INSTRUCTION BOOK

FOR

TYPE 17A4

COUNTERMEASURES RECEIVER

GENERAL ELECTRONIC LABORATORIES, INC.

8440 SECOND AVENUE
SILVER SPRING, MD.

18 AMES STREET
CAMBRIDGE, MASS.

WARNING

Due to the high gear ratio in the Main Tuning Dial, excess torque should not be applied to the Dial. Also, hitting the stops of the Tuning Dial with a high angular velocity may damage the tuning gears.

ADDENDUM

This is a temporary 17A4 manual converted from the 17A3-A instruction book. The performance specifications table as shown in Table Vi and Vii are up to date. The pictures in this book are a close resemblance of the 17A4 views. Two more controls, DELAY SET and THRESHOLD LEVEL, have been added to the front panel view on page Viii. Descriptions in Sections 1, 2, and 3 are generally correct with minor differences. Therefore, whenever in doubt, always refer to the up dated block diagram and schematics. The electrical parts list for the power supply chassis, IF main chassis, R.F. Heads, 4 MC and 300KC IF Strips are acceptable for 17A4 usage with minor differences. The narrowband IF Strip's electrical parts list is inaccurate and should not be used.

The description of section 2 is brief. In order to understand the operation of 17A4 thoroughly, the relationships between the IF GAIN SELECTOR, AUDIO SELECTOR, and IF BANDWIDTH Switches should be studied carefully. These switches also have important bearings on the operation of the carrier operated relay and the switched AGC output signal. 60KC instead of 10 KC IF Strips are used for the 17A4 units containing Serial No. 101 through 129; however, the alignment procedure is basically the same. A ZERO SET Control on the front panel RF Chassis is provided to zero the Signal Strength Meter on noise.

A brief description of the Carrier Operated Relay and the COR Adjustment Procedure is also added to the back of the manual.

COR VOLTAGE CHART

	6	7	8	1	2	3
V-1001	90-15V	0	10-0	150	90-10V	90-10
V-1002				150	70-30	75V Max.

ADDENDUM (for 17A3-A)(Continued)

c) J-115 - Integral Part of K-103

d) J-116 - Integral Part of K-103

e) J-117 - Integral Part of K-103

f) K-103 - Relay, Coaxial, RF Switch, Danbury Knudsen #318-010395-8

6. Page 34 - Add:

a) P-115 - Integral Part of W-101

b) P-116 - Integral Part of W-109

c) P-117 - Integral Part of W-102

Change:

a) W-101 to GEL Dwg. B11-637

b) W-102 to GEL Dwg. B11-636

7. Page 35 - Change:

a) W-109 to "Cable Assembly, Coaxial GEL Dwg. B11-635"

b) CR-101 to CR-104 to "1N547"

Remove - a) FL-101 to FL-107

8. Page 74 - Change C-805 to "HR839X5F"

9. Change all references to "17A1" to "17A3".

10. Replace pages 21 and 24 with the following two pages.

C. The Block Diagram and the pictorial views are those of the 17A1. The 17A3 will be slightly different.

ADDENDUM (for 17A3-A)

A. All statements that refer to the 10 kc IF amplifier in the following listed paragraphs and pages hold true for the 60 kc IF amplifier, except any references to L-711 and L-713 becomes L-713 and L-711 respectively.

Paragraphs - 2.1, 2.9, 2.10, 2.12, 2.13, 2.18, 3.6, 3.8, 3.11, 3.13, 4.6 (IF Alignment Procedure)

Pages - - - - 21 (Types of Tubes)
24 (Voltage Chart)
31 (Block Diagram)

B. Make the following corrections:

1. Page 2, Section 2.1 - Change, "The 10 kc IF amplifier converts from 21.4 mc to 13 mc and employs a crystal band-pass filter and crystal discriminator for accurate AFC", to, "The 10 kc IF amplifier employs a crystal band-pass filter and crystal discriminator for accurate AFC".

2. Page 16, Section 4.6, Item 9 - Change to read, "Adjust T-706 and L-713 for a symmetrical S curve".

3. Page 4, Section 2.8 - Change "Three 6DC6 IF stages are used followed by a 6AU6 driving a 1N295 detector" to "Three 6DC6 IF stages are used followed by a 6CB6 driving a 1N67A AM detector".

4. Page 32 - Change J-103 to "Receptacle IPC 21850".

5. Page 33 - Change:

   a) J-112 and J-113 to "Not assigned".

   b) L-103A, B to "Inductor, Fixed 5-10h GEL Dwg. D10-252".

   Add:

   a) J-108 - Connector, Receptacle IPC 46025

   b) J-114 - Integral Part of J-103

ADDENDUM

17A4

1. Change R-271 from "Not Assigned" to "Fixed Composition, 1.2K ± 5%, 1/2W, Allen Bradley EB 1225, GEL Part No. 10468" Mar. 1963

2. Change J-201 from "Deutsch, DM9601-27P, GEL No. 17354" June 1963
   to " Deutsch, DS-04-27P, GEL No. 17538"

3. Change C-103 from "Capacitor, Fixed Ceramic Feedthru, .001 μμf ± 20%, Erie GP2, Style 327, GEL Part No. 12067" to "Same as C-101"

4. Change C-104 from "Same as C-103" to "Same as C-101"

MODIFICATION ADDENDUM 17A4

CERAMIC TUBE MODIFICATION

This modification has been made to allow the newly developed General Electric type 7768 ceramic planar triode to replace the previous 1st RF amplifier tube, 6280/416B. This change has been made so as to increase the estimated life by at least eight times with a comparable noise figure. Also, with the high temperature characteristic of the ceramic triode, it is possible to operate without the use of blower, B-101, or the time delay relays, K-101, and K-102, normally required by the 6280/416B. The 7768 will directly replace the 6280/416B by the use of a tube socket adapter and a filament dropping resistor. The resistor is used to provide a filament voltage of 6.2 volts to the ceramic tubes. The following changes must be made to the manual.

1. Change all "6280/416B" to "7768"

2. Change the RF head parts list and schematic, V-301 and V-401 from "Tube Electron 6280/416B" to "Tube, Ceramic Planar Triode, GE Type 7768 , GEL Part No. 14774"

3. Add to parts list "R-108, Resistor Adjustable, 10 ohms, 11 Watts, Ohmite Part No. 1006 , GEL Part No. 11696"

4. It should be noted that during the alignment of the RF head, C-406 or C-307 and L-404 or L-304 should be somewhat reduced to provide the best noise figure.

5. Pins 5 and 7 of the relays K-101 and K-102 have been shorted-out so that a time delay will not incurr when switching from one RF head to the other. *

* These relays are not necessary when using the ceramic tube. HOWEVER, THE SHORTS MUST BE REMOVED IF THE 6280/416B IS PLACED IN THE CIRCUIT.

TABLE OF CONTENTS

SECTION I
GENERAL DESCRIPTION

SECTION II
OPERATION

SECTION III
THEORY OF OPERATION

SECTION IV
MAINTENANCE

SECTION V
PARTS LIST

LIST OF ILLUSTRATIONS

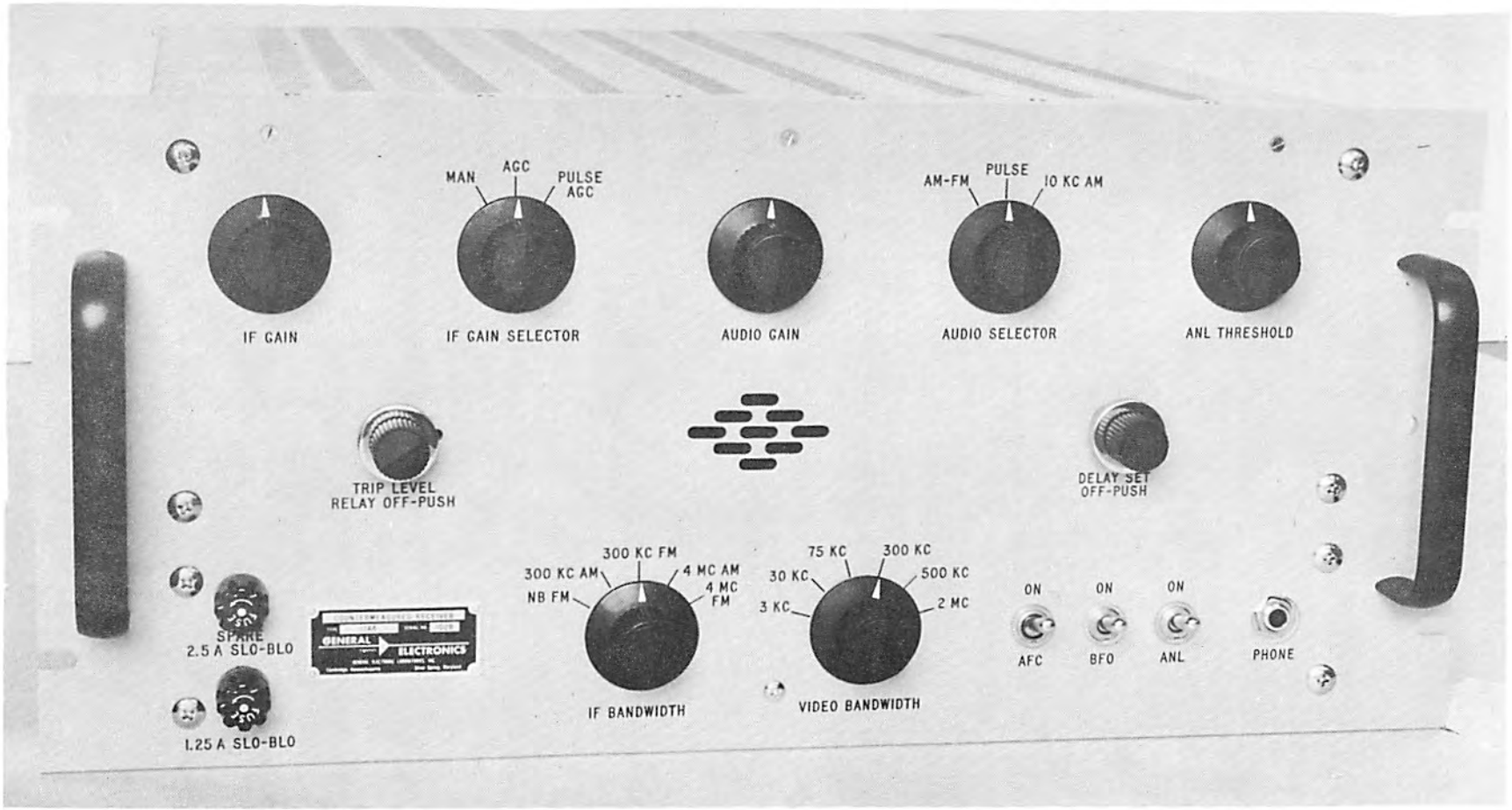


FIGURE 1B - 17A4 I. F. CHASSIS, FRONT VIEW

LIST OF CHARTS & TABLES

LIST OF SCHEMATICS

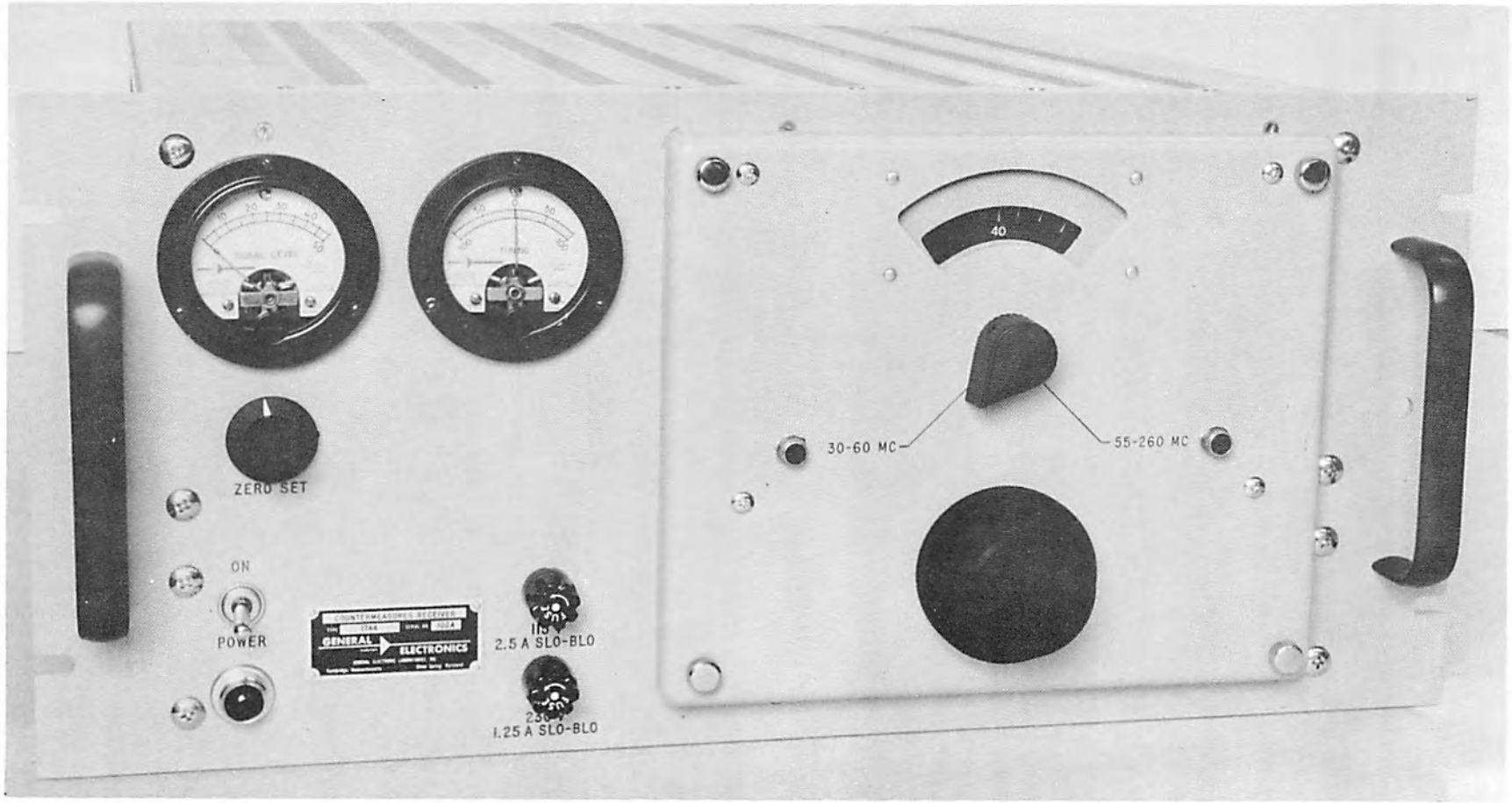


FIGURE 1A - 17A4 R. F. CHASSIS, FRONT VIEW

SECTION I

GENERAL DESCRIPTION

A. INTRODUCTION

The 17A4 Countermeasures Receiver provides extreme sensitivity for the reception of weak signals in the 30-260 mc frequency range.

The type 2A tuning head, which is a completely shielded sub-assembly, has extremely low local oscillator radiation. It covers the range in two bands and is equipped with a precision two-speed gear drive.

Three IF bandwidths are provided. Simultaneous narrow bandwidth AM output is available with either 4 mc or 300 kc bandwidth FM or AM detection. The wideband video is equipped with a six position video filter. The narrow band circuit is provided with a crystal-controlled BFO, an automatic noise limiter, and automatic frequency control.

An audio monitor is included as well as signal strength and tuning meters. Rear apron connectors allow direct access to all IF and detector outputs for signal strength recording and monitoring purposes.

The equipment is contained in two chassis measuring 8-3/4" x 19" x 15" complete with dust covers and interconnecting cables. The panels are notched for a standard 19" relay rack. A blower and a fan cool the equipment for improved reliability. The total weight is 81 lbs. Power consumption is 225 watts at 115-230 v AC, 50-60 cycles.

The 17A4 Countermeasures Receiver may be adapted to microwave reception by the addition of a remote mixer-preamplifier. In this application a 42 A1 mixer-power supply replaces the 2A tuning head and supplies power and metering functions through a rear apron connector.

The 17A4 Receiver also includes the following facilities:

1. Choice of narrowband IF amplifiers - 10KC, 60KC, or others. Notice the remaining instruction book is written assuming 10KC IF amplifier is used.

2. Plug in Carrier Operated Relay.

3. Connector for external IF source.

B. TECHNICAL SUMMARY

Tuning Range	Band 1:30-60 mc Band 2:55-260 mc
Input Impedance	To be driven from a 50-ohm source
Noise Figure	Band 1 4 DB Band 2 6DB
Image Rejection	Band 1 80 DB Band 2 60 DB
IF Rejection	Band 1 70 DB Band 2 70 DB
Local Oscillator Radiation	Less than 7 uv across 50 ohms (-90 DBM)
Intermediate Frequencies	21.4 mc
IF Bandwidths	4 mc or 300 kc and 10 kc
4 mc AM Video Response	100 cps to 2 mc
4 mc FM Video Response	100 cps to 2 mc
300 kc AM Video Response	100 cps to 150 kc
300 kc FM Video Response	100 cps to 70 kc
10 kc AM Video Response	100 cps to 3 kc
AM Output 4 mc	5 uv 30% mod. at 1 kc produces 0.5 v RMS
AM Output 300 kc	2 uv 50% mod. at 1 kc produces 0.9 v RMS
FM Output 4 mc	10 uv 960 kc dev. at 1 kc produces 0.4 v RMS
FM Output 300 kc	5 uv 100kc dev. at 1 kc produces 0.7 v RMS
AM Output 10 kc	1 uv 50% mod. at 1 kc produces 1.5 v RMS
Pulse Output	5 uv at 10 u sec. 1 kc prf produces 0.5 v peak
FM Output Stability 4 mc	Output varies 2 db for inputs above 5 uv
FM Output Stability 300 kc	Output varies 2 db for inputs above 1 uv
AM Output Stability 4 mc	Output varies 7 db for inputs above 5 uv
AM Output Stability 300 kc	Output varies 7 db for inputs above 1 uv

Audio Outputs	Speaker, phone jack & balance 600 ohm output
AM distortion 4 mc	200 uv input 30% mod. at 1 kc 7%
AM distortion 300 kc	200 uv input 50% mod. at 1 kc 5%
AM distortion 10 kc	200 uv input 50% mod. at 1 kc 7.5%
FM distortion 4 mc	200 uv input 240 kc dev at 1 kc 4%
FM distortion 300 kc	200 uv input 100 kc dev at 1 kc 1.5%

SECTION II

OPERATION

A. INTRODUCTION

Figure 1 shows the front panel and the location of most of the controls of the 17A4 VHF telemetry Receiver. The Block Diagram, figure 2, shows the relationship between the controls and the receiver's circuitry. Greater detail of the Receiver's overall circuitry can be obtained from the Main IF Chassis schematic.

B. CONTROLS

1. POWER-ON Switch (S-101) - The POWER ON switch turns the power to the receiver ON or OFF. When the receiver is ON the Pilot Light lamp, I-101, should be lit.

2. VOLTAGE SELECTOR Switch on rear apron (S-102) - This switch selects the proper receiver connection for 115V or 230V power source.

3. 30-60 MC 55-260 MC R. F. Head Selector Switch (S-401) - This switch selects either one of the two R. F. Heads for operation.

4. Main R. F. Tuning Control (L-305 or L-405) - This control manually tunes the receiver to the desired R. F. The control is automatically locked in with either one of the R. F. Head's inductuners, L-305 or L-405, depending on the R. F. Head's Selector Switch position.

5. IF GAIN SELECTOR (S-201) - This switch has three positions: MAN, AGC, and PULSE AGC, which function as each label indicates. Pulse AGC is effective only when the IF BANDWIDTH SELECTOR Switch, S-203, is in the 4MC AM position. If S-203 is set at any other position, PULSE AGC will function exactly as the regular AGC system.

6. IF GAIN Control (R-219) - This control manually adjusts the IF gain. It only functions when the IF GAIN SELECTOR Switch, S-201, is set in the MAN position.

7. IF BANDWIDTH Selector Switch (S-203) - This switch has five positions: 4MC FM, 4MC AM, 300KC FM, 300KC AM, and NBFM. The Switch selects the proper IF output connection to the video and audio amplifiers; however, the narrow band video amplifier is not subject to this selector switch and is connected to the detected 10KC AM signal at all times. Note from the Block Diagram, S-203 also controls the B+

voltage supply line to either the 4mc or 300kc IF strips. This means the 4mc and 300 kc IF strips can not operate at the same time. The 10 kc IF strip, however, is in operation at all time unless the POWER-ON Switch is turned OFF.

8. VIDEO BANDWIDTH Selector Switch (S-204) - This switch has six positions: 2MC, 500KC, 300KC, 75KC, 30KC, and 3KC. Each position indicates approximately the high frequency cutoff of the wideband video amplifier's frequency response. The narrow band Video Amplifier's, V-201, frequency response spectrum is not subject to this control switch.

9. AUDIO SELECTOR Switch (S-202) - This switch has three positions: AM-FM, PULSE, and NBAM . Normally the switch should be set at the AM-FM position which means the Audio Amplifier is connected to the Wideband Video Amplifier only. When the switch is in the PULSE position, the Pulse AGC amplifier is connected directly to the Audio amplifier. In the NB AM position, the 10KC AM Detector is connected to the Audio Amplifier.

10. AUDIO GAIN Control (R-251) - This controls the gain of the audio amplifier.

11. ANL THRESHOLD Control (R-259) - This controls the gain of the Automatic Noise Limiter which only functions if ANL/ON Switch is at the ON position.

12. ANL/ON Switch (S-206) - This switch connects or disconnects the Automatic Noise Limiter to the Narrow Band Video Amplifier.

13. BFO/ON Switch (S-207) - This turns the Beat Frequency Oscillator ON or OFF.

14. AFC/ON Switch (S-205) - This turns the Automatic Frequency Control ON or OFF.

15. TRIP LEVEL Control, R-287 and S-209 - This push to switch potentiometer serves two functions. When the control is up, R-287 may be adjusted to set up the proper AGC voltage level for the relay switch K-1001 to operate. When the control is pushed down, the COR output, TB-201 terminal 4 is opened. - See Block Diagram

16. DELAY SET Control, R-288 and S-208 - This push to switch potentiometer also serves two functions. When the control is up, R-288 may be adjusted for proper time delay for the COR. Time delay of COR is used to keep the relay K-1001, energized for a short period of time depending on R-288 setting even though AGC voltage source is cutoff from COR Amplifier V-1001A. When DELAY SET Control is pushed down, time delay device for COR is turned off.

17. R. F. SELECTOR Switch, S-103 - This switch connects IF Amplifier to either R. F. Head outputs or to the impedance matching network, which is in turn connected to 21.4MC EXTERNAL Connector, J-114.

18. ZERO SET Control, R-105 - This control is used to set for zero reading on Signal Strength Meter.

C. METERS

1. TUNING Meter (M-101) - This meter is designed to operate on CW, FM/FM, PDM/FM, or PCM signals. The TUNING Meter should read zero when the signal is centered in the IF passband.

2. SIGNAL LEVEL Meter (M-102) - This meter operates from the detected AM output voltage for wideband IF signal and the AGC voltage for narrowband IF signal. It is also operated from Pulse AGC voltage when the AUDIO SELECTOR Switch is set at PULSE and the IF GAIN SELECTOR Switch is set at MAN or PULSE AGC positions. If these switches are not set at the proper positions, this meter will not indicate the pulse signal strength.

D. INPUT & OUTPUT CONNECTORS

All connectors mentioned here are located on the rear apron.

(RF CHASSIS)

1. MIXER OUTPUT, J-109 - This is connected to either V-403 or V-303 mixer output, or to the external connector, J-114, through an impedance box, depending on the position of the R. F. Head Selector Switch and the R. F. SELECTOR Switch. (See R. F. Chassis Schematic.)

2. ANT INPUT, J-102 - 30 mc to 260 mc R. F. signal may be affixed to this connector.

3. 30-60 MC L. O. OUTPUT, J-104 - This connector is attached to a suitable voltage divider from the local oscillator cathode. It is used to measure the Low Frequency R. F. Head local oscillator radiation.

4. 55-260 MC L. O. OUTPUT, J-105 - This connector, similar to J-104, is used to measure the High Frequency R. F. Head local oscillator radiation.

5. EXTERNAL 21.4 MC Input, J-119 - This connector is attached to an impedance matching network. 21.4 mc signal may be applied to this connector for demodulation when R.F. SELECTOR Switch, S-103, is set in the EXT. position.

6. POWER Connector, J-111 - This should be linked to I. F. Chassis POWER Connector, J-201, with a special GEL power cable.

7. POWER INPUT Socket, J-110 - 115 or 230 VAC source may be connected to this socket.

(IF CHASSIS)

1. 4MC IF OUTPUT, J-206 - This is connected to a suitable voltage divider in the 4MC IF Strip. The output is an undetected IF signal.

2. FDU OUTPUT, J-202 - This output is used in conjunction with the GEL Type 14F1 Frequency Display Unit.

3. Terminal Board Output, TB-201

a. Terminals 1 & 2 - This pair of terminals is connected to Audio Amplifier output and should be terminated at 600 ohms.

b. Terminals 3 & 4 - This pair of terminals is connected to the Carrier Operated Relay. The relay switch either opens or shorts out these two terminals. - See II B 15

4. PULSE AGC OUTPUT, J-212 - This connector is attached to Pulse AGC Amplifier. Note the Pulse Amplifier only works when the IF SELECTOR Switch, S-203, is in the 4MC AM position, and IF GAIN SELECTOR Switch, S-201, is in the PULSE AGC position.

5. IF INPUT, J-203 - This connector should be attached to P-113, which is connected in turn to J-109 of R. F. Chassis. (See R. F. Chassis Schematic.)

6. 4MC FM DC OUTPUT, J-216 - This is connected to limiter discriminator output of 4MC IF Strip.

7. 4MC AM DC OUTPUT, J-207 - This is connected to the AM detector output of 4MC IF Strip.

8. 10KC FM DC OUTPUT, J-210 - This is connected to the crystal discriminator output of 10KC IF Strip.

9. 10KC FM, J-211 - Electrically, this is identical to J-210.

10. 10KC AM DC OUTPUT, J-220 - This is connected to the AM detector output of 10KC IF Strip.

11. 10KC AM VIDEO OUTPUT, J-213 - This is connected to the Narrow Band Video Amplifier. ANL/ON Switch and THRESHOLD Control on the front panel may be used for better noise limiting.

12. POWER Connector, J-201 - This should be linked to J-111 of R. F. Chassis with a special GEL power cable.

13. WIDEBAND VIDEO Output, J-218 - This is connected to the Wideband Video Amplifier. The following types of signals may be monitored at this connector: 4MC - FM or AM, 300KC - FM or AM, and 10KC FM. Six choices of video bandwidths are available by the front panel control.

14. SWITCHED AGC Output, J-221 - The AGC of all the IF strips used in the receiver may be obtained from this connector depending on the settings of S-203, S-202, and S-201 switches. - See Block Diagram.

15. 300KC AM DC OUTPUT, J-208 - This is connected to AM detector output of 300 KC IF Strip.

16. 300KC FM DC OUTPUT, J-209 - This is connected to the discriminator output of 300KC IF Strip.

17. 300KC IF OUTPUT, J-219 - This is connected to a suitable voltage divider in the 300KC IF Strip. The output is an undetected IF signal.

18. 10KC IF OUTPUT, J-215 - This connected to a suitable voltage divider in the 10KC IF Strip. The output is an undetected IF signal.

SECTION III

THEORY OF OPERATION

A. INTRODUCTION

A block diagram of the 17A4 Receiver is shown in Figure 2

The circuit is a single superhetrodyne with an intermediate frequency at 21.4 mc. The amplifiers are built as completely shielded subassemblies.

The RF tuners are designed to provide the lowest possible noise figure consistent with a tuning range 30 to 60 mc and 55 to 260 mc.

The 300 kc and 4 mc amplifiers each use four stages of amplification, followed by a diode detector, a limiter, and a discriminator. The 10 kc IF amplifier employs a crystal band-pass filter, crystal discriminator for accurate AFC, and a crystal controlled beat frequency oscillator.

The AM or FM output of the 300 kc or 4 mc IF amplifier are selected by means of a switch and drives the wideband video amplifier through a video filter. The AM detector of the 10 kc IF amplifier drives a separate resistance coupled video amplifier through an automatic noise limiter.

B. ANTENNA INPUT IMPEDANCE

Operates from 50-ohm source. The input signal is applied through a type "N" 50-ohm coaxial receptacle located on the rear apron of the chassis.

C. FIRST RF STAGE

The input signal is applied through an impedance matching network to the cathode of the 6280/416B low-noise planar triode. To prevent loss of the input signal due to cathode-to-filament capacity the filaments are kept above RF ground with broad-band chokes.

The plate tank circuit takes the form of a modified Pi network and is used to couple the high impedance plate circuit of the 6280/416B to the low input impedance of the 6J4 grounded grid second RF amplifier.

D. SECOND RF STAGE

The output of the Pi network drives the cathode of the 6J4 grounded-grid second RF amplifier. A low-noise, second-stage is used so that the system noise figure (first RF, second RF, and mixer) is essentially that of the first stage.

The plate of the 6J4 is coupled to the grid of the 6AK5 pentode mixer by a double-tuned, overcoupled band-pass filter. A capacity "T" is used to prevent coupling between the primary and secondary tuned circuit. The shunt element of the "T" is adjustable, thus providing a control over the interstage bandwidth. The single-tuned high-Q plate circuit of the 6280/416B tube is used to "fill in" the dip in the overcoupled interstage network.

A convenient means for measuring the plate current of the 6280/416B tube is made possible by TP-301 or TP-401 at the junction of R-301 and R-302, or R-401 and R-402, the cathode bias resistors. A VTVM at the test point will read the voltage drop across 100 ohms. Thus 2 v equals 20 ma, 3 v equals 30 ma, etc.

The filament of the 6280/416B is operated from a 10.8 v winding of T-101 through a total series dropping resistance of 4 ohms. This produces a self-regulating effect which extends the tube life.

A blower motor mounted on the main chassis at the rear of the RF subassembly is used to cool the 6280/416B tubes.

Positive grid bias of 8 v is applied from a voltage divider from the 150 v regulated B+. This voltage is necessary to cancel the cathode self-bias voltage to 8.2 v so that the tube will operate with approximately 0.2 v bias. The dc degeneration due to the large cathode resistor has a considerable stabilizing effect on the 6280/416B tube and minimizes performance variations from one tube to the next when replacement becomes necessary.

If, for any reason, the grid bias voltage is shorted or removed, the plate current is reduced and the tube will not be damaged.

E. MIXER

A 6AK5 pentode is used as a converter. The oscillator signal is injected into the grid circuit, developing an operating bias proportional to the amplitude of the local oscillator signal. This causes a minimum effect on the receiver operation due to variations in local oscillator amplitude. A decoupled test point (TP-302 or TP-402) from a tap on the mixer grid resistors provides a convenient means for observing the response of the RF circuits.

F. LOCAL OSCILLATOR

The local oscillator utilizes a 6AF4A tube in a modified Colpitts configuration. The end inductors for the 55 to 260 mc unit are made of solid brass bars to insure frequency stability. The 30 to 60 mc end inductors take the form of single layer space wound solenoids. The frequency stability of the oscillator is very high due to the use of a high Gm tube which is loosely coupled to the high Q tank circuit. Voltage variable capacitors are coupled to the oscillator to provide AFC for use with the 10 kc IF amplifier.

G. 4 MC IF AMPLIFIER

A primary winding of the first IF transformer is located on each of the two RF tuner sub-chassis. The primaries are coaxially switched with the RF band switch with the appropriate winding inductively coupled to the secondary of the first 4 mc IF transformer located on the 4 mc IF subchassis. The 4 mc IF sub-chassis uses four 6680 high-gain stages. Three 6680 stages are gain-controlled and use cathode degeneration. This is to eliminate detuning caused by changes in tube input capacitance resulting from a change in the bias voltage. The fourth 6680 drives a 1N67A AM detector and two 6BN6 limiters in parallel. The 6AL5 discriminator is a modified wideband ratio detector.

H. 300 KC IF AMPLIFIER

The grid of the first IF stage is connected by coaxial cable, through a small coupling capacitor, to the secondary of the first IF transformer in the 4 mc IF amplifier sub-chassis. Three 6DC6 IF stages are used followed by a 6CB6 driving a 1N67A AM detector. The 6CB6 also drives a 6AK5 limiter and a phase shift discriminator. The three gain-controlled stages employ cathode compensation. The IF bandwidth switch transfers plate and screen voltage from one IF amplifier to the other thus providing selectivity of either 300 kc or 4 mc.

I. NARROWBAND IF AMPLIFIER

The 10 kc amplifier consists of four synchronously tuned cascaded stages at 21.4 mc. 10 kc bandwidth crystal filter is inserted between the first and second IF amplifiers. Impedance matching is accomplished by transformers T-701 and T-702, and the overall selectivity of the 10 kc amplifier is determined by the response of the crystal filter. The fourth IF amplifier drives a crystal AM detector and FM limiter. The FM output from the crystal discriminator is used for AFC and tuning meter. The 60KC amplifier circuitry is identical to that of 10KC IF strip except the crystal filter and a few component changes in the tuning circuits.

J. BEAT FREQUENCY OSCILLATOR

A crystal-controlled BFO, off-set by 1 kc from the center frequency of the 10 kc IF amplifier, provides a 1 kc audio beat note when the received signal is tuned to the center of the 10 kc IF amplifier.

K. WIDEBAND VIDEO

The 300 kc or 4 mc bandwidth IF amplifier FM or AM detector output is selected by means of the VIDEO BANDWIDTH Switch and fed through the video filter to a cathode follower output stage. The output stage is designed to operate with a load impedance of 75 ohms.

L. 10 KC VIDEO

The 10 kc bandwidth IF amplifier, AM detector output is fed to a separate resistance coupled amplifier with cathode follower output stage designed to operate with a load impedance of 10 k ohms.

M. AUTOMATIC NOISE LIMITER

This circuit operates as an electronic switch cutting off the video on noise peaks. It is placed in series with the 10 kc video output and may be switched in or out. A threshold control permits optimum adjustment.

N. VIDEO FILTER

A low pass filter is placed between the wideband detectors and video amplifier. The cut-off frequency is selected by means of the VIDEO BANDWIDTH Switch on the front panel.

O. AUDIO

A two-stage monitor audio amplifier can be switched to either of the two video outputs. A third pulse position is included to improve the audibility on short pulses. The audio output is connected to a front panel phone jack and rear apron barrier strip in addition to the panel mounted speaker. The audio signal is removed from the speaker when the phone jack is inserted. The phone jack and barrier strip outputs are designed for operation with a 600 ohm load.

P. FREQUENCY DISPLAY UNIT

An output at 21.4 mc is provided for connection to a GEL Type 14F1 frequency display unit. This output is obtained from a capacity divider across the secondary of the first 4 mc IF transformer.

Q. PULSE AGC CIRCUIT

A pulse signal from the 4 mc AM detector is shaped, amplified, and detected to produce a DC voltage proportional to pulse amplitude. This voltage is combined with the DC voltage at the AM detector to provide AGC and signal strength meter voltages. With this arrangement the signal strength meter indicates on pulse or CW signals and the IF Amplifier will not overload on pulse signals nor block on CW signals.

R. TUNING INDICATOR - 10 KC IF AMPLIFIER

When AUDIO SELECTOR Control is set at NBAM position, the crystal discriminator output is being fed to the grid of V-204 which is connected in a balanced bridge circuit. A zero center meter connected between the cathodes reads up or down scale as the discriminator output goes positive or negative. A zero meter reading indicates correct tuning.

S. TUNING INDICATOR - 300 KC IF AMPLIFIER

The output of the discriminator is used to drive V-202, which is connected in a bridge circuit, so that the output voltage is zero when the discriminator output is zero. This in turn drives V-204 (see paragraph R). If the discriminator output is positive or negative, the tuning meter will read accordingly. This is the condition for a CW or sinusoidal frequency modulated signal when the receiver is off tune. When the output of the discriminator is a series of pulses with varying duty cycle, it is desirable to tune the receiver so the positive and negative frequency excursions are equal. In effect, this centers the pass-band of the receiver about the frequency variations of the transmitter. When such a wave form is applied to the grid of V-202, a similar output is obtained at the cathodes. This output is applied to two diode rectifiers in a fashion to indicate a difference between positive and negative peak voltages. Thus, when the output is zero, the receiver is properly tuned.

T. TUNING INDICATOR - 4 MC IF AMPLIFIER

The output of the discriminator is fed to one grid of V-202 as is the 300 kc discriminator but in this case the other grid of V-202 is biased about 4 volts positive by means of zener diode CR-206. This is done because the discriminator output is about 4 volts positive when correctly tuned. In all other respects operation is the same as the 300 kc tuning indicator. A zero meter reading indicates correct tuning.

U. POWER SUPPLY

The power supply of the 17A4 Receiver uses a center-tapped transformer and four silicon rectifiers in a bridge circuit to supply the various output voltages. These are 250 volts unregulated, 150 volts unregulated. The latter is obtained from the center tap of the same transformer driving the full wave bridge rectifier and uses the two rectifiers at the ground end of the bridge in a split-phase, full-wave rectifier. An OA2 supplies regulated 150 volts for the local oscillator.

A 6.3 v winding on the power transformer supplies filament power to all tubes in the tuning head except V-301 or V-401, the 6280/416B RF amplifier. These tubes are supplied from a separate 10.8 v winding on the power transformer series with a 3.5 ohm dropping resistor. Heaters on the IF chassis are supplied from a separate transformer located there with 6.3 v windings.

A switch on the rear apron permits operation of the receiver from either a 115 or 230 v AC line. RF line filtering is included in the equipment.

V. CARRIER OPERATED RELAY

The relay is basically an AGC voltage controlled device. The circuit consists of a 12AX7 DC coupled amplifier and a cathode follower for driving the capacitor C-1002. The adjustable relay drop out time is secured through the RC time constant of C-1002 and potentiometer R-299. The trip level potentiometer, R-287, controls the positive bias applied to the amplifiers input grid through a high impedance. This condition keeps V-1002 cutoff and the relay de-energized until the AGC voltage increases sufficiently to overcome the positive bias which then reverses the switched condition to close the relay contacts of V-1002.

Unit controls provide zero-set and gain adjustments of each of the four AGC signal sources used to key the relay. A master trip level control and the relay drop out delay adjustments are brought to the front panel for operational use. Push to switch potentiometers with shaft locks are used for switching out the control functions. The drop out delay is switched off when the DELAY SET is pushed in and the relay contact circuit is opened with the TRIP LEVEL pushed in. Also see IV M

W. EXTERNAL 21.4 MC INPUT IMPEDANCE MATCH NETWORK

This adjustable network (including the IF interconnecting cables W-111, W-112, and W-108) matches the external IF signal impedance to the 4MC IF Strip input impedance. The external IF jack J-114 has been terminated for a 91 ohm transmission line.

SECTION IV

MAINTENANCE

A. INTRODUCTION

This equipment has been designed to give comparatively trouble-free operation. The highest quality components, conservatively rated, have been used throughout. A thorough knowledge of the theory of operation, as contained in Section II, with the voltage chart and schematic diagram should facilitate servicing of the equipment. Alignment of the equipment should never be attempted as a means of making a non-operating device function. If difficulty is encountered, alignment is the very last thing that should be done and then only with the proper test equipment. Nothing will destroy the performance of the receiver faster than making unnecessary adjustments.

B. 30 - 60MC FRONT END ALIGNMENT

INTRODUCTION

30 - 60MC FRONT END seldom needs alignment. If alignment is necessary follow the procedure carefully and there should not be any difficulty.

RECOMMENDED EQUIPMENT

1. Hewlett Packard 608D Signal Generator or equivalent with crystal calibrator.
2. RCA VTVM WV98A or equivalent.
3. Dumont 401A Oscilloscope or equivalent.
4. RCA WR-59 Sweep Generator or equivalent.

30 - 60MC LOCAL OSCILLATOR ADJUSTMENT

The only adjustment necessary on the local oscillator is to make the tuning dial read properly. This section of alignment may be disregarded if the tuning dial reads properly. If a tube has been replaced and an error is noted, usually it may be corrected by step 1 through 5.

1. Connect the signal generator HP 608D to the antenna input J-102 and set at exactly 30 mc.

2. Set the R. F. Head Selector Switch to 30 - 60 MC position.

3. Tune the receiver to 30 mc and with the signal generator at 30 mc adjust C-342 for zero on the tuning meter.

4. Tune the receiver to 60 mc with the signal generator set at exactly 60 mc. The tuning meter should read zero.

5. If the tuning dial reading is within ± 1% tolerance disconnect the test equipments as the test is completed.

6. If the error is greater than ± 1%, move the turns on L-314 slightly and then repeat steps 1 through 6 until tuning dial error is within ± 1% throughout the entire 30 - 60 mc frequency range.

7. Use cement on L-314 so that its inductance will remain fixed permanently. This completes the local oscillator adjustment.

30 - 60 MC RF AMPLIFIER ADJUSTMENT

The RF circuits are designed around a highly stable, Mallory Signal Inductuner. The end inductors are very stable; therefore, realignment problems will be minimized. If realignment is found necessary, then proceed as follows:

1. Unsolder C-324 from the inductuner lug and solder to the BNC test connector J-302.

2. Connect a sweep generator with a 50-ohm source impedance to the BNC test connector J-302.

3. Connect an oscilloscope to the front end test point TP-302.

4. Set the dial to 30 mc.

5. Adjust C-330 and C-335 for a double-tuned symmetrical response centered at 29.9 mc.

6. Adjust C-334 for a 2% dip in the response.

7. Repeat step 5 above

8. Tune the receiver to 60 mc and adjust the end inductors L-309 and L-310 for a symmetrical response centered at 60.4 mc with 15% dip.

9. Unsolder C-324 from the BNC test jack J-302 and re-solder it to the inductuner lug.

10. Connect the sweep generator to the ANTENNA INPUT jack J-102 or J-301.

11. Set the dial to 30 mc.

12. Adjust C-307 for a symmetrical response.

13. Set the dial to 60 mc and adjust L-304 by sliding turns for a symmetrical response.

14. Repeat local oscillator adjustment if necessary.

C. 55 - 260 MC FRONT END ALIGNMENT

INTRODUCTION

A complete alignment of the 55 - 260 MC Front End should not be attempted as carelessness may destroy its function completely. It is more convenient to replace the entire R. F. Head with one that is factory aligned.

RECOMMENDED EQUIPMENT

1. Hewlett Packard 608D Signal Generator or equivalent with crystal calibrator.

2. RCA VTVM WV98A or equivalent.

3. Dumont 401A Oscilloscope or equivalent.

4. RCA WR-59 Sweep Generator or equivalent.

55 - 260 MC LOCAL OSCILLATOR ADJUSTMENT

The only adjustment necessary on the local oscillator is to make the tuning dial read properly. This section may be disregarded if the dial is reading properly. If a tube has been replaced and an error is noted, usually it may be corrected by step 1 through 8 that is to adjust C-439 only. If further adjustments are necessary it must be made with caution. Unnecessary adjustment may distroy R. F. Head function completely.

1. Connect the signal generator HP 608D to J-103 or J-401 and set at exactly 55 mc.

2. Set the R. F. Head Selector Switch to the 55 - 260 MC position.

3. Tune the receiver to 55 mc and adjust C-439 for zero, position on the tuning meter.

4. Tune to 260 mc and adjust L-411 by bending the wire slightly. L-411 and the position of C-440 and C-445 dominates high frequency adjustment (120 to 260 mc).

5. Tune to 55 mc and check the dial reading again. If necessary adjust C-439 again. C-439 dominates low frequency adjustment (55 to 150 mc).

6. Repeat step 4 and 5 until tuning dial reading throughout entire frequency range is within tolerance. This completes the local oscillator alignment.

55 - 260 MC RF AMPLIFIER ADJUSTMENT

The R. F. circuits are designed around a highly stable Mallory Spiral Inductuner.

The end inductors are very stable; therefore, realignment problems will be minimized. If realignment is found necessary, proceed as follows:

1. Unsolder C-426 from the inductuner lug and solder to the BNC test connector J-402.

2. Connect a sweep generator with a 50-ohm source impedance to the BNC test connector J-402.

3. Connect an oscilloscope to the front end test point TP-402.

4. Set the dial to 55 mc.

5. Adjust C-429 and C-433 for a double-tuned symmetrical response centered 54 mc.

6. Adjust C-431 for a 30% dip in the response.

7. Repeat step 5 above.

8. Set the dial to 260 mc and adjust end inductors L-409 and L-410 to produce a symmetrical response centered at 260.7 mc.

9. Unsolder C-426 from the BNC connector J-402 and resolder it to the inductuner lug.

10. Connect a sweep generator to the ANTENNA INPUT jack J-103 or J-401.

11. Set the dial to 55 mc.

12. Adjust C-406 for a symmetrical response.

13. Set the dial to 260 mc and move the position of C-406 along the portion of the end inductor L-404 to produce a symmetrical roundnose response.

14. Repeat local oscillator adjustment if necessary.

D. 300 KC BANDWIDTH IF AMPLIFIER ALIGNMENT PROCEDURE

RECOMMENDED EQUIPMENTS

1. RCA WR-59 Sweep Generator.

2. Dumont 401A Oscilloscope.

3. Hewlett Packard 606-A Signal Generator.

ALIGNMENT PROCEDURE

1. Remove the oscillator tubes V-404 and V-304 (6AF4A).

2. AGC selector switch should be in the MANUAL position.

3. IF GAIN control fully clockwise.

4. BFO switch should be "off".

5. AFC switch should be "off".

6. The IF BANDWIDTH switch should be in 300 kc AM position.

7. Remove V-604.

8. Connect an oscilloscope to the FM discriminator output.

9. Connect a sweep generator to pin 1 of V-605.

10. With maximum output from the sweep generator adjust the primary and secondary of T-609 for a maximum symmetrical "S" curve centered, at 21.4 mc with a peak separation of 750 kc +50 kc. Note: To adjust the peak separation remove the transformer can and adjust the coupling link between the primary and secondary windings. The can should be replaced each time the link is adjusted to insure proper tuning.

11. Connect the oscilloscope to the AM detector through a 10 k ohm resistor.

12. Replace V-604.

13. Remove V-603.

14. Connect the sweep generator to pin 1 of V-604.

15. With the output from the sweep generator adjusted to produce approximately 2 volts, peak tune the primary and secondary T-607 and T-608 for a maximum symmetrical response centered at 21.4 mc

16. Replace V-603.

17. Remove V-602.

18. Connect the sweep generator to pin 1 of V-603 through a 200 ohm resistor with a 10 ohm resistor from pin 1 to ground.

19. Adjust the primary and secondary T-605 and T-606 for a maximum symmetrical response centered at 21.4 mc with the sweep generator output adjusted to produce the same oscilloscope deflection as in step 15.

20. Remove the 200 ohm and the 10 ohm resistors.

21. Replace V-602.

22. Remove V-601.

23. Connect the sweep generator to pin 1 of V-602 through a 200 ohm resistor with a 10 ohm resistor from pin 1 of V-602 to ground.

24. Adjust the primary and secondary T-603 and T-604 for a maximum symmetrical response centered at 21.4 mc with the sweep generator output adjusted to produce the same oscilloscope deflection in step 15.

25. Replace V-601.

26. Remove the 10 ohm and the 200 ohm resistors.

27. Replace the bottom cover.

28. Connect the sweep generator to J-601.

29. Adjust the primary and secondary T-601 and T-602 for a maximum symmetrical response centered at 21.4 mc with the sweep generator output adjusted to produce the same oscilloscope deflection in step 15. Note: If noise is excessive reduce the IF GAIN with the controls on the front panel and increase the sweep generator output to produce the same oscilloscope deflection.

30. The overall response of the 300 kc IF amplifier should be 300 kc ± 15 kc at the 3 DB points with a maximum dip of 5%. This completes the alignment of the 300 kc IF amplifier.

E. 4 MC BANDWIDTH IF AMPLIFIER ALIGNMENT PROCEDURE

RECOMMENDED EQUIPMENTS

1. Hewlett Packard 415B Standing Wave Indicator.

2. RCA WV-98A VTVM.

3. RCA WR-59 Sweep Generator.

4. Dumont 401-A Oscilloscope.

5. Hewlett Packard 606-A Signal Generator.

ALIGNMENT PROCEDURE

1. Remove the oscillator tubes V-304 and V-404 (6AF4A).

2. Set the controls as follows: IF GAIN SELECTOR, MANUAL; IF GAIN CONTROL, FULLY CLOCKWISE; BFO, OFF; AFC, OFF; IF BANDWIDTH, 4 MC AM; RF SELECTOR Switch, S-103, Internal.

(DISCRIMINATOR ALIGNMENT)

3. Remove the longer of the two covers. The short cover should remain in place throughout the entire alignment procedure.

4. Connect the generator output to pin 2 V-803.

5. Short terminal B T-804 to ground. (Solder a very short piece of bus wire between the transformer terminal and the nearest grounding lug.)

6. Connect a sensitive audio voltmeter (a tuned voltmeter such as a Hewlett-Packard 415B standing wave indicator is recommended) to the FM output at the junction of L-201 and S-203 through a 51 k resistor.

7. Connect a VTVM to the AM output at the junction of L-204 and S-203 through a 51 ohm resistor.

8. Set the generator output to 200 k microvolts at 21.4 mc. Frequency modulate the generator with a 1 kc signal and 15 kc deviation.

9. Vary the input frequency plus and minus 2.7 mc and observe that the DC output at the AM detector does not fall below 3.5 volts. (This is to insure that the limiters are limiting over the entire peak-to-peak spacing of the discriminators. If the DC output falls below 3.5 volts it may indicate low gain or that the IF is out of alignment. In this case perform steps 15 through 21 before proceeding).

10. Set the generator to 21.4 mc. Adjust the gain of the HP415B for a convenient indication.

11. Set the generator to 18.9 mc ± 5 kc. Adjust T-811 for a minimum reading of the HP415B.

12. Set the generator to 23.9 mc ± 5 kc. Adjust T-810 for a minimum reading on the HP415B.

13. Repeat step 11.

14. Remove all test equipment. Remove the short on T-804. This completes the discriminator alignment.

(IF ALIGNMENT)

15. Connect the oscilloscope to the AM detector at the junction of L-204 and S-203 through a 51 k ohm resistor.

16. Connect the sweep generator to pin 2 V-804.

17. Short terminal B T-806 to ground. (In this and subsequent steps, solder a very short piece of bus wire between the transformer terminal and the nearest grounding lug.)

18. With maximum output from the sweep generator adjust the primary T-809 for a maximum symmetrical response centered at 21.4 mc.

19. Remove the ground wire from T-806 and ground terminal B T-804.

20. Connect the sweep generator to pin 2 of V-803.

21. Adjust the primary and secondary of T-806 and T-807 for a maximum symmetrical response centered at 21.4 mc with the sweep generator adjusted to produce the same oscilloscope deflection as before.

22. Remove the ground wire from terminal B T-804 and ground terminal B T-802.

23. Connect the sweep generator to pin 2 of V-802 through a 200 ohm resistor. Connect a 10 ohm resistor from pin 2 of V-802 to ground.

24. Adjust the primary and secondary, T-804 and T-805, for a maximum symmetrical response centered at 21.4 mc, with the sweep generator output adjusted to produce the same oscilloscope deflection as before.

25. Remove the ground wire from terminal B T-802. Remove the 200 ohm and 10 ohm resistors.

26. Connect the sweep generator to pin 2 of V-801 through a 200 ohm resistor. Connect a 10 ohm resistor from pin 2 of V-801 to ground.

27. Adjust the primary and secondary, T-802 and T-803, for a maximum symmetrical response centered at 21.4 mc with sweep generator adjusted to produce the same oscilloscope deflection as before.

28. Remove the 200 ohm and 10 ohm resistors.

29. Replace the long bottom cover.

(55-260 MC COUPLING LINK)

30. Remove the front end bottom covers.

31. The band switch should be in the 55-260 MC position.

32. Connect the sweep generator to the junction of the two 470 k resistors R-414 and R-415.

33. Set the IF GAIN control for 50% of maximum.

34. The oscilloscope should be connected as in step 15.

35. Adjust the primary L-413 and secondary T-801 for a maximum symmetrical response centered at 21.4 mc with the sweep generator output adjusted to produce the same oscilloscope deflection as before.

36. Connect the sweep generator to pin 1 of V-403.

37. Connect a 21.4 mc post amplifier to J-212 FDU OUTPUT. GEL POST AMPLIFIER TYPE 1 (the amplifier should be about 3.2 mc wide across the flat portion of the response.)

38. Connect the oscilloscope to the output of the post amplifier.

39. Set the IF GAIN control to minimum.

40. Adjust the output of the sweep generator to produce a 5 v peak deflection on the oscilloscope.

41. Readjust L-413 slightly to remove any tilt in the response.

42. Repeat steps 32 and 33.

43. With the sweep generator adjusted for 5 v peak output, readjust T-803 slightly to remove any tilt in the response.

44. The overall response measured under these conditions should be 4 mc ± 200 kc with no greater than 7% dip.

(30-60 MC COUPLING LINK)

45. Connect the sweep generator to pin 1 V-303.

46. Place the bandswitch in the 30-60 mc position.

47. Repeat steps 38, 39, 40 and adjust L-313 to remove any tilt in the response. Do not disturb the setting of T-801.

48. Connect the sweep generator to the junction of R-314, R-315, and repeat steps 15, 33, and 40. The response should look reasonably flat.

(External IF Coupling Link)

49. Connect the sweep generator to J-119 and set the RF SELECTOR Switch, S-103, in EXT. position.

50. Repeat steps 38, 39, 40 and adjust L-104 for symmetrical response centered around 21.4 mc, and then remove all test equipment.

F. NARROWBAND IF AMPLIFIER ALIGNMENT

RECOMMENDED EQUIPMENT

1. Hewlett Packard 606-A Signal Generator.
2. RCA WV-98A VTVM
3. Dumont 401A Oscilloscope.
4. RCA WR-59 Sweep Generator

ALIGNMENT PROCEDURE

1. Remove the oscillator tubes V-304 and V-404.
2. Place IF GAIN SELECTOR Switch in MAN position.
3. Turn IF GAIN Control fully clockwise.
4. BFO Switch should be "OFF".
5. AFC Switch should be "OFF".
6. Remove V-704.
7. Connect an oscilloscope to the FM output C-755.
8. Connect a sweep generator to pin 1 of V-705.
9. Adjust T-706 and L-713 or L-711 for a symmetrical S curve.
10. Replace V-704.
11. Disconnect the oscilloscope.

12. Disconnect the sweep generator.

13. Connect a vacuum tube volt meter to the AM output.

14. Connect the signal generator to Pin 1 of V-704.

15. Adjust T-705 for maximum output of 21.4 mc. The AM detector should be operated at 2 to 5 volts.

16. Connect the signal generator to Pin 1 of V-703.

17. Adjust T-704 for maximum output at 21.4 mc, keeping the AM output between 2 to 5 volts.

18. Connect the signal generator to pin 1 of V-702.

19. Adjust T-703 for maximum output at 21.4 mc, keeping the AM output between 2 and 5 volts.

20. Connect the signal generator to J-701.

21. Adjust T-701 and T-702 located near the crystal filter for maximum output again operating the detector between 2 and 5 volts.

22. Replace the bottom cover.

23. Peak all transformers except T-706 for maximum output at 21.4 mc.

24. Connect the sweep generator to J-701.

25. Connect the oscilloscope to C-755 FM output.

26. Throw BFO switch ON.

27. Adjust L-701 until BFO marker appears at center of "S" curve.

28. Remove test equipment. This completes the 10 KC IF and BFO alignment.

G. TUNING METER ADJUSTMENT

The tuning meter adjustment pots are located at the upper rear corner of the dust cover on the main IF chassis. Adjustment must be carried out in the following order, since the settings are interdependent.

RECOMMENDED EQUIPMENT

Hewlett Packard 608D Signal Generator

ALIGNMENT PROCEDURE

1. Set the IF GAIN SELECTOR to MANUAL; IF GAIN Control fully counter-clockwise; AUDIO SELECTOR to NBAM ; IF BANDWIDTH to 300 kc AM.

2. Adjust R-248 so that the TUNING meter reads zero.

3. Reset the AUDIO SELECTOR, only, to AM FM.

4. Adjust R-244 to zero the tuning meter.

5. Disconnect the IF cable from the IF INPUT J-203 on the rear apron of the main IF chassis and feed a signal generator into the jack.

6. Reset the AUDIO SELECTOR to NBAM and IF GAIN SELECTOR to AGC.

7. Adjust the generator output for approximately 80% of full scale reading on the SIGNAL LEVEL Meter and use the TUNING Meter to accurately set the generator to 21.4 mc.

8. Reset the AUDIO SELECTOR to AM FM, and the IF BANDWIDTH to 4 mc AM.

9. Adjust R-208 to zero the TUNING Meter.

10. Reset the IF BANDWIDTH to 300 kc AM. Check the TUNING Meter zero.

11. If further adjustment is needed, remove the large bottom cover and adjust the bottom slug on T-609. This is accessible through a hole in the bottom cover of the 300 KC BANDWIDTH IF Amplifier. Do not remove this cover.

12. Replace the bottom cover and reconnect the IF cable. This completes the tuning meter adjustments.

H. REPLACEMENT OF 6280/416B

The 6280/416B tube, V-301 and V-401 located on the rear of each Front End Assembly should be removed as follows:

1. Remove four screws that hold cover in place.

2. Loosen four captive screws located in the corners of the penthouse deck and lift penthouse vertically away from the tube. Tube will extract itself from socket and remain with main chassis.

3. Tube must then be unscrewed from Grid Flange and replaced with new tube.

4. Align pins on tube to closely match socket in penthouse by rotating the tube and grid flange in a CW direction thereby assuring it is not loose on the grid flange and then replace penthouse and cover.

I. MECHANICAL ALIGNMENT OF INDUCTUNER, STOP AND DIAL

1. Looking at the shaft ends rotate both inductuner shafts in a CCW direction until they are against their respective stops. Lock sprockets to shaft using cone-pointed set screws.

2. Attach the aligned inductuners to the gear train in such a manner that the mechanical stops on the knob shaft and the inductuner will reach their limits simultaneously.

3. Rotate shaft CCW against stop and loosen set screw on gear below dial shaft. Rotate dial so that arrow near mark on the inner scale is aligned under the marker line. Tighten set screws.

J. BEARINGS, BEARS CHAIN, AND STOP WASHERS

1. Gear faces, sprocket chain and mechanical stop washers should be wiped clean and washed with Varsol and relubricated with MIL-G-3278 every two months.

2. Ball bearings should be cleaned and lubricated with MIL-L-6082A every two months.

K. AIR FILTER

This equipment has been furnished with a permanent type air filter that should be removed and cleaned periodically, depending on environmental conditions.

1. Remove dust cover.

2. Slide filter up and out.

3. Wash filter and impregnate with Filter Coat No. 3, Research Products Corp., Madison, Wisconsin or equal and replaced in chassis.

L. FAN

1. Fan should be oiled with MIL-L-6085A every two weeks when used continuously on 50 cps or monthly when operated on 60 cps.

2. Keep centrifugal blades and housing free of dust and dirt for efficient operation.

M. CARRIER OPERATED RELAY ADJUSTMENT

Introduction

The procedure recommended here is merely one of the ways of making the COR operate properly at a low signal level; however, if the operator of 17A4 Receiver has other purposes in mind this procedure may be ignored.

Basically there are seven adjustable components in the COR circuit. Two external control functions are mentioned in paragraphs II B 15, II B 16, and III V. The functions of the other five controls are described briefly in the paragraph below.

R-1014 is set up for maximum TRIP LEVEL Control sensitivity. R-1021, R-1019, and R-1020 are set up for proper AGC levels of each IF strips feeding into the COR circuit. The 17A4 Receiver characteristic is such that the narrowband AGC level is lowest in comparison to the wideband AGC level; therefore, normally R-1021 should be shorted for weak signal input. R-1022 controls the level of pulse AGC feeding into COR circuit. Since the pulse AGC voltage fluctuates drastically at low level pulse signal input, the DELAY SET Control must be used. - See R-1022 Adjustment Page 17

Recommended Equipment

1. Signal Generator, Hewlett-Packard 608D.

2. Unit Pulser, General Radio Co., Type No. 1217-A.

3. Power Supply for Unit Pulser, General Radio Co., Type No. 1203B.

4. VTVM, RCA Senior Voltohmist, WV-98A.

5. Ohmmeter or a short circuit test light.

Procedure

(R-1014 Adjustment)

1. Connect VTVM to TP-1001 and set the meter for -3VDC scale.

2. Connect the signal generator to the receiver antenna input J-102 and set the generator output to 5 uv at the CW frequency.

3. Set the IF BANDWIDTH Switch on the front panel in the 300 KC FM or AM position.

4. Set the AUDIO SELECTOR Swith, S-202, in the AM-FM position.

5. Set the IF GAIN SELECTOR Switch, S-201, in the AGC position.

6. Adjust the tuning dial, L-301 or L-401, to make sure the receiver is tuned to the CW.

7. Connect the ohmmeter across the COR output TP-301 terminals 3 and 4. The purpose of this ohmmeter is to check when the COR opens or closes.

8. Adjust R-1014 for approximately 1000 ohm between center tap and ground.

9. Adjust R-1020 for -1VDC reading at TP-1001.

10. Press down DELAY SET Control, R-288, in order to notice TRIP LEVEL Control sensitivity.

11. Adjust TRIP LEVEL Control, R-287, on the front panel clockwise and then counterclockwise several times. Notice the two positions of TRIP LEVEL Control at which the COR switch changes from closed position to open and viseversa. The distance separating these two positions is inversely proportional to the TRIP LEVEL Control sensitivity.

12. Adjust R-1014 slightly and then recheck step 11.

13. Repeat steps 11 and 12 so that for each R-1014 setting the TRIP LEVEL Control sensitivity is increased until an optimum point is reached.

14. Lock the potentiometer R-1014 setting and proceed to the next adjustment.

(R-1021, R-1020, and R-1019 Adjustment)

1. Use the same test equipment set up in the previous adjustment.

2. Set the IF BANDWIDTH Switch, S-203, in the NBFM position. Leave the AUDIO SELECTOR and the IF GAIN SELECTOR Switches in the former positions.

3. Lock R-1021 for zero resistance so that maximum narrow-band AGC voltage is applied to the COR circuit.

4. Adjust the TRIP LEVEL Control, R-287, clockwise and then counterclockwise. Notice the two positions of R-287 at which the COR switch changes from closed position to open and viseversa. Lock R-287 to the midpoint between these two positions.

5. Turn IF BANDWIDTH Switch to the 300 KC AM or FM position.

6. Adjust R-1020 in similar manner as R-287 in step 4. Be sure to lock R-1020 after final adjustment.

7. Turn IF BANDWIDTH Switch to the 4 MC AM or FM position.

8. Adjust R-1019 in similar manner as R-287 in step 4. Be sure to lock R-1019 after final adjustment.

(R-1022 Adjustment)

1. Use the same test set up in the previous adjustment.

2. Modulate the signal generator with a unit pulser.

3. Adjust the signal and pulse generators for a modulated pulse with 10 uv level, 10 u sec pulse duration at 100 pulse rate frequency.

4. Set the IF GAIN SELECTOR Switch, S-201, in the PULSE AGC position, the AUDIO SELECTOR Switch, S-202, in the PULSE position, and the IF BANDWIDTH Switch, S-203, in the 4 MC AM position.

5. Set the DELAY SET Control, R-288, fully clockwise so that the COR Switch will be essentially controlled by the peak level of the fluctuating pulse AGC voltage.

6. Adjust R-1022 clockwise and then counterclockwise several times. Notice the two positions of R-1022 at which the COR Switch changes from closed position to open or viseversa.

7. Lock R-1022 at the midpoint between these two positions.

8. Disconnect the test equipment and the COR adjustment is completed.

PARTS LIST

TUBE COMPLEMENT

SYMBOL	TYPE	FUNCTION
V-101	OA2WA	Voltage regulator
V-201	5814A	10kc AM Video Amplifier and 10 kc AM Video Cathode Follower
V-202	5814A	Wideband Metering Amplifier
V-203	5814A	Pulse Amplifier and Pulse
V-204	5814A	10 kc Metering Amplifier
V-205	5726/6AL5W	10 kc and 300 kc AGC Delay
V-206	12AX7	Automatic Noise Limiter
V-207	6AU6WA	Audio Amplifier
V-208	6AQ5	Audio Output
V-209	6CL6	Wideband Video Cathode Follower
V-210	6CL6	Wideband Video Cathode Follower
V-301	6280/416B	First RF Amplifier
V-302	6J4	Second RF Amplifier
V-303	5654/6AK5W	Mixer
V-304	6AF4A	Oscillator
V-401	6280/416B	First RF Amplifier
V-402	6J4	Second RF Amplifier
V-403	5654/6AK5W	Mixer
V-404	6AF4A	Oscillator
V-601	6DC6	First IF Amplifier, 21.4 mc, 300 kc

SYMBOL	TYPE	FUNCTION
V-602	6DC6	Second IF Amplifier, 21.4 mc, 300 kc
V-603	6DC6	Third IF Amplifier, 21.4 mc, 300 kc
V-604	6CB6	Fourth IF Amplifier, 21.4 mc, 300 kc
V-605	5654/6AK5W	FM Limiter, 21.4 mc, 300 kc
V-606	5726/6AL5W	Discriminator, 21.4 mc, 300 kc
V-701	6DC6	First IF Amplifier, 21.4 mc, 10 kc
V-702	6DC6	Second IF Amplifier, 21.4 mc, 10 kc
V-703	6DC6	Third IF Amplifier, 21.4 mc, 10 kc
V-704	6CB6	Fourth IF Amplifier, 21.4 mc, 10 kc
V-705	6AU6WA	FM Limiter
V-706	6C4	Beat Frequency Oscillator
V-801	E180F/6688	First IF Amplifier, 21.4 mc, 4 mc
V-802	E180F/6688	Second IF Amplifier, 21.4 mc, 4 mc
V-803	E180F/6688	Third IF Amplifier, 21.4 mc, 4 mc
V-804	E180F/6688	Fourth IF Amplifier, 21.4mc, 4 mc
V-805	6BN6	FM Limiter
V-806	6BN6	FM Limiter
V-807	5726/6AL5W	Discriminator, 21.4 mc, 4 mc
V-1001 A	12AX7	Amplifier
V-1001 B	12AX7	Cathode Follower
V-1002 A	12AU7	Relay Amplifier

TABLE 2 - VOLTAGE MEASUREMENTS

UNIT	SYM \ PIN	1	2	3	4	5	6	7	8	9	Note
POWER SUPPLY	V101	147	0	NC	0	147	NC	0	-	-	
MAIN IF CHASSIS	V201	136	0	6.4	6.3ac	6.3ac	222	86	93	0	
	V202	237	4.0	13.7	0	0	237	2.84	12.8	6.3ac	
	V203	237	0	13.6	0	0	82	-.55	0	6.3ac	1
	V204	237	12.8	21.4	0	0	237	13.4	21.6	6.3ac	
	V205	0	0	6.3ac	0	0	0	0	-	-	
	V206	.55	-.32	.48	0	0	NC	NC	NC	6.3ac	
	V207	0	3.38	6.2ac	0	106	129	3.38	-	-	
	V208	0	6.9	6.2ac	0	133	140	0	-	-	
	V209	77	73	222	0	6.3ac	222	0	222	73	
	V210	77	73	222	0	6.3ac	222	0	222	73	

All measurements made with an 11 megohm VTVM

Conditions unless otherwise noted are:

IF BANDWIDTH - 4 MC AM
IF GAIN - Maximum no signal in
IF GAIN SELECTOR - MAN.
AUDIO GAIN - Minimum
AUDIO SELECTOR - AM FM
ANL - OFF
ANL THRESHOLD - Full CCW
BFO - OFF
115V Line

Notes: 1) IF GAIN SELECTOR IN PULSE AGC

TABLE 2 - VOLTAGE MEASUREMENTS (cont.)

UNIT	SYM \ PIN	1	2	3	4	5	6	7	8	9	Note
30-60 MC TUNING HEAD	V301	7.1	6.3ac	0		185		7.0	-	-	
	V302	0	1.0	0	6.3ac	0	0	110	-	-	
	V303	-.41	0	0	6.3ac	145	27	0	-	-	
	V304	71	*	0	6.3ac	2.1	*	71	-	-	
55-260 MC TUNING HEAD	V401	7.1	6.3ac			200		7.2	-	-	
	V402	0	1.10	0	6.3ac	0	0	127	-	-	
	V403	-2.5	0	0	6.3ac	147	64.5	0	-	-	
	V404	58	*	0	6.3ac	2.3	*	58	-	-	
300KC BANDWIDTH IF AMPLIFIER	V601	0	1.91	5.9ac	0	139	93	0	-	-	1
	V602	0	1.86	5.9ac	0	140	92	0	-	-	1
	V603	0	1.86	5.9ac	0	140	100	0	-	-	1
	V604	0	2.3	6.0ac	0	141	212	0	-	-	1
	V605	0	0	6.0ac	0	81	142	0	-	-	1
	V606	0	-.23	4.4ac	0	0	0	-.23	-	-	1, 2

Plate
Grid

Notes: 1) IF BANDWIDTH - 300 KC AM
2) IF GAIN - Minimum
* Do not measure

TABLE 2 - VOLTAGE MEASUREMENTS (cont.)

UNIT	SYM \ PIN	1	2	3	4	5	6	7	8	9	Note
10KC BANDWIDTH IF AMPLIFIER	V701	0	.93	5.9ac	0	160	57	0	-	-	
	V702	0	1.05	5.9ac	0	162	55	0	-	-	
	V703	0	1.75	5.9ac	0	162	68	0	-	-	
	V704	0	1.37	5.9ac	0	160	88	0	-	-	
	V705	-.042	0	5.9ac	0	160	75	0	-	-	
	V706	140	NC	5.9ac	0	140	-18	0	-	-	1, 2
4MC BANDWIDTH IF AMPLIFIER	V801	.99	0	.99	5.8ac	0	0	118	0	134	
	V802	1.09	0	1.09	5.9ac	0	0	118	0	130	
	V803	1.04	0	1.04	5.9ac	0	0	120	0	141	
	V804	1.25	0	1.25	5.9ac	0	0	175	0	144	
	V805	2.26	0	5.9ac	0	108	7.8	132	-	-	
	V806	2.26	0	5.9ac	0	108	7.8	132	-	-	
	V807	4.0	4.0	4.3ac	0	8.0	0	0	-	-	
COR	V1001	150	90-10	90-10	6AC	6AC	90-15	0	10-0	0	
	V1002	150	70-30	75max	6AC	6AC	-	-	-	0	

Notes: 1) BFO-ON
2) IF GAIN-MAXIMUM

PARTS LIST

Power Supply

SYMBOL	DESCRIPTION
B101	Blower, Heinze #D60425, GEL Part No. 18906
C101	Capacitor, Fixed, Ceramic Disc, .005 uf, GMV 1400V, Radio Materials Co., Type U, GEL Part No. 12051
C102	Same as C101
C103	Capacitor, Fixed, Ceramic Feed-thru, .001 uf ±20%, Erie GP2, Style 327, GEL Part No. 12067
C104	Same as C103
C105	Capacitor, Electrolytic, 45-45 uf, 400V, Pyramid CE-52C450Q, GEL Part No. 12701
C106	Same as C105
C107	Same as C105
* C108	Capacitor, Fixed, Ceramic Disc, .001 uf, Erie HR-839-X5T, GEL Part No. 12074
* C109	Same as C108
* C110	Same as C108
* C111	Capacitor, Ceramic Tubular, 47 uuf ± 5%, Erie NPO-T, GEL Part No. 12040
* C112	Capacitor, Ceramic Tubular, 15 uuf ± 5%, Erie #N1500301-P3J-150J, GEL Part No. 12041
F101	Fuse, Cartridge, 2.5 Amp, Slo-Blo, GEL Part No. 17905
F102	Fuse, Cartridge, 1.25 Amp, Slo-Blo, GEL Part No. 17901

SYMBOL	DESCRIPTION
I101	Lamp, Pilot, GE #47, GEL Part No. 17801
J101	Connector, Receptacle, Deutsch, DM9601-19S, GEL Part No. 17490
J103	Connector, Receptacle, IPC 21850, GEL Part No. 17544
J106	Connector, Receptacle, IPC 46025, GEL Part No. 17302
J107	Same as J106
J108	Same as J106
J110	Connector, Receptacle, Hubbel 7486G, GEL Part No. 17325
J111	Connector, Receptacle, Deutsch, DM9601-27S, GEL Part No. 17356
* J112	Same as J106
* J113	Same as J106
J114	Connector, Integral Part of J103
* J118	Same as J106
K101	Relay, Time Delay, Curtiss-Wright, Snapper Type 6.3-60DF, GEL Part No. 20500
K102	Same as K101
K103	Relay, Coaxial, RF Switch, Danbury-Knudsen #318-010395-8, GEL Part No. 20521
L101	Inductor, Fixed, 1.45 uh, GEL Dwg. No. B10-207, GEL Part No. 17006
L102	Same as L101

SYMBOL	DESCRIPTION
L103 A & B	Inductor, Fixed, 5-10 uh, GEL Dwg. No. D10-252 GEL Part No. 17020
* L104	Inductor, Fixed, 0.2-1 uh, GEL Dwg. No. A15-729,
M101	Meter, Tuning, 50-0-50 ua, GEL Dwg. No. B10-420 GEL Part No. 18502
M102	Meter, Signal Strength, 0-50 ua, GEL Dwg. No. B10-418, GEL Part No. 18503
P101	Connector, Plug, Deutsch, DM9702-19P, GEL Part No. 17382
R101	Resistor, Fixed, Wirewound, 3.5 ohms ± 3%, 25W, Dale RH-25, Dalohm, GEL Part No. 11607
R102	Resistor, Fixed, Wirewound, 200 ohm ± 3%, 25W, Dale RH25, Dalohm, GEL Part No. 11611
R103	Resistor, Fixed, Wirewound, 18 ohm ± 3%, 25W, Dale RH25, Dalohm, GEL Part No. 11608
R104	Resistor, Fixed, Wirewound, 2000 ohms ± 3%, 25W, Dale RH25, Dalohm, GEL Part No. 11642
R105	Resistor, Fixed, Composition, 2.2 M ± 5%, 1/2W Allen Br adley EB 2255, GEL Part No. 10514
R106	Potentiometer, Composition, 250K, Allen Bradley CU-2541, GEL Part No. 14039
R107	Resistor, Fixed Composition, 100 ohms ± 5%, 1/2W Allen Bradley 1015, GEL Part No. 10447
S101	Switch, Power, Smith #522, GEL Part No. 18004
S102	Switch, Power, Smith #523, GEL Part No. 18000

SYMBOL	DESCRIPTION
S103	Switch, Mod. Rotary, Centralab, PA-2015, GEL Dwg. No. A15-830
T101	Transformer, Power, GEL Dwg. No. C10-761 GEL Part No. 14026
V101	Tube, Electron, OA2WA, GEL Part No. 14782
W101	Cable Assy, Coaxial, GEL Dwg. No. B11-637
W102	Cable Assy, Coaxial, GEL Dwg. No. B11-636
W103	Cable Assy, Coaxial, GEL Dwg. No. B10-465-2
W104	Cable Assy, Coaxial, GEL Dwg. No. B10-465-1
W105	Cable Assy, Coaxial, GEL Dwg. No. B10-467-2
W106	Cable Assy, Coaxial, GEL Dwg. No. B10-467-1
W107	Cable Assy, Coaxial, GEL Dwg. No. B10-468-4
W108	Cable Assy, Coaxial, GEL Dwg. No. B10-466
W109	Cable Assy, Coaxial, GEL Dwg. No. B11-635
W110	Cable Assy, Coaxial Interconnecting, GEL Dwg. No. B10-577
* W111	Cable Assy, Coaxial, GEL Dwg. No. B15-746-1
* W112	Cable Assy, Same as W111
* W113	Cable Assy, Coaxial, GEL Dwg. No. B15-745

NOTE: * Denotes Items not used on serial numbers 101 thru 129

PARTS LIST

Main IF Chassis

SYMBOL	DESCRIPTION
B201	Blower, Rotron KS-401 DFE Airflow R, Series 92A Frame TA-1, GEL Part No. 18904
C201	Capacitor, Fixed Paper 1 uf, 600V, Pyramid CP53B1EF105K, GEL Part No. 12924
C202	Capacitor, Fixed Paper .47 uf ± 20%, 200V, Aerovox P123ZGP, GEL Part No. 12916
C203	Capacitor, Fixed Ceramic Tubular 47 uuf ± 5%, CC25CH470J, GEL Part No. 12040
C204	Capacitor, Fixed Silvered Mica 82 uuf ± 5%, Elmenco CM15E820J, GEL Part No. 12508
C205	Capacitor, Fixed Silvered Mica 390 uuf ± 5%, Elmenco CM15E391J, GEL Part No. 12504
C206	Capacitor, Fixed Silvered Mica, .001uf ± 5%, Elmenco CM20D102J, GEL Part No. 12515
C207	Capacitor, Fixed Paper, .01 uf ± 25%, 200V, Aerovox P123ZGP, GEL Part No. 12915
C208	Same as C203
C209	Same as C204
C210	Same as C205
C211	Same as C206
C212	Same as C207
C213	Capacitor, Fixed Paper, .047 uf ± 25%, 200V, Aerovox P123ZGP, GEL Part No. 12919
C214	Capacitor, Electrolytic Tubular, 20 ufd, 150V, Pyramid TD20150, GEL Part No. 12705

SYMBOL	DESCRIPTION
C215	Capacitor, Fixed Ceramic Disc, .001 uf + 100% - 20%, Erie CK61Y102Z, GEL Part No. 12070
C216	Same as C202
C217	Same as C202
C218	Capacitor, Fixed Silvered Mica, 360 uuf, Elmenco CM15E261J, GEL Part No. 12503
C219	Capacitor, Fixed Paper, .22 uf ± 20%, 400V, Aerovox P123Z GP, GEL Part No. 12910
C220	Capacitor, Fixed Paper, .22 uf ± 20%, 200V, Aerovox P123Z GP, GEL Part No. 12920
C221	Same as C213
C222	Capacitor, Fixed Ceramic Disc, .0047 uf + 100% - 20%, Erie CK62Y472Z, GEL Part No. 12050
C223	Capacitor, Fixed Ceramic Disc, .01 uf + 100% - 20%, Erie CK63Y103Z, GEL Part No. 12046
C224	Capacitor, Fixed Paper, .1 uf ± 20%, 200V, Aerovox P123Z GP, GEL Part No. 12917
C225	Same as C224
C226	Same as C223
C227	Not Assigned
C228	Capacitor, Fixed Paper, .1 uf ± 20%, 400V, Aerovox P123Z GP, GEL Part No. 12909
C229	Same as C222
C230	Same as C202
C231	Same as C224
C232	Same as C224

SYMBOL	DESCRIPTION
C233	Same as C224
C234	Same as C220
C235	Same as C223
C236	Same as C223
C237	Same as C220
C238	Same as C202
C239	Same as C220
C240	Capacitor, Electrolytic 20-20-20 uf, 450V, Aerovox AEP444J, GEL Part No. 12775
C241	Same as C219
C242	Same as C219
C243	Same as C202
C244	Same as C222
C245	Capacitor, Fixed Ceramic Tubular, 30 uuf ± 5%, CC25CH300G, GEL Part No. 12106
C246	Not Assigned
C247	Not Assigned
C248	Same as C202
C249	Same as C202
C250	Same as C223

* See C251 & C252 on Page V-16

CR201	Diode, Germanium, Raytheon 1N67A, GEL Part No. 14509
CR202	Diode, Germanium, Transitron 1N483, GEL Part No. 14507

SYMBOL	DESCRIPTION
CR203	Diode, Germanium, Raytheon 1N295, GEL Part No. 14508
CR204	Same as CR203
CR205	Same as CR203
CR206	Diode, Silicon Zener, Texas Instrument 652C5, GEL Part No. 14504

* See CR207 on Page V-16

F101	Spare, Fuse, 2.5 Amp, Slo-Blo #3AG, GEL Part No. 17905
F102	Spare, Fuse, 1.25 Amp, Slo-Blo #3AG, GEL Part No. 17901
J201	Connector, Receptacle, Deutsch DM9601-27P, GEL Part No. 17354
J202	Connector, Integral Part of W202
J203	Connector, Integral Part of W203
J204	Not Assigned
J205	Connector, Receptacle, Winchester, M12S-LS12N GEL Part No. 17327
J206	Connector, Integral Part of W205
J207	Connector, Receptacle UG-1094/U, GEL Part No. 17314
J208	Same as J207
J209	Same as J207
J210	Same as J207
J211	Same as J207
J212	Same as J207
J213	Same as J207

SYMBOL	DESCRIPTION
J214	Phone, Switchcraft C12A, GEL Part No. 17358
J215	Connector, Integral Part of W206
J216	Same as J207
J217	Connector, Receptacle, Alden 462MIN1-1, GEL Part No. 17445
J218	Same as J207
J219	Connector, Integral Part of W207
J220	Same as J207
J221	Connector, Power, AMP 200346-4, GEL Part No. 17506
J222	Same as J207
L201	Inductor, 11.5 uh, GEL Dwg. No. A10-163
L202	Same as L201
L203	Inductor, Fixed 430 uh, Wilco 3430-15, GEL Part No. 17003
L204	Same as L201
L205	Same as L201
L206	Same as L201
LS201	Speaker, PM 2" x 3", Elliptical, RCA 76373, GEL Part No. 18700
P201	Connector, Plug, Alden 462MIN2-2, GEL Part No. 17446
P202	Connector, Integral Part of W201
P203	Same as P202

SYMBOL	DESCRIPTION
P204	Connector, Integral Part of W203
P205	Not Assigned
P206	Connector, Integral Part of W205
P207	Connector, Integral Part of W206
P208	Connector, Integral Part of W202
P209	Connector, Integral Part of W207
R201	Resistor, Fixed Composition, 150K ohm ± 5%, 1/2W, Allen Bradley EB 1545, GEL Part No. 10424
R202	Resistor, Fixed Composition, 4.7K ohm ± 5%, 1/2W, Allen Bradley EB 4725, GEL Part No. 10414
R203	Resistor, Fixed Composition, 390K ohm ± 5%, 1/2W, Allen Bradley EB 3945, GEL Part No. 10524
R204	Resistor, Fixed Composition, 180K ohm ± 5%, 1/2W, Allen Bradley EB 1845, GEL Part No. 10486
R205	Resistor, Fixed Composition, 100K ohm ± 5%, 1/2W, Allen Bradley EB 1045, GEL Part No. 10430
R206	Resistor, Fixed Composition, 220K ohm ± 5%, 1/2W, Allen Bradley EB 2245, GEL Part No. 10608
R207	Resistor, Fixed Composition, 1.5K ohm ± 5%, 1/2W, Allen Bradley EB 1525, GEL Part No. 10470
R208	Potentiometer, Composition, 1K ohm, Ohmite AS 3604, GEL Part No. 14024
R209	Same as R207
R210	Same as R203
R211	Resistor, Fixed Composition, 22 ohm ± 5%, 1/2W, Allen Bradley EB 2205, GEL Part No. 10564
R212	Resistor, Fixed Composition, 820K ohm ± 5%, 1/2W, Allen Bradley EB 8245, GEL Part No. 10496

SYMBOL	DESCRIPTION
R213	Resistor, Fixed Composition, 100 ohm ± 5%, 1/2W, Allen Bradley EB 1015, GEL Part No. 10447
R214	Resistor, Fixed Composition, 27 ohm ± 5%, 1/2W, Allen Bradley EB 2705, GEL Part No. 10499
R215	Resistor, Wire Wound, 1K ohm 25W, 3%, Sage Silicohm M25W, GEL Part No. 11625
R216	Same as R214
R217	Same as R213
R218	Resistor, Fixed Composition, 10K ohm ± 5%, 1/2W, Allen Bradley EB 1035, GEL Part No. 10408
R219 A & B	Potentiometer, Composition, 10K ohm Dual, Ohmite CCU1031, GEL Part No. 14023
R220	Resistor, Fixed Composition, 5.6 megohm ± 5%, 1/2W, Allen Bradley EB 5655, GEL Part No. 10625
R221	Not Assigned
R222	Resistor, Fixed Composition, 180K ohm ± 5%, 1/2W, Allen Bradley EB 1845, GEL Part No. 10486
R223	Resistor, Fixed Composition, 330K ohm, ± 5%, 1/2W, Allen Bradley EB 3345, GEL Part No. 10439
R224	Not Assigned
R225	Resistor, Fixed Composition 560K, ohm ± 5%, 1/2W, Allen Bradley EB 5645, GEL Part No. 10433
R226	Resistor, Fixed Composition 270K ohm ± 5%, 1/2W, Allen Bradley EB 2745, GEL Part No. 10490
R227	Same as R225
R228	Same as R205
R229	Resistor, Fixed Composition, 1 megohm ± 5%, 1/2W, Allen Bradley EB 1055, GEL Part No. 11424

SYMBOL	DESCRIPTION
R230	Resistor, Fixed Composition, 18K ohm ± 5%, 2W, Allen Bradley HB 1835, GEL Part No. 11401
R231	Resistor, Fixed Composition, 56K ohm ± 5%, 1/2W, Allen Bradley EB 5635, GEL Part No. 11425
R232	Same as R205
R233	Same as R218
R234	Same as R205
R235	Same as R223
R236	Same as R201
R237	Same as R205
R238	Resistor, Fixed Composition, 3.3K ohm ± 5%, 1/2W, Allen Bradley EB 3325, GEL Part No. 10545
R239	Same as R223
R240	Same as R231
R241	Same as R231
R242	Same as R231
R243	Resistor, Fixed Composition, 2.2K ohm ± 5%, 1/2W, Allen Bradley EB 2225, GEL Part No. 10411
R244	Potentiometer, Composition, 2.5K ohm, Ohmite AS 3605, GEL Part No. 14010
R245	Same as R238
R246	Same as R218
R247	Same as R243
R248	Same as R244
R249	Resistor, Fixed Composition, 470K ohm ± 5%, 1/2W, Allen Bradley EB 4745, GEL Part No. 10541

SYMBOL	DESCRIPTION
R250	Resistor, Fixed Composition, 330 ohm ± 5%, 2W, Allen Bradley HB 3315, GEL Part No. 11422
R251	Potentiometer, Composition, 500K ohm, Ohmite Type AB CA5041, GEL Part No. 14022
R252	Same as R206
R253	Same as R249
R254	Resistor, Fixed Composition, 3.9K ohm ± 5%, 1/2W, Allen Bradley EB 3925, GEL Part No. 10404
R255	Resistor, Fixed Composition, 180K ohm ± 5%, 1/2W, Allen Bradley EB 1845, GEL Part No. 10486
R256	Resistor, Fixed Composition, 10 megohm ± 5%, 1/2W, Allen Bradley EB 1065, GEL Part No. 10515
R257	Resistor, Fixed Composition, 22K ohm ± 5%, 1/2W, Allen Bradley EB 2235, GEL Part No. 10427
R258	Resistor, Fixed Composition, 10 ohm ± 5%, 1/2W, Allen Bradley EB 1005, GEL Part No. 10442
R259	Potentiometer, Composition, 500K ohm, Ohmite Type AB CU 5041, GEL Part No. 14013
R260	Same as R206
R261	Same as R229
R262	Same as R226
R263	Same as R225
R264	Not Assigned
R265	Same as R229
R266	Same as R238
R267	Resistor, Fixed Composition, 47K ohm ± 5%, 1/2W, Allen Bradley EB 4735, GEL Part No. 10429

SYMBOL	DESCRIPTION
R268	Resistor, Fixed Composition, 1.5 megohm ± 5%, 1/2W, Allen Bradley EB 1555, GEL Part No. 10512
R269	Same as R229
R270	Resistor, Fixed Composition, 10K ohm ± 5%, 1W Allen Bradley GB 1035, GEL Part No. 10900
R271	Not Assigned
R272	Same as R229
R273	Resistor, Fixed Composition, 180 ohm ± 5%, 2W, Allen Bradley HB 1815, GEL Part No. 11479
R274	Resistor, Fixed Composition, 1K ohm ± 5%, 1/2W, Allen Bradley EB 1025, GEL Part No. 10401
R275	Same as R274
R276	Resistor, Fixed Composition, 560 ohm ± 5%, 1/2W, Allen Bradley EB 5615, GEL Part No. 10583
R277	Same as R249
R278	Resistor, Fixed Composition, 33K ohm ± 5%, 1/2W, Allen Bradley EB 3335, GEL Part No. 10600
R279	Same as R249
R280	Resistor, Fixed Composition, 8.2K ohm ± 5%, 1/2W, Allen Bradley EB 8225, GEL Part No. 10407
R281	Resistor, Fixed Composition, 15K ohm ± 5%, 2W, Allen Bradley HB 1535, GEL Part No. 11539
R282	Same as R231
R283	Same as R231
R284	Same as R231
R285	Same as R231
R286	Same as R205

SYMBOL	DESCRIPTION
R287	Potentiometer, 250K ± 10% with push-pull switch. CTS (same as LB-3650 except different value and shaft length of 7/8"), GEL Part No. 14080
R288	Potentiometer, 2.5 meg ± 10% with push-pull switch CTS (same as LB-3650 except different values and shaft length of 7/8"), GEL Part No. 14079
*	See R289 & R290 on Page V-16
S201	Switch, Rotary, GEL Dwg. No. A10-940
S202	Switch, Rotary, GEL Dwg. No. A10-985 B
S203	Switch, Rotary, GEL Dwg. No. B11-373
S204	Switch, Rotary, GEL Dwg. No. A10-986
S205	Switch, Toggle, Smith #521, GEL Part No. 18001
S206	Switch, Toggle, Smith #520, GEL Part No. 18002
S207	Same as S206
T201	Transformer, Audio, Chicago AMS5, GEL Part No. 15251
T202	Transformer, Audio, Chicago AMS2, GEL Part No. 15250
T203	Transformer, Filament, GEL Dwg. No. C10-995
TB 201	Terminal Board, Cinch Jones 4-141Y, GEL Part No. 16710
V201	Tube, Electron, 5814A, GEL Part No. 14781
V202	Same as V201
V203	Same as V201
V204	Same as V201

SYMBOL	DESCRIPTION
V205	Tube, Electron 5726/6AL5W, GEL Part No. 14784
V206	Tube, Electron 12AX7, GEL Part No. 14765
V207	Tube, Electron 6AU6WA, GEL Part No. 14762
V208	Tube, Electron 6AQ5, GEL Part No. 14754
V209	Tube, Electron 6CL6, GEL Part No. 14766
V210	Tube, Electron 6CL6, GEL Part No. 14766
W201	Cable Assembly, Coaxial, GEL Dwg. No. B10-998
W202	Cable Assembly, Coaxial, GEL Dwg. No. B10-471
W203	Cable Assembly, Coaxial, GEL Dwg. No. B10-997
W204	Not Assigned
W205	Cable Assembly, Coaxial, GEL Dwg. No. B10-999
W206	Cable Assembly, Coaxial, GEL Dwg. No. B10-669
W207	Cable Assembly, Coaxial, GEL Dwg. No. B10-996
R289	Resistor, Fixed Composition, 290K ± 5%, 1/2W, Allen Bradley EB 2745, GEL 10490
R290	Resistor, Fixed Composition, 39K ± 5%, 1/2W, Allen Bradley EB 3935, GEL Part No. 10422
CR207	Diode, Zener, 1N466, GEL Part No. 14608
C251	Capacitor, Disc Ceramic, .0047 ufd, +100% -20%, CK62Y472Z, GEL Part No. 12050
C252	Same as C251

PARTS LIST

30-60 MC R. F. Chassis

SYMBOL	DESCRIPTION
C301	Capacitor, Fixed Ceramic Feed-thru, .001 uf ± 20% Erie GP2, Style 327, GEL Part No. 12067
C302	Capacitor, Fixed Ceramic Tubular, 8.2 uuf ± .5 uuf, Erie NPO-A, GEL Part No. 12020
C303	Capacitor, Fixed Ceramic Disc, .001 uf + 100% - 20%, Erie CK61Y102Z, GEL Part No. 12070
C304	Capacitor, Fixed Ceramic Stand-off, .0015 uf ± 20%, Erie Style 326, GEL Part No. 12069
C305	Same as C301
C306	Capacitor, Fixed Ceramic Tubular, 12 uuf ± 5% Erie NPO-A, GEL Part No. 12024
C307	Capacitor, Variable Piston-Type, .8-8.5 uuf JFD VC20G, GEL Part No. 13305
C308	Capacitor, Fixed Silvered Mica Button, 200 uuf ± 10%, Erie 370FA201K, GEL Part No. 12059
C309	Same as C308
C310	Same as C308
C311	Same as C308
C312	Same as C308
C313	Same as C303
C314	Same as C303
C315	Same as C303
C316	Same as C301
C317	Same as C301

SYMBOL	DESCRIPTION
C318	Not Assigned
C319	Capacitor, Fixed Ceramic Tubular, 22 uuf ± 5%, Erie NPO-A, GEL Part No. 12057
C320	Capacitor, Fixed Ceramic Tubular, 33 uuf ± 5%, Erie NPO-T, GEL Part No. 12035
C321	Capacitor, Fixed Silvered Mica, 82 uuf ± 5%, Elmenco CM15E820J, GEL Part No. 12508
C322	Not Assigned
C323	Same as C301
C324	Capacitor, Fixed Ceramic Tubular, .001 uf ± 10%, Erie GP2, Style 331, GEL Part No. 12063
C325	Capacitor, Fixed Ceramic Tubular, 2 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12005
C326	Same as C301
C327	Same as C301
C328	Capacitor, Fixed Ceramic Tubular, 15 uuf ± 5%, Erie NPO-A, GEL Part No. 12027
C329	Capacitor, Fixed Ceramic Tubular, 6.2 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12017
C330	Same as C307
C331	Capacitor, Fixed Ceramic Tubular, 1 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12089
C332	Same as C325
C333	Same as C302
C334	Same as C307
C335	Same as C307
C336	Capacitor, Fixed Ceramic Tubular, 10 uuf ± .5 uuf, Erie NPO-A, GEL Part No. 12021

SYMBOL	DESCRIPTION
C337	Same as C303
C338	Capacitor, Fixed Ceramic Feed-thru, 47 uuf ± 20% Erie GP1, Style 327, GEL Part No. 12149
C339	Same as C306
C340	Capacitor, Voltage Variable, V-56 Pacific Semiconductor Co., GEL Part No. 13308
C341	Same as C301
C342	Same as C307
C343	Capacitor, Fixed Ceramic Tubular, 3.9 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12012
C344	Same as C306
C345	Same as C303
C346	Capacitor, Fixed Ceramic Tubular, .68 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12001
C347	Same as C336
C348	Capacitor, Fixee Ceramic Tubular, .5 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12000
C349	Same as C303
C350	Same as C301
C351	Same as C304
C352	Capacitor, Fixed Ceramic Disc, .0047 uf + 100% - 20%, Erie CK62Y472Z, GEL Part No. 12050
C353	Same as C306
C354	Capacitor, Fixed Ceramic Disc, .0047 uf + 100% - 20%, Erie CK62Y472Z, GEL Part No. 12050
C355	Same as C303

SYMBOL	DESCRIPTION
I301	Lamp, Pilot GE #328, GEL Part No. 17802
J301	Connector, Receptacle, UG 1098/U, GEL Part No. 17315
J302	Connector, Receptacle, UG 1094/U, GEL Part No. 17314
J303	Same as J302
J304	Same as J302
L301	Inductor, Fixed, .72 uh, GEL Dwg. No. B10-218, GEL Part No. 17072
L302	Inductor, Fixed, 14 uh, GEL Dwg. No. B10-216 GEL Part No. 17073
L303	Same as L302
L304	Inductor, Fixed GEL Dwg. No. A10-618, GEL Part No. 17067
L305 A, B, C, D	Inductor, Variable, Mallory Spiral Inductuner, GEL Dwg. No. B10-145-2, GEL Part No.
L306	Inductor, Fixed, 2.7 uh, GEL Dwg. No. P1-151, GEL Part No. 17001
L307	Same as L302
L308	Same as L302
L309	Inductor, Fixed, GEL Dwg. No. A10-619, GEL Part No. 17068
L310	Inductor, Fixed, GEL Dwg. A10-620, GEL Part No. 17069
L311	Not Assigned
L312	Inductor, Fixed, GEL Dwg. No. A10-621, GEL Part No. 17070

SYMBOL	DESCRIPTION
L313	Inductor, Variable, GEL Dwg. No. A10-766, GEL Part No. 17066
L314	Inductor, Fixed, GEL Dwg. No. A10-622, GEL Part No. 17071
L315	Inductor, Fixed 11.5 uh, GEL Dwg. No. A10-163 GEL Part No. 17000
L316	Same as L315
R301	Resistor, Fixed Composition, 160 ohm, ± 5% 1/2W, Allen Bradley EB 1615, GEL Part No. 10503
R302	Resistor, Fixed Composition, 100 ohm ± 5%, 1/2W Allen Bradley EB 1015, GEL Part No. 10447
R303	Not Assigned
R304	Resistor, Fixed Composition, 51K ohm ± 5%, 1/2W, Allen Bradley EB 5135, GEL Part No. 10481
R305	Resistor, Fixed Composition, 8.2K ohm ± 5%, 1/2W, Allen Bradley EB 8225, GEL Part No. 10407
R306	Resistor, Fixed Composition, 100K ohm ± 5%, 1/2W, Allen Bradley EB 1045, GEL Part No. 10430
R307	Resistor, Fixed Composition, 1.5K ohm ± 5%, 2W, Allen Bradley HR 1525, GEL Part No. 11514
R308	Resistor, Fixed Composition, 120 ohm ± 5%, 1/2W, Allen Bradley EB 1215, GEL Part No. 10449
R309	Resistor, Fixed Composition, 110K ohm ± 5%, 1/2W, Allen Bradley EB 1145, GEL Part No. 10542
R310	Resistor, Fixed Composition, 3K ± 5%, 1/2W Allen Bradley EB 3025, GEL Part No. 10403

SYMBOL	DESCRIPTION
R311	Resistor, Fixed Composition 1 megohm ± 5%, 1/2W, Allen Bradley EB 1055, GEL Part No. 11424
R312	Resistor, Fixed Composition, 12K ± 5%, 1W, Allen Bradley GB 1235, GEL Part No. 11055
R313	Resistor, Fixed Composition, 27K ± 5%, 1/2W, Allen Bradley EB 2735, GEL Part No. 10477
R314	Resistor, Fixed Composition, 470 K ± 5%, 1/2W Allen Bradley EB 4745, GEL Part No. 10541
R315	Same as R314
R316	Resistor, Fixed Composition, 150K ± 5%, 1/2W, Allen Bradley EB 1545, GEL Part No. 10424
R317	Resistor, Fixed Composition, 8.2K ± 5%, 2W, Allen Bradley HB 8225, GEL Part No. 11533
R318	Resistor, Fixed Composition, 1K ± 5%, 1W, Allen Bradley GB1025, GEL Part No. 11023
R319	Resistor, Fixed Composition, 22K ± 5%, 1/2W, Allen Bradley EB 2235, GEL Part No. 10427
R320	Resistor, Fixed Composition, 180 ohm ± 5%, 1/2W, Allen Bradley EB 1815, GEL Part No. 10453
R321	Resistor, Fixed Composition, 47 ohm ± 5%, 1/2W, Allen Bradley EB 4705, GEL Part No. 10546
R322	Resistor, Fixed Composition, 68 ohm ± 5%, 1/2W, Allen Bradley EB 6805, GEL Part No. 10444
R323	Resistor, Fixed Composition, 10K ± 5%, 1/2W, Allen Bradley EB 1035, GEL Part No. 10408
R324	Resistor, Fixed Composition, 1K ± 5%, 1/2W, Allen Bradley EB 1025, GEL Part No. 10401
R325	Resistor, Fixed Composition, 10 ohm ± 5%, 1/2W, Allen Bradley EB 1005, GEL Part No. 10442

SYMBOL	DESCRIPTION
R326	Same as R306
R327	Same as R302
V301	Tube, Electron, 6280/416B, GEL Part No. 14773
V302	Tube, Electron 6J4, GEL Part No. 14779
V303	Tube, Electron 5654/6AK5W, GEL Part No. 14752
V304	Tube, Electron 6AF4A, GEL Part No. 14764

PARTS LIST

55-260 MC Front End

SYMBOL	DESCRIPTION
C401	Capacitor, Fixed Ceramic Feed-thru, .001 uf ± 20%, Erie GP2, Style 327, GEL Part No. 12067
C402	Capacitor, Fixed Ceramic Tubular, 8.2 uuf ± .5 uuf, Erie NPO-A, GEL Part No. 12020
C403	Capacitor, Fixed Ceramic Disc, .001 uuf + 100% -20%, Erie CK61Y102Z, GEL Part No. 12070
C404	Capacitor, Fixed Ceramic Stand-off, .0015 uf ± 20%, Erie Style 326, GEL Part No. 12069
C405	Same as C401
C406	Capacitor, Variable Piston-Tyle, .8-8.5 uuf, JFD VC20G, GEL Part No. 13305
C407	Capacitor, Fixed Silvered Mica Button, 200 uuf ± 10%, Erie 370FA201K, GEL Part No. 12059
C408	Same as C407
C409	Same as C407
C410	Same as C407
C411	Same as C407
C412	Same as C403
C413	Same as C403
C414	Same as C403
C415	Same as C401
C416	Same as C401
C417	Same as C401

SYMBOL	DESCRIPTION
C418	Capacitor, Fixed Ceramic Feed-thru, 47 uus ± 20% Erie GP1 Style 327, GEL Part No. 12149
C419	Same as C401
C420	Capacitor, Fixed Ceramic Tubular, 22 uuf ± 5% Erie NPO-A, GEL Part No. 12168
C421	Capacitor, Fixed Ceramic Tubular, 18 uuf ± 5% Erie NPO-A, GEL Part No. 12029
C422	Same as C421
C423	Same as C401
C424	Same as C401
C425	Same as C401
C426	Capacitor, Fixed Ceramic Tubular, .001 uf ± 10% Erie GP2 Style 331, GEL Part No. 12063
C427 A & B	Capacitor, Fixed Printed Circuit GEL Dwg. No. A10-269
C428	Capacitor, Fixed Ceramic Tubular, 15 uuf ± 5%, Erie NPO-A, GEL Part No. 12027
C429	Same as C406
C430	Capacitor, Fixed Ceramic Tubular, 1 uuf ± .1 uuf Erie NPO-A, GEL Part No. 12089
C431	Same as C406
C432	Capacitor, Fixed Ceramic Tubular, 2 uuf ± .1 uuf Erie NPO-A, GEL Part No. 12005
C433	Same as C406
C434	Capacitor, Fixed Ceramic Tubular, 10 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12021
C435	Same as C403
C436	Same as C418

SYMBOL	DESCRIPTION
C437	Capacitor, Fixed Ceramic Tubular, 4.3 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12013
C438	Capacitor, Voltage Variable, V-56, Pacific Semiconductor Co., GEL Part No. 13308
C439	Same as C406
C440	Same as C434
C441	Capacitor, Fixed Ceramic Tubular, 3.9 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12012
C442	Same as C403
C443	Capacitor, Fixed Ceramic Tubular, .51 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12000
C444	Capacitor, Fixed Ceramic Tubular, 3.3 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12010
C445	Same as C443
C446	Same as C403
C447	Same as C401
C448	Same as C404
C449	Capacitor, Fixed Ceramic Disc, .0047 uf + 100% - 20%, Erie CK62Y472Z, GEL Part No. 12050
C450	Capacitor, Fixed Ceramic Tubular, 12 uuf ± 5%, Erie NPO-A, GEL Part No. 12024
C451	Same as C449
I401	Lamp, Pilot, GE 328, GEL Part No. 17802
I402	Same as I401
J401	Connector, Receptacle, UG 1098/U, GEL Part No. 17315

SYMBOL	DESCRIPTION
J402	Connector, Receptacle, UG 1094/U, GEL Part No. 17314
J403	Same as J402
J404	Same as J402
L401	Inductor, Fixed .72 uh, GEL Dwg. No. B10-218, GEL Part No. 17072
L402	Inductor, Fixed, 14 uh, GEL Dwg. B10-216, GEL Part No. 17073
L403	Same as L402
L404	Inductor, Fixed, GEL Dwg. A10-219
L405 A, B, C, D	Inductor, Variable, Mallory Spiral Inductuner, GEL Dwg. No. A10-540
L406	Inductor, Fixed, 2.7 uh, GEL Dwg. PL-151, GEL Part No. 17001
L407	Same as L402
L408	Same as L402
L409	Inductor, Fixed, GEL Dwg. A10-157,
L410	Inductor, Fixed GEL Dwg. A10-156
L411	Inductor, Fixed, GEL Dwg. A10-154
L412	Inductor, Fixed, 1.15 uh, GEL Dwg. B10-217, GEL Part No. 17078
L413	Inductor, Variable, GEL Dwg. A10-766
L414	Inductor, Fixed, GEL Dwg. A10-155
L415	Inductor, Fixed, GEL Dwg. A10-158
L416	Inductor, Fixed, GEL Dwg. A10-186

SYMBOL	DESCRIPTION
L417	Inductor, Fixed, 11.5 uh, GEL Dwg. A10-163, GEL Part No. 17000
L418	Same as L417
R401	Resistor, Fixed Composition, 160 ohm, ± 5%, 1/2W Allen Bradley EB 1615, GEL Part No. 10503
R402	Resistor, Fixed Composition, 100 ohm ± 5%, 1/2W Allen Bradley EB 1015, GEL Part No. 10447
R404	Resistor, Fixed Composition, 51K ± 5%, 1/2W, Allen Bradley EB 5135, GEL Part No. 10481
R405	Resistor, Fixed Composition, 8.2 K ± 5%, 1/2W, Allen Bradley EB 8225, GEL Part No. 10407
R406	Resistor, Fixed Composition, 100K ± 5%, 1/2W, Allen Bradley EB 1045, GEL Part No. 10430
R407	Resistor, Fixed Composition, 1.5K ± 5%, 1/2W, Allen Bradley HB 1521, GEL Part No. 11514
R408	Resistor, Fixed Composition, 120 ohm ± 5%, 1/2W, Allen Bradley EB 1215, GEL Part No. 10449
R409	Resistor, Fixed Composition, 110K ± 5%, 1/2W, Allen Bradley EB 1145, GEL Part No. 10542
R410	Resistor, Fixed Composition, 3K ± 5%, 1/2W, Allen Bradley EB 3025, GEL Part No. 10403
R411	Resistor, Fixed Composition, 1 meg ohm ± 5%, 1/2W, Allen Bradley EB 1051, GEL Part No. 11424
R412	Resistor, Fixed Composition, 12K ± 5%, 1 W, Allen Bradley GB 1235, GEL Part No. 11055
R413	Resistor, Fixed Composition, 27K ± 5%, 1/2W, Allen Bradley EB 2731, GEL Part No. 10477
R414	Resistor, Fixed Composition, 470 K ± 5%, 1/2W, Allen Bradley EB 4745, GEL Part No. 10541

SYMBOL	DESCRIPTION
R415	Same as R414
R416	Resistor, Fixed Composition, 150K ± 5%, 1/2W, Allen Bradley EB 1545, GEL Part No. 10424
R417	Resistor, Fixed Composition, 8.2K ± 5%, 2W, Allen Bradley GB 8225, GEL Part No. 11533
R418	Resistor, Fixed Composition, 1K ± 5%, 1W, Allen Bradley GB 1025, GEL Part No. 10940
R419	Resistor, Fixed Composition, 22K ± 5%, 1/2W, Allen Bradley EB 2235, GEL Part No. 10427
R420	Resistor, Fixed Composition, 180 ohm ± 5%, 1/2W, Allen Bradley EB 1815, GEL Part No. 10453
R421	Resistor, Fixed Composition, 47 ohm ± 5%, 1/2W, Allen Bradley EB 4705, GEL Part No. 10546
R422	Resistor, Fixed Composition, 68 ohm ± 5%, 1/2W, Allen Bradley EB 6805, GEL Part No. 10444
R423	Resistor, Fixed Composition, 10K ± 5%, 1/2W, Allen Bradley EB 1035, GEL Part No. 10408
R424	Resistor, Fixed Composition, 1K ± 5%, 1/2W, Allen Bradley EB 1025, GEL Part No. 10401
R425	Resistor, Fixed Composition, 10 ohm ± 5%, 1/2W Allen Bradley EB 1005, GEL Part No. 10442
R426	Resistor, Fixed Composition, 15 ohm ± 5%, 1W Allen Bradley GB 1505, GEL Part No. 10940
S401	Switch, Rotary Centralab, PA2019, GEL Part No. 18015
S402	Switch, Rotary Centralab 1460, GEL Part No. 18018
V401	Tube, Electron 6280/416B, GEL Part No. 14773

SYMBOL	DESCRIPTION
V402	Tube, Electron 6J4, GEL Part No. 14779
V403	Tube, Electron 5654/6AK5W, GEL Part No. 14752
V404	Tube, Electron 6AF4A, GEL Part No. 14764

PARTS LIST

300KC 600 Series

SYMBOL	DESCRIPTION
C601	Not Assigned
C602	Capacitor, Fixed Ceramic Disc, .0047 uf + 100% - 20%, Erie CK62Y472Z, GEL Part No. 12050
C603	Capacitor, Fixed Ceramic Disc, .0013 uf ± 10%, Erie HR-819-X5-F, GEL Part No. 12076
C604	Same as C602
C605	Same as C602
C606	Capacitor, Fixed Ceramic Tubular, 8.2 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12020
C607	Capacitor, Fixed Ceramic Tubular, 2 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12005
C608	Capacitor, Fixed Ceramic Tubular, 1.5 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12136
C609	Capacitor, Fixed Ceramic Tubular, 39 uuf ± 5%, Erie NPO-T, GEL Part No. 12037
C610	Capacitor, Fixed Ceramic Tubular, 470 uuf ± 10%, Erie GP2, Style 331, GEL Part No. 12062
C611	Same as C610
C612	Capacitor, Fixed Ceramic Feed-thru, .001 uf ± 20%, Erie GP2, Style 327, GEL Part No. 12067
C613	Same as C612
C614	Same as C602
C615	Same as C603
C616	Same as C602

SYMBOL	DESCRIPTION
C617	Same as C602
C618	Same as C606
C619	Same as C607
C620	Same as C608
C621	Same as C609
C622	Same as C610
C623	Same as C612
C624	Same as C602
C625	Same as C603
C626	Same as C602
C627	Same as C602
C628	Same as C606
C629	Same as C607
C630	Same as C607
C631	Same as C609
C632	Same as C602
C633	Same as C603
C634	Not Assigned
C635	Same as C602
C636	Same as C612
C637	Same as C602
C638	Same as C606

SYMBOL	DESCRIPTION
C639	Capacitor, Fixed Ceramic Tubular, 2.2 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12006
C640	Same as C608
C641	Same as C609
C642	Capacitor, Fixed Ceramic Disc, .001 uf + 100% - 20%, Erie CK61Y102Z, GEL Part No. 12070
C643	Capacitor, Fixed Ceramic Tubular, 10 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12021
C644	Same as C643
C645	Not Assigned
C646	Capacitor, Fixed Ceramic Tubular, .001 uf ± 10% Erie GP2, Style 331, GEL Part No. 12063
C647	Same as C602
C648	Capacitor, Fixed Ceramic Tubular, 33 uuf ± 5%, Erie NPO-T, GEL Part No. 12035
C649	Capacitor, Fixed Ceramic Tubular, 22 uuf ± 5%, Erie NPO-A, GEL Part No. 12057
C650	Same as C648
C651	Capacitor, Fixed Ceramic Tubular, 27 uuf ± 5%, Erie NPO-T, GEL Part No. 12034
C652	Same as C642
C653	Same as C612
C654	Same as C642
C655	Same as C642
C656	Same as C642
C657	Same as C642

SYMBOL	DESCRIPTION
C658	Same as C642
C659	Capacitor, Fixed Ceramic Stand-off, .0015 uf ± 20%, Erie Style #326, GEL Part No. 12069
C660	Same as C659
C661	Same as C659
CR601	Diode, Germanium, Raytheon 1N198 , GEL Part No. 14517
J601	Not Assigned
J602	Connector, Receptacle, 46025, GEL Part No. 17302
J603	Connector, Receptacle, UG 1098/U, GEL Part No. 17315
L601	Inductor, Fixed 11.5 uh, GEL Dwg. A10-163
L602	Not Assigned
L603	Not Assigned
L604	Same as L601
L605	Inductor, Fixed 2.7 uh, GEL Dwg. B10-103
L606	Same as L605
L607	Same as L605
L608	Same as L605
L609	Same as L605
L610	Same as L605
L611	Inductor, Fixed 11.5 uh, GEL Dwg. No. A10-163

SYMBOL	DESCRIPTION
L612	Same as L601
R601	Resistor, Fixed Composition, 100K ± 5%, 1/2W, Allen Bradley EB 1045, GEL Part No. 10430
R602	Resistor, Fixed Composition, 82 ohm ± 5%, 1/2W, Allen Bradley EB 8205, GEL Part No. 10519
R603	Same as R602
R604	Resistor, Fixed Composition, 47K ± 5%, 1/2W, Allen Bradley EB 4735, GEL Part No. 10429
R605	Resistor, Fixed Composition, 1K ± 5%, 1/2W, Allen Bradley EB 1025, GEL Part No. 10401
R606	Resistor, Fixed Composition, 100 ohm ± 5%, 1/2W, Allen Bradley EB 1015, GEL Part No. 10447
R607	Resistor, Fixed Composition, 22K ± 5%, 1/2W, Allen Bradley EB 2235, GEL Part No. 10427
R608	Same as R601
R609	Resistor, Fixed Composition, 10K ± 5%, 1/2W, Allen Bradley EB 1035, GEL Part No. 10408
R610	Same as R602
R611	Same as R602
R612	Same as R604
R613	Same as R605
R614	Same as R606
R615	Same as R607
R616	Same as R601
R617	Same as R606

SYMBOL	DESCRIPTION
R618	Same as R602
R619	Same as R602
R620	Same as R604
R621	Same as R605
R622	Same as R607
R623	Resistor, Fixed Composition, 220 ohm ± 5%, 1/2W, Allen Bradley EB 2215, GEL Part No. 10454
R624	Resistor, Fixed Composition, 33K ± 5%, 1/2W Allen Bradley EB 3335, GEL Part No. 10600
R625	Same as R606
R626	Resistor, Fixed Composition, 3.3K ± 5%, 1/2W, Allen Bradley EB 3325, GEL Part No. 10545
R627	Resistor, Fixed Composition, 51 ohm ± 5%, 1/2W, Allen Bradley EB 5105, GEL Part No. 10443
R628	Resistor, Fixed Composition, 130 ohm ± 5%, 1/2W, Allen Bradley EB 1315, GEL Part No. 10450
R629	Not Assigned
R630	Same as R601
R631	Same as R624
R632	Same as R624
R633	Same as R624
R634	Resistor, Fixed Composition, 4.7 ohm ± 5%, 1W, Allen Bradley GB 47G5, GEL Part No. 10950
R635	Same as R601

SYMBOL	DESCRIPTION
R636	Same as R601
R637	Same as R609
T601	Transformer, IF GEL Dwg. No. B10-135
T602	Transformer, IF GEL Dwg. No. B10-138
T603	Transformer, IF GEL Dwg. No. B10-135
T604	Transformer, IF GEL Dwg. No. B10-138
T605	Transformer, IF GEL Dwg. No. B10-135
T606	Transformer, IF GEL Dwg. No. B10-134
T607	Transformer, IF GEL Dwg. No. B10-132
T608	Transformer, IF GEL Dwg. No. B10-133
T609	Transformer, IF GEL Dwg. No. B10-214
V601	Tube, Electron, 6DC6, GEL Part No. 14789
V602	Same as V601
V603	Same as V601
V604	Tube, Electron 6CB6, GEL Part No. 14763
V605	Tube, Electron 5654/6AK5W, GEL Part No. 14752
V606	Tube, Electron 5726/6AL5W, GEL Part No. 14784

PARTS LIST

10KC IF Strip

SYMBOL	DESCRIPTION
C701	Capacitor, Fixed Ceramic Disc, .0047 uf + 100% - 20%, Erie CK62Y472Z, GEL Part No. 12050
C702	Same as C701
C703	Same as C701
C704	Capacitor, Fixed Ceramic Disc, .0013 uf ± 10% Erie HR819X5F, GEL Part No. 12076
C705	Same as C701
C706	Capacitor, Fixed Ceramic Tubular, 15 uuf ± 5% Erie NPO-A, GEL Part No. 12032
C707	Capacitor, Fixed Ceramic Tubular, 27 uuf ± 5% Erie 308-COG-270J, NPO-T, GEL Part No. 12034
C708	Same as C707
C709	Not Assigned
C710	Same as C701
C711	Same as C701
C712	Same as C704
C713	Same as C704
C714	Same as C704
C715	Capacitor, Fixed Ceramic Tubular, 10 uuf ± .25% Erie NPO-A, GEL Part No. 12021
C716	Same as C701
C717	Capacitor, Fixed Ceramic Tubular, 30 uuf ± 5% Erie NPO-T, GEL Part No. 12106

SYMBOL	DESCRIPTION
C718	Same as C701
C719	Same as C704
C720	Same as C704
C721	Same as C704
C722	Same as C715
C723	Same as C701
C724	Same as C717
C725	Same as C701
C726	Same as C704
C727	Same as C701
C728	Same as C715
C729	Capacitor, Fixed Ceramic Tubular, 1 uuf ± 5% Erie NPO-A, GEL Part No. 12089
C730	Same as C701
C731	Same as C701
C732	Capacitor, Fixed Ceramic Tubular, 12 uuf ± 5% Erie NPO-A, GEL Part No. 12024
C733	Same as C717
C734	Same as C701
C735	Not Assigned
C736	Same as C701
C737	Capacitor, Fixed Ceramic Feed-thru, .001 uf ± 20%, Erie GP2, Style 327, GEL Part No. 12067
C738	Capacitor, Fixed Ceramic Tubular, 36 uuf ± 5% Erie NPO-T, GEL Part No. 12036

SYMBOL	DESCRIPTION
C739	Same as C701
C740	Capacitor, Fixed Ceramic Tubular, .51 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12000
C741	Capacitor, Fixed Ceramic Disc, 300 uuf ± 10%, Erie HR839X5F, GEL Part No. 12079
C742	Same as C737
C743	Same as C737
C744	Capacitor, Fixed Ceramic Disc, .001 uf + 100% - 20%, Erie CK61Y102Z, GEL Part No. 12070
C745	Same as C744
C746	Same as C744
C747	Same as C744
C748	Same as C744
C749	Same as C744
C750	Same as C737
C751	Same as C737
C752	Same as C737
C753	Same as C737
C754	Same as C737
C755	Same as C737
C756	Same as C715
C757	Same as C744
C758	Same as C741
C759	Same as C741

SYMBOL	DESCRIPTION
C760	Capacitor, Fixed Ceramic Tubular, 18 uuf ± 5% Erie NPO-A, GEL Part No. 12029
C761	Capacitor, Fixed Ceramic Tubular, 3.6 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12011
C762	Same as C701
C763	Capacitor, Fixed Ceramic Tubular, 13 uuf ± 5% Erie 301-COG-130J, GEL Part No. 12026
CR701	Diode, Germanium, Raytheon 1N198, GEL Part No. 14517
CR702	Same as CR701
CR703	Diode, Hughes 1N198, GEL Part No. 14517
CR704	Same as CR703
J701	Connector, Receptacle IPC #46025, GEL Part No. 17302
J702	Same as J701
L701	Inductor, Variable, GEL Dwg. No. A11-764
L702	Inductor, Fixed 11.5, GEL Part No. 17000
L703	Same as L702
L704	Inductor, Fixed 2.7 uh, GEL Dwg. No. PL-151
L705	Same as L704
L706	Same as L704
L707	Same as L704
L708	Same as L704
L709	Same as L704
L710	Same as L702

SYMBOL	DESCRIPTION
L711	Inductor, Variable, GEL Dwg. No. All-988
L712	Same as L702
L713	Same as L702
L714	Same as L702
L715	Same as L702
L716	Same as L702
L717	Same as L702
P701	Connector, Plug, Winchester, M12P-M12H, GEL Part No. 17546
R701	Resistor, Fixed Composition, 100K ± 5%, 1/2W, Allen Bradley EB 1045, GEL Part No. 10430
R702	Resistor, Fixed Composition, 75 ohms ± 5%, 1/2W, Allen Bradley EB 7505, GEL Part No. 10445
R703	Resistor, Fixed Composition, 180 ohm ± 5%, 1/2W, Allen Bradley EB 1815, GEL Part No. 10453
R704	Resistor, Fixed Composition, 130K ± 5%, 1/2W, Allen Bradley EB 1345, GEL Part No. 10437
R705	Resistor, Fixed Composition, 75K ± 5%, 1/2W, Allen Bradley EB 7535, GEL Part No. 10605
R706	Resistor, Fixed Composition, 1K ± 5%, 1/2W, Allen Bradley EB 1025, GEL Part No. 10401
R707	Not Assigned
R708	Same as R701
R709	Resistor, Fixed Composition, 10K ± 5%, 1/2W, Allen Bradley EB 1035, GEL Part No. 10408

SYMBOL	DESCRIPTION
R710	Same as R702
R711	Same as R703
R712	Same as R704
R713	Same as R705
R714	Same as R706
R715	Not Assigned
R716	Resistor, Fixed Composition, 510K ± 5%, 1/2W, Allen Bradley EB 5145, GEL Part No. 10440
R717	Same as R702
R718	Resistor, Fixed Composition, 510 ohm ± 5%, 1/2W, Allen Bradley EB 5115, GEL Part No. 10508
R719	Same as R704
R720	Same as R705
R721	Same as R706
R722	Not Assigned
R723	Same as R716
R724	Resistor, Fixed Composition, 220 ohms ± 5%, 1/2W, Allen Bradley EB 2215, GEL Part No. 10454
R725	Resistor, Fixed Composition, 68K ± 5%, 1/2W, Allen Bradley EB 6835, GEL Part No. 10603
R726	Same as R706
R727	Resistor, Fixed Composition 220K ± 5%, 1/2W, Allen Bradley EB 2245, GEL Part No. 10608
R728	Resistor, Fixed Composition, 47K ± 5%, 1/2W, Allen Bradley EB 4735, GEL Part No. 10429

SYMBOL	DESCRIPTION
R729	Same as R706
R730	Same as R706
R731	Not Assigned
R732	Not Assigned
R733	Resistor, Fixed Composition, 4.7K ± 5%, 1/2W, Allen Bradley EB 4725, GEL Part No. 10414
R734	Same as R701
R735	Same as R728
R736	Resistor, Fixed Composition, 51 ohm ± 5%, 1/2W, Allen Bradley EB 5105, GEL Part No. 10443
R737	Same as R709
R738	Same as R705
R739	Same as R705
R740	Not Assigned
T701	IF Transformer, GEL Dwg. No. B11-877
T702	IF Transformer, GEL Dwg. No. B11-878
T703	IF Transformer, GEL Dwg. No. B11-756
T704	Same as T703
T705	IF Transformer, GEL Dwg. No. B11-760
T706	IF Transformer, GEL Dwg. B11-759
V701	Tube, Electron 6DC6, GEL Part No. 14789
V702	Same as V701
V703	Same as V701

SYMBOL	DESCRIPTION
V704	Tube, Electron, 6CB6, GEL Part No. 14763
V705	Tube, Electron, 6AU6WA, GEL Part No. 14762
V706	Tube, Electron 6C4, GEL Part No. 14759
Y701	Crystal Filter, McCoy, 10KC BW 21.4 MC C.F. GEL Dwg. No. A14-284
Y702	Crystal, Quartz, 21.401MC, CR-55/U in HC18/U Holder, GEL Part No. 19618
Y703	Crystal, Quartz, 21.4 MC, CR-19/U, CBXK, GEL Part No. 19619

PARTS LIST

60KC IF Strip

SYMBOL	DESCRIPTION
C701	Capacitor, Fixed Ceramic Disc, .0047 uf + 100% - 20%, Erie CK62Y472Z, GEL Part No. 12050
C702	Same as C701
C703	Same as C701
C704	Capacitor, Fixed Ceramic Disc, .0013 uf ± 10%, Erie HR819X5F, GEL Part No. 12076
C705	Same as C701
C706	Capacitor, Fixed Ceramic Tubular, 15 uuf ± 5%, Erie NPO-A, GEL Part No. 12027
C707	Capacitor, Fixed Ceramic Tubular, 27 uuf ± 5%, Erie NPO-T, GEL Part No. 12034
C708	Capacitor, Fixed Ceramic Tubular, 13 uuf ± 5%, Erie NPO-A, GEL Part No. 12026
C709	Same as C707
C710	Same as C701
C711	Same as C701
C712	Same as C704
C713	Same as C704
C714	Same as C704
C715	Capacitor, Fixed Ceramic Tubular, 10 uuf ± 25 uuf Erie NPO-A, GEL Part No. 12021
C716	Same as C701
C717	Capacitor, Fixed Ceramic Tubular, 30 uuf ± 5%, Erie NPO-T, GEL Part No. 12106

SYMBOL	DESCRIPTION
C718	Same as C701
C719	Same as C704
C720	Same as C704
C721	Same as C704
C722	Same as C715
C723	Same as C701
C724	Same as C717
C725	Capacitor, Fixed Ceramic Standoff, .0015 uf ± 20%, Erie Style #326, GEL Part No. 12069
C726	Same as C704
C727	Same as C701
C728	Same as C715
C729	Capacitor, Fixed Ceramic Tubular, 1.0 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12089
C730	Same as C701
C731	Same as C701
C732	Capacitor, Fixed Ceramic Tubular, 12 uuf ± 5% Erie NPO-A, GEL Part No. 12024
C733	Same as C717
C734	Same as C701
C735	Same as C701
C736	Same as C701
C737	Capacitor, Fixed Ceramic Feed-thru, .001 uf ± 20%, Erie GP2 Style #327, GEL Part No. 12067
C738	Capacitor, Fixed Ceramic Tubular, 36 uuf ± 5%, Erie NPO-T, GEL Part No. 12036

SYMBOL	DESCRIPTION
C739	Same as C701
C740	Capacitor, Fixed Ceramic Tubular, .51 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12000
C741	Capacitor, Fixed Ceramic Disc, 300 uf ± 10%, Erie HR839X5F, GEL Part No. 12079
C742	Same as C737
C743	Same as C737
C744	Capacitor, Fixed Ceramic Disc, .001 uf + 100% - 20%, Erie CK61Y102Z, GEL Part No. 12070
C745	Same as C744
C746	Same as C744
C747	Same as C744
C748	Same as C744
C749	Same as C744
C750	Same as C737
C751	Same as C737
C752	Same as C737
C753	Same as C737
C754	Same as C737
C755	Same as C737
C756	Same as C715
C757	Same as C744
C758	Same as C741
C759	Same as C741

SYMBOL	DESCRIPTION
C760	Capacitor, Fixed Ceramic Tubular, 18 uuf ± 5%, Erie NPO-A, GEL Part No. 12029
C761	Capacitor, Fixed Ceramic Tubular, 3.9 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12156
C762	Same as C701
CR701	Diode, Germanium, Raytheon 1N67A, GEL Part No. 14509
CR702	Same as CR701
CR703	Diode, Hughes, 1N198, GEL Part No. 14517
CR704	Diode, Same as CR703
J701	Connector, Receptacle, IPC #46025, GEL Part No. 17302
J702	Same as J701
L701	Inductor, Variable, GEL Dwg. No. A11-764
L702	Inductor, Fixed 11.5 uh, Coil Speciality Co. GEL Dwg. No. A10-163
L703	Same as L702
L704	Inductor, Fixed 2.7 uh, GEL Dwg. No. PL-151
L705	Same as L704
L706	Same as L704
L707	Same as L704
L708	Same as L704
L709	Same as L704
L710	Same as L702

SYMBOL	DESCRIPTION
L711	Inductor, Variable, GEL Dwg. No. B12-397-1
L712	Same as L702
L713	Same as L702
L714	Same as L702
L715	Same as L702
L716	Same as L702
L717	Same as L702

* See L-718 thru L-721 on page V - 53

P701	Connector, Plug, Winchester, M12P-M12H, GEL Part No. 17546
R701	Resistor, Fixed Composition, 100K ohms ± 5%, 1/2W, Allen Bradley EB 1045, GEL Part No. 10430
R702	Resistor, Fixed Composition, 75 ohms, ± 5%, 1/2W, Allen Bradley EB 7505, GEL Part No. 10445
R703	Resistor, Fixed Composition, 510 ohms ± 5%, 1/2W, Allen Bradley EB 5115, GEL Part No. 10508
R704	Resistor, Fixed Composition, 130K ohms ± 5%, 1/2W, Allen Bradley EB 1345, GEL Part No. 10437
R705	Resistor, Fixed Composition, 75K ohms ± 5%, 1/2W, Allen Bradley EB 7535, GEL Part No. 10605
R706	Resistor, Fixed Composition, 1K ohms ± 5%, 1/2W Allen Bradley EB 1025, GEL Part No. 10401
R707	Not Assigned
R708	Same as R701
R709	Resistor, Fixed Composition, 10K ohms ± 5%, 1/2W, Allen Bradley EB 1035, GEL Part No. 10408
R710	Same as R702

SYMBOL	DESCRIPTION
R711	Same as R703
R712	Same as R704
R713	Same as R705
R714	Same as R706
R715	Not Assigned
R716	Resistor, Fixed Composition, 510K ohms ± 5%, 1/2W, Allen Bradley EB 5145, GEL Part No. 10440
R717	Same as R702
R718	Same as R703
R719	Same as R704
R720	Same as R705
R721	Same as R706
R722	Not Assigned
R723	Same as R716
R724	Resistor, Fixed Composition, 220 ohm ± 5%, 1/2W Allen Bradley EB 2215, GEL Part No. 10454
R725	Resistor, Fixed Composition, 68K ohms ± 5%, 1/2W, Allen Bradley EB 6835, GEL Part No. 10603
R726	Same as R706
R727	Resistor, Fixed Composition, 220K ohms ± 5%, 1/2W, Allen Bradley EB 2245, GEL Part No. 10608
R728	Resistor, Fixed Composition, 47K ohms ± 5%, 1/2W Allen Bradley EB 4735, GEL Part No. 10429
R729	Same as R706
R730	Not Assigned

SYMBOL	DESCRIPTION
R731	Resistor, Fixed Composition, 12K ± 5%, 1/2W, Allen Bradley EB 1235, GEL Part No. 10418
R732	Not Assigned
R733	Resistor, Fixed Composition, 4.7K ohms ± 5%, 1/2W, Allen Bradley EB 4725, GEL Part No. 10414
R734	Same as R701
R735	Same as R728
R736	Resistor, Fixed Composition, 51 ohm ± 5%, 1/2W Allen Bradley EB 5105, GEL Part No. 10443
R737	Same as R709
R738	Same as R705
R739	Same as R705
T701	IF Transformer, GEL Dwg. No. B12-830
T702	IF Transformer, GEL Dwg. No. B12-831
T703	IF Transformer, GEL Dwg. No. B11-756
T704	IF Transformer, GEL Dwg. No. B11-755
T705	IF Transformer, GEL Dwg. No. B11-760
T706	IF Transformer, GEL Dwg. No. B11-759
V701	Tube, Electron 6DC6, GEL Part No. 14789
V702	Same as V701
V703	Same as V701
V704	Tube, Electron 6CB6, GEL Part No. 14763
V705	Tube, Electron 6AU6WA, GEL Part No. 14762
V706	Tube, Electron 6C4, GEL Part No. 14759

SYMBOL	DESCRIPTION
Y701	Crystal Filter, McCoy 60KC BW 21.4 MC C.F., GEL Dwg. No. A14-283
Y702	Crystal, Quartz 21.401 MC, CR-55/UIN M-21 Holder, GEL Part No. 19618
Y703	Crystal, Quartz, 21.4 MC, CR-19/U CBXK, per GEL Dwg. No. A14-687
L718	Inductor, Same as L702
L719	Same as L702
L720	Same as L702
L721	Same as L702

PARTS LIST

4MC IF Strip

SYMBOL	DESCRIPTION
C801	Capacitor, Fixed Ceramic Tubular, 8.2 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12020
C802	Capacitor, Fixed Ceramic Tubular, 4.7 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12014
C803	Capacitor, Fixed Ceramic Tubular, 6.2 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12017
C804	Capacitor, Fixed Ceramic Tubular, 39 uuf ± 5%, Erie NPO-T, GEL Part No. 12037
C805	Capacitor, Fixed Ceramic Disc, 240 uuf ± 10% Erie HR839X5F, GEL Part No. 12077
C806	Capacitor, Fixed Ceramic Disc, 300 uuf ± 10%, Erie HR839X5F, GEL Part No. 12079
C807	Capacitor, Fixed Ceramic Disc, .0047 uf + 100% - 20%, Erie CK62Y472Z, GEL Part No. 12050
C808	Same as C807
C809	Capacitor, Fixed Ceramic Tubular, 12 uuf ± 5%, Erie NPO-A, GEL Part No. 12024
C810	Capacitor, Fixed Ceramic Tubular, 3.9 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12012
C811	Same as C806
C812	Same as C807
C813	Same as C809
C814	Same as C810
C815	Same as C807
C816	Capacitor, Fixed Ceramic Disc, .001 uf + 100% - 20%, Erie CK61Y102Z, GEL Part No. 12070

SYMBOL	DESCRIPTION
C817	Same as C805
C818	Same as C807
C819	Same as C806
C820	Same as C809
C821	Same as C810
C822	Same as C806
C823	Same as C807
C824	Same as C809
C825	Same as C810
C826	Same as C807
C827	Capacitor, Fixed Ceramic Stand-off, .0015 uf ± 20%, Erie Style #326, GEL Part No. 12069
C828	Capacitor, Fixed Paper, 1 ufd, ± 20%, 200Volts Aerovox P123ZGP, GEL Part No. 12926
C829	Same as C805
C830	Same as C807
C831	Same as C806
C832	Same as C809
C833	Same as C810
C834	Same as C806
C835	Capacitor, Fixed Ceramic Tubular, 15 uuf ± 5%, Erie NPO-A, GEL Part No. 12027
C836	Same as C810
C837	Same as C807

SYMBOL	DESCRIPTION
C838	Capacitor, Fixed Ceramic Feed-thru, .001 uf ± 20% Erie GP2, Style 327, GEL Part No. 12067
C839	Same as C838
C840	Same as C816
C841	Same as C805
C842	Same as C816
C843	Same as C806
C844	Same as C806
C845	Same as C810
C846	Same as C807
C847	Same as C816
C848	Capacitor, Fixed Ceramic Tubular, 5.1 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12015
C849	Capacitor, Fixed Ceramic Tubular, 2.4 uuf ± .1 uuf, Erie NPO-A, GEL Part No. 12007
C850	Capacitor, Fixed Silvered Mica, 270 uuf ± 5%, Elmenco CM15E271J, GEL Part No. 12500
C851	Capacitor, Fixed Ceramic Tubular, 7.5 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12019
C852	Same as C807
C853	Same as C807
C854	Same as C807
C855	Same as C807
C856	Same as C807
C857	Capacitor, Fixed Ceramic Disc, .0015 uf + 100% - 20%, Erie CK61Y152Z, GEL Part No. 12053

SYMBOL	DESCRIPTION
C858	Capacitor, Fixed Ceramic Tubular, 18 uuf ± 5%, Erie NPO-A, GEL Part No. 12029
C859	Same as C857
C860	Same as C851
C861	Same as C807
C862	Same as C809
C863	Same as C838
C864	Same as C827
C865	Same as C816
C866	Same as C816
C867	Same as C816
C868	Same as C838
C869	Same as C816
C870	Same as C816
C871	Same as C807
C872	Same as C838
C873	Same as C838
C874	Same as C807
C875	Same as C827
C876	Same as C827
C877	Same as C838
C878	Same as C838
C879	Same as C857

SYMBOL	DESCRIPTION
C880	Same as C857
C881	Same as C857
C882	Same as C857
C883	Same as C809
C884	Same as C838
C885	Same as C857
C886	Capacitor, Fixed Ceramic Tubular, 6.8 uuf ± .25 uuf, Erie NPO-A, GEL Part No. 12018
CR801	Diode, Germanium, Raytheon 1N67A, GEL Part No. 14509
CR802	Diode, Silicon, Transitron 1N483, GEL Part No. 14507
CR803	Diode, Silicon Zener Texas Inst. 653C9, GEL Part No. 14502
J801	Connector, Receptacle, UG 1098/U, GEL Part No. 17315
J802	Same as J801
J803	Connector, Receptacle, UG 1094/U, GEL Part No. 17314
J804	Connector, Receptacle, IPC 46025, GEL Part No. 17302
L801	Inductor, Fixed 11.5 uh, GEL Dwg. A10-163
L802	Inductor, Fixed 2.7 uh, GEL Dwg. B10-103
L803	Same as L802
L804	Same as L802

SYMBOL	DESCRIPTION
L805	Same as L801
L806	Same as L802
L807	Same as L802
L808	Same as L802
L809	Same as L802
L810	Same as L801
L811	Same as L801
L812	Same as L801
L813	Same as L801
P801	Integral Part of W801
R801	Resistor, Fixed Composition, 51 ohm ± 5%, 1/2W, Allen Bradley EB 5105, GEL Part No. 10443
R802	Resistor, Fixed Composition, 910 K ± 5%, 1/2W, Allen Bradley EB 9115, GEL Part No. 10510
R803	Resistor, Fixed Composition, 100K ± 5%, 1/2W, Allen Bradley EB 1045, GEL Part No. 10430
R804	Resistor, Fixed Composition, 75 ohm ± 5%, 1/2W, Allen Bradley EB 7505, GEL Part No. 10445
R805	Resistor, Fixed Composition, 20 ohm ± 5%, 1/2W, Allen Bradley EB 2005, GEL Part No. 10498
R806	Resistor, Fixed Composition, 39K ± 5%, 1/2W, Allen Bradley EB 3935, GEL Part No. 10422
R807	Resistor, Fixed Composition, 10K ± 5%, 1/2W, Allen Bradley EB 1035, GEL Part No. 10408
R808	Resistor, Fixed Composition, 1K ± 5%, 1/2W, Allen Bradley EB 1025, GEL Part No. 10401

SYMBOL	DESCRIPTION
R809	Same as R808
R810	Resistor, Fixed Composition, 1.1K ± 5%, 1/2W, Allen Bradley EB 1125, GEL Part No. 10467
R811	Same as R803
R812	Resistor, Fixed Composition, 100 ohm ± 5%, 1/2W Allen Bradley EB 1015, GEL Part No. 10447
R813	Same as R804
R814	Same as R805
R815	Same as R806
R816	Same as R807
R817	Same as R808
R818	Resistor, Fixed Composition, 20 Meg ohm ± 5%, 1/2W, Allen Bradley EB 2065, GEL Part No. 10517
R819	Same as R808
R820	Same as R803
R821	Same as R810
R822	Same as R807
R823	Same as R804
R824	Same as R805
R825	Same as R812
R826	Same as R806
R827	Same as R808
R828	Resistor, Fixed Composition, 820 ohm ± 5%, 1/2W Allen Bradley EB 8215, GEL Part No. 10509

SYMBOL	DESCRIPTION
R829	Same as R812
R830	Same as R808
R831	Same as R808
R832	Resistor, Fixed Composition, 91 ohm ± 5%, 1/2W Allen Bradley EB 9105, GEL Part No. 10446
R833	Resistor, Fixed Composition, 11K, ± 5%, 1/2W, Allen Bradley EB 1135, GEL Part No. 10417
R834	Resistor, Fixed Composition, 2.7 ohm ± 5%, 2W, Allen Bradley HB 2725, GEL Part No. 1146
R835	Same as R808
R836	Resistor, Fixed Composition, 1.5K ± 5%, 1/2W Allen Bradley EB 1525, GEL Part No. 10470
R837	Resistor, Fixed Composition, 10 ohm ± 5%, 1/2W Allen Bradley EB 1005, GEL Part No. 10442
R838	Same as R812
R839	Resistor, Fixed Composition, 4.7 ohm ± 5% 1W, Allen Bradley GB 47G5, GEL Part No. 10950
R840	Same as R801
R841	Resistor, Fixed Composition, 180 ohm ± 5%, 1/2W, Allen Bradley EB 1815, GEL Part No. 10453
R842	Resistor, Fixed Composition, 4.7K ± 5%, 1/2W, Allen Bradley EB 4725, GEL Part No. 10414
R843	Resistor, Fixed Composition, 130K ± 5%, 1/2W, Allen Bradley EB 1345, GEL Part No. 10437
R844	Same as R842
R845	Same as R843
R846	Same as R841

SYMBOL	DESCRIPTION
R847	Same as R833
R848	Same as R833
R849	Same as R842
R850	Same as R842
R851	Resistor, Fixed Composition, 51K ± 5%, 1/2W Allen Bradley EB 5135, GEL Part No. 10481
R852	Same as R851
R853	Resistor, Fixed Composition, 27K ± 5%, 2W, Allen Bradley HB 2735, GEL Part No. 11415
R854	Resistor, Fixed Composition, 150 ohm ± 5%, 1/2W, Allen Bradley EB 1515, GEL Part No. 10451
R855	Same as R837
T801	Transformer, IF GEL Dwg. B10-656
T802	Transformer, IF GEL Dwg. B11-509
T803	Transformer, IF GEL Dwg. B10-654
T804	Transformer, IF GEL Dwg. B11-509
T805	Transformer, IF GEL Dwg. B10-654
T806	Transformer, IF GEL Dwg. B11-509
T807	Transformer, IF GEL Dwg. B10-652
T808	Transformer, IF GEL Dwg. B10-655
T809	Transformer, IF GEL Dwg. B10-653
T810	Transformer, IF GEL Dwg. B10-649
T811	Transformer, IF GEL Dwg. B10-650

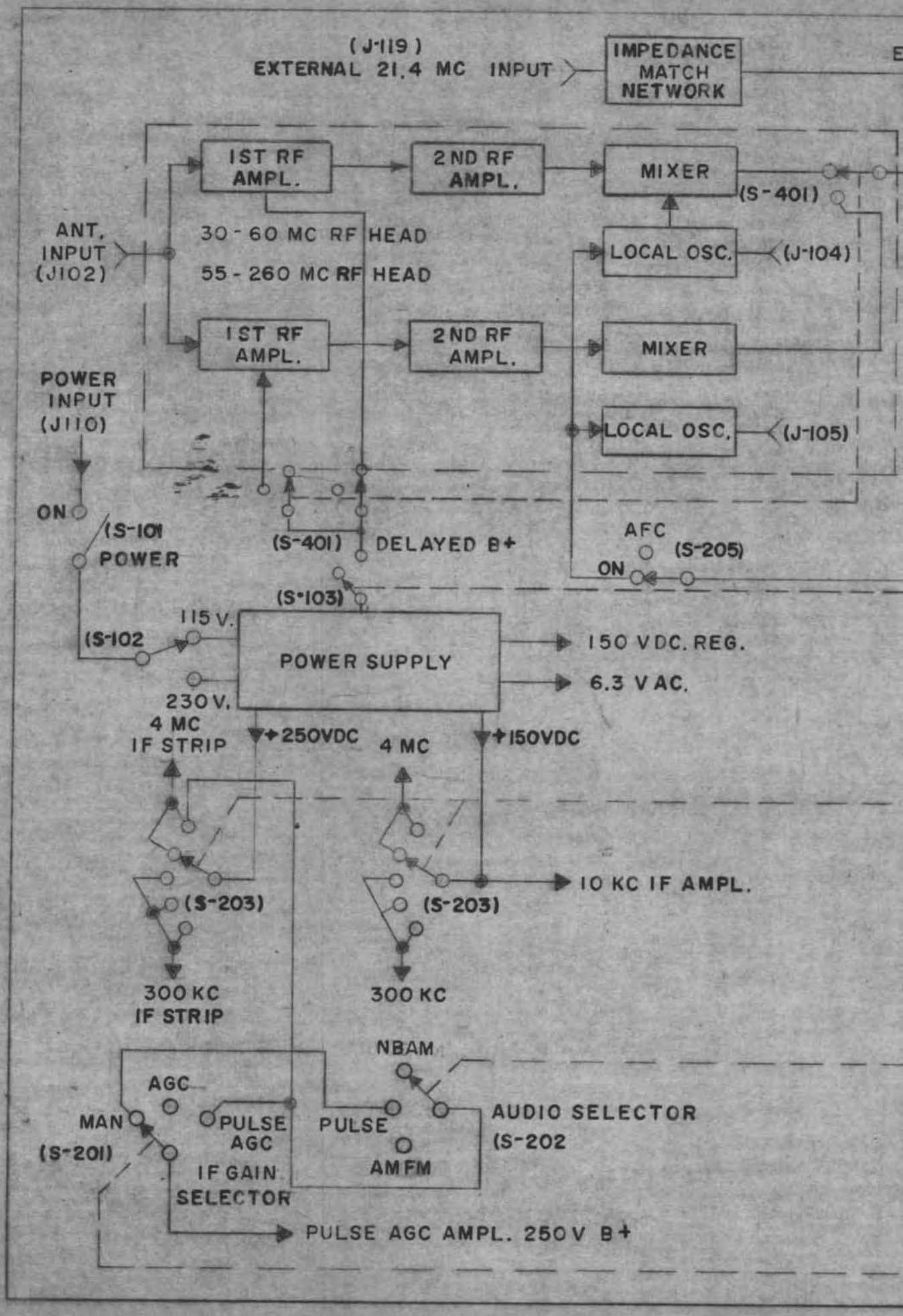
SYMBOL	DESCRIPTION
V801	Tube, Electron, Amperex E180F/6688, GEL Part No. 14770
V802	Same as V801
V803	Same as V801
V804	Same as V801
V805	Tube, Electron 6BN6, GEL Part No. 14780
V806	Same as V805
V807	Tube, Electron 5726/6AL5W, GEL Part No. 14784
W801	Cable Assembly, Coaxial GEL Dwg. B10-672
W802	Cable Assembly, Coaxial GEL Dwg. B10-673

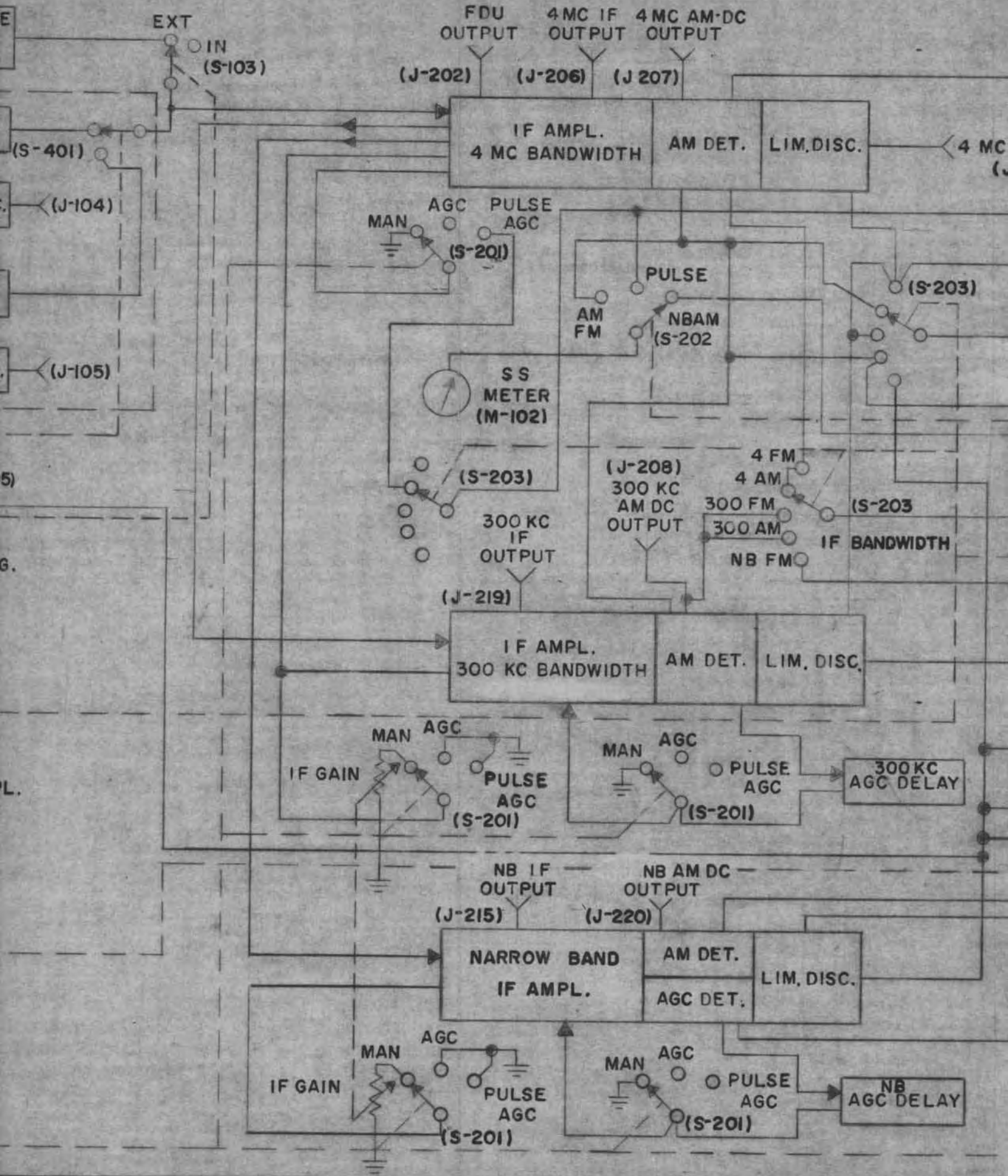
PARTS LIST

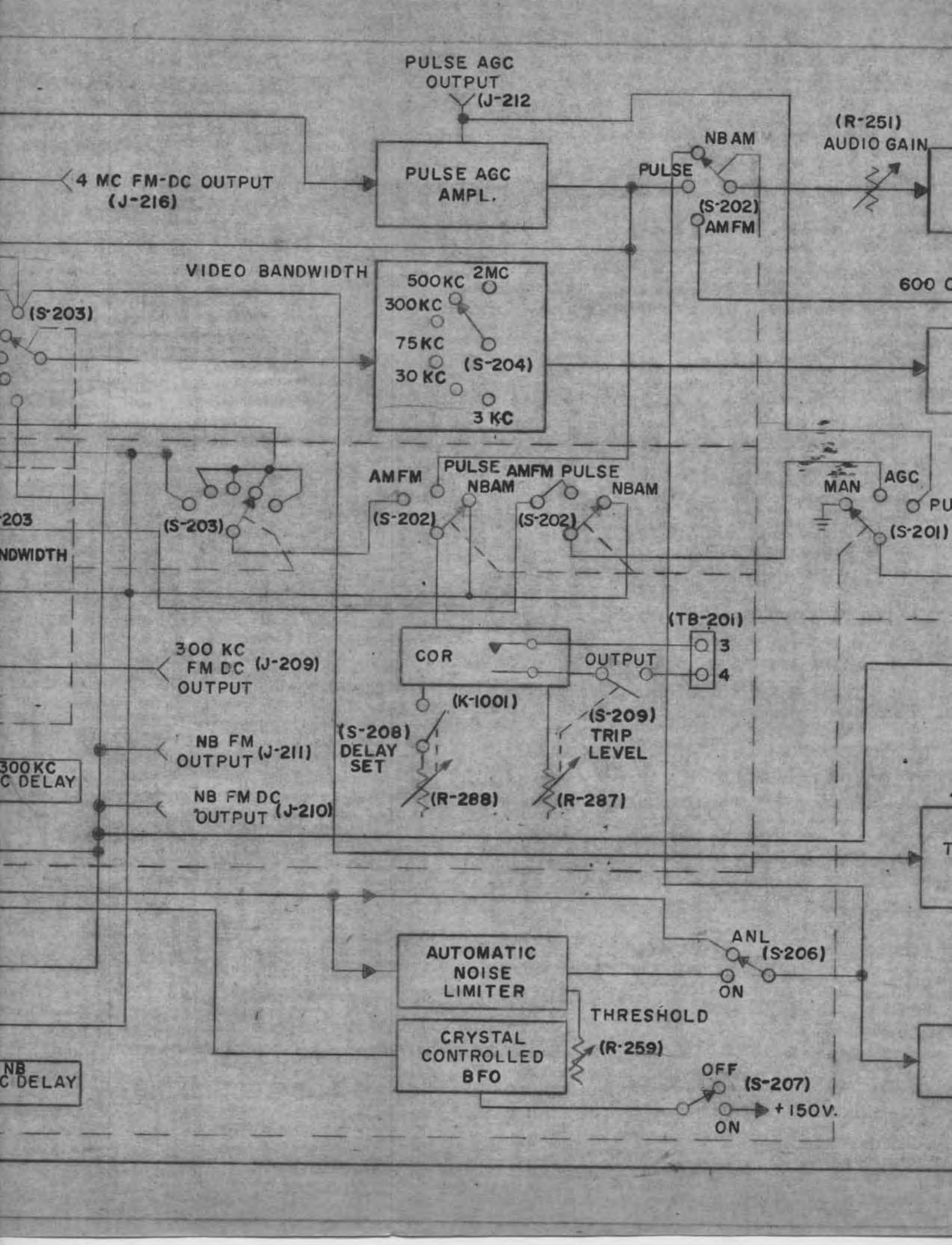
Carrier Operated Relay

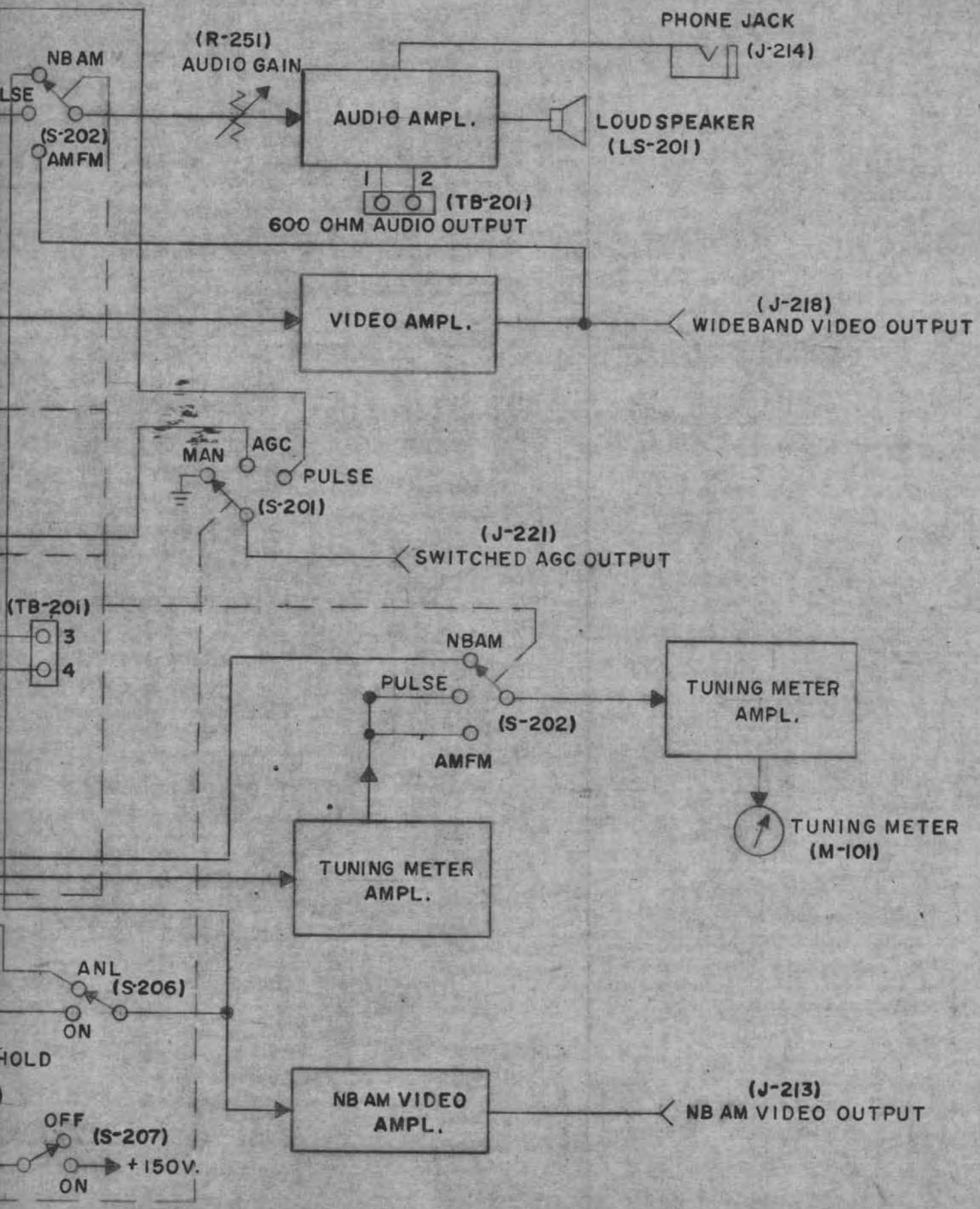
SYMBOL	DESCRIPTION
C1001	Not Assigned
C1002	Capacitor, Electrolytic, 20-20-20, 450V DC, Aerovox AEP444J, GEL Part No. 12775
CR1001	Diode, 1N458, Texas Instrument, GEL Part No. 14617
CR1002	Diode, Zener, 1/4 M75Z5, GEL Part No. 14614
P1001	Connector, Power, AMP Inc., 200345-4, GEL Part No. 17506
K1001	Relay, Sensitive - 40mw, Potter & Brumfield, PW5LS, 10K Coil, GEL Part No. 20531
R1001	Resistor, Fixed Composition, 130K ± 5%, 1/2W, Allen Bradley EB 1345, GEL Part No. 10437
R1002	Same as R1001
R1003	Resistor, Fixed Composition, 510K ± 5%, 1/2W, Allen Bradley EB 5045, GEL Part No. 10440
R1004	Resistor, Fixed Composition, 1.0M ± 5%, 1/2W, Allen Bradley EB 1055, GEL Part No. 11424
R1005	Not Assigned
R1006	Resistor, Fixed Composition, 68K ± 5%, 1/2W, Allen Bradley EB 6835, GEL Part No. 10603
R1007	Resistor, Fixed Composition, 62K ± 5%, 1/2W, Allen Bradley EB 6235, GEL Part No. 10423

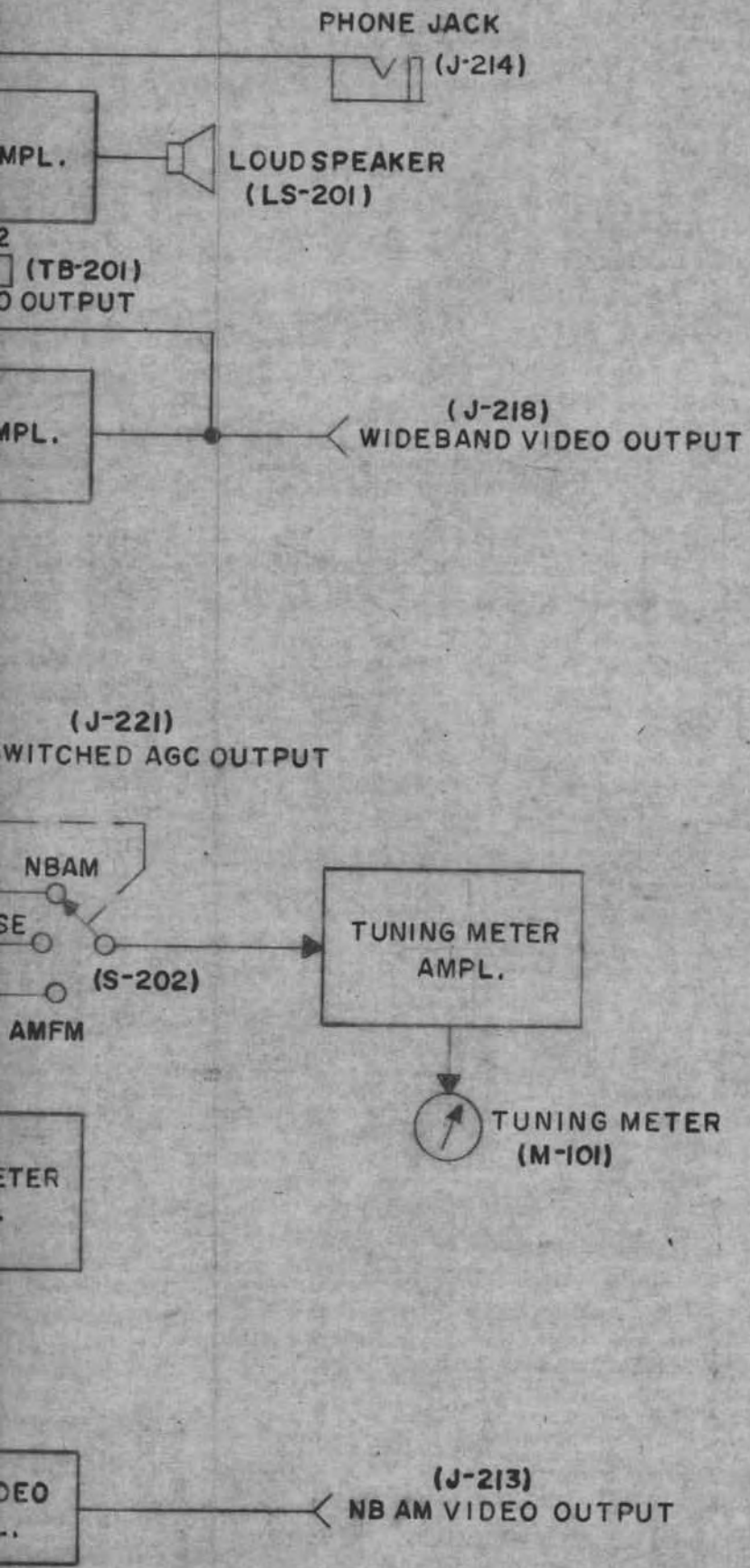
SYMBOL	DESCRIPTION
R1008	Resistor, Fixed Composition, 200K ± 5%, 1/2 W, Allen Bradley EB 2045, GEL Part No. 10488
R1009	Not Assigned
R1010	Resistor, Fixed Composition, 510K ± 5%, 1/2W, Allen Bradley EB 5145, GEL Part No. 10440
R1011	Not Assigned
R1012	Not Assigned
R1013	Not Assigned
R1014	Potentiometer, Composition, 250K ± 10%, 1/2W, Ohmite AS 3611, GEL Part No. 14041
R1015	Same as R1004
R1016	Same as R1004
R1017	Same as R1004
R1018	Same as R1004
R1019	Potentiometer, Composition, 5M ± 20%, 1/2W, Ohmite AS 3615, GEL Part No. 14078
R1020	Same as R1019
R1021	Same as R1019
R1022	Same as R1019
V1001	Tube, Electron 12AX7, GEL Part No. 14765
V1002	Tube, Electron 12AU7, GEL Part No. 14791


(J-119)
EXTERNAL 21.4 MC INPUT
IMPEDANCE MATCH NETWORK
1ST RF AMPL.
2ND RF AMPL.
MIXER
(S-401)
ANT. INPUT (J102)
30 - 60 MC RF HEAD
55 - 260 MC RF HEAD
LOCAL OSC.
(J-104)
1ST RF AMPL.
2ND RF AMPL.
MIXER
POWER INPUT (J110)
LOCAL OSC.
(J-105)
ON
(S-101 POWER
(S-401)
DELAYED B+
AFC
(S-205)
ON
(S-103)
115 V.
(S-102
POWER SUPPLY
150 VDC. REG.
6.3 VAC.
230 V.
4 MC IF STRIP
+250VDC
4 MC
+150VDC
10 KC IF AMPL.
(S-203)
(S-203)
300 KC IF STRIP
300 KC
NBAM
AGC
AUDIO SELECTOR (S-202
MAN (S-201)
PULSE AGC
PULSE
AMFM
IF GAIN SELECTOR
PULSE AGC AMPL. 250 V B+

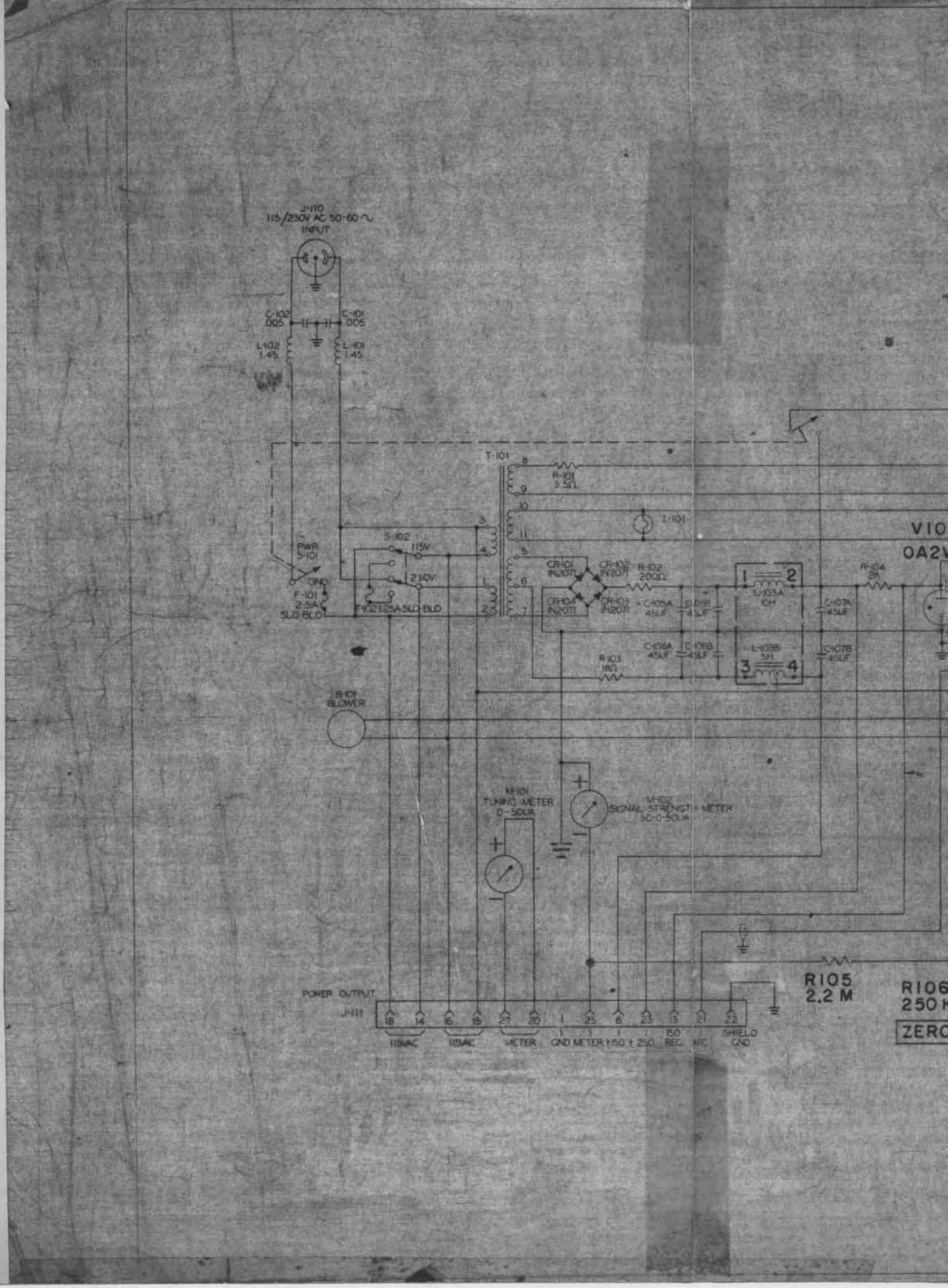

EXT
IN
(S-103)
FDU OUTPUT
(J-202)
4MC IF OUTPUT
(J-206)
4MC AM-DC OUTPUT
(J 207)
IF AMPL. 4 MC BANDWIDTH
AM DET.
LIM. DISC.
4 MC
(S-401)
(J-104)
(J-105)
AGC
PULSE AGC
MAN
(S-201)
PULSE
AM
FM
NBAM
(S-202
(S-203)
S S METER (M-102)
(S-203)
(J-208)
300 KC AM DC OUTPUT
4 FM
4 AM
300 FM
300 AM
NB FM
(S-203
IF BANDWIDTH
300 KC IF OUTPUT
(J-219)
IF AMPL. 300 KC BANDWIDTH
AM DET.
LIM. DISC.
MAN
AGC
IF GAIN
PULSE AGC
(S-201)
MAN
AGC
PULSE AGC
(S-201)
300 KC AGC DELAY
NB IF OUTPUT
(J-215)
NB AM DC OUTPUT
(J-220)
NARROW BAND IF AMPL.
AM DET.
AGC DET.
LIM. DISC.
MAN
AGC
IF GAIN
PULSE AGC
(S-201)
MAN
AGC
PULSE AGC
(S-201)
NB AGC DELAY

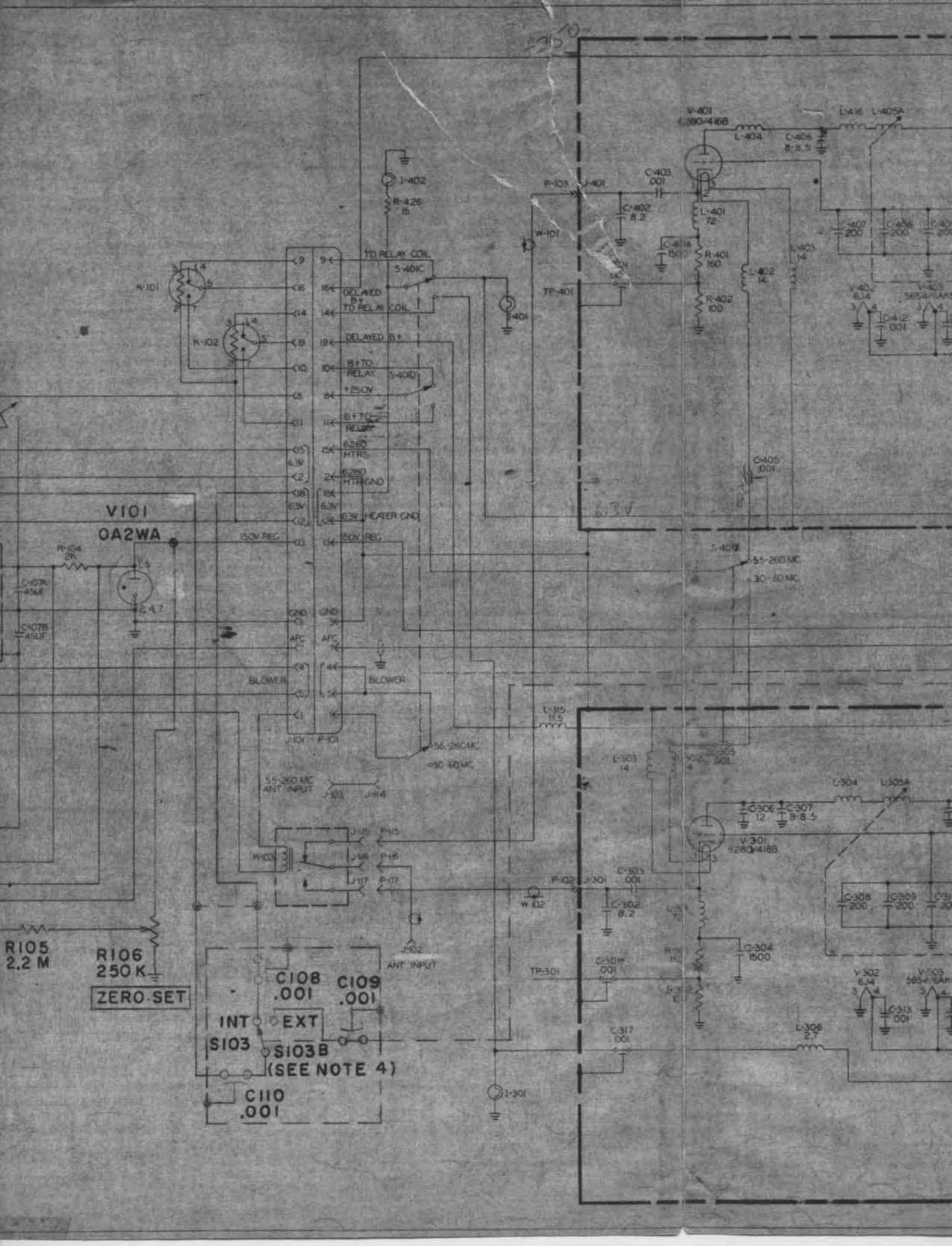

PULSE AGC OUTPUT (J-212)
4 MC FM-DC OUTPUT (J-216)
PULSE AGC AMPL.
NB AM
PULSE
(S-202) AM FM
(R-251) AUDIO GAIN
VIDEO BANDWIDTH
500 KC
2 MC
300 KC
75 KC
30 KC
3 KC
(S-204)
(S-203)
AM FM
PULSE AM FM
NB AM
PULSE
NB AM
(S-202)
(S-202)
MAN
AGC
(S-201)
(S-203)
(TB-201)
COR
OUTPUT
3
4
300 KC FM DC OUTPUT (J-209)
(K-1001)
(S-208) DELAY SET
(S-209) TRIP LEVEL
NB FM OUTPUT (J-211)
NB FM DC OUTPUT (J-210)
(R-288)
(R-287)
AUTOMATIC NOISE LIMITER
ANL
(S-206)
ON
THRESHOLD
CRYSTAL CONTROLLED BFO
(R-259)
OFF
(S-207)
ON
+150V.


PHONE JACK
(J-214)
(R-251)
AUDIO GAIN
NB AM
LSE
(S-202)
AM FM
AUDIO AMPL.
LOUDSPEAKER
(LS-201)
1
2
(TB-201)
600 OHM AUDIO OUTPUT
VIDEO AMPL.
(J-218)
WIDEBAND VIDEO OUTPUT
MAN
AGC
PULSE
(S-201)
(J-221)
SWITCHED AGC OUTPUT
(TB-201)
3
4
NBAM
PULSE
(S-202)
AMFM
TUNING METER
AMPL.
TUNING METER
(M-101)
TUNING METER
AMPL.
ANL
(S-206)
ON
HOLD
NB AM VIDEO
AMPL.
(J-213)
NB AM VIDEO OUTPUT
OFF
(S-207)
+150V.
ON

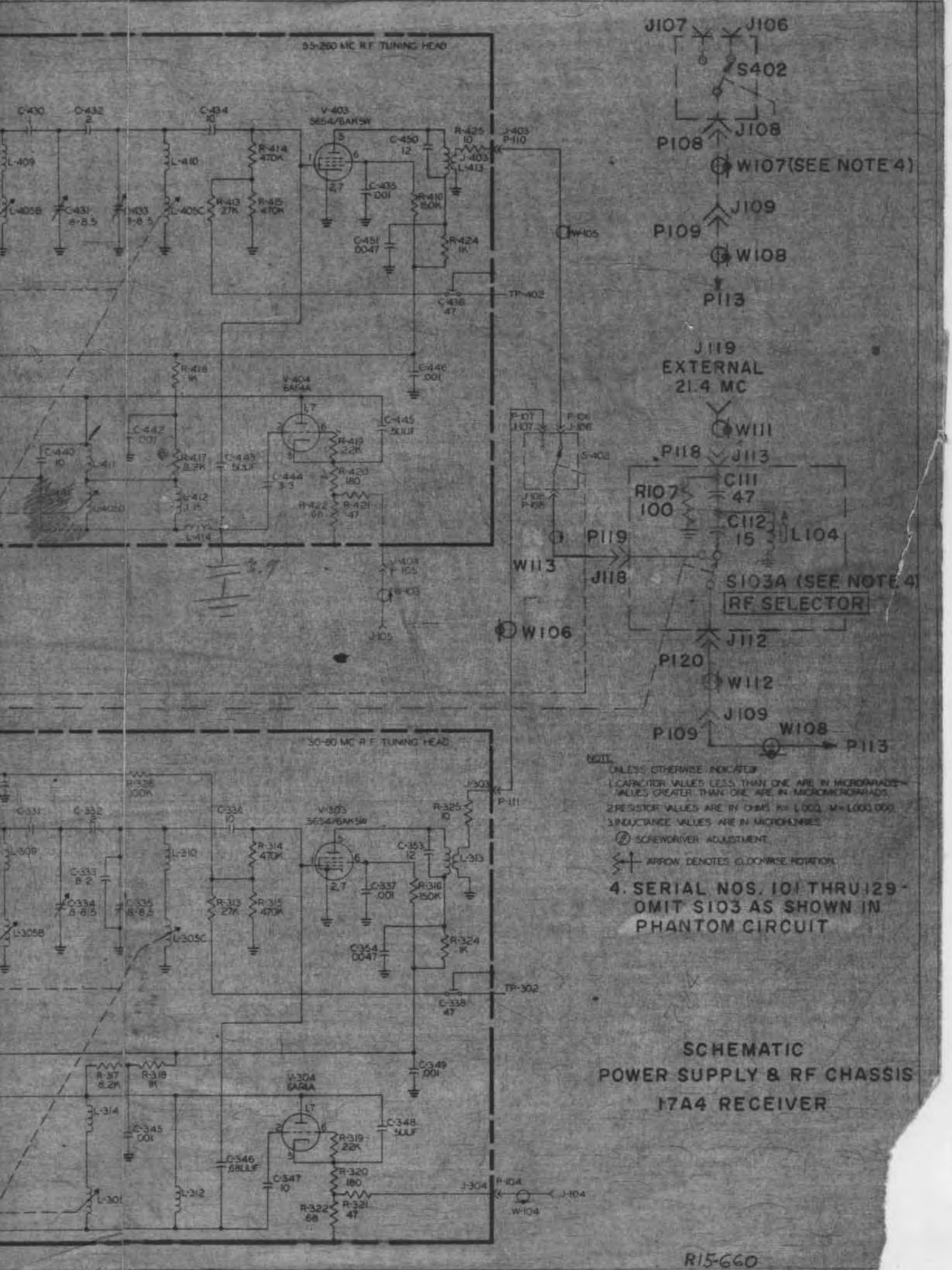


BLOCK DIAGRAM
R15-794


J-110
115/230V AC 50-60 ~
INPUT
C-102
.005
C-101
.005
L-102
1.45
L-101
1.45
PWR
S-101
GND
F-101
2.5A
SLO-BLO
S-102
115V
230V
T-101
R-101
3.5Ω
I-101
CR-101
IN2071
CR-102
IN2071
CR-104
IN2071
CR-103
IN2071
R-102
200Ω
C-105A
45μF
C-105B
45μF
C-106A
45μF
C-106B
45μF
R-103
180
L-103A
10H
L-103B
5H
C-107A
45μF
C-107B
45μF
R-104
2K
B-101
BLOWER
M-101
TUNING METER
0-50UA
M-102
SIGNAL STRENGTH METER
50-0-50UA
R105
2.2 M
R106
250 K
ZERO
POWER OUTPUT
J-111
18
14
16
19
27
20
1
25
6
23
13
21
22
115VAC
115VAC
METER
GND
METER
+150
+250
150
REG
NC
SHIELD
GND

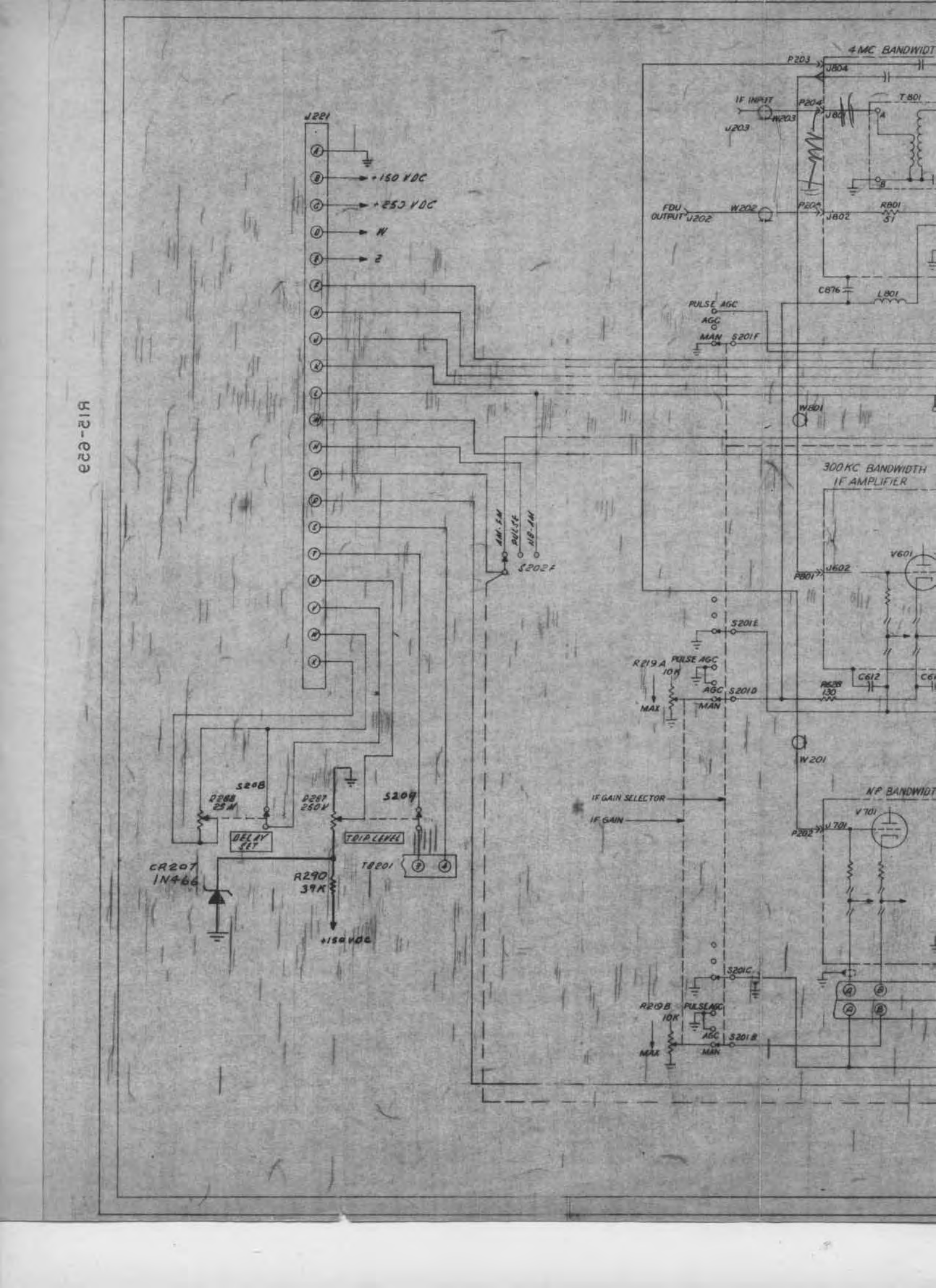

V101
0A2WA
R105
2.2 M
R106
250 K
ZERO-SET
C108
.001
C109
.001
INT
EXT
S103
S103B
(SEE NOTE 4)
C110
.001
V-401
6BQ7/416B
L-404
L-416
L-405A
C-406
8-8.5
C-403
.001
C-402
8.2
L-401
72
R-401
160
R-402
100
C-407
200
C-408
200
C-412
.001
C-405
.001
L-402
14
L-403
14
TP-401
W-101
P-103
J-401
J-402
R-426
15
K-101
K-102
TD RELAY COIL
S-401C
DELAYED B+
TD RELAY COIL
DELAYED B+
B+TO RELAY
S-401D
+250V
B+TO RELAY
6.3V HTRS
6.3V HTR GND
HEATER GND
150V REG.
S-401B
55-260 MC
30-50 MC
GND
AFC
BLOWER
J-101
P-101
55-260 MC ANT INPUT
J-103
J-414
J-102
ANT INPUT
K-103
J-115
P-115
J-116
P-116
J-117
P-117
W-102
P-102
J-301
C-303
.001
C-302
8.2
TP-301
C-304
1500
C-317
.001
L-306
2.7
L-315
11.5
L-303
14
L-304
L-305A
C-306
12
C-307
8-8.5
V-301
6BQ7/416B
C-308
200
C-309
200
C-313
.001
V-302
6.3V
V-303
6.3V
I-301
I-402
R-104
2M
C-107A
.45UF
C-107B
.45UF
2.4.7

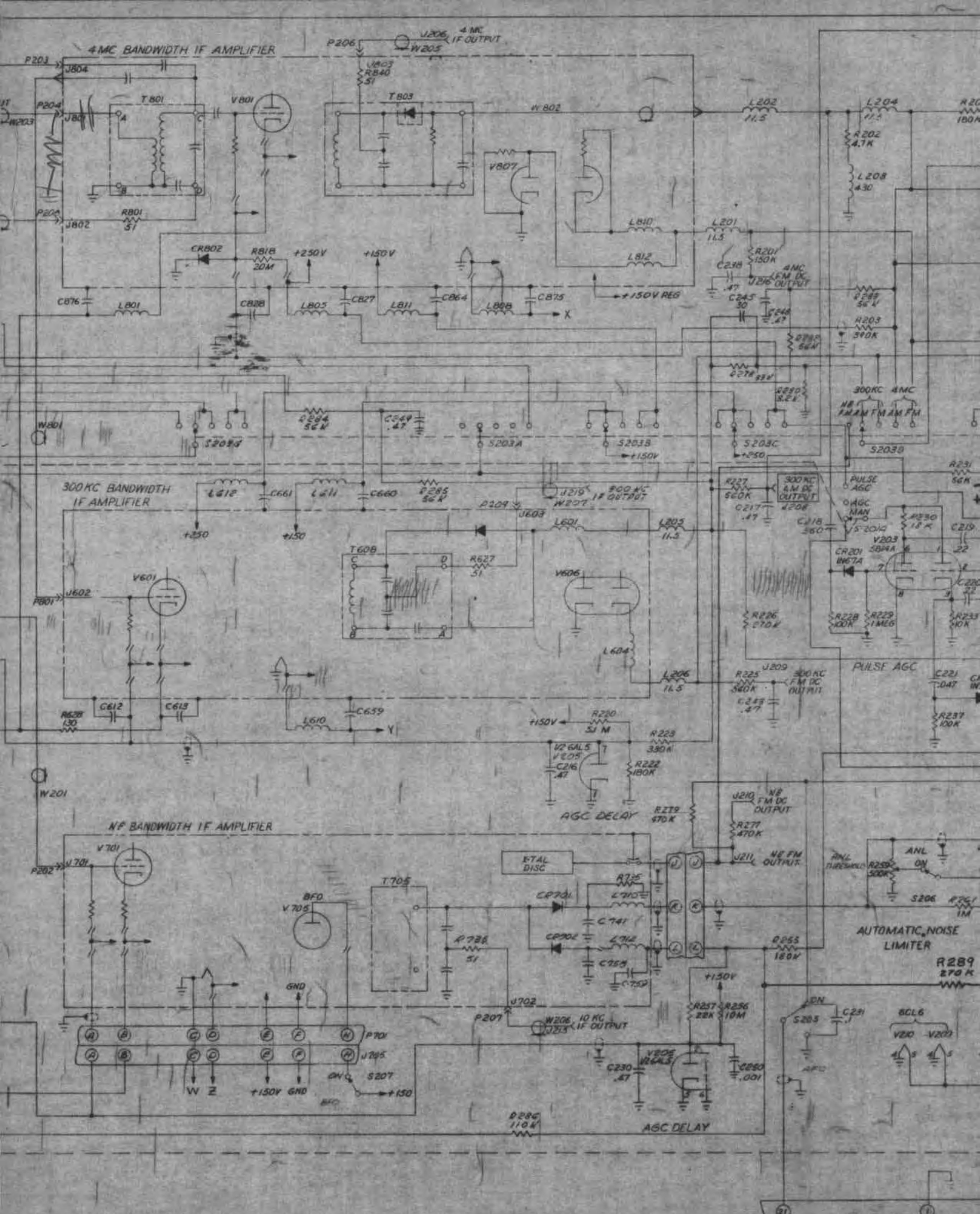

55-260 MC R.F. TUNI
L 417-11.5
L-416
L-405A
L-415
V-402 6J4
C-424 .001
L-408 34
R-407 1.7K
R-412 12K
C-448 .0047
C-426 15
C-430
C-432 2
C-434 10
V-403 3654/6AK5W
C-404 8-8.5
C-420 22
C-421 16
C-422 15
C-425 .001
C-427A
C-429 8-8.5
L-409
L-410
R-414 470K
C-435 .001
C-451 .0047
L-405B
C-431 8-8.5
C-433 8-8.5
L-405C
R-413 27K
R-415 470K
C-403 14
C-407 200
C-408 200
C-409 200
C-410 200
C-411 200
R-404 5K
R-405 8.2K
L-407 14
R-406 120
V-402 6J4
V-403 3654/6AK5W
V-404 6AF4W
C-412 .001
C-413 .001
C-414 .001
C-415 .001
C-417 .001
R-406 100K
C-427B
R-418 1K
V-404 6AF4A
L-406 2.7
R-409 110K
C-437 4.3
C-439 8-8.5
C-442 .001
C-443 5.5UF
C-444 3.3
R-419 22K
R-420 180
R-422 68
R-421 47
R-411 1M
C-438 VARICAP
C-440 10
L-411
R-417 8.2K
L-412 1.15
L-405D
L-414
C-416 .001
C-447 .001
C-448 47
L-418 11.5
R-423 10K
C-442 .001
L-413 11.5
J-105
R-323 10K
C-351 1500
C-327 .001
30-80 MC R.F. TUNI
L-308 14
C-350 .001
C-341 .001
C-326 .001
R-302 12K
C-352 .0047
C-355 .001
R-326 100K
L-304
L-305A
C-307 8-8.5
C-319 22
C-320 33
C-321 82
C-328 15
C-331
C-332 2
C-336 10
V-303 3654/6AK5W
V-302 6J4
C-324 .001
R-307 100
L-309
L-310
R-314 470K
C-333 8.2
C-334 8-8.5
C-335 8-8.5
R-313 27K
R-315 470K
C-337 .001
R-305 8.2K
J-302
C-308 200
C-309 200
C-310 200
C-311 200
C-312 200
L-307 14
C-325 2
C-329 6.2
C-330 8-8.5
L-305B
L-305C
C-354 .0047
R-304 51K
C-323 .001
V-302 6J4
V-303 3654/6AK5W
V-304 6AF4A
C-313 .001
C-314 .001
C-315 .001
C-316 .001
L-306 2.7
R-306 100K
C-340 VARICAP
R-317 8.2K
R-318 1K
V-304 6AF4A
C-339 12
R-309 110K
R-311 1M
C-343 3.9
C-342 8-8.5
L-314
C-345 .001
R-310 5K
C-346 68UUF
R-319 22K
C-347 10
R-320 180
R-322 68
R-321 47
C-344 12
L-301
L-312



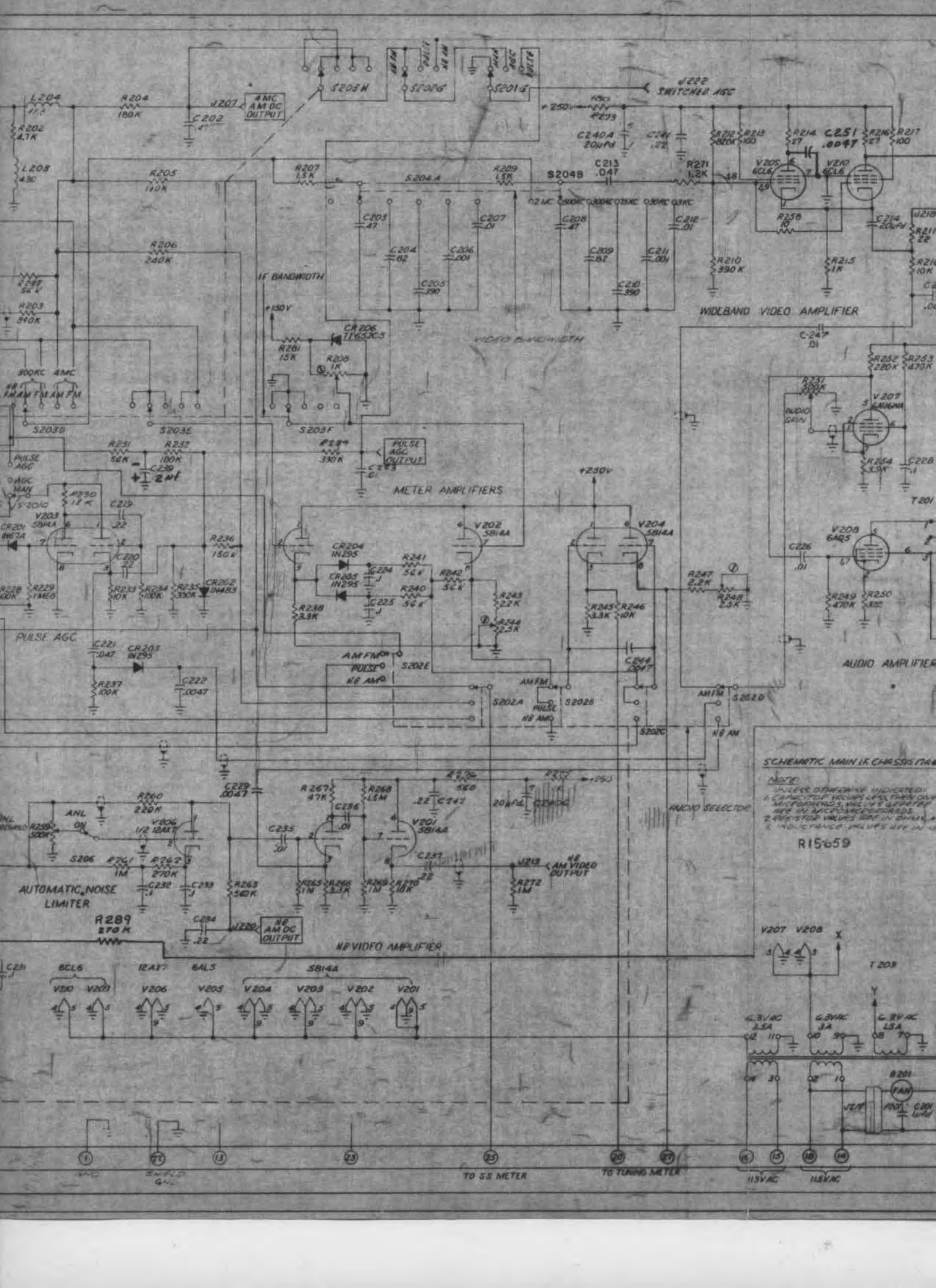
SCHEMATIC
POWER SUPPLY & RF CHASSIS
17A4 RECEIVER

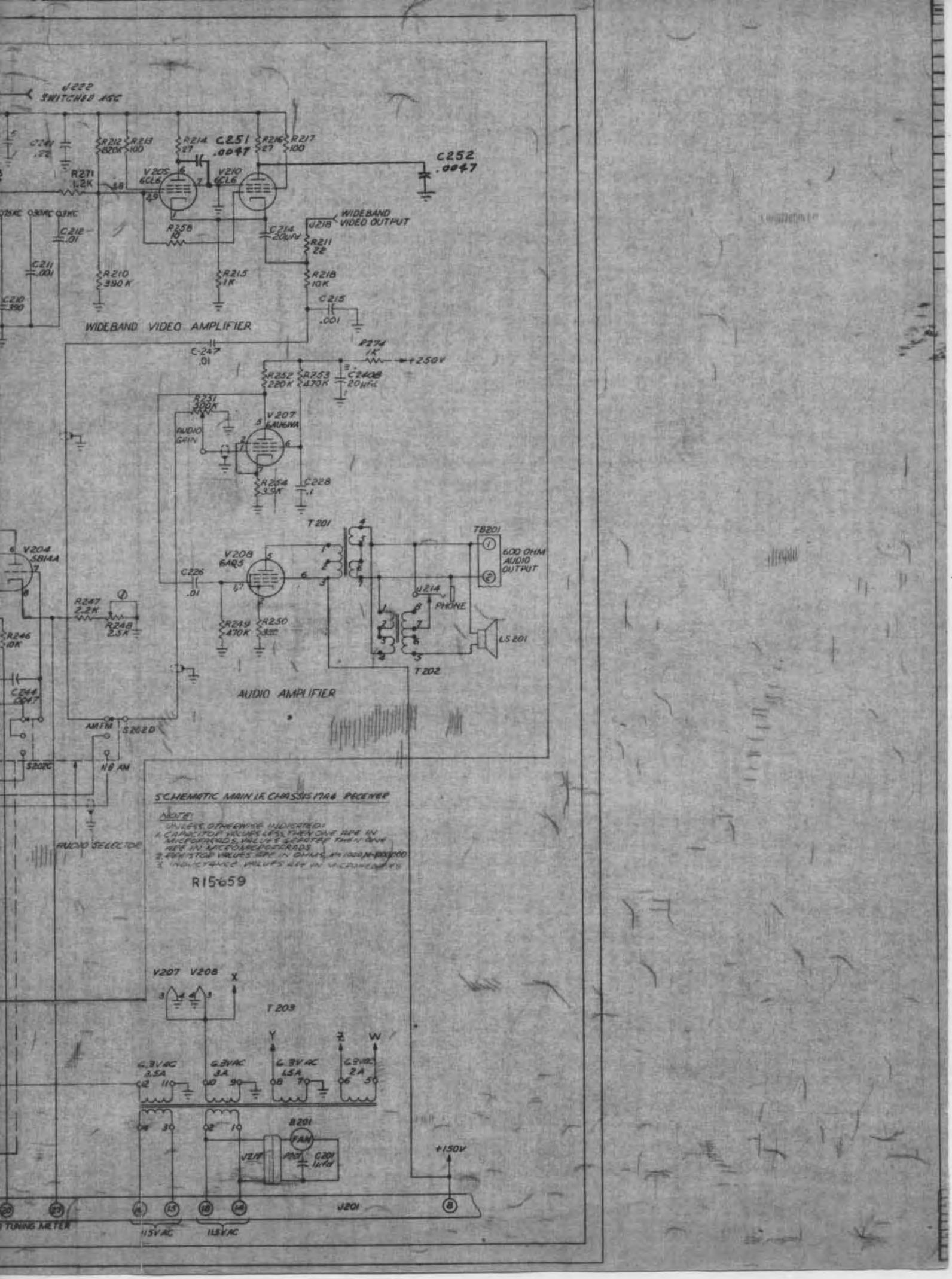
R15-660

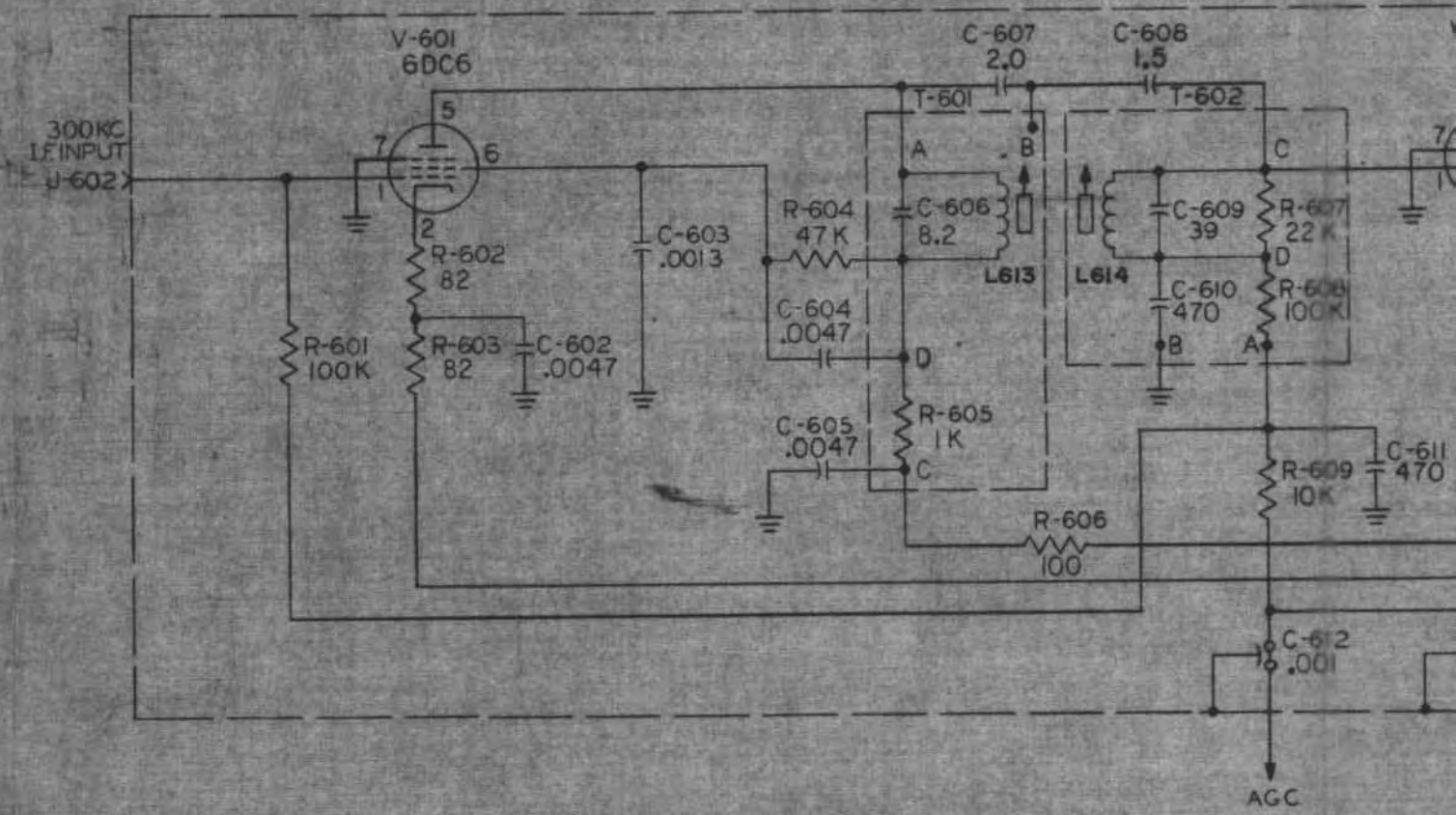

4 MC BANDWIDT
P203
J804
IF INPUT
P204
T 801
W203
J803
J203
FDU OUTPUT
J202
W202
P205
J802
R801
51
C876
L801
PULSE AGC
AGC
MAN
S201F
W801
300 KC BANDWIDTH
IF AMPLIFIER
V601
P801
J602
S201E
R219A
10K
PULSE AGC
AGC
MAN
S201D
C612
R628
130
MAX
W201
IF GAIN SELECTOR
IF GAIN
N.F. BANDWIDT
V701
P202
J701
S201C
R219B
10K
PULSE AGC
AGC
MAN
S201B
MAX
J201
+150 VDC
+250 VDC
W
Z
AM. FM
PULSE
NB. FM
S202F
S208
R288
25M
R287
250K
S209
DELAY SET
TRIP LEVEL
CR207
IN466
R290
39K
+150 VDC
T8201

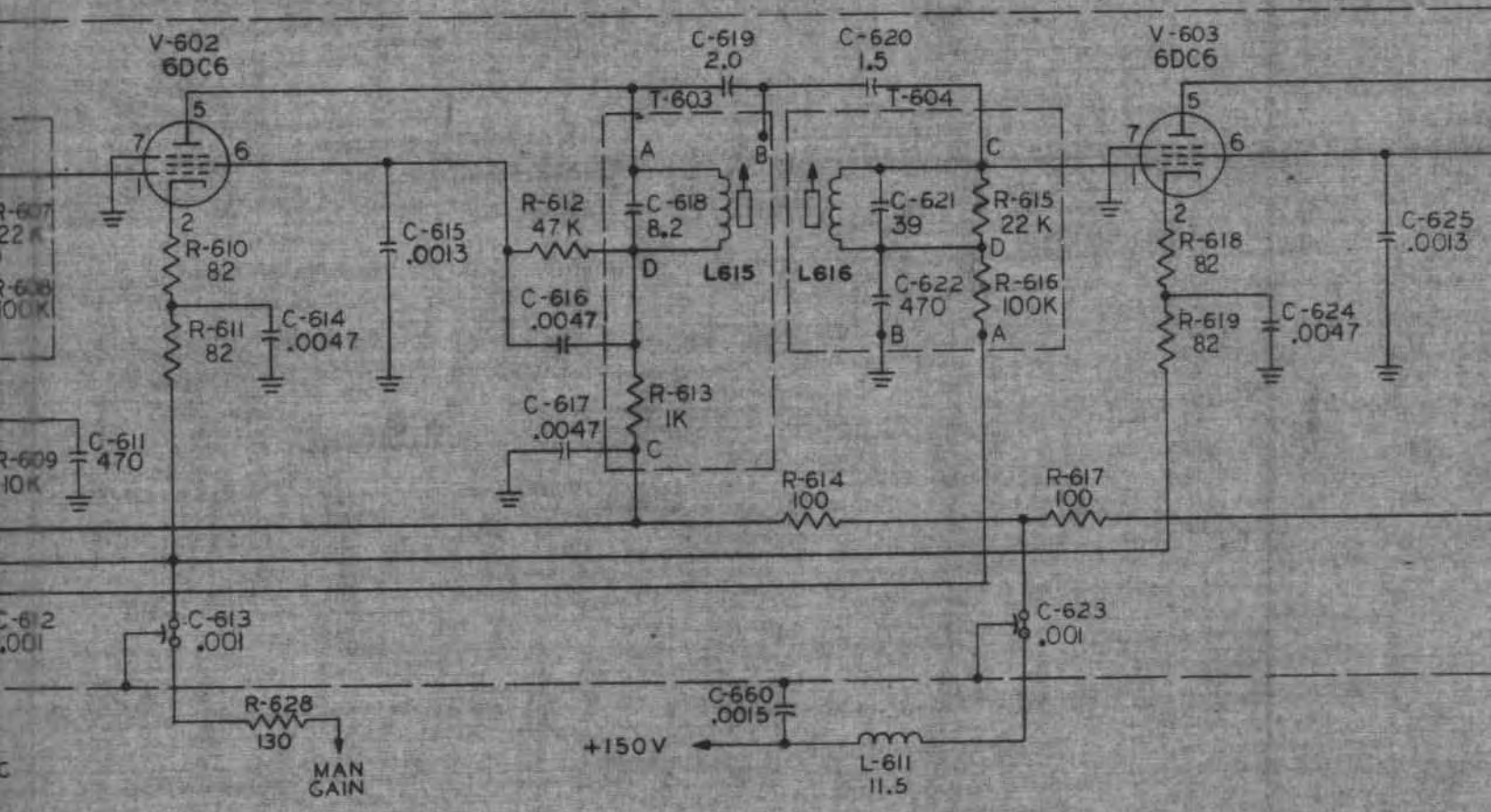


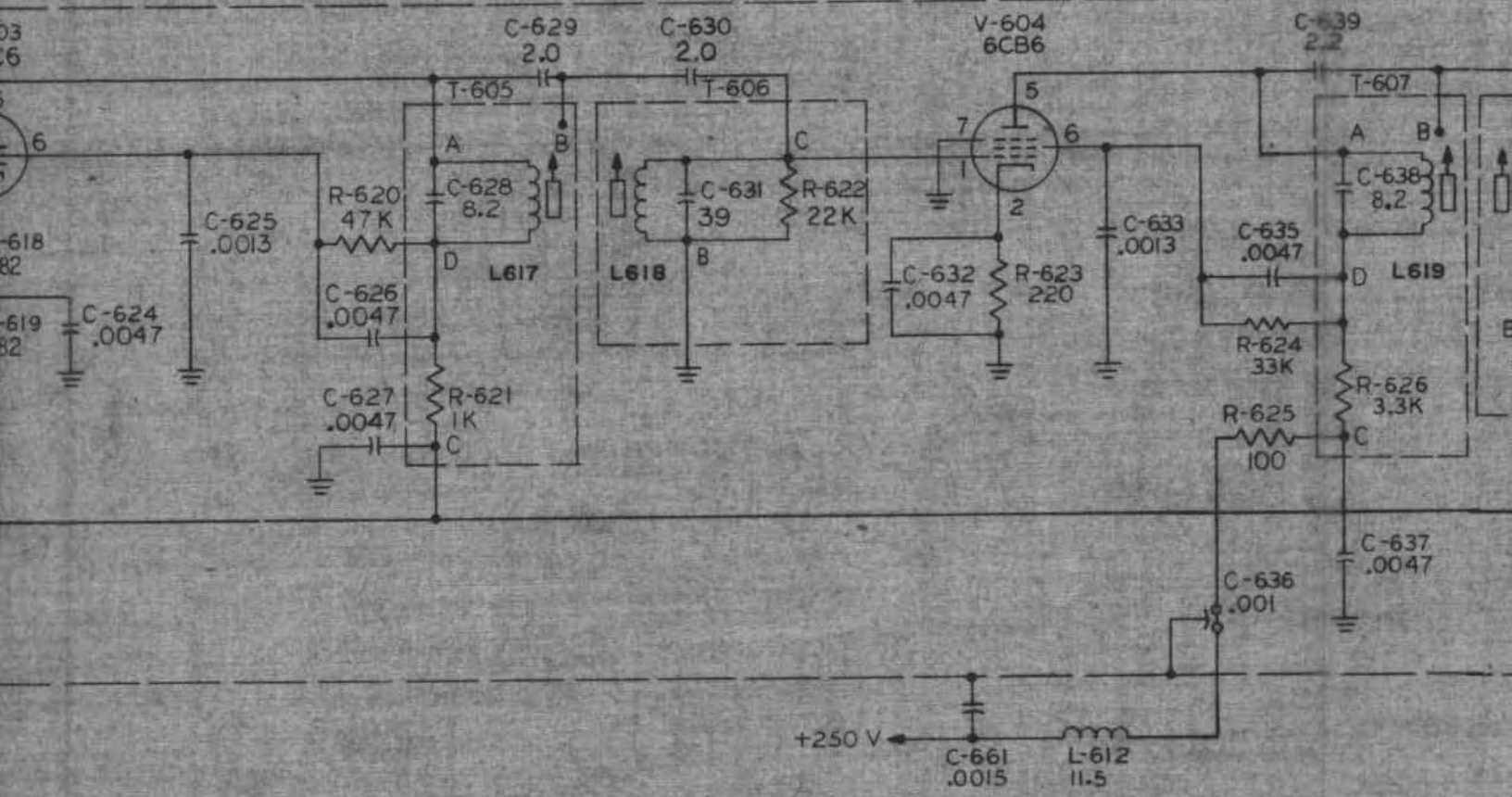
4MC BANDWIDTH IF AMPLIFIER
4 MC IF OUTPUT
300 KC BANDWIDTH IF AMPLIFIER
300 KC IF OUTPUT
NF BANDWIDTH IF AMPLIFIER
10 KC IF OUTPUT
AGC DELAY
PULSE AGC
AUTOMATIC NOISE LIMITER
X-TAL DISC
BFO
+150V REG
4MC AM FM DC OUTPUT
300 KC AM DC OUTPUT
300 KC FM DC OUTPUT
NB FM DC OUTPUT
NB FM OUTPUT
PULSE AGC
AGC MAN
AFC

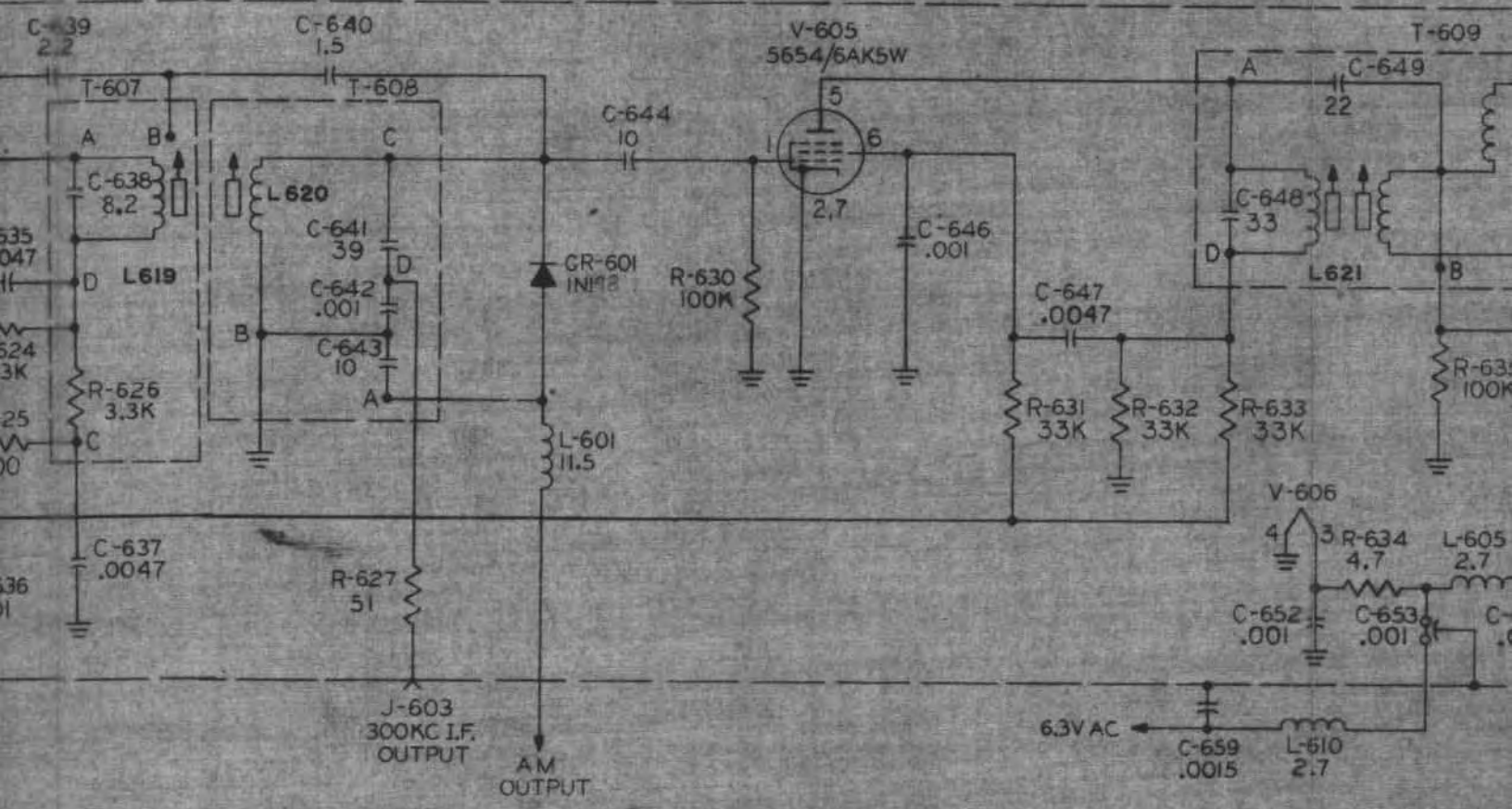

WIDEBAND VIDEO AMPLIFIER
METER AMPLIFIERS
AUDIO AMPLIFIER
PULSE AGC
AUTOMATIC NOISE LIMITER
NB VIDEO AMPLIFIER
AUDIO SELECTOR
SCHEMATIC MAIN I.F. CHASSIS
R15659
TO SS METER
TO TUNING METER
115V AC
115V AC

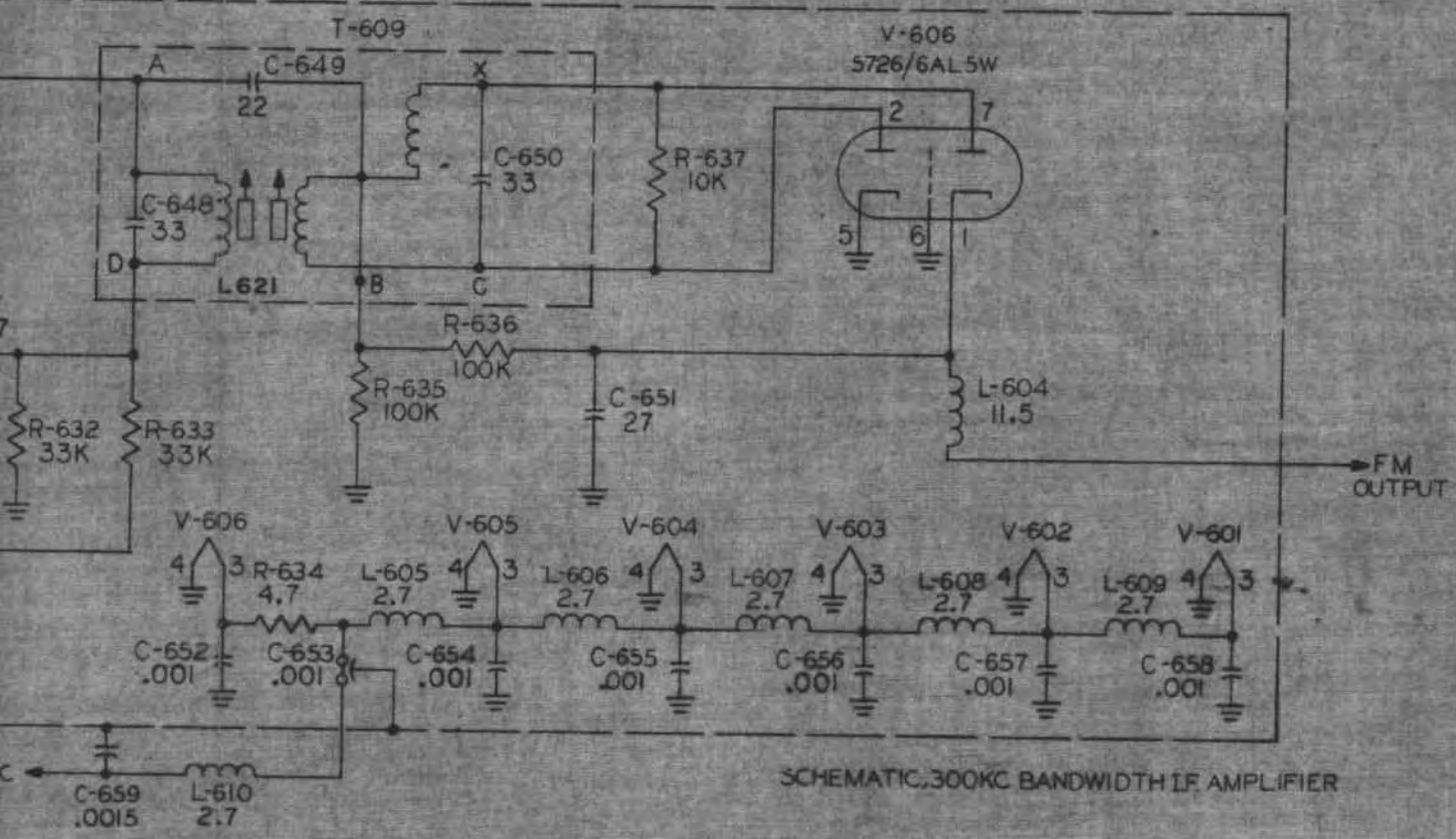

J222
SWITCHED AGC
C241 .22
R212 820K
R213 100
R214 27
C251 .0047
R216 27
R217 100
C252 .0047
R271 1.2K
V205 6CL6
V210 6CL6
R258 10
C214 20uFd
J218
WIDEBAND VIDEO OUTPUT
R211 22
C212 .01
C211 .001
C210 390
R210 390K
R215 1K
R218 10K
C215 .001
WIDEBAND VIDEO AMPLIFIER
C-247 .01
P274 1K
+250V
R252 220K
R253 470K
C240B 20Mfd
R231 300K
V207 6AU8WA
AUDIO GAIN
R254 3.9K
C228 .1
T201
TB201
600 OHM AUDIO OUTPUT
V204 5814A
V208 6AQ5
C226 .01
J214
PHONE
R247 2.2K
R248 2.5K
R249 470K
R250 330
LS 201
T202
R246 10K
C244 .047
AUDIO AMPLIFIER
AM FM
S202D
S202C
N B AM
AUDIO SELECTOR
SCHEMATIC MAIN I.F. CHASSIS 1748 RECEIVER
NOTE:
UNLESS OTHERWISE INDICATED:
1. CAPACITOR VALUES LESS THAN ONE ARE IN MICROFARADS, VALUES GREATER THAN ONE ARE IN MICROMICROFARADS.
2. RESISTOR VALUES ARE IN OHMS, M=1000,000
3. INDUCTANCE VALUES ARE IN MICROHENRYS
R15-659
V207 V208
T 203
6.3V AC 3.5A
6.3VAC 3A
6.3V AC 1.5A
6.3VAC 2A
B201 FAN
C201 1uFd
+150V
J201
TUNING METER
115V AC
115V AC


V-601
6DC6
300KC
I.F. INPUT
J-602
C-607
2.0
C-608
1.5
T-601
T-602
R-601
100K
R-602
82
R-603
82
C-602
.0047
C-603
.0013
R-604
47K
C-604
.0047
C-605
.0047
C-606
8.2
L613
R-605
1K
L614
C-609
39
C-610
470
R-607
22K
R-608
100K
R-609
10K
C-611
470
R-606
100
C-612
.001
AGC


V-602
6DC6
C-619
2.0
C-620
1.5
V-603
6DC6
T-603
T-604
R-610
82
R-611
82
C-614
.0047
C-615
.0013
R-612
47K
C-618
8.2
L615
L616
C-621
39
R-615
22K
C-622
470
R-616
100K
C-616
.0047
C-617
.0047
R-613
1K
R-614
100
R-617
100
R-618
82
R-619
82
C-624
.0047
C-625
.0013
C-611
470
C-613
.001
C-623
.001
R-628
130
MAN
GAIN
C-660
.0015
+150V
L-611
11.5


C-629
2.0
C-630
2.0
V-604
6CB6
C-639
2.2
T-605
T-606
T-607
A
B
C
D
L617
L618
L619
R-620
47K
C-628
8.2
C-631
39
R-622
22K
C-625
.0013
C-626
.0047
C-627
.0047
R-621
1K
C-632
.0047
R-623
220
C-633
.0013
C-635
.0047
C-638
8.2
R-624
33K
R-625
100
R-626
3.3K
C-637
.0047
C-636
.001
+250 V
C-661
.0015
L-612
11.5


C-639
2.2
C-640
1.5
T-607
T-608
V-605
5654/6AK5W
T-609
C-644
10
C-649
22
C-638
8.2
L620
C-641
39
C-642
.001
C-643
10
GR-601
IN198
R-630
100K
C-646
.001
C-648
33
L619
L621
C-647
.0047
R-626
3.3K
R-631
33K
R-632
33K
R-633
33K
L-601
11.5
V-606
R-634
4.7
L-605
2.7
C-637
.0047
R-627
51
C-652
.001
C-653
.001
J-603
300KC I.F.
OUTPUT
AM
OUTPUT
6.3V AC
C-659
.0015
L-610
2.7

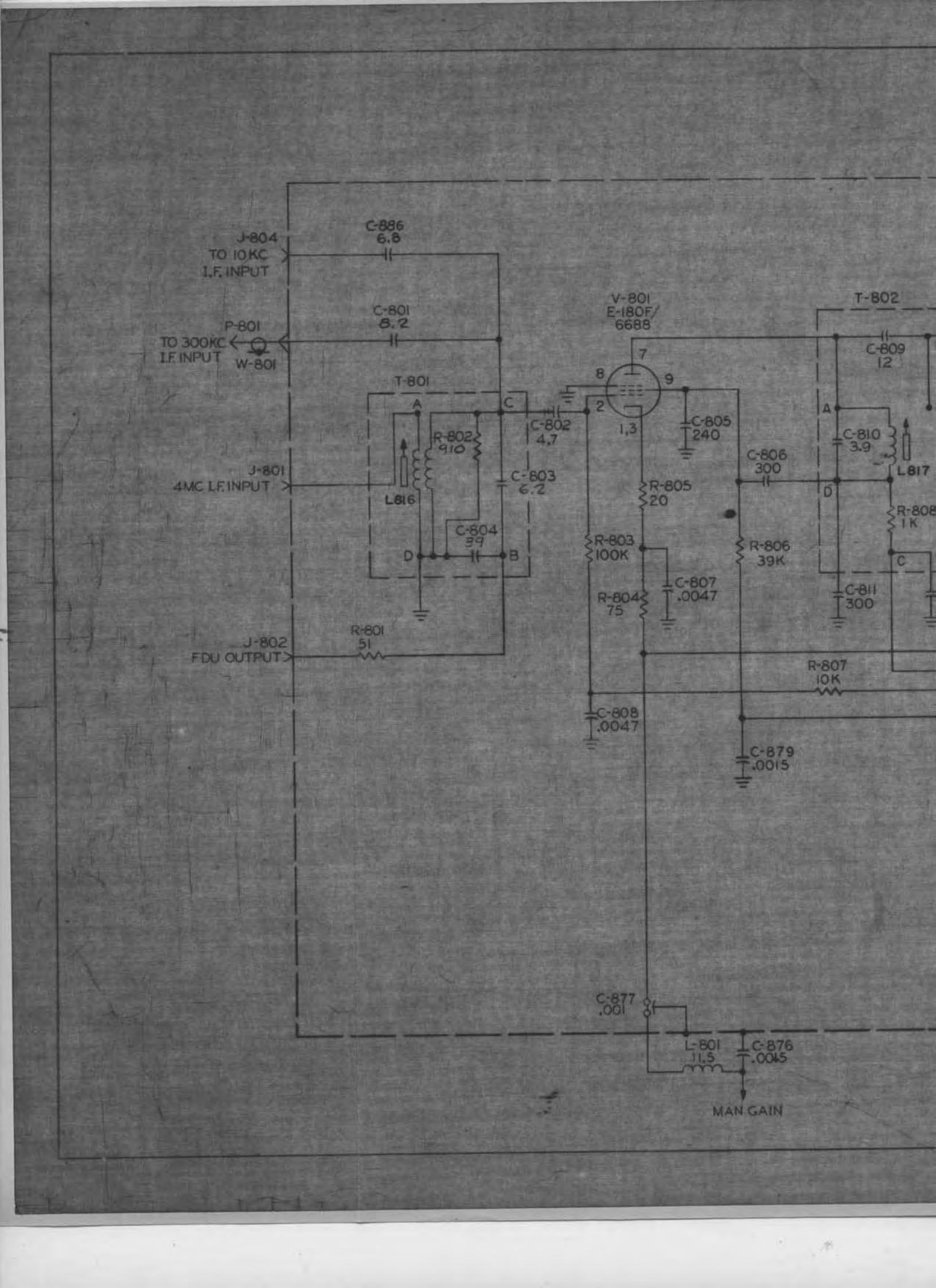


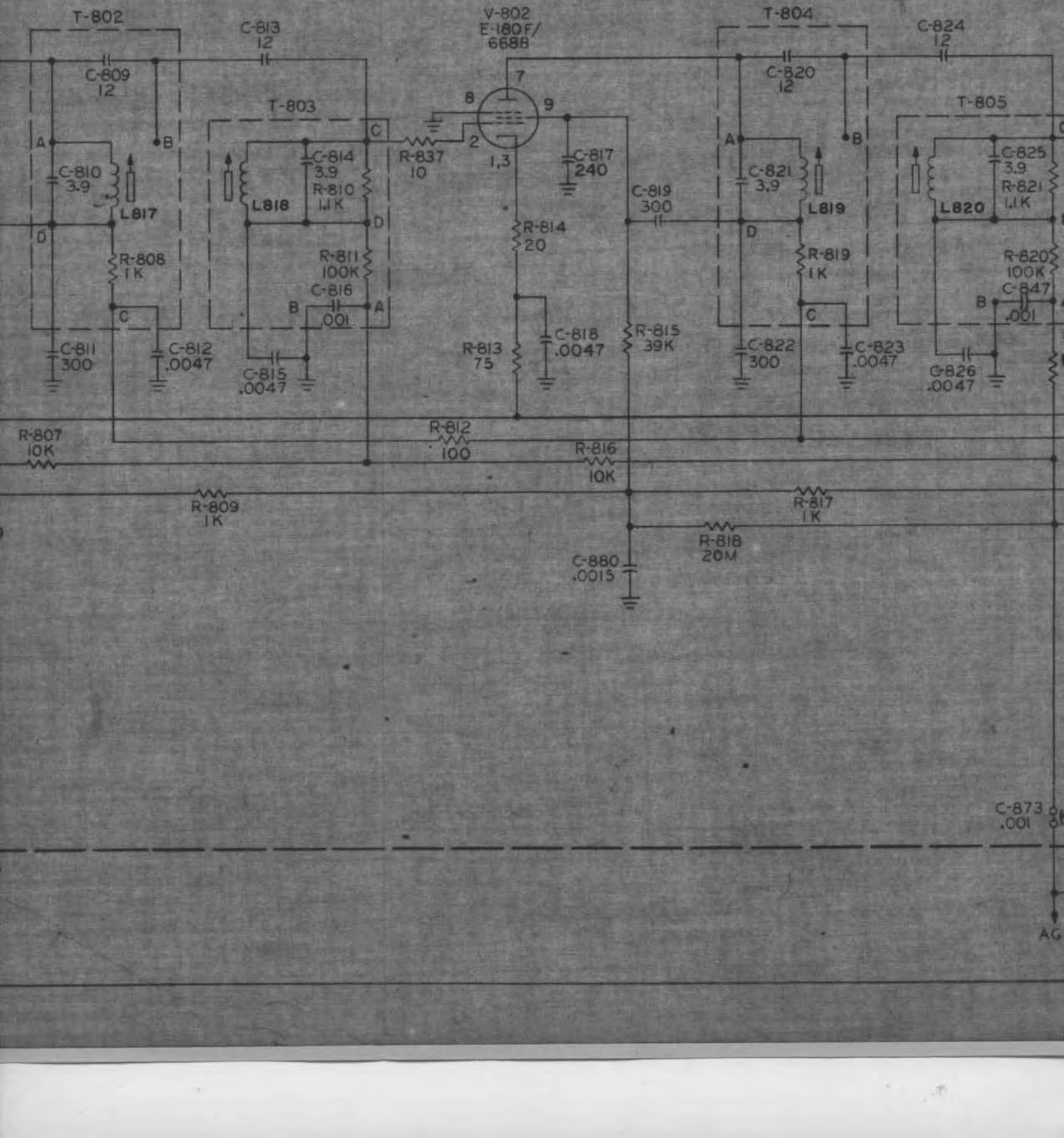
SCHEMATIC, 300KC BANDWIDTH I.F. AMPLIFIER

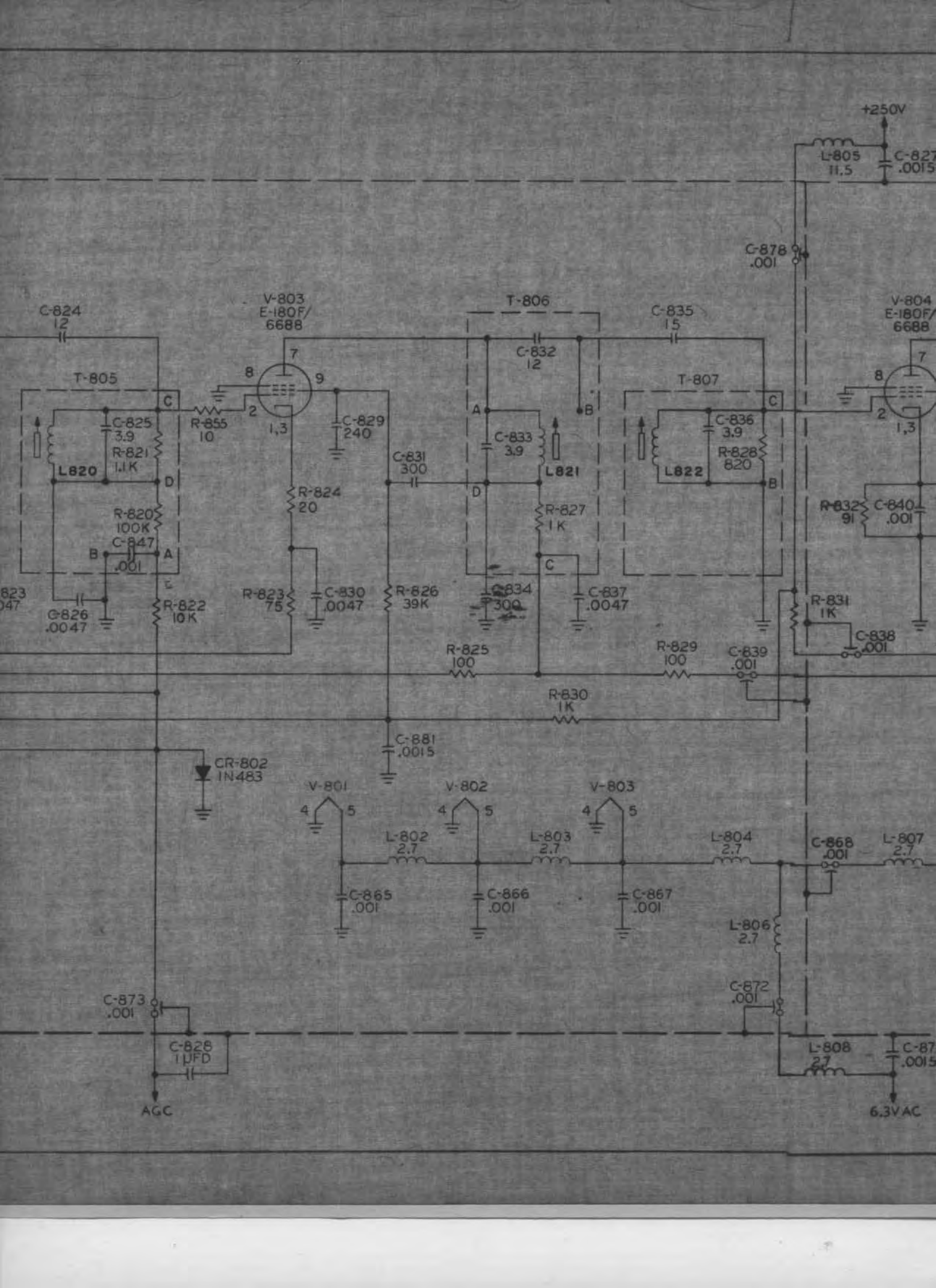
NOTE:
UNLESS OTHERWISE INDICATED

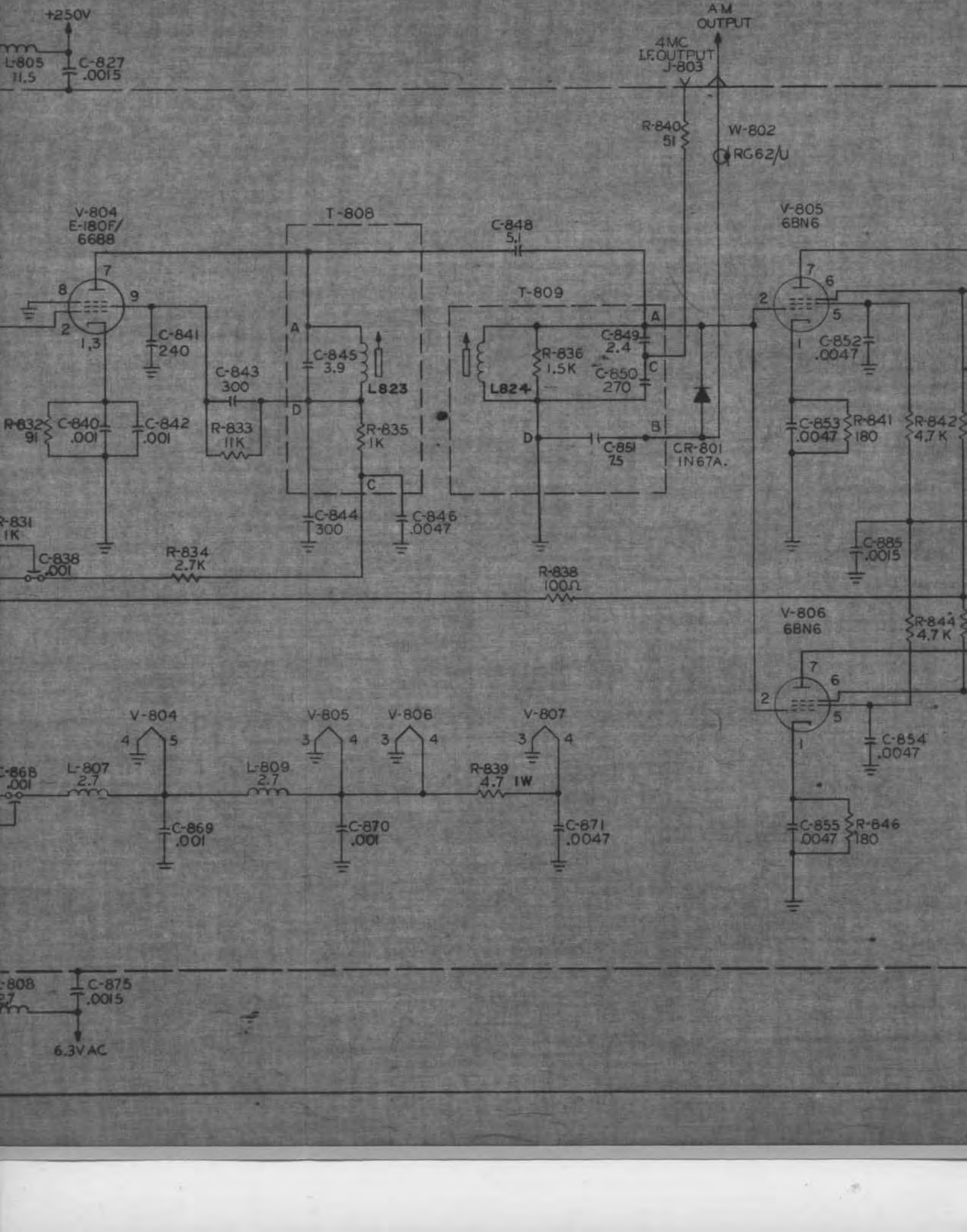
1. CAPACITOR VALUES LESS THAN ONE ARE IN MICROFARADS, VALUES GREATER THAN ONE ARE IN MICROMICROFARADS.
2. RESISTOR VALUES ARE IN OHMS, K=1000, M=1,000,000
3. INDUCTANCE VALUES ARE IN MICROHENRIES.

R10-635

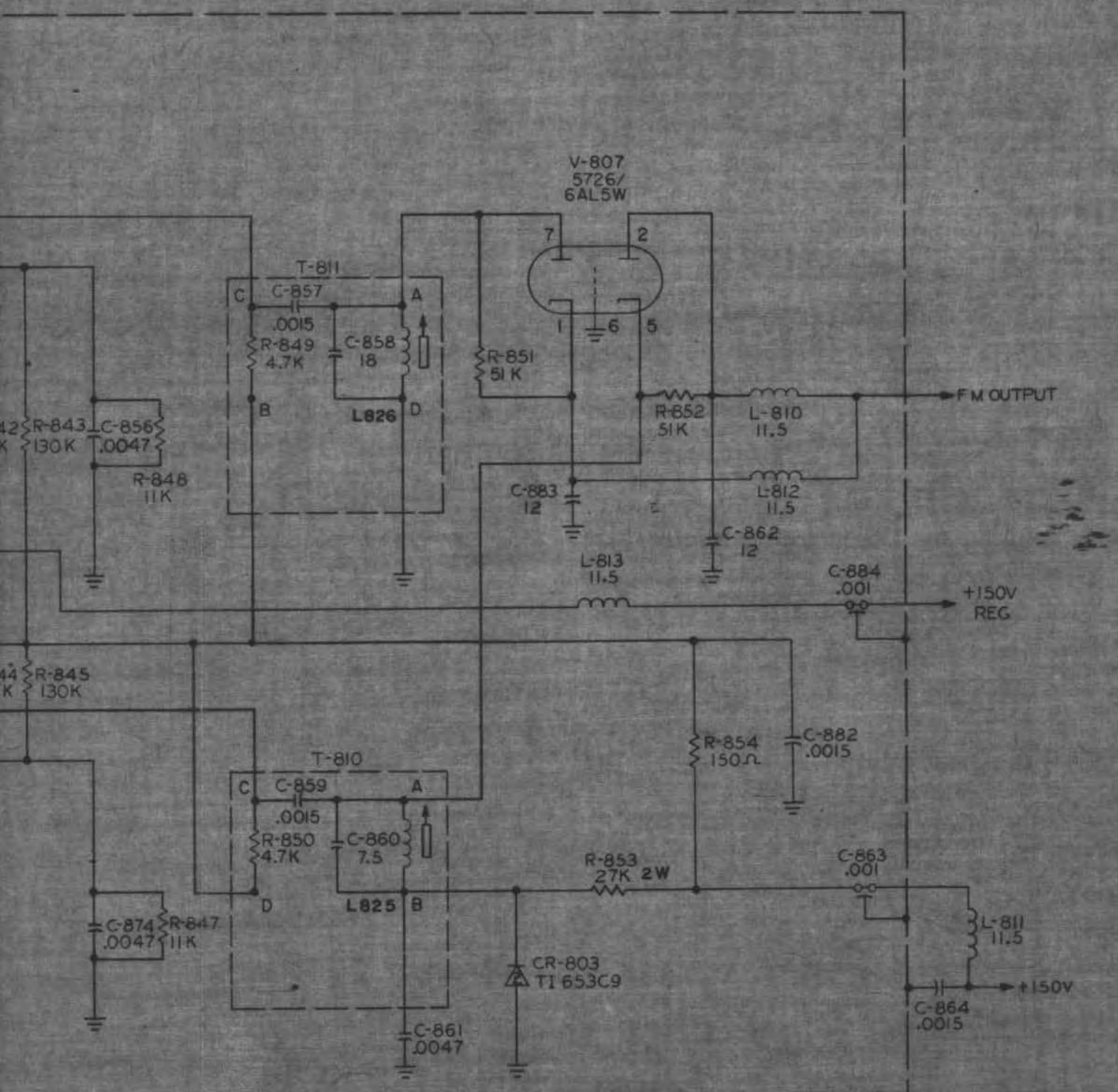

J-804
TO 10KC
I.F. INPUT
C-886
6.8
C-801
8.2
P-801
TO 300KC
I.F. INPUT
W-801
V-801
E-180F/
6688
T-802
C-809
12
T-801
A
C
C-802
4.7
R-802
910
C-803
6.2
L816
J-801
4MC I.F. INPUT
C-804
39
D
B
R-801
51
J-802
FDU OUTPUT
R-803
100K
R-804
75
C-807
.0047
R-805
20
C-805
240
C-806
300
R-806
39K
C-808
.0047
C-879
.0015
R-807
10K
A
C-810
3.9
L817
D
R-808
1K
C
C-811
300
C-877
.001
L-801
11.5
C-876
.0045
MAN GAIN


T-802
C-809 12
C-813 12
T-803
V-802 E-180F/ 6688
T-804
C-820 12
C-824 12
T-805
A
B
C
D
C-810 3.9
L817
C-814 3.9
R-810 1.1K
L818
R-837 10
2
1,3
7
8
9
C-817 240
C-819 300
C-821 3.9
L819
C-825 3.9
R-821 1.1K
L820
R-808 1K
R-811 100K
C-816 .001
R-814 20
R-819 1K
R-820 100K
C-847 .001
C-811 300
C-812 .0047
C-815 .0047
R-813 75
C-818 .0047
R-815 39K
C-822 300
C-823 .0047
C-826 .0047
R-807 10K
R-812 100
R-816 10K
R-809 1K
R-817 1K
R-818 20M
C-880 .0015
C-873 .001
AG


+250V
L-805
11.5
C-827
.0015
C-878
.001
V-803
E-180F/
6688
T-806
C-835
15
V-804
E-180F/
6688
C-824
12
C-832
12
T-805
T-807
C-825
3.9
R-821
1.1K
L820
R-855
10
C-829
240
C-831
300
C-833
3.9
L821
C-836
3.9
R-828
820
L822
R-824
20
R-827
1K
R-832
91
C-840
.001
R-820
100K
C-847
.001
R-823
75
C-830
.0047
R-826
39K
C-834
300
C-837
.0047
R-822
10K
C-826
.0047
R-831
1K
C-838
.001
R-825
100
R-829
100
C-839
.001
R-830
1K
C-881
.0015
CR-802
IN483
V-801
V-802
V-803
L-802
2.7
L-803
2.7
L-804
2.7
C-868
.001
L-807
2.7
C-865
.001
C-866
.001
C-867
.001
L-806
2.7
C-872
.001
C-873
.001
C-828
1 μFD
L-808
2.7
C-87
.0015
AGC
6.3VAC

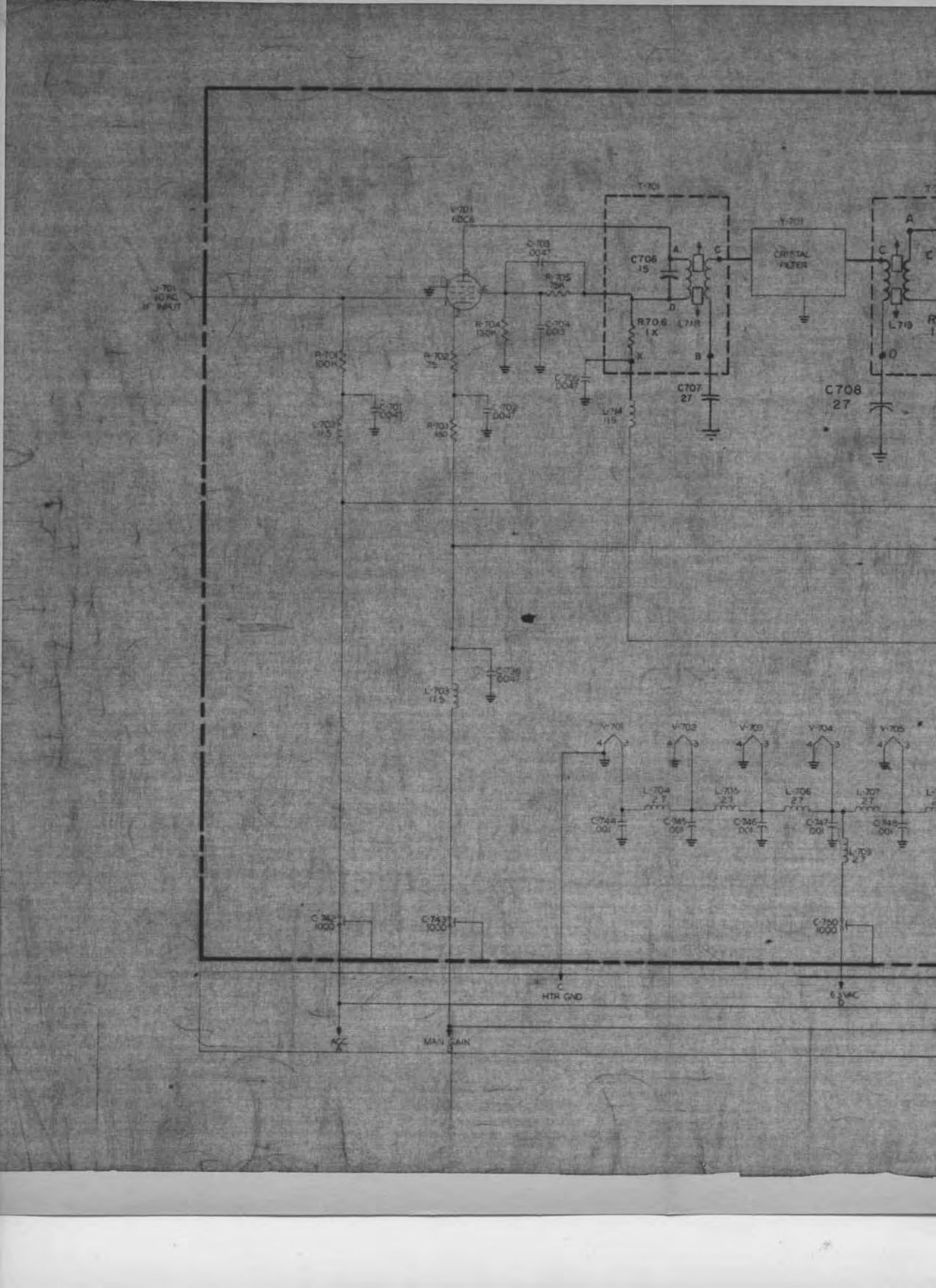

+250V
L-805 11.5
C-827 .0015
AM OUTPUT
4MC I.F. OUTPUT J-803
R-840 51
W-802 RG62/U
V-804 E-180F/ 6688
T-808
C-848 5.1
T-809
V-805 6BN6
C-841 240
C-843 300
C-845 3.9
L823
L824
R-836 1.5K
C-849 2.4
C-850 270
C-852 .0047
C-853 .0047
R-841 180
R-842 4.7K
R-832 91
C-840 .001
C-842 .001
R-833 11K
R-835 1K
C-851 75
CR-801 IN67A.
C-844 300
C-846 .0047
C-885 .0015
R-831 1K
C-838 .001
R-834 2.7K
R-838 100Ω
V-806 6BN6
R-844 4.7K
C-854 .0047
V-804
V-805
V-806
V-807
C-868 .001
L-807 2.7
L-809 2.7
R-839 4.7 1W
C-869 .001
C-870 .001
C-871 .0047
C-855 .0047
R-846 180
C-808
C-875 .0015
6.3VAC

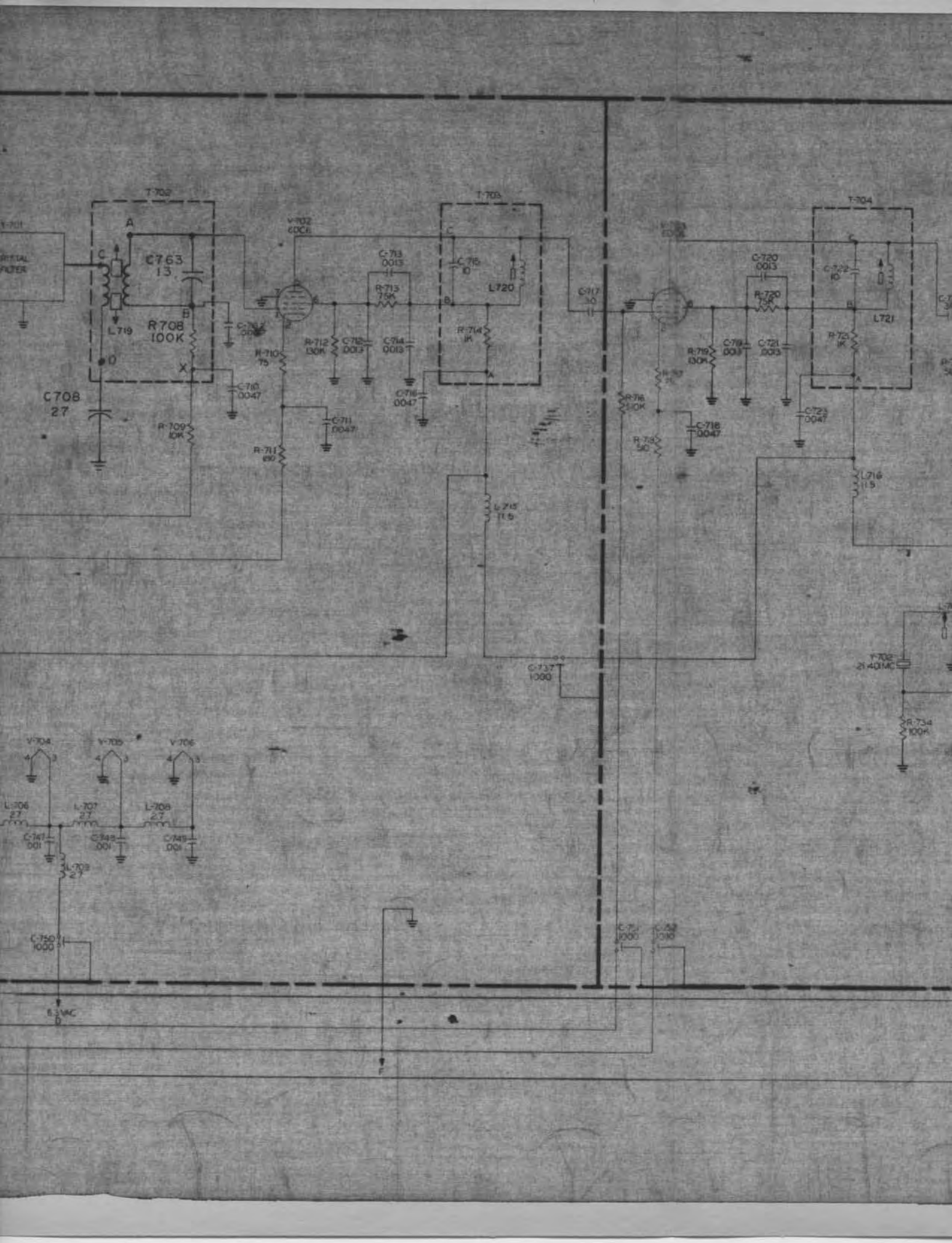
NOTE: UNLESS OTHERWISE INDICATED
1. CAPACITOR VALUES LESS THAN ONE ARE IN MICROFARADS, VALUES GREATER THAN ONE ARE IN MICROMICROFARADS.
2. RESISTOR VALUES ARE IN OHMS, K=1000, M=1,000,000
3. INDUCTANCE VALUES ARE IN MICROHENRIES.

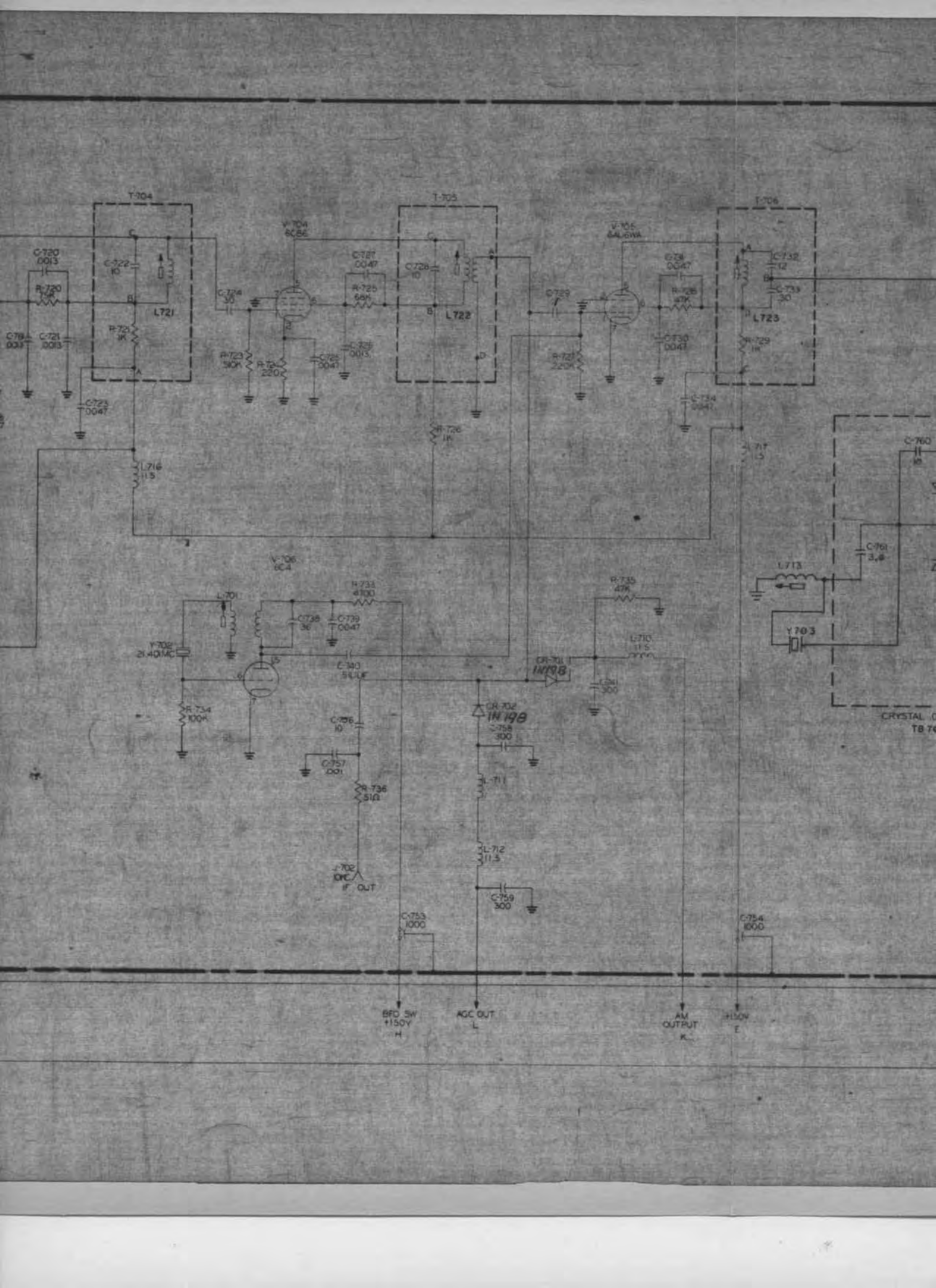


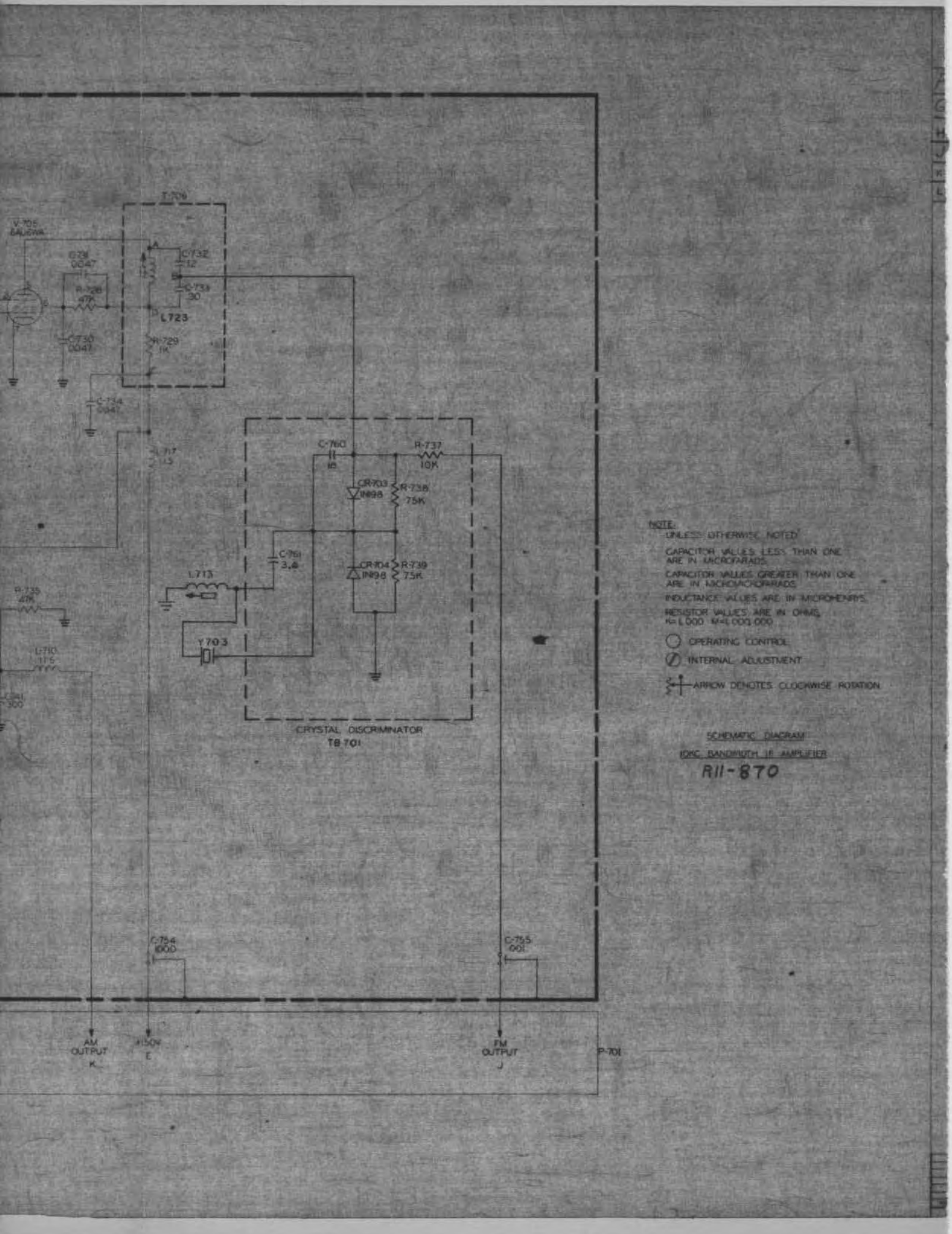
SCHEMATIC, 4 MC BANDWIDTH I.F. AMPLIFIER

R10-668


V-701
6DC8
C-703
.004
R-705
33K
C706
15
CRYSTAL
FILTER
R706
1K
L718
L719
C707
27
C708
27
R-704
130K
C-704
.003
R-701
100K
R-702
75
C-701
.004
C-702
.004
R-703
150
L-703
115
C-705
.004
L-714
115
C-739
.004
V-701
V-702
V-703
V-704
V-705
L-704
2.7
L-705
2.7
L-706
2.7
L-707
2.7
C-744
.001
C-745
.001
C-746
.001
C-747
.001
C-748
.001
L-709
2.7
C-742
1000
C-743
1000
C-750
1000
HTR GND
6.3 VAC
AGC
MAN GAIN


T-702
T-703
T-704
V-702
6DC8
C763
13
R708
100K
L719
C708
27
C-710
.0047
R-709
10K
R-710
75
R-711
690
C-711
.0047
C-712
.0013
C-713
.0013
C-714
.0013
R-712
130K
R-713
75K
C-715
10
L720
R-714
1K
C-716
.0047
C-717
10
C-720
.0013
R-720
75K
C-722
10
L721
R-719
130K
C-719
.003
C-721
.003
R-721
1K
R-716
130K
R-718
150
C-718
.0047
C-723
.0047
L716
11.5
L715
11.5
C-737
1000
T-702
21.401MC
R-734
100K
V-704
V-705
V-706
L-706
27
L-707
27
L-708
27
C-741
.001
C-743
.001
C-745
.001
L-703
27
C-750
1000
B+ VAC
D
F


T-704
T-705
T-706
V-704 6CB6
V-705 6AU6WA
V-706 6C4
L721
L722
L723
C-720 .0013
C-722 10
C-724 30
C-727 .0047
C-728 10
C-729 1
C-731 .0047
C-732 12
C-733 30
C-734 .0047
C-718 .033
C-721 .0013
C-723 .0047
C-725 .0047
C-726 .0013
C-730 .0047
R-720 47K
R-721 1K
R-723 390K
R-724 220
R-725 68K
R-726 1K
R-727 220K
R-728 47K
R-729 1K
L716 11.5
L717 1.5
L701
C-738 36
C-739 .0047
R-733 47.00
R-734 100K
R-735 47K
Y-702 21.401MC
E-700 5 VOLT
CR-701 IN198
CR-702 IN198
C-736 10
C-737 .001
C-758 300
C-761 3.6
L713
Y703
L710 11.5
L711
L712 11.5
C-759 300
C-760 10
R-736 51Ω
J-702 IFC IF OUT
C-753 1000
C-754 1000
BFO SW +150V H
AGC OUT L
AM OUTPUT K
+150V E
CRYSTAL
TB-76



NOTE:
UNLESS OTHERWISE NOTED

CAPACITOR VALUES LESS THAN ONE ARE IN MICROFARADS

CAPACITOR VALUES GREATER THAN ONE ARE IN MICROMICROFARADS

INDUCTANCE VALUES ARE IN MICROHENRYS

RESISTOR VALUES ARE IN OHMS
K=1,000 M=1,000,000

○ OPERATING CONTROL

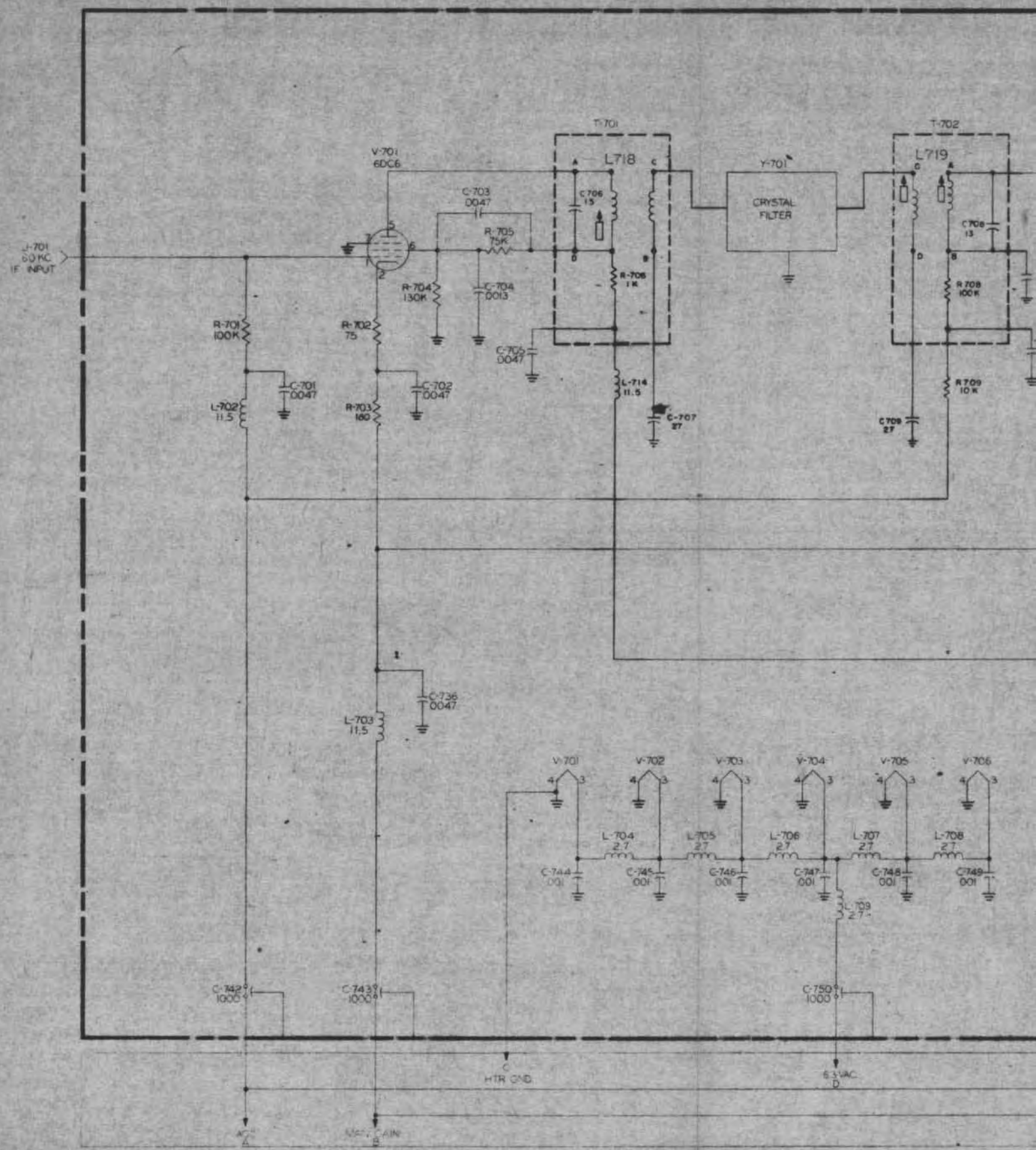
⊘ INTERNAL ADJUSTMENT

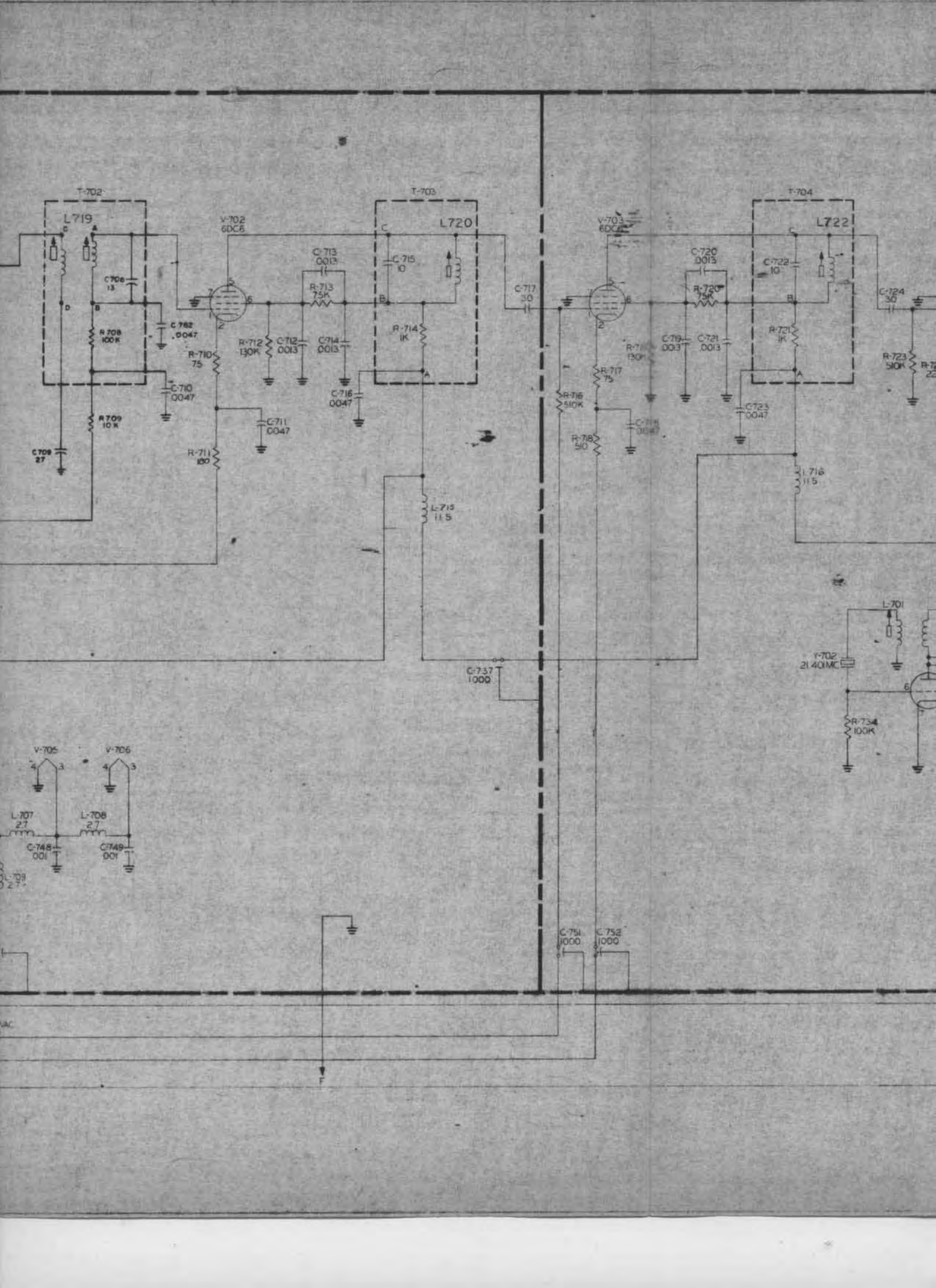
↻ ARROW DENOTES CLOCKWISE ROTATION

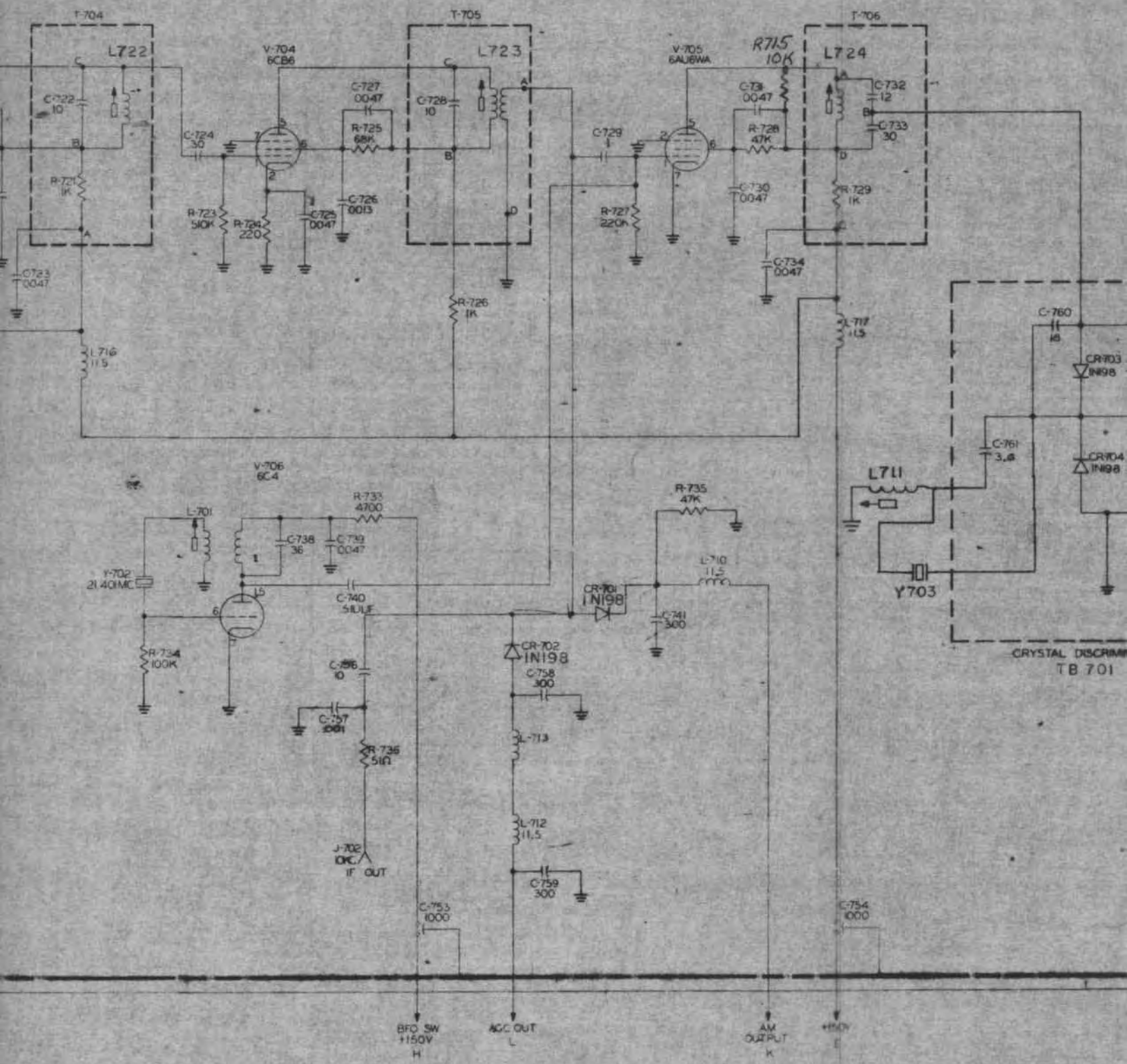
SCHEMATIC DIAGRAM

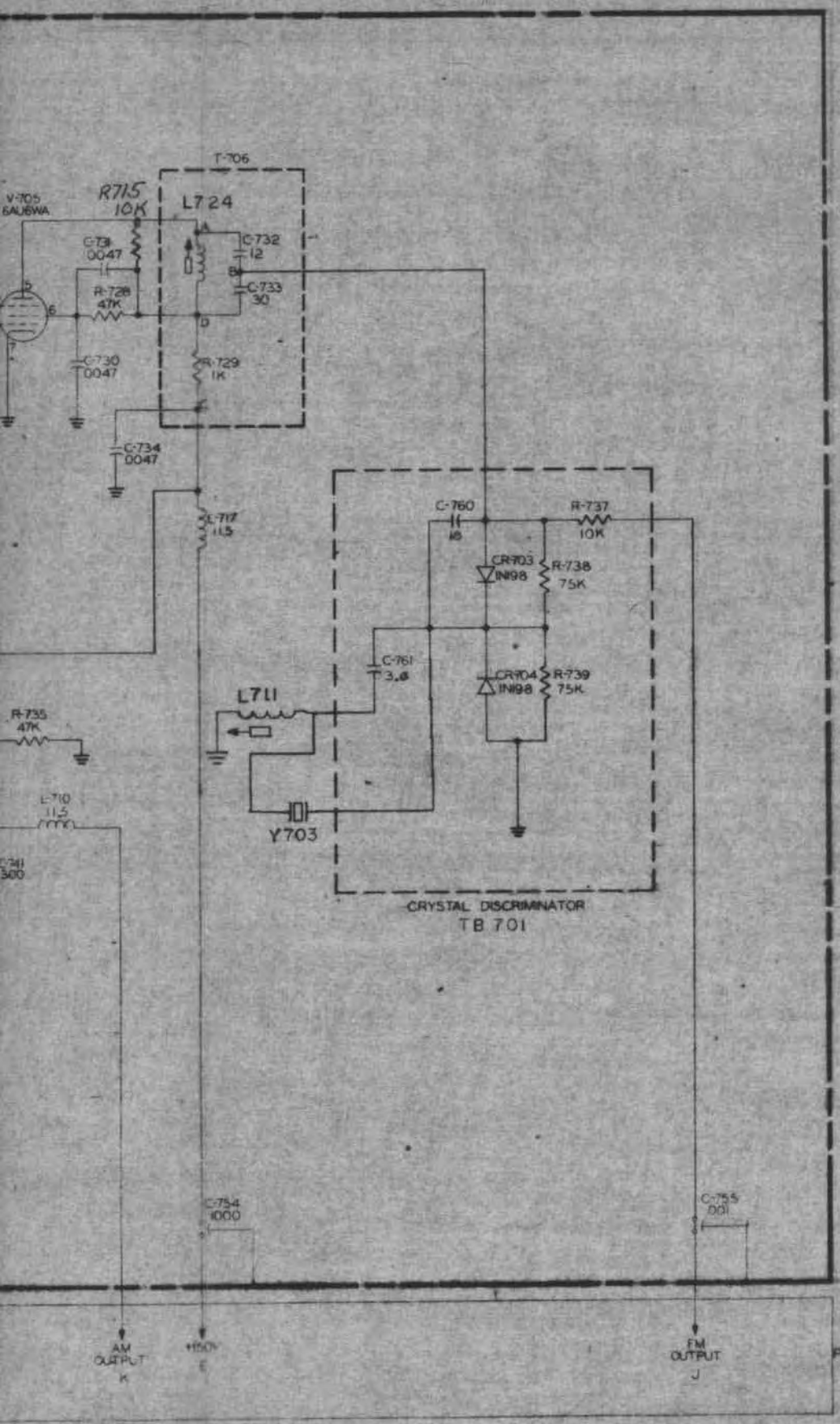
10KC BANDWIDTH IF AMPLIFIER

R11-870


J-701
60 KC
IF INPUT
V-701
6DC6
T-701
L718
T-702
L719
Y-701
CRYSTAL
FILTER
C-703
0047
R-705
75K
R-704
130K
C-704
0013
R-706
1K
C-705
0047
C-706
15
C-707
27
C-708
13
R-708
100K
R-709
10K
C-709
27
L-714
11.5
R-701
100K
R-702
75
R-703
100
C-701
0047
C-702
0047
L-702
11.5
C-736
0047
L-703
11.5
V-701
V-702
V-703
V-704
V-705
V-706
L-704
2.7
L-705
2.7
L-706
2.7
L-707
2.7
L-708
2.7
L-709
2.7
C-744
001
C-745
001
C-746
001
C-747
001
C-748
001
C-749
001
C-742
1000
C-743
1000
C-750
1000
C
HTR GND
6.3 VAC
D
A
B


T-702
L719
V-702
6DC6
T-703
L720
T-704
L722
V-703
6DC6
C-713
.0013
C-715
10
C-720
.0013
C-722
10
C-724
30
C-717
30
R-713
75K
R-720
75K
C 706
13
C 708
.0047
R 708
100K
R-712
130K
C-712
.0013
C-714
.0013
R-714
1K
C-719
.003
C-721
.0013
R-721
1K
R-723
510K
R-710
75
C-710
.0047
C-716
.0047
R-717
75
R-716
510K
C-723
.0047
R 709
10K
C 709
27
C-711
.0047
R-711
130
R-718
510
L-716
11.5
L-715
11.5
C-737
1000
L-701
Y-702
21.401MC
R-734
100K
V-705
V-706
L-707
2.7
L-708
2.7
C-748
.001
C-749
.001
C-751
1000
C-752
1000
VAC


T-704
L722
C-722 10
R-721 1K
C-723 0047
L716 11.5
V-704 6CB6
C-724 30
R-723 510K
R-724 220
C-725 0047
C-727 0047
R-725 68K
C-726 0013
T-705
L723
C-728 10
R-726 1K
C-729 1
R-727 220K
V-705 6AU8WA
R715 10K
C-730 0047
C-731 0047
R-728 47K
C-734 0047
T-706
L724
C-732 12
C-733 30
R-729 1K
L717 11.5
C-760 18
CR-703 IN198
C-761 3.8
CR-704 IN198
L711
Y703
CRYSTAL DISCRIM
TB 701
V-706 6C4
L-701
R-733 4700
C-738 36
C-739 0047
Y-702 21.401MC
C-740 5 MMF
R-734 100K
C-756 10
C-757 .001
R-735 51Ω
J-702 IMC IF OUT
CR-701 IN198
R-735 47K
L-710 11.5
C-741 300
CR-702 IN198
C-758 300
L-713
L-712 11.5
C-759 300
C-753 1000
C-754 1000
BFO SW +150V H
AGC OUT L
AM OUTPUT K
+150V E



NOTE:
UNLESS OTHERWISE NOTED

CAPACITOR VALUES LESS THAN ONE ARE IN MICROFARADS

CAPACITOR VALUES GREATER THAN ONE ARE IN MICROMICROFARADS

INDUCTANCE VALUES ARE IN MICROHENRYS

RESISTOR VALUES ARE IN OHMS
K=1,000 M=1,000,000

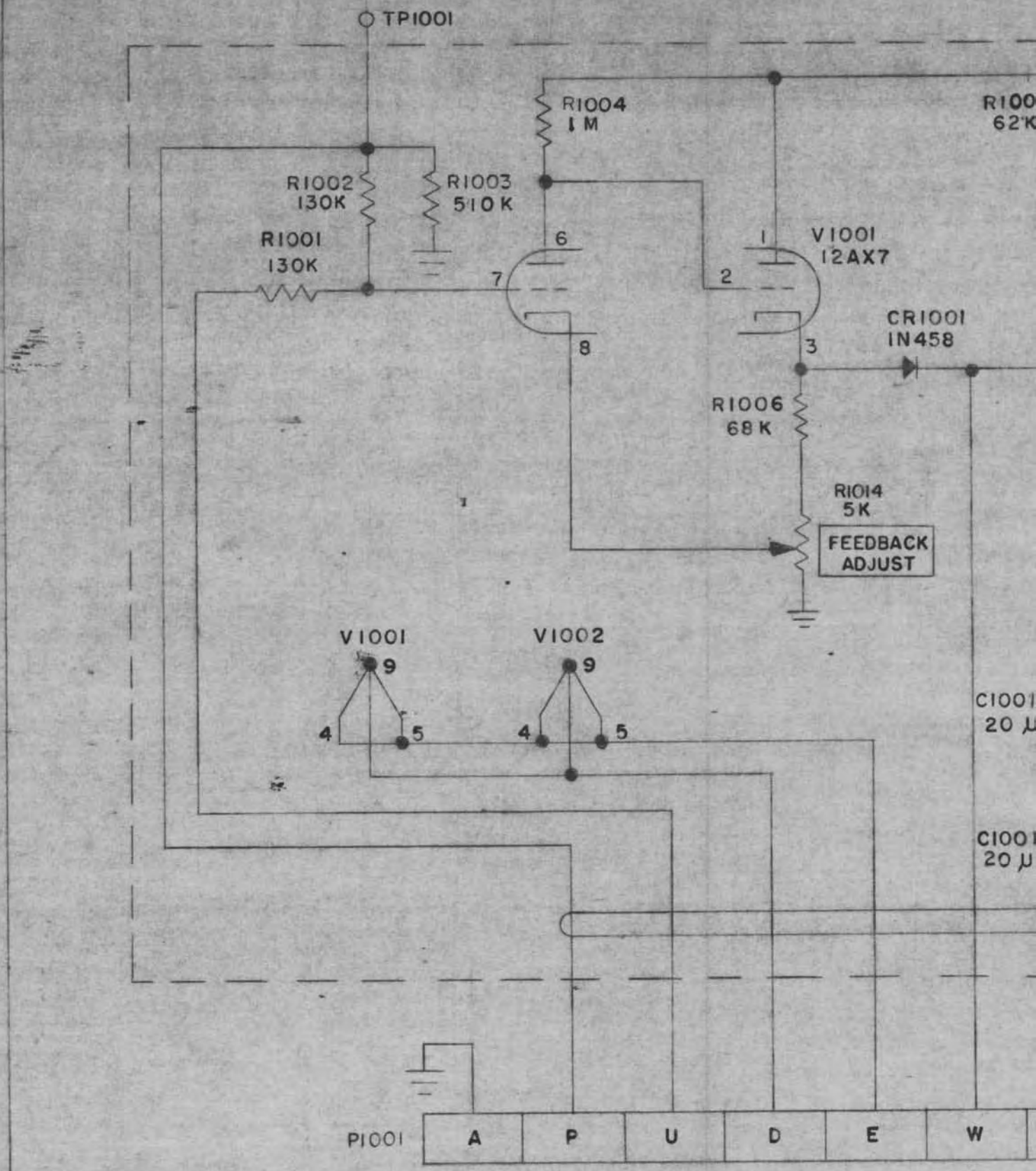
○ OPERATING CONTROL

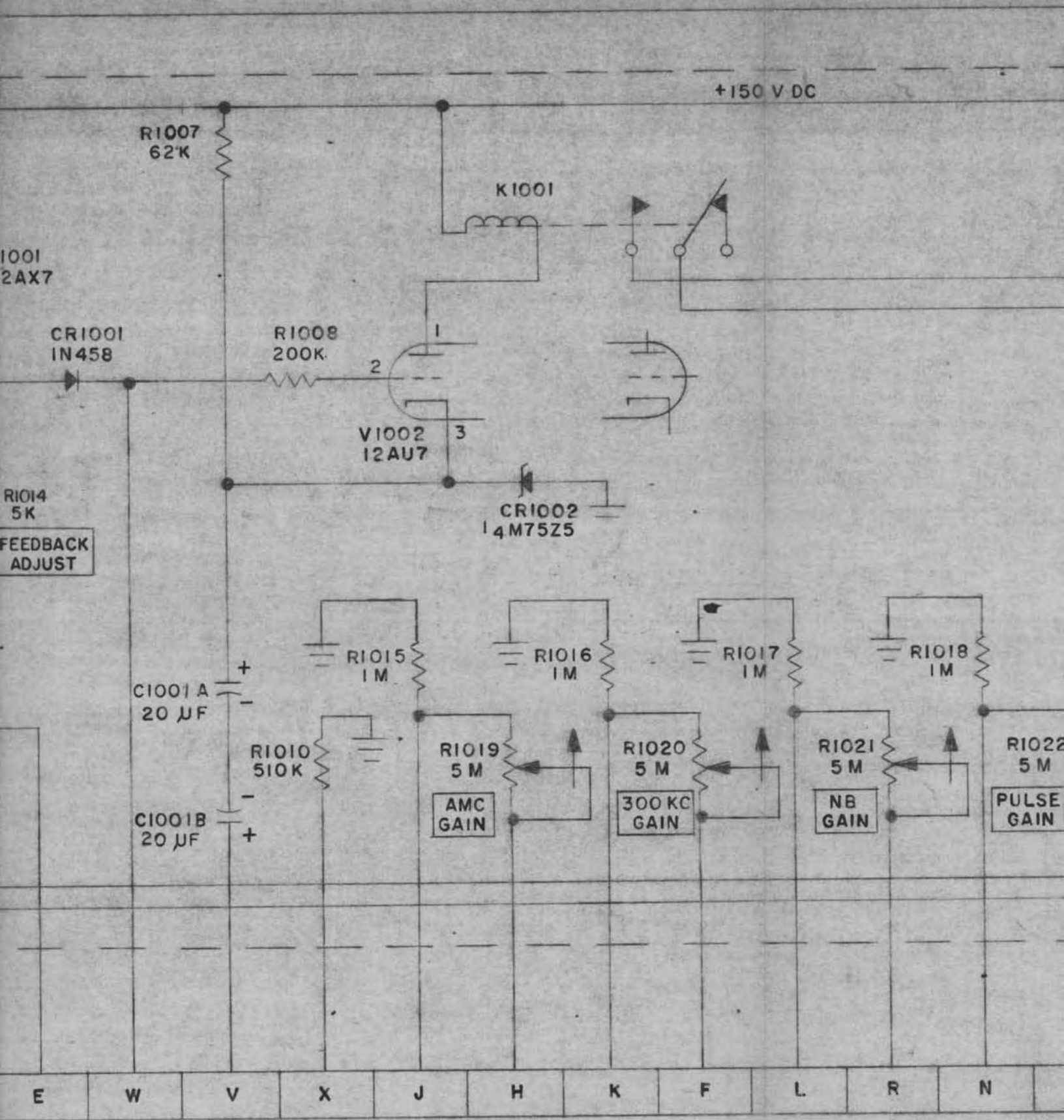
⊘ INTERNAL ADJUSTMENT

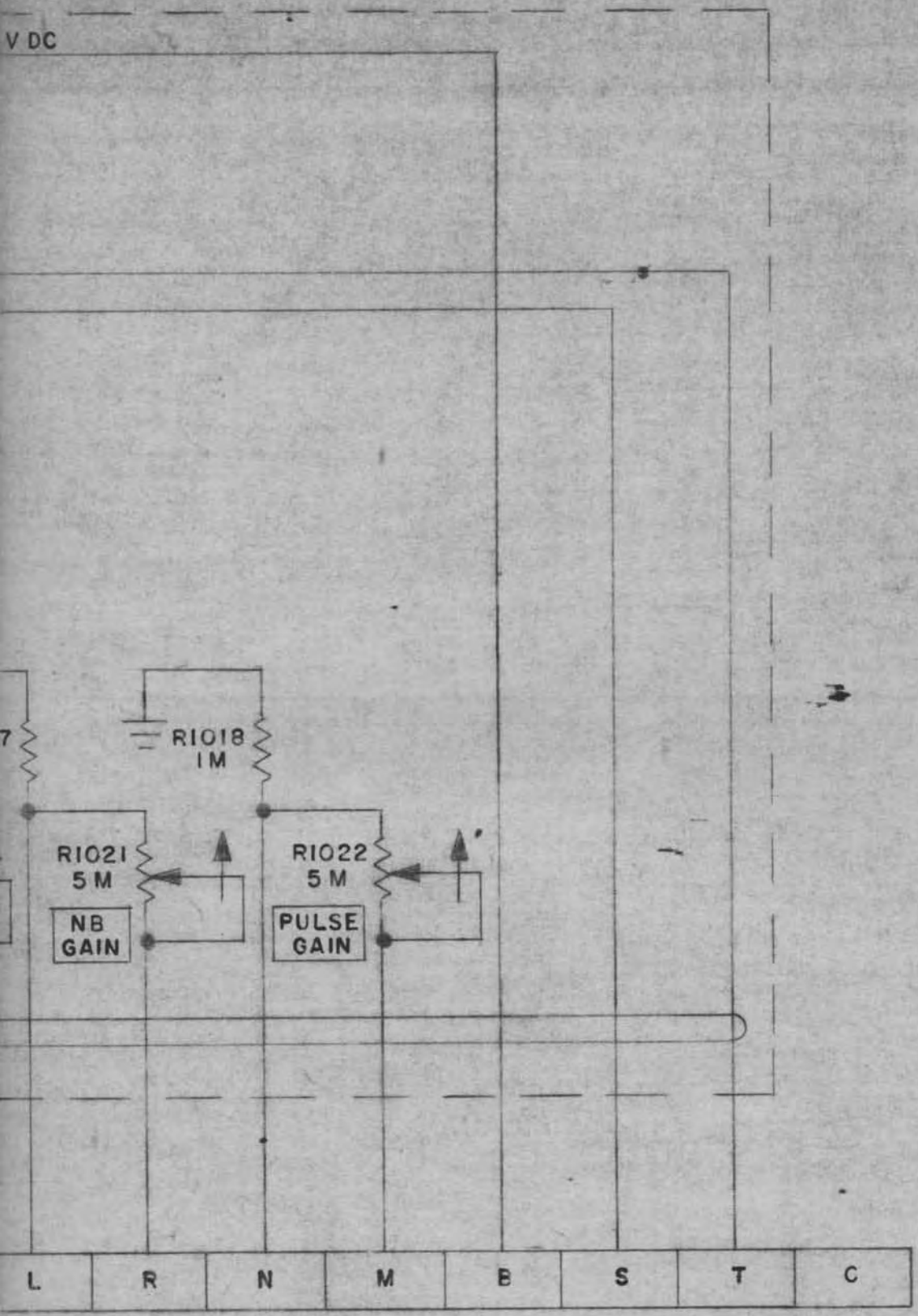
ARROW DENOTES CLOCKWISE ROTATION

SCHEMATIC DIAGRAM
LOW BANDWIDTH IF AMPLIFIER

R12-408


TP1001
R1004
1 M
R100
62K
R1002
130K
R1003
510K
R1001
130K
6
7
8
1
2
V1001
12AX7
CR1001
IN458
3
R1006
68 K
R1014
5K
FEEDBACK
ADJUST
V1001
V1002
9
4
5
9
4
5
C1001
20 µ
C100
20 µ
P1001
A
P
U
D
E
W


+150 V DC
R1007
62K
K1001
1001
2AX7
CR1001
IN458
R1008
200K
1
2
3
V1002
12AU7
R1014
5K
FEEDBACK
ADJUST
CR1002
1 4M75Z5
R1015
1M
R1016
1M
R1017
1M
R1018
1M
C1001A
20 µF
R1010
510K
R1019
5M
AMC
GAIN
R1020
5M
300 KC
GAIN
R1021
5M
NB
GAIN
R1022
5M
PULSE
GAIN
C1001B
20 µF
E
W
V
X
J
H
K
F
L
R
N



NOTES:

UNLESS OTHERWISE INDI

CAPACITOR VALUES LE

CAPACITOR VALUES GR

RESISTOR VALUES AR

ARROW DENOTES

NOTES:

UNLESS OTHERWISE INDICATED:

CAPACITOR VALUES LESS THAN ONE ARE IN MICROFARADS.

CAPACITOR VALUES GREATER THAN ONE ARE IN MICROMICROFARADS.

RESISTOR VALUES ARE IN OHMS K = 1000, M = 1000000

ARROW DENOTES CLOCKWISE ROTATION

SCHEMATIC,

CARRIER OPERATED RELAY

R15-702