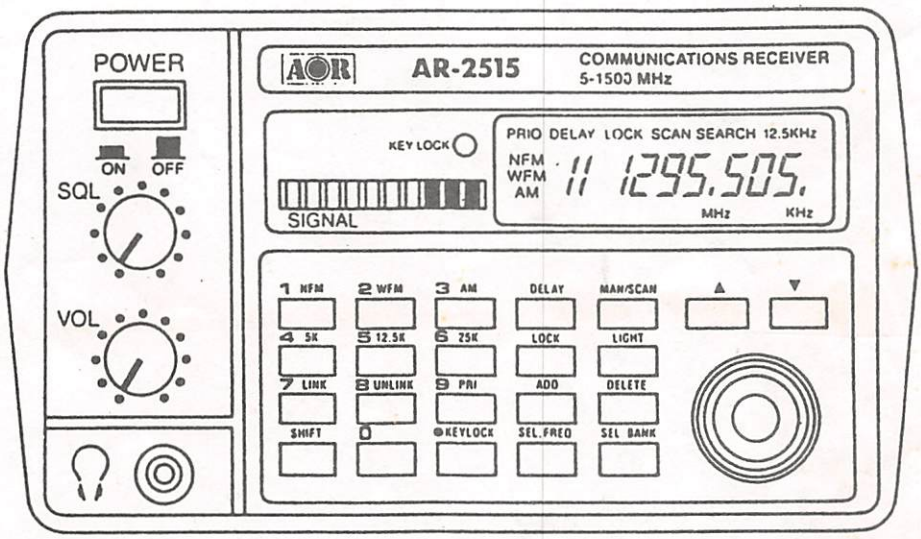
AOR
AR 2515

Owners Manual



ACE Communications

CONTENTS OF CARTON

AR 2515
Telescopic Antenna with BNC Connector
12 Volt DC Power Cord
110 Volt AC to 12 Volt DC wall plug adaptor

SET UP

Power off unit. Top left front panel power button should be extended rather than depressed. Connect antenna to back of unit. BNC connectors are fastened in a push on, quarter turn fashion. Plug AC adaptor into wall receptacle then firmly press connector into back of radio in receptacle labeled DC 12V. For DC power make sure the red wire is connected to a positive terminal and black goes to ground. Use a fused power source on the positive side. Move back panel attenuation switch to upper or 0 attenuation position. Apply power to unit by pressing power button.

PRECAUTIONS

For DC power sources, use only negative ground 12VDC fused systems. Avoid spilling liquids into the receiver, power jacks or connectors. Avoid placing the unit in direct sunlight or extended use under high ambient temperatures or extremely dusty conditions. Do not erect external antennas near power lines.

QUICK START
FOR EXPERIENCED SCANNER USERS

The 2515 should be readily usable by experienced scanner users if you keep the following points in mind.

SHIFT. The shift key allows toggling on or off the functions labeled in white on the keyboard. For example, to lock out the keyboard you must first press the shift key. Other changeable functions flash in the display when the shift key is pressed. The unit does not resume normal operation until a function is changed or shift is again pressed.

ADD & DELETE. In search and scan banks, frequencies must be added or deleted by pressing the add or delete key. This prevents inadvertently writing over and erasing a frequency from memory.

SEL. FREQ. and SEL. BANK. Select frequency allows you to view the frequencies programmed into a bank by repeated pressing of the Sel. Freq key. Auto slew through frequencies within a bank can by accomplished by the tuning knob or the up/down arrows. Select bank allows you to either directly access a bank by pressing the bank number then Sel. Bank or to slew through banks manually or automatically.

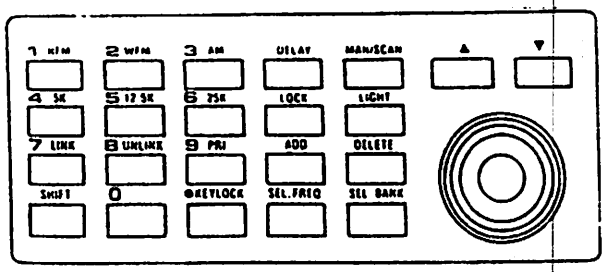
LINK & UNLINK. These functions put banks 1 through 63 into or out of the scan list. When the bank number to the left is flashing, the bank is not linked to the scan list. A solid number indicates the bank is linked. The toggle is performed by pressing shift then link or unlink.

NO DEFAULTS. The 2515 has no default settings. You must specify which mode: AM, FM, or NFM to use. Likewise, in search, you must specify which increments: 5, 12.5 or 25 KHz to use. See Frequencies and Increments section if you

are uncertain as to what increments to use.

SCAN FREQUENCY SORTING. To increase speed, the 2515 indexes all frequencies in scan banks into descending numerical order. The unit arranges frequencies into this order to insure the fastest possible reliable scan rate. Newly added frequencies are inserted into memory by their numerical order, not by channel number. The resulting lack of channel numbers should seem insignificant when you consider that a bank can be scanned in less than one second. We recommend entering frequencies that are not more than 25MHz apart into one bank for best results.

HF COVERAGE. Unlike any other scanner, the 2515 will receive 5 to 25 MHz. These are "shortwave" frequencies which will require a longer antenna for best reception. At its least sophisticated level, this will involve attaching a 10 to 15 foot length of ungrounded bare wire to the telescopic whip. Far better reception can be obtained by using custom indoor or outdoor antennas for HF or "shortwave" frequencies.



KEY FUNCTIONS

1 NFM Used as the digit one to enter frequencies or bank numbers. After pressing Shift, this key will put the unit into the Narrow FM mode, for public service band listening.

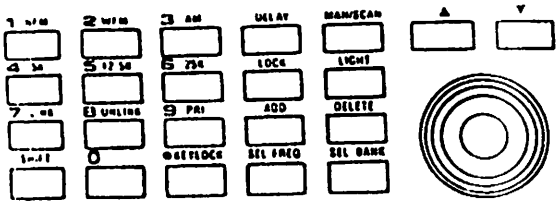
2 WFM Used in frequency entry or to select Wide Band FM reception mode. WFM is used for Broadcast FM or TV audio.

3 AM Digit select for bank or frequency number plus AM reception mode for frequencies below 30MHz and 108 to 136 and various other higher frequencies.

DELAY When delay is on, as indicated in the LCD annunciator, the unit will add an additional pause before resuming searching or scanning.

MAN/SCAN Basically a toggle between the scan or search and the manual mode of operation. Number keys, add or delete keys and select keys will also take the unit out of the auto scan mode in search or scan banks, but only the Man/Scan key will cause the unit to return to the auto mode. The display annunciators scan or search will light when the scan mode is toggled on.

UP/DOWN Arrows *In scan banks*, that are not linked, hitting the arrows will move upward or downward among the frequencies in the bank. Holding down the buttons will cause an automatic slew. When a scan bank is linked in with other scan banks and the unit is in manual mode, you can press the down pointing arrow to go through the remaining frequencies in the bank and then on to the next linked bank. Or you can press the up arrow to simply go through the frequencies in the current bank and then wrap around within the bank and not move to other linked banks. (Moving the knob clockwise is the same as pressing the up arrow and moving the knob counter clockwise is the same as pressing the down arrow.) *In search*, the arrows move up or



down to the next incremental frequency.

4 5K Digit select for bank or frequency number plus increment of 5K or 5KHz is selected for search when this key is pressed after pressing shift.

5 12.5K Digit five select for frequency or bank plus 12.5KHz search increment in shift mode.

6 25K Digit six select for frequency or bank plus 25KHz search increment select in shift mode.

LOCK This key serves to permanently lock out a frequency from the scan list when in the manual or scan mode by storing this bit of information in the permanent memory. The frequency can be reinstated in the scan list by moving to that frequency in manual mode then again pressing the lock key. The display will show the word LOCK above the frequency when that frequency is locked out.

LIGHT The sidelight for the LCD display is turned off or on by pressing this key

7 LINK Digit select for frequency or bank plus after pressing shift, pressing the link will add the current bank to the list of scan banks to be scanned. Bank number in display will stay solid (not flash) when bank is linked.

8 UNLINK Digit select for frequency or bank plus when pressed after shift, will cause current bank not to be scanned with the group of linked banks. Bank number in display flashes to indicate an unlinked bank.

9 PRI Digit select for frequency or bank plus in shift mode will toggle priority on or off. Priority means that when bank one is linked, bank one will be scanned after each successive bank that is scanned, e.g. scan bank order would be: 1, 2, 1, 3, 1, 4, 1, 5, etc.

ADD Pressing this key after entering a frequency will cause it to be added to the current search or scan bank. If the display says full, you must first delete a frequency before the you can add another.

DELETE Pressing this key will delete the currently displayed frequency from the current search or scan bank.

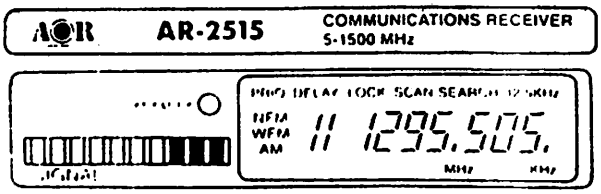
SHIFT Pressing this key will allow you to access any of the functions designated in white letters on the keyboard with the exception of the arrows. If shift is not pressed prior to an operation, the keys will function in accordance with their red designated operation.

0 Digit select for frequency or bank.

.KEYLOCK Used to enter decimal point when entering frequencies or in shift mode, for locking out input to the keyboard. The red keylock LED in the display will light when the keyboard is locked out from reprogramming and locked on a single frequency.

SEL FREQ. In scan or search banks you can directly access a frequency by pressing in the frequency digits then pressing select frequency. In search banks on manual mode, this key will display the upper and lower limits of a search range. In a search bank in auto search mode, the key will cause the search to revert to the highest frequency. In scan banks and in the manual mode pressing this key will step through the memorized frequencies and into the next bank if the current bank is linked. No operation is performed when this key is pressed while scanning.

SEL BANK In scan or search banks you can directly access another bank by pressing the bank number then pressing select bank. You can also manually step with quick keystrokes or automatically slew by holding down the key through all search banks or scan banks; depending on whether you start in a search or scan bank. In scan banks pressing this key will move you to the next scan bank. In search banks pressing this key will move you to the next higher search bank.



DISPLAY

The following is a summary of displayed messages and their meaning. Starting from top left of the LCD to bottom right, they are:

PRIO This annunciator is lighted when you press shift then pri keys. It indicates that priority is on and that in scanning linked banks, the unit will revert to scan bank 1 after scanning each other linked bank. To turn off priority, simply press the shift pri keys.

DELAY This annunciator is lighted when the blue delay key is pressed and turned out by simply pressing it again. In both the search and scan modes, delay will cause the unit to pause *after* a call has been received in the event a reply or a continuation of the call might be receivd.

LOCK This annunciator indicates that the scan frequency currently displayed is locked out from the scan list, i.e. it will not be received in scan mode. This feature is turned off or on by pressing the blue lock key.

SCAN The scan annunciator indicates the unit is on a scan bank and is in the scan mode. It is toggled on or off by pressing the blue man/scan key.

SEARCH This annunciator lets you know the unit is in auto search mode in a search bank. It is toggled on or off by pressing the blue man/scan key.

12.5KHz This is an indicator to show what increments are being used in search. It will also display 5khz, and 25khz.

NFM/WFM/AM The reception mode indicators. Select mode by pressing shift key, then the desired white key mode. Use NFM for public service above 30mhz. Use AM below 30mhz,

from 108 to 136mhz, and at various higher frequencies. Use WFM for FM broadcast radio and TV audio: 54 to 108, 174 to 220 and 470 or 512 to 806 comprise broadcast FM radio and VHF and UHF TV bands in the U.S.

11 These two digits are used to display the bank. Scan banks are from 1 to 62. Search banks are from 63 to 78.

1295.05 These digits are used to show the frequency currently selected or entered. All digits entered through the keyboard are displayed here first.

BACK PANEL

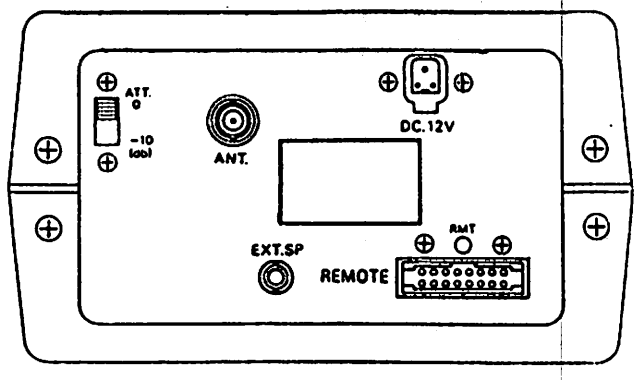
ATT This switch on the upper left has no effect in the 0 setting. In the -10db setting it will attenuate or reduce the level of incoming signals by 10db. This facilitates operation in areas or frequency groups where a high level of interference is present.

ANT. The antenna input jack, a BNC type connector is used. To install antenna, align openings on antenna side to protrusions on radio jack side then press on an rotate antenna connector clockwise until it "snaps" on.

DC. 12V Power input to unit. Use only with AC adaptor supplied or negative ground fused twelve volt direct current power source.

EXT. SP External speaker jack. 8 ohm impedance using a 3.5 millimeter mini plug.

RMT This connector is used to remotely control the unit by the serial port on a computer.

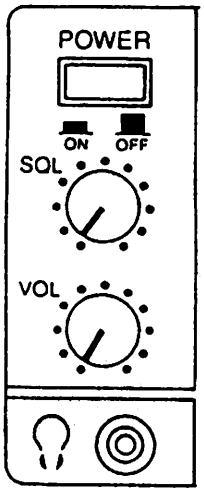


FRONT PANEL

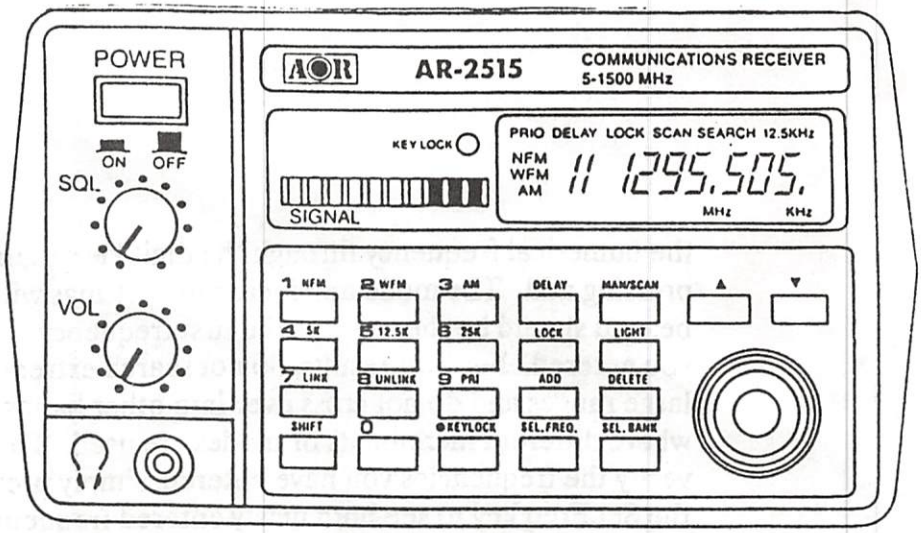
POWER The power button switches on power to the unit when pressed. The unit goes through a self test routine when initially powered up. Sometimes an error will be detected and the power up will fail. Do not become concerned. Simply press the button off then on once again. This will in effect re-boot the unit and again run it through its self test. When the test is satisfactorily completed, the model number, AR2515, will scroll across the LCD display.

SQL The squelch control eliminates background noise and thereby allows the unit to scan or search. Turn the squelch clockwise until it is slightly past the point at which noise disappears. If you have undesired frequencies interrupting search or scan, you can turn the control farther clockwise and possibly eliminate those signals. However, the farther you turn the squelch pot clockwise, less likely the chance of locking on an extremely weak signal.

VOL The volume control simply controls the amount of audio output from the speaker or the speaker jacks. Turning clockwise increases the amount of sound available.



Headphones An 8 ohm 3.5mm mini plug connector, this jack is designed to facilitate private listening as it disables the internal speaker of the unit when connected.



PROGRAMMING EXAMPLES

SEARCH

Search is used to find new and unknown frequencies. To search areas other than those pre-programmed, you must first delete currently entered frequencies. To do this, first go to a search bank by pressing the bank number then the blue select frequency key, (search banks are 63 through 78). For example, 63 then SEL BANK.

Delete currently programmed frequencies by pressing select frequency key then pressing delete. There are two frequencies in each search bank so you must do this operation twice. The display will still show the second deleted frequency you have deleted, do not be alarmed. Simply begin programming in your new frequencies.

To begin entering new frequencies into the bank, first set up the parameters. Do this by pressing the shift key then selecting the mode, by pressing a top row key. Then select the search increment by pressing shift and the desired increment on the second row of keys. Now enter either the upper or lower frequency of your desired search range by pressing in that number with the decimal point and then pressing the Add key. Next press in the second limit to the desired search range by pressing in

the numerical frequency through the digit keys then pressing add. The mode and increment settings will be, and should be the same as the first frequency you entered. For best results, do not search extremely large ranges and do not cross over into other bands where different increments or modes are used. To verify the frequencies you have entered, simply press the Sel.Freq key to see both newly entered frequencies and their mode and increment settings.

As an example, programming a search as per above for the frequencies 150 to 155 in bank 63 would have the following keystroke and display sequence:

Select Bank, Delete Present Frequencies:

Keystrokes: 6 3(red number keys) Sel. Bank
Display: 63 Current upper frequency.

Keystrokes: Delete, Sel.Freq, Delete
Display: Upper frequency, Lower Frequency

Both frequencies have now been deleted even though the lower frequency remains in the display. To enter new frequencies per the example, you would do this:

Keystrokes: Shift, NFM, Shift, 5KHz, 155.0, Add
Display: Flashes when shift is pressed. Shows new items as they are entered.

Keystrokes: 150.0 Add
Display: Shows new lower frequency, bank number, plus mode and increment settings.

Keystrokes: Man/Scan (with squelch closed)
Display: Search is lighted as numbers move down from 155.0.

If you find a frequency which you would like to retain by storing in a scan bank, simply press the digit keys for the bank you want to store it in then press Sel. Bank and Add. You can then return to search by pressing the search bank number then Sel. Bank. Please

read the notes appendix to determine which modes and increments to use in searching various ranges.

SCAN

Scan is used to find active calls on previously entered frequencies. Scan banks are 1 through 62. There are 32 frequency memories per bank, or 1,984 scan memories. You can scan a bank individually or link it to other banks, which will all be scanned.

To link a bank, first go to the bank by pressing the bank number then the blue select frequency key, (scan banks are 1 through 62). For example, 45 then SEL BANK. The number 45 will be flashing to indicate the bank is *not* linked. To link it in with other scan channels, press Shift then press Link. The 45 will stop flashing and stay solid to indicate that the bank is linked. To unlink a bank so that it can be scanned only by itself, go to the bank and press Shift Unlink. The bank number will then flash to indicate its unlinked state.

To add frequencies to a scan bank, first set the mode then press in the frequency then press Add. To delete currently programmed frequencies press the select frequency key until the frequency you want to delete is in the display. Then press the blue Delete key. The deleted frequency will immediately disappear from the display. *Important.* Additions and deletions are not stored into permanent memory until you move on to another bank. If you turn on the unit, then add or delete frequencies to one bank, they will not be retained if you immediately turn off the unit without switching to another bank. The unit operates this way to maximize the life of the permanent memory.

To begin entering new frequencies into a bank, you may need to first delete some present frequencies. The unit will not automatically write over frequencies, instead it will say Full in the display when a bank

has 32 frequencies. For best results, do not add frequencies that require large jumps, i.e. group frequencies within a bank that are numerically close together. Also, for best results, do not mix in frequencies which use different modes into the same bank. To verify the frequencies you have entered, simply press the Sel.Freq key to see both newly entered frequencies and their modes. The unit will always display the frequencies to you in the order which they are scanned; descending numerical order.

As an example of programming the scan frequency 460.450 into bank 16 would have the following keystroke and display sequence:

Keystrokes: 1 6(red number keys) Sel. Bank
Display: 16 Mode setting and a frequency currently in the bank.

Keystrokes: Shift, NFM, 460.450, Add
Display: Flashes when shift is pressed. Shows new items as they are entered.

Keystrokes: Man/Scan (with squelch closed)
Display: Scan is lighted as numbers move down from highest to lowest frequency in the bank.

In the example, the scan bank is assumed to not be full. If it had been, you would see the word Full in the display and could not program in a new frequency until you had deleted an old one. A frequency can be temporarily deleted from the scan list by pressing the lock key when that frequency is in the display. Delay can be toggled on to increase the wait time before scan is resumed after a call is received. Priority can be toggled on to cause bank one to be scanned *after* each linked bank is scanned. At approximately one second per bank, your priority frequencies will be sampled about once every two seconds. Please read the notes appendix to determine the mode settings for various frequencies. Also, check the list of pre-programmed frequencies, you may find that most of your favorite public service

frequencies are already in the unit. We hope they are and that we have saved you a lot of keystrokes.

Errors

You will note in the list of pre-programmed frequencies we have duplicated Banks 73 and 74. Bank 73 is actually 118 to 136 and bank 74 is actually 220 to 300. Also, bank 79 lives only in the minds of our software guys at this point. The last bank is 78. Therefore, there are no pre-programmed search frequencies in the 800 band. Most of the public service band action is in the 851 to 866 range in NFM at 12.5KHz increments.

Also, you probably already know, but it might bear repeating; listening to the 869 to 890 cellular phone band plus some tone and voice paging frequencies, plus some IMTS phones, plus some radio/TV/press frequencies is forbidden by the United States Communications Privacy Act of 1986. There is no Federal law which prohibits manufacture, sale or possession of a device capable of doing such things. The law just prohibits *people* from listening to such things. Please be warned. If your radio should happen to intercept this kind of call you can either shut it off, leave the room, or shoot it with an AK-47.

We have noticed some bad grammar in the first printing of this manual, but at least all the words should be spelled correctly. If our meaning in trying to explain something escapes you, please feel free to give us a call at 1 800 445 7717 or 317 849 2570. We will try our best to get things sorted out.

NOTES

Speed. In an extremely wide band coverage unit such as the AR2515, the slowest component is the section which must synthesize the various frequencies to be received. Compared to a conventional scanner, the AR2515 synthesizer must run through 10 to 15 times the normal frequency spread. Therefore, achieving scan speed is far more difficult than with a conventional scanner. The AR2515 microprocessor solves this problem by ordering scan frequencies in descending numerical order. In this way the synthesizer can run rapidly as it is only required to make small steps instead of great leaps between frequencies. You can help assure optimum operation by remembering to keep numerically close frequencies together in the same bank, in a fashion similar to the way we have pre-programmed the unit. For best results we suggest no more than 2 to 3 megahertz space between any two frequencies in a scan bank, and to maintain frequencies of the same reception mode within the same bank. The same thought applies when linking two or more banks where widely spaced frequency jumps are required to go from one to the other. If large jumps are necessary between banks the microprocessor will see this and calculate the difference and then insert its own delay. However, you may want to enter a few intermediate "buffer" frequencies in the lower numbered bank as a transition for the synthesizer to insure the highest probability of locking on weak signals. The unit will always move downward in frequency within a bank and will move from the highest to the lowest scan bank then back to the highest when banks are linked. The AR2515 will run at approximately 36 channels per second in search mode or in scanning close frequencies. But speed will decrease as will the probability of lock on if the ordering of frequencies requires large jumps from one frequency to another.

AM/NFM/WFM, when to use what	INCREMENTS for Search
AM:	5-54MHz use 5KHz
5-30mhz "shortwave" also SSB	54-108MHz use 25KHz
108-136mhz aircraft	108-136MHz use 12.5KHz
NFM:	136-174MHz use 5KHz
30-54mhz low band	174-220MHz use 25KHz
136-174mhz high band	220-470 or 512 use 25KHz
220-470 or 512mhz UHF(some AM)	470 or 512 to 806 use 25KHz
806-1500mhz 800 band	806-1500MHz use 5 or 12.5Khz
WFM:	*470-512 is used for UHF comm
54-108mhz 2-6 TV Audio & FM	in major metro areas only.
174-220mhz 7-13 TV Audio	*806-950 has 12.5, 25 and
470 or 512-806mhz UHF TV	30KHz spacing in use.

Antennas. The collapsible whip supplied with the unit will do a good job throughout the 25 to 1500 MHz band. For best results, fully collapse the antenna for best reception on 800 band and fully extend it for 30-50MHz reception. For frequencies in between, use an intermediate length. For shortwave or HF listening you will want a much longer antenna. One crude but effective method is to attach approximately 10 feet of bare ungrounded wire to the end of the whip antenna on the radio. This will allow you to receive great distances from shortwave broadcast stations. (When listening to shortwave, remember that sunlight has a real effect. Use 11 to 25 MHz for daytime listening and use frequencies below 11MHz for nighttime listening.) For more ambitious listening, you will want to use outdoor antennas, probably two, possibly more. The HF antenna will most likely be a long dipole wire and the VHF and above antenna should be specifically designed for

this purpose. As a general rule, you will find that reception improves the higher you mount any antenna. In areas with little Radio Frequency congestion you may want to use a combiner to combine the various antennas and feed them to the receiver. But in most cases you will be better off using a switch, which will allow you to switch in and out various antennas, or simply disconnect and reconnect your various antennas to the receiver.

Status Settings. Current status settings are stored in the RAM of the processor rather than being continuously written to permanent memory. Therefore they are lost when power is removed from the unit. We have done this to insure that the permanent memory's design life will coincide with the design life of the other components in the unit. All components of the unit are rated at 8 to 10 years life under normal usage.

Decoders. A number of coded messages can be received throughout the range of the AR2515. These messages, from foreign newspaper text to satellite weather pictures can normally be read by attaching an appropriate decoder to the external speaker jack. These signals are not accessible or decodable through the computer interface jack of the unit. Signals sent through this jack duplicate those control functions available through the keyboard and return what is normally seen in the display.

Warranty. The AR2515 is warranted against defects for 1 year from date of purchase. During this period we will repair or replace it without charge for parts or labor. Return your unit with dated proof of purchase to ACE Communications, 10707 E. 106th St. Indpls, IN 46256. Warranty does not cover transportation costs nor does it cover units subjected to misuse or accidental damage. Except as provided herein, we make no warranties, express or implied, including warranties of merchantability and fitness for a particular purpose. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusions(s) may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Credits: Byron Bowles, Lowell Atkinson, Eric Goberman and a number of other people who either didn't know or were too stubborn to believe that Americans weren't supposed to design and build radios anymore.

MEMORY SPECIFIC

The AR-2515 contains a 8K x 8 serial EEPROM that provides storage for the 78 frequency banks. There are 62 scan banks with 32 frequencies per bank, and 16 search banks with 2 frequencies per bank.

The frequencies in all banks are sorted in desending order. The frequency information is stored in memory as a pseudo BCD number occupying 4 bytes of data. The least-significant byte contains mode information, and the most-significant 3 bytes contain the frequency.

Organization of the stored frequency in 4 bytes:

bytes	4	3	2	1
	MSD...LSD			FLAGS

The flags currently contain 3 types of frequency information:

- modulation (AM, NFM, WFM)
- step-size (5K, 12.5K, 25K)
- lockout

The flags that occupy the first byte are organized as follows:

bits	7	6	5	4	3	2	1	0
AM	0	1	x	x	x	x	x	x
NFM	1	0	x	x	x	x	x	x
WFM	0	0	x	x	x	x	x	x
5K	x	x	0	1	x	x	x	x
12.5K	x	x	1	0	x	x	x	x
25K	x	x	1	1	x	x	x	x
LOCKOUT	x	x	x	x	1	x	x	x
EMPTY SLOT	0	0	0	0	0	0	0	0

There can be up to 8 digits on the LCD display to represent the current frequency. The LCD frequency display format is:

MMMM.KKK.H
where MMMM = 5 - 1500 MHz
KKK = multiples of the step-rate in KHz
H = multiples of the step-rate in .5KHz

Since the frequency is stored into 6 nibbles, two digits must be dropped. The lowest digit (.5KHz multiple) can be dropped, since the software automatically detects when the unit is in the 12.5K mode or when the frequency is a multiple of 12.5KHz. The highest valid frequency is 1500 MHZ, so the 7th and 8th digit (or the two most-significant digits) can be represented as a hex number. All other digits are represented as a BCD number.

example: Here is the current frequency as displayed on the

LCD.

1250.987.5 12.5K/AM

Here is the same frequency represented as bytes in memory.

	MSB--------LSB	
freq	125 09 87	12.5K/AM
memory	C5 09 87	60

The frequency is always sent least-significant byte first.

COMMUNICATIONS

This section outlines the communications protocol.

The AR-2515 and the PC communicate asynchronously through an RS-232C interface at 300, 1200, or 9600 baud, with 8 data bits, no parity, and 1 stop bit. To prevent the AR-2515 from data overflow, the CTS line is used by the scanner to acknowledge to the PC that it is prepared to receive data.

To send data, the PC must first send a signaling character, such as a space (the signaling character is basically a request-to-send, and is discarded). After the first signaling character is transmitted by the PC, the AR-2515 responds by taking such action as may be necessary and indicates completion of such actions by turning ON CTS, thereby indicating to the PC that data may be transferred across the interface point on TXD.

The AR-2515 will automatically detect the correct baud-rate. Initially, the PC must repeatedly send a Carriage Return (0Dh) character, until the scanner responds by returning a Carriage Return / Line Feed (CR/LF) sequence.

The signals used are as follows:

Signal	Pin
TRANSMITTED DATA (TXD)	2
RECEIVED DATA (RXD)	3
CLEAR TO SEND (CTS)	5
SIGNAL GROUND	7

where:

TXD - Data transfer path from PC to AR-2515
RXD - Data transfer path from AR-2515 to PC
CTS - Data enabling signal line from AR-2515 to PC

TXD. Signals on this line are generated by the PC and are transferred to the AR-2515. The PC shall hold TXD in marking "1" condition during intervals between characters or words, and at all times when no data are being transmitted. The PC shall not transmit data unless an ON condition is present on the CTS line.

RXD. Signals on this line are generated by the AR-2515 and are transferred to the PC. RXD shall be held in the marking "1" position. As long as the PC is not transmitting, the AR-2515 assumes that the PC is in the receive mode.

CTS. Signals on this circuit are generated by the AR-2515 to indicate whether or not the AR-2515 is ready to accept data.

COMMAND LIST

The following sections outline valid commands to the AR-2515. Most of these commands directly emulate the keys on the front of the receiver. There are receiver upload and download commands that allow blocks of information to be communicated to and from the PC and AR-2515. There is also an automatic frequency output mode, that will send the frequency and signal strength to the PC whenever squelch is released.

All commands are summarized in the following table.

AD - ADD CURRENT FREQUENCY TO BANK
AF - AUTO FREQUENCY MODE
AM - AM MODE (AM)
DE - DELETE CURRENT FREQUENCY
DL - DOWNLOAD COMMAND
DN - DOWN ARROW COMMAND
DY - DELAY COMMAND
EB - ERASE BANK COMMAND
FR - TUNE TO FREQUENCY
KL - KEYLOCK COMMAND
LI - LCD LIGHT COMMAND
LK - LOCK COMMAND
LN - LINK BANK COMMAND
MA - MANUAL MODE COMMAND
ME - SIGNAL STRENGTH METER
NB - NEW BANK COMMAND
NF - NEXT FREQUENCY COMMAND
NM - NARROW FM MODE (NFM)
PR - PRIORITY MODE COMMAND
RF - RETURN CURRENT FREQUENCY
SC - SCAN MODE COMMAND
SR - STEP RATE
UL - UPLOAD COMMAND
UN - UNLINK BANK COMMAND
UP - UP ARROW COMMAND
VR - VERSION NUMBER
WM - WIDE FM MODE (WFM)

NOTES:

- Unless otherwise stated, all characters transmitted are ASCII.
- Command strings contain no spaces unless otherwise noted.
- The string CR/LF, terminates all communication from the PC and the AR-2515. The ASCII code for CR/LF is 0Dh 0Ah (hex) or 13 10 (decimal). The CR/LF sequence may be sent from the

keyboard by typing CONTROL-M CONTROL-J.

- The communication routine will time-out after approximately 4 seconds of inactivity. (Exception: when the unit is detecting the baud rate.)
- Errors messages:
  ?? - generally means unknown command (or out-of-sync)
  ??T - Timing error (startflag, stopbit, command timeout)
  ??F - Format error (wrong number of bytes in command)

RECEIVER DIRECT CONTROL COMMANDS

AD - ADD CURRENT FREQUENCY TO BANK

Description: Adds a frequency to the bank. If the bank is not FULL, the frequency displayed on the LCD is added to the current bank, and the AR-2515 returns a "Y" as confirmation. If the bank was FULL, an "N" is returned.

Command: AD,CR,LF
Returned: BYTE(Y/N),CR,LF

AF - AUTO FREQUENCY MODE

Description: This command puts the AR-2515 into a mode where the frequencies are output automatically. The auto frequency mode is turned off by issuing a "0" with the AF command, and turned on with a "1".

Whenever squelch is released, the frequency is automatically output to the PC in the BCD format outlined above. As soon as squelch is detected, the signal strength is output (see ME command) followed by an asterisk (*).

Command: AF,BYTE,CR,LF
Returned: CR,LF

AM - AM MODE (AM)

Description: This command is used to set AM mode on the receiver.

Command: AM,CR,LF
Returned: CR,LF

DE - DELETE CURRENT FREQUENCY

Description: This command duplicates the DEL key on the AR-2515. If the frequency displayed on the LCD is present in the current bank, receipt of the DE command deletes the frequency from the bank. If the frequency displayed is not in the current bank, then the display is cleared.

Command: DE,CR,LF
Returned: CR,LF

DL - DOWNLOAD COMMAND

Description: Download a complete frequency bank from the

PC to the AR-2515. The DL command is issued, followed by 2 bytes (ASCII) specifying the bank, followed by the frequencies (pseudo-BCD format as outlined in Memory Specific section).

There are a maximum of 32 frequencies per bank (4 bytes/freq). Empty frequency slots are represented by zeros (4 bytes). Since banks are sorted in descending order, empty slots are always located at the end of the bank. Therefore, to minimize download time, at the first empty slot (4 zeros) download can be terminated.

Command: DL,2 BYTES,4 BYTES/FREQ(NON-ASCII),CR,LF
Returned: CR,LF

DN - DOWN ARROW COMMAND

Description: Duplicates the DOWN arrow function.
Command: DN,CR,LF
Returned: CR,LF

DY - DELAY COMMAND

Description: Controls a programmed delay for the SCAN and SEARCH banks. The DELAY is turned off by issuing a "0" with the DL command and turned on with a "1".
Command: DY,BYTE,CR,LF
Returned: CR,LF

EB - ERASE BANK COMMAND

Description: This command is used to erase the specified EEPROM memory bank, by issuing the EB command with a 2 byte (decimal) number representing the bank. The entire EEPROM can be erased by issuing the EB command with AL (all).
Command: EB,2 BYTES,CR,LF
Returned: CR,LF

FR - TUNE TO FREQUENCY

Description: Tunes to specified frequency. The FR command must be issued with a 4 byte pseudo-BCD number that represents the desired frequency (as outlined in the Memory Specific section). Leading zeros must be issued for frequencies less than 100 MHz. The frequency command is issued in the following format:

Freq - 1250.987.5 12.5K/AM
Format - 60 87 09 C5

The Flags are output first, followed by the least-significant digits of the frequency.
Command: FR,4 BYTES(NON-ASCII),CR,LF
Returned: CR,LF

KL - KEYLOCK COMMAND

Description: Duplicates the keylock function from the keypad. The keylock mode is turned off by issuing a "0" following the command bytes, or turned on with a "1".

Command: KL,BYTE,CR,LF

Returned: CR,LF

LI - LCD LIGHT COMMAND

Description: Controls the LCD backlight. The light is turned off by issuing a "0" with the LI command, and turned on with a "1".

Command: LI,BYTE,CR,LF

Returned: CR,LF

LK - LOCK COMMAND

Description: Lock out current frequency.

Command: LK,CR,LF

Returned: CR,LF

LN - LINK BANK COMMAND

Description: Link the current bank.

Command: LN,CR,LF

Returned: CR,LF

MA - MANUAL MODE COMMAND

Description: This command puts the AR-2515 into the Manual mode. On receipt of the SP command, the unit stops scanning/searching, and remains tuned to the frequency currently displayed on the LCD display.

Command: MA,CR,LF

Returned: CR,LF

ME - SIGNAL STRENGTH METER

Description: Return the signal strength of the current frequency. There are 10 LEDs on the unit that represent the current signal strength. The ME command returns a value from 0 to 10 (least-significant nibble in hex), that directly represents the number of LEDs that are on. (The highest nibble is a 3, to allow the value to be printed as a number.)

Command: ME,CR,LF

Returned: 1 BYTE(HEX),CR,LF

NB - NEW BANK COMMAND

Description: Command to change to specified bank. There are 78 valid banks (scan 1-62, search 63-78). To change to bank 50, issue the command NB50. If the NB command is issued with a zero (NB00), the bank is incremented to the next valid bank. Note that the scan and search banks wrap-around. For example, if incremented past bank

62, the unit will wrap to bank 1.

Command: NB,2 BYTES,CR,LF
Returned: CR,LF

NF - NEXT FREQUENCY COMMAND

Description: Increment to the next frequency in the current bank. The frequencies in each bank are organized in descending order. Issuing the NF command will increment to the next frequency, and if at the end of the bank will wrap-around to the first frequency.

Command: NF,CR,LF
Returned: CR,LF

NM - NARROW FM MODE (NFM)

Description: This command is used to set NFM mode on the receiver.

Command: NM,CR,LF
Returned: CR,LF

PR - PRIORITY MODE COMMAND

Description: This command is used to put the AR-2515 into the priority mode. The priority mode is turned off by issuing a "0" following the command bytes, or turned on with a "1".

Command: PR,BYTE,CR,LF
Returned: CR,LF

RF - RETURN CURRENT FREQUENCY

Description: Returns the current frequency displayed on the LCD. The frequency will be returned as a 4 character pseudo-BCD number that represents the desired frequency (as outlined in the Memory Specific section). Leading zeros will be issued for frequencies less than 100 MHz. The frequency is returned in the following format:

Freq - 1250.987.5 12.5K/AM
Format - 60 87 09 C5

The Flags are output first, followed by the least-significant digits of the frequency.

Command: RF,CR,LF
Returned: 4 BYTES(NON-ASCII),CR,LF

SC - SCAN MODE COMMAND

Description: This command puts the AR-2515 into the SCAN or SEARCH mode.

Command: SC,CR,LF
Returned: CR,LF

SR - STEP RATE

Description: Changes the current step rate. This command can be used to change the step-rate to 5K, 12.5K, or 25K mode by issuing the SR command

with a 05, 12 or 25 respectively.

Command: SR,2 BYTES,CR,LF
Returned: CR,LF

UL - UPLOAD COMMAND

Description: Upload a complete frequency bank from the AR-2515 to the PC. The UL command is issued, followed by 2 bytes (ASCII) specifying the bank. On receipt of the command, the frequencies of the specified bank are uploaded. (in the pseudo-BCD format as outlined in Memory Specific section).

There are a maximum of 32 frequencies per bank (4 bytes/freq). Empty frequency slots are represented by zeros (4 bytes). Since banks are sorted in descending order, empty slots are always located at the end of the bank. Therefore, to minimize upload time, at the first empty slot (4 zeros) upload will be terminated by CR/LF.

Command: UL,2 BYTES,CR,LF
Returned: 4 BYTES/FREQ(NON-ASCII),CR,LF

UN - LINK BANK COMMAND

Description: Unlink the current bank.
Command: UN,CR,LF
Returned: CR,LF

UP - UP ARROW COMMAND

Description: Duplicates the UP arrow function.
Command: UP,CR,LF
Returned: CR,LF

VR - VERSION NUMBER

Description: Displays the current version number.
Command: VR,CR,LF
Returned: CR,LF

WM - WIDE FM MODE (WFM)

Description: This command is used to set WFM mode on the receiver.
Command: WM,CR,LF
Returned: CR,LF

ACE COMMUNICATIONS

SET UP INSTRUCTIONS BW 1

Insert DB 25 connector into computer serial port and small connector serrated side up into AR2515. Insure that proper com port is selected by terminal program. Establish baud rate to AR2515 by 3 to 4 CR/LF.

When using EG1 software from ACE for AR2515 be sure that file ACECOMM.CFG is properly set up for your computer system, i.e. com port 0 or 1 selected and the desired baud rate is selected. 1200 baud is the default, as is com 0. Edit file with an ASCII text editor if changes are needed.

Important: With ACECOMM.EXE file always establish initial handshaking with AR2515 by pressing Alt F10 simultaneously. The radio will properly respond by flashing RS-232 on the LCD display then dropping back to the previously displayed frequencies.

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General Description

Software has been provided to facilitate the use of the AR-2515 monitor receiver. There are two distinct purposes to the software: communication with the monitor and maintain databases frequency information.

The communications section was designed to communicate specifically with the AR2515 monitor and thus understands the special nature of some of the commands. Some of this functionality is found in the Auto Frequency mode where the receiver returns the frequency and the signal strength back to the communications program. Frequency conversion is done in its entirety to save the user the time and effort required to do this.

Since the receiver can store over 2000 individual frequencies a data management capability has been included. This software organized exactly as the scanner: 62 scan banks of 32 frequencies and 16 search banks of 2 frequencies. Additionally, a 79th database is included for personal use. As with the scanner, the 78 data bases are store automatically in descending order while the 79th is in ascending order. The organization of the data in the databases is frequency, modulation, step rate, and 30 character description. The full 30 characters do not show on the screen but the field scrolls within itself to the full 30.

Additional capabilities are included which allow data to be sent from the the scanner to the data management software or from the data management software to the scanner.

To begin, copy the diskette onto your hard drive and type scanner.bat.
After 78 databases are created, you will see the following screen.

MAIN MENU

The main menu gives you 5 options:

ACE COMMUNICATIONS

1 Bank Management

2 Direct Access Scanner

3 Convert ACECOM.OUT

4 Read acecom.txt into database

5 QUIT

Navigation around the menu is done is one of two ways: 1) the up and down arrow keys highlight an option then press Enter (or carriage return) to execute the selection. 2) Press the number of the option and the selection will execute immediately.

OPTION 1 - **Bank Management**

The system will help you to manage not only all banks and channels that the 2515 can store but it also allows you to have a private area where additional frequencies can be stored.

Selecting options 1 brings up the bank selection. From here you can select a bank that also appears on the 2515. As on the 2515, banks 1 thru 62 each hold 32 channels and banks 63 through 78 each hold two channels. The last bank (FREQUEN) is your personal storage area. No limit is imposed on the number of frequencies except the amount of starage on your system.

You will see the screen:

ACE COMMUNICATIONS
AR-2515 FREQUENCY DATA BASE

BANK01	BANK21	BANK41	BANK61
BANK02	BANK22	BANK42	BANK62
BANK03	BANK23	BANK43	BANK63
BANK04	BANK24	BANK44	BANK64
BANK05	BANK25	BANK45	BANK65
BANK06	BANK26	BANK46	BANK66
BANK07	BANK27	BANK47	BANK67
BANK08	BANK28	BANK48	BANK68
BANK09	BANK29	BANK49	BANK69
BANK10	BANK30	BANK50	BANK70
BANK11	BANK31	BANK51	BANK71
BANK12	BANK32	BANK52	BANK72
BANK13	BANK33	BANK53	BANK73
BANK14	BANK34	BANK54	BANK74
BANK15	BANK35	BANK55	BANK75
BANK16	BANK36	BANK56	BANK76
BANK17	BANK37	BANK57	BANK77
BANK18	BANK38	BANK58	BANK78
BANK19	BANK39	BANK59	FREQUEN
BANK20	BANK40	BANK60	

|| -- PgUp PgDn Home End Esc

The keys presented move you around the screen, highlighting the banks. The up and down arrows move throught the banks one at a time from Bank 1 to Frequen and then starting over again or backwards through the banks. Page up move to the TOP of whatever column you are in, page down moves to the bottom. Home moves you to Bank 1 and END moves you to FREQUEN. Pressing ENTER selects the highlighted bank and a screen similiar to the following will appear:

ACE COMMUNICATIONS
AR-2515 FREQUENCY DATA BASE
Editing BANK01

Freq	Description	Freq	Description
162.5500	N 5	0.0000 0	
162.4750	N 5	0.0000 0	
162.4000	N 5	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	
0.0000	0	0.0000 0	

|| C/R F5-Print Bank F10-Look Up PgDn ESC

The bank in this case may contain up to 32 entries. The cursor begins on the first. To move around the screen: Carriage Return or Down Arrow move to the next part of the channel. Up Arrow goes back one field. Ctrl-Home goes to the top right (first channel, frequency) and Ctrl-End to the description of the last channel.

Entry of channels can be accomplished one of two ways. You can type in the data directly in this screen. The first entry is the frequency, the second is the band (Wide FM, Narrow FM, or AM), the third is the step of the frequency (1 for 12.5, 2 for 25, 5 for 5 mHz), and finally a description of the frequency. The description shows 20 characters but can store 30 (the entry will scroll as you type).

The second method of entry is to load the frequency not directly into the bank itself but rather from the FREQUEN section. Data stored there is available to the other 78 banks ! To gain access to FREQUEN while in Banks 1 through 78 the cursor must be a frequency column. From there, press F10 (Function Key 10).

ACE COMMUNICATIONS
AR-2515 FREQUENCY DATA BASE
Editing BANK02

Freq	Description	Freq	Description
34.0400	N 5	33.7200	N 5
34.0200	N 5		
34.0000	N 5		
33.9800	N 5		
33.9600	N 5		
33.9400	N 5		
33.9200	N 5		
33.9000	N 5		
33.8800	N 5		
33.8600	N 5		
33.8400	N 5		
33.8200	N 5		
33.8000	N 5		
33.7800	N 5		
33.7600	N 5		
33.7400	N 5	33.4200	N 5

FREQ	BAND	STEP
5.8850	N	5
5.9750	N	5
5.9900	N	5
6.0400	N	5
6.0600	N	5
6.0650	N	5
6.0850	N	5
6.1450	N	5
6.1750	N	5
6.1950	N	5

|| C/R F5-Print Bank F10-Look Up PgDn ESC

Your screen will appear as above. Any frequency stored in FREQUEN can be 'pulled' into a line of a bank. To do this use the page up, page down, up arrow or down arrow keys to hi-lite the line you wish to use. Press the Carriage Return (ENTER) and the frequency will be placed into the line of bank that you originally were on. To return to the bank WITHOUT selecting a frequency, press the ESC (Escape) key.

OPTION 2 - Direct Access Scanner

IMPORTANT NOTE !

Now that you've read all of this documentation it is important to know how to initiate the RS-232 communications with the scanner. After the scanner is turned on AND the communications program is active press ALT-F10. This establishes the communications link with the scanner. The scanner screen will show RS-232 and return to the regular display. If it does not, turn the scanner off then on again and again press the Alt-F10 combination.

The AR-2515 is equipped with an RS-232 serial port suitable for connection to an IBM PC/XT/AT or compatible just as one would connect a modem. Communications is satisfactory at 1200 or 9600 baud using 8 bits, no parity, one stop bit. Communicating with the 2515 must be done in upper case letters, no spaces between commands and the arguments, and ended with a carriage return - line feed. On the main menu is the option "Direct Access Scanner". This is a communications program designed specifically to communication withthe 2515. It understands not only the commands and structure of the commands but it also understands some of the special nuances of the 2515.

When first selected, the direct access module displays a blank screen with the notation

"PRESS F10 FOR HELP". Pressing F10 gives a brief display of all of the commands concerning the screen display and the keyboard interaction.

There are two distinct sections to ACECOM: input (you provide that) and output (the 2515 provides that). The screen is duly separated. The top 22 lines are for scanner output. This a "window" into a 40 line (by 80 col) scrollable buffer. You can see 22 lines of it at any given time. The difference between this and other software products which have scrolls is that the output ALWAYS goes to the bottom of the scroll. Not to where the cursor is at any given time.

Other features include:
Recall of the last ten items sent to the system.
Easy editing of input text BEFORE it is sent to the system.

You have a myriad of command functions that you can use, some affect the scroll, some affect the input window. They are presented here, separated by their functionality.

BUFFER COMMANDS (What you can do to what you see in the upper 22 lines.)

Pg Up - move the scoll window 'up' 20 lines in the 40 line buffer.
Pg Dn - move the scroll window 'down' 20 lines in the 40 line buffer.
Up arrow - move the arrow cursor up 1 line in the buffer
Down arrow - move the arrow cursor down 1 line in the buffer
Grey + key - move the window to the current output line in the buffer
Grey - key - move the window to the first line of the 40 line scroll.
Ctrl-Home - clear the entire 40 line buffer and move to line 1.
F1 - Turn on printer
Alt F6 - display the keyboard buffer on screen when sent to system.
F5 - Capture incoming (and outgoing data if Alt F6) to the file of your choice. Enter the filename into the input bufer before pressing key or use the system default of ACECOM.OUT (for capturing frequencies to be loaded into the bank management you MUST use ACECOM.OUT).

KEYBOARD BUFFER COMMANDS

Home - move cursor to the first position in the 160 character window
End - move cursor to the last CHARACTER in the 160 character window
INS - allow character inserting (while typing) at cursor position
DEL - Delete character under cursor and shift rest of line to the left
Right arrow (6 key) - move the cursor to the right.
Left Arrow (4 key) - move the cursor to the left
Grey Left Arrow - DESTRUCTIVE backspace
ESC - Clear input buffer completely (window only)
F9 - Roll the last ten items through the input window
Alt F9 - Roll the contents of the Alt buffer through the input window
F8 - CLEAR ALL 10 'last sent items' from system (set to blanks)
Alt F8 - CLEAR ALL 10 Alt buffers from system
Carriage Return - Send the input buffer to the system with a return ASCII 13 and linefeed ASCII 10. Sends all of the characters to the system to the end of the buffer, regardless of cursor location.

Control Carriage Return - Send the input buffer to the system with out a return.

There is a file for the configuration of the communications port.
The file is ACECOM.CFG it contains values in the format
ccbbbbpsaaaa where:
cc = comm line 1 (use a 0) or 2 (use a 1)

bbbb = baud rate
p = parity (2=even)
s = stop bits
aaaa = display attributes

White on black is 0001. Colors are C 31 (white on blue). The best thing for now is experiment. There are 128 color combinations. Some are good some are bad (C 0 = black on black??) Remember to use ANSI.SYS.

If you press ALT-C, a window opens which contains all the scanner commands. The up and down arrows and page up and page down move the cursor to different commands. Next to the command are the arguments (if any) needed for the command as well as a brief description of the command. Pressing ENTER or Carriage Return selects that command and places the first 2 characters into the keyboard area on the screen. You may now follow the command with the appropriate argument(s) (if any) followed by a carriage return. The automatically sends the carriage returnsequence to the scanner. In addition, if you refer to the scanner documentation you wills ee that the compaction method needed to send frequencies is not easy to type. To that end, commands which require frequencies to be sent to the scanner have a built in capability to translate the frequency, modulation, and step rate into the proper codes for the scanner.

On the hi-lited line 23 of the screen on the left is a status area. When you begin the communicationn program there are an "NF" and a "05" on the screen. When you send frequencies to the scanner the communications program uses these for the modulation and step rate. You change the settings with Alt-M to change the modulation. As you press Alt-M the display and internal setting change to "WF" then "AM" then back to "NF". The step rate is changed by pressing Alt-S. The rate changes from 05 to 12 to 25 and back to 05.

Other important capabilities of the communications program is its ability to monitor the scanner and capture the frequencies found to be active and their respective signal strength. This data can be displayed as well as captured to disk and loaded into one of the frequency databases.

The following commands are used when communicating with the scanner. The command WT, however, is specific to the AR-2515 communications program and will be described here only. Please refer to the scanner documentation for a complete description of these commands.

AD - Add Frequency
AF[0/1] - Auto Frequency Mode
AM - AM Mode (AM)
DE - Delete Current Frequency
DL[nn] - Download Bank Command
DN - Down Arrow
DY[0/1] - Delay
EB[nn] - Erase Bank
FR[nnnn] - Tune to Frequency
KL[0/1] - Keyboard Lock
LI[0/1] - LCD Light On or Off
LK - Lock out Frequency
LN - Link Bank
MA - Manual Mode
ME - Signal Strength Meter
NB[nn] - New Bank
NF - Next Frequency
NM - Narrow FM Mode (NFM)
PR[0/1] - Priority Mode
RF - Return Current Frequency

SC - Scan or Search
SR[nn] - Step Rate
UL[nn] - Upload Bank
UN - Unlink Bank
UP - Up Arrow
VR - Version Number
WM - Wide FM Mode
WT[nn] - Wait Interval

In addition to the documentation provided there is some additional information about some of the commands that you need with regard to the communications program.

AF[0/1] - Auto Frequency Mode

As decribed in the manual, AF1 instructs the scanner to return, through the RS-232 port, each active frequency (and step rate and modulation and signal strength). This information may be captured to disk by typing and F5 BEFORE issuing the AF1 command. On the bottom of the screen the message "ACECOM.OUT" will appear AND the letter F will appear on the separation bar showing that an output file is active. The output file may be disontinued at any time by pressing F5 again. This command also sets up some special code in the communications program. An AF0 MUST be issed to deactivate this special code. The communication program will behave erratically if you forget to turn off the auto frequency.

DL[nn] - Download Bank Command

If you use the Bank Management capability to store your frequencies and you wish to load a bank of the scanner DLnn will do just that. To execute this command either type (upper case!) DL followed by the bank number or you may select DL from the ALT-C menu followed by the bank number. The communications program will convert the frequency data to the scanner format and load the scanner directly from the database.

UL[nn] - Upload Bank

Similiar to AF, UL instructs the scanner to return frequencies etc. This command can be useful if the scanner is programmed by hand and you now wish to store those frequencies on the computer. Again, turn on the output file by pressing F10 ("ACECOM.OUT" shows on the bottom of the screen). Then enter the command UL (or select from the the Alt-C menu) followed by the bank number to upload. The data will be stored in ACECOM.OUT. You then must convert the data (menu option 3) and then you may load the data into the database of your choice. Again, note: the data in banks 1-78 will be OVERWRITTEN ! The data in FREQUEN will be added to.

WT[nn] - Wait Interval

This command does not exist on the scanner. It is used in conjunction with the AF command. The default timer is set for 10 seconds. What this means is that in AF mode the communications program will automatically issue a DN (down arrow) command after 10 seconds. This interval may be changed by use of the WT command. The syntax is WTN[N] (ie WT3 or WT99 for 3 seconds or 99 seconds). The maximum value for 'n' is 32,767 (seconds).

Option 3 - Convert ACECOM.OUT

The communications program can capture output from the scanner and place it into a file (see instructions above). In the case of the command "RF", the scanner returns frequency, modulation, step rate, and the signal strength. If the file that is used to capture this output is ACECOM.OUT then that file can be converted to a form that can then be added to the database FREQUEN or used to replace the contents of any other database. First the datamust be converted to a more suitable form. Option 3 does this. The output is stored in file ACECOM.TXT.

Option 4 - Read acecom.txt into database

Data can be added to FREQUEN from the file (and only the file) ACECOM.TXT. Option 4 asks:

Enter BANK Database Number or FREQUEN _____

Valid answers are: FREQUEN
or a number between 1 and 78

If the database is FREQUEN then the contents of ACECOM.TXT is added to the database. The data will be sorted but there is always the possibility of duplicate entries.

Since ACECOM.TXT can also contain Bank data from the scanner or some other source a database number may be entered. In that case, at most 32 entries will be saved into databases 1-62 and at most 2 entries will be saved into databases 63-78.

If the contents of ACECOM.TXT are from searching a range of frequencies then the best place to load the frequencies would probably be FREQUEN. Then use the F10 to bring frequencies into the proper database for regular scanning.

Mod 20(2

S# 122 8

AR 2515

AR 2515 Pre Programmed Frequencies

Bank 2				
1	33.4200	9	33.5800	17	33.7400	25	33.9000
2	33.4400	10	33.6000	18	33.7600	26	33.9200
3	33.4600	11	33.6200	19	33.7800	27	33.9400
4	33.4800	12	33.6400	20	33.8000	28	33.9600
5	33.5000	13	33.6600	21	33.8200	29	33.9800
6	33.5200	14	33.6800	22	33.8400	30	34.0000
7	33.5400	15	33.7000	23	33.8600	31	34.0200
8	33.5600	16	33.7200	24	33.8800	32	34.0400

Bank 3				
1	39.0200	9	39.1800	17	39.3400	25	39.5000
2	39.0400	10	39.2000	18	39.3600	26	39.5200
3	39.0600	11	39.2200	19	39.3800	27	39.5400
4	39.0800	12	39.2400	20	39.4000	28	39.5600
5	39.1000	13	39.2600	21	39.4200	29	39.5800
6	39.1200	14	39.2800	22	39.4400	30	39.6000
7	39.1400	15	39.3000	23	39.4600	31	39.6200
8	39.1600	16	39.3200	24	39.4800	32	39.6400

Bank 4				
1	39.6600	9	39.8200	17	39.9800	25	42.1600
2	39.6800	10	39.8400	18	42.0200	26	42.1800
3	39.7000	11	39.8600	19	42.0400	27	42.2000
4	39.7200	12	39.8800	20	42.0600	28	42.2200
5	39.7400	13	39.9000	21	42.0800	29	42.2400
6	39.7600	14	39.9200	22	42.1000	30	42.2600
7	39.7800	15	39.9400	23	42.1200	31	42.2800
8	39.8000	16	39.9600	24	42.1400	32	42.3000

Bank 5				
1	42.3400	9	42.5000	17	42.6600	25	42.8200
2	42.3600	10	42.5200	18	42.6800	26	42.8400
3	42.3800	11	42.5400	19	42.7000	27	42.8600
4	42.4000	12	42.5600	20	42.7200	28	42.8800
5	42.4200	13	42.5800	21	42.7400	29	42.9000
6	42.4400	14	42.6000	22	42.7600	30	42.9200
7	42.4600	15	42.6200	23	42.7800	31	42.9400
8	42.4800	16	42.6400	24	42.8000	32	42.9600

Bank 6				
1	44.6200	9	44.7800	17	44.9400	25	45.1000
2	44.6400	10	44.8000	18	44.9600	26	45.1200
3	44.6600	11	44.8200	19	44.9800	27	45.1400
4	44.6800	12	44.8400	20	45.0000	28	45.1600
5	44.7000	13	44.8600	21	45.0200	29	45.1800
6	44.7200	14	44.8800	22	45.0400	30	45.2000
7	44.7400	15	44.9000	23	45.0600	31	45.2200
8	44.7600	16	44.9200	24	45.0800	32	45.2400

Bank 7				
1	45.2600	9	45.4200	17	45.5800	25	45.7400
2	45.2800	10	45.4400	18	45.6000	26	45.7600
3	45.3000	11	45.4600	19	45.6200	27	45.7800
4	45.3200	12	45.4800	20	45.6400	28	45.8000
5	45.3400	13	45.5000	21	45.6600	29	45.8200
6	45.3600	14	45.5200	22	45.6800	30	45.8400
7	45.3800	15	45.5400	23	45.7000	31	45.8600
8	45.4000	16	45.5600	24	45.7200	32	45.8800

Bank 8				
1	45.9000	9	46.0600	17	46.2200	25	46.3800
2	45.9200	10	46.0800	18	46.2400	26	46.4000
3	45.9400	11	46.1000	19	46.2600	27	46.4200
4	45.9600	12	46.1200	20	46.2800	28	46.4400
5	45.9800	13	46.1400	21	46.3000	29	46.4600
6	46.0000	14	46.1600	22	46.3200	30	46.4800
7	46.0200	15	46.1800	23	46.3400	31	46.5000
8	46.0400	16	46.2000	24	46.3600	32	46.5200

Bank 9				
1	153.7400	9	153.8600	17	153.9800	25	154.1000
2	153.7550	10	153.8750	18	153.9950	26	154.1150
3	153.7700	11	153.8900	19	154.0100	27	154.1300
4	153.7850	12	153.9050	20	154.0250	28	154.1450
5	153.8000	13	153.9200	21	154.0400	29	154.1600
6	153.8150	14	153.9350	22	154.0550	30	154.1750
7	153.8300	15	153.9500	23	154.0700	31	154.1900
8	153.8450	16	153.9650	24	154.0850	32	154.2050

Bank 10				
1	154.2200	9	154.3400	17	154.6500	25	154.7700
2	154.2350	10	154.3550	18	154.6650	26	154.7850
3	154.2500	11	154.3700	19	154.6800	27	154.8000
4	154.2650	12	154.3850	20	154.6950	28	154.8150
5	154.2800	13	154.4000	21	154.7100	29	154.8300
6	154.2950	14	154.4150	22	154.7250	30	154.8450
7	154.3100	15	154.4300	23	154.7400	31	154.8600
8	154.3250	16	154.4450	24	154.7550	32	154.8750

Bank 11				
1	154.8900	9	155.0100	17	155.1300	25	155.2500
2	154.9050	10	155.0250	18	155.1450	26	155.2650
3	154.9200	11	155.0400	19	155.1600	27	155.2800
4	154.9350	12	155.0550	20	155.1750	28	155.2950
5	154.9500	13	155.0700	21	155.1900	29	155.3100
6	154.9650	14	155.0850	22	155.2050	30	155.3250
7	154.9800	15	155.1000	23	155.2200	31	155.3400
8	154.9950	16	155.1150	24	155.2350	32	155.3550

Bank 12				
1	155.3700	9	155.4900	17	155.6100	25	155.7300
2	155.3850	10	155.5050	18	155.6250	26	155.7450
3	155.4000	11	155.5200	19	155.6400	27	155.7600
4	155.4150	12	155.5350	20	155.6550	28	155.7750
5	155.4300	13	155.5500	21	155.6700	29	155.7900
6	155.4450	14	155.5650	22	155.6850	30	155.8050
7	155.4600	15	155.5800	23	155.7000	31	155.8200
8	155.4750	16	155.5950	24	155.7150	32	155.8350

Bank 13

1	155.8500 9	155.9700 17	156.0900 25	156.2100
2	155.8650 10	155.9850 18	156.1050 26	156.2250
3	155.8800 11	156.0000 19	156.1200 27	156.2400
4	155.8950 12	156.0150 20	156.1350 28	156.2550
5	155.9100 13	156.0300 21	156.1500 29	156.2700
6	155.9250 14	156.0450 22	156.1650 30	156.2850
7	155.9400 15	156.0600 23	156.1800 31	156.3000
8	155.9550 16	156.0750 24	156.1950 32	156.3150

Bank 14

1	158.7300 9	158.8500 17	158.9700 25	159.0900
2	158.7450 10	158.8650 18	158.9850 26	159.1050
3	158.7600 11	158.8800 19	159.0000 27	159.1200
4	158.7750 12	158.8950 20	159.0150 28	159.1350
5	158.7900 13	158.9100 21	159.0300 29	159.1500
6	158.8050 14	158.9250 22	159.0450 30	159.1650
7	158.8200 15	158.9400 23	159.0600 31	159.1800
8	158.8350 16	158.9550 24	159.0750 32	159.1950

Bank 15

1	453.0000 9	453.2000 17	453.4000 25	453.6000
2	453.0250 10	453.2250 18	453.4250 26	453.6250
3	453.0500 11	453.2500 19	453.4500 27	453.6500
4	453.0750 12	453.2750 20	453.4750 28	453.6750
5	453.1000 13	453.3000 21	453.5000 29	453.7000
6	453.1250 14	453.3250 22	453.5250 30	453.7250
7	453.1500 15	453.3500 23	453.5500 31	453.7500
8	453.1750 16	453.3750 24	453.5750 32	453.7750

Bank 16

1	453.8000 9	454.0000 17	460.1750 25	460.3750
2	453.8250 10	460.0000 18	460.2000 26	460.4000
3	453.8500 11	460.0250 19	460.2250 27	460.4250
4	453.8750 12	460.0500 20	460.2500 28	460.4500
5	453.9000 13	460.0750 21	460.2750 29	460.4750
6	453.9250 14	460.1000 22	460.3000 30	460.5000
7	453.9500 15	460.1250 23	460.3250 31	460.5250
8	453.9750 16	460.1500 24	460.3500 32	460.5500

Bank 17

1	460.5750 9	460.7750 17	470.4875 25	470.6875
2	460.6000 10	470.3125 18	470.5125 26	470.7125
3	460.6250 11	470.3375 19	470.5375 27	470.7375
4	460.6500 12	470.3625 20	470.5625 28	470.7625
5	460.6750 13	470.3875 21	470.5875 29	470.7875
6	460.7000 14	470.4125 22	470.6125 30	470.8125
7	460.7250 15	470.4375 23	470.6375 31	470.8375
8	460.7500 16	470.4625 24	470.6625 32	470.8625

Bank 18

1	470.8875 9	471.0875 17	476.4875 25	476.6875
2	470.9125 10	476.3125 18	476.5125 26	476.7125
3	470.9375 11	476.3375 19	476.5375 27	476.7375
4	470.9625 12	476.3625 20	476.5625 28	476.7625
5	470.9875 13	476.3875 21	476.5875 29	476.7875
6	471.0125 14	476.4125 22	476.6125 30	476.8125
7	471.0375 15	476.4375 23	476.6375 31	476.8375
8	471.0625 16	476.4625 24	476.6625 32	476.8625

Bank 19

1	851.0125 9	851.1125 17	851.2125 25	851.3125
2	851.0250 10	851.1250 18	851.2250 26	851.3250
3	851.0375 11	851.1375 19	851.2375 27	851.3375
4	851.0500 12	851.1500 20	851.2500 28	851.3500
5	851.0625 13	851.1625 21	851.2625 29	851.3625
6	851.0750 14	851.1750 22	851.2750 30	851.3750
7	851.0875 15	851.1875 23	851.2875 31	851.3875
8	851.1000 16	851.2000 24	851.3000 32	851.4000

Bank 20

1	851.4125 9	851.5125 17	851.6125 25	851.7125
2	851.4250 10	851.5250 18	851.6250 26	851.7250
3	851.4375 11	851.5375 19	851.6375 27	851.7375
4	851.4500 12	851.5500 20	851.6500 28	851.7500
5	851.4625 13	851.5625 21	851.6625 29	851.7625
6	851.4750 14	851.5750 22	851.6750 30	851.7750
7	851.4875 15	851.5875 23	851.6875 31	851.7875
8	851.5000 16	851.6000 24	851.7000 32	851.8000

Bank 21

1	851.8125 9	851.9125 17	852.0125 25	852.1125
2	851.8250 10	851.9250 18	852.0250 26	852.1250
3	851.8375 11	851.9375 19	852.0375 27	852.1375
4	851.8500 12	851.9500 20	852.0500 28	852.1500
5	851.8625 13	851.9625 21	852.0625 29	852.1625
6	851.8750 14	851.9750 22	852.0750 30	852.1750
7	851.8875 15	851.9875 23	852.0875 31	852.1875
8	851.9000 16	852.0000 24	852.1000 32	852.2000

Bank 22

1	852.2125 9	852.3125 17	852.4125 25	852.5125
2	852.2250 10	852.3250 18	852.4250 26	852.5250
3	852.2375 11	852.3375 19	852.4375 27	852.5375
4	852.2500 12	852.3500 20	852.4500 28	852.5500
5	852.2625 13	852.3625 21	852.4625 29	852.5625
6	852.2750 14	852.3750 22	852.4750 30	852.5750
7	852.2875 15	852.3875 23	852.4875 31	852.5875
8	852.3000 16	852.4000 24	852.5000 32	852.6000

Bank 23

1	852.6125 9	852.7125 17	852.8125 25	852.9125
2	852.6250 10	852.7250 18	852.8250 26	852.9250
3	852.6375 11	852.7375 19	852.8375 27	852.9375
4	852.6500 12	852.7500 20	852.8500 28	852.9500
5	852.6625 13	852.7625 21	852.8625 29	852.9625
6	852.6750 14	852.7750 22	852.8750 30	852.9750
7	852.6875 15	852.7875 23	852.8875 31	852.9875
8	852.7000 16	852.8000 24	852.9000 32	853.0000

Bank 24

1	853.0125 9	853.1125 17	853.2125 25	853.3125
2	853.0250 10	853.1250 18	853.2250 26	853.3250
3	853.0375 11	853.1375 19	853.2375 27	853.3375
4	853.0500 12	853.1500 20	853.2500 28	853.3500
5	853.0625 13	853.1625 21	853.2625 29	853.3625
6	853.0750 14	853.1750 22	853.2750 30	853.3750
7	853.0875 15	853.1875 23	853.2875 31	853.3875
8	853.1000 16	853.2000 24	853.3000 32	853.4000

Bank 25

1	853.4125	9	853.5125	17	853.6125	25	853.7125
2	853.4250	10	853.5250	18	853.6250	26	853.7250
3	853.4375	11	853.5375	19	853.6375	27	853.7375
4	853.4500	12	853.5500	20	853.6500	28	853.7500
5	853.4625	13	853.5625	21	853.6625	29	853.7625
6	853.4750	14	853.5750	22	853.6750	30	853.7750
7	853.4875	15	853.5875	23	853.6875	31	853.7875
8	853.5000	16	853.6000	24	853.7000	32	853.8000

Bank 26

1	853.8125	9	853.9125	17	854.0125	25	854.1125
2	853.8250	10	853.9250	18	854.0250	26	854.1250
3	853.8375	11	853.9375	19	854.0375	27	854.1375
4	853.8500	12	853.9500	20	854.0500	28	854.1500
5	853.8625	13	853.9625	21	854.0625	29	854.1625
6	853.8750	14	853.9750	22	854.0750	30	854.1750
7	853.8875	15	853.9875	23	854.0875	31	854.1875
8	853.9000	16	854.0000	24	854.1000	32	854.2000

Bank 27

1	854.2125	9	854.3125	17	854.4125	25	854.5125
2	854.2250	10	854.3250	18	854.4250	26	854.5250
3	854.2375	11	854.3375	19	854.4375	27	854.5375
4	854.2500	12	854.3500	20	854.4500	28	854.5500
5	854.2625	13	854.3625	21	854.4625	29	854.5625
6	854.2750	14	854.3750	22	854.4750	30	854.5750
7	854.2875	15	854.3875	23	854.4875	31	854.5875
8	854.3000	16	854.4000	24	854.5000	32	854.6000

Bank 28

1	854.6125	9	854.7125	17	854.8125	25	854.9125
2	854.6250	10	854.7250	18	854.8250	26	854.9250
3	854.6375	11	854.7375	19	854.8375	27	854.9375
4	854.6500	12	854.7500	20	854.8500	28	854.9500
5	854.6625	13	854.7625	21	854.8625	29	854.9625
6	854.6750	14	854.7750	22	854.8750	30	854.9750
7	854.6875	15	854.7875	23	854.8875	31	854.9875
8	854.7000	16	854.8000	24	854.9000	32	855.0000

Bank 29

1	855.0125	9	855.1125	17	855.2125	25	855.3125
2	855.0250	10	855.1250	18	855.2250	26	855.3250
3	855.0375	11	855.1375	19	855.2375	27	855.3375
4	855.0500	12	855.1500	20	855.2500	28	855.3500
5	855.0625	13	855.1625	21	855.2625	29	855.3625
6	855.0750	14	855.1750	22	855.2750	30	855.3750
7	855.0875	15	855.1875	23	855.2875	31	855.3875
8	855.1000	16	855.2000	24	855.3000	32	855.4000

Bank 30

1	855.4125	9	855.5125	17	855.6125	25	855.7125
2	855.4250	10	855.5250	18	855.6250	26	855.7250
3	855.4375	11	855.5375	19	855.6375	27	855.7375
4	855.4500	12	855.5500	20	855.6500	28	855.7500
5	855.4625	13	855.5625	21	855.6625	29	855.7625
6	855.4750	14	855.5750	22	855.6750	30	855.7750
7	855.4875	15	855.5875	23	855.6875	31	855.7875
8	855.5000	16	855.6000	24	855.7000	32	855.8000

Bank 31

1	855.8125	9	855.9125	17	856.0125	25	856.1125
2	855.8250	10	855.9250	18	856.0250	26	856.1250
3	855.8375	11	855.9375	19	856.0375	27	856.1375
4	855.8500	12	855.9500	20	856.0500	28	856.1500
5	855.8625	13	855.9625	21	856.0625	29	856.1625
6	855.8750	14	855.9750	22	856.0750	30	856.1750
7	855.8875	15	855.9875	23	856.0875	31	856.1875
8	855.9000	16	856.0000	24	856.1000	32	856.2000

Bank 32

1	856.2125	9	856.3125	17	856.4125	25	856.5125
2	856.2250	10	856.3250	18	856.4250	26	856.5250
3	856.2375	11	856.3375	19	856.4375	27	856.5375
4	856.2500	12	856.3500	20	856.4500	28	856.5500
5	856.2625	13	856.3625	21	856.4625	29	856.5625
6	856.2750	14	856.3750	22	856.4750	30	856.5750
7	856.2875	15	856.3875	23	856.4875	31	856.5875
8	856.3000	16	856.4000	24	856.5000	32	856.6000

Bank 33

1	856.6125	9	856.7125	17	856.8125	25	856.9125
2	856.6250	10	856.7250	18	856.8250	26	856.9250
3	856.6375	11	856.7375	19	856.8375	27	856.9375
4	856.6500	12	856.7500	20	856.8500	28	856.9500
5	856.6625	13	856.7625	21	856.8625	29	856.9625
6	856.6750	14	856.7750	22	856.8750	30	856.9750
7	856.6875	15	856.7875	23	856.8875	31	856.9875
8	856.7000	16	856.8000	24	856.9000	32	857.0000

Bank 34

1	857.0125	9	857.1125	17	857.2125	25	857.3125
2	857.0250	10	857.1250	18	857.2250	26	857.3250
3	857.0375	11	857.1375	19	857.2375	27	857.3375
4	857.0500	12	857.1500	20	857.2500	28	857.3500
5	857.0625	13	857.1625	21	857.2625	29	857.3625
6	857.0750	14	857.1750	22	857.2750	30	857.3750
7	857.0875	15	857.1875	23	857.2875	31	857.3875
8	857.1000	16	857.2000	24	857.3000	32	857.4000

Bank 35

1	857.4125	9	857.5125	17	857.6125	25	857.7125
2	857.4250	10	857.5250	18	857.6250	26	857.7250
3	857.4375	11	857.5375	19	857.6375	27	857.7375
4	857.4500	12	857.5500	20	857.6500	28	857.7500
5	857.4625	13	857.5625	21	857.6625	29	857.7625
6	857.4750	14	857.5750	22	857.6750	30	857.7750
7	857.4875	15	857.5875	23	857.6875	31	857.7875
8	857.5000	16	857.6000	24	857.7000	32	857.8000

Bank 36

1	857.8125	9	857.9125	17	858.0125	25	858.1125
2	857.8250	10	857.9250	18	858.0250	26	858.1250
3	857.8375	11	857.9375	19	858.0375	27	858.1375
4	857.8500	12	857.9500	20	858.0500	28	858.1500
5	857.8625	13	857.9625	21	858.0625	29	858.1625
6	857.8750	14	857.9750	22	858.0750	30	858.1750
7	857.8875	15	857.9875	23	858.0875	31	858.1875
8	857.9000	16	858.0000	24	858.1000	32	858.2000

Bank 37

1	858.2125 9	858.3125 17	858.4125 25	858.5125
2	858.2250 10	858.3250 18	858.4250 26	858.5250
3	858.2375 11	858.3375 19	858.4375 27	858.5375
4	858.2500 12	858.3500 20	858.4500 28	858.5500
5	858.2625 13	858.3625 21	858.4625 29	858.5625
6	858.2750 14	858.3750 22	858.4750 30	858.5750
7	858.2875 15	858.3875 23	858.4875 31	858.5875
8	858.3000 16	858.4000 24	858.5000 32	858.6000

Bank 38

1	858.6125 9	858.7125 17	858.8125 25	858.9125
2	858.6250 10	858.7250 18	858.8250 26	858.9250
3	858.6375 11	858.7375 19	858.8375 27	858.9375
4	858.6500 12	858.7500 20	858.8500 28	858.9500
5	858.6625 13	858.7625 21	858.8625 29	858.9625
6	858.6750 14	858.7750 22	858.8750 30	858.9750
7	858.6875 15	858.7875 23	858.8875 31	858.9875
8	858.7000 16	858.8000 24	858.9000 32	859.0000

Bank 39

1	859.0125 9	859.1125 17	859.2125 25	859.3125
2	859.0250 10	859.1250 18	859.2250 26	859.3250
3	859.0375 11	859.1375 19	859.2375 27	859.3375
4	859.0500 12	859.1500 20	859.2500 28	859.3500
5	859.0625 13	859.1625 21	859.2625 29	859.3625
6	859.0750 14	859.1750 22	859.2750 30	859.3750
7	859.0875 15	859.1875 23	859.2875 31	859.3875
8	859.1000 16	859.2000 24	859.3000 32	859.4000

Bank 40

1	859.4125 9	859.5125 17	859.6125 25	859.7125
2	859.4250 10	859.5250 18	859.6250 26	859.7250
3	859.4375 11	859.5375 19	859.6375 27	859.7375
4	859.4500 12	859.5500 20	859.6500 28	859.7500
5	859.4625 13	859.5625 21	859.6625 29	859.7625
6	859.4750 14	859.5750 22	859.6750 30	859.7750
7	859.4875 15	859.5875 23	859.6875 31	859.7875
8	859.5000 16	859.6000 24	859.7000 32	859.8000

Bank 41

1	859.8125 9	859.9125 17	860.0125 25	860.1125
2	859.8250 10	859.9250 18	860.0250 26	860.1250
3	859.8375 11	859.9375 19	860.0375 27	860.1375
4	859.8500 12	859.9500 20	860.0500 28	860.1500
5	859.8625 13	859.9625 21	860.0625 29	860.1625
6	859.8750 14	859.9750 22	860.0750 30	860.1750
7	859.8875 15	859.9875 23	860.0875 31	860.1875
8	859.9000 16	860.0000 24	860.1000 32	860.2000

Bank 42

1	860.2125 9	860.3125 17	860.4125 25	860.5125
2	860.2250 10	860.3250 18	860.4250 26	860.5250
3	860.2375 11	860.3375 19	860.4375 27	860.5375
4	860.2500 12	860.3500 20	860.4500 28	860.5500
5	860.2625 13	860.3625 21	860.4625 29	860.5625
6	860.2750 14	860.3750 22	860.4750 30	860.5750
7	860.2875 15	860.3875 23	860.4875 31	860.5875
8	860.3000 16	860.4000 24	860.5000 32	860.6000

Bank 43

1	860.6125 9	860.7125 17	860.8125 25	860.9125
2	860.6250 10	860.7250 18	860.8250 26	860.9250
3	860.6375 11	860.7375 19	860.8375 27	860.9375
4	860.6500 12	860.7500 20	860.8500 28	860.9500
5	860.6625 13	860.7625 21	860.8625 29	860.9625
6	860.6750 14	860.7750 22	860.8750 30	860.9750
7	860.6875 15	860.7875 23	860.8875 31	860.9875
8	860.7000 16	860.8000 24	860.9000 32	861.0000

Bank 44

1	861.0125 9	861.1125 17	861.2125 25	861.3125
2	861.0250 10	861.1250 18	861.2250 26	861.3250
3	861.0375 11	861.1375 19	861.2375 27	861.3375
4	861.0500 12	861.1500 20	861.2500 28	861.3500
5	861.0625 13	861.1625 21	861.2625 29	861.3625
6	861.0750 14	861.1750 22	861.2750 30	861.3750
7	861.0875 15	861.1875 23	861.2875 31	861.3875
8	861.1000 16	861.2000 24	861.3000 32	861.4000

Bank 45

1	861.4125 9	861.5125 17	861.6125 25	861.7125
2	861.4250 10	861.5250 18	861.6250 26	861.7250
3	861.4375 11	861.5375 19	861.6375 27	861.7375
4	861.4500 12	861.5500 20	861.6500 28	861.7500
5	861.4625 13	861.5625 21	861.6625 29	861.7625
6	861.4750 14	861.5750 22	861.6750 30	861.7750
7	861.4875 15	861.5875 23	861.6875 31	861.7875
8	861.5000 16	861.6000 24	861.7000 32	861.8000

Bank 46

1	861.8125 9	861.9125 17	862.0125 25	862.1125
2	861.8250 10	861.9250 18	862.0250 26	862.1250
3	861.8375 11	861.9375 19	862.0375 27	862.1375
4	861.8500 12	861.9500 20	862.0500 28	862.1500
5	861.8625 13	861.9625 21	862.0625 29	862.1625
6	861.8750 14	861.9750 22	862.0750 30	862.1750
7	861.8875 15	861.9875 23	862.0875 31	862.1875
8	861.9000 16	862.0000 24	862.1000 32	862.2000

Bank 47

1	862.2125 9	862.3125 17	862.4125 25	862.5125
2	862.2250 10	862.3250 18	862.4250 26	862.5250
3	862.2375 11	862.3375 19	862.4375 27	862.5375
4	862.2500 12	862.3500 20	862.4500 28	862.5500
5	862.2625 13	862.3625 21	862.4625 29	862.5625
6	862.2750 14	862.3750 22	862.4750 30	862.5750
7	862.2875 15	862.3875 23	862.4875 31	862.5875
8	862.3000 16	862.4000 24	862.5000 32	862.6000

Bank 48

1	862.6125 9	862.7125 17	862.8125 25	862.9125
2	862.6250 10	862.7250 18	862.8250 26	862.9250
3	862.6375 11	862.7375 19	862.8375 27	862.9375
4	862.6500 12	862.7500 20	862.8500 28	862.9500
5	862.6625 13	862.7625 21	862.8625 29	862.9625
6	862.6750 14	862.7750 22	862.8750 30	862.9750
7	862.6875 15	862.7875 23	862.8875 31	862.9875
8	862.7000 16	862.8000 24	862.9000 32	863.0000

Bank 49

1	863.0125 9	863.1125 17	863.2125 25	863.3125
2	863.0250 10	863.1250 18	863.2250 26	863.3250
3	863.0375 11	863.1375 19	863.2375 27	863.3375
4	863.0500 12	863.1500 20	863.2500 28	863.3500
5	863.0625 13	863.1625 21	863.2625 29	863.3625
6	863.0750 14	863.1750 22	863.2750 30	863.3750
7	863.0875 15	863.1875 23	863.2875 31	863.3875
8	863.1000 16	863.2000 24	863.3000 32	863.4000

Bank 50

1	863.4125 9	863.5125 17	863.6125 25	863.7125
2	863.4250 10	863.5250 18	863.6250 26	863.7250
3	863.4375 11	863.5375 19	863.6375 27	863.7375
4	863.4500 12	863.5500 20	863.6500 28	863.7500
5	863.4625 13	863.5625 21	863.6625 29	863.7625
6	863.4750 14	863.5750 22	863.6750 30	863.7750
7	863.4875 15	863.5875 23	863.6875 31	863.7875
8	863.5000 16	863.6000 24	863.7000 32	863.8000

Bank 51

1	863.8125 9	863.9125 17	864.0125 25	864.1125
2	863.8250 10	863.9250 18	864.0250 26	864.1250
3	863.8375 11	863.9375 19	864.0375 27	864.1375
4	863.8500 12	863.9500 20	864.0500 28	864.1500
5	863.8625 13	863.9625 21	864.0625 29	864.1625
6	863.8750 14	863.9750 22	864.0750 30	864.1750
7	863.8875 15	863.9875 23	864.0875 31	864.1875
8	863.9000 16	864.0000 24	864.1000 32	864.2000

Bank 52

1	864.2125 9	864.3125 17	864.4125 25	864.5125
2	864.2250 10	864.3250 18	864.4250 26	864.5250
3	864.2375 11	864.3375 19	864.4375 27	864.5375
4	864.2500 12	864.3500 20	864.4500 28	864.5500
5	864.2625 13	864.3625 21	864.4625 29	864.5625
6	864.2750 14	864.3750 22	864.4750 30	864.5750
7	864.2875 15	864.3875 23	864.4875 31	864.5875
8	864.3000 16	864.4000 24	864.5000 32	864.6000

Bank 53

1	864.6125 9	864.7125 17	864.8125 25	864.9125
2	864.6250 10	864.7250 18	864.8250 26	864.9250
3	864.6375 11	864.7375 19	864.8375 27	864.9375
4	864.6500 12	864.7500 20	864.8500 28	864.9500
5	864.6625 13	864.7625 21	864.8625 29	864.9625
6	864.6750 14	864.7750 22	864.8750 30	864.9750
7	864.6875 15	864.7875 23	864.8875 31	864.9875
8	864.7000 16	864.8000 24	864.9000 32	865.0000

Bank 54

1	865.0125 9	865.1125 17	865.2125 25	865.3125
2	865.0250 10	865.1250 18	865.2250 26	865.3250
3	865.0375 11	865.1375 19	865.2375 27	865.3375
4	865.0500 12	865.1500 20	865.2500 28	865.3500
5	865.0625 13	865.1625 21	865.2625 29	865.3625
6	865.0750 14	865.1750 22	865.2750 30	865.3750
7	865.0875 15	865.1875 23	865.2875 31	865.3875
8	865.1000 16	865.2000 24	865.3000 32	865.4000

Bank 55

1	865.4125 9	865.5125 17	865.6125 25	865.7125
2	865.4250 10	865.5250 18	865.6250 26	865.7250
3	865.4375 11	865.5375 19	865.6375 27	865.7375
4	865.4500 12	865.5500 20	865.6500 28	865.7500
5	865.4625 13	865.5625 21	865.6625 29	865.7625
6	865.4750 14	865.5750 22	865.6750 30	865.7750
7	865.4875 15	865.5875 23	865.6875 31	865.7875
8	865.5000 16	865.6000 24	865.7000 32	865.8000

Bank 56

1	865.8125 9	865.9125 17	866.0125 25	866.1125
2	865.8250 10	865.9250 18	866.0250 26	866.1250
3	865.8375 11	865.9375 19	866.0375 27	866.1375
4	865.8500 12	865.9500 20	866.0500 28	866.1500
5	865.8625 13	865.9625 21	866.0625 29	866.1625
6	865.8750 14	865.9750 22	866.0750 30	866.1750
7	865.8875 15	865.9875 23	866.0875 31	866.1875
8	865.9000 16	866.0000 24	866.1000 32	866.2000

Bank 57

1	866.2125 9	866.3125 17	866.4125 25	866.5125
2	866.2250 10	866.3250 18	866.4250 26	866.5250
3	866.2375 11	866.3375 19	866.4375 27	866.5375
4	866.2500 12	866.3500 20	866.4500 28	866.5500
5	866.2625 13	866.3625 21	866.4625 29	866.5625
6	866.2750 14	866.3750 22	866.4750 30	866.5750
7	866.2875 15	866.3875 23	866.4875 31	866.5875
8	866.3000 16	866.4000 24	866.5000 32	866.6000

Bank 58

1	866.6125 9	866.7125 17	866.8125 25	866.9125
2	866.6250 10	866.7250 18	866.8250 26	866.9250
3	866.6375 11	866.7375 19	866.8375 27	866.9375
4	866.6500 12	866.7500 20	866.8500 28	866.9500
5	866.6625 13	866.7625 21	866.8625 29	866.9625
6	866.6750 14	866.7750 22	866.8750 30	866.9750
7	866.6875 15	866.7875 23	866.8875 31	866.9875
8	866.7000 16	866.8000 24	866.9000 32	867.0000

Bank 59

1	867.0125 9	867.1125 17	867.2125 25	867.3125
2	867.0250 10	867.1250 18	867.2250 26	867.3250
3	867.0375 11	867.1375 19	867.2375 27	867.3375
4	867.0500 12	867.1500 20	867.2500 28	867.3500
5	867.0625 13	867.1625 21	867.2625 29	867.3625
6	867.0750 14	867.1750 22	867.2750 30	867.3750
7	867.0875 15	867.1875 23	867.2875 31	867.3875
8	867.1000 16	867.2000 24	867.3000 32	867.4000

Bank 60

1	867.4125 9	867.5125 17	867.6125 25	867.7125
2	867.4250 10	867.5250 18	867.6250 26	867.7250
3	867.4375 11	867.5375 19	867.6375 27	867.7375
4	867.4500 12	867.5500 20	867.6500 28	867.7500
5	867.4625 13	867.5625 21	867.6625 29	867.7625
6	867.4750 14	867.5750 22	867.6750 30	867.7750
7	867.4875 15	867.5875 23	867.6875 31	867.7875
8	867.5000 16	867.6000 24	867.7000 32	867.8000

Bank 61

1	867.8125	9	867.9125	17	868.0125	25	868.1125
2	867.8250	10	867.9250	18	868.0250	26	868.1250
3	867.8375	11	867.9375	19	868.0375	27	868.1375
4	867.8500	12	867.9500	20	868.0500	28	868.1500
5	867.8625	13	867.9625	21	868.0625	29	868.1625
6	867.8750	14	867.9750	22	868.0750	30	868.1750
7	867.8875	15	867.9875	23	868.0875	31	868.1875
8	867.9000	16	868.0000	24	868.1000	32	868.2000

Bank 62

1	868.2125	9	868.3125	17	868.4125	25	868.5125
2	868.2250	10	868.3250	18	868.4250	26	868.5250
3	868.2375	11	868.3375	19	868.4375	27	868.5375
4	868.2500	12	868.3500	20	868.4500	28	868.5500
5	868.2625	13	868.3625	21	868.4625	29	868.5625
6	868.2750	14	868.3750	22	868.4750	30	868.5750
7	868.2875	15	868.3875	23	868.4875	31	868.5875
8	868.3000	16	868.4000	24	868.5000	32	868.6000

Search Groups

Bank 63

1	5.0000
2	7.5000

Bank 64

1	7.5000
2	10.0000

Bank 65

1	10.0000
2	12.5000

Bank 66

1	12.5000
2	15.0000

Bank 67

1	15.5000
2	17.5000

Bank 68

1	17.5000
2	20.0000

Bank 69

1	20.0000
2	22.5000

Bank 70

1	22.5000
2	25.0000

Bank 71

1	26.0000
2	30.0000

Bank 72

1	50.0000
2	54.0000

Bank 73

1	118.000
2	122.600

Bank 74

1	129.000
2	136.000

Bank 73

1	220.000
2	224.000

Bank 74

1	224.000
2	300.000

Bank 75

1	300.000
2	350.000

Bank 76

1	350.000
2	400.000

Bank 77

1	400.000
2	440.000

Bank 78

1	440.000
2	450.000

Bank 79

1	890.000
2	950.000