# Remote Facilities Controller

## Model RFC-1/B

## – Software Instruction Book –

### Concise Edition for Electronic Distribution

*This documentation is valid for
Remote Facilities Controller firmware version 4.xx*

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# Section 11 — Basic Operation

## 11.1  OVERVIEW

The RFC-1 can be thought of as two different remote controls.  The user has the option of choosing which one is wanted.  The first is a simple, basic, dial-up remote control that gives the user the ability to monitor and control a remote facility and the convenience of a simple telephone alarm system.  It has only the most basic operating features but it has the advantage that, once it is installed, even a non-technical user can learn to operate and program it very quickly; usually in less than an hour.  The second remote control has all the operating capabilities of the first, plus a great many more. These include a wide choice of telemetry formats and options, automatic action sequences triggered by an internal clock/calendar or by telemetry conditions, options for serial-data operation, automatic logging, and much more.  The user can spend hours, if not days, learning all about the many features and deciding how to incorporate them into the needs of their particular facility.

If the the "first" remote control is desired, the only operating information needed is contained in "Section 11—Basic Operation."  This section was written for users with little or no technical training and teaches the basic operation of the RFC-1 in relatively simple terms.  If you want the "second" remote control, you'll need to read "Section 12—Advanced Operation."  This section was written for the more technically advanced user who wants to explore all the capabilities of the RFC-1.   Unless you are already very familiar with the RFC-1, we recommend that you get your RFC-1 "up and running" using Section 11 first.  Then as you become familiar with its operation, study the advanced information in Section 12 at your leisure.  You'll probably find a number of very handy features that will be useful in your facility and you can learn about and implement them gradually.

The RFC-1 comes factory programmed with the features most likely wanted for a relatively simple facility operated by a mixture of technical and non-technical personnel.  This includes a simple telephone alarm system and restrictions on remote programmability.  <u>The information in this chapter is based on the assumption that the original factory programming is unchanged</u>.  Portions of this chapter may not be accurate if the factory programmed values are modified.  These programming values are accessible and modifiable only in the Advanced Programming mode.

## 11.2  OPERATION FROM A REMOTE TELEPHONE

### 11.2.1    Calling the RFC-1

The first step in operation from a remote telephone is to call the number where the RFC-1 is located.  You can use a Touch Tone® (DTMF) telephone or you can use a rotary (pulse) dialed line if you have some way to generate DTMF tones after the RFC-1 answers.  This is most easily accomplished by using a telephone with a "Tone/Pulse" switch.

The RFC-1 will answer the call after four rings and speak the word "Enter."  The eight digit Main Security Code should be entered using the telephone keypad.  This is factory programmed as "12345678."  If it is entered correctly, the RFC-1 says "This is RFC-1/B."  If the Main Security Code is not entered or incorrectly entered, the RFC-1 does not respond, cannot be operated, and hangs up the line.

### 11.2.2    Reading Telemetry

After the entry of the correct security code you may then read telemetry on any of the channels  by pushing the two-digit number of the channel on the telephone keypad.   The channels are numbered "00" through "63."  For example, to select channel 02, simply push 02 on the keypad.  The RFC-1 will then speak "Channel 02" followed by the telemetry information for that channel.  This would be either four digits of telemetry data or the words "Status: On" or "Status: Off."  Telemetry information is spoken in three circumstances: 1) when a channel is selected, 2) after a control function is used, and 3) automatically when the telemetry data on the selected channel changes significantly (more than 10% of full scale).

To simplify routine telemetry reading, the RFC-1 may be instructed to scan automatically all channels and report their telemetry values.  To do this, push 64.  The RFC-1 will respond with "Autoscan" and then begin to read the telemetry values for all channels beginning at channel 00, at intervals of 5 seconds.  The "Autoscan" feature may be interrupted at any time by entering a channel number or programming function.

### 11.2.3    Operating the Control Relays

There are two control relays associated with each channel; one for "on/raise" functions and one for "off/lower" functions.  Before the control relays can be operated, the Control Security Code must first be entered.  This is done by pushing 66 on the keypad.  The RFC-1 responds with "OK" and the control functions are enabled for the remainder of the call.  If control functions are attempted without first entering the  Control Security Code, the RFC-1 says "Enter Control Security Code."  The operator should then push 66.  If  the correct Control Security Code (66) is not entered, the RFC-1 will not respond to further commands and will hang-up.  This is the case with all security codes, so, when the RFC-1 asks for a security code, enter it carefully.

The control relays are operated with the * and # keys on the telephone keypad.  The * key operates the off/lower relay and the # key operates the on/raise relay for the currently selected channel.  The relays operate for as long as the key is pressed, or 0.3 seconds, whichever is longer.

The occasional user of the RFC-1 may have trouble remembering which key is the "on" key: the * or the #.  An easy way to remember this is to think of the screen on a TV set.  Think of "#" representing the set being "on" and "*" is what the screen looks like as it is turned "off."  In other words, #=on and *=off.

The control relays are enabled as soon as the channel is selected.  It is not necessary to wait for the telemetry reading before a control action is made.  This feature is useful when it is desired that a series of control actions be taken rapidly.  For example, if it is desired to turn one transmitter off, switch an antenna relay and turn another transmitter on, the key sequence (01*08*05#, for example) can be initiated as rapidly as the operator's fingers can push the keys.  It is not necessary to wait for the channel number or telemetry readings to be spoken.

### 11.2.4    Ending a Telemetry/Control Session

When a telemetry/control session is finished, simply hang up the telephone.  The RFC-1 will

also hang-up and wait for the next call.

The RFC-1 will automatically hang up whenever two-and-a-half minutes elapses without receiving a DTMF tone.  The RFC-1 warns that this is about to happen by speaking "Goodbye" ten seconds before it hangs up.  If the operator wants to continue, a key must be pushed within ten seconds.

For special applications, the operator can cause the RFC-1 to hang-up and prevent the RFC-1 from answering a call for two minutes.  To do this,  push 98 and then hang up.  The RFC-1 also hangs up and will not respond another call for the next two minutes.  There are two common uses for this.  First, it can be used to signal someone working at the remote facility that the person calling wishes to talk to them, and not the RFC-1.  Second, it can be used to access a second device connected to the same telephone line as the RFC-1.  For example, suppose the RFC-1 is set to answer after one ring and another device connected to the line is set to answer after three rings.  To access the second device, a call is first place to the RFC-1 which is ended with the 98 command.  A return call within the next two minutes will be answered by the second device.

## 11.3  OPERATION FROM THE LOCAL TELEPHONE

Local operation of the RFC-1 (using the telephone that is plugged into the "TELEPHONE" jack on the front panel of the RFC-1) is identical to remote operation except for the following:  The operator should first push the "Local Control" pushbutton located  on the right-hand end of the RP-8 relay panels.  When pushed, the RFC-1 connects directly to the telephone plugged into the "Telephone" jack on the RFC-1.  When the button is pushed, the RFC-1 speaks "OK." The system is now entered just past the point where the Main Security Code would have been entered if remote operation were taking place.  In other words, it is not necessary to enter the Main Security Code.  At the end of the local control session, push 99 to tell the RFC-1 you're through.  It will say "Goodbye" and then connect the telephone back to the telephone line.  Otherwise, operation is exactly the same as described above in the "Operation From a Remote Telephone" section.

If the RFC-1 is in the local control mode and an incoming call occurs, the RFC-1 will speak "Ring—Ring—Ring" when the line is ringing.  To answer the call, push 99.  The RFC-1 will say "good-bye" and  connect the local telephone with the telephone line to answer the call.

The most common use for the Local Control mode will be the calibration of the telemetry channels.  This is done by reading the telemetry for a particular channel and then adjusting the calibration control for that channel on the RP-8 panel until the desired reading is achieved.  Re-enter the channel number as often as required to repeat the telemetry reading.

The RFC-1 has a full scale telemetry value of "2040" so if you are telemetering "17.46 amps," for example, you'll probably want to set the RFC-1 to read "1746."  If, however, you are telemetering "22.3 amperes," you'll need to set the RFC-1 to "0223."  Always take advantage of as much of the scale reading as possible.  For example, if you use "0100" as a calibration for "100% power," you are only using the bottom 5% of the scale and only 1% resolution will result.  If "1000" is used as a calibration, 0.1% resolution is obtained and the long term accuracy will be enhanced.

## 11.4  AUTOMATIC MONITORING SYSTEM

The RFC-1 can automatically monitor up to eight telemetry channels and originate telephone calls to report abnormal telemetry conditions.  In the Basic Programming Mode three telephone numbers, up to twelve digits each, can be programmed for calling.

The Automatic Monitoring System is temporarily disabled while the RFC-1 is being used from either a remote telephone or the local telephone.  This allows changes to be made without triggering an alarm sequence.  About 10 seconds after each telemetry/control session, the channels designated for monitoring are automatically scanned by the RFC-1 and the telemetry readings are recorded.  Afterward, at intervals of one channel every 10 seconds, the channels are rescanned and the telemetry readings are compared to the readings recorded at the end of the last telemetry/control session.  If any reading crosses a user-programmed upper or lower limit an alarm sequence is initiated.

Instructions for programming the Automatic Monitoring System will be discussed in the "Programming Automatic Monitoring System" section.

### 11.4.1    Telephone Alarm Sequence

A telephone alarm sequence begins with a call to the first telephone number.  The RFC-1 then speaks "This is RFC-1/B"  and then the channel number responsible for tripping the alarm.  The RFC-1 speaks this information, repeatedly, for 60 seconds and then hangs up.  The RFC-1 then waits 60 seconds to permit incoming calls, and then makes a 60 second call to the second telephone number (if a number is programmed), speaking the same information.  The RFC-1 then waits 60 seconds to permit incoming calls, and then makes a 60 second call to the third telephone number, speaking the same information.  All calls are 60 seconds long followed by a 60 second pause.  The sequence is repeated until each number has been called three times.  If the programming for a particular telephone number is "blank," the RFC-1 skips this number in the calling sequence.  When calling, the RFC-1 does not have the means to detect if a telephone call is answered.  The call continues for 60 seconds even if the line is busy or if the line is not answered.  The alarm sequence is terminated by any of three conditions:

(1)    If an alarm call is answered by an operator and the unit is operated.   Operation of the unit can occur simply by entering any channel number or entering the Control Security Code (66).  It is not necessary to enter the Main Security Code.

(2)    If an operator calls the unit during one of the pauses and enters the correct security code.

(3)    After the RFC-1 makes three calls to each telephone number.

When an alarm sequence is terminated (or 10 seconds after the call, if the alarm sequence is terminated during a call), the Monitored Channels are scanned and new telemetry values are recorded.  The RFC-1 then begins rescanning the Monitored Channels at a rate of one channel every 10 seconds.

### 11.4.2    Power Failure Alarm

To alert the remote operator that there has been a power failure at the remote site, the RFC-1 can be programmed automatically to initiate a telephone calling sequence 10 seconds after power returns.  When the call is made, the RFC-1 speaks "This is RFC-1/B" and the words "Power Failure" repeatedly, for 60 seconds.  If the "Power Failure" alarm is enabled and it is necessary temporarily to disconnect power to the unit, an alarm can be avoided by pushing the Local Control pushbutton within the first 8 seconds after power is reapplied.

### 11.4.3    Operating Examples

The Automatic Monitoring System can be thought of as a system that reports any change in conditions that existed at the end of the last telemetry/control session.  This allows complete freedom of operation without the need for a complicated system of status checks and interlocks. It also greatly simplifies the setup and operation of the RFC-1.  As an illustration of this, suppose that there is a site with a main and an auxiliary FM transmitter.  During the last telemetry/control session the main transmitter was on and the auxiliary was off.  Because the last recorded telemetry reading for the auxiliary transmitter power output was made when it was off, this would not cause an alarm as long as it continued to be off.  Now, suppose the main transmitter failed.  The RFC-1 initiates an alarm call, an operator answers the call and after not being able to get the main transmitter back on, turns on the auxiliary.  When this telemetry/control session ends, new telemetry values are recorded and are then checked periodically.  Now, the telemetry reading recorded for the main transmitter was made when it was off, so because it is off now will not cause an alarm.  An alarm would be initiated, however, if the auxiliary transmitter were to fail.

This system is not without its limitations, however.  For example, the application of power to the RFC-1 after a power interruption is treated exactly like the end of a telemetry/control session.  Approximately 10 seconds after power is reapplied, the channels are scanned (if the Automatic Monitoring System is enabled) and new telemetry categories are recorded.  If a transmitter went off when the power went off and did not come back on when power was restored, an alarm would not be reported since new reference readings were made with the transmitter off.  This potential situation can be averted by instructing the RFC-1 to report all power failures.  How to accomplish this is covered in the "Programming the Automatic Monitoring System" section.

Switching transmitters or changing operating conditions by a means other than the RFC-1 (for example, direct manual control or control by another remote control operating in "parallel" with the RFC-1) will cause an alarm.  The only way to avoid this is to disable the Automatic Monitoring System in the RFC-1 temporarily while making the changes, or make the changes with the RFC-1 instead.

Keep in mind that the Automatic Monitoring System is not instantaneous in its operation.  Since Monitored Channels are scanned at a rate of one channel every 10 seconds, it could take up to 80 seconds before an alarm condition is sensed.

Once an alarm starts, the RFC-1 stops scanning the channels and it makes no difference how the telemetry readings compare to the recorded reading.  The alarm will continue until three call attempts are made to each number or until it is cancelled by an operator.

Remember to inform all personnel who are likely to receive an alarm call from the RFC-1 about the meaning of the various channel numbers that can trip an alarm. A completely different response would be required depending on whether the FM transmitter output power is a little low or the smoke alarm has gone off.

## 11.5  PROGRAMMING THE RFC-1

The RFC-1 can be programmed to suit the individual needs of the user. Alarm parameters, telephone numbers, and security codes are examples of values which are user-programmable. The RFC-1 has two programming modes: the Basic Programming Mode and the Advanced Programming Mode. Only the Basic Programming Mode will be discussed in this chapter.

Some functions discussed in this section may be programmed either from the telephone connected directly to the "Telephone" jack on the RFC-1 (the local telephone) or from a remote telephone. The others can be programmed only from the local telephone.

To prevent accidental programming changes and to limit programming authority to key personnel, programming the RFC-1 in the Basic Programming Mode requires the entry of a Basic Programming Security Code. The Basic Programming Security Code is factory programmed as 4088. As an example, to reprogram the Ring Number from a remote telephone first push 76, the Ring Number code. The RFC-1 responds with "Ring Number: 1; push # to reprogram." If you then push #, the RFC-1 speaks "Enter Basic Programming Security Code." Enter the number 4088. The RFC-1 speaks "Enter one digit Ring Number" and the new Ring Number can then be entered. Other changes can be made using the Basic Programming Mode for the remainder of the call without re-entering the Basic Programming Security Code .

### 11.5.1  Programming the Main Security Code

To program a new Main Security Code, push 72 or "SC" on the telephone keypad. When this code is entered the RFC-1 responds with "Main Security Code: 12345678; push # to reprogram." If you then push "pound" (#), the RFC-1 speaks "Enter eight digit Main Security Code." The operator should then enter the eight digits of the desired security code. The RFC-1 will then respond with "OK" to indicate that the programming has been accepted. Remember that the security code can be changed only from the local telephone. If 72 is entered from a remote telephone, the RFC-1 will respond with "Error—Local Programming."

### 11.5.2  Programming the Ring Number

To program the Ring Number (number of rings required before the RFC-1 answers the telephone), push 76 or "RN" on the telephone keypad. When this code is entered the RFC-1 responds with "Ring Number: 1; push # to reprogram." If you then push #, the RFC-1 speaks "Enter one digit Ring Number." The operator should then enter a number from 1 to 9 that corresponds to the desired number of rings before the RFC-1 answers the call. After the digit is entered, the RFC-1 responds with "OK" to indicate that the programming has been accepted.

### 11.5.3    Software Version

To determine the software version contained in the RFC-1, push <u>78</u> or "SV" on the telephone keypad.  When this code is entered the RFC-1 speaks the number of the software version contained in its microprocessor.

### 11.5.4    Programming the Automatic Monitoring System

There are three programming functions that need to be done in order to use the Automatic Monitoring System.  First, one or more telephone numbers should be programmed.  Second, the channels to be monitored and their upper and lower limits should be programmed. Finally, the Automatic Monitoring System should be turned on by setting the Telemetry Alarm Status.

**11.5.4.1 Programming Telephone Numbers.**  To program the first telephone number to be called, push <u>86</u> ("TN" on the telephone keypad).  The RFC-1 responds with "Telephone Number: 555 1234 ten ten ten ten ten; push # to reprogram."   The "tens" correspond to "blank" digits.  If the # key is pushed, the RFC-1 says "Enter twelve digit telephone number." The telephone number should then be entered.    If the number is less than 12 digits, fill in the extra spaces with the <u>*</u> key.  For example: 5551234*****.  Two additional telephone numbers can be programmed by pushing <u>87</u> and <u>88</u>.  Any unused telephone numbers should be programmed with "************" (all stars).  "Stars" read back as "tens."

**11.5.4.2 Programming the  Channels to be Monitored.**  Up to eight telemetry channels can be designated for automatic monitoring.  These can be any eight channels out of the 64 possible channels.   The  programming  locations  for  the  eight  monitored  channels  are designated as "Monitored Channel A" through "Monitored Channel H."  One channel number can  be  assigned  to  each  Monitored  Channel.   It  is  not  necessary  to  use  all  Monitored Channels nor is it necessary to program them in numerical order.  For example, channel 07 could  be  assigned  to  Monitored  Channel  A,  channel  03  could  be  assigned  to  Monitored Channel B, and Monitored Channels C through H could be left blank.

For each Monitored Channel, three things must be programmed: the telemetry channel to be monitored, upper telemetry limit, and the lower telemetry limit.  The programming locations for Monitored Channel A through H are "90" through "97" respectively.  To make a Monitored Channel "blank" or non-functional, "64" should be programmed as the channel number.  To illustrate the programming of the Monitored Channels, the following example will be used: suppose an RFC-1 contains the original "blank" settings for the Monitored Channels.  The user wishes to program the RFC-1 to automatically monitor plate current on channel 02 and antenna current on channel 03.  Normal plate current is 0500 and normal antenna current is 0680.  The user wishes an alarm to be triggered if the plate current varies more than 10% from normal or if the antenna current varies outside the range of +5%/-10%.  To do this we first need to compute the upper an lower limits for each channel.  For the plate current it works out to be 0550 and 0450.  For the antenna current it is 0714 and 0612.  Now, we can program the data into the RFC-1.  Any two Monitored Channels may be used but we will pick Monitored Channels A and  B.  To program Monitored Channel A first push <u>90</u>.  The  RFC-1 will  then  speak  "Channel  Number  64,  Upper  Limit  2040,  Lower  Limit  1020;  push  #  to reprogram."  The RFC-1 is factory programmed with channel 64 for all Monitored Channels. This is considered "blank" programming and inhibits their operation.  To enter the new data, push <u>#</u>.  If the RFC-1 asks for the Basic Programming Security Code, push <u>4088</u>.  The RFC-1 then says "Enter two digit channel number."  Push <u>02</u>.  The RFC-1 then says "Enter four digit

upper limit." Push <u>0550</u>. The RFC-1 then says "Enter four digit lower limit." Push <u>0450</u>. The RFC-1 then says "OK" to indicate that the programming has been accepted. To check the programming, push <u>90</u> again and listen to the data. Monitored Channel B is programmed exactly the same way but start by pushing <u>91</u>. In our example, the data would be programmed as 03/0714/0612.

**11.5.4.3 Programming the Telemetry Alarm Status.** After the above information is programmed, the Automatic Monitoring System can be turned on and off by programming the "Telemetry Alarm Status." To program, push <u>82</u> on the keypad. The RFC-1 responds with, "Telemetry Alarm Status: 0; push # to reprogram." If the <u>#</u> key is pushed, the RFC-1 speaks "Enter one digit Telemetry Alarm Status." The operator should enter "0" for "off" or "1" for "on." The RFC-1 will then respond with "OK" to indicate that the programming has been accepted. If the Telephone Number(s) and Monitored Channel(s) have been programmed, when the Telemetry Alarm Status is set to "1" the Automatic Monitoring System becomes operational and will begin scanning the Monitored Channels about 10 seconds after the RFC-1 hangs up.

**11.5.4.4 Enabling the Power Failure Alarm.** To alert the remote operator that there has been a power failure at the remote site, the RFC-1 can be programmed automatically to initiate a telephone calling sequence 10 seconds after power returns. When the call is made, the RFC-1 speaks "This is RFC-1/B" and the words "Power Failure" repeatedly, for 60 seconds. To enable or disable the Power Failure Alarm push <u>81</u>. The RFC-1 responds with "Power Failure Alarm Status: 0; push # to reprogram." If the <u>#</u> key is pushed, the RFC-1 speaks "Enter one digit Power Failure Alarm Status." The operator should then enter "0" for "off" or "1" for "on." The RFC-1 will then respond with "OK" to indicate that the programming has been accepted.

## 11.6  SUMMARY OF BASIC CONTROL CODES

The following is a summary of the various control and programming codes discussed in this chapter.

<u>The following commands operate from both the local telephone (the telephone at the RFC-1 site) and  remotely.</u>

| | |
|---|---|
| 00 to 63 | Selects the desired channel for telemetry and control. |
| * | "OFF" command for the currently selected channel. Control Security Code must first be entered (66). |
| # | "ON" command for the currently selected channel. Control Security Code must first be entered (66). |
| 6 4 | Autoscan telemetry of all channels. |
| 66 | Control Security Code  This enables the control (OFF/ON) functions for the remainder of  the call. |
| 70 | Not recommended for use by non-technical personnel.  See Section 12. |
| 71 | Not recommended for use by non-technical personnel.  See Section 12. |
| 76   (RN) | Read/Program Ring Number; number of rings required before the RFC-1 answers a call (1 to 9). |
| 78   (SV) | Causes the RFC-1 to speak the software version residing in its microprocessor. |
| 80 | Not recommended for use by non-technical personnel.  See Section 12. |
| 81 | Read/Program Power Failure Alarm Status.  Enter "0" for off, "1" for on. |

82          Read/Program Telemetry Alarm Status.  Enter "0" for off, "1" for on.

85          Not recommended for use by non-technical personnel.  See Section 12.

86    (TN)  Read/Program Telephone Number "A."  Enter 12 digits; fill extra spaces with *.
87          Read/Program Telephone Number "B."  Enter 12 digits; fill extra spaces with *.
88          Read/Program Telephone Number "C."  Enter 12 digits; fill extra spaces with *.

90          Read/Program Monitored Channel A (Channel Number/Upper Limit/Lower Limit)
91          Read/Program Monitored Channel B (Channel Number/Upper Limit/Lower Limit)
92          Read/Program Monitored Channel C (Channel Number/Upper Limit/Lower Limit)
93          Read/Program Monitored Channel D (Channel Number/Upper Limit/Lower Limit)
94          Read/Program Monitored Channel E (Channel Number/Upper Limit/Lower Limit)
95          Read/Program Monitored Channel F (Channel Number/Upper Limit/Lower Limit)
96          Read/Program Monitored Channel G (Channel Number/Upper Limit/Lower Limit)
97          Read/Program Monitored Channel H (Channel Number/Upper Limit/Lower Limit)

98          Causes the RFC-1 to say "Goodbye" and hang-up.  The RFC-1 will not answer another call for two minutes.
99          Causes the RFC-1 to say "Goodbye" and hang-up.  Also answers call when in "Local" mode.


The following commands  operate only from the local telephone (the telephone at the RFC-1 site).

72    (SC)  Read/Program Main Security Code.  Enter 8 digits.

73          Not recommended for use by non-technical personnel.  See Section 12.

74          Read/Program Basic Programming Security Code.  Enter 4 digits.

75          Not recommended for use by non-technical personnel.  See Section 12.
84          Not recommended for use by non-technical personnel.  See Section 12.


## 11.7  RECORDING DATA

### 11.7.1     Recording User-Programming/Factory Programming

It is suggested that a table be recorded of "normal" programming for the RFC-1.  This serves
not only as a reminder of the current programming but it also acts as a handy guide to
remember how to change programming.   Here is an example, which includes the data
programmed initially at the factory:

|    |   | Factory Programming: | Current Programming: |
|----|---|----------------------|----------------------|
| 72 | Main Security Code | 12345678 | _____ |
| 73 | Basic Programming Security Code | 4088 | _____ |
| 76 | Ring Number | 2 | _____ |
| 81 | Power Failure Alarm Status | 0 | _____ |
| 82 | Telemetry Alarm Status | 0 | _____ |
| 86 | Telephone Number A | * * * * * * * * * * * * | _____ |
| 87 | Telephone Number B | * * * * * * * * * * * * | _____ |

| 88 | Telephone Number C | * * * * * * * * * * * * | _____ |
|----|---------------------|------------------------|------------------------------------|
| 90 | Monitored Channel A | 64 / 2040 / 1020 | _____ / _____ / _____ |
| 91 | Monitored Channel B | 64 / 2040 / 1020 | _____ / _____ / _____ |
| 92 | Monitored Channel C | 64 / 2040 / 1020 | _____ / _____ / _____ |
| 93 | Monitored Channel D | 64 / 2040 / 1020 | _____ / _____ / _____ |
| 94 | Monitored Channel E | 64 / 2040 / 1020 | _____ / _____ / _____ |
| 95 | Monitored Channel F | 64 / 2040 / 1020 | _____ / _____ / _____ |
| 96 | Monitored Channel G | 64 / 2040 / 1020 | _____ / _____ / _____ |
| 97 | Monitored Channel H | 64 / 2040 / 1020 | _____ / _____ / _____ |

## 11.7.2    Channel Assignment Table

To allow efficient operation, a table of information should be kept at the normal control point that documents the various control and telemetry channels.  The following is an example of such a table:

Channel:

| 00 | Telemetry: | FM Transmitter #1 Filaments |
|----|------------|------------------------------|
|    | Scale: | Status |
|    | Control: | FM Transmitter #1 Filaments; *=OFF, #=ON |

| 01 | Telemetry: | FM Transmitter #1 Plate Voltage |
|----|------------|----------------------------------|
|    | Scale: | Multiply reading by 10 volts to obtain actual value |
|    | Control: | FM Transmitter #1 Plate Voltage; *=OFF, #=ON |

| 02 | Telemetry: | FM Transmitter #1 Plate Current |
|----|------------|----------------------------------|
|    | Scale: | Multiply reading by amperes/100 to obtain actual reading |
|    | Control: | none |

| 03 | Telemetry: | FM Transmitter #1 Power Output |
|----|------------|--------------------------------|
|    | Scale: | 0948=minimum legal power, 1000=exact, 1024=maximum legal power |
|    | Control: | FM Transmitter #1 Power Control; *=Lower, #=Raise |

## 11.7.3    Recording Telemetry Data

This is an example of a table that might be used to record telemetry data:

| Channel→ | 01 | 02 | 03 | 05 | 06 | |
|---|---|---|---|---|---|---|
| Source→ | FM#1 Plate V | FM#1 Plate A | FM#1 Power | FM#2 Plate V | FM#2 Plate A | F P |
| Time ⌐ | | | | | | |
| 10.05A | 0940 | 0410 | 1000 | | | |
| 11.55A | 0941 | 0412 | 1005 | | | |
| 2.08P | 0942 | 0413 | 1006 | | | |
| 4.05P | 0941 | 0412 | 1004 | | | |
| 5.03P | 0941 | 0412 | 1004 | | | |

Here, the data is recorded only as the four digits spoken by the RFC-1. A separate table of multipliers and units for each column can be included at a single location in the log book. This makes routine data collection a very simple operation with no decimal points, multipliers or units to record.

## 11.7.4    "Quick Card"

To save time and avoid the pressure of trying to remember the control codes in an emergency, it is suggested that a "Quick Card" be prepared and carried by key operating personnel. Such a card could be plastic laminated for durability. Here is an example of what could be included on the card:

```
(615) 228-7387 [Enter]        00  FM1; Fils; off/on
12345678                      01  FM1; Plate Volts; off/on
66    Control Security Code    02  FM1; Plate Amps
4088 Basic Prog. Sec. Code     03  FM1; Power; lower/raise
64    Autoscan                 04  Building Power
76    Ring Number              05  Building Temperature
81    Power Fail Alarm Status   06
82    Telemetry Alarm Status    07  EBS Generator
86    Telephone Number A
87    Telephone Number B            (all; off=*, on=#)
88    Telephone Number C
```

# Section 12 — Advanced Operation

⚠ **WARNING!** This chapter was written for users who are technically knowledgeable. A wide range of operating characteristics and programming procedures are covered rather quickly in this chapter and without extended explanation. Unless you are sure you understand the information in this chapter, we strongly suggest that Section 11—Basic Operation be used the primary operating guide.

## 12.1  OVERVIEW

Through user-programming, the RFC-1 can be configured as a simple, basic, dial-up remote control that gives the user the ability to monitor and control a remote facility and the convenience of a simple telephone alarm system. Once it is installed, even a non-technical user can learn to operate and program it very quickly; usually in less than an hour. If desired, the user may configure the RFC-1 to be much more sophisticated in its operation and capabilities. These capabilities include a wide choice of telemetry formats and options, automatic Action Sequences triggered by an internal clock/calendar or by telemetry conditions, options for serial data operation, automatic logging and much more. The user can spend hours, if not days, learning all about the many features and deciding how to incorporate them into the needs of their particular facility.

The RFC-1 is factory-programmed with very basic operating characteristics. These are covered in Section 11—Basic Operation. The more advanced capabilities of the RFC-1 are covered in this section.

In the following sections, the <u>factory programmed values for the RFC-1 are assumed</u>. This avoids the need for complicated parenthetical qualifiers in the explanations. For example, the main security code is stated to be "12345678." Actually, this can be reprogrammed to be any 1 to 8 digit number, or the use of the main security code can be eliminated altogether.

## 12.2  MANUAL OPERATION--BY DTMF/VOICE

### 12.2.1    From A Dial-Up Line

Operating the RFC-1 through a dial-up line typically involves the operator at one end of the line with a source of DTMF tones (usually a pushbutton telephone) and the RFC-1 at the other end. In this case, the operator sends commands to the RFC-1 via DTMF tones and receives responses via the RFC-1's synthesized voice.

**12.2.1.1 Calling The RFC-1.**  The first step in operating the RFC-1 remotely is to call the telephone number where the RFC-1 is located. The call can be made with either a DTMF (Touch Tone®) dialed telephone line or a rotary (pulse) dialed telephone line as long as some method of generating DTMF tones is available after the RFC-1 answers the call. This could be done by using a telephone with switchable tone/pulse dialing or by using an acoustically coupled DTMF keypad.

The RFC-1 will answer a call after two rings, pause two seconds and then speak the word "Enter." This is the RFC-1's request for the operator to enter the main security code. The operator should then enter the eight-digit main security code: 12345678. If it is entered correctly the unit responds with, "This is RFC-1/B" and access to system telemetry is allowed. If the security code is not entered or incorrectly entered, the RFC-1 ignores further key

entries and hangs up after a pre-programmed period of time (factory set to 10 seconds).

**12.2.1.2 Reading Telemetry Data.**  Depending on the number of RP-8 Relay Panels installed, the RFC-1 is capable of controlling and monitoring up to 64 individual "channels." The channels are numbered from 00 to 63.  The first step in controlling or monitoring a channel is to "select" it.  Only one channel can be selected at a time.  When a channel is first selected, the telemetry values for that channel are automatically spoken by the RFC-1.  After a channel is selected, control (relay output) commands can also be made.  A channel remains selected until another channel is selected, another function is selected (discussed later), or until the operator hangs up.

To read telemetry, the operator simply selects the desired channel number.  The RFC-1 switches to that channel and automatically speaks the telemetry.  For example, suppose "output power" was monitored on channel 03.  The operator pushes "03" on the telephone keypad.  A moment later the RFC-1 speaks "Channel 03; 1007" indicating that the output power is 100.7%.  The operator may hear the same reading again by pushing "03" again or a different channel may be selected.

When entering a two digit channel number, enter the second digit within 5 seconds of the first digit.  Otherwise the RFC-1 will clear the first digit.  This applies only when selecting channels. The speed of digit entry in other functions is not restricted.

Telemetry information is spoken by the RFC-1 at three times: when a channel is selected, when a control command is made, and if the telemetry reading for the selected channel changes significantly (more than 10% of the full scale reading).  To illustrate the latter, suppose in the above example the operator had selected channel 03 and already heard the telemetry reading of 1007.  A short time later, suppose the output power suddenly drops.  The RFC-1 detects this and automatically respeaks the telemetry data as "0852."  The RFC-1 will respeak the telemetry data for a selected channel whenever the data changes significantly, and will remain silent if it does not change.

Some telemetry information is best reported with "off/on" status rather than analog information.  For example, "Is the security system on or off?"  By means of user-programming, the RFC-1 can be instructed to report telemetry for selected channels in this manner.  Choices include: Off/On; Status: Off/Status: On; Open/Closed; and others.

To simplify routine telemetry reading, the RFC-1 may be instructed to scan automatically all channels and report their telemetry values.  To do this, push <u>64</u>.  The RFC-1 will respond with "OK" and then begin to read the telemetry values for all channels beginning at channel 00, at intervals of 5 seconds.  The "autoscan" feature may be interrupted at any time by entering a channel number or programming function.  Optional programming can set an upper limit on the  channel number scanned.

**12.2.1.3 Operating Control Relays.**  Before the RFC-1's control relays can be operated, the (optional) Control Security Code must first be entered.  Once entered, the control relays may be operated for the remainder of the call.  The Control Security Code is factory programmed as "66."  To enable control functions, push <u>66</u> at any time.  After pushing <u>66</u>, the RFC-1 will speak "OK" and the control relays are enabled for the remainder of the call.  If a control function is attempted before the Control Security Code is entered, the RFC-1 will speak "Enter Control Security Code."  If the correct Control Security Code is not entered (66), the RFC-1 will ignore further commands and hang-up.

For special applications, up to three Control Security Codes may be used. Each eight channel "block" of channels can be assigned any one of the three Control Security Codes. This feature is useful in multi-user applications where two or three users share one remote control system. In this application, each user can have an individual Control Security Code for their block of channels.

The RFC-1's control relays are operated by pushing the # key, for the "On/Raise" relay and the * key for the "Off/Lower" relay, for the channel currently selected. When a channel is selected, the two control relays associated with that channel are enabled. The control relays operate for as long as the * or # key is pressed, or the programmed Relay On time (factory programmed to 0.6 seconds), whichever is more. This is advantageous if calling from a telephone system which allows only short, fixed length DTMF tones to be sent. When the key is released, telemetry is automatically spoken by the RFC-1.

As an example, suppose that channel 03 is wired to control a transmitter's output power. The operator first selects the channel by pushing 03 on the keypad. The RFC-1 then speaks "Channel 03; 1007." Now, the operator pushes the * key down for a couple of seconds. The "Off/Lower" control relay for channel 03 at the remote facility operates for the time that the * key is pushed and lowers the output power. When the operator releases the key, the RFC-1 automatically speaks the new telemetry data: "1002" or 100.2%. The "Off" and "On" control relays can be operated as many times as desired as long as the appropriate channel is selected. When a new channel is selected, a new pair of control relays becomes available for use.

It is important to remember that once the Control Security Code is entered, the * and # are "live" at all times. Pushing either of these keys will initiate a control function (if connected) for the last selected channel and therefore appropriate care should be exercised.

Control is enabled as soon as the channel is selected. It is not necessary to wait for the telemetry reading before a control action is made. This feature is useful when it is desired that a series of control actions be taken rapidly. For example, if it is desired to turn one transmitter off, switch an antenna relay and turn another transmitter on, the key sequence (01*08*05#, for example) can be initiated as rapidly as the operator's fingers can push the keys. It is not necessary to wait for the channel number or telemetry readings to be spoken.

The occasional user of the RFC-1 may have trouble remembering which key is the "On" key: the * or the #. An easy way to remember this is to think of the screen on a TV set. Think of "#" representing the set being "on" and "*" is what the screen looks like as it is turned "off." In other words, #=on and *=off.

**12.2.1.4 Ending the Call.** When a telemetry/control session is finished, simply hang up the telephone. The RFC-1 will then hang up and wait for the next call. Alternately, the operator can push 99. The RFC-1 will speak "Goodbye" and then hang-up. The RFC-1 will automatically hang up whenever a pre-programmed period of time (factory programmed to 2.5 minutes) elapses without receiving a DTMF tone. The RFC-1 warns that this is about to happen by speaking "Goodbye" ten seconds before it hangs up. If the operator wants to continue, a key must be pushed within the next ten seconds.

For special applications, the operator can cause the RFC-1 to hang-up and prevent the RFC-1 from answering a call for a short period of time. To do this, the operator pushes 98 and then hangs up. The RFC-1 also hangs up and will not respond to another call for two minutes. There are two common uses for this. First, it can be used to signal someone working at the remote facility that the person calling wishes to talk to them, and not the RFC-1. Second, it

can be used to access a second device connected to the same telephone line as the RFC-1.  For example, suppose the RFC-1 is set to answer after one ring and another device connected to the line is set to answer after three rings.  To access the second device, a call is first place to the RFC-1 which ends with the 98 command.  A return call will be answered by the second device.

### 12.2.2    From The Local Telephone

The RFC-1 can also be operated from the "local" telephone at the facility where the RFC-1 is installed.  This is the telephone that is connected directly to the jack on the RFC-1/B labeled "TELEPHONE."   Operation from the local telephone is almost identical to operation from a remote telephone.  The operator begins by pushing the "Local Control" pushbutton located on any of the RP-8 relay panels.  If the telephone is off hook when this is done, the dial tone goes away, the RFC-1 connects directly to the local telephone, and  speaks "This is RFC-1/B."  The operator may then monitor and control the facility in the same way that would be done from a remote telephone.  The only differences are as follows:

(1)    The Main Security Code <u>does not</u> have to be entered.    After the Local Control pushbutton is pushed and the RFC-1 speaks "This is RFC-1/B", you are ready to go.

(2)    The Basic Programming Security Code <u>does not</u> have to be entered to modify programming.

(3)    The Control Security Code and Advanced Programming Security Code <u>must</u> be entered, just like in the remote mode, if control functions or advanced programming is desired.

(4)    At the conclusion of the local control session it is usually desirable to push <u>99</u> before hanging up.  The RFC-1's automatic hang up detection does not work in the local mode and it will be two-and-a-half minutes before it exits the local mode and is ready for an outside call.

(5)    If someone is using RFC-1 from the local telephone and an incoming call occurs, the RFC-1 will speak "Ring, Ring, Ring" notifying the operator that the line is ringing.  The operator may answer the call, if desired, by pushing <u>99</u>.  The RFC-1 will disconnect and the call will be connected to the local telephone.

### 12.2.3    From The Dedicated Port

If desired, the jack on the front panel of the RFC-1 labeled "Local Telephone" can be converted for another use: a dedicated control port.  When enabled, this dedicated port may be used in place of the dial-up port ("LINE" jack) or in addition to it.  This option is selected in the Advanced Programming mode, discussed later.  The dedicated control port can be used to operate the RFC-1 from a dedicated communications link.  This link could be a dedicated line, a radio link, or any other communications link with a bidirectional voice-grade audio path.  Operation from the dedicated control port is identical to operation in the Local Control mode discussed previously.  A means is required for feeding DTMF tones to the RFC-1 and hearing the voice response from the RFC-1.  Technical details of how to use this port are covered in "Section 5—Installation" in the Hardware Book.

## 12.3    MANUAL OPERATION--BY SERIAL DATA

### 12.3.1    From A Dial-Up Line

Operation of the RFC-1 remotely with the optional RS-232 adaptor and a modem, is almost exactly like the DTMF/Voice operation described above.   The only difference is that communication is by serial data.   The basic serial communications options are controlled by programming the Communications Mode.   The four choices are:

    0      Answer in voice/DTMF mode only
    1      Answer in serial data mode first; if no carrier,  try voice/DTMF
    2      Answer in voice/DTMF mode first; if no DTMF (tones),  try serial data mode
    3      Answer in serial data mode only

Instructions for changing this programming will be discussed in the Programming section of this chapter.

As a simple example of how the serial data communications mode works, suppose that an operator wishes to contact the RFC-1 with a modem and a simple data terminal.   The first step is to type "ATDT" followed by the telephone number at the remote facility.   "ATDT" is a standard modem command to tone-dial a telephone number.   The call rings, the RFC-1 answers, and the two modems connect.   The following is an example of a session:

Operator:  ATDT 5551234
(modem dials number, line rings, RFC-1 answers)
Modem:     CONNECT 2400
RFC-1:     ENTER
Operator:  12345678
RFC-1:     THIS IS  RFC1B
Operator:  66
RFC-1:     OK
Operator:  03
RFC-1:     CHANNEL 03;  100.7 PERCENT
Operator:  *
RFC-1:     100.4 PERCENT
Operator:  02
RFC-1:     CHANNEL 02;  11.48 KILOVOLTS
Operator:  01
RFC-1:     CHANNEL 01;  STATUS: ON
Operator:  99
RFC-1      GOODBYE
           +++ [disconnect]


## 12.4   AUTONOMOUS OPERATION

### 12.4.1    Action Sequences

An Action Sequence, as the name indicates, is a pre-programmed series of events (actions) the user wishes the RFC-1 to execute.   The execution of an Action Sequence is triggered by a prearranged condition. Up to eight Action Sequences can be pre-programmed into the RFC-1's memory, each up to eight steps long.   Here is an example of an Action Sequence: Channel

01 Control Relay ON for 0.6 seconds, pause 30 seconds, Channel 02 Control Relay ON for 0.6 seconds, Channel 04 Control Relay OFF for 0.6 seconds, Channel 06 Control Relay ON for 0.6 seconds, Call Telephone Number "A" once.   The steps of an Action Sequence can be  control (relay output) functions, telephone alarm calls, or pauses.   The programming of Action Sequences will be discussed in the Advanced Programming section of this chapter.  If a new Action Sequence is triggered before the execution of a previously triggered Action Sequence is complete, it is stored in memory and its execution is begun when the previous one is finished. The following three subsections discuss the three ways an Action Sequence can be triggered.

**12.4.1.1 Triggered Manually.**  Action Sequences can be triggered manually by a specific command.   This allows complex, frequently used command strings to be executed with a minimum of keystrokes and a reduced possibility of error.  To manually trigger an Action Sequence, push <u>85</u>.  The RFC-1 responds by speaking "Enter One Digit Action Sequence."  The operator should then push a single key (1 to 8) corresponding to the Action Sequence to be executed.  There are 8 possible Action Sequences.  If no Action Sequence is desired, push <u>*</u>  or <u>0</u> to abort the command.  Because an Action Sequence can include operation of one or more control relays, Control Security Code (A) must be entered before requesting a manually triggered Action Sequence.

**12.4.1.2 Triggered by Telemetry Conditions.**   Action Sequences can be triggered by telemetry conditions.   Up to eight telemetry channels can be programmed for automatic monitoring and an Action Sequence can be programmed to execute based on the telemetry information.  For example, if the power level of a transmitter exceeds a certain level, an Action Sequence could reduce the power level and then notify a remote  operator that an adjustment had been made.

Any of the following ten rules can be used to trigger an Action Sequence:

1      Trigger an Action Sequence if the telemetry varies more than 2.5% from the telemetry reading at the end of the last control/telemetry session or Action Sequence.

2      Trigger an Action Sequence if the telemetry varies more than 5% from the telemetry reading at the end of the last control/telemetry session or Action Sequence.

3      Trigger an Action Sequence if the telemetry varies more than 10% from the telemetry reading at the end of the last control/telemetry session or Action Sequence.

4      Trigger an Action Sequence if the telemetry varies more than 20% from the telemetry reading at the end of the last control/telemetry session or Action Sequence.

5      Trigger an Action Sequence if the telemetry crosses either the Upper Limit or the Lower Limit.   The Upper and Lower Limits are pre-programmed four digit numbers.

6      Trigger an Action Sequence if the telemetry exceeds the Upper Limit but only if the telemetry was between the Upper and Lower Limits at the end of the last control/telemetry session or Action Sequence.

7      Trigger an Action Sequence if the telemetry falls below the Lower Limit but only if the telemetry was between the Upper and Lower Limits at the end of the last

control/telemetry session or Action Sequence.

8    Trigger an Action Sequence if the telemetry exceeds the Upper Limit or falls below the Lower Limit.

9    Trigger an Action Sequence if the telemetry exceeds the Upper Limit.

10   Trigger an Action Sequence if the telemetry falls below the Lower Limit.

The Automatic Monitoring System is automatically disabled from triggering an Action Sequence during a control/telemetry session.   If Trigger Rules 1 through 7 are used, this allows deliberate changes in operating conditions without triggering an Action Sequence.  The reference values for Trigger Rules 1 through 7 are recorded at two times:

(1)  nine seconds after the end of each control/telemetry session, and
(2)  at the end of each Action Sequence triggered by telemetry or the clock/calendar.

At these times, all of the up to eight channels designated as Monitored Channels are automatically scanned by the RFC-1 and the telemetry values for those channels are recorded.  Then, at intervals of one channel every 10 seconds, each Monitored Channel is rescanned and tested against one of the above ten rules.  If all eight Monitored Channels are used, and a 10 second scan interval is selected, each channel is checked once every 80 seconds. If the limits of a rule are exceeded, the designated Action Sequence is triggered.  With optional programming, one channel may be designated for checking on a more frequent rotation than the other channels.   When Monitored Channel programming is complete, use Basic Programming command 82 to enable the Telemetry Alarm system.

At the end of an Action Sequence that was triggered by telemetry conditions, new reference values are automatically recorded for each Monitored Channel.  This prevents the anomalous telemetry condition from triggering additional Action Sequences.  If necessary, the recording of new reference values can be inhibited.  This is done by programming the step "8-15" anywhere in the Action Sequence.  This is commonly  done when an Action Sequence is used to control the power level of a transmitter.

A simple example might assist in understanding how this system works.  Suppose a facility where channel 03 telemetered output power.  The normal reading is "1000."  Suppose that channel 03 is designated as a Monitored Channel and is to be monitored based on Rule #5 (above).  The Upper and Lower Limits are set at 1100 and 900 respectively.  A manual remote control session has just ended.  About 15 seconds after the RFC-1 hangs up the line, the various Monitored Channels are scanned and the telemetry values are read.  The reading for channel 03 is "0998;" between the Upper and Lower Limits.  This value is recorded in the RFC-1's memory.  Over the next couple of hours, the telemetry values are rescanned periodically and checked against the reference readings made at the end of the manual control session. The readings for channel 03 have wandered around between 0930 and 1080.  Then, during one scan, a reading of 1103 is encountered.  The RFC-1 consults the rule table to determine if action is required.  It finds that an Action Sequence should be triggered because the telemetry has "crossed either the Upper or Lower Limit."   The scanning of Monitored Channels is temporarily suspended and the RFC-1 executes the programmed Action Sequence.

For each of the eight Monitored Channels, five pieces of information are programmed by the user.  The following table illustrates an example of programming for three of the possible eight Monitored Channels:

|                        | Channel # | Upper Limit | Lower Limit | Trigger Rule | Action Sequence |
|------------------------|-----------|-------------|-------------|--------------|-----------------|
| Monitored Channel "A"  | 03        | 1100        | 0900        | 5            | 1               |
| Monitored Channel "B"  | 0 4       | ****        | ****        | 2            | 1               |
| Monitored Channel "C"  | 06        | 1450        | 0000        | 8            | 2               |

In the above example, channel 03 is set to trip Action Sequence 1 using Trigger Rule 5.  The upper and lower limits are set at 1100 and 0900 respectively.  Channel 04 is also set to trip Action Sequence 1 but using Trigger Rule 2.  Note that Trigger Rules 1 through 4 do not require the entry of Upper and Lower  Limits so a "blank" entry is made using "****"  for each ("*" is read back as a "ten').  Channel 06 is set to trip Action Sequence 2 using  Trigger Rule 8.

It is possible to test one telemetry channel using two or more rules.  The following example illustrates this:

|                        | Channel # | Upper Limit | Lower Limit | Trigger Rule | Action Sequence |
|------------------------|-----------|-------------|-------------|--------------|-----------------|
| Monitored Channel "A"  | 03        | 1100        | 0900        | 5            | 1               |
| Monitored Channel "B"  | 03        | 1080        | 0900        | 6            | 2               |
| Monitored Channel "C"  | 03        | 1100        | 0920        | 7            | 3               |

In the above example Action Sequence 1 is a telephone call list, Action Sequence 2 activates a relay which lowers power and Action Sequence 3 activates a relay which raises power.

**12.4.1.2.a      Disabling**  It is possible to enable and disable the channels to be monitored automatically at specific times.  For example, a tower lighting system could be monitored only between 8:00 PM and 6:00 AM each day. This is accomplished by programming special cases of Date/Time triggers called lock-outs.   During the periods specified in a lock out, the programmed Monitored Channel is inhibited from triggering an Action Sequence.   If an alarm attempt is suppressed by a lock-out, a telemetry is scanned and new values are recorded so that a false alarm does not trigger as soon as the lock period ends.  Lock-outs are discussed in Note 4 of the Referenced Notes section of this book and Date/Time triggers are discussed below.

**12.4.1.2.b     Conditional Execution.**   A telemetry triggered Action Sequence can programmed so that a portion of the Action Sequence can be executed and the telemetry value rechecked.  If the telemetry value is within limits, normal scanning continues.  If the telemetry is out-of-limits during the recheck, the entire Action Sequence is executed.  For example, suppose a transmitter overloads and turns off.  An Action Sequence is triggered by the absence of plate current.  The Action Sequence  starts off with an overload reset and then rechecks plate current.  If it has returned, no further action is taken.  If the plate current has not returned, the entire Action Sequence is completed which warms-up the standby transmitter and puts it on the air.

**12.4.1.3 Triggered by the Clock/Calendar.**   The RFC-1 contains an internal clock/calendar which gives it the ability to trigger an Action Sequence by date and/or time-of-day.   Up to 80 Date/Time triggers can be programmed in the RFC-1's memory.   Each programmed time can be set to trigger one Action Sequence.  Programming flexibility allows an Action Sequence to be triggered on a specific day of a specific month, or every day of a specific month, or a specific day of every month.   Similarly, an Action Sequence can be programmed to occur at a specific minute of a specific hour, or a specific minute of every hour.  The following steps must be completed for an Action Sequence to be triggered by the clock/calendar:

(1)    Program the calendar with the current date and the clock with the time-of-day using commands 70 and 71 respectively.   Detailed descriptions of these commands can be found under Basic Programming in this book.


(2)    If the events to be performed are already programmed as an Action Sequence, go on to the next step.   Otherwise, program the Action Sequence using the advanced programming mode entered with command 80.   (Advanced programming is discussed later in this section and Action Sequence programming details can be found in Note 6 of the Referenced Notes section of this book.)  If the Action Sequence contains one or more phone calls, verify that the necessary telephone numbers have been programmed. Enter any missing telephone numbers using commands 86, 87, 88 or the Advanced Programming mode for more than three telephone numbers.


(3)    Program the Date/Time trigger for the desired Action Sequence using the Advanced Programming mode.   Programming details are discussed in Note 4 of the Referenced Notes section of this book.

At the end of an Action Sequence that was triggered by the clock/calendar, new reference values are automatically recorded for each Monitored Channel.  This prevents the anomalous telemetry condition from triggering additional Action Sequences.  If necessary, the recording of new reference values can be inhibited by programming the step "8-15" anywhere in the Action Sequence.  This is commonly done when an Action Sequence is used to control the power level of a transmitter.

**12.4.1.3.a   Disabling.**  It is quite simple to temporarily disable Action Sequences that are tripped by the system clock/calendar without changing Action Sequence or Date/Time programming.  Set the clock minutes to "99".  This will stop the clock so that it is unable to trigger an Action Sequence.

**12.4.2    Automatic Logging**

As discussed earlier, an RS-232 adaptor is available for the RFC-1/B which can be connected to a modem for serial data communications.  An alternate use for the RS-232 adaptor is for connection to a printer.  The RFC-1 can be programmed to print the telemetry reading of selected channels at regular intervals with notations of date and time.  The printing sequence is triggered as a step in an Action Sequence, which in turn can be triggered by time, by telemetry or manually. Details of the various options concerning this feature are discussed in the Programming section of this chapter.

## 12.5  TELEMETRY FORMATS

The RFC-1 comes factory programmed to read telemetry as four digits, from 0000 to 2040. By means of user-programming, the telemetry output for each of the 64 channels can be customized to better fit the needs of a particular installation.  The various telemetry programming options are listed below and discussed  in detail in the Advanced Programming section of this chapter.

### 12.5.1  Units

A "unit word" can be appended to a telemetry reading.  These words can be selected from a list of about 25 commonly used units (kilovolts, amperes, degrees, percent, etc.) included in the Word Table.   See Note 1 in the Referenced Notes for programming details.

### 12.5.2  Status

The channel can be converted to "status" operation with a selection of output formats. Telemetry readings are reported as one of a pair of descriptive phrases in status mode (status off/status on, open/closed, etc.).  See Note 1 in the Referenced Notes for programming details.

### 12.5.3  Decimal Point Location

A decimal point can be added to telemetry readings in any one of four possible locations.  See Note 2 in the Referenced Notes for programming details.

### 12.5.4 Full Scale Range

The full scale reading can be selected from any of four ranges.  See Note 2 in the Referenced Notes for programming details.

### 12.5.5  Log Conversion

A logarithmic scale conversion can be applied to the telemetry reading.  See Note 3 in the Referenced Notes for programming details.

### 12.5.6  Indirect Power

Indirect power can be automatically computed using the voltage and current from two other channels and an efficiency factor.  See Note 3 in the Referenced Notes for programming details.

### 12.5.7  Automatic Relay Operation

The channel's control relay can be made to operate automatically when a channel is selected. See Note 3 in the Referenced Notes for programming details.

### 12.5.8  Telemetry Settling Time

Telemetry settling time is the amount of time after the telemetry relay is switched before the voltage is sampled by the analog-to-digital converter in the RFC-1.  It can be changed to any value from 0.2 to 3.2 seconds.  See Note 12 in the Referenced Notes for programming details.

## 12.6 USER PROGRAMMING

The RFC-1 contains a large number of user-programmable operating characteristics.   It is entirely feasible to install and operate the RFC-1 without changing any of these characteristics from their factory programmed values.  However, many users will want to take advantage of the numerous operating features and conveniences that can be utilized by customizing the RFC-1 for a particular installation.  The most often changed characteristics are accessible from the Basic Programming Mode using simple, easy to remember commands and voice prompting from the RFC-1.  Less frequently modified characteristics are accessible from the Advanced Programming Mode.  Programming in this mode is also simple, but because of the large number of data entries and operational choices that can be made, the operator will normally need the assistance of written documentation.  If it is desired that the programming capability be restricted to certain operators, provisions are included to optionally require the entry of  security codes before entering the basic and advanced programming modes.

All user programming in the RFC-1 is stored in a nonvolatile section of the internal microprocessor's memory.  This memory remains intact during power outages and does not require the use of a back-up battery or "memory" capacitor.  However, continued operation of the RFC-1's internal clock/calendar, if used, does require the use of some type of external back-up power.  This is discussed in the "Installation" section of the Hardware Instruction Book.

### 12.6.1    Basic Programming

The basic programming functions are invoked through a set of two digit commands entered from either the DTMF keypad or as serial data.  The two digit commands are listed below in numeric order--each followed by a full description of  the function performed.  (sample data shown in all cases)

70    Read/Set <u>Calendar</u>.  Push <u>70</u> and the RFC-1 responds with "Month: 09; Day: 23; Year: 92; push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter two digit month/enter two digit day/enter two digit year" with an "OK" after the final data entry. The RFC-1 needs to know the year in order to know how many days there are in February.

71    Read/<u>Set Clock</u>.  Push <u>71</u> and the RFC-1 responds with "Hours: 18; Minutes: 06; push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter two digit hours/enter two digit minutes" with an "OK" after the final data entry.  Use "24 hour time" e.g. 6 pm is equal to 6 plus 12 hours or 18 hours.  The "seconds" in the RFC-1 are not readable externally but are reset to zero when the clock is set.

There are four possible security codes that can be used to restrict operation and programming of the RFC-1.  These are the Main Security Code, the Control Security Code, the Basic Programming Security Code and the Advanced Programming Security Code.  Any or all of these can be used.  The four security codes can be programmed in either the Basic or Advanced Programming modes from the local telephone, or in the Advanced Programming mode from either the local or a remote telephone.  The RFC-1 security codes are factory programmed as:

        Main Security Code:                      12345678
        Control Security Code:                         66
        Basic Programming Security Code:         4088

Advanced Programming Security Code:    4150

72    Read/Program <u>Main Security Code</u>.   This function is not operable from a remote telephone.   From the local telephone, push <u>72</u> and the RFC-1 responds with "Main Security Code: 12345678; push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter eight digits."    When eight digits are entered, the RFC-1 responds with "OK."  If desired, the Main Security Code can be fewer than eight digits.  One to seven digit Main Security Codes can be selected by filling in the extra spaces with <u>*</u>.   For example, programming "927****" produces a three digit Main Security Code.  The use of the Main Security Code can be eliminated entirely by programming "********" (all stars).   In this case the RFC-1 answers the telephone with "This is RFC-1/B."   The following table may help to judge the relative security levels of various length security codes.

| Digits | Possible Codes | Time to try all codes (one try each 100 seconds) |
|---|---|---|
| 1 | 10 | 16.6 minutes |
| 2 | 100 | 2.77 hours |
| 3 | 1,000 | 27.7 hours |
| 4 | 10,000 | 11.6 days |
| 5 | 100,000 | 116 days |
| 6 | 1,000,000 | 3.16 years |
| 7 | 10,000,000 | 31.6 years |
| 8 | 100,000,000 | 316 years |

73    Read/Program <u>Control Security Code</u>.   This function is not operable from a remote telephone. Push <u>73</u> and the RFC-1 responds with "Control Security Code: 66; push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter four digits."    When four digits are entered, the RFC-1 responds with "OK."  If desired, the Control Security Code can be fewer than four digits (as in the case with the factory programming, 66).  One to four digit Control Security Codes can be selected by filling in the extra spaces with <u>*</u>.   For example, programming "900*" produces a three digit Control Security Code.  The use of the Control Security Code can be eliminated entirely by programming "****" (all stars).  In this case the RFC-1's control relays are always enabled.

Programming the Control Security Code to "66**" results in a special-case operating response from the RFC-1.  To enter the Control Security Code, all that is necessary is to push <u>66</u> at any time during the call.  <u>If any other code is used, the operating procedure is a little different</u>.  If control authority is desired, the operator should push <u>66</u> on the keypad.  If the Control Security Code is not "66**," the RFC-1 will respond with "Enter Control Security Code."  After the correct code is entered, the RFC-1 will respond with "OK" and the control relays will be enabled.  For example, if the Control Security Code is "1234" the operator should push "66" and then "1234."  Alternately, the operator can first attempt to operate a control relay.  The relay will not operate but the RFC-1 will speak "Enter Control Security Code."  The code can then be entered and the control relays will become operative.  In all the above cases, if the RFC-1 asks for a Control Security Code and the operator responds with the incorrect code, the RFC-1 will hang up the line.

74    Read/Program <u>Basic Programming Security Code</u>.  This function is not operable from a remote telephone. Push <u>74</u> and the RFC-1 responds with "Basic Programming Security Code: 4088; push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter four digits."    When four digits are entered, the RFC-1 responds with "OK."  If desired, the

Basic Programming Security Code can be fewer than four digits.  One to three digit Basic Programming Security Codes can be selected by filling in the extra spaces with *. For example, programming "94**" produces a two digit Basic Programming Security Code.  The use of the Basic Programming Security Code can be eliminated entirely by programming "****" (all stars).  In this case the RFC-1 Basic Programming mode is always enabled.

75      Read/Program <u>Advanced Programming Security Code</u>.  This function is not operable from a remote telephone. Push <u>75</u> and the RFC-1 responds with "Advanced Programming Security Code: 4150; push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter four digits."   When four digits are entered, the RFC-1 responds with "OK."  If desired, the Advanced Programming Security Code can be fewer than four digits.  One to three digit Advanced Programming Security Codes can be selected by filling in the extra spaces with <u>*</u>.  For example, programming "94**" produces a two digit Advanced Programming Security Code.  The use of the Advanced Programming Security Code can be eliminated entirely by programming "****" (all stars).  In this case the RFC-1 Advanced Programming mode is always enabled.

76      Read/Program <u>Ring Number</u>.  Push <u>76</u> and the RFC-1 responds with "Ring Number: 1; push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter one digit."   When the digit is entered, the RFC-1 responds with "OK."  The digits may be any number from 1 to 9 depending on how many rings are desired before the RFC-1 answers a call.

78      Read <u>Software Version</u>.  Push <u>78</u> and the RFC-1 responds with "Software Version: X.XX." This is a read-only function to allow the user to determine the software version residing in the microprocessor.

80      Enter <u>Advanced Programming Mode</u>.  The use of this function is discussed in the Advanced Programming Section.

81      Enable <u>Power Failure Alarm</u>.  Push <u>81</u> and the RFC-1 responds with "Power Failure Alarm: 0;  push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter one digit."   When one digit is entered, the RFC-1 responds with "OK."   Program this with "0" to disable the system or "1" to "8" to automatically trip the corresponding Action Sequence when power is restored.

82      Read/Program <u>Telemetry Alarm Status</u>.  Push <u>82</u> and the RFC-1 responds with "Telemetry Alarm Status: 0;  push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter one digit."    When one digit is entered, the RFC-1 responds with "OK." Program with "0" to disable or "1" to enable the Telemetry Alarm system.

84      <u>Manual Serial Data Commands</u>.  This function is not operable from a remote telephone. Push <u>84</u> and the RFC-1 responds with "Enter one digit command."

        Push <u>0</u> to cause the RFC-1 to switch to the serial-data mode.
        Push <u>1</u> to cause the RFC-1 to dump all 1024 nibbles of user-programming out the serial port.
        Push any other digit for "no command."

85      <u>Manually Trigger Action Sequence</u>.  Push <u>85</u> and the RFC-1 responds with "Enter one digit Action Sequence."  Then push a single digit corresponding the the desired Action Sequence.   Push <u>0</u> to exit without triggering an Action Sequence.  Because an Action Sequence can include operation of one or more control relays, the Control Security Code must be entered before requesting a manually triggered Action Sequence.

86    Read/Program <u>Telephone Number A</u>.  Push <u>86</u> and the RFC-1 responds with "Telephone Number: 5551234 ten ten ten ten ten; push # to reprogram."  The "tens" are "blank" digits programmed with "*."  If <u>#</u> is pushed the RFC-1 responds with "Enter twelve digits."   Twelve digits should then be entered.  If the telephone number has fewer than twelve digits, fill in the extra digits with <u>*</u> (e.g. 5551234*****)  When twelve digits are entered, the RFC-1 responds with "OK."   If "blank" programming is desired, enter "************" (all stars).

87    Read/Program <u>Telephone Number B</u>.  Telephone Number B programs exactly the same as Telephone Number A except start by pushing <u>87</u>.

88    Read/Program <u>Telephone Number C</u>.  Telephone Number C programs exactly the same as Telephone Number A except start by pushing <u>88</u>.

90    Read/Program <u>Monitored Channel A</u>.   Push <u>90</u> and the RFC-1 responds in one of two ways.  If the channel is programmed to use Trigger Rule 5 through 9, it responds with "Channel Number 64; Upper Limit: 2040; Lower Limit: 1020;  push # to reprogram."  If <u>#</u> is pushed the RFC-1 responds with "Enter two digit channel number," "Enter four digit upper limit," and "Enter four digit lower limit" respectively, as the values are entered.  When the final value (lower limit) is entered, the RFC-1 responds with "OK."  If Trigger Rules 1 through 4 are used, the reference to the upper and lower limits is omitted and the channel number is all that is read and programmed.

91—Read/Program <u>Monitored Channel B</u>.  Same as above, except push <u>91</u>.

92—Read/Program <u>Monitored Channel C</u>.  Same as above, except push <u>92</u>.

93—Read/Program <u>Monitored Channel D</u>.  Same as above, except push <u>93</u>.

94—Read/Program <u>Monitored Channel E</u>.  Same as above, except push <u>94</u>.

95—Read/Program <u>Monitored Channel F</u>.  Same as above, except push <u>95</u>.

96—Read/Program <u>Monitored Channel G</u>.  Same as above, except push <u>96</u>.

97—Read/Program <u>Monitored Channel H</u>.  Same as above, except push <u>97</u>.

**12.6.1.1 Command Summary.**   The following is a brief listing of all the two-digit commands recognized by the RFC-1.

00-63 select channel; * key operates off/lower relay, # key operates on/raise relay
64    autoscan
66    enable control relays (if Control Security Code=66)/request to enter Control Security Code
70    read/program Calendar
71    read/program Clock
72    read/program Main Security Code (up to 8 digits); <u>local telephone only</u>
73    read/program Control Security Code (up to 4 digits); <u>local telephone only</u>
74    read/program  Basic Programming Security Code (up to 4 digits); <u>local telephone only</u>
75    read/program  Advanced Programming Security Code (up to 4 digits); <u>local telephone only</u>
76    read/program Ring Number
78    read Software Version
80    enter Advanced Programming mode
81    enable Power Fail Alarm (0=off or sequence number)

82    read/program Telemetry Alarm Status (0=off, 1=on)

84    manual serial data commands; <u>local telephone only</u>

        0      switch to serial mode

        1      dump user-memory out serial port

        *      exit; no command

        (The above commands can be executed regardless of Communications Mode programming)

85    manually trigger Action Sequence

86    read/program  Telephone Number A (12 digits)

87    read/program  Telephone Number B (12 digits)

88    read/program  Telephone Number C (12 digits) (three more telephone numbers are programmable        in the Advanced Programming mode)

90    read/program  Monitored Channel A (CC/UUUU/LLLL or CC if Trigger Rule ≤4)

91    read/program  monitored channel B (CC/UUUU/LLLL or CC if Trigger Rule ≤4)

92    read/program  monitored channel C (CC/UUUU/LLLL or CC if Trigger Rule ≤4)

93    read/program  monitored channel D (CC/UUUU/LLLL or CC if Trigger Rule ≤4)

94    read/program  monitored channel E (CC/UUUU/LLLL or CC if Trigger Rule ≤4)

95    read/program  monitored channel F (CC/UUUU/LLLL or CC if Trigger Rule ≤4)

96    read/program  monitored channel G (CC/UUUU/LLLL or CC if Trigger Rule ≤4)

97    read/program  monitored channel H (CC/UUUU/LLLL or CC if Trigger Rule ≤4)

98    hang up with answer inhibit for 2 minutes

99    hang up

## 12.6.2    Advanced Programming

In the advanced programming mode, any programmable value in the RFC-1 can be modified, from either a remote telephone or the local telephone.  This results in a great potential for convenience...and disaster.  For this reason, <u>we strongly recommend that the optional Advanced Programming Security Code be used and that only personnel who need this capability be given the code</u>.

The Advanced Programming Mode allows the user to examine and modify all 512 bytes of the non-volatile EEROM contained in the RFC-1's microprocessor.  This is the section of memory allocated for the various user-programmable features.  To simplify things, the 512 eight-bit bytes of the EEROM are broken down into 1024 four-bit "nibbles."  Each nibble, therefore, can have one of 16 values, 0 to 15.

To enter the Advanced Programming Mode, push <u>80</u> on the keypad.  If the Advanced Programming Security Code has not been previously entered during this call the RFC-1 will respond with "Enter security code."  The Advanced Programming Security Code should then be entered.  Then the RFC-1 will say "Enter four digit address."  The address of the first data nibble in question should then be entered (0672, for example).  The RFC-1 will then respond with "Memory address: 0672."  Now, any of four things can be done:

(1)    Push <u>*</u> to exit the Advanced Programming Mode

(2)    Push <u>#</u> to cause the RFC-1 to speak the data (0 to 15) at this address and advance to the next address.

(3)    Push <u>X#</u> (or <u>XX#</u>) where X  or XX is a number from 0 to 15.  This modifies the data at this address (to the value entered) and advances to the next address.

(4)    Push <u>80</u> to enter a new four digit address.

For example, to read Telephone Number D, the operator would first push <u>80</u>.  Assuming that the Advanced Programming Security Code had been previously entered, the RFC-1 would respond with "Enter four digit address."  The address 0682 is entered.  The RFC-1 speaks "Address 0682."  Then the <u>#</u> key is pushed twelve times, allowing the RFC-1 to speak each time the key is pressed.  The RFC-1 speaks "five, five, five, one, two, three, four, ten, ten, ten, ten, ten."  In this case the number is 555-1234.  The last five digits are "10" which is "blank" programming.  To modify the number, push <u>80</u> again and once again enter the four digit starting address.  Then, for example, push "2, #, 2, #, 8, #, 3, #, 5, #, 0, #, 0, #, 10, #, 10, #, 10, #, 10, #, 10, #"  to program the telephone number "228-3500."

**12.6.2.1 Referenced Notes.**  The following notes are referenced by number from the Advanced Programming section of this book and the Advanced Programming Address Table.  In several sections of this book, the terms "V1," "V2," etc. are used.  Each represent a "value" from 0 to 15.

**Note 1:    Telemetry Units or Status Format**

If the user memory map is unchanged from the factory setting (see Note 29), the following may be programmed for each telemetry channel from 00 to 15.  Programming 0-0 causes the voice synthesizer to remain silent which is useful if the telephone line is "on the air" during a "remote" for example.   0-5 through 0-12 configure the channel for two-level detection (low/high) and designate words for each level.  1-0 through 9-14 choose four-digit telemetry reporting with a word from the word table to be spoken after the telemetry reading.  "V1-V2" refers to Value 1 and Value 2 in the programming table.

V1-V2:     Telemetry  Format or Units:

| | |
|---|---|
| 0-0 | channel number & telemetry not spoken |
| 0-1 | telemetry not spoken |
| 0-2 | units not spoken; auto status off |
| 0-3 | units not spoken; auto status on (factory programming) |
| 0-4 | reserved |
| 0-5 | "Status: Off" or "Status: On"; mid-scale trip point |
| 0-6 | "Off" or "On"; mid-scale trip point |
| 0-7 | "Closed" or "Open"; mid-scale trip point |
| 0-8 | "Negative" or "Positive"; mid-scale trip point |
| 0-9 | "Night" or "Day"; mid-scale trip point |
| 0-10 | "Normal" or "Alarm"; mid-scale trip point |
| 0-11 | "Normal" or "Intrusion"; mid-scale trip point |
| 0-12 | "Normal" or "Fire"; mid-scale trip point |
| 0-13 | "Status: A" or "Status: B"; mid-scale trip point |
| 0-14 | "Power Failure" or "Normal"; mid-scale trip point |
| 0-15 | "Normal" or "EBS Alarm"; mid-scale trip point |

1-0   to  9-14     words from Word Table; for example 4-1 = "Kilovolts"

**Note 2:    Full Scale Reading & Decimal Point Location**

The following programming sets the full-scale reading and decimal point location.

V1:   Full Scale & Decimal Point:

| | |
|---|---|
| 0 | 8160 |
| 1 | 4080 |

| | |
|---|---|
| 2 | 2040 (factory programming) |
| 3 | 1020 |
| 4 | 816.0 |
| 5 | 408.0 |
| 6 | 204.0 |
| 7 | 102.0 |
| 8 | 81.60 |
| 9 | 40.80 |
| 10 | 20.40 |
| 11 | 10.20 |
| 12 | 8.160 |
| 13 | 4.080 |
| 14 | 2.040 |
| 15 | 1.020 |

**Note 3:   Linear/Log Scale /Indirect Power Calculation & Auto Control Relay**

This is programmable for each channel.  "Linear" means if 1 volt produces a full-scale reading then 0.5 volt produces a 0.5 x full-scale reading.  "Logarithmic" (log) means if 1 volt produces a full-scale reading then 0.5 volt produces a 0.250 x full-scale reading.  This is useful to convert a voltage sampled from a transmission line to be "power-proportional" as in the case of an FM broadcast transmitter.  Another application for logarithmic scaling is to convert a current sampling off the AC line to the tower lights to power consumption when using a Sine Systems ACM-1 AC Current Monitor.

If "indirect power" is chosen, the RFC-1 does not sample telemetry for this channel but computes the reading from two other channels.  Programming the channel for indirect power requires special instructions discussed after the following "V1" table.

In some circumstances it is useful to have a set of auxiliary contacts to close whenever a telemetry channel is selected.  This is commonly needed for directional AM antenna monitors.  If the control relays for this channel are not needed for another purpose, they can be used to provide this auxiliary contact closure.  If the "Auto Control Relay" is selected as "on," the "off" control relay will close whenever the channel is selected.  It will remain closed until another channel is selected or until either an "Off" or an "On" command is given.

| V1: | Linear/Log/Indirect: | Auto Control Relay: |
|---|---|---|
| 0 | linear | off |
| 1 | logarithmic | off |
| 2 | indirect power (see following) | off |
| 3 | indirect power (see following) | off |
| 4 | linear | on |
| 5 | logarithmic | on |
| 6-up | reserved; do not use | |

To set up a channel for indirect power, the voltage to be monitored should be two channels "down" and the current to be monitored should be one channel down.  For example, if channel 03 is configured for indirect power, the transmitter's plate voltage should be on channel 01 and the plate current should be on channel 02.  The "units" for the indirect power channel will be automatically spoken as "kilowatts" or "percent power" depending on programming.

The telemetry value for the indirect power channel can be any reading from 0000 to 9999.  If the computed value exceeds 9999 or either the voltage or current channel reaches full-scale,

the words "Upper Limit" will be spoken.  The telemetry value for the indirect power channel is computed from the following equation:

$$P = \frac{E \ x \ I \ x \ Eff}{10,000,000}$$

where
P=    the computed four-digit reading of power (disregarding decimal point)
E=    the four-digit voltage reading (disregarding decimal point)
I=    the four-digit current reading (disregarding decimal point)
Eff=  the programmed efficiency, user-programmed from 1 to 1023 (for 1% to 1023%)
S=    the scale multiplier, user-programmed to be either 1, 10 or 100

Efficiencies greater than 100% can be used to compute effective radiated power (ERP).  For example, if an antenna has a gain of 6.5, the feedline has an efficiency of 75% and the transmitter has an efficiency of 72%, the overall efficiency (input power-to-ERP) is 6.5 x .75 x .72, or 3.51.  In this example, if the actual ERP were to be computed, the efficiency should be programmed to 351%.  If transmitter power output (TPO) is to be computed, the efficiency should be programmed to 72%.

The efficiency value can also be adjusted to allow the computed reading to express a percentage of authorized power.  In this case, the  efficiency  resulting from the above formula should be multiplied by 100 and then divided by the normal transmitter output power in kilowatts.  The goal is for the reading to be "100.0" at 100% of authorized power.  Select the option for "percent power" as the unit in the following programming table.

To determine "S," the scale multiplier, first do a trial calculation of the expected normal voltage, current and efficiency.  Start by setting S to "1" and compute "P" using the equation above.  Disregard decimal points and use only the four digits of data for voltage and current.  For example, use "4130" for voltage if the voltage is metered as either "4130 volts" or "4.130 kilovolts."  Use a calculator because the numbers will be quite large before the final division by 10,000,000.  As an example suppose the expected plate voltage is 8.0 kilovolts, the expected plate current is 3.8 amperes and the efficiency is 72%.   Using the above equation:

$$\frac{8000 \ x \ 3800 \ x \ 72 \ x \ 1}{10,000,000} = 218.88$$

The telemetry reading will include only the digits to the left of the decimal point in the above equation (0218).  Therefore, in our example it would be desirable to use the "S= x10" programming.   This would scale the raw reading to 2188.   An "S= x100" would be inappropriate in this case because it would produce a raw reading of  21888, well beyond the maximum of "9999."  As an independent step, the location of the decimal point should then be chosen.  In this case, the correct selection would be "XX.XX" to produce an output of "21.88 kilowatts."

There are four user-programmable values for each telemetry channel.  In a "normal" channel these are:

    Value 1:    Telemetry Units Or Status Format, Value 1
    Value 2:    Telemetry Units Or Status Format, Value 2
    Value 3:    Full Scale & Decimal Point
    Value 4:    Linear/Log/Indirect & Auto Relay

When a channel is programmed for indirect power, these four values are still programmed but their meaning is completely different. The procedure to obtain the necessary values is not difficult but it does require a number of steps which must be carefully completed. Before you start, determine the desired efficiency and scale multiplier (S).

Use a calculator as necessary to complete the following steps. In all cases, <u>write down the number when instructed, even if it is a zero</u>. If a calculation is instructed, <u>only write down the digits in the result that are to the left of the decimal point</u>. For example, if the result is 0.28125, write down "0".

Step 1: Select the desired efficiency from 1% to 1023%, expressed as a number from 1 to 1023 (for example, for an efficiency of 72% use "72"). Write this number on line L1.

L1: _____

Step 2: Divide L1 by 256. Place the number in the result to the left of the decimal point on L2.

L2: _____

Step 3: Multiply L2 times 256 and place the result on L3.

L3: _____

Step 4: Subtract L3 from L1 and enter the result on L4.

L4: _____

Step 5: Divide L4 by 16 and place the number(s) in the result to the left of the decimal point on L5.

L5: _____

Step 6: Multiply L5 times 16 and place the result on L6.

L6: _____

Step 7: Subtract L6 from L4 and place the result on L7.

L7: _____

Step 8: Multiply L2 times 4 and place the result on L8.

L8: _____

Step 9: If the desired unit word is "kilowatts" add 2 to L8 and place the result on L9.
If the desired unit word is "percent power" add 3 to L8 and place the result on L9.

L9: _____

Step 10: Select the number (0 to 3) from the following table for the desired decimal point location and place it on L10.

|   |      |
|---|------|
| 0 | 1234 |
| 1 | 123.4 |
| 2 | 12.34 |
| 3 | 1.234 |

L10: _____

Step 11:    Multiply L10 times 4 and place the result on L11.

L11: _____

Step 12:    Select "S," the scale multiplier from the following table and write the number (0, 1
or          2) on line L12.

|   |       |
|---|-------|
| 0 | x 1   |
| 1 | x 10  |
| 2 | x 100 |

L12: _____

Step 13:    Add L11 to L12 and place the result on L13.

L13: _____

The indirect power channel should then be programmed using the following information:

Program Value 1 with the number on L5.      V1: ____
Program Value 2 with the number on L7.      V2: ____
Program Value 3 with the number on L13.     V3: ____
Program Value 4 with the number on L9.      V4: ____

**Note 4:    Date/Time/Action Sequence**

Depending on how the memory is configured, from 48 to 80 Date/Times can be programmed
to trigger Action Sequences.  Memory configuration for Date/Time/Action Sequences is
discussed in Note 29.

Here are the steps in programming a Date/Time location:

| V1 | Action Sequence | Program from 1 to 8 |
|----|-----------------|---------------------|
| V1 | month | Program from 1 to 12 ; 15=default match (all months) |
| V1-V2 | day | Program from 0-1 to 3-1; 15-15 = default match |
| V1-V2 | hour (use 24 hour time) | Program from 0-0 to 2-3; 15-15 = default match |
| V1-V2 | minute | Program from 0-0 to 5-9; default match not allowed |

A "default match" means that this value <u>always</u> matches.  For example, programming the
month as "3" and the day as "15-15" causes an Action Sequence to be triggered at a specific
time, <u>every day</u> in March.

Examples:

To trigger Action Sequence #8 on July 22 at 10:13 AM, program 8; 7; 2-2; 1-0; 1-3. To trigger Action Sequence #1 every day during the month of March at 6:15 AM program: 1; 3; 15-15; 0-6; 1-5. To trigger Action Sequence #4 every night at 8:00 PM, program 4; 15; 15-15; 2-0; 0-0.

In addition to triggering Action Sequences, the Date/Time programming can be used to "lock-out" Monitored Channels for certain portions of the day. Here are instructions to do this:

| V1 | Lock-out function | Program 10 for a "lock-out" function |
|---|---|---|
| V1 | Monitored Channel | Program "1" to "8" for Monitored Channels "A" to "H" |
| V1-V2 | hour (24 hour time) | Program first lock-out hour (0-0 to 2-3) |
| V1-V2 | hour (24 hour time) | Program last lock-out hour (0-0 to 2-3) |
| V1-V2 | not used | Minutes default as "0-0" regardless of programming |

Note that the lock-out is programmed to block a Monitored Channel and not the telemetry channel directly. For instance, if a lock-out is programmed with "1" to lock-out Monitored Channel A, and Monitored Channel A is programmed to scan telemetry channel "01", then the lock-out blocks the alarm triggered by channel "01" telemetry. If, however, Monitored Channel A is programmed to scan telemetry channel "03", then the lock-out blocks the alarm triggered by channel "03".

Example:

Suppose that "Monitored Channel B" is set up to monitor a communications tower's lighting current and that is set to call a telephone number if the reading exceeds an upper limit or falls below a lower limit. Since the tower lights are turned off during the day by a photoelectric control, it is normal for them to be off during the day. To enable Monitored Channel B every night from 8:00 PM to 5:00 AM the next morning, the following is programmed into a Date/Time location: 10; 2; 0-5; 2-0; 0-0. This causes the monitoring of tower lights to be "locked-out" or not monitored between 5:00 AM and 8:00 PM.

**Note 5: Telephone Numbers**

Each telephone number consists of 12 digits. Program one value for each of the 12 digits. If a telephone number is shorter than 12 digits, program the extra values with "10." Modem dialing can be programmed with pauses in the dialing sequence by programming a "15" at the point in the number where the pause should occur. This sends a comma to the modem which Hayes® compatible modems interpret as a two-second pause. In the regular (voice) dialing mode, one-second pauses can be generated by programming "11". For example, "9, 11, 11, 5, 5, 5, 1, 2, 3, 4, 10, 10".

Next, program the calling mode:

V1    Result

0    Voice calling
1    Modem calling using tone dialing
2    Modem calling using pulse dialing

Next, program the number of attempts. This can be a number from 1 to 4. Numbers greater than 4 result in 4 attempts.

## Note 6:  Action Sequences

An Action Sequence consists of a sequence of up to 8 events.  Each event is programmed with two values (V1-V2).  The following table contains a listing of the events that can be programmed.

| V1-V2: | Result: | V1-V2: | Result: |
|---|---|---|---|
| 0-0 | Channel 00, On Relay | 4-0 | Channel 00, Off Relay |
| 0-1 | Channel 01, On Relay | 4-1 | Channel 01, Off Relay |
| 0-2 | Channel 02, On Relay | 4-2 | Channel 02, Off Relay |
| 0-3 | Channel 03, On Relay | 4-3 | Channel 03, Off Relay |
| 0-4 | Channel 04, On Relay | 4-4 | Channel 04, Off Relay |
| 0-5 | Channel 05, On Relay | 4-5 | Channel 05, Off Relay |
| 0-6 | Channel 06, On Relay | 4-6 | Channel 06, Off Relay |
| 0-7 | Channel 07, On Relay | 4-7 | Channel 07, Off Relay |
| 0-8 | Channel 08, On Relay | 4-8 | Channel 08, Off Relay |
| 0-9 | Channel 09, On Relay | 4-9 | Channel 09, Off Relay |
| 0-10 | Channel 10, On Relay | 4-10 | Channel 10, Off Relay |
| 0-11 | Channel 11, On Relay | 4-11 | Channel 11, Off Relay |
| 0-12 | Channel 12, On Relay | 4-12 | Channel 12, Off Relay |
| 0-13 | Channel 13, On Relay | 4-13 | Channel 13, Off Relay |
| 0-14 | Channel 14, On Relay | 4-14 | Channel 14, Off Relay |
| 0-15 | Channel 15, On Relay | 4-15 | Channel 15, Off Relay |
| 1-0 | Channel 16, On Relay | 5-0 | Channel 16, Off Relay |
| 1-1 | Channel 17, On Relay | 5-1 | Channel 17, Off Relay |
| 1-2 | Channel 18, On Relay | 5-2 | Channel 18, Off Relay |
| 1-3 | Channel 19, On Relay | 5-3 | Channel 19, Off Relay |
| 1-4 | Channel 20, On Relay | 5-4 | Channel 20, Off Relay |
| 1-5 | Channel 21, On Relay | 5-5 | Channel 21, Off Relay |
| 1-6 | Channel 22, On Relay | 5-6 | Channel 22, Off Relay |
| 1-7 | Channel 23, On Relay | 5-7 | Channel 23, Off Relay |
| 1-8 | Channel 24, On Relay | 5-8 | Channel 24, Off Relay |
| 1-9 | Channel 25, On Relay | 5-9 | Channel 25, Off Relay |
| 1-10 | Channel 26, On Relay | 5-10 | Channel 26, Off Relay |
| 1-11 | Channel 27, On Relay | 5-11 | Channel 27, Off Relay |
| 1-12 | Channel 28, On Relay | 5-12 | Channel 28, Off Relay |
| 1-13 | Channel 29, On Relay | 5-13 | Channel 29, Off Relay |
| 1-14 | Channel 30, On Relay | 5-14 | Channel 30, Off Relay |
| 1-15 | Channel 31, On Relay | 5-15 | Channel 31, Off Relay |
| 2-0 | Channel 32, On Relay | 6-0 | Channel 32, Off Relay |
| 2-1 | Channel 33, On Relay | 6-1 | Channel 33, Off Relay |
| 2-2 | Channel 34, On Relay | 6-2 | Channel 34, Off Relay |
| 2-3 | Channel 35, On Relay | 6-3 | Channel 35, Off Relay |
| 2-4 | Channel 36, On Relay | 6-4 | Channel 36, Off Relay |
| 2-5 | Channel 37, On Relay | 6-5 | Channel 37, Off Relay |
| 2-6 | Channel 38, On Relay | 6-6 | Channel 38, Off Relay |
| 2-7 | Channel 39, On Relay | 6-7 | Channel 39, Off Relay |
| 2-8 | Channel 40, On Relay | 6-8 | Channel 40, Off Relay |
| 2-9 | Channel 41, On Relay | 6-9 | Channel 41, Off Relay |
| 2-10 | Channel 42, On Relay | 6-10 | Channel 42, Off Relay |
| 2-11 | Channel 43, On Relay | 6-11 | Channel 43, Off Relay |
| 2-12 | Channel 44, On Relay | 6-12 | Channel 44, Off Relay |

| 2-13 | Channel 45, On Relay | 6-13 | Channel 45, Off Relay |
|------|---------------------|------|----------------------|
| 2-14 | Channel 46, On Relay | 6-14 | Channel 46, Off Relay |
| 2-15 | Channel 47, On Relay | 6-15 | Channel 47, Off Relay |
| 3-0 | Channel 48, On Relay | 7-0 | Channel 48, Off Relay |
| 3-1 | Channel 49, On Relay | 7-1 | Channel 49, Off Relay |
| 3-2 | Channel 50, On Relay | 7-2 | Channel 50, Off Relay |
| 3-3 | Channel 51, On Relay | 7-3 | Channel 51, Off Relay |
| 3-4 | Channel 52, On Relay | 7-4 | Channel 52, Off Relay |
| 3-5 | Channel 53, On Relay | 7-5 | Channel 53, Off Relay |
| 3-6 | Channel 54, On Relay | 7-6 | Channel 54, Off Relay |
| 3-7 | Channel 55, On Relay | 7-7 | Channel 55, Off Relay |
| 3-8 | Channel 56, On Relay | 7-8 | Channel 56, Off Relay |
| 3-9 | Channel 57, On Relay | 7-9 | Channel 57, Off Relay |
| 3-10 | Channel 58, On Relay | 7-10 | Channel 58, Off Relay |
| 3-11 | Channel 59, On Relay | 7-11 | Channel 59, Off Relay |
| 3-12 | Channel 60, On Relay | 7-12 | Channel 60, Off Relay |
| 3-13 | Channel 61, On Relay | 7-13 | Channel 61, Off Relay |
| 3-14 | Channel 62, On Relay | 7-14 | Channel 62, Off Relay |
| 3-15 | Channel 63, On Relay | 7-15 | Channel 63, Off Relay |

| 8-0 | Extra 1 second pause |
|-----|----------------------|
| 8-1 | Extra 2 second pause |
| 8-2 | Extra 5 second pause |
| 8-3 | Extra 10 second pause |
| 8-4 | Extra 20 second pause |
| 8-5 | Extra 40 second pause |
| 8-6 | Extra 80 second pause |

8-8     Print time, date and telemetry for channels from 00 to the programmed "stop" channel using a "local" printer (i.e., a printer located near the RFC-1).

8-9     Print time, date and telemetry for channels from 00 to the programmed "stop" channel using a "remote" printer (i.e., a printer located remotely from the RFC-1). The serial port on the RFC-1 should be connected to a modem. The RFC-1 will call Telephone Number F. The remote printer should be connected to a modem set to the"auto answer" mode.

8-14    Stop Execution and Recheck Telemetry. This step should be used only in Action Sequences which are triggered by Telemetry Rules. This instruction stops execution of an Action Sequence and rechecks telemetry for the triggering telemetry channel without a new reference scan. If the same telemetry channel triggers again, the entire Action Sequence is executed and a new reference scan is made. Here is an example of how this can be used: Channel 02 monitors the plate current of the main transmitter. Alarm Channel B is set up to monitor Channel 02. If the plate current falls to zero, Action Sequence 3 is triggered. Action Sequence 3 consists of: 0-2, 8-14, 4-1, 4-4, 0-5, 0-6. When Action Sequence 3 is triggered by the failure of Channel 02, the first step is to reset the main transmitter overload circuit with 0-2. Then the 8-14 step causes Channel 02 to be checked again (after the scan delay interval, normally 10 seconds). If the plate current has returned to normal, no additional steps in the Action Sequence will be executed and the telemetry scanning process will resume. If the plate current is still zero, Action Sequence 3 will start again, this time completing the entire sequence: the overload will be reset (already done to no avail), the main transmitter turned off, the antenna relay  switched to the backup transmitter and the backup

transmitter turned on.  A new set of telemetry reference readings will then be made and telemetry scanning will resume.

8-15  Inhibit new telemetry reference scan upon completion of Action Sequence.  At the end of an Action Sequence that was triggered by telemetry or the clock/calendar, new reference values are automatically recorded for each Monitored Channel. Programming this value in the Action Sequence will suppress a new telemetry reference scan.  As an example, this instruction step can be placed at the end of an Action Sequence used to control transmitter power.  This will allow the power to be controlled on subsequent telemetry scans even if the first power trim did not bring the telemetry reading to within limits.  The 8-15 instruction, if used, should be the last step in an Action Sequence.

9-0  Call all programmed numbers (rotation A, B, C, D, E, F, A, B, etc.) to programmed number of attempts.
9-1  Call all programmed numbers (rotation A, B, A, C, A, D, A, E, A, F, A, B, etc.) to programmed number of attempts.
9-2  Call Telephone Number A once
9-3  Call Telephone Number B once
9-4  Call Telephone Number C once
9-5  Call Telephone Number D once
9-6  Call Telephone Number E once
9-7  Call Telephone Number F once

15-15  Blank (no programming)

If ON and OFF control relays are programmed, the relay operate time is defined by programming address 1006 (discussed in Note 21).  The default time between steps in an Action Sequence is programmed at address 1007 (discussed in Note 22).

**Note 7:  Alarm Channel Programming**

Up to 8 of the 64 possible telemetry channels can be designated  for automatic monitoring. The channels are selected and monitoring conditions defined by programming Monitored Channels "A" through "H."  The following is a table showing  how the Monitored Channels can be programmed:

V1-V2  Channel Number  For example, channel 07 = 0-7
V1  Trigger Rule  See table below
V1  Action Sequence  from 1 to 8
V1-V2-V3-V4  Upper Limit  four digit upper limit
V1-V2-V3-V4  Lower Limit  four digit lower limit

Trigger Rules:

1  Trigger an Action Sequence if the telemetry varies more than 2.5% (or 20 units minimum) from the telemetry reading at the end of the last control/telemetry session or Action Sequence.

2  Trigger an Action Sequence if the telemetry varies more than 5% (or 20 units minimum) from the telemetry reading at the end of the last control/telemetry session or Action Sequence.

3  Trigger an Action Sequence if the telemetry varies more than 10% (or 20 units minimum) from the telemetry reading at the end of the last control/telemetry session or Action Sequence.

4	Trigger an Action Sequence if the telemetry varies more than 20% (or 20 units minimum) from the telemetry reading at the end of the last control/telemetry session or Action Sequence.

5	Trigger an Action Sequence if the telemetry crosses either the Upper Limit or the Lower Limit.

6	Trigger an Action Sequence if the telemetry exceeds the Upper Limit but only if the telemetry was between the Upper and Lower Limits at the end of the last telemetry/control session or Action Sequence.

7	Trigger an Action Sequence if the telemetry falls below the Lower Limit but only if the telemetry was between the Upper and Lower Limits at the end of the last telemetry/control session or Action Sequence.

8	Trigger an Action Sequence if the telemetry exceeds the Upper Limit or falls below the Lower Limit.

9	Trigger an Action Sequence if the telemetry exceeds the Upper Limit.

10	Trigger an Action Sequence if the telemetry falls below the Lower Limit.

Trigger Rules 1 through 4 are useful for situations where more than one reading is "normal" such as an AM broadcast transmitter which operates at three or four different power levels.  If Trigger Rules 1 through 4 are used, the Upper and Lower Limits are not used.  Also, in the Basic Programming Mode, the upper and lower limits are not requested.

Another approach to situations where more than one reading is normal is to use more than one Monitored Channel.  One pair of limits could monitor one range and another pair of limits could monitor a different range.

Trigger Rule 5 is probably the best for most applications.  It has the advantage of being able to monitor a channel with fixed trip points but it doesn't require a complicated set of interlocks to avoid an alarm condition if the equipment is deliberately turned off.

Trigger Rules 6 and 7 are similar to 5 but require a specific direction to trigger an alarm. These are useful for automatic power control and similar activities.

Trigger Rules 8, 9, and 10 should be used with great care.  These can cause continuous triggering and are not based on prior conditions.  For example, suppose that Trigger Rule 10 is used to monitor a transmitter's power output and automatically operate the "power raise" control if the output power falls below the lower limit.  If the transmitter were to be deliberately turned off, the RFC-1 would continuously operate the "power raise" control. Trigger Rule 7 would probably be better for this application.

**Note 8:  Main Security Code Programming**

The Main Security Code starts at address 0948.

To program any security code, simply enter any values between "0" to "9" for each address in the code.  If it is desired that the security code contain fewer that the maximum number of digits, program the extra spaces with "10."  For example, the Main Security Code can be up to 8 digits long. Programming "4  7  2  10  10  10  10  10" programs the Main Security Code to be  three digits long (472).  The security code can be eliminated altogether by programming "10" in all the digit locations.

**Note 9:    Control Security Code Channel Assignment**

Control Security Code A starts at address 0956.
Control Security Code B starts at address 0960.
Control Security Code C starts at address 0964.
Control Security Code block assignments start at address 0976

As factory programmed, all 64 possible channels are assigned the Control Security Code: 66. However, each block of 8 channels can be assigned any of three different Control Security Codes.  As an example, suppose one RFC-1 was shared at a common transmitter site with three radio stations.  Station #1 uses channels 00-07, station #2 uses channels 08-15, and station #3 uses channels 16-23.  By programming different numbers into Control Security Codes A, B and C, and assigning one to each of the three blocks of channels, each radio station can then have exclusive control of their group of channels.

When programming the Control Security Code for the eight block of channels (starting at address 0976), program "1" for Control Security Code A, "2" for Control Security Code B and "3" for Control Security Code C.

**Note 10:  Site Identification Phrase**

The Site Identification Phrase begins at address 0984.

This phrase is factory programmed to be "This is RFC-1/B."  This is the phrase that is spoken after the Main Security Code is correctly entered and when a telephone call is originated by the RFC-1.  The phrase can be programmed with any 6 words in the word table.  Each word requires the entry of two values.  This could be something official sounding like "This is site 27" or something less formal like "Hello, this is Billy Bob."  Fill in unused words with "Voice Pause 1."

If word 6 is programmed as "Voice Pause 5" <u>the RFC-1 will not say the word "Enter"</u> when it answers a call in voice mode.  This may be useful in cases where the RFC-1 shares the telephone line with other equipment.

**Note 11:  Hardware Version**

The Hardware Version is programmed at address 0996.

The RFC-1 hardware falls into one of two categories: hardware version 1.05 and earlier, and hardware version 1.99 and later.  The software needs to know which hardware version is being used.  The RFC-1 comes factory programmed for the latter version.  If this software has been installed as an upgrade to an older hardware version, this programming needs to be changed.  It should be changed in the Local Control mode without the RFC-1 being connected to a telephone line.


V1:   Hardware Version:

0     1.05 and earlier
1     1.99 and later (factory programmed)

**Note 12:  Telemetry Settling Time**

Telemetry Settling Time is programmed at address 0997.

This is the amount of time after the telemetry relay is switched before the voltage is sampled by the analog-to-digital converter in the RFC-1.  Because of the telemetry smoothing capacitors, if the impedance of the telemetry sources is fairly high, a longer waiting time (telemetry settling time) may be required between the time a reed relay on the RP-8 panel switches and the time the telemetry is actually read by the RFC-1.  If this is not long enough, the initial reading may be slightly different than subsequent readings on the same channel.  Unless the telemetry source impedance is fairly high (>5K) this is not a problem.   The telemetry settling time is factory set to 0.8 seconds and this should be satisfactory for most purposes.  The telemetry settling time can be changed to any value from 0.2 to 3.2 seconds by programming a value of "0" to "15."   The time in seconds is equal to $.2 +(.2 \times V)$ where V is the value from 0 to 15.

**Note 13:  Telemetry Lead Zero Suppression**

Leading Zero Suppression is programmed at address 0998.

V1:   Result:
0      No leading zero suppression      Example:  0714
1      Leading zero suppression        Example: 714

**Note 14:  Pause Between Words**

Pause Between Words is programmed at address 0999.

This programming is used to vary the length of the pause between words when the RFC-1 is speaking.  Factory default programming is 60 milliseconds.

V1:   Result:

0      30 milliseconds
1      60 milliseconds         (factory  programmed)
2      90 milliseconds
3      120 milliseconds
4      150 milliseconds
5      180 milliseconds
6      210 milliseconds
7      240 milliseconds        (approximately .25 seconds)
8      270 milliseconds
9      300 milliseconds
10     330 milliseconds
11     360 milliseconds
12     390 milliseconds
13     420 milliseconds
14     450 milliseconds
15     480 milliseconds        (approximately .5 seconds)

**Note 15:  Idle Time Before Hang-Up**

Idle Time Before Hang-Up is programmed at address 1000.

This is the maximum time allowed that the RFC-1 goes without receiving a valid DTMF command before terminating the call.  This is factory programmed to 2.5 minutes.

V1:  Result:

| 0 | 30 seconds |
|---|---|
| 1 | 60 seconds |
| 2 | 2.5 minutes      (factory programmed) |
| 3 | 5 minutes |
| 4 | 8.5 minutes |
| 5 | 13 minutes |
| 6 | 18.5 minutes |
| 7 | 25 minutes |
| 8 | 32.5 minutes |
| 9 | 41 minutes |
| 10 | 50.5 minutes |
| 11 | 61 minutes |
| 12 | 72.5 minutes |
| 13 | 85 minutes |
| 14 | 98.5 minutes |
| 15 | 113 minutes |

**Note 16:  Ring Number**

The Ring Number is programmed at address 1001.

This programming sets the required number of rings before the RFC-1 answers a telephone call.  This can be any value between 1 and 15.  Programming a "0" will result in one ring.

**Note 17:  Communications Mode**

The Communication Mode is programmed at address 1002.

V1:  Result:

| 0 | Answer in voice/DTMF mode only (factory programming) |
|---|---|
| 1 | Answer in serial data mode first; if no carrier within 10 seconds,  try voice/DTMF |
| 2 | Answer in voice/DTMF mode first; if no DTMF within 10 seconds,  try serial data mode |
| 3 | Answer in serial data mode only |

If mode 1 or 2 is used, it is recommended that the Incorrect Security Code Lockout Time be programmed for 10 seconds.  This is the amount of time the RFC-1 will wait before switching communications mode.  See Note 30 for programming details.

**Note 18:  Duration of Alarm Call**

The Duration of Alarm Call is programmed at address 1003.

This programming applies to voice/DTMF calls only.

V1:          Result:

1 to 15      10 to 150 seconds

Programming "0" results in 10 seconds.

**Note 19:  Wait Time Between Calls**

The Wait Time Between Calls is programmed at address 1004.

V1:          Result:

1 to 15      10 to 150 seconds

Programming "0" results in 10 seconds.

**Note 20:  Baud  Rate**

The Baud Rate is programmed at address 1005.

V1:          Result (baud):

0            9600
1            4800
2            2400 (factory  programmed)
3            1200
4            600
5            300
6            150
7            75

**Note 21:  Relay "On" Time In Serial Mode and Action Sequences**

The Relay "On" Time is programmed at address 1006.

This set the relay "on" time in the serial data mode and in Action Sequences.  It is also the minimum control relay "on" time for manual (DTMF) control tones.

V1:          Result:

0 to 15      0.3 to 4.8 seconds; $T=.3+(.3 \times V)$ ; factory programmed to 0.6 seconds

**Note 22: Time Between Steps in Action Sequences**

The Time Between Steps in Action Sequences is programmed at address 1007.

This is the default pause between the steps in an Action Sequence.

V1:          Result:

0 to 15     0.2 to 3.2 seconds; T=.2+(.2 x V) ; factory programmed to 0.4 seconds

**Note 23: Enable Power-Up Action Sequence**

The Enable Power-Up Action Sequence is programmed at address 1008.

This is the Action Sequence triggered  10 seconds after power is applied to the RFC-1.

V1:          Result:

0            Disabled (no Action Sequence)
1 to 8           Action Sequence 1 to 8

**Note 24: Enable Telemetry Alarm System**

The  Telemetry Alarm Status is programmed at location 1009.

Program with "0" to disable the Telemetry Alarm System.  Program with "1" to enable the Telemetry Alarm System.  This address can also be programmed using command 82 in the Basic Programming Mode.

**Note 25: Autoscan Stop Channel**

The Autoscan Stop Channel is programmed at address location 1010.

Program two digit channel number (V1-V2) for the highest channel number to be scanned by the Autoscan function and telemetry printing.   For example, channel 15 is programmed as 1-5.

**Note 26: Reserved**

**Note 27: Telemetry Scan Interval**

The Telemetry Scan Interval is programmed at address 1013.

The Monitored Channels are scanned at this interval.  It is factory programmed to 10 seconds.  At a scan interval of 10 seconds, it requires 80 seconds to scan all 8 channels.  The normal scanning sequence is Monitored Channel A, B, C, D, E, F, G, H.  If the second portion of the table is selected, Monitored Channel H is scanned every other channel.  For example, Monitored Channel A, H, B, H, C, H, D, H, etc.

V1:   Result:          Frequent scan of Monitored Channel H:

0     10 seconds         No    (factory programmed)
1     20 seconds         No
2     50 seconds         No
3     100 seconds    No
4     10 seconds         Yes
5     20 seconds         Yes
6     50 seconds         Yes
7     100 seconds    Yes

The second portion of the table is used when a short time delay is desired between a telemetry change and its detection by the RFC-1.  For example, if "4" were programmed, Monitored Channel H would be sampled every 20 seconds.  Channels not programmed for scanning are skipped.

## Note 28:  Dedicated Port Control/Ring Sensitivity

The Dedicated Port Control and Ring Sensitivity is programmed at address 1014.

See the Hardware Instruction Book for details about the Dedicated Control Port.

Ring sensitivity higher than the factory setting may be necessary when using the RFC-1 with UHF radiotelephones (sometimes called "ranch phones"), cellular-to-RJ11 adaptors, or other devices which generate a square wave ring signal.  Ring sensitivity lower than the factory setting may be necessary when used with telephone lines that have a large amount of "hum" present.  This prevents the hum from generating what the RFC-1 thinks is a continuous ring.

The following table shows programming for the Dedicated Port and the Ring Sensitivity:

V1:   Result:

8     Dedicated Port <u>Off</u> / Ring Sensitivity = 10
10    Dedicated Port <u>Off</u> / Ring Sensitivity = 4.66
12    Dedicated Port <u>Off</u> / Ring Sensitivity = 3.04
14    Dedicated Port <u>Off</u> / Ring Sensitivity = 2.25
0     Dedicated Port <u>Off</u> / Ring Sensitivity = 1.79 (factory setting)
2     Dedicated Port <u>Off</u> / Ring Sensitivity = 1.48
4     Dedicated Port <u>Off</u> / Ring Sensitivity = 1.27
6     Dedicated Port <u>Off</u> / Ring Sensitivity = 1.11

9     Dedicated Port <u>On</u> / Ring Sensitivity = 10
11    Dedicated Port <u>On</u> / Ring Sensitivity = 4.66
13    Dedicated Port <u>On</u> / Ring Sensitivity = 3.04
15    Dedicated Port <u>On</u> / Ring Sensitivity = 2.25
1     Dedicated Port <u>On</u> / Ring Sensitivity = 1.79
3     Dedicated Port <u>On</u> / Ring Sensitivity = 1.48
5     Dedicated Port <u>On</u> / Ring Sensitivity = 1.27
7     Dedicated Port <u>On</u> / Ring Sensitivity = 1.11

**Note 29:  Exchange Channel Label for Programmed Date/Times**

The Exchange Channel Label for Programmed Date/Times is programmed at address 1015.

The RFC-1 comes factory-programmed to allow up to 72 Date/Times to be programmed and the ability to program Telemetry Units/Status Formats for channel 00 through 15.  If circumstances permit, the user-memory can be reconfigured to reduce or expand the number of channels that can be programmed with Telemetry Units/Status Formats (TU/SF) with a corresponding shift in the number of Date/Time programming spaces.  If this is done, some of the telemetry channels can not be programmed with telemetry units or special status formats.  The channels can still be used but the format will default to the values programmed at addresses 1020 through 1023 (see Note 33). The following table contains the information necessary for programming:

| V1: | TU/SF programmable on channels: | Number of Date/Times available: |
|---|---|---|
| 0 | 00 to 63 | 48 |
| 1 | 00 to 55 | 52 |
| 2 | 00 to 47 | 56 |
| 3 | 00 to 39 | 60 |
| 4 | 00 to 31 | 64 |
| 5 | 00 to 23 | 68 |
| 6 | 00 to 15 | 72  (factory programmed) |
| 7 | 00 to 07 | 76 |
| 8 | none | 80 |

If TU/SF is exchanged for Date/Times, use the "Alternate Use" section for Date/Times 49 and above in the "Advanced Programming Addresses" book.

**Note 30:  Incorrect Security Code Lockout Time**

The Incorrect Security Code Lockout Time is programmed at address 1016.

When any security code is incorrectly entered by the operator, the RFC-1 hangs-up the telephone line.  The delay before the RFC-1 hangs-up is determined by this programming:

V1:          Result:

0 to 15      0 to 150 seconds (in increments of 10 seconds)

This value is factory programmed to 10 seconds.

This value also determines the length of time the RFC-1 will wait before switching communications mode when one of the intermediate modes is selected.  The intermediate communications modes are those where the RFC-1 answers in one mode, voice or data, and automatically switches to the other mode if it does not receive an appropriate response.  It is recommended that this value be programmed to 10 seconds if one of these modes are used. Communication mode programming details can be found in Note 17.

**Note 31:  Reserved**

**Note 32: Clock Speed Adjustment**

The Clock Speed Adjustment is programmed at addresses 1018-1019.

This adjustment has been included to compensate for variances in timing crystals. If the system clock runs fast, this value should be increased. If the system clock runs slow, this value should be decreased. Each step causes a one half second change over a 24 hour period.

Since this adjustment occupies two addresses, the range of values is 0-0 to 15-15. This allows a full range from 00 to FF hex or 0 to 255 decimal. At the midpoint of this range, 80 hex or 128 decimal, no compensation takes place. Values below the midpoint speed the clock and values above the midpoint slow the clock by one half second per 24 hours. It is extremely important to remember that these values are hexadecimal when altering this programming. Factory programming is 9-1.

For those a bit rusty on their hexadecimal arithmetic, the following example will help compute the correct clock adjustment. Suppose that the clock gains 5 seconds per day and the factory programming has not been altered.

Let: SECONDS = the number of seconds the clock gains or loses per day
V1 = the value currently programmed at address 1018
V2 = the value currently programmed at address 1019


ADJUSTMENT = SECONDS x 2
CURRENT.SETTING = (V1 x 16) + V2

NEW.SETTING = CURRENT.SETTING + ADJUSTMENT          (If clock runs **fast**)
NEW.SETTING = CURRENT.SETTING - ADJUSTMENT          (If clock runs **slow**)

$V1_{new} = \dfrac{NEW.SETTING}{16}$     (ignore anything to the right of the decimal)

$V2_{new} = NEW.SETTING - (V1_{new} \times 16)$

Determine the first three values in the list above according to your specific situation. For this example we will use:

SECONDS = 5
V1 = 9
V2 = 1

Now calculate the next two values in the list:

ADJUSTMENT = 5 x 2 = 10
CURRENT.SETTING = (9 x 16) + 1 = 145

Choose the correct equation from above for the next step: (notice the sign difference +/-)

NEW.SETTING = 145 + 10 = 155


Now determine new values for V1 and V2:

$$V1_{new} = \frac{155}{16} = 9.6875 = 9 \text{ (ignore anything right of the decimal)}$$

$$V2_{new} = 155 - (9 \times 16) = 11$$

Program $V1_{new}$ at 1018 and $V2_{new}$ at 1019.

**Note 33: Default Telemetry Formats**

Telemetry Format Defaults are programmed at addresses 1020 - 1023.

V1-V2        Telemetry Format or Units
             See Note 1 for programming options.
V1             Full Scale Reading & Decimal Point Location
             See Note 2 for programming options.
V1             Linear/Logarithmic Scale/Indirect Power Calculation; Auto Control Relay
             See Note 3 for programming options.

User memory in the RFC-1 can be configured to store 48 to 80 Date/Times to trip Action Sequences. Factory programming is 48 Date/Times. When more than 48 Date/Times are programmed, some of the channels can not be programmed with telemetry units or special status formats. The channels can still be used but the format will default to the format stored in these memory addresses. In factory programming: the full-scale reading is set to "2040," the auto-status will be "on," and there will no units spoken.

# RFC-1/B Word Table (software version 4.x)

| V1-V2 | Word | V1-V2 | Word | V1-V2 | Word |
|-------|------|-------|------|-------|------|
| 0-0 | Zero | 3-10 | Hertz | 7-4 | Spanky |
| 0-1 | One | 3-11 | Hours | 7-5 | Speaking |
| 0-2 | Two | 3-12 | Igor | 7-6 | Stan |
| 0-3 | Three | 3-13 | Interrupt | 7-7 | Star |
| 0-4 | Four | 3-14 | Intrusion | 7-8 | Status |
| 0-5 | Five | 3-15 | Joe | 7-9 | Telemetry |
| 0-6 | Six | 4-0 | Kiloamperes | 7-10 | Telephone |
| 0-7 | Seven | 4-1 | Kilograms | 7-11 | This Is |
| 0-8 | Eight | 4-2 | Kilovolts | 7-12 | Time |
| 0-9 | Nine | 4-3 | Kilowatts | 7-13 | To |
| 0-10 | Ten | 4-4 | Larry | 7-14 | Transmitter |
| 0-11 | Eleven | 4-5 | Limit | 7-15 | Triggered |
| 0-12 | Twelve | 4-6 | Local | 8-0 | Units |
| 0-13 | Thirteen | 4-7 | Lower | 8-1 | Upper |
| 0-14 | Fourteen | 4-8 | Main | 8-2 | Version |
| 0-15 | Fifteen | 4-9 | Manual | 8-3 | Volts |
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| 1-14 | Closed | 5-8 | Normal | 9-2 | L |
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| 2-5 | Day | 5-15 | Percent | 9-9 | S |
| 2-6 | Default | 6-0 | Percent Power | 9-10 | T |
| 2-7 | Degrees | 6-1 | Point | 9-11 | U |
| 2-8 | Digit | 6-2 | Positive | 9-12 | V |
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| 3-3 | Gary | 6-13 | Robbie | 10-7 | Voice Pause 3 (100 MS) |
| 3-4 | Gonzo | 6-14 | Scan | 10-8 | Voice Pause 4 (200 MS) |
| 3-5 | Goodbye | 6-15 | Security | 10-9 | Voice Pause 5 (500 MS) |
| 3-6 | Grams | 7-0 | Select | 10-10 | CR & LF |
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## Sine Systems RFC-1/B Advanced Programming Address Table
(for software versions beginning 4.04)

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Alternate Use | Note |
|---|---|---|---|---|---|---|
| 0000 | Channel 00; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 80; Action Sequence | 4 |
| 0001 | Channel 00; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 80; Month | 4 |
| 0002 | Channel 00; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 80; Day, Value 1 | 4 |
| 0003 | Channel 00; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 80; Day, Value 2 | 4 |
| 0004 | Channel 01; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 80; Hour, Value 1 | 4 |
| 0005 | Channel 01; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 80; Hour, Value 2 | 4 |
| 0006 | Channel 01; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 80; Minute, Value 1 | 4 |
| 0007 | Channel 01; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 80; Minute, Value 2 | 4 |
| 0008 | Channel 02; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 79; Action Sequence | 4 |
| 0009 | Channel 02; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 79; Month | 4 |
| 0010 | Channel 02; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 79; Day, Value 1 | 4 |
| 0011 | Channel 02; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 79; Day, Value 2 | 4 |
| 0012 | Channel 03; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 79; Hour, Value 1 | 4 |
| 0013 | Channel 03; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 79; Hour, Value 2 | 4 |
| 0014 | Channel 03; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 79; Minute, Value 1 | 4 |
| 0015 | Channel 03; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 79; Minute, Value 2 | 4 |
| 0016 | Channel 04; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 78; Action Sequence | 4 |
| 0017 | Channel 04; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 78; Month | 4 |
| 0018 | Channel 04; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 78; Day, Value 1 | 4 |
| 0019 | Channel 04; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 78; Day, Value 2 | 4 |
| 0020 | Channel 05; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 78; Hour, Value 1 | 4 |
| 0021 | Channel 05; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 78; Hour, Value 2 | 4 |
| 0022 | Channel 05; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 78; Minute, Value 1 | 4 |
| 0023 | Channel 05; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 78; Minute, Value 2 | 4 |
| 0024 | Channel 06; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 77; Action Sequence | 4 |
| 0025 | Channel 06; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 77; Month | 4 |
| 0026 | Channel 06; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 77; Day, Value 1 | 4 |
| 0027 | Channel 06; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 77; Day, Value 2 | 4 |
| 0028 | Channel 07; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 77; Hour, Value 1 | 4 |
| 0029 | Channel 07; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 77; Hour, Value 2 | 4 |
| 0030 | Channel 07; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 77; Minute, Value 1 | 4 |
| 0031 | Channel 07; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 77; Minute, Value 2 | 4 |
| 0032 | Channel 08; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 76; Action Sequence | 4 |
| 0033 | Channel 08; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 76; Month | 4 |
| 0034 | Channel 08; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 76; Day, Value 1 | 4 |
| 0035 | Channel 08; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 76; Day, Value 2 | 4 |
| 0036 | Channel 09; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 76; Hour, Value 1 | 4 |
| 0037 | Channel 09; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 76; Hour, Value 2 | 4 |
| 0038 | Channel 09; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 76; Minute, Value 1 | 4 |
| 0039 | Channel 09; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 76; Minute, Value 2 | 4 |
| 0040 | Channel 10; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 75; Action Sequence | 4 |
| 0041 | Channel 10; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 75; Month | 4 |
| 0042 | Channel 10; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 75; Day, Value 1 | 4 |
| 0043 | Channel 10; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 75; Day, Value 2 | 4 |
| 0044 | Channel 11; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 75; Hour, Value 1 | 4 |
| 0045 | Channel 11; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 75; Hour, Value 2 | 4 |
| 0046 | Channel 11; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 75; Minute, Value 1 | 4 |
| 0047 | Channel 11; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 75; Minute, Value 2 | 4 |
| 0048 | Channel 12; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 74; Action Sequence | 4 |
| 0049 | Channel 12; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 74; Month | 4 |
| 0050 | Channel 12; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 74; Day, Value 1 | 4 |
| 0051 | Channel 12; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 74; Day, Value 2 | 4 |
| 0052 | Channel 13; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 74; Hour, Value 1 | 4 |
| 0053 | Channel 13; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 74; Hour, Value 2 | 4 |
| 0054 | Channel 13; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 74; Minute, Value 1 | 4 |
| 0055 | Channel 13; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 74; Minute, Value 2 | 4 |
| 0056 | Channel 14; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 73; Action Sequence | 4 |
| 0057 | Channel 14; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 73; Month | 4 |
| 0058 | Channel 14; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 73; Day, Value 1 | 4 |
| 0059 | Channel 14; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 73; Day, Value 2 | 4 |

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Alternate Use | Note |
|---|---|---|---|---|---|---|
| 0060 | Channel 15; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 73; Hour, Value 1 | 4 |
| 0061 | Channel 15; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 73; Hour, Value 2 | 4 |
| 0062 | Channel 15; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 73; Minute, Value 1 | 4 |
| 0063 | Channel 15; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 73; Minute, Value 2 | 4 |
| 0064 | Channel 16; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 72; Action Sequence | 4 |
| 0065 | Channel 16; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 72; Month | 4 |
| 0066 | Channel 16; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 72; Day, Value 1 | 4 |
| 0067 | Channel 16; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 72; Day, Value 2 | 4 |
| 0068 | Channel 17; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 72; Hour, Value 1 | 4 |
| 0069 | Channel 17; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 72; Hour, Value 2 | 4 |
| 0070 | Channel 17; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 72; Minute, Value 1 | 4 |
| 0071 | Channel 17; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 72; Minute, Value 2 | 4 |
| 0072 | Channel 18; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 71; Action Sequence | 4 |
| 0073 | Channel 18; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 71; Month | 4 |
| 0074 | Channel 18; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 71; Day, Value 1 | 4 |
| 0075 | Channel 18; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 71; Day, Value 2 | 4 |
| 0076 | Channel 19; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 71; Hour, Value 1 | 4 |
| 0077 | Channel 19; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 71; Hour, Value 2 | 4 |
| 0078 | Channel 19; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 71; Minute, Value 1 | 4 |
| 0079 | Channel 19; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 71; Minute, Value 2 | 4 |
| 0080 | Channel 20; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 70; Action Sequence | 4 |
| 0081 | Channel 20; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 70; Month | 4 |
| 0082 | Channel 20; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 70; Day, Value 1 | 4 |
| 0083 | Channel 20; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 70; Day, Value 2 | 4 |
| 0084 | Channel 21; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 70; Hour, Value 1 | 4 |
| 0085 | Channel 21; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 70; Hour, Value 2 | 4 |
| 0086 | Channel 21; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 70; Minute, Value 1 | 4 |
| 0087 | Channel 21; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 70; Minute, Value 2 | 4 |
| 0088 | Channel 22; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 69; Action Sequence | 4 |
| 0089 | Channel 22; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 69; Month | 4 |
| 0090 | Channel 22; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 69; Day, Value 1 | 4 |
| 0091 | Channel 22; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 69; Day, Value 2 | 4 |
| 0092 | Channel 23; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 69; Hour, Value 1 | 4 |
| 0093 | Channel 23; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 69; Hour, Value 2 | 4 |
| 0094 | Channel 23; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 69; Minute, Value 1 | 4 |
| 0095 | Channel 23; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 69; Minute, Value 2 | 4 |
| 0096 | Channel 24; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 68; Action Sequence | 4 |
| 0097 | Channel 24; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 68; Month | 4 |
| 0098 | Channel 24; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 68; Day, Value 1 | 4 |
| 0099 | Channel 24; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 68; Day, Value 2 | 4 |
| 0100 | Channel 25; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 68; Hour, Value 1 | 4 |
| 0101 | Channel 25; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 68; Hour, Value 2 | 4 |
| 0102 | Channel 25; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 68; Minute, Value 1 | 4 |
| 0103 | Channel 25; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 68; Minute, Value 2 | 4 |
| 0104 | Channel 26; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 67; Action Sequence | 4 |
| 0105 | Channel 26; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 67; Month | 4 |
| 0106 | Channel 26; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 67; Day, Value 1 | 4 |
| 0107 | Channel 26; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 67; Day, Value 2 | 4 |
| 0108 | Channel 27; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 67; Hour, Value 1 | 4 |
| 0109 | Channel 27; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 67; Hour, Value 2 | 4 |
| 0110 | Channel 27; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 67; Minute, Value 1 | 4 |
| 0111 | Channel 27; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 67; Minute, Value 2 | 4 |
| 0112 | Channel 28; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 66; Action Sequence | 4 |
| 0113 | Channel 28; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 66; Month | 4 |
| 0114 | Channel 28; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 66; Day, Value 1 | 4 |
| 0115 | Channel 28; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 66; Day, Value 2 | 4 |
| 0116 | Channel 29; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 66; Hour, Value 1 | 4 |
| 0117 | Channel 29; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 66; Hour, Value 2 | 4 |
| 0118 | Channel 29; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 66; Minute, Value 1 | 4 |
| 0119 | Channel 29; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 66; Minute, Value 2 | 4 |

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Alternate Use | Note |
|---|---|---|---|---|---|---|
| 0120 | Channel 30; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 65; Action Sequence | 4 |
| 0121 | Channel 30; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 65; Month | 4 |
| 0122 | Channel 30; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 65; Day, Value 1 | 4 |
| 0123 | Channel 30; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 65; Day, Value 2 | 4 |
| 0124 | Channel 31; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 65; Hour, Value 1 | 4 |
| 0125 | Channel 31; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 65; Hour, Value 2 | 4 |
| 0126 | Channel 31; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 65; Minute, Value 1 | 4 |
| 0127 | Channel 31; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 65; Minute, Value 2 | 4 |
| 0128 | Channel 32; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 64; Action Sequence | 4 |
| 0129 | Channel 32; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 64; Month | 4 |
| 0130 | Channel 32; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 64; Day, Value 1 | 4 |
| 0131 | Channel 32; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 64; Day, Value 2 | 4 |
| 0132 | Channel 33; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 64; Hour, Value 1 | 4 |
| 0133 | Channel 33; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 64; Hour, Value 2 | 4 |
| 0134 | Channel 33; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 64; Minute, Value 1 | 4 |
| 0135 | Channel 33; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 64; Minute, Value 2 | 4 |
| 0136 | Channel 34; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 63; Action Sequence | 4 |
| 0137 | Channel 34; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 63; Month | 4 |
| 0138 | Channel 34; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 63; Day, Value 1 | 4 |
| 0139 | Channel 34; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 63; Day, Value 2 | 4 |
| 0140 | Channel 35; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 63; Hour, Value 1 | 4 |
| 0141 | Channel 35; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 63; Hour, Value 2 | 4 |
| 0142 | Channel 35; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 63; Minute, Value 1 | 4 |
| 0143 | Channel 35; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 63; Minute, Value 2 | 4 |
| 0144 | Channel 36; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 62; Action Sequence | 4 |
| 0145 | Channel 36; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 62; Month | 4 |
| 0146 | Channel 36; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 62; Day, Value 1 | 4 |
| 0147 | Channel 36; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 62; Day, Value 2 | 4 |
| 0148 | Channel 37; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 62; Hour, Value 1 | 4 |
| 0149 | Channel 37; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 62; Hour, Value 2 | 4 |
| 0150 | Channel 37; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 62; Minute, Value 1 | 4 |
| 0151 | Channel 37; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 62; Minute, Value 2 | 4 |
| 0152 | Channel 38; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 61; Action Sequence | 4 |
| 0153 | Channel 38; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 61; Month | 4 |
| 0154 | Channel 38; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 61; Day, Value 1 | 4 |
| 0155 | Channel 38; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 61; Day, Value 2 | 4 |
| 0156 | Channel 39; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 61; Hour, Value 1 | 4 |
| 0157 | Channel 39; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 61; Hour, Value 2 | 4 |
| 0158 | Channel 39; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 61; Minute, Value 1 | 4 |
| 0159 | Channel 39; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 61; Minute, Value 2 | 4 |
| 0160 | Channel 40; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 60; Action Sequence | 4 |
| 0161 | Channel 40; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 60; Month | 4 |
| 0162 | Channel 40; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 60; Day, Value 1 | 4 |
| 0163 | Channel 40; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 60; Day, Value 2 | 4 |
| 0164 | Channel 41; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 60; Hour, Value 1 | 4 |
| 0165 | Channel 41; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 60; Hour, Value 2 | 4 |
| 0166 | Channel 41; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 60; Minute, Value 1 | 4 |
| 0167 | Channel 41; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 60; Minute, Value 2 | 4 |
| 0168 | Channel 42; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 59; Action Sequence | 4 |
| 0169 | Channel 42; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 59; Month | 4 |
| 0170 | Channel 42; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 59; Day, Value 1 | 4 |
| 0171 | Channel 42; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 59; Day, Value 2 | 4 |
| 0172 | Channel 43; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 59; Hour, Value 1 | 4 |
| 0173 | Channel 43; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 59; Hour, Value 2 | 4 |
| 0174 | Channel 43; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 59; Minute, Value 1 | 4 |
| 0175 | Channel 43; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 59; Minute, Value 2 | 4 |
| 0176 | Channel 44; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 58; Action Sequence | 4 |
| 0177 | Channel 44; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 58; Month | 4 |
| 0178 | Channel 44; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 58; Day, Value 1 | 4 |
| 0179 | Channel 44; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 58; Day, Value 2 | 4 |

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Alternate Use | Note |
|---------|-----|------|------|------|---------------|------|
| 0180 | Channel 45; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 58; Hour, Value 1 | 4 |
| 0181 | Channel 45; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 58; Hour, Value 2 | 4 |
| 0182 | Channel 45; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 58; Minute, Value 1 | 4 |
| 0183 | Channel 45; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 58; Minute, Value 2 | 4 |
| 0184 | Channel 46; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 57; Action Sequence | 4 |
| 0185 | Channel 46; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 57; Month | 4 |
| 0186 | Channel 46; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 57; Day, Value 1 | 4 |
| 0187 | Channel 46; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 57; Day, Value 2 | 4 |
| 0188 | Channel 47; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 57; Hour, Value 1 | 4 |
| 0189 | Channel 47; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 57; Hour, Value 2 | 4 |
| 0190 | Channel 47; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 57; Minute, Value 1 | 4 |
| 0191 | Channel 47; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 57; Minute, Value 2 | 4 |
| 0192 | Channel 48; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 56; Action Sequence | 4 |
| 0193 | Channel 48; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 56; Month | 4 |
| 0194 | Channel 48; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 56; Day, Value 1 | 4 |
| 0195 | Channel 48; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 56; Day, Value 2 | 4 |
| 0196 | Channel 49; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 56; Hour, Value 1 | 4 |
| 0197 | Channel 49; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 56; Hour, Value 2 | 4 |
| 0198 | Channel 49; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 56; Minute, Value 1 | 4 |
| 0199 | Channel 49; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 56; Minute, Value 2 | 4 |
| 0200 | Channel 50; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 55; Action Sequence | 4 |
| 0201 | Channel 50; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 55; Month | 4 |
| 0202 | Channel 50; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 55; Day, Value 1 | 4 |
| 0203 | Channel 50; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 55; Day, Value 2 | 4 |
| 0204 | Channel 51; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 55; Hour, Value 1 | 4 |
| 0205 | Channel 51; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 55; Hour, Value 2 | 4 |
| 0206 | Channel 51; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 55; Minute, Value 1 | 4 |
| 0207 | Channel 51; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 55; Minute, Value 2 | 4 |
| 0208 | Channel 52; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 54; Action Sequence | 4 |
| 0209 | Channel 52; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 54; Month | 4 |
| 0210 | Channel 52; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 54; Day, Value 1 | 4 |
| 0211 | Channel 52; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 54; Day, Value 2 | 4 |
| 0212 | Channel 53; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 54; Hour, Value 1 | 4 |
| 0213 | Channel 53; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 54; Hour, Value 2 | 4 |
| 0214 | Channel 53; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 54; Minute, Value 1 | 4 |
| 0215 | Channel 53; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 54; Minute, Value 2 | 4 |
| 0216 | Channel 54; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 53; Action Sequence | 4 |
| 0217 | Channel 54; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 53; Month | 4 |
| 0218 | Channel 54; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 53; Day, Value 1 | 4 |
| 0219 | Channel 54; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 53; Day, Value 2 | 4 |
| 0220 | Channel 55; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 53; Hour, Value 1 | 4 |
| 0221 | Channel 55; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 53; Hour, Value 2 | 4 |
| 0222 | Channel 55; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 53; Minute, Value 1 | 4 |
| 0223 | Channel 55; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 53; Minute, Value 2 | 4 |
| 0224 | Channel 56; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 52; Action Sequence | 4 |
| 0225 | Channel 56; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 52; Month | 4 |
| 0226 | Channel 56; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 52; Day, Value 1 | 4 |
| 0227 | Channel 56; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 52; Day, Value 2 | 4 |
| 0228 | Channel 57; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 52; Hour, Value 1 | 4 |
| 0229 | Channel 57; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 52; Hour, Value 2 | 4 |
| 0230 | Channel 57; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 52; Minute, Value 1 | 4 |
| 0231 | Channel 57; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 52; Minute, Value 2 | 4 |
| 0232 | Channel 58; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 51; Action Sequence | 4 |
| 0233 | Channel 58; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 51; Month | 4 |
| 0234 | Channel 58; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 51; Day, Value 1 | 4 |
| 0235 | Channel 58; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 51; Day, Value 2 | 4 |
| 0236 | Channel 59; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 51; Hour, Value 1 | 4 |
| 0237 | Channel 59; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 51; Hour, Value 2 | 4 |
| 0238 | Channel 59; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 51; Minute, Value 1 | 4 |
| 0239 | Channel 59; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 51; Minute, Value 2 | 4 |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---|---|---|---|---|---|
| 0240 | Channel 60; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 50; Action Sequence 4 |
| 0241 | Channel 60; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 50; Month 4 |
| 0242 | Channel 60; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 50; Day, Value 1 4 |
| 0243 | Channel 60; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 50; Day, Value 2 4 |
| 0244 | Channel 61; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 50; Hour, Value 1 4 |
| 0245 | Channel 61; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 50; Hour, Value 2 4 |
| 0246 | Channel 61; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 50; Minute, Value 1 4 |
| 0247 | Channel 61; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 50; Minute, Value 2 4 |
| 0248 | Channel 62; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 49; Action Sequence 4 |
| 0249 | Channel 62; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 49; Month 4 |
| 0250 | Channel 62; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 49; Day, Value 1 4 |
| 0251 | Channel 62; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 49; Day, Value 2 4 |
| 0252 | Channel 63; Telemetry Units Or Status Format; Value 1 | 1 | 0 | ____ | Date/Time 49; Hour, Value 1 4 |
| 0253 | Channel 63; Telemetry Units Or Status Format; Value 2 | 1 | 3 | ____ | Date/Time 49; Hour, Value 2 4 |
| 0254 | Channel 63; Full Scale & Decimal Point | 2 | 2 | ____ | Date/Time 49; Minute, Value 1 4 |
| 0255 | Channel 63; Linear/Log/Indirect & Auto Relay Activation | 3 | 0 | ____ | Date/Time 49; Minute, Value 2 4 |
| 0256 | Date/Time 48; Action Sequence | 4 | 0 | ____ | _____ |
| 0257 | Date/Time 48; Month | 4 | 0 | ____ | _____ |
| 0258 | Date/Time 48; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0259 | Date/Time 48; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0260 | Date/Time 48; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0261 | Date/Time 48; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0262 | Date/Time 48; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0263 | Date/Time 48; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0264 | Date/Time 47; Action Sequence | 4 | 0 | ____ | _____ |
| 0265 | Date/Time 47; Month | 4 | 0 | ____ | _____ |
| 0266 | Date/Time 47; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0267 | Date/Time 47; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0268 | Date/Time 47; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0269 | Date/Time 47; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0270 | Date/Time 47; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0271 | Date/Time 47; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0272 | Date/Time 46; Action Sequence | 4 | 0 | ____ | _____ |
| 0273 | Date/Time 46; Month | 4 | 0 | ____ | _____ |
| 0274 | Date/Time 46; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0275 | Date/Time 46; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0276 | Date/Time 46; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0277 | Date/Time 46; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0278 | Date/Time 46; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0279 | Date/Time 46; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0280 | Date/Time 45; Action Sequence | 4 | 0 | ____ | _____ |
| 0281 | Date/Time 45; Month | 4 | 0 | ____ | _____ |
| 0282 | Date/Time 45; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0283 | Date/Time 45; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0284 | Date/Time 45; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0285 | Date/Time 45; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0286 | Date/Time 45; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0287 | Date/Time 45; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0288 | Date/Time 44; Action Sequence | 4 | 0 | ____ | _____ |
| 0289 | Date/Time 44; Month | 4 | 0 | ____ | _____ |
| 0290 | Date/Time 44; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0291 | Date/Time 44; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0292 | Date/Time 44; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0293 | Date/Time 44; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0294 | Date/Time 44; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0295 | Date/Time 44; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0296 | Date/Time 43; Action Sequence | 4 | 0 | ____ | _____ |
| 0297 | Date/Time 43; Month | 4 | 0 | ____ | _____ |
| 0298 | Date/Time 43; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0299 | Date/Time 43; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0300 | Date/Time 43; Hour, Value 1 | 4 | 0 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0301 | Date/Time 43; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0302 | Date/Time 43; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0303 | Date/Time 43; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0304 | Date/Time 42; Action Sequence | 4 | 0 | ____ | _____ |
| 0305 | Date/Time 42; Month | 4 | 0 | ____ | _____ |
| 0306 | Date/Time 42; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0307 | Date/Time 42; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0308 | Date/Time 42; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0309 | Date/Time 42; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0310 | Date/Time 42; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0311 | Date/Time 42; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0312 | Date/Time 41; Action Sequence | 4 | 0 | ____ | _____ |
| 0313 | Date/Time 41; Month | 4 | 0 | ____ | _____ |
| 0314 | Date/Time 41; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0315 | Date/Time 41; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0316 | Date/Time 41; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0317 | Date/Time 41; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0318 | Date/Time 41; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0319 | Date/Time 41; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0320 | Date/Time 40; Action Sequence | 4 | 0 | ____ | _____ |
| 0321 | Date/Time 40; Month | 4 | 0 | ____ | _____ |
| 0322 | Date/Time 40; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0323 | Date/Time 40; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0324 | Date/Time 40; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0325 | Date/Time 40; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0326 | Date/Time 40; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0327 | Date/Time 40; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0328 | Date/Time 39; Action Sequence | 4 | 0 | ____ | _____ |
| 0329 | Date/Time 39; Month | 4 | 0 | ____ | _____ |
| 0330 | Date/Time 39; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0331 | Date/Time 39; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0332 | Date/Time 39; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0333 | Date/Time 39; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0334 | Date/Time 39; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0335 | Date/Time 39; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0336 | Date/Time 38; Action Sequence | 4 | 0 | ____ | _____ |
| 0337 | Date/Time 38; Month | 4 | 0 | ____ | _____ |
| 0338 | Date/Time 38; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0339 | Date/Time 38; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0340 | Date/Time 38; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0341 | Date/Time 38; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0342 | Date/Time 38; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0343 | Date/Time 38; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0344 | Date/Time 37; Action Sequence | 4 | 0 | ____ | _____ |
| 0345 | Date/Time 37; Month | 4 | 0 | ____ | _____ |
| 0346 | Date/Time 37; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0347 | Date/Time 37; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0348 | Date/Time 37; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0349 | Date/Time 37; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0350 | Date/Time 37; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0351 | Date/Time 37; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0352 | Date/Time 36; Action Sequence | 4 | 0 | ____ | _____ |
| 0353 | Date/Time 36; Month | 4 | 0 | ____ | _____ |
| 0354 | Date/Time 36; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0355 | Date/Time 36; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0356 | Date/Time 36; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0357 | Date/Time 36; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0358 | Date/Time 36; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0359 | Date/Time 36; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0360 | Date/Time 35; Action Sequence | 4 | 0 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0361 | Date/Time 35; Month | 4 | 0 | ____ | _____ |
| 0362 | Date/Time 35; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0363 | Date/Time 35; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0364 | Date/Time 35; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0365 | Date/Time 35; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0366 | Date/Time 35; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0367 | Date/Time 35; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0368 | Date/Time 34; Action Sequence | 4 | 0 | ____ | _____ |
| 0369 | Date/Time 34; Month | 4 | 0 | ____ | _____ |
| 0370 | Date/Time 34; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0371 | Date/Time 34; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0372 | Date/Time 34; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0373 | Date/Time 34; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0374 | Date/Time 34; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0375 | Date/Time 34; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0376 | Date/Time 33; Action Sequence | 4 | 0 | ____ | _____ |
| 0377 | Date/Time 33; Month | 4 | 0 | ____ | _____ |
| 0378 | Date/Time 33; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0379 | Date/Time 33; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0380 | Date/Time 33; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0381 | Date/Time 33; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0382 | Date/Time 33; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0383 | Date/Time 33; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0384 | Date/Time 32; Action Sequence | 4 | 0 | ____ | _____ |
| 0385 | Date/Time 32; Month | 4 | 0 | ____ | _____ |
| 0386 | Date/Time 32; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0387 | Date/Time 32; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0388 | Date/Time 32; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0389 | Date/Time 32; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0390 | Date/Time 32; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0391 | Date/Time 32; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0392 | Date/Time 31; Action Sequence | 4 | 0 | ____ | _____ |
| 0393 | Date/Time 31; Month | 4 | 0 | ____ | _____ |
| 0394 | Date/Time 31; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0395 | Date/Time 31; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0396 | Date/Time 31; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0397 | Date/Time 31; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0398 | Date/Time 31; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0399 | Date/Time 31; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0400 | Date/Time 30; Action Sequence | 4 | 0 | ____ | _____ |
| 0401 | Date/Time 30; Month | 4 | 0 | ____ | _____ |
| 0402 | Date/Time 30; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0403 | Date/Time 30; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0404 | Date/Time 30; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0405 | Date/Time 30; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0406 | Date/Time 30; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0407 | Date/Time 30; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0408 | Date/Time 29; Action Sequence | 4 | 0 | ____ | _____ |
| 0409 | Date/Time 29; Month | 4 | 0 | ____ | _____ |
| 0410 | Date/Time 29; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0411 | Date/Time 29; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0412 | Date/Time 29; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0413 | Date/Time 29; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0414 | Date/Time 29; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0415 | Date/Time 29; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0416 | Date/Time 28; Action Sequence | 4 | 0 | ____ | _____ |
| 0417 | Date/Time 28; Month | 4 | 0 | ____ | _____ |
| 0418 | Date/Time 28; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0419 | Date/Time 28; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0420 | Date/Time 28; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0421 | Date/Time 28; Hour, Value 2 | 4 | 0 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0422 | Date/Time 28; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0423 | Date/Time 28; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0424 | Date/Time 27; Action Sequence | 4 | 0 | ____ | _____ |
| 0425 | Date/Time 27; Month | 4 | 0 | ____ | _____ |
| 0426 | Date/Time 27; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0427 | Date/Time 27; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0428 | Date/Time 27; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0429 | Date/Time 27; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0430 | Date/Time 27; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0431 | Date/Time 27; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0432 | Date/Time 26; Action Sequence | 4 | 0 | ____ | _____ |
| 0433 | Date/Time 26; Month | 4 | 0 | ____ | _____ |
| 0434 | Date/Time 26; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0435 | Date/Time 26; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0436 | Date/Time 26; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0437 | Date/Time 26; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0438 | Date/Time 26; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0439 | Date/Time 26; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0440 | Date/Time 25; Action Sequence | 4 | 0 | ____ | _____ |
| 0441 | Date/Time 25; Month | 4 | 0 | ____ | _____ |
| 0442 | Date/Time 25; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0443 | Date/Time 25; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0444 | Date/Time 25; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0445 | Date/Time 25; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0446 | Date/Time 25; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0447 | Date/Time 25; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0448 | Date/Time 24; Action Sequence | 4 | 0 | ____ | _____ |
| 0449 | Date/Time 24; Month | 4 | 0 | ____ | _____ |
| 0450 | Date/Time 24; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0451 | Date/Time 24; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0452 | Date/Time 24; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0453 | Date/Time 24; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0454 | Date/Time 24; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0455 | Date/Time 24; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0456 | Date/Time 23; Action Sequence | 4 | 0 | ____ | _____ |
| 0457 | Date/Time 23; Month | 4 | 0 | ____ | _____ |
| 0458 | Date/Time 23; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0459 | Date/Time 23; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0460 | Date/Time 23; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0461 | Date/Time 23; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0462 | Date/Time 23; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0463 | Date/Time 23; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0464 | Date/Time 22; Action Sequence | 4 | 0 | ____ | _____ |
| 0465 | Date/Time 22; Month | 4 | 0 | ____ | _____ |
| 0466 | Date/Time 22; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0467 | Date/Time 22; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0468 | Date/Time 22; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0469 | Date/Time 22; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0470 | Date/Time 22; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0471 | Date/Time 22; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0472 | Date/Time 21; Action Sequence | 4 | 0 | ____ | _____ |
| 0473 | Date/Time 21; Month | 4 | 0 | ____ | _____ |
| 0474 | Date/Time 21; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0475 | Date/Time 21; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0476 | Date/Time 21; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0477 | Date/Time 21; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0478 | Date/Time 21; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0479 | Date/Time 21; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0480 | Date/Time 20; Action Sequence | 4 | 0 | ____ | _____ |
| 0481 | Date/Time 20; Month | 4 | 0 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0482 | Date/Time 20; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0483 | Date/Time 20; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0484 | Date/Time 20; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0485 | Date/Time 20; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0486 | Date/Time 20; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0487 | Date/Time 20; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0488 | Date/Time 19; Action Sequence | 4 | 0 | ____ | _____ |
| 0489 | Date/Time 19; Month | 4 | 0 | ____ | _____ |
| 0490 | Date/Time 19; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0491 | Date/Time 19; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0492 | Date/Time 19; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0493 | Date/Time 19; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0494 | Date/Time 19; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0495 | Date/Time 19; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0496 | Date/Time 18; Action Sequence | 4 | 0 | ____ | _____ |
| 0497 | Date/Time 18; Month | 4 | 0 | ____ | _____ |
| 0498 | Date/Time 18; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0499 | Date/Time 18; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0500 | Date/Time 18; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0501 | Date/Time 18; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0502 | Date/Time 18; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0503 | Date/Time 18; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0504 | Date/Time 17; Action Sequence | 4 | 0 | ____ | _____ |
| 0505 | Date/Time 17; Month | 4 | 0 | ____ | _____ |
| 0506 | Date/Time 17; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0507 | Date/Time 17; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0508 | Date/Time 17; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0509 | Date/Time 17; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0510 | Date/Time 17; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0511 | Date/Time 17; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0512 | Date/Time 16; Action Sequence | 4 | 0 | ____ | _____ |
| 0513 | Date/Time 16; Month | 4 | 0 | ____ | _____ |
| 0514 | Date/Time 16; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0515 | Date/Time 16; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0516 | Date/Time 16; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0517 | Date/Time 16; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0518 | Date/Time 16; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0519 | Date/Time 16; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0520 | Date/Time 15; Action Sequence | 4 | 0 | ____ | _____ |
| 0521 | Date/Time 15; Month | 4 | 0 | ____ | _____ |
| 0522 | Date/Time 15; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0523 | Date/Time 15; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0524 | Date/Time 15; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0525 | Date/Time 15; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0526 | Date/Time 15; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0527 | Date/Time 15; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0528 | Date/Time 14; Action Sequence | 4 | 0 | ____ | _____ |
| 0529 | Date/Time 14; Month | 4 | 0 | ____ | _____ |
| 0530 | Date/Time 14; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0531 | Date/Time 14; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0532 | Date/Time 14; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0533 | Date/Time 14; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0534 | Date/Time 14; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0535 | Date/Time 14; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0536 | Date/Time 13; Action Sequence | 4 | 0 | ____ | _____ |
| 0537 | Date/Time 13; Month | 4 | 0 | ____ | _____ |
| 0538 | Date/Time 13; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0539 | Date/Time 13; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0540 | Date/Time 13; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0541 | Date/Time 13; Hour, Value 2 | S.W.B. | 0 | ____ | _____ |
| 0542 | Date/Time 13; Minute, Value 1 | 4 | 0 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0543 | Date/Time 13; Minute, Value 2 | 4 | 0 | _____ | _____ |
| 0544 | Date/Time 12; Action Sequence | 4 | 0 | _____ | _____ |
| 0545 | Date/Time 12; Month | 4 | 0 | _____ | _____ |
| 0546 | Date/Time 12; Day, Value 1 | 4 | 0 | _____ | _____ |
| 0547 | Date/Time 12; Day, Value 2 | 4 | 0 | _____ | _____ |
| 0548 | Date/Time 12; Hour, Value 1 | 4 | 0 | _____ | _____ |
| 0549 | Date/Time 12; Hour, Value 2 | 4 | 0 | _____ | _____ |
| 0550 | Date/Time 12; Minute, Value 1 | 4 | 0 | _____ | _____ |
| 0551 | Date/Time 12; Minute, Value 2 | 4 | 0 | _____ | _____ |
| 0552 | Date/Time 11; Action Sequence | 4 | 0 | _____ | _____ |
| 0553 | Date/Time 11; Month | 4 | 0 | _____ | _____ |
| 0554 | Date/Time 11; Day, Value 1 | 4 | 0 | _____ | _____ |
| 0555 | Date/Time 11; Day, Value 2 | 4 | 0 | _____ | _____ |
| 0556 | Date/Time 11; Hour, Value 1 | 4 | 0 | _____ | _____ |
| 0557 | Date/Time 11; Hour, Value 2 | 4 | 0 | _____ | _____ |
| 0558 | Date/Time 11; Minute, Value 1 | 4 | 0 | _____ | _____ |
| 0559 | Date/Time 11; Minute, Value 2 | 4 | 0 | _____ | _____ |
| 0560 | Date/Time 10; Action Sequence | 4 | 0 | _____ | _____ |
| 0561 | Date/Time 10; Month | 4 | 0 | _____ | _____ |
| 0562 | Date/Time 10; Day, Value 1 | 4 | 0 | _____ | _____ |
| 0563 | Date/Time 10; Day, Value 2 | 4 | 0 | _____ | _____ |
| 0564 | Date/Time 10; Hour, Value 1 | 4 | 0 | _____ | _____ |
| 0565 | Date/Time 10; Hour, Value 2 | 4 | 0 | _____ | _____ |
| 0566 | Date/Time 10; Minute, Value 1 | 4 | 0 | _____ | _____ |
| 0567 | Date/Time 10; Minute, Value 2 | 4 | 0 | _____ | _____ |
| 0568 | Date/Time 9; Action Sequence | 4 | 0 | _____ | _____ |
| 0569 | Date/Time 9; Month | 4 | 0 | _____ | _____ |
| 0570 | Date/Time 9; Day, Value 1 | 4 | 0 | _____ | _____ |
| 0571 | Date/Time 9; Day, Value 2 | 4 | 0 | _____ | _____ |
| 0572 | Date/Time 9; Hour, Value 1 | 4 | 0 | _____ | _____ |
| 0573 | Date/Time 9; Hour, Value 2 | 4 | 0 | _____ | _____ |
| 0574 | Date/Time 9; Minute, Value 1 | 4 | 0 | _____ | _____ |
| 0575 | Date/Time 9; Minute, Value 2 | 4 | 0 | _____ | _____ |
| 0576 | Date/Time 8; Action Sequence | 4 | 0 | _____ | _____ |
| 0577 | Date/Time 8; Month | 4 | 0 | _____ | _____ |
| 0578 | Date/Time 8; Day, Value 1 | 4 | 0 | _____ | _____ |
| 0579 | Date/Time 8; Day, Value 2 | 4 | 0 | _____ | _____ |
| 0580 | Date/Time 8; Hour, Value 1 | 4 | 0 | _____ | _____ |
| 0581 | Date/Time 8; Hour, Value 2 | 4 | 0 | _____ | _____ |
| 0582 | Date/Time 8; Minute, Value 1 | 4 | 0 | _____ | _____ |
| 0583 | Date/Time 8; Minute, Value 2 | 4 | 0 | _____ | _____ |
| 0584 | Date/Time 7; Action Sequence | 4 | 0 | _____ | _____ |
| 0585 | Date/Time 7; Month | 4 | 0 | _____ | _____ |
| 0586 | Date/Time 7; Day, Value 1 | 4 | 0 | _____ | _____ |
| 0587 | Date/Time 7; Day, Value 2 | 4 | 0 | _____ | _____ |
| 0588 | Date/Time 7; Hour, Value 1 | 4 | 0 | _____ | _____ |
| 0589 | Date/Time 7; Hour, Value 2 | 4 | 0 | _____ | _____ |
| 0590 | Date/Time 7; Minute, Value 1 | 4 | 0 | _____ | _____ |
| 0591 | Date/Time 7; Minute, Value 2 | 4 | 0 | _____ | _____ |
| 0592 | Date/Time 6; Action Sequence | 4 | 0 | _____ | _____ |
| 0593 | Date/Time 6; Month | 4 | 0 | _____ | _____ |
| 0594 | Date/Time 6; Day, Value 1 | 4 | 0 | _____ | _____ |
| 0595 | Date/Time 6; Day, Value 2 | 4 | 0 | _____ | _____ |
| 0596 | Date/Time 6; Hour, Value 1 | 4 | 0 | _____ | _____ |
| 0597 | Date/Time 6; Hour, Value 2 | 4 | 0 | _____ | _____ |
| 0598 | Date/Time 6; Minute, Value 1 | 4 | 0 | _____ | _____ |
| 0599 | Date/Time 6; Minute, Value 2 | 4 | 0 | _____ | _____ |
| 0600 | Date/Time 5; Action Sequence | 4 | 0 | _____ | _____ |
| 0601 | Date/Time 5; Month | 4 | 0 | _____ | _____ |
| 0602 | Date/Time 5; Day, Value 1 | 4 | 0 | _____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---|---|---|---|---|---|
| 0603 | Date/Time 5; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0604 | Date/Time 5; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0605 | Date/Time 5; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0606 | Date/Time 5; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0607 | Date/Time 5; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0608 | Date/Time 4; Action Sequence | 4 | 0 | ____ | _____ |
| 0609 | Date/Time 4; Month | 4 | 0 | ____ | _____ |
| 0610 | Date/Time 4; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0611 | Date/Time 4; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0612 | Date/Time 4; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0613 | Date/Time 4; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0614 | Date/Time 4; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0615 | Date/Time 4; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0616 | Date/Time 3; Action Sequence | 4 | 0 | ____ | _____ |
| 0617 | Date/Time 3; Month | 4 | 0 | ____ | _____ |
| 0618 | Date/Time 3; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0619 | Date/Time 3; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0620 | Date/Time 3; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0621 | Date/Time 3; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0622 | Date/Time 3; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0623 | Date/Time 3; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0624 | Date/Time 2; Action Sequence | 4 | 0 | ____ | _____ |
| 0625 | Date/Time 2; Month | 4 | 0 | ____ | _____ |
| 0626 | Date/Time 2; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0627 | Date/Time 2; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0628 | Date/Time 2; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0629 | Date/Time 2; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0630 | Date/Time 2; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0631 | Date/Time 2; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0632 | Date/Time 1; Action Sequence | 4 | 0 | ____ | _____ |
| 0633 | Date/Time 1; Month | 4 | 0 | ____ | _____ |
| 0634 | Date/Time 1; Day, Value 1 | 4 | 0 | ____ | _____ |
| 0635 | Date/Time 1; Day, Value 2 | 4 | 0 | ____ | _____ |
| 0636 | Date/Time 1; Hour, Value 1 | 4 | 0 | ____ | _____ |
| 0637 | Date/Time 1; Hour, Value 2 | 4 | 0 | ____ | _____ |
| 0638 | Date/Time 1; Minute, Value 1 | 4 | 0 | ____ | _____ |
| 0639 | Date/Time 1; Minute, Value 2 | 4 | 0 | ____ | _____ |
| 0640 | Telephone Number A; Value 1 | 5 | 10 | ____ | _____ |
| 0641 | Telephone Number A; Value 2 | 5 | 10 | ____ | _____ |
| 0642 | Telephone Number A; Value 3 | 5 | 10 | ____ | _____ |
| 0643 | Telephone Number A; Value 4 | 5 | 10 | ____ | _____ |
| 0644 | Telephone Number A; Value 5 | 5 | 10 | ____ | _____ |
| 0645 | Telephone Number A; Value 6 | 5 | 10 | ____ | _____ |
| 0646 | Telephone Number A; Value 7 | 5 | 10 | ____ | _____ |
| 0647 | Telephone Number A; Value 8 | 5 | 10 | ____ | _____ |
| 0648 | Telephone Number A; Value 9 | 5 | 10 | ____ | _____ |
| 0649 | Telephone Number A; Value 10 | 5 | 10 | ____ | _____ |
| 0650 | Telephone Number A; Value 11 | 5 | 10 | ____ | _____ |
| 0651 | Telephone Number A; Value 12 | 5 | 10 | ____ | _____ |
| 0652 | Telephone Number A; Voice/Data (0/1) | 5 | 0 | ____ | _____ |
| 0653 | Telephone Number A; Number Of Attempts | 5 | 3 | ____ | _____ |
| 0654 | Telephone Number B; Value 1 | 5 | 10 | ____ | _____ |
| 0655 | Telephone Number B; Value 2 | 5 | 10 | ____ | _____ |
| 0656 | Telephone Number B; Value 3 | 5 | 10 | ____ | _____ |
| 0657 | Telephone Number B; Value 4 | 5 | 10 | ____ | _____ |
| 0658 | Telephone Number B; Value 5 | 5 | 10 | ____ | _____ |
| 0659 | Telephone Number B; Value 6 | 5 | 10 | ____ | _____ |
| 0660 | Telephone Number B; Value 7 | 5 | 10 | ____ | _____ |
| 0661 | Telephone Number B; Value 8 | 5 | 10 | ____ | _____ |
| 0662 | Telephone Number B; Value 9 | 5 | 10 | ____ | _____ |
| 0663 | Telephone Number B; Value 10 | 5 | 10 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0664 | Telephone Number B; Value 11 | 5 | 10 | ____ | _____ |
| 0665 | Telephone Number B; Value 12 | 5 | 10 | ____ | _____ |
| 0666 | Telephone Number B; Voice/Data (0/1) | 5 | 0 | ____ | _____ |
| 0667 | Telephone Number B; Number Of Attempts | 5 | 3 | ____ | _____ |
| 0668 | Telephone Number C; Value 1 | 5 | 10 | ____ | _____ |
| 0669 | Telephone Number C; Value 2 | 5 | 10 | ____ | _____ |
| 0670 | Telephone Number C; Value 3 | 5 | 10 | ____ | _____ |
| 0671 | Telephone Number C; Value 4 | 5 | 10 | ____ | _____ |
| 0672 | Telephone Number C; Value 5 | 5 | 10 | ____ | _____ |
| 0673 | Telephone Number C; Value 6 | 5 | 10 | ____ | _____ |
| 0674 | Telephone Number C; Value 7 | 5 | 10 | ____ | _____ |
| 0675 | Telephone Number C; Value 8 | 5 | 10 | ____ | _____ |
| 0676 | Telephone Number C; Value 9 | 5 | 10 | ____ | _____ |
| 0677 | Telephone Number C; Value 10 | 5 | 10 | ____ | _____ |
| 0678 | Telephone Number C; Value 11 | 5 | 10 | ____ | _____ |
| 0679 | Telephone Number C; Value 12 | 5 | 10 | ____ | _____ |
| 0680 | Telephone Number C; Voice/Data (0/1) | 5 | 0 | ____ | _____ |
| 0681 | Telephone Number C; Number Of Attempts | 5 | 3 | ____ | _____ |
| 0682 | Telephone Number D; Value 1 | 5 | 10 | ____ | _____ |
| 0683 | Telephone Number D; Value 2 | 5 | 10 | ____ | _____ |
| 0684 | Telephone Number D; Value 3 | 5 | 10 | ____ | _____ |
| 0685 | Telephone Number D; Value 4 | 5 | 10 | ____ | _____ |
| 0686 | Telephone Number D; Value 5 | 5 | 10 | ____ | _____ |
| 0687 | Telephone Number D; Value 6 | 5 | 10 | ____ | _____ |
| 0688 | Telephone Number D; Value 7 | 5 | 10 | ____ | _____ |
| 0689 | Telephone Number D; Value 8 | 5 | 10 | ____ | _____ |
| 0690 | Telephone Number D; Value 9 | 5 | 10 | ____ | _____ |
| 0691 | Telephone Number D; Value 10 | 5 | 10 | ____ | _____ |
| 0692 | Telephone Number D; Value 11 | 5 | 10 | ____ | _____ |
| 0693 | Telephone Number D; Value 12 | 5 | 10 | ____ | _____ |
| 0694 | Telephone Number D; Voice/Data (0/1) | 5 | 0 | ____ | _____ |
| 0695 | Telephone Number D; Number Of Attempts | 5 | 3 | ____ | _____ |
| 0696 | Telephone Number E; Value 1 | 5 | 10 | ____ | _____ |
| 0697 | Telephone Number E; Value 2 | 5 | 10 | ____ | _____ |
| 0698 | Telephone Number E; Value 3 | 5 | 10 | ____ | _____ |
| 0699 | Telephone Number E; Value 4 | 5 | 10 | ____ | _____ |
| 0700 | Telephone Number E; Value 5 | 5 | 10 | ____ | _____ |
| 0701 | Telephone Number E; Value 6 | 5 | 10 | ____ | _____ |
| 0702 | Telephone Number E; Value 7 | 5 | 10 | ____ | _____ |
| 0703 | Telephone Number E; Value 8 | 5 | 10 | ____ | _____ |
| 0704 | Telephone Number E; Value 9 | 5 | 10 | ____ | _____ |
| 0705 | Telephone Number E; Value 10 | 5 | 10 | ____ | _____ |
| 0706 | Telephone Number E; Value 11 | 5 | 10 | ____ | _____ |
| 0707 | Telephone Number E; Value 12 | 5 | 10 | ____ | _____ |
| 0708 | Telephone Number E; Voice/Data (0/1) | 5 | 0 | ____ | _____ |
| 0709 | Telephone Number E; Number Of Attempts | 5 | 3 | ____ | _____ |
| 0710 | Telephone Number F; Value 1 | 5 | 10 | ____ | _____ |
| 0711 | Telephone Number F; Value 2 | 5 | 10 | ____ | _____ |
| 0712 | Telephone Number F; Value 3 | 5 | 10 | ____ | _____ |
| 0713 | Telephone Number F; Value 4 | 5 | 10 | ____ | _____ |
| 0714 | Telephone Number F; Value 5 | 5 | 10 | ____ | _____ |
| 0715 | Telephone Number F; Value 6 | 5 | 10 | ____ | _____ |
| 0716 | Telephone Number F; Value 7 | 5 | 10 | ____ | _____ |
| 0717 | Telephone Number F; Value 8 | 5 | 10 | ____ | _____ |
| 0718 | Telephone Number F; Value 9 | 5 | 10 | ____ | _____ |
| 0719 | Telephone Number F; Value 10 | 5 | 10 | ____ | _____ |
| 0720 | Telephone Number F; Value 11 | 5 | 10 | ____ | _____ |
| 0721 | Telephone Number F; Value 12 | 5 | 10 | ____ | _____ |
| 0722 | Telephone Number F; Voice/Data (0/1) | 5 | 0 | ____ | _____ |
| 0723 | Telephone Number F; Number Of Attempts | 5 | 3 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0724 | Action Sequence 1; Step 1; Value 1 | 6 | 9 | ____ | _____ |
| 0725 | Action Sequence 1, Step 1; Value 2 | 6 | 0 | ____ | _____ |
| 0726 | Action Sequence 1; Step 2; Value 1 | 6 | 15 | ____ | _____ |
| 0727 | Action Sequence 1; Step 2; Value 2 | 6 | 15 | ____ | _____ |
| 0728 | Action Sequence 1; Step 3; Value 1 | 6 | 15 | ____ | _____ |
| 0729 | Action Sequence 1; Step 3; Value 2 | 6 | 15 | ____ | _____ |
| 0730 | Action Sequence 1; Step 4; Value 1 | 6 | 15 | ____ | _____ |
| 0731 | Action Sequence 1; Step 4; Value 2 | 6 | 15 | ____ | _____ |
| 0732 | Action Sequence 1; Step 5; Value 1 | 6 | 15 | ____ | _____ |
| 0733 | Action Sequence 1; Step 5; Value 2 | 6 | 15 | ____ | _____ |
| 0734 | Action Sequence 1; Step 6; Value 1 | 6 | 15 | ____ | _____ |
| 0735 | Action Sequence 1; Step 6; Value 2 | 6 | 15 | ____ | _____ |
| 0736 | Action Sequence 1; Step 7; Value 1 | 6 | 15 | ____ | _____ |
| 0737 | Action Sequence 1; Step 7; Value 2 | 6 | 15 | ____ | _____ |
| 0738 | Action Sequence 1; Step 8; Value 1 | 6 | 15 | ____ | _____ |
| 0739 | Action Sequence 1, Step 8; Value 2 | 6 | 15 | ____ | _____ |
| 0740 | Action Sequence 2; Step 1; Value 1 | 6 | 15 | ____ | _____ |
| 0741 | Action Sequence 2; Step 1; Value 2 | 6 | 15 | ____ | _____ |
| 0742 | Action Sequence 2; Step 2; Value 1 | 6 | 15 | ____ | _____ |
| 0743 | Action Sequence 2, Step 2; Value 2 | 6 | 15 | ____ | _____ |
| 0744 | Action Sequence 2; Step 3; Value 1 | 6 | 15 | ____ | _____ |
| 0745 | Action Sequence 2; Step 3; Value 2 | 6 | 15 | ____ | _____ |
| 0746 | Action Sequence 2; Step 4; Value 1 | 6 | 15 | ____ | _____ |
| 0747 | Action Sequence 2; Step 4; Value 2 | 6 | 15 | ____ | _____ |
| 0748 | Action Sequence 2; Step 5; Value 1 | 6 | 15 | ____ | _____ |
| 0749 | Action Sequence 2; Step 5; Value 2 | 6 | 15 | ____ | _____ |
| 0750 | Action Sequence 2; Step 6; Value 1 | 6 | 15 | ____ | _____ |
| 0751 | Action Sequence 2, Step 6; Value 2 | 6 | 15 | ____ | _____ |
| 0752 | Action Sequence 2, Step 7; Value 1 | 6 | 15 | ____ | _____ |
| 0753 | Action Sequence 2, Step 7; Value 2 | 6 | 15 | ____ | _____ |
| 0754 | Action Sequence 2, Step 8; Value 1 | 6 | 15 | ____ | _____ |
| 0755 | Action Sequence 2, Step 8; Value 2 | 6 | 15 | ____ | _____ |
| 0756 | Action Sequence 3; Step 1; Value 1 | 6 | 15 | ____ | _____ |
| 0757 | Action Sequence 3; Step 1; Value 2 | 6 | 15 | ____ | _____ |
| 0758 | Action Sequence 3; Step 2; Value 1 | 6 | 15 | ____ | _____ |
| 0759 | Action Sequence 3; Step 2; Value 2 | 6 | 15 | ____ | _____ |
| 0760 | Action Sequence 3; Step 3; Value 1 | 6 | 15 | ____ | _____ |
| 0761 | Action Sequence 3; Step 3; Value 2 | 6 | 15 | ____ | _____ |
| 0762 | Action Sequence 3; Step 4; Value 1 | 6 | 15 | ____ | _____ |
| 0763 | Action Sequence 3; Step 4; Value 2 | 6 | 15 | ____ | _____ |
| 0764 | Action Sequence 3; Step 5; Value 1 | 6 | 15 | ____ | _____ |
| 0765 | Action Sequence 3; Step 5; Value 2 | 6 | 15 | ____ | _____ |
| 0766 | Action Sequence 3; Step 6; Value 1 | 6 | 15 | ____ | _____ |
| 0767 | Action Sequence 3; Step 6; Value 2 | 6 | 15 | ____ | _____ |
| 0768 | Action Sequence 3; Step 7; Value 1 | 6 | 15 | ____ | _____ |
| 0769 | Action Sequence 3; Step 7; Value 2 | 6 | 15 | ____ | _____ |
| 0770 | Action Sequence 3; Step 8; Value 1 | 6 | 15 | ____ | _____ |
| 0771 | Action Sequence 3, Step 8; Value 2 | 6 | 15 | ____ | _____ |
| 0772 | Action Sequence 4; Step 1; Value 1 | 6 | 15 | ____ | _____ |
| 0773 | Action Sequence 4; Step 1; Value 2 | 6 | 15 | ____ | _____ |
| 0774 | Action Sequence 4; Step 2; Value 1 | 6 | 15 | ____ | _____ |
| 0775 | Action Sequence 4; Step 2; Value 2 | 6 | 15 | ____ | _____ |
| 0776 | Action Sequence 4; Step 3; Value 1 | 6 | 15 | ____ | _____ |
| 0777 | Action Sequence 4; Step 3; Value 2 | 6 | 15 | ____ | _____ |
| 0778 | Action Sequence 4; Step 4; Value 1 | 6 | 15 | ____ | _____ |
| 0779 | Action Sequence 4; Step 4; Value 2 | 6 | 15 | ____ | _____ |
| 0780 | Action Sequence 4; Step 5; Value 1 | 6 | 15 | ____ | _____ |
| 0781 | Action Sequence 4; Step 5; Value 2 | 6 | 15 | ____ | _____ |
| 0782 | Action Sequence 4; Step 6; Value 1 | 6 | 15 | ____ | _____ |
| 0783 | Action Sequence 4, Step 6; Value 2 | 6 | 15 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0784 | Action Sequence 4; Step 7; Value 1 | 6 | 15 | ____ | _____ |
| 0785 | Action Sequence 4, Step 7; Value 2 | 6 | 15 | ____ | _____ |
| 0786 | Action Sequence 4; Step 8; Value 1 | 6 | 15 | ____ | _____ |
| 0787 | Action Sequence 4, Step 8; Value 2 | 6 | 15 | ____ | _____ |
| 0788 | Action Sequence 5; Step 1; Value 1 | 6 | 15 | ____ | _____ |
| 0789 | Action Sequence 5; Step 1; Value 2 | 6 | 15 | ____ | _____ |
| 0790 | Action Sequence 5; Step 2; Value 1 | 6 | 15 | ____ | _____ |
| 0791 | Action Sequence 5; Step 2; Value 2 | 6 | 15 | ____ | _____ |
| 0792 | Action Sequence 5; Step 3; Value 1 | 6 | 15 | ____ | _____ |
| 0793 | Action Sequence 5; Step 3; Value 2 | 6 | 15 | ____ | _____ |
| 0794 | Action Sequence 5; Step 4; Value 1 | 6 | 15 | ____ | _____ |
| 0795 | Action Sequence 5, Step 4; Value 2 | 6 | 15 | ____ | _____ |
| 0796 | Action Sequence 5; Step 5; Value 1 | 6 | 15 | ____ | _____ |
| 0797 | Action Sequence 5; Step 5; Value 2 | 6 | 15 | ____ | _____ |
| 0798 | Action Sequence 5; Step 6; Value 1 | 6 | 15 | ____ | _____ |
| 0799 | Action Sequence 5; Step 6; Value 2 | 6 | 15 | ____ | _____ |
| 0800 | Action Sequence 5; Step 7; Value 1 | 6 | 15 | ____ | _____ |
| 0801 | Action Sequence 5; Step 7; Value 2 | 6 | 15 | ____ | _____ |
| 0802 | Action Sequence 5; Step 8; Value 1 | 6 | 15 | ____ | _____ |
| 0803 | Action Sequence 5, Step 8; Value 2 | 6 | 15 | ____ | _____ |
| 0804 | Action Sequence 6; Step 1; Value 1 | 6 | 15 | ____ | _____ |
| 0805 | Action Sequence 6, Step 1; Value 2 | 6 | 15 | ____ | _____ |
| 0806 | Action Sequence 6, Step 2; Value 1 | 6 | 15 | ____ | _____ |
| 0807 | Action Sequence 6, Step 2; Value 2 | 6 | 15 | ____ | _____ |
| 0808 | Action Sequence 6, Step 3; Value 1 | 6 | 15 | ____ | _____ |
| 0809 | Action Sequence 6, Step 3; Value 2 | 6 | 15 | ____ | _____ |
| 0810 | Action Sequence 6; Step 4; Value 1 | 6 | 15 | ____ | _____ |
| 0811 | Action Sequence 6; Step 4; Value 2 | 6 | 15 | ____ | _____ |
| 0812 | Action Sequence 6; Step 5; Value 1 | 6 | 15 | ____ | _____ |
| 0813 | Action Sequence 6; Step 5; Value 2 | 6 | 15 | ____ | _____ |
| 0814 | Action Sequence 6; Step 6; Value 1 | 6 | 15 | ____ | _____ |
| 0815 | Action Sequence 6; Step 6; Value 2 | 6 | 15 | ____ | _____ |
| 0816 | Action Sequence 6; Step 7; Value 1 | 6 | 15 | ____ | _____ |
| 0817 | Action Sequence 6, Step 7; Value 2 | 6 | 15 | ____ | _____ |
| 0818 | Action Sequence 6; Step 8; Value 1 | 6 | 15 | ____ | _____ |
| 0819 | Action Sequence 6, Step 8; Value 2 | 6 | 15 | ____ | _____ |
| 0820 | Action Sequence 7; Step 1; Value 1 | 6 | 15 | ____ | _____ |
| 0821 | Action Sequence 7, Step 1; Value 2 | 6 | 15 | ____ | _____ |
| 0822 | Action Sequence 7, Step 2; Value 1 | 6 | 15 | ____ | _____ |
| 0823 | Action Sequence 7, Step 2; Value 2 | 6 | 15 | ____ | _____ |
| 0824 | Action Sequence 7, Step 3; Value 1 | 6 | 15 | ____ | _____ |
| 0825 | Action Sequence 7, Step 3; Value 2 | 6 | 15 | ____ | _____ |
| 0826 | Action Sequence 7, Step 4; Value 1 | 6 | 15 | ____ | _____ |
| 0827 | Action Sequence 7, Step 4; Value 2 | 6 | 15 | ____ | _____ |
| 0828 | Action Sequence 7, Step 5; Value 1 | 6 | 15 | ____ | _____ |
| 0829 | Action Sequence 7, Step 5; Value 2 | 6 | 15 | ____ | _____ |
| 0830 | Action Sequence 7, Step 6; Value 1 | 6 | 15 | ____ | _____ |
| 0831 | Action Sequence 7, Step 6; Value 2 | 6 | 15 | ____ | _____ |
| 0832 | Action Sequence 7, Step 7; Value 1 | 6 | 15 | ____ | _____ |
| 0833 | Action Sequence 7, Step 7; Value 2 | 6 | 15 | ____ | _____ |
| 0834 | Action Sequence 7, Step 8; Value 1 | 6 | 15 | ____ | _____ |
| 0835 | Action Sequence 7, Step 8; Value 2 | 6 | 15 | ____ | _____ |
| 0836 | Action Sequence 8; Step 1; Value 1 | 6 | 15 | ____ | _____ |
| 0837 | Action Sequence 8, Step 1; Value 2 | 6 | 15 | ____ | _____ |
| 0838 | Action Sequence 8; Step 2; Value 1 | 6 | 15 | ____ | _____ |
| 0839 | Action Sequence 8, Step 2; Value 2 | 6 | 15 | ____ | _____ |
| 0840 | Action Sequence 8; Step 3; Value 1 | 6 | 15 | ____ | _____ |
| 0841 | Action Sequence 8, Step 3; Value 2 | 6 | 15 | ____ | _____ |
| 0842 | Action Sequence 8; Step 4; Value 1 | 6 | 15 | ____ | _____ |
| 0843 | Action Sequence 8; Step 4; Value 2 | 6 | 15 | ____ | _____ |
| 0844 | Action Sequence 8; Step 5; Value 1 | 6 | 15 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---|---|---|---|---|---|
| 0845 | Action Sequence 8, Step 5; Value 2 | 6 | 15 | ____ | _____ |
| 0846 | Action Sequence 8; Step 6; Value 1 | 6 | 15 | ____ | _____ |
| 0847 | Action Sequence 8; Step 6; Value 2 | 6 | 15 | ____ | _____ |
| 0848 | Action Sequence 8; Step 7; Value 1 | 6 | 15 | ____ | _____ |
| 0849 | Action Sequence 8; Step 7; Value 2 | 6 | 15 | ____ | _____ |
| 0850 | Action Sequence 8; Step 8; Value 1 | 6 | 15 | ____ | _____ |
| 0851 | Action Sequence 8, Step 8; Value 2 | 6 | 15 | ____ | _____ |
| 0852 | Alarm Channel A; Channel Number; Value 1 | 7 | 6 | ____ | _____ |
| 0853 | Alarm Channel A; Channel Number; Value 2 | 7 | 4 | ____ | _____ |
| 0854 | Alarm Channel A; Trigger Rule | 7 | 5 | ____ | _____ |
| 0855 | Alarm Channel A; Action Sequence | 7 | 1 | ____ | _____ |
| 0856 | Alarm Channel A; Upper Limit; Value 1 | 7 | 2 | ____ | _____ |
| 0857 | Alarm Channel A; Upper Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0858 | Alarm Channel A; Upper Limit; Value 3 | 7 | 4 | ____ | _____ |
| 0859 | Alarm Channel A; Upper Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0860 | Alarm Channel A; Lower Limit; Value 1 | 7 | 1 | ____ | _____ |
| 0861 | Alarm Channel A; Lower Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0862 | Alarm Channel A; Lower Limit; Value 3 | 7 | 2 | ____ | _____ |
| 0863 | Alarm Channel A; Lower Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0864 | Alarm Channel B; Channel Number; Value 1 | 7 | 6 | ____ | _____ |
| 0865 | Alarm Channel B; Channel Number; Value 2 | 7 | 4 | ____ | _____ |
| 0866 | Alarm Channel B; Trigger Rule | 7 | 5 | ____ | _____ |
| 0867 | Alarm Channel B; Action Sequence | 7 | 1 | ____ | _____ |
| 0868 | Alarm Channel B; Upper Limit; Value 1 | 7 | 2 | ____ | _____ |
| 0869 | Alarm Channel B; Upper Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0870 | Alarm Channel B; Upper Limit; Value 3 | 7 | 4 | ____ | _____ |
| 0871 | Alarm Channel B; Upper Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0872 | Alarm Channel B; Lower Limit; Value 1 | 7 | 1 | ____ | _____ |
| 0873 | Alarm Channel B; Lower Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0874 | Alarm Channel B; Lower Limit; Value 3 | 7 | 2 | ____ | _____ |
| 0875 | Alarm Channel B; Lower Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0876 | Alarm Channel C; Channel Number; Value 1 | 7 | 6 | ____ | _____ |
| 0877 | Alarm Channel C; Channel Number; Value 2 | 7 | 4 | ____ | _____ |
| 0878 | Alarm Channel C; Trigger Rule | 7 | 5 | ____ | _____ |
| 0879 | Alarm Channel C; Action Sequence | 7 | 1 | ____ | _____ |
| 0880 | Alarm Channel C; Upper Limit; Value 1 | 7 | 2 | ____ | _____ |
| 0881 | Alarm Channel C; Upper Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0882 | Alarm Channel C; Upper Limit; Value 3 | 7 | 4 | ____ | _____ |
| 0883 | Alarm Channel C; Upper Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0884 | Alarm Channel C; Lower Limit; Value 1 | 7 | 1 | ____ | _____ |
| 0885 | Alarm Channel C; Lower Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0886 | Alarm Channel C; Lower Limit; Value 3 | 7 | 2 | ____ | _____ |
| 0887 | Alarm Channel C; Lower Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0888 | Alarm Channel D; Channel Number; Value 1 | 7 | 6 | ____ | _____ |
| 0889 | Alarm Channel D; Channel Number; Value 2 | 7 | 4 | ____ | _____ |
| 0890 | Alarm Channel D; Trigger Rule | 7 | 5 | ____ | _____ |
| 0891 | Alarm Channel D; Action Sequence | 7 | 1 | ____ | _____ |
| 0892 | Alarm Channel D; Upper Limit; Value 1 | 7 | 2 | ____ | _____ |
| 0893 | Alarm Channel D; Upper Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0894 | Alarm Channel D; Upper Limit; Value 3 | 7 | 4 | ____ | _____ |
| 0895 | Alarm Channel D; Upper Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0896 | Alarm Channel D; Lower Limit; Value 1 | 7 | 1 | ____ | _____ |
| 0897 | Alarm Channel D; Lower Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0898 | Alarm Channel D; Lower Limit; Value 3 | 7 | 2 | ____ | _____ |
| 0899 | Alarm Channel D; Lower Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0900 | Alarm Channel E; Channel Number; Value 1 | 7 | 6 | ____ | _____ |
| 0901 | Alarm Channel E; Channel Number; Value 2 | 7 | 4 | ____ | _____ |
| 0902 | Alarm Channel E; Trigger Rule | 7 | 5 | ____ | _____ |
| 0903 | Alarm Channel E; Action Sequence | 7 | 1 | ____ | _____ |
| 0904 | Alarm Channel E; Upper Limit; Value 1 | 7 | 2 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0905 | Alarm Channel E; Upper Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0906 | Alarm Channel E; Upper Limit; Value 3 | 7 | 4 | ____ | _____ |
| 0907 | Alarm Channel E; Upper Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0908 | Alarm Channel E; Lower Limit; Value 1 | 7 | 1 | ____ | _____ |
| 0909 | Alarm Channel E; Lower Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0910 | Alarm Channel E; Lower Limit; Value 3 | 7 | 2 | ____ | _____ |
| 0911 | Alarm Channel E; Lower Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0912 | Alarm Channel F; Channel Number; Value 1 | 7 | 6 | ____ | _____ |
| 0913 | Alarm Channel F; Channel Number; Value 2 | 7 | 4 | ____ | _____ |
| 0914 | Alarm Channel F; Trigger Rule | 7 | 5 | ____ | _____ |
| 0915 | Alarm Channel F; Action Sequence | 7 | 1 | ____ | _____ |
| 0916 | Alarm Channel F; Upper Limit; Value 1 | 7 | 2 | ____ | _____ |
| 0917 | Alarm Channel F; Upper Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0918 | Alarm Channel F; Upper Limit; Value 3 | 7 | 4 | ____ | _____ |
| 0919 | Alarm Channel F; Upper Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0920 | Alarm Channel F; Lower Limit; Value 1 | 7 | 1 | ____ | _____ |
| 0921 | Alarm Channel F; Lower Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0922 | Alarm Channel F; Lower Limit; Value 3 | 7 | 2 | ____ | _____ |
| 0923 | Alarm Channel F; Lower Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0924 | Alarm Channel G; Channel Number; Value 1 | 7 | 6 | ____ | _____ |
| 0925 | Alarm Channel G; Channel Number; Value 2 | 7 | 4 | ____ | _____ |
| 0926 | Alarm Channel G; Trigger Rule | 7 | 5 | ____ | _____ |
| 0927 | Alarm Channel G; Action Sequence | 7 | 1 | ____ | _____ |
| 0928 | Alarm Channel G; Upper Limit; Value 1 | 7 | 2 | ____ | _____ |
| 0929 | Alarm Channel G; Upper Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0930 | Alarm Channel G; Upper Limit; Value 3 | 7 | 4 | ____ | _____ |
| 0931 | Alarm Channel G; Upper Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0932 | Alarm Channel G; Lower Limit; Value 1 | 7 | 1 | ____ | _____ |
| 0933 | Alarm Channel G; Lower Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0934 | Alarm Channel G; Lower Limit; Value 3 | 7 | 2 | ____ | _____ |
| 0935 | Alarm Channel G; Lower Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0936 | Alarm Channel H; Channel Number; Value 1 | 7 | 6 | ____ | _____ |
| 0937 | Alarm Channel H; Channel Number; Value 2 | 7 | 4 | ____ | _____ |
| 0938 | Alarm Channel H; Trigger Rule | 7 | 5 | ____ | _____ |
| 0939 | Alarm Channel H; Action Sequence | 7 | 1 | ____ | _____ |
| 0940 | Alarm Channel H; Upper Limit; Value 1 | 7 | 2 | ____ | _____ |
| 0941 | Alarm Channel H; Upper Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0942 | Alarm Channel H; Upper Limit; Value 3 | 7 | 4 | ____ | _____ |
| 0943 | Alarm Channel H; Upper Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0944 | Alarm Channel H; Lower Limit; Value 1 | 7 | 1 | ____ | _____ |
| 0945 | Alarm Channel H; Lower Limit; Value 2 | 7 | 0 | ____ | _____ |
| 0946 | Alarm Channel H; Lower Limit; Value 3 | 7 | 2 | ____ | _____ |
| 0947 | Alarm Channel H; Lower Limit; Value 4 | 7 | 0 | ____ | _____ |
| 0948 | Main Security Code; Value 1 | 8 | 1 | ____ | _____ |
| 0949 | Main Security Code; Value 2 | 8 | 2 | ____ | _____ |
| 0950 | Main Security Code; Value 3 | 8 | 3 | ____ | _____ |
| 0951 | Main Security Code; Value 4 | 8 | 4 | ____ | _____ |
| 0952 | Main Security Code; Value 5 | 8 | 5 | ____ | _____ |
| 0953 | Main Security Code; Value 6 | 8 | 6 | ____ | _____ |
| 0954 | Main Security Code; Value 7 | 8 | 7 | ____ | _____ |
| 0955 | Main Security Code; Value 8 | 8 | 8 | ____ | _____ |
| 0956 | Control Security Code A; Value 1 | 8 | 6 | ____ | _____ |
| 0957 | Control Security Code A; Value 2 | 8 | 6 | ____ | _____ |
| 0958 | Control Security Code A; Value 3 | 8 | 10 | ____ | _____ |
| 0959 | Control Security Code A; Value 4 | 8 | 10 | ____ | _____ |
| 0960 | Control Security Code B; Value 1 | 8 | 6 | ____ | _____ |
| 0961 | Control Security Code B; Value 2 | 8 | 6 | ____ | _____ |
| 0962 | Control Security Code B; Value 3 | 8 | 10 | ____ | _____ |
| 0963 | Control Security Code B; Value 4 | 8 | 10 | ____ | _____ |
| 0964 | Control Security Code C; Value 1 | 8 | 6 | ____ | _____ |
| 0965 | Control Security Code C; Value 2 | 8 | 6 | ____ | _____ |

## RFC-1/B Advanced Programming Address Table

| Address | Use | S.W.B. Note | Factory Prog | Current Prog | Notes |
|---------|-----|-------------|--------------|--------------|-------|
| 0966 | Control Security Code C; Value 3 | 8 | 10 | ____ | _____ |
| 0967 | Control Security Code C; Value 4 | 8 | 10 | ____ | _____ |
| 0968 | Basic Programming Security Code; Value 1 | 8 | 4 | ____ | _____ |
| 0969 | Basic Programming Security Code; Value 2 | 8 | 0 | ____ | _____ |
| 0970 | Basic Programming Security Code; Value 3 | 8 | 8 | ____ | _____ |
| 0971 | Basic Programming Security Code; Value 4 | 8 | 8 | ____ | _____ |
| 0972 | Advanced Programming Security Code; Value 1 | 8 | 4 | ____ | _____ |
| 0973 | Advanced Programming Security Code; Value 2 | 8 | 1 | ____ | _____ |
| 0974 | Advanced Programming Security Code; Value 3 | 8 | 5 | ____ | _____ |
| 0975 | Advanced Programming Security Code; Value 4 | 8 | 0 | ____ | _____ |
| 0976 | Control Security Code For Channels 00-07 | 9 | 1 | ____ | _____ |
| 0977 | Control Security Code For Channels 08-15 | 9 | 1 | ____ | _____ |
| 0978 | Control Security Code For Channels 16-23 | 9 | 1 | ____ | _____ |
| 0979 | Control Security Code For Channels 24-31 | 9 | 1 | ____ | _____ |
| 0980 | Control Security Code For Channels 32-39 | 9 | 1 | ____ | _____ |
| 0981 | Control Security Code For Channels 40-47 | 9 | 1 | ____ | _____ |
| 0982 | Control Security Code For Channels 48-55 | 9 | 1 | ____ | _____ |
| 0983 | Control Security Code For Channels 56-63 | 9 | 1 | ____ | _____ |
| 0984 | Site Identification Phrase, Word 1; Value 1 | 10 | 7 | ____ | _____ |
| 0985 | Site Identification Phrase, Word 1; Value 2 | 10 | 11 | ____ | _____ |
| 0986 | Site Identification Phrase, Word 2; Value 1 | 10 | 9 | ____ | _____ |
| 0987 | Site Identification Phrase, Word 2; Value 2 | 10 | 8 | ____ | _____ |
| 0988 | Site Identification Phrase, Word 3; Value 1 | 10 | 8 | ____ | _____ |
| 0989 | Site Identification Phrase, Word 3; Value 2 | 10 | 12 | ____ | _____ |
| 0990 | Site Identification Phrase, Word 4; Value 1 | 10 | 8 | ____ | _____ |
| 0991 | Site Identification Phrase, Word 4; Value 2 | 10 | 9 | ____ | _____ |
| 0992 | Site Identification Phrase, Word 5; Value 1 | 10 | 0 | ____ | _____ |
| 0993 | Site Identification Phrase, Word 5; Value 2 | 10 | 1 | ____ | _____ |
| 0994 | Site Identification Phrase, Word 6; Value 1 | 10 | 8 | ____ | _____ |
| 0995 | Site Identification Phrase, Word 6; Value 2 | 10 | 8 | ____ | _____ |
| 0996 | Hardware Version | 11 | 1 | ____ | _____ |
| 0997 | Telemetry Settling Time | 12 | 3 | ____ | _____ |
| 0998 | Telemetry Lead Zero Supression (0/1) | 13 | 0 | ____ | _____ |
| 0999 | Pause Between Words | 14 | 1 | ____ | _____ |
| 1000 | Idle Time Before Hang-Up | 15 | 2 | ____ | _____ |
| 1001 | Ring Number | 16 | 2 | ____ | _____ |
| 1002 | Communications Mode | 17 | 0 | ____ | _____ |
| 1003 | Duration Of Alarm Call | 18 | 6 | ____ | _____ |
| 1004 | Wait Time Between Calls | 19 | 6 | ____ | _____ |
| 1005 | Baud Rate | 20 | 2 | ____ | _____ |
| 1006 | Relay On Time; Serial & Action Seq.; Manual Minimum | 21 | 1 | ____ | _____ |
| 1007 | Time Between Steps In Action Sequence | 22 | 1 | ____ | _____ |
| 1008 | Power-Up Action Sequence (0/1) | 23 | 0 | ____ | _____ |
| 1009 | Enable Telemetry Triggered Action Sequences (0/1) | 24 | 0 | ____ | _____ |
| 1010 | Autoscan Stop Channel, Value 1 | 25 | 0 | ____ | _____ |
| 1011 | Autoscan Stop Channel, Value 2 | 25 | 7 | ____ | _____ |
| 1012 | Reserved | | 0 | ____ | _____ |
| 1013 | Telemetry Scan Interval/Channel H Scan | 27 | 0 | ____ | _____ |
| 1014 | Dedicated Control Port Control/Ring Sensitivity | 28 | 0 | ____ | _____ |
| 1015 | Eerom Map (Channel Lable Exchange For Time Prog) | 29 | 6 | ____ | _____ |
| 1016 | Incorrect Security Code Lockout Time | 30 | 1 | ____ | _____ |
| 1017 | Reserved | | 0 | ____ | _____ |
| 1018 | Clock Adjust; Value 1 | 32 | 9 | ____ | _____ |
| 1019 | Clock Adjust; Value 2 | 32 | 1 | ____ | _____ |
| 1020 | Default Telemetry Units Or Status Format; Value 1 | 33 | 0 | ____ | _____ |
| 1021 | Default Telemetry Units Or Status Format; Value 2 | 33 | 3 | ____ | _____ |
| 1022 | Default Full Scale & Decimal Point | 33 | 2 | ____ | _____ |
| 1023 | Default Linear/Log/Indirect & Auto Relay Activation | 33 | 0 | ____ | _____ |