

SERVICE MANUAL



ADVENT MODEL 100
NOISE REDUCTION UNIT

Advent Corporation
377 Putnam Avenue
Cambridge, Mass. 02139

NRU 10-70

1.1 PERFORMANCE AND ELECTRICAL SPECIFICATIONS

FREQUENCY RESPONSE:

Dolby Out: 20-20,000Hz +0 -1db
Dolby In: 20-20,000Hz +1 -2db
With MX FILTER "in" the upper limit is 15 kHz

DISTORTION:

Less than 0.5% THD @ Dolby Level, 20-20,000Hz

SIGNAL TO NOISE RATIO:

(Measured straight through exclusive of tape deck)
-66db from Dolby Level

NOISE REDUCTION vs. FREQUENCY:

3db @ 600Hz
6db @ 1200Hz
9db @ 2400Hz
10db @ 4000Hz to 20,000Hz

INPUT SENSITIVITIES:

MIC: 0.5mv for Dolby Level @ 1000 ohms (50,000 ohms
after serial number 02800)

LINE: 60mv for Dolby Level @ 50,000 ohms

FROM TAPE RECORDER OUTPUT: 150mv for Dolby Level @
50,000 ohms. (Adjustable
by PLAY CAL control)

OUTPUT LEVELS:

TO TAPE RECORDER INPUT: Maximum 500mv for 0 VU
tape level @ 1000 ohms.

TO AMP INPUT: 1.0 V from 0 VU tape level, less than
1000 ohms output impedance.

MX FILTER:

less than 1db down @ 15kHz
greater than 30db down @ 19kHz
greater than 20 db down @ 38kHz

In open reel recording, Dolby Level is the same flux level on the tape as Ampex Operating Level.

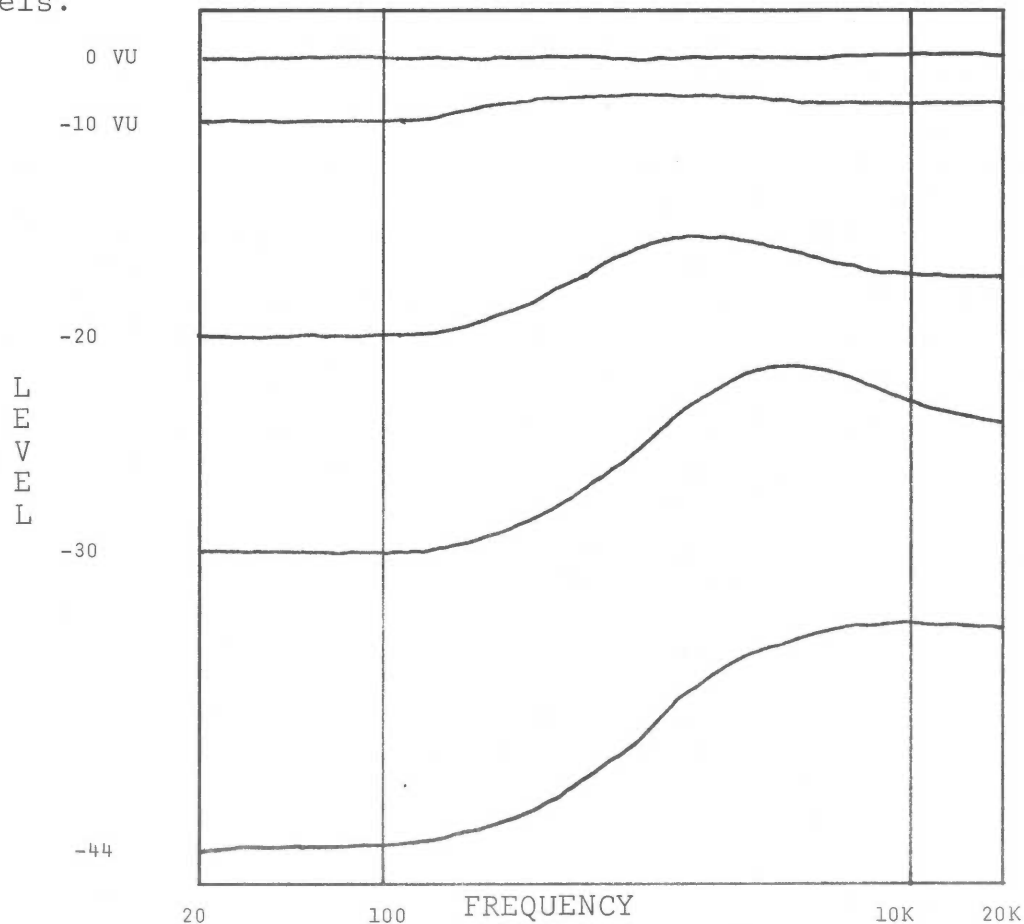
For cassettes, Dolby Level is defined as a flux level on the tape of 200 nanoWebers per meter.

1.2 INTRODUCTION TO THE MODEL 100

THE ADVENT NOISE REDUCTION UNIT - MODEL 100 is a simultaneous record-playback control center incorporating the "B-type" Dolby Audio Noise Reduction System*. This system is designed to reduce the noise inherent in the tape recording process - "tape hiss" - and does so by improving the signal to noise ratio by 3db at 600Hz increasing rapidly to 6db at 1200Hz and 10db at 4000Hz and above.

The principle of the system is to boost low-level signals before they are recorded and to attenuate the playback signal in precisely a complementary manner. The noise added during the recording process is therefore reduced in a like manner.

The Dolby action increases as the record input signal level decreases. Higher level signals are passed thru the circuitry unchanged. The graph below shows representative curves of the Dolby circuitry boost action at different input levels.



Again, in playback only the previously boosted low-level signals are attenuated by the same amount they had been boosted, the higher level signals are passed thru unchanged. It is thru this playback attenuation process that the noise reduction takes place. The noise added during the recording process is attenuated with the previously boosted high frequency signals. Since the Dolby circuit does not discriminate between signal and noise it automatically attenuates the noise as it attenuates the signal.

* A Trademark of Dolby Laboratories, Inc.

1.3 CIRCUIT DESCRIPTION

Inputs are made thru the MIC and FROM PREAMP OUTPUT (line input) jacks on the rear panel.

The MIC input feeds directly into a microphone pre-amp, then to the MIC input level control. The AUX input feeds directly into the LINE input level control then to the 22K isolating resistor.

The outputs of the MIC and LINE controls feed into the master RECORD LEVEL control, which adjusts both channels simultaneously.

The signal is then fed to a X4 voltage amplifier, then to the record Dolby circuit thru a low-pass filter. Note: Part of the low-pass filter is always in the circuit to eliminate supersonic high frequency components from the input signal (RF interference, etc.) that might erroneously trigger the Dolby circuitry. The other section of the filter is a notch filter to eliminate the 19kHz pilot signal in FM multiplex broadcasts, and may be switched in or out of the circuit by operation of the MX FILTER switch.

The Dolby Level calibration circuit may also be connected to the input of the record Dolby board by activating the spring-loaded REC CAL TONE switch located on the front panel. This switch provides operating D.C. voltage to a 400Hz oscillator, the output of which (adjustable by rear panel 100 MV OSC CAL pot) feeds to the inputs of both record Dolby boards. The switch action also desconnects the meter amplifiers.

The output of the record Dolby board is fed into a X5 voltage amplifier and then through the back panel REC CAL control to the TO TAPE RECORDER INPUT jack.

Playback signals from the tape recorder are fed to the jacks labeled FROM TAPE RECORDER OUTPUT to the Play Cal control, then to a bias filter. Concurrently the signal is fed to the meter circuit.

The output of the bias filter is fed to the playback Dolby board then to the TAPE position of the SOURCE-TAPE switch. The source position of that switch connects to the input of the record Dolby Board.

The output of the SOURCE-TAPE switch is fed to the OUTPUT LEVEL control then to a X10 voltage amplifier then to the TO AMP INPUT jack and Headphone jack.

2.1 DISASSEMBLY INSTRUCTIONS

First, remove the bottom panel. The screws securing the four feet do not hold the panel to the chassis and need not be removed. Beneath the panel is a bottom shield. Remove it by carefully bending the middle area of it away from the chassis and pull one of the long edges from under the chassis lip until it is clear.

Next, the pilot lamp located on the corner of the chassis adjacent to the on-off switch must be moved to prevent its possible breakage. Unclip it from the chassis and lay it off to one side -- away from the bottom of the chassis.

Next, remove the top panel.

The front and back panels may now be swung out and away from the main chassis, pivoting on the two screws that connect each of their bottom edges to the chassis.

Finally, any of the printed circuit boards may be removed for inspection or repair by pulling it smoothly up from the chassis. Move it only in the vertical plane; bending it may damage the amp pin connectors.

IMPORTANT: When reassembling the unit, tighten the four screws and nuts at the corners of the front and back panels.

2.2 REPAIRING THE MODEL 100

Follow the check out procedure on the next page to quickly establish that the Model 100 is operating properly. Please go through the entire procedure in the order set down, since the later procedures presume that the earlier ones have been performed.

If either channel of the Dolby System fails the frequency response test at -25 db, you can then isolate the fault by exchanging the Record and/or Play Dolby board from the known good channel for those in the defective channel. This will determine whether the Play or Record Dolby is at fault. The faulty board should then be aligned (see Sections 2.3 and 2.4).

SECTION	PROCEDURES	COMMENT
Oscillator Calibration	Connect VTVM to 100MV TEST jack. Switch REC CAL TONE on.	Adjust OSC CAL 100MV pot for 100mv±0.5db.
Dolby Meter Calibration	Switch REC CAL TONE and METER TEST on. (Use a #6 screw head to hold the switch on.)	Adjust METER CAL pots so that meters read to the Dolby Level line.
Dolby Calibration	Connect signal generator (1 kHz @ >100mv) to FROM PREAMP OUTPUT jacks. Interconnect TO and FROM TAPE RECORDER jacks. Connect VTVM and scope to TO AMP INPUT jacks. Set RECORD LEVEL and REC CAL pots full up (clockwise from rear view). MX FILTER and DOLBY switches "out". SOURCE-TAPE switches to TAPE. Switch METER TEST on.	Adjust LINE INPUTS so that meters read to Dolby Level line.
	Release METER TEST switch.	Adjust PLAY CAL so that meters read to Dolby Level line.
Frequency Response	Set OUTPUT LEVELS for convenient reference on VTVM. Sweep signal generator 20-20kHz.	Output +0,-1db.
Record-play Dolby	Decrease level from signal generator by 25db. Switch Dolby in. Sweep signal generator from 20Hz to 20kHz.	Output flat to +1,-2db.
Noise and Hum	Increase signal generator output by 25db (to Dolby Level). Increase OUTPUT LEVELS full up to read 1 volt out. Disconnect signal generator.	Noise 66db down from Dolby Level.

2.3 TEST AND ALIGNMENT OF RECORD DOLBY

Set Up: Feed oscillator @ 5kHz to pin 1 of Record Dolby. Connect VTVM to pin 4. At Step 2, reconnect VTVM to pin 6.

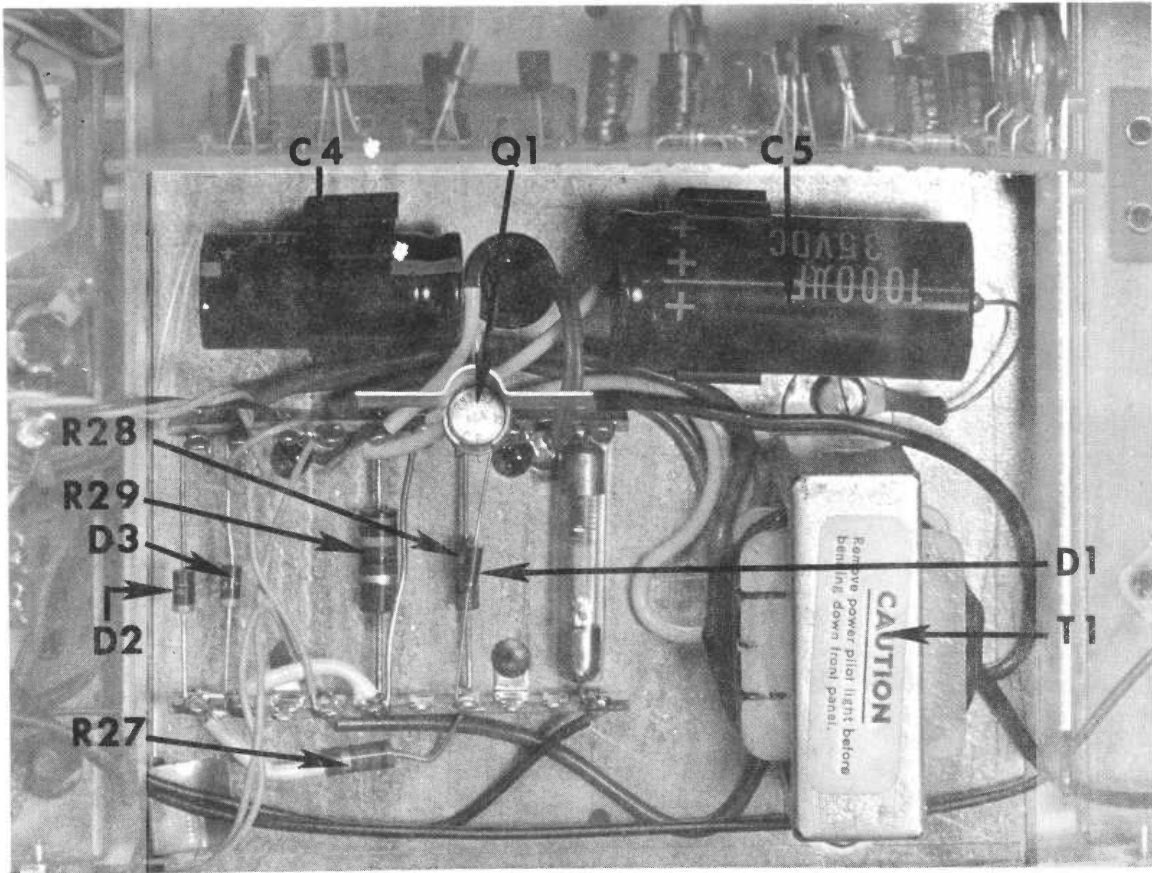
STEP	5kHz INPUT	VTVM	SCOPE @ OUTPUT (PIN 6)	FET	DOLBY	COMMENT
1	To input (pin 1)	10 mv fs	5 mv/div	ground	out	Short FET (pin 7) to ground Adjust signal gen for 3 mv @ meter point (pin 4)
2	"	10 mv fs @ output (pin 6)	"	"	in	Switch DOLBY in - adjust GAIN pot for 10 db increase
3	"	100 mv fs	50 mv/div	remove ground	"	Adjust LAW pot for 2 db decrease
4	"	"	"	ground	"	Short FET to ground-check for 2 db increase
5	"	"	"	"	out	Check for 10 db decrease
6						If the reading for either Step 4 or 5 is incorrect repeat Step 2 and 3 until the proper results are achieved
7	100 mv @ input	1 v fs	0.5 v/div	remove ground	out	Check output for a reading of approximately 2v p-p with no visible distortion
8	3 mv @ input	10 mv fs	5 mv/div	ground	"	Seal GAIN and LAW pots with Glyptal cement - recheck Steps 4 and 5

2.4 TEST AND ALIGNMENT OF PLAYBACK DOLBY

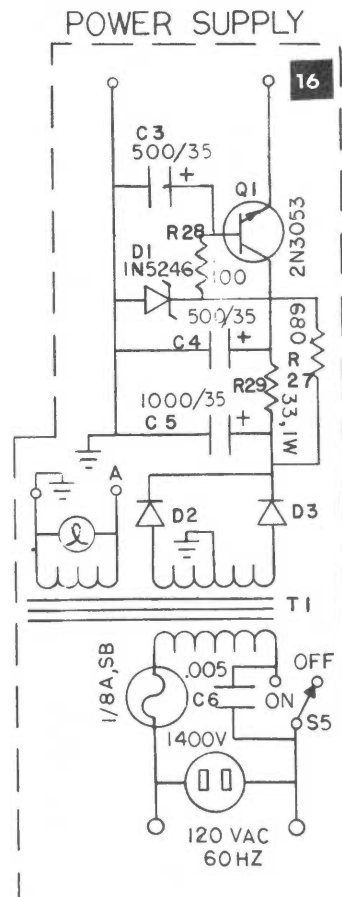
Set Up: Feed signal generator (5kHz) to pin 2 of Playback Dolby. Connect VTVM and scope to pin 6.

STEP	5kHz INPUT	VTVM (pin 6)	SCOPE (pin 6)	FET	DOLBY	COMMENT
1	Approx 7.6 mv @ input (pin 2)	10 mv fs	5 mv/div	ground	out	Short FET (pin 7) to ground (pin 5) Adjust sig gen for 7.6 mv @ output (pin 6)
2	"	"	"	"	in	Switch DOLBY in - adjust GAIN pot for a 10 db drop (to 2.4 mv)
3	"	"	"	remove ground	"	Remove FET ground - adjust LAW pot for a 2 db increase (to 3 mv)
4	"	"	"	ground	"	Short FET to ground-check for 2 db decrease
5	"	"	"	"	out	Check for 10 db increase
6						If the reading for either step 4 or 5 is incorrect repeat step 2 and 3 until the proper results are achieved
7	100 mv @ input (pin 2)	100 mv fs	20 mv/div	"	out	Check input and output level for unity gain within 1 db and no visible distortion
8	7.6 mv @ input (pin 2)	10 mv fs	5 mv/div	"	in	Seal GAIN and LAW pots with Glyptal cement - recheck Steps 2 and 3

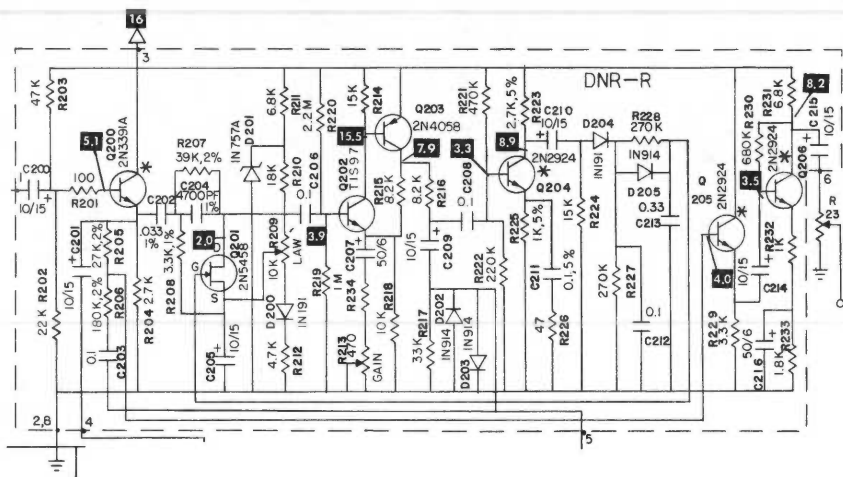
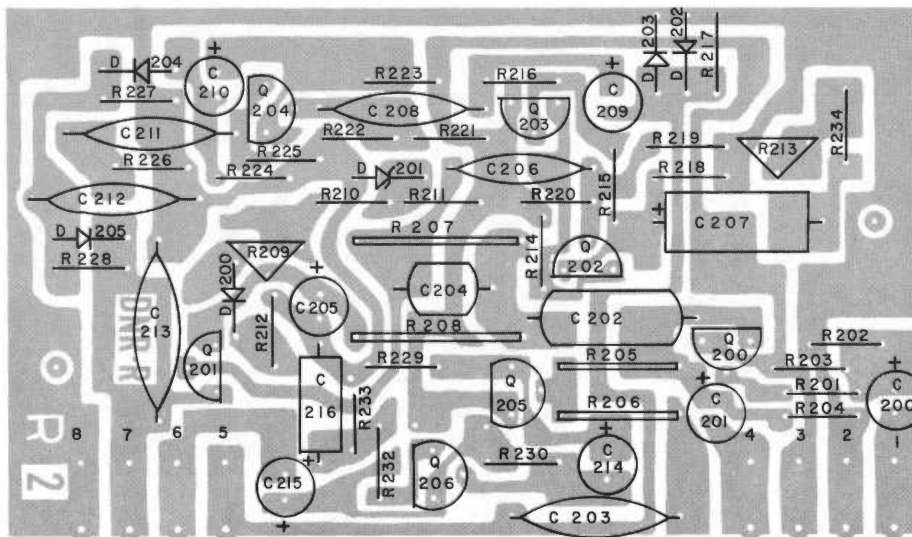
POWER
SUPPLY



QTY.	PART #	DESCRIPTION	SYMBOL
1	10-990-024	Power Transformer *	T 1
2	60-653-001	Resistor 15K Ohms $\frac{1}{4}$ wt. 10%	R 21, R 22
4	60-653-041	Resistor 560 Ohms $\frac{1}{4}$ wt. 10%	R 17, R 18, R 19, R 20
1	60-652-013	Resistor 33 Ohm 1 wt. 10%	R 29
2	60-613-017	Elec. Cap 500 MFD 15V TW Axial	C 1, C 2
2	60-613-008	Elec. Cap 500 MFD 35V	C 3, C 4
1	60-613-018	Elec. Cap 1000 MFD 35V	C 5
1	60-674-002	Transistor 2N-3053	Q 1
2	60-663-001	Diodes 40267	D 2, D 3
1	60-743-003	Fuse 1/8 Amp Pig Tail	
1	60-663-006	IN5246A Diode	D 1
1	60-651-063	Resistor 680 Ohms $\frac{1}{4}$ wt. 10%	R 27
1	60-651-064	Resistor 100 Ohms $\frac{1}{4}$ wt. 10%	R 28
1	60-632-001	.005 MFD Cer. Disc 1400V	C 6
<u>BACK PANEL ASSEMBLY</u>			
QTY.	PART #	DESCRIPTION	SYMBOL
1	40-693-005	Black AC Line Cord 6'	
1	60-312-013	Heyco SP 4 Strain Relief	
1	50-211-008	AC Receptacle #MSS-0818-1	
4	50-211-004	Dual Phono Sockets #352	
4	50-211-005	Dual Phono Insulators #352A	
1	50-263-008	3 POT Mom. Slide Switch #50209M	S 3
2	50-714-006	Controls 50K Screwdriver Adjust. CTS # VA 2403	R 23, R 24
2	50-211-006	Mic Jack Switchcraft # L 112 A	J 1, J 2
2	60-653-023	Resistor 1K $\frac{1}{4}$ wt. 10%	R 1, R 2

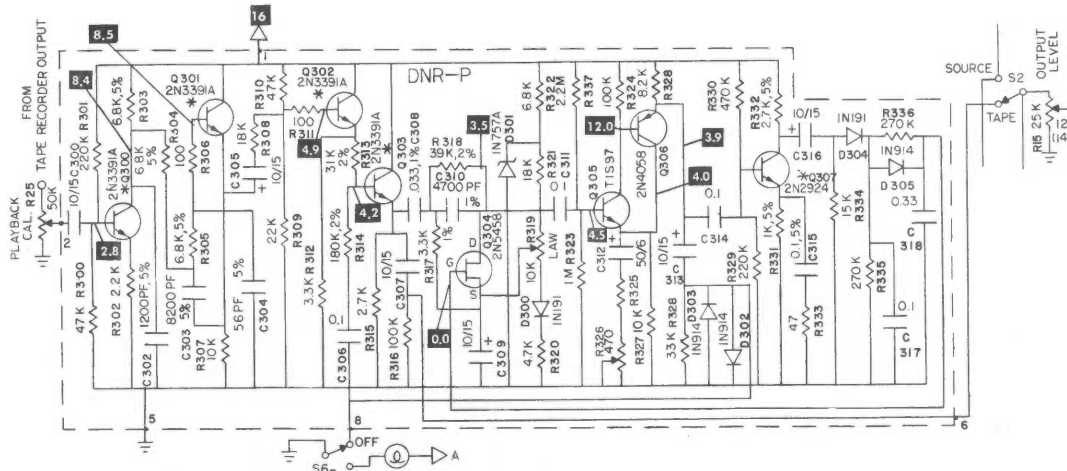
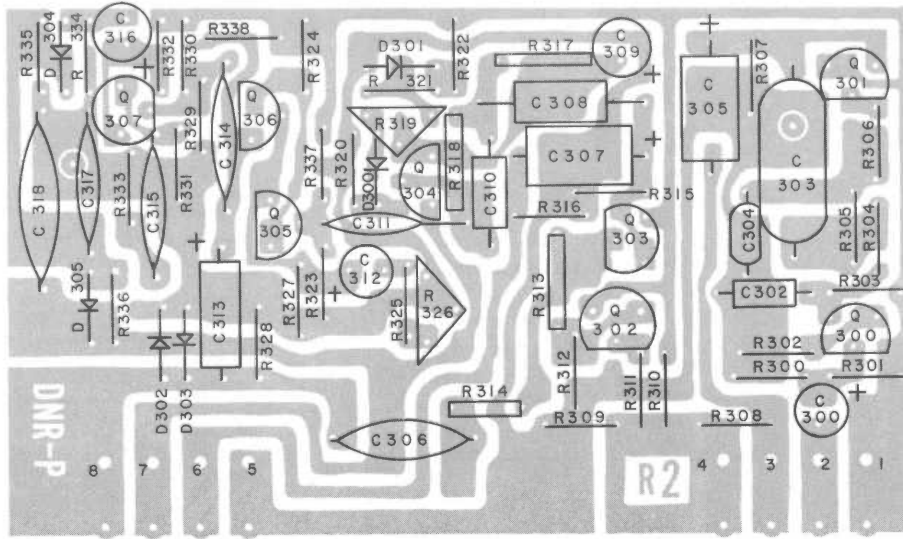


RECORD



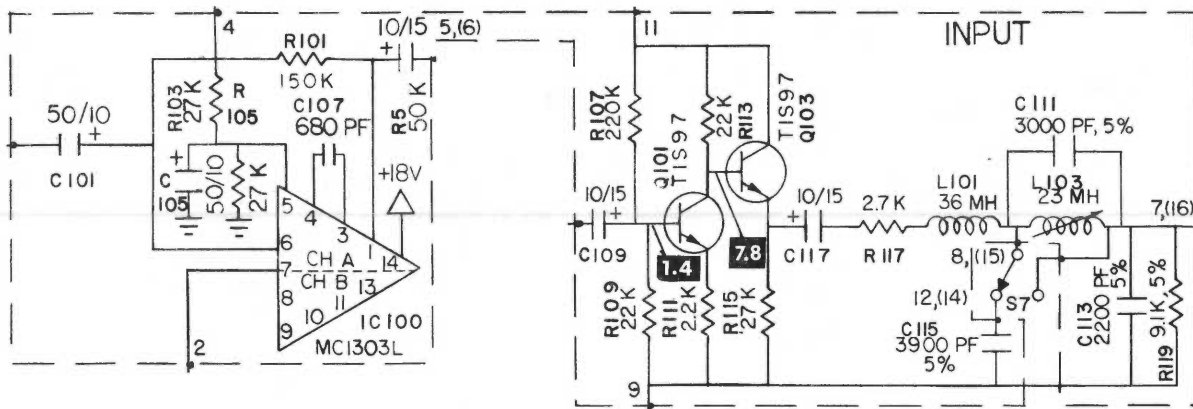
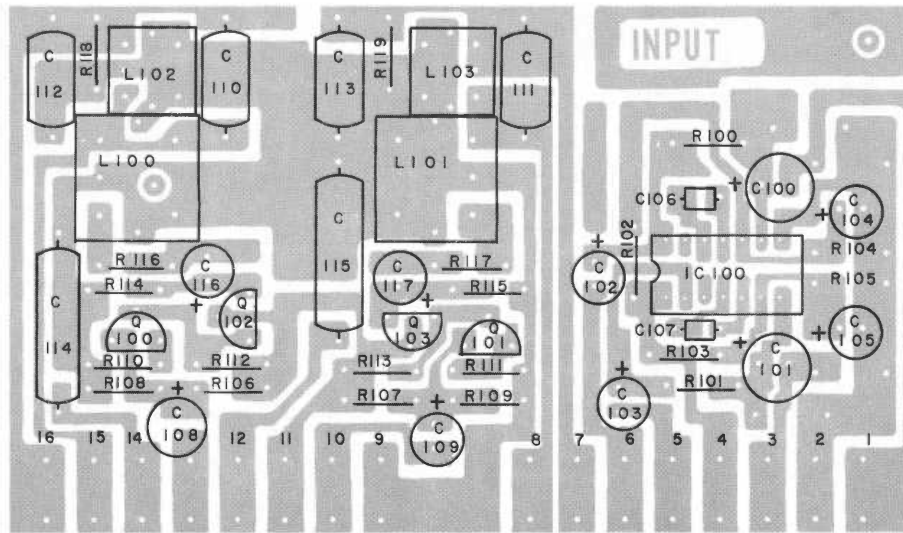
QTY.	PART #	DESCRIPTION	SYMBOL	QTY.	PART #	DESCRIPTION	SYMBOL
1	50-714-007	Trimmer Pots CTSX201 10K Ohms	R 209	1	60-653-004	Resistor 2.7K Ohms 1/4wt. 5%	R 223
1	50-714-008	Trimmer Pots CTSX201 500 Ohms	R 213	1	60-653-005	Resistor 2.7K Ohms 1/4wt. 10%	R 204
7	60-613-005	Electro Caps 10MFD 15V	C 200, C 201, C 205, C 209, C 210, C 214, C 215	1	60-653-006	Resistor 3.3K Ohms 1/4wt. 10%	R 229
2	60-613-016	Electro Caps 50MFD 6V axial	C 207, C 216	1	60-653-007	Resistor 4.7K Ohms 1/4wt. 10%	R 212
4	60-633-002	Mylar Caps .1 MFD 10% 50V	C 206, C 203, C 208, C 212	2	60-653-008	Resistor 6.8K Ohms 1/4wt. 10%	R 211, R 231
1	60-633-005	Mylar Caps .33 MFD 10% 50V	C 213	1	60-653-009	Resistor 8.2K Ohms 1/4wt. 10%	R 215, R 216
1	60-633-011	Mylar Caps .1 MFD 5% 50V	C 211	1	60-653-010	Resistor 10K Ohms 1/4wt. 10%	R 218
1	60-633-012	Poly Caps .033 MFD 1% 50V	C 202	2	60-653-011	Resistors 15K Ohms 1/4wt. 10%	R 214, R 224
1	60-633-013	Poly Caps 4700 PF 1% 50V	C 204	1	60-653-012	Resistor 18K Ohms 1/4wt. 10%	R 210
2	60-663-002	Diodes IN191	D 200, D 204	1	60-653-013	Resistor 22K Ohms 1/4wt. 10%	R 202
3	60-663-003	Diodes IN914	D 203, D 202, D 205	1	60-653-014	Resistor 33K Ohms 1/2wt. 10%	R 217
1	60-663-004	Diodes IN757A	D 201	1	60-653-015	Resistor 47K Ohms 1/4wt. 10%	R 203
3	60-673-001	Transistors 2N-2924	Q 204, Q 205, Q 206	1	60-653-017	Resistor 220K Ohms 1/4wt. 10%	R 222
1	60-673-002	Transistor 2N-3391 A	Q 200	2	60-653-018	Resistors 270K Ohms 1/4wt. 10%	R 227, R 228
1	60-673-004	Transistor 2N 4058	Q 203	1	60-653-019	Resistor 1Meg Ohms 1/4wt. 10%	R 219
1	60-674-001	Transistor 2N-5458 *	Q 201	1	60-653-020	Resistor 2.2Meg Ohms 1/4wt. 10%	R 220
1	60-652-007	Resistor 3.3K Ohms 1/4wt. 1%	R 208	1	60-653-026	Resistor 470K Ohms 1/4wt. 10%	R 221
1	60-652-009	Resistor 27K Ohms 1/2wt. 1%	R 205	1	60-653-039	Resistor 680K Ohms 1/4wt. 10%	R 230
1	60-652-010	Resistor 39K Ohms 1/2wt. 2%	R 207	1	60-653-032	Resistor 820K Ohms 1/4wt. 10%	R 232
1	60-652-011	Resistor 180K Ohms 1/2wt. 2%	R 206	1	60-653-042	Resistor 1.8K Ohms 1/4wt. 10%	R 233
1	60-653-001	Resistor 47 Ohms 1/4wt. 10%	R 226	1	60-673-006	Transistor TIS 97	Q 202
1	60-653-002	Resistor 100 Ohms 1/4wt. 10%	R 201	1	60-653-003	Resistor 1K Ohms 1/4wt. 5%	R 225
				1		Resistor, as required	R 234

PLAYBACK

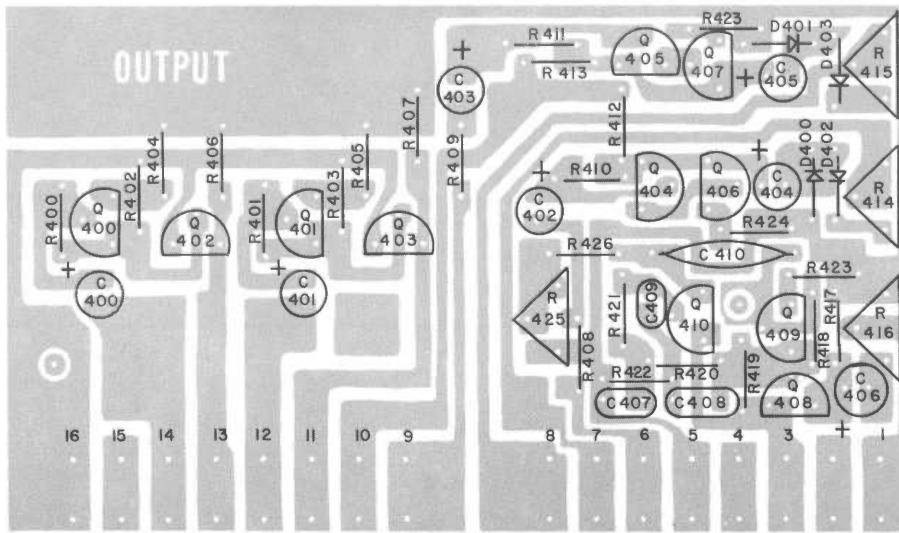


QTY.	PART #	DESCRIPTION	SYMBOL	QTY.	PART #	DESCRIPTION	SYMBOL
1	50-714-007	Trimmer Pots CTSX201 10K Ohms	R 319	1	60-652-011	Resistor 180K Ohms $\frac{1}{2}$ wt. 2%	R 314
1	50-714-008	Trimmer Pots CTSX201 500 Ohms	R 326	2	60-653-002	Resistor 100 Ohms $\frac{1}{2}$ wt. 10%	R 311, R 306
3	60-613-005	Elec. Caps 10 MFD 15V	C 300, C 309, C 316	1	60-653-003	Resistor 1K Ohms $\frac{1}{2}$ wt. 5%	R 331
1	60-613-013	Elec. Caps 50 MFD 6V	C 312	1	60-653-004	Resistor 2.7K Ohms $\frac{1}{2}$ wt. 5%	R 332
3	60-613-015	Elec. Caps 10 MFD 15V Axial	C 305, C 307, C 313	1	60-653-005	Resistor 2.7K Ohms $\frac{1}{2}$ wt. 10%	R 315
4	60-633-002	Mylar Caps .1 MFD 10% 50V	C 306, C 311, C 314, C 317	1	60-653-006	Resistor 3.3K Ohms $\frac{1}{2}$ wt. 10%	R 312
1	60-633-005	Mylar Caps .33 MFD 10% 50V	C 318	1	60-653-007	Resistor 4.7K Ohms $\frac{1}{2}$ wt. 10%	R 320
1	60-633-011	Mylar Caps .1 MFD 10% 50V	C 315	1	60-653-008	Resistor 6.8K Ohms $\frac{1}{2}$ wt. 5%	R 322
1	60-633-012	Poly Caps .033 MFD 1% 50V	C 308	1	60-653-009	Resistor 8.2K Ohms $\frac{1}{2}$ wt. 10%	R 338
1	60-633-013	Poly Caps 4700 PF 1% 50V	C 310	2	60-653-010	Resistor 10K Ohms $\frac{1}{2}$ wt. 10%	R 307, R 327
1	60-632-031	Poly Caps 1200 PF 5% 50V	C 302	1	60-653-011	Resistor 15K Ohms $\frac{1}{2}$ wt. 10%	R 334
1	60-632-032	Poly Caps 56 PF 5% 50V	C 304	2	60-653-012	Resistor 18K Ohms $\frac{1}{2}$ wt. 10%	R 308, R 321
1	60-632-033	Poly Caps 8200 PF 5% 50V	C 303	1	60-653-013	Resistor 22K Ohms $\frac{1}{2}$ wt. 5%	R 309
2	60-663-002	Diodes IN-191	D 300, D 304	1	60-653-014	Resistor 33K Ohms $\frac{1}{2}$ wt. 10%	R 328
3	60-663-003	Diodes IN-914	D 302, D 303, D 305	2	60-653-015	Resistor 47K Ohms $\frac{1}{2}$ wt. 10%	R 300, R 310
1	60-663-004	Diodes IN-758A	D 301	2	60-653-016	Resistor 100K Ohms $\frac{1}{2}$ wt. 10%	R 316, R 324
1	60-673-001	Transistors 2N-2924	Q 307	2	60-653-017	Resistor 220K Ohms $\frac{1}{2}$ wt. 10%	R 301, R 329
1	60-673-004	Transistor 2N-4058 *	Q 306	2	60-653-018	Resistor 270K Ohms $\frac{1}{2}$ wt. 10%	R 335, R 336
1	60-674-001	Transistor 2N-5458	Q 304	1	60-653-019	Resistor 1Meg. Ohms $\frac{1}{2}$ wt. 10%	R 323
1	60-653-001	Resistor 47 Ohms $\frac{1}{2}$ wt. 10%	R 333	1	60-653-020	Resistor 2.2Meg. Ohms $\frac{1}{2}$ wt. 10%	R 337
4	60-673-002	Transistor 2N 3391A	Q 300, Q 301, Q 302, Q 303	1	60-653-021	Resistor 2.2K Ohms $\frac{1}{2}$ wt. 10%	R 302
1	60-652-007	Resistor 3.3K Ohms $\frac{1}{2}$ wt. 1%	R 317	1	60-653-026	Resistor 470K Ohms $\frac{1}{2}$ wt. 10%	R 330
1	60-652-008	Resistor 31K Ohms $\frac{1}{2}$ wt. 2%	R 313	3	60-653-036	Resistor 6.8K Ohms $\frac{1}{2}$ wt. 5%	R 303, R 304, R 305
1	60-652-010	Resistor 39K Ohms $\frac{1}{2}$ wt. 2%	R 318	1	60-673-006	TIS 97 Transistors	Q 305
				1		Resistor, as required	R 325

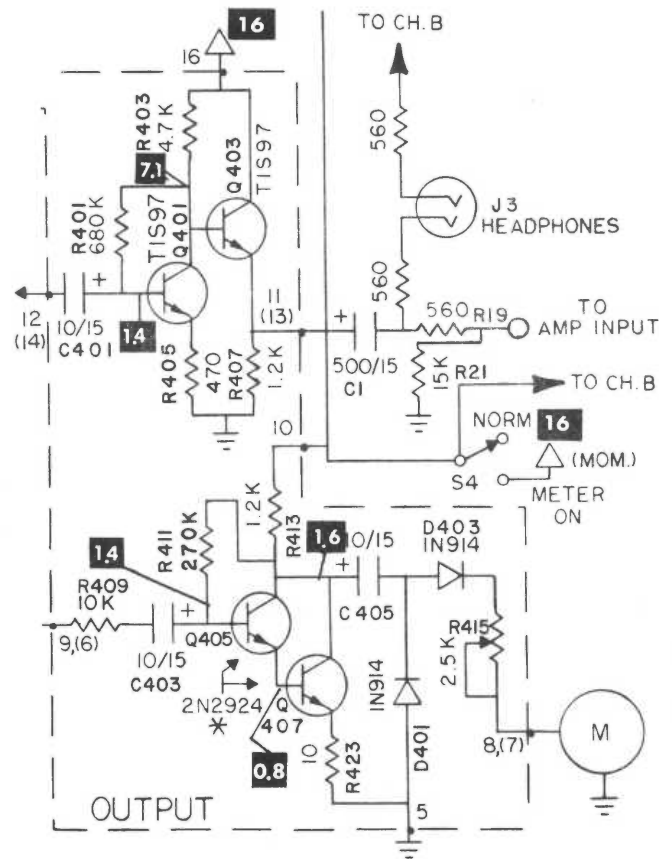
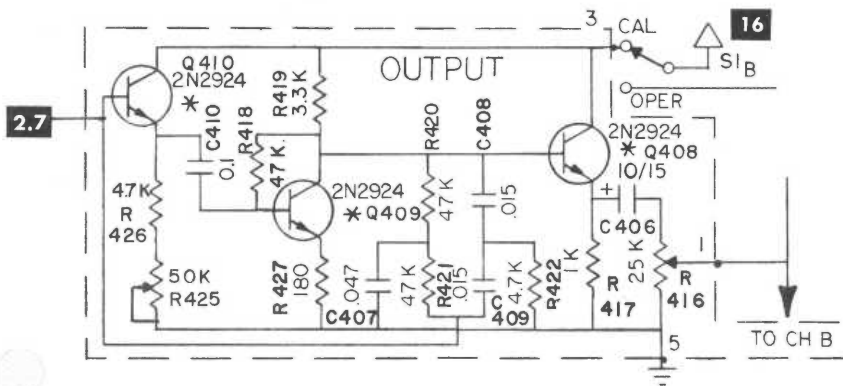
INPUT



QTY.	PART #	DESCRIPTION	SYMBOL
1	60-677-001	Motorola IC #1303L	IC 100
2	60-623-001	36 MH Coils Mitsumi LGA15 *	L 100, L 101
2	60-623-002	23 MH Coils Mitsumi K10 *	L 102, L 103
6	60-613-005	Electro Caps 10MFD 15V	C 102, C 103, C 108, C 109, C 116, C 117
4	60-613-013	Electro Caps 50 MFD-6	C 100, C 101, C 104, C 105
2	60-632-027	Poly Cap 680 PF 50V	C 106, C 107
2	60-632-028	Poly Caps 3000 PF 5% 50V	C 110, C 111
2	60-632-029	Poly Caps 2200 PF 5% 50V	C 112, C 113
2	60-632-030	Poly Caps 3900 PF 5% 50V	C 114, C 115
2	60-653-005	Resistors 2.7K Ohms 1/4wt. 10%	R 116, R 117
2	60-653-013	Resistors 22K Ohms 1/4wt. 10%	R 112, R 113
2	60-653-021	Resistors 2.2K Ohms 1/2wt. 10%	R 110, R 111
6	60-653-025	Resistors 27K Ohms 1/4wt. 10%	R 102, R 103, R 104, R 105, R 114, R 115
2	60-653-034	Resistors 9.1K Ohms 1/4wt. 5%	R 118, R 119
2	60-652-004	Resistor 150K Ohms 1/2wt. 1N	R 100, R 101
4	60-673-006	TIS 97 Transistors	Q 100, Q 101, Q 102, Q 103
2	60-651-013	22K Ohms 1/2wt. 10% Resistor	R 108, R 109
2	60-651-014	220K Ohms 1/2wt. 10% Resistor	R 106, R 107



OUTPUT



QTY.	PART #	DESCRIPTION	SYMBOL
4	50-714-009	Trimmer Pots CTSX201 25K Ohms	R 414, R 415, R 416, R 425
7	60-613-005	Electro Caps 10MFD 15V	C 400, C 401, C 402, C 403, C 404, C 405, C 406
2	60-632-009	Mylar Caps .015MFD 50V 10%	C 408, C 409
1	60-632-018	Mylar Caps .047MFD 50V 10%	C 407
1	60-633-002	Mylar Caps .1MFD 50V 10%	C 410
11	60-673-001	Transistors 2N-2924	Q 400, Q 401, Q 402, Q 403, Q 404, Q 405, Q 406, Q 407, Q 408, Q 409, Q 410
4	60-633-003	Diode IN 914	D 400, D 401, D 402, D 403
1	60-653-006	Resistor 3.3K Ohms 1/4wt. 10%	R 419
4	60-653-007	Resistor 4.7K Ohms 1/4wt. 10%	R 402, R 403, R 422, R 426
2	60-653-010	Resistor 10K Ohms 1/4wt. 10%	R 408, R 409
2	60-653-015	Resistors 47K Ohms 1/4wt. 10%	R 420, R 421
2	60-653-018	Resistor 270K Ohms 1/4wt. 10%	R 410, R 411
1	60-653-022	Resistor 180 Ohms 1/4wt. 10%	R 427
2	60-653-033	Resistor 470 Ohms 1/4wt. 10%	R 404, R 405
2	60-653-037	Resistor 10 Ohms 1/4wt. 10%	R 424, R 423
1	60-653-038	Resistor 47K Ohms 1/4wt. 10%	R 418
2	60-653-039	Resistor 680K Ohms 1/4wt. 10%	R 400, R 401
1	60-653-023	Resistor 1K Ohms 1/4wt. 10%	R 417
4	60-653-028	Resistor 1.2K Ohms 1/4wt. 10%	R 406, R 407, R 412, R 413

ADVENT CORP. NRU/M-100

UNIT PARTS LIST

<p>* Items marked with an asterisk are manufactured or selected by Advent Corporation and should be ordered directly from the company. All other parts may be obtained locally.</p>

INPUT BOARD

QTY.	PART #	DESCRIPTION	SYMBOL
1	60-677-001	Motorola IC #1303L	IC 100
2	60-623-001	36 MH Coils Mitsumi LGA15 *	L 100, L 101
2	60-623-002	23 MH Coils Mitsumi KIO *	L 102, L 103
6	60-613-005	Electro Caps 10MFD 15V	C 102, C 103, C 108, C 109, C 116, C 117
4	60-613-013	Electro Caps 50 MFD-6	C 100, C 101, C 104, C 105
2	60-632-027	Poly Cap 680 PF 50V	C 106, C 107
2	60-632-028	Poly Caps 3000 PF 5% 50V	C 110, C 111
2	60-632-029	Poly Caps 2200 PF 5% 50V	C 112, C 113
2	60-632-030	Poly Caps 3900 PF 5% 50V	C 114, C 115
2	60-653-005	Resistors 2.7K Ohms $\frac{1}{4}$ wt. 10%	R 116, R 117
2	60-653-013	Resistors 22K Ohms $\frac{1}{4}$ wt. 10%	R 112, R 113
2	60-653-021	Resistors 2.2K Ohms $\frac{1}{2}$ wt. 10%	R 110, R 111
6	60-653-025	Resistors 27K Ohms $\frac{1}{4}$ wt. 10%	R 102, R 103, R 104, R 105, R 114, R 115
2	60-653-034	Resistors 9.1K Ohms $\frac{1}{4}$ wt. 5%	R 118, R 119
2	60-652-004	Resistor 150K Ohms $\frac{1}{2}$ wt. LN	R 100, R 101
4	60-673-006	TIS 97 Transistors	Q 100, Q 101, Q 102, Q 103
2	60-651-013	22K Ohms $\frac{1}{2}$ wt. 10% Resistor	R 108, R 109
2	60-651-014	220K Ohms $\frac{1}{2}$ wt. 10% Resistor	R 106, R 107

RECORD BOARD

QTY.	PART #	DESCRIPTION	SYMBOL
1	50-714-007	Trimmer Pots CTSX201 10K Ohms	R 209
1	50-714-008	Trimmer Pots CTSX201 500 Ohms	R 213
7	60-613-005	Electro Caps 10MFD 15V	C 200, C 201, C 205, C 209, C 210, C 214, C 215
2	60-613-016	Electro Caps 50MFD 6V axial	C 207, C 216
4	60-633-002	Mylar Caps .1 MFD 10% 50V	C 206, C 203, C 208, C 212
1	60-633-005	Mylar Caps .33 MFD 10% 50V	C 213
1	60-633-011	Mylar Caps .1 MFD 5% 50V	C 211
1	60-633-012	Poly Caps .033 MFD 1% 50V	C 202
1	60-633-013	Poly Caps 4700 PF 1% 50V	C 204
2	60-663-002	Diodes IN191	D 200, D 204
3	60-663-003	Diodes IN914	D 203, D 202, D 205
1	60-663-004	Diodes IN757A	D 201
3	60-673-001	Transistors 2N-2924	Q 204, Q 205, Q 206
1	60-673-002	Transistor 2N-3391 A	Q 200
1	60-673-004	Transistor 2N 4058	Q 203
1	60-674-001	Transistor 2N-5458 *	Q 201
1	60-652-007	Resistor 3.3K Ohms $\frac{1}{2}$ wt. 1%	R 208
1	60-652-009	Resistor 27K Ohms $\frac{1}{2}$ wt. 1%	R 205
1	60-652-010	Resistor 39K Ohms $\frac{1}{2}$ wt. 2%	R 207
1	60-652-011	Resistor 180K Ohms $\frac{1}{2}$ wt. 2%	R 206
1	60-653-001	Resistor 47 Ohms $\frac{1}{4}$ wt. 10%	R 226
1	60-653-002	Resistor 100 Ohms $\frac{1}{4}$ wt. 10%	R 201
1	60-653-003	Resistor 1K Ohms $\frac{1}{4}$ wt. 5%	R 225
1		Resistor, as required	R 234

QTY.	PART #	DESCRIPTION	SYMBOL
1	60-653-004	Resistor 2.7K Ohms $\frac{1}{4}$ wt. 5%	R 223
1	60-653-005	Resistor 2.7K Ohms $\frac{1}{4}$ wt. 10%	R 204
1	60-653-006	Resistor 3.3K Ohms $\frac{1}{4}$ wt. 10%	R 229
1	60-653-007	Resistor 4.7K Ohms $\frac{1}{4}$ wt. 10%	R 212
2	60-653-008	Resistor 6.8K Ohms $\frac{1}{4}$ wt. 10%	R 211, R 231
2	60-653-009	Resistors 8.2K Ohms $\frac{1}{4}$ wt. 10%	R 215, R 216
1	60-653-010	Resistor 10K Ohms $\frac{1}{4}$ wt. 10%	R 218
2	60-653-011	Resistors 15K Ohms $\frac{1}{4}$ wt. 10%	R 214, R 224
1	60-653-012	Resistor 18K Ohms $\frac{1}{4}$ wt. 10%	R 210
1	60-653-013	Resistor 22K Ohms $\frac{1}{4}$ wt. 10%	R 202
1	60-653-014	Resistor 33K Ohms $\frac{1}{2}$ wt. 10%	R 217
1	60-653-015	Resistor 47K Ohms $\frac{1}{4}$ wt. 10%	R 203
1	60-653-017	Resistor 220K Ohms $\frac{1}{4}$ wt. 10%	R 222
2	60-653-018	Resistors 270K Ohms $\frac{1}{4}$ wt. 10%	R 227, R 228
1	60-653-019	Resistor 1Meg Ohms $\frac{1}{4}$ wt. 10%	R 219
1	60-653-020	Resistor 2.2Meg Ohms $\frac{1}{4}$ wt. 10%	R 220
1	60-653-026	Resistor 470K Ohms $\frac{1}{4}$ wt. 10%	R 221
1	60-653-039	Resistor 680K Ohms $\frac{1}{4}$ wt. 10%	R 230
1	60-653-032	Resistor 820K Ohms $\frac{1}{4}$ wt. 10%	R 232
1	60-653-042	Resistor 1.8K Ohms $\frac{1}{4}$ wt. 10%	R 233
1	60-673-006	Transistor TIS 97	Q 202

PLAYBACK BOARD

QTY.	PART #	DESCRIPTION	SYMBOL
1	50-714-007	Trimmer Pots CTSX201 10K Ohms	R 319
1	50-714-008	Trimmer Pots CTSX201 500 Ohms	R 326
3	60-613-005	Elec. Caps 10 MFD 15V	C 300, C 309, C 316
1	60-613-013	Elec. Caps 50 MFD 6V	C 312
3	60-613-015	Elec. Caps 10 MFD 15V Axial	C 305, C 307, C 313
4	60-633-002	Mylar Caps .1 MFD 10% 50V	C 306, C 311, C 314, C 317
1	60-633-005	Mylar Caps .33 MFD 10% 50V	C 318
1	60-633-011	Mylar Caps .1 MFD 10% 50V	C 315
1	60-633-012	Poly Caps .033 MFD 1% 50V	C 308
1	60-633-013	Poly Caps 4700 PF 1% 50V	C 310
1	60-632-031	Poly Caps 1200 PF 5% 50V	C 302
1	60-632-032	Poly Caps 56 PF 5% 50V	C 304
1	60-632-033	Poly Caps 8200 PF 5% 50V	C 303
2	60-663-002	Diodes IN-191	D 300, D 304
3	60-663-003	Diodes IN-914	D 302, D 303, D 305
1	60-663-004	Diodes IN-758A	D 301
1	60-673-001	Transistors 2N-2924	Q 307
1	60-673-004	Transistor 2N-4058 *	Q 306
1	60-674-001	Transistor 2N-5458	Q 304
1	60-653-001	Resistor 47 Ohms $\frac{1}{4}$ wt. 10%	R 333
4	60-673-002	Transistor 2N 3391A	Q 300, Q 301, Q 302, Q 303
1	60-652-007	Resistor 3.3K Ohms $\frac{1}{2}$ wt. 1%	R 317
1	60-652-008	Resistor 31K Ohms $\frac{1}{2}$ wt. 2%	R 313
1	60-652-010	Resistor 39K Ohms $\frac{1}{2}$ wt. 2%	R 318

QTY.	PART #	DESCRIPTION	SYMBOL
1	60-652-011	Resistor 180K Ohms $\frac{1}{2}$ wt. 2%	R 314
2	60-653-002	Resistor 100 Ohms $\frac{1}{4}$ wt. 10%	R 311, R 306
1	60-653-003	Resistor 1K Ohms $\frac{1}{4}$ wt. 5%	R 331
1	60-653-004	Resistor 2.7K Ohms $\frac{1}{4}$ wt. 5%	R 332
1	60-653-005	Resistor 2.7K Ohms $\frac{1}{4}$ wt. 10%	R 315
1	60-653-006	Resistor 3.3K Ohms $\frac{1}{4}$ wt. 10%	R 312
1	60-653-007	Resistor 4.7K Ohms $\frac{1}{4}$ wt. 10%	R 320
1	60-653-008	Resistor 6.8K Ohms $\frac{1}{4}$ wt. 5%	R 322
1	60-653-009	Resistor 8.2K Ohms $\frac{1}{4}$ wt. 10%	R 338
2	60-653-010	Resistor 10K Ohms $\frac{1}{4}$ wt. 10%	R 307, R 327
1	60-653-011	Resistor 15K Ohms $\frac{1}{4}$ wt. 10%	R 334
2	60-653-012	Resistor 18K Ohms $\frac{1}{4}$ wt. 10%	R 308, R 321
1	60-653-013	Resistor 22K Ohms $\frac{1}{4}$ wt. 5%	R 309
1	60-653-014	Resistor 33K Ohms $\frac{1}{4}$ wt. 10%	R 328
2	60-653-015	Resistor 47K Ohms $\frac{1}{4}$ wt. 10%	R 300, R 310
2	60-653-016	Resistor 100K Ohms $\frac{1}{4}$ wt. 10%	R 316, R 324
2	60-653-017	Resistor 220K Ohms $\frac{1}{4}$ wt. 10%	R 301, R 329
2	60-653-018	Resistor 270K Ohms $\frac{1}{4}$ wt. 10%	R 335, R 336
1	60-653-019	Resistor 1Meg. Ohms $\frac{1}{4}$ wt. 10%	R 323
1	60-653-020	Resistor 2.2Meg. Ohms $\frac{1}{4}$ wt. 10%	R 337
1	60-653-021	Resistor 2.2K Ohms $\frac{1}{4}$ wt. 10%	R 302
1	60-653-026	Resistor 470K Ohms $\frac{1}{4}$ wt. 10%	R 330
3	60-653-036	Resistor 6.8K Ohms $\frac{1}{4}$ wt. 5%	R 303, R 304, R 305
1	60-673-006	TIS 97 Transistors	Q 305
1		Resistor, as required	R 325

OUTPUT BOARD

QTY.	PART #	DESCRIPTION	SYMBOL
4	50-714-009	Trimmer Pots CTSX201 25K Ohms	R 414, R 415, R 416, R 425
7	60-613-005	Electro Caps 10MFD 15V	C 400, C 401, C 402, C 403, C 404, C 405, C 406
2	60-632-009	Mylar Caps .015MFD 50V 10%	C 408, C 409
1	60-632-018	Mylar Caps .047MFD 50V 10%	C 407
1	60-633-002	Mylar Caps .1MFD 50V 10%	C 410
11	60-673-001	Transistors 2N-2924	Q 400, Q 401, Q 402, Q 403, Q 404, Q 405, Q 406, Q 407, Q 408, Q 409, Q 410
4	60-633-003	Diode IN 914	D 400, D 401, D 402, D 403
1	60-653-006	Resistor 3.3K Ohms $\frac{1}{4}$ wt. 10%	R 419
4	60-653-007	Resistor 4.7K Ohms $\frac{1}{4}$ wt. 10%	R 402, R 403, R 422, R 426
2	60-653-010	Resistor 10K Ohms $\frac{1}{4}$ wt. 10%	R 408, R 409
2	60-653-015	Resistors 47K Ohms $\frac{1}{4}$ wt. 10%	R 420, R 421
2	60-653-018	Resistor 270K Ohms $\frac{1}{4}$ wt. 10%	R 410, R 411
1	60-653-022	Resistor 180 Ohms $\frac{1}{4}$ wt. 10%	R 427
2	60-653-033	Resistor 470 Ohms $\frac{1}{4}$ wt. 10%	R 404, R 405
2	60-653-037	Resistor 10 Ohms $\frac{1}{4}$ wt. 10%	R 424, R 423
1	60-653-038	Resistor 47K Ohms $\frac{1}{4}$ wt. 10%	R 418
2	60-653-039	Resistor 680K Ohms $\frac{1}{4}$ wt. 10%	R 400, R 401
1	60-653-023	Resistor 1K Ohms $\frac{1}{4}$ wt. 10%	R 417
4	60-653-028	Resistor 1.2K Ohms $\frac{1}{4}$ wt. 10%	R 406, R 407, R 412, R 413

FRONT SUB PANEL ASSEMBLY

QTY.	PART #	DESCRIPTION	SYMBOL
1	50-263-004	S.P.S.T. Slide Switch 46202L	S 5
5	50-263-005	D.P.O.T. Slide Switch 46206L	S 2, S 3, S 6a, S 6b, S 7, S 8a, S 8b
1	50-263-008	3 P.O.T. Slide Switch 50209 M-M	S 1a, S 1b
1	50-263-007	DPDT Slide Switch Mom. 46206M	S 4
6	50-714-003	50K Volume Controls CTS # VA 2450	R 3, R 4, R 5, R 6, R 15, R 16
2	50-714-005	50K Mim Volume Controls CTS #VA 2452	R 25, R 26
1	50-714-004	50K Dun Volume Control CTS #VA * 2451	R 11, R 12
1	50-211-003	Headphone Jack L-112B	J 3
3	60-733-002	Pilot Light Sockets Drake #4080-019	
3	60-733-003	#51 Pilot Lamps	
2	60-786-001	Meters TS-151C *	
4	60-653-013	22K Ohms $\frac{1}{4}$ wt. 10% Resistors	R 7, R 8, R 9, R 10

PACKING, ACCESSORIES AND KNOBS

QTY.	PART #	DESCRIPTION	SYMBOL
2	30-533-016	Play Cal Knobs	
6	30-533-015	Input and Output Level Knobs *	
1	30-533-017	Record Level Knob *	
2	40-693-008	3' black audio cables	
2	40-693-009	3' grey audio cables	
1	85-863-007	Poly bag *	
1	85-945-002	Carton *	
2	85-863-006	Foam End Caps *	
18	60-311-114	#6 x $\frac{1}{4}$ black nick s/m screws-cover and bottom panel	
1	85-954-003	Cassette test tape *	
1	85-954-004	Reel test tape *	

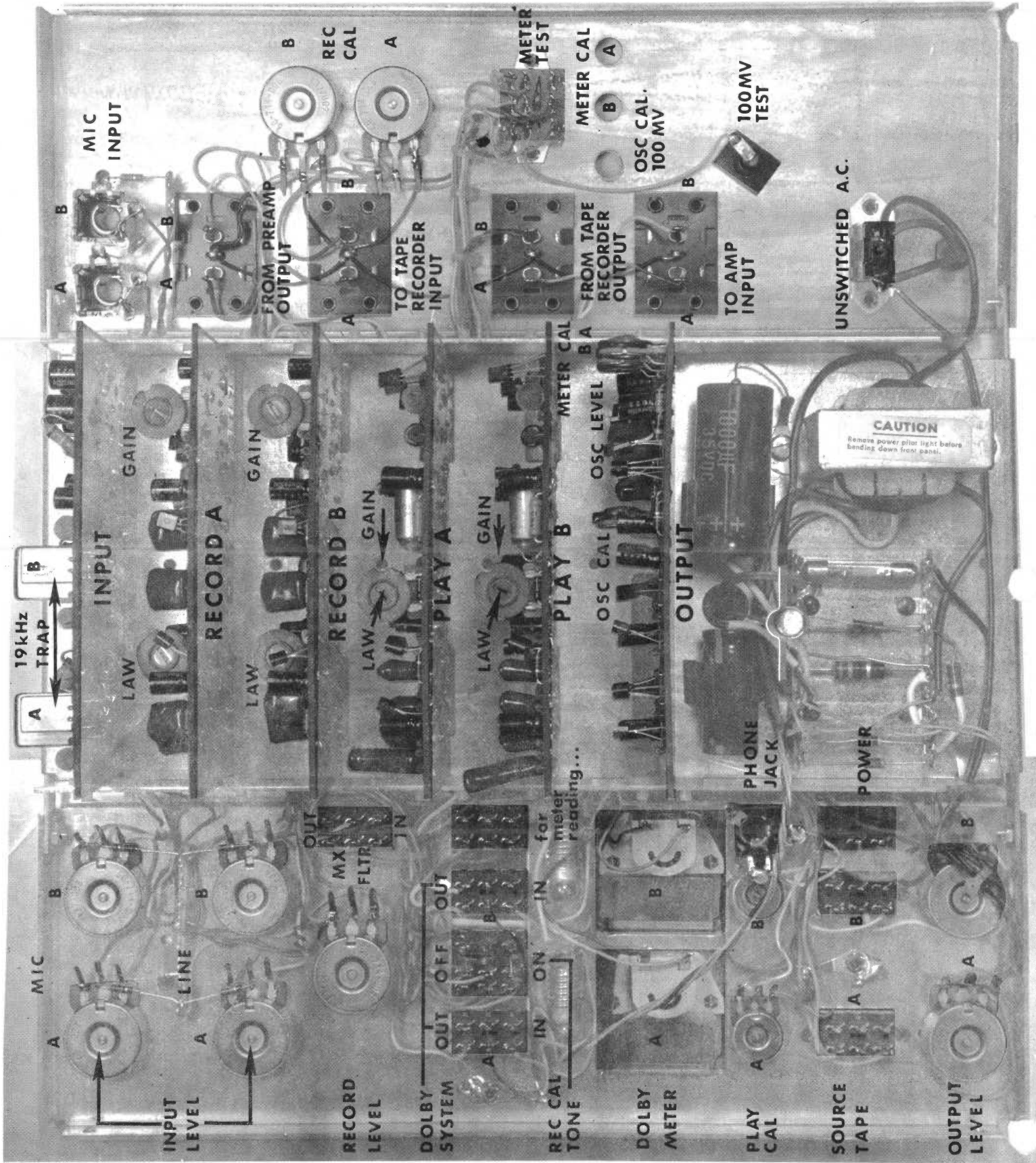
CARD RACK ASSEMBLY

QTY.	PART #	DESCRIPTION	SYMBOL
1	10-990-024	Power Transformer *	T 1
8	60-213-011	Amp 4 Pin Connectors 86285-2	
4	60-213-010	Amp 8 Pin Connectors 86285-6	
2	60-653-001	Resistor 15K Ohms $\frac{1}{4}$ wt. 10%	R 21, R 22
2	60-653-010	Resistor 10K Ohms $\frac{1}{4}$ wt. 10%	R 13, R 14
4	60-653-041	Resistor 560 Ohms $\frac{1}{4}$ wt. 10%	R 17, R 18, R 19, R 20
1	60-652-013	Resistor 33 Ohm 1 wt. 10%	R 29
2	60-613-017	Elec. Cap 500 MFD 15V TW Axial	C 1, C 2
2	60-613-008	Elec. Cap 500 MFD 35V	C 3, C 4
1	60-613-018	Elec. Cap 1000 MFD 35V	C 5
1	60-674-002	Transistor 2N-3053	Q 1
2	60-663-001	Diodes 40267	D 2, D 3
1	60-743-003	Fuse 1/8 Amp Pig Tail	
1	60-663-006	IN5246A Diode	D 1
1	60-651-063	Resistor 680 Ohms $\frac{1}{2}$ wt. 10%	R 27
1	60-651-064	Resistor 100 Ohms $\frac{1}{2}$ wt. 10%	R 28
1	60-632-001	.005 MFD Cer. Disc 1400V	C 6

BACK PANEL ASSEMBLY

QTY.	PART #	DESCRIPTION	SYMBOL
1	40-693-005	Black AC Line Cord 6'	
1	60-312-013	Heyco SP 4 Strain Relief	
1	50-211-008	AC Receptacle #MSS-0818-1	
4	50-211-004	Dual Phono Sockets #352	
4	50-211-005	Dual Phono Insulators #352A	
1	50-263-008	3 POT Mom. Slide Switch #50209M	S 3
2	50-714-006	Controls 50K Screwdriver Adjust. CTS # VA 2403	R 23, R 24
2	50-211-006	Mic Jack Switchcraft # L 112 A	J 1, J 2
2	60-653-023	Resistor 1K $\frac{1}{4}$ wt. 10%	R 1, R 2

TOP VIEW



BOTTOM VIEW

