

E2V D2100 IOT

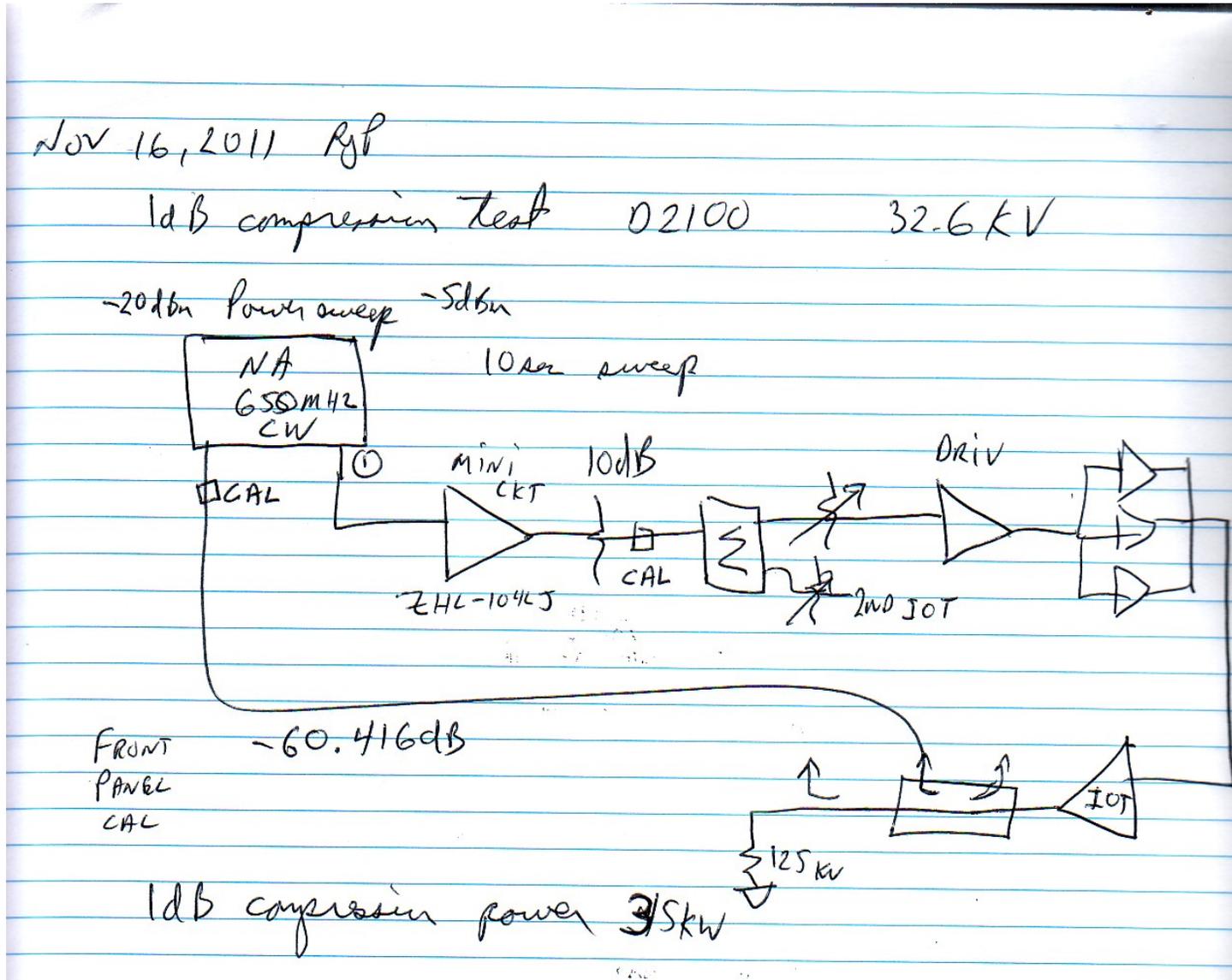
Pulse Power Compression Test
@ Meson Test Facility
Comark IOX Transmitter V2
November 16, 2010

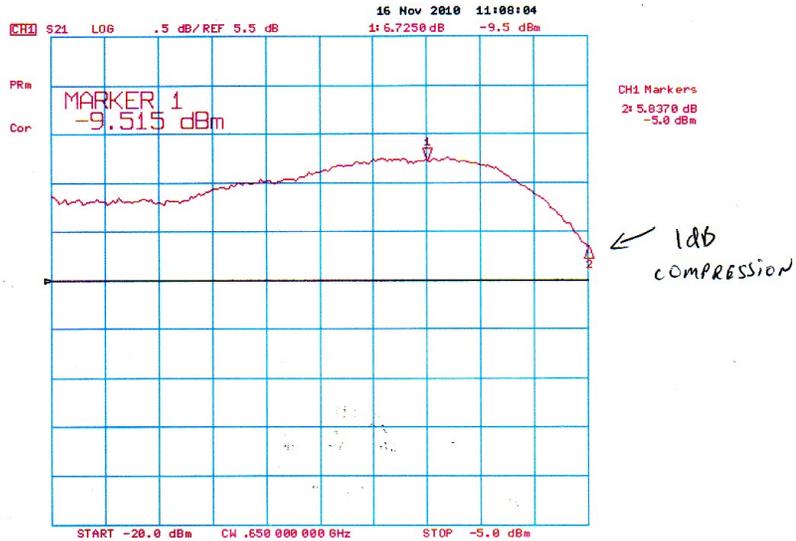
RJP

IOT Pulse Power Test

- Motivation is to measure the 1 dB compression power on the D2100 IOT
- Installed in Station V2
- IOT is seven years old
- Measure how much peak power above 1 dB compression is available

Network analyzer used to measure 1 dB compression





1 dB Compression Test With power sweep on NA Power is swept 15 dBm

System gain fluctuated
By as much as 0.5 dB
As the IOT warmed up
As a function of sweep time

E2V D2100 IOT power sweep

1dB compression power 35kW @ MKK2

Beam V 32.6KV

Beam I 2.1 Amps

RF driver 192 WATTS

G = 22.6 dB
~~23.7~~ dB

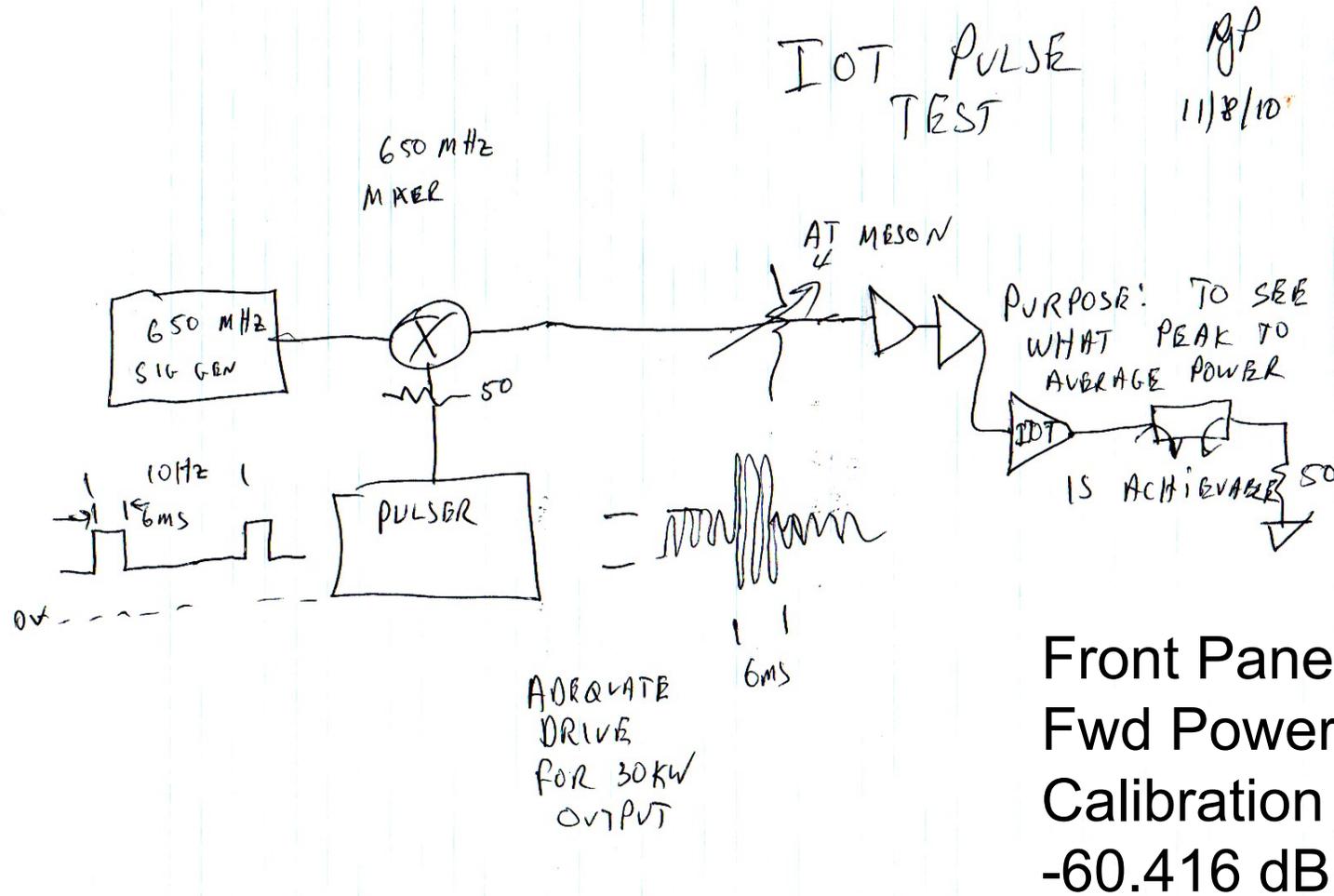
Power supply @ 68.46 kW

$$\text{efficiency} = \frac{35}{68.5} = 51\%$$

(2.75 A) TRIPPED
on beam I
89. kW

The front panel calibration
Was used at -60.416 dB
Efficiency from Beam Voltage
And current is approximate
For more accurate
measurements
Calorimetric techniques
should be used.

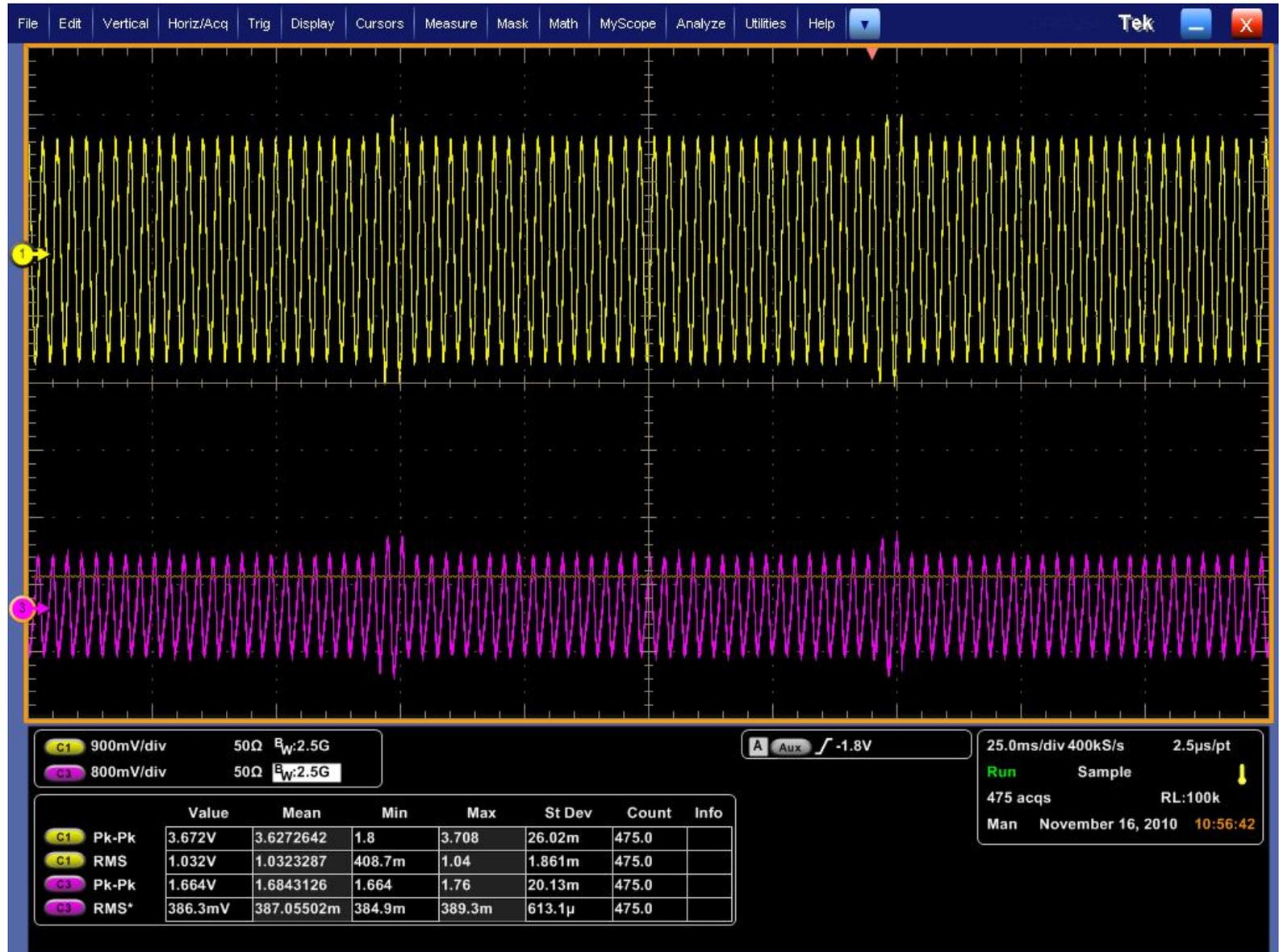
A mixer is used to pulse the drive above the 1 dB compression
With a 6 ms 10 Hz pulse.



Yellow is IOT output from front panel at Drive Rack
-60.416 dB Cal factor

Peak
Output
~37KW
Average
Output
24 KW

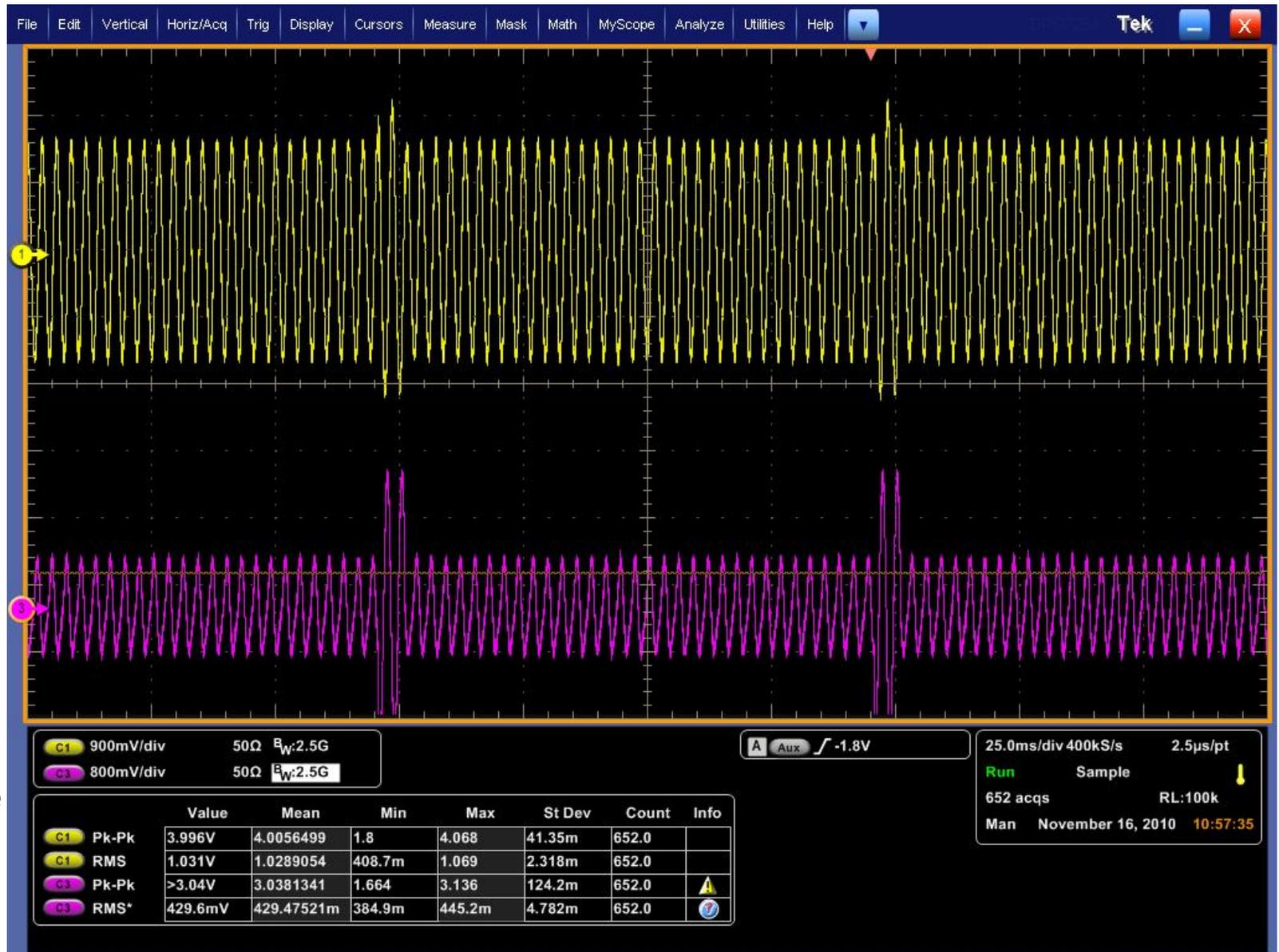
Drive
sample
With
Pulsed
overdrive



Yellow is IOT output from front panel at Drive Rack
 -60.416 dB Cal factor

Peak
 Output
 ~44KW
 Average
 Output
 24 KW

Drive
 sample
 With
 Pulsed
 overdrive



Conclusions:

IOT 1 dB saturation approximately 35 KW
Some overhead is available, but the tube is
Highly compressed as shown on slide 7.
The transmitter did not behave in a stable
Manner when the overdrive was performed.
Crowbar trips occurred, grid current pulsed to
High values.