

WX 2000

OPERATION MANUAL



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WX 2000

OPERATION MANUAL

Radio Facsimile Terminal
Model WX-2000 .
Instruction manual

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1. General

The WX-2000 is a stand alone radio facsimile terminal designed to produce high quality A4 size hard copy images from various facsimile services including Weather charts, Maps, News media and even satellite pictures from NOAA, GOES, METEOR etc. The WX-2000 features a built-in automatic control circuit which enables many hours of unattended operation.

The decoder and built-in printer is housed in an extremely compact, strong and attractive grey cabinet measuring only 310mm (W) x 70mm (H) x 200mm (D) Approx. The latest electronics technology has been combined with high quality components to achieve the highest level of performance and reliability.

The built-in high resolution (8 dots per mm) thermal line printer produces crisp images with highest resolution. The WX-2000 is also capable of simulating grey scale which is ideal for Automatic Picture Transmission by weather satellites.

The WX-2000 uses locally available thermal fax paper such as TOSHIBA 216mm x 30m part number 01456410. This can be easily fitted into the printer in just a few moments. To insert a new paper roll release the top case levers, insert a new paper roll, pass the paper through a single slot, close the lid and away you go. There are no complex threading mechanisms to master.

Most controls are located on the top face of the unit and protected beneath a membrane keypad, these include SPEED, SENS, SHADE, I.O.C., MODE and START/STOP. The paper feed and power switches are also located on the top panel for ease of operation. The monitor level rotary control, audio in (FM and AM), DC input and monitor speaker are located on the rear panel.

In addition to the basic functions, the WX-2000 provides full operational control such as Auto Start, Sync, Adjustment, Position alignment, Tuning LED etc to produce the highest quality images.

A 7 bit tuning LED makes centring of signals and adjustment very easy ensuring the highest accuracy for the very best results and assurance of long term stability.

The power requirement is 12 - 13.5V DC (nominal) @ 3A making the WX-2000 ideal from both on land and off shore applications.

To operate, the WX-2000 simply requires an audio signal of up to 700 mV in FM mode and 1000 mV in AM mode. This can be taken directly from most shortwave or satellite receivers capable of receiving facsimile signals (such as the AR3000A receiver). The signal can often be taken straight from the speaker output connection of the receiver dispensing with the need for complex interconnection.

Easy operation:

As easy as 1 - 2 - 3 ... well almost!

1. Connect a shortwave receiver to the FM input on the WX-2000
2. Select USB on the receiver and tune to a fax transmission
3. Increase the receiver volume to about 1/3 position.
4. Connect the WX-2000 to a DC supply and switch on. The default setting is SHADE 2, I.O.C. 576, FM on.
5. Press SPEED to confirm the LED is lit.

The unit is 'ready to receive' and can automatically start/stop by using the WMO signal of the facsimile signal. Of course you may manually set to WX-2000 in compliance with the different requirements

of the facsimile stations., this includes manual start/stop at any time.

2. Safety precautions

This unit is powered by a nominal 12V DC supply only. Under no circumstance should it be connected to the AC mains supply.

If operation is required from the mains supply, a regulated DC power supply MUST be used. The requirement is a regulated output of 12 to 13.5V DC with a current capacity of 3A or greater.

Either excessive or inadequate voltage / current may cause damage to the unit or degrade the picture quality.

Ensure the correct supply connection polarity, RED is positive and BLACK negative. Reverse connection may cause fire and/or serious damage to the unit.

3. Operating conditions

When locating the set in it's operating position please ensure the following:

- a. Avoid a location of excessive heat, humidity or dust. The unit must not be located in direct sunlight or in a poorly ventilated location.
- b. It is advisable to use material in order to both dampen and absorb mechanical shock to the unit and prevent vibration.
- c. Clean the unit only with a damp cloth, do not use solvents or chemicals such as thinners or benzine.
- d. Your attention is drawn that the reception of certain facsimile transmissions is subject to licensing agreements.

4. Controls, indicators and connectors.

Top panel
(Location of the control, indication and connectors are shown in figure 1)

- | | | |
|---|--------|--|
| 1 | TUNING | Tuning LEDs |
| 2 | SPEED | Facsimile speed select switch
This button selects the receiving speed. Each press of the button will toggle the receiving speed between 60, 90, 120 & 240 rpm as confirmed by LED indication. |
| 3 | SENS | Positive / Negative polarity switch.
This switch selects the polarity of the picture (whether the picture should be black on white or white on black). |
| 4 | SHADE | Intensity level select switch
This switch selects the intensity level of printing. |

For a hand drawn weather facsimile chart, set this switch to 2 to produce a high contrast image.

Set the switch to 16 for reception of press photographs and satellite pictures where shading is required.

- | | | |
|----|------------|---|
| 5 | I.O.C. | I.O.C. value select switch
These values refer to the height/width ratio and vary depending on facsimile service type. |
| 6 | MODE | Mode select switch
This switch selects the reception modulation type. Use FM for shortwave weather facsimile and AM for the direct image services from the satellite. |
| 7 | START/STOP | Start/Stop switch
Press this switch to start/stop the printing of the WX-2000 during the middle of transmission.

If the WX-2000 does not start/stop automatically, use this switch the start/stop the reception manually. This usually happens when the receive signal is weak or does not contain the start/stop signal.

If the WX-2000 is forced to start, the receiving picture may be split into two due to non-synchronisation. |
| 8 | PAPER FEED | Paper feed button
This button advances the thermal paper feed. |
| 9 | POWER | Main power switch.
Switches the WX-2000 ON/OFF. |
| 10 | 60 | Facsimile speed LED 60 rpm. |
| 11 | 90 | Facsimile speed LED 90 rpm. |
| 12 | 120 | Facsimile speed LED 120 rpm. |
| 13 | 240 | Facsimile speed LED 240 rpm. |
| 14 | 2 | Intensity level indicator, 2 shade. |
| 15 | 16 | Intensity level indicator, 16 shade. |
| 16 | M288 | IOC value indicator.
This value represents the height/width ratio. |
| 17 | M576 | IOC value indicator.
This value represents the height/width ratio. |
| 18 | FM | FM mode indicator.
This indicator when the FM mode is selected (weather facsimile on shortwave). It is not lit when AM mode is selected for direct satellite image reception. |
| 19 | RUN | System run indicator.
If this LED is illuminated, the unit is ready to synchronise to a facsimile signal. At the end of |

transmission is will extinguish.

5. Rear panel controls and connections.
(figure 2)

- | | | |
|---|-------|---|
| 1 | DC IN | DC input connector.
Connect 12 to 13.5V DC @ 3A to this point. Note the lead is wired at RED = positive and BLACK = negative. |
| 2 | FM | FM audio input connector.
Connect a shortwave receiver to this PHONO socket for FM mode reception. |
| 3 | AM | AM audio input connector.
Connect a specialist satellite receiver output to this PHONO connector for AM mode direct image satellite reception. |
| 4 | EARTH | Earth point.
Connect a good RF earth to this point to reduce the possibility of noise generation and radiation by the WX-2000. |
| 5 | MONI | Monitor volume control.
Adjusts the monitor volume from the internal speaker unit. |

6. Thermal paper loading

(Refer to figures 3a, 3b & 3c for loading a paper roll)

You may find it easier with the front of the WX-2000 facing toward you as it would be in the final operating position.

1. Remove the thermal paper roll from the protective cover.
2. Open the top cover by releasing the levers (pushing away from you) and lifting the lid toward you.
3. With the paper trailing away from you, insert the roll into the WX-2000 pressing home to the right of the unit. Locate the left side of the roll downwards and into position.
4. Lift the paper vertically and pass through the case paper slot passing over the black roller.
5. Close the lid and ensure the levers click into position.

A buzzer sounds when the thermal paper roll runs out. Stop the WX-2000 and replace the thermal roll.

7. Receiving facsimile transmissions

Make the receiver ready for facsimile reception. For shortwave reception you will need a shortwave receiver with SSB (USB) mode.

An external aerial will more-or-less be essential for shortwave reception. By nature the signals will probably have travelled a great distance and the signal strength weak.

Connect the shortwave receiver to the FM PHONE connector of the WX-2000. The inner connection is for audio and the outer is ground.

Switch on the shortwave receiver and select SSB (USB) mode on the shortwave receiver.

Increase the volume of the receiver to approximately one third travel. Adjust the WX-2000 rotary monitor control for comfortable listening.

Tune the receiver to a known facsimile frequency such as 4.24785 MHz or 132.5 kHz.

Connect the WX-2000 to a suitable power source and switch on. Most facsimile transmissions can be received using the default settings of the WX-2000. Of course you can manually set the WX-2000 to comply with the different requirements of facsimile stations.

Press the SPEED button to confirm the LED (12) is illuminated.

The WX-2000 is ready for reception. The default setting is:

SHADE:	2
I.O.C.:	576
FM:	ON

This being the standard setting for shortwave weather facsimile reception.

It is possible to monitor the audio from the internal monitor speaker, a rotary control adjusts level. When found, the facsimile signal has two forms of tone:

1. Continuous 'Pi' tone - no picture being transmitted.
2. Pulsing 'Pi Pi' tone - facsimile picture being transmitted.

The frequency to enable decoding may be 1.5 kHz offset from the listed frequency. The LED tuning indicator should light with the incoming signal. Tune around the receiving frequency until the far right LED lights with the continuous 'Pi' tone. When the pulsing 'Pi Pi' tone is received the far left indicator should flash.

If you wish to start the WX-2000 in the middle of a facsimile transmission, press the START/STOP button. In this case the picture is likely to be split into two pieces due to lack of synchronisation. The following frame transmitted should however be correctly received and printed.

The WX-2000 is designed to automatically start and stop by using the WMO signal contained within the facsimile signal.

The above refers to general weather facsimile reception (based on Japanese satellites). Reception from other areas of the world may require different settings of the WX-2000, in terms of frequency, IOC value, and Speed (rpm).

For reception of direct image satellite transmissions such as Himawari, a wide band radio receiver is required fitted with FM such as the AR3000A. A parabolic or high gain aerial system will be

required or a loop yagi array with low noise preampli:
The following settings of the WX-2000 should be used:

SHADE: 16
I.O.C.: 288
AM: FM/AM LED unlit

Adjust the volume control of the receiver so that the
is illuminated. If the picture is faded, reduce the
If the picture is printed too dark increase the audio

A buzzer sounds when the thermal paper roll runs out.
WX-2000 and replace the thermal roll (see section 6).

8. Specification.

Printing method:	Thermal line printer 8 dots
Printing scale:	2 (B/W), or 16 selectable
Paper width:	Thermal sensitive 216mm x 30
	Such as Toshiba part 0145641
Audio input:	FM 1900 +/- 400Hz 0.7V / 600
	AM 2400 Hz 0 - 1V / 600 OHM
Auto start:	APSS type WMO
Synchronisation:	Independent type
Reception speed:	60, 90, 120 & 240 rpm sele
Collaboration factor:	576 or 288
Power requirements:	12 - 13.5V DC nominal @ 3A
Size:	310mm (W) x 70mm (H) x 200mm

9. Facsimile frequencies.

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
KHABAROVSK (U.S.S.R)		4516.7		
	RHB	7475	90	288
	RHO	9230	120	576
		14737	60	576
		19275		
BEIJING (CHINA)	BAF6	5525		
	BAF36	8120		
	BAF4	10115	120	576
	BAF8	14365		
	BAF33	18235		
BANGKOK (THAILAND)	HSW69	6765		
	HSW64	7395	60	576
	HSW	17520.5		
GUAM (U.S.A.)	NPN	4975		
		7894		
		10255	120	576
		15990		
		19860		
	22910			

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
CANBERRA	AXM32	5100		
(AUSTRALIA)	AXM34	11030	120	576
	AXM35	13920		
	AXM37	19690		
DARWIN	AXI32	5755		
(AUSTRALIA)	AXI33	7535		
	AXI34	10555	120	576
	AXI35	15615		
	AXI36	18060		
AUCKLAND	ZKLF	5805		
(NEW ZEALAND)		9459	120	576
		13550		
		16220		
RESOLUTE	VFR	3253	120	576
(CANADA)		7710		
FROBISHER BAY	VFF	3235	120	576
(CANADA)		7710		
OLINAD/PPO	PPO	8291.1	120	576
(BRAZIL)				
BRASILIA	PPN9	10225	120	576
(BRAZIL)		18080		
RIO DE JANEIRO	PWZ	12025	120	576
(BRAZIL)		17140		

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
BUENOS AIRES (ARGENTINE)	LRO69	5185		
	LRO72	10720	120	576
	LRO84	18093		
BELLOTO (CHILE)	CCV6	4766		
		6418		
		8594	120	576
		13525		
		22071		
SANTIAGO (CHILE)	CCS	2716		
		2886		
		4063		
		6418		
		8682	120	576
		8776		
		12600		
		13525		
MOLODEZHNAYA (U.S.S.R.)	RUZU	9280		
		15830	120	576
		17660		
		18490		
KODIAK ALASKA (U.S.A.)	NOJ	4298	120	576
		8459		

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
PEARL HARBOR (U.S.A.)	NAM	2122		
		4855		
		8494	120	576
		9396		
		14826		
SAN FRANCISCO (U.S.A.)	NMC	21837		
		4346		
		8682	120	576
		12730		
		17151.2		
ESGUIMALT (CANADA)	CKN	4268		
		6946	120	576
		12125		
LA JOLLA (U.S.A.)	WWD	8646.1		
		17410.6	120	576
FORT DE FRANCE (MARTINIGUE)	FFP	5013		
		14521.5	120	576
MOBILE (U.S.A.)	WLO	6852		
		9157.5	120	576
		11145		

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
NORFOLK (U.S.A.)	NAM	3357		
		8080		
		10865	120	576
		16410		
BOSTON (U.S.A.)	NIK	3502		
		12750	120	576
	NMF	3242.5		
HALIFAX (CANADA)	CFH	7530	120	576
		4271		
		6330	120	576
ROTA (SPAIN)	AOK	10536		
		13510		
		4053.5	120	576
		4704		
		7453		
MADRID (SPAIN)		8506		
		9875		
		12759		
		17585		
		3650		
		6918.5		
		10250		

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
MONSANTO (PORTUGAL)	CTV4	4235	120	576
	CTW	8526		
	CTU2	13002		
BRACKNELL (ENGLAND)	GFE25	2618.5	120	288
	GFE21	4782		
	GFE22	9203		
	GFE23	14436	120	576
	GFE24	18261		
	GFA21	3289.5	120	288
	GFA22	4610		
	GFA23	8040	120	576
	GFA24	11086.5		
	GFA25	14582.5		
NORTHWOOD (ENGLAND)	GYA1	2813.85		
	GYA6	3436.85		
	GZZ2	4247.85	120	576
	GZZ3	6436.85		
QUICKBORN- PINNEBERG (GERMANY)	GZZ40	8494.85		
	DDH3	3855	120	288
	DDK3	7880	120	576
	DDK6	13882.5		

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
NORRKPING (SWEDEN)	SMA4	4037.5	120	576
	SMA6	6901		
	SMA8	8077.5		
HELSINKI (FINLAND)	OFB28	8018	120	576
MOSKVA (U.S.S.R.)		2815	60	576
		5355	90	288
		7750	120	576
		10980		
		15950		
NEW DELHI (INDIA)	ATA55	4993.5	120	576
	ATP57	7405		
	ATV65	14842		
		14772		
	ATP38	18227		
		18233		
NAIROBI (KENYA)	5YE	9044.9	120	576
		10115		
	5YE3	17366.9		
		22867		

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
PRETORIA	ZR05	4014	120	576
(SOUTH AFRICA)	ZR02	7508		
	ZR03	13773		
	ZR04	18238		
ST. DENIS-	HXP	8176	120	576
CHAUDRON	FZS63	16335		
(REUNION)				
DAKAR	6VY41	7587.5	120	576
(SENEGAL)	6VU73	13667.5		
	6VU79	19750		
CAIRO	SUU36	4526	120	576
(EGYPT)	SUU2	10123		
SOFIA	LZJ2	5093	120	576
(BULGARIA)				
ANKARA	YMA5	3377	90	288
(TURKEY)	YMA5	6790		
BEOGRAD	YZZ2	3520	120	576
(YUGOSLAVIA)	YZZ1	5800		
ROMA	IMB51	4777.5	120	576
(ITALY)	IMB55	8146.6		
	IMB56	13600		

COUNTRY	CALL SIGN	FREQ(KHz)	RPM	IOC
PARIS	FTE4	4047.5	120	576
(FRANCE)	FT18/B	8185	120	288
	FTM30	12305		
COPENHAGEN	OXT	5850	120	576
(DENMARK)		9360		
		13855		
		17510		
ATHENS	MGR	5206	120	576
(GREECE)		8100		
		12903		
TOKYO	JMH	3622.5	120	576
(JAPAN)		7305		
		9970		
		13597		
		18220		
		22770		
TOKYO	JMJ	3365	120	576
(JAPAN)		5405		
		9438		
		14692.5		
		18130		

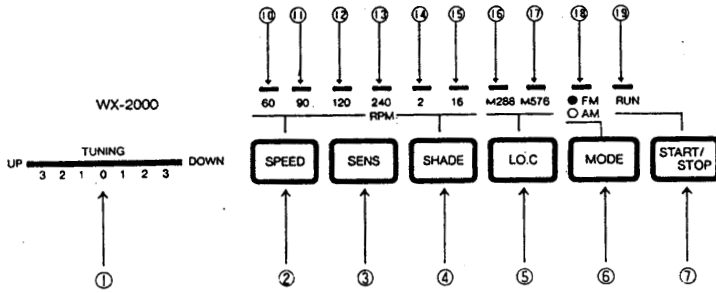


Fig-1

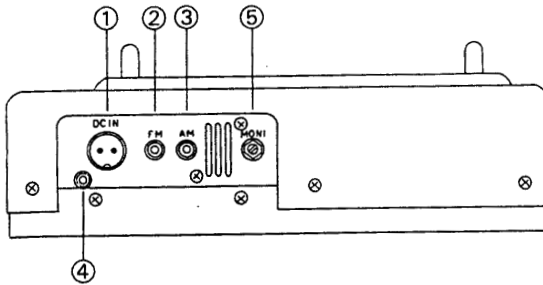


Fig-2

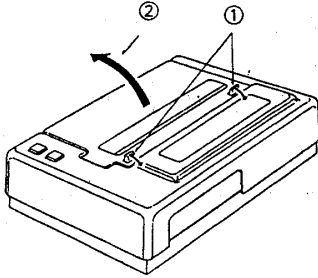


Fig. 3A

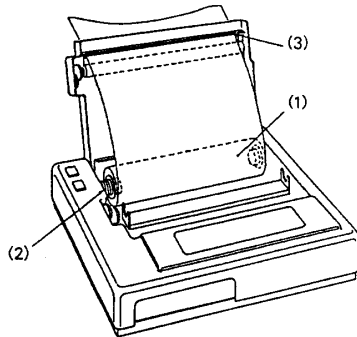


Fig. 3B

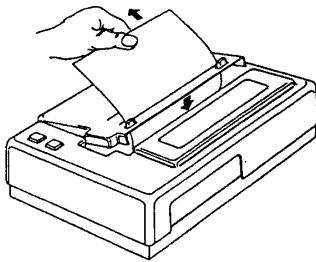


Fig. 3C

Paper requirement:

(TF50KS-E45)

TOSHIBA
WX1000 + WX

感熱記録紙

Thermal Sensitive Paper

SIZE : 216mm X 30m

CODE : 01456410

RADIO FACSIMILE TERMINAL WX2000

STAND ALONE RADIO FACSIMILE TERMINAL FOR REMOTE IMAGE SENSING

RADIO FACSIMILE TERMINAL MODEL WX-2000

The WX2000 is a stand alone radio facsimile terminal designed to produce hard copy images from various radio facsimile services including weather charts, maps, news media and even satellite pictures from NOAA, GOES and METEOR SAT. The WX2000 requires only audio signal from storeware receiver.

The built-in telephone facsimile grade thermal line printer assures very strong mechanical withstand and crisp images with high resolution. It is also capable of producing simulated 16 gray scale which is ideal for Automatic Picture Transmission by weather satellite.

■ Specifications

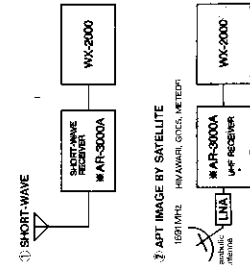
- 81mm (dot/line)
- Printing Density 60, 90, 120, 240/dpm
- Reception speed 576, 288
- Collaboration factor 2(B-W) or 16 gray scale
- Printing Scale AFS type
- Auto start WMO type
- WMO type Independent type
- Synchronization FM 190kHz / / 400Hz
- AF Input 0.18mV/500 ohm
- Power Supply AM 240VDC 0.1V/600 Jhm
- DC 27V
- Current Drain 5A
- Size 300(W)X200(H)X200(D)mm

■ APPLICATIONS

- Short-wave weather broadcast
- APT images from Satellite
- News Media

Specifications subject to change without notice.

■ TYPICAL SYSTEM LAYOUT



■ APT IMAGE BY SATELLITE
1.5M ANTENNA, G.F.C.E., METEPEP

■ AR-3000A APT Receiver Coverage W 56 Band Receiver 100MHz - 2038MHz

