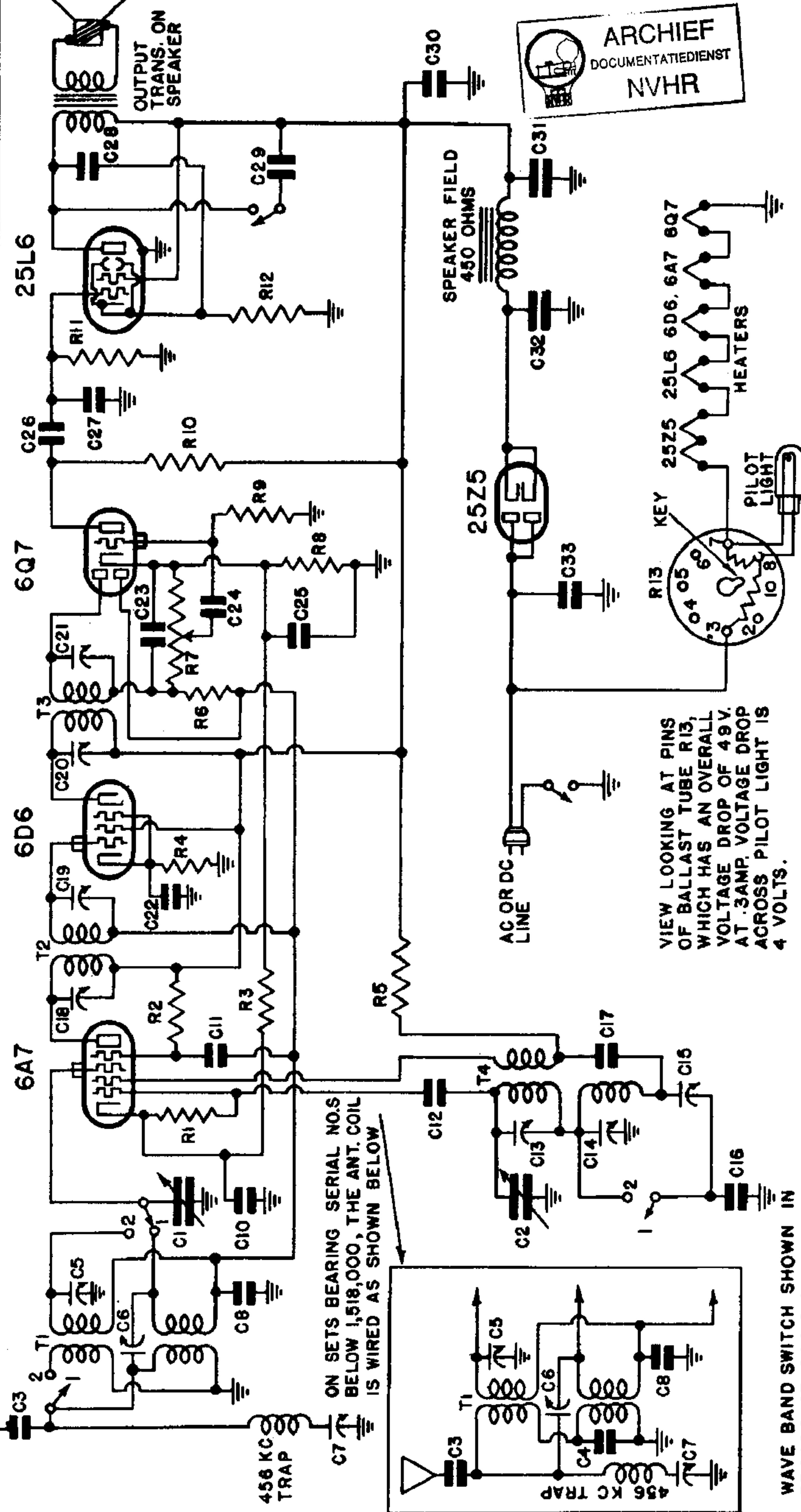


Chassis AM and BF
Schematic, Voltage

EMERSON RADIO & PHONO CORP.
Ned. Ver. v. Historie v/d Radio.

MODELS AM131, AM169
AM187 Late
MODELS AM153, BF191



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. All readings except cathode and heater voltages were taken on 250 volt scale. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

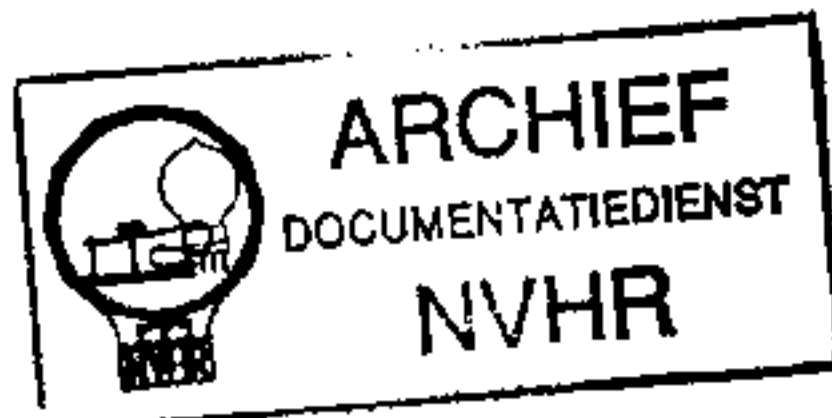
Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	96	45	2.8	74	6.3
6D6	96	96	4.5	—	6.3
6Q7	40	—	1.0	—	6.3
25L6	92	100	6.2	—	25.0

Voltage at 25Z5 cathode—125 volts.
Voltage across speaker field—29 volts.
Voltage drop across ballast tube (pins Nos. 3, 7)—49 volts.
Voltage drop across pilot light section (pins Nos. 8, 7)—4 volts.

1-F³ PEAKED AT 456 ...
6 TUBE AC DC RECEIVER

Tube Data

The tube complement is as follows:
1—6A7 pentagrid oscillator-modulator.
1—6D6 first i-f amplifier.
1—6Q7 diode detector, a-f amplifier, a.v.c.
1—25L6 beam power output.
1—25Z5 dual half-wave rectifier.
1—2UR-224 ballast tube (R13 on schematic).



MODELS AM131, AM169
AM187 Late
MODELS AM153, BF191

EMERSON RADIO & PHONO. CORP.

Chassis AM and BF
Changes, Alignment
Notes, Parts

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1400 and 15,000 kc should be used. In addition an output meter should be used across the voice coil or output transformer for observing maximum response.

The set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Always use as weak a test signal as possible during alignment.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Location of Coils and Trimmer Adjustments

The broadcast antenna coil, short-wave antenna coil, and 456 kc wave-trap are one assembly mounted underneath the chassis deck, in the right of the variable condenser. The trimmers for these coils are accessible through three holes in the top of the chassis. The trimmer closest to the front of the chassis is for the 456 kc wave-trap. The central trimmer is for the broadcast antenna coil, and the trimmer farthest from front is for short-wave antenna coil.

The broadcast oscillator and short-wave oscillator coils are wound on one form and mounted on the inside of the rear chassis wall. The trimmers for these coils are accessible through two holes in the rear chassis wall. The left hand trimmer (looking at the rear wall) is for the short-wave oscillator coil and the right-hand trimmer is for the broadcast oscillator coil.

The two i-f transformers are in oblong coil cans located on the top of the chassis. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans.

The broadcast series padding condenser is located on the top of the chassis, to the left of the variable condenser. The adjusting screw is reached through a hole in the top of the chassis.

i-f Transformer and Wave-Trap Alignment

Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc through a .02 mf condenser to the grid cap of 6A7 tube and adjust the four i-f trimmers for maximum response. Feed 456 kc through a .0002 mf condenser to the antenna and adjust the wave-trap trimmer (front screw beside variable condenser) for minimum response.

Short-Wave Alignment

Use a dummy antenna (400 ohm resistor) when aligning the short-wave coils.

Rotate the wave-band switch counter-clockwise to the short-wave position and set the dial pointer to 15 megacycles. Feed 15 megacycles through the dummy antenna and adjust the short-wave oscillator trimmer (left-hand screw on rear chassis wall) for maximum response and then adjust the short-wave antenna trimmer (rear screw beside variable condenser) for maximum response. The variable condenser should be rocked while adjusting the antenna trimmer. (Rotate variable condenser rotor shaft back and forth through a small arc).

Broadcast Alignment

Rotate the wave-band switch to the broadcast position, clockwise, and set the dial pointer at 60. Feed 600 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute).

Adjust the broadcast series padding condenser (on rear chassis wall, below 6A7 tube) for maximum response. Move pointer to 140, feed 1400 kc and adjust the broadcast antenna trimmer (right-hand screw on rear chassis wall) for maximum response and then adjust the broadcast antenna trimmer (central screw beside variable condenser) for maximum response. Return pointer to 50, feed 600 kc and readjust the series padding condenser, rocking the variable condenser for maximum response.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the i-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R18 on schematic) is in a special tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
5. The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unsolder all its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
6. The color coding of the i-f transformer leads is as follows:
Grid—green
Grid return—black
Plate—blue
B plus—red
7. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.
In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.
8. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

Voltage rating 105-125 volts, a.c. or d.c.
Power consumption 50 watts.
Frequency ranges 540 to 1,730 kc, and 5.6 to 18.0 megacycles.

REPLACEMENT PARTS LIST

Part No.	DESCRIPTION	PRICE
4RT-418	Two-band antenna coil	\$1.75
4VT-420A	456 kc first i-f transformer	1.25
4VT-421A	456 kc second i-f transformer	1.25
3CT-290A	Two-band oscillator coil	1.35
KR-53	50,000 ohm 1/4 watt carbon resistor	.16
ZR-194	30,000 ohm 1/4 watt carbon resistor	.16
3RR-274	310 ohm 1/2 watt wire-wound resistor	.16
3CR-295	410 ohm 1/2 watt wire-wound resistor	.16
LR-66	10,000 ohm 1/4 watt carbon resistor	.16
HR-42	2 megohm 1/4 watt carbon resistor	.16
3FR-256B	Volume control, 500,000 ohms, with line switch	1.00
3CR-294	240 ohm 1/2 watt wire-wound resistor	.16
KR-55	250,000 ohm 1/4 watt carbon resistor	.16
KR-56	500,000 ohm 1/4 watt carbon resistor	.16
3FR-293	140 ohm 1/2 watt wire-wound resistor	.16
2UR-224	Plug-in ballast tube	.80
4VC-369	Two-gang variable condenser (see changes)	4.16
NNC-199	0.001 mf 500 volt tubular condenser	.20
AAC-106A	0.00005 mf mica condenser	.20
BC-12	Trimmers; part of antenna coil assembly.	.20
	0.05 mf, 200 volt tubular condenser	.20
AC-6	0.1 mf, 200 volt tubular condenser	.20
KC-59	0.005 mf, 400 volt tubular condenser	.20
2NC-231	Trimmers; part of oscillator coil assembly.	.50
3EC-267	Adjustable padding condenser. Range 300-600 mmf	.40
KC-58	0.0042 mf mica condenser	.20
5AC-384	0.01 mf, 400 volt tubular condenser	.20
LC-65	Trimmers; part of second i-f transformer.	.20
3CC-337	0.0002 mf, 600 volt tubular condenser	.20
3CC-261	0.002 mf, 400 volt tubular condenser	.20
2VC-242A	0.02 mf, 400 volt tubular condenser	.20
3CS-254	40 mf, 150 volt wet electrolytic condenser	.90
4BL-94	20 mf, 150 volt wet electrolytic condenser	.90
4MS-316	0.1 mf, 400 volt molded condenser	.20
3FS-255F	6 1/2" dynamic speaker	6.25
6FZ-755	Pilot light, 6.3 volt, .25 amp. Mazda No. 44	.20
4MZ-558	Wave-band switch	.60
3CZ-339	Tone control switch	.50
3CZ-336A	Dial face	.25
3CZ-341	Dial pointer	.05
3CZ-340	Idle pulley	.10
3CZ-341	Dial drive belt	.05
3CZ-341	Condenser shaft pulley	.10
3CZ-341	Drive shaft and pulley	.10
3CZ-350	Escutcheon with crystal (131 and 169 cabinets)	1.05
4MZ-544	Pyralin crystal (187 cabinet)	.60
6FZ-758	Pyralin crystal (191 cabinet)	.45

When ordering replacement parts specify part number

- *Item number locates the article on the schematic diagram.
- +These trimmers are part of coil assemblies and cannot be supplied separately.

PRODUCTION CHANGES

In AM receivers bearing serial numbers below 1583750 and BF receivers bearing serial numbers below 1523000:

- (a) R6 and R9 were 1 megohm resistors, part no. KR-57.
- (b) R7 was a 250,000 ohm resistor, part no. 2NR-214C.
- (c) C23 and C27 were .00025 mf mica condensers, part no. AC-7A.
- (d) C24 was a .02 mf, 200 volt condenser, part no. FC-23.

In AM receivers bearing serial numbers below 1518000:

- (a) T1 was part no. 3CT-289A.
- (b) T2 was part no. 3CT-274.
- (c) T3 was part no. 3CT-275.
- (d) Wave-band switch was part no. TTS-111G.

In AM receivers bearing serial numbers below 1184290:

- (a) The variable condenser was part no. 3CC-275.
- (b) Dial pointer was part no. 4MZ-590.

In AM receivers bearing serial numbers between 1184290 and 1518000:

- (a) Variable condenser was part no. 3CC-275A.
- (b) Dial face was part no. 3CZ-514.



Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

<i>Tube</i>	<i>Plate</i>	<i>Screen</i>	<i>Cathode</i>	<i>Osc. Plate</i>	<i>Fil.</i>
6A7	96	45	2.3	74	6.3
6D6	96	96	4.5	—	6.3
6Q7	40	—	1.0	—	6.3
25L6	92	100	6.2	—	25.0

Voltage at 25Z5 cathode—125 volts.

Voltage across speaker field—29 volts.

Voltage drop across ballast tube (pins Nos. 3, 7)—49 volts.

Voltage drop across ballast tube (pins Nos. 3, 7)—4.5 volts.
Voltage drop across pilot light section (pins Nos. 8, 7)—4 volts.

MODELS AM131, AM169, AM187

Chassis AM

EMERSON RADIO & PHONO. CORP.

Alignment, Notes, Parts

Broadcast Alignment

Rotate the wave-band switch to the broadcast position, clockwise, and set the dial pointer at 60. Feed 600 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute).
Adjust the broadcast series padding condenser (on rear chassis wall, below 6A7 tube) for maximum response. Move pointer to 142.5 kc and adjust the broadcast oscillator trimmer (right-hand screw on rear chassis wall) for maximum response and then adjust the broadcast antenna trimmer (central screw beside variable condenser) for maximum response. Return pointer to 60, feed 600 kc and readjust the series padding condenser rocking the variable condenser for maximum response.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R13 on schematic) is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
5. The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unsolder all the leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
6. The color coding of the i-f transformer leads is as follows:
Grid—green
Grid return—black
Plate—blue
B plus—red

7. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.

In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

8. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1425 and 16,000 kc should be used.

In addition an output meter should be used across the voice coil or output transformer for observing maximum response.

The set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Always use as weak a test signal as possible during alignment.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Location of Coils and Trimmer Adjustments

The broadcast antenna coil and the 456 kc wave trap are one assembly mounted underneath the chassis deck to the right of the variable condenser. The trimmers for these coils are accessible through three holes in the top of the chassis. The trimmer closest to the front of the chassis is for the short-wave antenna coil. The central trimmer is for the broadcast antenna coil and the trimmer farthest from the chassis front is for the 456 kc wave trap.

The broadcast oscillator and short-wave oscillator coils are wound on one form and mounted on the inside of the rear chassis wall. The trimmers for these coils are accessible through two holes in the rear chassis wall. The left hand trimmer (looking at the rear wall) is for the short-wave oscillator coil and the right-hand trimmer is for the broadcast oscillator coil.

The two i-f transformers are in oblong coil cans located on the top of the chassis. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans.

The broadcast series padding condenser is located on the rear wall of the chassis below the 6A7 tube.

i-f Transformer and Wave-Trap Alignment

Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6A7 tube and adjust the four i-f trimmers for maximum response. Feed 1425 kc to the antenna and adjust the wave-trap trimmer (rear screw beside variable condenser) for minimum response.

Short-Wave Alignment

Use a dummy antenna (400 ohm resistor) when aligning the short-wave coils.

Rotate the wave-band switch counter-clockwise to the short-wave position and set the dial pointer to 15 megacycles. Feed 15 megacycles through the dummy antenna and adjust the short-wave oscillator trimmer (left-hand screw on rear chassis wall) for maximum response and then adjust the short-wave antenna trimmer (front screw beside variable condenser) for maximum response. The variable condenser should be rocked while adjusting the antenna trimmer. (Rotate variable condenser rotor shaft back and forth through a small arc).

REPLACEMENT PARTS LIST

Part No.	DESCRIPTION	PRICE
3CT-289A	Two-band antenna coil	\$1.30
3CT-274	456 kc first i-f transformer	1.60
3CT-275	456 kc second i-f transformer	1.35
3CT-280A	Two-band oscillator coil	1.35
KR-63	50,000 ohm 1/4 watt carbon resistor	.16
ZR-196	30,000 ohm 1/4 watt carbon resistor	.16
AA-119	300 ohm 1/2 watt wire-wound resistor	.16
3CB-296	410 ohm 1/2 watt wire-wound resistor	.16
LR-45	10,000 ohm 1/4 watt carbon resistor	.16
KR-57	1 megohm 1/4 watt carbon resistor	.16
2NB-214C	Volume control with line switch—250,000 ohms	1.30
3CB-294	240 ohm 1/2 watt wire-wound resistor	.16
KR-56	250,000 ohm 1/4 watt carbon resistor	.16
KR-55	500,000 ohm 1/4 watt carbon resistor	.16
3FR-258	140 ohm 1/2 watt wire-wound resistor	.16
2UR-224	Plug-in type ballast resistor	.30
3CC-276A	Two-band variable condenser (see production changes)	3.95
AAC-114	0.001 mf mica condenser	.30
AAC-106A	0.00005 mf mica condenser	.30
BC-12	Trimmer, part of antenna coil assembly. 0.05 mf, 200 volt tubular condenser	.30
AC-6	0.1 mf, 200 volt tubular condenser	.30
KC-59	0.006 mf, 400 volt tubular condenser	.30
2NC-231	Trimmer, part of oscillator coil assembly.	.50
3EC-287	Single adjustable padding condenser. Range: 300 to 500 mmf	.40
CCO-127	0.0042 mf mica condenser	.30
AC-7A	0.01 mf, 200 volt tubular condenser	.30
FC-29	Trimmer, part of second i-f transformer.	.30
LC-66	0.00425 mf mica condenser	.30
3CC-337	0.02 mf, 200 volt tubular condenser	.30
3CC-261	0.02 mf, 400 volt wet electrolytic condenser	.90
3EC-182	20 mf, 150 volt wet electrolytic condenser	.90
BE-254	0.1 mf, 400 volt tubular condenser	.30
TIS-111G	Tone control switch	.50
3CS-264	Wave-band switch	.60
XL-9	6 1/2" dynamic speaker	5.25
3CZ-514	Pilot light, 6.3 volt, 25 amp., Mazda No. 45	.70
3CZ-386A	Dial face	.10
3CZ-387	Dial drive belt	.10
3CZ-388	Drive shaft and pulley	.10
3CZ-389	Idle pulley	.06
3CZ-390	Idle spring	.06
3CZ-341	Condenser shaft pulley	.10
4MZ-588	Dial pointer (see production changes)	.25
3CZ-350	Escutcheon with crystal (for Models AM-131 and AM-169)	1.05
4MZ-544	Dial crystal (for Model AM-187)	.50

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram.

†These trimmers cannot be supplied separately.