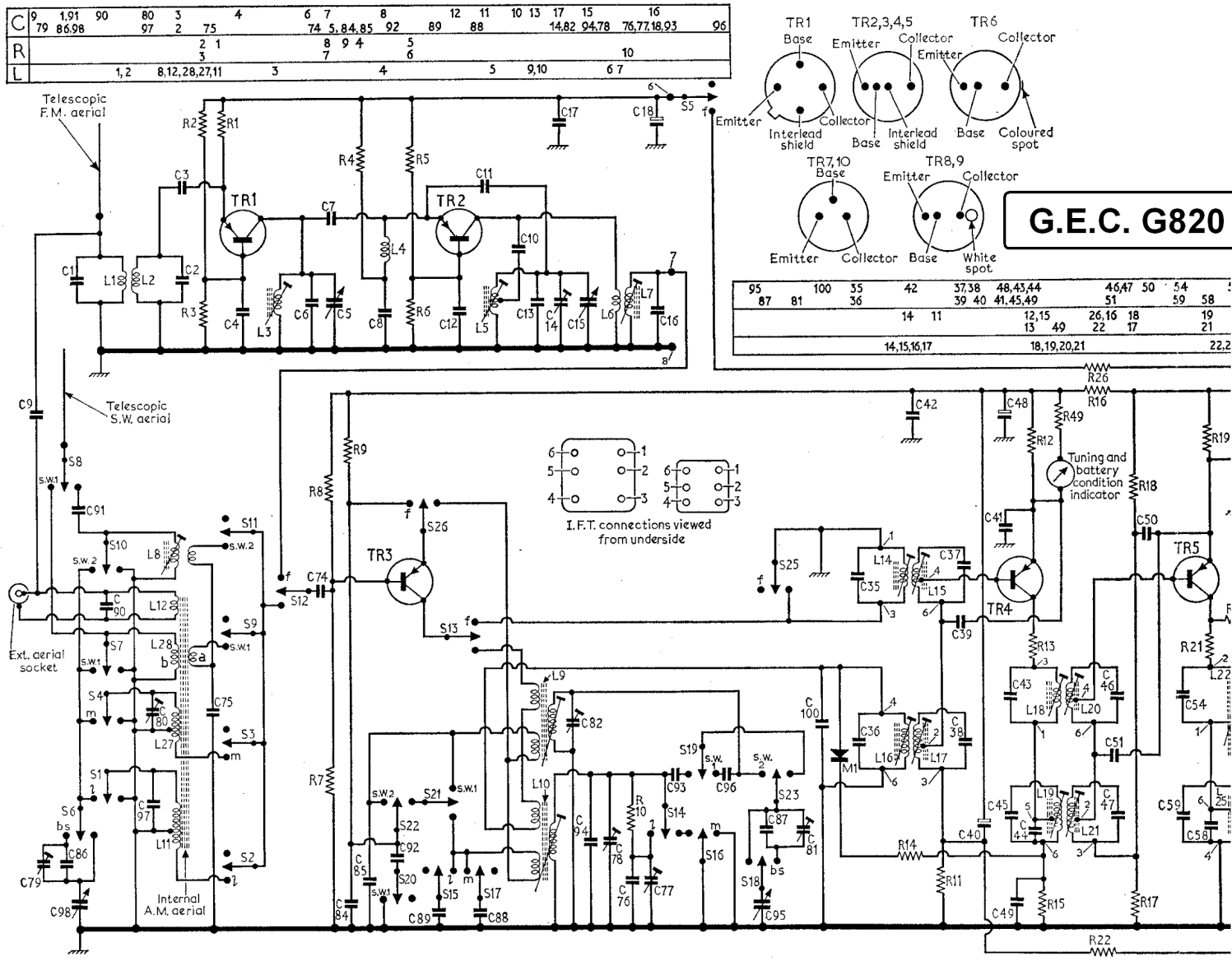
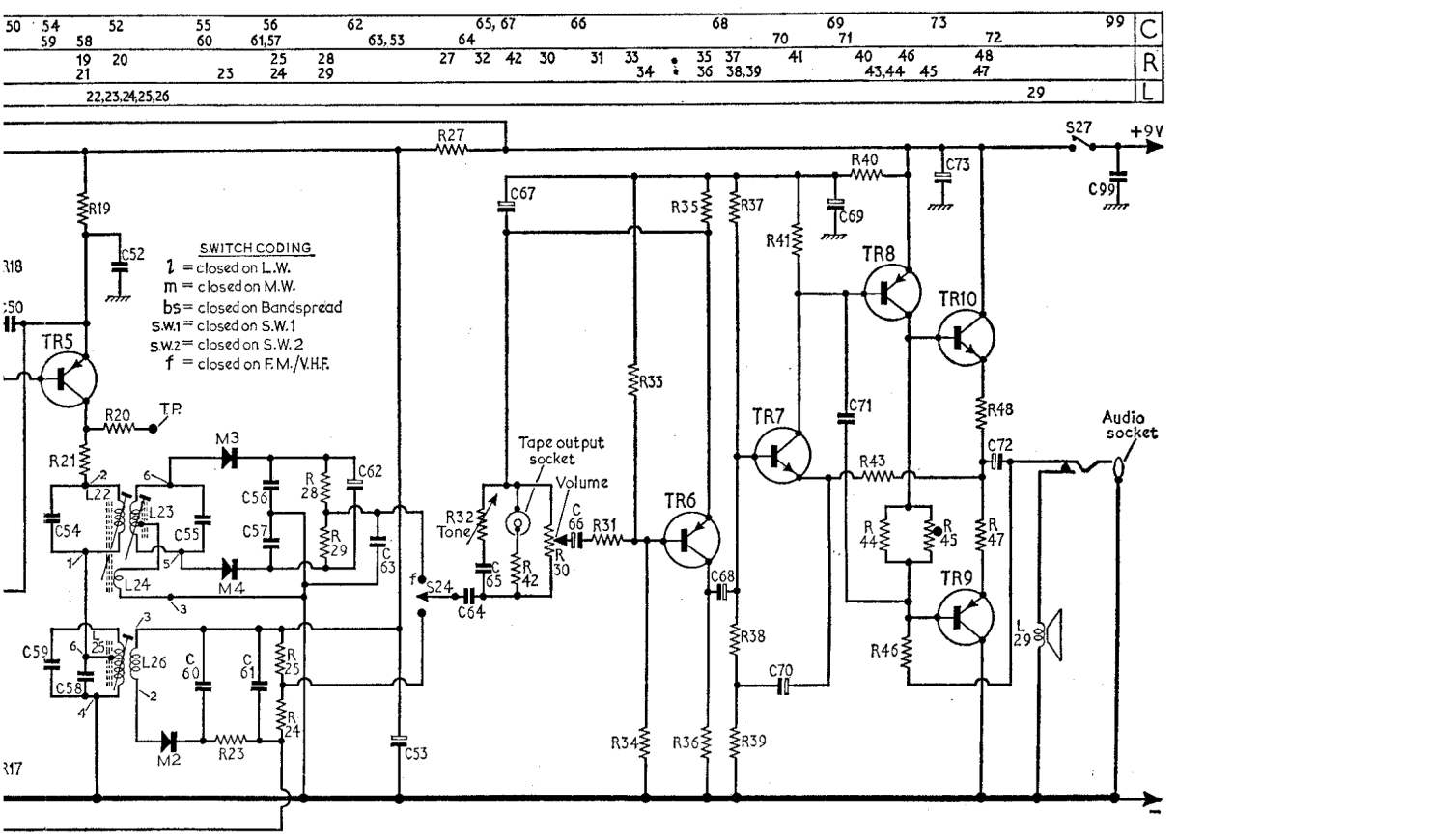
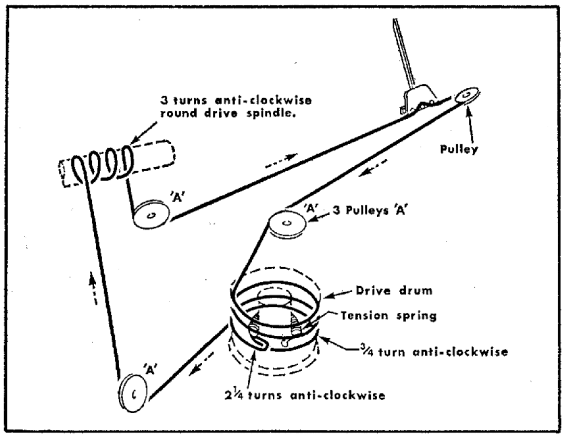
G.E.C. G820


Telescopic F.M. aerial
Telescopic S.W. aerial
Ext. aerial socket
Internal A.M. aerial
TR1
TR2
TR3
TR4
TR5
I.F.T. connections viewed from underside
Tuning and battery condition indicator
S.W.1
S.W.2

TR1
Base
Emitter
Collector
Interlead shield
TR2,3,4,5
Emitter
Collector
Base
Interlead shield
TR6
Collector
Emitter
Base
Coloured spot
TR7,10
Base
Emitter
Collector
TR8,9
Emitter
Collector
Base
White spot


SWITCH CODING
1 = closed on L.W.
m = closed on M.W.
bs = closed on Bandspread
S.W.1 = closed on S.W.1
S.W.2 = closed on S.W.2
f = closed on F.M./V.H.F.
TR5
TR6
TR7
TR8
TR9
TR10
Tape output socket
Volume
Tone
Audio socket
+9V



Sketch of drive cord assembly shown with tuning gang at maximum.

Resistors

R1	680Ω	F3
R2	5·6kΩ	F3
R3	27kΩ	F3
R4	560Ω	F3
R5	5·6kΩ	F3
R6	27kΩ	F3
R7	33kΩ	A1
R8	5·6kΩ	A1
R9	680Ω	A1
R10	470kΩ	B1
R11	100kΩ	E4
R12	680Ω	E4
R13	100Ω	E4
R14	820Ω	E4
R15	1·5kΩ	E4
R16	220Ω	D4
R17	3·9kΩ	D4
R18	18kΩ	E4
R19	470Ω	D4
R20	100kΩ	E4
R21	100Ω	E4
R22	22kΩ	E3
R23	470Ω	D3
R24	15kΩ	E3
R25	3·3kΩ	E3
R26	220Ω	D3
R27	470Ω	D4
R28	12kΩ	E3
R29	12kΩ	E3
R30	10kΩ	B1
R31	470Ω	D3
R32	10kΩ	C1
R33	47kΩ	D3
R34	120kΩ	D3
R35	8·2kΩ	D3
R36	6·8kΩ	D3
R37	12kΩ	D3
R38	15kΩ	D3
R39	10Ω	D3
R40	680Ω	D3
R41	470Ω	D4
R42	100kΩ	A2
R43	1kΩ	D4
R44	68Ω*	D3
R45	VA1040	D4
R46	560Ω	D4
R47	1Ω	D4
R48	1Ω	D4
R49	1·8kΩ	E4

Capacitors

C1	33pF	F4
C2	47pF	F4
C3	1,000pF	F3
C4	1,000pF	F4
C5	15pF	A2
C6	13pF	F4
C7	4pF	F3
C8	680pF	F3
C9	15pF	C1
C10	75pF	F3
C11	2·2pF	F3
C12	1,000pF	F3
C13	13pF	F3
C14	15pF	F3
C15	10pF	A2
C16	120pF	F3
C17	1,000pF	F3
C18	400μF	F3
C35	200pF	E4
C36	560pF	F4
C37	200pF	E4
C38	560pF	F4
C39	2,200pF	E4
C40	3μF	E4
C41	0·05μF	E4
C42	0·05μF	D4
C43	200pF	E4
C44	560pF	D4
C45	180pF	D4
C46	200pF	E4
C47	270pF	D4
C48	160μF	D4
C49	0·1μF	E4
C50	0·05μF	D4
C51	2,200pF	E4
C52	0·05μF	E4
C53	400μF	D3
C54	200pF	E4
C55	60pF	E4
C56	300pF	E3
C57	300pF	E3
C58	560pF	D3
C59	220pF	D3
C60	2,200pF	D3
C61	0·01μF	E3
C62	2μF	E3
C63	0·01μF	E3
C64	0·22μF	E3
C65	0·05μF	C1
C66	10μF	D3
C67	64μF	D3
C68	10μF	D3
C69	200μF	D3
C70	400μF	D4
C71	2,200pF	D4
C72	400μF	D4
C73	400μF	D3
C74	0·01μF	A1
C75	1,000pF	A1
C76	360pF	B2
C77	15pF	B2
C78	15pF	B2
C79	15pF	B1
C80	15pF	B2
C81	15pF	B2
C82	15pF	B2
C84	1,500pF	A1
C85	22pF	A2
C86	22pF	B1
C87	22pF	B1
C88	0·01μF	B1
C89	0·04μF	B1
C90	40pF	B1
C91	40pF	B1
C92	1,000pF	B1
C93	430pF	B1
C94	6pF	B2
C95	430pF	A2
C96	1,800pF	B1
C97	100pF	C1
C98	430pF	A2
C99	0·05μF	C1
C100	22pF	A2

Transistor Table

Transistor		Emitter (V) A.M.	Emitter (V) F.M.	Base (V) A.M.	Base (V) F.M.	Collector (V) A.M.	Collector (V) F.M.
TR1	AF178	—	—	—	—	—	—
TR2	AF115	—	—	—	—	—	—
TR3	AF115	3·25	3·20	3·35	3·30	9·00	9·00
TR4	AF116	3·10	3·05	3·10	3·00	7·70	7·65
TR5	AF116	3·10	3·10	3·30	3·30	9·00	9·00
TR6	OC71	2·50	2·50	2·30	2·30	7·00	7·00
TR7	AC127	4·40	4·40	4·25	4·25	—	—
TR8	OC81D	—	—	—	—	4·60	4·60
TR9	OC81**	4·80	4·80	5·00	5·00	9·00	9·00
TR10	AC127	4·80	4·80	4·60	4·60	—	—

** *May be AC128.*

Below: Circuit diagram of G820. **Note.**—*Bandspread switches (b) work independently and are not interlocked with the waveband switches.*

Coils

L1	—	F4
L2	—	F4
L3	—	F3
L4	—	F3
L5	—	F3
L6	—	F3
L7	—	F3
L8	—	A1
L9	—	B2
L10	—	B2
L11	—	C1
L12	—	B1
L14	—	E5
L15	—	E5
L16	—	F4
L17	—	F4
L18	—	E4
L19	—	D4
L20	—	E4
L21	—	D4
L22	—	E3
L23	—	E3
L24	—	E3
L25	—	D3
L26	—	D3
L27	—	A1
L28	—	B1
L29†	—	B2

Miscellaneous

M1	OA79	E4
M2	OA90	D3
M3	AA119	E4
M4	AA119	E4
S1-S26	—	B1
S27	—	C1

† *Loudspeaker (10Ω impedance)*
* *47Ω when TR9 is AC128*

CIRCUIT ALIGNMENT

Before commencing circuit alignment, remove chassis from case as in "Dismantling Instructions".

Equipment Required.—An a.m. signal generator: A sweep frequency generator; an oscilloscope (should the sweep generator have no display facilities); an audio output meter; a 0·01μF capacitor; a 15pF capacitor; suitable non-ferrous trimming tools and an r.f. coupling loop for a.m. r.f. alignment.

Note.—All trimmers should be adjusted with a non-metallic tool.

A.M. Circuits.—Connect the a.m. signal generator via a 0·01μF capacitor to the base of **TR3.** Connect the audio output meter in place of the loudspeaker, disconnect the a.m. telescopic aerial and turn volume control to maximum.

1.—Feed in a 470kc/s signal and adjust the cores of **L25/L26, L19/L21** and **L16/L17** in that order to their outer peaks, for maximum output on the audio output meter. Signal generator output should be reduced as the circuits come into line so as to avoid a.g.c. action.
2.—Ensure that the cursor lines up with the datum mark at the l.f. end of the scale.
3.—Switch receiver to m.w. and connect signal generator output to an r.f. coupling loop placed near the receiver.
4.—Tune receiver to the 600kc/s "pip" on the m.w. tuning scale and feed in a 600kc/s signal, adjust **L10** for maximum output and slide **L27** along the ferrite rod for maximum output.
5.—Tune receiver to the 1,480kc/s pip on the m.w. tuning scale and adjust **C78** and **C80** for maximum output.
6.—Repeat operations 4 and 5.
7.—Keeping m.w. button depressed, press the bandspread button. With receiver still tuned to the 1,480kc/s "pip" adjust **C81** and ***C79,*** in that order, for maximum output.
8.—Feed in a 1,440kc/s signal and check that when the receiver is tuned to this signal, the cursor coincides with the "m" in Luxembourg. Accurate adjustment of **C79** and **C81** is essential as the alignment of other wavebands is affected by their settings.
9.—Switch receiver to l.w. and tune receiver to the 220kc/s "pip" (located below "c" in "Caroline") Feed in a 220kc/s signal and adjust **C77** and slide coil **L11** along ferrite rod aerial, both for maximum output.
10.—Switch receiver to s.w.1 and connect signal generator output to the disconnected s.w. telescopic aerial wire via a 15pF capacitor.
11.—Tune receiver to 3·5Mc/s and feed in a 3·5Mc/s signal. Adjust **L9** for maximum output, then slide **L28** along ferrite rod aerial, also for maximum output.
12.—Tune receiver to 9·5Mc/s, feed in a 9·5 Mc/s signal and adjust **C82** for maximum output.
13.—Repeat operations 11 and 12 carefully until no further improvement in sensitivity or tracking can be obtained.

Note.—Accurate alignment of s.w.1 band is essential, as the calibration of all other s.w. bands will be adversely affected should s.w.1 band be innaccurately aligned.

14.—Keeping s.w.1 button depressed, press bandspread button. Feed in a 9·5Mc/s signal and check that the cursor lies in the first half of the l.f. end of the 31m band, when the receiver is tuned to this signal.
15.—Switch receiver to s.w.2 and feed in a 9·5Mc/s signal, tune receiver to this signal and check that the cursor coincides with the 9·5Mc/s calibration pip on the tuning scale. Adjust **L8** carefully for maximum output. (This adjustment determines the sensitivity of the receiver at the h.f. end of both s.w.2 and bandspread s.w.2).
16.—Keeping receiver switched to s.w.2 depress bandspread button. Feed in a 21.5Mc/s signal and check that when the receiver is tuned to this signal, the cursor lies in the first half of the l.f. end of the 13m band.

F.M. Circuits.—Connect the output of the sweep generator to the base of **TR3** via a 0·01μF capacitor. Connect the oscilloscope (or display unit) "diode input" to the free end of **R20.**

Detune **L23** so that its core protrudes from the top of the former by 1/16in.

1.—Feed in a 10·7Mc/s swept signal and adjust **L22, L18, L20, L14** and **L15** in that order for maximum amplitude and symmetry at 10·7Mc/s.
2.—Transfer signal generator output to rear f.m. stator on tuning gang and adjust **L6** and **L7** for maximum amplitude and symmetry at 10·7Mc/s.
3.—Connect oscilloscope (or display unit) "direct input" to junction of **R28/R29** and adjust core of **L23** for "S" curve with linear position and symmetry centred on 10·7Mc/s.
4.—Disconnect all connections to the oscilloscope and connect the sweep generator output to the aerial input of the f.m. tuner unit. (tags 1 and 2).
5.—Tune receiver to 88Mc/s and feed in an 88Mc/s f.m. signal. Adjust, with an insulated trimming tool, **L5** and **L3** for maximum output on the audio output meter (volume control set at maximum.)
6.—Tune receiver to 108Mc/s and feed in a 108Mc/s f.m. signal, adjust **C14** for maximum output.
7.—Repeat operations 5 and 6 until no further improvement in sensivity or tracking can be obtained.
8.—Check sensitivity at 88Mc/s, 100Mc/s and 108Mc/s. For 50mW output the input level at 88Mc/s should be 0·8μV; for 100Mc/s, 0·75μV, and for 108Mc/s 0·7μV, −0+6dB.
9.—Feed in a 2·5μV 93Mc/s f.m. signal. Tune receiver for maximum output. Switch signal generator to a.m. and adjust **L23** for minimum output. (core should not need adjusting more than ¼ turn).
10.—Reassemble chassis into cabinet (see dismantling instructions) and check that all sockets etc. function correctly.

G.E.C. G820