Harris RF-350 (RT-1446/URC) Control Program
Dale Chidester AAR9WI/NJ7C
aar9wi@cox.net
10 May 2008

To use this program, the radio must be equipped with a remote control interface card. Such radios will have a tag beside the ID tag stating "THIS UNIT HAS BEEN MODIFIED USING KIT 10191-4029. SEE THE RF-7100-04 MANUAL FOR DETAILS." The modification consists of a Radio Remote Control Interface A1A19 which is located behind display panel. The circuit board is marked as p/n 10088-6000. Just recently, Ken Fowler, KO6NO, ko6no@yahoo.com, has developed an interface board that emulates the RS-232 functions of the A1A19 and will operate at 19200 baud. The radio ROM revision code should be 604M for best operation. The ROMs are located on the left side of the board visible when the front panel is swung down. The program will work, sort of, with revision 601 but not all features are there. Ken Fowler has been able in the past to provide updated ROMs.

MSCOMM32.OCX:
Recently (15 June 2007) it has been found that some Windows istallations do not have an ActiveX file necessary for the program to operate. This file is named MSCOMM32.OCX and should be found in the Windows\System32 directory. If you receive an error message of "An unsupported operation was attempted" make sure this file is present. If not, move the copy included in the .zip file to the directory you put Serial.exe in. Follow the instructions in the HowToRegister.txt file to register MSCOMM32.OCX in your Registry.

Setup for RS-232 control:
> On the Remote Control Interface A1A19 located behind the display panel, set S-1 to position 9 (ADAPT) Set S-2 to Position 1 (RS-232) [To use with Harris RF-7210 Adaptive Controller, S-2 should be set to position 2 (RS-422.)] Set S-5 to 4 wire audio input/output. Radio should be in REMOTE mode. If using the KO6NO serial interface board, set his board for 19200 baud.

Computer:
> Set the PC serial port for 9600 Baud, 7-bit data, odd parity, 1 stop bit, xon-xoff or no handshake. If using the KO6NO serial interface board, set the serial port for 19200 baud. Jumpers (pins 4 to 6 and pins 7 to 8) on the 9 pin connector are necessary for legacy PC serial ports to transmit and receive data.

Audio Interface PWB ASSY - A1A16:
> Set the Patch Selector Switch (S1) and the Line Selector Switch (S2) both to the 4-wire position.

Wiring:

Computer (COMx)	Radio J9 (Remote)
9 pin female D connector	**25 pin Female D connector**
2 (input)	3 (output)
3 (output)	2 (input)
5 (Ground)	7 (Ground)
4-Jump to 6	12 Audio Line Out (-)
	13 Audio Line Out (+)
7-Jump to 8	24 Audio Line In (+)
	25 Audio Line In (-)
	CAUTION: Observe the polarity of the Audio Lines
	(-) is ground.

Installation:
Create a directory for the Harris Control program. Copy the files SERIAL.EXE and H350SAVE.DAT to that directory. A shortcut to SERIAL.EXE can be created on your desktop. Edit the H350SAVE.DAT file using Notepad or other text editor so the first character in the first line is the PC Serial Port number to be used to control the radio (i.e. 1 = com1, 2 = com2, etc.) and the second number is the baud rate (9600 if using the A1A19 interface card, 19200 if using Ken Fowler's interface.) The information on the second line is the lower limit, upper limit for frequency scanning and the lower limit, upper limit for channel scanning. Starting with the third line are data for 300 saved channels: channel number, frequency (in kHz,) Mode, AGC, and Audio Source (separated by a space) followed on the fourth line with a 30 character descriptor string. Subsequent

pairs of lines contain data for the rest of the channels. The H350SAVE.DAT file is updated when the program is terminated to save the latest information.

Firmware Versions:
There are two known versions of firmware for the Harris radio, 601 and 604. 604 is the latest version and works 100% with this program. If you look in the radio with the front panel swung down, you will see a circuit board with 3 EPROMs labeled U16, U17 and U18. The revision number on these EPROMs is the firmware version. This program will function with the 601 version... sort of.. To select a channel, you must double-click the channel twice. Channel scanning will not work correctly, there is no gain control, etc. For best results, simply update to revision 604. Updated EPROMs are available from Ken Fowler, KO6NO, ko6no@yahoo.com.

Operation:
Turn on the radio. If REMOTE is not set, press 2nd then the down arrow (REMOTE) to put the radio in REMOTE mode.
Start the program.

The controls should be fairly intuitive, but the following explanations are provided; from left to right on the display:

Xmit-	Clicking will start transmitting. Audio must come from the J9 REMOTE connector unless LocalAudio is selected. All other audio sources are normally disabled in the REMOTE mode.
Receive-	Clicking will stop Xmit and start receiving.
Freq. in kHz	Window displays current operating frequency.

Frequency:
Set	Set button causes frequency entered in box beneath it to become current operating frequency.

Scan Frequencies:
Up-	Causes operating frequency to scan up by increments set in Delta F
Down-	Causes operating frequency to scan down by increments set in Delta F.
Lower Limit-	Sets lower limit for Scan Frequencies.
Upper Limit-	Sets upper limit for Scan Frequencies.

Delta F:
-	The column of "buttons" selects the increment for Scan Frequencies; both Up and Down.

Audio:
-	MIC, AUD2, PATCH select audio source. Note: Normally in REMOTE mode ONLY the audio lines from the J9 REMOTE connector are active. To actually get audio from MIC, AUD2 or PATCH, LocalAudio (see below) has to be selected. Mute mutes speaker output. Side-Tone enables side-tone (usually for CW work, but can be useful in digital modes too.)

AGC-	Mode selected in pull-down becomes active AGC mode.
Chan Scan-	Causes scanning between channel limits set in boxes below the button.
Mode-	Mode selected in pull-down becomes active mode of operation (USB, LSB, AM, CW.)
Lower-	Lower channel number for Chan. Scan.
Upper-	Upper channel number for Chan. Scan.

Jog Frequency:
Up-	Raise current operating frequency one Delta F increment.
Down-	Lower current operating frequency one Delta F increment.

Chnl....etc.:
The edit box under these headings can be used to change preset channel settings. Type in: Channel number (0-299,) Frequency, Mode, AGC. Audio source, I/O, and Channel description. (Note, channel description must always have at least one non-blank character.).
The window below the edit box contains all the preset channels. Double clicking on an entry will cause it to become the current operating conditions. The parameters will also be displayed in the edit box. The values in the edit box can be edited and then saved by pressing Save Channel.
Save Channel- Sets a given channel to what is entered in the edit box (Chnl....etc.) below it.

Ext. PTT-   Usually in REMOTE mode, the MIC, AUD2 and PATCH push-to-talk (PTT) function is disabled. Clicking this control will enable the TB1-11 and TB1-12 connections on the PATCH plug-in on the back of the radio as well as enabling the PTT function of the selected audio device (MIC, AUD2 or PATCH.)
Clipping--   Enables/disables audio clipping.
BPF Off-   Turns Band Pass Filter (BPF) off. Used for scanning without excessive relay chatter. Note: the radio will not transmit when PBF is off.
LocalAudio   Enables the selected local audio input (MIC, AUD2 or PATCH) Note that this DISABLES the audio lines of the J9 REMOTE connector. When "unchecked," ONLY the audio lines of the J9 REMOTE connector are active.
VOX-   Controls for VOX (Off, Voice, Data)
RF Gain-   A number entered in the box will control RF Gain. 00 is maximum gain, 63 is minimum (must enter 2 digit number.).
Tune-   Toggle action. Radio transmits in AM mode (about 30 watt output) while selected.
BFO-   A number entered in the box will control BFO frequency.
                0 to -99 sets negative offset from normal 1000 Hz in increments of 10 Hz.
                100 sets zero offset from normal 1000 Hz
                101 to 199 sets positive offsets from normal 1000 Hz in increments of 10 Hz.

Meter:
-               Selects what is to be displayed on the Meter.

Serial Settings:
                Displays: Serial Port, Baud Rate, Parity, Data bits, Stop bits. Read from H350SAVE.DAT
Power (DTR):
                Toggles the DTR line of the serial port for optional power control. DTR is on (+12v) when program starts and is turned off (-12v) when program is exited.
Amplifier Controls:
Pwr-   Toggles Amplifier power on/off (Works only if Amp installed and Power Enabled. Equivalent to 2nd+2 on radio keypad.)
Rdy   Check mark shows up when Amplifier has warmed up. (Equivalent to StandBy light NOT flashing)
Oper   Toggles Amplifier between Ready and Operate states. (Equivalent to 2nd+3 on keyboard.) Note: ONLY Oper will toggle between Ready and Operate. Clicking the Rdy box doesn't do anything.
Tuning   Check mark shows while amplifier is tuning.

Mnemonics for channel settings:
AGC: O (letter "oh," not zero) = Off, S = Slow, M = Medium, F = Fast
Mode: U = Upper Sideband, L = Lower Sideband, A = AM, C = CW
Audio: M = Mic, A = AUD2, P = Patch
I/O   L = Local (ExtPTT+LocalAudio), R = Remote (Normal REMOTE), T = TNC (ExtPTT+J9REMOTE audio)

Format of H350SAVE.DAT file:

All entries separated by a space.

Line	Contents
1	Serial Port Number, Baud Rate, Parity, Data bits, Stop bits (p 9600 O 7 1)
	Note: the parity is an "oh," not a "zero."
2	Scan Low Limit, Scan High Limit, Low Channel, High Channel. (LLLLL.LL HHHHH.HH l h)
3	Channel #, Frequency, Mode, AGC, Audio, I/O (nnn fffff.ff M A A I)
	Note: channel numbers start with zero (0,) highest channel number is 299
4	Channel Description (Note: Must always have non-blank in first character.)
...	

Contents of lines 3 and 4 repeated for subsequent channels, with changing channel number.