CL1 CALIBRATION PROCEDURE

EQUIPMENT NEEDED:

OSCILLOSCOPE
SOUND TEK DISTORTION SYSTEM
VOLT METER
TRIM POT TOOL OR SMALL BLADED SCREWDRIVER

HOOK UP:
ALL CONNECTIONS WILL BE WITH THE ONE-QUARTER INCH JACKS FROM THE AB BOX AND THE SIGNAL GENERATOR.

1. PLACE THE TWO GRAY COLORED JACKS IN THE INPUT JACKS ON THE BACK OF THE UNIT.
2. PLACE THE BLACK COLORED PLUGS INTO THE OUTPUT JACKS ON THE BACK.
3. THIS WILL ALLOW AN AUDIO SIGNAL TO PASS TO EACH CHANNEL SEPARATELY AS YOU CHANGE THE AB SWITCH BACK AND FORTH TO CALIBRATE THE STEREO CHANNELS. OR JUST USE A DUAL SCOPE

FRONT CONTROL PANEL ADJUSTMENTS

1. SET THE RATIO KNOBS AT 2:1
2. SET THE ATTACK AT FULL COUNTER-CLOCKWISE.
3. SET THE RELEASE AT 12:00 O'CLOCK
4. SET THE GR SWITCH TO THE "IN" POSITION
5. SET THE SENSITIVITY CONTROL TO "LOW"
6. SET THE METERS TO "GR"
7. POWER UP THE UNIT AND MONITOR THE PLATE VOLTAGE AS IT COMES UP...EASIEST TO READ AT THE CENTER TAB OF THE SUPPLY REGULATOR...AND ADJUST THE TRIM POT ON THE SUPPLY FOR ABOUT 325 VOLTS DC.
8. LET THE UNIT WARM UP FOR ABOUT 10 MINUTES.

OUTPUT/THRESHOLD ADJUSTMENTS

1. SET THE SOUND TEK GENERATOR LEVEL CONTROLS TO -20DB POSITION AND THE SIGNAL GENERATOR TO 2000 HERTZ. or .077vAC @ input
2. SET THE INDICATOR TO "VOLTS/POWER"
3. SET THE INPUT TO -20DB POSITION.
4. SLOWLY TURN THE OUTPUT UP ON THE CL1 ON THE FIRST CHANNEL TILL THE METER ON THE SOUNDTEK READS +1DB...THEN BRING UP THE THRESHOLD TILL THE NEEDLE GOES BACK DOWN TO 0DB. THE UNIT IS NOW ADJUSTED TO ONE DB OF COMPRESSION. REPEAT FOR THE NEXT CHANNEL.

.774vAC

.869vAC @ output across 600Ω

THE NEXT STEPS INVOLVE A SERIES OF TRIMPOT ADJUSTMENTS ON THE CONTROL BOARD TO BRING THE OPTO-ISOLATORS TO MATCH AS CLOSELY AS POSSIBLE FOR THE STEREO EFFECT.

THERE ARE 7 TRIMPOTS ON EACH CONTROL BOARD. THE TWO FRONT ONES CLOSEST TO THE VR206 VR207 TUBE BOARD ARE THE ONES THAT ARE INVOLVED IN THE 2:1 RATIO ADJUSTING.

NEXT, TURN THE SOUNDTEK TO THE +20DB POSITION. OBSERVE THE POSITION OF THE RMS VOLTMETER NEEDLE AS YOU MOVE THE AB SWITCH BACK AND FORTH. YOU NEED TO ADJUST THE LEFT CONTROL POT TILL THE NEEDLE GETS CLOSE TO THE 0DB POSITION. DO THE SAME FOR EACH CHANNEL. VR206

RETURN THE SOUNDTEK TO THE -20DB POSITION. IF THE NEEDLE ON THE METER DOES NOT SETTLE ON THE 0DB ADJUST THE THRESHOLD TILL IT GETS CLOSE...DO THE SAME FOR BOTH CHANNELS.

WHEN THE CHANNELS LOOK EVENLY MATCHED...SET THE STEREO LINK SWITCH TO "IN" POSITION. SEE HOW CLOSE THE SOUNDTEK'S RMS VOLTMETER NEEDLE IS TO 0DB..SWITCH THE AB BACK AND FORTH AND COMPARE THE CHANNELS. IF THE CHANNELS ARE MORE THAN 0.4DB APART FURTHER ADJUSTMENTS WILL BE NECESSARY. ONE CHANNEL WILL MOST LIKELY "LEAD" THE OTHER INTO COMPRESSION. WE NEED TO MATCH THE COMPRESSION AS CLOSELY AS POSSIBLE FOR A GOOD STEREO MATCH.

IF CHANNEL "A" LEADS CHANNEL "B" INTO COMPRESSION...YOU WILL BE MAKING

USE VR207

ADJUSTMENTS TO THE RIGHT CONTROL BOARD. IN THIS EXAMPLE...THE RIGHT HAND CONTROL BOARD'S UPPER RIGHT TRIMPOT MAY BE TURNED CLOCKWISE JUST A SMALL AMOUNT. THIS WILL CAUSE THAT CHANNEL TO COMPRESS JUST A LITTLE MORE TO "CATCH-UP" WITH THE CHANNEL THAT IS LEADING INTO COMPRESSION.

AFTER THIS ADJUST IS MADE RAISE THE SOUNDTEK BACK TO THE +20DB POSITION. OBSERVE THE METER AGAIN AND SEE HOW CLOSE THE UNIT IS SIDE TO SIDE. THIS POT NEEDS TO BE SLIGHTLY ADJUSTED EACH TIME UNTIL THE UNIT LINES UP IN THE STEREO LINK.

MOVE THE SOUNDTEK BACK DOWN TO THE -20DB POSITION AND AGAIN MOVE THE THRESHOLD KNOB TO REALIGN THE NEEDLE TO 0DB. REPEAT THE +20DB POSITION AND THROW THE UNIT INTO LINK. ADJUST THE RIGHT TRIM SLIGHTLY AND RETURN TO -20DB. WHEN THE UNIT IS ALIGNED IN THE 2:1 RATIO THE NEXT STEP WILL BE TO ALIGN THE 4:1 RATIO.

4:1 ADJUSTMENT

1. PLACE THE SOUNDTEK AT 0DB.
2. ADJUST CL1 RATIO KNOBS TO 4:1.
3. ADJUST CL1 OUTPUT CONTROL SO THE SOUNDTEK'S RMS METER NEEDLE READS -2DB ON BOTH CHANNELS. THEN ADJUST THE THRESHOLD ON THE CL1 SO THAT THE SOUNDTEK NEEDLE COMPRESSES DOWN TO -3DB.

ADJUST THE SOUNDTEK TO +10DB. NEEDLE SHOULD MOVE TO AROUND 1.2DB ON THE RMS METER. ADJUST THE CL1 CONTROL BOARD LOWER LEFT POT TO GET THIS READING. DO THE SAME FOR BOTH CONTROL BOARDS.

VR205

ADJUST THE SOUNDTEK TO +20DB NOW AND PERFROM POT ADJUSTMENTS ON THE CL1 CONTROL BOARDS LOWER RIGHT POT. THE AIM POINT ON THE RMS METER FOR THIS IS ABOUT +2DB. PERFORM THESE +10DB AND +20DB POT ADJUSTMENTS UNTIL BOTH CL1 CHANNELS ARE EVEN. YOU WILL THEN BE CALIBRATED FOR STEREO IN THE 4:1 RATIO.

CL1 VU METER CALIBRATION

1. WITH NO SIGNAL RUNNING THRU THE CL1 (JUST TURN IT OFF ON THE SOUNDTEK BY PRESSING THE PUSHBUTTON) AND THE GR SWITCH IN THE "OUT" POSITION...ADJUST THE LEFT TRIM POT (OF THE THREE POTS THAT ARE IN FRONT OF THE METER BOARD) UNTIL THE NEEDLE ON THE CL1 VU METER IS AT "0" ...REPEAT FOR OTHER CHANNEL. VR252
2. NEXT IS THE -10DB CALIBRATION. RUN A SIGNAL THRU THE CL1, WITH THE CL1 ~~GR~~ METER SWITCH IN THE "GR" POSITION. ADJUST THE SOUNDTEK TO GIVE +10DB ON THE SIGNAL GENERATOR. TURN THE CL1 OUTPUT KNOBS ON EACH CHANNEL TILL THEY READ 0DB ON THE SOUNDTEK RMS METER. THEN...USING THE CL1 THRESHOLD CONTROL...COMPRESS THE SIGNAL TO READ -10DB ON THE SOUNDTEK RMS METER. THEN ADJUST THE MIDDLE POT ON THE CL1 CONTROL BOARD TO MAKE SURE THE CL1 VU METER READS -10DB. REPEAT FOR THE OTHER CHANNEL. VR253

"0" VU/+4DBM ADJUSTMENT

PUT THE CL1 GR IN THE "OUT" POSITION AND PLACE THE METER SWITCH IN THE "VU" POSITION. NOW, TURN THE SIGNAL GENERATOR ON THE SOUNDTEK DOWN TO -6 ON THE MIDDLE CONTROL...YOU WERE ALREADY IN THE +10 POSITION FOR THE LAST ADJUSTMENT...SO THIS PLACES THE SOUNDTEK AT A +4 LEVEL. NOW...ADJUST THE THIRD POT ON THE CL1 BOARD SO THAT THE CL1 VU METER READS "0" VU. DO THE SAME FOR BOTH CHANNELS.

SET UP

1. ADJUST THE SOUNDTEK SIGNAL GENERATOR TO +20DB.

2. ADJUST THE INPUT SENSITIVITY CONTROL TO +20DB.

3. SET THE RATIO CONTROL KNOB TO -80DB.

4. SET THE PUSHBUTTON CONTROLS ON THE SOUNDTEK TO "THD" MODE.

5. SET THE CL1 GR SWITCH TO "OUT"

6. SET THE METER SWITCH TO "VU"

7. SET THE CL1 SENSITIVITY SWITCH TO "LOW"

YOU WILL BE WATCHING THE RMS VOLTMETER ON THE SOUNDTEK AND LOOKING AT THE MIDDLE SCALE FOR A READING OF .4 OR LESS.

THE INPUT TUBE WHICH IS THE LEFT TUBE ON EACH TUBE BOARD IS THE ONE THAT YOU WILL START THE SELECTION PROCEDURE WITH. JUST LOOK AT THE METER READING...AND KEEP CHANGING TUBES UNTIL YOU GET THE THD READING AS LOW AS REQUIRED. NEXT DO THE SAME TO THE RIGHT TUBE ON EACH TUBE BOARD AND SEE IF THAT TUBE CHANGE GETS THE THD DOWN TO THE REQUIRED LEVEL. USUALLY...THE 12AX7 IN THE MIDDLE DOES NOT AFFECT THE THD VERY MUCH. YOU CAN VIEW THE THD ON EACH CHANNEL OF THE CL1 BY JUST SWITCHING THE AB BOX. Since there is no Hard bypass

TUBE HARMONIC DISTORTION/"CHERRYPICKING"
THE CL1 SHOULD BE SET UP SO IT HAS VERY QUIET TUBES AS FAR AS THD READINGS. WE LIKE THEM TO LEAVE THE FACTORY WITH A THD OF .004 OR LESS.

TABLE 5 : DECIBELS ABOVE AND BELOW REFERENCE LEVEL 1 mW INTO 600 OHMS

Note that the power holds for any impedance, but the voltage holds only for 600 ohms.

db down		Level	db up	
Volts	Milliwatts	dbm	Volts	Milliwatts
0.774 6	1.000	−0+	0.774 6	1.000
0.690 5	.794 3	1	0.869 1	1.259
0.616 7	.631 0	2	0.975 2	1.585
0.548 4	.501 2	3	1.094	1.995
0.488 7	.398 1	4	1.228	2.512
0.435 6	.316 2	5	1.377	3.162
0.388 2	.251 2	6	1.546	3.981
0.346 0	.199 5	7	1.734	5.012
0.308 4	.158 5	8	1.946	6.310
0.274 8	.125 9	9	2.183	7.943
0.244 9	.100 0	10	2.449	10.000
0.218 3	.079 43	11	2.748	12.59
0.194 6	.063 10	12	3.084	15.85
0.173 4	.050 12	13	3.460	19.95
0.154 6	.039 81	14	3.882	25.12
0.137 7	.031 62	15	4.356	31.62
0.122 8	.025 12	16	4.887	39.81
0.109 4	.019 95	17	5.484	50.12
0.097 52	.015 85	18	6.153	63.10
0.086 91	.012 59	19	6.905	79.43
0.077 46	.010 00	20	7.746	100.00
0.043 56	.003 16	25	13.77	316.2
0.024 49	.001 00	30	24.49	1.000W
0.013 77	.000 316	35	43.56	3.162W
0.007 746	.000 100	40	77.46	10.00W
0.004 356	3.16×10^{-5}	45	137.7	31.62W
0.002 449	1.00×10^{-5}	50	244.9	100W
0.001 377	3.16×10^{-6}	55	435.6	316.2W
0.000 774 6	1.00×10^{-6}	60	774.6	1 000W
0.000 435 6	3.16×10^{-7}	65	1 377	3 162W
0.000 244 9	1.00×10^{-7}	70	2 449	10 000W
0.000 137 7	3.16×10^{-8}	75	4 356	31 620W
0.000 077 46	1.00×10^{-8}	80	7 746	100 000W