WARRANTY

All UFI instruments are warranted against defects in materials and workmanship to the original using purchaser for a period of one year from the date of original purchase. The warranty is void if our inspection shows the equipment has been tampered with, or installed at variance with factory designated procedures or has been subjected to negligence, misuse, accident beyond normal usage, or has had it's serial number altered, defaced, or removed.

All questions regarding the warranty stated above should be directed to:

CUSTOMER SERVICE DEPT.
UFI
545 Main Street Suite C2
Morro Bay, CA 93442

NO person, including any dealer or agent is authorized to assume any liability for UFI. When corresponding or communicating with UFI concerning your equipment, please include the model number and serial number of the instrument.

UFI instruments and transducers are subject to continuous improvement. We reserve the right to modify any design or specification without notice and without incurring any obligation.

ALL UFI TRANSDUCERS AND ELECTRODES ARE COVERED BY OUR EXCLUSIVE "LIFELINE® WARRANTY" AS OUTLINED BELOW

LIFELINE® WARRANTY

If your UFI transducer, electrode, or electrode tester ceases to operate---regardless of the cause---accidental, intentional, or whatever---**RETURN IT TO US.**
We will repair it or replace it with a new one for a minimal handling charge, as listed below:

Model 1010, 1010C, 1020, 1020EC, 1020FC, 1110----------	$25.00
Model 1030, 1040, 1070, 1081FT----------	$50.00
Model 1081 & 1081 SNP----------	$11.00
Model 1089 MK II & MK III----------	$65.00
Model 1130, 1131, 1132----------	$35.00

Prices subject to change

MODEL 1089 MK III ES CHECKTRODE®
(eff. 4/00)

INTRODUCTION

The CHECKTRODE® Electrode Tester may be used to:

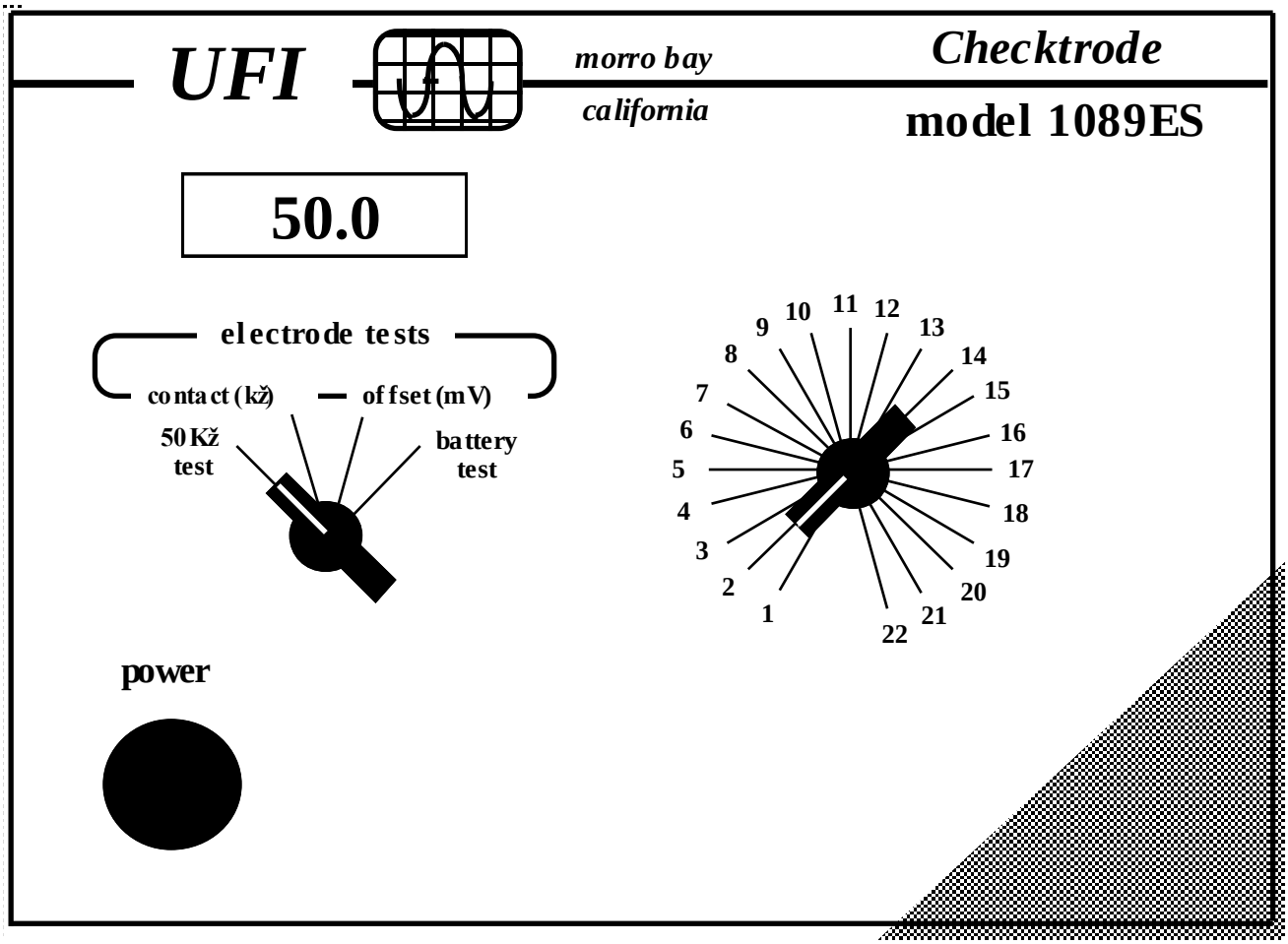
A. Test the integrity of electrode/skin contact in physiological and/or bio-electrical data acquisition systems;

B. Test the integrity of associated electrode wires used in such systems;

C. Test the "quality" of the electrodes;

D. Test external batteries (9 V & others) such as used in telemetry and other physiological monitoring systems.

1. FUNCTION OF CONTROLS AND CONNECTORS



POWER SWITCH

Push button — turns unit ON. Power remains ON for approximately 3 minutes, then **AUTOMATICALLY TURNS OFF.**

FUNCTION SELECTOR SWITCH

4 position switch which selects the measurement function of the CHECKTRODE®

50 KΩ TEST Connects a precision 50 KΩ resistor to the CHECKTRODE® INPUT. The instrument should read between 49.5 and 50.5.

IMPEDANCE (KΩ) Displays the electrode contact impedance in KΩ (between 0 and 199.9 KΩ). The display will indicate "1" when the electrode impedance exceeds 199.9 KΩ

OFFSET (mV) Displays the potential generated by a pair of electrodes when connected to the body. Known as "offset potential", this measurement indicates the purity of the metals used in the electrode manufacturing process. The lower the reading the higher the purity. Readings which vary wildly or which exceed "10" are usually indicative of severe electrode problems.

EXT BATTERY Reads the voltage of a battery when it is connected to the EXTERNAL BATTERY TEST CONNECTOR.

NOTE: THE BATTERY IS READ USING A 1,000Ω LOAD!

ELECTRODE SELECTOR SWITCH

When your electrode cap is connected to the connector on the back of the unit this switch allows you to quickly test the contact impedance of the selected electrode on the cap against all the remaining electrodes.

NOTE: TO TEST INDIVIDUAL ELECTRODES USING THE CONNECTORS ON THE FRONT PANEL THERE MUST NOT BE AN ELECTRODE CAP PLUGGED IN TO THE CONNECTOR ON THE BACK OF THE UNIT.

NOTE: The following 4 pages describe the switch positions for the selector switch. Please note that as of this writing the available electrode caps use three different connectors. If you purchased a Checktrode® with the DB25 25 pin connector you will only be able to test electrode caps with the same connector. The same holds true for the DB37 connector and the 40 pin header versions of the Checktrode® and the electrode caps that use these connectors.

SPECIAL NOTES FOR 1089 MKIII/ES WITH DB25, 25 PIN CONNECTOR FOR LEXICOR ELECTRODE CAP

Using information supplied to us by Lexicor the switch positions relate to the electrodes in Lexicor's model 1020 cap as follows:

Switch Position	Electrode
1	FP1
2	FP2
3	F3
4	F4
5	C3
6	C4
7	P3
8	P4
9	O1
10	O2
11	F7
12	F8
13	T3
14	T4
15	T5
16	T6
17	GND
18	CZ
19	FZ
20	PZ
21	LEFT EAR REFERENCE
22	RIGHT EAR REFERENCE

SPECIAL NOTES FOR 1089 MKIII/ES WITH DB25, 25 PIN CONNECTOR FOR ELECTRO-CAP INTERNATIONAL ELECTRODE CAP MODEL 10-20

Electro-Cap and Lexicor use the same DB25 pin connector and the switch positions are the same for both caps, except that Electro-Cap does not use positions 21 & 22. To test the earclip electrodes, plug them into the connectors on the front panel (make sure that the connector from the electrode cap is not plugged in to the connector on the back of the unit) and check the impedance between the two earclip electrodes.

SPECIAL NOTES FOR MINDSET USERS

Please note that Mindset does not use all of the electrodes mounted in the Electro-Cap and Lexicor electrode caps. Please refer to your Mindset manual for further information on this subject.

SPECIAL NOTES FOR 1089 MKIII/ES WITH DB37, 37 PIN CONNECTOR FOR ELECTRO-CAP INTERNATIONAL SPECTRUM 32 HEAD CAP ELECTRODE CAP

Electro-Cap and Lexicor use the same electrode configuration except that Electro-Cap uses different electrode attachments for positions 21 & 22. The 1089ES is not configured to test electrode positions C3', C4', or Cz'.

Switch Position	Electrode
1	FP1
2	FP2
3	F3
4	F4
5	C3
6	C4
7	P3
8	P4
9	O1
10	O2
11	F7
12	F8
13	T3
14	T4
15	T5
16	T6
17	GND
18	CZ
19	FZ
20	PZ
21	Fpz
22	Oz

SPECIAL NOTES FOR 1089 MKIII/ES WITH 40 PIN CONNECTOR FOR NEUROMEDICAL SUPPLIES® INC. QUICK-CAP, 19 CHANNEL STANDARD ELECTRODE CAP

The Quick-Cap uses a 40 pin connector. Switch positions relate to the electrodes in the Quick-Cap 19 channel cap as follows:

Switch Position	Electrode
1	F7
2	FP1
3	F3
4	GND @ AFZ
5	FP2
6	T7
7	FZ
8	F4
9	F8
10	C3
11	CZ
12	C4
13	T8
14	P7
15	P3
16	PZ
17	P4
18	O1
19	O2
20	P8
21	REF @ M1 & M2
22	N/C

SPECIAL NOTES FOR 1089 MKIII/ES WITH 50 PIN CONNECTOR FOR PHYSIOMETRIX, INC. E-NET CAP

The E-Net cap uses a 50 pin connector. The adapter supplied for use with this connector uses two 25 pin connectors labeled "CONN A" and "CONN B" To use this adapter, connect the desired 25 pin connector to the 1089ES and test your electrode connections. When supplied with this adapter the switch positions on the 1089ES relate to the electrodes in the E-Net Cap as follows:

Switch Position	CONN A Electrode	CONN B Electrode
1	FP1	FpZ & GND
2	FP2	O1
3	F3	O2
4	F4	F7
5	C3	F8
6	C4	T3
7	P3	T4
8	P4	T5
9	OPEN	T6
10	AUX REF	OPEN
11	OPEN	OPEN
12	OPEN	OPEN
13	FZ	OPEN
14	CZ	AUX 25
15	PZ	AUX 26
16	OZ	AUX 27
17	AUX 21	AUX 28
18	AUX 22	AUX 29
19	AUX 23	AUX 30
20	AUX 24	A1
21	OPEN	A2
22	N/C	OPEN

2. USING THE CHECKTRODE®

CHECKING INTEGRITY OF ELECTRODE CONTACT

(a) Prepare the electrode sites and attach the electrodes.

NOTE: See attached discussion "Technical aspects of monitoring the heart rate of active persons."

(b) Connect the electrode cap to the mating connector on the back of the unit or insert the electrode connectors for two individual electrodes into the mating connectors on the front panel.

NOTE: DO NOT HAVE ELECTRODES CONNECTED TO THE FRONT PANEL WHEN YOU ARE CHECKING YOUR ELECTRODE CAP AND REMOVE THE ELECTRODE CAP CONNECTOR FROM THE BACK PANEL WHEN CHECKING INDIVIDUAL ELECTRODES USING THE CONNECTOR ON THE FRONT PANEL

(c) Depress the POWER SWITCH. Set the FUNCTION SWITCH to 50KΩ TEST. The display should indicate between 49.5 and 50.5.

(d) Set FUNCTION SWITCH to CONTACT (KΩ) —The display will indicate the integrity of the electrode contact. Higher impedances are indicative of poor skin preparation, and often result in a recording with moderate to severe motion artifacts.

5KΩ or below	Good prep
5KΩ — 10 KΩ	OK, but can cause some noise
10 KΩ — 30KΩ	FAIR, might improve with time, but for best results, should be removed and skin re-prepped.
30 KΩ & above	BAD, will cause much noise on the recording with the slightest patient motion. REMOVE AND RE-PREP!

(e) If testing electrodes in your electrode cap, slowly switch through the available switch positions to test each available electrode on your cap.

CHECKING INTEGRITY OF ELECTRODE WIRES

(a) Connect one electrode wire to the RED ELECTRODE INPUT JACK.

(b) Energize instrument as above. Select "CONTACT KΩ"

(c) Connect the free ends of the wire the snap connector on the CHECKTRODE. The display should read "00.0" and not change. If the display changes with wire motion, there probably is an intermittent open in the wire.

CHECKING OFFSET POTENTAL

(a) Connect electrodes as in Section 1.

(b) Select "OFFSET" with the FUNCTION SWITCH

(c) The display will indicate the potential generated by the half-cell combination of two electrodes and the body. The reading should be "10" or below.

BATTERY TEST

(a) Select "EXT. BATTERY" with the FUNCTION SWITCH

(b) Depress POWER button

(c) Connect the battery to be tested to the BATTERY TEST CONNECTOR. The display will indicate the battery voltage.