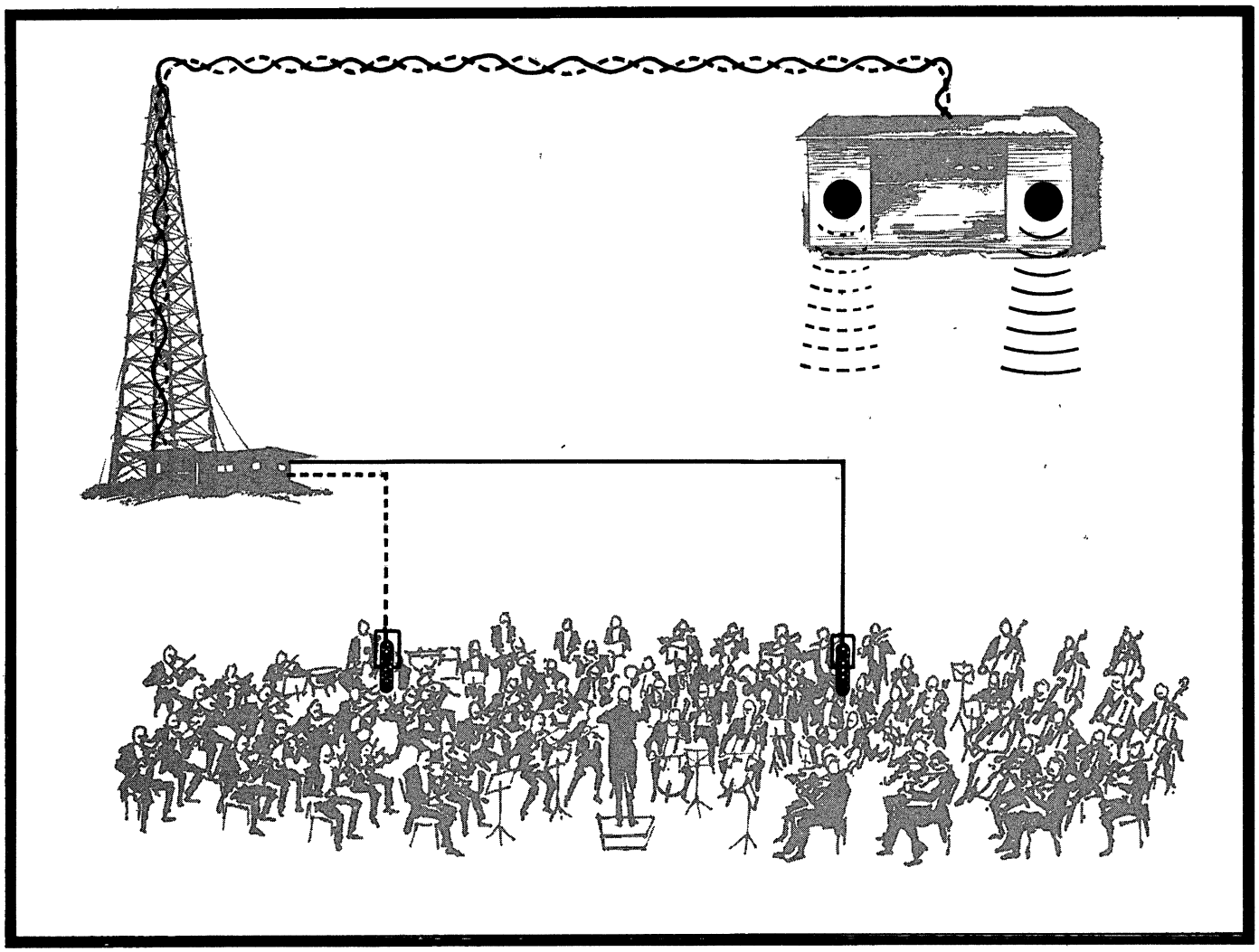
ZENITH®

SERVICE MANUAL



1964 HIGH FIDELITY AND STEREO FM MODELS

ZENITH RADIO CORPORATION

6001 DICKENS AVENUE CHICAGO 39, ILLINOIS

HF11

PRICE 75 CENTS

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FEATURES OF HIGH FIDELITY & STEREO FM MODELS

MODEL NO.	CABINET				CHASSIS			SPEAKER	
	STYLE	MATERIAL	FINISH	COLOR	MODEL	TYPE	EIA POWER OUTPUT	SIZE (IN.)	MAGNET (WT. OZ.)
LT10		DROP-IN-TUNER			7L21	AM-FM Tuner	---	---	---
LT11		DROP-IN-TUNER			7L20	AM-FM Tuner	---	---	---
MLT14		DROP-IN-TUNER			9L21	AM-FM Tuner	---	---	---
MLT15		DROP-IN-TUNER			9L20	AM-FM Tuner	---	---	---
ZP2B	Table (w/handle) (lift lid)	Plastic	Textured Plastic	Blue & White	IL20	1 Tube Phono Only	---	4	.68
ZP2L	Table (w/handle) (lift lid)	Plastic	Textured Plastic	Beige & White	1L20	1 Tube Phono Only	---	4	.68
ZP2F	Table (w/handle) (lift lid)	Plastic	Textured Plastic	Green & White	1L20	1 Tube Phono Only	---	4	.68
ZP2V	Table (w/handle) (lift lid)	Plastic	Textured Plastic	Red & White	1L20	1 Tube Phono Only	---	4	.68
ZP2P	Table (w/handle) (lift lid)	Plastic	Textured Plastic	Yellow & White	1L20	1 Tube Phono Only	---	4	.68
LP8B	Table (w/handle) (hinged panel)	Wood	Plastic Coated Paper	Lt. Blue & Ivory	1L21	1 Tube Phono Only	---	4 x 6	2.3
LP8L	Table (w/handle) (hinged panel)	Wood	Plastic Coated Paper	Sea Shell & Off White	1L21	1 Tube Phono Only	---	4 x 6	2.3
LPS45L	Table (w/handle) (hinged panel)	Wood	Plastic Coated Paper	Sea Shell & Off White	2L20	2 Tube Phono Only	---	2-4 x 6	1.47
LPS45J	Table (w/handle) (hinged panel)	Wood	Plastic Coated Paper	Brown & White	2L20	2 Tube Phono Only	---	2-4 x 6	1.47
KPS5CL	Table (w/handle) (lift lid)	Wood	Plastic Coated Cloth	Gold & White	Waters-Conley	3 Tube Phono Only	---	2-6	1.47
KPS70C	Table (w/handle) (lift lid)	Wood	Plastic Coated Cloth	Charcoal Gray & Planked Walnut	Waters-Conley	3 Tube Phono Only	---	2-6 1/2 2-4	2.15 .68
KPS80L1	Table (w/handle) (lift lid)	Wood	Plastic Coated Cloth	Metallic Tan & White	Waters-Conley	4 Tube Phono Only	---	2-3 1/2 2-5 1/4 1-8	.46 .97 2.15
KPS80C1	Table (w/handle) (lift lid)	Wood	Plastic Coated Cloth	Silver Black & White	Waters-Conley	4 Tube Phono Only	---	2-3 1/2 2-5 1/4 1-8	.46 .97 2.15
SP401W	Console (lift lids)	Wood	Wood	Walnut	3L01	Phono Only	5W.	2-3 1/2 2-6 x 9	.85 3.16
MP401W	IDENTICAL TO SP401W EXCEPT INCLUDES MLT14 DROP-IN-TUNER & 3LO1Z AMPLIFIER CHASSIS								
ST1951W	Console (lift lid)	Wood	Wood	Walnut	3LO1	Phono Only	5W.	4-3 1/2 2-6 x 9	.85 3.16
ST1951R	Console (lift lid)	Wood	Wood	Mahogany	3LO1	Phono Only	5W.	4-3 1/2 2-6 x 9	.85 3.16
MT1951W	IDENTICAL TO ST 1951W EXCEPT INCLUDES MLT14 DROP-IN-TUNER								

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

	RECORD CHANGER							
TYPE	MOUNTING	CARTRIDGE	STYLUS	CONTROL PANEL	INDI-CATOR LIGHT	TYPE OF IDENTIFICATION AND SPECIAL FEATURES	RECORD STORAGE	RADIAL SOUND SPEAKER
---	---	---	---	Die-Cast Escutcheon	No	ZENITH Crest	---	---
---	---	---	---	Die-Cast Escutcheon	No	ZENITH Crest	---	---
---	---	---	---	Die-Cast Escutcheon	No	ZENITH Crest	---	---
---	---	---	---	Die-Cast Escutcheon	No	ZENITH Crest	---	---
Manual Player	Shelf	142-95	Sapphire Sapphire	None	No	ZENITH Crest	---	None
Manual Player	Shelf	142-95	Sapphire Sapphire	None	No	ZENITH Crest	---	None
Manual Player	Shelf	142-95	Sapphire Sapphire	None	No	ZENITH Crest	---	None
Manual Player	Shelf	142-95	Sapphire Sapphire	None	No	ZENITH Crest	---	None
Manual Player	Shelf	142-95	Sapphire Sapphire	None	No	ZENITH Crest	---	None
169-191	Shelf	142-125	Sapphire Sapphire	Hot Stamped on Cabinet	No	ZENITH Stereophonic Crest	None	None
169-191	Shelf	142-125	Sapphire Sapphire	Hot Stamped on Cabinet	No	ZENITH Stereophonic Crest	None	None
169-192	Hinged Panel	142-124	Sapphire Sapphire	Hot Stamped on Cabinet	No	ZENITH Stereophonic Crest	None	None
169-192	Hinged Panel	142-124	Sapphire Sapphire	Hot Stamped on Cabinet	No	ZENITH Stereophonic Crest	None	None
169-185	Shelf	142-103	Sapphire Sapphire	Mylar Coated Paper	No	ZENITH Stereophonic Crest	None	None
169-205	Shelf	142-126	Sapphire Sapphire	Metal Plate	No	ZENITH Stereophonic Crest	None	None
169-206	Shelf	142-127	Diamond Sapphire	Metal Plate	No	ZENITH Stereophonic Crest	None	None
169-206	Shelf	142-127	Diamond Sapphire	Metal Plate	No	ZENITH Stereophonic Crest	None	None
169-200	Hinged Panel	142-127	Diamond Sapphire	Plastic Escutcheon	No	ZENITH Stereophonic High Fidelity - Crest	Yes	♦
169-203	Shelf	142-127	Diamond Sapphire	Plastic Escutcheon	No	ZENITH Stereophonic High Fidelity - Crest	Yes	♦
169-203	Shelf	142-127	Diamond Sapphire	Plastic Escutcheon	No	ZENITH Stereophonic High Fidelity - Crest	Yes	♦

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

MODEL NO.	CABINET				CHASSIS			SPEAKER	
	STYLE	MATERIAL	FINISH	COLOR	MODEL	TYPE	EIA POWER OUTPUT	SIZE (IN.)	MAGNET (WT. OZ.)
MT1951R	IDENTICAL TO ST1951R EXCEPT INCLUDES MLT14 DROP-IN-TUNER								
MT1955M	IDENTICAL TO ST1955M EXCEPT INCLUDES MLT14 DROP-IN-TUNER								
ST1959H	Console (lift lid)	Wood	Wood	Cherry	3L01	Phono Only	5W.	4-3 1/2 2-6 x 9	.85 3.16
MT1959H	IDENTICAL TO ST1959H EXCEPT INCLUDES MLT14 DROP-IN-TUNER								
ST1971W	Console (lift lid)	Wood	Wood	Walnut	4L21	Phono Only	8.5W.	2-3 1/2 2-4 2-10	.46 .68 3.16
ST1981	Console (lift lid)	Wood	Wood	Walnut	4L21	Phono Only	8.5W.	2-3 1/2 2-4 2-10	.46 .68 3.16
MT1971W	IDENTICAL TO ST1971W EXCEPT INCLUDES MLT15 DROP-IN-TUNER								
MT1981	IDENTICAL TO ST1981 EXCEPT INCLUDES MLT15 DROP-IN-TUNER								
SL2501W	Console (lift lid)	Wood	Wood	Walnut	3L01	Phono Only	5W.	4-3 1/2 2-6 x 9	.85 3.16
SL2501R	Console (lift lid)	Wood	Wood	Mahogany	3L01	Phono Only	5W.	4-3 1/2 2-6 x 9	.85 3.16
ML2601W	IDENTICAL TO SL2501W EXCEPT INCLUDES MLT14 DROP-IN-TUNER								
ML2601R	IDENTICAL TO SL2501R EXCEPT INCLUDES MLT14 DROP-IN-TUNER								
ML2601E	IDENTICAL TO SL2501E EXCEPT INCLUDES MLT14 DROP-IN-TUNER								
SL2505R	Console (lift lid)	Wood	Wood	Mahogany	5L29	Phono Only	10W.	4-3 1/2 2-5 2-12	.46 1.47 6.8
SL2505M	Console (lift lid)	Wood	Wood	Maple	5L29	Phono Only	10W.	4-3 1/2 2-5 2-12	.46 1.47 6.8
ML2605R	IDENTICAL TO SL2505R EXCEPT INCLUDES MLT15 DROP-IN-TUNER								
ML2605M	IDENTICAL TO SL2505M EXCEPT INCLUDES MLT15 DROP-IN-TUNER								
ML2606W	IDENTICAL TO SL2506W EXCEPT INCLUDES MLT15 DROP-IN-TUNER								
ML2607R	IDENTICAL TO SL2507R EXCEPT INCLUDES MLT15 DROP-IN-TUNER								
ML2607H	IDENTICAL TO SL2507H EXCEPT INCLUDES MLT15 DROP-IN-TUNER								
ML2608W	Console (lift lid)	Wood	Wood	Walnut	5L29 MHT15 (9L20)	Phono-AM-FM	10W.	4-3 1/2 2-5 2-12	.46 1.47 6.8
ML2610M	Console (lift lid)	Wood	Wood	Maple	5L29 MLT15 (9L20)	Phono-AM-FM	10W.	4-3 1/2 2-5 2-12	.46 1.47 6.8
ML2636R	Console (lift lid) (casters)	Wood	Wood	Mahogany	5L29 MLT15 (9L20)	Phono-AM-FM	10W.	4-3 1/2 2-5 2-12	.46 1.47 6.8
ML2636M	Console (lift lid) (casters)	Wood	Wood	Maple	5L29 MLT15 (9L20)	Phono-AM-FM	10W.	4-3 1/2 2-5 2-12	.46 1.47 6.8
ML2636H	Console (lift lid) (casters)	Wood	Wood	Cherry	5L29 MLT15 (9L20)	Phono-AM-FM	10W.	4-3 1/2 2-5 2-12	.46 1.47 6.8
ML2668	Console (lift lid) (pivotal louver doors)	Wood	Wood	Walnut	11L8T25 8LT25	Phono-AM-FM	120W.	4-3 1/2 2-Horn 2-12	.46 4.28 13.0

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

RECORD CHANGER				CONTROL PANEL	INDICATOR LIGHT	TYPE OF IDENTIFICATION AND SPECIAL FEATURES	RECORD STORAGE	RADIAL SOUND SPEAKER
TYPE	MOUNTING	CARTRIDGE	STYLUS					
							None	
							None	
169-203	Shelf	142-127	Diamond Sapphire	Plastic Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest	Yes	♦
							None	
169-203	Shelf	142-127	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Bass Boost	Yes	KR102
169-203	Shelf	142-127	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Bass Boost	Yes	KR102
							None	
169-203	Shelf	142-127	Diamond Sapphire	Plastic Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest	Yes	♦
169-203	Shelf	142-127	Diamond Sapphire	Plastic Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest	Yes	♦
							None	
							None	
							None	
169-203	Shelf	142-127	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Bass Boost	Yes	KR102
169-203	Shelf	142-127	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Bass Boost	Yes	KR102
							Yes	
							Yes	
							Yes	
							Yes	
							Yes	
169-203	Shelf	142-127	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio Bass Boost	Yes	KR102
169-203	Shelf	142-127	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio Bass Boost	Yes	KR102
169-197	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio Bass Boost	Yes	KR102
169-197	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio Bass Boost	Yes	KR102
169-197	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio Bass Boost	Yes	KR102
169-174	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	Yes	ZENITH Extended Stereophonic High Fidelity-Crest Stereo FM Radio	Yes	KR105

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

MODEL NO.	CABINET				CHASSIS			SPEAKER	
	STYLE	MATERIAL	FINISH	COLOR	MODEL	TYPE	EIA POWER OUTPUT	SIZE (IN.)	MAGNET (WT. OZ.)
ML2670W	Console (lift lid) (pivotal louver doors)	Wood	Wood	Walnut	11L8T25 8LT25	Phono-AM-FM	120W.	4-3 1/2 2-Horn 2-12	.46 4.28 13.0
ML2675R	Console (lift lid)	Wood	Wood	Mahogany	11L8T25 8LT25	Phono-AM-FM	120W.	4-3 1/2 2-Horn 2-12	.46 4.28 13.0
ML2685H	Console (lift lid)	Wood	Wood	Cherry	11L8T25 8LT25	Phono-AM-FM	120W.	4-3 1/2 2-Horn 2-12	.46 4.28 13.0
ML2685X	Console (lift lid)	Wood	Wood	Antique White	11L8T25 8LT25	Phono-AM-FM	120W.	4-3 1/2 2-Horn 2-12	.46 4.28 13.0
RL2785W	Console (lift lid)	Wood	Wood	Walnut	15L33 4L22 LT11 7L20	TV-Phono AM-FM	8.5W.	2-3 1/2 2-10	.46 3.16
RL2785R	Console (lift lid)	Wood	Wood	Mahogany	15L33 4L22 LT11 7L20	TV-Phono AM-FM	8.5W.	2-3 1/2 2-10	.46 3.16
RL2785M	Console (lift lid)	Wood	Wood	Maple	15L33 4L22 LT11 7L20	TV-Phono AM-FM	8.5W.	2-3 1/2 2-10	.46 3.16
ML2785W	Console (lift lid)	Wood	Wood	Walnut	15L33 4L22 MLT15 (9L20)	TV-Phono AM-FM	8.5W.	2-3 1/2 2-10	.46 3.16
ML2785R	Console (lift lid)	Wood	Wood	Mahogany	15L33 4L22 MLT15 (9L20)	TV-Phono AM-FM	8.5W.	2-3 1/2 2-10	.46 3.16
ML2785M	Console (lift lid)	Wood	Wood	Maple	15L33 4L22 MLT15 (9L20)	TV-Phono AM-FM	8.5W.	2-3 1/2 2-10	.46 3.16
ML2786W	Console (lift lids)	Wood	Wood	Walnut	15L33 4L21 MLT15 (9L20)	TV-Phono AM-FM	8.5W.	2-3 1/2 2-10	.85 6.8
7200W	Console (lift lids) (sliding doors)	Wood	Wood	Walnut	25LC20 4L21 MLT15 (9L20)	Color TV Phono AM-FM	8.5W.	2-3 1/2 2-10	.85 6.8
7500W4	Console (lift lids) (Folding doors)	Wood	Wood	Walnut	25LC20QS 11L8T25 8LT25	Color TV Phono AM-FM	120W.	4-3 1/2 2-Horn 2-12	.46 4.28 13.0
KR102W	Table	Wood	Wood	Walnut	---	----	---	3 1/2 6 x 9	.46 3.16
KR105W	Table	Wood	Wood	Walnut	---	----	---	Horn 6 x 9	4.28 3.16

♦ - DENOTES MODELS WHICH HAVE PROVISIONS FOR FIELD INSTALLATION OF RADIAL SPEAKER ADAPTER KIT THAT WILL PERMIT USE OF EITHER JR104, KR101 or KR102 RADIAL SOUND SPEAKERS.

FEATURES OF HIGH FIDELITY & STEREO FM MODELS

RECORD CHANGER				CONTROL PANEL	INDICATOR LIGHT	TYPE OF IDENTIFICATION AND SPECIAL FEATURES	RECORD STORAGE	RADIAL SOUND SPEAKER
TYPE	MOUNTING	CARTRIDGE	STYLUS					
169-174	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	Yes	ZENITH Extended Stereophonic High Fidelity-Crest Stereo FM Radio	Yes	KR105
169-196	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	Yes	ZENITH Extended Stereophonic High Fidelity-Crest Stereo FM Radio	Yes	KR105
169-196	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	Yes	ZENITH Extended Stereophonic High Fidelity-Crest Stereo FM Radio	Yes	KR105
169-196	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	Yes	ZENITH Extended Stereophonic High Fidelity-Crest Stereo FM Radio	Yes	KR105
169-202	Shelf	142-126	Sapphire Sapphire	Silk Screened on Cabinet	No	ZENITH Stereophonic High Fidelity-Crest	None	♦
169-202	Shelf	142-126	Sapphire Sapphire	Silk Screened on Cabinet	No	ZENITH Stereophonic High Fidelity-Crest	None	♦
169-202	Shelf	142-126	Sapphire Sapphire	Silk Screened on Cabinet	No	ZENITH Stereophonic High Fidelity-Crest	None	♦
169-202	Shelf	142-126	Sapphire Sapphire	Silk Screened on Cabinet	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio	None	♦
169-202	Shelf	142-126	Sapphire Sapphire	Silk Screened on Cabinet	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio	None	♦
169-202	Shelf	142-126	Sapphire Sapphire	Silk Screened on Cabinet	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio	None	♦
169-203	Shelf	142-127	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Stereophonic High Fidelity-Crest Stereo FM Radio Bass Boost	None	KR102
169-196	Shelf	142-127	Diamond Sapphire	Die-Cast Escutcheon	No	ZENITH Color TV Color Emblem-Crest Stereo FM Radio Bass Boost	None	KR102
169-196	Shelf	142-128	Diamond Sapphire	Die-Cast Escutcheon	Yes	ZENITH Color TV Color Emblem-Crest Extended Stereophonic High Fidelity SPACE COMMAND "400" Stereo FM Radio	None	KR105
---	---	---	---	----	No	ZENITH Radial Sound	---	---
---	---	---	---	----	No	ZENITH Radial Sound	---	---

GENERAL

MUTING CONTROL

The 25K muting control which supplies a back bias voltage to the cathode of the 19KC pilot 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 19 KC pilot amplifier, carefully rotate the 25KC muting control in a counter-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 it should not be advanced to a point where the desired stereo signal is cut off.

More precise adjustment of the mute control can be made by using the SPTE-1 multiplex generator. This procedure is described in the multiplex alignment procedure included in this manual.

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.

Zenith has designed and manufactured an SPTE-1 Multiplex Generator that can be used to properly align the multiplex portion of these receivers. The multiplex alignment procedure is included in later pages of this manual. The SPTE-1 Multiplex Generator is available at your Zenith Distributor.

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.

FM CABINET ANTENNA

All models except the MK1025 contain an FM antenna built into the cabinet. This antenna consists of a length of wire cut to the desired frequency, and attached to the internal periphery of the cabinet. The MK1025 uses a built-in line antenna

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. For chassis 9L20, 9L21 and 11L8T25 connect a V.T.V.M. to the rear terminal of the FM antenna coil. This is the AGC line connected to Pin #2 of the 6JK8 RF amplifier.

For Chassis 10K01, connect a V.T.V.M. to the .001 feed-thru condenser on top of the chassis and to the left of the 6DT8. This is the AGC line connected to Pin #2 of the 6DT8 RF amp.

Chassis 9L20 and 9L21

Micro-volts Input	AGC Voltage at RF Coil
0	.8
25	.95
50	1.27
100	1.6
200	1.95
500	2.35
1 K	*2.7
5 K	3.6
10 K	4.0
20 K	4.5
50 K	5.1
100 K	5.6

Chassis 10K01

Micro-volts Input	AGC Voltage at RF Coil
0	.46
20	.85
50	1.34
100	1.71
200	2.0
500	2.43
1 K	*2.73
5 K	3.45
10 K	3.9
20 K	4.4
50 K	5.2
100 K	6.1

Chassis 11L8T25

Micro-volts Input	AGC Voltage at RF Coil
0	.75
10	.82
20	.9
50	1.32
100	1.72
200	2.1
500	2.6
1 K	*2.95
2 K	3.3
5 K	3.85
10 K	4.3
20 K	4.8
50 K	5.3
100 K	6.0

AUTOMATIC FREQUENCY CONTROL AFC

These receivers feature an automatic frequency control which automatically keeps your receiver on the exact station frequency when you are tuned to an FM station. To utilize this feature tune the receiver as instructed and then turn the band switch to AFC position.

When the desired FM station is a weak station, adjacent in frequency to a strong station, the AFC may pull the tuning into the stronger station. Under these conditions, place the bandswitch in FM position and tune the receiver as instructed.

Tuning the receivers on the frequency modulation band will require more care than on the broadcast band. A hissing sound may be noted when tuning between Frequency Modulation stations. This is normal, and will disappear as the station is tuned in. After a station is located, the pointer should be moved back and forth over it until the point of quietest reception and best tone quality is found. Correct tuning is indicated by the disappearance of background noise.

SPEAKER PHASING

It is most important that coded speaker leads be connected to coded terminals on speakers for proper polarity within each speaker group. It is also then most important that the speaker groups be in phase with each other. One excellent method to determine if the speaker groups are in phase is to play a monaural record as described under Automatic Balance Control.

Under these conditions the sound should appear to come from a point midway between the two speaker groups. If the sound comes from any other point than midpoint, then one speaker group is out of phase with the other and 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.

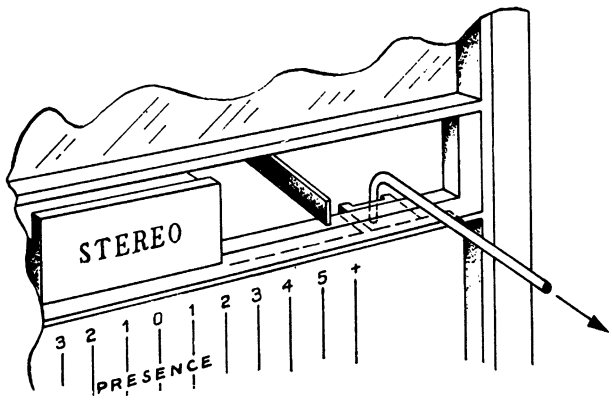
8LT25 POWER AMPLIFIER

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 8LT25 amplifier uses 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.
2. When a power transistor is replaced the insulator between the transistor and the heat sink should also be replaced.
3. Do not operate either amplifier without its proper speaker load (approximately 6.4 ohms).
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 .39 ohm emitter resistors for the specific channel. Also be certain to check the condition of the silicon diode rectifiers.
6. Remove transistors from their sockets before doing any soldering to the socket lugs.

11L8T25 TONE LIGHT REPLACEMENT

To replace the tone lights pull off the PUSH ON – PUSH OFF, FM-AFC, TAPE, and EXT STEREO Selector Switch knobs. Then take a stiff piece of wire shaped as in the illustration and pull out the tonal dial scale as indicated. This should be repeated at the four spots where the Selector Switch knobs have been removed. Pull off the plastic color shields to remove and replace the tone lights.



CHANGER, CARTRIDGE AND STYLUS INFORMATION

CHANGER	CARTRIDGE	STYLII	DESCRIPTION
	142-95	1.0 56-371	
		3.0 56-372	Sapphire-Sapphire
169-174	142-128 or 142-138	S-55805 or S-62649	Diamond-Sapphire
169-185	142-103	NON REPLACEABLE	Sapphire-Sapphire
169-191	142-125	1.0 56-371	
		3.0 56-372	Sapphire-Sapphire
169-192	142-124	1.0 56-371	
		3.0 56-372	Sapphire-Sapphire
169-196	142-128 or 142-138	S-55805 or S-62649	Diamond-Sapphire
169-197	142-128 or 142-138	S-55805 or S-62649	Diamond-Sapphire
169-200	142-127 or 142-137	S-55805 or S-62649	Diamond-Sapphire
169-202	142-126 or 142-136	S-55804 or S-62648	Sapphire-Sapphire
169-203	142-127 or 142-137	S-55805 or S-62649	Diamond-Sapphire
169-205	142-126 or 142-136	S-55804 or S-62648	Sapphire-Sapphire
169-206	142-127 or 142-137	S-55805 or S-62649	Diamond-Sapphire

FM, RF, AND IF ALIGNMENT
CHASSIS 9L20, 9L21, 10K01, 11L8T25

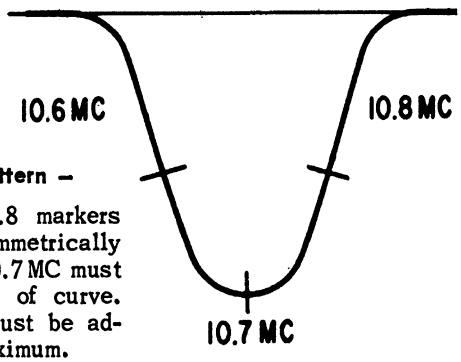
Alignment of these chassis will, in most cases, not be necessary unless an RF or IF transformer is replaced or if someone has tampered with the adjustments.

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 KC with a sweep rate of 60 cycles 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. To help achieve this symmetry, it is desirable to have 10.6, 10.7, and 10.8 megacycle markers in obtaining IF curve symmetry. The scope pattern example illustrating marker use to obtain this symmetry, is in illustration B.

The condenser mentioned further on in the alignment procedure should be as small as possible and the ground lead of the generator must be connected to the chassis at the base of the tube socket, where the signal is being injected. Should the signal be injected at some point other than a tube socket, then the ground lead should be connected to ground as closely as possible to this point.

In all alignment procedures, the signal generator output should be kept just high enough to obtain an indication. This is most necessary, since on some chassis we have a zero time constant limiter which will clip the signals if their magnitude is too great, resulting in erroneous waveforms.

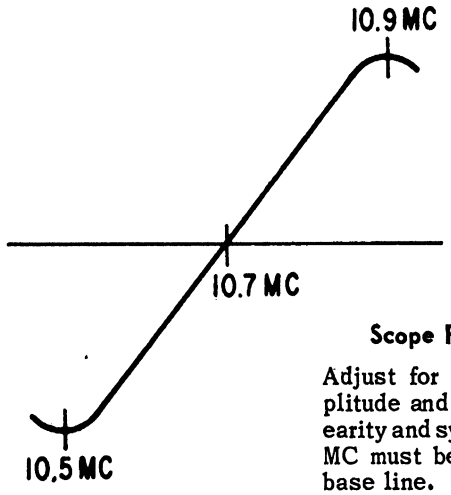
A. Connect scope or V.T.V.M. to Pin #1 of the 6AU6 or 12AU6 limiter. The common scope or V.T.V.M. terminal should be connected to chassis.



Scope Pattern –

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

B. On Chassis 9L20, 9L21 and 11L8T25 connect scope or V.T.V.M. to junction of 100 ohm and 330 mmf capacitor. This 100 ohm resistor is connected to terminal #6 of the ratio detector transformer. On Chassis 10K01 connect the scope or V.T.V.M. to terminal #5 of the 6AL5 discriminator and chassis.



Scope Pattern –

Adjust for maximum amplitude and maintain linearity and symmetry. 10.7 MC must be on curve at base line.

AM ALIGNMENT

C. An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM, IF, and RF adjustments.

NEUTRALIZING 6JK8 R.F. AMPLIFIER
Equipment – Bias Supply (Variable 0 to 20 Volts)

1. Tune receiver to 108 mc.
2. Insert a 108 mc R.F. signal at FM-G antenna terminals.
3. Connect V.T.V.M. or scope to Pin #1 grid of the 6AU6 limiter. The common scope or V.T.V.M. terminal should be connected to chassis.
4. Remove the AGC line from the tuner feed through and connect the (–) negative lead of the bias supply to this point. Connect the (+) terminal to chassis.
5. Adjust the bias supply to approximately -10 volts.
6. Carefully vary the position of the two wires adjacent to the body of C5 until minimum output is obtained, from the limiter grid test point.

RF AND IF ALIGNMENT
CHASSIS 7L20, 7L21 AND 10K01

Alignment of these chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

FM IF Alignment: Because of the wide band pass, it is desirable to use an FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete

FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined in this service note.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 1 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter to Pin #5 of 6AL5 transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Vacuum Tube Voltmeter Lug 2 of T7 to Chassis.
(e) Vacuum Tube Voltmeter Lug 2 of T9 to Chassis.
(f) Vacuum Tube Voltmeter Pin #1 of 19GQ7 Disc. Tube to Chassis (full discriminator load)

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL TO	ADJUST	PURPOSE
1(d)	Pin 7 12BE6 Converter	.05 Mfd.	455 Kc. 400 Cycle Modulated	BC	600 Kc.	L12, 13, 14, 15, 16, 17	Align IF channel for maximum output
2(d)	2 turns loosely coupled to wavemagnet		1600 Kc. 400 Cycle Modulated	BC	1600 Kc.	C18D	Set oscillator to dial scale
3(d)	2 turns loosely coupled to wavemagnet		1400 Kc. 400 Cycle Modulated	BC	1400 Kc.	C18B	Align antenna stage
4(a)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM		L10 coil slug pri. discr.	Align primary of discriminator for maximum reading
5(f)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM		L11 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading
6(c)	Pin 1 (grid) on 12BA6 2nd I.F.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L8 & L9 pri. & sec. of 3rd If transf.	Align 3rd IF transf. for max. reading
7(c)	Pin 1 (grid) on 12BA6 1st IF	.05 Mfd.	10.7 Mc. Unmodulated	FM		L6 & L7 2nd IF transf.	Align 2nd IF transf. for max. reading
8(c)	Pin 7 (grid) on 12DT8 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM		L4 & 5 pri. & sec. of 1st IF transf.	Align 1st IF transf. for max. reading
9(c)	Antenna Post FM	270 Ohms	98 Mc. Unmodulated	FM	98 Mc.	L3 osc. coil slug	Set osc. to dial scale
10(c)	(Remove line ant.)	270 Ohms	98 Mc. Unmodulated	FM	98 Mc.	L2 det. coil slug	Align det. stage to max. reading

For A, C, D, F See Page 13.

RF AND IF ALIGNMENT PROCEDURE FOR CHASSIS 7L20 – 7L21

OPERATION	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST IRON CORES	PURPOSE
1 B	Pin #1 12AU6 Limiter Grid	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L15	Adjust primary and secondary of ratio detector for maximum amplitude and symmetry as shown in Scope Pattern "B"
2 B	Pin #1 12AU6 Limiter Grid	.001 mfd	10.7 Mc 400 Kc. Deviation	88 Mc.	L17	
3 A	Pin #1 12BA6 2nd I.F. Grid	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L11, L12	Align I.F. transformers for maximum output and symmetry; this pattern is not necessarily identical to the over all Scope Pattern "A"
4 A	Pin #1 12BA6 1st I.F. Grid	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L7, L8	
5 A	Junction C9, and L2 FM Detector Coil Test Point "F"	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L4, L5	Align I.F. transformers for maximum out & symmetry as indicated in Scope Pattern "A"
6 A		.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	Readjust L4, L5, L7, L8 L11, L12	
7 A	FM Antenna post (remove antenna)	300 ohms	98 Mc. 400 Kc. Deviation	98 Mc.	L3	Set Oscillator to dial scale
8 A	FM Antenna post (remove antenna)	300 ohms	98 Mc. 400 Kc. Deviation	98 Mc.	L2 & L1	Align detector and antenna stages for maximum
9 C	Pin #1 12BE6 Converter Grid	.05	455 Kc. 400 Cycle Modulated	600 Kc.	L21, L22, L9, L10, L13, L14	Align AM, I.F. for maximum
10 C	Two turn loop loosely coupled to Wavemagnet		1600 Kc. 400 Cycle Modulated	1600 Kc.	C35F	Set oscillator to dial scale
11 C	Two turn loop loosely coupled to Wavemagnet		1400 Kc. 400 Cycle Modulated	1400 Kc.	C35D, C35B	Align detector and antenna stages.

For A, B, C See Page 13.

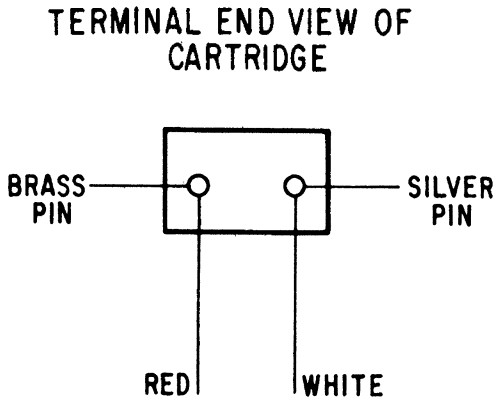
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL TO	ADJUST	PURPOSE
1(e)	Pin 7 6BE6 Converter	.05 Mfd.	455 Kc. 400 Cycle Modulated	BC	600 Kc.	L6, 7, 22, 23	Align IF channel for maximum output
2(e)	2 turns loosely coupled to wavemagnet		1600 Kc. 400 Cycle Modulated	BC	1600 Kc.	C13D	Set oscillator to dial scale
3(e)	2 turnsloosely coupled to wavemagnet		1400 Kc. 400 Cycle Modulated	BC	1400 Kc.	C13B	Align antenna stage
4(a)	Pin 1 (grid) on 6AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM		L14 coil slug pri. discr.	Align primary of discriminator for maximum reading
5(b)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM		L15 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading
6(c)	Pin 2 (grid) on 6EQ7 2nd I.F.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L12 & L13 pri. & sec. of 3rd IF transf.	Align 3rd IF transf. for max. reading
7(c)	Pin 1 (grid) on 6BA6 1st IF	.05 Mfd.	10.7 Mc. Unmodulated	FM		L10 & L11 2nd IF transf.	Align 2nd IF transf. for max. reading
8(c)	Pin 2 (grid) on 6DT8 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM		L8 & L9 pri. & sec. of 1st IF transf.	Align 1st IF transf. for max. reading
9(c)	Antenna Post FM	270 Ohms	98 Mc. Unmodulated	FM	98 Mc.	L3 osc. coil slug	Set osc. to dial scale
10(c)	(Remove line ant.)	270 Ohms	98 Mc. Unmodulated	FM	98 Mc.	L2 det. coil slug	Align det. stage to max. reading

For A, B, C, D, See Page 13.

RF and IF Alignment Procedure for Chassis 10K01

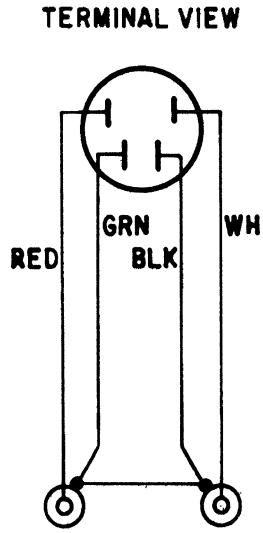
OPERATION	CONNECT GENERATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	SET DIAL TO	ADJUST IRON CORES	PURPOSE
1 B	Pin #1 6AU6 2nd limiter grid	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L11	Adjust primary and secondary of ratio detector for maximum amplitude & symmetry as shown in Scope Pattern "B"
2 B	Pin #1 6AU6 2nd limiter grid	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L13	
3 A	Pin #2 6BN6 1st limiter grid	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L10	Align I.F. transformers for maximum output & symmetry This pattern is not necessarily identical to the overall Scope Pattern "A"
4 A	Pin #2 6EQ7 2nd I.F. grid	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L8, L9	
5 A	Pin #1 6BA6 1st I.F. grid	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L6, L7	
6 A	Junction C9, and L2 FM Detector Coil Test Point "F"	.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	L4, L5	Align I.F. transformers for maximum output & symmetry as indicated in Scope Pattern "A"
7 A		.001 mfd	10.7 Mc. 400 Kc. Deviation	88 Mc.	Readjust L4, L5, L6, L7, L8, L9, L10	
8 A	FM antenna post (remove antenna)	300 ohms	98 Mc. 400 Kc. Deviation	98 Mc.	L3	Set oscillator to dial scale
9 A	FM antenna post (remove antenna)	300 ohms	98 Mc. 400 Kc. Deviation	98 Mc.	L2 & L1	Align detector and antenna stages for maximum.
10 C	Pin #1 6BE6 converter grid	.05	455 Kc. 400 Cycle Modulated	600 Kc.	L21, L22, L14, L15, L16, L17	Align AM I.F. for maximum
11 C	Two turn loop loosely coupled to wavemagnet		1600 Kc. 400 Cycle Modulated	1600 Kc.	C37F	Set oscillator to dial scale
12 C	Two turn loop loosely coupled to wavemagnet		1400 Kc. 400 Cycle Modulated	1400 Kc.	C37D & 37B	Align detector and antenna stages

For A, B, C See Page 13.

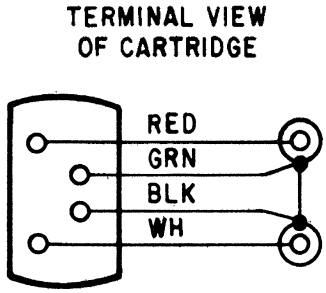


142-95-125 CARTRIDGE CONNECTIONS

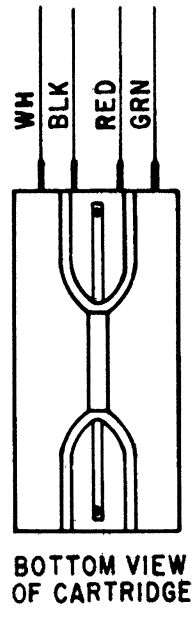
142 – 95 – 125 CARTRIDGE CONNECTIONS



142 – 103 CARTRIDGE CONNECTIONS



142 – 124 CARTRIDGE CONNECTIONS



142 – 126 – 127 – 128 – 136 – 137 – 138 CARTRIDGE CONNECTIONS

NOTES

OPERATING INSTRUCTIONS

for

ZENITH®

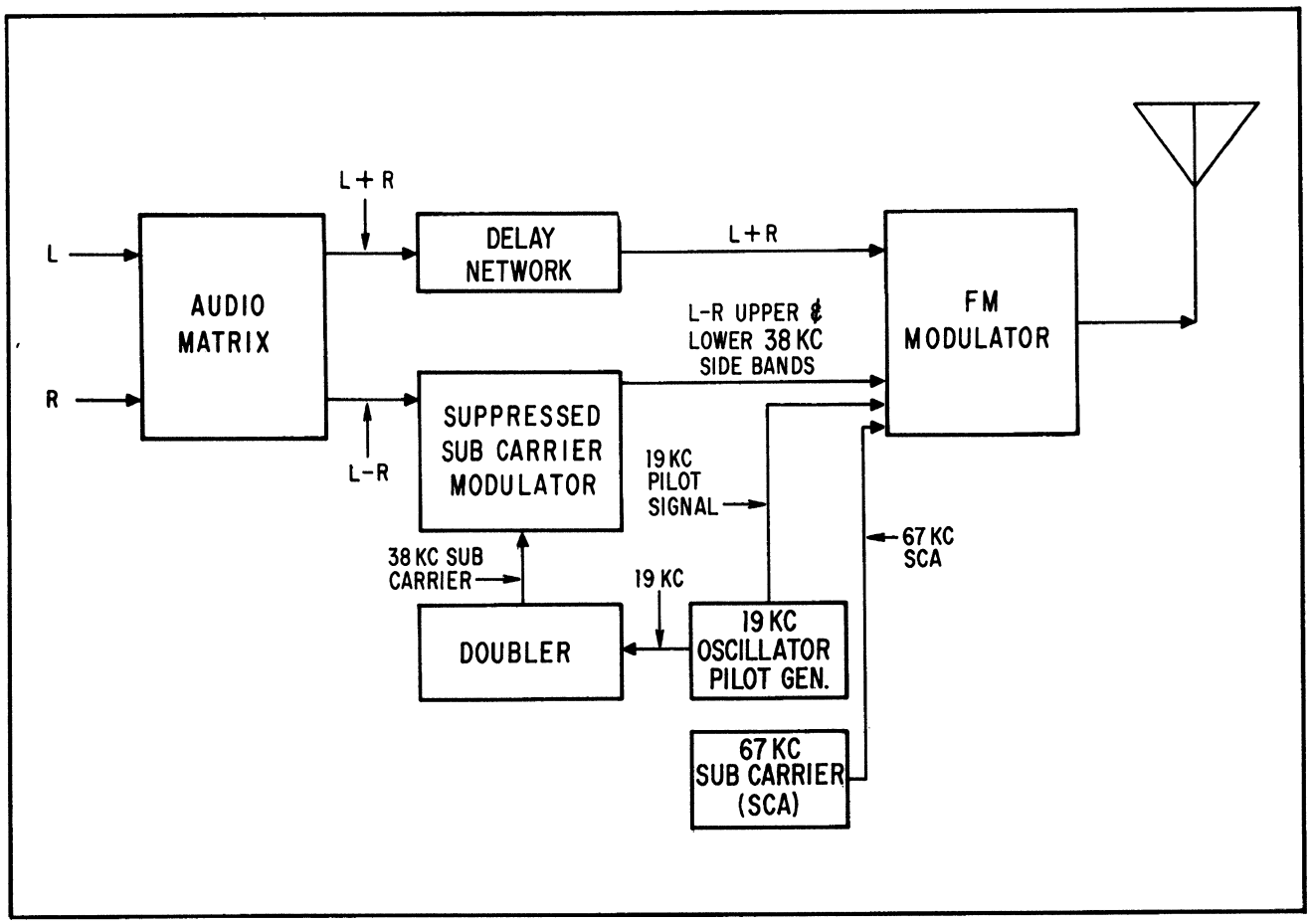
MODEL SPTE-1

FM MULTIPLEX SIGNAL GENERATOR

MULTIPLEX TRANSMITTER THEORY

To help the technician thoroughly understand the purpose and performance of a stereo multiplex generator, he should be familiar with the operation of a stereo FM transmitter since, in essence, the FM multiplex generator must simulate the multiplex transmitter. Therefore, this generator should perform and adhere to all specifications which apply to the FM transmitter.

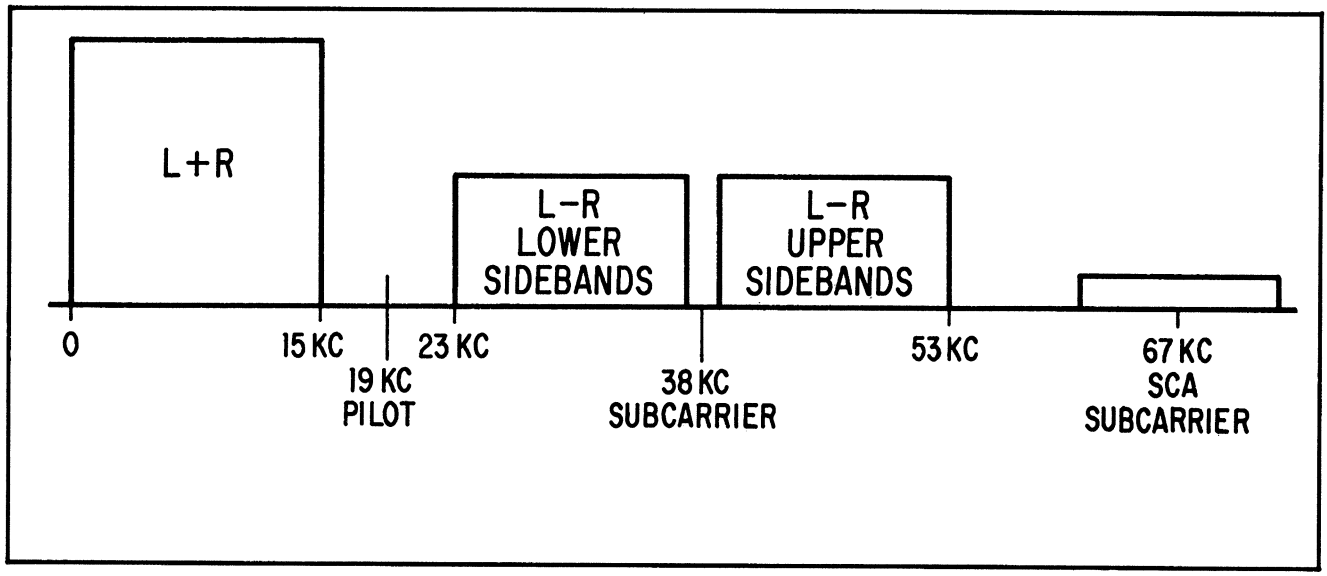
It would be best to familiarize the technician with the method by which stereo information is transmitted. As a result, we must review the very basic concepts of stereophonic FM transmitters. A stereophonic FM transmission must not only be compatible with existing monophonic transmissions, but it also must be capable of transmitting background music, facsimile or any other form of SCA (Subsidiary Communications Authorization) simultaneously with the stereophonic programming. This must be done without any co-interference and still remain within the channel limits licensed to any FM broadcast station.



TRANSMITTER BLOCK DIAGRAM

The two basic components necessary for any stereo system are right R and left L audio channel information. This information is matrixed and we obtain sum information L + R and difference information L - R. To obtain sum information L + R, +R was added to L; to obtain the difference information L - R a negative -R of the same magnitude as the +R only 180 degrees out of phase is added to L and thus L - R, the difference signal was created. The composite L + R and L - R information is now used as FM modulating components in this system. Normally, the L + R information could immediately FM modulate the carrier however, to be certain that the L + R information is in the same phase relationship to the L - R information as they were when they came from the matrix when they FM modulate the carrier, it is necessary to insert a delay network in the L + R channel. The sole purpose of this delay system is to shift the phase of the L + R modulating component in such a manner that it will be in phase with the L - R upper and lower 38KC sidebands when they too FM modulate the carrier.

In the stereo FM system of transmission, it is necessary that the L - R information AM modulate a subcarrier. To create this subcarrier, an extremely stable crystal oscillator produces a 19KC signal. The 19KC signal is doubled to obtain a 38KC subcarrier that is then AM modulated by the L - R information. The 19KC signal is also used as a pilot signal or synchronization signal and it too FM modulates the carrier. Since all the necessary signal information in the subcarrier system is contained in the upper and lower L-R 38KC sidebands of the AM modulating envelope, the 38KC subcarrier need not FM modulate the carrier. Therefore, the 38KC carrier is suppressed and only the remaining upper and lower L - R 38KC sidebands are used to FM modulate the carrier.



FM MODULATING COMPONENTS

We now have three carrier modulating components: L + R audio information, two L - R upper and lower 38KC sidebands, and the 19KC pilot signal. As we have stated previously, it is necessary that this system be compatible with facsimile or SCA transmissions, therefore, another modulating component can be added, the 67KC subcarrier (SCA).

MULTIPLEX RECEIVER THEORY

Since the basic principles involved in the operation of a stereo FM transmitter have already been discussed, the next link in the chain of information necessary for the proper use of a multiplex generator would be a basic discussion of the operation of the operation of the multiplex FM receiver.

These four modulating components can then be used as building blocks to recreate the L and R audio information necessary for stereo listening. See Multiplex Receiver Block Diagram, and the FM modulation components illustration. The ratio detector has demodulated the multiplex signal and obtained:

19KC pilot signal
L + R audio signal
L - R upper and lower 38KC sidebands
67KC subcarrier (SCA)

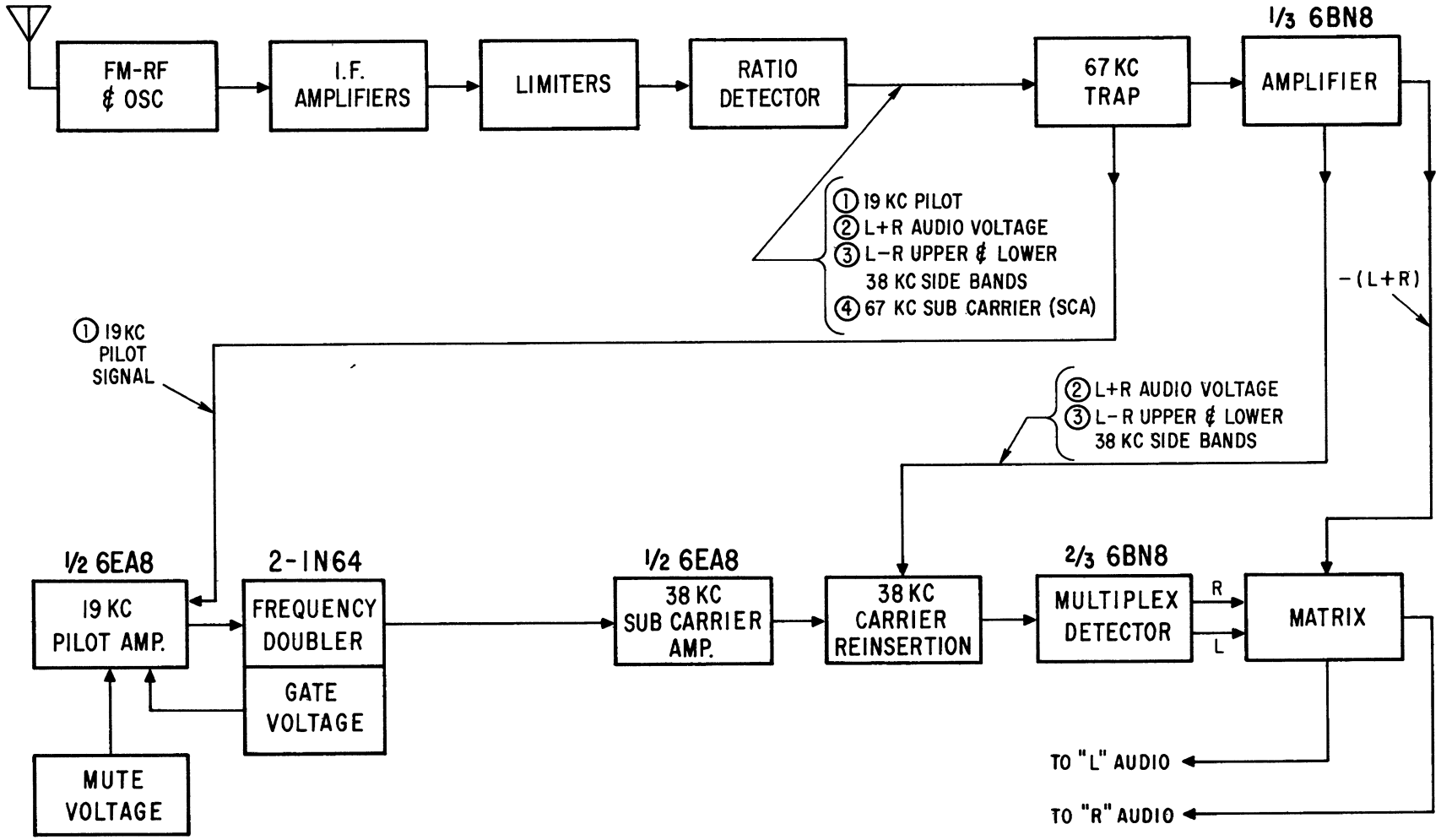
All these modulating components are fed to the 67KC trap where the 67KC SCA subcarrier is removed. This is necessary since if it were not done the 67KC could cause audio distortion in the multiplex detector.

The 19KC pilot signal from the output of the ratio detector is fed to a tuned grid tuned plate 19KC pilot amplifier to not only increase its amplitude, but also to eliminate other undesired signals. To insure its operation only on 19KC signals of sufficient amplitude for practical stereophonic reception, the 19KC amplifier is muted. This mute voltage is obtained from the B+ line and fed through a variable mute control to the cathode of the amplifier. When the incoming 19KC signal is sufficient to overcome this mute voltage or back bias, it then causes this amplifier to conduct and, of course, amplify. The secondary of the plate transformer is center tapped and has a pair of diodes across it. This operates as a full wave unfiltered rectifier which is a basic frequency doubler.

From the antenna input through the output of the ratio detector, a multiplex FM receiver is, for all practical purposes, identical to a monaural receiver. However, a great many technical improvements have been made in the RF, IF amplifier, limiters, and ratio detector to insure not only more sensitivity and selectivity, but better noise immunity. It is also imperative with multiplex transmissions that the receiver's IF and ratio detector curves be symmetrical, broadbanded, and remain constant with changes in input signal strength. The sole function of these four circuits is to receive the signal from the FM antenna, amplify it, and then demodulate the RF signal at the ratio detector to produce the four modulating components inserted at the transmitter.

The output of this frequency doubler is a series of 38KC positive pulses. These 38KC DC pulses perform two functions ... part is used as a gate voltage and fed back to the grid of the 19KC pilot amplifier raising it to a potential that approximates the mute voltage previously impressed on the cathode; this changes the tube's operating characteristics resulting in greater amplification. During normal monaural operation, the pilot amplifier is muted and even on stereo it only becomes operative when a 19KC signal is of sufficient magnitude to insure reliable and acceptable stereo reception. The second use for the 38KC DC pulses will be discussed further on.

Zenith receivers all utilize a stereo monaural indicator which consists of a neon bulb which lights when the receiver is properly tuned to an incoming stereo signal of sufficient magnitude to insure proper stereo operation. One side of this neon bulb is connected to a B+ line and the other side is connected to the screen of the 19KC pilot amplifier. During monaural operation without a 19KC pilot signal, the pilot amplifier will not be drawing screen current, therefore, the voltage on its screen will be high and of a magnitude relative to the B+ voltage impressed at the other side of the neon indicator, so the potential difference between the two voltages is not sufficient for ignition of the neon bulb. During stereo operation when a 19KC pilot signal arrives that is of sufficient magnitude to overcome the mute voltage or back bias on the pilot amplifier, then cur-



MULTIPLEX RECEIVER BLOCK DIAGRAM

rent flows in the pilot amplifier dropping the screen voltage to a point where the potential difference between the B+ voltage on either side of the neon indicator is sufficient for ignition ... conduction occurs and the neon bulb lights. With the mute voltage adjusted to the proper threshold level, the receiver will only respond to a 19KC pilot signal of sufficient amplitude for acceptable stereo reception and then the 19KC pilot amplifier automatically triggers the neon stereo indicator.

The 38KC DC pulses from the doubler are also used to create the 38KC carrier which must be inserted with the L - R upper and lower 38KC sidebands. These pulses are fed to the grid of the 38KC subcarrier amplifier through a 47000 ohm resistor where clipping occurs to remove any noise bursts from the pulses. The plate circuit of the 38KC subcarrier amplifier is tuned to 38KC and when pulses are injected into a parallel resonant circuit so that the pulses and the tuned circuit are of the same frequency, ringing occurs. This process is called "Ringing A Circuit", and a sine wave is created. If one were to observe the wave form at the plate of the 38KC subcarrier amplifier, a 38KC sine wave would be seen. This 38KC sine wave is now ready for reinsertion with the L - R upper and lower 38KC sidebands that were obtained from the output of the ratio detector.

At this point we must return to the output of the ratio detector and use the remaining pieces of modulating information that were obtained through detection. The L + R audio voltage, the L - R upper and lower 38KC sidebands as well as the 67KC subcarrier (SCA). These signals are fed through the 67KC trap which must remove all vestiges of the 67KC subcarrier to prevent distortion occurring further on in the multiplex detector. Since the L + R and the L - R upper and lower 38KC sidebands are of low magnitude, it is necessary to amplify both these signals, therefore, they are fed to the grid of a triode amplifier where their level is raised. The output of this amplifier is coupled to the center tap of the 38KC carrier reinsertion transformer. At the primary of this transformer, a 38KC sine wave is present and by transformer action, this also appears at the secondary. Now, the L - R upper and lower 38KC sidebands will be reunited with the 38KC carrier and we would then have the original symmetrically identical AM modulated envelope. In addition, the L + R information is added to this envelope and this composite modulation envelope appears at the diode plates of the multiplex detector. If a base line were to be drawn through this composite amplitude modulated envelope, there would be both positive and negative phases of this envelope with information in both halves being symmetrically identical. During the positive half cycle, one diode will demodulate the positive half of the envelope and we would obtain the algebraic summation of the L - R upper sideband and the L + R audio voltage. Going through the mathematics as follows, we obtain 2L information.

$$(L - R) + (L + R) =$$
$$L - R + L + R) =$$
$$L - \cancel{R} + L + \cancel{R} = 2L$$

On the negative half cycle which is 180 degrees out of phase with the positive cycle, the other diode will demodulate the negative half of the envelope and we will obtain the algebraic summation of the - (L - R) sideband and the L + R audio voltages. Going through the mathematics as follows we obtain 2R information:

$$-(L - R) + (L + R) =$$
$$- L + R + L + R =$$
$$- \cancel{L} + R + \cancel{L} + R = 2R$$

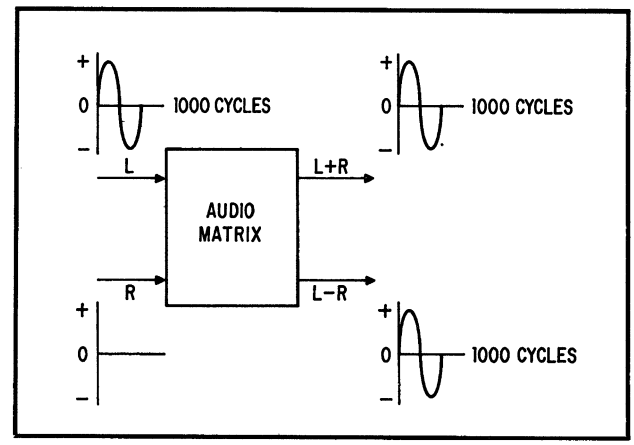
In this manner, on both the positive and negative phases, we have added the signals and obtained separate L and R information which can now be fed to their respective audio channels.

In the previous explanation of the multiplex detector, it was necessary to assume that the values of L + R and L - R were of equal magnitude, however, this assumption is not always correct since there can be a difference in the magnitude of these signals. As a result, after demodulation, there is sometimes a small component of R information in the L channel and some small component of L information in the R channel, however, as long as the circuit can maintain a difference of approximately 20 db in the respective magnitudes of these two signals, excellent stereo reproduction will be achieved.

To help improve this separation even more, a negative portion of -(L + R) information is fed to the matrix. On earlier receivers the quantity of -(L + R) feedback to the matrix was controlled by a separation control, however, in later models the separation control was removed since a fixed quantity was found to be satisfactory.

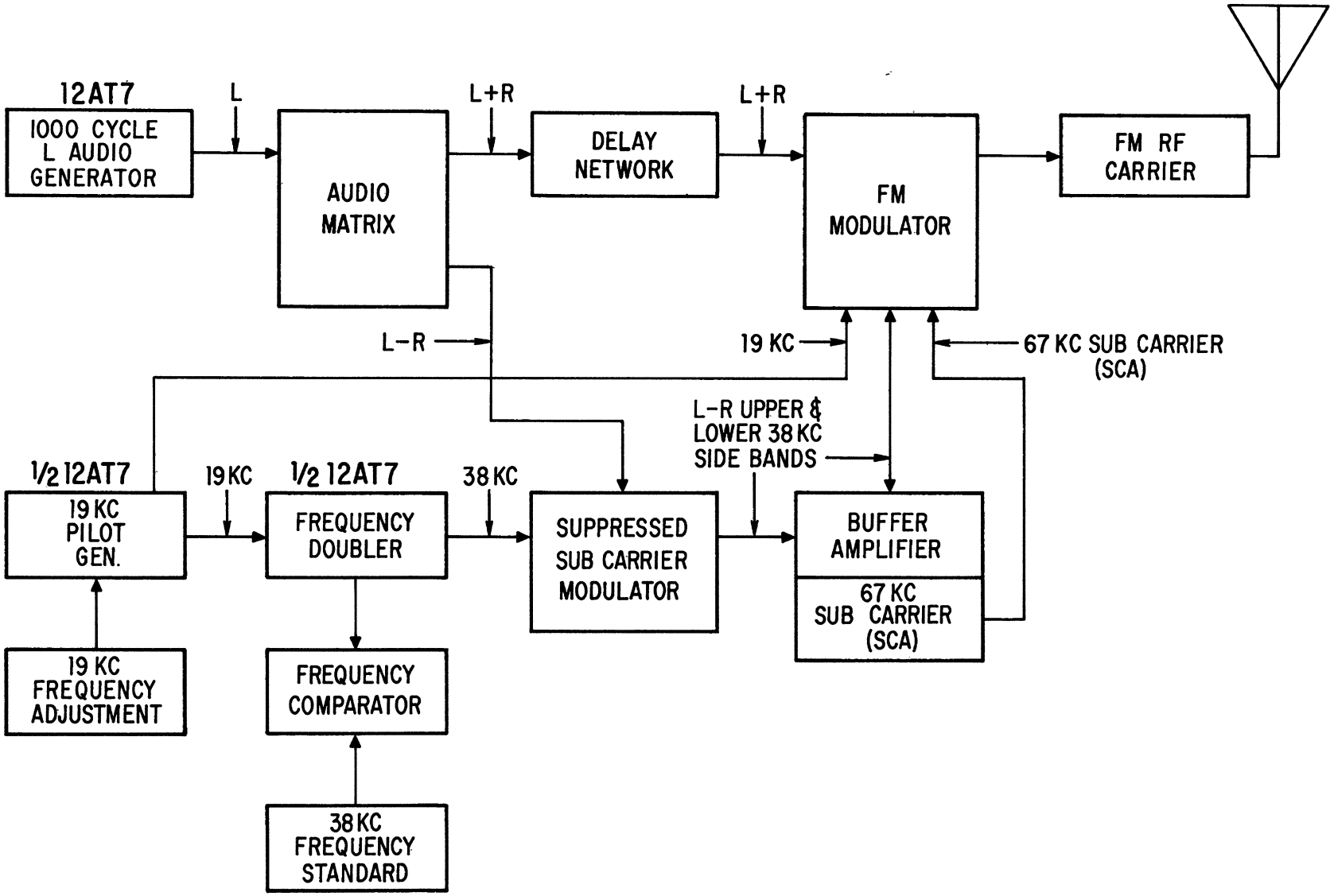
MULTIPLEX GENERATOR THEORY

Now that we have discussed both the basic transmitter and receiver theory, the next logical step should now describe the design and operation of the stereo multiplex generator. This, in essence, must simulate the functions of a multiplex transmitter and even though small and portable, it must fulfill all the specifications which apply to the FM multiplex transmitter.



AUDIO MATRIX WITH SINE WAVES

The Zenith Multiplex Generator does all this and since the sole reason for our designing and manufacturing this piece of equipment was to provide a reliable, simplified, and economical generator, we have chosen to use only an L signal source. At some moment of time in a multiplex program there is the possibility that there could only be an L signal, or only an R signal created. As a result, we can use either only an L signal or an R signal. Based on this



MULTIPLEX GENERATOR BLOCK DIAGRAM

logical assumption the multiplex generator design and the receiver alignment procedure will be greatly simplified thus enabling the technician to more easily understand and operate the equipment. As a result, this generator shall only use a 1000 cycle L signal produced by the 12AT7 audio generator.

Since we are only using an L signal and R is zero, when L and R are combined after being fed into an audio matrix, L + R will be identical to L since if an L signal is added to a zero R signal, the summation will be L. The same applies to the L - R signal when a -R signal is added to an L signal with R being zero, then the summation of the L - R signal will be identical to L. As a result, the L + R and L - R signals will be identical and the recovered signal will only be an L signal in the receiver's L audio output.

The multiplex generator must simulate a multiplex transmitter, therefore, it is necessary to create a 19KC pilot signal. The 12AT7 and associated oscillator circuitry is used to generate the 19KC pilot signal. This circuit is extremely stable, however, since the oscillator must conform to tolerances identical to the transmitter, provisions have been made to check the 19KC pilot frequency against a known standard. A reliable 38KC frequency standard is available since every local stereo station maintains a 19KC pilot signal in accordance with the Federal Communications Commission's specifications. A frequency standard can be obtained from a multiplex receiver in the following manner. Tune the receiver to a stereo station. When the stereo indicator lights up, the receiver will be on frequency and the receiver's doubler and ringing circuit will be producing a 38KC sine wave. With one of the connecting cables supplied with this generator, take a 38KC signal from the receiver and feed it back to the 38KC input on the generator. With this 38KC frequency standard inserted in the generator the 19KC oscillator can be checked two ways. Observe the neon 38KC beat indicator and/or insert a pair of high impedance headphones at the point marked "Beat Frequency Output Phones". By adjusting the pilot carrier frequency adjust slug, you can obtain a zero beat either audibly or visually on the neon indicator. When you have zero beat the 19KC oscillator, you then know that it is on frequency and you are developing standard 19KC and 38KC frequencies. The 19KC pilot signal also is fed to the FM modulator.

Another portion of this 19KC signal is then doubled and the 38KC sign wave generated is fed to the suppressed subcarrier modulator. The suppressed subcarrier modulator also receives a 1000 cycle L - R signal. The circuit performs two functions: The 1000 cycle L - R signal AM modulates the 38KC carrier producing an AM modulated wave and at the same time it removes the 38KC carrier leaving only the L - R upper and lower 38KC sidebands. The two L - R upper and lower 38KC sidebands are then fed to a buffer amplifier whose output in turn FM modulates the carrier.

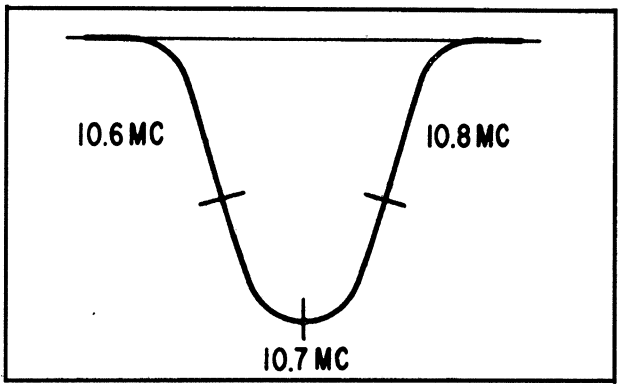
The 6AB4 performs two functions ... it acts as a buffer amplifier while an L - R signal is being transmitted and also acts as a 67KC subcarrier generator (SCA). It does not perform these two functions simultaneously but since the 67KC subcarrier is only required for nulling our 67KC trap circuits, the 67KC signal need only be used momentarily while these adjustments are being made. During the time the 6AB4 is used as a 67KC subcarrier generator, this information, too, is fed to the FM modulator.

As a result of this simplified and ingenious circuitry, Zenith has in a very small piece of test equipment, recreated all the functions of a multiplex FM transmitter since it is creating an FM carrier with the four basic modulation components necessary for a stereo transmission.

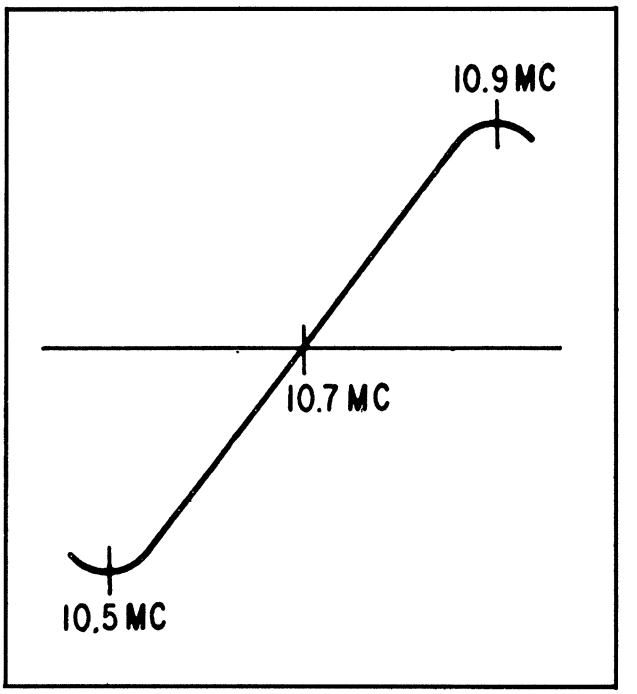
L + R audio signal
19KC pilot signal
L - R upper and lower 38KC sidebands
67KC subcarrier (SCA)

MULTIPLEX ALIGNMENT PROCEDURE

Using the Zenith FM multiplex signal generator, the multiplex portion of Zenith or any FM multiplex receiver can be aligned, but first before any attempt is made to do this it is necessary that the technician be certain that the RF, IF, and ratio detector alignment is correct, and that the receiver operates normally on monaural signals.



IF CURVE



RATIO DETECTOR CURVE

Because of the wide band pass required in the multiplex FM receiver, it is desirable to use an FM signal

generator having a deviation of at least 200 KC with a sweep rate of 60 cycles, 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 this IF curve symmetry 10.6 and 10.8 megacycle markers must be symmetrically positioned and the 10.7 megacycle marker must be at the center of the curve. When aligning the ratio detector 10.5 and 10.9 megacycle 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 megacycles must be on the curve at the reference line. 10.5 megacycles and 10.9 megacycles 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 the Zenith FM multiplex signal generator, it is recommended that it be connected to the power source and turned on giving it a 10 to 20 minute warmup period. This will allow ample time for the RF, audio, and 19KC oscillators to stabilize.

The following procedure is only necessary when the generator has been received from the factory, or has been subjected to a great deal of handling or transportation vibration. Although the 19KC pilot generator oscillator is extremely stable, there is always the possibility that it could shift from its precisely assigned frequency. As a result, we have a very simple method to check the 19KC pilot frequency using an FM multiplex receiver and an FM multiplex station as a frequency standard. Proceed as follows:

1. Tune your FM multiplex receiver to an FM multiplex station and when the pilot indicator lights up, this indicates the 19KC pilot amplifier is functioning and the doubler and ringing circuit will be creating a 38KC sine wave. Since this 38KC sine wave is developed from information obtained from the transmitter, it must be on frequency and can be used as a reference standard. With the enclosed cable, connect to the plate terminal of the 38KC subcarrier amplifier (380 volts PP) and connect the other end of this cable to the 38KC input terminal on the FM multiplex generator.
2. Set the pilot carrier amplitude control to 10%, plug in a pair of high impedance earphones into the Beat Frequency Output Jack on the generator, then adjust the pilot carrier frequency with an IF alignment wrench. Watch the 38KC neon zero beat indicator, and listen to the phones. When the zero beat is obtained between the two 38KC signals, the standard from the receiver and the 38KC from the multiplex generator, the 19KC oscillator in the generator will be on the exact frequency. After this zero beat adjustment has been made, disconnect all cables.

This generator provides composite multiplex output as well as an RF signal, FM modulated by the composite multiplex signal. The composite signal is very useful since it is an excellent tool that can be used in trouble-shooting and signal tracing the multiplex portion of a 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 a possibility of some phase shift occurring in the RF, IF, or ratio detector circuits, multiplex alignment made by signal injection at the ratio detector would not be as correct for each receiver as it would be if the composite signal FM modulated an RF carrier and this signal were injected into the FM antenna terminals. With the signal injected in this manner, the multiplex alignment would be the best that could possibly be achieved, and separation would be the maximum obtainable for this specific receiver.

The RF carrier in this generator is variable from 88 to 108 MC. 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 adjusting slug on the generator to this same frequency. The AGC voltage developed in the receiver should be approximately 5 to 6 volts. AGC voltage substantially less than this will indicate the RF frequency adjusting slug is tuned to an image.

67 KC Trap Adjustment

1. Connect the stereo generator RF leads to the G and F FM antenna terminals and set the pilot carrier control to zero.
2. Move L + R and L - R switches to OFF position.
3. Move 67KC generator switch from OFF position up to 67KC.
4. Connect the V.T.V.M. (AC scale) and/or scope to either C.T. or either end of multiplex detector coil and chassis ground.
5. Adjust 67KC trap for minimum output.
6. Move 67KC generator switch to OFF position.

19 KC Subcarrier amplifier adjustment

1. Turn generator pilot carrier amplitude control to 10% position.
2. Connect the V.T.V.M. (DC scale) and/or scope to the junction of the two frequency doubling diodes and chassis.
3. Adjust the mute control to maximum bias so that the 19KC pilot carrier amplifier is cut off. (It may be necessary to momentarily switch receiver to AM position to disrupt the 19KC signal so the stereo indicator will turn off.) After the pilot carrier is cut off, it will be necessary to rotate the receiver mute control towards minimum bias so there will be sufficient signal for alignment in Step #4. Then as the 19KC signal increases while making the adjustment in Step #4, the mute control must simultaneously be rotated towards maximum bias so the stereo indicator will not fire. (If it does fire, it may be necessary to momentarily switch receiver to AM to extinguish it).
4. Adjust the 19KC and frequency doubler coils for maximum DC output from the diodes.
5. Now slowly rotate the mute control towards minimum bias and stop when the 19KC stereo indicator fires (lights up).
6. Place the V.T.V.M. (AC scale) and/or scope at either end of the secondary of the multiplex detector coil and chassis.
7. Adjust the multiplex detector coil for maximum 38KC output.

Separation Adjustments

1. Move L - R generator switch from OFF position up to L - R position.
2. Connect a V.T.V.M. (AC scale) and/or scope to the L audio output after the 38KC filter and chassis.
3. Adjust doubler coil for maximum voltage at L output. This will be a very critical adjustment. There may be two peaks, in which case the one closest to the adjustment obtained in 19KC SUBCARRIER ADJUSTMENT, procedure #4, will be the correct one.
4. Now also turn on the L + R signal and check R output after the 38KC filter. The magnitude of this signal should be much less than the signal at the L output. The signal voltage at the L audio output should be approximately 10 times greater than the voltage at the R output.
5. On receivers having a separation control, adjust it for minimum signal at R output.

Mute Level Adjustment

1. Turn generator pilot carrier amplitude control to 5% and rotate the mute control to maximum bias position. Then momentarily switch to AM to disrupt the 19KC signal so the stereo indicator will turn off.
2. Now slowly rotate the mute control in the opposite direction and stop the instant the stereo indicator lights up.

TROUBLE-SHOOTING

Should a problem arise in aligning the FM multiplex portion of the receiver and the technician does not know 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, the multiplex generator can be used as 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 P, the output of the ratio detector. To reduce possible extraneous signals coming through the ratio detector, connect the screen and plate of the limiter together with a jumper lead. The wave forms and their magnitudes may vary slightly from chassis to chassis, however, they are quite indictive of what will be seen when signal tracing the multiplex circuitry.

67 KC Signal Tracing

1. Set the 19KC pilot carrier control to zero.
2. Move L + R and L - R switches to OFF position.
3. Move the 67KC generator switch from OFF position up to 67KC. Sequentially connect an oscilloscope to points P, Q, T, and S. A 67KC sine wave should be seen at P. At Q a 67KC signal should be seen but it will be much smaller in magnitude that at P, indicating that the trap has attenuated the signal. The voltage relationship should be approximately 20 to 1. 67KC can also be observed at points T and S. If the relationship of all wave forms is correct, the 67KC circuitry has now been thoroughly checked and is functioning correctly.

19 KC Signal Tracing

1. Move the 67KC generator switch to OFF position.
2. Turn the generator 19KC pilot carrier amplitude control to 10% position.

Sequentially connect your scope to points Q, L, M, and N. At all points you should see the 19KC sine wave. At the plate, point N, of the 19KC pilot amplifier the 19KC sine wave should be seen in much greater magnitude than at M.

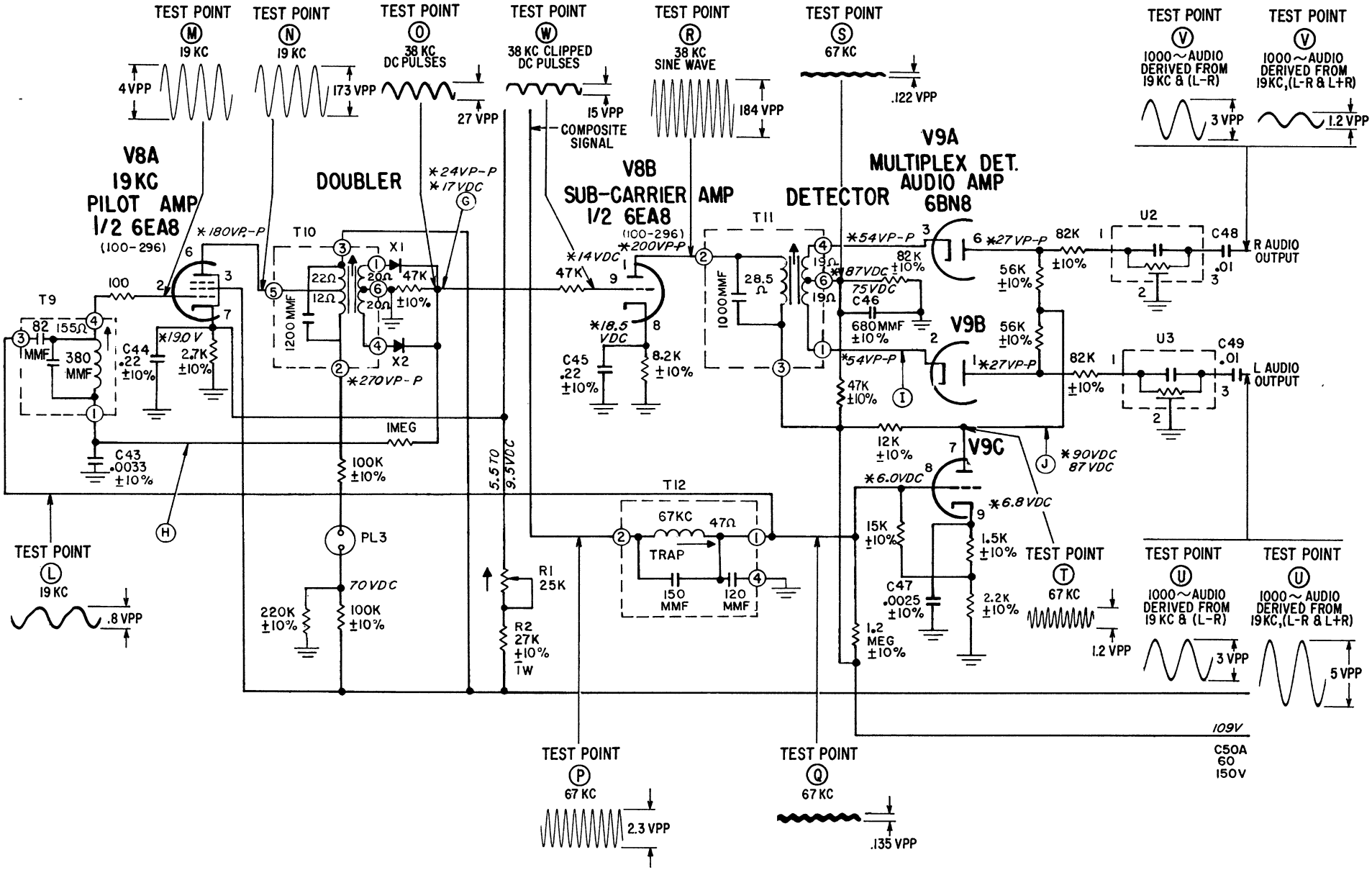
Doubler and Subcarrier Signal Tracing

To determine if the doubler is functioning, place your scope at point O and you will see 38KC DC pulses. Placing the scope at W you will see 38KC clipped DC pulses. Placing the scope at the plate, R, of the subcarrier amplifier, you should see a 38KC sine wave which will indicate that the subcarrier amplifier and associated ringing circuitry is functioning properly.

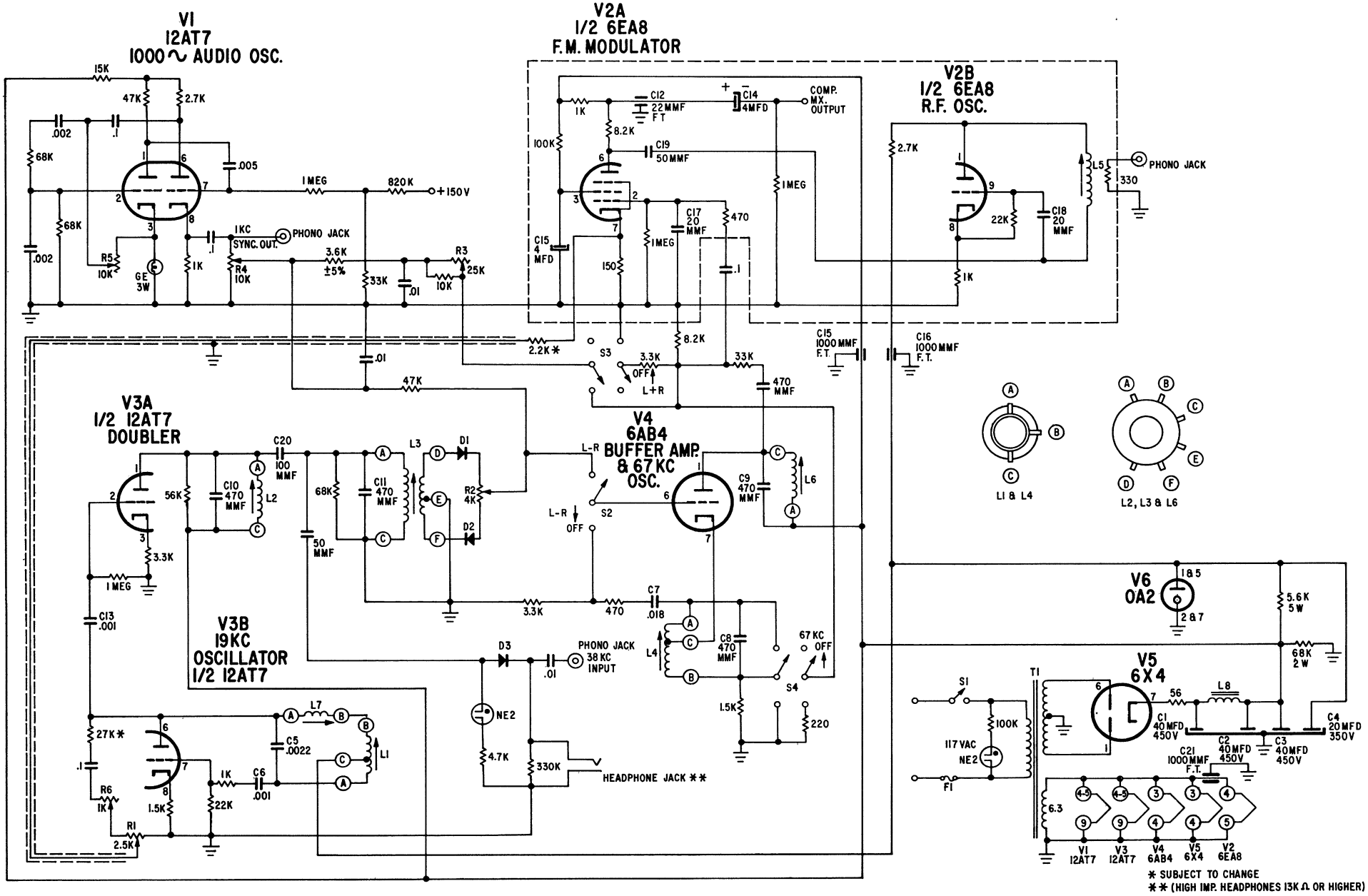
Multiplex Detector Signal Tracing

1. Leave the 19KC amplitude control at 10%.
2. Move the L-R generator switch from OFF position to L-R position. You should see equal amplitude 1000 cycle sine waves at both points V and U.
3. Move the L+R switch from OFF up to L+R and look at the L audio output, point U, and measure the magnitude of the 1000 cycle sine wave. At point V you will also see a 1000 cycle sine wave and if the multiplex detector and preceeding circuitry are aligned properly, the magnitude of the wave form at U should be greater than at V.

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.

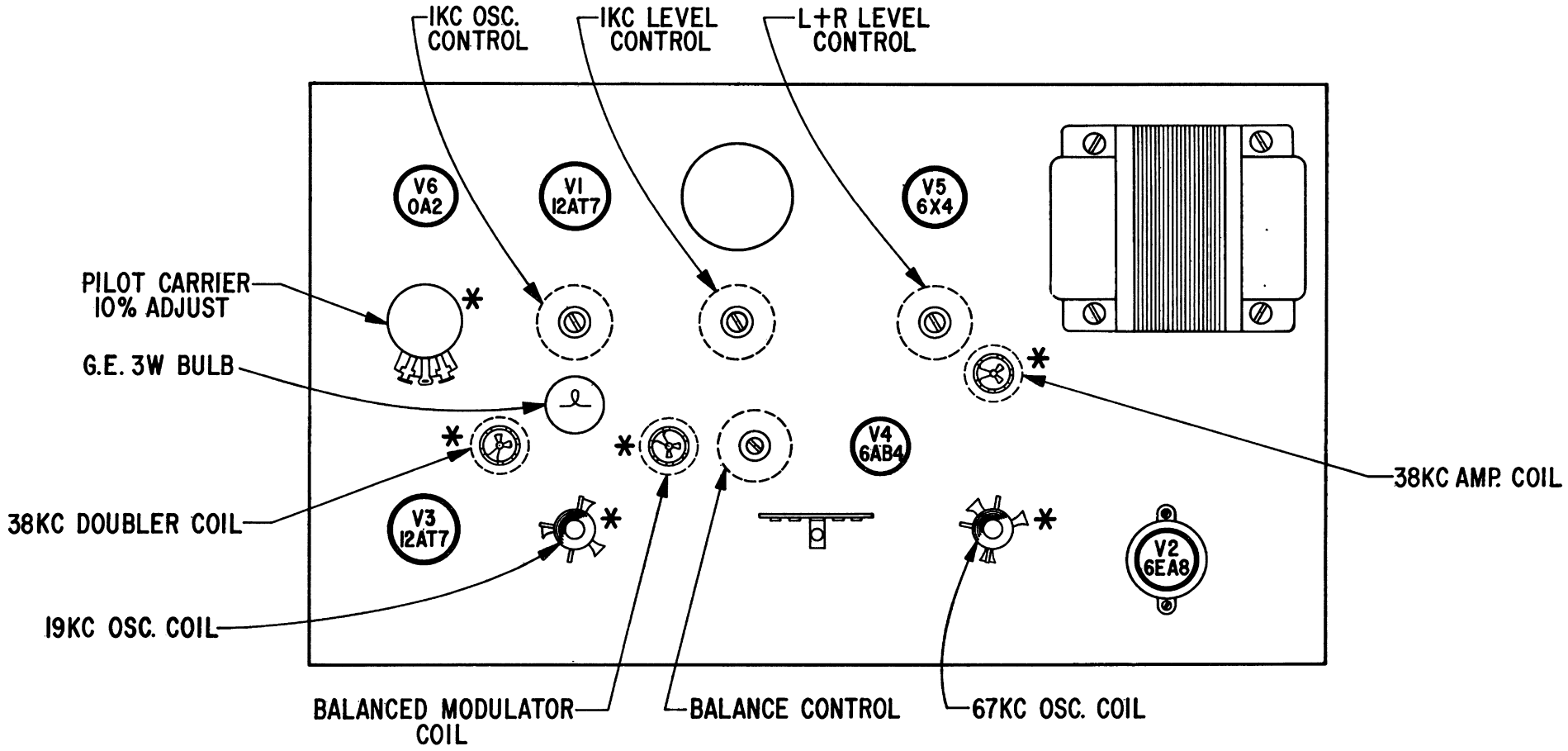


TROUBLE SHOOTING TEST POINTS

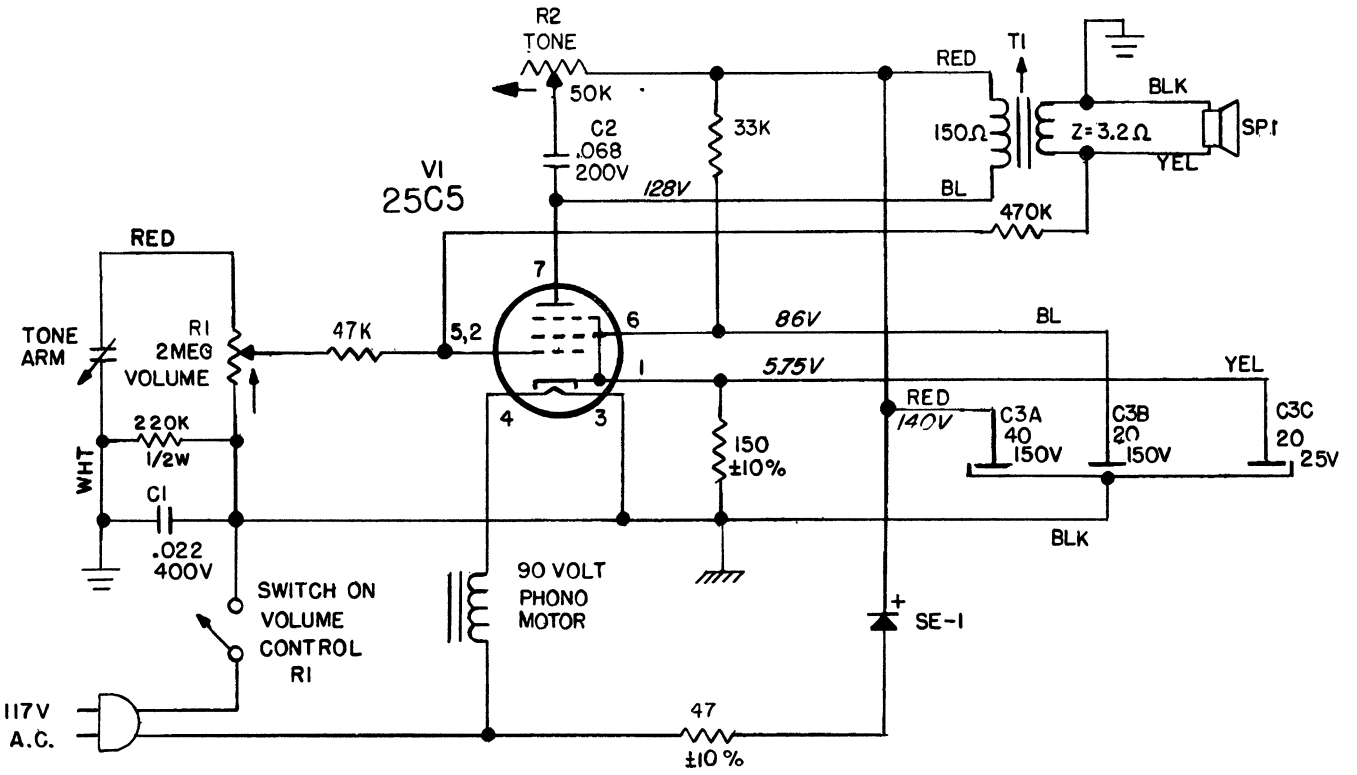


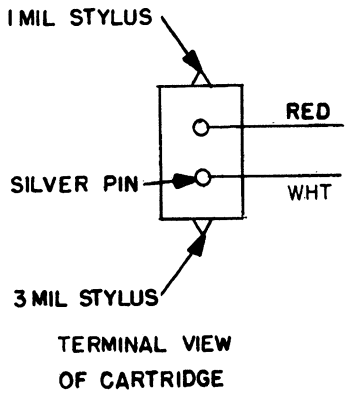
MULTIPLEX SIGNAL GENERATOR

Item No.	Part No.	Description
C1		40 mfd Electro 450V
C2	22-3686	40 mfd Electro 450V
C3		40 mfd Electro 450V
C4		20 mfd Electro 350V
C5	22-3180	.0022 mfd Mica
C6	22-2163	.001 mfd Mica
C7	22-2439	.018 mfd Durez Paper
C8	22-2524	470 mmf Mica
C9	22-2524	470 mmf Mica
C10	22-2524	470 mmf Mica
C11	22-2524	470 mmf Mica
C12	22-3270	22 mmf F.T.
C13	22-2163	.001 mfd Mica
C14		4 mfd Electro 350V
C15	22-3029	1000 mmf F.T.
C16	22-3029	1000 mmf F.T.
C17	22-2593	20 mmf Npo
C18	22-2593	20 mmf Npo
C19	22-2370	50 mmf N330 ±20%
C20	22-2397	100 mmf N750 ±10%
C21	22-3029	1000 mmf F.T.
R1		2.5K ohm Pilot Carrier
R2	63-3266	Amplitude Control
R2	63-3266	4K ohm Balance Control
R3	63-4880	25K ohm L. & R. Level Control
R4	63-4095	10K ohm 1KC Level Control
R5	63-4095	10K ohm 1KC Osc. Control
R6		1K ohm Pilot Carrier 10% ADJ.
L1	S-45679	19KC Osc. Coil
L2	S-54469	38KC Doubler Coil
L3	S-45679	Balanced Mod. Coil
L4	S-45679	67KC Osc. Coil
L5	S-58047	R.F. Tank Coil
L6	S-54469	38KC Amp. Coil
L7	EXH. 63586	19KC Osc. Trimmer Coil
L8	27-CF-125	Filter Choke
T1	27-PF-31	Power Transformer
D1	103-23	Bal. Mod. Diode
D2	103-23	Bal. Mod. Diode
D3	103-23	Beat Ind. Diode
F1		2 Amp. Fuse



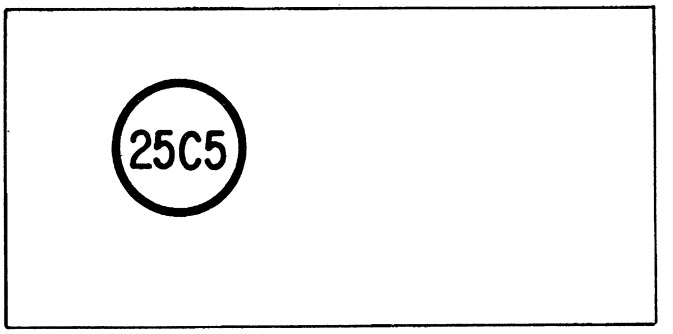
MULTIPLEX GENERATOR CHASSIS



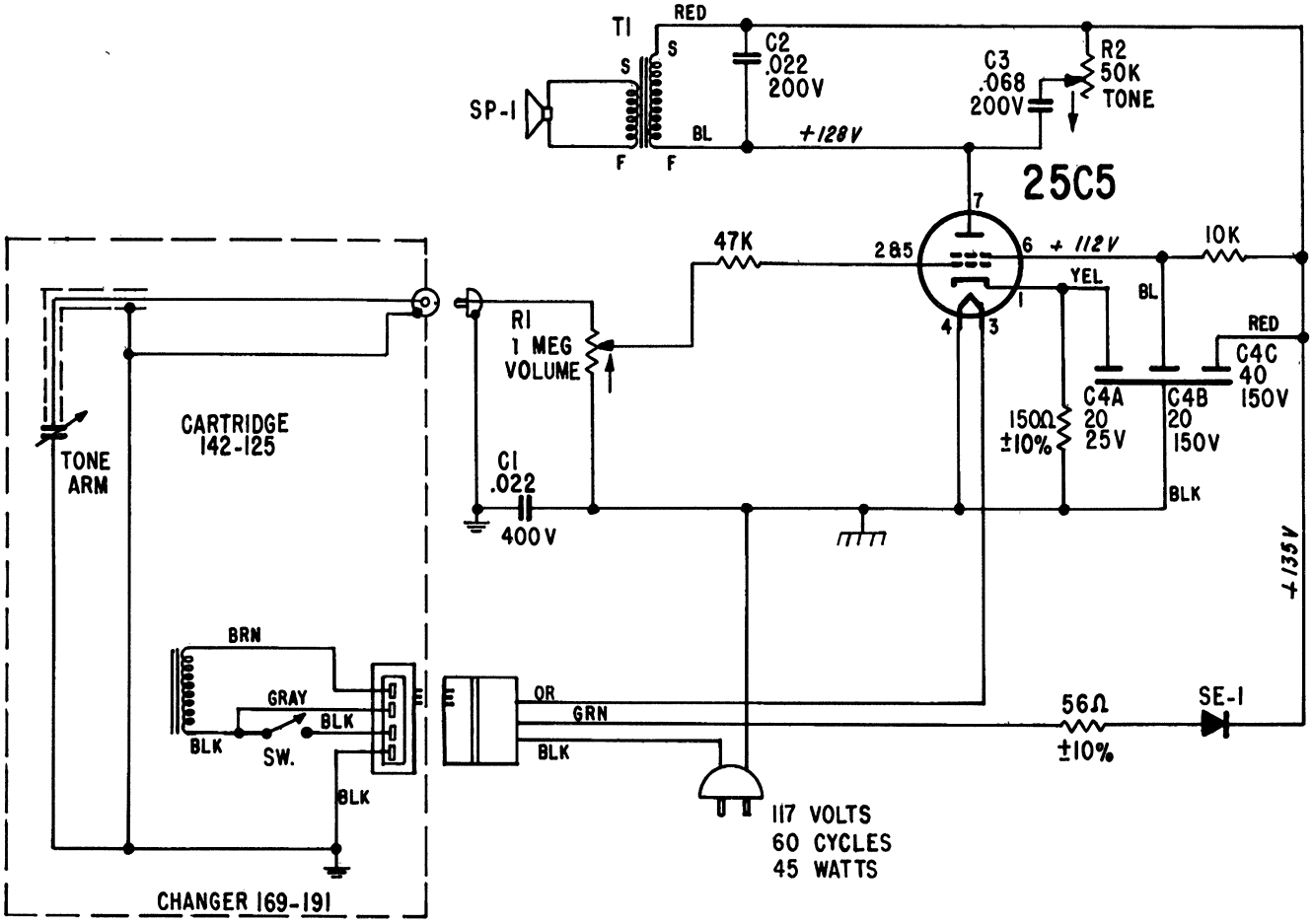


TERMINAL VIEW
OF CARTRIDGE

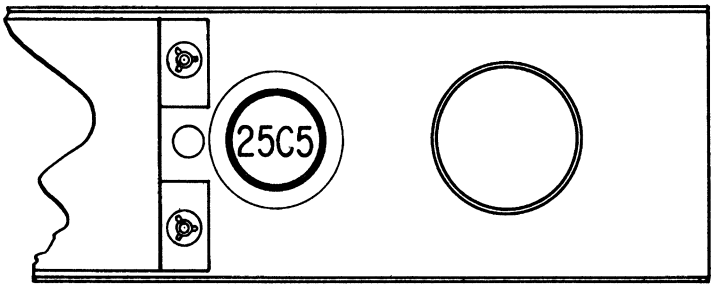
1L20 SCHEMATIC FOR MODEL ZP2



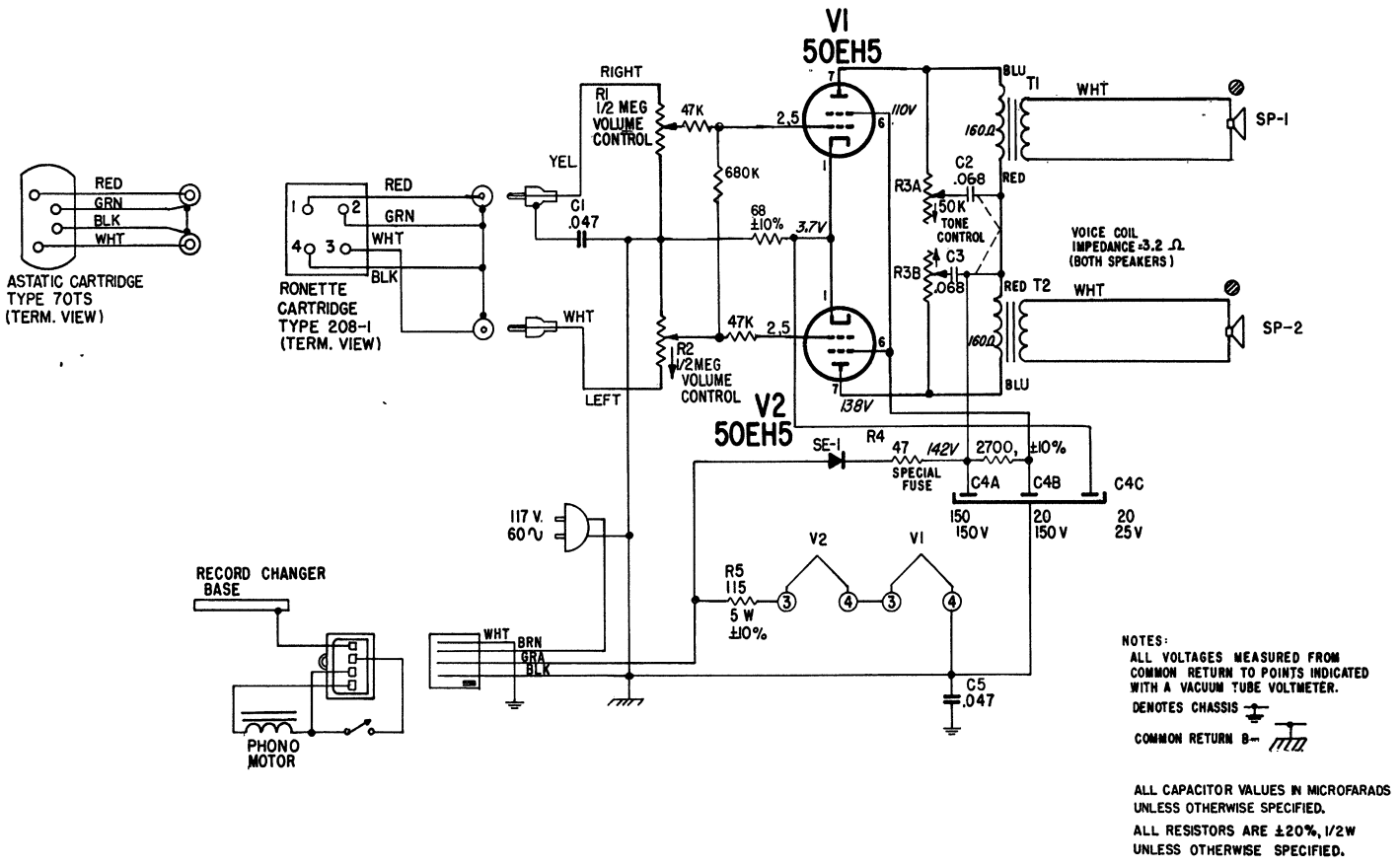
1L20 TUBE LAYOUT FOR MODEL ZP2



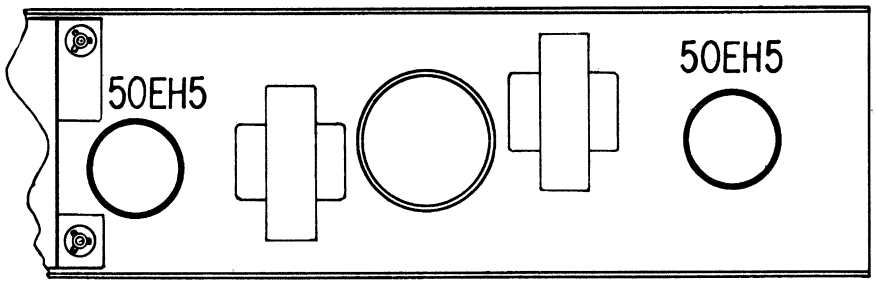
1L21 SCHEMATIC FOR MODEL LP8.



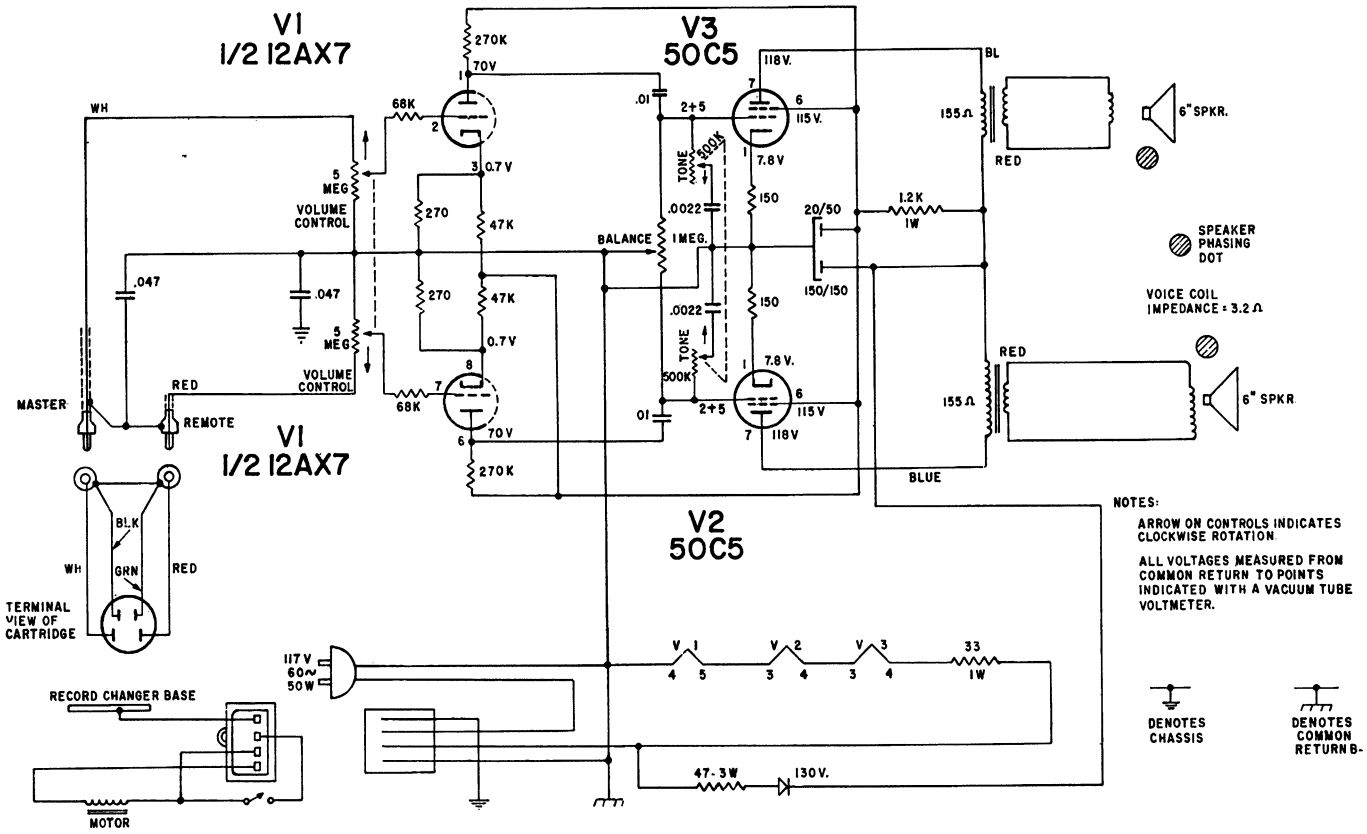
1L21 TUBE LAYOUT FOR MODEL LP8.



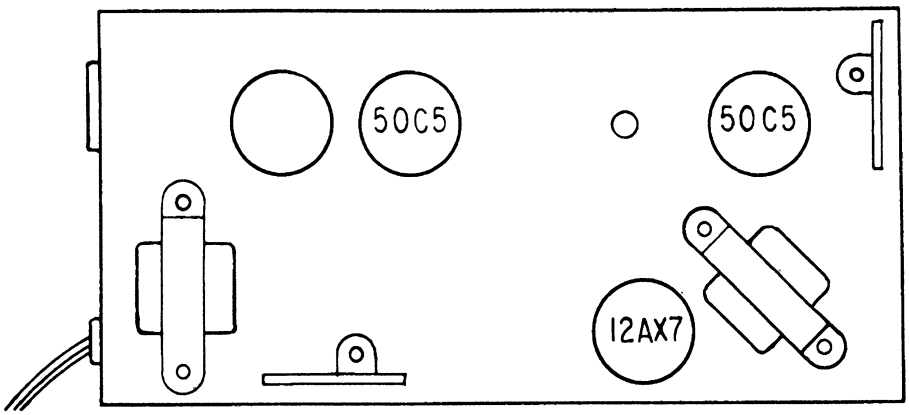
2L20 SCHEMATIC FOR MODEL LPS45



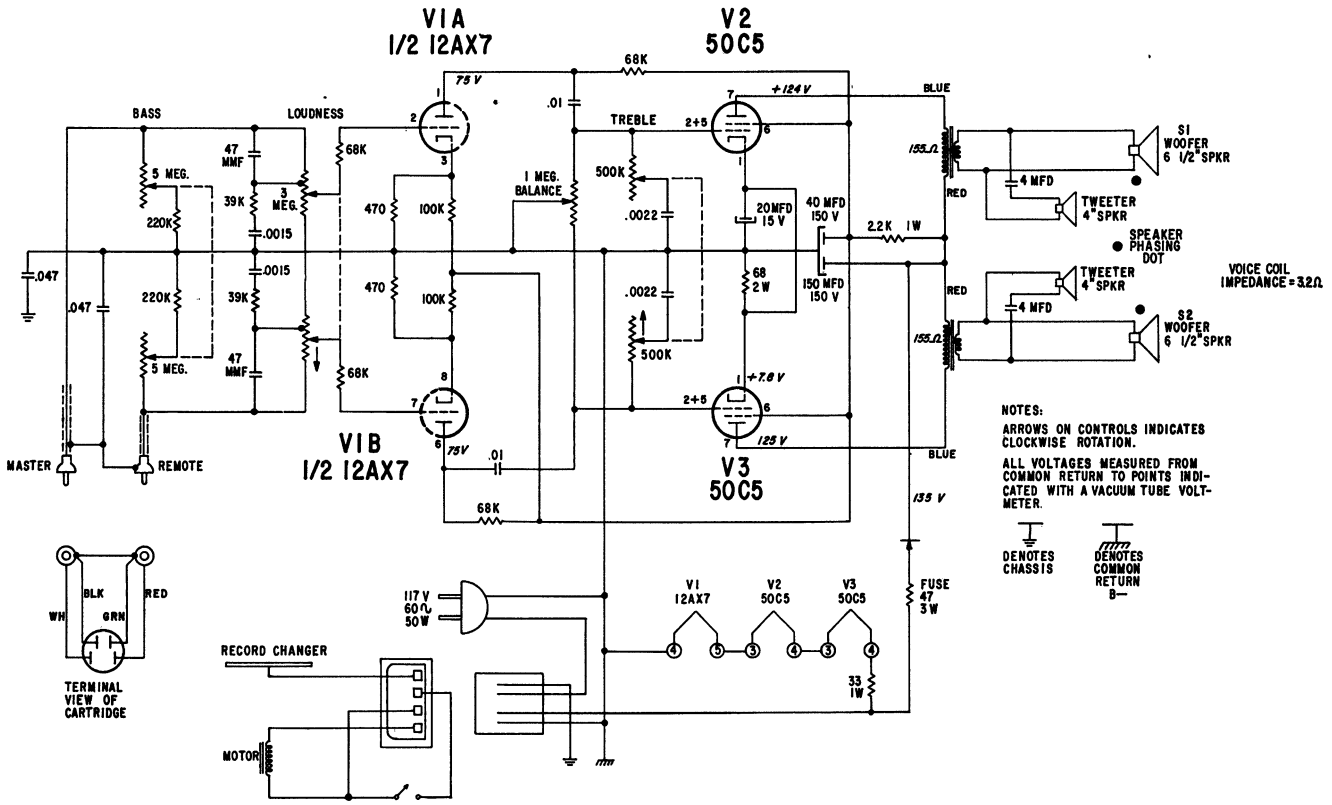
2L20 TUBE LAYOUT FOR MODEL LPS45



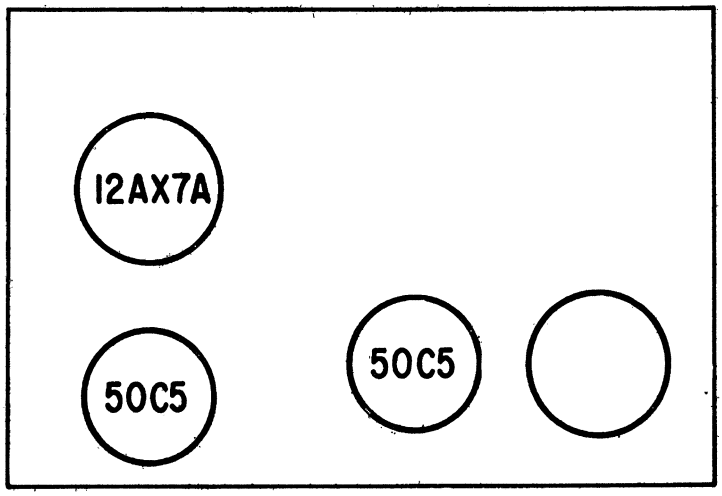
SCHEMATIC FOR KPS50



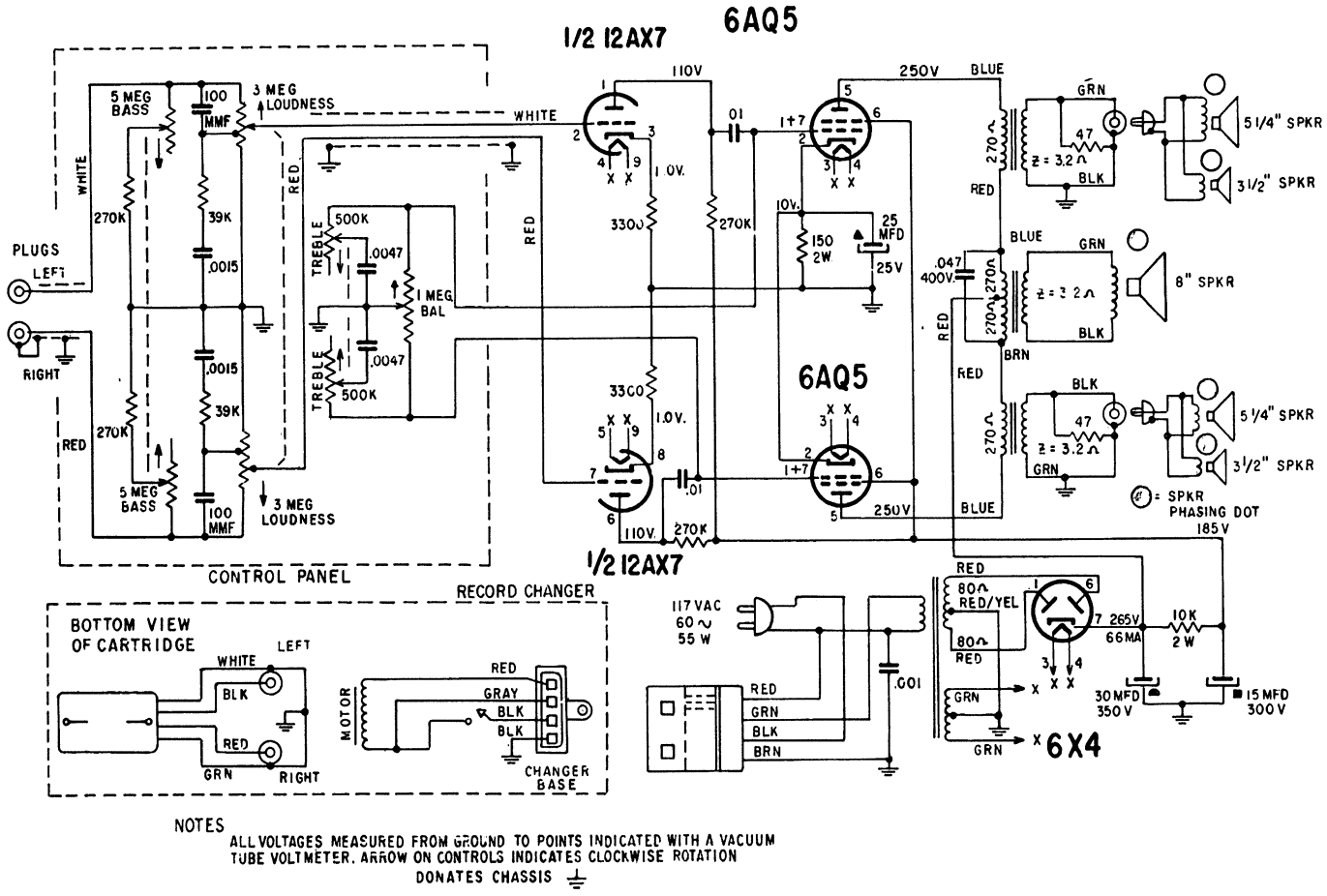
TUBE LAYOUT FOR KPS50



SCHEMATIC FOR KPS70-1



TUBE LAYOUT FOR KPS70-1

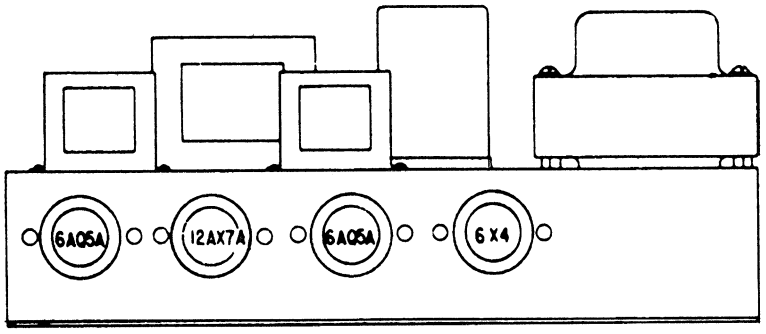


NOTES

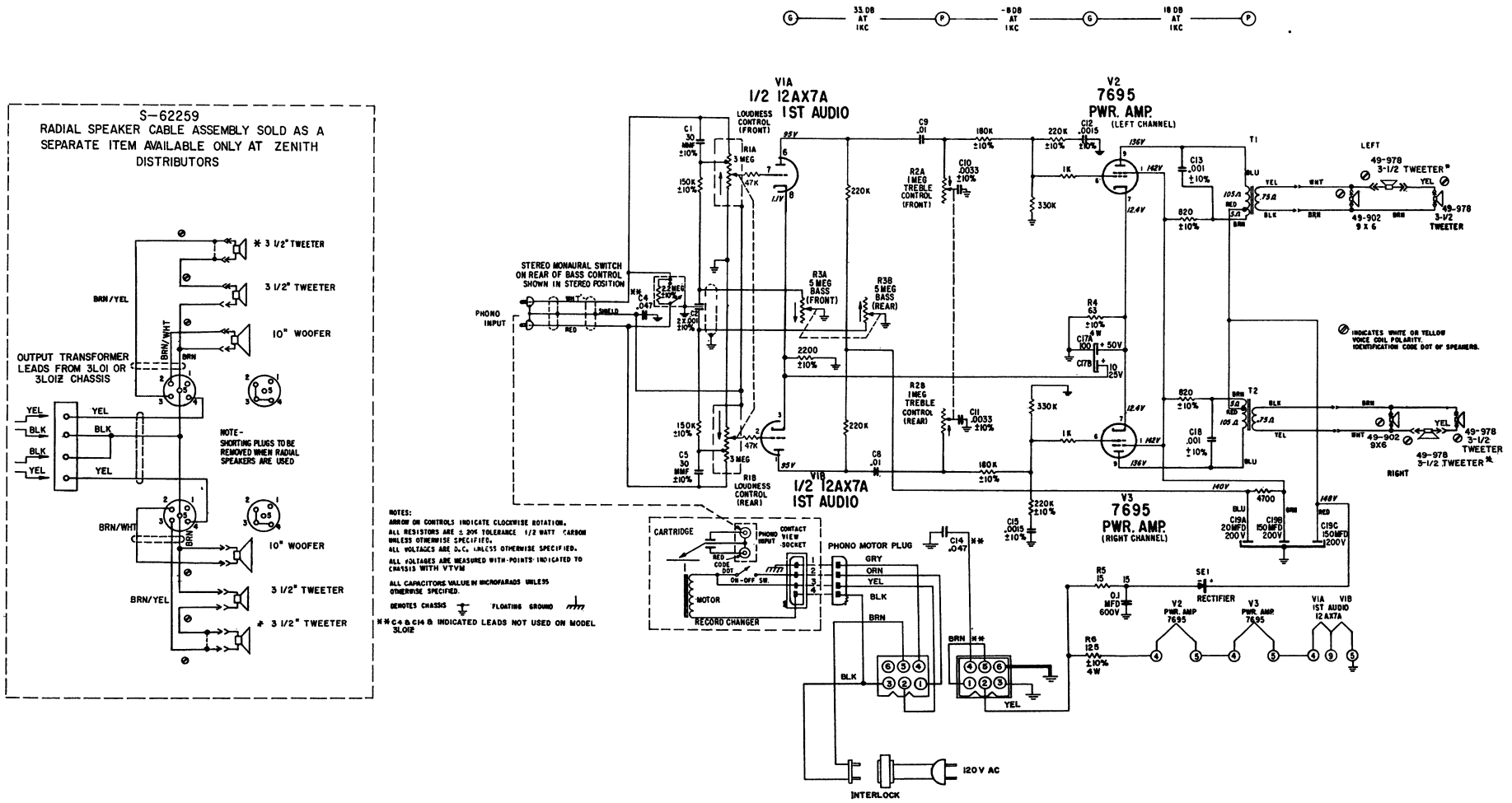
ALL VOLTAGES MEASURED FROM GROUND TO POINTS INDICATED WITH A VACUUM TUBE VOLTMETER. ARROW ON CONTROLS INDICATES CLOCKWISE ROTATION

DONATES CHASSIS ⏚

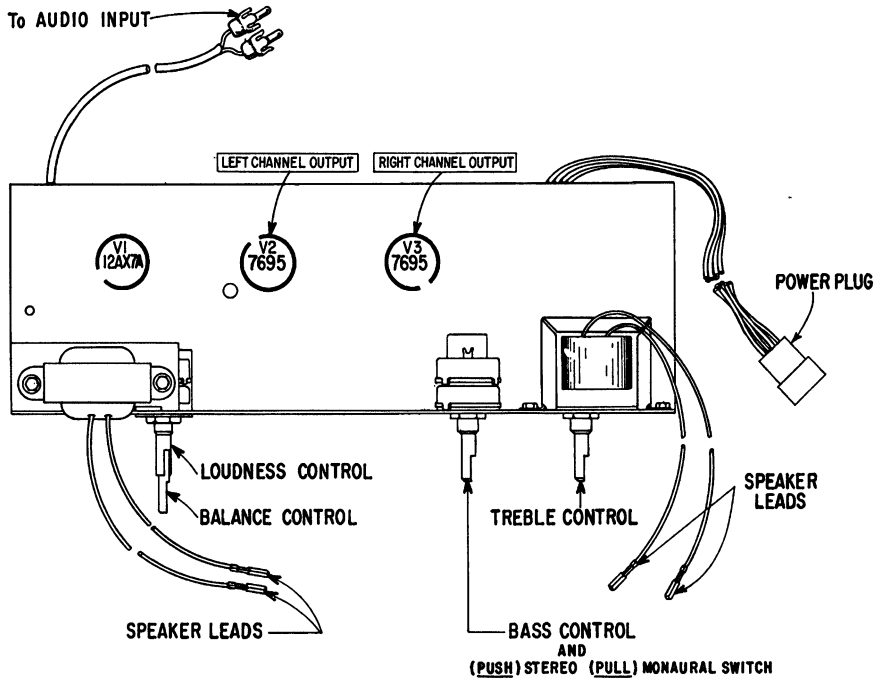
SCHEMATIC FOR KPS80-1



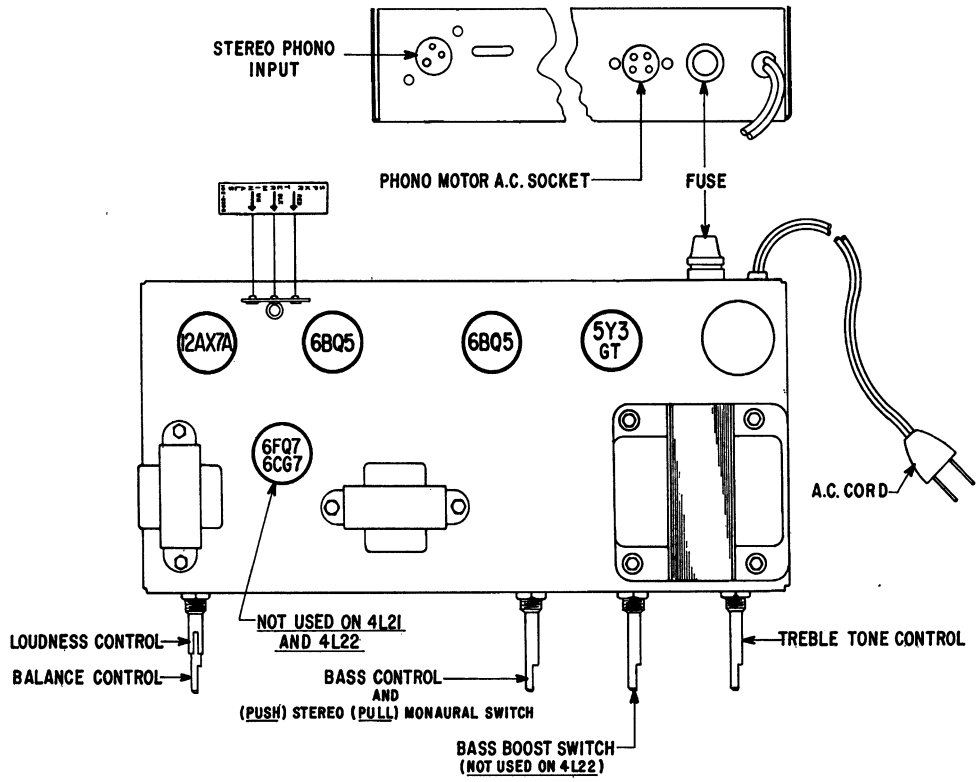
TUBE LAYOUT FOR KPS80-1



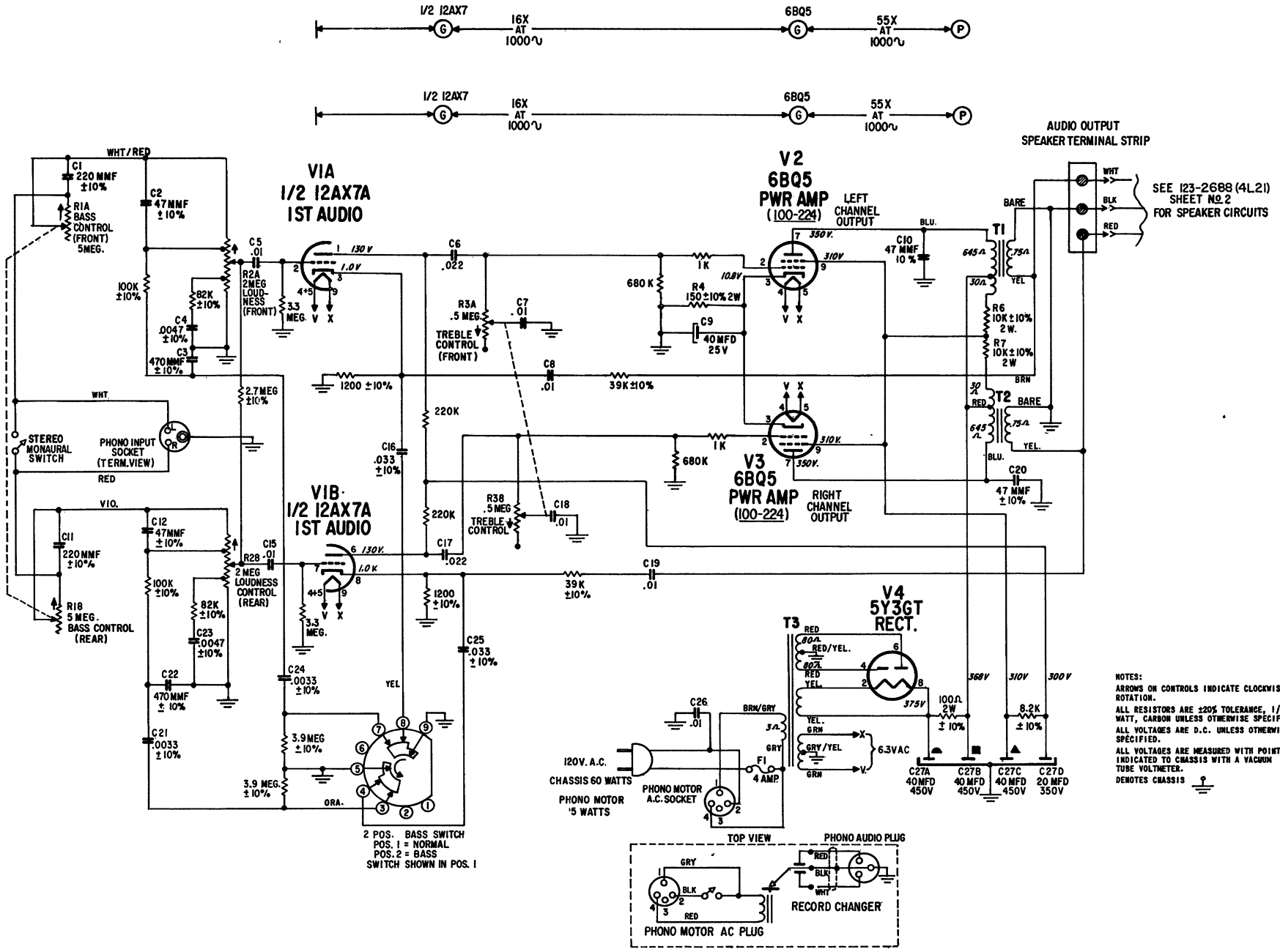
3L01 SCHEMATIC FOR MODELS SP401, MP401, ST1951, MT1951, MT1955, ST1959, SL2501 AND ML2601.



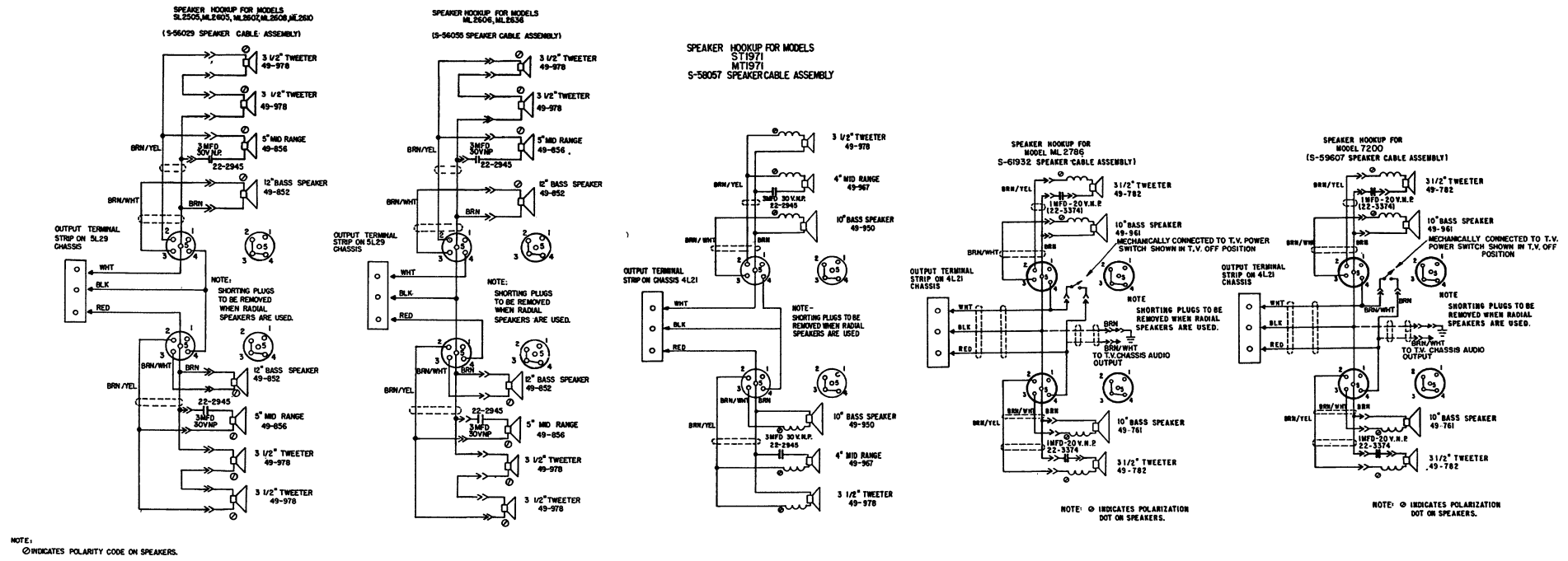
3L01 TUBE LAYOUT FOR MODELS SP401, MP401, ST1951, MT1951, MT1955, ST1959, SL2501 AND ML2601.



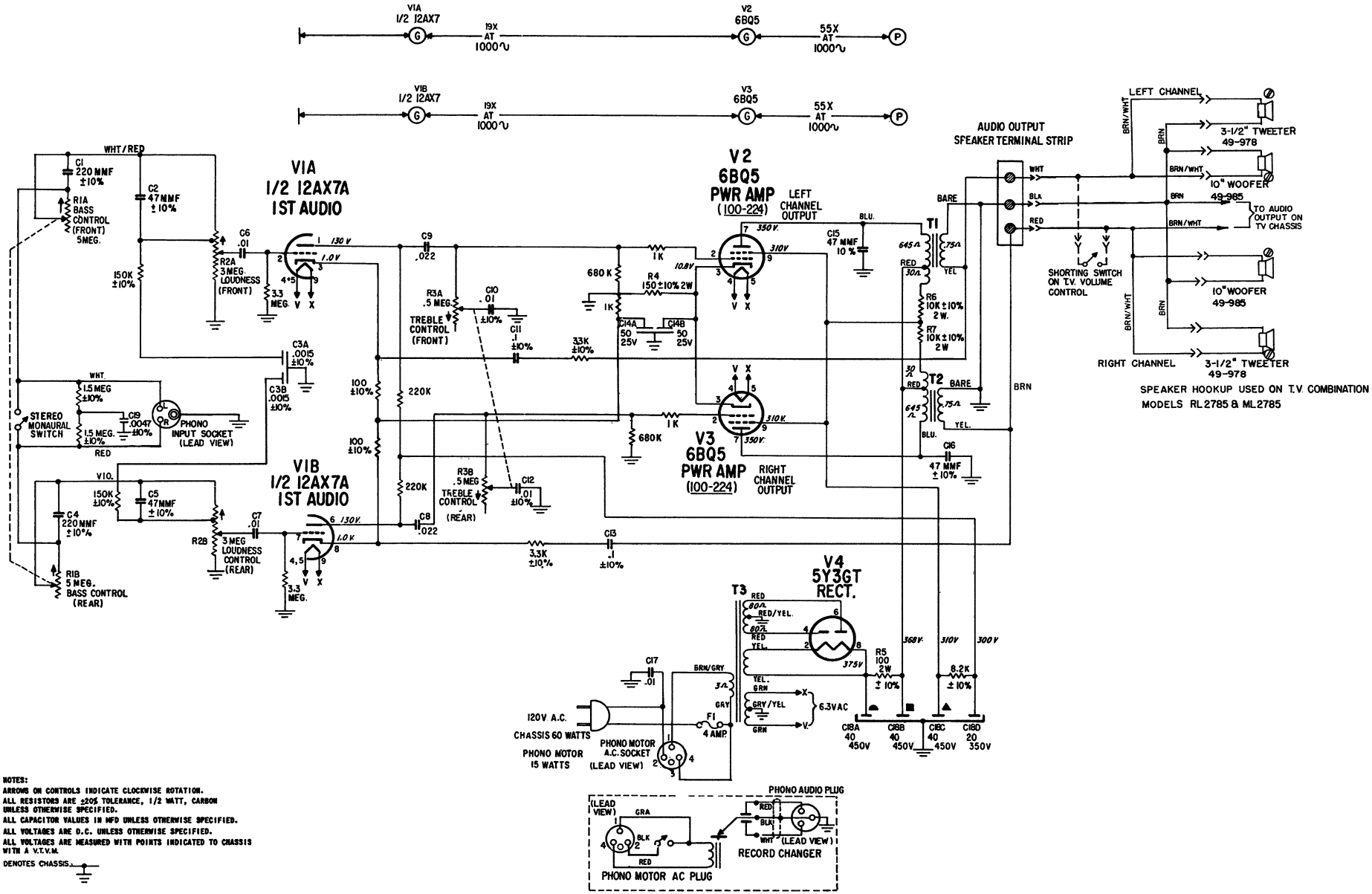
4L21, 4L22 AND 5L29 TUBE LAYOUT FOR MODELS ST1971, MT1971, ST1981, MT1981, SL2505, ML2605, ML2606, ML2607, ML2608, ML2610, ML2636, RL2785, ML2785, ML2786 AND 7200.



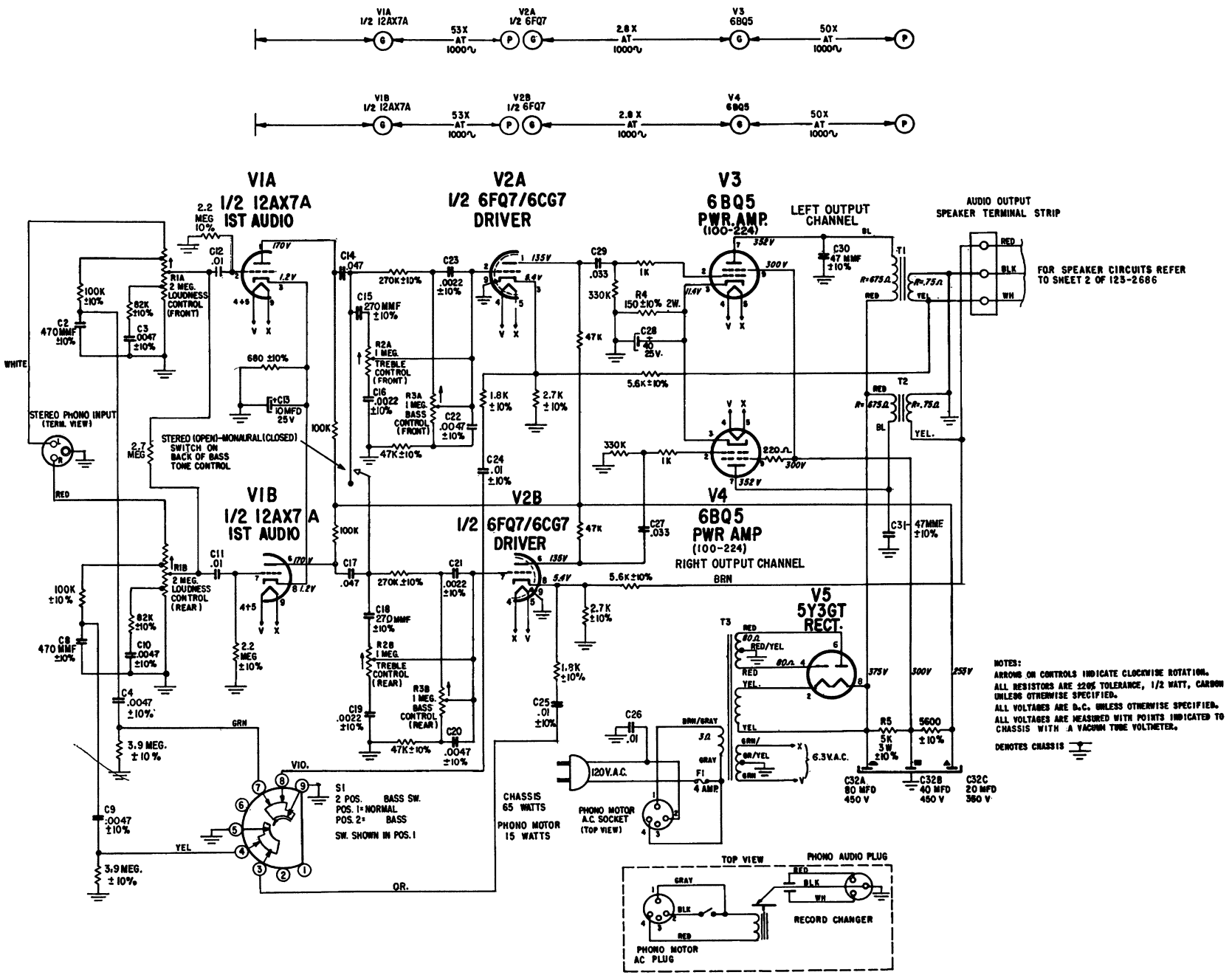
4L21 SCHEMATIC FOR MODELS ST1971, MT1971, ST1981, MT1981, ML2786 AND 7200.



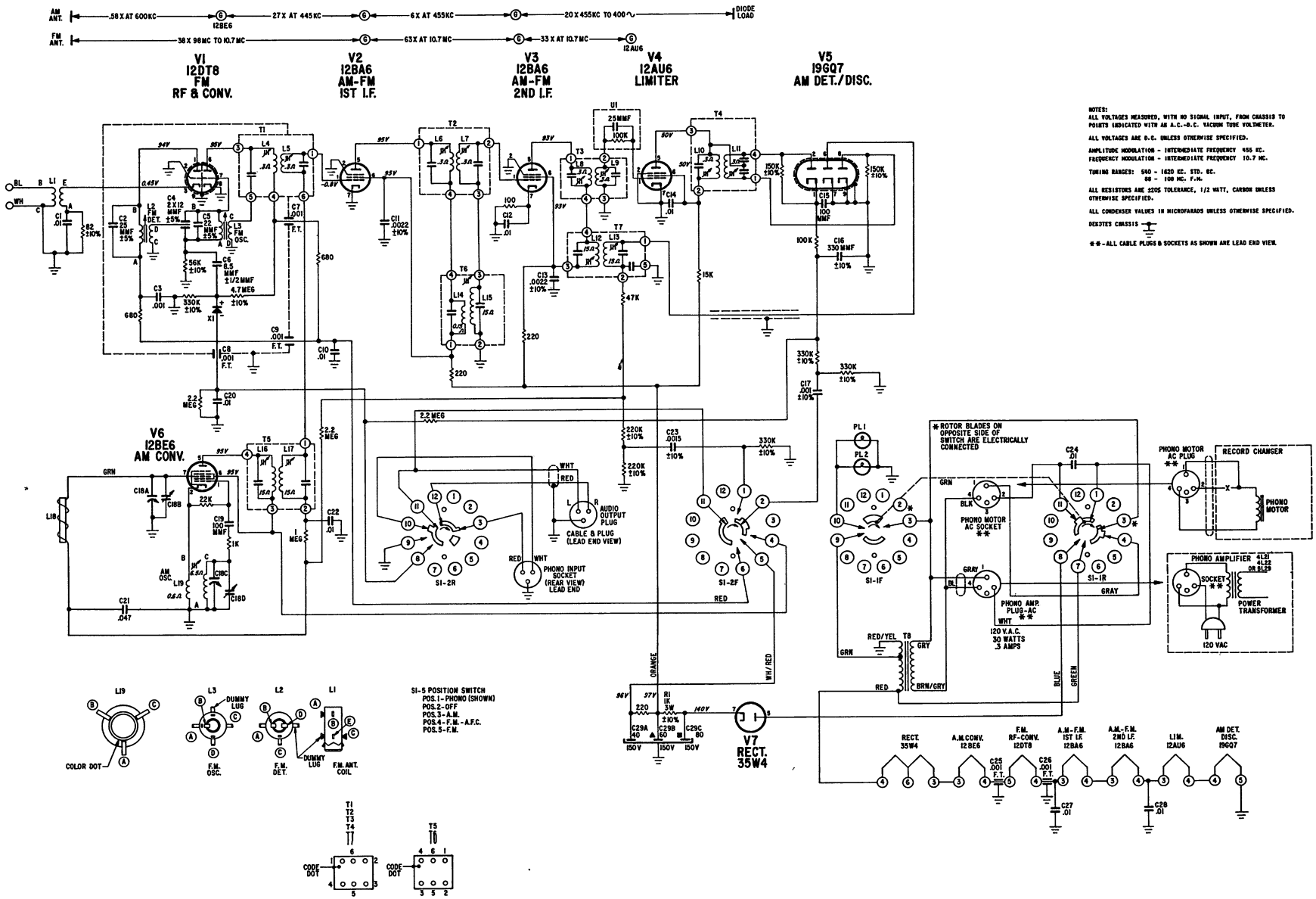
4L21 AND 5L29 SPEAKER SCHEMATICS FOR MODELS ST1971, MT1971, ST1981, MT1981, ML2786, 7200 AND SL2505, ML2605, ML2606, ML2607, ML2608, ML2610, ML2636.



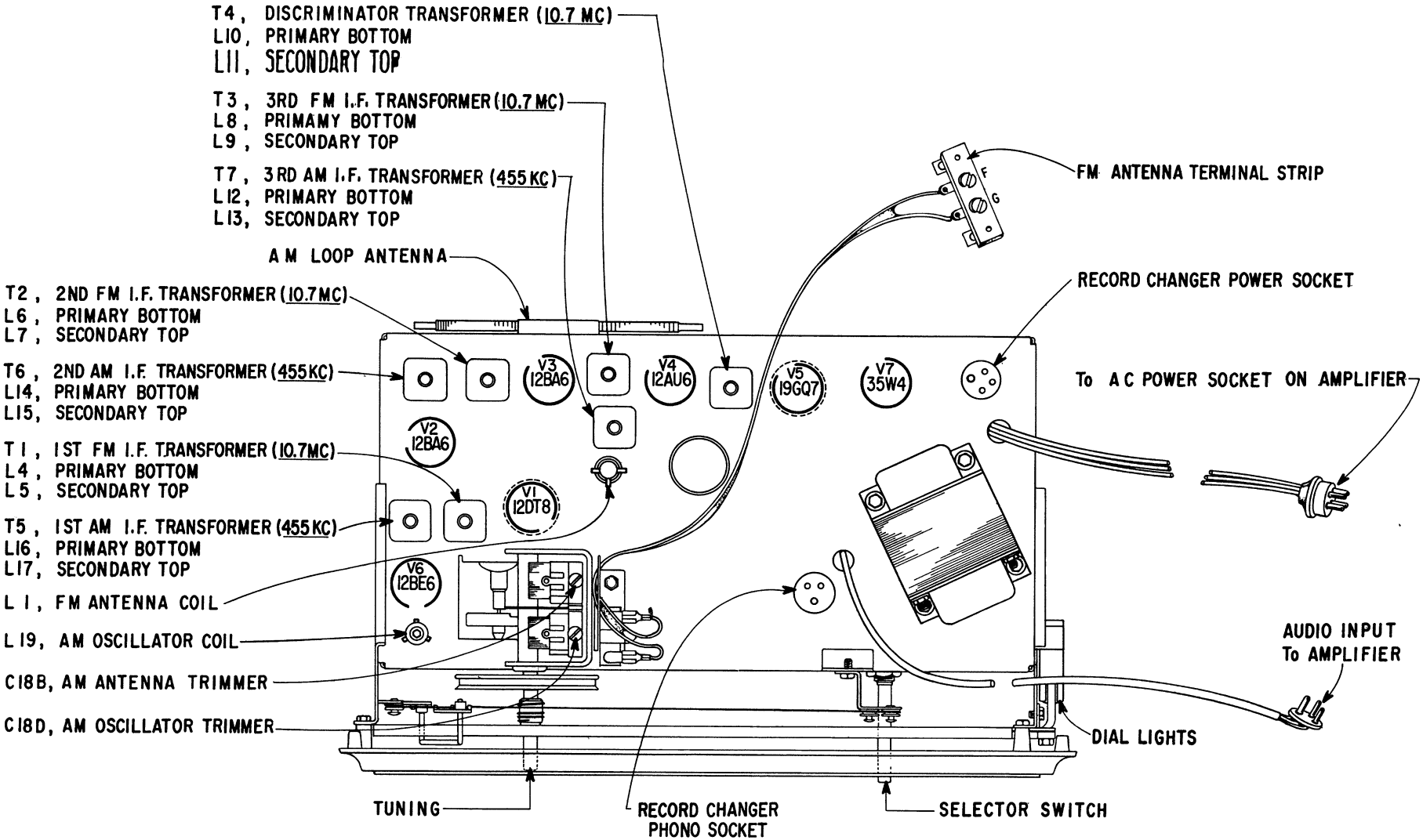
4L22 SCHEMATIC FOR MODELS RL2785 AND ML2785.



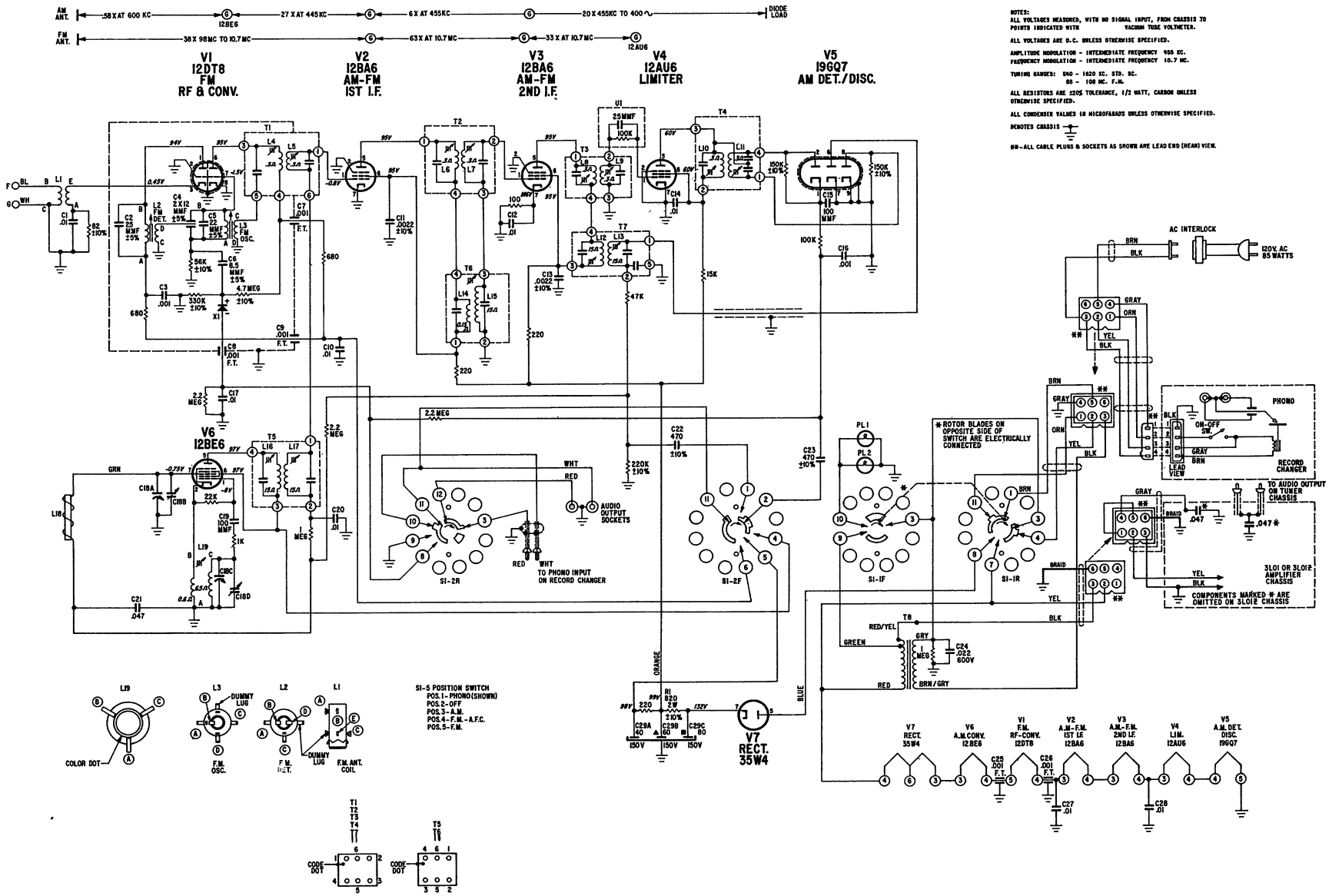
5L29 SCHEMATIC FOR MODELS SL2505, ML2605, ML2606, ML2607, ML2608, ML2610 AND ML2636.



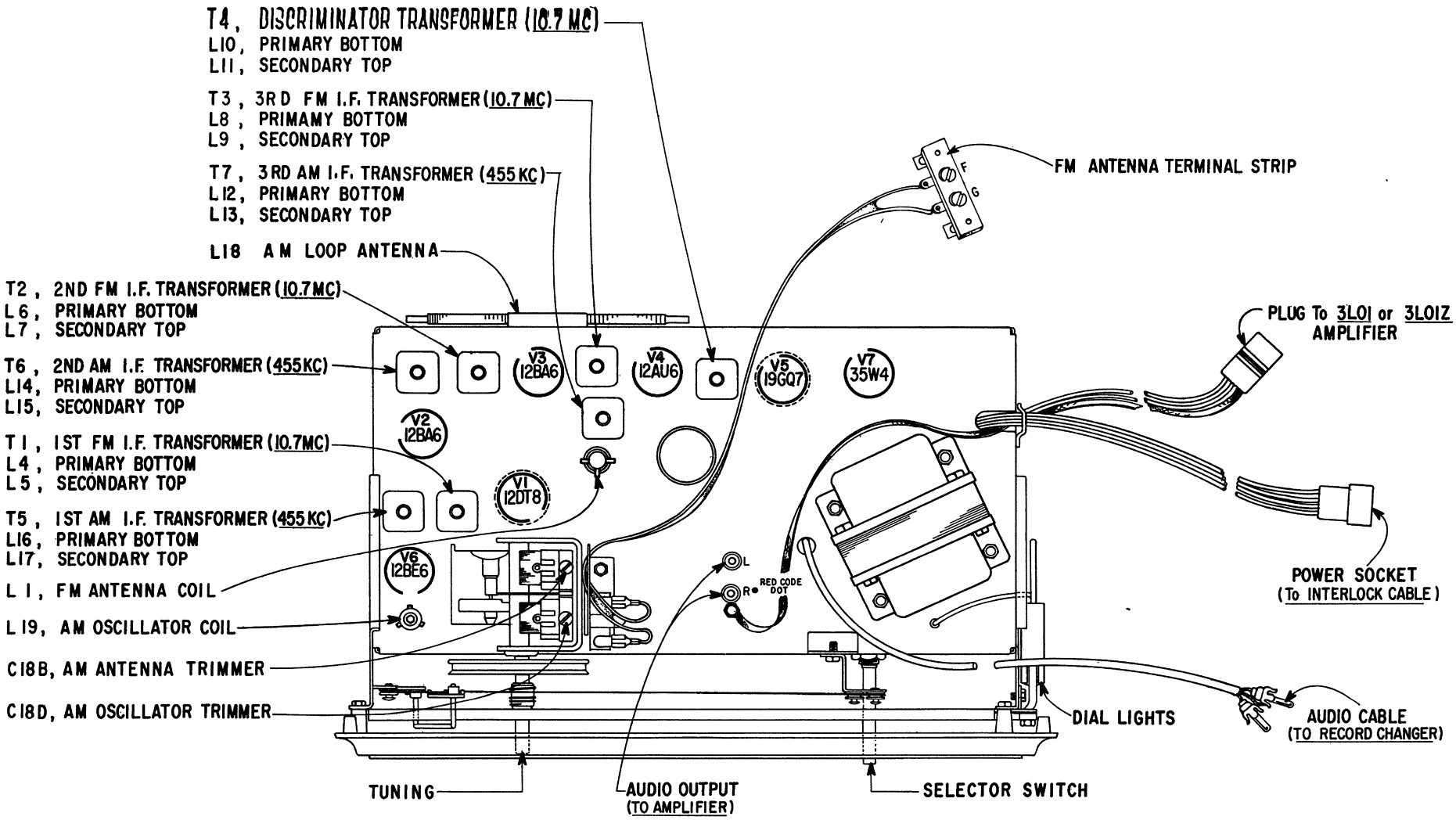
7L20 SCHEMATIC FOR MODEL RL2785.



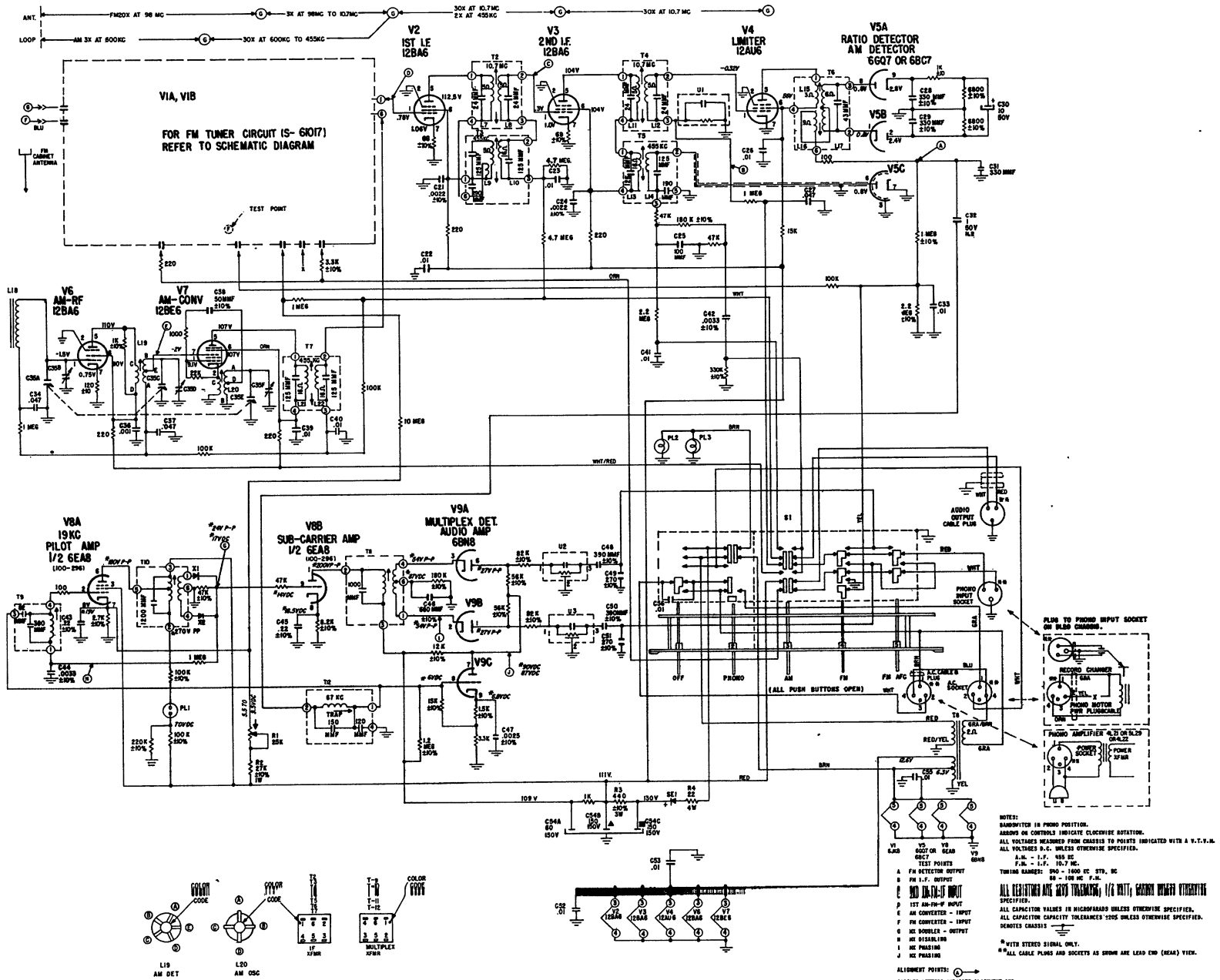
7L20 TUBE LAYOUT FOR MODEL RL2785.



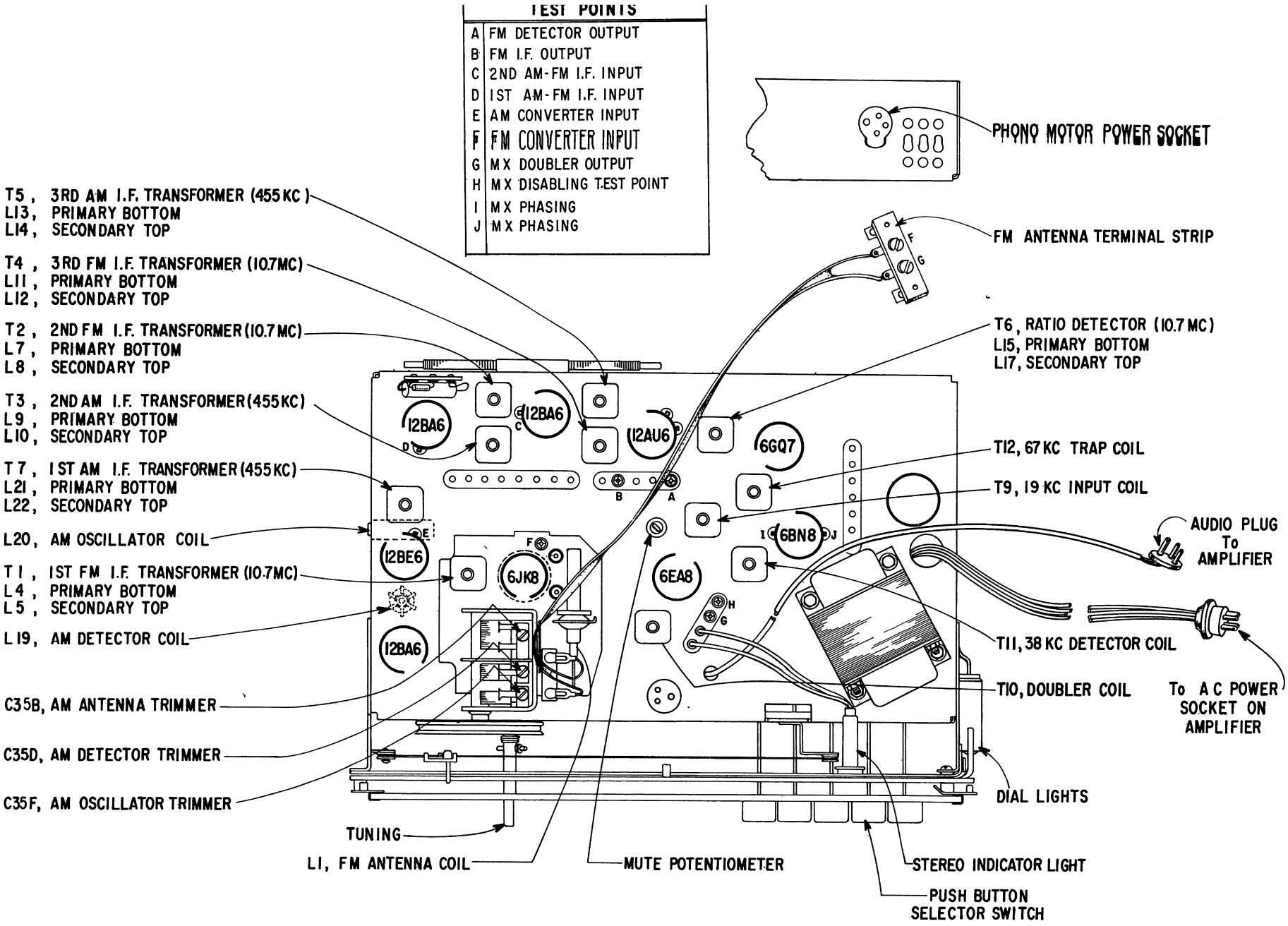
7L21 SCHEMATIC



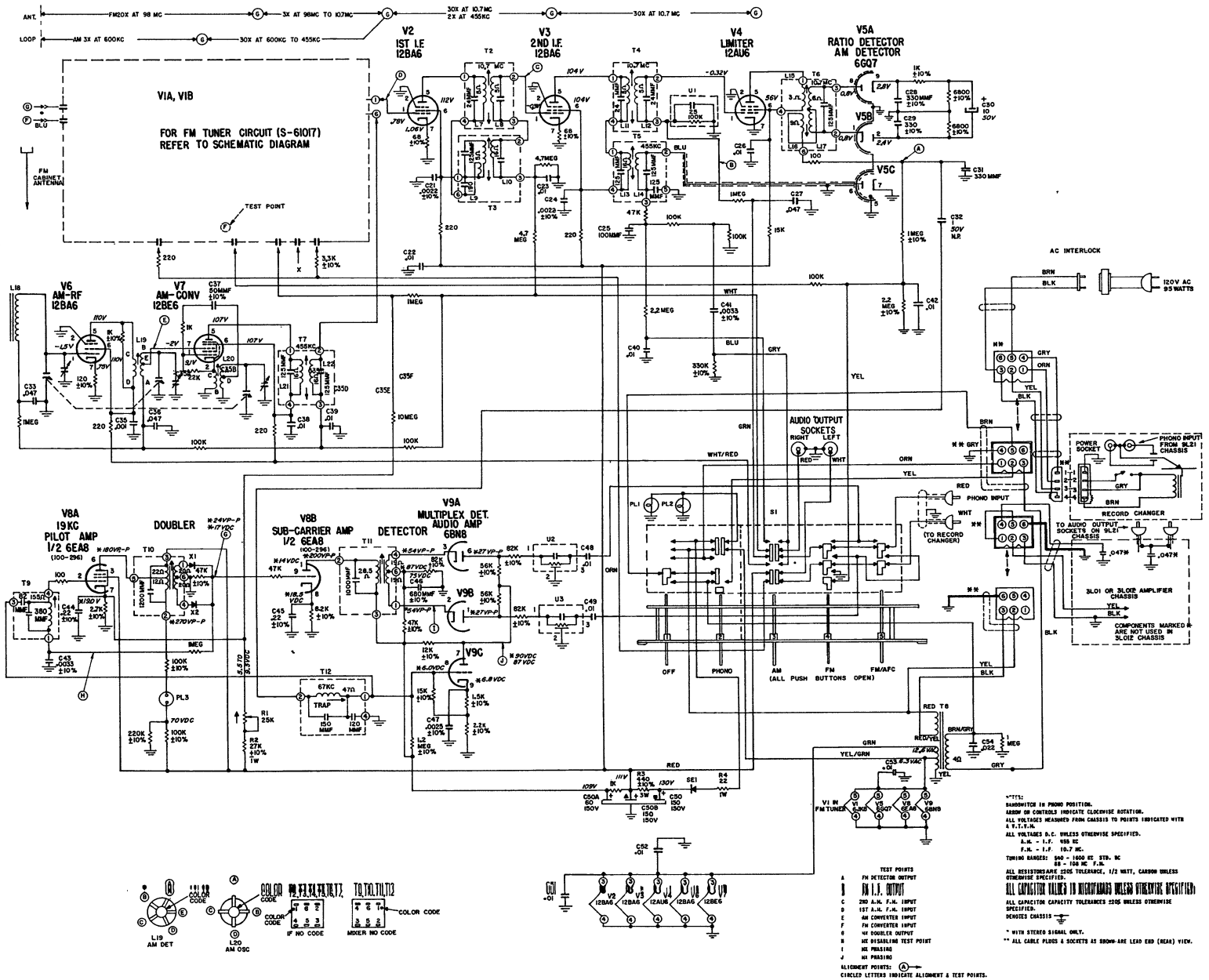
7L21 TUBE LAYOUT



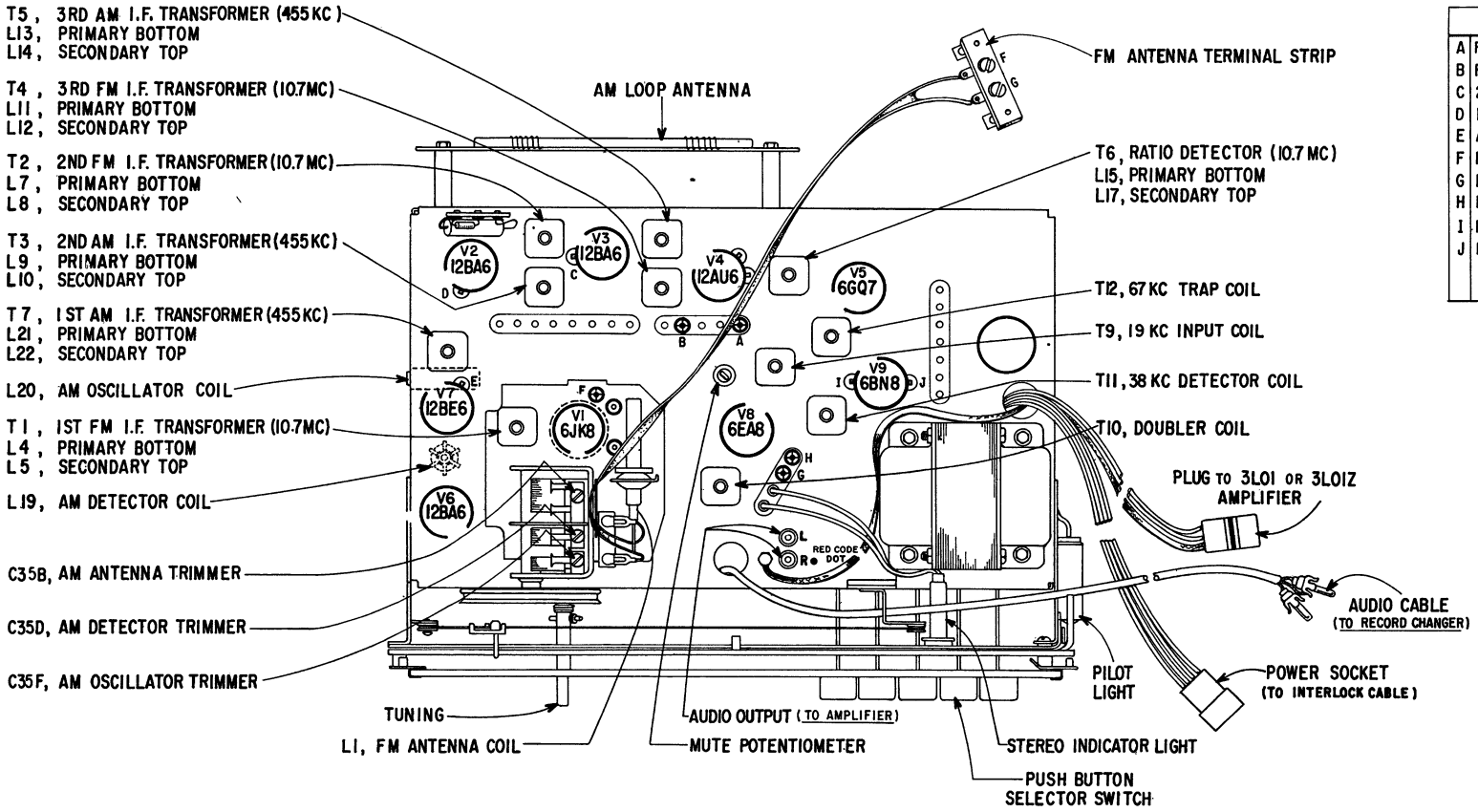
9L20 SCHEMATIC FOR MODELS ML2605, ML2606, ML2607, ML2608, ML2610, ML2636, ML2785, ML2786 AND 7200.



9L20 TUBE LAYOUT FOR MODELS ML2605, ML2606, ML2607, ML2608, ML2610, ML2636, ML2785, ML2786 AND 7200.

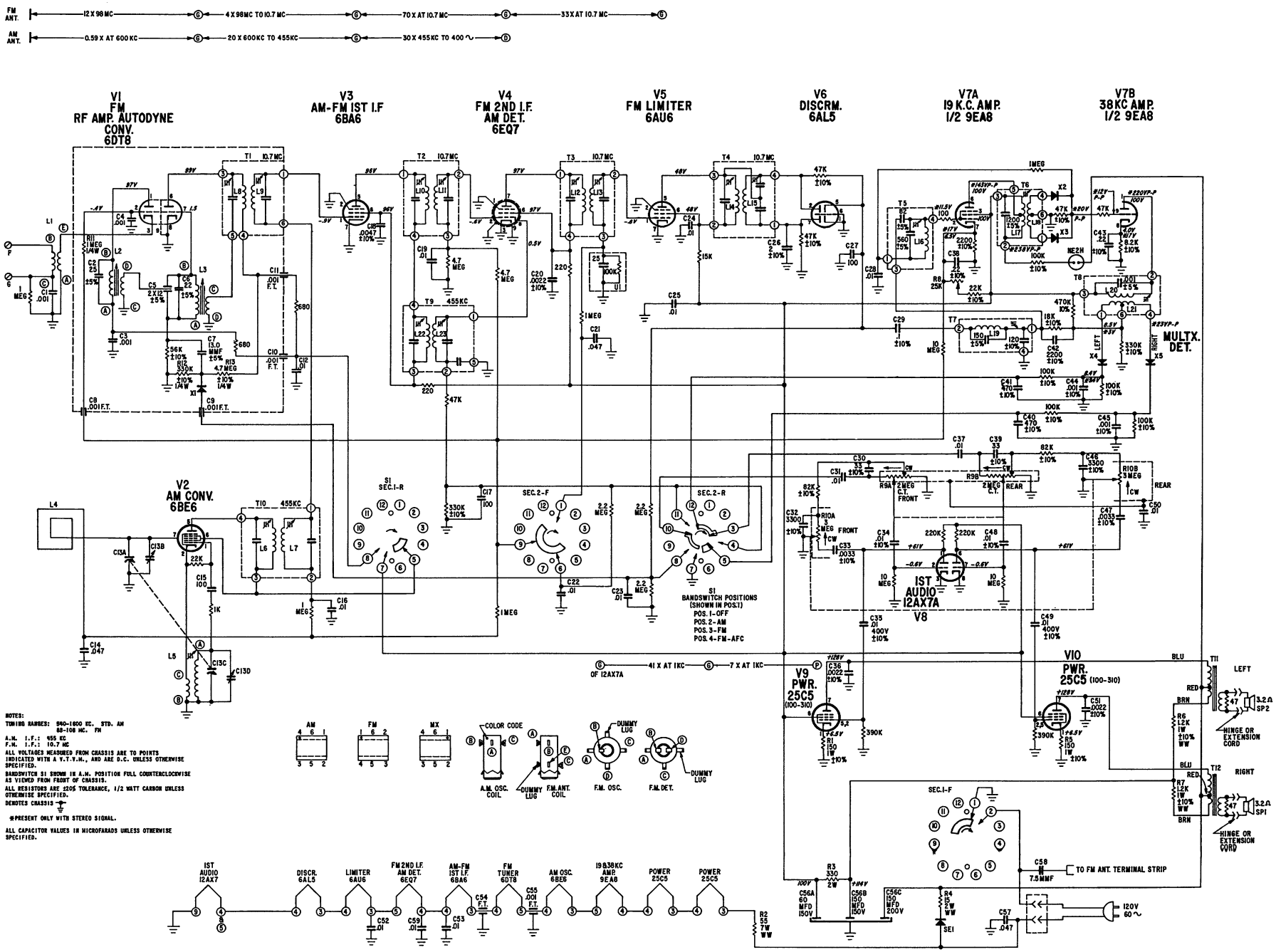


9L21 SCHEMATIC FOR MODELS MP401, MT1951, MT1955, MT1959 AND ML2601.

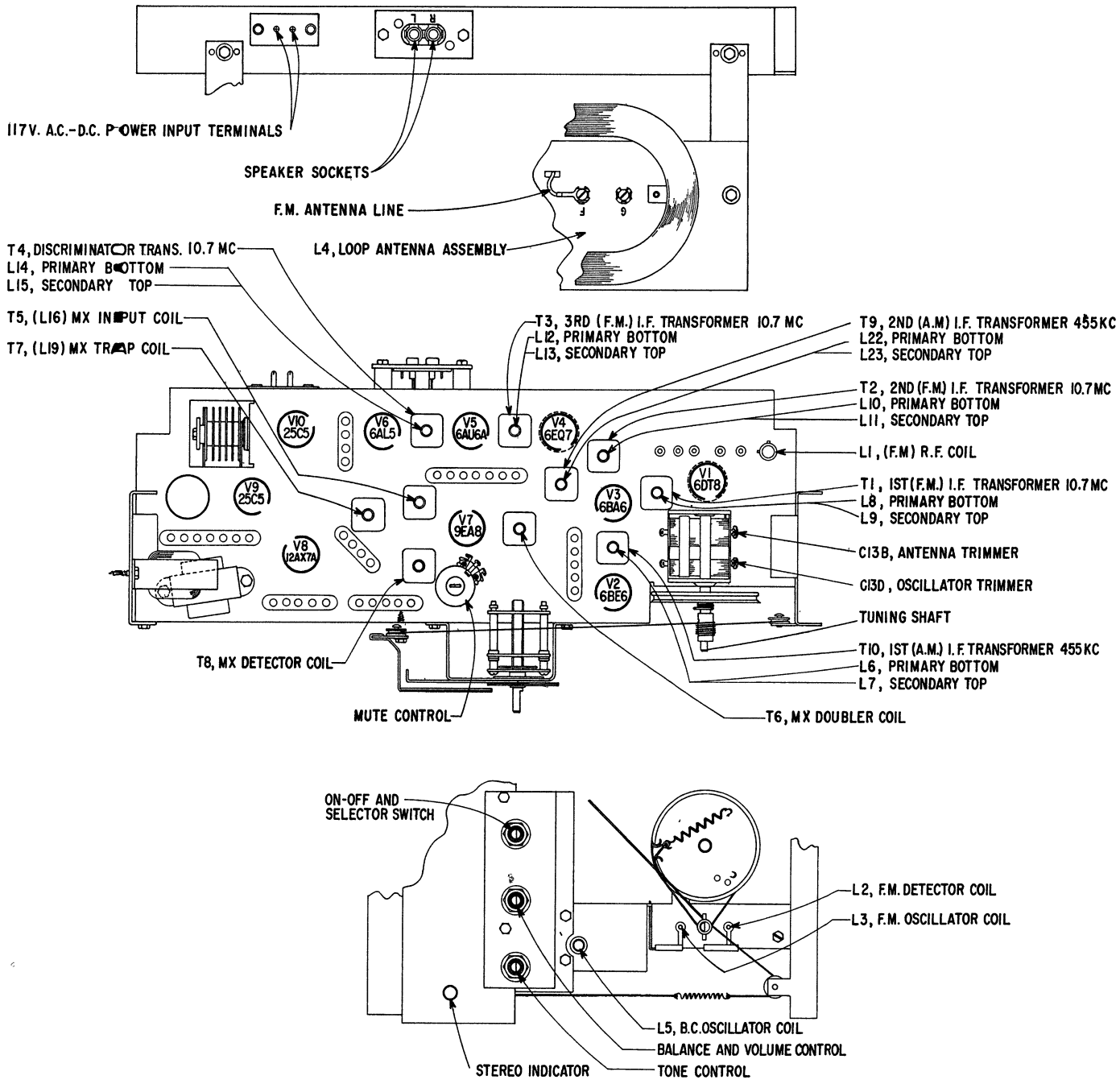


TEST POINTS	
A	FM DETECTOR OUTPUT
B	FM I.F OUTPUT
C	2ND AM-FM I.F. INPUT
D	IST AM-FM I.F. INPUT
E	AM CONVERTER INPUT
F	FM CONVERTER INPUT
G	MX DOUBLER OUTPUT
H	MX DISABLING TEST POINT
I	MX PHASING
J	MX PHASING

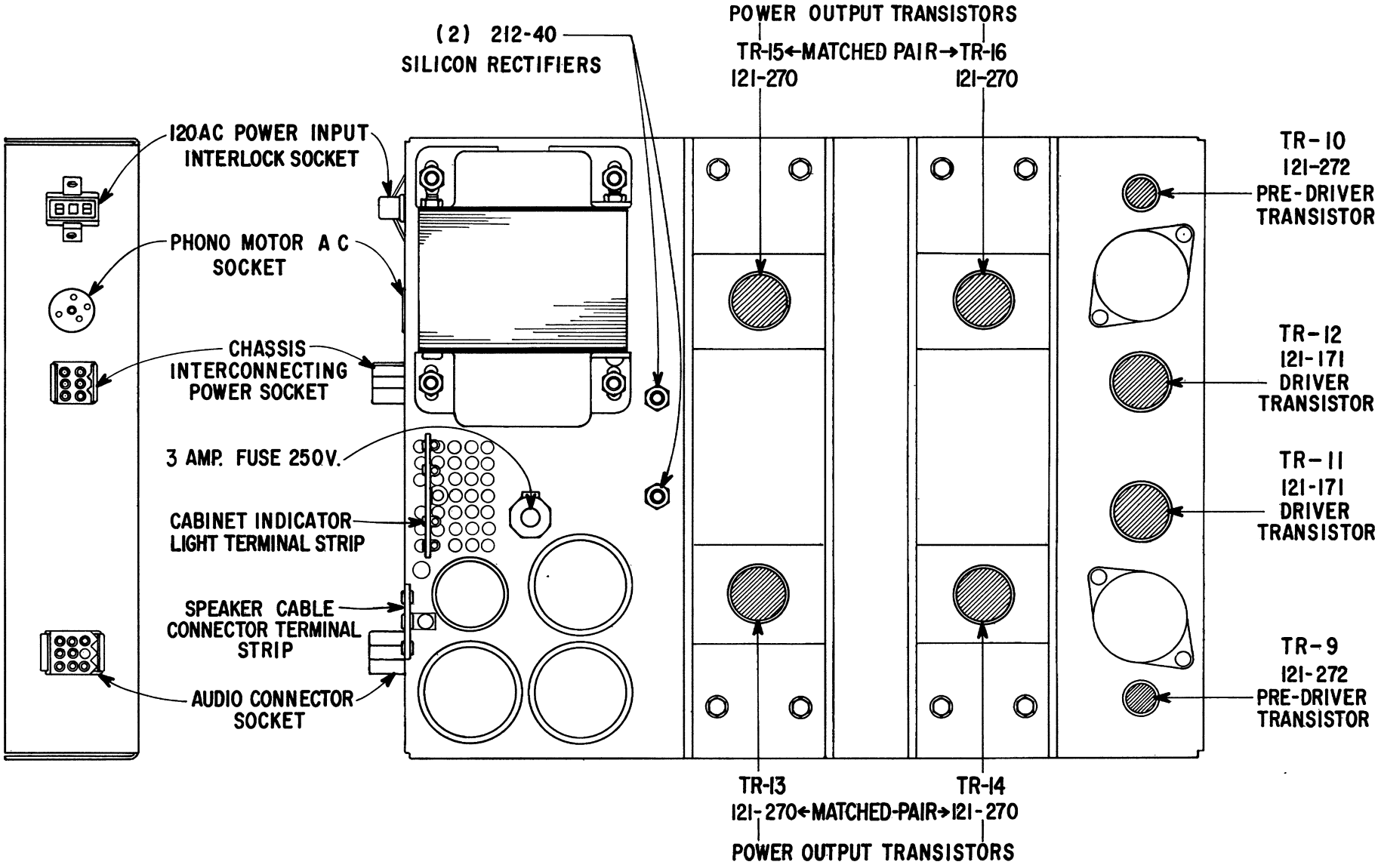
9L21 TUBE LAYOUT FOR MODELS MP401, MT1951, MT1955, MT1959 AND ML2601.



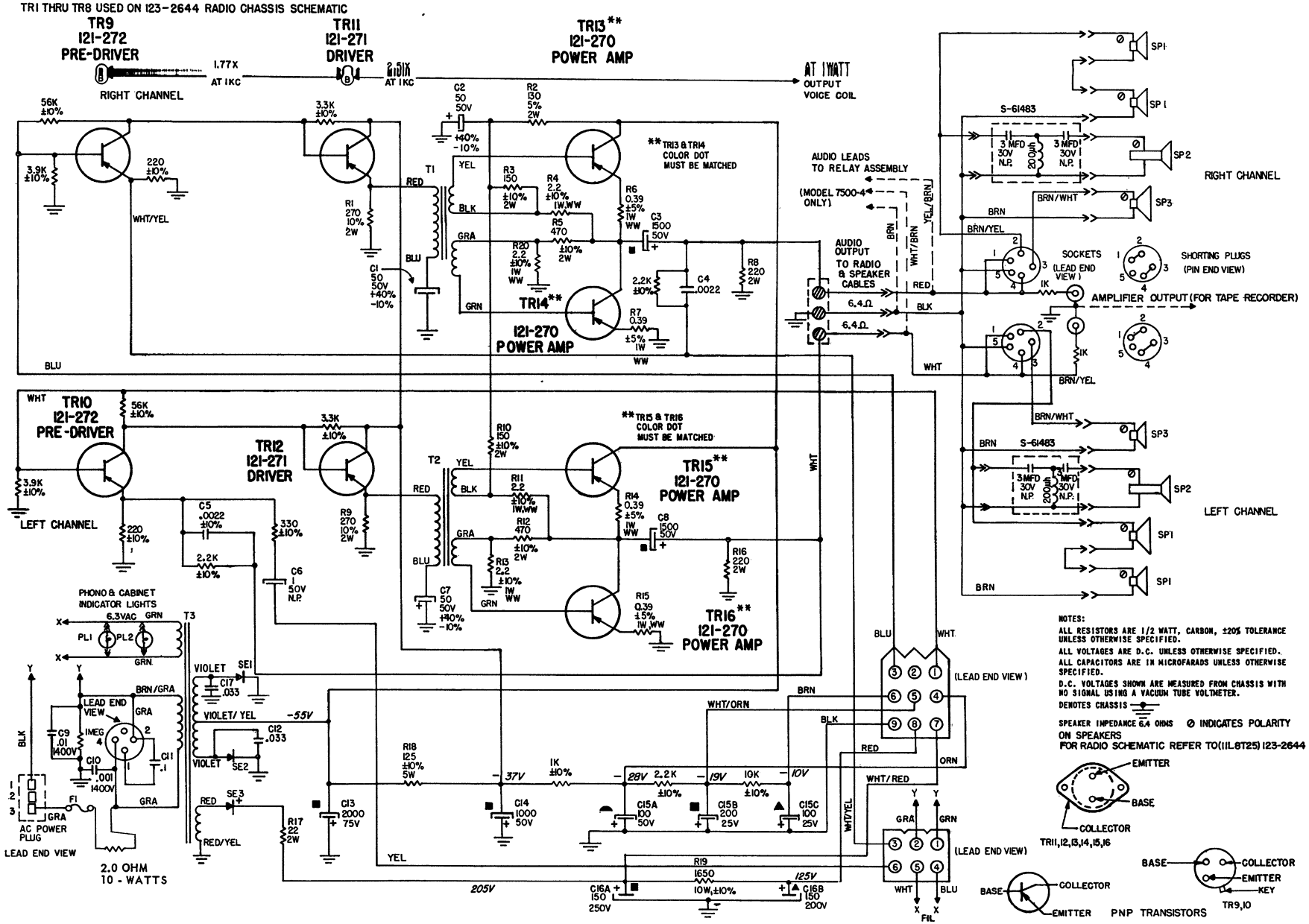
10K01 SCHEMATIC FOR MODEL MK1025.



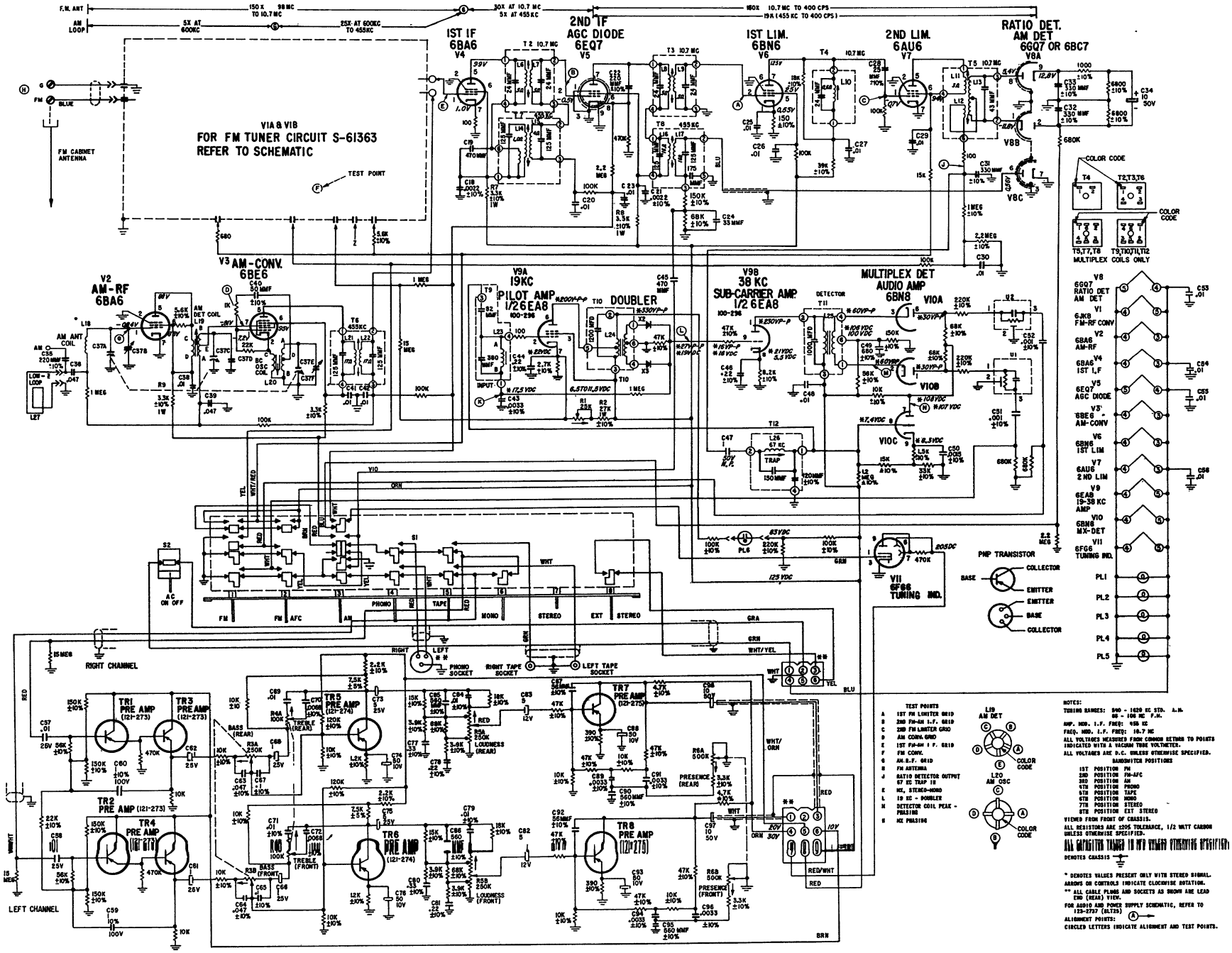
10K01 TUBE LAYOUT FOR MODEL MK1025.



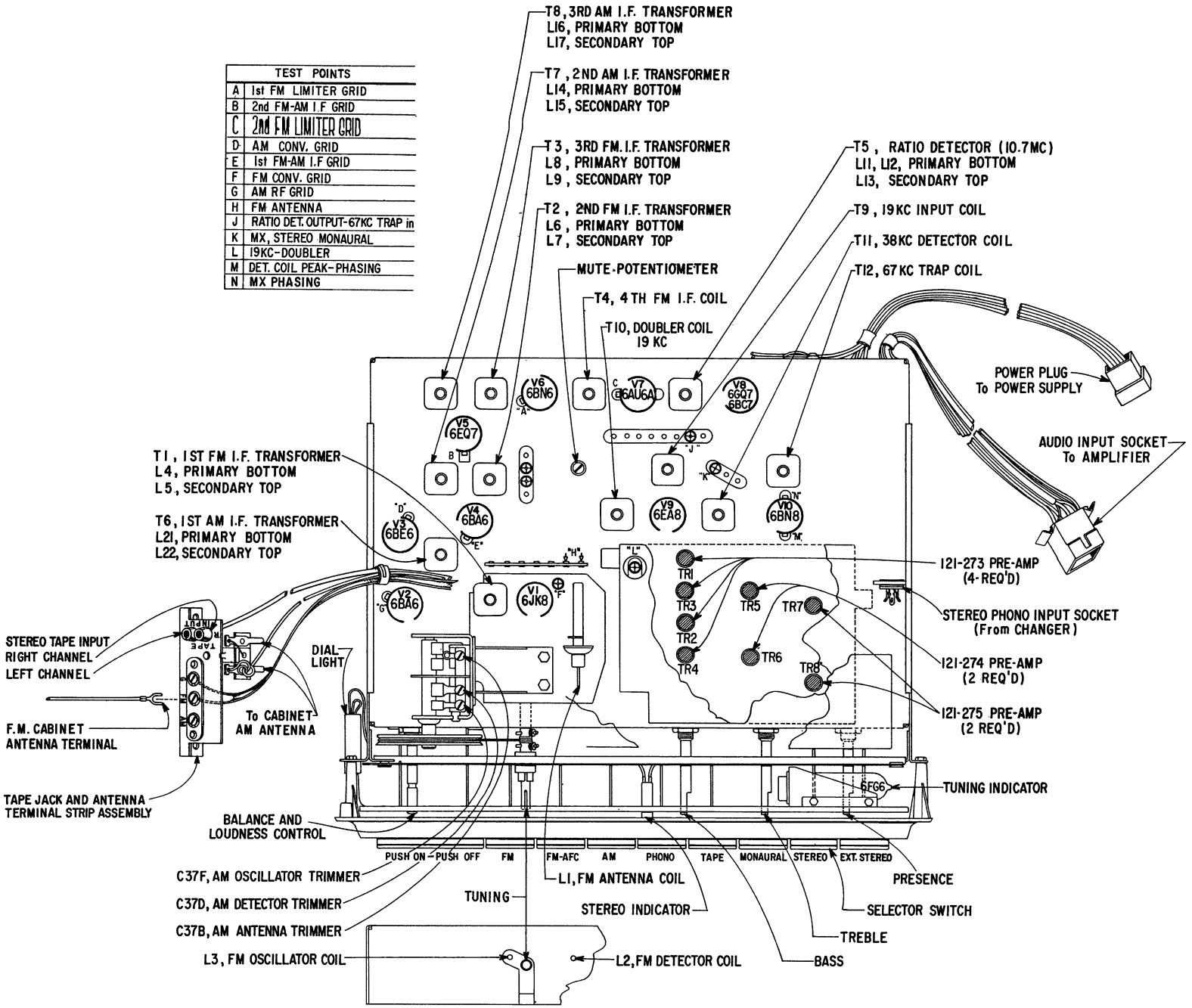
8LT25 TUBE LAYOUT FOR MODELS ML2668, ML2670, ML2675, ML2685 AND 7500.



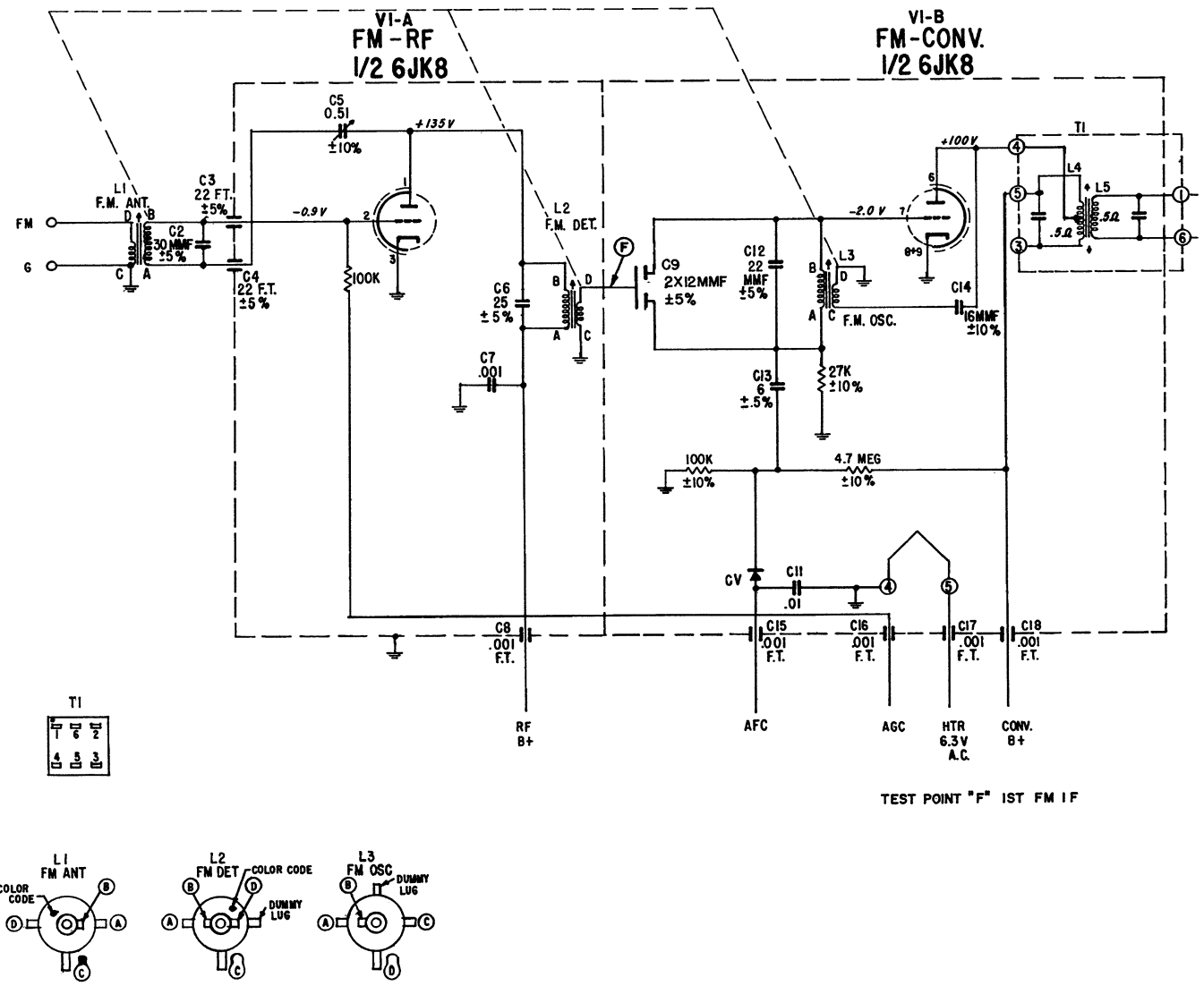
8LT25 SCHEMATIC FOR MODELS ML2668, ML2670, ML2675, ML2685 AND 7500.



11L8T25 SCHEMATIC FOR MODELS ML2668, ML2670, ML2675, ML2685 AND 7500.



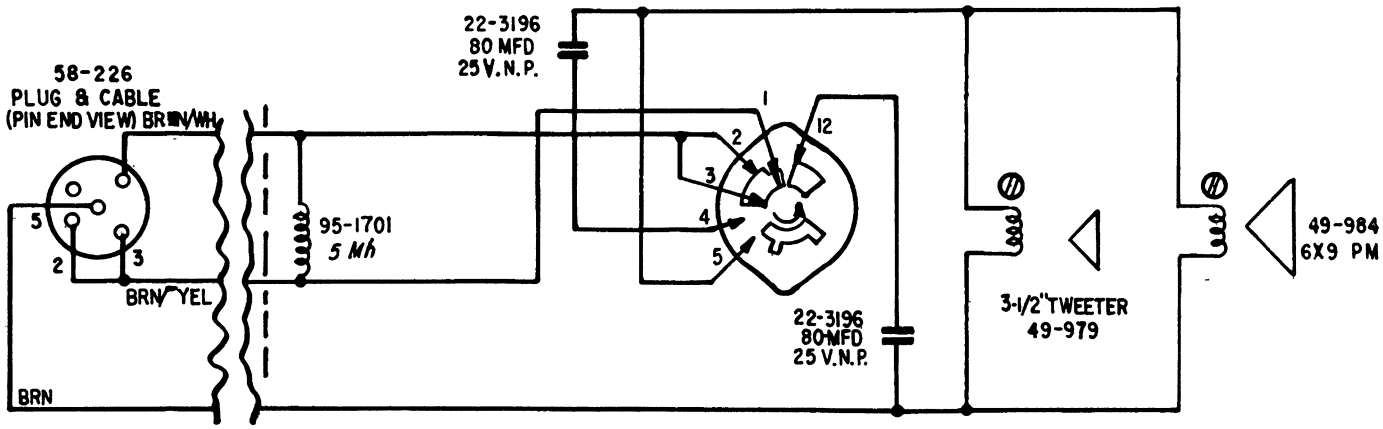
11L8T25 TUBE LAYOUT FOR MODELS ML2668, ML2670, ML2675, ML2685 AND 7500.



S-61017 AND S-61363 SCHEMATIC FOR FM TUNER USED ON CHASSIS 9L20, 9L21 AND 11L8T25.

SHOWN IN FIRST POSITION

1ST — OFF
2ND — RADIAL SPEAKER (ONLY)
3RD — MASTER & RADIAL SPEAKER

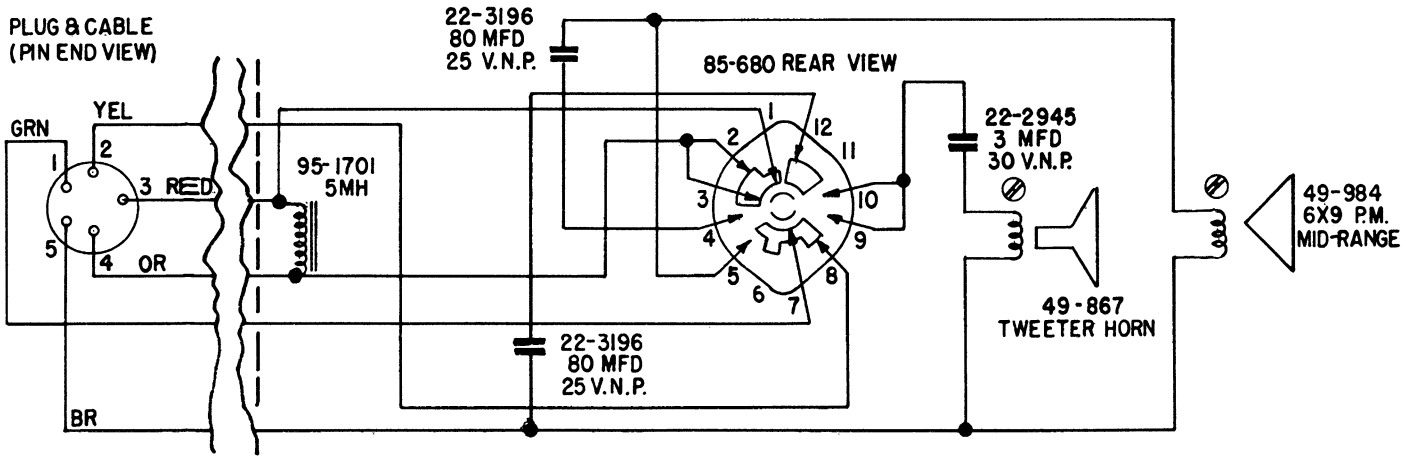


⊘ INDICATES POSITIVE POLARITY OF SPEAKER
(YELLOW OR WHITE)

SCHEMATIC FOR KR102

SHOWN IN FIRST POSITION

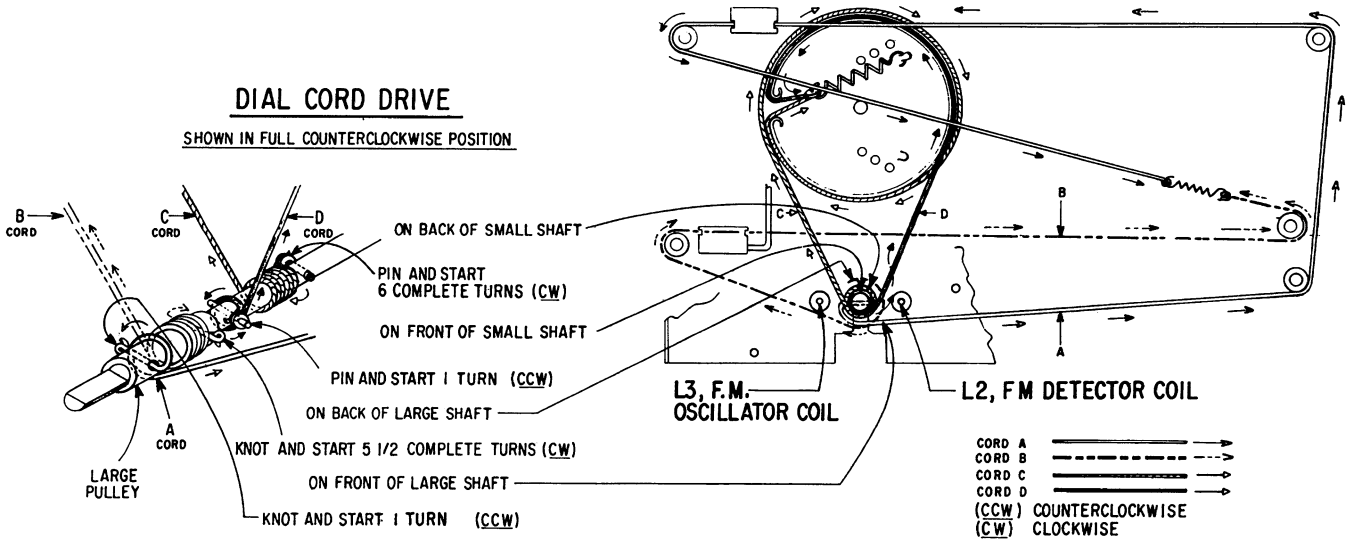
1ST — OFF
2ND — RADIAL SPEAKER (ONLY)
3RD MASTER & RADIAL SPEAKER



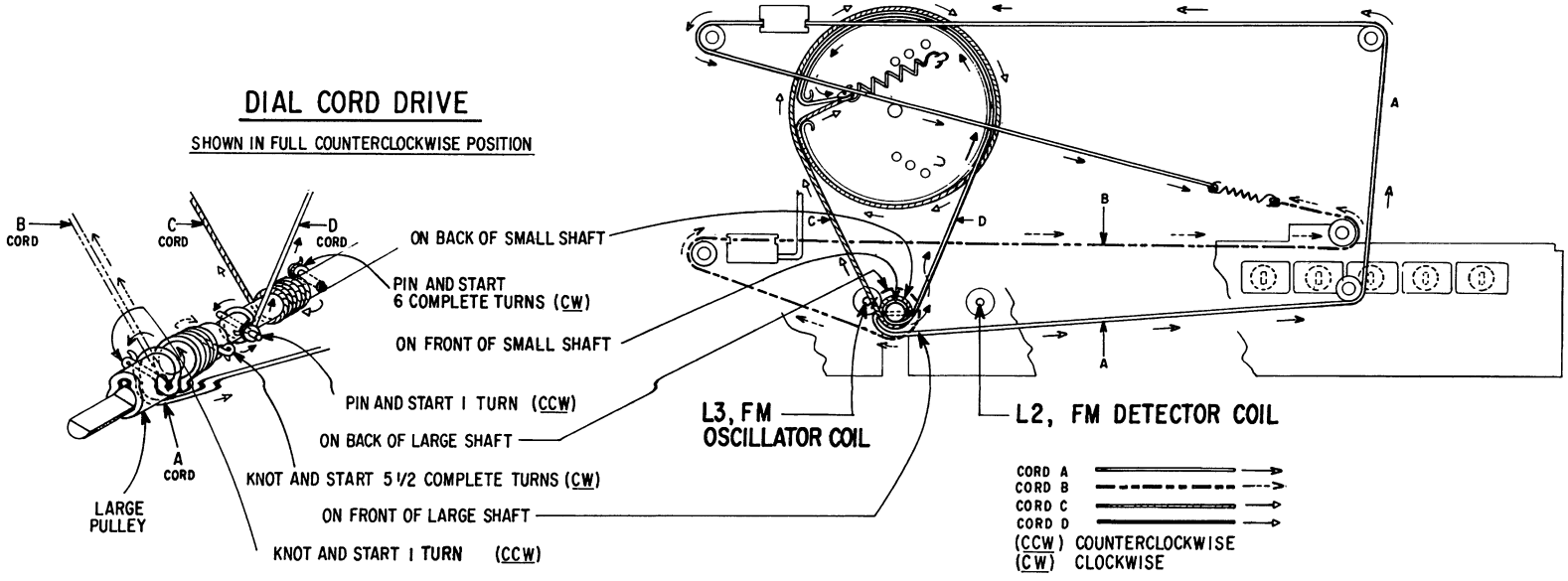
⊘ INDICATES POS. POLARITY OF SPEAKER
(YELLOW OR WHITE)

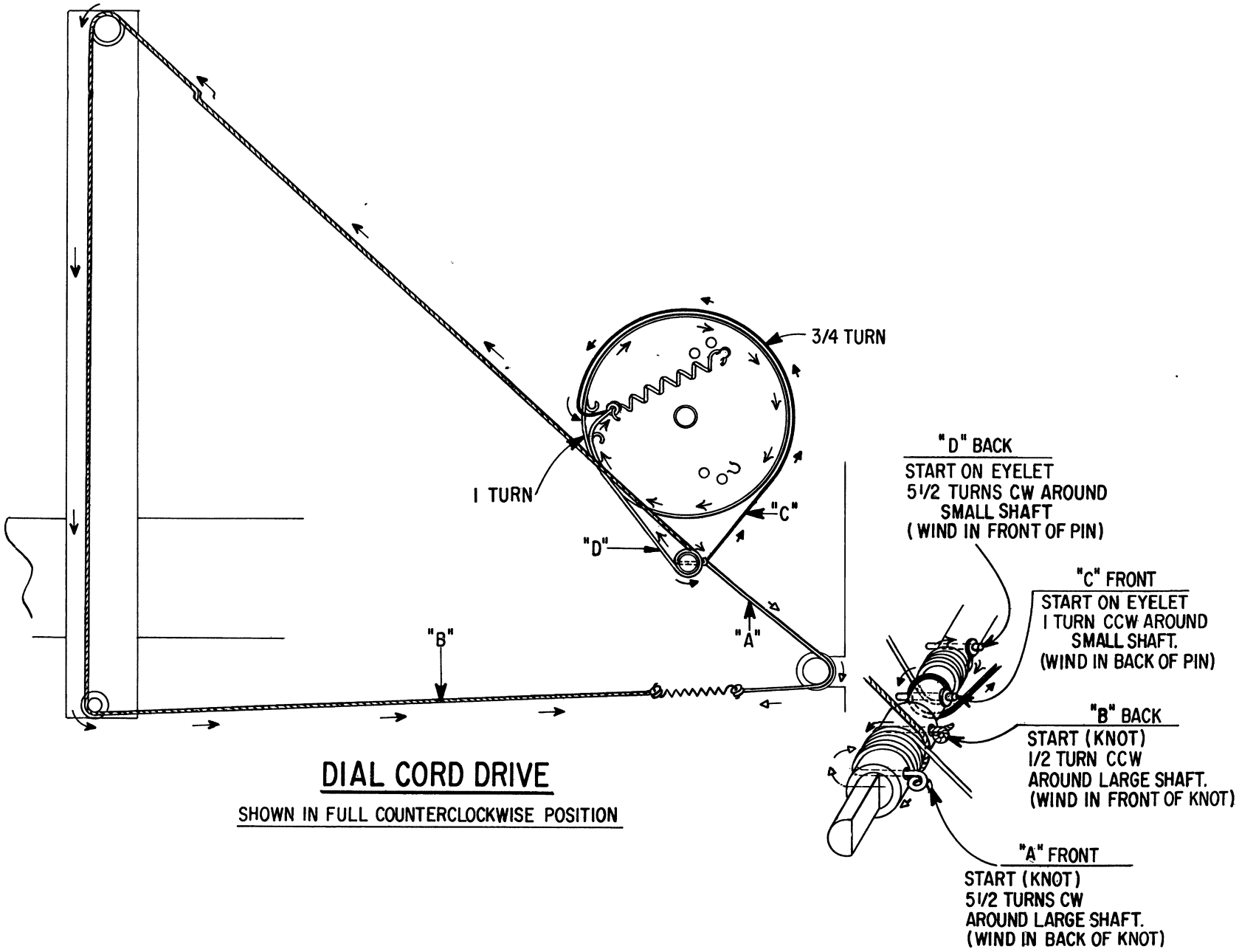
SCHEMATIC FOR KR105

DIAL CORD DRIVE FOR CHASSIS 7L20 AND 7L21



DIAL CORD DRIVE FOR CHASSIS 9L20 AND 9L21

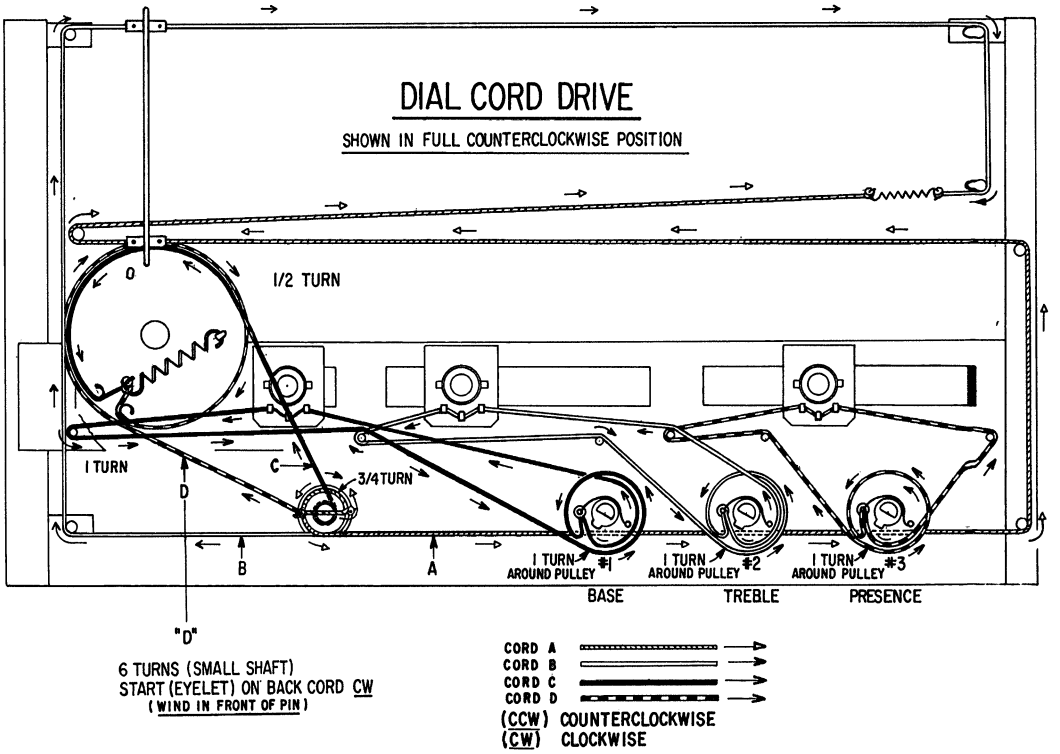


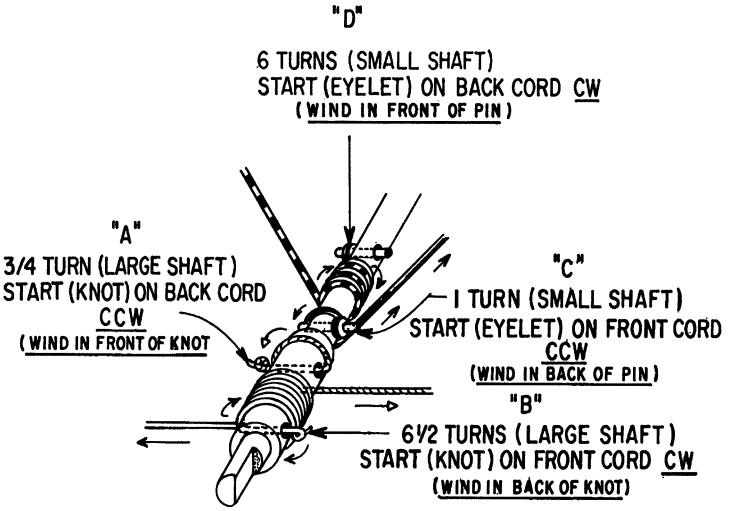


DIAL CORD DRIVE

SHOWN IN FULL COUNTERCLOCKWISE POSITION

DIAL CORD DRIVE FOR CHASSIS 10K01





DIAL CORD DRIVE FOR CHASSIS 11L8T25

NUMERICAL PARTS LIST

CHASSIS 1L20

PART NO.	DESCRIPTION	PRICE
22-2786	.068 mfd molded 200V	.45
22-2805	.022 mfd molded 400V	.25
22-3762	Electrolytic 40/150 20/150 20/25	
54-139	3/8-32 x 9/16 Palnut (1 used on each 63-5035 and 5036)	.03
63-1729	47 ohm 1/2W 10%	.17
63-1750	150 ohm 1/2W 10%	.17
63-1849	33K ohm 1/2W 20%	.17
63-4747	47K ohm resistor 1/2W 10%	.17
63-4481	220K ohm resistor 1/2W 10%	.17
63-1897	470K ohm 1W 10%	.25
63-5035	Tone control	1.40
63-5036	Volume control and switch	2.05
78-1542	Wafer tube socket	.20
93-1576	Steel washer (2 req'd)	
95-2041	Output transformer	
212-38	Selenium rectifier	1.00

CHASSIS 1L21

11-183	Line cord & plug	
22-2786	.068 mfd capacitor - 200V	
22-2805	.022 mfd capacitor - 400V (2 req'd)	
22-3853	Electrolytic capacitor	
43-519	Socket contact housing	.20
52-1051	Phono cable	
63-1733	56 ohm resistor - 1/2W 10%	.17
63-1750	150 ohm resistor - 1/2W 10%	.17
63-1828	10K ohm resistor - 1/2W 20%	.17
63-1856	47K ohm resistor - 1/2W 20%	.17
63-5117	Volume control	
63-5118	Tone control	
78-1542	Wafer tube socket	.20
83-2538	Three lug terminal strip	.10
83-3265	Five lug terminal strip	.10
86-334	Terminal (3 req'd)	.03
95-2083	Output transformer	
212-41	Selenium rectifier	

MODEL LP8 CABINET PARTS

2-1676	Cabinet back	
12-3766	Changer drawer pull bracket	
14-5176	Portable phono cabinet - model LP8B	
14-5177	Portable phono cabinet - model LP8L	
16-2415	Packing carton	
17-141	Retaining clamp	.20
24-1197	Chassis bottom cover	
46-3444	Control knob - volume & tone (2 req'd) - model LP8B	
46-3445	Control knob - volume & tone (2 req'd) - model LP8L	
49-999	4" x 6" PM speaker	
54-138	6-32 Palnut (2 used on 49-999)	.03
57-3997	Mounting plate (2 part of each cabinet)	.30
70-231	#6 x 1" Phillips oval hd wood screw (4 used on 169-191)	.05
83-4528	Retaining strip (4 req'd)	
112-1264	6-32 x 1" Speaker mtg screw (2 part of each cabinet)	.03
112-1520	4-24 x 5/16 Phillips rd hd self-tap screw (9 mt 2-1676)	
114-390	8-15 x 7/16 x 1/4 Hex hd self-tap screw (4 used on 1L21)	.03
125-62	Rubber grommet	.03
142-125	Dual pickup cartridge (sapphire - sapphire) (1 part of 169-191)	7.00
159-104	Trimount stud (3 req'd)	.03
161-191	Four speed record changer (See changer parts list for components)	
166-90	Polyethylene bumper (6 part of each cabinet)	
202-2217	Instruction book	
S-59908	Hinge plate & pin assembly	
HDW2049	Handle strap (part of 14-5177) - model LP8L	
HDW2050	Handle strap (part of 14-5176) - model LP8B	
HDW4028	Strike (2 part of each cabinet)	
HDW5010	Catch (2 part of each cabinet)	
HDW10009	Chrome moulding (part of each cabinet)	
GRC162-1	Grille cloth (part of 14-5177) - model LP8L	
GRC163-1	Grille cloth (part of 14-5176) - model LP8B	

PART NO.	DESCRIPTION	PRICE

CHASSIS 2L20

11-183	Line cord & plug	
22-2572	.068 mfd capacitor - 200V (2 req'd)	.45
22-2792	.047 mfd capacitor - 200V (2 req'd)	.30
22-3854	Electrolytic capacitor	
43-519	Socket contact housing	.20
58-214	Connector plug (part of S-60971)	.10
63-1736	68 ohm resistor - 1/2W 10%	.17
63-1803	2700 ohm resistor - 1/2W 10%	.17
63-1856	47K ohm resistor - 1/2W 20% (2 req'd)	.17
63-2897	47 ohm fusing resistor	.50
63-5130	Dual tone control	
63-5145	115 ohm resistor - 5W 10%	.75
63-5154	Control - volume & balance (2 req'd)	
78-781	Molded tube socket (2 req'd)	
83-2638	Three lug terminal strip	.05
83-2639	Three lug terminal strip	.05
83-3265	Five lug terminal strip	.10
86-334	Terminal (4 req'd)	.10
95-2100	Output transformer (2 req'd)	
114-773	6-20 x 1" Hex hd self-tap screw (used on 212-22)	
212-22	Selenium rectifier	2.20
S-60971	Phono cable & plug assembly	

MODEL LPS45 CABINET PARTS

2-1676	Cabinet back	
12-3766	Changer drawer pull bracket (part of 14-5174) - model LPS45L	
12-3767	Changer drawer pull bracket (part of 14-5175) - model LPS45J	
14-5168	Speaker cabinet - left (part of 14-5174) - model LPS45L	
14-5169	Speaker cabinet - right (part of 14-5174) - model LPS45L	
14-5171	Speaker cabinet - left (part of 14-5175) - model LPS45J	
14-5172	Speaker cabinet - right (part of 14-5175) - model LPS45J	
14-5174	Portable phono cabinet - complete - model LPS45L	
14-5175	Portable phono cabinet - complete - model LPS45J	
16-2436	Packing carton	
24-1198	Chassis bottom cover	
46-3444	Control knob (volume - bass - treble) (3 req'd) - model LPS45L	
46-3445	Control knob (volume - bass - treble) (3 req'd) - model LPS45J	
49-1001	4" x 6" PM speaker (2 req'd)	
54-138	6-32 Palnut (2 used on each 49-1001)	.03
57-3997	Mounting plate (2 part of each complete cabinet)	.30
70-200	#6 x 5/8 Phillips rd washer hd wood screw - brass plated (4 used on each speaker baffle)	
70-231	#6 x 1" Phillips oval hd wood screw (4 used on 169-192)	.05
83-4234	Retaining strip (3 req'd)	
83-4528	Retaining strip (4 req'd)	
112-1264	6-32 x 1" Speaker mtg screw (2 part of each speaker cabinet)	.03
112-1520	4-24 x 5/16 Phillips rd hd self-tap screw (9 mt 2-1676)	
114-390	8-15 x 7/16 x 1/4 Hex hd self-tap screw (5 used on 2L20)	.03
125-62	Rubber grommet	.03
139-123	Speaker baffle - left (part of 14-5168)	
139-124	Speaker baffle - right (part of 14-5169)	
139-125	Speaker baffle - left (part of 14-5171)	
139-126	Speaker baffle - right (part of 14-5172)	
142-124	Dual pickup cartridge (sapphire - sapphire) (part of 169—192)	7.00
159-104	Trimount stud (4 req'd)	
166-90	Polyethylene bumper (6 part of each cabinet)	
169-192	Four speed record changer (see record changer parts List for components)	
202-2244	Instruction book	
S-59908	Hinge plate & pin (part of each cabinet)	
HDW2049	Gray handle strap (part of 14-5174) - model LPS-45L	
HDW2051	Brown handle strap (part of 14-5175) - model LPS-45J	
HDW3065	Male stop hinge - brass (2 part of 14-5175) - model LPS45J	
HDW3066	Male stop hinge - nickel (2 part of 14-5174) - model LPS45L	
HDW3067	Female stop hinge - brass (2 part of 14-5172)	
HDW3068	Female stop hinge - nickel (2 part of 14-5169)	
HDW3069	Male stop hinge - brass (2 part of 14-5175) - model LPS45J	
HDW3070	Male stop hinge - nickel (2 part of 14-5174) - model LPS45L	
HDW3071	Female stop hinge - brass (2 part of 14-5171)	
HDW3072	Female stop hinge - nickel (2 part of 14-5168)	
HDW4028	Strike - nickel (2 part of 14-5174) - model LPS45L	
HDW4030	Strike - burnished brass (2 part of 14-5175) - model LPS45J	
HDW4031	Strike - brass (2 part of 14-5175) - model LPS45J	
HDW4032	Strike - nickel (2 part of 14-5174) - model LPS45L	
HDW5010	Catch - nickel (2 part of 14-5174) - model LPS45L	

PART NO.	DESCRIPTION	PRICE

MODEL LPS45 CABINET PARTS Continued

HDW5011	Catch - burnished brass (2 part of 14-5175) - model LPS45J	
HDW5013	Magnetic catch - tan (2 used on each speaker cabinet)	
HDW10009	Chrome moulding (2 part of 14-5174) - model LPS45L	
HDW10010	Brass moulding (2 part of 14-5175) - model LPS45J	
HDW12077	Rolled flange eyelet - brass (2 part of each 14-5171 & 14-5172) - model LPS45J	
HDW12078	Rolled flange eyelet - nickel (2 part of each 14-5168 & 14-5169) - model LPS45L	
GRC162-2	Grille cloth (1 part of each 14-5168 & 14-5169) - model LPS45L	
GRC176-1	Grille cloth (1 part of each 14-5171 & 14-5172) - model LPS45J	

CHASSIS KPS50L

22-1814	Capacitor .0022 mfd 600V (2 req'd)	.30
22-1843	Capacitor .01 mfd 600V (2 req'd)	.30
22-2078	Capacitor .047 mfd 600V (2 req'd)	.35
WC14690	Electrolytic 150/150 V 20/150 V	3.00
63-1750	Resistor 150 ohm 1/2W 10% (2 req'd)	.17
63-1761	Resistor 270 ohm 1/2 W 10% (2 req'd)	.17
63-1863	Resistor 68K ohm 1/2W 20% (2 req'd)	.17
63-1887	Resistor 270K ohm 1/2W 10% (2 req'd)	.17
63-4747	Resistor 47K ohm 1/2W 20% (2 req'd)	.17
WC12877	Resistor 33 ohm 1W 10%	.25
WC13851	Resistor 1200 ohm 1W 10%	.25
WC14132	Fuse resistor 47 ohm 3W	.50
WC13229	Volume control (5 megohm)	2.50
WC13501	Balance control (1 megohm)	1.40
WC13706	Transformer (2 req'd)	2.00
WC13800	Tone control (50K)	2.75
WC14027	Rectifier	3.80

MODEL KPS50L CABINET PARTS

WC10683B	Hinge	.25
WC12861B	Remote hinge	
WC13448-8B	Handle assembly with end plates	.60
WC13554	Recessed nut	.15
WC14327	Audio cable	1.40
WC14754	Amplifier panel	1.50
WC15109-9	Dot bumper	
WC15106	Motorboard protector	
WC15432-9E	Knob assembly with clip (3 req'd)	.40
WC15445-5	External speaker cord	1.00
WC15798-B	Catch	.35
WC16232	Case assembly with hardware and motorboard	
WC16233	6" Speaker (2 req'd)	
WC16260	Motorboard (covered)	
57-3259	Name plate	.75
142-103	Cartridge	8.50
169-185	Record changer (see record changer parts list for components)	
202-2097	Instruction book	

CHASSIS KPS70C

22-1814	.0022 mfd Molded capacitor 600V (2 req'd)	.30
22-1843	.01 mfd Capacitor 600V (2 req'd)	.30
22-2586	.0015 mfd Capacitor 600V (2 req'd)	.25
22-2634	.047 mfd Capacitor 400V (2 req'd)	
22-2766	47 mmf Capacitor 600V (2 req'd)	.70
22-2945	3 mfd Electrolytic capacitor - Non-Pole 30V (2 req'd)	1.25
WC-16435	Electrolytic capacitor 150/150 40/150 20/15	3.50
63-949	2200 ohm Resistor 1W 10%	.25
63-1771	470 ohm Resistor 1/2W 10% (2 req'd)	.17
63-1883	220K ohm Resistor 1/2W 10% (2 req'd)	.17
63-2808	68 ohm Resistor 2W 20%	.34
63-3992	68K ohm Resistor 1/2W 10% (2 req'd)	.17
63-4019	39K ohm Resistor 1/2W 10% (2 req'd)	.17
63-4482	100K ohm Resistor 1/2W 10% (2 req'd)	.17
WC-12877	33 ohm Resistor 1W 10%	.25
WC-14132	Fusing type resistor 47 ohm 3W	.50
WC-13229	Bass Tone control (5 megohm)	2.50
WC-13501	Balance control (1 megohm)	1.40
WC-13800	Treble tone control (500K ohm)	2.75
WC-14027	Rectifier	3.80
WC-15730	Loudness control (3 megohm)	
WC-15732	Output transformer (2 req'd)	3.00

MODELS KPS70C CABINET PARTS

PART NO.	DESCRIPTION	PRICE
WC-11792	4" Speaker (2 req'd)	5.00
WC-12963	6" Speaker (2 req'd)	8.00
WC-13004-A	Catch - remote speaker	.75
WC-13554	Recessed Nut	.15
WC-14183-A	Stud - remote speaker	.25
WC-14184-A	Locator eyelet - stud	.20
WC-14195	Lower door stop	.35
WC-14289	8-32 x 7/8 Bolt (2mt WC-16438-P)	
WC-14327	Audio cable - input	1.40
WC-14648-8C	Knob assembly (bass-treble-volume) (3 req'd)	.75
WC-14649-8C	Knob assembly - balance	.85
WC-15090-X	Logo (name) plate	1.00
WC-15101-9	Support bumper (4 part of main cabinet)	.30
WC-15105-9	Support bumper (4 part of remote speaker cabinet)	.25
WC-15435	Nut (1 used on each WC-14289)	
WC-15445-5	External remote speaker cord - 8 ft. long	1.00
WC-15484-A	Eyelet	.05
WC-15821	Cable clamp (3 req'd)	
WC-16226	Lockwasher (1 used on each WC16380)	
WC-16358	Spacer (1 used on each WC16380)	
WC-16374-C	Plug button (2 used on record changer drawer)	.25
WC-16380	1/4-20 x 1" Long 7/16 unslotted indented hex hd (2 mt record changer drawer)	.10
WC-16387	Upper door stop	.25
WC-16428	Case assembly w/hardware	
WC-16429	Control plate	
WC-16436-L	Panel (lefthand) with eyelet	
WC-16436-R	Panel (righthand) without eyelet	
WC-16438-P	Handle - drawer	1.25
WC-16450-A	Hinge - remote speaker (2 req'd)	.45
WC-16451-9A	Handle assembly - cabinet	
WC-16467	Tee Nut (1 retains each WC-16380)	.20
WC-16534-A	Handle hardware cap (part of WC-16451-9A)	.50
WC-16535-A	Trim strip 30" length (part of cabinet)	.75
WC-16539	Grille cloth - cabinet speaker only	.50
WC-16540	Grille cloth - remote speaker only	.60
19-414	Line cord clip (2 used on cabinet speaker back)	.10
142-126	Dual pickup cartridge (sapphire - sapphire) (part of 169-199)	10.00
169-199	Record changer (see changer parts list for components)	
202-2218	Instruction book	.40
S-55804	Dual stylus assembly (sapphire - sapphire) (part of 142-126)	2.50

CHASSIS KPS80C

22-1843	Capacitor .01 mfd 600V (2 req'd)	.30
22-1849	Capacitor .0047 mfd 600V (2 req'd)	.25
22-1947	Capacitor 100 mmf 20% (2 req'd)	.25
22-2586	Capacitor .0015 mfd 600V (2 req'd)	.25
22-2634	Capacitor .047 mfd 400V	.30
22-2845	Capacitor .001 mfd 600V	
WC14244	Electrolytic 30/350V 15/300V 25/25V	3.50
63-1730	Resistor 47 ohm 1/2W 20% (2 req'd)	.17
63-1806	Resistor 3300 ohm 1/2W 10% (2 req'd)	.17
63-1887	Resistor 270K ohm 1/2W 10% (4 req'd)	.17
63-2019	Resistor 150 ohm 2W WW 10%	.34
63-3170	Resistor 10K ohm 2W 20%	.34
63-4019	Resistor 39K ohm 1/2W 10% (2req'd)	.17
WC13229	Base tone control (5 meg.)	2.50
WC13485	Power transformer	13.00
WC13501	Balance control (1 meg.)	1.40
WC13800	Treble control (500K)	2.75
WC15099	Output transformer	4.50
WC15100	Output transformer (2 req'd)	3.00

MODEL KPS80C CABINET PARTS

WC10683-A	Hinge KPS80C (2 req'd)	.25
WC10683-B	Hinge KPS80L (2 req'd)	.25
WC12006A	Catch KPS80C (2 req'd)	.75
WC12006-B	Catch KPS80L (2 req'd)	.75
WC13975	Speaker 8"	11.00
WC14181	Ext. speaker cable 12'	1.50
WC14263-6A	Handle assembly - used on KPS80C	1.25
WC14263-6B	Handle assembly - used on KPS80L	1.25
WC14327	Shielded cable 22"	1.40
WC14942	Clamp	.30
WC15077	Audio cable 8"	1.25
WC15105-3	Bumper - used on KPS80L only	.25
WC15105-9	Bumper - used on KPS80C only	.25
WC15551-8JU	Knob assembly with clip KPS80L (4 req'd)	.75
WC15551-9CU	Knob assembly with clip KPS80C (4 req'd)	.75
WC15977	Speaker 5-1/4" (2 req'd)	8.00
WC16089-6	Clamp	
WC16219	Control plate - used on KPS80L	1.50
WC16237	Speaker 3-1/2" (2 req'd)	5.00
WC16238-6	Metal panel	1.50
WC16239-6	Vent plate	.75
WC16242	Case assembly with hardware and motorboard KPS80L	
WC16253	Remote speaker cabinet with baffle KPS80L (2 req'd)	
WC16255	Motorboard (covered)	3.50
WC16256	Remote cover - used on KPS80L	1.00
WC16256-6	Remote cover - used on KPS80C	1.00
WC16393-W	Control plate - used on KPS80C	1.50
WC16394	Case assembly with hardware and motorboard KPS80C	
WC16399	Remote speaker cabinet with baffle KPS80C (2 req'd)	
142-126	Dual Pickup cartridge (2G) (.7 Mil & 3 Mil Mfg. sapphire)	10.00
169-186	Record changer (see record changer parts list for components)	
202-2098	Instruction book	
S-55616	45RPM record adapter (white)	2.75
S-55804	Dual stylus assembly (.7 mil & 3 mil mfg sapphire) part of 142-126	2.50

CHASSIS 3L01 & 3L01Z

PART NO.	DESCRIPTION	PRICE
22-3	.01 mfd Disc capacitor - 500V (2 req'd)	.30
22-12	.0015 mfd Disc capacitor - 500V (2 req'd)	.25
22-13	.0033 mfd Disc capacitor - 500V (2 req'd)	.25
22-17	.001 mfd Disc capacitor - 1000V (2 req'd)	.25
22-21	2 x .001 mfd Disc capacitor - 500V	.40
22-1775	.047 mfd Capacitor - 400V - 3L01	.26
22-2569	.047 mfd Capacitor - 600V - 3L01	
22-2782	.1 mfd Capacitor - 600V	.45
22-3327	30 mmf Disc capacitor - 500V (2 used on 63-5123)	.25
22-3859	Dual electrolytic capacitor	
22-3903	Electrolytic capacitor	
24-1201	Control cover (used on 63-5122)	
43-570	Six contact housing - male	.45
54-139	3/8 - 32 x 9/16 Palnut (1 used on each 63-5122, 63-5123 & 63-5124)	.03
58-214	Single prong plug (2 part of each S-53660 & S-59527)	.10
63-1782	820 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1786	1000 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1799	2200 ohm Resistor - 1/2W 10%	.17
63-1814	4700 ohm Resistor - 1/2W 20%	.17
63-1856	47K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1876	150K ohm Resistor - 1/2W 10% (2 used on 63-5123)	.17
63-1880	180K ohm Resistor - 1/2W 10% (2 required)	.17
63-1883	220K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1884	220K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1891	330K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1925	2.2 Megohm resistor - 1/2W 10%	.17
63-4843	63 ohm Resistor - 4W 10%	.65
63-4851	125 ohm Resistor - 4W 10%	.65
63-5196	Fusing type resistor	
63-5122	Dual bass control & stereo - monaural switch	
63-5123	Dual loudness control	
63-5124	Dual treble control	
78-1139	Noval wafer socket (12AX7A)	.20
78-1156	Noval molded socket (7695) (2 req'd)	.25
83-1635	Insulating strip (used on 63-5123)	.03
83-2639	Three lug terminal strip	.05
83-2715	Three lug terminal strip	
83-3675	Twelve lug terminal strip	.30
83-3676	Four lug terminal strip	.10
83-4232	Felt strip	
86-328	Wire retaining terminal (5 req'd)	.03
86-370	Male terminal (6 used on 3L01 & 3 used on 3L01E)	.03
93-993	Insulating washer (used on 63-5123)	.03
93-1183	Fibre washer (2 used on each 78-1156)	.03
94-1171	Insulating bushing (3 req'd)	.10
95-1956	Audio output transformer (2 req'd)	3.00
114-801	8 - 18 x 5/16 x 1/4 Hex hd self-tap screw (2 used on each 95-1956)	
125-26	Rubber grommet (4 req'd)	
199-198	Shielded sleeve	.05
199-350	Spacer sleeve (1 used on each 94-1171)	.03
212-27	Selenium rectifier	
S-53660	Shielded lead & plug assembly - 3L01	
S-59527	Shielded lead & plug assembly - 3L01E	

CHASSIS 4L21

PART NO.	DESCRIPTION	PRICE
11-158	AC cord & plug	.75
15-201	Fuseholder cap	.30
22-2	220 mmf Disc capacitor - 500V (2 req'd)	.25
22-3	.01 mfd Disc capacitor - 500V (4 req'd)	.30
22-13	.0033 mfd Disc capacitor - 500V (2 required)	.25
22-16	470 mmf Disc capacitor - 500V (2 required)	.25
22-1156	Electrolytic capacitor	1.10
22-1813	.022 mfd capacitor - 600V (2 req'd)	
22-1842	.0047 mfd Capacitor - 200V (2 req'd)	
22-2376	47 mmf Disc capacitor - 500V (4 req'd)	.25
22-2510	.033 mfd Capacitor - 200V (2 req'd)	.30
22-2565	.01 mfd Capacitor - 200V (2 req'd)	.25
22-2655	.01 mfd Disc capacitor - 1400V	.50
22-3686	Electrolytic capacitor	5.50
54-139	3/8 - 32 x 9/16 Hex palnut (1 used on each 63-5112, 63-5113, 63-5114 & 85-778)	.03
54-473	Fuse receptacle nut	.05
62-23	Fuse receptacle	.50
63-1786	1000 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1789	1200 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1824	8200 ohm Resistor - 1/2W 10%	.17
63-1852	39K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1866	82K ohm Resistor - 1/2W 10%	.17
63-1869	100K ohm Resistor - 1/2W 10%	.17
63-1883	220K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1905	680K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1929	2.7 Megohm Resistor - 1/2W 10%	.17
63-1933	3.3 Megohm Resistor - 1/2W 20% (2 req'd)	.17
63-1936	3.9 Megohm Resistor - 1/2W 10% (2 req'd)	.17
63-1973	100 ohm Resistor - 2W 10%	.34
63-2019	150 ohm Resistor - 2W 10%	.34
63-3176	10K ohm Resistor - 2W 10%	.34

CHASSIS 4L21 Continued

PART NO.	DESCRIPTION	PRICE
63-5112	Dual bass control & stereo-monaural switch	
63-5113	Dual treble control	
63-5114	Dual loudness control	
78-402	Four contact socket	.15
78-755	Octal tube socket (5Y3GT)	.20
78-846	Noval wafer socket (12AX7A)	
78-1089	Noval molded socket-6BQ5 (2 req'd)	.25
78-1099	Three contact socket	.20
83-2963	Four lug terminal strip	.10
83-2965	Seven lug terminal strip	.10
83-3239	Eight lug terminal strip	
83-3652	Three lug terminal strip	.05
83-3937	Seven lug terminal strip	
85-798	Lo-bass switch	
86-328	Wire retaining termina l (10 req'd)	.03
93-1036	1/2" Internal lockwasher (used on 62-23)	.03
93-1179	Rubber washer (used on 62-23)	.03
95-1957	Audio output transformer (2 req'd)	5.50
95-2082	Power transformer	
114-699	10-16 x 3/8 x 5/16 H ex washer hd self-tap screw (4 used on 95-2082)	.03
125-96	Strain relief grommet (used on 11-158)	.03
136-31	Fuse-4 amp.	.25

CHASSIS 4L22

PART NO.	DESCRIPTION	PRICE
11-158	AC cord & plug	.75
15-201	Fuseholder cap	.30
22-2	220 mmf Disc capacitor - 500V (2 req'd)	.25
22-3	.01 mfd Disc capacitor-500V (2 req'd)	.30
22-14	.0047 mfd Disc capacitor - 500V	.25
22-26	2 x .0015 mfd Disc capacitor - 500V	.40
22-1813	.022 mfd Capacitor - 600V	
22-2376	47 mmf Disc capacitor - 500V (4 req'd)	.25
22-2565	.01 mfd Capacitor - 200V (2 req'd)	.25
22-2655	.01 mfd Disc capacitor - 1400V	.50
22-3292	Electrolytic capacitor	1.90
22-3686	Electrolytic capacitor	5.50
22-3694	.1 mfd Capacitor - 100V (2 req'd)	.35
54-139	3/8-32 x 9/16 Hex palnut (1 used on each 63-5112, 63-5113 & 63-5119)	.03
54-473	Fuse receptacle nut	.05
62-23	Fuse receptacle	.50
63-1743	100 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1786	1000 ohm Resistor - 1/2W 20% (3 req'd)	.17
63-1806	3300 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1824	8200 ohm Resistor - 1/2W 10%	.17
63-1876	150K ohm Resistor - 1/2W 10% (2 used on 63-5119)	.17
63-1884	220K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1905	680K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1918	1.5 Megohm resistor – 1/2W 10% (2 req'd)	.17
63-1933	3.3 Megohm resistor – 1/2W 20% (2 req'd)	.17
63-1973	100 ohm Resistor - 2W 10%	.34
63-2019	150 ohm Resistor - 2W 10%	.34
63-3176	10K ohm Resistor - 2W 10% (2 req'd)	.34
63-5112	Dual bass control & stereo - monaural switch	
63-5113	Dual treble tone control	
63-5119	Dual loudness control	
78-402	Four contact socket	.15
78-755	Octal tube socket (5Y3GT)	.20
78-846	Noval wafer socket (12AX7A)	
78-1089	Noval molded socket (6BQ5) (2 req'd)	.25
78-1099	Three contact socket	.20
83-2965	Seven lug terminal strip	.10
83-3239	Eight lug terminal strip	
83-3265	Five lug terminal strip	.10
83-3652	Three lug terminal strip	.05
83-4634	Three lug terminal strip	
86-328	Wire retaining terminal (9 req'd)	.03
93-1036	1/2" Internal lockwasher (used on 62-23)	.03
93-1179	Rubber washer (used on 62-23)	.03
95-1957	Audio output transformer (2 req'd)	5.50
95-2082	Power transformer	
114-699	10-16 x 3/8 x 5/16 Hex washer hd self-tap screw (4 used on 95-2082)	.03
125-96	Strain relief grommet (used on 11-158)	.10
136-31	Fuse-4 amp.	.25

CHASSIS 5L29

PART NO.	DESCRIPTION	PRICE
11-158	AC cord & plug	.75
15-201	Fuseholder cap	.30
22-3	.01 mfd Disc capacitor - 500V (2 req'd)	.30
22-14	.0047 mfd Disc capacitor - 500V (4 req'd)	.25
22-16	470 mmf Disc capacitor - 500V (2 req'd)	.25
22-18	.0022 mfd Disc capacitor - 500V (4 req'd)	.25
22-1156	Electrolytic capacitor	1.10
22-1842	.0047 mfd capacitor – 200V (2 req'd)	
22-1844	.047 mfd capacitor - 600V (2 req'd)	
22-1901	.033 mfd capacitor - 600V (2 req'd)	
22-2376	47 mmf Disc capacitor - 500V (2 req'd)	.25
22-2565	.01 mfd Capacitor - 200V (2 req'd)	.25
22-2655	.01 mfd Capacitor - 1400V	.50
22-3076	Electrolytic capacitor 10/25V	1.75

CHASSIS 5L29 Continued

PART NO.	DESCRIPTION	PRICE
22-3140	270 mfd Disc capacitor - 500V (2 req'd)	.25
22-3245	Electrolytic capacitor	4.75
54-139	3/8-32 x 9/16 Hex palnut (1 used on each 63-5114, 63-5115, 63-5116 & 85-778)	.03
54-473	Fuse receptacle nut	.05
62-23	Fuse receptacle	.50
63-1758	220 ohm Resistor - 1/2W 20%	.17
63-1778	680 ohm Resistor - 1/2W 10%	.17
63-1786	1000 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1796	1800 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1803	2700 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1817	5600 ohm Resistor - 1/2W 10% (3 req'd)	.17
63-1855	47K ohm Resistor - 1/2W 10% (2 used on 63-5116)	.17
63-1856	47K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1866	82K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1869	100K ohm Resistor - 1/2W 10% (2 used on 63-5114)	.17
63-1870	100K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1887	270K ohm Resistor - 1/2W 10% (2 used on 63-5116)	.17
63-1891	330K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1925	2.2 Megohm resistor - 1/2W 10% (2 req'd)	.17
63-1929	2.7 Megohm resistor - 1/2W 10%	.17
63-1936	3.9 Megohm resistor - 1/2W 10% (2 req'd)	.17
63-2019	150 ohm Resistor - 2W 10%	.34
63-4687	5K ohm Resistor - 3W 10%	.45
63-5114	Dual loudness control	
63-5115	Dual treble tone control	
63-5116	Dual bass control & stereo - monaural switch	
78-402	Four contact socket	.15
78-755	Octal tube socket (5Y3GT)	.20
78-846	Noval wafer socket (12AX7A)	
78-1089	Noval molded socket (6BQ5) (2 req'd)	.25
78-1099	Three contact socket	.20
78-1270	Noval wafer socket (6FQ7-6CQ7)	.20
83-2639	Three lug terminal strip	.05
83-3239	Eight lug terminal strip (3 req'd)	
83-3652	Three lug terminal strip	.05
85-798	Lo-bass switch	
86-328	Wire retaining terminal (9 req'd)	.03
93-1036	1/2" Internal lockwasher (used on 62-23)	.03
93-1179	Rubber washer (used on 62-23)	.03
95-1650	Audio output transformer (2 req'd)	4.75A
95-2082	Power transformer	
114-699	10-16 x 3/8 x 5/16 Hex washer hd self-tap screw (4 used on 95-2082)	.03
125-96	Strain relief grommet (used on 11-158)	.10
136-31	Fuse - 4 amp	.25

CHASSIS 7L20

PART NO.	DESCRIPTION	PRICE
12-3385	Tuner bracket	.40
12-3680	Escutcheon mtg bracket (RH)	
12-3698	Variable capacitor mtg bracket	
19-238	Coil mounting clip (1 part of each S-52362 & S-61505)	.10
19-440	Dial crystal retaining clip (2 req'd)	
22-3	.01 mfd Disc capacitor - 500V (8 req'd)	.30
22-5	100 mmf Disc capacitor - 500V	.25
22-12	.0015 mfd Disc capacitor - 500V	.25
22-17	.001 mfd Disc capacitor - 1000V	.25
22-18	.0022 mfd Disc capacitor - 500V (2 req'd)	.25
22-1669	100 mmf Ceramic capacitor -	.25
22-1778	.047 mfd Capacitor - 200V	.30
22-1888	.001 mfd Ceramic capacitor	.25
22-2643	8.5 mmf Disc capacitor - used on S-52359)	.25
22-2655	.01 mfd capacitor - 1400V	.50
22-2732	.001 mfd Feed-thru capacitor - (5 req'd)	.30
22-3255	330 mmf Disc capacitor - 500V	.25
22-3456	2 x 12 mmf Disc capacitor - (used on S-52359)	.30
22-3621	22 mmf Disc capacitor - (used on S-52359)	.25
22-3649	25 mmf Disc capacitor - (used on S-13871)	.25
22-3717	Electrolytic capacitor	2.75
22-3864	Two section variable capacitor	
24-1208	Tuner cover	
52-891	Three conductor cable & plug	1.00
52-978	Two conductor shielded lead	.75
54-139	3/8-32 x 9/16 Palnut (used on 85-789)	.03
54-504	Tinnerman speed nut (used on S-61509)	.03
54-541	Palnut (1 used on each 19-440 & 2 used on each 83-4535)	.03
54-549	Tinnerman speed nut (2 used on 192-319)	.03
56-426	Roll pin	.05
57-3519	Antenna mtg plate	.10
57-4371	Dial scale background plate	
57-4392	Die-cast escutcheon	
57-4453	Chassis bottom plate	
58-238	Three prong plug (used on 52-978)	.10
59-547	Dial pointer	
63-1740	82 ohm Resistor - 1/2W 10% (used on S-52362)	.17
63-1744	100 ohm Resistor - 1/2W 20%	.17

CHASSIS 7L20 Continued

PART NO.	DESCRIPTION	PRICE
63-1758	220 ohm Resistor - 1/2W 20% (3 req'd)	.17
63-1779	680 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1786	1000 ohm Resistor - 1/2W 20%	.17
63-1835	15K ohm Resistor - 1/2W 20%	.17
63-1842	22K ohm Resistor - 1/2W 20%	.17
63-1856	47K ohm Resistor - 1/2W 20%	.17
63-1859	56K ohm Resistor - 1/2W 10% (used on S-52359)	.17
63-1870	100K ohm Resistor - 1/2W 20%	.17
63-1876	150K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1883	220K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1890	330K ohm Resistor - 1/2W 10% (4 req'd)	.17
63-1912	1 Megohm resistor - 1/2W 20%	.17
63-1926	2.2 Megohm resistor - 1/2W 20% (3 req'd)	.17
63-1939	4.7 Megohm resistor - 1/2W 10%	.17
63-4796	1000 ohm Resistor - 3W 10%	.45
76-1364	Tuning shaft	
76-1377	Guide shaft	
78-402	Four contact socket	.15
78-806	Wafer socket (35W4)	.15
78-870	Wafer socket (12BA6 & 12AU6) (2 req'd)	.15
78-871	Wafer socket (12BA6)	.15
78-912	Wafer socket (12BE6)	.15
78-1099	Three contact socket	.20
78-1235	Noval wafer socket (12DT8)	.25
78-1565	Dual pilot light socket & wire	
78-1572	Noval wafer socket (19GQ7)	
80-1188	Tension spring (gang)	.08
80-1140	Tension spring (pointer)	.10
80-1467	Retaining spring	.05
80-1468	Ground spring	.05
83-2123	Antenna terminal strip	.25
83-2143	Felt strip (drive cord spring) (2 req'd)	.10
83-2612	Two lug terminal strip	.05
83-2964	Six lug terminal strip	.10
83-3561	Cable retaining strip (used on 22-3864)	.05
83-3648	Four lug terminal strip	
83-4533	Rubber channel strip (top & bottom) (2 req'd)	
83-4534	Rubber channel strip (sides) (2 req'd)	
83-4535	Dial crystal retainer (2 req'd)	
83-4543	Rubber spacer (2 req'd)	
83-4596	Trim strip	
83-4600	Blanking strip	
83-4655	Two lug terminal strip (2 req'd)	
85-789	Bandswitch	
86-247	Insulated feed-thru terminal	.10
86-344	Connector terminal (2 part of S-54774)	.03
93-1580	Steel washer	
94-613	Iron core bushing (2 req'd)	.10
94-773	Coil insert (part of S-61505)	.10
94-1249	Shaft bushing	
95-1505	3rd IF transformer (AM)	2.50
95-1718	1st IF transformer (AM)	2.50
95-1847	1st IF transformer (FM)	2.50
95-1866	Discriminator transformer (FM)	2.50
95-1919	2nd & 3rd IF transformer (FM) (2 req'd)	2.50
95-1922	2nd IF transformer (AM)	
95-2110	Power transformer	
100-249	Pilot light bulb (2 req'd)	.18
103-39	Varicap silicon diode	3.00
105-42	R/C network	.50
112-1484	8-18 x 1/2 Phillips flat hd self-tap screw (8 used on 57-4453)	.03
113-8	6-32 x 1/4 x 1/4 Hex hd mach screw - internal tooth lockwasher attached (1 used on 83-2612 & 2 used on 22-3864)	.03
114-77	6-20 x 5/16 x 1/4 Hex hd self-tap screw (3 used on 57-4371 & 2 used on 22-3864)	.03
114-390	8-18 x 7/16 x 1/4 Hex hd self-tap screw (4 used on 57-4392)	.03
114-564	8-18 x 5/16 Hex hd self-tap screw - flat washer attached (2 used on 57-3519)	.03
114-594	8-18 x 3/8 Hex hd self-tap screw - flat washer attached (4 used on 95-2110)	
114-654	6-20 x 3/8 x 1/4 Hex hd self-tap screw (2 used on S-60926)	.03
114-801	8-18 x 5/16 x 1/4 Hex hd self-tap screw (1 used on 57-3519 & 4 used on each S-60927 & L2-3680)	.03
114-901	6-20 x 7/16 Hex hd self-tap screw - flat washer attached (4 used on S-61509)	
125-116	Rubber grommet (2 req'd)	.05
126-937	Tube shield (2 req'd)	.10
126-1047	Interstage shield	
126-1048	Pilot light shield (2 req'd)	
149-211	Iron core (part of S-61505)	.10
149-294	Iron core & spring (2 req'd)	.50
188-177	Retaining ring (1 part of each S-60575 & S-60740 & 1 used on 94-1249)	.03
188-232	Clamping ring (2 used on 76-1364)	.03
188-322	Retaining ring (1 part of each S-60929)	.03
192-319	Dial crystal	
196-464	Escutcheon gasket (top & bottom) (2 req'd)	
196-465	Escutcheon gasket (sides) (2 req'd)	
S-13871	FM detector coil	7.20
S-52359	FM oscillator coil	1.00
S-52362	FM antenna coil	.60
S-54774	Antenna cable & terminal	.25
S-60575	Knob & ring assembly - tuning	
S-60740	Knob & ring assembly - bandswitch	
S-60922	Drive cord & eyelet (pointer)	
S-60923	Drive cord & eyelet (pointer)	
S-60926	Pulley & bracket	
S-60927	Escutcheon mtg bracket	
S-60929	Pointer support & ring assembly (2 req'd)	
S-61348	Antenna assembly	
S-61505	Oscillator coil (BC)	
S-61509	Dial scale & channel strip	
S-61577	Drive cord & eyelet (gang)	
S-61578	Drive cord & eyelet (gang)	

PART NO.	DESCRIPTION	PRICE
	CHASSIS LT11	
13-20	Tack strip (part of S-61876)	.03
16-2502	Packing carton	
70-165	#6 x 3/8 rd hd wood screw (2 part of S-61876)	.03
86-323	Spade terminal	.03
93-1579	Rubber washer (4 part of S-61876)	
114-910	#8-18 x 7/16 Slotted hex hd self-tap screw - flat washer attached (4 part of S-61876)	
202-1833	FM instruction book	.20
202-2302	Instruction book	
S-61876	Accessories kit	
	CHASSIS 7L21	
12-3385	Tuner bracket	.40
12-3680	Escutcheon mtg bracket (RH)	
12-3698	Variable capacitor mtg bracket	
19-238	Coil mounting clip (1 part of each S-52362 & S-61505)	.10
19-440	Dial crystal retaining clip (2 req'd)	
22-3	.01 mfd Disc capacitor - 500V (7 req'd)	.30
22-5	100 mmf Disc capacitor - 500V	.25
22-16	470 mmf Disc capacitor - 500V (2 req'd)	.25
22-17	.001 mfd Disc capacitor - 1000V	.25
22-18	.0022 mfd Disc capacitor - 500V (2 req'd)	.25
22-1669	100 mmf Ceramic capacitor	.25
22-1778	.047 mfd capacitor - 200V	.30
22-1888	.001 mfd Ceramic capacitor	.25
22-2643	8.5 mmf Disc capacitor (used on S-52359)	.25
22-2732	.001 mfd Feed-thru capacitor - (5 req'd)	.30
22-3456	2 x 12 mmf Disc capacitor - (used on S-52359)	.30
22-3621	22 mmf Disc capacitor - (used on S-52359)	.25
22-3649	25 mmf Disc capacitor - (used on S-13871)	.25
22-3717	Electrolytic capacitor	2.75
22-3864	Two section variable capacitor	
22-3870	.022 mfd capacitor - 600V	
24-1208	Tuner cover	
43-570	Contact housing - male	.45
43-573	Contact housing - female	.45
44-48	Phono jack (2 req'd)	.20
52-1076	Four conductor cable	
54-139	3/8-32 x 9/16 Palnut (used on 85-789)	.03
54-504	Tinnerman speed nut (used on S-61509)	.03
54-541	Palnut (1 used on each 19-440 & 2 used on each 83-4535)	.03
54-549	Tinnerman speed nut (2 used on 192-319)	.03
56-426	Roll pin	.05
57-3519	Antenna mtg plate	.10
57-4371	Dial scale background plate	
57-4392	Die-cast escutcheon	
57-4453	Chassis bottom plate	
58-214	Single prong plug (2 part of S-54511)	.10
59-547	Dial pointer	
63-1740	82 ohm Resistor - 1/2W 10% (used on S-52362)	.17
63-1744	100 ohm Resistor - 1/2W 20%	.17
63-1758	220 ohm Resistor - 1/2W 20% (3 req'd)	.17
63-1779	680 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1786	1000 ohm Resistor - 1/2W 20%	.17
63-1835	15K ohm Resistor - 1/2W 20%	.17
63-1842	22K ohm Resistor - 1/2W 20%	.17
63-1856	47K ohm Resistor - 1/2W 20%	.17
63-1859	56K ohm Resistor - 1/2W 10% (used on S-52359)	.17
63-1870	100K ohm Resistor - 1/2W 20%	.17
63-1876	150K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1883	220K ohm Resistor - 1/2W 10%	.17
63-1890	330K ohm Resistor - 1/2W 10%	.17
63-1912	1 Megohm resistor - 1/2W 20% (2 req'd)	.17
63-1926	2.2 Megohm resistor - 1/2W 20% (3 req'd)	.17
63-1939	4.7 Megohm resistor - 1/2W 10%	.17
63-5666	820 ohm Resistor - 2W 10%	.34
76-1364	Tuning shaft	
76-1377	Guide shaft	
78-806	Wafer socket (35W4)	.15
78-870	Wafer socket (12BA6 & 12AU6) (2 req'd)	
78-871	Wafer socket (12BA6)	.15
78-912	Wafer socket (12BE6)	.15
78-1235	Noval wafer socket (12DT8)	.25
78-1565	Dual pilot light socket & wire	
78-1572	Noval wafer socket (19GQ7)	
80-1188	Tension spring (gang)	.08
80-1140	Tension spring (pointer)	.10
80-1467	Retaining spring	.05
80-1468	Ground spring	.05
83-2123	Antenna terminal strip	.25
83-2143	Felt strip (drive cord spring) (2 req'd)	.10
83-2612	Two lug terminal strip	.05
83-2964	Six lug terminal strip (2 req'd)	.10
83-3353	Two lug terminal strip	.10
83-3561	Cable retaining strip (used on 22-3864)	.05
83-4533	Rubber channel strip (top & bottom) (2 req'd)	
83-4534	Rubber channel strip (sides) (2 req'd)	
83-4535	Dial crystal retainer (2 req'd)	
83-4543	Rubber spacer (2 req'd)	
83-4560	Guide strip	
83-4596	Trim strip	
83-4655	Two lug terminal strip	
85-789	Bandswitch	
86-81	Shakeproof terminal	
86-247	Insulated feed-thru terminal	.10

CHASSIS 7L21 Continued

PART NO.	DESCRIPTION	PRICE
86-344	Connector terminal (2 part of S-54774)	.03
86-328	Wire retaining terminal	.03
86-370	Male terminal (5 req'd)	.03
86-371	Female terminal (3 req'd)	.03
93-1580	Steel washer	
94-613	Iron core bushing (2 req'd)	.10
94-773	Coil insert (part of S-61505)	.10
94-1249	Shaft bushing	
95-1505	3rd IF transformer (AM)	2.50
95-1718	1st IF transformer (AM)	2.50
95-1847	1st IF transformer (FM)	2.50
95-1866	Discriminator transformer (FM)	2.50
95-1919	2nd & 3rd IF transformer (FM) (2 req'd)	2.50
95-1922	2nd IF transformer (AM)	
95-2112	Power transformer	
100-249	Pilot light bulb (2 req'd)	.18
103-39	Varicap silicon diode	3.00
105-42	R/C network	.50
112-1484	8-18 x 1/2 Phillips flat hd self-tap screw (8 used on 57-4453)	.03
113-8	6-32 x 1/4 x 1/4 Hex hd mach screw - internal tooth lockwasher attached (1 used on 83-2612 & 2 used on 22-3864)	.03
114-77	6-20 x 5/16 x 1/4 Hex hd self-tap screw (3 used on 57-4371 & 2 used on 22-3864)	.03
114-390	8-18 x 7/16 x 1/4 Hex hd self-tap screw (4 used on 57-4392)	.03
114-564	8-18 x 5/16 Hex hd self-tap screw - flat washer attached (2 used on 57-3519)	.03
114-594	8-18 x 3/8 Hex hd self-tap screw - flat washer attached (4 used on 95-2112)	.03
114-654	6-20 x 3/8 x 1/4 Hex hd self-tap screw (2 used on S-60926)	.03
114-801	8-18 x 5/16 x 1/4 Hex hd self-tap screw (1 used on 57-3519 & 4 used on each S-60927 & 12-3680)	.03
114-901	6-20 x 7/16 Hex hd self-tap screw - flat washer attached (4 used on S-61509)	
125-116	Rubber grommet (2 req'd)	.05
126-937	Tube shield (2 req'd)	.10
126-1047	Interstage shield	
126-1048	Pilot light shield (2 req'd)	
149-211	Iron core (part of S-61505)	.10
149-294	Iron core & spring (2 req'd)	.50
188-177	Retaining ring (1 used on 94-1249 & 1 part of each S-60575 & S-60740)	.03
188-232	Clamping ring (2 used on 76-1364)	.03
188-322	Retaining ring (1 part of each S-60929)	.03
192-319	Dial crystal	
196-464	Escutcheon gasket (top & bottom) (2 req'd)	
196-465	Escutcheon gasket (sides) (2 req'd)	
S-13871	FM detector coil	7.20
S-52359	FM oscillator coil	1.00
S-52362	FM antenna coil	.60
S-54511	Shielded lead & plug	1.25
S-60575	Knob & ring assembly — tuning	
S-60740	Knob & ring assembly — bandswitch	
S-60922	Drive cord & eyelet (pointer)	
S-60923	Drive cord & eyelet (pointer)	
S-60926	Pulley & bracket	
S-60927	Escutcheon mtg bracket	
S-60929	Pointer support & ring assembly (2 req'd)	
S-61348	Antenna assembly	
S-61505	Oscillator coil (BC)	
S-61509	Dial scale & channel strip	
S-61577	Drive cord & eyelet (gang)	
S-61578	Drive cord & eyelet (gang)	

CHASSIS LT10

PART NO.	DESCRIPTION	PRICE
13-20	Tack strip (part of S-61876)	.03
16-2502	Packing carton	
70-165	#6 x 3/8 rd hd wood screw (2 part of S-61876)	.03
86-323	Spade terminal	.03
93-1579	Rubber washer (4 part of S-61876)	
114-910	8-18 x 7/16 Slotted hex hd self-tap screw - flat washer attached (4 part of S-61876)	
202-1833	FM instruction book	.20
202-2301	Instruction book	
S-61876	Accessories kit	

CHASSIS 8LT25

PART NO.	DESCRIPTION	PRICE
22-3	.01 mfd Disc capacitor - 500V (2 req'd)	.30
22-2061	.1 mfd Capacitor - 400V	.35
22-2655	.01 mfd Capacitor - 1400V	.50
22-2704	.0068 mfd Disc capacitor	.30
22-3180	2200 mmf Mica capacitor - 300V (2 req'd)	.75
22-3616	1 mfd Electrolytic capacitor - 50V	1.00
22-3881	1500 mfd Electrolytic capacitor - (2 req'd)	
22-3878	2000 mfd Electrolytic capacitor	
22-3879	1000 mfd Electrolytic capacitor	
22-3880	Three section electrolytic capacitor	
22-3882	Two section electrolytic capacitor	
22-3883	50 mfd Electrolytic capacitor (3 req'd)	
43-333	Three contact housing (male)	.20
43-573	Six contact housing (female)	.45
43-574	Nine contact housing (female)	.35
54-385	6-32 x 5/16 Hex nut (used on 114-393)	.03
54-579	10-32 x 3/8 x 3/16 Hex nut (1 used on each 212-40)	
62-30	Fuse holder	

CHASSIS 8LT25 Continued

PART NO.	DESCRIPTION	PRICE
63-1757	220 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1764	330 ohm Resistor - 1/2W 10%	.17
63-1785	1000 ohm Resistor - 1/2W 10%	.17
63-1799	2200 ohm Resistor - 1/2W 10% (3 req'd)	.17
63-1806	3300 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1810	3900 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1827	10K ohm Resistor - 1/2W 10%	.17
63-1859	56K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1912	1 Megohm resistor - 1/2W 20%	.17
63-4851	125 ohm Resistor - 5W 10%	.75
63-5001	1650 ohm Resistor - 10W 10%	.90
63-5189	.39 ohm Resistor - 1W 5% (4 req'd)	.50
63-5190	2.2 ohm Resistor - 1W 5% (4 req'd)	.50
63-5599	22 ohm Resistor - 2W 20%	.34
63-5635	150 ohm Resistor - 2W 10% (2 req'd)	.34
63-5633	130 ohm Resistor - 2W 5%	.68
63-5641	220 ohm Resistor - 2W 10% (2 req'd)	.34
63-5645	270 ohm Resistor - 2W 10% (2 req'd)	.34
63-5656	470 ohm Resistor - 2W 10% (2 req'd)	.34
78-402	Four contact socket	.15
78-1223	Three contact transistor socket (2 req'd)	.35
78-1347	Electrolytic socket (5 req'd)	
78-1568	Two contact transistor socket (6 req'd)	
83-1520	Rectifier insulating strip (used on 212-39)	.05
83-3265	Five lug terminal strip (5 req'd)	.10
83-3881	Four lug terminal strip	.20
83-4203	Three lug terminal strip	
83-4237	Seven lug terminal strip	.15
83-4523	Insulating strip - transistors (6 req'd)	
83-4633	Felt strip	
86-303	Male terminal (2 req'd)	.04
86-328	Wire retaining terminal (2 req'd)	.03
86-389	Female terminal (14 req'd)	.03
93-166	#6 Internal shakeproof lockwasher #1206 (used on 114-393)	.03
93-369	#10 Internal shakeproof lockwasher #1210 (1 used on each 212-40)	.03
95-2107	Power transformer	
95-2108	Driver transformer (2 req'd)	
113-156	6-32 x 9/16 Phillips pan hd mach screw - internal lockwasher attached (2 used on each 121-270 & 121-271)	
114-393	6-32 x 1-3/8" x 1/4 Hex hd mach screw (used on 212-39)	.03
114-699	10-16 x 3/8 Hex washer hd self-tap screw (4 used on 95-2107)	.03
114-801	8-18 x 5/16 x 1/4 Hex hd self-tap screw (4 used on each S-61233)	.03
121-270	Transistor (power) (4 req'd)	
121-271	Transistor (driver) (2 req'd)	
121-272	Transistor (pre-driver) (2 req'd)	
136-61	Fuse - 3 amp	
212-39	Selenium rectifier	
212-40	Silicon rectifier (2 req'd)	
S-61233	Heat sink assembly	

CHASSIS 9L20

PART NO.	DESCRIPTION	PRICE
12-3249	Variable capacitor mtg bracket	.05
12-3680	Escutcheon mtg bracket (RH)	
19-306	Coil mtg clip (2 req'd)	.10
19-440	Dial crystal mtg clip (2 req'd)	
22-3	.01 mfd Disc capacitor - 500V (10 req'd)	.25
22-5	100 mmf Disc capacitor - 500V	.25
22-7	.001 mfd Disc capacitor - 500V	
22-13	.0033 mfd Disc capacitor - 500V (2 req'd)	.25
22-18	.0022 mfd Disc capacitor - 500V (2 req'd)	.25
22-27	.0025 mfd Disc capacitor	.25
22-1778	.047 mfd Capacitor - 200V (2 req'd)	.30
22-2370	50 mmf Disc capacitor	.25
22-2655	.01 mfd capacitor - 1400V	.50
22-2939	680 mmf Disc capacitor	.25
22-3140	270 mmf Disc capacitor - 500V (2 req'd)	.30
22-3177	390 mmf Disc capacitor - (2 req'd)	.25
22-3255	330 mmf Disc capacitor - 500V (3 req'd)	.25
22-3537	.047 mfd Capacitor - 200V	.30
22-3616	1.0 mfd Electrolytic capacitor-50V	1.00
22-3618	10 mfd Electrolytic capacitor-50V	1.25
22-3626	.22 mfd capacitor - 100V (2 req'd)	.50
22-3636	Electrolytic capacitor	3.00
22-3862	Three section variable capacitor	
46-3512	Push button - AM	
46-3513	Push button - FM	
46-3514	Push button (FM-AFC)	
46-3515	Push button - phono	
46-3516	Push button - off	
52-891	Three conductor cable & plug	1.00
52-978	Two conductor shielded lead	.75
54-12	6-32 x 5/16 Hex nut (used on 212-23)	.03
54-504	Tinnerman speed nut (used on S-60934)	.03
54-541	Palnut (1 used on each 19-440 & 2 used on each 83-4535)	.03
54-549	Tinnerman speed nut (2 used on 192-319)	.03
57-3519	Antenna mtg plate	.10
57-4372	Dial scale background plate	
57-4373	Chassis bottom plate	
57-4374	Trim plate	
57-4380	Die-cast escutcheon	
58-238	Three prong plug (used on 52-978)	.10
59-547	Dial pointer	
63-1192	27K ohm Resistor - 1W 10%	.25
63-1736	68 ohm Resistor - 1/2W 10% (2 req d)	.17
63-1744	100 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1747	120 ohm Resistor - 1/2W 10%	.17
63-1758	220 ohm Resistor - 1/2W 20% (5 req'd)	.17
63-1785	1000 ohm Resistor - 1/2W 10% (2 req'd)	.17

CHASSIS 9L20 Continued

PART NO.	DESCRIPTION	PRICE
63-1786	1000 ohm Resistor - 1/2W 20%. (2 req'd)	.17
63-1792	1500 ohm Resistor - 1/2W 10%.	.17
63-1803	2700 ohm Resistor - 1/2W 10%.	.17
63-1806	3300 ohm Resistor - 1/2W 10%. (2 req'd)	.17
63-1820	6800 ohm Resistor - 1/2W 10%. (2 req'd)	.17
63-1824	8200 ohm Resistor - 1/2W 10%.	.17
63-1831	12K ohm Resistor - 1/2W 10%.	.17
63-1834	15K ohm Resistor - 1/2W 10%.	.17
63-1835	15K ohm Resistor - 1/2W 20%.	.17
63-1842	22K ohm Resistor - 1/2W 20%.	.17
63-1855	47K ohm Resistor - 1/2W 10%. (2 req'd)	.17
63-1856	47K ohm Resistor - 1/2W 20%. (2 req'd)	.17
63-1859	56K ohm Resistor - 1/2W 10%. (2 req'd)	.17
63-1866	82K ohm Resistor - 1/2W 10%. (2 req'd)	.17
63-1869	100K ohm Resistor - 1/2W 10%. (2 req'd)	.17
63-1870	100K ohm Resistor - 1/2W 20%. (3 req'd)	.17
63-1880	180K ohm Resistor - 1/2W 10%. (2 req'd)	.17
63-1883	220K ohm Resistor - 1/2W 10%.	.17
63-1890	330K ohm Resistor - 1/2W 10%.	.17
63-1911	1 Megohm resistor - 1/2W 10%.	.17
63-1912	1 Megohm resistor - 1/2W 20%. (4 req'd)	.17
63-1915	1.2 Megohm Resistor - 1/2W 20%	.17
63-1925	2.2 Megohm resistor - 1/2W 10%.	.17
63-1926	2.2 Megohm resistor - 1/2W 20%.	.17
63-1940	4.7 Megohm resistor - 1/2W 20%. (2 req'd)	.17
63-1954	10 Megohm resistor - 1/2W 20%	.17
63-4880	Potentiometer	1.40
63-4896	440 ohm Resistor - 3W 10%.	.45
63-5193	22 ohm Resistor - fusing type - 4W 20%	.65
68-39	Tuning wrench	.50
78-402	Four contact socket	.15
78-1099	Three contact socket	.20
78-1311	Wafer socket (12BA6 - V6)	
78-1333	Noval wafer socket (6CQ7)	
78-1560	Wafer socket (12BA6 - V2 &V3) (2 req'd)	
78-1561	Wafer socket (12AU6)	
78-1562	Noval wafer socket (6EA8)	
78-1563	Noval wafer socket (6BN8)	
78-1564	Wafer socket (12BE6)	
78-1565	Dual pilot light socket	
80-1140	Tension spring (pointer	.10
80-1188	Tension spring (gang)	.10
83-1520	Rectifier insulating strip	.05
83-2123	Antenna terminal strip	.25
83-2538	Three lug terminal strip	.10
83-2612	Two lug terminal strip	.05
83-2639	Three lug terminal strip	.05
83-3561	Cable retaining strip	.05
83-3674	Seven lug terminal strip	.20
83-3676	Four lug terminal strip	.10
83-4530	Thirteen lug terminal strip	
83-4533	Rubber channel strip (top & bottom) (2 req'd)	
83-4534	Rubber channel strip (sides) (2 req'd)	
83-4535	Dial crystal retainer (2 req'd)	
83-4543	Rubber spacer (2 req'd)	
83-4560	Guide strip	
85-783	Push button bandswitch	
86-328	Wire retaining terminal (2 req'd)	.03
86-344	Connector terminal (2 part of S-54774)	.03
93-127	#1210 Internal shakeproof lockwasher (1 used on each 19-306)	
93-898	Steel washer (used on S-60928)	
93-1522	Spring washer	.03
93-1580	Steel washer	
94-812	Coil insert (1 part of each S-54155 & S-54156)	.05
94-1249	Shaft bushing	
95-1915	1st IF transformer (AM)	2.50
95-1917	3rd IF transformer (AM)	2.50
95-1919	2nd & 3rd IF transformer (FM)	2.50
95-1920	Ratio detector transformer	2.50
95-1924	2nd IF transformer (AM)	2.50
95-2073	Input mixer transformer	
95-2074	Trap coil	
95-2075	Detector mixer transformer	
95-2076	Doubler mixer transformer	
95-2106	Power transformer	
100-249	Pilot light bulb (2 req'd)	.18
103-23	Crystal diode (2 req'd)	.75
105-42	R/C network	.50
105-50	R/C network (2 req'd)	.90
112-1484	8-18 x 1/2 Phillips flat hd self-tap screw (8 mt 57-4373)	.03
113-8	6-32 x 1/4 x 1/4 Hex hd mach screw - internal shakeproof lockwasher (3 used on 22-3862)	.03
113-34	6-32 x 3/8 x 1/4 Hex hd mach screw - external shakeproof lockwasher (2 used on 85-783)	
114-26	8-18 x 1/4 x 1/4 Hex hd self-tap screw (2 used on 12-3249)	.03
114-77	6-20 x 5/16 x 1/4 Hex hd self-tap screw (3 used on 57-4372 & 2 used on 83-4560)	.03
114-390	8-18 x 7/16 x 1/4 Hex hd self-tap screw (4 used on 57-4380)	.03
114-393	6-32 x 1-3/8 x 1/4 Hex hd mach screw (used on 212-23)	.03
114-564	8-18 x 5/16 Hex hd self-tap screw - flat washer attached (2 used on S-54500)	.03
114-654	6-20 x 3/8 x 1/4 Hex hd self-tap screw (2 used on S-60926)	.03
114-801	8-18 x 5/16 x 1/4 Hex hd self-tap screw (1 used on 57-3519 & 4 used on each S-60927 & 12-3680)	.03
114-804	8-18 x 1/2 Hex hd self-tap screw - flat washer attached (4 used on each S-61017 & 95-2106)	.03
114-901	6-20 x 7/16 Hex hd self-tap screw - flat washer attached (4 used on S-60934)	
125-117	Rubber grommet (1 used on each 114-804)	.03
126-797	Tube shield (6CQ7)	.10
126-1048	Pilot light shield (2 req'd)	
126-1049	Hum shield	

CHASSIS 9L20 Continued

PART NO.	DESCRIPTION	PRICE
149-211	Iron core (1 used on each S-54155 & S-54156)	.10
188-177	Retaining ring (1 used on 94-1249 & 1 part of S-60575)	.03
188-322	Retaining ring (1 used on each S-60929)	.03
192-319	Dial crystal	
196-464	Escutcheon gasket (top & bottom) (2 req'd)	
196-465	Escutcheon gasket (sides) (2 req'd)	
212-23	Selenium rectifier	1.80
S-54155	Oscillator coil (BC)	1.25
S-54156	Detector coil (BC)	1.25
S-54500	Antenna assembly	2.50
S-54774	Antenna cable & terminal	.25
S-60575	Knob & ring assembly (tuning)	
S-60922	Drive cord & eyelet (pointer)	
S-60923	Drive cord & eyelet (pointer)	
S-60926	Pulley & bracket	
S-60927	Escutcheon mtg bracket	
S-60928	Neon bulb & terminal	
S-60929	Pointer support & ring (2 req'd)	
S-60934	Dial scale & channel strip	
S-61017	FM tuner (see tuner parts list for components)	
S-62551	Drive cord eyelet (gang)	
S-62552	Drive cord eyelet (gang)	

MODEL MLT15

PART NO.	DESCRIPTION	PRICE
13-20	Tack strip (part of S-61876)	.03
16-2504	Packing carton	
70-165	#6 x 3/8 rd hd wood screw (2 part of S-61876)	.03
86-323	Spade terminal	.03
93-1579	Rubber washer (4 part of S-61876)	
114-910	8-18 x 7/16 Slotted hex hd self-tap screw - flat washer attached (4 part of S-61876)	
202-1833	FM instruction book	.20
202-2304	Instruction book	
S-61876	Accessories kit	

CHASSIS 9L21

PART NO.	DESCRIPTION	PRICE
12-3249	Variable capacitor mtg bracket	.05
12-3680	Escutcheon mtg bracket (RH)	
19-306	Coil mtg clip (2 req'd)	.10
19-440	Dial crystal retaining clip (2 req'd)	
22-3	.01 mfd Disc capacitor - 500V (12 req'd)	.25
22-5	100 mmf Disc capacitor - 500V	.25
22-7	.001 mfd Disc capacitor - 500V	
22-13	.0033 mfd Disc capacitor - 500V (2 req'd)	.25
22-18	.0022 mfd Disc capacitor - 500V (2 req'd)	.25
22-27	.0025 mfd Disc capacitor	.25
22-1778	.047 mfd Capacitor - 200V (2 req'd)	.30
22-2370	50 mmf Disc capacitor	.25
22-2939	680 mmf Disc capacitor	.25
22-3255	330 mmf Disc capacitor - 500V (3 req'd)	.25
22-3537	.047 mfd Capacitor - 200V	.30
22-3616	1.0 mfd Electrolytic capacitor - 50V	1.00
22-3618	10 mfd Electrolytic capacitor - 50V	1.25
22-3626	.22 mfd Capacitor - 100V (2 req'd)	.50
22-3636	Electrolytic capacitor	3.00
22-3862	Three section variable capacitor	
22-3870	.022 mfd Capacitor - 600V	
43-570	Contact housing - male	.45
43-573	Contact housing - female	.45
44-48	Connector jack	.20
46-3512	Push button - AM	
46-3513	Push button - FM	
46-3514	Push button - FM - AFC	
46-3515	Push button - phono	
46-3516	Push button - off	
52-1076	Four conductor cable	
54-12	6-32 x 5/16 Hex nut (used on 212-23)	.03
54-504	Tinnerman speed nut (used on S-60934)	.03
54-541	Palnut (1 used on each 19-440 & 2 used on each 83-4535)	.03
54-549	Tinnerman speed nut (2 used on 192-319)	.03
57-4372	Dial scale background plate	
57-4373	Chassis bottom plate	
57-4374	Trim plate	
57-4380	Die cast escutcheon	
58-214	Single prong plug (used on S-54511)	.10
59-547	Dial pointer	
63-1736	68 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1744	100 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1747	120 ohm Resistor - 1/2W 10%	.17
63-1758	220 ohm Resistor - 1/2W 20% (5 req'd)	.17
63-1785	1000 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1786	1000 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1792	1500 ohm Resistor - 1/2W 10%	.17
63-1799	2200 ohm Resistor - 1/2W 10%	.17
63-1803	2700 ohm Resistor - 1/2W 10%	.17
63-1806	3300 ohm Resistor - 1/2W 10%	.17
63-1820	6800 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1824	8200 ohm Resistor - 1/2W 10%	.17
63-1831	12K ohm Resistor - 1/2W 10%	.17
63-1834	15K ohm Resistor - 1/2W 10%	.17
63-1835	15K ohm Resistor - 1/2W 20%	.17
63-1842	22K ohm Resistor - 1/2W 20%	.17
63-1855	47K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1856	47K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1859	56K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1866	82K ohm Resistor - 1/2W 10% (3 req'd)	.17

CHASSIS 9L21 Continued

PART NO.	DESCRIPTION	PRICE
63-1869	100K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1870	100K ohm Resistor - 1/2W 20% (5 req'd)	.17
63-1883	220K ohm Resistor - 1/2W 10%	.17
63-1890	330K ohm Resistor - 1/2W 10%	.17
63-1911	1 Megohm resistor - 1/2W 10%	.17
63-1912	1 Megohm resistor - 1/2W 20% (5 req'd)	.17
63-1915	1.2 Megohm resistor - 1/2W 10%	.17
63-1925	2.2 Megohm resistor - 1/2W 10%	.17
63-1926	2.2 Megohm resistor - 1/2W 20%	.17
63-1940	4.7 Megohm resistor - 1/2W 20% (2 req'd)	.17
63-1954	10 Megohm resistor - 1/2W 20%	.17
63-4880	Potentiometer	1.40
63-4896	440 ohm Resistor - 3W 10%	.45
63-6129	27K ohm Resistor - 1W 10%	.25
63-5193	22 ohm Resistor - fusing type - 4W 20%	.65
68-39	Tuning wrench	.50
78-1311	Wafer socket (12BA6 - V6)	
78-1333	Noval wafer socket (6GQ7)	
78-1560	Wafer socket (12BA6 - V2 & V3)	
78-1561	Wafer socket (12AU6)	
78-1562	Noval wafer socket (6EA8)	
78-1563	Noval wafer socket (6BN8)	
78-1564	Wafer socket (12BE6)	
78-1565	Dual pilot light socket	
80-1140	Tension spring (pointer)	.10
80-1188	Tension spring (gang)	.10
83-1520	Rectifier insulating strip	.05
83-2123	Antenna terminal strip	.25
83-2538	Three lug terminal strip	.10
83-2612	Two lug terminal strip	.05
83-2639	Three lug terminal strip	.05
83-3561	Cable retaining strip	.05
83-3674	Seven lug terminal strip	.20
83-3676	Four lug terminal strip	.10
83-4530	Thirteen lug terminal strip	
83-4533	Rubber channel strip (top & bottom) (2 req'd)	
83-4534	Rubber channel strip (sides) (2 req'd)	
83-4535	Dial crystal retainer (2 req'd)	
83-4543	Rubber spacer (2 req'd)	
83-4560	Guide strip	
85-783	Push button bandswitch	
86-81	Shakeproof terminal	.03
86-312	Shakeproof terminal	.03
86-328	Wire retaining terminal (2 req'd)	.03
86-344	Connector terminal (2 part of S-54774)	.03
86-370	Male terminal (5 req'd)	.03
86-371	Female terminal (3 req'd)	.03
93-127	#1210 Internal shakeproof lockwasher (1 used on each 19-306)	
93-149	Fiber washer (1 used on each 114-562)	.03
93-898	Steel washer	
93-1580	Steel washer	
93-1522	Spring washer (used on S-60928)	
94-812	Coil insert (1 part of each S-54155 & S-54156)	.05
94-1035	Spacer (2 part of S-54773)	.10
94-1249	Shaft bushing	
95-1915	1st IF transformer (AM)	2.50
95-1917	3rd IF transformer (AM)	2.50
95-1919	2nd & 3rd IF transformer (FM) (2 req'd)	2.50
95-1920	Ratio detector transformer	2.50
95-1924	2nd IF transformer (AM)	2.50
95-2073	Input mixer transformer	
95-2074	Trap coil	
95-2075	Detector mixer transformer	
95-2076	Doubler mixer transformer	
95-2103	Power transformer	
100-249	Pilot light bulb (2 req'd)	.18
103-23	Crystal diode (2 req'd)	.75
105-42	R/C network	.50
105-50	R/C network (2 req'd)	.90
112-1484	8-18 x 1/2 Phillips flat hd self-tap screw (8 used on 57-43-73)	.05
113-8	6-32 x 1/4 x 1/4 Hex hd mach screw - internal shakeproof lockwasher (3 used on 22-3862)	.03
113-34	6-32 x 3/8 x 1/4 Hex hd mach screw - external shakeproof lockwasher (2 used on 85-783)	
114-26	8-18 x 1/4 x 1/4 Hex hd self-tap screw (2 used on 12-3249)	.03
114-77	6-20 x 5/16 x 1/4 Hex hd self-tap screw (3 used on 57-4372 & 2 used on 83-4560)	.03
114-390	8-18 x 7/16 x 1/4 Hex hd self-tap screw (4 used on 57-4380)	.03
114-393	6-32 x 1-3/8 x 1/4 Hex hd mach screw (used on 212-23)	.03
114-562	6-18 x 1-1/2 Hex hd self-tap screw (2 used on S-54773)	
114-654	6-20 x 3/8 x 1/4 Hex hd self-tap screw (2 used on S-60926)	.03
114-801	8-18 x 5/16 x 1/4 Hex hd self-tap screw (4 used on S-60927 & 5 used on 12-3680)	.03
114-804	8-18 x 1/2 Hex hd self-tap screw - flat washer attached (4 used on each S-61017 & 95-2103)	.03
114-901	6-20 x 7/16 Hex hd self-tap screw - flat washer attached (4 used on S-60934)	
125-117	Rubber grommet (1 used on each 114-804)	.03
126-797	Tube shield (6GQ7)	.10
126-1048	Pilot light shield (2 req'd)	
149-211	Iron core (1 part of each S-54155 & S-54156)	.10
188-177	Retaining ring (1 used on each 94-1249 & S-60575)	.03
188-322	Retaining ring (part of S-60929)	.03
192-319	Dial crystal	
196-464	Escutcheon gasket (top & bottom) (2 req'd)	
196-465	Escutcheon gasket (sides) (2 req'd)	
212-23	Selenium rectifier	
S-54155	Oscillator coil (BC)	
S-54156	Detector coil (BC)	
S-54511	Shielded lead & plug	
S-54773	Antenna assembly	
S-54774	Antenna cable & terminal	
S-60575	Knob & ring assembly - tuning	
S-60922	Drive cord & eyelet (pointer)	

PART NO.	DESCRIPTION	PRICE
CHASSIS 9L21 Continued		
S-60923	Drive cord & eyelet (pointer)	
S-60926	Pulley & bracket	
S-60927	Escutcheon mtg bracket	
S-60928	Neon bulb & terminal	
S-60929	Pointer support & ring (2 req'd)	
S-60934	Dial scale & channel strip	
S-61017	FM tuner (see tuner parts list for components)	
S-62551	Drive cord & eyelet (gang)	
S-62552	Drive cord & eyelet (gang)	
MODEL MLT14		
13-20	Tack strip (part of S-61876)	.03
16-2504	Packing carton	
70-165	#6 x 3/8 rd hd wood screw (2 part of S-61876)	.03
86-323	Spade terminal	.03
93-1579	Rubber washer (4 part of S-61876)	
114-910	8-18 x 7/16 Slotted hex hd self-tap screw-flat washer attached (4 part of S-61876)	
202-1833	FM instruction book	
202-2303	Instruction book	
S-61876	Accessories kit	
CHASSIS 10K01		
12-3130	Coil support bracket	.10
12-3385	Tuner bracket	.40
12-3609	Chassis mounting bracket - left	
12-3613	Antenna mounting bracket (2 req'd)	
12-3615	Control mounting bracket	
12-3616	Support bracket	
19-238	Coil mounting clip (1 part of each S-50127 & S-52362)	.10
22-3	.01 mfd Disc capacitor - 500V (14 req'd)	.30
22-5	100 mmf Disc capacitor - 500V (2 req'd)	.25
22-9	100 mmf Disc capacitor - 500V	.25
22-14	.0047 mfd Disc capacitor - 500V	.25
22-17	.001 mfd Disc capacitor - 1000V	.25
22-18	.0022 mfd Disc capacitor - 500V (3 req'd)	.25
22-1784	.01 mfd Capacitor - 400V (2 req'd)	
22-1852	7.5 mmf Ceramic capacitor	.25
22-1888	.001 mfd Ceramic capacitor	.25
22-2524	470 mmf Mica capacitor - 500V (2 req'd)	.25
22-2569	.047 mfd Capacitor - 600V	
22-2655	.01 mfd Disc capacitor - 1400V	.50
22-2664	.0033 mfd Capacitor - 200V (2 req'd)	
22-2672	7.5 mmf Disc capacitor	.25
22-2732	Feed thru capacitor (6 req'd)	.30
22-2863	33 mmf Disc capacitor - 500V (2 req'd)	.25
22-3093	3300 mmf Mica capacitor (2 req'd)	1.00
22-3180	2200 mmf Mica capacitor - 300V	.75
22-3318	.001 mfd Disc capacitor - 25V	.25
22-3366	1000 mmf Mica capacitor - 500V (2 req'd)	.40
22-3456	2 x 12 mmf Disc capacitor	.30
22-3537	.047 mfd Capacitor - 200V (2 req'd)	.30
22-3591	.1 mfd Capacitor - 200V	.30
22-3621	22 mmf Disc capacitor	.25
22-3626	.22 mfd capacitor - 100V (2 req'd)	.50
22-3649	25 mmf Disc capacitor	.25
22-3693	Electrolytic capacitor	3.50
22-3737	82 mmf Mica capacitor 500V	.25
22-3774	2 mmf Disc capacitor	.25
22-3809	Variable capacitor	
24-1068	Tuner cover	
54-139	3/8-32 x 9/16 Palnut (1 mts each 63-5082, 63-5093 & 85-772)	.03
56-426	Roll Pin	.05
57-4186	Dial background plate	
58-209	AC plug	.35
59-528	Dial pointer	
63-1729	47 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1744	100 ohm Resistor - 1/2W 20%	.17
63-1758	220 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1770	680 ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1786	1000 ohm Resistor - 1/2W 20%	.17
63-1799	2200 ohm Resistor - 1/2W 10%	.17
63-4814	8200 ohm Resistor - 1/2W 10%	.17
63-1835	15K ohm Resistor - 1/2W 20%	.17
63-4045	18K ohm Resistor - 1/2W 10%	.17
63-2848	22K ohm Resistor - 1/2W 10%	.17
63-1842	22K ohm Resistor - 1/2W 20%	.17
63-2872	47K ohm Resistor - 1/2W 10% (3 req'd)	.17
63-4747	47K ohm Resistor - 1/2 20% (2 req'd)	.17
63-3991	56K ohm Resistor - 1/2W 10%	.17
63-1866	82K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-4482	100K ohm Resistor - 1/2W 10% (5 req'd)	.17
63-4481	220K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-4091	330K ohm Resistor - 1/2 10% (2 req'd)	.17
63-1894	390K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1897	470K ohm Resistor - 1/2W 10%	.17
63-1912	1 Megohm Resistor - 1/2W 20% (5 req'd)	.17
63-1926	2.2 Megohm Resistor - 1/2W 20% (3 req'd)	.17
63-4376	4.7 Megohm Resistor - 1/2W 20% (2 req'd)	.17
63-1954	10 Megohm Resistor - 1/2W 20% (3 req'd)	.17
63-3225	330 ohm Resistor - 2W 20%	.34
63-1977	150 ohm Resistor - 1W 10% (2 req'd)	.25
63-1976	1200 ohm Resistor - 1W 10% (2 req'd)	.25
63-4290	330K ohm Resistor - 1/4W 10%	.17
63-4312	1 Megohm Resistor - 1/4W 20%	.17
63-4339	4.7 Megohm Resistor - 1/4W 10%	.17
63-4880	Potentiometer	1.40

CHASSIS 10K01 Continued

PART NO.	DESCRIPTION	PRICE
63-5082	Dual volume control	
63-5093	Dual tone control	
63-5095	55 ohm Resistor 7W 10%	
76-1141	Guide shaft	.10
76-1352	Tuning shaft	
78-788	Noval wafer socket (9EA8)	.40
78-861	Molded socket (25C5) (2 req'd)	.25
78-870	Wafer socket (6AU6 - 6BA6) (2 req'd)	.15
78-912	Wafer socket (6BE6)	.15
78-1552	Noval wafer socket (6EQ7)	
78-1553	Wafer socket (6AL5)	
78-1554	Noval wafer socket (12AX7A)	
78-1558	Noval wafer socket (6DT8)	
80-209	Tension spring (gang)	.03
80-1091	Tension spring (pointer)	.08
80-1467	Retaining spring	.05
80-1468	Grounding spring	.05
83-2612	Two lug terminal strip	.05
83-3671	Five lug terminal strip	.15
83-3672	Seven lug terminal strip (2 req'd)	.20
83-3673	Ten lug terminal strip	.25
83-3676	Four lug terminal strip (2 req'd)	.10
83-1635	Control insulating strip (3 req'd)	.03
83-4456	Control insulating strip	
85-772	Bandswitch	
86-247	Insulated feed thru terminal (2 req'd)	.10
86-348	Terminal & screw (2 part of S-59192)	.10
90-653	Spacer (4 req'd)	
93-993	Insulating washer (3 req'd)	.03
93-1522	Spring washer (used on 100-309)	.03
94-613	Iron core bushing (2 req'd)	.10
94-812	Coil insert	.05
94-1210	Tuning shaft bushing	
95-1505	2nd IF transformer (AM)	2.50
95-1718	1st IF transformer (AM)	2.50
95-1847	1st IF transformer (FM)	2.50
95-1866	Discriminator transformer	2.50
95-1919	Limiter & 2nd IF transformer (FM) (2 req'd)	2.50
95-2069	Audio output transformer (2 req'd)	
95-2073	Input coil	
95-2074	Trap coil	
95-2076	Doubler coil	
95-2077	Detector coil	
97-607	Chassis mounting stud (4 req'd)	.10
100-309	Neon indicator	
103-23	Crystal diode (2 req'd)	.75
103-34	Crystal diode (2 req'd)	1.00
103-39	Silicon diode	3.00
105-42	R/C network	.50
113-26	6-32 x 1/4 x 1/4 Hex hd mach screw - external lockwasher attached (2 used on 126-927)	.03
113-154	6-32 x 5/8 x 1/4 Hex hd mach screw - internal lockwasher (2 req'd)	
114-77	6-20 x 5/16 x 1/4 Hex hd self-tapping screw (4 used on 12-3615 & 2 used on each 12-3613 & 12-3616)	.03
114-271	6-20 x 1/2 Hex hd self-tapping screw (2 join S-59716 & 12-3116)	
114-352	6-20 x 7/8 x 1/4 Hex hd self-tapping screw (used on 212-18)	
114-394	6-32 x 1-1/2 x 1/4 Hex hd self-tapping screw (used on 212-18)	.03
114-594	8-18 x 3/8 Hex hd self-tapping screw - flat washer attached (2 used on S-59192)	.03
114-801	8-18 x 5/16 x 1/4 Hex hd self-tapping screw (3 used on each S-59715 & 12-3609)	.03
114-822	6-20 x 1/4 Hex hd self-tapping screw (2 used on 57-41-86)	.03
125-116	Rubber grommet (2 req'd)	.05
126-797	Tube shield (6EQ7)	.10
126-927	Shield	.10
126-937	Tube shield & base	.10
149-211	Iron core (part of S-501 27)	.10
149-294	Iron core & spring (2 req'd)	.50
188-232	Retaining ring (2 req'd)	.03
212-18	Selenium rectifier	2.35
S-13871	Detector coil (FM)	1.25
S-50127	AM oscillator coil	1.25
S-52359	Oscillator coil (FM)	1.00
S-52362	Antenna coil	.60
S-59192	Wavemagnet	
S-59541	Drive cord & eyelet	
S-59542	Drive cord & eyelet	
S-59543	Drive cord & eyelet	
S-59544	Drive cord & eyelet	
S-59715	Chassis mounting bracket	
S-59716	Pulley & plate	
S-59722	Connector jack & mounting strip	

CHASSIS 11L8T25

12-3684	On-off switch mtg bracket	
12-3685	Pulley bearing bracket	
12-3686	Front bracket - indicator light (3 req'd)	
12-3691	Switch mtg bracket	
12-3687	Variable capacitor mtg bracket	
17-149	Clamp (3 req'd)	.05
19-306	Coil mtg clip (2 req'd)	.10
22-2	220 mmf Disc capacitor - 500V	.25
22-3	.01 mfd Disc capacitor - 500V (15 req'd)	.30
22-12	.0015 mfd Disc capacitor - 500V	.25
22-13	.0033 mfd Disc capacitor - 500V (5 req'd)	.25
22-17	.001 mfd Disc capacitor - 1000V (2 req'd)	.25
22-18	.0022 mfd Disc capacitor - 500V (2 req'd)	.25
22-1778	.047 mfd Capacitor - 200V (2 req'd)	.30
22-2671	25 mmf Disc capacitor - 500V	.25
22-2703	220 mmf Disc capacitor - 500V	.25
22-2726	50 mfd Electrolytic capacitor - 10V (4 req'd)	1.50
22-2863	33 mmf Disc capacitor - 500V	.25
22-2884	5 mfd Electrolytic capacitor - 12V (2 req'd)	1.50
22-2927	56 mmf Disc capacitor - 500V (2 req'd)	.25

CHASSIS 11L8T25 Continued

PART NO.	DESCRIPTION	PRICE
22-2939	680 mmf Disc capacitor	.25
22-3010	.01 mfd Disc capacitor - 25V (2 req'd)	.45
22-3255	330 mmf Disc capacitor - 500V (3 req'd)	.25
22-3362	560 mmf Disc capacitor - 500V (4 req'd)	.25
22-3363	470 mmf Disc capacitor - 500V (2 req'd)	.25
22-3595	.33 mfd Capacitor - 50V (2 req'd)	
22-3615	1 mfd Electrolytic capacitor - 25V (4 req'd)	1.25
22-3616	1.0 mfd Electrolytic capacitor - 50V	1.00
22-3618	10 mfd Electrolytic capacitor - 50V (3 req'd)	1.25
22-3626	.22 mfd Capacitor - 100V (4 req'd)	.50
22-3678	.047 mfd Capacitor - 100V (2 req'd)	
22-3694	.1 mfd Capacitor - 100V (2 req'd)	.35
22-3865	Three section variable capacitor	
22-3889	50 mmf Disc capacitor	
22-3891	.0068 mfd Capacitor - 100V (2 req'd)	
22-3892	.01 mfd Capacitor - 100V (4 req'd)	
22-3893	1 mfd Capacitor - 100V (2 req'd)	
22-3896	5 mfd Electrolytic capacitor - 25V	
26-826	Dial scale	
43-570	Male contact housing	.45
43-571	Male contact housing	.30
44-48	Connector jack (2 part of S-54151)	.20
46-3553	Push button (FM-AFC)	
46-3554	Push button - FM	
46-3555	Push button - AM	
46-3556	Push button - phono	
46-3557	Push button - tape	
46-3558	Push button - ext stereo	
46-3559	Push button - stereo	
46-3560	Push button - monaural	
46-3565	Push button (push-on push-off)	
52-1063	Two conductor shielded lead	
52-1064	Two conductor shielded lead	
52-1066	Two conductor shielded lead	
52-1067	Two conductor shielded lead	
54-139	3/8-32 Palnut (4 req'd)	.03
54-541	Palnut (2 used on each 80-1681 & 1 used on each 80-1682)	.03
54-504	Tinnerman speed clip	.03
57-3515	Chassis bottom plate	2.00
57-4387	Dial scale background plate	
57-4431	Indicator light backing plate (3 req'd)	
59-548	Dial pointer	
61-256	Tone control pulley (3 req'd)	
63-1744	100 ohm Resistor - 1/2W 20% (3 req'd)	.17
63-1750	150 ohm Resistor - 1/2W 10%	.17
63-1768	390 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1785	1000 ohm Resistor - 1/2W 10%	.17
63-1786	1000 ohm Resistor - 1/2W 20%	.17
63-1789	1200 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1792	1500 ohm Resistor - 1/2W 10%	.17
63-1799	2200 ohm Resistor - 1/2W 10% (3 req'd)	.17
63-1803	2700 ohm Resistor - 1/2W 10%	.17
63-1806	3300 ohm Resistor - 1/2W 10% (4 req'd)	.17
63-1810	3900 ohm Resistor - 1/2W 10% (4 req'd)	.17
63-1813	4700 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1817	5600 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1820	6800 ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1822	7500 ohm Resistor - 1/2W 50% (2 req'd)	.34
63-1824	8200 ohm Resistor - 1/2W 10%	.17
63-1827	10K ohm Resistor - 1/2W 10% (11 req'd)	.17
63-1828	10K ohm Resistor - 1/2W 20% (2 req'd)	.17
63-1834	15K ohm Resistor - 1/2W 10% (3 req'd)	.17
63-1835	15K ohm Resistor - 1/2W 20%	.17
63-1838	18K ohm Resistor - 1/2W 10% (3 req'd)	.17
63-1841	22K ohm Resistor - 1/2W 10%	.17
63-1842	22K ohm Resistor - 1/2W 20%	.17
63-1852	39K ohm Resistor - 1/2W 10%	.17
63-1855	47K ohm Resistor - 1/2W 10% (8 req'd)	.17
63-1859	56K Resistor - 1/2W 10% (3 req d)	.17
63-1862	68K ohm Resistor - 1/2W 10% (5 req'd)	.17
63-1869	100K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1870	100K ohm Resistor - 1/2W 20% (6 req'd)	.17
63-1873	120K ohm Resistor - 1/2W 10% (2 req'd)	.17
63-1876	150K ohm Resistor - 1/2W 10% (6 req'd)	.17
63-1883	220K ohm Resistor - 1/2W 10% (3 req'd)	.17
63-1898	470K ohm Resistor - 1/2W 20% (4 req'd)	.17
63-1905	680K ohm Resistor - 1/2W 20% (3 req'd)	.17
63-1911	1 Megohm resistor - 1/2W 10%	.17
63-1912	1 Megohm resistor - 1/2W 20% (3 req'd)	.17
63-1915	1.2 Megohm resistor - 1/2W 10%	.17
63-1925	2.2 Megohm resistor - 1/2W 10%	.17
63-1926	2.2 Megohm resistor - 1/2W 20% (2 req'd)	.17
63-1961	15 Megohm resistor - 1/2W 20% (3 req'd)	.17
63-1974	3300 ohm Resistor - 1W 10% (3 req'd)	.25
63-4880	Potentiometer	
63-5131	Treble control	
63-5132	Presence control	
63-5146	Loudness control	
63-5147	Bass control	
63-6129	27K ohm Resistor - 1W 10%	.25
68-39	Tuning wrench	.50
78-1089	Molded tube socket (part of S-61671)	.25
78-1099	Three contact socket (part of S-61675)	.20

CHASSIS 11L8T25 Continued

PART NO.	DESCRIPTION	PRICE
78-1223	Transistor socket (8 req'd)	.35
78-1512	Dual pilot light socket	
78-1560	Wafer socket (6BA6)	
78-1562	Noval wafer socket (6EA8)	
78-1563	Noval wafer socket (6BN8)	
78-1564	Wafer socket (6BF6)	
78-1576	Noval wafer socket (6GQ7)	
78-1577	Wafer socket (6BA6)	
78-1578	Wafer socket (6BN6)	
78-1579	Wafer socket (6AU6)	
78-1580	Noval wafer socket	
80-1188	Tension spring (gang)	.10
80-1681	Glass retaining spring (2 req'd)	
80-1682	Glass retaining spring (top) (2 req'd)	
80-1683	Tone pulley tension spring (3 req'd)	
80-1686	Tuning tube retaining spring	
80-1698	Tension spring (pointer)	
83-1475	Cable retaining strip (5 req'd)	
83-2145	Five lug terminal strip	.10
83-2216	Seven lug terminal strip	
83-2649	Two lug terminal strip (3 req'd)	.05
83-3025	Rubber strip	.03
83-3670	Six lug terminal strip (2 req'd)	.15
83-3671	Five lug terminal strip (2 req'd)	.15
83-3672	Eight lug terminal strip (2 req'd)	.20
83-3674	Seven lug terminal strip (3 req'd	.20
83-3676	Four lug terminal strip (3 req'd)	.10
83-4332	Wire tie down strip	
83-4337	Three lug terminal strip	.10
83-4537	Trim strip - escutcheon (part of S-61713)	
83-4539	Mashing strip	
83-4543	Center bar rubber strip (3 req'd)	
83-4565	Rubber channel strip (2 req'd)	
83-4566	Rubber channel strip (2 req'd)	
83-4635	Switch sock mtg strip (2 req'd)	
85-780	AC switch	
85-781	Push button bandswitch	
86-328	Wire retaining terminal (3 req'd)	.03
86-344	Connector terminal (2 req'd)	.03
86-390	Connector terminal (14 req'd)	.03
93-1522	Spring washer (used on S-61721)	.03
93-1580	Spacer washer	
94-812	Coil insert (1 part of each S-54155 & S-54156)	.05
94-1248	Shaft bushing	
95-1915	1st IF transformer (AM)	2.50
95-1916	2nd IF transformer (AM)	2.50
95-1917	3rd IF transformer (AM)	2.50
95-1918	4th IF transformer (FM)	2.50
95-1919	2nd & 3rd IF transformer (FM) (2 req'd)	2.50
95-1920	Ratio detector transformer	2.50
95-2073	Input mixer transformer	
95-2074	Trap coil	
95-2075	Detector mixer transformer	
95-2076	Doubler mixer transformer	
100-249	Pilot light bulb (5 req'd)	.18
103-34	Crystal diode (2 req'd)	1.00
105-50	R/C network (2 req'd)	.90
113-8	6-32 x 1/4 x 1/4 Hex hd mach screw - internal shakeproof lockwasher (3 used on 22-3865 & 2 used on 85-780)	.03
114-77	6-20 x 5/16 x 1/4 Hex hd self-tap screw (5 mt 57-3515)	.03
114-344	6-20 x 1/4 x 1/4 Hex hd self-tap screw (2 used on each S-61671 & 126-1051)	.03
114-390	8-18 x 7/16 x 1/4 Hex hd self-tap screw (6 mt S-61713)	.03
114-801	8-18 x 5/16 x 1/4 Hex hd self-tap screw (2 join 22-3855 & S-61363; 8 join 52-1067 & S-61710 to S-61675 & 6 join 85-871 & 126-1046)	
114-804	8-18 x 1/2 Hex hd self-tap screw - flat washer attached (4 used on S-61363)	.03
114-813	6-20 x 3/8 x 1/4 Hex hd self-tap screw (4 used on S-62368)	.03
114-822	6-20 x 1/4 x 1/4 Hex hd self-tap (4 used on S-62368)	.03
121-273	Transistor - pre - amp (4 req'd)	
121-274	Transistor - pre - amp (2 req'd)	
121-275	Transistor - pre - amp (2 req'd)	
125-117	Rubber grommet (4 req'd)	
125-130	Rubber grommet	
126-1046	Hum Shield	
126-1048	Pilot light shield (2 req'd)	
126-1050	Tone indicator background shield	
126-1051	Transistor shield	
149-211	Iron core (1 part of each S-54155 & S-54156)	.10
188-177	Knob clamping ring (1 part of each S-61499, S-61500, S-61501 & S-61502)	
188-232	Clamping ring (1 part of each S-61711)	.03
188-367	Clamping ring (4 part of S-61712)	
192-320	Dial crystal	
196-466	Bottom gasket	
196-467	Top right gasket	
196-468	Top left gasket	
199-263	Shielded paper sleeve	.10
199-389	Shielded paper sleeve	
S-18812	Antenna loading coil	.80
S-47742	Drive cord & eyelet assembly - treble	
S-54151	Antenna strip & bracket	1.00
S-54155	Oscillator coil (BC)	1.25
S-54156	Detector coil (BC)	1.25
S-61363	FM tuner (see tuner parts list for components)	
S-61499	Knob & ring - tuning	
S-61500	Knob & ring - bass	
S-61501	Knob & ring - treble	
S-61502	Knob & ring - presence	
S-61503	Knob & ring - loudness	
S-61504	Knob & ring - balance	
S-61648	Antenna cable & terminal	
S-61671	Bracket & socket	
S-61675	Escutcheon mtg bracket - (RH)	
S-61710	Escutcheon mtg bracket - (LH)	
S-61711	Pointer support & ring (2 req'd)	
S-61712	Tone indicator & ring assembly	
S-61713	Escutcheon	
S-61714	Tone indicator mtg bracket	
S-61718	Shield & lens - bass	

CHASSIS 11L8T25 Continued

PART NO.	DESCRIPTION	PRICE
S-61719	Shield & lens - treble	
S-61720	Shield & lens - presence	
S-61721	Neon bulb & terminal	
S-61727	Drive cord & eyelet (gang)	
S-61728	Drive cord & eyelet (gang)	
S-61729	Drive cord & eyelet (treble)	
S-61730	Drive cord & eyelet (bass)	
S-61731	Drive cord & eyelet (presence)	
S-62371	Drive cord & eyelet - pointer	

REMOTE SPEAKER KR102W

PART NO.	DESCRIPTION	PRICE
2-1484	Cabinet back	
14-4672	Table cabinet	
16-2302	Packing carton	
22-3196	Electrolytic capacitor 80/25V (2 req'd)	2.00
46-2614	Switch knob	.25
49-978	3-1/2" PM speaker	4.75
49-984	6" x 9" PM speaker	
54-139	3/8 x 32 x 9/16 Hex palnut	.03
54-385	6-32 x 5/16 Hex nut (1 used on each 112-1265)	.03
54-424	8-32 x 11/32 Hex palnut washer (1 used on each 112-1269)	.03
54-469	Tinnerman speed nut (part of 14-4672)	.10
57-2816	Nameplate (part of 14-4672)	.35
58-226	Five prong plug	.15
83-2145	Five lug terminal strip (part of S-50862)	.10
85-680	Three position switch	2.50
86-333	Connector terminal (4 req'd)	.03
95-1701	Audio choke (part of S-50862)	2.50
112-1265	6-32 x 1-1/4 speaker mounting screw (2 part of 14-4672)	.05
112-1269	8-32 x 1-7/16 speaker mounting screw (4 part of 14-4672)	.10
114-453	6-18 x 5/8 Hex washer hd self-tap screw (4 mt 2-1484)	.10
114-701	8-15 x 3/8 Hex washer hd self-tap screw (3 req'd)	.03
125-100	Strain relief grommet	.15
S-50862	Filter mounting plate assembly	3.50
GRC130-1	Grille cloth (part of 14-4672)	

REMOTE SPEAKER KR105W

PART NO.	DESCRIPTION	PRICE
2-1485	Cabinet back	
14-4673	Table cabinet	
16-2303	Packing carton	
22-2945	Electrolytic capacitor 3/30V	1.25
22-3196	Electrolytic capacitor 80/25V (2 req'd)	2.00
46-2614	Switch knob	.25
49-867	Horn tweeter speaker	30.00
49-984	6" x 9" PM speaker	
52-929	Speaker cable	.25
54-139	3/8-32 x 9/16 Hex palnut (used on 85-680)	.03
54-385	6-32 x 5/16 Hex nut (1 used on each S-26657 & 112-1265)	.03
54-424	8-32 x 11/32 Hex palnut (1 used on each 112-1269)	.03
54-469	Tinnerman speed nut (part of 14-4673)	.10
57-2816	Nameplate (part of 14-4673)	.35
58-176	Five prong plug (part of S-50859)	.30
83-2145	Five lug terminal strip (part of S-50862)	.10
85-680	Three position switch	2.50
86-270	Terminal (2 part of S-26657)	.03
86-333	Connector terminal (6 req'd)	.03
95-1701	Audio choke (part of S-50862)	2.50
112-1265	6-32 x 1-1/4 Speaker mounting screw (4 part of 14-4673)	.05
112-1269	8-32 x 1-7/16 Speaker mounting screw (4 part of 14-4673)	.10
114-453	6-18 x 5/8 Hex washer hd self-tap screw (4 mt 2-1485)	.10
114-701	8-15 x 3/8 Hex washer hd self-tap screw (3 req'd)	.03
125-100	Strain relief grommet	.15
S-26657	Terminal strip	.20
S-50859	Cable and plug assembly	2.25
S-50862	Filter mounting plate	3.50
GRC103-2	Grille cloth (part of 14-4673)	

FM TUNER S-61017

PART NO.	DESCRIPTION	PRICE
12-3195	Coil support bracket	.15
22-1888	.001 Ceramic capacitor - 500V	.25
22-2374	6 mmf Disc capacitor - 500V	.25
22-2550	30 mmf Disc capacitor - 500V	.25
22-2676	0.51 mmf Gimmick capacitor - 500V	.25
22-2732	1000 mmf Feed-thru capacitor - 500V (5 req'd)	.30
22-2896	16 mmf Disc capacitor - 500V	.25
22-3010	.01 mfd Disc capacitor - 25V	.45
22-3232	25 mmf Disc capacitor - 500V	.25
22-3270	22 mmf Feed-thru capacitor - 500V (2 req'd)	.25
22-3456	2 x 12 mmf Disc capacitor	.30
22-3621	22 mmf Disc capacitor - 500V	.25
56-426	Roll pin (4 req'd)	.05
63-1845	27K ohm Resistor - 1/2W 10%	.17
63-1869	100K ohm Resistor - 1/2W 10%	.17
63-1870	100K ohm Resistor - 1/2W 20%	.17
63-1939	4.7 Megohm resistor - 1/2W 10%	.17
76-1154	Guide shaft	.35
76-1167	Guide shaft	.30

FM TUNER S-61017 Continued

PART NO.	DESCRIPTION	PRICE
76-1371	Drive shaft	
78-1169	Noval molded socket (6JK8)	.40
80-1467	Retaining spring	.05
80-1521	Compression spring	.05
80-1534	Shaft tension spring	
83-3783	Single lug terminal strip (part of S-53205)	.05
86-331	Insulated feed-thru terminal	.05
94-613	Iron core bushing (3 req'd)	.10
95-1900	1st IF transformer (FM) - 10.7MC	2.50
103-39	Silicon diode	3.00
or		
103-47	Silicon diode	
113-26	6-32 x 1/4 x 1/4 Hex hd mach screw - external lockwasher attached (2 used on 12-3195)	.03
125-116	Grommet (3 req'd)	.05
126-804	Tube shield	.10
148-189	Tuner guide arm	
149-294	Iron core & spring (3 req'd)	.50
188-232	Clamping ring (3 req'd)	.03
188-293	Retaining ring	.05
S-13871	FM detector coil	1.00
S-14192	FM antenna coil	.90
S-52359	FM oscillator coil	.75
S-53205	Shield & terminal strip	.15
S-53700	Tuner cover & spring	.50

FM TUNER S-61363

PART NO.	DESCRIPTION	PRICE
12-3195	Coil support bracket	.15
22-1888	.001 Ceramic capacitor - 500V	.25
22-2374	6 mmf Disc capacitor - 500V	.25
22-2550	30 mmf Disc capacitor - 500V	.25
22-2676	0.51 mmf Gimmick capacitor - 500V	.25
22-2732	1000 mmf Feed-thru capacitor - 500V (5 req'd)	.30
22-2896	16 mmf Disc capacitor - 500V	.25
22-3010	.01 mfd Disc capacitor - 25V	.45
22-3232	25 mmf Disc capacitor - 500V	.25
22-3270	22 mmf Feed-thru capacitor - 500V (2 req'd)	.25
22-3456	2 x 12 mmf Disc capacitor	.30
22-3621	22 mmf Disc capacitor - 500V	.25
56-426	Roll pin (4 req'd)	.05
63-1845	27K ohm Resistor - 1/2W 10%.	.17
63-1869	100K ohm Resistor - 1/2W 10%.	.17
63-1870	100K ohm Resistor - 1/2W 20%.	.17
63-1939	4.7 Megohm resistor - 1/2W 10%.	.17
76-1154	Guide shaft	.35
76-1167	Guide shaft	.30
76-1375	Drive shaft	
78-1169	Noval molded socket (6JK8)	.40
80-1467	Retaining spring	.05
80-1521	Compression spring	.05
80-1534	Shaft tension spring	
83-3783	Single lug terminal strip (part of S-53205)	.05
86-331	Insulated Feed-thru terminal	.05
94-613	Iron core bushing (3 req'd)	.10
94-1900	1st IF transformer (FM) – 10.7MC	2.50
103-39	Silicon diode	3.00
or		
103-47	Silicon diode	
113-26	6-32 x 1/4 x 1/4 Hex hd mach screw - external lockwasher attached (2 used on 12-3195)	.03
125-116	Grommet (3 req'd)	.05
126-804	Tube shield	.10
149-189	Tuner guide arm	
149-294	Iron core & spring (3 req'd)	.50
188-232	Clamping ring (3 req'd)	.03
188-293	Retaining ring	.05
S-13871	FM detector coil	1.00
S-14192	FM antenna coil	.90
S-52359	FM oscillator coil	.75
S-53205	Shield & terminal strip	.15
S-53700	Tuner cover & spring	.50

NOTES

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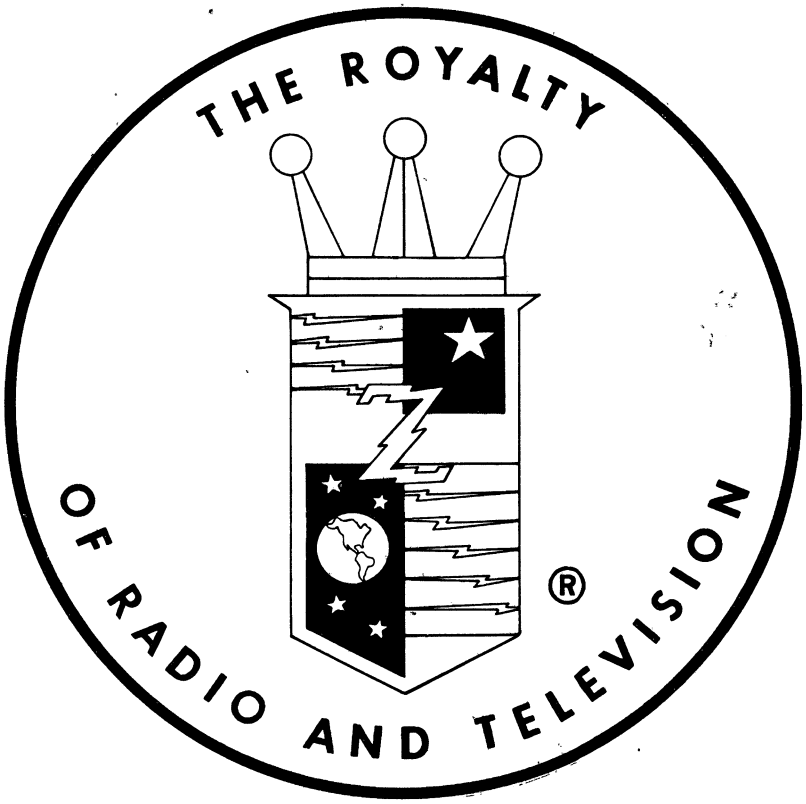

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