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PIONEER MUNICIPAL HIGH INCOME TRUST

Form N-Q

March 28, 2008

OMB APPROVAL

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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 811-21043

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: January 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 1/31/08 (unaudited)

Principal Amount		Value
	TAX EXEMPT OBLIGATIONS - 123.8% of Net Assets	
	Alabama - 1.3%	
1,500,000	Camden Alabama Industrial Development Board, \$	1,550,715
1,000,000	Huntsville-Redstone Village Special Care Facil	911,990
2,000,000	Huntsville-Redstone Village Special Care Facil	1,762,340
	\$	4,225,045
	Arizona - 5.4%	
5,000,000	Apache County Industrial Development Authorit\$	4,930,050
5,000,000	Apache County Industrial Development Authority	4,906,450
7,000,000	(a)Downtown Phoenix Hotel Corp., RIB, 5.646%, 7/1	6,488,510
980,000	Pima County Industrial Development Authority,	1,031,107
500,000	Yavapai County Industrial Development Authorit	515,790
	\$	17,871,907
	California - 6.2%	
5,150,000	+ Golden State Tobacco Securitization Corp., 7.\$	6,369,108
7,000,000	+ Golden State Tobacco Securitization Corp., 7.8	8,681,610
2,500,000	University of California Revenue, 5.0%, 5/15/2	2,572,950
5,000,000	Valley Health System Hospital Revenue, 6.5%, 5	2,925,000
	\$	20,548,668
	Connecticut - 1.5%	
5,000,000	Mohegan Tribe Indians Gaming Authority, 6.25%\$	5,028,900
	Delaware - 0.4%	
765,000	Sussex County Delaware Revenue, 5.9%, 1/1/26 \$	746,464
600,000	Sussex County Delaware Revenue, 6.0%, 1/1/35	569,340
	\$	1,315,804
	District of Columbia - 3.4%	
5,000,000	District of Columbia Tobacco Settlement Finan\$	5,144,300
6,000,000	District of Columbia Tobacco Settlement Financ	6,130,920
	\$	11,275,220
	Florida - 2.9%	
2,000,000	Beacon Lakes Community Development, 6.9%, 5/1\$	1,992,400
1,000,000	St. Johns County Industrial Development Author	904,550
2,000,000	St. Johns County Industrial Development Author	1,746,780
5,000,000	Tallahassee Health Facilities Revenue, 6.375%,	5,103,700
	\$	9,747,430
	Georgia - 2.9%	
4,240,000	(a)Atlanta Georgia Water & Waste Revenue, RIB, 1\$	4,582,889
2,400,000	Fulton County Residential Care Facilities Reve	2,053,152
2,600,000	Fulton County Residential Care Facilities Reve	2,150,408
1,000,000	Rockdale County Development Authority Revenue,	980,220
	\$	9,766,669
	Guam - 1.4%	
5,000,000	Northern Mariana Islands, 5.0%, 10/1/22 \$	4,735,700
	Idaho - 1.5%	
5,000,000	Power County Industrial Development Corp., 6.\$	5,113,050
	Illinois - 6.0%	
1,000,000	Centerpoint Intermodal Center, 8.0%, 6/15/23 \$	970,860
2,000,000	Chicago Illinois O'Hare International Airport	1,994,260
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/1	966,220

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1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/1	949,710
1,500,000	Illinois Health Facilities Authority Revenue,	1,334,580
16,880,000	(b)Metropolitan Pier & Exposition Authority Dedic	11,976,529
1,800,000	Southwestern Illinois Development Authority Re	1,694,556
	\$	19,886,715
	Indiana - 3.0%	
5,000,000	Indiana Health & Educational Facility Financi\$	4,787,350
1,000,000	Indiana State Development Finance Authority Re	1,004,920
4,300,000	Indiana State Development Finance Authority Re	4,334,873
	\$	10,127,143
	Louisiana - 1.5%	
5,000,000	Louisiana Public Facilities Authority Revenue\$	5,029,550
	Maryland - 1.5%	
5,000,000	Maryland State Health & Higher Educational Fa\$	4,933,000
	Massachusetts - 9.0%	
3,000,000	Massachusetts Bay Transportation Authority, 5\$	3,336,300
7,050,000	Massachusetts Health & Educational Facilities	7,409,127
3,500,000	Massachusetts Health & Educational Facilities	3,639,580
5,000,000	Massachusetts Health & Educational Facilities	5,213,850
9,810,000	(a)Massachusetts State Development Finance Agency	10,541,335
	\$	30,140,192
	Michigan - 3.0%	
950,000	Doctor Charles Drew Academy, 5.7%, 11/1/36	\$ 834,869
1,700,000	Flint Michigan Hospital Building Authority Rev	1,656,531
1,500,000	John Tolfree Health System Corp., 6.0%, 9/15/2	1,515,420
2,000,000	Michigan State Hospital Finance Authority Reve	1,835,420
4,010,000	Michigan State Hospital Finance Authority Reve	4,012,085
7,720,000	Wayne Charter County Special Airport Facilitie	-
	\$	9,854,325
	Minnesota - 2.2%	
1,675,000	Duluth Economic Development Authority Health \$	1,750,810
1,500,000	North Oaks Senior Housing Revenue, 6.0%, 10/1/	1,472,895
2,000,000	North Oaks Senior Housing Revenue, 6.125%, 10/	1,981,840
2,000,000	North Oaks Senior Housing Revenue, 6.5%, 10/1/	2,042,920
	\$	7,248,465
	Mississippi - 0.9%	
3,000,000	Mississippi Business Finance Corp. Pollution \$	3,015,000
	Montana - 0.4%	
1,600,000	Two Rivers Authority, Inc. Correctional Facil\$	1,175,920
	Nevada - 2.1%	
1,000,000	Clark County Industrial Development Revenue, \$	1,045,010
4,600,000	Clark County Industrial Development Revenue, 5	4,247,134
2,000,000	Nevada State Department of Business & Industry	1,600,020
	\$	6,892,164
	New Hampshire - 0.9%	
3,000,000	Manchester School Facilities Revenue, 5.125%, \$	3,089,970
	New Jersey - 10.1%	
2,000,000	New Jersey Economic Development Authority Rev\$	1,932,620
13,350,000	New Jersey Economic Development Authority Reve	12,508,950
1,000,000	New Jersey Economic Development Authority Reve	958,990
6,150,000	New Jersey Economic Development Authority Reve	6,195,080
10,000,000	+ Tobacco Settlement Financing Corp., 6.75%, 6/1	11,984,900
	\$	33,580,540
	New Mexico - 1.3%	
1,500,000	Otero County New Mexico Project Revenue, 6.0%\$	1,455,015
2,960,000	Otero County New Mexico Project Revenue, 6.0%,	2,834,378
	\$	4,289,393

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	New York - 12.4%	
2,500,000	Albany New York Industrial Development Agency\$	2,463,500
2,000,000	Nassau County New York Industrial Development	2,034,600
2,000,000	New York City Industrial Development Agency, 5	2,003,640
12,990,000	New York City Industrial Development Agency, 6	12,721,367
5,000,000	New York City Trust Cultural Resources Revenue	5,113,300
7,040,000	(a)New York State Dormitory Authority Revenue, RI	8,691,373
2,000,000	Suffolk County Industrial Development Agency,	2,051,400
6,000,000	Triborough Bridge & Tunnel Authority Revenue,	6,282,720
	\$	41,361,900
	North Carolina - 2.5%	
4,030,000	Charlotte North Carolina Special Facilities R\$	3,618,980
4,600,000	Charlotte North Carolina Special Facilities Re	4,729,214
	\$	8,348,194
	Oklahoma - 6.4%	
3,000,000	+ Oklahoma Development Finance Authority Revenu\$	3,183,600
8,000,000	+ Oklahoma Development Finance Authority Revenue	8,489,600
4,100,000	Tulsa Municipal Airport Revenue, 5.65%, 12/1/3	4,078,024
1,225,000	Tulsa Municipal Airport Revenue, 6.25%, 6/1/20	1,186,057
4,350,000	Tulsa Municipal Airport Revenue, 7.35%, 12/1/1	4,352,567
	\$	21,289,848
	Pennsylvania - 6.8%	
3,000,000	Allegheny County Hospital Development Authori\$	2,598,000
1,550,000	Allegheny County Hospital Development Authorit	1,550,046
12,300,000	+ Allegheny County Hospital Development Authorit	14,733,309
1,000,000	Columbia County Hospital Authority Health Care	883,580
1,000,000	Hazleton Health Services Authority Hospital Re	985,960
1,280,000	Langhorne Manor Borough Higher Education & Hea	1,287,296
500,000	Pennsylvania Higher Educational Facilities Aut	503,270
	\$	22,541,461
	Rhode Island - 1.3%	
4,000,000	Central Falls Detention Facilities Revenue, 7\$	4,267,120
	South Carolina - 2.1%	
5,185,000	+ South Carolina Jobs Economic Development Auth\$	6,114,567
665,000	+ South Carolina Jobs Economic Development Autho	782,366
	\$	6,896,933
	Tennessee - 3.3%	
7,000,000	Johnson City Health & Educational Facilities \$	8,530,200
2,480,000	Knox County Health Educational & Housing Facil	2,597,850
	\$	11,128,050
	Texas - 11.3%	
1,345,000	Bexar County Housing Finance Corp., 8.0%, 12/\$	1,377,993
1,000,000	Dallas-Fort Worth International Airport Revenu	943,720
4,000,000	Decatur Hospital Authority Revenue, 7.0%, 9/1/	4,140,000
1,000,000	+ Georgetown Health Facilities Development Corp.	1,080,120
2,000,000	Gulf Coast Industrial Development Authority Re	1,880,100
3,750,000	Houston Airport System Special Facilities Reve	3,334,050
5,340,000	Lubbock Health Facilities Development Corp., 6	5,401,036
2,450,000	(a)Northside Independent School District, RIB, 10	2,740,374
500,000	Sabine River Authority Pollution Control Reven	469,020
7,040,000	(a)Texas State, RIB, 10.068%, 4/1/30 (144A)	7,875,789
1,365,000	(c)Willacy County Local Government Corp. Revenue,	1,392,901
1,500,000	Willacy County Local Government Corp. Revenue,	1,509,975
5,250,000	Willacy County Local Government Corp. Revenue,	5,403,720
	\$	37,548,798
	Utah - 0.2%	
800,000	Spanish Fork City Charter School Revenue, 5.5\$	760,712
	Vermont - 0.5%	
1,500,000	Vermont Educational & Health Buildings Financ\$	1,637,175

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	Virginia - 0.3%		
1,000,000	Peninsula Ports Authority, 6.0%, 4/1/33	\$	1,026,810
	Washington - 7.3%		
4,710,000	Spokane Public Facilities District Hotel/Motel	\$	5,124,574
7,025,000	Tobacco Settlement Authority Revenue, 6.625%,		7,170,839
14,315,000	Washington State General Obligation, 0.0%, 6/1		7,438,217
5,000,000	Washington State Housing Finance Committee Non		4,687,350
		\$	24,420,980
	Wisconsin - 0.6%		
2,400,000	Aztalan Wisconsin Exempt Facilities Revenue,	\$	2,138,376
	TOTAL TAX-EXEMPT OBLIGATIONS		
	(Cost \$384,745,017)	\$	412,257,127
	MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 2.9% of Net Assets		
10,000,000 (d)	Non-Profit Preferred Funding Trust I, Series	\$	9,652,500
	TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION		
	(Cost \$10,000,000)	\$	9,652,500
Shares	COMMON STOCK - 1.0% of Net Assets		
184,048	Northwest Airlines Corp.	\$	3,443,538
	TOTAL COMMON STOCK		
	(Cost \$6,612,756)	\$	3,443,538
	TAX-EXEMPT MONEY MARKET MUTUAL FUND - 1.3% of Net Assets		
4,278,574	BlackRock Liquidity Funds MuniFund Portfolio	\$	4,278,574
	TOTAL TAX-EXEMPT MONEY MARKET MUTUAL FUND		
	(Cost \$4,278,574)	\$	4,278,574
	TOTAL INVESTMENTS IN SECURITIES - 129.0%		
	(Cost \$405,636,347) (e) (f)	\$	429,631,739
	OTHER ASSETS AND LIABILITIES - 1.3%	\$	4,436,109
	PREFERRED SHARES AT REDEMPTION VALUE,		
	INCLUDING DIVIDENDS PAYABLE - (30.3)%	\$	-101,012,956
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS	-\$	333,054,892

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 January 31, 2008 the value of these securities amounted to \$42,651,842 or 12.8% 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 rate at January 31, 2008.

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(b) Debt obligation initially issued at one coupon which converts to a higher coupon at a specific date.

The rate shown is the rate at January 31, 2008.

(c) Escrow to maturity.

(d) The interest rate is subject to change periodically. The interest rate shown is the rate at January 31, 2008.

(e) The concentration of investments by type of obligation/market sector is as follows:

Insured	13%
General Obligation	7
Revenue Bonds:	
Health Revenue	27
Airport Revenue	12
Tobacco Revenue	11
Development Revenue	5
Pollution Control Revenue	5
Facilities Revenue	5
Education Revenue	4
Housing Revenue	3
Power Revenue	3
Other Revenue	2
Transportation Revenue	1
Gaming Revenue	1
School District Revenue	1
Utilities Revenue	0
	100%

(f) At January 31, 2008, the net unrealized gain on investments based on cost for federal income tax purposes of \$403,825,220 was as follows:

Aggregate gross unrealized gain for all invest\$ 36,777,359  
there is an excess of value over tax cost

Aggregate gross unrealized loss for all invest (10,970,840)  
there is an excess of tax cost over value \$ 25,806,519  
Net unrealized gain

For financial reporting purposes net unrealized gain on investments was \$23,995,392 and cost of investments aggregated \$405,636,347.

### 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 evaluation of these controls and procedures required by Rule 30a-3(b) under the Act (17 CFR 270.30a-3(b)) and Rule 13a-15(b) or 15d-15(b) under the Exchange Act (17 CFR 240.13a-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

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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 March 31, 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

Date March 31, 2008

By (Signature and Title)\* /s/ Vincent Nave

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Vincent Nave, Treasurer

Date March 31, 2008

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