



Palstar Incorporated
9676 N. Looney Rd.,
Piqua, OH 45356 USA
Customer Service and Sales Telephone:
1-800-773-7931
Fax:
1-937-773-8003
Email:
info@palstar.com



R30 SHORTWAVE RECEIVER

Owner's Manual



© Copyright 2006 Palstar Inc.
Printed in the U.S.A.

WARNING: TO PREVENT FIRE OR ELECTRICAL SHOCK DO NOT EXPOSE TO RAIN OR MOISTURE



An appliance and cart combination should be moved with care. Quick stops, excessive force and uneven surfaces may cause the appliance and cart combination to overturn.

	!WARNING! RISK OF ELECTRIC SHOCK DO NOT OPEN	
WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER-SERVICABLE PARTS INSIDE REFER SERVICING TO QUALIFIED PERSONNEL		



The lightning flash with arrow head symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DO NOT OPEN THE CABINET WHILE OPERATING. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

CAUTION: TO PREVENT ELECTRIC SHOCK, DO NOT USE THE THREE WIRE CORD WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

- 1. Read Instructions**—All the safety and operating instructions should be read before the appliance is operated.
- 2. Retain Instructions**—The safety and operating instructions should be retained for future reference.
- 3. Heed Warnings**—All warnings on the appliance should be adhered to.
- 4. Follow Instructions**—All operating and use instructions should be followed.
- 5. Cleaning**—Unplug this appliance from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- 6. Do Not Use Attachments**—not recommended by the manufacturer or they may cause hazards.
- 7. Water and Moisture**—Do not use this product near water—for example, near a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool—and the like.
- 8. Accessories**—Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the appliance.
- 9. Ventilation**—This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation such as a bookcase or rack unless

- proper ventilation is provided or the manufacturer's instructions have been adhered to. Any slots or openings in the cabinet are provided for ventilation. To ensure reliable operation of the video product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface.
- 10. Grounding or Polarization**—this product is equipped with a 3-wire line cord receptacle. It is intended for use with a 3-wire properly grounded power socket. Do not defeat the safety purpose of the supplied line cord and plug.
 - 11. Power Sources**—This product should be operated only from the type of power source indicated on the marketing label. If you are not sure of the type of power supplied to your home, consult your appliance dealer or local power company.
 - 12. Power-cord Protection**—Power-supply cords should be routed so they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit.
 - 13. Lightning**—For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet.

22 The Electromagnetic Spectrum

Greenwich, England. In the past, World Time was known as Greenwich Mean Time, today it is usually called Coordinated Universal Time, abbreviated as UTC. The military designates UTC with the letter “Z” and refers to it as “Zulu”, which is the phonetic pronouncer for “Z.” UTC is a 24 hour clock and the times are written in four digits with no punctuation. Thus, midnight is 0000 hours, 1pm is 1300 hours, and so on. To convert UTC to local time, you will need to know how many time zones you are located east or west of Greenwich, England. If you are located east of Greenwich, you add the number of time zones, west of Greenwich you subtract the number of time zones. Also, you need to remember that UTC never goes on Daylight or Summer Time, so your offset will be different between summer and winter if you live in an area that sets the clocks forward in summer.

Important Safeguards cont'd 3

14. Power Lines—An outside antenna system should not be located in the vicinity of overhead power lines, other electric light or power circuits, where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them may be fatal.

15. Overloading—Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

16. Object and Liquid Entry—Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

17. Servicing—Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

18. Damage Requiring Service—Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a. When the power-supply cord or plug is damaged.
- b. If liquid has been spilled, or objects have fallen into the product.
- c. If the product has been exposed to rain or water.
- d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. An improper adjustment may result in damage and will often require extensive work by a qualified

technician to restore the product to its normal operation.

e. If the product has been dropped or the cabinet has been damaged.

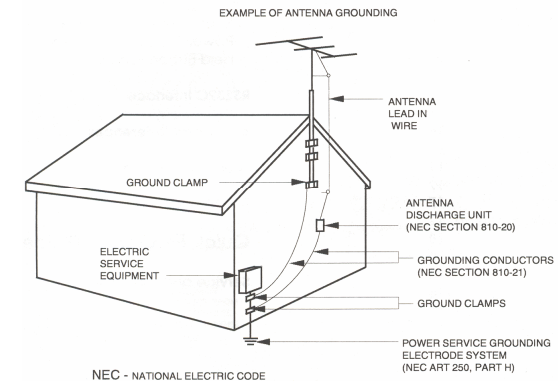
f. When the product exhibits a distinct change in performance—this indicates a need for service.

19. Replacement Parts—when replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original parts. Unauthorized substitutes may result in fire, electric shock or other hazards.

20. Safety Checks—Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

21. Outdoor Antenna Grounding—Before attempting to install this product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges.

- a. Use No.10 AWG copper, No.8AWG aluminum, No.17AWB copper-clad steel or bronze wire or larger, as ground wire.
- b. Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4 feet to 6 feet apart.
- c. Mount antenna discharge unit as close as possible to where lead-in enters house.
- d. A driven rod may be used as the grounding electrode where other types of electrode systems do not exist. Refer to the National Electric Code, ANSI/NFPA 70-1990 for information.
- e. Use jumper wire not smaller than No.6 AWG copper or equivalent, when a separate antenna grounding electrode is used.



The R30 HF shortwave receiver is a compact high-performance radio capable of receiving multi-mode signal handling, high sensitivity and high dynamic range to eliminate annoying inter-modulation distortion interference. The radio also features 100 programmable memories, variable rate tuning and switchable bandwidth in all modes. The R30 receiver is also equipped with a 10 AA cell internal battery pack that automatically connects to the radio when the AC adaptor plug is disconnected allowing portable operation.

Important safeguards	2	SSB Reception	17
Product Specifications	2	Antennas	17
R30	4	Warranty & Returns	19
Front Panel Functions	4		
Rear Panel Functions	8		
Other Features	10		
Shortwave Frequency Sampler	10		
Radio Theory Primer— Frequency & Wavelength	11		
The Electromagnetic Spectrum	12		
Radio Propagation	12		
Amateur Radio Bands	14		
World Time	15		
Time Conversion Chart	16		
CW Reception	16		

of a disaster area for many days after the occurrence. In fact, the ability of Hams to provide emergency communications is one of the primary reasons Ham radio exists.

The primary modes heard on the Ham bands are CW (Morse code, usually down at the lower end of each band), and voice communications in the form of Single Sideband (SSB, there will be more about SSB later on). There is also a smattering of other modes: radioteletype, slow-scan TV, and other data communications methods. These signals require the use of special decoder devices or computers with special decoding software in order to read or view them. The Amateur Radio bands are as follows:

Frequency in kHz	Band Name
3500-4000	80 Meters
7000-7300	40 Meters
10100-10150	30 Meters (CW/Data only)
14000-14350	20 Meters
21000-21450	15 Meters
24890-24990	12 Meters (Shared with Fixed Service)

Other Services

The Shortwave spectrum is also home to many other radio services, including ship-to-shore, transoceanic airlines, government, military, and others. Often called “Utility Stations” or “Utes” for short, their transmission modes include CW, AM voice, SSB voice, radioteletype and data. The monitoring of Utes is a specialized and rapidly changing area of the SWL hobby. It is beyond the scope of this guide to provide more details, but there are books, magazine columns, newsletters, and internet newsgroups if you want more information.

World Time

Let’s say you want to listen to a BBC newscast at 5pm. But, is that 5pm in London where the program originates, 5pm in Southeast Asia where the BBC relay transmitter is located, or 5pm in New Zealand, where the intended audience lives? To eliminate such problems, shortwave broadcast schedules are kept in World Time. World Time is the local time at the Prime Meridian, zero degrees of longitude, which runs through

They are as follows:

Frequency in kHz	Band Name
2300-2495	120 Meters
3200-3400	90 Meters
4750-5060	60 Meters
5960-6200	49 Meters
7100-7300	41 Meters
9500-9900	31 Meters
11650-12050	25 Meters
15100-15600	19 Meters
17550-17900	16 Meters
21450-21850	13 Meters
25600-26100	11 Meters

Everyone is familiar with standard AM and FM stations, which occupy a single frequency and broadcast on it every day. The biggest difference that you will notice between these standard broadcast stations and shortwave broadcasters is that shortwave stations move around a lot. Because the target audiences of shortwave stations are located all over the world, shortwave broadcasters transmit on frequencies and at times chosen to have the best chance of reaching the target audience at the correct time of day. In addition, these frequencies are often changed with the seasons to take advantage of the seasonal changes in propagation.

Another difference is that there is more day-to-day variability in the reception shortwave stations. Because the stations are located so far away, often on another continent, reception is totally dependant on the condition of the atmosphere between the transmitter and your receiver. There will be some days when your favorite station will be very weak or not heard at all.

Amateur Radio Bands

The Amateur Radio (Ham) bands are occupied by ordinary people from all over the world who have been licensed by their governments to engage in two-way radio transmissions as a hobby. Whenever there is a natural disaster such as a tornado, hurricane, earthquake, etc., the Ham bands are the place to listen. It is common for Ham radio to be the only communications link into or out



The word is spreading about Palstar's unique, high-end amateur and shortwave radio products carrying on in the Palstar tradition for products of the highest quality.

The American made R30 shortwave receiver is no exception.

After surveying all the SWL receivers on the market, Palstar President and chief engineer Paul Hrivnak and his design team put their heads together to produce a SWL receiver that performs in a real world setting with no overloading in the front end.

Combining their years of experience in designing and manufacturing amateur radio equipment they came up with a small, portable unit that performs like nothing you've heard. The R30 won't disappoint you, but don't take

our word for it. Here's what an eHam.net reviewer had to say,

"I think this [R30] is one of those not too well known jewels that is already a precious commodity to those who own one."

High quality basics, small footprint and portability.

Frequency Coverage	100 kHz to 30 Mhz
Reception Modes	AM, LSB, USB, CW
Receiver System	Microprocessor controlled PLL tuning, dual conversion superheterodyne receiver.
Display	6-digit backlit LCD display, additional indicators show ATT, AGC, LSB, USB, AM, BW Analog S-meter, calibrated S1 to S9, +20dB, +40dB, +60dB
Tuning	Rotary encoder, Mhz band buttons Tuning rate: 20 Hz to 100 Hz slow and 100 Hz to 500 Hz per step in fast mode. Both rates per step are speed variable.
Memory	100 frequency memories selected with front panel encoder tuning knob or up/dn Mhz buttons. Receiver frequency is retained while switched off. Locked display with tuning knob.
IF Filters	All modes, either 2.4 kHz or 6 kHz operator selectable
RF Attenuator	10 dB
Controls	Power on/off and volume Mode: AM, LSB, USB Mem: Memory button Att: Attenuator Mhz—up/down (1 Mhz)
Antenna Inputs	50 Ω SO239 and 500 Ω and ground with compression terminals
Audio Outputs	External speaker—1/4" jack selected balanced output. Headphone—1/4" jack Internal Speaker is disconnected when headphones or external speaker are plugged in. Recorder output (line audio). Mute audio for use with a transmitter.
Power Supply	External 12 DC supply & internal 10 cell battery pack for portable use (lamps in off mode). 2.1 mm DC Jack input for DC

2. The lower frequencies are better during nighttime and in the winter months.
3. Periods of high sunspot activity favor the higher frequencies, periods of low sunspot activity favor the lower frequencies.
4. Solar flares and other disturbances on the Sun can cause geomagnetic storms that upset normal propagation for hours and days at a time. These disturbances are more frequent during times of high sunspot activity.

What you can hear on your Palstar R30 Receiver?

Long Wave (LW), 100 kHz to 300 kHz

The most common inhabitants of this range of frequencies are navigation aids known as non-directional beacons. They transmit at low power (usually 100 watts or so), and their signal consists of a two or three letter identifier repeated over and over in Morse code.

Medium Wave (MW): frequencies - range of 300kHz to 2 MHz

The lower end of this range, from 300 kHz to 540 kHz, was once the mainstay of ship to shore communications, mostly in Morse code. As ships have increasingly switched to high-tech satellite communications, there is less and less activity there. Many official agencies such as the Coast Guard have even abandoned their round the clock monitoring of the old international distress frequency of 500 kHz. The main band of interest in this frequency range is the Standard AM broadcast band which runs from 540 kHz to 1700 kHz. The higher power stations can be heard over large areas at night. MW is also home to one Amateur Radio band, the 160 meter band from 1600 kHz to 2000 kHz.

Short Wave (SW): frequencies in the range of 2 MHz-30 MHz

Shortwave Broadcasters

The primary bands of interest in the Shortwave (SW) spectrum for most listeners are undoubtedly the international broadcast bands.

Radio Propagation

Propagation refers to the way radio waves travel through the air. When radio waves leave an antenna, some of them travel close to the ground. Receivers close to the antenna receive these *ground waves* directly. The range of ground waves is limited. The closeness of the waves to the Earth means that the Earth absorbs some of their energy, and farther away from the antenna, the Earth curves downward away from the straight-traveling waves, and the waves pass too high overhead to be received on the ground. To receive radio waves at longer distances, some other mechanism is needed.

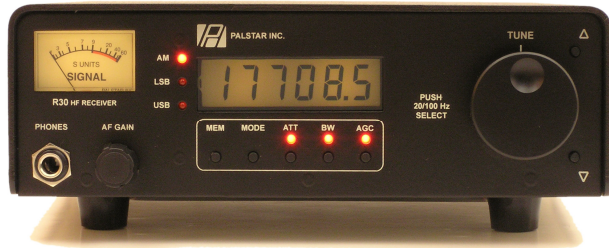
The upper atmosphere of the Earth contains layers of electrically charged or ionized gasses. These ionized layers are caused by the action of light and energy from the Sun on the atmosphere. The ionized layers act as reflectors of radio waves, causing them to bounce back toward the Earth. By bouncing back and forth between the Earth and the ionized layers, it is possible for radio waves to travel all the way around the world. This is called *sky wave* reception.

The study of shortwave radio propagation is a scientific discipline in itself, but, fortunately for us, it can be simplified. Because the nature and location of the ionized layers in the atmosphere are caused by the action of light and energy from the Sun, it is easy to understand that the differences vary between day and night, and between summer radio reflective ionized layers are at higher altitude, and the maximum frequency that the layers will reflect (called the Maximum Usable Frequency, abbreviated MUF) is higher. At night, and more so in the winter when the days are shorter, the reflective layers are at lower altitudes, and the MUF is lower. Frequencies in the lower VHF range and higher usually penetrate right through the ionized layers and are only able to be reflected under rare conditions.

The basics of shortwave radio propagation can be summarized in a few statements:

1. The higher frequencies are better during daytime and in the summer months.

Dimensions	210mm W x 65mm H x 195mm D 8.26" W x 2.56" H x 7.68" D Weight: 1kg (2.2 lbs)	
Sensitivity	100 kHz to 2 Mhz AM 2 μ V SSB .5 μ V 2 Mhz to 30 Mhz AM 1 μ V SSB .5 μ V max 10db(S+N/N)	
Selectivity	45 Mhz 8 kHz BW 455 Khz (AM) 6 kHz SSB 2.4 kHz	
Dynamic Range	>90 dB at 50 kHz from desired	
Spurious Responses	At 45 Mhz > 65 dB rejection At 455 Mhz > 90 dB rejection	
Intermodulation	Third order Intercept +15dbm	
Frequency Stability	+/- 20 Hz per hour -15°C to +50°C	
AGC Range	1 μ V to 500 mV < 2 dB change Attack time < 3 ms Delay - slow < 4 secs Delay - fast < .5 secs	
Audio	2 watts into 8 Ω 2% THD Distortion: 1 kHz signal AM at 60% mod. Depth < 1% SSB < .5%	
S/N Ratio	(AM Mode) 6 kHz filter ref. 60% @ 1 kHz 5 μ V 20 dB 500 μ V > 50 dB (SSB Mode) 5 μ V 30 dB 500 μ V > 50 dB	
Power Supply	DC required 12 vdc@300-600 mA Quiescent current 300 mA (with lamps) Typical current use 350-600 mA	



On/Off Volume Control This knob functions as the power on/off switch and controls the audio output volume.

Tuning Knob

NORMAL MODE: Turning the Tuning Knob changes the frequency of the receiver. The tuning rate varies with the speed at which the knob is turned. There are two tuning rate ranges. The SLOW rate is 20 Hz per step, increasing to a maximum of 100 Hz per step as the knob is turned faster. The FAST rate is 100 Hz per step, increasing to a maximum of 500 Hz per step as the knob is turned faster. To switch between the two rates, press the Tuning Knob toward the front panel until it clicks. To return to the other rate, once again press the knob until it clicks. With a bit of experience, you can easily tell which rate is selected by watching the digital display change while turning the knob.

MEMORY MODE: Once Memory Mode is enabled (by pressing the MEM button once), turning the Tuning Knob steps through the stored memory channels. Pressing the Tuning Knob toward the front panel until it clicks switches between display of the channel numbers and display of the frequency of the stations stored in each memory channel.

If the digital display shows “CH” {number}”, [{number}] is the number of the active memory channel; then pressing the Tuning Knob toward the front panel until it clicks will cause the stored frequencies to be displayed, instead of the channel numbers. To return to channel number display, once again press the Tuning Knob until it clicks. To return to Normal Mode, press the MEM button again.

If we were to radiate a wave with a frequency of one million hertz, one cycle would only take one one-millionth of a second, and the wavelength would therefore be one one-millionth of 300 million or 300 meters. One million hertz can be referred to as 1000 kilohertz (kHz) or 1 megahertz (MHz). 1 Mhz is located just about in the center of the standard AM broadcast band. To calculate the wavelength of any frequency in meters, simply divide 300 by the frequency in megahertz.

With this explanation of wavelength, you can now understand what is meant when someone talks about, say, the “80 meter band” or the “49 meter band.” This is just another way to refer to a group of frequencies that have been set aside for a specific purpose. For example, the 80 meter band is an amateur radio (ham) band that runs from 3.5 Mhz to 4.0 Mhz. The 49 meter band is assigned to international shortwave broadcasts and runs from 5.90 Mhz to 6.20 Mhz.

These meter designations for the bands are chosen to be a nice round number from somewhere near the middle of the band. The frequency of an 80 meter wave is 3.75 Mhz, the frequency of a 49 meter wave is 6.122 Mhz. Obviously, some of the wavelengths in the band are shorter, and some are longer than the length designated by the band name.

The Electromagnetic Spectrum

Electromagnetic waves have different characteristics depending on their frequency. The only difference between radio waves, the microwaves that cook your food, light beams, and X-rays, is their frequency. The Palstar R30 receives frequencies in the range of 100 kilohertz (kHz) to 30 megahertz (MHz). Frequencies in the range of 100 kHz to 300 kHz are called Long Wave (LW). Frequencies in the range of 300 kHz to 2 MHz are called Medium Wave (MW). Frequencies in the range of 2 MHz to 30 Mhz are called Short Wave (SW) or High Frequency (HF).

At frequencies above 30 MHz (which are higher than those received by the Palstar R30), we run into the range of Very High Frequency (VHF) and Ultra High Frequency (UHF) and beyond. We will discuss later what you can expect to hear on these different frequencies.

16 The Electromagnetic Spectrum

UTC	Frequency	Station/Country	Notes
0200	9475	Radio Cairo, Egypt	
0200	9885	Swiss Radio Int'l	
0200	11765	RAI, Italy	IL
0200	17675	Radio New Zealand Int'l	
0230	6020	Radio Budapest, Hungary	
0230	9495	Radio Sweden	
0230	9605	Vatican Radio	FF
0300	7375	Radio Bulgaria	
0330	9895	Merlin Network One, England	
0400	9505	Radio Austria Int'l, via Canada	
0500	4770	Voice of Nigeria	
0500	7465	Kol Israel	

Radio Theory Primer - Frequency and Wavelength

Radio is a way of communicating across distances without the use of wires by means of electromagnetic waves. These electromagnetic waves can travel through the Earth's atmosphere, but unlike sound waves, they are not reliant on the air to carry them. They travel just as well (or even better) through the vacuum of space. The most basic characteristic of any electromagnetic wave is its *frequency*, which is the rate at which it rises from zero to some positive level, and then back through zero to some negative level and then back to zero again. (see Fig. 1) One of these complete alternations is called a *cycle*. The number of these cycles occurring each second is the frequency of the electromagnetic wave. The unit of frequency, the cycle per second, is named after Heinrich Hertz, an early radio researcher. One Hertz is equal to one cycle per second.

Closely related to the frequency of electromagnetic waves is the characteristic known as *wavelength*. As a single radio wave or cycle begins to leave an antenna, it travels outward through space. How far does it get before one cycle is completed? It travels at the speed of light, 186,000 miles per second, or in Metric units, 300 million (300,000,000) meters per second. If we were to radiate a one hertz wave, the front edge of it would have traveled 300 million meters by the time the rear edge of the wave leaves the antenna one second later. Thus, the wavelength of a one hertz transmission would be 300 million meters or 186,000 miles long!

Front Panel Functions

9

FREQUENCY LOCK MODE prevents the tuned frequency from being changed by either the Tuning Knob or the UP and DOWN buttons. This is used when it is necessary to monitor a specific frequency, and you want to be sure the tuning cannot be changed by inadvertently bumping the controls or by vibration. After tuning in the desired station, to engage Frequency Lock Mode press in and hold the Tuning Knob for 2 seconds. The Digital Display will show "LOCDIS" to indicate that the frequency cannot be changed. To release the Frequency Lock, once again press in and hold the Tuning Knob for 2 seconds. If the R30 is powered down while the frequency is locked, it will still be locked when powered up again.

UP Button

NORMAL MODE: Increases receiver frequency in 1 Megahertz steps. If the button is held down, it repeats automatically..

MEMORY MODE: Steps UP through the recorded memory channels one at a time. If the button is held down, it repeats automatically.

MEMORY STORE MODE: Steps UP through all memory channels one at a time. If the button is held down, it repeats automatically.

DOWN Button

NORMAL MODE: Decreases receiver frequency in 1 Megahertz steps. If the button is held down, it repeats automatically.

MEMORY MODE: Steps DOWN through the recorded memory channels one at a time. If the button is held down, it repeats automatically

MEMORY STORE MODE: Steps DOWN through all memory channels one at a time. If the button is held down, it repeats automatically.

MEMORY Button

1. Entering memory mode: Starting from the Normal Mode, pressing the MEM button once will place the receiver in Memory Mode, and the digital display will show memory channel information. The display will be "CH {number}", where {number} is the number of the active memory channel. To display the frequency of the active

memory channel, press once on the Tuning Knob until it clicks. To return to the channel number, press on the Tuning Knob again.

To step through the memory channels, either press the UP or DOWN buttons or turn the Tuning Knob. If you have pressed the Tuning Knob to display memory channel frequency, then the frequency of the stored channels will be displayed instead of the channel numbers as you step through.

Only memory channels that have information stored in them will be displayed. For example, if only memory channels 1 through 10 have information stored in them, continuing to step past memory channel 10 will loop back to memory channel 1 and start over. Likewise, if channels 1 through 10 and 15 through 20 have information stored, while channels 11 through 14 are empty, stepping past 10 will skip over 11 through 14 and resume at 15.

To return to Normal Mode, press the MEM button again. Upon the return to Normal Mode, the unit will be tuned to the station stored in the memory channel selected while in Memory Mode.

If the R30 is turned off while in memory Mode, it will be in Memory Mode when it is powered up again.

2. To store memory information: In Normal Mode, tune in the station you wish to store in memory. All associated settings (i.e. AM, LSB, or USB; Bandwidth; ABC; and Attenuation) will be stored along with the frequency. Be certain that everything is correct before entering Memory Store Mode, because once Memory Store Mode is enabled, you will not be able to view or change the frequency or to view or change the associated settings.

3. To enter Memory Store Mode, first tune in the station you desire to store, then press and hold the MEM button for 2 seconds. The digital display will show "CH {number}." The default {number} displayed will be the lowest available empty memory channel number, and {number} will be flashing.

4. To store the previously tuned station in the default channel number, press the MEM button once.

Internal Battery Pack - The Palstar R30 has provision for internal battery operation. Operation from the battery pack is enabled by the Power Source switch on the back panel. The internal battery pack uses 10 "AA" size penlight cells (not provided). Alkaline cells are recommended for maximum battery life. If rechargeable cells such as Nicad or NiMH are used, they must be recharged in a separate charger. Access for installing or changing the batteries is gained by unscrewing the 4 screws located on the sides of the unit and removing the top cover. Next, remove the battery restraining strap by removing the screw at one end and then pivot it up until the other end unhooks. Be sure to observe proper polarity when installing the batteries. Once the batteries are in place, secure them with the battery restraining strap and replace its screw, then reinstall the top cover.

Shortwave Sampler

This listing is designed to help you hear more shortwave broadcasting stations. The list includes a variety of stations, including international broadcasters transmitting programs to North America and others to other parts of the world. Many of the transmissions are not in English. Your ability to receive these stations will depend on the time of day, time of year, your geographic location and highly variable propagation conditions. AA, FF, SS, GG etc. are abbreviations for languages (Arabic, French, Spanish, German) Times are given in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 4 p.m. PST.

UTC	Frequency	Station/Country	Notes
0000	5960	Radio Canada Int'l	
0030	4472	Radio Movima, Bolivia	SS
0100	3300	Radio Cultural, Guatemala	
0100	6200	Radio Prague, Czech, Republic	
0100	7450	Voice of Greece	Greek/E
0100	9965	Voice of Russia, via Armenia	SS

7. DISPLAY LIGHT SWITCH: This press-on, press-off switch allows the illuminating lamps in the Digital Display and the Signal Strength Meter to be turned off to conserve power when operating from batteries (recommended).

8. MUTE JACK: Ground to mute receiver when using an external transmitter. A standard phono (RCA type) jack is provided to connect a mute control line for use when the R30 is used in conjunction with a transmitter. A relay contact closure or other control circuit capable of pulling a +5 VDC logic line to ground will cause the R30 to mute.

9. EXTERNAL POWER JACK: Connect to the provided wall adaptor or other suitable 12 VDC power source. When an external power source is plugged into the power jack, the internal battery pack is disabled. The limit of the acceptable voltage range that can be connected to the power jack is between 10.5 and 15 VDC. However, operating the R30 from voltages in excess of 14 VDC for prolonged periods can cause excessive heating of the built-in regulator chips. Wall adaptors should be capable of providing 800 mA because wall adaptors of lesser capacity often have poor voltage regulation at the current levels used by the R30. If the power supply used is voltage regulated, 500 mA capacity will be adequate. **If you choose to power the R30 from a source capable of supplying high currents such as the battery of a car or boat, you must protect the radio by placing an in-line fuseholder in the power cable and use a fast blow fuse rated no more than 1 Amp.**

10. FUSE: For internal battery only—use 5mm x 20mm 1A replacement.

5. To store the previously tuned station in a memory channel other than the default: First select the channel desired by using the Tuning Knob or the UP and DOWN buttons. Empty channels will be indicated by a **FLASHING** channel number. Previously used channels will be indicated by a **FLASHING** channel number, followed by the **FLASHING** letter “P”. Choosing to store in a previously used channel will cause the new station information to overwrite the previously stored information. Once the desired channel number is displayed, press the MEM button once to store.

6. If you are in Memory Store Mode, and decide that you do not want to store a memory, turn the power off and wait 5 seconds or so. When the R30 is turned on again, it will come up in Normal Mode.

NOTE: The memories in the Palstar R30 are non-volatile, they will remain no matter how long power is disconnected from the receiver. Once a memory channel has had information stored to it, it cannot be deleted or emptied, **it can only be overwritten by new information.**

Digital Display

NORMAL MODE: Displays received frequency.

MEMORY MODES: Displays memory channel information.

FREQUENCY LOCK MODE: Displays “LOC DIS”

MODE Button - Repeatedly pressing the **MODE** button steps through Amplitude Modulation (AM), Lower Side Band (LSB), and Upper Side Band (USB) reception modes. The currently selected mode is indicated by the lights to the left of the digital display. The bandwidth automatically switches to the width appropriate for the reception mode selected.

BW (BandWidth) Button - Switches between *WIDE* bandwidth (6 kHz for North America, 4 kHz for Europe) for AM reception and *NARROW* bandwidth (2.5 kHz) for SSB reception. The indicator is lit when bandwidth is *NARROW*. The bandwidth automatically switches to the width appropriate for the reception mode selected by the **MODE** button, but the opposite bandwidth can be selected by pushing the **BW** button once. Pressing **BW** again will return to the previous setting.

AGC (Automatic Gain Control) Button - *Switches between Fast and Slow AGC response time.* The indicator is lit when AGC response time is FAST. For most normal reception, AGC response time should be SLOW. The primary use for the FAST response time is when listening to CW (Morse code) stations.

ATTenuator Button - *Switches in 10 dB of attenuation to prevent overloading of the receiver by strong local stations.* The indicator is lit when attenuation is ON. For most normal reception, attenuation should be OFF.

Headphone Jack - A standard 1/4" monaural phone plug (2 conductor) is provided to enable listening without disturbing others. The headphone jack is designed for use with 8 ohm monaural headphones. If stereo headphones are used, the sound will only be heard in one ear. When headphones are plugged in, the internal speaker is disabled.

Rear Panel Functions/Connections

1. LINE AUDIO: A standard phono (RCA type) jack is provided to connect audio to the Line Input jack of a tape recorder so that off-air recordings can be made.

2. GROUND: To earth ground or water pipe.

3. CLIP GROUND: Also a connection to wing nut ground.

4. Low impedance coaxial antenna connection. A standard SO-239 connector for use with a standard PL-259 plug and coaxial cable antenna feed line. This connector is for unbalanced antennas. To use with a balanced antenna, an external BALUN (BALanced to Unbalanced transformer) should be used.

5. High impedance connection for long wire and Hi-Z dipole antennas. For connecting a random length wire, or other end-fed, unbalanced, wire antenna. To connect, press on the colored tab and insert the bare end of the wire into the hole, and then release the tab. Antennas of this type require a good RF ground for best performance. Connect the antenna to the RED terminal, and the ground to the BLACK terminal.

Be sure to go to our website: www.palstar.com and check out the AA30 Active Antenna Matcher. It is a low loss antenna tuner using active electronics to give high selectivity & variable gain. The tunable input peak control ensures best possible weak signal reception and interference rejection. It can be used with the provided whip as an active antenna, or it can match a wire antenna to the R30.

6. EXTERNAL SPEAKER OUTPUT: Audio output is DC isolated and balanced (use 1/4" mono jack or supplied 3.5mm adaptor) The external speaker should have an impedance of 8 Ω , and a minimum power handling capability of 3 Watts. When the external speaker is plugged in, the internal speaker is disabled.