

OPERATING MANUAL

FOR

REK-O-KUT

RE-EQUALIZER



PRICE: \$5.00

INSTRUCTIONS FOR OPERATION OF REK-O-KUT RE-EQUALIZER

INTRODUCTION:

Modern preamps are designed solely for today's microgroove, RIAA equalized recordings. In the 1950's, they included switches providing several different *RECORD COMPENSATIONS*. The more expensive units had two switches labeled *TURNOVER* and *ROLLOFF*. Turnover refers to the bass boost that must be applied to compensate for the diminishment of bass during record cutting to avoid crosscutting of the grooves. Rolloff refers to the treble loss to compensate for high frequency boost applied during record cutting. The benefit of the latter is a reduction of surface noise during play.

Before 1954, there were a variety of recording characteristics, such as AES, LP, NAB and FFRR. Most were used for a brief period, say between 1940 and 1954. Before 1940, most records were cut flat with only a low frequency turnover below from 300 Hz to 800 Hz. This also applied to broadcast transcriptions and Vitaphone-type recordings used before sound-on-film. So, if you play a pre-WWII 78 rpm record through a modern preamp, you are actually effectively playing it with a scratch filter whose cutoff begins at 2200 Hz. This accounts for the lack of highs and slightly muffled voices experienced with these records.

One way of dealing with the equalization problem is to use a graphic equalizer, but it is very difficult to get accurate results by this method. Another way of dealing with the record compensation problem is to modify your modern stereo preamp with an equalization switch for both RIAA and other compensations, but it may spoil the cosmetics of your \$1800 preamp.

There is also the problem of what to do with recordings of vintage discs made off of modern RIAA phono amplifiers. They will suffer from the frequency response distortion caused by the RIAA amplifier and they cannot be played through the phono input of a properly equalized preamp.

The *RE-EQUALIZER* solves this. It is used after the RIAA phono stage, and connects to the system like a common graphic equalizer. It will then compensate any signal source for proper equalization. The *RE-EQUALIZER* allows the use of any phono amplifier and will not degrade the performance of any audiophile unit.

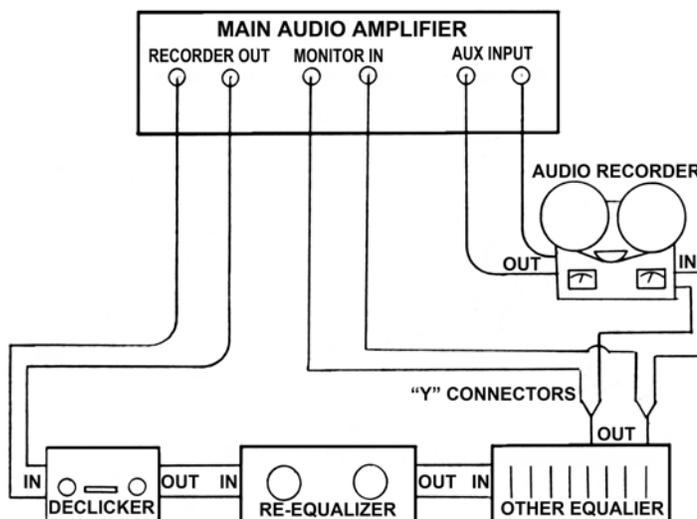
CONNECTION:

The *RE-EQUALIZER* should be connected to the stereo system just like any other auxiliary sound processing component. De-clickers, such as the Packburn 323 or Esoteric Sound *SURFACE NOISE REDUCER*, must always precede the *RE-EQUALIZER*. If tape recording is not used, connect the *RE-EQUALIZER* in the tape monitor path. If tape recording is desired, connect the *RE-EQUALIZER* in the tape monitor path (Fig. 1) and use a "Y" connector to feed its (or associated equipment's) output to an unused "Aux" input. Tape playback will be via this "Aux" input. With the tape monitor switched in, you will hear via your speakers the sound that is being processed.

If your preamp/amp/receiver does not have a separate "Aux" input, eliminate the "Y"

ONE POSSIBLE CONNECTION ARRANGEMENT

This one assumes 3 audio devices and an audio recorder



connectors and connect directly into the recorder, and connect the recorder's output to the amp's "Tape In." Then for normal listening of Re-Equalized or otherwise processed sound monitor the tape recorder. If the tape recorder has a "Monitor" switch, it must be in "Source" to do this.

CONTROLS:



The front panel has three controls: Turnover, Rolloff, and Bypass. The Turnover has eight positions: FLAT, 300 Hz, 400 Hz, RIAA, Lp, 629 Hz, 800 Hz, and 1000 Hz. The Rolloff also has eight positions: FLAT, -5 db, BBC, -8 dB, -10 db, -12 db, RIAA, and NAB. The BYPASS switch provides a hard wire connection from input to output with no intervening circuitry. When switched to "IN," the two inputs are connected together providing mono operation. This reduces some noise and facilitates recording.

Turnover (FLAT) - Can be used with acoustical 78 rpm records and cylinders. Then use graphic EQ for best sounding bass. Acoustic recording bass compensation is highly subjective. Suggest you use 300.

Turnover (300 Hz) - This is used for Columbia brand and manufactured electrical 78 records, London FFRR 78s, BBC broadcast transcriptions, many pre-WWII records & transcriptions, early Western Electric products. Also, it is useful for improving bass on acoustical records.

Turnover (400 Hz)(AES) - Some post-WWII 33s, 45s, 78s using the AES characteristic.

Turnover (500 Hz)(RIAA) - Most post-1935 US 78s, broadcast transcriptions and also for Orthoacoustic and NAB transcriptions.

Turnover (500 Hz, modified)(LP) - For early Columbia and some other LPs. 100Hz rumble shelf.

Turnover (629 Hz) - Used with some early electrical 78s, some 1931 vintage Victor LPs.

Turnover (800 Hz) - Used mostly by RCA for early RCA-Victor 1950s LPs and 45s.

Turnover (1000 Hz) - Used with many old 78s, 45s, BBC microgroove LPs, provided there is a sharp rumble filter.

Rolloff (0dB)(FLAT) - For acoustical records and all early (pre-1938) electrical 78s and transcriptions. A low-pass (scratch) filter is useful in conjunction with this setting.

Rolloff (-5 dB) - This is for a -5 db drop at 10 KHz. Used for some post-1938 78's, FFRR 78s, or to soften noise on early recordings.

Rolloff (BBC) - A setting for late 1940s, early 1950s BBC transcriptions. Approx. 2 dB per octave.

Rolloff (-8dB) - This is for a -8 db drop at 10 KHz. Mostly for early RCA-Victor LPs.

Rolloff (-10 dB) - Used for some post-1938 78s, early LPs, such as London.

Rolloff (-12 dB)(AES) - This is used for some post WWII records employing the AES characteristic.

Rolloff (-13.7 dB)(RIAA) - For most modern records.

Rolloff (-16 dB)(NAB) - For early Columbia LPs and all NAB and Orthoacoustic transcriptions.

RECOMMENDED SETTINGS (see tables):

These are recommendations, but not written in stone. As documentation of recording curves is difficult to track down, some experimentation may be called for. Be particularly observant of matrix numbers surrounding the label area and record labels for dating records.

Tables for record compensation settings were published in most early hifi magazines ("Dialing You Discs" in *High Fidelity*) but are often fallacious. These turn up occasionally and may be consulted. In "Conversations With Toscanini," by B. H. Haggin, many subjective suggestions are given for playback of Toscanini discs.

HINTS ON USE:

One advantage of the *RE-EQUALIZER* is the ability to use it on tape recordings of vintage records made with RIAA equalized preamps. Do not trust all transcription and record labels. Also, many small recording company and radio station engineers seemingly didn't understand the technology and often employed no pre-emphasis on recordings labeled as NAB. This has been found to occur even on discs cut in the 1960's! Many pre-WWII radio shows which were recorded with flat highs were re-syndicated again in the late 40's and 50's. As original masters were normally used, the re-release will require a flat Rolloff even though the label states NAB or Orthoacoustic! This is also true for post-WWII 78s. Play LP reissues of 78s, as on RCA Bluebird, with the Flat Rolloff position and you will be in for a pleasant surprise.

You may find many discs that do not fit the tables or are ambiguous. For these, you will have to let your ear be your guide. Western Electric, Columbia, and non-US companies tended to use 300 Hz Turnover. Listening to the material will often suffice to impress you whether to use 300 Hz or 500 Hz. Once the low end is determined, try various Rolloffs. Almost all early electrical recordings were recorded with flat response. If noise proves a problem try more than the recommended Rolloff.

When playing older or abused records that require less Rolloff, i.e., Flat, -5, -8, a significant increase in noise level will often be noticed due to surface noise. In these cases, a high frequency, lo-pass, hi-cut, or "scratch" filter is recommended. Don't forget that when playing a flat cut record with an RIAA preamp, you are actually effectively using a scratch filter that is some 13.7 db down at 10 KHz. With these types of records, with let's say a 7.5 KHz scratch filter and the *RE-EQUALIZER* set to FLAT, you will be gaining in highs between 2.2 KHz and 7.5 KHz. Although the scratch filter is employed, its use with the *RE-EQUALIZER* may result in significantly more highs than with a standard RIAA preamp and no filter.

When playing vertical-cut records, such as Edison or Pathe, switch one pair of leads (non-earth ground) of a stereo cartridge used for play. If not done, the channels will largely cancel when the *RE-EQUALIZER* is switched to "IN," resulting in very low volume.

Most commercial, pre-RIAA records had matrix numbers that were of larger, often cursive fonts, and were raised from the surface. Their characters appeared to be made with punches. Most RIAA discs had smaller, more Arial fonts and appeared to be etched into the surface. You can use a toothpick and magnifying glass to help determine this.



LONDON/DECCA OLDER MATRIX



LONDON/DECCA NEWER MATRIX

The photos above are of British London/Decca LPs made circa 1954. The left matrix number has the raised, large font commonly associated with RIAA/-10 dB equalization. The right matrix number, ARL-1425, would ordinarily indicate an earlier equalization; however, it has the engraved into font associated with RIAA/RIAA equalization. Also, note the "R." That signifies remastered for RIAA.



US DECCA OLDER MATRIX



US DECCA NEWER MATRIX

US Decca has a similar distinctive matrix identification. Also note the higher "Take Number," or "Stamper Number." Usually, smaller Take Numbers are associated with pre-RIAA records. The record on the left requires 800/-8 dB equalization in order to make it sound like the RIAA on the right.



US COLUMBIA OLDER MATRIX

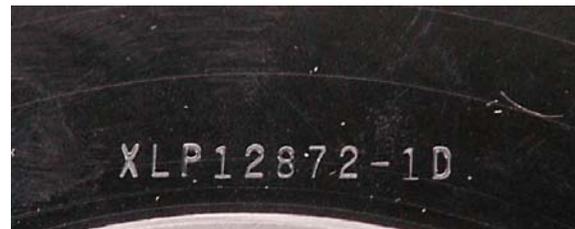


US COLUMBIA NEWER MATRIX

US Columbia follows similarly. Note that both matrix numbers are the same. The RIAA issue, however, has smaller Arial font, and also larger Take Numbers.



US COLUMBIA OLDER MATRIX (Version 2)



US COLUMBIA NEWER MATRIX

Sometimes font characterization is not enough. Above, only the take number and label are different.



Labels can tell a lot about a record's age. These US Decca labels are from the same recording of show music. On the left is the earlier, pre-RIAA version. On the right is the later, RIAA version. However, this is not a guarantee of a records age, but one of several indicators. It was the Matrix Numbers that confirmed this equalization choice.

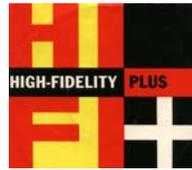




Although the label on the left is the older label, only one side of this record is pre-RIAA. The matrix number font and Take Number was the give away. With US Decca, one can expect pre-RIAA only up to and including T3.



Below are two common Columbia LP labels. Both of these labels have appeared on records that were either "LP curve" or RIAA. The blue label was almost exclusively used during the pre-RIAA era. The "6-Eyes" label appeared as Columbia switched to RIAA. Almost all are RIAA. You will sometimes find records with LP EQ on one side and RIAA on the other. You must check the matrix number for absolute certainty.



During the Columbia transition to RIAA, they reissued records with a "HIFI Plus" sticker to indicate an RIAA release. The labels were often the old blue at the left.



Lastly, are a pre-RIAA RCA label on the left and an RIAA label on the right. However, you must check matrix numbers. The remaining records in this Beethoven set were all RIAA. This set was issued during RCA's transition to RIAA. Try to find preponderance of EQ indicators.



SPECIFICATIONS:

Max input signal level:	3.5 volts (+12 dbm)
THD at max output :	0.02%
Frequency Response (RIAA compensation):	20 - 20 KHz ± .5 db
Gain:	1
Signal-to-Noise relative max out:	85 db

HELP SET THE RECORD STRAIGHT

If you have any additional equalization information, please bring it to our attention so that it can be included in future updates.

****** WARRANTY ******

This unit is warranted to perform properly for one year from date of purchase. All parts and labor are covered. Should the unit malfunction, return it properly packed, and with payment of \$12.00 to cover return postage, and it will be repaired and returned as soon as possible.

Foreign purchasers are requested to remove the *RE-EQUALIZER* from its cabinet (if purchased) and return the unit along with payment of \$40.00 via surface shipping. We will return the unit via the same process.

PHONOGRAPH RECORD EQUALIZATION COMPENSATION SETTINGS

MANUFACTURER	SPEED	BASS (TURNOVER)	TREBLE (ROLLOFF)
Acoustic records*	All	300	FLAT
AFRS Transcriptions	33	RIAA	FLAT
1944 Some or if NAB Stated		RIAA	NAB
12" Transcriptions		1000	FLAT
Allegro	33	Lp	NAB
Allied	33	RIAA	NAB
American Recording Society (<E2KP9607)	33	RIAA	-12
Angel (2XEA213-392/XAX561-817)(1N,2N)	33	RIAA	FLAT
Arizona (up till 1955)	33	400	-12
Artist	78	RIAA	NAB
Atlantic	33	RIAA	NAB
Audiophile	33	RIAA	-12
	78	400	FLAT
Autograph (Marsh electrical)	78	1000	FLAT
Audio Fidelity (901-903)	33	RIAA	NAB
Bach Guild (501-529)	33	Lp	NAB
Balkan	78	500	-5
Banner (up to 10002)	33	Lp	NAB
Bartok	33	Lp	NAB
(301-307, 309, 906-920)	33	629	NAB
Berliner*	71.29	300	FLAT
BBC Transcriptions (1930-1949)(<50000)	All	300	FLAT
(1949-1953)(>70000)	All	300	BBC
("P" matrix) (1954-1956)	33	400	-10
("R"matrix)(<1961)(<105403)LP-cut	33	1000	FLAT
Bluebird	All	See RCA-Victor	See RCA-Victor
Blue Note	33	400	-12
Boston (up to B202)	33	Lp	NAB
Brunswick (1925)	78	300	FLAT
(1946-1954)	78	629	-12
(up to MG4400)(w/raised matrix)**	33	800	-8
Caedmon	33	629	-12
(1001-1022)	33	629	NAB
Canyon (to C6160)	33	400	-12
Capitol<1954	78	800	-10
<1954	45	800	-12
(FDS) (up to P8155)	33	400	-12
(1953,FDS>8156)	All	RIAA	RIAA

MANUFACTURER	SPEED	BASS (TURNOVER)	TREBLE (ROLLOFF)
Capitol-Telefunken	78	RIAA	FLAT
Capitol-Cetra (up to A-50155)(9/53)#	33	400	-12
Cetra-Soria	33	Lp	NAB
Colosseum	33	400	-12
Some Long Operas	33	1000	-5
Columbia-1925	78	300	FLAT
Columbia-1938	78	300	-5
Columbia-1948	78	300	NAB
Columbia-1948*	45	RIAA	NAB
Columbia-1948 (up to ML4895, XLP3200)#	33	Lp	NAB
Columbia-1954 (after XLP3200 matrix)#	All	RIAA	RIAA
Columbia with "HIFI+" sticker **	All	RIAA	RIAA
Columbia(English) (1925-53)	78	300	FLAT
1949-1953 (XA561-XAX817-1N,2N only)	33	RIAA	FLAT
Contemporary	33	400	-12
Concert Hall	78	RIAA	-5
(XTV matrix to 20383)(low take nos)	33	Lp	NAB
(E0 matrix)	33	800	-8
(E1KP/E2KP matrix)	33	RIAA	-12
(CH matrix?)	33	RIAA	-10
(E2RP>4095/E2KP>9607)	33	RIAA	RIAA
Contemporary (3501, 2501/2/5/7, 2001/2 (2504)	33	400	-12
(after AP121)	33	RIAA	NAB
	33	RIAA	RIAA
Cook	33	RIAA	-12
(binaural-inside band)	33	RIAA	FLAT
Coral (1946-1954)	78	629	-12
(up to MG4400)(w/raised matrix)**	33	800	-8
Cylinder records*	All	FLAT	FLAT
Decca (US)(pre 1946)	78	300	FLAT
(1946-1954)	78	629	-12
(up to MG4400)(w/raised matrix)**	33	800	-8
Decca-English	78	300	FLAT
FFRR(1944)(<DR8485-2)	78	300	-5
FFRR (after 6/50)***	33	RIAA	FLAT
(>ARL1186-1B)***	33	RIAA	-10
(>ARL2530-2A)***#	33	RIAA	RIAA
DGG (Deutsche Grammophone)	33	Lp	-10
	78	300	-5
Dial	33	Lp	NAB
	45/78	Lp	NAB
Edison	80	FLAT	FLAT
Electra (2-15, 18-20, 24-26)	33	629	NAB
(17, 22)	33	400	-12
(16, 21, 23, 24)	33	RIAA	RIAA
Electrical 78's (general) (1925-1938)	78	300	FLAT
1932-1938	78	300/RIAA	FLAT
1938-1946	78	300/RIAA	FLAT, -5
1947-1954	78	300/RIAA	NAB

MANUFACTURER	SPEED	BASS (TURNOVER)	TREBLE (ROLLOFF)
Electrola	78	800	-10
EMI (1931-53)	78	300	FLAT
1949-53 (2XEA213-392/XAX561-817) (1N,2N)	33/45	RIAA	FLAT
7/17/53	33/78	RIAA	RIAA
EMS	33	400	-12
Epic	33	Lp	NAB
Esoteric (ES500, 517, EST5, 6)	33	400	-12
(E2KP to 9607)		RIAA	-12
European 78's (general)	78	300	-5
Festival	33	Lp	NAB
Folkways	33	Lp	NAB
Fraternity Records (up to F-1013)	33	RIAA	FLAT
Good Time Jazz (3, 9-19)	33	400	-12
(1, 5-8)	33	RIAA	-16
Gramophone Company	78	300	FLAT
Handel Society	33	Lp	NAB
Haydn Society (<XTV20383, HS3062, HS80)#	33	Lp	NAB
Hit Of The Week	78	RIAA	-5
Home recordings	33/78	RIAA	-5
HMV(English)			
1925-1953	78	300	FLAT
1949-1953 (2XEA213-392 -1N,2N only)	33	RIAA	FLAT
HMV(American-1951)	33	RIAA	-12
Improved Record (Eldridge R. Johnson)*	71.29	FLAT	FLAT
Kapp (100-103,1000,1001)	33	800	NAB
Kendall	33	RIAA	NAB
Keynote	78	RIAA	FLAT
King	78	RIAA	NAB
Linguaphone	78	300	FLAT
L'Oiseau-Lyre (up to OL50018)#	33	Lp	-10
London (pre 1944)	78	300	FLAT
FFRR (1944)(<DR8485-2)	78	300	-5
FFRR (after 6/1950)***	33	RIAA	FLAT
(>ARL1186-1B)***	33	RIAA	-10
(>ARL2530-2A)***#	33	RIAA	RIAA
Lyricond (before 1953)(E0-E3 matrix)	33	400	-12
(XTV matrix)	33	Lp	NAB
(If 629 listed on jacket)	33	629	NAB
Majestic	78	RIAA	NAB

MANUFACTURER	SPEED	BASS (TURNOVER)	TREBLE (ROLLOFF)
Marsh Laboratories (electrical)	78	1000	FLAT
Mercury (MG10000 series-approx fit)	33	500	-10
(thru 10/54, <MG50026, 7000)#	ALL	400	-12
MGM (up to E3071)#	All	RIAA	-12
Montilla	33	RIAA	-12
Musicraft	78	800	RIAA
NAB/NARTB transcriptions	33/78	RIAA	NAB
vertical transcriptions	33/78	400	NAB
New Records	33	RIAA	-12
Nocturne (LP 1-3, 5, XP 1-10)	33	400	-12
Oceanic (up to XTV20383)(low take nos)	33	Lp	NAB
Odeon	33	300	-10
some early electrical	78	800	FLAT
pre-1953)	78	300	FLAT
Okeh(electrical)	78	300	FLAT
Orthoacoustic transcriptions	33/78	RIAA	NAB
Overtone (up to XTV20383)(low take nos)	33	Lp	NAB
Oxford	33	Lp	NAB
Pacific Jazz (1-13)	33	400	-12
Parlophone			
1925-1953	78	300	FLAT
1949-1953	33	500	FLAT
Period (up to 576)#	33	RIAA	NAB
Philharmonia	33	400	-12
Polydor	33	300	-10
	78	300	-10
Polymusic	33	RIAA	NAB
binaural-inside band	33	RIAA	FLAT
Rachmaninoff Society	33	Lp	NAB
RCA-Victor			
Early Acoustics*	71.29	300	FLAT
Later Acoustics*	76.59-78	300	FLAT
1925	78	300	FLAT
1931(Program Transcription)	33	800	FLAT
1935	78	300/RIAA	-5
1938-1954	78	RIAA	-8
1954 (New Ortho only)	78	RIAA	RIAA
1930-50 (European)	78	300	FLAT
1949 (D9 to EOLRC3980)#	33/45	800	-8
1950-8/52 (>EOLRC3981)#	33/45	RIAA	-12
8/52(New Orthophonic)(>E2RP4094)	33/45/78	RIAA	RIAA
Remington (up to 199-135)#	33	RIAA	NAB

MANUFACTURER	SPEED	BASS (TURNOVER)	TREBLE (ROLLOFF)
Riverside	33	400	-12
Renaissance	33	Lp	-12
Stradivari	33	Lp	NAB
Supraphone	78	400	FLAT
Technicord	78	800	-12
Telefunken	78	400	-5
Tempo	33	RIAA	NAB
Transcriptions(many pre-WWII)	33/78	RIAA	FLAT
(vertical-old)	33	300	-5
(vertical-NAB)	33	400	NAB
Transradio	33	Lp	NAB
Ultraphone	33/78	400	FLAT
Urania-old (up to XTV20383)(low take nos)	33	Lp	NAB
later (<E2KP9607)	33	RIAA	-12
late 1954 (>E2KP9607)	33	RIAA	RIAA
Vanguard (411-422, 6000-6018, 7001-7011, 8000-8004,(up to XTV20383)	33	Lp	NAB
Vox (up to XTV20386), PL8400)#	33	Lp	NAB
War Department-Special Services - 12"	33	800	-5
Westminster (EO matrix)	33	800	-8
(up to E2KP9607)	33	RIAA	-12
(up to XTV20383)(low take nos)	33	Lp	NAB
Victor	All	See RCA-Victor	See RCA-Victor
Vitaphone(motion picture)	33	300	FLAT
Vocalion(electrical)	78	300	FLAT
Western Electric(early transcriptions)	33	300	FLAT
Zonophone	78	300	FLAT
(early)*	71.29	300	FLAT
RIAA, Ortho, New Ortho, New NARTB, New AES used on recordings since 1955	All	RIAA	RIAA

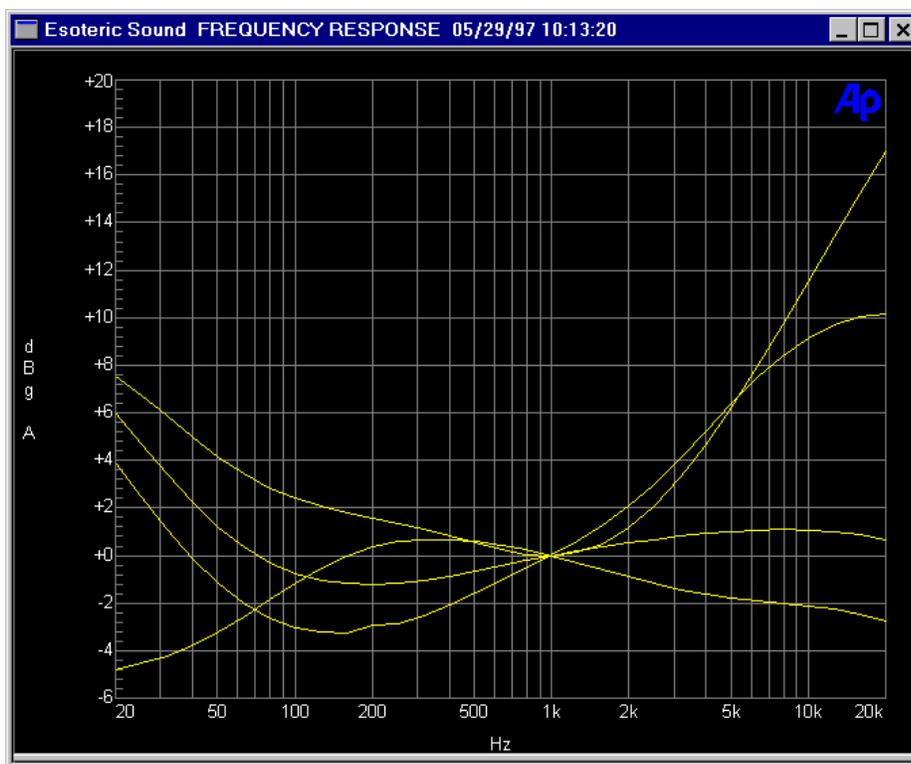
Notes:

- * On some recordings with very thin bass, such as 45 rpm EP's and acoustics, 800 or 1000 Hz Turnover may be used with appropriate rumble filter.
- ** Sometimes, one side has old matrix number, the other new. There are two Eqs.
- *** Only for non-"R" matrix with punched, large-font, raised matrix numbers.
- # These are approximate record numbers circa adoption of RIAA

Sources:

Letter from E.C. Forman to John M. Kaar, 1935.
Drawing KRD-1384, from letter of H. I. Reiskind of RCA to John M. Kaar, 12-10-49.

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 Preamplifier Switching and Equalizing Unit for Critical Listening, M. V. Kiebert, Audio, 1952.
 Professional Equalizing-Preamp Suitable for Home Use, K. W. Betsh, Audio, 1957.



FREQUENCY RESPONSE OF *RE-EQUALIZER* FOR VARIOUS SETTINGS OF TURNOVER AND ROLLOFF

Esoteric Sound
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