

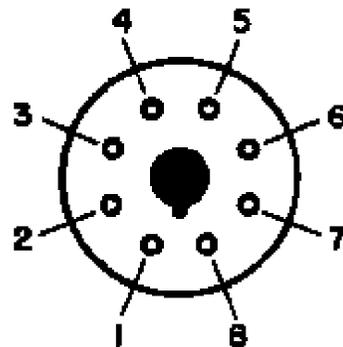
**ALIGNMENT PROCEDURE**  
**SKY CHALLENGER II**  
**Models S-18 SX-18**



**the hallicrafters co.**  
MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT. CHICAGO 24, ILL. U. S. A.

## ALIGNMENT PROCEDURE FOR SKY-CHALLENGER II MODELS S-18, SX-18

THE FOLLOWING MEASUREMENTS MADE WITH 1000 OHMS PER VOLT METER AND TAKEN FROM THE POINT INDICATED TO GROUND WITH THE AVC SWITCH IN THE "ON" POSITION. ANTENNA AND GROUND DISCONNECTED AND R. F. AND A. F. GAIN CONTROLS SET AT MAXIMUM. LINE VOLTAGE OF 115 AT THE TIME THESE MEASUREMENTS WERE TAKEN. NORMAL TOLERANCE ALLOWS VARIATIONS OF PLUS OR MINUS 10% FROM THE VALUES INDICATED. "DL" INDICATES A DEAD LUG BUT WILL INDICATE VOLTAGE WHEN USED AS A TIE.



BOTTOM VIEW OF SOCKET

TUBE	FUNCTION	1	2	3	4	5	6	7	8
6K7	R. F. AMP.			260	125	5	DL	6.3	5
6L7	MIXER			260	105	-6	DL	6.3	4.5
6J5G	Osc.			168	DL	-19	DL	6.3	0
6K7	IF AMP (1)			265	125	5	DL	6.3	5
6K7	IF AMP (2)			250	125	5	260DL	6.3	5
6Q7G	2ND DET. A.V.C. 1ST AUDIO			75	1	1		6.3	2
6F6G	2ND AUDIO			245	260	0	16DL	6.3	16
6J7	BEAT Osc.			105	105	0	0DL	6.3	0

## INTERMEDIATE FREQUENCY ALIGNMENT (465 KC)

HAVE THE CONTROLS SET IN THE FOLLOWING POSITIONS:

B.F.O. SWITCH "OFF"

A. F. AND R. F. GAIN CONTROLS ON FULL.

CRYSTAL PHASING CONDENSER MIDWAY (POINTER STRAIGHT UP).

A.V.C. SWITCH "OFF".

CRYSTAL SWITCH "IN".

BAND SWITCH ON #1 BAND - TUNING GANG OPEN (MINIMUM CAPACITY).

REMOVE 6J5G OSCILLATOR TUBE FROM ITS SOCKET.

REMOVE THE 6L7 GRID CAP.

## PROCEDURE

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CONNECT THE SIGNAL GENERATOR TO GRID OF THE 6L7 TUBE THROUGH A .1 MFD CONDENSER. TUNE THE SIGNAL GENERATOR TO 465 KC AND THEN ADJUST THE CONDENSERS ON THE INTERMEDIATE FREQUENCY TRANSFORMERS T1, T2, T3, T4, RESPECTIVELY. NOW THROW THE CRYSTAL SWITCH TO THE "OUT" POSITION AND READJUST T1 FOR MAXIMUM OUTPUT. AS AN OUTPUT INDICATOR IT IS SUGGESTED THAT A RECTIFIER TYPE METER BE USED.

## ALIGNMENT USING A 465 KC CRYSTAL

SHOULD THE RECEIVER BE A CRYSTAL MODEL IT IS NECESSARY THAT THE CRYSTAL BE USED IN AN EXTERNAL OSCILLATOR IN PLACE OF A SIGNAL GENERATOR SUCH AS THE ABOVE. THE OUTPUT OF THIS CRYSTAL CONTROLLED OSCILLATOR IS THEN FED TO THE GRID OF THE 6L7 TUBE AND THE ABOVE PROCEDURE FOLLOWED. WHEN THE IF AMPLIFIER HAS BEEN ALIGNED FROM THE CRYSTAL OSCILLATOR'S OUTPUT, RE-INSERTING THE CRYSTAL IN ITS SOCKET IN THE RECEIVER WILL SHOW LITTLE DIFFERENCE IN OUTPUT WHETHER THE CRYSTAL IS "IN" OR "OUT" OF THE CIRCUIT AS INDICATED BY THE CRYSTAL SWITCH.

## R. F. ALIGNMENT PROCEDURE

ON BAND #1, OR BROADCAST, USE A .0002 MFD CONDENSER IN SERIES WITH THE OUTPUT LEAD FROM THE GENERATOR TO A1 ON THE RECEIVER. ON THE OTHER BANDS A 400 OHM RESISTOR SHOULD BE USED. BE SURE THE JUMPER FROM THE DOUBLET, OR A2 POST, TO GROUND REMAINS CONNECTED WHEN ALIGNING THE RECEIVER.

ALL PAD ADJUSTMENTS (LOCATED ON THE TOP OF THE CHASSIS) ARE FOR THE LOW FREQUENCY ENDS OF THE BANDS.

ALL TRIMMER ADJUSTMENTS (LOCATED ON THE BOTTOM OF THE CHASSIS) ARE FOR THE HIGH FREQUENCY ENDS OF THE BANDS.

REDUCE R.F. GAIN CONTROL BELOW THE POINT OF BLOCKING OR OVERLOADING; ALSO BE SURE THAT THE CRYSTAL SWITCH IS IN THE "OUT" POSITION AND THE AVC SWITCH IS IN THE "OFF" POSITION.

BE SURE TO CHECK IMAGES - IMAGES WILL FALL A LITTLE LESS THAN 1 MC LOWER IN FREQUENCY ON BANDS 1 TO 4 INCLUSIVE. ON BAND 5 THE IMAGE WILL FALL ABOUT 1 MC HIGHER IN FREQUENCY THAN THE FUNDAMENTAL.

REJECTOR ADJUSTMENT - ON BANDS 1, 2 AND 3 THE REJECTOR CIRCUIT SHOULD BE LEFT AT 34 MC. ON BANDS 4 AND 5 THE REJECTOR IS IN THE CIRCUIT. CARE SHOULD BE EXERCISED TO SEE THAT THE REJECTOR CIRCUIT IS NOT ADJUSTED SO THAT IT WILL REJECT THE SIGNAL FREQUENCY. IF THIS OCCURS VERY LOW SENSITIVITY WILL RESULT WHICH CAN BE CURED BY DETUNING THE REJECTOR ABOUT 1 MC.

WHEN ALIGNING THE R.F. END OF THE RECEIVER THE TUNING GANG SHOULD BE ROCKED BACK AND FORTH ACROSS THE SIGNAL SO THAT YOU ARE SURE YOUR ADJUSTMENTS ARE SUCH THAT YOU HAVE OBTAINED MAXIMUM GAIN AND ACCURATE TRACKING.

NOTE #1 HARMONICS OF SUITABLE FREQUENCIES MAY BE USED IF THE FOLLOWING FREQUENCIES SUGGESTED ARE NOT AVAILABLE.

NOTE #2 IT IS NECESSARY TO REPEAT EACH PAIR OF OPERATIONS SEVERAL TIMES UNTIL NO CHANGE IS NOTED.

OPR.	BAND	RECEIVER DIAL SETTING	SIGNAL GENERATOR FREQUENCY	ADJUST OSC. WITH	TRIMMERS R. F. & MIXER WITH	ADJUST OSC. PAD WITH	SET REJECTOR DIAL AT
1 2	1	600kc 1100kc	600kc 1100kc	----- CA	----- Cc - Cb	C38 -----	----- -----
3 4	2	1300kc 2600kc	1300kc 2600kc	----- Cb	----- Cf - Ce	C43 -----	----- -----
5 6	3	3000kc 6000kc	3000kc 6000kc	----- Ca	----- Ci - Ch	C42 -----	----- -----
7 8	4	7000kc 14000kc	7000kc 14000kc	----- Cj	----- Cl - Ck	C41 -----	9 mc 14mc
9 10	5	17000kc 34000kc	17000kc 34000kc	----- Cm	----- Co - Cn	C40 -----	24mc 34mc

IT IS HELPFUL TO REMEMBER THAT THE CARTRIDGE TYPE AIR TRIMMING CONDENSERS WILL SHOW AN INCREASE OF CAPACITY WHEN THE SCREW IS ROTATED COUNTER-CLOCKWISE.

WHEN MAKING ADJUSTMENTS ON THIS RECEIVER IT IS SUGGESTED THAT GAIN BE CONTROLLED BY USING THE R.F. GAIN CONTROL ONLY. LEAVE THE A.F. GAIN CONTROL ON FULL AT ALL TIMES.

TO MAKE A RAPID CHECK OF THE RECEIVER REMOVE THE GRID CAP OF THE 6Q7 TUBE AND TOUCH THE GRID OF THE TUBE WITH YOUR FINGER. IF A LOUD HUM IS HEARD THE AUDIO END OF THE RECEIVER IS OK.

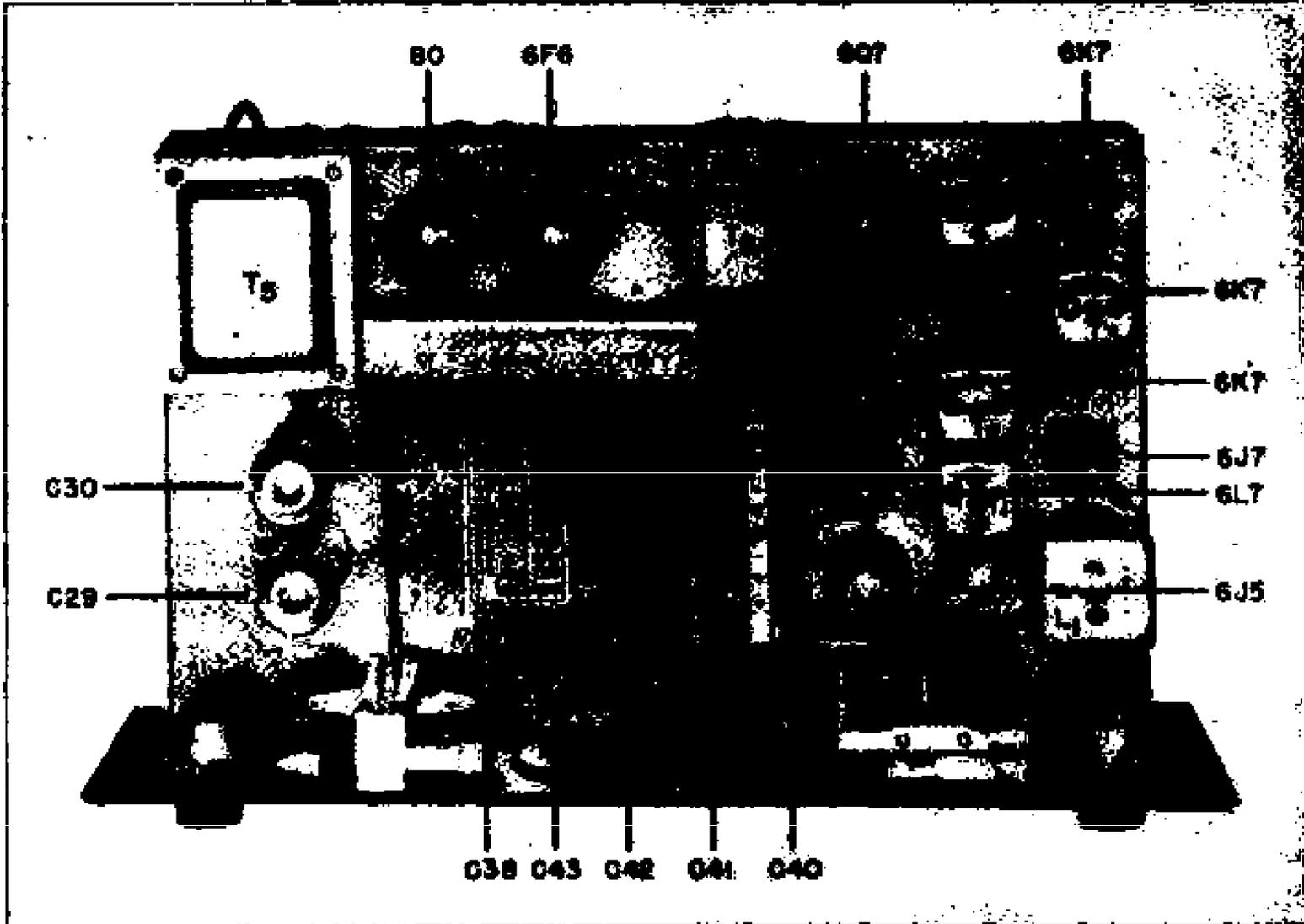
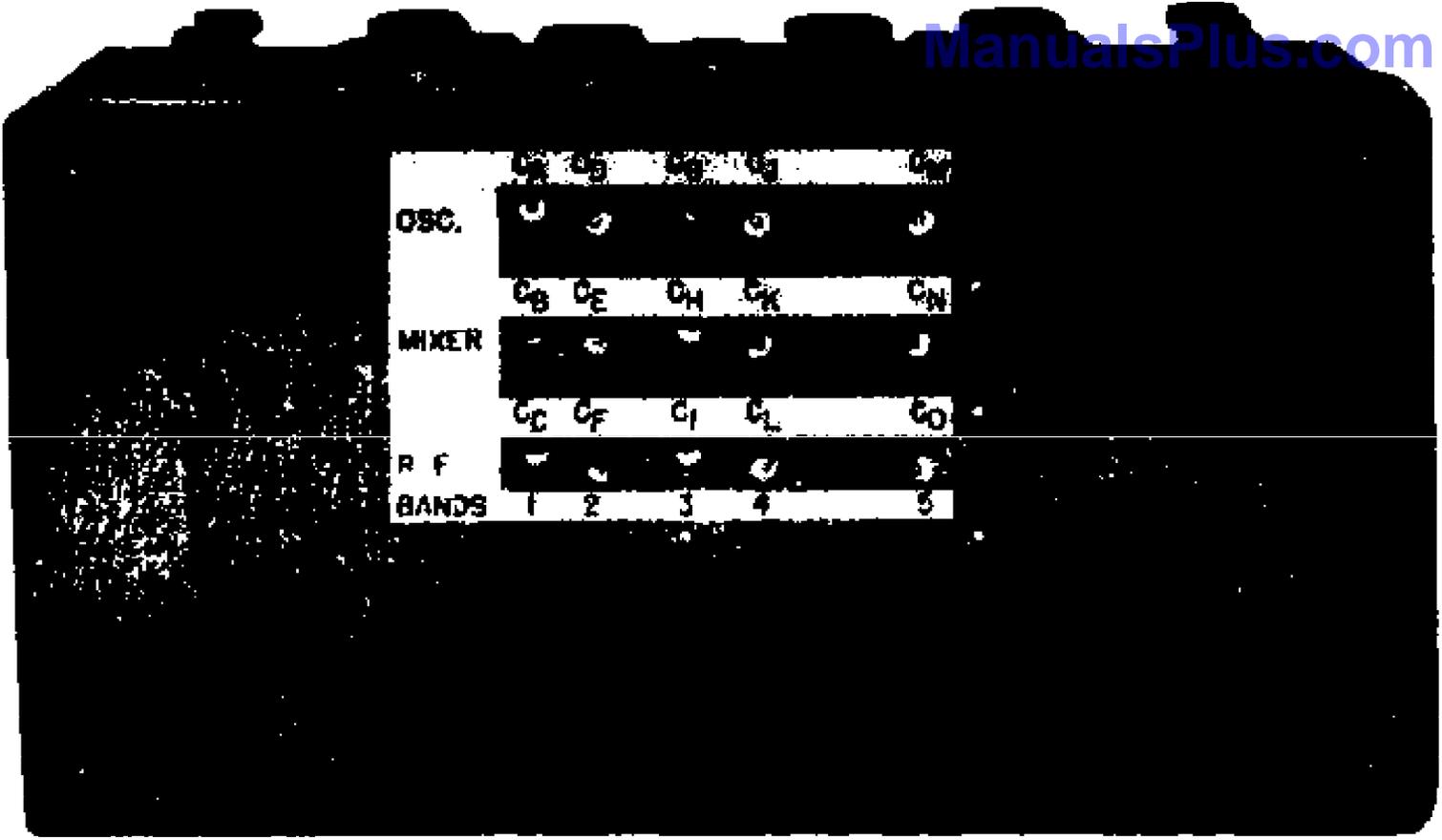
DEAD SET. CHECK BIAS ON THE R. F. TUBES. IF THIS BIAS IS TOO HIGH CHECK THE R.F. GAIN CONTROL FOR AN OPEN CIRCUIT. ADDITIONALLY, CHECK THE PLATE AND SCREEN VOLTAGE OF THE R.F. TUBES - (SEE CHART). CHECK B PLUS FOR A SHORT TO GROUND - IF SO CHECK ALL TUBES.

IF THE TUNING GANG IS NOISY WHEN THE SET IS JARRED, INCREASE THE TENSION ON THE GANG WIPERS.

NOISY COIL ASSEMBLY - CHECK SWITCH CONTACTS. ALSO CHECK THE TRIMMERS ON THE PARTICULAR BAND IN WHICH NOISE OCCURS. IT IS POSSIBLE THAT THE TRIMMER HAS DEVELOPED A PARTIAL SHORT.

IF LOW SIGNAL AND HIGH NOISE LEVEL DEVELOPS, REPLACE THE 6L7 TUBE.

DEAD BEAT OSCILLATOR - IF THE 6J7 SHOULD SHORT TO GROUND THE BEAT OSCILLATOR WILL BE DEFECTIVE. CHECK B PLUS TO B0 COIL FOR A GROUND. IN MOST CASES A NEW 6J7 WILL CORRECT A DEAD B0.



## CONDENSERS

C1	250	MMFD					
C2	250	"					
C3	250	"					
C4	15	"	AIR	VARIABLE			
C5	.002	MFD					
C6	.002	MFD	400	VOLT	MICA		
C7	.25	"	200	"			
C8	.002	"	"	"	"		
C9-	.05	"	"	"	"		
C10	.002	"	"	"	"		
C11	.05	"	400	"	"		
C12	50	MMFD					
C13	25	"	AIR	VARIABLE			
C14	.02	MFD	200	VOLT			
C15	.25	"	400	"			
C16	.02	"	200	"			
C17	.1	"	400	"			
C18	.05	"	"	"			
C19	250	MMFD					
C20	500	"					
C21	10	MFD	25	"	ELECTROLYTIC		
C22	250	MMFD					
C23	.05	MFD	200	"			
C24	.005	"	400	"			
C25	.1	"	"	"			
C26	.05	"	"	"			
C27	.003	"					
C28	10	"	25	"	"		
C29	16	"	400	"	"		WET
C30	16	"	"	"	"		"
C31	.01	"	"	"			
C32	10	MMFD					
C33	250	"					
C34	.02	MFD	"	"			
C35	25	MMFD	AIR	VARIABLE			
C36	25	"					
C37	10	"					
C38	200	"	VARIABLE	PAD			
C39	25	"	MICA				
C40	.0012	MFD	VARIABLE	PAD			
C41	.0011	"	"	"			
C42	.00093	"	"	"			
C43	.00039	"	"	"			

No.	OHMS	
R1	250	
R2	125	
R3	100,000	
R4	30,000	
R5	10,000	R. F. GAIN CONTROL
R6	250	
R7	15,000	
R8	100,000	
R9	600	
R10	100,000	
R11	30,000	
R12	100,000	
R13	100,000	
R14	1,000	
R15	20,000	
R16	4,000	
R17	500,000	
R18	500,000	VOLUME CONTROL
R19	1,000,000	
R20	500,000	TONE CONTROL
R21	100,000	
R22	250,000	
R23	500	
R24	250,000	
R25	100,000	
R26	100,000	
R27	50,000	
R28	10,000	
R29	50,000	

