

INSTRUCTION MANUAL

NYE VIKING

RF POWER MONITOR



- MODEL -
RFM-003
RFM-005

SPECIFICATIONS

ACCURACY:

$\pm 5\%$ of full scale

SWR THRESHOLD:

Typically 5W or less depending on coupler

SAMPLE TIME:

For Peak and Hold, 1mS typical, 3mS max

HOLD TIME:

.5 to 20 seconds typical

ALO SWR ADJUSTMENT RANGE:

Approx. 1.6:1 - 7:1, factory set at 2:1

ALO REV. ADJUSTMENT RANGE:

For (K) couplers, 40-400 watts, factory setting 100 watts.

For (C) couplers, 4-40 watts, factory setting 10 watts.

ALO RELAY CONTACT RATINGS:

5 amps 120vac/28vdc. (contacts isolated)

POWER CONSUMPTION:

Maximum operating- 450 mW.

Typical operating- 64 mW.

SIZE:

H 5" X W 8.5" X D 5.75" max. values with swivel bracket fully extended.

WEIGHT:

4 lbs. Shipping 5 lbs.

DESCRIPTION

The Nye RF Power Monitoring System is a combination of fully automatic SWR meter, peak and average reading watt-meter, reverse power meter and a self contained ALO relay circuit. The later, a unique feature of this monitor is for protecting your amplifier, and its costly tubes, from undesirable loads. There is also a meter power mode called Peak & Hold. This is a circuit which stores short duration pulse type RF power levels for meter display.

This monitor was designed for very low power consumption and is powered by re-chargeable nicad batteries which are, in the case of the HF couplers, charged by the applied RF, or by a separate charger supplied for fast charging and back-lighting of the panel meters. All directional couplers for the RFM-003 and RFM-005 monitors are calibrated for complete interchangeability.

INSTALLATION

The installation of the monitor is quite straight forward. The RF power from the desired source is connected by 50 ohm cable to the proper directional coupler via PL-259 or UHF connector. The antenna is connected, also by a PL-259, to the load side of the coupler. The ALO or automatic lockout feature requires series connection with your amplifiers relay line. Two RCA phono jacks are supplied for inserting the internal ALO relay in series with this line. Connect the relay line from the transceiver to the (ALO IN) jack on the monitors rear panel. If back-lighting of the panel meters or quick charging of the nicad battery pack is desired, the supplied external charger must be connected to the 12 volt (IN) receptacle on the rear panel.

The monitor is now ready to be conveniently placed for easy viewing. You will note that there is sufficient flexible cable to remote the directional coupler connections from the monitor for convenient placement. Mounting may be done in various ways depending on your stations requirements. The monitor can be desk mounted, with or without the swivel mounting bracket. Two sets of holes on the bracket allow for different height adjustments. This bracket can be used for wall or under-shelf mounting if desired.

NOTE: The nicad batteries which are supplied with the monitor have been charged at the factory which will allow you to operate the unit without additional charging. If however you are going to operate the ALO lock for long periods of time, or using a VHF directional coupler, it will be necessary to keep the external charger in operation.

OPERATION

The SWR portion of the monitor is activated by very low RF levels for accurate direct readings in SWR and is displayed on its own front panel meter. This reading will remain constant as RF power is increased.

The meter on the right front panel, scaled either 0-300 or 0-500, depending on the monitor model, will be used to measure all RF power levels using an automatically switched multiplier. One scale will be ten times the other, as indicated by high or low range LED displays. Exactly what the ranges are will depend on the directional coupler. Forward power can be measured in either Peak, Peak & Hold, or average modes, by front panel selection. Reverse power measurement, switchable from the rear panel, will also be displayed in the above modes. All meter modes will read the same value for a key down or continuous input. Peak and Peak & Hold modes are necessary for reading the actual output power, for transmitting modes such as SSB, CW, AM, and Pulse. The Peak meter mode will measure peak power for longer sample times, and does not have the holding feature. Peak & Hold is used for shorter power samples from typically 1MS or longer, and can display the peak level for more than twenty seconds. The hold time is adjustable by front panel control.

* It is possible on a key down CW signal to notice slight differences in the displayed power values for the different meter modes. This can be caused by hum, noisy carrier adjustment pots, microphonics etc. This can be considered real and not a meter fault.

When in the Peak & Hold mode two front panel LED's will indicate the meters sampling and holding states.

The ALO feature is something that has not been done before on a SWR/Power meter, and stands for amplifier lockout. It is used to prevent damage to your amplifier do to high SWR or reflected power. A switch is provided on the rear panel for selecting SWR or reflected power ALO trip. The ALO sense adjustment, also on the rear panel, works with either ALO switch position. It will be necessary to complete one of the following adjustment procedures if lockout is desired other than factory settings. These settings along with ALO adjustment ranges are listed under specifications.

NOTE: When using the ALO with some QSK amplifiers such as Alpha 78 or 77, a latching circuit is used with the amplifiers In/Out relay, which will not allow its transferring to straight thru operation until RF is removed from its input. This will be a problem when using RTTY or AM modes and the ALO trip feature. In this case, you may wish to break the push to talk line rather than the amplifiers relay line.

ALO TRIP ADJUSTMENTS (SWR) METHOD

For this adjustment it is necessary to provide a load to the coupler which will give the desired SWR value for sense adjustment. This can be done for example, with a fixed load resistor, such as 25 or 100 ohms, which will provide a 2:1 SWR. You could also use a tuner and dummy load to dial in the SWR desired, as displayed on the monitors SWR meter. You can now adjust the rear panel ALO sense pot until the sense LED, on the front panel, just lights. Adjustment is now complete.

(REFLECTED POWER) METHOD

This adjustment is most easily made by reversing the directional coupler and applying RF to the load side and a 50 ohm termination to the input side. With the monitors power switch in the reverse position and the back panel ALO switch to REV, apply the amount of RF power, as measured on the monitors power meter, that you expect to have trip the ALO relay. Adjust the ALO sense pot until the sense LED, on the front panel, just lights. Re-connect coupler normally and return the power switch if necessary. This will complete the adjustment.

It should be noted, that in either ALO modes, the ALO "LOCK" will not occur unless the forward power meter is reading on its high scale. There is a front panel LED to indicate that "LOCK" has occurred. The locked state will continue until approximately five seconds after RF is removed. When in the Peak & Hold mode the locked state will continue for five seconds beyond its time period.

NOTE: Back-lighting of panel meters, is switched on automatically with the applied RF and will remain on until approximately 1.5 minutes after RF is removed. The monitor circuitry is also powered as soon as RF is applied and remains on for (5) seconds after use.

PARTS LIST

RESISTORS

R1- 1K	R38- 1K
R2- 330	R39- 1M
R3- 10K	R40- 47K
R4- 220K	R41,43- 10K
R5,6- 1M	R42- 47K
R7- 47K	R43,44- 100K
R8- 4.7K	R45- 10K
R9- 220K	R46- 100K
R10- 1M	R47- 1M
R11- 470K	R48- 1K
R12- 220K	R49,58- 470K
R13,14- 1M	R50- 100
R15- 22K	R51- 10M
R16- 100K	R52,54- 100K
R17- 33	R55,56- 10K
R18- 220K	R57- 1K
R19- 470K	R59- 1M
R20- 1M	R60- 10K
R21- 1K	R61- 10M
R22, 470K	R62- 1K
R23- 10K	R63- 3.3K
R24- 22M*	R64- 100K
R25- 1K	R65- 1M
R26- 1M	R66- 22K
R27- 4.7K	R67,68- 10K
R28- 220K	R69- 220
R29- 22K	R70- 100K
R30- 10K	R71- 10M
R31- 1K	R72- 1K
R32,33- 10K	R73,74- 330
R34- 1K	R75- 1K
R35- 1K	R76- 330
R36- 330	R77- 10M*
R37- 10K	R78- 27K

RELAYS

RY1- CMIRON
G4S-112P-US-B

CAPACITORS

C1- 10 @ 16V
C2- .001
C3- .15
C4- .01
C5- .15
C6,7- .001
C8,9- .15
C10- .001
C11-12- .01
C14- .001 @ 1KV
C15- .01
C16- .47
C17- 10 @ 16V
C13,18,19- 10 @ 16v
C20- .01
C21,22- 47 @ 16V
C23- .01
C24- 10 @ 16V
C25,26- .01
C27-29- .001 @ 1KV

TRANSISTORS

TR1,2,3- 2N3904
TR4- PN2907
TR5- VN10KM
TR6- 2N3904
TR7- VN10KM
TR8- 2N3904
TR9- PN2907
TR10- 2N3904
TR11- PN2907
TR12-15- 2N3904

IC'S

IC1- CD4066
IC2- LM324
IC3- CD4093
IC4- CD4066
IC5- LM324
IC6-CD4066

DIODES

D1- 1N4148
D2- LED ORG.
D3- 1N4148
D4- 1N5711
D5- 1N4148
D6,7- 1N4004
D8- 1N4148
D9- LED RED
D10-16- 1N4148
D17- LED GRN.
D18- LED RED
D19- 1N4004
D20- LED YEL.
D21- LED GRN
D22-24- 1N4148
D25- 1N4004
D26- 1N4148
D27- 1N5711

POTS

P1- 100K
P2- 20K
P3- 100K
P4,5- 20K
P6- 1M

CHOKES

L1,2- 100

LAMPS

ML1,2- 1813

BATTERY

B1- 4AA NICAD

* Factory selected values.

All resistors in ohms and .25W unless specified.

All capacitors are in MFD and rated at 100v unless specified.

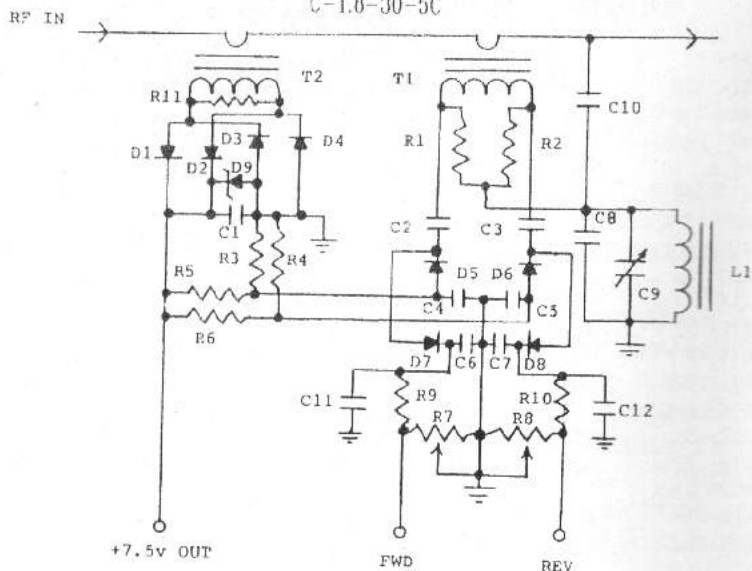
All chokes are rated in MICRO HENRY.

RF POWER MONITOR SYSTEM

-COUPLER-

C-1.8-30-5K

C-1.8-30-5C



PARTS LIST

COUPLER- C-1.8-30K

C-1.8-30C

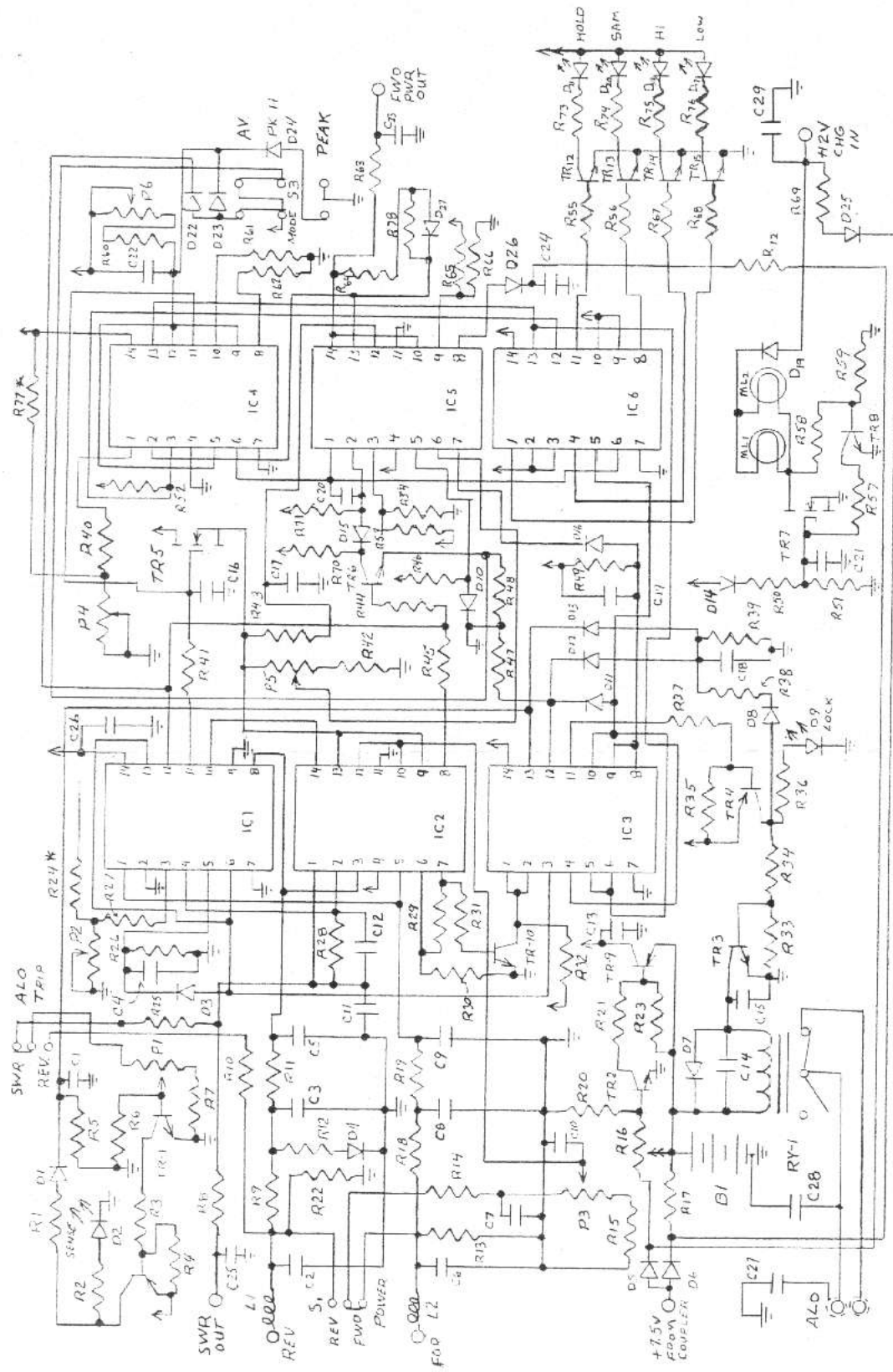
C1	.15 MFD 100V POLY.
C2-7	.01 MFD 100V
C8	15CPF 1KV
C9	12-100PF VAR.
C10	5PF TEFLON
C11,12	.01 MFD
D1-4	1N4850
D5-8	MBD701(1N5711)
D9	1N5343B
L1	1MH CHOKE
R1,2	51 OHM 2W
R3,4	100 OHM .25W
R5,6	3.3K OHM .25W
R7,8	100K POT
R9,10	4.7K OHM
R11	1K OHM .25W
T1	50 TURNS ON FERRITE CORE
T2	20 TURNS ON FERRITE CORE

15PF

16
8

SCHEMATIC DIAGRAM

RFM-003
RFM-005

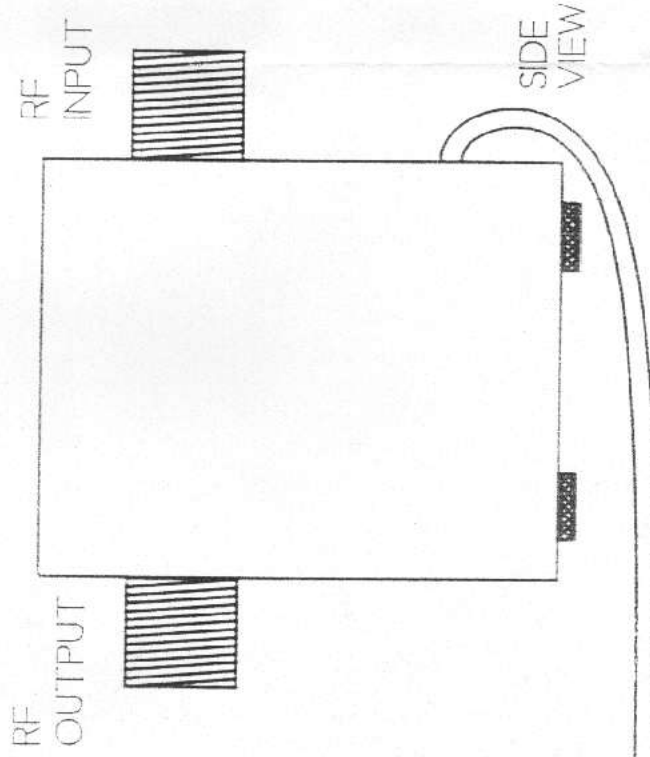


Drq. No. 39632A
041587
Rev. 060887
080787

RFM COUPLER MODULE

MODELS: C-1.8-30-5K

C-1.8-30-5C



SIDE
VIEW

COUPLER MODEL D.C. OUTPUTS

"K" SERIES = 15.00 VOLTS @ 500 WATTS

"C" SERIES = 47.40 VOLTS @ 500 WATTS

WM. M. NYE CO., INC.
1614 130TH AVE., N.E.
BELLEVUE WA. 98005

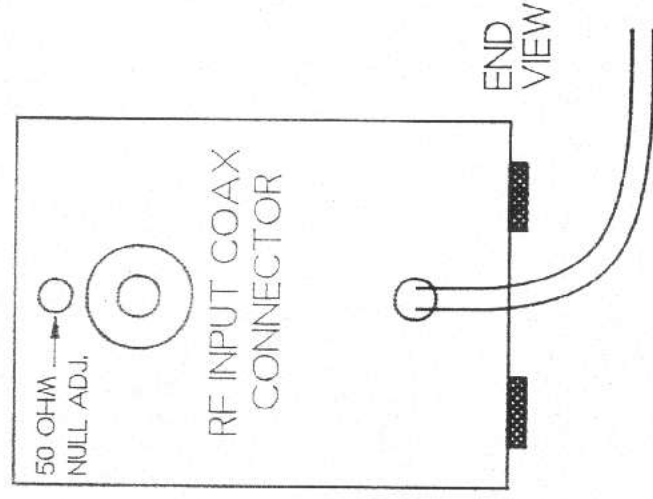
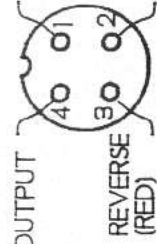
DN 39640

12-28-87

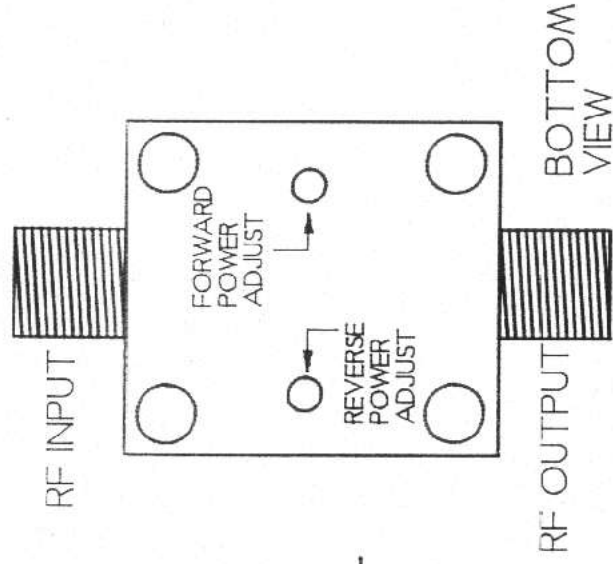
DRAWN BY C.M.

7.5 VOLT OUTPUT
(WHITE)

GROUND
(GREEN)



END
VIEW



BOTTOM
VIEW