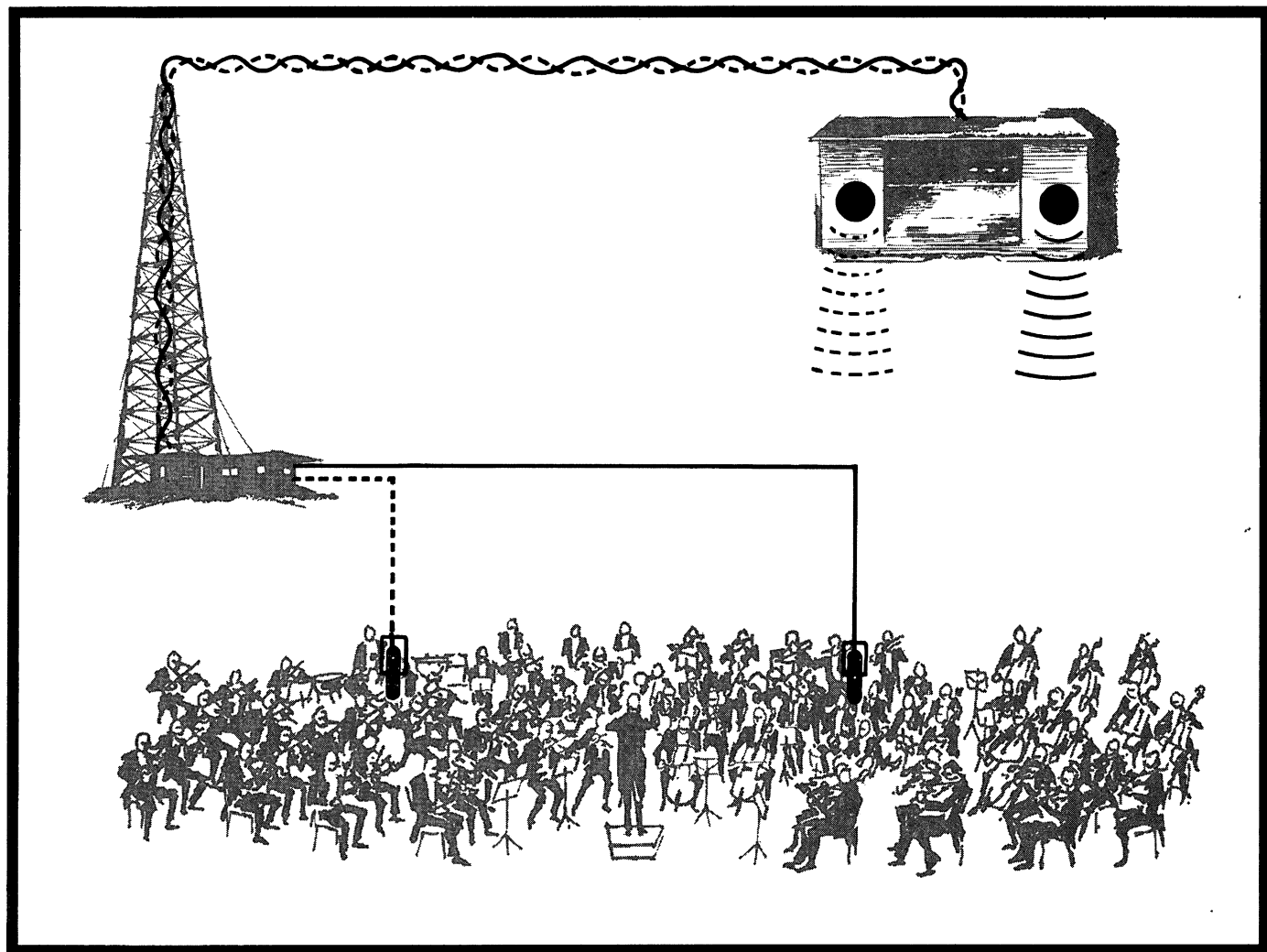


HF 29S2

HF 29S2



SERVICE MANUAL



HIGH FIDELITY AND STEREO FM MODELS

ZENITH RADIO CORPORATION

1900 N. AUSTIN AVENUE

CHICAGO, ILLINOIS 60639

To the Service Technician

PRODUCT SAFETY SERVICING GUIDELINES FOR ALL AUDIO AMPLIFIERS AND RADIO RECEIVERS

CAUTION: No modification of the circuit should be attempted. Service work should be performed only after you are thoroughly familiar with all of the following precautions. To do otherwise increases the risk of potential hazards and injury to the user.

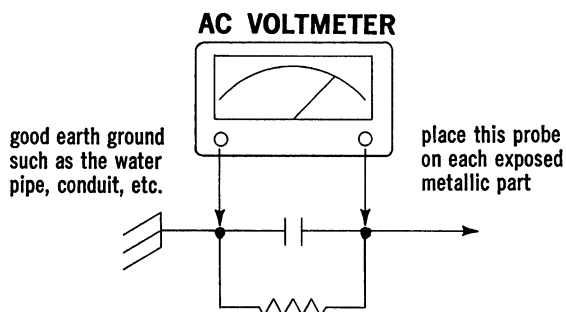
SAFETY CHECKS

SUBJECT: Fire & Shock Hazard

1. Be sure that all components are positioned in such a way to avoid possibility of adjacent components shorts. This is especially important on those chassis which are transported to and from the repair shop.
2. Always replace all protective devices such as insulators and barriers after working on a set.
3. Check for frayed insulation on wires including the AC cord.
4. Check across-the-line components for damage and replace if necessary.
5. After re-assembly of the set always perform an AC leakage test on the exposed metallic parts of the cabinet such as the knobs, antenna terminals, etc. to be sure the set is safe to operate without danger of electrical shock. Do not use a line isolation transformer during this test. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following

manner: Connect a 1500 ohm 10 watt resistor, paralleled by .15 mfd. AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination 1500 ohm resistor and .15 mfd. capacitor. Reverse the AC plug on the set and repeat AC voltage measurements again for each exposed metallic part. Voltage measured must not exceed .3 volts RMS. This corresponds to 0.2 milliamp AC.

Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



MODEL F736W ILLUSTRATED

INDEX

CHASSIS OR MODEL	SCHEMATIC PAGE	CHASSIS LAYOUT PAGE	PARTS LIST PAGE	PRIOR DATA IS ALSO CONTAINED IN
1WDA10	—	—	—	HF 26
1WDA10Z1	—	—	—	HF 28
1WEA10 (Z1)	—	—	—	HF 28S1, 29
1WEA11 (Z1)	—	—	—	HF 28S1, 29
3WEA10 (Z1)	14, 15	16	—	HF 29
3AT20	—	—	—	HF 18S1, 18S2, 19, 21, 26
3AT20Z1	—	—	—	HF 28, 29
3AT20Z2	—	—	—	HF 29
4WDR50X	—	—	—	HF 25, 26
4WDR50X (X1)	—	—	—	HF 26
5WDR50X (X1)	—	—	—	HF 26
5WER50	—	—	—	HF 28S1, 29, 29S1
5WER51	—	—	—	HF 29, 29S1
5WER52	18, 19, 20, 21, 22	17	12, 13	—
5WER53	—	—	—	HF 29, 29S1
6AT24	—	—	—	HF 18, 19, 22, 26, 27, 29
10AT26	—	—	—	HF 18S2, 20, 22
15WCA10	—	—	—	HF 23, 24, 27
15WEA10	—	—	—	HF 29S1
15WDR50Z1	—	—	—	HF 25, 26, 29
15WDR51	—	—	—	HF 26, 27, 29
15WER55	24, 25	23	—	HF 29, 29S1
15WER56	26, 27	28	—	HF 29, 29S1
16CT21	—	—	—	HF 22, 25, 26
21BT34	—	—	—	HF 19, 20, 21, 22, 23
21BT34Z1	—	—	—	HF 22, 23
25BT22	—	—	—	HF 19, 23
25WDA10	—	—	—	HF 27, 28
25WDR50	—	—	—	HF 26, 27
25WDR50Z1	—	—	—	HF 27
27BT30	—	—	—	HF 19, 21, 22
29CT20	—	—	—	HF 22, 24
29CT21	—	—	—	HF 22, 24
29CT21Z1	—	—	—	HF 24
29CT21Z2	—	—	—	HF 26, 27
29AT24	—	—	—	HF 18, 19, 22
29AT24Z1	—	—	—	HF 22
29AT24Z2	—	—	—	HF 26, 29
29CT30	—	—	—	HF 22, 23, 24
35WDR50	—	—	—	HF 26, 28, 29
35WDR50Z1	—	—	—	HF 29, 29S1
E543W (1)	—	—	—	HF 29, 29S1
B545W	—	—	—	HF 21, 23, 24
D546W (1)	—	—	—	HF 26, 28
B553W	—	—	—	HF 21, 22, 24
D554W (1)	—	—	—	HF 26, 28
D556W (1)	—	—	—	HF 26, 28
D583W (1)	—	—	—	HF 26
D742W (1)	—	—	—	HF 26, 28
E743W (1)	—	—	—	HF 29S1
D9011W	—	—	—	HF 26, 29, 29S1
E9012W	—	—	—	HF 29S1
D9013W	—	—	—	HF 26, 28
E9014W, X	—	—	—	HF 29S1
C9015W	—	—	—	HF 24, 25
C9016W	—	—	—	HF 24, 25
D9016W	—	—	—	HF 29, 29S1
S9017W (1)	—	—	—	HF 18, 22, 27
S9017W2	—	—	—	HF 27
E9018W	—	—	—	HF 29S1
E9029W	—	—	—	HF 29S1
S82931	—	—	—	HF 18S1, 19, 23
S83179	—	—	—	HF 18, 18S1, 19, 22, 26, 29
Speaker Wiring Drawings	16	—	—	—

HF 18 is Part No. 923-558

HF 19 is Part No. 923-606

HF 22 is Part No. 923-642

HF 25 is Part No. 923-669

HF 28 is Part No. 923-718

HF 29S2 is Part No. 923-762

HF 18S1 is Part No. 923-576

HF 20 is Part No. 923-610

HF 23 is Part No. 923-646

HF 26 is Part No. 923-702

HF 28S1 is Part No. 923-734

HF 18S2 is Part No. 923-592

HF 21 is Part No. 923-626

HF 24 is Part No. 923-653

HF 27 is Part No. 923-707

HF 29 is Part No. 923-740

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).

HF 22: Theory — JFET, IGFET, MOSFET, Applications — Dual Gate MOSFET FM-RF, JFET Bilex Detector, Quasi-Complementary Symmetry.

HF 23: Applications — Model C9029/Chassis 15WCA10 Four Channel Decoder.

HF 26: Applications — Chassis 15WDR51 (JFET Meter Circuit, Multiplex IC, Four Channel Decoding).

HF 27: Applications — Model SD2568 Speaker Switching Circuitry.

HF 28: Applications — Model D9013W Allegro Speaker System.

HF 29: Theory — Light Emitting Diodes (LED), Applications — Three Light Tuning (Target Tuning), Multiplex IC.

HF 29S1: Applications — Snap-off Escutcheon and Out Front Chassis Removal.

PRODUCT FEATURES
SEE NOTES FOR FURTHER DETAILS

CABINET			CHASSIS			SPEAKERS		
MODEL	COLOR	STYLE NOTE A	MODEL	MPO OUTPUT NOTE B	TYPE	PART NUMBER	IMPED. (In Ohms)	QTY. AND SIZE (In Inches)
D507F1 D507L1	Green Beige	P,H,LL	3AT20Z1	1x1W	Phono Only	49-1184	32	1-2x6
EX541L	Beige	P,H,DS	1WEA11	2x1W	Phono Only	49-1247	16	2-4x6
D546WX11	Walnut	P,H,DS	—	2x1W	Phono Only	964-24020	16	2-5½
E584W1	Walnut	M,LL	5WER51	2x5W	FM/AM/Phono	49-1168 49-1249	8 8	2-3½ 2-6½
E585J1	Brown	M,LL	15WER56	2x15W	FM/AM/Phono	49-1168 49-1254	8 16	2-3½ 2-8
E586W	Walnut	M,LL	15WER56	2x15W	FM/AM/Phono	49-1168 49-1254	8 16	2-3½ 2-8
E586X	White	M,LL	15WER56	2x15W	FM/AM/Phono	49-1168 49-1254	8 16	2-3½ 2-8
E587W1	Walnut	M,LL	5WER51	2x5W	FM/AM/Phono/ Tape	49-1168 49-1249	8 8	2-3½ 2-6½
E589W1	Walnut	M,LL	15WER56	2x15W	FM/AM/Phono/ Tape	49-1168 49-1240	8 16	2-3½ 2-10
E594W1	Walnut	M,LL	15WER56	2x15W	FM/AM/Phono/ Tape	49-1168 49-1240	8 16	2-3½ 2-10
F712W	Walnut	M	5WER52	4x5W	FM/AM/Tape	49-1168 49-1249	8 8	4-3½ 4-6½
F736W	Walnut	M,LL	5WER52	4x5W	FM/AM/Phono/ Tape	49-1168 49-1249	8 8	4-3½ 4-6½
E903M2	Maple	C,LL	5WER50	2x5W	FM/AM/Phono	49-1094 49-1224-01	45 8	2-3½ 2-6x9
ET903M2	Maple	C,LL	5WER50	2x5W	FM/AM/Phono/ Tape	49-1094 49-1224-01	45 8	2-3½ 2-6x9
ET904DE2	Dark Oak	C,LL	5WER50	2x5W	FM/AM/Phono/ Tape	49-1094 49-1224-01	45 8	2-3½ 2-6x9
E912M1	Maple	C,LL	15WER55	2x15W	FM/AM/Phono	49-1166 49-1245	8 16	2-3½ 2-8
E913DE1 E913P1	Dark Oak Pecan	C,LL	15WER55	2x15W	FM/AM/Phono	49-1166 49-1245	8 16	2-3½ 2-8

PRODUCT FEATURES
SEE NOTES FOR FURTHER DETAILS

RECORD CHANGER					OTHER FEATURES			
MOUNTING	PART NUMBER	CARTRIDGE	STYLUS NOTE C	45 RPM ADAPTER	TAPE PROVISION NOTE D	RECORD WELL OR STORAGE	SPEAKER PROV. NOTE E	MISC. NOTE F
Integral	169-493	142-170	D-S 56-567	S-85021	—	—	—	—
Hinged Shelf	169-470	142-167	D-S S-82621	S-72910	—	—	—	—
Hinged Shelf	169-455	142-167	D-S S-82621	S-82964	—	—	—	—
Shelf	169-478	142-167	D-S S-82621	S-72910	TM	—	2+2, A1	A1,DGL, H
Shelf	169-478	142-167	D-S S-82621	S-72910	TM	—	2+2, A2,A3	A2,DGL, TT,H
Shelf	169-466	142-167	D-S S-82621	S-82964	TM	—	2+2, A1	A2,DGL, TT, H
Shelf	169-478	142-167	D-S S-82621	S-72910	TM	—	2+2, A1	A2,DGL, TT,H
Shelf	169-478	142-167	D-S S-82621	S-72910	8TK-P 169-458	—	2+2, A1	A1,DGL, H
Shelf	169-479	142-167	D-S S-82621	S-72910	8TK-P 169-473	—	2+2, A2,A3	A3,DGL, TT,H
Shelf	169-479	142-167	D-S S-82621	S-72910	8TK-R/P 169-469	—	2+2, A2,A3	A3,DGL, TT,H
—	—	—	—	—	8TK-P 169-471	—	—	A1,HH
Shelf	169-479	142-167	D-S S-82621	S-72910	8TK-P 169-471	Well	—	A1,HH
Shelf	169-461	142-167	D-S S-82621	S-72910	TM	Storage	Yes,D	H
Shelf	169-461	142-167	D-S S-82621	S-72910	8TK-P 169-464	Well	Yes,D	H
Shelf	169-461	142-167	D-S S-82621	S-72910	8TK-P 169-464	Well	Yes,D	H
Shelf	169-478	142-167	D-S S-82621	S-72910	EM	Well	2+2,D	H
Shelf	169-478	142-167	D-S S-82621	S-72910	EM	Well	2+2,D	H

PRODUCT FEATURES
SEE NOTES FOR FURTHER DETAILS

CABINET			CHASSIS			SPEAKERS		
MODEL	COLOR	STYLE NOTE A	MODEL	MPO OUTPUT NOTE B	TYPE	PART NUMBER	IMPED. (In Ohms)	QTY. AND SIZE (In Inches)
ET914W1	Walnut	C,LL	15WER55	2x15W	FM/AM/Phono/ Tape	49-1166 49-1221	8 16	2-3½ 2-10
ET915P1 ET915P21	Pecan Pecan	C,LL	15WER55	2x15W	FM/AM/Phono/ Tape	49-1166 49-1221	8 16	2-3½ 2-10
E935M2	Maple	C,LL	35WDR50Z1	2x35W	FM/AM/Phono	49-1094 49-1166 49-1217	45 8 8	2-3½ 2-3½ 2-10
E9012W1	Walnut	M,SP	—	—	—	49-1168 49-1249	8 8	1-3½ 1-6½
E9014W1	Walnut	M,SP	—	—	—	49-1168 49-1254	8 16	1-3½ 1-8
E9018W1	Walnut	M,SP	—	—	—	49-1168 49-1240	8 16	1-3½ 1-10

NOTES

NOTE A – CABINET STYLE:

C = Console, M = Modular, P = Portable, H = Handle, DS = Detachable Speaker Enclosure, LL = Lift Lid, 2LL = Two Lift Lids, RL = Removable Lid, SP = Speaker System.

NOTE B – POWER OUTPUT:

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

NOTE C – STYLUS:

Stylus: D = Diamond, S = Manufactured Sapphire.

NOTE D – TAPE INPUT AND OUTPUT PROVISION:

Factory Installed: 8TK = Eight Track Cartridge, Cass = Cassette, P = Play, R = Record.
Field Installed: EM = Easy Mount installation of the following in the designated consoles. (May also use Top of Set models listed below):

Model E633 - Cassette Recorder/Player.

Field Installed: TM = Top of Set Model for installation with the designated console or modular models:

Model D635 - Cartridge Tape Player.

Model E637 - Cassette Tape Player/Recorder.

NOTE D – TAPE INPUT AND OUTPUT PROVISION: (Cont'd)

Model D638 - Cartridge Tape Player/Recorder.

Model D762 - Cartridge Tape Player.

NOTE E – SPEAKER PROVISIONS:

2+2 = Speaker Matrix or Conventional Extension Speaker System Provisions.

A1 = Model E9012W Allegro 1000 Speaker System may be used.

A2 = Model E9014W Allegro 2000 Speaker System may be used.

A3 = Model E9018W Allegro 3000 Speaker System may be used.

D = Model D9016W Speaker System may be used.

NOTE F – MISCELLANEOUS FEATURES:

A = Speaker System is Allegro.

A1 = Speaker System is Allegro 1000.

A2 = Speaker System is Allegro 2000.

A3 = Speaker System is Allegro 3000.

DGL = Digilite Dial Scale.

H = Headphone Jack (Stereo).

HH = Headphone Jack (Four Channel).

PL = Power Indicator Light.

TT = Target Tuning (Three Light) Indicator.

*Refer to Master Index for models not covered in this manual.

PRODUCT FEATURES
SEE NOTES FOR FURTHER DETAILS

RECORD CHANGER					OTHER FEATURES			
MOUNTING	PART NUMBER	CARTRIDGE	STYLUS NOTE C	45 RPM ADAPTER	TAPE PROVISION NOTE D	RECORD WELL OR STORAGE	SPEAKER PROV. NOTE E	MISC. NOTE F
Shelf	169-478	142-167	D-S S-82621	S-72910	8TK-P 169-464	Well	2+2, A1	A,H
Shelf	169-478	142-167	D-S S-82621	S-72910	8TK-P 169-464	Well	2+2, A1	A,H
Shelf	169-467	142-167	D-S S-82621	S-82964	EM	Well	2+2, A1,A2, A3	A,H
—	—	—	—	—	—	—	—	A1
—	—	—	—	—	—	—	—	A2
—	—	—	—	—	—	—	—	A3

RECORD CHANGER FEATURES

Part No.	Mfg.	Baseplate	Turntable
169-455	VM	Black	Black
169-461	BSR	Black	Light Gray
169-466	VM	Black	Black
169-467	VM	Black	Black
169-470	BSR	Black	Light Gray
169-478	BSR	Black	Black
169-479	BSR	Black	Silver Gray
169-493	BSR	Black	Black

SECTION TWO

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.

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 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.

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.): 3AT20Z1, 3AT20Z2, 5WER50, 5WER51, 5WER52, 5WER53, 6AT24, 15WEA10, 15WDR50Z1, 15WDR51, 15WER55, 15WER56, 35WDR50, 35WDR50Z1.

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: 5WER50, 5WER51, 5WER52, 5WER53, 6AT24, 15WEA10, 15WDR50Z1, 15WDR51, 15WER55, 15WER56, 35WDR50, 35WDR50Z1.

3. Do not operate these amplifiers without their proper speaker load.
4. Do not short out the audio output of either channel when the amplifier is operating.
5. 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.
6. Remove plug-in transistors from their sockets before doing any soldering to the socket lugs.

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 micro-volt 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 5WER52, — Test Point at junction of R2 and R22; gang end of R226.

Chassis 5WER52

Micro Volts Input	Reverse AGC Voltage At Gate 2 of FM RF (Junction R2 & R226)
0	5.5
25	5.0
100	3.5
200	2.9
500	2.3
1K	*1.9
5K	0.2
50K	-1.3
100K	-1.4

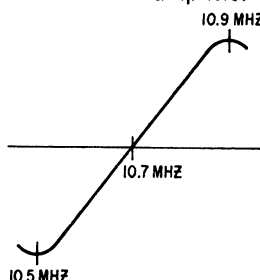
SECTION THREE

FM/AM ALIGNMENT

FM ALIGNMENT

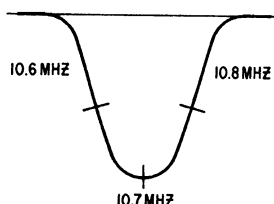
Alignment of these chassis will, in most cases, not be necessary unless an RF or IF transformer is replaced or if someone has tampered with the adjustment.

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



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

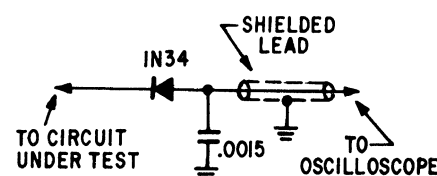
10.6 and 10.8 MHz markers must be symmetrically positioned with 10.7 MHz at center of curve. This point must be adjusted for maximum.

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.



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 5WER50, 5WER51, 5WER53, 15WER55

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.	None	455 KHz	600 KHz	L203, L204, L207, L210	Align IF channel for maximum output.
2				1600 KHz	1600 KHz	C1G	Set Oscillator to dial scale.
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 capaci- tor.	10.7 MHz	Gang Closed	L212 (T207)	Adjust Primary and Secondary of Ratio Detector for maximum amplitude and symmetry as shown in Scope Pattern "A".
7		L214 (T207)					
8	Scope Last FM IF Test Point "G"	Term No. 3 of T203 2nd IF Trans. Test Point "F"				L208 & L209 (T205)	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 (T203)	
10		Connect to Test Point "D"				L201 & L202 (T201)	
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 (Disconnect 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 5WER52

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.	None	455 KHz	600 KHz	L203, L204, L207, L208, L211	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 No. 2 & 3			
5				1400 KHz	1400 KHz	C1F	Align Antenna stage.
NOTE: For FM Alignment Use A Signal With 400 KHz Deviation, Bandswitch in FM. AFC "Off".							
6	ScopeRatio Detector Test Point "H"	Term No. 5 of T205 3rd IF Trans. Test Point "G".	47 ohm in shunt with generator output.	10.7 MHz	Gang Closed	L214 (T207)	Adjust Primary and Secondary of Ratio Detector for maximum amplitude and symmetry as shown in Scope Pattern "A".
7						L215 (T207)	
8	Scope Last FM IF Test Point "G"	Term No. 3 of T203 2nd IF Trans. Test Point "F".	Then from hot lead a 27 ohm in series with a .001 MFD Capacitor.			L209 & L210 (T205)	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 (T203)	
10		Connect to Test Point "D".				L201 & L202 (T201)	
11						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 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 (Disconnect 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	C1C	Align FM Detector stage for maximum.
16				90 MHz	90 MHz	L2 if necessary	
17				106 MHz	106 MHz	C1A	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 15WER56

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.	None	455 KHz	600 KHz	L203, L204, L207, L210	Align I.F. channel for maximum output.
2				1600 KHz	1600 KHz	C1G	Set Oscillator to dial scale.
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 generator output. Then from hot lead a 27 ohm in series with a .001 MFD Capacitor.	10.7 MHz	Gang Closed	L212 (T207)	Adjust Primary and Secondary of Ratio Detector for maximum amplitude and symmetry as shown in Scope Pattern "A".
7						L214 (T207)	
8	Scope Last FM IF Test Point "G"	Term No. 3 of T203 2nd IF Trans. Test Point "F".				L208 & L209 (T205)	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 (T203)	
10		Connect to Test Point "D".				L201 & L202 (T201)	
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 (Disconnect 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 thru 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			
20		One turn loosely coupled to wavemagnet.	None	1000 KHz	1000 KHz	T601	Adjust so green light CR606 will be illuminated for maximum intensity on a weak signal.
21							Red "low" and "high" lights CR605, CR606, will "turn-on" when detuned equal frequency above and below center frequency.
22							Readjust, if needed, so "high" and "low" lights will "turn-on" at equal frequency from center frequency.

SECTION FOUR

MULTIPLEX ALIGNMENT

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.

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.

Most 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 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.

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, 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.

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—MULTIPLEX ALIGNMENT PROCEDURE — CHASSIS 5WER50, 5WER51, 5WER53, 15WER55, 15WER56.

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.

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. USE RF FREQUENCY NEAR CENTER SCALE.											
1	Test Point "M"	Test Point "A" FM Antenna	300 Ohm	98 MHz 10% Pilot	FM	98 MHz	T301	Adjust 19 KHz Amp for maximum.			
2				98 MHz 5% Pilot			NOTE: — Stereo Indicator Lamp may be on or off during the above steps.				
3	"L" Tape Output			98 MHz 10% Pilot L+R, L-R, (Mod. L Only)			T302	Adjust for maximum L Channel reading.			
4	"R" Tape Output						T302 if necessary	Adjust for minimum R Channel reading.			
5							REPEAT STEPS 4 and 5 for MINIMUM CHANGE.		To provide max. separation.		

FM—MULTIPLEX ALIGNMENT PROCEDURE — CHASSIS 5WER52

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 USE RF FREQUENCY NEAR CENTER SCALE.								
1	Test Point "M"	Test Point "A" FM Antenna	300 Ohm	98 MHz 10% Pilot	FM	98 MHz	T301	Adjust 19 KHz Amp for maximum.
2				98 MHz 5% Pilot			NOTE: — Stereo Indicator Lamp may be on or off during the above steps.	
							R301	Adjust mute control to point where stereo lamp lights up.
							NOTE — Stereo Indicator Lamp must remain on during the following steps.	
							T302	Adjust for maximum L Channel reading.
3	"L" Tape Output	98 MHz 10% Pilot L+R, L-R, (Mod. L Only)	T302 if necessary	Adjust for minimum R Channel reading.				
4	"R" Tape Output							
5				REPEAT STEPS 4 and 5 for MINIMUM CHANGE.		To provide max. separation.		

CHASSIS 5WERS2

LINE CORD & PLUG	
11-150	LINE CORD & PLUG
12-6268	P.C. BOARD MTG. BRACKET
12-6270	P.C. BOARD MTG. BRACKET (RIGHT SIDE)
12-6285	POWER SUPPLY MTG. BRACKET
19-766	CABLE RETAINER (3 REQ.)
20-1631	TRAP COIL - 10.7 MHZ
20-3545	FM OSCILLATOR COIL
20-3594	FM/RP COIL
20-3595	FM ANTENNA COIL
22-13	3300 PF CERAMIC CAPACITOR - 500V. 10% (3 REQ.)
22-16	470 PF CERAMIC CAPACITOR - 500V. 10% (6 REQ.)
22-2428	1.8 PF GIMMICK CAPACITOR - 500V. 10% (3 REQ.)
22-2593	20 PF CERAMIC CAPACITOR - 500V. 5%
22-2729	1000 PF CERAMIC CAPACITOR - 25V. +50% -30% (6 REQ.)
22-2939	680 PF CERAMIC CAPACITOR - 500V. 10% (14 REQ.)
22-3034	.05 MF CERAMIC CAPACITOR - 25V. +100% -50% (13 REQ.)
22-3035	12 PF CERAMIC CAPACITOR - 500V. 5%
22-3080	5000 PF CERAMIC CAPACITOR - 25V. +100% -30% (6 REQ.)
22-3177	390 PF CERAMIC CAPACITOR - 500V. 10% (3 REQ.)
22-3362	560 PF CERAMIC CAPACITOR - 500V. 10% (4 REQ.)
22-3381	39 PF CERAMIC CAPACITOR - 500V. 5% (3 REQ.)
22-3393	.01 MF CERAMIC CAPACITOR - 25V. +80% -30% (4 REQ.)
22-3652	.1 MF CERAMIC CAPACITOR - 10V. +80% -20% (4 REQ.)
22-3675	10 PF CERAMIC CAPACITOR - 500V. 5%
22-3687	1 MF ELECTROLYTIC - 50V. 5%
22-3768	68 PF CERAMIC CAPACITOR - 500V. 5%
22-3770	5.5 PF CERAMIC CAPACITOR - 500V. ±25 PF (2 REQ.)
22-4819	2 PF CERAMIC CAPACITOR - 500V. ±25 PF
22-4855	TRIMMER CAPACITOR
22-5474	200 MF ELECTROLYTIC - 30V. +100% -10%
22-5481	560 PF CERAMIC CAPACITOR - 500V. 10% (2 REQ.)
22-5482	680 PF CERAMIC CAPACITOR - 500V. 10% (3 REQ.)
22-5486	10 MF ELECTROLYTIC - 6V. +100% -10%
22-5487	.47 MF CERAMIC CAPACITOR - 3V. +100% -0% (2 REQ.)
22-5632	.022 MF MYLAR CAPACITOR - 200V. 10% (2 REQ.)
22-5637	4700 PF MYLAR CAPACITOR - 200V. 10% (2 REQ.)
22-5639	.22 MF MYLAR CAPACITOR - 100V. 10% (4 REQ.)
22-5782	2200 PF TUBULAR CAPACITOR - 50V. 5% (2 REQ.)
22-5815	.056 MF MYLAR CAPACITOR - 100V. 10% (4 REQ.)
22-5863	.01 MF MYLAR CAPACITOR - 100V. 10% (2 REQ.)
22-5866	.047 MF MYLAR CAPACITOR - 100V. 10% (2 REQ.)
22-5972	390 PF TUBULAR CAPACITOR - 125V. 5%
22-5989	.02 MF CERAMIC CAPACITOR - 25V. 20% (4 REQ.)
22-6005	.01 MF CERAMIC CAPACITOR (2 REQ.)
22-6344	7 PF CERAMIC CAPACITOR - 500V. 7%
22-6447-01	.047 MF MYLAR CAPACITOR - 100V. 20% (6 REQ.)
22-7142-03	4.7 MF ELECTROLYTIC - 25V. +100% -10%
22-7151-08	100 MF ELECTROLYTIC - 16V. +100% -10% (4 REQ.)
22-7151-13	2200 MF ELECTROLYTIC - 16V. +100% -10%
22-7152-03	4.7 MF ELECTROLYTIC - 25V. +100% -10% (4 REQ.)
22-7152-11	1 MF ELECTROLYTIC - 25V. +100% -10% (4 REQ.)
22-7153	1 MF ELECTROLYTIC - 50V. +100% -10% (19 REQ.)
22-7153-09	220 MF ELECTROLYTIC - 50V. +100% -10%
22-7214	GANG CAPACITOR - FM ANTENNA TRIMMER, FM ANTENNA TUNING, FM/RP TRIMMER, FM/RP TUNING, FM OSCILLATOR TUNING, AM ANTENNA TRIMMER, AM ANTENNA TUNING, AM OSCILLATOR TRIMMER, AM OSCILLATOR TUNING
22-7251	2.2 PF CERAMIC CAPACITOR - 500V. ±0.1 PF (2 REQ.)
33-377-01	FRAME - PRINTED CIRCUIT BOARD (POWER AMP.)
33-458	FRAME - PRINTED CIRCUIT BOARD
SOCKET CONTACT HOUSING	
44-90	PLATE & JACK ASSEM.
52-2039	SHIELDED LEAD CABLE - 2 CONDUCTOR
52-2132-01	3 CONDUCTOR CABLE
52-2189	SHIELDED LEAD CABLE - 2 CONDUCTOR
52-2195-03	SHIELDED LEAD CABLE - 2 CONDUCTOR
52-2195-04	SHIELDED LEAD CABLE - 2 CONDUCTOR
52-2195-05	SHIELDED LEAD CABLE - 2 CONDUCTOR
52-2195-06	SHIELDED LEAD CABLE - 2 CONDUCTOR
52-2195-07	SHIELDED LEAD CABLE - 2 CONDUCTOR
52-2195-08	SHIELDED LEAD CABLE - 2 CONDUCTOR
52-2215	TWIN LEAD CABLE - 300 OHM
54-808	SPRING NUT - FLAT (1 USED ON EA. 121-976 & 121-977)
54-828	LOCKING NUT - 1/2-20 X .750 AF
54-933	SPRING NUT - "U" SHAPED
59-1136	4 CHANNEL BALANCE SLIDE
59-1136-01	4 CHANNEL BALANCE SLIDE
61-350	GROOVED PULLEY
63-1701	10 OHM RESISTOR - 1/2W. 10%
63-1707	15 OHM RESISTOR - 1/2W. 5% (4 REQ.)
63-1708	15 OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1726	39 OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1756	220 OHM RESISTOR - 1/2W. 5% (4 REQ.)
63-1757	220 OHM RESISTOR - 1/2W. 10% (5 REQ.)
63-1760	270 OHM RESISTOR - 1/2W. 5% (4 REQ.)
63-1764	330 OHM RESISTOR - 1/2W. 10%
63-1765	330 OHM RESISTOR - 1/2W. 20% (2 REQ.)
63-1772	470 OHM RESISTOR - 1/2W. 20% (5 REQ.)
63-1775	560 OHM RESISTOR - 1/2W. 10% (3 REQ.)
63-1778	680 OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1782	820 OHM RESISTOR - 1/2W. 10%
63-1785	1K OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1789	1200 OHM RESISTOR - 1/2W. 10%
63-1790	1300 OHM RESISTOR - 1/2W. 5% (2 REQ.)
63-1792	1500 OHM RESISTOR - 1/2W. 10% (2 REQ.)
63-1796	1800 OHM RESISTOR - 1/2W. 10% (6 REQ.)
63-1798	2200 OHM RESISTOR - 1/2W. 5% (4 REQ.)
63-1799	2200 OHM RESISTOR - 1/2W. 10% (3 REQ.)
63-1803	2700 OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1806	3300 OHM RESISTOR - 1/2W. 10% (5 REQ.)
63-1808	3600 OHM RESISTOR - 1/2W. 5% (4 REQ.)
63-1810	3900 OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1813	4700 OHM RESISTOR - 1/2W. 10% (7 REQ.)
63-1816	5600 OHM RESISTOR - 1/2W. 5% (2 REQ.)

63-1817	5600 OHM RESISTOR - 1/2W. 10%
63-1824	8200 OHM RESISTOR - 1/2W. 10%
63-1825	9100 OHM RESISTOR - 1/2W. 5% (2 REQ.)
63-1827	10K OHM RESISTOR - 1/2W. 10% (12 REQ.)
63-1831	12K OHM RESISTOR - 1/2W. 10% (2 REQ.)
63-1834	15K OHM RESISTOR - 1/2W. 10% (3 REQ.)
63-1840	22K OHM RESISTOR - 1/2W. 5% (4 REQ.)
63-1841	22K OHM RESISTOR - 1/2W. 10% (2 REQ.)
63-1844	27K OHM RESISTOR - 1/2W. 5% (2 REQ.)
63-1845	27K OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1848	33K OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1852	39K OHM RESISTOR - 1/2W. 10% (3 REQ.)
63-1855	47K OHM RESISTOR - 1/2W. 10%
63-1856	47K OHM RESISTOR - 1/2W. 20%
63-1858	56K OHM RESISTOR - 1/2W. 5% (4 REQ.)
63-1861	68K OHM RESISTOR - 1/2W. 5% (2 REQ.)
63-1862	68K OHM RESISTOR - 1/2W. 10% (3 REQ.)
63-1869	100K OHM RESISTOR - 1/2W. 10% (10 REQ.)
63-1870	100K OHM RESISTOR - 1/2W. 20% (2 REQ.)
63-1873	120K OHM RESISTOR - 1/2W. 10% (2 REQ.)
63-1876	150K OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1880	180K OHM RESISTOR - 1/2W. 10% (2 REQ.)
63-1883	220K OHM RESISTOR - 1/2W. 10% (2 REQ.)
63-1887	270K OHM RESISTOR - 1/2W. 10%
63-1890	330K OHM RESISTOR - 1/2W. 10%
63-1897	470K OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1898	470K OHM RESISTOR - 1/2W. 20%
63-1915	1.2 MEG. OHM RESISTOR - 1/2W. 10%
63-1918	1.5 MEG. OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-1925	2.2 MEG. OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-4122	33 OHM RESISTOR - 1/2W. 20%
63-4129	47 OHM RESISTOR - 1/4W. 10%
63-4501	1 OHM RESISTOR - 1/2W. 10% (4 REQ.)
63-5628	100 OHM RESISTOR - 2W. 10%
63-6045	270 OHM RESISTOR - 1W. 10%
63-8328	ROTARY CONTROL
63-9842-01	BALANCE CONTROL - DUAL (2 REQ.)
63-10229	VOLUME CONTROL - DUAL
63-10230	BASS CONTROL - DUAL
63-10231	TREBLE CONTROL - DUAL
66-155	SLIDER GUIDE ROD (2 REQ.)
73-123	8-32 X 1/4 ALLEN HEAD SET SCREW
76-2100	SOLID SHAFT
AC CORD & SOCKET	
78-2080	INTERGRADED CIRCUIT SOCKET
78-2137	STEREO HEADPHONE JACK (2 REQ.)
79-173-12	CLEAR SLEEVING
79-174-12	YELLOW SLEEVING (4 REQ.)
79-243-14	SLEEVING - 3/8 (2 REQ.)
79-316-4	BLACK SLEEVING (2 PART OF S-96588)
80-2069	TENSION SPRING
80-2326	CONICAL SPRING
83-8066	TIE STRIP - 6" (3 REQ.)
83-8298	INSULATING STRIP (1 USED ON EA. 121-976)
83-8655	WIRE RETAINER STRIP
83-8665	SUPPORT STRIP
83-8666	LEAD CAPTIVATING STRIP
83-8671	BACKGROUND STRIP
83-8706	JACK RETAINER STRIP
PUSH BUTTON SWITCH (POWER)	
85-1403	PUSH-BUTTON SWITCH ASSEM. (FUNCTION)
86-334	SOCKET TERMINAL (3 REQ.)
86-500	CONNECTOR PIN (9 REQ.)
86-625	FEMALE TERMINAL (2 PART OF S-95241)
86-659	INSERT TERMINAL (2 PART OF S-96588)
94-1382	INSULATED BUSHING
94-1384	INSULATED BUSHING (6 REQ.)
94-1532	SHAFT BUSHING - NYLON
94-1545	SHOULDER BUSHING - NYLON (4 REQ.)
95-2544	OSCILLATOR COIL - AM
95-2689	3RD. AM/IF TRANSFORMER
95-2751	1ST. AM/IF TRANSFORMER
95-2752	2ND. AM/IF TRANSFORMER
95-2753	1ST. FM/IF TRANSFORMER
95-2754	2ND. FM/IF TRANSFORMER
95-2755	3RD. FM/IF TRANSFORMER
95-2756	RATIO DETECTOR TRANSFORMER - FM
95-3021	INPUT TRANSFORMER - 19KHZ
95-3023	DETECTOR TRANSFORMER - 38KHZ
POWER TRANSFORMER	
100-604	AM & FM DIAL SCALE BULB (2 REQ.)
100-610	PILOT BULB (2 REQ.)
100-625	DIAL POINTER BULB
101-4715	FUSE LABEL
101-5584-03	FUSE LABEL
103-23	GERMANIUM DIODE (3 REQ.)
103-90	DIODE - MATCHED PAIR (2 REQ.)
103-96	ZENER DIODE
103-142	SILICON DIODE
103-189	AFC DIODE
-OR-	
103-47	AFC DIODE
103-222	BIAS DIODE (4 REQ.)
112-1402	4-24 X .25 RD. HD. PHILLIPS SCREW - STAT. BRONZE (2 MT. 85-1289)
112-2267	M3 X .5 X 5 RECESS FILLISTER HD. MACHINE SCREW (6 REQ.)
112-2268	M2.6 X 0.45 X 5 RECESS FILLISTER HD. MACHINE SCREW (2 MT. 85-1403) (6 REQ.)
114-803	6-20 X 0.25 X .250 AF HEX WASHER HD. THD. SCREW - STAT. BRONZE (23 REQ.)
114-806	8-18 X 1/4 X 1/4 AF HEX WASHER HD. SELF - TAP. SCREW (6 REQ.)
114-1302	4-24 X 5/8 X .187 AF HEX WASHER HD. THD. SCREW (1 USED ON EA. 121-976 & 121-977)
121-430	TRANSISTOR - PRE-AMP. (4 REQ.)
121-433	TRANSISTOR - PRE-DRIVER/DECODER (9 REQ.)
121-613	TRANSISTOR - FM CONVERTER
121-735	TRANSISTOR - AM CONVERTER
121-768	TRANSISTOR - DRIVER (4 REQ.)
121-950	TRANSISTOR - 1ST. AM-FM/IF, 2ND. AM-FM/IF, 3RD. FM/IF (3 REQ.)
121-953	TRANSISTOR - FM/RP
121-976	TRANSISTOR - OUTPUT (MATCHED PAIRS) (4 REQ.)
121-977	TRANSISTOR - OUTPUT (MATCHED PAIRS) (4 REQ.)
125-140	LINE CORD RETAINING BUSHING
125-194	SYMMETRICAL GROMMET (4 REQ.)
126-1651	TRANSISTOR HEAT SINK

CHASSIS 5WER52 CONT'D

126-1668	BULB SHIELD (2 REQ.)
136-24	FUSE - 4 AMP
136-108	FUSE (WITH LEADS) - 6 AMP.
149-311	IRON CORE
188-140	RETAINING RING
212-76	SILICON RECTIFIER (2 REQ.)
221-65	INTERGRATED CIRCUIT PACKAGE
S-88993	DIAL CORD ASSEM.
S-93292	AM ANTENNA COIL ASSEM.
S-95241	BULB ASSEM. (WITH TERMINAL)
S-96439	JACK & BRACKET ASSEM.
S-96506	PULLEY & BRACKET ASSEM.
S-96552	TERMINAL STRIP ASSEM.
S-96553	LAMP HOLDER & BRACKET ASSEM.
S-96554	PULLEY & BRACKET ASSEM.
S-96588	CARRIAGE & DIODE ASSEM.
S-96638	POINTER & MTG. BRACKET ASSEM.

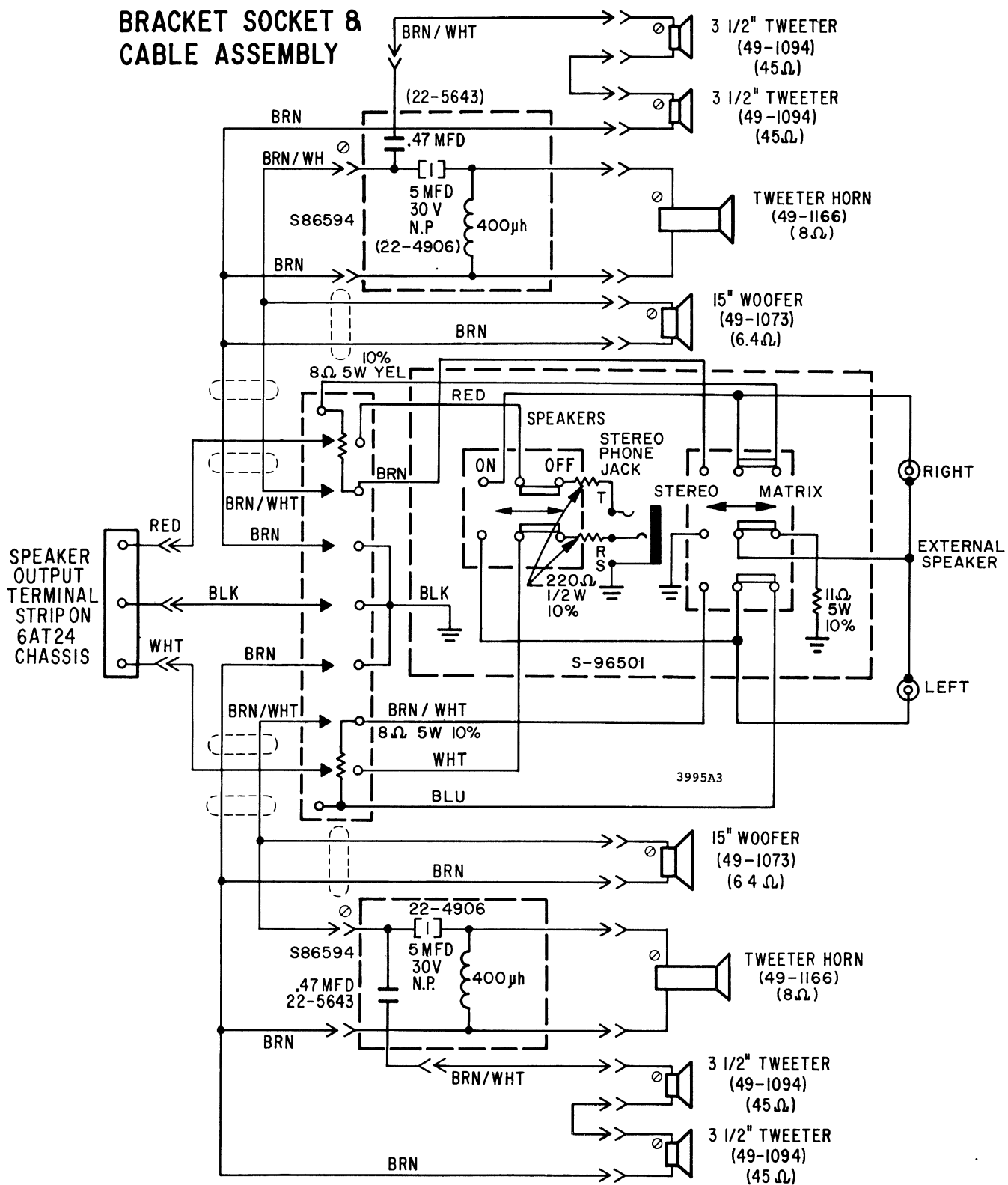
CHASSIS 15WER56

REFER TO SERVICE MANUAL HF29

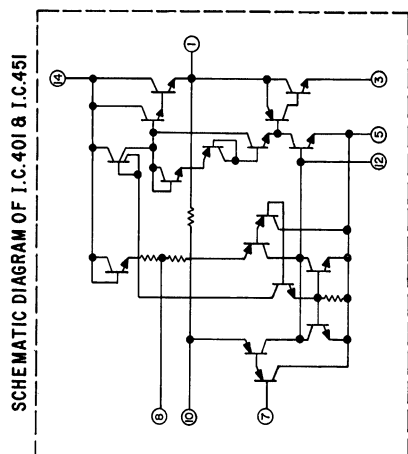
CHASSIS 15WER55

REFER TO SERVICE MANUAL HF29

E966DE, E966P



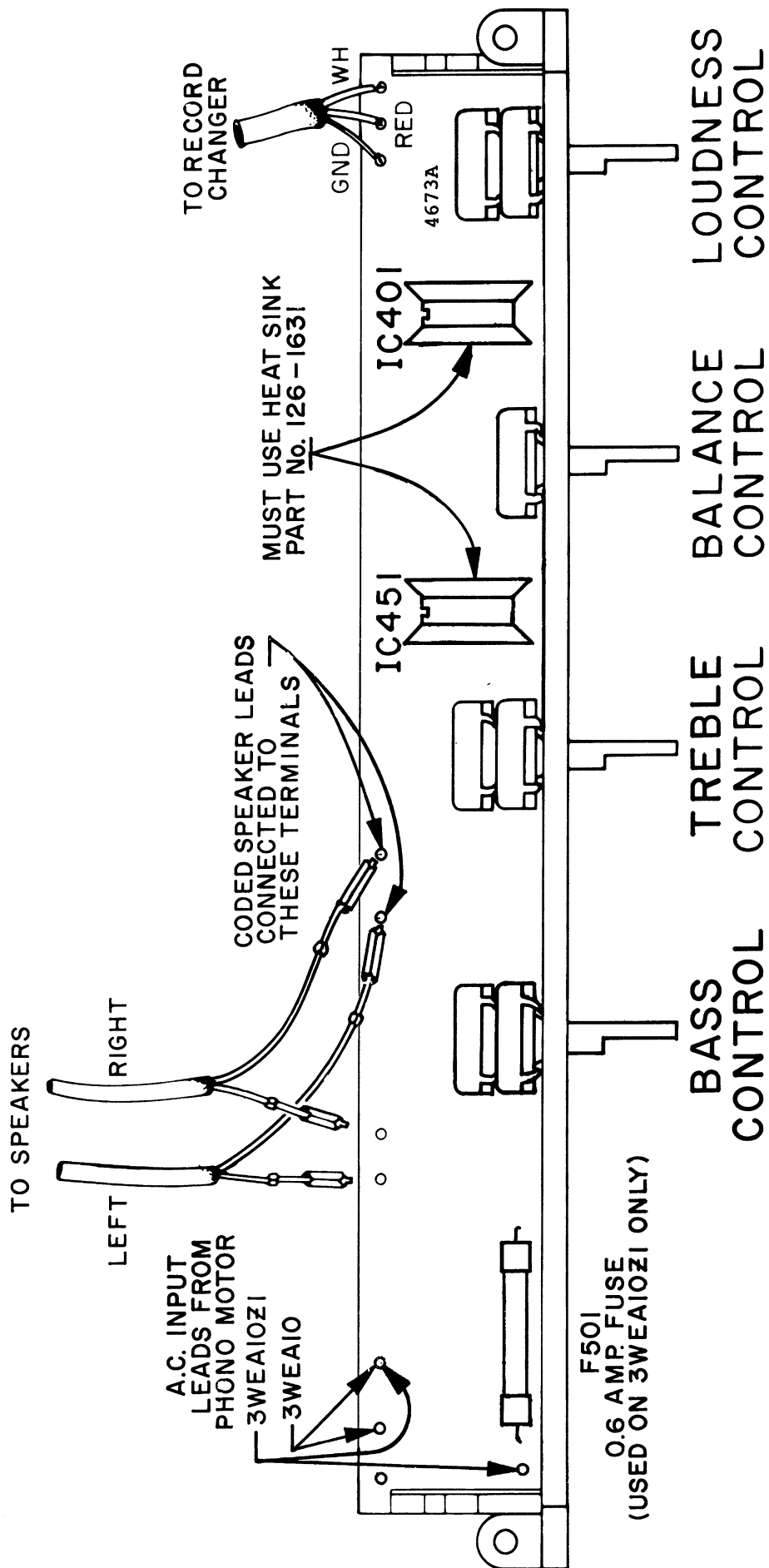
SPEAKER WIRING SCHEMATICS



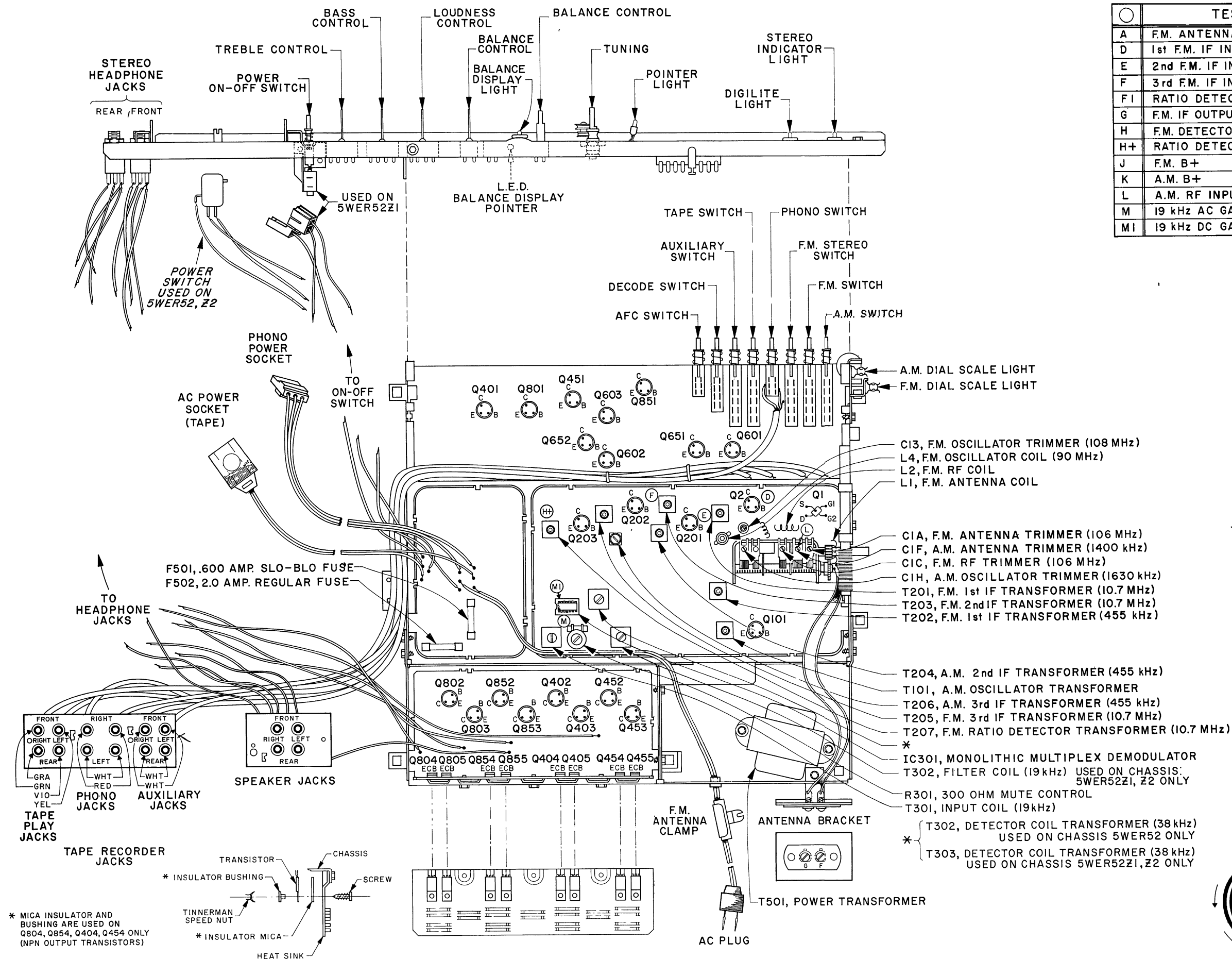
4649C

ITEM "A"
SEE NOTE 7



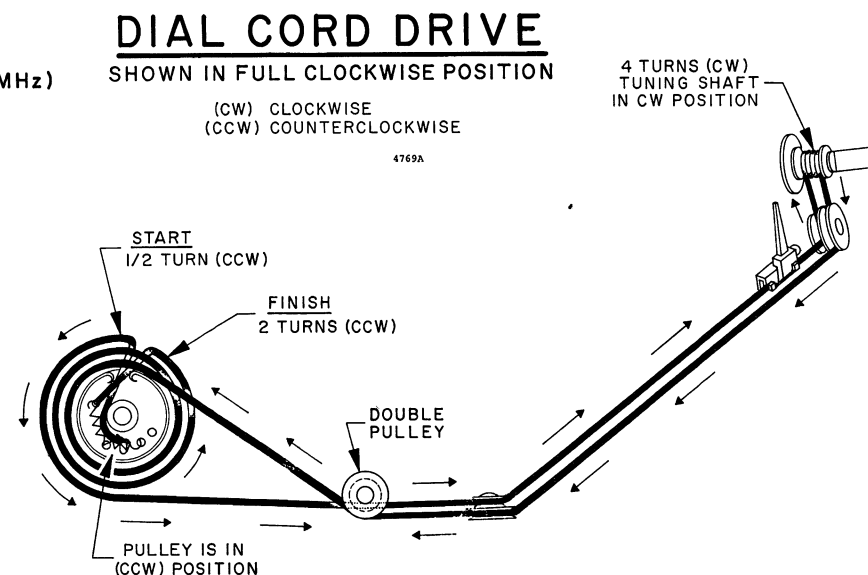


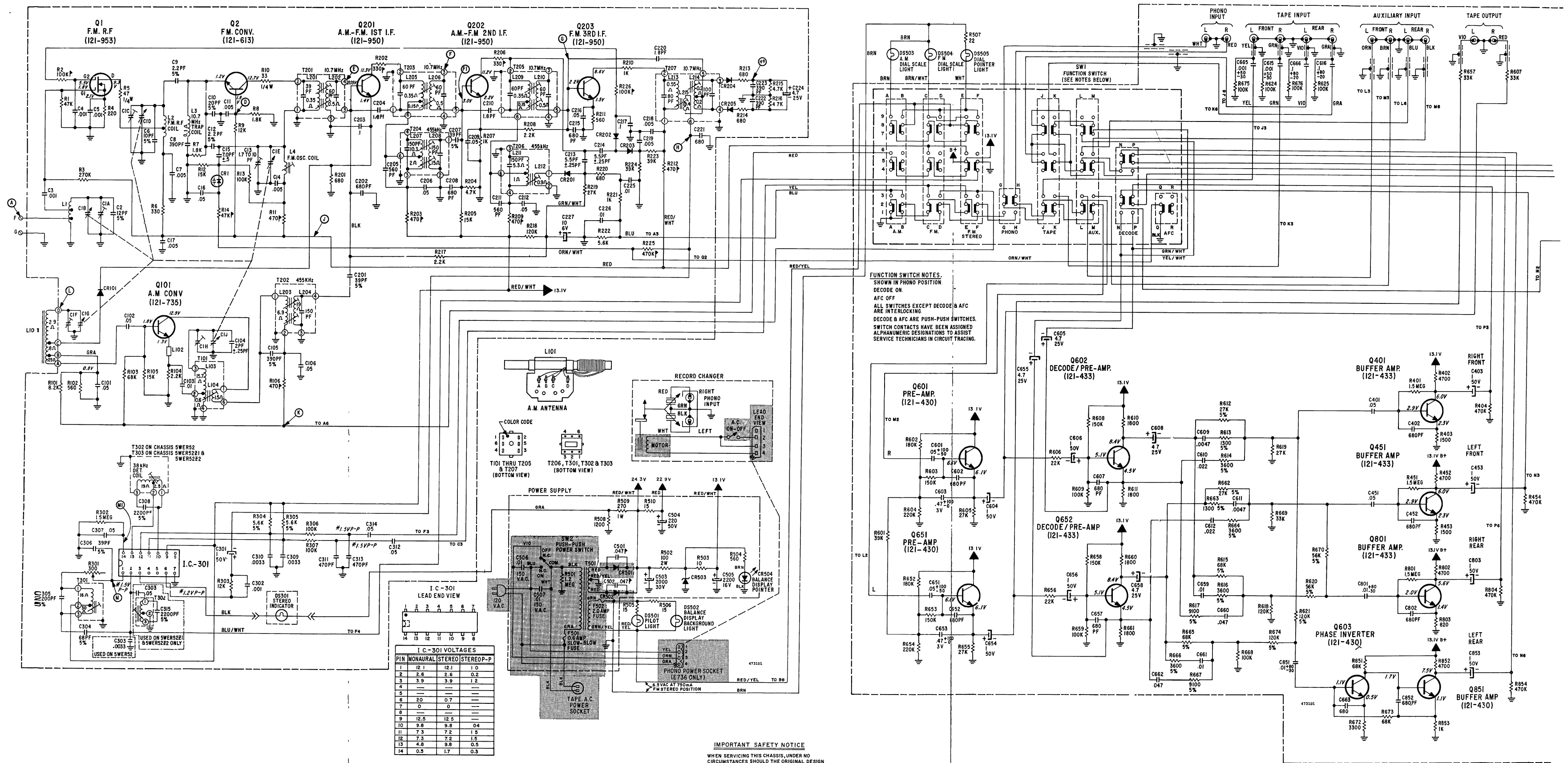
CHASSIS 3WEA10 (Z1) - CHASSIS LAYOUT



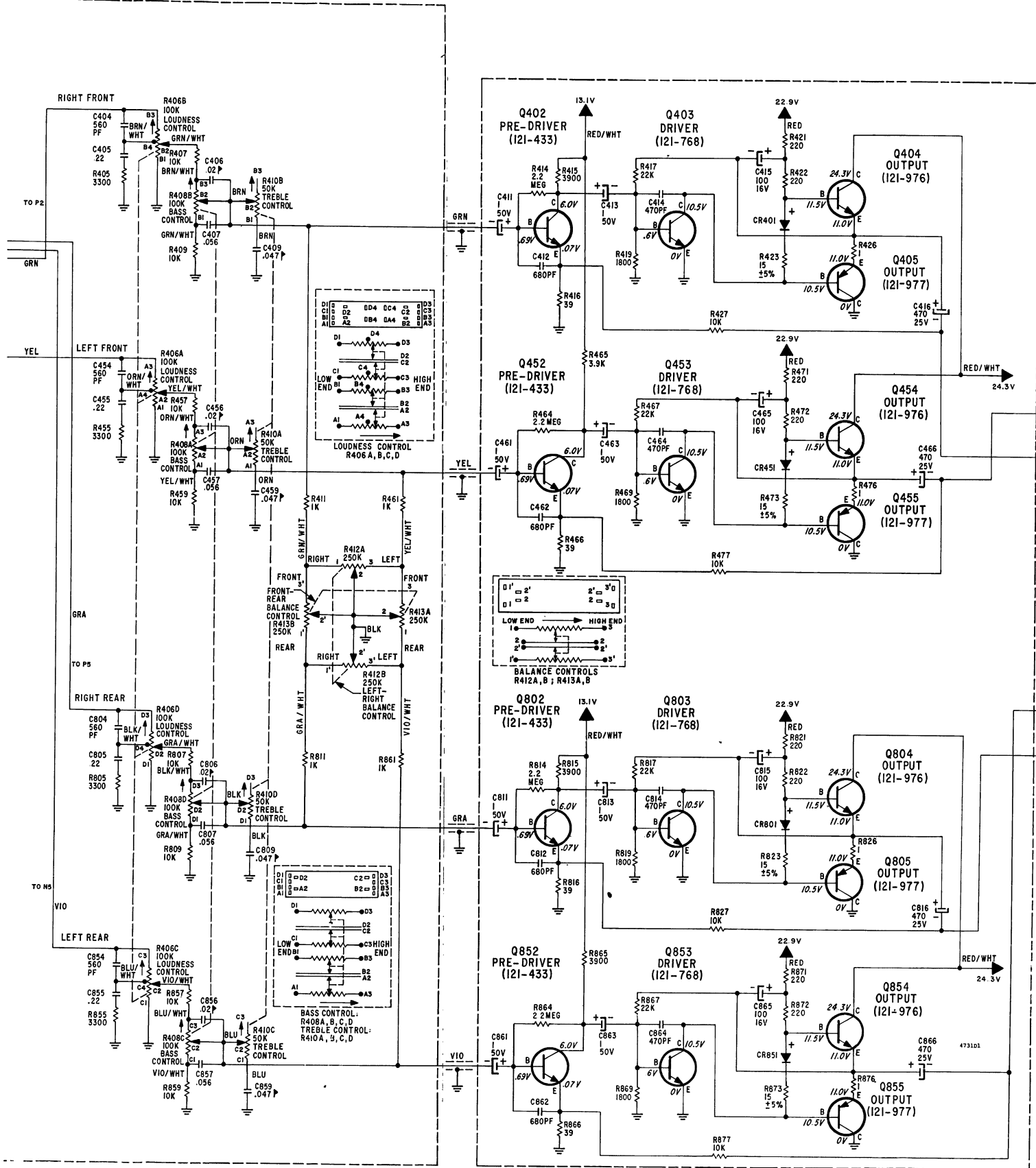
TEST POINTS	
A	F.M. ANTENNA INPUT
D	1st F.M. IF INPUT
E	2nd F.M. IF INPUT
F	3rd F.M. IF INPUT
F1	RATIO DETECTOR IF INPUT
G	F.M. IF OUTPUT
H	F.M. DETECTOR OUTPUT
H+	RATIO DETECTOR PRIMARY TUNING
J	F.M. B+
K	A.M. B+
L	A.M. RF INPUT & A.M. IF INPUT
M	19 kHz AC GAIN
MI	19 kHz DC GAIN

TRANSISTORS		
No.	PART No.	DESCRIPTION
Q1	121-953	F.M.-R.F.
Q2	121-613	F.M. CONVERTER
Q101	121-735	A.M. CONVERTER
Q201		A.M.-F.M. 1st IF
Q202	121-950	A.M.-F.M. 2nd IF
Q203		F.M. 3rd IF
Q401		BUFFER AMPLIFIER
Q402	121-433	PRE-DRIVER
Q403	121-768	DRIVER
Q404	121-976	OUTPUT
Q405	121-977	OUTPUT
Q451		BUFFER AMPLIFIER
Q452	121-433	PRE-DRIVER
Q453	121-768	DRIVER
Q454	121-976	OUTPUT
Q455	121-977	OUTPUT
Q601	121-430	PRE-AMPLIFIER
Q602	121-433	DECODE PRE-AMPLIFIER
Q603		PHASE INVERTER
Q651	121-430	PRE-AMPLIFIER
Q652		DECODE PRE-AMPLIFIER
Q801	121-433	BUFFER AMPLIFIER
Q802		PRE-DRIVER
Q803	121-768	DRIVER
Q804	121-976	OUTPUT
Q805	121-977	OUTPUT
Q851	121-430	BUFFER AMPLIFIER
Q852	121-433	PRE-DRIVER
Q853	121-768	DRIVER
Q854	121-976	OUTPUT
Q855	121-977	OUTPUT
IC301	221-79	MULTIPLEX DEMODULATOR
	221-65	MULTIPLEX DEMODULATOR



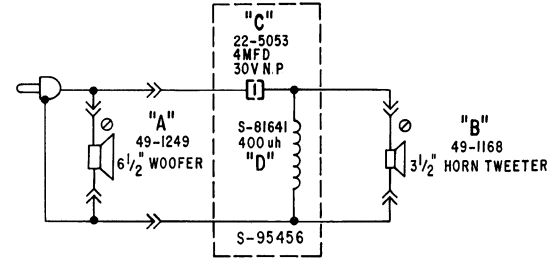


CHASSIS 5WER52 - SCHEMATIC



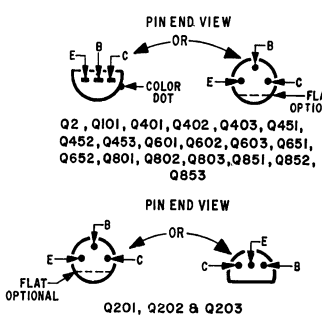
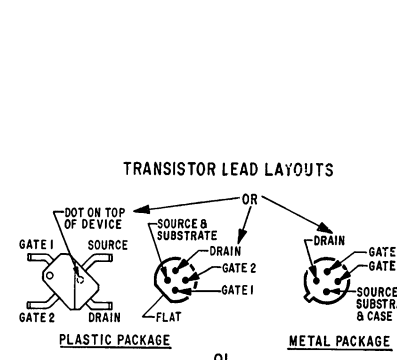
TEST POINTS

- A FM ANTENNA INPUT
- D 1ST F.M. I.F. INPUT
- E 2ND F.M. I.F. INPUT
- F RATIO DETECTOR INPUT
- G F.M. I.F. OUTPUT
- H F.M. DETECTOR OUTPUT
- I RATIO DETECTOR PRIMARY TUNING
- J F.M. B+
- K A.M. B+
- L A.M. R.F. INPUT 8 A.M. I.F. INPUT
- M 19 kHz AC GAIN
- N 19 kHz DC GAIN
- F 3RD F.M. I.F. INPUT



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

SPEAKERS			
RIGHT FRONT	LEFT FRONT	RIGHT REAR	LEFT REAR
A LS401	LS451	LS801	LS851
B LS402	LS452	LS802	LS852
C C418	C468	C818	C868
D L401	L451	L801	L851



IMPORTANT SAFETY NOTICE

WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE ZENITH RADIO CORPORATION. ALL COMPONENTS SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT. SPECIAL COMPONENTS ARE USED TO PREVENT SHOCK AND FIRE HAZARD. THESE CRITICAL COMPONENTS ARE SHOWN IN THE SCHEMATIC AND PARTS LISTS FOR EASY IDENTIFICATION.

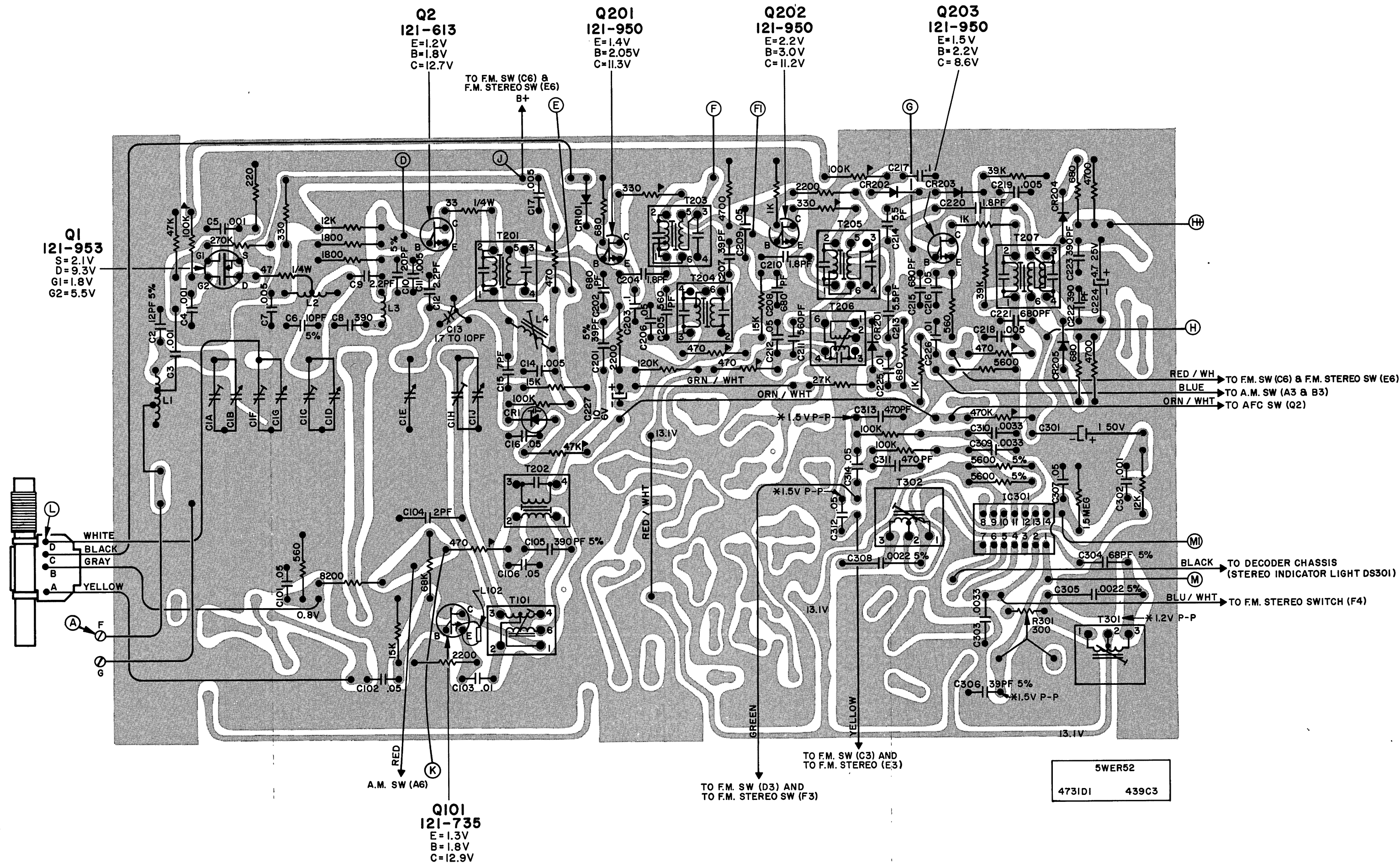
THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIFFER FROM THE ACTUAL CIRCUIT USED IN THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

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.
FUNCTION SWITCH IN F.M. STEREO POSITION, LINE VOLTAGE 120 V.A.C. USING 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 EXCEPT ELECTROLYTICS WHICH ARE *10%
L.F. FREQUENCY: A.M. 455 KHz
F.M. 10.7 MHz
TUNING RANGE: A.M. 540-1600 MHz
F.M. 88-108 MHz

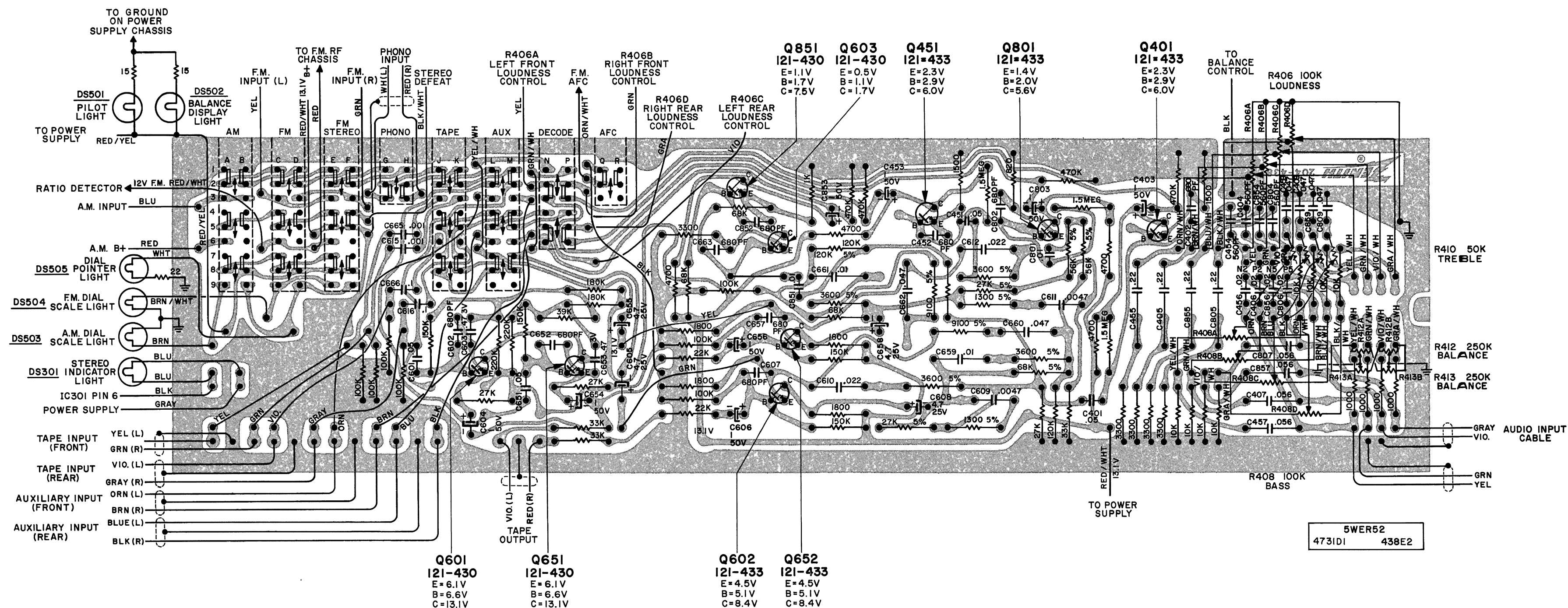
⬆ INDICATES ±20% TOLERANCE
⬆ INDICATES VOLTAGE
⊙ INDICATES TEST POINTS
4KΩ ON CONTROLS INDICATE MAXIMUM POSITION:
I21-976 IS INSULATED FROM CHASSIS. OUTPUT TRANSISTORS IN EACH CHANNEL SHALL BE A PAIR CONSISTING OF I21-976 & I21-977.
* VOLTAGES MEASURED WITH STEREO INPUT (10% PILOT, 45% L+R, 45% L-R).
⬆ INDICATES CHASSIS GROUND.

LEGEND CHASSIS 5WR52

ITEM NO.	PART NUMBER	DESCRIPTION	ITEM NO.	PART NUMBER	DESCRIPTION	ITEM NO.	PART NUMBER	DESCRIPTION
C1A	22-5053	FM ANTENNA TRIMMING	C856	22-5889	.02 MFD DISC ±20% 25V	R658	63-1876	150K OHM
C1B	22-5053	FM OSCILLATOR TUNING	C857	22-5889	.02 MFD MYLAR ±10% 100V	R659	63-1880	100K OHM
C1C	22-5053	FM ANTENNA TRIMMING	C858	22-6447-01	.047 MFD MYLAR ±20% 100V	R660	63-1795	1800 OHM
C1D	22-5053	FM OSCILLATOR TUNING	C859	22-6447-01	.047 MFD MYLAR ±20% 100V	R661	63-1844	100K OHM
C1E	22-5053	FM ANTENNA TRIMMING	C860	22-7163	1 MFD ELECTROLYTIC ±10% 10% 50V	R662	63-1790	100K OHM
C1F	22-5053	FM OSCILLATOR TUNING	C861	22-7163	1 MFD ELECTROLYTIC ±10% 10% 50V	R663	63-1790	100K OHM
C1G	22-5053	FM ANTENNA TRIMMING	C862	22-7163	1 MFD ELECTROLYTIC ±10% 10% 50V	R664	63-1880	100K OHM
C1H	22-5053	FM OSCILLATOR TUNING	C863	22-7163	1 MFD ELECTROLYTIC ±10% 10% 50V	R665	63-1880	100K OHM
C1I	22-5053	FM ANTENNA TRIMMING	C864	22-7163	1 MFD ELECTROLYTIC ±10% 10% 50V	R666	63-1880	100K OHM
C1J	22-5053	FM OSCILLATOR TUNING	C865	22-7163	1 MFD ELECTROLYTIC ±10% 10% 50V	R667	63-1880	100K OHM
C1K	22-5053	FM ANTENNA TRIMMING	C866	22-7163	1 MFD ELECTROLYTIC ±10% 10% 50V	R668	63-1880	100K OHM
C1L	22-5053	FM OSCILLATOR TUNING	C867	22-5053	4 MFD N.P. 30V	R669	63-1880	100K OHM
C1M	22-5053	FM ANTENNA TRIMMING	C868	22-5053	4 MFD N.P. 30V	R670	63-1880	100K OHM
C1N	22-5053	FM OSCILLATOR TUNING	C869	22-5053	4 MFD N.P. 30V	R671	63-1880	100K OHM
C1O	22-5053	FM ANTENNA TRIMMING	C870	22-5053	4 MFD N.P. 30V	R672	63-1880	100K OHM
C1P	22-5053	FM OSCILLATOR TUNING	C871	22-5053	4 MFD N.P. 30V	R673	63-1880	100K OHM
C1Q	22-5053	FM ANTENNA TRIMMING	C872	22-5053	4 MFD N.P. 30V	R674	63-1880	100K OHM
C1R	22-5053	FM OSCILLATOR TUNING	C873	22-5053	4 MFD N.P. 30V	R675	63-1880	100K OHM
C1S	22-5053	FM ANTENNA TRIMMING	C874	22-5053	4 MFD N.P. 30V	R676	63-1880	100K OHM
C1T	22-5053	FM OSCILLATOR TUNING	C875	22-5053	4 MFD N.P. 30V	R677	63-1880	100K OHM
C1U	22-5053	FM ANTENNA TRIMMING	C876	22-5053	4 MFD N.P. 30V	R678	63-1880	100K OHM
C1V	22-5053	FM OSCILLATOR TUNING	C877	22-5053	4 MFD N.P. 30V	R679	63-1880	100K OHM
C1W	22-5053	FM ANTENNA TRIMMING	C878	22-5053	4 MFD N.P. 30V	R680	63-1880	100K OHM
C1X	22-5053	FM OSCILLATOR TUNING	C879	22-5053	4 MFD N.P. 30V	R681	63-1880	100K OHM
C1Y	22-5053	FM ANTENNA TRIMMING	C880	22-5053	4 MFD N.P. 30V	R682	63-1880	100K OHM
C1Z	22-5053	FM OSCILLATOR TUNING	C881	22-5053	4 MFD N.P. 30V	R683	63-1880	100K OHM
C2A	22-5053	FM ANTENNA TRIMMING	C882	22-5053	4 MFD N.P. 30V	R684	63-1880	100K OHM
C2B	22-5053	FM OSCILLATOR TUNING	C883	22-5053	4 MFD N.P. 30V	R685	63-1880	100K OHM
C2C	22-5053	FM ANTENNA TRIMMING	C884	22-5053	4 MFD N.P. 30V	R686	63-1880	100K OHM
C2D	22-5053	FM OSCILLATOR TUNING	C885	22-5053	4 MFD N.P. 30V	R687	63-1880	100K OHM
C2E	22-5053	FM ANTENNA TRIMMING	C886	22-5053	4 MFD N.P. 30V	R688	63-1880	100K OHM
C2F	22-5053	FM OSCILLATOR TUNING	C887	22-5053	4 MFD N.P. 30V	R689	63-1880	100K OHM
C2G	22-5053	FM ANTENNA TRIMMING	C888	22-5053	4 MFD N.P. 30V	R690	63-1880	100K OHM
C2H	22-5053	FM OSCILLATOR TUNING	C889	22-5053	4 MFD N.P. 30V	R691	63-1880	100K OHM
C2I	22-5053	FM ANTENNA TRIMMING	C890	22-5053	4 MFD N.P. 30V	R692	63-1880	100K OHM
C2J	22-5053	FM OSCILLATOR TUNING	C891	22-5053	4 MFD N.P. 30V	R693	63-1880	100K OHM
C2K	22-5053	FM ANTENNA TRIMMING	C892	22-5053	4 MFD N.P. 30V	R694	63-1880	100K OHM
C2L	22-5053	FM OSCILLATOR TUNING	C893	22-5053	4 MFD N.P. 30V	R695	63-1880	100K OHM
C2M	22-5053	FM ANTENNA TRIMMING	C894	22-5053	4 MFD N.P. 30V	R696	63-1880	100K OHM
C2N	22-5053	FM OSCILLATOR TUNING	C895	22-5053	4 MFD N.P. 30V	R697	63-1880	100K OHM
C2O	22-5053	FM ANTENNA TRIMMING	C896	22-5053	4 MFD N.P. 30V	R698	63-1880	100K OHM
C2P	22-5053	FM OSCILLATOR TUNING	C897	22-5053	4 MFD N.P. 30V	R699	63-1880	100K OHM
C2Q	22-5053	FM ANTENNA TRIMMING	C898	22-5053	4 MFD N.P. 30V	R700	63-1880	100K OHM
C2R	22-5053	FM OSCILLATOR TUNING	C899	22-5053	4 MFD N.P. 30V	R701	63-1880	100K OHM
C2S	22-5053	FM ANTENNA TRIMMING	C900	22-5053	4 MFD N.P. 30V	R702	63-1880	100K OHM
C2T	22-5053	FM OSCILLATOR TUNING	C901	22-5053	4 MFD N.P. 30V	R703	63-1880	100K OHM
C2U	22-5053	FM ANTENNA TRIMMING	C902	22-5053	4 MFD N.P. 30V	R704	63-1880	100K OHM
C2V	22-5053	FM OSCILLATOR TUNING	C903	22-5053	4 MFD N.P. 30V	R705	63-1880	100K OHM
C2W	22-5053	FM ANTENNA TRIMMING	C904	22-5053	4 MFD N.P. 30V	R706	63-1880	100K OHM
C2X	22-5053	FM OSCILLATOR TUNING	C905	22-5053	4 MFD N.P. 30V	R707	63-1880	100K OHM
C2Y	22-5053	FM ANTENNA TRIMMING	C906	22-5053	4 MFD N.P. 30V	R708	63-1880	100K OHM
C2Z	22-5053	FM OSCILLATOR TUNING	C907	22-5053	4 MFD N.P. 30V	R709	63-1880	100K OHM
C3A	22-5053	FM ANTENNA TRIMMING	C908	22-5053	4 MFD N.P. 30V	R710	63-1880	100K OHM
C3B	22-5053	FM OSCILLATOR TUNING	C909	22-5053	4 MFD N.P. 30V	R711	63-1880	100K OHM
C3C	22-5053	FM ANTENNA TRIMMING	C910	22-5053	4 MFD N.P. 30V	R712	63-1880	100K OHM
C3D	22-5053	FM OSCILLATOR TUNING	C911	22-5053	4 MFD N.P. 30V	R713	63-1880	100K OHM
C3E	22-5053	FM ANTENNA TRIMMING	C912	22-5053	4 MFD N.P. 30V	R714	63-1880	100K OHM
C3F	22-5053	FM OSCILLATOR TUNING	C913	22-5053	4 MFD N.P. 30V	R715	63-1880	100K OHM
C3G	22-5053	FM ANTENNA TRIMMING	C914	22-5053	4 MFD N.P. 30V	R716	63-1880	100K OHM
C3H	22-5053	FM OSCILLATOR TUNING	C915	22-5053	4 MFD N.P. 30V	R717	63-1880	100K OHM
C3I	22-5053	FM ANTENNA TRIMMING	C916	22-5053	4 MFD N.P. 30V	R718	63-1880	100K OHM
C3J	22-5053	FM OSCILLATOR TUNING	C917	22-5053	4 MFD N.P. 30V	R719	63-1880	100K OHM
C3K	22-5053	FM ANTENNA TRIMMING	C918	22-5053	4 MFD N.P. 30V	R720	63-1880	100K OHM
C3L	22-5053	FM OSCILLATOR TUNING	C919	22-5053	4 MFD N.P. 30V	R721	63-1880	100K OHM
C3M	22-5053	FM ANTENNA TRIMMING	C920	22-5053	4 MFD N.P. 30V	R722	63-1880	100K OHM
C3N	22-5053	FM OSCILLATOR TUNING	C921	22-5053	4 MFD N.P. 30V	R723	63-1880	100K OHM
C3O	22-5053	FM ANTENNA TRIMMING	C922	22-5053	4 MFD N.P. 30V	R724	63-1880	100K OHM
C3P	22-5053	FM OSCILLATOR TUNING	C923	22-5053	4 MFD N.P. 30V	R725	63-1880	100K OHM
C3Q	22-5053	FM ANTENNA TRIMMING	C924	22-5053	4 MFD N.P. 30V	R726	63-1880	100K OHM
C3R	22-5053	FM OSCILLATOR TUNING	C925	22-5053	4 MFD N.P. 30V	R727	63-1880	100K OHM
C3S	22-5053	FM ANTENNA TRIMMING	C926	22-5053	4 MFD N.P. 30V	R728	63-1880	100K OHM
C3T	22-5053	FM OSCILLATOR TUNING	C927	22-5053	4 MFD N.P. 30V	R729	63-1880	100K OHM
C3U	22-5053	FM ANTENNA TRIMMING	C928	22-5053	4 MFD N.P. 30V	R730	63-1880	100K OHM
C3V	22-5053	FM OSCILLATOR TUNING	C929	22-5053	4 MFD N.P. 30V	R731	63-1880	100K OHM
C3W	22-5053	FM ANTENNA TRIMMING	C930	22-5053	4 MFD N.P. 30V	R732	63-1880	100K OHM
C3X	22-5053	FM OSCILLATOR TUNING	C931	22-5053	4 MFD N.P. 30V	R733	63-1880	100K OHM
C3Y	22-5053	FM ANTENNA TRIMMING	C932	22-5053	4 MFD N.P. 30V	R734	63-1880	100K OHM
C3Z	22-5053	FM OSCILLATOR TUNING	C933	22-5053	4 MFD N.P. 30V	R735	63-1880	100K OHM
C4A	22-5053	FM ANTENNA TRIMMING	C934	22-5053	4 MFD N.P. 30V	R736	63-1880	100K OHM
C4B	22-5053	FM OSCILLATOR TUNING	C935	22-5053	4 MFD N.P. 30V	R737	63-1880	100K OHM
C4C	22-5053	FM ANTENNA TRIMMING	C936	22-5053	4 MFD N.P. 30V	R738	63-1880	100K OHM
C4D	22-5053	FM OSCILLATOR TUNING	C937	22-5053	4 MFD N.P. 30V	R739	63-1880	100K OHM
C4E	22-5053	FM ANTENNA TRIMMING	C938	22-5053	4 MFD N.P. 30V	R740	63-1880	100K OHM
C4F	22-5053	FM OSCILLATOR TUNING	C939	22-5053	4 MFD N.P. 30V	R741	63-1880	100K OHM
C4G	22-5053	FM ANTENNA TRIMMING	C940	22-5053	4 MFD N.P. 30V	R742	63-1880	100K OHM
C4H	22-5053	FM OSCILLATOR TUNING	C941	22-5053	4 MFD N.P. 30V	R743	63-1880	100K OHM
C4I	22-5053	FM ANTENNA TRIMMING	C942	22-5053	4 MFD N.P. 30V	R744	63-1880	100K OHM
C4J	22-5053	FM OSCILLATOR TUNING	C943	22-5053	4 MFD N.P. 30V	R745	63-1880	100K OHM
C4K	22-5053	FM ANTENNA TRIMMING	C944	22-5053	4 MFD N.P. 30V	R746	63-1880	100K OHM
C4L	22-5053	FM OSCILLATOR TUNING	C945	22-5053	4 MFD N.P. 30V	R747	63-1880	100K OHM
C4M	22-5053	FM ANTENNA TRIMMING	C946	22-5053	4 MFD N.P. 30V	R748	63-1880	100K OHM
C4N	22-5053	FM OSCILLATOR TUNING	C947	22-5053	4 MFD N.P. 30V	R749	63-1880	100K OHM
C4O	22-5053	FM ANTENNA TRIMMING	C948	22-5053	4 MFD N.P. 30V	R750	63-1880	100K OHM
C4P	22-5053	FM OSCILLATOR TUNING	C949	22-5053	4 MFD N.P. 30V	R751	63-1880	100K OHM
C4Q	22-5053	FM ANTENNA TRIMMING	C950	22-5053	4 MFD N.P. 30V	R752	63-1880	100K OHM
C4R	22-5053	FM OSCILLATOR TUNING	C951	22-5053	4 MFD N.P. 30V	R753	63-1880	100K OHM
C4S	22-5053	FM ANTENNA TRIMMING	C952	22-5053	4 MFD N.P. 30V	R754	63-1880	100K OHM
C4T	22-5053	FM OSCILLATOR TUNING	C953	22-5053	4 MFD N.P. 30V	R755	63-1880	100K OHM
C4U	22-5053	FM ANTENNA TRIMMING	C954	22-5053	4 MFD N.P. 30V	R756	63-1880	100K OHM
C4V	22-5053	FM OSCILLATOR TUNING	C955	22-5053	4 MFD N.P. 30V	R757	63-1880	100K OHM
C4W	22-5053	FM ANTENNA TRIMMING	C956	22-5053	4 MFD N.P. 30V	R758	63-1880	100K OHM
C4X	22-5053	FM OSCILLATOR TUNING	C957	22-5053	4 MFD N.P. 30V	R759	63-1880	100K OHM
C4Y	22-5053	FM ANTENNA TRIMMING	C958	22-5053	4 MFD N.P. 30V	R760	63-1880	100K OHM
C4Z	22-5053	FM OSCILLATOR TUNING	C959	22-5053	4 MFD N.P. 30V	R761	63-1880	100K OHM
C5A	22-5053	FM ANTENNA TRIMMING	C960	22-5053	4 MFD N.P. 30V	R762	63-1880	100K OHM
C5B	22-5053	FM OSCILLATOR TUNING	C961	22-5053	4 MFD N.P. 30V	R763	63-1880	100K OHM
C5C	22-5053	FM ANTENNA TRIMMING	C962	22-5053	4 MFD N.P. 30V	R764	63-1880	100K OHM
C5D	22-5053	FM OSCILLATOR TUNING	C963	22-5053	4 MFD N.P. 30V	R765	63-1880	100K OHM
C5E	22-5053	FM ANTENNA TRIMMING	C964	22-5053	4 MFD N.P. 30V	R766	63-1880	100K OHM
C5F	22-5053	FM OSCILLATOR TUNING	C965	22-5053	4 MFD N.P. 30V	R767	63-1880	100K OHM
C5G	22-5053	FM ANTENNA TRIMMING	C966	22-5053	4 MFD N.P. 30V	R768	63-1880	100K OHM
C5H	22-5053	FM OSCILLATOR TUNING	C967	22-5053	4 MFD N.P. 30V	R769	63-1880	100K OHM
C5I	22-5053	FM ANTENNA TRIMMING	C968	22-5053	4 MFD N.P. 30V	R770	63-1880	100K OHM
C5J	22-5053	FM OSCILLATOR TUNING	C969	22-5053	4 MFD N.P. 30V	R771	63-1880	100K OHM
C5K	22-5053	FM ANTENNA TRIMMING	C970	22-5053	4 MFD N.P. 30V	R772	63-1880	100K OHM
C5L	22-5053	FM OSCILLATOR TUNING	C971	22-5053	4 MFD N.P. 30V	R773	63-1880	100K OHM
C5M	22-5053	FM ANTENNA TRIMMING	C972	22-5053	4 MFD N.P. 30V	R774	63-1880	100K OHM
C5N	22-5053	FM OSCILLATOR TUNING	C973	22-5053	4 MFD N.P. 30V	R775	63-1880	100K OHM
C5O	22-5053	FM ANTENNA TRIMMING	C974	22-5053	4 MFD N.P. 30V	R776	63-1880	100K OHM
C5P	22-5053	FM OSCILLATOR TUNING	C975	22-5053	4 MFD N.P. 30V	R777	63-1880	100K OHM
C5Q	22-5053	FM ANTENNA TRIMMING	C976	22-5053	4 MFD N.P. 30V	R778	6	

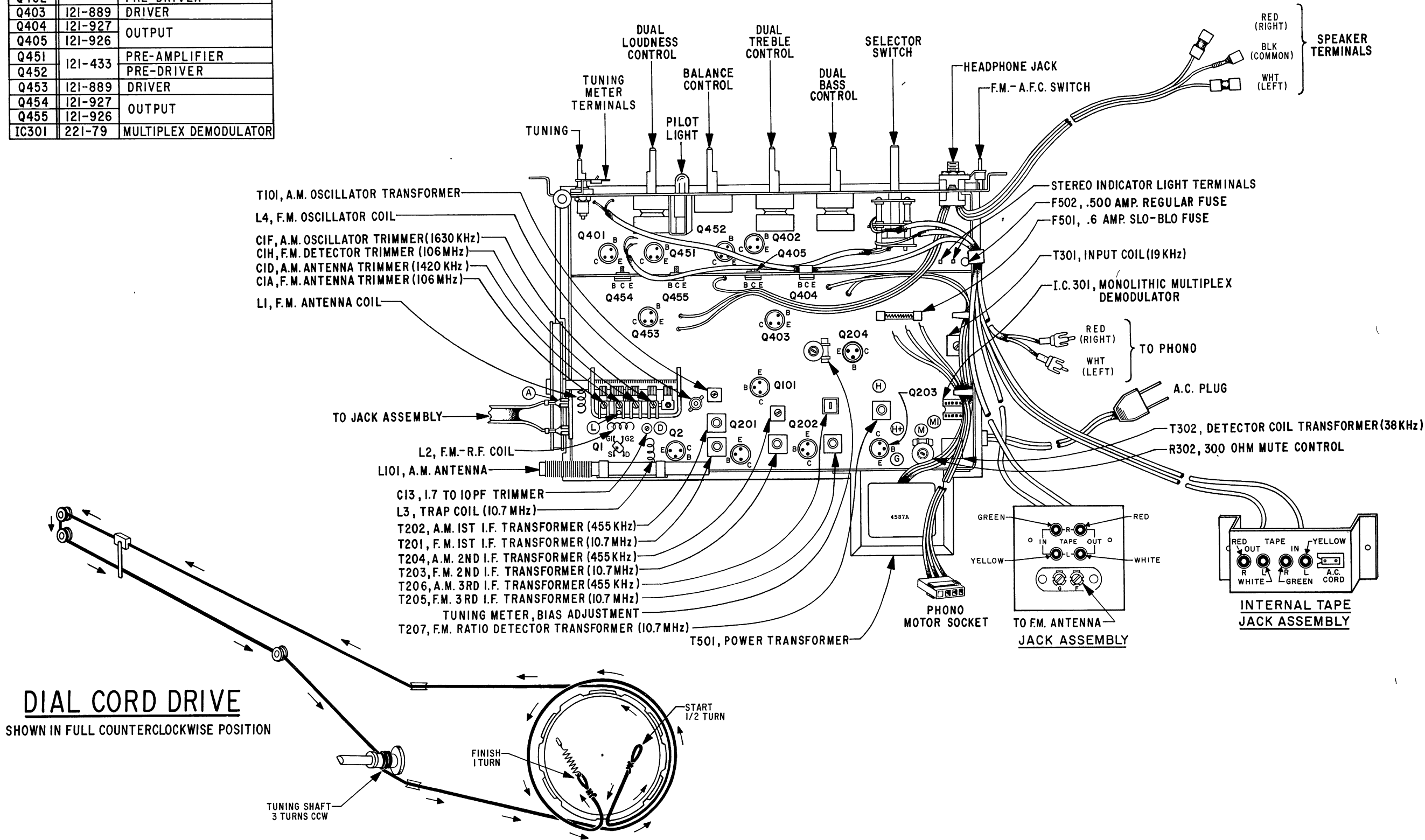
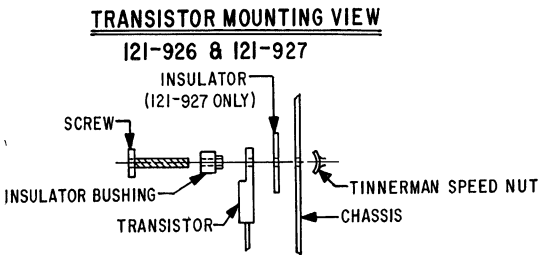


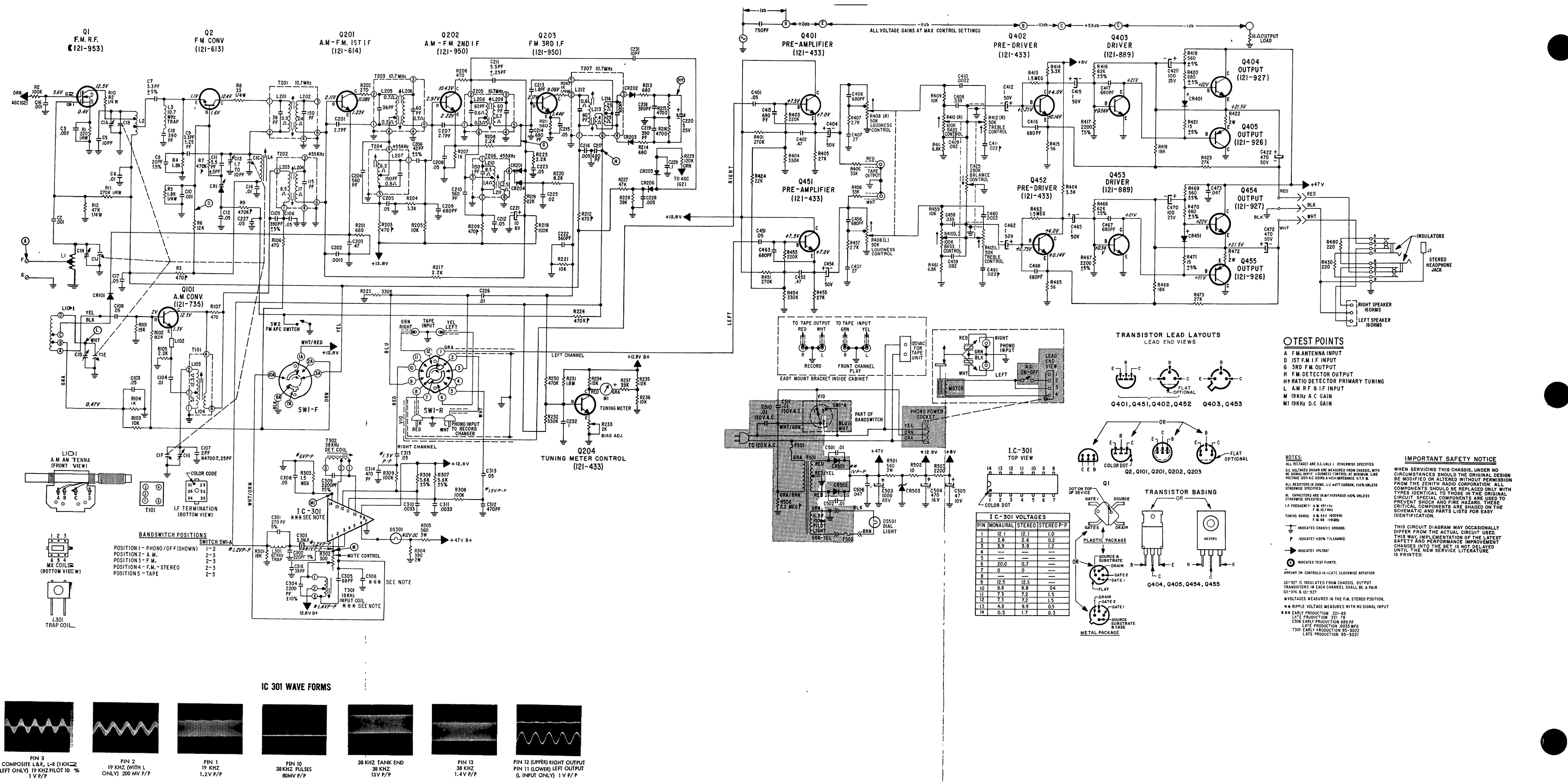
CHASSIS 5WER52 - RF/IF - CHASSIS WIRING AND COMPONENTS VIEWED FROM FOIL SIDE



TRANSISTORS		
No.	PART No.	DESCRIPTION
Q1	121-953	F.M.-R.F.
Q2	121-613	F.M. CONVERTER
Q101	121-735	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		TUNING METER CONTROL
Q401	121-433	PRE-AMPLIFIER
Q402		PRE-DRIVER
Q403	121-889	DRIVER
Q404	121-927	OUTPUT
Q405	121-926	OUTPUT
Q451	121-433	PRE-AMPLIFIER
Q452		PRE-DRIVER
Q453	121-889	DRIVER
Q454	121-927	OUTPUT
Q455	121-926	OUTPUT
IC301	221-79	MULTIPLEX DEMODULATOR

TEST POINTS	
A	F.M. ANTENNA INPUT
D	1st F.M. I.F. INPUT
G	3rd F.M. OUTPUT
H	F.M. DETECTOR OUTPUT
H+	RATIO DETECTOR PRIMARY TUNING
L	A.M. R.F. & I.F. INPUT
M	19KHz A.C. GAIN
MI	19KHz D.C. GAIN

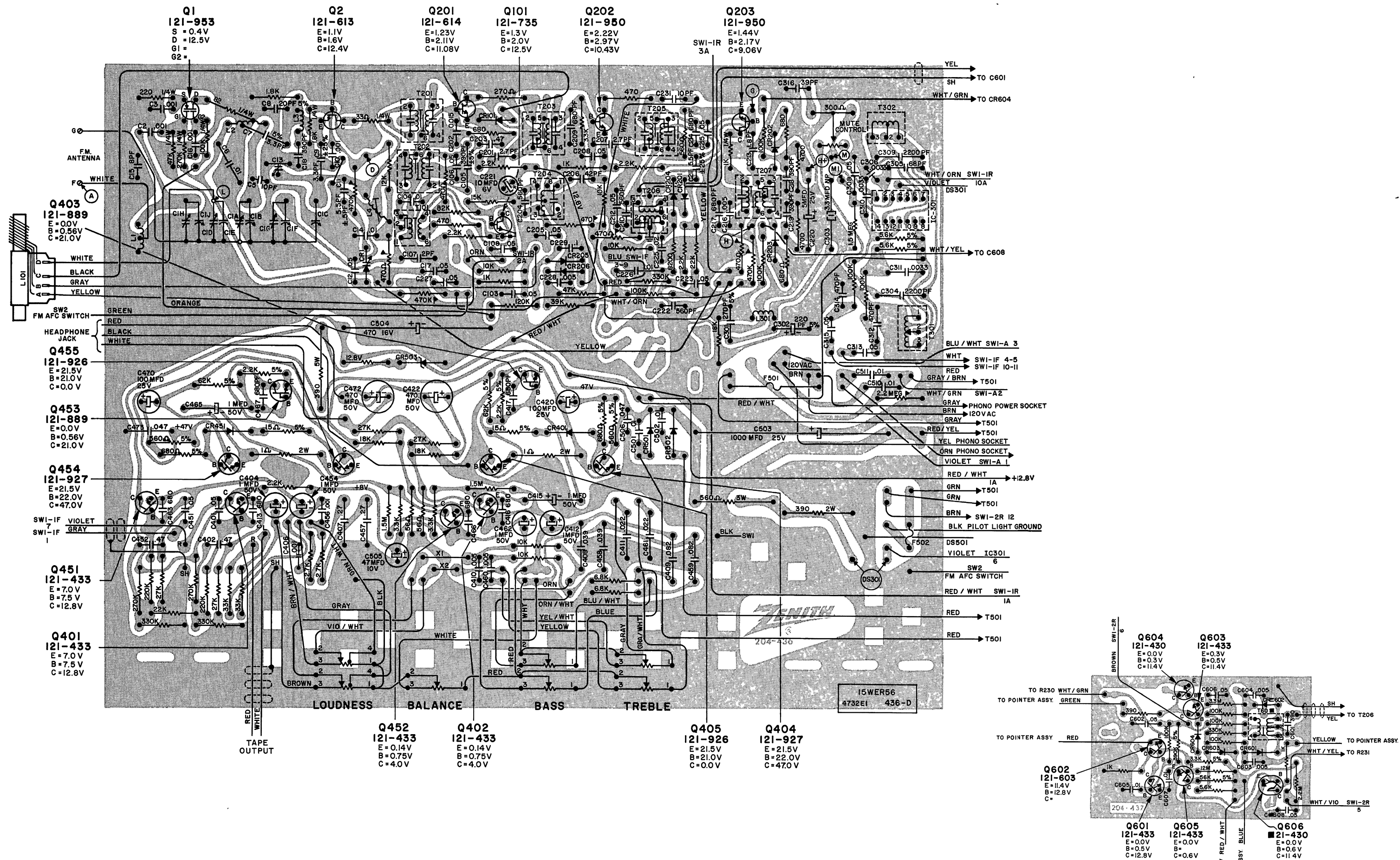




ITEM NO.	PART NUMBER	DESCRIPTION	ITEM NO.	PART NUMBER	DESCRIPTION
C1A		F.M. DETECTOR TRIMMER	R211	85-1775	560 OHM
C1B		F.M. DETECTOR TUNING	R212	85-1772	470 OHM 20%
C1C		F.M. OSCILLATOR TUNING	R213	85-1778	680 OHM
C1D		A.M. ANTENNA TRIMMER	R214	85-1778	220 OHM
C1E		A.M. ANTENNA TUNING	R215	85-1813	4700 OHM
C1F	22-1374	A.M. OSCILLATOR TUNING	R216	85-1813	4700 OHM
C1G		A.M. OSCILLATOR TRIMMER	R217	85-1799	2.2K OHM
C1H		F.M. ANTENNA TRIMMER	R218	85-1699	100K OHM
C1J		F.M. ANTENNA TUNING	R219	85-1841	22K OHM
C2	22-7229	.001 MFD DISC 25V	R220	85-1824	330 OHM
C3	22-7229	.001 MFD DISC 25V	R221	85-1827	10K OHM
C4	22-3675	10 PF DISC .5% 500V	R222	85-1890	330K OHM
C5	22-3393	.01 MFD DISC 25V	R223	85-1898	10K OHM 20%
C6	22-3393	.01 MFD DISC 25V	R224	85-1799	2.2K OHM
C7	22-3361	3.3 PF GIMMICK ±.5% 500V	R225	85-1855	47K OHM
C8	22-3761	20 PF DISC .5% 500V	R226	85-1862	33K OHM
C9	22-5879	3.3 PF DISC ±.25 PF 25V	R227	85-1873	120K OHM
C10	22-7229	.001 MFD DISC 25V	R228	85-1873	120K OHM
C11	22-5879	5.5 PF DISC ±.0.5 PF 25V	R229	85-1822	1.8 MEG OHM
C12	22-3393	.05 MFD DISC 25V	R230	85-1890	330K OHM
C13	22-5879	1.7 TO 10 PF CERAMIC TRIMMER	R231	85-1820	300 OHM 20% TOLER CONTROL
C14	22-3393	.01 MFD DISC 25V	R232	85-1834	15K OHM
C15	22-7229	.01 MFD DISC ±.5% 25V	R233	85-1831	12K OHM
C16	22-3393	.05 MFD DISC 25V	R234	85-1827	10K OHM
C17	22-3393	300 PF DISC 500V	R235	85-1822	39K OHM
C18	22-3024	.05 MFD DISC 25V	R301	85-1838	18K OHM
C19	22-3393	.01 MFD DISC 25V	R302	85-6328	300 OHM MUTE CONTROL
C20	22-5879	300 PF ±.5% POLYSTYRENE 125V	R303	85-1918	1.5 MEG OHM
C21	22-3024	.05 MFD DISC 25V	R304	85-1468	390 OHM 2W
C22	22-5879	2.7 TO 10 PF CERAMIC TRIMMER	R305	85-1043-90	300 OHM 2W
C23	22-3393	.05 MFD DISC 25V	R306	85-1918	5.6K OHM 5%
C24	22-3393	2.7 PF GIMMICK ±.10% 500V	R307	85-1918	5.6K OHM 5%
C25	22-5879	.001 MFD DISC 25V	R308	85-1699	100K OHM
C26	22-5879	.47 MFD DISC 3V	R309	85-1699	100K OHM
C27	22-3393	560 PF DISC 500V	R401	85-1887	270K OHM
C28	22-3024	.05 MFD DISC 25V	R402	85-1883	270K OHM
C29	22-3771	42 PF DISC ±.5% 500V	R403	85-1890	330K OHM
C30	22-3393	2.7 PF GIMMICK ±.10% 500V	R404	85-1845	27K OHM
C31	22-5879	.05 MFD DISC 25V	R405	85-1846	27K OHM
C32	22-5879	5.5 PF DISC 25V	R406	85-1846	27K OHM
C33	22-3393	.05 MFD DISC 25V	R407	85-1903	2.7K OHM
C34	22-5879	560 PF DISC 500V	R408R	85-9965	60K DUAL LOUDNESS CONTROL
C35	22-5879	560 PF DISC 500V	R408L	85-9965	60K DUAL LOUDNESS CONTROL
C36	22-3393	5.5 PF DISC 25V	R409	85-1827	10K OHM
C37	22-3393	5.5 PF DISC 25V	R410R	85-9966	100K DUAL BASS CONTROL
C38	22-3393	5.5 PF DISC 25V	R410L	85-9966	100K DUAL BASS CONTROL
C39	22-3393	5.5 PF DISC 25V	R411	85-1820	6.8K OHM
C40	22-3393	5.5 PF DISC 25V	R412R	85-9256	60K DUAL TREBLE CONTROL
C41	22-3393	5.5 PF DISC 25V	R412L	85-9256	60K DUAL TREBLE CONTROL
C42	22-3393	5.5 PF DISC 25V	R413	85-1918	1.5 MEG OHM
C43	22-3393	5.5 PF DISC 25V	R414	85-1806	3.3K OHM
C44	22-3393	5.5 PF DISC 25V	R415	85-1733	58 OHM
C45	22-3393	5.5 PF DISC 25V	R416	85-1860	100 OHM 5%
C46	22-3393	5.5 PF DISC 25V	R417	85-1798	2200 OHM 5%
C47	22-3393	5.5 PF DISC 25V	R418	85-1838	18K OHM
C48	22-3393	5.5 PF DISC 25V	R419	85-1774	560 OHM 5%
C49	22-3393	5.5 PF DISC 25V	R420	85-1777	680 OHM 5%
C50	22-3393	5.5 PF DISC 25			



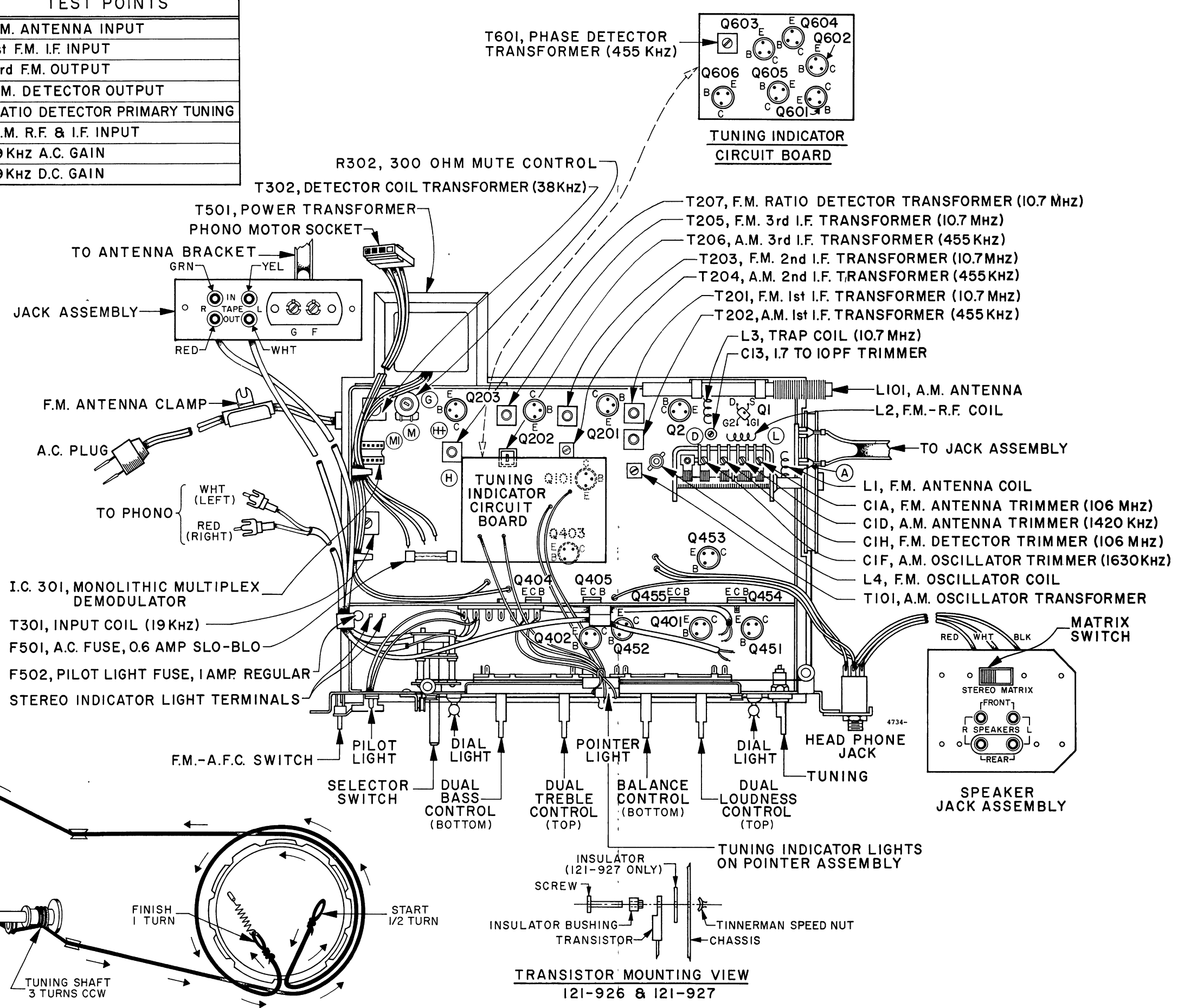
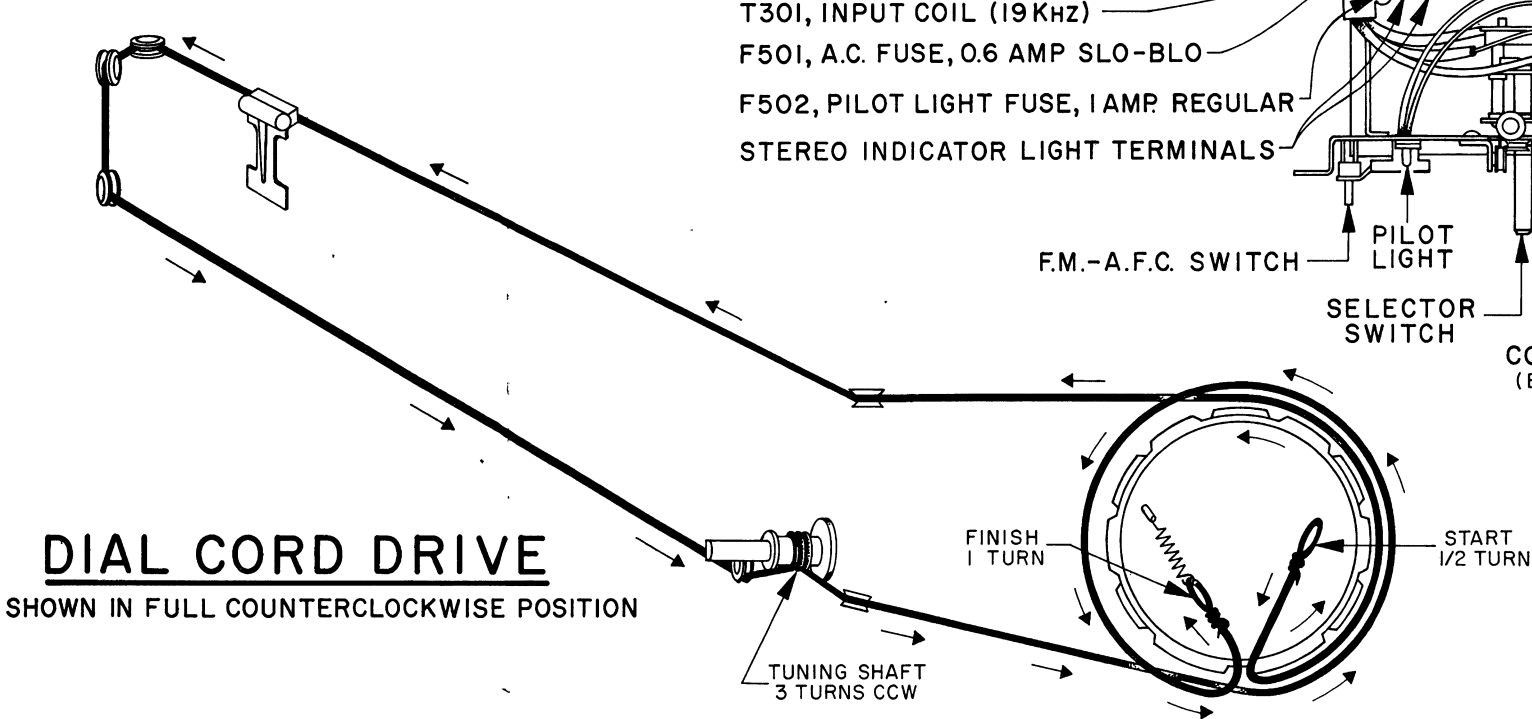
ITEM NO.	PART NUMBER	DESCRIPTION	ITEM NO.	PART NUMBER	DESCRIPTION
C1A		F. M. DETECTOR TRIMMER	R229	CS-1873	120K OHM
C1B		F. M. DETECTOR TUNING	R230	CS-1868	100K OHM
C1C		F. M. OSCILLATOR TUNING	R231	CS-1869	100K OHM
C1D		F. M. ANTENNA TRIMMER	R232	CS-1828	100K OHM
C1E		F. M. ANTENNA TUNING	R233	CS-8729	300 OHM MUTE CONTROL
C1F	22-1334	F. M. OSCILLATOR TRIMMER	R234	CS-1829	100 OHM
C1G		A. M. OSCILLATOR TRIMMER	R235	CS-1810	3.0 MED OHM
C1H		F. M. ANTENNA TRIMMER	R236	CS-1811	300 OHM SW
C1I		F. M. ANTENNA TUNING	R237	CS-6462	600 OHM SW
C1J		.001 MFD DISC 50V	R238	CS-1812	100K OHM
C1K	22-2729	.001 MFD DISC 50V	R239	CS-1810	100K OHM
C1L	22-2729	.001 MFD DISC 50V	R240	CS-1889	100K OHM
C1M	22-2729	.001 MFD DISC 50V	R401	CS-1887	270K OHM
C1N	22-2729	.001 MFD DISC 50V	R403	CS-1883	220K OHM
C1O	22-2729	.001 MFD DISC 50V	R404	CS-1880	270K OHM
C1P	22-2729	.001 MFD DISC 50V	R405	CS-1848	27K OHM
C1Q	22-2729	.001 MFD DISC 50V	R406	CS-1848	33K OHM
C1R	22-2729	.001 MFD DISC 50V	R407	CS-1803	2.7K OHM
C1S	22-2729	.001 MFD DISC 50V	R408	CS-1803	2.7K OHM
C1T	22-2729	.001 MFD DISC 50V	R409	CS-1803	2.7K OHM
C1U	22-2729	.001 MFD DISC 50V	R410	CS-1803	2.7K OHM
C1V	22-2729	.001 MFD DISC 50V	R411	CS-1803	2.7K OHM
C1W	22-2729	.001 MFD DISC 50V	R412	CS-1803	2.7K OHM
C1X	22-2729	.001 MFD DISC 50V	R413	CS-1803	2.7K OHM
C1Y	22-2729	.001 MFD DISC 50V	R414	CS-1803	2.7K OHM
C1Z	22-2729	.001 MFD DISC 50V	R415	CS-1803	2.7K OHM
C20	22-2729	.001 MFD DISC 50V	R416	CS-1803	2.7K OHM
C21	22-2729	.001 MFD DISC 50V	R417	CS-1803	2.7K OHM
C22	22-2729	.001 MFD DISC 50V	R418	CS-1803	2.7K OHM
C23	22-2729	.001 MFD DISC 50V	R419	CS-1803	2.7K OHM
C24	22-2729	.001 MFD DISC 50V	R420	CS-1803	2.7K OHM
C25	22-2729	.001 MFD DISC 50V	R421	CS-1803	2.7K OHM
C26	22-2729	.001 MFD DISC 50V	R422	CS-1803	2.7K OHM
C27	22-2729	.001 MFD DISC 50V	R423	CS-1803	2.7K OHM
C28	22-2729	.001 MFD DISC 50V	R424	CS-1803	2.7K OHM
C29	22-2729	.001 MFD DISC 50V	R425	CS-1803	2.7K OHM
C30	22-2729	.001 MFD DISC 50V	R426	CS-1803	2.7K OHM
C31	22-2729	.001 MFD DISC 50V	R427	CS-1803	2.7K OHM
C32	22-2729	.001 MFD DISC 50V	R428	CS-1803	2.7K OHM
C33	22-2729	.001 MFD DISC 50V	R429	CS-1803	2.7K OHM
C34	22-2729	.001 MFD DISC 50V	R430	CS-1803	2.7K OHM
C35	22-2729	.001 MFD DISC 50V	R431	CS-1803	2.7K OHM
C36	22-2729	.001 MFD DISC 50V	R432	CS-1803	2.7K OHM
C37	22-2729	.001 MFD DISC 50V	R433	CS-1803	2.7K OHM
C38	22-2729	.001 MFD DISC 50V	R434	CS-1803	2.7K OHM
C39	22-2729	.001 MFD DISC 50V	R435	CS-1803	2.7K OHM
C40	22-2729	.001 MFD DISC 50V	R436	CS-1803	2.7K OHM
C41	22-2729	.001 MFD DISC 50V	R437	CS-1803	2.7K OHM
C42	22-2729	.001 MFD DISC 50V	R438	CS-1803	2.7K OHM
C43	22-2729	.001 MFD DISC 50V	R439	CS-1803	2.7K OHM
C44	22-2729	.001 MFD DISC 50V	R440	CS-1803	2.7K OHM
C45	22-2729	.001 MFD DISC 50V	R441	CS-1803	2.7K OHM
C46	22-2729	.001 MFD DISC 50V	R442	CS-1803	2.7K OHM
C47	22-2729	.001 MFD DISC 50V	R443	CS-1803	2.7K OHM
C48	22-2729	.001 MFD DISC 50V	R444	CS-1803	2.7K OHM
C49	22-2729	.001 MFD DISC 50V	R445	CS-1803	2.7K OHM
C50	22-2729	.001 MFD DISC 50V	R446	CS-1803	2.7K OHM
C51	22-2729	.001 MFD DISC 50V	R447	CS-1803	2.7K OHM
C52	22-2729	.001 MFD DISC 50V	R448	CS-1803	2.7K OHM
C53	22-2729	.001 MFD DISC 50V	R449	CS-1803	2.7K OHM



27

TRANSISTORS		
No.	PART No.	DESCRIPTION
Q1	121-953	F.M.-R.F.
Q2	121-613	F.M. CONVERTER
Q101	121-735	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.
Q401	121-433	PRE-AMPLIFIER
Q402		PRE-DRIVER
Q403	121-889	DRIVER
Q404	121-927	OUTPUT
Q405	121-926	
Q451	121-433	PRE-AMPLIFIER
Q452		PRE-DRIVER
Q453	121-889	DRIVER
Q454	121-927	OUTPUT
Q455	121-926	
Q601		HIGH
Q603	121-433	CENTER
Q605		LOW
Q602	121-603	HIGH
Q604	121-430	CENTER
Q606		LOW
IC301	221-65	MULTIPLEX DEMODULATOR

○	TEST POINTS
A	F.M. ANTENNA INPUT
D	1st F.M. I.F. INPUT
G	3rd F.M. OUTPUT
H	F.M. DETECTOR OUTPUT
H+	RATIO DETECTOR PRIMARY TUNING
L	A.M. R.F. & I.F. INPUT
M	19 KHz A.C. GAIN
M+	19 KHz D.C. GAIN



TRANSISTOR MOUNTING VIEW
121-926 & 121-927

HF 29S2