

SECTION 10. RECEIVER BOARD (A8)

10.1 DESCRIPTION

The Receiver board recovers baseband signals and determines input-carrier levels. The 10.7-MHz IF input signal can be amplitude (AM), frequency (FM), or single sideband (SSB) modulated with the baseband information.

Separate detectors are provided for AM, FM, and SSB; the demodulated outputs are routed to the audio filters.

Selectable high-pass and low-pass filters then further process the baseband signal before it leaves the Receiver board. Separate board outputs provide baseband signals to the front panel, to the circuitry for determining modulation level, and to the speaker amplifier.

Input-carrier level is determined by a logarithmically responding amplifier. The amplitude of the output signal from the log amplifier is proportional to the log of the input-carrier level. This output, which is used for the spectrum-analyzer mode, also provides a signal-strength level for the squelch circuitry.

The system processor provides primary control of the Receiver board's functions via a serial data bus. The data bus uses a single data line, a clock line, and a latch-enable line to serially shift control information from the Processor board to the Receiver board.

Block diagrams of the Receiver board and its functions are shown at the end of the section in Figure 10-1a-e, a schematic in Figure 10-2, and the printed wiring board assembly and parts list in Figure 10-3.

10.2 THEORY OF OPERATION

10.2.1 LINEAR IF SECTION

10.2.1.1 General

The linear IF section consists of 1) a tuned, gain-controlled filter amplifier with switchable bandwidths, 2) an AGC amplifier, 3) an overload detector driven by the AM-detected output, and 4) an AM detector. RF outputs are provided to the scope, the FM limiter, the SSB-product detector and the logarithmic amplifier. The AM demodulated audio signal is provided to the audio-filter circuits.

A block diagram of the linear IF amplifier is shown in Figure 10-1b at the end of the section.

10.2.1.2 Pre-Selector

The linear IF is preceded by a pre-selector. This limits the number of out-of-band signals reaching the pre-amplifier and provides a good termination for the first mixer/low-pass filter located on A17A2. The pre-selector is fixed-tuned without adjustment and has a bandwidth of 2 MHz ($Q = 5$).

10.2.1.3 Pre-Amplifier/Filter

The pre-selector is followed by a low-noise pre-amplifier (a grounded gate with a source follower) with a gain of 28 dB. This pre-amplifier provides good impedance-matching for input/output of the mixer and FL301 (a 6-pole ceramic filter with a bandwidth of 280 kHz), as well as the ability to handle high-level signals. The high gain of this pre-amplifier negates both the 9-dB loss associated with FL301 and the 3-dB power-split following the filter. FL301 determines the wideband frequency response and rejection of the Receiver and logarithmic amplifier (log amp).

10.2.1.4 Active Power Split

A matched pair of parallel, grounded-gate J Fet amplifiers equally split the received signal between the linear IF and log IF. The grounded-gate amplifier provides isolation between the two IF strips as well as a good impedance match for the output of FL301. No automatic gain control (AGC) is applied before this point to maintain calibration of the log amp. This requires a high dynamic-range amplifier inherent in the grounded-gate approach.

10.2.1.5 Switched IF Filters and 10.7-MHz Amplifier

The IF bandwidth is determined by a wideband/narrowband filter-set, selectable under software control. Switching occurs downstream of the log-amp pick-off, in order to maintain log-amp calibration. FL303, (a 2-pole, wideband ceramic filter) reduces image noise to the mixer in wideband mode. FL302 sets the narrowband pre-detection bandwidth and adjacent-channel rejection of the Receiver. Q305 serves as an AGC'd amplifier to terminate the filters and isolate them from the active mixer (U302). Diodes driven by U301 (an RS232 driver) do the filter-switching. This provides level translation and drive capability from the control circuit.

10.2.1.6 Second Mixer and Local-Oscillator (L.O.) Filter

The IF signal is down-converted to 700 kHz by U302 (an active AGC'd mixer) for two reasons: 1) to translate the IF into a range usable by the scope's IF display, and 2) to distribute the IF gain between two different frequency-amplifier strips in order to ease isolation and shielding requirements. To maintain frequency accuracy, the second L.O. is generated by filtering the 10-MHz system reference.

10.2.1.7 70-kHz IF Amplifier

The remainder of the IF gain is provided at 700 kHz by AGC'd amplifier U303 and Q303-Q304; these form a feedback amplifier for low-output impedance, to drive the detectors and buffer amplifiers.

10.2.1.8 AM Detector

U304A, CR307, and CR308 form a biased-diode peak detector for maximum sensitivity and linearity. U304B forms a 2-pole, low-pass, gain-of-10 active filter with 3 functions: 1) removal of the residual RF from the detected baseband, 2) baseband amplification, and 3) low-output impedance to drive the audio-filter strip and associated outputs. The average detected dc from the AM detector is filtered and then routed to the AGC amplifier for level-control.

10.2.1.9 AGC Amplifiers and Overload Detector

U305 and U306 form the AGC and delayed AGC (DAGC) amplifiers, respectively. To provide the level-accuracy necessary for the AM modulation measurements, the AGC loop is a single integrator. AGC to Q305 is delayed to prevent deterioration of the Receiver's noise figure under initial gain-reduction. U316 monitors the DAGC output to determine AGC saturation and to signal the computer of overload conditions in AM and SSB.

10.2.1.10 IF Buffer Amplifiers

The IF output is buffered and amplified by Q309 and Q312 before it is applied to the Scope Amplifier and the FM limiter.

10.2.2 LOGARITHMIC AMPLIFIER

10.2.2.1 General

The log IF section consists of a 3-stage, synchronously-tuned amplifier operating at 460 kHz with taps to a logging IC at each stage's output. The linear IF

provides an output after FL301 for the log amp. This output signal is down-converted via U201 and the on-board, 10.24-MHz, XTAL oscillator, Q204. The output of the logging IC is amplified, peak-detected, and then gain- and offset-scaled to provide the log-amp output to the spectrum analyzer and to the DVM.

A block diagram of the logarithmic amplifier is shown in Figure 10-1c at the end of the section.

10.2.2.2 Down-Converter and XTAL Oscillator

The IF signal from Q302 is down-converted by active mixer U201. A thermistor at the mixer input (R205) provides temperature compensation for the linear IF amplifiers. The 10.24-MHz L.O. is generated by XTAL oscillator Q204. Frequency-calibration of the 10.24-MHz oscillator is done via C236.

10.2.2.3 Synchronous-Tuned Amplifiers

A 3-stage, synchronous-tuned amplifier provides the inputs to the logging IC. The amplifier consists of three series-tuned, interstage bandpass filters – C208, C213, C218 are the associated trim capacitors – and three amplifier stages. The first stage is a buffer amplifier driven by the active mixer. The second and third stages are differential amplifiers with controlled limiting. R219, R226, and R229 balance the gain between the stages; R229 is an attenuation.

10.2.2.4 Logging Integrated Circuit

U204 performs the logging function. It consists of four pairs of differential amplifiers with paralleled outputs. Each successive input is driven by a signal 15 dB larger than the last. (Each of the four inputs drives two stages separated by a 15-dB internal attenuator.) As the input level increases, successive stages saturate, thereby piece-wise approximating the log function.

10.2.2.5 Log Post-Amplifier

The log-amp output is amplified and buffered by the post-amplifier to provide a high-level, low-impedance drive to a biased-diode detector. For gain stability, Q202 forms a common-emitter amplifier with ac and dc emitter-degeneration. Emitter-follower Q203 buffers Q202's output to provide a low-impedance output.

10.2.2.6 Log-Amp Peak Detector

A biased-diode peak detector converts the logging IC output to a baseband dc level. Buffered diode bias minimizes the quiescent diode-current requirements, and allows equal bias current in both diodes to minimize offset voltage and temperature drift.

10.2.2.7 Log-Amp Gain and Offset Adjust

To convert the log-amp detector's output to the required level for the Scope Amplifier's input, an operational amplifier (U206A) is configured as an inverting amplifier to perform the overall gain and offset scaling. To compensate the TC of the logging IC, the offset voltage is temperature-tracked via CR204. The output voltage is 50 mV/dB with -80 dBm, providing 0.0 Vdc out. The absolute output depends on the losses in the A17.

10.2.2.8 Base-Line Limiter

The spectrum-analyzer display is base-line limited to prevent the display from dropping below the bottom of the screen. A precision rectifier circuit (U206 and CR203) clamps the log-amp output whenever it goes below -2.000 volts.

10.2.2.9 Offset Buffer Amplifier

The log-amp's calibrated output from U206A is amplified and offset to conform with the System Analyzer's internal DVM. This DVM requires a unipolar input with a 0 to 10V range.

10.2.3 FM/SSB/WB SIGNAL-PRESENT DETECTORS

10.2.3.1 General

In addition to AM detection, which is described in the linear IF section 10.2.1.8, the Receiver incorporates a pulse-counting FM discriminator, a product detector/BFO for SSB/CW demodulation, and a wideband signal-present detector. The latter tests for the presence of a sufficiently strong signal for the Scan Lock function and flags the CPU when a signal of sufficient amplitude is present.

A block diagram of the FM/SSB/WB signal-present detector is shown at the end of the section in Figure 10-1d.

10.2.3.2 IF Limiter

The IF output is hard-limited by Q310/Q311 configured as an emitter-coupled amplifier with positive feedback. A high-speed, CMOS hex-inverter (U310) buffers the limiter's output to the pulse-counting discriminator and to the IF/BFO frequency-counter select gate. The limiter will provide an accurate frequency to the counter in the presence of as much as 90 percent AM.

10.2.3.3 Pulse-Counting Discriminator

The pulse-counting (averaging) technique is used for FM demodulation. That is, a constant width and amplitude pulse is generated for each zero-crossing of

the IF signal. The pulses are then averaged in an RC low-pass filter to generate a voltage proportional to the input frequency. The output is then a dc voltage proportional to the average frequency, with the FM-demodulated signal riding on top. The Receiver uses a dual-edge, triggered monostable (U311/U312) to provide a pulse with each zero-crossing, thereby doubling the carrier frequency and easing the filtering requirements. Differential amplification by U313 removes the dc offset and increases detection-gain by 6 dB. The pulse width is set for a 50 percent duty cycle at 700 kHz, the nominal IF-center frequency. U314A provides additional filtering and FM-gain calibration.

10.2.3.4 Product Detector

Reinjection of the carrier in a product detector demodulates SSB and CW. An active mixer (U317) performs the detection; it requires a low-level BFO-injection signal minimizing shielding requirements. Q313 and Q314 form a feedback filter amplifier to 1) amplify the detected SSB/CW output, 2) filter the IF/BFO components, and 3) provide a low output impedance to the audio filters.

10.2.3.5 BFO

The BFO (Q306) is a modified Colpitts-type oscillator with gate-bias AGC. The oscillator nominal frequency of 700 kHz is adjustable ± 3 to 5 kHz from the front panel. Select-in-test C377 provides centering of C394's adjustment range. As a buffer, Q307 isolates the BFO from the product detector and the frequency counter. Under software control, Q315 disables the BFO when the Receiver is not in SSB mode.

10.2.3.6 Wideband Signal-Present Detector

The wideband signal-present detection circuit is used only for the Scan Lock function. U307 provides an amplified (40 dB) signal to the frequency counter via counter-output select gate U315, which, in conjunction with the 20-MHz low-pass filter following the first mixer on A17A2, allows the System Analyzer to determine the frequency of a signal within 20 MHz of the L.O. frequency. U308 monitors the signal strength of the incoming signals. When the input signal is of sufficient level and the L.O. is within 20 MHz, U308 flags the microprocessor, which then determines the frequency. U308 is set to trip at a nominal level of -50 dBm into A8J1, the Receiver input.

10.2.3.7 Counter-Output Select Gate

The BFO, the limited-IF output, or the wideband signal-present output are selected and routed to the internal frequency counter under software control via U315. The Processor board then determines the error frequency relative to the programmed L.O. frequency that is displayed on the CRT in receive mode.

10.2.4 BASEBAND AUDIO-PROCESSING CIRCUITS

10.2.4.1 General

Under processor control, the audio-processing circuits provide filtering, polarity inversion, gain scaling, squelch, and detector selection. With the special function codes, the operator has override control of certain filter selections.

A block diagram of the baseband audio-processing circuits is shown at the end of the section in Figure 10-1e.

10.2.4.2 Modulation Selection/Squelch Gate

Analog gate U101, under direct processor control, selects modulation, routing the AM, FM, or product-detector output to the squelch gate, which is also part of U101. To provide the squelch-gate drive, the log-amp output is compared to a reference level derived from the front panel's Squelch control. The log-amp output provides a stable, logarithmic, linear-squelch control.

10.2.4.3 Speaker Buffer Amplifier

The squelch-gate output is routed directly to the speaker audio amplifier on the Scope/DVM Control board (A7). This output goes through the front panel's Volume control and the Receiver buffer amplifier (U314), bypassing the Receiver audio filters. To maintain output volume, the buffer amplifier provides a 20-dB gain boost in narrowband FM. U106 serves as a processor-controlled speaker-enable. A series-output capacitor serves as a 1-pole, 300-Hz, high-pass filter, while a low-pass filter on the A7 board selects either a 3-dB, 1-kHz, 1-pole roll-off or a 75- μ s equalization at the speaker audio amplifier.

10.2.4.4 Audio Low-Pass Filters

A 4-pole, selectable bandwidth, low-pass filter provides 300-Hz, 3-kHz or 20-kHz filtering. The filter is split into two 2-pole sections to 1) initially filter wideband noise and RF residual at the detector outputs and 2) suppress wideband noise introduced by the various high-pass filters, the polarity-inversion amplifier, and the circuit-board pickup at the output.

10.2.4.5 Modulation-Sense Amplifier

Because the System Analyzer can select either high- or low-side mixing, the FM-detector output must be polarity-selectable to maintain correct digital-data

sense as in DPL etc. Under processor control, U103 performs this function by providing a gain of ± 1 .

10.2.4.6 Audio High-Pass Filters

A 4-pole, selectable-bandwidth, high-pass filter provides 300-Hz and 3-kHz high-pass filtering. The filter can be bypassed for low-frequency signals. U105A and B, which provide two poles each, are cascaded to form the 4-pole active filter.

10.2.4.7 Audio Output-Buffer Amplifiers

To prevent limiting in the audio filters, the audio signals are filtered at low level and then amplified 12 dB by U108. U108 provides audio to the detectors and scope. Q101, Q102, and U207B a buffered, uncalibrated audio output to the front-panel port. U207B provides a processor-selectable of 1X/10X for narrowband

10.2.5 DIGITAL CONTROL AND CONDITIONING

10.2.5.1 General

The Receiver is programmed by a serial data stream to minimize the system's interconnect complexity. Detector accuracy requires a stable, accurate power supply. A precision reference provides the Receiver with a temperature-stable reference from which all critical voltages are generated.

10.2.5.2 Digital Control

Digital control is provided by a pair of cascaded, latching, 8-bit, serial-in, parallel-out, CMOS shift registers. To obtain the processor-programming data, the Receiver strips off the last 16 bits of the Synthesizer's control-data stream and routes the shift-register output to the Synthesizer. Tables 10-1 through 10-4 detail functions of the digital control bits.

10.2.5.3 Power Conditioning

U115 provides the Receiver's power-supply reference of 2.5V. U111 and associated components generate $-2.5V$, $+5V$ Ref., and $\pm 9V$ for the various Receiver circuits. No current limiting is provided on-board; therefore, the Receiver's voltage regulators depend upon the current limit of the system's power supply. This is particularly important if a test fixture is used.

Table 10-1. Functions of Digital Control Bits

Bit No.	Name	Function
0	IF CNT EN	Logic 0 enables IF frequency to IF/BFO Output
1	WB DET EN	Logic 0 enables the Wideband Detector
2	NB FM GAIN X10	Logic 0 increases Audio Gain 20 dB
3	SPARE	—
4	SPARE	—
5	SPKR EN	Logic 0 enables the Speaker Audio
6	BIT 12	Soft Inverter
7	DEMODO INV	Logic 1 inverts the Receive Signal -/+
8	WB/NB	Logic 1 selects the Wide IF Bandwidth
9	LPFL 300	Logic 0 selects the 300-Hz LPFL
10	LPFL 3K	Logic 0 selects the 3-kHz LPFL
11	HPFL 3-kHz	Logic 0 select the 3-kHz HPFL
12	HPFL 300-Hz and HPFEN	Logic 0 selects the 300-Hz HPFL and Enables HPFL
13	AM EN	Logic 0 enables the AM Output
14	FM EN	Logic 0 enables the FM Output
15	SSB EN	Logic 0 enables the SSB Output

Table 10-2. Low-Pass Filter—Control-Bit Patterns

Function	Bit Patterns	
	9	10
300-Hz LPF	0	1
3-kHz LPF	1	0
20-Hz LPF	1	1

Table 10-3. High-Pass Filter—Control-Bit Patterns

Function	Bit Patterns		
	6	11	12
5-Hz HPF	0	1	1
300-Hz HPF	1	1	0
3-kHz HPF	1	0	0

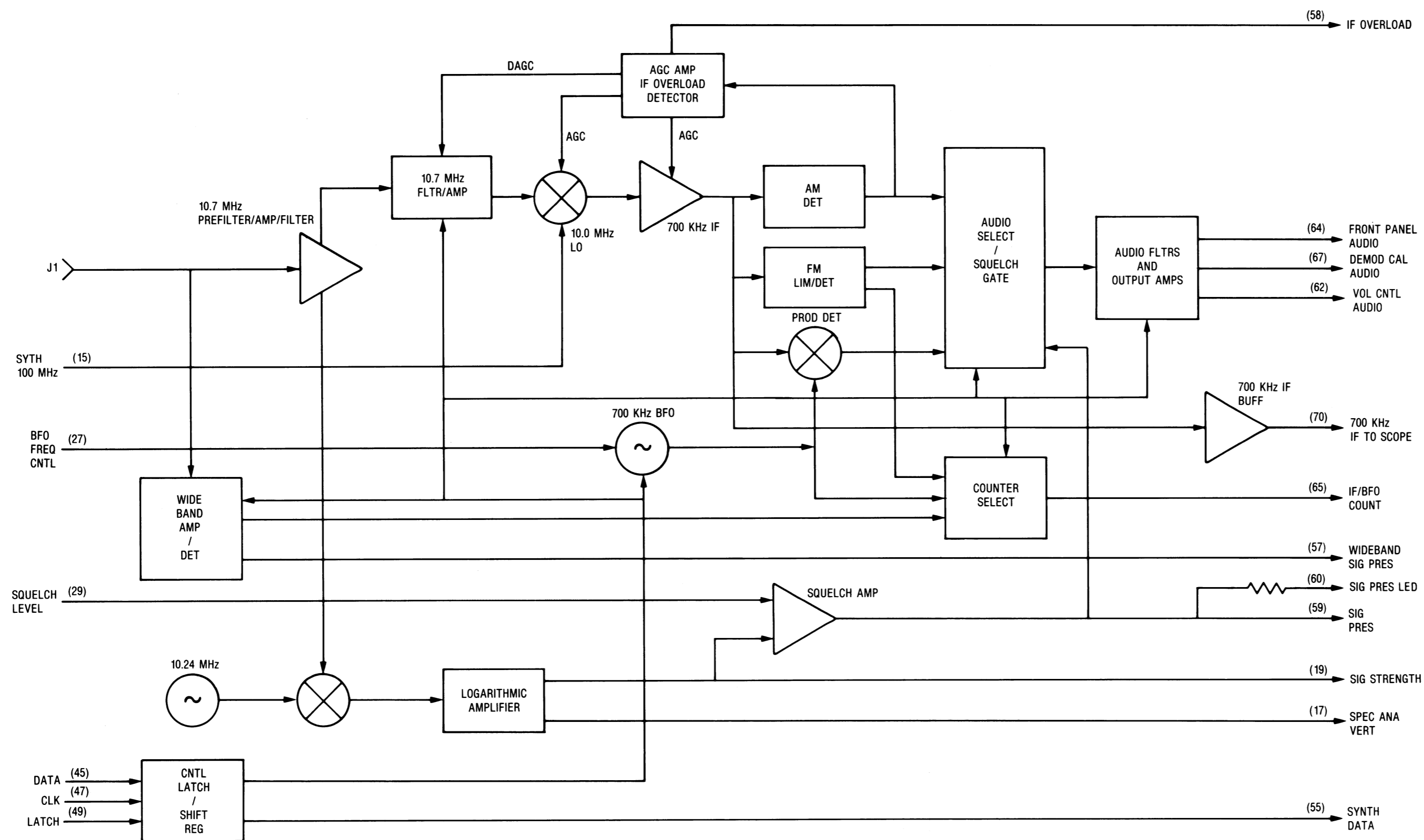
Table 10-4. Modulation-Select—Control-Bit Patterns

Function	Bit Patterns						
	0	1	2	8	13	14	15
AM WB	0	1	1	1	0	1	1
AM NB	0	1	1	0	0	1	1
SSB WB	1	1	1	1	1		0
SSB NB	1	1	1	0	1	1	0
FM WB	0	1	1	1	1	0	1
FM NB	0	1	0	0	1	0	1
WB DET EN	1	0	X	X	1	1	1

RECEIVER BOARD (A8)

(RTL-1019A)

Figure 10-1a. Block Diagram (Sheet 1 of 4)

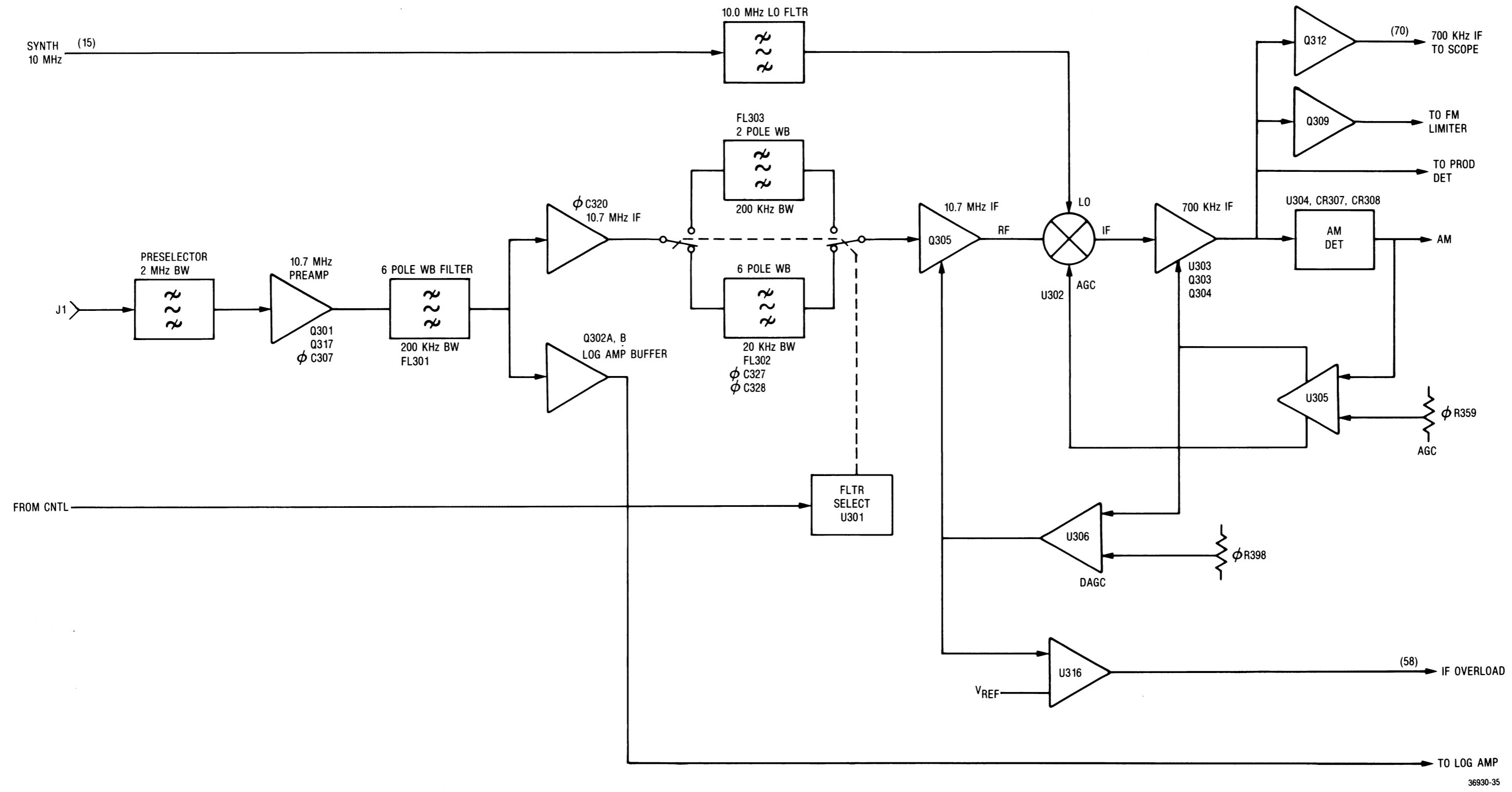


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RECEIVER BOARD

LINEAR IF AMPLIFIER

Figure 10-1b. Block Diagram (Sheet 2 of 4)



RECEIVER BOARD
LOGARITHMIC AMPLIFIER
 Figure 10-1c. Block Diagram

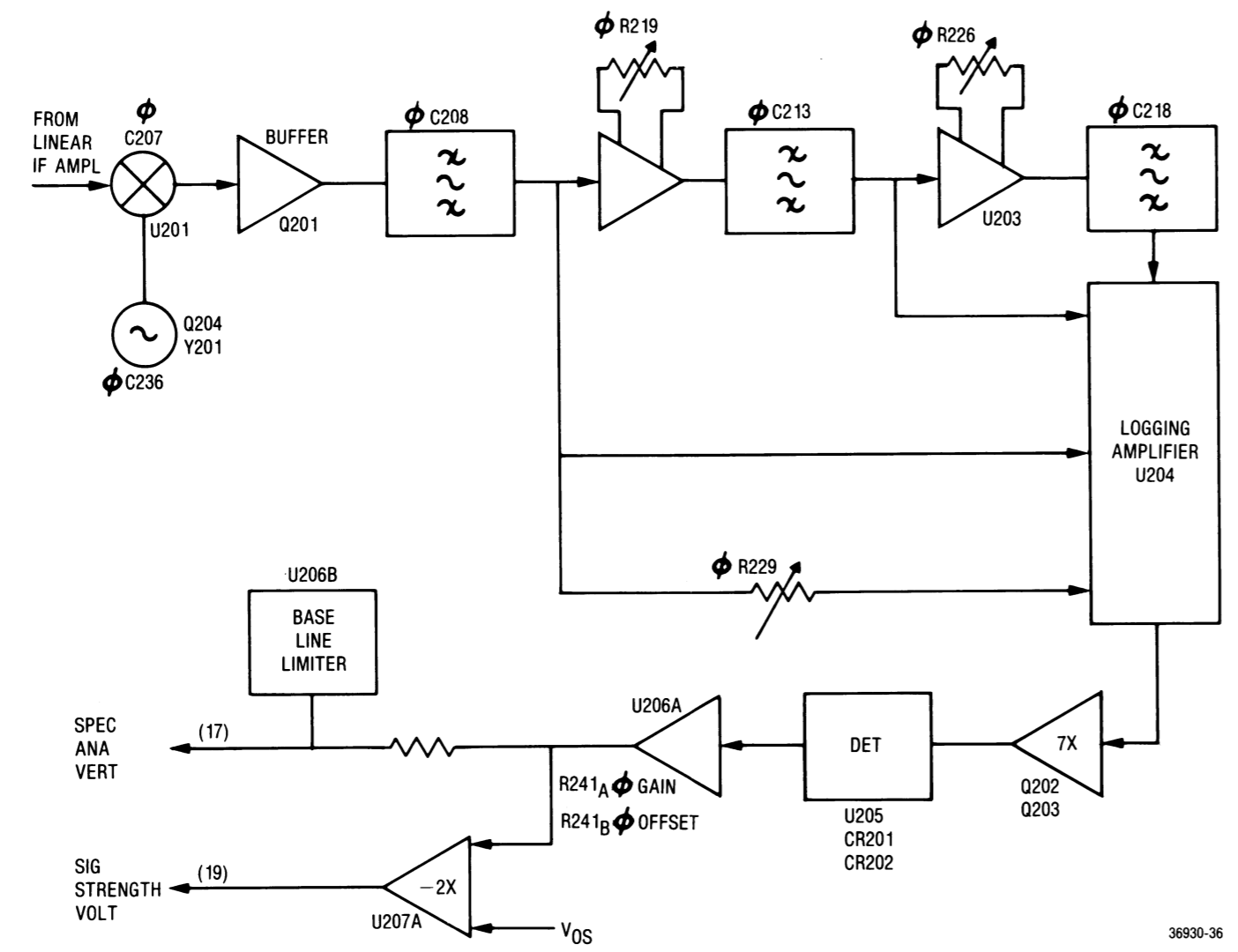


Figure 10-1c. Logarithmic Amplifier — Block Diagram

FM/SSB/WB SIGNAL-PRESENT DETECTORS
 Figure 10-1d. Block Diagram
 (Sheet 3 of 4)

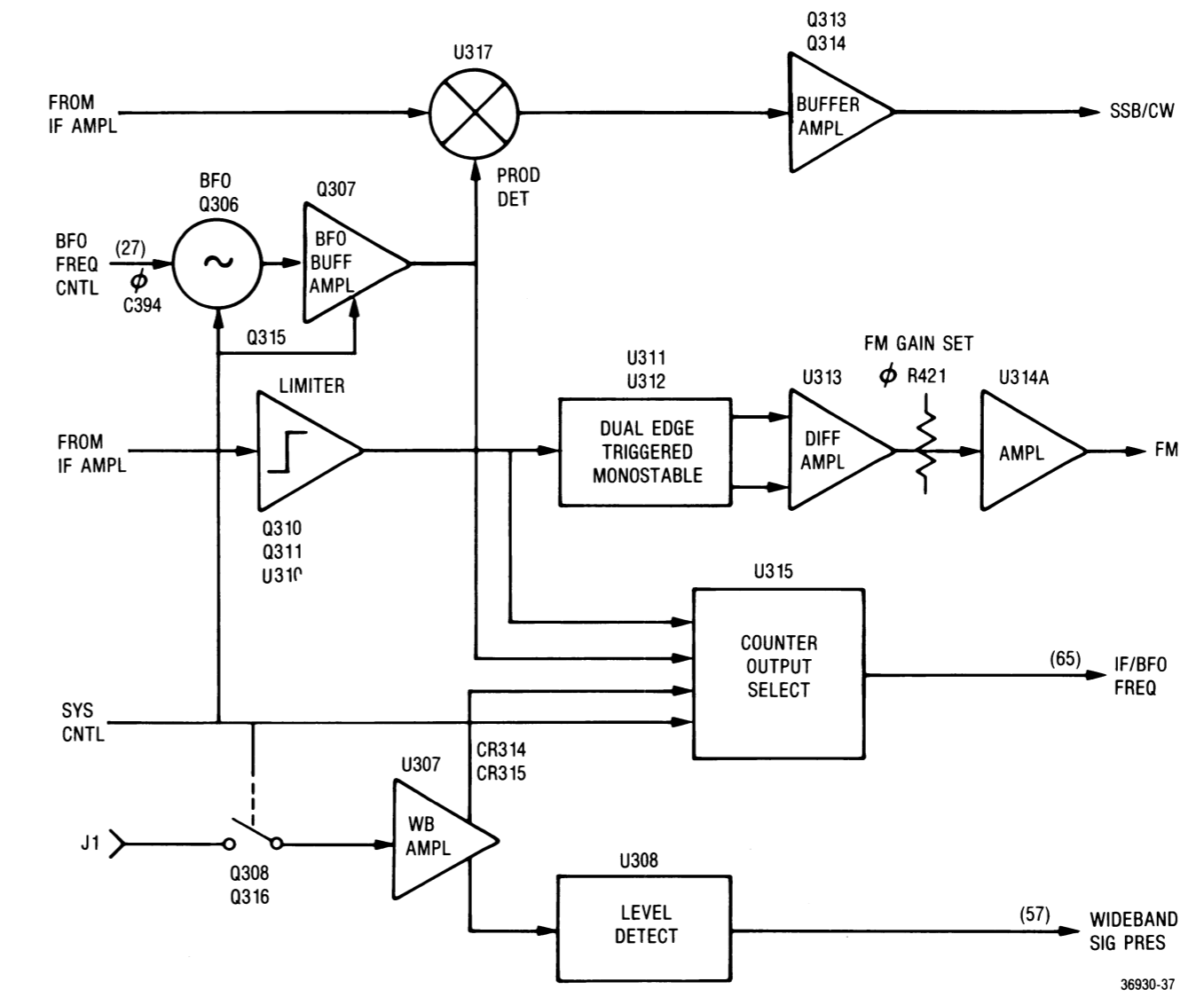
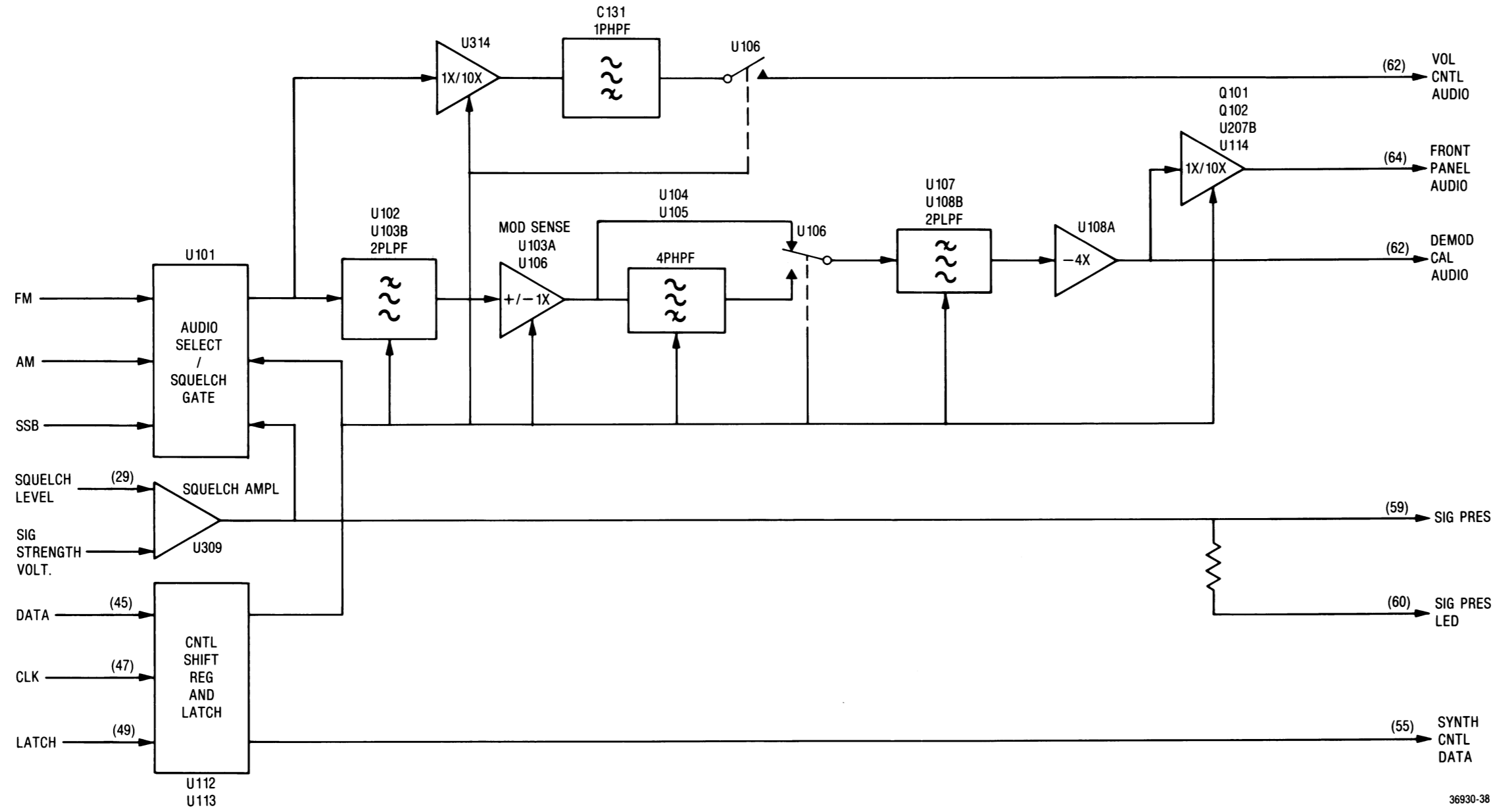


Figure 10-1d. FM/SSB/WB Signal-Present Detectors — Block Diagram

RECEIVER BOARD
**BASEBAND AUDIO-PROCESSING
 CIRCUITS**

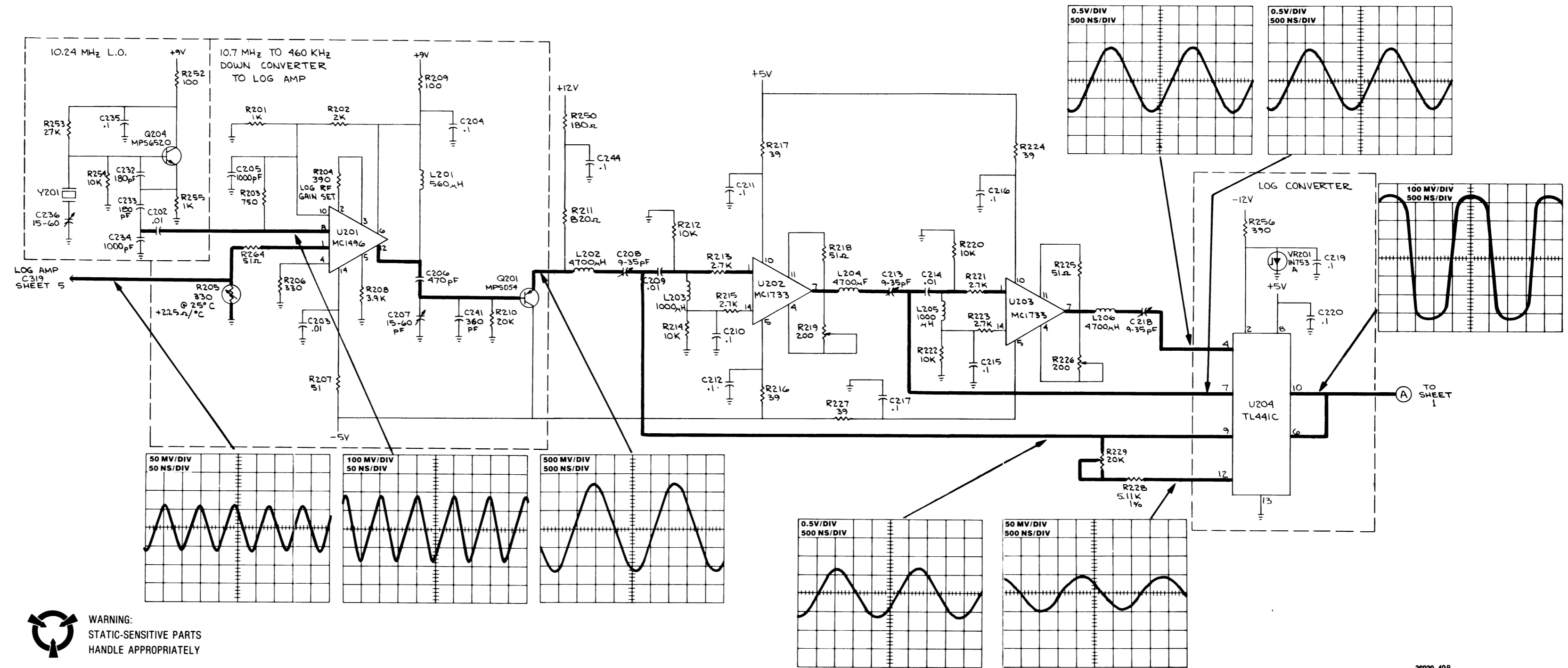
Figure 10-1e. Block Diagram
 (Sheet 4 of 4)



RECEIVER BOARD (A8)

(RTL-1019A)

Figure 10-2b. Schematic (Sheet 2 of 5)



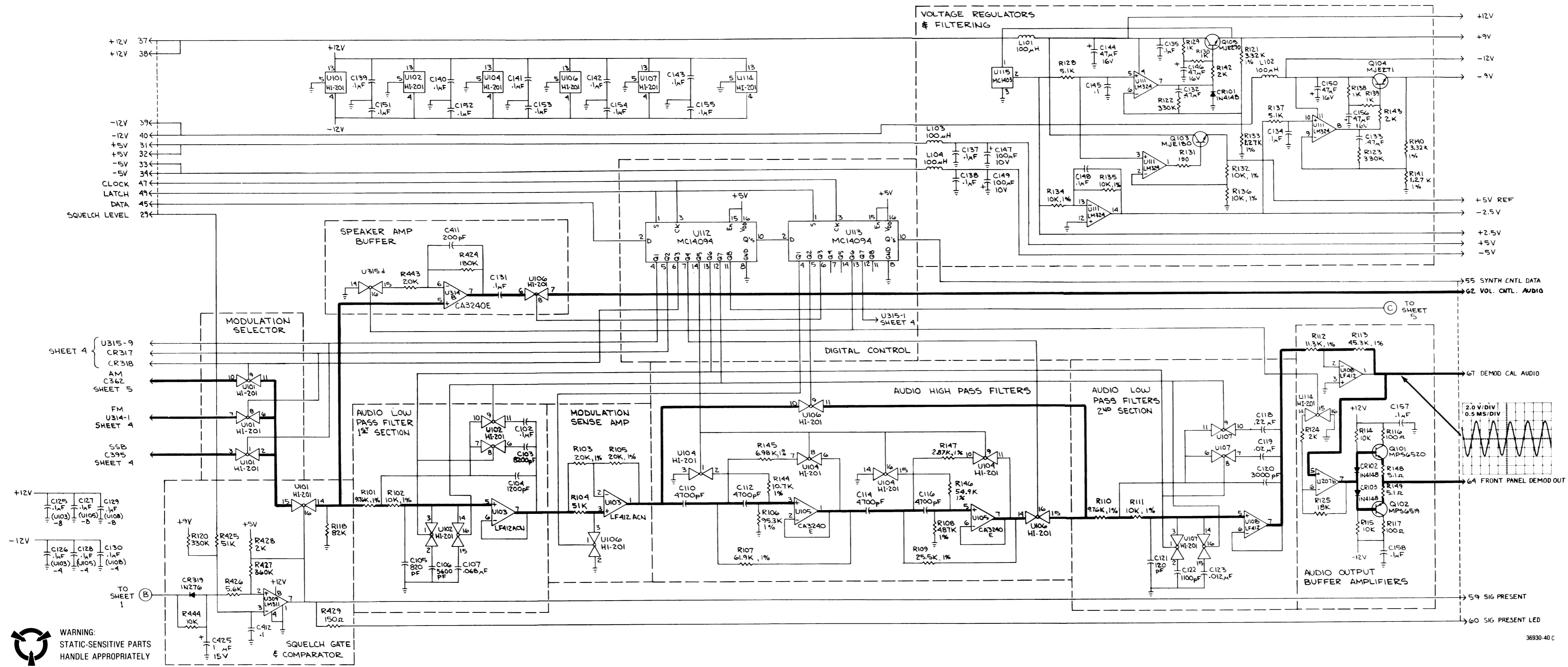
WARNING:
STATIC-SENSITIVE PARTS
HANDLE APPROPRIATELY

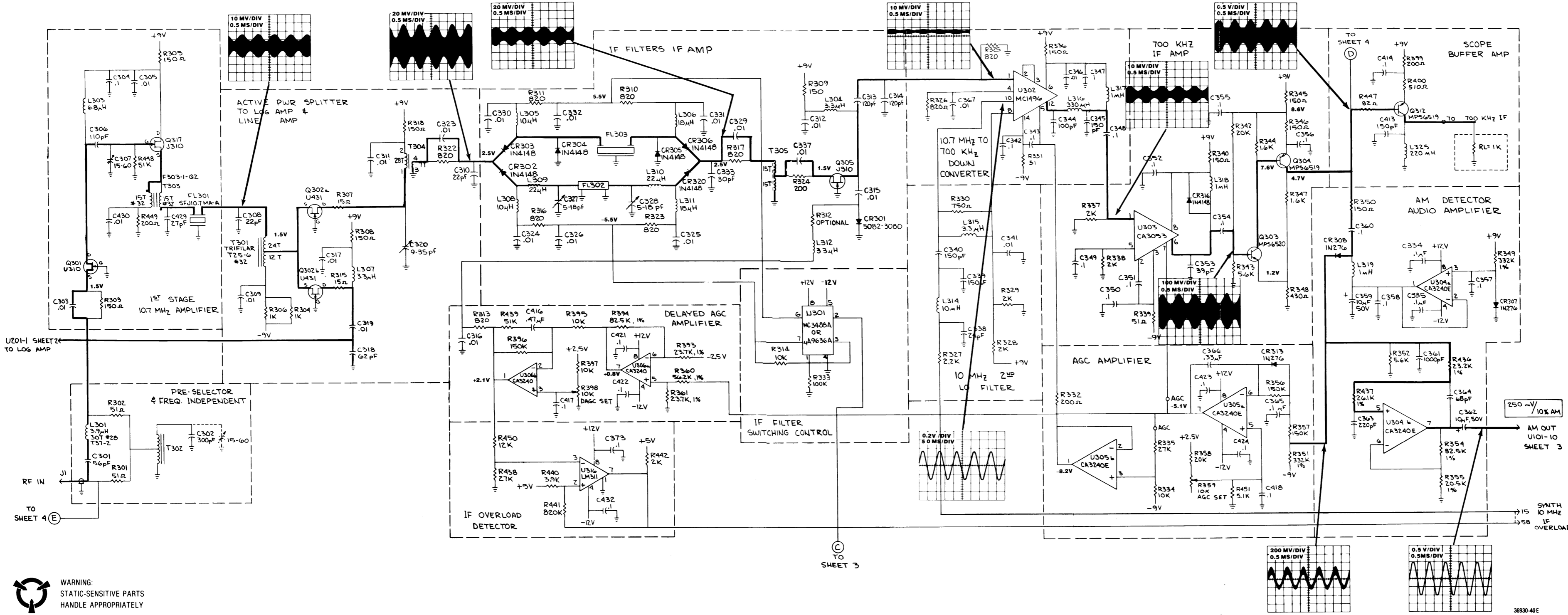
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RECEIVER BOARD (A8)

(RTL-1019A)

Figure 10-2c. Schematic (Sheet 3 of 5)





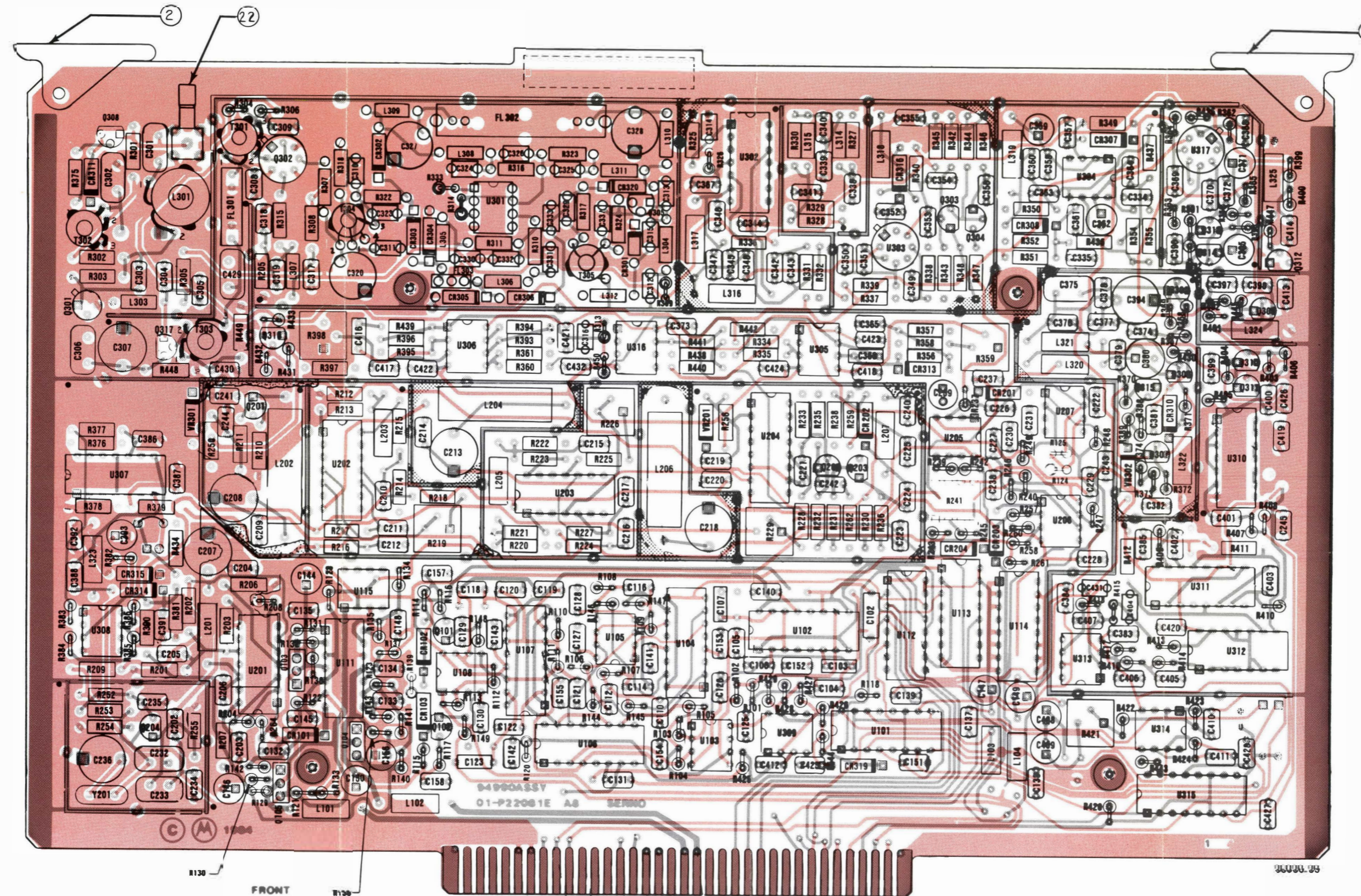
WARNING:
 STATIC-SENSITIVE PARTS
 HANDLE APPROPRIATELY

36930-40E

RECEIVER BOARD (A9)

(RTL-1019A)

Figure 10-3a. Printed Wiring Board
Assembly and Parts List (Sheet 1 of 4)



FRONT AND BACK OF FOUR
LAYER RECEIVER BOARD.
COMPONENTS AND COMPONENT
SIDE TRACK SHOWN IN BLACK.
SOLDER-SIDE TRACK SHOWN
IN ORANGE.

(See Sheet 2, p. 10-19, for Parts List)

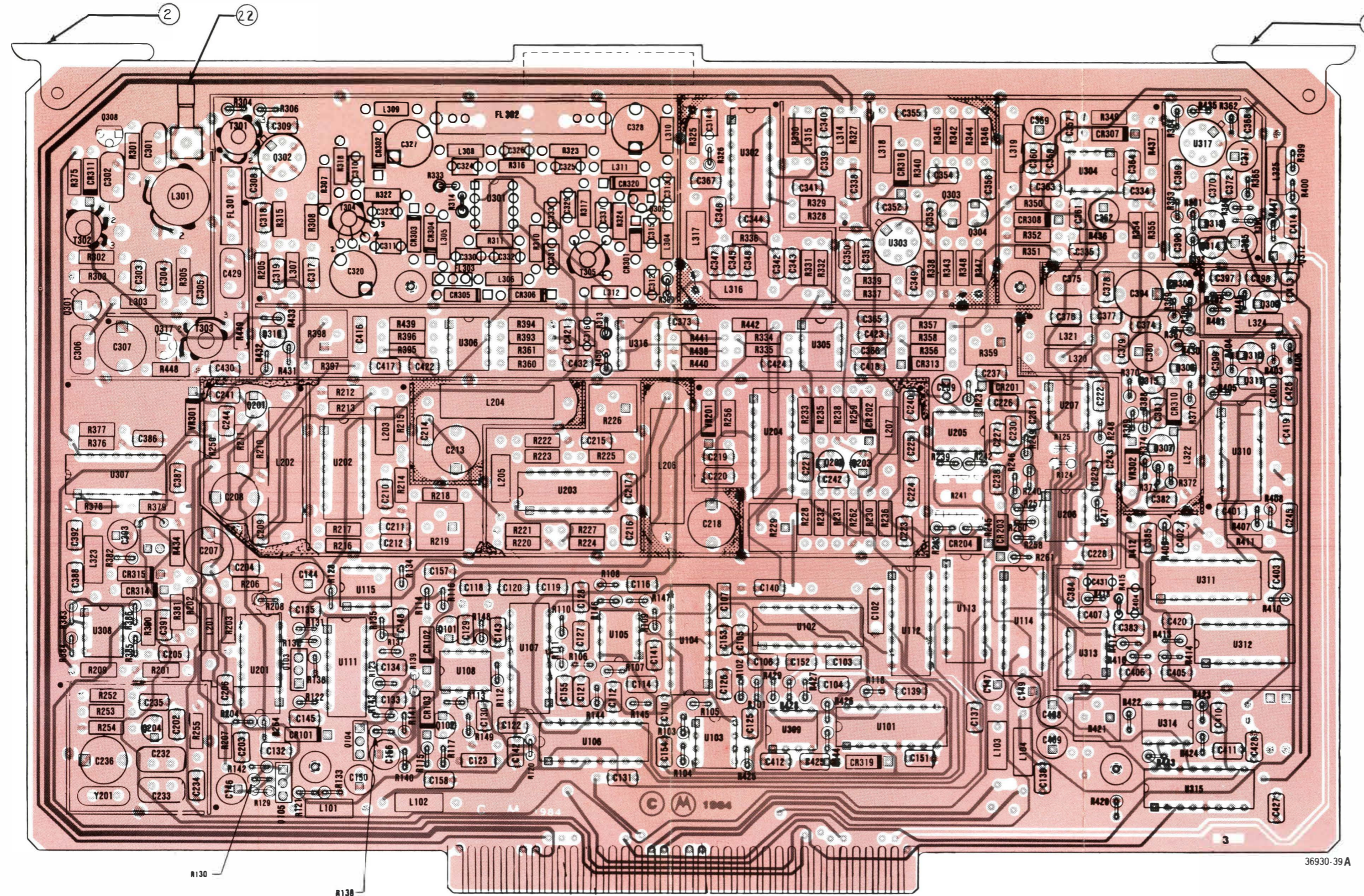
RECEIVER BOARD (A8)

(RTL-1019A)

Figure 10-3b. Printed Wiring Board Assembly and Parts List (Sheet 2 of 4)

RECEIVER BOARD (A8)

RTL-1019A



INNER TWO LAYERS OF FOUR LAYER RECEIVER BOARD. COMPONENTS SHOWN IN BLACK. LAYER 2 SHOWN IN GREY, LAYER 3 SHOWN IN ORANGE.

Find No.	Qty. Req.	Part No.	Nomenclature	Part Value
002	1	45-80339B28	CARD EJECTOR	
003	1	45-80339B41	CARD EJECTOR	MARKED
022	1	09-80344B23	CONNECTOR	
C 102	1	08-80343B12	CAPACITOR	.1UF-10-100
C 103	1	21-80342B41	CAPACITOR	8200PF-5-50
C 104	1	21-80341B49	CAPACITOR	1200PF-5-50
C 105	1	21-80341B90	CAPACITOR	820PF-5-50
C 106	1	21-80341B86	CAPACITOR	5600PF-5-50
C 107	1	08-80343B19	CAPACITOR	.069UF-5-63
C 110	1	21-80341B83	CAPACITOR	4700PF-5-50
C 112	1	21-80341B83	CAPACITOR	4700PF-5-50
C 114	1	21-80341B83	CAPACITOR	4700PF-5-50
C 116	1	21-80341B83	CAPACITOR	4700PF-5-50
C 118	1	08-80343B14	CAPACITOR	.22UF-10-100
C 119	1	21-80342B38	CAPACITOR	.02UF-5-50
C 120	1	21-80341B67	CAPACITOR	3000PF-5-20
C 121	1	21-80341B48	CAPACITOR	120PF-5-50
C 122	1	21-80341B47	CAPACITOR	1100PF-5-50
C 123	1	21-80342B35	CAPACITOR	.012UF-10-50
C 125	1	21-80342B10	CAPACITOR	.1UF-20-50
C 126	1	21-80342B10	CAPACITOR	.1UF-20-50
C 127	1	21-80342B10	CAPACITOR	.1UF-20-50
C 128	1	21-80342B10	CAPACITOR	.1UF-20-50
C 129	1	21-80342B10	CAPACITOR	.1UF-20-50
C 130	1	21-80342B10	CAPACITOR	.1UF-20-50
C 131	1	21-80342B10	CAPACITOR	.1UF-20-50
C 132	1	21-80342B14	CAPACITOR	47UF-20-50
C 133	1	21-80342B14	CAPACITOR	47UF-20-50
C 134	1	21-80342B10	CAPACITOR	.1UF-20-50
C 135	1	21-80342B10	CAPACITOR	.1UF-20-50
C 137	1	21-80342B10	CAPACITOR	.1UF-20-50
C 138	1	21-80342B10	CAPACITOR	.1UF-20-50
C 139	1	21-80342B10	CAPACITOR	.1UF-20-50
C 140	1	21-80342B10	CAPACITOR	.1UF-20-50
C 141	1	21-80342B10	CAPACITOR	.1UF-20-50
C 142	1	21-80342B10	CAPACITOR	.1UF-20-50
C 143	1	21-80342B10	CAPACITOR	.1UF-20-50
C 144	1	23-80341B11	CAPACITOR	47UF-20-16
C 145	1	21-80342B10	CAPACITOR	.1UF-20-50
C 146	1	23-80341B11	CAPACITOR	47UF-20-16
C 147	1	23-80341B07	CAPACITOR	100UF-10V
C 148	1	21-80342B10	CAPACITOR	.1UF-20-50
C 149	1	23-80341B07	CAPACITOR	100UF-10V
C 150	1	23-80341B11	CAPACITOR	47UF-20-16
C 151	1	21-80342B10	CAPACITOR	.1UF-20-50
C 152	1	21-80342B10	CAPACITOR	.1UF-20-50
C 153	1	21-80342B10	CAPACITOR	.1UF-20-50
C 154	1	21-80342B10	CAPACITOR	.1UF-20-50
C 155	1	21-80342B10	CAPACITOR	.1UF-20-50
C 156	1	23-80341B11	CAPACITOR	47UF-20-16
C 157	1	21-80342B10	CAPACITOR	.1UF-20-50
C 158	1	21-80342B10	CAPACITOR	.1UF-20-50
C 202	1	21-80342B09	CAPACITOR	.01UF-20-50
C 203	1	21-80342B09	CAPACITOR	.01UF-20-50
C 204	1	21-80342B10	CAPACITOR	.1UF-20-50
C 205	1	21-80341B93	CAPACITOR	1000PF-20-100
C 206	1	21-80341B82	CAPACITOR	470PF-5-50
C 207	1	20-80343B37	CAPACITOR, VARIABLE	15 TO 60PF-50
C 208	1	20-80396A57	CAPACITOR	9 TO 35PF-200
C 209	1	21-80342B09	CAPACITOR	.01UF-20-50
C 210	1	21-80342B10	CAPACITOR	.1UF-20-50
C 211	1	21-80342B10	CAPACITOR	.1UF-20-50
C 212	1	21-80342B10	CAPACITOR	.1UF-20-50
C 213	1	20-80396A57	CAPACITOR	9 TO 35PF-200
C 214	1	21-80342B09	CAPACITOR	.01UF-20-50
C 215	1	21-80342B10	CAPACITOR	.1UF-20-50
C 216	1	21-80342B10	CAPACITOR	.1UF-20-50
C 217	1	21-80342B10	CAPACITOR	.1UF-20-50
C 218	1	20-80396A57	CAPACITOR, VARIABLE	9-35PF
C 219	1	21-80342B10	CAPACITOR	.1UF-20-50
C 220	1	21-80342B10	CAPACITOR	.1UF-20-50
C 221	1	21-80342B10	CAPACITOR	.1UF-20-50
C 222	1	21-80342B10	CAPACITOR	.1UF-20-50
C 223	1	21-80342B10	CAPACITOR	.1UF-20-50
C 224	1	21-80342B10	CAPACITOR	.1UF-20-50
C 225	1	21-80342B01	CAPACITOR	.022UF-10-100
C 226	1	21-80342B10	CAPACITOR	.1UF-20-50
C 227	1	21-80341B69	CAPACITOR	330PF-5-50
C 228	1	21-80342B10	CAPACITOR	.1UF-20-50
C 229	1	21-80342B10	CAPACITOR	.1UF-20-50
C 230	1	21-80342B10	CAPACITOR	.1UF-20-50

RECEIVER BOARD (A8)

(RTL-1019A)

Figure 10-3b. Printed Wiring Board
Assembly and Parts List (Sheet 4 of 4)

RECEIVER BOARD (A8) (Cont)

RTL-1019A

Find No.	Qty. Req.	Part No.	Nomenclature	Part Value	Find No.	Qty. Req.	Part No.	Nomenclature	Part Value	Find No.	Qty. Req.	Part No.	Nomenclature	Part Value	Find No.	Qty. Req.	Part No.	Nomenclature	Part Value
C 231	1	21-80342B10	CAPACITOR	.1UF-20-50	C 376	1	21-80339B22	CAPACITOR	270PF-5-300	L 201	1	24-80369A40	COIL	560UH	R 135	1	06-10621C91	RESISTOR	10K-1-1/4
C 232	1	21-80369A95	CAPACITOR	180PF-5-500	C 377	1	21-80341B54	CAPACITOR	150PF-5-50 NOMINAL	L 202	1	24-80369A44	COIL	4700UH	R 136	1	06-10621C91	RESISTOR	10K-1-1/4
C 233	1	21-80369A95	CAPACITOR	180PF-5-500	C 377	S01	21-80341B48	CAPACITOR	120PF-5-50	L 203	1	24-80369A42	COIL	1000UH	R 137	1	06-11009C66	RESISTOR	5.1K-5-1/4
C 234	1	21-80341B46	CAPACITOR	1000PF-5-50	C 377	S01	21-80341B57	CAPACITOR	180PF-5-50	L 204	1	24-80369A44	COIL	4700UH	R 138	1	06-11009C49	RESISTOR	1K-5-1/4
C 235	1	21-80342B10	CAPACITOR	.1UF-20-50	C 378	1	21-80341B55	CAPACITOR	1500PF-5-50	L 205	1	24-80369A42	COIL	1000UH	R 139	1	06-11009C49	RESISTOR	1K-5-1/4
C 236	1	20-80343B37	CAPACITOR	15 TO 60PF-200	C 379	1	21-80342B10	CAPACITOR	.1UF-20-50	L 206	1	24-80369A44	COIL	4700UH	R 140	1	06-10621C45	RESISTOR	3.32K-1-1/4
C 237	1	21-80342B10	CAPACITOR	.1UF-20-50	C 380	1	23-84665F26	CAPACITOR	100UF-20-16	L 207	1	24-80369A42	COIL	1000UH	R 141	1	06-10621C05	RESISTOR	1.27-1-1/4
C 238	1	21-80342B10	CAPACITOR	.1UF-20-50	C 381	1	21-80342B10	CAPACITOR	.1UF-20-50	L 301	1	25-80342B83	COIL	3.9UH	R 142	1	06-11009C56	RESISTOR	2K-5-1/4
C 239	1	23-80341B15	CAPACITOR	10UF-50V	C 382	1	21-80341B94	CAPACITOR	01UF-10-100	L 302	1	24-80369A28	COIL	6.8UH	R 143	1	06-11009C56	RESISTOR	2K-5-1/4
C 240	1	21-80342B10	CAPACITOR	.1UF-20-50	C 383	1	21-80342B10	CAPACITOR	.1UF-20-50	L 303	1	24-80369A28	COIL	3.3UH	R 144	1	06-10621C94	RESISTOR	10.7K-1-1/4
C 241	1	21-80341B72	CAPACITOR	360PF-5-50	C 384	1	21-80342B10	CAPACITOR	.1UF-20-50	L 304	1	24-80340B54	COIL	10UH	R 145	1	06-10621C76	RESISTOR	6.98-1-1/4
C 242	1	21-80342B10	CAPACITOR	.1UF-20-50	C 385	1	21-80342B10	CAPACITOR	.1UF-20-50	L 305	1	24-80369A29	COIL	10UH	R 146	1	06-10621D63	RESISTOR	54.9K-1-1/4
C 243	1	21-80344B38	CAPACITOR	047UF-10-100	C 386	1	21-80342B10	CAPACITOR	.1UF-20-50	L 306	1	24-80340B56	COIL	18UH	R 147	1	06-10621C39	RESISTOR	2.87K-1-1/4
C 244	1	21-80342B10	CAPACITOR	.1UF-20-50	C 387	1	21-80342B10	CAPACITOR	.1UF-20-50	L 307	1	24-80340B54	COIL	3.3UH	R 148	1	06-10621C39	RESISTOR	5.1-5-1/4
C 245	1	21-80341B53	CAPACITOR	15PF-5-50	C 388	1	21-80342B10	CAPACITOR	.1UF-20-50	L 308	1	24-80369A29	COIL	10UH	R 149	1	06-80036G18	RESISTOR	5.1-5-1/4
C 301	1	21-80339B17	CAPACITOR	56PF-5-500	C 391	1	21-80341B94	CAPACITOR	01UF-10-100	L 309	1	24-80369A31	COIL	22UH	R 201	1	06-11009C49	RESISTOR	1K-5-1/4
C 302	1	21-80339B23	CAPACITOR	300PF-5-300	C 392	1	21-80342B10	CAPACITOR	.1UF-20-50	L 310	1	24-80369A31	COIL	22UH	R 149	1	06-80036G18	RESISTOR	5.1-5-1/4
C 303	1	21-80341B94	CAPACITOR	.01UF-10-100	C 393	1	23-80341B15	CAPACITOR	10UF-50V	L 311	1	24-80340B56	COIL	18UH	R 201	1	06-11009C49	RESISTOR	1K-5-1/4
C 304	1	21-80342B10	CAPACITOR	.1UF-20-50	C 394	1	20-80396A57	CAPACITOR	9 TO 35PF-200	L 312	1	24-80340B58	COIL	33UH	R 202	1	06-11009C46	RESISTOR	2K-5-1/4
C 305	1	21-80341B94	CAPACITOR	.01UF-10-100	C 395	1	23-80341B15	CAPACITOR	10UF-50V	L 313	1	24-80340B58	COIL	33UH	R 203	1	06-11009C46	RESISTOR	750-5-1/4
C 306	1	21-80339B24	CAPACITOR	110PF-5-500	C 396	1	21-80341B55	CAPACITOR	10UF-50V	L 314	1	24-80369A29	COIL	10UH	R 204	1	06-11009C39	RESISTOR	390-5-1/4
C 307	1	20-80343B37	CAPACITOR, VARIABLE	15 TO 60PF-200	C 397	1	21-80342B10	CAPACITOR	1500PF-5-50	L 315	1	24-80340B54	COIL	3.3UH	R 205	1	06-80339B75	THERMISTOR	330-10-1/4
C 308	1	21-80341B62	CAPACITOR	22PF-5-50	C 398	1	21-80342B10	CAPACITOR	.1UF-20-50	L 316	1	24-80369A39	INDUCTOR	330UH	R 206	1	06-11009C37	RESISTOR	330-5-1/4
C 309	1	21-80341B94	CAPACITOR	.01UF-10-100	C 399	1	21-80341B54	CAPACITOR	150PF-5-50	L 317	1	24-80369A42	COIL	100UH	R 207	1	06-11009C18	RESISTOR	51-5-1/4
C 310	1	21-80341B62	CAPACITOR	22PF-5-50	C 400	1	21-80342B10	CAPACITOR	.1UF-20-50	L 318	1	24-80369A42	COIL	1000UH	R 208	1	06-11009C63	RESISTOR	3.9K-5-1/4
C 311	1	21-80341B94	CAPACITOR	.01UF-10-100	C 401	1	21-80342B10	CAPACITOR	.1UF-20-50	L 319	1	24-80369A42	COIL	1000UH	R 209	1	06-11009C25	RESISTOR	100-5-1/4
C 312	1	21-80341B94	CAPACITOR	.01UF-10-100	C 402	1	21-80342B10	CAPACITOR	.1UF-20-50	L 320	1	24-80369A37	COIL	100UH	R 210	1	06-11009C80	RESISTOR	20K-5-1/4
C 313	1	21-80341B48	CAPACITOR	120PF-5-50	C 403	1	21-80342B10	CAPACITOR	.1UF-20-50	L 321	1	24-80369A42	COIL	100UH	R 211	1	06-11009C47	RESISTOR	820-5-1/4
C 314	1	21-80341B48	CAPACITOR	120PF-5-50	C 404	1	21-80341B74	CAPACITOR	39PF-5-50	L 322	1	24-80369A37	COIL	1000UH	R 212	1	06-11009C73	RESISTOR	10K-5-1/4
C 315	1	21-80341B94	CAPACITOR	.01UF-10-100	C 405	1	21-80341B74	CAPACITOR	39PF-5-50	L 323	1	24-80369A42	COIL	1000UH	R 213	1	06-11009C59	RESISTOR	2.7K-5-1/4
C 316	1	21-80341B94	CAPACITOR	.01UF-10-100	C 406	1	21-80341B65	CAPACITOR	270PF-5-50	L 324	1	24-80369A38	COIL	220UH	R 214	1	06-11009C73	RESISTOR	10K-5-1/4
C 317	1	21-80341B94	CAPACITOR	.01UF-10-100	C 407	1	21-80341B65	CAPACITOR	270PF-5-50	L 325	1	24-80369A38	COIL	220UH	R 215	1	06-11009C59	RESISTOR	2.7K-5-1/4
C 318	1	21-80341B87	CAPACITOR	.01UF-10-100	C 408	1	21-80341B64	CAPACITOR	27PF-5-50	Q 101	1	48-80340B86	TRANSISTOR	MPS6520	R 216	1	06-11009C15	RESISTOR	39-5-1/4
C 319	1	21-80341B94	CAPACITOR	.01UF-10-100	C 409	1	23-80341B11	CAPACITOR	27PF-5-50	Q 102	1	48-80340B86	TRANSISTOR	MP6519	R 217	1	06-11009C15	RESISTOR	39-5-1/4
C 320	1	20-80396A57	CAPACITOR	9 TO 35PF-200	C 410	1	21-80341B64	CAPACITOR	47UF-20-16	Q 103	1	48-80340B86	TRANSISTOR	MP6519	R 218	1	06-11009C18	RESISTOR	51-5-1/4
C 321	1	21-80341B94	CAPACITOR	.01UF-10-100	C 411	1	21-80341B64	CAPACITOR	47UF-20-16	Q 104	1	48-80340B86	TRANSISTOR	MP6519	R 219	1	18-80342B97	RESISTOR, VARIABLE	200
C 322	1	21-80341B94	CAPACITOR	.01UF-10-100	C 412	1	21-80341B58	CAPACITOR	27PF-5-50	Q 105	1	48-80340B86	TRANSISTOR	MP6519	R 220	1	06-11009C73	RESISTOR	10K-5-1/4
C 323	1	21-80341B94	CAPACITOR	.01UF-10-100	C 413	1	21-80342B10	CAPACITOR	200PF-5-50	Q 201	1	48-00869849	TRANSISTOR	MSP6520	R 221	1	06-11009C59	RESISTOR	2.7K-5-1/4
C 324	1	21-80341B94	CAPACITOR	.01UF-10-100	C 414	1	21-80341B54	CAPACITOR	150PF-5-50	Q 202	1	48-80340B86	TRANSISTOR	MPS6520	R 222	1	06-11009C73	RESISTOR	10K-5-1/4
C 325	1	21-80341B94	CAPACITOR	.01UF-10-100	C 415	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 203	1	48-80340B86	TRANSISTOR	MPS6520	R 223	1	06-11009C59	RESISTOR	2.7K-5-1/4
C 326	1	20-80343B35	CAPACITOR	5 TO 18PF-200	C 416	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 204	1	48-80340B86	TRANSISTOR	MPS6520	R 224	1	06-11009C15	RESISTOR	39-5-1/4
C 327	1	20-80343B35	CAPACITOR	5 TO 18PF-200	C 417	1	21-80342B45	CAPACITOR	47UF-10-100	Q 301	1	48-00869933	TRANSISTOR	U310, SCREENED	R 225	1	06-11009C18	RESISTOR	51-5-1/4
C 328	1	20-80343B35	CAPACITOR	5 TO 18PF-200	C 418	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 302	1	48-80368A90	TRANSISTOR	MPS6520	R 226	1	18-80342B97	RESISTOR, VARIABLE	200
C 329	1	21-80341B94	CAPACITOR	.01UF-10-100	C 419	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 303	1	48-80340B86	TRANSISTOR	MPS6520	R 227	1	06-11009C15	RESISTOR	39-5-1/4
C 330	1	21-80341B94	CAPACITOR	.01UF-10-100	C 420	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 304	1	48-80340B86	TRANSISTOR	MPS6519	R 228	1	06-10621C63	RESISTOR	5.11K-1-1/4
C 331	1	21-80341B94	CAPACITOR	.01UF-10-100	C 421	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 305	1	48-00869878	TRANSISTOR	MPS6519	R 229	1	18-83452F16	RESISTOR, VARIABLE	20K
C 332	1	21-80341B94	CAPACITOR	.01UF-10-100	C 422	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 306	1	48-00869878	TRANSISTOR	MPS6519	R 230	1	06-11009C29	RESISTOR	150-5-1/4
C 333	1	21-80341B66	CAPACITOR	30PF-5-50	C 423	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 307	1	48-00869878	TRANSISTOR	MPS6519	R 231	1	06-10621C42	RESISTOR	3.09K-1-1/4
C 334	1	21-80342B10	CAPACITOR	.1UF-20-50	C 424	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 308	1	48-00869878	TRANSISTOR	MPS6519	R 232	1	06-10621D12	RESISTOR	16.2K-1-1/4
C 335	1	21-80342B10	CAPACITOR	.1UF-20-50	C 425	1	23-80344B35	CAPACITOR	.1UF-20-50	Q 309	1	48-80340B85	TRANSISTOR	MPS6520	R 233	1	06-10621C59	RESISTOR	4.64K-1-1/4
C 336	1	21-80341B94	CAPACITOR	.01UF-10-100	C 426	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 310	1	48-80340B86	TRANSISTOR	MPS6520	R 234	1	06-10621B94	RESISTOR	1K-1-1/4
C 337	1	21-80341B94	CAPACITOR	.01UF-10-100	C 427	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 311	1	48-80340B86	TRANSISTOR	MPS6520	R 235	1	06-11009C41	RESISTOR	470-5-1/4
C 338	1	21-80341B63	CAPACITOR	24PF-5-50	C 428	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 312	1	48-80340B85	TRANSISTOR	MPS6519	R 236	1	06-11009C29	RESISTOR	332K-1-1/4
C 339	1	21-80341B54	CAPACITOR	150PF-5-50	C 429	1	21-80342B10	CAPACITOR	.1UF-20-50	Q 313	1	48-80340B86	TRANSISTOR	MPS6520	R 237	1	06-10621E39	RESISTOR	332K-1-1/4
C 340	1	21-80341B54	CAPACITOR	150PF-5-50	C 430	1	21-80341B64	CAPACITOR	27PF-5-50	Q 314	1	48-80340B85	TRANSISTOR	MPS6519	R 238	1	06-11009C61	RESISTOR	3.3K-5-1/4
C 341	1	21-80341B94	CAPACITOR	.01UF-10-100	C 431	1	21-80341B94	CAPACITOR	.01UF-10-100	Q 315	1	48-80340B85	TRANSISTOR	MPS6519	R 239	1	06-10621D21	RESISTOR	20K-1-1/4
C 342	1	21-80342B10	CAPACITOR																

RECEIVER BOARD (A8)

(RTL-1019A)

Figure 10-3b. Printed Wiring Board
Assembly and Parts List (Sheet 3 of 4)

Find No.	Qty. Req.	Part No.	Nomenclature	Part Value	Find No.	Qty. Req.	Part No.	Nomenclature	Part Value	Find No.	Qty. Req.	Part No.	Nomenclature	Part Value
R 314	1	06-11009C73	RESISTOR	10K-5-1/4	R 403	1	06-11009C51	RESISTOR	1.2K-5-1/4	U 312	1	51-80340B25	INTEGRATED CIRCUIT	
R 315	1	06-11009C05	RESISTOR	15-5-1/4	R 404	1	06-11009C46	RESISTOR	750-5-1/4	U 313	1	51-80339B97	INTEGRATED CIRCUIT	
R 316	1	06-11009C47	RESISTOR	820-5-1/4	R 405	1	06-11009C47	RESISTOR	820-5-1/4	U 314	1	51-80345A04	INTEGRATED CIRCUIT	CA3240E SCREENED
R 317	1	06-11009C47	RESISTOR	820-5-1/4	R 406	1	06-11009C88	RESISTOR	43K-5-1/4	U 315	1	51-80345A05	INTEGRATED CIRCUIT	HI-201-5 SCREENED
R 318	1	06-11009C29	RESISTOR	150-5-1/4	R 407	1	06-11009C66	RESISTOR	5.1K-5-1/4	U 316	1	51-80347A38	INTEGRATED CIRCUIT	
R 322	1	06-11009C47	RESISTOR	820-5-1/4	R 408	1	06-11009C66	RESISTOR	5.1K-5-1/4	U 317	1	51-80339B06	INTEGRATED CIRCUIT	
R 323	1	06-11009C47	RESISTOR	820-5-1/4	R 409	1	06-10621C95	RESISTOR	11K-1-1/4	VR201	1	48-83461E36	DIODE	6.2V-5-500MW
R 324	1	06-11009C32	RESISTOR	200-5-1/4	R 410	1	06-10621C95	RESISTOR	11K-1-1/4	VR301	1	48-83461E36	DIODE	6.2V-5-500MW
R 325	1	06-11009C47	RESISTOR	820-5-1/4	R 411	1	06-11009C46	RESISTOR	750-5-1/4	VR302	1	48-83461E36	DIODE	6.2V-5-500MW
R 326	1	06-11009C47	RESISTOR	820-5-1/4	R 412	1	06-11009C46	RESISTOR	750-5-1/4	Y 201	1	48-80343B32	CRYSTAL	10.24 MHZ
R 327	1	06-11009C57	RESISTOR	2.2-5-1/4	R 413	1	06-10621C91	RESISTOR	10K-1-1/4					
R 328	1	06-11009C56	RESISTOR	2K-5-1/4	R 414	1	06-10621C91	RESISTOR	10K-1-1/4					
R 329	1	06-11009C56	RESISTOR	2K-5-1/4	R 415	1	06-10621C91	RESISTOR	10K-1-1/4					
R 330	1	06-11009C46	RESISTOR	750-5-1/4	R 416	1	06-10621C91	RESISTOR	10K-1-1/4					
R 331	1	06-11009C18	RESISTOR	51-5-1/4	R 417	1	06-10621D76	RESISTOR	75K-1-1/4					
R 332	1	06-11009C32	RESISTOR	200-5-1/4	R 418	1	06-10621D76	RESISTOR	75K-1-1/4					
R 333	1	06-11009C97	RESISTOR	100K-5-1/4	R 420	1	06-11009C73	RESISTOR	10K-5-1/4					
R 334	1	06-11009C73	RESISTOR	10K-5-1/4	R 421	1	18-80342B98	RESISTOR, VARIABLE	2K					
R 335	1	06-11009C83	RESISTOR	27K-5-1/4	R 422	1	06-10621C87	RESISTOR	9.09K-1-1/4					
R 336	1	06-11009C29	RESISTOR	150-5-1/4	R 423	1	06-10621C91	RESISTOR	10K-1-1/4					
R 337	1	06-11009C56	RESISTOR	2K-5-1/4	R 424	1	06-11009D04	RESISTOR	180K-5-1/4					
R 338	1	06-11009C56	RESISTOR	2K-5-1/4	R 425	1	06-11009C90	RESISTOR	51K-5-1/4					
R 339	1	06-11009C18	RESISTOR	51-5-1/4	R 426	1	06-11009C67	RESISTOR	5.6K-5-1/4					
R 340	1	06-11009C29	RESISTOR	150-5-1/4	R 427	1	06-11009D11	RESISTOR	360K-5-1/4					
R 342	1	06-11009C80	RESISTOR	20K-5-1/4	R 428	1	06-11009C56	RESISTOR	2K-5-1/4					
R 343	1	06-11009C67	RESISTOR	5.6K-5-1/4	R 429	1	06-11009C29	RESISTOR	150-5-1/4					
R 344	1	06-11009C54	RESISTOR	1.6K-5-1/4	R 430	1	06-11009C90	RESISTOR	51K-5-1/4					
R 345	1	06-11009C29	RESISTOR	150-5-1/4	R 431	1	06-11009C83	RESISTOR	27K-5-1/4					
R 346	1	06-11009C29	RESISTOR	150-5-1/4	R 432	1	06-11009C80	RESISTOR	20K-5-1/4					
R 347	1	06-11009C54	RESISTOR	1.6K-5-1/4	R 433	1	06-11009C66	RESISTOR	5.1K-5-1/4					
R 348	1	06-11009C40	RESISTOR	430-5-1/4	R 434	1	06-11009C37	RESISTOR	330-5-1/4					
R 349	1	06-10621E39	RESISTOR	332K-1-1/4	R 435	1	06-11009C63	RESISTOR	3.9K-5-1/4					
R 350	1	06-11009C29	RESISTOR	150-5-1/4	R 436	1	06-10621D27	RESISTOR	23.2K-1-1/4					
R 351	1	06-10621E39	RESISTOR	332K-1-1/4	R 437	1	06-10621D32	RESISTOR	26.1K-1-1/4					
R 352	1	06-11009C67	RESISTOR	5.6K-5-1/4	R 438	1	06-11009C83	RESISTOR	27K-5-1/4					
R 354	1	06-10621D80	RESISTOR	82.5K-1-1/4	R 439	1	06-11009C90	RESISTOR	51K-5-1/4					
R 355	1	06-10621D24	RESISTOR	20.5K-1-1/4	R 440	1	06-11009C63	RESISTOR	3.9K-5-1/4					
R 356	1	06-11009D02	RESISTOR	150K-5-1/4	R 441	1	06-11009D20	RESISTOR	820K-5-1/4					
R 357	1	06-11009D02	RESISTOR	150K-5-1/4	R 442	1	06-11009C56	RESISTOR	2K-5-1/4					
R 358	1	06-11009C80	RESISTOR	20K-5-1/4	R 443	1	06-11009C80	RESISTOR	20K-5-1/4					
R 359	1	18-80342B96	RESISTOR, VARIABLE	10K	R 444	1	06-11009C73	RESISTOR	10K-5-1/4					
R 360	1	06-10621D64	RESISTOR	56.2K-1-1/4	R 445	1	06-11009C23	RESISTOR	82-5-1/4					
R 361	1	06-10621D28	RESISTOR	23.7K-1-1/4	R 447	1	06-11009C23	RESISTOR	82-5-1/4					
R 362	1	06-11009C28	RESISTOR	130-5-1/4	R 448	1	06-11009C90	RESISTOR	51K-5-1/4					
R 363	1	06-11009C28	RESISTOR	130-5-1/4	R 449	1	06-11009C32	RESISTOR	200-5-1/4					
R 364	1	06-11009C18	RESISTOR	51-5-1/4	R 450	1	06-11009C75	RESISTOR	12K-5-1/4					
R 365	1	06-11009C23	RESISTOR	82-5-1/4	R 451	1	06-11009C66	RESISTOR	5.1K-5-1/4					
R 366	1	06-11009C60	RESISTOR	3K-5-1/4	T 301	1	25-80342B84	TRANSFORMER						
R 367	1	06-11009C66	RESISTOR	5.1K-5-1/4	T 302	1	25-80342B78	TRANSFORMER						
R 368	1	06-11009C90	RESISTOR	51K-5-1/4	T 303	1	25-80342B76	TRANSFORMER						
R 369	1	06-11009C90	RESISTOR	51K-5-1/4	T 304	1	25-80342B81	TRANSFORMER						
R 370	1	06-11009C29	RESISTOR	150-5-1/4	T 305	1	25-80342B76	TRANSFORMER						
R 371	1	06-11009C49	RESISTOR	1K-5-1/4	U 101	1	51-80345A05	INTEGRATED CIRCUIT	HI-201-5 SCREENED					
R 372	1	06-11009C32	RESISTOR	200-5-1/4	U 102	1	51-80345A05	INTEGRATED CIRCUIT	HI-201-5 SCREENED					
R 373	1	06-11009C32	RESISTOR	200-5-1/4	U 103	1	51-80339B99	INTEGRATED CIRCUIT						
R 374	1	06-11009C18	RESISTOR	51-5-1/4	U 104	1	51-80345A05	INTEGRATED CIRCUIT	HI-201-5 SCREENED					
R 375	1	06-11009C90	RESISTOR	51K-5-1/4	U 105	1	51-80345A04	INTEGRATED CIRCUIT	CA3240E SCREENED					
R 376	1	06-11009C56	RESISTOR	2K-5-1/4	U 106	1	51-80345A05	INTEGRATED CIRCUIT	HI-201-5 SCREENED					
R 377	1	06-11009C15	RESISTOR	39-5-1/4	U 107	1	51-80345A05	INTEGRATED CIRCUIT	HI-201-5 SCREENED					
R 378	1	06-11009C22	RESISTOR	75-5-1/4	U 108	1	51-80339B99	INTEGRATED CIRCUIT						
R 379	1	06-11009C15	RESISTOR	39-5-1/4	U 111	1	51-80396A16	INTEGRATED CIRCUIT	LM324N SCREENED					
R 380	1	06-11009B05	RESISTOR	200K-5-1/4	U 112	1	51-83627M42	INTEGRATED CIRCUIT						
R 381	1	06-11009C83	RESISTOR	27K-5-1/4	U 113	1	51-83627M42	INTEGRATED CIRCUIT						
R 382	1	06-11009C94	RESISTOR	75K-5-1/4	U 114	1	51-80345A05	INTEGRATED CIRCUIT	HI-201-5 SCREENED					
R 383	1	06-11009C90	RESISTOR	51K-5-1/4	U 115	1	51-0549E13	INTEGRATED CIRCUIT						
R 384	1	06-11009C49	RESISTOR	1K-5-1/4	U 201	1	51-83222M02	INTEGRATED CIRCUIT						
R 385	1	06-11009D19	RESISTOR	750K-5-1/4	U 202	1	51-80365A15	INTEGRATED CIRCUIT						
R 386	1	06-11009C49	RESISTOR	1K-5-1/4	U 203	1	51-80365A15	INTEGRATED CIRCUIT						
R 388	1	06-11009C66	RESISTOR	5.1K-5-1/4	U 204	1	51-80368A65	INTEGRATED CIRCUIT	TL441CN SCREENED					
R 389	1	06-11009C63	RESISTOR	3.9K-5-1/4	U 205	1	51-80345A04	INTEGRATED CIRCUIT	CA3240E SCREENED					
R 390	1	06-11009C56	RESISTOR	2K-5-1/4	U 206	1	51-80345A04	INTEGRATED CIRCUIT	CA3240E SCREENED					
R 391	1	06-11009C59	RESISTOR	2.7K-5-1/4	U 207	1	51-80345A04	INTEGRATED CIRCUIT	CA3240E SCREENED					
R 392	1	06-11009C58	RESISTOR	2.4K-5-1/4	U 301	1	51-80340B20	INTEGRATED CIRCUIT						
R 393	1	06-10621D28	RESISTOR	23.7K-1-1/4	U 302	1	51-83222M02	INTEGRATED CIRCUIT						
R 394	1	06-10621D80	RESISTOR	82.5K-1-1/4	U 303	1	51-80339B06	INTEGRATED CIRCUIT						
R 395	1	06-11009C73	RESISTOR	10K-5-1/4	U 304	1	51-80345A04	INTEGRATED CIRCUIT	CA3240E SCREENED					
R 396	1	06-11009D02	RESISTOR	150K-5-1/4	U 305	1	51-80345A04	INTEGRATED CIRCUIT	CA3240E SCREENED					
R 397	1	06-11009C73	RESISTOR	10K-5-1/4	U 306	1	51-80345A04	INTEGRATED CIRCUIT	CA3240E SCREENED					
R 398	1	18-80342B96	RESISTOR, VARIABLE	10K	U 307	1	51-80365A15	INTEGRATED CIRCUIT						
R 399	1	06-11009C32	RESISTOR	200-5-1/4	U 308	1	51-80347A38	INTEGRATED CIRCUIT						
R 400	1	06-11009C42	RESISTOR	510-5-1/4	U 309	1	51-80347A38	INTEGRATED CIRCUIT						
R 401	1	06-11009C42	RESISTOR	510-5-1/4	U 310	1	51-80340B24	INTEGRATED CIRCUIT						
R 402	1	06-11009C36	RESISTOR	300-5-1/4	U 311	1	51-05722G02	INTEGRATED CIRCUIT						

