



# Series 220

## 7x7mm Compact Rotary DIP Switch

- Robust metal bracket design
- Standard through hole and surface mount gull-wing terminal configurations
- Binary coded decimal, Hexadecimal code and Single pole output
- Clockwise or counterclockwise rotation



### Ordering Information

| Series | Terminal Type | Actuator Height | Number of Positions | Packaging Type |
|--------|---------------|-----------------|---------------------|----------------|
| 220    | AM            | A               | 04                  | R              |

| Code | Spec.                                 |
|------|---------------------------------------|
| AM   | Surface mount gull wing, 3.8mm height |
| AD   | Standard through hole, 3.6mm height   |

| Code | Spec.                             |
|------|-----------------------------------|
| A    | Flush arrow rotor                 |
| B    | Knurled, slotted, flattened shaft |
| C    | Knurled, slotted shaft            |

| Code | Spec.        |
|------|--------------|
| 04   | 4 Positions  |
| 10   | 10 Positions |
| 16   | 16 Positions |

| Code  | Spec.                                                  |
|-------|--------------------------------------------------------|
| Blank | Tube packaging only for through hole terminals         |
| R     | Tape & reel packaging only for surface mount terminals |

Notes: Contact CTS for other common features not listed.

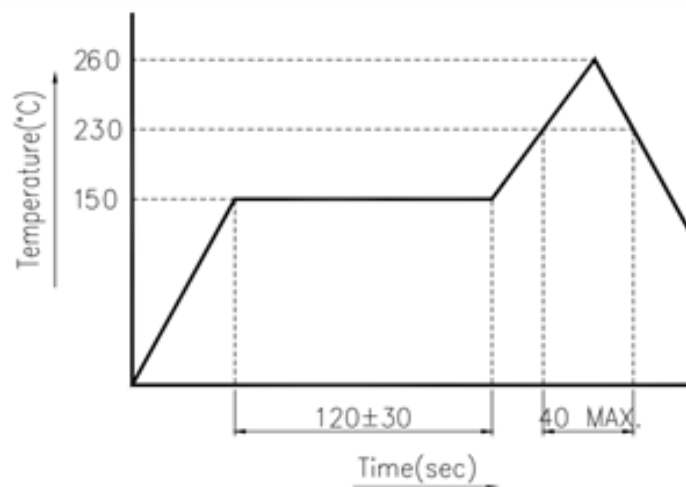
## Electrical Specifications

| Parameter             | Conditions & Remarks              | Min  | Max              | Unit            |
|-----------------------|-----------------------------------|------|------------------|-----------------|
| Output                | Binary coded decimal              |      | 10               | position        |
|                       | Hexadecimal                       |      | 16               |                 |
|                       | Single pole                       |      | 4                |                 |
| Contact Resistance    |                                   |      | 100              | milliohms       |
| Insulation Resistance | Between insulated terminals       | 1000 |                  | megohms         |
| Dielectric Strength   | 250 Vac between adjacent switches |      | 1                | minute          |
| Nonswitching Rating   |                                   |      | 100<br>or<br>50  | mA<br>or<br>VDC |
|                       | Load                              |      | 1 $\mu$ A<br>20m | VDC             |

## Mechanical and Environmental

|                             |                                                                                                                                                      |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soldering                   | Maximum reflow temperature, 260°C for 5 seconds<br>Maximum wave temperature, 260°C for 10 seconds<br>Maximum manual temperature, 350°C for 4 seconds |
| RoHS                        | Lead-Free. Fully compliant to RoHS                                                                                                                   |
| Rotational Torque:          | 40~200 gf-cm                                                                                                                                         |
| Actuation Life              | 10,000 steps                                                                                                                                         |
| Marking:                    | Special top marking available-consult CTS                                                                                                            |
| Packaging :                 | Standard anti-static tube packaging for through hole terminal<br>Standard tape and reel packaging for gull wing terminal                             |
| Operating Temperature Range | -40°C to +85°C                                                                                                                                       |
| Storage Temperature Range:  | -40°C to +85°C                                                                                                                                       |

## Soldering Profile



### Mechanical Specifications

Figure 1 – 220AM\_10, 16R - Surface Mount Gull Wing, 10 and 16 Position

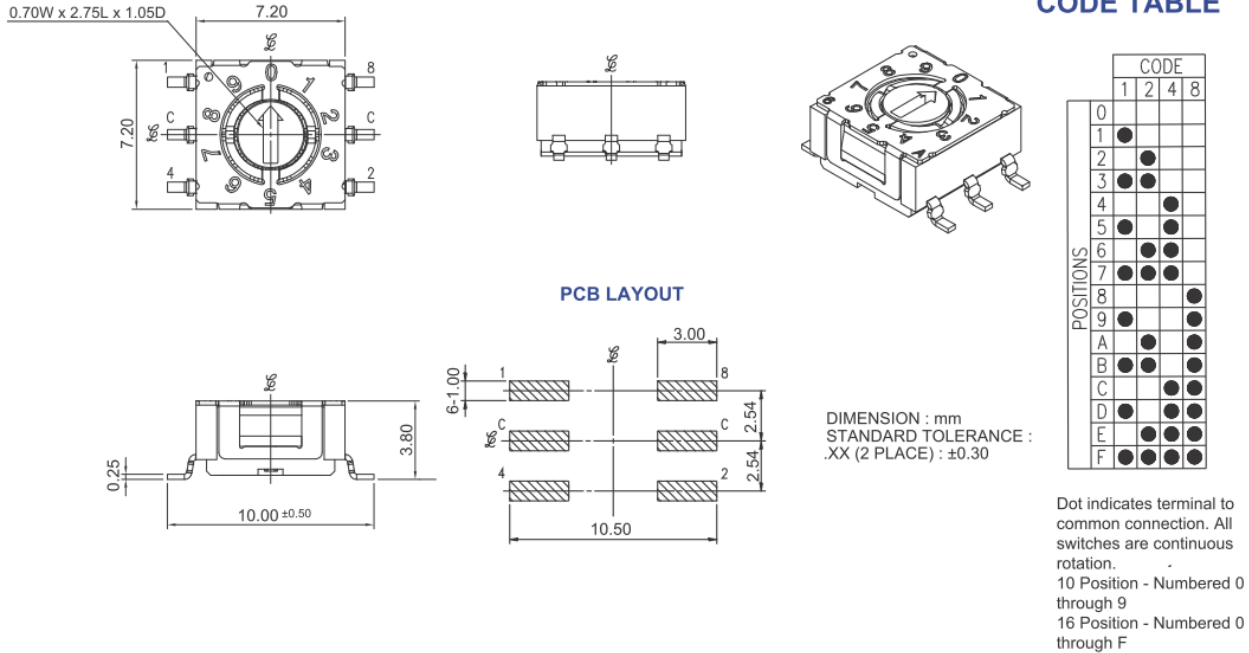


Figure 2 – 220AD\_10, 16 - Standard Through Hole, 10 and 16 Position

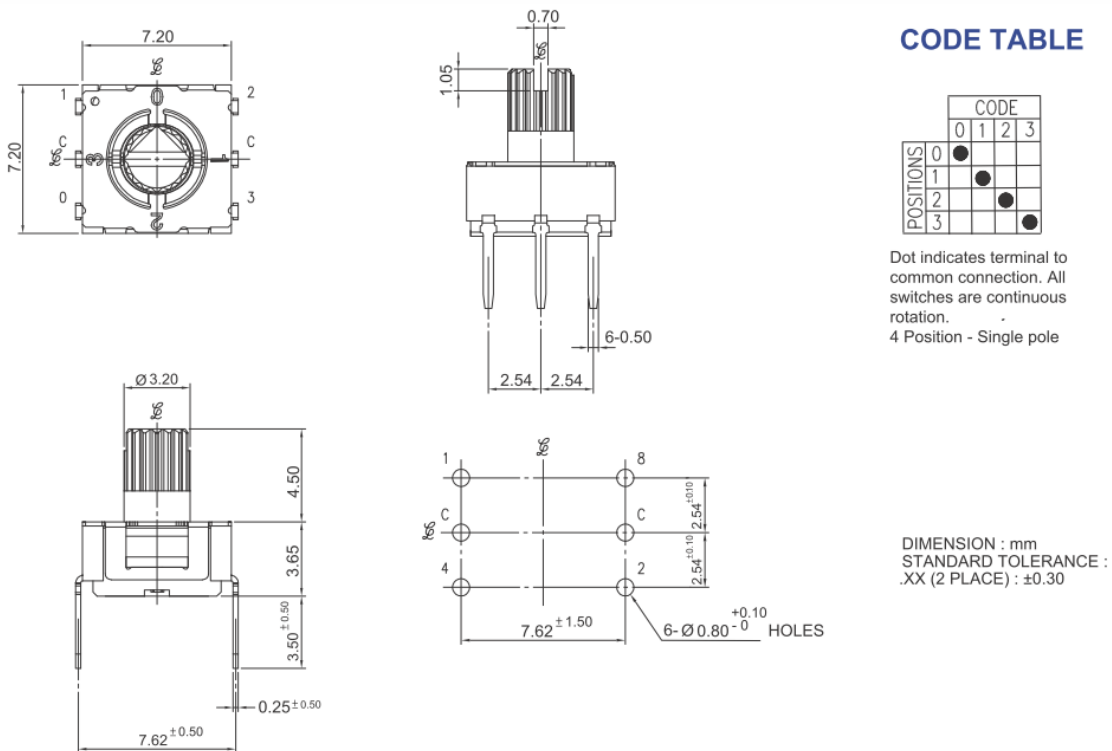
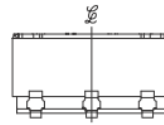
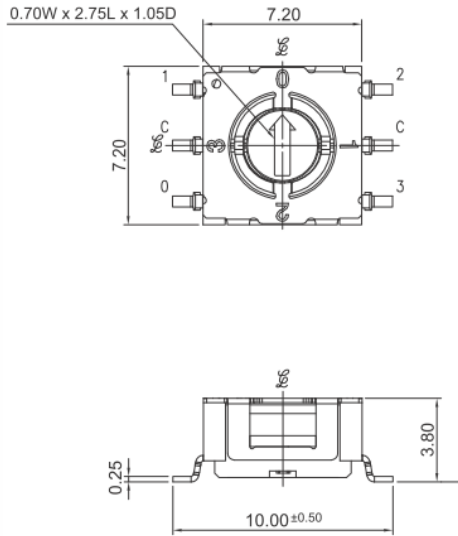
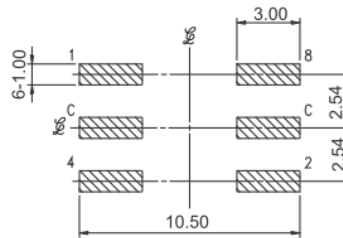


Figure 3 – 220AM\_04R - Surface Mount Gull Wing, 4 Position



**PCB LAYOUT**



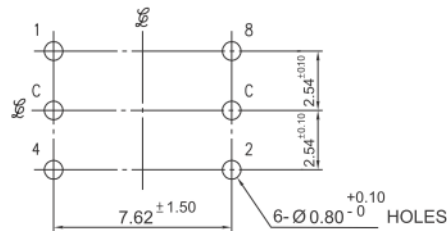
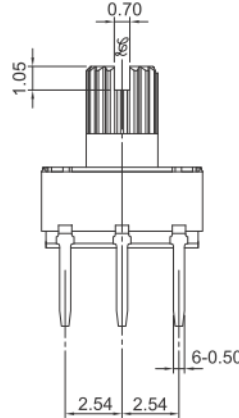
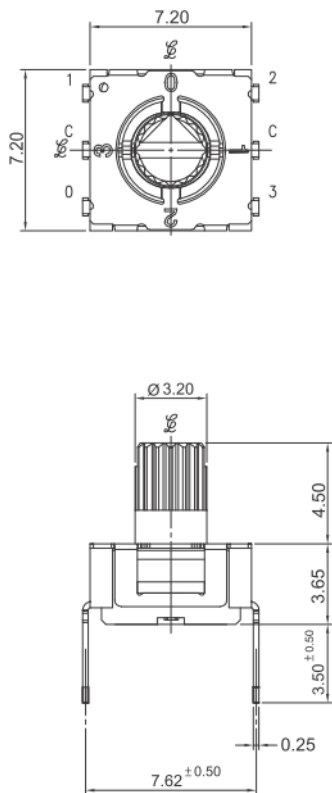
**CODE TABLE**

|           |   | CODE |   |   |   |
|-----------|---|------|---|---|---|
|           |   | 0    | 1 | 2 | 3 |
| POSITIONS | 0 | ●    |   |   |   |
|           | 1 |      | ● |   |   |
|           | 2 |      |   | ● |   |
|           | 3 |      |   |   | ● |

Dot indicates terminal to common connection. All switches are continuous rotation.  
4 Position - Single pole

DIMENSION : mm  
STANDARD TOLERANCE :  
.XX (2 PLACE) : ±0.30

Figure 4 – 220AD\_04 - Standard Through Hole, 4 Position

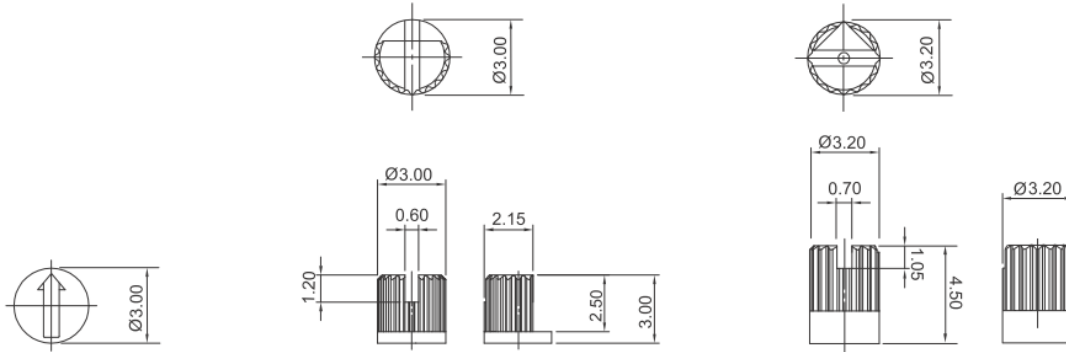


**CODE TABLE**

|           |   | CODE |   |   |   |
|-----------|---|------|---|---|---|
|           |   | 0    | 1 | 2 | 3 |
| POSITIONS | 0 | ●    |   |   |   |
|           | 1 |      | ● |   |   |
|           | 2 |      |   | ● |   |
|           | 3 |      |   |   | ● |

Dot indicates terminal to common connection. All switches are continuous rotation.  
4 Position - Single pole

DIMENSION : mm  
STANDARD TOLERANCE :  
.XX (2 PLACE) : ±0.30



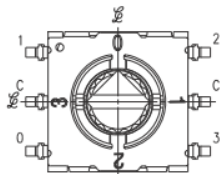
A: FLUSH ARROW ROTOR

B: KNURLED, SLOTTED, FLATTED SHAFT

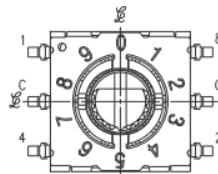
C: KNURLED, SLOTTED SHAFT

DIMENSION : mm  
STANDARD TOLERANCE :  
.XX (2 PLACE) : ±0.30

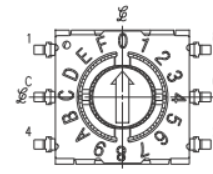
Position Options



04: 4 POSITIONS



10: 10 POSITIONS

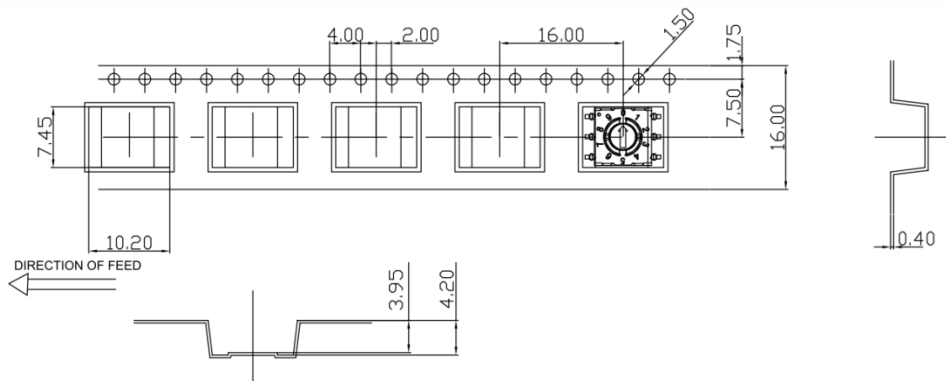


16: 16 POSITIONS

Packing: Tape and Reel

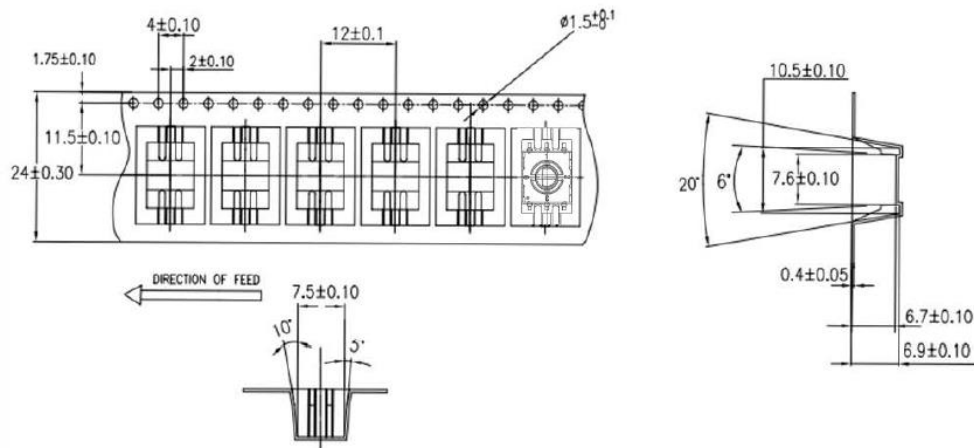
TAPE : ↕

(A) 220AMAxxR –MATERIAL& DIMENSIONS: ↕



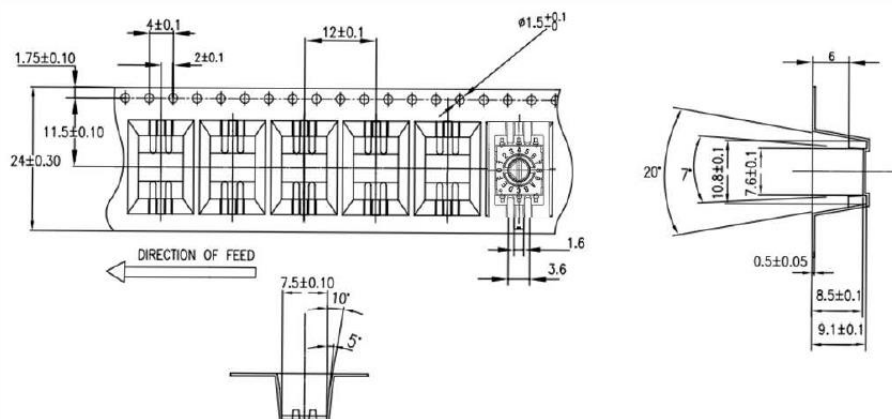
**MATERIAL: CONDUCTIVE POLYSTYRENE, BLACK COLOR**  
**ALL DIMENSIONS MEET EIA-481-2A REQUIREMENTS**  
**CARRIER TAPE THICKNESS: 0.40±0.05MM.**  
**PACKING LENGTH PER 13" REEL: 16.6 METERS.**  
**COMPONENT LOADED PER 13" REEL: 1038 PCS.**  
**SPQ: 1000 PCS/ REEL**

**(B) 220AMBxxR – MATERIAL & DIMENSIONS:**



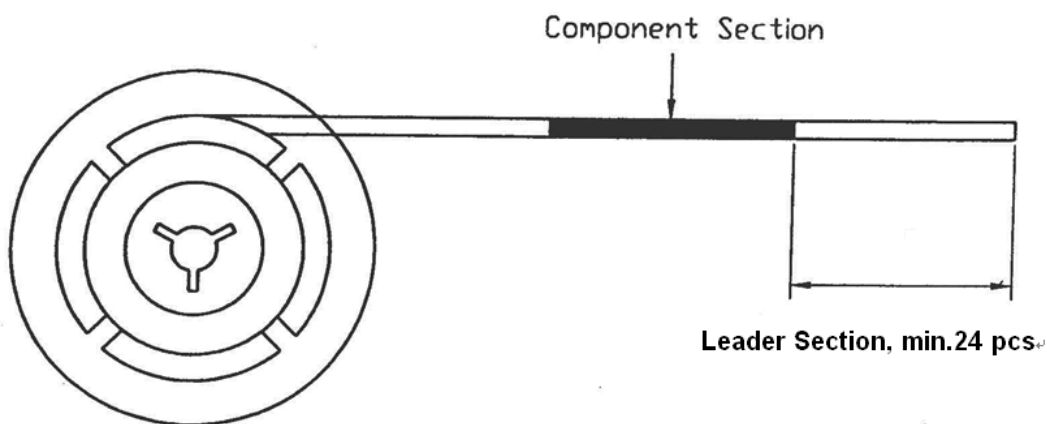
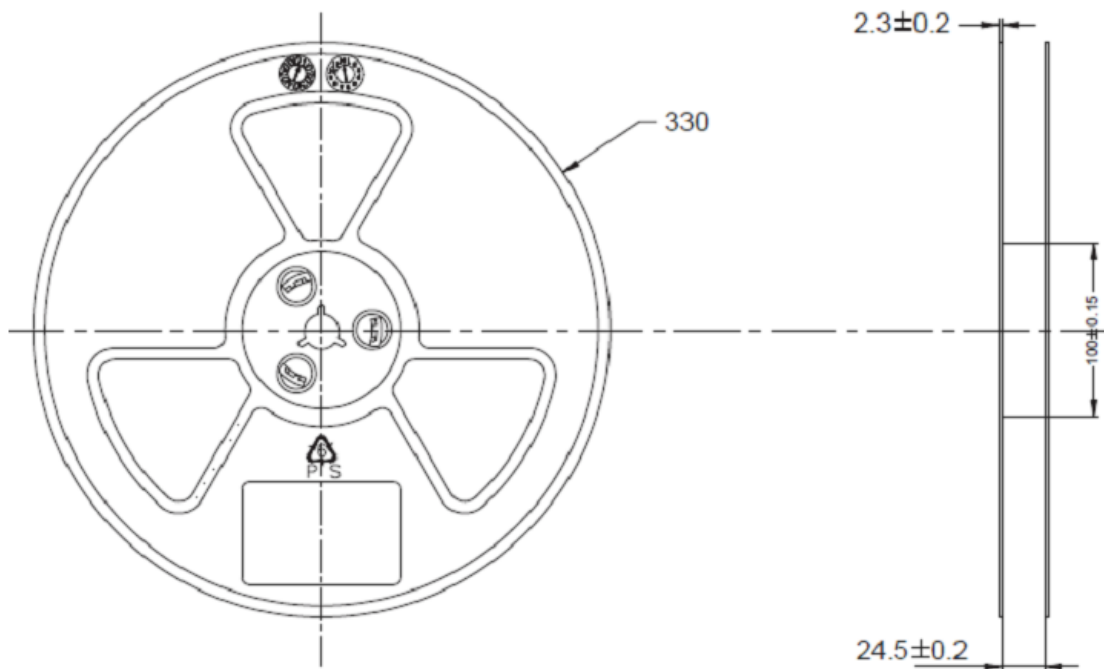
**MATERIAL: ANTI-STATIC POLYSTYRENE, TRANSPARENT, BLACK COLOR**  
**ALL DIMENSIONS MEET EIA-481-B REQUIREMENTS**  
**CARRIER TAPE THICKNESS: 0.40±0.05MM.**  
**PACKING LENGTH PER 13" REEL: 8.93 METERS.**  
**COMPONENT LOADED PER 13" REEL: 744 PCS.**  
**SPQ: 700 PCS/REEL**

**(C) 220AMCxxR – MATERIAL & DIMENSIONS:**



REEL:

(A) SPECIFIED REEL PARTS DIMENSIONS : (COMMON TO ALL SMT COMPONENTS)



**TAPE BREAK FORCE, PEEL STRENGTH AND ANGLE:  
REQUIRED SETTINGS :**

- TOP COVER TAPE PEEL FORCE : 10 ~ 140 gm
- ANGLE BETWEEN THE TOP COVER TAPE AND THE DIRECTION OF FEED DURING PEEL OFF : 165° ~ 180°



**THE COVER TAPES MAY NOT EXTEND OVER THE DEGE OF THE CARRIER TAPE OR COVER ANY PART OF THE SPROCKETS HOLES.**