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ICTION
amplifier -f amplifier 'C rectifier and i-f output cathode id first audio·amplifier plifier oscillator or ncy oscillator tion amplifier

etwork consisting of a .01 capacitor
sistor in series with clip leads.

akelite adjusting tool, 1/8-inch
ewdriver type bit. (Supplied)

akelite adjusting tool, 5/16-inch
ewdriver type bit. (Supplied)

wdriver.

NOTE

L GENERATOR IS NOT
E, THE CALIBRATION
OR MAY BE USED FOR
TS 5.3.5 (a through h)
9 through 14). USE THE
TE OUTLINED BELOW BUT
E CALIBRATION OSCIL-
. SET THE BFO AT
500 KC AS IN PARAGRAPH
UPLE THE OUTPUT OF
BRATION OSCILLATOR,
TO PIN 7 OF V106 WITH A
). TUNE THE RECEIVER
ALIGNMENT FREQUENCY
BEATING WITH THE BFO.
E TRIMMERS AND CORES,
UT METER TO INDICATE
READINGS.

L OSCILLATOR TRIMMER

of a "Q" meter or accurate bridge
, adjust trimmer C167 marked
, to provide an input capacitance of
e crystal holders. This value will
minimum capacitance setting. Make
removing any one of the hfo crystals

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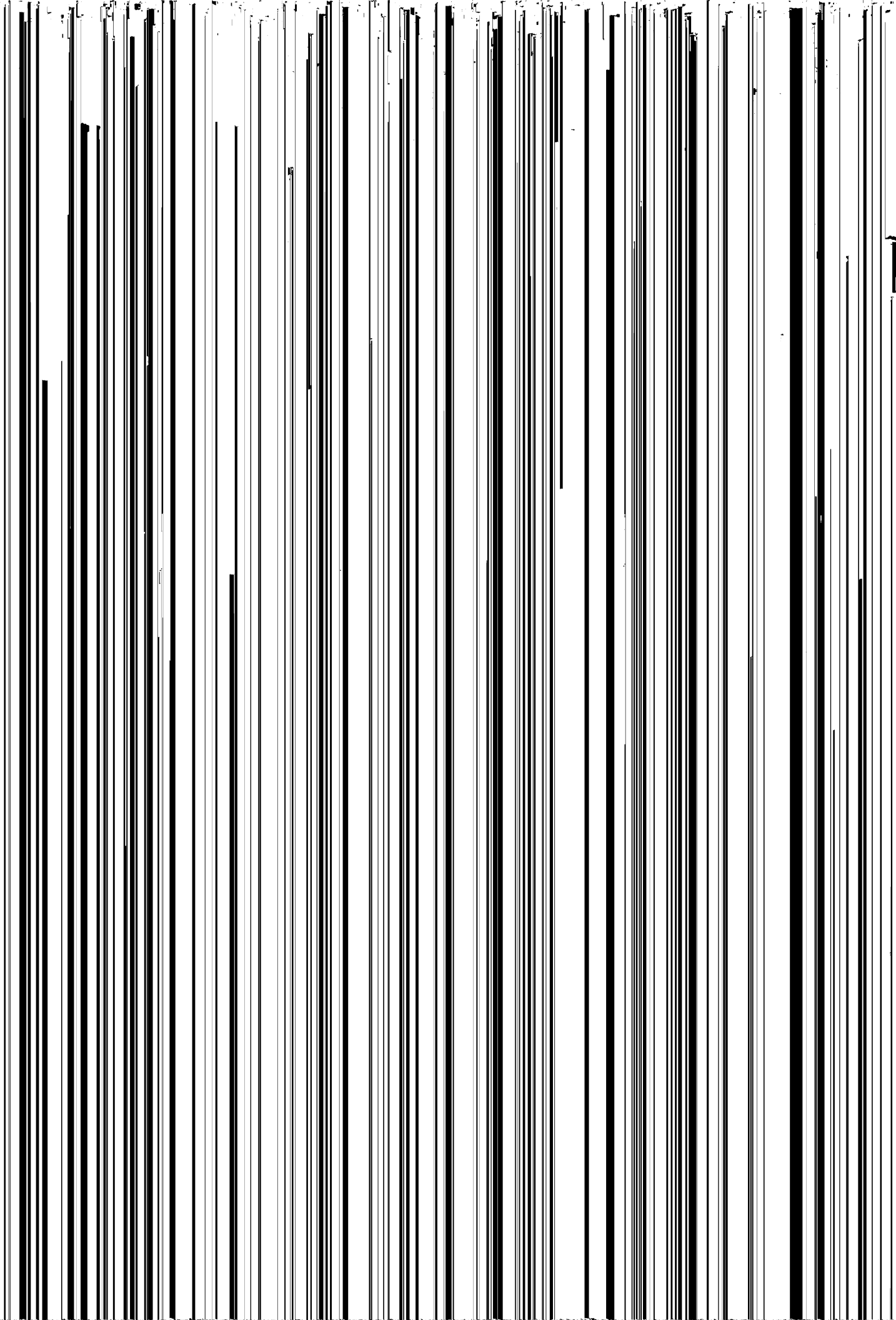
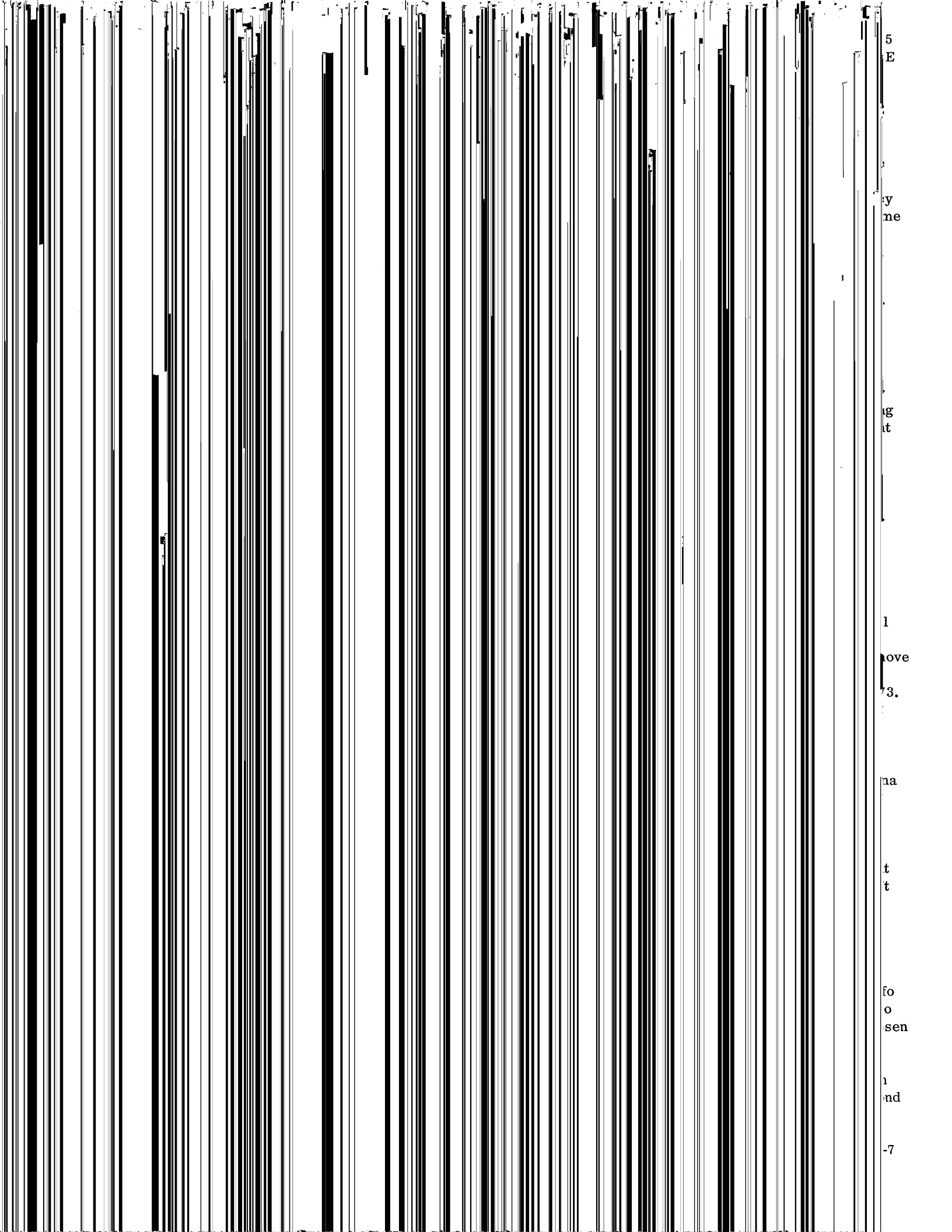




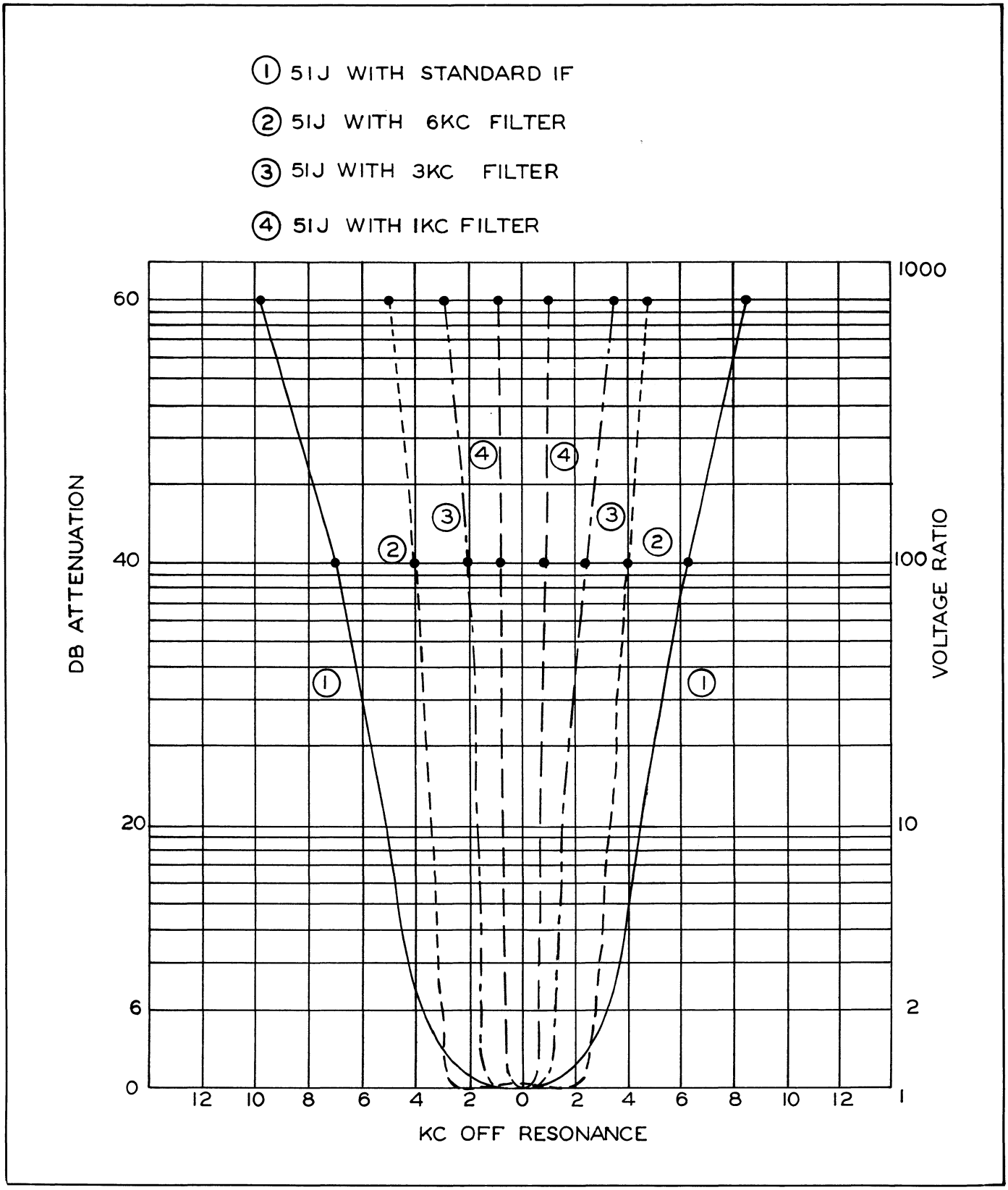


Figure 5-2. 51J-4 Selectivity Curves

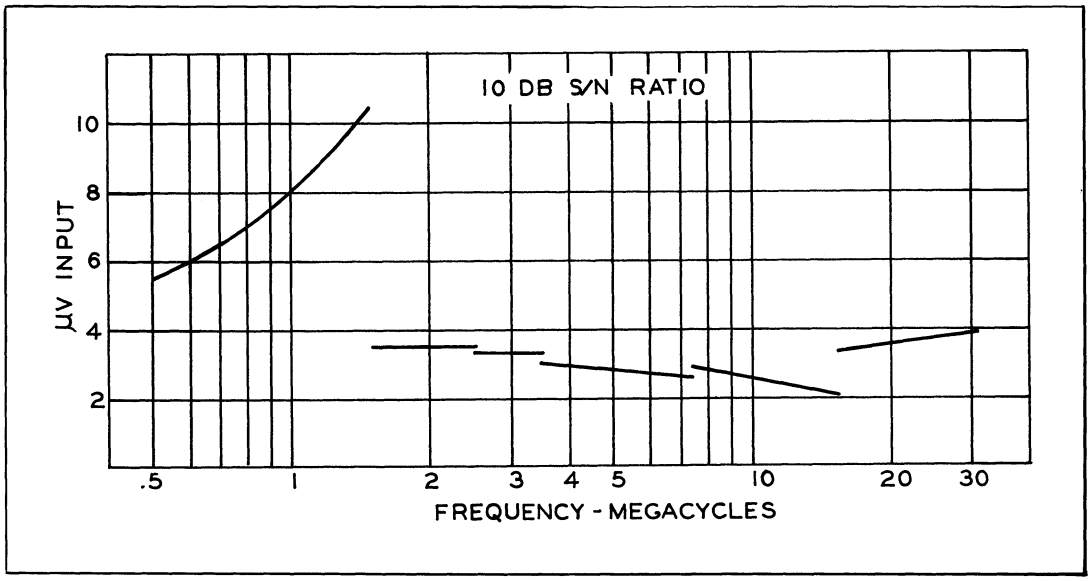


Figure 5-3. 51J-4 Sensitivity Curve

screw is loosened must be noted, since the dial reading at this point is the reference for the 100-kc correction to be made.

Hold the vfo shaft rigid at this position and set the receiver dials to read 100 kc higher than the reference setting if zero beat ocurred at 1.9 mc in steps (1) or (2), or 100-kc lower than the reference setting if zero beat occurred at 2.1 mc. Tighten screws in coupler and check setting. Additional fine adjustment can be made by moving the KILOCYCLE dial on the shaft or moving the fiducial line on the KILOCYCLE dial opening.

5.3.9. VARIABLE I-F ALIGNMENT AND RF ALIGNMENT BAND 2.

(a) Connect signal generator in series with a 47 ohm resistor and a 100 uuf capacitor to the ANTENNA terminal. Connect VTVM between DIODE LOAD test point and chassis. Switch receiver to band 2. Set dial to read 1.6 mc. Set ANT TRIM to midrange.

(b) Turn BFO on and set at 500 kc as in 5.3.6. Set signal generator to zero beat at 1.6 mc. Turn BFO off. Adjust output of signal generator to give some value of diode load voltage below 5 volts. Tune slugs marked 1.6 (in L116, L118 and L102) for a maximum indication while adjusting the signal generator to keep diode load voltage below 5 volts.

(c) Set dial to read 2.4 mc. Set generator to zero beat at 2.4 mc with BFO. Turn BFO off. Tune adjustments marked 2.4 (trimmer capacitors C174, C180 and C104) for a maximum indication, keeping diode load voltage below 5 volts.

(d) Repeat tuning procedures at 1.6 and 2.4 mc until no further increase in output can be obtained.

NOTE

IN THE FOLLOWING RF ALIGNMENT PROCEDURES KEEP DIODE LOAD VOLTAGE BELOW 5 VOLTS AS IN PARAGRAPH 5.3.9.(b) ABOVE, AND BFO SET AT 500 KC AS IN PARAGRAPH 5.3.6.

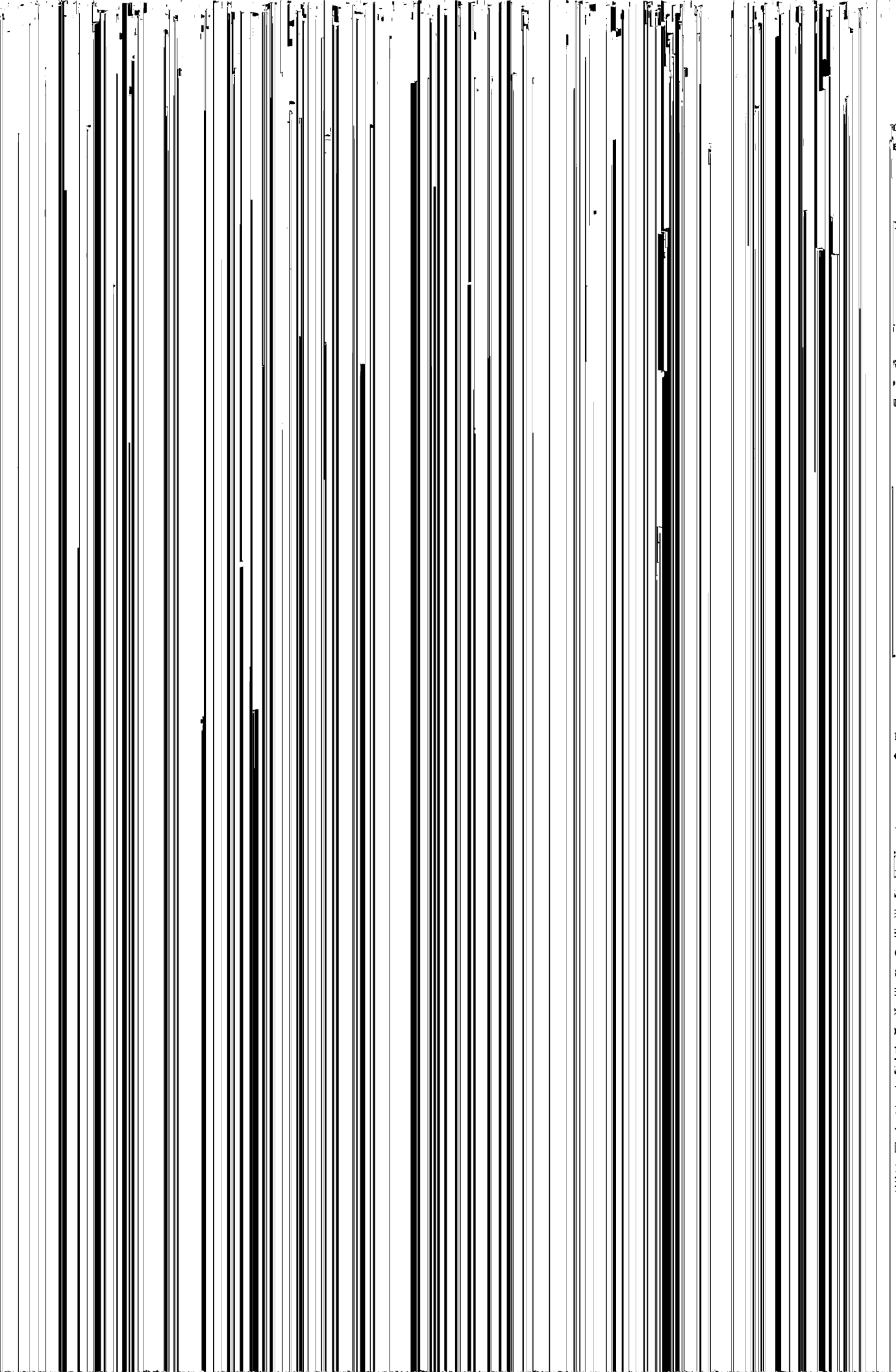
5.3.10. VARIABLE I-F ALIGNMENT AND RF ALIGNMENT BAND 3.

(a) Connect the signal generator and VTVM as in step 5.3.9.(a). Set bandswitch to band 3.

(b) Set dial to read 2.6 mc. Set signal generator to zero beat at 2.6 mc with BFO. Turn BFO off. Adjust tuning cores marked 2.6 (in L117, L119 and L103) for a maximum indication.

(c) Set dial to read 3.4 mc. Set signal generator to zero beat at 3.4 mc with BFO. Turn BFO off. Adjust trimmer capacitors marked 3.4 (C176, C182 and C106) for a maximum indication.

(d) Repeat tuning procedures at 2.6 and 3.4 mc until no further increase in output can be obtained.



REACHES THE STOP AT
ND OF THE RANGE.

'O setting is now within 20 kc of 2.0
adjusted more accurately as follows:
generator from pin 1 of V106.
ad from the 100 kc oscillator at
V106. Turn 100-kc oscillator on.
VFO shaft to the nearest zero beat.
ow exactly 2.0 mc. Place VFO
ero, being careful to retain the zero

the VFO shaft exactly 10 turns in a
e direction, counting exact turns
ial. Find zero beat by turning the
divisions toward either side of the

beat occurs on either side of the
ote the magnitude and direction of
nting divisions between zero and the
y this number of error divisions

o beat occurs at less than 10 turns,
haft counterclockwise by the number
ved at in step (9) (1.5 times the error

o beat occurs at more than 10 turns,
haft clockwise by the number of
l at in step (9) (1.5 times the error

ve the hex plug from the front of the
g the outer part of the special VFO
Illustrated in figure 5-7, loosen the
isible when the hex plug is removed.
driver portion of the VFO tool into
. Adjust the timmer screw by
wdriver until zero beat is again
en lock nut, being careful to retain

igh and low end (2.0 and 3.0 mc) zero
ould now be exactly ten turns apart.
case, repeat the above procedure
It will be necessary to zero the
ne initial zero beat position each
lure is repeated. Be sure to tighten
r making each trimmer adjustment.
o lose the endpoints by counting in-
getting the count. If they are lost
kc oscillator and start the procedure

ER GAIN
s of 51J-4 are
adjusting the
esistor is R187,
s reached from
is set and
sults. If aging
y to readjust
d:

IF OUTPUT

lated into the
receiver and
2 mc band.

187 until 270
TPUT jack.

REPLACEMENT.

be completely
icing, proceed

l allow it to
aragraph 5.6.2.
g the front

vfo coupler.
enter disk.

res so that they
older the wires.

hat hold the vfo
er right screw,
essible through
OCYCLE shaft

he rear downward.

ver.
e a vfo in the
ire. Replace the
ne vfo coupler.
t do not tighten
e coupler. The
ith the receiver

or shaft in a
the oscillator
SHAFT BEYOND

with a 30K-ohm re-
check to see that bulb
n mounting. If bulb
w bulb to insure re-
oltages on the antenna.

IGE GEAR MAINTENANCE.

placing and synchro-
d band change mechanism
icult job. It is recom-
to the factory for
epairs be required.

NG

THE GEAR UNIT
INSTRUCTIONS
2. and 5.6.3.
CLOSELY OR
LE TO SYN-
S UPON RE-

GEAR BOX.

e returned to the
ed as follows:

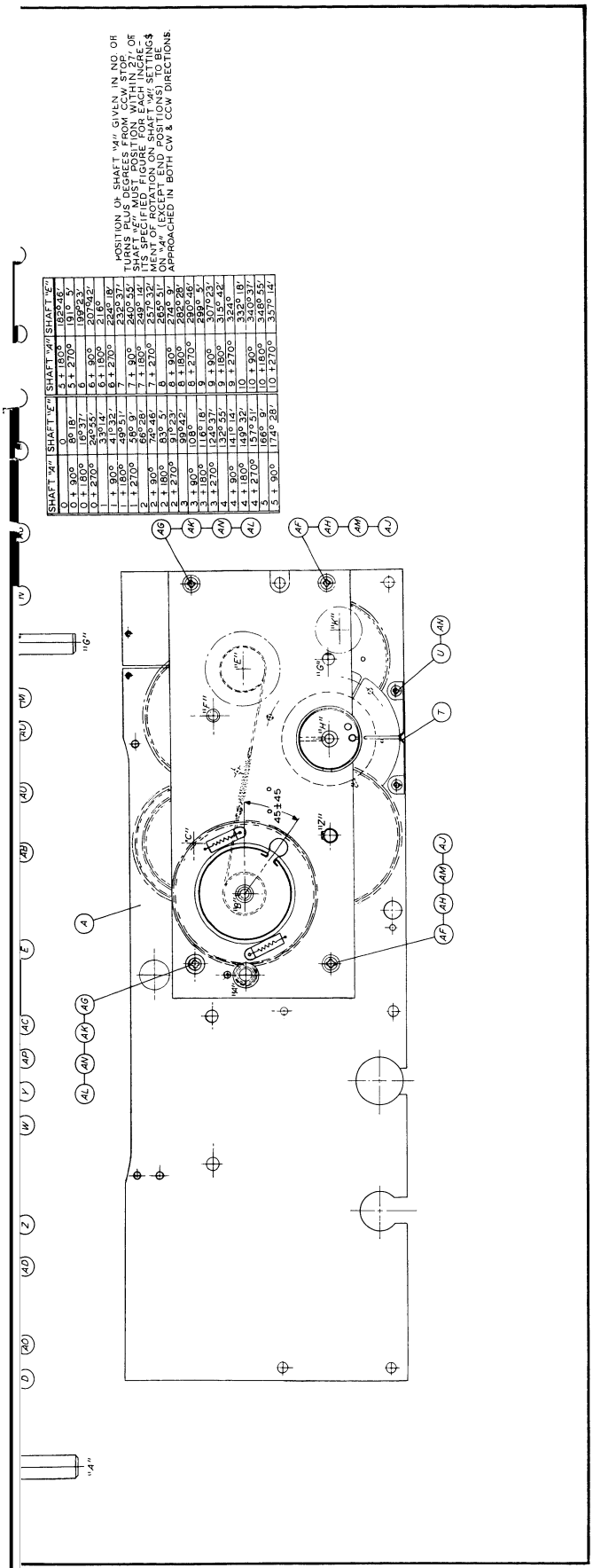
its back. Remove the
ITY, PHASING, BFO
LOCYCLE tuning, and
llar, tension washer
OCYCLE shaft. Remove
nt panel to the chassis.
ly allow it to hang to

and end bracket from

in the following
k and i-f slug rack
he top of the receiver,
accessible from the

ounting screws and the
Lift the gear box from

ade in the field the gear
rom the receiver or
nt of repairs. If the
he MEGACYCLE knob
KILOCYCLE knob to



SHAFT "A"	SHAFT "E"
0	0
0 + 90°	80° 18'
0 + 180°	160° 37'
0 + 270°	240° 55'
1	319° 14'
1 + 90°	41° 32'
1 + 180°	49° 51'
1 + 270°	58° 9'
2	66° 28'
2 + 90°	74° 46'
2 + 180°	83° 5'
2 + 270°	91° 23'
3	99° 42'
3 + 90°	108° 0'
3 + 180°	116° 18'
3 + 270°	124° 37'
4	132° 55'
4 + 90°	141° 14'
4 + 180°	149° 32'
4 + 270°	157° 51'
5	166° 9'
5 + 90°	174° 28'

SHAFT "A"	SHAFT "E"
5 + 180°	182° 46'
5 + 270°	191° 5'
6	199° 23'
6 + 90°	207° 42'
6 + 180°	216°
6 + 270°	224° 18'
7	232° 37'
7 + 90°	240° 55'
7 + 180°	249° 14'
7 + 270°	257° 32'
8	265° 51'
8 + 90°	274° 9'
8 + 180°	282° 28'
8 + 270°	290° 46'
9	299° 5'
9 + 90°	307° 23'
9 + 180°	315° 42'
9 + 270°	324°
10	332° 18'
10 + 90°	340° 37'
10 + 180°	348° 55'
10 + 270°	357° 14'

nd Bandswitch Gear Box

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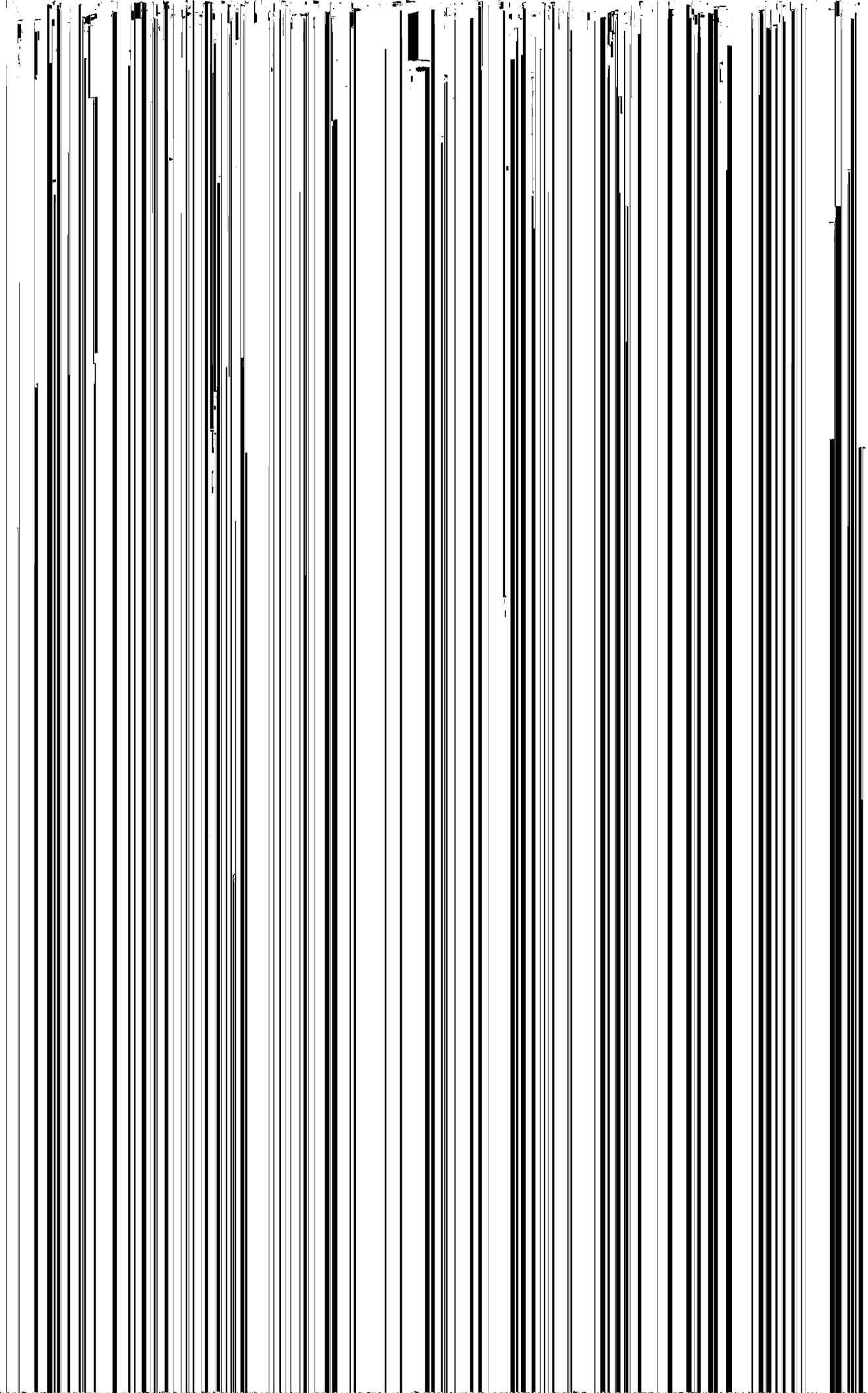

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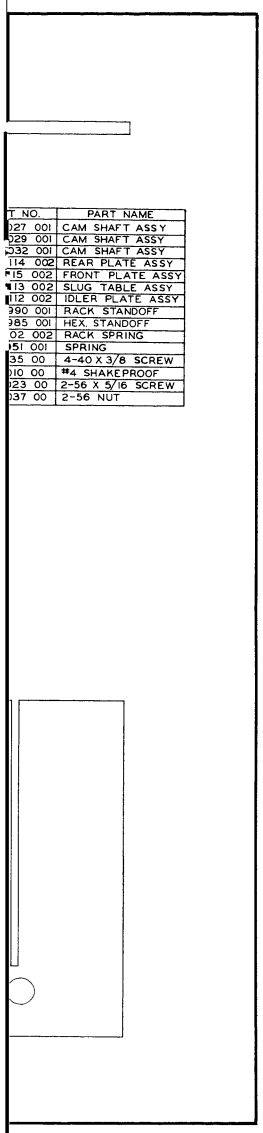

T NO.	PART NAME
027 001	CAM SHAFT ASSY
029 001	CAM SHAFT ASSY
032 001	CAM SHAFT ASSY
114 002	REAR PLATE ASSY
15 002	FRONT PLATE ASSY
113 002	SLUG TABLE ASSY
112 002	IDLER PLATE ASSY
990 001	RACK STANDOFF
985 001	HEX. STANDOFF
02 002	RACK SPRING
151 001	SPRING
35 00	4-40 X 3/8 SCREW
10 00	#4 SHAKEPROOF
23 00	2-56 X 5/16 SCREW
37 00	2-56 NUT

front panel according to
5. 6. 2. (a). If the cord is
/8 inches of Collins number
ed cord.

shaft counterclockwise to

ord. Loop the cord over
e 5-6.

ne-half turn clockwise on
ley B, pointer, pulley C,

-1/2 turns clockwise around
the spring on pulley A with

n cord has jumped
ioving the front
ve the front panel
ies of Collins
r replacement.

to band 30.

bout one-half

not it. Wind
on pulley D;
/2 turns or more
cord in hole and

o band 15.

b and turn drum
escutcheon

a-c input,

on, audio gain
tube voltmeter,

2 - 3 4 - 30
n 2 & 3
2 - 3 4 - 30

SISTANCE	VOLTAGE	
0K	-1.3	Band 1
	-2.	Band 2
	-0	Bands 3 - 30
0	+1.8	
ıd	Gnd	
1	AC 6.3	
K	+210	Band 1
	0	Bands 2 - 30
K	+85	Band 1
	+70	Bands 2 - 30
	0	
0K	0	Calibrate Off
	-24	Calibrate On
Calibrate Off	+60	Calibrate Off
00 Calibrate On	+7.2	Calibrate On
1	AC 6.3	
ıd	Gnd	
0K	+170	Calibrate Off
	+80	Calibrate On
0K	+175	Calibrate Off
	+64	Calibrate On
Calibrate Off	+60	Calibrate Off
00 Calibrate On	+7.2	Calibrate On
0K	-10 to -30	
	+.1	
ıd	Gnd	
1	AC 6.3	
K	+39	Bands 1 - 2
	+165	Bands 3 - 12
	+39	Bands 13 - 30
K	+105	Bands 1 - 2
	+115	Bands 3 - 12
	+105	Bands 13 - 30
	.1	
0K	-.2	
0	+2.6	
ıd	Gnd	
1	AC 6.3	
K	+205	
K	+82	
	0	
K	-2.1	
ıd	Gnd	
ıd	Gnd	
1	AC 6.3	
500	+162	
K	+52.5	
ıd	Gnd	

PIN	RESISTANCE	VOLTAGE
1	Gnd	Gnd
2	270	+2.45
3	Gnd	Gnd
4	Fil	AC 6.3
5	29K	+190
6	65K	+100
7	270	+2.45
ter used.		
1	55000	-2.1
2	Gnd	Gnd
3	Gnd	Gnd
4	Fil	AC 6.3
5	28500	+165
6	21500	+55
7	Gnd	Gnd
1	58K	-1.4
2	30	+.03
3	Gnd	Gnd
4	Fil	AC 6.3
5	38K	+175
6	85K	+90
7	30	+.03
1	550	-56
2	550	-56
3	100K	-53
4	Fil	AC 6.3
5	Fil	AC 6.3
6	100K	-2.4
7	100K	-2.4
8	Gnd	Gnd
9	Gnd	Gnd
1	48K	-1.4
2	700K	-52
3	2600	-44
4	Fil	AC 6.3
5	Fil	AC 6.3
6	42K	+195
7	100K	0
8	1000	+6
9	Gnd	Gnd
1	33K	-.8
2	33K	-.8
3	33K Limiter Off	-.8 Limiter Off
	1 Meg Limiter On	-.3 Limiter On
4	Fil	AC 3.4
5	Fil	AC 6.3
6	260K	+135
7	500K	0
8	3300	+1.2
9	Gnd	0

PIN	RESISTANCE	VOLTAGE
1	NC	NC
2	Gnd	Gnd
3	Gnd	Gnd
4	Fil	AC 6.3
5	40K	+220
6	40K	+210
7	100K	-12.5
1	100K	-.5 BFO OFF -10 BFO On
2	Gnd	Gnd
3	Gnd	Gnd
4	Fil	AC 6.3
5	75K 75K	200 BFO Off 140 BFO On
6	0 BFO Off 142K BFO On	0 BFO Off 69 BFO On
7	.6	0
1	NC	NC
2	40K	+240
3	NC	NC
4	620	AC 300
5	NC	NC
6	620	AC 300
7	NC	NC
8	40K	+240
1	44K	+150
2	NC	NC
3	NC	NC
4	Gnd	Gnd
5	44K	+150
6	NC	NC
7	NC	NC

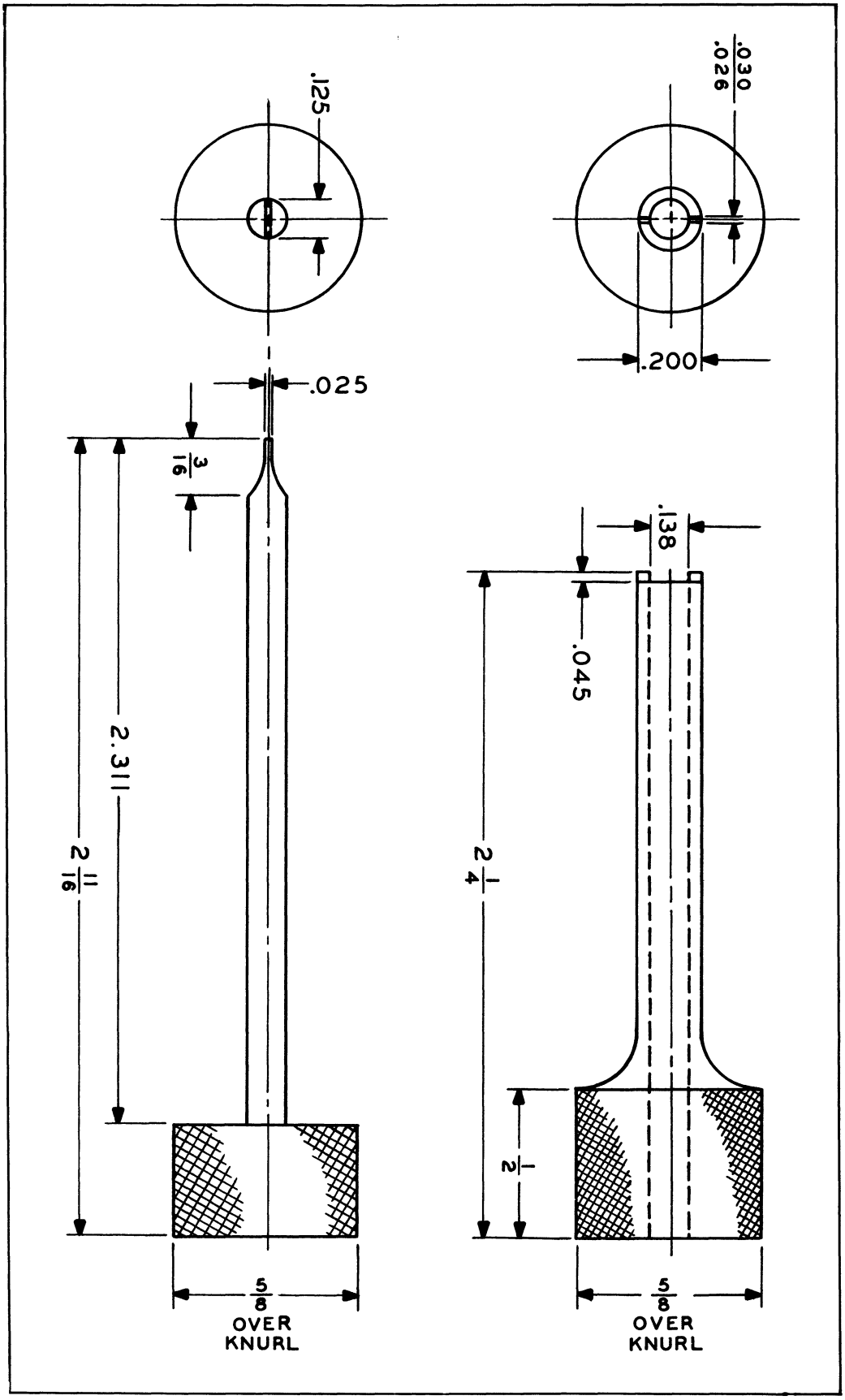

Figure 5-7. 51J-4 VFO Adjustment Tool