RA6337

LOW FREQUENCY CONVERTER

INSTRUCTION MANUAL

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RA.6337 LOW FREQUENCY CONVERTER

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RA6337 LOW FREQUENCY CONVERTER

RA6337 LF CONVERTER

CHAPTER 1

General Description

This converter was designed for use with the RA6217 HF Receiver to extend the frequency range down to 3 kHz. The composite equipment provides total coverage of the frequency range 3 kHz to 30 MHz. With RF input signals in the range 3 to 980 kHz the converter produces an inverted output spectrum (2.997 - 2.02 MHz) which is fed to the interpolation section of the RA6217 Receiver. The converter derives its 1 MHz input signal, AGC signal and operating power via rear panel connectors from the RA6217 Receiver.

Technical Specifications

Input Frequency Range	3 - 980 kHz
Input Impedance	75 ohms nominal
Input VSWR	2:1 or better
Input Preselection (RF RANGE KC)	A. Double tuned circuits in five ranges: 3-10 kHz 10-30 kHz 30-100 kHz 100-300 kHz 300-980 kHz B. Two low pass filter sections with cut-offs at 1 MHz and 500 kHz. In addition to the above range positions, wideband positions, WB-500 and WB-980 are included. A range is provided to cover 300 - 500 kHz using the 300 - 980 kHz double tuned circuits with the 500 kHz low pass filter.
RF Attenuator	A five position attenuator provides up to 40 dB in 10 dB steps in the "A" version. An alternate attenuator provides up to 60 dB in 15 dB steps in the "B" version converter.

Sensitivity	From 100-980 kHz in a 3 kHz bandwidth; 1 microvolt CW for 15 dB S/N ratio. From 3 - 100 kHz in a 200 Hz bandwidth; 1 microvolt CW for 15 dB S/N ratio.
Noise Figure (Tuned Mode)	100-980 kHz; 10 dB or better 3-100 kHz; 20 dB or better
Gain	The voltage gain from the antenna (75 ohms) to the output sockets terminated by 2K ohms is 50 dB nominal.
Output Impedance	200 ohms or less (Output load approx. 2000 ohms).
3 MHz Leakage to Output	Less than 30.0 millivolts under all conditions.
3 MHz Leakage to Antenna	Less than 5 microvolts under all conditions with antenna terminated by 75 ohms.
Power Supplies	-16 volts stabilized and switched from RA6217; -0.5 to -4 volts AGC potential from RA6217.
Environmental Conditions	Operating +55°C to 0°C Storage +70°C to -40°C
Dimensions	1-3/4" x 5-1/2" x 16" (depth behind front panel not including rear connectors).
Rear Connections	
Antenna Input	BNC - UG1094/U
RF Output	Miniature connector
1-MHz Input	UG1619/U
Manual/AGC Line	Barrier terminal strip
-16 Volts (switched)	" " "
-16 Volts (unswitched)	Barrier terminal strip
Ground	
Front Panel Controls	RF Attenuator RF Tuning RF Range
Weight	5 pounds
All Other Characteristics	Comparable with the RA6217 HF Receiver specifications.

CHAPTER 2

INSTALLATION

1. Fuse

The single fuse in the converter is a 1/2 amp pigtail fuse (F2801) situated in the antenna input circuit. Normally, it will not be necessary to visually inspect the fuse unless unusually high signal strengths are encountered.

2. Antenna

Connect a suitable antenna to the antenna input connector J2601 (BNC UG1094/U) on the rear panel. The input impedance of the converter at J2601 is 75 ohms nominal.

3. Connections to the RA6217 Receiver

The following connections between the RA6337 and the RA6217 should be made with the cables supplied:

A. Coaxial Cables

RA6337	RA6217
1.0 MHz input (J2602)	1.0 MHz output
2-3 MHz output (J2603)	2-3 MHz input

B. 3 Wire Cable

* RA6337 (TB301)	RA6217
-16 SW	-16 SW
Ground	Ground
AGC	AGC bus

* RA6337 "A" and "B" Models (TB2601)

Although the RA6337 can be used with other receivers, it was specifically designed for use with the RA6217.

CHAPTER 3

OPERATION OF CONTROLS

Reference to the controls are in capitals and are in accordance with the front panel titles adjacent to them. Power input requirements are supplied by the companion RA6217 Receiver. When the Receiver MHz control is dialed to 00, Power is applied to the RA6337 Converter. All other positions of the MHz control removes power from this unit.

RF Attenuator

This control is used to attenuate incoming signals. In the "A" version, five positions provide up to 40 dB of attenuation in 10 dB steps starting at the MIN position and rotating the switch counterclockwise. The steps are 0, 10, 20, 30 and 40 dB respectively. In the "B" version, a total of 60 dB attenuation is available in 15 dB steps. Note: The only difference between the "A" and "B" Converters is the amount of attenuation available in the attenuator switch.

RF Range KC

This eight position switch provides the following:

A. Double tuned circuits in five ranges:

3 - 10 kHz
10 - 30 kHz
30 - 100 kHz
100 - 300 kHz
300 - 980 kHz

B. Low pass filter 980 kHz cut-off (WB-980)

C. Low pass filter 500 kHz cut-off (WB-500)

D. The range 300 - 500 kHz uses the 300 - 980 kHz double tuned circuits with the 500 kHz low pass filter.

The ranges marked in red (10-30 and 100-300) correspond to the red numbers on the tuning scale.

Tuning

This control adjusts a variable capacitor to tune the antenna for maximum sensitivity.

CHAPTER 4

BRIEF TECHNICAL DESCRIPTION

1. With the aid of the block diagram this chapter outlines the signal flow through the converter. For a more detailed explanation, see Chapter 5 Detailed Circuit Description.

2. RF Amplifier and Filter

Signals from the antenna are fed to the RF amplifier via the antenna attenuator and the 0 to 1-MHz low pass filter. The 0 to 0.5 MHz low pass filter (WB-500) can also be switched into the circuit to discriminate against high level signals in the broadcast band. Any of five double tuned input filters covering the range 3 to 980 kHz may be selected as required.

The RF amplifier output circuit is a 0-1 MHz low pass filter; coupling the 3 to 980 kHz spectrum to the balanced mixer.

3. Harmonic Generator and Filter

The 1-MHz input from the RA6217 crystal oscillator is fed to the harmonic generator where the amplifier and the output bandpass filter circuit select the third harmonic to be fed to the balanced mixer.

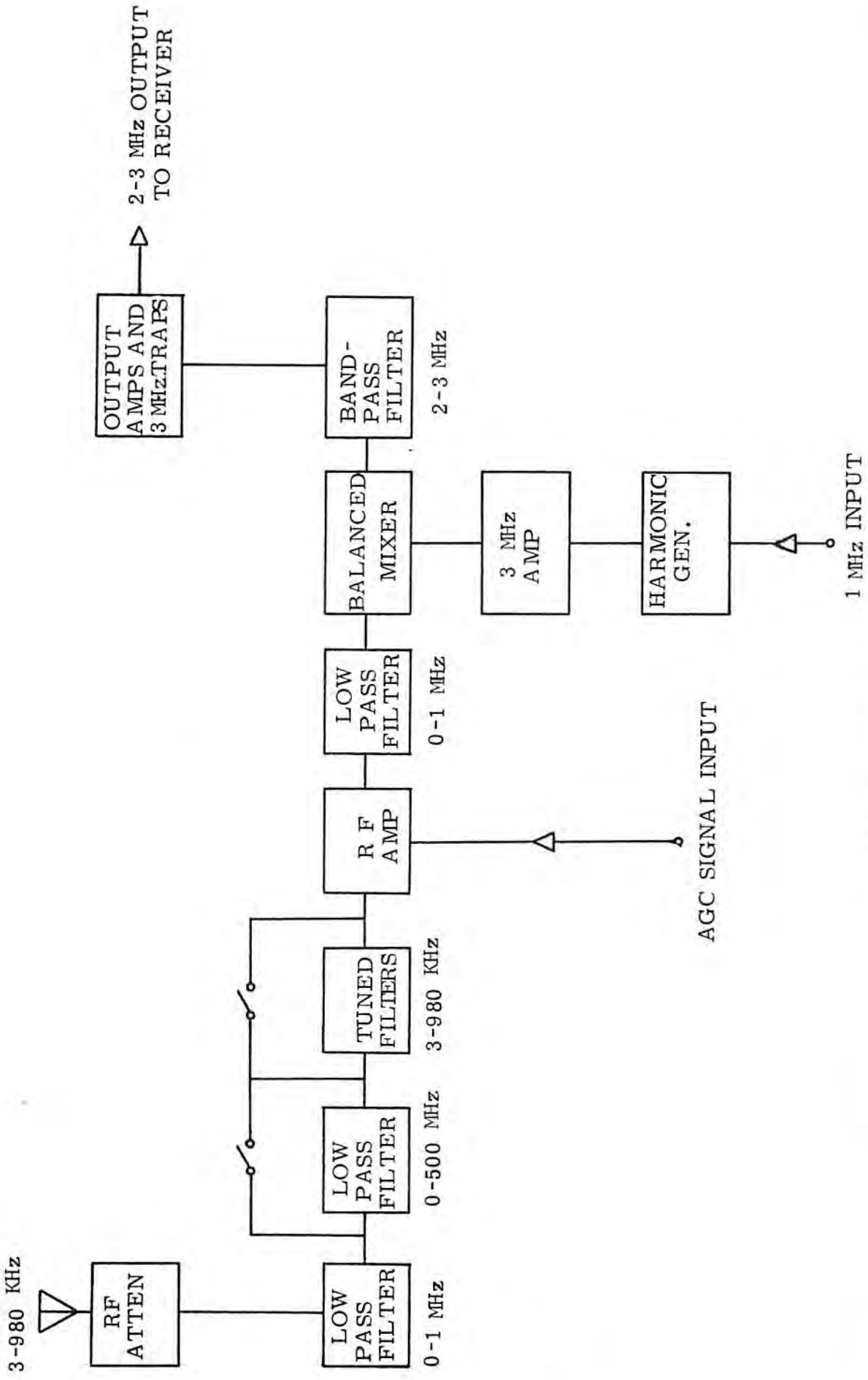
4. Balanced Mixer

The mixer combines the third harmonic signal with the 3 to 980 kHz spectrum providing a difference frequency in the range 2.997 to 2.02 MHz. This signal is fed via the 2-3 MHz bandpass filter to the output amplifiers and 3 MHz trap circuits.

5. Output Amplifiers and 3-MHz Trap Circuits

The output amplifiers serve to raise the required signal to a level suitable for application to the interpolation receiver section of the RA6217.

The required signal is finally selected by the kilohertz control of the RA6217 Receiver. The trap circuits serve to reduce the level of any 3-MHz breakthrough from the balanced mixer so that the following receiver stages are not overloaded.



RA. 6337 - BLOCK DIAGRAM

CHAPTER 5

DETAILED CIRCUIT DESCRIPTION

Reference should be made to the schematic diagrams in the rear of the manual.

1. Antenna Input Circuits — Ref. Dwg. G-01811

The input impedance at the antenna input (J2601) is 75 ohms nominal under all normal operating conditions. Signals are fed via a fuse to a five position attenuator (S2601) which provides up to 40 dB ("A" version) or 60 dB ("B" version) of attenuation to the incoming signal spectrum. A 0-to-1 MHz low pass filter (Dwg. G-01809) is permanently in the circuit and a 0-to-0.5 MHz low pass filter is included on all positions of the Antenna Range switch except wideband (980 kHz) and the tuned range 300-980 kHz. The Antenna Range switch (S2801) selects either of two wideband input conditions, WB-980 or WB-500, or any one of five double tuned filters which consist of the paired transformer T2801 through T2810, their associated trimmer capacitors C2801 through C2805 and the common variable capacitors C2601A, B and fixed capacitor C2602. A sixth tuned range is provided covering 300-500 kHz with the 0-0.5 MHz low pass filter in series with the 300-980 kHz tuned filter.

The filters are tuned over an approximate 3:1 frequency range by the ganged variable capacitor C2601, which is the front panel Tuning control.

Circuit alignment is accomplished by adjusting the variable slugs in their respective transformers (T2801-T2810) and the associated trimmer capacitors C2801 through C2805.

In both wideband input positions an autotransformer (T2501) is used to step up the antenna impedance to the base of the RF amplifier transistor Q1. This is done to keep the overall system gain and noise figure essentially constant in both wideband and tuned conditions.

A spark gap E2601 is included in the antenna input circuit for protection against short duration, high voltage transients.

2. RF Amplifier — Ref. Dwg. G-02230

The selected input signal spectrum is capacitance coupled via C2-C3 to the base of RF amplifier transistor Q1. Diode CR1 protects Q1 against overload. AGC and/or manual gain control is provided via the transistor Q2 which acts as a variable emitter impedance that changes with the DC circuit conditions.

The DC conditions corresponding to maximum gain are set by potentiometer R3 with -4 volts applied to the AGC line. Under these conditions Q2 has a low collector impedance and little degeneration occurs in the emitter of Q1.

The action of the AGC circuits causes the AGC voltage to move toward zero thereby increasing the collector impedance of Q2 and decreasing the gain of Q1. The control characteristic is made more linear by the clamp circuit consisting of R7, R8, CR2 and zener diode VR1.

The output circuit of the RF stage is a 0-1 MHz low pass filter consisting of coil assemblies A1, A2 and capacitors C4, C8 and C9. This filter serves to couple the amplified input spectrum to the balanced mixer and to discriminate against 3-MHz heterodyne signal leakage back into the RF stage and antenna circuits.

3. Balanced Mixer

Transistors Q3 and Q4 are arranged as a balanced mixer so that the 3-MHz heterodyne signal and input spectrum signal tend to cancel in the output circuit. Balance adjustment is provided by R12. The input spectrum is applied to the base of Q3 via parallel capacitors C10 - C11, and also to the emitter of Q4 via the capacitor configuration C13 - C14. The 3-MHz heterodyne signal is applied to the base of Q4 via capacitors C35 and C36 and also fed to the emitter of Q3 via C15 and C16 at a suitable mixing level.

The required output spectrum in the range 2.997 - 2.02 MHz is selected by the 2-3 MHz output bandpass filter consisting of coils A3, A4, A5 and A6 and then fed to the following output amplifier and 3-MHz trap circuits.

4. Output Amplifier and 3-MHz Trap Circuits

Resistor R20 together with variable capacitor C21 and the 3-MHz crystal Y1 constitute a frequency selective attenuator (or trap circuit) with maximum attenuation occurring at the series resonant frequency of Y1 and C1. This circuit is tuned to resonate precisely at 3-MHz by adjusting C21 to trap the 3-MHz heterodyne signal. Buffer stage Q5 is arranged as an emitter follower to provide a relatively high impedance input and suitable low impedance output to drive the following amplifier stage Q6. The amplifier stage Q6 is resistance-capacitance coupled to a second 3-MHz trap circuit (R31, C27 and Y2) and the output emitter follower Q7 included in the circuit to provide a low impedance signal drive to the third mixer stage of the RA6217 companion receiver.

5. Harmonic Generator and 3-MHz Amplifier

The 1-MHz standard output from the RA6217 is fed via a wide-band step-up transformer (L1) to the harmonic generator stage at the base of Q8. The collector voltage of Q8 is limited by the voltage divider R38-R39 while the collector load consists of a 3-MHz tuned circuit (A7) with a capacitance tap at terminal 6 to provide a low impedance drive to the following 3-MHz amplifier stage Q9. The gain of amplifier stage Q9 can be adjusted by variable resistor R42 to provide the correct drive level to the balanced mixer via a double tuned 3-MHz transformer A8-A9. The secondary coil of transformer A9 is tapped to provide a low impedance output and the large value coupling capacitor combination C35-C36 is used to preserve the symmetry of the balanced mixer.

6. Power Supply

The -16 vdc required to operate the equipment is provided from the companion receiver. The switching inside the receiver is arranged so that when the MHz control is set to 00, the normal receiver front end is muted and the required -16 vdc is switched via a rear terminal on the receiver to the converter.

With this arrangement, the digital readout on the RA6217 Receiver will display the correct tuned frequency of the converter in kHz.

CHAPTER 6

ALIGNMENT PROCEDURE AND TEST DATA

The following procedures provide data typical of a properly functioning unit. The procedures include testing the circuits individually as well as overall gain tests. They should be performed independently of the companion receiver or until any fault located in the converter is definitely isolated from the receiver. The receiver power supply, AGC voltage and 1-MHz signal may be used in lieu of other sources.

Equipment Required:

1. Signal Generator, 3-kHz - 30-MHz, 50 ohms impedance
2. Vacuum Tube Voltmeter, 3-kHz - 3-MHz
3. Oscilloscope
4. 1.0 uf Capacitor and 50/75 ohm Matching Pad

1. RF Attenuator

A. Connect the signal generator to the antenna input connector J2601, and connect the voltmeter to terminal E2701 on the LPF board. Set the RF ATT. switch to MIN. and the RF RANGE KC switch to WB-500. Determine that an input signal of 500 kHz at 30 millivolts produces 30 millivolts at E2701.

B. Switch the attenuator switch step by step towards the MAX. position and determine that each step produces a *10 dB drop in signal level at E2701 for a total of *40 dB attenuation. Then reset the attenuator to MIN.

* NOTE: An alternate ("B") version has 15 dB steps for a total of 60 dB attenuation.

2. Low Pass Filter 500 kHz and 1-MHz

A. Set the RF RANGE KC switch to WB-980 and connect the voltmeter to terminal E2703.

B. Ensure that potentiometer R2503 is set to minimum. With the signal generator still connected to J2601, vary the signal generator frequency from 3 kHz to 1-MHz while peaking coils L2705 through L2708 on the 1-MHz LPF to obtain not more than a 6 dB ripple across the passband.

C. Set the range switch to WB-500 and peak coils L2701 through L2704 on the 500 kHz LPF to obtain not more than a 3 dB ripple across the passband (500 kHz).

D. Connect the AC voltmeter to terminal E2501 and set the RF RANGE switch to WB-980. Set the signal generator to 980 kHz and determine that 30 millivolts input produces approximately 60 millivolts at E2501. Then set the signal generator to 3 kHz and ensure that an input of 30 millivolts produces at least 20 millivolts at E2501.

E. Set the RF RANGE KC switch to WB-500. With the signal generator set to 500 kHz, ensure that a 30 millivolt input produces approximately 60 millivolts at E2501.

3. Tuned Circuits

A. 3-10 kHz Set the RF RANGE KC switch to the 3-10 kHz position. With the signal generator connected to J2601 and set to 3 kHz connect the AC voltmeter to E2501. Adjust the TUNING control on the front panel for maximum indication on the voltmeter. Loosen the set screw and without moving the tuned position of capacitor C2601, set the dial to 3 kHz and tighten the set screw.

B. Set the signal generator to 10 kHz and tune the converter to 10 kHz. Adjust C2801 for maximum on the voltmeter. Determine that an input of 30 millivolts produces approximately 60 millivolts output.

C. 10-30 kHz: Set the signal generator to 10 kHz and set the RF RANGE KC switch to the 10-30 kHz position. Tune the converter to 10 kHz and adjust transformers T2803 and T2804 for maximum indication on the voltmeter.

Tune the signal generator and converter to 30 kHz. Adjust C2802 for maximum indication on the voltmeter. Determine that a 30 millivolt input produces approximately 60 millivolts output.

D. Repeat paragraph c (10-30 kHz) for the following positions on the RF RANGE KC switch adjusting the respective transformers and capacitor for each range.

Range kHz	Transformers	Capacitor
30-100	T2805, T2806	C2803
100-300	T2807, T2808	C2804
300-980	T2809, T2810	C2805

The 300-500 kHz range is aligned when adjusting the 300-980 kHz range.

RF Amplifier and AGC Circuits

A. Connect -16 vdc and -4 vdc (AGC) to the correct terminals on TB2301 (rear panel). Connect the AC voltmeter to the junction of R2510 and R2511. Set the signal generator to 2.4 MHz and connect it to terminal E2501. Adjust the signal generator level for a convenient low level reading on the voltmeter and adjust coil assembly A2501 for minimum.

B. Set the signal generator to 1.45 MHz and adjust A2502 for minimum. Sweep the signal generator over the range 3-980 kHz and check the pass band for a maximum ripple of 3 dB.

C. Set the signal generator to 500 kHz (at 1 millivolt) and adjust the AGC voltage to -2vdc. Set R2503 to obtain 20 dB less than maximum gain.

5. Harmonic Generator and 3-MHz Amp

A. Connect an accurate 1-MHz signal at 65 millivolts to J2602. Connect the AC voltmeter to the Junction of R2540-R2541. Adjust Coil A2507 for maximum.

B. Connect the AC voltmeter to the junction of R2516-R2517 and adjust coils A2508 and A2509 for maximum. Then adjust R2542 for 80 millivolts on the voltmeter.

6. 2-3 MHz Bandpass Filter

A. Remove the 1-MHz input from J2602 and connect the signal generator to the junction of R2510-R2511 through a 1.0 uf capacitor. Connect the voltmeter to the junction of R2520-R2521. Set the signal generator to 4.1 MHz and adjust coil A2505 for a minimum. Then set the signal generator to 2.1 MHz and adjust A2503 and A2506 for maximum.

B. Set the signal generator to 1.54 MHz and adjust A2504 for a minimum (slight indication). Repeat procedures (in paragraph 6.A above and 1.54 MHz setting) until the passband is flat within 3 dB.

C. Connect the voltmeter to E2506 and reconnect the 1-MHz source to J2602. Disconnect the signal generator. Adjust R2512, C2521, and C2527 for a minimum (approximately 10 millivolts) at 3-MHz.

7. Overall Gain Tests

A. Connect the signal generator to the antenna input J2601. Set the RF RANGE KC switch to WB-980 and the RF attenuator to MIN. Set the signal generator to the frequencies listed below and check for the corresponding levels on the RF Voltmeter.

Sig. Gen. Freq. kHz	Input Level	Output Level
980	1 mv(0 dB)	50 dB
500	1 mv	50 dB
3	1 mv	40 dB

Approximately 50 dB gain should be obtained for all wide-band and tuned input conditions for any frequency in the range.

CHAPTER 7

PARTS LISTS AND SCHEMATIC DIAGRAMS

The parts lists consist of four sections:

SERIES	ASSEMBLY	ASSEMBLY NO.	DRAWING NO.
2500	LF Converter	A02232	G02230F
2600	LF Adapter & RF Attenuator	A02841	G01811E
2700	LP Filter	A02195	G01809B1
2800	LF Preselector	A02194	G01811E

ORDERS FOR SPARE PARTS

When ordering spare parts, it is recommended that users include the following information:

(1) Type and serial number of equipment.

(2) Circuit reference, description and manufacturer of part required.

(3) Quantity required.

RA6337 LF CONVERTER - Dwg. G-02230

Ckt. Ref.	Description	Value	Tol. %	Rating	Racal Part No.	Manufacturers Part No.
RESISTORS						
R2501	Fixed Comp.	5.1K	5	1/4	10680	RC07GF512J
R2502	Fixed Comp.	470	5	1/4	10655	RC07GF471J
R2503	Potentiometer	1K	30	1/2	16015	Beckman 62P-R1K
R2504	Fixed Comp.	220	5	1/4	10647	RC07GF221J
R2505	Fixed Comp.	680	5	1/4	10659	RC07GF681J
R2506	Fixed Comp.	27	5	1/4	10625	RC07GF270J
R2507	Fixed Comp.	1.8K	5	1/4	10669	RC07GF182J
R2508	Same as R2504					
R2509	Fixed Comp.	2.7K	5	1/4	10673	RC07GF272J
R2510	Fixed Comp.	15K	5	1/4	10691	RC07GF153J
R2511	Fixed Comp.	4.7K	5	1/4	10679	RC07GF472J
R2512	Potentiometer	10K	30	1/2	16023	Beckman 62P-R10K
R2513	Fixed Comp.	120	5	1/4	10641	RC07GF121J
R2514	Fixed Comp.	1K	5	1/4	10633	RC07GF102J
R2515	Same as R2513					
R2516	Same as R2510					
R2517	Same as R2511					
R2518	Fixed Comp.	6.8K	5	1/4	10683	RC07GF682J
R2519	Fixed Comp.	10	5	1/4	10615	RC07GF100J
R2520	Fixed Comp.	3.9K	5	1/4	10677	RC07GF392J
R2521	Same as R2514					
R2522	Same as R2511					
R2523	Fixed Comp.	10K	5	1/4	10687	RC07GF103J
R2524	Same as R2504					
R2525	Same as R2504					
R2526	Same as R2523					
R2527	Same as R2510					
R2528	Same as R2520					
R2529	Fixed Comp.	820	5	1/4	10661	RC07GF821J
R2530	Same as R2514					
R2531	Same as R2520					
R2532	Same as R2511					
R2533	Same as R2523					
R2534	Same as R2504					
R2535	Not Assigned					
R2536	Fixed Comp.	3.3K	5	1/4	10675	RC07GF332J
R2537	Same as R2507					
R2538	Same as R2511					
R2539	Fixed Comp.	150	5	1/4	10643	RC07GF151J
R2540	Same as R2520					
R2541	Same as R2510					
R2542	Potentiometer	100	30	1/2	16028	Beckman 62P-R100
R2543	Fixed Comp.	1.5K	5	1/4	10667	RC07GF152J
R2544	Fixed Comp.	100	5	1/4	10639	RC07GF101J
R2545	Same as R2519					
R2546	Same as R2514					

RA6337 LF CONVERTER - Dwg. G-02230 (Cont'd)

Ckt. Ref.	Description	Value	Tol. %	Rating	Racal Part No.	Manufacturers Part No.
CAPACITORS						
C2501	Electrolytic	5uf	+100-20	25	24020	Sprague 30D505G025BA2
C2502	Ceramic Disc.	.1uf	20	25	21706	Sprague 5C023104X0250B3
C2503	Same as C2501					
C2504	Fixed Mica	1500pf	5	500	22053	CM06F152JN3
C2505	Same as C2502					
C2506	Same as C2501					
C2507	Same as C2501					
C2508	Fixed Mica	1800pf	5	500	22055	CM06F182JN3
C2509	Fixed Mica	1200pf	5	500	22051	CM06F122JN3
C2510	Same as C2501					
C2511	Same as C2502					
C2512	Same as C2502					
C2513	Same as C2501					
C2514	Same as C2502					
C2515	Same as C2502					
C2516	Same as C2501					
C2517 thru C2520	Same as C2502					
C2521	Variable	7-35pf			28021	7S Triko N-1500
C2522 thru C2526	Same as C2502					
C2527	Same as C2521					
C2528	Same as C2502					
C2529	Not Assigned					
C2530	Same as C2502					
C2531	Same as C2502					
C2532	Fixed Mica	5000pf	5	500	22067	CM07F502JN3
C2533	Same as C2502					
C2534	Ceramic Disc.	.047uf	20	25	21719	Sprague 3C023473X0250A3
C2535	Same as C2502					
C2536	Same as C2501					
C2537 thru C2539	Same as C2502					
*C2540	Electrolytic	100uf		25	24015	Sprague 30D107G025DD2
INDUCTORS						
A2501	Coil Assembly				D-02253	
A2502	Coil Assembly				D-02254	

*Ref. Dwg. G-02230, C40 is added in parallel with C12.

Ckt. Ref.	Description	Value	Tol. %	Rating	Racal Part No.	Manufacturers Part No.
INDUCTORS (Cont'd)						
A2503	Coil Assembly				D-02255	
A2504	Coil Assembly				D-02256	
A2505	Coil Assembly				D-02257	
A2506	Coil Assembly				D-02258	
A2507	Coil Assembly				D-02259	
A2508	Coil Assembly				D-02260	
A2509	Coil Assembly				D-02261	
L2501	Coil Assembly, Wide Band Transformer				D-02262	
TRANSFORMERS						
T2501	RF Wide Band Transformer				D-02252	
DIODES						
VR2501	Zener SZ3.6A				35528	
CR2501	Germanium				35508	1N281
CR2502	Same as CR2501					
TRANSISTORS						
Q2501					30004	TI363
Q2502					30253	2N964
Q2503	Same as Q1					
Q2504	Same as Q1					
Q2505					30251	2N3323
Q2506					30500	2N3283
Q2507 thru Q2509	Same as Q2505					
CRYSTALS						
Y2501	2.9997 MHz				37021	Perrott Eng. Labs. CR69/U
Y2502	Same as Y1					

RA6337 LF ADAPTER - Dwg. G-01811 (A), G-02395 (B)

Ckt. Ref.	Description	Value	Tol. %	Rating	Racal Part No.	Manufacturers Part No.
RESISTORS*						
R2601	A. Fixed Comp.	15	5	1/4	10619	RC07GF150J
	B. Fixed Comp.	4.7	5	1/4	10607	RC07GR4R7J
R2602	A. Fixed Comp.	56	5	1/4	10633	RC07GF560J
	B. Fixed Comp.	68	5	1/4	10635	RC07GF680J
R2603	A. Same as R2602					
	B. Same as R2602					
R2604	A. Fixed Comp.	47	5	1/4	10631	RC07GF470J
	B. Fixed Comp.	27	5	1/4	10625	RC07GF270J
R2605	A. Fixed Comp.	33	5	1/4	10627	RC07GF330J
	B. Fixed Comp.	51	5	1/4	10632	RC07GF510J
R2606	A. Same as R2605					
	B. Same as R2605					
R2607	A. Same as R2602					
	B. Same as R2602					
R2608	A. Same as R2602					
	B. Same as R2602					
R2609	A. Same as R2601					
	B. Same as R2601					
CAPACITORS						
C2601A&B	Variable, 2 section Ganged				C-02122	
C2602B	Silver Mica	7pf	5	500	22083	CM05C070JN3
MISCELLANEOUS						
E2601	Lightning Arrestor				64001	Siemens B1-A230
SWITCH						
S2601A&B	5 position 2 deck modified RF Attenuator Switch Assembly (Ref. Dwg. D-02920)				A-02841 (40 dB) A-02841 (60 dB)	
CONNECTORS						
J2601	Coaxial BNC UG-1094/U				60002	
J2602	Coaxial, miniature, UG-1619/U, Male				60016	Micon #1003
J2603	Same as J2602					
TB2601	Terminal Block				70319	Cinch 351-28-03-001

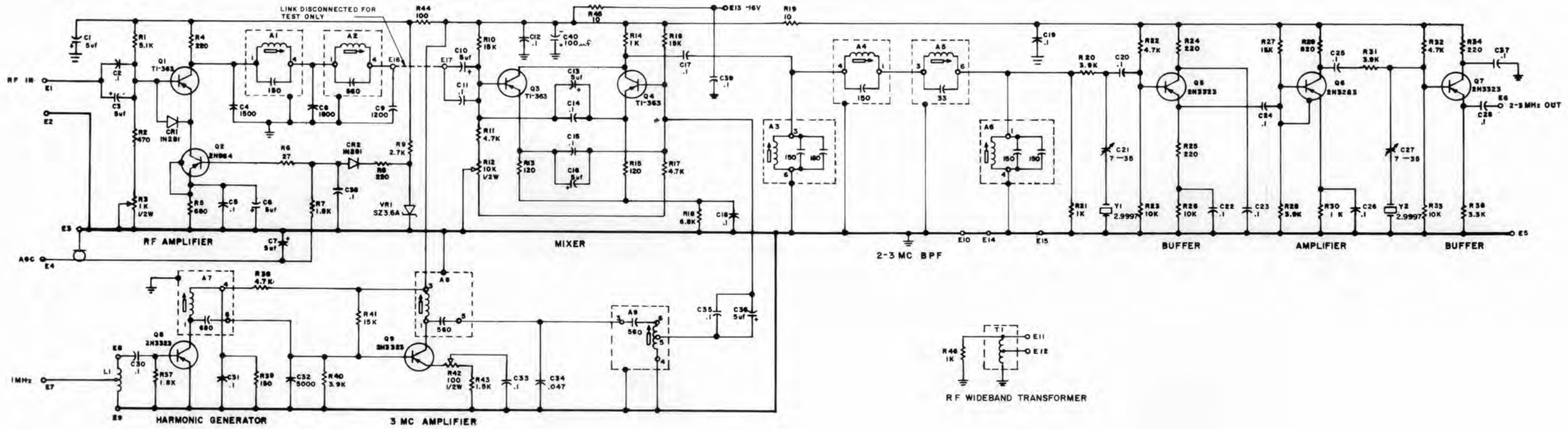
*NOTE: "A" values for 40 dB attenuation
"B" values for 60 dB attenuation

RA6337 LF PRESELECTOR - Dwg. G-01811 (A), G-02395 (3)

Ckt. Ref.	Description	Value	Tol. %	Rating	Racal Part No.	Manufacturers Part No.
CAPACITORS						
C2801	Variable	4.5-20pf			28020	7S Triko N-750
C2802	Same as C2801					
C2803	Same as C2801					
C2804	Variable	7-35 pf			28021	7S Triko N-1500
C2805	Same as C2801					
C2806	Mica	12 pf	10	500	22002	CM05C120JN3
C2807	Ceramic Disc.	.047 uf	20	25	21719	Sprague 3C023473X0250A3
C2808	Same as C2807					
C2809A	Silver Mica	7 pf	5	500	22083	CM05C0705N3
SWITCH						
S2801A,B,C,D,E, & F	8 position, 6 deck (RF Range kHz)				C-02097	
TRANSFORMERS						
T2801					D-02181	
T2802					D-02182	
T2803					D-02183	
T2804					D-02184	
T2805					D-02185	
T2806					D-02186	
T2807					D-02187	
T2808					D-02188	
T2809					D-02189	
T2810					D-02190	
FUSE						
F2801	Pigtail 1/2 amp, 125V				40006	Littlefuse 279.500
CHOKE						
L2801	680 uhy, ±5%				43001	Miller 9220-20

RA6337 LP FILTER - Dwg. G-01809

Ckt. Ref.	Description	Value	Tol. %	Rating	Racal Part No.	Manufacturers Part No.
CAPACITORS						
C2701	Mica	5000pf	5	500	22067	CM07F502JN3
C2702	Mica	910pf	5	500	22048	CM06F911JN3
C2703	Mica	6200pf	5	500	22070	CM07F622JN3
C2704	Mica	5600pf	5	500	22069	CM07F562JN3
C2705	Mica	3600pf	5	500	22063	CM06F362JN3
C2706	Mica	9100pf	5	500	22074	CM07F912JN3
C2707	Mica	4300pf	5	500	22065	CM06F432JN3
C2708	Mica	3300pf	5	500	22062	CM06F332JN3
C2709	Same as C2702					
C2710	Mica	2400pf	5	500	22058	CM06F242JN3
C2711	Mica	680pf	5	500	22045	CM06F681JN3
C2712	Mica	2700pf	5	500	22060	CM06F272JN3
C2713	Mica	4700pf	5	500	22066	CM06F472JN3
C2714	Mica	1300pf	5	500	22052	CM06F132JN3
C2715	Mica	7500pf	5	500	22072	CM07F752JN3
C2716	Mica	1800pf	5	500	22055	CM06F182JN3
C2717	Same as C2712					
C2718	Same as C2714					
INDUCTORS						
L2701	Filter Coil Assembly	27uhy			47023	WEE VL-27
L2702	Filter Coil Assembly	15uhy			47024	WEE VL-15
L2703	Filter Coil Assembly	10uhy			47021	WEE VL-10
L2704	Filter Coil Assembly	18uhy			47025	WEE VL-18
L2705	Filter Coil Assembly	12uhy			47026	WEE VL-12
L2706	Filter Coil Assembly	4.7uhy			47027	WEE VL-4.7
L2707	Filter Coil Assembly	3.3uhy			47028	WEE VL-3.3
L2708	Filter Coil Assembly	6.8uhy			47029	WEE VL-6.8

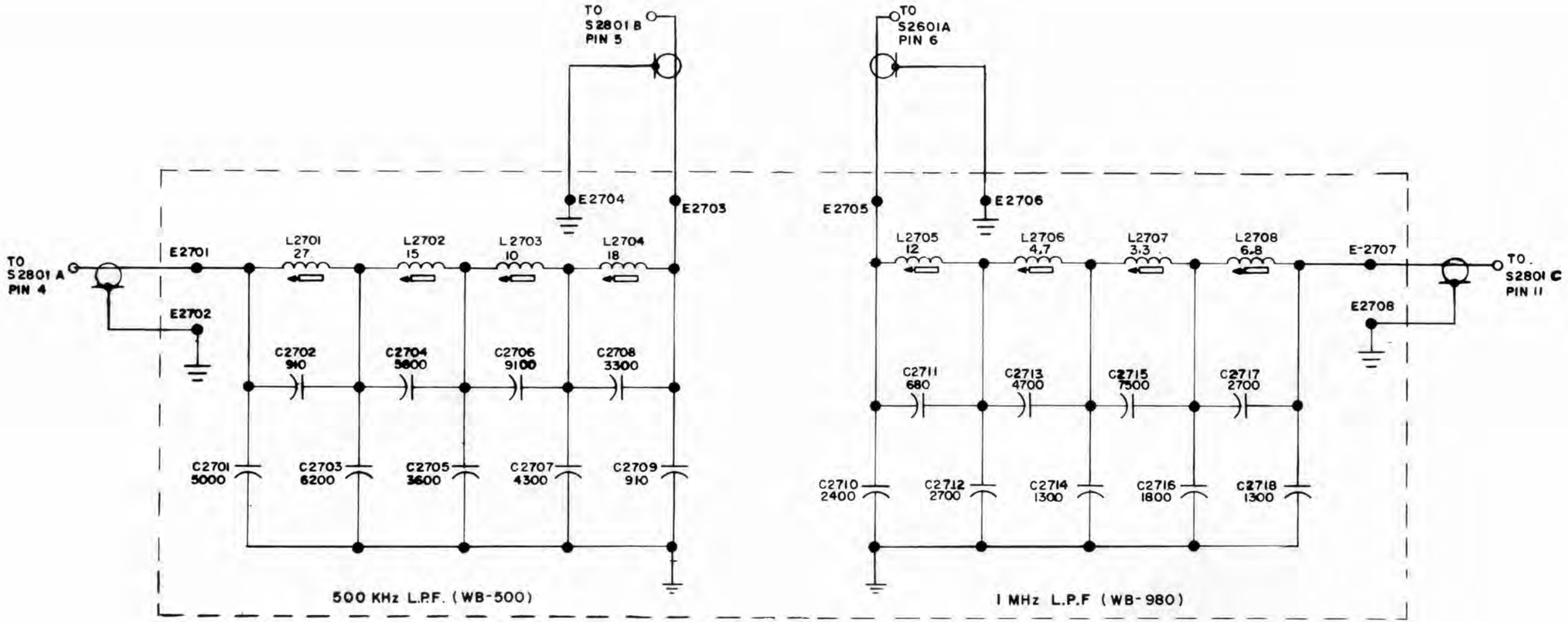


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL
L F CONVERTER
DWG. NO. G-02230 F
SERIES 2500



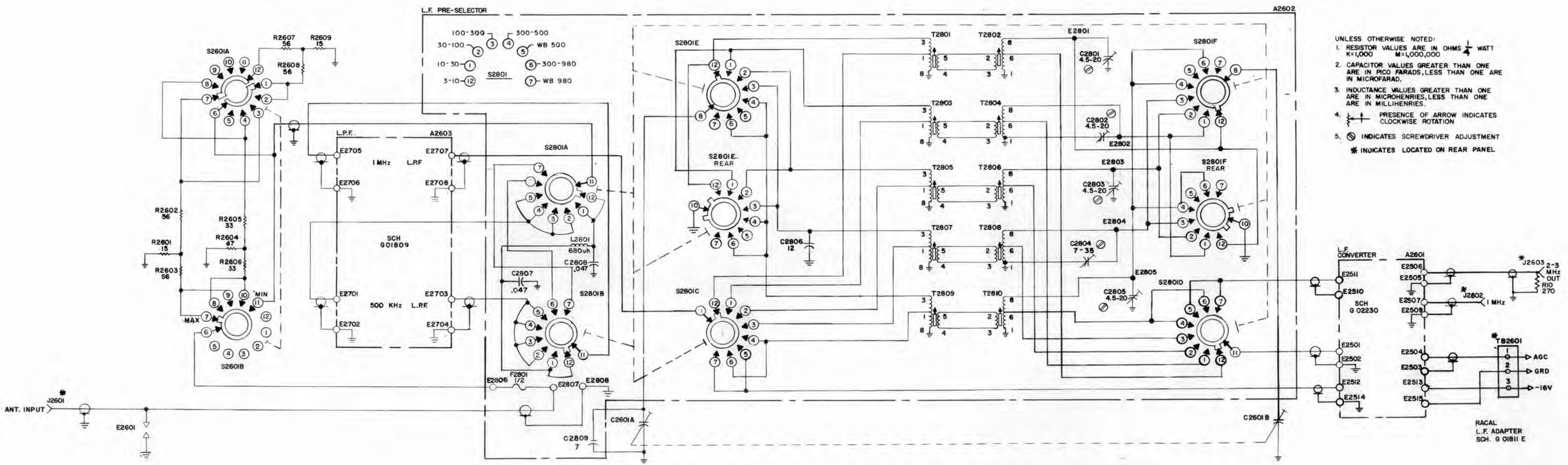
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ¼ WATT K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARAD.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. INDICATES SCREWDRIVER ADJUSTMENT

RACAL

L P FILTER 500KHz & 1MHz

DWG 6-01809 B.



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ¼ WATT K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARAD.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. INDICATES SCREWDRIVER ADJUSTMENT

* INDICATES LOCATED ON REAR PANEL