

OCT 25, 1963

LETTER TO IVOR DARREG AND JOHN CHALMERS FROM ERVIN WILSON

I KNOW ITS A DRAG, BABYS, TO BE BROUGHT DOWN BY PSEUDO-ERUDITE (LIKE, DOUBLE-WCW, YOU KNOW WHAT I MEAN) RANTINGS ON MANTISSI OF LOGS BASE 2 and all THAT JAZZ---WHEN ALL WE REALLY WANT TO DO IS MAKE WAY OUT SOUNDS. BUT THERE IS A LITTLE DIRTY WORK TO BE DONE BEFORE WE CAN ALL GET STONED ON HARMONICS, SO HERE WE GO---LIKE A HERD OF TURTLES, UGH!

A DOUBLE-PEDANTIC LITTLE PAPER ON SYSTEM TO INTERVAL EFFICIENCY

EFFICIENCY IS MEASURED BY THAT FRACTION OF THE SYSTEM-UNIT-INTERVAL WHICH DESCRIBES THE DIFFERENCE BETWEEN THE ABSOLUTE INTERVAL, EXPRESSED IN TERMS OF THE SYSTEM, AND ITS SYSTEM-INTERVAL EQUIVALENT. MAYBE I'D BETTER ILLUSTRATE: THE ABSOLUTE VALUE OF 7 (OR  $7/4$ ) IS .807355 (MANTISSA  $\log_2$  of 7). THIS VALUE MAY BE EXPRESSED IN TERMS OF THE 5-TONE SYSTEM SIMPLY BY MULTIPLYING IT BY 5;  $5 \times .807355 = 4.037$ . THE SYSTEM-INTERVAL EQUIVALENT OF IS THEN SEEN, BY ROUNDING OFF, TO BE 4 (DEGREES). THE DIFFERENCE IS .037. I.E.  $7/4$  EXPRESSED IN 5T OCCURS ON THE 4TH DEGREE AND IS -.037 UNIT-INTERVAL DEFECTIVE OF THE ABSOLUTE  $7/4$ , 4.037.

IT HAS BEEN TRADITIONAL TO EVALUATE & GRADE THE VARIOUS SYSTEMS IN TERMS OF THE ACOUSTICAL ACCURACY OF THE 3 AND 5 IDENTITIES. IN VIEW OF CERTAIN TRENDS AND PRACTICES BY THE (DEFINITELY) LUNATIC FRINGE, IT IS, QUITE POSSIBLY, NOT INADVISEABLE, TO RE-EVALUATE THE ENTIRE GAMUT OF SYSTEMS FOR THE IDENTITIES AT LEAST THROUGH 13. WHILE ACOUSTICAL ACCURACY REMAINS PERTINENT, GRADING THE SYSTEMS ON THEIR APPROXIMATIVE EFFICIENCY, IN TERMS OF EACH SYSTEM INVOLVED, GIVES US VERY MUCH USEFUL INFORMATION. ESPECIALLY WHEN WE GET RIGHT DOWN TO COMPOSING IN THAT SYSTEM.

BARBOUR, FOR EXAMPLE, MENTIONS THAT THE FIFTHS OF 50T HAVE ABOUT THE SAME VALUE AS THE FIFTHS OF 31T. IN RELATION TO THEIR RESPECTICTIVE SYSTEMS, HOWEVER, THE FIFTH OF 50T HAS A DEFECT OF -.250 UNIT-INTERVAL, WHERE THE FIFTH OF 31T HAS A DEFECT OF -.134 UNIT-INTERVAL. THE 31T FIFTH IS SIGNIFICANTLY MORE EFFICIENT. LET US CARRY THE 50T FIFTH 2 PLACES AND IT HAS A DEFECT OF -.500 UNIT-INTERVAL; ITS MEANING IS ALREADY MELODICALLY AMBIGUOUS IN THAT SYSTEM. CARRYING IT 4 PLACES, IT HAS A DEFECT OF -1.000 UNIT-INTERVAL; A DEFINITE CONFLICT IN MEANING IS SET UP. THAT IS, IN 50T A WOULD-BE PYTHAGOREAN MAJOR THIRD EXISTS WHICH HAS NO MEANINGFUL RELATION TO THE FIFTH. AT BEST THIS IS A WASTEFUL CONDITION. AT WORST THIS COULD HAVE A DISINTEGRATING EFFECT ON THE STABILITY OF THE SYSTEM.

THE SAME SORT OF THING OCCURS WITH THE MAJOR THIRD OF 36T (WHICH IS, I ASSURE YOU, AS ACOUSTICALLY ACCURATE AS THE M3 OF 12T) WITH ITS DEFECT OF PLUS 0.41 CARRIED 2 PLACES BECOMES PLUS 0.82 UNIT-INTERVAL DEFECT. IN OTHER WORDS, TO BE CONSISTANT, THE AUGMENTED FIFTH  $25/16$  would BE TAKEN ON THE 24TH DEGREE OF THE 36T SYSTEM (TWICE THE DEGREES TAKEN FOR THE MAJOR THIRD  $5/4$ ). IF WE DO THIS WE END UP 0.82 UNIT-INTERVAL SHARP, WHICH IS MILDLY PARADOXICAL CONSIDERING A PERFECTLY GOOD REPRESENTATION OF THE  $25/16$  OCCURS ON THE 23RD DEGREE;  $36 \times 2 \times .3219$  equals 23.177.

THESE INSIDIOUS CONFLICTS OF MEANING GO ON AND ON, DISGUISED FREQUENTLY IN SUBTLE AND BEGUILING FORM, AND BECOME EXTREMELY FRUSTRATING TO TRY TO WORK WITH, ESPECIALLY AS THE DEFECT OF THE INTERVAL INVOLVED GETS UP AROUND .300 UNIT-INTERVAL OR MORE. ITS IMPOSSIBLE TO AVOID THEM COMPLETELY IN EQUAL SYSTEMS, BUT IT IS BEST TO AVOID THEM AS MUCH AS POSSIBLE.

IN THE ACCOMPANYING TABLE OF SYSTEMS TO ABSOLUTE VALUE, EFFICIENCY COMPARISONS, THE SPECTRUM OF SYSTEMS HAS BEEN RUTHLESSLY CENSORED TO INCLUDE, PRIMARILY, THOSE HAVING FIFTHS  $3/2$  WITH A UNIT-INTERVAL DEFECT OF .200 or LESS (15T, 27T, 80T EXCEPTED). THIS IS INCLUDES THE FOLLOWING SERIES':

MINUS SERIES	7 + 12N	TO 67
EQUAL SERIES	12N	TO 120
PLUS SERIES	5 + 12N	TO 113
DOUBLE-PLUS SERIES	10 + 12N	TO 118
TRIPLE-PLUS SERIES	15 + 12N	TO 111
TETRA-PLUS SERIES	20 + 12N	FROM 80 TO 116

IF WE WERE TO CENSOR THE REMAINING IDENTITIES AS SEVERELY AS THE 3, WE WOULD END UP WITH NO 13-LIMIT SYSTEM AT ALL. REGARDLESS OF HOW THE THEORIST GRADES THE REMAINING IDENTITIES, MAY I INVITE HIS ATTENTION TO THE EFFICIENCY OF THE FOLLOWING SYSTEMS: 22 31 41 46 53 72 87 94 118 AND POSSIBLY 63.

ABOUT READING THE TABLE: 53, for EXAMPLE; BY READING ACROSS THE SHEET FROM 53 one MAY SEE, BY ROUNDING OFF, THAT THE SYSTEM VALUES FOR

3	5	7	9	11	13 ARE
31	17	43	9	24	37 DEGREES RESPECTIVELY
-.003	-.062	+.021	-.006	-.350	-.123 UNIT INTERVAL DEFECT

THE GREATEST ACCUMULATED DEFECT OCCURS BETWEEN 7 (+.021) AND 11 (-.350) a TOTAL OF .371 or -.371 FOR THE 11/7, which IS NOT TOO GOOD, AT LEAST NOT ON PAPER. WORSE IS THE DIRECT DEFECT OF -.350 for THE SIMPLER, AND DYNAMICALLY ACTIVE INTERVAL 11/8.

AGAIN, AN EXAMPLE OF A WORSE CONDITION: IN 87T THE 7 HAS A UID (UNIT-INTERVAL DEFECT) OF -.240 AND THE 9 HAS A UID OF +.217, TOTAL UID FOR 9/7 BEING +.457, OR, SUPERIMPOSING THE 9/7 TO 81/49 (IF THAT INTERVAL WILL BE EVER APPRECIATED) A UID OF +.914. BECAUSE OF THE COMPLEXITY OF THIS INTERVAL AND THE SMALLNES OF THE UNIT-INTERVAL THIS DEFECT OF ALMOST ONE DEGREE WILL PROBABLY REMAIN A PAPER PROBLEM. UNLESS WE ASTOUND OURSELVES BY ACTUALLY APPRECIATING THE 81/49 AND DISCOVER THAT WE CAN SUSTAIN AN 87 TONE PSYCHOLOGICAL GESTALT; IN WHICH CASE CONFLICT OF MEANING WOULD RESULT. IT IS MY WILD GUESS THAT 41T BUT NO SYSTEM ABOVE THAT HAS SUFFICIENT ARTICULATION AND AUTO-REENFORCEMENT TO BE SUSTAINED BY THE PSYCHE AS A SIMULTANEOUS TONAL GESTALT. IN THIS SENSE, 41T IS QUITE POSSIBLY AN ULTIMATE SCALE (IN DISTINCTION TO SYSTEM). BUT I'M DRIFTING FROM THE SUBJECT.

I WONT WRITE A BOOK RIGHT NOW. THE OBJECT HAS BEEN TO BRING CERTAIN PROBLEMS UP TO DATE, AND TO GET A BROAD VIEW AT CERTAIN RELEVANT PARAMETERS OF SOLUTION.

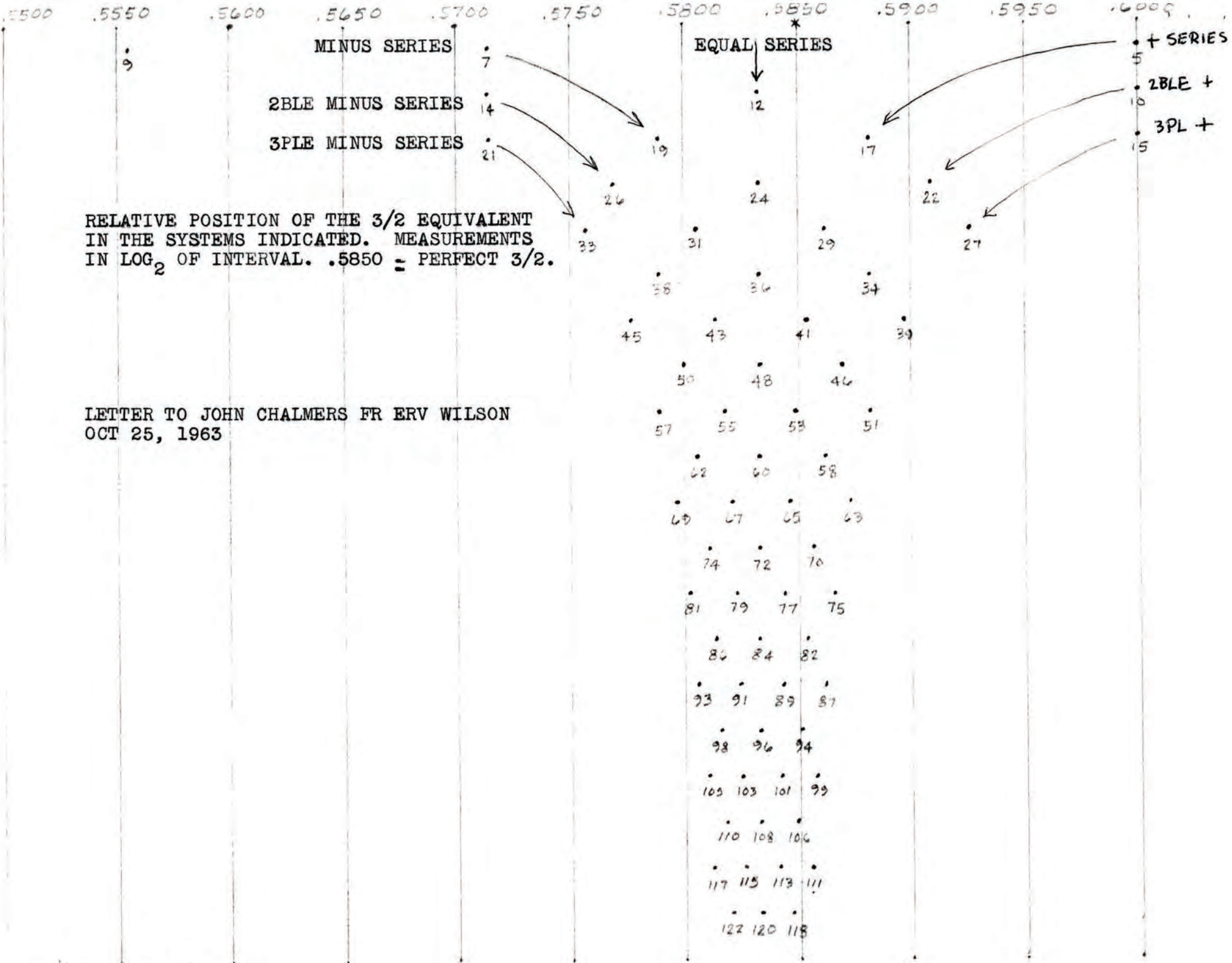
SINCERELY YOURS,

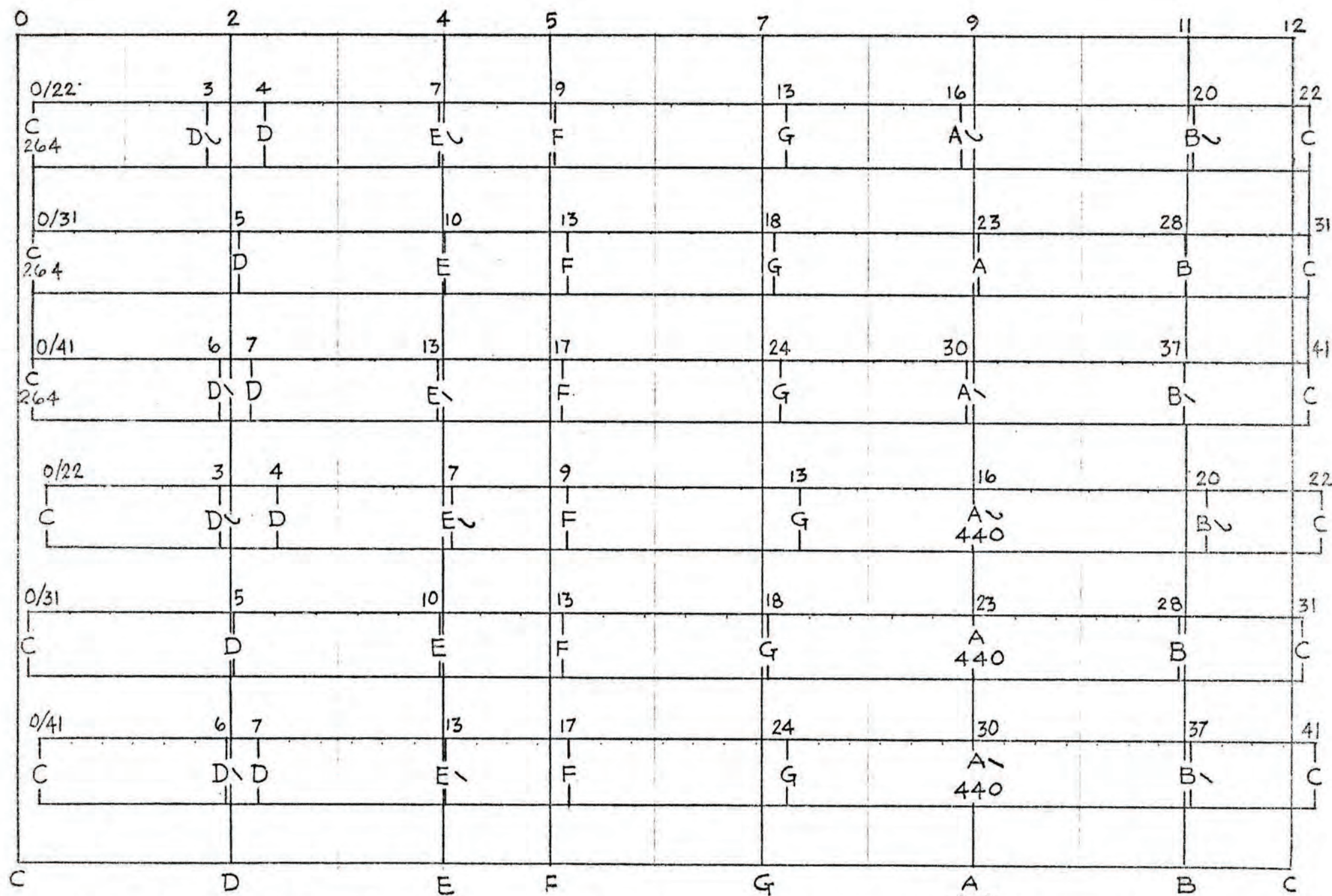
ERV

3 5 7 9 11 13  
 (.5849625) (.321928) (.807355) (.169925) (.459432) (.700440)

5	2.925	1.610	4.037	0.850	2.297	3.502
7	4.095	2.253	5.651	1.189	3.216	4.903
10	5.850	3.219	8.074	1.699	4.594	7.004
12	7.020	3.863	9.688	2.039	5.513	8.405
15	8.774	4.829	12.110	2.549	6.891	10.506
17	9.944	5.473	13.725	2.889	7.810	11.907
19	11.114	6.117	15.340	3.228	8.729	13.308
22	12.869	7.082	17.762	3.738	10.108	15.409
24	14.039	7.726	19.376	4.078	11.026	16.810
27	15.794	8.692	21.798	4.588	12.405	18.912
29	16.964	9.336	23.413	4.928	13.324	20.313
31	18.134	9.980	25.028	5.268	14.242	21.714
34	19.889	10.946	27.450	5.777	15.621	23.815
36	21.159	11.589	29.065	6.117	16.540	25.216
39	22.814	12.555	31.487	6.627	17.918	27.317
41	23.983	13.199	33.102	6.967	18.837	28.718
43	25.153	13.843	34.716	7.307	19.756	30.119
46	26.908	14.809	37.138	7.816	21.134	32.220
48	28.078	15.452	38.753	8.156	22.053	33.621
51	29.833	16.418	41.175	8.666	23.431	35.722
53	31.003	17.062	42.790	9.006	24.350	37.123
55	32.173	17.706	44.404	9.346	25.269	38.524
58	33.928	18.672	46.826	9.856	26.647	40.625
60	35.098	19.316	48.441	10.196	27.566	42.026
63	36.853	20.281	50.863	10.705	28.944	44.128
65	38.022	20.925	52.478	11.045	29.863	45.529
67	39.192	21.569	54.093	11.385	30.782	46.929
70	40.947	22.535	56.515	11.895	32.160	49.031
72	42.117	23.179	58.130	12.235	33.079	50.432
75	43.872	24.145	60.552	12.744	34.457	52.533
77	45.042	24.788	62.166	13.084	35.376	53.934
80	46.797	25.754	64.588	13.594	36.754	56.035
82	47.967	26.398	66.203	13.934	37.673	57.436
84	49.137	27.042	67.818	14.274	38.592	58.837
87	50.892	28.008	70.240	14.783	39.970	60.938
89	52.062	28.651	71.854	15.123	40.889	62.339
92	53.816	29.617	74.277	15.633	42.268	64.440
94	54.986	30.261	75.791	15.973	43.187	65.841
96	56.156	30.905	77.506	16.313	44.105	67.242
99	57.911	31.871	79.928	16.822	45.484	69.343
101	59.081	32.515	81.543	17.162	46.403	70.744
104	60.836	33.480	83.965	17.672	47.781	72.846
106	62.006	34.124	85.580	18.012	48.700	74.247
108	63.176	34.768	87.194	18.352	49.619	75.648
111	64.931	35.734	89.616	18.862	50.997	77.749
113	66.101	36.378	91.231	19.202	51.916	79.150
116	67.856	37.344	93.653	19.711	53.294	81.251
118	69.026	37.988	95.268	20.051	54.213	82.652
120	70.196	38.631	96.883	20.391	55.132	84.053







Comparison of 22, 31, & 41 at C264 and at A440 To 12 at A440

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