Scintillator Products, Inc.

RB-208/210 OPERATOR'S MANUAL

Published: 7-22-03
Revision: 1.0

Rexon Components, Inc.
24500 Highpoint Road
Beachwood, Ohio 44122-1022

Phone: (216)292-7373
Fax: (216)292-7714
E-mail: rexonsales@rexon.com
Visit us at www.rexon.com

REXON
Scintillator Products, Inc.

MODEL RB-208/210 Series Integrated PMT Base

The Rexon Model RB-200 series Integrated PMT Base provides a simple solution for a reliable interface to photomultiplier tubes (PMT). The unit provides a high speed, low noise preamplifier, regulated, low ripple high voltage power supply and divider network is suitable for use in a wide variety of scintillation detector applications. The low noise design of the HV supply eliminates spurious counts often associated with lower quality units while eliminating the need for a costly external supply and associated cabling The PMT socket is a standard 14 pin configuration and is available for both 8-stage and 10-stage dynode configurations.

The RB-200 features a convenient, sub-miniature LCD that displays the HV setting. The HV supply can be adjusted either the locally or remotely. In addition, a logic level output signal indicates HV normal or fault status. The RB-200 features high stability and low ripple PMT bias supply necessary to meet the most demanding requirements.

The Integrated PMT Base provides an interface for use with a variety of MCA cards allowing remote control of the HV, monitoring of the HV supply status and low voltage supply direct from the MCA card.

Since the RB-200 provides all of the functionality necessary to properly bias the PMT, condition and drive the signal system integration becomes easy. Connection to the unit requires simply a low voltage power converter and a coax cable with a BNC connector. An internal jumper allows output impedance to be set for 50 ohms or 93 ohms to match the particular coax cable used.

The RB-200 is available in several versions. It can be supplied in either a 8-stage dynode or 10-stage dynode configuration. A preamplifier only version provides an SHV connector when external HV is used.

Both 120VAC/60Hz and 220VAC/50Hz power converters are available as well as a wide variety of international converters.

Consult our factory for other custom versions, configurations or gain selections.

Rexon Components, Inc.
24500 Highpoint Road
Beachwood, Ohio 44122-1022

Phone: (216)292-7373
Fax: (216)292-7714
E-mail: rexonsales@rexon.com
Visit us at www.rexon.com

REXON
Scintillator Products, Inc.

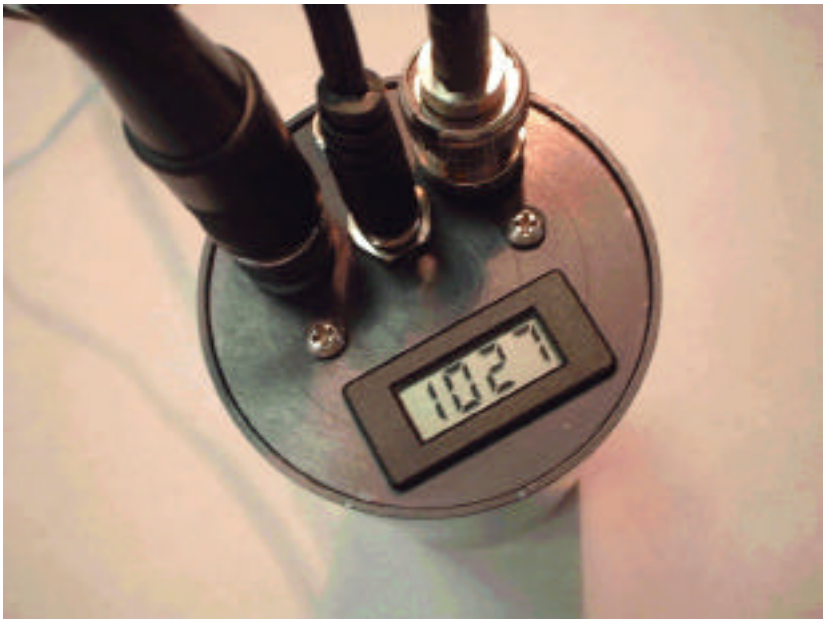


Figure 1: RB-200 SERIES CONNECTOR PANEL

Specifications

Display:	3.5 digit LCD
Display resolution:	1V
Voltage range:	0 to 2000VDC (positive)
Operator controls:	HV adjustment, remote/local selection (internal)
Signal connector:	BNC type
Output impedance:	50Ω or 93Ω
HV output current:	0 to 0.5mA
HV ripple (, full load, P-P):	<0.0005%
HV stability:	<0.005%/hr
HV Temperature coefficient (typ.):	<25ppm/°C
Operating temperature:	-10° to +50°C
	(85% RH max.)
Storage temperature:	-25° to +95°C
	(95% RH max.)
Power requirements:	120VAC/60Hz to 12VDC @ 300mA power converter (220VAC/50Hz available)

Rexon Components, Inc.
24500 Highpoint Road
Beachwood, Ohio 44122-1022

Phone: (216)292-7373
Fax: (216)292-7714
E-mail: rexonsales@rexon.com
Visit us at www.rexon.com

Scintillator Products, Inc.

	Direct from MCA (+12V)
Dimensions (Dia. x H):	2.2" x 5.4" (5.6 cm x 13.7 cm)
Weight:	0.8 lb (0.28 kg)

Set-up and connections:

All user connections are located on the RB-200 connector panel. The following section describes these connections.

POWER :
The RB-200 requires a 12VDC @ 300mA power supply which is supplied with the unit. The standard DC power jack (positive center pin) plugs directly into the base of the unit. There is no power switch, therefore the RB-200 turns on immediately when the power cord is connected.

SIGNAL OUTPUT:
The output signal from the RB-200 is available on the BNC connector. This signal is 50 ohm impedance and suitable for direct connection to most Multi-Channel Analyzers (MCA) or counters and a variety of other data acquisition systems. This output signal is positive polarity and its amplitude is controlled by adjusting the PMT high voltage supply. Standard RG-58 coaxial cable is normally used for this connection.

HV ADJUSTMENT:
The potentiometer on the connector panel allows the HV to be set by the user. The HV setting is indicated on the display (LCD).
CAUTION: It should be noted that some PMTs high voltage ratings that are considerably lower than the 2000V range of the HV supply. It is necessary that the user be aware of the maximum rating for the PMT used and that when making adjustment, be cautious not to exceed that rating.

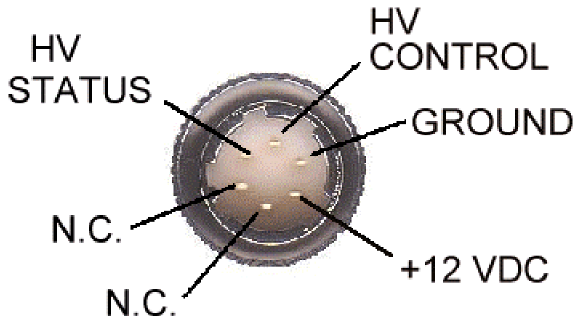
MCA CONNECTOR:
The MCA connector is provided for applications where it is desirable to supply power and input connections directly from the MCA. Although some MCA's provide this capability, others do not. Refer to the appropriate MCA Operator's Manual for interface requirements. As noted, the RB-200 requires 12VDC @ 300ma.

Rexon Components, Inc.
24500 Highpoint Road
Beachwood, Ohio 44122-1022

Phone: (216)292-7373
Fax: (216)292-7714
E-mail: rexonsales@rexon.com
Visit us at www.rexon.com

REXON

Scintillator Products, Inc.



MCA SIGNAL DESCRIPTION:

HV CONTROL:
This input signal, a positive, 0-5V signal, applied externally, via the MCA, to adjust the high voltage supply, thereby altering the overall gain of the unit. Internally, the REM/LOCAL switch must be placed in the REM (remote) position. This 0-5V signal controls the high voltage supply over it's entire, 0 to 2000V range.
CAUTION: It should be noted that some PMTs high voltage ratings that are considerably lower than the 2000V range of the HV supply. It is necessary that the user be aware of the maximum rating for the PMT used and that when making adjustment, be cautious not to exceed that rating.

HV STATUS:
This signal is a digital (0-5V) output indicating whether the HV supply greater than approximately 200VDC. This signal is pulled to ground when the HV is greater than 200V and is pulled high (10K ohms /+5V) when the supply has failed (below 200 VDC).

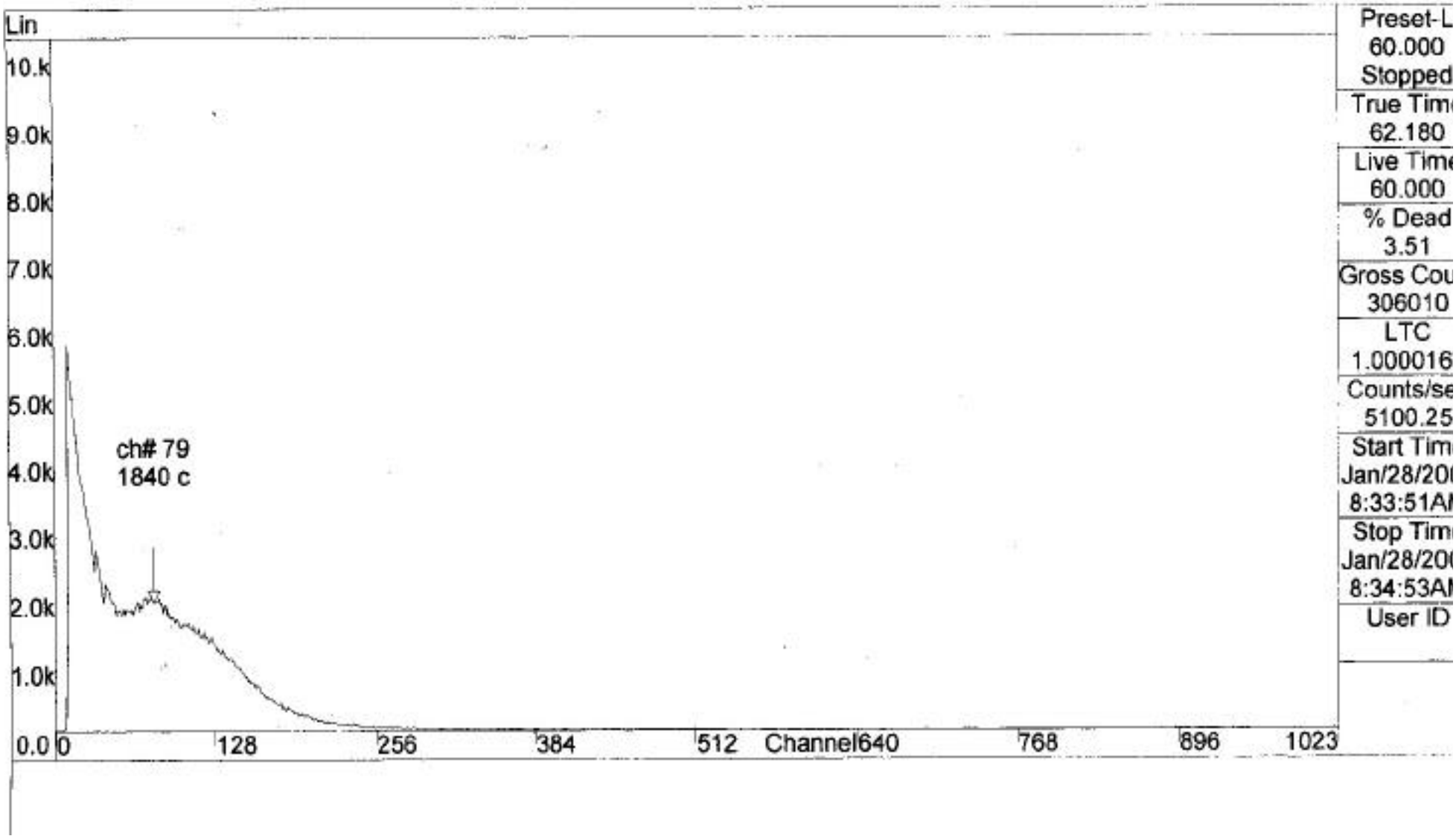
Operation:

After the appropriate connections have been made, plug in the power cord and apply power to the unit. The HV adjustment may be used to set the gain of the system. The user can verify that the gain is appropriate and that the signal amplitude is sufficient by observing the signal output on an oscilloscope. A combination of HV adjustment, to obtain optimum performance from the PMT and external gain adjustment, such as MCA input amplification, will provide a suitable spectrum for analysis purposes. In counter applications, the output signal needs to be high enough to exceed a threshold adjustment generally provided by the counter. Note, the output signal is an analog signal and as such, depending on gain and source energies, can vary greatly in amplitude. **Do not input directly to a device that requires a digital signal.**

REXON
Components, Inc.
24500 Highpoint Rd.
Beachwood, Oh 44122
Phone: (216) 292-7373
Fax: (216) 292-7714

Job No.	9671	**Analyser**	Aptec Stable
Customer	Amali Inc.	**Conv Gain**	1024
Type	PVT M51 PX 1000m/2-8B210	**Amp Gain**	MCA Card Bipolar 10x1 (R8210 internal)
Date	1-28-03	**PMT**	Rexon R00P (WE7878)
Tested By	KE	**Source**	Cs137 sole" approx 6" from PMT
Serial No	030128-1	**High Voltage**	1200

QA OK ☐ YES ☐ NO

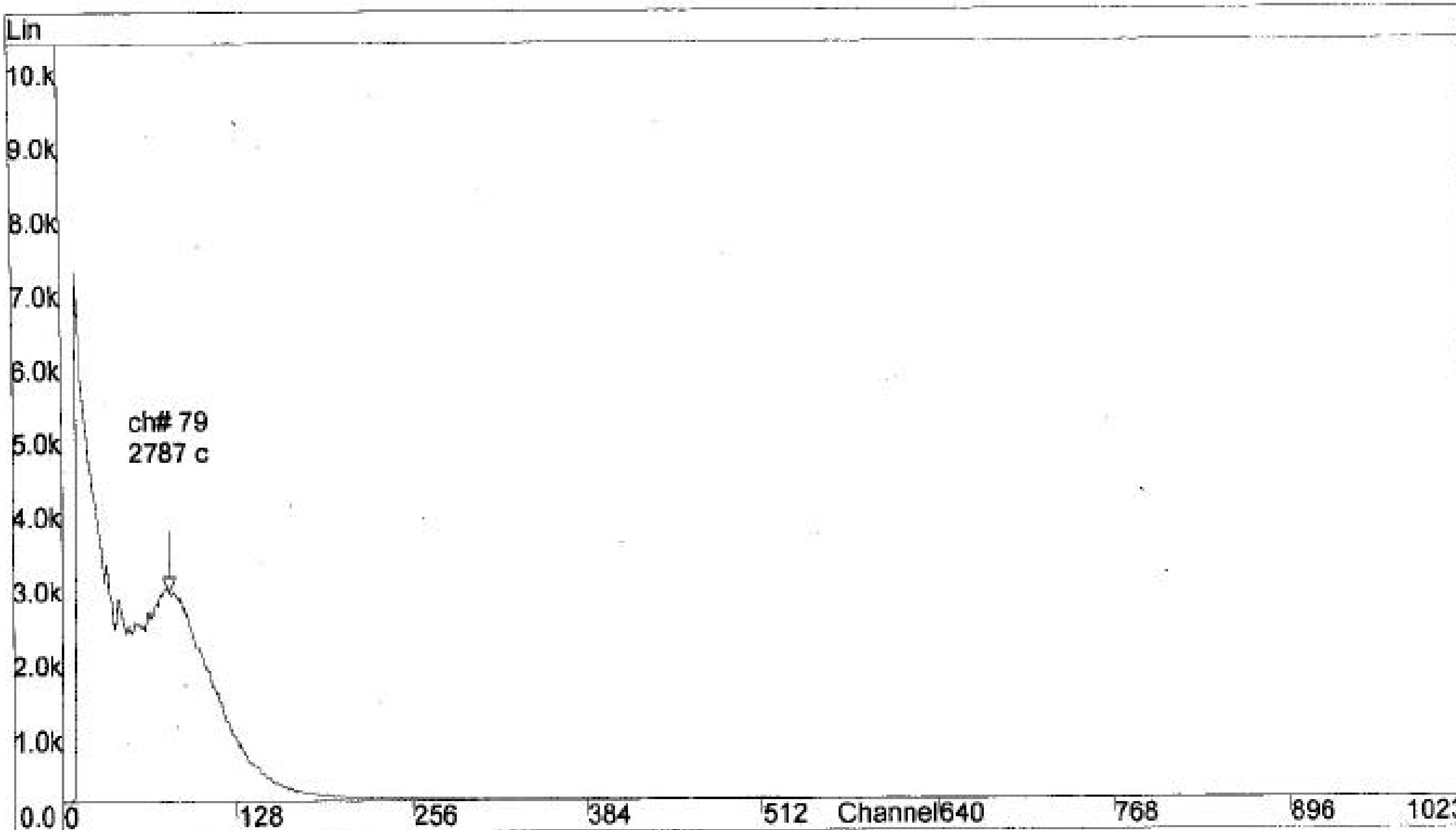


REXON
Components, Inc.
24500 Highpoint Rd.
Beachwood, Oh 44122
Phone: (216) 292-7373
Fax: (216) 292-7714

Job No.	9671	**Analyser**	Aptec S5016
Customer	Anjali Inc.	**Conv Gain**	1024
Type	PVT M51 PX1000m / 2RB210	**Amp Gain**	McAleard Bipolar 10x4 (RB210 Internal)
Date	1-28-03	**PMT**	Rexon 800P (WE7878)
Tested By	KE	**Source**	Cs137 5oc" Approx 18" from PMT
Serial No	030128-1	**High Voltage**	1200

QA OK

☐ YES
☐ NO

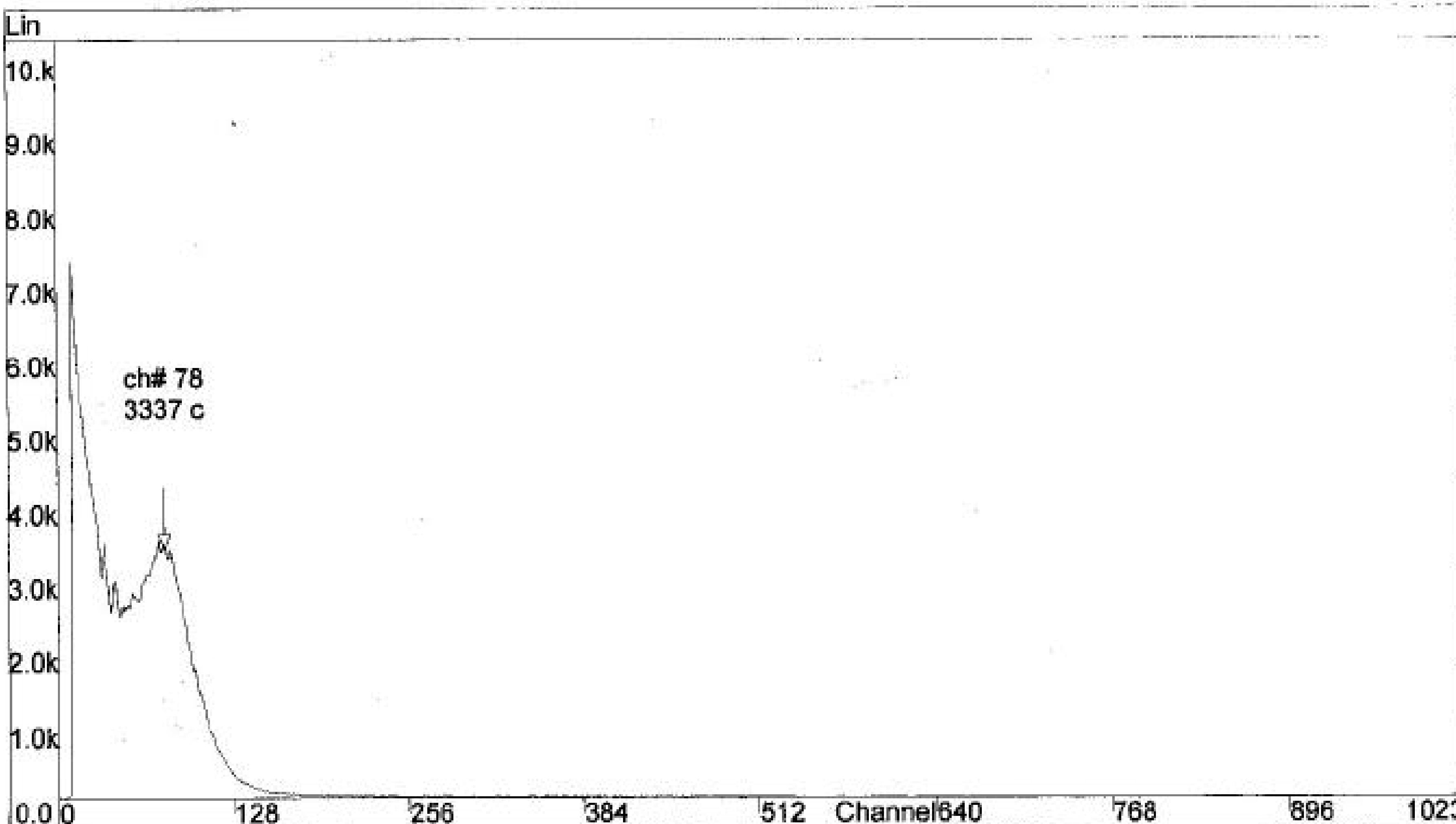


Preset-L
60.000
Stopped
True Tim
62.395
Live Tim
60.000
% Dead
3.84
Gross Cou
337132
LTC
1.000016
Counts/se
5618.96
Start Tim
Jan/28/20
8:37:25A
Stop Tim
Jan/28/20
8:38:28A
User ID

REXON
Components, Inc.
24500 Highpoint Rd.
Beachwood, Oh 44122
Phone: (216) 292-7373
Fax: (216) 292-7714

Job No.	9671	**Analyser**	Aptec-5016
Customer	Anjali Inc.	**Conv Gain**	1024
Type	PVT M51 9X1000M/2-PRS	**Amp Gain**	MCA Card Bipolar 1024 (PB210 Internal)
Date	1-28-03	**PMT**	Rexon 800P (W67878)
Tested By	KE	**Source**	CS137 5.06" Approx 34" from PMT
Serial No	030128-1	**High Voltage**	1200

QA OK ☐ YES ☐ NO



Preset-L
60.000
Stopped
True Tim
62.355
Live Time
60.000
% Dead
3.78
Gross Cou
331817
LTC
1.000016
Counts/se
5530.38
Start Tim
Jan/28/20
8:39:37A
Stop Tim
Jan/28/20
8:40:39A
User ID