'TRADER' SERVICE SHEET

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MARCONIPHONE 559, 575, 576, 557 AND 567

AN R.F. amplifier is incorporated in the Marconiphone 559 5-valve (plus rectifier) A.C. 3-band superhet, while another feature is the inclusion of a cathode-ray tuning indicator. The receiver covers a short-wave range of 16·5-52 m. and is suitable for mains of 195-255 V, 50-100 C/S.

An almost identical chassis is fitted in the 575 radiogram and the 576 automatic radiogram, but these models are for 50-60 C/S.

The chassis in the 557 receiver and 567 radiogram are also very similar, but do not include the cathode-ray tuning indicator, the difference being explained under "General Notes."

This *Service Sheet* was prepared on a 559 model.

CIRCUIT DESCRIPTION

Aerial input via series condenser **C1** to single-tuned circuits **L1** (S.W.), plus **L2** (M.W.) plus **L3** (L.W.), tuned by **C35** which precede variable-mu R.F. pentode signal-frequency amplifying valve (**V1, Marconi W42**).

Tuned anode coupling by coils **L4** (S.W.), plus **L5** (M.W.), plus **L6** (L.W.), tuned by **C38,** between **V1** and second valve (**V2, Marconi X42**), a heptode operating as frequency changer with electron coupling. Oscillator grid coils **L8** (S.W.), plus **L9** (M.W.), plus **L10** (L.W.), are tuned by **C39**; parallel trimming by **C40** (SW.), **C41** (M.W.) and **C7, C43** (L.W.); series tracking by **C8** (fixed) (S.W.), **C9, C42** (M.W.) and **C44** (L.W.). Anode reaction by coils **L11** (S.W.), **L12** (M.W.) and **L13** (L.W.).

Third valve (**V3, Marconi W42**) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C45, L14, L15, C46** and **C47, L16, L17, C48.**

Intermediate frequency 465KC/S.

Diode second detector is part of double-diode triode valve (**V4, Marconi DH42**). Audio frequency component in rectified output is developed across load resistance **R12** and passed via I.F. stopper **R10,** A.F. coupling condensers **C18** (M.W. and L.W.) and **C18, C19** (S.W.), and manual volume control **R11** to C.G. of triode section which operates as A.F. amplifier. Tone compensation in anode circuit by **C24.**

Provision for connection of gramophone pick-up via **S13** across **R11.**

Second diode of **V4,** fed via **C17** from **V3** anode, provides D.C. potentials which are developed across load resistances **R16, R17, R18** and fed back through decoupling circuits as G.B. to R.F., F.C. and I.F. valves, giving automatic volume control.

Resistance-capacity coupling by **R15, C25** and **R22** between **V4** triode and pentode or beam tetrode output valve (**V5, Marconi N42** or **KT42**). G.B. potentials for **V5** and delay voltage for **V4** A.V.C. diode are obtained by potential divider **R19, R20, R21** from drop across speaker field **L20** in H.T. negative lead to chassis. Fixed tone correction in anode circuit of **V5** by **C28**; variable tone control by variable condenser **C49** between anode and control grid.

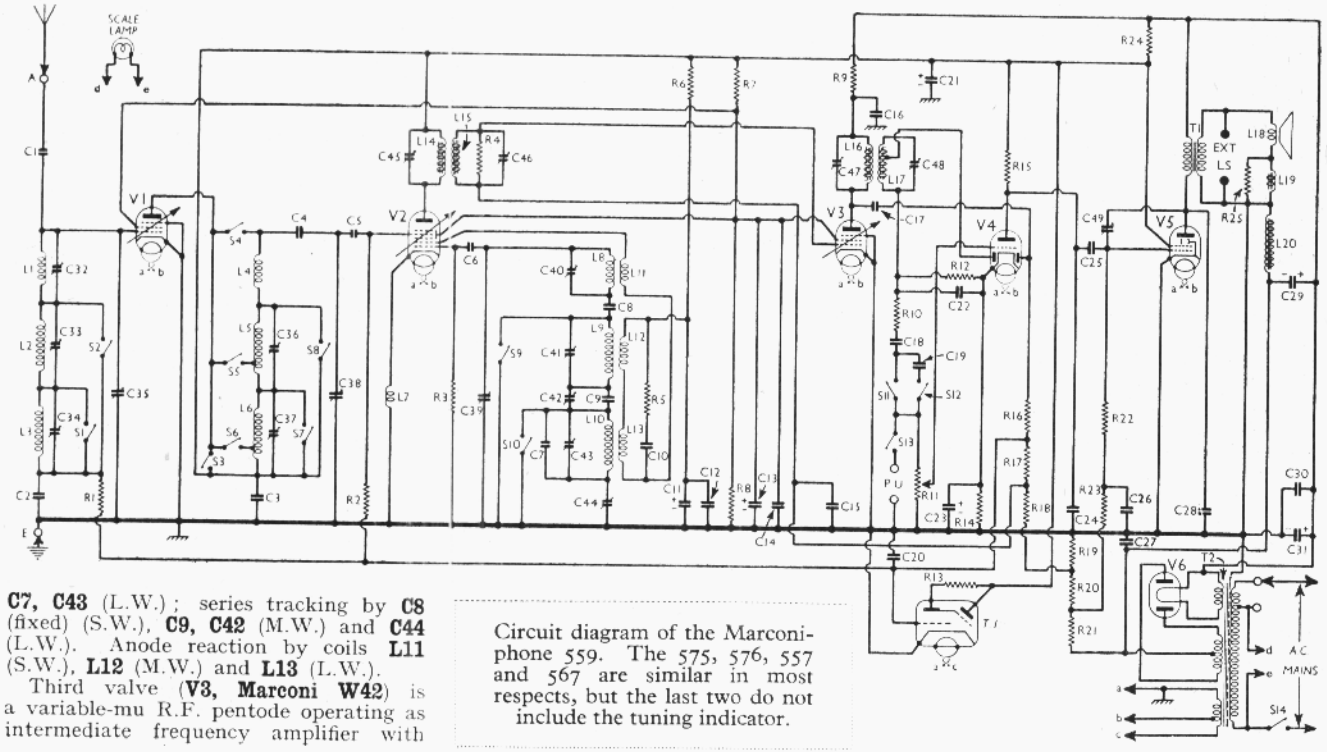
Provision for connection of external speaker across secondary of **T1.**

Cathode-ray tuning indicator (**T.I., Marconi Y63**) is controlled by D.C. potential on **V1, V2** A.V.C. line.

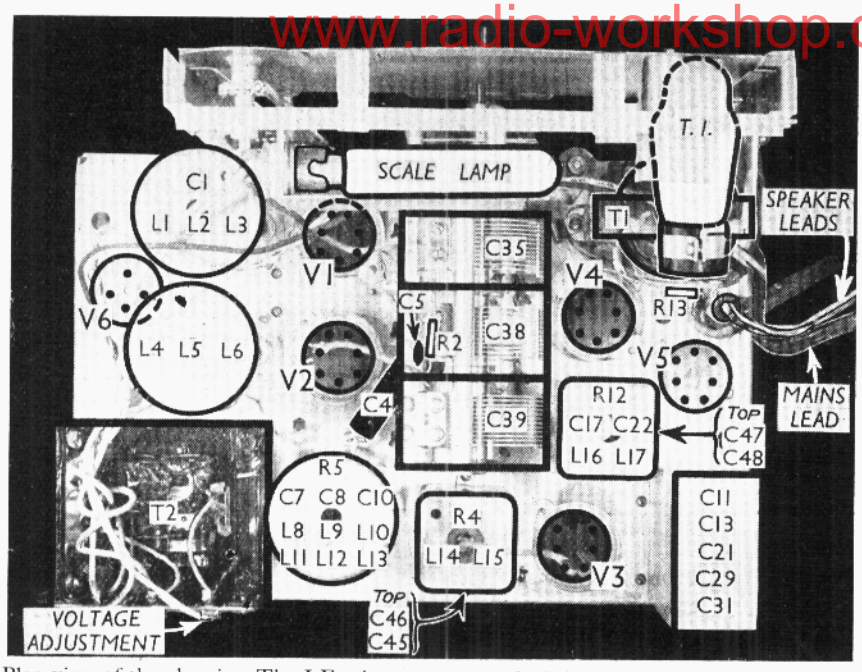
H.T. current is supplied by full-wave rectifying valve (**V6, Marconi U12**). H.T. smoothing by speaker field **L20** in negative lead and dry electrolytics **C29, C31.** R.F. filtering by **C30.**

COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 C.G. decoupling	75,000
R2	V2 C.G. tetrode decoupling	500,000
R3	V2 osc. C.G. resistance	50,000
R4	1st I.F. trans. sec. shunt	750,000
R5	Part of V2 oscillator anode circuit stabiliser	100
R6	V2 osc. anode H.T. feed	23,000
R7	V1, V2, V3 S.G.'s H.T. potential divider	23,000
R8		35,000
R9	V3 anode H.T. feed	10,000
R10	I.F. stopper	100,000
R11	Manual volume control	2,000,000
R12	V4 signal diode load	500,000
R13	T.I. anode H.T. feed	1,000,000
R14	V4 G.B. resistance	750
R15	V4 triode anode load	50,000
R16	V4 A.V.C. diode load resistances	500,000
R17		500,000
R18		500,000
R19	A.V.C. delay and V5 G.B. potential divider	1,000
R20		7,500
R21		50,000
R22	V5 C.G. resistance	150,000
R23	V5 C.G. decoupling	100,000
R24	V1, V2, V3, V4, S.G.'s and V1, V2, V4 anodes H.T. feed	1,000
R25	Hum neut. coil shunt	0·4



Circuit diagram of the Marconiphone 559. The 575, 576, 557 and 567 are similar in most respects, but the last two do not include the tuning indicator.



Plan view of the chassis. The I.F. trimmers are reached through holes in the sides of the cans. Note the additional components in several of the coil units.

	CONDENSERS	Values (μF)
C1	Series aerial condenser	0·0000075
C2	V1 C.G. decoupling	0·05
C3	V1 anode R.F. by-pass	0·1
C4	H.T. blocking condenser	0·1
C5	V1 to V2 R.F. coupling	0·000035
C6	V2 osc. C.G. condenser	0·00005
C7	Osc. circuit L.W. fixed trimmer	0·000023
C8	Osc circuit S.W. tracker	0·0035
C9	Osc. circuit M.W. fixed tracker	0·00035
C10	Part of V1 oscillator anode circuit stabiliser	0·00015
C11*	V2 osc. anode decoupling	4·0
C12	V2 osc. anode R.F. by-pass	0·005
C13*	V1, V2, V3 S.G.'s decoupling	4 0
C14	V1, V2, V3 S.G.'s R.F. by-pass	0·1
C15	V3 C.G. decoupling	0·23
C16	V3 anode decoupling	0·05
C17	Coupling to V4 A.V.C. diode	0·000075
C18	M.W. and L.W. A.F. coupling to V4 triode	0·01
C19	S.W. A.F. coupling to V4 triode	0·001
C20	I.F. C.G. and A.V.C. line decoupling	0·05
C21*	V1, V2, V4 anodes decoupling	4·0
C22	I.F. by-pass	0·0001
C23*	V4 cathode by-pass	25·0
C24	Fixed tone corrector	0·00035
C25	V4 triode to V5 A.F. coupling	0·05
C26	V5 C.G. decoupling	0·23
C27	Auto G.B. R.F. by-pass	0·05
C28	Fixed tone corrector	0·0023
C29*	H.T. smoothing	8·0
C30	H.T. circuit R.F. by-pass	0·015
C31*	H.T. smoothing	4·0
C32‡	Aerial circuit S.W. trimmer	—
C33‡	Aerial circuit M.W. trimmer	—
C34‡	Aerial circuit L.W. trimmer	—
C35‡	Aerial circuit tuning	—
C36‡	V1 anode circuit M.W. trimmer	—
C37‡	V1 anode circuit L.W. trimmer	—
C38‡	V1 anode circuit tuning	—
C39†	Oscillator circuit tuning	—
C40‡	Osc. circuit S.W. trimmer	—
C41‡	Osc. circuit M.W. trimmer	—
C42‡	Osc. circuit M.W. tracker	—
C43‡	Osc. circuit L.W. trimmer	—
C44‡	Osc. circuit L.W. tracker	—
C45‡	1st I.F. trans. pri. tuning	—
C46‡	1st trans. sec. tuning	—
C47‡	2nd I.F. trans. pri. tuning	—
C48‡	2nd I.F. trans. sec. tuning	—
C49†	Variable tone control	—

* Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial S.W. tuning coil	0·1
L2	Aerial M.W. tuning coil	6·0
L3	Aerial L.W. tuning coil	14·0
L4	V1 anode S.W. tuning coil	0·1
L5	V1 anode M.W. tuning coil	5·5
L6	V1 anode L.W. tuning coil	14·0
L7	V2 cathode frequency stabiliser	0·1
L8	Osc. circuit S.W. tuning coil	0·1
L9	Osc. circuit M.W. tuning coil	5·5
L10	Osc. circuit L.W. tuning coil	4·2
L11	Osc. S.W. reaction coil	1·0
L12	Osc. M.W. reaction coil	2·0
L13	Osc. L.W. reaction coil	3·0
L14	1st I.F. trans. Pri.	5·0
L15	1st I.F. trans. Sec.	5·0
L16	2nd I.F. trans. Pri.	5·0
L17	2nd I.F. trans. Sec.	5·0

	OTHER COMPONENTS (*continued*)	Approx. Values (ohms)
L18	Speaker speech coil	4·0
L19	Hum neutralising coil	0·8
L20	Speaker field coil	1,600·0
T1	Output trans. Pri.	400·0
	Output trans. Sec.	0·6
T2	Mains trans. Pri., total,	30·0
	Mains trans. Heater sec., total	0·4
	Mains trans. Rect. heat. sec.,	0·1
	Mains trans. H.T. sec., total	630·0
S1-S12	Waveband switches	—
S13	Gram. pick-up switch	—
S14	Mains switch, ganged R11	—

DISMANTLING THE SET

A detachable bottom is fitted to the cabinet and upon removal (three round-head wood screws) gives access to most of the components beneath the chassis.

Removing Chassis.—If it should be necessary to remove the chassis from the cabinet, remove the knobs from the spindles of the wave-change switch and volume control (recessed self-tapping screws), those from the tone control and slow-motion tuning (recessed grub screws), and the large tuning knob (pull off).

Next remove the four bolts (with washers and spring washers) holding the chassis to the bottom of the cabinet and free the speaker leads from the cleat holding them to the sub-baffle. The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

To free the chassis entirely, unsolder the speaker leads and *when replacing*, connect them as follows:—2, yellow; 6, black and black lead to speaker; 7, yellow; black.

Removing Speaker.—If it is desired to remove the speaker from the cabinet, remove the four screws (with lock washers) holding it to the sub-baffle. *When replacing* see that tags 6, 7 and 8 are at the top.

VALVE ANALYSIS

Valve voltages and currents given in the table (p. VIII) are those measured in

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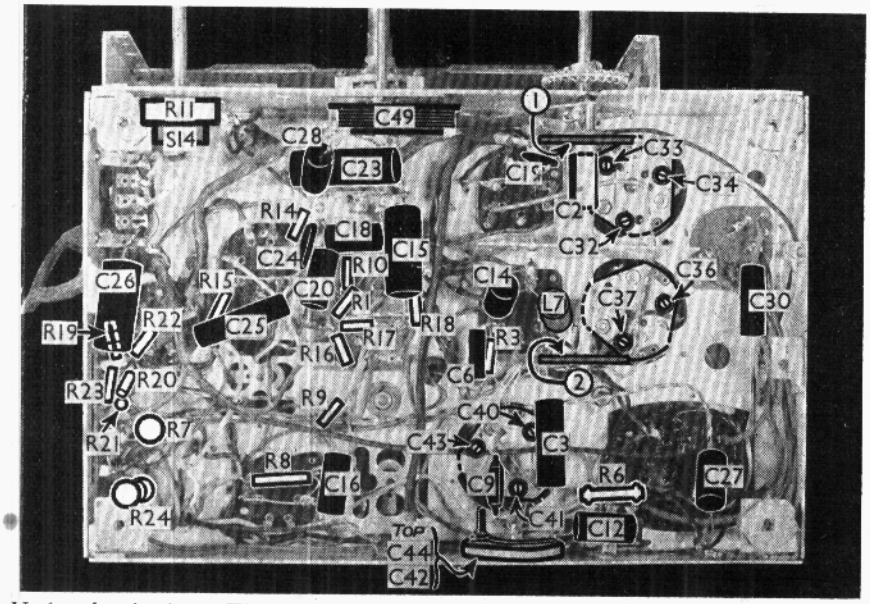


Under-chassis view. The switch units are indicated, and are shown in detail overleaf.

MARCONIPHONE—*Continued*

our receiver when it was operating on mains of 232 V, using the 224-255 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

If **V2** should become unstable when measurements are being made of its screen current, as in our case, it can be stabilised by connecting a non-inductive condenser of about 0·1 μF from the grid (top cap) to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 W42*	228	5·6	70	1·3
V2 X42	228	2·2	70	2·1
V3 W42	186	5·0	70	1·3
V4 DH42	127	1·8	—	—
V5 N42†	237	30·0	228	4·5
V6 U12	338‡	—	—	—

* Oscillator anode (G2) 135 V, 3·7 mA.
† May be a KT42.
‡ Each anode, A.C.

GENERAL NOTES

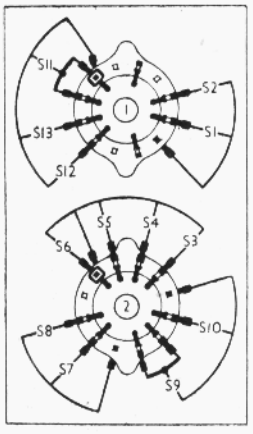
Switches.—S1-S12 are the waveband switches, and **S13** the pick-up switch, ganged in two rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams below.

The table below gives the switch positions for the four control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

Switch	L.W.	M.W.	S.W.	Gram
S1	—	C	—	—
S2	—	—	C	—
S3	—	—	—	C
S4	—	—	C	—
S5	—	C	—	—
S6	C	—	—	—
S7	—	C	—	—
S8	—	—	C	—
S9	—	—	C	C
S10	—	C	—	—
S11	C	C	—	—
S12	—	—	—	C
S13	—	—	C	—

S14 is the Q.M.B. mains switch, ganged with the volume control, **R11.**

Coils.—L1-L3; **L4-L6**; **L8-L13,** and the I.F. transformers **L14, L15** and **L16,** **L17** are in five screened units on the chassis deck. Most of these contain additional components as indicated in our plan chassis view. **L7** is a small coil on a tubular former beneath the chassis.



Switch diagrams, looking at the underside of the chassis, in the directions of the arrows in the under-chassis view.

Scale Lamp.—This is a special high voltage Osram tubular type, with a small double-pole bayonet cap base. It is rated at 230 V, 15 W, and is connected across the 195-223 V input to the primary of **T2.**

External Speakers.—These should be low resistance (5 O) types, and in the case of the Models 559 and 557, they should be connected across tags 2 and 3 on the internal speaker terminal strip, that is, across the secondary of **T1.**

In the case of the radiogram models 567, 575 and 576, two sockets are provided for a 5 O external speaker. Across these sockets is connected a 50 O resistance. A switch is fitted, which connects into circuit either the internal or external speakers separately, or both together.

Condensers C11, C13, C21, C29, C31.—These are five dry electrolytics in a single metal-cased unit on the chassis deck. The case is isolated.

The red lead is the positive of **C29** (8 μF) and the brown the negative. The black lead is the common negative of all the other condensers in the unit. The yellow lead to **R6** is the positive of **C11** (4 μF), the yellow lead to **R15** is the positive of **C21** (4μF), the yellow lead to **R24** the positive of **C31** (4μF), and the green lead the positive of **C13** (4μF). The unit is a Dubilier type 3221.

Trimmers.—Note that the majority of these are reached from the underside of the chassis, the trimmers being inside the bases of the respective coil units. The I.F. trimmers are reached through holes in the sides of their cans.

Trackers.—The two variable trackers can be adjusted through holes in the rear chassis member.

Resistance R25.—The hum neutralising coil shunt is a short length of resistance wire, with insulating sleeving, connected between tags 3 and 4 on the internal speaker terminal panel.

T.I. Connections.—The Y63 C.R. indicator has an octal base, and with the usual pin numberings the connections are: 1, blank; 2, heater; 3, anode; 4, target; 5, grid; 6, no pin; 7, heater; 8, cathode.

Chassis Divergencies.—The various models alluded to in this sheet have minor divergencies.

In the first place, models 557 (table) and 567 (radiogram) have no tuning indicator. The circuit is the same as that which we give, except that the Y63 indicator and its connections, together with **R13,** are removed. The mains transformer is also slightly different, in that the extra winding between **b** and **c** on the heater secondary, to give 6·3 V, is not included.

Next, the tone control circuit may be different. Broadly speaking, the 559, 575 and 576 have the variable condenser tone control shown by us, but the 557 and 567 mostly have an older type of tone control. Also, some of the 559, 575 and 576 models may have the old control, while some of the 557 and 567 models may have the later type.

In chassis having the earlier type, **C49** is missing. Instead, there is a three-position rotary switch, with two common tags joined to the anode side of **T1** primary, and two other tags joined to one side respectively of each of two fixed condensers, 0·01 μF and 0·023 μF. The other sides of each of these condensers are joined together and to the H.T. side of **T1** primary.

In the first position of the switch, neither condenser is in circuit, in the second position, the smaller condenser is in parallel with **T1** primary, and in the third position, both condensers are in parallel with it.

All radiogram models have a 7,500 O resistance connected across the pick-up winding. The external speaker connections are explained earlier under "External Speaker." In early models an N42 output pentode is used in place of the KT42 tetrode.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to L.W., turn gang to maximum and volume control to maximum. Connect signal generator to grid (top cap) of **V2,** via a 0·1 μF condenser, leaving existing top cap connection in place, and to chassis. Feed in a 465 KC/S signal and adjust **C45, C46, C47** and **C48** in that order, for maximum output. Re-check these adjustments.

R.F. and Oscillator Stages.—S.W.—Connect signal generator to **A** and **E** sockets and switch set to S.W. Feed in an 18 m. (16·7 MC/S) signal, tune it in, and adjust **C40** and **C32** for maximum output, rocking the gang slightly for optimum results.

Feed in a 50 m. (6 MC/S) signal, tune it in. Then adjust the inductance of **L1** if necessary. A loop of wire will be found running across the coil former and this loop must be bent up or down until maximum output is obtained. Identify the loop by first removing the coil can; then replace the can and move the loop by a strip of insulating material with a suitable nick in it. This adjustment will not normally be necessary.

Return to 18 m. and re-adjust **C32** very carefully, while rocking the gang.

M.W.—Switch set to M.W., turn gang to minimum, and feed in a 195 m. (1,540 KC/S) signal. Adjust **C41** for maximum output. Feed in a 225 m. (1,330 KC/S) signal, tune it in, and adjust **C33** and **C36** for maximum output. Feed in a 530 m. (565 KC/S) signal, tune it in, and adjust **C42** for maximum output, rocking the gang for optimum results. Return to 195 m., and check setting of **C41.**

L.W.—Switch set to L.W., turn gang to minimum, and feed in a 725 m. (413 KC/S) signal. Adjust **C43** for maximum output. Feed in an 800 m. (375 KC/S) signal, tune it in, and adjust **C34** and **C37** for maximum output. Feed in a 1,900 m. (158 KC/S) signal, tune it in, and adjust **C44** for maximum output, rocking the gang for optimum results. Check setting of **C43** at 725 m.

Finally, return to M.W., and go through whole of M.W. and L.W. alignment again. Set the scale pointer to give best possible calibration compromise.

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