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PIONEER MUNICIPAL HIGH INCOME TRUST

Form N-Q

September 29, 2008

OMB APPROVAL

OMB Number: 3235-0578

Expires: April 30, 2010

Estimated average burden
hours per response.....

10.5

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM N-Q

CERTIFIED SHAREHOLDER REPORT OF REGISTERED
MANAGEMENT INVESTMENT COMPANIES

Investment Company Act file number 811-21321

Pioneer Municipal High Income Trust
(Exact name of registrant as specified in charter)

60 State Street, Boston, MA 02109
(Address of principal executive offices) (ZIP code)

Dorothy E. Bourassa, Pioneer Investment Management, Inc.,
60 State Street, Boston, MA 02109
(Name and address of agent for service)

Registrant's telephone number, including area code: (617) 742-7825

Date of fiscal year end: April 30

Date of reporting period: July 31, 2008

Form N-Q is to be used by management investment companies, other than small business investment companies registered on Form N-5 (239.24 and 274.5 of this chapter), to file reports with the Commission, not later than 60 days after close of the first and third fiscal quarters, pursuant to Rule 30b1-5 under the Investment Company Act of 1940 (17 CFR 270.30b-5). The Commission may use the information provided on Form N-Q in its regulatory, disclosure review, inspection, and policymaking roles.

A registrant is required to disclose the information specified by Form N-Q, and the Commission will make this information public. A registrant is not required to respond to the collection of information contained in Form N-Q unless the Form displays a currently valid Office of Management and Budget ("OMB") control number. Please direct comments concerning the accuracy of the information collection burden estimate and any suggestions for reducing the burden to Secretary, Securities and Exchange Commission, 450 Fifth Street, NW, Washington, DC 20549-0609. The OMB has reviewed this collection of information under the clearance requirements of 44 U.S.C. ss. 3507.

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ITEM 1. Schedule of Investments.

Pioneer Municipal High Income Trust
SCHEDULE OF INVESTMENTS 7/31/08 (unaudited)

Principal Amount (\$)		Value (\$)
	TAX EXEMPT OBLIGATIONS - 129.0% of Net Assets	
	Alabama - 1.3%	
1,500,000	Camden Alabama Industrial Development Board, 6.125%,	1,462,860
1,000,000	Huntsville-Redstone Village Special Care Facilities F	847,610
2,000,000	Huntsville-Redstone Village Special Care Facilities F	1,583,660
		3,894,130
	Arizona - 2.1%	
5,000,000	Apache County Industrial Development Authority, 5.85%	4,775,550
980,000	Pima County Industrial Development Authority, 7.25%,	1,004,304
500,000	Yavapai County Industrial Development Authority, 6.0%	496,800
		6,276,654
	California - 5.9%	
5,150,000 +	Golden State Tobacco Securitization Corp., 7.8%, 6/1/	6,110,114
7,000,000 +	Golden State Tobacco Securitization Corp., 7.875%, 6/	8,327,130
2,500,000	University of California Revenue, 5.0%, 5/15/25	2,530,575
655,000	Valley Health System Hospital Revenue, 6.5%, 5/15/25	480,639
		17,448,458
	Connecticut - 5.1%	
10,335,00 (a)	Lehman Municipal Trust Receipts, RIB, 8.573%, 7/1/42	10,636,369
5,000,000	Mohegan Tribe Indians Gaming Authority, 6.25%, 1/1/31	4,531,500
		15,167,869
	Delaware - 0.4%	
765,000	Sussex County Delaware Revenue, 5.9%, 1/1/26	691,682
600,000	Sussex County Delaware Revenue, 6.0%, 1/1/35	524,928
		1,216,610
	District of Columbia - 3.6%	
5,000,000	District of Columbia Tobacco Settlement Financing Cor	4,714,350
6,000,000	District of Columbia Tobacco Settlement Financing Cor	5,937,180
		10,651,530
	Florida - 6.4%	
2,000,000	Beacon Lakes Community Development, 6.9%, 5/1/35	1,888,320
7,000,000 (a)	Lehman Municipal Trust Receipts, RIB, 8.16%, 11/1/39	7,190,470
2,500,000	Liberty County Subordinate Revenue, 8.25%, 7/1/28	2,461,375
1,000,000	St. Johns County Industrial Development Authority Rev	839,080
2,000,000	St. Johns County Industrial Development Authority Rev	1,550,880
5,000,000	Tallahassee Health Facilities Revenue, 6.375%, 12/1/3	5,033,250
		18,963,375
	Georgia - 6.6%	
4,240,000 (a)	Atlanta Georgia Water & Waste Revenue, RIB, 8.049%, 1	3,967,877
2,400,000	Fulton County Residential Care Facilities Revenue, 5.	1,957,080
2,600,000	Fulton County Residential Care Facilities Revenue, 5.	1,980,342
7,500,000	Main Street Natural Gas Project Revenue, 6.25%, 7/15/	6,775,350
4,500,000	Main Street Natural Gas Project Revenue, 6.375%, 7/15	4,102,290
1,000,000	Rockdale County Development Authority Revenue, 6.125%	954,780
		19,737,719
	Guam - 1.5%	
5,000,000	Northern Mariana Islands, 5.0%, 10/1/22	4,370,800
	Idaho - 1.6%	
5,000,000	Power County Industrial Development Corp., 6.45%, 8/1	4,904,400

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	Illinois - 5.6%	
1,000,000	Centerpoint Intermodal Center, 8.0%, 6/15/23 (144A)	913,550
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/15/27	910,630
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/15/39	871,350
1,500,000	Illinois Health Facilities Authority Revenue, 6.9%, 1	1,137,150
16,880,00 (b)	Metropolitan Pier & Exposition Authority Dedicated St	11,387,923
1,800,000	Southwestern Illinois Development Authority Revenue,	1,584,828
		16,805,431
	Indiana - 3.3%	
5,000,000	Indiana Health & Educational Facility Financing Autho	4,437,050
1,000,000	Indiana State Development Finance Authority Revenue,	939,340
4,300,000	Indiana State Development Finance Authority Revenue,	4,332,981
		9,709,371
	Louisiana - 2.0%	
1,500,000	Louisiana Local Government Environmental Facilities R	1,456,140
5,000,000	Louisiana Public Facilities Authority Revenue, 5.5%,	4,665,250
		6,121,390
	Massachusetts - 6.1%	
7,050,000	Massachusetts Health & Educational Facilities Authori	7,152,295
3,500,000	Massachusetts Health & Educational Facilities Authori	3,520,300
2,500,000	Massachusetts Health & Education Facilities Authority	2,362,625
5,000,000	Massachusetts Health & Educational Facilities Authori	4,990,350
		18,025,570
	Michigan - 3.2%	
950,000	Doctor Charles Drew Academy, 5.7%, 11/1/36	639,084
1,700,000	Flint Michigan Hospital Building Authority Revenue, 5	1,586,457
1,500,000	John Tolfree Health System Corp., 6.0%, 9/15/23	1,445,085
2,000,000	Michigan State Hospital Finance Authority Revenue, 5.	1,806,260
4,010,000	Michigan State Hospital Finance Authority Revenue, 6.	4,010,000
		9,486,886
	Minnesota - 2.3%	
1,675,000	Duluth Economic Development Authority Health Care Fac	1,739,069
1,500,000	North Oaks Senior Housing Revenue, 6.0%, 10/1/33	1,384,905
2,000,000	North Oaks Senior Housing Revenue, 6.125%, 10/1/39	1,856,760
2,000,000	North Oaks Senior Housing Revenue, 6.5%, 10/1/47	1,955,400
		6,936,134
	Mississippi - 1.0%	
3,000,000	Mississippi Business Finance Corp. Pollution Control	2,885,040
	Montana - 0.4%	
1,600,000	Two Rivers Authority, Inc. Correctional Facility Impr	1,146,592
	Nebraska - 0.7%	
2,000,000	Grand Island Solid Waste Disposal Facilities Revenue,	1,988,800
	Nevada - 1.5%	
4,600,000	Clark County Industrial Development Revenue, 5.5%, 10	3,915,198
2,000,000	Nevada State Department of Business & Industry, 7.25%	575,760
		4,490,958
	New Jersey - 9.5%	
2,000,000	New Jersey Economic Development Authority Revenue, 6.	1,575,460
13,350,000	New Jersey Economic Development Authority Revenue, 6.	9,564,340
1,000,000	New Jersey Economic Development Authority Revenue, 6.	763,580
6,150,000	New Jersey Economic Development Authority Revenue, 7.	4,804,749
10,000,00 +	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	11,619,800
		28,327,929
	New Mexico - 1.4%	
1,500,000	Otero County New Mexico Project Revenue, 6.0%, 4/1/23	1,389,540
2,960,000	Otero County New Mexico Project Revenue, 6.0%, 4/1/28	2,628,776
		4,018,316
	New York - 9.5%	
2,500,000	Albany New York Industrial Development Agency Civic F	2,380,400

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2,000,000	Nassau County New York Industrial Development Agency	1,972,860
2,000,000	New York City Industrial Development Agency, 5.375%,	1,837,640
12,990,000	New York City Industrial Development Agency, 6.9%, 8/	5,849,657
7,040,000 (a)	New York State Dormitory Authority Revenue, RIB, 9.97	7,920,986
2,000,000	Suffolk County Industrial Development Agency, 7.25%,	2,035,660
6,000,000	Triborough Bridge & Tunnel Authority Revenue, 5.25%,	6,115,920
		28,113,123
	North Carolina - 2.2%	
4,030,000	Charlotte North Carolina Special Facilities Revenue,	2,697,642
4,600,000	Charlotte North Carolina Special Facilities Revenue,	3,952,596
		6,650,238
	Oklahoma - 7.0%	
3,000,000 +	Oklahoma Development Finance Authority Revenue, 5.625	3,139,260
8,000,000 +	Oklahoma Development Finance Authority Revenue, 5.625	8,371,360
4,100,000	Tulsa Municipal Airport Revenue, 5.65%, 12/1/35	4,051,005
1,225,000	Tulsa Municipal Airport Revenue, 6.25%, 6/1/20	965,276
4,350,000	Tulsa Municipal Airport Revenue, 7.35%, 12/1/11	4,119,059
		20,645,960
	Pennsylvania - 7.3%	
3,000,000	Allegheny County Hospital Development Authority Reven	2,382,180
1,550,000	Allegheny County Hospital Development Authority Reven	1,459,278
12,300,00 +	Allegheny County Hospital Development Authority Reven	14,361,357
1,000,000	Columbia County Hospital Authority Health Care Revenu	832,560
925,000	Hazleton Health Services Authority Hospital Revenue,	870,221
1,280,000	Langhorne Manor Borough Higher Education & Health Aut	1,233,587
500,000	Pennsylvania Higher Educational Facilities Authority	477,795
		21,616,978
	Rhode Island - 1.3%	
4,000,000	Central Falls Detention Facilities Revenue, 7.25%, 7/	4,009,600
	South Carolina - 2.3%	
5,185,000 +	South Carolina Jobs Economic Development Authority Re	5,926,196
665,000 +	South Carolina Jobs Economic Development Authority Re	757,428
		6,683,624
	Tennessee - 3.7%	
7,000,000 +	Johnson City Health & Educational Facilities Board Ho	8,296,400
2,480,000	Knox County Health Educational & Housing Facilities B	2,579,051
		10,875,451
	Texas - 14.6%	
1,345,000	Bexar County Housing Finance Corp., 8.0%, 12/1/36	1,335,814
1,000,000	Dallas-Fort Worth International Airport Revenue, 6.0%	510,460
4,000,000	Decatur Hospital Authority Revenue, 7.0%, 9/1/25	4,023,200
1,000,000 +	Georgetown Health Facilities Development Corp., 6.25%	1,057,990
2,000,000	Gulf Coast Industrial Development Authority Revenue,	1,746,240
3,750,000	Houston Airport System Special Facilities Revenue, 5.	2,459,400
5,340,000	Lubbock Health Facilities Development Corp., 6.625%,	5,087,258
10,000,000	North Texas Tollway Authority Revenue, 5.75%, 1/1/33	9,718,500
2,450,000 (a)	Northside Independent School District, RIB, 9.169%, 6	2,491,944
500,000	Sabine River Authority Pollution Control Revenue, 6.1	402,770
7,040,000 (a)	Texas State, RIB, 9.134%, 4/1/30 (144A)	7,305,830
735,000 (c)	Willacy County Local Government Corp. Revenue, 6.0%,	751,420
1,500,000	Willacy County Local Government Corp. Revenue, 6.0%,	1,484,160
5,250,000	Willacy County Local Government Corp. Revenue, 6.875%	4,948,493
		43,323,479
	Utah - 0.2%	
800,000	Spanish Fork City Charter School Revenue, 5.55%, 11/1	703,128
	Vermont - 0.5%	
1,500,000	Vermont Educational & Health Buildings Financing Agen	1,549,740
	Virginia - 0.3%	
1,000,000	Peninsula Ports Authority, 6.0%, 4/1/33	938,850

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	Washington - 7.9%	
4,710,000	Spokane Public Facilities District Hotel/Motel Tax &	5,023,121
7,025,000	Tobacco Settlement Authority Revenue, 6.625%, 6/1/32	6,871,995
14,315,000	Washington State General Obligation, 0.0%, 6/1/22	7,065,455
5,000,000	Washington State Housing Finance Committee Nonprofit	4,529,850
		23,490,421
	Wisconsin - 0.7%	
2,400,000	Aztalan Wisconsin Exempt Facilities Revenue, 7.5%, 5/	2,005,752
	TOTAL TAX-EXEMPT OBLIGATIONS	
	(Cost \$385,918,633)	383,180,306
	MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 3.3% of Net Assets	
10,000,00 (d)	(Non-Profit Preferred Funding Trust I, 12.0%, 9/15/37 (9,654,600
	TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION	
	(Cost \$10,000,000)	9,654,600
Shares	COMMON STOCK - 0.6% of Net Assets	
194,770 (f)	Northwest Airlines Corp.	1,784,093
	TOTAL COMMON STOCK	
	(Cost \$6,612,756)	1,784,093
	TOTAL INVESTMENTS IN SECURITIES - 132.9%	
	(Cost \$402,531,389) (g) (h)	394,618,999
	OTHER ASSETS AND LIABILITIES - 1.1%	3,407,266
	PREFERRED SHARES AT REDEMPTION VALUE,	
	INCLUDING DIVIDENDS PAYABLE - (34.0)%	(101,014,388)
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0%	297,011,877
RIB	Residual Interest Bonds	
NR	Security not rated by S&P or Moody's.	
(144A)	Security is exempt from registration under Rule 144A of the Securities Act of 1933. Such securities may be resold normally to qualified institutional buyers in a transaction exempt from registration. At July 31, 2008 the value of these securities amounted to \$50,784,754 or 17.1% of net assets applicable to common shareowners.	
+	Prerefunded bonds have been collateralized by U.S. Treasury securities or U.S. Government Agencies which are held in escrow to pay interest and principal on the tax exempt issue and to retire the bonds in full at the earliest refunding date.	
(a)	The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown is the coupon rate at July 31, 2008.	
(b)	Debt obligation initially issued at one coupon which converts to a higher coupon at a specific date. The rate shown is the coupon rate at July 31, 2008.	
(c)	Escrow to maturity.	
(d)	The interest rate is subject to change periodically. The interest rate shown is the coupon rate at July 31, 2008.	

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- (e) Indicates a security that has been deemed illiquid. The aggregate cost of illiquid securities is \$10,000,000. The aggregate value \$9,654,600 represents 3.3% of the net assets.
- (f) Non-income producing.
- (g) The concentration of investments by type of obligation/market sector is as follows:

	Insured:		
		MBIA	
5.7%			
		FGIC	1.8
		FSA	1.0
		ACA	0.9
		AMBAC	0.7
	General Obligation		7.3
	Revenue Bonds:		
		Health Revenue	27.0
		Tobacco Revenue	11.1
		Airport Revenue	10.3
		Other Revenue	6.1
		Development Revenue	5.2
		Facilities Revenue	4.7
		Education Revenue	4.5
		Pollution Control Revenue	3.5
		Utilities Revenue	2.8
		Housing Revenue	2.8
		Transportation Revenue	2.6
		Gaming Revenue	1.2
		School District Revenue	0.6
		Power Revenue	0.2

100.0%

- (h) At July 31, 2008, the net unrealized loss on investments based on cost for federal income tax purposes of \$400,665,447 was as follows:

2	Aggregate gross unrealized gain for all investments i \$	
	there is an excess of value over tax cost	
(2	Aggregate gross unrealized loss for all investments i	
(there is an excess of tax cost over value	\$
	Net unrealized loss	
	For financial reporting purposes net unrealized loss on investments was \$(7,912,390) and cost of investments aggregated \$402,531,389	

ITEM 2. CONTROLS AND PROCEDURES.

(a) Disclose the conclusions of the registrant's principal executive officer or officers and principal financial officer or officers, or persons performing similar functions, about the effectiveness of the registrant's disclosure controls and procedures (as defined in Rule 30a-3(c) under the Act (17 CFR 270.30a-3(c))) as of a date within 90 days of the filing date of the report that includes the disclosure required by this paragraph, based on their

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evaluation of these controls and procedures required by Rule 30a-3(b) under the Act (17 CFR270.30a-3(b)) and Rule 13a-15(b) or 15d-15(b) under the Exchange Act (17 CFR240.13a-15(b) or 240.15d-15(b)).

The registrant's principal executive officer and principal financial officer have concluded that the registrant's disclosure controls and procedures are effective based on their evaluation of these controls and procedures as of a date within 90 days of the filing date of this report.

(b) Disclose any change in the registrant's internal controls over financial reporting (as defined in Rule 30a-3(d) under the Act (17 CFR270.30a-3(d)) that occurred during the registrant's last fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

There were no significant changes in the registrant's internal control over financial reporting that occurred during the second fiscal quarter of the period covered by this report that have materially affected, or are reasonably likely to materially affect, the registrant's internal control over financial reporting.

ITEM 3. EXHIBITS.

(a) A separate certification for each principal executive officer and principal financial officer of the registrant as required by Rule 30a-2 under the Act (17 CFR 270.30a-2).

Filed herewith.

SIGNATURES

[See General Instruction F]

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

(Registrant) Pioneer Municipal High Income Trust

By (Signature and Title)* /s/ John F. Cogan, Jr.
John F. Cogan, Jr, President

Date September 29, 2008

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By (Signature and Title)* /s/ John F. Cogan, Jr.
John F. Cogan, Jr., President

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Date September 29, 2008

By (Signature and Title)* /s/ Mark Bradley
Mark Bradley, Treasurer

Date September 29, 2008

* Print the name and title of each signing officer under his or her signature.