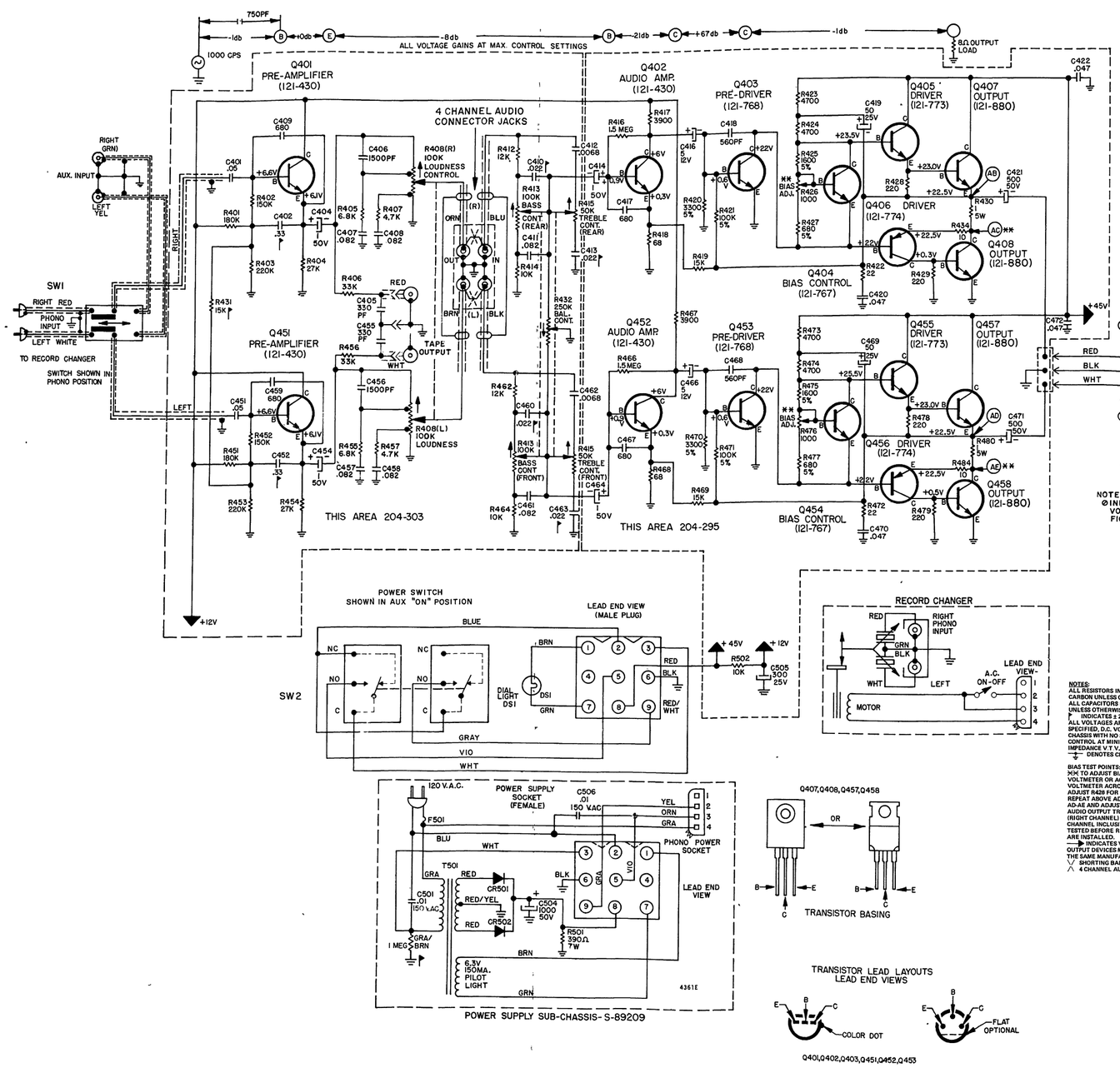


POWER SUPPLY
S-89209



OUTPUT TRANSISTOR MOUNTING VIEW





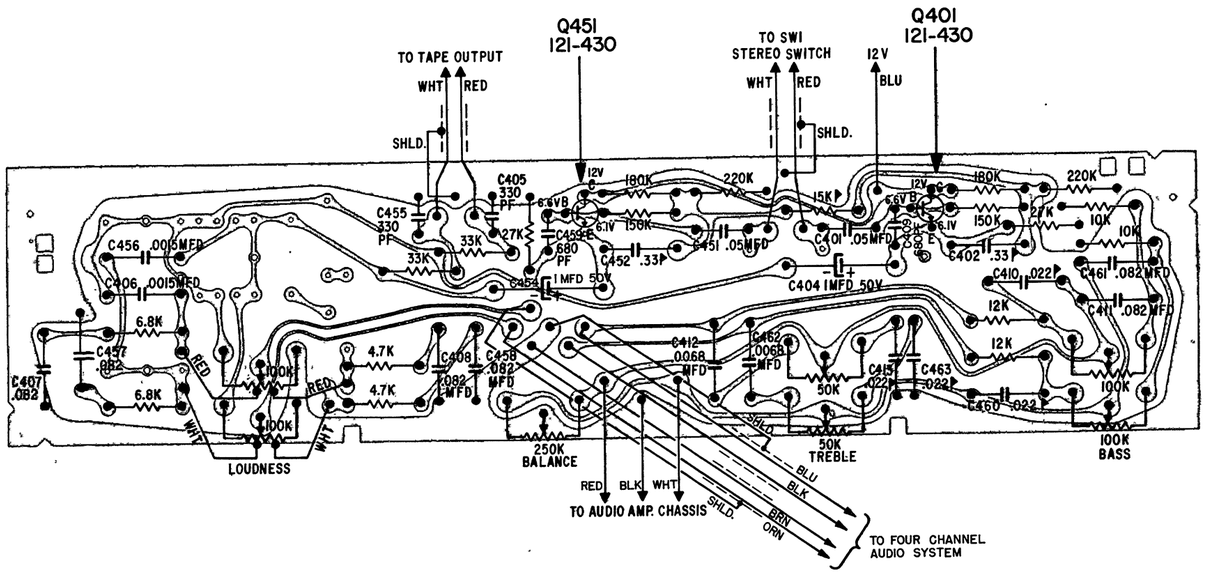
NOTES:
ALL RESISTORS IN OHMS, ± 10%, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.
ALL CAPACITORS IN MICROFARADS ± 10% UNLESS OTHERWISE SPECIFIED.
† INDICATES ± 20%.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED, D.C. VOLTAGES ARE MEASURED FROM CHASSIS WITH NO SIGNAL AND LOUDNESS CONTROL AT MINIMUM USING A HIGH INPUT IMPEDANCE V.T.V.M. LINE VOLTAGE 120 V.A.C.
⏚ DENOTES CHASSIS GROUND.

BIAS TEST POINTS: (AB), (AC), (AD), (AE)
✻✻ TO ADJUST BIAS CONNECT A DIGITAL VOLTMETER OR ACCURATE LOW RANGE VOLTMETER ACROSS TEST POINTS AB-AC AND ADJUST R428 FOR .010V TO .015V
REPEAT ABOVE ADJUSTMENT FOR TEST POINTS AD-AE AND ADJUST R478 FOR .010V TO .015V
AUDIO OUTPUT TRANSISTORS Q403 TO Q408 (RIGHT CHANNEL) AND Q453 TO Q458 (LEFT CHANNEL INCLUSIVE IN EACH GROUP SHOULD BE TESTED BEFORE REPLACEMENT TRANSISTORS ARE INSTALLED.
→ INDICATES VOLTAGE SOURCE
OUTPUT DEVICES MUST BE USED AS PAIRS FROM THE SAME MANUFACTURER IN EACH CHANNEL.
\/ SHORTING BAR MUST BE REMOVED WHEN
/\ 4 CHANNEL AUDIO SYSTEM IS USED.

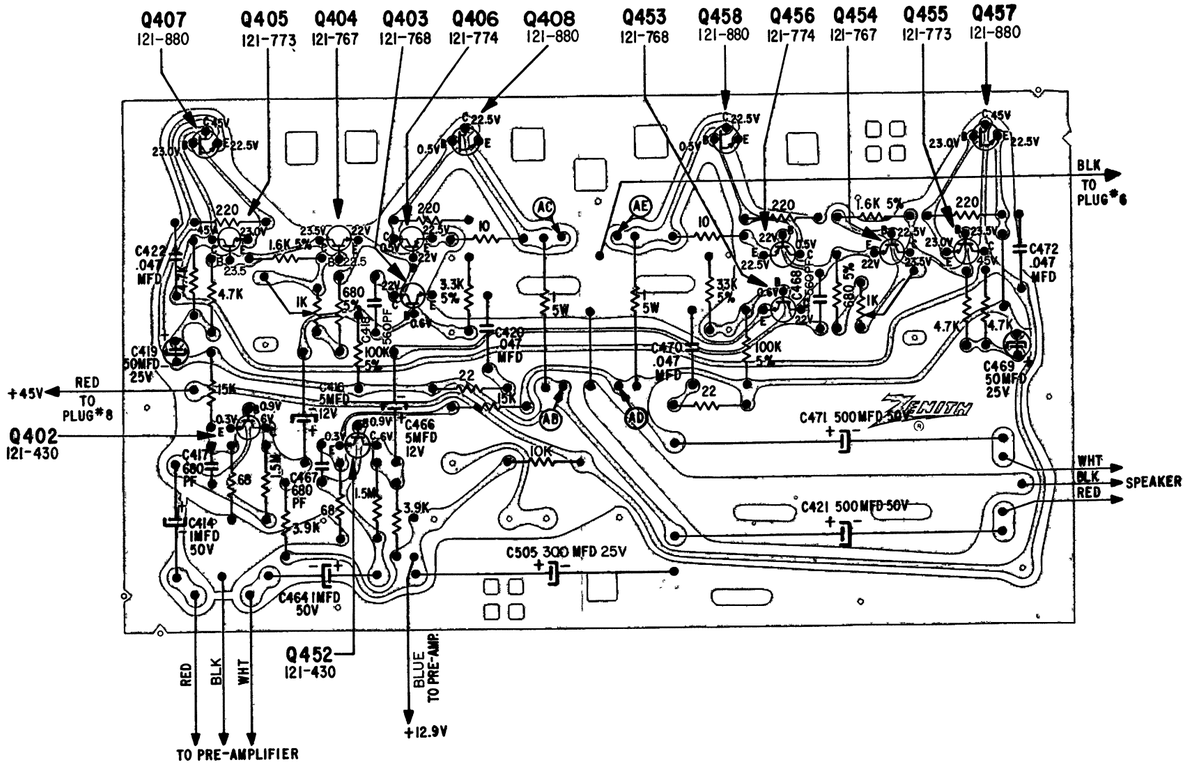
LEGEND CHASSIS 16CT21

ITEM NO.	PART NUMBER	DESCRIPTION
C401	22-3034	.05 MFD DISC 25 V
C402	22-6343	.33 MFD 20% 50 V
C404	22-3687	1 MFD ELECTROLYTIC 50 V
C405	22-3255	330 PF DISC 500 V
C406	22-5483	1500 PF 500 V
C407	22-5884	.082 MFD 100 V
C408	22-5884	.082 MFD 100 V
C409	22-5482	680 PF DISC 500 V
C410	22-5814	.022 MF 20% 100 V
C411	22-5884	.056 MFD 100 V
C412	22-3415	.0068 MF 50 V
C413	22-5814	.022 MF 20% 100 V
C414	22-3687	1 MFD ELECTROLYTIC 50 V
C416	22-2884	5 MFD ELECTROLYTIC 12 V
C417	22-5482	680 PF DISC 500 V
C418	22-3362	560 PF 500 V
C419	22-5986	50 MFD ELECTROLYTIC 25 V
C420	22-6866	.047 MFD 100 V
C421	22-5316	500 MFD ELECTROLYTIC 50 V
C422	22-5866	.047 MFD 100 V
C451	22-3034	.05 MFD DISC 25 V
C452	22-6343	.33 MFD 20% 50 V
C454	22-3687	1 MFD ELECTROLYTIC 50 V
C455	22-3255	330 PF DISC 500 V
C456	22-5483	1500 PF 500 V
C457	22-5884	.082 MFD 50 V
C458	22-5884	.082 MFD 100 V
C459	22-5482	680 PF DISC 500 V
C460	22-5814	.022 MF 20% 100 V
C461	22-5884	.082 MFD 100 V
C462	22-3415	.0068 MF 25 V
C463	22-5814	.022 MF 20% 100 V
C464	22-3687	1 MFD ELECTROLYTIC 50 V
C466	22-2884	5 MFD ELECTROLYTIC 12 V
C467	22-5482	680 PF DISC 500 V
C468	22-3362	560 PF 500 V
C469	22-5986	50 MFD ELECTROLYTIC 25 V
C470	22-5866	.047 MFD 100 V
C471	22-5316	500 MFD ELECTROLYTIC 50 V
C472	22-5866	.047 MFD 100 V
C501	22-6005	.01 MFD DISC 150 VAC
C504	22-5362	1000 MFD ELECTROLYTIC 50 V
C505	22-5168	300 MFD 25 V
C506	22-6005	.01 MFD DISC 150 VAC
C507	22-4588	.2 MFD ELECTROLYTIC N.P. 30 V
C508	22-4588	2 MFD ELECTROLYTIC N.P. 30 V
R401	63-1890	180 K
R402	63-1876	150 K
R403	63-1883	220 K OHM
R404	63-1845	27 K OHM
R405	63-1820	6.8 K OHM
R406	63-1848	33 K OHM
R407	63-1813	4.7 K OHM
R408L	63-9324	100 K DUAL LOUDNESS CONTROL
R408R		
R412	63-1831	12 K OHM
R413R	63-7682	100 K DUAL BASS CONTROL
R413L		
R414	63-1827	10 K OHM
R415	63-7681	50 K TREBLE CONTROL
R416	63-1918	1.5 MEG
R417	63-1810	3900 OHM
R418	63-1736	68 OHM
R419	63-1834	15 K OHM
R420	63-1805	3300 OHM 5%
R421	63-1868	100 K OHM 5%
R422	63-1715	22 OHM
R423	63-1813	4700 OHM
R424	63-1813	4700 OHM
R425	63-1794	1600 OHM 5%
R426	63-8977	1000 OHM BIAS ADJUST
R427	63-1777	680 OHM 5%
R428	63-1757	220 OHM
R429	63-1757	220 OHM
R430	63-6424	1 OHM 5 W
R431	63-1835	15 K 20%
R432	63-9000	250 K BALANCE CONTROL
R434	63-1701	10 OHM
R451	63-1880	180 K
R452	63-1876	150 K
R453	63-1883	220 K OHM
R454	63-1845	27 K OHM
R455	63-1820	6.8 K
R456	63-1848	33 K OHM
R457	63-1813	4.7 K OHM
R462	63-1831	12 K OHM
R464	63-1827	10 K OHM
R466	63-1918	1.5 MEG
R467	63-1810	3900 OHM
R468	63-1736	68 OHM
R469	63-1834	15 K OHM
R470	63-1805	3300 OHM 5%
R471	63-1868	100 K OHM 5%
R472	63-1715	22 OHM
R473	63-1813	4700 OHM
R474	63-1813	4700 OHM
R475	63-1794	1600 OHM 5%
R476	63-8977	1000 OHM BIAS ADJUST
R477	63-1777	680 OHM 5%
R478	63-1757	220 OHM
R479	63-1757	220 OHM
R480	63-6424	1 OHM 5 W
R484	63-1701	10 OHM
R501	63-4380	390 OHM 10% 7 W
R502	63-1827	10 K OHM 10% ½ W
R506	63-1912	1 MEG OHM 20% ½ W
T501	95-2040	POWER TRANSFORMER
F501	136-24	2A FUSE
CR501	212-61	SILICON RECTIFIER
CR502	212-61	SILICON RECTIFIER
SW1	85-1212	PHONO-AUX SWITCH
SW2	85-1211	POWER SWITCH
DS1	100-249	PILOT LIGHT BULB
SP-1	49-1216	6" PM SPEAKER
SP-2	49-1216	6" PM SPEAKER
SP-3	49-1168	HORN SPEAKER
SP-4	49-1168	HORN SPEAKER

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CHASSIS 16CT21 – PRE AMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

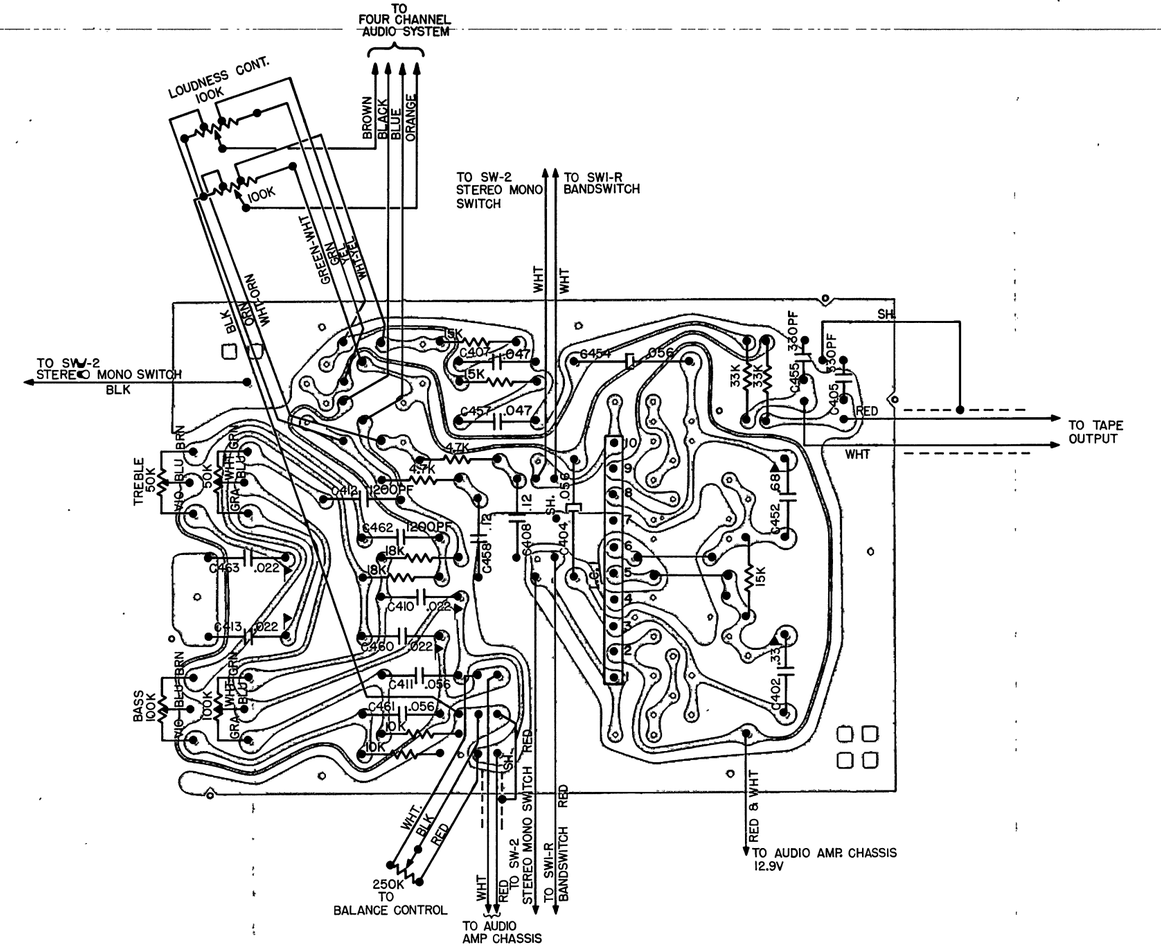


CHASSIS 16CT21 – POWER AMP – POWER AMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

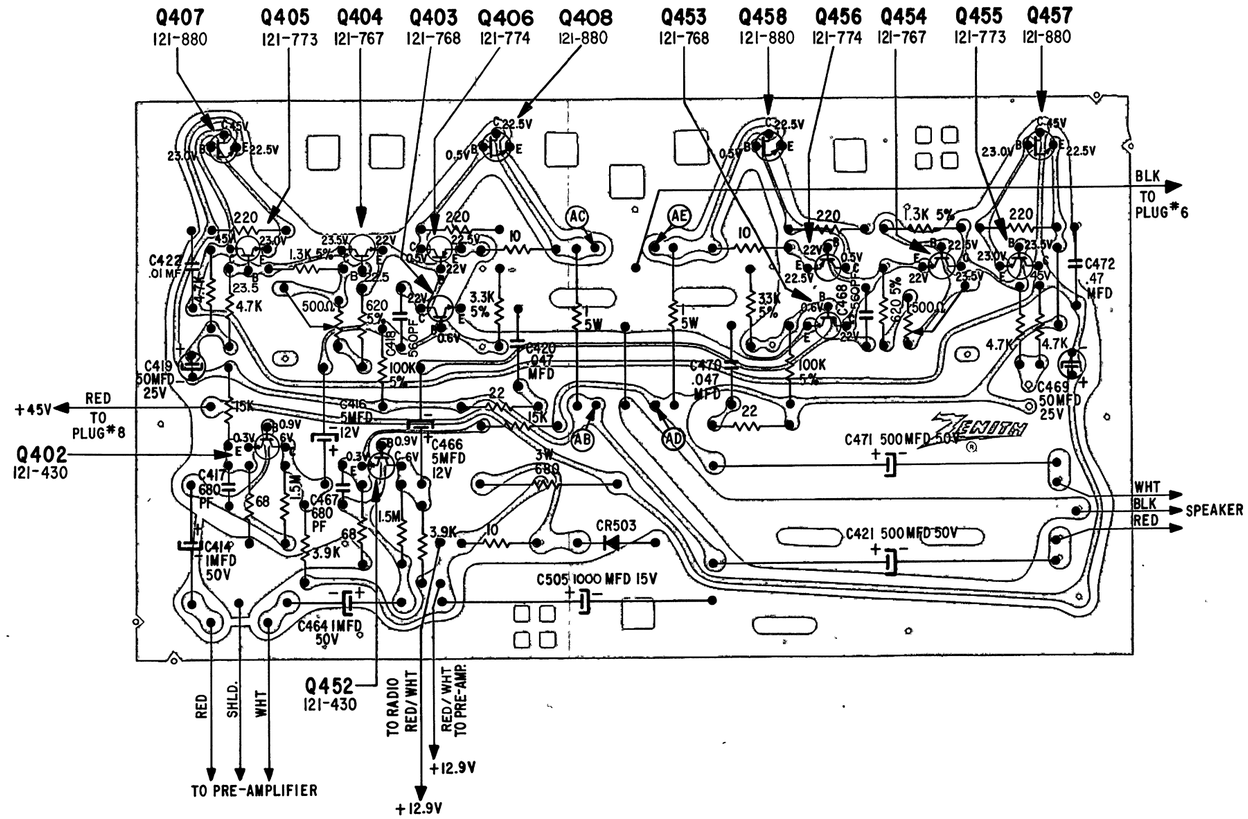
LEGEND CHASSIS 25WDR50

ITEM NO.	PART NUMBER	DESCRIPTION
CIA		FM ANT TRIMMER
CIB		FM ANT. TUNING
CIC		FM DETECTOR TRIMMER
CID		FM DETECTOR TUNING
CIE		FM OSC. TRIMMER
CIF	23-4346	FM OSC. TUNING
CIG		AM ANT. TUNING
CIH		AM DETECTOR TRIMMER
CIJ		AM DETECTOR TUNING
CIK		AM OSC. TRIMMER
CIL		AM OSC. TUNING
C1	23-2729	.0033 MFD DISC 2KV
C2	23-2729	.001 MFD DISC 2KV
C5	23-3575	10 PF DISC ± 5% 500V
C6	23-3303	.01 MFD DISC 150VAC
C7	23-3541	3.3 PF GIMMICK ± 5% 500V
C8	23-3570	10 PF DISC ± 5% 500V
C9	23-3592	3.4 PF DISC ± .25 PF 2KV
C10	23-3544	5 PF DISC ± .5% 500V
C11	23-3544	7 PF DISC ± 1% 500V
C12	23-3634	.05 MFD DISC 25V
C13	23-4053	1.7 TO 10 PF CERAMIC TRIMMER 500V
C14	23-3293	.01 MFD DISC 25V
C15	23-3293	.001 MFD DISC 25V
C16	23-3729	.0033 MFD DISC 2KV
C17	23-3705	.02 MFD DISC 25V
C101	23-13	.0033 MFD DISC ± 50% 500V
C102	23-3634	.05 MFD DISC 25V
C103	23-3634	.05 MFD DISC 25V
C104	23-3634	.05 MFD DISC 25V
C105	23-3634	.05 MFD DISC 25V
C106	23-4198	.01 MFD DISC 1KV ± 5%
C107	23-3293	.01 MFD DISC 1KV
C108	23-3310	2 PF 500V
C109	23-3310	2.7 PF GIMMICK 500V
C201	23-3482	680 PF DISC 500V
C202	23-3634	.05 MFD DISC 25V
C203	23-3634	.05 MFD DISC 25V
C204	23-3634	.05 MFD DISC 25V
C205	23-3634	.05 MFD DISC 25V
C206	23-3310	33 PF DISC ± 5% 500V
C207	23-3310	2.7 PF GIMMICK 500V
C208	23-3634	.05 MFD DISC 25V
C209	23-3482	680 PF DISC 500V
C210	23-3482	680 PF DISC 500V
C211	23-3634	.05 MFD DISC 25V
C212	23-3634	.05 MFD DISC 25V
C213	23-3574	56 PF DISC ± 5% 500V
C214	23-3482	680 PF DISC 500V
C215	23-3634	.05 MFD DISC 25V
C216	23-3060	.006 MFD DISC 25V
C217	23-3060	.006 MFD DISC 25V
C218	23-3177	390 PF DISC 500V
C219	23-3177	390 PF DISC 500V
C220	23-4466	10 MFD ELECTROLYTIC 25V
C221	23-4466	10 MFD ELECTROLYTIC 6V
C222	23-3303	.0047 MFD DISC 150VAC
C223	23-3303	.01 MFD DISC 150V
C224	23-3581	.0047 MFD DISC 500V
C225	23-3581	.0047 MFD DISC 500V
C226	23-3581	39 PF DISC ± 5% 500V
C227	23-3634	.05 MFD DISC 25V
C228	23-3060	.006 MFD DISC 25V
C229	23-3634	.01 MFD DISC 50V
C230	23-3056	.022 MFD DISC 25V
C231	23-3634	.05 MFD DISC 25V
C232	23-4780	.0022 MFD DISC CAP 500V
C233	23-4780	270 PF POLYESTYRENE ± 5% 500V
C234	23-4780	1000 PF POLYESTYRENE ± 5% 500V
C301	23-4246	3.3 MFD N.P. 15V
C302	23-4780	2500 PF POLYESTYRENE 50V
C303	23-4782	9.900 PF ELECTROLYTIC 15V
C304	23-4780	3300 PF POLYESTYRENE ± 5% 500V
C305	23-4782	6 MFD ELECTROLYTIC 12V
C306	23-3584	1000 PF POLYESTYRENE ± 5% 500V
C307	23-3415	.0068 MFD 25V
C308	23-3415	.0033 MFD DISC 25V
C309	23-3634	.05 MFD DISC 25V
C401	23-3082	.0033 MFD MYLAR 50V
C402	23-3255	.0033 MFD MYLAR 100V
C403	23-3255	330 PF DISC 500V
C404	23-3255	.047 MFD MYLAR 100V
C405	23-3667	12 MFD MYLAR 100V
C406	23-3667	12 MFD MYLAR 100V
C407	23-4466	1 MFD ELECTROLYTIC 50V
C408	23-4466	1 MFD ELECTROLYTIC 50V
C409	23-3255	.022 MFD MYLAR 100V
C410	23-3482	680 PF DISC 500V
C411	23-3255	.022 MFD MYLAR 100V
C412	23-4696	1200 PF MYLAR 50V
C413	23-3667	.022 MFD MYLAR 100V
C414	23-3667	1 MFD ELECTROLYTIC 50V
C415	23-3667	1 MFD ELECTROLYTIC 50V
C416	23-3482	680 PF DISC 500V
C417	23-3482	680 PF DISC 500V
C418	23-3996	.02 MFD ELECTROLYTIC 25V
C419	23-3996	.047 MFD MYLAR 100V
C420	23-3667	500 MFD ELECTROLYTIC 25V
C421	23-4417	.01 MFD DISC 500V
C422	23-4417	.68 MFD 2.5% MYLAR 50V
C423	23-4615	.056 MFD MYLAR 100V
C424	23-4615	.056 MFD MYLAR 100V
C425	23-3667	.047 MFD MYLAR 100V
C426	23-3667	12 MFD MYLAR 100V
C427	23-3667	.022 MFD 20% 50V
C428	23-4615	.056 MFD MYLAR 100V
C429	23-3667	1200 PF MYLAR 50V
C430	23-3667	1200 PF MYLAR 50V
C431	23-3667	.022 MFD 20% 50V
C432	23-3667	1 MFD ELECTROLYTIC 50V
C433	23-3667	1 MFD ELECTROLYTIC 50V
C434	23-3482	680 PF DISC 500V
C435	23-3482	680 PF DISC 500V
C436	23-3996	.02 MFD ELECTROLYTIC 25V
C437	23-3996	.047 MFD MYLAR 100V
C438	23-3667	500 MFD ELECTROLYTIC 25V
C439	23-4417	.01 MFD DISC 500V
C440	23-4417	.68 MFD 2.5% MYLAR 50V
C441	23-4615	.056 MFD MYLAR 100V
C442	23-4615	.056 MFD MYLAR 100V
C443	23-3667	.047 MFD MYLAR 100V
C444	23-3667	12 MFD MYLAR 100V
C445	23-3667	.022 MFD 20% 50V
C446	23-4615	.056 MFD MYLAR 100V
C447	23-3667	1200 PF MYLAR 50V
C448	23-3667	1200 PF MYLAR 50V
C449	23-3667	.022 MFD 20% 50V
C450	23-4417	.01 MFD DISC 500V
C451	23-4417	.01 MFD DISC 500V
C452	23-4696	1000 MFD ELECTROLYTIC 50V
C453	23-4696	1000 MFD ELECTROLYTIC 15V
C454	23-4006	.01 MFD DISC 150 VAC
C455	23-4009	.01 MFD DISC 150VAC
C501	23-4157	220 OHM 5WW
C502	23-4157	220 OHM 5WW
C503	23-3772	470 OHM 20%
C504	23-3796	1.8K OHM
C505	23-4198	1.8K OHM 1/4W
C506	23-4231	12K OHM 1/4W
C507	23-3810	4700 OHM 20%
C508	23-4122	33 OHM 1/4W
C509	23-4139	47 OHM 1/4W
C510	23-4139	47 OHM 1/4W
C511	23-4287	270K OHM 1/4W
C512	23-4251	47K OHM 1/4W
C513	23-1772	470 OHM 20%
C514	23-1761	270 OHM
C515	23-3810	3.9K OHM
C516	23-3772	470 OHM
C517	23-1863	2.7K OHM
C518	23-1799	2.2K OHM
C519	23-1775	960 OHM
C520	23-1761	270 OHM
C521	23-1772	470 OHM 20%
C522	23-1813	4.7K OHM
C523	23-1772	470 OHM
C524	23-1774	476 OHM
C525	23-1705	1K OHM
C526	23-1799	2.2K OHM
C527	23-1772	470 OHM 20% 1/4W
C528	23-1772	1K OHM
C529	23-1863	2.7K OHM
C530	23-1775	960 OHM
C531	23-1863	2.7K OHM
C532	23-1863	2.7K OHM
C533	23-1863	2.7K OHM
C534	23-1863	2.7K OHM
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C900	23-1863	2.7K OHM
C901	23-1863	2.7K OHM
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C903	23-1863	2.7K OHM
C904	23-1863	2.7K OHM
C905	23-1863	2.7K OHM
C906	23-1863	2.7K OHM
C907	23-1863	2.7K OHM
C908	23-1863	2.7K OHM
C909	23-1863	2.7K OHM
C910	23-1863	2.7K OHM
C911	23-1863	2.7K OHM
C912	23-1863	2.7K OHM
C913	23-1863	2.7K OHM
C914	23-1863	2.7K OHM
C915	23-1863	2.7K OHM
C916	23-1863	2.7K OHM
C917	23-1863	2.7K OHM
C918	23-1863	2.7K OHM
C919	23-1863	2.7K OHM
C920	23-1863	2.7K OHM
C921	23-1863	2.7K OHM
C922	23-1863	2.7K OHM
C923	23-1863	2.7K OHM
C924	23-1863	2.7K OHM
C925	23-1863	2.7K OHM
C926	23-1863	2.7K OHM
C927	23-1863	2.7K OHM
C928	23-1863	2.7K OHM
C929	23-1863	2.7K OHM
C930	23-1863	2.7K OHM
C931	23-1863	2.7K OHM
C932	23-1863	2.7K OHM
C933	23-1863	2.7K OHM
C934	23-1863	2.7K OHM
C935	23-1863	2.7K OHM
C936	23-1863	2.7K OHM
C937	23-1863	2.7K OHM
C938	23-1863	2.7K OHM
C939	23-1863	2.7K OHM
C940	23-1863	2.7K OHM
C941	23-1863	2.7K OHM
C942	23-1863	2.7K OHM
C943	23-1863	2.7K OHM
C944	23-1863	2.7K OHM
C945	23-1863	2.7K OHM
C946	23-1863	2.7K OHM
C947	23-1863	2.7K OHM
C948	23-1863	2.7K OHM
C949	23-1863	2.7K OHM
C950	23-1863	2.7K OHM
C951	23-1863	2.7K OHM
C952	23-1863	2.7K OHM
C953	23-1863	2.7K OHM
C954	23-1863	2.7K OHM
C955	23-1863	2.7K OHM
C956	23-1863	2.7K OHM
C957	23-1863	2.7K OHM
C958	23-1863	2.7K OHM
C959	23-1863	2.7K OHM
C960	23-1863	2.7K OHM
C961	23-1863	2.7K OHM
C962	23-1863	2.7K OHM
C963	23-1863	2.7K OHM
C964	23-1863	2.7K OHM
C965	23-1863	2.7K OHM
C966	23-1863	2.7K OHM
C967	23-1863	2.7K OHM
C968	23-1863	2.7K OHM
C969	23-1863	2.7K OHM
C970	23-1863	2.7K OHM
C971	23-1863	2.7K OHM
C972	23-1863	2.7K OHM
C973	23-1863	2.7K OHM
C974	23-1863	2.7K OHM
C975	23-1863	2.7K OHM
C976	23-1863	2.7K OHM
C977	23-1863	2.7K OHM
C978	23-1863	2.7K OHM
C979	23-1863	2.7K OHM
C980	23-1863	2.7K OHM
C981	23-1863	2.7K OHM
C982	23-1863	2.7K OHM
C983	23-1863	2.7K OHM
C984	23-1863	2.7K OHM
C985	23-1863	2.7K OHM
C986	23-1863	2.7K OHM
C987	23-1863	2.7K OHM
C988	23-1863	2.7K OHM
C989	23-1863	2.7K OHM
C990	23-1863	2.7K OHM
C991	23-1863	2.7K OHM
C992	23-1863	2.7K OHM
C993	23-1863	2.7K OHM
C994	23-1863	2.7K OHM
C995	23-1863	2.7K OHM
C996	23-1863	2.7K OHM
C997	23-1863	2.7K OHM
C998	23-1863	2.7K OHM
C999	23-1863	2.7K OHM
C1000	23-1863	2.7K OHM

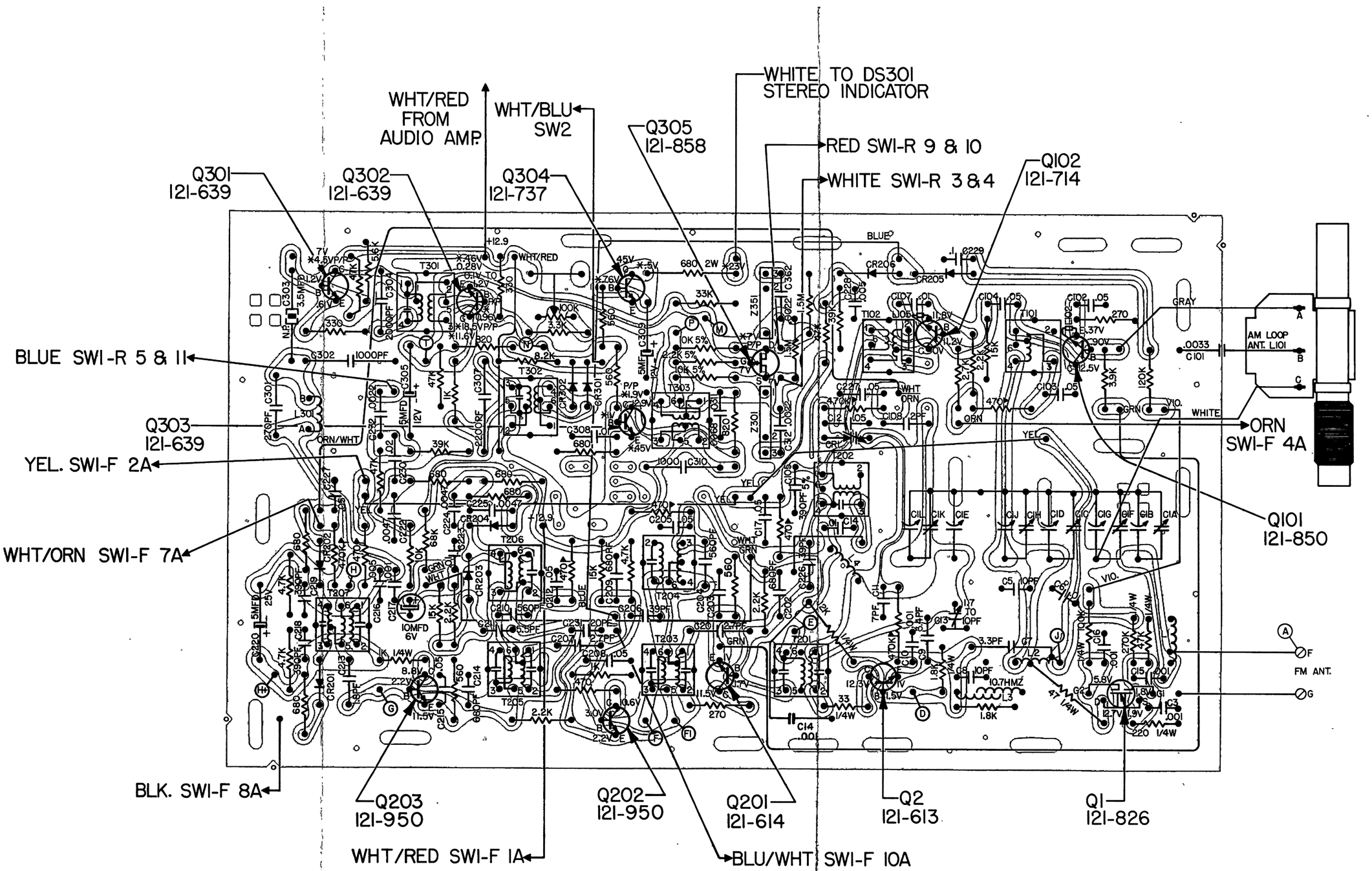
ITEM NO.	PART NUMBER	DESCRIPTION
R219	63-1824	15K ☐OHM
R220	63-1778	680 ☐OHM
R221	63-1677	10K ☐OHM
R222	63-1778	680 ☐OHM
R223	63-1904	680K OHM
R224	63-1799	470K OHM 20%
R225	63-1990	2.2M OHM
R226	63-1852	39K ☐OHM
R227	63-1852	47K ☐OHM
R228	63-1852	39K ☐OHM
R229	63-1873	120K OHM
R230	63-1835	47K ☐OHM
R231	63-1835	47K ☐OHM
R302	63-1817	5.6K ☐OHM
R303	63-1764	330 OHM
R304		
R305	63-1805	47K ☐OHM
R306	63-1764	330 OHM
R307	63-1764	330 OHM
R308	63-4438	100K MUTE CONTROL
R309	63-1785	10 ☐OHM
R310	63-1782	820 OHM
R311		
R312	63-1824	8.2K ☐OHM
R313	63-1775	960 OHM
R314	63-1778	680 OHM
R315	63-1778	680 OHM
R316	63-6863	680 OHM 2W
R317		
R318	63-1781	820 OHM 5%
R319	63-1836	10K 5%
R320	63-1738	220 OHM
R321	63-1839	22K 5%
R322	63-1918	1.5 MEG OHM
R324	63-1918	1.5 MEG OHM
R400	63-1834	15K ☐OHM
R402	63-1849	33K ☐OHM
R403	63-1836	10K ☐OHM
R404	63-3999	100K DUAL LOUDNESS CONTROL
R413	63-1836	10K ☐OHM
R414,5,6R	63-3997	100K DUAL BASS CONTROL
R416	63-1827	10K ☐OHM
R417,8,9R	63-3998	100K DUAL TREBLE CONTROL
R430	63-1918	1.5 MEG
R431	63-1836	10K
R432	63-1738	68 OHM
R438	63-1834	15K
R439	63-1836	10K OHM 5%
R421	63-1968	100K OHM 5%
R422	63-1738	220 OHM
R423	63-1813	4700 OHM
R424	63-1813	4700 OHM
R425	63-1780	1000 OHM 5%
R426	63-3261	500 OHM# BI



CHASSIS 25WDR50 – PRE AMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



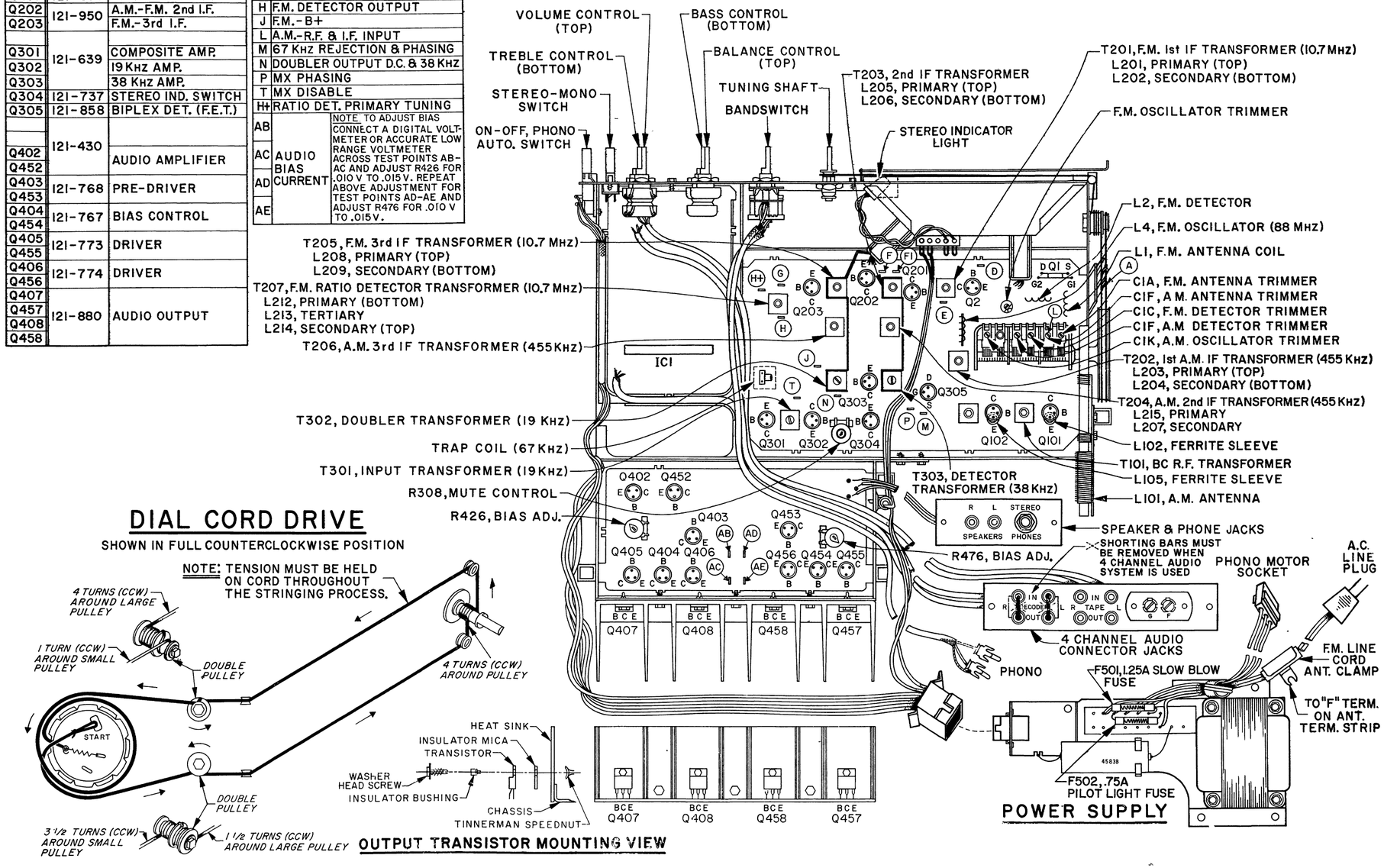
CHASSIS 25WDR50 – POWER AMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE


WHT/RED FROM AUDIO AMP.
WHT/BLU SW2
WHITE TO DS301 STEREO INDICATOR
RED SWI-R 9 & 10
WHITE SWI-R 3 & 4
Q301 121-639
Q302 121-639
Q304 121-737
Q305 121-858
Q102 121-714
BLUE SWI-R 5 & 11
Q303 121-639
YEL. SWI-F 2A
WHT/ORN SWI-F 7A
BLK. SWI-F 8A
Q203 121-950
Q202 121-950
Q201 121-614
Q2 121-613
Q1 121-826
WHT/RED SWI-F 1A
BLU/WHT SWI-F 10A
ORN SWI-F 4A
Q101 121-850
AM LOOP ANT. L101
FM ANT.
GRAY
WHITE
BLUE
+12.9
T301
T302
T303
T201
T202
T203
T204
T205
T206
T207
T1101
T1102
L301
L101
L202
L3
Z301
Z351
CR205
CR206
CR301
CR302
CR303
CR304
CR201
CR202
CR203
CR204
C101
.0033
C1101
.05
.01
.0022
.0047
.002
.001
.022
.0082
.0068
.0056
.0039
.0033
.0027
.0022
.0018
.0015
.0012
.001
.00047
.00033
.00022
.00015
.00012
.0001
.00068
.00056
.00039
.00027
.00018
.00082

TRANSISTORS		
No.	PART No.	DESCRIPTION
Q1	121-826	F.M.-R.F. (F.E.T.)
Q2	121-613	F.M. CONVERTER
Q101	121-850	A.M.-R.F.
Q102	121-714	A.M. CONVERTER
Q201	121-614	A.M.-F.M. 1st I.F.
Q202	121-950	A.M.-F.M. 2nd I.F.
Q203		F.M.-3rd I.F.
Q301	121-639	COMPOSITE AMP.
Q302		19 KHZ AMP.
Q303		38 KHZ AMP.
Q304	121-737	STEREO IND. SWITCH
Q305	121-858	BIPLEX DET. (F.E.T.)
Q402	121-430	AUDIO AMPLIFIER
Q452		
Q403	121-768	PRE-DRIVER
Q453		
Q404	121-767	BIAS CONTROL
Q454		
Q405	121-773	DRIVER
Q455		
Q406	121-774	DRIVER
Q456		
Q407	121-880	AUDIO OUTPUT
Q457		
Q408		
Q458		

TEST POINTS		
A	F.M. ANTENNA INPUT	
D	1st F.M. I.F. INPUT	
E	2nd F.M. I.F. INPUT	
F	3rd F.M. I.F. INPUT	
FI	RATIO DETECTOR INPUT	
G	3rd F.M. OUTPUT	
H	F.M. DETECTOR OUTPUT	
J	F.M.-B+	
L	A.M.-R.F. & I.F. INPUT	
M	67 KHZ REJECTION & PHASING	
N	DOUBLER OUTPUT D.C. & 38 KHZ	
P	MX PHASING	
T	MX DISABLE	
H+	RATIO DET. PRIMARY TUNING	
AB	AUDIO BIAS CURRENT	NOTE: TO ADJUST BIAS CONNECT A DIGITAL VOLTMETER OR ACCURATE LOW RANGE VOLTMETER ACROSS TEST POINTS AB-AC AND ADJUST R426 FOR .010 V TO .015 V. REPEAT ABOVE ADJUSTMENT FOR TEST POINTS AD-AE AND ADJUST R476 FOR .010 V TO .015 V.
AC		
AD		
AE		

INTEGRATED CIRCUITS		
No.	PART No.	DESCRIPTION
IC1	223-6	AUDIO PRE-AMP. I.C.



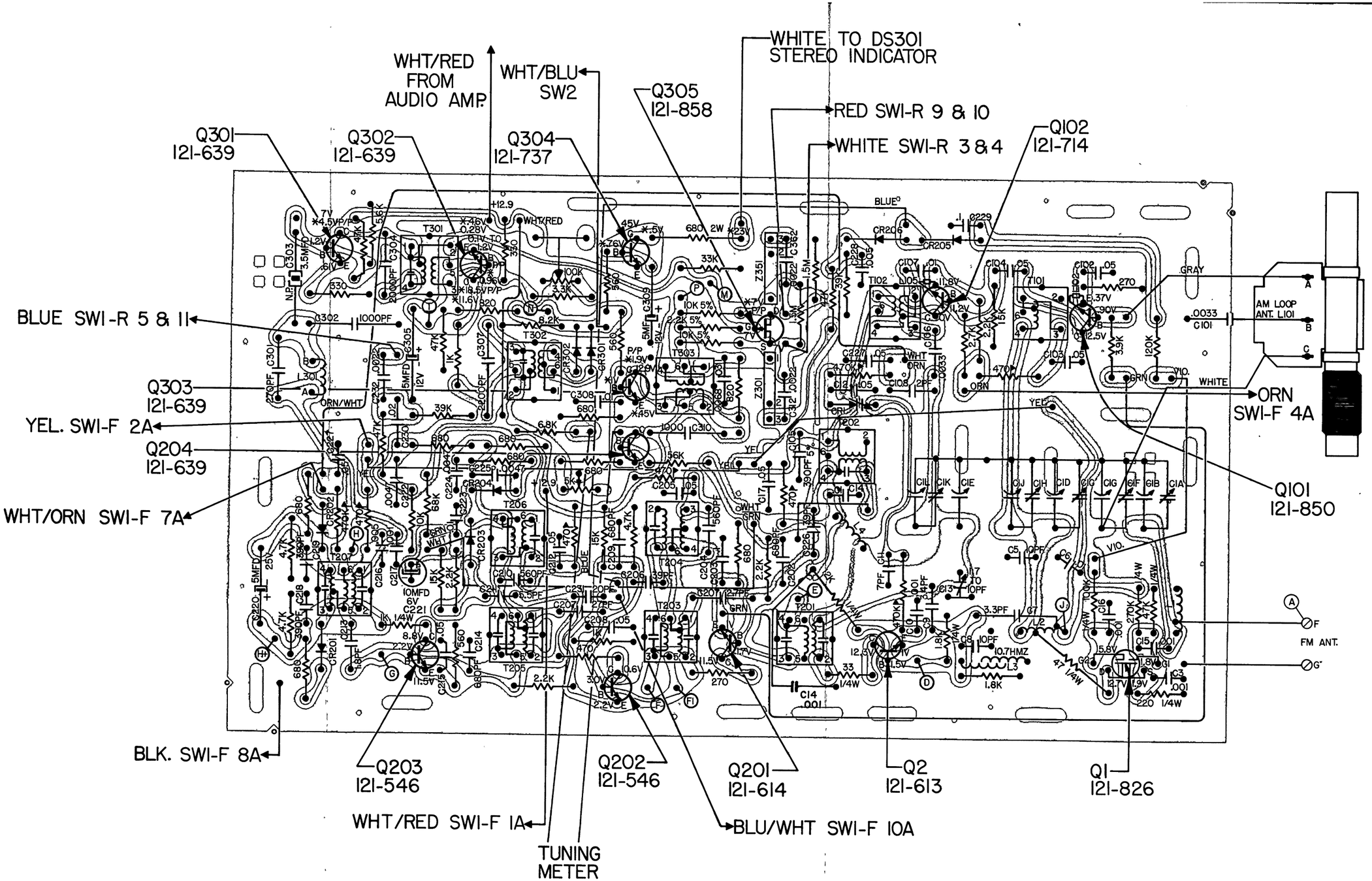
DIAL CORD DRIVE

SHOWN IN FULL COUNTERCLOCKWISE POSITION

NOTE: TENSION MUST BE HELD ON CORD THROUGHOUT THE STRINGING PROCESS.

OUTPUT TRANSISTOR MOUNTING VIEW

CHASSIS 25WDR50 – CHASSIS LAYOUT

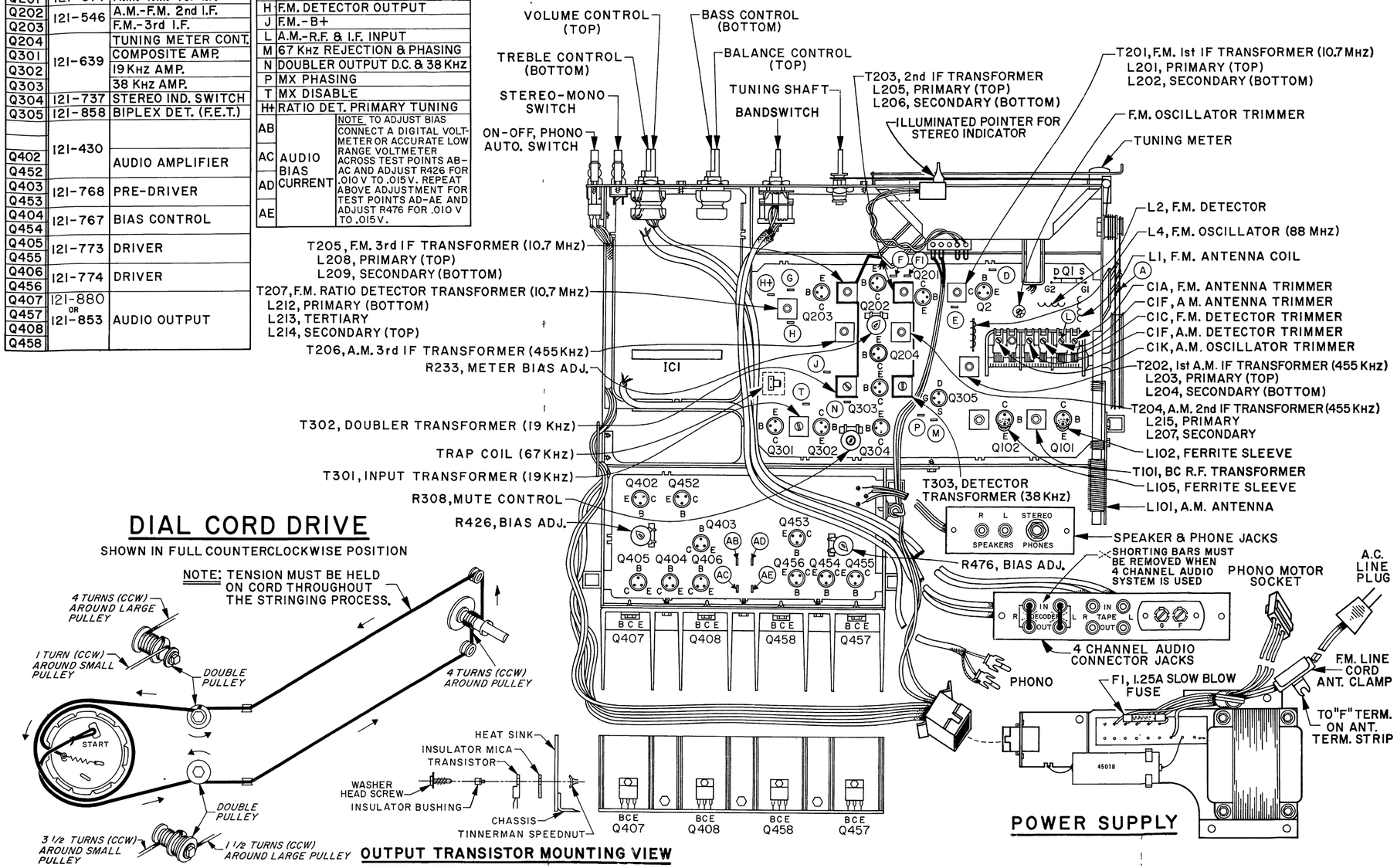


CHASSIS 29CT21Z2 – RF/IF – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

TRANSISTORS		
No.	PART No.	DESCRIPTION
Q1	121-826	F.M.-R.F. (F.E.T.)
Q2	121-613	F.M. CONVERTER
Q101	121-850	A.M.-R.F.
Q102	121-714	A.M. CONVERTER
Q201	121-614	A.M.-F.M. 1st I.F.
Q202	121-546	A.M.-F.M. 2nd I.F.
Q203		F.M.-3rd I.F.
Q204	121-639	TUNING METER CONT.
Q301		COMPOSITE AMP.
Q302		19 KHZ AMP.
Q303		38 KHZ AMP.
Q304	121-737	STEREO IND. SWITCH
Q305	121-858	BIPLEX DET. (F.E.T.)
Q402	121-430	AUDIO AMPLIFIER
Q452		
Q403	121-768	PRE-DRIVER
Q453		
Q404	121-767	BIAS CONTROL
Q454		
Q405	121-773	DRIVER
Q455		
Q406	121-774	DRIVER
Q456		
Q407	121-880 OR 121-853	AUDIO OUTPUT
Q457		
Q408		
Q458		

O TEST POINTS		
A	F.M. ANTENNA INPUT	
D	1st F.M. I.F. INPUT	
E	2nd F.M. I.F. INPUT	
F	3rd F.M. I.F. INPUT	
FI	RATIO DETECTOR INPUT	
G	3rd F.M. OUTPUT	
H	F.M. DETECTOR OUTPUT	
J	F.M.-B+	
L	A.M.-R.F. & I.F. INPUT	
M	67 KHZ REJECTION & PHASING	
N	DOUBLER OUTPUT D.C. & 38 KHZ	
P	MX PHASING	
T	MX DISABLE	
HH	RATIO DET. PRIMARY TUNING	
AB	AUDIO BIAS CURRENT	NOTE: TO ADJUST BIAS CONNECT A DIGITAL VOLTMETER OR ACCURATE LOW RANGE VOLTMETER ACROSS TEST POINTS AB-AC AND ADJUST R426 FOR .010 V TO .015 V. REPEAT ABOVE ADJUSTMENT FOR TEST POINTS AD-AE AND ADJUST R476 FOR .010 V TO .015 V.
AC		
AD		
AE		

INTEGRATED CIRCUITS		
No.	PART No.	DESCRIPTION
IC1	223-6	AUDIO PRE-AMP. I.C.

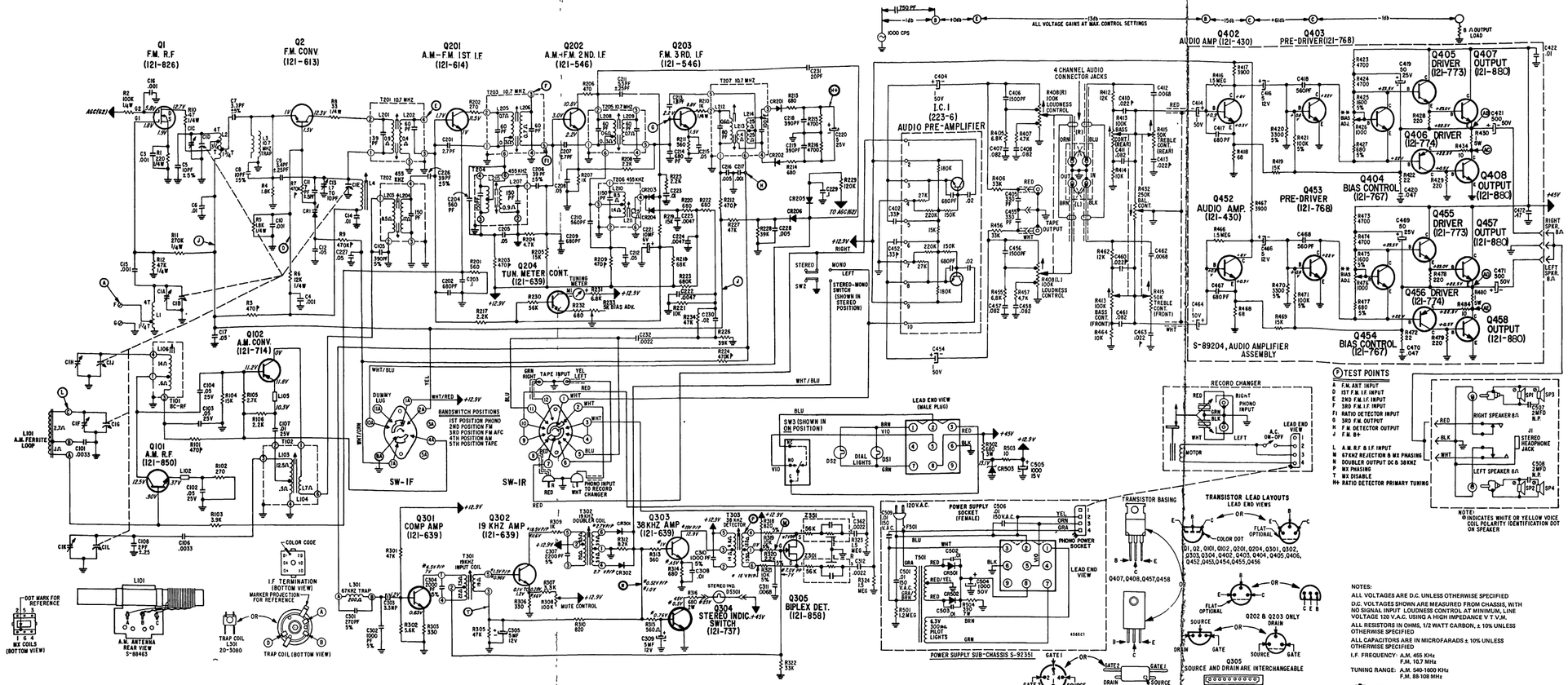


DIAL CORD DRIVE

SHOWN IN FULL COUNTERCLOCKWISE POSITION

OUTPUT TRANSISTOR MOUNTING VIEW

CHASSIS 29CT21Z2 – CHASSIS LAYOUT

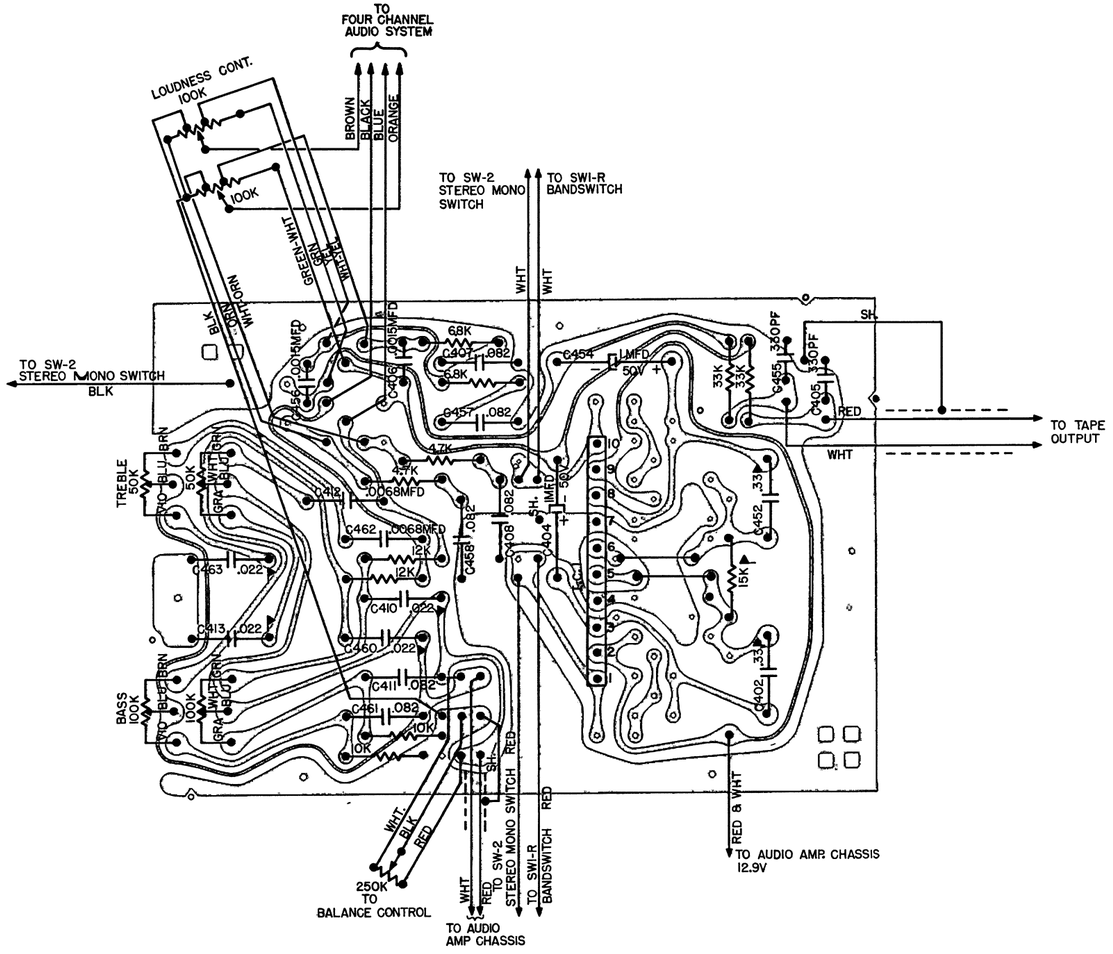


LEGEND CHASSIS 29CT21Z2

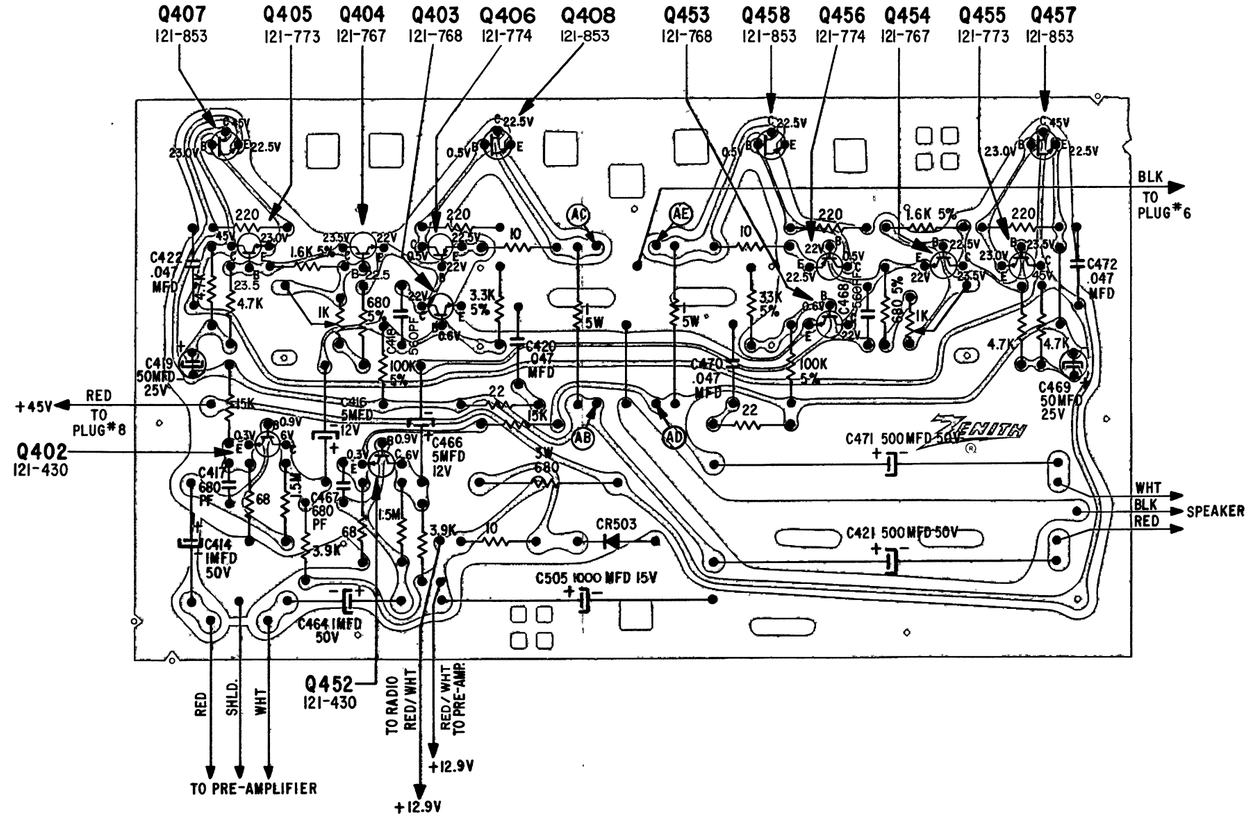
ITEM NO.	PART NUMBER	DESCRIPTION
C1A		FM ANT TRIMMER
C1B		FM ANT TUNING
C1C		FM DETECTOR TRIMMER
C1D		FM DETECTOR TUNING
C1E		FM OSC. TUNING
C1F	23-6245	AM ANT. TRIMMER
C1G		AM ANT. TUNING
C1H		AM DETECTOR TRIMMER
C1J		AM DETECTOR TUNING
C1K		AM OSC TRIMMER
C1L		AM OSC. TUNING
C3	22-2726	.001 MFD DISC 25 V
C4	22-2726	.001 MFD DISC 25 V
C5	22-3676	10 PF DISC ± 5% 500 V
C6	22-3393	.01 MFD DISC 25 V
C7	22-2641	3.3 PF GIMMICK ± .5% 500 V
C8	22-3675	10 PF DISC ± 5% 500 V
C9	22-2592	3.4 PF DISC ± .25 PF 25 V
C10	22-2729	.001 MFD DISC 25 V
C11	22-5344	7 PF DISC ± 5% 500 V
C12	22-3034	.05 MFD DISC 25 V
C13	22-4805	1.7 TO 10 PF CERAMIC TRIMMER
C14	22-3393	.01 MFD DISC 25 V
C15	22-2729	.001 MFD DISC 25 V
C16	22-2729	.001 MFD DISC 25 V
C17	22-3034	.05 MFD DISC 25 V
C101	22-13	.0033 MFD DISC ± 10% 500 V
C102	22-3034	.05 MFD DISC 25 V
C103	22-3034	.05 MFD DISC 25 V
C104	22-3034	.05 MFD DISC 25 V
C105	22-5672	390 PF MICA ± 5% 125 V
C106	22-13	.0033 MFD DISC ± 10% 500 V
C107	22-3393	.01 MFD DISC 25 V
C108	22-4819	2 PF 500 V
C201	22-3310	2.7 PF GIMMICK 500 V
C202	22-5462	680 PF DISC 500 V
C203	22-3652	1 MFD DISC 10 V
C204	22-5462	680 PF DISC 500 V
C205	22-3034	.05 MFD DISC 25 V
C206	22-3304	39 PF DISC ± 5% 500 V
C207	22-3310	2.7 PF GIMMICK 500 V
C208	22-3034	.05 MFD DISC 25 V
C209	22-5462	680 PF DISC 500 V
C210	22-5462	680 PF DISC 500 V
C211	22-3770	5.5 PF DISC ± .25 PF 500 V
C212	22-3034	.05 MFD DISC 25 V
C213	22-2428	1.8 PF GIMMICK 500 V
C214	22-5462	680 PF DISC 500 V
C215	22-3034	.05 MFD DISC 25 V
C216	22-3080	.005 MFD DISC 25 V
C217	22-2726	.001 MFD DISC 25 V
C218	22-3177	390 PF DISC 500 V
C219	22-3177	390 PF DISC 500 V
C220	22-3986	5 MFD ELECTROLYTIC 25 V
C221	23-5496	10 MFD ELECTROLYTIC 6 V
C222	22-14	.0047 MFD 500 V
C223	22-3393	.01 MFD DISC 25 V
C224	22-14	.0047 MFD 500 V
C225	22-14	.0047 MFD 500 V
C226	22-3381	39 PF DISC ± 5% 500 V
C227	22-3034	.05 MFD DISC 25 V
C228	22-3080	.005 MFD DISC 25 V
C229	22-3652	1 MFD DISC 10 V
C230	22-5066	.02 MFD DISC 25 V
C231	22-3751	20 PF ± .25 500 V
C232	22-18	.0022 MFD DISC CAP 500 V
C301	23-5780	270 PF POLYSTYRENE ± 5% 500 V
C302	22-5781	1000 PF POLYSTYRENE ± 5% 500 V
C303	22-6246	3.3 MFD N.P. 15 V
C304	22-5496	2000 PF ± 5% 100 V
C305	22-2684	5 MFD ELECTROLYTIC 12V
C306	22-5781	1000 PF POLYSTYRENE ± 5% 500 V
C308	22-3393	.01 MFD DISC 25 V
C309	22-2884	5 MFD ELECTROLYTIC 12 V
C310	22-5781	1000 PF POLYSTYRENE ± 5% 500 V
C311	22-3415	.0068 MFD 25 V
C312	22-18	.0022 MFD DISC 25 V
C362	22-18	.0022 MFD DISC 25 V
C402	22-6343	.33 MFD ± 20% 50 V
C404	22-3687	1 MFD ELECTROLYTIC 50 V
C405	22-3255	330 PF DISC 500 V
C406	22-5483	1500 PF 500 V
C407	22-5884	.082 MFD 100 V
C408	22-5884	.082 MFD 100 V
C410	22-5814	.022 MF 20% 50 V
C412	22-3415	.0068 MF 25 V
C413	22-5884	.082 MFD 100 V
C414	22-5814	.022 MF 20% 50 V
C416	22-5884	.082 MFD 100 V
C417	22-5482	680 PF DISC 500 V
C418	22-3362	560 PF 500 V
C419	22-5986	50 MFD ELECTROLYTIC 25 V
C420	22-5868	.047 MFD 100 V
C421	22-5316	500 MFD ELECTROLYTIC 50 V
C422	22-4617	.01 MFD 500 V
C452	22-6343	.33 MFD ± 20% 50 V
C454	22-3687	1 MFD ELECTROLYTIC 50 V
C455	22-3255	330 PF DISC 500 V
C456	22-5483	1500 PF 500 V
C457	22-5884	.082 MFD 100 V
C458	22-5884	.082 MFD 100 V
C460	22-5814	.022 MF 20% 50 V
C461	22-5884	.082 MFD 100 V
C462	22-3415	.0068 MF 25 V
C463	22-5814	.022 MFD 20% 50 V
C464	22-3687	1 MFD ELECTROLYTIC 50 V
C466	22-2884	5 MFD ELECTROLYTIC 12 V
C467	22-5482	680 PF DISC 500 V
C469	22-3362	560 PF 500 V
C470	22-5986	50 MFD ELECTROLYTIC 25 V
C471	22-5868	.047 MFD 100 V
C472	22-5316	500 MFD ELECTROLYTIC 50 V
C501	22-3638	.47 MFD 100 V
C502	23-4005	.01 MFD DISC 150 VAC
C503	22-4617	.01 MFD DISC 500 V
C504	22-4617	.01 MFD DISC 500 V
C505	22-5362	1000 MFD ELECTROLYTIC 50 V
C506	22-4573	1000 MFD ELECTROLYTIC 15 V
C507	22-4005	.01 MFD DISC 150 VAC
C508	22-4988	2 MFD ELECTROLYTIC N.P. 30 V
C509	22-3687	1 MFD ELECTROLYTIC N.P. 50 V
C510	22-5005	.01 MFD DISC 150 VAC
R1	23-4157	220 OHM 1/4 W
R2	23-4269	100K OHM 1/4 W
R3	23-4172	270 OHM 1/4 W
R4	23-1796	1.5K OHM
R5	23-4196	1.8K OHM 1/4W
R6	23-4231	12K OHM 1/4 W
R7	23-1808	4.7K OHM 20%
R8	23-4122	33 OHM 1/4 W
R9	23-1898	470K OHM 20%
R10	23-4129	47 OHM 1/4 W
R11	23-4227	270K OHM 1/4 W
R12	23-4255	47K OHM 1/4 W
R101	23-1772	470 OHM 20%
R102	23-1761	270 OHM
R103	23-1816	3.9K OHM
R104	23-1824	15K OHM
R105	23-1802	2.7K OHM
R106	23-1799	2.2K OHM
R201	23-1775	560 OHM
R202	23-1761	270 OHM
R203	23-1772	470 OHM 20%
R204	23-1813	4.7K OHM
R205	23-1834	15K OHM
R206	23-1771	470 OHM
R207	23-1785	1K OHM
R208	23-1799	2.2K OHM
R209	23-1772	470 OHM 20%
R210	23-4195	1K OHM 1/4 W
R211	23-1775	560 OHM
R212	23-1772	470 OHM 20%
R213	23-1778	680 OHM
R214	23-1778	680 OHM
R215	23-1812	4700 OHM
R216	23-1812	4700 OHM
R217	23-1799	2.2K OHM
R218	23-1862	68K OHM
R219	23-1834	15K OHM
R220	23-1778	680 OHM
R221	23-1827	10K OHM
R222	23-1778	680 OHM
R223	23-1904	680K OHM
R224	23-1898	470K OHM ±20%
R225	23-1799	2.2K OHM
R226	23-1852	39K OHM
R227	23-1855	47K OHM
R228	23-1852	39K OHM
R229	23-1873	120K OHM
R230	23-1859	86K OHM
R231	23-1820	6.8K OHM
R232	23-1778	680 OHM
R233	63-6708	5K BIAS ADJUST
R234	23-1855	47K OHM
R301	23-1855	47K OHM
R302	23-1817	5.6K OHM
R303	23-1764	330 OHM
R305	23-1855	47K OHM
R306	23-1764	330 OHM
R307	23-1806	3.3K OHM
R308	63-6405	100K MUTE CONTROL
R309	23-1765	1K OHM
R310	23-1782	820 OHM
R312	23-1824	8.2K OHM
R313	23-1776	560 OHM
R314	23-1778	680 OHM
R315	23-1779	560 OHM
R316	63-5663	680 OHM 2 W
R318	23-1781	820 OHM 5%
R319	23-1826	10K 5%
R320	23-1769	2.2K 5%
R321	23-1826	10K 5%
R322	23-1948	3.3K 5%
R323	63-1918	1.5 MEG OHM
R324	63-1918	1.5 MEG OHM
R405	63-1820	6.8K OHM
R406	23-1948	33K OHM
R407	63-1813	4.7K OHM
R408(L&R)	63-6695	100K DUAL LOUDNESS CONTROL
R412	63-1831	12K OHM
R413(L&R)	63-6696	100K DUAL BASS CONTROL
R414	63-1827	10K OHM
R415(L&R)	63-6698	500K DUAL "T" REBLE CONTROL
R416	63-1918	1.5 MEG
R417	63-1910	390K
R418	63-1736	68 OHM
R419	63-1834	15K
R420	63-1805	3.3K OHM 5%
R421	63-1868	100K OHM 5%
R422	63-2715	22 OHM
R423	63-1813	4700 OHM
R424	63-1813	4700 OHM
R425	63-1794	1600 OHM 5%
R426	63-6977	5K BIAS ADJUST
R427	63-1777	680 OHM 5%
R428	63-1757	220 OHM
R429	63-1757	220 OHM
R430	63-6424	1 OHM 5 W
R432	63-6996	250K BALANCE CONTROL
R434	63-1701	10 OHM
R455	63-1820	6.8K
R456	63-1848	33K OHM
R457	63-1813	4.7K OHM
R462	63-1831	12K
R464	63-1827	10K OHM
R466	63-1918	1.5 MEG
R467	63-1810	3900 OHM
R468	63-1736	68 OHM
R469	63-1834	15K OHM
R470	63-1805	3.3K OHM 5%
R471	63-1868	100K OHM 5%
R472	63-1715	22 OHM
R473	63-1813	4700 OHM
R474	63-1813	4700 OHM
R475	63-1794	1600 OHM 5%
R476	63-5977	5K OHM B & AS ADJUST
R477	63-1777	680 OHM 5%
R478	63-1757	220 OHM
R479	63-1757	220 OHM
R480	63-6424	1 OHM 5 W
R484	63-1701	10 OHM
R501	63-1915	1.2 MEG
R502	63-6085	680 OHM 3 W
R503	63-1701	10 OHM
R504	63-4380	390 OHM 7 W
L1	20-3076	FM ANTENNA A COIL
L2	20-3077	FM DETECTOR COIL
L3	20-1256	TRAP COIL 10.7 MHz
L4	20-1611	AM OSCILLATOR COIL
L101	S-89463	AM ANTENNA A COIL ASSEMBLY
L102	149-3111	AM OSCILLATOR SLEEVE
L103	IN T102	AM OSCILLATOR TRANS. PRI.
L104	IN T102	AM OSCILLATOR TRANS. SEC.
L105	149-311	FERRITE CORE SLEEVE
L106	IN T101	RF TRANSFORMER
L201	IN T201	1ST IF TRANSFORMER 10.7 MHz PRI.
L202	IN T201	1ST IF TRANSFORMER 10.7 MHz SEC.
L203	IN T202	1ST IF AM 455 KHz SEC.
L204	IN T202	1ST IF AM 455 KHz SEC.
L205	IN T203	2ND IF TRANSFORMER 10.7 MHz PRI.
L206	IN T203	2ND IF TRANSFORMER 10.7 MHz SEC.
L207	IN T204	2ND AM 455 KHz SEC.
L208	IN T205	3RD IF TRANSFORMER 10.7 MHz PRI.
L209	IN T205	3RD IF TRANSFORMER 10.7 MHz SEC.
L210	IN T206	3RD IF AM 4-455 KHz PRI.
L211	IN T206	3RD IF AM 4-455 KHz SEC.
L212	IN T207	RATIO DETECTOR TRANS. 10.7 MHz PRI.
L213	IN T207	RATIO DETECTOR TRANS. 10.7 MHz TERTIARY
L214	IN T207	RATIO DETECTOR TRANS. 10.7 MHz SEC.
L215	IN T209	2ND AM 455 KHz PRI.
L301	20-3080	67 KHz TRAP COIL (PREFERRED)
	S-79435	67 KHz TRAP COIL (ALTERNATE)
T101	85-2750	B.C. R.F. TRANSFORMER
T102	85-2544	AM OSCILLATOR TRANSFORMER
T201	85-2753	FM 1ST IF TRANSFORMER 10.7 MHz
T202	85-2751	AM 1ST IF AM 455 KHz
T203	85-2754	FM 2ND IF TRANSFORMER 10.7 MHz
T204	85-2752	AM 2ND IF AM 455 KHz
T205	85-2755	FM 3RD IF TRANSFORMER 10.7 MHz
T206	85-2543	AM 3RD IF AM 455 KHz
T207	85-2756	FM RATIO DETECTOR 10.7 MHz
T301	85-2858	19 KHz TRANSFORMER 19 KHz
T302	85-2856	DOUBLER TRANSFORMER 19 KHz
T303	85-2857	DETECTOR IF TRANSFORMER 38 KHz
T501	85-2545	POWER TRANSFORMER
F501	136-79	1.25A SLOW BLOW FUSE
S1	85-1210	BAND SWITCH
S2	85-1212	STEREO-MONO SWITCH
S3	85-1349	A.C. ON-OFF SWITCH
CR1	103-47 OR 103-189	AFC DIODE
CR201	103-90	GERMANIUM DIODE
CR202	103-90	GERMANIUM DIODE (MATCHED PAIRS)
CR203	103-23	GERMANIUM DIODE
CR204	103-23	GERMANIUM DIODE
CR205	103-23	GERMANIUM DIODE
CR206	103-23	GERMANIUM DIODE
CR301	103-23	GERMANIUM DIODE
CR302	103-23	GERMANIUM DIODE
CR501	213-76	SILICON RECTIFIER
CR502	213-76	SILICON RECTIFIER
CR503	103-96	DIODE
M1	122-68	TUNING METER
I.C.1	223-6	THICK FILM I.C.
Z201	105-103	INTEGNET
Z351	105-107	INTEGNET
DS1	100-249	PILOT LIGHT NO. 1847
DS2	100-249	PILOT LIGHT NO. 1847
DS301	100-507	STEREO INDICATOR LIGHT
SP1	49-1214	6" PM SPEAKER
SP2	49-1214	6" PM SPEAKER
SP3	49-1168	HORN SPEAKER
SP4	49-1168	HORN SPEAKER
J1	44-78	EARPHONE JACK

4566C2

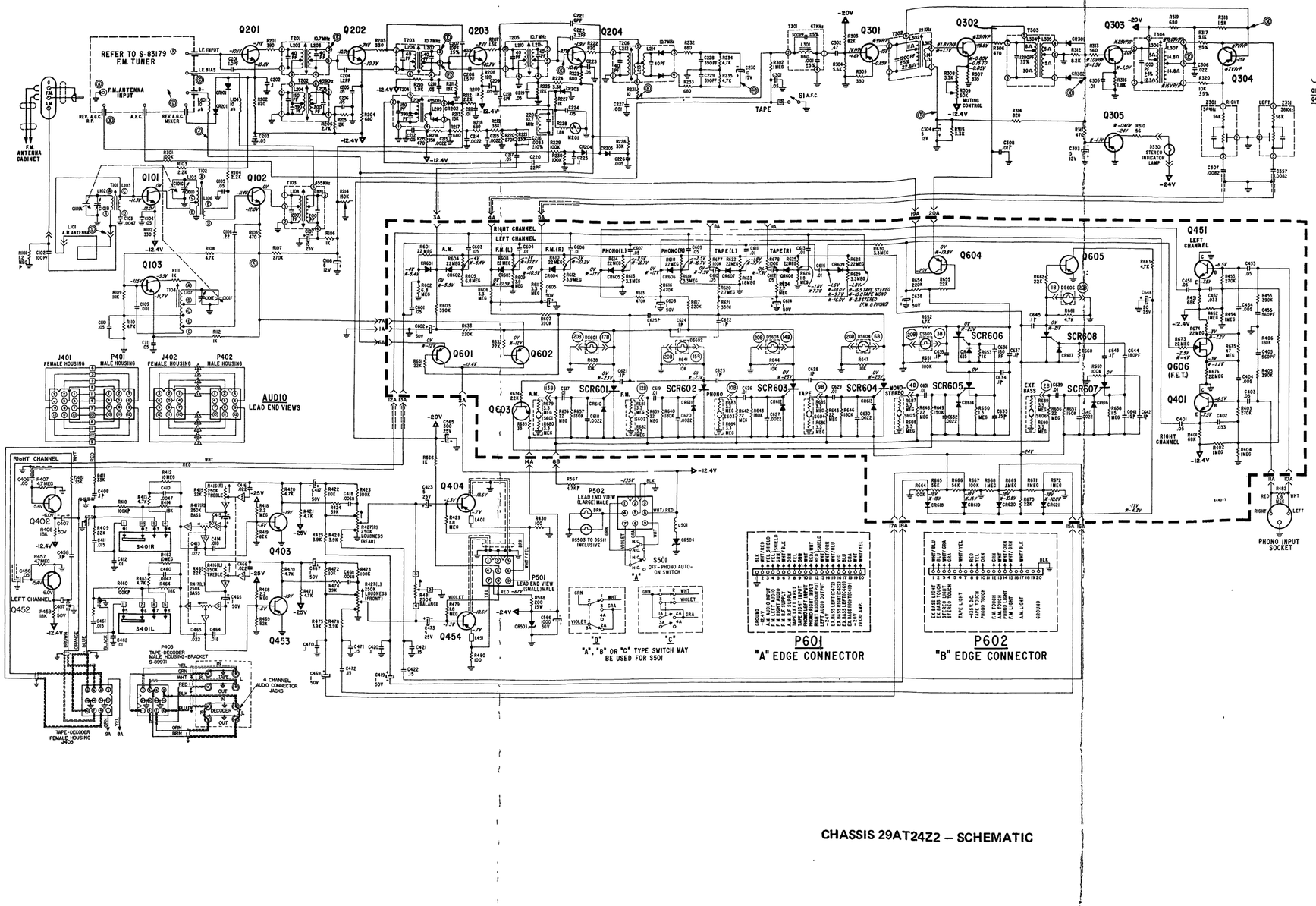
CHASSIS 29CT21Z2 — SCHEMATIC



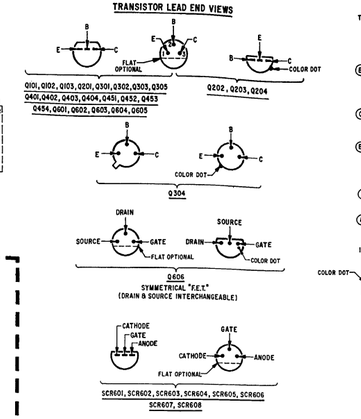
CHASSIS 29CT21Z2 – PRE AMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



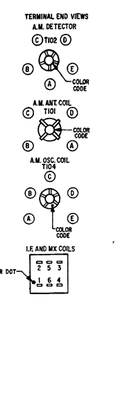
CHASSIS 29CT21Z2 – POWER AMP – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



TRANSISTOR LEAD END VIEWS



TERMINAL END VIEWS



TRANSISTORS

No.	PART No.	DESCRIPTION
Q101	121-753	A.M. R.F.
Q102	121-638	A.M. MIXER
Q103	121-753	A.M. OSCILLATOR
Q201	121-604 OR 121-775	F.M. & A.M. 1ST I.F.
Q202	121-546	F.M. & A.M. 2ND I.F.
Q203	121-546	F.M. 3RD I.F.
Q204	121-546	F.M. 4TH I.F.
Q301	121-496	COMP. AMPLIFIER
Q302	121-496	19KHz AMPLIFIER
Q303	121-496	38KHz AMPLIFIER
Q304	121-734	BIPLEX DETECTOR
Q305	121-496	STEREO INDICATOR SWITCH
Q401	121-433	PRE-AMPLIFIER
Q402	121-430	PRE-AMPLIFIER
Q403	121-603	PRE-AMPLIFIER
Q404	121-602	PRE-DRIVER
Q451	121-433	PRE-AMPLIFIER
Q452	121-430	PRE-AMPLIFIER
Q453	121-603	PRE-AMPLIFIER
Q454	121-602	PRE-DRIVER
Q601	121-497	F.M. B- SWITCHING
Q602	121-497	A.M. B- SWITCHING
Q603	121-447	STEREO-MONO SWITCH SUPPLY
Q604	121-497	STEREO B- SWITCH
Q605	121-497	EXT. BASS SWITCH
Q606	121-756	PHONO STEREO-MONO SWITCH
SCR601	185-3	A.M. SWITCH
SCR602	185-3	F.M. SWITCH
SCR603	185-3	PHONO SWITCH
SCR604	185-3	TAPE B+ SWITCH
SCR605	185-5	STEREO-MONO SWITCH
SCR606	185-4	STEREO-MONO SWITCH
SCR607	185-5	EXT. BASS SWITCH ON-OFF
SCR608	185-4	EXT. BASS SWITCH ON-OFF

TEST POINTS

- A F.M. ANTENNA INPUT
- B F.M.-R.F.-A.G.C. (REV.)
- C F.M. MIXER A.G.C. (REV.)
- D 1ST & 2ND I.F. INPUT
- E 3RD I.F. INPUT
- F 4TH I.F. INPUT
- FI RATIO DETECTOR INPUT
- G 4TH I.F. OUTPUT
- H F.M. DETECTOR OUTPUT
- H+ RATIO DETECTOR PRIMARY TUNING
- J F.M. B-
- K A.M. B-
- L A.M. R.F. INPUT & A.M. I.F. INPUT
- M 67 KHz REJECTION & MX PHASING
- N MX DOUBLER OUTPUT
- P MX PHASING
- R F.M. R.F. SOURCE (F.E.T.) VOLTAGE
- T MX DISABLING

ON PRINTED CIRCUIT BOARD ONLY:
VOLTAGES MEASURED WITH R.C.A. V.T.V.M. TYPE WV-98C, WITH ALL SCR IN OFF CONDITION.
INDICATES VOLTAGES PRESENT ONLY WHEN DESIRED FUNCTION AND RELATED CIRCUITS ARE IN "ON" CONDITION.
→1A← INDICATES "A" EDGE CONNECTOR TIE POINTS.
1B INDICATES "B" EDGE CONNECTOR TIE POINTS.
F.E.T. – FIELD EFFECT TRANSISTOR.

NOTES:
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS, WITH NO SIGNAL INPUT, LOUDNESS CONTROL AT MINIMUM, LINE VOLTAGE 120 V.A.C. USING A HIGH IMPEDANCE V.T.V.M.
ALL RESISTORS IN OHMS, 1/2 WATT CARBON, ± 10% UNLESS OTHERWISE SPECIFIED.
ALL CAPACITORS ARE IN MICROFARADS ± 10% UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY: A.M. 455 KHz, F.M. 10.7 MHz
TUNING RANGE: A.M. 540-1600KHz, F.M. 88-108MHz

- INDICATES CHASSIS GROUND.
- INDICATES ± 20% TOLERANCE.
- INDICATES VOLTAGE.
- (A) INDICATES TEST POINTS.
- * INDICATES VALUES PRESENT ONLY WITH STEREO SIGNAL.
- 1 AND 2 INDICATE INTERCONNECTING HOUSING FOR TONE CONTROL.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION.

X SHORTING BAR MUST BE REMOVED WHEN 4 CHANNEL AUDIO SYSTEM IS USED.

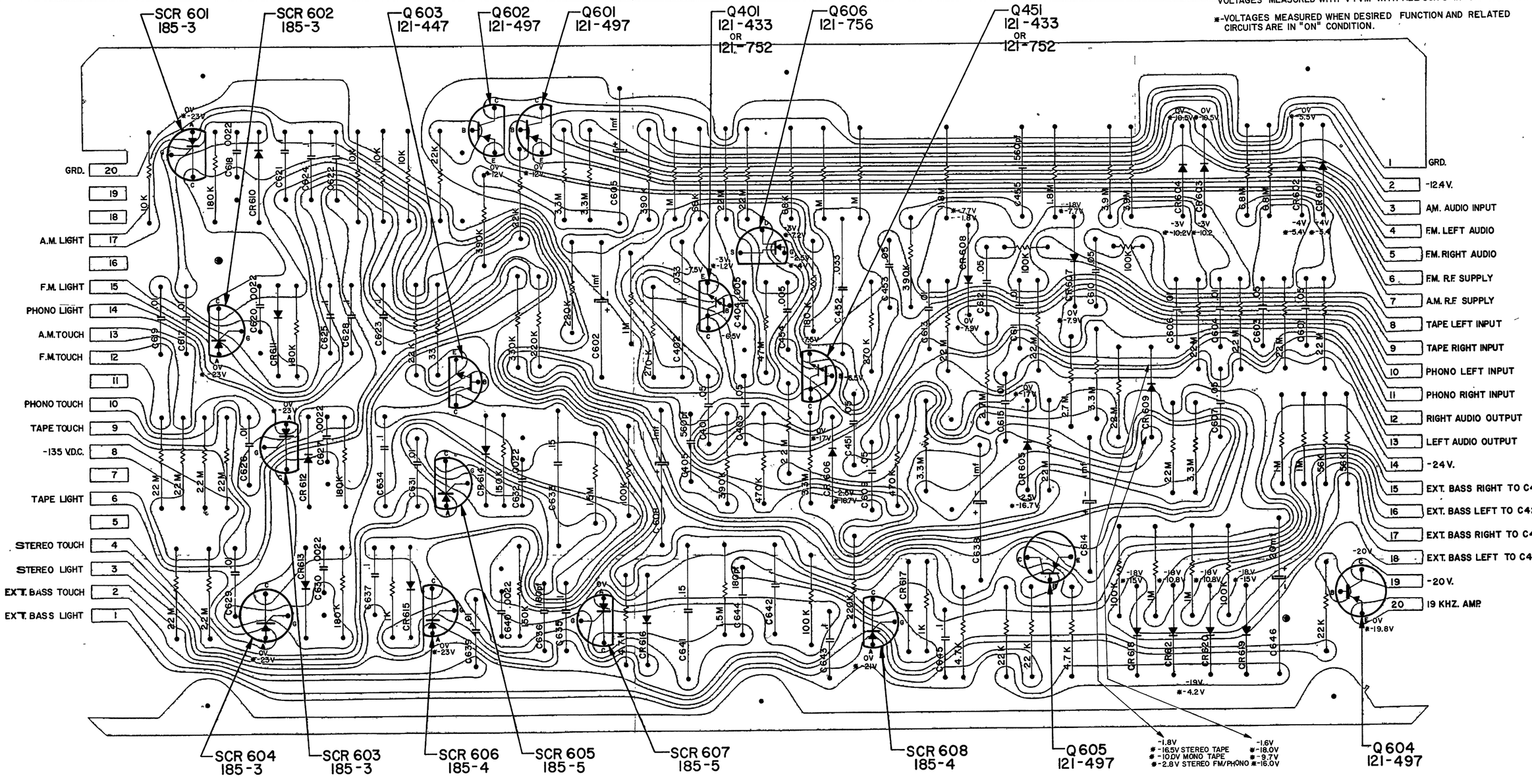
CHASSIS 29AT24Z2 – SCHEMATIC

LEGEND

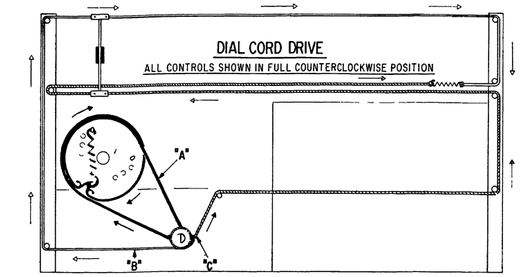
B-BASE C-COLLECTOR E-EMITTER	C - CATHODE A - ANODE G - GATE	D - DRAIN S - SOURCE G - GATE
Q601, Q602, Q603, Q604, Q605, Q401, Q451.	SCR601, SCR602, SCR603, SCR604, SCR605, SCR606, SCR607, SCR608.	Q606,

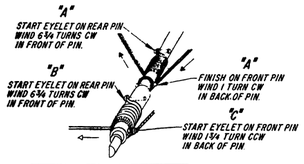
VOLTAGES MEASURED WITH VTVM WITH ALL SCR'S IN "OFF" CONDITION.

*-VOLTAGES MEASURED WHEN DESIRED FUNCTION AND RELATED CIRCUITS ARE IN "ON" CONDITION.

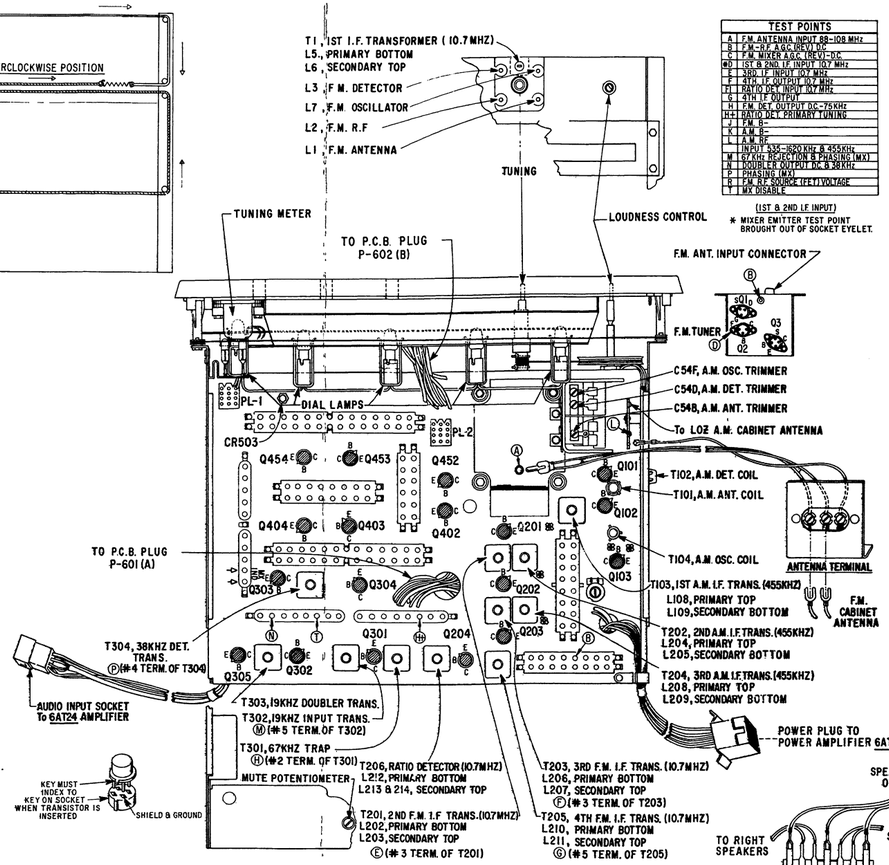


CHASSIS 29AT24Z2 – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE





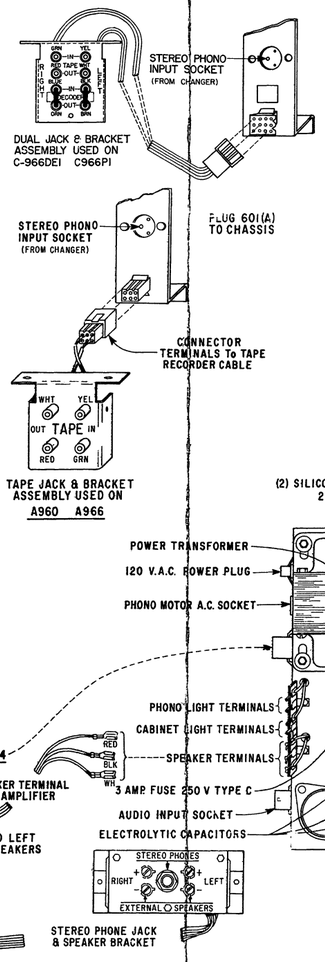
TRANSISTORS		
No.	PART No.	DESCRIPTION
Q1	121-731	F.M. R.F.
Q2	121-732	F.M. MIXER
Q3	121-432	F.M. OSC.
Q101	121-763	A.M. RF
Q102	121-438	A.M. MIXER
Q103	121-733	A.M. OSC.
Q201	121-434or775	F.M. A.M. 1st I.F.
Q202	121-546	F.M. A.M. 2nd I.F.
Q203	121-545	F.M. 3rd I.F.
Q204	121-546	F.M.
Q301	121-496	COMPOSITE AMP.
Q302	121-498	19KHz AMP.
Q303	121-498	19 KHz AMP.
Q304	121-734	BI PLEX DET.
Q305	121-496	STEREO IND. SWITCH
Q401	69-752or433	PHONO PRE AMP (R)
Q402	121-430	PRE AMP (R)
Q403	121-603	PRE AMP (R)
Q404	121-602	1st AUDIO (R)
Q451	69-752or433	PHONO PRE AMP (L)
Q452	121-430	PRE AMP (L)
Q453	121-603	PRE AMP (L)
Q454	121-602	1st. AUDIO (L)
Q601	121-497	F.M. B- SWITCHING
Q602	121-497	A.M. B- SWITCHING
Q603	121-447	STEREO-MONO SWITCH
Q604	121-497	STEREO 19 KHz AMP.
Q605	121-497	EXT BASS B- SWITCHING
Q606	121-756	PHONO STER-MONO SW.
SCR601	185-3	A.M. SWITCH
SCR602	185-3	F.M. SWITCH
SCR603	185-3	PHONO SWITCH
SCR604	185-3	TAPE SWITCH
SCR605	185-5	STEREO SWITCH 1
SCR606	185-4	STEREO SWITCH 2
SCR607	185-5	EXT. BASS SWITCH 1
SCR608	185-4	EXT. BASS SWITCH 2

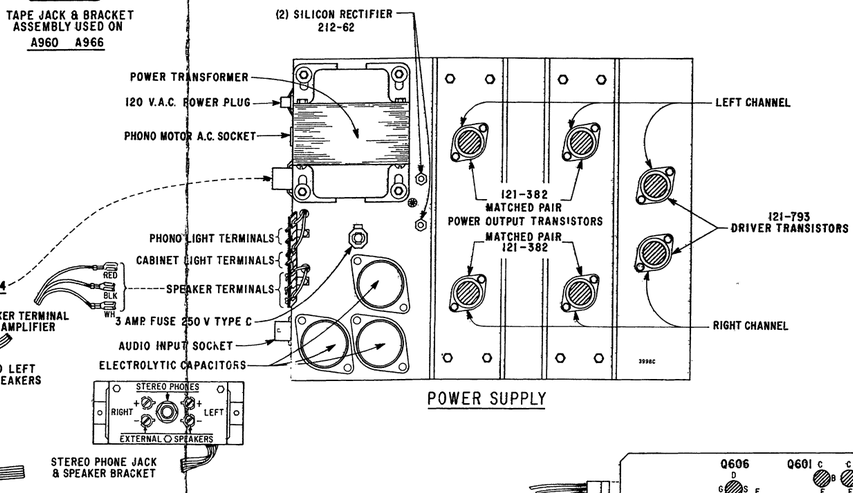


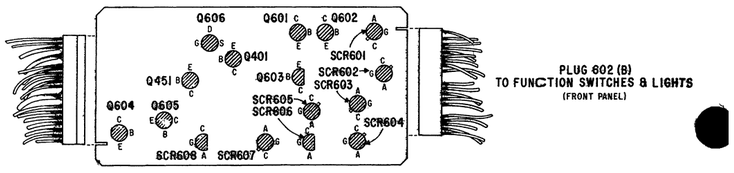
TEST POINTS	
A	F.M. ANTENNA INPUT 88-108 MHz
B	F.M. 1ST A.G.C. (REV) DC
C	F.M. MIXER A.G.C. (REV) DC
*D	1ST & 2ND I.F. INPUT 10.7 MHz
E	3RD I.F. INPUT 10.7 MHz
F	4TH I.F. OUTPUT 10.7 MHz
G	RATIO DET. INPUT 10.7MHz
H-I	RATIO DET. PRIMARY TUNING
J	F.M. B-
K	A.M. B-
L	A.M. RF INPUT 535-1620 KHz & 455KHz
M	67 KHz REJECTION & PHASING (MX)
N	DOUBLER OUTPUT DC & 38KHz
P	PHASING (MX)
R	F.M. RF SOURCE (FET) VOLTAGE
T	MX DISABLE

(1ST & 2ND I.F. INPUT)

* MIXER EMITTER TEST POINT BROUGHT OUT OF SOCKET EYELET.





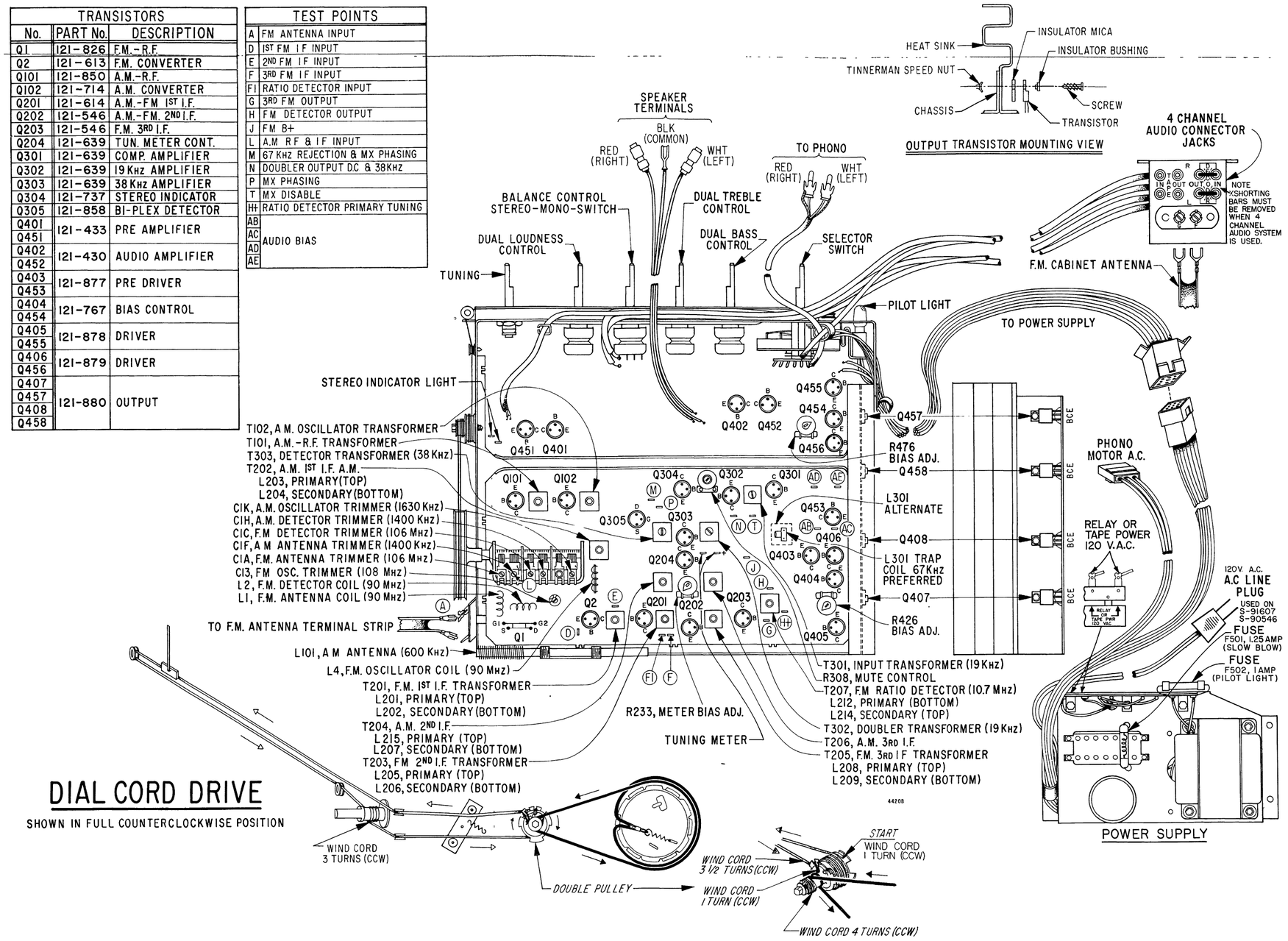


LEGEND CHASSIS 29AT24, 29AT24Z1, AND 29AT24Z2

ITEM NO.	PART NO.	DESCRIPTION
C101A		AM ANTENNA TUNING
C101B		AM ANTENNA TRIMMER
C101C	22-4617	AM ANTENNA PADDER
C101D		AM DETECTOR TRIMMER
C101E		AM OSCILLATOR TUNING
C101F		AM OSCILLATOR TRIMMER
C102	22-6	100 PF DISC 500V
C103	22-5564	.0047 MFD 10% 25V
C104	22-5564	.0047 MFD DISC 25V
C105	22-3021	.05 MFD DISC 25V
C106	22-3021	.05 MFD DISC 25V
C107	22-5564	.0047 MFD DISC 25V
C108	22-3599	5 MFD ELECTROLYTIC 12V
C109	22-3599	5 MFD ELECTROLYTIC 12V
C110	22-3021	.05 MFD DISC 25V
C111	22-3021	.05 MFD DISC 25V
C112	22-3021	.05 MFD DISC 25V
C201	22-3021	.05 MFD DISC 25V
C202	22-3056	.05 MFD DISC 50V
C203	22-3056	.05 MFD DISC 50V
C204	22-3021	.05 MFD DISC 25V
C205	22-3056	.05 MFD DISC 50V
C206	22-3056	.05 MFD DISC 50V
C207	22-3056	.05 MFD DISC 50V
C208	22-3056	.05 MFD DISC 50V
C209	22-3056	.05 MFD DISC 50V
C210	22-3018	.02 MFD DISC 500V
C211	22-3018	.02 MFD DISC 500V
C212	22-3018	.02 MFD DISC 500V
C213	22-18	.0022 MFD DISC 500V
C214	22-18	.0022 MFD DISC 500V
C215	22-18	.0022 MFD DISC 500V
C216	22-13	.0033 MFD DISC 500V
C217	22-3024	.05 MFD DISC 25V
C218	22-3024	.05 MFD DISC 25V
C219	22-3024	.05 MFD DISC 25V
C220	22-3059	.01 MFD DISC 500V
C221	22-3059	.01 MFD DISC 500V
C222	22-2033	2.2 PF CHIMMIX 500V
C223	22-2033	2.2 PF CHIMMIX 500V
C224	22-3024	.05 MFD DISC 25V
C226	22-2394	1 MFD DISC 25V
C227	22-3021	.05 MFD DISC 25V
C228	22-3059	.001 MFD DISC 500V
C229	22-2177	390 PF DISC 500V
C230	22-3044	.047 MFD DISC 500V
C231	22-3044	.047 MFD DISC 500V
C301	22-3044	.047 MFD DISC 500V
C302	22-3044	.047 MFD DISC 500V
C303	22-3599	5 MFD ELECTROLYTIC 12V
C304	22-3599	5 MFD ELECTROLYTIC 12V
C305	22-3044	.047 MFD DISC 500V
C306	22-3018	.022 MFD DISC 500V
C307	22-3018	.022 MFD DISC 500V
C308	22-3018	.022 MFD DISC 500V
C309	22-3018	.022 MFD DISC 500V
C310	22-3018	.022 MFD DISC 500V
C311	22-3018	.022 MFD DISC 500V
C312	22-3018	.022 MFD DISC 500V
C313	22-3018	.022 MFD DISC 500V
C314	22-18	.0022 MFD DISC 500V
C315	22-18	.0022 MFD DISC 500V
C316	22-18	.0022 MFD DISC 500V
C317	22-3018	.022 MFD DISC 500V
C318	22-3018	.022 MFD DISC 500V
C319	22-3018	.022 MFD DISC 500V
C320	22-3018	.022 MFD DISC 500V
C321	22-3018	.022 MFD DISC 500V
C322	22-3018	.022 MFD DISC 500V
C323	22-3018	.022 MFD DISC 500V
C324	22-3018	.022 MFD DISC 500V
C325	22-3018	.022 MFD DISC 500V
C326	22-3018	.022 MFD DISC 500V
C327	22-18	.0022 MFD DISC 500V
C328	22-3021	.05 MFD DISC 25V
C329	22-3021	.05 MFD DISC 25V
C330	22-3021	.05 MFD DISC 25V
C331	22-3021	.05 MFD DISC 25V

TRANSISTORS		
No.	PART No.	DESCRIPTION
Q1	121-826	F.M.-R.F.
Q2	121-613	F.M. CONVERTER
Q101	121-850	A.M.-R.F.
Q102	121-714	A.M. CONVERTER
Q201	121-614	A.M.-FM 1ST I.F.
Q202	121-546	A.M.-FM. 2ND I.F.
Q203	121-546	F.M. 3RD I.F.
Q204	121-639	TUN. METER CONT.
Q301	121-639	COMP. AMPLIFIER
Q302	121-639	19 KHz AMPLIFIER
Q303	121-639	38 KHz AMPLIFIER
Q304	121-737	STEREO INDICATOR
Q305	121-858	BI-PLEX DETECTOR
Q401, Q451	121-433	PRE AMPLIFIER
Q402, Q452	121-430	AUDIO AMPLIFIER
Q403, Q453	121-877	PRE DRIVER
Q404, Q454	121-767	BIAS CONTROL
Q405, Q455	121-878	DRIVER
Q406, Q456	121-879	DRIVER
Q407, Q457, Q408, Q458	121-880	OUTPUT

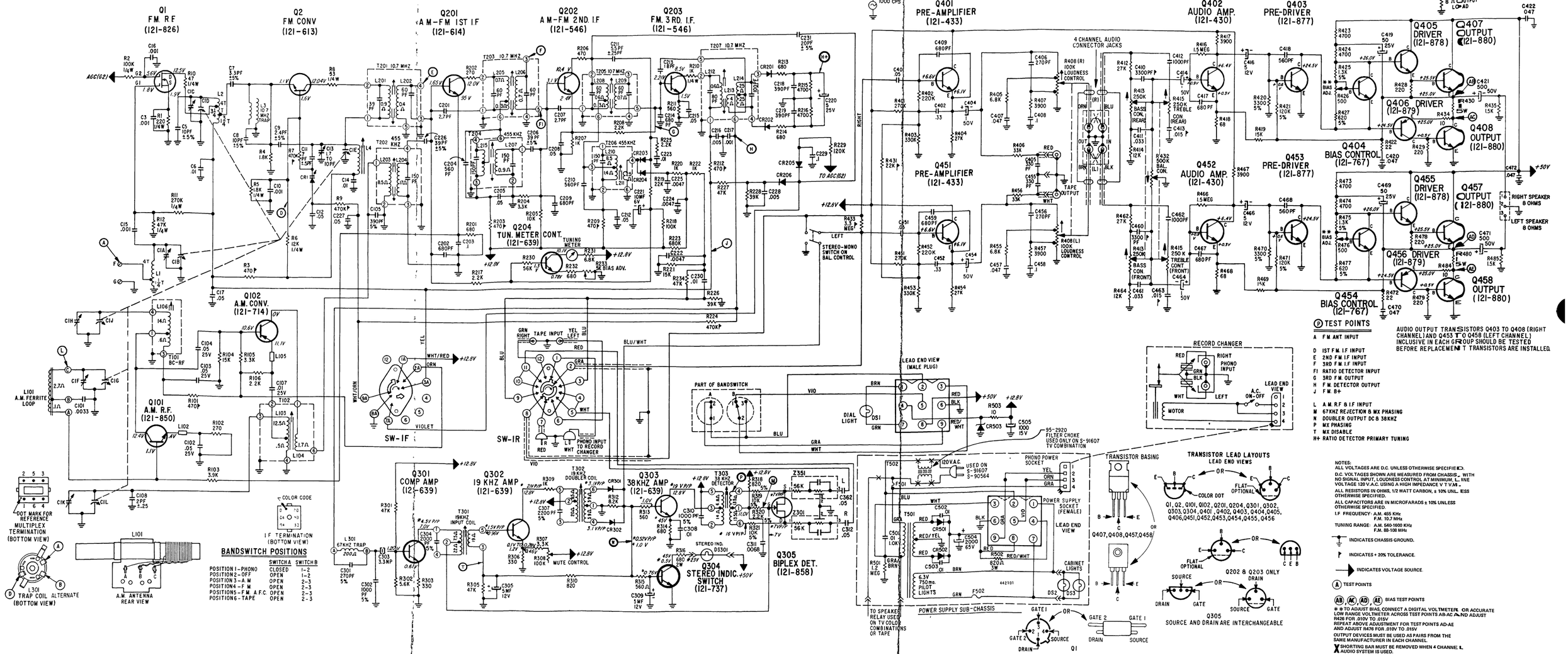
TEST POINTS	
A	FM ANTENNA INPUT
D	1ST FM IF INPUT
E	2ND FM IF INPUT
F	3RD FM IF INPUT
FI	RATIO DETECTOR INPUT
G	3RD FM OUTPUT
H	FM DETECTOR OUTPUT
J	FM B+
L	A.M RF & IF INPUT
M	67 KHz REJECTION & MX PHASING
N	DOUBLER OUTPUT DC & 38KHz
P	MX PHASING
T	MX DISABLE
HH	RATIO DETECTOR PRIMARY TUNING
AB, AC, AD, AE	AUDIO BIAS



OUTPUT TRANSISTOR MOUNTING VIEW

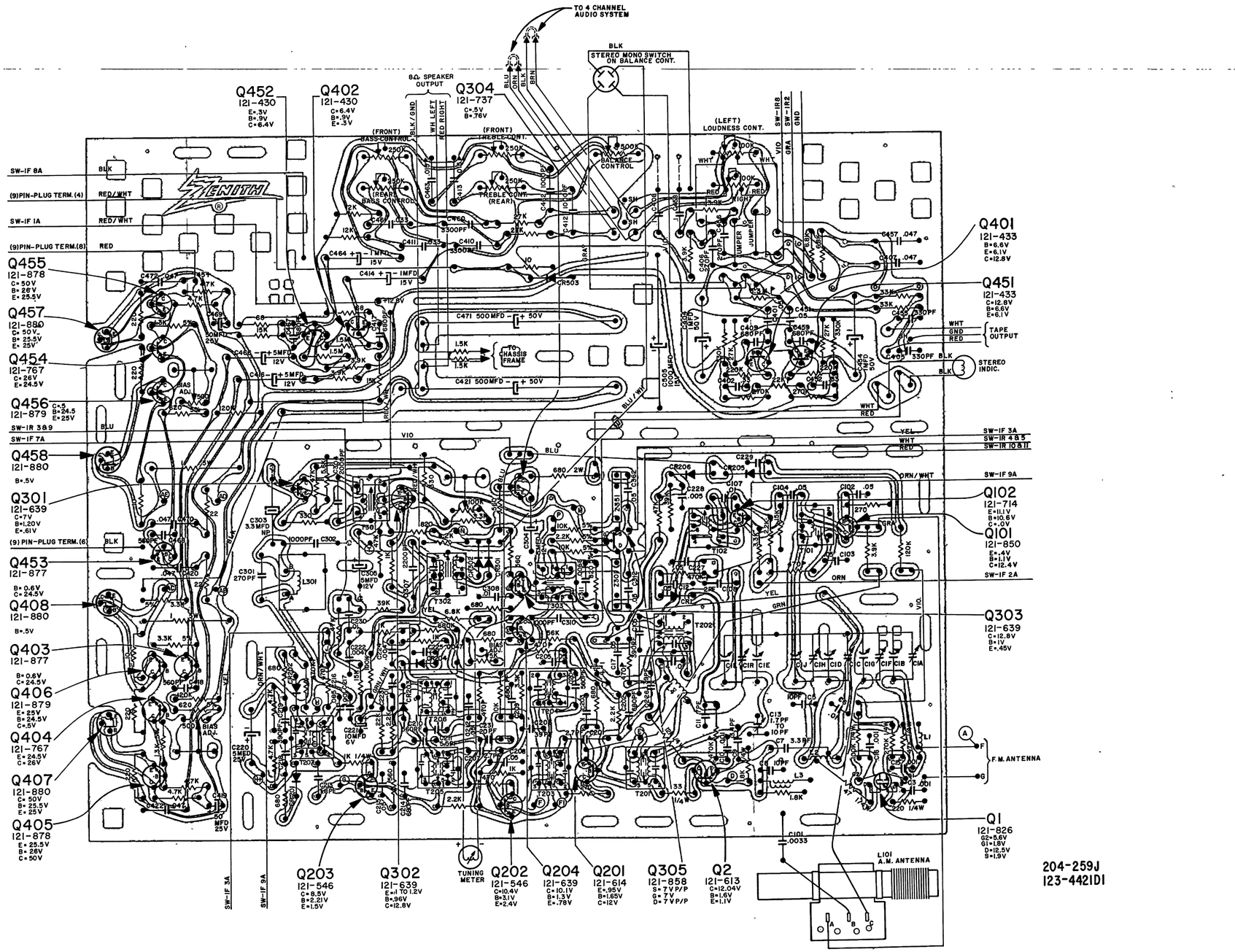
DIAL CORD DRIVE

SHOWN IN FULL COUNTERCLOCKWISE POSITION


Q1 FM. R.F (121-826)
Q2 FM CONV (121-613)
Q201 AM-FM 1ST I.F (121-614)
Q202 AM-FM 2ND. I.F (121-546)
Q203 FM. 3 RD. I.F. (121-546)
Q204 TUN. METER CONT. (121-639)
Q102 A.M. CONV. (121-714)
Q101 A.M. R.F. (121-850)
Q301 COMP AMP (121-639)
Q302 19 KHZ AMP. (121-639)
Q303 38KHZ AMP (121-639)
Q304 STEREO INDIC. SWITCH (121-737)
Q305 BIPLEX DET. (121-858)
Q401 PRE-AMPLIFIER (121-433)
Q451 PRE-AMPLIFIER (121-433)
Q402 AUDIO AMP. (121-430)
Q452 AUDIO AMP. (121-430)
Q403 PRE-DRIVER (121-877)
Q453 PRE-DRIVER (121-877)
Q404 BIAS CONTROL (121-767)
Q454 BIAS CONTROL (121-767)
Q405 DRIVER (121-878)
Q406 DRIVER (121-879)
Q407 OUTPUT (121-880)
Q408 OUTPUT (121-880)
Q455 DRIVER (121-878)
Q456 DRIVER (121-879)
Q457 OUTPUT (121-880)
Q458 OUTPUT (121-880)
ALL VOLTAGE GAINS AT MAX. CONTROL SETTINGS
4 CHANNEL AUDIO CONNECTOR JACKS
8 Ω OUTPUT LOAD
RIGHT SPEAKER 8 OHMS
LEFT SPEAKER 8 OHMS
TEST POINTS
A F.M. ANT. INPUT
D 1ST F.M. I.F. INPUT
E 2ND F.M. I.F. INPUT
F 3RD F.M. I.F. INPUT
F1 RATIO DETECTOR INPUT
G 3RD F.M. OUTPUT
H F.M. DETECTOR OUTPUT
J F.M. B+
L A.M. R.F. & I.F. INPUT
M 67KHZ REJECTION & MX PHASING
N DOUBLER OUTPUT DC & 38KHZ
P MX PHASING
T MX DISABLE
H+ RATIO DETECTOR PRIMARY TUNING
AUDIO OUTPUT TRANSISTORS Q403 TO Q408 (RIGHT CHANNEL) AND Q453 TO Q458 (LEFT CHANNEL) INCLUSIVE IN EACH GROUP SHOULD BE TESTED BEFORE REPLACEMENT TRANSISTORS ARE INSTALLED.
BANDSWITCH POSITIONS
POSITION 1 - PHONO
POSITION 2 - OFF
POSITION 3 - A.M
POSITION 4 - F.M
POSITION 5 - F.M. A.F.C.
POSITION 6 - TAPE
SWITCH A / SWITCH B
CLOSED I-2
OPEN I-2
OPEN 2-3
OPEN 2-3
OPEN 2-3
OPEN 2-3
SW-IF
SW-IR
L101 A.M. FERRITE LOOP
L101 A.M. ANTENNA REAR VIEW
L301 TRAP COIL ALTERNATE (BOTTOM VIEW)
MULTIPLEX TERMINATION (BOTTOM VIEW)
I.F. TERMINATION (BOTTOM VIEW)
COLOR CODE
DOT MARK FOR REFERENCE
TUNING METER
STEREO-MONO SWITCH ON BAL CONTROL
TAPE OUTPUT
TAPE INPUT
PHONO INPUT TO RECORD CHANGER
RECORD CHANGER
PHONO INPUT
LEAD END VIEW (MALE PLUG)
PART OF BANDSWITCH
DIAL LIGHT
95-2920 FILTER CHOKE USED ONLY ON S-91607 TV COMBINATION
USED ON S-91607 S-90564
PHONO POWER SOCKET
POWER SUPPLY SOCKET (FEMALE)
LEAD END VIEW
CABINET LIGHTS
TO SPEAKER RELAY USED ON TV COLOR COMBINATIONS OR TAPE
POWER SUPPLY SUB-CHASSIS
TRANSISTOR BASING
TRANSISTOR LEAD LAYOUTS
LEAD END VIEWS
Q1, Q2, Q101, Q102, Q201, Q204, Q301, Q302, Q303, Q304, Q401, Q402, Q403, Q404, Q405, Q406, Q451, Q452, Q453, Q454, Q455, Q456
Q407, Q408, Q457, Q458
Q202 & Q203 ONLY
Q305 SOURCE AND DRAIN ARE INTERCHANGEABLE
Q1
NOTES:
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL INPUT, LOUDNESS CONTROL AT MINIMUM. WITH VOLTAGE 120 V.A.C. USING A HIGH IMPEDANCE V.T.V.M.
ALL RESISTORS IN OHMS, 1/2 WATT CARBON, ± 10% UNLESS OTHERWISE SPECIFIED.
ALL CAPACITORS ARE IN MICROFARADS ± 10% UNLESS OTHERWISE SPECIFIED.
I.F. FREQUENCY- A.M. 455 KHz F.M. 10.7 MHz
TUNING RANGE A.M. 540-1600 KHz F.M. 88-108 MHz
INDICATES CHASSIS GROUND.
INDICATES ± 20% TOLERANCE.
INDICATES VOLTAGE SOURCE.
TEST POINTS
BIAS TEST POINTS
* TO ADJUST BIAS, CONNECT A DIGITAL VOLTMETER OR ACCURATE LOW RANGE VOLTMETER ACROSS TEST POINTS AB-AC AND ADJUST R426 FOR .010V TO .015V
REPEAT ABOVE ADJUSTMENT FOR TEST POINTS AD-AE AND ADJUST R476 FOR .010V TO .015V
OUTPUT DEVICES MUST BE USED AS PAIRS FROM THE SAME MANUFACTURER IN EACH CHANNEL.
SHORTING BAR MUST BE REMOVED WHEN 4 CHANNEL AUDIO SYSTEM IS USED.
463IC1

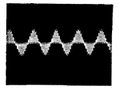
LEGEND CHASSIS 35WDR50

ITEM NO.	PART NUMBER	DESCRIPTION
C1A		FM ANT TRIMMER
C1B		FM ANT TUNING
C1C		FM DETECTOR TRIMMER
C1D		FM DETECTOR TUNING
C1E		FM OSC. TUNING
C1F	22-6752	AM ANT. TRIMMER
C1G		AM ANT. TUNING
C1H		AM DETECTOR TRIMMER
C1J		AM DETECTOR TUNING
C1K		AM OSC. TRIMMER
C1L		AM OSC. TUNING
C3	22-2729	.001 MFD DISC 25V
C6	22-3676	10 PF DISC ± 5% 500V
C8	22-3393	.01 MFD DISC 25V
C7	22-3541	3.3 PF GIMMICK ± 5% 500V
C8	22-3675	10 PF DISC ± 5% 500V
C9	22-5469	2.4 PF GIMMICK 5% 500V
C10	22-2729	.001 MFD DISC 25V
C11	22-5344	7 PF ± .5 PF 500V
C12	22-3034	.05 MFD DISC 25V
C13	22-4805	1.7 TO 10 PF CERAMIC TRIMMER
C14	2203393	.01 MFD DISC 25V
C15	22-2729	.001 MFD DISC 25V
C16	22-2729	.001 MFD DISC 25V
C17	22-3034	.05 MFD DISC 25V
C101	22-13	.003 MFD DISC ±10%
C102	22-3034	.05 MFD DISC 25V
C103	22-3034	.05 MFD DISC 25V
C104	22-3034	.05 MFD DISC 25V
C105	22-5972	390 PF MICA ± 5% 125V
C107	22-3393	.01 MFD DISC
C108	22-4819	2 PF ± .25 500V
C201	22-3316	2.7 PF GIMMICK 500V
C202	23-5482	680 PF DISC 500V
C203	22-3652	1 MFD DISC 10V
C204	23-5481	560 PF DISC 500V
C205	22-3034	.05 MFD DISC 25V
C206	22-3381	39 PF DISC ±5% 500V
C207	22-3310	2.7 PF GIMMICK 500V
C208	22-3034	.05 MFD DISC 25V
C209	23-5482	680 PF DISC 500V
C210	23-5481	560 PF DISC 500V
C211	22-3770	5.5 PF DISC ± .25 PF 500V
C212	22-3034	.05 MFD DISC 25V
C213	22-2428	1.8 PF GIMMICK 500V
C214	23-5482	680 PF DISC 500V
C215	22-3034	.05 MFD DISC 25V
C216	22-3092	.005 MFD DISC 25V
C217	22-2729	.001 MFD DISC 25V
C218	22-3177	390 PF DISC 500V
C219	22-3177	390 PF DISC 500V
C220	22-3896	5 MFD ELECTROLYTIC 25V
C221	22-5486	10 MFD ELECTROLYTIC 6V
C222	22-14	.0047 MFD 500V
C223	22-3393	.01 MFD DISC 25V
C224	22-14	.0047 MFD 500V
C225	22-14	.0047 MFD 500V
C226	22-3381	39 PF DISC ± 5%
C227	22-3034	.05 MFD DISC 25V
C228	22-3089	.005 MFD DISC 25V
C229	22-3652	1 MFD DISC 10V
C230	22-3393	.01 MFD DISC 25V
C231	22-3751	20 PF ± 5% 500V
C301	22-5780	270 PF POLYSTYRENE ± 5% 500V
C302	22-5781	1000 PF POLYSTYRENE ± 5% 500V
C303	22-6246	3.3 MFD N.P. 15V
C304	22-6347	2000 PF ± 5% POLYSTYRENE 50V
C305	22-2894	5 MFD ELECTROLYTIC 12V
C307	22-5762	2200 PF POLYSTYRENE ± 5% 500V
C308	22-3393	.01 MFD DISC 25V
C309	22-2884	6 MFD ELECTROLYTIC 12V
C310	22-5781	1000 PF POLYSTYRENE ± 5% 500V
C311	22-3415	.0068 MFD 25V
C312	22-3034	.05 MFD DISC 25V
C362	22-3034	.05 MFD DISC 25V
C401	22-3034	.05 MFD DISC 25V
C402	22-5343	.33 MFD ± 20% 50V
C404	22-3687	1 MFD ELECTROLYTIC 50V
C405	22-3255	330 PF DISC 500V
C406	23-6343	270 PF 500V
C407	22-5866	.047 MFD 100V
C408	23-5862	1 MFD 100V
C409	23-5482	680 PF DISC 500V
C410	22-5971	3300 PF 20% 50V
C411	22-5883	.033 MFD 100V
C412	22-3111	1000 PF 50V
C413	22-5233	.015 ± 20% 50V
C414	22-3687	1 MFD ELECTROLYTIC 50V
C416	22-3687	1 MFD ELECTROLYTIC 50V
C417	23-5482	680 PF DISC 500V
C418	23-3362	560 PF 500V
C419	22-5986	50 MFD ELECTROLYTIC 25V
C420	22-5866	.047 MFD 100V
C421	22-5316	500 MFD ELECTROLYTIC 50V
C422	22-5866	.047 MFD 100V
C451	22-3034	.05 MFD DISC 25V
C452	22-5343	.33 MFD ± 20% 50V
C454	23-3687	1 MFD ELECTROLYTIC 50V
C455	23-3255	330 PF DISC 500V
C456	23-6363	270 PF 500V
C457	22-5866	.047 MFD 50V
C458	23-5862	1 MFD 100V
C459	23-5482	680 PF DISC 500V
C460	22-5971	3300 PF 20% 50V
C461	22-5883	.033 MFD 100V
C462	22-3111	1000 PF 50V
C463	22-5233	.015 ± 20% 50V
C464	22-3687	1 MFD ELECTROLYTIC 50V
C466	22-2884	6 MFD ELECTROLYTIC 12V
C467	23-5482	680 PF DISC 500V
C468	23-3362	560 PF 500V
C469	22-5986	50 MFD ELECTROLYTIC 25V
C470	22-5866	.047 MFD 100V
C471	22-5316	500 MFD ELECTROLYTIC 50V
C472	22-5866	.047 MFD 100V
C501	22-5005	.01 MFD DISC 150VAC
C502	22-4617	.01 MFD DISC 500V
C503	22-4617	.01 MFD DISC 500V
C504	22-6417	2000 MFD ELECTROLYTIC 75V
C505	22-4973	1000 MFD ELECTROLYTIC 15V
R1	63-4157	220 OHM 1/4W
R2	63-4269	100K OHM 1/4W
R3	63-1772	470 OHM 20%
R4	63-1796	1.8K OHM
R5	63-4196	1.8K OHM 1/4W
R6	63-4231	12K OHM 1/4W
R7	63-1888	470K OHM 20%
R8	63-4122	33 OHM 1/4W
R9	63-1888	470K OHM 20%
R10	63-4129	2.7K OHM 1/4W
R11	63-4287	270K OHM 1/4W
R12	63-4259	47K OHM 1/4W
R101	63-1772	470 OHM 20%
R102	63-1791	270 OHM
R103	63-1810	3.9K OHM
R104	63-1834	15K OHM
R105	63-1806	2.2K OHM
R106	63-1798	2.2K OHM
R201	63-1778	680 OHM
R202	63-1761	270 OHM
R203	63-1772	470 OHM 20%
R204	63-1806	3.3K OHM
R205	63-1827	10K OHM
R206	63-1771	470 OHM
R207	63-1785	1K OHM
R208	63-1799	2.2K OHM
R209	63-1772	470 OHM 20%
R210	63-4185	1K OHM 1/4W
R211	63-1775	560 OHM
R212	63-1772	470 OHM 20%
R213	63-1778	680 OHM
R214	63-1778	680 OHM
R215	63-1813	4700 OHM
R216	63-1813	4700 OHM
R217	63-1799	2.2K OHM
R218	63-1869	100K OHM
R219	63-1841	22K OHM
R220	63-1785	1K OHM
R221	63-1834	15K OHM
R222	63-1785	1K OHM
R223	63-1904	680K OHM
R224	63-1898	470K OHM 20%
R225	63-1799	2.2K OHM
R226	63-1852	39K OHM
R227	63-1855	47K OHM
R228	63-1852	39K OHM
R229	63-1873	120K OHM
R230	63-1859	56K OHM
R231	63-1820	6.8K OHM
R232	63-1778	680 OHM
R233	63-6708	5K BIAS ADJUST
R234	63-1855	47K OHM
R301	63-1855	47K OHM
R302	63-1817	5.6K OHM
R303	63-1764	330 OHM
R304		
R305	63-1855	47K OHM
R306	63-1764	330 OHM
R307	63-1805	3.3K OHM
R308	63-5485	100K MUTE CONTROL
R309	63-1785	1K OHM
R310	63-1782	820 OHM
R311		
R312	63-1824	8.2K OHM
R313	63-1775	560 OHM
R314	63-1778	680 OHM
R315	63-1775	450 OHM
R316	63-5663	680 OHM 2W
R317		
R318	63-1781	620 OHM 5%
R319	63-1826	10K 5%
R320	63-1798	2.2K 5%
R321	63-1826	10K 5%
R322		
R401	63-1887	270K OHM
R402	63-1883	220K OHM
R403	63-1890	330K OHM
R404	63-1845	27K OHM
R405	63-1820	6.8K OHM
R406	63-1848	33K OHM
R407	63-1810	3900 OHM
R408R	63-8967	100K DUAL LOUDNESS CONTROL
R408L		
R412	63-1845	27K OHM
R413R	63-8965	250K DUAL BASS CONTROL
R413L		
R414	63-1831	12K OHM
R415R	63-8964	250K DUAL TREBLE CONTROL
R415L		
R416	63-1818	1.5 MEG
R417	63-1810	3900 OHM
R418	63-1726	68 OHM
R419	63-1834	15K OHM
R420	63-1805	3.3K OHM 5%
R421	63-1872	120K OHM 5%
R422	63-1711	22 OHM
R423	63-1813	4700 OHM
R424	63-1813	4700 OHM
R425	63-1790	1300 OHM 5%
R426	63-9361	600 OHM BIAS ADJUST
R427	63-1776	620 OHM 5%
R428	63-1757	220 OHM
R429	63-1787	220 OHM
R430	63-5424	1 OHM 5W
R431	63-1842	220K 20%
R432	63-8963	500K BALANCE CONTROL & SW.
R433	63-1853	5.2 MEG OHM 20%
R434	63-1701	10 OHM
R435	63-1729	1500 OHM
R451	63-1687	270K
R452	63-1863	220K OHM
R453	63-1850	330K
R454	63-1845	27K OHM
R455	63-1820	6.8K
R456	63-1848	33K OHM
R457	63-1810	3900 OHM
R458	63-1845	27K OHM
R462	63-1831	12K
R465		
R466	63-1918	1.5 MEG
R467	63-1810	3900 OHM
R468	63-1726	68 OHM
R469	63-1834	15K OHM
R470	63-1805	3.3K OHM 5%
R471	63-1872	120K OHM 5%
R472	63-1715	22 OHM
R473	63-1813	4700 OHM
R474	63-1813	4700 OHM
R475	63-1790	1300 OHM 5%
R476	63-5251	500 OHM BIAS ADJUST
R477	63-1776	620 OHM 5%
R478	63-1757	220 OHM
R479	63-1757	220 OHM
R480	63-1724	1 OHM
R484	63-1701	10 OHM
R485	63-1729	1500 OHM
R501	b=1910	1.2 MEG OHM
R502	63-4694	820 OHM
R503	63-1701	10 OHM
L1	20-3076	FM ANTENNA COIL
L2	20-3077	FM DETECTOR COIL
L3	20-1256	TRAP COIL 10.7 MHz
L4	20-3545	FM OSCILLATOR COIL
L101	S-98463	AM ANTENNA COIL ASSEMBLY
L102	149-311	FERRITE CORE SLEEVE
L103	IN T102	AM OSCILLATOR TRANS. PRI.
L104	IN T102	AM OSCILLATOR TRANS. SEC.
L105	149-311	FERRITE CORE SLEEVE
L106	IN T101	RF-RF TRANS.
L201	IN T201	1ST IF TRANSFORMER 10.7 MHz PRI.
L202	IN T201	1ST IF TRANSFORMER 10.7 MHz SEC.
L203	IN T202	1ST IF AM 455 KHz PRI.
L204	IN T202	1ST IF AM 455 KHz SEC.
L205	IN T203	2ND IF TRANSFORMER 10.7 MHz PRI.
L206	IN T203	2ND IF TRANSFORMER 10.7 MHz SEC.
L207	IN T204	2ND AM 455 KHz
L208	IN T205	3RD IF TRANSFORMER 10.7 MHz PRI.
L209	IN T205	3RD IF TRANSFORMER 10.7 MHz SEC.
L210	IN T206	3RD IF AM 455 KHz PRI.
L211	IN T206	3RD IF AM 455 KHz SEC.
L212	IN T207	RATIO DETECTOR TRANS. 10.7 MHz PRI.
L213	IN T207	RATIO DETECTOR TRANS. 10.7 MHz TERTIARY
L214	IN T207	RATIO DETECTOR TRANS. 10.7 MHz SEC.
L215	IN T204	2ND AM 455 KHz
L301	20-3080	67 KHz TRAP COIL (PREFERRED)
	S-79436	67 KHz TRAP COIL (ALTERNATE)
T101	95-2750	B.C. R.F. TRANSFORMER
T102	95-2544	AM OSCILLATOR TRANSFORMER
T201	95-2753	FM 1ST IF TRANSFORMER 10.7 MHz
T202	95-2751	AM 1ST IF AM 455 KHz
T203	95-2754	FM 2ND IF TRANSFORMER 10.7 MHz
T204	95-2752	AM 2ND IF AM 455 KHz
T205	95-2755	FM 3RD IF TRANSFORMER 10.7 MHz
T206	95-2543	AM 3RD IF AM 455 KHz
T207	95-2756	FM RATIO DETECTOR 10.7 MHz
T301	95-2856	INPUT TRANSFORMER 19 KHz
T302	95-2856	DOUBLER TRANSFORMER 19 KHz
T303	95-2857	DETECTOR TRANSFORMER 38 KHz
T501	95-2965	POWER TRANSFORMER
T502	95-2620	FILTER CHOKE ON S-81607, POWER SUPPLY
F501	136-78	1.25 AMP SLOW-BLOW FUSE
F502	136-96	1.0 AMP FUSE (PILOT LIGHT)
SW-1	85-1344	BAND SWITCH
CR1	103-47	AFC DIODE
CR201	103-90	GERMANIUM DIODE MATCHED PAIR
CR202	103-90	GERMANIUM DIODE
CR203	103-23	GERMANIUM DIODE
CR204	103-23	GERMANIUM DIODE
CR205	103-23	GERMANIUM DIODE
CR206	103-23	GERMANIUM DIODE
CR301	103-23	GERMANIUM DIODE
CR302	103-23	GERMANIUM DIODE
CR501	212-76	SILICON RECTIFIER
CR502	212-76	SILICON RECTIFIER
CR503	103-96	DIODE (ZENER)
Z301	105-107	INTEGNET
Z351	105-107	INTEGNET
DS1	100-249	PILOT LIGHT NO. 1847
DS2	100-249	PILOT LIGHT NO. 1847
DS6	100-249	PILOT LIGHT NO. 1847
DS301	100-507	STEREO INDICATOR LIGHT
M1	122-62	METER (TUNING) 4421G2

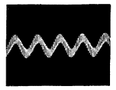


CHASSIS 35WDR50 – CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE

DESCRIPTION FOR THE TRANSISTORS AND IC									
Q1	FM RF			Q401	PRE AMPLIFIER	Q403	DRIVER	Q405	OUTPUT
Q2	FM MIX	Q201	AM FM 1st IF	Q451	PRE AMPLIFIER	Q453	DRIVER	Q455	OUTPUT
Q3	FM OSC	Q202	AM FM 2nd IF	Q402	PRE DRIVER	Q404	OUTPUT	IC301	MPX DEMODULATOR
Q101	AM CONV	Q203	FM 3rd IF	Q452	PRE DRIVER	Q454	OUTPUT		



PIN 3
COMPOSITE L&R, L-R (1 KHZ LEFT ONLY) 19 KHZ PILOT 10% 1 V P/P



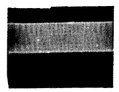
PIN 2
19 KHZ (WITH L ONLY) 200 MV P/P



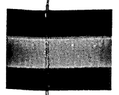
PIN 1
19 KHZ
1.2 V P/P



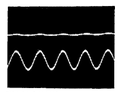
PIN 10
38 KHZ PULSES
80MV P/P



38 KHZ TANK END
38 KHZ
13 V P/P

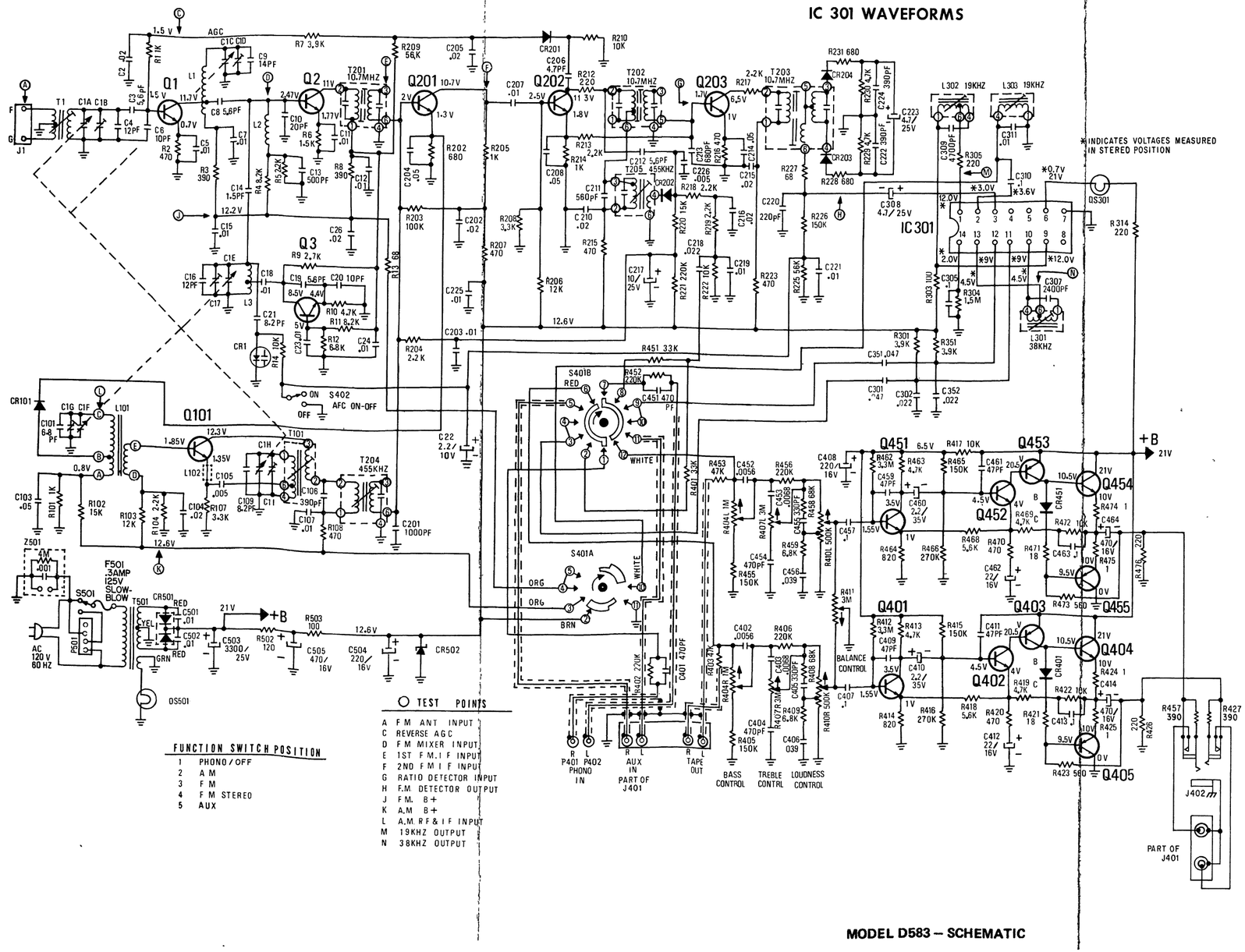


PIN 13
38 KHZ
4.4 V P/P



PIN 12 (UPPER) RIGHT OUTPUT
PIN 11 (LOWER) LEFT OUTPUT
(L INPUT ONLY) 1 V P/P

IC 301 WAVEFORMS



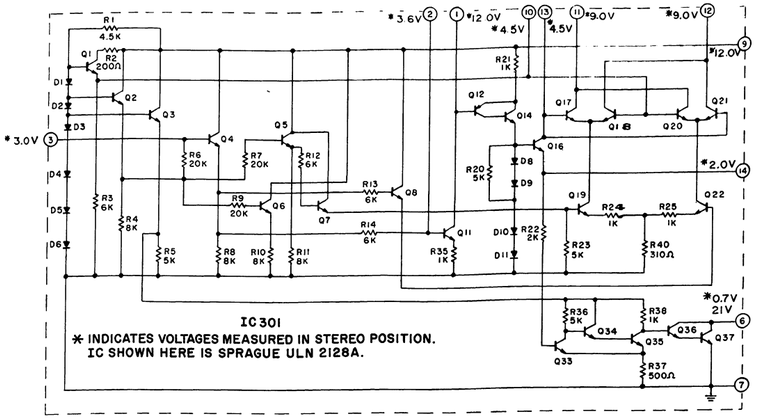
TEST POINTS

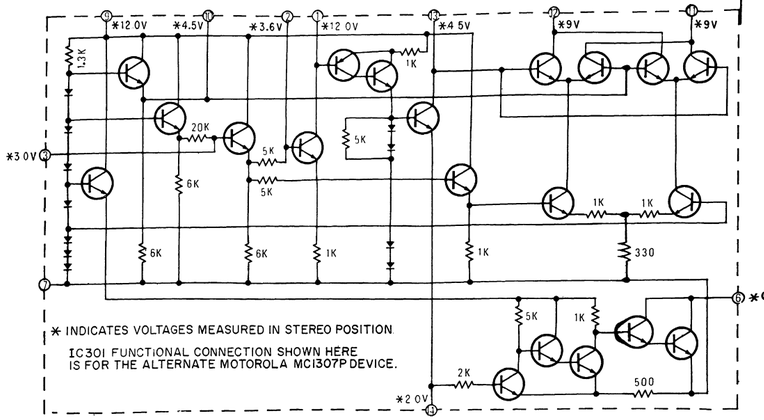
A	F M ANT INPUT
C	REVERSE AGC
D	F M MIXER INPUT
E	1ST F.M.I F INPUT
F	2ND F M I F INPUT
G	RATIO DETECTOR INPUT
H	F.M. DETECTOR OUTPUT
J	FM. B+
K	A.M B+
L	A.M. RF & I F INPUT
M	19KHZ OUTPUT
N	38KHZ OUTPUT

FUNCTION SWITCH POSITION

1	PHONO / OFF
2	A M
3	F M
4	F M STEREO
5	AUX

MODEL D583 — SCHEMATIC

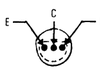




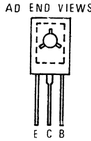
NOTES

1 I F FREQUENCY — AM 455KHZ; FM 10.7MHZ
2 TUNING RANGE — AM 540KHZ — 1600 KHZ; FM 88 MHZ — 108 MHZ
3 ALL RESISTORS ARE 1/2 WATT, 10% UNLESS OTHERWISE SPECIFIED. RESISTANCE VALUES IN OHMS. CAPACITANCE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
4 ALL VOLTAGES ARE D C UNLESS OTHERWISE SPECIFIED AND ARE MEASURED WITHOUT SIGNAL INPUT USING A HIGH IMPEDANCE VACUUM TUBE VOLT METER
5 VOLTAGES MEASURED IN THE FM STEREO POSITION Q101 MEASURED IN THE AM POSITION
6 ⏚ DENOTES CHASSIS GROUND. ⊘ INDICATES SPEAKER POLARITY

TRANSISTOR LEAD LAYOUTS
LEAD END VIEWS



Q1 Q2 Q3 Q101
Q201 Q202 Q203 Q401
Q402 Q403 Q451 Q452
Q453



Q404
Q405
Q454
Q455

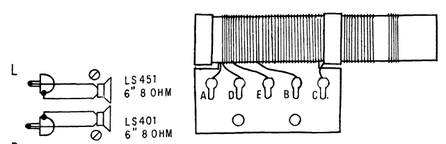


L301
L302
L303
T101
T204
T206

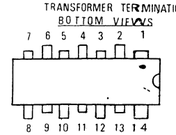


T201
T202
T203
T205
T207

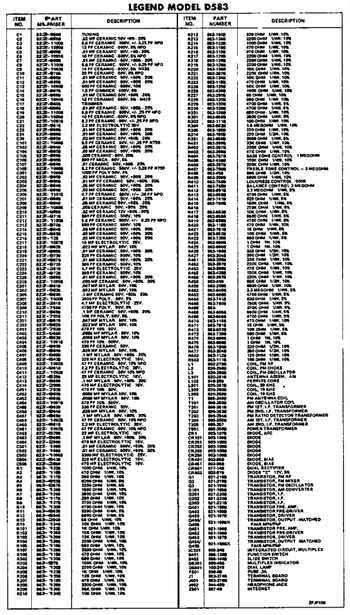
TRANSFORMER TERMINATION BOTTOM VIEWS

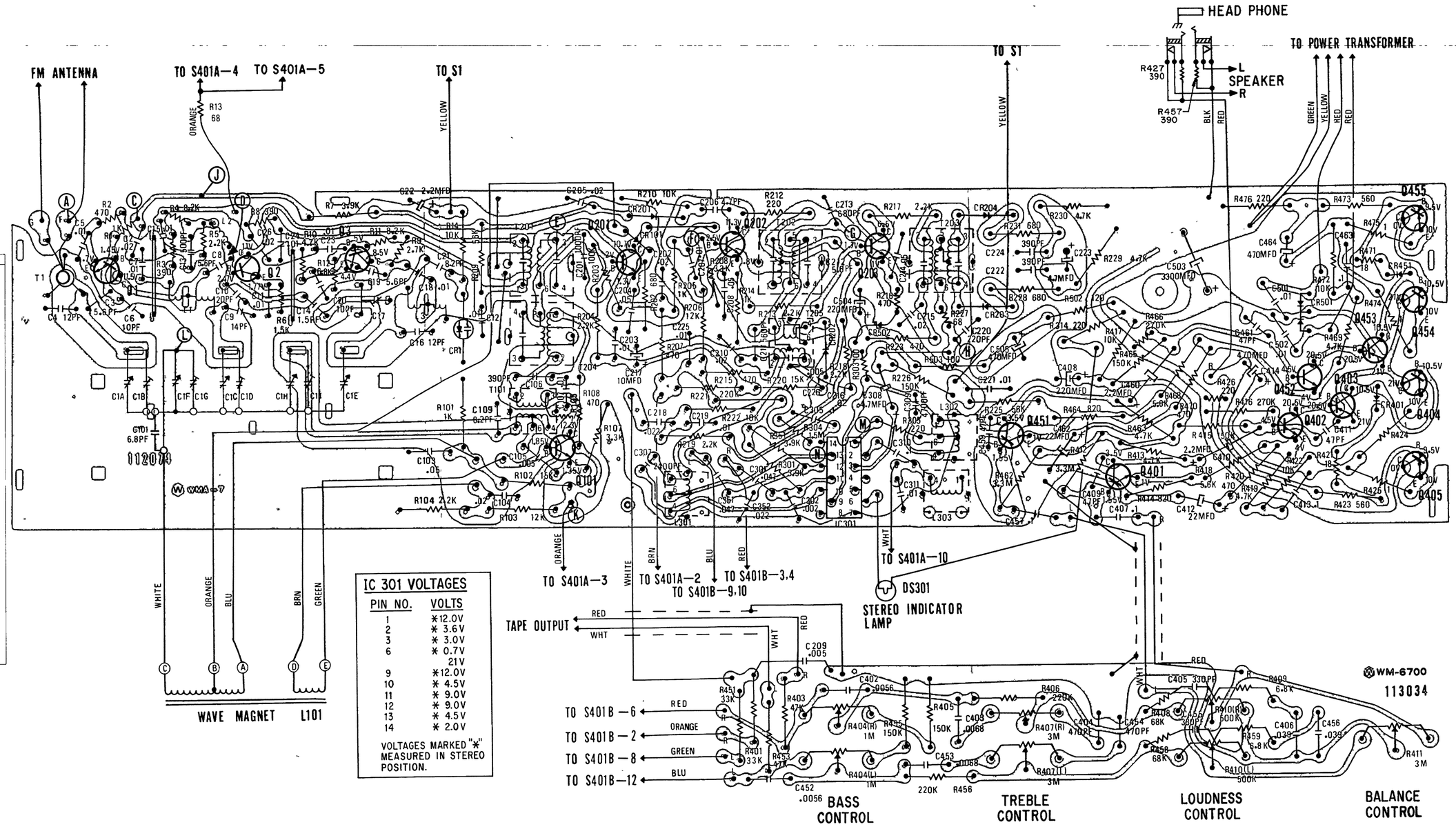


L101 A.M. ANTENNA



IC BASE DIAGRAM



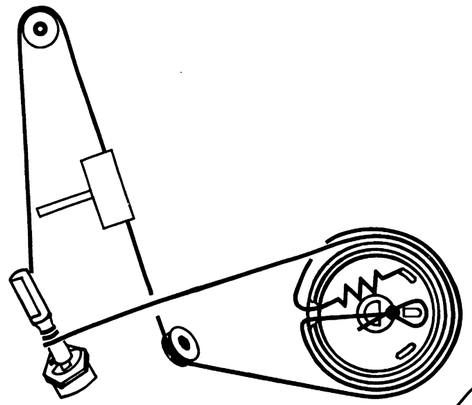


IC 301 VOLTAGES	
PIN NO.	VOLTS
1	*12.0V
2	* 3.6V
3	* 3.0V
6	* 0.7V
	21V
9	*12.0V
10	* 4.5V
11	* 9.0V
12	* 9.0V
13	* 4.5V
14	* 2.0V

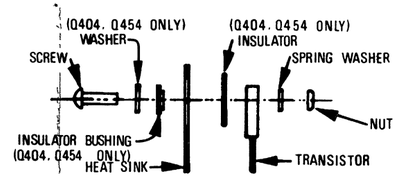
VOLTAGES MARKED "*" MEASURED IN STEREO POSITION.

MODEL D583/-1 COMPONENTS VIEWED FOIL SIDE OF CIRCUIT BOARD

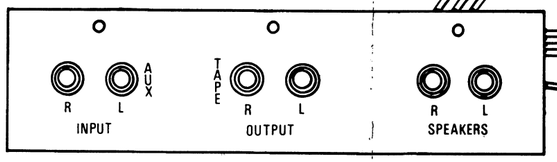
DESCRIPTION FOR THE TRANSISTORS AND IC									
Q1	FM RF	Q201	AM FM 1ST IF	Q451	PRE AMPLIFIER	Q453	DRIVER	Q455	OUTPUT
Q2	FM MIX.	Q202	AM FM 2ND IF	Q402	PRE DRIVER	Q404	OUTPUT	IC301	MPX DEMODULATOR
Q3	FM OSC	Q203	FM 3RD IF	Q452	PRE DRIVER	Q454	OUTPUT		
Q101	AM CONV	Q401	PRE AMPLIFIER	Q403	DRIVER	Q405	OUTPUT		



DIAL CORD DRIVE



AC CORD

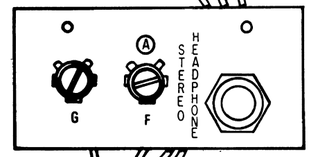


AUDIO CONNECTOR JACKS J401

T501

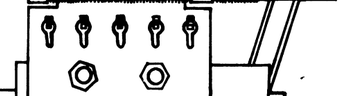
P401 PHONO

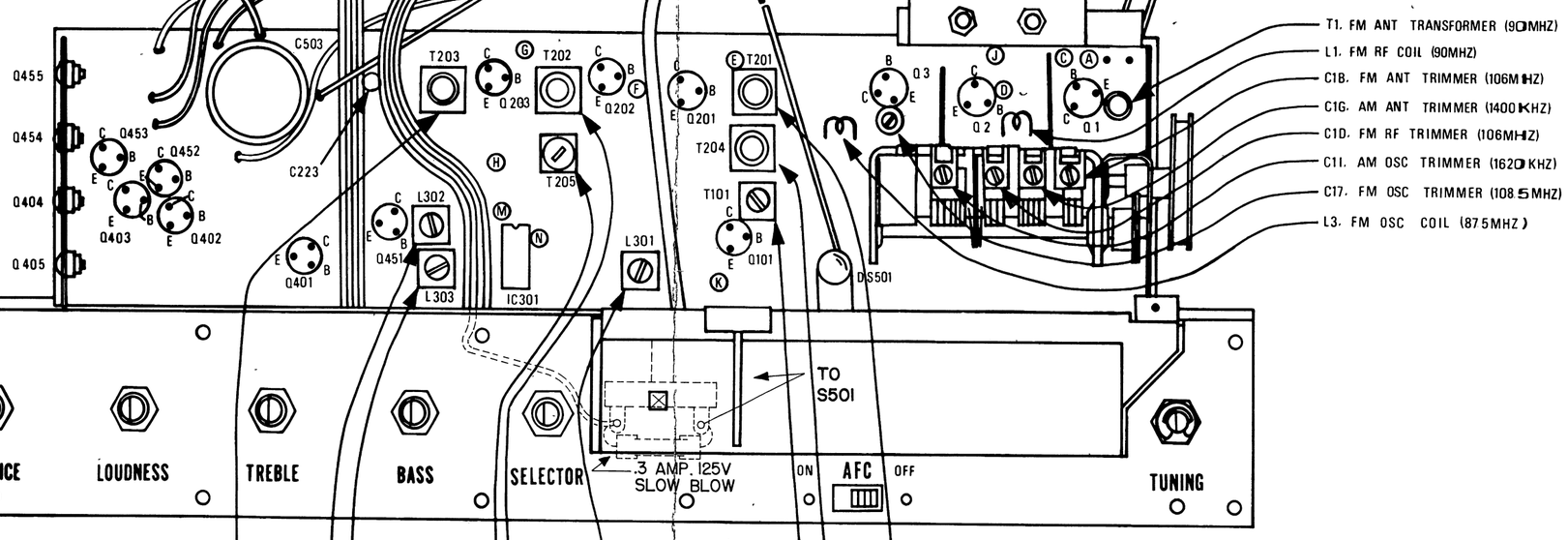
P501 PHONO AC



FM ANTENNA TERMINAL J1

L101





T1. FM ANT TRANSFORMER (90MHZ)
L1. FM RF COIL (90MHZ)
C1B. FM ANT TRIMMER (106MHZ)
C1G. AM ANT TRIMMER (1400KHZ)
C1D. FM RF TRIMMER (106MHZ)
C11. AM OSC TRIMMER (1620KHZ)
C17. FM OSC TRIMMER (108.5MHZ)
L3. FM OSC COIL (87.5MHZ)

L303. INPUT COIL (19KHZ)
L302. DOUBLER COIL (19KHZ)
T203. FM RATIO DETECTOR (10.7MHZ)

L301 SWITCHING COIL (38KHZ)
T202 2ND I F FM TRANSFORMER (10.7MHZ)
T205 2ND I F AM TRANSFORMER (455KHZ)

T201. 1ST I F FM TRANSFORMER (10.7MHZ)
T204. 1ST I F AM TRANSFORMER (455 KHZ)
T101. AM OSCILLATOR TRANSFORMER (600KHZ)

TEST POINTS	
A	FM ANT INPUT
C	REVERSE AGC
D	FM MIXER INPUT
E	1ST FM I F INPUT
F	2ND FM I F INPUT
G	RATIO DETECTOR INPUT
H	FM DETECTOR OUTPUT
J	FM B+
K	AM B+
L	AM RF & I F INPUT
M	19KHZ OUTPUT
N	38KHZ OUTPUT

MODEL D583 – CHASSIS LAYOUT