



Installation and Operation Manual

USC-16/SG Universal Satellite Channel Controller StarGuide II / III Upgrade Guide

Firmware Version 1.8

Manual Update: 04/04/04

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INTRODUCTION

Thank you for your purchase of a Broadcast Tools® USC-16/SG. We're confident that this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the unit.

SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

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WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

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BROADCAST TOOLS® BRAND PRODUCTS!***



CAUTION!

Broadcast Tools® Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.



NOTE:

This manual should be read thoroughly before installation and operation.

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SECTION TITLE

PRODUCT DESCRIPTION

The USC-16/SG is an upgrade for the USC-16, Universal Satellite Channel Controller. After the upgrade has been installed, the USC-16 will be referred to as the USC-16/SG. The USC-16/SG is completely programmed with services of most StarGuide affiliates. The USC-16/SG is field programmable to switch audio ports, audio port channel swapping, services, providers and carriers on the StarGuide II and III satellite receivers. The USC-16/SG, when operated with contact closures or serial control, will provide sixteen, 31 - character string selections for the StarGuide II or III receivers. Programming of the USC-16/SG is straightforward. Using a NON-DEDICATED computer along with the communication program (HyperTerminal) included with the Windows 95/98/ME/2000/NT operating system. After the desired locations have been programmed, the USC-16/SG may be unplugged and installed. The program information is stored in non-volatile memory.

UNPACKING AND HANDLING

Please examine your USC-16/SG for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately. Retain the packaging for inspection by the shipper. The package should contain the USC-16/SG upgrade chip, 1 - modular cable /w 9 pin male D-sub "SG-9" serial adapter and this manual.

UPGRADE PROCEDURE

Please follow these steps:

- 1 Remove power and ALL connections from the USC-16.
- 2 Remove the cover.
- 3 Be sure to follow proper "STATIC SENSITIVE DEVICE" procedures with the IC in position U3.
- 4 Locate U3 and carefully remove.
***NOTE: Use an IC puller or small (Greenie) screwdriver to pry out U3.**
- 5 Carefully insert the USC-16/SG upgrade IC into U3.
***NOTE: Be sure to observe the correct pin orientation.**
- 6 Replace the cover and reattach all cabling.
- 7 Remove JP-3, if installed
- 8 Follow the procedure below.

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PRODUCT DESCRIPTION

COMPILING THE NEEDED INFORMATION TO PROGRAM THE USC-16/SG

- 1 Have your receiver installed and authorized. Be sure you can manually select the program(s) from the receiver's front panel keyboard and have an audio monitor attached to the correct audio port.
- 2 Request the provider number(s) for the program(s) you will be receiving.
- 3 Request the service number(s) for the program(s) you will be receiving.
- 4 Determine what audio port(s) you plan to use.
- 5 Record this information for later use.

TESTING YOUR STARGUIDE RECEIVER WITH YOUR COMPUTER'S SERIAL (COM) PORT

- A new window will open labeled CONNECTION DESCRIPTION.
 - In this window, Type a name that describes the connection (We suggest BTI96), click the appropriate icon, if desired this is not required, and then click OK.
 - A new window will open labeled CONNECT TO.
 - At the CONNECT TO screen,
 1. Move your cursor to the CONNECT USING box
 2. Press the down arrow on the right of the box to select the available com port ("Direct to com x"),
 3. Then click the OK button.
 - The PORT SETTING window will appear.
 - At the PORT SETTING window,
 1. Change the baud rate to 9600,
 2. Flow control to NONE
 3. Then click OK button.
- You will have a new window open labeled with the Connection Description you typed in earlier (in our example, BTI96).
- At this window
 1. Click on the word FILE at the upper left portion of the menu bar and click on Properties.
 - i) Click the Settings tab, and then change the
 - (1) EMULATION to ANSI,
 - (2) Then click the OK button.
 2. Click on FILE, click Save.
 3. Click on FILE, click Exit.
 4. Click Yes, when asked to disconnect. This will place you back at the HyperTerminal screen
 - At the HyperTerminal screen, find the Icon and/or file you named and double click on it.

! TIP

Take advantage of your program provider and receiver manual. They are great resources!

This step is required to confirm that the communication program and StarGuide II / III receiver are configured properly. The following instructions are for use with Windows 95/98/ME/NT/2000 HyperTerminal. You can start HyperTerminal by clicking Start, pointing to Programs, pointing to Accessories, pointing to Communications, clicking HyperTerminal, and then double-clicking on the icon labeled Hypertrm or Hypertrm.exe.

TESTING THE STARGUIDE II or III RECEIVER

1 Set your receivers M & C serial port for 9600,8,N,1 via the receivers front panel keyboard.

2 Connect a Male - Female, DB-9 straight-through serial cable between the M & C port on the receiver and your computers com port.

* NOTE: Do not use the cables supplied by us!

3 On your computer keyboard, type the following command: VER and press the ENTER key.

4 If the two are communicating, the details of the current receiver's software and other information will be displayed.

5 If your test was successful, remove the Male - Female, DB-9 straight through serial cable from the computer and receiver; proceed to the section labeled "Connecting the USC-16/SG to your computers serial port". If your test failed, follow the troubleshooting steps A through G that follows.

TROUBLESHOOTING

A. Build a loop-back "TESTER" by purchasing a "FEMALE" 9 pin D-sub solder cup connector (Radio Shack, CompUSA, Local Electronic Store, etc).

B. Solder a jumper between pins 2 & 3.

C. Try typing on the keyboard with nothing connected to the computer's com port. You shouldn't see any characters. If you do, the "ECHO typed characters locally" is checked (ON)" in the ASCII settings in HyperTerminal. Turn this OFF (Uncheck) and retest Step C.

D. Plug the "TESTER" into the com port under test

E. Try typing on the keyboard, if you're using the correct com port, each character typed will be displayed.

F. If this test fails, try changing com ports on the communication program until you find the correct port. When a working com port is found, repeat the above test starting at step 1.



CAUTION!

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products, as any electronic device, can fail ...



NOTE:

If you find that a failure is traced to the receiver and ALL receiver troubleshooting has failed, contact the receiver manufacture.

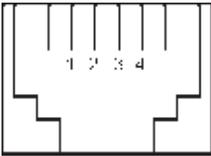


TIP

With some communication programs, any change made to the program settings requires you to save the changes, exit the program and restart the program.

CONNECTING THE USC-16/SG TO YOUR COMPUTER'S SERIAL (COM) PORT

The pin-out of the adapters is shown below.



Modular Jack,
Pin Numbers

RJ-11 Adapter Pin	"S-9 or S" Female Adapter "Computer"	"SG-9" Male Adapter "RCVR"	USC-16/SG (Point of view)
4	3, Yellow	2, Yellow	RS-232 Receive
3	2, Green	3, Green	RS-232 Transmit
2	5, Red	5, Red	Ground

Locate the originally provided modular (Telephone) cord (only use the modular cord that was supplied with the USC-16 or a replacement that reverses, such as Radio Shack Cat No. 279?422) and the "S-9 or S", 9 pin female D-Sub adapter. Connect one end of the modular cord into the "COMPUTER" (J-5) jack on the USC-16/SG. Connect the other end of the modular cord into the "S or S9" adapter. Plug the "S or S9" adapter into the TESTED com port. The communication program should still be active. Press the space bar p ONCE, then type the ID number. NOTE: If the ID is 0, no number is entered. The display menu should look like the menu below.

Broadcast Tools, Inc USC-16/SG - Satellite Controller V1.8 (c) 2000

- Unit ID: 0
- 1 - Modify Satellite Command Strings
- 2 - Set Unit ID
- 3 - Re-initialize all settings to defaults

Enter desired function number, or Q to quit:

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PROGRAMMING

To program the StarGuide II/III command strings. Select 1. The screen below will be displayed. To program location 01, type 01. Follow the prompts for entering character strings. The USC-16/SG has been completely programmed with the most current services. The USC-16/SG may be field programmed to switch audio ports, audio channel swapping, services, providers, carriers, data rates, etc, on the StarGuide II and/or III satellite receivers.

We have provided a list of the programming below. This sample data may be changed and your own data inserted.

Memorize Variable Strings for Recvr Port 1

01. "SP C,S,2[13]AM C,0[13]"
02. "SP C,S,3[13]AM C,0[13]"
03. "SP C,S,4[13]AM C,0[13]"
04. "SP C,S,5[13]AM C,0[13]"
05. "SP C,S,6[13]AM C,0[13]"
06. "SP C,S,11[13]AM C,0[13]"
07. "SP C,S,12[13]AM C,0[13]"
08. "SP C,S,14[13]AM C,0[13]"
09. "SP C,S,15[13]AM C,0[13]"
10. "SP C,S,16[13]AM C,0[13]"
11. "SP C,S,17[13]AM C,0[13]"
12. "SP A,S,5[13]"
13. "SP A,S,8[13]"
14. "SP A,S,16[13]"
15. "SP C,S,3[13]AM C,3[13]"
16. "SP C,S,5[13]AM C,3[13]"

Enter 2 digit String Number to Change, or Q:

STARGUIDE II / III COMMAND DESCRIPTION

Memorize Variable Strings for Rcvr Port

01 Carriage Return
 SP Audio mode number
 C Audio port A through F
 S Audio Mode command
 2 Carriage Return
 [13] Service or Provider code
 AM Service or Provider command
 C Audio port A through F
 0 Setting Port configuration command
 [13] Memory Location

STARGUIDE II / III PROGRAMMING EXAMPLES

"SP A,P,3[13] SP A,S,8[13] AM A,0[13]"

***NOTE:** This string has the port, provider, service and audio mode command examples.

"SP C,S,18[13]AM C,0[13]"

***NOTE:** This string has the port, service and audio mode command examples.

"SP A,S,5[13]"

***NOTE:** This string has the port and service command examples.

"SCM 1103700,7680000[13]"

***NOTE:** This string has the frequency and data rate command example

***NOTE:** The carriage return is entered by typing a backslash (\) followed by the enter key. The carriage return will appear as [13] on screen. You need to press the enter key a second time to complete the command.

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CONNECTING THE USC-16/SG TO YOUR RECEIVER

Cables were supplied with the original USC-16. Simply connect one end of the modular cable to the modular jack on the USC-16 labeled J4 “RCVR” and the other end to the modular 9 pin male D-sub “SG-9” adapter (supplied with the upgrade) that is plugged into the “M&C” connector on the StarGuide II/III receiver. Refer to your StarGuide II and/or III users manual for the proper setting of the M & C port to 9600,8,N,1. If you plan on using contact closures to remote control the USC-16, these functions are available on the connector labeled J1 “CONTROL” 25 pin D-sub male connector (mate, supplied).

***Note:** The inputs on J1 are pulled high to Vcc. To select any location, the desired pin must be pulsed low (> 200ms).

***NOTE:** Pins 17 – 21 & 25 are not used

***Note:** Remove JP-3 if installed

J-1 “CONTROL” PIN-OUT, and INFORMATION

USC-16 /SG J-1:	USC-16/SG Memory Location:	Service:	Service Number:	Audio Mode:	Provider:
Pin 1	01	DATS 00 / 01	2	DUAL, 0	WW1/SG II
Pin 2	02	DATS 09.0 / 09.1	3	DUAL, 0	WW1/SG II
Pin 3	03	DATS 06.1 / 09.1	4	DUAL, 0	WW1/SG II
Pin 4	04	DATS 14 / 15	5	DUAL, 0	WW1/SG II
Pin 5	05	CNBC / MISC	6	DUAL, 0	WW1/SG II
Pin 6	06	CNN-E / NEWSLINK	11	DUAL, 0	WW1/SG II
Pin 7	07	CNN-W / NEWSLINK	12	DUAL, 0	WW1/SG II
Pin 8	08	DATS 07 / 08	14	DUAL, 0	WW1/SG II
Pin 9	09	MBS-E/NEWSEVENTS	15	DUAL, 0	WW1/SG II
Pin 10	10	MBS-W / NEWSEVENTS	16	DUAL, 0	WW1/SG II
Pin 11	11	NBC-E / NEWSEVENTS	17	DUAL, 0	WW1/SG II
Pin 12	12	PREMIERE TWO	5	MONO	Premiere/SG III
Pin 13	13	PREMIERE ONE	8	MONO	Premiere/SG III
Pin 14	14	PREMIERE SIX	16	MONO	Premiere/SG III
Pin 15	15	DATS 09.1 / 09.0	3	SWAP, 3	WW1/SG II
Pin 16	16	DATS 15 / 14	5	SWAP, 3	WW1/SG II
Pins 22,23,24 Ground					

***NOTE:**

- SG II refers to the StarGuide II receiver**
- SG III refers to the StarGuide III receiver**
- WW1 refers to the Westwood One Network**
- Premiere refers to The Premiere Network**
- ABC refers to ABC Radio Network**

COMPUTER BURST MODE COMMANDS

Burst mode allows a computer or ASCII terminal to control the unit. This section defines all burst mode commands. Each burst mode commands starts with an asterisk (“*”). Next is a single decimal digit that corresponds to the unit (ID) address 1-7 (NOTE: Not required when the ID is 0). Following that are one or more ASCII characters specifying the command. A carriage-return is required to terminate the command. Unsuccessful commands are responded to with “ERROR”. The syntax of each command is given below. The syntax shows the command exactly as it should be sent, except that lower case characters represent values that should be substituted:

GLOSSARY OF COMMAND NOTATION

Character String	Meaning	Allowable Values
U	Unit ID	1 – 7, NOTE: Not required with ID = 0
cc Xxxxx	Memory Number String	01-16

COMMANDS

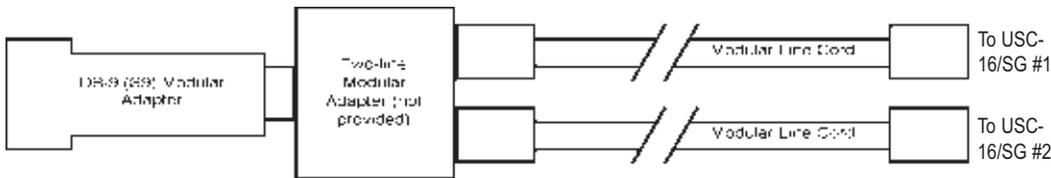
- *uU<cr> Send units model and version number
- *uPXXXXXXXXXXXXXXXXXXXX... (Pass-through) Send this string to the receiver
- *ucc<cr> USC-16/SG Memory location

Example:

- *01<cr> Commands the USC-16/SG with a ID of 0 to send the ASCII string stored in Location 01 to the Receiver
- *101<cr> Commands the USC-16/SG with a ID of 1 to send the ASCII string stored in Location 01 to the Receiver

CONNECTING TWO – USC-16/SG’s TO A SINGLE COMPUTERS COM PORT

Multiple USC-16/SG’s may be cascaded serially to operate from the same serial port. The first step is to assign ID’s to each USC-16/SG. One suggestion is to assign ID 1 to the first unit and ID 2 to the second. The second step is to parallel the serial ports of the USC-16/SG’s. Plug the male end of the duplex modular adapter into the supplied female “S-9 or S” DB-9 to RJ-11 adapter, then attach the supplied modular line cords into each of the duplex modular adapter receptacles and the other ends into each USC-16/SG “COMPUTER” modular receptacles. See the diagram below. NOTE: Three or more USC-16/SG’s may be daisy chained by using the above description and a Radio Shack 279-410UK 5-jack modular adapter.



Broadcast Tools also manufactures the SDD-8 which allows up to 8 - additional RS-232 devices to be controlled and monitored from one com port.

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PROGRAMMING

Network Program, Provider and Service codes as of 05/25/01

NOTE: Check our web site for current codes.

**ABC Services Available on StarGuide III on
GE-8 (Satcom C-5) as of 05/25/01**

**Carrier Name: ABC RADIO NEW YORK / Frequency = 1103700 / Data
Rate = 7680000 / VIT= 2/3**

Provider (ID#)	ABC Radio New York	Service ID#	SEDAT or DATS Equiv.
ABC Radio (4)	Classic Rock	4	
ABC Radio (4)	Rejoice!	5	
ABC Radio (4)	Hot AC	6	
ABC Radio (4)	Memories	12	
ABC Radio (4)	Touch	9	
ABC Radio (4)	Classic R&B	8	
ABC Radio (4)	Tom Joyner	7	
ABC Radio (4)	Doug Banks	27	
ABC Radio (4)	S&F	10	
ABC News (2)	News NET1E/SATQ	11	T23 SEDAT 01/Voice Cue 19-00
ABC News (2)	News NET1C/SATQ	13	T23 SEDAT 02/Voice Cue 19-00
ABC News (2)	News NET1P/SATQ	14	T23 SEDAT 03/Voice Cue 19-00
ABC News (2)	News NET2E/3E	15	T23 SEDAT 04/T23 SEDAT 07
ABC News (2)	News NET2C/3C	16	T23 SEDAT 05/ T23 SEDAT 08
ABC News (2)	News NET2P/3P	17	T23 SEDAT 06/ T23 SEDAT 09
ABC News (2)	ESPN East	18	T23 SEDAT 00/ T23 SEDAT 19
ABC News (2)	ESPN West	26	T23 SEDAT 24/ T23 SEDAT 19
ABC News (2)	ABC 50/ABC 52	20	T23 SEDAT 50/ T23 SEDAT 52
ABC News (2)	ABC 51/ABC 53	21	T23 SEDAT 51/ T23 SEDAT 53
ABC News (2)	ABC98/ABC99	45	T23 VARIOUS/T23 VARIOUS
ABC News (2)	NETCUE/DATA	36	T23 DATA 19-08
ABC NY (1)	WOR1/WOR2	19	T23 SEDAT 21/T19 SEDAT 18
ABC NY (1)	TALK 1/TALK2	22	T23 SEDAT 54/T23 SEDAT 20
ABC NY (1)	ABC STEREO 00	23	T23 SEDAT 48/T23 SEDAT 49
ABC NY (1)	SBLINE/SALEM	24	T19 DAT S 17/T23 SEDAT 22
ABC NY (1)	DGNNET/RAMSEY	25	T23 VARIOUS/T23 VARIOUS
ABC NY (1)	TALKAM1/TALKAM2	28	T15 DATS 16-0/T15 DATS 17-1
ABC NY (1)	RETRO ROCK	29	T19 DATS 00/T19 DATS 01
ABC NY (1)	SAT SRVS 01 L/R	30	T23 SEDAT 26/T23 SEDAT 27
ABC NY (1)	SAT SRVS 02 L/R	31	
ABC NY (1)	SAT SRVS 03 L/R	32	T23 SEDAT 23/TBA
ABC NY (1)	SAT SRVS 04 L/R	33	
ABC NY (1)	AM ONE/BTR	34	T23 SEDAT 32/T15 DATS 11-0
ABC NY (1)	PGA TR/SS 06R	35	
ABC NY (1)	MRN/SAT SVS 07R	37	T19 DATS 16 / T19 DATS 18
ABC NY (1)	WSJ/SAT SRVS 08R	38	T23 SEDAT 56 / TBA
ABC NY (1)	THE BEST	39	N/A
ABC NY (1)	SAT SRVS 11 L/R	40	
ABC NY (1)	SAT SRVS 12 L/R	41	
ABC NY (1)	RADIOA/TRN1	42	N/A
ABC NY (1)	SAT SRVS 14 L/R	43	
ABC NY (1)	SAT SRVS 15 L/R	44	

WW1 Network Program and Service Codes:

Programs	Service	Code / ID #	Strings	Comments
FOXTALK / WFAN	23	SP C,S,23\#AM C,0##		Bill O'Reilly is on Foxtalk
CBS 36 / CBS 39	24	SP C,S,24\#AM C,0##		
CBS 37 / CBS 39	25	SP C,S,25\#AM C,0##		
CBS 38 / CBS 39	26	SP C,S,26\#AM C,0##		
DATS 00 / DATS 01	2	SP C,S,2\#AM C,0##		
NBC-E / NEWS EVENTS	17	SP C,S,17\#AM C,0##		
NBC-W / NEWS EVENTS	18	SP C,S,18\#AM C,0##		
CNN-W / ATOM	12	SP C,S,12\#AM C,0##		
MBS-E / NEWS EVENTS	15	SP C,S,15\#AM C,0##		
MBS-W / NEWS EVENTS	16	SP C,S,16\#AM C,0##		
CNN HEADLINE / NEWSLINK	20	SP C,S,20\#AM C,0##		
DATS 06-1 / TALK 10	4	SP C,S,4\#AM C,0##		
DATS 07 / DATS 08	14	SP C,S,14\#AM C,0##		
DATS 09-0 / TALK 10	3	SP C,S,3\#AM C,0##		
CNN-E / ATOM	11	SP C,S,11\#AM C,0##		
FOX RADIO NET / MISC 2	21	SP C,S,21\#AM C,0##		
DATS 14 / DATS 15	5	SP C,S,5\#AM C,0##		
MARKETWATCH / MISC	6	SP C,S,6\#AM C,0##		
TALK 7 / TALK 8	7	SP C,S,7\#AM C,0##		
CBS 40 / CBS VC	27	SP C,S,27\#AM C,0##		
CBS 41 / CBS 43	8	SP C,S,8\#AM C,0##		
CBS 42 / CBS 44	22	SP C,S,22\#AM C,0##		
CBS 45 / CBS 46	19	SP C,S,19\#AM C,0##		
SPORTS 1 / SPORTS 2	9	SP C,S,9\#AM C,0##		
TRNET / TALK 1	28	SP C,S,28\#AM C,0##		
SPECIAL 1 / 2	29	SP C,S,29\#AM C,0##		

Denotes pressing the enter key once ## Denotes pressing the enter key twice

Use the "AM" Command to add audio flow control. Examples are given below:

AM C,0## Leaves audio on Port C normal.

AM C,1## The Program on the "LEFT" Channel is routed to the left and right channel of Port C

AM C,2## The Program on the "RIGHT" Channel is routed to the left and right channel of Port C

AM C,3## Swaps the Left and Right Channels on Port C

Please check with your NETWORK to verify that they support the "AM" (Audio Mode) command.

Note: We offer three handy solutions for wiring up the audio and relays on the StarGuide II & III receivers: 1.) COP; 2.) COA-15, and 3.) COA-37. Please check our website for more information at www.broadcasttools.com

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Premiere / NSN Program, Provider and Service Codes:

Program	Provider Code / ID #	Service Code / ID #	Audio Mode	String
Premiere One	3	8	Mono	SP x,S,8\##
Premiere Two	3	5	Mono	SP x,S,5\##
Premiere Three	3	19	Mono	SP x,S,19\##
Premiere Four	3	21	Mono	SP x,S,21\##
Premiere Five	3	20	Mono	SP x,S,20\##
Premiere Six	3	16	Mono	SP x,S,16\##
Premiere Seven	3	27	Mono	SP x,S,27\##
Premiere Eight	3	14	Mono	SP x,S,14\##
Premiere Nine	3	18	Mono	SP x,S,18\##
Premiere Ten	3	31	Mono	SP x,S,31\##
x = Port A through F				
NSN 4 /				
Equity 1	1	28		
NSN 5 & 6	1	2		
NSN 8	1	24	Left/Right	
NSN 10 / Nubian	1	30		
Comedy 1 / 2	1	26		
Fisher / Jason	1	29		

Denotes pressing the enter key once
 ## Denotes pressing the enter key twice

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