Command*			Description	Result(s)
ASCII	DECIMAL	HEX		
[SPACE]	32	20	Initialize	Enables communication with scan controller. This command must be entered first on initial power-up. If using a terminal program, pressing the "space bar" will achieve the same result. The controller will respond with its current software version.
[CR]	13	0D	Carriage return	This command must follow all commands entered. If using a terminal program, pressing the "Carriage return" key will achieve the same result.
@	64	40	Soft Stop	Causes deceleration to a stop.
^C	3	03	Reset	(1) Stops motion. (2) Sets counter to "0" (3) Assumes "Idle" state
C1	67	43	Clear	Erases pre-programmed parameters. Only use when an unexplainable scanning error has occurred.
G	103	67	Run Internal Program	Executes a program stored in non-volatile memory after entering [G] followed by the program's starting address.
I	73	49	Starting velocity	Starting and stopping speed of scan.
K	75	4B	Ramp Slope	Acceleration /deceleration factor. Value less than 127 will result in both acceleration and deceleration having the same slope. Entering 2 values will set the acceleration slope to the first value and the deceleration slope to the second value. Range = 0-255
P	80	50	Enter & Exit Program Mode	Entering P0 through P1000 sets the 789A-3 into internal program mode. See the Programming Sample for more details.

Command*			Description	Result(s)
ASCII	DECIMAL	HEX		
S	83	53	Save	Stores parameters to non-volatile memory. Should be used if parameters had to be re-entered after "C1" command.
V	86	56	Scanning velocity	Sets scan speed in steps per second. Range = 36 sps to 60000 sps.(1)
X	88	58	Examine parameters	Sends values of "K", "I", and "V" parameters. Actual values may be slightly different than entered values. This is due to internal calibration to system clock oscillator.
]	93	5D	Read limit switch status	0 = No limit encountered. 32 = Home Limit Encountered. 64 = High limit encountered. 128 = Low limit encountered.
+	43	2B	Index scan in "up" direction	+36000 = Scan 36000 steps in upward direction. This scan usually results in 1 motor revolution. Max. value = 8388600.
-	45	2D	Index scan in "down" direction	-36000 = Scan 36000 steps in downward direction. This scan usually results in 1 motor revolution. Maximum value = 8388600.
^	94	5E	Read moving status	0 = No motion detected. 1 = Moving 2 = High in constant velocity. 16 = Slewing - Ramping complete.

Example – Homing Program

1) Apply power to 789A-4 Controller and send ASCII [Spacebar] to initialize the 789A-4 COM port.
2) See the Homing Table below.

Finding Home Position with Home Switch Blocked

Line	Command	Explanation	Notes
1	A8	Enable Home Circuit	
2	]	Check Limit Status	If Home Switch is blocked, bit 5 is active-response = 32 "Home" LED is lit.
3	M+23000	Move at constant velocity (23 KHz)	For a faster move, enter +3000000.
4	]	Check Limit Status	Send every 0.8 seconds until bit 5 clears.
5	@	Soft Stop	Stop when Homing flag is located.
6	-108000	Back into Home Switch 3 motor revolutions	
7	+72000	Go 2 motor revolutions up	Removes backlash
8	A24	Enable "High Accuracy" Circuit	
8	F1000,0	Find edge of Home Flag at 1000 steps/sec	Scan will stop when edge is found
9	A0	Disable Home Circuit	Necessary on monochromators with Home Switch inside optic chamber. Switch uses IR LED.

Finding Home Position with Home Switch Clear

Line	Command	Explanation	Notes
1	A8	Enable Home Circuit	
2	]	Check Limit Status	If Home Switch is clear, bit 5 is active- response = 0 "Home" LED is not lit.
3	M-23000	Move at constant velocity (23 KHz)	For a faster result, enter -3000000.
4	]	Check Limit Status	Send every 0.8 seconds until bit 5 is active
5	@	Soft Stop	Stop when Homing flag is located.
6	-108000	Back further into Home Switch 3 motor revolutions	
7	+72000	Go 2 motor revolutions up	Removes backlash
8	A24	Enable "High Accuracy" Circuit	
8	F1000,0	Find edge of Home Switch at 1000 steps/second	Scan will stop when edge is found

9	A0	Disable Home Circuit	Necessary on monochromators with Home Switch inside optic chamber. Switch uses IR LED.