

Technical Data Sheet

75A-4 Receiver Modifications and Production Changes A97-001

Determining What You Have

Collins 75A-4 receivers were manufactured from March 1955 through October 1959. As many as 6,000 rigs may have been produced, mostly in Cedar Rapids but an unknown quantity was built by Collins Radio Company of Canada, Ltd. in Toronto so indicated by markings on the rear panel.

Serial numbers, unlike the S-Line equipment, were sequential so we can get some idea of the changes which were incorporated in the production line over the life of the receiver. In a recent survey of 100 owners of the 75A-4, the lowest serial number found was 11 and the highest was 5808.

Radios produced in Canada generally fell in the 4011-4191 range (in our survey) but oddly, not all radios in this range were built in Canada; none were found *outside* this serial number range however. A couple of these Canadian-built rigs had inspection dates indicating manufacture in late 1956. To further confuse matters, some resources indicate a small number of units above serial number 5000 were also built in Canada toward the end as production lines in Cedar Rapids (Anamosa) shifted to S-Line assembly. We found no evidence to support this however.

We found no serial numbers in the 1100s, 2200s, 2600s, 2800s, 3000s, 3700s, 4200s, 4800s, and 5100s. This is not to say there were no radios built in these number classes, just that none was found in the survey. No company records survive so the missing numbers will remain a mystery until such numbered rigs surface.

Only five examples were found bearing staggered lettering of the Noise Limiter control and AM-CW-SSB switch— numbers 11, 32, 43, 133 and 1962. On other units the nomenclature for the controls is in a straight line. Strangely the photographs of the front panel in all manuals show the staggered lettering but photos in some of the promotion literature show the "straight" lettering. We have no data to support any firm conclusion to explain the vast difference in serial numbers between 133 and 1962.

On the units with staggered lettering, the Rejection Tuning control is also lettered differently than those with straight lettering. A range scale consisting of the numbers "3-2-1-0-1-2-3" appears around the circumference of the control on staggered-lettered rigs where as simple "tick" marks appear on the straight-

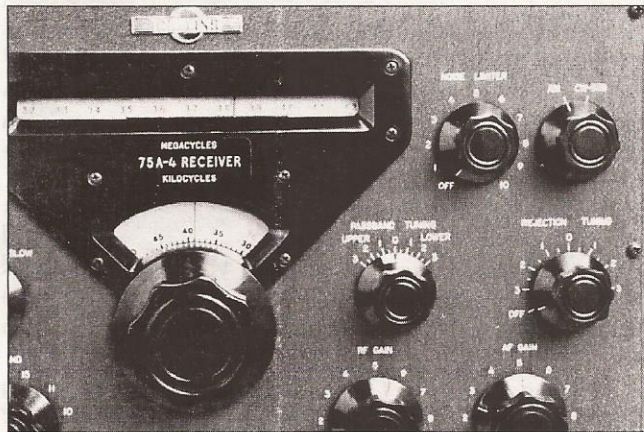


Figure 2 Note the uneven or staggered lettering on the Noise Limiter and AM-CW-SSB switch and the standard skirted main tuning knob on this early model receiver. See also the scalar numbering on the Rejection Tuning control common to units with staggered lettering.



Figure 1 The 75A-4 was the first commercial single sideband amateur receiver. It remains probably one of the most prized possessions of any Collins enthusiast.

—Photo by KK5IM

lettered versions. See figure 2.

The drum dial on the 15 meter band shows a range of 20.8 to 21.8 mc. on serial numbers 3548 and below (on our survey). On higher-numbered rigs the range is 20.5 to 21.5 mc. It is very important to note that the 15 meter oscillator crystal (Y5) frequency corresponds to the scale used on the drum dial. For dials marked 20.8 to 21.8, the proper crystal frequency is 23.3 mc. For dials marked 20.5 to 21.5, the proper crystal frequency is 23 mc. Replacement drum dial overlays are available, so careful inspection may be necessary to determine true vintage.

The date of this change is June 1, 1957 as indicated by an Addendum to the manual. No reason is given for the change—there were no changes in FCC regulations so it is assumed to be an engineering revision.

The 75A-4 was first released with a standard skirted knob but the familiar 4:1 gear reduction and bell knob quickly became standard. A kit (part number 307E-1) was sold in 1956 to make the aftermarket change. It is not possible to tell at what point the production change over was made to the 4:1 knob. However if a rig is marked "Dial Drag" rather than "Dial Lock," it is safe to assume the 4:1 knob was added after purchase (see below).

Three types of antenna connectors are found on the receivers. Early units (up to about serial number 2100) probably came with the Type-N chassis connector. Most units in the survey however had either a SO-239 UHF connector or a BNC connector.

Data Sheet Contents

S-Meter Differences	3
Low-Pass Filter	3
Company Issued Service Bulletins	4
Non-documented Production Line Changes	4
Other Non-Collins Modifications	4
S-Meter Adjustment Controls	5
IF Gain Voltage Divider Resistor	6
RF Gain Gate Added to V19	6
Mechanical Filter Shunt Feed	7
AVC Cathode Bias Resistor	7
Mechanical Filter Reference	8
Manual Versions	8

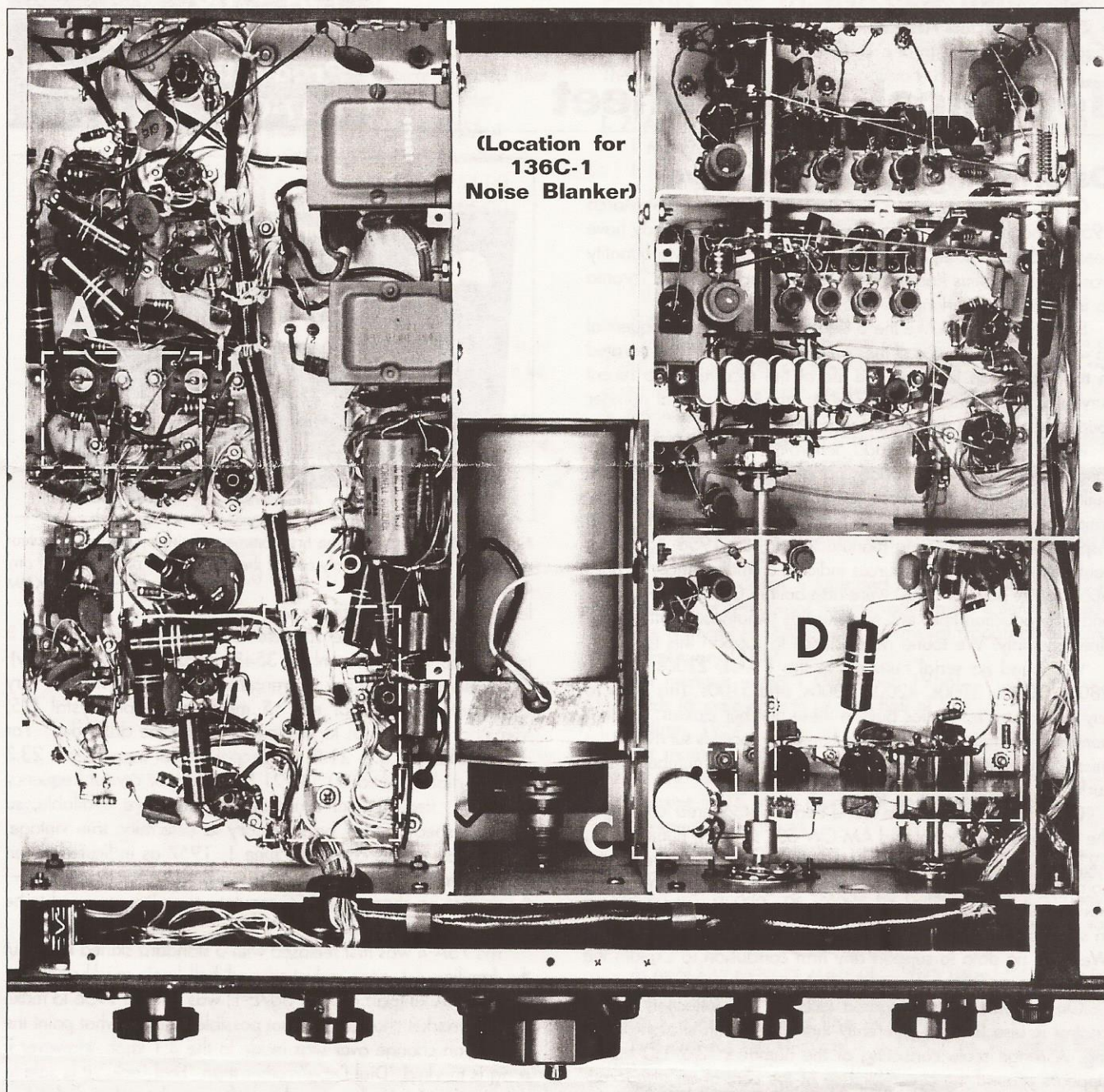


Figure 3 This is the under-chassis view of serial number 372, a relatively early unmodified 75A-4 receiver. Important areas of discussion in this Data Sheet are highlighted by dotted lines: **A**, AVC cathode bias resistor; **B**, S-meter adjustment pots; **C**, IF gain voltage divider resistor and **D**, mechanical filter shunt feed. The optional 136C-1 noise blanker was installed in the blank area behind the PTO. —Photo by N5MDI

Generally speaking the later the unit, the more likely it is to have the BNC connector. Changing the connector is very simple so the antenna connector on a particular radio may simply reflect the owner's preference.

Three receivers were found with a model 35U-1 low-pass filter installed on the outside rear panel (see figure 5). This filter was available as a user-installed accessory (Collins part number 522-0703-00). It was sold (manual dated May 21, 1957) to eliminate interference from nearby television transmitting stations. Specifications indicated the filter would provide not less than 70 dB attenuation to all signals above 60 mc. All three units so equipped had a BNC antenna connector.

Various styles of S-meter dials are common on the 75A-4: solid red line above S-9, light red line (with crosshatched pattern) and red numbers above S-9 and dials with no red at all. Typically higher serial numbered rigs (above 4992) do not have any red markings on the S-meter dial at all. Meters for the 75A-4 were

supplied by at least two different meter manufacturers—Simpson and Bartlett Instrument. The Simpson meter is characterized by its raised "ribs" on the face while the Bartlett model is smooth. Some Canadian-built units used meters marked "Made in Canada."

Several other differences and anomalies between receivers were found as a result of the survey. (1) "Dial Drag" vs. "Dial Lock" front panel markings, (2) small screw holes on each side of the Collins emblem on the front panel and (3) small black dots on the kilocycle dial approximately 3kc apart were *not* found on very early rigs.

The "Dial Drag" panel marking on the kilocycle dial locking mechanism appears mostly on rigs below serial number 3153 (on our survey). Rigs above this serial number generally are marked "Dial Lock." The mechanical function of the control is to add some mechanical resistance to the kilocycle dial/PTO or to lock it in place. Before the 4:1 assembly was available, turning the Passband Tuning control would accidentally move the PTO and

change frequency. The Dial Drag added enough mechanical resistance to keep this from happening. The 4:1 mechanism did not require the drag so the panel lettering was changed to "Dial Lock" (see figure 7).

A very rare optional accessory for the 75A-4, the 136C-1 noise blander, was found in only two rigs in the survey. Offered as a user-installed kit it was installed above the chassis immediately behind the PTO (see figures 3 and 6).

Special attention should be given to the instruction manual for the receiver at hand. At least seven different versions/revisions

of the manual were located and examined. The top-level manual is dated 15 July 1957 and incorporates all company Service Bulletins and the schematic shows the "undocumented" production changes. See the subsection on Manuals in this Data Sheet.

Our survey of 100 rigs constitutes about six percent of the total 75A-4 production. While it may be statistically significant, the data should not be considered as absolute! Our sincere thanks goes to the subscribers of the CCA Internet Mail Reflector who contributed the information used in this survey.

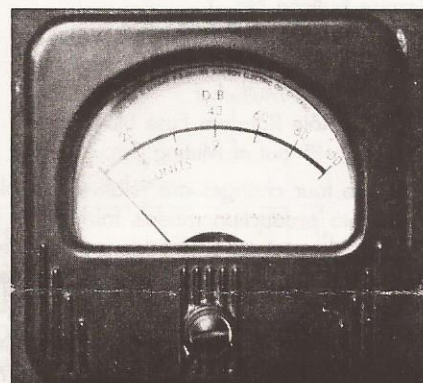
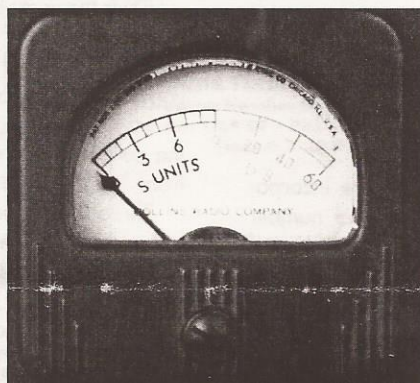
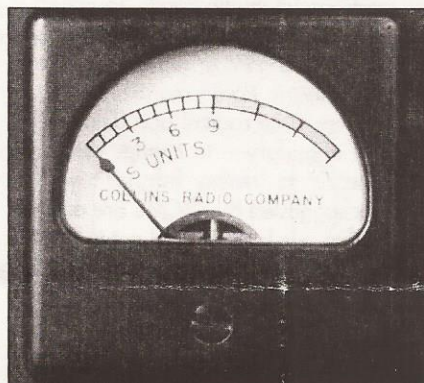


Figure 4 There were at least three different styles of S-Meter dials used on the radio. From left to right are the earliest to the latest versions: solid red line above S-9 (manufactured by Bartlett Instrument Company), light red line with "crosshatched" or "lined" pattern and red numbers and no red on the meter dial (both manufactured by Simpson).
-Photos by KK5IM

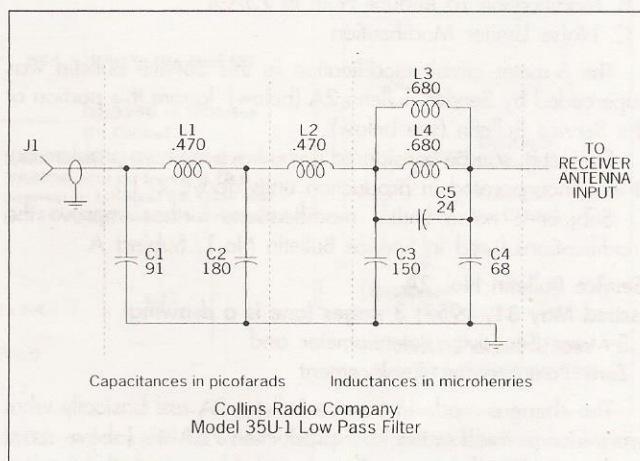
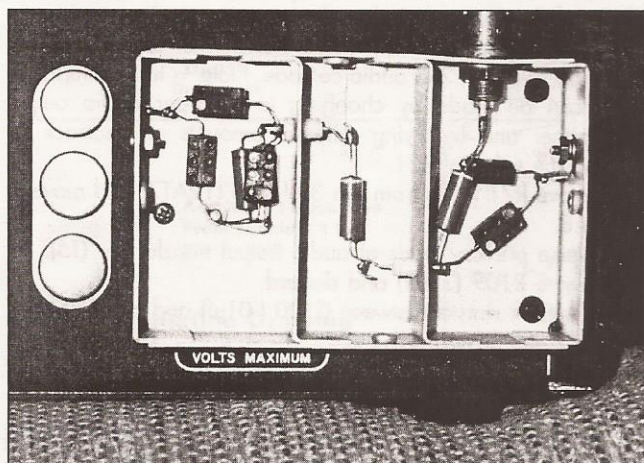


Figure 5 The 35U-1 Low-Pass Filter was an unusual accessory for the 75A-4. Shown at left with the cover removed, it was painted St. James Gray and attached to the rear of the radio over the antenna inputs. Installation required removal of both the antenna input terminal strip and the antenna jack. The BNC connector was reinstalled on the top of the filter box. A schematic diagram is shown at right.
-Photo by KD9QI

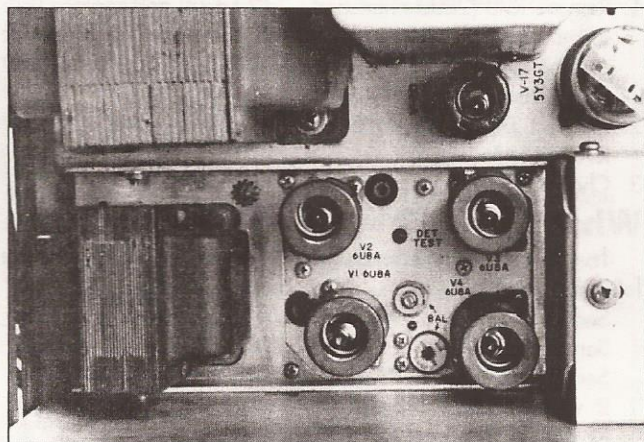


Figure 6 A rare accessory, the 136C-1 noise blander, is shown here in serial number 522. The front panel Noise Limiter control was fitted with a "push-pull" switch to operate the accessory. Two radios in our survey were so equipped.
-Photo by KK5IM

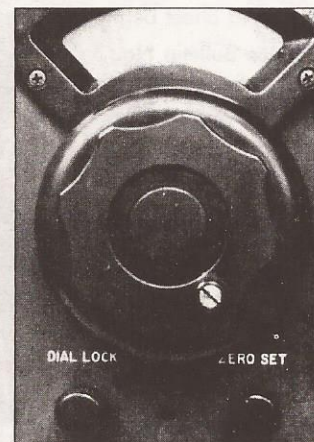
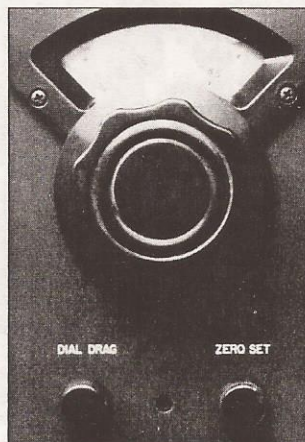


Figure 7 Prior to introduction of the 4:1 dial mechanism, friction in the form of "dial drag" had to be applied to the kilocycle dial and the PTO shaft to keep them from turning when the Passband Tuning control was adjusted. Hence the differences in panel lettering.
-Photo by KK5IM

Service Bulletins

Only four official company Service Bulletins were issued for the 75A-4. As with all Collins Service Bulletins they should be only incorporated if the receiver is having the problems addressed. If you feel your receiver is having a problem, read all Service Bulletins first as certain circuit changes are changed again in preceding Bulletins. The Bulletins issued for the 75A-4 are listed as follows:

Service Bulletin No. 1

Issued December 14, 1955; 3 pages

- A. Improve Noise Limiter Operation
- B. Revise Q Multiplier
- C. Eliminate Random Fuse Blowing
- D. Keep RF out of Muting Circuit

These four changes are relatively simple and were incorporated into production models fairly early in the serial number range. Subject A requires adding a new wire to the Noise Limiter control on the front panel so it is fairly easy to spot. V7 was changed from a 12AT7 to a 12AX7 in Subject B. Subject D is a .01 μ f capacitor across terminals 'M' and 'G' of terminal strip E3 on the back of the radio (Muting-Stand By).

Service Bulletin No. 2

Issued October 15, 1956; 10 pages

- A. S-Meter Sensitivity Potentiometer Replacement
- B. Modification To Reduce Hum in 75A-4
- C. Noise Limiter Modification

The S-meter circuit modification in this Service Bulletin was superseded by Service Bulletin 2A (below). Ignore this portion of the Service Bulletin (see below).

Subject B can be considered if you have the hum problem but it was incorporated in production units above 2715.

Subject C noise limiter modifications further improve the modifications listed in Service Bulletin No.1, Subject A.

Service Bulletin No. 2A

Issued May 31, 1957; 3 pages (one is a drawing)

- S-Meter Sensitivity Potentiometer and Zero Potentiometer Replacement

The changes made in Service Bulletin 2A are basically what were incorporated in the later production 75A-4's (above serial number 3423). If your receiver does not have both the S-meter sensitivity and the zero potentiometers mounted below the chassis on a small mounting plate, this change should be considered (this portion of the Service Bulletin is reproduced in this Data Sheet beginning on page 5).

Service Bulletin No. 3

Issued September 18, 1957; 1 page

- Elimination of RF Pickup White in Standby Position

For most installations, the standby circuit in the 75A-4 is entirely satisfactory. Collins received some complaints about the receiver not quieting entirely during transmit and the circuit changes in this Service Bulletin were suggested. If you do not have any RF pickup in Standby, you can ignore these changes.

Copies of all of the company Service Bulletins are contained in the *Collins 75A-4 Modifications Compendium* published by *Electric Radio* magazine and available from the publisher.

Other Production Line Changes

Several important circuit changes were made during the production life of the radio that were not covered by company Service Bulletins.

Schematics for 75A-4's after about serial number 2000 show the addition of a 56K ohm, 2-watt IF gain voltage divider resistor, (R130) from the unused terminal of R9 to the B+ line.

Likewise shown on later schematics are two circuit changes (1) the second mixer being shunt fed through an LC network to take B+ off the filters (removing the B+ from the filter will prevent filter damage) and (2) an RF gain gate added to V19.

Another change not covered in the schematics, but strongly suggested, is to increase the current carrying capability of the AVC cathode bias resistor (R86) to 2 watts.

Non-Collins Modifications

Over the years many, many circuit modifications appeared in the pages of *QST* and *73* magazine. As the interest in classic equipment gained momentum in the 1990s, modifications and conversions also appeared in *Electric Radio* magazine.

Some of the modifications are quite radical and detailed. To the collector they represent a quandary—to change the radio from "as Art intended it to be...." to "neither fish nor fowl."

Three simple modifications suggested by K7CMS are outlined below but in the interest of purity, we have elected not to present further more drastic modifications in the Data Sheet. A complete listing is, however, contained in the *75A-4 Modifications Compendium* published by *Electric Radio*.

The following "K7CMS Mods" appeared on page 27 of issue number 13 of *Electric Radio* (May 1990) and are reproduced here with permission from the publisher:

Improved Audio

This modification removes inverse feedback between the plates of the 1st and 2nd audio stages and changes inverse feedback originating at the output transformer secondary from the 1st audio to the 2nd audio cathode. Note: a further improvement can be made by changing to a larger audio output transformer and by trying different amounts of feedback by varying the value of R71.

1. Remove R71 (33k) from pin 3 of V13 (12AT7) and move to pin 8.
2. Reverse primary leads of audio output transformer (T5).
3. Remove R109 (390k) and discard.
4. Add 470k resistor between C100 (.01 μ f) and pin 7 of V13.

Reduced SSB Distortion

Reduces the level of IF signal injection to the product detector

1. Replace C87 (10 pf) with 5 pf.
2. Add 50pf capacitor in parallel with C99 (100pf)

Improved Slow AVC

This increases the slow AVC time constant. It also reduces the AVC attack time and allows the AVC voltage to drop instantaneously when switching to standby.

1. Remove R90 (2200 ohm) and C112 (.1 μ f) and replace with 22k and .47 μ f respectively but with the bottom of the .47 μ f capacitor connected to junction of R98 (22k) and R104 (270 ohms) instead of to ground.
2. Connect .001 mfd from the junction of R89 (10k) and former R90 (22k) to ground.
3. Change C20 (.1 μ f) to .01 μ f.

What To Do?

To sum up, it is recommended that a receiver incorporate the following Service Bulletins, circuit changes and modifications:

Service Bulletin No. 1—Subjects A, B, C and D

Service Bulletin No. 2—Subjects B and C

Service Bulletin No. 2A (see page 5)

IF voltage gain voltage divider resistor (see page 6)

RF gain gate added to V19 (see page 6)

Mechanical filter shunt feed (see page 7)

AVC cathode bias resistor (see page 7)

The K7CMS mods (see above)

S-Meter Adjustment Potentiometers

According to Collins Service Bulletin #2A, issued May 31, 1957, "all production 75A-4 receivers above serial number 3423" incorporated a change in the S-meter sensitivity and zero adjustment controls. Units below serial number 3423 had pots located above the chassis. These low-grade components were prone to failure and replacement of both pots is recommended. Also of note, the original value of R41 and R43 was 100Ω. They later jumped to 1000Ω in some radios and finally became 500Ω (meter shunt R40 is removed).

Here is the final iteration:

"Subject A of 75A-4 Service Bulletin No. 2 dated 10-15-56 discussed replacement of the S-Meter Sensitivity Potentiometer, R41. Subsequent research has proved a more effective improvement of the S-meter functions can be obtained by replacing both the Sensitivity (R41) and Zero (R43) potentiometers and modifying the related circuits as outlined below."

Continued on page 6

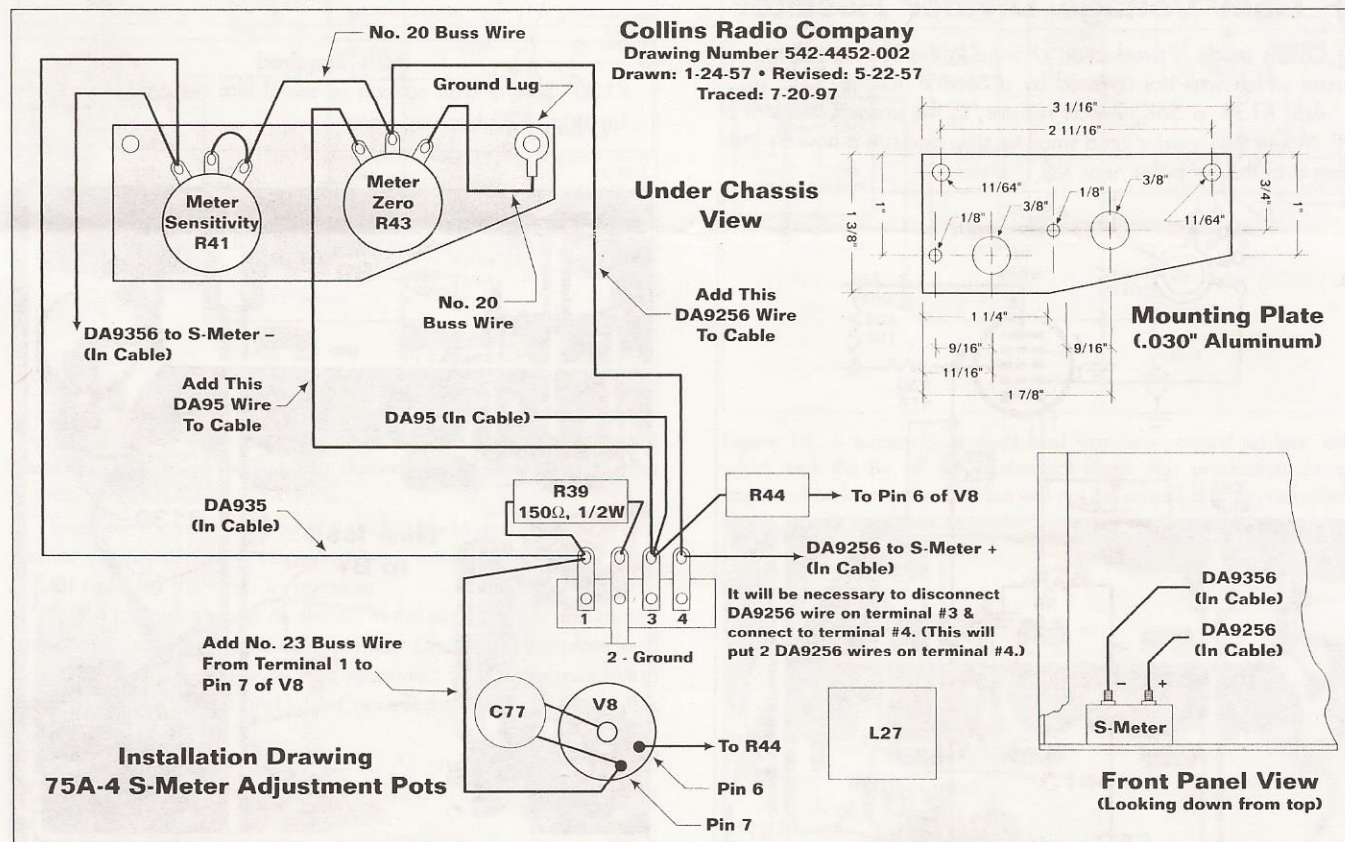


Figure 8 This is a tracing of Collins Radio Company drawing number 542-4454-002 used to install the S-meter adjustment pot modifications in Service Bulletin 2A. Refer to the abbreviated Hook-Up Wire Color Code Chart below to determine proper wire colors.

Collins Radio Company Abbreviated Hook-Up Wire Coding

1st Letter= Wire Type	2nd Letter= Wire Gauge
1st Number= wire body color	Add'l numbers= tracers
DA9256	Miniature insulated wire, #22AWG, white with red, green and blue tracers.
DA935	Miniature insulated wire, #22AWG, white with orange and green tracers.
DA9356	Miniature insulated wire, #22AWG, white with orange, green and blue tracers.
DA95	Miniature insulated wire, #22AWG, white with green tracers.

Parts Required

R41	500Ω variable resistor
R43	500Ω variable resistor
2	6-32 x 1 1/4" spacers
4	6-32 x 3/8" screws
4	#6 lock washers
1	Solder lug
1	Mounting plate (see drawing)
	Misc. hook-up wire

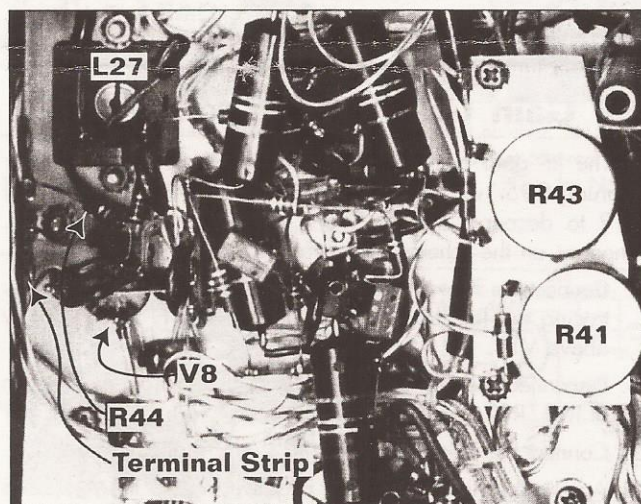


Figure 9 Number 3414 has received the S-meter adjustment modification. Service Bulletin #2 recommended moving only R41 below the chassis and specified 100K values for the pots. Service Bulletin #2A moved both R41 and R43 and specified 500Ω values. The two 1/2-watt resistors in parallel with the pots bring the total circuit resistance to 500Ω in this instance which corrects the 1000Ω resistance of the pots (see text).

Replacement of R41 and R43 involves the following procedure:

1. Remove Meter Sensitivity and Meter Zero potentiometers.
2. Mount 6-32 x 1 1/4 spacers in holes formerly used for mounting zero set and sensitivity potentiometers.
3. Fabricate a mounting plate from aluminum stock as shown in Figure 8. Attach potentiometers (500Ω) to plate and mount this assembly to the spacers.
4. Remove resistor R42.
5. Move resistor R39 as illustrated on installation drawing Figure 8. Delete resistor R40 which shunts the meter.

IF Gain Voltage Divider Resistor

Collins made a production change in the IF gain adjustment circuit which was not covered by a Service Bulletin.

Add R130, a 56K, 2-watt resistor, to the unused terminal of R9. Mount the resistor on a small tie strip and run a new B+ lead from it to the B+ point near V5.

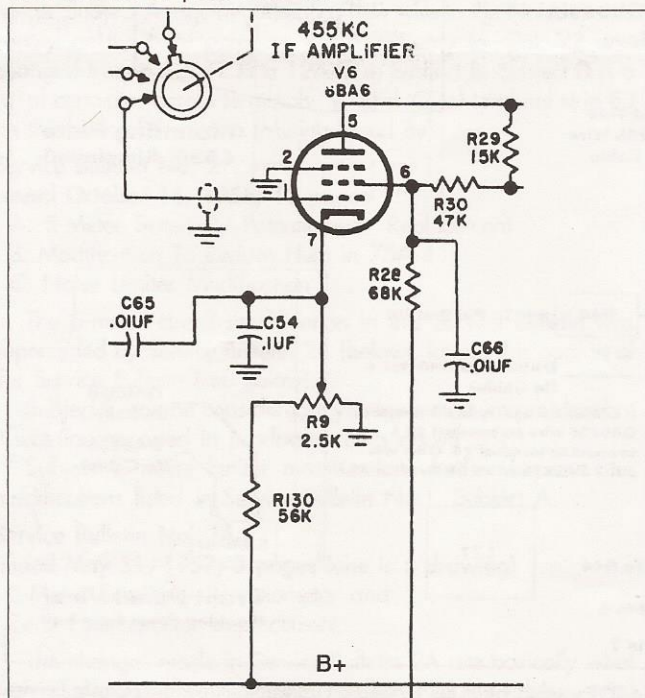


Figure 10 Collins made a production change in the IF gain adjustment circuit which was not covered by a Service Bulletin. B+ is fed to the IF gain adjustment control (R9) through a voltage divider consisting of a new R130 and the existing pot. This change gave more range to the control.

RF Gain Gate Added to V19

The RF gain control circuit of receivers manufactured after February 1957 were modified to make use of the unused half of V19 to decouple the RF GAIN control from the AVC line. Changes on the schematic diagram are as follows:

- a. Connect Pin 7 of V19 to the AVC bus. This can be found by tracing the line from the AVC TEST POINT, J4, to directly above V19.
- b. Disconnect the arm of RF GAIN control R99 from the junction of R91, R92, and R93 and connect it to pin 1 of V19.
- c. Connect the junction of R91, R92, and R93 to ground.

Advancing the control adds negative bias to the AVC bias and reduces the gain of the tubes connected to the AVC line, namely, V-2, V-6, V-8 and V-9. The value of R104 is selected in final test and ranges from 270 ohms to 560 ohms. R104 in this set will be one of the following values: 270 ohms, 330 ohms, 390 ohms, 470 ohms or 560 ohms.

6. Remove from the cable the short wire with orange and green tracers which connects the meter zero potentiometer to the meter sensitivity potentiometer.
7. Connect the wire with orange, green and blue tracers which formerly went to the hot terminal of the meter sensitivity potentiometer to the clockwise terminal of the new meter sensitivity potentiometer.
8. The meter should be wired as shown in the top view of the front panel on installation drawing (Figure 8).
9. Rewire the terminal strip adjacent to tube V8 as shown in installation drawing (Figure 8).

Parts Required

R130 56K, 2-watt carbon or metal film resistor
Tie strip, #20 hook-up wire

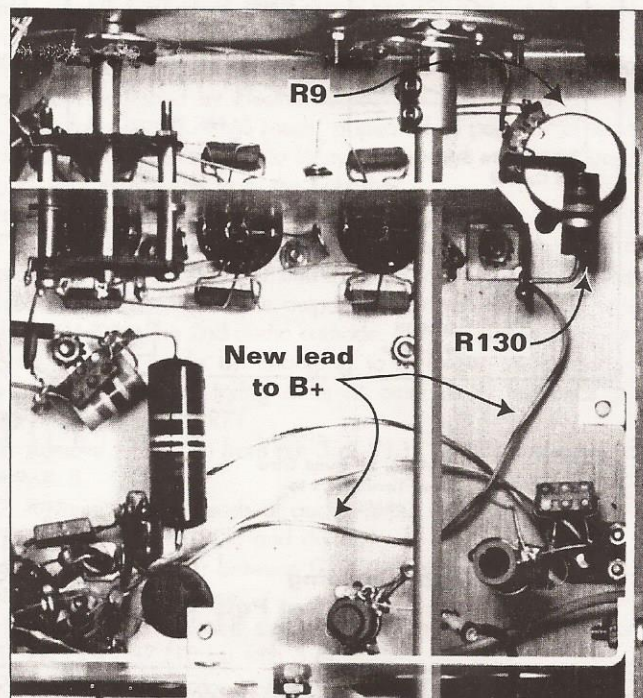


Figure 11 Mount the new R130 to the unused terminal of R9. Insulate the resistor lead as shown. Mount a small tie strip and tie the other lead of the resistor. Run a piece of #20 hook-up wire from the B+ point near V5 to the new tie strip.

-Photo by N5MDI

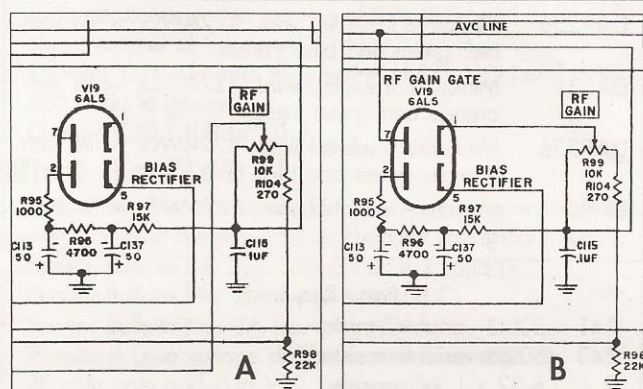


Figure 12A In one of the earliest 75A-4 schematics (manual revision dated December 1, 1956), half of the bias rectifier tube (V19) was unused. **Figure 12B** The other half of V19 was utilized as an RF gain gate on receivers built after February 1957.

Mechanical Filter Shunt Feed

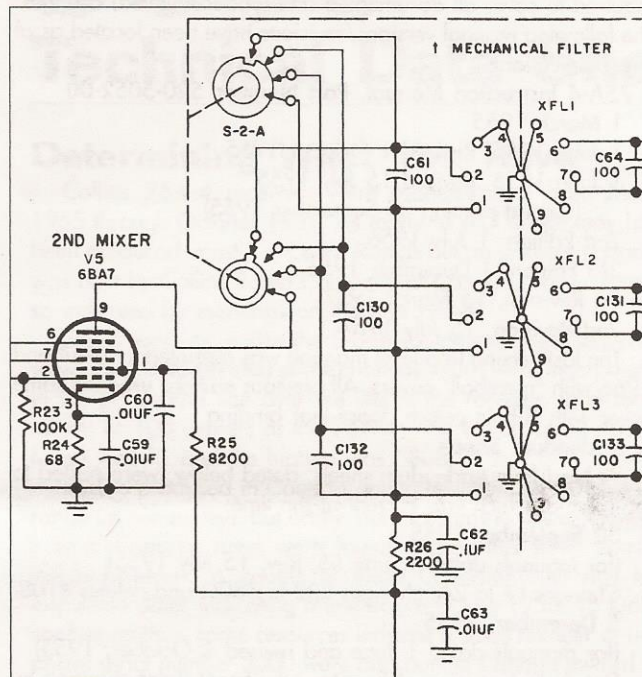


Figure 13 The mechanical filter B+ circuit of early production 75A-4 receivers could lead to serious filter damage should any of the blocking capacitors (C61, C130, C131) fail.

Examine the receiver from the underside to determine whether or not this production change has been incorporated. See Figure 15 at right for the area in question.

Install a small tie strip as shown in the photograph and mount the choke and the silver mica capacitor. Disconnect the plate lead from pin 9 of V5 and S-2-A and reconnect it to the terminal strip junction of new C145 and L32. Connect the new C144 from this junction to S-2-A.

Break the connection between C132 and pin 1 of XFL3 and R26, C62. Tie the other ends of new L32 and C145 to the junction of R26 and C62.

Add a chassis ground connection as shown common to all pin 1 connections of the 3 mechanical filters.

Parts Required

L32 2.2 MH choke (Mouser 434-05-222J) (2200 μ H)*

C144 1000pf ceramic disc capacitor

C145 56 pf silver mica (Mouser 5982-15-500V56)*

Tie strip

* Standard component values (different from those indicated in the schematic) which will yield 455 kc in the tuned LC network.

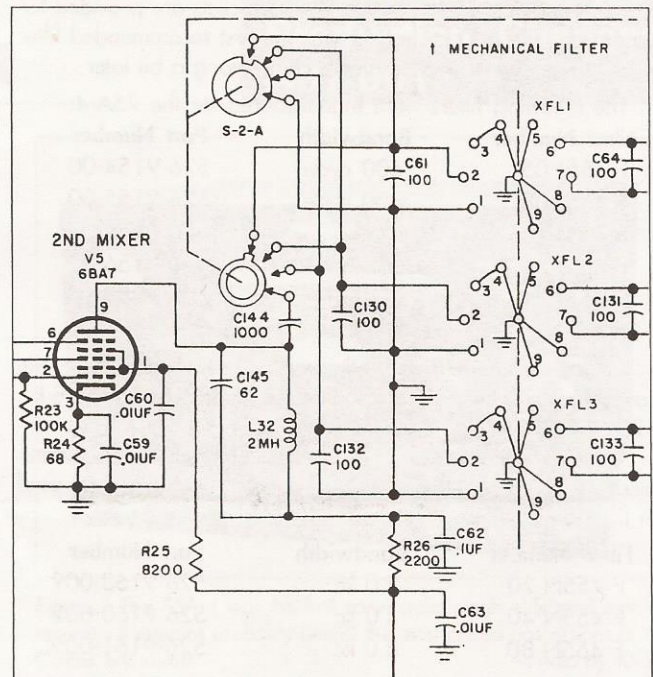


Figure 14 A tuned circuit shunt feed was incorporated on later units which took the B+ off the mechanical filters. This production change appeared on later schematics but was not the subject of a service bulletin.

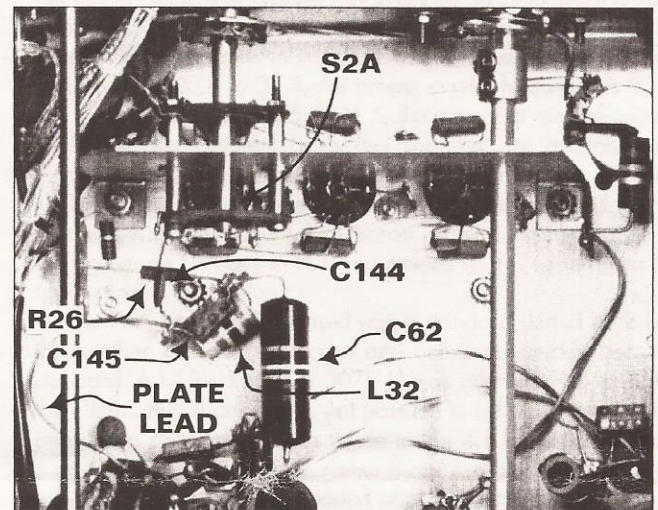


Figure 15 Shunt feed parts arrangement in serial number 3414. This tuned circuit is indicated on later schematics but was not covered under any Collins Radio Company service bulletins. —Photo by N5MDI

AVC Cathode Bias Resistor

In time, AVC cathode bias resistor R86 may deteriorate degrading the receiver's sensitivity and cause erratic S-meter operation. This fault is due to excessive current through the resistor caused by today's higher AC line voltages. As built, most receivers used a 39K, 1/2-watt resistor for R86 which was marginal for 110vac line voltages. R86 should be replaced with at least a 1-watt—preferably a 2-watt resistor—in all rigs.

As R86 is used with R87 as a voltage divider, check the value of R87 and replace if it is out-of-value. A 1/2-watt resistor is fine for this component.

Parts Required

R86 39K, 2-watt carbon or metal film resistor

R87 3300 Ω , 1/2-watt carbon or metal film resistor

(Replace only if existing component is out of value.)

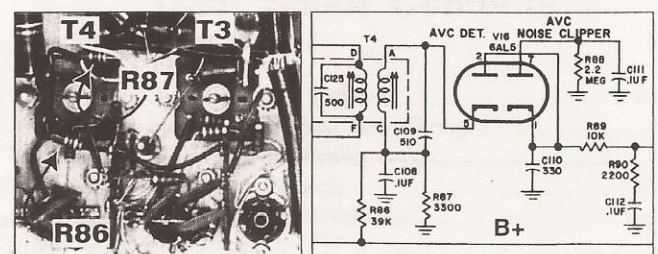


Figure 16A Note the 1/2-watt resistor for R86 coming off terminal 'C' of T4 in this unmodified receiver. Replace with a 2-watt resistor of the same value. Also check the value of R87 and replace if necessary. **Figure 16B** The schematic of the AVC circuit. —Photo by N5MDI

Mechanical Filter Data

The receiver was shipped from the factory with a standard 3.1kc mechanical filter. Two additional sockets are provided for expansion. The 800 cycle filter was the first recommended filter for CW use; the 500 cycle model came along a bit later.

The following filters were manufactured for the 75A-4:

Filter Number	Bandwidth	Part Number
F-455J-05	500 cycle	526-9154-00
F-455J-08	800 cycle	526-9155-00
F-455J-15	1.5 kc	526-0155-00
F-455J-21	2.1 kc	526-9156-00
F-455J-31	3.1 kc	526-9089-00
F-455J-60	6.0 kc	526-9091-00

Collins also made several other mechanical filters in the J-style case which conceivably could be used in the receiver (4 kc, 8 kc, 12 kc and 16 kc).

Certain mechanical filters used in the Collins R-390A communications receiver, when fitted with a 9-pin plug, may be used in the 75A-4. These include:

Filter Number	Bandwidth	Part Number
F-455N-20	2.0 kc	526-9163-009
F-455N-40	4.0 kc	526-9160-009
F-455N-80	8.0 kc	526-9161-009

About the Instruction Manuals

At least seven versions/revisions of the 75A-4 manual are required to cover all documented and (undocumented) changes. The following manual versions/revisions have been located as of this publication:

I. 75A-4 Instruction Manual, Part Number 520-5052-00

1 March 1955

1 June 1955, Revised 1 October 1955

1 June 1955, Revised 15 July 1955

(second printing 30 September 1955)

2nd Edition, 1 July 1956

3rd Edition, 1 December 1956

1st Revision, 15 March 1957

2nd Revision, 15 July 1957

The last version (top-level manual) was reprinted in 1964 and 1966 with "meatball" covers. All previous editions used the same cover with 3-hole punch, loose-leaf binding.

II. Addendum Sheets

At least four Addendum sheets, dated below, were added to the manual which was current at the time:

30 September 1955

(for manuals dated 1 June 55, Rev. 15 July 1955)

Changes F1 to 2A; changes R32 to 680Ω and deletes R108.

5 December, 1955

(for manuals dated 1 June and revised 1 October, 1955)

Details first revision of S-meter adjustment (later changed by Service Bulletin No. 2A) as well as several typographical errors.

5 February, 1957

(for manuals dated 1 December, 1956)

Adds RF gain gate to unused half of V19.

1 June, 1957

(for manuals dated 1 December 1956

and revised 15 March 1957)

Change in 15 meter drum dial and crystal.

III. Schematic Diagrams

To further complicate the issue, Collins Radio Company of Canada, Ltd. printed their own manuals (sometimes indicated by "Printed in Canada" or "Made by Collins Radio Company of Canada, Ltd."). Most likely, these manuals contained the same information as their US counterparts.

At least four different schematics were issued for the receiver and only two of them have printed dates.

(a) Original schematic (has no date)

Best clue for identification is a 12AT7 as V7 rather than a 12AX7.

(b) First Revision dated 15 July 1955

Adds C139 V8 grid shunt; RF Gain gate on V19; adds C141, V7 changed to 12AX7; etc.

(c) Second Revision dated 1 October 1955

Removes R108, changes R32 to 680Ω.

(d) Final revision (has no date)

Shows all modifications and undocumented production changes (mechanical filter shunt feed; IF gain resistor; 500Ω value for R41 and R43); Y5 changed to 23.0 mc.

The writers will appreciate anyone with additional documentation coming forward.



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