

TABLE OF CONTENTS

APPLICANT: VDO ADOLF SCHINDLING AG

FCC ID: MZ241081963

TEST REPORT CONTAINING:

PAGE	1.....	CLASS II PERM CHANGE LETTER
PAGE	2.....	TEST PROCEDURE
PAGE	3.....	CIRCUIT DESCRIPTION & TEST PROCEDURE
PAGE	3.....	RADIATION INTERFERENCE TEST DATA
PAGE	4.....	CALCULATION OF DUTY CYCLE
PAGE	5.....	OCCUPIED BANDWIDTH

EXHIBIT ATTACHMENTS:

EXHIBIT	1.....	POWER OF ATTORNEY LETTER
EXHIBIT	2.....	LIST OF CHANGES
EXHIBIT	3.....	SCHEMATIC
EXHIBIT	4.....	BLOCK DIAGRAM
EXHIBIT	5.....	OCCUPIED BANDWIDTH PLOT
EXHIBIT	6.....	FRONT VIEW EXTERNAL PHOTO
EXHIBIT	7.....	REAR VIEW EXTERNAL PHOTO
EXHIBIT	8.....	SIDE VIEW EXTERNAL PHOTO
EXHIBIT	9.....	EXTERNAL PHOTO WITH FCC ID LABEL
EXHIBIT	10.....	COMPONENT SIDE INTERNAL PHOTO
EXHIBIT	11.....	COPPER SIDE INTERNAL PHOTO

APPLICANT: VDO ADOLF SCHINDLING AG  
FCC ID: MZ241081963  
REPORT #: F:\CUS\V\VDO\VDO153A8.RPT  
PAGE: TABLE OF CONTENTS LIST

AUGUST 10, 1998

Federal Communication Commission  
Authorization and Evaluation Division  
7435 Oakland Mills Road  
Columbia, MD 21046

SUBJECT: FCC ID: MZ241081963  
VDO ADOLF SCHINDLING AG

REFERENCE: REQUEST FOR CLASS II PERMISSIVE CHANGE

TO WHOM IT MAY CONCERN:

This letter is a request for a Class II Permissive change. The applicant has made modifications to their device.

Attached please find the test data and a revised schematic to reflect these changes.

Should you require any further information, please contact me at 1-800-255-2424.

Sincerely,

S. S. Sanders

SSS/sh  
Encl.

APPLICANT: VDO ADOLF SCHINDLING AG  
FCC ID: MZ241081963  
REPORT #: F:\CUS\V\VDO\VDO153A8.RPT  
PAGE #: 1

APPLICANT: VDO ADOLF SCHINDLING AG  
FCC ID: MZ241081963

#### TEST EQUIPMENT LIST

1. Spectrum Analyzer: Hewlett Packard 8566B, with preselector HP 85685A, & Quasi-Peak Adapter HP 85650A, & HP 8449B OPT H02  
Cal. 9/30/97
2. Eaton Biconnical Antenna Model 94455-1  
20-200 MHz Serial No. 0997 Cal. 9/17/97
3. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA 25 cal. 5/15/97
4. Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 9/24/97
5. Electro-Metric Antennas Model TDS-25-1, TDS-25-2, 9/3/97
6. Electro-Metric Line Impedance Stabilization Network Model  
No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. 9/30/97
7. Electro-Metric Line Impedance Stabilization Network Model  
No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. 9/30/97
8. Special low loss cable was used above 1 GHz.

#### TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz. The ambient temperature of the UUT was 98.3oF with a humidity of 40%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF = FS  
33 20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

APPLICANT: VDO ADOLF SCHINDLING AG  
FCC ID: MZ241081963  
REPORT #: F:\CUS\V\VDO\VDO153A8.RPT  
PAGE #: 2

TEST PROCEDURES CONTD.

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings were converted to average readings based on the duration of "ON" time.

Measurements were made by TIMCO ENGINEERING INC. at the registered open field test site located at 6051 N.W. 19th Lane, Gainesville, FL 32605.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

APPLICANT: VDO ADOLF SCHINDLING AG  
FCC ID: MZ241081963  
REPORT #: F:\CUS\V\VDO\VDO153A8.RPT  
PAGE #: 3

APPLICANT: VDO ADOLF SCHINDLING AG

FCC ID: MZ241081963

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.: 15.231

REQUIREMENTS:

Fundamental Frequency MHz	Field Strength of Fundamental dBuV	Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
470 and above	81.94	61.94

THE LIMIT FOR AVERAGE FIELD STRENGTH dBuV/m FOR THE FUNDAMENTAL  
FREQUENCY= 75.62 dBuV/m dBuV/m.

THE LIMIT FOR AVERAGE FIELD STRENGTH dBuV/m FOR THE HARMONICS AND  
SPURIOUS FREQUENCIES = 55.62 dBuV/m dBuV/m

TEST DATA:

EMISSION FREQ. MHz	METER READING @ 3m dBuV	COAX LOSS dB	ACF dB	PEAK FIELD STRNGTH dBuV/m	AVERAGE FIELD STRNGTH dBuV/m	MARGIN dB	ANT.
314.97	48.44	1.40	15.16	65.00	59.94	15.68	V
629.94	17.64	1.60	20.76	40.00	34.94	20.68	V
944.92	25.84	2.90	24.26	53.00	47.94	7.68	V
1259.89	32.96	1.00	25.04	59.00	53.94	1.68	V
1574.86R	30.70	1.00	26.30	58.00	52.94	1.06	V
1889.83	24.43	1.01	27.56	53.00	47.94	7.68	V
2204.80R	22.43	1.06	28.51	52.00	46.94	7.06	V

SAMPLE CALCULATION OF LIMIT @ 303 MHz:

(470 - 260)Mhz = 210 MHz  
(12500 - 3750)uV/m = 8750 uV/m  
 $8750\text{uV/m}/210\text{MHz} = 41.67 \text{ uV/m/MHz}$   
(303-260)MHz = 43 MHz  
 $43 \text{ MHz} * 41.67 \text{ uV/m/MHz} = 1791.81 \text{ uV/m}$   
 $(1791.81 + 3750)\text{uV/m} = 5541.81 \text{ uV/m limit @ 303 MHz}$

The transmitter ceases transmitting when the button is released.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: \_\_\_\_\_ DATE TESTED: 8/10/98

REPORT #: F:\CUS\V\VDO\VDO153A8.RPT

PAGE #: 4

APPLICANT: VDO ADOLF SCHINDLING AG

FCC ID: MZ241081963

NAME OF TEST: Occupied Bandwidth

RULES PART NO.: 15.231(C)

REQUIREMENTS: The bandwidth of the emission shall be no wider than .25% of the center frequency for devices operating between 70 and 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

$$\begin{aligned} 314.97 \text{ MHz} * .0025 &= .787425 \text{ MHz} \\ .787425 \text{ MHz} / 2 &= +/- 393.71 \end{aligned}$$

THE GRAPH ON THE FOLLOWING PAGE REPRESENTS THE EMISSIONS TAKEN FOR THE DEVICE.

METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the above photo was taken. The vertical scale is set to 10 dB per division: the horizontal scale is set to 100 kHz per division.

TEST RESULTS: The unit meets the FCC requirements.

PERFORMED BY:

DATE: 8/10/98

APPLICANT: VDO ADOLF SCHINDLING AG  
FCC ID: MZ241081963  
REPORT #: F:\CUS\V\VDO\VDO153A8.RPT  
PAGE #: 5