SRI **Summation Research Inc**
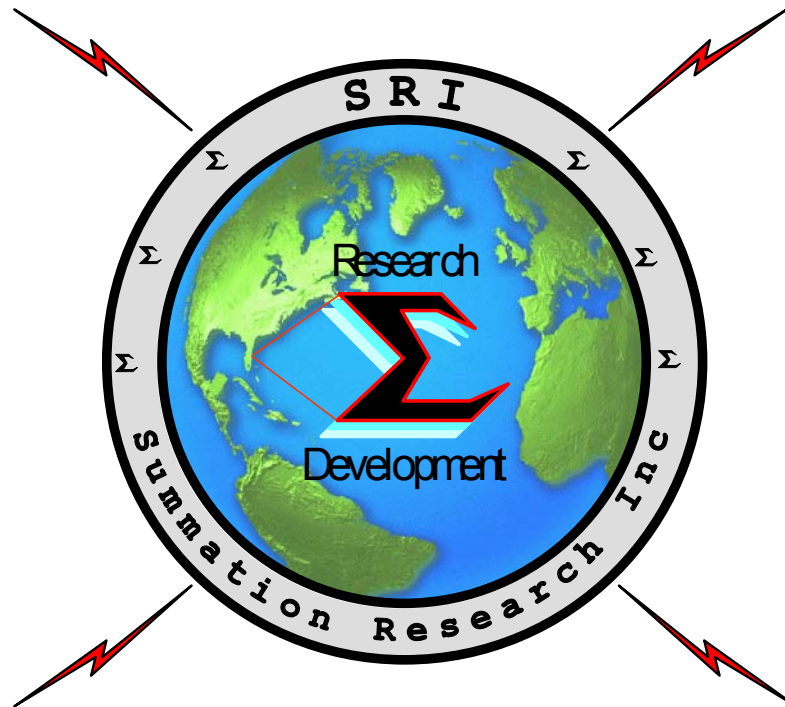
STR-1700 UHF/VHF Land Mobile Radio

Operations and Maintenance Manual

Meeting the 21st Century Challenges

– with –

Advanced Technology Solutions

Prepared by: Summation Research Inc – Melbourne, FL

Drawing Number: 70-STR1700-00 Revision A.1
October, 2004

SUMMATION RESEARCH, INC.

LIMITED WARRANTY

Summation Research, Inc. (herein called SRI) warrants that the equipment's of its manufacture as identified and described within this manual shall, at the time of shipment to the original purchaser, be free from defects in material and workmanship. This warranty applies only to equipment installed, operated, and maintained in accordance with SRI recommendations. This warranty does not apply where SRI determines that installation, repair, alteration, or accidents have caused any claimed defect, or that excessive deterioration due to environmental contamination has occurred.

SRI's obligation under this warranty is limited to repairing, or replacing, exclusive of cost of installation and labor charges, any part that SRI determines to be defective, provided that such part is received at SRI's principal office, freight prepaid. All equipment's must receive prior approval for return to SRI for warranty repair, and must be sent prepaid. If they are returned collect, they will not be accepted.

This warranty is subject to any existing conditions of supply that may directly affect SRI's ability to obtain materials or manufacture replacement parts.

SRI makes no warranty that the equipment shall be merchantable or fit for any particular purpose; nor does SRI make other warranties, express or implied, by operation of law or otherwise, except such as are expressly set forth herein. SRI shall not be liable to buyer, or to any third persons for any incidental, consequential, special or contingent damages for breach of any warranty.

All specifications within this document are subject to change without prior written notice.

RF Exposure Statement

The radio generates RF electromagnetic energy during transmit mode. This radio is designed for and classified as "Occupational Use Only", meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards. This radio is NOT intended for use by the "General Population" in an uncontrolled environment.

• For compliance with FCC and Industry Canada RF Exposure Requirements, the transmitter antenna installation shall comply with the following two conditions:

1. The transmitter antenna gain shall not exceed a limit necessary for the application.
2. The transmitter antenna is required to be located outside of a vehicle and kept at a separation distance of 45 centimeters or more between the transmitter antenna of this device and persons during operation.

To ensure that your exposure to RF electromagnetic energy is within the FCC allowable limits for occupational use, always adhere to the following guidelines:
•**DO NOT** operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed FCC RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically required to meet application requirements.
•**DO NOT** transmit for more than 50% of total radio use time("50% duty cycle"). Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded.

Electromagnetic Interference/Compatibility

During transmissions, the radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. **DO NOT** operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.

RECORD OF CHANGES

Dates of issue for original and each revision of this document are:

      Revision A   October 2004   Initial Production Release
      Revision A.1   January 2005   Added FCC RF Exposure Statement
                                          Corrected VHF channel spacing
                                          specification

LIST OF EFFECTIVE PAGES

Number of pages in this publication (excluding schematics, assembly and mechanical diagrams in appendices) is as follows:

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SECTION 1   INTRODUCTION

The STR-1700 series of UHF/VHF radio product represents a state-of-the-art communications line providing half-duplex audio to radio frequency (RF) transmit and receive functions. Consisting of multiple models, the series provides FM transceiver functions in the 140 to 162 MHz and 400 to 512 MHz frequency bands. The design has been tailored towards narrowband data telemetry applications requiring fast transmit/receive response times with compact size and high reliability.

1.1   Scope

This manual describes the Summation Research, Incorporated STR-1700 series of Land Mobile Radios. The manual includes specifications, design description, installation, and operation instructions along with routine maintenance requirements for the STR-1700.

1.2   Product Description

The STR-1700 is a modified version of a standard UHF/VHF radio product produced by ICOM. The VHF versions of the radio incorporate the ICOM IC-F521 transceiver while the UHF version incorporate the IC-F610 or IC-F621. In order to make the product more applicable for data communications functions, the STR-1700 product line incorporates a custom front panel as depicted in the following picture.

IC-F521/F610/F621   STR-1700
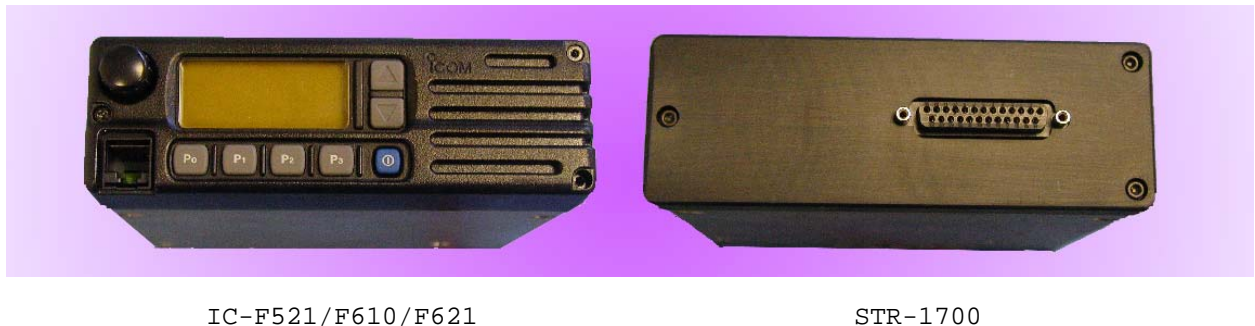
FIGURE 1-1 PRODUCT COMPARISON

The custom front panel replaces the normal operator oriented local status/control interface and audio interface connector with a single DB-25 connector targeted for computer control. The DB-25 provides both the audio interface and a strapping capability for frequency select. This feature is incorporated via a custom printed circuit board (PCB) located within the STR-1700 front panel known as an External Interface Card (EIC). The following figure depicts this implementation.
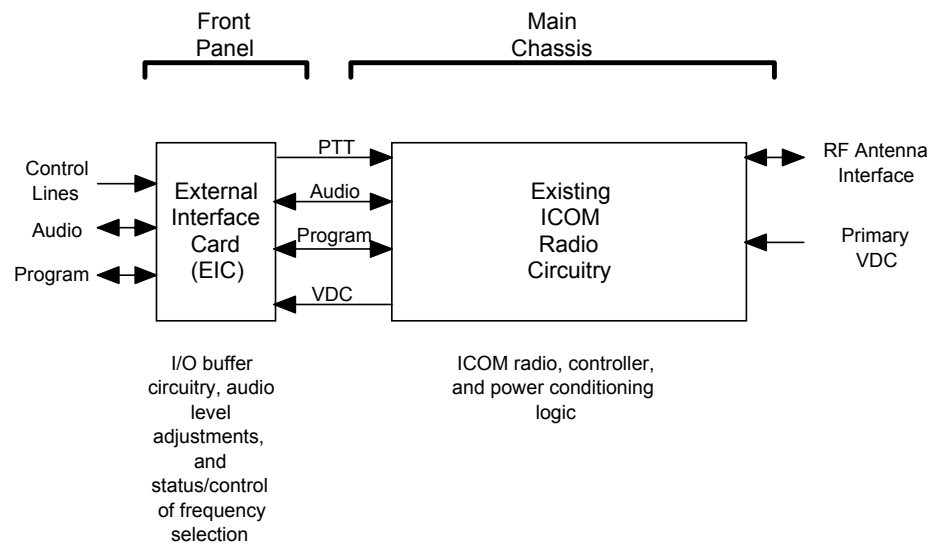
FIGURE 1-2 SYSTEM OVERVIEW

1.3   Technical Specifications

The technical capabilities of the STR-1700 radios are summarized in the following table.

Item	Specification
Frequency Range	STR-1710: 136-174 MHz STR-1720: 440-490 MHz STR-1730: 440-490 MHz (ETSI Certified)
Number of Channels	8 preset channels
Frequency Stability	±0.0005% of assigned center frequency from -30°C to +60°C (+25°C reference)
Compliance	STR-1730 is ETSI type certified All other models are FCC type certified (FCC 47 CFR 90) as well as Industry Canada.
Operating Power	13.6 VDC ± 15% (current @ 13.6 V: transmit 12.5 A, receive 0.7 A)
Operator Adjustments	None
Reliability	25,000 hr MBTF
Antenna Connector	Mini-UHF female located on rear panel
Audio Interface and	DB-25 socket on front panel including 3 channel select lines, audio

Item	Specification
Control Connector	in/out, push-to-talk, and programming interface.
Power Connector	AMP High Power DC
Channel Spacing	UHF: Selectable to either 25 KHz or 12.5 KHz channel spacing. VHF: Selectable to either 30 KHz or 15 KHz channel spacing.
RF Output Power	Selectable between 5 and 30 watts (±2%) into a VSWR of 2:1 or better. (ETSI models limited to 25 watts max.)
Output Impedance	50 ohms, nominal
Output Protection	Operating into a 10:1 VSWR of any phase angle will not damage the transceiver.
Modulation	FM with a rated deviation of +/- 5 KHz for 25 KHz channel spacing and +/- 2.5 KHz for 12.5 KHz channel spacing.
Modulation Sensitivity	An 80 mvolt RMS audio input signal produces 60% of rated deviation.
Turn-On Time	Within 20 msec (UHF models) or 40 msec (VHF model) of application of the keying signal, the transceiver reaches 90% of programmed output power and is capable of transmitting an on frequency signal with a SINAD of 30 dB or greater.
Spurious and Harmonic Output	-70 dB below rated power
Audio Input Impedance	10 K Ohm ±20%
Transmit Audio Frequency Response	Flat response over the 300-3000 Hz range. No pre-emphasis.
Minimum Duty Cycle	Capable of 30 seconds transmit keying or 25% continuous duty cycle.
Output S/N Ratio	30 dB minimum fully modulated
Spurious Leakage	-57 dBm maximum
Selectivity	70 dB minimum for 25 KHz channel spacing and 60 dB min. for 12.5 KHz spacing
Intermodulation	65 dB mininimum
Dynamic Range	With input signals ranging from -100 dBm to 0 dBm, the SINAD at the receiver is 23 dB minimum when receiving a signal modulated with a 1 KHz tone at 60% rated deviation
Sensitivity	0.5 uV (12 dB SINAD) minimum
Spurious and Image Rejection	70 dB minimum
Transmit to Receive Recovery Time	30 msec maximum measured from removal of keying signal to the transmitter
Audio Output	A 1 KHz signal at 60% rated deviation produces a 1 V p-p audio output into a 600 ohm resistive load.

Item	Specification
Receive Frequency Response	Flat response over the 300-3000 Hz range. No deemphasis.
Receiver Overload	A +28 dBm signal continuously applied to the input will not cause any permanent damage.
Dimensions	Approximately 2" high x 6" wide x 7" deep
Weight	3.3 pounds
Vibration	2 g rms 5 Hz-300 Hz sinusoidal, 3 axes, continuous
Shock	10 g half sine, 15 msec; 3 axes
Temperature	-30°C to +60°C (operating and storage)
Humidity	Any obtainable humidity value versus temperature up 100% 'non-condensing'
Altitude	Sea level to 10,000 feet operating and 40,00 feet non-operating

1.4   Reference Documentation

The following documents, or the latest revision of these documents, serve as an addendum to this document. Users are referred to these documents for maintenance and design information pertaining to the standard ICOM radio circuitry.

> Service Manual – UHF Land Mobile Radio – IC-F510/511/521
>   (Copyright 2002 by Icom Inc.)
>
> Service Manual – VHF Land Mobile Radio – IC-F610/620/621
>   (Copyright 2002 by Icom Inc.)

SECTION 2   RECEIVING, INSPECTION AND INSTALLATION

2.1   Unloading and Unpacking

NOTE

If shipping carton is damaged upon receipt,
request carrier's agent be present during unpacking
and inspection of the system.

Upon receipt of the equipment, inspect the shipping container for damage. If the container or the cushioning material is found damaged, they should be kept until the contents of the shipment have been verified for completeness and the equipment has been inspected for mechanical and electrical defects. If the contents are incomplete or if there is a mechanical or electrical defect, please notify:

SUMMATION RESEARCH, INCORPORATED
751 North Drive
Melbourne, Florida 32934

2.2   Receiving Documentation

Each STR-1700 system is shipped with a packing slip. The packing slip should be carefully checked against the contents of the shipping container.

2.3   Installation and Connection Requirements

The STR-1700 has three (3) connectors. These are:

1)   Primary Power
2)   Antenna
3)   Audio/control

After carefully reviewing the connector and signal descriptions below, the user should establish all connections, making sure that the primary power input is turned off at the source. Once all interconnections are in place, primary power may be applied.

2.4   Connector Descriptions and Signal Definitions

This section describes the types of connectors used on the STR-1700 and provides the definition of the signals associated with each.

2.4.1   Primary Power

The Primary Power connector is located on the rear of the STR-1700 and is attached to the unit itself via approximately 6 inches of 12 gage wire. Characteristics of this connector are as indicated in the following table.

TABLE 2-1   PRIMARY POWER CONNECTOR CHARACTERISTICS

PARAMETER	VALUES
Pin Part numbers	MOLEX 19035-0005 MOLEX 19039-0009
Pin Assignments	Pin 1 - +13.6 VDC Pin 2 - Ground
Input Voltage Range	13.6 VDC +/- 15%
Current Drain	11 Amps maximum
Connector to Radio Color Coding	Pin 1 - Red Pin 2 - Black

2.4.2   Antenna

The Antenna connector is located on the rear of the STR-1700 and is mounted directly to the main housing of the radio. Characteristics of this connector are as indicated in the following table.

TABLE 2-2   ANTENNA PORT CONNECTOR CHARACTERISTICS

PARAMETER	VALUES
Connector Type	Mini-UHF Female
Mating (i.e., User Supplied) Connector Type	Mini-UHF Male
Antenna Impedance	50 Ohms
Maximum Output Power	35 Watts
Output Frequency Range	STR-1710: 136-174 MHz STR-1720: 440-490 MHz STR-1730: 440-490 MHz (ETSI Certified)

2.4.3   Audio/Control

The Audio/Control connector is located on the front of the STR-1700 and is mounted directly to the front panel mold of the radio. Characteristics of this connector are as indicated in the following table.

TABLE 2-3   AUDIO/CONTROL CONNECTOR CHARACTERISTICS

PARAMETER	VALUES
Connector Part Number	DB-25 Female
Mating (i.e., User Supplied) Connector Part Number	DB-25 Male

The following table defines the signal contents of all assigned pins on this connector.

TABLE 2-4   AUDIO/CONTROL CONNECTOR PIN ASSIGNMENTS

PIN	SIGNAL	DESCRIPTION AND CHARACTERISTICS
2	Ground	Ground for the external interface side of the EIC card as well as all externally driven signals or power inputs via the Audio/Control Connector.
4	Receive Audio	Recovered audio signal output from the radio. Approximately 1 V p-p into a 600 ohm resistive load for 300 to 3000 Hz outputs.
7	Transmit Enable (i.e., Push-to-Talk)	Places the radio into transmit mode when low (i.e., grounded) or receive mode when high or floating. Input will support 20 mA current or 28 volt stand-off.
8	Serial Programming Interface	Half-duplex serial line utilized to program frequencies, bandwidths and output power selections into the STR-1700. This interface should only be utilized with the SRI provided programming interface cabling/software.
9	Radio +5 VDC	VCC from the main radio unit. THIS OUTPUT IS PROVIDED AS A MONITOR POINT ONLY!!! May be utilized to validate that the STR-1700 is in a power on state.
10	Serial Programming Interface	Half-duplex serial line utilized to program frequencies, bandwidths and output power selections into the STR-1700. This interface should only be utilized with the SRI provided programming interface cabling/software.
11	Ground	See "Ground" description above.
12	Power On/Off Control	Toggle control for radio on/off control. Reference the notes that follow this table for further description.
13	Radio Ground	Ground for the internal interface side of the EIC card as well as all internal radio logic of the STR-1700. *Note – do not connect this signal to an external ground.* Signal is provided only to be used in conjunction with Power On/Off Control as described below.
14	Channel Select 2	Control signal which when combined with "Channel Select 0" and "Channel Select 1" forms a 3-bit binary channel selection control. Input will support 20 mA current or 28 volt stand-off. See table that follows for channel selection definitions.
17	Transmit Audio	Audio signal input to the radio when transmit operation is active. Signal exhibits a 10 K Ohm input impedance. An 80 mvolt RMS input produces approximately 60% rated deviation for input frequencies from 300 to 3000 Hz.
18	Ground	See "Ground" description above.
19	Channel Select 0	See "Channel Select 2" description above.
20	+13.6 VDC	+13.6 VDC power input to the EIC. This power is utilized for external interface logic only and is wholly isolated from the primary input power to the STR-1700.
21	Ground	See "Ground" description above.
22	+13.6 VDC	See "+13.6 VDC" description above.
23	Channel Select 1	See "Channel Select 2" description above.

Pins not listed within this table are all defined as no connects.

When the "Power On/Off Control" signal is momentarily connected to "Radio Ground" and then released, it causes the power on/off state of the STR-1700 to toggle. This can be utilized in conjunction with the "Radio +5 VDC" signal to insure the STR-1700 is powered on for operation. Note that STR-1700 units will maintain the power on/off state across removal of the primary power to the radio. As such, users need not utilize this control signal but may simply always leave the STR-1700 in a powered on state. When delivered from the factory, STR-1700 units are left in a power on state.

For the channel select lines described above, the following table defines the control functions of these inputs.

TABLE 2-5   CHANNEL SELECTION CONTROL SETTINGS

FRONT PANEL 25 PIN D SIGNAL STATES			DEFINITION
Channel Select 2	Channel Select 1	Channel Select 0	
High	High	High	Select Chan 1
High	High	Low	Select Chan 2
High	Low	High	Select Chan 3
High	Low	Low	Select Chan 4
Low	High	High	Select Chan 5
Low	High	Low	Select Chan 6
Low	Low	High	Select Chan 7
Low	Low	Low	Select Chan 8

SECTION 3   OPERATION

Operation of the STR-1700 is accomplished by utilizing a special software program to configure the radio for the proper configuration and then connecting the system into the target platform for audio data transmission and reception.

The following sections describe the STR-1700 operations from the perspective of configuring the unit for the proper radio channel characteristics prior to final system installation.

3.1   Minimum System Requirements

This package requires a PC executing under the Windows operating system. The version of Windows may be Windows 95, Windows 98, or Windows 2000. At a minimum, the system should include:

* 16 Mb RAM (32 Mb recommended)
* Color monitor (minimum of 600x800 pixel resolution)
* 2 Mb available hard-drive disk space
* Serial port (COM1: through COM4:)
* 3 1/2 " floppy disk drive

3.2   Software Installation

The control software for the STR-1700 is provided on a set of 3 1/2" floppy disks. The first disk of the set will contain the program "setup.exe". Executing this program activates a standard windows software installation process with full instructions as to required user actions. The installation will create the program "STR1700.exe" in the specified install directory.

3.3   Conventions and File Structures

The STR-1700 control software supports standard Windows type operation, including menu based selection processes. Throughout the remaining portions of this document, a reference such as "select *aaaa : bbbb*" indicates a Windows type menu selection process where *aaaa* is the text name which appears at the top of the active program screen and *bbbb* is the submenu item displayed once the *aaaa* menu is selected. Further submenu items are preceded by the same *:* and then the text name of the lower submenu item.

In addition to the STR1700.exe program, the install directory will also contain the file "prefs.cfg" after the first execution of the program. This file is utilized to record user settings (e.g., communications port selection) such that these configurable items can be carried forward across executions of the program.

The STR-1700 control program utilizes Labview, a software package from National Instruments. The install directory also contains other support files associated with the run-time version capability required of Labview for the control program.

3.4   Getting Started

3.4.1   Radio Interconnect

Before taking any actions from the control program with an STR-1700 radio, the radio must be connected to a primary power source and to the PC via a special programming interface cable and adapter. The following figure depicts the required interconnects.
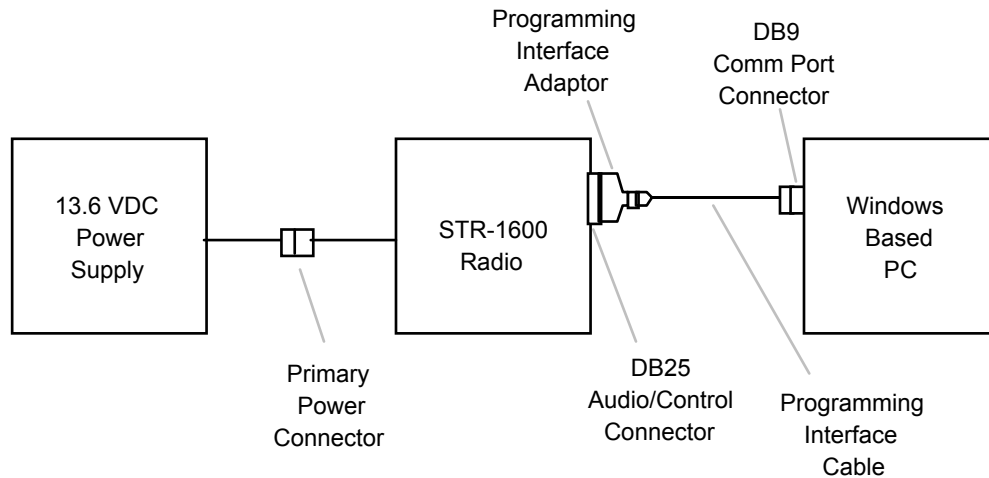

FIGURE 3-1   RADIO TO PC INTERCONNECT CONFIGURATION

The 13.6 VDC power supply need only support the radio operation in a quiescent mode (i.e., < 0.7 A). The power up sequence of the radio versus the PC is not critical.

The interconnect from the radio to the PC is via an interface cable and adapter provided with the software (SRI P/N 50-STR1700-200). The cable consists of a DB9 female connection on one end and an RG45 male connector on the other end. The DB9 end should be plugged into any standard serial communications port on the PC. DB9 to DB25 adapters may be utilized as required.

The interface adapter accepts the RG45 connection on one side and interfaces with the STR-1700 female DB-25 front panel connector on the other. The adapter also includes an LED and a momentary push button switch on the sides of the plastic housing.

3.4.2   Power-on Sequence

Once the above configuration has been established, the primary power supply and PC should be powered on and initialized. When the primary power is activated to the STR-1700, the LED on the side of the programming interface adapter should illuminate. This indicates that the radio has successfully powered up in an "ON" condition.

If the LED fails to illuminate within two (2) seconds, the user should attempt to establish an "ON" condition by momentarily activating the push button on the side of the programming interface adapter and then releasing it. If a

radio has been inadvertently left in an "OFF" condition, this will toggle the state, which should then illuminate the LED. If this action fails to correct the problem, the user should validate the primary power connection to the radio and then attempt the "ON"/"OFF" toggle switch again.

3.4.3   Reading the Radio Configuration

Assuming the above process is successful, the user can proceed to activate the STR1700.exe program. This will result in the following sample screen on the PC's monitor.
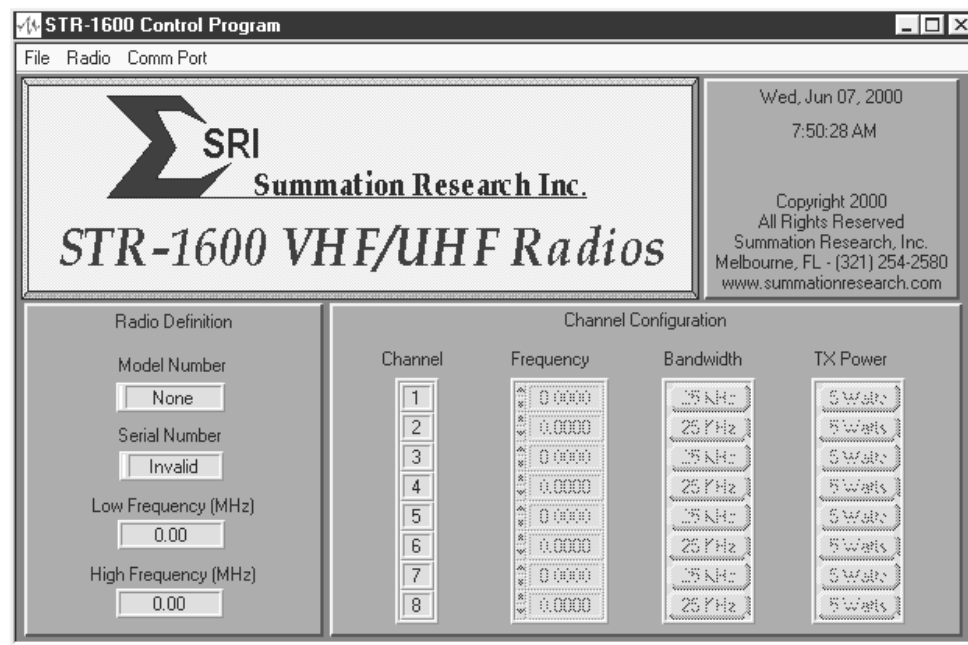

FIGURE 3-2   CONTROL SOFTWARE INITIAL SCREEN

If this is the first time the program is being utilized or if the operator has changed the PC's serial communications port being utilized, the first action taken by the user should be to establish the correct port selection. This can be accomplished by selecting **Comm Port : COM1:**, **Comm Port : COM2:**, **Comm Port : COM3:**, or **Comm Port : COM4:**. The port selection will immediately be changed and the new configuration will be recorded to disk for future executions of the program

After this action, the user may select **Radio : Read Radio**. This will cause the software to interrogate the interconnected STR-1700 and then update the displayed fields. The Serial Number field should reflect the five (5) digit serial number from the product label on the STR-1700. The model number will indicate the specific model of the radio and the low and high frequency values will indicate the valid operational frequency range of this particular model.

The right hand side of the screen indicates the current settings for the eight (8) preset channel selections of the radio. This includes the channel frequency, bandwidth (i.e., wideband at 25 KHz or narrowband at 12.5 KHz) and output power level (i.e., 5 Watts or 30 Watts).

3.5   Altering the Radio Configuration

3.5.1   Changing Individual Channel Settings

Once a radio has been read as described above, the channel configuration fields on the right hand side of the screen may be edited. The frequency field may be changed via standard text edit methods, or it may be incremented or decremented via the arrows located at the side of each setting. The bandwidth and power selections are toggle controls which flip states each time the user selects the button.

After establishing the changes to all channel settings, the user should select *Radio : Write Radio*. The system will again interrogate the radio as to it's current settings, modify the channel configurations according to the edited fields, and then write the new configuration back to the radio.

By interrogating the radio again prior to modifying it's settings, the software insures the correct configuration update even if a new radio has been connected to the PC since the last read radio action. As such, a user may establish a channel configuration and then write the data to multiple radios simply by connecting a new radio to the PC and invoking *Radio : Write Radio*. The fields on the left hand side of the screen will be updated each time this action is taken.

The software does not preclude the operator from establishing invalid configuration settings, but it does prevent these settings from being written to the radio. As such, an operator may edit a channel frequency field to values outside of the indicated range for the current model, but it will notify the user of the error and abort writing the configuration after the *Radio : Write Radio* action is taken. Similarly, channel frequencies not centered on 25 KHz steps for wideband or 12.5 KHz steps for narrowband will be cause an abort of the configuration update.

3.5.2   Setting/Changing Model Defaults

The STR-1700 control software supports user default settings for each of the various model types. An operator may establish settings for the eight (8) channels pertaining to frequency, bandwidth, and output power levels and then store these as the default settings for that model type. This information is stored on disk and, as such, the settings will carry across executions of the control program.

To establish a particular model default, the user must connect a radio of that model type to the PC. Selecting *Radio : Read Radio* will update the display to the information appropriate for that model of radio. The user then may change the frequency, bandwidth, and power level settings that should be utilized for the defaults. After carefully checking the configuration, the operator should select *File : Save Current Settings as Default for this Model*. After interrogating the user as to the validity of this action, the system will replace the previous default settings with the new configuration. Each model type only supports a single default configuration.

After having established the desired defaults, any radio can be updated to the defaults simply by connecting it to the PC and then taking the single action of selecting *Radio : Write from Default Settings for this Model*. This action will cause the software to interrogate the radio, determine the model type, and then write the appropriate default settings for the channel

configurations. At the same time, the display will be updated to reflect the new information for the radio.

3.5.3   Saving/Restoring Channel Parameters

In addition to saving default settings for each model type, the control software also supports saving and restoring channel parameters pertaining to frequency, bandwidth, and output power levels to user specified disk files.

To save a channel parameter configuration to a disk, the user must connect a radio with the desired parameters to the PC. Selecting **_Radio : Radio Settings : Save Current to Disk_** will read the radio and then interrogate the operator as to the desired file name under which the configuration should be stored. By default, the file name is Sxxxxx.usr, where xxxxx is replaced with the 5-digit serial number of the radio connected to the PC. However, the operator may specify any desired, valid file name.

After having saved a configuration to file, any radio of the same model type may be restored to the settings by selecting **_Radio : Radio Settings : Restore Current from Disk._** This action will read the radio connected to the PC, interrogate the operator as to the desired file to read the channel parameters from, change the radio's channel parameters to the previously stored settings, and then write the data back to the radio.

3.6   Radio Operation

Having established the proper channel configuration for the radio, the STR-1700 is now ready for target platform installation. The following operational considerations should be noted:

1)   Radios which are powered up with an active push-to-talk condition will not operate until the push-to-talk is removed and stay's in a non-active condition for a period of 2 seconds.
2)   On initial power up or on any change of the frequency select lines into the radio, the target frequency setting may take up to 1 second to obtain.
3)   If push-to-talk is active at any time during the 1 second tuning period outlined in note 2 above, the tuning action will not complete until push-to-talk is removed and stay's in a non-active condition for a period of 2 seconds.

SECTION 4   MAINTENANCE

In order to ensure that the STR-1700 system is always ready for operation, it should be checked periodically so that potential defects may be discovered and corrected before they develop into any serious damage or system failure. A minimal preventive maintenance program will significantly increase the systems life span.

This section describes the necessary preventive maintenance checks and tests the user can perform to easily identify most defects and problems. Any other defects or problems discovered during the normal operation of the system should be noted for future corrective measures.

<u>**CAUTION**</u>

Stop the operation of the system immediately
if a problem is noted during normal operation
that can otherwise damage the system.

This section also describes the corrective maintenance checks that can be performed on the STR-1700 system.

4.1   Maintenance Concept

The maintenance concept for the STR-1700 system is limited to the removal and replacement of the entire unit.

4.2   Preventive Maintenance Requirements

The following is a recommended timetable for performing preventive maintenance checks on the STR-1700.

<u>**CAUTION**</u>

Primary power to the radio must be turned OFF when
performing preventive maintenance on the equipment.

4.2.1   Inspection

The STR-1700 system should be inspected periodically for defects or physical damage developed during operation. Inspect all the interface cables to and from the system for cracks, breaks and proper seating with their mating connectors on the card. Inspect all cables for frayed, broken or damaged wires. In addition, inspect all STR-1700 connections for accumulation of dirt, grease, or any foreign material that can cause a non-connection. If a cable is found damaged or non-repairable, it should be replaced before operating the system again.

Inspection should be performed at least once every month. The frequency of inspection should be increased for units exposed to dusty or heavy particulate environments.

4.2.2   Cleaning

Clean the outside surfaces and areas around the connectors periodically. Clean the surfaces with a clean, soft, lint-free cloth. Clean the areas around the connectors with a soft bristle brush. To remove grease, fungus, or corrosion, use a cloth dampened with an appropriate electronics cleaning fluid. Cleaning should be done at least once every month. The frequency of cleaning should be increased for units exposed to dusty or heavy particulate environments.

APPENDIX A   Mechanical Drawing

The following page contains the mechanical outline of the STR-1700.

APPENDIX B   SCHEMATICS

The following page provides the circuit schematics for the EIC portion of the STR-1700 radio.

APPENDIX C   ASSEMBLY DRAWINGS

The following pages contain the component placement drawings associated with the EIC portion of the STR-1700 radio.