

EDITION 2

U.S.: RESTRICTED

Br.: FOR OFFICIAL USE ONLY

T.O. _____

N.T.N. _____

A.P. _____

OPERATING MANUAL

for

AN/ART-13

AIRBORNE RADIO EQUIPMENT

8

Airplane Type _____

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Airplane Type _____

Airplane Number _____

Serial No. 457- 5175

529 9103 00

SECTION I OPERATION

I. FUNCTION OF CONTROLS.

a. The high frequency control knobs are marked "A", "B", "C", "D", and "E", and are located along the lower part of the front panel. These controls are preset for one channel by loosening locking bar in center of knob, rotating control either direction to desired setting, (but approach final setting clockwise), then tightening the locking bar. The CHANNEL switch can then be turned to another channel, and after motor stops, all controls can be preset on another frequency, etc.

CAUTION

Always tighten locking bars before changing channels. Failure to do so will result in loss of dial settings.

b. Knob "A" is the coarse control of the high frequency oscillator. There are 12 high frequency positions, each marked with its frequency coverage in megacycles. Knob "A" also serves in Position 13 as a transfer switch to disconnect the high frequency oscillator and to connect the low frequency oscillator.

c. Knob "B" is the fine tuning control for high frequency operation. It consists of a main tuning knob, calibrated 0-100 which rotates 20 turns for each tuning range, and a small counter dial which counts turns of the large knob. The dial reading is the reading of the counter dial followed by the reading of the large knob. For example, if the counter dial is between 16 and 17, and the large knob is at 43, the dial would be read as 1643.

d. Knob "C" is a coarse antenna tuning control, operating a tap switch. This tap switch changes inductance and capacity in

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various combinations for different frequencies, and to tune different antennas. In general, the dial settings increase with frequency. An interlock on this switch opens the keying relay to reduce arcs as the arm on the tap switch moves between points. It is necessary to set this knob accurately to position to permit the relay to operate.

e. Knob "D" controls fine tuning of the inductive portion of the antenna tuning network. Its scale is graduated 0-100 with maximum inductance occurring at 0 and minimum inductance at 100.

f. Knob "E" controls the capacitive portion of the antenna tuning network. This knob has two scales, graduated 0-100 and 100-200.

Scale on Knob "E"	Capacity	Maximum Capacity at	Minimum Capacity at
100-200	Variable capacitor alone.	100	200
0-100	Variable capacitor plus fixed section to extend range.	0	100

WARNING

Do not leave the knob set in the blank space between scales and do not move Control E across the space between 100 and 200 or between 0 and 100 while the test switch, microphone button or key is closed. An internal switch will be damaged if this precaution is not followed.

g. Knob "F" is the coarse frequency control for the low frequency oscillator. Its six positions are marked directly in frequency coverage.

h. Knob "G" is the fine frequency control for the low frequency oscillator. It rotates 20 turns to cover each range. The dial reading is the reading of the small turn counter, followed by the reading of the large knob. For example, if the turn counter is between 8 and 9, and the large knob is at 32, the dial reading for "G" is 832.

NOTE

It is necessary for Knob "A" to be set at 13 for low frequency operation.

i. The LOCAL-REMOTE switch transfers control of frequency and emission to the panel switches in LOCAL, or to the pilot's control box in REMOTE position.

j. The CHANNEL switch permits selection of the 10 high frequency and 1 low frequency preset channels. In addition, a position marked MANUAL is provided where, if the Autotune system is allowed to operate, the knobs can be rotated freely without disturbing preset positions.

CAUTION

See that locking bars in Knobs "A", "B", "C", "D", and "E" are tight before changing channels.

k. The BATTERY—P. A. GRID—P. A. PLATE switch switches the right-hand meter to the circuits named. For tuning and normal operation, leave this switch in the P. A. PLATE position.

l. The CALIBRATE—TUNE—OPERATE switch turns on the calibrating oscillator and disables the power amplifier in the CALIBRATE position. In TUNE position the equipment is operative at reduced power to prevent damage to the P. A. tube during preliminary tuning. In OPERATE position the

equipment operates at full power. This switch will normally be left in the OPERATE position except during tuning.

m. The EMISSION switch controls type of emission, and also controls battery power. In the OFF position all power to the equipment is turned off.

n. A test key in the upper left-hand corner of the front panel can be used to operate the keying relay for tuning, etc.

o. The CARBON-DYNAMIC microphone switch and the sidetone output control are located behind the calibration chart, and are accessible by releasing the snap-slides on the chart and swinging it outward and upward. The sidetone OUTPUT control varies the sidetone output from one-half volt to 18 volts in 6 steps. Minimum output is at Position 1, and maximum output at Position 6.

p. A pressure operated switch in the dynamotor unit reduces P.A. plate voltage at altitudes above approximately 25,000 feet to reduce the danger of flashover. This function is automatic and requires no attention from the operator. The P.A. PLATE meter circuit is also switched at the same time so that its reading after the switch operates remains the same as before. A sharp change in reading of the antenna meter is the only indication that the pressure switch has operated.

2. LOW FREQUENCY OSCILLATOR INSTALLATION.

a. A Type NX-128/ART-13 dummy unit containing a 28 ohm 10 watt filament substitute resistor is installed in the transmitter in place of the Type 0-16/ART-13 LFO unit.

b. As supplied, the Model AN/ART-13 Transmitter will not operate in the frequen-

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cy range 200 to 1500 kc. If operation in the range 200 to 1500 kc is desired and a Type 0-16/ART-13 LFO Unit is available, proceed as follows:

(1) Remove transmitter cover by inserting coin or screwdriver in holddown screws, making half turn counterclockwise. Lift off cover.

(2) Remove 813 tube V104 by removing plate connector, inserting screwdriver through back of transmitter and using as a lever between tube base and socket, lift out tube.

(3) Using Phillips screwdriver remove two screws, exposed by removal of tube, that hold back of dummy unit.

(4) Loosen all screws along top edge of Autotune cover plate and remove screws at bottom and sides of dummy LFO unit panel.

(5) Lift out dummy unit and insert the Type 0-16/ART-13 LFO unit.

(6) Replace screws removed. Tighten all screws loosened.

(7) Replace tube by orienting base pin with slot in hole above socket and pressing down firmly until tube snaps solidly in socket. Replace plate cap connector.

(8) Attach LFO plate lead from multiplier unit to LFO unit using 5-16 wrench.

(9) The transmitter will now operate in frequency range 200 to 1500 kc.

3. ADJUSTMENT OF TRANSMITTER ON DESIRED FREQUENCY USING INTERNAL CRYSTAL FREQUENCY CALIBRATOR (CFI).

a. GENERAL.

(1) Plug a pair of headphones into the No. 1 sidetone jack on the transmitter, or listen to sidetone through ICS. Sidetone No. 2 cannot be used unless proper external connections have been made through remote jack J106.

(2) Turn LOCAL-REMOTE switch to LOCAL.

(3) Find desired frequency in calibration table, pages 1-16 thru 1-66.

(4) The main frequency controls ("B" for the high frequency range and "G" for the low frequency range) each rotate 20 turns to cover a tuning range. The dial reading given in the table is the number of turns indicated on the small turn counter followed by the dial setting of the large knob. Thus, the dial reading shown in Figure 1 is 1447.

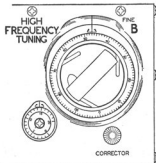


Figure 1. High Frequency Tuning Control

OPERATION

b. FOR FREQUENCIES BETWEEN 200 AND 1500 KC. (Refer to Table I.)

(1) Turn CHANNEL switch to L. FREQ.

(2) Turn EMISSION switch to VOICE.

(3) After motor stops, see that Knob "A" is at Position 13. If not, loosen locking bar, rotate Knob "A" to 13, approaching the setting clockwise through at least one-eighth turn, and tighten locking bar.

(4) Set switch F to the position given in the table for the desired frequency.

(5) Turn CALIBRATE-TUNE-OPERATE switch to CALIBRATE.

(6) Loosen dial lock and turn Knob "G" to the dial setting of the nearest crystal check point, shown in heavy type in the group of frequencies containing the desired frequency. Adjust Knob "G" accurately for zero beat in the headphones.

(7) Leave Knob "G" at zero beat and adjust the CORRECTOR which moves the indicating mark until the dial reading at the mark is correct for the check point.

(8) Turn CALIBRATE-TUNE-OPERATE switch to TUNE.

(9) Turn Knob "G" to the dial setting given in the table for the desired frequency. Tighten dial lock.

(10) The low frequency oscillator is now set on the desired frequency. If it is desired to tune the output and antenna circuits of the transmitter into an antenna, proceed as described on pages 1-9, 1-10 and 1-11.

c. FOR FREQUENCIES BETWEEN 2000 AND 18,100 KC. (Refer to Table II.)

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(1) Turn CHANNEL switch to desired channel.

(2) After motor stops, loosen locking bar on Knob "A". Set this knob to the position shown in the table for the desired frequency, approaching the setting clockwise through at least one-eighth turn, and tighten the locking bar.

(3) Turn CALIBRATE-TUNE-OPERATE switch to CALIBRATE.

(4) Loosen locking bar in Knob "B". Turn Knob "B" to the dial setting of the nearest crystal check point, shown in heavy type in the group of frequencies in the table containing the desired frequency. Adjust Knob "B" accurately for zero beat in the headphones.

(5) Leave Knob "B" at zero beat and adjust the CORRECTOR which moves the indicating mark over "B" until the dial reading at the mark is correct for the check point.

(6) Turn CALIBRATE-TUNE-OPERATE switch to TUNE.

(7) Turn Knob "B" to the dial setting given in the table for the desired frequency. Approach the given dial setting clockwise through at least 20 or 30 degrees. Hold knob on setting and tighten locking bar.

(8) The high frequency oscillator is now set on desired frequency. If it is desired to tune the output and antenna circuits to an antenna, proceed as described on pages 1-11, 1-12, 1-13, 1-14 and 1-15.

d. The calibration tables give dial settings at 2 kc intervals from 200 to 500 kilocycles; 5 kc intervals from 500 to 8000 kilocycles; and 10 kc intervals from 8000 to 18,100 kilocycles. The transmitter can also be set to

frequencies between those given in the table by the following simple method:

(1) Find the difference between the desired frequency and the next lower frequency given in the table.

(2) Multiply this difference by the number given in parenthesis at the right of the column of figures containing the next lower frequency.

(3) Add the product thus obtained to the dial setting given in the table for the next lower frequency. The result is the dial setting for the desired frequency.

(4) Example: It is desired to work on 9653 kilocycles. The next lower frequency given in the table is 9650, and the difference is 3. The number in parenthesis at the right of the column is 0.8. Multiplying 3 by 0.8 gives 2.4. Adding 2.4 to 636, which is the dial setting for the next lower frequency, gives 638.4 as the dial setting for 9653 kilocycles.

4. TUNING INSTRUCTIONS FOR LOW FREQUENCY OPERATION IN THE RANGE 200 KC TO 1500 KC.

a. Knobs "F" and "G" are coarse and fine frequency controls. Knob "A" MUST be set at 13. Knobs "B", "D", and "E" have no effect on low frequency tuning. They will rotate when automatically shifting to low frequency, but their final position is unimportant. Knob "C" must be set to number 8 since this position allows the least power to be dissipated in the high frequency output circuits. All antenna tuning controls are located on the external loading coil.

b. The following procedure is recommended for tuning the equipment on a desired low frequency:

(1) Set transmitter to desired frequency using Knobs "F" and "G". See instructions paragraph 3., b. in this book, and calibration tables, pages 1-16 thru 1-22.

(2) Use loading coil of type shown in following table:

Frequency	"AN" Type	Length of Trailing Wire
200-600 kc	CU-25/ART-13	200 ft.
500-1100 kc	CU-26/ART-13	200 ft.
1100-1500 kc	CU-25/ART-13	150 ft.

(3) Reel out trailing wire antenna to length shown in above table.

(4) Place BATTERY-P.A. GRID-P.A. PLATE switch in P.A. PLATE position.

Place CALIBRATE-TUNE-OPERATE switch in TUNE position.

Place EMISSION switch in CW position.

See that Knob "A" is in Position 13.

(5) Set the tap switch (Knob "K" on CU-25/ART-13) (Knob "H" on CU-26/ART-13) on the loading coil to the desired frequency, using the rough frequency calibration by the knob as a guide.

(6) Press key. Rotate the fine tuning control (Knob "L" on CU-25/ART-13) (Knob "J" on CU-26/ART-13) for minimum P.A. plate meter reading. If no sharp dip is found, move the tap switch on the loading coil one position and retune the fine tuning control. If no dip is found, move the tap switch one position the other way and try again. Set and lock (Knob "L" on CU-25/ART-13) (Knob "J" on CU-26/ART-13) at the position of minimum P.A. Plate meter reading. Release key.

NOTE

The resonant point lowest in frequency must be found to prevent doubling of frequency in the output circuit.

(7) Place CALIBRATE-TUNE-OPERATE switch in OPERATE position. The transmitter is now ready for use.

NOTE

The correct tuning point is at minimum P.A. plate meter reading. The actual value of P.A. plate meter reading is of little importance, and will vary between 20 and 110 on the numbered scale, depending on frequency. DO NOT detune any of the knobs to make the meter read in the CW area on the scale. The transmitter is operated below maximum loading on some low frequencies in order to reduce flash-over troubles in the loading coil and fairlead at high altitudes.

5. TUNING INSTRUCTIONS FOR HIGH FREQUENCY OPERATION IN THE RANGE 2000 KC TO 18,100 KC.

a. Knobs "A" and "B" are coarse and fine frequency controls. Knobs "C", "D", and "E" tune the antenna circuit. Knobs "F" and "G" and all knobs on external loading coils have no effect during high frequency operation.

b. The following procedure is recommended for tuning the equipment to any desired high frequency:

(1) One of the tables of dial settings for "C", "D" and "E" in TABLE III or TABLE IV will be found to be approximately correct for any aircraft antenna installation. To determine which table to use, measure the

length of the antenna taking the total length of wire from the antenna terminal of the T-47/ART-13 transmitter to the extreme end of the antenna (include the length of lead inside the airplane). If the antenna is a "T" disregard the length of wire in the shorter branch at the top of the "T", or, if the two branches are equal, include the length of only one of them.

(2) To check the choice of table, tune up the set on one of the frequencies given in the table for the antenna length nearest that measured above. Choose a frequency which tunes on Position 7 on the C dial. Compare the actual dial settings obtained with the dial settings given in this table and also in the tables for the next shorter and the next longer antenna lengths. Of these three tables the one showing dial settings closest to the actual dial settings is the table to use for this particular installation. The above procedure need only be followed once for a given type of antenna installation. Once the particular table which applies is known, it can be used thereafter.

(3) Set transmitter to desired frequency with Knobs "A" and "B". See instructions paragraph 3, c. in this book, and calibration table pages 1-23 thru 1-66.

(4) Set Knobs "C", "D", and "E" to the dial settings given in the table chosen above for the frequency nearest to the desired frequency. Some of the tables give two sets of dial settings for the same frequency. Use the dial settings which give most nearly correct P.A. plate meter reading when tuned as described below.

(5) Place BATTERY-P.A. GRID-P.A. PLATE switch in P.A. PLATE position.

Place CALIBRATE-TUNE-OPERATE switch in TUNE position.

Place EMISSION switch in CW position.

(6) Press key. Turn Knob "D" for minimum P.A. plate meter reading.

(7) Place CALIBRATE-TUNE-OPERATE switch in OPERATE position. The pointer of the meter reading P.A. plate should be in the white area marked CW. If the needle does not read in the area marked CW, detune Knob "E" a few degrees and retune Knob "D" to minimum P.A. plate meter reading. If the new meter reading is more nearly correct, detune Knob "E" a few more degrees the same direction and retune with Knob "D". If the new meter reading is farther from correct value, detune Knob "E" a few degrees the other way and find dip in P.A. plate meter reading with Knob "D". Continue until the dip in P.A. plate meter reading falls within the area marked CW. Release key.

The object is to make the meter reading at the dip, fall within the white CW area on the meter scale. Knob "E" controls loading while Knob "D" controls fine antenna tuning, but their effects are interlocking. If one knob is turned, it is necessary to readjust the other.

WARNING

The correct tuning is at the minimum dip in P.A. plate meter reading. If meter reading is too low, follow the procedure described above. Do not detune from dip to get the "correct" meter reading. Always tune to the dip in P.A. plate meter reading as the final step.

NOTE

Set Knob "C" accurately to mark.

(8) In the tuning process the knobs have been moved either direction as required.

It is now necessary to set and lock these knobs so the Autotune quick-shift mechanism will retune them automatically to the correct position. Note the setting of Knob "C". Move it one position counter-clockwise, (to next lower number) then back clockwise to the original setting, stopping exactly on the mark. Hold knob and tighten locking bar.

Note the setting of Knob "D". Move it 10 or 15 degrees counterclockwise, then return it clockwise exactly to the original setting. Hold knob and tighten locking bar.

Turn Knob "E" one-eighth turn counterclockwise. Press key. Retune Knob "E" slowly clockwise and stop at minimum P.A. plate meter reading. If you turn past the point of minimum P.A. plate meter reading, back up 20 or 30 degrees and try again. Set Knob "E" at the point of dip in P.A. plate meter reading, hold knob, and tighten locking bar. Release key. The equipment is now tuned and ready for use.

(9) A useful check on accuracy of setup is, after all locking bars are tightened, to turn each knob by hand clockwise against its stop, then press key momentarily and note if the set is correctly tuned. If so, the Autotune quick-shift mechanism will repeat the settings thereafter.

(10) The transmitter can be tuned and loaded with low battery voltage if proper allowance is made so that the loading will not be too high with normal battery voltage. Switch the right-hand meter to read BATTERY and note the meter reading. Switch the meter back to read P.A. PLATE and proceed to tune the antenna as described in paragraph 7 above, but adjust minimum P.A. plate meter reading to the meter reading obtained above rather than to the area marked CW. Thus when the battery voltage

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is low, the transmitter is loaded proportionately low, and the loading will be correct when battery voltage is normal.

(11) All antenna tuning and loading should be done in the CW position. Upon switching to VOICE position the reading of the right-hand meter will increase slightly without modulation, and will kick upwards to about 150 on the scale during normal talking. In the MCW position the meter will read in or near the area marked MCW.

NOTE

Under no circumstances should the transmitter be actually operating (key down or microphone push-button closed) when the EMISSION selector switch is operated. Such operation, especially at high altitudes, can cause an arc to occur and sustain between the contacts of the CW relay.

(12) Antenna tuning data for antennas of various lengths are given in the following table. Use the data in Table III where the lowest desired frequency can be tuned with the particular antenna in use.

(13) If it is necessary to tune to a lower frequency than is possible with the given antenna alone, the Type CU-24/ART-13 shunt capacitors may be connected between the terminals on the transmitter marked COND and GROUND. This additional capacity will extend the tuning range. Antenna tuning data in Table III shows the amount of shunt capacity to use with each antenna to reach 2000 kcs.

IMPORTANT

Use Table III whenever possible. Use Table IV only when shunt capacity must be added to extend antenna tuning range.

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Table I. Frequency 200 to 300 kilocycles

Frequency	A	F	G	Frequency	A	F	G
200	13	1	393	250	13	1	1729
202	13	1	469	252	13	1	1770
204	13	1	540	254	13	1	1810
206	13	1	609	256	13	1	1851
208	13	1	676	258	13	1	1890
210	13	1	739	260	13	1	1929
212	13	1	801	262	13	1	1968
214	13	1	861				
216	13	1	919	262	13	2	175
218	13	1	976	264	13	2	242
220	13	1	1030	266	13	2	305
222	13	1	1084	268	13	2	366
224	13	1	1136	270	13	2	423
				272	13	2	480
226	13	1	1187	274	13	2	533
228	13	1	1237	276	13	2	585
230	13	1	1286	278	13	2	635
232	13	1	1334	280	13	2	684
234	13	1	1381	282	13	2	731
236	13	1	1426	284	13	2	778
238	13	1	1472	286	13	2	823
240	13	1	1515	288	13	2	868
242	13	1	1560	290	13	2	911
244	13	1	1603	292	13	2	953
				294	13	2	995
246	13	1	1646	296	13	2	1035
248	13	1	1688	298	13	2	1075
250	13	1	1729	300	13	2	1114

Use nearest check point shown in heavy type.

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Table I. Frequency 300 to 400 kilocycles

Frequency	A	F	G
300	13	2	1114
302	13	2	1153
304	13	2	1192
306	13	2	1229
308	13	2	1266
310	13	2	1302
312	13	2	1338
314	13	2	1373
316	13	2	1407
318	13	2	1442
320	13	2	1476
322	13	2	1508
324	13	2	1542
(18 divisions per kc)			
326	13	2	1574
328	13	2	1606
330	13	2	1638
332	13	2	1670
334	13	2	1701
336	13	2	1732
338	13	2	1763
340	13	2	1793
342	13	2	1823
344	13	2	1854
346	13	2	1883
348	13	2	1912
350	13	2	1942
352	13	2	1971
354	13	2	2000
356	13	2	2028
(18 divisions per kc)			
358	13	3	154
360	13	3	205
362	13	3	255
364	13	3	302
366	13	3	347
368	13	3	392
370	13	3	434
372	13	3	476
374	13	3	515
376	13	3	555
378	13	3	593
380	13	3	631
382	13	3	668
384	13	3	704
386	13	3	739
388	13	3	774
390	13	3	808
392	13	3	841
394	13	3	874
396	13	3	906
398	13	3	938
400	13	3	970
(12 divisions per kc)			
402	13	3	1000
404	13	3	1030
406	13	3	1061
408	13	3	1090

Use nearest check point shown in heavy type.

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Table I. Frequency 400 to 500 kilocycles

Frequency	A	F	G
400	13	3	1090
402	13	3	1120
404	13	3	1148
406	13	3	1177
408	13	3	1205
410	13	3	1233
412	13	3	1260
414	13	3	1288
416	13	3	1314
418	13	3	1341
420	13	3	1368
422	13	3	1394
424	13	3	1419
(12 divisions per kc)			
426	13	3	1445
428	13	3	1470
430	13	3	1495
432	13	3	1519
434	13	3	1544
436	13	3	1569
438	13	3	1593
440	13	3	1616
442	13	3	1641
444	13	3	1665
446	13	3	1688
448	13	3	1710
450	13	3	1734
452	13	3	1757
454	13	3	1780
456	13	3	1802
(10 divisions per kc)			
458	13	3	1825
460	13	3	1847
462	13	3	1870
464	13	3	1892
466	13	3	1913
468	13	3	1936
470	13	3	1958
472	13	3	1980
474	13	3	2001
476	13	3	2022
(11 divisions per kc)			
478	13	4	191
480	13	4	213
482	13	4	235
484	13	4	257
486	13	4	279
488	13	4	300
490	13	4	321
492	13	4	342
494	13	4	363
496	13	4	383
498	13	4	402
500	13	4	422
(10 divisions per kc)			
502	13	4	442
504	13	4	462
506	13	4	481
508	13	4	499
510	13	4	518

Use nearest check point shown in heavy type.

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Table I. Frequency 500 to 750 kilocycles

Frequency	A	F	G	Frequency	A	F	G
500 13 4	518	630 13 4	1518	635 13 4	1548	640 13 4	1584
505 13 4	555	645 13 4	1618	650 13 4	1655	655 13 4	1691
510 13 4	599	660 13 4	1728	665 13 4	1766	670 13 4	1804
515 13 4	634	675 13 4	1845	680 13 4	1886	685 13 4	1928
520 13 4	697	690 13 4	1976	695 13 4	2023	695 13 5	1566
525 13 4	739	700 13 5	1955	705 13 5	231	710 13 5	269
530 13 4	781	715 13 5	303	720 13 5	338	725 13 5	373
535 13 4	821	730 13 5	406	735 13 5	438	740 13 5	471
540 13 4	862	745 13 5	502	750 13 5	533		
545 13 4	901						
550 13 4	940						
555 13 4	978						
560 13 4	1016						
565 13 4	1053						
570 13 4	1090						
575 13 4	1127						
580 13 4	1163						
585 13 4	1198						
590 13 4	1234						
595 13 4	1270						
600 13 4	1304						
605 13 4	1340						
610 13 4	1375						
615 13 4	1408						
620 13 4	1444						
625 13 4	1479						

Use nearest check point shown in heavy type.

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Table I. Frequency 750 to 1000 kilocycles

Frequency	A	F	G	Frequency	A	F	G
750 13 5	533	885 13 5	1247	910 13 5	1364	915 13 5	1387
755 13 5	565	890 13 5	1270	920 13 5	1410	925 13 5	1433
760 13 5	594	895 13 5	1294	930 13 5	1457	935 13 5	1480
765 13 5	624	900 13 5	1317	940 13 5	1503	945 13 5	1526
770 13 5	654	905 13 5	1341	950 13 5	1550	955 13 5	1574
775 13 5	683	910 13 5	1364	960 13 5	1597	965 13 5	1621
780 13 5	711	915 13 5	1387	970 13 5	1645	975 13 5	1670
785 13 5	739	920 13 5	1410	980 13 5	1694	985 13 5	1718
790 13 5	768	925 13 5	1433	990 13 5	1744	995 13 5	1770
795 13 5	795	930 13 5	1457	1000 13 5	1795		
800 13 5	821						
805 13 5	849						
810 13 5	876						
815 13 5	901						
820 13 5	927						
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865 13 5	1152						
870 13 5	1176						
875 13 5	1199						
880 13 5	1223						

Use nearest check point shown in heavy type.

OPERATION

Table I. Frequency 1000 to 1250 kilocycles

Frequency	A	F	G	Frequency	A	F	G
1000	13	5	1795	1125	13	6	556
1005	13	5	1822	1130	13	6	576
1010	13	5	1850	1135	13	6	596
1015	13	5	1878	1140	13	6	615
1020	13	5	1905	1145	13	6	635
1025	13	5	1935	1150	13	6	656
1030	13	5	1966	1155	13	6	675
1035	13	5	1998	1160	13	6	694
			(2.5 divisions per kc)	1165	13	6	712
1035	13	6	145	1170	13	6	731
1040	13	6	171	1175	13	6	751
1045	13	6	196				
1050	13	6	219	1180	13	6	770
1055	13	6	244	1185	13	6	788
1060	13	6	270	1190	13	6	806
1065	13	6	293	1195	13	6	823
1070	13	6	315	1200	13	6	842
			(4.5 div. per kc)	1205	13	6	860
1075	13	6	338	1210	13	6	878
1080	13	6	363	1215	13	6	895
1085	13	6	385	1220	13	6	913
1090	13	6	407	1225	13	6	930
1095	13	6	428				
1100	13	6	451	1230	13	6	948
1105	13	6	473	1235	13	6	966
1110	13	6	493	1240	13	6	983
1115	13	6	514	1245	13	6	999
1120	13	6	534	1250	13	6	016
			(4.5 div. per kc)				(3.5 div. per kc)

Use nearest check point shown in heavy type.

OPERATION

Table I. Frequency 1250 to 1500 kilocycles

Frequency	A	F	G	Frequency	A	F	G
1250	13	6	1016	1380	13	6	1436
1255	13	6	1032	1385	13	6	1452
1260	13	6	1050	1390	13	6	1468
1265	13	6	1067	1395	13	6	1484
1270	13	6	1084	1400	13	6	1499
1275	13	6	1100	1405	13	6	1514
			(3.4 div. per kc)	1410	13	6	1530
1280	13	6	1116	1415	13	6	1547
1285	13	6	1132	1420	13	6	1563
1290	13	6	1149	1425	13	6	1580
1295	13	6	1166				
1300	13	6	1182	1430	13	6	1595
1305	13	6	1198	1435	13	6	1611
1310	13	6	1214	1440	13	6	1627
1315	13	6	1230	1445	13	6	1644
1320	13	6	1246	1450	13	6	1661
1325	13	6	1262	1455	13	6	1678
			(3.2 divisions per kc)	1460	13	6	1694
1330	13	6	1278	1465	13	6	1710
1335	13	6	1294	1470	13	6	1727
1340	13	6	1309	1475	13	6	1744
1345	13	6	1325				
1350	13	6	1341	1480	13	6	1763
1355	13	6	1358	1485	13	6	1780
1360	13	6	1374	1490	13	6	1797
1365	13	6	1389	1495	13	6	1813
1370	13	6	1404	1500	13	6	1832
1375	13	6	1419				
			(3.1 div. per kc)				(3.5 divisions per kc)

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 2000 to 2250 kilocycles

Frequency	A	B	Frequency	A	B
2000	1	100	2155	1	675
2005	1	119	2160	1	693
2010	1	138	2165	1	713
2015	1	156	2170	1	732
2020	1	174	2175	1	750
2025	1	193	2180	1	769
2030	1	211	2185	1	787
2035	1	230	2190	1	806
2040	1	248	2195	1	824
2045	1	267	2200	1	843
2050	1	285	2205	1	862
			2210	1	880
2055	1	303	2215	1	898
2060	1	322	2220	1	917
2065	1	340	2225	1	935
2070	1	359	2230	1	954
2075	1	377	2235	1	972
2080	1	396	2240	1	991
2085	1	415	2245	1	1009
2090	1	433	2250	1	1027
2095	1	452			
2100	1	470			
2105	1	489			
2110	1	508			
2115	1	526			
2120	1	545			
2125	1	564			
2130	1	582			
2135	1	601			
2140	1	620			
2145	1	638			
2150	1	657			

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 2250 to 2500 kilocycles

Frequency	A	B	Frequency	A	B
2250	1	1027	2375	1	1486
2255	1	1046	2380	1	1504
2260	1	1064	2385	1	1523
2265	1	1083	2390	1	1541
2270	1	1101	2395	1	1560
2275	1	1119	2400	1	1578
2280	1	1138			
2285	1	1156	2400	2	060
2290	1	1174	2405	2	076
2295	1	1193	2410	2	091
2300	1	1211	2415	2	106
2305	1	1229	2420	2	121
2310	1	1247	2425	2	137
2315	1	1265	2430	2	152
2320	1	1284	2435	2	168
2325	1	1302	2440	2	183
2330	1	1321	2445	2	198
2335	1	1339	2450	2	213
2340	1	1357			
2345	1	1376	2455	2	228
2350	1	1394	2460	2	243
			2465	2	259
2355	1	1412	2470	2	274
2360	1	1430	2475	2	290
2365	1	1449	2480	2	305
2370	1	1468	2485	2	320
2400	1	1578	2490	2	335
			2495	2	351
			2500	2	366

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 2500 to 2750 kilocycles

Frequency	A	B	Frequency	A	B
2500	2	366	2600	2	674
2505	2	381	2605	2	782
2510	2	397	2610	2	797
2515	2	412	2615	2	813
2520	2	427	2620	2	828
2525	2	443	2625	2	(3 div. per kc)
2530	2	458	2630	2	844
2535	2	474	2635	2	859
2540	2	489	2640	2	874
2545	2	505	2645	2	890
2550	2	520	2650	2	905
2555	2	535	2655	2	920
2560	2	551	2660	2	935
2565	2	567	2665	2	951
2570	2	590	2670	2	966
2575	2	597	2675	2	981
2580	2	613	2680	2	996
2585	2	628	2685	2	1012
2590	2	644	2690	2	1027
2595	2	659	2695	2	1042
2600	2	674	2700	2	1057
2605	2	690	2705	2	1073
2610	2	705	2710	2	1088
2615	2	721	2715	2	1103
2620	2	736	2720	2	1118
2625	2	756	2725	2	1133
2630	2	767	2730	2	1148
			2735	2	1163
			2740	2	1178
			2745	2	1193
			2750	2	1208

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 2750 to 3000 kilocycles

Frequency	A	B	Frequency	A	B
2750	2	1133	2885	2	1544
2755	2	1148	2890	2	1559
2760	2	1163	2895	2	1574
2765	2	1179	2900	2	1590
2770	2	1194	2905	2	1605
2775	2	1209	2910	2	1621
2780	2	1224	2915	2	1636
2785	2	1239	2920	2	1653
2790	2	1254	2925	2	1668
2795	2	1270	2930	2	1683
2800	2	1285	2935	2	1699
2805	2	1300	2940	2	1715
2810	2	1315	2945	2	1731
2815	2	1330	2950	2	1749
2820	2	1345	2955	2	1763
2825	2	1361	2960	2	1779
2830	2	1376	2965	2	1795
2835	2	1391	2970	2	1811
2840	2	1406	2975	2	1827
2845	2	1421	2980	2	1843
2850	2	1436	2985	2	1860
2855	2	1452	2990	2	1877
2860	2	1469	2995	2	1893
2865	2	1482	3000	2	1910
2870	2	1498			
2875	2	1513			
2880	2	1528			
2900	2	1590			

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 3000 to 3250 kilocycles

Frequency	A	B	Frequency	A	B
3000	3	100	3130	3	420
3005	3	113	3135	3	433
3010	3	126	3140	3	445
3015	3	138	3145	3	457
3020	3	150	3150	3	470
3025	3	162	3155	3	483
3030	3	174	3160	3	496
3035	3	186	3165	3	508
3040	3	198	3170	3	520
3045	3	211	3175	3	532
3050	3	223	3180	3	545
3055	3	235	3185	3	557
3060	3	248	3190	3	569
3065	3	260	3195	3	582
3070	3	272	3200	3	594
3075	3	285	3205	3	606
			3210	3	620
3080	3	297	3215	3	632
3085	3	309	3220	3	644
3090	3	322	3225	3	657
3095	3	334			
3100	3	346	3230	3	669
3105	3	359	3235	3	681
3110	3	371	3240	3	693
3115	3	383	3245	3	706
3120	3	396	3250	3	719
3125	3	408	3300	3	843
3150	3	470			

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 3250 to 3500 kilocycles

Frequency	A	B	Frequency	A	B
3250	3	719	3380	3	1039
3255	3	731	3385	3	1051
3260	3	743	3390	3	1064
3265	3	755	3395	3	1076
3270	3	769	3400	3	1088
3275	3	781	3405	3	1101
3280	3	793	3410	3	1113
3285	3	806	3415	3	1125
3290	3	818	3420	3	1138
3295	3	830	3425	3	1150
3300	3	843	3430	3	1162
3305	3	855	3435	3	1174
3310	3	867	3440	3	1186
3315	3	880	3445	3	1198
3320	3	892	3450	3	1211
3325	3	904	3455	3	1223
3330	3	917	3460	3	1235
3335	3	929	3465	3	1247
3340	3	941	3470	3	1259
3345	3	954	3475	3	1271
3350	3	966	3480	3	1284
3355	3	978	3485	3	1296
3360	3	991	3490	3	1308
3365	3	1003	3495	3	1321
3370	3	1015	3500	3	1333
3375	3	1027	3505	3	1345
			3510	3	1357
			3515	3	1369
			3520	3	1381
			3525	3	1394

Use nearest check point shown in heavy type.

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994000
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999000
1000000

MAINTENANCE INSTALLATION

OPERATION

Table II. Frequency 3500 to 3750 kilocycles

Frequency	A	B	Frequency	A	B
3530	3	1406	3600	4	060
3535	3	1418	3635	4	131
3540	3	1430	3640	4	141
3545	3	1443	3645	4	152
3550	3	1456	3650	4	162
3555	3	1468	3655	4	172
3560	3	1480	3660	4	183
3565	3	1492	3665	4	193
3570	3	1504	3670	4	203
3575	3	1516	3675	4	213
3580	3	1528			
3585	3	1541	3680	4	223
3590	3	1553	3685	4	233
3595	3	1565	3690	4	243
3600	3	1578	3695	4	253
			3700	4	264
3600	4	060	3705	4	275
3605	4	070	3710	4	285
3610	4	080	3715	4	295
3615	4	091	3720	4	305
3620	4	101	3725	4	315
3625	4	116	3730	4	325
3630	4	121	3735	4	335
			3740	4	345
			3745	4	355
			3750	4	366

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 3750 to 4000 kilocycles

Frequency	A	B	Frequency	A	B
3750	4	366	3880	4	633
3755	4	376	3885	4	644
3760	4	386	3890	4	654
3765	4	397	3895	4	664
3770	4	407	3900	4	674
3775	4	417	3905	4	684
3780	4	427	3910	4	694
3785	4	437	3915	4	705
3790	4	447	3920	4	715
3795	4	458	3925	4	725
3800	4	469	3930	4	736
3805	4	479	3935	4	746
3810	4	489	3940	4	756
3815	4	499	3945	4	767
3820	4	509	3950	4	777
3825	4	520			
			3955	4	787
3830	4	530	3960	4	797
3835	4	540	3965	4	807
3840	4	551	3970	4	817
3845	4	561	3975	4	828
3850	4	571	3980	4	838
3855	4	582	3985	4	848
3860	4	592	3990	4	859
3865	4	602	3995	4	869
3870	4	613	4000	4	879
3875	4	623			
3900	4	674			

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 4000 to 4250 kilocycles

Frequency	A	B	Frequency	A	B
4000	5	100	4135	5	349
4005	5	109	4140	5	359
4010	5	119	4145	5	368
4015	5	128	4150	5	377
4020	5	138	4155	5	386
4025	5	147	4160	5	396
4030	5	156	4165	5	405
4035	5	165	4170	5	415
4040	5	174	4175	5	424
4045	5	183	4180	5	433
4050	5	193	4185	5	442
4055	5	202	4190	5	452
4060	5	211	4195	5	461
4065	5	220	4200	5	470
4070	5	230	4205	5	479
4075	5	239	4210	5	489
4080	5	248	4215	5	498
4085	5	257	4220	5	508
4090	5	267	4225	5	517
4095	5	276	4230	5	526
4100	5	285	4235	5	535
			4240	5	545
4105	5	295	4245	5	554
4110	5	303	4250	5	564
4115	5	312			
4120	5	322			
4125	5	331			
4130	5	340			
4200	5	470			

(1.5 divisions per kc)

(1.5 div. per kc)

(1.5 divisions per kc)

OPERATION

Table II. Frequency 4250 to 4500 kilocycles

Frequency	A	B	Frequency	A	B
4200	5	470	4380	5	806
4250	5	564	4385	5	815
4255	5	573	4390	5	824
4260	5	582	4395	5	833
4265	5	591	4400	5	843
4270	5	601	4405	5	852
4275	5	610	4410	5	862
4280	5	620	4415	5	871
4285	5	629	4420	5	880
4290	5	638	4425	5	889
4295	5	647	4430	5	898
4300	5	657	4435	5	907
			4440	5	917
4305	5	666	4445	5	926
4310	5	675	4450	5	935
4315	5	684	4455	5	944
4320	5	693	4460	5	954
4325	5	702	4465	5	963
4330	5	713	4470	5	972
4335	5	722	4475	5	981
4340	5	732	4480	5	991
4345	5	741	4485	5	1000
4350	5	750	4490	5	1009
4355	5	759	4495	5	1018
4360	5	769	4500	5	1027
4365	5	778			
4370	5	787			
4375	5	796			
4400	5	843			

(1.5 divisions per kc)

(1.5 divisions per kc)

(1.5 divisions per kc)

Use nearest check point shown in heavy type.

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 4500 to 4750 kilocycles

Frequency	A	B	Frequency	A	B
4500	5	1027	4600	5	1211
4505	5	1036	4635	5	1275
4510	5	1046	4640	5	1284
4515	5	1055	4645	5	1293
4520	5	1064	4650	5	1302
4525	5	1073	4655	5	1311
4530	5	1083	4660	5	1321
4535	5	1092	4665	5	1330
4540	5	1101	4670	5	1339
4545	5	1110	4675	5	1348
4550	5	1119	4680	5	1357
4555	5	1128	4685	5	1366
4560	5	1138	4690	5	1375
4565	5	1147	4695	5	1385
4570	5	1156	4700	5	1394
4575	5	1165			
4580	5	1174	4705	5	1403
4585	5	1183	4710	5	1412
4590	5	1193	4715	5	1421
4595	5	1202	4720	5	1430
4600	5	1211	4725	5	1439
4605	5	1220	4730	5	1449
4610	5	1229	4735	5	1458
4615	5	1238	4740	5	1468
4620	5	1247	4745	5	1477
4625	5	1256	4750	5	1486
4630	5	1266	4800	5	1578

(1.8 divisions per kc)

(1.8 divisions per kc)

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 4750 to 5000 kilocycles

Frequency	A	B	Frequency	A	B
4750	5	1486	4800	6	060
4755	5	1495	4875	6	176
4760	5	1504	4880	6	183
4765	5	1513	4885	6	191
4770	5	1523	4890	6	198
4775	5	1532	4895	6	206
4780	5	1541	4900	6	213
4785	5	1550			
4790	5	1560	4905	6	221
4795	5	1569	4910	6	228
4800	5	1578	4915	6	236
			4920	6	243
4800	6	060	4925	6	251
4805	6	068	4930	6	259
4810	6	076	4935	6	267
4815	6	084	4940	6	274
4820	6	091	4945	6	282
4825	6	099	4950	6	290
4830	6	106	4955	6	298
4835	6	114	4960	6	305
4840	6	121	4965	6	313
4845	6	129	4970	6	320
4850	6	137	4975	6	328
4855	6	145	4980	6	335
4860	6	152	4985	6	343
4865	6	160	4990	6	351
4870	6	168	4995	6	359
			5000	6	366

(1.8 divisions per kc)

(1.8 divisions per kc)

(1.8 div. per kc)

(1.8 divisions per kc)

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 5000 to 5250 kilocycles

Frequency	A	B	Frequency	A	B
5000	6	366	5135	6	575
5005	6	374	5140	6	582
5010	6	381	5145	6	590
5015	6	389	5150	6	597
5020	6	397	5155	6	605
5025	6	405	5160	6	613
5030	6	412	5165	6	621
5035	6	420	5170	6	628
5040	6	427	5175	6	636
5045	6	435	5180	6	644
5050	6	443	5185	6	652
5055	6	451	5190	6	659
5060	6	458	5195	6	667
5065	6	466	5200	6	674
5070	6	474	5205	6	682
5075	6	482	5210	6	690
5080	6	489	5215	6	698
5085	6	497	5220	6	705
5090	6	505	5225	6	713
5095	6	513	5230	6	721
5100	6	520	5235	6	729
			5240	6	736
			5245	6	744
5105	6	528	5250	6	752
5110	6	535			
5115	6	543			
5120	6	551			
5125	6	559			
5130	6	567			
5200	6	674			

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 5250 to 5500 kilocycles

Frequency	A	B	Frequency	A	B
5200	6	674	5370	6	935
5250	6	752	5375	6	943
5255	6	760	5380	6	951
5260	6	767	5385	6	959
5265	6	775	5390	6	966
5270	6	782	5395	6	974
5275	6	790	5400	6	981
5280	6	797	5405	6	989
5285	6	805	5410	6	996
5290	6	813	5415	6	1004
5295	6	821	5420	6	1012
5300	6	828	5425	6	1020
			5430	6	1027
5305	6	836	5435	6	1035
5310	6	844	5440	6	1042
5315	6	852	5445	6	1050
5320	6	859	5450	6	1057
5325	6	867	5455	6	1065
5330	6	874	5460	6	1073
5335	6	882	5465	6	1081
5340	6	890	5470	6	1088
5345	6	898	5475	6	1096
5350	6	905	5480	6	1103
5355	6	913	5485	6	1111
5360	6	920	5490	6	1118
5365	6	928	5495	6	1126
5400	6	981	5500	6	1133

Use nearest check point shown in heavy type.

5000
5500
6000
6500
7000
7500
8000
9000
10000
11000
12000
13000
14000
15000
16000
17000

MAINTENANCE
INSTALLATION

OPERATION

Table II. Frequency 5500 to 5750 kilocycles

Frequency	A	B	Frequency	A	B
5500	6	1183	5600	6	1285
5505	6	1141	5635	6	1338
5510	6	1148	5640	6	1345
5515	6	1156	5645	6	1353
5520	6	1163	5650	6	1361
5525	6	1171	5655	6	1369
5530	6	1179	5660	6	1376
5535	6	1187	5665	6	1384
5540	6	1194	5670	6	1391
5545	6	1202	5675	6	1399
5550	6	1209	5680	6	1406
5555	6	1217	5685	6	1414
5560	6	1224	5690	6	1421
5565	6	1232	5695	6	1429
5570	6	1239	5700	6	1436
5575	6	1247			
5580	6	1254	5705	6	1444
5585	6	1262	5710	6	1452
5590	6	1270	5715	6	1460
5595	6	1278	5720	6	1467
5600	6	1285	5725	6	1475
5605	6	1293	5730	6	1482
5610	6	1300	5735	6	1490
5615	6	1308	5740	6	1498
5620	6	1315	5745	6	1506
5625	6	1323	5750	6	1513
5630	6	1330	5800	6	1590

(1.5 divisions per kc)

(1.5 divisions per kc)

(1.5 divisions per kc)

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 5750 to 6000 kilocycles

Frequency	A	B	Frequency	A	B
5750	6	1513	5800	6	1590
5755	6	1521	5880	6	1715
5760	6	1528	5885	6	1723
5765	6	1536	5890	6	1731
5770	6	1544	5895	6	1739
5775	6	1552	5900	6	1747
5780	6	1559			
5785	6	1567	5905	6	1755
5790	6	1574	5910	6	1763
5795	6	1582	5915	6	1771
5800	6	1590	5920	6	1779
5805	6	1598	5925	6	1787
5810	6	1605	5930	6	1795
5815	6	1613	5935	6	1803
5820	6	1621	5940	6	1811
5825	6	1629	5945	6	1819
5830	6	1636	5950	6	1827
5835	6	1644	5955	6	1835
5840	6	1653	5960	6	1844
5845	6	1661	5965	6	1852
5850	6	1668	5970	6	1860
5855	6	1676	5975	6	1868
5860	6	1683	5980	6	1877
5865	6	1691	5985	6	1885
5870	6	1699	5990	6	1893
5875	6	1707	5995	6	1901
			6000	6	1910

(1.5 divisions per kc)

(1.5 divisions per kc)

Use nearest check point shown in heavy type.

5500
6000
6500
7000
7500
8000
900
10000
11000
12000
13
14
15000
16000
17000
MAINTENANCE
INSTRUMENTS

OPERATION

Table II. Frequency 6000 to 6250 kilocycles

Frequency	A	B	Frequency	A	B
6000	7	100	6000	7	100
6005	7	106	6130	7	260
6010	7	112	6135	7	267
6015	7	119	6140	7	273
6020	7	125	6145	7	279
6025	7	131	6150	7	285
6030	7	138			(1.2 div. per kc)
6035	7	144	6155	7	291
6040	7	150	6160	7	297
6045	7	156	6165	7	303
6050	7	162	6170	7	309
6055	7	168	6175	7	315
6060	7	174	6180	7	322
6065	7	180	6185	7	328
6070	7	186	6190	7	334
6075	7	193	6195	7	340
6080	7	199	6200	7	346
6085	7	205	6205	7	352
6090	7	211	6210	7	359
6095	7	217	6215	7	365
6100	7	223	6220	7	371
6105	7	230	6225	7	377
6110	7	236	6230	7	383
6115	7	242	6235	7	389
6120	7	248	6240	7	396
6125	7	254	6245	7	402
			6250	7	408
			6300	7	470

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 6250 to 6500 kilocycles

Frequency	A	B	Frequency	A	B
6250	7	408	6300	7	470
6255	7	415	6380	7	570
6260	7	421	6385	7	576
6265	7	427	6390	7	582
6270	7	433	6395	7	588
6275	7	439	6400	7	595
6280	7	445	6405	7	601
6285	7	452	6410	7	607
6290	7	458	6415	7	613
6295	7	464	6420	7	620
6300	7	470	6425	7	626
6305	7	476	6430	7	632
6310	7	482	6435	7	638
6315	7	489	6440	7	644
6320	7	495	6445	7	650
6325	7	501	6450	7	657
6330	7	508			(1.2 divisions per kc)
6335	7	514	6455	7	663
6340	7	520	6460	7	669
6345	7	526	6465	7	675
6350	7	532	6470	7	681
6355	7	538	6475	7	687
6360	7	545	6480	7	693
6365	7	551	6485	7	699
6370	7	557	6490	7	705
6375	7	564	6495	7	713
6400	7	595	6500	7	719
			6600	7	843

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 6500 to 6750 kilocycles

Frequency	A	B	Frequency	A	B
6500	7	719	6600	7	843
6505	7	725	6640	7	892
6510	7	732	6645	7	898
6515	7	738	6650	7	904
6520	7	744	6655	7	910
6525	7	750	6660	7	917
6530	7	756	6665	7	923
6535	7	762	6670	7	929
6540	7	769	6675	7	935
6545	7	775	6680	7	941
6550	7	781	6685	7	947
6555	7	787	6690	7	954
6560	7	793	6695	7	960
6565	7	799	6700	7	966
6570	7	806	6705	7	972
6575	7	812	6710	7	978
6580	7	818	6715	7	984
6585	7	824	6720	7	991
6590	7	830	6725	7	997
6595	7	836	6730	7	1003
6600	7	843	6735	7	1009
6605	7	849	6740	7	1015
6610	7	855	6745	7	1021
6615	7	862	6750	7	1027
6620	7	868			
6625	7	874			
6630	7	880			
6635	7	886			

(1.2 divisions per kc)

(1.2 divisions per kc)

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 6750 to 7000 kilocycles

Frequency	A	B	Frequency	A	B
6750	7	1027	6880	7	1186
6755	7	1033	6885	7	1193
6760	7	1039	6890	7	1199
6765	7	1046	6895	7	1205
6770	7	1052	6900	7	1211
6775	7	1058	6905	7	1217
6780	7	1064	6910	7	1223
6785	7	1070	6915	7	1229
6790	7	1076	6920	7	1235
6795	7	1083	6925	7	1241
6800	7	1089	6930	7	1247
6805	7	1095	6935	7	1253
6810	7	1101	6940	7	1259
6815	7	1107	6945	7	1266
6820	7	1113	6950	7	1272
6825	7	1119	6955	7	1278
6830	7	1125	6960	7	1284
6835	7	1131	6965	7	1290
6840	7	1138	6970	7	1296
6845	7	1144	6975	7	1302
6850	7	1150	6980	7	1308
6855	7	1156	6985	7	1314
6860	7	1162	6990	7	1321
6865	7	1168	6995	7	1327
6870	7	1174	7000	7	1333
6875	7	1180			
6900	7	1211			

(1.2 divisions per kc)

(1.2 divisions per kc)

Use nearest check point shown in heavy type.

6500

7000

7500

8000

9000

10000

11000

12000

13000

14000

15000

16000

17000

18000

19000

20000

MAINTENANCE
INSTRUMENT
LATION TUNING

OPERATION

Table II. Frequency 7000 to 7250 kilocycles

Frequency	A	B	Frequency	A	B
6900	7	1211	7135	7	1498
7000	7	1333	7140	7	1504
7005	7	1339	7145	7	1510
7010	7	1345	7150	7	1516
7015	7	1351	7155	7	1523
7020	7	1357	7160	7	1529
7025	7	1363	7165	7	1535
7030	7	1369	7170	7	1541
7035	7	1376	7175	7	1547
7040	7	1382	7180	7	1553
7045	7	1388	7185	7	1560
7050	7	1394	7190	7	1566
			7195	7	1572
7055	7	1400	7200	7	1578
7060	7	1406			
7065	7	1412	7200	8	060
7070	7	1418	7205	8	065
7075	7	1424	7210	8	070
7080	7	1430	7215	8	076
7085	7	1436	7220	8	081
7090	7	1442	7225	8	086
7095	7	1449	7230	8	091
7100	7	1455	7235	8	096
7105	7	1461	7240	8	101
7110	7	1468	7245	8	106
7115	7	1474	7250	8	111
7120	7	1480			
7125	7	1486			
7130	7	1492			
7200	7	1578			

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 7250 to 7500 kilocycles

Frequency	A	B	Frequency	A	B
7200	8	060	7385	8	248
7250	8	111	7390	8	253
7255	8	116	7395	8	259
7260	8	121	7400	8	264
7265	8	126	7405	8	269
7270	8	131	7410	8	274
7275	8	137	7415	8	279
7280	8	142	7420	8	284
7285	8	147	7425	8	290
7290	8	152	7430	8	295
7295	8	157	7435	8	300
7300	8	162	7440	8	305
7305	8	168	7445	8	310
7310	8	173	7450	8	315
7315	8	178	7455	8	320
7320	8	183	7460	8	325
7325	8	188	7465	8	330
7330	8	193	7470	8	335
7335	8	198	7475	8	340
7340	8	203	7480	8	345
7345	8	208	7485	8	351
7350	8	213	7490	8	356
			7495	8	361
7355	8	218	7500	8	366
7360	8	223			
7365	8	228			
7370	8	233			
7375	8	238			
7380	8	243			
7500	8	366			

Use nearest check point shown in heavy type.

7000
7500
8000
900
10000
11000
12000
13
14
15000
16000
17000
MAINTENANCE
INSTALLATION

OPERATION

Table II. Frequency 7500 to 7750 kilocycles

Frequency	A	B	Frequency	A	B
7500	8	366	7500	8	366 (1 div. per kc)
7505	8	371	7635	8	505
7510	8	376	7640	8	510
7515	8	381	7645	8	515
7520	8	386	7650	8	520 (1 div. per kc)
7525	8	391			
7530	8	397	7655	8	525
7535	8	402	7660	8	530
7540	8	407	7665	8	535
7545	8	412	7670	8	540
7550	8	417	7675	8	545
7555	8	422	7680	8	551
7560	8	427	7685	8	556
7565	8	432	7690	8	561 (1 division per kc)
7570	8	437	7695	8	567
7575	8	443 (1 division per kc)	7700	8	572
7580	8	448	7705	8	577
7585	8	453	7710	8	582 (1 division per kc)
7590	8	458	7715	8	587
7595	8	463	7720	8	592
7600	8	469	7725	8	597
7605	8	474	7730	8	602
7610	8	479	7735	8	607
7615	8	484	7740	8	613
7620	8	489	7745	8	618
7625	8	494	7750	8	623
7630	8	499	7800	8	674

OPERATION

Table II. Frequency 7750 to 8000 kilocycles

Frequency	A	B	Frequency	A	B
7750	8	623	7800	8	674
7755	8	628	7880	8	757
7760	8	633	7885	8	762
7765	8	638	7890	8	767
7770	8	644	7895	8	772
7775	8	649	7900	8	777
7780	8	654	7905	8	782
7785	8	659	7910	8	787 (1 division per kc)
7790	8	664	7915	8	792
7795	8	669 (1 division per kc)	7920	8	797
7800	8	674	7925	8	802
7805	8	679	7930	8	807
7810	8	684	7935	8	813
7815	8	690	7940	8	818
7820	8	695	7945	8	823
7825	8	700 (1 division per kc)	7950	8	828
7830	8	705			
7835	8	710	7955	8	833
7840	8	715	7960	8	838
7845	8	721	7965	8	844
7850	8	726	7970	8	849
7855	8	731	7975	8	854 (1 division per kc)
7860	8	736	7980	8	859
7865	8	741	7985	8	864
7870	8	746	7990	8	869
7875	8	752	7995	8	874
			8000	8	879
			8100	8	981

Use nearest check point shown in heavy type.

Use nearest check point shown in heavy type.

7500
8000
900
10000
11000
12000
13
14
15000
16000
17000
MAINTENANCE
INSTRUMENT
LATION

OPERATION

Table II. Frequency 8000 to 8500 kilocycles

Frequency	A	B	Frequency	A	B
8000	8	879	8260	8	1143
8010	8	890	8270	8	1153
8020	8	900	8280	8	1163
8030	8	910	8290	8	1173
8040	8	920	8300	8	1183
8050	8	930	8310	8	1194
8060	8	940	8320	8	1204
8070	8	951	8330	8	1214
8080	8	961	8340	8	1224
8090	8	971	8350	8	1234
8100	8	981	8360	8	1244
8110	8	991	8370	8	1254
8120	8	1001	8380	8	1264
8130	8	1012	8390	8	1274
8140	8	1022	8400	8	1285
8150	8	1032	8410	8	1295
8160	8	1042	8420	8	1305
8170	8	1052	8430	8	1315
8180	8	1062	8440	8	1325
8190	8	1073	8450	8	1335
8200	8	1083	8460	8	1345
8210	8	1093	8470	8	1355
8220	8	1103	8480	8	1365
8230	8	1113	8490	8	1376
8240	8	1123	8500	8	1386
8250	8	1133			

Use nearest check point shown in heavy type.

OPERATION

Table II. Frequency 8500 to 9000 kilocycles

Frequency	A	B	Frequency	A	B
8400	8	1285	8700	8	1590
8500	8	1386	8760	8	1653
8510	8	1396	8770	8	1663
8520	8	1406	8780	8	1673
8530	8	1416	8790	8	1683
8540	8	1426	8800	8	1694
8550	8	1436	8810	8	1704
		(1 division per kc)	8820	8	1715
8560	8	1446	8830	8	1725
8570	8	1456	8840	8	1736
8580	8	1467	8850	8	1747
8590	8	1477			
8600	8	1487	8860	8	1757
8610	8	1498	8870	8	1768
8620	8	1508	8880	8	1779
8630	8	1518	8890	8	1789
8640	8	1528	8900	8	1799
8650	8	1538	8910	8	1811
8660	8	1548	8920	8	1821
8670	8	1559	8930	8	1832
8680	8	1569	8940	8	1843
8690	8	1579	8950	8	1854
8700	8	1590	8960	8	1865
8710	8	1600	8970	8	1877
8720	8	1610	8980	8	1888
8730	8	1621	8990	8	1899
8740	8	1631	9000	8	1910
8750	8	1641			

Use nearest check point shown in heavy type.

8000

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10000

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209000

210000

211000

OPERATION

Table II. Frequency 9000 to 9500 kilocycles

Frequency	A	B	Frequency	A	B
9000	9	100	9230	9	288
9010	9	108	9240	9	296
9020	9	116	9250	9	304
9030	9	124	9260	9	313
9040	9	132	9270	9	322
9050	9	140	9280	9	330
9060	9	148	9290	9	338
9070	9	156	9300	9	346
9080	9	165	9310	9	354
9090	9	174	9320	9	362
9100	9	182	9330	9	370
9110	9	190	9340	9	378
9120	9	198	9350	9	387
9130	9	206	9360	9	396
9140	9	214	9370	9	404
9150	9	222	9380	9	412
9160	9	230	9390	9	420
9170	9	239	9400	9	428
9180	9	248	9410	9	436
9190	9	256	9420	9	444
9200	9	264	9430	9	452
9210	9	272	9440	9	461
9220	9	280	9450	9	470
			9460	9	478
			9470	9	486
			9480	9	494
			9490	9	502
			9500	9	510

Use nearest check point shown in heavy type.

OPERATION

Table II.
Frequency 9500 to 10000 kilocycles

Frequency	A	B	Frequency	A	B
9450	9	470	9760	9	725
9500	9	510	9770	9	733
9510	9	518	9780	9	742
9520	9	527	9790	9	751
9530	9	536	9800	9	760
9540	9	545	9810	9	769
9550	9	553	9820	9	777
9560	9	561	9830	9	785
9570	9	570	9840	9	793
9580	9	578	9850	9	801
9590	9	586	9860	9	809
9600	9	595	9870	9	817
9610	9	601	9880	9	825
9620	9	610	9890	9	834
9630	9	620	9900	9	843
9640	9	628	9910	9	851
9650	9	636	9920	9	859
9660	9	644	9930	9	867
9670	9	652	9940	9	875
			9950	9	883
			9960	9	891
			9970	9	899
			9980	9	908
			9990	9	917
			10000	9	925
9680	9	660			
9690	9	668			
9700	9	676			
9710	9	684			
9720	9	693			
9730	9	701			
9740	9	709			
9750	9	717			
9900	9	843			

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 10000 to 10500 kilocycles

Frequency	A	B	Frequency	A	B
9900	9	843	10270	9	1146
10000	9	925	10280	9	1154
10010	9	933	10290	9	1162
10020	9	941 (0.8 divisions per kc)	10300	9	1170
10030	9	949	10310	9	1178
10040	9	957	10320	9	1186
10050	9	965	10330	9	1194
10060	9	973 (0.8 divisions per kc)	10340	9	1202
10070	9	982	10350	9	1211
10080	9	991	10360	9	1219 (0.8 divisions per kc)
10090	9	999	10370	9	1227
10100	9	1007	10380	9	1235
10110	9	1015	10390	9	1243
10120	9	1023	10400	9	1251
			10410	9	1259
10130	9	1031	10420	9	1267 (0.8 divisions per kc)
10140	9	1039	10430	9	1275
10150	9	1047	10440	9	1284
10160	9	1055 (0.8 divisions per kc)	10450	9	1292
10170	9	1064	10460	9	1300
10180	9	1072	10470	9	1308
10190	9	1080	10480	9	1316
10200	9	1089	10490	9	1324
10210	9	1097 (0.8 divisions per kc)	10500	9	1333
10220	9	1105			
10230	9	1113 (0.8 divisions per kc)			
10240	9	1121			
10250	9	1129			
10260	9	1138			
10350	9	1211			

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 10500 to 11000 kilocycles

Frequency	A	B	Frequency	A	B
10350	9	1211 (0.8 divisions per kc)	10760	9	1544
10500	9	1333	10770	9	1552
10510	9	1341	10780	9	1560
10520	9	1349	10790	9	1569
10530	9	1357	10800	9	1578 (0.8 div. per kc)
10540	9	1365			
10550	9	1373 (0.8 divisions per kc)	10800	10	060
10560	9	1381	10810	10	066
10570	9	1389	10820	10	072
			10830	10	079
10580	9	1397	10840	10	086
10590	9	1405	10850	10	093
10600	9	1413	10860	10	100
10610	9	1421	10870	10	107
10620	9	1430	10880	10	114
10630	9	1438 (0.8 divisions per kc)	10890	10	121
10640	9	1446	10900	10	127
10650	9	1454	10910	10	134
10660	9	1462	10920	10	141
10670	9	1470 (0.8 divisions per kc)	10930	10	148
10680	9	1478	10940	10	155
10690	9	1486	10950	10	162
10700	9	1494	10960	10	169 (0.45 divisions per kc)
10710	9	1504	10970	10	176
10720	9	1512	10980	10	183
10730	9	1520	10990	10	189
10740	9	1528	11000	10	196
10750	9	1536	11010	10	202
10800	9	1578	11020	10	209

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 11000 to 11500 kilocycles

Frequency	A	B	Frequency	A	B
11030	10	216	11250	10	366
11040	10	223	11260	10	372
11050	10	230	11270	10	378
11060	10	237	11280	10	385
11070	10	243	11290	10	392
11080	10	249	11300	10	399
11090	10	256	11310	10	406
11100	10	264	11320	10	413
11110	10	270	11330	10	420
11120	10	277	11340	10	427
11130	10	284	11350	10	433
11140	10	291	11360	10	440
11150	10	297	11370	10	447
11160	10	305	11380	10	454
11170	10	311	11390	10	462
11180	10	317	11400	10	469
11190	10	324	11410	10	475
11200	10	331	11420	10	482
11210	10	338	11430	10	489
11220	10	345	11440	10	495
11230	10	352	11450	10	503
11240	10	359	11460	10	510
11250	10	366	11470	10	517
			11480	10	524
			11490	10	531
			11500	10	538
			11700	10	674

(0.48 divs. per kc)

OPERATION

Table II.

Frequency 11500 to 12000 kilocycles

Frequency	A	B	Frequency	A	B
11500	10	538	11700	10	674
11510	10	545	11760	10	715
11520	10	551	11770	10	722
11530	10	557	11780	10	729
11540	10	563	11790	10	736
11550	10	570	11800	10	742
11560	10	577	11810	10	748
11570	10	584	11820	10	755
11580	10	591	11830	10	762
11590	10	598	11840	10	769
11600	10	605	11850	10	776
11610	10	613			
11620	10	619	11860	10	783
11630	10	625	11870	10	790
11640	10	632	11880	10	797
11650	10	639	11890	10	803
11660	10	646	11900	10	810
11670	10	653	11910	10	817
11680	10	660	11920	10	824
11690	10	667	11930	10	831
11700	10	674	11940	10	838
11710	10	680	11950	10	845
11720	10	687	11960	10	852
11730	10	694	11970	10	859
11740	10	701	11980	10	866
11750	10	708	11990	10	873
			12000	10	879

(0.48 divs. per kc)

Use nearest check point shown in heavy type.

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 12000 to 12500 kilocycles

Frequency	A	B	Frequency	A	B
12000	11	100	12000	11	100
12010	11	106	12260	11	260
12020	11	112	12270	11	267
12030	11	119	12280	11	273
12040	11	125	12290	11	279
12050	11	131	12300	11	285
12060	11	138			(0.6 div. per kc)
12070	11	144	12310	11	291
12080	11	150	12320	11	297
12090	11	156	12330	11	303
12100	11	162	12340	11	309
12110	11	168	12350	11	315
12120	11	174	12360	11	322
12130	11	180	12370	11	328
12140	11	187	12380	11	334
12150	11	193	12390	11	340
12160	11	199	12400	11	346
12170	11	205	12410	11	352
12180	11	211	12420	11	359
12190	11	217	12430	11	365
12200	11	223	12440	11	371
12210	11	230	12450	11	377
12220	11	236	12460	11	383
12230	11	242	12470	11	389
12240	11	248	12480	11	396
12250	11	254	12490	11	402
			12500	11	408
			12600	11	470

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 12500 to 13000 kilocycles

Frequency	A	B	Frequency	A	B
12500	11	408	12600	11	470
12510	11	415	12760	11	570
12520	11	421	12770	11	576
12530	11	427	12780	11	582
12540	11	433	12790	11	590
12550	11	439	12800	11	595
12560	11	445	12810	11	601
12570	11	452	12820	11	607
12580	11	458	12830	11	613
12590	11	464	12840	11	620
12600	11	470	12850	11	626
12610	11	476	12860	11	632
12620	11	482	12870	11	638
12630	11	489	12880	11	644
12640	11	495	12890	11	650
12650	11	501	12900	11	657
12660	11	508			(0.6 divisions per kc)
12670	11	514	12910	11	663
12680	11	520	12920	11	669
12690	11	526	12930	11	675
12700	11	532	12940	11	681
12710	11	538	12950	11	687
12720	11	545	12960	11	693
12730	11	551	12970	11	699
12740	11	557	12980	11	706
12750	11	564	12990	11	713
			13000	11	719
			13200	11	843

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 13000 to 13500 kilocycles

Frequency	A	B	Frequency	A	B
13000	11	719	13200	11	843
13010	11	725	13280	11	892
13020	11	732	13290	11	898
13030	11	738	13300	11	904
13040	11	744	13310	11	910
13050	11	750	13320	11	917
13060	11	756	13330	11	923
13070	11	762	13340	11	929
13080	11	769	13350	11	935
13090	11	775	13360	11	941
13100	11	781	13370	11	947
13110	11	787	13380	11	954
13120	11	793	13390	11	960
13130	11	799	13400	11	966
13140	11	806	13410	11	972
13150	11	812	13420	11	980
13160	11	818	13430	11	986
13170	11	824	13440	11	991
13180	11	830	13450	11	997
13190	11	836	13460	11	1003
13200	11	843	13470	11	1009
13210	11	849	13480	11	1015
13220	11	855	13490	11	1021
13230	11	862	13500	11	1027
13240	11	868			
13250	11	874			
13260	11	880			
13270	11	886			

(0.6 divisions per kc)

(0.6 divisions per kc)

OPERATION

Table II.

Frequency 13500 to 14000 kilocycles

Frequency	A	B	Frequency	A	B
13500	11	1027	13760	11	1186
13510	11	1033	13770	11	1193
13520	11	1039	13780	11	1199
13530	11	1046	13790	11	1205
13540	11	1052	13800	11	1211
13550	11	1058	13810	11	1217
13560	11	1064	13820	11	1223
13570	11	1070	13830	11	1229
13580	11	1076	13840	11	1235
13590	11	1083	13850	11	1241
13600	11	1089	13860	11	1247
13610	11	1095	13870	11	1253
13620	11	1101	13880	11	1259
13630	11	1107	13890	11	1266
13640	11	1113	13900	11	1272
13650	11	1119	13910	11	1278
13660	11	1125	13920	11	1284
13670	11	1131	13930	11	1290
13680	11	1138	13940	11	1296
13690	11	1144	13950	11	1302
13700	11	1150	13960	11	1308
13710	11	1156	13970	11	1314
13720	11	1162	13980	11	1321
13730	11	1168	13990	11	1327
13740	11	1174	14000	11	1333
13750	11	1180			
13800	11	1211			

(0.6 divisions per kc)

(0.6 divisions per kc)

Use nearest check point shown in heavy type.

Use nearest check point shown in heavy type.

OPERATION
Table II.
Frequency 14000 to 14500 kilocycles

Frequency	A	B	Frequency	A	B
13800	11	1211	14260	11	1492
14000	11	1333	14270	11	1498
14010	11	1339	14280	11	1504
14020	11	1345	14290	11	1510
14030	11	1351	14300	11	1516
14040	11	1357	14310	11	1523
14050	11	1363	14320	11	1529
14060	11	1369	14330	11	1535
14070	11	1376	14340	11	1541
14080	11	1382	14350	11	1547
14090	11	1388	14360	11	1553
14100	11	1394	14370	11	1560
			14380	11	1566
14110	11	1400	14390	11	1572
14120	11	1406	14400	11	1578
14130	11	1412			
14140	11	1418	14400	12	060
14150	11	1424	14410	12	065
14160	11	1430	14420	12	070
14170	11	1436	14430	12	076
14180	11	1442	14440	12	081
14190	11	1449	14450	12	086
14200	11	1455	14460	12	091
14210	11	1461	14470	12	096
14220	11	1468	14480	12	101
14230	11	1474	14490	12	106
14240	11	1480	14500	12	111
14250	11	1486			
14400	11	1578			

OPERATION
Table II.
Frequency 14500 to 15000 kilocycles

Frequency	A	B	Frequency	A	B
14400	12	060	14710	12	218
14500	12	111	14720	12	223
14510	12	116	14730	12	228
14520	12	121	14740	12	233
14530	12	126	14750	12	238
14540	12	131	14760	12	243
14550	12	137	14770	12	248
14560	12	142	14780	12	253
14570	12	147	14790	12	259
14580	12	152	14800	12	264
14590	12	157	14810	12	269
14600	12	162	14820	12	274
14610	12	168	14830	12	279
14620	12	173	14840	12	284
14630	12	178	14850	12	290
14640	12	183	14860	12	295
14650	12	188	14870	12	300
14660	12	193	14880	12	305
14670	12	198	14890	12	310
14680	12	203	14900	12	315
14690	12	208	14910	12	320
14700	12	213	14920	12	325
			14930	12	330
			14940	12	335
			14950	12	340
			14960	12	345
			14970	12	351
			14980	12	356
			14990	12	361
			15000	12	366

Use nearest check point shown in heavy type.

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 15000 to 15500 kilocycles

Frequency	A	B	Frequency	A	B
15000	12	366	15000	12	366
15010	12	371	15260	12	499
15020	12	376	15270	12	505
15030	12	381	15280	12	510
15040	12	386	15290	12	515
15050	12	391	15300	12	520
15060	12	397			(0.5 div. per kc)
15070	12	402	15310	12	525
15080	12	407	15320	12	530
15090	12	412	15330	12	535
15100	12	417	15340	12	540
15110	12	422	15350	12	545
15120	12	427	15360	12	551
15130	12	432	15370	12	556
15140	12	437	15380	12	561
15150	12	443	15390	12	567
15160	12	448	15400	12	572
15170	12	453	15410	12	577
15180	12	458	15420	12	582
15190	12	463	15430	12	587
15200	12	469	15440	12	592
15210	12	474	15450	12	597
15220	12	479	15460	12	602
15230	12	484	15470	12	607
15240	12	489	15480	12	613
15250	12	494	15490	12	618
			15500	12	623
			15600	12	674

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 15500 to 16000 kilocycles

Frequency	A	B	Frequency	A	B
15500	12	623	15600	12	674
15510	12	628	15770	12	762
15520	12	633	15780	12	767
15530	12	638	15790	12	772
15540	12	644	15800	12	777
15550	12	649	15810	12	782
15560	12	654	15820	12	787
15570	12	659	15830	12	792
15580	12	664	15840	12	797
15590	12	669	15850	12	802
15600	12	674	15860	12	807
15610	12	679	15870	12	813
15620	12	684	15880	12	818
15630	12	689	15890	12	823
15640	12	694	15900	12	828
15650	12	699			(0.5 divisions per kc)
15660	12	705	15910	12	833
15670	12	710	15920	12	838
15680	12	715	15930	12	844
15690	12	721	15940	12	849
15700	12	726	15950	12	854
15710	12	731	15960	12	859
15720	12	736	15970	12	864
15730	12	741	15980	12	869
15740	12	746	15990	12	874
15750	12	752	16000	12	879
15760	12	757	16200	12	981

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 16000 to 16500 kilocycles

Frequency	A	B	Frequency	A	B
16000	12	879	16200	12	981
16010	12	884	16260	12	1012
16020	12	890	16270	12	1017
16030	12	895	16280	12	1022
16040	12	900	16290	12	1027
16050	12	905	16300	12	1032
16060	12	910	16310	12	1037
16070	12	915	16320	12	1042
16080	12	920	16330	12	1047
16090	12	925	16340	12	1052
16100	12	930	16350	12	1057
16110	12	935	16360	12	1062
16120	12	940	16370	12	1067
16130	12	945	16380	12	1073
16140	12	951	16390	12	1078
16150	12	956	16400	12	1083
16160	12	961	16410	12	1088
16170	12	966	16420	12	1093
16180	12	971	16430	12	1098
16190	12	976	16440	12	1103
16200	12	981	16450	12	1108
16210	12	986	16460	12	1113
16220	12	991	16470	12	1118
16230	12	996	16480	12	1123
16240	12	1001	16490	12	1128
16250	12	1006	16500	12	1133

(0.5 divisions per kc)

(0.5 divisions per kc)

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 16500 to 17000 kilocycles

Frequency	A	B	Frequency	A	B
16500	12	1133	16760	12	1264
16510	12	1138	16770	12	1270
16520	12	1143	16780	12	1275
16530	12	1148	16790	12	1280
16540	12	1153	16800	12	1285
16550	12	1158	16810	12	1290
16560	12	1163	16820	12	1295
16570	12	1168	16830	12	1300
16580	12	1173	16840	12	1305
16590	12	1179	16850	12	1310
16600	12	1184	16860	12	1315
16610	12	1189	16870	12	1320
16620	12	1194	16880	12	1325
16630	12	1199	16890	12	1330
16640	12	1204	16900	12	1335
16650	12	1209	16910	12	1340
16660	12	1214	16920	12	1345
16670	12	1219	16930	12	1350
16680	12	1224	16940	12	1355
16690	12	1229	16950	12	1361
16700	12	1234	16960	12	1366
16710	12	1239	16970	12	1371
16720	12	1244	16980	12	1376
16730	12	1249	16990	12	1381
16740	12	1254	17000	12	1386
16750	12	1259			
16800	12	1285			

(0.5 divisions per kc)

(0.5 divisions per kc)

Use nearest check point shown in heavy type.

16000

17000

MAINTENANCE LATION TUNING

OPERATION

Table II.

Frequency 17000 to 17550 kilocycles

Frequency	A	B	Frequency	A	B
16800	12	1285	17300	12	1538
17000	12	1386	17310	12	1544
17010	12	1391	17320	12	1549
17020	12	1396	17330	12	1554
17030	12	1401	17340	12	1559
17040	12	1406	17350	12	1564
17050	12	1411	17360	12	1569
17060	12	1416	17370	12	1574
17070	12	1421	17380	12	1579
17080	12	1426	17390	12	1584
17090	12	1431	17400	12	1590
17100	12	1436	17410	12	1595
17110	12	1441	17420	12	1600
17120	12	1446	17430	12	1605
17130	12	1452	17440	12	1610
17140	12	1457	17450	12	1615
17150	12	1462	17460	12	1621
17160	12	1467	17470	12	1626
17170	12	1472	17480	12	1631
17180	12	1477	17490	12	1636
17190	12	1482	17500	12	1641
17200	12	1487	17510	12	1647
17210	12	1492	17520	12	1653
17220	12	1498	17530	12	1658
17230	12	1503	17540	12	1663
17240	12	1508	17550	12	1668
17250	12	1513			
17260	12	1518			
17270	12	1523			
17280	12	1528			
17290	12	1533			
17400	12	1590			

Use nearest check point shown in heavy type.

OPERATION

Table II.

Frequency 17550 to 18100 kilocycles

Frequency	A	B	Frequency	A	B
17400	12	1590	17810	12	1805
17550	12	1668	17820	12	1811
17560	12	1673	17830	12	1816
17570	12	1678	17840	12	1821
17580	12	1683	17850	12	1827
17590	12	1688	17860	12	1832
17600	12	1694	17870	12	1837
17610	12	1699	17880	12	1843
17620	12	1704	17890	12	1848
17630	12	1709	17900	12	1854
17640	12	1715	17910	12	1860
17650	12	1720	17920	12	1865
17660	12	1725	17930	12	1871
17670	12	1731	17940	12	1877
17680	12	1736	17950	12	1882
17690	12	1742	17960	12	1888
17700	12	1747	17970	12	1893
17710	12	1752	17980	12	1898
17720	12	1757	17990	12	1904
17730	12	1763	18000	12	1910
17740	12	1768	18010	12	1915
17750	12	1773	18020	12	1921
17760	12	1779	18030	12	1927
17770	12	1784	18040	12	1933
17780	12	1789	18050	12	1939
17790	12	1795	18060	12	1944
17800	12	1800	18070	12	1949
18000	12	1910	18080	12	1955
			18090	12	1961
			18100	12	1966

Use nearest check point shown in heavy type.

OPERATION

Table III. Antenna Tuning

20 Ft. Antenna

22.5 Ft. Antenna

Type Airplane:

Type Airplane:

KC	C	D	E
3000	1-2	...	70
3500	2-3	...	115
4000	3-4	...	130
5000	4-5	70	150
6000	5-6	45	170
8000	6-7	30	185
10000	7	75	190
11000	7	90	200
11300	7	100	200

10500	11	67	200
11000	11	75	200
11500	11	85	200
12000	11	100	200
12000	11	75	30
13000	11	75	140
14000	11	80	164
15000	11	85	170

11500	12	60	10
12000	12	55	60
13000	12	55	155
14000	12	60	180
16000	12	75	190
18000	12	85	200

16000	13	60	150
17000	13	65	170
18000	13	65	180

KC	C	D	E
2800	1-2	...	70
3000	1-2	...	70
3500	2-3	...	120
4000	3-4	...	130
5000	4-5	90	150
6000	5-6	60	160
8000	6-7	40	185
10000	7	80	200

9500	11	60	200
10000	11	65	200
10500	11	77	200
11000	11	94	200
11000	11	64	66
12000	11	65	150
13000	11	68	165
14000	11	75	180
15000	11	80	180

11500	12	38	145
12000	12	40	170
13000	12	45	190
14000	12	65	200
16000	12	75	200

16000	13	40	170
17000	13	60	175
18000	13	65	185

OPERATION

Table III. Antenna Tuning

25 Ft. Antenna

27.5 Ft. Antenna

Type Airplane:

Type Airplane:

KC	C	D	E
2700	1-2	...	10
3000	2-3	...	60
3500	3-4	...	100
4000	4-5	...	125
5000	5-6	...	150
6000	6	80	160
8000	6-7	70	180
9800	7	100	200

9000	10	75	200
9500	10	85	200
9500	10	65	0
10000	10	65	55
11000	10	65	150
12000	10	70	170
14000	10	85	180
15000	10	95	190

11000	11	53	160
12000	11	55	180
14000	11	70	200
15000	11	80	200
16000	11	95	200

15000	13	0	155
16000	13	0	180
17000	13	35	190
18000	13	55	195

KC	C	D	E
2600	1	...	0
3000	2	...	75
3500	3-4	...	110
4000	4-5	...	130
5000	6	...	150
6000	6-7	...	165
8000	7	70	190
9100	7	100	200

9000	10	59	10
9500	10	57	80
10000	10	55	110
11000	10	60	175
12000	10	65	185
14000	10	80	195
15500	10	100	195

9000	11	45	40
10000	11	40	140
12000	11	55	195
14000	11	75	200
16500	11	95	200

16000	13	0	180
17000	13	45	190
18000	13	60	195

OPERATION

Table III. Antenna Tuning

27.5 Ft. Antenna

30 Ft. Antenna

Type Airplane:

Type Airplane:

KC	C	D	E
2600	1	...	0
3000	2	...	75
3500	3-4	...	110
4000	4-5	...	130
5000	6	...	150
6000	6-7	...	165
8000	7	70	190
9100	7	100	200
9000	10	59	10
9500	10	57	80
10000	10	55	110
11000	10	60	175
12000	10	65	185
14000	10	80	195
15500	10	100	195
9000	11	45	40
10000	11	40	140
12000	11	55	195
14000	11	75	200
16500	11	95	200
16000	13	0	180
17000	13	45	190
18000	13	60	195

KC	C	D	E
2500	1-2	...	20
3000	3-4	...	70
3500	4	...	95
4000	4-5	...	120
5000	5-6	...	145
6000	6-7	...	165
8000	7	95	180
8500	7	100	200
8200	10	48	0
9000	10	48	130
10000	10	50	170
11000	10	55	200
12000	10	63	200
14000	10	82	200
15000	10	92	200
15600	10	98	200
8000	11	62	110
10000	11	32	180
12000	11	45	200
14000	11	65	200
16000	11	90	200
16600	11	98	200
16000	13	0	184
17000	13	45	188
18000	13	70	188

DO NOT USE ANTENNA CAPACITOR

OPERATION

Table III. Antenna Tuning

32.5 Ft. Antenna

35 Ft. Antenna

Type Airplane:

Type Airplane:

KC	C	D	E
2450	1-2	...	26
3000	3	...	65
3500	4-5	...	100
4000	5	...	120
5000	5-6	...	150
6000	6-7	...	165
8000	7	100	200
7600	10	36	0
8000	10	37	90
9000	10	42	160
10000	10	46	185
11000	10	54	200
12000	10	65	200
13000	10	75	200
14000	10	82	200
14600	10	88	200
8000	11	0	113
9000	11	22	168
10000	11	35	188
11000	11	47	200
12000	11	60	200
14000	11	78	200
16000	11	100	188
16200	11	100	200
16000	13	52	165
16500	13	69	160
17000	13	70	170
18000	13	75	180

KC	C	D	E
2400	1-2	...	0
3000	3-4	...	70
3500	4-5	...	100
4000	5-6	...	120
5000	6-7	...	145
6000	7	...	160
7000	7	...	180
7600	7	100	200
7500	8	70	0
8000	8	75	40
9000	8	85	62
10000	8	100	100
10400	8	100	126
8700	11	0	175
9000	11	8	180
10000	11	28	200
11000	11	52	200
12000	11	62	200
14000	11	77	200
15000	11	86	200
15700	11	100	190
15000	13	0	166
16000	13	66	152
17000	13	84	142
18000	13	100	154

DO NOT USE ANTENNA CAPACITOR

OPERATION

Table III. Antenna Tuning

35 Ft. Antenna

Type Airplane:

40 Ft. Antenna

Type Airplane:

KC	C	D	E
2400	1-2	...	0
3000	3-4	...	70
3500	4-5	...	100
4000	5-6	...	120
5000	6-7	...	145
6000	7	...	160
7000	7	...	180
7600	7	100	200
7500	8	70	0
8000	8	75	40
9000	8	85	62
10000	8	100	100
10400	8	100	126
8700	11	0	175
9000	11	8	180
10000	11	28	200
11000	11	52	200
12000	11	62	200
14000	11	77	200
15000	11	86	200
15700	11	100	190
15000	13	0	166
16000	13	66	152
17000	13	84	142
18000	13	100	154

DO NOT USE ANTENNA CAPACITOR

OPERATION

Table III. Antenna Tuning

45 Ft. Antenna

Type Airplane:

50 Ft. Antenna

Type Airplane:

KC	C	D	E
2200	1-2	...	0
2500	2-3	...	20
3000	4-5	...	62
3500	5-6	...	90
4000	6	...	120
5000	7	...	155
6000	7	100	175
6100	7	100	185
6000	8	49	0
7000	8	59	106
8000	8	69	129
9000	8	85	106
9800	8	100	90
7500	10	0	171
8000	10	0	185
9000	10	38	193
10000	10	53	200
11000	10	64	200
12000	10	73	200
13000	10	83	200
13740	10	100	182
13500	12	66	200
14000	12	70	200
15000	12	82	92
16000	12	85	125
17000	12	87	164
18000	12	86	195

KC	C	D	E
2100	1-2	...	0
2500	3-4	...	19
3000	4-5	...	55
3500	5-6	...	95
4000	6-7	...	120
5000	7	...	160
5500	7	100	180
5400	8	32	0
6000	8	38	90
7000	8	48	148
8000	8	65	152
9000	8	85	148
10000	8	92	142
9000	11	29	200
10000	11	40	200
11000	11	53	200
12000	11	72	200
13000	11	82	200
14000	11	100	0
15000	11	98	185
13500	13	37	28
14000	13	45	52
15000	13	52	125
16000	13	69	186
17000	13	71	164
18000	13	68	184

DO NOT USE ANTENNA CAPACITOR

OPERATION

Table III. Antenna Tuning

50 Ft. Antenna

55 Ft. Antenna

Type Airplane:

Type Airplane:

KC	C	D	E
2100	1-2	...	0
2500	3-4	...	19
3000	4-5	...	55
3500	5-6	...	95
4000	6-7	...	120
5000	7	...	160
5500	7	...	100
5400	8	32	0
6000	8	38	90
7000	8	48	148
8000	8	65	152
9000	8	85	143
10000	8	92	142
9000	11	29	200
10000	11	40	200
11000	11	58	200
12000	11	72	200
13000	11	82	200
14000	11	100	0
15000	11	98	135
13500	13	37	28
14000	13	45	52
15000	13	52	125
16000	13	69	136
17000	13	71	164
18000	13	68	184

KC	C	D	E
2000	1-2	...	0
2500	3-4	...	15
3000	4-5	...	45
3500	5-6	...	100
4000	6-7	...	130
5000	7	100	168
5170	7	100	181
5000	8	15	0
6000	8	35	126
7000	8	51	152
8000	8	64	160
9000	8	81	136
9700	8	100	106
9500	9	62	198
10000	9	68	195
11000	9	87	171
11500	9	100	165
11200	10	78	200
12000	10	90	161
12200	10	100	82
12100	12	60	200
13000	12	62	133
14000	12	63	183
15000	12	68	200
14800	13	0	155
15000	13	0	160
16000	13	45	169
17000	13	62	177
18000	13	72	185

DO NOT USE ANTENNA CAPACITOR

OPERATION

Table III. Antenna Tuning

60 Ft. Antenna

Type Airplane:

KC	C	D	E
2000	1-2	...	0
2500	3-4	...	15
3000	5-6	...	55
3500	6-7	...	90
4000	7	...	125
4800	7	100	178
4750	8	0	0
5000	8	4	60
6000	8	22	155
7000	8	44	170
8000	8	63	164
9000	8	80	150
9700	8	100	120
8000	9	39	290
9000	9	58	290
10000	9	74	186
10880	9	100	123
10500	10	65	200
11000	10	78	181
11350	10	89	0
11290	11	74	200
12000	11	75	190
11600	12	59	30
12000	12	50	141
13000	12	49	197
15000	12	71	200
17000	12	85	200
18000	12	94	200

DO NOT USE ANTENNA CAPACITOR

OPERATION

Table IV. Antenna Tuning

20 Ft. Antenna

22.5 Ft. Antenna

Type Airplane:

Type Airplane:

Use 75 mmfd capacitor
(3 sections)

Use 75 mmfd capacitor
(3 sections)

Freq. C D E

Freq. C D E

2100	1	—	0
2500	3-4	—	0
3000	4-5	—	30
3500	5-6	—	52
4000	6	—	65
5000	6-7	—	102
6000	7	50	118
8000	7	72	146
10000	7	90	168
10500	7	100	174
10000	10	75	200
10500	10	85	200
11000	10	94	200
11300	10	100	200
11100	11	76	200
11600	11	95	200
11600	11	75	0
12000	11	75	80
13000	11	80	142
14000	11	86	180
15000	11	92	200
14500	13	0	164
15000	13	0	180
16000	13	66	185
17000	13	84	190
17700	13	100	200

2100	1	—	0
2500	2-3	—	20
3000	4-5	—	45
3500	5-6	—	62
4000	6	—	80
5000	6-7	—	108
6000	7	48	120
7000	7	65	132
8000	7	76	149
10000	7	94	184
10400	7	100	200
10000	10	81	200
10450	10	100	200
10450	10	73	0
11000	10	76	75
12000	10	82	160
13000	10	88	178
14000	10	96	195
14100	10	100	200
14000	13	0	140
14500	13	0	176
15000	13	30	200
16000	13	67	200
17000	13	85	200
17600	13	100	200

USE THESE DATA ONLY IF ONE OR MORE CHANNELS IS BETWEEN 2000 AND 3000 KCS, OTHERWISE SEE PAGE 1-46.

OPERATION

Table IV. Antenna Tuning

25 Ft. Antenna

27.5 Ft. Antenna

Type Airplane:

Type Airplane:

Use 75 mmfd capacitor
(3 sections)

Use 75 mmfd capacitor
(3 sections)

Freq. C D E

Freq. C D E

2160	1-2	—	0
2500	2-3	—	28
3000	4-5	—	50
3500	5-6	—	65
4000	6-7	—	80
5000	6-7	—	106
6000	7	44	125
7000	7	64	140
9000	7	80	184
9500	7	90	200
9500	10	65	0
10000	10	66	92
11000	10	68	166
12000	10	74	184
13000	10	82	192
14000	10	90	200
14500	10	100	200
14400	13	0	162
14500	13	0	164
15000	13	0	181
16000	13	51	200
17000	13	73	200
18000	13	89	200

2130	1-2	—	0
2500	2-3	—	20
3000	4-5	—	44
3500	5-6	—	65
4000	6	—	85
5000	6-7	—	116
6000	7	52	138
7000	7	65	154
8000	7	75	174
8800	7	86	200
8800	10	58	0
9000	10	59	40
10000	10	62	156
11000	10	63	191
12000	10	75	200
13000	10	84	200
14000	10	92	200
14400	10	100	200
13000	11	76	200
14000	11	85	200
15000	11	94	200
15600	11	100	200
14400	13	0	161
15000	13	0	186
16000	13	56	200
17000	13	76	200
18000	13	90	200

USE THESE DATA ONLY IF ONE OR MORE CHANNELS IS BETWEEN 2000 AND 2500 KCS, OTHERWISE SEE PAGE 1-46.

OPERATION

Table IV. Antenna Tuning

27.5 Ft. Antenna

Type Airplane:

30 Ft. Antenna

Type Airplane:

Use 75 mmfd capacitor
(3 sections)

Freq.	C	D	E
2130	1-2	—	0
2500	2-3	—	20
3000	4-5	—	44
3500	5-6	—	65
4000	6	—	85
5000	6-7	—	116
6000	7	52	138
7000	7	65	154
8000	7	75	174
8800	7	86	200
9800	10	58	0
9000	10	59	40
10000	10	62	156
11000	10	63	191
12000	10	75	200
13000	10	84	200
14000	10	92	200
14400	10	100	200
13000	11	76	200
14000	11	85	200
15000	11	94	200
15600	11	100	200
14400	13	0	161
15000	13	0	186
16000	13	56	200
17000	13	76	200
18000	13	90	200

Use 75 mmfd capacitor
(3 sections)

Freq.	C	D	E
2100	1	—	0
2500	2-3	—	30
3000	4-5	—	48
3500	5-6	—	64
4000	6	—	80
5000	6-7	—	121
6000	7	54	138
7000	7	71	152
8000	7	81	186
8350	7	100	200
8100	10	50	0
8500	10	50	88
9000	10	52	138
10000	10	55	165
11000	10	66	200
12000	10	76	200
13000	10	85	200
13500	10	89	200
14000	10	93	200
13500	11	81	200
14000	11	85	200
14500	11	89	200
15000	11	93	200
14800	13	0	180
15000	13	0	188
15500	13	41	200
16000	13	58	200
17000	13	76	200
18000	13	91	200

USE THESE DATA ONLY IF ONE OR MORE CHANNELS IS BETWEEN 2000 AND 2400 KCS. OTHERWISE SEE PAGE 1-68.

OPERATION

Table IV. Antenna Tuning

32.5 Ft. Antenna

Type Airplane:

35 Ft. Antenna

Type Airplane:

Use 50 mmfd capacitor
(2 sections)

Freq.	C	D	E
2100	1-2	—	0
2500	3-4	—	10
3000	4-5	—	44
3500	5-6	—	70
4000	6-7	—	90
5000	7	—	124
6000	7	55	144
7000	7	70	173
7790	7	90	200
7650	9	60	0
8000	9	64	60
9000	9	69	112
10000	9	74	169
11000	9	81	179
12000	9	90	179
12500	9	100	180
11000	10	69	200
12000	10	78	200
13000	10	86	200
14000	10	95	200
14100	10	100	200
13000	11	79	200
14000	11	86	200
15000	11	94	200
15800	11	100	200
15000	13	5	200
16000	13	60	200
17000	13	86	164
18000	13	100	185

Use 50 mmfd capacitor
(2 sections)

Freq.	C	D	E
2150	1	—	0
2500	2-3	—	22
3000	4-5	—	60
3500	5-6	—	85
4000	6-7	—	110
5000	7	32	128
6000	7	56	156
7000	7	75	184
7435	7	95	200
7200	9	54	0
7500	9	58	49
8000	9	60	112
9000	9	67	142
10000	9	72	160
11000	9	80	176
12000	9	88	178
13000	9	100	181
10000	10	53	200
11000	10	65	200
12000	10	74	200
13000	10	82	200
14000	10	90	200
14600	10	100	200
14500	13	0	160
15000	13	0	178
16000	13	70	156
17000	13	90	180
17700	13	100	146

USE THESE DATA ONLY IF ONE OR MORE CHANNELS IS BETWEEN 2000 AND 2400 KCS. OTHERWISE SEE PAGE 1-70.

OPERATION

Table IV. Antenna Tuning

35 Ft. Antenna

40 Ft. Antenna

Type Airplane:

Type Airplane:

Use 50 mmfd capacitor
(2 sections)

Use 50 mmfd capacitor
(2 sections)

Freq.	C	D	E
2150	1	—	0
2500	2-3	—	22
3000	4-5	—	60
3500	5-6	—	85
4000	6-7	—	110
5000	7	32	128
6000	7	56	156
7000	7	75	184
7435	7	95	200

7200	9	54	0
7500	9	58	49
8000	9	60	112
9000	9	67	142
10000	9	72	160
11000	9	80	176
12000	9	88	178
13000	9	100	181

10000	10	53	200
11000	10	65	200
12000	10	74	200
13000	10	82	200
14000	10	90	200
14600	10	100	200

14500	13	0	160
15000	13	0	178
16000	13	70	156
17000	13	90	130
17700	13	100	146

USE THESE DATA ONLY IF ONE OR MORE CHANNELS
IS BETWEEN 2000 AND 2400 KCS. OTHERWISE SEE
PAGE 1-71.

OPERATION

Table IV. Antenna Tuning

45 Ft. Antenna

50 Ft. Antenna

Type Airplane:

Type Airplane:

Use 25 mmfd capacitor
(1 section)

Use 25 mmfd capacitor
(1 section)

Freq.	C	D	E
2050	1-2	—	0
2500	3-4	—	33
3000	4-5	—	70
3500	5-6	—	111
4000	6	—	132
5000	7	43	160
5500	7	54	180
5900	7	60	200

5800	9	27	0
6000	9	30	42
7000	9	42	138
8000	9	55	158
9000	9	67	165
10000	9	74	170
11000	9	83	173
12000	9	100	150
12200	9	100	173

12000	11	70	200
13000	11	80	200
14000	11	91	153
14400	11	100	110

14000	12	75	200
15000	12	82	75
16000	12	85	143
17000	12	89	174
18000	12	92	200

USE THESE DATA ONLY IF ONE OR MORE CHANNELS
IS BETWEEN 200 AND 2000 KCS. OTHERWISE SEE
PAGE 1-71.

INSTALLATION

a. Figure 3 shows a complete AN/ART-13 installation. This drawing shows all accessories, including low frequency oscillator, low frequency loading coil, shunt antenna capacitors, pilot's control box, etc.

b. In some installations certain of these accessories can be omitted. If low frequency operation is not required, the low frequency loading coil and its connecting leads can be omitted.

c. The shunt antenna capacitors can be omitted if the fixed antenna is large enough to work at the lowest desired operating frequency in the 2000-18,100 kc. range.

<u>Lowest desired operating frequency:</u>	<u>Capacity of antenna at this frequency must be at least:</u>
2000 kc.	175 mmfd.
2200 kc.	125 mmfd.
2400 kc.	100 mmfd.
2700 kc.	75 mmfd.

d. If the transmitter is to be operated only from the transmitter panel, the pilot's control box and interconnecting cable can be omitted.

e. Figure 2 shows an AN/ART-13 installation with all low frequency equipment omitted. This installation is suitable for operation in the range 2000-18,100 Kcs. (with suitable fixed antenna).

[illegible]

FIG. 9 MOTOR, AN/ART-13 HIGH FREQUENCY INSTALLATION

INSTALLATION

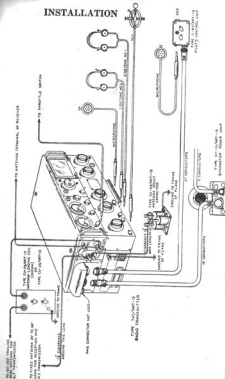


FIG. 3. MODUL. AVANT-13 COMPLETE INSTANTANÉE

SECTION III

MAINTENANCE

1. TUBE COMPLEMENT

a. The transmitter uses the following tubes:

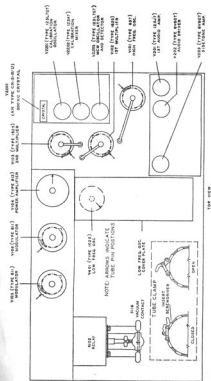
<u>Tube</u>	<u>Use</u>	<u>Tube</u>	<u>Use</u>
837	H.F. Oscillator	1625	L.F. Oscillator
1625	1st Multiplier	12SJ7	Speech Amplifier
1625	2nd Multiplier	6V6GT	Speech Driver Sidetone
813	Power Amplifier	6V6GT	Amplifier
811	Modulator	12SL7GT	MCW OSC. And Detector
811	Modulator	12SL7GT	Calibration Oscillator
		12SA7	Calibration Mixer

2. TUBE REPLACEMENT.

a. Tubes V101, V102, V103, V105 and V106 have been provided with clamps to prevent the tubes from being shaken from the sockets during flights. Refer to Figure 4 for location of tubes.

b. To gain access to the tubes, remove the transmitter cabinet cover. Removing the cabinet cover makes all the tubes except the low-frequency oscillator tube, V401, accessible. The high frequency oscillator tube, V101, clamp may be loosened by inserting a screwdriver through one of the ventilating holes in the transmitter cabinet wrap-around. To loosen the clamp insert a screwdriver beneath the clamp lock (Figure 4) and pry gently until the lock releases. The tube clamp locks on V102 and V103 may best be reached from the top of the transmitter.

MAINTENANCE



MAINTENANCE

To release the clamps on tubes V105 and V106 insert a screwdriver through a ventilating hole in the rear cover plate. To gain access to the low-frequency oscillator tube, V401, it is necessary to remove the oscillator unit cover plate. Tube V401 is not clamped and may be easily removed by simply pulling upward on the tube. Tubes V104, V201, V202, V203, V2201, V2202 and V2203 are not provided with clamps and may be removed from the sockets when the transmitter cabinet cover has been removed.

3. VACUUM CONTACT REPLACEMENT AND ADJUSTMENT.

a. If the vacuum contact, S116, requires replacement the following procedure is recommended (Refer to Figure 5).

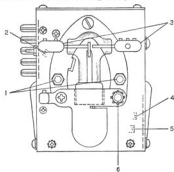


FIG. 5

- (1) Loosen the set screws that hold the connecting wires to the fixed contact terminals, Item 3, and remove the wire connectors.

- (2) Loosen the stud, Item 6, until the clamp around the base of the vacuum contact becomes loose enough to allow the removal of the vacuum tube.
- (3) Insert the new vacuum contact assembly, with the rubber gasket, in the clamp and tighten the stud, Item 6.
- (4) With relay K102 in the normally unoperated position, loosen the tube yoke mounting studs, Item 1, and move the mounting yoke assembly, using the adjusting screw, Item 2, until the movable contact within the vacuum tube is resting firmly against the fixed contact that is normally connected to the RECEIVER terminal.
- (5) When the above adjustment has been completed, tighten the yoke mounting studs and operate relay K102.
- (6) With the relay operated, check the position of the movable contact within the vacuum tube. The movable contact should rest firmly against the fixed contact that is normally connected to the COND. terminal. The movable arm should rest firmly against the fixed contact but should not apply enough pressure to damage the vacuum seal. If the movable contact is applying too much pressure to the fixed contact when the relay is operated, some readjustment of Item 2 will be necessary.

3. DYNAMOTOR BRUSH REPLACEMENT.

There are three sets of brushes in the dynamotor. The 28 volt and the 750 volt commutator are located on the end of the dynamotor nearest the connector plugs. The 400 volt commutator is located on the oppo-

site end of the dynamotor. To gain access to the brushes, remove dynamotor end bells. Badly worn brushes should be replaced. Carbon and copper dust on the commutators may also cause erratic operation of the dynamotor. Blow or brush the dust from the commutators.