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**APPLICATION FOR LICENSE TO EXPORT  
BYPRODUCT, SOURCE, OR SPECIAL NUCLEAR MATERIAL**

**THIS DOCUMENT CONTAINS  
POOR QUALITY PAGES**

*Submit in Triplicate*

*Carefully Read Instructions on Back*

1. DATE OF APPLICATION <b>October 18, 1978</b>	2. APPLICANT'S REFERENCE NO. (if any)	3. COUNTRY OF ULTIMATE DESTINATION <b>Singapore</b>
4. NAME OF APPLICANT <b>SELF POWERED LIGHTING, LTD.</b> STREET ADDRESS <b>8 Westchester Plaza</b> CITY, STATE, AND ZIP CODE <b>Elmsford, New York 10523</b>		5. ULTIMATE CONSIGNEE IN FOREIGN COUNTRY (Name and address) 5) One or more of the following a) Branch assembly plants of US Based Companies b) subcontractors to US based companies c) local firms engaged in the manufacture of liquid crystal display digital timepieces
6. INTERMEDIATE CONSIGNEE IN FOREIGN COUNTRY (Give name and address. If same as ultimate consignee, state "Same.")  <b>SAME</b>		7. IF PURCHASER IN FOREIGN COUNTRY IS OTHER THAN ULTIMATE CONSIGNEE, GIVE NAME AND ADDRESS. (If same, state "Same.")  <b>SAME</b>
8. (a) QUANTITY TO BE SHIPPED (See instructions on back) <b>750,000 Curies per year at a maximum monthly rate of 100,000 Curies (see Supplement)</b>	(b) COMMODITY DESCRIPTION (Include chemical and physical form for special nuclear material and byproduct material also specify isotopic content; if in a device, identify the device, manufacturer, and model number.) <b>Hydrogen - 3 (tritium) as sealed tritium-gas luminous light sources (Betallights) to be furnished by Self-Powered Lighting Ltd. These sources will conform to type E as described in N.Y. License No. 1308-1611 held by Self Powered Lighting, Ltd., Section (5), a, b. Each source will contain no more than 200 mCi of hydrog</b>	

(c) SHIPPING AND PACKING PROCEDURES (Required for special nuclear material. See instructions on back.)

In accordance with 49 CFR Parts 170-189 and 10 CFR Part 71.7(b):

9. END USE OF COMMODITIES COVERED BY THIS APPLICATION: (Describe fully, stating what will be produced or manufactured, what service will be rendered, or the nature of the research that will be performed.) (See instructions on back for special nuclear material.)

Light sources exported under this license will be assembled in Liquid Crystal Display watches or watch modules. The majority of finished complete watches or modules will be re-imported into the U.S. for Exempt distribution in the U.S. under NRC license (See supplement).

10. The applicant, and any official executing this certificate on behalf of the applicant named in Item 4, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Parts 30 and 31 (for byproduct material), or Part 70 (if for special nuclear material), and Part 71 (for transport of radioactive material, if applicable) and that all information contained herein, including any supplements attached hereto, is true and correct to the best of their knowledge and belief.

**SELF-POWERED LIGHTING, LTD.**

(Applicant named in Item 4)

By: Ronald G. Harper  
**Ronald G. Harper**  
**Vice President**

(Title of certifying official authorized to act on behalf of the applicant)

**7810300317**

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Warning: 18 U.S.C. Section 1001; Act of June 25, 1948: 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

INTERNATIONAL SAFEGUARDS



# SELF-POWERED LIGHTING LIMITED

8 WESTCHESTER PLAZA ELMSFORD NY 10523

October 18, 1978

## SUPPLEMENT TO FORM AEC-7

### Item 8a

Light sources as described in Item 8b and Item 9 contain a maximum of 200 mCi of tritium gas, and an average quantity of 175 mCi based on our current estimates of product mix. It is expected that the monthly delivery schedule will vary during the year due to seasonal demand for the product, and this is reflected in the monthly quantity shown on the application.

### Item 9

It is expected that almost all, if not all, of the light sources exported under the license application will be re-imported into the U.S. after assembly into watches or watch modules. This is due to the following factors:

- (a) At the present time, distribution of the finished watches containing tritium lights is approved only in the United States, Canada and United Kingdom.
- (b) Even after other countries grant approval for distribution, the U.S. remains by far the largest single watch market in the world as shown in the attached information from the watch industry trade publication, Jeweler's Circular Keystone.

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EXPORT/IMPORT  
AND  
INTERNAT'L SECLOS

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## Watchmaking in Japan

Japan today ranks as the number two watch producer in the world. One reason is the homogeneity of the Japanese watch industry. It is comprised of only four major watch producers—Seiko, Citizen, Orient and Ricoh—and it presents a uniquely unified front. True, individual companies are competitors in every sense of the word, both in home and foreign markets. But almost without exception, the "Big Four" and the few other smaller companies in the marketplace exhibit the same single-mindedness of purpose in market definition, approach and strategy. *—JCK*

The Japanese market is not split evenly. The most recent full-year figures available show that K. Hattori/Seiko, the top producer, accounted for 58% of the output in 1974. Next came Citizen (25%), Orient (12%) and Ricoh (5%).

—JCK, April 1977

## Clock changes faces

A New York inventor recently introduced an interchangeable clock design that gives you several clocks for the price of one. Anthony Ginefra Sr. designed clock housings with interchangeable faces, featuring different designs. Clocks can easily be mounted and removed from a housing. In addition, different symbolic plaques, which match the decor of the clock face, can be placed on the outside of a housing.

JCK, Jan. 1977

## Black market crystals

Are you selling watches containing quartz crystals bought on the black market? That may be the latest kink in the turbulent digital market.

The growing demand for digital watches keeps giving birth to more digital makers and assemblers. They,

in turn, have created too big a demand for quartz crystals for the known suppliers to fill. Presto, a black market supply at beefed up prices.

The five leading crystal suppliers—Reeves-Hoffman, Motorola Quartz Timepiece, Sentry Manufacturing, CTS Knights and Statek—acknowledge that both low quality and prime grade crystals are appearing on the market without trademarks. And, say these makers, some users—to guarantee a supply—order from both legitimate and black market sources.

## HOW THE DIGITAL MARKET WILL DEVELOP

(Source: A leading U.S. digital watch producer)

Country	Share of world solid-state digital watch production	
	1974	1980
United States	75%	50%
Japan	10	22
Switzerland	7	14
All others	8	14
Total	100%	100%

The quartz crystal firms aren't too worried. They all plan to expand production to meet the growing demand.

—JCK, July 1976

## WORLD DIGITAL SALES: LED VS. LCD

(Source: American Microsystems Inc.)

Year	LED	LCD
1973	150,000	100,000
1974	420,000	350,000
1975	3,700,000	1,700,000
1976	17,500,000	8,500,000
1977	18,000,000	21,000,000
1978	19,000,000	34,000,000
1979	20,000,000	55,000,000
1980	19,000,000	86,000,000
1981	18,000,000	114,000,000

## WORLD WATCH SALES, BY PRICE

(Source: American Microsystems Inc.)

Price range	% of 1975 unit watch sales in each range
Under \$20	71%
\$20-\$39	13
\$40-\$49	5
\$50-\$99	8
\$100 or more	3

## U.S. WATCH SALES, BY PRICE

(Source: Micro Display Systems Inc. predictions)

		Watch sales (in millions of units) in each price range						
		1974	1975	1976	1977	1978	1979	1980
Under \$20	All	35.5	35.5	37.0	45.0	47.0	48.0	48.0
	LED	—	—	4.0	15.0	19.0	19.0	17.0
	LCD	—	—	—	1.0	3.0	7.0	11.0
	Digital	—	—	4.0	16.0	22.0	26.0	28.0
\$20-\$49	All	9.9	9.9	13.0	12.4	11.9	12.4	12.6
	LED	—	1.5	5.5	5.0	4.5	4.5	4.0
	LCD	—	1	2.0	2.5	3.0	3.5	4.0
	Digital	—	1.6	7.5	7.5	7.5	8.0	8.0
\$50-\$99	All	4.5	4.5	5.0	5.5	5.7	5.8	5.9
	LED	—	1.2	2.0	1.8	1.8	1.6	1.5
	LCD	—	.8	1.5	2.0	2.2	2.5	2.7
	Digital	—	2.0	3.5	3.8	4.0	4.1	4.2
\$100 or more	All	1.3	1.6	1.9	2.2	2.4	2.6	2.8
	LED	—	2	2	2	1	1	1
	LCD	—	2	4	8	1.1	1.3	1.5
	Digital	—	4	6	10	12	14	16

## WATCH SALES FORECASTS

(Source: American Microsystems Inc. and Micro Display Systems Inc.)

World watch sales, in millions of units, as predicted by:		U.S. watch sales, in millions of units, as predicted by:	
AMI	MDS	AMI	MDS
1974	220	51	51.3
1975	232	54	51.5
1976	246	57	56.9
1977	261	60	65.1
1978	276	64	67.0
1979	293	68	68.8
1980	311	72	69.5

World digital watch sales, in millions of units, as predicted by:

AMI	MDS
0.77	0.6
5.40	5.6
25.00	19.6
39.00	39.0
53.00	52.0
75.00	64.5
105.00	74.5

U.S. digital watch sales, in millions of units, as predicted by:

AMI	MDS
0.65	0.4
4.50	4.0
20.00	15.6
25.00	28.3
32.00	34.7
39.00	39.5
50.00	41.8

## French go electronic

The French watch industry has started production of electronic watches. The French Board of Industry

### WATCH CONSUMPTION IN MAJOR COUNTRIES

(Source: Ebauches SA, 1976)

Country	Watch consumption in units per 1000 people
United States	272
Great Britain	258
France	178
Japan	157
Spain	137
Argentina	115
South Africa	77
U.S.S.R.	52
Brazil	39
Mexico	33
China	13
Egypt	3
India	1

& Research is running the electronic watch plan, with guidance from the Watch Development Association, a financial trade company.

France now has several manufacturers able to supply various components, including liquid and LED displays, and quartz crystals. The industry, however, still depends on foreign sources for integrated circuits.

By 1980, France hopes its production —most of it to be exported— will total 3 million watch parts. Of these, nearly 2 million movements and modules will be for electronic watches and 500,000 quartz movements for alarms and clocks.

—J.C.K., Aug. 1976

### The tritium glow

"Laser Beam Digital Watch. Never press another button, day or night, with America's first digital watch that glows in the dark."

That promotional, and somewhat exaggerated, copy appeared in an ad for the new Sensor Tri-lite watch from Micro Display Systems Inc. The watch has little to do with lasers, but it does, indeed, glow in the dark. The secret is tritium.

Tritium, a gas, has long been used with phosphorus to make luminous dials on mechanical watches. Mixed with paint, it is then applied on the dial in the appropriate places.

In the Tri-lite watch, tritium is sealed in two glass tubes and placed behind the digital display, forming a fluorescent panel. Just as with a luminous analog watch, the tritium will cause the display to "glow" and become visible in the dark.

The gas is sealed in the glass tube with laser beams, to prevent leakage of the tritium. It's estimated a Tri-lite watch will remain fluorescent for as long as 20 years.

—J.C.K., Aug. 1976

### WORLD WATCH PRODUCTION: 1948-1974

(Source: La Suisse Horlogère, Nov. 11, 1976, reprinted by permission)

Year	Number of watches and watch movements produced (in thousands) by:									Total
	Switzerland	Japan	United States	Russia	France	West Germany	Great Britain	China	All others	
1948	25,100	593	11,566	700	2,600	730	717	—	400	42,406
1950	25,000	694	9,092	2,150	3,200	3,150	1,385	—	2,370	47,041
1952	34,300	1,217	11,559	3,634	3,680	4,831	2,053	—	2,939	64,714
1954	32,000	2,000	7,396	5,449	3,350	6,416	2,931	—	5,818	65,360
1956	40,900	2,686	9,449	11,145	4,680	7,832	2,835	—	5,560	81,087
1958	34,344	4,500	7,800	15,000	4,500	7,710	2,238	—	3,790	74,882
1960	42,225	7,148	9,555	16,521	5,500	8,020	2,952	650	5,600	98,171
1962	46,047	10,574	11,939	18,000	5,700	6,951	3,055	900	5,113	108,279
1964	49,240	13,214	12,000	14,800	5,900	6,738	3,950	1,700	5,498	113,040
1966	62,400	15,531	15,500	16,500	7,600	7,200	4,300	1,500	5,900	136,431
1968	68,682	17,747	17,110	20,000	9,000	8,453	3,131	1,500	6,800	152,423
1970	73,646	23,922	20,000	22,000	10,900	8,215	3,212	2,000	7,607	171,502
1972	78,199	25,613	22,000	25,000	14,100	8,509	5,352	5,500	10,309	194,581
1974	87,027	32,517	25,500	26,000	16,800	8,746	7,500	10,000	13,400	227,486

### WORLD WATCH EXPORTS: 1960-1974

(Source: La Suisse Horlogère, Nov. 11, 1976, reprinted by permission)

	Number of watches and watch movements exported (in thousands) by:								
Year	Switzerland	Japan	United States	Russia	France	West Germany	Great Britain	All others	Total
1960	40 981	145	131	4 000	1 290	3 849	536	1 499	52 431
1961	42 021	535	79	4 500	1 319	3 219	617	1 499	53 789
1962	44 665	710	94	4 500	1 649	3 311	778	1 000	56 707
1963	45 536	1 951	105	4 500	1 468	2 866	800	1 983	59 209
1964	47 764	2 983	105	4 500	1 577	3 588	800	2 165	63 480
1965	53 184	4 334	120	5 000	1 871	3 531	800	2 219	71 019
1966	60 566	6 993	120	5 000	2 426	3 467	820	1 697	81 089
1967	63 213	7 640	150	7 378	3 846	4 228	780	1 781	89 017
1968	66 621	8 582	150	8 000	3 300	4 823	1 158	2 230	94 864
1969	69 469	11 301	150	8 000	3 236	4 830	976	2 200	100 162
1970	71 437	13 667	150	8 000	4 071	4 050	938	2 280	104 593
1971	70 178	14 358	160	8 500	6 211	2 820	817	4 085	107 129
1972	75 253	16 687	200	9 000	6 857	3 583	660	4 301	116 541
1973	81 778	17 338	300	10 000	8 204	3 817	747	4 340	126 524
1974	84 416	19 449	500	12 500	8 282	3 430	2 144	4 400	135 111