H. H. SCOTT, INC.
111 POWDER MILL RD., MAYNARD, MASS., 01754

SERVICE MANUAL
FOR
MODEL 342
SOLID STATE STEREO TUNER/AMPLIFIER

SPECIFICATIONS

TUNER (FM-MPX)

Usable Sensitivity (IHF)	2.2 microvolts
Cross Modulation Rejection	80 db
Signal to Noise Ratio	below 100% modulation 60
Total Harmonic Distortion	0.8%
Frequency Deviation (Drift)	0.02%
*Frequency Response	30 to 15,000 Hz ± 1 db
Capture Ratio	3 db
Selectivity	40 db
Tuning Range	87 to 108 mc
Accuracy of Calibration	0.5%
Separation	35 db or more
FM & IF Limiting Stages	6

*This is limit of FCC Stereo Broadcast specifications. All H. H. SCOTT tuners have far wider frequency response.

TAPE OUTPUT

Rated Voltage Output to Tape Recorder	0.5 v
Minimum Recommended Load Resistance	47 k ohms

PRE-AMPLIFIER

Input:

Tape Head - Input Impedance	47 k ohms
Signal for Rated Output	3 mv
S/N Ratio	55 db
Phono-Input Impedance (All Switch Positions)	47 k ohms
Signal for Rated Output (Adjustable by Switch)	3, 5, 9 mv
S/N Ratio	55 db
High Level Inputs - Input Impedance	60 k ohms
Signal for Rated Output	75 db
S/N Ratio	80 db
Frequency Response in Flat Position	20-20 khz 1.0 db
Treble Controls Measured at 10,000 Hz, Boost & Cut	10 db ± 2 db
Bass Controls Measured at 30 Hz, Boost & Cut	12 db ± 2 db
Scratch Filter	-6 db/octave: -3 db @ 5 k Hz
Loudness Compensation (maximum)	+ 12 db @ 50 Hz
Loudness Compensation	+ 4 db @ 10 k Hz

AMPLIFIERS

Power Ratio (watts per channel)	
@ 0.8% Harmonic Distortion	
@ 4 ohms	32.5 watts
@ 8 ohms	25 watts
Continuous Output Single Channel	
@ 8 ohms, 0.8% Harmonic Distortion	18 watts
Continuous Output Both Channels	
@ 8 ohms, 0.8% Harmonic Distortion	18 watts
Total Harmonic Distortion	0.8%
Frequency Response	18-25,000 ± 1 db
Power Bandwidth at Rated Distortion (IHF Method)	25-20,000 Hz
Hum and Noise	80 db below rated power
Range of Line Voltage and Frequency	105-120v, 50-60 Hz.
Power Consumption - 117 v at 60 Hz (AC only)	25-95 watts

342 TEST PROCEDURE, TUNER SECTION

EQUIPMENT NEEDED
A.C. VTVM
Oscilloscope
VOM
Distortion Meter
FM Generator (or source)
MX Generator (or source)
Audio Generator (or source)

Set Controls to the Following:

Separation Pots	Max CW
Input Select. Switch	FM

Preliminary Checks

Inspect unit for defects such as broken wafers, cracked terminals, and jacks, loose transformers, binding tuning condenser, broken components, lead dress, scrap in unit, etc.Make certain all transistors are firmly seated in correct sockets. Take output from tape our jacks.

Turn unit on, check voltage at Zener Diode; should measure +12 ±1v.

1. Mono Alignment and Sensitivity Check

Front End and IF Alignment
With about 10 uv generator output, align and peak front end for max. output. With 3 uv input, align IF's for max. audio. With 1 or 2k uv input, align detector for minimum distortion.

2. Sensitivity and Distortion

Measure sensitivity of tuner with 22uv RF input, at antenna terminals. Must obtain 30db usable sensitivity at 92, 98, and 106 mc.

Recheck distortion, 2k uv input. 400 cps - max. distortion of 0.8%.

3. FM Hum Check

Tune to unmodulated signal, measure min, of 60 db (may reverse AC plug)

De-emphasis Check
Change Mod. to 8 kc, from 100% modulation note decrease of 12 ± 2 db in output from 400 Hz reference

Calibration Check
Check calibration against stations - max. tolerance ± .2 mc.

4. Multiplex Alignment - Unit to Stereo

a.) Pilot Adj.
Scope probe (Low-Cap) to test point L501 peak T501, and L501 for max. pilot. With VOM, measure 4-6v dc across 47k resistor (R526)

b.) Oscillator Sync. Adj.
Scope probe to output scope Sync. to input, tuner to Ch. A output. Pull transistors Q503 and Q505. Adjust T502 for zero beat as seen on scope. Replace both transistors, scope Sync. to Int.

c.) Separation Adj.
Output from Ch. A. Adjust scope to obtain pattern and adjust L501 for min. output observing scope. Adjust A separation pot for min. output. Tuner output from Ch. B and adjust B separation pot for min. as outlined above. Repeat between A & B until no further improvement is seen.

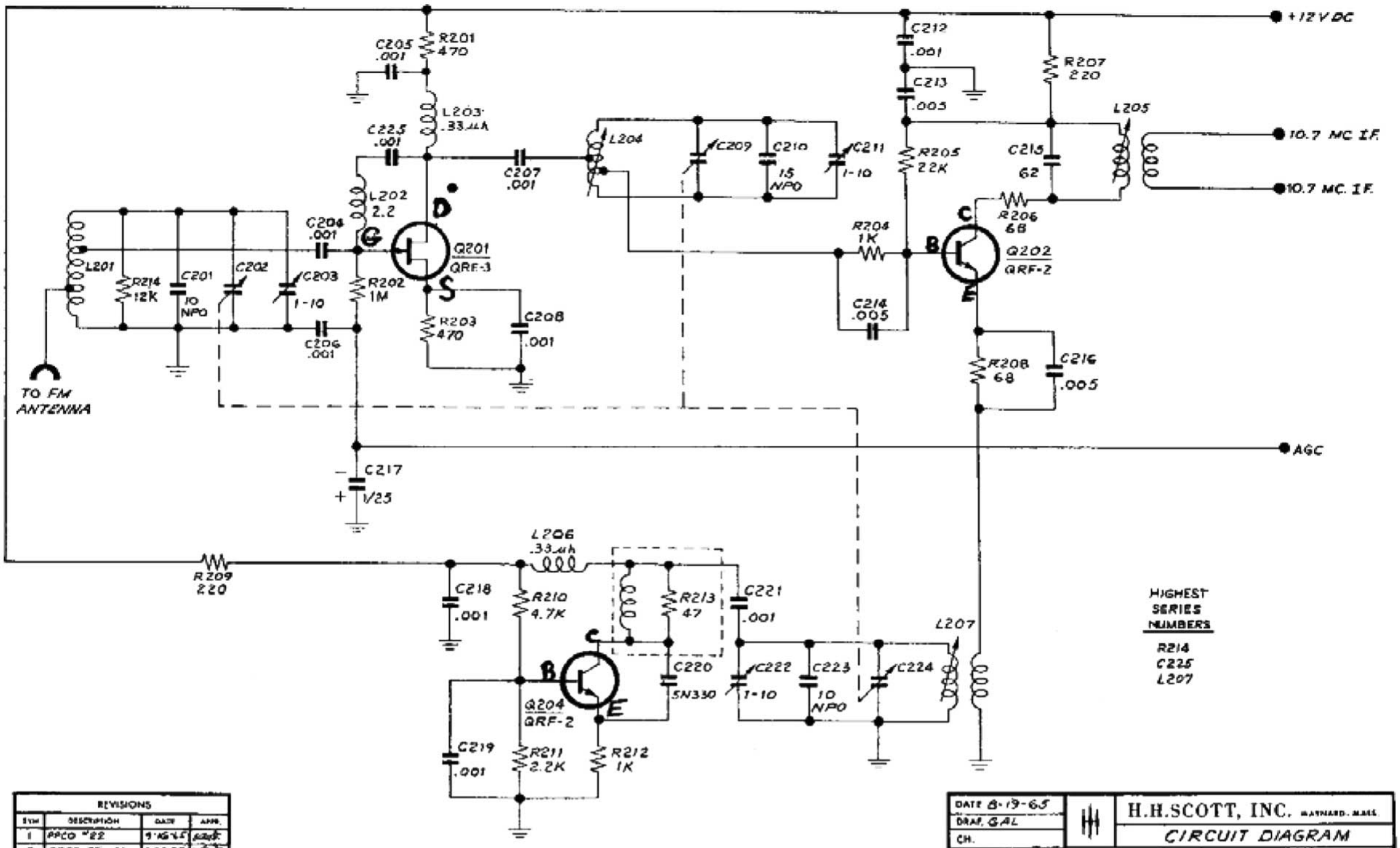
d.) Final separation measurements to be done in each channel:

Audio Modulation	Minimum Separation
400 cps	35db

If separation specs are not met, recheck IF's for proper alignment. Also recheck steps 4.b) and 4.c).

e.) Stereo Switchover Check
Check Switchover point (15 to 50 pv at antenna terminal)

f.) Final Listen Check
Check all inputs and outputs (including phone jacks), switches and controls for proper operation. Check overall appearance and scrap inside unit. Check for proper switching of stereo light. Check Calibration against stations - specs are ± 0.2 mc.



REVISIONS			
SYM	DESCRIPTION	DATE	APPR.
1	PPCO #22	9-16-65	
2	PPCO ES 48	9-24-65	
3	ECO 1302	1-18-66	

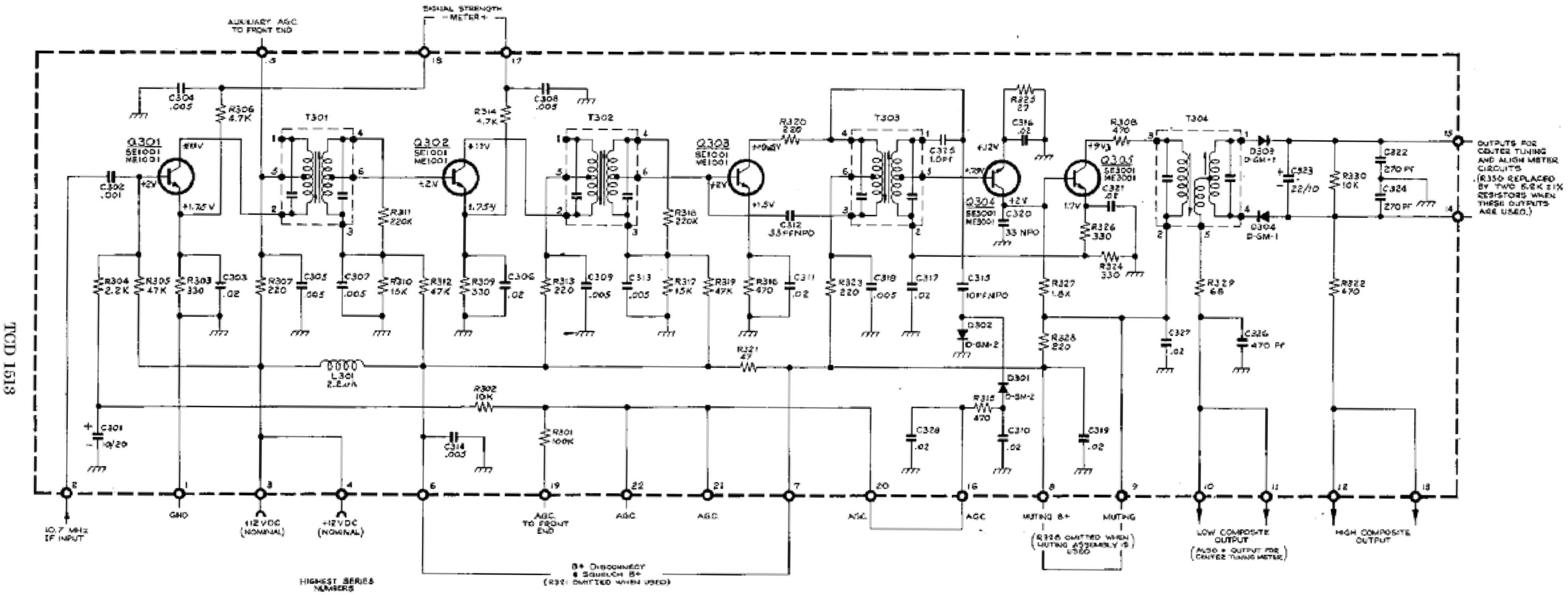
DATE 8-19-65	H.H.SCOTT, INC. MAYNARD, MASS.		
DRAF. GAL			
CH.	CIRCUIT DIAGRAM		
ENG. RWF	SCALE: —	DWG. SIZE C	2-FM-15-C1
PROD.	SHEET 1 OF 1		

All voltages measured with 20,000 ohm/volt VOM; 300 ohm antenna and no signal.

Q201		Q202		Q204	
G	.025	B	.45	B	3
D	9.2	E	.05	E	2.6
S	1.05	C	10.8	C	10.2

Troubleshooting Guide

Trouble	Possible Remedy
Low gain	Replace Q201
No Output	Open LRFC 2.2 or .33 defective Q201, Q202, Q204



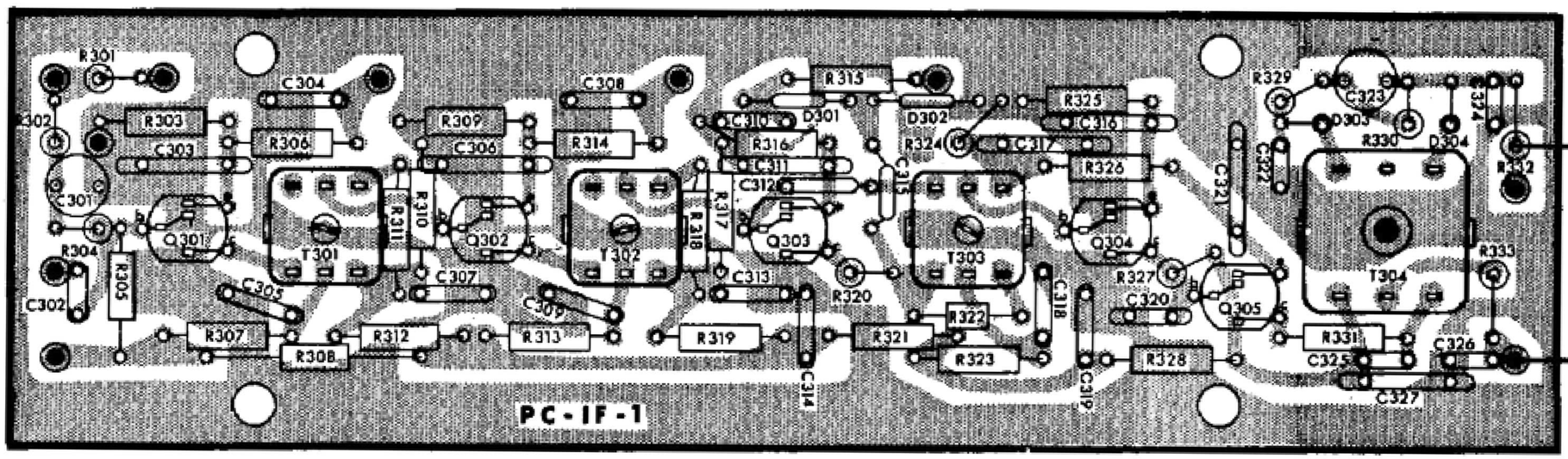
NOTES

1. UNLESS OTHERWISE SPECIFIED: RESISTANCE IN OHMS ±10% RESISTORS ½ WATT, CAPACITANCE IN MFD'S.
2. D.C. VOLTAGES ±5% MEASURED WITH 20 K Ω/V V.O.M.
3. INDICATED SUPPLY VOLTAGES MAY VARY ABOVE OR BELOW NOMINAL VOLTAGE SHOWN FROM MODEL TO MODEL.
4. ARROW-HEADS INDICATE MAIN SIGNAL PATH.

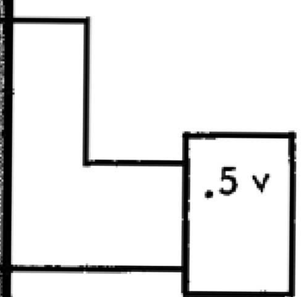
Z-PC-IF-1 02

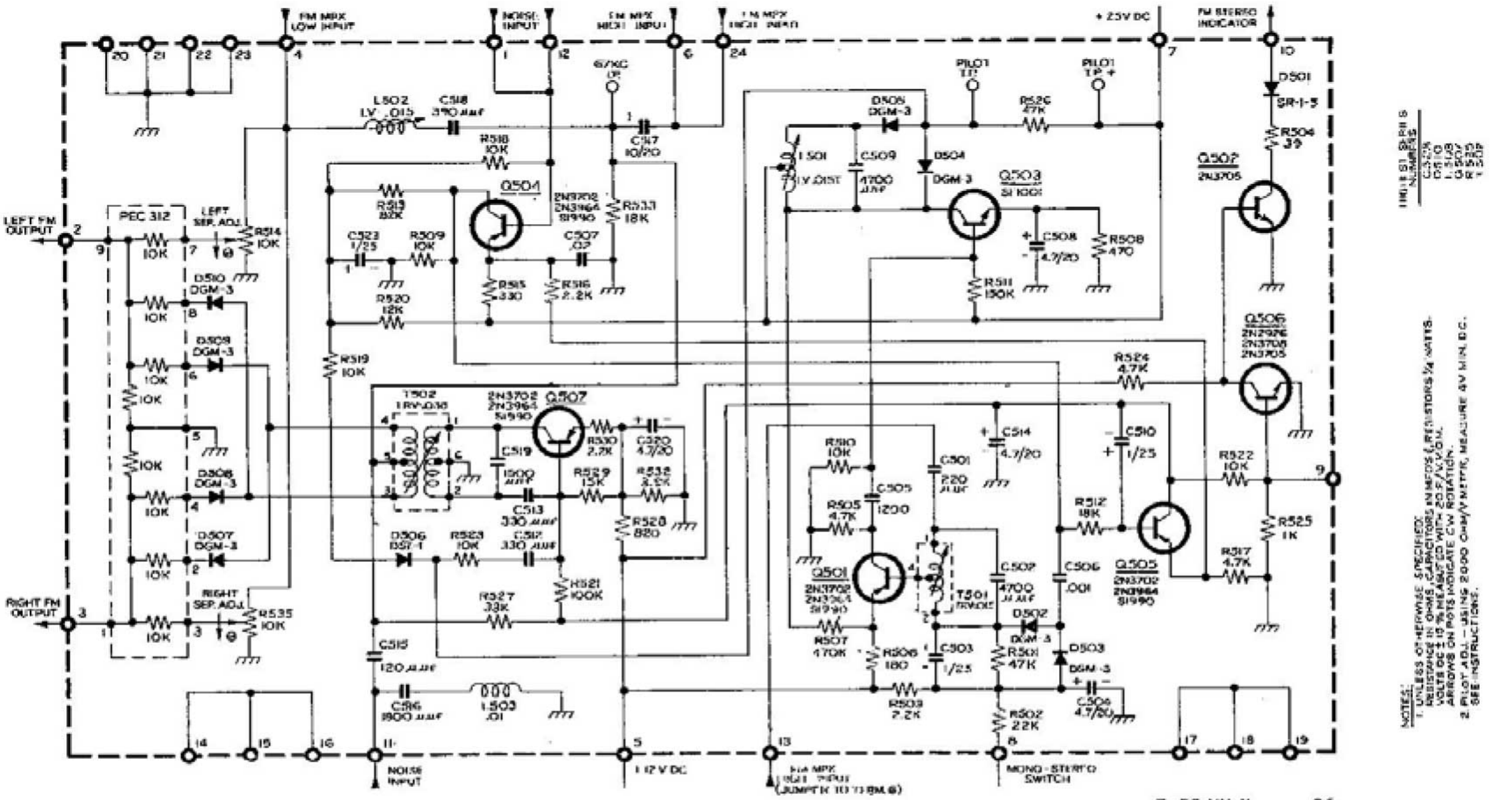
TROUBLE	POSSIBLE CAUSE
Low output; no output	Defective Q301, Q302, Q303
Erratic meter movement	Q301

Q301-303-SE1001 304-305-SE3001



.5 volts peak to peak Output of IF with 100% modulation and 1MV input.



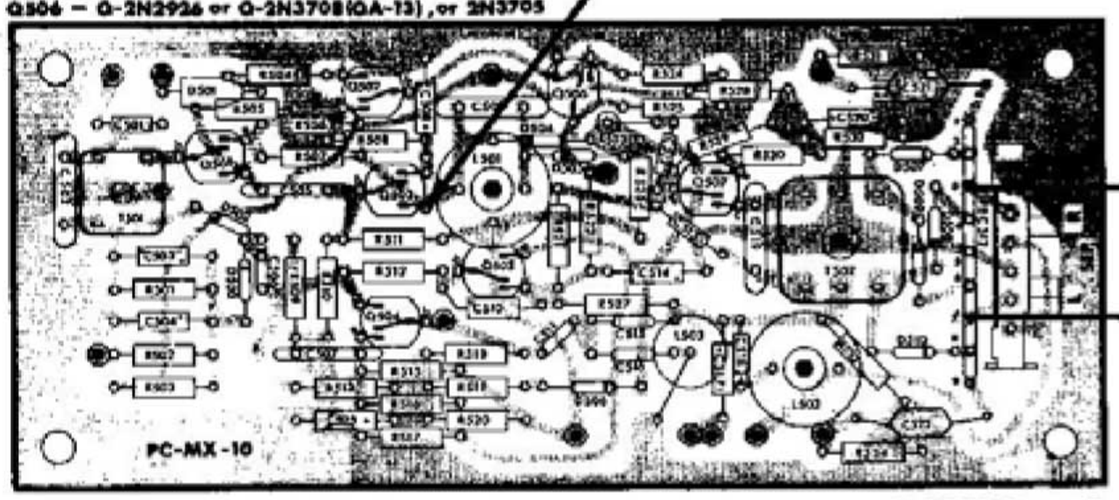


NOTES:
1. UNLESS OTHERWISE SPECIFIED: RESISTANCE IN OHMS, CAPACITORS IN MFDS (µF), RESISTORS ¼ WATTS. VOLTS DC ± 10% MEASURED WITH 20K/V VOM. ARROWS ON POTS INDICATE CW ROTATION.
2. PILOT ADJ. - USING 2000 OHM/V METER, MEASURE 4V MIN. DC. SEE INSTRUCTIONS.

HIGH SIDE NUMBERS
C523
D510
L502
Q504
R535
T502

1 22v Peak to Peak.
Pilot signal taken at Step A in Test Procedure

Q501, Q504, Q505, Q507 – S1990, 2N3964, 2N3702
Q502 – Q-2N3705
Q503 – SE 1001
Q506 – Q-2N2926 or Q-2N3708(QA-13), or 2N3705



MULTIPLEX N-PC109-2R 3

2 .15v Peak to Peak

3 .15v Peak to Peak

} Output of multiplex (Left & Right channels)

**Z-PC-MX-11	e	b	c
Q501	11v	10v	1.5v to 7v
Q502	0v	.7v	1.1v
Q503	.2v	.35v	26v
Q504	23v	22v	8v
Q505	15.5v	13v	13.8v
Q506	ov	.1v	.7v
Q507	7.6v	8.3v	0v
▲ Q501	11v	11v	5v
▲ Q502	0v	0v	2.7v
▲ Q503	.8v	1.4v	23.5v
▲ Q504	23v	23v	24v
▲ Q505	16.5v	23v	6v
▲ Q506	0v	.5v	0v
▲ Q507	9v	9v	0v

**VOLTAGES MEASURED WITH 300 OHM LOAD ON EXTERNAL FM ANTENNA TERMINALS, INPUT SWITCH IN "FM"POSITION, MODE SWITCH IN "MONO" POSITION, TUNER OFF-STATION.
▲ VOLTAGES MEASURED UNDER SAME CONDITIONS AS ABOVE EXCEPT MODE SWITCH IN "AUTOMATIC STEREO" POSITION WITH STEREO SIGNAL FED INTO TUNER.

TROUBLE	POSSIBLE CAUSE
Low Pilot	C508, Q503
Poor Separation in one channel	Defective D507, D508, D509 or D510.
Not Switching to stereo except on very strong signal	Check pilot signal, if OK then check C523
Intermittent low output both channels	Cold Solder or defective L502
No output 1 channel	C522 or C521 open
Stereo light frequently burning out	Change R504 to limit voltage across light to .9-1.2v

342 TEST PROCEDURE, AUDIO SECTION

EQUIPMENT NEEDED

Audio Oscillator
AC VTVM
Oscilloscope
VOM
Load Box
Attenuator
Distortion Meter
Variac
AC Supply Fixture

Set Controls to the Following:

Input Selector	Extra
Stereo Switch	Mono
Tone Controls	Flat "0"
Loudness	Min.
Stereo Bal. Sw.	Norm.
Noise Filter	OUT
Speaker Switch	ON
Power Switch	OFF

Preliminary Visual Inspection and Continuity Checks

Inspect unit for defects such as broken wafers, loose stand up resistors, cracked terminals and jacks, loose transformer bolts, and other such defects. See transistor precaution list. Check production tag for necessary inspectors' stamps. Shake unit to free all scrap wire pieces. Turn bias max. ccw and balance pots max. ccw.

1. Bias and Balance Settings and Voltage Checks

Turn unit on - watch carefully for any signs of voltage shorts. With bias pots (1k) still full ccw (from top of unit), check supply for 48 to 50. Now adjust balance pots (10K) for approx. 25 volts from CETM each 1000/50 to ground. Adjust bias pots for 17 mv current from each test point in the rear of the unit to ground.

Check Zener diode (on PC-TD-3)	for 27v ±10%
Check Zener diode (on Center Chassis)	for 12v ±10%

2. Sensitivity Check

Audio Oscillator to EXTRA at .25v (±2 db) input. Connect 8 ohm load to Main Speaker taps. Turn loudness pot to maximum. Observe output of 18 watts (12v). Check tape output jack with trouble shooting lead for same output as signal.

3. Distortion Check

At 12v output max. distortion 0.6%. Recheck balance pot at clipping (13 to 14v) for symmetrical clipping.

4. Tape Monitor Switch Check

Audio Oscillator to EXTRA at .25v input to L channel. Note output at Left channel speaker terminal. Put tape monitor switch in the IN position. Note loss of output. Connect cable from L channel tape out to L channel tape in. Note restoration of signal out. Repeat process for R channel then return tape monitor to OUT position.

5. Speakers Switch Check and Phone Jack Check

Speakers switch to OFF position. Note complete loss of signal. Loudness to min., insert phone plug to phone jacks, remove speaker leads and connect to phone-plug leads. Loudness to max., note drop of 26 ±2db.

342 TEST PROCEDURE, AUDIO SECTION (Continued)

6. Crosstalk and Stereo Switch Check

At 1Kc, turn loudness pot to #10 flat - return input voltage to 0.5. Mono-Stereo switch to Stereo. Balance switch to bal. L, note drop of 0.5. Bal. switch to bal. R, note additional drop of 50db.

7. Tone Control Check (1 Volt Output)

Bass		Treble	
Boost	10db ±2 db	Boost	10 db ±2 db
Cut	15db ±2 db	Cut	10 db ±2 db

8. Frequency Response Check (1 Volt Output)

3 db down @ 20 cps or lower
3 db down @ 30Kc

9. Regulation Check (12 Volt Output)

At 1Kc, load out - output rise 1 db max.

10. Noise Filter Check (1 Volt Output)

At 5Kc noise filter to "in", note 4 ±@ db drop.

11. Preamp Gain Check (Phono High)

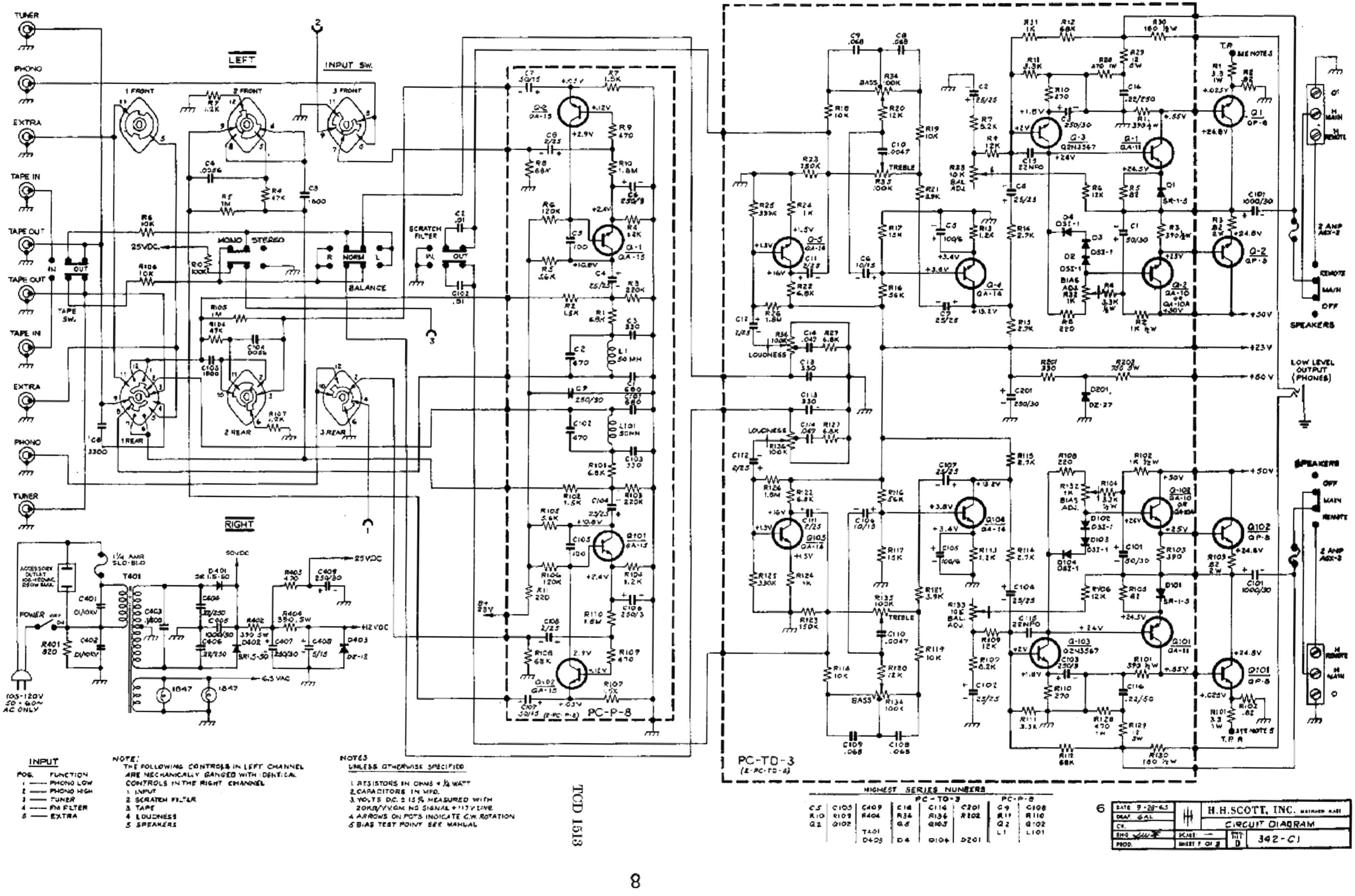
Attenuate input 35 db from .25v (±2 db) at 1 kc, input switch to phono, input leads to phono, note output of 1 v. Switch to phono low note 6 db increase in output.

12. HUM Checks

Position	Loudness Pot	Max. Hum
Extra	0	3 mv
Extra	10	5 mv
Phono High	10	30 mv
Phono Low	10	30 mv

13. Repeat Steps 2 through 12 for R channel.

AMPLIFIER SCHEMATIC



INPUT

POS.	FUNCTION
1	PHONO LOW
2	PHONO HIGH
3	TUNER
4	FM FILTER
5	EXTRA

NOTE:
THE FOLLOWING CONTROLS IN LEFT CHANNEL ARE MECHANICALLY GANGED WITH IDENTICAL CONTROLS IN THE RIGHT CHANNEL
1. INPUT
2. SCRATCH FILTER
3. TAPE
4. LOUDNESS
5. SPEAKERS

NOTES
UNLESS OTHERWISE SPECIFIED
1. RESISTORS IN OHMS ± ½ WATT
2. CAPACITORS IN MFD.
3. VOLTS DC. ± 15% MEASURED WITH 20KΩ/VOLT DC NO SIGNAL +117 V LINE
4. ARROWS ON POTS INDICATE C.W. ROTATION
5. BIAS TEST POINT SEE MANUAL

TCD 1513

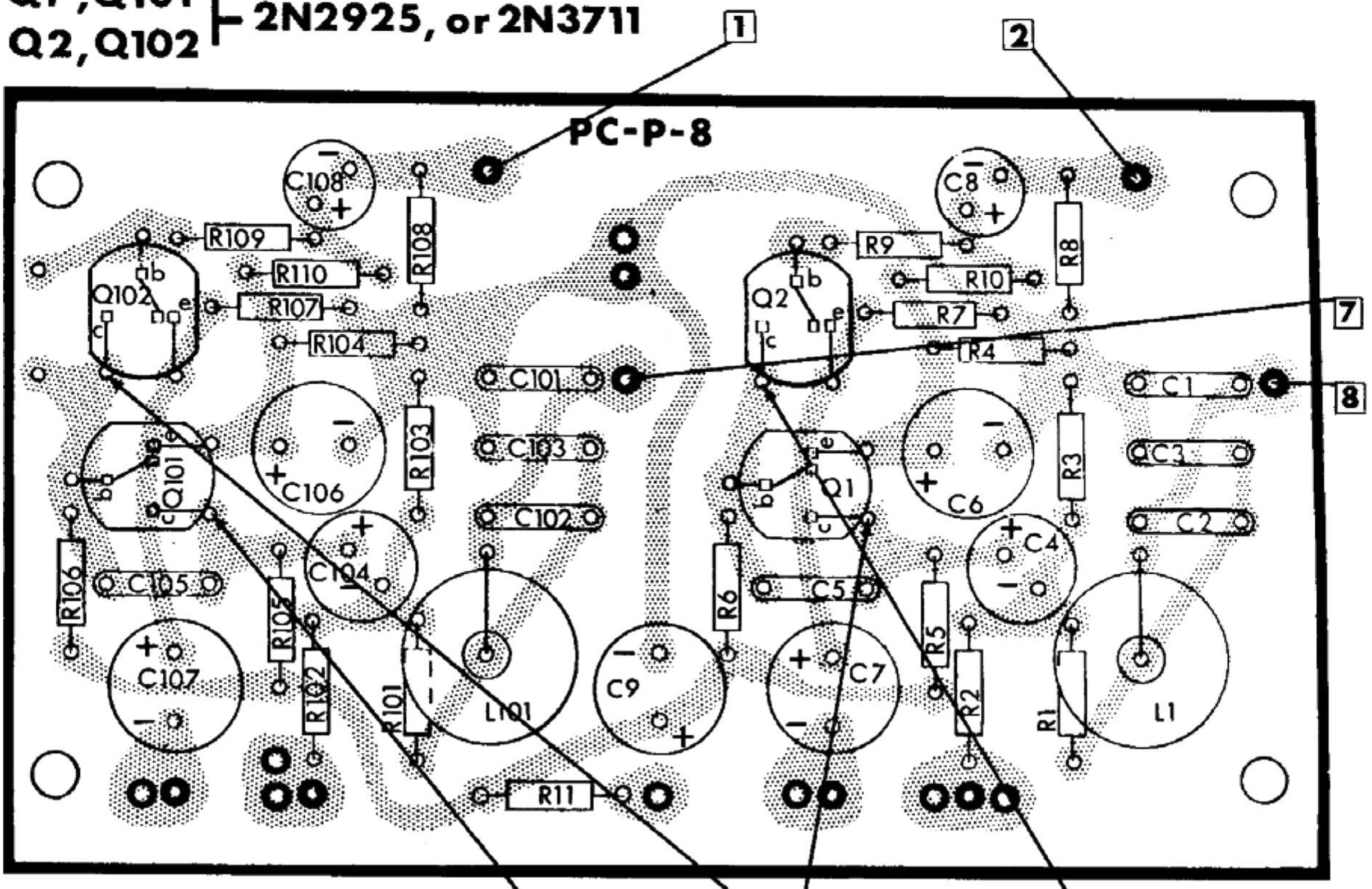
HIGHEST SERIES NUMBERS

PC-TO-3						PC-P-8	
C5	C105	C409	C18	C114	C201	C9	C106
R10	R109	R404	R36	R136	R202	R11	R110
Q2	Q102		Q6	Q103		Q2	Q102
		T401				L1	L101
		D403	D4	Q104	D201		

DATE 9-28-65	H.H.SCOTT, INC. MAYNARD, MASS.	
DRAF. GAL	CIRCUIT DIAGRAM	
CK.	SCALE: —	INT. D
ENG.	SHEET 1 OF 2	342-C1
PROD.		

6

Q1 ,Q101
Q2,Q102 ⊢ **2N2925, or 2N3711**



Signal Path through PCP8 board and peak to peak Voltage measurements 8 ohm load; 3mv input

[1] and [2] Input Signal

[3] and [4] .02 Volts

[5] and [6] 1 Volt

[7] and [8] 1 Volt Output Signal

CAPACITORS

C1, C101	CC-680	10%
C2, C102	CC-470	10%
C3, C103	CC-330	10%
C4, C104	CEPC-25/25	
C5, C105	CC-100	10%
C6, C106	CEPC-250/3	
C7, C107	CEPC-50/15	
C8, C108	CEPC-2/25	
C9	CEPC-50/30	

TRANSISTORS

Q1, Q2, Q101, Q102 ---- 2N2925

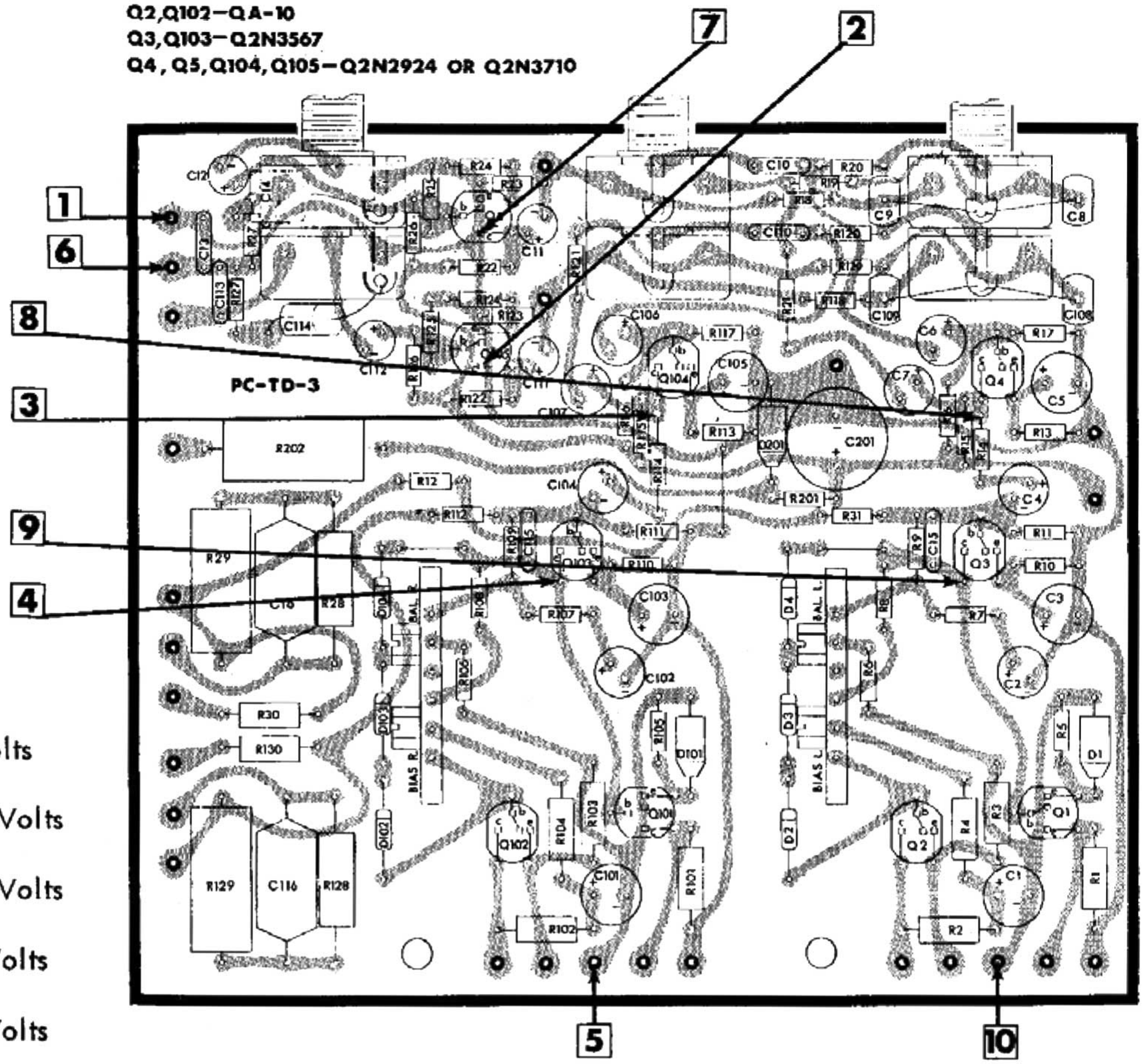
RESISTORS

R1, R101	RC11-6.8K
R2, R102	RC11-1.5K
R3, R103	RC11-220K
R4, R104	RC11-1.2K
R5, R105	RC11-5.6K
R6, R106	RC11-120K
R7, R107	RC11-820
R8, R108	RC11-68K
R9, R109	RC11-470
R10, R110	RC11-1.8M
R11	RC11-220

CHOKE

L1, L101 ---- L-RFC-.05

TONE CONTROL, DRIVER



1 and 6 .7 Volts

2 and 7 2.5 Volts

3 and 8 2.8 Volts

4 and 9 30 Volts

5 and 10 32 Volts

Signal Path thru TD-3 board and Peak to Peak voltage measurements acquired with 8 ohm load and .5 Volts input.

TROUBLE	POSSIBLE REMEDY
Intermittent output 1 channel (All positions except xtra)	Intermittent capacitor or cold solder connection on Pc P8 board. If trouble is corrected by switching from stereo to mono it is definitely in pre-amp. section. If not trouble is in TD-3 board.
Blown outputs	Bias should adjust smoothly, if not 1 of DSI-1's is open (3 in series). Shorted QP-8, QA-11 or QA-10 no good. (All transistors in string should be changed if outputs are blown) (QA10 & QA-11)
No Bias Adjust	shorted DSI-1
Intermittent High Output	open 50/15 (feedback cap)(C7, C107 on PC-P8)

CAPACITORS

C1, C101----------CEPC-50/30	Electrolytic Printed Circuit Type
C2, C4, C7, C102, C104, C107 ---------CEPC-25/25	" " " "
C3, C103 ----------CEPC-250/3	" " " "
C5, C105 ----------CEPC-100/6	" " " "
C6, C106 ----------CEPC-10/15	" " " "
C8, C108 ----------CMM-.068/250	Capacitor Mylar Molded
C9, C109 ----------CMM-.068/250	" " "
C10, C110 ----------CC-.0047	Ceramic Capacitor
C11, C12, C111, C112-CEPC-2/25	Electrolytic Printed Circuit Type
C13, C113 ----------CC-330K	Ceramic Capacitor
C14, C114 ----------CMM-.047/250	Capacitor Mylar Molded
C15, C115 ----------CC-22K NPO	Ceramic Capacitor
C16, C116 ----------CCM-.22/250	Capacitor Mylar Molded
C201 ----------CEPC-150/30	Electrolytic Printed Circuit Type

TRANSISTORS

Q1, Q101 ----------QA-11 or TA2670	Transistor
Q2, Q102 ----------QA-10 or QA-10A	"
Q3, Q103 ----------2N3567 or QA-10	"
Q4, Q5, Q104, Q105---2N2924 or 2N3710	"

RESISTORS

R1, R3, R101, R103 --RC21-390	1/2 Watt Carbon Resistor
R2, R102 ----------RC21-1K	1/2 " " "
R4, $104 ----------RC21-3.3K	1/2 " " "
R5, R105 ----------RC11-82	1/4 " " "
R6, R106 ----------RC11-12K	1/4 " " "
R7, R17, R107, R117--RC11-15K	1/4 " " "
R8, R108 ----------RC11-220	1/4 " " "
R9, R109 ----------RC11-12K	1/4 " " "
R10, R110 ----------RC11-270	1/4 " " "
R11, R111 ----------RC11-3.3K	1/4 " " "
R12, R112 ----------RC11-68K	1/4 " " "
R13, R113 ----------RC11-1.2K	1/4 " " "
R14, R15, R114, R115-RC11-2.7K	1/4 " " "
R16, R116 ----------RC11-56K	1/4 " " "
R18, R19, R118, R119-RC11-10K	1/4 " " "
R20, R120 ----------RC11-12K	1/4 " " "
R21, R121 ----------RC11-3.9K	1/4 " " "
R22, R122 ----------RC11-6.8K	1/4 " " "
R23, R123 ----------RC11-150K	1/4 " " "
R24, R124 ----------RC11-1.5K	1/4 " " "
R25, R125 ----------RC11-330K	1/4 " " "
R26, R126 ----------RC11-1.8M	1/4 " " "
R27, R127 ----------RC11-6.8K	1/4 " " "
R28, R128 ----------RC21-470	1/2 " " "
R30, R130 ----------RC21-180	1/2 " " "
R31 ----------RC11-1K	1/4 " " "
R201 ----------RC11-330	1/4 " " "
R202 ----------RW5-750	Wire Wound Resistor
R29, R129 ----------RW5-12	" " "
R32, R33, R132, R133--RCV-10K/1K-PC	Variable Carbon Resistor
R35, R135 ----------RCVCC-100KT-PC	Carbon Resistor Concentric Clutche

342 PARTS PRICE LIST

(Subject to Change Without Notice)

Part #	Description	Customer List
A-DC-15	Dial Cord	$ 1.75
A-FW-B	Flywheel Assembly	4.80
CETM-5/15	Electrolytic Capacitor	.84
CETM-250/30	Electrolytic Capacitor	1.68
CETM-1000/30	Electrolytic Capacitor	2.45
CETM-1000/50	Electrolytic Capacitor	3.48
D-CM-3	Diode	.32
DZ-12	Zener Diode	2.24
F-AGX-2	Fuse (Speaker)	.24
F-SB-11/4	Fuse (Power)	.45
J-3ST-5	Phone Jack	.65
KN-P-6LTT (1)	Plastic Knob	.65
KN-P-6CTT (3)	Plastic Knobs	.65
KN-P-8CTT (3)	Plastic Knobs	.65
KN-P-10PTT (1)	Plastic Knob	.75
M-SS-10	Meter	5.94
N-342-1	Panel	8.55
N-D-FM-17	Glass Dial	2.94
RCV-5K-PH	Potentiometer	.84
QP-8	Power Transistors	6.00
RW-2-.82	Wire Wound Resistors	.35
RW-5-390	Wire Wound Resistors	.32
SPS-12-3	On/Off Switch (Power)	.40
SR-1.5-50	Rectifier	3.15
SRW-115-2	Rotary Switch	5.76
SS-22-3/3A	Slide Switch	.30
SS-43-3	Slide Switch	.40
TR-8-9	Power Transformer	18.00
V-PL-49	Neon Light Bulb	.30
V-PL-1847	Pilot Light Bulb	.40
Z-FM-15	Front End	48.24
Z-PC-IF-1	IF Board	40.00
Z-PC-MX-11	Multiplex Board	36.60
Z-PC-P8	Preamp Board	13.85
Z-PC-TD-3	Driver Board	26.96