The RF80-K Charger/Analyzer

The RF80-K is the worldwide industry leader for high-grade aircraft battery chargers/analyzers. With its many user-friendly features, automatic operation, digital timers and displays, battery reconditioning capability, and selection of charge modes including Christie’s exclusive Fast ReFLEX charging, the RF80-K is unsurpassed. And, it is the only battery charger/analyzer in the industry offered with a full three-year warranty.

Capabilities

The RF80-K offers a choice of several charging techniques, such as ReFLEX, constant current, constant potential and two-step constant current. Christie’s exclusive ReFLEX charging method offers the advantage of charging batteries faster, without heating, and in as little as one hour while simultaneously reconditioning the batteries. Additionally, the RF80-K employs negative slope sensing as a built-in safety measure to prevent overcharging and possible thermal runaway.

Features and Benefits

- Automatic Operation
- Heavy Duty Design and Performance
- Digital Timing/Display
- Charges and Analyzes All Aircraft Batteries - NiCd and Lead-Acid (3-55 AH)
- Unique ReFLEX® Charging Technique
- Constant Current/Constant Potential Charging
- One-hour Charge, One-hour Discharge (NiCd)
- Reconditions NiCd Batteries
- Exclusive DigiFLEX® Analysis
- Cell Voltage Balance Testing
- Full Three (3) Year Warranty

Analyzer Function

Battery analysis is automatically performed by the RF80-K with a preprogrammed charge-discharge-recharge cycle that matches the characteristics of each battery type. Via a quick switch selection, the RF80-K provides the user with a simple “GO/NO GO” battery condition, or an exact ampere-hour capacity determination. A third switch position performs a deep discharge to recondition NiCd batteries or prepare them for storage.

Battery analysis by individual cell performance and condition is offered when used in conjunction with Christie’s DataFX. Aside from instantaneous cell voltage measurement during the service cycle, the DataFX monitors cells for error conditions such as cell imbalance, low cell voltage, negative slope and reversed cell polarity. Hard-copy reports, when used with the optional printer, offer detailed documentation of servicing tasks for each battery. And, the built-in RS232 PC interface allows the DataFX to tie into Christie’s CBS software system to fully automate the documentation process and store essential data.
Multi-Functional & Versatile

The wide selection of charging techniques of the RF80-K provides the capacity of servicing NiCd, vented lead-acid and sealed lead-acid batteries. Furthermore, it analyzes and reconditions batteries.

ReFLEX Reconditioning

ReFLEX charging has an important reconditioning effect by preventing the formation of gases across the plate area and restoring the crystal structure of the cadmium anode. Among the benefits are accelerated charge times, more efficient charging, lower charge temperatures, elimination of “memory” effect, improvement in cell balance and a significant increase in cycle life.

DigiFLEX Analysis

The RF80-K incorporates a special circuit called DigiFLEX which measures battery condition during the charge cycle. This circuit presents information on the Trend Bar style display, wherein a series of luminescent bars depict the relative state of charge as well as the battery’s general condition of health.

**STANDARD ACCESSORIES**

**Battery cable assembly:** Connects battery being charged or analyzed to RF80-K.

**Cell-scanning probe set:** Test probes for manually checking cell voltages.

**OPTIONAL ACCESSORIES**

**ProEase™ DATAFx:** Battery cell monitoring instrument for data logging and automated battery servicing documentation.

**Christie Battery System (CBS):** Windows 95 based software automates management of service data.

**SPECIFICATIONS**

**Mechanical**
- Size: Overall 18.5” (47.1cm) wide x 21.5” (54.6cm) deep x 11” (27.9cm) high
- Size: Cabinet 17” (43.2cm) wide x 20.8” (52.3cm) deep x 10.25” (26cm) high
- Net weight: 145 pounds (65.9 kg)
- Case material: Steel
- Front panel material: Steel with polyester overlay

**Electrical—Input**
- Input voltage: 187 to 265 VAC, single phase
- Frequency: 47 to 63 Hertz

**Electrical—Output**
- ReFLEX Charge: 2 to 80 A
- Constant current: 1 to 65A, maximum
- Constant current discharge: 0.2 to 50A

**Electrical—Displays**
- Current: 99.9 full scale, accuracy ±2% of full scale
- Individual Cells: 19.9 full scale, accuracy ±2% of full scale
- DigiFLEX: 10 segment trend bar display

**Environmental—Non-operating**
- Ambient temperature: −40°C to +71°C
- Altitude: 0 to 50,000 feet

**Environmental—Operating**
- Ambient temperature: 0°C to 50°C
- Altitude: 0 to 8,000 feet

**Warranty**
- Three year parts and labor

COPYRIGHT 2003 by Christie Electric Corp. All rights reserved. CHRISTIE and ReFLEX are registered trademarks of Christie Electric Corp. ProEase and DATAFx are trademarks of Christie Electric Corp.
RF80-K
AIRCRAFT BATTERY CHARGER-ANALYZER

- AUTOMATIC OPERATION
- DIGITAL TIMING/DISPLAY
- CHARGES & ANALYZES ALL AIRCRAFT BATTERIES—NICKEL-CADMIUM & LEAD-ACID (3-55AH)
- UNIQUE ReFLEX® CHARGING TECHNIQUE
- CONSTANT CURRENT/CONSTANT POTENTIAL CHARGING
- ONE-HOUR CHARGE, ONE-HOUR DISCHARGE (NICKEL-CADMIUM)
- RECONDITIONS NICKEL-CADMIUM BATTERIES
- EXCLUSIVE DigiFLEX® ANALYSIS
- CELL VOLTAGE BALANCE TESTING
- OPTIONAL WAIT STATE DURING ANALYSIS

CHRISTIE
Since 1929
RF80-K AIRCRAFT BATTERY

ReFLEX® CHARGING TECHNIQUE

UNIQUE METHOD
ReFLEX® charging was developed by Christie specifically for charging nickel-cadmium batteries. This uniquely advantageous charging method employs positive current charge pulses alternated with negative current discharge pulses.

RECONDITIONS NICKEL-Cadmium BATTERIES
For vented nickel-cadmium batteries, the type most commonly used for aircraft starting, ReFLEX® charging has an important reconditioning effect, preventing the formation of gasses across the plate area and restoring the crystal structure of the cadmium anode.

Among the benefits are accelerated charge times, more efficient charging, lower charge temperatures, elimination of "memory" effect, improvement in cell balance, and significant increase in cycle life.

DigiFLEX® ANALYSIS
The ReFLEX® charging waveform includes a negative discharge component. RF80-K incorporates a special circuit, called DigiFLEX®, which measures the battery condition during the charge cycle. This circuit presents information on a "trend bar" type of display. A series of luminous bars shows the relative battery state of charge and condition of health.

RF80-K OPERATION

The RF80-K Aircraft Battery Charger-Analyzer charges all commonly used types of aircraft batteries, such as nickel-cadmium, vented lead-acid, and sealed lead-acid. The instrument also analyzes batteries to determine their condition, or useful capacity.

The RF80-K has many user-friendly features, including automatic operation; digital timers and displays; a well organized front panel; and simple, accessible controls.

CHARGER FUNCTION
The Charger function of the RF80-K is capable of providing the charge method recommended by aircraft battery manufacturers or battery maintenance specialists.

ReFLEX®
As described in this brochure, ReFLEX® charging is customarily used for nickel-cadmium batteries with 11, 19, 20, or 22 cells. This exclusive Christie process permits charging batteries in as little as one hour, and also reconditions batteries while they are charging.

Constant-Current
In the constant-current mode, the Charger-Analyzer can be used to charge nickel-cadmium batteries with up to 24 cells, as well as charging individual cells or groups of cells. This method is also recommended for some lead-acid batteries. The charging rate and time in the constant-current mode are adjustable.

Two-Step Constant Current
As an alternative charge method, the Charger-Analyzer can provide a high charge rate for a certain period of time, then drop to a lower charge rate for an equal charge period.

Constant Potential
For vented or sealed lead-acid batteries, constant-potential charging is available. The Charger-Analyzer can accommodate 6, 12, 24, and 28-volt batteries.

Negative Slope Sensing
When charging causes the temperature of nickel-cadmium batteries to rise, the voltage of the batteries diminishes, which can result in further heating. As a safety feature, the Charger-Analyzer employs negative slope sensing of the charge curve to detect overcharging, and halt possible thermal runaway of the battery.

ANALYZER FUNCTION
The Analyzer function of the RF80-K permits complete aircraft battery analysis automatically, with a charge-discharge-recharge cycle that can be preprogrammed to match the characteristics of each battery type. The battery condition is evaluated by a "go - no go" indication. The actual ampere-hour capacity can be determined using the elapsed time and discharge rate.

Short, Long, and Deep Cycles
The Charger-Analyzer permits analysis of a battery based on criteria established by the operator. In the Short cycle, the battery is discharged for a preprogrammed period. If the battery drops below a minimum acceptable voltage level before the end of the preprogrammed period, the red "Battery Reject" light illuminates.

In the Long cycle, the battery voltage is brought to approximately one volt per cell. In this mode, the exact ampere-hour capacity of the battery can be determined.

To recondition or store nickel-cadmium batteries, a deep discharge mode is available.

Optional Wait State
To enhance battery life, the Charger-Analyzer can be programmed to introduce a wait state after the discharge portion of the analysis, allowing the battery to cool before automatic recharge takes place.
**METERING FUNCTION**

The Metering function of the RF80-K allows the value of the parameter selected by the Meter Switch to be displayed for operator convenience on a single digital panel meter.

**Voltage/Current Monitoring**

The Charger-Analyzer permits the voltage or current of the battery undergoing processing to be monitored at any point in the process, from initial adjustment of the charge or discharge current through completion of the charge, discharge, or recharge stages.

**Cell-by-Cell Testing**

Front panel jacks allow a pair of test probes to be connected to the Charger-Analyzer. When the Meter Switch is in the “Cell Volts” position, the probes can be used to check the voltages of individual battery cells or groups of cells. A typical application for this capability is cell balance or gas barrier check during charge.

---

**CONTROLS & INDICATORS**

All controls and indicators for the RF80-K Charger-Analyzer are conveniently located on the instrument’s front panel. To facilitate use of the RF80-K, the operating controls and displays are located generally in three functional groupings. The left third of the front panel relates to the Charger function; the central third to the Analyzer function; and the right third to the Metering function. The Mode Switch, between the charge and analyze sections, allows the process to be selected. The charge method is chosen by a switch in the lower part of the Metering sector.

---

<table>
<thead>
<tr>
<th>NAME</th>
<th>PURPOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 AC Power Switch</td>
<td>Primary or mains AC power ON-OFF switch</td>
</tr>
<tr>
<td><strong>CHARGER SECTION</strong></td>
<td></td>
</tr>
<tr>
<td>2 Set Charge Time</td>
<td>Establishes charge time</td>
</tr>
<tr>
<td>3 Time to Charge</td>
<td>Displays charge time remaining</td>
</tr>
<tr>
<td>4 Charge Current Adj</td>
<td>Allows charging current to be set to desired value</td>
</tr>
<tr>
<td><strong>ANALYZER SECTION</strong></td>
<td></td>
</tr>
<tr>
<td>5 Cycle Indicators</td>
<td>Indicator lights: Cycle Complete (green); Battery Reject (red); Negative Slope Sensing (yellow)</td>
</tr>
<tr>
<td>6 Elapsed Discharge Time</td>
<td>Displays elapsed discharge time</td>
</tr>
<tr>
<td>7 Mode Switch</td>
<td>Selects RF80-K process</td>
</tr>
<tr>
<td>8 Cycle Reset</td>
<td>Resets the automatic cycle to the beginning of the selected mode</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>NAME</th>
<th>PURPOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Discharge Current Adj</td>
<td>Sets discharge current rate</td>
</tr>
<tr>
<td>10 Set Discharge Time</td>
<td>Sets total discharge time</td>
</tr>
<tr>
<td>11 Discharge Cycle</td>
<td>Switch for Short, Long, or Deep discharge options</td>
</tr>
<tr>
<td><strong>METERING SECTION</strong></td>
<td></td>
</tr>
<tr>
<td>12 Metering Display</td>
<td>Displays battery voltage, cell voltage, or charge/discharge current</td>
</tr>
<tr>
<td>13 DigiFLEX®</td>
<td>Trend bar display showing relative state of charge and battery health</td>
</tr>
<tr>
<td>14 Meter Switch</td>
<td>Selects metering display inputs</td>
</tr>
<tr>
<td>15 Cell Volts</td>
<td>Jacks for test leads permitting cell-by-cell testing</td>
</tr>
<tr>
<td>16 Charge Method Switch</td>
<td>Selects type of charging to be performed</td>
</tr>
<tr>
<td>17 Battery Type Switch</td>
<td>Selects proper ReFLEX® charge for battery under analysis</td>
</tr>
</tbody>
</table>
RF80-K AIRCRAFT BATTERY CHARGER-ANALYZER

OUTLINE & MOUNTING DIMENSIONS

STANDARD ACCESSORIES
Battery cable assembly Connects battery being charged or analyzed to RF80-K
Cell-scanning probe set Test probes for manually checking cell voltages

SPECIFICATIONS

Mechanical
- Size: Overall 18.55" (47.12 cm) wide x 21.5" (54.61 cm) deep x 11" (27.94 cm) high
- Cabinet 17" (43.18 cm) wide x 20.81" (52.86 cm) deep x 10.25" (26.04 cm) high
- Net weight: 145 pounds (65.90 kg)
- Case material: Steel
- Front panel material: Steel with polyester overlay

Electrical-Input
- Input voltage: 187 to 265 VAC, single phase
- Frequency: 47 to 63 hertz

Electrical-Output
- ReFLEX® charge: 2 to 80 A
- Constant current charge: 1 to 65 A, maximum
- Constant current discharge: 0.2 to 50 A

Electrical-Displays
- Current: 99.9 full scale, accuracy ±2% of full scale
- Voltage: 99.9 full scale, accuracy ±2% of full scale

- Current requirements: 25 A, maximum
- Power switch: Opens both sides of line

Environmental-Nonoperating
- Ambient temperature: -40 °C to +71 °C (-40 °F to +159.8 °F)
- Altitude: 0-50,000 feet

Environmental-Operating
- Ambient temperature: 0°C to 50°C (+32°F to 122°F)
- Altitude: 0-8,000 feet

Note: Specifications subject to change without notice

A COMPANY WITH A VISION

Christie Electric Corp. has excelled in the design and manufacturing of systems and equipment in two major product areas:
- Chargers and analyzers for a variety of battery types, as well as high-current DC power supplies for precision ground power and specialty applications.
- Electro-optical equipment, including projectors, Xenon light sources, and automatic film handling equipment.

With six decades of experience in its fields of specialty, Christie enjoys a unique reputation for products offering performance and reliability blended with sound technical innovation. A case in point is the Christie CASP®, a sophisticated, microprocessor-based charger-analyzer for use with smaller rechargeable batteries, such as those for emergency aircraft power.

Government agencies for which Christie has supplied commercial and Mil-spec systems and equipment include the U.S. Air Force, Army, Navy, Marine Corps, and NASA. The Space Shuttle today, as the Apollo program earlier, relies on Christie for DC power to ground checkout and launch control systems.

The RF80-K Aircraft Charger-Analyzer is the latest in a family of successful equipments designed to service all aircraft batteries. As an aid to effective aircraft battery maintenance, the RF80-K is without peer. This capable and versatile instrument exemplifies the Christie vision of meeting today's maintenance needs with an eye to tomorrow's technical requirements.