# High Power RF Test Equipment Catalog

BIRD

*Now in its fifth decade of serving the broadcasting industry, Bird Electronic Corporation has been the pioneer in developing products for measurement, filtering and termination of RF power. The company's products, originally developed in response to specific design requirements of broadcast equipment manufacturers, have since become standards of the industry.*

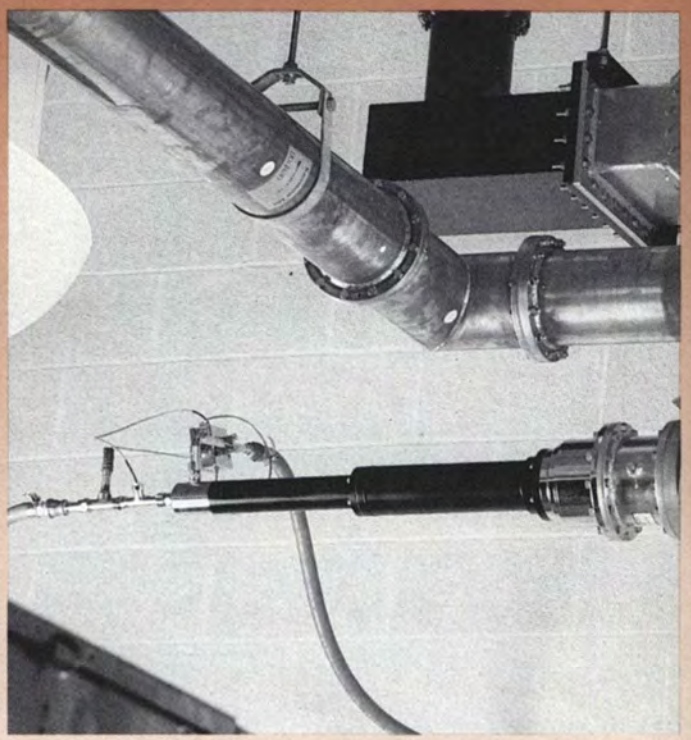
*Recognizing that broadcast test equipment must be even more reliable than the transmitter, must be constantly on-call and totally trustworthy, Bird has achieved an enviable record of reliability.*

*Government regulations have been based on the measurement accuracy of Bird instruments, and agencies have continued to consult with Bird engineers to evaluate the feasibility of new regulations under consideration.*

*Confining itself in the broadcasting field to products for frequencies from 2 to 1000MHz at power levels to 250kW, Bird has developed a high degree of expertise in its technology. The expertise, combined with an understanding and responsiveness to customers' requirements, makes Bird the dependable choice of both manufacturers and users of broadcasting equipment.*

*Bird's 20 years of experience in FM filters and filter-couplers, for example, while evident in numerous designs for 1kW through 50kW, is available to meet special requirements as needed.*

*Although Bird's standard products are recognized throughout the world for their quality and reliability resulting from many years of field experience, the company is keenly alert to challenging industry trends, which demand innovative product development. For example, Bird's dedication to advancing the state of the art has reduced the weight of its water-cooled TERMALINE® RF loads from 1400 lb. to today's 13 lb. models. And the new rhombic-shaped radiator of air-cooled loads improves their size-to-power ratio.*

*Station WCLQ-TV, channel 61 in Cleveland, measures output of their new TTU-110C UHF-TV transmitter with a Bird model 6080 Digital Calorimeter. During measurement and maintenance, visual and aural power is dissipated in the 80kW TERMALINE® Econoload® model 8790 mounted overhead on the waveguide switch following the filterplexer.*

**Catalog No. BC-383**

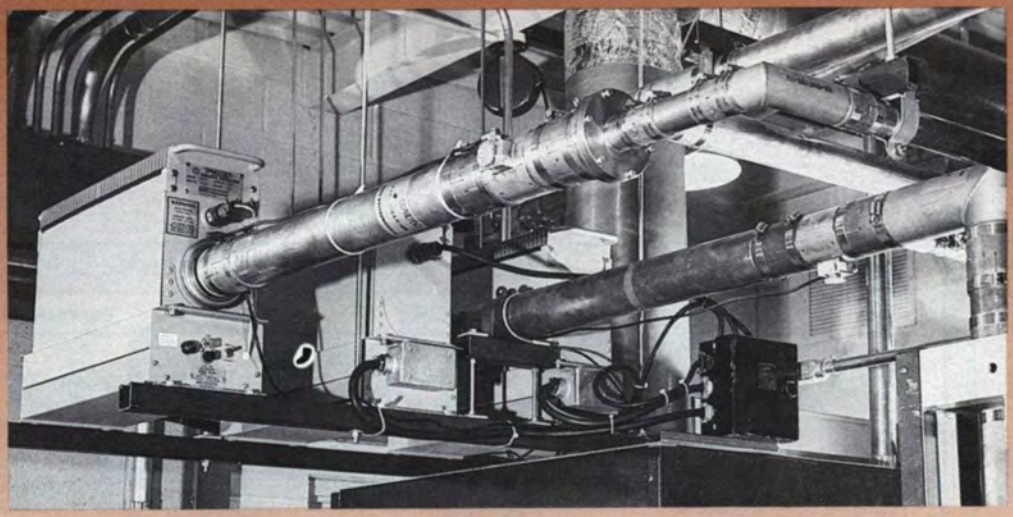
Litho in U.S.A.

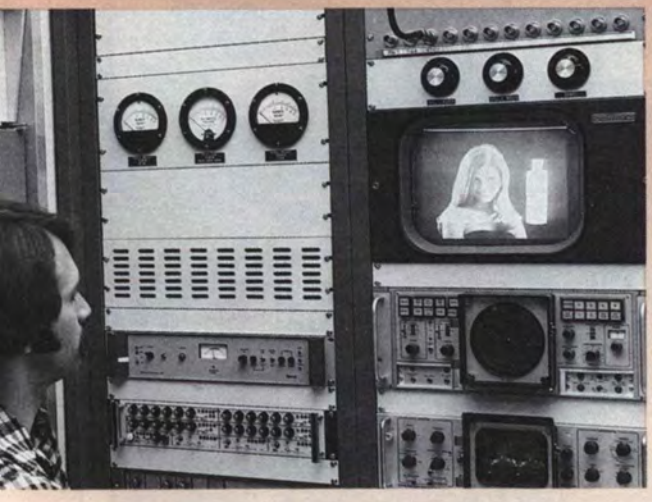
*Typical of Bird's determination to continue its pioneering role is its unique line of compact, self-cooling MODULOAD® terminations. As transmitter power has increased, Bird has expanded its line of these self-contained RF loads and has integrated into them calorimeters, which quickly measure RF power with a high degree of accuracy. Currently available Bird calorimeters are capable of meeting proposed requirements for increased measurement accuracy.*

*Other examples of recent advances are the digital RF POWER ANALYST® Wattmeters, which measure RF power from 250W to 250kW, and HighSpeed WATTCHER® Monitoring Systems for remote and on-location protection of transmitters and plant.*

*Throughout its history Bird has maintained its commitment to quality products and to strong support for those products in the field. Rugged construction protects against physical damage, and electrical interlocks guard against abnormal load conditions. Parts which can fail under extreme stress are easily replaceable in minutes, so that off-the-air time is minimized or eliminated. In rare cases when equipment must be returned for repair, every effort is made to speed turn-around or provide temporary equipment to ensure continuity of operation.*

*As the rapid expansion of communications continues — doubling and tripling every five years — Bird is committed to its traditional role as industry leader in developing products for accurate measurement, termination and filtering of RF signals. Bird's field representatives and engineers are always available to discuss special requirements in these areas.*





*This TT50FL dual transmitter installation at WKYC-TV is the first in the country. Shown above are three TERMALINE "Reject Loads" with their THRULINE Wattmeters. The 50kW Test Load/ Wattmeter above left is switched remotely (including water flow) from the studio 10 miles distant, where the reject power levels and main feed power are monitored (left).*

# THRULINE® RF Directional Wattmeters

50 ohms nominal

Each Bird High Power Rigid Line THRULINE® RF Directional Wattmeter is comprised of a Line Section and a direct reading 3 scale meter housed in a convenient carrying case. Measuring Element(s) are ordered separately.

**Line Section:** A precise 50 ohm 1⅝", 3⅛" or 6⅛" coaxial air line is designed for insertion into your transmission line between transmitter and antenna or load. Each Line Section is equipped with one or two sockets into which Plug-in Element(s) with the desired power and frequency range are inserted. Double-socket Line Sections are for simultaneous measurement of forward and reflected power.

**Indicating Meter:** A shock-mounted sensitive microampere meter with 3 expanded scales of 5/10/25 (or 15/30/60) unit calibration to permit full scale direct power reading from 250 watts to 250kW. Sockets for storing extra elements are provided on the side of the rugged cast aluminum case. A 10-foot (3 meters) shielded cable for connecting meter to Line Section is standard, other cable lengths on request.

Wattmeters with two separate element sockets (one for FORWARD and one for REFLECTED power measurement) are equipped with a dual dc-input meter case and two shielded cables. A switch mounted on the meter face selects the desired reading.

Wattmeters ordered by MODEL NUMBER are supplied with the appropriate Line Section, connecting cable(s) and portable meter. If panel-mounted meter(s) for 19" equipment racks are preferred, Line Section, connecting cables and meter panels should be ordered individually (see fold-out pages XX, YY, and below right). In case of doubt, select a MODEL from these pages and ask for a quote on replacing the portable meter by a meter panel.

**Plug In Elements:** (See Tables 1⅝, 3⅛, 6⅛ A or B on fold-out page XX). These elements read both forward and reflected power as indicated by the direction in which the arrow is pointing. Frequency range and full scale power are marked on each Element. Since Elements are *not* interchangeable between different THRULINE models, be sure to specify wattmeter model number (or Line Section part number) for which elements are intended. For periodic verification convenience, we recommend ordering Elements in identical pairs for each socket.

**Finish:** Line Sections are bright silver plated, meter housings and panels are finished in Light Navy Grey Baked Enamel (MIL-E-15090).

## High-Power Rigid Line Series

**Specifications: Accuracy:** ±5% of full scale **Insertion VSWR:** 1.05 max.

### 1⅝" LINE 50 ohms nominal

| Model No. | Freq. Range MHz | Power Range kW | Flg/Unflg | No. of Sockets | Scale Divisions | Element Table | Overall Length | Weight |
|---|---|---|---|---|---|---|---|---|
| 4712 | 2-1000 | ¼-25 | EIA Flg | Single | 5/10/25 | 1⅝A | 6¾ " (171mm) | 3lbs (1¼kg) |
| 4715-200 | 2-1000 | ¼-25 | EIA Flg | Double | 5/10/25 | 1⅝A | 6¾ " (171mm) | 3¼ lbs(1.4kg) |
| 4720 | 2-1000 | ¼-25 | Unflg | Single | 5/10/25 | 1⅝A | 6⅜ " (162mm) | 1¼ lbs (0.6kg) |
| 4723-200 | 2-1000 | ¼-25 | Unflg | Double | 5/10/25 | 1⅝A | 6⅜ " (162mm) | 1½ lbs (0.7kg) |
| 4712-037 | 50-250 | 0.3-6 | EIA Flg | Single | 15/30/60 | 1⅝B | 6¾ " (171mm) | 3lbs (1¼kg) |
| 4715-300 | 50-250 | 0.3-6 | EIA Flg | Double | 15/30/60 | 1⅝B | 6¾ " (171mm) | 3¼ lbs (1.4kg) |

### 3⅛" LINE 50 ohms nominal

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 460 | 2-1000 | 1-100 | EIA Flg | Single | 5/10/25 | 3⅛A | 7 1/32" (179mm) | 7 lbs (3kg) |
| 4610-200 | 2-1000 | 1-100 | EIA Flg | Double | 5/10/25 | 3⅛A | 7 1/32" (179mm) | 7¼ lbs (3.1kg) |
| 4805 | 2-1000 | 1-100 | Unflg | Single | 5/10/25 | 3⅛A | 6½ " (165mm) | 4 lbs (2kg) |
| 4802-200 | 2-1000 | 1-100 | Unflg | Double | 5/10/25 | 3⅛A | 6½ " (165mm) | 4¼ lbs (2.1kg) |
| 4600-037 | 50-250 | 1½-30 | EIA Flg | Single | 15/30/60 | 3⅛B | 7 1/32" (179mm) | 7 lbs (3kg) |
| 4610-300 | 50-250 | 1½-30 | EIA Flg | Double | 15/30/60 | 3⅛B | 7 1/32" (179mm) | 7¼ lbs (3.1kg) |
| 4805-037 | 50-250 | 1½-30 | Unflg | Single | 15/30/60 | 3⅛B | 6½ " (165mm) | 4 lbs (2kg) |
| 4802-300 | 50-250 | 1½-30 | Unflg | Double | 15/30/60 | 3⅛B | 6½ " (165mm) | 4¼ lbs (2.1 kg) |

### 6⅛" LINE 50 ohms nominal

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4902 | 2-1000 | 2½-250 | EIA Flg | Single | 5/10/25 | 6⅛A | 10 7/32" (260mm) | 16¾ lbs (7½kg) |
| 4905-200 | 2-1000 | 2½-250 | EIA Flg | Double | 5/10/25 | 6⅛A | 10 7/32" (260mm) | 17 lbs (7¾kg) |
| 4907 | 2-1000 | 2½-250 | Unflg | Single | 5/10/25 | 6⅛A | 9⅝ " (245mm) | 12½ lbs (5½kg) |
| 4909-200 | 2-1000 | 2½-250 | Unflg | Double | 5/10/25 | 6⅛A | 9⅝ " (245mm) | 12¾ lbs (5¾kg) |
| 4902-037 | 50-250 | 3-60 | EIA Flg | Single | 15/30/60 | 6⅛B | 10 7/32" (260mm) | 16¾ lbs (7½kg) |
| 4905-300 | 50-250 | 3-60 | EIA Flg | Double | 15/30/60 | 6⅛B | 10 7/32" (260mm) | 17 lbs (7¾kg) |
| 4902-080 | 50-750 | 8, 80 | EIA Flg | Single | 8/80 | 6⅛C | 10 7/32" (260mm) | 16¾ lbs (7½kg) |
| 4907-080 | 50-750 | 8, 80 | Unflg | Single | 8/80 | 6⅛C | 9⅝ " (245mm) | 12½ lbs (5½kg) |

## To assemble a rack-mounted Wattmeter, use selection guides below.

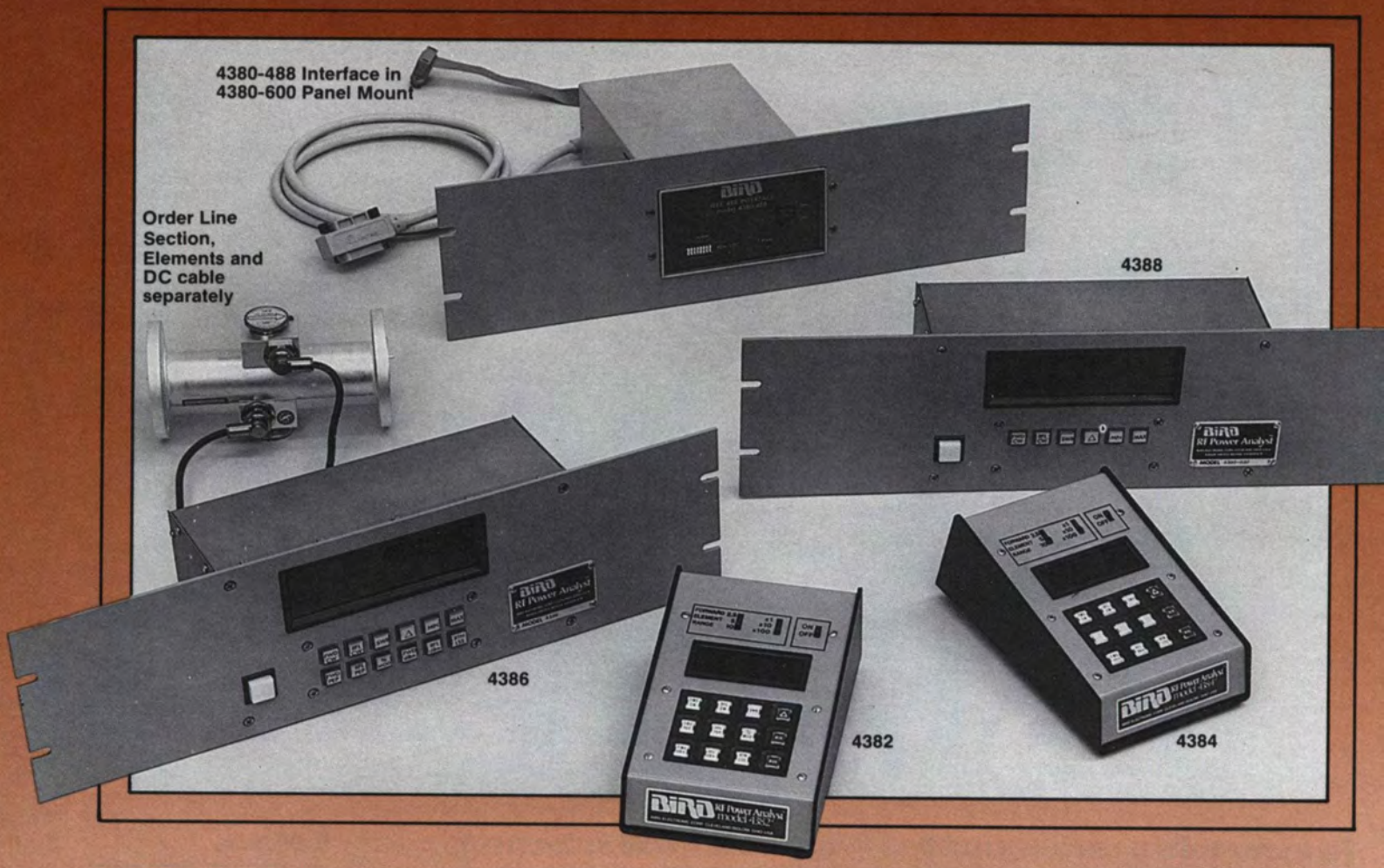
| | 5/10/25 scale-division meters | 15/30/60 scale-division meters |
|---|---|---|
| **for 1⅝" systems** | **Meter:** No. 3127-035<br>**Line Section:** 4712-000 single socket 1⅝" EIA Flg or 4720-000 single socket 1⅝" Unflanged<br>**Element:** Choose one from Table 1⅝A<br>or<br>**Meter:** No. 3127-055 with switch or No. 3127-040 double meters<br>**Line Section:** 4715-000 double socket 1⅝" EIA Flg or 4723-000 double socket 1⅝" Unflanged<br>**Elements:** Select two in 10:1 power ratio from Table 1⅝A | **Meter:** No. 3127-070<br>**Line Section:** 4712-000 single socket 1⅝" EIA Flg or 4720-000 single socket 1⅝" Unflanged<br>**Element:** Choose one from Table 1⅝B<br>or<br>**Meter:** No. 3127-080 with switch or No. 3127-075 double meters<br>**Line Section:** 4715-000 double socket 1⅝" EIA Flg or 4723-000 double socket 1⅝" Unflanged<br>**Elements:** Select two in 10:1 power ratio from Table 1⅝B |
| **for 3⅛" systems** | **Meter:** No. 3127-035<br>**Line Section:** 4600-000 single socket 3⅛" EIA Flg or 4805-000 single socket 3⅛" Unflanged<br>**Element:** Choose one from Table 3⅛A<br>or<br>**Meter:** No. 3127-055 with switch or No. 3127-040 double meters<br>**Line Section:** 4610-000 double socket 3⅛" EIA Flg or 4802-000 double socket 3⅛" Unflanged<br>**Elements:** Select two in 10:1 power ratio from Table 3⅛A | **Meter:** No. 3127-070<br>**Line Section:** 4600-000 single socket 3⅛" EIA Flg or 4805-000 single socket 3⅛" Unflanged<br>**Element:** Choose one from Table 3⅛B<br>or<br>**Meter:** No. 3127-080 with switch or No. 3127-075 double meters<br>**Line Section:** 4610-000 double socket 3⅛" EIA Flg or 4802-000 double socket 3⅛" Unflanged<br>**Elements:** Select two in 10:1 power ratio from Table 3⅛B |
| **for 6⅛" systems** | **Meter:** No. 3127-035<br>**Line Section:** 4902-000 single socket 6⅛" EIA Flg or 4907-000 single socket 6⅛" Unflanged<br>**Element:** Choose one from Table 6⅛A<br>or<br>**Meter:** No. 3127-055 with switch or No. 3127-040 double meters<br>**Line Section:** 4905-000 double socket 6⅛" EIA Flg or 4909-000 double socket 6⅛" Unflanged<br>**Elements:** Select two in 10:1 power ratio from Table 6⅛A | **Meter:** No. 3127-070<br>**Line Section:** 4902-000 single socket 6⅛" EIA Flg or 4907-000 single socket 6⅛" Unflanged<br>**Element:** Choose one from Table 6⅛B<br>or<br>**Meter:** No. 3127-080 with switch or No. 3127-075 double meters<br>**Line Section:** 4905-000 double socket 6⅛" EIA Flg or 4909-000 double socket 6⅛" Unflanged<br>**Elements:** Select two in 10:1 power ratio from Table 6⅛B |

**Panel Dimensions:** 19" x 5 7/32" (483 x 133mm) **Finish:** Light Navy Grey (MIL-E-15090)

*To complete a Wattmeter package, order a 25 ft. DC cable assembly P/N 4220-097-10 (for 1⅝" and 3⅛" lines) or P/N 4220-077-1 (for 6⅛" lines). Double-socket Line Sections require two cable assemblies.*



*Also see fold-out pages XX, YY*




# RF Power Analyst®

50 ohms nominal

## A New Generation of Microprocessor-Based THRULINE® RF Directional Wattmeters

**2-1000 MHz**
**250W-250kW**

**for CW, FM, AM and TV transmissions in 1⅝", 3⅛" and 6⅛" Lines**

*At the push of a button, these new digital RF Wattmeters*

***read*** *incident and reflected CW, FM, SSB/DSB and symmetrical AM power (models 4382 and 4386) or CW, FM and TV power (models 4384 and 4388).*

***calculate*** *dB return loss, percent modulation and/or SWR.*

***remember*** *your high and low readings when you adjust for specific signal levels.*

***overrange*** *at least 20% beyond nominal full scale and will do all this* ***with Plug-in Elements and RF Line Sections you may already own from other Bird THRULINE Wattmeters.***

RF POWER ANALYST® Wattmeters also calculate parameter products that used to require tracing on a graph or chart, reveal whether AM modulation is present — desirable or undesirable, such as hum — and how much, and they make min./max. power level searches a breeze.

1 To measure forward and reflected power, insert in the Line Sections two Elements with a 10:1 power ratio (for better resolution of the lower reflected levels) and set the range switches to match. Push FWD/CW or RFL/CW to read in watts or kilowatts while making equipment adjustments, or push SWR to find the optimum match. The memory circuit also retains MIN and MAX readings when monitoring transmitter stability over an extended period of time.

2 Transmitters are routinely measured at higher than rated power — some FCC rules *require* measurement at 110%. The instrument's 120% of over-range on each Plug-in Element lets you measure at these levels without changing Elements and with "up-scale" accuracy. Think of it: You get an additional 20% beyond full-scale power, and at much better accuracy than obtainable if you had to switch to the next higher-power Element and read it downscale.

3 Built-in memory recalls max. and min. signal levels which occurred since the last measurement, at the push of the MIN or MAX buttons. Keep track of level excursions during specified intervals (e.g. 24 hours, a week, etc.).

**Models 4382 and 4386** read peak envelope power in either direction with the same Elements used for CW power. They are so sensitive that you can measure a 1% ripple of hum on a carrier by pushing %MOD, if you notice a difference in the PEP and CW readings. That feature alone is likely to solve signal mysteries. Desirable AM modulation up to 99.9 percent is also displayed.

**Models 4384 and 4388** are designed to read average power of Black Level TV transmissions (as well as CW and FM signals), in exactly the same fashion as Bird THRULINE® analog wattmeters in current broadcast use. With either type of instrument, PEP is obtained by multiplying the black level reading by 1.68.

## Specifications

**Power Range** 250W to 250kW full scale using Bird Plug-in Elements from 1⅝A, 3⅛A or 6⅛A tables.
**Usable over-range** To 120% of nominal full scale (for compliance with FCC 110% regulations without the need to buy and use higher power Elements)
**Display** 3½ digit 0.8" LED (4386, 4388), 0.3" LED (4382, 4384)
**Accuracy, Power** ±5% of nominal full scale
**SWR** ±10% of reading
**A.C. Power** 100-130/200-260 VAC 50/60Hz 8W (specify volts for 4382, 4384)

***NOTES:***
*Frequency band and power range is determined by Plug-in Elements. Select two Elements in a 10:1 power ratio from the 1⅝A, 3⅛A or 6⅛A tables on fold-out page XX.*
*RF Power Analyst® Wattmeters also require a double-socket Line Section (see fold-out page YY or use your present double-socket Line Section) and two DC cable assemblies 25 feet long P/N 3170-058-3 (for 1⅝", 3⅛") or P/N 3171-010 (for 6⅛").*

### RF POWER ANALYST® Series

| MODEL | CONNECTORS |
|---|---|
| 4382 Portable ① ② | 1⅝, 3⅛ or 6⅛ |
| 4384 Portable ① ② | 1⅝, 3⅛ or 6⅛ |
| 4300-080 Carrying Case for above | |
| 4386 Panel Mounted 4382 ② | 1⅝, 3⅛ or 6⅛ |
| 4388 Panel Mounted 4384 ② | 1⅝, 3⅛ or 6⅛ |

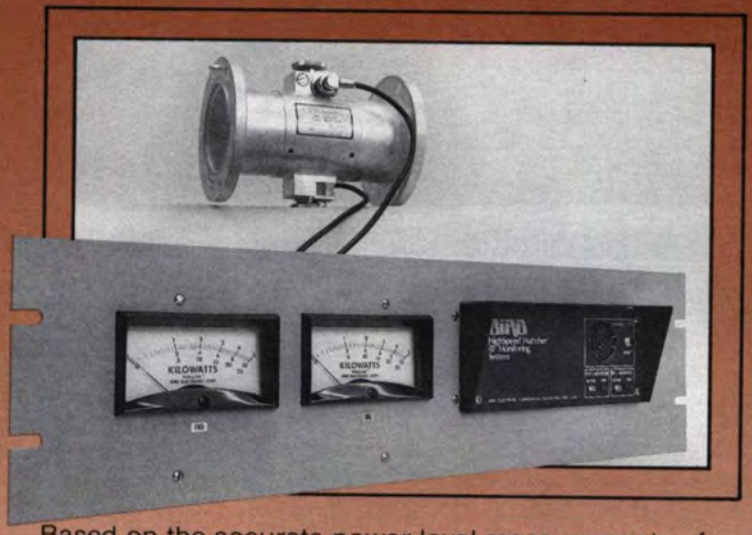
① Charger included. Specify 115V or 230V
② Less line section and DC cables.

*CARRYING CASE 4300-080 for portable 4380 series instruments includes space for spare Elements.*

*TRANSMISSION INSURANCE*

# HighSpeed Wattcher® RF Monitoring System model 3171

**Adds protection for your substantial investment in transmitting equipment from damage — and loss of air time — when faults cause high standing waves.**



Based on the accurate power level measurements of its reliable THRULINE® Directional Wattmeter, this solid state Wattcher System will . . .

- display a continuous, simultaneous view of VSWR conditions and power output, which can be remoted.
- provide a fast fault response time — 250 times faster than other monitors — for forward and reflected power monitoring.
- signal forward power drop-off below a set level (e.g. to conform to FCC part 21.107 specifications).
- activate audible/visual alarms when reflected power increases.
- allow remote reset in event of false alarm or momentary disturbance which leaves transmission unimpaired.

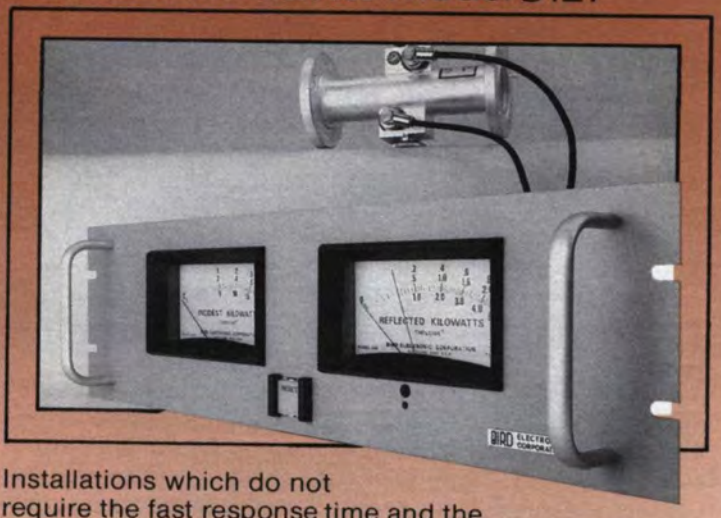
Wattcher 3171 RF Monitoring System warns a remote operator of (1) low power due to detuning, component deterioration, or AC line difficulties, (2) high VSWR due to antenna icing, transmission line problems, physical accidents, lightning strikes, etc.

If the disturbance is not catastrophic and equipment returns to acceptable operating status, the alarm system can be reset from many miles away. An engineer needs to be dispatched to the transmitter site only when the alarm cannot be deactivated by the remote reset.

**Power Range** 250W to 100kW full scale*
**Accuracy** ±5% of full scale
**Over-range (Alarms)** beyond 200% of scale
**Response Time** 25 μsec. max.
**Activate Forward Monitor Adjustable Delay** 73μsec. to 50 msec. nominal
**Inputs and Outputs** TTL compatible
**Insertion VSWR** 1.05 max.
**AC Power** 115/230VAC, 50/60Hz, 10 watts max.
**Nominal Size** 19" x 5 7/32" (483 x 133mm)
**Frequency and Power Range determined by Plug-in Elements. Select two — typically with a 10:1 ratio for the correct line size from model 3171 Element tables on fold-out page XX.*

*Also select a double-socket Line Section of appropriate size for your transmission line and two DC cables from fold-out page YY.*

## WATTCHER® RF Power Monitor/Alarm model 3127



Installations which do not require the fast response time and the forward-power drop-off alarm of model 3171 are protected from high VSWR by WATTCHER model 3127.

Abnormal load conditions quickly cause transmitter shut-down, a buzzer alarm and a change of illumination color of the reset button from green to red. Audible and visual alarms indicating system malfunction may be remoted. Fail-Safe or Non-Fail-Safe Modes are switch-selectable and the Reflected Power meter-relay has a front-adjustable trip-level.

**Power Range** 250W to 250kW full scale *
**Accuracy** ±5% of full scale
**Insertion VSWR** 1.05 max.
**AC Power** 115 VAC, 50/60Hz, 10W (230 VAC optional)
**Nominal Size** 19" x 5 7/32" (483 x 133mm)
** Frequency band and power range is determined by Plug-in Elements. Select two Elements in a 10:1 power ratio from the 1 5/8A, 3 1/8A or 6 1/8A tables on fold-out page XX.*

*Also select a double-socket Line Section of appropriate size for your transmission line and two DC cables from fold-out page YY.*

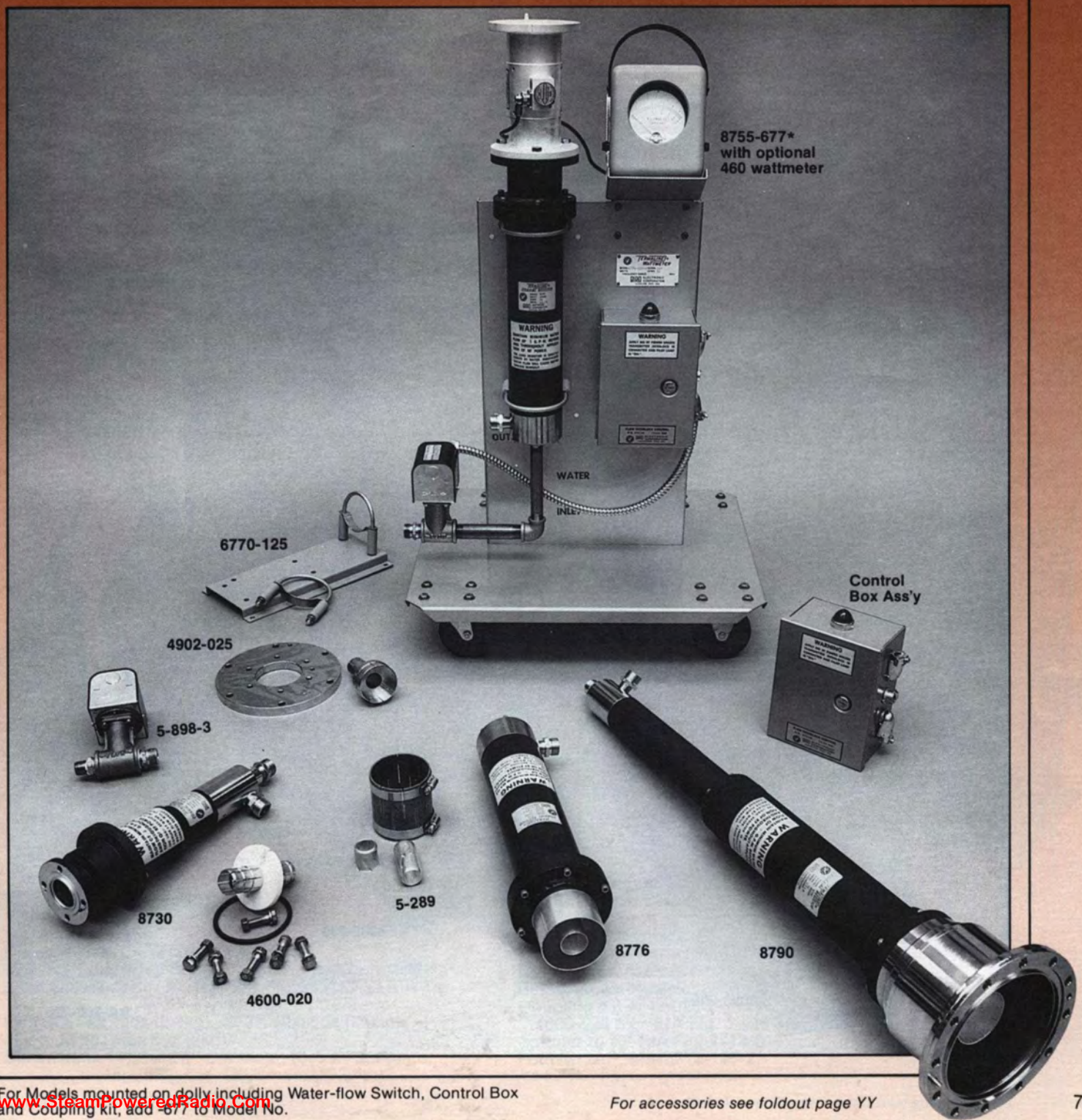
*Also available for rigid line systems with full scale requirements of 300 to 6000W (1 5/8"), 1.5 to 30kW (3 1/8") and 3 to 60kW (6 1/8") is high speed WATTCHER model 3171-020 and WATTCHER model 3126, with meter scales marked 15/30/60. Except for Plug-in Elements, all other accessories and specifications are identical to the respective models above.*

# ECONOLOAD® High Power TERMALINE® Load Resistors

50 ohms nominal

While the new water-cooled Econoloads are built with traditional Bird quality and reliability, they are designed for low initial cost and economical maintenance. The series of six models covers the range from 10kW to 80kW.

The loads have newly designed, rugged resistors that withstand thermal shocks. In the rare case of damage, however, a resistor can be replaced in only 15 minutes in the models to 50kW without removing




*For Models mounted on dolly including Water-flow Switch, Control Box and Coupling kit, add -677 to Model No.



*For accessories see foldout page YY*

the load from the line, and in only 30 minutes in the 80kW model.

With far less water pressure drop than in competitive units, Econoload terminations eliminate the need for dedicated pumps if water pressure is low, for example atop mountains or tall structures, or where other water-cooled systems are operating.

The 80kW load can be bolted directly to a 6⅛" transmission line without an adapter. This design ensures the best match to the most common line size in high-power installations. However, adapters are available to connect the load to smaller lines.

A number of safety and convenience options are available:

- Water-flow sensing switch that protects against unsafe flow levels.
- Time-delay control, which interlocks with the transmitter, delaying application of RF power long enough to ensure an even flow of water and protecting the equipment if flow is interrupted.
- Four-wheel dolly, which mounts the load, water-flow sensing switch and time-delay control. A Thruline® Wattmeter for proof-of-performance measurements can also be included on the dolly.
- Spare, field-installable, cylindrical resistors.
- Coupling kit for same-size connection.
- Adapters for connecting to different sizes of EIA-flanged lines.

# and Air-Cooled Liquid-Dielectric TERMALINE® RF Loads

For 40 years, Bird liquid-dielectric, convection-cooled terminations have given trouble-free service as dummy antennas.

A recent design advance is the rhombic-shaped radiator, which improves the size-to-power ratio of both the static-ambient and fan-cooled models. Capacity has been extended to 10kW. The stand-alone, rhombic models are always ready to absorb power without requiring water or energy in standby mode. Thus, they are ideal as "reject loads" used with remote, dual transmitters to absorb power in case of transmitter failure. As such, with their 10kW average power capacity, the load resistors can be used in FM installations to 40kW and TV installations to 67kW, or as prime terminations for transmitters with 2½, 5 or 10kW output.

## 5kW & 10kW models

OIL DIELECTRIC
**VSWR & Frequency Range:**
5kW models: 1.1 max. dc to 1000MHz
10kW models: 1.15 max dc to 1000MHz

**Ambient Air Temperature Range** −40° to +45° C
**Operating Position** Horizontal only
**Finish** Light Navy Grey baked enamel (MIL-E-15090)

| Model | Power Rating CW | Input Connector | Weight | Overall Length | AC Power required |
|---|---|---|---|---|---|
| **8921** | 5kW | QC-LC(F) | 119lbs (54kg) | 30 27/32" (783mm) | none |
| **8922** | 5kW | 1⅝ EIA Flg | 121lbs (55kg) | 30 27/32" (783mm) | none |
| **8926** | 5kW | 3⅛EIA Flg | 126½lbs (57kg) | 32¾" (832mm) | none |
| **8927** | 5kW | 3⅛ Unflg | 126lbs (57kg) | 31⅞" (809mm) | none |
| **8931-115** | 10kW | QC-LC(F) | 135lbs (61kg) | 30 7/32" (768mm) | 115V 60Hz |
| **8931-230** | 10kW | QC-LC(F) | 135lbs (61kg) | 30 7/32" (768mm) | 230V 50Hz |
| **8932-115** | 10kW | 1⅝ EIA Flg | 137lbs (62kg) | 30 7/32" (768mm) | 115V 60Hz |
| **8932-230** | 10kW | 1⅝ EIA Flg | 137lbs (62kg) | 30 7/32" (768mm) | 230V 50Hz |
| **8936-115** | 10kW | 3⅛ EIA Flg | 142½lbs (64.6kg) | 32⅛" (816mm) | 115V 60Hz |
| **8936-230** | 10kW | 3⅛ EIA Flg | 142½lbs (64.6kg) | 32⅛" (816mm) | 230V 50Hz |
| **8937-115** | 10kW | 3⅛ Unflg | 142lbs (64kg) | 31¼" (793mm) | 115V 60Hz |
| **8937-230** | 10kW | 3⅛ Unflg | 142lbs (64kg) | 31¼" (793mm) | 230V 50Hz |

**Width & Height:** 5kW models: 9½" x 25 13/16" (241 mm x 656 mm); 10kW models: 9½" x 33 5/16" (241mm x 821mm)

*We do not recommend 8930 series Loads for continuous power applications such as life-testing of components and transmitters*

## series 8890-300 2½ kW, 5kW†

OIL DIELECTRIC
**Power Rating** 2500 watts (5000 watts)* continuous duty
**VSWR** 1.1 max. dc to 1000MHz
1.25 max. 1000 to 2000MHz
**Ambient Air Temperature Range** −40° to +45° C
**Operating Position** Horizontal only
**Finish** Light Navy Grey baked enamel (MIL-E-15090)

**NOTE:** Overload Thermoswitch P/N 8890-008 is optional for 8890-300 series.

*Power capacity can be doubled through forced air cooling with BA-300

| Connector | Weight | Overall Length | Model |
|---|---|---|---|
| QC-LC(F) | 57lbs (26kg) | 23⅛" (587mm) | 8890-300 |
| 1⅝ EIA Flg | 58lbs (26kg) | 23⅛" (587mm) | 8892-300 |
| 1⅝ Unflg | 58lbs (26kg) | 23 3/16" (579mm) | 8895-300 |
| 3⅛ EIA Flg | 59lbs (27kg) | 25⅛" (638mm) | 8891-300 |
| 3⅛ Unflg | 59lbs (27kg) | 24 5/32" (626mm) | 8897-300 |

**Width & Heights:** (all models) 7" x 17 3/16" (178 x 437mm)
(with BA-300) 7⅜" x 22 1/16" (187 x 560mm)

## † model BA-300 -115 -230 Blower Assembly

Forced air cooling doubles the rated capacity of the 8890-300 series Loads on this page from 2500 watts to 5000 watts. With the blowers turned off but still attached, the original ratings are cut in half. Thermoswitches are recommended when using blower assembly.
**Weight** — 13½lbs (6kg)
**AC Power Required** — 40 watts
model BA-300-115: 115V 50/60Hz.
model BA-300-230: 230V 50/60Hz.

# ECONOLOAD® Load Resistors: Specifications

## models 8730, 8731, 8738 10 KILOWATTS

WATER-COOLED
**Power Rating** 10kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 1000MHz*
**Input Connector** 8730: 1⅝" EIA Flg, 8731: 3⅛" EIA Flg, 8738: 3⅛" Unflg
**Weight** 8730: 5lbs (2.3kg), 8731: 6lbs 5oz (2.9kg) 8738: 4lbs 8oz (2kg)
**Dimensions** 14¾" x 2¾" Dia. nom. (375 x 70mm) Input Flg Dia. 5 3/16" max. (132mm)

**Operating Position** Any
**Finish** Lusterless Black Enamel (Fed. Spec. TT-E-527)
**Water Connections** ½" pipe thread or ¾" hose
**Accessories** (optional):
Water-flow switch 5-898-6
Control Box Ass'y 8750-100
Replacement Resistor 8731-021
Coupling Kit 4712-020 1⅝" EIA Flg, 4600-020 3⅛" EIA Flg, 5-726 3⅛" Unflg
Adapter to ⅞" EIA Flg: 4712-015
Four-wheel Dolly 6770-105-2
*Also 50 ohms at dc for continuity checks

*Please turn page for additional specifications.*

## models 8745, 8746
# 20 KILOWATTS

WATER-COOLED
**Power Rating** 20kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 900MHz*
**Input Connector** 8745: 3⅛" EIA Flg, 8746: 3⅛" Unflg
**Weight** 8745: 13lbs (5.9kg), 8746: 12½lbs (5.7kg)
**Dimensions** 19½" x 3½" Dia. (495 x 90mm)
Input Flg Dia. 5 3/16" Dia. (132mm)
**Operating Position** Any
**Finish** Lusterless Black Enamel (Fed. Spec. TT-E-527)
**Water Connections** ½" pipe thread or ¾" hose
**Accessories** (optional):
- Water-flow switch 5-898-2
- Control Box Ass'y 8750-100
- Replacement Resistor 8755-029-2
- Coupling Kit 4600-020 3⅛" EIA Flg, 5-726 3⅛" Unflg
- Adapter to 1⅝" EIA Flg: 4600-025, adapter to 6⅛" EIA Flg: 4902-025
- Four-wheel Dolly 6770-105-1

**Also 50 ohms at dc for continuity checks*

## models 8775, 8776
# 50 KILOWATTS

WATER-COOLED
**Power Rating** 50kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 900MHz*
**Input Connector** 8775: 3⅛" EIA Flg, 8776: 3⅛" Unflg
**Weight** 8775: 13lbs (5.9kg), 8776: 12½lbs (5.7kg)
**Dimensions** 19½" x 3½" Dia. (495 x 90mm)
Input Flg Dia. 5 3/16" Dia. (132mm)
**Operating Position** Any
**Finish** Lusterless Black Enamel (Fed. Spec. TT-E-527)
**Water Connections** ½" pipe thread or ¾" hose
**Accessories** (optional):
- Water-flow switch 5-898-7
- Control Box Ass'y 8750-100
- Replacement Resistor 8755-027-5
- Coupling Kit 4600-020 3⅛" EIA Flg, 5-726 3⅛" Unflg
- Adapter to 1⅝" EIA Flg: 4600-025, adapter to 6⅛" EIA Flg: 4902-025
- Four-wheel Dolly 6770-105-1

**Also 50 ohms at dc for continuity checks*

## models 8755, 8756
# 30 KILOWATTS

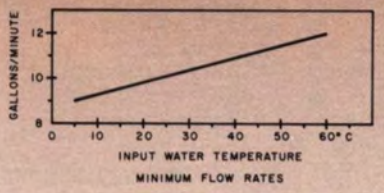
WATER-COOLED
**Power Rating** 30kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 900MHz*
**Input Connector** 8755: 3⅛" EIA Flg, 8756: 3⅛" Unflg
**Weight** 8755: 13lbs (5.9kg), 8756: 12½lbs (5.7kg)
**Dimensions** 19½" x 3½" Dia. (495 x 90mm)
Input Flg 5 3/16" Dia. (132mm)
**Operating Position** Any
**Finish** Lusterless Black Enamel (Fed. Spec. TT-E-527)
**Water Connections** ½" pipe thread or ¾" hose
**Accessories** (optional):
- Water-flow switch 5-898-3
- Control Box Ass'y 8750-100
- Replacement Resistor 8755-027-3
- Coupling Kit 4600-020 3⅛" EIA Flg, 5-726 3⅛ Unflg
- Adapter to 1⅝" EIA Flg: 4600-025, adapter to 6⅛" EIA Flg: 4902-025
- Four-wheel Dolly 6770-105-1

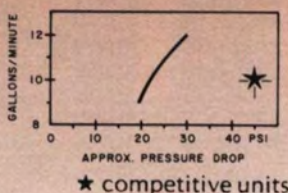
**Also 50 ohms at dc for continuity checks*

## model 8790
# 80 KILOWATTS

WATER-COOLED
**Power Rating** 80kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 800MHz*
**Input Connector** 6⅛" EIA Flg (8791: 6⅛" Unfl)
**Weight** 27lbs (12¼kg)
**Dimensions** 35" x 5" Dia. (899 x 127mm)
Input Flg 8⅛" Dia. (206mm)
**Operating Position** Any
**Finish** Lusterless Black Enamel (Fed. Spec. TT-E-527)
**Water Connections** ½" pipe thread or ¾" hose
**Accessories** (optional):
- Water-flow switch 5-898-7
- Control Box Ass'y 8750-100
- Replacement Resistor 8790-035 (Two)
- Coupling Kit 4902-020 6⅛" EIA Flg, 5-1322 6⅛" Unflg
- Four Wheel Dolly 6770-105-5

**Also 50 ohms at dc for continuity checks*



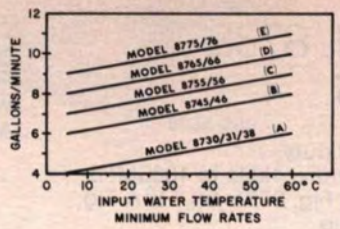

★ competitive units

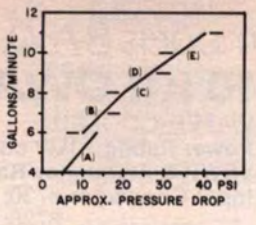
**Model 8790**

## models 8765, 8766
# 40 KILOWATTS

WATER-COOLED
**Power Rating** 40kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 900MHz*
**Input Connector** 8765: 3⅛" EIA Flg, 8766: 3⅛" Unflg
**Weight** 8765: 13lbs (5.9kg), 8766: 12½lbs (5.7kg)
**Dimensions** 19½" x 3½" Dia. (495 x 90mm)
Input Flg Dia. 5 3/16" Dia. (132mm)
**Operating Position** Any
**Finish** Lusterless Black Enamel (Fed. Spec. TT-E-527)
**Water Connections** ½" pipe thread or ¾" hose
**Accessories** (optional):
- Water-flow switch 5-898-3
- Control Box Ass'y 8750-100
- Replacement Resistor 8755-027-4
- Coupling Kit 4600-020 3⅛" EIA Flg, 5-726 3⅛" Unflg
- Adapter to 1⅝" EIA Flg: 4600-025, adapter to 6⅛" EIA Flg: 4902-025
- Four-wheel Dolly 6770-105-1

**Also 50 ohms at dc for continuity checks*



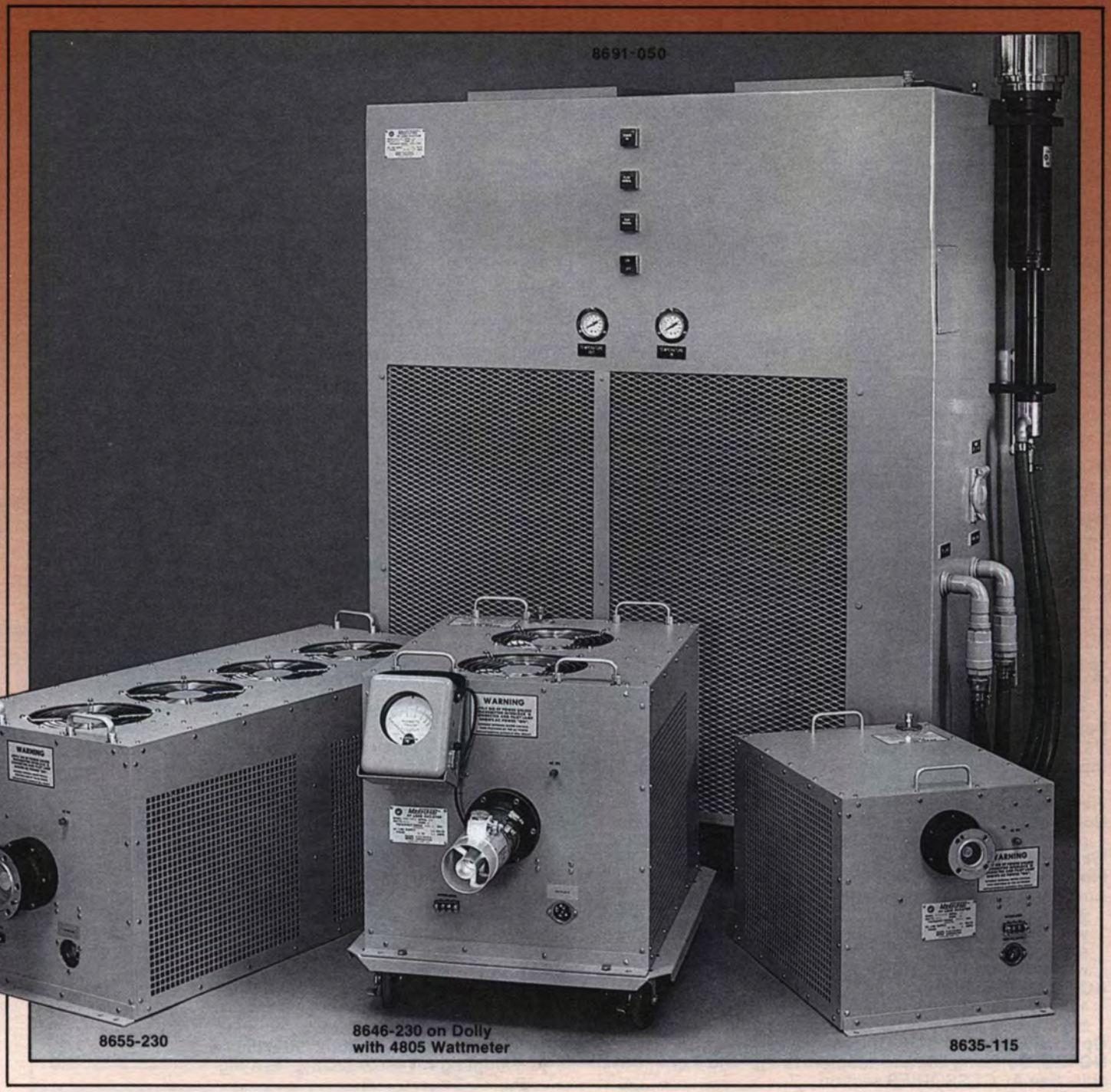
BIRD

# MODULOAD® RF Load Resistors

50 ohms nominal

**For CW, AM, FM, SSB and TV transmitters.**
In 1968, Bird introduced the concept of compact self-cooling MODULOAD® RF terminating systems which eliminated the need for external cooling water. Following years of experience with these space-saving Load Resistors at mountain-top, desert and other hostile environment locations, our current series of MODULOAD® systems require substantially lower initial investment and save additional money by being field-repairable. Should the resistor element ever need replacing, a new one can be customer-installed in 20-30 minutes!

The new Self-Cooling MODULOAD® RF Load Resistors operate continually in a few cubic feet of space under full rated RF power without the need for external cooling water. These line terminating systems are, therefore, ideal for locations where water supply



is unreliable, expensive or simply not available. Self-contained, with integral heat exchanger and protective devices, models are available for 115V 60Hz and 230V 50Hz operation. The suffix indicating which power source is applicable is part of each model's number.

Units are protected by electrical interlocks with a flow switch (for proper minimum flow rate), a thermo-switch (to sense high coolant temperature due to air flow obstruction or failure, high ambients, etc.) and a ½-second time delay before application of RF power. The normally open transmitter-interlock relay contacts are rated at 5 amps 115 volts resistive or inductive load. Airflow through the units must, of course, be unrestricted and a 3 foot clearance should be allowed. The air outlet may be ducted.

For convenient dissipation of heat from the 80kW model, its heat exchanger cabinet can be installed as far as 20 feet from the Load Resistor mounting. The Load can be stored on a wall bracket and only bolted to the transmission line during tests.

*NOTE: For "Reject Load" applications in parallel dual transmitter operation, we recommend TERMALINE® Load Resistor Series 8920 and 8930-(___). See pages 7 and 8.*

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## series 8631-( )
# 10 KILOWATTS

FORCED AIR COOLED
**Power Rating** 10kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1000Hz to 1000MHz*
**Input Connector** (8635-115, 8635-230) 1⅝" EIA Flg
(8631-115, 8631-230) 3⅛" EIA Flg
(8638-115, 8638-230) 3⅛" Unflg
**Field-replaceable Load Resistor** P/N 8731-021
**Nominal Size** excl. conn. 16" x 15 13/16" x 22⅛"
(406 x 402 x 562mm)
**Weight** 110lbs (50kg)
**Finish** Light Navy Grey Baked Enamel (MIL-E-15090)
**Ambient Air Temperature Range**
with distilled water: 5° C to 45° C
with 35% industrial Ethylene Glycol: −20° C to +35° C
**AC Power Required** 9½ amps @ 115 volts
60Hz — all models with -115 suffix.
4¾ amps @ 230V 50Hz — all models with -230 suffix.
**Optional Dolly** P/N 6771-011
**Also 50 ohms at dc for continuity checks*

## series 8645-( )
# 25 KILOWATTS

FORCED AIR COOLED
**Power Rating** 25kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 900MHz*
**Input Connector** (8645-115, 8645-230) 3⅛" EIA Flg
(8646-115, 8646-230) 3⅛" Unflg
**Field-replaceable Load Resistor** P/N 8755-029-2
**Nominal Size** excl. conn. 19 5/32" x 19 9/16" x 26"
(487 x 497 x 660mm)
**Weight** 155lbs (70kg)
**Finish** Light Navy Grey Baked Enamel (MIL-E-15090)
**Ambient Air Temperature Range** (25kW)
with distilled water: 5° C to 30° C
with 35% industrial Ethylene Glycol: −20° C to +25° C
**at 20kW cont. duty** with distilled water: 5° C to 45° C
with 35% industrial Ethylene Glycol: −20° C to +35° C
**AC Power Required**
11 amps @ 115 volts 60Hz — models with -115 suffix.
5½ amps @ 230 volts 50Hz — models with -230 suffix.
**Optional Dolly** P/N 6771-011
**NOTES:** Coupling kits and adapters to 1⅝" and 6⅛" line available. See ACCESSORIES section.

## series 8655-( )
# 50 KILOWATTS

FORCED AIR COOLED
**Power Rating** 50kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 900MHz*
**Input Connector** (8655-115, 8655-230) 3⅛" EIA Flg
(8656-115, 8656-230) 3⅛" Unflg
**Field-replaceable Load Resistor** P/N 8755-027-4
**Nominal Size** excl. conn. 19 5/32" x 19 9/16" x 46½"
(487 x 497 x 1181mm)
**Weight** 275lbs (125kg)
**Finish** Light Navy Grey Baked Enamel (MIL-E-15090)
**Ambient Air Temperature Range** (50kW)
with distilled water: 5° C to 30° C
with 35% industrial Ethylene Glycol: −20° C to +25° C
**at 40kW cont. duty** with distilled water: 5° C to 45° C
with 35% industrial Ethylene Glycol: −20° C to +35° C
**AC Power Required**
14 amps @ 115 volts 60Hz — models with -115 suffix.
7 amps @ 230 volts 50Hz — models with -230 suffix.
**Optional Dolly** P/N 6772-011
**NOTES:** Coupling kits and adapters to 1⅝" and 6⅛" line available. See ACCESSORIES section.

## model 8690-( )
# 80 KILOWATTS

FORCED AIR COOLED
**Power Rating** 80kW continuous duty
**VSWR & Frequency Range** 1.1 max. 1kHz to 800MHz*
**Input Connector** 6⅛" EIA Flg (8691: 6⅛" Unflg)
**Weight** (filled) 826lbs (375kg)
**Finish** (Heat Exchanger)
Light Navy Grey Baked Enamel (MIL-E-15090)
(RF Load) Lusterless Black Enamel (Fed. Spec. TT-E-527)
**Ambient Air Temperature Range** −20° C to +35° C
**Nominal Size** (Heat Exchanger)
65¼"H x 27"D x 51" (1657 x 686 x 1295mm);
7½" (190mm) clearance required for valves on top and load on side. Load Resistor may be wall- or line-mounted up to 20ft. (6m) from cabinet.
**AC Power Required** 10 amps @ 230 volts/3 phase 50Hz
Models 8690-050 " " " " " " " 50Hz
Models 8690-060 " " " " " " " 60Hz
**Accessories** (optional)
Replacement Resistor 8790-035 (Two)
Coupling Kit 4902-020 6⅛" EIA Flg

**Also 50 ohms at dc for continuity checks*

# MODULOAD® RF Calorimeter/ Load Resistors

50 ohms nominal

## 10kW, 25kW, 50kW
## 80kW (Calorimeter only)

- **Measure RF power quickly with precision, after simple set-up.**
- **Automatically processes all sensor inputs.**
- **Displays power directly without charts or calculations.**
- **Conveniently portable.**

This new wide range Calorimetric Line Terminating System combines convenience, speed and simplicity in accurate high-power RF measurement with the economy of MODULOAD® self-cooled RF Load Resistors. Its large digital display indicates power in kilowatts.

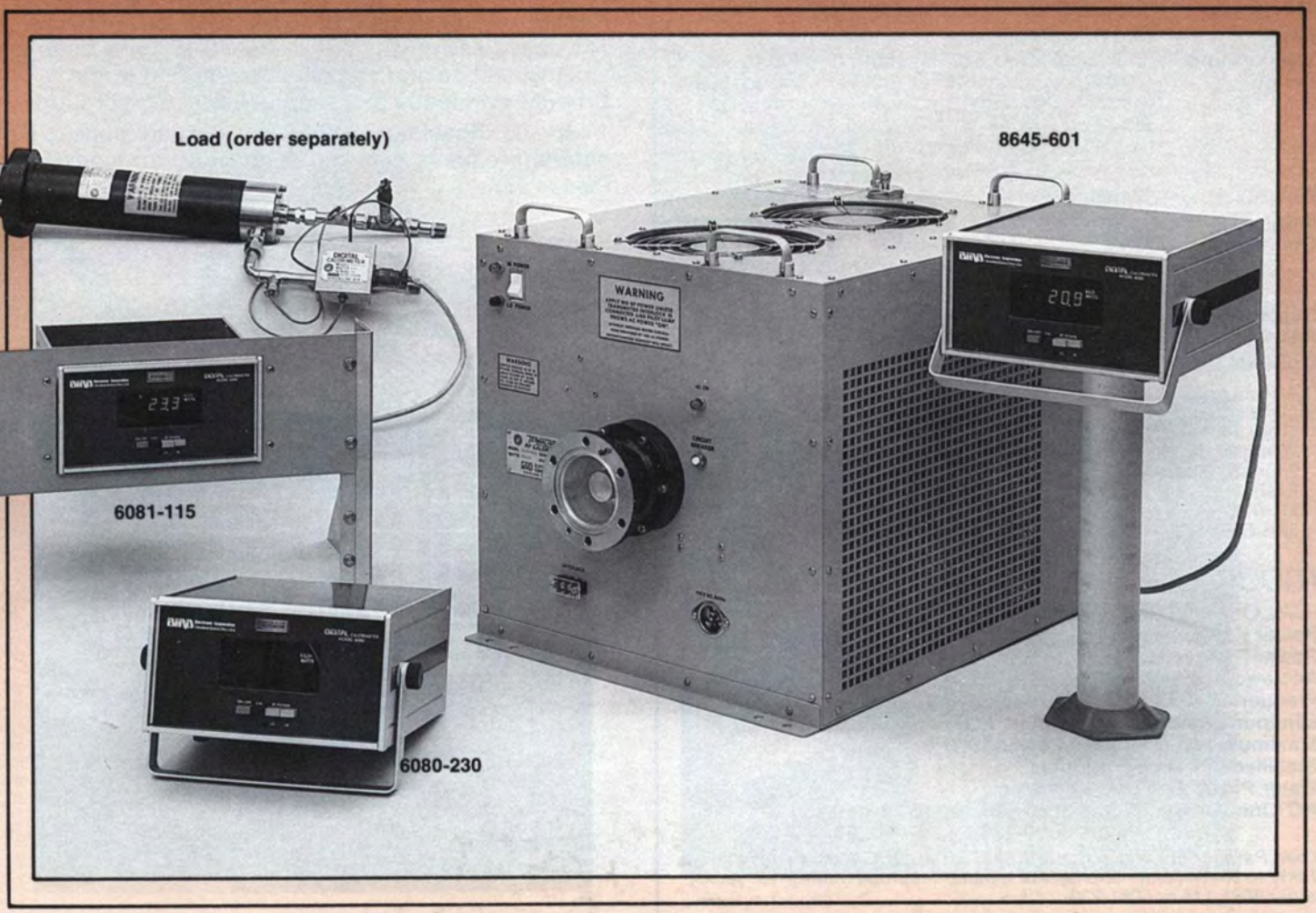
Making measurements with accuracy exceeding FCC regulations requires no special skills and little time: connect the Load to the transmission line, let the system run until coolant flow and temperature have stabilized, adjust display to zero, apply RF power and read directly in kilowatts.

No charts, calculations or other manipulations are required and additional readings are taken within seconds with an accuracy of ±2½% *of indication*. The large digital readout can be remotely located several feet from the load for operator convenience.

The Calorimetric portion (model 6080-___) is also available without a Moduload, for use with water-cooled Load Resistors such as well-matched low VSWR Econoload® TERMALINE® series. Accuracy is ±3% of reading from one to 80 kilowatts.

With CW or FM, the power indicated is the same as that measured by our average reading THRULINE® wattmeters, which makes the Bird calorimeter an ideal in-house calibration instrument. With a black-level television transmission, the indicated power will be 60.1% of peak (as compared to 59.6% on an analog THRULINE wattmeter).

Modulating an AM carrier 100% with a pure single tone will increase the calorimeter reading by 50%, measuring the average power contained in the sidebands in addition to the carrier. In other words, the calorimeter's digital readout always indicates the heating power dissipated **in the load resistor.**



## series 8631-(6_ _) 10kW

**Power Rating** 10kW continuous duty
**Power Ranges** 1kW — 10kW
**Accuracy** ±2½% of reading
**Stabilization Time** 3 minutes
**VSWR & Frequency Range** 1.1 max 1kHz to 1000MHz①
**Ambient Air Temperature Range**
with potable water +5° C to +40° C
with industrial Ethylene Glycol −5° C to +35° C
**Weight** 115lbs (52kg)
**Input Connectors** ②8635-6_ _: 1⅝" EIA Flg
②8631-6_ _: 3⅛" EIA Flg
②8638-6_ _: 3⅛ Unflg
**Replacement Resistor** P/N 8731-021
**Optional Dolly** P/N 6771-011

## series 8645-(6_ _) & 8655-(6_ _) 25kW, 50kW

| | | |
|---|---|---|
| **Power Rating** | 25kW continuous duty | 50kW continuous duty |
| **Power Ranges** | 1kW — 10kW; 10kW — 25kW | 1kW — 10kw; 10kW — 50kW |
| **Accuracy** | ±2½% of reading above 5kW (±3% at 5kW and below) | ±2½% of reading above 10kW (±3% at 10kW and below) |
| **Stabilization Time** | 3 minutes | 3 minutes |
| **VSWR & Frequency Range** | 1.1 max. 1kHz to 900MHz① | 1.1 max. 1kHz to 900MHz① |
| **Ambient Air Temperature Range** | with potable water (25kW) +5° C to +30° C (20 kW) +5° C to +40° C with 35% industrial Ethylene Glycol (25kW) −5° C to +25° C (20kW) −5° C to +35° C | with potable water (50kW) +5° C to +30° C (40kW) +5° C to +40° C with 35% industrial Ethylene Glycol (50kW) 0° C to +25° C (40kW) 0° C to +35° C |
| **Weight** | 184lbs (84kg) | 277lbs (126kg) |
| **Input Connectors** | ②8645-6_ _: 3⅛" EIA Flg ②8646-6_ _: 3⅛" Unflg | ②8655-6_ _: 3⅛" EIA Flg ②8656-6_ _: 3⅛" Unflg |
| **Replacement Resistor** | P/N 8755-027-3 | P/N 8755-027-5 |
| **Optional Dolly** | P/N 6771-011 | P/N 6772-011 |

①*Also 50 ohms at dc for continuity checks.*
②*In the model number, the 6th digit identifies the coolant desired: Insert 0 for 100% water, or 3 for 35% Glycol. The 7th digit identifies AC line power:* Insert 1 for 115 volts 60Hz, or 2 for 230 volts 50Hz.
Example: Order Model 8635-631 for a 10kW Calorimetric MODULOAD® *with 1⅝" EIA Flange input connector, 35% Glycol coolant and 115 volt/60Hz AC line power.*

## model 6080-_ _ _ 1 - 80kW

(CALORIMETER ONLY)
**Power Ranges Lo** 1kW — 10kW
**Power Ranges Hi** 10kW — 80kW
**Accuracy** ±3% of reading
**Frequency** Not frequency dependent
**Minimum Water Flow Lo Power** 2GPM
**Maximum Water Flow Hi Power** 10GPM
**Stabilization Time** 2 minutes
**Water Purity** Any potable water
**AC Line Voltage:** model 6080-115 — 115V 50/60Hz
model 6080-230 — 230V 50/60Hz

*Load Resistor optional (choose from TERMALINE® Econoload® 10kW to 80kW Terminations). For a panel-mounted unit for 19" racks, order 6081-115 or 6081-230.*

# Compact High Power FM Filters & Filter Couplers

50 ohms nominal

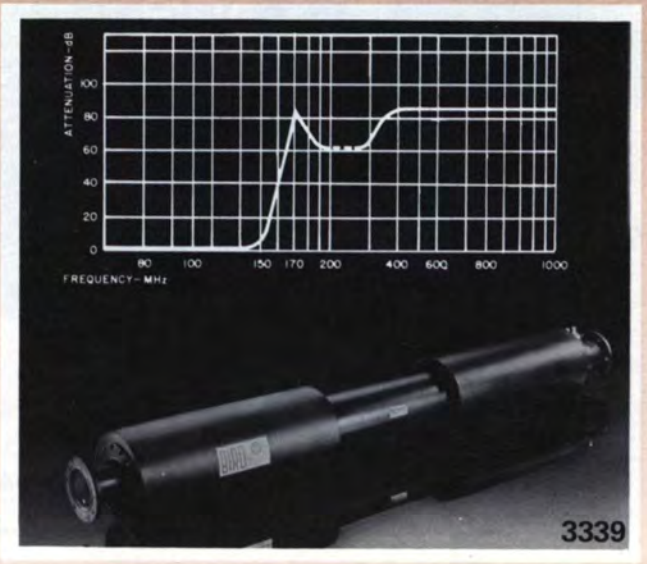
Bird's coaxial Filters and Filter/Couplers designed for FM broadcast equipment of 1kW to 50kW have long been recognized for their superior attenuation of undesirable harmonic frequencies, together with their minimum pass-band insertion loss. Attenuation in most of the stop band from 176MHz to 1000MHz is 60dB or more, insertion loss is 0.15dB or less.

Because they are exceptionally compact — as little as one-half the length of competitive models — the Filters require less space and are easier to install.

Filters are available with either standard 1⅝" or 3⅛" flanged and unflanged connectors.

Bird Filter/Couplers combine a low-pass filter with an easily customized sensor section which provides a DC or RF signal for many purposes, such as transmitter power monitoring and VSWR protection, video display, on-the-air indication and frequency checks. The space-saving combination units simplify ordering and installation and are a unique offering to the Broadcast Industry by Bird Electronic Corporation.

Models shown here are typical and variations to suit different requirements can often be accommodated. Please inquire.




LOW-PASS
FILTER/COUPLER
**Model 3117 1kW Series**
**Passband:** 88-108MHz
**Stopband:** 176-1000MHz
**Power Rating:** 1kW
**Insertion Loss:** 0.2dB max
**VSWR:** 1.2:1 max
**Temperature Range:**
−55° C to +85° C
**Connectors:** Female N
**Size:** 6" x 2" x 2"

LOW-PASS
FILTER/COUPLER
**Model 3111 5kW Series**
**Passband:** 88-108MHz
**Stopband:** 176-1000MHz
**Power Rating:** 5kW
**Insertion Loss:** 0.15dB max
**VSWR:** 1.15:1 max
**Temperature Range:**
−55° C to +85° C
**Weight:** 10½lbs (5kg)
**Size:** 14½" x 5" x 3"

LOW-PASS
FILTER/COUPLER
**Model 3330 15kW Series**
**Passband:** 88-108MHz
**Stopband:** 176-1000MHz
**Power Rating:** 15kW
**Insertion Loss:** 0.15dB max
**VSWR:** 1.25:1 max
**Temperature Range:**
−55° C to +85° C
**Weight:** 56lbs (25kg)
**Size:** 59$\frac{1}{16}$" x 4½" Dia.

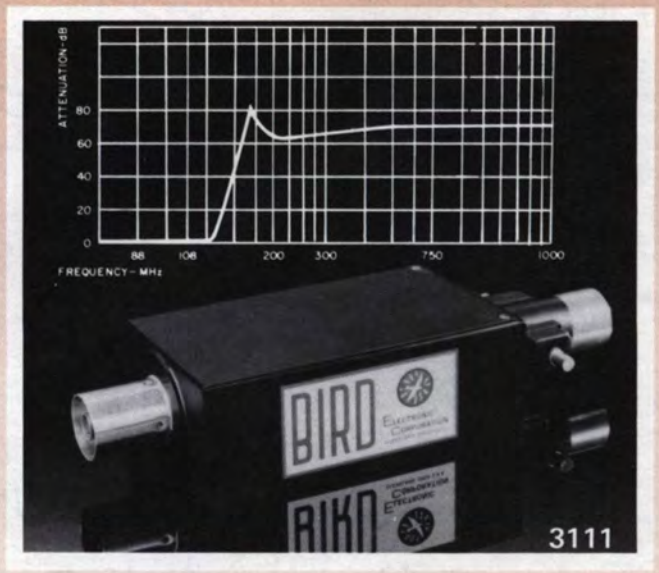
LOW-PASS
FILTER/COUPLER
**Model 3339 50kW Series**
**Passband:** 88-108MHz
**Stopband:** 176-1000MHz
**Power Rating:** 50kW
**Insertion Loss:** 0.1dB max
**VSWR:** 1.15:1 max
**Temperature Range:**
−40° C to +85° C
**Weight:** 93lbs (42kg)
**Size:** 58⅜" x 7½" Dia.

LOW-PASS
FILTER
**Model 3111C 5kW Series**
**Passband:** 88-108MHz
**Stopband:** 176-1000MHz
**Power Rating:** 5kW
**Insertion Loss:** 0.15dB max
**VSWR:** 1.15:1 max
**Temperature Range:**
−55° C to +85° C
**Weight:** 10lbs (4½kg)
**Size:** 14½" x 5" x 3"

LOW-PASS
FILTER
**Model 5178 15kW Series**
**Passband:** 88-108MHz
**Stopband:** 176-1000MHz
**Power Rating:** 15kW
**Insertion Loss:** 0.15dB max
**VSWR:** 1.25:1 max
**Temperature Range:**
−55° C to +85° C
**Weight:** 44lbs (20kg)
**Size:** 56¾" x 4½" Dia.

LOW-PASS
FILTER
**Model 5177 30kW Series**
**Passband:** 88-108MHz
**Stopband:** 176-1000MHz
**Power Rating:** 30kW
**Insertion Loss:** 0.15dB max
**VSWR:** 1.2:1 max
**Temperature Range:**
−55° C to +85° C
**Weight:** 82lbs (37kg)
**Size:** 56¾" x 6" Dia.

LOW-PASS
FILTER
**Model 5179 50kW Series**
**Passband:** 88-108MHz
**Stopband:** 176-1000MHz
**Power Rating:** 50kW
**Insertion Loss:** 0.1dB max
**VSWR:** 1.15:1 max
**Temperature Range:**
−40° C to +50° C
**Weight:** 92lbs (42kg)
**Size:** 56¾" x 7½" Dia.



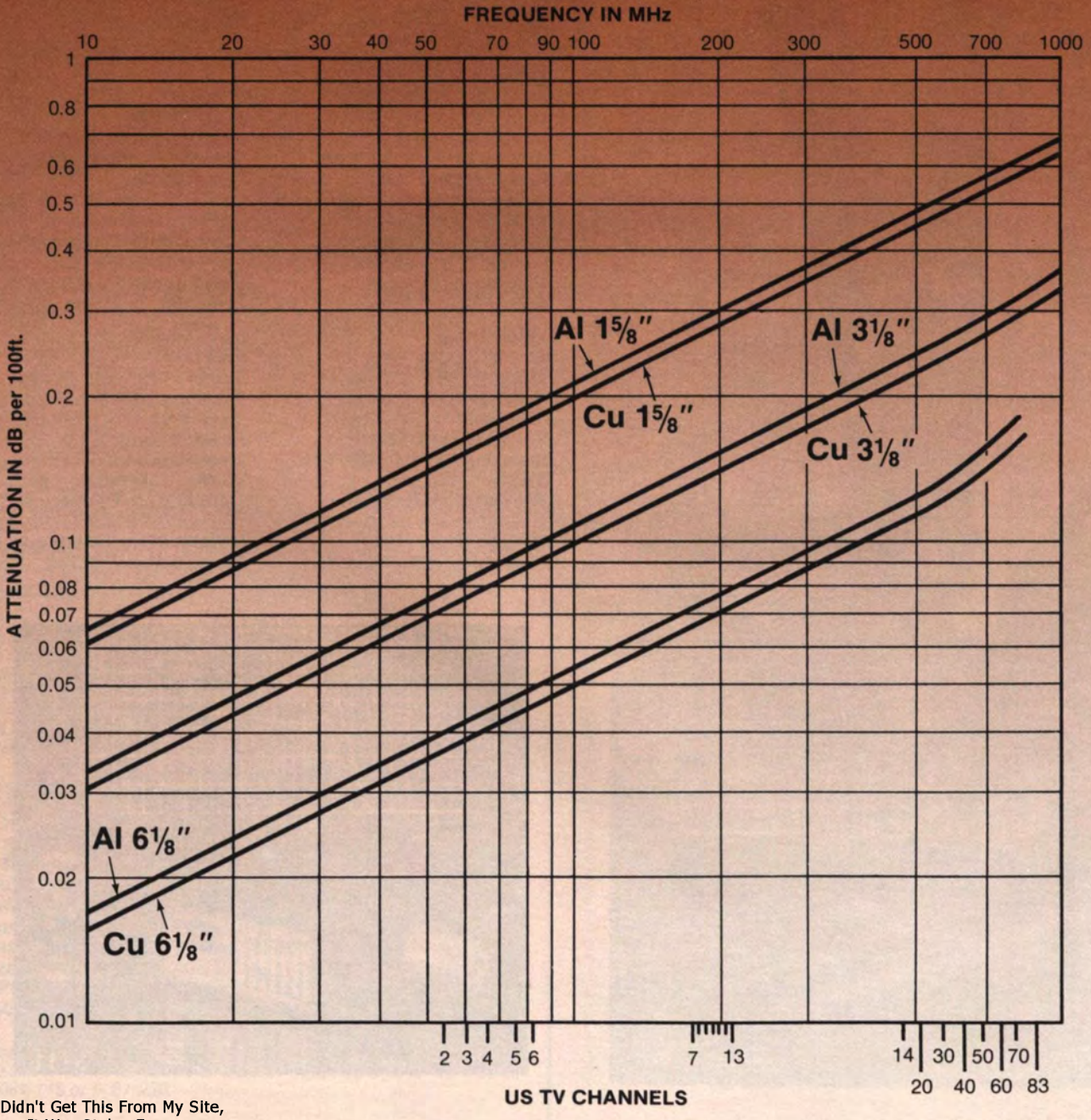
## Typical Peak Power Ratings

PULSE WIDTH (MICROSECONDS)

| SERIES | AVG. POWER | 1 | 10 | 100 | 1000 | 5000 | 10,000 |
|---|---|---|---|---|---|---|---|
| **LIQUID DIELECTRIC LOADS** | | | | | | | |
| 8890-Series | 2.5kW | 150kW | 115kW | 80kW | 54kW | 22kW | 5kW |
| 8920-Series | 5kW | 150kW | 115kW | 80kW | 54kW | 22kW | 5kW |
| 8930-Series | 10kW | 150kW | 120kW | 85kW | 55kW | 30kW | 10kW |
| **DIRECT WATER-COOLED LOADS** | | | | | | | |
| 8730 | 10kW | 100kW | 77kW | 56kW | 32kW | 16kW | 10kW |
| 8740 | 20kW | 250kW | 190kW | 135kW | 75kW | 35kW | 20kW |
| 8750 | 30kW | 250kW | 190kW | 135kW | 75kW | 40kW | 30kW |
| 8760 | 40kW | 250kW | 197kW | 145kW | 90kW | 55kW | 40kW |
| 8770 | 50kW | 250kW | 197kW | 145kW | 97kW | 65kW | 50kW |
| 8790 | 80kW | 250kW | 210kW | 170kW | 130kW | 100kW | 80kW |

## Attenuation vs. Frequency

(20° C Ambient, Unity VSWR)
Copper and Aluminum 50 ohm Transmission Line



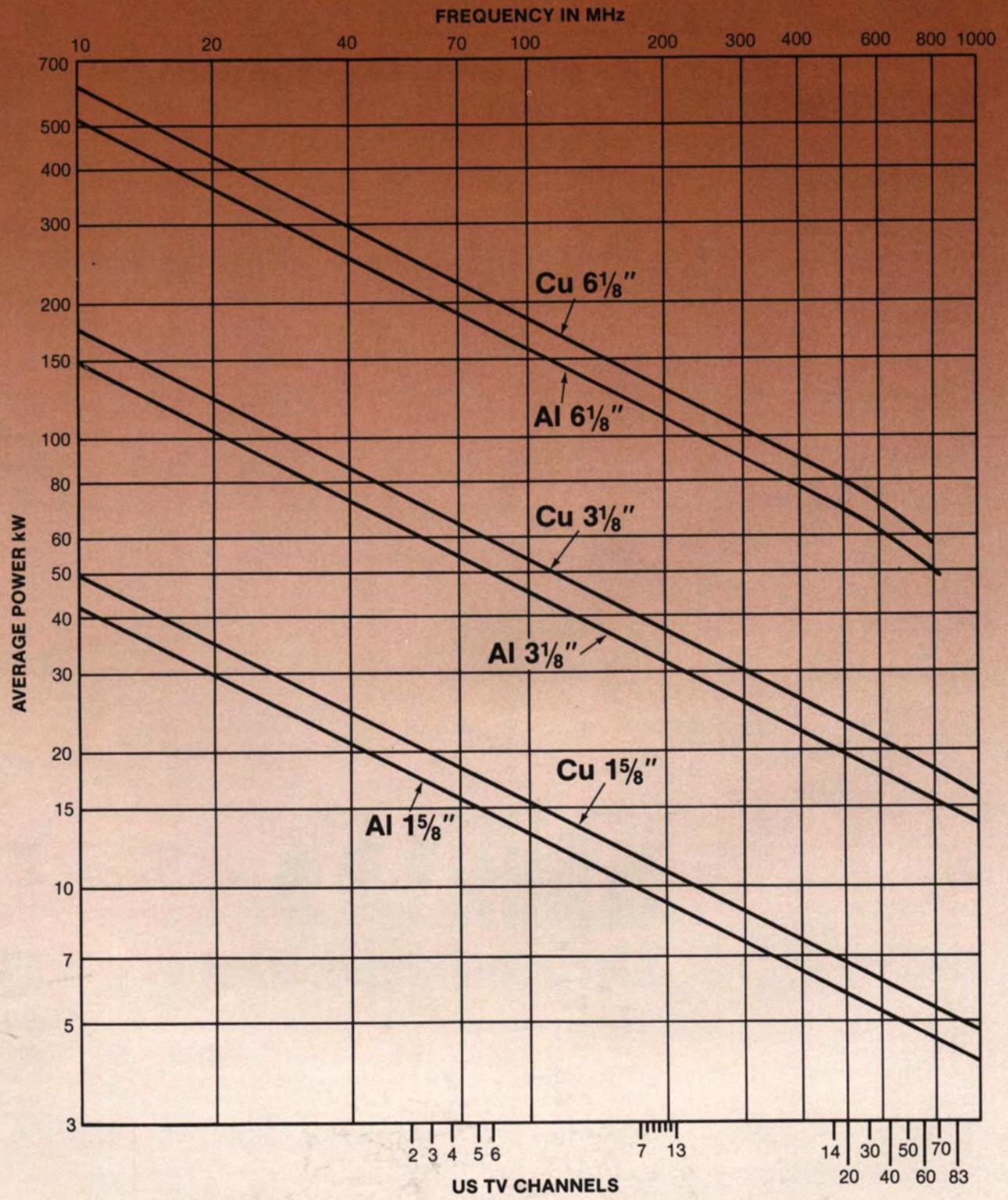
## Altitude Derating

Listed continuous power ratings for aircooled terminations are valid to 5000 ft. Above that altitude, aircooled load resistors with finned radiators are derated approximately 2% for each additional 1000 ft.

The self-cooled Moduload® terminating systems are derated approximately 10% for each 1000 ft. above 5000 ft. at their listed maximum ambient temperature of operation. As an alternative, this maximum ambient temperature needs to be reduced by approximately 2° C for every additional 1000 ft.

## Average Power Rating vs. Frequency

**(40° C Ambient, 100° C Max. Inner Conductor Temperature, Unity VSWR)**
**Copper and Aluminum 50 ohm Transmission Line**



## Accessories (Continued)

### DOLLIES

| Model | Description |
|---|---|
| 6770-105-1 | For 20, 30, 40 & 50kW Econoloads |
| 6770-105-2 | Dolly for 10kW Econoloads |
| 6770-105-5 | For 80kW Econoloads |
| 6771-011 | For 10 & 25kW Moduloads |
| 6772-011 | For 50kW Moduloads |

### For Air Cooled Loads

### THERMOSWITCHES

| Used on | Function | Thermoswitch Part Number | Temperature set point — | at which switch |
|---|---|---|---|---|
| 8630 Series | Over Temperature Interlock | 8630-013 | 86° C | opens |
| 8640 Series | Over Temperature Interlock | 8640-066 | 77° C | opens |
| 8650 Series | Over Temperature Interlock | 8640-066 | 77° C | opens |
| 8890 Series | Over Temperature Interlock | 8890-008 | 236° C | opens |
| 8920 Series | Over Temperature Interlock | 8890-006 | 236° C | opens |
| 8930 Series | Blower | 2450-085 | 155° C | closes |
| 8930 Series | Over Temperature Interlock | 8890-017 | 226° C | opens |
| BA-300-115, -230 | Automatic | 8896-012 | 100° C | closes |

# Plug In Elements

## Elements for THRULINE, RF POWER ANALYST and 3126, 3127 WATTCHER models

### TABLE 1⅝A STANDARD ELEMENTS

| Power Range | Frequency Bands (MHz) 2-30 | 25-60 | 50-125 | 100-250 | 200-500 | 400-1000 |
|---|---|---|---|---|---|---|
| 250 watts | | 250A1 | 250B1 | 250C1 | 250D1 | 250E1 |
| 500 watts | | 500A1 | 500B1 | 500C1 | 500D1 | 500E1 |
| 1000 watts | 1000H1 | 1000A1 | 1000B1 | 1000C1 | 1000D1 | 1000E1 |
| 2500 watts | 2500H1 | 2500A1 | 2500B1 | 2500C1 | 2500D1 | 2500E1 |
| 5000 watts | 5000H1 | 5000A1 | 5000B1 | 5000C1 | 5000D1 | 5000E1 |
| 10kW | 10KH1 | 10KA1 | 10KB1 | | | |
| 25kW | 25KH1 | | | | | |

### TABLE 3⅛A STANDARD ELEMENTS

| Power Range | Frequency Bands (MHz) 2-30 | 25-60 | 50-125 | 100-250 | 200-500 | 400-1000 |
|---|---|---|---|---|---|---|
| 1000 watts | | 1000A3 | 1000B3 | 1000C3 | 1000D3 | 1000E3 |
| 2500 watts | | 2500A3 | 2500B3 | 2500C3 | 2500D3 | 2500E3 |
| 5000 watts | 5000H3 | 5000A3 | 5000B3 | 5000C3 | 5000D3 | 5000E3 |
| 10kW | 10KH3 | 10KA3 | 10KB3 | 10KC3 | 10KD3 | 10KE3 |
| 25kW | 25KH3 | 25KA3 | 25KB3 | 25KC3 | 25KD3 | 25KE3 |
| 50kW | 50KH3 | | | | | |
| 100kW | 100KH3 | | | | | |

### TABLE 6⅛A STANDARD ELEMENTS

| Power Range | Frequency Bands (MHz) 2-30 | 25-60 | 50-125 | 100-250 | 200-500 | 400-1000 |
|---|---|---|---|---|---|---|
| 2500 watts | | 2500A6 | 2500B6 | 2500C6 | 2500D6 | 2500E6 |
| 5000 watts | | 5000A6 | 5000B6 | 5000C6 | 5000D6 | 5000E6 |
| 10kW | | 10KA6 | 10KB6 | 10KC6 | 10KD6 | 10KE6 |
| 25kW | 25KH6 | 25KA6 | 25KB6 | 25KC6 | 25KD6 | 25KE6 |
| 50kW | 50KH6 | 50KA6 | 50KB6 | 50KC6 | 50KD6 | 50KE6 |
| 100kW | 100KH6 | | | | | |
| 250kW | 250KH6 | | | | | |

### TABLE 1⅝B

| Power Range | 50-125MHz | 100-250 |
|---|---|---|
| 300 watts | 300B1 | 300C1 |
| 600 watts | 600B1 | 600C1 |
| 1500 watts | 1500B1 | 1500C1 |
| 3000 watts | 3000B1 | 3000C1 |
| 6000 watts | 6000B1 | 6000C1 |

### TABLE 3⅛B

| Power Range | 50-125MHz | 100-250 |
|---|---|---|
| 1500 watts | 1500B3 | 1500C3 |
| 3000 watts | 3000B3 | 3000C3 |
| 6000 watts | 6000B3 | 6000C3 |
| 15kW | 15KB3 | 15KC3 |
| 30kW | 30KB3 | 30KC3 |

### TABLE 6⅛B

| Power Range | Frequency Bands (MHz) 50-125 | 100-250 | 470-750 |
|---|---|---|---|
| 3000 watts | 3000B6 | 3000C6 | 3000U6 |
| 6000 watts | 6000B6 | 6000C6 | 6000U6 |
| 15kW | 15KB6 | 15KC6 | 15KU6 |
| 30kW | 30KB6 | 30KC6 | 30KU6 |
| 60kW | 60KB6 | 60KC6 | 60KU6 |

### TABLE 6⅛C

| Power Range | Frequency Bands (MHz) 50-125 | 100-250 | 470-750 |
|---|---|---|---|
| 8kW | 8KB6 | 8KC6 | 8KU6 |
| 80kW | 80KB6 | 80KC6 | 80KU6 |

## Special Elements for use with model 3171 HighSpeed WATTCHER RF Monitoring System

for 1⅝" Line

| Power Range | Frequency Bands (MHz) 2-30 | 25-60 | 50-125 | 100-250 | 200-500 | 400-1000 |
|---|---|---|---|---|---|---|
| 250 watts | | 250A12 | 250B12 | 250C12 | 250D12 | 250E12 |
| 500 watts | 500H12 | 500A12 | 500B12 | 500C12 | 500D12 | 500E12 |
| 1000 watts | 1000H12 | 1000A12 | 1000B12 | 1000C12 | 1000D12 | 1000E12 |
| 2500 watts | 2500H12 | 2500A12 | 2500B12 | 2500C12 | 2500D12 | 2500E12 |
| 5000 watts | 5000H12 | 5000A12 | 5000B12 | 5000C12 | 5000D12 | 5000E12 |
| 10kW | 10KH12 | 10KA12 | 10KB12 | | | |

for 3⅛" Line

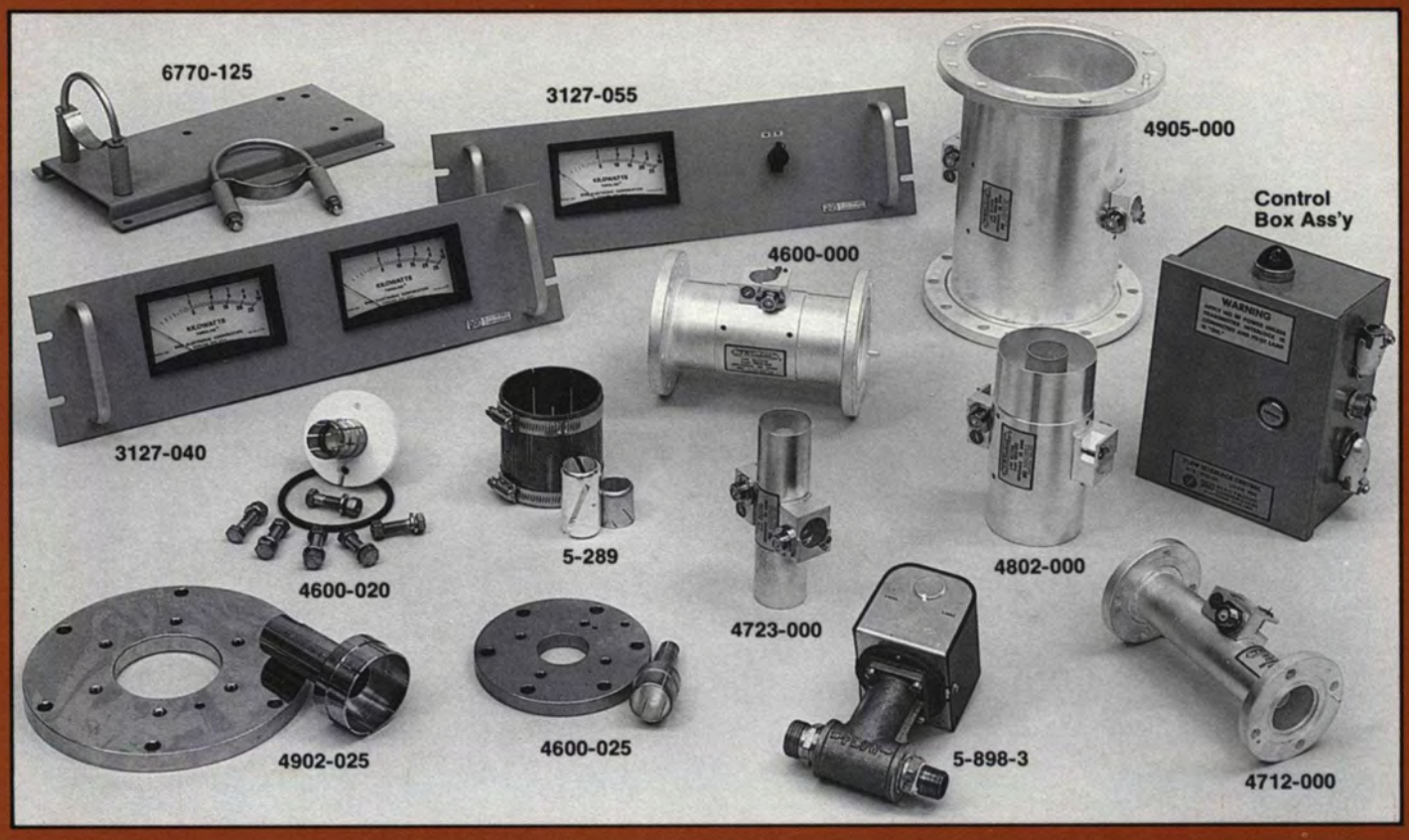
| Power Range | Frequency Bands (MHz) 2-30 | 25-60 | 50-125 | 100-250 | 200-500 | 400-1000 |
|---|---|---|---|---|---|---|
| 1000 watts | | 1000A32 | 1000B32 | 1000C32 | 1000D32 | 1000E32 |
| 2500 watts | 2500H32 | 2500A32 | 2500B32 | 2500C32 | 2500D32 | 2500E32 |
| 5000 watts | 5000H32 | 5000A32 | 5000B32 | 5000C32 | 5000D32 | 5000E32 |
| 10kW | 10KH32 | 10KA32 | 10KB32 | 10KC32 | 10KD32 | 10KE32 |
| 25kW | 25KH32 | 25KA32 | 25KB32 | 25KC32 | 25KD32 | 25KE32 |
| 50kW | 50KH32 | 50KA32 | 50KB32 | 50KC32 | 50KD32 | 50KE32 |
| 100kW | 100KH32 | | | | | |

*Higher Power Elements for 3⅛" Lines. Element Models 50KA32, 50KB32, 50KC32 are available. Element 50KC32 should not be used above maximum rated line power of 35kW. Order special line section 4616-000 for use with Elements 50KA32, 50KB32, 50KC32.*

for 6⅛" Line

| Power Range | Frequency Bands (MHz) 2-30 | 25-60 | 50-125 | 100-250 | 200-500 | 400-1000 |
|---|---|---|---|---|---|---|
| 2500 watts | | 2500A62 | 2500B62 | 2500C62 | 2500D62 | 2500E62 |
| 5000 watts | | 5000A62 | 5000B62 | 5000C62 | 5000D62 | 5000E62 |
| 10kW | 10KH62 | 10KA62 | 10KB62 | 10KC62 | 10KD62 | 10KE62 |
| 25kW | 25KH62 | 25KA62 | 25KB62 | 25KC62 | 25KD62 | 25KE62 |
| 50kW | 50KH62 | 50KA62 | 50KB62 | 50KC62 | 50KD62 | 50KE62 |
| 100kW | 100KH62 | | | | | |

# Accessories




### RIGID LINE REDUCERS①

| Part No. | Description |
|---|---|
| 4240-201 | 7/8" EIA Flanged to QC-Type Connector |
| 4240-260 | 1 5/8" EIA Flanged to QC-Type Connector |
| 4240-194 | 3 1/8" EIA Flanged to QC-Type Connector |
| 4240-187 | 3 1/8" Unflanged (51.5-ohms) to QC-Type |

### COUPLING KITS

| | |
|---|---|
| 4240-220 | Complete kit for 7/8" EIA Flanged Line |
| 4712-020 | Complete kit for 1 5/8" EIA Flanged Line |
| 4600-020 | Complete kit for 3 1/8" EIA Flanged Line |
| 4902-020 | Complete kit for 6 1/8" EIA Flanged Line |
| 5-289 | Coupling kit for 3 1/8" Unflanged 51.5-ohm line, including sleeve clamp band, 51.5-ohm bullet, and 50-ohm adapter |

①These versatile reducers for impedance measurements and other applications where it is desirable to keep reflections to a minimum, exhibit less than 1.05 insertion VSWR up to 1000MHz.

## For Thruline® Wattmeters

### METERS (100 microamps)

| Bird Part No. | Size | Standard Scales (kW) |
|---|---|---|
| 2150-088 | 4½" Rectangular | 5/10/25 |
| 2000-030 | 4½" Round | 5/10/25 |
| 2000-059 | 4½" Round | 15/30/60 |
| 6810-009-7 | In Housing | 5/10/25 |
| 6810-020 | In Housing (FWD & RFL Switch) | 5/10/25 |
| 6810-030 | In Housing (FWD & RFL Switch) | 15/30/60 |
| 3127-035 | Panel - 1 meter | 5/10/25 |
| 3127-055 | Panel - 1 meter (FWD & RFL Switch) | 5/10/25 |
| 3127-040 | Panel - 2 meters | 5/10/25 |
| 3127-070 | Panel - 1 meter | 15/30/60 |
| 3127-080 | Panel - 1 meter (FWD & RFL SWITCH) | 15/30/60 |
| 3127-075 | Panel - 2 meters | 15/30/60 |

### 50-OHM LINE SECTIONS

| LINE SECTION PART NUMBERS Single Socket | Double Socket | Connector |
|---|---|---|
| 4712-000 | 4715-000 | 1 5/8" EIA Flanged |
| 4720-000 | 4723-000 | 1 5/8" Unflanged |
| 4600-000 | 4610-000 | 3 1/8" EIA Flanged |
| 4805-000 | 4802-000 | 3 1/8" Unflanged |
| 4902-000 | 4905-000 | 6 1/8" EIA Flanged |
| 4907-000 | 4909-000 | 6 1/8" Unflanged |

### MISCELLANEOUS ADAPTERS

| Part No. | Description |
|---|---|
| 4712-015 | 1 5/8" EIA Flanged to 7/8" EIA Flanged line |
| 4600-025 | 3 1/8" EIA Flanged to 1 5/8" EIA Flanged line |
| 4902-025 | 3 1/8" EIA Flanged to 6 1/8" EIA Flanged line |

## For WATTCHER® And Panel-Mounted Wattmeters

### DC CABLES

| | | |
|---|---|---|
| 4220-097-10 | 25' | for models 3126, 3127 & all panel mounted wattmeters |
| 4220-077-1 | 25' for 6 1/8" lines only | |
| 3170-058-3 | 25' | for models 3171 and 3171-020 |
| 3171-010 | 25' for 6 1/8" lines only | |

## For Water-Cooled Loads

### WALL MOUNTING BRACKETS

| Part No. | Power | Part No. | Power |
|---|---|---|---|
| 6770-120 | 10kW | 6770-125 | 20kW, 30kW |
| 6770-130 | 80kW | | 40kW, 50kW |

### WATER FLOW SWITCH — ECONOLOADS

| Part No. | Power | Part No. | Power |
|---|---|---|---|
| 5-898-2 | 20kW | 5-898-6 | 10kW |
| 5-898-3 | 30kW | 5-898-7 | 80kW |
| 5-898-4 | 40kW, 50kW | | |

### CONTROL BOX ASSEMBLY

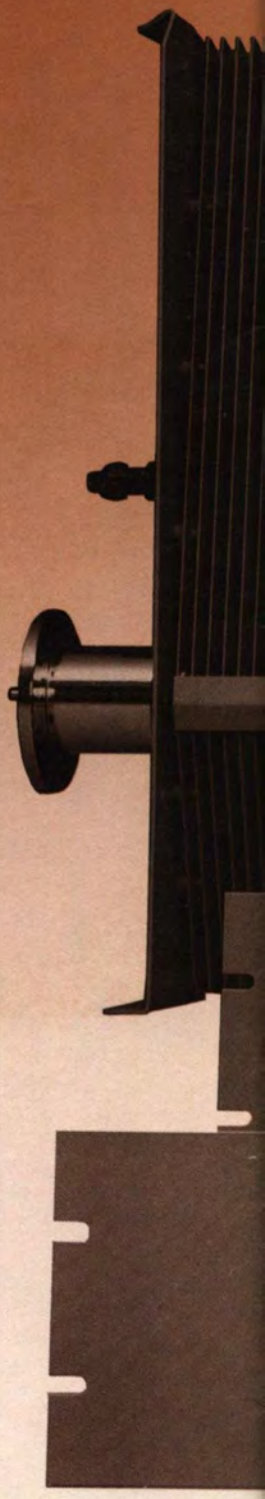
8750-100 For all Econoloads



*Please turn page for additional Accessories.*

BIRD

# Bird Quality Instruments for RF Power Measurement — worldwide



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BIRD

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