Chadwick 8500C+ Balancer/Analyzer

Honeywell

**ONE BALANCER/ANALYZER
FOR ALL YOUR NEEDS**

Keeps flight time up and maintenance costs down

The Chadwick 8500C+ comes flight-line ready as a complete kit, with all of the accessories and instructions for one or more particular aircraft types in side of a rugged, portable carrying case.

It interfaces to a variety of sensors for vibration and phase measurement, and uses the FasTrak™ Optical Blade Tracker or Strobex for helicopter blade track. With the Chadwick 8500C+, you'll be able to perform the following vibration analysis tasks:

Smart Charts™

Honeywell Smart Charts™ are application software dedicated to Helicopter Rotor & Track & Balance. The Smart Chart™ walks the user through equipment installation, operation, data acquisition and provides a rotor smoothing solution.
This smoothing interaction between mass balance and blade track to give a solution that minimizes vibrations across the flight envelope while minimizing blade track spread.

The result is lower vibrations for optimum performance and ride quality, with a minimum of time and engine starts.

Since 1986, Honeywell has fielded over 2000 Chadwick 8500 Balancer/Analyzer systems, and supports those systems and customers today. The newest in this successful line of vibration analysis tools is the Chadwick 8500C+.

The Chadwick 8500C+

The Chadwick 8500C+ performs helicopter rotor track & balance, fixed-wing propeller track & balance, helicopter and fixed- wing vibration surveys and vibration analysis/trend analysis.

The digital computer/FFT analyzer uses a bright, backlit display, integral printer, built-in help and Smart Chart™ technology enabling anyone from the trainee to the experienced dynamics engineer to realize optimal maintenance solutions for all vibration-related maintenance tasks.

Built-in printer

The printer provides you with a permanent record of what you see in the LCD panel, so you won't have to write everything down, or hook up to an external printer.
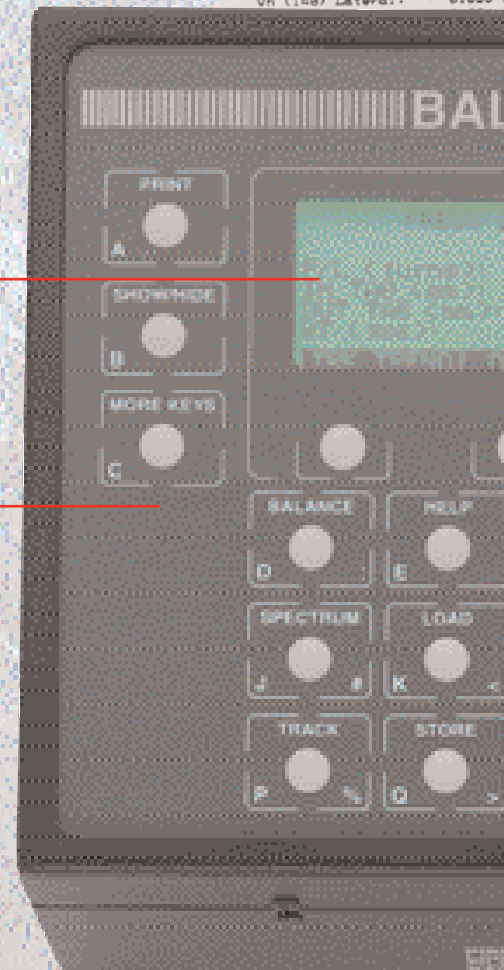
Easy-to-read, backlit LCD panel and keypad

Displays step-by-step instructions and is operator-friendly.

Positive-click buttons

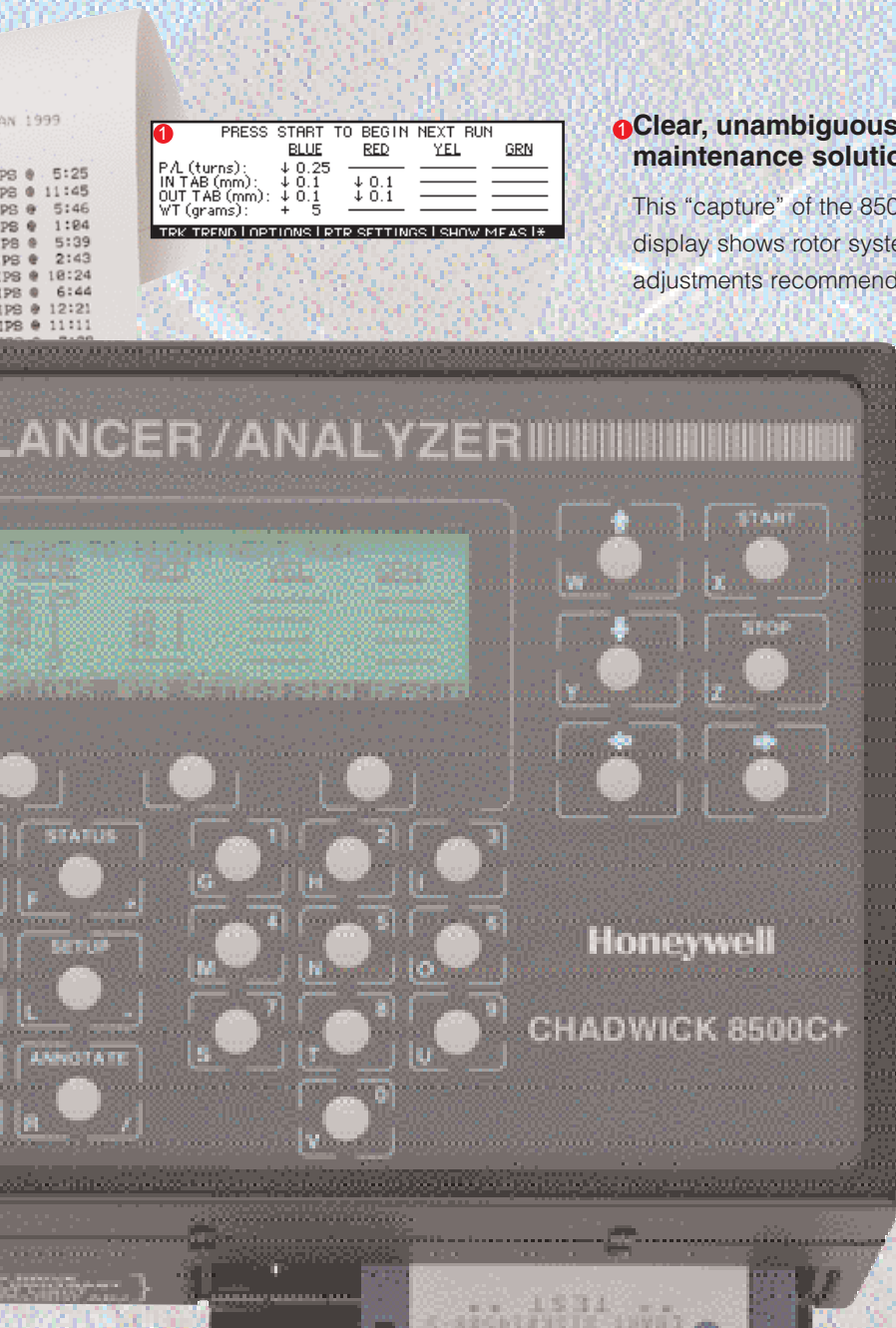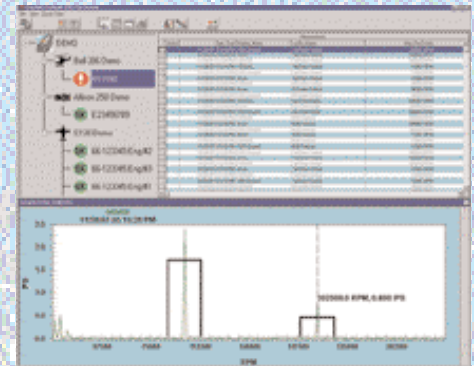Your fingers will appreciate the tactile feedback.

Balance Charts

Balance Chart software is used for balance operations other than helicopter main rotors. These applications include tail rotors, fixed-wing propellers, shafts and any rotating components requiring balance.

VibraLog™ and Vib Review™

Data from vibration surveys can be archived and analyzed on a PC with VibraLog™ or Vib Review™. This data is used for troubleshooting, advanced trend monitoring and predictive maintenance programs.

Route Disks

With the Chadwick 8500C+, vibration checks and surveys are accomplished quickly and reliably with a "route disk". The route disk converts the Chadwick 8500C+ into a menu-driven data collector, acquiring spectral data, balance points and other data from a variety of sensors on the aircraft.

❶ **Clear, unambiguous maintenance solutions**

This "capture" of the 8500's display shows rotor system adjustments recommended.

```
❶      PRESS START TO BEGIN NEXT RUN
             BLUE      RED      YEL      GRN
P/L (turns):   ↓ 0.25   ─────
IN TAB (mm):   ↓ 0.1    ↓ 0.1   ─────
OUT TAB (mm):  ↓ 0.1    ↓ 0.1   ─────
WT (grams):    +  5             ─────
TRK TREND | OPTIONS | RTR SETTINGS | SHOW MEAS | *
```

```
❷  97% Ground Lateral:     0.020  IPS @  5:25
   Hover Lateral:          0.022  IPS @ 11:45
   Hover Vertical:         0.070  IPS @  5:46
    80 KIAS  Lateral:      0.013  IPS @  1:04
    80 KIAS  Vertical:     0.080  IPS @  5:39
    80 KIAS  Vertical:  4P:0.378  IPS @  2:43
   120 KIAS  Lateral:      0.045  IPS @ 10:24
   120 KIAS  Vertical:     0.090  IPS @  6:44
   120 KIAS  Vertical:  4P:0.395  IPS @ 12:21
   Vh (140) Lateral:       0.063  IPS @ 11:11
   Vh (140) Vertical:      0.094  IPS @  7:09
   Vh (140) Vertical:   4P:0.473  IPS @  3:12
```

```
T    GND
R    HVR
A     80
C    120
K    140
   BLADE  +B-  +R-  +Y-  +G-  + -  + -  + -
```

Track Measurements (MILLIMETERS):

Blade	B	R	Y	G
GND	+1	+9	−1	+3
HVR	0	+2	−5	+1
80	0	−3	−2	−3
120	+1	−6	+2	−1
140	0	−5	+3	+2

Lead (+) / Lag (−) in MILLIMETERS:

Blade	B	R	Y	G
GND	----	----	----	----
HVR	----	----	----	----
80	----	----	----	----
120	----	----	----	----
140	----	----	----	----

Measurements are relative to blade MEAN

❷ **Vibration and track/lag measurements**

The solution above shows an example of flight measurements. Vibration amplitude and phase measurement units can be changed to g's or mils, phase to degrees. Rotor Blade Track and Lead/Lag measurements can be shown in inches or millimeters.

LANCER/ANALYZER

Honeywell

CHADWICK 8500C+

START   STOP   STATUS   SETUP   ANNOTATE

Customer Support

For 50 years, aircraft manufacturers and civilian and military operators worldwide have relied on our systems and Honeywell's support of their aviation vibration control programs.


```
❸ Current Solution Options:
   Use P/L: YES   Tab: YES   Weight: YES
   Solve for:  VIB + TRACK
❹ Iterations: 6
   Good improvement predicted
   Ground Goal: 0.056 IPS
   Flight Goal: 0.056 IPS

❺ Current weight (grams) and tab
   configuration for each blade:
   Blade    BLUE    RED    YEL    GRN

   INB TAB   3.7    5.0    5.4    7.2
   OUT TAB   3.7    5.0    5.4    7.2
   WEIGHT    224    50     0      0
```

❸ Solution options

Solution options are shown here. Options can be changed to allow flexibility. With any options change, a new solution will be generated.
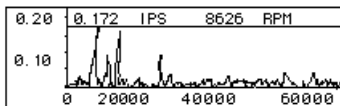
❹ Solution quality information

The iterations and vibration goals shown are relative indications of the solution's anticipated performance. This information is used to select the appropriate solution options.

❺ Configuration

Current rotor settings are entered manually at the beginning of each exercise and updated automatically as changes are made. The solution will use this information to minimize overall changes and respect manufacturers' weight and tab limits as applicable.

```
❻ AIRSPEED:    KTS        PICKUP #:
   ALTITUDE:   FT         RUN #:
   MFR/MODEL:             ID #:
   COMMENTS: C130 RAAF RICHMOND 71 #3

      10:38:55    14 Nov 98

   0.20  0.172   IPS     8626   RPM

   0.10

         0   20000    40000    60000

   8520 Signal Input:   3 Only
   Data Acquired:  10:38:17  14 Nov 98
   Highest Amplitude Peaks:
   0.076 IPS  1953 RPM
   0.057 IPS  2930 RPM
   0.080 IPS  3743 RPM
   0.067 IPS  4232 RPM
   0.172 IPS  8626 RPM
   0.108 IPS 13346 RPM
   0.141 IPS 17090 RPM
   0.064 IPS 25716 RPM
```

❻ Spectrum data

The spectrum data shown allows the user to quickly identify mechanical discrepancies. The eight highest amplitude peaks are itemized for expedient analysis.

Everything you need fits in one suitcase.

The Chadwick 8500C+ comes as a complete kit, with all the accessories, software and instructions for your particular type of aircraft in a rugged, portable carrying case.

Worried about adding new aircraft or modifying your fleet? No problem. Your Chadwick 8500 System will grow with you. It interfaces to a variety of sensors for vibration and phase measurement for over 300 types of aircraft around the world. If you add one we don't have the application for, we'll create the software for you.

Over 300 Applications for Rotor and Fixed-Wing Aircraft

Helicopter Applications

- Smart Chart™ main rotor track & balance

- Tail rotor track & balance

- Tail rotor shaft balance

- Engine vibration analysis

- High speed shaft balance

- Vibration absorber check & adjustment

- Vibration surveys up to 36 channels

- Data collection for trend monitoring

- Predictive maintenance with VibraLog™ and Vib Review™

- Stand alone operation for "random" balance point, spectrum or other measurements

Fixed-Wing Applications

- Propeller dynamic balance

- Turbofan dynamic balance

- Engine vibration analysis

- Data collection for trend monitoring

- Predictive maintenance with Vibralog™ and Vib Review™

- Stand alone operation for "random" balance point, spectrum or other measurements

- Vibration surveys up to 36 channels

Our application engineers are located in El Monte, California and throughout North America to support worldwide consulting, training and development of new applications. Our network of factory trained representatives supports the full range of Honeywell products in over 180 countries.

Consulting and training are available at our factory in El Monte, or at your facility. Please contact the Honeywell office at (626) 575-6161 for additional information.

Specifications

Instrument specifications for the Chadwick 8500C+

Dimensions	10.8 x 7.5 x 4.0 in. (27.4 x 19.1 x 10.2 cm)
Weight	7.1 lbs. (3.22 kg)
Vibration Amplitude accuracy	± 0.2 dB (for balance)
Phase accuracy	± 2 degrees
Spectrum max frequency	200 to 600,000 rmp in arbitrary user selected steps
Spectrum resolution	461 lines up to 7.5 kHz, 400 lines up to 10 kHz
Printer	integral thermal printer
Data storage/transfer	integral 1.44 meg 3.5" disk drive PC/MS-DOS compatible
Display	backlit and heated LCD display 1.4" x 5.3", 64 x 256 pixels
Memory	up to 2 MB SRAM, 1 MB flash EPROM
Strobex connector	allows use of Strobex for visual track observation/phase measurement

System specifications for the Chadwick 8500C+

Vibration channels	36
Phase input channels	4
FasTrak™ Optical Tracker accuracy	± 1mm ± 5% of reading
Power requirements	12 to 28 VDC (28 VDC nominal), battery option available for self-contained operation
Temperature range: operating	-40°C to 55°C (-10°C for printer/disk drive)
storage	-40°C to 70°C

Specifications subject to change without notice

Diagnostic Solutions International LLC

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