

RADIO CONSTRUCTORS DATA SHEET

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625-LINE COLOUR AND

MONOCHROME TELEVISION

The Table lists extracts from the current (February 1969) specification for transmitted 625-line colour and monochrome television signals in the U.K.

Colour (PAL system)

Relationship between colour, line and field synchronising signals:

Colour sub-carrier frequency
 $(f_{sc}) = (284 - \frac{1}{2}) f_{line} + \frac{1}{2} f_{field}$
 $= 4.43361875 \text{ Mc/s} \pm 1 \text{ c/s}$

Complete colour picture signal

General specification:

The colour picture signal corresponds to a luminance (brightness) component transmitted as amplitude modulation of the picture carrier and a simultaneous pair of chrominance (colouring) components transmitted as the amplitude-modulation sidebands of a pair of suppressed sub-carriers in quadrature having a common frequency as defined above.

Delay specification:

The group-delay characteristic of the transmitter is nominally flat; there is no pre-correction for receiver performance.

Luminance component:

The *attenuation versus frequency* characteristic of the luminance signal is substantially uniform from d.c. to 5.5 Mc/s, except where it may be modified in a region embracing the colour sub-carrier frequency, e.g. by use of a notch filter.

General (colour and monochrome)

Channel width 8 Mc/s
 Spacing between unmodulated sound and vision carriers 6 Mc/s

Vision modulation (a.m., negative):

Upper sideband 5.5 Mc/s
 Lower sideband 1.25 Mc/s
 Synchronising level¹ 100%
 Blanking level¹ 76%
 White level¹ 20%

Sound modulation (f.m.):

Peak deviation 50 kc/s
 Pre-emphasis 50 μ S

Ratio of vision power during synchronising pulses to sound power 5:1

Lines per picture 625

Interlace 2:1

Field frequency 50 c/s²

Line frequency 15,625 c/s²

Approximate gamma of picture signal 0.36

Aspect ratio 4:3

¹ As percentage of maximum vision carrier amplitude.

² The transmissions are asynchronous; i.e., the synchronising signals are derived from a stable oscillator and are not locked to the mains.

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INCH/MILLIMETRE CONVERSION TABLE

Conversions from inches to millimetres and vice versa are tedious when using the relations 1 inch = 25.4 millimetres or 1 millimetre = 0.03937 inch. Fortunately, most dimensions in electronic work are small and the Table (which lists millimetre equivalents for inches in $\frac{1}{16}$ -inch steps up to 3 inches and in $\frac{1}{2}$ -inch steps up to 5 inches) will enable quick approximations to be made in converting from one set of units to the other. Also given are decimal equivalents of the inch fractions.

Inches (Fractions)	Inches (Decimal)	Millimetres	Inches (Fractions)	Inches (Decimal)	Millimetres	Inches (Fractions)	Inches (Decimal)	Millimetres	Inches (Fractions)	Inches (Decimal)	Millimetres
$\frac{1}{16}$	0.0625	1.59	$\frac{1}{8}$	0.125	3.18	$\frac{1}{4}$	0.25	6.35	$\frac{3}{8}$	0.375	9.53
$\frac{1}{8}$	0.125	3.18	$\frac{1}{4}$	0.25	6.35	$\frac{1}{2}$	0.5	12.7	$\frac{3}{4}$	0.75	19.1
$\frac{3}{16}$	0.1875	4.76	$\frac{1}{2}$	0.5	12.7	$\frac{5}{8}$	0.625	15.9	$\frac{7}{8}$	0.875	22.2
$\frac{1}{4}$	0.25	6.35	$\frac{5}{8}$	0.625	15.9	$1\frac{1}{16}$	0.6875	17.5	$1\frac{1}{8}$	1.125	28.6
$\frac{5}{16}$	0.3125	7.94	$1\frac{1}{16}$	0.6875	17.5	$1\frac{1}{4}$	1.25	31.8	$1\frac{1}{2}$	1.5	38.1
$\frac{3}{8}$	0.375	9.53	$1\frac{1}{4}$	1.25	31.8	$1\frac{3}{8}$	1.375	34.9	$1\frac{1}{2}$	1.5	38.1
$\frac{7}{16}$	0.4375	11.1	$1\frac{3}{8}$	1.375	34.9	$1\frac{1}{2}$	1.4375	36.5	$1\frac{3}{4}$	1.875	47.6
$\frac{1}{2}$	0.5	12.7	$1\frac{1}{2}$	1.5	38.1	$1\frac{5}{8}$	1.5625	39.7	$1\frac{3}{4}$	1.875	47.6
$\frac{9}{16}$	0.5625	14.3	$1\frac{5}{8}$	1.5625	39.7	$1\frac{3}{4}$	1.625	41.3	$1\frac{7}{8}$	1.9375	49.2
$\frac{5}{8}$	0.625	15.9	$1\frac{3}{4}$	1.625	41.3	$1\frac{7}{8}$	1.6875	42.9	2	2.0	50.8
$1\frac{1}{16}$	0.6875	17.5	$1\frac{7}{8}$	1.6875	42.9	2	1.75	44.5	$2\frac{1}{16}$	2.0625	52.4
$\frac{3}{4}$	0.75	19.1	2	1.75	44.5	$2\frac{1}{8}$	1.8125	46.0	$2\frac{1}{8}$	2.125	54.0
$1\frac{1}{8}$	0.8125	20.6	$2\frac{1}{8}$	1.8125	46.0	$2\frac{1}{4}$	1.875	47.6	$2\frac{1}{4}$	2.1875	55.6
$1\frac{1}{4}$	0.875	22.2	$2\frac{1}{4}$	1.875	47.6	$2\frac{3}{8}$	1.9375	49.2			
$\frac{7}{8}$	0.9375	23.8	$2\frac{3}{8}$	1.9375	49.2						
$1\frac{5}{16}$	1.0	25.4	$2\frac{1}{2}$	2.0	50.8						
1	1.0625	27.0	$2\frac{1}{2}$	2.0625	52.4						
$1\frac{1}{8}$	1.125	28.6	$2\frac{3}{4}$	2.125	54.0						
			$2\frac{3}{4}$	2.1875	55.6						

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ROUND FIGURE VALUES FOR $2\pi f$

It is frequently necessary to carry out calculations involving the expression $2\pi f$. When approximate solutions only are required, however, calculations become tedious after the unwieldy figure for π has been introduced. The Table provides an answer to this problem by listing round figure values for $2\pi f$, whereupon subsequent calculations are eased. The Table is used by finding the frequency nearest that under consideration. Thus, the approximate value of $2\pi f$ when f equals 700kHz is 450×10^4 .

$2\pi f$	Hz	$2\pi f \times 10$	Hz	$2\pi f \times 10^2$	kHz	$2\pi f \times 10^3$	kHz	$2\pi f \times 10^4$	kHz	$2\pi f \times 10^5$	MHz
100	15.9	100	159	100	1.59	100	15.9	100	159	100	1.59
150	23.9	150	239	150	2.39	150	23.9	150	239	150	2.39
200	31.8	200	318	200	3.18	200	31.8	200	318	200	3.18
250	39.8	250	398	250	3.98	250	39.8	250	398	250	3.98
300	47.7	300	477	300	4.77	300	47.7	300	477	300	4.77
350	55.7	350	557	350	5.57	350	55.7	350	557	350	5.57
400	63.7	400	637	400	6.37	400	63.7	400	637	400	6.37
450	71.6	450	716	450	7.16	450	71.6	450	716	450	7.16
500	79.6	500	796	500	7.96	500	79.6	500	796	500	7.96
550	87.5	550	875	550	8.75	550	87.5	550	875	550	8.75
600	95.5	600	955	600	9.55	600	95.5	600	955	600	9.55
650	103	650	1,030	650	10.3	650	103	650	1,030	650	10.3
700	111	700	1,110	700	11.1	700	111	700	1,110	700	11.1
750	119	750	1,190	750	11.9	750	119	750	1,190	750	11.9
800	127	800	1,270	800	12.7	800	127	800	1,270	800	12.7
850	135	850	1,350	850	13.5	850	135	850	1,350	850	13.5
900	143	900	1,430	900	14.3	900	143	900	1,430	900	14.3
950	151	950	1,510	950	15.1	950	151	950	1,510	950	15.1
1,000	159	1,000	1,590	1,000	15.9	1,000	159	1,000	1,590	1,000	15.9

SQUARES OF NUMBERS

The Table lists squares of numbers from 1 to 100.

Number	Square	Number	Square	Number	Square	Number	Square	Number	Square
1	1	21	441	41	1,681	61	3,721	81	6,561
2	4	22	484	42	1,764	62	3,844	82	6,724
3	9	23	529	43	1,849	63	3,969	83	6,889
4	16	24	576	44	1,936	64	4,096	84	7,056
5	25	25	625	45	2,025	65	4,225	85	7,225
6	36	26	676	46	2,116	66	4,356	86	7,396
7	49	27	729	47	2,209	67	4,489	87	7,569
8	64	28	784	48	2,304	68	4,624	88	7,744
9	81	29	841	49	2,401	69	4,761	89	7,921
10	100	30	900	50	2,500	70	4,900	90	8,100
11	121	31	961	51	2,601	71	5,041	91	8,281
12	144	32	1,024	52	2,704	72	5,184	92	8,464
13	169	33	1,089	53	2,809	73	5,329	93	8,649
14	196	34	1,156	54	2,916	74	5,476	94	8,836
15	225	35	1,225	55	3,025	75	5,625	95	9,025
16	256	36	1,296	56	3,136	76	5,776	96	9,216
17	289	37	1,369	57	3,249	77	5,929	97	9,409
18	324	38	1,444	58	3,364	78	6,084	98	9,604
19	361	39	1,521	59	3,481	79	6,241	99	9,801
20	400	40	1,600	60	3,600	80	6,400	100	10,000