

NEOS TECHNOLOGIES

A Gooch & Housego Company

OPERATING MANUAL

**POLYCHROMATIC ACOUSTO-OPTIC MODULATOR
EIGHT CHANNEL RF DRIVER**

FOR THE **48062** PCAOM

MODEL NUMBER:

64040-75-.1-8CH-16B

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SECTION I
INSPECTION PROCEDURE

Examine the shipping carton for damage. If the shipping carton or packing material is damaged it should be kept for the carrier's inspection. Check the contents of the shipment for completeness, mechanical damage, and then test the equipment electronically. Operating procedures are contained in Section VI. Notify the carrier and NEOS Technologies. If the contents are incomplete, or the equipment does not pass the electrical testing please notify NEOS Technologies.

If there is any problem with the use of this equipment, or if the equipment fails to function as expected contact NEOS Technologies, do not try to trouble shoot or repair this equipment. Consult with a NEOS service engineer. If the equipment needs repair

SECTION II DESCRIPTION

The 64040-75-.1-8CH-16B PCAOM driver generates the precise RF frequency to select the proper laser wavelength out of the light spectrum of a multi-wavelength laser. The driver has eight channels. The driver generates all RF signals by indirect synthesis. These wavelengths are factory set to cover all the common laser wavelengths in the visible spectrum. If requested NEOS will set the wavelengths as specified on a custom basis.

Each channel has 16 preset wavelengths to choose from. To change the wavelength selection for any or all channels, dial in the new wavelength and press the reset button. Each channel has an 8 KHz / step fine tuning control to accommodate for any variations in the PCAOM. Once the PCAOM Bragg angle is set for one wavelength, this angle adjustment should not be touched again. If the PCAOM efficiency at a different wavelength is not peaked as high as it should be, then dial the fine tune control on the driver and press the reset button. The output power (factory set) can be easily adjusted to set the diffraction efficiency to maximum. Each channel has an easy to access trimpot with a range adjustment of 50 to 200 mW.

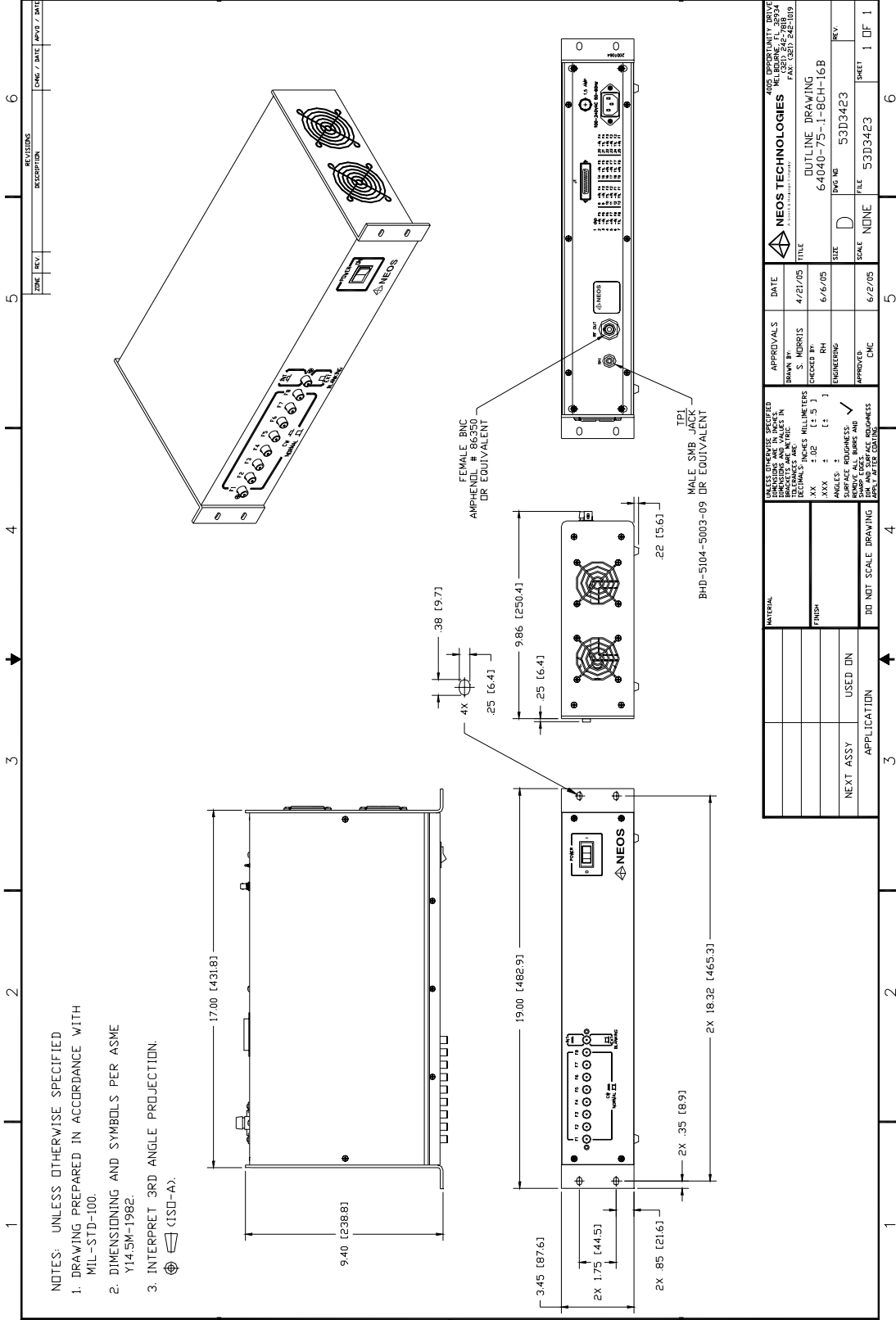
There are two ports for modulation input: a differential AM analog port and a TTL blanking port. The analog port is 0 to 5 Volts and can be either single ended or differential. Differential is used to cancel common mode noise. To use the input single ended, either ground the minus input and apply a positive signal to the plus input or ground the plus input and apply a negative signal to the minus input. The input impedance is high enough ($10K\Omega$) so that the driver can be easily driven from existing pc boards (refer to figure 2). The analog modulation has a RF extinction ratio of $> 60\text{dB}$. The TTL modulation extinction ratio is also $> 60\text{dB}$. The rise/fall time of the driver is 500 nanoseconds. For a 2.0mm beam in the PCAOM the system will support a modulation rate greater than 100 KHz.

The output sample port (TP1) provides a -20 dB sample of the actual output frequency. The pin-outs for the D connector are silk screened on the housing (Refer to figure 1 for pin outs). The system has a set of eight push button-CW/Normal switches, one for each of the eight wavelengths, to allow for testing when a computer or other modulating source is not available.

SECTION III
SPECIFICATIONS

<u>PARAMETER</u>	<u>SPECIFICATION</u>
Number of Channels	Eight
Frequency Stability	$\pm .01\%$
Power Out	50-200 mW
Wavelengths per Channel	16
Fine Tuning Range	+ 56 KHz, - 64 KHz in 8 KHz Steps
Analog Inputs (8)	0-5 Volts into 10K Ohms
Blanking Inputs (8)	TTL, 4.7K Ohms pull-ups. No input or HIGH is not Blanked.
Rise/Fall Time	500 ns Max
Extinction Ratio	Analog > 60 dB TTL > 60 dB
Power	100-240 VAC, 50-60Hz, 1.5A Maximum
Connectors:	
RF out:	BNC Female (mates with Amphenol P/N 69475)
Data in:	25 Pin D-Sub Female (mates with Panduit P/N IDM25PH5)
TP1(-20dB)	SMB Male (mates with ITT Cannon P/N B51-007-0000-220)
Outline Drawing:	53D3423

SECTION IV OUTLINE DRAWING



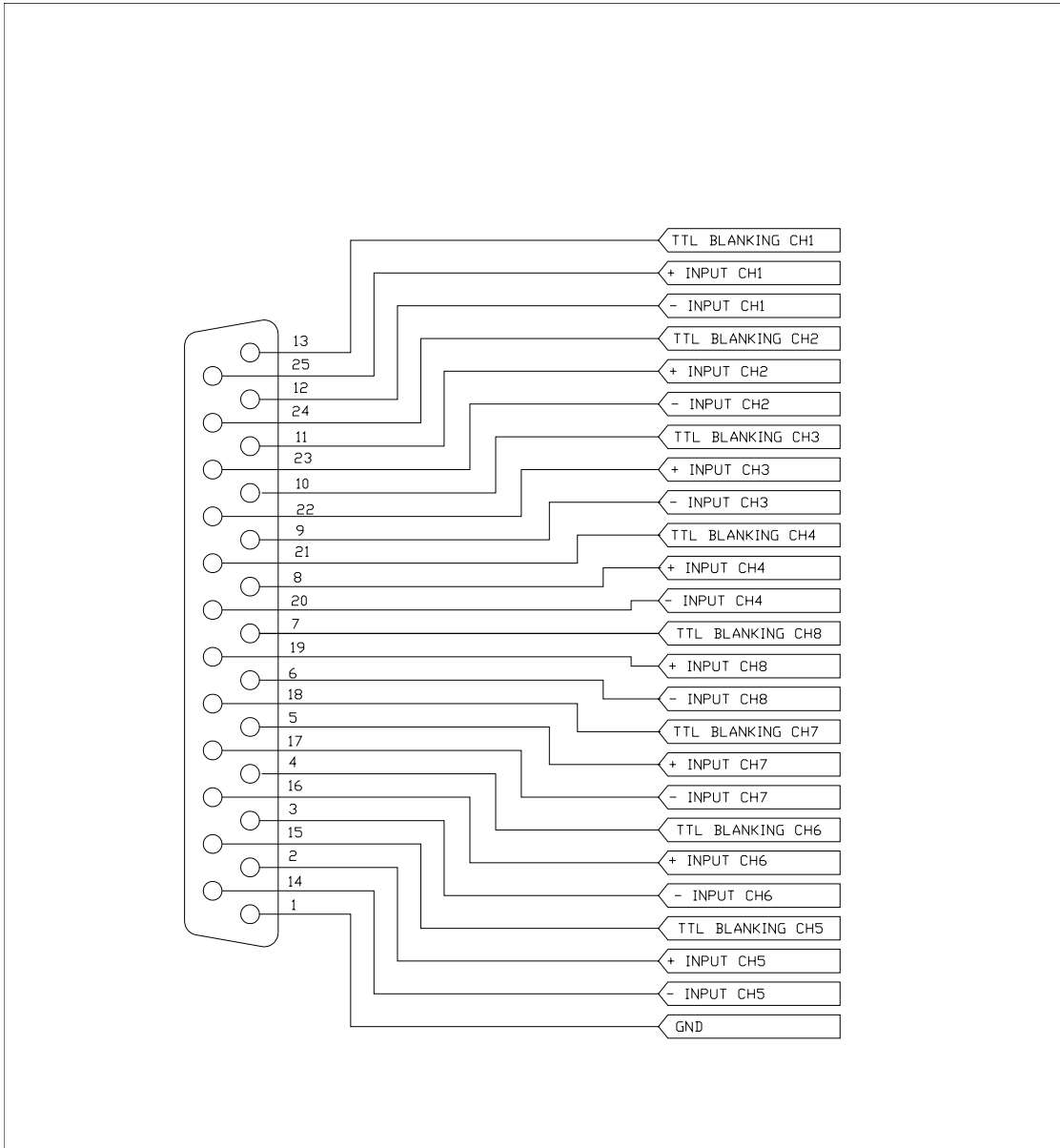


figure 1
 J1 PINOUT
 FEMALE DB 25

45A8212

SECTION V

CONTROLS AND CONNECTIONS

B. Front Panel Controls:

Push Buttons (F1-F8) – Turn on the selected wavelength, disables computer input.

INT Push Button selects the blanking mode:

- A. Internal – when the AM signal is less than approximately 150 mV the blanking is automatically engaged, no external blanking is required.
- B. External – A TTL low ($< 0.3V$) on the blanking input blanks the selected wavelength.

B. Inputs/Outputs: **J1** (See figure 1)

Blanking Modulation Input – This input accepts TTL level signals and modulates the carrier. When a TTL “1” or high is input to this port there is no blanking for the selected wavelength. When a TTL low “0” is input the selected wavelength is blanked.

AM Input – 0 to 5 Volts differential input with $10K\Omega$ input impedance. To use this input single ended ground one side “+” or “-” and apply the proper signal to other side.

TP1 – SMB Male – Provides a -20 dBc sample of the actual output frequency

RF OUTPUT – BNC female connector – Combined RF output of all eight channels.

C. Internal Controls on module:

Wavelength select (X8) – a 16 position switch. See list next page.

Fine Frequency Adjustment (X8) – a 16 position switch. + 56 KHz to - 64 KHz in 8 KHz Steps

Reset Button – Resets the synthesizer to the new selected frequency.

Output RF power adjustment (X8) – Counter clockwise is more RF power.

Note: The total RF power combined from all eight channels should not exceed 1.6 Watts CW.

SWITCH SETTINGS VS. WAVELENGTH FOR EACH CHANNEL
STANDARD WAVELENGTHS

(λ) SWITCH POSITION	WAVELENGTH nm	Frequency MHz
0	676*	47.17
1	647*	49.72
2	632	51.10
3	575	57.50
4	568*	58.35
5	530	63.75
6	528	64.04
7	520*	65.32
8	514*	66.39
9	501	68.69
A	496	69.69
B	488*	71.38
C	476*	73.85
D	472	74.67
E	465	76.29
F	457*	78.19

* Standard NEOS Factory settings

Note: Fine frequency adjustment is + 56 KHz to - 64 KHz in 8 KHz Steps from those frequencies listed.

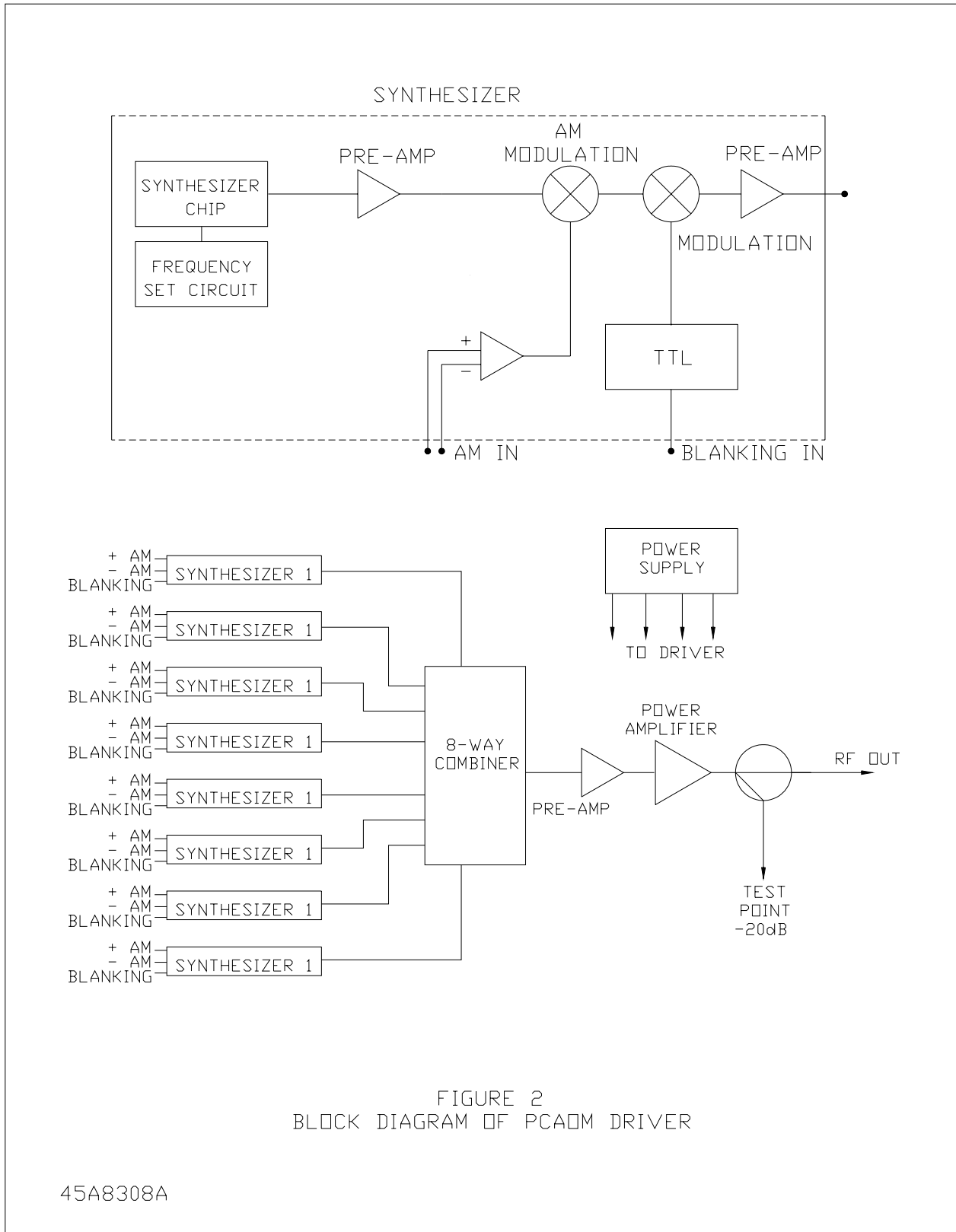


FIGURE 2
BLOCK DIAGRAM OF PCAOM DRIVER

45A8308A

SECTION VI

Testing Procedure:

1. Before applying power, connect the RF output to a load capable of dissipating 1 Watt or connect to a "good" PCAOM.
2. Apply 100-240VAC to the back panel and turn on the power switch.
3. Input proper modulation signal into driver or push the proper button on the front panel, then measure power and frequency for each channel or measure light for each wavelength and diffraction efficiency.
4. The unit is operating if 50 to 200 mW are output at the correct frequency from each channel. See the acceptance test report for this unit for frequency for each channel.

Operating Procedure:

1. Apply 100-240VAC to the back panel and turn on the power switch.
2. Input proper modulation signal into driver or push the proper button on the front panel so as to select the 488 nm wavelength.
3. Align the **48062** PCAOM to the laser beam (Horizontal Polarization Required) and adjust the Bragg angle to output maximum diffraction efficiency into the + First order beam (away from the connector).
4. Deselect the 488 nm wavelength.
5. Without readjusting the Bragg angle, select each of the seven other wavelengths, one at a time, and adjust the fine frequency adjustment for that wavelength: pressing the reset button each time for each position of the fine frequency adjustment switch. Adjust the power adjustment for each wavelength for maximum diffraction efficiency.
6. Apply the appropriate control signals to select the desired wavelengths and effects.

Wavelength Change:

Each channel has 16 preset wavelengths to choose from. The desired wavelength can be selected by changing (λ) switch to the desired wavelength and pushing the reset button. The fine tuning of the frequency is accomplished by adjusting the fine tune switch and pushing reset button.

NOTE: Never have two channels tuned to the same wavelength.