



Collins

INSTRUCTION BOOK

GUARANTEE

Collins agrees to repair or replace, without charge, any equipment, parts, or accessories which are de-

fective in design, workmanship, material, and which are returned to Collins at its factory. Equipment

prepaid, provided

- (a) Notice of the claimed defect is given Collins within one (1) year from date of delivery and goods are returned in accordance with Collins' instructions.

(b) Equipment, accessories, tubes, and batteries returned to Collins from Collins' factory

CUSTOMER

This Instruction Book contains all essential information for the installation, operation and maintenance of your Collins Radio Equipment.

Collins' Research and Development and Manufacturing Divisions have designed and built equipment of the highest possible quality for your use. Many pieces of information have been assembled by the Publications Engineering Department; this book has also been tested against a similar quality standard.

With these production goals achieved, it would be easy to regard all tasks as completed.

Collins Radio Equipment is designed for easy installation and maintenance.



INSTRUCTION BOOK

**COMMUNICATIONS
RECEIVER**

51J-4



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CEDAR RAPIDS, IOWA, U.S.A.

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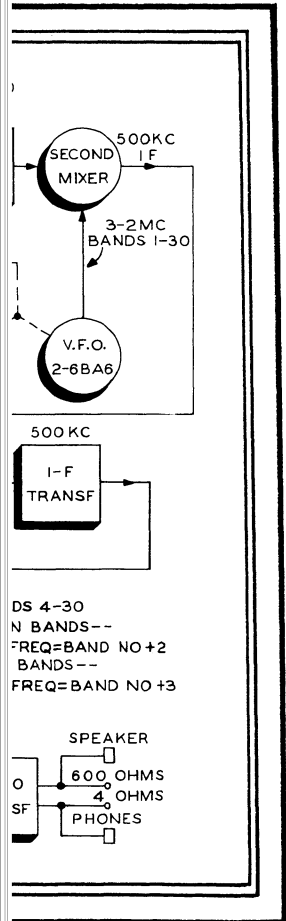
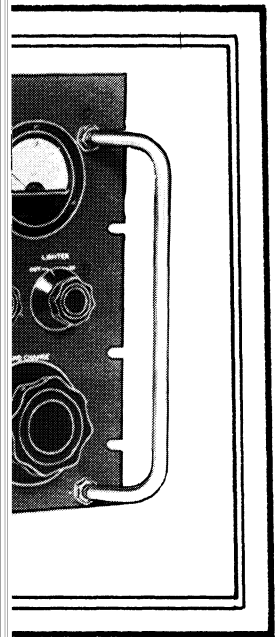
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cam

OPTION

TER OUT-IN	METER OUTPUT-INPUT
TRIM	CAL (100 K-C ADJUST-
STAL FILTER	MENTS)
LECTIVITY	FILTER SELECTOR

operating range of 540 kc to 30.5 mc is provided by 30 one-megacycle bands that are selected by a tuning knob and indicated by a slide rule with graduations of one-tenth megacycle (100- μ vals). The main tuning control covers each megacycle range with 10 turns of a 100-dial calibrated at one-kilocycle intervals. Receiver's frequency stability is consistent with finely divided calibration even at the highest frequencies.

A 400-ohm headphone jack and a 600-ohm speaker are provided on the front panel. The antenna terminal, 50-ohm i-f output connector, breakin terminals and four-ohm and 600-ohm audio terminals are provided on the rear. A heavy-duty power cord extends from the rear of the receiver.

ELECTRICAL. - When advantageous, the 51J-4 Communications Receiver uses single or triple conversion in tuning the entire frequency spectrum of 540 kc to 30.5 mc. Nineteen of which are dual, are employed in the receiver. With the exception of the rectifier tube, all tubes are of the miniature type.

The receiver r-f circuits tune from .5 to 30.5 mc. Band 1 is referred to as covering the range from .5 to 5 mc. However, the lower end of the tuning range is considered to be 540 kc rather than 500 kc because of the questionable operation in the extreme low end of the band where frequencies below the receiver i-f frequency of 500 kc. Operation at the extreme low end is possible with somewhat reduced performance.

The frequency range of the 51J-4 Receiver, .5 to 30.5 mc, is divided into 30 one-megacycle bands by a system of switches and coils which form the amplifier and first mixer circuits. Band 1 consists of moving powdered iron "slugs" in the coils in one megacycle steps until inductance of the coils are reached, then changing coils and repeating. Injection voltage for the first mixer is derived from the fundamental or harmonic output of the oscillator, the frequency of which is controlled

respectively,
variable i-f
mixer

second mixer
ed inter-
mechanical
0 kc is
gnal from a
fference of
ner band of
70E-15
ng control

assured by
berating in

duce automatic
amplification
s provided
detector.
over signal
icrovolts
noise
%. This
strong noise

INS NUMBER
4 096
4 086
4 00

the 51J-4.

INS NUMBER
9 00
3 004
0 002
9 003
9 002
0 002
8 002
9 002
3 00

units just described.

FUNCTION
radio-frequency amplifier first mixer second mixer vibration oscillator high-frequency crystal oscillator second mixer first 500 kc i-f amplifier second 500 kc i-f amplifier third 500 kc i-f amplifier fourth 500 kc i-f amplifier detector and A. V. C. rectifier V. C. amplifier and i-f output cathode follower noise limiter and first audio amplifier audio power amplifier beat frequency oscillator power rectifier voltage regulator variable frequency oscillator oscillator isolation amplifier

cycles

temperature is within 300 cps if the nearest 100 kc
to adjust the fiducial.

with 10 db s/n

watt with 10 db s/n

characteristics is given in paragraph 5. 3.7. of this book.

40 db

db increase in audio power output with an increase in

5 to 125, 000 uv

db above AVC threshold and -10 to +6 db audio level

o stage

with less than 15% distortion

more than 3 db at 200 cps and not more than 7 db at 2500

when 6 kc filter is used

with a high impedance whip or single-ended antenna

70 cps. Same power required when reconnected for

operation

is wide, notches for standard rack mounting