Lab Code: 200707-0

FCC PART 15B, CLASS B

TEST REPORT

For

KAREL ELEKTRONIK SANAYI VE TICARET A.S.

KORE SEHITLERI CADDESI YZB. KAYA ALDOGAN SOKAK NO: 16 ZINCIRLIKUYU,

ISTANBUL, TURKEY

FCC ID: OZWKAREL-IPV20

Report Type:	**Product Name:**
Original Report	IP PBX

Test Engineer: Lebron Wang

Report Number: RSZ120806052-00

Report Date: 2012-10-16

Reviewed By: Sula Huang, RF Engineer

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *KAREL ELEKTRONIK SANAYI VE TICARET A.S.*'s product, model number *IPV20 (FCC ID: OZWKAREL-IPV20)* or the "EUT" in this report was an *IP PBX*, which was measured approximately: 28.0 cm (L) x 17.5 cm (W) x 3.3 cm (H), rated input: DC 12.0V from adapter, the highest operating frequency of EUT is 600 MHz.

Adapter information: SWITCHING POWER SUPPLY
Manufacturer: Gospell Digital Technology Co., Ltd.
Model: GP306A-120-500;
Input: 100-240V~1.5A MAX 50/60 Hz;
Output: DC 12.0V, 5A

**All measurement and test data in this report was gathered from production sample serial number: MA16V4112150415 (Assigned by the applicant). The EUT supplied by the applicant was received on 2012-08-06.*

Objective

The following test report is prepared on behalf of *KAREL ELEKTRONIK SANAYI VE TICARET A.S.* in accordance with Part 2-Subpart J, and Part 15-Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine compliance with FCC Part 15 Class B.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Equipment Modifications

No modification was made to the EUT tested.

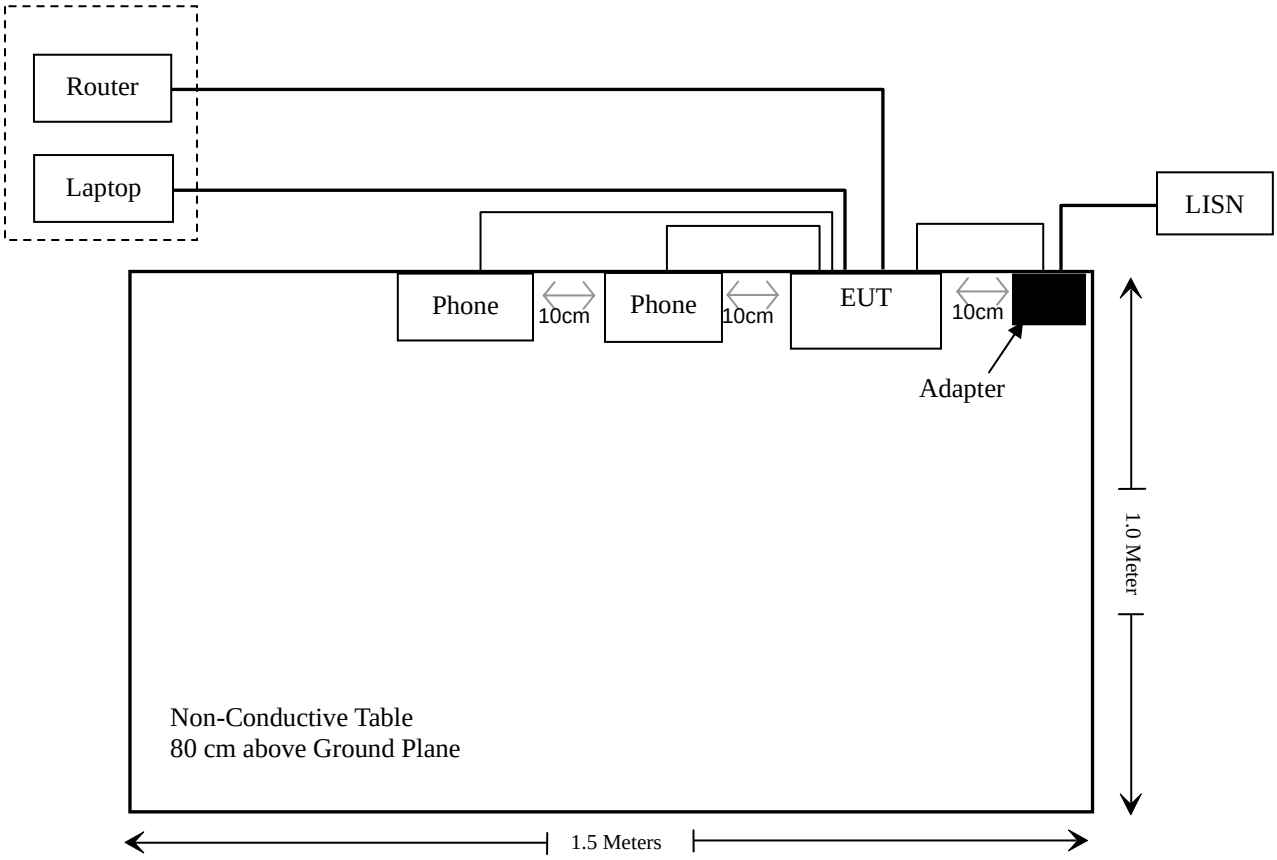
Remote and Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	N/A
TIANNIAO	PHONE	TL2201	N/A
SPIKER	PHONE	HP100	N/A
SAGEMCOM	Modem/Router	F@st 3804	LK11153DP530005

External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable RJ11Cable	1.5	PHONE	EUT
Unshielded Detachable RJ45 Cable	6.0	EUT	Laptop
Unshielded Detachable RJ45 Cable	6.0	EUT	Router
Unshielded Detachable AC Cable	1.5	Adapter	LISN
Unshielded Detachable DC Cable	1.5	Adapter	EUT

Block Diagram of Test Setup

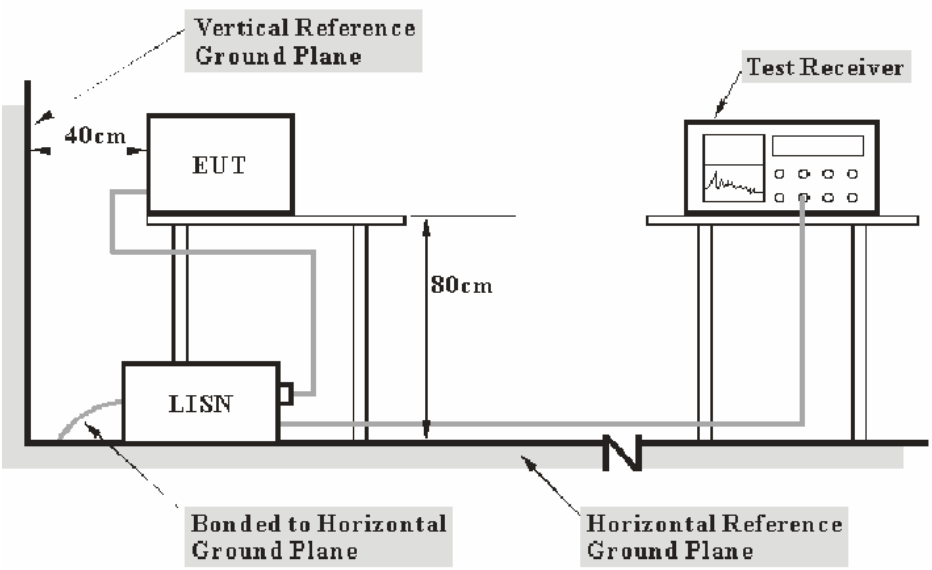


SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

FCC §15.107 – AC LINE CONDUCTED EMISSIONS

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.107 Class B limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source for AC adapter power supply.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	***IF B/W***
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Rohde & Schwarz	Attenuator	ESH3Z2	DE25985	2012-07-08	2013-07-07
BACL	CE Test software	BACL-CE	V1.0	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed using suitable standards traceable to the NIST.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Pulse Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Pulse Limiter Attenuation

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the worst margin reading of:

8.28 dB at **0.495 MHz** in the **Line** conducted mode

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

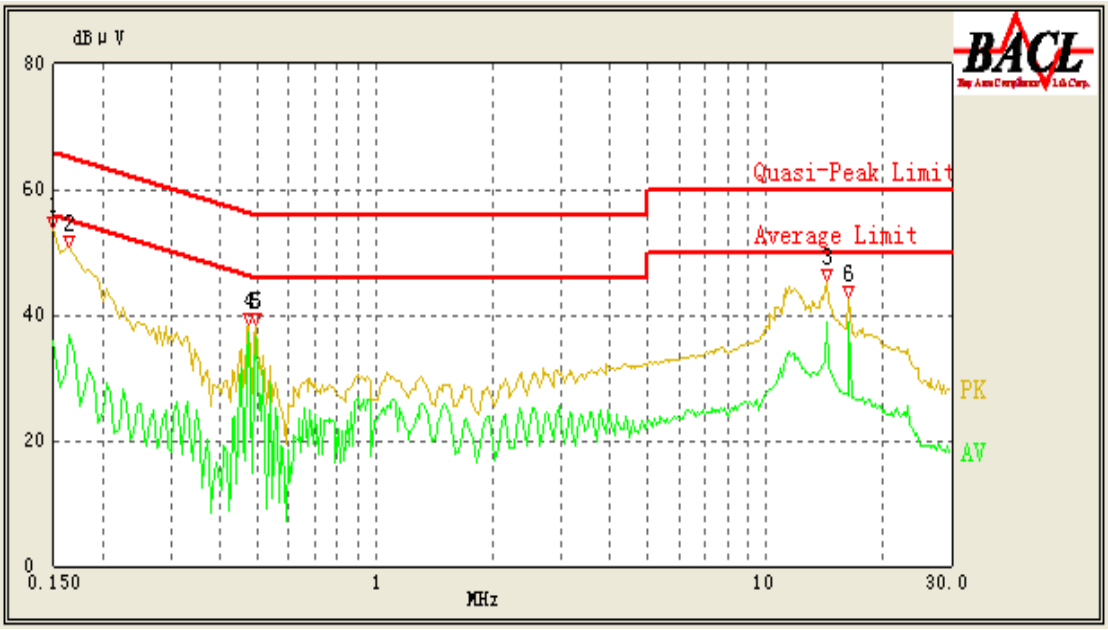
The testing was performed by Lebron Wang on 2012-10-15.

Test Mode: Running

AC 120V/60 Hz, Line:

Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.495	37.86	10.25	46.14	8.28	Ave.
14.335	38.80	11.21	50.00	11.20	Ave.
16.385	37.85	11.73	50.00	12.15	Ave.
0.470	33.96	10.26	46.86	12.90	Ave.
0.150	50.22	10.27	66.00	15.78	QP
0.165	48.45	10.27	65.57	17.12	QP
14.335	42.11	11.21	60.00	17.89	QP
0.495	38.02	10.25	56.14	18.12	QP
0.165	35.49	10.27	55.57	20.08	Ave.
16.385	39.57	11.73	60.00	20.43	QP
0.150	35.07	10.27	56.00	20.93	Ave.
0.470	35.16	10.26	56.86	21.70	QP

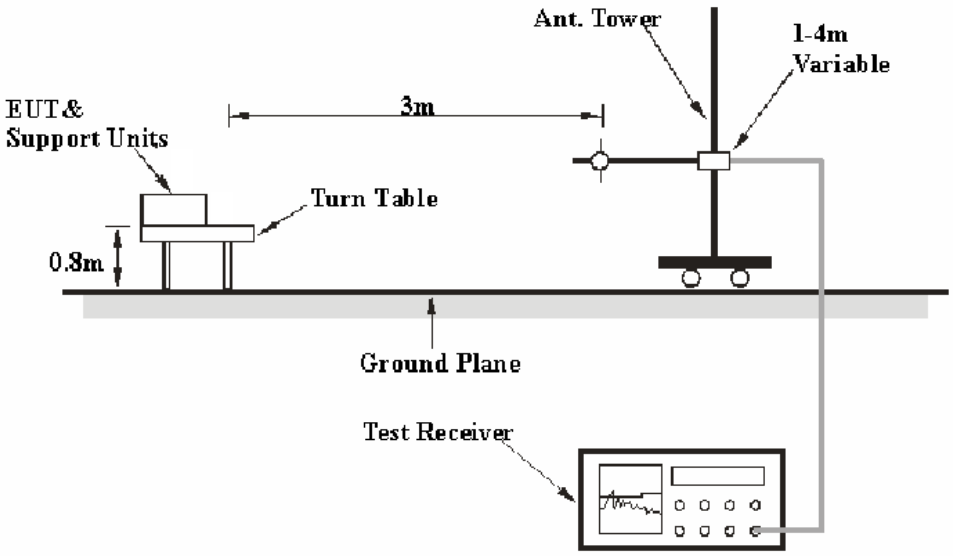
AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.475	37.13	10.25	46.71	9.58	Ave.
0.495	36.39	10.24	46.14	9.75	Ave.
14.335	38.78	11.14	50.00	11.22	Ave.
16.385	38.72	11.61	50.00	11.28	Ave.
0.150	50.82	10.24	66.00	15.18	QP
0.165	49.00	10.24	65.57	16.57	QP
14.335	42.84	11.14	60.00	17.16	QP
0.165	36.95	10.24	55.57	18.62	Ave.
0.475	37.75	10.25	56.71	18.96	QP
0.495	36.58	10.24	56.14	19.56	QP
16.385	40.18	11.61	60.00	19.82	QP
0.150	36.00	10.24	56.00	20.00	Ave.

FCC§15.109 - RADIATED EMISSIONS

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

According to FCC 15.33 requirements, the EUT system was measured from 30 MHz to 5 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	***RBW***	***Video B/W***	***Detector***
30MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 5 GHz	1 MHz	3 MHz	PK
1000 MHz – 5 GHz	1 MHz	10 Hz	Ave.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
HP	Amplifier	8447E	1937A01046	2011-11-24	2012-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27
Rohde & Schwarz	Signal Analyzer	FSIQ26	N/A	2012-03-15	2013-03-14
SUPER ULTRA	Amplifier	ZVA-213+	N/A	2011-11-24	2012-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
Rohde & Schwarz	Auto test Software	EMC32	V6.30	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp (Shenzhen). attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the data in the following table, the worst margin reading is below:

2.5 dB at **840.103400 MHz** in the **Vertical** polarization

Test Data

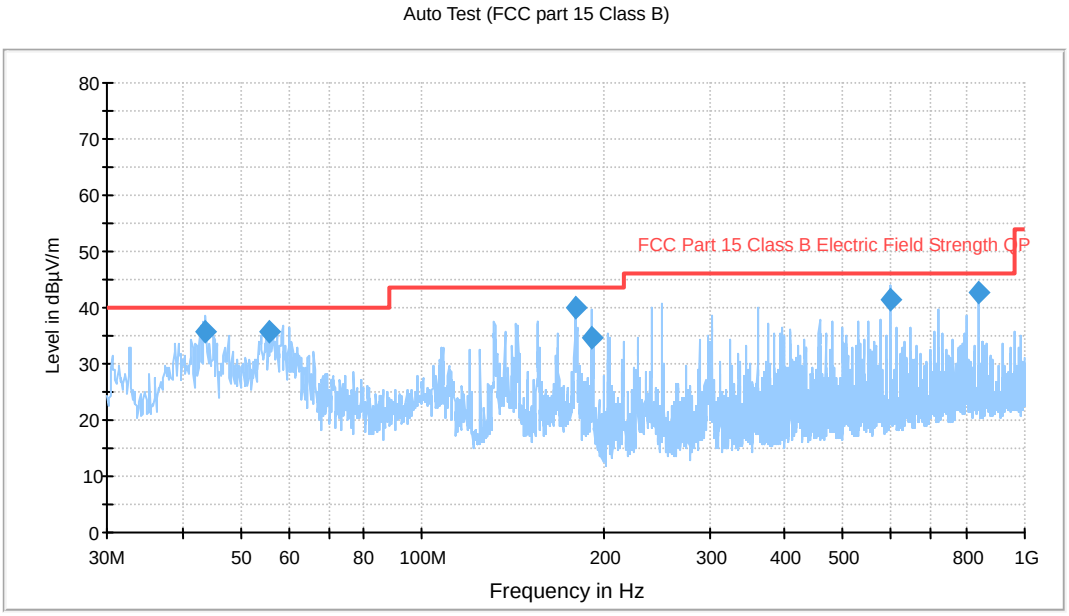
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Lebron Wang on 2012-10-15.

Test Mode: Running

1): 30-1000 MHz



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
840.103400	43.5	104.0	V	311.0	-4.9	46.0	2.5*
180.035800	40.1	220.0	H	4.0	-16.0	43.5	3.4*
43.791150	35.7	104.0	V	60.0	-17.0	40.0	4.3
55.917200	35.6	105.0	V	48.0	-20.9	40.0	4.4
600.065000	41.6	106.0	V	164.0	-9.4	46.0	4.4
191.904400	34.5	188.0	H	322.0	-15.9	43.5	9.0

*Within measurement uncertainty.

2) 1 – 5 GHz

Frequency (MHz)	Receiver		Turntable Degree	Antenna		Correction Factor (dB)	Cord. Amp. (dBµV/m)	Part 15.107	
	Reading (dBµV/m)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBµV/m)	Margin (dB)
2492.9	36.48	Ave.	27	1.2	V	7.21	43.69	54	10.31
1040.1	38.98	Ave.	78	1.1	H	-0.66	38.32	54	15.68
2492.9	30.61	Ave.	116	1.2	H	7.21	37.82	54	16.18
1200.4	33.73	Ave.	83	1.3	V	0.13	33.86	54	20.14
1040.1	51.95	PK	78	1.1	H	-0.66	51.29	74	22.71
2492.9	42.96	PK	27	1.2	V	7.21	50.17	74	23.83
1200.4	45.82	PK	83	1.3	V	0.13	45.95	74	28.05
2492.9	37.52	PK	116	1.2	H	7.21	44.73	74	29.27

******* END OF REPORT *******