

KWM-2 restoration and updates

F1LAG

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1st and 2nd MIC Amplifiers

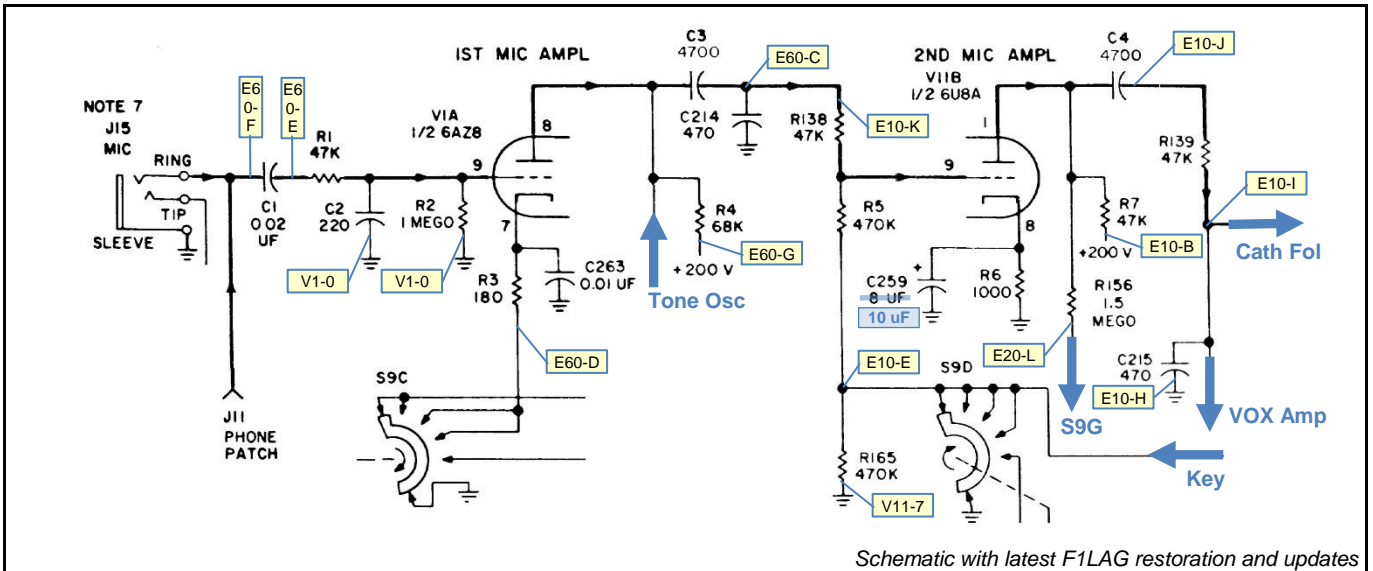
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R6	680Ω	1kΩ 1/2W carbon	id 3 rd ed	id 3 rd ed
R165	220kΩ	470kΩ 1/2W carbon	id 3 rd ed	id 3 rd ed
C263	not used	10nF 500V ceramic	id 3 rd ed	id 3 rd ed

R6 R165 no information
 C263 ASAB1003-15 (August 1960): added to prevent machine gun effect on VOX relay.

Current schematic

F1LAG KWM-2 as per 3rd (and later) edition: R6 R165 new values, C263 in place (ASAB1003-15).



Restoration and updates

Before 08/2015 new C259 (wrong value: 1500uF)
 Jan 2016: corrected wrong values for R6 and C259

Jan 2016 restoration	Resistance			Voltage [RX / TX 0W]		
	V11-1	V11-8	V11-9	V11-1	V11-8	V11-9
3 rd ed	55 k	1 k	480 k	96 / 86	2 / 1.8	0
6 th ed	600 k	1 k	480 k	96 / 86	2 / 1.8	0
9 th ed	55 k	1 k	450 k	85 / 75	2.2 / 2.0	0
Before (R6 330Ω)	64.7 k	351	476 k	67 / 63	0.97 / 0.94	0.0
After (R6 1kΩ)	64.7 k	997	476 k	91.4 / 88.9	2.10 / 2.04	0.0

Ref	before	after	Date
R6	330Ω 1/2W carbon error in previous update?	1kΩ 0.6W 1% metal film REICHELTT METALL 1,00 K	Jan 2016 / F1LAG
C259	1500uF 10V electrolytic error in previous update?	10uF 50V electrolytic TREC ZA series	Jan 2016 / F1LAG

Tone Oscillator

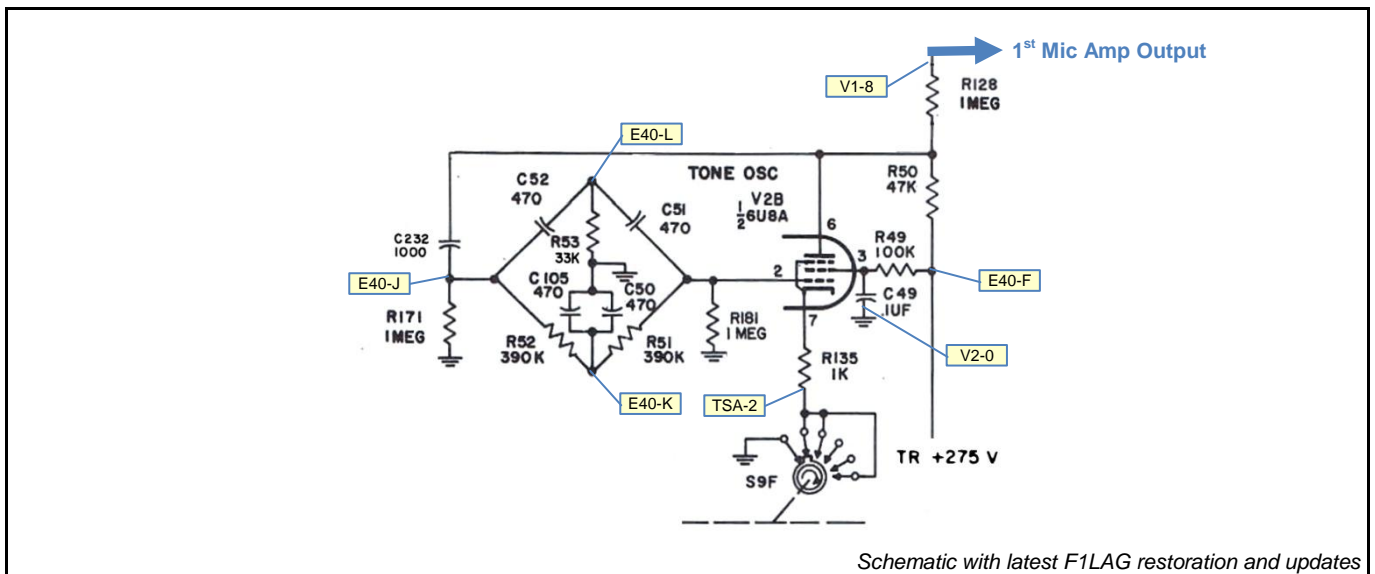
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R50	47kΩ	47kΩ 1/2W carbon	id 3 rd ed	47kΩ 1W carbon
R51 R52	390kΩ	390kΩ 1/4W carbon	id 3 rd ed	330kΩ 1/4W carbon
R53	33kΩ	27kΩ 1/4W carbon	18kΩ 1/2W carbon	27kΩ 1/4W carbon
R128	1MΩ	3.3MΩ 1/4W carbon	1.5MΩ 1/2W carbon	3.3MΩ 1/4W carbon
R181	not used	1MΩ 1/4W carbon	id 3 rd ed	id 3 rd ed
R215	not used	not used	not used	47Ω 1/2W carbon
C232	1nF	10nF 500V ceramic	id 3 rd ed	id 3 rd ed
C261	not used	100pF 500V mica	id 3 rd ed	id 3 rd ed

R50 mod 2: changed from 1/2W to 1W for extended service life - recommended
 R51 R52 R53 mod 1: 330k/330k/27k to get 1750Hz tone, otherwise 390k/390k/18k
 R215 mod 39 = SB10 (Apr 1974): added to eliminate VHF parasitic oscillations (audible tone in CW with key open)
 C261 ASAB 1004-3 (Aug 1960): added to prevent parasitic oscillation - recommended

Current schematic

F1LAG KWM-2 1959 ed with R181 added but before Aug 1960 (ASAB 1004-3 not done)
 (R215 C261 absent, R53 R128 C232 as 1959 values)
 mod 1, mod 2, mod 39 / SB 10 not done



Restoration and updates

Before 08/2015 R181 added or renewed 1MΩ 1/4W metal film
 C49 changed to 100nF 630V MPP (HF polypropylene capacitor)
 Mar 2016 intall a new terminal strip (TSA),
 at TSA-2, connect R135 and wire going to S9-F in order to free E60-B for PTO mod 11B
 Mar 2016: mod 2 upgrade R50 power rating (mod 2) and add C261 (ASAB1004-3)

Ref	before	after	Date
R181	?	1MΩ 1/4W metal film	Before Aug 2015
C49	?	100nF 630V MPP	Before Aug 2015
R50	47kΩ 1/2W carbon	47kΩ 2W 5% metal oxide Vitrohm PO593-0	Mar 2016 / F1LAG
C261	none	100pF 500V mica CDE CD15FD101JO3F	Mar 2016 / F1LAG

MIC Cathode Follower

Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R122	not used	47kΩ 2W carbon	id 3 rd ed	id 3 rd ed
R176	not used	4.7kΩ 1W carbon	id 3 rd ed	id 3 rd ed
R177	not used	27kΩ 2W carbon	id 3 rd ed	id 3 rd ed
R208	not used	not used	not used	470Ω 1/4W carbon
L38	not used	not used	1mH 16Ω 135mA	1mH RF coil
L41	not used	not used	not used	1mH RF coil
C6	470nF	470nF 25V ceramic	id 3 rd ed	1uF 25V ceramic
C7	10nF	10nF 500V ceramic	id 3 rd ed	id 3 rd ed
C264	not used	4uF 350V electrolytic	id 3 rd ed	20uF 350V electrolytic
CR10	not used	not used	1N1490	1N5060 (*)

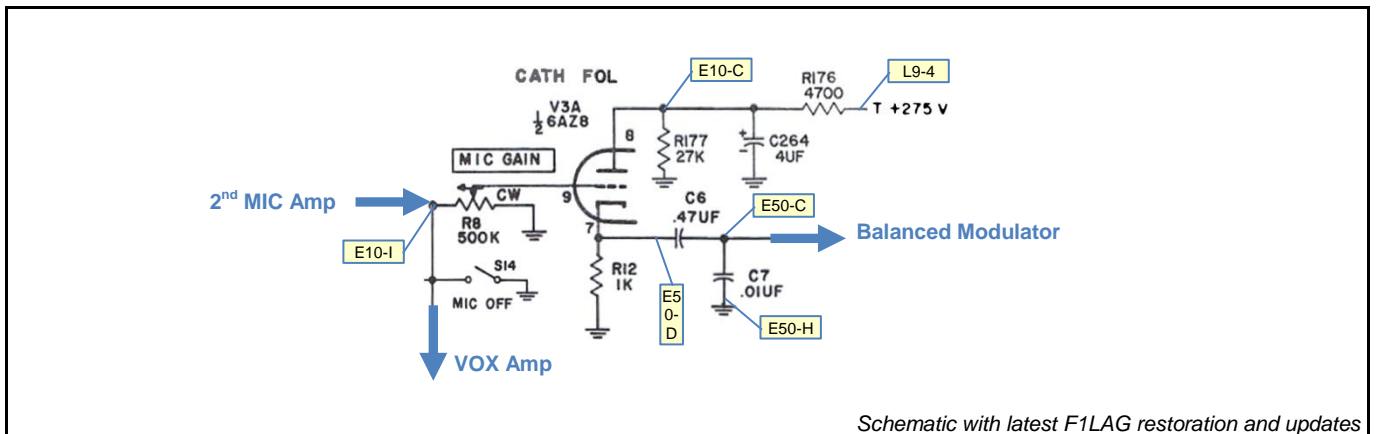
(*) 1N1490 in component list / 1N5060 on schematic

- C264 ASAB 1003-14 (Aug 1960): added to improve carrier suppression in case of supply ripple
- R122 ASAB 1006-A (May 1961): added to cut off cathode follower during TX preventing feed through from microphone and balanced modulator into RX 1st IF amplifier and audio output
- R176 CR10 ASAB 1016-B (Oct 1965): R176 rewired from L9-4 to L9-3 and CR10 added to prevent 'yelp' when going back in RX
- R208 L38 L41 C6 C264 CR10 mod 3: C6 C264 values changed, CR10 added, R208 L38 L41 added to block RF feedback - optional.

Current schematic

- F1LAG KWM-2 Post 1959 ed (R176 R177 C264 present) but before May 1961 (R122 absent)
ASAB 1016-B done (F1LAG) and C264 changed to 22uF
ASAB 1006 and mod 3 not done (except C264 / CR10)

Update image with C264 / CR10



Restoration and updates

- Before 08/2015 C264 added
- Mar 2016 ASAB 1016-B: implemented also with C264 value change (= part of mod 3)
DO NOT add R122 (ASAB 1006-A) unless strictly necessary (see DJ7HS [3])

Ref	before	after	Date
C264	4uF 350V electrolytic	22uF 350V electrolytic SC AX22/350 105°C	Mar 2016 / F1LAG
CR10	none	1N5060	Mar 2016 / F1LAG

BFO

Collins schematic revisions

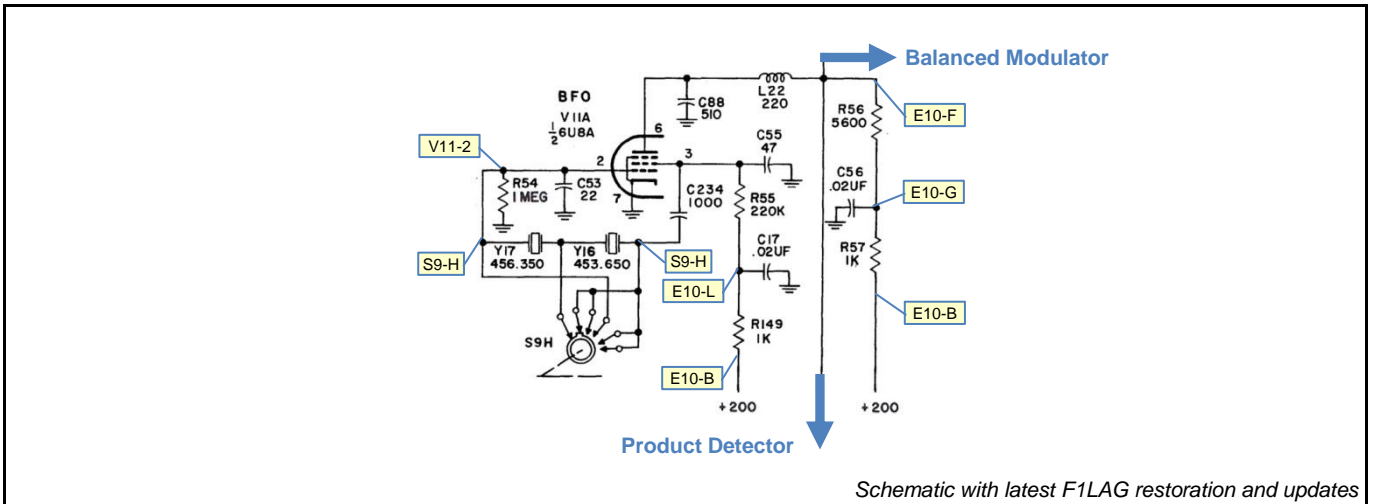
Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R54	68kΩ	1MΩ 1/2W carbon	id 3 rd ed	id 3 rd ed
R149	1kΩ	1kΩ (*)	not used	not used
R195	not used	not used	47Ω 1/2W carbon	id 6 th ed
L22	220uH	220uH wirewound	220uH shielded	id 3 rd ed
C17	20nF	20nF500V ceramic	not used	not used
C53	22pF	15pF 500V mica	id 3 rd ed	id 3 rd ed
C55	47pF	100pF 500V mica	180pF 500V mica	id 6 th ed

(*) R149 not in component list but shown on schematic

- R57 ASAB 1005-2 (Dec 1960): R57 rewired from E10-A (TR+275V) to E10-B (+200V) to reduce hum on carrier
- R149 / C17 suppressed in later KWM-2: R55 connected to R56/R57 junction and R57 connected to +200V
- R195 mod 10: R195 added to prevent spurious oscillations – do not add if not present
- L22 mod 9A: inductor type changed from 3 sections / 75 turns each / 36AWG / powdered iron core 220uH / 1A to shielded / single layer / 220uH / 7.2Ω / 210mA - recommended
- C53 / C55 ASAB 1004-4 (Aug 1960): values changed from 22pF/47pF to 15pF/100pF to prevent instabilities in some KWM-2 - optional
- C55 mod 10: changed from 100pF to 180pF to decrease feedback – recommended

Current schematic

- F1LAG KWM-2 Post 1959 ed (R54 is 1M) but before Aug 1960 (ASAB 1004 not done, C53/55 are 22/47pF) mod 9A, mod 10 not done, no TS10 (= as per 3rd ed= upgrade F1LAG: ASAB 1005-2



Restoration and updates

- Before 08/2015 none
- Feb 2016 ASAB 1005-2 / 6th ed schematic: remove jumper E10-A/E20-B (TR275), rewire R57 from E10-A to E10-B

Recheck R V11-6 to GND with maplin

Feb 2016 ASAB 1005-2	Resistance			Voltage [RX / TX]		
	V11-2	V11-3	V11-6	V11-2	V11-3	V11-6
3 rd ed	95 k	230 k	17 k	-5.3 / -4.7	70 / 65	195 / 185
6 th ed	1 M	120 k	17 k	-11.2 / -10.5	86 / 85	195 / 185
9 th ed	1 M	230 k	18 k	-9 / -8	81 / 75	180 / 165
Before (R57 to E10-A)	1.08 M	259 k	18.1 k	-3.25 / -3.12	71 / 69	264 / 257
After (R57 to E10-B)	1.08 M	259 k	27.1 k	-2.15 / -2.11	65.3 / 63.8	183 / 177

eventuellement

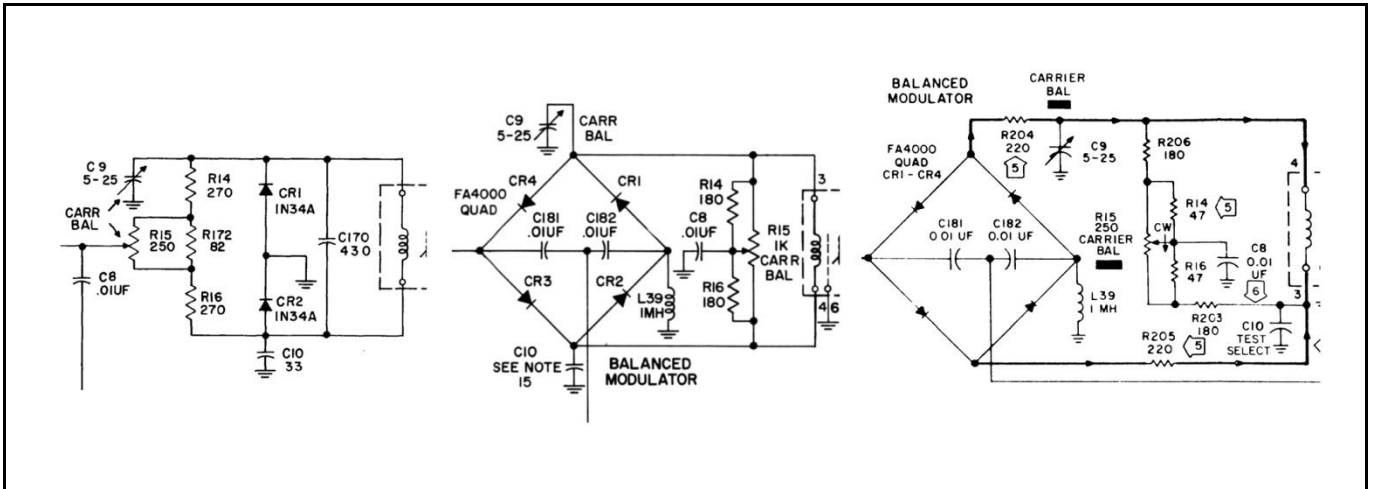
Ref	before	after	Date
Jumper	E10-A to E20-B	Removed	
R55	V11-3 to E10-L	No change	Feb 2016 / F1LAG
R56	E10-F to E10G	E10-F to E10-L	
R57	E10-G to E10-A	Removed	
R149	E10-L to E10-B	Renamed R57	ASAB 1005-2
C17	E10-L to GND	Renamed C56	6 th ed schematic
C56	E10-G to GND	Removed	

Balanced Modulator

Collins schematic revisions

Four different sources = four different schematics!

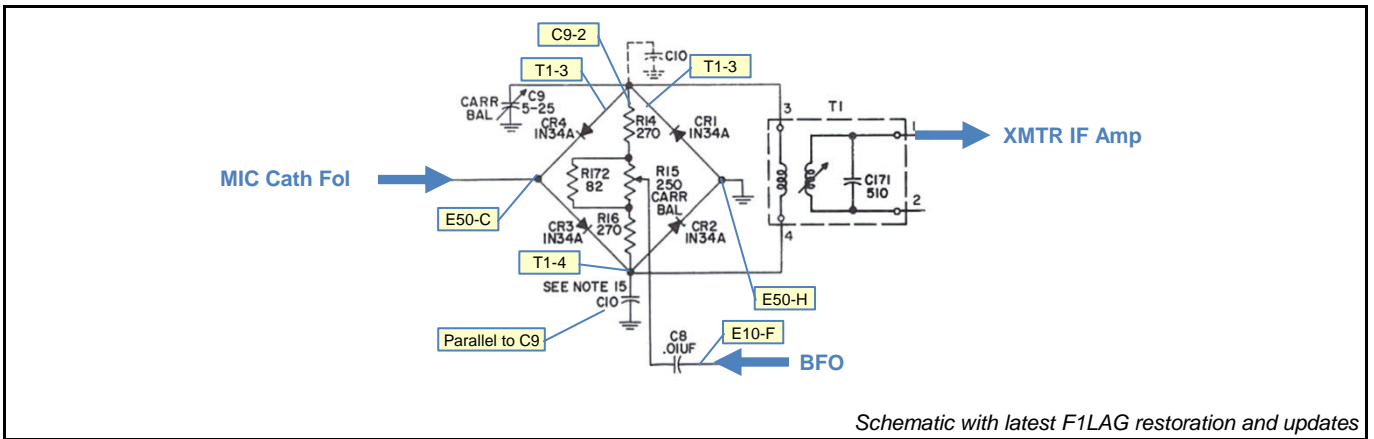
For reference, the 1959, 1968 and 1978 versions (1962 version: see current schematic):



- ASAB 1009-4: C181 and C182 references used for capacitor at K3 (1959 and 3rd ed).
- mod 4: if 3th ed version, do not attempt to upgrade.
- mod 6: C10 test select, might be on same side as C9
- mod 4A and 5: for later balanced modulator design

Current schematic

- F1LAG KWM-2 as per 3rd (1962) edition
- mod 6: C10 is 33pF + 68 pF 500V mica wired in parallel to C9.
- T1 layout as per 3rd ed (mirrored in 6th and 9th ed)



Restoration and updates

Before 08/2015 none

VOX Amplifier, Rectifiers and Relay Actuator

Collins schematic revisions

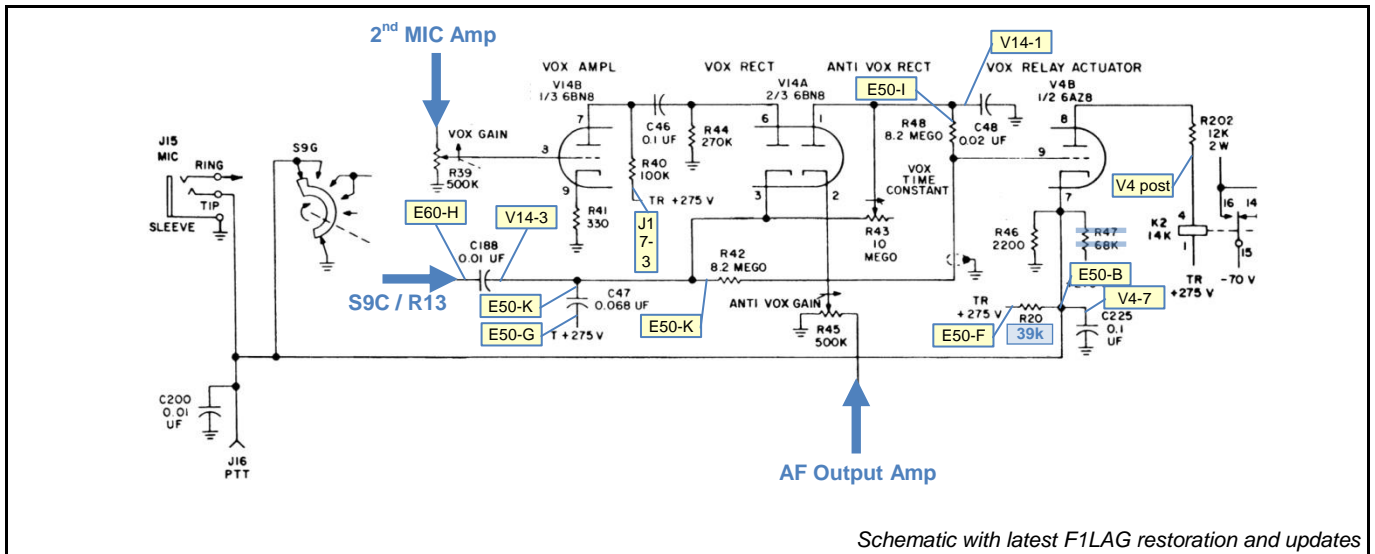
Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R43	1MΩ fixed	1MΩ variable	id 3 rd ed	id 3 rd ed
R46	2.2kΩ	2.2kΩ 1/2W carbon	id 3 rd ed (*)	id 3 rd ed
R199	not used	not used	2.2MΩ 1/4W carbon	id 6 th ed
R201	not used	not used	220kΩ 1/2W carbon	id 6 th ed
R202	not used	not used	330Ω 1/2W carbon	12kΩ 2W carbon
R209	not used	not used	not used	100Ω 1/2W carbon
C47	10nF	47nF 400V paper	id 3 rd ed	68nF 400V plastic
C200	not used	10nF 500V ceramic	id 3 rd ed	id 3 rd ed

(*) R46 2.2kΩ on schematic but 3.3kΩ in component list

- R43 / C47 SB2 (Jan 1960): implement adjustable VOX time constant. Fixed R43 replaced with potentiometer and 47nF paper dielectric added in parallel to original 10nF.
- R46 mod 9: 3.3kΩ in some units, shall be 2.2kΩ
- R199 mod 8: added to improve time constant control range – do not add if not present.
- R201 mod 7: added to isolate VOX amplifier from VOX gain control – do not add if not present.
- R202 mod 9: added to limit K2 energizing current. Changed from 330Ω at V4B cathode to 12kΩ at V4B plate. Do not implement for open relays, but must be added for closed type relays.
- R209 mod 35: added to improve AF output to anti VOX isolation – do not add if not present.
- C47 mod 11: value changed to 68nF to increase VOX time constant, type changed to polycarbonate to reduce leakage – recommended
- C200 1959 version used single capacitor (C225 100nF 75V) on PTT line. Later versions have C200 at J16 (PTT jack) and C225 at V4B socket.

Current schematic

- F1LAG KWM-2 as per 3rd (1962) edition plus mod 9 (R202) for enclosed relays and mod 11 (F1LAG) mod 7, mod 8, mod 35 not done (R199 R201 R209 absent)



Restoration and updates

- Before 08/2015 renewed components: R20/R47 (single 39kΩ 5W), R202, C47
- Feb 2016 add missing C225 at [V4-7 | V4-5]
- Mar 2016 implement mod 11: remove 10nF used for C47 and replace it with 68nF 400V PP

Ref	before	after	Date
R20 / R47	?	39kΩ 5W metal Vishay Dale CW5	Before Aug 2015
R202	?	12kΩ 2W metal oxide	Before Aug 2015
C47	?	10nF 1kV ceramic	Before Aug 2015
C47	10nF 1kV ceramic	68nF 400V polypropylene Panasonic ECWF4683JL	Mar 2016 / F1LAG
C225	none	100nF 63V polyester Panasonic ECQV1J104JM	Feb 2016 / F1LAG

XMTR IF Amplifier

Collins schematic revisions

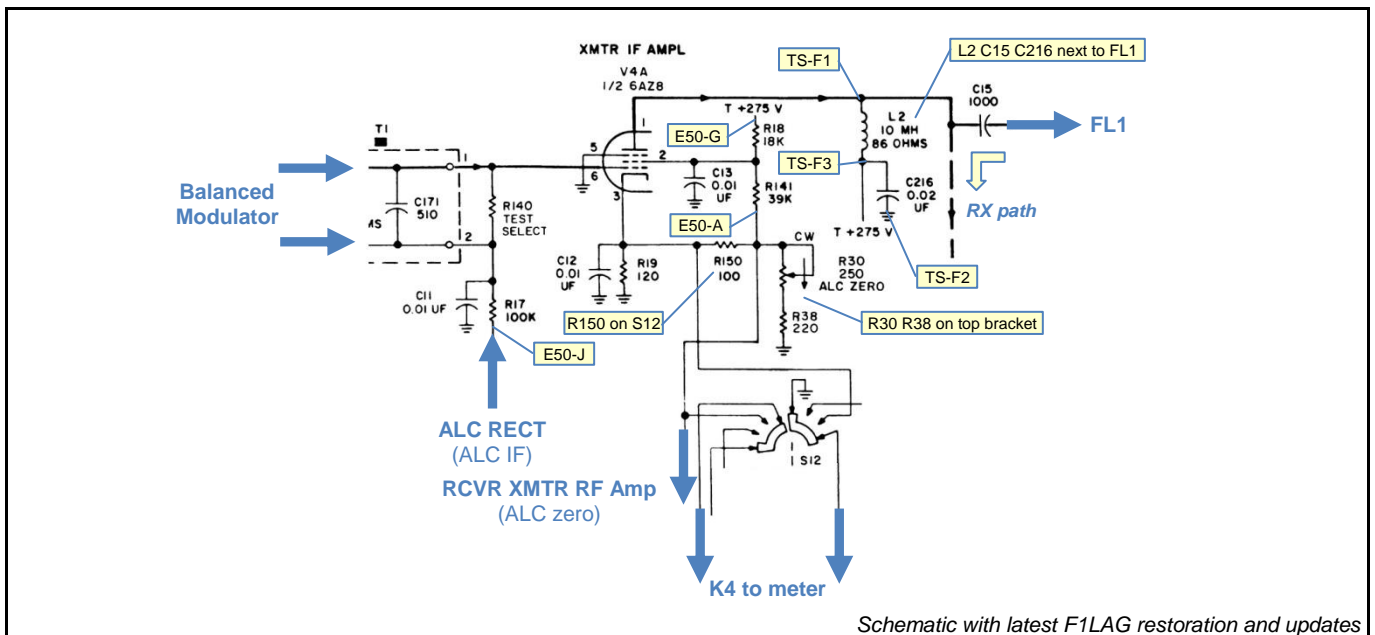
Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R17	100kΩ	100kΩ 1/4W carbon	10kΩ 1/4W carbon	id 6 th ed
R18	47kΩ	47kΩ 1W carbon	id 3 rd ed	18kΩ 2W carbon
R19	47Ω	47Ω 1/2W carbon	120Ω 1/2W carbon	id 6 th ed
R38	270Ω	220Ω 1/2W carbon	68Ω 1/2W carbon	220Ω 1/2W carbon
R140	22kΩ	390Ω-27kΩ selected	id 3 rd ed	id 3 rd ed
R150	82Ω	180Ω 1/2W carbon	id 3 rd ed	id 3 rd ed
R170	220Ω (*)	not used (*)	id 3 rd ed	id 3 rd ed
R207	not used	not used	not used	680Ω 1/2W carbon
C11	1nF	1nF 500V ceramic	10nF 500V ceramic	id 6 th ed

(*) R170 in XMTR IF amp only for 1959 ed. Later versions: R170 reference is re-used in -70V bias circuit

- R17 no documentation but 100kΩ associated with old ALC circuit (1959 / 3rd ed with V17-2 gnd) and 10kΩ value associated with new design (6th / 9th ed with V17-2 to R192/R191 divider).
- R38 ASAB 1004-2 (Aug 1960): changed from 150Ω (KWM-2 version unknown – see above table) to 220Ω to improve ALC zeroing.
- R18 R38 mod 12: R18 change to increase IF amp gain, R38 added to improve range of ALC control and changed to maintain proper voltage levels- 47kΩ/68Ω changed to 18kΩ/220Ω - recommended
- R140 mod 6: test select 390Ω - 27kΩ to provide ALC threshold of 2 to 5mV.
- R170 ASAB 1003-16 (Aug 1960) = SB4 (Sep 1960): suppressed. R170 is in XMTR IF Amp only in 1959 ed. In later editions, R170 reference is reused in -70V bias circuit (see Relay-Power).
- R207 L2 C216 mod 12: improve decoupling - R207 470Ω then 680Ω, L2 added (but on all available schematics!), C216 changed location – if L2/R207 absent, do not add.
- R19 R150 C11 no information on value change
- Global ALC redesigned: zeroing pot at V4-3 in 1959 ed and 3rd ed, at V4-2 in 6th ed and 9th ed.

Current schematic

- F1LAG KWM-2 Upgraded to 9th ed except R17 kept at 100kΩ (old ALC circuit?) and R207 absent
- R150 is 100Ω as per F6CER paper.



Restoration and updates

- Before 08/2015 upgraded to 9th ed except R17/R207. R150 100 Ω as per F6CER instead of 180. R18/ R19/R141/R150 new.
- Feb 2016 Weak weld at V4-2: R18 lead escaped when touched, re-welded.

add R207 and relocate components as per F6CER (post near meter)?

Ref	before	after	Date
R18	?	18kΩ 2W metal oxide	Before Aug 2015
R19	?	120Ω 1/2W carbon	Before Aug 2015
R141	?	39kΩ 2W metal oxide	Before Aug 2015

R150	?	100Ω 1/2W metal film	Before Aug 2015
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Mechanical Filter – FL1

Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R198	not used	not used	not used	27kΩ 1/4W carbon
C14	100pF	51pF 500V mica	id 3 rd ed (*)	id 3 rd ed
C54	not used	7-60pF 350V ceramic	id 3 rd ed	id 3 rd ed
FL1	?	ref 526-9337-00	id 3 rd ed	ref 526-9427-00

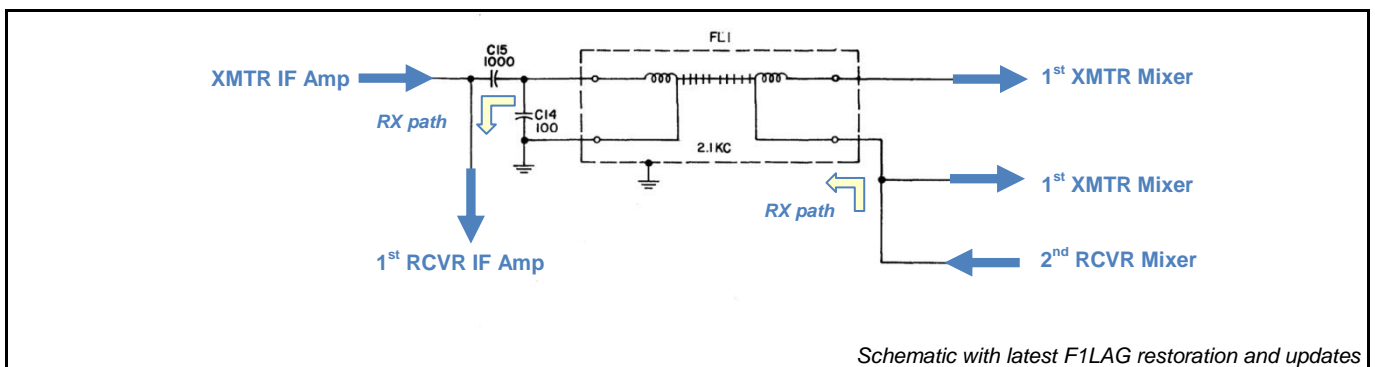
(*) C14 51pF on schematic but 47pF in component list

R198 mod 13: added to reduce IF leakage then removed to improve IF gain. If present do not remove.

FL1 mod 13: filter type changed (new type held by clip).

Current schematic

F1LAG KWM-2 as per 1959 ed (C14 = 100pF, no C54, no R198, old filter type)



Restoration and updates

Before 08/2015 none

1st XMTR Mixer

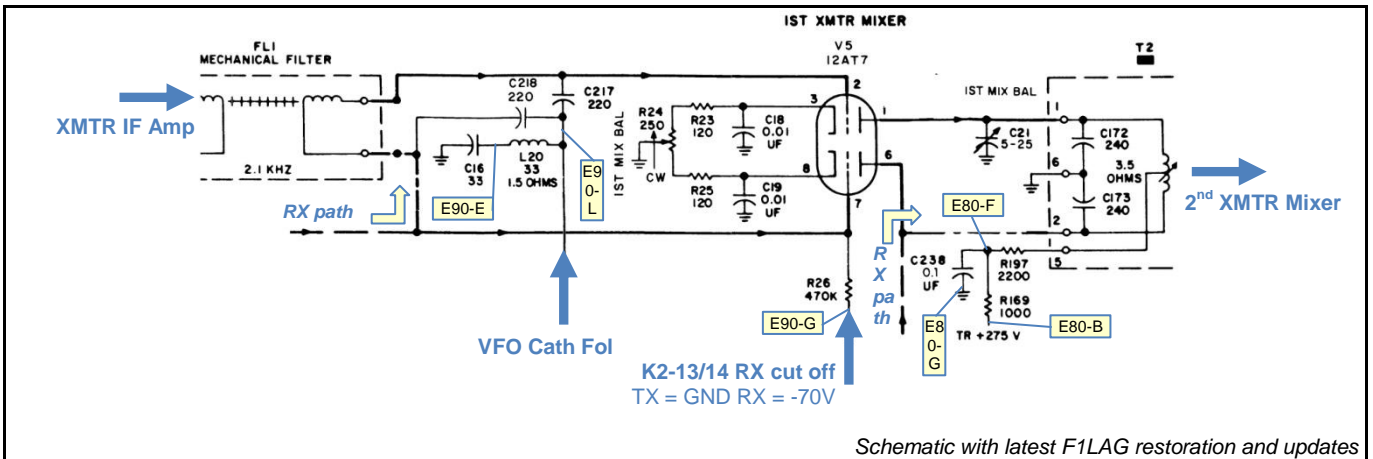
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R197	not used	not used	2.2kΩ 1/2W carbon	id 6 th ed
R212	not used	not used	not used	1MΩ 1/4W carbon
C16	51pF	33pF 500V mica	id 3 rd ed	id 3 rd ed
C20	not used	10nF 500V ceramic	id 3 rd ed	id 3 rd ed
C22	22pF	22pF 500V mica	id 3 rd ed	not used
L3	2mH	2mH RF coil	not used	not used
L24	not used	220uH RF coil	id 3 rd ed	id 3 rd ed

- R197 L3 mod 16: R197 added in place of L3 to improve decoupling – change only if L3 need replacing.
- R212 mod 14: added to reduce mixer bias in RX - if absent, do not add
- C18 C19 ASAB 1006-C (May 1961): move ground end of C19 to same ground point as C18 in order to reduce 3.5MHz spurious.
- C238 ASAB 1016-C (Oct 1965): connection relocated to L3/R169 junction (R197/R169 junction after mod 16) to reduce low frequency spurious oscillations.
- C16 C22 no info on value change
- C20 L24 -70V bias decoupling absent only in 1959 ed.

Current schematic

F1LAG KWM-2 1959 ed with many upgrades making it nearly 9th ed as per 9th ed: mod 16, ASAB 1006, ASAB 1016 done, C22 removed still as per 1959 ed: C20 L24 R212 absent and C16 51pF



Restoration and updates

Before 08/2015 new R169 R197 C238

Jan 2016 add C20 L24

Ref	before	after	Date
R169	?	1.2kΩ 1/4W metal oxide	Before Aug 2015
R197	?	2.2kΩ 1/2W metal oxide	Before Aug 2015
L3	?	removed	Before Aug 2015
C238	?	0.1uF 630V MKT	Before Aug 2015

VFO (PTO) and VFO Cathode Follower

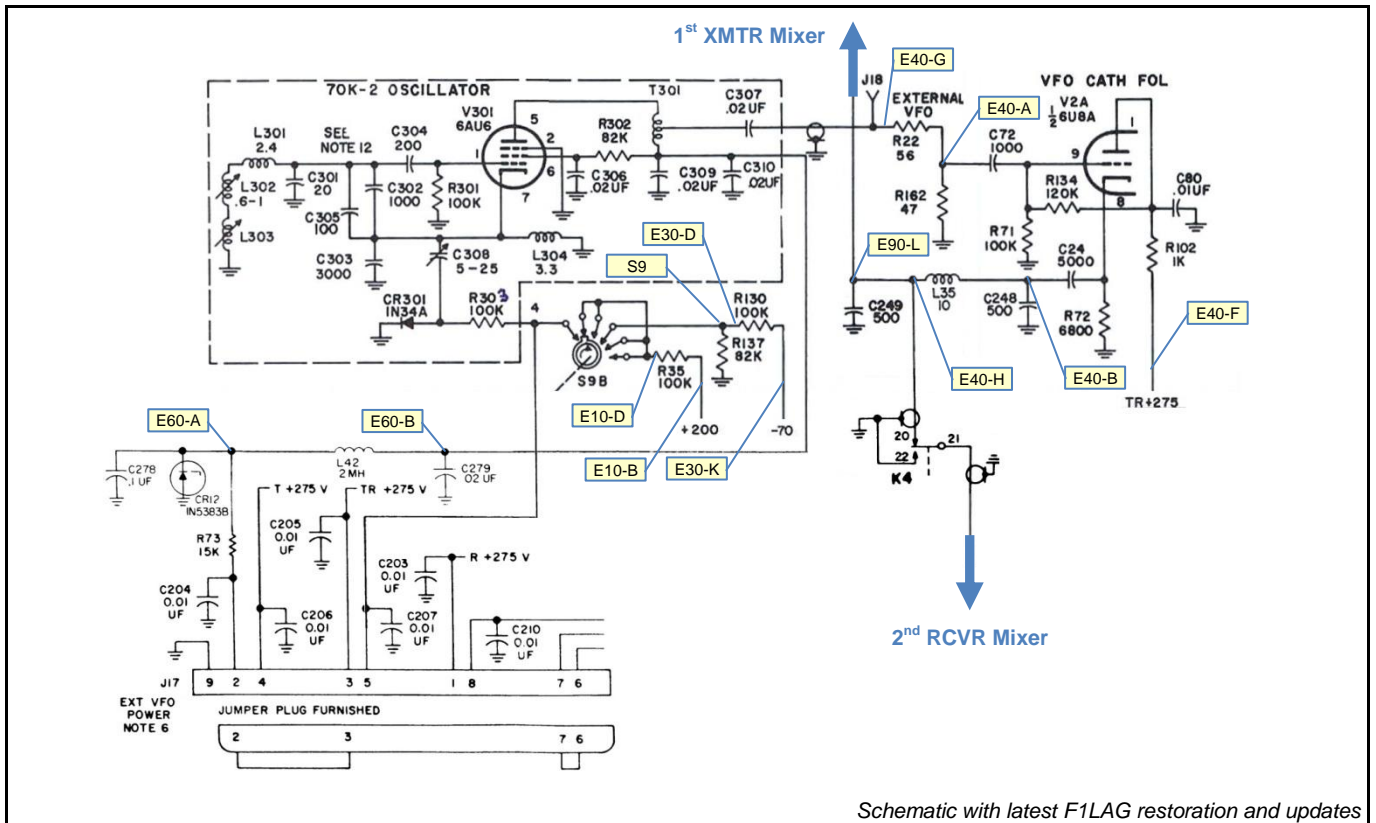
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R22	56Ω	56Ω 1/2W carbon	100Ω 1/2W carbon	id 6 th ed
R131	33kΩ	33kΩ 2W carbon	id 1959 ed	not used
R162	47Ω	47Ω 1/2W carbon	id 1959 ed	Test select
R196	not used	not used	not used	100Ω 1/2W carbon
C278	not used	not used	not used	100nF 75V ceramic
C279	not used	not used	not used	20nF 1kV ceramic
L42	not used	not used	not used	2mH
CR12	not used	not used	not used	1N5383B

- R22 ASAB 1016-D (Oct 1965): selected value (suggested 100Ω) to eliminate HF tweets due to excessive VFO injection.
- R22 R196 mod 17: R22 changed value and R196 added to isolate external VFO. If not done, R22 shall be kept 56Ω (contradiction with ASAB 1016 -)
- R131 C278 C279 L42 CR12 mod 11B: R131 removed, C278 C279 L42 CR12 added to improve frequency stability
- R162 mod 17: 47Ω to 100Ω to provide 1.25V_{AC} at V2-9 in LSB

Current schematic

- F1LAG KWM-2 1959 ed with mod 11B done (stabilized supply), although C279 L42 not found (forgotten?, added F1LAG Mar 2016)
- ASAB 1016, mod 17 not done



Schematic with latest F1LAG restoration and updates

Restoration and updates

- Before 08/2015 mod 11B except missing C279 L42
- Mar 2016 install L42 and C279 to finalize mod 11B
- Jan 2016 **Mod 17 to isolate VFO**

Ref	before	after	Date
C279	not used	22nF 630V X7R ceramic muRata RDER72J223K	Mar 2016 / F1LAG
L44	not used	2.2mH R 34.7Ω I 80mA Fastron SMCC-222X-YY	Mar 2016 / F1LAG
CR12	not used	1N5383B	Before Aug 2015

2nd XMTR Mixer

Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R124	12kΩ	3.9kΩ 1/4W carbon	id 3 rd ed	6.8kΩ 1/4W carbon
R143	2.2kΩ	2.2kΩ 1W carbon	id 3 rd ed	id 3 rd ed
R200	not used	not used	1MΩ 1/4W carbon	id 6 th ed
C25	3 pF	6 pF 500V ceramic	id 3 rd ed	id 3 rd ed
C274	not used	not used	10nF 500V ceramic	id 6 th ed
L40	not used	not used	220uH RF coil	id 6 th ed

R124 no info on value change

R143 ASAB 1004-1 (Aug 1960): value changed from 1.5kΩ (early KWM-2 before mid-1960) to 2.2kΩ to reduce plate dissipation and extend service life – recommended mod 22: id to improve decoupling.

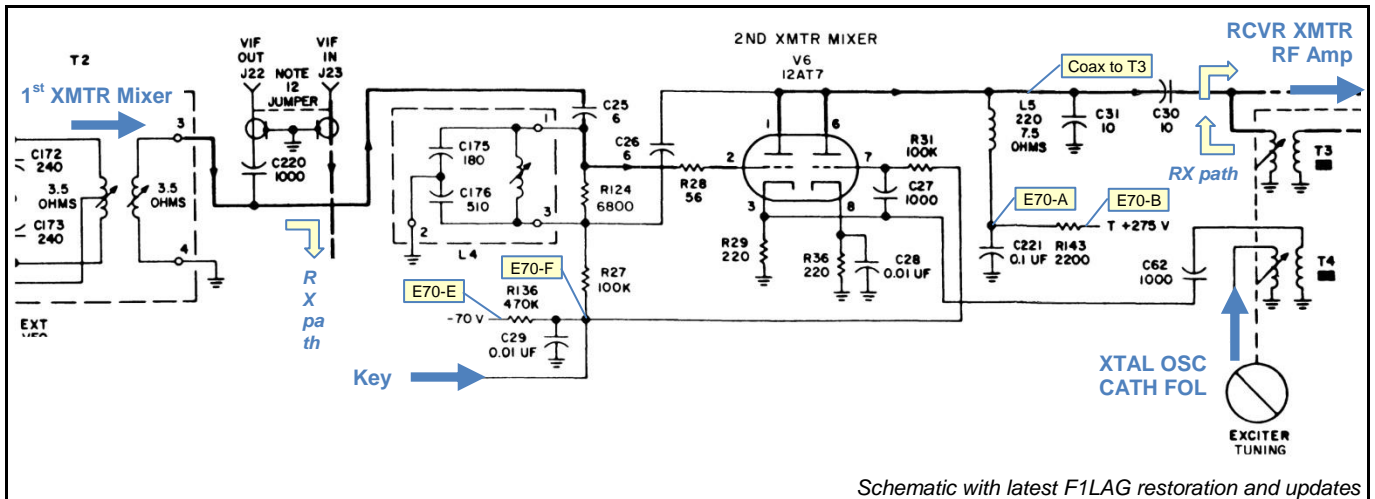
R200 mod 21: added to change bias to cut off during RX – no need to add if not present

C25 ASAB 1003-1 (Aug 1960): 3pF in early units results in poor coupling between T2 and L4. Change to 6pF recommended.

C274 L40 mod 23: added to improve decoupling – no need to add if not present

Current schematic

F1LAG KWM-2 as per 1959 ed with ASAB 1003, ASAB 1004 / mod22 done (original)
mod 21, mod 23 not done



Restoration and updates

Before 08/2015 none

Mar 2016: Replaced R143: was Collins original but wrong rating (carbon 2.2kΩ 1/2W instead of 1W – probably because of KWM-2 very early version) and damaged (measured 3.18kΩ).

Ref	before	after	Date
R143	2.2kΩ 1/2W carbon <i>Bad: measured 3.18kΩ</i>	2.2kΩ 2W metal oxide Vitrohm PO593-0 series	F1LAG / Mar 2016

XTAL Oscillator and Cathode Follower

Collins schematic revisions

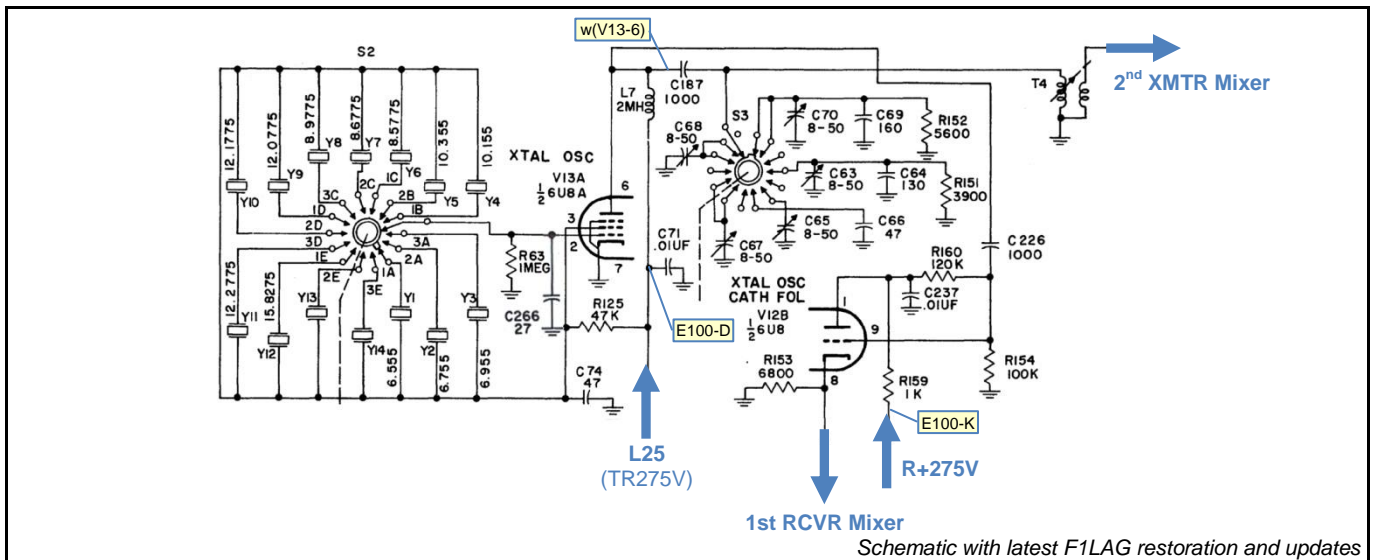
Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R125	47kΩ	47kΩ 1/2W carbon	id 3 rd ed	12kΩ 2W carbon (*)
R151	3.9kΩ	3.9kΩ 1/4W carbon	id 3 rd ed	2.2kΩ 1/4W carbon
R188	not used	470Ω 1/2W carbon	not used	not used
R214	not used	not used	not used	4.7kΩ 1/4W carbon
C69	160pF	220pF 500V mica	id 3 rd ed	240pF 500V mica
C71	10nF	10nF 500V ceramic	not used	not used
C74	47pF	47pF 500V mica	id 3 rd ed	43pF 500V mica
C266	not used	27pF 500V mica	id 3 rd ed	12pF 500V mica
C280	not used	not used	not used	100nF 500V ceramic
C281	not used	not used	not used	100nF 500V ceramic
L43	not used	not used	not used	1mH RF coil
L44	not used	not used	not used	2.2mH RF coil
CR13	not used	not used	not used	1N5383B

(*) R125 = 33kΩ 1/2W before mod 27D

- R125 C74 C266 SB3 (Jul 1960, revised Oct 1971): values changed to improve correlation between frequencies on different bands
- R125 C74 mod 27B: idem SB3 to increase gain and feedback of oscillator
- R151 R214 mod 27B: R151 changed and R214 added to equalize oscillator output on all frequencies
- C266 mod 27C – in KWM-2 only: change value from 27pF to 12pF to increase feedback
- R125 C280 C281 L43 L44 CR13 mod 27D: R125 changed, others components added to stabilize oscillator power supply
- C69 mod 23: changed from 220pF to 240pF to provide greater plate tuning range for 3.8MHz
- C71 replaced by C280 after mod 27D
- R188 C69 no information

Current schematic

- F1LAG KWM-2 Post 1959 ed but before 3rd ed (C266 in place = post 1959 ed, R188 absent = only in 3rd ed) mod 27B, mod 27D not done



Restoration and updates

Before 08/2015 none

Ref	before	after	Date

RCVR XMTR RF Amplifier

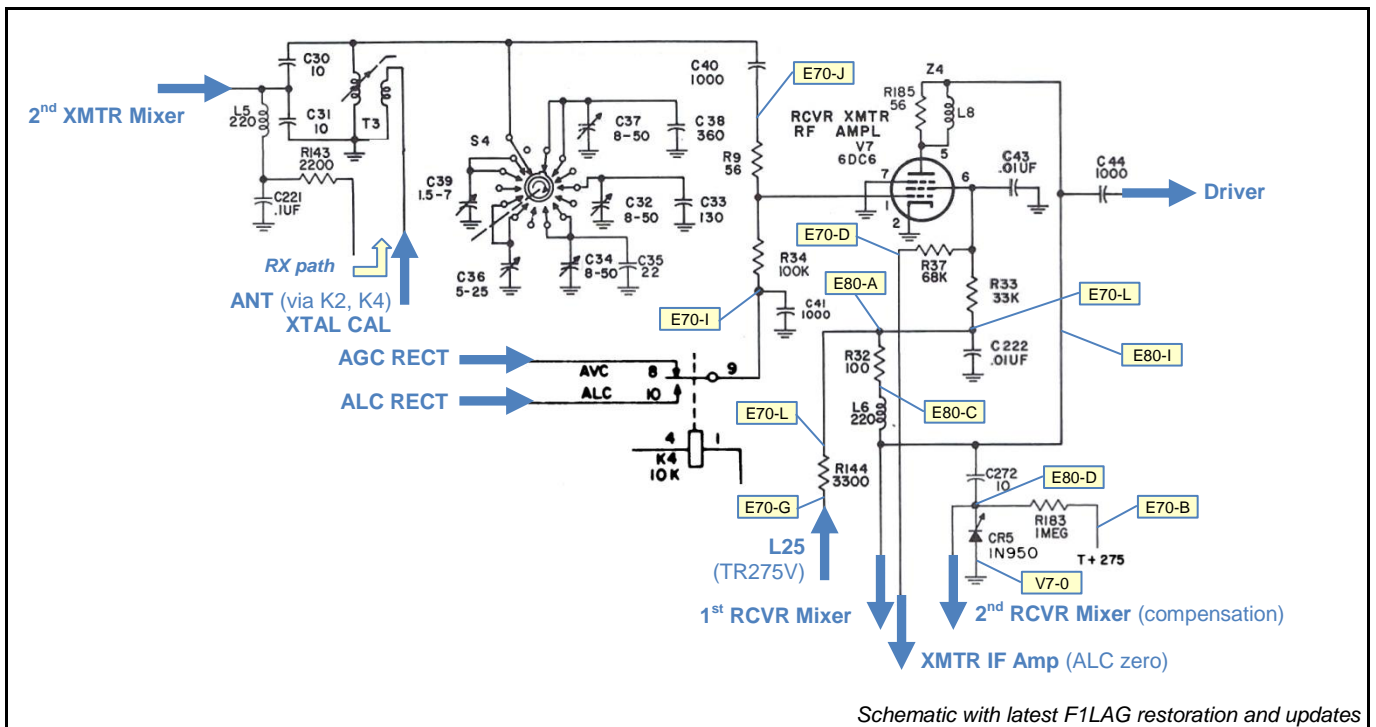
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R34	3.3MΩ	100kΩ 1/4W carbon	id 3 rd ed	id 3 rd ed
R144	1kΩ	3.3kΩ 1W carbon	id 3 rd ed	id 3 rd ed
R183	not used	1MΩ 1/4W carbon	id 3 rd ed	id 3 rd ed
C38	330pF	360pF 500V mica	id 3 rd ed	id 3 rd ed
C272	not used	10pF 500V mica	id 3 rd ed	7.5pF 500V mica
CR5	not used	HC7001	1N950	id 6 th ed

R34 SB4 (Sept 1960): change value to improve ALC action and avoid overshoot
 R183 C272 CR5 SB5-B (Nov 1960, rev Jan 1961): added to get better RX / TX exciter tuning coincidence
 C272 mod 30: changed to 7.5pF for better RX / TX coincidence - recommended
 R144 C38 no information

Current schematic

F1LAG KWM-2 as per 3rd ed (post 1959 ed but before Nov 1960: SB4 is original, SB5 is upgrade with 1N950).
 SB4 SB5 done, mod 30 not done



Restoration and updates

Before 08/2015 new R32 and SB5 components (R183 C272 CR5)
 Error with R183: connected to E80-B (TR+275) instead if E70-B (T+275)
 Feb 2016 R183 replaced and rewired from [E80-D | E80-B] to [E80-D | E70-B]
 Mar 2016: Replaced R144: was Collins original but wrong rating (carbon 1kΩ 1/2W instead of 1W – probably because of KWM-2 very early version) and damaged (measured 1.58kΩ).

Ref	before	after	Date
R32	?	100Ω 1/4W metal film	Before Aug 2015
R144	1kΩ 1/2W carbon Bad: measured 1.58kΩ	3.3kΩ 2W metal oxide Vitrohm PO593-0 series	F1LAG / Mar 2016
R183	not used	1MΩ 1/4W metal film	Before Aug 2015
R183	1MΩ 1/4W metal film from E80-D to E80-B	1MΩ 0.6W metal film from E80-D to E70-B	F1LAG / Feb 2016
C272	not used	10pF 500V mica	Before Aug 2015
CR5	not used	1N950	Before Aug 2015

Driver

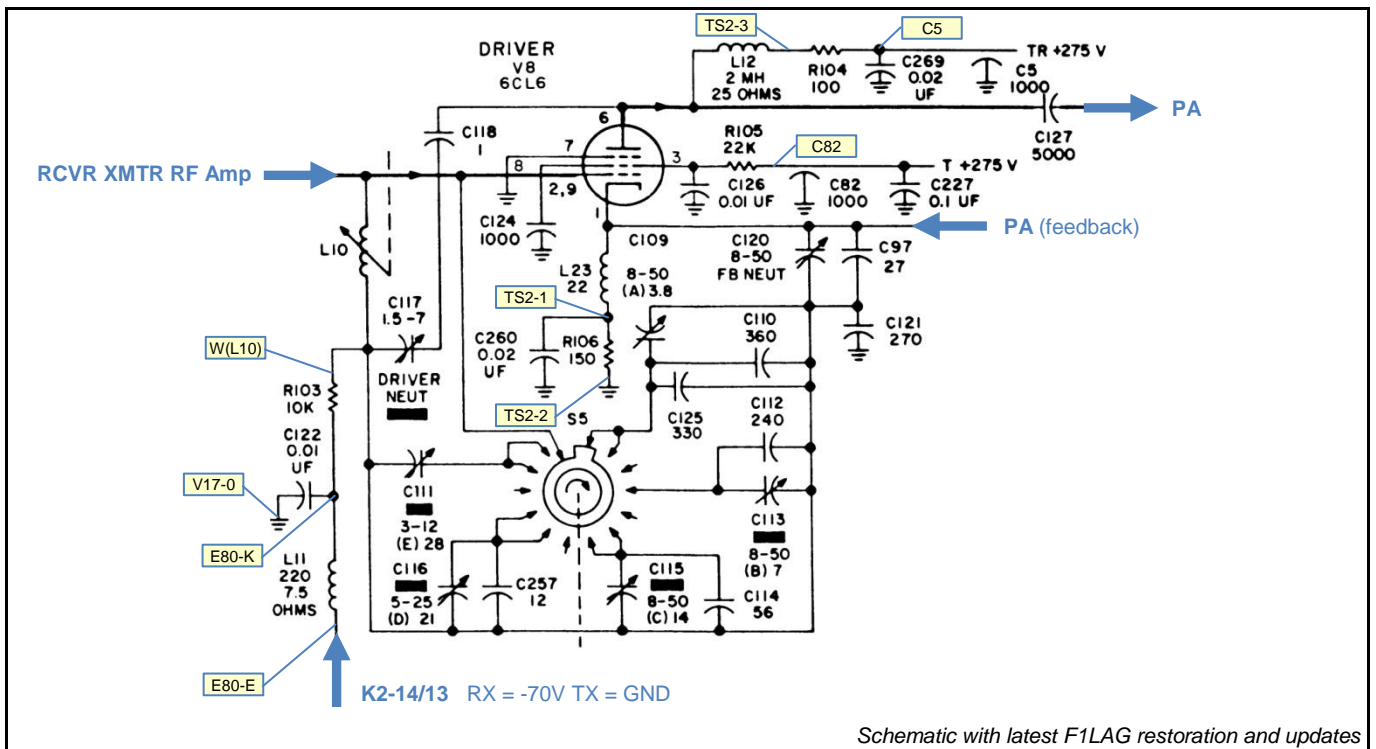
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R105	22kΩ	22kΩ 2W carbon	id 3 rd ed	12kΩ 1W carbon
R106	100Ω	150Ω 1/2W carbon	id 3 rd ed	id 3 rd ed
C97	27pF	27pF 500V mica	id 3 rd ed	39pF 500V mica
C121	220pF	220pF 500V mica	id 3 rd ed	270pF 500V mica
C124	1nF	1nF 500V ceramic	2.2nF 500V ceramic	id 6 th ed

R105 L11 SB5-A (Nov 1960): rerouted for RX/TX coincidence mod
 R105 C134 C135 mod 31: value changed to improve input tuning range – change all or none (C134 C135 = PA)
 C97 C121 mod 32: new value to improve neutralization range

Current schematic

F1LAG KWM-2 as per 3rd ed
 SB5 done
 mod 31, mod 32 not done



Restoration and updates

Before 08/2015 R104 replaced

Ref	before	after	Date
R104	?	100Ω 2W metal oxide	Before Aug 2015

PA

Collins schematic revisions

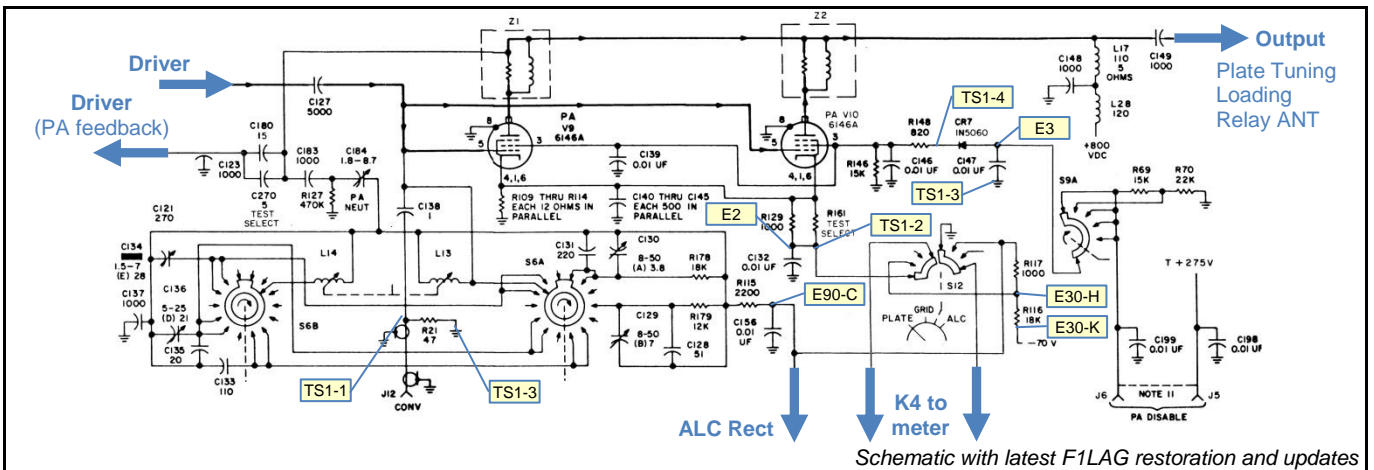
Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R129	?	1kΩ 1/2W carbon	id 3 rd ed	id 3 rd ed
R148	820Ω	820Ω 2W carbon	id 3 rd ed	820Ω 6.5W wirewound
R161	?	5.6kΩ-12kΩ	2.2kΩ-12kΩ	id 6 th ed
C148				
C155	15-120pF	5-120pF	id 3 rd ed	63-320pF
C180	10pF	10pF 5kV ceramic	15pF 5kV ceramic	id 6 th ed
C270	not used	5pF 500V ceramic	id 3 rd ed	id 3 rd ed
L28	not used	not used	120 uH	id 6 th ed
CR7	not used	1N1490	1N1940 (typo)	1N5060

- R129 ASAB 1005-3 (Dec 1960): changed from 820Ω to 1000Ω for new meter type.
- R148 change to 6.5W from 2W
- R161 mod 34: selected to calibrate plate current meter
- C155 mod 38: changed to improve PA loading on 15m and 10m - recommended
- C180 mod 33: changed to minimize IMD
- C270 mod 33: added only in some units to minimize IMD – do not add if absent
- C148 L28 ASAB 1009-4 (Jul 1960): C148 rewired, L28 added to prevent instability
- CR7 SB6 (Nov 1962): CR7 added to prevent TX to RX delay

Current schematic

F1LAG KWM-2 basis 1959 ed (no grid parasitic suppressors Z6, Z7) with mod 34 and SB6 done and R148 updated to 5W. C270 absent.

Check if L28 present or not



Restoration and updates

Before 08/2015 none

Ref	before	after	Date
R117	?	1kΩ 1/2W metal film	Before Aug 2015
R148	?	820kΩ 5W carbon	Before Aug 2015
CR7	not used	1N4001	Before Aug 2015

ALC Rectifier

Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R119	3.3MΩ	1.5MΩ 1/4W carbon	id 3 rd ed	id 3 rd ed
R189	not used	not used	82kΩ 1/2W carbon (*)	id 6 th ed
R190	not used	not used	2.2kΩ 1/2W carbon	1.5kΩ 1/2W carbon
R191	1kΩ (**)	not used	1.5kΩ 1/2W carbon	id 6 th ed
R192	10kΩ (**)	not used	270kΩ 1/2W carbon	id 6 th ed
R211	not used	not used	not used	470Ω 1/4W carbon
C157	100nF	100nF 500V ceramic	100nF 100V ceramic	100nF 200V ceramic
CR8	not used	not used	1N458	id 6 th ed

(*) R189 'not used' in component list but 82kΩ on schematic

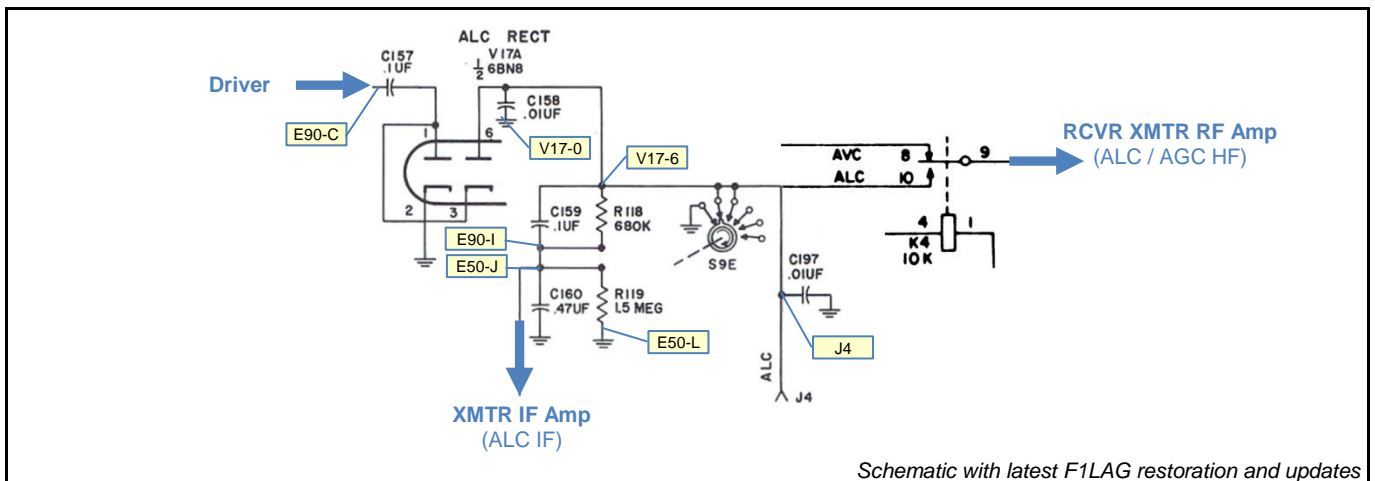
(**) R191 R192 referenced R10 R11 in 1959 ed schematic – R11 reference used in XTAL CAL in 3rd ed and later.

- R119 R191 R192 SB4 (Sept 1960): to improve ALC action and avoid ALC overshoot, remove R10 R11 (reinstated as R191 R192 in later versions) and ground V17-2, also change R119 value mod 37: change R190 value and add R211 to shift ALC bias and avoid gain variation between LSB/USB/CW and TUNE/LOCK
- R190 R211
- C157 ASAB 1004-5 (Aug 1960): new rating 500V to prevent capacitor failure - recommended

Note: in earlier versions (e.g. 1959 ed), there is a resistor divider (R10 R11) at V17-2 cathode. It was been removed by SB4 (3rd ed schematic) and then reinstated (6th ed and 9th ed) but with different values (R191 R192).

Current schematic

F1LAG KWM-2 as per 3rd ed (grounded V17-2).



Restoration and updates

Before 08/2015 new C157

CX new 47nF 630V MPP was installed between E50-J and E50-G (TR+275V). This is an error:

- It might have been intended to replace the old C160; but this is still in place at E50-J to E50-L (GND) and it was checked OK. Also, CX has the wrong value and rating: 47nF 630V instead of 470nF 25V.
- Alternatively, it might have been for C47 (VOX RECT) at E50-K to E50-G; but there is already a new 10nF 1kV ceramic capacitor. However SB2 put a 47nF paper capacitor in parallel with the initial C47 10nF ceramic, so the intent might have been 10nF ceramic in parallel with 47nF polypropylene to get the 68nF value of late versions (mod 11). F6CER recommendation for C47 is to put a 68nF 250V polypropylene capacitor.

CX was either for [E50-J | E50-L] or for [E50-K | E50-G] but in no case [E50-J | E50-G].

Jan 2016 CX removed

Mar 2016 replace R119 (measured > 2MΩ instead of 1.5MΩ)

Ref	before	after	Date
R119	2 // 3.3MΩ 1/4W carbon bad: measured > 2MΩ	1.5MΩ 0.6W metal film	Mar 2016 / F1LAG
C157	?	100nF 63V polypro	Before 08/2015
CX	47nF MPP 630V from E50-J to E50-G	none	Jan 2016 / F1LAG

XTAL CAL

Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R11	not used (*)	1MΩ 1/4W carbon	id 3 rd ed	id 3 rd ed
R67	39kΩ	100kΩ 1/2W carbon	id 3 rd ed	id 3 rd ed
C76	8-50pF	3-12pF	5-25pF (**)	id 6 th ed
C119	2pF	2pF 500V ceramic	10pF 500V ceramic	id 6 th ed
C267	not used	5pF 500V mica	id 3 rd ed (**)	id 3 rd ed (***)
CR6	not used	1N34A	id 3 rd ed	id 3 rd ed

(*) in 1959 ed, R11 was a resistor in ALC RECT circuit later removed (see SB4)

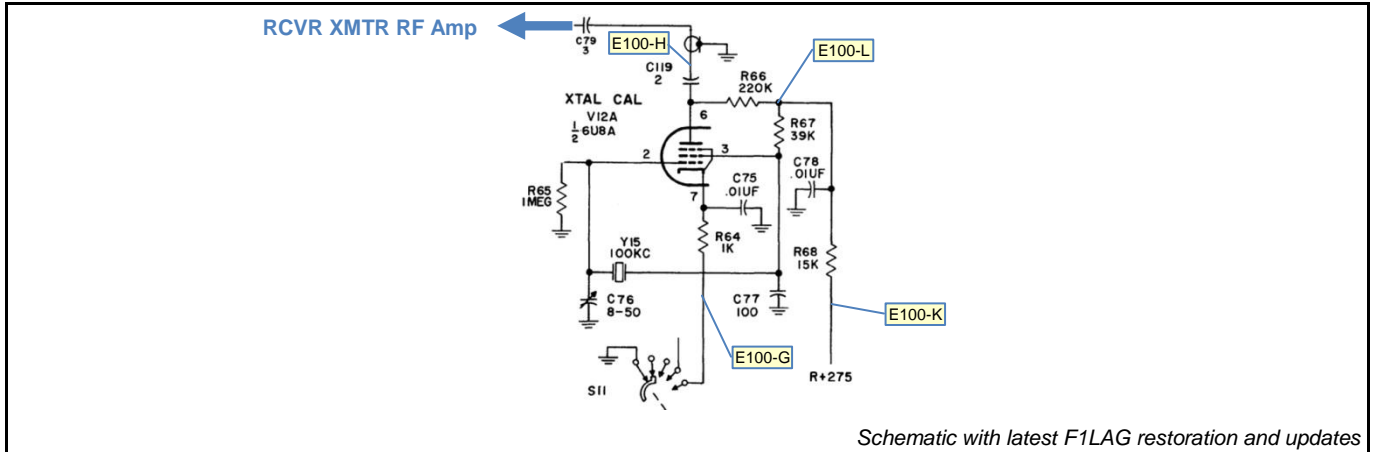
(**) in 6th ed component list C76 = 5-37.5 pF, C79 and C267 = 10pF

(***) C276 (// to C76) not shown on 9th ed schematic but listed in component list

- R11 CR6 ASAB 1009-1 (Jul 1962): add R11 and CR6 for higher injection voltage on 28MHz
- C76 mod 28: use 5-25pF for larger tuning range – recommended
- C119 mod 29: value changed to increase output level – recommended
- C267 ASAB 1016-A (Oct 1965): changed from 5pF to 10pF
- mod 28: changed from 10pF to 5pF – recommended
- ASAB 1016-A and mod 28 to improve range of calibration (depends also on C76)
- C78 C236 both are same capacitor: referenced C78 in 1959 ed, C236 otherwise

Current schematic

F1LAG KWM-2 as per 1959 ed (none of ASAB or mod implemented)



Schematic with latest F1LAG restoration and updates

Restoration and updates

Before 08/2015 none

Ref	before	after	Date

1st RCVR MIXER

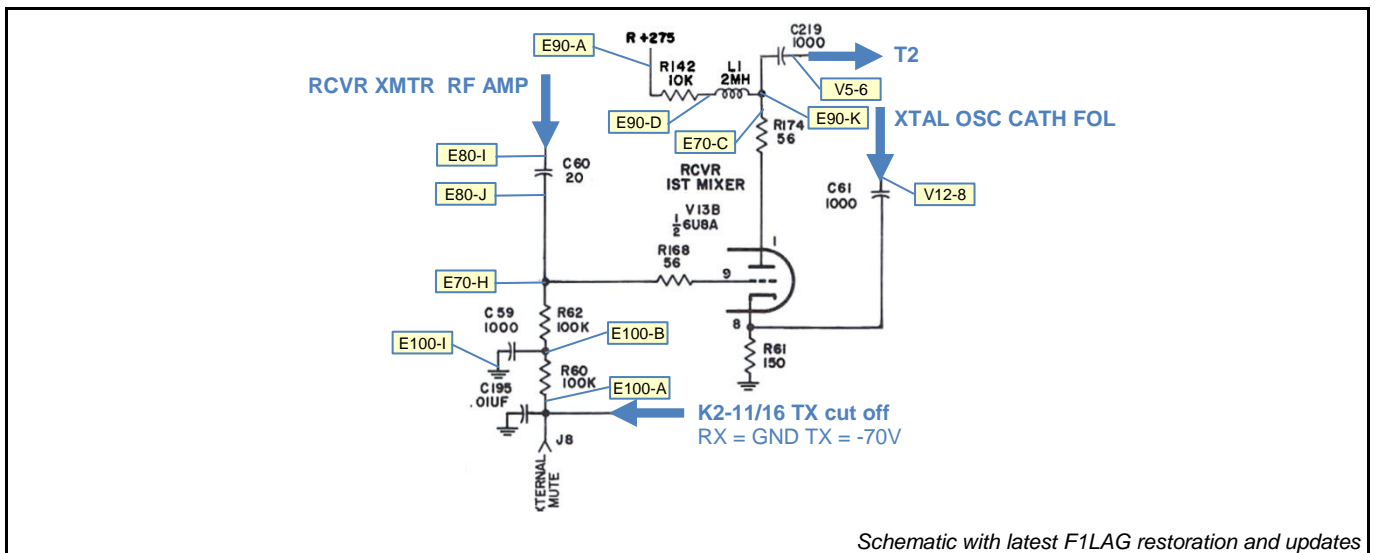
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R60	100kΩ	100kΩ 1/4W carbon	not used	not used
C42	not used	not used	10nF 500V ceramic	id 6 th ed
C60	20pF	20pF 500V mica	10pF 500V mica	id 6 th ed
C219	1nF	1nF 500V ceramic	100pF 500V ceramic	id 6 th ed
L1	not used	2mH 27.5Ω 100mA	id 3 rd ed	id 3 rd ed

- R60 Receive mute (J8) suppressed in 6th ed and 9th ed.
 C42 L1 no information – used for V13B plate supply:
 - 1959 ed: from TR+275 at V5-6 (1st TX mixer) thru R142 paralleled to C219 coupling capacitor
 - 3rd ed: from R+275 thru R142 L1
 - 6th and 9th ed: similar to 3rd ed with C42 bypass capacitor added
 C60 mod 18: changed to improve decoupling between TX and RX circuits – recommended.
 C219 mod 15: changed to improve decoupling between 1st TX mixer and 1st RX mixer – recommended.

Current schematic

F1LAG KWM-2 as per 3rd ed (RCVR Mute at J8 still present) with mod 15 done (C219 100pF)



Restoration and updates

Before 08/2015 R142 replaced

Ref	before	after	Date
R142	?	10kΩ 5W metal oxide	Before Aug 2015

2nd RCVR MIXER

Collins schematic revisions

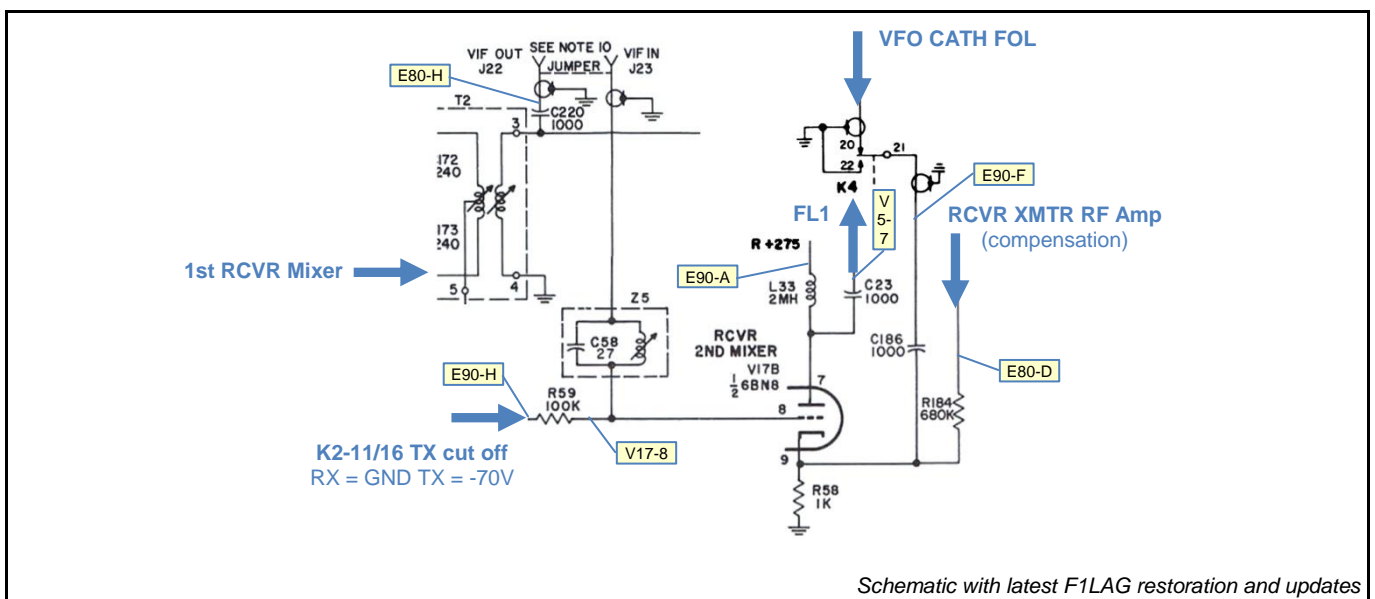
Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R184	not used	680kΩ 1/4W carbon	id 3 rd ed	id 3 rd ed
R193	not used	not used	1MΩ 1/4W carbon	id 6 th ed
R194	not used	not used	470kΩ 1/2W carbon (*)	id 6 th ed
C58	15 pF	27 pF – part of Z5	id 3 rd ed	id 3 rd ed
L33	2mH	2mH unshielded	10mH molded	id 6 th ed
CR9	not used	not used	1N458	id 6 th ed

(*) R194 = 100kΩ 1W in component list

R184 SB5-B (Nov 1960, rev Jan 1961): added to get better RX / TX exciter tuning coincidence.
 R193 R194 CR9 mod 19: added to isolate 2nd RX mixer from 1st TX mixer – if absent no need to add.
 mod 19 and ASAB 1016 (Oct 1965) item E: R values changed and CR relocated to eliminate 455kHz bypassing TX mixer.

Current schematic

F1LAG KWM-2 as per 3rd ed (mod 19 not done)



Restoration and updates

Before 08/2015 none

Ref	before	after	Date

1st and 2nd IF Amplifiers

Collins schematic revisions

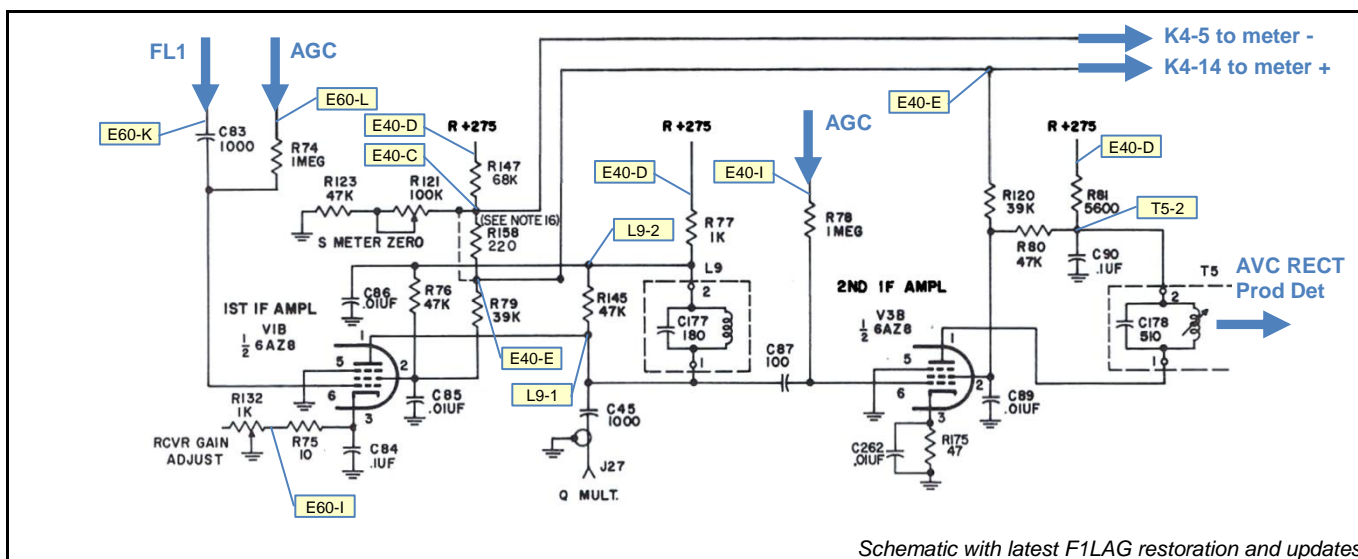
Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R81	1kΩ	5.6kΩ 1W carbon	id 3 rd ed	id 3 rd ed
R89	not used (*)	180kΩ 1/2W carbon	id 3 rd ed	id 3 rd ed
R132	RV 1kΩ	RV 1kΩ 0.2W	id 3 rd ed	RV 2.5kΩ 0.2W
R145	1kΩ	47kΩ 1/2W carbon	150kΩ 1/4W carbon	82kΩ 1/4W carbon
R147	82kΩ	68kΩ 1/2W carbon	id 3 rd ed	id 3 rd ed
R158	100Ω	220Ω // 39Ω to 220Ω	id 3 rd ed	id 3 rd ed
R175	not used	47Ω 1/2W carbon	id 3 rd ed	id 3 rd ed
C262	not used	10nF 500V ceramic	id 3 rd ed	id 3 rd ed

(*) in 1959 ed, R89 is for a resistor at AF output Amp (V16)

- R81 no information on value change
- R89 ASAB 1009-2 (Jul 1962): added to get wider range for receive gain adjustment R132
- R132 mod 20A: value changed to get greater range of receive gain adjustment – recommended
- R145 C262 mod 20: changed from 47kΩ or 68kΩ or 150kΩ to 82kΩ to reduce IF gain, if 82kΩ then C262 shall not be present, receiver gain to be readjusted after change – recommended.
- R147 R158 ASAB 1009-3 (Jul 1962), mod 20: changed to increase accuracy of S-meter and range of zeroing.
- R158 mod 20: paralleled resistor added to get S8 to S9+10 for 100uV HF.
- R175 C262 ASAB 1003-12 (Aug 1960): added to provide bias voltage and improve working of V3.

Current schematic

F1LAG KWM-2 as per 3rd ed except R89 absent as in 1959 ed – ASAB 1003 done
ASAB 1009, mod 20, mod 20A not done



Schematic with latest F1LAG restoration and updates

Restoration and updates

- Before 08/2015 R147 renewed
- Mar 2016 replace bad C262 (10nF measured erratic 75nF)

Ref	before	after	Date
R147	?	68kΩ 1/2W film	Before Aug 2015
C262	10nF 1kV ceramic bad: measured 75nF	10nF 630V X7R ceramic muRata RDER72J103K	Jan 2016 / F1LAG

AVC Rectifier (AGC)

Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R82	4.7kΩ	4.7kΩ 1/4W carbon	id 3 rd ed	4.7kΩ 1/2W carbon
R83	3.3MΩ	3.3MΩ 1/4W carbon	1.5MΩ 1/2W carbon	id 6 th ed
R126	820Ω	820Ω 1/2W carbon	680Ω 1/2W carbon	id 6 th ed
R180	not used	not used	680kΩ 1/2W carbon	id 6 th ed
R210	not used	not used	not used	620kΩ 1/2W carbon
R213	not used	not used	not used	2.2MΩ 1/4W carbon
C93	50nF	50nF 100V ceramic	470nF 25V ceramic	id 6 th ed
C265	not used	not used	10nF 500V ceramic	id 6 th ed
C275	not used	not used	not used	10nF 500V ceramic
C276	not used	not used	not used	50nF 500V ceramic
CR11	not used	not used	not used	1N458

R82 mod 24: rating changed for longer service life – recommended
 R83 R180 C93 C265

ASAB 1013 (Mar 1964) = SB8-A (Sept 1970) = mod 25: new AGC circuit to prevent overshoot and to add two time constants – recommended

R210 C275 SB8-B (Sept 1970) = mod 26: added to change source of AGC delay bias and prevent low frequency detection.

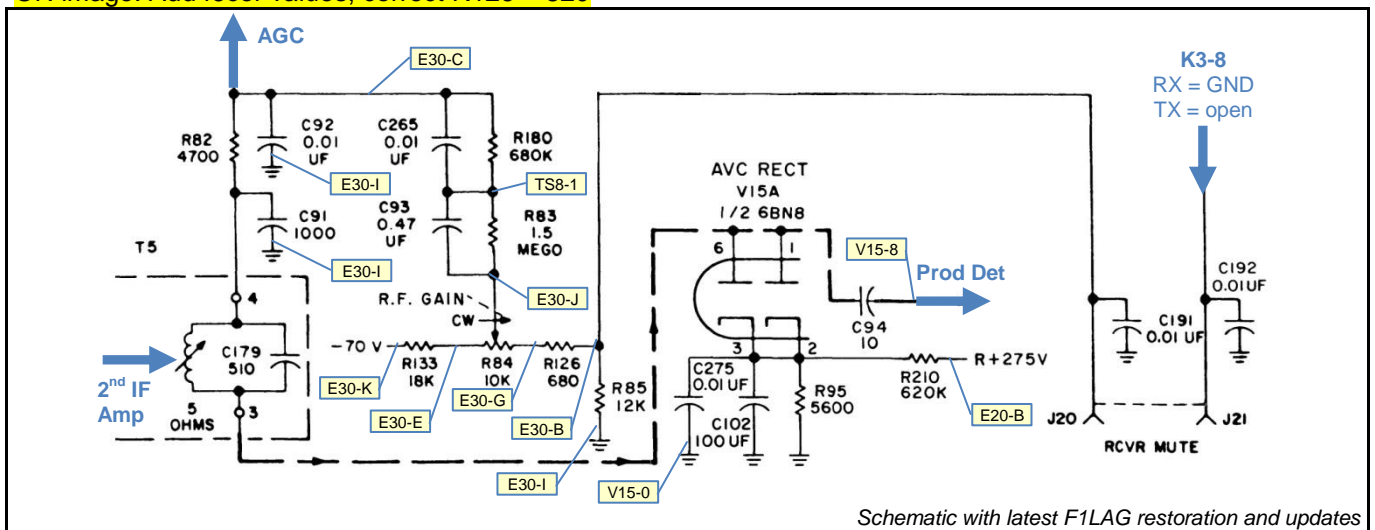
R213 C276 CR11 SB8-C (Sept 1970) = mod 27: added to get delayed decay of AGC for RCVR XMTR RF Amp and reduce effect of strong adjacent signals – if absent no need to add.

R126 no information.

Current schematic

F1LAG KWM-2 as per 3rd ed (R126 820Ω) with ASAB1013 = SB8-A = mod 25 and SB8-B = mod 26 done. SB8-C = mod 27 not done (R213 C276 CR11 absent), ASAB1009-4 not done (L32 absent).
R210 wired as per SB8-B (to TR275), not as per mod 26 (to R275).

ON image: Add f6cer values, correct R126 = 820



Schematic with latest F1LAG restoration and updates

Restoration and updates

Before 08/2015 new components: R82 R83 R95 R180 R210 C92 C93 C102 C265 C275

AGC time constant: Collins values = [1.5M // 0.47uF] + [680k // 0.01uF]
 F6CER values = [2.2M // 0.47uF] + [100k // 0.10uF]
 Installed = [1.0M // 1.00uF] + [100k // 0.10uF]

February 2016

R210 to E20-B (TR275) should have been to E40-D (R275)

Ref	before	after	Date
R82	?	4.7kΩ 1/2W metal film	Before Aug 2015
R83	?	1MΩ 1/2W metal film	Before Aug 2015
R95	?	5.6kΩ 1/2W metal film	Before Aug 2015
R180	?	100kΩ 1/2W metal film	Before Aug 2015
R210	?	620kΩ 1/4W metal film	Before Aug 2015
C92	?	10nF 1kV ceramic	Before Aug 2015

C93	?	1uF 100V polycarbonate	Before Aug 2015
C102	?	100uF 16V electrolytic	Before Aug 2015
C265	?	100nF 63V polycarbonate	Before Aug 2015
C275	?	10nF 1kV ceramic	Before Aug 2015

Product Detector

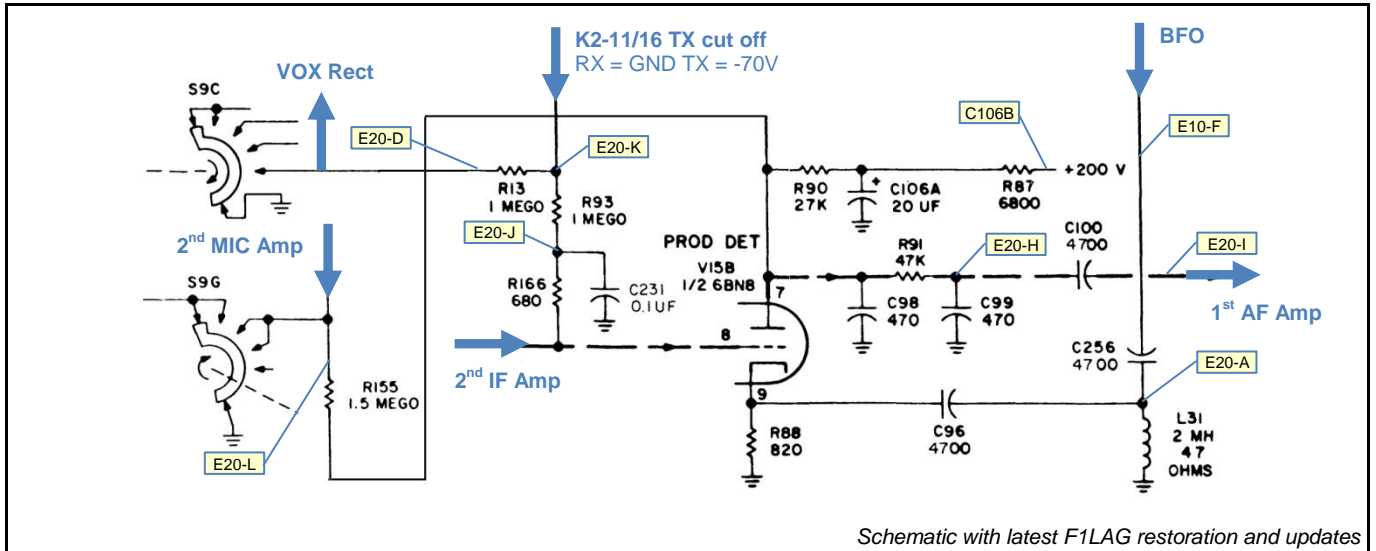
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R166	1.8kΩ	680Ω 1/2W carbon	id 3 rd ed	id 3 rd ed

R166 no information on value change

Current schematic

F1LAG KWM-2 as per 3rd ed (and later ed)



Restoration and updates

R166 =820

Before 08/2015 new components R90 R166

Mar 2016 E20-D / R13 was jumpered to ground – wire removed.

Ref	Before	after	Date
R90	?	27kΩ 1/2W metal film	Before Aug 2015
R166	?	820Ω 1/2W metal film	Before Aug 2015

1st AF Amplifier and AF Output Amplifier

Collins schematic revisions

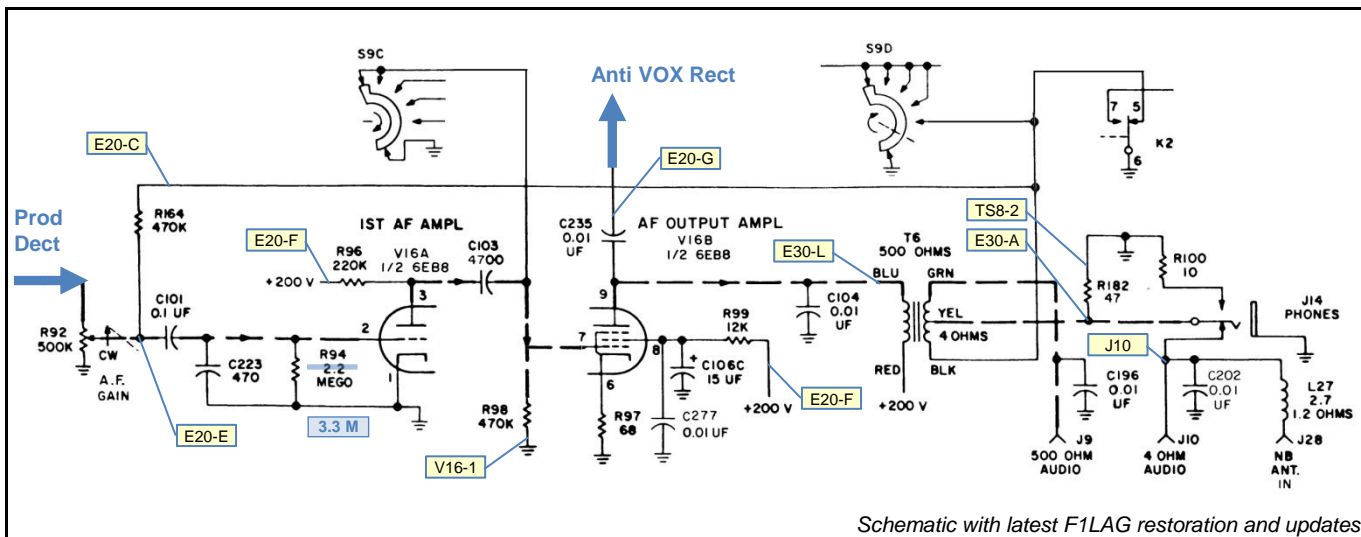
Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R89	220kΩ	not used (*)	id 3 rd ed	id 3 rd ed
R182	not used	68Ω 1/2W carbon	id 3 rd ed	47Ω 1/2W carbon
R164	not used	470kΩ 1/2W carbon	id 3 rd ed	id 3 rd ed
R182	not used	68Ω 1/2W carbon	id 3 rd ed	47Ω 1/2W carbon
R209				
C233	100nF	not used	not used	not used
C240	100pF	not used	not used	not used
C277	not used	not used	not used	10nF 500V ceramic

(*) not used in AF Amp – From 3rd ed onwards, R89 reference is for a resistor in 1st IF Amp

- R89 C233 only shown in 1959 schematic
- R164 R182 C104 ASAB 1002 (Aug 1960): R164 220kΩ to 470kΩ, C104 4.7nF to 10nF, R182 added in order to prevent audio squeal in TX at high AF gain
- R182 mod 35A: changed value to prevent amplifier oscillation – recommended
- C240 ASAB 1005-1 (Dec 1960): removed to prevent instability at high AF gain and calibration near zero beat.
- C277 mod 36B: added to provide high frequency by pass - recommended

Current schematic

- F1LAG KWM-2 updated as per 9th ed except mod 35A not done
- R94 = 3.3MΩ as per F6CER [2].



Restoration and updates

Before 08/2015 new components R94 R96 R9- C101 C103 C277

Ref	before	after	Date
R94	?	3.3MΩ 1/4W carbon (*)	Before Aug 2015
R96	?	220kΩ 1/2W metal film	Before Aug 2015
R99	?	12kΩ 2W metal film	Before Aug 2015
C101	?	100nF 100V PES	Before Aug 2015
C103	?	4.7nF 2kV ceramic	Before Aug 2015
C277	?	10nF 1kV ceramic	Before Aug 2015

(*) value OK as per F6CER: increase value up to 4.7M to reduce V16 current.

Recupérer c103 2kV et remplacer par 500V

Meter

Collins schematic revisions

Current schematic

F1LAG KWM-2



Restoration and updates

Before 08/2015 none

Ref	before	after	Date

Relays - Power

Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
R167	not used	100Ω 1/2W carbon	id 3 rd ed	id 3 rd ed
R170	not used (1)	100kΩ 1/4W carbon	id 3 rd ed	id 3 rd ed
C170	100nF	not used	id 3 rd ed	id 3 rd ed
C181	10nF	10nF 500V ceramic	not used (2)	id 6 th ed
C182	10nF	10nF 500V ceramic	not used (2)	id 6 th ed
C211	10nF	100nF 500V ceramic	id 3 rd ed	id 3 rd ed
L32	not used	not used	120uH RF coil	id 6 th ed

(1) In 1959 ed, R170 is a resistor in XMTR IF Amp – suppressed by SB4 / ASAB 1003-16.

(2) C181 C182 no longer used at K3 (ASAB1009-4) but reference re-used at Balanced Modulator

R167 C170 C211 ASAB 1006-B (May 1961): to prevent pitting of relay contacts K2-12 K2-13 K4-15 K4-16 K4-17. R167 added, C170 moved from K2-12 to K4-1. In later units C170 moved to K3-2 and C211 deleted.

R170 ASAB 1006-D (May 1961): added to prevent RF transient when VOX drops out.

C181 C182 C211 L32

ASAB 1009-4 (Jul 1962): C181 C182 removed, L32 added, C211 relocated from K3-2 to K4-1 in order to prevent instability.

K2 K4 SB7 (Feb 1970) = mod 36: change to enclosed relays

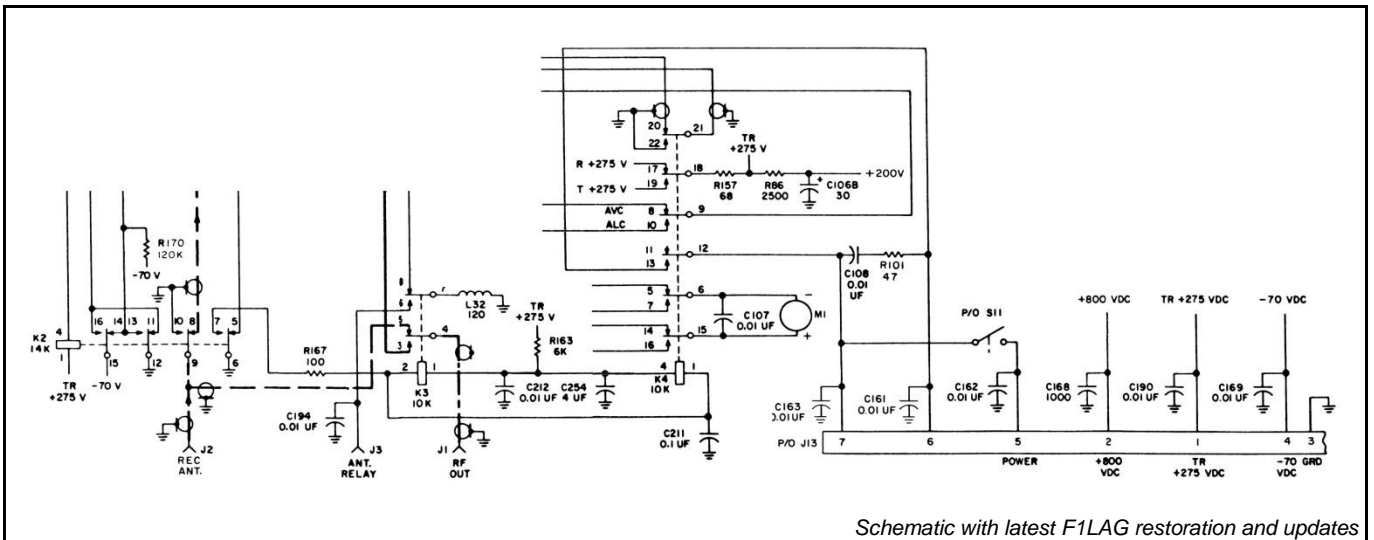
Possible interpretation of schematics and ASAB 1006-B, 1009-4 and SB7:

Version	C170	C211	R167
1959 ed	100nF at K2-12	10nF at K3-2	not used
ASAB 1006-B	100nF at K4-1	10nF at K3-2	K2-12 to K3-2
intermediate	100nF at K3.2	not used	K2-12 to K3-2
intermediate (*)	not used	100nF at K3-2	K2-12 to K3-2
ASAB 1009-4	not used	100nF at K4-1	K2-12 to K3-2
1968 ed / SB7 / final	not used	100nF at K4-1	K2-7 to K3-2

(*) Just a change of reference – no change in component value or location

Current schematic

F1LAG KWM-2 Updated with enclosed relays (SB7 – mod 36)



redraw pour add L25, c181 c182 at k3-6 k3-8 and remove L32

Restoration and updates

New R157 (2//120) + xxxx

Filaments

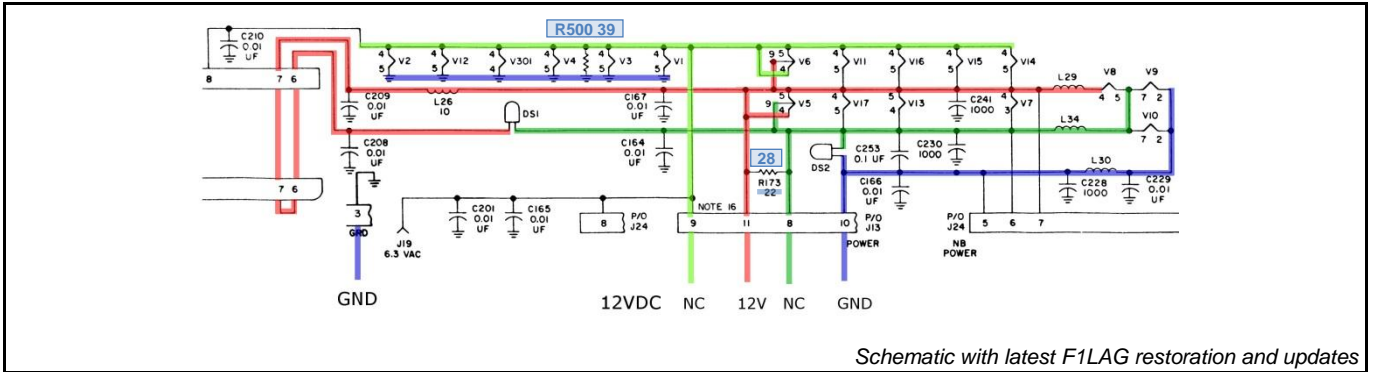
Collins schematic revisions

Ref	1959 ed	3 rd ed 1962	6 th ed 1968	9 th ed 1978
C268	not used	100nF 75V ceramic	id 3 rd ed	id 3 rd ed
C273	not used	100nF 75V ceramic	id 3 rd ed	id 3 rd ed

C268 C273 no information on modification

Current schematic

F1LAG KWM-2 as per 1959 – C268 (V6-9 GND) and C273 (C228 GND) absent



Rail	6.3 VAC supply	12 VDC supply	24 VDC supply
J13-3	GND	GND	GND
J13-9	Rail 1	6.3 V	NC
J13-11	Rail 2	GND	12 V
J13-8	Rail 3	6.3 V	NC
J13-10	Rail 4	GND	24 V

Restoration and updates

Before 08/2015 none

Feb 2016: added missing R173 as 2 // 56Ω 2W (Collins schematic 22Ω)
 added R500 39Ω 2W to equilibrate filament groups
R500 MUST BE REMOVED IF EXTERNAL VFO IS USED

Add C268 C273 ?

Ref	before	after	Date
R173	missing	2 // 56Ω 2W 5% metal oxide TE ROX2SJ56R	Feb 2016 / F1LAG
R500	none	39Ω 2W 5% metal oxide TE ROX2SJ39R	Feb 2016 / F1LAG

References

- [1] F6CER – Restauration d'un KWM-2
- [2] F6CER – Modernisation d'un KWM-2 (V2)
- [3] DJ7HS – Curing T/R Switching Transients

A faire MP-1

Remplacer 100k par résistance 500v

Check R14 33ohms 2W on MP-1

A faire KWM-2

TONE OSC R50 C261

F6CER-1

Vérif. même tonalité HP LSB USB CW (F6CER-1)

40V anode V11

Régler L9 et T5 pour max RX

En TUNE, signal DSB sur V4-6 (régler équilibre avec R15 et max amplitude avec T1)

En TUNE, T2-3 à GND = sinusoïde 3MHz (DSB filtrée) puis V9-5 = sinusoïde 7MHz