



AMPEX
PROFESSIONAL PRODUCTS
COMPANY



**SUPPLEMENT
FOR CCIR*
EQUALIZATION
STANDARDS
MODELS 300,
351, AND 352**



JANUARY 1960

TM2006

* INTERNATIONAL RADIO CONSULTATIVE COMMITTEE

FOREWORD

This manual provides supplementary information regarding changes and additions to circuitry for CCIR equalization. The Ampex equipment affected by these changes are the Models 351 single channel, 351-2 two channel, 300 single channel, 300 multichannel, and 352 single channel. CCIR equalization is available only in the 7½ and 15 inch per second (ips) tape speeds.

In each of the three sections of this manual are part numbers and description of components which are used to obtain CCIR equalization curves. All other standard part numbers are listed in the operation and maintenance manuals for the applicable model. Curves and schematics for the CCIR configuration of the various models appear throughout this manual.

section

topic

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4	CCIR EQUALIZATION CURVES	
	RECORD AMPLIFIER RESPONSE (CCIR) 100 μ SEC. 7 $\frac{1}{2}$ INCHES PER SECOND	
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351 and 351-2 CCIR
Equalization**

MODEL 351 ELECTRONIC ASSEMBLY

VARIATIONS IN CIRCUITRY FOR CCIR EQUALIZED ELECTRONIC ASSEMBLIES FROM THE STANDARD NAB EQUALIZATION.

RECORD BOARD —

1. An additional equalization circuit comprised of a 20 millihenry choke (1L1); .0024 microfarad capacitor (1C11), is wired across 1R22 through contacts of switch 4S2B as shown on schematic diagram 30961.
2. 1C8 is changed to a .068 microfarad capacitor.
3. 1C46 and 1C7 are both changed to 275-970 microfarad adjustable capacitors.

For the location of these components see Figure 1 of this section.

REPRODUCE BOARD —

1. Capacitor 2C15 is changed to .0012 microfarad and the jumper between 2R30 and 2R31, is removed. Variable resistor 2R30 (500K) is utilized for CCIR equalization.

For the location of these components see Figure 1A.

CHANGES AND ADDITIONS MODEL 351 CCIR PARTS LIST ELECTRONIC ASSEMBLY CATALOG NUMBER 30960-05 AND -06

<i>Ref. No.</i>	<i>Part Description</i>	<i>Ampex Catalog No.</i>
1C7	Capacitor, variable: 275-970 pF, 175 V dcw: El Menco Part No. 306 Type 30	038-003
1C8	Capacitor, paper: tubular, .068 uF, 10%, 400 V dcw: Sprague Part No. 89 P 68394	035-299
1C11	Capacitor, paper: .0027 uF, 5%, 400 V dcw: Sprague Part No. 89 P 27255	035-298
2C15	Capacitor, paper: tubular, .0012 uF, 400 V dcw, 5% : Sprague Part No. 109 P 12254	034-203
1C46	Same as 1C7	038-003
1L1	Choke, air core: 20 MH	30767-01
2R30	Resistor, variable: .5 meg ohm, 30%, 1/4 W: Chicago Telephone Supply Part No. Type UPE-70, Spec. 31184	044-207
	Reproduce Board Assembly	30962-04
	Record Board Assembly	30963-04
	Harness Assembly (Master)	30966-01
	Harness Assembly (Slave)	30966-02

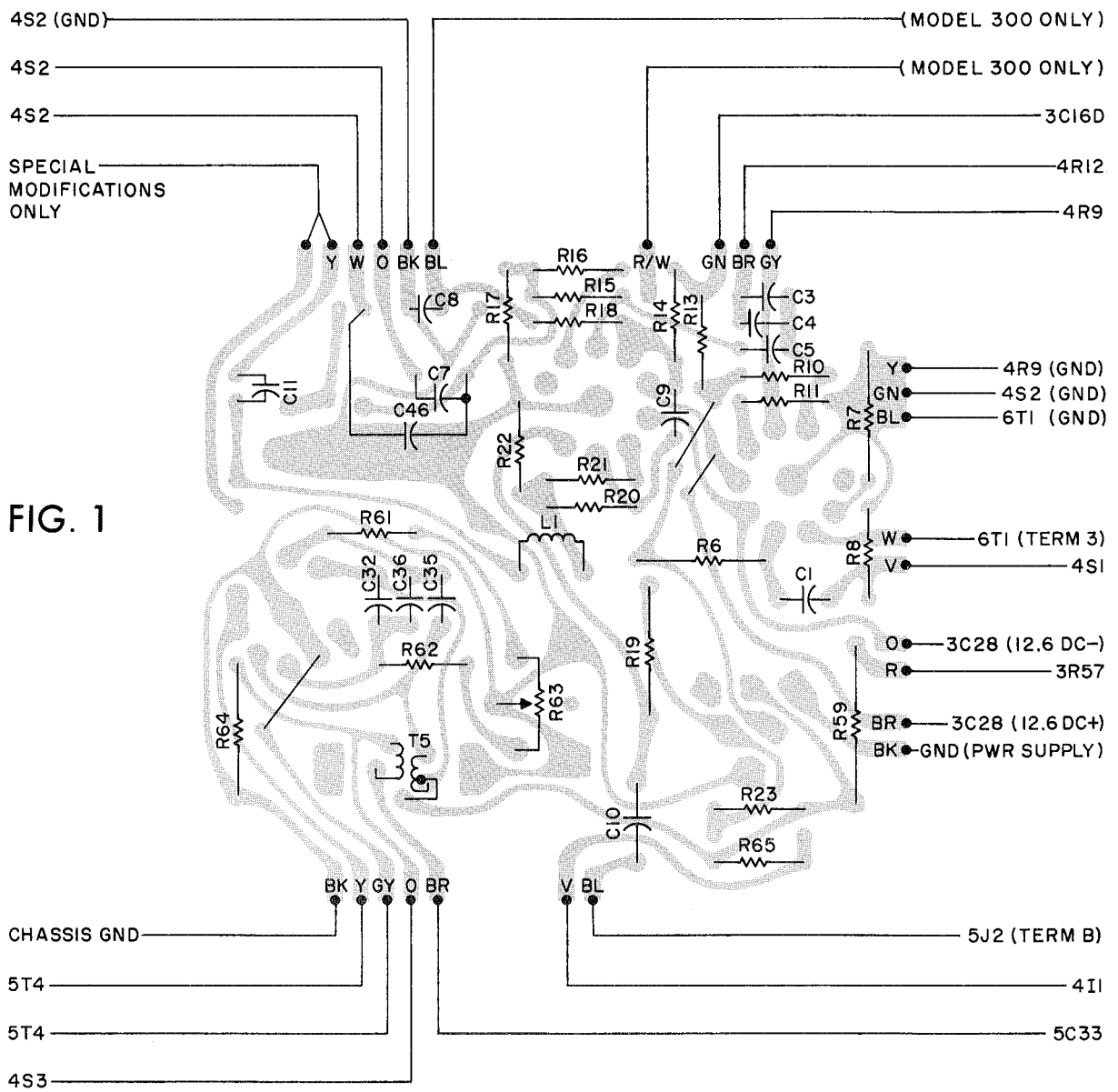


FIG. 1

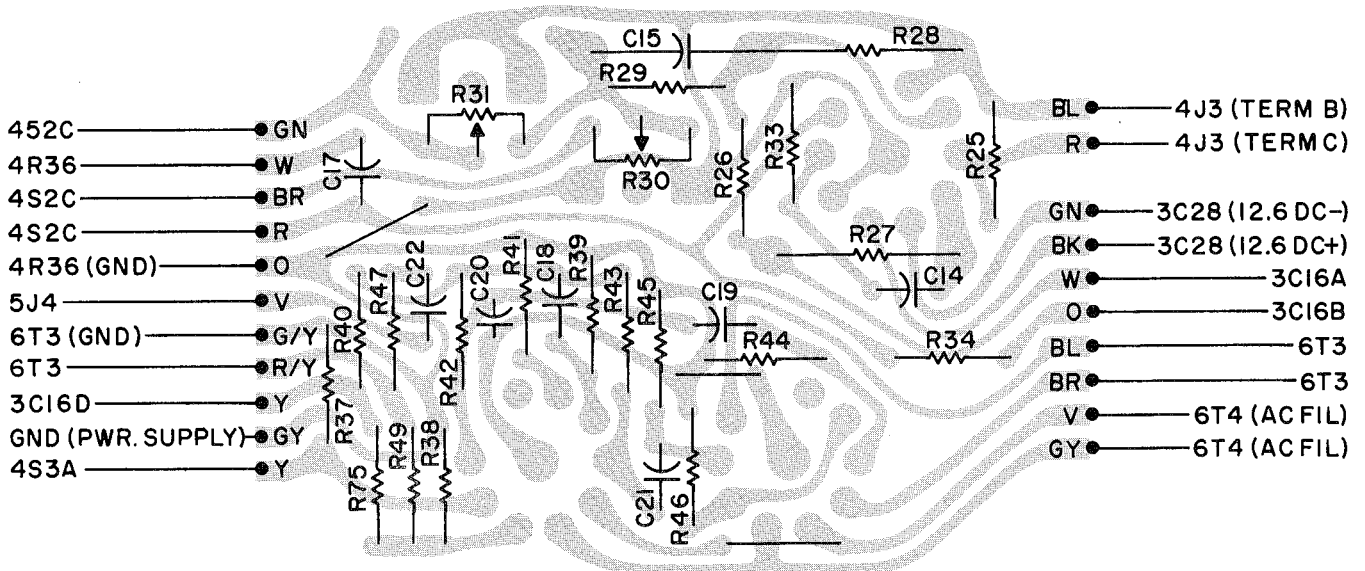
PARTS LOCATION RECORD AMPLIFIER AND BIAS AND ERASE OSCILLATOR

LEGEND

THE FIRST NUMBERS SIGNIFY THE LOCATION

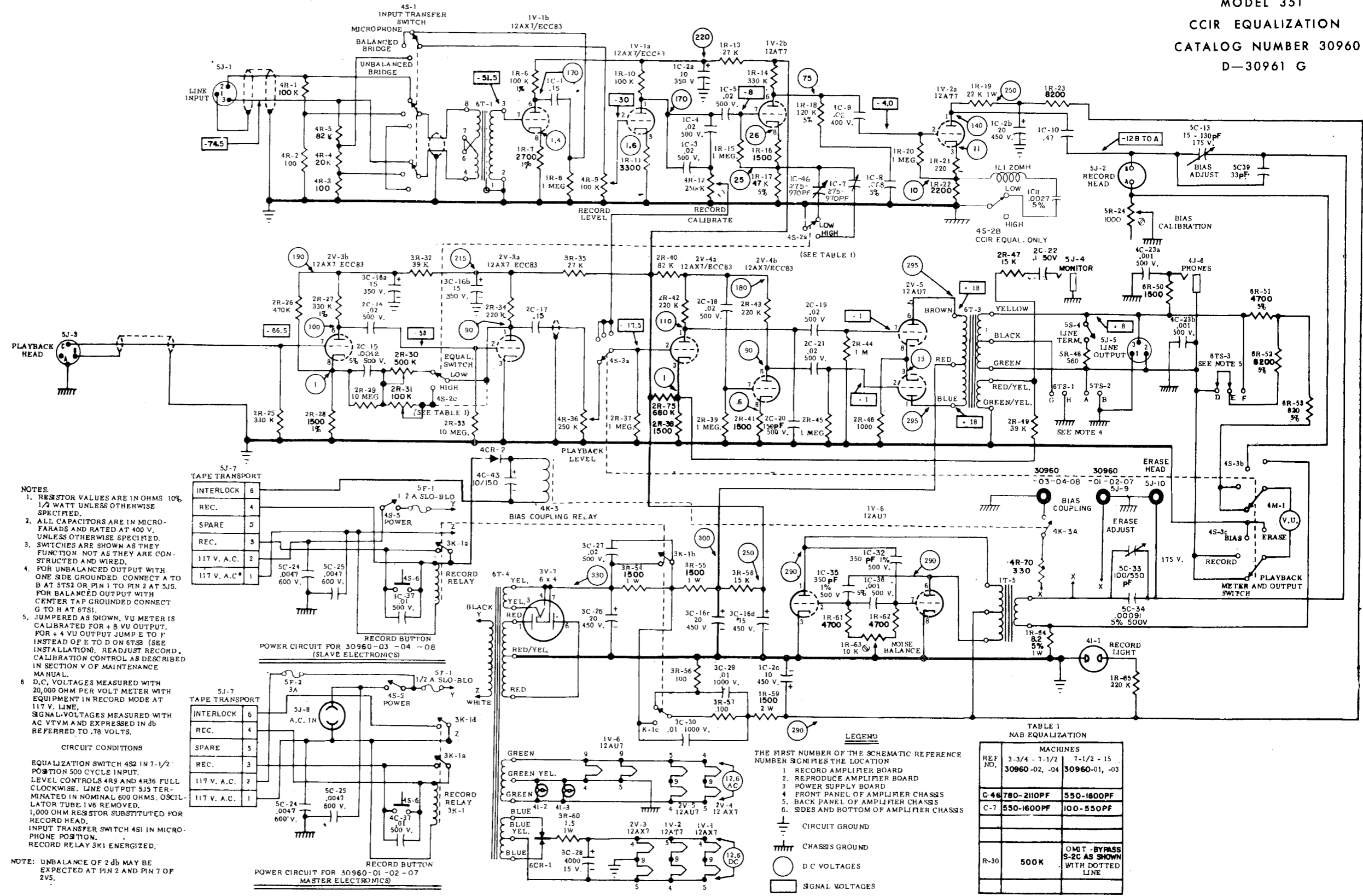
1. RECORD AMPLIFIER BOARD
2. REPRODUCE AMPLIFIER BOARD
3. POWER SUPPLY BOARD
4. FRONT PANEL OF AMP. CHASSIS
5. BACK PANEL OF AMP. CHASSIS
6. SIDES AND BOTTOM

FIG. 1A



PARTS LOCATION REPRODUCE AMPLIFIER

SCHEMATIC DIAGRAM
ELECTRONIC ASSEMBLY
MODEL 351
CCIR EQUALIZATION
CATALOG NUMBER 30960
D-30961 G

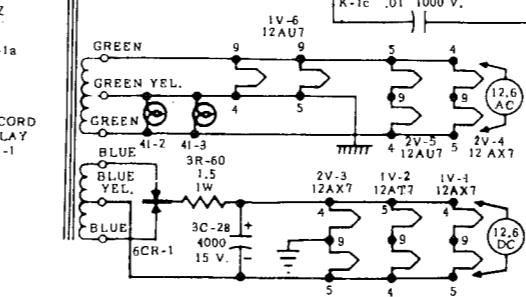
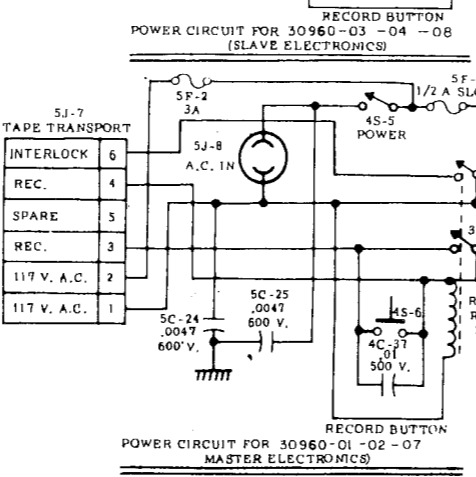
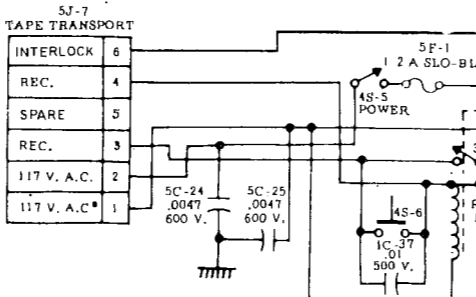


- NOTES:**
1. RESISTOR VALUES ARE IN OHMS 10%, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
 2. ALL CAPACITORS ARE IN MICRO-FARADS AND RATED AT 400 V. UNLESS OTHERWISE SPECIFIED.
 3. SWITCHES ARE SHOWN AS THEY FUNCTION NOT AS THEY ARE CONSTRUCTED AND WIRED.
 4. FOR UNBALANCED OUTPUT WITH ONE SIDE GROUNDED, CONNECT A TO B AT 5T5 OR PIN 1 TO PIN 2 AT 5J5. FOR BALANCED OUTPUT WITH CENTER TAP GROUNDED CONNECT G TO H AT 8T5.
 5. JUMPERS AS SHOWN, VU METER IS CALIBRATED FOR +8 VU OUTPUT. FOR +4 VU OUTPUT JUMPER E TO F INSTEAD OF E TO D ON 6T5 (SEE INSTALLATION). READJUST RECORD CALIBRATION CONTROL AS DESCRIBED IN SECTION V OF MAINTENANCE MANUAL.
 6. D.C. VOLTAGES MEASURED WITH 20,000 OHM PER VOLT METER WITH EQUIPMENT IN RECORD MODE AT 117 V. LINE. SIGNAL VOLTAGES MEASURED WITH AC VTVM AND EXPRESSED IN db REFERRED TO .78 VOLTS.

CIRCUIT CONDITIONS

EQUALIZATION SWITCH 4S2 IN 7-1/2' POSITION 500 CYCLE INPUT. LEVEL CONTROLS 4R9 AND 4R36 FULL CLOCKWISE. LINE OUTPUT 5J5 TERMINATED IN NOMINAL 600 OHMS. OSCILLATOR TUBE 1V6 REMOVED. 1,000 OHM RESISTOR SUBSTITUTED FOR RECORD HEAD. INPUT TRANSFER SWITCH 4S1 IN MICROPHONE POSITION. RECORD RELAY 3K1 ENERGIZED.

NOTE: UNBALANCE OF 2 db MAY BE EXPECTED AT PIN 2 AND PIN 7 OF 2V5.



**TABLE 1
NAB EQUALIZATION**

REF. NO.	MACHINES	
	3-3/4 - 7-1/2	7-1/2 - 15
C-46	780-210PF	550-1600PF
C-7	550-1600PF	100-550PF
R-30	500K	OMIT - BYPASS S-2C AS SHOWN WITH DOTTED LINE

2

Section 2
352 CCIR
Equalization

MODEL 352 ELECTRONIC ASSEMBLY

VARIATIONS IN CIRCUITRY FOR CCIR EQUALIZED ELECTRONIC ASSEMBLIES FROM STANDARD NAB EQUALIZATION.

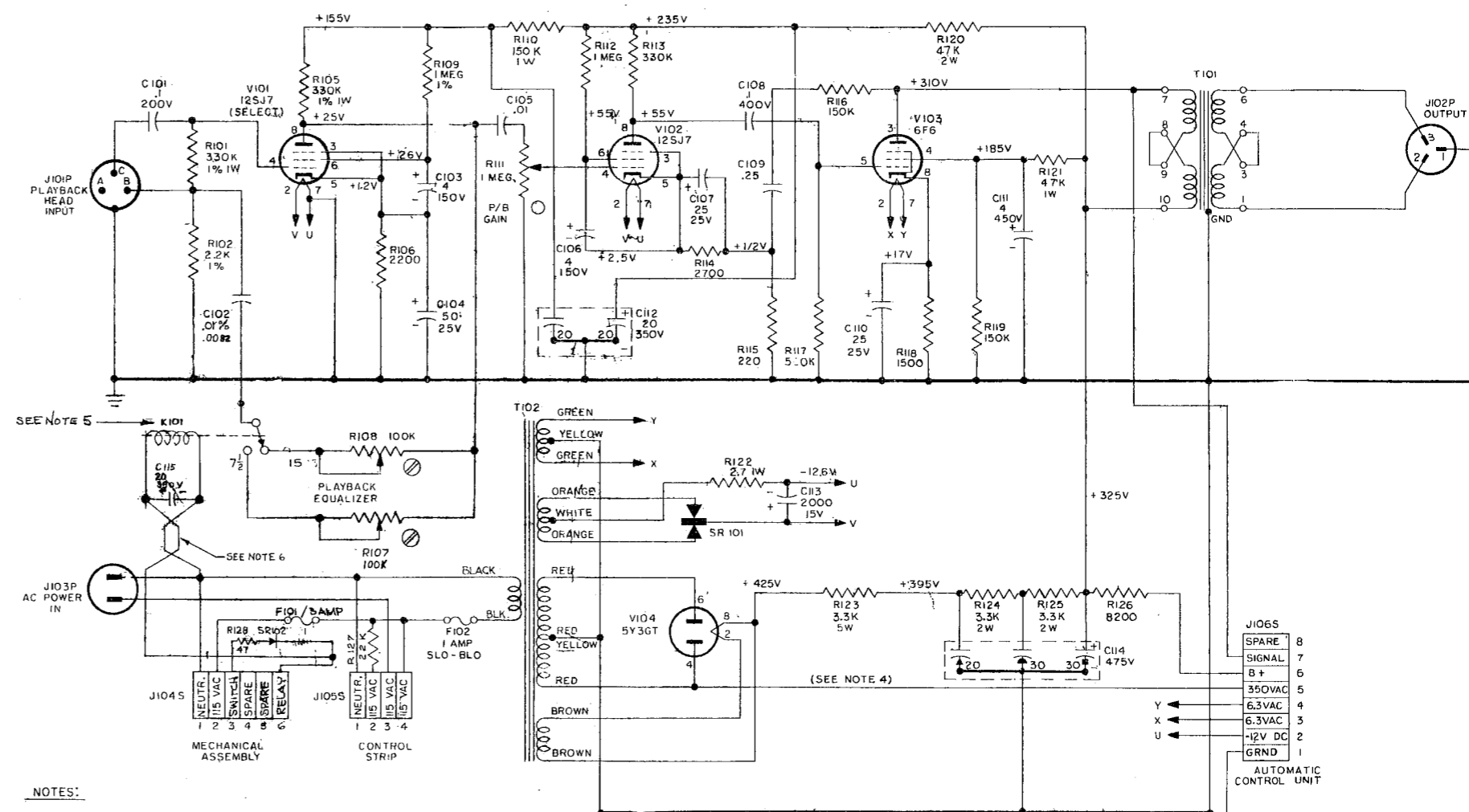
REPRODUCE AMPLIFIER —

1. The Plugbutton marked "120-200 microsecond" was removed and replaced with a 100 K variable resistor (R107).
2. Relay K101 was mounted in the electronic chassis. (See Note 5 on Schematic 30095-105.)
3. A .20 microfarad capacitor was connected across the K101 relay.
4. A 47 ohm resistor (R128) and a rectifier (SR102) was connected in series with pin #3 and pin #6 of the J104S.
5. Capacitor C102 was changed from .006 microfarad to .0082 microfarad.

352 CCIR PARTS LIST ELECTRONIC ASSEMBLY CATALOG NUMBER 30512

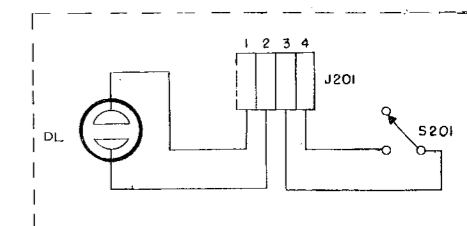
<i>Ref. No.</i>	<i>Part Description</i>	<i>Ampex Catalog No.</i>
C102	Capacitor, mica: .0082 mfd., 500 V dcw, 1% : Elmenco Part No. CM40C822F	034-087
C115	Capacitor, electrolytic: 30 mfd., 350 V dcw, -10 +100% : Sprague Part No. Type DEE	031-048
SR102	Rectifier, Silicon: 6 amp. DC max. out, 400 VAC rms max. out: Texas Inst. Part No. 1N2070	582-036
K101	Relay, 3P DT: 80 to 140 VDC, contacts should switch 1.5 amps at 115 VAC or 28VDC.	5760-00
R107	Resistor, variable: .1 meg ohm, 1/4 W, 20% : Centralab Part No. Model 2 (TPR C2).	044-038
R128	Resistor, fixed : carbon, axial, 47 ohms, 1/2 W, 10% : MIL-R-11: RC20GF470K	041-034

SCHEMATIC DIAGRAM
ELECTRONIC ASSEMBLY
MODEL 352
CCIR EQUALIZATION
CATALOG NUMBER 30512
ED 30095-105 E



NOTES:

1. ALL RESISTORS IN OHMS AND RATED $\frac{1}{2}$ W, 10% UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITORS RATED IN MICROFARADS.
3. ALL VOLTAGES MEASURED WITH 20,000 OHMS/VOLT METER, WITH 115V AC LINE, AND AMPLIFIER CONNECTED TO TAPE TRANSPORT.
4. TRANSFORMER VOLTAGE AT PIN NO.5 OF J106S MUST BE IN PHASE WITH VOLTAGE AT PIN NO.3 OF J106S.
5. MOUNT K101 ON THE SIDE PANEL BETWEEN R108 AND T101, CONTACTS SIDE FACING TOWARDS INPUT J101P AND SOLENOID FACING OUTPUT TRANSFORMER T101.
6. TWIST THE WIRES AND RUN THEM AGAINST THE SIDE OF THE CHANNELS.



CONTROL STRIP
REF. C-3061

3

Section 3
Single Channel and
Multichannel 300 Series
CCIR Equalization

MODEL 300 MULTICHANNEL EQUIPMENT

VARIATIONS IN CIRCUITRY FOR CCIR ELECTRONIC ASSEMBLIES FROM STANDARD NAB EQUALIZATION.

1. The 30920 EQUALIZER BRACKET ASSEMBLY is removed and the 30761-01 EQUALIZATION SWITCH is installed in the same location.

RECORD BOARD —

- a. An additional equalization circuit comprised of a 20 millihenry choke (1L1); .0027 microfarad capacitor (1C11) is wired across 1R22 through contacts of switch 4S2B as shown on the schematic diagram 30961.
- b. Capacitor 1C8 is changed to a .068 microfarad capacitor.
- c. 1C46 and 1C7 are both changed to 275-970 microfarad adjustable capacitors.

For the location of these components see Figure 1 in Section 1.

REPRODUCE BOARD —

- a. Capacitor 2C15 is changed to .0012 microfarad. Variable resistor 2R30 (500K) is mounted on the etched board, replacing 4R69 formerly located on the bracket assembly. Variable resistor 2R31 (100K) is installed in place of fixed resistor 2R31 (68K).

For the location of these components see Figure 1A of Section 1.

CHANGES AND ADDITIONS 300 CCIR PARTS LIST ELECTRONIC ASSEMBLY CATOLOG NUMBER 30960-07 AND -08

<i>Ref. No.</i>	<i>Part Description</i>	<i>Ampex Catalog No.</i>
1C7	Capacitor, Variable: 275-970 pF, 175 V dcw: El Menco Part No. 306 Type 30	038-003
1C8	Capacitor, paper: tubular, .068 uF, 10%, 400 V dcw: Sprague Part No. 89 P 68394	035-299
1C11	Capacitor, paper: tubular, .0027 uF, 5%, 400 V dcw: Sprague Part No. 89 P 27255	035-298
2C15	Capacitor, paper: tubular, .0012 uF, 400 V dcw, 5% : Sprague Part No. 109 P 12254	035-203
1C46	Same as 1C7	038-003
1L1	Choke, air core: 20 MH	30767-01
2R30	Resistor, variable: .5 meg ohm, 30%, ¼ W: Chicago Telephone Supply Part No. Type UPE-70, Spec. 31184	044-207

2R31	Resistor, variable: 100 K ohm, 20%, ¼ watt: Chicago Telephone Supply Part No. UPE-70, Spec. 31186	044-204
	Reproduce Board Assembly	30962-04
	Record Board Assembly	30963-04
	Harness Assembly	30819-03

MODEL 300 ELECTRONIC ASSEMBLY

VARIATIONS IN CIRCUITRY FOR CCIR EQUALIZED ELECTRONIC ASSEMBLIES FROM STANDARD NAB EQUALIZATION.

RECORD AMPLIFIER —

1. An additional equalization circuit comprising of a 20 millihenry choke (1L1) and a .0025 microfarad capacitor (C109) was mounted on the terminal board.
2. Capacitor C105 (.1 microfarad) and resistor R107 (100K) were removed and the terminals were shorted to ground.

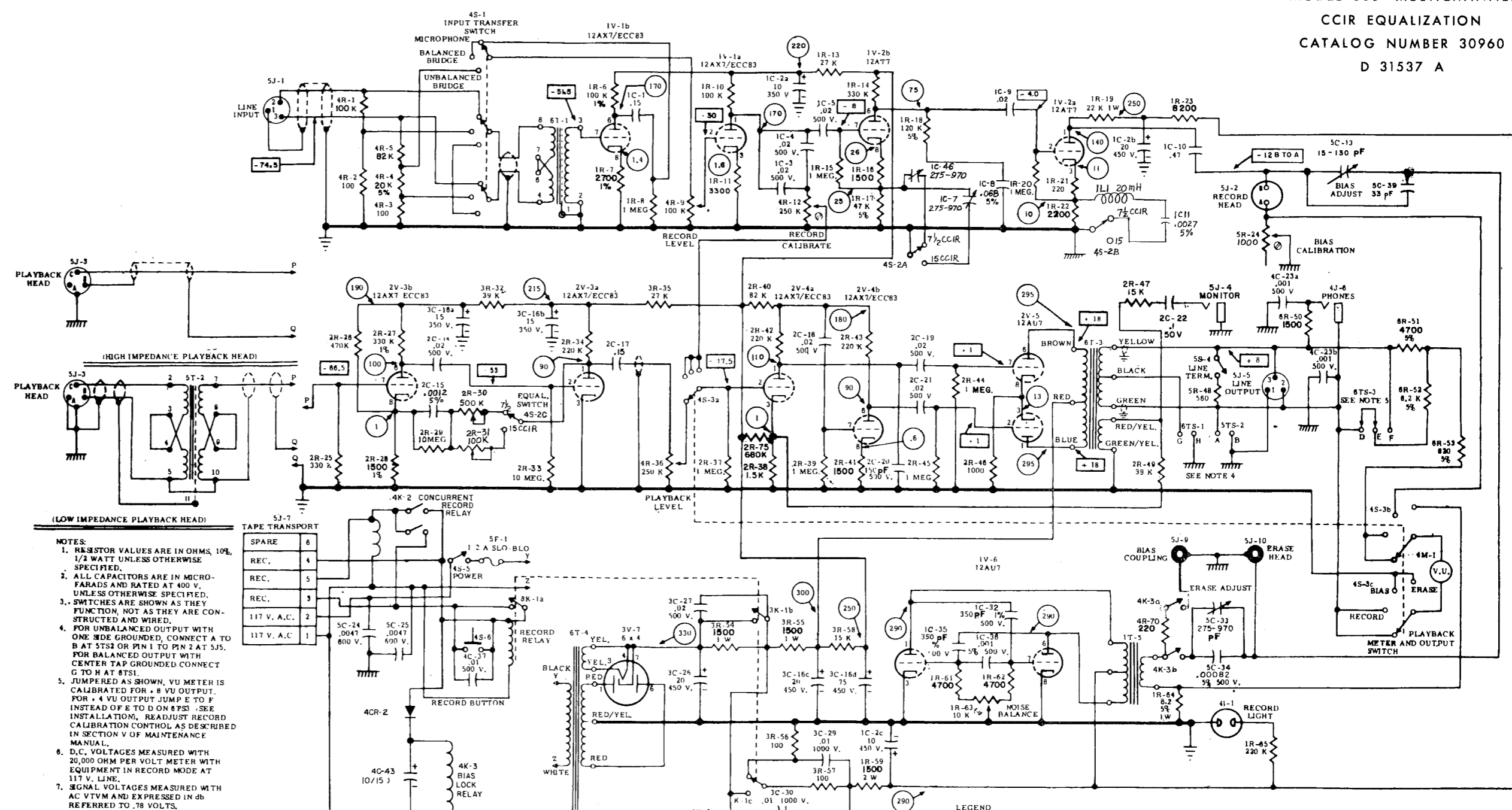
REPRODUCE AMPLIFIER —

1. A 5K pot was added (R224). One terminal was connected to ground and the other terminal connected to a normally closed circuit of K102 (a previously unused contact set). One terminal of L101 was connected to one lead of C109. The remaining lead of C109 was connected to the moving contact of K102. The normally closed contact of this contact set is connected to ground.
2. Capacitor C206 was changed to .068 microfarad. C206 lead (formerly connected to R207) now connects to a moving contact of K102. The terminal of R207 now free, was connected to a normally open contact of K102.

300 CCIR PARTS LIST ELECTRONIC ASSEMBLY CATALOG NUMBER MOD. 559-00

<i>Ref. No.</i>	<i>Part Description</i>	<i>Ampex Catalog No.</i>
R224	Resistor, variable: 5K ohms, 20%, ½ W: Chicago Telephone supply: Type 65 (TRP D) LT-2	044-073
C109	Capacitor, mica: .0025 mfd., 500V dcw, 5% : Elmenco Part No. CM30B202M	034-076
C206	Capacitor, paper: tubular, .068 mfd., 400 V dcw, 10% : Sprague Part No. 88P68394S4	035-134
L101	Coil, RF: 20 MA: Miller Part No. 691	051-018

SCHEMATIC DIAGRAM
ELECTRONIC ASSEMBLY
MODEL 300 MULTICHANNEL
CCIR EQUALIZATION
CATALOG NUMBER 30960
D 31537 A



NOTES:

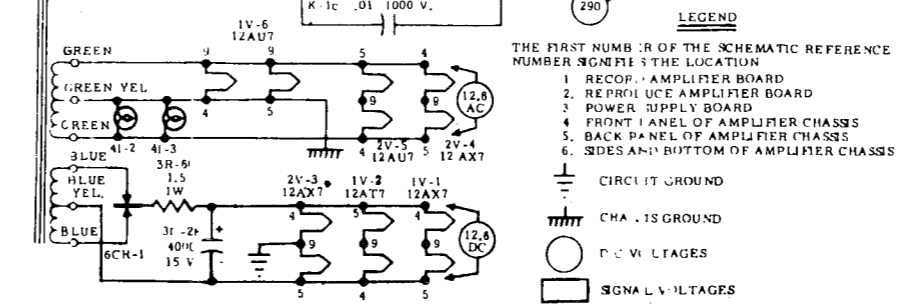
- RESISTOR VALUES ARE IN OHMS, 10%, 1/4 WATT UNLESS OTHERWISE SPECIFIED.
- ALL CAPACITORS ARE IN MICRO-FARADS AND RATED AT 400 V. UNLESS OTHERWISE SPECIFIED.
- SWITCHES ARE SHOWN AS THEY ARE CONSTRUCTED AND WIRED.
- FOR UNBALANCED OUTPUT WITH ONE SIDE GROUNDED, CONNECT A TO B AT STS2 OR PIN 1 TO PIN 2 AT 5J5. FOR BALANCED OUTPUT WITH CENTER TAP GROUNDED CONNECT C TO H AT 6TS1.
- JUMPERED AS SHOWN, VU METER IS CALIBRATED FOR .8 VU OUTPUT. FOR .4 VU OUTPUT JUMPER TO F INSTEAD OF E TO D ON 6TS3. (SEE INSTALLATION, READJUST RECORD CALIBRATION CONTROL AS DESCRIBED IN SECTION V OF MAINTENANCE MANUAL.)
- D.C. VOLTAGES MEASURED WITH 20,000 OHM PER VOLT METER WITH EQUIPMENT IN RECORD MODE AT 117 V. LINE.
- SIGNAL VOLTAGES MEASURED WITH AC VTVM AND EXPRESSED IN db REFERRED TO .78 VOLTS.

CIRCUIT CONDITIONS

EQUALIZATION SWITCH 4S2 IN 7-1 2' POSITION 500 CYCLE INPUT. LEVEL CONTROLS 4R9 AND 4R36 FULL CLOCKWISE. LINE OUTPUT 5J5 TERMINATED IN NOMINAL 600 OHMS. OSCILLATOR TUBE 1V6 REMOVED. 1,000 OHM RESISTOR SUBSTITUTED FOR RECORD HEAD. INPUT TRANSFER SWITCH 4S1 IN MICROPHONE POSITION. RECORD RELAY 3K1 ENERGIZED.

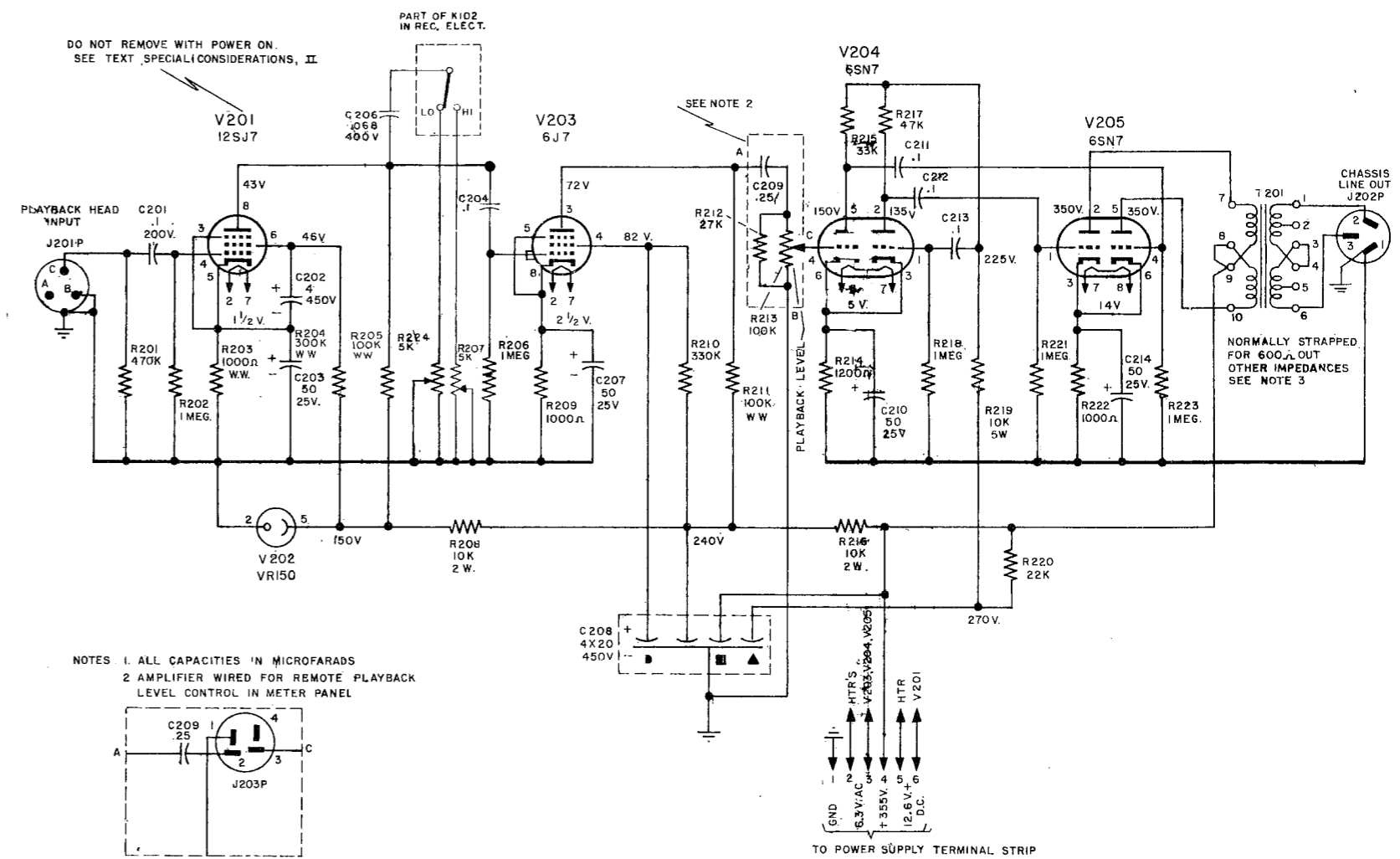
NOTE: UNBALANCE OF 2 db MAY BE EXPECTED AT PIN 2 AND PIN 7 OF 2V5.

5J-7 TAPE TRANSPORT	
SPARE	6
REC.	4
REC.	5
REC.	3
117 V. A.C.	2
117 V. A.C.	1

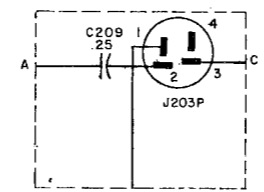


SCHEMATIC DIAGRAM
ELECTRONIC ASSEMBLY
MODEL 300 MONAURAL
CCIR EQUALIZATION
PLAYBACK AMPLIFIER
CATALOG NUMBER 559-105
ED 498-105

MODIFICATION COMPONENTS
ADDED:
SCHEMATIC PART 4
R224 044-073
C206 035 134



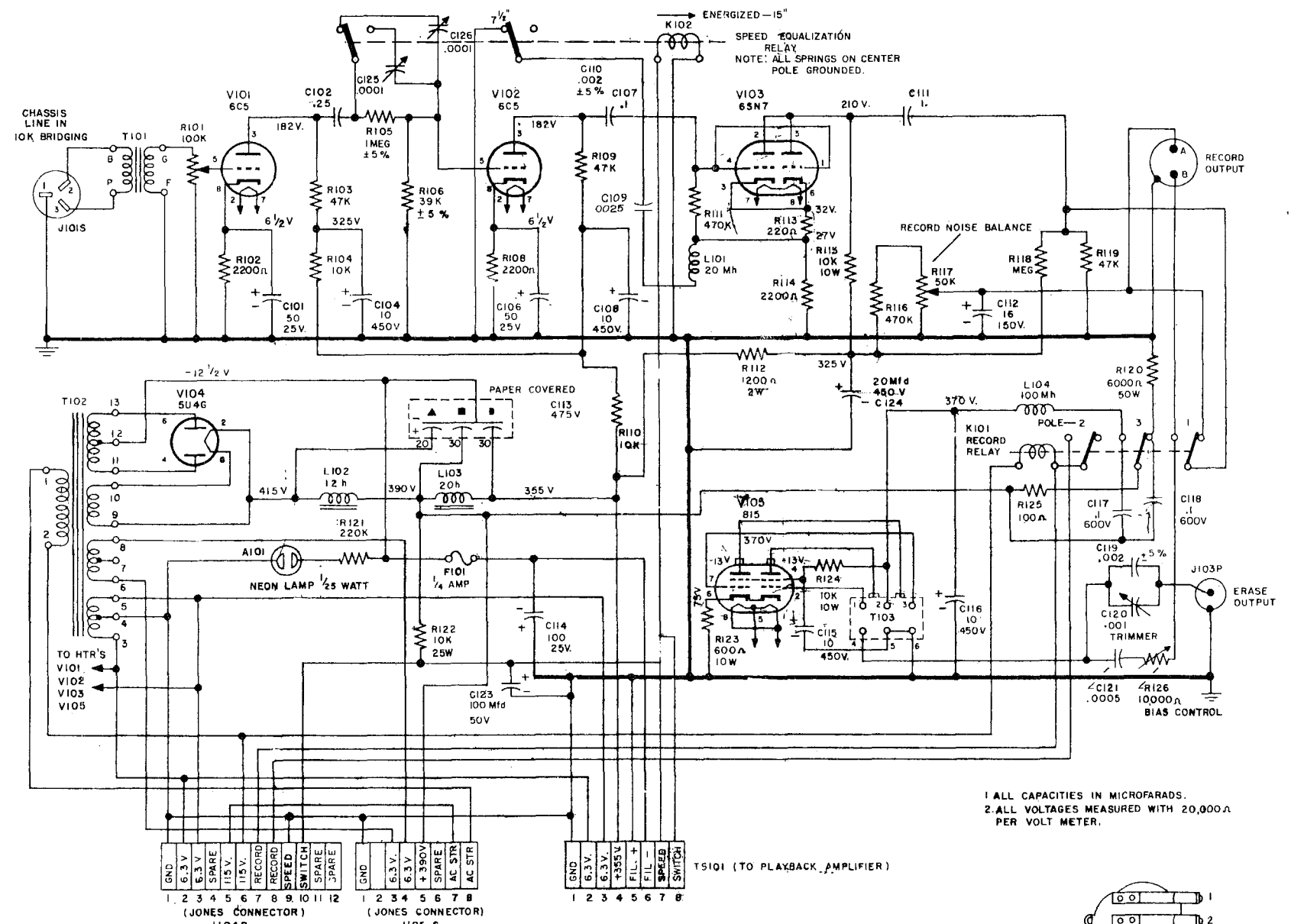
NOTES
1. ALL CAPACITIES IN MICROFARADS
2. AMPLIFIER WIRED FOR REMOTE PLAYBACK LEVEL CONTROL IN METER PANEL



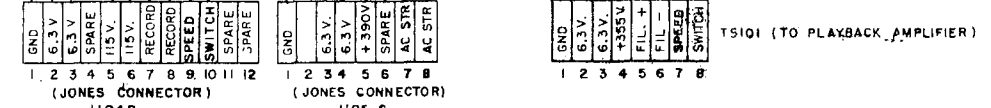
3. 600 OHMS CONNECT TO 1 & 6, JOIN 3 TO 4
333 OHMS CONNECT TO 1 & 5, JOIN 3 TO 4
250 OHMS CONNECT TO 1 & 6, JOIN 2 TO 3 (APPROX)
200 OHMS CONNECT TO 2 & 5, JOIN 3 TO 4
125 OHMS CONNECT TO 1 & 4, JOIN 1 TO 3 & 4 TO 6
50 OHMS CONNECT TO 2 & 4, JOIN 2 TO 3 & 4 TO 5

TO POWER SUPPLY TERMINAL STRIP

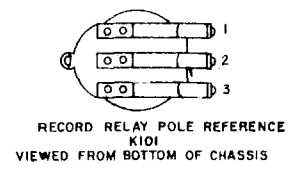
SCHEMATIC DIAGRAM
ELECTRONIC ASSEMBLY
MODEL 300 MONAURAL
CCIR EQUALIZATION
RECORD AMPLIFIER AND POWER SUPPLY
CATALOG NUMBER 559-105
ED 499-105



1. ALL CAPACITIES IN MICROFARADS.
2. ALL VOLTAGES MEASURED WITH 20,000 Ω PER VOLT METER.



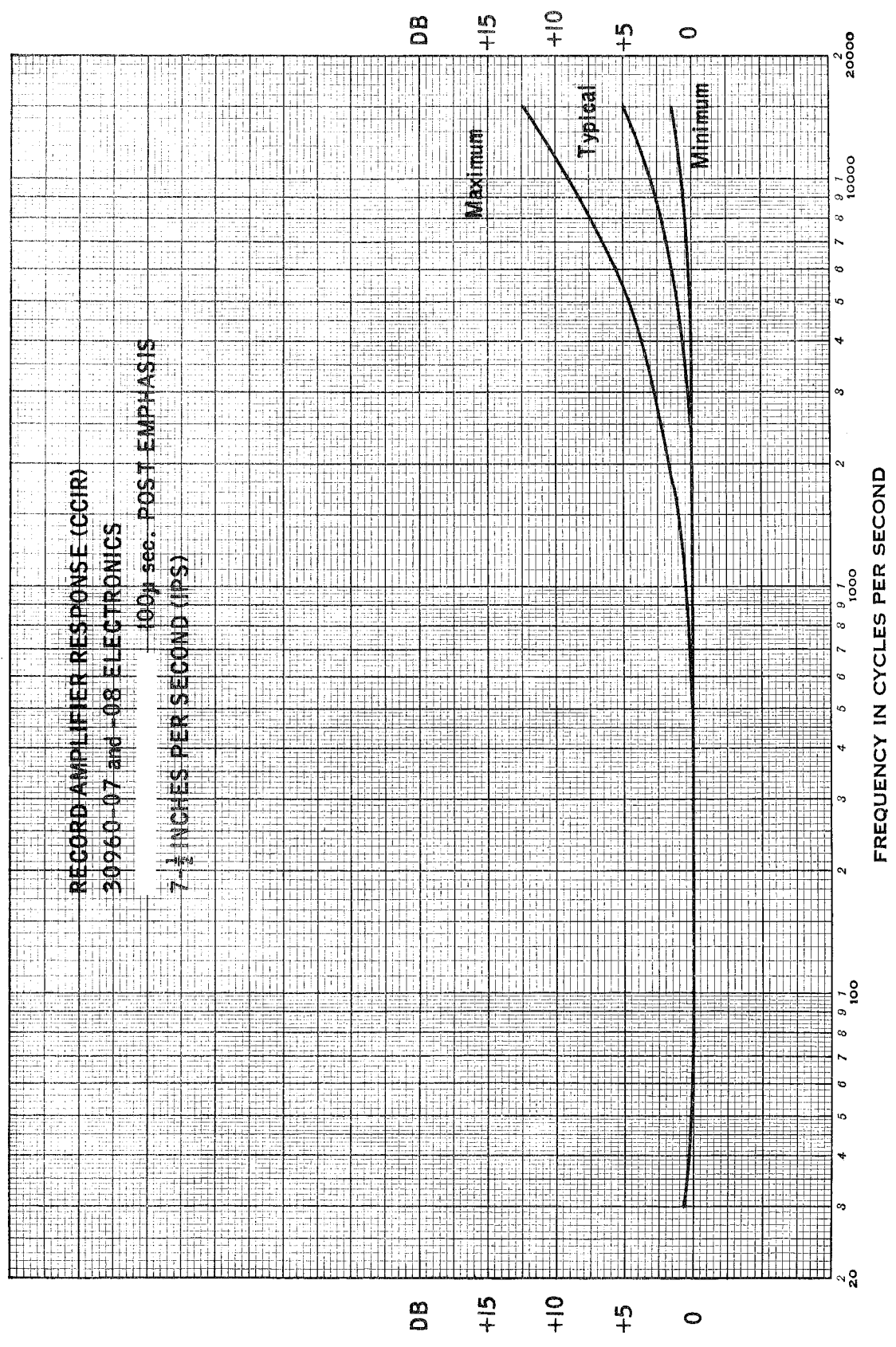
PLUG A-567 (WITH 1 JUMPERED TO 2 & 7 JUMPERED TO 8) MUST BE INSERTED IN ABSENCE OF MIXER PRE-AMP CABLE



4

Section 4
CCIR
Equalization Curves

RECORD AMPLIFIER RESPONSE (CCIR)
 20960-07 and -08 ELECTRONICS
 100 μ sec. POST EMPHASIS
 7 1/2 INCHES PER SECOND (IPS)

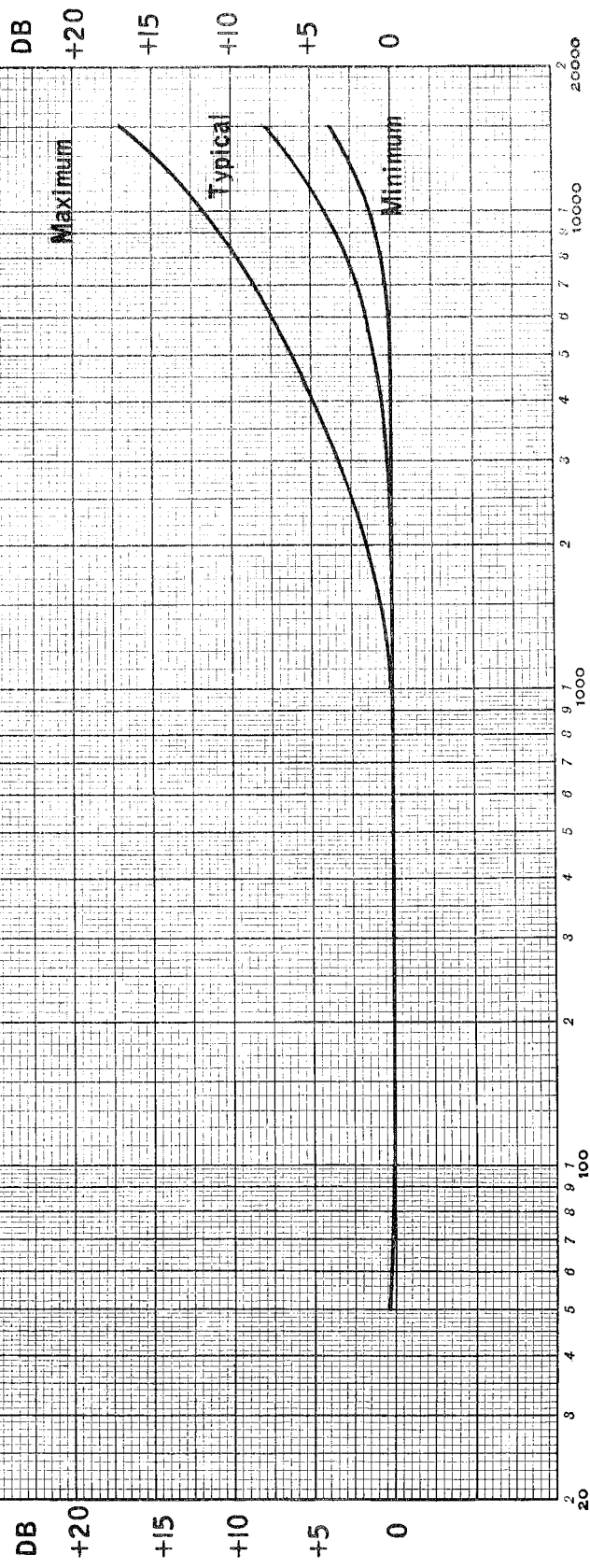


RECORD AMPLIFIER RESPONSE (CCIR)

30960-07 and-08 ELECTRONICS

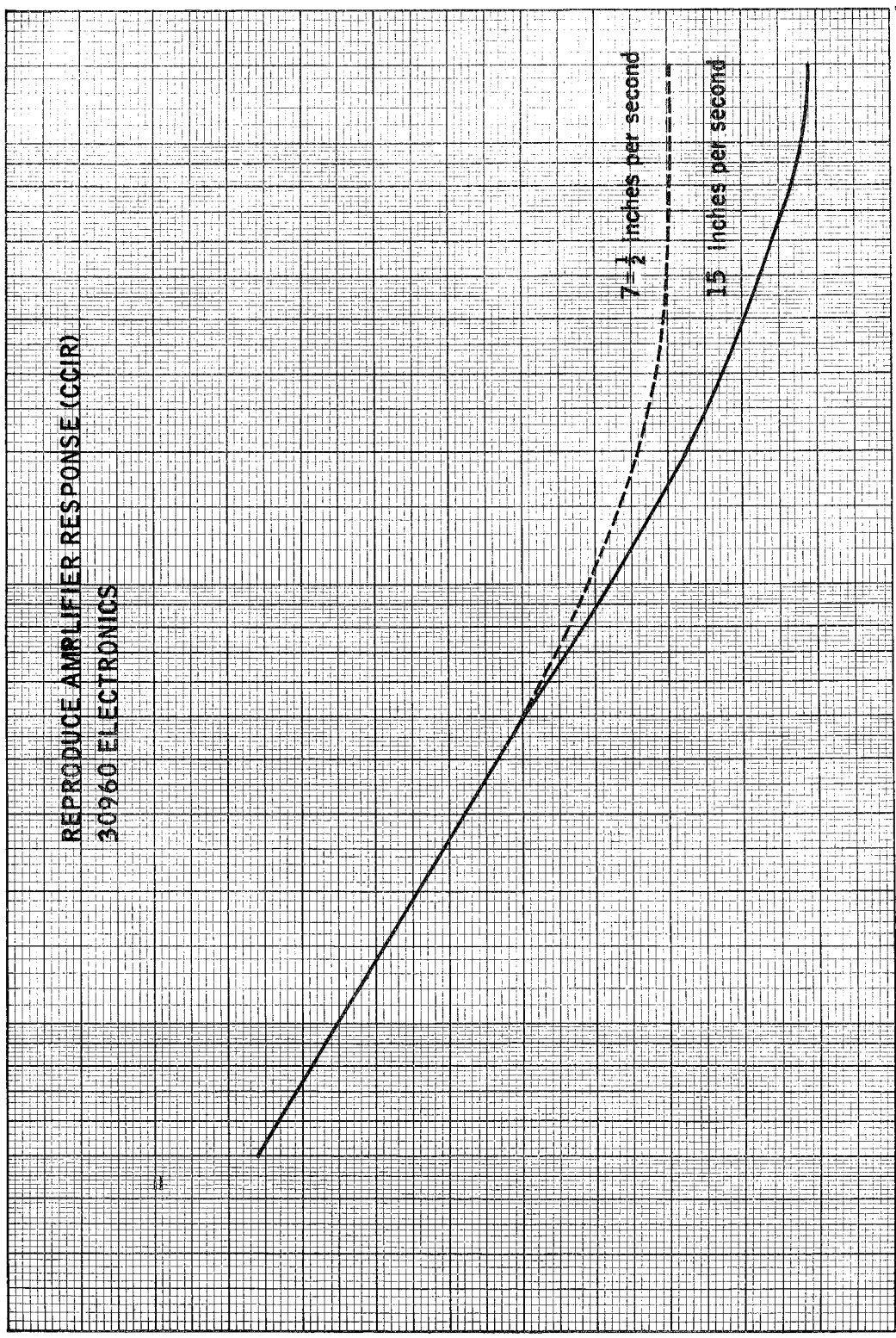
35 μ sec. POSITIVE EMPHASIS

15 INCHES PER SECOND (IPS)



REPRODUCE AMPLIFIER RESPONSE (CCIR)
30960 ELECTRONICS

DB
+20
+15
+10
+5
0
-5
-10
-15
-20



FREQUENCY IN CYCLES PER SECOND

DB
+20
+15
+10
+5
0
-5
-10
-15
-20

20
100
1000
20000