INSTRUCTION MANUAL

MULTIPLE BANDWIDTH
TELEMETRY RECEIVERS
MODELS 1455, 1455A, 1456A, AND 1456BS

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RHODES-GROOS LABORATORIES, INC.
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200630

Vitro ELECTRONICS
A DIVISION OF VITRO CORPORATION OF AMERICA
919 JESUP-BLAIR DRIVE • SILVER SPRING, MARYLAND

PRODUCERS OF NEMS • CLARKE EQUIPMENT

Courtesy of http://BlackRadios.terryo.org

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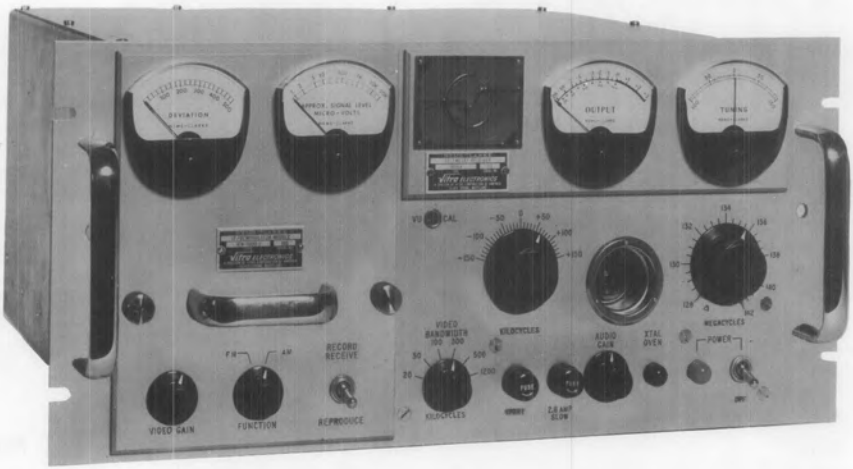

Figure 1. Receiver and IFM Demodulator Module, Front View

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SECTION 1. GENERAL DESCRIPTION

ELECTRICAL CHARACTERISTICS

The Multiple Bandwidth Telemetry Receivers are double conversion superheterodynes; the 1455 and 1455A have a frequency range of 215 to 260 mc; the 1456A and 1456BS have a frequency range of 128 to 142 mc. The multiple bandwidth feature is achieved by using plug in IF Demodulator Modules (IFM) which are available in several bandwidths ranging from 30 kc to 1.5 mc. Additional features of these receivers include: a built in VFO (variable frequency oscillator); 5 mc predetection recording output and playback input; output jacks for a signal strength recorder; SDU (spectrum display unit); frequency monitor; front panel VU and tuning meters; and a monitor speaker. The VFO is automatically activated whenever the crystal oven assembly is removed from the front panel socket. Performance specifications for the receiver are listed in Table 1. Semiconductor and tube complement are listed in Table 2. IFM-10, 30, 50, 100, 200, 300, 500, 750, 1000, 1500 single bandwidth IF Demodulator Modules and IFM-30/50, 50/100, 150/300, 300/500, 750/1500, dual bandwidth IF Demodulator Modules are available for use with Models 1455, 1455A, 1456A, and 1456BS Multiple Bandwidth Telemetry Receivers. These plug in modules (IFM) determine the operating bandwidth of the receivers and provide the necessary versatility so that any type telemetry signal can be received. The IFM's contain the 5 mc IF amplifiers; limiter stages; and demodulators for the receiver. IFM-30, 50, 100, 200, 300, and 500 each contain three demodulators: AM envelope detector; Foster-Seeley FM discriminator; and an FM phase lock detector. The IFM-750, 1000, and 1500 each contain an AM envelope detector and a Foster-Seeley FM discriminator. For further information on the IFM's refer to the Vitro Electronics Instruction Manual for the IFM's.

PHYSICAL CHARACTERISTICS

The receivers are 19 inches wide, 8-3/4 inches high, and 16-1/2 inches deep and are designed for mounting in a standard 19 inch rack. The front panel and chassis are constructed of aluminum. Figure 1 illustrates the front panel of the receiver with an IFM installed. Operating controls include: main tuning (MEGACYCLES), fine tuning (KILOCYCLES), VIDEO BANDWIDTH, and AUDIO GAIN. All controls and connectors are clearly designated; all input and output connections are made at the chassis rear apron. The main chassis contains the power supply audio and video stages, RF section and 1st IF section. The plug in IFM contains the 2nd IF amplifiers and the demodulators. Operating controls on the IFM front panel include: VIDEO GAIN, FUNCTION, and RECORD RECEIVE-REPRODUCE. The panel mounted meters indicate the approximate signal strength and deviation of the received signal. All IFM connections are made by an internal self aligning jack and plug on the rear apron as the IFM is inserted into the receiver chassis. Operating power for the IFM is supplied from the receiver chassis.

Courtesy of http://BlackRadios.terryo.org

Table 1. Performance Specifications

	Models 1455, 1455A	Models 1456A, 1456BS
Type of Receiver	Double conversion, superheterodyne	Double conversion, superheterodyne
Frequency Range	215 to 260 mc	128 to 142 mc
Noise Figure	Less than 8 db	Less than 6 db
IF Rejection	60 db	60 db
Image Rejection	48 db	48 db
1st Local Oscillator Stability:		
Crystal with oven	± 0.002%	± 0.002%
Crystal without oven	± 0.005%	± 0.005%
VFO	± 0.005% per degree Centrigrade	± 0.005% per degree Centrigrade
1st IF Frequency	30 mc	30 mc
1st IF Bandwidth	2.2 mc (approx)	2.2 mc (approx)
2nd Local Oscillator	Tunable, ± 150 kc	Tunable, ± 150 kc
2nd IF Frequency	5 mc	5 mc
2nd IF Bandwidth	Determined by plug in module	Determined by plug in module
Input Impedance	50 ohms (nominal)	50 ohms (nominal)
Outputs:		
Video	1455: 5 cps to 1.2 mc ± 3 db less than 100 ohm source impedance 1455A: 1 cps (sq wave) (15% tilt) to 1.2 mc less than 100 ohm source impedance	1456A: 5 cps to 1.2 mc ± 3 db less than 100 ohm source impedance 1456BS: 1 cps (sq wave) to 1.2 mc ± 3 db less than 100 ohm source impedance

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Table 1. Performance Specifications (cont)

	Models 1455, 1455A	Models 1456A, 1456BS
Signal Strength	0 to -11 vdc (approx) 500,000 ohm minimum load impedance	0 to -11 vdc (approx) 500,000 ohm minimum load impedance
Frequency Monitor	30 mc (for Nems-Clarke) 1402 Frequency Monitor	30 mc (for Nems-Clarke) 1402 Frequency Monitor
Spectrum Display	30 mc (for Nems-Clarke) SDU-200-3 Spectrum Display Unit	30 mc (for Nems-Clarke) SDU-200-3 Spectrum Display Unit
Predetection Recording	5 mc, 1 volt peak-to-peak (nominal) with 100 uv input signal, 200 ohms source impedance	5 mc, 1 volt peak-to-peak (nominal) with 100 uv input signal, 200 ohms source impedance
Video Output Level	2 volts (rms) (into 300 ohms, 3000 uuf)	2 volts (rms) (into 300 ohms, 3000 uuf)
Predetection Recording Input	5 mc, 50 mv for 40 db s/n ratio, less than 25 ohms impedance	5 mc, 50 mv for 40 db s/n ratio, less than 25 ohms impedance
Video Bandwidth Filter	6 db/octave rolloff (See schematic diagrams)	6 db/octave rolloff (See schematic diagrams)
Power Requirements	115 vac, 60 cycles, 260 watts	115 vac, 60 cycles, 260 watts
Size	19 inches wide by 8-3/4 inches high by 16-1/2 inches deep	19 inches wide by 8-3/4 inches high by 16-1/2 inches deep
Weight	60 pounds approx	60 pounds approx

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Table 2. Semiconductor and Tube Complement

Reference Designation	Type	Function
CR101 through CR104	1N1696	B Plus Rectifier
CR105 through CR108	1N270	Bridge Rectifier, VU Meter
CR109	1N270	Rectifier, Deviation Meter
CR110	1N270	Rectifier, Deviation Meter
CR111	10M150ZR5	Voltage Regulator
CR112	1/4M150Z5	Voltage Regulator
CR113 through CR116	1N1695	B Minus Rectifier
CR117	10M120Z5	DC Coupling Unit for Models 1455A, 1456A, and 1456BS only. Not used with 1455.
V101	6AW8	Deviation Audio Amplifier
V102	12AU7	Deviation Output; Audio Output
V103	6AW8	Video Amplifier
V104	6CL6	Video Output
V105	6CL6	Video Output
V106	6CL6	Shunt Regulator
V201	417A	RF Amplifier
V202	6AK5	1st Mixer
V203	6AK5	Buffer
V204	6AK5	Doubler
V205	6AK5	Amplifier

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Table 2. Semiconductor and Tube Complement (cont)

Reference Designation	Type	Function
V206	6BZ7	1st Oscillator Tripler, Models 1455, 1455A 1st Oscillator 1st Doubler, Models 1456A, 1456BS
V207	6AU6	2nd Oscillator
V208	6AU6	Buffer
V209	6AU6	2nd Mixer
V210	6CB6	30 mc IF Amplifier
V401	7586	VFO
V402	7586	Buffer

SECTION 2. INSTALLATION

INSTALLATION PROCEDURES

MOUNTING

The receivers are designed for standard 19 inch rack mounting. Provision must be made for adequate ventilation at the rear of the chassis.

ANTENNA CONNECTION

Connect antenna to the coaxial connector J103, marked ANT INPUT at left end of chassis rear apron (see figure 2).

SIGNAL CONNECTIONS

All signal output connections are made at the chassis rear apron (see figure 2) and include: SDU OUTPUT J104 (Spectrum Display Unit), FREQ MON OUTPUT J109 (Frequency Monitor), SIGNAL STRENGTH J108, VIDEO OUTPUT J105, PRE-DETECT OUTPUT 5MC J106, VIDEO OUTPUT (DIRECT) J110, and RECORD INPUT 5MC J107.

LINE VOLTAGE

Turn off POWER switch (down) and insert power plug into 115 vac, 60 cps receptacle.

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Figure 2. Receiver Chassis, Rear View

SECTION 3. THEORY OF OPERATION

BLOCK DIAGRAM ANALYSIS

Figure 3 is a block diagram of the 1455, 1455A, 1456A, and 1456BS receivers. The RF amplifier is a grounded grid triode operating in a frequency band of 215 to 260 mc in 1455 and 1455A receivers, and in a frequency band of 128 to 142 mc in the 1456A and 1456BS receivers. Microswitch S201 in the 1st oscillator multiplier chain is operated by inserting or removing the crystal oven from the receiver front panel. When the crystal oven is in place the receiver is crystal controlled. With the oven removed, the receiver 1st oscillator is used as a VFO (variable frequency oscillator). The SDU (spectrum display unit) and frequency monitor outputs are developed in the plate circuit of the 1st mixer stage. The difference frequency from the mixer passes through the 30 mc IF amplifier to the 2nd mixer. The fine tuning control on the second oscillator (marked KILOCYCLES on the front panel) will vary the frequency of the oscillator ±150 kc from the normal 25 mc. The 5 mc difference frequency signal from the 2nd mixer is connected to the plug in IFM (IF Demodulator Module). After demodulation in the IFM, the video and deviation audio signals are connected back to the main receiver chassis. The deviation audio signal is amplified and applied to a cathode follower and then back to the deviation

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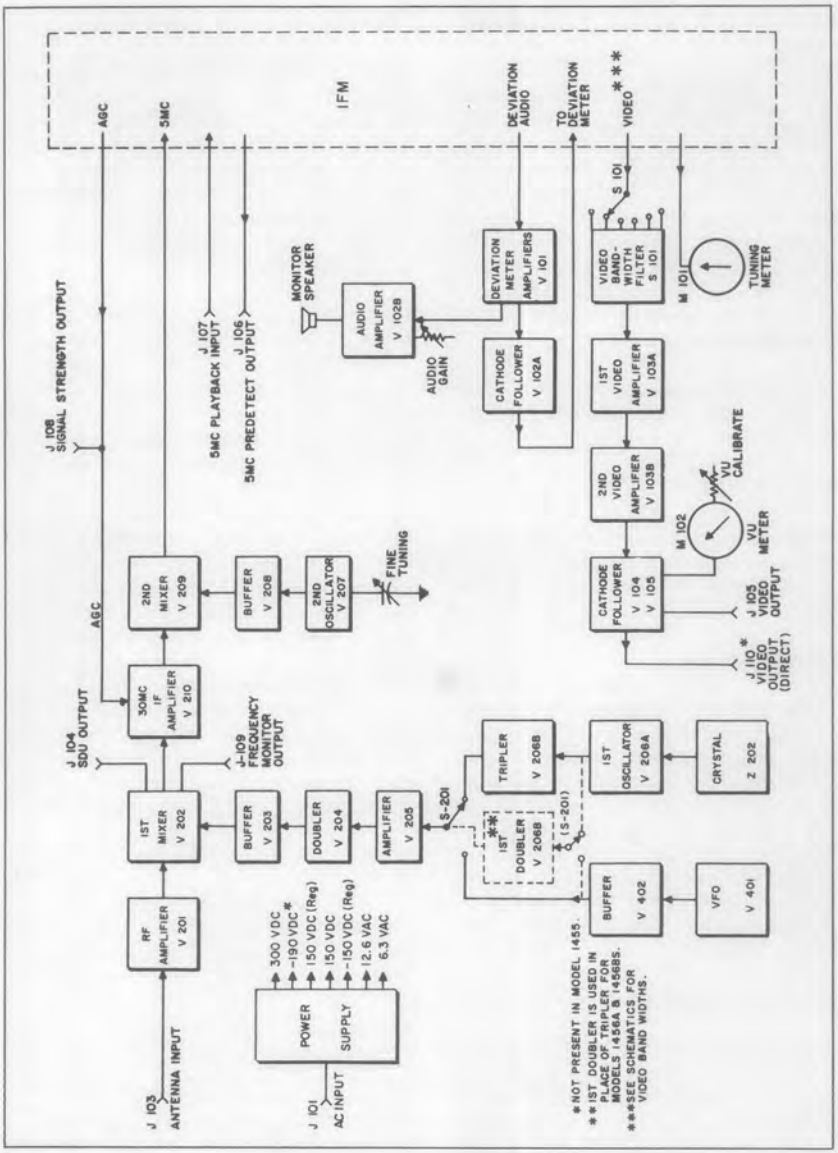

Figure 3. Model 1455, 1455A, 1456A, and 1456BS Receivers, Block Diagram

Courtesy of http://BlackRadios.terryo.org

meter on the IFM chassis. A second signal from the deviation audio amplifier drives an audio stage and monitor speaker. The video output signal from the IFM passes through an adjustable low pass filter and two amplifier stages to a cathode follower. One output from the cathode follower drives the VU meter; the other output is the ac coupled video output present at J105. In the 1455A, 1456A, and 1456BS receivers, a direct coupled video output is available at J110. The receiver chassis power supply provides all operating voltages for the receiver and the IFM.

For IFM theory of operation, refer to Vitro Electronics Instruction Manual for the IFM's.

DETAILED THEORY

Notations on the left side of the column on the following pages indicate which receiver the theory applies to. Refer to schematic diagrams.

RF AMPLIFIER

ALL RF Amplifier V102 uses a 417A triode in a grounded grid circuit. Inductor L201 is connected across the input to provide a 50 ohm input impedance. The input signal is applied to J103 and coupled to the cathode of V201 by capacitor C201. A doubled tuned bandpass circuit is used to couple the plate of RF amplifier V201 to the grid of mixer V202. This circuit is inductively tuned by L204A and L204B. RF tracking is adjusted by C208.

FIRST LOCAL OSCILLATOR

ALL Switch S201 selects one of two networks for the first local oscillator. One network is a crystal oscillator followed by an amplifier multiplier circuit; the other network is a variable frequency oscillator, VFO followed by an amplifier multiplier circuit. When using the crystal oscillator network, V206 is operated as a modified Butler oscillator. Crystal Z201 serves as the frequency selective feedback element between the cathode circuits of oscillator V206A, and first multiplier V206B. When the crystal oven is removed from the receiver, microswitch S201 applies B plus to variable frequency oscillator V401, and VFO buffer V402.

1455 The overtone crystals (crystal
1455A ovens) fundamental frequency ranges from 40.83 mc to 48.33 mc. The frequency of 1st oscillator V206B is tripled by tuning the plate circuit to three times the crystal oven frequency. Variable inductors L219 and L235, form the plate circuit of V206B. When used the VFO operates between 122 mc and 145 mc; its frequency is varied by L402; low end tracking is adjusted by C403. The output of VFO oscillator V401 is developed across the parallel combination of C402 and C412, and is directly coupled to the cathode of buffer V402. V402 operates as a grounded grid amplifier and isolates the VFO oscillator from any effects produced by other tubes. The output of V402 is applied through C238 to the cathode of V206B which functions as an amplifier instead of a tripler stage when the VFO is operating.

1456A The fundamental frequency of the
1456BS overtone crystals (crystal ovens) range from 37.75 mc to 43.00 mc. The tuned plate circuit of V206B doubles the crystal frequency. Variable inductors L218, L219 and L235 form the plate load for V206B. When the VFO is used it operates between 37.75 mc and 43 mc. The VFO frequency is varied by L401. High end tracking is adjusted by L402, low end tracking is adjusted by C403. The output of VFO V401 is developed across C402 and directly coupled to the cathode of V402.

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V402 operates as a grounded grid amplifier. Its output is applied to the cathode of V206A through C290. The signal is then coupled from the plate of V206A to the grid of V206B. The tuned plate circuit of V206B doubles the frequency of the oscillator signal.

AMPLIFIER AND MULTIPLIER

ALL The output of the first multiplier is coupled to amplifier V205, through a broad band tuned circuit. All the circuits of the amplifier and doubler stages up to the second buffer are broad band tuned to eliminate the necessity for ganged operation of the stages. The signal is taken from the plate load of V206B and applied to amplifier V205 through the tuned circuits consisting of L218, L219, L235, C230 and C231. The amplified output of V205 passes through a double tuned network to doubler V204. The double tuned plate circuit of V204 is tuned to twice the signal input frequency. The output of V204 is then applied to buffer V203. V203 acts as a grounded cathode amplifier. L204C tunes plate circuit of V203 (ganged to the tuned circuits of the RF amplifier and the VFO).

FIRST MIXER

ALL First mixer V202, uses a 6AK5 connected for triode operation to improve the over all noise figure of the RF section. The incoming RF signal from V201 is coupled to the mixer grid by C209. The injection signal from buffer V203 is coupled to V202 by C216. Three outputs are derived in the plate circuit of mixer V202; one output is taken from T201 through C280 to feed 30 mc IF amplifier V210; a second output is coupled through C211 to J104 (SDU OUTPUT) to drive a Spectrum Display Unit; the third mixer output is a 30 mc frequency monitoring output (J109) derived from the capacitive voltage divider consisting of C210 and C282.

30MC IF AMPLIFIER

ALL The output of mixer V202 is amplified by 30 mc IF amplifier V210. The gain of V210 is controlled by AGC voltage is applied to V210 through R251. The cathode resistor is unbypassed in order to eliminate detuning due to changes in tube input capacitances resulting from changes in bias voltage. Double tuned interstage network consisting of T207, T206, C272, C271, and C269, couples the 30 mc signal to V209. J108 (SIGNAL STRENGTH) is connected to R251 to provide a convenient connection to read the relative signal strength.

SECOND LOCAL OSCILLATOR

ALL The 2nd local oscillator consists of a 25 mc oscillator and a buffer stage. The oscillator circuit (V207) is a series fed Hartley type using a 6AU6 pentode. Variable capacitor C248 permits a ±150 kc adjustment of the second oscillator frequency so that the receiver can be precisely tuned to the incoming signal. The signal is coupled from the plate of oscillator V207 to the grid of buffer V208 by C260. T204 in the plate circuit of buffer V208 is also tuned to 25 mc. From the plate of V208 the signal is injected into the grid of V209 through capacitor C267.

SECOND MIXER

ALL V209 is a 6AU6 pentode used as the 2nd mixer. The 30 mc output of V210 is applied to the grid of V209 through C269, and combined with the oscillator frequency in V209 to produce a 5 mc difference frequency. The oscillator frequency is injected into the grid of V209 through C267. The 5 mc output signal is coupled

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from the plate of V209 through capacitor C284 to pin B of P301 to feed the IFM.

VIDEO BANDWIDTH FILTER

ALL After detection in the IFM, the video signal is applied to pin NN of P301. Resistor R138 is connected between pin NN and pin LL of P301, R138 is the cathode resistor for the last stage in the IFM. The video signal is coupled through C115 and R136 to the video bandwidth filter. The filter has a 6 db per octave rolloff, adjustable by means of switch S101. (See schematic diagrams for S101 bandwidth settings) The response of the 1455, 1455A, 1456A video amplifier under different settings of the video bandwidth switch is shown in figure 4. An improvement in signal to noise ratio can be realized if this filter is adjusted to pass only those signal components necessary for satisfactory transmission.

VIDEO AMPLIFIERS

1455 V103 operates as the 1st and 2nd video amplifier. V103A amplifies that portion of the video signal passed through the video bandwidth filter through R139. The output of V103A is coupled through C113 to the grid of 2nd video amplifier V103B. Large value (0.1 uf) coupling capacitors are used in the video amplifier to improve the low frequency response. The signal is coupled from V103B to the output stage through C112.

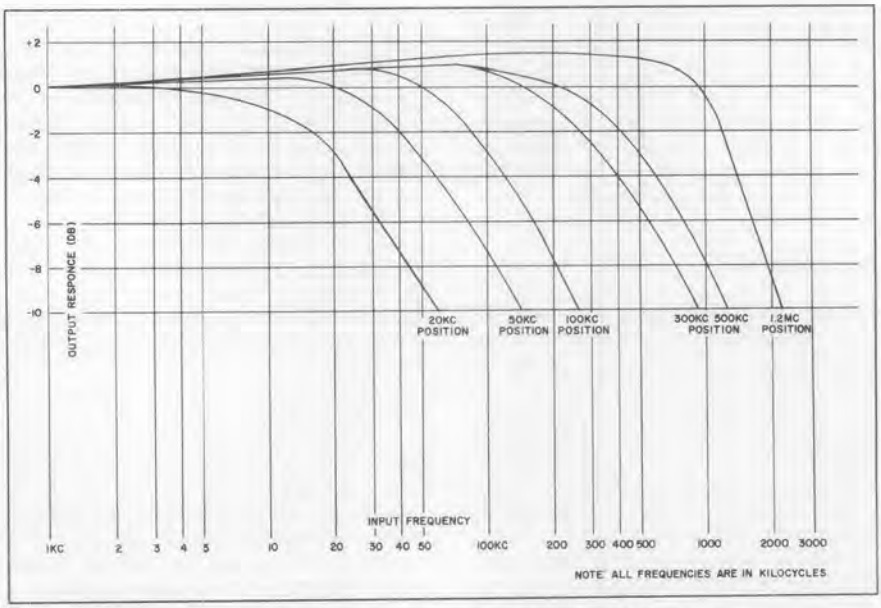

Figure 4. Video Response for 1455, 1455A, 1456A Receivers

Courtesy of http://BlackRadios.terryo.org

1455A Direct coupled amplifiers are
1456A used to extend the low frequency
1456BS response of the video stages. The video signal is applied through R139 to the grid of the 1st video amplifier V103A. V103 serves as the 1st and 2nd video amplifiers. The output of V103A is dc coupled through resistor R147 to the grid of V103B. Capacitor C113 across R147 compensates for the input capacitance of the tube and preserves the high frequency response of the video amplifier. The output of V103B is directly coupled through R128 and C112 to the cathode follower output stage. Potentiometer R146 in the grid circuit of V103B is used to adjust the dc output of the receiver at jack J110 to 0 vdc. To provide proper bias for operation as direct coupled amplifiers, negative 190 vdc is applied to the cathode circuit of V103A and regulated negative 150 vdc is applied to the grid circuits of V103A and V103B.

VIDEO OUTPUT

1455 Video output stages V104 and V105 operate in parallel as a cathode follower. Two outputs are derived from the parallel combination of resistor R120 and potentiometer R121; one output provides a video output signal coupled through C110 and R146 to jack (VIDEO OUTPUT) J105; the second output provides voltage from potentiometer R121 to operate the VU meter.

1455A Video output stage V104 and V105
1456A operate in parallel as a cathode
1456BS follower. Three outputs are derived across the parallel combination of resistor R120 and potentiometer R121: (1) the ac video output signal which is coupled through C128 and R156 to (VIDEO OUTPUT) jack J105; (2) the direct video output signal which is directly connected through R156 to VIDEO OUTPUT DIRECT jack J110; (3) the voltage derived from potentiometer R121 to operate the VU meter. Zener diode CR117 is used as a dc coupling unit to preserve the dc component of the video signal and prevent the high positive voltage on the cathode of V104 and V105 from appearing at the output jack.

VU METER

ALL The signal to drive VU meter M102 is derived in the video output stage of the receiver across (VU CAL) potentiometer R121. The signal is coupled from the arm of the potentiometer through C111 to the bridge rectifier circuit formed by diodes CR105 through CR108. The VU meter connected across the bridge, provides a relative indication of output signal level. Diode CR118 protects the VU meter from overload damage. At approximately 1.5 vdc, the diode switches from a high impedance state to a low impedance state and safely shunts excess current away from the meter movement.

DEVIATION AND AUDIO MONITOR

ALL A second output signal developed in a cathode follower stage of the IFM, appears on pin H of P301. Resistor R101 is the cathode resistor for the last IFM stage. The signal is coupled through C103 and applied to the two stage voltage amplifier V101. After being amplified by V101A and V101B the signal is coupled from the plate of V101B to the grids of V102A and V102B through capacitors C106 and C107. The output of V102B is applied to front panel speaker LS101 through transformer T102. AUDIO GAIN potentiometer R114 adjusts the volume.

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DEVIATION OUTPUT

ALL The signal from the plate circuit of V101B is applied to the grid of cathode follower V102A. The signal on the cathode of V101B is applied through C108 to a fullwave rectifier consisting of diodes CR109 and CR110. The output of the rectifier is connected through potentiometer R160 to pin V and pin Y of P301. This rectified voltage operates the deviation meter mounted in the IFM.

TUNING METER

ALL The tuning meter is connected to pins MM and HH of P301. These pins are connected to the center of a bridge circuit in the IFM.

B PLUS SUPPLIES

ALL Input power for the receiver is applied through J101, S102, and F101 to the primary of T101. The secondary of T101 contains three filament windings and two high voltage windings. Terminals 3, 4 and 5 of the secondary winding of T101 are used to develop the unregulated plus 150 vdc and plus 300 vdc potentials. The full secondary voltage is applied to bridge rectifier CR101 through CR104 to furnish plus 300 vdc. Plus 150 vdc is obtained by rectification of the secondary voltage with respect to the center tap, terminal 4. CR103 and CR104 perform a dual function by forming part of the bridge rectifier for plus 300 vdc and by acting as a full wave rectifier for the plus 150 vdc source.

REGULATED MINUS 150 VOLT SOURCE

ALL Terminals 6 and 7 of power transformer T101 are used for the negative voltage supply. The bridge rectifier formed by CR113 through CR116 is connected to provide a negative voltage to the chassis at the junction of C126A and R153. Zener diode CR111 in series with resistor R143 regulates the output voltage at minus 150 vdc.

REGULATED PLUS 150 VOLT SOURCE

ALL The output of the plus 300 vdc supply is applied to shunt regulator V106. Conduction through V106 in series with resistor R130 is controlled to provide a regulated plus 150 vdc source at the plate of V106. Zener diode CR112 and resistor R144 form a voltage dropping network across the plus 150 vdc and minus 150 vdc sources. The voltage at the junction of CR112 and R144 is used as a control bias for regulator tube V106. Any change in the load or input voltage will be reflected as a voltage change at the midpoint of the voltage divider. These changes increase or decrease the current flow through V106 in series with R130 to maintain a regulated output.

MINUS 190 VOLT SOURCE

1455A 1456A 1456BS A 190 vdc source is provided by the addition of resistor R137 and filter capacitor C126B. This additional negative source is required to operate the direct coupled video amplifier stages.

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SECTION 4. OPERATING PROCEDURES

GENERAL

All controls, meters, and indicators are located on the front panel. The antenna is connected to ANT INPUT J103 on the chassis rear apron. After the operating frequency has been determined, the proper crystal frequency can be determined by use of the following formulae:

1. 1455, 1455A $F_C = \frac{F_O + 30}{6}$

2. 1456A, 1456BS $F_C = \frac{F_O + 30}{4}$

F_C = Crystal frequency in mc

F_O = Operating frequency in mc

The VFO can be used in lieu of crystals by removing the crystal oven and turning the main tuning dial to the desired operating frequency. To change the IFM loosen the two thumb screws located on each side of the front panel and pull forward. Then slide the new IFM in place and tighten the thumb screws. All connections between the IFM and the receiver chassis are made as the IFM is inserted by means of a jack on the IFM rear apron.

CONTROLS

The function of the meters, switches, and controls are described as follows.

MEGACYCLES

The MEGACYCLES dial is the main tuning control. It is geared to a three section inductuner in the RF stages and a single inductuner in the VFO. Rotate the control to the desired operating frequency and then carefully tune for a maximum indication on the signal strength meter located on the IFM.

KILOCYCLES

The KILOCYCLES dial is the fine tuning control. This control operates a small trimmer capacitor in the 2nd local oscillator tank circuit. Adjust for a zero reading on the tuning meter. When a zero reading is obtained, the approximate frequency difference between the transmitter and receiver is indicated on the KILOCYCLES dial, if the receiver is crystal controlled.

VIDEO BANDWIDTH

The six position VIDEO BANDWIDTH switch controls the low pass filter which precedes the video amplifier stages. Determine the bandwidth of the incoming signal and set the bandwidth switch to the position corresponding to the high frequency limit of the signal. For example, if the bandwidth of the incoming signal extends to 250 kc, set the bandwidth switch to the 300 kc position. In this position all frequencies above 300 kc will be attenuated at a rate of 6 db per octave. Adjustment of the bandwidth switch in this manner will often yield an improvement in signal to noise ratio since noise components present in the high end of the signal spectrum will be effectively removed.

AUDIO GAIN

The AUDIO GAIN control adjusts the signal level applied to the monitor audio stage.

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Set this control for the desired sound level in the monitor speaker.

OUTPUT METER

The output meter indicates the relative amplitude of the video output signal. Adjust the calibration (VU CAL) until the meter reads zero at the output level desired.

TUNING METER

The tuning meter indicates the relative position of the incoming signal in the IF strip. A zero reading means that the signal is centered on the IF response curve.

DEVIATION METER

The deviation meter indicates the approximate deviation of the incoming signal when the IFM is in the FM or ØL (phase lock) modes. The function switch disables the meter circuit in the AM mode.

SIGNAL STRENGTH METER

The signal strength meter is connected to the AGC bus, it indicates the approximate received signal level in microvolts.

BANDWIDTH

The BANDWIDTH switch, on the dual bandwidth IFM's, permits immediate choice of either of the two bandwidths offered by the dual IFM in use.

SECTION 5. MAINTENANCE

GENERAL

Models 1455, 1455A, 1456A, and 1456BS receivers are designed to give trouble free performance for long periods with a minimum of routine maintenance. For trouble shooting, a review of the theory of operation (Section 3), and familiarity with the schematic diagrams and the tube socket voltages (table 3) are essential for rapid trouble shooting. Tube failures are the most frequent causes of equipment malfunction. A simple visual inspection often reveals faults such as improperly seated connectors and plugs, burned components, arcing, and breaks in wiring. Signal tracing or signal substitution, using the alignment instructions outlined in this section, should be used for extensive testing. Often the failure can be isolated to a particular stage or section by use of the meters and controls on the front panel. For example, if no signal is present at the output, observation of the SIGNAL STRENGTH and DEVIATION meters may indicate trouble in the video amplifier stages. Substitution of the particular IFM under test with a different IFM may determine whether the defect lies in the IFM or in the receiver chassis. Defective parts can then be found by voltage and resistance measurements.

CLEANING AND LUBRICATION

Cleaning is best accomplished by the use of compressed air at not more than 60 psi. The gear train should occasionally be lubricated with light machine oil.

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Table 3. Tube Socket Voltage Chart for 1455, 1455A, 1456A, 1456BS

All measurements taken with VFO in operation

Tube	Type	1	2	3	4	5	6	7	8	9
V101	6AW8	+2.2	0	+255	6.2 ac	Gnd	+4.2	0	+175	+193
V102	12AU7	+293	0	+14	6.2 ac	6.2 ac	+293	+44	+60	Gnd
V103	6AW8	†2.0	†0	†235	†6.2 ac	†Gnd	†32	†26	†177	†114
		+1.8	-0.9	+207	6.2 ac	Gnd	+2.0	0	+124	+75
V104	6CL6	†173	†162	†318	*†6.1 ac	*†6.1 ac	†320	†173	†318	†162
		+124	+120	+293	*6.1 ac	*6.1 ac	+293	+125	+293	+120
V105	6CL6	+124	+120	+293	*6.1 ac	*6.1 ac	+293	+124	+293	+120
V106	6CL6	Gnd	-3.8	+148	Gnd	6.2 ac	+149	Gnd	+149	-3.8
V201	5842	+100	Gnd	Gnd	Gnd	Gnd	+0.8	Gnd	Gnd	6.2 ac
V202	6AK5	-1.4	Gnd	6.2 ac	Gnd	+50	+50	Gnd	-	-
V203	6AK5	-0.8	Gnd	6.2 ac	Gnd	+145	+65	Gnd	-	-
V204	6AK5	-7.0	Gnd	6.2 ac	Gnd	+140	+105	Gnd	-	-
V205	6AK5	-1.9	Gnd	6.2 ac	Gnd	+135	+105	Gnd	-	-
V206	6BZ7	0	Gnd	+0.15	Gnd	6.2 ac	+140	0	+2.2	0
V207	6AU6	-1.8	Gnd	6.2 ac	Gnd	+145	+128	0	-	-
V208	6AU6	-5.9	Gnd	6.2 ac	Gnd	+145	+105	Gnd	-	-
V209	6AU6	-6.7	Gnd	6.2 ac	Gnd	+145	+114	Gnd	-	-
V210	6CB6	+0.14	+1.2	6.2 ac	Gnd	+140	+100	Gnd	-	-
									-	-

* Filament voltage V, taken across 4 and 5

† For Model 1455 only

All voltage measurements taken with a Simpson 303 VTVM with signal input and equipment operated from a 117 vac line.

Courtesy of http://BlackRadios.terryo.org

Table 3. Tube Socket Voltage Chart for 1455, 1455A, 1456A, 1456BS (cont)

Tube	Type	1	2	3	4	5	6	7	8	9
	Pin #	2	4	8	10	12	-	-	-	-
V401	7586	+82	-2.6	+0.92	6.2 ac	Gnd	-	-	-	-
		2	4	8	10	12	-	-	-	-
V402	7586	+37	Gnd	+1.1	Gnd	6.2 ac	-	-	-	-

ALIGNMENT PROCEDURES

INTRODUCTION

The alignment procedures must be followed carefully, and the adjustments made in the order given. Before attempting alignment, make certain that the IFM is installed properly in the receiver, and sufficient warm up time has been allowed to stabilize the equipment. Unless otherwise indicated, all potentiometers should be set at mid-range, the RECORD RECEIVE REPRODUCE switch set to RECORD RECEIVE, and the FUNCTION switch set to FM. When using the outline procedures, use only the procedures adjacent to the notations (left hand margin of the column) which pertain to the receiver. The following test equipment or equivalent is required to perform the alignment procedures.

1. Sweep Generator, Transitron SG-132
2. Sweep Generator, RCA-WR-59C (for IFM's)

NOTE

If the sweep generator used does not have built in markers, an external, crystal controlled marker generator is required.

3. Signal Generator, Hewlett-Packard 608
4. FM Signal Generator, Boonton 202-D
5. Oscilloscope, Dumont 304-A
6. 50 ohm, 6 db pad, Microlab AB-6
7. Frequency counter, Hewlett-Packard 524-C
8. VTVM, RCA Voltohmyst
9. 30 mc Post Amplifier, Vitro Electronics Type 4227

SECOND OSCILLATOR

ALL 1. Loosely couple frequency counter to plate circuit of V207.
2. Set fine tuning control (KILOCYCLES) to "0".
3. Adjust slug in oscillator grid coil L221 for a frequency of 25 mc.
4. Tune T203 for maximum voltage at test point TP208 in the grid circuit of V208 (about 15 volts dc).
5. Recheck frequency and repeat step 3.

25 MC BUFFER

ALL 1. Connect VTVM to TP209 in the grid circuit of V209.
2. Tune T204 for maximum voltage on the VTVM. (Voltage will normally be about 1.5 volts dc when the 30 ma circuit in the second mixer grid is properly tuned.)

FIRST MIXER TRANSFORMER T201 AND T202

ALL 1. Place the RECORD RECEIVE REPRODUCE switch in the RECORD RECEIVE position.

Courtesy of http://BlackRadios.terryo.org

2. Install a Type CA-100 crystal holder, without crystal, to disable the VFO.
3. Remove V201.
4. Turn MEGACYCLE control fully counterclockwise.
5. Place the FUNCTION switch in the AM position.
6. Ground the AGC bus at J108 (Signal Strength) with a short clip lead.
7. Connect the output of the sweep generator to pin 1 of V202 through a 0.0047 uf disc capacitor (keep capacity leads as short as possible).
8. Connect the input of the 30 mc Post Amplifier to J104 (SDU Output).
9. Connect the vertical input of the oscilloscope gain to 0.5 volts peak-to-peak.
10. Couple a 30 mc and a 1 mc marker to produce visible marks on the response curve.
11. Adjust T202 (primary), T201 (secondary), and coupling loop in T202 for an overcoupled response with 2 mc ±0.1 mc separation between peaks, approximately 50% dip. The peaks should be equal in amplitude and centered on the 1 mc side band markers.
12. Cement the coupling loop in T202 and replace the shield can.
13. Make final alignment and bandwidth check with shield can in place.
14. Move the Post Amplifier input from J104 to J109 (Frequency Monitor).
15. The amplitude at J109 should be approximately 80% of the amplitude at J104, with approximately 1.45 mc separation between peaks, 15% tilt high frequency peak low.
16. Replace V201.
17. Remove ground from AGC bus.

30 MC IF AMPLIFIER T206 AND T207

ALL 1. Place the RECORD RECEIVE REPRODUCE switch in the RECORD RECEIVE position.
2. Remove the lead from TP209 (other end of lead terminates on pin N of P301).
3. Install a Type CA-100 crystal holder, without crystal, to disable the VFO.
4. Remove V201.
5. Turn MEGACYCLE control fully CCW.
6. Place FUNCTION switch in the AM position.
7. Ground the AGC bus at J108 (Signal Strength) with a short clip lead.
8. Connect the output of the sweep generator to pin 1 of V202 through a 0.0047 uf disc capacitor (keep capacitor leads as short as possible).
9. Connect the vertical input of the oscilloscope to TP209 and adjust the oscilloscope gain to 0.33 volts peak-to-peak.
10. Couple in a 30 mc and a 1 mc marker to produce visible marks on the response curve.
11. Adjust T207 (primary) and T206 (secondary) for an overcoupled response centered on 30 mc with a 38% dip. The peaks should be symmetric and equal in amplitude. Using peak amplitude as 0 db reference, the 3 db bandwidth should be 2 mc ±0.2 mc.
12. Disconnect test equipment and replace lead on TP209.
13. Replace V201, remove ground from AGC bus.

FIRST OSCILLATOR

ALL 1. Plug in 43.0833 mc crystal for 1455 and 1455A or 41.2500 mc for the 1456A and 1456BS.
2. Attach VTVM to TP207 in grid circuit of V206B.
3. Tune L220 for maximum voltage (about 3 volts).

AMPLIFIER L216 AND L217

1455 1455A 1. Remove crystal from crystal oven assembly.
2. Couple sweep and marker generators into pin 1 of V205.

Courtesy of http://BlackRadios.terryo.org

3. Connect oscilloscope to test point TP205 in the grid of V204.
4. Tune primary L217 and secondary L216 for overcoupled response with a peak-to-peak bandwidth of 25 mc (120 to 145 mc).

1456A 1456BS
1. Remove crystal from crystal oven assembly.
2. Remove plug P205 from jack J205.
3. Couple sweep and marker generators into J205 through a 6 db pad.
4. Connect oscilloscope to test point TP205 in the grid of V204.
5. Tune primary L217 and secondary L216 for overcoupled response with a peak-to-peak bandwidth of 7 mc. If necessary, adjust L235 to improve response.

FIRST DOUBLER L218 AND L219

1455 1455A
1. Remove crystal from crystal oven assembly.
2. Couple sweep and marker generators into pin 7 of V206.
3. Connect oscilloscope to test point TP206 in grid circuit of V205.
4. Tune primary L219, and secondary L218 for over-crowded response with a peak-to-peak bandwidth of 25 mc (120 to 145 mc), about 75% dip.

1456A 1456BS
1. Remove crystal from crystal oven assembly.
2. Remove plug P205 from jack J205.
3. Couple sweep and marker generators into J205 through a 6 db pad.
4. Connect oscilloscope to test point TP206 in grid circuit of V205. Use a 1.0 volt peak-to-peak response.
5. Tune primary L219, and secondary L218, for overcoupled response with a peak-to-peak bandwidth of 7 mc (79 to 86 mc), centered at 82.5 mc.

OVER ALL FIRST MULTIPLIER AND AMPLIFIER

1455 1455A
1. Remove crystal from crystal oven assembly.
2. Couple sweep and marker generators into pin 7 of V206.
3. Connect oscilloscope to test point TP205 in grid circuit of V204.
4. Observed response should have a 3 db bandwidth of about 25 mc (120 to 145 mc), 55% dip. Touch up L216, L217, L218, and L219 if necessary.

1456A 1456BS
1. Remove crystal from crystal oven assembly.
2. Remove plug P205 from jack J205.
3. Couple sweep and marker generators into pin 7 of V206.
4. Connect oscilloscope to test point TP205 in grid circuit of V204.
5. Observed response should have a 3 db bandwidth of about 7 mc (79 to 86 mc).

SECOND DOUBLER L214 AND L215

1455 1455A
1. Remove crystal and set main tuning dial (MEGACYCLES) to 215 mc.
2. Couple sweep and marker generators into pin 1 of V204.
3. Connect oscilloscope to test point TP204 in grid circuit of V203.
4. Short plate (pin 5) of V203 to ground using a 1000 uuf ceramic disc capacitor. Keep the capacitor leads as short as possible.
5. Tune primary L215, and secondary L214, for overcoupled response with a 3 db bandwidth of about 45 mc (245 to 290 mc) and a dip of approximately 25%.

1456A 1456BS
1. Remove crystal and set main tuning dial (MEGACYCLES) to 128 mc.
2. Remove plug P205 from jack J205.

Courtesy of http://BlackRadios.terryo.org

3. Couple sweep and marker generators into J205 through a 6 db pad.
4. Connect oscilloscope to test point TP204 in grid circuit of V203. Use a 1.0 volt peak-to-peak response.
5. Short plate (pin 5) of V203 to ground using a 1000 uuf ceramic disc capacitor. Keep the capacitor leads as short as possible.
6. Tune primary L215, and secondary L216, for overcoupled response with a 3 db bandwidth of about 7 mc centered at 82.5 mc.

NOTE

Doubling gives a true center frequency of 165 mc with 14 mc bandwidth.

FRONT END TRACKING

1455 1. Connect sweep and marker gen-
1455A erators to antenna input J103.
2. Connect oscilloscope and VTVM to test point TP203 in grid of V302.
3. Set main tuning dial to 256 mc and plug in appropriate crystal (47.6666 mc).
4. Adjust L213 by spreading or squeezing turns for maximum voltage as indicated on the VTVM.
5. Adjust L205 and L208 (by spreading or squeezing turns) and the coupling capacitor C208 for a slightly overcoupled response centered at 256 mc. The 3 db bandwidth should be about 4 mc.
6. Set RF dial to 216.5 mc and plug appropriate crystal (41.0833 mc). Change sweep and marker generators accordingly.
7. If the response shape at 216.5 mc is distorted or tilts more than 20%, go back to 256 mc. Adjust L205 and L208 to produce some overtilt in the opposite direction. Recheck the 216.5 mc response shape to assure that the tilt or distortion has been eliminated. Some adjustments of C208 coupling capacitor may also be needed for proper bandwidth (approximately 4 mc at the 3 db points).
8. Check the RF response at 224.0 mc, 240.5 mc, 247 mc, and 260 mc.

1456A 1. Connect sweep and marker gen-
1456BS erators to antenna input J103.
2. Remove crystal and oven assembly.
3. Connect oscilloscope and VTVM to test point TP203 in grid of V202.
4. Set main tuning dial to 140 mc.
5. Adjust L213 by spreading or squeezing turns for maximum voltage as indicated on the VTVM.
6. Adjust L205 and L208 by spreading or squeezing turns and the coupling capacitor C208 for a slightly overcoupled response centered at 140 mc. The 3 db bandwidth should be about 4 mc.
7. Set RF dial to 129 mc. Change sweep and marker generators accordingly.
8. If the response shape at 129 mc is distorted or tilts more than 20%, go back to 140 mc. Adjust L205 and L208 to produce some overtilt in the opposite direction. Then, recheck the 129 mc response shape to assure that the tilt or distortion has been eliminated. Some adjustment of C208 coupling capacitor may also be needed for proper bandwidth (approximately 4 mc at the 3 db points).
9. Check the RF response at 128 mc, 132 mc, 136 mc, and 142 mc.

VFO

1455 1. Remove VFO cover and set
1455A main tuning dial to 260 mc.
2. Adjust C403 to approximately the center of its range.
3. Feed in an accurate 260 mc signal to antenna input J103. (Signal can be set up by first plugging a 260 mc crystal into the crystal socket and tuning generator for exact frequency.) Use a 1 mv level.

Courtesy of http://BlackRadios.terryo.org

4. Adjust L401 for zero reading on the tuning meter. (Tune in signal from generator.)
5. Set main tuning dial to 215.0 mc and tune generator to 215.0 mc using a 215.0 mc crystal.
6. Adjust C403 for zero reading on the tuning meter. (Tune in signal from generator.)
7. Repeat steps 3 through 6.
8. Check VFO tuning across the band. It should track within 1 mc over the entire band.
9. Should VFO tracking be off by more than 1 mc anywhere in the band, it is permissible to offset the ends by as much as ±0.25 mc to correct the tracking.

1456A 1. Remove VFO cover and set
1456BS main tuning dial to 142 mc.
2. Adjust C403 to approximately the center of its range.
3. Feed in an accurate 142 mc signal to antenna input J103. (Signal can be set up by first plugging a 142 mc crystal into the crystal socket and tuning generator for exact frequency.) Use a 1 mv level.
4. Adjust L402 for zero reading on the tuning meter. (Tune in signal from generator.)
5. Set main tuning dial to 128 mc and tune generator to 128 mc using a 128 mc crystal.
6. Adjust C403 for zero reading on the tuning meter. (Tune in signal from generator.)
7. Repeat steps 3 through 6.
8. Check VFO tuning across the band. It should track within 0.5 mc over the entire band.

VFO OUTPUT STAGE

1455 1. Remove cover of VFO.
1455A 2. Remove the plate connection on pin 6 of V206.
3. Connect the plate detector (see figure 5) between pin 6 of V206 and B plus.

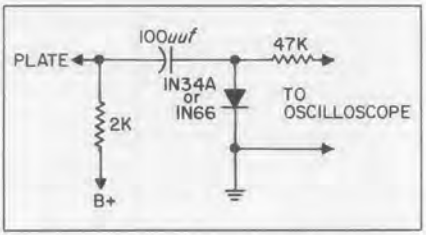


Figure 5. Plate Detector, Schematic

4. Connect the oscilloscope to the plate detector.
5. Disconnect the cathode lead of V402 at the feedthru. Leave the cathode resistor R402 in place. (It may be easier to remove the capacitors attached to the opposite end of the feedthru.)
6. Connect the sweep and marker generators to the cathode of V402.
7. Tune L403 and L404 by spreading or squeezing turns to obtain an overcoupled response with a peak-to-peak bandwidth of about 12 mc, centered at 133 mc.
8. Remove plate detector and input cable and reconnect all components.

TUNING METER CALIBRATION

ALL 1. Short pin 2 of V312 on IFM chassis (pin 2 of V311 on IFM 30 and 50) to ground with a short lead.
2. Adjust potentiometer R348 on IFM chassis (R351 on IFM 30 and 50) for zero on the tuning meter.
3. Remove short from pin 2 of V312 (V311 on IFM 30 and 50).

SIGNAL STRENGTH METER CALIBRATION

1455 1. Place the receiver in operation
1455A at or near 240.5 mc.
2. Feed a 1.0 microvolt signal into antenna input jack J103 from a signal generator.

Courtesy of http://BlackRadios.terryo.org

3. Adjust R375 on IFM chassis (R364 on IFM 30 and 50) for the best compromise reading of the meter in both FM and ØL modes (when applicable).
4. Increase the signal into the receiver to a level of 50,000 microvolts.
5. With the function switch in the ØL position (when applicable) adjust R380 on IFM chassis (R362 on IFM 30 and 50) for full scale reading.
6. Place the function switch in the FM position and adjust R387 on IFM chassis (R319 on IFM 30 and 50) for full scale reading.
7. Repeat steps 5 and 6 several times for proper final adjustment.

1456A 1. Place the receiver in operation at or near 136 mc.
1456BS 2. Repeat steps 2 through 7. Same as types 1455 and 1455A.

DEVIATION METER CALIBRATION

1455 1. With the receiver operating at
1455A or near 240 mc, set the function switch in the FM position.
2. Feed a 1000 microvolt signal into the antenna jack from a signal generator.
3. Adjust the signal generator frequency until the tuning meter of the receiver reads exactly zero.
4. Frequency modulate the signal generator at a rate of 1000 cycles and at a deviation of one fifth the IF bandwidth.
5. Adjust R346 on IFM chassis (R344 on IFM 30 and 50) for a reading of 80 mv on ac VTVM connected across R101.
6. Remove VTVM and adjust R160 for proper indication on Deviation Meter.

1456A 1. Set receiver at or near 136
1456BS mc, with function switch in the FM position.
2. Repeat steps 2 through 6. Same as types 1455 and 1455A.

VU METER CALIBRATION

1455 1. With the receiver operating at
1455A or near 240 mc, set the function switch to FM.
2. Feed a 1000 microvolt signal into the antenna jack from a signal generator.
3. Frequency modulate the signal generator at a rate of 1000 cycles at desired deviation.
4. Increase the video gain until the desired signal amplitude is obtained at video output jack J105.
5. Adjust the calibrating potentiometer, R121 (VU CAL) until the VU meter reads zero.

1456A 1. Set receiver at or near 136
1456BS mc, with function switch in FM position.
2. Repeat steps 2 through 5. Same as types 1455 and 1455A.

VIDEO AMPLIFIER DC LEVEL ADJUSTMENT

1455A 1. Feed a 1000 microvolt signal,
1456A unmodulated, into the antenna
1456BS jack.
2. Connect dc VTVM to output jack J110.
3. Adjust potentiometer R146 for 0 vdc on the meter.

Courtesy of http://BlackRadios.terryo.org

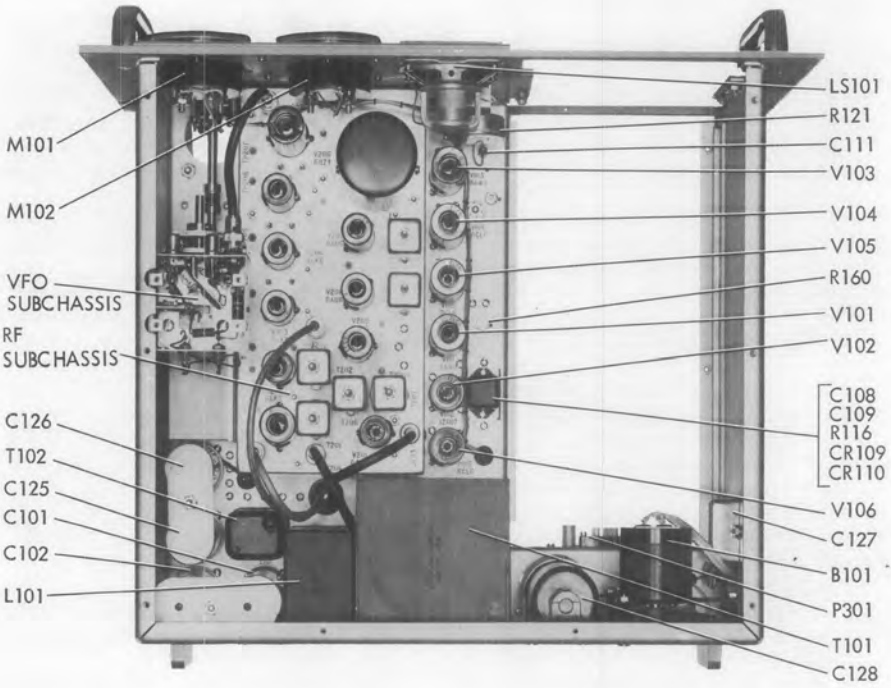


Figure 6. Receiver Chassis, Top View

Courtesy of http://BlackRadios.terryo.org

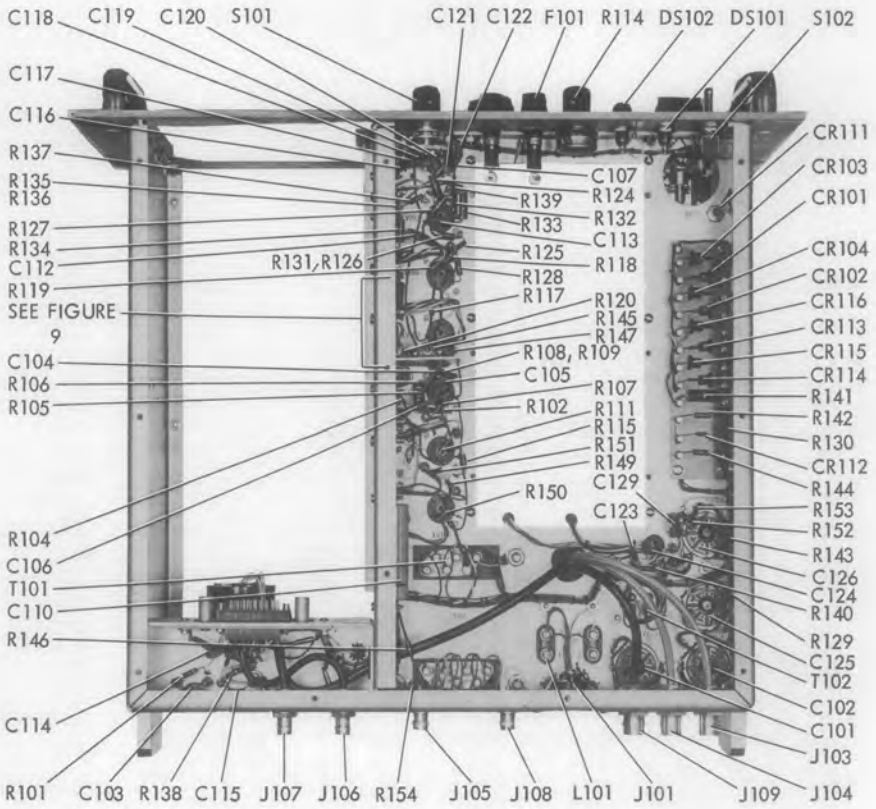


Figure 7. 1455 Receiver Chassis, Bottom View

Courtesy of http://BlackRadios.terryo.org

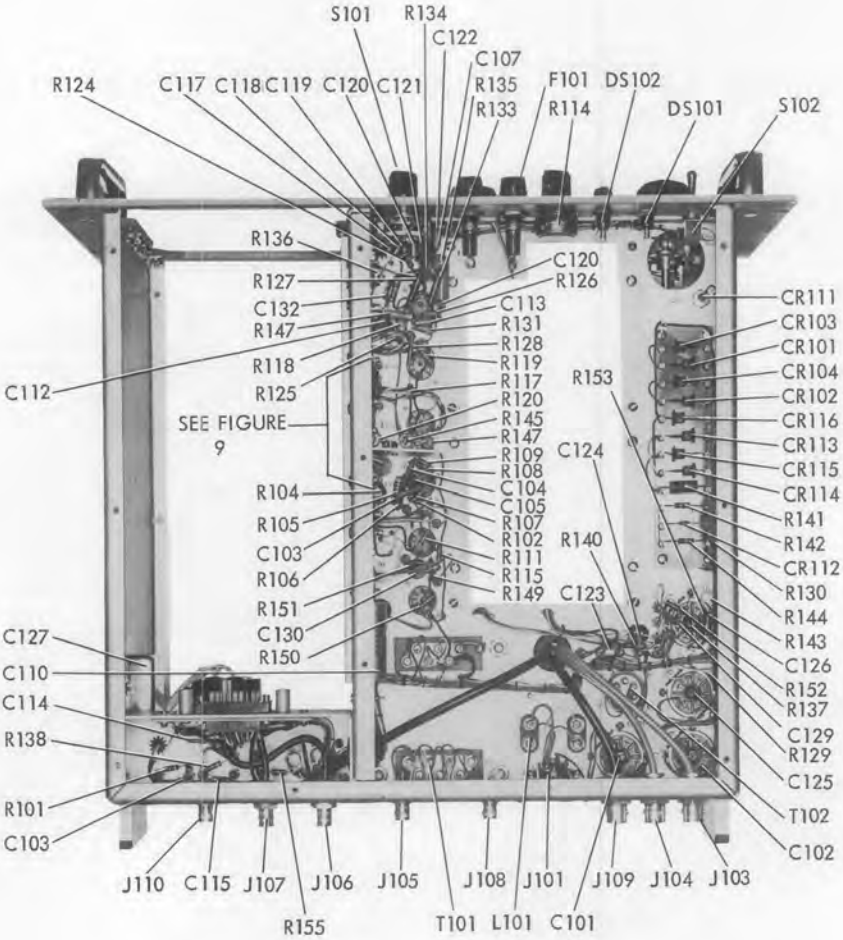


Figure 8. 1455A, 1456A, 1456BS Receiver Chassis, Bottom View

Courtesy of http://BlackRadios.terryo.org

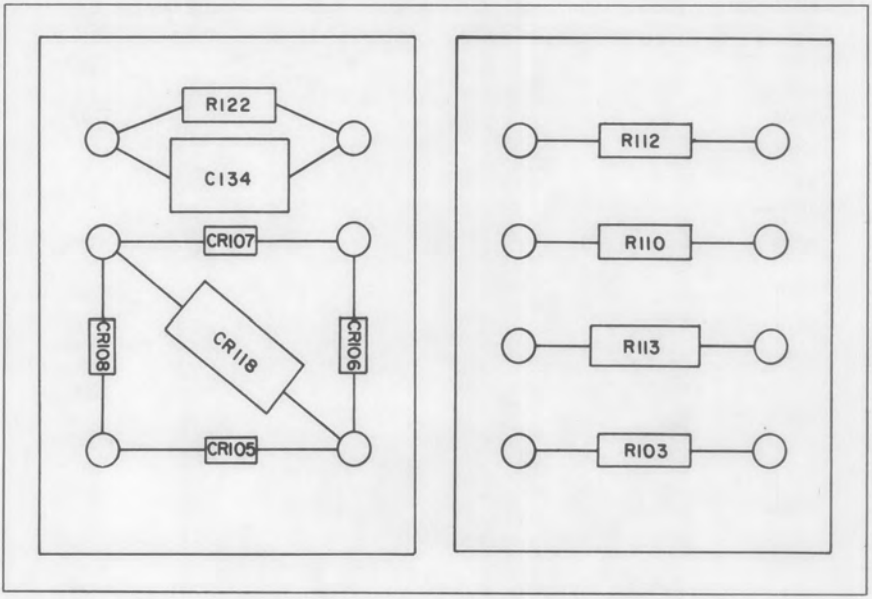


Figure 9. Receiver Chassis Vertical Mounted Component Boards

Courtesy of http://BlackRadios.terryo.org

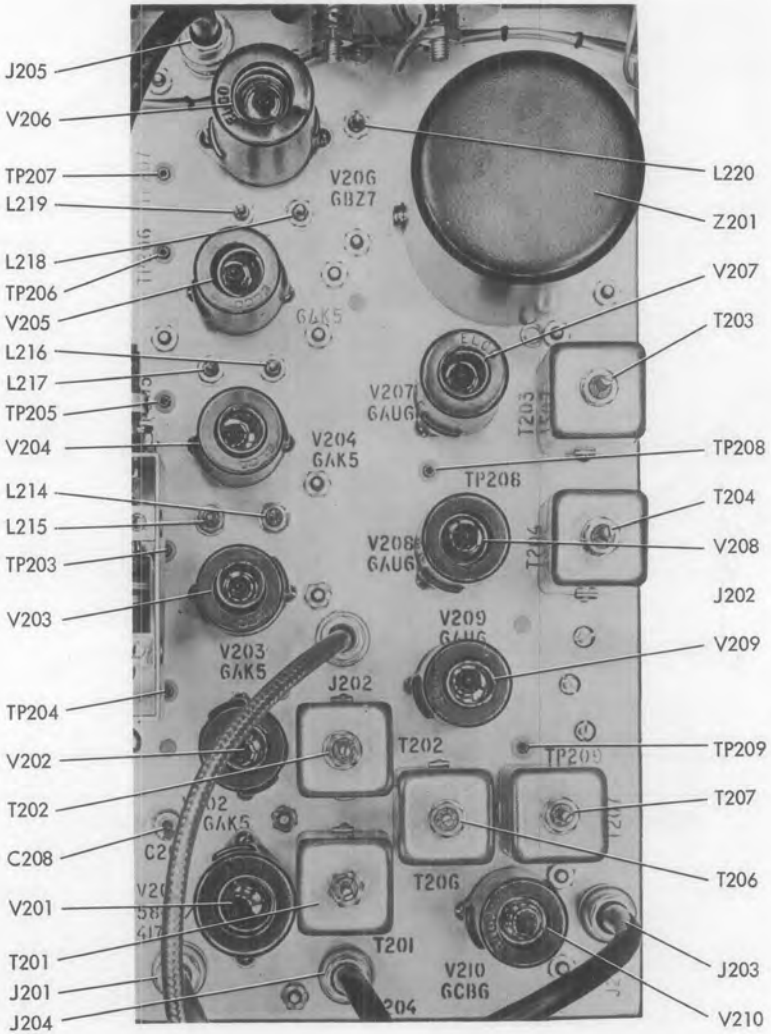
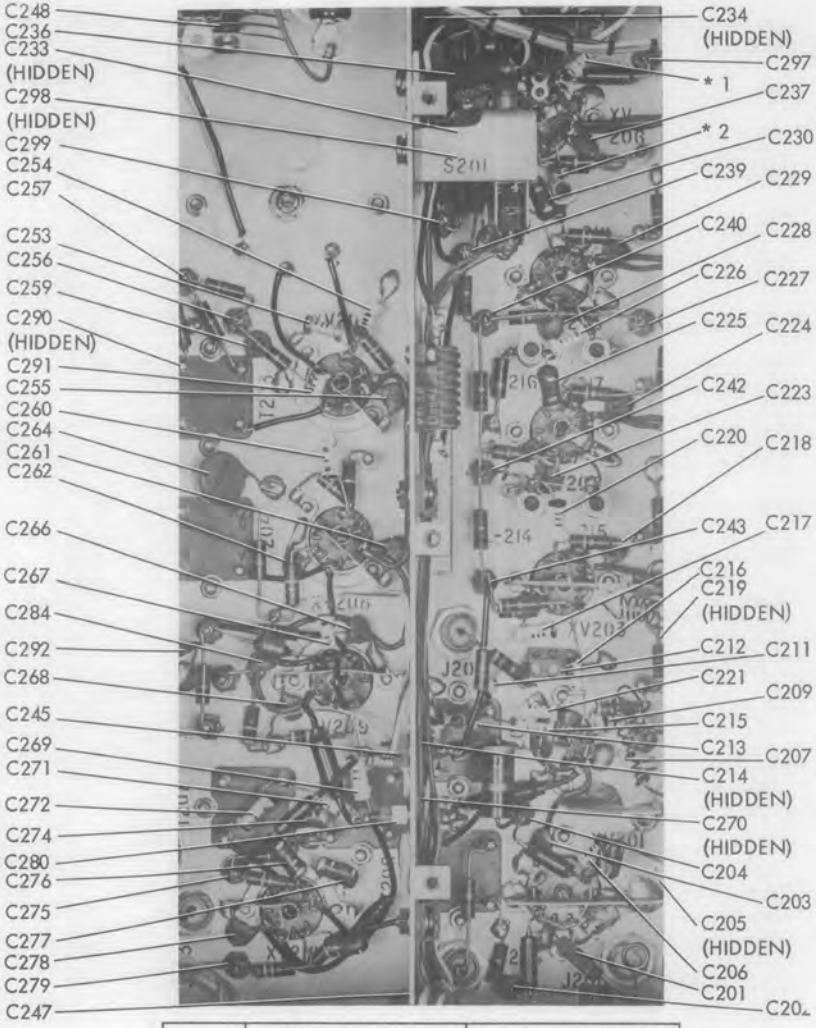


Figure 10. RF Subchassis, Top View

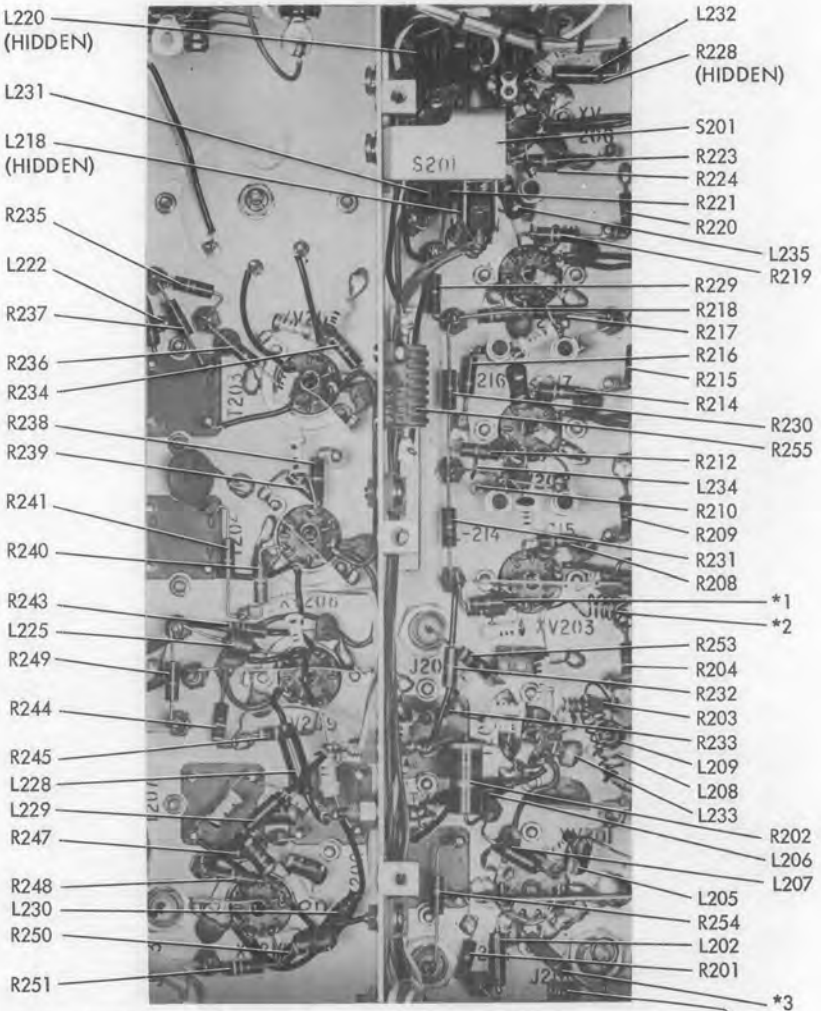
Courtesy of http://BlackRadios.terryo.org



	1455 AND 1455A	1456A AND 1456BS
*1	C283	C291
*2	C231	NOT USED

Figure 11. RF Subchassis, Bottom View Capacitor Identification

Courtesy of http://BlackRadios.terryo.org



	1455 AND 1455A	1456 AND 1456BS
*1	L212	NOT USED
*2	L213	L212
*3	NOT USED	L203 INSERTED BETWEEN J201 AND C201

Figure 12. RF Subchassis, Bottom View Resistor and Inductor Identification

Courtesy of http://BlackRadios.terryo.org

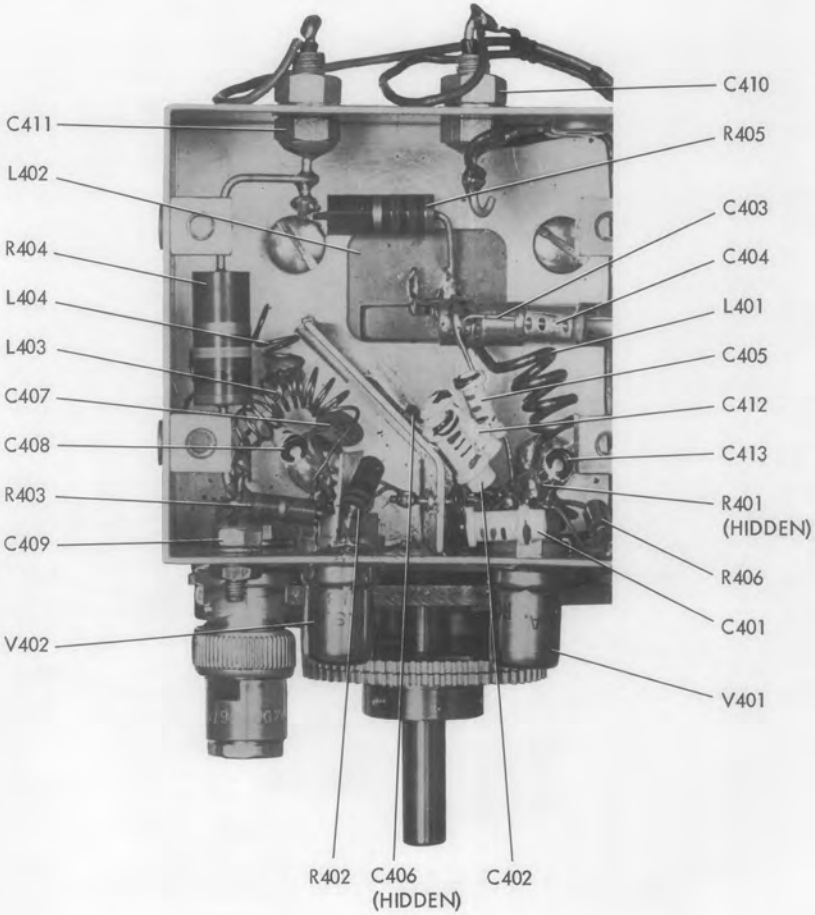


Figure 13. 1455 and 1455A, VFO Subchassis, Bottom View

Courtesy of http://BlackRadios.terryo.org

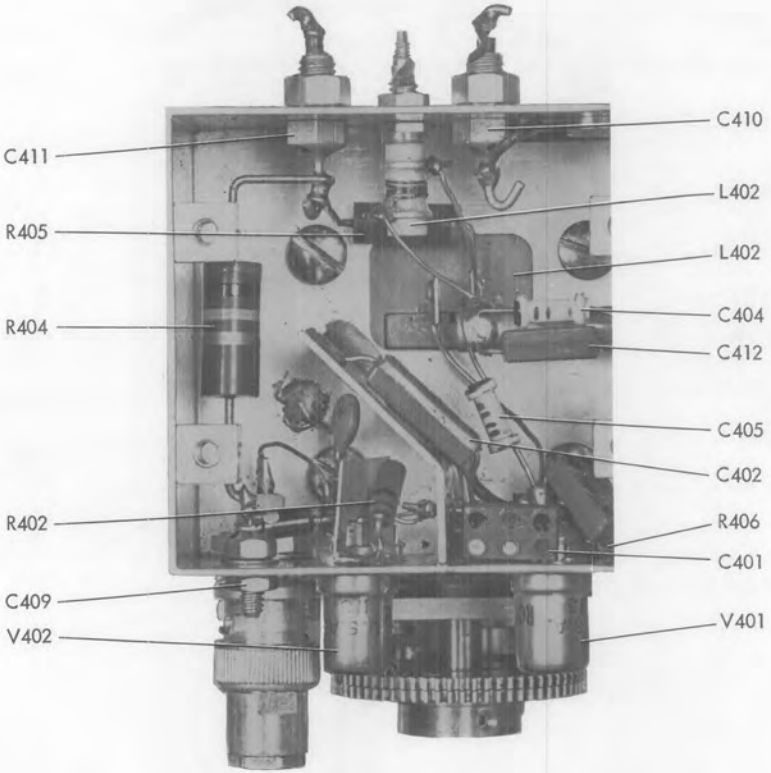


Figure 14. 1456A and 1456BS, VFO Subchassis, Bottom View

Courtesy of http://BlackRadios.terryo.org

SECTION 6. PARTS LIST

GENERAL

When ordering replacement parts, give the equipment name and model number, and the reference designation number and description of each item ordered. The parts list combines the parts for all of the Receivers covered in this manual. Only parts which apply to a particular Receiver appear adjacent to the "X" in the "Receiver" Column.

Reference Designation	Receiver				Name and Description	Part Number	
	1455	1455A	1456A	1456BS		Vitro	Vendor
B101	X	X	X	X	BLOWER ASSEMBLY: 115 vac, 60 cycle, 1 phase, axial fan		Air Marine A1221-23
C101	X	X	X	X	CAPACITOR, Electrolytic: 45-45 uf, 400 v		Sprague CE52B450Q
C102	X	X	X	X	CAPACITOR, Electrolytic: 100 uf, 400 v		Sprague 3P-CE51B101Q
C103	X	X	X	X	CAPACITOR, Ceramic: 0.1 uf, GMV 500 v		Sprague 5HK-P10
C104	X	X	X	X	CAPACITOR, Ceramic: 0.1 uf, GMV 500 v		Sprague 5HK-P10
C105	X	X	X	X	CAPACITOR, Ceramic: 0.1 uf, GMV 500 v		Sprague 5HK-P10
C106	X	X	X	X	CAPACITOR, Ceramic: 0.1 uf, GMV 500 v		Sprague 5HK-P10
C107	X	X	X	X	CAPACITOR, Ceramic: 0.01 uf, GMV 500 v		Sprague 29C9B8
C108	X	X	X	X	CAPACITOR, Ceramic: 0.1 uf, +80% -20%, 50 v		Sprague 33C41
C109	X	X	X	X	CAPACITOR, Ceramic: 0.1 uf, +80% -20%, 50 v		Sprague 33C41
C110	X				CAPACITOR, Ceramic: 50 uf, GMV 250 v		Sprague TVA-1512
		X	X	X	CAPACITOR, Ceramic: 0.001 uf, GMV 1000 v		Sprague 40C230
C111	X	X	X	X	CAPACITOR, Paper: 0.5 uf ±20%, 200 v		Aerovox P123ZGP
C112	X				CAPACITOR, Ceramic: 0.1 uf, GMV 500 v		Sprague 5HK-P10
		X	X	X	CAPACITOR, Mica: 30 uuf ±5%, 500 v		Elmenco

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
C113	X				CAPACITOR, Ceramic: 0.1 uf, GMV 500 v		Sprague 5HK-P10
		X	X	X	CAPACITOR, Mica: 120 uuf, ±5%, 500 v		Elmenco CM15E121J
C114	X	X	X	X	CAPACITOR, Ceramic: 0.01 uf, GMV 500 v		Sprague 29C9B8
C115	X				CAPACITOR, Electrolytic: 1.0 uf, +20% -15%, 25 v		Sprague 5C13A
		X	X	X	CAPACITOR, Electrolytic: 10 uf, +20% -15%, 25 v		Sprague 109D106C 2025C2
C116	X				CAPACITOR, Mica: 12 uuf, ±5%, 500 v		Elmenco CM15C120J
		X	X	X	Not Used		
C117	X				CAPACITOR, Mica: 12 uuf, ±5%, 500 v		Elmenco CM15E510J
		X	X	X	CAPACITOR, Mica: 39 uuf, ±5%, 500 v		Elmenco CM15E390J
C118	X			X	CAPACITOR, Mica: 91 uuf, ±5%, 500 v		Elmenco CM15E910J
		X	X		CAPACITOR, Mica: 75 uuf, ±5%, 500 v		Elmenco CM15E750J
C119	X				CAPACITOR, Mica: 330 uuf, ±5%, 500 v		Elmenco CM15E331J
		X	X		CAPACITOR, Mica: 300 uuf, ±5%, 500 v		Elmenco CM15E301J
				X	CAPACITOR, Mica: 180 uuf, ±5%, 500 v		Elmenco CM15E181J
C120	X				CAPACITOR, Mica: 750 uuf, ±5%, 500 v		Elmenco CM19E751J
		X	X		CAPACITOR, Mica: 620 uuf, ±5%, 500 v		Elmenco CM19E621J
				X	CAPACITOR, Mica: 220 uuf, ±5%, 500 v		Elmenco CM15E221J
C121	X				CAPACITOR, Mica: 910 uuf, ±5%, 500 v		Elmenco CM19E911J
				X	CAPACITOR, Mica: 820 uuf, ±5%, 500 v		Elmenco CM15E821J
		X	X		CAPACITOR, Mica: 620 uuf, ±5%, 500 v		Elmenco CM19E621J

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
C122	X	X	X		CAPACITOR, Mica: 910 uuf, ±5%, 500 v		Elmenco CM19E911J
				X	Not Used		
C123	X	X	X	X	CAPACITOR, Ceramic: 0.0047 uf, GMV 500 v		Sprague 20C8
C124	X	X	X	X	CAPACITOR, Ceramic: 0.0047 uf, GMV 500 v		Sprague 20C8
C125A, B	X	X	X	X	CAPACITOR, Electrolytic: 50-50 uf, 200 v		Sprague CE52B500K
C126	X	X			CAPACITOR, Electrolytic: 55-55 uf, 250 v		Sprague CE52C550M
			X	X	Not Used		
C126	X	X	X	X	CAPACITOR, Electrolytic: 55-55 uf, 250 v		Sprague Special D33811
C127	X	X	X	X	CAPACITOR, Paper: 1.0 uf, 600 v		Sprague CPBTS-55
C128	X				Not Used		
		X	X	X	CAPACITOR, Electrolytic: 500 uf, 125 v		Mallory NP1255A or Aerovox NPB
C129	X	X	X	X	CAPACITOR, Ceramic: 0.01 uf, GMV 500 v		Sprague 29C9B8
C130	X	X	X	X	CAPACITOR, Ceramic: 0.01 uf, GMV 500 v		Sprague 29C9B8
C131	X	X	X	X	CAPACITOR, Ceramic: 0.01 uf, GMV 500 v		Sprague 29C9B8
C132	X				Not Used		
		X	X	X	CAPACITOR, Mica: 56 uuf, ±5%, 500 v		CM15E560J
C133	X	X	X	X	Not Used		
C134			X		Not Used		
	X	X			CAPACITOR, Mica: 100 uuf, ±5%, 500 v		Elmenco CM15E101J
				X	CAPACITOR, Mica: 220 uuf, ±5%, 500 v		Elmenco CM15E221J
C135	X	X	X	X	CAPACITOR, Electrolytic: 2 uf, +150% -10%, 50 v		NLW-2-50
C201	X	X	X	X	CAPACITOR, Mica: 150 uuf, ±5%, 500 v		Elmenco CM15E151J

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
C202	X	X	X	X	CAPACITOR, Ceramic: 470 uuf, GMV 500 v		Sprague 507C8
C203	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C204	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C205	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C206	X	X	X	X	CAPACITOR, Ceramic: 1.0 uuf, 500 v		Erie NPO-301
C207	X	X	X	X	CAPACITOR, Ceramic: 0.68 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C208	X	X	X	X	CAPACITOR, Variable, Ceramic: 0.5-4.5 uuf, 500 v		CTC CST-6
C209	X	X			CAPACITOR, Ceramic: 18 uuf, ±10%, 500 v		Erie NPO-301
			X	X	CAPACITOR, Ceramic: 8.2 uuf, ±2.5 uuf, 500 v		Erie NPO-301
C210	X	X	X	X	*CAPACITOR, Ceramic: 10 uuf, p/o T201		
C211	X	X	X	X	CAPACITOR, Ceramic: 4.7 uuf, ±0.25 uf, 500 v		Erie NPO-301
C212	X	X	X	X	CAPACITOR, Mica: 120 uuf, ±5%, 500 v		Elmenco CM15E121J
C213	X	X	X	X	CAPACITOR, Ceramic: 10 uuf, ±10%, 500 v		Erie NPO-301
C214	X	X	X	X	CAPACITOR, Ceramic: 10 uuf, ±10%, 500 v		Erie NPO-301
C215	X	X	X	X	CAPACITOR, Ceramic: 0.68 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C216	X	X	X	X	CAPACITOR, Ceramic: 1.0 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C217	X	X	X	X	CAPACITOR, Ceramic: 15 uuf, ±10%, 500 v		Erie NPO-301
C218	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C219	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C220	X	X	X	X	CAPACITOR, Ceramic: 22 uuf, ±10%, 500 v		Erie NPO-301

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
C221	X	X	X	X	CAPACITOR, Ceramic: 0.68 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C222	X	X	X	X	Not Used		
C223	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C224	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C225	X	X	X	X	CAPACITOR, Ceramic: 470 uuf, ±10%, 500 v		Erie GP2-331
C226	X	X			CAPACITOR, Ceramic: 1.8 uuf, ±0.25 uuf, 500 v		Erie NPO-301
			X	X	CAPACITOR, Ceramic: 0.68 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C227	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C228	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C229	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C230	X	X	X	X	CAPACITOR, Ceramic: 470 uuf, ±10%, 500 v		Erie GP2-331
C231	X	X			CAPACITOR, Ceramic: 2.0 uuf, ±0.1 uuf, 500 v		Erie NPO-301
			X	X	Not Used		
C232	X	X	X	X	Not Used		
C233	X	X	X	X	CAPACITOR, Ceramic: 22 uuf, ±10%, 500 v		Erie NPO-301
C234	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C235	X	X	X	X	Not Used		
C236	X	X	X	X	CAPACITOR, Paper: 0.1 uf, ±20%, 200 v		Aerovox P123ZGP
C237	X	X			CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
			X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C238	X	X	X	X	Not Used		
C239	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C240	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
C241	X	X	X	X	Not Used		
C242	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C243	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C244	X	X	X	X	Not Used		
C245	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, GMV 500 v		Sprague 514C1
C246	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, GMV 500 v		Sprague 514C1
C247	X	X			CAPACITOR, Ceramic: 0.001 uf, GMV 500 v		Sprague 514C1
			X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C248	X	X	X	X	CAPACITOR, Variable, air: 2.8-16.0 uuf 800 v		Hammarlund HFA-15B
C249	X	X	X	X	*CAPACITOR, Ceramic: 200 uuf, p/o Z201		
C250	X	X	X	X	*CAPACITOR, Ceramic: 180 uuf, p/o Z201		
C251	X	X	X	X	*CAPACITOR, Ceramic: 10 uuf, p/o Z201		
C252	X	X	X	X	*CAPACITOR, Ceramic: 47 uuf, p/o Z201		
C253	X	X			CAPACITOR, Ceramic: 10 uuf, ±0.5 uuf, 500 v		Erie NPO-301
			X	X	CAPACITOR, Ceramic: 10 uuf, ±0.25 uuf, 500 v		Erie NPO-301
C254	X				CAPACITOR, Ceramic: 10 uuf, ±10%, 500 v		Erie N030-A
		X			CAPACITOR, Ceramic: 10 uuf, ±10%, 500 v		Erie NPO-301
			X	X	CAPACITOR, Ceramic: 1.0 uuf, 500 v		Erie N030-301
C255	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C256	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C257	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
C258	X		X	X	*CAPACITOR, Ceramic: 15 uuf, p/o T203		
		X			CAPACITOR, Ceramic: 15 uuf, ±10%, 500 v		Erie NPO-301
C259	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C260	X	X	X	X	CAPACITOR, Ceramic: 1.0 uuf, 500 v		Erie NPO-301
C261	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C262	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C263	X	X	X	X	*CAPACITOR, Ceramic: 22 uuf, p/o T204		
C264	X	X			CAPACITOR, Ceramic: 0.01 uf, GMV 500 v		Sprague 29C9B8
			X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C265	X	X			CAPACITOR, Ceramic: 0.001 uf, GMV 500 v		Sprague 514C1
			X	X	Not Used		
C266	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C267	X	X	X	X	CAPACITOR, Ceramic: 2.2 uuf, ± ±0.1 uuf, 500 v		Erie NPO-301
C268	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf,		Sprague 40C230A
C269	X	X			CAPACITOR, Ceramic: 47 uuf, ±10%, 500 v		Erie NPO-308
			X	X	CAPACITOR, Ceramic: 1.0 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C270	X	X	X	X	CAPACITOR, Ceramic: 10 uuf, ±10%, 500 v		Erie NPO-301
C271	X	X	X	X	CAPACITOR, Ceramic: 2.2 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C272	X	X	X	X	CAPACITOR, Ceramic: 2.2 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C273	X	X	X	X	*CAPACITOR, Ceramic: 3.3 uuf, p/o T207		
C274	X	X	X	X	CAPACITOR, Ceramic: 470 uuf, ±10%, 500 v		Erie GP2-331

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver				Name and Description	Part Number	
	1455	1455A	1456A	1456BS		Vitro	Vendor
C275	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C276	X	X	X	X	CAPACITOR, Ceramic: 470 uuf, ±10%, 500 v		Erie GP2-331
C277	X	X	X	X	CAPACITOR, Ceramic: 470 uuf, ±10%, 500 v		Erie GP2-331
C278	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C279	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C280	X	X	X	X	CAPACITOR, Ceramic: 470 uuf, ±10%, 500 v		Erie GP2-331
C281	X	X			CAPACITOR, Ceramic: 0.001 uf, GMV 500 v		Sprague 514C1
			X	X	CAPACITOR, Ceramic: 10 uuf, ±10%, 500 v		Erie NPO-301
C282	X	X	X	X	*CAPACITOR, Mica: 240 uuf, p/o T201		
C283	X	X			CAPACITOR, Ceramic: 0.68 uuf, ±0.1 uuf, 500 v		Erie NPO-301
			X	X	Not Used		
C284	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, ±20%, 1000 v		Sprague 40C230A
C285 thru C289	X	X	X	X	Not Used		
C290	X	X			CAPACITOR, Ceramic: 0.01 uf, GMV 500 v		Sprague 29C9B8
			X	X	CAPACITOR, Ceramic: 5.1 uuf, ±0.25 uuf, 500 v		Erie NPO-301
C291	X	X			CAPACITOR, Ceramic: 10 uuf, ±10%, 500 v		Erie NPO-301
			X	X	CAPACITOR, Ceramic: 2.0 uuf, ±0.1 uuf, 500 v		Erie NPO-301
C292	X	X	X	X	CAPACITOR, Ceramic: 0.0047 uf, GMV 500 v		Sprague 20C8
C293 thru C296	X	X	X	X	Not Used		
C297	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
C298	X	X	X	X	CAPACITOR, Ceramic: 10 uuf, ±10%, 500 v		Erie NPO-301
C299	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, 500 v		Sprague 507C2
C401	X	X			CAPACITOR, Ceramic: 27 uuf, ±5%		Erie NPO-316
			X	X	CAPACITOR, Ceramic: 100 uuf, ±5%, 500 v		Elmenco CM15E101J
C402	X	X			CAPACITOR, Ceramic: 50 uuf, ±5%, 500 v		Erie NPO-308
			X	X	CAPACITOR, Mica: 430 uuf, ±5%, 300 v		Elmenco CM15E431J
C403	X	X	X	X	CAPACITOR, Variable, quartz: 0.6-9.5 uuf, 1000 v		JFD MQ-106
C404	X	X			CAPACITOR, Ceramic: 18 uuf, ±5%, 500 v		Erie N150-301
			X	X	CAPACITOR, Ceramic: 100 uuf, ±5%, 500 v		Elmenco CM15E101J
C405	X	X	X	X	CAPACITOR, Ceramic: 22 uuf, ±5%, 500 v		Erie NPO-301
C406	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, GMV 1000 v		Sprague 40C214
C407	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, GMV 1000 v		Sprague 40C214
C408	X	X			CAPACITOR, Ceramic: 1.8 uuf, ±0.1 uuf, 500 v		Erie NPO-301
			X	X	CAPACITOR, Mica: 20 uuf, ±5%, 500 v		Elmenco CM15E200J
C409	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, GMV 500 v		Sprague 507C2
C410	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, GMV 500 v		Sprague 514C1
C411	X	X	X	X	CAPACITOR, Ceramic: 0.001 uf, GMV 500 v		Sprague 514C1
C412	X	X			CAPACITOR, Ceramic: 50 uuf, ±5%, 500 v		Erie NPO-308
			X	X	CAPACITOR, Ceramic: 5.1 uuf, ±0.25 uuf, 500 v		Erie NPO-301
C413	X	X			CAPACITOR, Ceramic: 0.5 uuf, ±0.1 uuf, 500 v		Erie NPO-301
			X	X	Not Used		

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
CR101	X	X	X	X	DIODE, Silicon		1N1696
CR102	X	X	X	X	DIODE, Silicon		1N1696
CR103	X	X	X	X	DIODE, Silicon		1N16196
CR104	X	X	X	X	DIODE, Silicon		1N16196
CR105	X	X	X	X	DIODE, Silicon		1N270
CR106	X	X	X	X	DIODE, Silicon		1N270
CR107	X	X	X	X	DIODE, Silicon		1N270
CR108	X	X	X	X	DIODE, Silicon		1N270
CR109	X	X	X	X	DIODE, Silicon		1N270
CR110	X	X	X	X	DIODE, Silicon		1N270
CR111	X	X	X	X	DIODE, Zener silicon: 10W, 150 nominal voltage ±5%		Motorola 10M150Z5
CR112	X	X	X	X	DIODE, Zener silicon: 1/4W, 150 nominal voltage ±5%		Motorola 1/4M150Z5
CR113	X	X	X	X	DIODE, Silicon		1N1695
CR114	X	X	X	X	DIODE, Silicon		1N1695
CR115	X	X	X	X	DIODE, Silicon		1N1695
CR116	X	X	X	X	DIODE, Silicon		1N1695
CR117	X				Not Used		
		X	X	X	DIODE, Zener, silicon: 10W, 120 nominal voltage ±5%		Motorola 10M120Z5
CR118	X	X	X	X	DIODE, Silicon		SV-3141
DS101	X	X	X	X	LAMP, Incandescent: Midget, flange base, 6.0 v, 0.4 amp		Dialco 345
DS102	X	X	X	X	LAMP, Incandescent: Midget, flange base, 6.0 v, 0.4 amp		Dialco 345
F101	X	X	X	X	FUSE, Cartridge, dual element: Slo-Blo, 2.8 amp, 125 v (with 1 spare)		Bussmann MDL
J101	X	X	X	X	CONNECTOR, Receptacle: Male, 3 contacts, flush base		Hubbell 7486
J102	X	X	X	X	Not Used		
J103	X				Not Used		
		X	X	X	CONNECTOR, Receptacle: Type C, panel jack		UG-704/U
J104	X				Not Used		
		X	X	X	CONNECTOR, Receptacle: Type C, panel jack		UG-704/U
J105	X	X	X	X	CONNECTOR, Receptacle: Type BNC, single hole mount		UG-625A/U
J106	X	X	X	X	CONNECTOR, Receptacle: Type BNC, bulkhead jack		UG-909A/U

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
J107	X	X	X	X	CONNECTOR, Receptacle: Type BNC, bulkhead jack		UG-909A/U
J108	X	X	X	X	CONNECTOR, Receptacle: Type BNC, single hole mount		UG-625A/U
J109	X	X	X	X	CONNECTOR, Receptacle: Type C, panel jack		UG-704/U
J110	X	X	X	X	CONNECTOR, Receptacle: Type BNC		UG-1094/U
J201	X	X	X	X	CONNECTOR, Receptacle: Type BNC		UG-1094/U
J202	X	X	X	X	CONNECTOR, Receptacle: Type BNC		UG-1094/U
J203	X	X	X	X	CONNECTOR, Receptacle: Type BNC		UG-1094/U
J204	X	X	X	X	CONNECTOR, Receptacle: Type BNC		UG-1094/U
J205	X	X	X	X	CONNECTOR, Receptacle: Type BNC		UG-1094/U
J401	X	X	X	X	CONNECTOR, Receptacle: Type BNC		UG-1094/U
L101	X	X	X	X	CHOKE, Filter: 2 sections, 2 hy each section	AA-25467-02	
L201	X	X			COIL	AA-19699-01	
			X	X	COIL	AA-26331-01	
L202	X	X			COIL	AA-15496-01	
			X	X	COIL	AA-2632	
L203	X	X			Not Used		
			X	X	COIL	AA-26331-02	
L204	X				INDUCTUNER	AB-32702	
		X			INDUCTUNER	AB-15517	
			X	X	INDUCTUNER	AB-100204-01	
L205	X	X			COIL	AA-19700-01	
			X	X	COIL	AA-26331-03	
L206	X	X	X	X	COIL	AA-15496-02	
L207	X	X			COIL	AA-19699-02	
			X	X	COIL	AA-26332	
L208	X	X			COIL	AA-19700-02	
			X	X	COIL	AA-26331-04	
L209	X	X			COIL	AA-19699-03	
			X	X	COIL	AA-26331-05	
L210	X	X	X	X	*COIL: p/o T201		

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
L211	X	X	X	X	*COIL: p/o T202		
L212	X	X			COIL	AA-19699-05	
			X	X	COIL	AA-26331-06	
L213	X	X			COIL	AA-19700-03	
			X	X	COIL	AA-26331-07	
L214	X	X			COIL	AA-19701-06	
			X	X	COIL	AA-26333-06	
L215	X	X			COIL	AA-19701-06	
			X	X	COIL	AA-26333-01	
L216	X	X			COIL	AA-19701-05	
			X	X	COIL	AA-26333-02	
L217	X	X			COIL	AA-19701-04	
			X	X	COIL	AA-26333-03	
L218	X	X			COIL	AA-19701-03	
			X	X	COIL	100212-01	
L219	X	X			COIL	AA-19701-02	
			X	X	COIL	100212-02	
L220	X	X			COIL	AA-19701-01	
			X	X	COIL	AA-19701-01	
L221	X	X	X	X	*COIL: Inductance p/o Z201		Corning Glass #68/058REV8
L222	X	X	X	X	COIL	AA-15496-01	
L223	X	X	X	X	*COIL: p/o T203		
L224	X	X	X	X	*COIL: p/o T204		
L225	X	X	X	X	CHOKE		Wilco 3240-15
L226	X	X	X	X	*COIL: p/o T206		
L227	X	X	X	X	*COIL: p/o T207		
L228	X	X	X	X	COIL	AA-15496-02	
L229	X	X	X	X	COIL	AA-15496-01	
L230	X	X	X	X	COIL	AA-15496-02	
L231	X	X	X	X	COIL	AA-19087-01	
L232	X	X	X	X	COIL	AA-19087-01	
L233	X	X	X	X	COIL	AA-19699-04	
L234	X	X			COIL: Inductance; 0.688 in. lg., #22 bus wire		
			X	X	COIL	AA-26331-08	
L235	X	X			COIL: Inductance, 1.063 in. lg., #22 bus wire		
			X	X	COIL	100213-01	
L401	X	X			COIL	AA-27059-01	
			X	X	INDUCTUNER	200632-02	

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
L402	X	X			INDUCTUNER	200632-01	
			X	X	COIL	100221-01	
L403	X	X			COIL	A-27058-01	
			X	X	COIL		Wilco 204-11
L404	X	X			COIL	A-27057-01	
			X	X	Not Used		
LS101	X	X	X	X	SPEAKER: Permanent magnet		RCA KS16107
M101	X	X	X	X	METER ASSEMBLY	AA-27327-01	
M102	X	X	X	X	METER ASSEMBLY	AA-27331-01	
P101	X	X	X	X	*CONNECTOR, Plug: p/o W101		
P102	X	X	X	X	Not Used		
P103	X	X	X	X	Not Used		
P104	X	X	X	X	Not Used		
P105	X	X	X	X	Not Used		
P106	X	X	X	X	*CONNECTOR, Plug: p/o W101		
P201	X	X	X	X	CONNECTOR, Plug: Type BNC		UG-88/U
P202	X	X	X	X	CONNECTOR, Plug: Type BNC		UG-88/U
P203	X	X	X	X	CONNECTOR, Plug: Type BNC		UG-260/U
P204	X	X	X	X	CONNECTOR, Plug: Type BNC		UG-260/U
P205	X	X	X	X	CONNECTOR, Plug: Type BNC		UG-260/U
P301	X	X	X	X	CONNECTOR, Plug		Amphenol 200837-2 200334-1 200390-2
P401	X	X	X	X	CONNECTOR, Plug: Type BNC		UG-260/U
R101	X	X	X	X	RESISTOR, Fixed composition: 2.4K±5%, 1/2W		Allen-Bradley EB2425
R102	X	X	X	X	RESISTOR, Fixed composition: 47K±5%, 1/2W		Allen-Bradley EB4735
R103	X	X	X	X	RESISTOR, Fixed composition: 200 ohms ±5%, 1/2W		Allen-Bradley EB2015
R104	X	X	X	X	RESISTOR, Fixed composition: 75 ohms ±5%, 1/2W		Allen-Bradley EB7505
R105	X	X	X	X	RESISTOR, Fixed composition: 10K±5%, 2W		Allen-Bradley HB1035
R106	X	X	X	X	RESISTOR, Fixed composition: 43K±5%, 1W		Allen-Bradley GB4335
R107	X	X	X	X	RESISTOR, Fixed composition: 10K±5%, 1/2W		Allen-Bradley EB1035
R108	X	X	X	X	RESISTOR, Fixed composition: 1 meg ±5%, 1/2W		Allen-Bradley EB1055

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
R109	X	X	X	X	RESISTOR, Fixed composition: 510 ohms ±5%, 1/2W		Allen-Bradley EB5115
R110	X	X	X	X	RESISTOR, Fixed composition: 470K±5%, 1/2W		Allen-Bradley EB4745
R111	X	X	X	X	RESISTOR, Fixed composition: 470K±5%, 1/2W		Allen-Bradley EB4745
R112	X	X	X	X	RESISTOR, Fixed composition: 820 ohms ±5%, 1/2W		Allen-Bradley EB8215
R113	X	X	X	X	RESISTOR, Fixed composition: 4.7K±5%, 1W		Allen-Bradley GB4725
R114	X	X	X	X	RESISTOR, Variable composition: 1 meg ±20%, 2W		Allen-Bradley JA1N056P 105RA
R115	X	X	X	X	RESISTOR, Fixed composition: 3K±5%, 1/2W		Allen-Bradley EB3025
R116	X	X	X	X	RESISTOR, Fixed composition: 300K±5%, 1/2W		Allen-Bradley EB3045
R117	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R118	X				RESISTOR, Fixed composition: 1 meg ±5%, 1/2W		Allen-Bradley EB1055
		X	X	X	RESISTOR, Fixed film: 332K ±1%, 1/4W		RN65B3323F
R119	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R120	X	X	X	X	RESISTOR, Fixed wirewound: 10K±3%, 10W		Dalohm RH-10
R121	X	X	X	X	RESISTOR, Variable wirewound: 10K±10%, 4W		Mallory M10MPK
R122	X	X	X	X	RESISTOR, Fixed compoaition: 3.6K±5%, 1/2W		Allen-Bradley EB3625
R123	X	X	X	X	Not Used		
R124	X				RESISTOR, Fixed composition: 200 ohms ±5%, 1/2W		Allen-Bradley EB2015
		X	X	X	RESISTOR, Fixed wirewound: 180 ohms ±5%, 2W		Sprague 240E1815
R125	X				RESISTOR, Fixed composition: 1.1 meg ±5%, 1/2W		Allen-Bradley EB1155
		X	X	X	RESISTOR, Fixed composition: 1 meg ±1%, 1/4W		RN65B1004F
R126	X				RESISTOR, Fixed composition: 510 ohms ±5%, 1/2W		Allen-Bradley EB5115
		X	X	X	RESISTOR, Fixed wirewound: 500 ohms ±5%, 2W		Sprague 240E5015

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
R127	X				RESISTOR, Fixed composition: 22K±5%, 1/2W		Allen-Bradley EB2235
		X	X	X	RESISTOR, Fixed wirewound: 22K±5%, 5W		Sprague 243E2235
R128	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R129	X	X	X	X	RESISTOR, Fixed wirewound: 14 ohms ±3%, 25W		Dalohm RH-25
R130	X	X	X	X	RESISTOR, Fixed wirewound: 2K±3%, 25W		Dalohm RH-25
R131	X	X	X	X	RESISTOR, Fixed composition: 1 meg ±1%, 1/4W		RN65B1004F
R132	X				RESISTOR, Fixed composition: 43K±5%, 1W		Allen-Bradley GB4335
		X	X	X	RESISTOR, Fixed composition: 63.4K±1%, 1W		RN75B342F
R133	X				RESISTOR, Fixed composition: 22K±5%, 1/2W		Allen-Bradley EB2235
		X	X	X	RESISTOR, Fixed wirewound: 22K±5%, 5W		Sprague 243E2235
R134	X				RESISTOR, Fixed composition: 100K±5%, 1W		Allen-Bradley GB1045
		X	X	X	RESISTOR, Fixed wirewound: 1.8K±5%, 2W		Sprague 240E1825
R135	X				RESISTOR, Fixed composition: 1.5 meg ±5%, 1/2W		Allen-Bradley EB1555
		X	X	X	RESISTOR, Fixed film: 1.5 meg ±1%, 1/4W		RN65B1504F
R136	X				RESISTOR, Fixed composition: 4.3K±5%, 1/2W		Allen-Bradley EB4325
		X	X		RESISTOR, Fixed composition: 4.7K±5%, 1/2W		Allen-Bradley EB4725
				X	RESISTOR, Fixed composition: 5.1K±5%, 1/2W		Allen-Bradley EB5125
R137	X	X	X	X	RESISTOR, Fixed composition: 300 ohms ±5%, 1W		Allen-Bradley GB3015
R138	X	X	X	X	RESISTOR, Fixed composition: 2.4K±5%, 1/2W		Allen-Bradley EB2425
R139	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R140	X	X	X	X	RESISTOR, Fixed composition: 1K±5%, 1/2W		Allen-Bradley EB1025
R141	X	X	X	X	RESISTOR, Fixed composition: 20 ohms ±5%, 2W		Allen-Bradley HB2005

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
R142	X	X	X	X	RESISTOR, Fixed composition: 100K±5%, 1/2W		Allen-Bradley EB1045
R143	X	X	X	X	RESISTOR, Fixed wirewound: 1.1K±3%, 10W		Dalohm RH-10
R144	X	X	X	X	RESISTOR, Fixed composition: 200K±5%, 1/2W		Allen-Bradley EB2045
R145	X	X	X	X	RESISTOR, Fixed wirewound: 5K±3%, 10W		Dalohm RH-10
R146	X				RESISTOR, Fixed composition: 36 ohms ±5%, 1/2W		Allen-Bradley EB3605
		X	X	X	RESISTOR, Variable composition: 5.0 meg ±20%, 1/2W		Ohmite AS-3615
R147	X				RESISTOR, Fixed composition: 22K±5%, 1/2W		Allen-Bradley EB2235
		X	X	X	RESISTOR, Fixed composition: 1 meg ±1%, 1/4W		RN65B1004F
R148	X				Not Used		
		X	X	X	RESISTOR, Fixed wirewound: 6.5K±3%, 10W		Dalohm RH-10
R149	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R150	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R151	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R152	X	X	X	X	RESISTOR, Fixed composition: 1K±5%, 1/2W		Allen-Bradley EB1025
R153	X	X	X	X	RESISTOR, Fixed composition: 150K±5%, 1/2W		Allen-Bradley EB1545
R154	X				RESISTOR, Fixed composition: 3.3K±5%, 2W		Allen-Bradley HB3325
		X	X	X	RESISTOR, Fixed composition: 9.1K±5%, 2W		Allen-Bradley HB9125
R155	X	X	X	X	RESISTOR, Fixed composition: 27 ohms ±5%, 1/2W		Allen-Bradley EB2705
R156	X	X	X	X	RESISTOR, Fixed composition: 27 ohms ±5%, 1/2W		Allen-Bradley EB2705
R157 thru R159	X	X	X	X	Not Used		

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
R160	X	X	X	X	RESISTOR, Variable composition: 500K±10%, 1/2W		Ohmite AS3612
R201	X	X	X	X	RESISTOR, Fixed composition: 68 ohms ±5%, 1/2W		Allen Bradley EB6805
R202	X	X	X	X	RESISTOR, Fixed composition: 3K±5%, 2W		Allen-Bradley HB3035
R203	X	X	X	X	RESISTOR, Fixed composition: 470K±5%, 1/2W		Allen-Bradley EB4745
R204	X	X	X	X	RESISTOR, Fixed composition: 470K±5%, 1/2W		Allen-Bradley EB4745
R205	X	X	X	X	*RESISTOR, Fixed composition: 12K, p/o T201		
R206	X	X	X	X	RESISTOR, Fixed composition: 51K±5%, 1/2W		Allen-Bradley EB5135
R207	X	X	X	X	RESISTOR, Fixed composition: 4.7K±5%, 1/2W		Allen-Bradley EB4725
R208	X	X	X	X	RESISTOR, Fixed composition: 220K±5%, 1/2W		Allen-Bradley EB2245
R209	X	X	X	X	RESISTOR, Fixed composition: 220K±5%, 1/2W		Allen-Bradley EB2245
R210	X	X			RESISTOR, Fixed composition: 620 ohms ±5%, 1/2W		Allen-Bradley EB6215
			X	X	RESISTOR, Fixed composition: 3K±5%, 1/2W		Allen-Bradley EB3025
R211	X	X			Not Used		
			X	X	RESISTOR, Fixed composition: 200 ohms ±10%, 1/2W		Allen-Bradley EB2015
R212	X	X	X	X	RESISTOR, Fixed composition: 27K±5%, 1/2W		Allen-Bradley EB2735
R213	X	X	X	X	Not Used		
R214	X	X	X	X	RESISTOR, Fixed composition: 220K±5%, 1/2W		Allen-Bradley EB2245
R215	X	X	X	X	RESISTOR, Fixed composition: 220K±5%, 1/2W		Allen-Bradley EB2245
R216	X	X			RESISTOR, Fixed composition: 15 ohms ±5%, 1/2W		Allen-Bradley EB1505
			X	X	RESISTOR, Fixed composition: 20 ohms ±5%, 1/2W		Allen-Bradley EB2005
R217	X	X	X	X	RESISTOR, Fixed composition: 1K±5%, 1/2W		Allen-Bradley EB1025

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
R218	X	X	X	X	RESISTOR, Fixed composition: 20K±5%, 1/2W		Allen-Bradley EB2035
R219	X	X	X	X	RESISTOR, Fixed composition: 220K±5%, 1/2W		Allen-Bradley EB2245
R220	X	X	X	X	RESISTOR, Fixed composition: 220K±5%, 1/2W		Allen-Bradley EB2245
R221	X	X			RESISTOR, Fixed composition: 820 ohms ±5%, 1/2W		Allen-Bradley EB8215
			X	X	RESISTOR, Fixed composition: 5.6K±5%, 1/2W		Allen-Bradley EB5625
R222	X	X	X	X	Not Used		
R223	X	X	X	X	RESISTOR, Fixed composition: 1 meg ±5%, 1/2W		Allen-Bradley EB1055
R224	X	X	X	X	RESISTOR, Fixed composition: 47K±5%, 1/2W		Allen-Bradley EB4735
R225	X	X	X	X	RESISTOR, Fixed composition: 1K±5%, 1/2W		Allen-Bradley EB1025
R226	X	X	X	X	RESISTOR, Fixed composition: 1.2K±5%, 1/2W		Allen-Bradley EB1225
R227	X	X	X	X	RESISTOR, Fixed composition: 270 ohms ±5%, 1/2W		Allen-Bradley EB2715
R228	X	X	X	X	RESISTOR, Fixed composition: 270 ohms ±5%, 1/2W		Allen-Bradley EB2715
R229	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R230	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R231	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R232	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R233	X	X	X	X	RESISTOR, Fixed composition: 47K±5%, 1/2W		Allen-Bradley EB4735
R234	X	X	X	X	RESISTOR, Fixed composition: 47K±5%, 1/2W		Allen-Bradley EB4735
R235	X	X	X	X	RESISTOR, Fixed composition: 10K±5%, 1/2W		Allen-Bradley EB1035
R236	X	X	X	X	RESISTOR, Fixed composition: 18 ohms ±5%, 1/2W		Allen-Bradley EB1805
R237	X	X	X	X	RESISTOR, Fixed composition: 1K±5%, 1/2W		Allen-Bradley EB1025

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
R238	X	X	X	X	RESISTOR, Fixed composition: 1 meg ±5%, 1/2W		Allen-Bradley EB1055
R239	X	X	X	X	RESISTOR, Fixed composition: 10K±5%, 1/2W		Allen-Bradley EB1035
R240	X	X	X	X	RESISTOR, Fixed composition: 22K±5%, 1/2W		Allen-Bradley EB2235
R241	X	X	X	X	RESISTOR, Fixed composition: 1K±5%, 1/2W		Allen-Bradley EB1025
R242	X	X			*RESISTOR, Fixed composition: 4.7K, p/o T204		
			X	X	*RESISTOR, Fixed composition: p/o T204		
R243	X	X	X	X	RESISTOR, Fixed composition: 33K±5%, 1/2W		Allen-Bradley EB3335
R244	X	X	X	X	RESISTOR, Fixed composition: 470K±5%, 1/2W		Allen-Bradley EB4745
R245	X	X	X	X	RESISTOR, Fixed composition: 470K±5%, 1/2W		Allen-Bradley EB4745
R246	X	X	X	X	*RESISTOR, Fixed composition: p/o T206		
R247	X	X	X	X	RESISTOR, Fixed composition: 1K±5%, 1/2W		Allen-Bradley EB1025
R248	X	X	X	X	RESISTOR, Fixed composition: 22K±5%, 1/2W		Allen-Bradley EB2235
R249	X	X	X	X	RESISTOR, Fixed composition: 1K±5%, 1/2W		Allen-Bradley EB1025
R250	X	X	X	X	RESISTOR, Fixed composition: 100 ohms ±5%, 1/2W		Allen-Bradley EB1015
R251	X	X	X	X	RESISTOR, Fixed composition: 390K±5%, 1/2W		Allen-Bradley EB3945
R252	X	X	X	X	Not Used		
R253	X	X	X	X	RESISTOR, Fixed composition: 47 ohms ±5%, 1/2W		Allen-Bradley EB4705
R254	X	X	X	X	RESISTOR, Fixed composition: 82 ohms ±5%, 1/2W		Allen-Bradley EB8205
R255	X	X	X	X	RESISTOR, Fixed wirewound: 7.5K±3%, 10W		Dalohm RH-10
R401	X	X	X	X	RESISTOR, Fixed composition: 100K±5%, 1/2W		Allen-Bradley EB1045
R402	X	X	X	X	RESISTOR, Fixed composition: 68 ohms ±5%, 1/2W		Allen-Bradley EB6805

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
R403	X	X			RESISTOR, Fixed composition: 1.8K±5%, 1/2W		Allen-Bradley EB1825
			X	X	Not Used		
R404	X	X	X	X	RESISTOR, Fixed composition: 10K±5%, 2W		Allen-Bradley HB1035
R405	X	X	X	X	RESISTOR, Fixed composition: 7.5K±5%, 1W		Allen-Bradley GB7525
R406	X	X	X	X	RESISTOR, Fixed composition: 120 ohms ±5%, 1/2W		Allen-Bradley EB1215
S101	X	X	X	X	SWITCH, Rotary	AA-27504-01	
S102	X	X	X	X	SWITCH, Toggle: SPST, bat lever		H. H Smith 510
S201	X	X	X	X	SWITCH, Pushbutton: SPDT, 5 amps 250 vac		Micro Switch 1PB81-T2
T101	X	X	X	X	TRANSFORMER, Power	AA-25466-01	
T102	X	X	X	X	TRANSFORMER, Audio	101473-90	
T201	X	X	X	X	TRANSFORMER, IF	AB-32690-01	
T202	X	X	X	X	TRANSFORMER, IF	AB-15532-01	
T203	X	X	X	X	TRANSFORMER, IF	AB-15540-01	
T204	X	X	X	X	TRANSFORMER, IF	AB-15493-01	
T205	X	X	X	X	Not Used		
T206	X	X	X	X	TRANSFORMER, IF	AB-32691-01	
T207	X	X	X	X	TRANSFORMER, IF	AB-15539-01	
TP201	X	X			Not Used		
			X	X	TEST POINT		Sealectro RST-SM-1
TP202	X	X	X	X	TEST POINT		Sealectro RST-SM-1
TP203	X	X	X	X	TEST POINT		Sealectro SKT-5BC
TP204	X	X	X	X	TEST POINT		Sealectro SKT-5BC
TP205	X	X	X	X	TEST POINT		Sealectro SKT-5BC
TP206	X	X	X	X	TEST POINT		Sealectro SKT-5BC
TP207	X	X	X	X	TEST POINT		Sealectro SKT-5BC
TP208	X	X	X	X	TEST POINT		Sealectro SKT-5BC
TP209	X	X	X	X	TEST POINT		Sealectro SKT-5BC

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
TP210	X	X	X	X	TEST POINT		Sealectro RST-SM-1
V101	X	X	X	X	ELECTRON TUBE		6AW8A
V102	X	X	X	X	ELECTRON TUBE		12AU7
V103	X	X	X	X	ELECTRON TUBE		6AW8A
V104	X	X	X	X	ELECTRON TUBE		6CL6
V105	X	X	X	X	ELECTRON TUBE		6CL6
V106	X	X	X	X	ELECTRON TUBE		6CL6
V201	X	X	X	X	ELECTRON TUBE		5842/417A
V202	X	X	X	X	ELECTRON TUBE		5654/6AK5W
V203	X	X	X	X	ELECTRON TUBE		5654/6AK5W
V204	X	X	X	X	ELECTRON TUBE		5654/6AK5W
V205	X	X	X	X	ELECTRON TUBE		5654/6AK5W
V206	X	X	X	X	ELECTRON TUBE		6BZ7
V207	X	X	X	X	ELECTRON TUBE		6AU6WA
V208	X	X	X	X	ELECTRON TUBE		6AU6WA
V209	X	X	X	X	ELECTRON TUBE		6AU6WA
V210	X	X	X	X	ELECTRON TUBE		6CB6
V401	X	X	X	X	ELECTRON TUBE: Nuvisitor type		RCA 7586
V402	X	X	X	X	ELECTRON TUBE: Nuvisitor type		RCA 7586
W101	X	X	X	X	CABLE ASSEMBLY, Power	AA-19709	
XC101	X	X	X	X	SOCKET: Octal base, mica, bottom mounting		TS-101P01
XC102	X	X	X	X	SOCKET: Octal base, mica, bottom mounting		TS-101P01
XC103	X	X	X	X	Not Used		
XC104	X	X	X	X	Not Used		
XC105	X	X			Not Used		
			X	X	SOCKET: Octal base, mica, bottom mounting		TS-101P01
XC106	X	X			Not Used		
			X	X	SOCKET: Octal base, mica, bottom mounting		TS-101P01
XC107 thru XC124	X	X	X	X	Not Used		
XC125	X	X			SOCKET: Octal base, mica, bottom mounting		TS-101P01
			X	X	Not Used		
XC126	X	X			SOCKET: Octal base, mica, bottom mounting		TS-101P01

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	1455A	1456A	1456BS	Name and Description	Part Number Vitro	Vendor
			X	X	Not Used		
XDS101	X	X	X	X	LAMPHOLDER: Panel mounted		Dialco 101-4630-931
XDS102	X	X	X	X	LAMPHOLDER: Panel mounted		Dialco 101-4630-932
XF101	X	X	X	X	FUSEHOLDER: Panel mounted		Bussmann HKP
XV101	X	X	X	X	SOCKET, Electron tube: 9 pin		Elco BR-283-BC-125
XV102	X	X	X	X	SOCKET, Electron tube: 9 pin		Elco BR-283-BC-125
XV103	X	X	X	X	SOCKET, Electron tube: 9 pin		Elco BR-283-BC-125
XV104	X	X	X	X	SOCKET, Electron tube: 9 pin		Elco BR-283-BC-125
XV105	X	X	X	X	SOCKET, Electron tube: 9 pin		Elco BR-283-BC-125
XV106	X	X	X	X	SOCKET, Electron tube: 9 pin		Elco BR-283-BC-125
XV201	X	X	X	X	SOCKET, Electron tube: 9 pin		Mycalex 90A299
XV202	X	X			SOCKET, Electron tube: 7 pin		Elco BR-151-BC-125
			X	X	SOCKET, Electron tube: 7 pin		Alcon 550LL-2
XV203	X	X			SOCKET, Electron tube: 7 pin		Elco BR-151-BC-125
			X	X	SOCKET, Electron tube: 7 pin		Alcon 550LL-2
XV204	X	X			SOCKET, Electron tube: 7 pin		Elco BR-151-BC-125
			X	X	SOCKET, Electron tube: 7 pin		Alcon 550LL-2
XV205	X	X			SOCKET, Electron tube: 7 pin		Elco BR-151-BC-125
			X	X	SOCKET, Electron tube: 7 pin		Alcon 550LL-2
XV206	X	X			SOCKET, Electron tube: 9 pin		Elco BR-283-BC-125
			X	X	SOCKET, Electron tube: 9 pin		Alcon 950LL-2
XV207	X	X			SOCKET, Electron tube: 7 pin		Elco BR-151-BC-125
			X	X	SOCKET, Electron tube: 7 pin		Alcon 550LL-2
XV208	X	X			SOCKET, Electron tube: 7 pin		Elco BR-151-BC-125
			X	X	SOCKET, Electron tube: 7 pin		Alcon 550LL-2

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

Reference Designation	Receiver 1455	Receiver 1455A	Receiver 1456A	Receiver 1456BS	Name and Description	Part Number Vitro	Part Number Vendor
XV209	X	X			SOCKET, Electron tube: 7 pin		Elco BR-151-BC-125
			X	X	SOCKET, Electron tube: 7 pin		Alcon 550LL-2
XV210	X	X			SOCKET, Electron tube: 7 pin		Elco BR-151-BC-125
			X	X	SOCKET, Electron tube: 7 pin		Alcon 550LL-2
XV401	X	X	X	X	SOCKET, Electron tube: 5 pin		Cinch Jones 133-65-10-001
XV402	X	X	X	X	SOCKET, Electron tube: 5 pin		Cinch Jones 133-65-10-001
Y201	X	X			COIL ASSEMBLIES	AB-16509-01	
			X	X	COIL ASSEMBLY, Oscillator tuning	AB-16509-05	
Z201	X	X	X	X	CRYSTAL AND OVEN ASSEMBLY: Nems-Clarke type CO-400 (frequency to be specified, not furnished with receiver)		

*Parts not separately replaceable.

Courtesy of http://BlackRadios.terryo.org

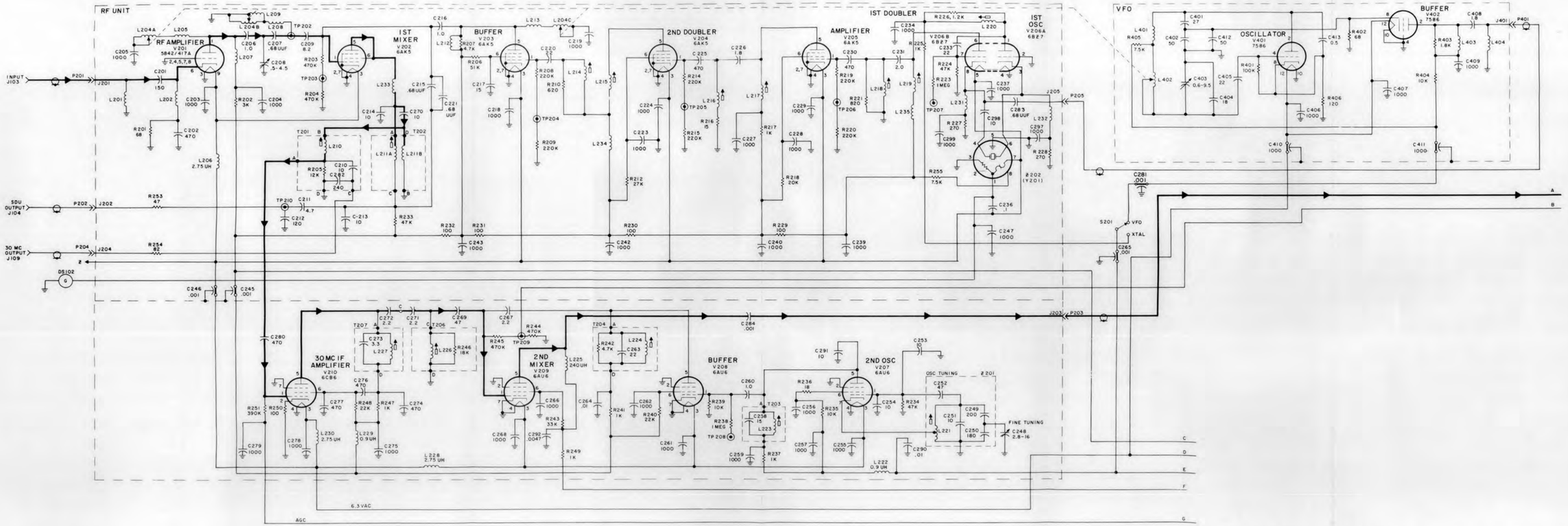


Figure 15. 1455 Telemetry Receiver, Schematic Diagram (Sheet 1 of 2)

Courtesy of http://BlackRadios.terryo.org

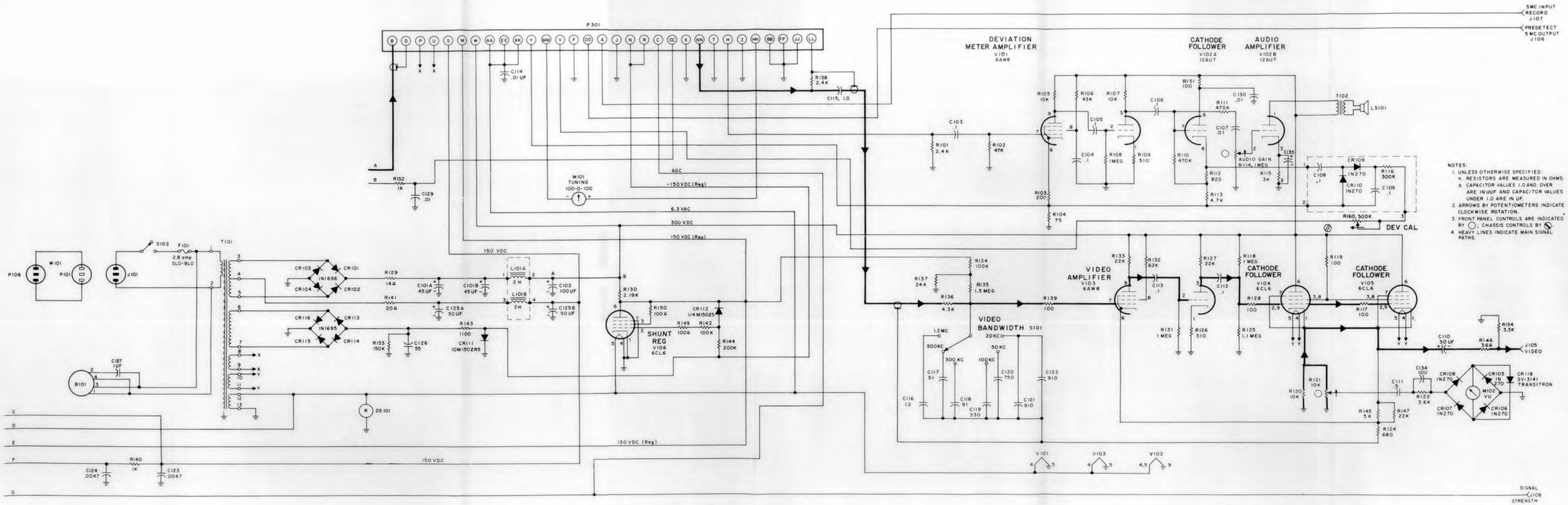


Figure 15. 1455 Telemetry Receiver, Schematic Diagram (Sheet 2 of 2)

Courtesy of http://BlackRadios.terryo.org

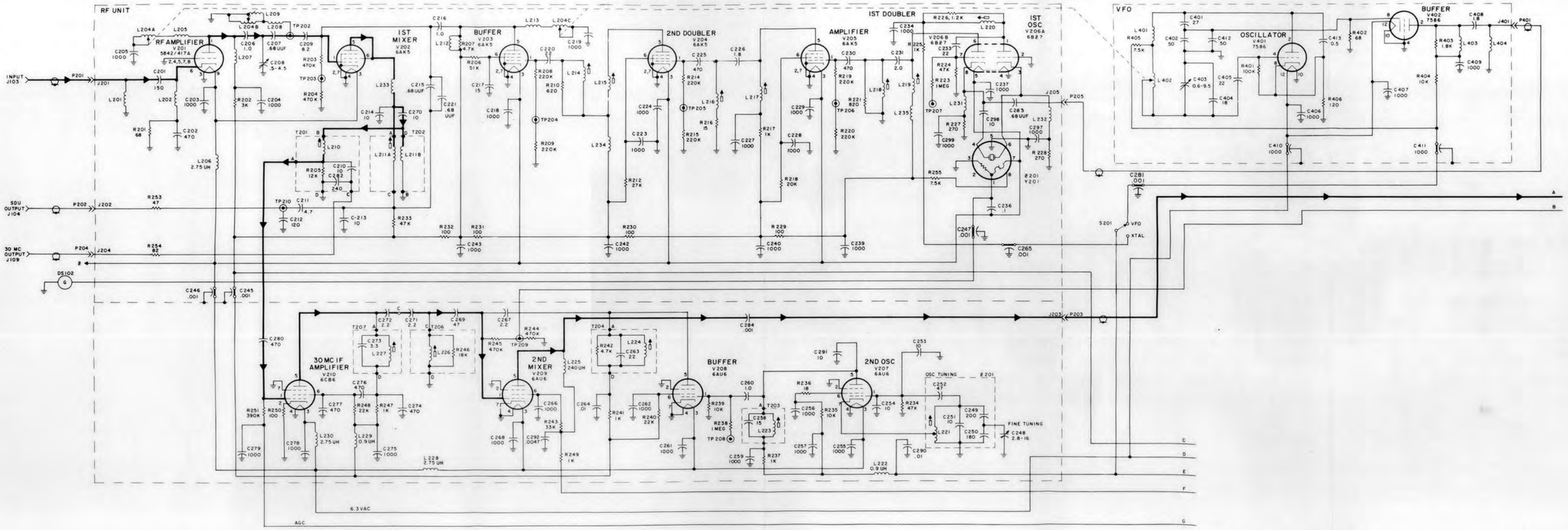


Figure 16. 1455A Telemetry Receiver, Schematic Diagram (Sheet 1 of 2)

Courtesy of http://BlackRadios.terryo.org

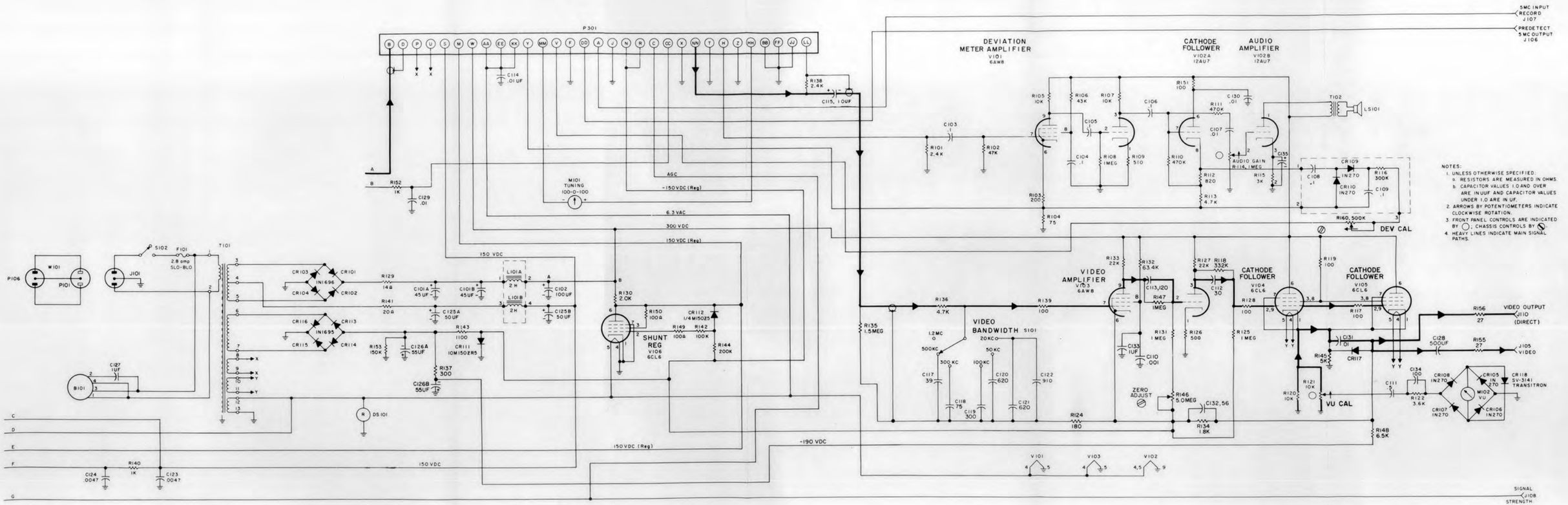


Figure 16. 1455A Telemetry Receiver, Schematic Diagram (Sheet 2 of 2)

Courtesy of http://BlackRadios.terryo.org

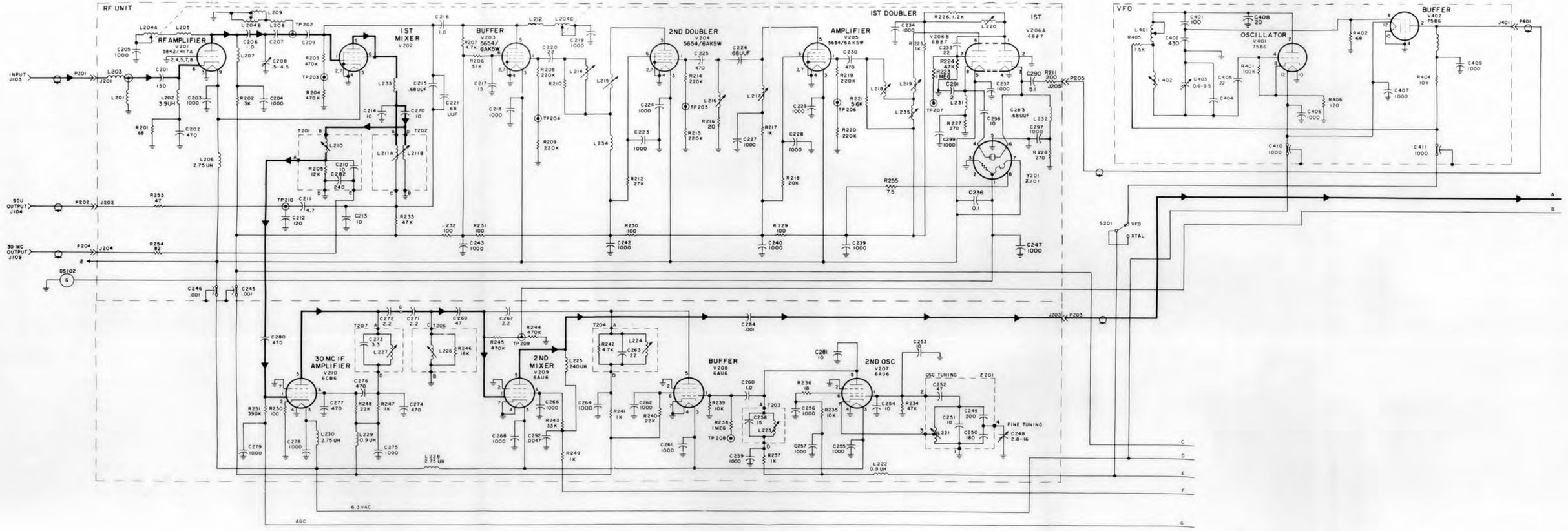


Figure 17. 1456A and 1456BS Telemetry Receiver, Schematic Diagram (Sheet 1 of 2)

Courtesy of http://BlackRadios.terryo.org

TABLE I

RECEIVER	SYMBOL	C118	C119	C120	C121	C122	C134	R136
MODEL 1456 A	VALUE	75	300	620	620	910	——	4.7
	BANDWIDTH	300KC	100 KC	50 KC	20 KC	20 KC	——	——
MODEL 1456 BS	VALUE	91	180	220	820		220	5.1
	BANDWIDTH	280 KC	140 KC	70 KC	35 KC		70 KC	——

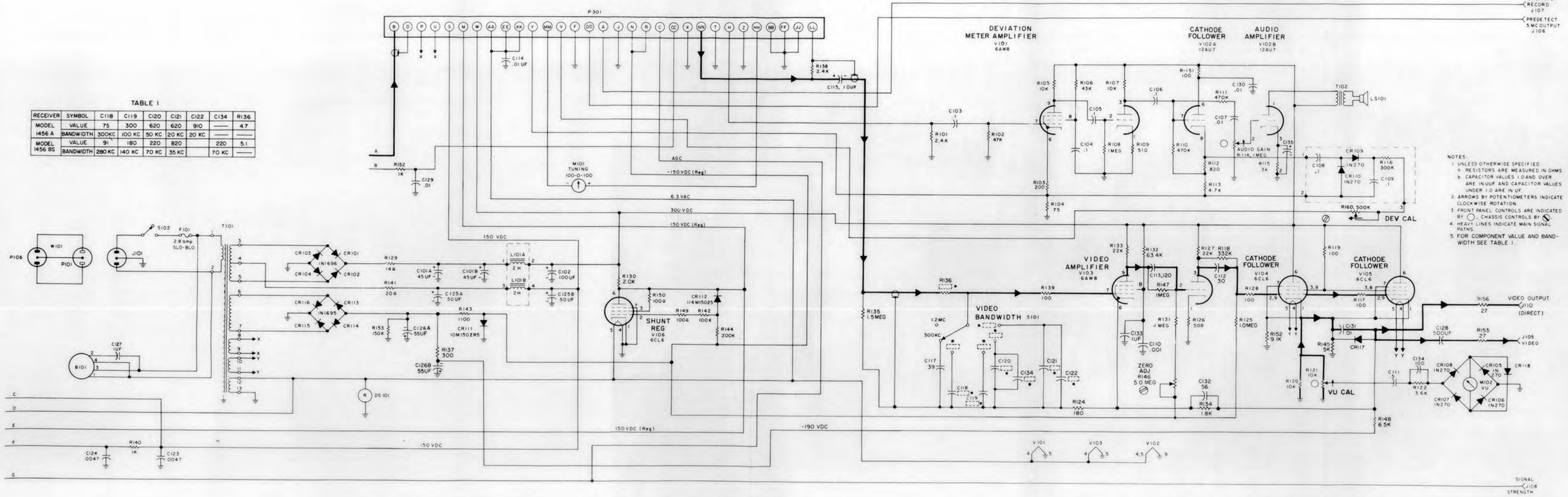


Figure 17. 1456A and 1456BS Telemetry Receiver, Schematic Diagram (Sheet 2 of 2)

Courtesy of http://BlackRadios.terryo.org