

C-FAX

Model 3

RADIO FACSIMILE RECEIVER



USER HANDBOOK

BHM Electronics

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Introduction

The C-Fax radio facsimile receiver has been designed as an easy to use, reasonably priced unit with low operating costs.

The materials and finishes used ensure durability and long life, and the small size enables fitting in areas where space is at a premium.

The C-Fax uses standard fax paper as used in telephone fax machines. This paper is generally available from any office supply shop or stationer.

Information contained in the weather maps received can be analysed to give useful insight into the weather trends for your particular part of the world. This makes it a valuable tool for those to whom the elements are important in their lifestyle or occupation. Useful books on the interpretation of these maps are available through most larger book stores. After a little practice you will find that quite reliable predictions can be made as to future weather conditions.

Unpacking

Remove the unit from the packing and check that the following is included:

- 1 x C-Fax radio facsimile printer
- 1 x wall mounting bracket, fixed to rear of C-Fax

- 2 x rolls of thermal paper, 216mm by 30m
- 1 x power lead, 2m long with 4 pin plug
- 2 x spare fuses (2 amps)

- 1 x coaxial aerial lead, 2m long with BNC plug (internal receiver model only)
or
- 1 x audio lead, 2m long, 3.5mm to 3.5mm plug (external receiver model only)

- 1 x user handbook
- 1 x New Zealand and Australian weather fax schedule

Mounting the C-Fax

The C-Fax may be left free standing or wall mounted on the supplied bracket. To fix the C-Fax to a wall, remove the mounting bracket from the rear of the C-Fax by taking out the two screws holding it at the bottom. Screw the bracket to the wall, slide the C-Fax back onto the bracket and replace the two bottom screws.

Connecting Power

Plug the power lead into the round 4 pin socket on the panel on the right side of the C-Fax. The other end of the lead is connected to the power source, red wire to positive, black wire to negative. The C-Fax can operate on a direct current (DC) voltage of from 12 to 15 volts only.

Caution! THE C-FAX MUST NOT BE CONNECTED DIRECTLY TO A 24V SUPPLY. To run it on 24V DC a voltage reducer must be used. The power lead from the C-Fax must not be connected directly to the mains power supply (110V or 230V AC). For use with the mains supply a suitable power supply must be used which can supply 12V DC at 2 amps.

Connecting an Aerial (for an internal receiver)

The aerial lead plugs into the BNC socket on the side panel. At the other end the center conductor of the coaxial cable should be connected to an outside wire aerial. This should consist of a length of wire approximately 10 metres long (30 feet). The wire should run horizontally and be supported at each end by insulators, with a lead taken from one end to the C-Fax. The aerial is not critical, try any existing high frequency aerial first.

Caution! Never connect the C-Fax to an aerial used by a radio transmitter. Severe damage could occur to the receiver in the C-Fax.

The outside shield on the end of the aerial cable can be connected to an earth, such as the hull of a metal boat or a metal rod driven into the ground as close as practical to the C-Fax. This earthing is not absolutely necessary but can be of help in reducing interference on the printed pictures.

Using an External Receiver

An external receiver may be used with the C-Fax and is required if your model has no internal receiver. It must be a crystal controlled or synthesised SSB (single side band) type, with LSB (lower side band) mode.

Connection should be made from either the speaker output or line level output of the external receiver to the audio socket on the side panel of the C-Fax. This input will accept a wide range of signal levels from 1V to 5V RMS. Putting a plug into the external receiver socket automatically overrides the internal receiver, if present.

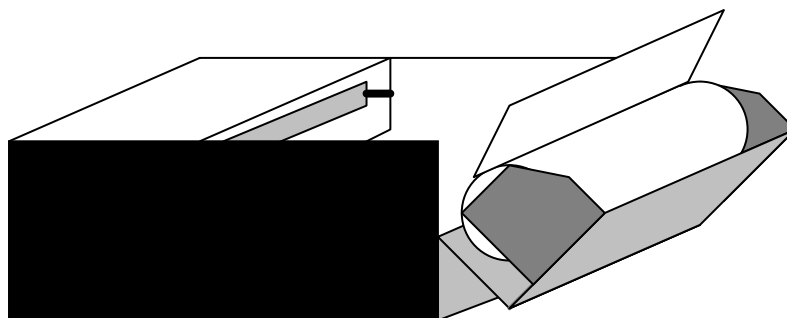
Switch the external receiver to LSB and tune it to 1.9 kHz above the listed frequency. For example, to listen to a channel transmitting on 9459 kHz tune the receiver to 9460.9 kHz.

Loading Paper

The C-Fax uses standard telephone fax machine paper, 216mm wide. The recommended paper length is 30m, longer rolls may not fit.

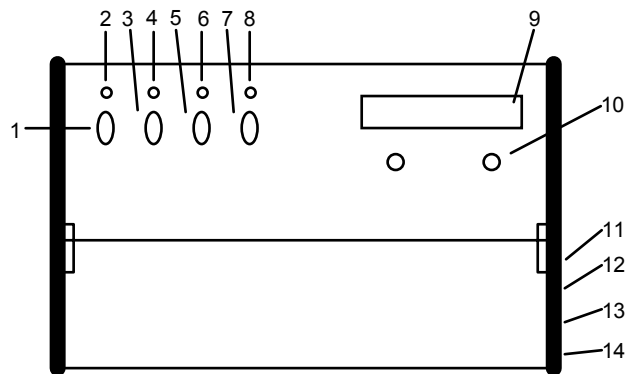
To load a roll of paper into the C-Fax, open the two catches located each side on the front. Pull the lower edge of the catch away from the C-Fax and then unhook the upper edge. The lower section of the case will then open down. Remove the empty roll by pushing it to the right against the spring and then pulling it up and out.

Insert a new roll of paper by pushing the right end against the spring and then pushing the left end down. Make sure the outside surface of the paper roll is against the print head, as shown in the illustration below. This is the side of the paper that the C-Fax prints on. Pull the end of the paper up and out the front before closing the door.



To close the paper compartment, push the cover closed until both parts of the catches interlock. Then hook the lower catch over the upper part and push the lower catch down until it clicks into place.

The Controls



Brief Description of the Controls

- 1 Audio On/Off/Picture Align
Up - received signal audible
Centre - no audio
Down - hold down to manually align picture
- 2 Align Indicator - used for manual align
- 3 Fast Paper Feed
- 4 Paper Out Indicator
- 5 Stop/Auto/Start
Up - receiver only, no printing
Centre - automatic start/print/stop
Down - continuous printing
- 6 Run Indicator - printer is operating
- 7 Power On/Off
- 8 Data Indicator - printing signal
- 9 Channel Display (internal receiver model only)
- 10 Channel Selection Buttons (internal receiver model only)
- 11 Fuse
- 12 Power Input Socket
- 13 External Receiver Input
- 14 Aerial Input Socket (internal receiver model only)

Using the C-Fax

Switching On

Make sure power plug and aerial connections have been made and that a roll of paper is properly inserted in the C-Fax, as described on pages 4 to 7.

Move the power switch (number 7 in the picture on the previous page) down. If your C-Fax has an internal receiver the channel display (9) should show the current channel number, location and frequency the C-Fax is listening to.

for example:

3 Auckland ZKLF 13550.5kHz

This indicates that the receiver is set to channel 3, which transmits from Auckland on a frequency of 13550.5 kHz (kilohertz) using the call sign ZKLF.

Selecting a Channel

To change the channel use the two channel selection buttons (10) to move up or down the list. Refer to the frequency list starting on page 18 to find the channel number of a station transmitting near you, then change to this channel. If you are using an external receiver you must manually enter a frequency into your receiver.

The yellow data light (8) should be on or flickering. This indicates a signal is present.

If it is not already on, turn on the audio by switching the Audio switch (1) up. You should be able to hear the received signal.

If you hear a continuous tone, this is generally a resting tone, a signal many stations send between maps. If you can hear a signal quickly changing between two tones then a picture is being sent. Try all the different frequencies for your local station to find the signal which sounds loudest and has the least static in it.

Printing a Picture

Set the Start switch (5) to the middle position for automatic stop and start.

When a picture is sent it is preceded by a start signal, telling the receiver to start printing. This is heard as a tone lasting from 5 to 10 seconds. Next the transmitting station sends the alignment signal which synchronises the picture being sent with that being printed. This usually sounds as two tones, a very short tone and a longer half second tone, repeated for 30 seconds. Following this is the actual picture, which is two tones alternating randomly, one tone represents the white parts of the picture, the other tone is used for the black parts. The

picture generally takes about 15 minutes to send. Finally the stop signal is sent. This is 5 seconds of alternating tones followed by 10 seconds of a steady tone.

You may turn off the audio by putting the Audio switch (1) back to the middle position. It is only required for determining the signal quality of a channel.

While the C-Fax is left on Automatic it will start and stop printing whenever a picture is received. You will generally not need to do anything else.

If for some reason the C-Fax misses the stop signal, for example if the radio signal becomes very noisy or fades, it will continue to print even after the picture has finished. A built in timer will automatically stop the C-Fax printing after about 40 minutes if it hasn't had a stop signal, minimising paper wastage.

Useful Hints

If you switch on the C-Fax and the start tone has passed and a picture is being printed, switch the Stop/Auto/Start switch down to start the printer, then back to Auto. Let it print for about 10 seconds then fast feed the paper out a little to see where the edge of the picture is positioned. Manual alignment can now be carried out as described on page 11.

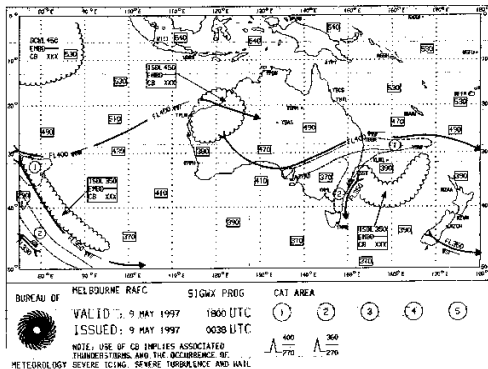
If the printer is started after the start tone but during the phasing pulse period (during the first 10 seconds or so) it will automatically align the picture.

Before tearing off the paper fast feed out about 5cm so as not to leave any of the printout inside the C-Fax.

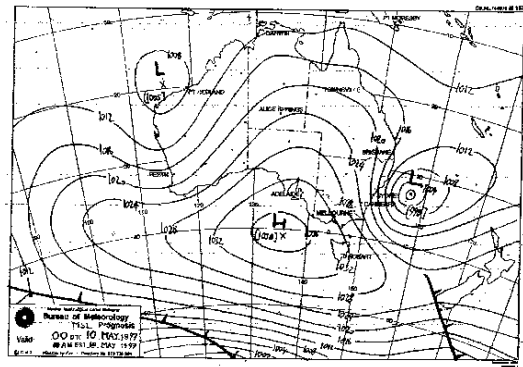
Tearing off the paper is best done in a downwards direction against the edge of the metal strip.

Sample Weather Maps

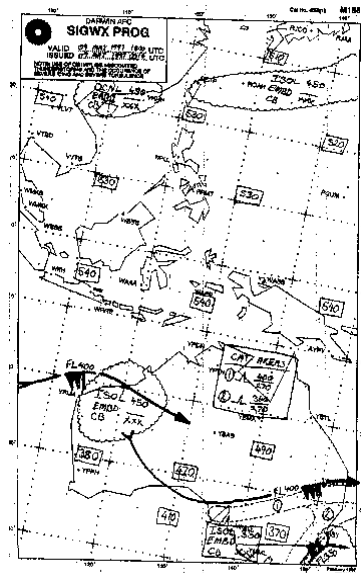
Australia Significant Weather Prognosis



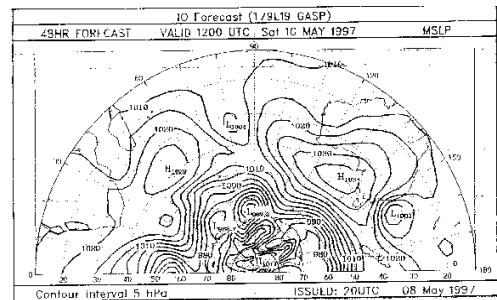
Australia Mean Sea Level Prognosis



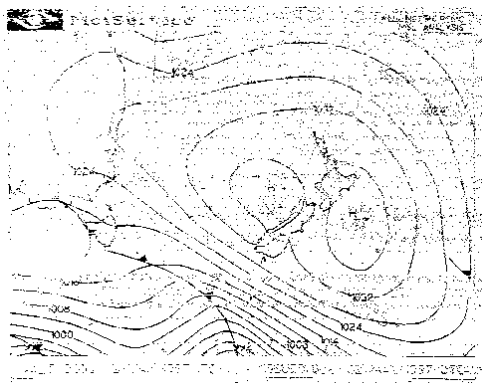
Darwin Tropics Significant Weather Prognosis



Indian Ocean Mean Sea Level Prognosis



Example of a noisy signal



Weather Map Abbreviations

These are some of the common abbreviations you will see on weather maps.

Map areas

ASIA	50°N to 50°S, 100°E to 180°
IO	Indian Ocean
NPAC	50°N to 50°S, 160°E to 110°W
NREG	Equator to 50°S, 140°E to 140°W
NZ	New Zealand
SPC	South Pacific (Australia to South America)
SWP	South West Pacific (Australia to Tahiti)
TNZ	Tasman Sea and New Zealand

Map Types

ANAL	Analysis
FCST	Forecast
MAR WX	Significant Marine Weather
NEPHANAL	Nephanalysis (analysis of cloud information taken from satellite pictures)
PROG	Prognosis
SIG WX	Significant Aviation Weather
TEMP	Temperatures

Levels

MSL	Mean Sea Level
700MB	Height of 700 millibar pressure level (10000 feet)
500MB	Height of 500 millibar pressure level (18400 feet)
250MB	Height of 250 millibar pressure level (34000 feet)

Time

GMT	Greenwich Mean Time
UTC	Coordinated Universal Time
(H+number)	Number is number of hours ahead for forecast

Detailed Description of the Controls

Numbers in brackets refer to the picture on page 6

Audio On/Align switch (1) and Align light (2)

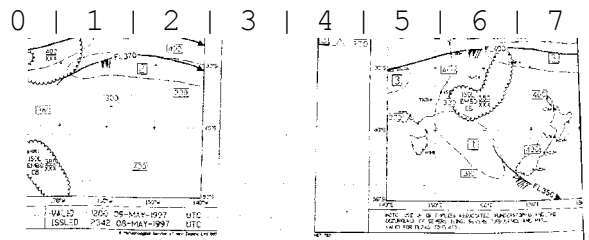
When this switch is placed in the up position then audio from the receiver can be heard. This can be used to listen to the quality of the radio reception on any of the channels. Placing the switch back in the center position turns off the sound.

If a map printout is started manually or if the synchronising signal at the beginning of a transmission is missed the picture may be out of alignment. This shows up as a picture starting part way along the paper instead of at the left side.

To manually align a picture:

- Look at the picture being printed
- Find the normal left hand edge of the picture
- Note where this is on the 0-7 scale on the front panel
- Hold down the align switch (3)
- Count the number of flashes of the align light (4)
- When this is equal to the number on the scale release the align switch promptly
- The rest of the picture should be correctly aligned

In the sample map below you would need to hold the align switch for 4 flashes of the align light to realign the left edge.



Fast Paper Feed switch (3)

This switch is used to feed the paper out at a faster than normal rate. This allows a completed map to be cleared from the C-Fax printer before tearing it off.

It is also useful for the manual align procedure described above, by feeding out some of the picture so it is possible to check the alignment sooner.

Paper Out indicator light (4)

When the end of the paper roll is reached this red light will flash to indicate the C-Fax is out of paper, and the C-Fax will stop printing. There is normally a warning stripe printed on most types of paper near the end which shows during the last metre or two to warn that the paper is running out.

Note: Some brands of paper are glued to the center core, in this case the paper out light will not operate as the paper remains in the print area. If you find this happening try changing the roll within a few maps of the warning stripe appearing.

Stop/Auto/Start switch (5) and Run light (6)

In the up position the printer is off. Only the receiver is working. The green run light is off. In the centre position the printer automatically starts and stops printing pictures using the received start and stop signals. The run light is on during printing. In the down position the printer starts and prints continuously. The run light remains on. If you have missed the start signal of a picture moving the switch down will start the picture printing. Moving the switch back to Auto lets the picture print until the normal stop signal is received. Starting a picture manually normally requires it to be manually aligned on the paper, see the Align section on the previous page.

Power switch (7)

In the up position the C-Fax is turned off. In the down position the C-Fax is turned on. The channel display back lighting turns on and the last used channel is shown.

Data light (8)

The yellow data light turns on when a signal is received. It will normally flicker when a picture is being sent.

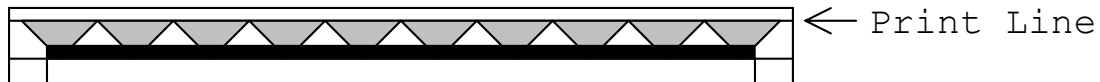
Care of the C-Fax

There are no parts to be lubricated.

When a new roll of paper is fitted remove any paper scraps or dust from the paper compartment. At this time also check and clean the rubber pressure roller if necessary. The roller should only be cleaned with alcohol.

If a printed picture has vertical light stripes through it the most likely cause is dirt on the print head. If this problem appears open the paper compartment and check the print head, which is mounted on a horizontal metal bar at the top of the paper compartment. Near the top of the print head (about 5mm above the line of black rubber) is a thin black line, this is the thermal print line. Dirt on this print line causes the reduced print density. This should be gently wiped clean with alcohol (methylated spirits or isopropyl alcohol) on a clean lint free cloth or paper tissue.

Avoid excessive cleaning of the print head or the use of abrasive substances.



This problem can be kept to a minimum by taking care when fitting paper rolls that the outside layer of paper is clean and by not touching the print head.

Some brands of thermal paper leave behind a white chalky residue. If this builds up it can cause printing problems. The easiest way to remove it is to run the edge of a finger nail along the print line and scrape it clean. If the problem reoccurs we suggest trying a different brand of paper.

Trouble Shooting

Unit is dead - no lights

Check Power switch is on (down)
Power lead is connected
Fuse on side panel is intact
Power polarity, red wire of lead is positive, black is negative
Voltage to the C-Fax is correct, between 12 and 15V

If all these check ok, or if the fuse fails again after replacement, seek technical assistance.

No Printing

Check Paper Out light is not flashing, if it is replace the paper
Paper is fitted correctly
Run switch is in Auto or Start position

Replacing the Fuse

The fuse on the side panel can be removed for checking or replacement by unscrewing the cap anticlockwise.

This fuse protects some very expensive components inside the C-Fax. It must only be replaced with one of the same rating. The warranty is void if a heavier fuse is used.

The fuse is the standard small size, 20 x 5mm, 2A current rating.

Specifications

RECORDING SYSTEM	Printing by static thermal head on thermal paper
RECORDING PAPER	High sensitivity thermosensitive
INDEX OF COOPERATION	576
SCANNING SPEED	120 lines per minute
RESOLUTION	8 dots/mm
START AND STOP	Automatic or manual
PHASING	Automatic or manual
DATA TONES	White 1500Hz Black 2300Hz
RECEIVING SYSTEM	Double conversion superheterodyne
NUMBER OF CHANNELS	up to 203 pre-programmed
FREQUENCY RANGE	50kHz to 30MHz
RECEPTION MODE	F4
RECEIVE IF FREQUENCY	45MHz & 455kHz
BFO FREQUENCY	453.1 kHz
SENSITIVITY	2 microvolts for useable copy
DIMENSIONS	322mm wide x 250mm high x 95mm deep
WEIGHT	Approx. 4kg
MOUNTING POSITIONS	Vertical or horizontal, free standing or on bracket supplied
POWER SUPPLY	12 to 15V DC
POWER CONSUMPTION	12W when printing
OPTIONS	230V AC to 12V DC Power Supply

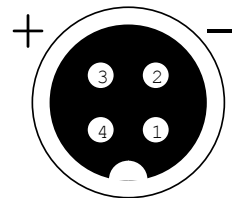
NOTE: All effort will be made to supply the equipment as per the specifications, however we reserve the right to change any of the above details without notice.

Wiring Connections

Power

Supplied via a 4 pin round line socket, standard threaded locking collar.

Side Panel Power



pin 1 unused
pin 2 negative (black)
pin 3 positive (red)
pin 4 unused

Power supply 12 to 15V DC at 1.5A, 12W maximum

Audio In

Standard 3.5mm mono audio plug for external receiver.

Center is signal, outside is signal return.

Level: 100mV to 3V RMS

Frequency list for the C-Fax

Channel	Frequency	Call sign	Location/Country
1 Auckland	5807.0 kHz	ZKLF	Auckland, New Zealand
2 Auckland	9459.0 kHz	ZKLF	
3 Auckland	13550.5 kHz	ZKLF	
4 Auckland	16340.1 kHz	ZKLF	
5 Melbourne	2628.0 kHz	AXM31	Melbourne, Australia
6 Melbourne	5100.0 kHz	AXM32	
7 Melbourne	11030.0 kHz	AXM34	
8 Melbourne	13920.0 kHz	AXM35	
9 Melbourne	20469.0 kHz	AXM37	Darwin, Australia
10 Darwin	5755.0 kHz	AXI32	
11 Darwin	7535.0 kHz	AXI33	
12 Darwin	10555.0 kHz	AXI34	
13 Darwin	15615.0 kHz	AXI35	Casey, Antarctica
14 Darwin	18060.0 kHz	AXI36	
15 Casey	7470.0 kHz	VLM	
16 Casey	11455.0 kHz	VLM	
17 Bangkok	7396.8 kHz	HSW64	Bangkok, Thailand
18 Bangkok	17520.0 kHz	HSW61	
19 New Delhi	7403.0 kHz	ATP57	New Delhi, India
20 New Delhi	14840.0 kHz	ATV65	
21 St Denis	8176.0 kHz	FZR81	Saint Denis, Reunion
22 St Denis	16335.0 kHz	FZS63	
23 Tai-pei	4616.0 kHz	BMB	Tai-pei, Taiwan
24 Tai-pei	5250.0 kHz	BMB	
25 Tai-pei	8140.0 kHz	BMB	
26 Tai-pei	13900.0 kHz	BMB	
27 Tai-pei	18560.0 kHz	BMB	Central News Agency Tai-pei, Taiwan
28 Tai-pei CNA	9430.0 kHz	3MA34	
29 Tai-pei CNA	13766.0 kHz	3MA26	
30 Tai-pei CNA	14685.0 kHz	3MA25	
31 Tai-pei CNA	15878.0 kHz	3MA24	Hong Kong Beijing, China
32 Tai-pei CNA	19680.0 kHz	3MA23	
33 Tai-pei CNA	22850.0 kHz	3MA36	
34 Hong Kong	16904.0 kHz		
35 Beijing	5526.9 kHz	BAF6	
36 Beijing	8121.9 kHz	BAF36	
37 Beijing	10116.9 kHz	BAF4	
38 Beijing	14366.9 kHz	BAF8	
39 Beijing	16025.9 kHz	BAF9	
40 Beijing	18236.9 kHz	BAF33	
41 Beijing NMEFC	8461.9 kHz	3SD	
42 Beijing NMEFC	12831.9 kHz	3SD	
43 Beijing NMEFC	16903.9 kHz	3SD	Shanghai, China
44 Shanghai	3241.0 kHz	BDF	
45 Shanghai	5100.0 kHz	BDF	
46 Shanghai	7420.0 kHz	BDF	
47 Shanghai	11420.0 kHz	BDF	
48 Shanghai	18940.0 kHz	BDF	
49 Kyodo News S.	16035.0 kHz	9VF252	
50 Kyodo News S.	17430.0 kHz	9VF252	
51 Kyodo News J.	4316.0 kHz	JJC	Kyodo News, Japan
52 Kyodo News J.	8467.5 kHz	JJC	
53 Kyodo News J.	12745.5 kHz	JJC	
54 Kyodo News J.	16971.0 kHz	JJC	
55 Kyodo News J.	17069.6 kHz	JJC	Chuo Fisheries, Japan Tokyo, Japan
56 Kyodo News J.	22542.0 kHz	JJC	
57 Chuo Fisheries	16907.5 kHz	JFA	
58 Tokyo JMH	3622.5 kHz	JMH	
59 Tokyo JMH	7305.0 kHz	JMH2	
60 Tokyo JMH	9970.0 kHz	JMH3	

61	Tokyo JMH	13597.0	kHz	JMH4	
62	Tokyo JMH	18220.0	kHz	JMH5	
63	Tokyo JMH	23522.9	kHz	JMH6	
64	Tokyo Radio	4316.0	kHz	JJC	Tokyo Radio, Japan
65	Tokyo Radio	8467.5	kHz	JJC	
66	Tokyo Radio	12745.5	kHz	JJC	
67	Tokyo Radio	16971.0	kHz	JJC	
68	Tokyo Radio	17069.5	kHz	JJC	
69	Tokyo Radio	22542.0	kHz	JJC	
70	Seoul	5835.0	kHz	HLL2	Seoul, South Korea
71	Seoul	5857.5	kHz	HLL2	
72	Seoul	7433.5	kHz	HLL2	
73	Seoul	9165.0	kHz	HLL2	
74	Seoul	13570.0	kHz	HLL2	
75	Kodiak	2054.0	kHz	NOJ	Kodiak, Alaska, USA
76	Kodiak	4298.0	kHz	NOJ	
77	Kodiak	8459.0	kHz	NOJ	
78	Kodiak	12412.5	kHz	NOJ	
79	Iqaluit	3253.0	kHz	VFF/VFR	Iqaluit & Resolute
80	Iqaluit	7710.0	kHz	VFF/VFR	Canada
81	Inuvik	8457.8	kHz	VFA	Inuvik, Canada
82	Vancouver	2754.5	kHz	CKN	Vancouver, Canada
83	Vancouver	4268.0	kHz	CKN	
84	Vancouver	6456.0	kHz	CKN	
85	Vancouver	12753.0	kHz	CKN	
86	Honolulu	9982.5	kHz	KVM70	Honolulu, Hawaii
87	Honolulu	11090.0	kHz	KVM70	
88	Honolulu	16135.0	kHz	KVM70	
89	Honolulu	23331.5	kHz	KVM70	
90	Pt. Reyes	4346.0	kHz	NMC	Pt. Reyes, California, USA
91	Pt. Reyes	8682.0	kHz	NMC	
92	Pt. Reyes	12730.0	kHz	NMC	
93	Pt. Reyes	17151.2	kHz	NMC	
94	Pt. Reyes	22527.0	kHz	NMC	
95	Valparaiso	4228.0	kHz	CBV	Valparaiso Radio, Chile
96	Valparaiso	8677.2	kHz	CBV	
97	Valparaiso	17144.4	kHz	CBV	
98	Marambio	2401.0	kHz	LSB	Marambio, Argentina
99	Marambio	4807.0	kHz	LSB	
100	Marambio	9951.0	kHz	LSB	
101	P. Belgrano	5705.0	kHz	LOR	Puerto Belgrano, Argentina
102	P. Belgrano	12764.0	kHz	LOR	
103	RioDeJaneiro	12665.0	kHz	PWZ33	Rio de Janeiro, Brazil
104	RioDeJaneiro	16978.0	kHz	PWZ33	
105	New Orleans	4317.9	kHz	NMG	New Orleans, Louisiana, USA
106	New Orleans	8503.9	kHz	NMG	
107	New Orleans	12789.9	kHz	NMG	
108	Elkhorn	3232.0	kHz	AFS	USAF Elkhorn, USA
109	Elkhorn	5908.0	kHz	AFS	
110	Elkhorn	6906.0	kHz	AFS	
111	Elkhorn	11122.0	kHz	AFS	
112	Elkhorn	19327.0	kHz	AFS	
113	Boston	4235.0	kHz	NMF	Boston, Massachusetts, USA
114	Boston	6340.5	kHz	NMF	
115	Boston	9110.0	kHz	NMF	
116	Boston	12750.0	kHz	NMF	
117	Halifax	4271.0	kHz	CFH	Halifax, Nova Scotia, Canada
118	Halifax	6496.4	kHz	CFH	
119	Halifax	10536.0	kHz	CFH	
120	Halifax	13510.0	kHz	CFH	
121	Charlottetwn	4616.0	kHz	XL1763	Charlottetown Radio, Canada
122	Charlottetwn	6915.1	kHz	XL1763	
123	Maritime Air	4618.0	kHz	CZW	Maritime Air Group, Canada
124	Maritime Air	6917.0	kHz	CZW	
125	Maritime Air	7710.0	kHz	CZW	

126	Maritime Air	14626.0	kHz	CZW	
127	Bracknell	2618.5	kHz	GFE25	Bracknell, United Kingdom
128	Bracknell	4610.0	kHz	GFA22	
129	Bracknell	8040.0	kHz	GFA23	
130	Bracknell	14436.0	kHz	GFE23	
131	Bracknell	18261.0	kHz	GFE24	
132	Northwood	2618.5	kHz	GYA	Northwood, United Kingdom
133	Northwood	4610.0	kHz	GYA	
134	Northwood	8040.0	kHz	GYA	
135	Northwood	11086.5	kHz	GYA	
136	Hamburg	3855.0	kHz	DDH3	Hamburg/Pinneburg, Germany
137	Hamburg	7880.0	kHz	DDK3	
138	Hamburg	13882.5	kHz	DDK6	
139	Skamlebaek	5850.0	kHz	OXT	Skamlebaek, Denmark
140	Skamlebaek	9360.0	kHz	OXT	
141	Skamlebaek	13855.0	kHz	OXT	
142	Skamlebaek	17510.0	kHz	OXT	
143	Rota	7595.2	kHz	AOK	US Navy, Rota, Spain
144	Rota	9045.0	kHz	AOK	
145	Rota	9050.2	kHz	AOK	
146	Rota	10542.0	kHz	AOK	
147	Rota	15790.0	kHz	AOK	
148	Rome	4777.5	kHz	IMB51	Rome, Italy
149	Rome	8146.6	kHz	IMB55	
150	Rome	13597.4	kHz	IMB56	
151	Athens	4481.0	kHz	SVJ4	Athens, Greece
152	Athens	8105.0	kHz	SVJ4	
153	Ankara	3377.4	kHz	YMA20	Ankara, Turkey
154	Ankara	6790.0	kHz	YMA20	
155	Cairo	4526.0	kHz	SUU36	Cairo, Egypt
156	Cairo	10123.0	kHz	SUU2	
157	Moscow	3830.0	kHz		Moscow, Russia
158	Moscow	5008.0	kHz		
159	Moscow	6987.0	kHz		
160	Moscow	7695.0	kHz		
161	Moscow	10980.0	kHz	RCC76	
162	Moscow	11617.0	kHz	RDD78	
163	Moscow	12961.0	kHz		
164	Murmansk	5336.0	kHz	RBW41	Murmansk, Russia
165	Murmansk	6445.5	kHz		
166	Murmansk	7908.8	kHz		
167	Murmansk	10130.0	kHz	RBW48	
168	Arkhangelsk	3657.0	kHz	RVZ73	Arkhangelsk, Russia
169	Arkhangelsk	5347.0	kHz	RSW71	
170	Arkhangelsk	7762.0	kHz	RGH77	
171	Khabarovsk	3250.0	kHz	RBX70	Khabarovsk, Russia
172	Tashkent 1	3690.0	kHz	RBV70	Tashkent, Uzbekistan
173	Tashkent 1	4365.0	kHz	RPJ78	
174	Tashkent 1	5890.0	kHz	RBV78	
175	Tashkent 1	7570.0	kHz	RBX72	
176	Tashkent 1	9340.0	kHz	RCH72	
177	Tashkent 1	14982.5	kHz	RBV76	
178	Tashkent 2	3280.0	kHz	RBX70	Tashkent, Uzbekistan
179	Tashkent 2	5285.0	kHz	RBX71	
180	Tashkent 2	8083.0	kHz	RIJ75	
181	Tashkent 2	9150.0	kHz	RCH73	
182	Tashkent 2	13947.0	kHz	ROM5	
183	Dakar	4790.5	kHz	6VU23	Dakar, Senegal
184	Dakar	13667.5	kHz	6VU73	
185	Dakar	19750.0	kHz	6VU79	
186	Cape Naval	4014.0	kHz	ZSJ	Cape Naval, South Africa
187	Cape Naval	7508.0	kHz	ZSJ	
188	Cape Naval	13538.0	kHz	ZSJ	
189	Cape Naval	18238.0	kHz	ZSJ	
190	Nairobi	9043.0	kHz	5YE1	Nairobi, Kenya

191	Nairobi	12315.0 kHz	5YE2	
192	Nairobi	15525.0 kHz	5YE9	
193	Nairobi	16315.0 kHz	5YE6	
194	Nairobi	17365.0 kHz	5YE3	
195	Nairobi	22867.0 kHz	5YE7	
196	Test 1750kHz	1750.0 kHz	test	Receiver test frequencies
197	Test 3.5MHz	3500.0 kHz	test	
198	Test 7.0MHz	7000.0 kHz	test	
199	Test 14.0MHz	14000.0 kHz	test	
200	Test 28.0MHz	28000.0 kHz	test	



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