NEOS TECHNOLOGIES
A Gooch & Housego Company

OPERATING MANUAL

**POLYCHROMATIC ACOUSTO-OPTIC MODULATOR**
FOUR CHANNEL RF DRIVER
FOR THE **48058** PCAOM

MODEL NUMBER:

# 64048-80-.1-4CH-5

**DOCUMENT NUMBER: 51A17690**

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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 PCAOM driver generates the precise RF frequency to select the proper laser wavelength out of the visible light spectrum (refer to figure 1). The driver has four channels combined into one output. Each channel is factory set to cover the common laser wavelengths in the visible spectrum. Channel one has the capability of being switched between two different wavelengths with the push of a button. The standard configuration of wavelengths is as follows: Channel 1 – 647 nm or 632 nm, Channel 2 – 514 nm, Channel 3 – 488 nm, and Channel 4 – 476 nm. If requested NEOS will set the wavelengths as specified on a custom basis.

The extinction ratio must be high for most applications. There are two ports for modulation on each channel: an AM analog modulation port and a TTL blanking port. The TTL modulation extinction ratio is > 60dB. The TTL port turns off the RF output when a TTL low is applied. The analog modulation has an extinction ratio of > 60 dB. The analog port requires a 0 to 5 volt input. The control voltage transfer function is linear and the input impedance is 6KΩ, therefore the driver can be easily driven from existing pc boards. The rise/fall time of the driver is 100 nanoseconds. For a 2.0 mm beam in the PCAOM, the system will support a modulation rate greater than 100 KHz. The driver generates all RF signals by using crystal oscillators. The frequency is factory set and cannot be adjusted.

The system comes in a 1.71" x 6.18" x 19" rack mounted box and has a set of four push button CW / Normal switches to allow for testing when a computer or other modulating source is not available. The output power (factory set) can be easily adjusted. Each channel has a trimpot with a range adjustment of 50 to 250 mW accessible inside on the module. The channel 1 wavelength select button is accessible inside on the module. The pin outs for the D connector are silk screened on the housing (Refer to figure for pin out).

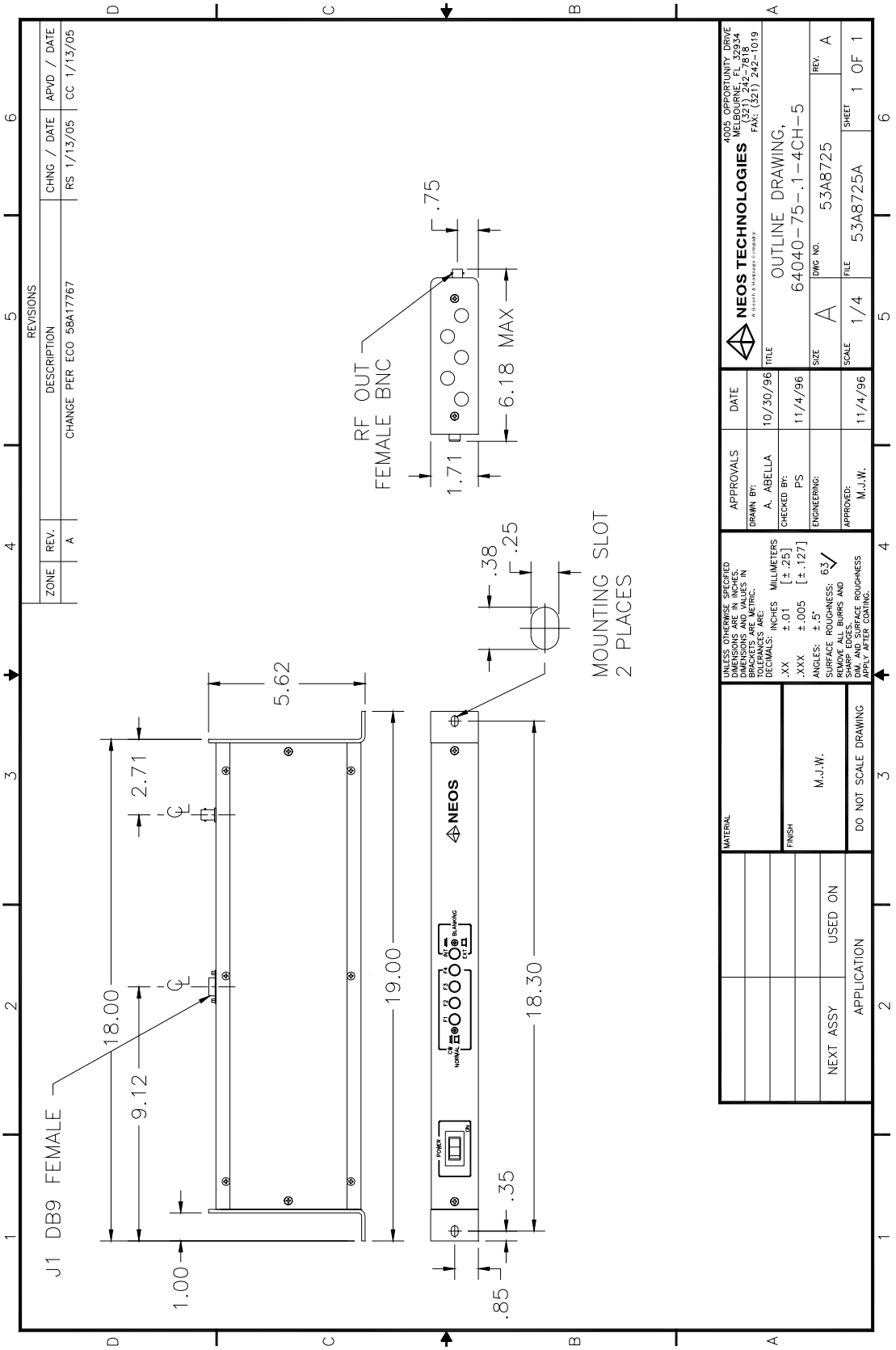
## SECTION III

## SPECIFICATIONS

| PARAMETER | SPECIFICATION |
|---|---|
| Number of Channels | Four |
| Frequency Stability | ±0.01% |
| Power Out | 40-200 mW / Channel |
| Wavelengths<br>*CH 1 wavelength selectable by switch | CH 1 647 nm or 632 nm<br>CH 2 514 nm<br>CH 3 488 nm<br>CH 4 476 nm |
| Analog Inputs (4) | 0 - 5 Volts into 6K Ohms |
| Blanking Inputs (4) | TTL, 4.7 K Ohms, no input or high is not blanked |
| Rise/Fall Time | 200 ns typical |
| Extinction Ratio | Analog > 60 dB<br>TTL > 60 dB |
| Power | 100 – 240 VAC 50 – 60 Hz 1.5 Amps |
| Connectors: | |
| RF out: | BNC Female |
| Data in: | 9 Pin D-Sub female |
| Outline Drawing | 53A8725 |

## SECTION IV

## OUTLINE DRAWING



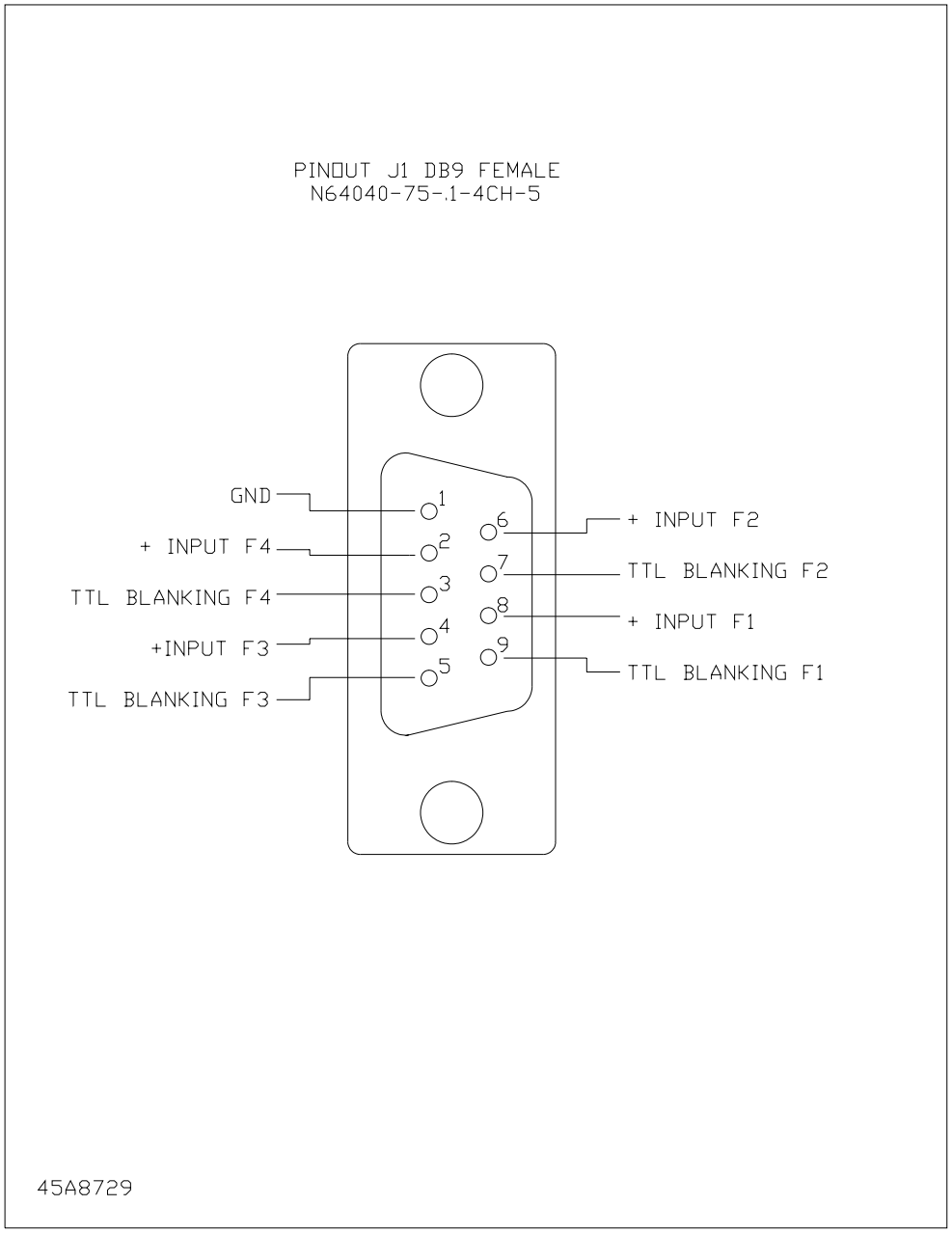

PINOUT J1 DB9 FEMALE
N64040-75-.1-4CH-5
GND
1
+ INPUT F4
2
TTL BLANKING F4
3
+INPUT F3
4
TTL BLANKING F3
5
6
+ INPUT F2
7
TTL BLANKING F2
8
+ INPUT F1
9
TTL BLANKING F1
45A8729

**Figure 1**

## SECTION V
## CONNECTION AND CONTROLS

A. Controls

**Push Buttons (F1-F4)** - Turn on selected channel, disables computer input.

**Blanking Push Button** - Selects the blanking mode:

(1) Internal (INT) - when the AM signal is less than 750 mV DC, the blanking is automatically engaged, no external blanking is required.

(2) External - A TTL low (< 0.3 VDC) on the blanking input blanks the selected wavelength.

**Channel 1 Select Push Button** – Inside on module.

Out selects 647 nm. In selects 632 nm.

**Channel Power Adjustment Pots** - Inside on module.

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

**Blanking Modulation Inputs** (4X)- This input accepts TTL level signals and modulates the carrier. When a TTL high is input to this port there is no blanking for the selected wavelength. When a TTL low is input the selected wavelength is blanked.

**AM Inputs** (4X) - 0 to 5 Volts single ended input with 6KΩ input impedance.

## SECTION VI

## OPERATING PROCEDURE

C. 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 250 mW are output at the correct frequency from each channel. See the acceptance test report for this unit for frequency foe 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 **48058** PCAOM to the laser beam (Vertical Polarization Required) and adjust the Bragg angle to output maximum diffraction efficiency into the - First order beam (toward the connector).
4. Deselect the 488 nm wavelength.
5. Without readjusting the Bragg angle, select each of the four wavelengths, one at a time, and adjust the power adjustment for each wavelength for maximum diffraction efficiency.
6. Apply the appropriate control signals to select the desired wavelengths and effects.