RADIO and TELEVISION POCKET BOOK

2/6

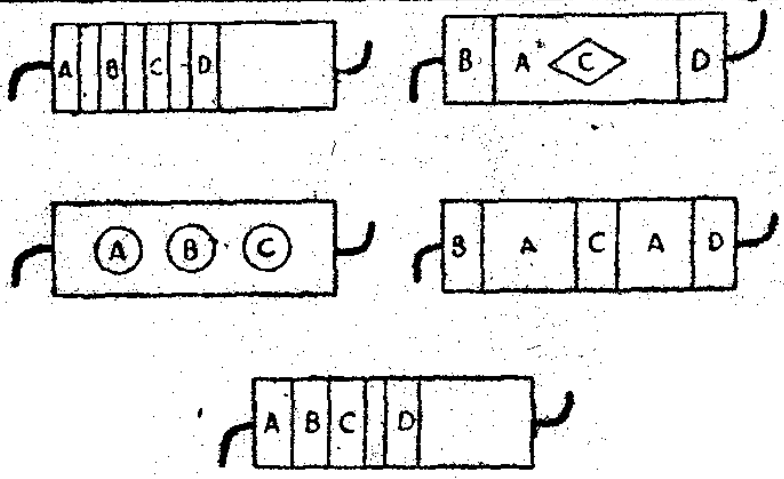
Compiled by B. BABANI

BERNARDS RADIO SERIES No. 120

BRITISH AND U.S.A. RESISTANCE COLOUR CODE.

Colour code shall consist of four bands of colour which may be adjacent to each other or be slightly separated from each other as desired. They shall be placed on the resistor towards one end of it and the significance of the colour bands shall be read from the band nearest to one end and in the order of the bands as follows :—

Band	*Indicates*
1st	First significant figure of the resistance value.
2nd	Second significant figure of the resistance value.
3rd	Decimal multiplier applicable to the first two significant figures.
4th	% Tolerance.



The meaning assigned to the various colours are set out in the Table below :—

Colour	*Shade*	*Significant Figures*	*Decimal Multiplier*	*Tolerance*
Black	—	0	1	—
Brown	No. 13	1	10	—
Red	No. 38	2	100	—
Orange	No. 57	3	1,000	—
Yellow	No. 55	4	10,000	—
Green	No. 26	5	100,000	—
Blue	No. 5	6	1,000,000	—
Violet	*	7	10,000,000	—
Grey	No. 31	8	100,000,000	—
White	—	9	1,000,000,000	—
Gold (metallic)	*	—	0.1	5%
Silver (metallic)	*	—	0.01	10%
No additional colour	—	—	—	20%

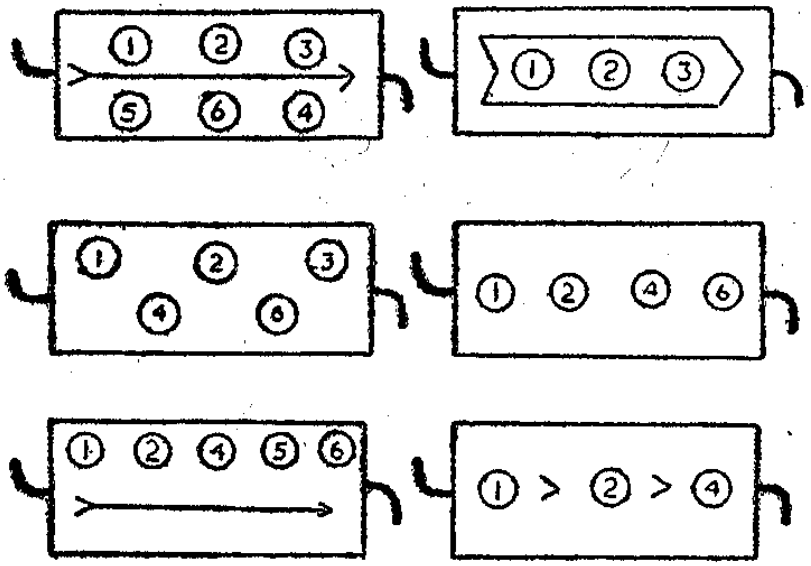
*No suitable shade is included in the B.S. Specification. The violet shall be a dark violet.

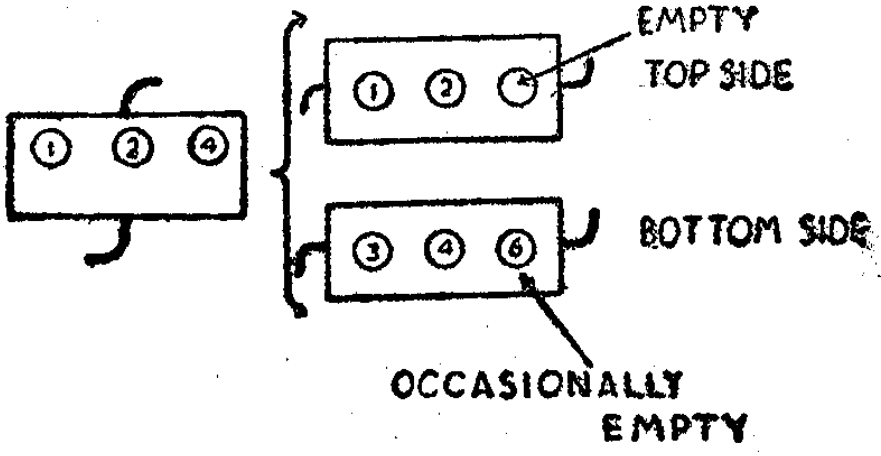
NOTE.—The shade colours specified are those referred to in B.S.S. No. 381C—1931.

The above information supplied by courtesy of Dubilier Condenser Co. (1925) Ltd.

BRITISH AND U.S.A. COLOUR CODES FOR FIXED MICA CONDENSERS.

Colour Mark	1 First Figure	2 Second Figure	3 Third Figure	4 Multiplier Value	5 Direct Current Voltage Best Rating	6 Percentage Tolerance Plus or Minus
Black ...	0	0	0	Nil	—	—
Brown ...	1	1	1	× 10	100	1%
Red ...	2	2	2	× 100	200	2%
Orange ...	3	3	3	× 1,000	300	3%
Yellow ...	4	4	4	× 10,000	400	4%
Green ...	5	5	5	× 100,000	500	5%
Blue ...	6	6	6	× 1,000,000	600	6%
Violet ...	7	7	7	× 10,000,000	700	7%
Grey ...	8	8	8	× 100,000,000	800	8%
White ...	9	9	9	× 1,000,000,000	900	9%
Gold ...	—	—	—	÷ 10	1,000	5%
Silver ...	—	—	—	÷ 100	2,000	10%
No Colour	—	—	—	—	500	20%





BRITISH AND U.S.A. COLOUR CODES FOR RADIO COMPONENTS.

FUSES.

Colour:	*Value*:	*Colour*:	*Value*:
Black ...	.060 Amp.	Dark Blue ...	1 Amp.
Grey ...	.100 Amp.	Light Blue ...	1.5 Amp.
Red... ...	.150 Amp.	Purple	2 Amp.
Brown ...	.250 Amp.	White	3 Amp.
Yellow ...	.500 Amp.	Black and White	5 Amp.
Green ...	.750 Amp.		

FIXED CONDENSER LEADS.

Value:	*Colour*:
Centre lead of Voltage doubler Condensers	White
Principal Negative Lead	Black
2nd Negative „	Brown
3rd „ „	Grey
5th highest Capacity +	Violet
4th „ „ +	Blue
3rd „ „ +	Green
2nd „ „ +	Yellow
Highest Capacity +	Red

When 2 capacities are of the same value, the one of the higher voltage rating has the higher colour in the table.

Series connections are marked ±
Common Positive junctions are marked +
Unconnected sections are marked &
Common Negative junctions are marked —

Examples :—

6 ± 6 = A series voltage doubler connection.
2 + 2 = Two 2uF condensers with common positive lead.
4 & 4 = Two isolated 4uF condensers.
8 — 8 = Two 8uF condensers with common negative lead.

WANDER PLUGS.

Value:	*Colour*:
Highest + H.T.	Red
2nd highest + H.T.	Yellow
3rd highest + H.T.	Green
4th highest + H.T.	Blue
L.T. Positive	Pink
L.T. —	Black
H.T. —	Black
G.B. +	Black
Highest G.B. —	Brown
2nd highest G.B. —	Grey
3rd highest G.B. —	White

Any additional battery lead is Violet, and any centre tap is White.

U.S.A. COLOUR CODES FOR LOUDSPEAKER LEADS AND PLUG CONNECTORS.

A = Blue lead. B = Brown lead. C = Red lead. D = Black and Red striped lead. E = Slate and Red striped lead. F = Yellow and Red striped lead. G = Black lead. H = Green lead. J = Black and Green striped lead. K = Yellow and Green striped lead, P. = Primary. S = Secondary.

Sketch A.
Plugs shown with Pins facing the reader.

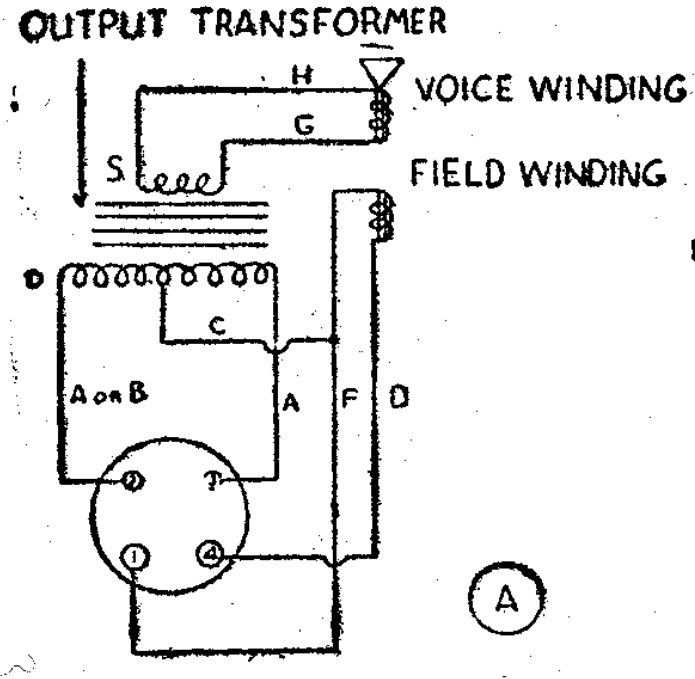
Sketch B.
Plugs shown with Pins facing the reader.

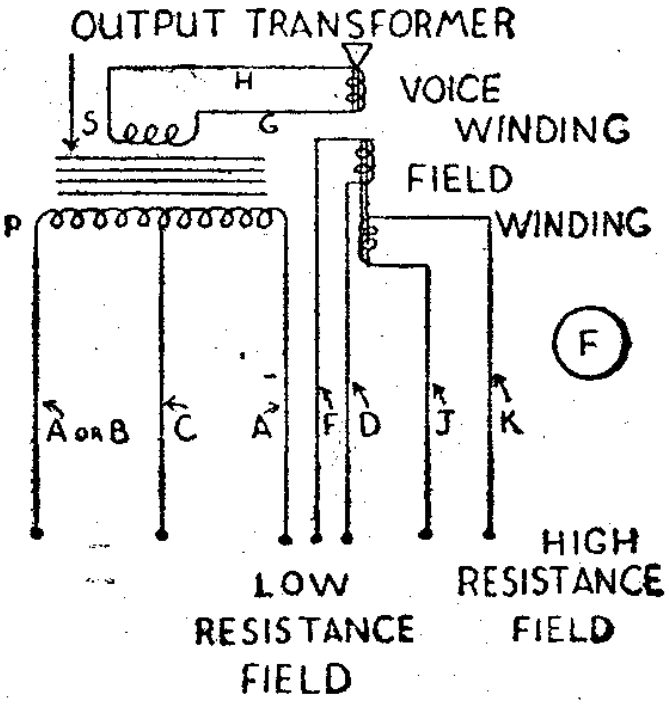
Sketch C.
Plugs shown with Pins facing the reader.

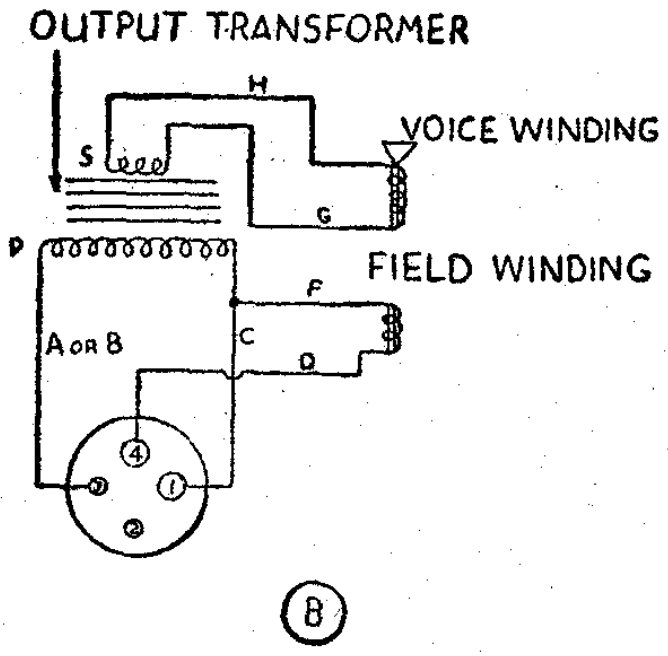
Sketch D.
Plugs shown with Pins facing the reader.

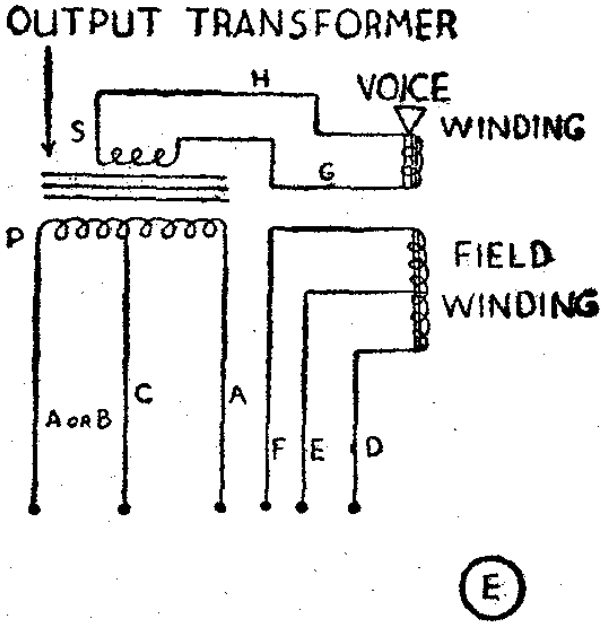
Sketch E.
Plugs shown with Pins facing the reader.

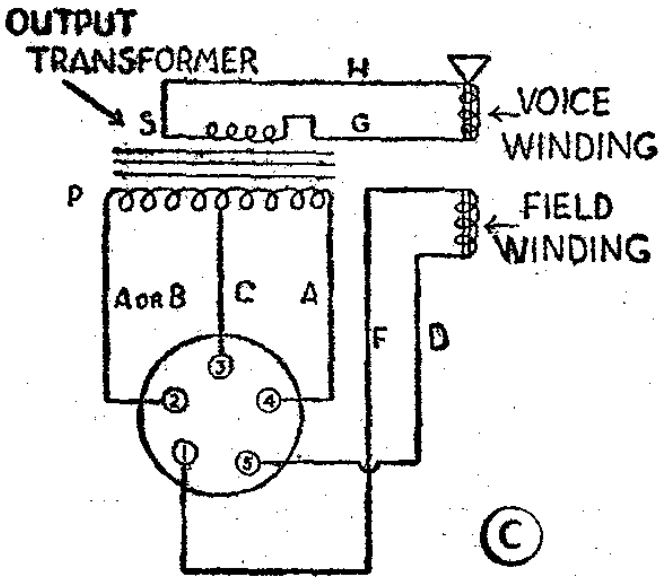
Sketch F.
Plugs shown with Pins facing the reader.

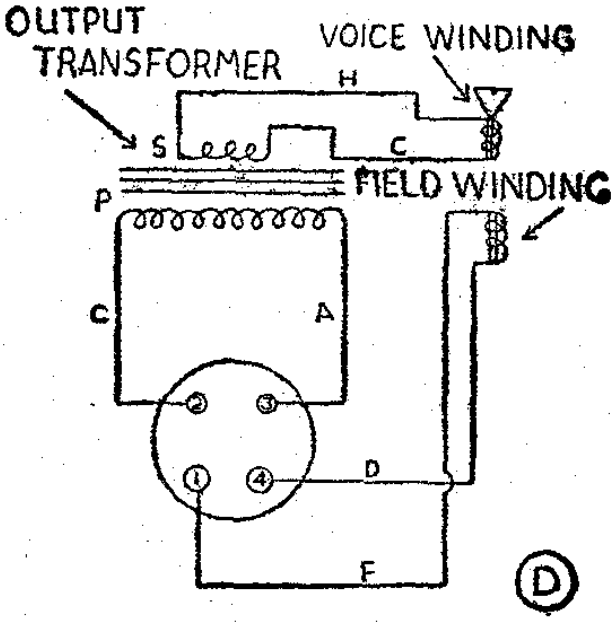












BRITISH AND U.S.A. COLOUR CODES.

BRITISH COLOUR CODE FOR BATTERY CORDS.

Colour.	*Purpose.*
Maroon	3rd Positive Voltage.
Maroon and Red	2nd Positive Voltage.
Red	Highest Positive Voltage.
Black and Green	2nd Negative Bias.
Black with Green Tracer	Maximum Negative Bias.
Green	Positive Bias Voltage.
Black with Yellow Tracer	Negative L.T. Voltage.
Yellow	Positive L.T. Voltage.
Black with Red Tracer	Negative H.T.
Black with Brown Tracer	Loud-speaker Connections.
High Potential, Brown	Loud-speaker Connections.

U.S.A. COLOUR CODE FOR

A.F. Transformers.

Blue = plate (finish) lead of primary.

Red = B + lead (this applies whether the primary is plain or centre-tapped).

Brown = plate (start) lead on centre-tapped primaries. (Blue may be used for this lead if polarity is not important).

Green = grid (finish) lead to secondary.

Black = grid return (this applies whether the secondary is plain or centre-tapped).

Yellow = grid (start) lead on centre-tapped secondaries. (Green may be used for this lead if polarity is not important).

NOTE.—These markings apply also to line-to-grid and tube-to-line transformers.

Loudspeaker Voice Coils.

Green = finish.

Black = start.

Loudspeaker Field Coils.

Black and Red = start.

Yellow and Red = finish.

Slate and Red = tap (if any).

Power Transformers.

1.	Primary Leads	*Black*
	If tapped :	
	Common	*Black*
	Tap	*Black and Yellow Striped*
	Finish	*Black and Red Striped*
2.	High-Voltage Plate Winding	*Red*
	Centre-Tap	*Red and Yellow Striped*
3.	Rectifier Fil. Winding	*Yellow*
	Centre-Tap	*Yellow and Blue Striped*
4.	Fil. Winding No. 1	*Green*
	Centre-Tap	*Green and Yellow Striped*
5.	Fil. Winding No. 2	*Brown*
	Centre-Tap	*Brown and Yellow Striped*
6.	Fil. Winding No. 3	*Slate*
	Centre-Tap	*Slate and Yellow Striped*

RADIO GRAMOPHONE ELECTRIC MOTORS. COLOUR CODE FOR FREQUENCY.

White dot = 25 cycles.
Green dot = 50 „
No mark = 60 „

U.S.A. COLOUR CODE FOR MULTIPLE BATTERY CABLES.

Blue	= H.T. +	highest.
White	= H.T. +	medium.
Yellow	= H.T. —	
Red	= L.T. +	
Black	= L.T. —	
Brown	= G.B. +	
Green	= G.B. —	highest.
Orange	= G.B. —	medium.

BRITISH MAINS TRANSFORMER LEADS.

		Colour.
Primary Winding	10 volt tapping	Black and Green.
	210 volt „	Black and Yellow.
	230 volt „	Black and Red.
	250 volt „	Black and Brown.
	Zero tapping	Black.

		Colour.
Secondary Winding	High tension ends	Red.
	„ „ centre tap	Red and Yellow.
	Rectifier heater ends	Green.
	„ centre tap	Green and Yellow.
	Valve heater ends	Brown.
	„ „ centre tap	Brown and Yellow.
	Additional L.T. winding ends	Blue
	„ „ centre tap	Blue and Yellow.
	Earthing Lead	Bare Wire

G.E.C. Wiring Colour Code.

White	High-potential connections to aerial and first section of band-pass circuits, also non-earth side of special coil.
Green	Other high potential signal circuits, including grid circuits.
Blue	Screening grid circuits.
Pink	Cathode connections.
Orange	Anode connections.
Black	Earth connections.
Slate	H.T. negative, when not earthed.
Red	Smoothed H.T. positive.
Red/White ...	Unsmoothed H.T. positive.
Green/White ...	A.V.C. and grid de-coupling.
Black/Red ... } Black/White ... }	Heaters.
Black/Red ...	L.T. positive (in battery sets).

BRITISH MOVING COIL SPEAKER—COLOUR CODE.

Colour.	*Purpose.*
Green (outer end)	Output Transformer—Primary ends of winding.
Brown (inner end)	„ „ Primary ends of winding.
Red	„ „ Primary centre tap.
Maroon	„ „ Secondary end—inside.
White	„ „ „ „ outside.
Yellow	Field Winding—Outside end.
Black	„ „ Inside end.

I.F. Transformers.

Blue = plate lead.
Red = B + lead.
Green = grid (or diode) lead.
Black = grid (or diode) return.

NOTE.—If the secondary of the i.f.t. is centre-tapped, the second diode plate lead is green-and-black striped, and black is used for the centre-tap lead.

REACTANCE FORMULAS.

Reactance is measured in ohms and is defined as the resistance against the flow of an A.C. in any component due to its capacity or inductance. Amongst other factors it is variable due to the frequency of the A.C.

Reactance in ohms of a condenser is equal to 1 divided by (6.283 × frequency of A.C. in cycles per second × capacity of condenser in farads).

Reactance of a coil is equal to (6.283 × frequency of A.C. in cycles per second × inductance of coil in henries).

Reactance of a condenser and a coil in series is equal to the reactance of the coil on its own minus the reactance of the condenser.

RESONANT FREQUENCY.

This is the condition when a condenser and coil in a tuning circuit are so adjusted as to produce resonance. The formula for this condition is as follows :—

Frequency of resonance = $1 \div [6.283$ (square root of the coil inductance in henries multiplied by the condenser capacity in farads)$]$

Capacity in farads of a condenser in a resonant circuit =

$1 \div [39.478 \times (\text{resonant frequency})^2 \times$ inductance of the coil in circuit in henries$]$

Inductance in henries of a coil in a resonant circuit =

$1 \div [39.478 \times (\text{resonant frequency})^2 \times$ capacity of the condenser in circuit in farads$]$.

OHMS LAW FOR D.C.

AMPERES = Volts ÷ Resistance.

" = Watts ÷ Volts.

" = $\sqrt{\text{Watts} \div \text{Resistance}}$.

VOLTS = Resistance x Amperes.

" = Watts ÷ Amperes.

" = $\sqrt{\text{Watts} \times \text{Resistance}}$.

WATTS = $[\text{Amperes}]^2$ x Resistance.

" = $[\text{Volts}]^2 \div$ Resistance.

" = Amperes x Volts.

RESISTANCE = Volts ÷ Amperes.

" = $[\text{Volts}]^2 \div$ Watts.

" = Watts ÷ $[\text{Amperes}]^2$

RESISTANCES IN PARALLEL

$$R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} + \text{etc.}}$$

2 PARALLEL RESISTANCES

$$R = [R_1 \times R_2] \div [R_1 + R_2]$$

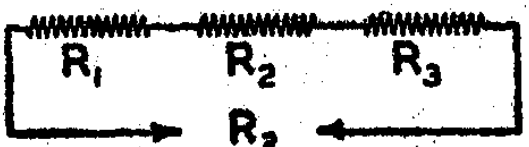
3 PARALLEL RESISTANCES

$$R = \frac{R_1 \times R_2 \times R_3}{[R_1 \times R_2] + [R_2 \times R_3] + [R_3 \times R_1]}$$

4 PARALLEL RESISTANCES

$$R = \frac{R_1 \times R_2 \times R_3 \times R_4}{[R_1 \times R_2 \times R_3] + [R_2 \times R_3 \times R_4] + [R_3 \times R_4 \times R_1] + [R_4 \times R_1 \times R_2]}$$

RESISTANCES IN SERIES



$$R = R_1 + R_2 + R_3 + \text{etc}$$

OHMS. LAW FOR A.C.

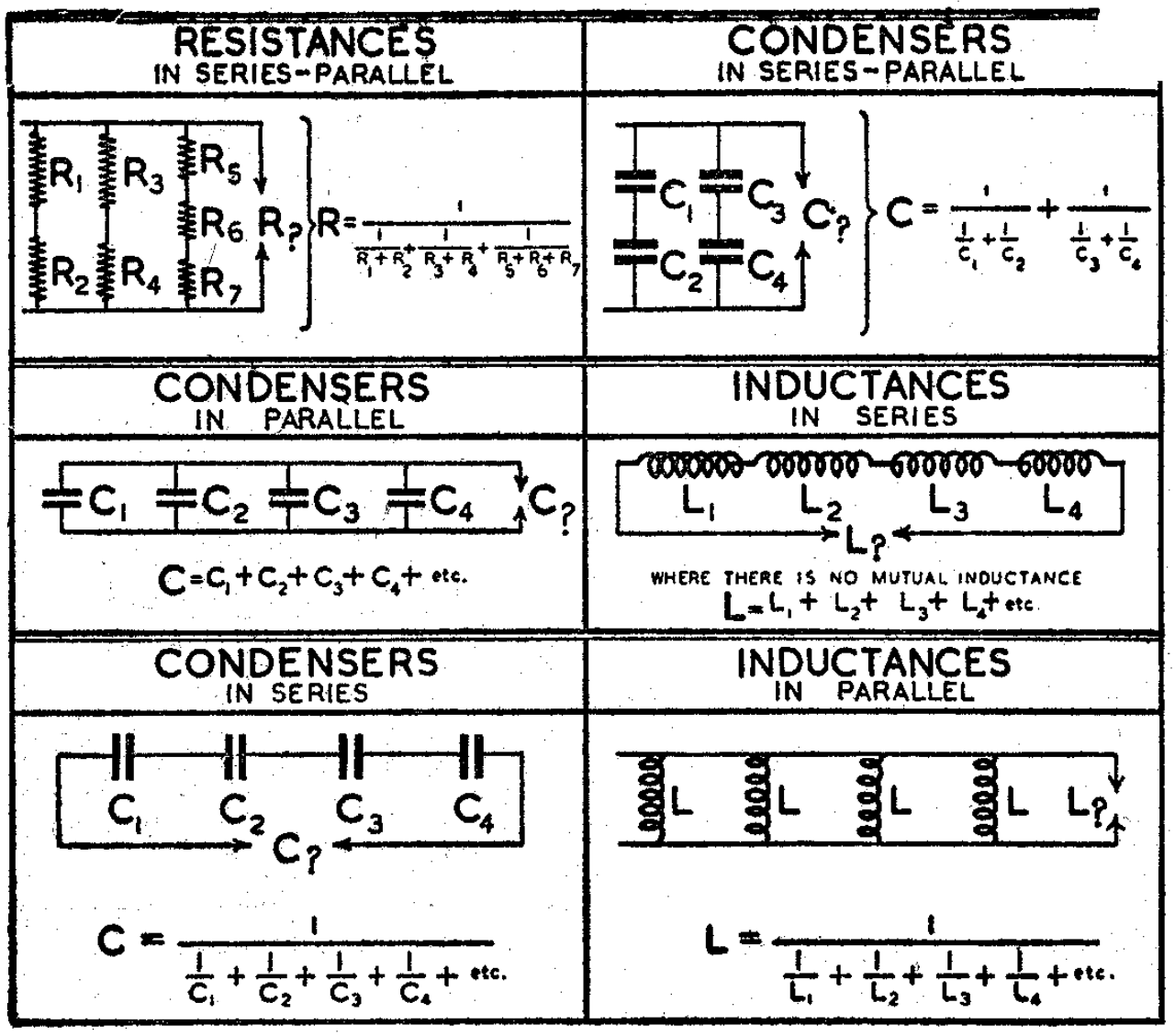
Where I = current in amperes.
Z = impedance in ohms.
E = voltage across Z.
P = wattage.
X = degrees of phase angle.

E = P ÷ (I cos X).
= $\sqrt{PZ \div \cos X}$.
= IZ.

Z = P ÷ (I^2 cos X).
= E ÷ I.
= (E^2 cos X) ÷ P.

P = IE cos X.
= (E^2 cos X) ÷ Z.
= I^2 Z cos X.

I = P ÷ (E cos X).
= E ÷ Z.
= $\sqrt{P \div (Z \cos X)}$.



WAVELENGTH AND FREQUENCY TABLE.

This table enables all calculations for wavelength and frequency to be arrived at. Although the table only covers a limited scale it is quite easy to cover any range required by the following method : If the figure in column A is multiplied by 10 the answer in column B must be divided by 10, or if the figure in column A is divided by 100 the answer in column B must be multiplied by 100. If column A is used to denote wavelength, then the answer in column B will be in Megacycles, or if column A is used for Frequency in Megacycles, the answer in column B will denote the equivalent wavelength in metres. This table is based on the fact that the frequency in kilocycles is equal to 299,820 ÷ by the wavelength in metres, whilst the wavelength in metres is equal to 299,820 ÷ by the frequency in kilocycles.

FREQUENCY AND WAVELENGTH TABLE

A	B	A	B	A	B	A	B	A	B
299·8	1000	315·6	950	333·1	900	352·7	850	374·8	800
300·1	999	315·9	949	3335	899	353·1	849	375·2	799
300·4	998	316·2	948	3339	898	3536	848	375·7	798
300·7	997	316·6	947	3342	897	3540	847	376·2	797
301·0	996	316 9	946	3346	896	3544	846	376·7	796
301·3	995	317·3	945	3350	895	3548	845	377·1	795
301·6	994	317·6	944	335·4	894	355·2	844	377·6	794
301·9	993	317·9	943	335·7	893	3556	843	378·2	793
302·2	992	318·3	942	336·1	892	356·1	842	378·6	792
302·5	991	318·6	941	3365	891	356·5	841	379·0	791
302·8	990	319·0	940	3369	890	3569	840	379·5	790
303·1	989	319·3	939	337·3	889	357·4	839	380·0	789
303·5	988	319·6	938	337·6	888	357·8	838	380·5	788
303·8	987	319·9	937	3380	887	358·2	837	381·0	787
304·1	986	320·3	936	338·4	886	358·6	836	381·4	786
304·4	985	320·7	935	3388	885	359·0	835	381·9	785
304·7	984	321·0	934	339·2	884	359·5	834	382·4	784
305·0	983	321·4	933	339·5	883	359·9	833	382·9	783
305·3	982	321·7	932	3398	882	360·4	832	383·4	782
305·6	981	322·0	931	3403	881	360·8	831	383·9	781
305·9	980	322·3	930	340·7	880	361·2	830	384·4	780
306·3	979	322·7	929	341·1	879	361·6	829	384·9	779
306·6	978	323·1	928	341·5	878	382·1	828	385·4	778
306·9	977	323·4	927	341·9	877	362·5	827	385·9	777
307·2	976	323·8	926	342·3	876	363·0	826	386·4	776
307·5	975	324·1	925	342·7	875	363·4	825	386·9	775
307·8	974	3245	924	3430	874	363·9	824	387·4	774
3081	973	3248	923	3434	873	364·3	823	387·9	773
308·4	972	325·2	922	3438	872	3647	822	388·4	772
3088	971	325·5	921	3442	871	365·2	821	388·9	771
309·1	970	325·9	920	3446	870	3657	820	389·4	770
309·4	969	326·2	919	3450	869	366·1	819	389·9	769
3098	968	3266	918	3454	868	3665	818	390·4	768
310·1	967	327·0	917	3458	867	367·0	817	390·9	767
310·4	966	327·3	916	3462	866	367·4	816	391·4	766
310·8	965	327·7	915	3466	865	367·9	815	391·9	765
311·0	964	3280	914	3470	864	3683	814	392·4	764
311·3	963	3284	913	3474	863	3688	813	392·9	763
311·7	962	3288	912	3478	862	369·2	812	393·4	762
312·0	961	329·1	911	3482	861	3696	811	394·0	761
312·3	960	3295	910	3486	860	370·1	810	394·5	760
312·7	959	3299	909	3490	859	3706	809	395·0	759
313·0	958	3302	908	349·4	858	371·1	808	395·5	758
313·3	957	3306	907	3498	857	371·5	807	396·0	757
313·6	956	3309	906	3502	856	372·0	806	3966	756
314·0	955	3313	905	3507	855	372·4	805	397·1	755
314·3	954	3317	904	351·1	854	372·9	804	397·6	754
314·6	953	332·1	903	351·5	853	373·4	803	398·2	753
314·9	952	3324	902	351·9	852	373·8	802	398·7	752
315·3	951	3328	901	352·3	851	374·3	801	399·2	751

FREQUENCY AND WAVELENGTH TABLE

A	B	A	B	A	B	A	B	A	B
399·8	750	428·3	700	461·3	650	499·7	600	545·1	550
400·3	749	428·9	699	462·0	649	500·5	599	546·1	549
400·8	748	429·5	698	462·7	648	501·4	598	547·1	548
401·4	747	430·1	697	463·4	647	502·2	597	548·1	547
401·9	746	430·8	696	464·1	646	503·1	596	549·1	546
402·4	745	431·4	695	464·8	645	503·9	595	550·1	545
402·9	744	432·1	694	465·6	644	504·7	594	551·1	544
403·5	743	432·6	693	466·4	643	505·6	593	552·2	543
404·1	742	433·3	692	467·0	642	506·5	592	553·2	542
404·6	741	433·9	691	467·7	641	507·3	591	554·2	541
405·2	740	434·5	690	468·5	640	508·2	590	555·2	540
405·7	739	435·1	689	469·2	639	509·0	589	556·3	539
406·3	738	435·8	688	469·9	638	509·9	588	557·3	538
406·8	737	436·4	687	470·7	637	510·8	587	558·3	537
407·4	736	437·1	686	471·4	636	511·6	586	559·4	536
407·9	735	437·7	685	472·1	635	512·5	585	560·4	535
408·5	734	438·3	684	472·9	634	513·4	584	561·5	534
409·0	733	439·0	683	473·6	633	514·3	583	562·5	533
409·6	732	439·6	682	474·4	632	515·2	582	563·6	532
410·2	731	440·3	681	475·2	631	516·0	581	564·6	531
410·7	730	440·9	680	475·9	630	516·8	580	565·7	530
411·3	729	441·6	679	476·7	629	517·7	579	566·8	529
411·8	728	442·3	678	477·4	628	518·7	578	567·8	528
412·4	727	442·9	677	478·2	627	519·6	577	568·9	527
413·0	726	443·5	676	478·9	626	520·5	576	570·1	526
413·6	725	444·2	675	479·7	625	521·4	575	571·1	525
414·1	724	444·8	674	480·5	624	522·3	574	572·2	524
414·7	723	445·5	673	481·3	623	523·2	573	573·3	523
415·3	722	446·2	672	482·0	622	524·2	572	574·4	522
415·8	721	446·8	671	482·8	621	525·1	571	575·5	521
416·4	720	447·6	670	483·6	620	526·0	570	576·6	520
417·0	719	448·2	669	484·4	619	526·9	569	577·7	519
417·6	718	448·8	668	485·1	618	527·9	568	578·8	518
418·2	717	449·5	667	485·9	617	528·8	567	579·9	517
418·8	716	450·2	666	486·7	616	529·7	566	581·1	516
419·3	715	450·9	665	487·5	615	530·7	565	582·2	515
419·9	714	451·5	664	488·3	614	531·6	564	583·3	514
420·5	713	452·2	663	489·1	613	532·5	563	584·4	513
421·1	712	452·9	662	489·9	612	533·5	562	585·5	512
421·7	711	453·6	661	490·7	611	534·5	561	586·6	511
422·3	710	454·3	660	491·5	610	535·4	560	587·8	510
422·9	709	455·1	659	492·4	609	536·4	559	588·9	509
423·5	708	455·7	658	493·1	608	537·3	558	590·2	508
424·1	707	456·3	657	493·9	607	538·3	557	591·3	507
424·7	706	457·0	656	494·8	606	539·2	556	592·5	506
425·3	705	457·7	655	495·7	605	540·2	555	593·7	505
425·9	704	458·4	654	496·5	604	541·2	554	594·9	504
426·5	703	459·1	653	497·3	603	542·2	553	596·1	503
427·1	702	459·8	652	498·0	602	543·2	552	597·3	502
427·7	701	460·5	651	498·9	601	544·1	551	598·4	501

FREQUENCY AND WAVELENGTH TABLE

A	B	A	B	A	B	A	B	A	B
599·6	500	666·3	450	749·4	400	856·5	350	999·4	300
600·8	499	667·8	449	751·3	399	859·1	349	1003·	299
602·1	498	669·2	448	753·2	398	861·6	348	1006·	298
603·3	497	670·7	447	755·1	397	864·1	347	1009·	297
604·5	496	672·2	446	757·1	396	866·5	346	1013·	296
605·7	495	673·8	445	759·1	395	869·1	345	1016·	295
606·9	494	675·3	444	761·0	394	871·6	344	1020·	294
608·2	493	676·9	443	762·8	393	874·2	343	1024·	293
609·4	492	678·3	442	764·8	392	876·7	342	1027·	292
610·6	491	679·9	441	766·7	391	879·2	341	1030·	291
611·9	490	681·4	440	768·7	390	881·8	340	1034·	290
613·1	489	683·0	439	770·7	389	884·4	339	1037·	289
614·4	488	684·6	438	772·7	388	887·1	338	1041·	288
615·6	487	686·1	437	774·7	387	889·7	337	1045·	287
616·9	486	687·7	436	776·8	386	892·3	336	1048·	286
618·2	485	689·2	435	778·8	385	895·1	335	1052·	285
619·5	484	690·8	434	780·8	384	897·7	334	1056·	284
620·7	483	692·4	433	782·8	383	900·3	333	1059·	283
622·1	482	694·0	432	784·8	382	903·1	332	1063·	282
623·3	481	695·6	431	786·9	381	905·8	331	1066·	281
624·6	480	697·3	430	789·0	380	908·6	330	1070·	280
625·9	479	698·9	429	791·1	379	911·3	329	1074·	279
627·3	478	700·6	428	793·2	378	914·1	328	1078·	278
628·6	477	702·2	427	795·3	377	916·9	327	1082·	277
629·9	476	703·8	426	797·4	376	919·7	326	1086·	276
631·2	475	705·5	425	799·5	375	922·5	325	1090·	275
632·5	474	707·1	424	801·7	374	925·4	324	1094·	274
633·9	473	708·8	423	803·8	373	928·2	323	1098·	273
635·2	472	710·5	422	805·9	372	931·1	322	1102·	272
636·6	471	712·2	421	808·1	371	934·1	321	1106·	271
637·9	470	713·9	420	810·3	370	936·9	320	1110·	270
639·3	469	715·6	419	812·5	369	939·8	319	1115·	269
640·6	468	717·3	418	814·7	368	942·8	318	1119·	268
642·1	467	719·1	417	817·1	367	945·8	317	1123·	267
643·4	466	720·7	416	819·2	366	948·8	316	1127·	266
644·8	465	722·5	415	821·4	365	951·8	315	1131·	265
646·2	464	724·2	414	823·8	364	954·8	314	1136·	264
647·6	463	725·9	413	826·1	363	957·9	313	1141·	263
649·1	462	727·7	412	828·3	362	961·1	312	1145·	262
650·4	461	729·5	411	830·4	361	964·1	311	1149·	261
651·8	460	731·3	410	832·8	360	967·2	310	1153·	260
653·2	459	733·1	409	835·2	359	970·3	309	1158·	259
654·6	458	734·9	408	837·5	358	973·4	308	1162·	258
656·1	457	736·7	407	839·8	357	976·7	307	1167·	257
657·5	456	738·5	406	842·2	356	979·8	306	1171·	256
658·9	455	740·3	405	844·6	355	983·1	305	1176·	255
660·4	454	742·1	404	847·1	354	986·2	304	1180·	254
661·9	453	744·1	403	849·4	353	989·4	303	1185·	253
663·3	452	745·8	402	851·8	352	992·8	302	1190·	252
664·8	451	747·7	401	854·2	351	996·2	301	1195·	251

FREQUENCY AND WAVELENGTH TABLE

A	B	A	B	A	B	A	B	A	B
1199	250	1362	220	1578	190	1873	160	2306	130
1204	249	1369	219	1587	189	1885	159	2323	129
1209	248	1375	218	1595	188	1898	158	2342	128
1214	247	1381	217	1603	187	1910	157	2361	127
1219	246	1388	216	1612	186	1923	156	2380	126
1224	245	1395	215	1620	185	1934	155	2399	125
1229	244	1401	214	1629	184	1947	154	2417	124
1234	243	1407	213	1638	183	1960	153	2438	123
1239	242	1414	212	1647	182	1973	152	2458	122
1244	241	1421	211	1656	181	1986	151	2478	121
1249	240	1428	210	1665	180	2000	150	2498	120
1255	239	1435	209	1675	179	2012	149	2521	119
1260	238	1442	208	1684	178	2025	148	2541	118
1265	237	1448	207	1694	177	2040	147	2563	117
1270	236	1454	206	1703	176	2053	146	2585	116
1276	235	1463	205	1713	175	2067	145	2607	115
1281	234	1470	204	1723	174	2082	144	2630	114
1287	233	1477	203	1733	173	2097	143	2653	113
1293	232	1484	202	1743	172	2110	142	2677	112
1298	231	1492	201	1753	171	2127	141	2701	111
1303	230	1499	200	1763	170	2142	140	2726	110
1309	229	1507	199	1774	169	2157	139	2751	109
1315	228	1514	198	1784	168	2173	138	2776	108
1321	227	1523	197	1794	167	2188	137	2808	107
1327	226	1531	196	1806	166	2204	136	2828	106
1333	225	1538	195	1817	165	2221	135	2855	105
1338	224	1545	194	1828	164	2237	134	2883	104
1344	223	1553	193	1839	163	2254	133	2911	103
1351	222	1562	192	1851	162	2272	132	2939	102
1357	221	1570	191	1862	161	2289	131	2969	101
								2998	100

CALCULATION OF CORRECT RESISTOR FOR SELF BIAS.

From Ohms. law :—

$$R = \frac{\text{Grid Bias Voltage} \times 1{,}000.}{\text{Total Cathode Current in Ma} \times \text{number of Valves involved.}}$$

For Triodes total cathode current = plate current.

For Pentodes and Tetrodes, total cathode current = plate plus screen currents.

For Pentagrids, total cathode current = plate plus screen plus oscillator plate currents.

Example.—Find Bias Resistor for two 6K6 Valves operating in push pull with 315 volts on the plates.

The following data is obtained from valve characteristics for the 6K6 from Bernards " Radio Valve Manual, No. 30," price 3/6.

Grid Bias = 21 volts.

Screen Current = 4 Ma.

Plate Current = 25.5 Ma. ∴ Total Cathode Current = 29.5 Ma.

Therefore, $R = \frac{21 \times 1{,}000}{29.5 \times 2} = \frac{21{,}000}{59} = 355$ ohms. approximately.

When over biased operation is used the advised bias resistor value will be shewn under Ratings and current applications for the type of Valve involved in Bernard's " Radio Valve Manual."

POWER RATINGS OF FIXED RESISTANCES

Wattage Rating	OHMS →	50	100	250	500	750	1000	2000	3000	4000	5000
0·5 Watt	Amps	·1	·07	·045	·032	·025	·022	·016	·013	·011	·010
	Volts	5	7	11	16	20	22	32	39·5	45	50
1·0 Watt	Amps	·141	·10	·063	·045	·036	·032	·022	·018	·016	·014
	Volts	7	10	16	22	27	32	45	55	62·5	71
2·0 Watts	Amps	·2	·141	·089	·061	·051	·045	·032	·026	·022	·020
	Volts	10	14·1	23·1	32·5	39	45	62	77	89	100
3·0 Watts	Amps	·25	·173	·108	·076	·062	·055	·040	·032	·027	·025
	Volts	12·2	17·3	27·2	39	49	55	77	95	110	121
5·0 Watts	Amps	·32	·224	·141	·100	·083	·071	·050	·041	·035	·032
	Volts	15·8	22·4	35·5	50	60	71	100	124	141	159

Wattage Rating	OHMS →	6000	7000	8000	9000	10000	15000	20000	25000	30000
0·5 Watt	Amps	·009	·008	·008	·0075	·007	·0058	·0065	·0045	·004
	Volts	55	59	63	67	71	86	100	110	124
1·0 Watt	Amps	·013	·012	·011	·0105	·010	·008	·007	·0063	·0058
	Volts	77	84	89	95	100	121	141	158	174
2·0 Watts	Amps	·018	·017	·016	·015	·014	·011	·010	·009	·0082
	Volts	110	118	125	135	141	172	200	225	244
3·0 Watts	Amps	·022	·021	·020	·018	·017	·014	·012	·011	·010
	Volts	135	145	154	164	172	213	245	272	300
5·0 Watts	Amps	·029	·027	·025	·023	·022	·018	·016	·014	·013
	Volts	173	188	200	212	225	265	315	355	389

Wattage Rating	OHMS →	40000	50000	75000	100000	200000	250000	500000	750000	1000000
0·5 Watt	Amps	·0035	·003	·0025	·0021	·0015	·0014	·001	·0008	·0007
	Volts	140	159	194	220	321	350	500	612	709
1·0 Watt	Amps	·005	·0043	·0036	·003	·0023	·002	·0014	·0012	·001
	Volts	200	225	275	309	441	500	700	866	1000
2·0 Watts	Amps	·0071	·0063	·0052	·0044	·0032	·0028	·002	·0016	·0014
	Volts	282	317	387	440	631	700	1000	1224	1410
3·0 Watts	Amps	·0087	·0077	·0062	·0055	·004	·0035	·0025	·002	·0017
	Volts	344	386	475	550	770	861	1200	1500	1720
5·0 Watts	Amps	·011	·010	·008	·007	·005	·0045	·003	·0026	·0022
	Volts	448	500	613	707	1000	1120	1581	1937	2250

S.W.G. Tables

S.W.G.	DIA IN INS.	AREA CIRCULAR MILS.	OHMS PER 1000 YDS	OHMS PER POUND (lb)	YARDS PER lb	lbs. PER 1000 YDS	TURNS PER INCH CLOSE WOUND			
							ENAMEL	SINGLE SILK	DOUBLE SILK	SINGLE COTTON
7/0	500	250000	·12227	·000053	·440	2271				
6/0	464	215296	·14202	·000073	·511	1955				
5/0	·432	186624	·16379	·000096	·589	1695				
4/0	·400	160000	·19110	·000132	·688	1453				
3/0	372	138384	·2209	·000175	·797	1257				
2/0	348	121104	·2526	·000229	·910	1100				
1/0	·324	104976	·2912	·000305	1·049	953				
1	300	105000	·3396	·000415	1·228	818				
2	·276	76176	·4013	·000580	1·446	692				
3	·252	63504	·4815	·000834	1·733	577				
4	·232	53824	·5679	·001162	2·046	489				
5	·212	44944	·6804	·001666	2·449	408				
6	·192	36864	·8292	·002476	2·987	335				
7	·176	30976	·9870	·003507	3·55	281				
8	·160	25600	1·194	·005135	4·30	232				
9	·144	20736	1·474	·007827	5·31	188				
10	·128	16384	1·866	·012537	6·72	149	7·8			7·3
1	·116	13456	2·272	·018587	8·18	122	8·3			8·1
2	·104	10816	2·826	·02877	10	98·2	9·3			8·9
3	·092	8464	3·612	·04698	13	76·9	10·4			10
4	·080	6400	4·776	·08216	17	58·1	11·9			11·4
5	·072	5184	5·897	·12520	21	47·1	13·2			12·7
6	·064	4096	6·611	·2006	27	37·2	14·8	14·9	14·7	14·1
7	·056	3136	9·747	·3422	35	28·5	16·9	16·9	16·6	15·9
8	·048	2304	13·27	·6340	48	20·9	19·7	20	19·6	18·2
9	·04	1600	19·11	1·315	69	14·5	23·5	23·8	23·3	21·3
20	·036	1296	23·59	2·004	85	11·8	26·0	26·3	25·7	23·8
1	·032	1024	29·85	3·209	108	9·30	29·2	29·4	28·6	26·3
2	·028	784	38·99	5·475	140	7·12	33	33·3	32·3	29·4
3	·024	576	53·07	10·14	191	5·23	38·3	38·5	37·1	34·5
4	·022	484	63·16	14·37	228	4·40	42·4	42·6	40	37·1
5	·020	400	76·42	21·03	275	3·63	46·5	46·5	43·5	40
6	·018	324	94·35	32·06	339	2·94	51·5	51·8	48·5	43·5
7	·0164	268·96	113·6	46·52	410	2·44	56·5	56·5	52·9	46·7
8	·0148	219·04	139·6	70·14	503	1·99	62·5	62·1	57·8	505
9	·0136	184·96	165·3	98·37	595	1·68	67·6	67·1	62·1	53·8
30	·0124	153·76	198·8	142·4	716	1·40	74·6	73	67·1	57·5
1	·0116	134·56	227·2	185·9	818	1·22	79·4	77·5	709	60·3
2	·0108	116·64	262·1	247·4	944	1·06	85·7	82·6	75·2	63·3
3	·010	100·0	305·7	336·5	1101	·908	91·7	88·5	80·1	66·7
4	·0092	84·64	361·2	469·8	1300	·769	100	95·2	85·5	70·4
5	·0084	70·56	433·2	676·0	1564	·641	109	103	92	80·6
6	·0076	57·76	529·2	1009	1906	·525	120	112	99	86·2
7	·0068	46 24	661·1	1574	2381	·420	135	123	107	99·2
8	·0060	36	849·1	2596	3058	327	151	137	118	100
9	·0052	27·04	1130	4603	4070	·246	175	154	130	109
40	·0048	23·04	1327	6340	4777	·209	189	164	137	114
1	·0044	19·36	1579	8979	5687	·176	208	179	151	
2	·004	16·0	1911	13146	6880	·145	227	192	161	
3	·0036	12·96	2359	20040	8493	·118	256	208	172	
4	·0032	10·24	2985	32090	10753	·093	285	227	185	
5	·0028	7·84	3899	54750	14040	·071	322	250	200	
6	·0024	5·76	5307	101400	19113	·052	377	278	217	
7	·002	4·00	7642	210300	27527	·036	444	312	238	
8	·0016	2·56	11941	513500	43000	·023				
9	·0012	1·44	21230	1623000	76466	·013				
50	·001	1·00	30570	3365000	101000	·009				

T.R.I. CL. WD. DOUBLE COTTON	TURNS PER SQUARE INCH ENAMEL	SINGLE SILK	DOUBLE SILK	SINGLE COTTON	DOUBLE COTTON	CURRENT AT 1000 AMPS PER SQUARE INCH	SECTIONAL AREA OF WIRE IN SQUARE INCHES	LENGTH PER OHM OF WIRE IN YARDS
						196	·1963	8179
						169	·1691	7042
						147	·1466	6105
						126	·1257	5233
						109	·1090	4531
						95·1	·0951	3961
						82·5	·0825	3434
						70·7	·0707	2945
						59·9	·0598	2491
						49·9	·0499	2077
						42·3	·0423	1761
						35·3	·0353	1469
						28·9	·0289	1206
						24·3	·0243	1013
						20·1	·0201	837
						16·3	·0163	678
7·1	58				49	12·9	·0129	536
7·7	69				59	10·6	·0106	440·1
8·5	86				72	8·50	·00849	354·1
9·4	108				89	6·65	·00665	276·9
10·6	141				113	5·03	·00503	209·9
11·9	175				141	4·07	·00467	169·9
13·2	219	216	210	193	169	3·22	·00322	151·3
14·7	285	279	272	246	216	2·46	·00246	102·6
16·9	388	392	376	324	285	1·81	·00181	75·36
19·6	550	552	529	441	384	1·26	·00126	52·33
21·3	676	676	640	552	451	1·02	·00102	42·37
23·3	852	847	800	681	540	·804	·00080	33·51
25·6	1089	1089	1017	846	655	·616	·00062	25·64
29·4	1513	1568	1350	1169	860	·452	·00045	18·85
31·2	1789	1800	1590	1346	971	380	·00038	15·84
33·3	2070	2160	1860	1568	1105	·314	·00031	13·09
35·7	2650	2600	2300	1850	1270	·255	·00025	10·608
37·9	3190	3170	2750	2100	1430	·211	·00021	8·803
40·3	3900	3800	3300	2500	1620	·172	·00017	7·163
42·4	4550	4450	3800	2800	1790	·145	·00014	6·050
44·6	5550	5300	4450	3250	1980	·121	·00012	5·030
46·3	6300	6000	5000	3550	2140	106	·00011	4·405
48·1	7300	6800	5600	3950	2340	·092	·000092	3·817
50·1	8400	7800	6400	4350	2500	·078	·000078	3·271
52·1	10000	9000	7300	4850	2700	·066	·000066	2·770
57·5	12000	10000	8400	6400	2300	·055	·000055	2·309
60·2	14500	12500	9750	7370	3600	·045	·000045	1·890
63·3	18200	15000	11000	9650	4000	·036	·000036	1·513
66·7	22900	18500	13500	9900	4400	·028	·000028	1·178
70·4	30600	23500	16500	11500	4900	·021	·000021	·885
72·5	35600	26500	18500	12600	5200	·018	·000018	·750
	43000	32000	22000			·015	·000015	·633
	51000	36500	25500			·012	·000012	·520
	65000	43000	29000			·010	·00001	·424
	81000	51200	34000			·008		·336
	104000	62000	39500			·0061		·256
	142000	72000	46500			·0045		·188
	197000	97000	56000			·0031		·131
						·0021		·048
						·0011		·047
						·0007		·033

PROPERTIES AND CHARACTERISTICS OF RESISTANCE MATERIALS

MATERIAL	Resistance relative to COPPER	Resistance in ohms per circular Mil-Foot.	Temperature Coefficient of Resistivity per °C	Resistance in Microhms per cubic Centimetre	Resistance in ohms per square Mil-Foot	Resistance in Microhms per cubic Inch
Copper.	1·0	10·3	+·0039	1·724	8·0	0·68
Steel.	6·4	67·4	+·0043	11·2	53·0	4·41
Aluminium.	1·7	16·9	+·0038	2·82	13·0	1·11
Pure Iron.	5·8	60·2	+·005	10·0	47·0	3·94
Silver.	0·9	9·5	+·0037	1·59	7·5	0·63
Gold.	1·3	14·6	+·0035	2·43	11·0	0·94
Platinum.	5·8	60·2	+·0031	10·0	47·0	3·94
Tin.	6·6	67·5	+·0043	11·4	54·0	4·49
Zinc.	3·3	33·8	+·0036	5·7	27·0	2·25
Lead.	12·7	133·0	+·0039	21·9	104·0	8·63
Nickel.	6·0	61·4	+·0059	10·2	48·0	4·02
Advance.	28·4	295·0	+·000014	49·0	232·0	19·31
Eureka.	28·4	295·0	+·000014	49·0	232·0	19·31
Glowray.	58·0	602·0	+·00001	100·0	473·0	39·4
Climax.	50·4	524·0	+·00069	87·0	412·0	34·28
Constantan.	28·4	295·0	+·000014	49·0	232·0	19·31
Excello.	52·8	547·0	+·00017	91·0	430·0	35·86
Ideal.	28·0	295·0	+·000014	49·0	232·0	19·31
Manganin.	25·5	265·0	+·000014	44·0	208·0	17·33
Platinoid.	24·3	253·0	+·0003	42·0	199·0	16·55
Ia.–Ia.	29·6	307·0	−·000024	51·0	241·0	20·1
Tungsten.	3·3	33·8	+·0044	5·7	27·0	2·25
Monel.	24·3	253·0	+·0021	42·0	199·0	16·55
Alumel.	19·1	199·0	+·0011	33·0	156·0	13·10
Chromel.	44·0	458·0	+·00007	76·0	360·0	29·94
Copel.	28·4	295·0	+·000001	49·0	232·0	19·31
Carbon.	2030·0	21070·0	−·0005	3500·0	16555·0	1379·0
Brightray.	58·0	602·0	+·00019	100·0	473·0	39·4
Dullray.	50·4	525·0	+·0007	87·0	412·0	29·94
Cupro.	15·0	157·0	+·0003	26·0	123·0	10·24
No-Mag.	81·8	848·0	+·00091	141·0	667·0	55·55
Nicrome 5%	52·8	547·0	+·00105	91·0	430·0	35·86
Nicrome 15%	63·8	662·0	+·0002	110·0	520·0	43·34
" 80%20%	63·2	656·0	+·0001	109·0	515·0	42·95
Corronil.	29·0	301·0	+·00065	50·0	236·0	19·7
Redray.	53·9	559·0	+·00026	93·0	440·0	36·65
Mangonic.	8·6	90·2	+·0035	14·95	74·0	5·87
B.B.	23·2	241·0	+·00021	40·0	189·0	15·76
Ferry.	27·8	289·0	+·00002	48·0	227·0	18·91
Zodiac.	20·9	217·0	+·00023	36·0	170·0	14·19
Tarnac.	22·6	235·0	+·000017	39·0	184·0	15·36
Ferrozoid.	48·8	506·0	+·00076	84·0	398·0	33·09
Cromaloy. 2	63·8	662·0	+·00013	110·0	520·0	43·34
" 3	53·9	559·0	+·00013	93·0	440·0	36·65
" 4	58·0	602·0	+·00008	100·0	473·0	39·4
Nickel-Silver. 1	18·0	187·0	+·00027	31·0	147·0	12·22
" " 4	12·2	127·0	+·00047	21·0	100·0	8·28
Platinum-Iridium.	18·0	187·0	+·00082	31·0	147·0	12·22
" Silver.	18·2	190·0	+·00028	31·4	148·0	12·38
Kromore.	52·2	542·0	+·0002	90·0	426·0	35·46

RESISTANCE WIRE DATA

S.W.G.	NICKEL SILVER WIRE				MANGANIN WIRE				PLATINOID WIRE				Dia. in INCHES
	RESISTANCE		Amperage required for temperature rise of		RESISTANCE		Amperage required for temperature rise of		RESISTANCE		Amperage required for temperature rise of		
	Ohms per 1000 ft. approx.	Ohms per Ounce approx.	200°C	100°C	Ohms per 1000 ft. approx.	Ohms per Ounce approx.	200°C	100°C	Ohms per 1000 ft. approx.	Ohms per Ounce approx.	200°C	100°C	
8	—	—	—	—	9·6	·008	61	39	9·5	·008	—	—	·160
10	—	—	—	—	15·0	·018	39	27	14·9	·018	—	—	·128
12	—	—	—	—	22·7	·042	28	21	22·7	·042	—	—	·104
14	—	—	—	—	38·3	·12	17·5	11·7	38·4	·12	—	—	·080
16	34	·17	14·2	8·1	59·6	·30	10·1	7·2	59·7	·31	—	—	·064
18	59	·53	9·4	6·1	107	·95	7·6	5·1	108	·95	—	—	·048
20	109	1·7	6·3	4·1	190	2·9	5·1	3·6	189	2·9	—	—	·036
21	—	—	—	—	241	4·9	—	—	—	—	—	—	·032
22	180	5·04	4·2	3·1	315	8·8	3·8	2·6	316	8·7	—	—	·028
23	—	—	—	—	428	15	—	—	—	—	—	—	·024
24	292	12·25	—	—	510	21	—	—	509	22	—	—	·022
25	—	—	—	—	617	32	—	—	—	—	—	—	·020
26	437	27·56	—	—	763	48	—	—	764	48	—	—	·018
27	—	—	—	—	918	70	—	—	—	—	—	—	·0164
28	669	64·37	—	—	1166	112	—	—	1165	112	—	—	·0148
30	917	121	—	—	1600	211	—	—	1601	212	—	—	·0124
32	—	—	—	—	2105	367	—	—	2104	367	—	—	·0108
34	—	—	—	—	2935	704	—	—	2933	705	—	—	·0092
36	—	—	—	—	4303	1520	—	—	4305	1520	—	—	·0076
38	—	—	—	—	6918	3900	—	—	6917	3901	—	—	·006
40	—	—	—	—	10762	9530	—	—	10764	9531	—	—	·0048
42	—	—	—	—	15413	19500	—	—	15416	19500	—	—	·004
44	—	—	—	—	24083	48000	—	—	24087	48000	—	—	·0032
46	—	—	—	—	42816	152000	—	—	48819	152000	—	—	·0024

The above data supplied by courtesy of London Electric Wire Co. & Smiths Ltd. [LEWCOS]

FUSE WIRE TABLES

Figures are approximate and for commercial use only

Fusing Current in Amperes	DIAMETER IN INCHES.				
	Copper.	Aluminium.	Tin.	Allo-Tin.	Lead.
1	·0020	·0028	·0076	·0084	·0084
2	·0036	·0040	·0116	·0136	·0124
3	·0044	·0052	·0148	·018	·0164
4	·0052	·0068	·018	·022	·020
5	·0060	·0076	·022	·024	·024
10	·0100	·0124	·036	·040	·036
15	·0124	·0164	·044	·048	·048
20	·0156	·0180	·052	·064	·060
25	·018	·0220	·064	·072	·072
30	·020	·024	·072	·080	·078
35	·023	·028	·076	·092	·084
40	·024	·030	·084	·096	·096
45	·026	·032	·092	·104	·104
50	·028	·036	·096	·116	·108
60	·032	·040	·110	·128	·124
70	·036	·044	·122	·144	·136
80	·040	·048	·134	·160	·150
90	·044	·052	·144	·168	·162
100	·048	·056	·152	·180	·174
120	·052	·064	·176	·202	·196

EUREKA RESISTANCE WIRE

(REGD.)

CURRENT NECESSARY TO MAINTAIN GIVEN TEMPERATURE RISE. WIRE HELD STRAIGHT AND HORIZONTAL IN AIR WITH FREE RADIATION.

Size S.W.G.	Diam. Inch.	M/m.	Amperes for a Temperature rise of			Resistance per 1,000 yards at 15·5° C. Ohms.	Weight per 1,000 yards, lbs.
			100° C.	200° C.	300° C.		
8	·160	4·06	29·0	44·5	57·9	34·5	233·5
9	·144	3·65	24·0	37·2	48·7	42·6	189·0
10	·128	3·25	20·1	30·8	40·0	54·0	149·2
11	·116	2·94	18·6	28·1	36·4	65·7	122·8
12	·104	2·64	14·8	22·4	29·0	81·8	98·6
13	·092	2·33	12·6	18·8	24·5	104·4	77·1
14	·080	2·03	10·5	15·5	20·1	138·1	58·4
15	·072	1·82	9·3	13·4	17·4	170·6	47·3
16	·064	1·62	8·1	11·5	15·1	215·9	37·4
17	·056	1·42	7·0	9·8	13·0	281·9	28·6
18	·048	1·21	5·75	8·2	11·0	384	21·0
19	·040	1·01	4·8	6·7	9·2	552	14·6
20	·036	·91	4·1	6·0	8·3	682	11·8
21	·032	·81	3·6	5·4	7·4	864	9·35
22	·028	·71	3·1	4·6	6·5	1128	7·15
23	·024	·60	2·7	4·00	5·5	1535	5·24
24	·022	·55	2·4	3·55	5·0	1826	4·41
25	·020	·50	2·18	3·20	4·06	2211	3·64
26	·018	·45	2·00	2·90	3·60	2729	2·96
27	·0164	·41	1·82	2·68	3·21	3288	2·46
28	·0148	·37	1·66	2·42	2·85	4205	2·00
29	·0136	·34	1·54	2·22	2·58	4781	1·69
30	·0124	·31	1·40	2·00	2·30	5750	1·40
31	·0116	·29	1·30	1·81	2·13	6570	1·23
32	·0108	·27	1·20	1·64	1·94	7581	1·06
33	·0100	·25	1·08	1·46	1·77	8842	·912
34	·0092	·23	·98	1·30	1·60	10440	·771
35	·0084	·21	·85	1·13	1·42	12530	·644
36	·0076	·19	·75	·98	1·26	15310	·526
37	·0068	·17	·66	·83	1·09	19130	·421
38	·0060	·15	·58	·70	·93	24550	·328
39	·0052	·13	·50	·58	·78	32700	·246
40	·0048	·12	·46	·52	·70	38380	·210
41	·0044	·11				45670	·176
42	·0040	·10				55260	·146
43	·0036	·09				68070	·118
44	·0032	·08				86370	·093
45	·0028	·07				112800	·072
46	·0024	·06				153500	·053
47	·0020	·05				221000	·036
48	·0016	·040				345400	·023
49	·0012	·030				614000	·013
50	·0010	·025				884200	·009

The resistance values given above are standard and are subject to the tolerances given in B.S.I. Specification No. 115 of 1938

Approximate Characteristics

Temperature Co-efficient .. .. 0·000014.
Specific Resistance .. .. .. 49 microhms per cm cube
Comparative Resistance Copper—Unity 28
Specific Gravity .. .. 8·92

Thermo E.M.F against Copper (20° to 200° C.) .. .. 0·5 millivolts per ° C
Melting Point .. .. .. 1,250° C.
Tensile Strength .. .. .. 36 tons per square inch

The above information supplied by courtesy of Lewcos Ltd.

ELECTRICAL CABLE SIZES

NOMINAL AREA Sq. Inch.	OLD STANDARD No. S.W.G.	NEW STANDARD No/Inch.	Dia. in Inches	WEIGHT per 1000 yds. in lbs.	MAXIMUM RESISTANCE per 1000 yds. in OHMS.	LENGTH of CIRCUIT per Volt drop in feet.	CAPACITY of single cables in AMPS.
·001	1/20	1/·036	0·036	11·76	24·29	30	4·1
·0015	–	1/·044	0·044	17·58	16·26	30	6·1
·002	–	3/·029	0·062	23·37	12·61	30	7·8
·003	3/20	3/·036	0·078	36·02	8·180	29	12·0
·003	1/16	1/·064	0·064	37·20	7·688	29	12·9
·0045	–	7/·029	0·087	54·39	5·387	28	18·2
·007	7/20	7/·036	0·108	83·81	3·496	33	24·0
·01	–	7/·044	0·132	125·4	2·340	39	31·0
·0145	–	7/·052	0·156	174·9	1·675	45	37·0
·0225	7/16	7/·064	0·192	264·9	1·106	56	46·0
·03	–	19/·044	0·220	340·4	0·8637	61	53·0
·04	19/17	19/·052	0·260	475·5	0·6184	71	64·0
·06	19/16	19/·064	0·320	720·3	0·4085	83	83·0
·075	19/15	19/·072	—	911·8	0·3229	90	97·0
·10	–	19/·083	0·415	1212·0	0·2427	98	119·0
·12	37/16	37/·064	—	1403·0	0·2097	104	130·0
·15	37/15	37/·072	0·504	1776·0	0·1657	112	152·0
·20	–	37/·083	0·581	2360·0	0·1247	123	185·0
·25	–	37/·093	—	2963·0	0·09933	132	214·0
·30	–	37/·103	0·721	3635·0	0·08089	145	240·0
·40	–	61/·093	0·837	4886·0	0·06026	162	288·0
·50	–	61/·103	0·927	5994·0	0·04913	173	332·0
·60	–	91/·093	—	7290·0	0·04040	181	384·0
·75	–	91/·103	1·133	8942·0	0·03294	185	463·0
·85	–	127/·093	—	10175·0	0·02895	190	512·0
1·00	–	127/·103	1·339	12481·0	0·02360	200	595·0

FLEXIBLE CORDS

SIZE	AREA in Sq. Inches	CURRENT RATING in Amps.	RESISTANCE per 1000 yards single core..	MAXIMUM WEIGHT in lbs.	YARDS PER POUND WEIGHT for TWIN SILK (twisted)
14/·0076	·0006	2	39·7	3	17·6
23/·0076	·0010	3	24·2	5	13·3
40/·0076	·0017	5	13·8	10	9·75
70/·0076	·0030	10	7·94	10	6·55
110/·0076	·0048	15	5·05	10	4·68
162/·0076	·0070	20	3·43	10	3·33

MAXIMUM CURRENT RATING OF CABLES

SIZE	Rating in AMPERES A.C. & Voltage drop per 100 feet				SIZE	Rating in AMPERES A.C. & Voltage drop per 100 feet			
	Cores in one sheath					Cores in one sheath			
	UP TO 4		UP TO 8			UP TO 2		UP TO 4	
	AMPS.	VOLTS	AMPS.	VOLTS		AMPS.	VOLTS	AMPS.	VOLTS
1/·044	5	2·8	5	2·8	19/·052	78	1·75	62	1·4
3/·029	5	2·1	5	2·1	19/·064	102	1·55	82	1·19
3/·036	10	2·8	8	2·4	19/·083	147	1·35	119	1·04
7/·029	15	2·9	12	2·4	37/·072	190	1·28	151	0·98
	UP TO 2		UP TO 4		37/·083	229	1·26	183	0·98
					37/·103	298	1·28	238	0·98
7/·036	29	3·4	23	2·9	61/·093	358	1·38	286	1·04
7/·044	38	3·1	30	2·4	61/·103	413	1·50	330	1·15
7/·052	45	2·7	36	2·2	91/·103	530	1·80	—	—
7/·064	56	2·1	46	1·75	127/·103	648	2·10	—	—
19/·044	65	2·0	52	1·6					

CAPACITY OF FUSES IN AMPERES

FUSE RATING in Amps.	TINNED COPPER WIRE		STANDARD ALLOY WIRE		FUSE RATING in Amps.	TINNED COPPER WIRE		STANDARD ALLOY WIRE	
	Dia.	S.W.G.	Dia.	S.W.G.		Dia.	S.W.G.	Dia.	S.W.G.
1·8	—	—	·0164	27	30	·032	21	—	—
3	·006	38	·024	23	37	·04	19	—	—
5	·0084	35	·032	21	46	·048	18	—	—
8·5	·0124	30	—	—	53	·048	18	—	—
10	·0136	29	—	—	60	·056	17	—	—
15	·02	25	—	—	64	·056	17	—	—
17	·022	24	—	—	83	·072	15	—	—
20	·024	23	—	—	100	·08	14	—	—
24	·028	22	—	—					

COMPARISON BETWEEN
BRITISH & U.S.A. WIRE GAUGES
DIAMETERS IN INCHES

SIZE	4/0	3/0	2/0	0	1	2	3	4	5	6	7
S.W.G.	·400	·372	·348	·324	·300	·276	·252	·232	·212	·192	·176
B.W.G.	·454	·425	·380	·340	·300	·284	·259	·238	·220	·203	·180
B.&S.	·460	·4096	·3648	·3249	·2893	·2576	·2294	·2043	·1819	·1620	·1443

SIZE	8	9	10	11	12	13	14	15	16	17	18
S.W.G.	·160	·144	·128	·116	·104	·092	·080	·072	·064	·056	·048
B.W.G.	·165	·148	·134	·120	·109	·095	·083	·072	·065	·058	·049
B.&S.	·1285	·1144	·1019	·0907	·0808	·072	·0641	·0571	·0508	·0453	·0403

SIZE	19	20	21	22	23	24	25	26	27	28	29
S.W.G.	·040	·036	·032	·028	·024	·022	·020	·018	·0164	·0148	·0136
B.W.G.	·042	·035	·032	·028	·025	·022	·020	·018	·016	·014	·013
B.&S.	·0359	·032	·0285	·0253	·0226	·0201	·0179	·0159	·0142	·0126	·0113

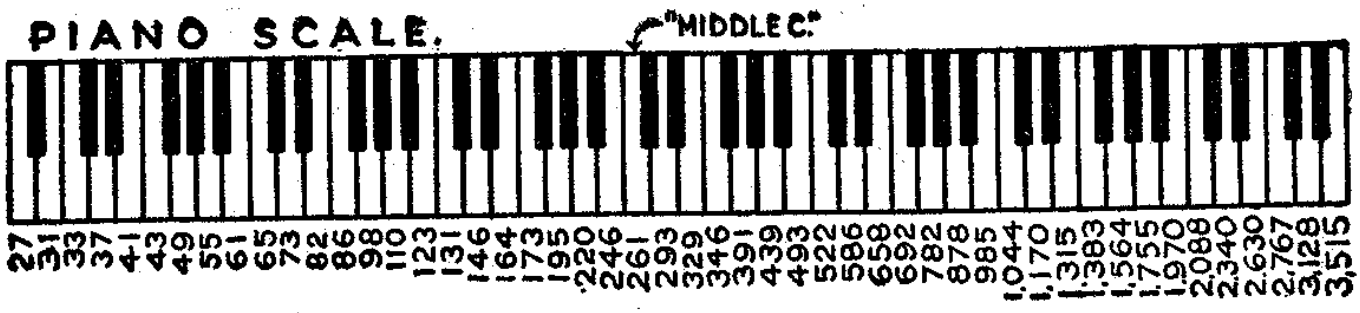
SIZE	30	31	32	33	34	35	36	37	38	39	40
S.W.G.	·0124	·0116	·0108	·010	·0092	·0084	·0076	·0068	·006	·0052	·0048
B.W.G.	·012	·010	·009	·008	·007	·005	·004	—	—	—	—
B.&S.	·0100	·0089	·0079	·0071	·0063	·0056	·005	·0045	·004	·0035	·0031

SIZE	41	42	43	44	45	46	47	48	49	50
S.W.G.	·0044	·0040	·0036	·0032	·0028	·0024	·002	·0016	·0012	·001
B.W.G.	—	—	—	—	—	—	—	—	—	—
B.&S.	·0028	·0025	·0022	·002	·0018	—	—	—	—	—

The above data supplied by courtesy of LEWCOS LTD.

RADIO SOLDER COMPOSITION AND MELTING POINTS

Composition	Percentage	Melting at °F	Composition	Percentage	Melting at °F
LEAD / TIN	100 / —	452	LEAD / TIN	40 / 60	462
LEAD / TIN	90 / 10	411	LEAD / TIN	30 / 70	494
LEAD / TIN	80 / 20	381	LEAD / TIN	20 / 80	551
LEAD / TIN	70 / 30	366	LEAD / TIN	10 / 90	588
LEAD / TIN	60 / 40	373	LEAD / TIN	— / 100	617
LEAD / TIN	50 / 50	411			



Piano scale showing the frequencies to which the keys are usually tuned, which is to a slightly different pitch from that used by physicists, based on Middle C = 256 c/s., and such scales are apt to be misleading. Frequencies of black keys can be obtained by multiplying the frequency of the white key below it by 1.05946. This scale is useful for the approximate calibration of oscillators and rough determination of resonant frequencies, etc.

VIBRATIONS AND THE MUSICAL SCALE.

Ratio of vibrations of 1 octave in any part of the Musical Scale :—

Note	C.	D.	E.	F.	G.	A.	B.	C.
Ratio	1	9/8	5/4	4/3	3/2	5/3	15/8	2
Decimal Ratio ...	1	1.125	1.25	1.33	1.5	1.66	1.875	2
Tonic Sol Fa Scale	Doh	Ray	Me	Fah	Soh	Lah	Te	Doh

* STROBOSCOPE TABLE.

FREQUENCY of Supply (c/s.)		15	25	33	40	50	60	80	90	100
RECORD SPEED	78 r.p.m.	23	38	51	62	77	92	123	139	154

To find the number of black spokes required for any speed and a.c. mains-frequency, the formula is :—

$$N \ \ldots \ = \frac{120.f}{r}$$

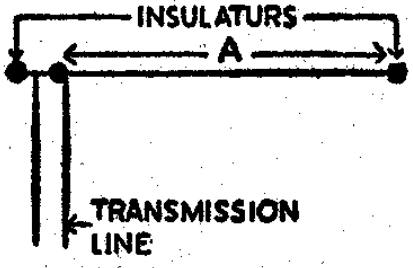
where N = number of black spokes.
f = mains supply frequency.
r = speed of record required.

N.B.—180 black spokes are required at 33⅓ r.p.m. for 50 c/s. mains.

FORMULAS FOR AERIALS CUT TO RESONATE AT ANY DESIRED FREQUENCY

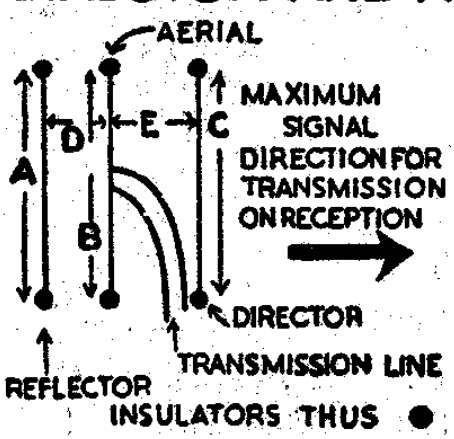
LONG WIRE MULTIBAND ZEPPELIN AERIAL

CUT FOR MOST FREQUENT BAND USED



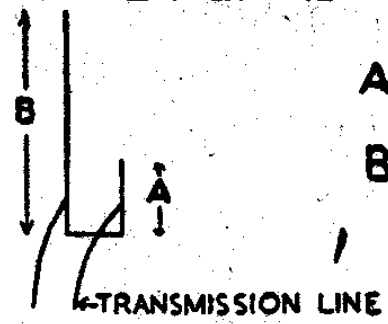
A=[{(164(NUMBER OF HALF WAVES ON THE AERIAL REQUIRED, MINUS ·05))÷(FREQUENCY IN MEGACYCLES OF MOST USED BRAND)}] YDS.

DIRECTOR AND REFLECTOR HALF WAVE AERIAL



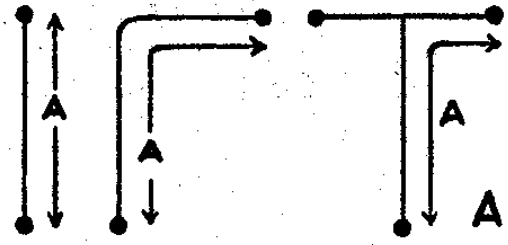
A={164÷(FREQUENCY IN MEGACYCLES)} YDS.
B={156÷(FREQUENCY IN MEGACYCLES)} YDS.
C={150÷(FREQUENCY IN MEGACYCLES)} YDS.
D={(WAVELENGTH IN METRES X·125)X1·094} YDS.
E={(WAVELENGTH IN METRES X·1)X1·094} YDS.

J TYPE AERIAL FOR VERY HIGH FREQUENCIES



A={(WAVELENGTH IN METRES ÷4)X1·094} YDS.
B={(WAVELENGTH IN METRES X·75)X1·094} YDS.

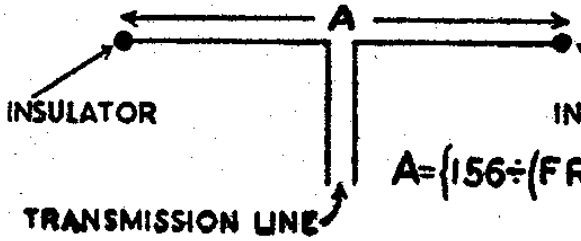
MARCONI TYPE ¼ WAVE AERIAL



A={(WAVELENGTH IN METRES ÷ 4)X 1·094} YARDS

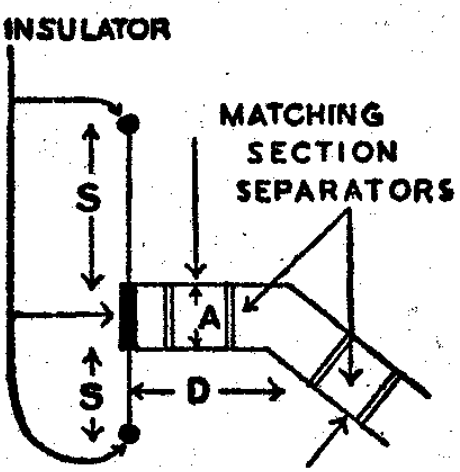
A HERE INCLUDES LENGTH OF LEADIN

HALF WAVE AERIAL



A={156÷(FREQUENCY IN MEGACYCLES)} YDS.

HALF WAVE Q MATCHED AERIAL



THE DIMENSION A DEPENDS UPON THE AERIAL IMPEDANCE AND THE IMPEDANCE OF THE TRANSMISSION LINE AND THE IMPEDANCE IN OHMS OF THE MATCHING SECTION IS EQUAL TO

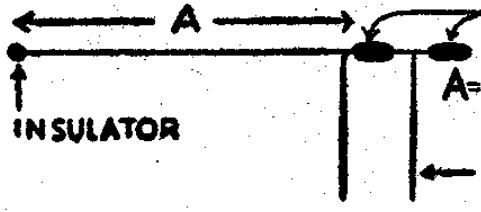
$$\sqrt{\text{AERIAL IMPEDANCE IN OHMS} \times \text{TRANSMISSION LINE IMPEDANCE IN OHMS}}$$

THEREFORE DIMENSION A IS OBTAINED BY REFERENCE TO THE SECTION DEALING WITH TRANSMISSION LINE FORMULAS ONCE THE IMPEDANCE OF THE MATCHING SECTION IS OBTAINED

$D = \{78 \div \text{FREQUENCY IN MEGACYCLES}\}$ YDS.

$S = \{78 \div \text{FREQUENCY IN MEGACYCLES}\}$ YDS.

ZEPPELIN AERIAL



$A = \{156 \div (\text{FREQUENCY IN MEGACYCLES})\}$ YDS

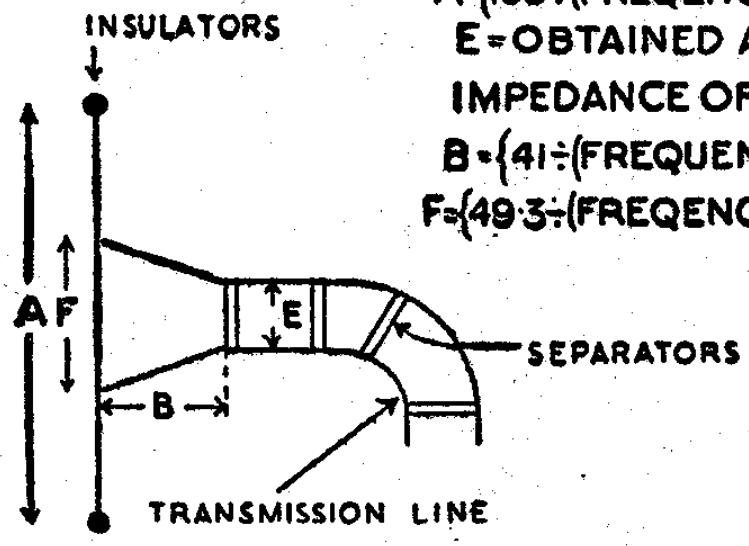
HALF WAVE DELTA MATCHED AERIAL

$A = \{156 \div (\text{FREQENCY IN MEGACYCLES})\}$ YDS.

E = OBTAINED ACCORDING TO THE IMPEDANCE OF THE TRANSMISSION LINE

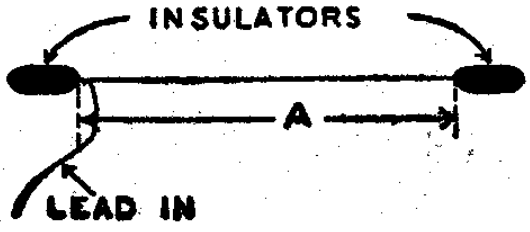
$B = \{41 \div (\text{FREQUENCY IN MEGACYOLES})\}$ YDS.

$F = \{49{\cdot}3 \div (\text{FREQENCY IN MEGACYCLES})\}$ YDS.



LONG WAVE AERIAL

ANY NUMBER OF HALF WAVES IN LENGTH



$A = [\{164(\text{NUMBER OF HALF WAVES ON THE AERIAL MINUS } 0{\cdot}5)\} \div \{\text{FREQUENCY IN MEGACYCLES}\}]$ YDS.

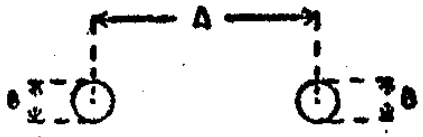
TRANSMISSION AND FEEDER LINE FORMULAS.

Two Wire Line.

Let A = Wire centre spacing in inches.
B = Wire diameters in inches.
C = Line impedance in ohms.
D = Capacity of twin line feeder in mmf. per foot.
E = Inductance of twin line feeder in millihenries per foot.

$$C = 276.36 \left\{\log (2A \div B)\right\}. \quad D = 3.679 \div \left\{\log (2A \div B)\right\}.$$

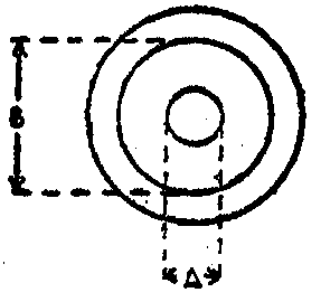
$$E = .2812 \left\{\log (2A \div B)\right\}.$$



Concentric Line.

A and B are given in inches.

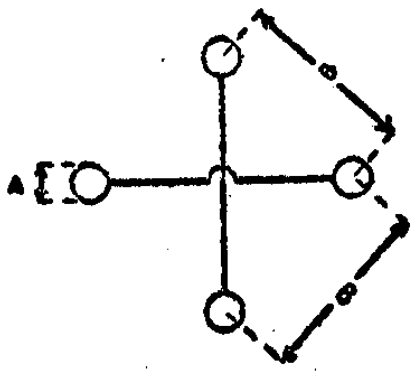
$$C = 138.18 \left\{\log (B \div A)\right\} \text{ ohms.}$$



Double Twin Line.

A and B are given in inches.

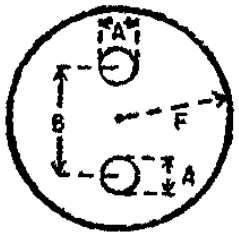
$$C = 138.18 \left\{\log (1.41421\ B \div A)\right\} \text{ ohms.}$$



Shielded Twin Line.

A, B and F are given in inches.

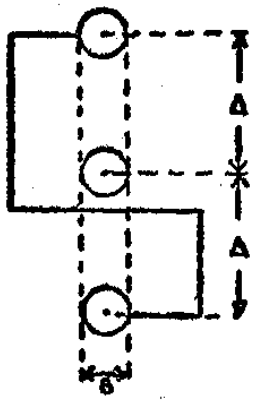
$$C = 276.36 \log \frac{2B}{A} \left\{\left\{1 - (B \div 2F)^2\right\} \div \left\{1 + (B \div 2F)^2\right\}\right\} \text{ ohms.}$$



Twin Single Line.

A and B are given in inches.

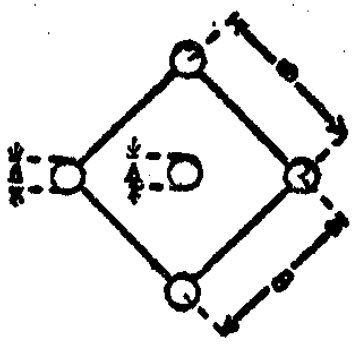
$$C = 207.3 \left\{ \log (1.587401A \div B) \right\} \text{ ohms.}$$



Square Concentric Line.

A and B are given in inches.

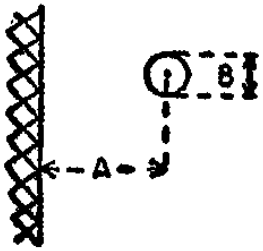
$$C = 171.71 \left\{ \log (1.148\ B \div A) \right\} \text{ ohms.}$$



Single Wire Line.

A and B are given in inches.

$$C = 138.18 \left\{ \log (4\ A \div B) \right\} \text{ ohms.}$$

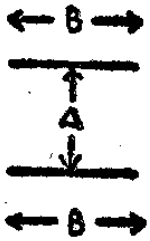


Parallel Thin Strip Foil Line.

A and B are given in inches.

$$C = 1188 \div \left[1 + 2.3 \log \left\{ 2.3 \log \left(\frac{(1+3.142B)}{A} \right) + \frac{3.142B}{A} + 1 \right\} + \frac{3.142B}{A} \right]$$

The formula for this type of line is only true when B is much greater than A.



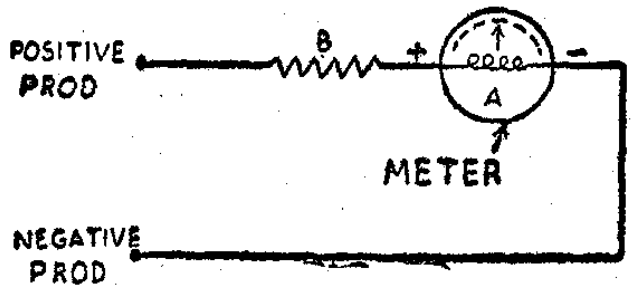
METER FORMULAS FOR DIRECT CURRENT MEASUREMENTS.

(*a*) To find the ohms. per volt resistance of a voltmeter. This value is equal to :—

1 ÷ full scale current in amperes.

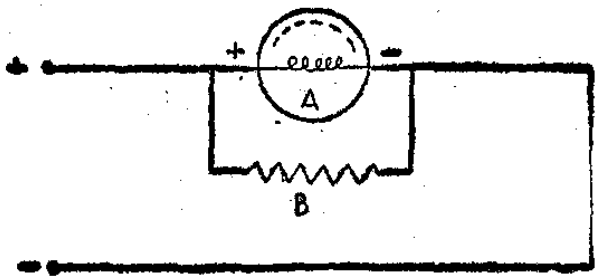
(*b*) To increase range of meter for voltage reading by any desired multiplier.

Let B = multiplier resistance value in ohms.
A = Total meter resistance in ohms.
Then B = (Required full scale reading in volts ÷ by the full scale meter current in amperes).



(*c*) To increase range of milliameter for current reading by any desired multiplier.

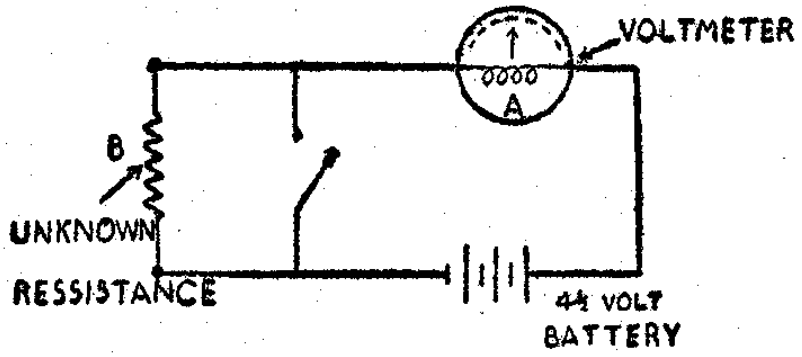
Let C = Required multiplying factor.
B = Shunt resistance value in ohms.
A = Total meter resistance in ohms.
Then B = A ÷ (C — 1).



(*d*) To find ohmage value of unknown resistance by using a voltmeter and battery.

Let B = value of unknown resistance.
A = resistance of voltmeter in ohms.

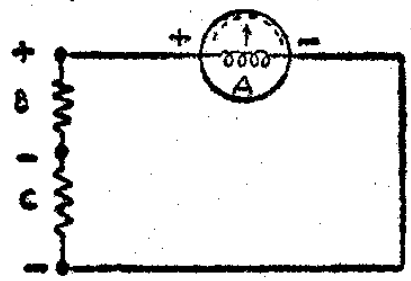
Then B = A {(Reading of voltmeter with closed switch ÷ Reading of voltmeter with open switch) — 1}



(*e*) To find value of universal current shunts.

Let D = required multiplier factor.
C + B = total resistance in ohms. for lowest shunted current range required.
A = meter resistance in ohms.

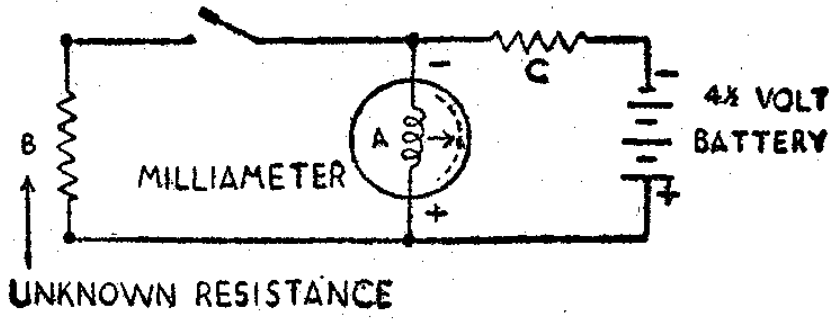
B = (A + B + C) ÷ D.



(*f*) To find ohmage value of unknown resistance by means of milliameter and battery.

Let C = series resistor for limiting battery current so as to give a reading on the meter scale when switch is open.
B = unknown resistance.
A = resistance of milliameter in ohms.

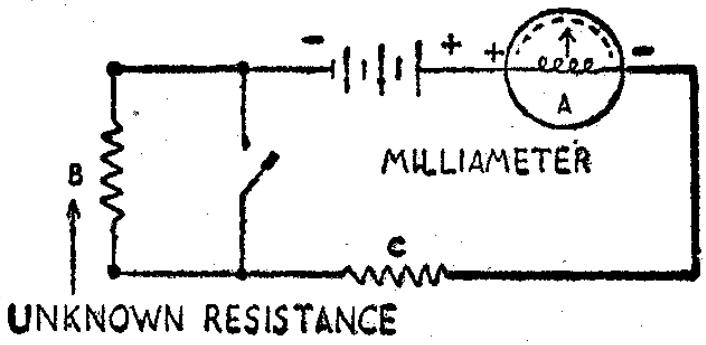
Then B = {Switch closed meter current reading ÷ (switch open meter current reading minus switch closed meter current reading)}.



(*g*) To find ohmage value of unknown resistance by means of milliameter, battery and any known resistor.

Let C = known resistance value in ohms.
B = unknown resistance value in ohms.
A = Meter resistance in ohms.

Then B = $\left\{C + A\right\}$ $\left\{$(Meter current reading with closed switch minus meter current reading with open switch) ÷ current meter reading with open switch$\right\}$.

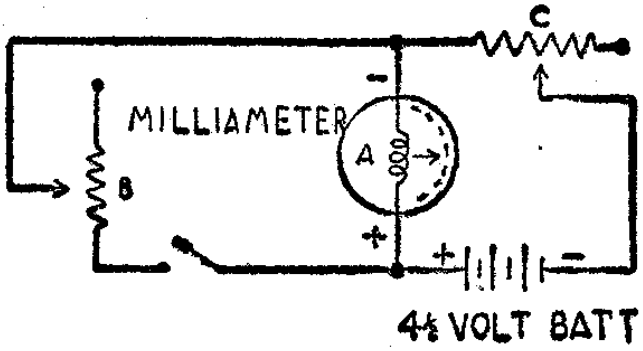


(*h*) To find the direct current resistance in ohms. of an unidentified voltmeter or milliameter.

Let C and B = Variable resistors.
A = unknown meter resistance.

Then connect circuit as shown in diagram with resistor C only being used in circuit, whilst B is disconnected by switch being open. With switch open vary C for full scale meter reading, then bring resister B into circuit by closing switch, and vary B until the meter reading returns to half scale. Then, if the value of resistance B at this setting is checked by an ohmmeter, the reading shown is equal to the resistance of A. It is vital that resistance C is of sufficiently high value to prevent an off the scale meter reading. If the full scale current of the meter is known, it is easy to calculate value of C by the following formula :—

C = (1,000 times testing battery voltage used) ÷ (meter full scale current in milliamperes).



SPEAKER OUTPUT TRANSFORMERS FORMULAS.

Ascertain output valve load resistance from "Bernards Valve Manual" No. 30, price 3/6, or from manufacturers data sheets and also speaker speech coil impedance in ohms. NOTE.—When two valves operate in Push-Pull, reckon the output load resistance to be twice that of a single valve, and when two valves are operating in parallel reckon output load resistance to be half that of a single valve.

The speaker output transformer ratio is equal to :—

$$\text{Square root of} \left\{ (\text{Optimum valve load resistance}) \div (\text{speaker speech coil impedance in ohms}) \right\}.$$

When extension speakers are required to be used with the same speech coil impedance as that used in the normal internal speaker, the output transformer ratio is equal to :—

$$\text{Square root of} \left[\text{Number of speakers} \times \left\{ (\text{optimum valve load resistance}) \div (\text{single speaker speech coil impedance in ohms.}) \right\} \right]$$

Output transformer ratio for extra speakers with different speech coil impedances. In this case it is necessary for each speaker to have its own output transformer.

The output transformer ratio of each speaker is equal to :—

$$\text{Square root of} \left[\text{Number of speakers} \times \left\{ (\text{Optimum valve load resistance}) \div (\text{Impedance in ohms. of speech coil of speaker being used}) \right\} \right]$$

OUTPUT TRANSFORMERS
TABLE OF RATIOS

VALVE LOAD (PLATE TO PLATE FOR P.P. OPERATION)	RATIOS →	SPEECH COIL IMPEDANCES							
		2 Ω	3 Ω	5 Ω	8 Ω	10 Ω	15 Ω	20 Ω	25 Ω
4000		44·7	36·5	28·3	22·4	20	16·4	14·1	12·6
5000		50	40·8	31·6	25	22·4	18·3	15·8	14·1
6000		54·8	44·7	34·6	27·4	24·5	20	17·3	15·5
8000		63·3	51·6	40	31·6	28·3	23	20	17·9
10000		70·7	57·7	44·7	35·3	31·6	25·8	22·4	20
12000		77·5	63·3	49	38·7	34·6	28·3	24·5	22
14000		83·7	68·3	53	41·8	37·4	30·6	26·5	23·7
16000		89·4	73	56·6	44·7	40	32·8	28·3	25·3
20000		100	81·6	63·2	50	44·7	36·5	31·6	28·3
25000		111·8	91·3	70·7	55·9	50	40·8	35·3	31·6

WAVELENGTH FREQUENCY AND L.C. FACTOR TABLES.

To use these tables which give inductance capacity values for Radio Frequencies the following examples are shown :—

1. Given a tuned circuit total capacity .0005 mfd. and inductance 245 microhenries, what is the natural wavelength and frequency? Answer : the L.C. constant is .0005 × 245 = .1225 ; therefore, wavelength is 660 metres and frequency 454.3 Kilocycles.

2. What inductance is needed to tune a .0005 mfd. condenser to 1,900 metres. Answer : L.C. for 1,900 metres = 1.016 ; therefore, inductance is 1.016 divided by .0005 which equals 2.032 microhenries.

3. A circuit with a natural frequency of 1,250 Kc. is required, the tuning coil inductance being 81 microhenries. What capacity should be connected across the coil? Answer : L.C. for 1,250 Kc. = .01624 ; hence capacity is .01622 ÷ by 81 which equals .0002 microfarads.

MULTIPLYING FACTORS FOR OTHER RANGES OUTSIDE THIS TABLE.

(A) If column 1 is multiplied by 10 then read column 2 multiplied by 100, and column 3 divided by 10.

(B) If column 1 is divided by 10, then read column 2 divided by 100 and column 3 multiplied by 10.

(C) If column 2 is multiplied by 10 then column 1 is multiplied by $\sqrt{10}$ and column 3 is divided by $\sqrt{10.}$

(D) If column 2 is divided by 10 then column 1 is divided by $\sqrt{10}$ and column 3 is multiplied by $\sqrt{10.}$

(E) If column 3 is multiplied by 10 then column 1 is divided by 10 and column 2 is divided by 100.

(F) If column 3 is divided by 10 then column 1 is multiplied by 10, and column 2 is multiplied by 100.

W/length Metres.	L. × C. Factor m.f. and m.h.	Frequency Kilocycles.	W/length Metres.	L. × C. Factor m.f. and m.h.	Frequency Kilocycles
1	.00000028	299820.0	55	.0008521	5451.0
2	.00000112	149910.0	60	.001014	4997.0
3	.00000253	99940.0	65	.001188	4613.0
4	.00000451	74955.0	70	.001379	4283.0
5	.00000704	59964.0	75	.001583	3998.0
6	.00001014	49970.0	80	.001801	3748.0
7	.00001383	42831.4	85	.002034	3527.0
8	.00001801	37477.5	90	.002280	3331.0
9	.00002282	33313.3	95	.002541	3156.0
10	.00002816	29982.0	100	.002816	2998.0
15	.0000635	19990.0	105	.003101	2855.0
20	.0001129	14991.0	110	.003404	2726.0
25	.0001754	11990.0	115	.003721	2607.0
30	.0002531	9994.0	120	.004052	2498.0
35	.0003445	8566.0	125	.004402	2399.0
40	.0004503	7495.5	130	.004757	2306.0
45	.0005702	6663.0	135	.005132	2221.0
50	.0007039	5996.4	140	.005518	2142.0

W/length Metres.	L. × C. Factor m.f. and m.h.	Frequency Kilocycles	W/length Metres.	L. × C. Factor m.f. and m.h.	Frequency Kilocycles
145	.005923	2067.0	395	.04392	759.1
150	.006335	1999.0	400	.04503	749.4
155	.006764	1934.0	405	.04617	740.3
160	.007204	1873.0	410	.04733	731.3
165	.007661	1817.0	415	.04851	722.5
170	.008134	1763.0	420	.04968	713.9
175	.008622	1713.0	425	.05084	705.5
180	.009120	1665.0	430	.05198	697.3
185	.009631	1620.0	435	.05323	689.2
190	.01016	1578.0	440	.05446	681.4
195	.01070	1539.0	445	.05573	673.8
200	.01129	1499.0	450	.05700	666.3
205	.01182	1463.0	455	.05830	658.9
210	.01239	1428.0	460	.05960	651.8
215	.01301	1395.0	465	06092	644.8
220	.01362	1362.0	470	.06225	637.9
225	.01425	1333.0	475	.06356	631.2
230	.01490	1303.0	480	.06485	624.6
235	.01554	1276.0	485	.06624	618.2
240	.01624	1249.0	490	.06757	611.9
245	.01689	1224.0	495	.06898	605.7
250	.01755	1199.0	500	.07039	599.6
255	.01830	1176.0	505	07184	593.7
260	.01902	1153.0	510	07327	587.8
265	.01977	1131.0	515	.07468	582.2
270	.02052	1110.0	520	.07606	576.6
275	.02125	1090.0	525	.07757	571.1
280	.02209	1070.0	530	.07903	565.7
285	.02285	1052.0	535	.08055	560.4
290	.02372	1034.0	540	.08208	555.2
295	.02451	1016.0	545	.08363	550.1
300	.02530	999.4	550	.08518	545.1
305	.02621	983.1	555	.08677	540.2
310	.02704	967.2	560	.08836	535.4
315	.02795	951.8	565	.08986	530.7
320	.02884	936.9	570	.09141	526.0
325	.02975	922.5	575	.09304	521.4
330	.03069	908.6	580	.09467	516.8
335	.03161	895.1	585	.09630	512.5
340	.03250	881.8	590	.09803	508.2
345	.03351	869.1	595	.09973	503.9
350	.03446	856.5	600	.1014	499.7
355	.03552	844.6	605	.1031	495.7
360	.03648	832.8	610	.1047	491.5
365	.03753	821.4	615	.1064	487.5
370	.03856	810.3	620	.1082	483.6
375	.03962	799.5	625	.1099	479.7
380	.04070	789.0	630	.1117	475.9
385	.04173	778.8	635	.1136	472.1
390	.04277	768.7	640	.1154	468.5

W/length Metres.	L. × C. Factor m.f. and m.h.	Frequency Kilocycles.	W/length Metres.	L. × C. Factor m.f. and m.h.	Frequency Kilocycles
645	.1171	464.8	895	.2254	335.0
650	.1188	461.3	900	.2280	333.1
655	.1205	457.7	905	.2306	331.3
660	.1225	454.3	910	.2332	329.5
665	.1244	450.9	915	.2357	327.7
670	.1263	447.6	920	.2381	325.9
675	.1282	444.2	925	.2407	324.1
680	.1302	440.9	930	.2434	322.3
685	.1322	437.7	935	.2461	320.7
690	.1341	434.5	940	.2487	319.0
695	.1360	431.4	945	.2514	317.3
700	.1378	428.3	950	.2541	315.6
705	.1398	425.3	955	.2568	314.0
710	.1419	422.3	960	.2595	312.3
715	.1439	419.3	965	.2621	310.7
720	.1459	416.4	970	.2647	309.1
725	.1479	413.6	975	.2676	307.5
730	.1501	410.7	980	.2704	305.9
735	.1520	407.9	985	.2731	304.4
740	.1540	405.2	990	.2759	302.8
745	.1561	402.4	995	.2788	301.3
750	.1583	399.8	1,000	.2816	299.8
755	.1604	397.1	1,010	.2879	296.9
760	.1625	394.5	1,020	.2927	293.9
765	.1646	391.9	1,030	.2986	291.1
770	.1668	389.4	1,040	.3045	288.3
775	.1691	386.9	1,050	.3105	285.5
780	.1714	384.4	1,060	.3161	282.8
785	.1735	381.9	1,070	.3222	280.2
790	.1756	379.5	1,080	.3283	277.6
795	.1778	377.1	1,090	.3344	275.1
800	.1801	374.8	1,100	.3404	272.6
805	.1824	372.4	1,110	.3468	270.1
810	.1847	370.1	1,120	.3531	267.7
815	.1870	367.9	1,130	.3595	265.3
820	.1893	365.7	1,140	.3660	263.0
825	.1917	363.4	1,150	.3721	260.7
830	.1941	361.2	1,160	.3786	258.5
835	.1963	359.0	1,170	.3853	256.3
840	.1985	356.9	1,180	.3921	254.1
845	.2009	354.8	1,190	.3988	252.1
850	.2034	352.7	1,200	.4052	249.8
855	.2057	350.7	1,220	.4191	245.8
860	.2081	348.6	1,240	.4326	241.7
865	.2106	346.6	1,260	.4470	238.0
870	.2132	344.6	1,280	.4609	234.2
875	.2156	342.7	1,300	.4757	230.6
880	.2179	340.7	1,320	.4905	227.2
885	.2204	338.8	1,340	.5053	223.7
890	.2229	336.9	1,360	5208	220.4

W/length Metres.	L. × C. Factor m.f. and m.h.	Frequency Kilocycles.	W/length Metres.	L. × C. Factor m.f. and m.h.	Frequency Kilocycles
1,380	.5359	217.3	2,500	1.7597	119.9
1,400	.5517	214.2	2,600	1.9027	115.3
1,420	.5675	211.0	2,700	2.0521	111.0
1,440	.5837	208.2	2,800	2.2071	107.0
1,460	.5999	205.3	2,900	2.3662	103.4
1,480	.6165	202.5	3,000	2.5331	99.9
1,500	.6334	199.9	3,100	2.7052	96.7
1,520	.6502	197.3	3,200	2.8831	93.7
1,540	.6671	194.7	3,300	3.0849	90.9
1,560	.6849	192.3	3,400	3.2552	88.2
1,580	.7028	189.8	3,500	3.4479	85.6
1,600	.7206	187.3	3,600	3.6478	83.3
1,620	.7388	185.1	3,700	3.8539	81.0
1,640	.7573	182.8	3,800	4.0648	78.9
1,660	.7756	180.6	3,900	4.2811	76.9
1,680	.7946	178.4	4,000	4.5007	74.9
1,700	.8135	176.3	4,100	4.7322	73.1
1,720	.8329	174.3	4,200	4.9657	71.4
1,740	.8520	172.3	4,300	5.2061	69.7
1,760	.8720	170.3	4,400	5.4512	68.1
1,780	.8917	168.4	4,500	5,6999	66.6
1,800	.9121	166.5	4,600	5,9561	65.2
1,820	.9327	164.7	4,700	6.2188	63.8
1,840	.9531	162.9	4,800	6.4861	62.5
1,860	.9742	161.2	4,900	6.7592	61.2
1,880	.9949	159.5	5,000	7.038	59.9
1,900	1.0165	157.8	5,100	7.321	58.8
1,920	1.0375	156.2	5,200	7.609	57.7
1,940	1.0598	154.5	5,300	7.911	56.6
1,960	1.0811	153.1	5,400	8.212	55.5
1,980	1.1036	151.4	5,500	8.508	54.5
2,000	1.1257	149.9	5,600	8.829	53.5
2,100	1.2413	142.8	5,700	9.151	52.6
2,200	1.3624	136.2	5,800	9.472	51.7
2,300	1.4894	130.3	5,900	9.809	50.8
2,400	1.6218	124.9	6,000	10.11	49.9

THE CIRCULAR MIL.

The circular mil. is a modern and facile method of calculating area of wire cross sections and is equal to the square of the wire diameter given in mils., which are the one thousandth part of an inch. Example : 26 S.W.G. wire is equal to .018″ diameter ; the circular mil. area of this size wire is calculated thus, 18 × 18 = 324. Therefore, the circular mil. area is equal to 324 mils.

The circular mil. foot is a piece of wire one foot in length by one circular mil. in area.

"Q" SIGNALS.

The signals are intended as advice when no question mark follows them.

This code was originally used by wireless telegraphy operators at sea, but it has now become the standard code for use in all forms of Wireless Telegraphic Service.

It should be noted that, in a number of Aeronautical Services the words "True Bearing" and "True Course" are called "Geographical Bearing" and "Geographical Course."

QRA ... What is the name of your station?
QRB ... How far approximately are you from my station?
QRC ... What Company (or Government) settles the accounts for your station?
QRD ... Where are you bound for and where are you from?
QRG ... Will you tell me my exact frequency (wavelength) in kc/s. (or metres)?
QRH ... Does my frequency (wavelength) vary?
QRI ... Is my note good?
QRJ ... Do you receive me badly? Are my signals weak?
QRK ... What is the legibility of my signals (1 to 5)?
QRL ... Are you busy?
QRM ... Are you being interfered with?
QRN ... Are you troubled by atmospherics?
QRO ... Shall I increase power?
QRP ... Shall I decrease power?
QRQ .. Shall I send faster?
QRS .. Shall I send slower?
QRT ... Shall I stop sending?
QRU ... Have you anything for me?
QRV ... Are you ready?
QRW ... Shall I tell.....that you are calling him on..... kc/s. (or.....metres)?
QRX ... Shall I wait. When will you call me again?
QRY ... What is my turn?
QRZ ... Who is calling me?
QSA ... What is the strength of my signals (1 to 5).
QSB ... Does the strength of my signals vary?
QSD ... Is my keying correct? Are my signals distinct?
QSG ... Shall I send.....Telegrams (or one telegram) at a time?
QSJ ... What is the charge per word for.....including your internal telegraph charge?
QSK ... Shall I continue with the transmission of all my traffic? I can hear you through my signals.
QSL ... Can you give me acknowledgment of receipt?
QSM ... Shall I repeat the last telegram I sent you?
QSO ... Can you communicate with.....direct (or through the medium of.....)?
QSP ... Will you re-transmit to.....free of charge?
QSR ... Has the distress call received from.....been cleared?
QST ... General call preceding message addressed to all amateurs.
QSU ... Shall I send (or reply) on.....kc/s. (or metres) and/or on waves of Type A1, A2, A3 or B?
QSV ... Shall I send a series of VVV.....?
QSW ... Will you send on.....kc/s. (or.....metres), and/or on waves of Type A1, A2, A3. or B?

QSX	...	Will you listen for.....(call sign) on.....kc/s. (or.....,metres) ?
QSY	...	Shall I change to transmission on .....kc/s. (or .....metres) without changing the type of wave. or shall I change to transmission on another wave ?
QSZ	...	Shall I send each word or group twice ?
QTA	...	Shall I cancel telegram No..... as if it had not been sent ?
QTB	...	Do you agree with my number of words ?
QTC	...	How many telegrams have you to send ?
QTE	...	What is my true bearing in relation to you ? OR What is my true bearing in relation to.....(call sign) ? What is the true bearing of.....(call sign) in relation to .....(call sign) ?
QTF	...	Will you give me the position of my station according to the bearings taken by the direction finding stations which you control ?
QTG	...	Will you send your call sign for fifty seconds followed by a dash of ten seconds on .....kc/s. (or.....metres) in order that I may take your bearing ?
QTH	...	What is your position in latitude and longitude (or by any other way of showing it) ?
QTI	...	What is your true course ?
QTJ	...	What is your speed ?
QTM	...	Send Radio-electric signals and submarine sound signals to enable me to fix my bearing and my distance.
QTO	...	Have you left dock (or port) ?
QTP	...	Are you going to enter dock (or port) ?
QTQ	...	Can you communicate with my station by means of the International code of Signals ?
QTR	...	What is the exact time ?
QTU	...	What are the hours during which your station is open ?
QUA	...	Have you news of.....(call sign of the mobile station) ?
QUB	...	Can you give me in this order information concerning visibility, height of clouds, ground wind for..... (place of observation) ?
QUC	...	What is the last message received by you from..... (call sign of the mobile station) ?
QUD	...	Have you received the urgency signal sent by..... (call sign of the mobile station) ?
QUF	...	Have you received the distress signal sent by..... (call sign of the mobile station) ?
QUG	...	Are you being forced to alight in the sea (or to land) ?
QUH	...	Will you indicate the present barometric pressure at sea level ?
QUJ	...	Will you indicate the true course for me to follow, with no wind, to make for you ?
QUK	...	Can you tell me the condition of the sea observed at..... (place or co-ordinates) ?
QUL	...	Can you tell me the swell observed at.....(place or co-ordinates) ?
QUM	...	Is the distress traffic ended ?

SIGNAL STRENGTH REPORTS.

THE "QSA-R" SYSTEM.

"Q" Readability System.

QSA1—Barely perceptible; unreadable.
QSA2—Weak; readable only now and then.
QSA3—Fairly good; readable with difficulty.
QSA4—Good readable signals.
QSA5—Very good signals; perfectly readable.

"R" Audibility System.

R1—Very weak signals; hardly readable.
R2—Weak signals; barely readable.
R3—Weak signals; but can be read.
R4—Fair signals; easily readable.
R5—Fairly strong signals.
R6—Good signals.
R7—Good strong signals, that come through QRM and QRN.
R8—Very strong signals; heard several feet from the phones.
R9—Extremely strong signals.

"T" Tone System.

T1—("T3, R6") very rough 25 or 60 cycle A.C. tone.
T2—Rough 60 cycle A.C. tone.
T3—Poor A.C. tone. Sounds like no filter.
T4—Fair A.C., small filter.
T5—Nearly pure D.C. tone, good filter, but has key thumps, or back wave, etc.
T6—Nearly pure D.C. tone. Very good filter; keying perfect.
T7—Pure D.C. tone, but has key thumps, back wave, etc.
T8—Pure D.C.
T9—Pure crystal controlled D.C. tone.

THE "RST" SYSTEM.

Readability.

R1—Unreadable.
R2—Barely readable—very few words distinguishable.
R3—Readable with some difficulty.
R4—Readable with practically no difficulty.
R5—Perfectly readable.

Signal Strength.

S1—Faint—signals barely perceptible.
S2—Extremely weak signals.
S3—Weak signals.
S4—Fair signals.
S5—Fairly good signals.
S6—Good signals.
S7—Fairly strong signals.
S8—Strong signals.
S9—Extremely strong signals.

Tone.

T1—Extremely rough, hissing note.
T2—Very rough A.C. note—no trace of musicality.
T3—Rough, low-pitched A.C. note—slightly musical.
T4—Rather rough A.C. note—moderately musical.
T5—Musically modulated note.
T6—Modulated note—slight trace of whistle.
T7—New D.C. note—smooth ripple.
T8—Good D.C. note—minute trace of ripple.
T9—Purest D.C. note.

If the note appears to be crystal controlled, add **X** following the appropriate number.

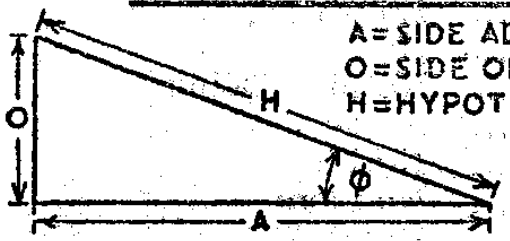
AMATEUR OR "HAM" ABBREVIATIONS USUALLY USED IN NON-COMMERCIAL WIRELESS TRAFFIC.

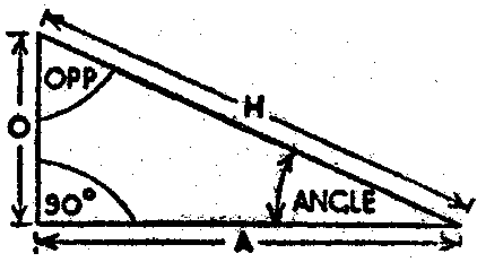
ABT ... About
AGN ... Again
AHD ... Ahead
AHR ... Another
ANI ... Any
APRX Approximate—Approximately
BC ... Broadcast
BD ... Bad
B4 ... Before
BK ... Break
BN ... Been
BND ... Band
BCUZ ... Because
BTWN Between
BIZ ... Business
C .... See, Yes.
CLR ... Clear
CN ... Can
CNT ... Cant
CK ... Check
CKT ... Circuit
CMG ... Coming
CUD ... Could
CW ... Continuous Wave
CUL ... See you later
CUAGN See you again
DA ... Day
DE ... From
DH ... Deadhead
DINT ... Did not
DNT ... Don't
DX ... Long distance
ES ... And
EZ ... Easy
FB ... Fine business
FM ... From
FR ... For
FRQ ... Frequency
GA ... Go ahead
GB ... Good Bye
GM ... Good Morning
GN ... Good Night
GG ... Going
GT ... Got Get
GND ... Ground
HA or HI Laughter
HM ... Him
HR ... Here—Hear
HV ... Have
HW ... How
IC ... I see
ICW ... Interrupted Continuous Wave
K ... Go ahead
LID ... Poor Operator
LIL ... Little
LFT ... Left
LST ... Last—Listen
LTR ... Letter
MG ... Motor Generator
MI ... My
MK ... Make
MO ... More
MSG ... Message
MT ... Empty
N ... No
ND ... Nothing Doing
NG ... No good
Nil ... Nothing
NM ... No more
NR ... Number
NW ... Now
OB ... Old Boy
OL ... Old Lady
OM ... Old Man
OP ... Operator
OT ... Old Top-Timer
OW ... Old Woman
PLS ... Please
PSE ... Please
PX ... Press
R ... OK
RCD ... Received
RCVR ... Receiver
RI ... Radio Inspector
SA ... Say
SEZ ... Says
SM ... Some
SW ... Short Wave
SIG ... Signal
SKED ... Schedule
TFC ... Traffic
TMW ... To-morrow
TR ... There
TT ... That
TK ... Take
TKS ... Thanks
TNK ... Think
TNX ... Thanks
U ... You
UD ... You would

AMATEUR ABBREVIATIONS—*continued.*

UL	...	You will	WT	...	What
UR	...	Your	WX	...	Weather
VT	...	Vacuum Tube (Valve)	X	...	Interference
VY	...	Very	XMTR		Transmitter
WA	...	Word after	XTAL	...	Crystal
WB	...	Word before	YF	...	Wife
WD	...	Would	YL	...	Young Lady
WF	...	Word following	YR	...	Your
WK	...	Work	30	...	Finish—end
WL	...	Will—would	73	...	Best regards
WN	...	When	88	...	Love and Kisses

SOLUTION OF RIGHT ANGLE TRIANGLES





$\text{SINE } \phi = \frac{O}{H}$ $\text{TANGENT } \phi = \frac{O}{A}$ $\text{SECANT } \phi = \frac{H}{A}$

$\text{COSINE } \phi = \frac{A}{H}$ $\text{COTANGENT } \phi = \frac{A}{O}$ $\text{COSECANT } \phi = \frac{H}{O}$

PARTS GIVEN	PARTS TO BE FOUND				
	HYP	ADJ SIDE	OPP SIDE	ANGLE	OPP ANGLE
HYPOTENUSE AND ADJACENT	——	——	$\sqrt{HYP^2-ADJ^2}$	$\text{COSINE} = \frac{ADJ}{HYP}$	$\text{SINE} = \frac{ADJ}{HYP}$
HYPOTENUSE AND OPPOSITE	——	$\sqrt{HYP^2-OPP^2}$	——	$\text{SINE} = \frac{OPP}{HYP}$	$\text{COSINE} = \frac{OPP}{HYP}$
HYPOTENUSE AND ANGLE	——	HYP × COSINE	HYP × SINE	——	90°—ANGLE
ADJACENT AND OPPOSITE	$\sqrt{ADJ^2+OPP^2}$	——	——	$\text{TAN} = \frac{OPP}{ADJ}$	$\text{COTAN} = \frac{OPP}{ADJ}$
ADJACENT AND ANGLE	$\frac{ADJ}{COSINE}$	——	ADJ × TANGENT	——	90°—ANGLE
OPPOSITE AND ANGLE	$\frac{OPP}{SINE}$	OPP × COTAN	——	——	90°—ANGLE

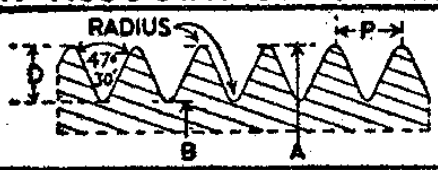
B.A. TAPPING DRILLS

B.A. No	DRILL SIZE	B.A. No	DRILL SIZE	B.A. No	DRILL SIZE	B.A. No	DRILL SIZE
0	No 12	5	No 40	10	No 56	15	No 72
1	No 19	6	No 44	11	No 58	16	No 74
2	No 26	7	No 48	12	No 63	17	No 76
3	No 30	8	No 51	13	No 65	18	No 77
4	No 34	9	No 53	14	No 70	19	No 79

B.A. CLEARANCE DRILLS

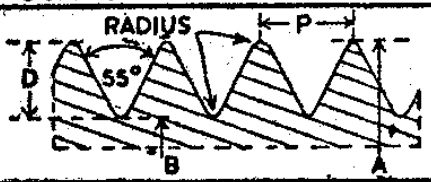
B.A. No	DRILL SIZE	B.A. No	DRILL SIZE	B.A. No	DRILL SIZE
0	"C"	6	No 32	12	No 54
1	No 3	7	No 37	13	No 54
2	No 11	8	No 42	14	3/64"
3	No 19	9	No 46	15	No 60
4	No 26	10	No 49		
5	No 29	11	No 51		

BRITISH ASSOCIATION THREADS (B.A)



B.A. N°	THRDS PER INCH	OUTSIDE DIA "A"	CORE DIA "B"	PITCH "P"	DEPTH "D"	RADIUS "R"
0	25·38	·2362	·1890	·0394	·0236	·0072
1	28·25	·2087	·1663	·0354	·0212	·0064
2	31·35	·1850	·1468	·0319	·0191	·0058
3	34·84	·1614	·1272	·0287	·0172	·0052
4	38·46	·1417	·1105	·0260	·0156	·0047
5	43·10	·1260	·0980	·0232	·0139	·0042
6	47·85	·1102	·0852	·0209	·0125	·0038
7	52·91	·0984	·0758	·0189	·0113	·0034
8	59·17	·0866	·0664	·0169	·0101	·0031
9	64·94	·0748	·0564	·0154	·0092	·0028
10	72·46	·0669	·0503	·0138	·0083	·0025
11	81·97	·0591	·0445	·0122	·0073	·0022
12	90·91	·0511	·0375	·0110	·0066	·0020
13	102·0	·0472	·0354	·0098	·0059	·0018
14	109·9	·0394	·0284	·0091	·0055	·0016
15	120·5	·0354	·0254	·0083	·0050	·0015
16	133·3	·0311	·0221	·0075	·0045	·0014
17	149·3	·0276	·0196	·0067	·0040	·0012
18	169·5	·0244	·0174	·0059	·0035	·0011
19	181·8	·0213	·0147	·0055	·0033	·0010
20	212·8	·0189	·0133	·0047	·0028	·0009
21	232·6	·0165	·0113	·0043	·0026	·0008
22	256·4	·0146	·0100	·0039	·0023	·0007
23	285·7	·0130	·0088	·0035	·0021	·0006
24	323·6	·0114	·0076	·0031	·0019	·0006

BRITISH STANDARD FINE THREADS (B.S.F.)



DIA	OUTSIDE DIA "A"	CORE DIA "B"	THRDS PER INCH	PITCH "P"	DEPTH "D"	RADIUS "R"
7/32	·21875	·1731	28	·03571	·0229	·0049
1/4	·250	·2007	26	·0385	·0246	·0053
9/32	·28125	·2320	26	·0385	·0246	·0053
5/16	·3125	·2543	22	·0454	·0291	·0062
3/8	·375	·3110	20	·050	·0320	·0069
7/16	·4375	·3664	18	·0556	·0356	·0076
1/2	·500	·420	16	·0625	·040	·0086
9/16	·5625	·4825	16	·0625	·040	·0086
5/8	·625	·5335	14	·0714	·0457	·0098
11/16	·6875	·596	14	·0714	·0457	·0098
3/4	·750	·6433	12	·0833	·0534	·0114
13/16	·8125	·7058	12	·0833	·0534	·0114
7/8	·875	·7586	11	·09091	·0582	·0125
1"	1·000	·8719	10	·1000	·064	·0137
1 1/8	1·125	·9827	9	·1111	·0711	·0153
1 1/4	1·250	1·1077	9	·1111	·0711	·0153
1 3/8	1·375	1·2149	8	·1250	·080	·0172
1 1/2	1·500	1·3399	8	·1250	·080	·0172
1 5/8	1·625	1·4649	8	·1250	·080	·0172
1 3/4	1·750	1·567	7	·1428	·0915	·0196
2	2·000	1·817	7	·1428	·0915	·0196
2 1/4	2·250	2·0366	6	·1667	·1067	·0229
2 1/2	2·500	2·2866	6	·1667	·1067	·0229
2 3/4	2·750	2·5366	6	·1667	·1067	·0229
3	3·000	2·7439	5	·2000	·1281	·0275

METRIC TO DECIMAL EQUIVALENTS

M/M	INCH	M/M	INCH	M/M	INCH
·01	·0004	·43	·0169	·85	·0335
·02	·0008	·44	·0173	·86	·0339
·03	·0012	·45	·0177	·87	·0343
·04	·0016	·46	·0181	·88	·0347
·05	·0020	·47	·0185	·89	·0350
·06	·0024	·48	·0189	·90	·0354
·07	·0028	·49	·0193	·91	·0358
·08	·0032	·50	·0197	·92	·0362
·09	·0036	·51	·0201	·93	·0366
·10	·004	·52	·0205	·94	·03701
·11	·0043	·53	·0209	·95	·0374
·12	·0047	·54	·0213	·96	·0378
·13	·0051	·55	·0217	·97	·0382
·14	·0055	·56	·0221	·98	·0386
·15	·0059	·57	·0225	·99	·03898
·16	·0063	·58	·0228	1	·0394
·17	·0067	·59	·0232	2	·0787
·18	·0071	·60	·0236	3	·1181
·19	·0075	·61	·0240	4	·1575
·20	·0079	·62	·0244	5	·1968
·21	·0083	·63	·0248	6	·2362
·22	·0087	·64	·0252	7	·2756
·23	·0091	·65	·0256	8	·315
·24	·0095	·66	·026	9	·3543
·25	·0099	·67	·0264	10	·3937
·26	·0103	·68	·0268	11	·4331
·27	·0106	·69	·0272	12	·4724
·28	·0110	·70	·0276	13	·5118
·29	·0114	·71	·0279	14	·5512
·30	·0118	·72	·0283	15	·5905
·31	·0122	·73	·0287	16	·6299
·32	·0126	·74	·0291	17	·6693
·33	·013	·75	·0295	18	·7082
·34	·0134	·76	·0299	19	·748
·35	·0138	·77	·0303	20	·7874
·36	·0142	·78	·0307	21	·8268
·37	·0146	·79	·0311	22	·8661
·38	·0150	·80	·0315	23	·9055
·39	·0154	·81	·0319	24	·9449
·40	·0158	·82	·0323	25	·9842
·41	·0162	·83	·0327		
·42	·0166	·84	·0331		

B.S.F. TAPPING DRILLS

DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE
1/4	13/64	7/16	"U"	11/16	39/64	1"	7/8
1/4	No 7	1/2	27/64	3/4	21/32	1 1/8	63/64
5/16	"F"	9/16	31/64	13/16	23/32	1 1/4	1 7/64
3/8	"O"	5/8	35/64	7/8	49/64		

B.S.F. CLEARANCE DRILLS

DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE	DIA	DRILL SIZE
1/4	17/64	3/8	"V"	11/16	45/64	1 1/8	1 9/64
1/4	"F"	7/16	29/64	3/4	49/64	1 1/4	1 17/64
5/16	21/64	1/2	33/64	13/16	53/64	1 3/8	1 25/64
5/16	"O"	9/16	37/64	7/8	57/64	1 1/2	1 33/64
3/8	25/64	5/8	41/64	1"	1 1/64	1 5/8	1 41/64

MATHEMATICAL SYMBOLS

$\gg$	Is much greater than.
$>$	Is greater than.
$\equiv$	Identity.
$\cong$	Is approximately equal to.
$\neq$	Does not equal.
$\leqslant$	Less than or equal to.
$\geqslant$	Greater than or equal to.
$\ll$	Is much less than.
$<$	Is less than.
$\lvert n \rvert$	Absolute value of n.
$\perp$	Perpendicular to.
$\angle$	Angle.
$\therefore$	Therefore.
Δ	Increment or Decrement.
$\parallel$	Parallel to.
$-$	Negative. Minus. Subtract.
$\times$ or $\cdot$	Multiplied by.
$+$	Positive. Plus. Add.
$\mp$	Negative or positive. Minus or Plus.
$\pm$	Positive or Negative. Plus or Minus.
$\div$ or $:$	Divided by.
$=$ or $::$	Equals

UNITS

A	Ampere
Ah	Ampere-hour
C	Coulomb
F	Farad
H	Henry
db	Decibel
V	Volt
W	Watt
Wh	Watt-hour
Ω	Ohm
C/S	Cycles per Second

Examples:—

$M\Omega$	=	Megohm [meg.]
kW	=	Kilowatt.
mA	=	Milliamp
μV	=	Microvolt
$\mu\mu F$	=	Micro-Microfarad
Mc/s	=	Megacycles per second.
k c/s	=	Kilocycles per second.
mH	=	Millihenry
μF	=	Microfarad
pF	=	Pica-farad

MULTIPLES AND SUBMULTIPLES

M	Mega.	$= 10^{6}$	μ	Micro $= 10^{-6}$
k	Kilo.	$= 10^{3}$	$\mu\mu$	Micro-micro. $= 10^{-12}$
m	Milli	$= 10^{-3}$	*p*	Pico. $= 10^{-12}$

SYMBOLS

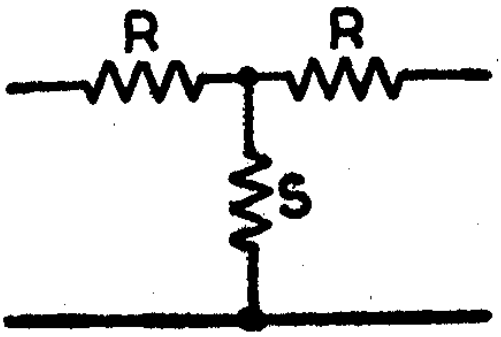
NORMALLY IN COMMON USE IN RADIO AND ELECTRICAL FORMULAE

B	Magnetic Flux Density.
C	Capacity.
E	Electromotive Force [E.M.F].
i	Instantaneous E.M.F.
f	Frequency.
G	Magneto-Motive-Force [M.M.F.]
G	Conductance.
g or g_m	Mutual Conductance of Valve.
H	Magnetic Field Strength.
I	Current.
i	Instantaneous Current.
K	Specific Inductive Capacity.
L	Self Inductance.
M	Mutual Inductance.
m or μ	Amplification Factor of Valve.
P	Power
Q	Quantity of Electricity.
R	Resistance.
R_a	A.C. Anode Resistance of Valve.
R_d	Dynamic Resistance of Tuned Circuit = L/CR.
S	Magnetic Reluctance.
t	Time
V	Potential Difference
W	Energy.
X	Reactance.
Z	Impedance.
λ	Wavelength.
μ	Valve Amplification Factor
μ	Magnetic Permeability
π	Ratio of Circumference to Diameter of Circle = 3·14 [approx.]
ρ	Specific Resistance
Φ	Magnetic Flux.
φ	Phase Angle.
ω	Angular Velocity

CONVERSION TABLES.

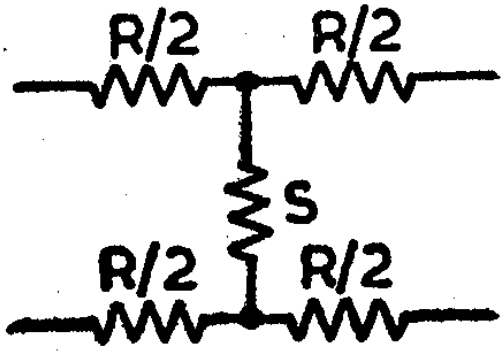
To change	*Into*	*Multiply by*	*To obtain converse multiply by*
Cubic Centimetres	Cubic Inches	0.06102	16.39
Calories	Kilogrammetres	427.0	0.00234
Dynes	Grammes weight	0.001019	980.39
Cubic Yards	Cubic Metres	0.7646	1.308
Cubic Inches	Litres	0.0164	61.0
B.Th.U.	Watt-hours	0.2931	3.41
Atmospheres	Lb./sq. in.	14.70	0.068
B.Th.U.	Calories	0.252	3.97
B.Th.U.	Foot Pounds	777.4	0.001285
Centimetres	Inches	0.3937	2.54
Cubic Feet	Cubic Metres	0.0283	35.31
Dynes	Poundals	0.000072	13825.52
Feet	Metres	0.305	3.281
Ergs	Foot-lb.	7.373×10^{-8}	1.36×10^{7}
Foot-lb.	Kilogrammetres	0.1384	7.23
Feet/sec.	Miles/hr.	0.68182	1.467
Feet/min.	Miles/hr.	0.01137	88.0
Feet/sec.	Metres/min.	18.288	0.0547
Grains	Grammes	0.0648	15.432
Gallons	Litres	4.546	0.2205
Foot-lb./sec.	Horse-power	0.0018	55.0
Feet/min.	Metres/sec.	0.00508	196.8
Horse-power	B.Th.U./min.	42.41	0.0236
Grammes/c.c	Lb./cu. in.	0.03613	27.68
Gallons	Cubic Feet	0.161	6.211
Grammes	Ounces	0.03527	28.35
Grammes/sq m	Ounces/sq. yd.	0.0295	33.9
Inches	Millimetres	25.4	0.03937
Horse-power	Kilogrammetres/sec.	76.04	0.01315
Horse-power	Watts	746.0	0.00134
Joules	Watt-seconds	1.0	1.0
Inches	Feet	0.0833	12.0
Imperial Gallons	U.S. Gallons	1.205	0.830
Kilocalories/Kilogramme	B.Th.U./lb.	1.80	0.55
Joules	Ergs	10^{7}	10^{-7}
Inches of Mercury	Lb./sq. in.	0.4902	2.04
Inches	Metres	0.0254	39.37
Inches	Yards	0.0277	36.0
Kilocalories	B.Th.U	3968.0	0.000251
Kg./P.S.	Lb./h.p.	2.235	0.4475
K.Cal./cm.²/cm./hr.C°	B.Th.U./in./hr./F°	5.598	0.180
Kilogrammes	Lb.	2.205	0.454
Metres	Yards	1.094	0.914
Kilowatt Hours	Joules	36×10^{5}	27×10^{-7}
Kilogrammes/sq cm	Lb./sq. in.	14.22	0.0703
Kilogrammes	Tons	0.000891	1016.2
Kilometres	Miles	0.621	1.609
Poundals	Lb. weight	0.03107	32.15
Knots	m.p.h.	1.151	0.868
Kilowatts	Horse-power	1.3406	0.746
Litres	Pints	1.76	0.568
Metres/sec.	m.p.h.	2.24	0.447
Square Metres	Square Yards	1.197	0.8361
Square Centimetres	Square Inches	0.155	6.4516
Tonnes	Tons	0.9842	1.016

TELEVISION AERIAL ATTENUATORS



75 ohm Feeder—"T" Section

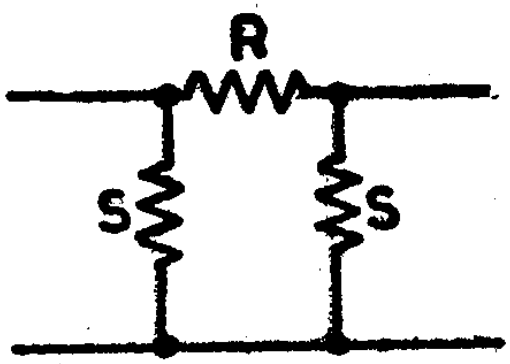
5	db	R —	22	ohms. S —	120 ohms.
6	db	R —	25	ohms. S —	100 ohms.
7	db	R —	29	ohms. S —	84 ohms.
8	db	R —	32	ohms. S —	71 ohms.
9	db	R —	36	ohms. S —	61 ohms.
10	db	R —	38	ohms. S —	56 ohms.
11	db	R —	42	ohms. S —	46 ohms.
12	db	R —	45	ohms. S —	39 ohms.
13	db	R —	48	ohms. S —	35 ohms.
14	db	R —	50	ohms. S —	31 ohms.
15	db	R —	52	ohms. S —	26 ohms.
16	db	R —	54	ohms. S —	22 ohms.
17	db	R —	57	ohms. S —	19 ohms.
18	db	R —	58	ohms. S —	17 ohms.
19	db	R —	59	ohms. S —	16 ohms.
20	db	R —	61	ohms. S —	15 ohms.



50 ohm Feeder—"H" Section

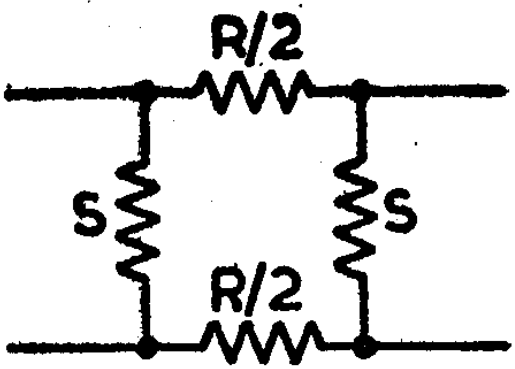
5	db	R —	14	ohms. S —	82 ohms.
6	db	R —	17	ohms. S —	67 ohms.
7	db	R —	19	ohms. S —	59 ohms.
8	db	R —	22	ohms. S —	47 ohms.
9	db	R —	24	ohms. S —	41 ohms.
10	db	R —	26	ohms. S —	35 ohms.
11	db	R —	28	ohms. S —	31 ohms.
12	db	R —	30	ohms. S —	27 ohms.
13	db	R —	32	ohms. S —	24 ohms.
14	db	R —	33	ohms. S —	21 ohms.
15	db	R —	35	ohms. S —	18 ohms.
16	db	R —	37	ohms. S —	16 ohms.
17	db	R —	37	ohms. S —	14 ohms.
18	db	R —	38	ohms. S —	13 ohms.
19	db	R —	38	ohms. S —	11 ohms.
20	db	R —	50	ohms. S —	10 ohms.

π SECTIONS



75 ohm Feeder

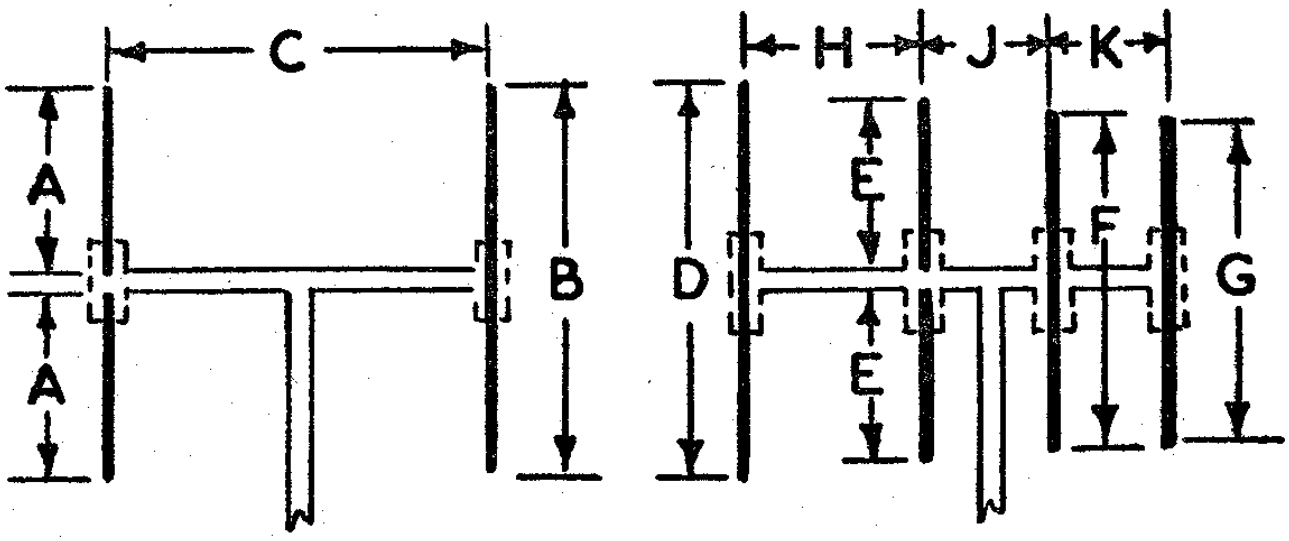
25	db	R —	664	ohms. S —	83 ohms.
25	db	R —	1,195	ohms. S —	80 ohms.
35	db	R —	2,100	ohms. S —	78 ohms.
40	db	R —	3,750	ohms. S —	76 ohms.
45	db	R —	6,670	ohms. S —	76 ohms.
50	db	R —	11,850	ohms. S —	75 ohms.
60	db	R —	37,500	ohms. S —	75 ohms.



50 ohm Feeder

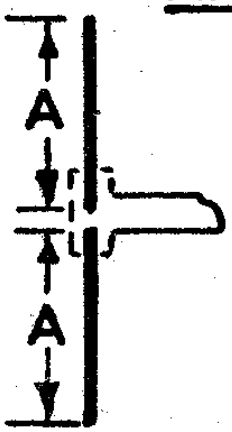
25	db	R —	443	ohms. S —	56 ohms.
30	db	R —	790	ohms. S —	53 ohms.
35	db	R —	1,400	ohms. S —	52 ohms.
40	db	R —	2,500	ohms. S —	51 ohms.
45	db	R —	4,500	ohms. S —	50 ohms.

TELEVISION AERIAL DIMENSIONS



H DIPOLE

ARRAY WITH 2 DIRECTORS



SINGLE DIPOLE

	A	B	C	D	E	F	G	H	J	K
Alexandra Palace	5′ 3″	11′ 6″	2′ 10″	11′ 2″	5′ 5″	10′ 5″	10′ 0″	3′ 5″	2′ 2½″	2′ 2½″
Holme Moss	4′ 8″	10′ 2″	2′ 6″	9′ 8″	4′ 8″	9′ 0″	8′ 8″	2′ 10″	1′ 11″	1′ 11″
Kirk o' Shotts	4′ 2″	9′ 4″	2′ 4″	8′ 10″	4′ 3″	8′ 2″	7′ 11″	2′ 8″	1′ 9″	1′ 9″
Sutton Coldfield	3′ 10″	8′ 4″	2′ 1½″	8′ 0½″	3′ 10½″	7′ 5½″	7′ 2½″	2′ 5″	1′ 7″	1′ 7″
Wenvoe	3′ 6½″	7′ 8″	1′ 11½″	7′ 5½″	3′ 7½″	6′ 11½″	6′ 9″	2′ 1½″	1′ 5″	1′ 5″

"H" AERIAL MEASUREMENTS ARE REPRODUCED BY COURTESY OF ANTI-FERENCE LTD.

INTERNATIONAL AMATEUR CALL SIGN PREFIXES

AC3 ..... Sikkim
AC4 ..... Tibet
AG2 ..... (See I)
AP ..... Pakistan
AR8 ..... Lebanon
C (unofficial) ..... China
C3 ..... Formosa
C9 ..... Manchuria
CE ..... Chile
CM, CO ..... Cuba
CN ..... French Morocco
CP ..... Bolivia
CR4 ..... Cape Verde Islands
CR5 ..... Portuguese Guinea
CR5 ..... Principe, Sao Thome
CR6 ..... Angola
CR7 ..... Mozambique
CR8 ..... Goa (Portuguese India)
CR9 ..... Macau
CR10 ..... Portuguese Timor
CT1 ..... Portugal
CT2 ..... Azores Islands
CT3 ..... Madeira Islands
CX ..... Uruguay
DL ..... Germany
DU ..... Philippine Islands
EA ..... Spain
EA6 ..... Balearic Islands
EA8 ..... Canary Islands
EA9 ..... Spanish Morocco
EI ..... Eire (Irish Free State)
EK ..... Tangier Zone
EL ..... Liberia
EP, EQ ..... Iran (Persia)
ET ..... Ethiopia
F ..... France
FA ..... Algeria
FB8 ..... Amsterdam & St. Paul Islands
FB8 ..... Kerguelen Islands
FB8 ..... Madagascar
FC ..... Corsica
FD8 ..... French Togoland
FE8 ..... French Cameroons
FF8 ..... French West Africa
FG8 ..... Guadeloupe
FI8 ..... French Indo-China
FK8 ..... New Caledonia
FL8 ..... French Somaliland
FM8 ..... Martinique
FN ..... French India
FO8 ... French Oceania (e.g., Tahiti)
FP8 ..... St. Pierre & Miquelon Islands
FQ8 ..... French Equatorial Africa
FR8 ..... Reunion Island
FU8, YJ ..... New Hebrides
FY8 ..... French Guiana & Inini
G ..... England
GC ..... Channel Islands
GD ..... Isle of Man
GI ..... Northern Ireland
GM ..... Scotland
GW ..... Wales
HA ..... Hungary
HB ..... Switzerland
HC ..... Ecuador
HE ..... Liechtenstein
HH ..... Haiti
HI ..... Dominican Republic
HK ..... Colombia
HL ..... Korea
HP ..... Panama
HR ..... Honduras
HS ..... Siam
HV ..... Vatican City
HZ ..... Saudi Arabia (Hedjaz & Nejd)
I ..... Italy
I, AG2, MF2 ..... Trieste
I5, MD4, MS4 ... Italian Somaliland
I6, MD3, MI3 ..... Eritrea
IS ..... Sardinia
J ..... Japan
JAø ..... Bonin & Volcano Islands
K ..... (See W)
KB6 ... Baker Howland & American Phoenix Islands
KC6 ..... Caroline Islands
KC6 ..... Palau Islands
KG4 ..... Guantanamo Bay
KG6 ..... Mariana Islands
KH6 ..... Hawaiian Islands
KJ6 ..... Johnston Island
KL7 ..... Alaska
KM6 ..... Midway Islands
KP4 ..... Puerto Rico
KP6 ..... Palmyra Group, Jarvis Island
KR6 ..... Ryukyu Islands (e.g., Okinawa)
KS4 ..... Swan Island
KS6 ..... American Samoa
KV4 ..... Virgin Islands
KW6 ..... Wake Island
KX6 ..... Marshall Islands
KZ5 ..... Canal Zone
LA ..... Norway
LA ..... Svalbard (Spitzbergen)
LI, MC1, 2, MD1, 2, MT1, 2 ... Libya
LU ..... Argentina
LX ..... Luxembourg
LZ ..... Bulgaria
M1 ..... San Marino
MB9 ..... (See OE)
MC1, 2 ..... (See LI)
MD1, 2 ..... (See LI)
MD3 ..... (See I6)
MD4 ..... (See I5)
MD5 ..... (See SU)
MD6 ..... (See YI)
MF2 ..... (See I)
MI3 ..... (See I6)
MP4 ..... (See VU7)
MP4 ..... Kuwait
MP4 ..... Oman
MS4 ..... (See I5)
MTI, 2 ..... (See LI)
OA ..... Peru
OE, MB9 ..... Austria
OH ..... Finland
OK ..... Czechoslovakia
ON ..... Belgium
OQ ..... Belgian Congo
OX ..... Greenland
OY ..... Faeroes
OZ ..... Denmark
PA ..... Netherlands
PJ ..... Netherlands West Indies
PK1, 2, 3 ..... Java
PK4 ..... Sumatra
PK5 ..... Netherlands Borneo
PK6 ... Celebes & Molucca Islands
PK6, 7 ... Netherlands New Guinea
PX ..... Andorra
PY ..... Brazil
PZ ..... Netherlands Guiana

INTERNATIONAL AMATEUR CALL SIGN PREFIXES—*cont.*

SM ..... Sweden
SP ..... Poland
ST ..... Anglo-Egyptian Sudan
SU, MD5 ..... Egypt
SV ..... Greece
SV ..... Crete
SV5 ..... Dodecanese (e.g., Rhodes)
TA ..... Turkey
TF ..... Iceland
TG ..... Guatemala
TI ..... Costa Rica
TI ..... Cocos Island
UA1, 3, 4, 6 ..... European Russian Socialist Federated Soviet Republic
UA9, ø ... Asiatic Russian S.F.S.R.
UB5 ..... Ukraine
UC2 ..... White Russian Soviet Socialist Republic
UD6 ..... Azerbaijan
UF6 ..... Georgia
UG6 ..... Armenia
UH8 ..... Turkoman
UI8 ..... Uzbek
UJ8 ..... Tadzhik
UL7 ..... Kazakh
UM8 ..... Kirghiz
UN1 ..... Karelo-Finnish Republic
UO5 ..... Moldavia
UP2 ..... Lithuania
UQ2 ..... Latvia
UR2 ..... Estonia
VE, VO ..... Canada
VK ..... Australia (including Tasmania)
VK1 ..... Heard Island
VK1 ..... Macquarie Island
VK9 ..... Papua Territory
VK9 ..... Territory of New Guinea
VK9 ..... Norfolk Island
VO ..... (see VE)
VP1 ..... British Honduras
VP2 ..... Leeward Islands
VP2 ..... Windward Islands
VP3 ..... British Guiana
VP4 ..... Trinidad & Tobago
VP5 ..... Cayman Islands
VP5 ..... Jamaica
VP5 ..... Turks & Caicos Islands
VP6 ..... Barbados
VP7 ..... Bahama Islands
VP8 ..... Falkland Islands
VP8 ..... South Georgia
VP8 ..... South Orkney Islands
VP8 ..... South Sandwich Islands
VP8 ..... South Shetland Islands
VP9 ..... Bermuda Islands
VQ1 ..... Zanzibar
VQ2 ..... Northern Rhodesia
VQ3 ..... Tanganyika Territory
VQ4 ..... Kenya
VQ5 ..... Uganda
VQ6 ..... British Somaliland
VQ8 ..... Chagos Islands
VQ8 ..... Mauritius
VQ9 ..... Seychelles
VR1 ..... Gilbert & Ellice Islands & Ocean Island
VR1 ..... British Phoenix Islands
VR2 ..... Fiji Islands
VR3 ..... Fanning Island (Christmas Island)
VR4 ..... Solomon Islands
VR5 ..... Tonga (Friendly) Islands
VR6 ..... Pitcairn Island
VS1, 2 ..... Malaya
VS4 ..... British North Borneo
VS5 ..... Brunei
VS5 ..... Sarawak
VS6 ..... Hong Kong
VS7 ..... Ceylon
VS9 ..... Aden & Socotra
VS9 ..... Maldive Islands
VU ..... India
VU4 ..... Laccadive Islands
VU7, MP4 ..... Bahrein Island
W, K ..... U.S.A.
XE ..... Mexico
XZ ..... Burma
YA ..... Afghanistan
YI, MD6 ..... Iraq
YJ ..... (See FU8)
YK ..... Syria
YN ..... Nicaragua
YO, YR ..... Roumania
YS ..... Salvador
YT, YU ..... Jugoslavia
YV ..... Venezuela
ZA ..... Albania
ZB1 ..... Malta
ZB2 ..... Gibraltar
ZC1 ..... Transjordan
ZC2 ..... Cocos Islands
ZC3 ..... Christmas Island
ZC4 ..... Cyprus
ZC6 ..... Palestine
ZD1 ..... Sierra Leone
ZD2 ..... Nigeria
ZD3 ..... Gambia
ZD4 ..... Gold Coast, Togoland
ZD6 ..... Nyasaland
ZD7 ..... St. Helena
ZD8 ..... Ascension Island
ZD9 ..... Tristan da Cunha & Gough Island
ZE ..... Southern Rhodesia
ZK1 ..... Cook Islands
ZK2 ..... Niue
ZL ..... New Zealand
ZM ..... British Samoa
ZP ..... Paraguay
ZS1, 2, 4, 5, 6 ..... Union of South Africa
ZS3 ..... South-west Africa
ZS7 ..... Swaziland
ZS8 ..... Basutoland
ZS9 ..... Bechuanaland
3A1, 2 ..... Monaco
3V8 ..... Tunisia
4X4 ..... Israel
9S4 ..... Saar

INTERNATIONAL COMMERCIAL RADIO STATION PREFIXES

AAA-ALZ	U.S.A.	AXA-AXZ	Australia
AMA-AOZ	Spain	AYA-AZZ	Argentine Republic
APA-ASZ	Pakistan	CAA-CEZ	Chile
ATA-AWZ	India	CFA-CKZ	Canada

INTERNATIONAL COMMERCIAL RADIO STATION PREFIXES—*cont.*

CLA-CMZ	Cuba
CNA-CNZ	Morocco
COA-COZ	Cuba
CPA-CPZ	Bolivia
CQA-CRZ	Portuguese Colonies
CSA-CUZ	Portugal
CVA-CXZ	Uruguay
CYA-CZZ	Canada
DAA-DMZ	Germany
DNA-DQZ	Belgian Congo
DRA-DTZ	Bielorussia
DUA-DZZ	Philippines
EAA-EHZ	Spain
EIA-EJZ	Ireland
EKA-EKZ	U.S.S.R.
ELA-ELZ	Liberia
EMA-EOZ	U.S.S.R.
EPA-EQZ	Iran
ERA-ERZ	U.S.S.R.
ESA-ESZ	Estonia
ETA-ETZ	Ethiopia
EUA-EZZ	U.S.S.R.
FAA-FZZ	France and Colonies
GAA-GZZ	Great Britain
HAA-HAZ	Hungary
HBA-HBZ	Switzerland
HCA-HDZ	Ecuador
HEA-HEZ	Switzerland
HFA-HFZ	Poland
HGA-HGZ	Hungary
HHA-HHZ	Haiti
HIA-HIZ	Dominican Republic
HJA-HKZ	Republic of Colombia
HLA-HMZ	Korea
HNA-HNZ	Iraq
HOA-HPZ	Panama
HQA-HRZ	Honduras
HSA-HSZ	Siam
HTA-HTZ	Nicaragua
HUA-HUZ	Republic of El Salvador
HVA-HVZ	Vatican City
HWA-HYZ	France and Colonies
HZA-HZZ	Saudi Arabia
IAA-IZZ	Italy and Colonies
JAA-JSZ	Japan
JTA-JVZ	Mongolian Republic
JWA-JXZ	Norway
JYA-JYZ	Jordan
JZA-JZZ	Netherlands New Guinea
KAA-KZZ	U.S.A.
LAA-LNZ	Norway
LOA-LWZ	Argentine
LXA-LXZ	Luxembourg
LYA-LYZ	Lithuania
LZA-LZZ	Bulgaria
MAA-MZZ	Great Britain
NAA-NZZ	U.S.A.
OAA-OCZ	Peru
ODA-ODZ	Lebanon
OEA-OEZ	Austria
OFA-OJZ	Finland
OKA-OMZ	Czechoslovakia
ONA-OTZ	Belgium and Colonies
OUA-OZZ	Denmark
PAA-PIZ	Netherlands
PJA-PJZ	Curacao
PKA-POZ	Netherlands Indies
PPA-PYZ	Brazil
PZA-PZZ	Surinam
QAA-QZZ	(Service abbreviations)
RAA-RZZ	U.S.S.R.
SAA-SMZ	Sweden
SNA-SRZ	Poland
SSA-SUZ	Egypt
SVA-SZZ	Greece
TAA-TCZ	Turkey
TDA-TDZ	Guatemala
TEA-TEZ	Costa Rica
TFA-TFZ	Iceland
TGA-TGZ	Guatemala
THA-THZ	France and Colonies
TIA-TIZ	Costa Rica
TJA-TZZ	France and Colonies
UAA-UQZ	U.S.S.R.
URA-UTZ	Ukranian Republic
UUA-UZZ	U.S.S.R.
VAA-VGZ	Canada
VHA-VNZ	Australia
VOA-VOZ	Newfoundland
VPA-VSZ	British Colonies
VTA-VWZ	India
VXA-VYZ	Canada
VZA-VZZ	Australia
WAA-WZZ	U.S.A.
XAA-XIZ	Mexico
XJA-XOZ	Canada
XPA-XPZ	Denmark
XQA-XRZ	Chile
XSA-XSZ	China
XTA-XWZ	France and Colonies
XXA-XXZ	Portuguese Colonies
XYA-XZZ	Burma
YAA-YAZ	Afghanistan
YBA-YHZ	Netherlands Indies
YIA-YIZ	Iraq
YJA-YJZ	New Hebrides
YKA-YKZ	Syria
YLA-YLZ	Latvia
YMA-YMZ	Turkey
YNA-YNZ	Nicaragua
YOA-YRZ	Roumania
YSA-YSZ	El Salvador
YTA-YUZ	Jugoslavia
YVA-YYZ	Venezuela
YZA-YZZ	Jugoslavia
ZAA-ZAZ	Albania
ZBA-ZJZ	British Colonies
ZKA-ZMZ	New Zealand
ZNA-ZOZ	British Colonies
ZPA-ZPZ	Paraguay
ZQA-ZQZ	British Colonies
ZRA-ZUZ	Union of South Africa
ZVA-ZZZ	Brazil
2AA-2ZZ	Great Britain
3AA-3AZ	Principality of Monaco
3BA-3FZ	Canada
3GA-3GZ	Chile
3HA-3UZ	China
3VA-3VZ	France and Colonies
3WA-3WZ	Viet-Nam
3YA-3YZ	Norway
3ZA-3ZZ	Poland
4AA-4CZ	Mexico
4DA-4IZ	Philippines
4JA-4LZ	U.S.S.R.
4MA-4MZ	Venezuela
4NA-4OZ	Jugoslavia
4PA-4SZ	British Colonies
4TA-4TZ	Peru
4UA-4UZ	United Nations
4VA-4VZ	Haiti
4WA-4WZ	Yemen
4XA-4XZ	Israel
4YA-4YZ	International Civil Aviation organization
5CA-5CZ	French Morocco
6AA-6ZZ	(Not allocated)
7AA-7ZZ	(Not allocated)
8AA-8ZZ	(Not allocated)
9AA-9AZ	San Marino
9NA-9NZ	Nepal
9SA-9SZ	Saar

U.S.A. AMATEUR W PREFIXES BY STATES

Alabama	W4
Arizona	W7
Arkansas	W5
California	W6
Colorado	Wø
Connecticut	W1
Delaware	W3
District of Columbia	W3
Florida	W4
Georgia	W4
Idaho	W7
Illinois	W9
Indiana	W9
Iowa	Wø
Kansas	Wø
Kentucky	W4
Louisiana	W5
Maine	W1
Maryland	W3
Massachusetts	W1
Michigan	W8
Minnesota	Wø
Mississippi	W5
Missouri	Wø
Montana	W7
Nebraska	Wø
Nevada	W7
New Hampshire	W1
New Jersey	W2
New Mexico	W5
New York	W2
North Carolina	W4
North Dakota	Wø
Ohio	W8
Oklahoma	W5
Oregon	W7
Pennsylvania	W3
Rhode Island	W1
South Carolina	W4
South Dakota	Wø
Tennessee	W4
Texas	W5
Utah	W7
Vermont	W1
Virginia	W4
Washington	W7
West Virginia	W8
Wisconsin	W9
Wyoming	W7

FRACTION TO DECIMAL INCH EQUIVALENTS

FRACTION	DECIMAL
1/64	.0156
1/32	.03125
3/64	.04687
1/16	.0625
5/64	.07812
3/32	.09375
7/64	.10937
1/8	.125
9/64	.14062
5/32	.15625
11/64	.17187
3/16	.1875
13/64	.2031
7/32	.2187
15/64	.2344
1/4	.250
17/64	.26562
9/32	.28125
19/64	.29687
5/16	.3125
21/64	.32812
11/32	.34375
23/64	.35937
3/8	.375
25/64	.3906
13/32	.4062
27/64	.4219
7/16	.4375
29/64	.4531
15/32	.4687
31/64	.4844
1/2	.500
33/64	.5156
17/32	.5312
35/64	.5469
9/16	.5625
37/64	.5781
19/32	.5937
39/64	.6094
5/8	.625
41/64	.6406
21/32	.6562
43/64	.6719
11/16	.6875
45/64	.7031
23/32	.7187
47/64	.7344
3/4	.750
49/64	.76562
25/32	.78125
51/64	.79687
13/16	.8125
53/64	.82812
27/32	.84375
55/64	.85937
7/8	.875
57/64	.89062
29/32	.90625
59/64	.92187
15/16	.9375
61/64	.95312
31/32	.96875
63/64	.98437
1	1.000

METRIC TO DECIMAL INCH EQUIVALENTS

M/M	INCH	M/M	INCH	M/M	INCH	M/M	INCH
.01	.0004	.32	.0126	.63	.0248	.94	.03701
.02	.0008	.33	.013	.64	.0252	.95	.0374
.03	.0012	.34	.0134	.65	.0256	.96	.0378
.04	.0016	.35	.0138	.66	.026	.97	.0382
.05	.0020	.36	.0142	.67	.0264	.98	0386
.06	.0024	.37	.0146	.68	.0268	.99	.03898
.07	.0028	.38	.0150	.69	.0272	1	.0394
.08	.0032	.39	.0154	.70	.0276	2	.0787
.09	.0036	.40	.0158	.71	.0279	3	.1181
.10	.004	.41	.0162	.72	.0283	4	.1575
.11	.0043	.42	.0166	.73	.0287	5	.1968
.12	.0047	.43	.0169	.74	.0291	6	.2362
.13	.0051	.44	.0173	.75	.0295	7	.2756
.14	.0055	.45	.0177	.76	.0299	8	.315
.15	.0059	.46	.0181	.77	.0303	9	.3543
.16	.0063	.47	.0185	.78	.0307	10	.3937
.17	.0067	.48	.0189	.79	.0311	11	.4331
.18	.0071	.49	.0193	.80	.0315	12	.4724
.19	.0075	.50	.0197	.81	.0319	13	.5118
.20	.0079	.51	.0201	.82	.0323	14	.5512
.21	.0083	.52	.0205	.83	.0327	15	.5905
.22	.0087	.53	.0209	.84	.0331	16	.6299
.23	.0091	.54	.0213	.85	.0335	17	.6693
.24	.0095	.55	.0217	.86	.0339	18	.7082
.25	.0099	.56	.0221	.87	.0343	19	.748
.26	.0103	.57	.0225	.88	.0347	20	.7874
.27	.0106	.58	.0228	.89	.0350	21	.8268
.28	.0110	.59	.0232	.90	.0354	22	.8661
29	.0114	.60	.0236	.91	.0358	23	.9055
.30	.0118	.61	.0240	.92	.0362	24	.9449
.31	.0122	.62	.0244	.93	.0366	25	.9842